PREMO Catalogue - Aldinet

PREMO

GENERAL CATALOGUE 2023

LEGAL DISCLAIMER

"All the information contained in this catalogue is for general guidance on any matters of interest. As such, it should not be used as a substitute for consultation with professional Premo technicians or competent advisers. Before making any decision or taking any action, you should consult a Premo professional for updated and detailed information." "Given the changing nature of the electronic market, and the inherent hazards of publications and communication, there may be omissions or inaccuracies in the information contained in this catalogue. Furthermore all the information and characteristics contained can be changed without any prior warning." "All products contained in this catalogue have been designed by PREMO S.L. and the unauthorized copy of them is strictly prohibited." "All images on this catalogue, including text, photos, illustrations, graphs, tradenames, logos and components are fully owned or under licence of Premo Group and are protected by copyright, trademark rights and/or any other intellectual property rights. The (intellectual) property right is in no way transferred to the (legal) entity that has access to this catalogue." "All products in this catalogue are sold under the General Terms and Sales Conditions of PREMO S.L. available at www.grupopremo.com"

PREMO 3DCoil is protected under spanish patent number: P200102446
3DCoil Cap Adaptor is protected under Spanish patent number: W2013003888
3DCoil Split Base is protected under Spanish patent number: EP14380009
Alma Flexible Antenna is protected under Spanish patent number: EP16380004
PREMO planar transformers are protected under Spanish patent numer: P200201465
3DPower technology is protected under international patent: WO2018083249
PREMO inductive coupler is protected under european patent: Blocking filter is protected under Spanish patent number: ES1134166U

To get more information about PREMO patents please check out: ***PREMO Innovation: The Patents Book.***

PREMO S.L.

Severo Ochoa 47 Parque Tecnológico de Andalucía
29590 Campanillas - Málaga - Spain
T: +34 951 231 320

info@grupopremo.com
www.grupopremo.com

https://3dcoil.grupopremo.com
3dpower.grupopremo.com

GENERAL CATALOGUE 2023

Aldinet

CONTENTS

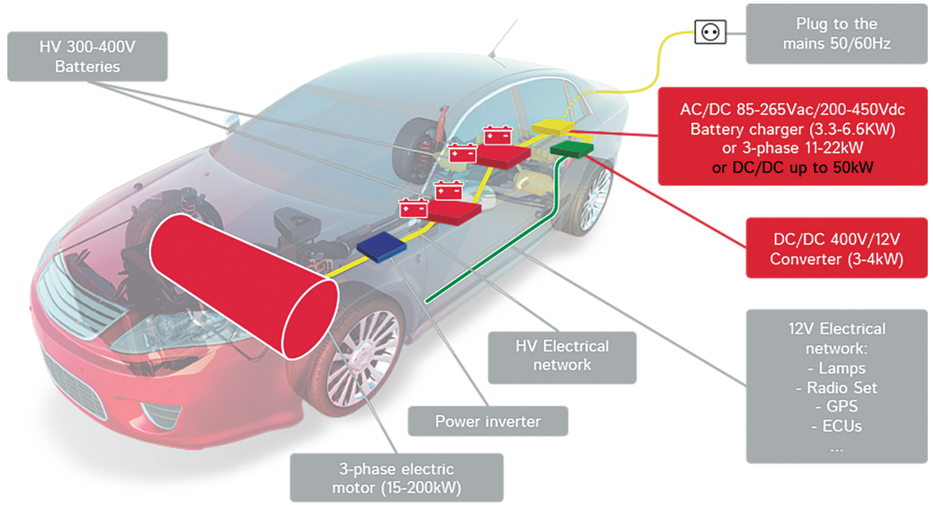
INDEX

Aldinet

01

RFID TRANSPONDERS

01 PASSIVE KEYLESS ENTRY

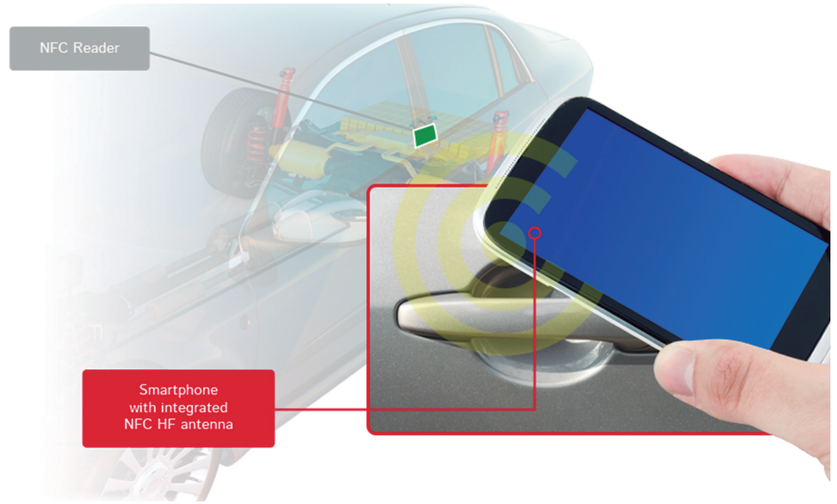


Passive Keyless Entry system, is a generic term for an automotive technology which allows a driver to lock and unlock a vehicle without using the corresponding keyfob buttons. This technology is based on Radio Frequency Identification (RFID). Once a driver enters a vehicle with an equipped PKE or Keyless Go keyfob (or cardkey), they have the ability to start and stop the engine, without inserting the SmartKey. A transponder antenna built within the keyfob allows the vehicle to identify a driver. The SMD components located in the smart key are required high levels of sensitivity, good temperature stability and robustness against mechanical shocks and drops.

The system works by having a series of LF (low frequency 125 kHz) transmitting antennas both inside and outside the vehicle. The external antennas are located in the door handles, mirrors, or trunk position.

When the vehicle is triggered either by pulling the handle or touching the handle an LF signal is transmitted from the antennas to the key. The key becomes activated if it is sufficiently close and it transmits its ID back to the vehicle via RF (Radio frequency >300 MHz) to a receiver located in the vehicle. If the key has the correct ID the module unlocks the vehicle.

02 NFC



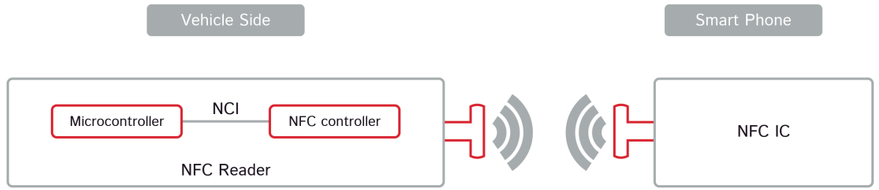
After the boom of Near field communication (NFC) applications in mobile environments, this technology is spreading to the automotive sector enabling advanced services like user authentication, secure communications and e-payment.

The industry is introducing several and innovative applications in today's cars that are taking advantage of NFC technology main properties: data transmission (near field contactless) and identification/encrypted data, including smart car access, electronic immobilizer, data streaming and pairing, e-payment, car user settings, diagnosis and status of the car, etc. This technology enables improvements on current applications like car access (PKE/RKE) and electronic immobilizer systems, providing a secure and most robust architecture for communications between car and user device (Smartphone).

In a typical car access application, the final user could use his mobile device (smartkey or Smartphone) with NFC functionality, locating it close to some external area of the vehicle, for example, the side mirror,

equipped with an NFC antenna, and connected with a reader inside the vehicle (and finally connected with the control unit of the car). A secure communication will be established (Near Field Communication at 13,56MHz) between the user device and the control unit of the car. After authentication / identification was been verified, the car unlocks the doors allowing the user access.

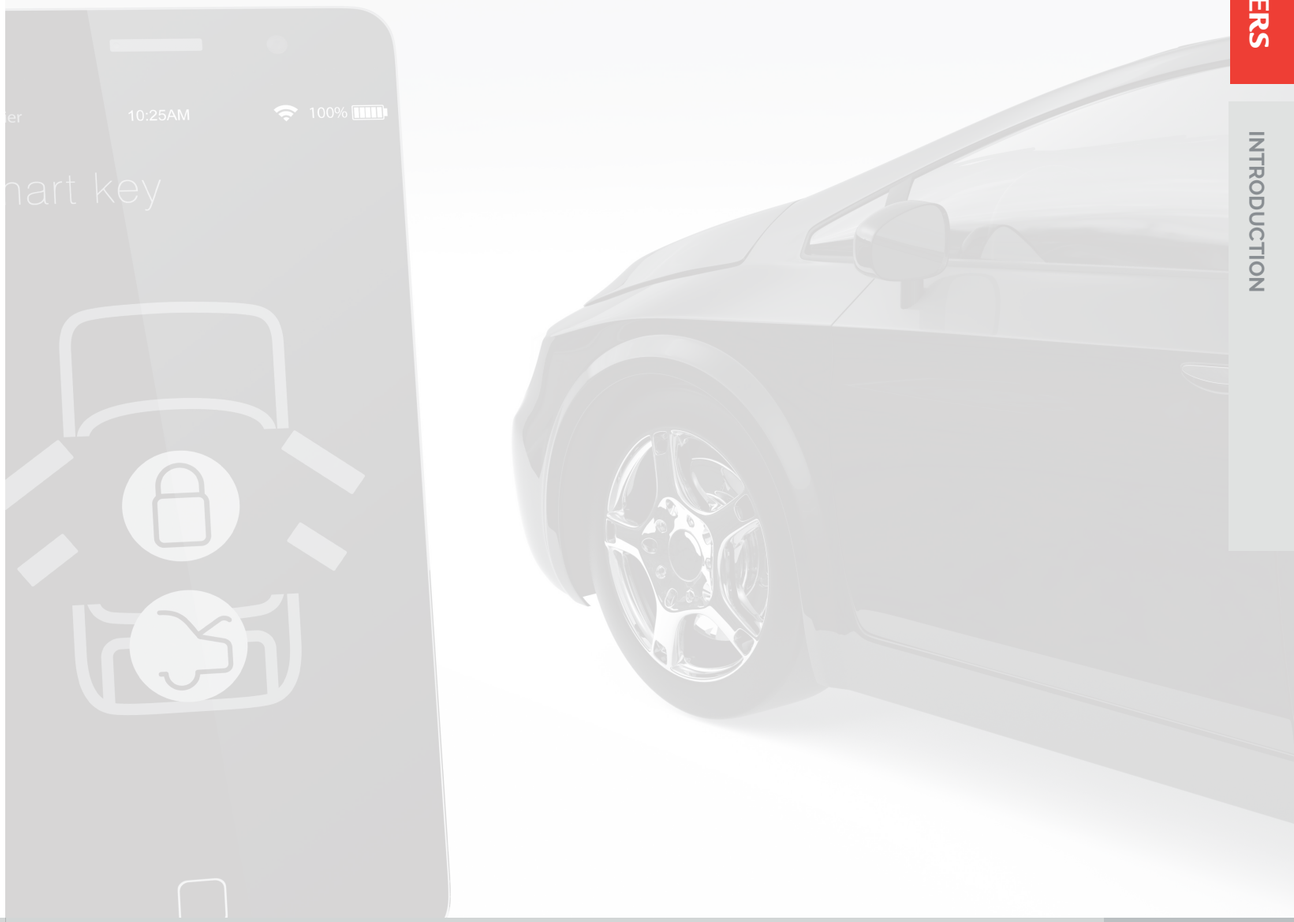
To meet the growing integration of NFC applications in the automotive market, PREMO has developed an outstanding NFC antenna product range (13.56MHz) very well suited for mobile devices.



Custom
NFC Tx antenna

Standard
NFC Rx antenna

- SDTR1103HF
- ZC1003HF
- 4DCOIL
- 2D1D15
- 3DC15HF



	New  TP502CAP	 TP0602	New  TP0602CAP
Size (L x W x H)mm	5.4x2.8x2.9	6.6x2.3x1.75	7.1x2.9x2.05
Construction	Metallized ferrite	Metallized ferrite	Metallized ferrite
Production status	Mass production	In mass production	Mass Production
Applications	RTPMS, Inmobilizer	RTPMS, Inmobilizer	RTPMS, Inmobilizer
Inductance range	5.89-16.0 mH @125 kHz	2.38 mH to 10.8mH @125 kHz	2.38-10.8 mH @125 kHz
Q factors	20-22	>30	18-22
Sensitivity levels	20-40 mV/uT	> 50 mVpp/App/m	12-40 mV/uT
Temperature stability	200 ppm (-40 -> +125 °C)	200 ppm (-40 -> +125 °C)	200 ppm (-40 -> +125 °C)
Drop test perfomance		150 times 1 m	150 times 1 m
Notes			
Page number	**28**	**30**	**32**

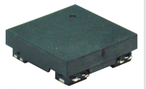
	 TP0702	 TP0702U	 TP0702UCAP
Size (L x W x H)mm	7.7x2.5x2.2	7.8x2.5x2.2MAX	8.7x2.7x3 MAX
Construction	Metallized ferrite	Metallized ferrite	Metallized ferrite
Production status	In mass production	Mass production	Mass production in 2013
Applications	RTPMS, Inmobilizer	RTPMS, Inmobilizer	RTPMS, Inmobilizer
Inductance range	2.38 mH to 10.8mH @125 kHz	2.38mH-9mH @125 kHz	2.38mH-9mH @125 kHz
Q factors	>20	>30	>30
Sensitivity levels	>50 mVpp/App/m	25 mVpp /App / m	25 mVpp /App / m
Temperature stability	200 ppm (-40 -> +125 °C)	200ppm (-40°C -> +125°C)	200ppm (-40°C -> +125°C)
Drop test perfomance	300 times 1 m	150 times 1 m	300 times 1 m
Notes		Other inductances under request	Other inductances under request
Page number	**34**	**36**	**38**

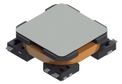
	 TP0702CAP	 TR1102	 TR1102CAP
Size (L x W x H)mm	8.7x2.7x3 MAX	11x2.6x2.2	11.9x3.2x2.6 MAX
Construction	Metallized ferrite	Metallized ferrite	Metallized ferrite
Production status	Mass production in 2013	In mass production	Mass production
Applications	2.38 mH to 10.8 mH @ 125 kHz	RTPMS, Inmobilizer	RTPMS, Inmobilizer
Inductance range	2.38 mH to 10.8mH @125 kHz	290µH to 16.2 mH @125 kHz	2.38mH-9mH
Q factors	>20	>30	>30
Sensitivity levels	>50 mVpp/App/m	>75 mVpp/App/m	>75 mVpp/App/m
Temperature stability	200 ppm (-40 -> +125 °C)	450 ppm (-40 -> +125 °C)	450ppm (-40°C -> +125°C)
Drop test perfomance	300 times 1 m	20 times 1 m	20 times 1 m
Notes		Plastic cap available	Other inductance values under request
Page number	**40**	**42**	**44**

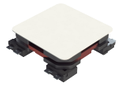
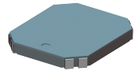
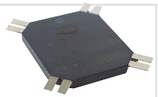
	 SDTR1103	 SDTR1103CAP	 SDTR1103-HF1
Size (L x W x H)mm	11.8x3.6x2.5 MAX	12.1x4x2.9 MAX	11.8x3.6x2.5 MAX
Construction	Plastic +Ferrite	Plastic + ferrite	Plastic +Ferrite
Production status	In mass production	Mass production	
Applications	RTPMS, Inmobilizer, KES	RTPMS, Inmobilizer, KES	RFID readers
Inductance range	340µH to 16.2 mH @125 kHz	2.38mH-9mH	100uH-400uH @ 2 kHz
Q factors	>40	>40	>45
Sensitivity levels	> 80 mVpp/App/m	> 80 mVpp /App / m	
Temperature stability	200 ppm (-40 -> +125 °C)	200 ppm (-40 -> +125 °C)	
Drop test perfomance	500 times 1 m	500 times 1 m	500 times 1 m
Notes	Optional coating	Other inductances under request	Other inductances under request
Page number	**46**	**48**	**50**

	ZC1003	ZAC1203
		
Size (L x W x H)mm	10x10x3.2	14.3x12x2.5
Construction	Plastic + ferrite	Plastic bobbin
Production status	In mass production	In mass production
Applications	RTPMS, Inmobilizer, KES, Logistics, Industrial	RTPMS, Inmobilizer, KES, Logistics
Inductance range	2.38 mH to 16.2 mH @125kHz	2.38 mH to 6.38 mH @ 125 kHz
Q factors	>80	>20
Sensitivity levels	>65 mVpp/App/m	>50 mVpp/App/m
Temperature stability	200 ppm (-40 -> +125 °C)	200 ppm (-40 -> +125 °C)
Drop test perfomance	300 times 1 m	300 times 1 m
Notes		
Page number	**52**	**54**

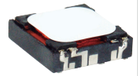
	3DC06ISO	3DC09LP	3DC11LP
			
Size (L x W x H)mm	7X7X2.3	9.5X9.5X3.1	13x11.6x3.20 mm MAX
Construction	Plastic + ferrite	Plastic + ferrite	Plastic + ferrite
Production status	In mass production	In masss production	In mass production
Applications	KES, Inmobilizer	KES, Inmobilizer	RTPMS, Inmobilizer, KES
Inductance range	2.38 – 10.5 mH	2.38 – 7.2 mH	2.38 mH to 7.2 mH @125 kHz
Q factors	>15	>15	>15
Sensitivity levels	>37	>80	>75 mVpp/App/m
Temperature stability	300 ppm (-40 ->+85 °C)	300 ppm (-40 ->+85 °C)	200 ppm (-40 -> +125 °C)
Drop test perfomance	500 times 1 m	500 times 1 m	500 times 1 m
Notes	Plastic cap, AOI	Plastic cap, AOI	Plastic cap, foam label available.
Page number	**62**	**64**	**66**

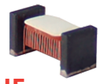
	3DC11LP-AOI	3DC11LP-AOIF	3DC11LP-AOIC
			
Size (L x W x H)mm	13x11.6x3.20 mm MAX	13X11.6X4.70 mm	13X12.7x4.15 mm
Construction	Plastic + ferrite	Ferrite + plastic	Ferrite + plastic
Production status	In mass production	In mass production	In mass production
Applications	RTPMS, Inmobilizer, KES	KES, shock absorbing env.	RTPMS, Inmobilizer, KES
Inductance range	2.38 mH to 7.2 mH @125 kHz	2.38 mH to 7.2 mH @125 kHz	2.38 mH to 7.2 mH @125 kHz
Q factors	>20	35 to 20	35 to 20
Sensitivity levels	>75 mVpp/App/m	>75 mV/A/m	>75 mV/A/m @125 kHz
Temperature stability	200 ppm (-40 -> +125 °C)	200 ppm (-40 -> +125 °C)	200 ppm (-40 ->+125°C)
Drop test perfomance	500 times 1 m	500 times 1 m	400 times 1 m
Notes	Plastic cap, foam label available, AOI	Foam label, AOI	Plastic+ferrite+cap
Page number	**68**	**70**	**72**

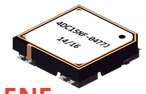
	 3DC11CAP	 3DC11F	 3DC11AOI-05DR
Size (L x W x H)mm	13X12.8X3.7 mm	13X11.6X4.35 mm	13x11.6x3.9
Construction	Plastic +Ferrite	Plastic + derrite + foam	Plastic + ferrite
Production status	In mass production	In mass production	Development
Applications	RTPMS, Inmobilizer, KES	KES, shock absorbing env	PKE
Inductance range	2.38 mH to 7.2 mH @125 kHz	2.38 mH to 7.2 mH @125 kHz	4,91-7,2mH @125 kHz
Q factors	>15	>15	18-22
Sensitivity levels	>75 mV/A/m @125 kHz	>75 mV/A/m @125 kHz	72-80 mV/A/m @125 kHz
Temperature stability	200 ppm (-40 -> +125 °C)	200 ppm (-40 -> +125 °C)	200 ppm (-40 ->+125°C)
Drop test perfomance	400 times 1 m	500 times 1 m	300 times 1 m
Notes	Plastic+ferrite+cap	Foam label	Plastic cap, foam label available
Page number	**74**	**76**	**78**

	 3DC11DR	New  3DC14EM-ULP	New  3DC14EMR-ULP
Size (L x W x H)mm	13x11.6x3.5	14.4x12.2x1.65	14x12x1.65
Construction	Plastic +Ferrite	Ferrite + Epoxi	Ferrite + Epoxi
Production status	In mass production	Development	Development
Applications	PKE	PKE	PKE
Inductance range	4,91-10mH @125 kHz	2.38-9mH	2.38-4.5mH (x,y)/4.5-9mH (z)
Q factors	25-35	15-25	15-25
Sensitivity levels	60-100 mV/A/m @125 kHz	40-65	40-60
Temperature stability	200 ppm (-40 -> +125 °C)	400 ppm (-40->+85°C)	
Drop test perfomance	300 times 1 m		
Notes	Plastic cap, foam label available	Ferrite + Epoxi molding	Ferrite + Epoxi molding
Page number	**80**	**82**	**84**

	 3DC1515	 3DC15CAP	 3DC15F
Size (L x W x H)mm	17.5x16x4 MAX	17.5X16X4.30	17.5X15.5X5
Construction	Plastic + ferrite	Plastic + ferrite	Plastic + ferrite + foam
Production status	In mass production	In mass production	In mass production
Applications	RTPMS, Inmobilizer, KES,	RTPMS, Inmobilizer, KES	KES, shock absorbing env.
Inductance range	340µH to 10 mH @125 kHz	340 µH to 10 mH @125 kHz	340 µH to 10 mH @125 kHz
Q factors	25	25	25
Sensitivity levels	>105 mVpp/App/m @125 kHz	>105 mV/A/m @125 kHz	>105 mV/A/m @125 kHz
Temperature stability	200 ppm (-40 -> +125 °C)	200 ppm (-40 -> +125 °C)	200 ppm (-40 -> +125 °C)
Drop test perfomance	500 times 1 m	400 times 1 m	500 times 1 m
Notes	Plastic cap, foam label available	Plastic+ferrite+cap	Foam label
Page number	**86**	**88**	**90**

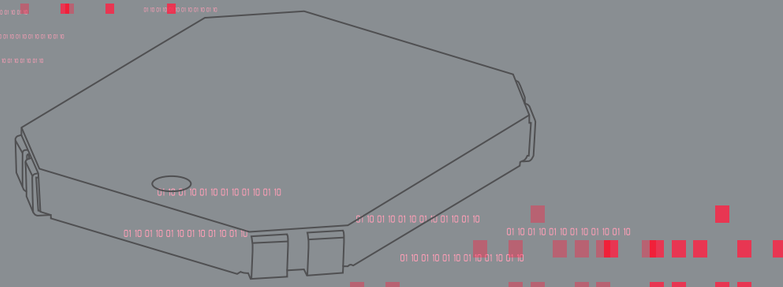
	New  3DC12S	New  3DC13S	New  3DC14S
Size (L x W x H)mm	12.5x13.5.x3.6	13.25x13.55x4.05	13.25x13.55x4.05mm
Construction	Plastic + Ferrite	Plastic + Ferrite	Plastic + Ferrite
Production status	Mass Production	Mass Production	Mass Production
Applications	PKE	PKE	PKE
Inductance range	2.36-7.2mH @125 kHz	2.36-7.2mH @125 kHz	2.36-7.2mH @125 kHz
Q factors	18-35	20-45	20-45
Sensitivity levels	42-75 mV/A/m @125 kHz	40-60 mV/A/m @125 kHz	40-60 mV/A/m @125 kHz
Temperature stability	200 ppm (-40 -> +125 °C)	200 ppm (-40 -> +125 °C)	200 ppm (-40 -> +125 °C)
Drop test perfomance	500 times 1 m	300 times 1 m	300 times 1 m
Notes	Foam label available	Foam label available	Foam label available
Page number	**92**	**94**	**96**

	 TC0502HF	 SDTR1103-HF2	 3DC15HF
Size (L x W x H)mm	5.4x2.8x2.85	11.8x3.6x2.5 MAX	17.5x16x4 MAX
Construction	Metallized ferrite	Plastic + ferrite	Plastic + ferrite
Production status	In mass production		In mass production
Applications	NFC	NFC	NFC
Inductance range	2-4.7uH @13,56 kHz	1uH-20uH @13,56 kHz	3uH-18uH @13,56 kHz
Q factors	15-18	>20	15-24
Sensitivity levels			
Temperature stability			
Drop test perfomance		500 times 1 m	500 times 1 m
Notes			
Page number	**100**	**102**	**104**

	 4DC15NF	 2D1D15	 ZC1003HF
Size (L x W x H)	16x17.2x4.1	17x15.6x3.7	10.0x10.0x3.1 MAX
Construction	Ferrite + plastic	Plastic +Ferrite	Plastic + ferrite
Production status	In mass production	In mass production	
Applications	NFC/PKE	KES, NFC	NFC
Inductance range	4.7mH (125kHz)/0.85uH (13.56MHz)	2.38-7.2 mH; 6 uH	22uH-45uH
Q factors	>24 (125kHz) / >4.5 (13.56MHz)	>20	>80
Sensitivity levels		>75 mV/A/m	
Temperature stability		200 ppm (-40 ->+85 °C)	
Drop test perfomance		500 times 1 m	
Notes			
Page number	**106**	**108**	**110**

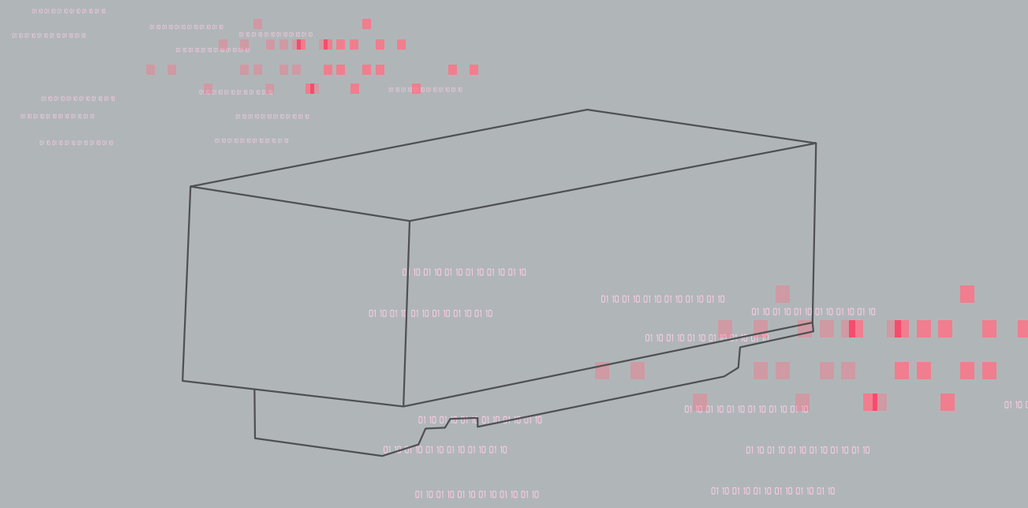
1.1

RFID TRANSPONDERS



1.1.1

RFID TRANSPONDERS
SINGLE AXIS TRANSPONDER INDUCTORS



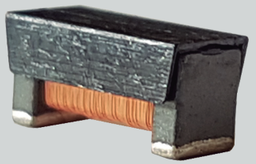
New

TP0502CAP

SMD Transponder Coil with CAP

5.4x2.8x2.9mm

SINGLE AXIS TRANSPONDERS INDUCTORS



FEATURES

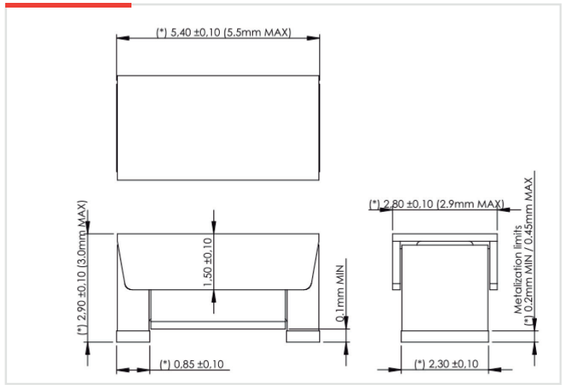
This single axis transponder suitable for Surface Mountable process combines a very small size and a good electrical performance and stability in temperature. A very good solution for RTPMS.

01 CHARACTERISTICS

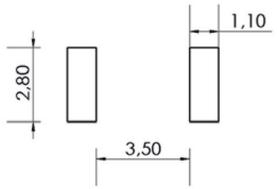
- Very small size: 5.4x2.8x2.9mm
- Good mechanical performance
- Good sensitivity in small volume
- Very stable electrical properties in full operational operative range (-40°C +125°C)
- Wire: H, 125°C solderable.
- Terminals: Ag-Ni-Sn100
- Max. Operating Temperature: +125°C
- Suitable for Pick&Place SMD assembly
- This component is also functional to 20kHz and 134kHz.

02 SPECIFICATIONS

DIMENSIONS (mm)



RECOMMENDED PAD-LAYOUT



› Standard tolerances: ±0.1mm

ELECTRICAL SPECIFICATIONS | 125kHz

Code	L (mH)	Q min	SRF (kHz) Min	Cres (pF)	DCR (Ω) Max	Sensitivity (mV/uT) min	Dimensions (mm) Max
TP0502CAP-0589J	5.89 ± 5%	22	550	270	96.8	20	5.4 x 2.8 x 2.9
TP0502CAP-0720J	7.2 ± 5%	20	550	220	107.8	25	5.4 x 2.8 x 2.9
TP0502CAP-1600J	16.0 ± 5%	21	400	100	191.4	40	5.4 x 2.8 x 2.9

TP0602

Micro SMD Hard Ferrite Transponder Inductor

6.6x2.3x1.75mm (2.38mH - 10.8mH)

SINGLE AXIS TRANSPONDERS INDUCTORS

FEATURES

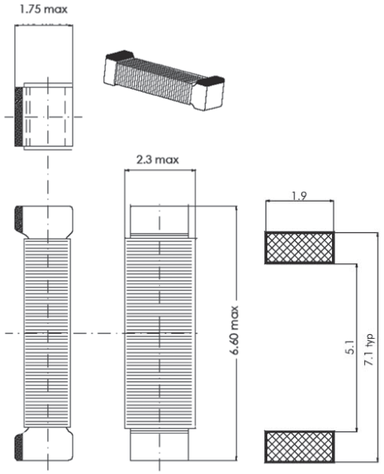
The TP0602 Series of Surface Mountable ferrite wound inductor **is a small transponder solution for automotive applications like TPMS, Keyless Go and Keyless entry systems.**

01 CHARACTERISTICS

- Size: 6.6mm x 2.3mm x 1.75mm.
- Good mechanical performance.
- High sensitivity for 20KHz,40KHz and 125KHz applications.
- Good perfomance in thermal shock test.
- Good cost/perfomance ratio.
- Available high inductance version for hearing aids applications.
- Good solution for TPMS moulded solutions.
- The TP0602 is the smaller SMD transponder coil available in the market.
- This component is also functional to 20kHz and 134kHz.

02 SPECIFICATIONS

DIMENSIONS AND RECOMMENDED PAD-LAYOUT (mm)



› Standard tolerances: ±0.1mm

ELECTRICAL SPECIFICATIONS 20kHz

P/N	L (mH)	Toler.	Q min	SRF Min (kHz)
TP0602-124J	120	±5%	4	100
TP0602-104J	100	±5%	5.0	120
TP0602-823J	82	±5%	5.6	140
TP0602-673J	67	±5%	5.2	100
TP0602-563J	56	±5%	7.5	190
TP0602-473J	47	±5%	8.0	200
TP0602-333J	33	±5%	10	200

ELECTRICAL SPECIFICATIONS | 125kHz

P/N	L (mH)	Tolerance	Q min	SRF Min (kHz)	Sensitivity (mVpp/App/m) min
TP0602-0238J	2.38	±5%	20.7	900	16
TP0602-0491J	4.91	±5%	20.7	600	25
TP0602-0720J	7.20	±5%	18	500	30
TP0602-0900J	9.00	±5%	18	450	35

Operating and test freq: 125kHz.
SRF: Self-resonant frequency of the coil.
C: Capacitor for tuning circuits (125khz).
This chart is a reference guide for the most common required values at working frequency of 125 kHz. Any other inductance value at LF or tighter tolerances can be provided. Please contact our sales department for any inquiry.
Sensitivity measured with Helmholtz coils H=8.36 App/m @125 kHz.
Contact us for measurement specification.

- Terminals: Ag-Ni-Sn100.
- Wire: H, 180°C, Solderable.
- Max. Operating Temperature 125°C.
- Refer to the General Features of SMD
- transponder inductors page.

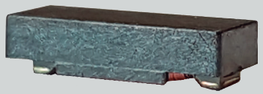
New

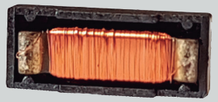
TP0602CAP

Micro SMD Hard Ferrite Transponder Inductor

7.1x2.9x2.05mm

SINGLE AXIS TRANSPONDERS INDUCTORS





FEATURES

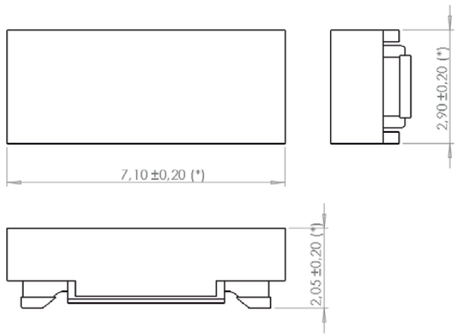
This single axis transponder suitable for Surface Mountable process combines a very small size and a good electrical performance and stability in temperature. A very good solution for RTPMS.

01 CHARACTERISTICS

- Very small size: 7.1x2.9x2.05mm
- Good mechanical performance
- Good sensitivity in small volume
- Very stable electrical properties in full operational operative range (-40°C +125°C)
- Wire: H, 125°C solderable.
- Terminals: Ag-Ni-Sn100
- Max. Operating Temperature: +125°C
- Suitable for Pick&Place SMD assembly
- This component is also functional to 20kHz and 134kHz.

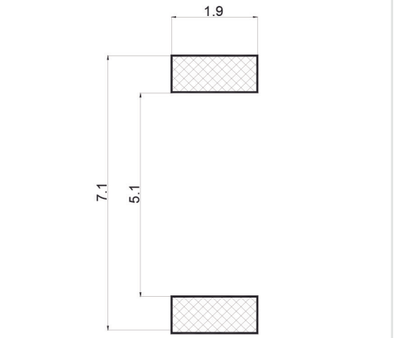
02 SPECIFICATIONS

DIMENSIONS (mm)



› Standard tolerances: ±0.1mm

RECOMMENDED PAD-LAYOUT



ELECTRICAL SPECIFICATIONS | 125kHz

Code	L (mH)	Q min	SRF (kHz) Min	Cres (pF)	DCR (Ω) Max	Sensitivity (mV/uT) min	Dimensions (mm) Max
TP0602CAP-0238J	2.38 ± 5%	21	900	680	49.5	12	7.1 x 2.9 x 2.05
TP0602CAP-0491J	4.91 ± 5%	20	600	330	95.2	20	7.1 x 2.9 x 2.05
TP0602CAP-0720J	7.2 ± 5%	18	500	220	168.3	23	7.1 x 2.9 x 2.05
TP0602CAP-0900J	9.0 ± 5%	18	450	180	190.3	27	7.1 x 2.9 x 2.05
TP0602CAP-1080J	10.8 ± 5%	20	400	150	220.0	39	7.1 x 2.9 x 2.05

This chart is a reference guide for the most common required values at working frequency of 125kHz. Any other inductance value at LF or tighter tolerances can be provided. Please contact our sales department for any inquiry. Sensitivity measured with Helmholtz coils H=8.36 App/m @125kHz. Contact us for measurement specification.
SRF: Self-resonant frequency of the coil
Cres: Capacitor for tuning circuits (125kHz)

TP0702

SMD Hard Ferrite Mechanically Improved Transponder Inductor

7.7x3x2.5x2.2mm (2.38mH - 10.8mH)

SINGLE AXIS TRANSPONDERS INDUCTORS

FEATURES

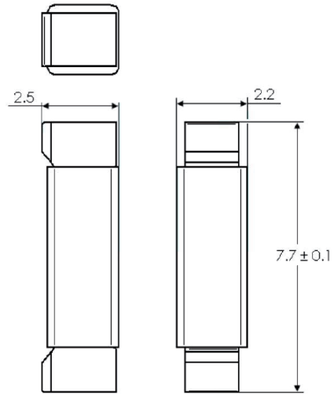
This TP0702 Series of Surface Mountable ferrite wound inductor is a stronger solution in very small dimensions performing very good electrical properties, **a very good solution for RTPMS, Keyless Go and Keyless entry systems.**

01 CHARACTERISTICS

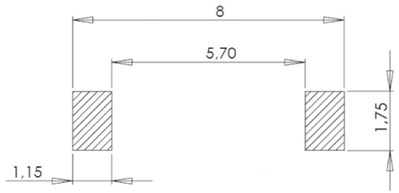
- Size: 7.7 x 3 x 2.2 mm.
- Very good mechanical performance.
- High sensitivity in the smallest volume.
- Very stable electrical properties in full operational temperature range (-40 g +125 °C).
- Good performance in thermal shock.
- Big metallised pad area Pb free.
- Good cost/performance ratio.
- Due to its small dimensions, it's a suitable design for other applications working at lower frequencies.
- This component is also functional to 20kHz and 134kHz.

02 SPECIFICATIONS

DIMENSIONS (mm)



RECOMMENDED PAD-LAYOUT



Tolerances unless otherwise specified: ± 0.20mm

ELECTRICAL SPECIFICATIONS | 125kHz

P/N	L (mH)	Tolerance	Cres (pF)	Q@125 kHz	SRF Min (kHz)	Sensitivity (mVpp/App/m) min
TP0702-0238J	2.38	±5%	680	>20	>750	>25
TP0702-0491J	4.91	±5%	330	>22	>500	>50
TP0702-0720J	7.20	±5%	225	>18	>450	>47
TP0702-0900J	9.00	±5%	180	>18	>400	>47

This chart is a reference guide for the most common required values at **working frequency of 125 kHz**. Any other inductance value at LF or tighter tolerances can be provided. Please contact our sales department for any inquiry.
Sensitivity measured with Helmholtz coils H=8.36 App/m @125 kHz. Contact us for measurement specification.
SRF: Self Resonant Frequency of the coil.
Cres: Capacitor for tuning circuits (125 kHz).

- Terminals: Ag-Ni-Sn100.
- Wire: H, 180 °C, Solderable.
- Refer to the General Features of SMD transponder inductors page.

TP0702U

SMD Transponder Coil

7.8x2.2x2.5mm MAX

SINGLE AXIS TRANSPONDERS INDUCTORS

FEATURES

This TP0702U Series of Surface Mountable ferrite wound inductor is a stronger solution in very small dimensions performing very good electrical properties, **a very good solution for RTPMS, Keyless Go and Keyless entry systems.**

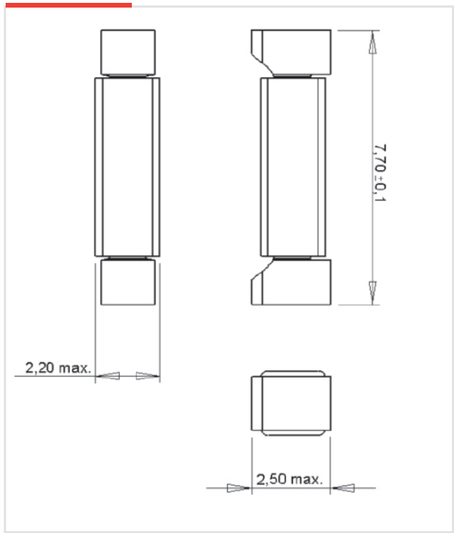
Due to its small dimensions, it's a suitable design for other applications working at lower frequencies.

01 CHARACTERISTICS

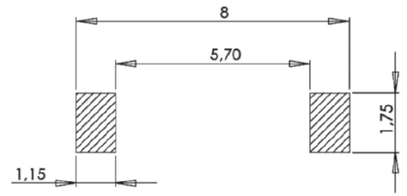
- Size: 8x2.2x2.5mm.
- Very good mechanical performance.
- High sensitivity in the smallest volume.
- Very stable electrical properties in full operational temperature range (-40, +125°C).
- Good performance in thermal shock.
- Big metallised pad area Pb free.
- Good cost/performance ratio.
- Terminals: Ag-Ni-Sn100.
- Wire: H, 125°C, Solderable.
- Max. Operating Temperature 125°C.

02 SPECIFICATIONS

DIMENSIONS (mm)



RECOMMENDED PAD-LAYOUT



Tolerances unless otherwise specified: ± 0.20mm

ELECTRICAL SPECIFICATIONS | 125kHz

P/N	L (mH)	Q min	SRF (kHz) Min	DCR (Ω) Max	Sensitivity (mVpp/App/m) min)	Dimensions (mm) Max
TP0702U-0238J	2.38 ± 5%	30	900	25.3	25	7.8 x 2.2 x 2.5
TP0702U-0491J	4.91 ± 5%	35	700	38.5	38	7.8 x 2.2 x 2.5
TP0702U-0720J	7.2 ± 5%	30	500	61.1	50	7.8 x 2.2 x 2.5
TP0702U-0900J	9.0 ± 5%	30	450	84.7	55	7.8 x 2.2 x 2.5

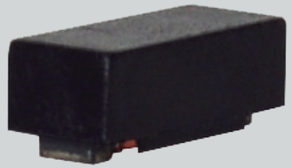
The specification chart is a reference guide for the most common required values at working frequencies of 125 kHz. Any other inductance value at LF or tighter tolerances can be provided.

TP0702UCAP

SMD Transponder Coil with CAP

8.7x2.7x3mm MAX (2.38mH – 18.5mH)

SINGLE AXIS TRANSPONDERS INDUCTORS



FEATURES

This TP0702UCAP Series of Surface Mountable ferrite wound inductor **is a stronger solution in very small dimensions performing very good electrical properties a very good solution for RTPMS, Keyless Go and Keyless entry systems.**

01 CHARACTERISTICS

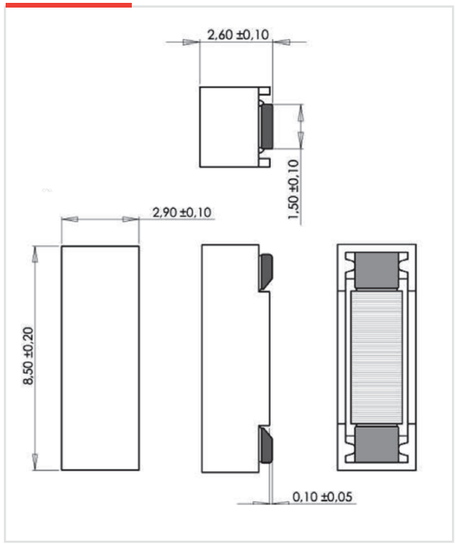
- Size: 8.7x2.7x 3mm.
- Very good mechanical performance.
- High sensitivity in the smallest volume
- Very stable electrical properties in full operational temperature range (-40 °C --> +125 °C).
- Good performance in thermal shock.
- Big metallised pad area Pb free.
- Good cost/performance ratio.

Due to its small dimensions, it's a suitable design for other applications working at lower frequencies.

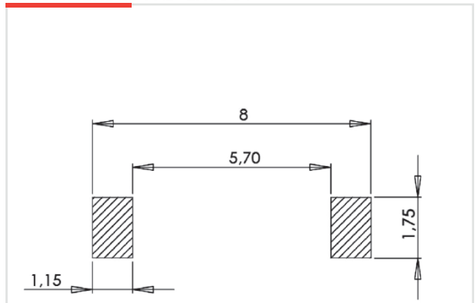
- Terminals: Ag-Ni-Sn100.
- Wire: H, 125°C, Solderable.
- Max. Operating Temperature 125°C.

02 SPECIFICATIONS

DIMENSIONS (mm)



RECOMMENDED PAD-LAYOUT



Tolerances unless otherwise specified: ± 0.1mm

ELECTRICAL SPECIFICATIONS | 125kHz

P/N	L (mH)	Q min	SRF (Ω) Max	DCR (Ω) Max	Sensitivity (mVpp/Ap-p/m) min	Dimensions (mm) Max
TP0702UCAP-0238J	2.38 ± 5%	30	900	25.3	25	8.6 x 3.0 x 2.7
TP0702UCAP-0491J	4.91 ± 5%	35	700	38.5	38	8.6 x 3.0 x 2.7
TP0702UCAP-0720J	7.2 ± 5%	30	500	61.1	50	8.6 x 3.0 x 2.7
TP0702UCAP-0900J	9.0 ± 5%	30	450	84.7	55	8.6 x 3.0 x 2.7
TP0702UCAP-1850J	18.5 ± 5%	28	400	165	90	8.6 x 3.0 x 2.7

The specification chart is a reference guide for the most common required values at working frequencies of 125 kHz. Any other inductance value at LF or tighter tolerances can be provided. Please contact our sales deparment for any inquiry.

TP0702CAP

SMD CAP Hard Ferrite Transponder Inductor

8.7x2.7x3mm (2.38mH – 9mH)

SINGLE AXIS TRANSPONDERS INDUCTORS

FEATURES

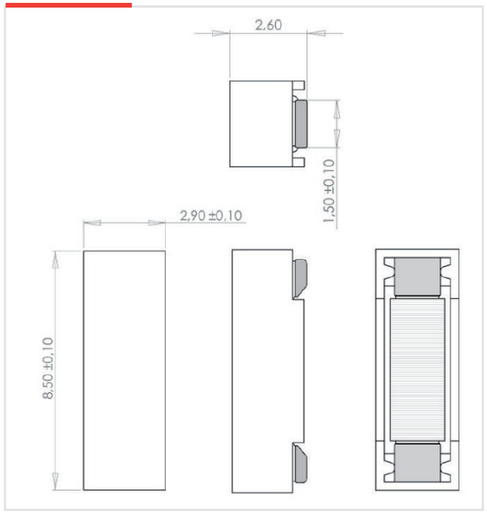
This TP0702 with CAP is a very strong solution in very small dimensions. The component has very good electrical properties and it is a very good solution for RTPMS, Keyless Go and Keyless Entry Systems. On the other hand, the plastic box, where it is inserted the piece, offers a special protection to the wound and facilitates the pick and place.

01 CHARACTERISTICS

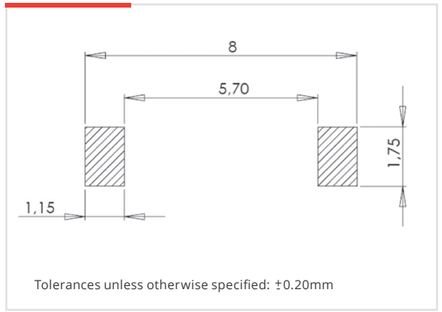
- Size: 8.7x2.7x 3mm.
- Very good mechanical performance.
- High sensitivity in the smallest volume
- Very stable electrical properties in full operational temperature range (-40 °C --> +125 °C).
- Good performance in thermal shock.
- Good cost/performance ratio.
- This component is functional also to 20kHz and 134kHz.

02 SPECIFICATIONS

DIMENSIONS (mm)



RECOMMENDED PAD-LAYOUT



Tolerances unless otherwise specified: ±0.20mm

ELECTRICAL SPECIFICATIONS | 125kHz

P/N	L (mH) @125 kHz	Tolerance	Cres (pF)	Q @125 kHz	SRF(kHz)	Sensitivity (mVpp/App/m) @125 kHz
TP0702CAP-0238J	2.38	±5%	680	>20	>750	>25
TP0702CAP-0491J	4.91	±5%	330	>22	>500	>50
TP0702CAP-0720J	7.20	±5%	220	>18	>450	>47
TP0702CAP-0900J	9.00	±5%	180	>18	>400	>47

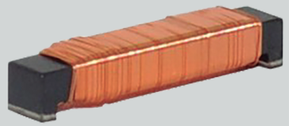
The specification chart is a reference guide for the most common required values at working frequencies of 125 kHz. Any other inductance value at LF or tighter tolerances can be provided. Please contact our sales deparment for any inquiry.

TR1102

SMD Ferrite Transponder Inductor

11x2.6x2.2mm (0.29mH - 16.2mH)

SINGLE AXIS TRANSPONDERS INDUCTORS



FEATURES

The TR1102 series of surface mountable ferrite wound inductor is the very first SMD coil designed for transponder use. Its length and cross sectional area are optimized to achieve the maximum sensibility in the coil axis. Its size is excellent for plastic moulded inmobilizer transponders.

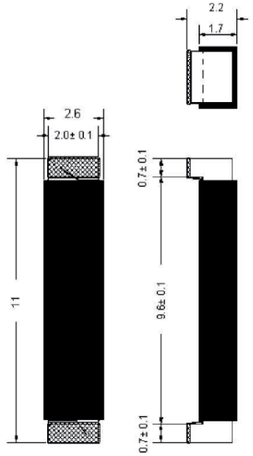
The TR1102 is the best solution when both cost and high-speed assembly of the circuit components are sought. This component is also functional to 20kHz and 134kHz.

01 CHARACTERISTICS

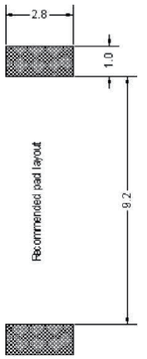
- Size: 11 x 2.6 x 2.2 mm.
- Terminals: Ag-Ni-Sn100.
- Wire: H, 180°C, Solderable.
- Max. Operating Temperature +125°C.

02 SPECIFICATIONS

DIMENSIONS (mm)



RECOMMENDED PAD-LAYOUT



Tolerances unless otherwise specified: ± 0.20mm

ELECTRICAL SPECIFICATIONS | 125KHz

P/N	L (mH)	Tolerance	Cres (pF)	Q	SRF (kHz)	Sensitivity (mVpp/App/m) min)	DCR (Ω) Max
TR1102-0238J	2.38	±5%	680	>25	500	>35	40.70
TR1102-0491J	4.91	±5%	330	>30	420	>50	49
TR1102-0720J	7.20	±5%	220	>27	350	>70	90.2
TR1102-0900J	9.00	±5%	180	>24,3	280	>75	152

Operating and test freq: 125KHz.
SRF: Self-resonant frequency of the coil.
C: Capacitor for tuning circuits (125khz).
This chart is a reference guide for the most common required values at working frequency of 125 kHz. Any other inductance value at LF or tighter tolerances can be provided. Please contact our sales department for any inquiry.
Sensitivity measured with Helmholtz coils H=8.36 App/m @125 kHz. Contact us for measurement specification.

- Terminals: Ag-Ni-Sn100.
- Wire: H, 180 °C, Solderable.
- Refer to the General Features of SMD transponder inductors page.

TR1102CAP

SMD CAP Ferrite Transponder Inductor

11.8x3.1x 2.6mm (2.38mH - 9.0mH)

SINGLE AXIS TRANSPONDERS INDUCTORS

FEATURES

The TR1102CAP series of surface mountable ferrite wound inductor **is an evolution of the TR1102 series, and also one of the very first SMD coils designed for transponder use**. Its length and cross sectional area are optimized to achieve the maximum sensitivity in the coil axis. And the use of high quality plastic material for the cap provides an additional mechanical protection to the coil with the thinnest walls, combined with a high performance in temperature.

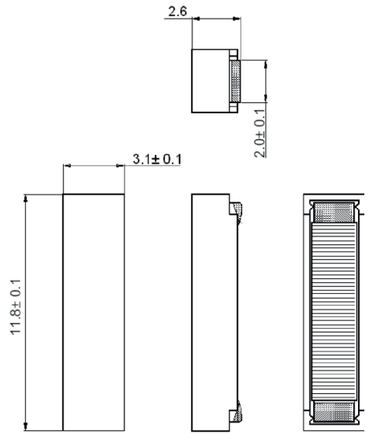
01 CHARACTERISTICS

- Size: 11.8 x 3.1 x 2.6 mm.
- Terminals: Ag-Ni-Sn100.
- Wire: H, 180°C, Solderable.
- Max. Operating Temperature 125°C.

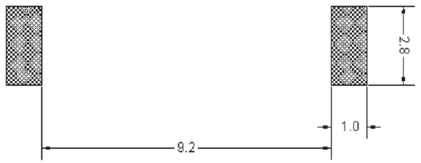
The TR1102CAP is a solution that combines the low cost and high-speed assembly of the circuit component, with the high mechanical protection provided by the cap, and it's excellent when the application demands a stronger coil.

02 SPECIFICATIONS

DIMENSIONS (mm)



RECOMMENDED PAD-LAYOUT



Tolerances unless otherwise specified: ± 0.20mm

ELECTRICAL SPECIFICATIONS | 125KHz

Code	L@125 kHz (mH)	Q min. @125 kHz	SRF min. (kHz)	DCR MAX (Ohm)	Sensitivity min.@125 kHz (mVpp/App/m)
TR1102CAP-0238J	2.38 ±5%	25	500	40,7	35
TR1102CAP-0491J	4.91 ±5%	30	420	49	50
TR1102CAP-0720J	7.20 ±5%	27	330	90.2	70
TR1102CAP-0900J	9.00 ±5%	24.3	300	132	75

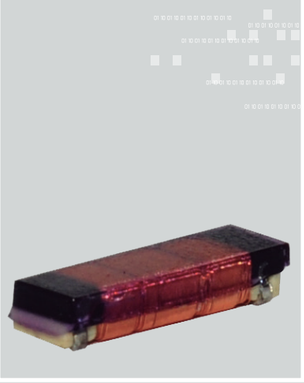
Inductance, Q factor, DCR and SRF measured with an LCR meter Wayne Kerr PMA 3260A.
The specification chart is a reference guide for the most common required values at working frequencies of 125 kHz. Any other inductance value at LF or tighter tolerances can be provided. Please contact our sales deparment for any inquiry.

SDTR1103

SMD Drop Resistant Transponder Coil

11.8x3.6x2.5mm (340µH - 16.2mH)

SINGLE AXIS TRANSPONDERS INDUCTORS



FEATURES

This inductor is the best solution when high electrical and mechanical performance is needed.

01 CHARACTERISTICS

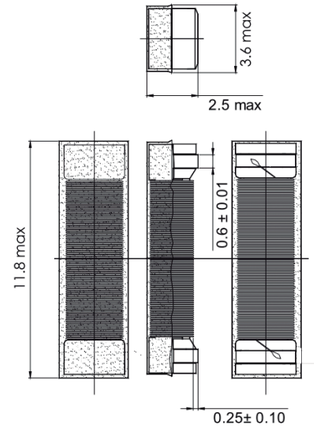
- High stability in temperature. (-40°C to +125°C for TPMS applications no coated version (-40°C to +85°C for Keyless Entry Systems)
- High drop test resistance (more than 500 times x 1 meter).
- High sensitivity.
- Epoxy coated. High reliability with pick & place machines warranted.
- This component is also functional to 20kHz and 134kHz.

02 APPLICATIONS

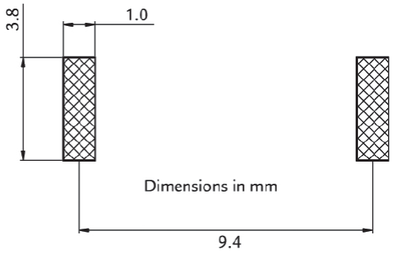
- Inmobilizers.
- Tyre Pressure Monitoring Systems.
- Keyless Entry Systems.
- Industrial applications.
- Access control.

03 SPECIFICATIONS

DIMENSIONS (mm)



RECOMMENDED PAD-LAYOUT



Tolerances unless otherwise specified: ± 0.20mm

ELECTRICAL SPECIFICATIONS | 125KHz

P/N	L@125 kHz(mH)	Cres (pF)	Q @125 kHz	SRF(kHz)	RDC (Ω) max.	Sensitivity min.@125 kHz (mVpp/App/m)
SDTR1103-0238J	2.38	680	> 34.2	> 500	39	> 30
SDTR1103-0477J	4.77	340	> 303	> 350	63.8	> 60
SDTR1103-0491J	4.91	330	> 27.9	> 380	85	> 50
SDTR1103-0720J	7.20	220	> 29.7	> 300	103	> 70

This chart is a reference guide for the most common required values at working frequency of 125 kHz. Any other inductance value at LF or tighter tolerances can be provided. Please contact our sales department for any inquiry.
Sensitivity measured with Helmholtz coils H=8.36 App/m @125 kHz. Contact us for measurement specification.
Operating and test freq: 125KHz.
SRF: Self-resonant frequency of the coil.
Other tolerances available under customer requirements.

SDTR1103CAP

SMD Drop Resistant Transponder

12.1x4.0x2.9mm MAX (2.38mH-9mH)

SINGLE AXIS TRANSPONDERS INDUCTORS

FEATURES

The SDTR1103CAP Series of Surface Mount ferrite wound inductor is the best solution when high electrical and mechanical performance is needed. Its length and cross sectional area are optimized to achieve the maximum sensitivity in the coil axis. The construction of the coil offer high mechanical performance due to the plastic base and ferrite laminate.

01 CHARACTERISTICS

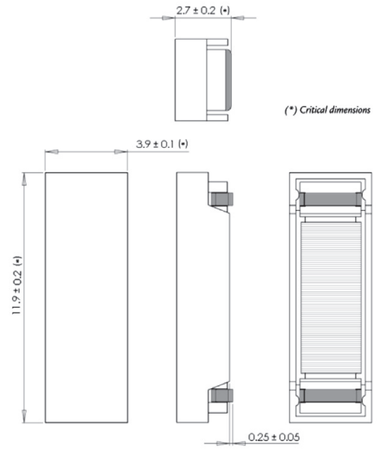
- **High stability in temperature, ranges: Δ**
  - Δ Ls/Ls (-40°C 25°C): -2% max. Δ
  - Δ Ls/Ls (+25°C +85°C): +0.5% max.
- **Typical temperature coefficient Δ Δ Ls/°C:**
  - +200±50ppm/°C.
  - -40°C to +125°C for TPMS applications.
  - -40°C to +85°C for Keyless Entry Systems
- High sensitivity. 75 mVpp/App/m for 7.2 mH (@125 kHz). 135 mVpp/App/m for 16.2 mH (@125 kHz).
- Mechanical performance. Drop test: more than 500 times x 1 meter.
- CAP protection, 5 sides protected , high reliability with Pick&Place machines warranted.
- Taped & Reel: 3000pcs / reel.
- Inductance values from 340µH to 16.2mH for 125KHz operations (contact PREMO RFID for inductance range for other working frequencies such as 20KHz and 40KHz)..

02 APPLICATIONS

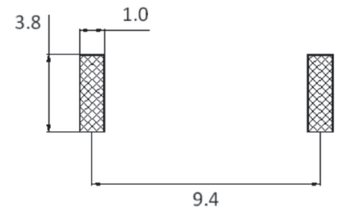
- Inmobilizers.
- Tyre Pressure Monitoring Systems.
- Keyless Entry Systems
- Industrial applications.
- Access control.

03 SPECIFICATIONS

DIMENSIONS (mm)



RECOMMENDED PAD-LAYOUT



Tolerances unless otherwise specified: ± 0.20mm

ELECTRICAL SPECIFICATIONS | 125KHz

P/N	L (mH)	Q min	SRF (kHz) Min	DRC (Ω) Max	Sensitivity (mVpp/Ap-p/m) min
SDTR1103CAP-0238J	2.38	45	500	27.5	45
SDTR1103CAP-0491J	4.91	36	380	68	50
SDTR1103CAP-0720J	7.20	39.5	300	82	70
SDTR1103CAP-0900J	9.00	40.5	300	92	80

The specification chart is a reference guide for the most common required values at working frequencies of 125 kHz. Any other inductance value at LF or tighter tolerances can be provided. Please contact our sales deparment for any inquiry.

SDTR1103-HF1

SMD Drop Resistant Transponder Coil High Frequency

11.8x3.6x2.5mm MAX (100mH - 400mH)

SINGLE AXIS TRANSPONDERS INDUCTORS

FEATURES

The SDTR1103 Series of Surface Mount ferrite wound inductor is the best solution when high electrical and mechanical performance is needed.Its length and cross sectional area are optimized to achieve the maximum sensitivity in the coil axis. The construction of the coil offer high mechanical performance due to the plastic base and ferrite laminate.

01 CHARACTERISTICS

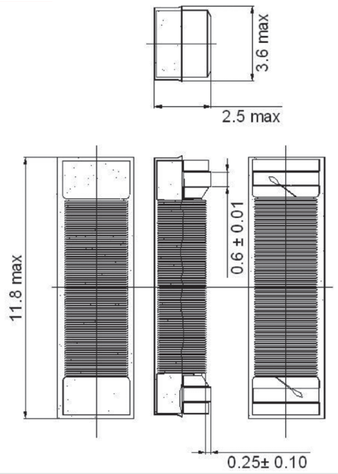
- High stability in temperature (-40°C to +85°C)
- Good mechanical performance. Drop test: more than 500 times x 1 meter.
- Taped & Reel: 3000pcs / reel.

02 APPLICATIONS

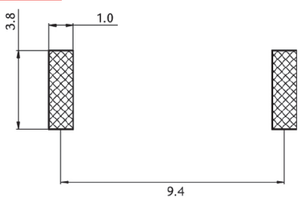
- RF reception at 500kHz and till 2MHz

03 SPECIFICATIONS

DIMENSIONS (mm)

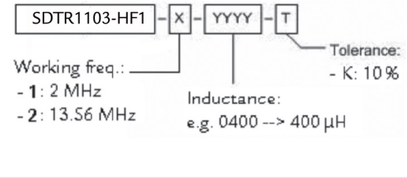


RECOMMENDED PAD-LAYOUT



Tolerances unless otherwise specified: ± 0.20mm

NOMENCLATURE



ELECTRICAL SPECIFICATIONS | 2MHz

P/N	L (uH)	Q	Operating Freq. (MHz)
SDTR1103-HF1-0100J	100 ± 5%	45 ± 5%	0,5
SDTR1103-HF1-0290K	290 ± 10%	70 ± 10%	2
SDTR1103-HF1-0400K	400 ± 10%	90 ± 10%	2

Tolerance K=10%
This chart is a reference guide for the most common required values at working frequency. Any other inductance value at HF or tighter tolerances can be provided. Please contact our sales department for any inquiry.
L and Q factor measured at 1Vac. Contact us for measurement specification.

ZC1003

SMD Z AXIS Coil Low Profile

10x10x3.2mm (2.38mH - 16.2mH)

SINGLE AXIS TRANSPONDERS INDUCTORS

FEATURES

This SMD coil offers a very low profile solution for applications in which it's needed a transponder vertical coil with high sensitivity in z direction and in a small surface area. It's so a lower profile solution for those applications in which the height of the component is critical. The design combines the best electrical performance in these dimensions together with mechanical robustness.

Keyless Entry Systems is a typical application for this coil where performs high sensitivity in a very small package and with the advantage of easy SMD assembly. This design shows also very good sensitivity performance in angle deviation from z axes.

01 CHARACTERISTICS

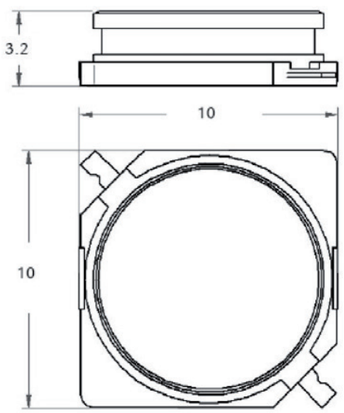
- Standard size 10x10x3 mm.
- Very good electrical and mechanical performance.
- High stability in temperature (-40°C to +125°C).
- Inductivity value can be customized to achieve customer requirements.
- Designs at lower frequencies such as 20 kHz and 40 kHz show a very good electrical performance as well.
- High sensitivity values achieved with very good thermal and mechanical performance.
- This component is also functional to 20kHz and 134kHz.

02 APPLICATIONS

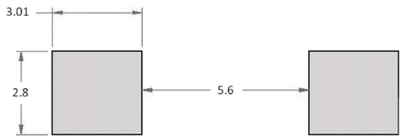
- Passive Keyless Entry and Keyless Go Systems.
- RTPMS with wake up functions.
- Industrial logistics and control.
- Access control.
- Tracking devices.

03 SPECIFICATIONS

DIMENSIONS (mm)



RECOMMENDED PAD-LAYOUT



Tolerances unless otherwise specified: ± 0.20mm

ELECTRICAL SPECIFICATIONS

P/N	L (mH)	Cres (pF)	Q	SRF (kHz)	RDC (Ω) max.	Sensitivity (mVpp/App/m)
ZC1003-0073J	0.735	2205	>65.7	>1000	5	>20
ZC1003-0238J	2.38	680	>58.5	>1000	27	>20
ZC1003-0266J	2.66	609	>58.5	>1000	29	>20
ZC1003-0491J	4.91	330	>72	>900	41	>25
ZC1003-0720J	7.20	220	>55	>850	55	>35
ZC1003-0900J	9.00	180	>81	>800	62	>40

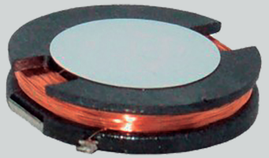
This chart is a reference guide for the most common required values at working frequency of 125 kHz. Any other inductance value at LF or tighter tolerances can be provided. Please contact our sales department for any inquiry.
L and Q factor measured at 125 kHz, 1 Vac.
Sensitivity measured with Helmholtz coils H=8.36 App/m @125 kHz. Contact us for measurement specification.
SRF: Self Resonant Frequency of the coil.

ZAC1203

SMD Z AXIS AIR Coil Low Profile

14.3x12x2.5mm (2.38mH – 6.38mH)

SINGLE AXIS TRANSPONDERS INDUCTORS



FEATURES

This SMD coil offers a very low profile solution for applications in which it's needed a transponder vertical coil with high sensitivity in z direction and a small surface area. **It's so a lower profile solution for those applications in which the height of the component is critical.** The design has the best electrical performance in these dimensions.

01 CHARACTERISTICS

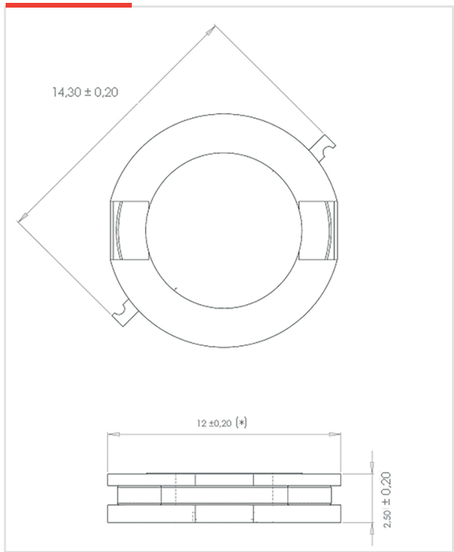
- Very good electrical and mechanical performance
- High stability in temperature (-40°C to +125°C)
- High sensitivity values achieved with very good thermal performance
- This component is also functional to 20 and 125 kHz.

02 APPLICATIONS

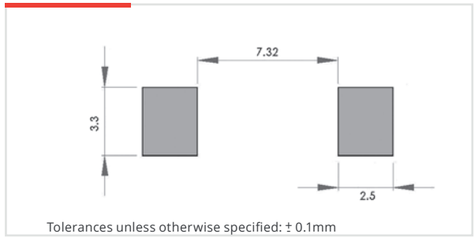
- Passive Keyless Entry and Keyless Go Systems
- RTPMS with wake up functions
- Industrial logistics and control
- Access control
- Tracking devices

03 SPECIFICATIONS

DIMENSIONS (mm)



RECOMMENDED PAD-LAYOUT



Tolerances unless otherwise specified: ± 0.1mm

ELECTRICAL SPECIFICATIONS | 125KHz

P/N	L (mH)	Q	SRF (MHz)	RDC (Ω) max.	Sensitivity (mVpp/App/m)
ZAC1203-0238J	2.38 ± 5%	>18	>1	93	>30
ZAC1203-0491J	4.91 ± 5%	>18	>1	192,5	>45
ZAC1203-0638J	6.38 ± 5%	>18	>1	230	>50

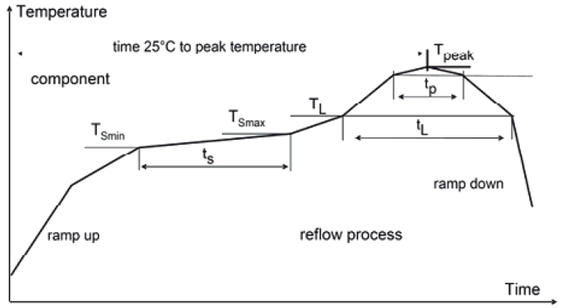
This chart is a reference guide for the most common required values at working frequency of 125 kHz. Any other inductance value at LF or tighter tolerances can be provided. Please contact our sales department for any inquiry.
L and Q factor measured at 125 kHz, 1 Vac.
Sensitivity measured with Helmholtz coils H=8.36 App/m @125 kHz. Contact us for measurement specification.
SRF: Self Resonant Frequency of the coil.

GENERAL SPECIFICATIONS

Transponder Inductors SMD Soldering and Packaging

SINGLE AXIS TRANSPONDER INDUCTORS

01 SOLDERING: RECOMMENDED REFLOW PROFILE



For the Premo's recommended reflow profile, please refer to document:

› **PREMO_reflow_recommendations_V0_102018**

Request it at: *info@grupopremo.com*

ramp up to 150 °C	TSmin	tS	TS max	TL	tL	Tpeak*	tp**	time 25°C to peak	ramp down
≥3°C/s	190 ±5 °C	≥110 s	200±5°C	217±5°C	≥90s	245±5°C	≥30s	≥300s	≥6°C/s

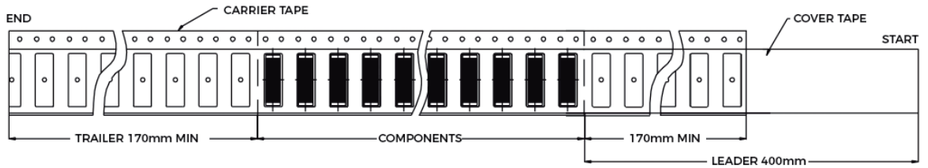
› Minimum requirements for Pb-free soldering
› *peak temperature is measured on the center top of the component package
› **tp measured @ Tpeak-5°C

02 MEASURING EQUIPMENTS AND CONDITIONS

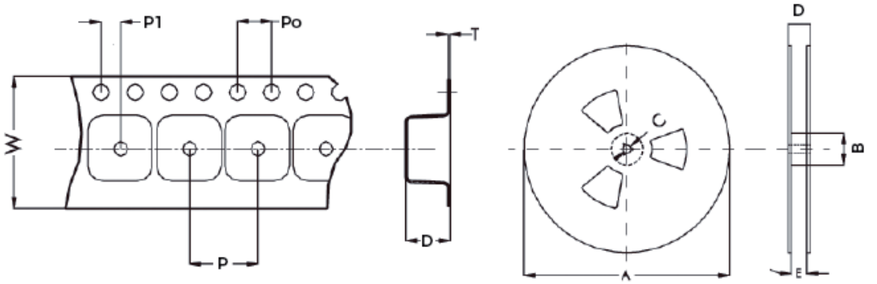
1. Rated inductance LR
2. Q factor Qmin
3. Self-resonance frequency fmin
4. DC resistance Rmax
5. Sensitivity

Measured at frequency fL, with impedance analyser WK3260 with 3MHz installed
Measured at frequency fL, with impedance analyser WK3260 with 3MHz installed
Measured at frequency fL, with impedance analyser WK3260 with 3MHz installed
Measured at 20 °C ambient temperature, measuring current < IR.
Measured with Helmholtz coils 5 turns, 160mm Ø, + waveform generator Agilent 33120A + oscilloscope Agilent 54622A . Contact PREMO RFID for complete measurement specification

03 TAPING



04 PACKING



05 TAPE AND REEL PACKAGING SPECIFICATIONS

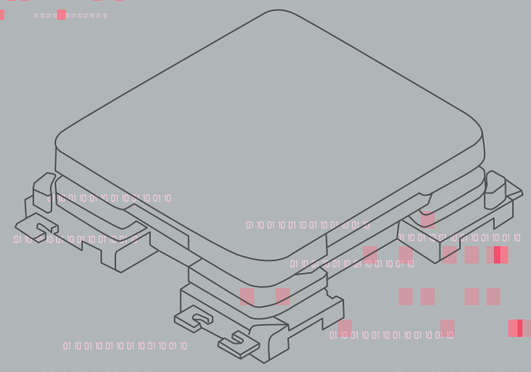
	REEL DIMENSIONS						TAPE DIMENSIONS					
Series	A	B	C	D	E	W	P	Po	P1	D	T	Parts/ Reel
TR1102	330	50	13	30.4	24.4	24	4	4	2	2.5	0.3	5000
TR1102CAP	330	50	13	30.4	24.4	24	8	4	2	2.8	0.3	3000
TP0602	330	50	13	22.4	16.4	16	4	4	2	2.5	0.3	5000
TP0702	330	50	13	22.4	16.4	16	8	4	2	2.9	0.3	3000
TP0702CAP	330	50	13	22.4	16.4	16	8	4	2	2.8	0.3	3000
TP0702UCAP	330	50	13	22.4	16.4	16	8	4	2	2.9	0.3	2500
3DV06	330	50	13	22.4	16.4	16	12	4	2	2.8	0.4	2000
3DV09	330	50	13	30.4	24.4	24	16	4	2	3.6	0.4	1000
3DV11	330	50	13	30.4	24.4	24	16	4	2	4.2	0.3	1000
3DV15	330	50	13	30.4	24.4	24	20	4	2	4.2	0.3	600
3DC14EM	330	50	13	30.4	24.4	24	16	4	2	4.2	0.3	1000
3DC15	330	50	13	30.4	24.4	24	20	4	2	4.2	0.3	600
3DC15CAP	330	50	13	30.4	24.4	24	20	4	2	4.2	0.3	600
3DC1515-HF	330	50	13	30.4	24.4	24	20	4	2	4.2	0.3	600
ZC1003	330	50	13	30.4	24.4	24	16	4	2	4.2	0.3	1000
ZC1003HF	330	50	13	30.4	24.4	24	16	4	2	4.2	0.3	1000
ZAC1203	330	50	13	30.4	24.4	24	8	4	2	2.7	0.3	600
SDTR1103	330	50	13	30.4	24.4	24	8	4	2	2.7	0.3	3000
3DC15F	330	50	13	30.4	24.4	24	20	4	2	5.4	0.3	600
TP0602CAP	330	50	13	30.4	24.4	24	8	4	2	2.8	0.3	3000

	REEL DIMENSIONS						TAPE DIMENSIONS					
Series	A	B	C	D	E	W	P	Po	P1	D	T	Parts/ Reel
SDTR1103CAP	330	50	13	30.4	24.4	24	8	4	2	2.7	0.3	3000
SDTR1103-HF1	330	50	13	30.4	24.4	24	8	4	2	2.7	0.3	3000
SDTR1103-HF2	330	50	13	30.4	24.4	24	8	4	2	2.7	0.3	3000
3DC11LP	330	50	13	30.4	24.4	24	16	4	2	4.2	0.3	1000
3DC11CAP	330	50	13	30.4	24.4	24	16	4	2	4.2	0.3	600
3DC11F	330	50	13	30.4	24.4	24	16	4	2	5.6	0.5	600
3DC11LP-AOI	330	50	13	30.4	24.4	24	16	4	2	4.2	0.3	1000
3DC11LP-AOIF	330	50	13	30.4	24.4	24	16	4	2	5.6	0.4	600
3DC11LP-AOIC	330	50	13	30.4	24.4	24	16	4	2	4.5	0.4	600
TC0502HF	330	50	13	22.4	16.4	16	8	4	2	2.5	0.3	2000
TP0502	330	50	13	22.4	16.4	16	8	4	2	2.5	0.3	2000
4DC15NF	330	50	13	30.4	24.4	24	20	4	2	4.2	0.3	600
2D1D15	330	50	13	30.4	24.4	24	20	4	2	4.2	0.3	600
SDTR1103EM	330	50	13	30.4	24.4	24	8	4	2	2.7	0.3	3000
3DC06ISO	330	50	13	22.4	16.4	16	12	4	2	2.8	0.4	2000
3DC09LP	330	50	13	30.4	24.4	24	16	4	2	3.6	0.4	1000
TP0502CAP	330	50	13	22.4	16.4	16	8	4	2	2.5	0.3	2000
3DC14-ULP	330	50	13	30.4	24.4	24	16	4	2	4.2	0.3	600
3DC12S	330	50	13	30.4	24.4	24	16	4	2	4.2	0.3	600
3DC13S	330	50	13	30.4	24.4	24	16	4	2	4.2	0.3	600
3DC14S	330	50	13	30.4	24.4	24	16	4	2	4.2	0.3	600

1.1.2

RFID TRANSPONDERS

3-AXIS TRANSPONDER INDUCTORS (3DCOILS™)



3DC06ISO

SMD 3D Coil

7x7x2.3mm

3-AXIS TRANSPONDER INDUCTOR (3DCOILS™)

FEATURES

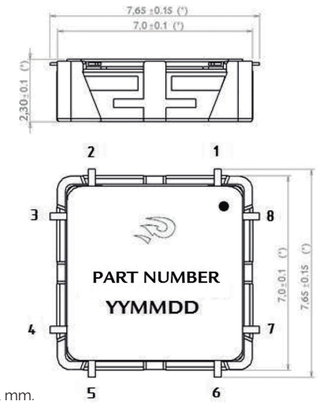
The currently smallest 3D coil in the market. New secure devices in the KES require smaller sizes in this passive component and still a long reading distance together with higher reliability. 3DC06ISO offers new design possibilities due to its size with a more than acceptable electrical performance.

01 CHARACTERISTICS

- Size: 7 x 7 x 2.3 mm
- High drop test resistance (up to 500 times 1 m) due to a maximized pin area
- Allows Automatic Optical Inspection
- High stability in temperature (-40°C to +85°C)
- Labelled to allow P&P operations
- Taped & Reeled
- Designed for 125KHz,134KHz and 20 kHz

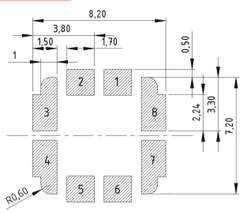
02 SPECIFICATIONS

DIMENSIONS (mm)

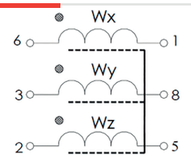


› Pins coplanarity 0.1 mm.

RECOMMENDED PAD-LAYOUT



ELECTRICAL DIAGRAM



ELECTRICAL SPECIFICATIONS | 3DC06ISO-0345J

L x,y (mH)	3.45
Lz (mH)	10.5
Qx Min	17
Qy Min	15
Qz Min	24
f (kHz)	125
SRFx,y (kHz) Min	500
SRFz (kHz) Min	750
DCRx,y (Ω) Max	150
DCRz (Ω) Max	320
Sensitivity x,y,z (mVpp/App/m) Min	37
Length (mm)	7.0
Width (mm)	7.0
Height (mm)	2.3

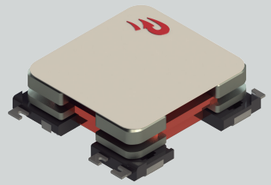
This chart is a reference guide for the most common required values at working frequency of 125 kHz. Any other inductance value at LF or tighter tolerances can be provided. Also can be supplied different inductance values in the different winding axis. Please contact our sales department for any inquiry.
Sensitivity measured with Helmholtz coils H=8.36 App/m @125 kHz. Contact us for measurement specification.
SRF: Self Resonant Frequency of the coil.

3DC09LP

SMD 3D Coil

9.5x9.5x3.1mm

3-AXIS TRANSPONDER INDUCTOR (3DCOILS™)



APPLICATIONS

- Automotive Passive keyless entry systems.
- Automotive RTPMS with wake up functions.
- Industrial logistics and control.
- Access control.
- Tracking devices.

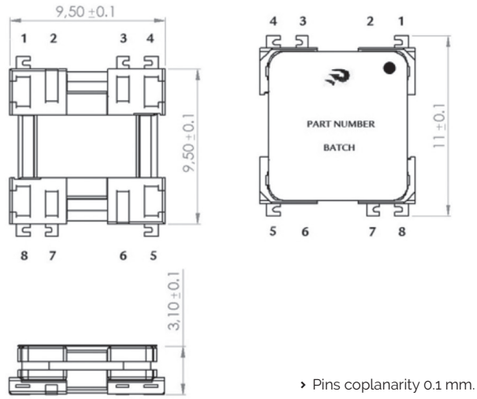
01 CHARACTERISTICS

- 3 coils in one component, oriented in the 3 space axes with full functionality.
- Allows Automatic Optical Inspection.
- Improved sensitivity for X and Y axes. Q factor improved for Z axis.
- Suitable for automotive Key Less Entry applications with miniaturized designs.
- The inductivity in each axis can be customized to achieve customer requirements.

Aldinet

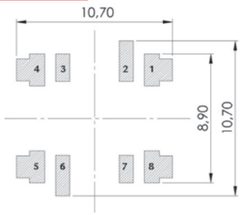
02 SPECIFICATIONS

DIMENSIONS (mm)

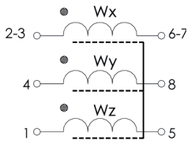


› Pins coplanarity 0.1 mm.

RECOMMENDED PAD-LAYOUT



ELECTRICAL DIAGRAM



ELECTRICAL SPECIFICATIONS | 3DC09LP-0720J

L x,y (mH)	7.2
Qx Min	19
Qy Min	19
Qz Min	21
f (kHz)	125
SRFx,y (kHz) Min	300
SRFz (kHz) Min	900
DCRx,y (Ω) Max	220
Sensitivity x,y (mVpp/App/m) Min	75
Sensitivity z (mVpp/App/m) Min	40
Length (mm)	9.5
Width (mm)	9.5
Height (mm)	3.1

This chart is a reference guide for the most common required values at working frequency of 125 kHz. Any other inductance value at LF or tighter tolerances can be provided. Also can be supplied different inductance values in the different winding axis. Please contact our sales department for any inquiry.
Sensitivity measured with Helmholtz coils H=8.36 App/m @125 kHz. Contact us for measurement specification.
SRF: Self Resonant Frequency of the coil.

3DC11LP

SMD 3D Coil Low profile

13x11.6x3.20mm MAX (2.38mH – 7.2mH)

3-AXIS TRANSPONDER INDUCTOR (3DCOILS™)

APPLICATIONS

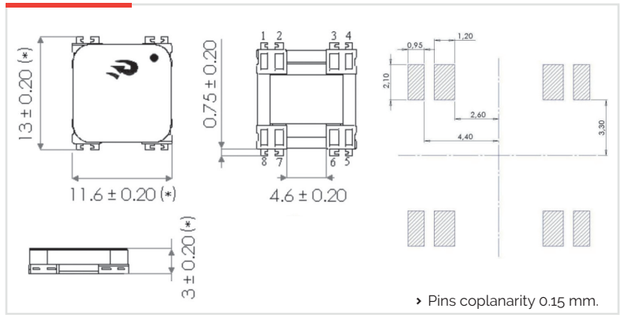
- Automotive Passive keyless entry systems.
- Automotive RTPMS with wake up functions.
- Industrial logistics and control.
- Access control.
- Tracking devices.

01 CHARACTERISTICS

- Offers 3 coils, oriented in the 3 space axes, assembled in a single component with full functionality.
- Suitable for automotive applications (Keyless Entry Systems, RTPMS), etc.
- Very good electrical performance in the smallest dimensions.
- High stability in temperature (-40°C to +85°C).
- High sensitivity values.
- The inductivity in each axis can be customized to achieve customer requirements.
- Designs at lower frequencies, 20 kHz or 40 kHz, show a very good electrical performance as well.

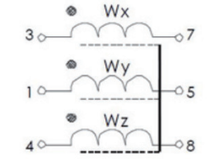
02 SPECIFICATIONS

DIMENSIONS AND RECOMMENDED PAD-LAYOUT (mm)



› Pins coplanarity 0.15 mm.

ELECTRICAL DIAGRAM



(2-3 and 6-7 are interconnected)

ELECTRICAL SPECIFICATIONS

P/N	L x,y,z (mH)	Qx,y,z Min	Freq (KHz)	Cres (pF)	SRFx,y (kHz) Min	SRFz (kHz) Min	DCRx,y (Ohm) Max	DCRx,y (Ohm) Max	Sensitivity x,y,z (mV/App/m) Min	Length (mm)	Width (mm)	Height (mm)
3DC11LP-0238J	2.38	18	125	680	450	900	60,5	82,5	40	13	11,6	3,15
3DC11LP-0247J	2.47	17	125	656	450	900	68	82,5	40	13	11,6	3,15
3DC11LP-0345J	3.45	15	125	470	350	800	100	121	55	13	11,6	3,15
3DC11LP-0405J	4.05	15	125	400	300	600	100	138	60	13	11,6	3,15
3DC11LP-0477J	4.77	15	125	340	320	600	100	150	70	13	11,6	3,15
3DC11LP-0491J	4.91	18	125	330	300	600	100	160	70	13	11,6	3,15
3DC11LP-0720J	7.20	15	125	225	250	500	165	209	85	13	11,6	3,15
3DC11LP-A-2000J	20	5	20	3166	120	350	495	385	22	13	11,6	3,15

This chart is a reference guide for the most common required values at working frequency of 125 kHz. Any other inductance value at LF or tighter tolerances can be provided. Also can be supplied different inductance values in the different winding axis. Please contact our sales department for any inquiry.
L and Q factor measured at 125 kHz, 1 Vac.
Sensitivity measured with Helmholtz coils H=8.36 App/m @125 kHz. Contact us for measurement specification.
SRF: Self Resonant Frequency of the coil.

3DC11LP-AOI

SMD 3D11 Coil Low Profile AOI

13x11.6x3.45mm

3-AXIS TRANSPONDER INDUCTOR (3DCOILS™)

APPLICATIONS

- Automotive Passive keyless entry systems.
- Automotive RTPMS with wake up functions.
- Industrial logistics and control.
- Access control.
- Tracking devices.

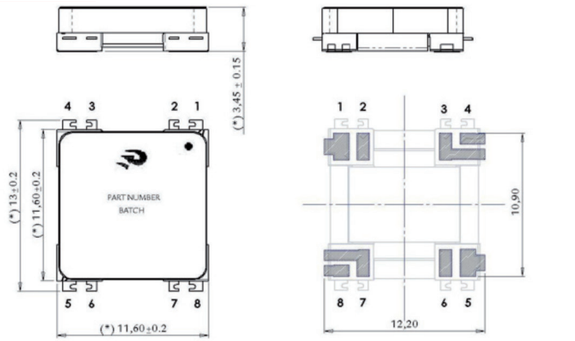
01 CHARACTERISTICS

AOI version for the 3DC11LP with the same electrical and mechanical characteristics:

- Offers 3 coils, oriented in the 3 space axes, assembled in a single component with full functionality.
- Suitable for automotive applications (Keyless Entry Systems RTPMES), etc
- Very good electrical performance in the smallest dimensions.
- High stability in temperature (-40 °C to +85 °C).
- High sensitivity values.
- The inductivity in each axis can be customized to achieve customer requirements.
- Designs at lower frequencies, 20 kHz or 40 kHz, show a very good electrical performance as well.
- Allows the Automatic Optical Inspection in customers reflow process since provides lateral meniscus in all sodering points.

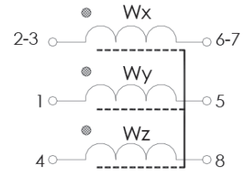
02 SPECIFICATIONS

DIMENSIONS AND RECOMMENDED PAD-LAYOUT (mm)



- Pins coplanarity 0.1 mm.
- DCRX para 3DC11LP-AOI-0477J= 91 Ohm max

ELECTRICAL DIAGRAM



ELECTRICAL SPECIFICATIONS

CODE	L x,y,z (mH)	Q x,y nom	Qz nom	f (kHz)	SRFx,y (kHz) Min	SRFz (kHz) Min	DCRx (Ohm) Max	DCRy (Ohm) Max	DCRz (Ohm) Max	Cpxy (pF) Max	Cpxz (pF) Max	C pyz (pF) Max)
3DC11LP-AOI-0238J	2.38	25	19	125	700	750	50	55	83	25	10	10
3DC11LP-AOI-0477J	4.77	26	24	125	500	650	50	103	122	30	15	15
3DC11LP-AOI-0720J	7.20	20	20	125	300	450	127	143	220	40	15	15
3DC11LPAOI-C-0720J	7.20	20	20	134	300	450	127	143	220	40	15	15
3DC11LPAOI-A-3000J	30	6	5	20	100	200	605	704	539	50	15	15

CODE	Sensitivity x,y (mV/A/m) Min(*)	Sensitivity z (mV/A/m) Min(*)
3DC11LP-AOI-0238J	40	38
3DC11LP-AOI-0477J	60	55
3DC11LP-AOI-0720J	80	70
3DC11LPAOI-C-0720J	80	70
3DC11LPAOI-A-3000J	27	23

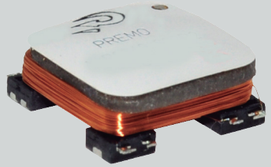
This chart is a reference guide for the most common required values at working frequency of 125 kHz. Any other inductance value at LF or tighter tolerances can be provided. Also can be supplied different inductance values in the different winding axis. Please contact our sales department for any inquiry.
L and Q factor measured at 125 kHz, 1 Vac.
Sensitivity measured with Helmholtz coils H=8.36 App/m @125 kHz.
Contact us for measurement specification.
SRF: Self Resonant Frequency of the coil.

3DC11LP-AOIF

SMD 3D11 Coil Low Profile AOI (foam option)

13x11.6x4.7mm

3-AXIS TRANSPONDER INDUCTOR (3DCOILS™)



APPLICATIONS

- Automotive Passive keyless entry systems.
- Automotive RTPMS with wake up functions.
- Industrial logistics and control.
- Access control.
- Tracking devices.

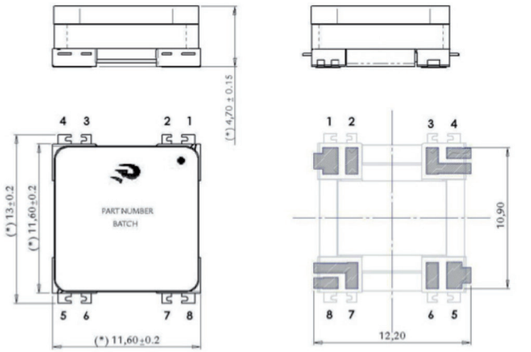
01 CHARACTERISTICS

AOI version for the 3DC11LP with a label foam on top to improve mechanical characteristics:

- Evolution of the 3DC11LP-AOI series.
- The foam, placed on top of the part, absorbs better the shocks and, thus, improves the mechanical performance of the piece.
- Very good electrical performance in the smallest dimensions.
- High stability in temperature (-40 °C to +85 °C).
- High sensitivity values.
- The inductivity in each axis can be customized to achieve customer requirements.
- Designs at lower frequencies, 20 kHz or 40 kHz, show a very good electrical performance as well.
- Allows the Automatic Optical Inspection in customers reflow process since provides lateral meniscus in all soldering points.

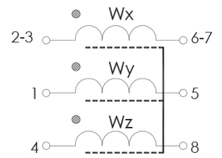
02 SPECIFICATIONS

DIMENSIONS AND RECOMMENDED PAD-LAYOUT (mm)



› Pins coplanarity 0.1 mm.

ELECTRICAL DIAGRAM



ELECTRICAL SPECIFICATIONS

CODE	L x,y,z (mH)	Q x,y nom	Qz nom	f (kHz)	SRFx,y (kHz) Min	SRFz (kHz) Min	DCRx (Ohm) Max	DCRy (Ohm) Max	DCRz (Ohm) Max	Cpxy (pF) Max	Cpxz (pF) Max	C pyz (pF) Max
3DC11LP-AOIF-0238J	2.38	25	19	125	700	750	50	55	83	25	10	10
3DC11LP-AOIF-0477J	4.77	26	24	125	500	650	91	103	122	30	15	15
3DC11LP-AOIF-0720J	7.20	20	20	125	300	450	127	143	220	40	15	15
3DC11LPAOIF-C-0720J	7.20	20	20	134	300	450	127	143	220	40	15	15
3DC11LPAOIF-A-3000J	30	6	5	20	100	200	605	704	539	50	15	15

CODE	Sensitivity x,y (mV/A/m) Min(*)	Sensitivity z (mV/A/m) Min(*)
3DC11LP-AOIF-0238J	40	38
3DC11LP-AOIF-0477J	60	55
3DC11LP-AOIF-0720J	80	70
3DC11LPAOIF-C-0720J	80	70
3DC11LPAOIF-A-3000J	27	23

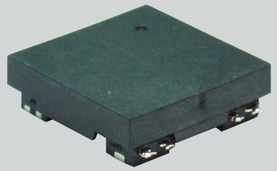
This chart is a reference guide for the most common required values at working frequency of 125, 134 and 20 kHz. Any other inductance value at LF or tighter tolerances can be provided. Also can be supplied different inductance values in the different winding axis. Please contact our sales department for any inquiry.

3DC11LP-AOIC

SMD 3D11 Coil Low Profile AOI (cap option)

13x11.6x4.15mm

3-AXIS TRANSPONDER INDUCTOR (3DCOILS™)



APPLICATIONS

- Automotive Passive keyless entry systems.
- Automotive RTPMS with wake up functions.
- Industrial logistics and control.
- Access control.
- Tracking devices.

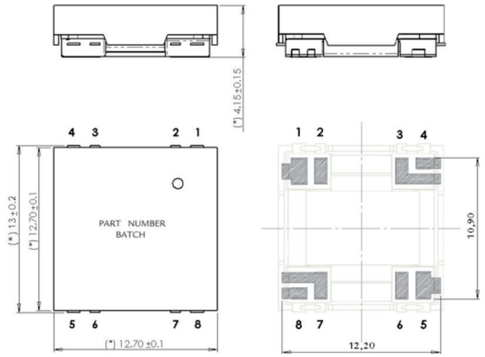
01 CHARACTERISTICS

AOI version for the 3DC11LP with a plastic cap on top to improve winding lateral protection:

- Evolution of the 3DC11LP-AOI series.
- The cap, made of high quality plastic material, improves the mechanical protection of the coil.
- Very good electrical performance in the smallest dimensions.
- High stability in temperature (-40 °C to +85 °C).
- High sensitivity values.
- The inductivity in each axis can be customized to achieve customer requirements.
- Designs at lower frequencies, 20 kHz or 40 kHz, show a very good electrical performance as well.
- Allows the Automatic Optical Inspection in customers reflow process since provides lateral meniscus in all soldering points.

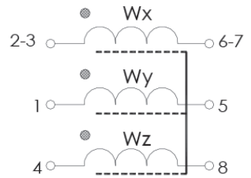
02 SPECIFICATIONS

DIMENSIONS AND RECOMMENDED PAD-LAYOUT (mm)



› Pins coplanarity 0.1 mm.

ELECTRICAL DIAGRAM



ELECTRICAL SPECIFICATIONS

CODE	L x,y,z (mH)	Q x,y nom	Qz nom	f (kHz)	SRFx,y (kHz) Min	SRFz (kHz) Min	DCRx (Ohm) Max	DCRy (Ohm) Max	DCRz (Ohm) Max	Sensit. x,y (mV/A/m) Min(*)	Sensit.z (mV/A/m) Min(*)
3DC11LP-AOIC-0238J	2.38	22	18	125	400	650	50	55	83	40	38
3DC11LP-AOIC-0477J	4.77	20	18	125	350	500	91	103	122	60	55
3DC11LP-AOIC-0720J	7.20	20	18	125	350	450	127	143	220	80	70
3DC11LPAOIC-C-0720J	7.20	20	18	134	350	450	127	143	220	80	70
3DC11LPAOIC-A-3000J	30	6	5	20	100	200	605	704	539	27	23

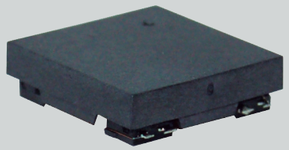
This chart is a reference guide for the most common required values at working frequency of 125, 134 and 20 kHz. Any other inductance value at LF or tighter tolerances can be provided. Also can be supplied different inductance values in the different winding axis. Please contact our sales department for any inquiry.

3DC11LPCAP

SMD CAP 3D Coil Low Profile

13x12.8x3.7mm (2.38mH - 7.2mH)

3-AXIS TRANSPONDER INDUCTOR (3DCOILS™)



APPLICATIONS

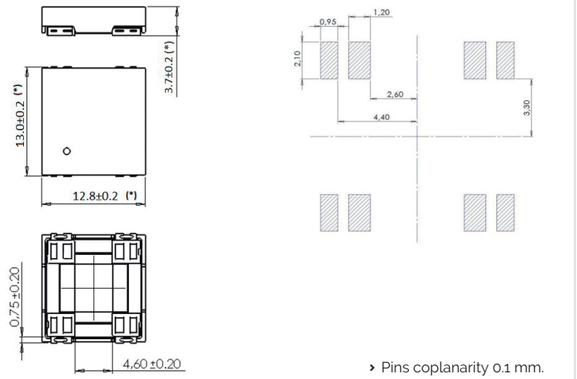
- Automotive Passive keyless entry systems.
- Automotive RTPMS with wake up functions.
- Industrial logistics and control.
- Access control.
- Tracking devices.

01 CHARACTERISTICS

- Evolution of the 3DC11LP series.
- The cap, made of high quality plastic material, improves the mechanical protection to the coil.
- Keyless Entry Systems is a typical application for this coil.
- Very good electrical performance.
- High stability in temperature (-40°C to +85°C).
- High sensitivity values.
- The inductance in each axis can be customized to ssachieve customer requirements.
- Designs at lower frequencies, 20 kHz or 40 kHz, show a very good electrical performance as well.

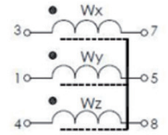
02 SPECIFICATIONS

DIMENSIONS AND RECOMMENDED PAD-LAYOUT (mm)



› Pins coplanarity 0.1 mm.

ELECTRICAL DIAGRAM



(2-3 and 6-7 are interconnected)

ELECTRICAL SPECIFICATIONS

P/N	L x,y,z (mH)	Q x,y,z Min	Frequency (kHz)	Cres(pF)	SRFx,y (kHz) Min	SRFz (kHz) Min	DCR x,y (Ω) Max	DCR z (Ω) Max
3DC11CAP-0238J	2.38	17	125	680	450	850	60,5	82,5
3DC11CAP-0491J	4.91	15	125	330	300	700	111	150
3DC11CAP-0720J	7.20	15	125	225	250	500	176	209

P/N	Sensitivity x,y,z (mV/A/m) Min	Length (mm)	Width (mm)	Height (mm)
3DC11CAP-0238J	40	13,0	12.8	3.7
3DC11CAP-0491J	60	13,0	12.8	3.7
3DC11CAP-0720J	85	13,0	12.8	3.7

This chart is a reference guide for the most common required values at working frequency of 125 kHz. Any other inductance value at LF or tighter tolerances can be provided. Also can be supplied different inductance values in the different winding axis. **Please contact our sales department for any inquiry.**
L and Q factor measured at 125 kHz, 1 Vac.
Sensitivity measured with Helmholtz coils H=8.36 App/m @125 kHz. Contact us for measurement specification.
SRF: Self Resonant Frequency of the coil.

3DC11F

SMD Foam Label 3D Coil Low Profile

13x11.6x4.35mm (2.38mH - 7.2mH)

3-AXIS TRANSPONDER INDUCTOR (3DCOILS™)

APPLICATIONS

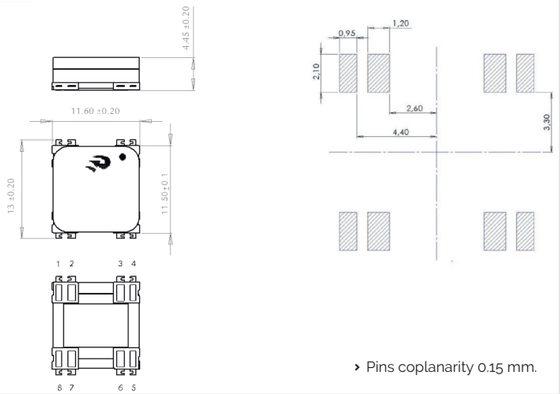
- Automotive Passive keyless entry systems.
- Automotive RTPMS with wake up functions.
- Industrial logistics and control.
- Access control.
- Tracking devices.

01 CHARACTERISTICS

- Evolution of the 3DC11LP series.
- The foam, placed on the top of the part, absorbs better the shocks and, thus, improves the mechanical performance of the piece.
- Very good electrical performance.
- High stability in temperature (-40°C to +85°C).
- High sensitivity values.
- The inductivity in each axis can be customized to achieve customer requirements.
- Designs at lower frequencies, 20 kHz or 40 kHz, show a very good electrical performance as well.

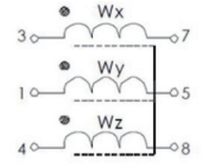
02 SPECIFICATIONS

DIMENSIONS AND RECOMMENDED PAD-LAYOUT (mm)



- Pins coplanarity 0.15 mm.

ELECTRICAL DIAGRAM



(2-3 and 6-7 are interconnected)

ELECTRICAL SPECIFICATIONS

P/N	L x,y,z (mH)	Q x,y,z Min	Frequency (kHz)	Cres(pF)	SRFx,y (kHz) Min	SRFz (kHz) Min	DCR x,y (Ω) Max	DCR z (Ω) Max
3DC11F-0238J	2.38	18	125	680	450	900	60,5	82,5
3DC11F-0491J	4.91	18	125	330	300	600	100	160
3DC11F-0720J	7.20	15	125	225	250	500	165	209

P/N	Sensitivity x,y,z (mV/A/m) Min	Length (mm)	Width (mm)	Height (mm)
3DC11F-0238J	40	13,0	11.6	4.35
3DC11F-0491J	70	13,0	11.6	4.35
3DC11F-0720J	85	13,0	11.6	4.35

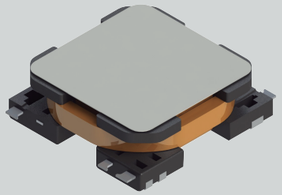
This chart is a reference guide for the most common required values at working frequency of 125 kHz. Any other inductance value at LF or tighter tolerances can be provided. Also can be supplied different inductance values in the different winding axis. **Please contact our sales department for any inquiry.**
L and Q factor measured at 125 kHz, 1 Vac.
Sensitivity measured with Helmholtz coils H=8.36 App/m @125 kHz. Contact us for measurement specification.
SRF: Self Resonant Frequency of the coil.

3DC11AOI-05DR

SMD 3D Coil Half Drumcore

13x11.6x3.9mm (4.91-7.2mH)

3-AXIS TRANSPONDER INDUCTOR (3DCOILS™)



APPLICATIONS

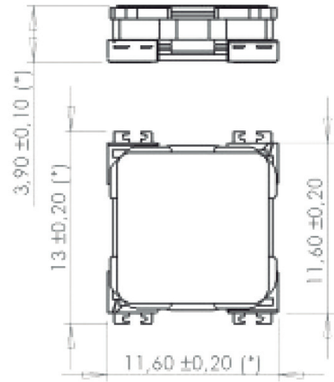
- Automotive Passive keyless entry systems.
- Automotive RTPMS with wake up functions.
- Industrial logistics and control.
- Access control.
- Tracking devices

01 CHARACTERISTICS

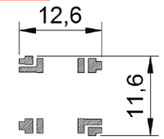
- 3 coils in one component, oriented in the 3 space axes with full functionallity
- Allows Automatic Optical Inspection
- High sensitivity (>72mV/A/m) and isotropic performance
- Availaible with different inductance values
- Very stable electrical properties in full operational operative range (-40°C ⟶ +125°C)
- Max. Operating Temperature: +125°C
- Suitable for Pick&Place SMD assembly

02 SPECIFICATIONS

DIMENSIONS (mm)

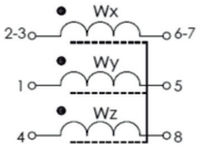


RECOMMENDED PAD-LAYOUT



Tolerances unless otherwise specified: ± 0.1mm

ELECTRICAL DIAGRAM



ELECTRICAL SPECIFICATIONS | 125KHz

P/N	L x,y,z (mH)	Q x,y Min	Qz min	SRFx,y (kHz) Min	SRFz (kHz) Min	DCR x,y,z(Ω) Max	Sensitivity x,y,z (mV/A/m) Min	Dimensions (mm) Max
3DC11AOI-05DR-0491J	4.91±5%	22	20	400	500	180	72	13 x 11.6 x 3.9
3DC11AOI-05DR-0720J	7.2±5%	20	18	380	480	150	80	13 x 11.6 x 3.9

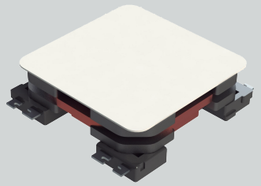
This chart is a reference guide for the most common required values at working frequency of 125 kHz. Any other inductance value at LF or tighter tolerances can be provided. Also can be supplied different inductance values in the different winding axis. **Please contact our sales department for any inquiry.**
L and Q factor measured at 125 kHz, 1 Vac.
Sensitivity measured with Helmholtz coils H=8.36 App/m @125 kHz. Contact us for measurement specification.
SRF: Self Resonant Frequency of the coil.

3DC11-DR

SMD 3D Coil Drumcore

13.2 x 11.8 x 3.5mm (4.91-7.2mH)

3-AXIS TRANSPONDER INDUCTOR (3DCOILS™)



APPLICATIONS

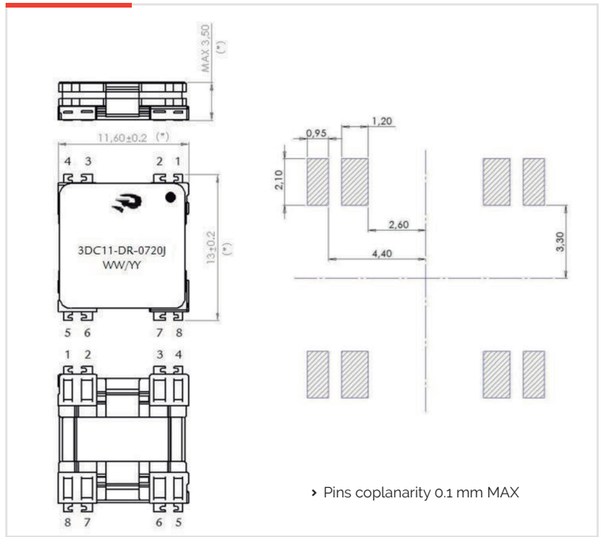
- Automotive Passive keyless entry systems.
- Automotive RTPMS with wake up functions.
- Industrial logistics and control.
- Access control.
- Tracking devices

01 CHARACTERISTICS

- 3 coils in one component, oriented in the 3 space axes with full functionallity
- High sensitivity (>90mV/A/m [X,Y]; >40mV/A/m [Z])
- Availaible with different inductance values
- Very stable electrical properties in full operational operative range (-40°C ⟶ +125°C)
- Max. Operating Temperature: +125°C
- Suitable for Pick&Place SMD assembly

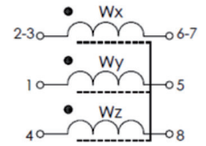
02 SPECIFICATIONS

DIMENSIONS AND RECOMMENDED PAD-LAYOUT (mm)



› Pins coplanarity 0.1 mm MAX

ELECTRICAL DIAGRAM



ELECTRICAL SPECIFICATIONS | 125KHz

P/N	L x,y,z (mH)	Q x,y Min	Qz min	SRFx,y (kHz) Min	SRFz (kHz) Min	DCR x,y,z (Ω) Max	Sensitivity x,y (mV/A/m) Min	Sensitivity z (mV/A/m) Min	Dimensions (mm) Max
3DC11-DR-0491J	4.91±5%	22	30	300	500	110	100	50	13.2 x 11.8 x 3.5
3DC11-DR-0720J	7.2±5%	25	35	300	500	140	95	32	13.2 x 11.8 x 3.5

This chart is a reference guide for the most common required values at working frequency of 125 kHz. Any other inductance value at LF or tighter tolerances can be provided. Also can be supplied different inductance values in the different winding axis. Please contact our sales department for any inquiry.
L and Q factor measured at 125 kHz, 1 Vac.
Sensitivity measured with Helmholtz coils H=8.36 App/m @125 kHz. Contact us for measurement specification.
SRF: Self Resonant Frequency of the coil.

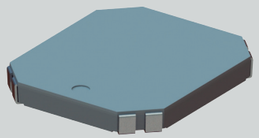
New

3DC14EM-ULP

SMD 3D Coil Ultra-Low-Profile

14x12x1.65mm (2.38-4.77mH)

3-AXIS TRANSPONDER INDUCTOR (3DCOILS™)



APPLICATIONS

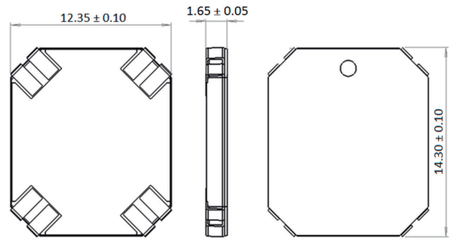
- Smartphones.
- Automotive.
- Acces Control with low profles devices.
- Access control in mobile devices.
- Electro Magnetic Motion Tracking using Smartphones as handles.
- EM Tracking of Smart Phones.

01 CHARACTERISTICS

- 3 coils in one component, oriented in the 3 space axes with full functionality
- Ultra-Low profile. Best in market. Suitable for Smartphone
- Allows Automatic Optical Inspection
- High sensitivity (>80mV/A/m)
- Available with different inductance values
- Very stable electrical properties in full operational operative range (-40°C → +85°C)
- Suitable for Pick&Place SMD assembly

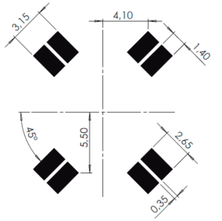
02 SPECIFICATIONS

DIMENSIONS (mm)



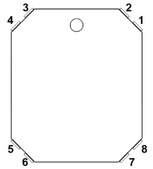
Standard tolerances: ±0.1mm

RECOMMENDED PAD-LAYOUT



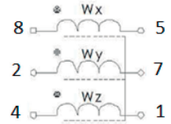
Tolerances unless otherwise specified: ± 0.1mm

PINS MARKING



UPPER VIEW

ELECTRICAL DIAGRAM



- Start of windings is indicated with the dot

ELECTRICAL SPECIFICATIONS

CODE	Lx (mH)	L,y (mH)	Lz (mH)	Qx,y min	Qz min	SRFx,y (kHz) min	SRFz (kHz) min	DCR x,y (Ω) Max	DCRz (Ω) Max	Sensitivity x,y,z (mVpp/ App/m) min	Dimensions (mm) Max
3DC14EM-ULP-0238J	2.38 (1)	2.38 (1)	7.2 (1)	15	20	350	900	84	172	50	14.4 x 12.2 x 1.70
3DC14EM-ULP-0477J	4.77 (1)	6.30 (1)	10.5 (1)	14.8	25	250	600	198	264	80	14.4 x 12.2 x 1.70
3DC14EM-ULP-0450J	4.50 (1)	4.50 (1)	7.60 (1)	14.8	25	250	600	150	176	60	14,4 x 12.2 x 1.70

(1) Other tolerances under request. Inductance tolerance ±5%. Please contact PREMO for any inquiry.

This chart is a reference guide for the most common required values at working frequency of 125kHz.. Please contact our sales department for any inquiry. Sensitivity measured with Helmholtz coils H=8.36 App/m @125kHz. Contact us for measurement specification.

SRF: Self-resonant frequency of the coil

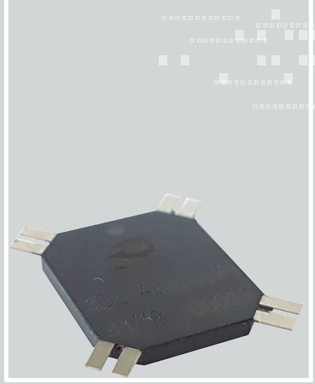
New

3DC14EMR-ULP

SMD 3D Coil Ultra-Low-Profile

14x12x1.65mm (2.38-4.77mH)

3-AXIS TRANSPONDER INDUCTOR (3DCOILS™)



APPLICATIONS

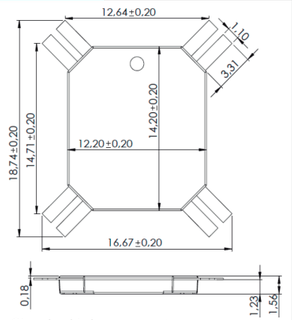
- Smartphones.
- Automotive.
- Acces Control with low profles devices.
- Access control in mobile devices.
- Electro Magnetic Motion Tracking using Smartphones as handles.
- EM Tracking of Smart Phones.

01 CHARACTERISTICS

- 3 coils in one component, oriented in the 3 space axes with full functionality
- Ultra-Low profile. Best in market. Suitable for Smartphone
- Allows Automatic Optical Inspection
- High sensitivity (>80mV/A/m)
- Available with different inductance values
- Very stable electrical properties in full operational operative range (-40°C→+85°C)
- Suitable for Pick&Place SMD assembly

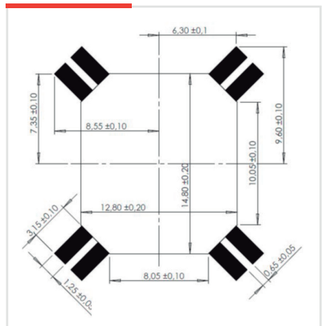
02 SPECIFICATIONS

DIMENSIONS (mm)

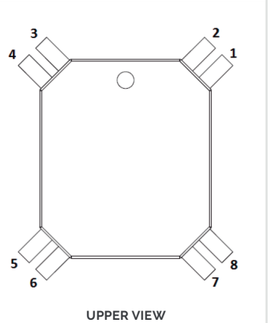


› Standard tolerances: ±0.1mm

RECOMMENDED PAD-LAYOUT

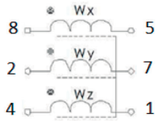


PINS MARKING



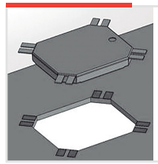
UPPER VIEW

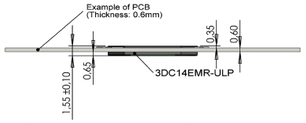
ELECTRICAL DIAGRAM



› Start of windings is indicated with the dot

HIDDEN ASSEMBLY EX. OVER 0.6T PCB





› Tolerances unless specified ±0.05mm

ELECTRICAL SPECIFICATIONS

CODE	Lx (mH)	L,y (mH)	Lz (mH)	Qx,y min	Qz min	SRFx,y (kHz) min	SRFz (kHz) min	DCR x,y(Ω) Max	DCR z (Ω) Max	Sensitivity x,y (mVpp/ App/m) min	Sensitivity z (mVpp/ App/m) min	Dimensions (mm) Max
3DC14EMR-ULP-0238J	2.38 (1)	2.38 (1)	7.2 (1)	15	20	350	900	84	172	45	50	14.4 x 12.2 x 1.65 (2)
3DC14EMR-ULP-0477J	4.77 (1)	6.30 (1)	10.5 (1)	14.8	25	250	600	190	259	95	80	14.4 x 12.2 x 1.65 (2)
3DC14EMR-ULP-0450J	4.50 (1)	4.50 (1)	7.60 (1)	14.8	25	250	600	150	176	90	60	14,4 x 12.2 x 1.65 (2)

(1) Other inductances under request. Inductance tolerance ±5%. Please contact PREMO for any inquiry.

(2) Body size without pins.

This chart is a reference guide for the most common required values at working frequency of 125kHz.. Please contact our sales department for any inquiry. Sensitivity measured with Helmholtz coils H=8.36 App/m @125kHz. Contact us for measurement specification.

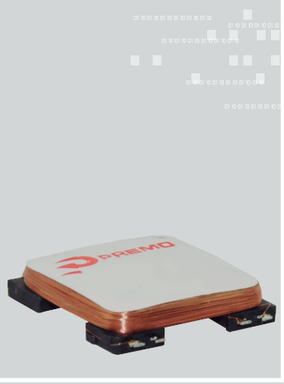
SRF: Self-resonant frequency of the coil

3DC1515

SMD 3D Coil

17.5x16x4mm MAX (2.47mH – 10mH)

3-AXIS TRANSPONDER INDUCTOR (3DCOILS™)



APPLICATIONS

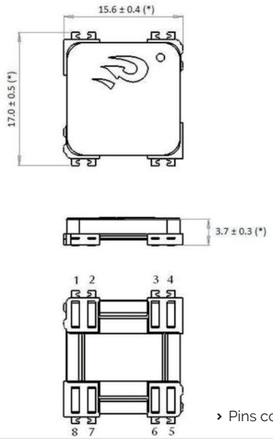
- Automotive passive keyless entry systems.
- Automotive TPMS with wake up functions.
- Access control.
- Tracking devices.

01 CHARACTERISTICS

- This 3D coil, RFID innovate component, highlights for its high sensitivity, low profile and small size.
- Ensures optimal field sensing regardless position.
- Best choice for Keyless Entry Systems.
- High drop test resistance (up to 500 times 1m) due to a maximized pin area.
- High stability in temperature (-40°C to +85°C).
- Isotropic version available.
- With cover cap or labeled.
- Designed for 125 kHz and 134 kHz.

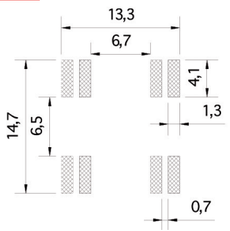
02 SPECIFICATIONS

DIMENSIONS (mm)

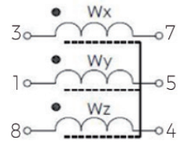


› Pins coplanarity 0.15 mm.

RECOMMENDED PAD-LAYOUT



ELECTRICAL DIAGRAM



ELECTRICAL SPECIFICATIONS | 7.2 mH

CODE	L x,y,z (mH)	Cres (pF)	Qx,y typ	SRFx,y (KHz) min	SRFz (KHz) min	RDC max x,y (Ω)	RDC max z (Ω)	Sensitivity x,y,z (mVpp/App/m)
3DC15-0247J	2.47	656	>25	400	900	75	75	>65
3DC15-0345	3.45	470	>25	300	700	77	116	>67
3DC15-0405J	4.05	400	>25	400	800	98	98	>72
3DC15-0477	4.77	340	>25	300	600	100	136	>80
3DC15-0491J	4.91	330	>25	300	700	100	140	>85
3DC15-0720J	7.20	225	>25	250	600	120	170	>95
3DC15-1000J	10.00	162	>25	220	500	160	275	>140

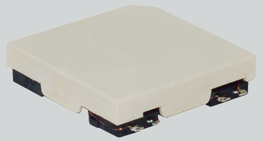
This chart is a reference guide for the most common required values at working frequency of 125 kHz. Any other inductance value at LF or tighter tolerances can be provided. Also can be supplied different inductance values in the different winding axis. Please contact our sales department for any inquiry.
L and Q factor measured at 125 kHz, 1 Vac.
Sensitivity measured with Helmholtz coils H=1.27 App/m @125 kHz. **Contact us for measurement specification.**
SRF: Self Resonant Frequency of the coil.

3DC15CAP

SMD CAP 3D Coil

17.5x16x4.1mm MAX (2.47mH – 7.2mH)

3-AXIS TRANSPONDER INDUCTOR (3DCOILS™)



APPLICATIONS

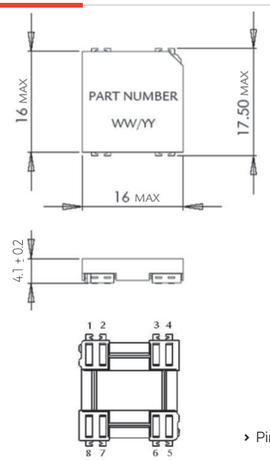
- Automotive passive keyless entry systems.
- Automotive TPMS with wake up functions.
- Access control.
- Tracking devices.

01 CHARACTERISTICS

- Evolution of the 3DC15 series.
- The cap provides an additional mechanical protection to the coil, combined with a high performance in temperature.
- Also, the cap allows an easier handling and placing aof the part.
- High drop test resistance (up to 500 times 1m) due to a maximized pin area.
- High stability in temperature (-40°C to +85°C).
- Isotropic version available.
- Designed for 125 kHz and 134 kHz.

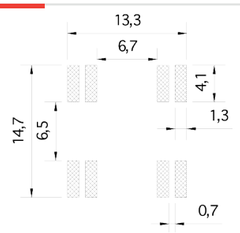
02 SPECIFICATIONS

DIMENSIONS (mm)

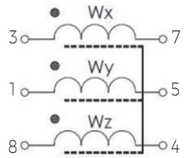


› Pins coplanarity 0.1 mm.

RECOMMENDED PAD-LAYOUT



ELECTRICAL DIAGRAM



ELECTRICAL SPECIFICATIONS

CODE	L x,y,z (mH)	Q x,y,z Min	Frequency (kHz)	Cres (pF)	SRF x,y (kHz) Min	SRF z (kHz) Min	DCR x,y (Ω) Max	DCR z (Ω) Max	Sensitivity x,y,z (mVpp/App/m) Min
3DC15CAP-0247J	2.47	22	125	656	400	900	75	75	65
3DC15CAP-0491J	4.91	25	125	330	250	550	100	140	70
3DC15CAP-0720J	7.20	20	125	225	250	550	120	230	95

Length (mm)	Width (mm)	Height (mm)
16.0	17.5	4.1

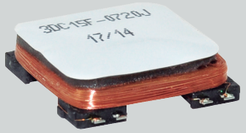
This chart is a reference guide for the most common required values at working frequency of 125 kHz. Any other inductance value at LF or tighter tolerances can be provided. Also can be supplied different inductance values in the different winding axis. Please contact our sales department for any inquiry.
L and Q factor measured at 125 kHz, 1 Vac.
Sensitivity measured with Helmholtz coils H=8.36 App/m @125 kHz. Contact us for measurement specification.
SRF: Self Resonant Frequency of the coil.

3DC15F

SMD 3D Coil

17.5x15.6x4.8mm MAX (2.47mH – 7.2mH)

3-AXIS TRANSPONDER INDUCTOR (3DCOILS™)



APPLICATIONS

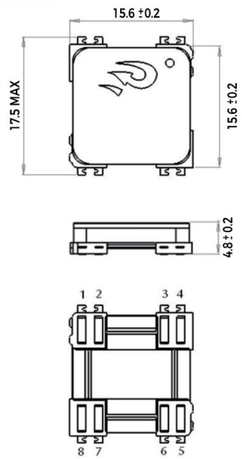
- Automotive passive keyless entry systems.
- Automotive TPMS with wake up functions.
- Access control.
- Tracking devices.

01 CHARACTERISTICS

- Evolution of the 3DC15 series.
- The foam, placed on the top of the part, absorbs better the shocks and, thus, improves the mechanical performance of the piece.
- High drop test resistance (up to 500 times 1m) due to a maximized pin area.
- High stability in temperature (-40°C to +85°C).
- Isotropic version available.
- Designed for 125 kHz and 134 kHz.

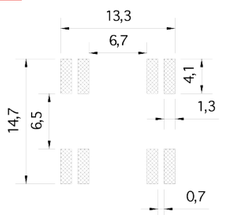
02 SPECIFICATIONS

DIMENSIONS (mm)

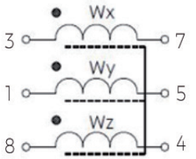


- Pins coplanarity 0.15 mm.

RECOMMENDED PAD-LAYOUT



ELECTRICAL DIAGRAM



ELECTRICAL SPECIFICATIONS

P/N	L x,y,z (mH)	Q x,y,z Min	Frequency (kHz)	Cres (pF)	SRF x,y (kHz) Min	SRF z (kHz) Min	DCR x,y (Ω) Max	DCR z (Ω) Max	Sensitivity x,y,z (mVpp/App/m) Min
3DC15F-0247J	2.47	22	125	656	400	900	75	75	65
3DC15F-0491J	4.91	23	125	330	300	700	100	140	85
3DC15F-0720J	7.20	25	125	225	250	600	120	170	95

Length (mm)	Width (mm)	Height (mm)
15.6	17.5	4.8

This chart is a reference guide for the most common required values at working frequency of 125 kHz. Any other inductance value at LF or tighter tolerances can be provided. Also can be supplied different inductance values in the different winding axis. Please contact our sales department for any inquiry.
L and Q factor measured at 125 kHz, 1 Vac.
Sensitivity measured with Helmholtz coils H=8.36 App/m @125 kHz. Contact us for measurement specification.
SRF: Self Resonant Frequency of the coil.

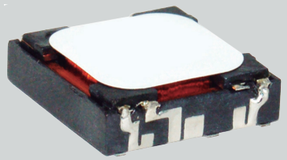
New

3DC12S

SMD 3D Coil Cap Adaptor

12.5x13.5.x3.6mm (2.36-7.2mH)

3-AXIS TRANSPONDER INDUCTOR (3DCOILS™)



FEATURES

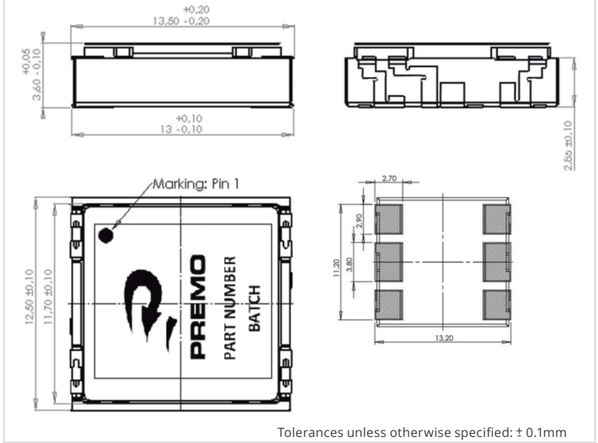
Three axis transponder suitable for Surface Mountable according market standards. Very good electrical performance and stability in temperature. A very good solution for Keyless Go and Keyless entry systems.

01 CHARACTERISTICS

- 3 coils in one component, oriented in the 3 space axes with full functionality
- Allows Automatic Optical Inspection
- High sensitivity (75mV/A/m)
- Available with different inductance values
- Very stable electrical properties in full operational operative range (-40°C +85°C)
- Max. Operating Temperature: +85°C
- Suitable for Pick&Place SMD assembly
- Options with protective foam against shocks also available

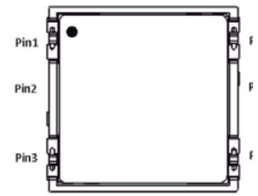
02 SPECIFICATIONS

DIMENSIONS AND RECOMMENDED PAD-LAYOUT (mm)

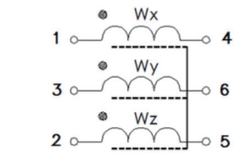


Tolerances unless otherwise specified: ± 0.1mm

PINOUT



ELECTRICAL DIAGRAM



ELECTRICAL SPECIFICATIONS | 125KHz

Code	Lx,y,z (mH) nom	Qx,y,z nom	f(kHz) (KHz)	SRFx,y (KHz) Min	SRFz (KHz) Min	DCRx (Ohm) Max	DCR y (Ohm) Max	DCRz (Ohm) Max	Sensitivity x,y,z (mV/A/m) Min (*)
3DC12S-0236J	2.36/2.36/3.4 ±5%	23/20/18	125	450	500	58	66	160	42
3DC12S-C-0236J	2.36/2.36/3.4 ±5%	23/20/18	134	450	500	58	66	160	42
3DC12S-0470J	4.7/4.7/7.2 ±5%	34/28/18	125	400	440	102	115	253	60
3DC12S-C-0470J	4.7/4.7/7.2 ±5%	34/28/18	134	400	440	102	115	253	60
3DC12S-0675J	6.75/6.75/6.75 ±5%	33/27/19	125	400	460	123	139	245	72
3DC12-0720J	7.2/7.2/7.2 ±5%	33/27/18	125	400	420	138	158	288	75
3DC12S-0720J	7.2/7.2/9.0 ±5%	33/33/19	125	400	380	138	158	324	75
3DC12-C-0720J	7.2/7.2/7.2 ±5%	33/27/18	134	400	420	138	158	288	75

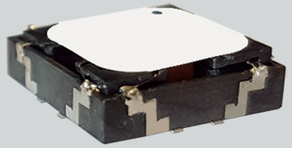
New

3DC13S

SMD 3D Coil Cap Adaptor

13.25x13.55x4.05mm (2.36-7.2mH)

3-AXIS TRANSPONDER INDUCTOR (3DCOILS™)



FEATURES

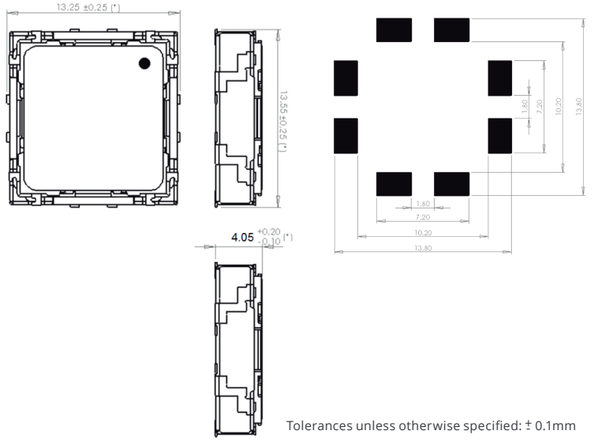
Three axis transponder suitable for Surface Mountable according market standards. Very good electrical performance and stability in temperature. A very good solution for Keyless Go and Keyless entry systems.

01 CHARACTERISTICS

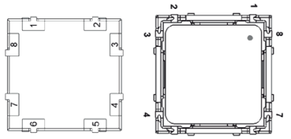
- 3 coils in one component, oriented in the 3 space axes with full functionality
- Allows Automatic Optical Inspection
- High sensitivity (60mV/A/m)
- Available with different inductance values
- Very stable electrical properties in full operational operative range (-40°C +85°C)
- Max. Operating Temperature: +85°C
- Suitable for Pick&Place SMD assembly
- Options with protective foam against shocks also available

02 SPECIFICATIONS

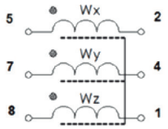
DIMENSIONS AND RECOMMENDED PAD-LAYOUT (mm)



PINOUT



ELECTRICAL DIAGRAM



ELECTRICAL SPECIFICATIONS | 125KHz

Code	Lx,y,z (mH) nom	Qx,y,z nom	f(kHz)	SRF x,y (kHz) Min	SRFz (kHz) Min	DCRx (Ohm) Max	DCRy Max	DCRz Max	Sensit. x,y (mV/A/m) Min (*)	Sensit. z (mV/A/m) Min (*)
3DC13S-0236J	2.36/2.36/3.4 ±5%	33/27/20	125	500	850	43	47	152	55	40
3DC13S-C-0236J	2.36/2.36/3.4 ±5%	33/27/20	134	500	850	43	47	152	55	40
3DC13S-0470J	4.7/4.7/7.2 ±5%	40/33/30	125	450	750	70	75	187	80	50
3DC13S-C-0470J	4.7/4.7/6.8 ±5%	40/33/30	134	450	750	70	75	187	80	50
3DC13S-0720J	7.2/7.2/10.6 ±5%	44/36/33	125	300	500	95	102	258	95	60
3DC13S-C-0720J	7.2/7.2/10.6 ±5%	44/36/33	134	300	500	95	102	258	95	60

This chart is a reference guide for the most common required values at working frequency of 125kHz/134kHz. Any other inductance value at LF or tighter tolerances can be provided. Please contact our sales department for any inquiry. Sensitivity measured with Helmholtz coils H=8.36 App/m @125kHz and H=8.63 App/m @134kHz. Contact us for measurement specification.

SRF: Self-resonant frequency of the coil

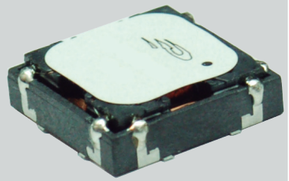
New

3DC14S

3D Coil cap adaptor

13.25x13.55x4.05mm (2.36-7.2mH)

3-AXIS TRANSPONDER INDUCTOR (3DCOILS™)



FEATURES

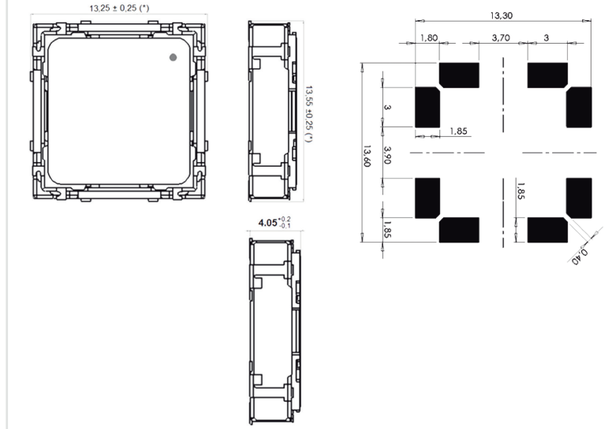
Three axis coil suitable for Surface Mountable according market standards. Very good electrical performance and stability in temperature. A very good solution for Keyless Go and Keyless entry systems.

01 CHARACTERISTICS

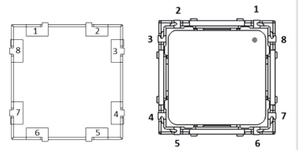
- 3 coils in one component, oriented in the 3 space axes with full functionality
- Allows Automatic Optical Inspection
- High sensitivity (60mV/A/m)
- Available with different inductance values
- Very stable electrical properties in full operational operative range (-40°C +85°C)
- Max. Operating Temperature: +85°C
- Suitable for Pick&Place SMD assembly
- Options with protective foam against shocks also available

02 SPECIFICATIONS

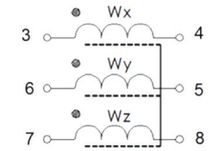
DIMENSIONS AND RECOMMENDED PAD-LAYOUT (mm)



PINOUT



ELECTRICAL DIAGRAM



ELECTRICAL SPECIFICATIONS

Code	Lx,y,z (mH) nom	Qx,y,z nom	f(kHz)	SRF x,y (KHz) Min	SRFz (KHz) Min	DCRx (Ohm) Max	DCRy Max	DCRz Max	Sensit. x,y (mV/A/m) Min (*)	Sensit. z (mV/ A/m)Min (*)
3DC14S-0236J	2.36/2.36/3.4 ±5%	33/27/20	125	500	850	43	47	152	55	40
3DC14S-C-0236J	2.36/2.36/3.4 ±5%	33/27/20	134	500	850	43	47	152	55	40
3DC14S-0470J	4.7 / 4.7 / 7.2 ±5%	40/33/30	125	450	750	70	75	187	80	50
3DC14S-C-0470J	4.7 / 4.7 / 7.2 ±5%	40/33/30	134	450	750	70	75	187	80	50
3DC14S-0630J	6.3 / 6.3 / 7.8 ±5%	40/33/30	134	380	750	86	80	140	90	40
3DC14S-0720J	7.2/7.2/7.2 ±5%	44/36/33	125	300	500	95	102	258	95	60
3DC14S-C-0720J	7.2/7.2/7.2 ±5%	44/36/33	134	300	500	95	102	258	95	60

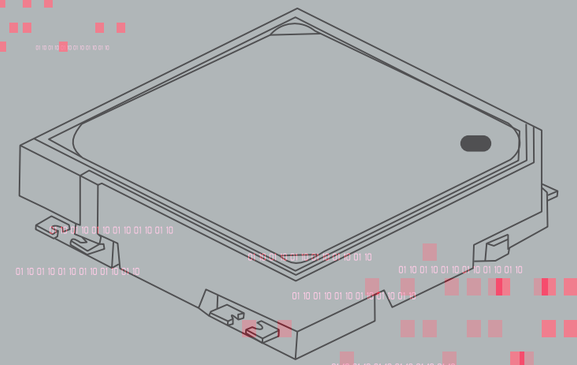
This chart is a reference guide for the most common required values at working frequency of 125kHz/134kHz. Any other inductance value at LF or tighter tolerances can be provided. Please contact our sales department for any inquiry. Sensitivity measured with Helmholtz coils H=8.36 App/m @125kHz and H=8.63 App/m @134kHz. Contact us for measurement specification.

SRF: Self-resonant frequency of the coil

1.1.3

RFID TRANSPONDERS

NFC ANTENNAS

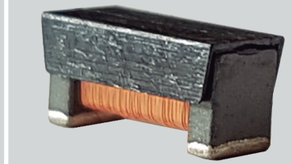


TC0502HF

NFC SMD antenna

5.4x2.8x2.85mm

NFC ANTENNAS



FEATURES

This component is an SMD ferrite antenna suitable for signal reception/transmission at 13.56MHz.

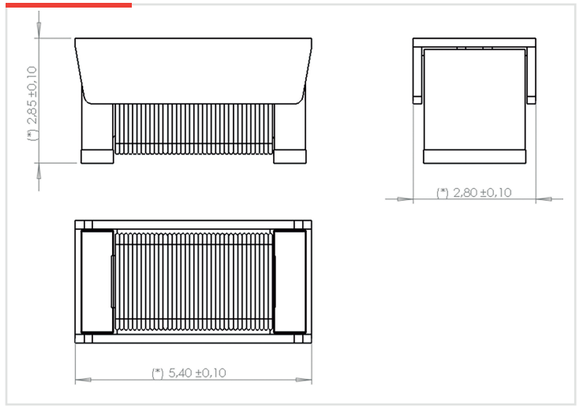
TC0502HF is a highly sensitive and compact solution specially designed for those NFC applications where size of components is critical. TC0502HF series is offered with 2.0 and 4.7 µH (@13,56MHz) inductance values and can be custom according to customer's specification.

01 CHARACTERISTICS

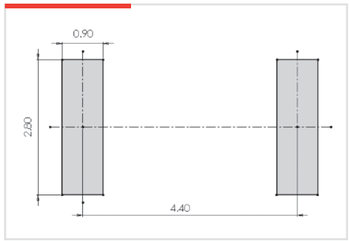
- This component is functional to 13.56MHz (NFC applications)
- Can be used in RFID applications with ISO15693 (vicinity: I-Code), ISO 14443A&B (proximity: MIFARE) interface, ISO 18092 and Felica
- Very small size: 5.2x2.4x2.7mm
- Good mechanical performance
- Very stable electrical properties in full operational operative range (-40°C +125°C)
- Wire: H, 125°C solderable.
- Terminals: Ag-Ni-Sn100
- Max. Operating Temperature: +125°C
- Suitable for Pick&Place SMD assembly

02 SPECIFICATIONS

DIMENSIONS (mm)



RECOMMENDED PAD-LAYOUT



ELECTRICAL SPECIFICATIONS

	L (mH)	Q Min	Cres (pF)	SRF (MHz) Min	DCR (Ω) Max	Dimensions (mm) Max
TC0502HF-0002K	2.0 ± 10%	16	68	25	0.978	5.2 x 2.4 x 2.7
TC0502HF-00047K	4.7 ± 10%	18	29	25	1.430	5.2 x 2.4 x 2.7

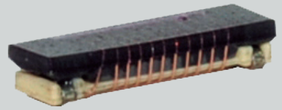
Inductance, Q factor, DCR and SRF measured with an LCR meter HP 4887A 5.2x2.4x2.7mm MAX

SDTR1103-HF2

SMD Transponder for NFC applications

11.8x3.6x4.2.5mm MAX (1mH – 20mH)

NFC ANTENNAS



FEATURES

The SDTR1103-HF2 Series of Surface Mount ferrite wound inductor is the best solution when high electrical and mechanical performance is needed. Its length and cross sectional area are optimized to achieve the maximum sensitivity in the coil axis.

The construction of the coil offer high mechanical performance due to the plastic base and ferrite laminate.

01 CHARACTERISTICS

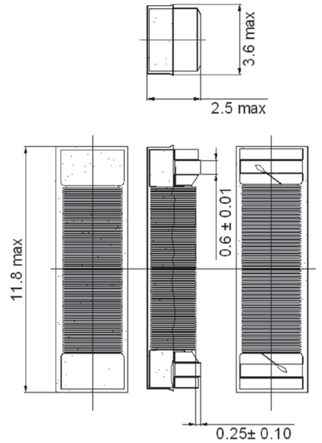
- High stability in temperature
- Operation temperature (-40°C to +85 °C)
- Good mechanical performance.
- Drop test: more than 500 times x 1 meter.
- Taped & Reel: 3000pcs / reel.

02 APPLICATIONS

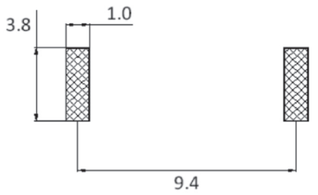
- RFID readers at 13.56MHz.
- NFC applications at 13.56MHz.

03 SPECIFICATIONS

DIMENSIONS (mm)

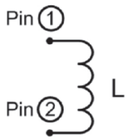


RECOMMENDED PAD-LAYOUT



Tolerances unless otherwise specified: ± 0.1mm

SCHEMATIC DIAGRAM



ELECTRICAL SPECIFICATIONS | (1µH – 20µH)

	L @13,56 MHz (µH)	Q min. @13,56MHz	SRF (MHz) Min	DCR Max (Ω)
SDTR1103-HF2-0001K	1.0 ± 10%	20	25	0.286
SDTR1103-HF2-0002K	2.0 ± 10%	20	25	0.4345
SDTR1103-HF2-0003K	3.0 ± 10%	20	25	0.506
SDTR1103-HF2-0006K	6.00 ± 10%	20	25	0.704
SDTR1103-HF2-0020K	20.00 ± 10%	20	25	1.32

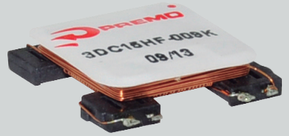
Inductance, Q factor, DCR and SRF measured with an LCR meter HP 4887A

3DC15-HF

SMD 3D Coil

17.5x16.0x4.0mm MAX (3mH – 18mH)

NFC ANTENNAS



FEATURES

In the last few years, Communication technology by Near Field Communications (NFC) has experienced a lot of improvements. PREMO enlarges its NFC product range with the new 3DC15-HF series. A combination of 3 single coils oriented in the 3 space axis. The new 3D coil from PREMO RFID offers the possibility of mounting a single component instead of three, thus reducing cost, saving PCB space and increasing the circuit reliability. Sensitivity, low profile and small size are the key of this RFID innovative component. **Best choice for keyless entry systems the three tri-rectangular windings ensure optimum field sensing regardless position.**

01 CHARACTERISTICS

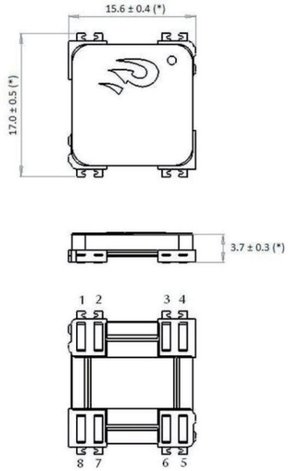
- Size: 17.5x16.0x4.0 mm
- High drop test resistance (up to 500 times 1 m) due to a maximized pin area.
- High stability in temperatur (-40°C to +85°C).
- Isotropic version available.
- With cover cap or labelled.
- Taped & Reeled.
- Designed for 13,56MHz.

02 APPLICATIONS

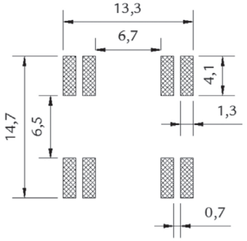
- NFC applications

03 SPECIFICATIONS

DIMENSIONS (mm)



RECOMMENDED PAD-LAYOUT



Tolerances unless otherwise specified: ± 0.1mm

ELECTRICAL SPECIFICATIONS

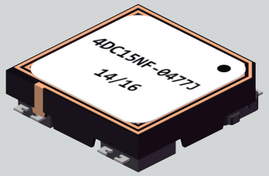
	L x,y,z (µH)	L parallel (µH)	Q min x,y	Q min z	SRF x,y,z (MHz) Min	DCR x,y (mΩ) Max	DCR z (mΩ) Max	Dimensions (mm) Max
3DC15HF-0003K	3 ± 10%	1 ± 10%	24	18	25	352	561	17.5 x 16.0 x 4.0
3DC15HF-0006K	6 ± 10%	2 ± 10%	20	15	25	506	737	17.5 x 16.0 x 4.0
3DC15HF-0009K	9 ± 10%	3 ± 10%	20	10	25	594	836	17.5 x 16.0 x 4.0
3DC15HF-0018K	18 ± 10%	6 ± 10%	15	6	25	836	1012	17.5 x 16.0 x 4.0

This specification chart is a reference guide for the most common required values at working frequencies of 13,56MHz. Any other inductance value at HF or tighter tolerances can be provided. Please contact our sales deparment for any inquiry.

4DC15NF

4D-COIL 125kHz-PKE, 13,56MHz-NFC

NFC ANTENNAS



FEATURES

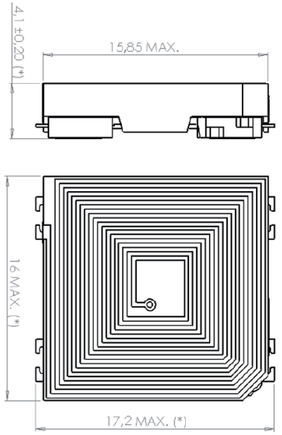
The new 4Dcoil Series, provides three orthogonal coils for working at low frequency (standard 125 kHz) and an additional coil for working at high frequency (standard 13,56 MHz).With very stable properties in a wide range of temperature (-40°C to +85°C). **Its efficient design of low frequency coils has very high sensitivity and excellent isotropy.** The inductance value is 4.77mH @125kHz (other values under request). Inductance value of high frequency (NFC) antenna is 0.85uH @13.56MHz.

01 CHARACTERISTICS

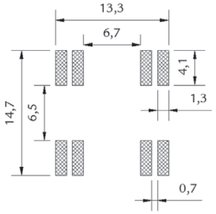
- This component is functional at 125kHz and 13.56MHz (NFC applications)
- Can be used in RFID applications with ISO15693 (vicinity: I-Code), ISO 14443A&B (proximity: MIFARE) interface, ISO 18092 and Felica.
- Good mechanical performance
- Suitable for Pick&Place SMD assembly- Taped & Reeled.
- Designed for 13,56MHz.

02 SPECIFICATIONS

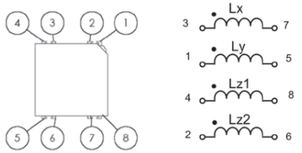
DIMENSIONS (mm)



RECOMMENDED PAD-LAYOUT



ELECTRICAL DIAGRAM



ELECTRICAL SPECIFICATIONS | 4DC15NF-0477J

L x,y,z (mH)	4,77 ± 5%
Lz2 (µH)	0,85 ± 10%
Q min x,y,z1	24
Q min z2	4,5
SRFx,y (kHz) Min	250
SRFz1 (kHz) Min	350
SRFz2 (MHz) Min	25
DCRxy (mΩ) Max	99
DCRz1 (mΩ) Max	132
DCRz2 (mΩ) Max	4,95

This specification chart is a reference guide at working frequencies of 125 kHz. ans 13,56 MHz.

2D1D15

SMD 3D Coil

17.5x16.0x4.0mm MAX

NFC ANTENNAS

FEATURES

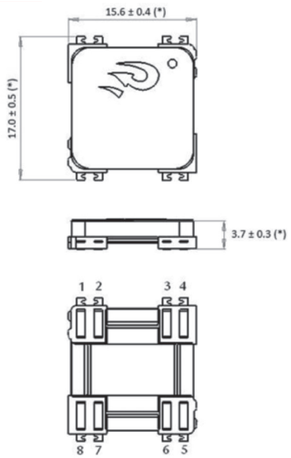
The 2D1D15 integrates in the same component NFC and LF performance. Since in the last few years, communication technology by Near Field Communication (NFC) has experienced a lot of improvements and still Low Frequency (LF) is widely used for security communications, this component offers the possibility to work with both communication ranges. A combination of 2 single coils in LF and one single coil in NFC oriented in the 3 space axis offers the possibility of mounting a single component instead of three and working with the two frequency ranges.

01 CHARACTERISTICS

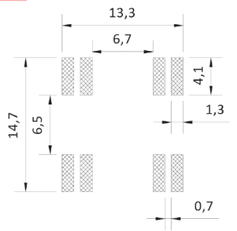
- Size: 17.5 x 16.0 x 4.0mm MAX
- High drop test resistance (up to 500 times 1 m) due to a maximized pin area.
- High stability in temperature (-40°C to +85°C).
- With cover cap or labelled.
- Taped & Reeled.
- Designed for 125KHz,134KHz and 13.56 MHz.

02 SPECIFICATIONS

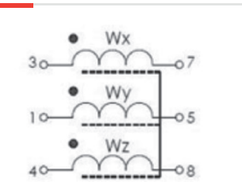
DIMENSIONS (mm)



RECOMMENDED PAD-LAYOUT



ELECTRICAL DIAGRAM



ELECTRICAL SPECIFICATIONS | 2D1D15-0477J

L x,y (mH)	4.77
Lz (uH)	6
Qx,y Min	23
Qz Min	15
fxy (kHz)	125
Fz (MHz)	13.56
SRFx,y (kHz) Min	250
SRFz (kHz) Min	25
DCRx,y (Ω) Max	96
DCRz (Ω) Max	0.75
Sensitivity x,y (mVpp/App/m) Min	77

Length (mm)	16.0
Width (mm)	17.5
Height (mm)	4.0

This chart is a reference guide for the most common required values at working frequency of 125 kHz. Any other inductance value at LF or tighter tolerances can be provided. Also can be supplied different inductance values in the different winding axis. Please contact our sales department for any inquiry.
Sensitivity measured with Helmholtz coils H=8.36 App/m @125 kHz. Contact us for measurement specification.
SRF: Self Resonant Frequency of the coil.

ZC1003HF

SMD Z axis for NFC applications

10x10x3.2mm

NFC ANTENNAS

FEATURES

This component is a Z-axis SMD ferrite antenna suitable for signal reception/transmission at 13.56MHz. **ZC1003HF series is a highly sensitive and compact solution** (10x10x3.1mm) specially designed for those NFC applications where size of components is critical. This innovative antenna requires less board space compared with antennas designed for a PCB and offers larger reading distances. Furthermore, this Z-axis coil's design offers an outstanding electrical performance and mechanical robustness, providing an excellent reliability.

ZC1003HF series is offered with 2,5µH-4,5µH (@13.56MHz) inductance value and can be custom according to customer's specifications.

01 CHARACTERISTICS

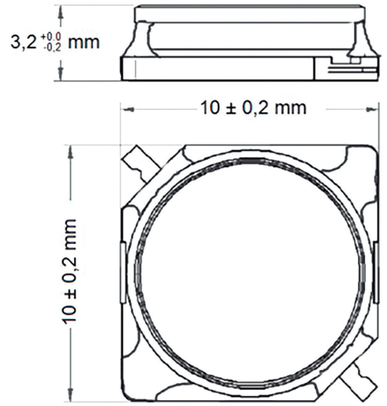
- Very good electrical and mechanical performance.
- High performance NiZn ferrite core material (>10^6 Ohm•m)
- High stability in temperature: (-40°C to +100°C).
- High sensitivity values achieved with very good thermal performance.
- RoHS compliant

02 APPLICATIONS

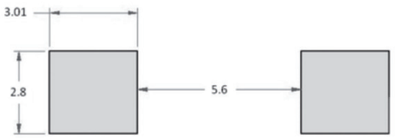
- This component is functional to 13,56 MHz (NFC applications)
- Can be used in RFID applications with ISO15693 (vicinity: I-CODE), ISO 14443A&B (proximity: MIFARE) interface, ISO18092, and Felica.

03 SPECIFICATIONS

DIMENSIONS (mm)



RECOMMENDED PAD-LAYOUT



Tolerances unless otherwise specified: ± 0.1mm

ELECTRICAL SPECIFICATIONS | 13,56 MHz

	L @13,56 MHz (µH)	Q min. @13,56MHz	SRF(MHz) Min	DCR.(Ohm)
ZC1003HF-00022K	2.2 ± 10%	80	25	0.130 ± 10%
ZC1003HF-00045K	4.5 ± 10%	80	25	0.380 ± 10%

The specification chart is a reference guide for the most common required values at working frequencies of 13,56MHz. Any other inductance value at HF or tighter tolerances can be provided. Please contact our sales deparment for any inquiry.

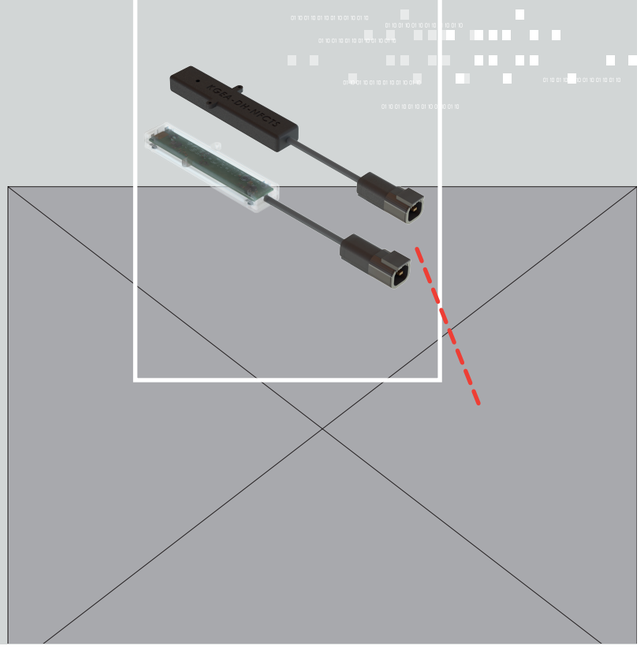
New

KGEA-DH-NFCTS

NFC module for Door Handle

NFC module + Touch sensor + Pocket light

NFC ANTENNAS



APPLICATIONS

- Door handle for Smart Key (NFC) car access.
- Demo kit for developing Smart Key applications.

01 FEATURES

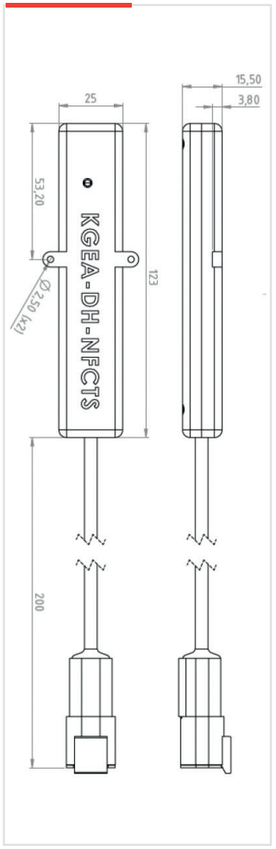
- NFC reader compliant with ISO14443A, ISO14443B, ISO15693 and FeliCa™.
- Lock and Unlock touch sensors.
- Pocket lighting.
- CAN-FD link with the ECU.
- Include basic Android app.
- Low power consumption.
- Secure communication.
- Resilient and effective in different weather conditions.
- Electronics designed to meet automotive standards.

02 OPERATION

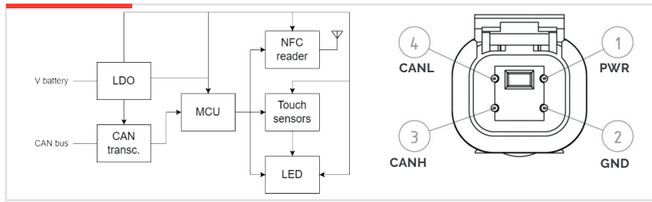
1. Power the device and open the example Android app in the smartphone.
2. Activate one of the touch sensors to wake-up the device and start the NFC reading.
3. Bring the smartphone closer to the NFC antenna of the DH.
4. You will receive a light indication with each touch sensing and NFC correct reading.

03 SPECIFICATIONS

DIMENSIONS (mm)



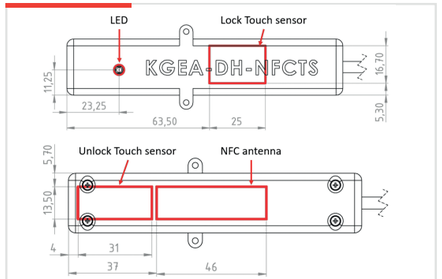
SCHEMATIC DIAGRAM



ELECTRICAL SPECIFICATIONS

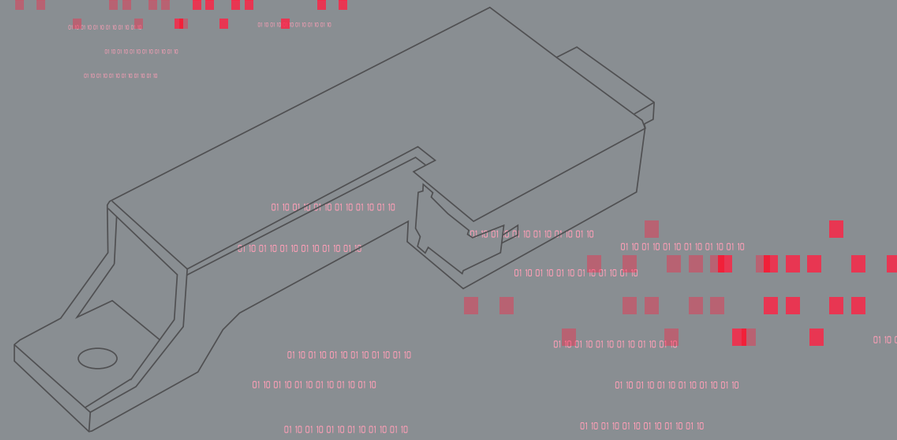
Operating frequency	13.56 MHz for NFC
Operating voltage	6-36 Vdc, 12 Vdc typ.
Max. current consumption	300 mA
Sleep mode consumption	450 uA
NFC reading distance	5cm with smartphone
Waterproof, flammability	IP67, UL94-V0
EMC testing	CISPR25, ISO7637-2, ISO11452-2, ISO11452-4, ISO10605
Operating temperature	-40°C to 85°C

POSITION OF THE FEATURES



1.2

RFID TRANSPONDERS
EMITTER ANTENNAS & SWITCHES



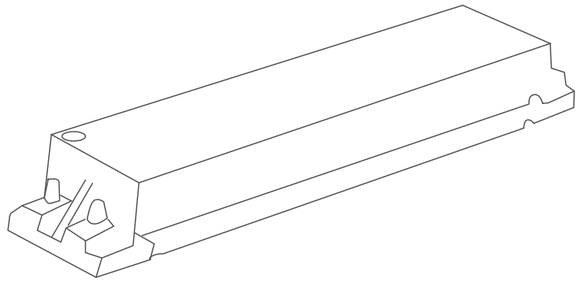
01 INTRODUCTION

Passive Keyless Entry system, is a generic term for an automotive technology which allows a driver to lock and unlock a vehicle without using the corresponding keyfob buttons. Once a driver enters a vehicle with an equipped PKE or Keyless Go keyfob (or cardkey), they have the ability to start and stop the engine, without inserting the SmartKey. A transponder antenna built within the keyfob allows the vehicle to identify a driver.

The SMD components located in the smart key are required high levels of sensitivity, good temperature stability and robustness against mechanical shocks and drops.

The system works by having a series of LF (low frequency 125 kHz, transmitting antennas both inside and outside the vehicle. The external antennas are located in the door handles, mirrors, or trunk position.

When the vehicle is triggered either by pulling the handle or touching the handle an LF signal is transmitted from the antennas to the key. The key becomes activated if it is sufficiently close and it transmits its ID back to the vehicle via RF (Radio frequency >300 MHz) to a receiver located in the vehicle. If the key has the correct ID the module unlocks the vehicle.

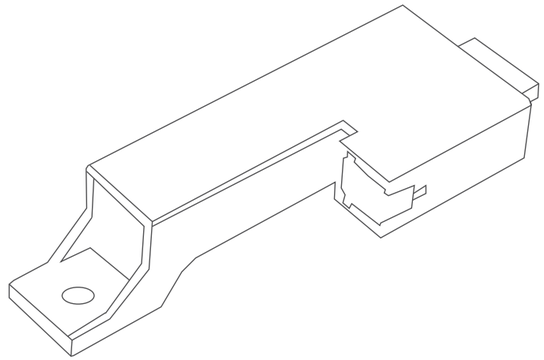


02 PREMO SOLUTIONS

PREMO's Emitter Antennas & Switches (catalog standard values) are available for LF 20, 125 and 134.2kHz operating frequencies with different inductance/ capacitor combinations and appropriate current capability. All members of the KGEA series (type BFCR, BFCWX, BFCAM, etc.) have been developed using special ferrite (low losses) and capacitors dedicated for high pulse applications (COG and low ESR). The antennas meet the AEC-Q200 (specific automotive quality standard) and IP68 standards due to their specific packaging (rugged plastic box filled with polyurethane foam). As standard version these antennas are delivered without connector. If requested by the customer, a
connector can be added during production according to the customer's specification (waterproof or non-waterproof).

PREMO is developing customized antennas using different types of technologies over-molding low pressure and high pressure depending on the mechanical requirements and waterproof IP degree required by the customer. For Door Handle Antennas, we also have the ability to integrate in a unique connector (6ways), the Antenna LF +Switch + LED as a single whole.

PREMO also offers the possibility of integrating the connector into the antenna by fully over-molding by method of high pressure or external housing integrated connector with filled with Polyurethane Plastic.



SEA

KGEA-SMD

	SEA	KGEA-SMD
Size (L x W x H)mm	50.8x10.6x6.8 mm	75x15x6.3 mm
Construction	Housing+SMD terminals	Housing+SMD terminals
Production status	In mass production	In mass production
Applications	Reader RF antenna	RKES, PKES, RTPMS
Electrical diagram	L (coil)	L (coil)
Working Resonant Frequencies	@20kHz, @125kHz and @134,2 kHz	@20kHz, @125kHz and @134,2 kHz
Products range	Radio Frequency Antenna	SMD Emitter Antenna
Temperature stability	-40°C to 85°C	-40°C to 85°C
Characteristics	Very small size, high stability in temperature and SMD mounting	Small size, high stability in temperature and SMD mounting
Notes	Standard Test AEC-Q200	Standard Test AEC-Q200
Page number	**124**	**126**

KGEA-BFCR

LFAD-BF/BFC

	KGEA-BFCR	LFAD-BF/BFC
L:Size (L x W x H)mm	145x26x12mm	L: until 70mm W x H: 67 x 17 mm.
Construction	Housing + Potting + Connector	External Housing (PTB-GF30% or PA66-GF30%) + Module LF (Ferrite or Ferrite+Cap)+ To cover by LPM or PU-resin. Connector located outside assembly housing plastic.
Production status	In mass production	In prototype
Applications	RKES, PKES	RKES, PKES
Electrical diagram	L+C in series	L (only inductance) or L+C in series
Working Resonant Frequencies	@20kHz, @125kHz and @134,2 kHz	@125kHz @134,2kHz
Products range	Door handler and Interior Antenna	Door handler and Interior Antenna
Temperature stability	40°C to 85°C	(-40 ->+85 °C)
Characteristics	Long reading distance, IP67 and connector located outside assembly housing plastic base	Long emitting-reading distances in the smallest volume, IP67 and connector located outside assembly housing plastic base
Notes	Optional parallel or serial Resistor. Standard Test AEC-Q200	Standard AEC-Q200
Page number	**128**	**130**

KGEA-BFCWX

KGEA-BFCAM

	KGEA-BFCWX	KGEA-BFCAM
Size (L x W x H)mm	103x20x9 mm	85x16.8x7 mm
Construction	Housing + Potting + Connector	Housing + Potting + Connector
Production status	In mass production	In mass production
Applications	RKES, PKES	RKES, PKES
Electrical diagram	L+C in series	L+C in series
Working Resonant Frequencies	@125kHz and @134,2 kHz	@125kHz and @134,2 kHz
Products range	Door handler and Interior Antenna	Door handler and Interior Antenna
Temperature stability	-40°C to 85°C	-40°C to 85°C
Characteristics	Long emitting-reading distances in the smallest volume, IP67 and connector located outside assembly housing plastic base	Very low profile transmitter antenna Aftermarket
Notes	Optional parallel or serial Resistor. Standard Test AEC-Q200	Optional parallel or serial Resistor. Standard Test AEC-Q200
Page number	**134**	**136**

KGEA-HB

KGEA-HBT

	KGEA-HB	KGEA-HBT
Size (L x W x H)mm	116,75x37x25 mm	141x20x20
Construction	Ultrasonic Welding	External Housing PA66-GF30%, Module LF Antenna + LPM (cover), CONNECTOR KET MG641762 Non Waterproof IP52
Production status	In mass production	Mass production
Applications	RKES, PKES	Smart entry system
Electrical diagram	L+C in series	L+C IN SERIES
Working Resonant Frequencies	@125KHz and 134.2kHz	@134,5Khz
Products range	Door handler, Interior antenna and trunk or bumper antenna	Short range antenna
Temperature stability	-40°C to 85°C	-40°C up to +85°C
Characteristics	Long reading distance , IP67, Connector integrated in the enclosure	External housing shape H-bridge Material PBT-GF30% or PA66-GF30%, IP56 grade Waterproof, Connector Non Waterproof IP52, Resonant frequency adjusting below +/- 2kHz, Custom L-C value (F-Resonant)
Notes	Optional parallel or serial Resistor. Standard Test AEC-Q200	This antenna is designed based on AECQ-200
Page number	**138**	**140**

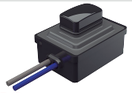
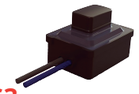
	KGEA-HBB	KGEA-HBW
		
Size (L x W x H)mm	141x20x20	L:116,75 mm WxH =19,5 x21 mm
Construction	External Housing PA66-GF30%, Module LF Antenna + LPM (cover), CONNECTOR 17435-2 (TYCO) IP67	External housing (integrated connector) + Module LF (Ferrite or Ferrite+Cap) + PU-resin (filled
Production status	Mass production	Mass production
Applications	Smart entry system	RKES, PKES
Electrical diagram	L+C IN SERIES	L (only inductance) or L+C in series
Working Resonant Frequencies	@134,5Khz	@20kHz, @125kHz @134,2kHz
Products range	Door Handle antenna	Door Handle antenna
Temperature stability	-40°C up to +85°C	(-40 ->+85 °C)
Characteristics	IP56 grade Waterproof, Connector IP67 Waterproof located outside assembly housing plastic base, Resonant frequency adjusting below +/- 2kHz, Custom L-C value (F-Resonant).	Antenna LF with a high mechanical robustness and the best performance electrical on metal surface due to its bridge type design external housing.
Notes	Based on AECQ-200	
Page number	142	144

	KGEA-DHS	KGEA-DHSL
		
Size (L x W x H)mm	LxW:75x15 mm Low Profile. Height max= 7,2 mm.	LxW:75x15 mm Low Profile. Height max= 7,2 mm.
Construction	Door Handle= Antenna LF (Ferrite or Ferrite+Cap +LPM process) + Connector located outside assembly Antenna LF + SWITCH.	Door Handle= Antenna LF(Ferrite or Ferrite+Cap+ LPM process) + Connector located outside assembly Antenna LF + SWITCH+LED
Production status	Mass production	Mass production
Applications	RKES, PKES	RKES, PKES
Electrical diagram	L (only inductance) or L+C in series	L (only inductance) or L+C in series
Working Resonant Frequencies	@20kHz, @125kHz @134,2kHz	@20kHz, @125kHz @134,2kHz
Products range	Door Handle antenna	Door Handle antenna
Temperature stability	(-40 ->+85 °C)	(-40 ->+85 °C)
Characteristics	Door Handle Antenna integrate in a unique connector (4ways), the Antenna LF + Switch as a single whole.	Door Handle Antenna integrate in a unique connector (6ways), the Antenna LF + Switch as a single whole
Notes	Standard AEC-Q200	Standard AEC-Q200
Page number	146	148

	KGEA-MRHB	KGEA-MRHPM
		
Size (L x W x H)mm	L: until 200mm W x H: 23 x 20mm.	168.10x16x12.9
Construction	External Housing (PTB-GF30% or PA66-GF30%) + Module LF (Ferrite or Ferrite+Cap)+ To cover by LPM or PU-resin. Connector located outside assembly housing plastic.	Antenna completely overmolded to HPM with Integrated Connector according to Drawing FCI 211FT0289,Terminal 1.5x0.8mm keying#6, brown.
Production status	In prototype	mass production
Applications	RKES, PKES	smart entry systems
Electrical diagram	L (only inductance) or L+C in series	L+C In series
Working Resonant Frequencies	@20kHz, @125kHz @134,2kHz	@120 Khz
Products range	Middle range antenna	Middle range antenna
Temperature stability	(-40 ->+85 °C)	40°C to 85°C
Characteristics	New Middle Range Antenna with Low Pressure Technology (LPM) New Middle Range Antenna with PU-resin	IP 68 grade Waterproof. Middle antenna (length until 200mm). Shape flat Material PBT-GF30%. Anchor point (Clips and pivot).
Notes	Standard AEC-Q200	This antenna is designed based on AECQ-200
Page number	154	158

	LFAD-MRLC	KGEA-AF/AFC
		New 
Size (L x W x H)mm	125.05x4.1x16.10	**L:** 200-300 until 500mm. W x **H:** 22 x 12mm.
Construction	External housing shape flat Material PBT-GF30% or PA66-GF30%	Box Integrated Connector+ Tube PBT + Module LF (Ferrite or Ferrite+Cap)+ Support legs
Production status	Mass production Q1-2022	In prototype
Applications	Designed to reduce the number of antennas respect the number of shorts antennas, keeping the same reading distance	RKES, PKES
Electrical diagram	L (only inductance) or L+C in series	L (only inductance) or L+C in series
Working Resonant Frequencies	125Khz	@20kHz, @125kHz @134,2kHz
Products range	Middle antenna	Long range antenna
Temperature stability	-40°C up to +85°C	-40 ->+85 °C
Characteristics	Resonant frequency adjusting below +/- 2kHz. Custom L-C value (F-Res: LFAD-BF) under demand.	Flexible Antenna and robustness mechanical. Very large length and Long reading distance. IP67, Connector integrated in the enclosure
Notes	This antenna is designed based on AECQ-200	
Page number	162	168

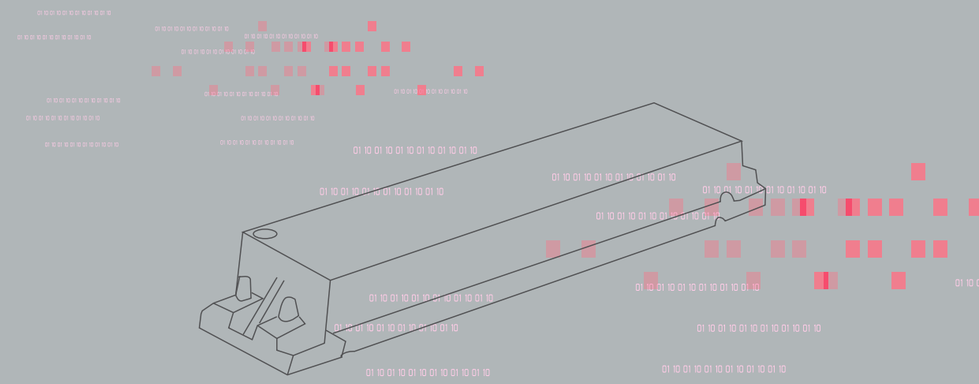
	New  KGEA-AFULR	New  SWITCH PB-S1
Size (L x W x H)mm	**L:** 200-300 until 500mm. W x **H:** 22 x 12mm.	18.10x17.4x19.91
Construction	Box Integrated Connector+ Tube PBT + Module LF (Ferrite or Ferrite+Cap)+ Support legs	Switches fully made with rubber compound, for interior usage on hidden lash door handlers
Production status	In prototype	In production
Applications	RKES, PKES	PKE and PEPS/others
Electrical diagram	L (only inductance) or L+C in series	SWITCH BLOCK DIAGRAM
Working Resonant Frequencies	@20kHz, @125kHz @134,2kHz	NA
Products range	Long range antenna	Push button switch LF-RH-W
Temperature stability	(-40 ->+85 °C)	-40 to 85°C
Characteristics	Flexible Antenna and robustness mechanical. Very large length and Long reading distance. IP67, Connector integrated in the enclosure	Full rubber switch. Rigid housing with rubber encapsulation in full shape. Low stroke force and full waterproofness capability. This product is served with 15cm cable, without terminal nor connector.
Page number	**170**	**174**

	New  SWITCH PB-S2	New  SWITCH PB-S3
Size (L x W x H)mm	19x24.4x17.6	19x24.4x17.6
Construction	Switches fully made with rubber compound, for interior usage on hidden lash door handlers	Switches fully made with rubber compound, for interior usage on hidden lash door handlers
Production status	In production	In production
Applications	PKE and PEPS/others	PKE and PEPS/others
Electrical diagram	SWITCH BLOCK DIAGRAM	SWITCH BLOCK DIAGRAM
Working Resonant Frequencies	NA	NA
Products range	Push button switch LF-RH-W	Push button switch LF-RH-W
Temperature stability	-40 to 85°C	-40 to 85°C
Characteristics	Full rubber switch. Rigid housing with rubber encapsulation in full shape. Low stroke force and full waterproofness capability. This product is served with 15cm cable, without terminal nor connector.	Full rubber switch. Rigid housing with rubber encapsulation in full shape. Low stroke force and full waterproofness capability. This product is served with 15cm cable, without terminal nor connector.
Page number	**176**	**178**

1.2.1

EMITTER ANTENNAS & SWITCHES

SHORT RANGE



SEA

SMD Small Emitter Antenna

50.80x10.60x6.80mm (33uH - 470uH)

EMITTER ANTENNAS & SWITCHES / **SHORT RANGE**

FEATURES

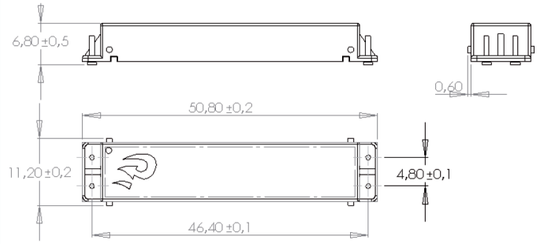
This part can be used as emitter antenna of a RF application in low frequency range and can be mounted like any other SMD component, directly to the PCB. Some use example: telemetric, telecontrol, atomic watch, PKE, etc. Size of this component compared to other existing Emitter Antennas & Switches is very small.

01 CHARACTERISTICS

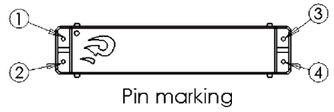
- Small size (50.8 x 10.6 x 6.8).
- High stability in temperature (-40°C up to +85°C).
- Wide working range (20kHz - 150KHz).
- SMD mounting.
- Custom inductance value under demand.

02 SPECIFICATIONS

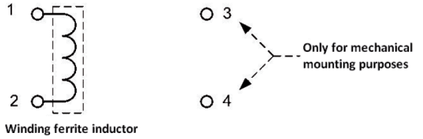
DIMENSIONS (mm)



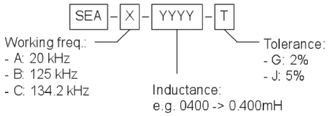
RECOMMENDED PAD-LAYOUT



ELECTRICAL DIAGRAM



NOMENCLATURE DESCRIPTION



ELECTRICAL SPECIFICATIONS

	L (mH)	Tolerance	Cres (nF)	SRF (MHz)	Freq. (kHz)
SEA-A-0192J	0.192	5%	330	>3	20@
SEA-B-0345J	0.345	5%	4.7	>3	125@
SEA-B-0500J	0.500	5%	3.3	>3	125@
SEA-B-0734J	0.734	5%	2.2	>3	125@
SEA-C-0300J	0.300	5%	4.7	>3	134,2@

Add under the chart: This chart is a reference guide for the most common required values at working frequency of 20 kHz, 125 kHz or 134.2 kHz. Any other inductance value at LF or tighter tolerances can be provided. Please contact our sales department for any inquiry.
Sensitivity measured with Helmholtz coils H=8.36 App/m @125 kHz. Contact us for measurement specification

KGEA-SMD

Keyless go emitter antenna smd

75x15x6.3mm (33µH - 500µH)

EMITTER ANTENNAS & SWITCHES / **SHORT RANGE**

FEATURES

This emitter antenna is specifically designed for applications in which it is necessary to get a big read range with a minimum size on PCB in low frequency base stations.

It is a perfect solution to be used in vehicles passive entry applications (PE, passive entry) or TPMS (Tire Pressure Monitoring system).

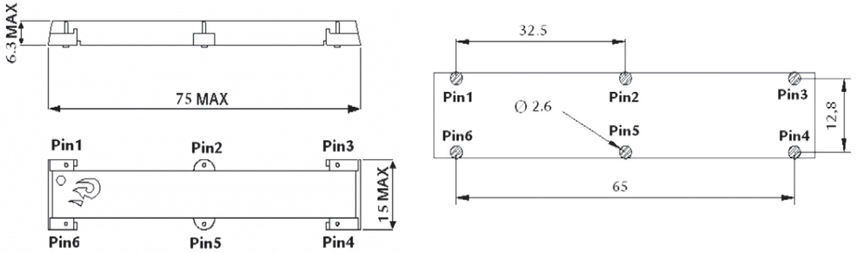
It has 75mm x 15mm x 6.3mm for SMD assembly. The module antenna is formed only by ferrite core wound inside of a plastic housing.

01 CHARACTERISTICS

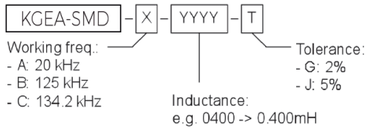
- High reading distance with minimum size.
- Designed for a range of working frequency LF (20kHz, 125kHz and 134,2kHz).
- Antenna current. Max. 4 App, Duty 30%
- High stability in temperature (- 40°C to +85°C).
- SMD mounting and customer inductance value under demand.

02 SPECIFICATIONS

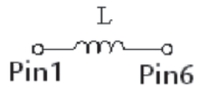
DIMENSIONS AND RECOMMENDED PAD-LAYOUT (mm)



NOMENCLATURE DESCRIPTION



ELECTRICAL DIAGRAM



ELECTRICAL SPECIFICATIONS

	L (mH)	Cres (nF)	Q	SRF (MHz)	Freq. (kHz)
KGEA-SMD-B-0108J	0.108	15,00	>110	>3	125@
KGEA-SMD-B-0162J	0.162	10,00	>125	>3	125@
KGEA-SMD-B-0240J	0.240	6,8	>125	>3	125@
KGEA-SMD-B-0345J	0.345	4,7	>125	>3	125@
KGEA-SMD-B-0500J	0.500	3,3	>125	>3	125@
KGEA-SMD-C-0141J	0.141	10,00	>125	>3	134,2@
KGEA-SMD-C-0207J	0.207	6,8	>130	>3	134,2@
KGEA-SMD-C-0300J	0.300	4,7	>130	>3	134,2@
KGEA-SMD-C-0426J	0.426	3,3	>130	>3	134,2@

Tolerance J=5%.
This chart is a reference guide for the most common required values at working frequency of 20 kHz, 125 kHz or 134.2 kHz. Any other inductance value at LF or tighter tolerances can be provided. Please contact our sales department for any inquiry.
Sensitivity measured with Helmholtz coils H=8.36 App/m @125 kHz. Contact us for measurement specification.

KGEA-BFCR

Emitter antenna housing plastic base with resin and outside connector unsealed & sealed

145x26x12mm (33µH - 500µH)

EMITTER ANTENNAS & SWITCHES / **MIDDLE RANGE**

FEATURES

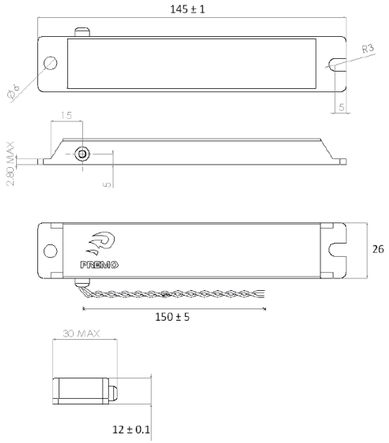
The antenna KGEA-BFCR is designed for emission of a LF field to allow hands free access towards the Customer Device Identification for automotive application. This type antenna is inserted in the vehicle being integrated into the Access and Start Hand Free subsystem for requirements Passive Entry and Remote keyless Go System. Housing plastic base (materials PBT, PA-66 or ABS) assuring extreme conditions of humidity, liquids, substance and extreme environments. The connector (sealed and unsealed) is optional and it can be customized to required features. Designed to allow long emitting-reading distances in the smallest volume.

01 CHARACTERISTICS

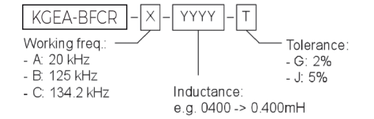
- Ideally used in keyless smart entry system
- Transmitting low frequency LF (20kHz, 125kHz and 134kHz).
- Low tolerances in the resonance frequency LC
- High stability in temperature (-40°C up to +85°C).
- Connector located outside assembly housing plastic base (Optional).
- Long reading distances and average current 4App.
- Strong anchor points which provide an easy assembly and will ensure mechanical robustness.
- Custom LCR value under demand.

02 SPECIFICATIONS

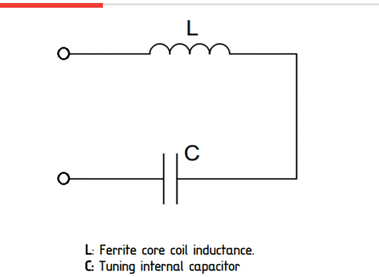
DIMENSIONS AND RECOMMENDED PAD-LAYOUT (mm)



NOMENCLATURE DESCRIPTION



ELECTRICAL DIAGRAM



ELECTRICAL SPECIFICATIONS

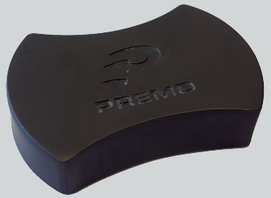
	L (mH)	Cres (nF)	Q	SRF (MHz)	Freq. (kHz)
KGEA-BFCR-B-0500J	0.500	3.3	>125	>3	125@
KGEA-BFCR-C-0426J	0.426	3,3	>125	>3	134,2@
KGEA-BFCR-A-0161J	0.161	330	>60	>1	20@

This chart is a reference guide for the most common required values at working frequency of 125 kHz. Any other inductance value at LF or tighter tolerances can be provided. Please contact our sales department for any inquiry.Sensitivity measured with Helmholtz coils H=8.36 App/m @125 kHz. Contact us for measurement specification.

LFAD-BF/BFC

Diabolo antenna shape for smart entry system

EMITTER ANTENNAS & SWITCHES / **SHORT RANGE**



FEATURES

This is a new low profile antenna specially designed to assembly in the aftermarket operation.Antenna concept is similar to those KGEA-BFC series, but smaller in size (ferrite + capacitor in a box potted) and easy to joint to anywhere by a simple adhesive tape. These kind of antennas provide a cable with a customized length without connector in its standard version (connector can be assembly under demand). Several combinations of inductance and capacitor values are offered as standard versions. Any other combination can be provied, together with the possibility of fully customized design, depending mainly of capacitor size available.

01 CHARACTERISTICS

Depending on the requirements and location of the antennas in the vehicle and taking into account its exposure to environmental conditions, grade IP waterproof, mechanical robustness, etc.. PREMO offers from LPM technology, to Polyurethane, mixed LPM-resin and HPM.

New Diabolo with Low Pressure Technology (LPM)

- LPM is a well know technology in PREMO
- Vert fast to produce (No Curing needed)
- IP56 grade Waterproof

New Diabolo with PU-resin

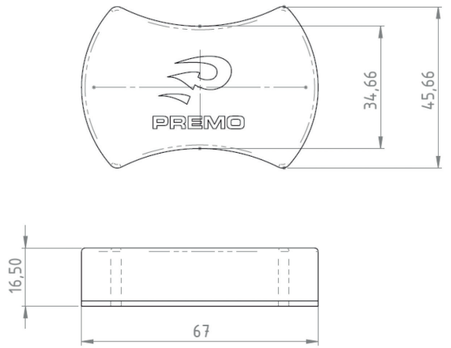
- High mechanical robustness
- IP68 grade Waterproof

THE MAIN TECHNICAL AND ECONOMIC ADVANTAGE

- Middle antenna (length until 70mm).
- External housing shape flat Material PBT-GF30% or PA66-GF30%
- High stability in temperature (-40°C up to +85°C).
- Resonant frequency adjusting below +/- 2kHz.
- Custom L-C value (F-Res: LFAD-BF) under demand
- This antenna is designed based on AECQ-200.
- Less length than classic ferrite rod antenna.

02 SPECIFICATIONS

DIMENSIONS (mm)

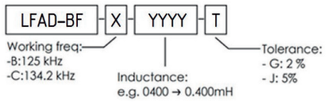


SCHEMATIC DIAGRAM

- L: inductance value
- C: capacitor value

NOMENCLATURE

- L+C in series:



ELECTRICAL SPECIFICATIONS

Operating Frequency @125Khz @25°C @1Vac (L+C in series)

LFAD-BF-B-0500J

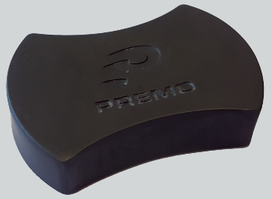
L(mH)	0.500
Cres (nF)	3.3
Q(L+C)	>100
Rac (Ω)	<2
Arms	1A
H-Field (dBµV/m) @1App@1m	108.3

- Antenna is measured in resonant mode.
- The specification chart is a reference guide for the most common required values at working frequencies of 125 kHz, 20 kHz and 134.2 kHz. Any other inductance value at LF or tighter tolerances can be provided. Please contact our sales department for any inquiry.

LFAD-BF/BFC

Diabolo antenna shape for smart entry system

EMITTER ANTENNAS & SWITCHES / **SHORT RANGE**



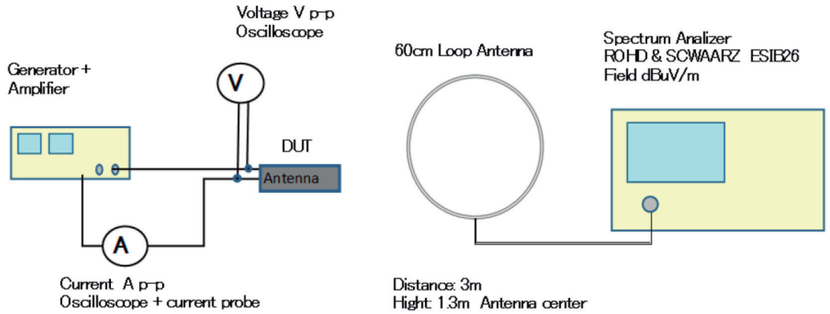
RADIATED H-field (Ipp)@distance:

PROCEDURE

› Magnetic field probe measures in load Ipp=1App to 1meters @ fo=125KHz

› Receiving the signal from the probe field with the spectrum analyzer.

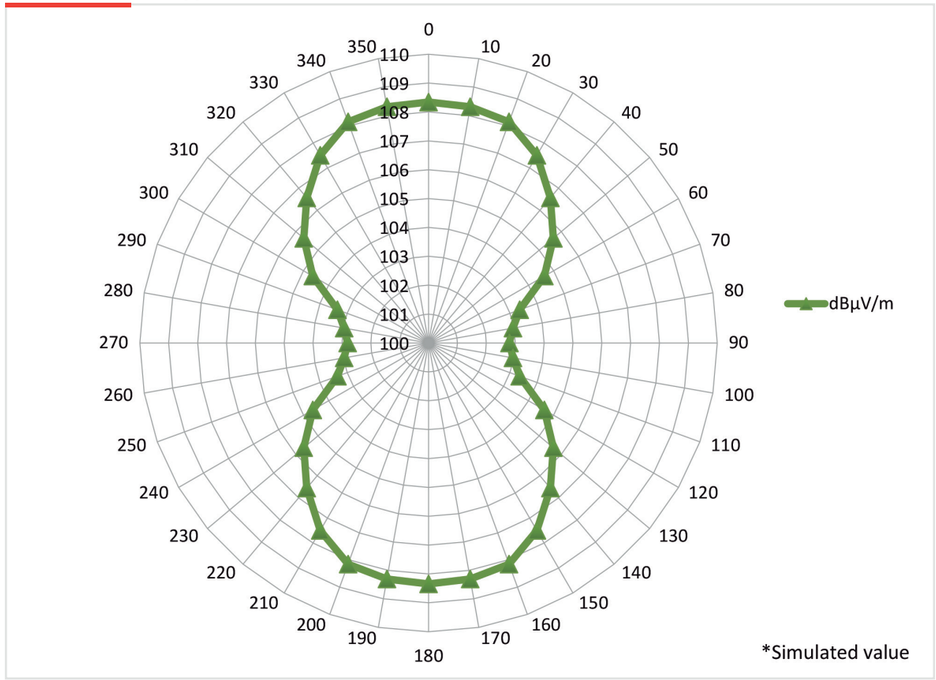
SETUP



› The sample (antenna under test), the current flowing through it and the EM-field at 3m measured with a loop antenna (60cm) are obtained at 125Khz frequency.

› Note: Ipp is the current peak to peak measured with the oscilloscope

LFAD-BF-B-0500J ,1App,3m



KGEA-BFCWX

Keyless Go Emitter Antenna Low Profile Potted Unsealed & Sealed Connector

103x20x9mm (33µH – 500µH)

EMITTER ANTENNAS & SWITCHES / **SHORT RANGE**

FEATURES

This is a new low profile antenna specially designed to assembly in the aftermarket operation.Antenna concept is similar to those KGEA-BFC series, but smaller in size (ferrite + capacitor in a box potted) and easy to joint to anywhere by a simple adhesive tape. These kind of antennas provide a cable with a customized length without connector in its standard version (connector can be assembly under demand). Several combinations of inductance and capacitor values are offered as standard versions. Any other combination can be provided, together with the possibility of fully customized design, depending mainly of capacitor size available.

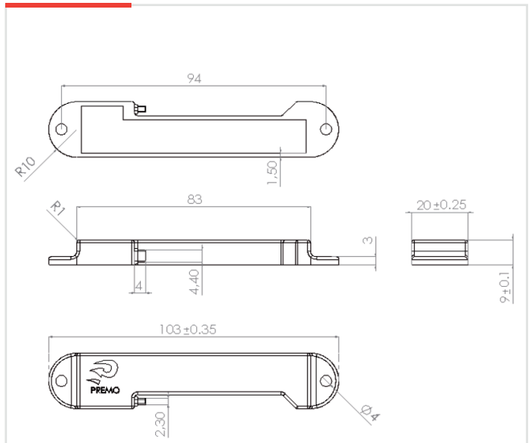
01 CHARACTERISTICS

- Low profile size.
- Low tolerances in the resonance frequency LC
- High stability in temperature (-40°C up to +85°C).
- Transmitting low frequency LF (20kHz, 125kHz and 134kHz).
- Long reading distances and average current 2-4App.
- Custom LCR value under demand.

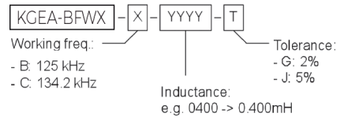
Ideally used access and start Hand Free subsystem for Passive Entry keyless Go System. Requirements for automotive application.

02 SPECIFICATIONS

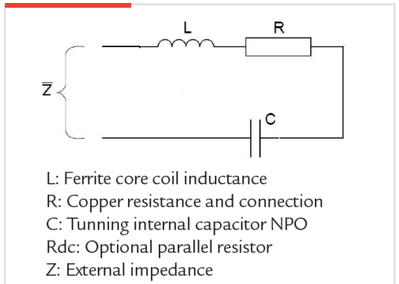
DIMENSIONS



NOMENCLATURE DESCRIPTION



ELECTRICAL DIAGRAM



L: Ferrite core coil inductance
R: Copper resistance and connection
C: Tunning internal capacitor NPO
Rdc: Optional parallel resistor
Z: External impedance

ELECTRICAL SPECIFICATIONS

	L (mH)	Cres (nF)	Q	SRF (MHz)	Freq. (kHz)
KGEA-BFCWX-B-0500J	0.500	3.3	>115	>3	125@
KGEA-BFCWX-C-0426J	0.426	3.3	>100	>3	134,2@

The specification chart is a reference guide for the most common required values at working frequencies of 125 kHz, 20 kHz and 134.2 kHz.
Any other inductance value at LF or tighter tolerances can be provided. Please contact our sales department for any inquiry.

KGEA-BFCAM

Emitter Antenna housing plastic base-potted and outside connector unsealed & sealed

85x16.8x7mm (33µH – 500µH)

EMITTER ANTENNAS & SWITCHES / **SHORT RANGE**

FEATURES

The antenna KGEA-BFCAM is designed for emission of a LF field to allow hands free access towards the Customer Device Identification for automotive application. This type antenna is inserted in the vehicle being integrated into the Access and Start Hand Free subsystem for requirements Passive Entry and Remote keyless

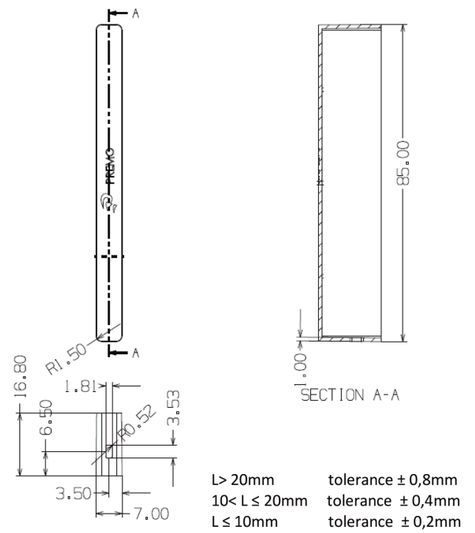
Go System. Housing plastic base (materials PBT, PA-66 or ABS) assuring extreme conditions of humidity, liquids, substance and extreme environments. The antenna concept is similar to KGEA-BFCR series, but smaller in size. The connector (sealed and unsealed) is optional and it can be customized to required features. Designed to allow long emitting-reading distances in the smallest volume.

01 CHARACTERISTICS

- Ideally used in keyless smart entry system
- Transmitting low frequency LF (20kHz, 125kHz and 134kHz).
- Low tolerances in the resonance frequency LC
- High stability in temperature (-40°C up to +85°C).
- Connector located outside assembly housing plastic base (Optional).
- Long reading distances and average current 2-4App.
- Strong anchor points which provide an easy assembly and will ensure mechanical robustness.
- Custom LCR value under demand.

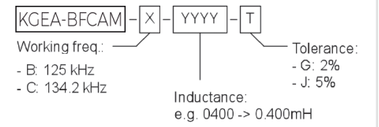
02 SPECIFICATIONS

DIMENSIONS (mm)

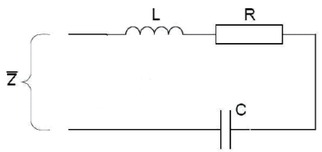


L> 20mm	tolerance ± 0,8mm
10< L ≤ 20mm	tolerance ± 0,4mm
L ≤ 10mm	tolerance ± 0,2mm

NOMENCLATURE DESCRIPTION



ELECTRICAL DIAGRAM



L: Ferrite core coil inductance
R: Copper resistance and connection
C: Tunning internal capacitor NPO
Z: External impedance

ELECTRICAL SPECIFICATIONS

	L (mH)	Cres (nF)	Q	SRF (MHz)	Freq. (kHz)
KGEA-BFCAM-B-0345J	0.345	3.3	>90	>3	125@
KGEA-BFCAM-B-0500J	0.500	3.3	>115	>3	125@
KGEA-BFCAM-C-0426J	0.426	3.3	>100	>3	134,2@

The specification chart is a reference guide for the most common required values at working frequencies of 125 kHz, 20 kHz and 134.2 kHz. Any other inductance value at LF or tighter tolerances can be provided. Please contact our sales department for any inquiry.

KGEA-HB

LF interior antenna shape h bridge

116,75x20x23mm (100uH - 500uH)

EMITTER ANTENNAS & SWITCHES / **SHORT RANGE**

FEATURES

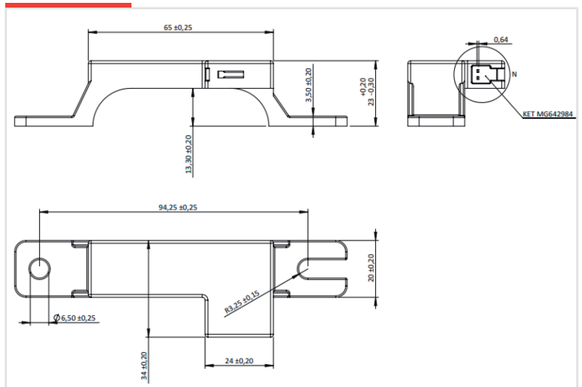
- Transmitting low frequency.
- LF emitter antenna assembly by external housing + LPM process.
- The connector integrated in the external housing plastic.
- Shape H bridge (best performance electrical on metal surfaces).
- Strong anchor points which provide an easy assembly and will ensure mechanical robustness
- IP56 grade waterproff.

01 ELECTRICAL PARAMETERS

- Resonant frequency LF (L+C in serial). Custom LC value under demand
- Capacitor type SMD NPO/COG 630Vdc
- Fine adjust the tank resonant frequency L+C. Max tolerance Vs fres: ± 2kHz @ [-40°C to 85°C].
- Ipp max= 2 App
- High stability in temperature (-40°C up to +85°C).
- Reliability test: This part is according to AEC-Q200 Revision C.

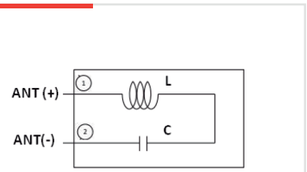
02 SPECIFICATIONS

DIMENSIONS (mm)

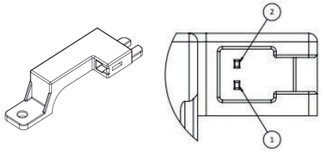


- Tolerances not indicates according iso2768-m

SCHEMATIC DIAGRAM



CONNECTOR PIN LAYOUT



NOTE: Using as referenced the nut model indicated below figure, we recommend screwing torque on anchor of the box of 8Nm maximum.

- **Measuring Equipment: Tonichi DB25N Range: 3-25Nm. Accuracy:**
  - 3% S/N 329485D Ds: 0.5Nm
- **Materials used:**
  - Support: Aluminum sheet
  - Nut: M6 DIN 6923 galvanized
  - Screw: M6x20-25 DIN 6923 - 8.8

ELECTRICAL SPECIFICATIONS

PART NUMBER	L Inductance ± 5%	C Capacitor ±5%	Freq. (kHz)	Zimp@fo (Ω)
KGEA-HB-B-0240J	240uH	6.8nF	125,0	< 1,5
KGEA-HB-C-0205J	205uH	6.8nF	134	<1,5

Mechanical notes

1. All dimensions are in mm.
2. The external housing and cover is closed-sealed by ultrasonic welding.
3. Plastic Material PBT-GF30%.

KGEA-HBT

Short Range Antenna LF for smart entry system.
External housing + LPM (filled)

EMITTER ANTENNAS & SWITCHES / **SHORT RANGE**

FEATURES

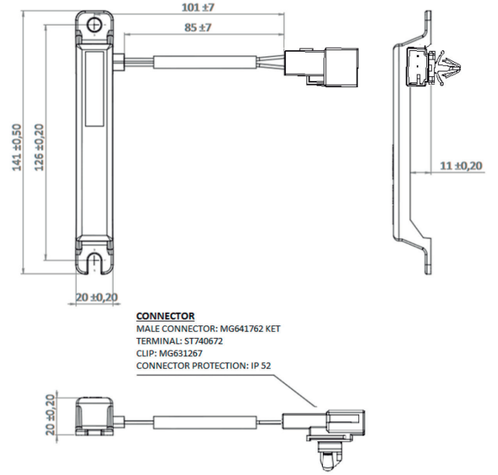
PREMO offers a short antenna with a high mechanical robustness and the best performance electrical on metal surface due to its bridge type design external housing.

01 CHARACTERISTICS

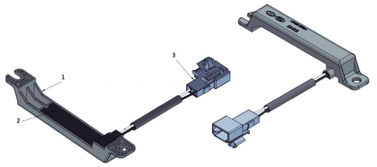
- Short antenna (length until 150 mm).
- External housing shape H-bridge Material PBT-GF30% or PA66-GF30%.
- Strong anchor points which provide an easy assembly and will ensure mechanical robustness.
- Higher impact absorption and mechanical reduction preventive.
- LF antenna module inside external housing is to cover by Low Pressure Technology (LPM)
- LPM is a well know technology in PREMO.
- Very fast to produce (No Curing needed)
- IP56 grade Waterproof
- Connector Non Waterproof IP52 located outside assembly housing plastic base.
- High stability in temperature (-40°C up to +85°C).
- Resonant frequency adjusting below +/- 2kHz.
- Custom L-C value (F-Resonant)
- This antenna is designed based on AECQ-200.

02 SPECIFICATIONS

DIMENSIONS (mm)



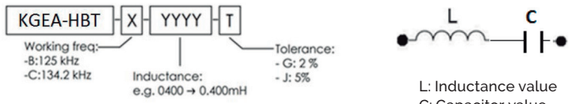
COMPONENTS OF THE PART



	PART NAME
1	External Housing PA66-GF30%
2	Module LF Antenna + LPM (cover)
3	CONNECTOR KET MG641762 Non Waterproof IP52

NOMENCLATURE DESCRIPTION AND SCHEMATIC DIAGRAM

L+C IN SERIES



ELECTRICAL SPECIFICATIONS

Operating Frequency @134,5Khz @25°C @1Vac. (L+C in series)

KGEA-HBT-C-0205J

L (mH)	0.205
Cres (nF)	6.8
Q (L+C)	>135
Rac(Ω)	<1,5
Arms	1A

Antenna is measured in resonant mode.

FIELD MAGNETIC STRENGTH

PROCEDURE / SETUP

- Antenna PREMO mounted on Reader and signal amplifier (I=2App, V=5Vpp).
- Probe FMZB 1538143 (as receiver) used to measure the magnetic field (dBµV/m).

RESULT

- 105 dBµV/m ± 2dB@3 meters (I=2App; V=5Vpp) in maximum direction.

KGEA-HBB

Short Range Antenna LF for smart entry system.
External housing + LPM (cover)

EMITTER ANTENNAS & SWITCHES / **SHORT RANGE**

FEATURES

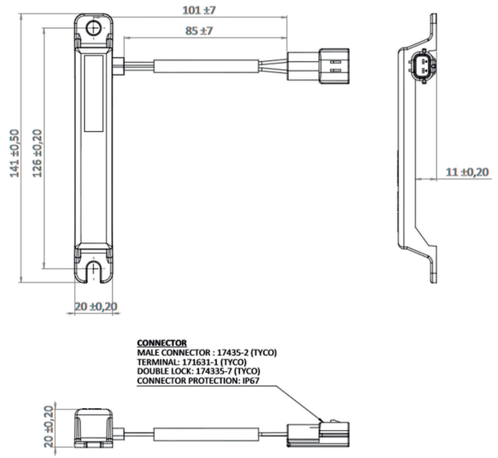
PREMO offers a short antenna with a high mechanical robustness and also has the best performance electrical on metal surface due to its bridge type design external housing.

01 CHARACTERISTICS

- Short antenna (length until 150 mm).
- External housing shape H-bridge Material PBT-GF30% or PA66-GF30%
- Strong anchor points which provide an easy assembly and will ensure mechanical robustness
- Higher impact absorption and mechanical reduction preventive.
- LF antenna module inside external housing is to cover by Low Pressure Technology (PM)
- LPM is a well know technology in PREMO.
- Very fast to produce (No Curing needed)
- IP56 grade Waterproof
- Connector Waterproof located outside assembly housing plastic base.
- High stability in temperature (-40°C up to +85°C).
- Resonant frequency adjusting below +/- 2kHz.
- Custom L-C value (F-Resonant)
- This antenna is designed based on AECQ-200.

02 SPECIFICATIONS

DIMENSIONS (mm)

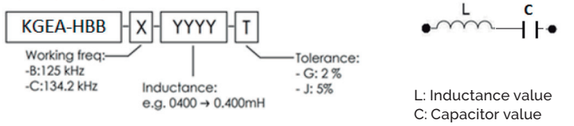


COMPONENTS OF THE PART

	PART NAME
1	External Housing PA66-GF30%
2	Module LF Antenna + LPM (cover)
3	CONNECTOR 17435-2 (TYCO) IP67

NOMENCLATURE DESCRIPTION AND SCHEMATIC DIAGRAM

L+C IN SERIES



ELECTRICAL SPECIFICATIONS

Operating Frequency @134,5Khz @25°C @1Vac. (L+C in series)

L (mH)	0.205
Cres (nF)	6.8
Q (L+C)	>135
Rac(Ω)	<1,5
Arms	1A

Antenna is measured in resonant mode.

FIELD MAGNETIC STRENGTH

PROCEDURE / SETUP

- Antenna PREMO mounted on Reader and signal amplifier (I=2App, V=5Vpp).
- Probe FMZB 1538143 (as receiver) used to measure the magnetic field (dBµV/m).

RESULT

- 105 dBµV/m ± 2dB@3 meters (I=2App; V=5Vpp) in maximum direction.

KGEA-HBW

Short Range Antenna LF for smart entry system.
External housing (integrated connector) + PU-resin (filled)

EMITTER ANTENNAS & SWITCHES / **SHORT RANGE**

FEATURES

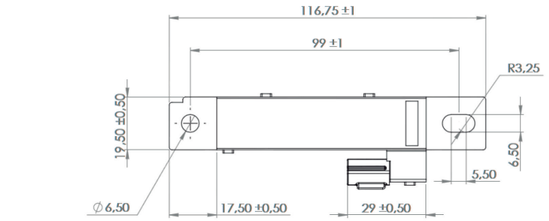
PREMO offers a short antenna with a high mechanical robustness and also has the best performance electrical on metal surface due to its bridge type design external housing. Integrated connector in the external housing. This part is IP68 waterproof issue.

01 CHARACTERISTICS

- Short antenna (length until 120 mm).
- External housing shape H-bridge (Integrate connector).
- Material PBT-GF30% or PA66-GF30%
- Strong anchor points which provide an easy assembly and will ensure mechanical robustness
- Higher impact absorption and mechanical reduction preventive.
- LF antenna module inside external housing is filled by PU-resin
- IP68 grade Waterproof
- High stability in temperature (-40°C up to +85°C).
- Resonant frequency adjusting below +/- 2kHz.
- Custom L-C value (F-Resonant)
- This antenna is designed based on AECQ-200.

02 SPECIFICATIONS

DIMENSIONS (mm)



ELECTRICAL SPECIFICATIONS

Operating Frequency @134,2Khz
@25°C @1Vac. (Only L)

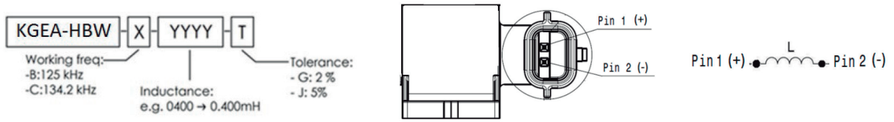
KGEA-HBW-C-0127J

L (mH)	0.127
Cres (nF)	----
Q (L)	>130
Rdc(Ω)	<1,0
Arms	1A

Antenna is measured in resonant mode.

NOMENCLATURE DESCRIPTION AND SCHEMATIC DIAGRAM

ONLY L



FIELD MAGNETIC STRENGTH

PROCEDURE / SETUP

- Antenna PREMO mounted on Reader and signal amplifier (I=1App)@1meter distance
- Probe FMZB 1538143 (as receiver) used to measure the magnetic field (dBµV/m).

RESULT

- 125,4 dBµV/m ± 2dB@1 meter (I=1App) in maximum direction.

KGEA-DHS

Door Handle antenna LF for smart entry system (+SWITCH)

EMITTER ANTENNAS & SWITCHES / **SHORT RANGE**

FEATURES

PREMO is developing customized door handle antennas using a type of technology over-molding low pressure depending on the mechanical requirements and waterproof IP degree required by the customer.

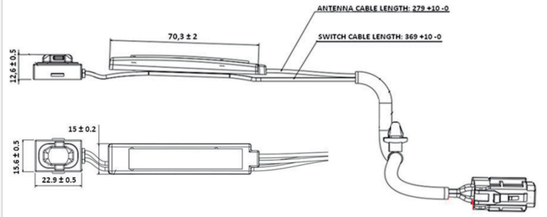
For Door Handle Antennas, we also have the ability to integrate in a unique connector (6ways), the Antenna LF + Switch + LED as a single whole.

01 CHARACTERISTICS

- Overmolded Antenna with Low Pressure Technology (LPM)
- LPM is a well know technology PREMP
- Very fast to produce (No Curing needed)
- Low Profile. Height max= 7,2 mm.
- IP56 grade Waterproof.
- Connector located outside assembly Antenna LF+ SWITCH
- High stability in temperature (-40°C up to +85°C).
- Resonant frequency adjusting below +/- 2kHz.
- Custom L-C value @ F-Res
- This antenna is designed based on AECQ-200

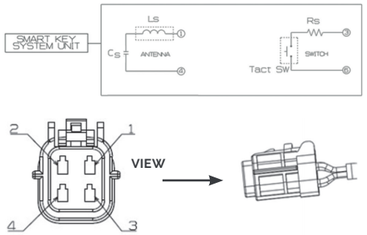
02 SPECIFICATIONS

DIMENSIONS (mm)



	PART NAME
1	LF Antenna Over-molded by LPM
2	SWITCH
3	CONNECTOR KET MG610331-5

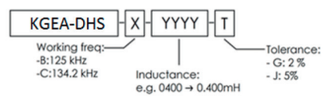
CIRCUIT DIAGRAM



N°	FUNCTION	HARNESS
1	ANTENNA .PWR	WHITE TXL SAE AW22
2	TOGGLE BUTTON.PWR	BLUE AVS 0.3
3	ANTENNA. GND	BLACK TXL SAE AW22
4	TOGGLE BUTTON. GND	GRAY AVS 0.3

NOMENCLATURE DESCRIPTION AND SCHEMATIC DIAGRAM

L+C IN SERIES



L: Inductance value
C: Capacitor value

ELECTRICAL SPECIFICATIONS

KGEA-DHS-C-0285J

L (mH)	0.285
Cres (nF)	6.8
Cres (nF)	>115
Q (L+C)	>135
Rac(Ω)	<2
Arms	1A

Antenna is measured in resonant mode.

FIELD MAGNETIC STRENGTH

PROCEDURE / SETUP

- Antenna PREMO mounted on Reader and signal amplifier (I=2App, V=5Vpp).
- Probe FMZB 1538143 (as receiver) used to measure the magnetic field (dBµV/m).

RESULT

- 105 dBµV/m ± 2dB@3 meters (I=2App; V=5Vpp) in maximum direction.

KGEA-DHSL

Door Handle antenna LF for smart entry system (SWITCH and LED)

EMITTER ANTENNAS & SWITCHES / **SHORT RANGE**

FEATURES

PREMO is developing customized door handle antennas using a type of technology over-molding low pressure depending on the mechanical requirements and waterproof IP degree required by the customer.

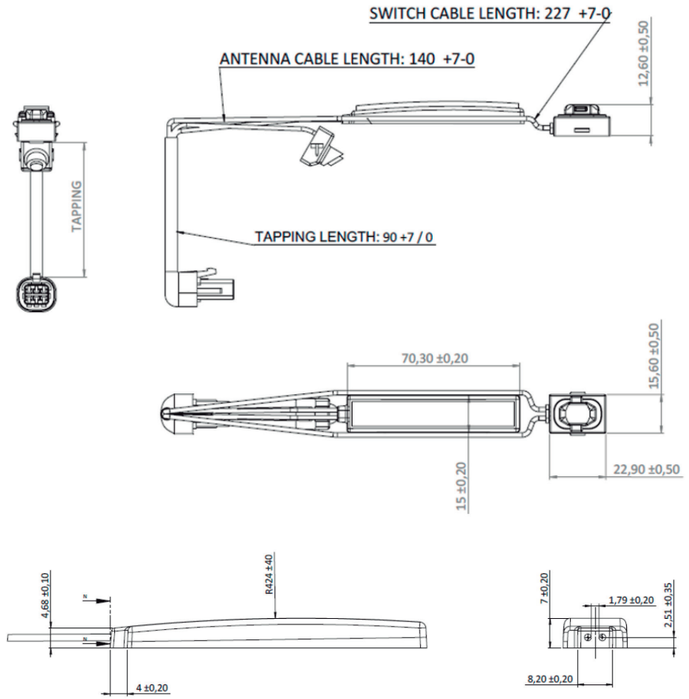
For Door Handle Antennas, we also have the ability to integrate in a unique connector (6ways), the Antenna LF + Switch + LED as a single whole.

01 CHARACTERISTICS

- Overmolded Antenna with Low Pressure Technology (LPM)
- LPM is a well know technology PREMP
- Very fast to produce (No Curing needed)
- Low Profile. Height max= 7,2 mm.
- IP56 grade Waterproof.
- Connector located outside assembly Antenna LF, Switch and LED.
- High stability in temperature (-40°C up to +85°C).
- Resonant frequency adjusting below +/- 2kHz.
- Custom L-C value @ F-Res
- This antenna is designed based on AECQ-200

02 SPECIFICATIONS

DIMENSIONS (mm)

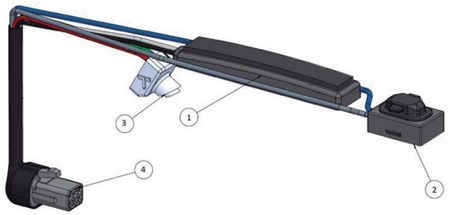


KGEA-DHSL

Door Handle antenna LF for smart entry system (SWITCH and LED)

EMITTER ANTENNAS & SWITCHES / **SHORT RANGE**

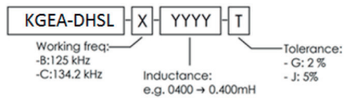
COMPONENTS OF THE PART



	PART NAME
1	LF Antenna Over-molded by LPM
2	SWITCH
3	LED
4	CONNECTOR KET MG614130-4

NOMENCLATURE DESCRIPTION AND SCHEMATIC DIAGRAM

L+C IN SERIES



L: Inductance value
C: Capacitor value

ELECTRICAL SPECIFICATIONS

Operating Frequency @114,5Khz @25°C @1Vac. (L+C in series)

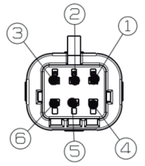
KGEA-DHSL-C-0285J

L (mH)	0.285
Cres (nF)	6.8
Cres (nF)	>115
Q (L+C)	>135
Rac(Ω)	<2
Arms	1A

Antenna is measured in resonant mode.

CIRCUIT DIAGRAM

O/S CONNECTOR (SMK WITH P/ LIGHT)
Female Connector: KET MG614130-4



VIEW "Y"
SCALE 2/1
(B,4)

PART NAME

Nº	FUNCTION	HARNESS COLOR	MATERIAL	2Q.
1	ANTENNA .PWR	WHITE	TXL	0.3
2	LED.PWR	RED	UL	0.5
3	BUTTON.PWR	BLUE	AVS	0.3
4	ANTENNA.GND	BLACK	TXL	0.3
5	LED.GND	GREEN	UL	0.5
6	BUTTON.GND	GRAY	AVS	0.3

FIELD MAGNETIC STRENGTH

PROCEDURE / SETUP

- Antenna PREMO mounted on Reader and signal amplifier (I=2App, V=5Vpp).
- Probe FMZB 1538143 (as receiver) used to measure the magnetic field (dBµV/m).

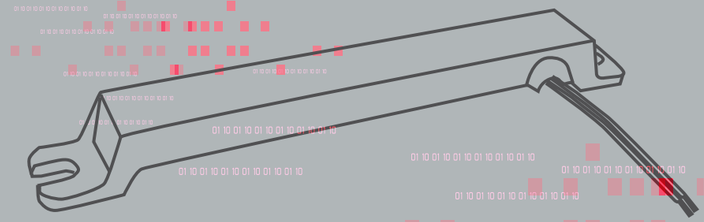
RESULT

- 105 dBµV/m ± 2dB@3 meters (I=2App; V=5Vpp) in maximum direction.

1.2.2

EMITTER ANTENNAS & SWITCHES

MIDDLE RANGE



KGEA-MRHB

Middle Range Antenna LF for smart entry system.

EMITTER ANTENNAS & SWITCHES / **MIDDLE RANGE**

FEATURES

The Middle range antenna have been designed in order to reduce the number of antennas respect to the total number short antennas with equal or better performance reading distance and H-field around the whole vehicle

01 CHARACTERISTICS

Depending on the requirements and location of the antennas in the vehicle and taking into account its exposure to environmental conditions, grade IP waterproof, mechanical robustness, etc.. PREMO offers from LPM technology, to Polyurethane, mixed LPM-resin and HPM.

New Middle Range Antenna with Low Pressure Technology (LPM)

- LPM is a well know technology in PREMO
- Vert fast to produce (No Curing needed)
- IP56 grade Waterproof

New Middle Range Antenna with PU-resin

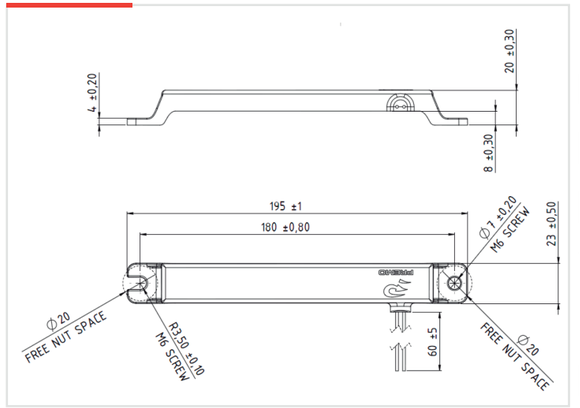
- High mechanical robustness
- IP68 grade Waterproof

THE MAIN TECHNICAL AND ECONOMIC ADVANTAGE

- Middle antenna (length until 200mm).
- External housing shape H-bridge (best performance electrical on metal surfaces). Material PBT-GF30% or PA66-GF30%
- Strong anchor points which provide an easy assembly and will ensure mechanical robustness
- Higher impact absorption and mechanical reduction preventive.
- Connector located outside assembly housing plastic base.
- High stability in temperature (-40°C up to +85°C).
- Resonant frequency adjusting below +/- 2kHz.
- Custom L-C value (F-Res: KGEA-MRHBC) under demand or only L (KGEA-MRHBL)
- This antenna is designed based on AECQ-200

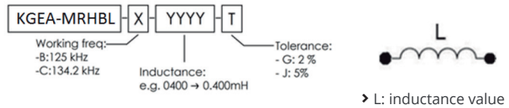
02 SPECIFICATIONS

DIMENSIONS (mm)



NOMENCLATURE DESCRIPTION AND SCHEMATIC DIAGRAM

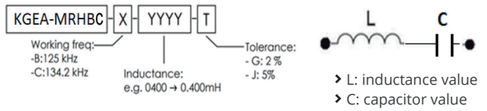
› Only L:



› L: inductance value

NOMENCLATURE DESCRIPTION AND SCHEMATIC DIAGRAM

› L+C in series:



› L: inductance value
› C: capacitor value

ELECTRICAL SPECIFICATIONS

Operating Frequency @125Khz @25°C @1Vac (Only L)

L(mH)	0.240
Cres (nF)	-
Q(L)	>100
Rdc (Ω)	<1,5
Arms	1A
H-Field (dBµV/m) @2App@3m	145

ELECTRICAL SPECIFICATIONS

Operating Frequency @125Khz @25°C @1Vac (L+C in series)

L(mH)	0.240
Cres (nF)	6.8
Q(L+C)	>100
Rdc (Ω)	<2
Arms	1A
H-Field (dBµV/m) @2App@3m	145

› Antenna is measured in resonant mode.

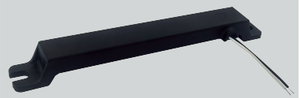
› The specification chart is a reference guide for the most common required values at working frequencies of 125 kHz, 20 kHz and 134.2 kHz. Any other inductance.

› value at LF or tighter tolerances can be provided. Please contact our sales department for any inquiry.

KGEA-MRHB

Middle Range Antenna LF for smart entry system

EMITTER ANTENNAS & SWITCHES / **MIDDLE RANGE**

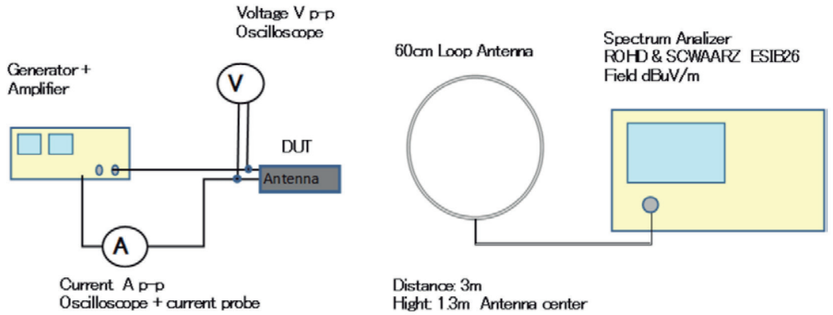


RADIATED H-field (Ipp)@distance:

PROCEDURE

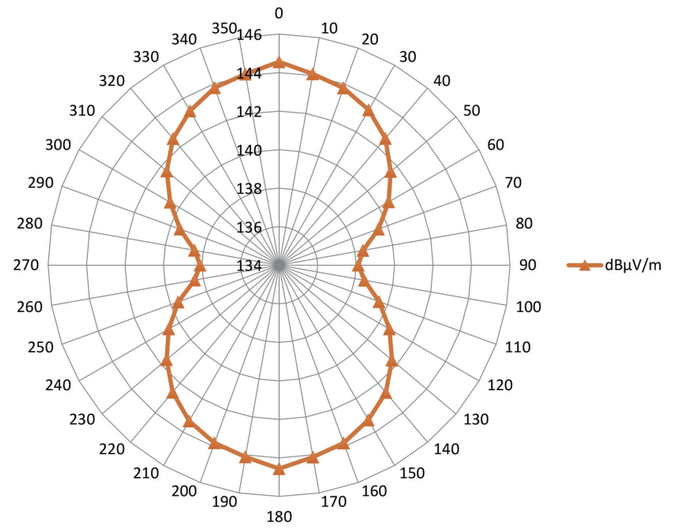
- Magnetic field probe measures in load Ipp=2App to 3meters @ fo=125KHz
- Receiving the signal from the probe field with the spectrum analyzer.

SETUP



- The sample (antenna under test), the current flowing through it and the EM-field at 3m measured with a loop antenna (60cm) are obtained at 125Khz frequency.
- Note: Ipp is the current peak to peak measured with the oscilloscope

KGEA-MRHBC-B0240J / H-FIELD@125KHz@2App@3m



KGEA-MRHPM
(Integrated connector)

Middle Range Antenna LF for smart entry system.

EMITTER ANTENNAS & SWITCHES / **MIDDLE RANGE**

FEATURES

The middle range antenna have been designed in order to reduce the number of antennas respect to the total number short antennas with equal or better performance reading distance and H-field around the whole vehicle.

01 CHARACTERISTICS

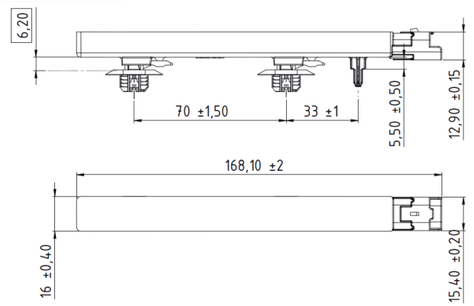
Depending on the requirements and location of the antennas in the vehicle and taking into account its exposure to environmental conditions, grade IP waterproof, mechanical robustness, etc.. PREMO offers from LPM technology, to Polyurethane, mixed LPM-resin and HPM.

New Middle Range Antenna with High Pressure Technology (HPM)

- Cover 100% of Ferrite-Coil Inductance.
- Designed to allow long reading distances
- High mechanical robustness
- High stability in temperature
- IP 68 grade Waterproof
- Middle antenna (length until 200mm).
- Shape flat Material PBT-GF30%
- Anchor point (Clips and pivot).
- Resonant frequency adjusting below +/- 2kHz.
- Custom L-C value (F-Res: KGEA-MRHPM) under demand
- This antenna is designed based on AECQ-200.

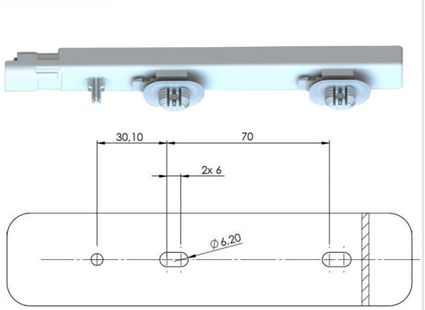
02 SPECIFICATIONS

DIMENSIONS (mm)



- Integrated Connector according to Drawing FCI 211FT0289,Terminal 1.5x0.8mm keying#6, brown.

RECOMMENDED LANDPATTERN FOR TRW30413438



ELECTRICAL SPECIFICATIONS

	L(mH)	Cres (nF)	Q(L+C)	Rac (Ω)	Arms	H-Field (dBµV/m) @2App3@m	Freq (kHz)	Height (mm)	Length
KGEA-MRHPM-B-0175J	0.175	10	>140	>2	1A	140	120	12.9	168.10
KGEA-MRHPM-B-0162J	0.162	10	>140	>2	1A	140	125	12.9	168.10

- Antenna is measured in resonant mode.

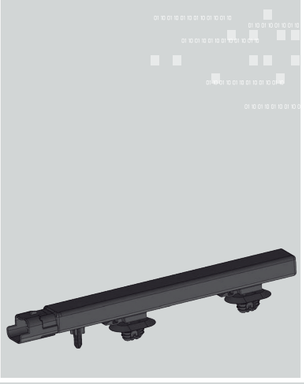
SCHEMATIC DIAGRAM

- L: inductance value
- C: capacitor value

KGEA-MRHPM
(Integrated connector)

Middle Range Antenna LF for smart entry system

EMITTER ANTENNAS & SWITCHES / MIDDLE RANGE



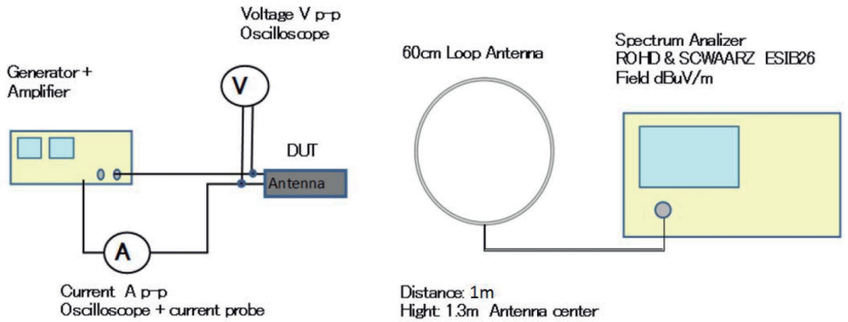
FUNCTIONAL PERFORMANCES. (H-FIELD MAGNETIC)

PROCEDURE

› Magnetic field probe measures in load Ipp=2App to 1meter @fo=120khz.

› Receiving the signal from the probe field with the spectrum analyzer.

SETUP

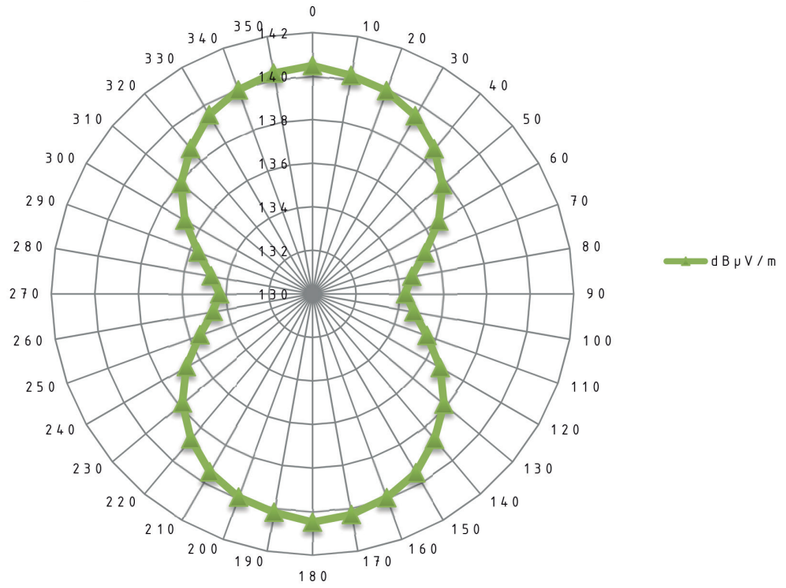


› The sample (antenna under test), the current flowing through it and the EM-field at 1 m measured with a loop antenna (60cm) are obtained at 120Khz frequency.

› Note: Ipp is the current peak to peak measured with the oscilloscope.

KGEA-MRHPM-B-0175J / H-FIELD @120kHz @2App @1m

H-FIELD ROAD MAP 360°

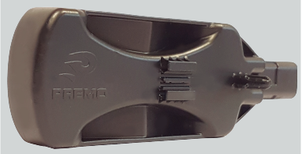


LFAD-MRLC

INTEGRATED CONNECTOR

Middle Range Antenna LF for smart entry system

EMITTER ANTENNAS & SWITCHES / **MIDDLE RANGE**



FEATURES

The Middle range alternative has been designed to reduce the number of antennas respect the number of shorts antennas, keeping the same reading distance.

Rooming an antenna in the car sometime becomes a very hard task.

This kind of antennas keep the performance saving space, little bit wider, but very reduced length in the total space.

This shape design has been developed & patented by PREMO.

01 CHARACTERISTICS

Depending on the requirements and location of the antennas in the vehicle and taking into account its exposure to environmental conditions, grade IP waterproof, mechanical robustness, etc.. PREMO offers from LPM technology, to Polyurethane, mixed LPM-resin and HPM.

New Diabolo with Low Pressure Technology (LPM)

- LPM is a well know technology in PREMO
- Vert fast to produce (No Curing needed)
- IP56 grade Waterproof

New Diabolo with PU-resin

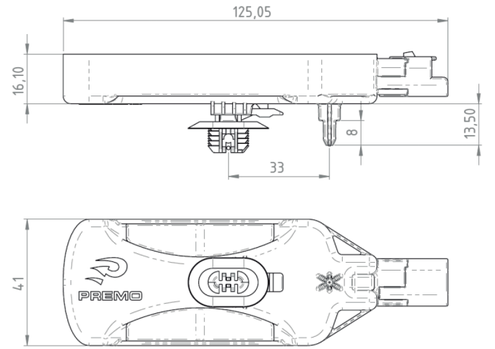
- High mechanical robustness
- IP68 grade Waterproof

THE MAIN TECHNICAL AND ECONOMIC ADVANTAGE

- Middle antenna (length until 120mm).
- External housing shape flat Material PBT-GF30% or PA66-GF30%
- High stability in temperature (-40°C up to +85°C).
- Resonant frequency adjusting below +/- 2kHz.
- Custom L-C value (F-Res: LFAD-BF) under demand
- This antenna is designed based on AECQ-200.
- Less length than classic ferrite rod antenna.

02 SPECIFICATIONS

DIMENSIONS (mm)



ELECTRICAL SPECIFICATIONS

Operating Frequency @125Khz @25°C @1Vac (L+C in series)

LFAD-MRLC-B-0500J

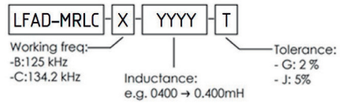
L(mH)	0.500
Cres (nF)	3.3
Q(L+C)	>100
Rac (Ω)	<2
Arms	1A
H-Field (dBµV/m) @1App@1m	113.11

› Antenna is measured in resonant mode.

› The specification chart is a reference guide for the most common required values at working frequencies of 125 kHz, 20 kHz and 134.2 kHz. Any other inductance value at LF or tighter tolerances can be provided. Please contact our sales department for any inquiry.

NOMENCLATURE

› L+C in series:

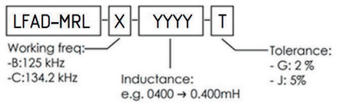


SCHEMATIC DIAGRAM

› L: inductance value
› C: capacitor value

NOMENCLATURE

› L:



SCHEMATIC DIAGRAM

› L: inductance value

LFAD-MRLC

INTEGRATED CONNECTOR

Middle Range Antenna LF for smart entry system

EMITTER ANTENNAS & SWITCHES / **MIDDLE RANGE**

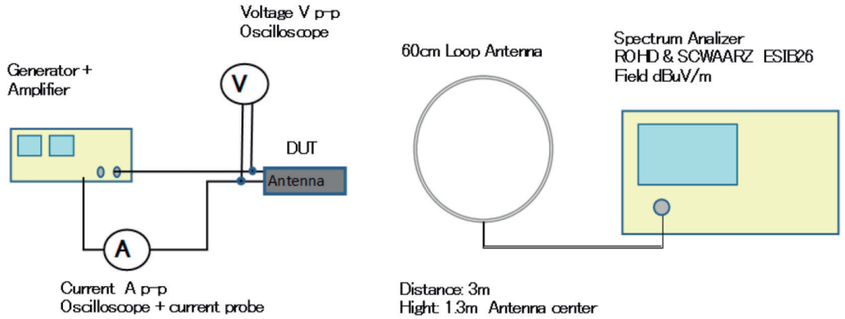
RADIATED H-field (Ipp)@distance:

PROCEDURE

› Magnetic field probe measures in load Ipp=1App to 41meters @ fo=125KHz

› Receiving the signal from the probe field with the spectrum analyzer.

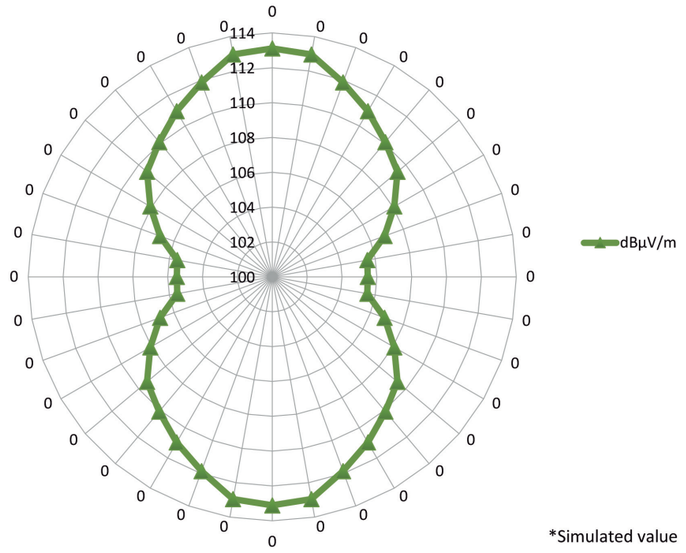
SETUP



› The sample (antenna under test), the current flowing through it and the EM-field at 3m measured with a loop antenna (60cm) are obtained at 125Khz frequency.

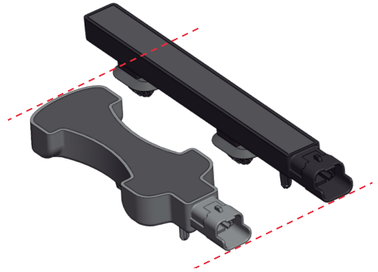
› Note: Ipp is the current peak to peak measured with the oscilloscope

LFAD-MR-B-0500J ,1App,3m



SIZE COMPARISON WITH OTHER MID-RANGE ANTENNA

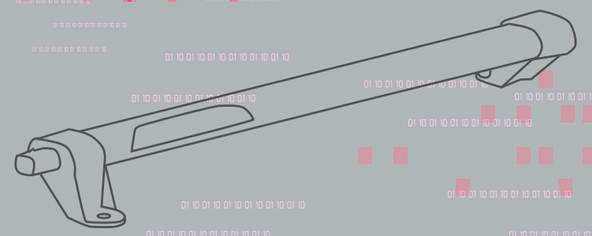
› Same performance – less size.



1.2.3

EMITTER ANTENNAS & SWITCHES

LONG RANGE

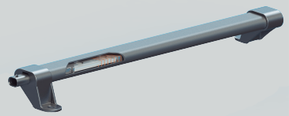


New

KGEA-AF/AFC

Long Range Flexible Antenna LF for smart entry system

EMITTER ANTENNAS & SWITCHES / **LONG RANGE**



FEATURES

- Length from 300mm until 500mm
- Higher impact absorption and mechanical reduction preventive.
- IP protection 68 (maximum degree against dust and water).
- High stability in temperature (-40°C up to +85°C).
- High accuracy inductance and/or resonance frequency
- Custom L-C value (F-Res: KGEA-AFC) under demand or only L (KGEA-AF)
- Significant saving in final PKE application: harness, connectors and power switching devices reduced by 4 or 5.
- Saving in power consumption.

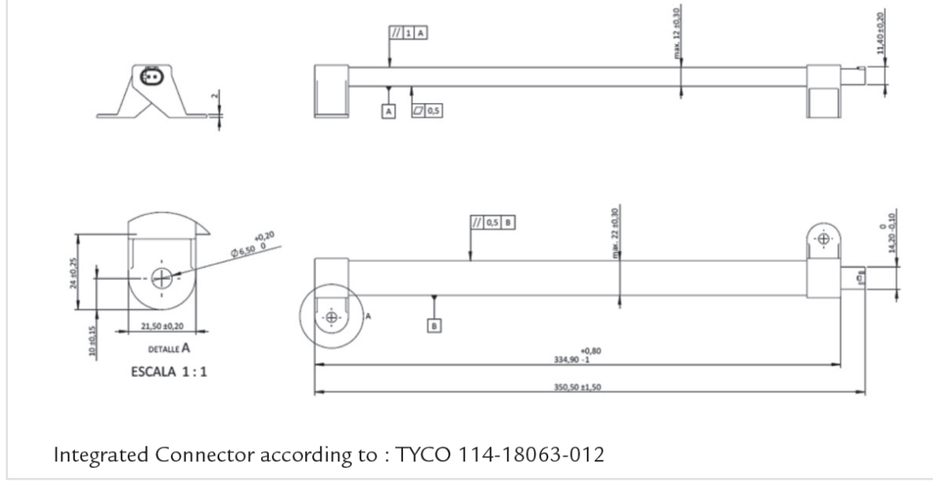
01 ELECTRICAL PARAMETERS

TECHNICAL AND ECONOMIC ADVANTAGES

- Longer antenna (length from 300mm until 500mm).
- Completely flexible antenna.
- Deformation in the middle of the antenna.
- Higher impact absorption and mechanical reduction preventive.
- IP protection 67.
- High stability in temperature (-40°C up to +85°C).
- Resonant frequency adjusting below +/- 2kHz.
- Custom L-C value (F-Res: KGEA-AF) under demand or only L (KGEA-AFC)
- Wiring and connectors is reduced by 1/3, ¼ or 1/5 respectively.
- OEM assembly time is reduced by 1/3, ¼ or 1/5 respectively.
- Total energy consumption and battery current leaking , a very important parameter specially in electric vehicles is reduced proportionally.
- A longer antenna need lower currents to generate equal or more intense magnetic fields thus reducing the again the energy needed and the cross section of the wire to the antennas.

02 SPECIFICATIONS

DIMENSIONS (mm)



Integrated Connector according to : TYCO 114-18063-012

ELECTRICAL SPECIFICATIONS

PART NUMBER	Operating Frequency	L(mH)	Cres (nF)	Q	SRF (MHz)
KGEA-AF-B-0104J	@125Khz. (Only L)	0.104		>100	>1
KGEA-AFC-A-0161J	@21.8Khz. (L+C in series)	0.161	330nF	>60	>1
KGEA-AFC-B-0240J	@125Khz. (L+C in series)	0.240	6.8	>100	>1

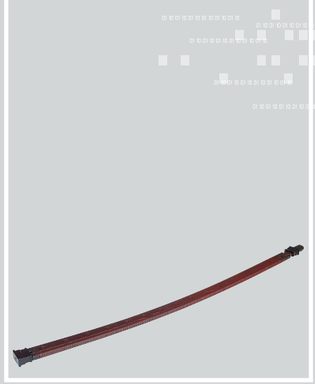
The specification chart is a reference guide for the most common required values at working frequencies of 125 kHz, 20 kHz and 134.2 kHz. Any other inductance value at LF or tighter tolerances can be provided. Please contact our sales department for any inquiry.

New

KGEA-AFULR

Ultra Long Range Flexible Antenna LF for smart entry system

EMITTER ANTENNAS & SWITCHES / **LONG RANGE**



FEATURES

Ultra-long-range antenna specially designed for CAR2CAR (Platooning) communication in the range of 100kHz.

Most of the vehicles currently manufactured in the world with a KES (keyless entry system) use a number of short antennas. Depending on the quality of the vehicle and the system they use 3, 4, 5 antennas (in the door handles, interior antenna, in the trunk handle...).

The long range flexible antenna have been designed in order to use only one antenna (until 500mm) and to reduced the number of antennas by car to just one with equal or better performance reading distance and H-field around the whole vehicle.

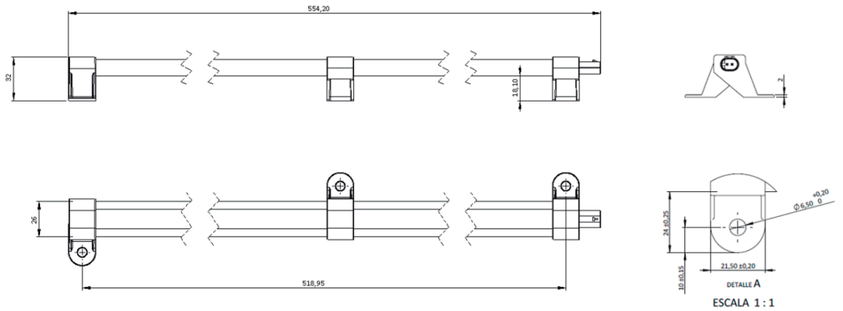
01 ELECTRICAL PARAMETERS

TECHNICAL AND ECONOMIC ADVANTAGES

- Longer antenna (until 500mm).
- Completely flexible antenna.
- Deformation in the middle of the antenna.
- Higher impact absorption and mechanical reduction preventive.
- IP protection 67.
- High stability in temperature (-40°C up to +85°C).
- Resonant frequency adjusting below +/- 2kHz.
- Custom L-C value (F-Res: KGEA-AF) under demand or only L (KGEA-AFC).
- Wiring and connectors is reduced by 1/3, ¼ or 1/5 respectively.
- OEM assembly time is reduced by 1/3, ¼ or 1/5 respectively.
- Total energy consumption and battery current leaking , a very important parameter specially in electric vehicles is reduced proportionally.
- A longer antenna need lower currents to generate equal or more intense magnetic fields thus reducing the again the energy needed and the cross section of the wire to the antennas.

02 SPECIFICATIONS

DIMENSIONS (mm)



- Connector according to: EWCAP 120-S-002-1-Z02 Keying OPTION A

NOMENCLATURE DESCRIPTION AND SCHEMATIC DIAGRAM

ONLY L

ELECTRICAL SPECIFICATIONS

KGEA-AFULR-B-0100J

L (mH)	0.100
Cres (nF)	----
Q	>150
I	2App
H-Field	123 dBuV/m@2App@3meter
Sensitivity@125khz	722mVpp/App/m

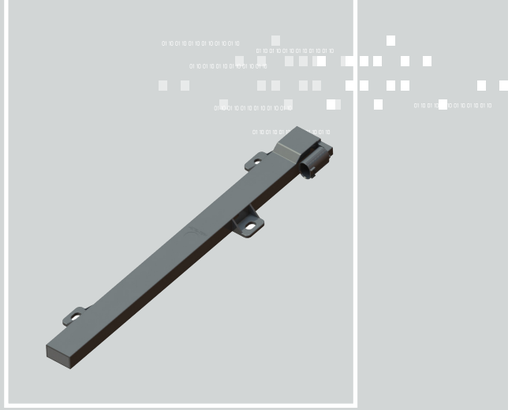
The specification chart is a reference guide for the most common required values at working frequencies of 125 kHz, 20 kHz and 134.2 kHz. Any other inductance value at LF or tighter tolerances can be provided. Please contact our sales department for any inquiry.

New

KGEA-LR

LF Long Range Antenna Housing
265x21x11,5mm (100µH - 500µH)

EMITTER ANTENNAS / **LONG RANGE**



FEATURES

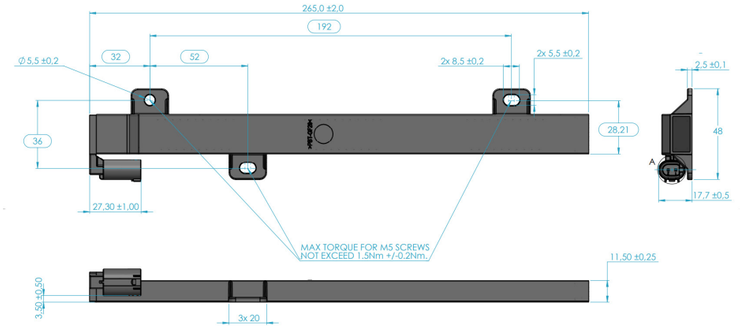
- Transmitting low frequency.
- High Strength Magnetic Field and Sensitivity.
- High impact absorption and mechanical reduction preventive. Material PBT-GF20%
- LF emitter antenna assembly by external housing + Sealed by PU-resin.
- Flat antenna lateral position connector assembled into external housing plastic.
- Strong anchor points which provide an easy assembly and will ensure mechanical robustness.
- IP6kgk grade waterproof

01 ELECTRICAL PARAMETERS

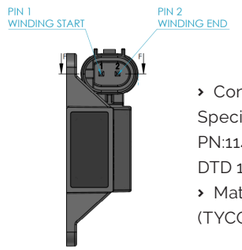
- Work frequency LF: fo= 20Khz, 125kHz and 134,2,KHz
- Reference Electrical Field: E-field > 145 (dBµV/m @2App@1 meter @125khz)
- Reading Distance from 6 to 9 meters (depending load Ipp)
- Ipp max until 5App
- High stability in temperature (-40°C up to +85°C).
- Reliability test: This part is according to AEC-Q200 Revision C.

02 SPECIFICATIONS

DIMENSIONS (mm)

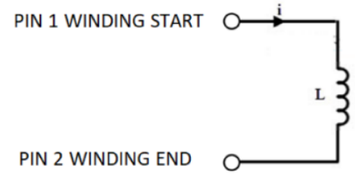


CONECTOR PIN LAYOUT



- Connector according to Specification: AMP (TYCO), PN:114-18063-012 REV D4 DTD 10MAR08, CODIG A.
- Mating Connector; AMP (TYCO) PN: 1-1438608-1.

SCHEMATIC DIAGRAM



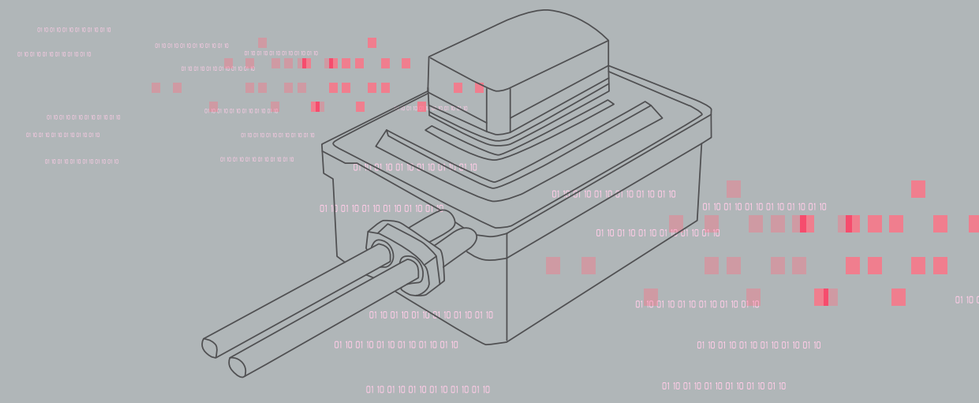
ELECTRICAL SPECIFICATIONS

PART NUMBER	L Inductance ± 5%	Q-factor min	Freq. (kHz)	Rdc (mΩ) ± 10%
KGEA-LR-B-0125J	125uH	150	125,0	280

1.2.4

EMITTER ANTENNAS & SWITCHES

SWITCHES



New

SWITCH PB-S1

Push button switch LF-RH-W

EMITTER ANTENNAS & SWITCHES / **SWITCHES**

FEATURES

Switches fully made with rubber compound, for interior usage on hidden lash door handlers.

Full rubber switch. Rigid housing with rubber encapsulation in full shape. Low stroke force and full waterproofness capability.

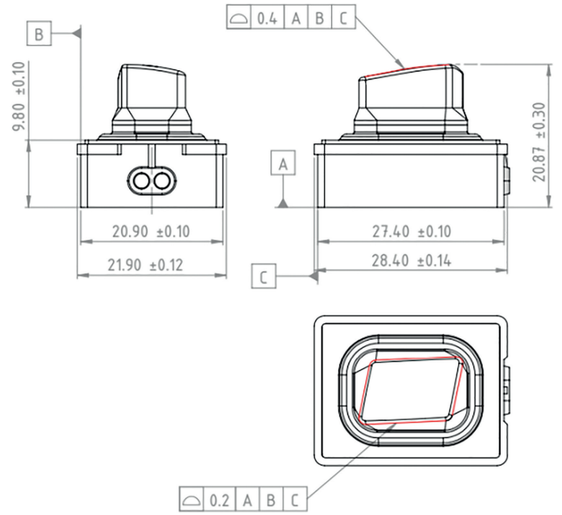
This product is served with 15cm cable, without terminal nor connector.

01 APPLICATIONS

- Application for lock and unlock the car in combination with PKE (Passive keyless Entry System)
- PEPS (Passive Entry/Passive Start) for a vehicle secure access.

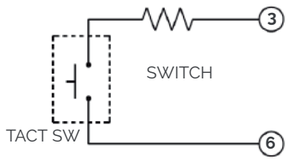
02 SPECIFICATIONS

DIMENSIONS (mm)



- Effort of the smart key button must be 11.8±2.9N (1.2±0.3kgf) = F
- Switch operating stroke: 0.8 +/- 0.3 mm

ELECTRICAL DIAGRAM



SWITCH BLOCK DIAGRAM

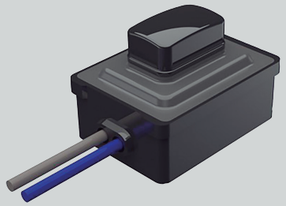
Rs	100 Ω Max
Resistance R off min	10^6 Ω
Bounce time	< 5ms
Mechanical Life	> 100000 pushes
Power Supply	9V – 16V
Switching Current	Minimum 1mA Maximum 10mA

New

SWITCH PB-S2

Push button switch LF-RH-W

EMITTER ANTENNAS & SWITCHES / **SWITCHES**



FEATURES

Switches with integrated rigid button on top, developed for exposed external locations.

Rigid housing, rubber cushion and top button made on rigid plastic. Medium force rubber and stroke. Integrated tact microswitch with full waterproofness capability.

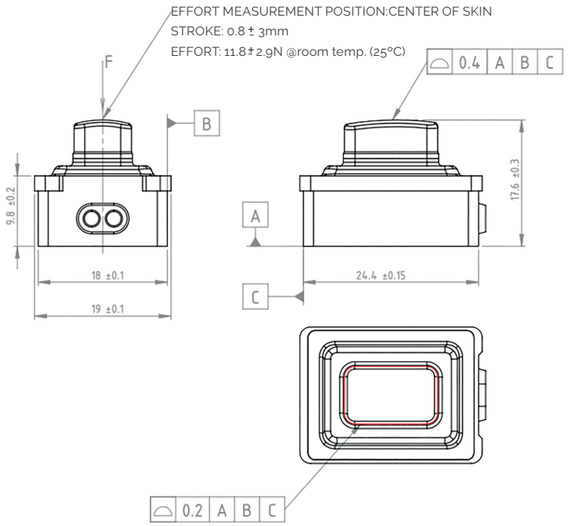
This product is served with 15cm cable, without terminal nor connector.

01 APPLICATIONS

- Application for lock and unlock the car in combination with PKE (Passive keyless Entry System)
- PEPS (Passive Entry/Passive Start) for a vehicle secure access.

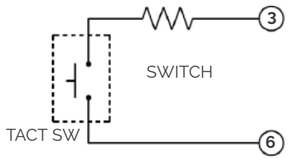
02 SPECIFICATIONS

DIMENSIONS (mm)



- Effort of the smart key button must be 11.8±2.9N (1.2±0.3kgf) = F
- Switch operating stroke: 0.8 +/- 0,3 mm
- BUTTON texture/roughness on top according EMBO Type: 048F EMBO spec of MOLTEX.

ELECTRICAL DIAGRAM



SWITCH BLOCK DIAGRAM

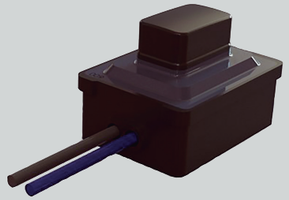
Rs	100 Ω Max
Resistance R off min	10^6 Ω
Bounce time	<5ms
Mechanical Life	> 100000 pushes
Power Supply	9V – 16V
Switching Current	Minimum 1mA Maximum 10mA

New

SWITCH PB-S3

Push button switch LF-RH-W

EMITTER ANTENNAS & SWITCHES / **SWITCHES**



FEATURES

Switches with integrated rigid button on top, developed for exposed external locations.

Strong switch. Rigid housing, stronger rubber cushion and top button made on rigid plastic. Higher pushing force and smaller stroke. Integrated tact microswitch with full waterproofness capability.

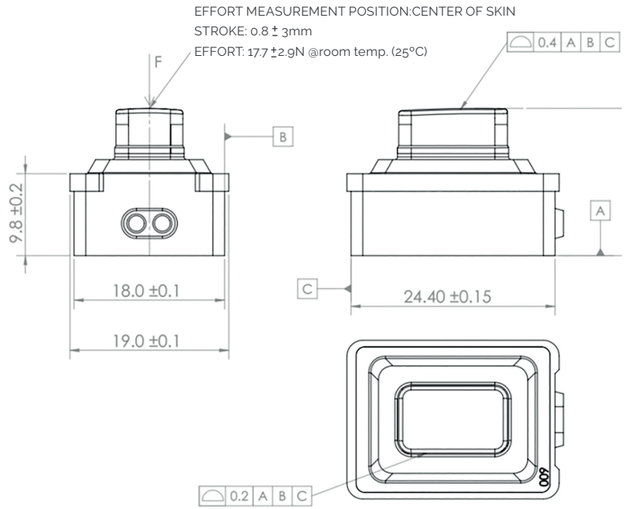
This product is served with 15cm cable, without terminal nor connector.

01 APPLICATIONS

- Application for lock and unlock the car in combination with PKE (Passive keyless Entry System)
- PEPS (Passive Entry/Passive Start) for a vehicle secure access.

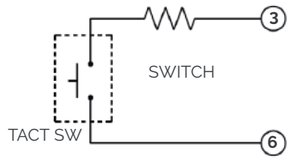
02 SPECIFICATIONS

DIMENSIONS (mm)



- Effort of the smart key button must be 17.7±2.9N (1.2±0.3kgf) = F
- Switch operating stroke: 0.8 +/- 0.3 mm
- BUTTON texture/roughness on top according EMBO Type: 048F EMBO spec of MOLTEX.

ELECTRICAL DIAGRAM



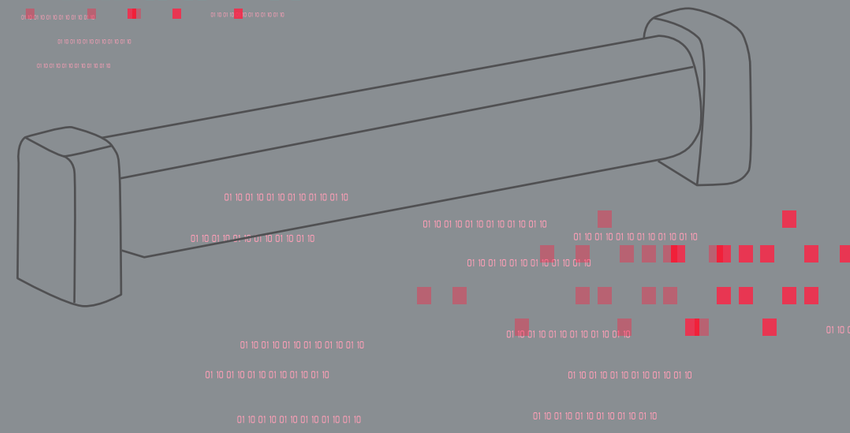
SWITCH BLOCK DIAGRAM

Rs	30 Ω ± 10%
Resistance R off min	10^6 Ω
Bounce time	<5ms
Mechanical Life	> 100000 pushes
Power Supply	9V – 16V
Switching Current	Minimum 1mA Maximum 10mA

1.3

RFID TRANSPONDERS

TELECOILS



01 INTRODUCTION

Tcoils or Telecoils are small coils used in hearing aid devices to sense magnetic fields instead sound signals. The Telecoil allows, for example, to sense directly the electromagnetic field of a telephone rather than an open acoustic microphone. Moreover, telecoils provide access to assistive listening systems, including neck-loop and room-based loop transmitter (installed in some theaters, conference rooms, etc.). Introduction of these Telecoils in the hearing aid devices also improve the binaural communication (stereo sound) allowing hearing of mobile phones, televisions, etc.

PREMO TCoils are very small special ferrite cores wound with ultra thin copper (up to 16 and 12 µm) and can be easily mounted in the PCB of the hearing aid devices using their SMD metallisations.

User of the device can switch from manual mode to automatic mode, creating a magnetic field enough to transmit the signal to the hearing aid.

PREMO TCoils series includes single axis coils such as TC0502, TP0602-TC, TC0902, TC1102 and Z-axis coil such.

Electrical values (for single axis coils) range from 40mH up to 460mH (measured at 1kHz).

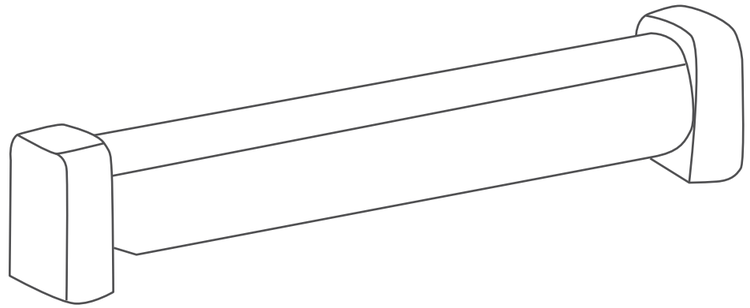
02 MAIN CHARACTERISTICS

- Very small size
- Very stable electrical properties
- High sensitivity
- SMD mounting
- Pb free contacts

03 INDUCTANCE RANGE GRAPHS FOR SINGLE AXIS COILS

INDUCTANCE RANGE GRAPHS FOR SINGLE AXIS COILS

	100µH	150µH	40mH	75mH	140mH	180mH	270mH	340mH	460mH
TC0502			20-16um (wire)				16-12um (wire)		
TP0602-TC			20-16um (wire)				16-12um (wire)		
TC0902			20-16um (wire)					16-12um (wire)	
TC1102			20-16um (wire)						

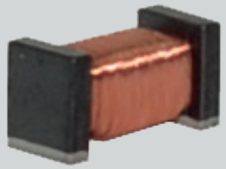


TC0502

SMD Telecoil

5.1x2.3x2.6mm (40mH - 270mH)

TELECOILS



FEATURES

This new design is coil with a very stable and high quality ferrite core and tiny size (5.1 x 2.3 x 2.4mm) and high sensitivity in low frequency range (20-40kHz). Those pieces are winding with thin copper wire up to12µm and its inductances range is 40-270mH. Besides, it has good frequency and temperature behaviour and can be served with "custom" electrics characteristics according requirements of hearing aid devices manufacturers.

01 CHARACTERISTICS

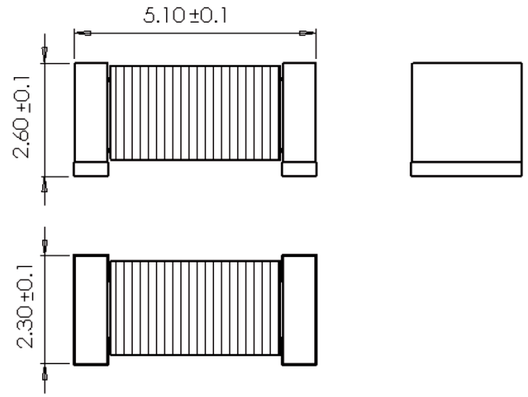
- Small size
- High sensitivity
- SMD mounting

02 APPLICATIONS

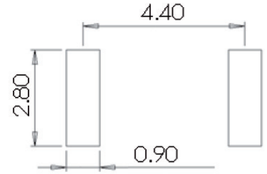
- Hearing aid devices

03 SPECIFICATIONS

DIMENSIONS (mm)



RECOMMENDED PAD-LAYOUT



ELECTRICAL SPECIFICATIONS

	L (mH) @ 1kHz	Tolerance	Rdc (KΩ)	SRF (kHz)	Sensitivity (mVpp/App/m) @1kHz
TC0502-04000J	40	±5%	0,6	> 250	> 0,66
TC0502-14000J	140	±5%	2,9	> 90	> 1,18
TC0502-17000J	170	±5%	3,2	> 80	> 1,38
TC0502-27000J	270	±5%	4,2	> 70	> 1,76

This chart is a reference guide for the most common required values at working frequency of 1KHz. Any other inductance value at LF or tighter tolerances can be provided. Please contact our sales department for any inquiry. Sensitivity measured with Helmholtz coils H=6.34 App/m @1 kHz. Contact us for measurement specification. Metallization: Ag(Base)/Ni(inter)/Sn(Finish)

TP0602-TC

Micro SMD Hard Ferrite Telecoil

6.6x2.3x1.75mm (40mH - 170mH)

TELECOILS

FEATURES

The TP0602-TC surface mountable ferrite wound inductor is a small telecoil solution for hearing aid devices. It uses high quality ferrite core and tiny size (6.6 x 2.3 x1.75 mm). Those pieces are winding with thin copper wire up to 12 µm and its inductance range is 40-170mH. Besides, it has good frequency and temperature behavior and can be served with "custom" electrics characteristics according requirements of hearing aid devices manufacturers.

01 CHARACTERISTICS

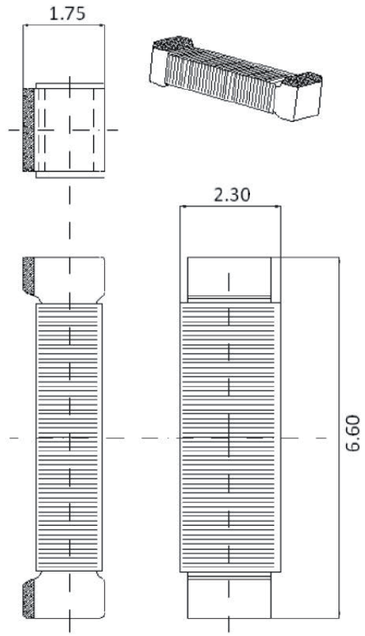
- Small size
- High sensitivity
- SMD mounting

02 APPLICATIONS

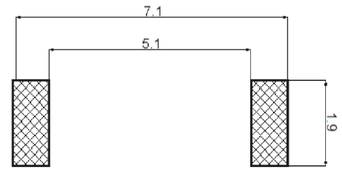
- Hearing aid devices

03 SPECIFICATIONS

DIMENSIONS (mm)



RECOMMENDED PAD-LAYOUT



ELECTRICAL SPECIFICATIONS | TP0602-TC-04000J

L (mH) @ 1kHz	40
Tolerance	±5%
Rdc (KΩ)	1,1
SRF (kHz)	> 220
Sensitivity (mVpp/App/m) @1kHz	0,80

This chart is a reference guide for the most common required values at working frequency of 1 kHz. Please contact our sales department for any inquiry. Contact us for measurement specification.
Operating and test frequency: 1kHz
SRF: Self-resonance frequency of the coil

TC0902

SMD Telecoil

9x1.5x2mm (260mH - 340mH)

TELECOILS

FEATURES

This new design is coil with a very stable and high quality ferrite core and tiny size (9 x 1.5 x 2 mm) and high sensitivity in low frequency range (20-40kHz). Those pieces are winding with thin copper wire up to12µm and its inductances range is 260-340 mH. Besides, it has good frequency and temperature behaviour and can be served with "custom" electrics characteristics according requirements of hearing aid devices manufacturers.

01 CHARACTERISTICS

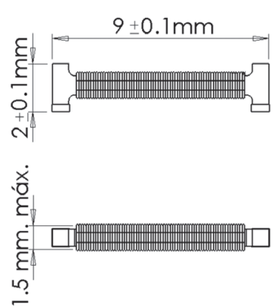
- Small size
- High sensitivity
- SMD mounting

02 APPLICATIONS

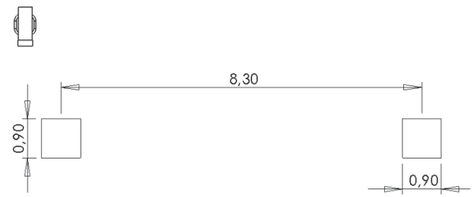
- Hearing aid devices

03 SPECIFICATIONS

DIMENSIONS (mm)



RECOMMENDED PAD-LAYOUT



ELECTRICAL SPECIFICATIONS

	L (mH) @ 1kHz	Tolerance	Rdc (KΩ)	SRF (kHz)	Sensitivity (mVpp/App/m) @1kHz
TC0902-26000J	260	±5%	1,2	> 90	> 1,8
TC0902-34000J	340	±5%	1,4	> 60	> 2,1

This chart is a reference guide for the most common required values at working frequency of 1KHz. Any other inductance value at LF or tighter tolerances can be provided. Please contact our sales department for any inquiry. Sensitivity measured with Helmholtz coils H=6.34 App/m @1 kHz. Contact us for measurement specification. Metallization: Ag(Base)/Ni(inter)/Sn(Finish)

TC1102

SMD Telecoil

10.5x1.4x2mm (350mH - 460mH)

TELECOILS

FEATURES

This new design is coil with a very stable and high quality ferrite core and tiny size (10.5x1.4x2mm) and high sensitivity in low frequency range (20-40kHz). Those pieces are winding with thin copper wire up to12µm and its inductances range is 350-630 mH. Besides, it has good frequency and temperature behaviour and can be served with "custom" electrics characteristics according requirements of hearing aid devices manufacturers.

01 CHARACTERISTICS

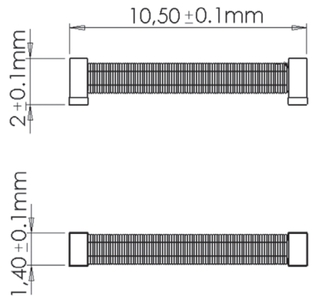
- Small size
- High sensitivity
- SMD mounting

02 APPLICATIONS

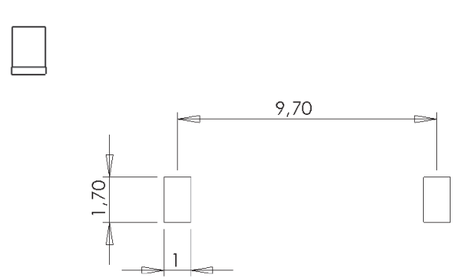
- Hearing aid devices

03 SPECIFICATIONS

DIMENSIONS (mm)



RECOMMENDED PAD-LAYOUT



ELECTRICAL SPECIFICATIONS

	L (mH) @ 1kHz	Tolerance	Rdc MAX (KΩ)	SRF (kHz)	Sensitivity (mVpp/App/m) @1kHz
TC1102-35000J	350	±5%	2,75	> 50	> 2,3
TC1102-46000J	460	±5%	3,3	> 50	> 3,16

This chart is a reference guide for the most common required values at working frequency of 1KHz. Any other inductance value at LF or tighter tolerances can be provided. Please contact our sales department for any inquiry. Sensitivity measured with Helmholtz coils H=6.34 App/m @1 kHz. Contact us for measurement specification. Metallization: Ag(Base)/Ni(inter)/Sn(Finish)

01 SOLDERING: RECOMMENDED REFLOW PROFILE

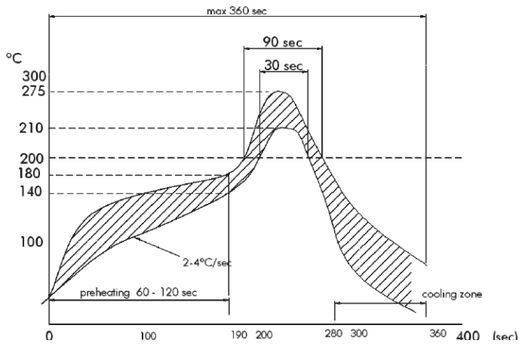
Reflow soldering, vapour-phase soldering. A maximum soldering temperature of 260°C during 10 s should not be exceeded for (see recommended soldering profile with maximum and minimum temperature-time).

The reflow condition recommended above is according to the machine used by our company. Big differences will arise as a result of the type of machine, reflow conditions, method, etc. used.

For the Premo's recommended reflow profile, please refer to document:

› **PREMO_reflow_recommendations_V0_102018**

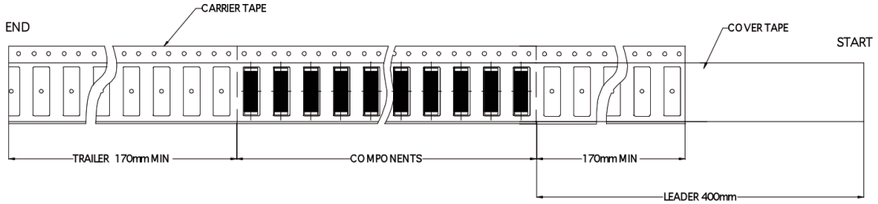
Request it at: *info@grupopremo.com*



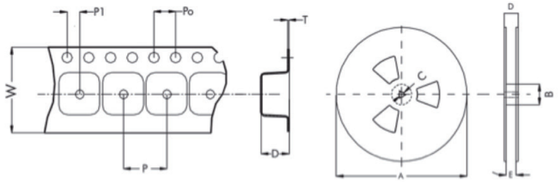
MEASURING EQUIPMENTS AND CONDITIONS

Rated inductance LR	Measured at freq. fL, with impedance analyzer WK3260 with 3MHz installed
Q factor Qmin	Measured at freq. fL, with impedance analyzer WK3260 with 3MHz installed
Self-resonance freq. fmin	Measured at freq. fL, with impedance analyzer WK3260 with 3MHz installed
DC resistance Rmax	Measured at 20°C ambient temperature, measuring current < IR
Sensitivity	Measured with Helmholtz coils 5 turns, Ø160mm + waveform generator Agilent 33120A + oscilloscope Agilent 54622A. Contact PREMO

03 TAPING



04 PACKING

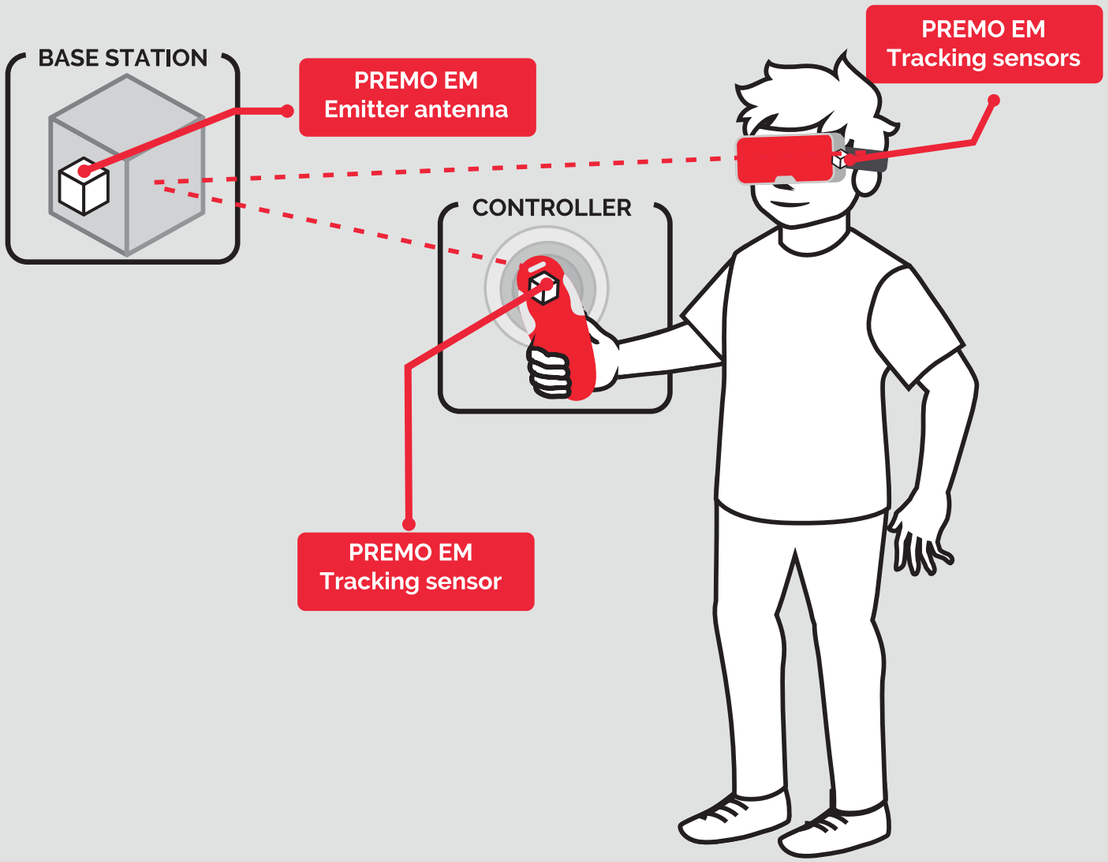


05 TAPE AND REEL PACKAGING SPECIFICATIONS

	REEL DIMENSIONS			TAPE DIMENSIONS								
	A	B	C	D	E	W	P	P_0	P_1	D	T	Parts/ Reel
TC0502	330	50	13	22.4	16.4	16	8	4	2	2.8	0.3	2000
TP0602-TC	330	50	13	22.4	16.4	16	4	4	2	2.5	0.3	2000
TC0902	330	50	13	22.4	16.4	16	8	4	2	2.5	0.3	2000
TC1102	330	50	13	22.4	16.4	16	8	4	2	2.5	0.3	2000

02

AR VR EM TRACKING SENSORS



01 INTRODUCTION

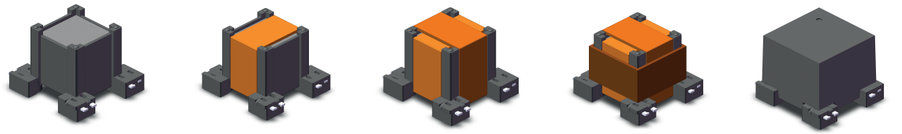
Electromagnetic motion tracking systems work by using a low frequency isotropic magnetic field generator (3D emitter) and one or several isotropic 3D magnetic sensors. Emitter and receiver sides need special 3D magnetic coils to generate and receive the magnetic field signals.

These sensors offered to the AR/VR market include more than six degrees of freedom (6DOF): 3 positions and 3 orientations generated by 3 transmitter coils and 3 receiver coils.Typical operating frequencies range are from a few kHz (even Hz) to several kHz (20-50-60kHz).

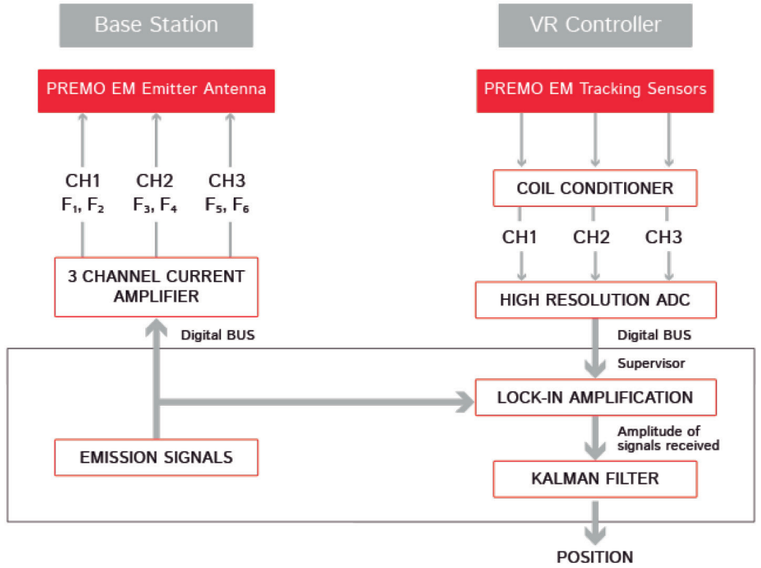
Premo's 3DCoils and 3DCoilCube motion tracking magnetic sensors use a 3D emitter antenna that generates an electromagnetic field. The use of low frequency/long wavelength signals allow tracking sensors to be embedded or out of sightline, ideal for any virtual reality controller.

Due to Premo's wide experience in these products, we offer a large portfolio of Tx/Rx electromagnetic tracking sensors, covering all kinds of range, dimensions or performance constraints. From cube to low-profile configurations, and from lower to higher sensitivities, the range of possibilities is very wide.They are entirely customizable and deliverable within 4 weeks. We are equipped to produce over 50 million **3DCoils and 3DCoilCubes** per year.

3DCoilCube™



PBM Core SMT	X Winding Pitch	Y Winding Yaw	Z Winding Roll	X winding Pitch
High Precision base	Sensor Coil	Sensor Coil	Sensor Coil	3DCoilCube



>> 3DCOILCUBE (TX, RX COILS)

Choosing the right digital hardware in virtual reality and augmented reality systems is one of the most important decisions you will make. Cubic design is the most effective approach to an isotropic magnetic coil emitter or receiver.

Already used in some of the world's most advanced VR/AR devices, the 3DCoilCube has an unmatched precision of 0.001m and can track the smallest, slowest movements for optimum 3D motion tracking.

>> 3DCOIL (RX COILS)

The low profile 3DCoil design achieves electromagnetic sensitivity isotropy by clever design techniques and fine-tuned windings calculations. By using these, the sensor volume required shrinks to SMT PCB mounted components standards (<3.5mm height).

>> CUSTOM SOLUTIONS

PREMO biggest competitive advantage is the short time-to-market performance when developing a custom-made solution according to customer specifics.

A wide variety of EM sensors can be designed to meet AR/VR systems requirements. From cube configurations to low-profile configurations, and from lower to higher sensitivities, the range of possibilities is very wide:

- Shapes (i.e. rectangular, quasi-cub, ultralow-profile)
- Inductance: Tx (20µH – 2mH), Rx(300µH – 7mH)
- Operation frequency (3 – 300kHz)
- Standard cables to male/female connector
- FPC connection
- Over-Molded (low pressure molding)

>> VR CONSULTING EXPERT - AMFITECH

PREMO has entered a strategic partnership with Amfitech, highly specialized in electromagnetic tracking systems development and customization.

AmfiTrack is an embedded stand-alone, high precision and low cost electromagnetic tracking system based on electromagnetic field (EMF) tracking, using an EMF transmitter and one or more EMF receivers

Our VR/AR EM Trackers are included in AmfiTrack six degrees of freedom (6DOF) 3D tracking system.

More info at: http://amfitrack.com

>> KITS

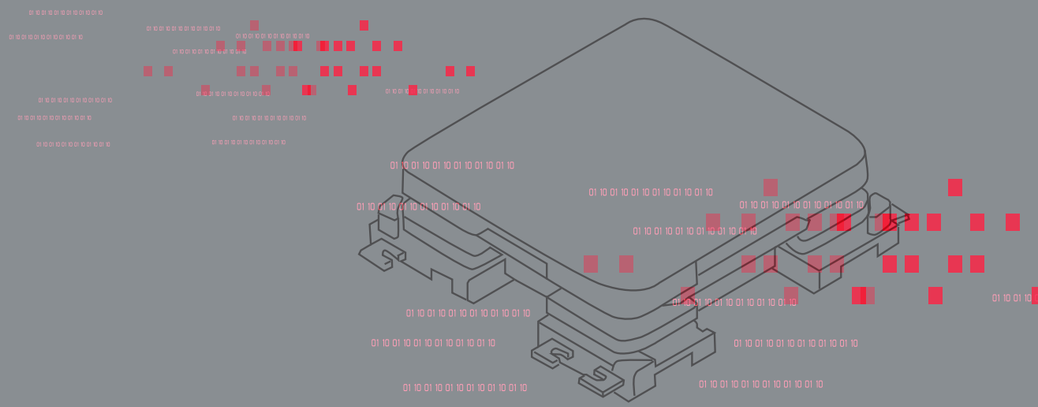
PREMO Tx/Rx VR Sensors Kit includes a set of Tx & Rx coils. Place the transmitter in gloves, remote controls or in the console and the receiver in the VR glasses. Let the magnetic field do the rest. This unique, wireless, Tx/Rx motion sensing technology leaves no movement undetected

PREMO AR/VR Demo Kit is an Electromagnetic Motion Tracking System Demo kit. Main benefits are full six degrees of freedom (6DOF) tracking, high precision, low system components cost, easy installation, and no line-of-sight issue, which as a very notable advantage compared with camera-based tracking systems. AmfiTrack is an embedded stand-alone, high precision and low cost electromagnetic tracking system based on electromagnetic field (EMF) tracking, using an EMF transmitter and one or more EMF receivers.

2.1

AR VR EM TRACKING SENSORS

Rx EM MOTION TRACKING SENSORS

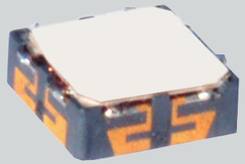


3DV06

SMD 3D Coil

7x7x2.3mm

Rx EM MOTION TRACKING SENSORS



FEATURES

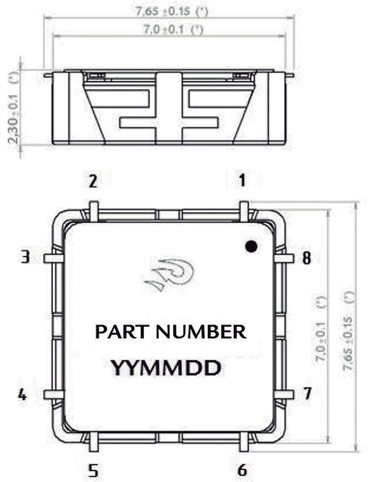
Electromagnetic motion tracking system Works by using one low frequency isotropic magnetic field generator and one or several isotropic 3D magnetic sensors. 3D coils have huge flexibility in terms of customization and setup to fulfill the application needs or environment changes. This is the smallest 3D coil in the market allowing to be used for very small volumes to be traced.

01 CHARACTERISTICS

- Size 7x7x2.3 mm
- SMD solution
- Suitable for AOI
- High stability in temperature (-40 °C to +85 °C)
- Labelled to allow P&P operations
- Same sensitivity in the three axis.

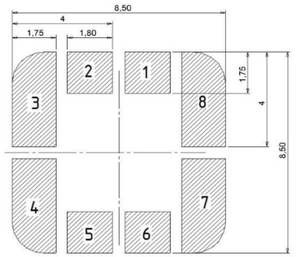
02 DIMENSIONS

DIMENSIONS (mm)

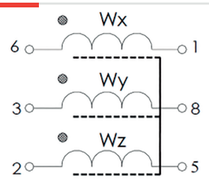


› Pins coplanarity 0.1 mm

RECOMMENDED PAD-LAYOUT



ELECTRICAL DIAGRAM



› Start of winding is indicated with the dot

ELECTRICAL SPECIFICATIONS

Code	Lx,y,z nom (mH)	Qx,y,z nom	f (kHz)	SRFx,y (kHz) Min	SRFz (kHz) Min	DCRx (Ohm) Max	DCRy (Ohm) Max	DCRz (Ohm) Max	Sensit. x,y,z (mV/A/m) Min (*)
3DV06-A-S0100J	1.0 / 1.0 / 5.8	3.4/3/3.5	20	1000	1000	44	49	230	2.7
3DV06-A-S0340J	3.40 / 3.40 / 10.2	3.5/3/4.0	20	500	750	141	154	350	5

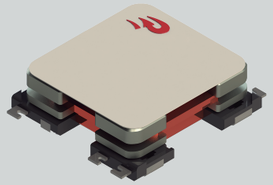
(*) Ask for sensitivity test set up and recommendations

3DV09

SMD 3D Coil

9.5x9.5x3.2mm

Rx EM MOTION TRACKING SENSORS



FEATURES

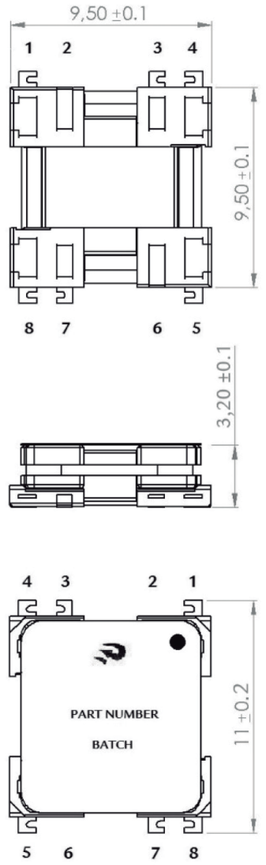
Electromagnetic motion tracking system Works by using one low frequency isotropic magnetic field generator and one or several isotropic 3D magnetic sensors. 3D coils have huge flexibility in terms of customization and setup to fulfill the application needs or environment changes. Size of this coil makes it suitable in several applications where reduced size is a must.

01 CHARACTERISTICS

- Size 9.5x9.5x3.2 mm
- SMD solution
- Suitable for AOI
- Inductance range: 2-20 mH
- Labelled to allow P&P operations
- Sensitivity over 20 mV/A/m.

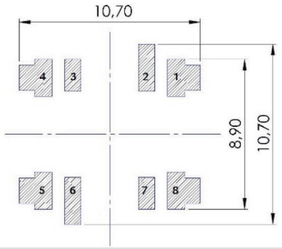
02 DIMENSIONS

DIMENSIONS (mm)

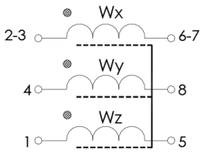


- Pins coplanarity 0.1 mm

RECOMMENDED PAD-LAYOUT



ELECTRICAL DIAGRAM



ELECTRICAL SPECIFICATIONS | 3DCV9-A-2000J

L x,y,z (mH)	18(xy)/30(z)
Qx,y nom	4.5(x) /4(y)
4.5(x) /4(y)	5.5
f(kHz)	20
SRFx,y (kHz) Min	150
SRFz (kHz) Min	450
DCRx (Ohm) Max	520
DCRy (Ohm) Max	570
DCRz (Ohm) Max	715
Sensitivity x,y (mV/A/m) Min (*)	20
Sensitivity z (mV/A/m) Min (*)	15

(*) Ask for sensitivity test set up and recommendations

3DV11AOI

SMD 3D Coil

11.6x11.6x3.2mm

Rx EM MOTION TRACKING SENSORS

FEATURES

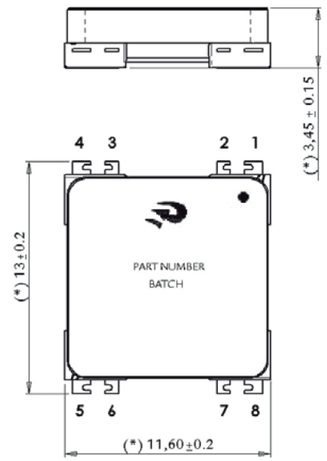
Electromagnetic motion tracking system Works by using one low frequency isotropic magnetic field generator and one or several isotropic 3D magnetic sensors. 3D coils have huge flexibility in terms of customization and setup to fulfill the application needs or environment changes. Performance of this coil makes it suitable in several applications where low profile is a must.

01 CHARACTERISTICS

- Size 11.6x11.6x3.2 mm
- SMD solution
- Suitable for AOI
- Inductance range: 2-20 mH
- Labelled to allow P&P operations
- Best size/sensitivity ratio. Sensitivity over 20 mV/A/m @20 kHz.

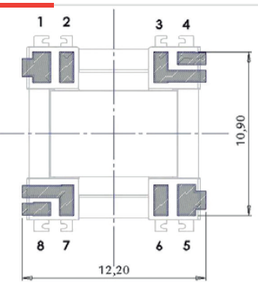
02 DIMENSIONS

DIMENSIONS (mm)

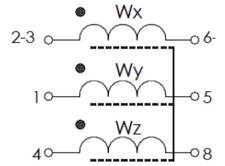


› Pins coplanarity 0.1 mm

RECOMMENDED PAD-LAYOUT



ELECTRICAL DIAGRAM



ELECTRICAL SPECIFICATIONS

Code	Lx,y,z nom(1) mH	Qx,y,z Min(1)	f (kHz)	SRF x,y (kHz) Min	SRFz (kHz) Min	DCRx (Ohm) Max	DCRy (Ohm) Max	DCRz (Ohm) Max	Sensit. x,y,z (mV/A/m) Min (*)
3DV11AOI-A-S0600J	6 / 6 / 6.9	5.0/5.0/4.0	20	300	500	113	130	180	11
3DV11AOI-A-2000J	20 / 22 / 15	5.0/5.0/5.0	20	120	350	500	550	400	20XY / 15Z
3DV11AOI-A-3000J	30 / 30 / 25	6.0/5.5/5.0	20	100	200	600	700	680	27XY / 23Z

› (1) Measured at 20kHz, 1Vac
› (*) Ask for sensitivity test set up and recommendations

3DV15

SMD 3D Coil

15.6x15.6x3.8mm

Rx EM MOTION TRACKING SENSORS

FEATURES

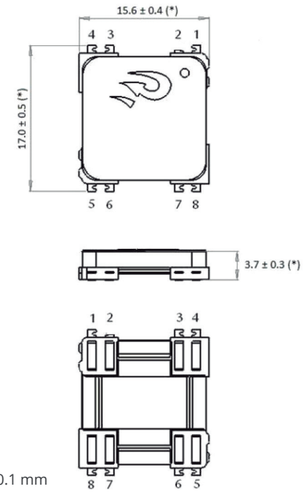
Electromagnetic motion tracking system Works by using one low frequency isotropic magnetic field generator and one or several isotropic 3D magnetic sensors. 3D coils have huge flexibility in terms of customization and setup to fulfill the application needs or environment changes. Higher electrical performance in the 3DC low profile rage.

01 CHARACTERISTICS

- Size 15.6x15.6x3.8 mm
- SMD solution
- Highly customizable solution
- Inductance range: 2-50 mH
- Labelled to allow P&P operations
- Best size/sensitivity ratio. Sensitivity over 45 mV/A/m @20 kHz.

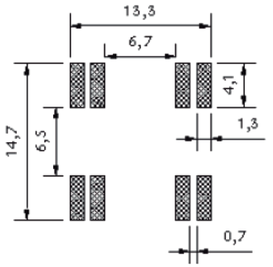
02 DIMENSIONS

DIMENSIONS (mm)

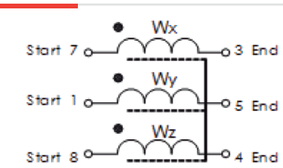


› Pins coplanarity 0.1 mm

RECOMMENDED PAD-LAYOUT



ELECTRICAL DIAGRAM



ELECTRICAL SPECIFICATIONS

Code	Lx,y,z nom(1) mH	Qx,y,z nom(1)	f (kHz)	SRF x,y (kHz) Min	SRFz (kHz) Min	DCRx (Ohm) Max	DCRy (Ohm) Max	DCRz (Ohm) Max	Sensit. x,y,z (mV/A/m) Min (*)
3DV15-A-S0600J	6.0 / 6.0 / 7.1	5.5/5.5/4.0	20	225	550	143	143	220	15
3DV15-A-S0900J	9.0 / 9.0 / 10.6	6.0/6.0/4.5	20	200	300	176	176	275	19
3DV15-A-S2000J	20/20/20	8.0/8.0/5.5	20	120	250	330	330	500	30
3DV15-A-5350J	53.5/53.5/34	7.5/7.5/5.2	20	120	150	925	950	875	43 XY/33Z

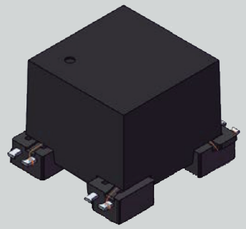
› (1) Measured at 20kHz, 1Vac
› (*) Ask for sensitivity test set up and recommendations

3DCC08

3D Coil Cube receiver sensor for VR magnetic tracking system

16.5x14.8x11.8mm (300-600uH/2-10mH)

Rx EM MOTION TRACKING SENSORS



FEATURES

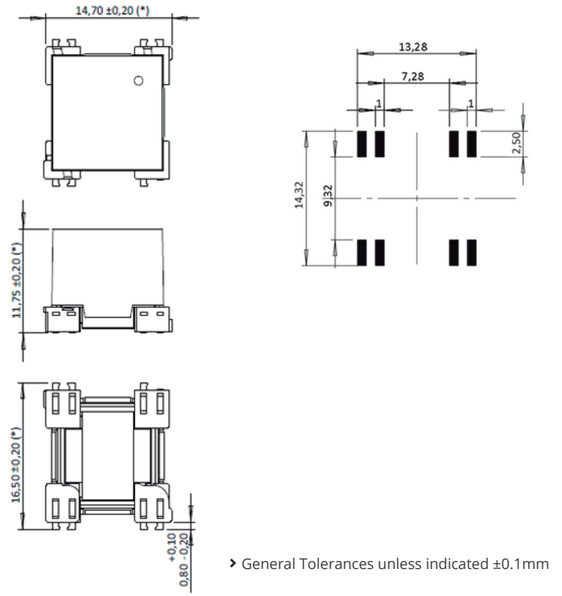
Three axis magnetic sensor for magnetic tracking sensor systems. Very good performance/size ratio, with isotropic response. Used as receiver in VR/AR applications (gaming, etc.) and motion capture applications. Very low latency compared with other motion tracking technologies.

01 CHARACTERISTICS

- High axis symmetry (X,Y,Z), repeatability (very good isotropy) and accuracy (up to 1% tolerances)
- Magnetic Sensitivity: 18 mVpp / App / m @20kHz.(high inductance)
- Magnetic Sensitivity: 4.5 mVpp / App / m @20kHz (low inductance)
- Mechanical Drop & Vibration compliant.
- Mounting method: SMT (Taped & Reeled).
- -20°C to 85°C Temperature Performance.
- Multiple frequencies available (typ 60kHz, 125kHz, 134kHz)
- According industry and safety standards: UL94-V0
- High X/Y/Z symmetry and repeatability.

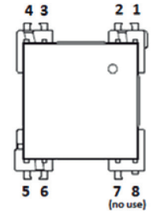
02 DIMENSIONS

DIMENSIONS AND RECOMMENDED PAD-LAYOUT (mm)



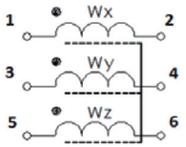
› General Tolerances unless indicated ±0.1mm

PINOUT



› Pins Coplanarity 0.15mm.

ELECTRICAL DIAGRAM



ELECTRICAL SPECIFICATIONS | 20kHz

Code	Lx,y,z nom	Qx,y,z nom(1)	f(kHz)	SRF x,y (kHz) Min	SRFz (kHz) Min	DCRx (Ohm) Max	DCRy (Ohm) Max	DCRz (Ohm) Max	Sensit. x,y z (mV/A/m) Min (*)
3DCC08-A-0038J	343 / 313 / 327 µH	4.3/4.7/3.5	20	500	500	10.8	9.5	11.9	4
3DCC08-A-0550J	5.4 / 5.5 / 5.1 mH	4.1/4.4/3.4	20	200	150	178	176	198	17.5

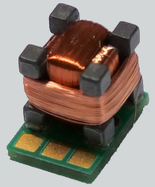
This chart is a reference guide for the most common required values at working frequency of 20kHz. Any other inductance value at LF or tighter tolerances can be provided. Please contact our sales department for any inquiry. Sensitivity measured with Helmholtz coils H=11.37 App/m @20kHz. Contact us for measurement specification.
SRF: Self-resonant frequency of the coil

3DCC03

3D Cube

4.2x3.5x3.2mm

Rx EM MOTION TRACKING SENSORS



APPLICATIONS

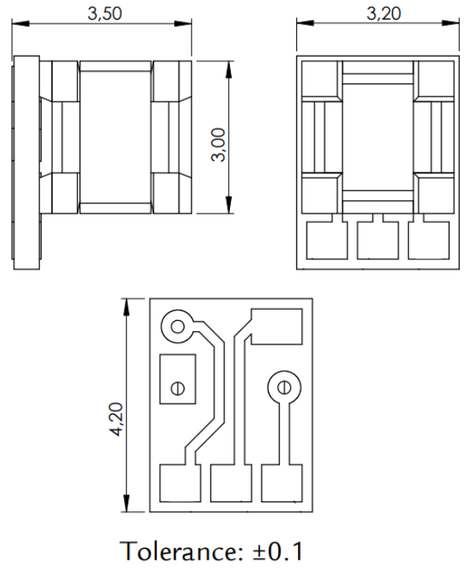
Micro 3D magnetic field receiver / Micro 3D motion tracking antenna.

01 CHARACTERISTICS

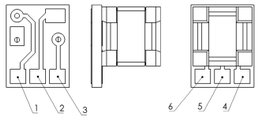
- Size 4.2x3.5x3.2 mm
- Passive inductive receiver
- 3D Magnetic field sensitive
- Working frequency: 20 kHz
- Operating temperature: -40 °C to +85 °C
- Storage temperature: -40 °C to +85 °C.

02 DIMENSIONS

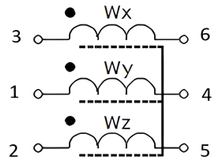
DIMENSIONS (mm)



PINOUT DIAGRAM



ELECTRICAL DIAGRAM



ELECTRICAL SPECIFICATIONS | 20kHz

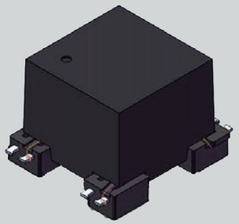
Code	Lx,y,z nom (mH)	Qx,y,z nom Min	f(kHz)	SRF x,y (kHz) Min	SRFz (kHz) Min	DCRx (Ohm) Max	DCRy (Ohm) Max	DCRz (Ohm) Max	Sensit. x,y, z (mV/nT) Min
3DCC03-A-0570J	5.7/5.3/4.9	1.5/ 1.2 / 1.0	20	500	500	396	462	605	250

3DCC10

3D Coil Cube receiver sensor for VR magnetic tracking system

17.4x15.2x13.9mm (600-800uH/2-10mH)

Rx EM MOTION TRACKING SENSORS



FEATURES

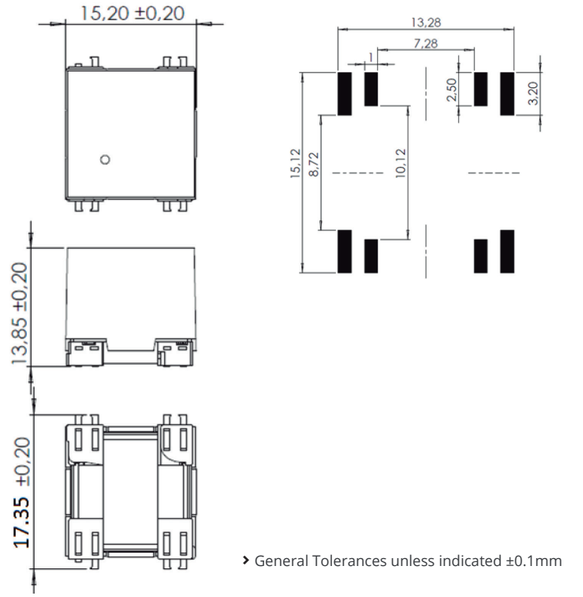
Three axis magnetic sensor for magnetic tracking sensor systems. Very good performance/size ratio, with isotropic response. Used as receiver in VR/AR applications (gaming, etc.) and motion capture applications. Very low latency compared with other motion tracking technologies.

01 CHARACTERISTICS

- High axis symmetry (X,Y,Z), repeatability (very good isotropy) and accuracy (up to 1% tolerances)
- Magnetic Sensitivity: 25 mVpp / App / m @20kHz. (High inductance)
- Magnetic Sensitivity: 8.5 mVpp / App / m @20kHz. (Low inductance)
- Mechanical Drop & Vibration compliant.
- Mounting method: SMT (Taped & Reeled).
- -20°C to 85°C Temperature Performance.
- Multiple frequencies available (typ 60kHz, 125kHz, 134kHz).
- According industry and safety standards: UL94-V0.

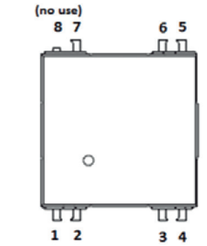
02 DIMENSIONS

DIMENSIONS AND RECOMMENDED PAD-LAYOUT (mm)



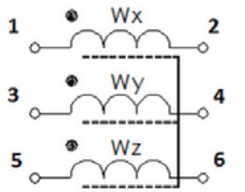
› General Tolerances unless indicated ±0.1mm

PINOUT



› Pins Coplanarity 0.15mm.

ELECTRICAL DIAGRAM



ELECTRICAL SPECIFICATIONS | 20kHz

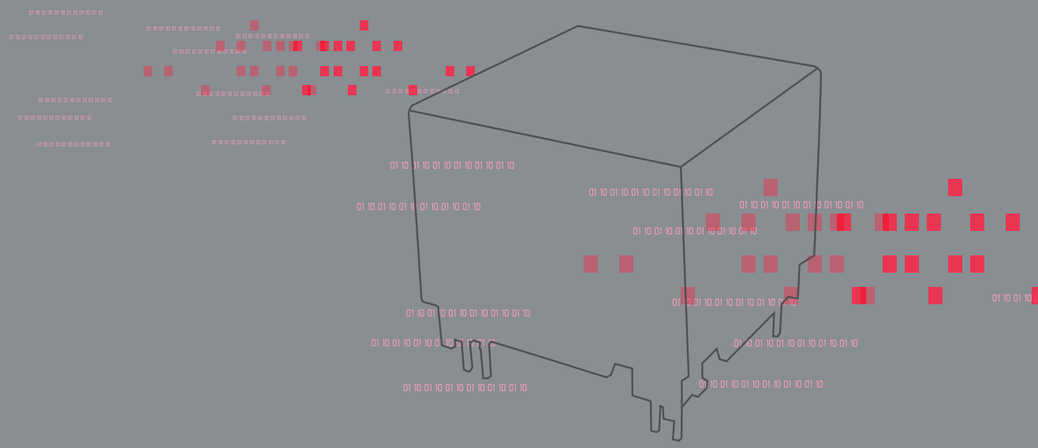
Code	Lx,y,z nom	Qx,y,z nom	f(kHz)	SRF x,y (kHz) Min	SRFz (kHz) Min	DCRx (Ohm) Max	DCRy (Ohm) Max	DCRz (Ohm) Max	Sensit. x,y z (mV/A/m) Min (*)
3DCC10-A-0066J	645 / 664 / 610 µH	4.1/4.3/3.4	20	500	500	21.2	20.5	23.7	7.0
3DCC10-A-0600J	8.0 / 8.0 / 7.3 mH	4.4/4.4/4.0	20	150	120	240	240	240	27.0

This chart is a reference guide for the most common required values at working frequency of 20kHz. Any other inductance value at LF or tighter tolerances can be provided. Please contact our sales department for any inquiry. Sensitivity measured with Helmholtz coils H=11.37 App/m @20kHz. Contact us for measurement specification.
SRF: Self-resonant frequency of the coil

2.2

AR VR EM TRACKING SENSORS

Tx EM MOTION TRACKING ANTENNAS

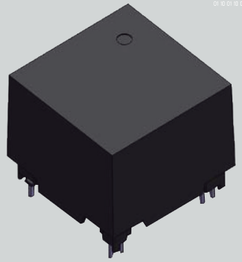


3DCC20

3D Coil Cube emitter for VR magnetic tracking system

30.7x30.75x30.7mm (300-600uH/1.0-1.5mH)

Tx EM MOTION TRACKING ANTENNAS



FEATURES

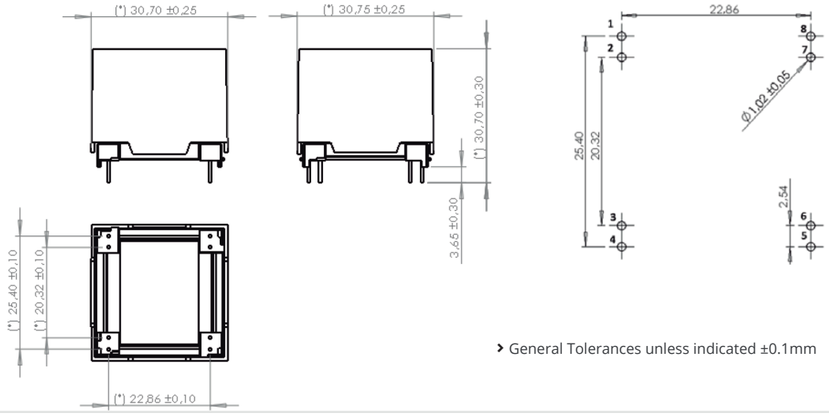
Emitter 3D cubic magnetic antenna for magnetic tracking sensor systems. For VR/AR applications (gaming, etc.) and motion capture applications. Very low latency compared with other motion tracking technologies.

01 CHARACTERISTICS

- Medium size Emitter 3DCoilCube for Magnetic tracking systems for Virtual Reality Systems
- High axis symmetry (X,Y,Z), repeatability (very good isotropy) and accuracy (up to 1% tolerances)
- Magnetic Sensitivity: 32 mVpp / App / m @20kHz. (High inductance)
- Magnetic Sensitivity: 18 mVpp / App / m @20kHz. (Low inductance)
- Mechanical Drop and Vibration compliant.
- Mounting method: PTH.
- -20°C to 85°C Temperature Performance.
- According industry and safety standards: UL94-V0
- Dimensions: 30.7x30.75x30.7 mm

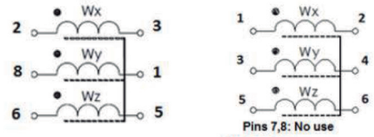
02 DIMENSIONS

DIMENSIONS AND RECOMMENDED PAD-LAYOUT (mm)



› General Tolerances unless indicated ±0.1mm

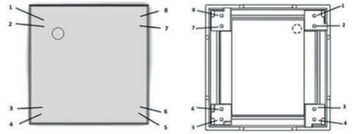
ELECTRICAL DIAGRAM



› 3DCC20-A-0030J

› 3DCC28-A-0110J

PINS MARKING



› UPPER VIEW

› BOTTOM

ELECTRICAL SPECIFICATIONS | 20kHz

Code	Lx,y,z nom	Qx,y,z nom	f (kHz)	SRF x,y,z (kHz) Min	DCRx (Ohm) Max	DCRy (Ohm) Max	DCRz (Ohm) Max	Magnetic Field x,y,z(@1m, 20kHz, 0.25Arms) nom
3DCC20-A-0030J	300 / 295 / 300 µH	15.1/14.3/13.1	20	500	2.6	2.8	2.8	4.4 nT
3DCC20-A-0110J	1.16 / 1.14 / 1.11 mH	26.3/27.8/25.1	20	250	5.1	4.9	5.4	7.0 nT

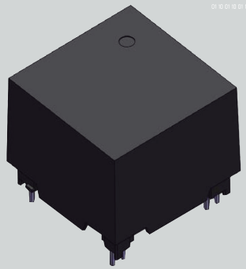
This chart is a reference guide for the most common required values at working frequency of 20kHz. Any other inductance value at LF or tighter tolerances can be provided. Please contact our sales department for any inquiry. Sensitivity measured with Helmholtz coils H=11.37 App/m @20kHz. Contact us for measurement specification.
SRF: Self-resonant frequency of the coil

3D20LW

3D Coil Cube emitter for VR magnetic tracking system

30.7×30.7×30.2mm (1.0-1.5mH)

Tx EM MOTION TRACKING ANTENNAS



FEATURES

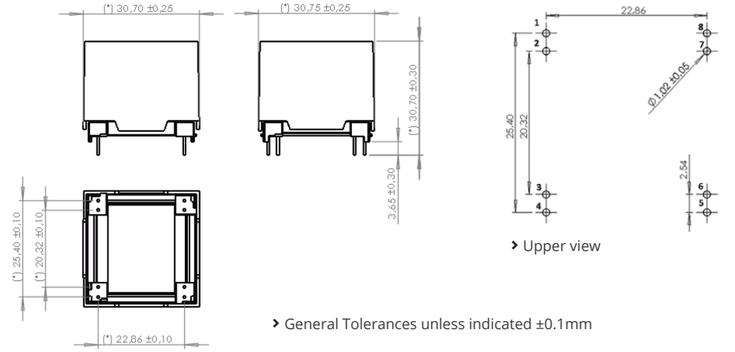
Emitter 3D cubic magnetic antenna for magnetic tracking sensor systems. Light weight version that allow best performance/weight ratios. For VR/AR applications (gaming, etc.) and motion capture applications. Very low latency compared with other motion tracking technologies.

01 CHARACTERISTICS

- Medium size Isotropic 3D Cubic magnetic tracking sensor (20 × 20 mm internal core)
- Medium range and high sensitivity solution
- Light Weight (30gr)
- THT technology
- Inductance range: 1-1.5mH (high inductance)
- Dimensions: 30.7 × 30.7 × 30.2 mm
- Sensitivity (mV/A/m): 30 (min)

02 DIMENSIONS

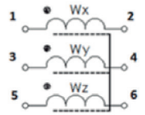
DIMENSIONS AND RECOMMENDED PAD-LAYOUT (mm)



› Upper view

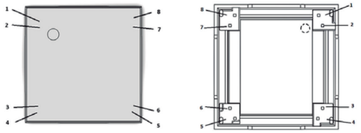
› General Tolerances unless indicated ±0.1mm

ELECTRICAL DIAGRAM



› PINS 7&8 (NOT CONNECTED)

PINS MARKING



› UPPER VIEW

› BOTTOM

ELECTRICAL SPECIFICATIONS | 20kHz

Code	Lx,y,z nom	Qx,y,z nom	f (kHz)	SRF x,y,z (kHz) Min	DCRx (Ohm) Max	DCRy (Ohm) Max	DCRz (Ohm) Max	Magnetic Field x,y,z(@1m, 20kHz, 0.25Arms) nom
3DLW20-A-0145J	1.45 / 1.45 / 1.45 mH	22.0/21.0/20.0	20	250	8.5	8.8	9.4	TBD

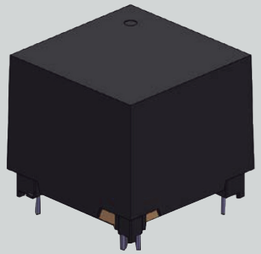
This chart is a reference guide for the most common required values at working frequency of 20kHz. Any other inductance value at LF or tighter tolerances can be provided. Please contact our sales department for any inquiry. Sensitivity measured with Helmholtz coils H=11.37 App/m @20kHz. Contact us for measurement specification.
SRF: Self-resonant frequency of the coil

3DCC28

3D Coil Cube emitter for VR magnetic tracking system

39.5x39.5x38.6mm (350-600uH/1.0-3.0mH)

Tx EM MOTION TRACKING ANTENNAS



FEATURES

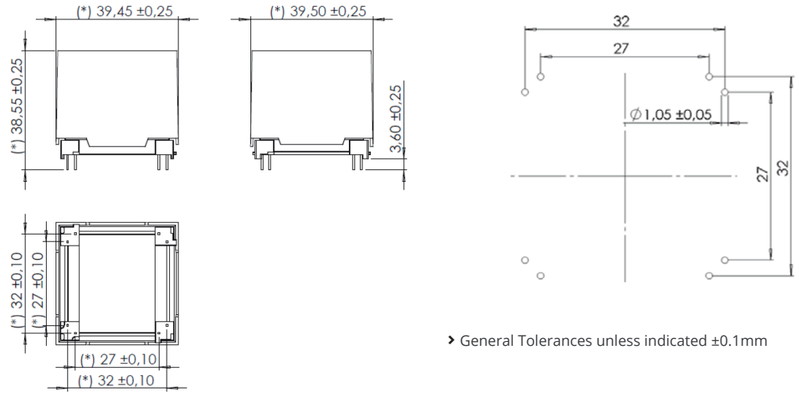
Emitter 3D cubic magnetic antenna for magnetic tracking sensor systems. For VR/AR applications (gaming, etc.) and motion capture applications. Very low latency compared with other motion tracking technologies.

01 CHARACTERISTICS

- High axis symmetry (X,Y,Z), repeatability (very good isotropy) and accuracy (up to 1% tolerances)
- Magnetic Sensitivity: 60 mVpp / App / m @20kHz. (High inductance)
- Magnetic Sensitivity: 30 mVpp / App / m @20kHz. (Low inductance)
- Mechanical Drop and Vibration compliant.
- -20°C to 85°C Temperature Performance.
- Mounting method: PTH.
- Multiple frequencies available (typ 60kHz, 125kHz, 134kHz)
- According industry and safety standards: UL94-V0
- Dimensions: 39.5x39.5x38.6 mm

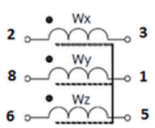
02 DIMENSIONS

DIMENSIONS AND RECOMMENDED PAD-LAYOUT (mm)

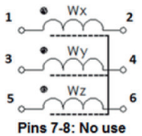


› General Tolerances unless indicated ±0.1mm

ELECTRICAL DIAGRAM

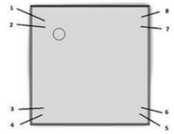


› 3DCC28-A-0039J

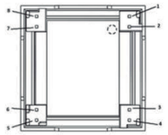


› 3DCC28-A-0150J

PINS MARKING



› UPPER VIEW



› BOTTOM

ELECTRICAL SPECIFICATIONS

Code	Lx,y,z nom	Qx,y,z nom	f (kHz)	SRF x,y (kHz) Min	SRF z (kHz) Min	DCRx (Ohm) Max	DCRy (Ohm) Max	DCRz (Ohm) Max	Magnetic Field x,y,z(@1m, 20kHz, 0.25Arms) nom
3DCC28-A-0039J	380 / 375 / 365 µH	31/30/28	20	1500	1500	1.4	1.4	1.4	6.9 nT
3DCC28-A-0150J	1.49 / 1.46 / 1.39 mH	46/46/46	20	200	200	3.0	2.9	3.2	8.9 nT

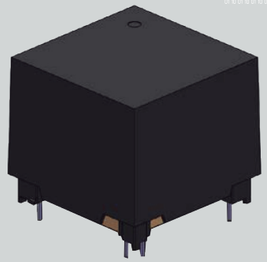
This chart is a reference guide for the most common required values at working frequency of 20kHz. Any other inductance value at LF or tighter tolerances can be provided. Please contact our sales department for any inquiry. Sensitivity measured with Helmholtz coils H=11.37 App/m @20kHz. Contact us for measurement specification.
SRF: Self-resonant frequency of the coil

3D28LW

3D Coil Cube emitter for VR magnetic tracking system

39.5×39.5×38.6mm (350-600uH/1.0-3.0mH)

Tx EM MOTION TRACKING ANTENNAS



FEATURES

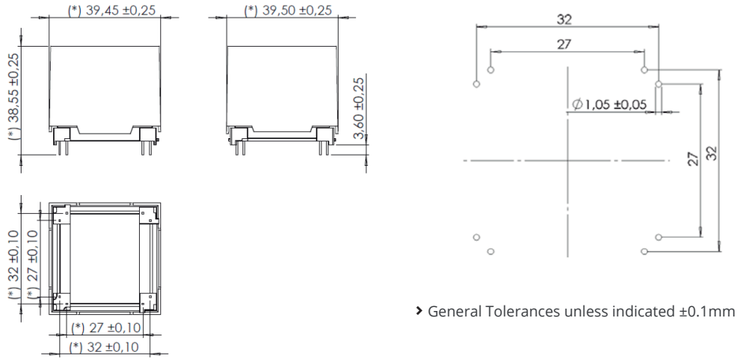
Emitter 3D cubic magnetic antenna for magnetic tracking sensor systems. Light weight version that allow best performance/weight ratios. For VR/AR applications (gaming, etc.) and motion capture applications. Very low latency compared with other motion tracking technologies.

01 CHARACTERISTICS

- Big size Isotropic 3D Cubicmagnetic tracking sensor (28 × 28 mm internal core)
- Long range and high sensitivity solution
- THT technology
- Light Weight (65gr)
- Inductance range: 1.5-3mH (high inductance)
- Dimensions: 39.5 × 39.5 × 38.6 mm
- Sensitivity (mV/A/m): 54 (min)

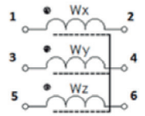
02 DIMENSIONS

DIMENSIONS AND RECOMMENDED PAD-LAYOUT (mm)



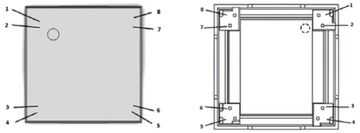
› General Tolerances unless indicated ±0.1mm

ELECTRICAL DIAGRAM



› PINS 7&8 (NOT CONNECTED)

PINS MARKING



› UPPER VIEW › BOTTOM

ELECTRICAL SPECIFICATIONS | 20kHz

Code	Lx,y,z nom	Qx,y,z nom	f (kHz)	SRF x,y,z (kHz) Min	DCRx (Ohm) Max	DCRy (Ohm) Max	DCRz (Ohm) Max	Magnetic Field x,y,z(@1m, 20kHz, 0.25Arms) nom
3D28LW-A-0200J	2.0 / 2.0 / 2.0 mH	38/36/36	20	200	5.8	6.1	6.4	TBD

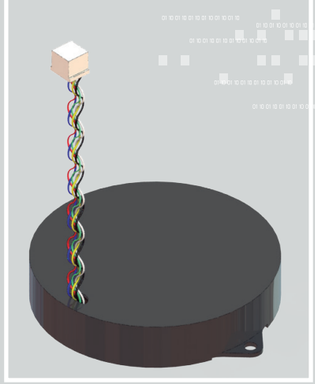
This chart is a reference guide for the most common required values at working frequency of 20kHz. Any other inductance value at LF or tighter tolerances can be provided. Please contact our sales department for any inquiry. Sensitivity measured with Helmholtz coils H=11.37 App/m @20kHz. Contact us for measurement specification.
SRF: Self-resonant frequency of the coil

3DCD90

3D Electromagnetic Tracking Disc

105x20mm

Tx EM MOTION TRACKING ANTENNAS



APPLICATIONS

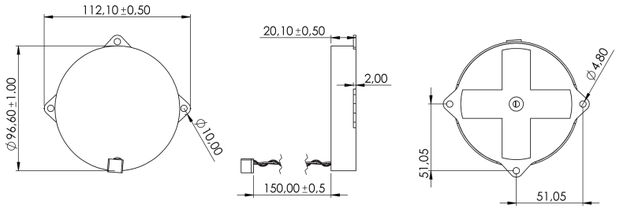
- Virtual Reality / Augmented reality / Mixed Reality
- Gaming Consoles
- Set top boxes

01 CHARACTERISTICS

- 3 orthogonal coils in one component, oriented in the 3 space axes with full functionality
- 3D Emitter antenna for VR/AR Application
- Low profile emitter antenna. (H20mm)
- Highest H-field@ 6m, 1App (H>90dBµV/m)
- Available with different inductance values
- Very stable electrical properties in full operational operative range (-20˚C +65˚C)
- Solution for extra long-range requirements
- PNDP-08V-Z connector 2.0mm Pitch 8POS DUAL

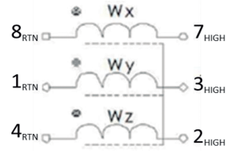
02 DIMENSIONS

DIMENSIONS (mm)



- Standard tolerances: ±0.15mm

ELECTRICAL DIAGRAM



ELECTRICAL SPECIFICATIONS | 20kHz

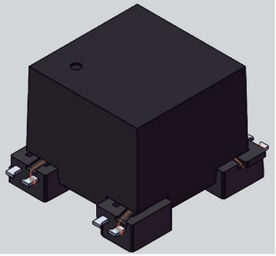
Code	L (mH)	Q min	Z@20kHz (Ω) Min/ Max	Rdc (Ω) Min/Max	H (nT) @ 0.25Arms, 1m, 20kHz Min	H (dBµV/m) @ 1App,6m, 20kHz, Min	Sensitivity @20kHz (mVpp/ App/m) Min	Freq (kHz)	Dimensions (mm) Max
3DCD90-A-0100J	1.1 ± 5%	28	110/150	2.4/2.6	21	92	67	20	105 x 20
3DCD90-A-0039J	0.39 ± 5%	20	40/70	0.7/1.6	11	80	20	20	105 x 20

3DTX08

3D Coil Cube receiver sensor for VR magnetic tracking system

16.5x14.8x11.8 mm (50-200uH)

Tx EM MOTION TRACKING ANTENNAS



FEATURES

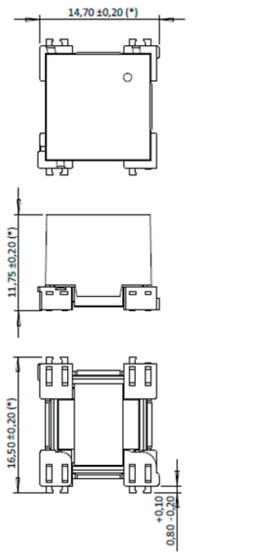
Three axis magnetic antenna for magnetic tracking sensor systems. Very good performance/size ratio, with isotropic response. Used as receiver in VR/AR applications (gaming, etc.) and motion capture applications. Very low latency compared with other motion tracking technologies.

01 CHARACTERISTICS

- High axis symmetry (X,Y,Z), repeatability (very good isotropy) and accuracy (up to 5% tolerances)
- Magnetic Sensitivity: 2.6 mVpp / App / m @20kHz.
- Mechanical Drop & Vibration compliant.
- Mounting method: SMT (Taped & Reeled).
- -20°C to 85°C Temperature Performance.
- Multiple frequencies available (typ 60kHz, 125kHz, 134kHz)
- According industry and safety standards: UL94-V0
- High X/Y/Z symmetry and repeatability.

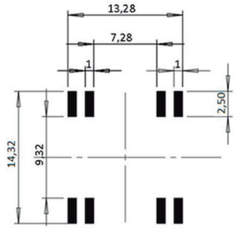
02 DIMENSIONS

DIMENSIONS (mm)

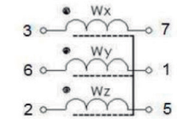


- General Tolerances unless indicated ±0.1mm
- Pins Coplanarity 0.15mm

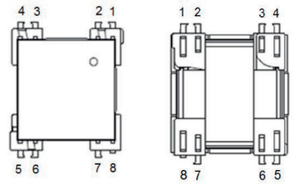
RECOMMENDED PAD LAYOUT



ELECTRICAL DIAGRAM



PINS MARKING



› TOP VIEW › BOTTOM

ELECTRICAL SPECIFICATIONS

Code	Lx,y,z nom (µH)	Qx,y,z min	f (kHz)	SRF x,y,z (MHz) Min	DCRx (Ohm) Max	DCRy (Ohm) Max	DCRz (Ohm) Max	Sensitivity x,y,z (mV/A/m) Min (*)
3DTX08-A-0060J	100 / 100 / 78	2.2/2.2/1.5	20	1	5.4	5.6	5.6	2.2

This chart is a reference guide for the most common required values at working frequency of 20kHz. Any other inductance value at LF or tighter tolerances can be provided. Please contact our sales department for any inquiry. Sensitivity measured with Helmholtz coils H=11.37 App/m @20kHz. Contact us for measurement specification.

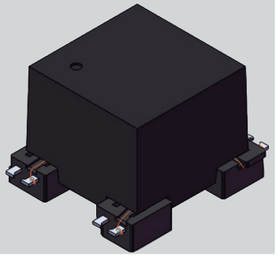
SRF: Self-resonant frequency of the coil

3DTX10

3D Coil Cube receiver sensor for VR magnetic tracking system

17.4x15.2x13.9 mm (100-200uH)

Tx EM MOTION TRACKING ANTENNAS



FEATURES

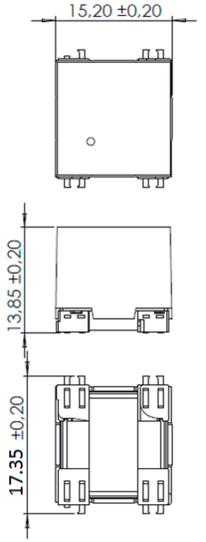
Three axis magnetic antenna for magnetic tracking sensor systems. Very good performance/size ratio, with isotropic response. Used as receiver in VR/AR applications (gaming, etc.) and motion capture applications. Very low latency compared with other motion tracking technologies.

01 CHARACTERISTICS

- High axis symmetry (X,Y,Z), repeatability (very good isotropy) and accuracy (up to 5% tolerances)
- Magnetic Sensitivity: 3.8 mVpp / App / m @20kHz.
- Mechanical Drop & Vibration compliant.
- Mounting method: SMT (Taped & Reeled).
- -20°C to 85°C Temperature Performance.
- Multiple frequencies available (typ 60kHz, 125kHz, 134kHz).
- According industry and safety standards: UL94-V0.

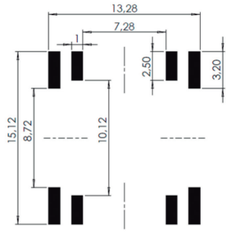
02 DIMENSIONS

DIMENSIONS (mm)

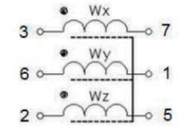


- General Tolerances unless indicated ±0.1mm
- Pins Coplanarity 0.15mm

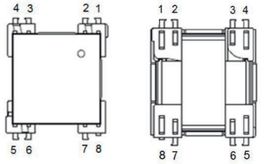
RECOMMENDED PAD LAYOUT



ELECTRICAL DIAGRAM



PINS MARKING



› TOP VIEW › BOTTOM

ELECTRICAL SPECIFICATIONS

Code	Lx,y,z nom (µH)	Qx,y,z min	f (kHz)	SRF x,y,z (MHz) Min	DCRx (Ohm) Max	DCRy (Ohm) Max	DCRz (Ohm) Max	Sensitivity x,y,z (mV/A/m) Min (*)
3DTX10-A-0100J	140 / 140 / 104	2.6/2.6/2.0	20	1	6.7	6.9	6.5	3.5

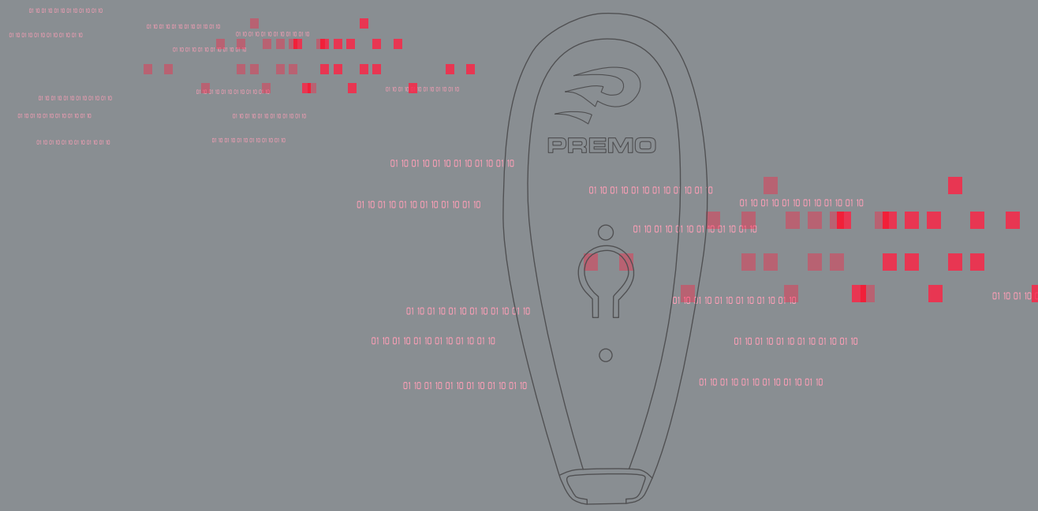
This chart is a reference guide for the most common required values at working frequency of 20kHz. Any other inductance value at LF or tighter tolerances can be provided. Please contact our sales department for any inquiry. Sensitivity measured with Helmholtz coils H=11.37 App/m @20kHz. Contact us for measurement specification.

SRF: Self-resonant frequency of the coil

2.3

AR VR EM TRACKING SENSORS

SOCIAL DISTANCING WARNING WEARABLE DEVICE



New

EPI-DWS

Social Distancing Warning Wearable Device

Smart wearable social distance warning device. It uses a combination of light and sound to warn other people when the distance threshold is exceeded.

APPLICATIONS

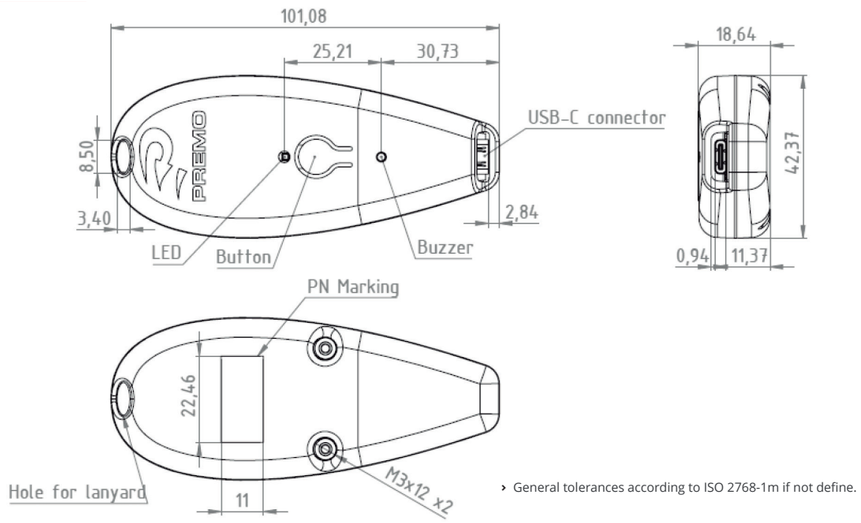
- Work offices.
- Public spaces (schools, libraries, museums).
- Public events (meetings, convections, etc).
- Construction.
- Industry, factory and warehouses.
- Theme parks, stadiums.
- Logistics.
- Retail and supermarkets.

01 FEATURES

- Plug & play and stand-alone device. Fast deployment.
- Respect people privacy. Any personal information or location tracking is not shared.
- High precision (±5cm).
- Low power consumption, high battery life (>12h).
- Battery rechargeable through USB-C cable.
- Warning based on the combination of light (LED) and sound (buzzer), with the possibility to mute/unmute the buzzer.
- Different distance thresholds and warning levels.
- Distance detection based on low frequency communication.
- Non-line-of-sight detection.
- Short range (<2m).

02 DIMENSIONS

DIMENSIONS (mm)



› General tolerances according to ISO 2768-1m if not define.

FUNCTIONAL PERFORMANCES

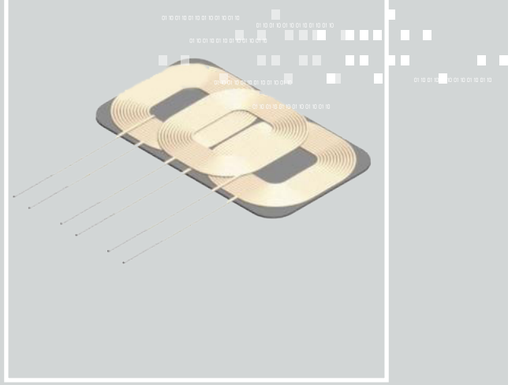
SYMBOL	PARAMETER	MIN	TYP	MAX	UNITS
f_{sw}	Carrier frequency	-	125	-	kHz
T_s	Sampling time	-	1	-	s
d_{th1}	Distance threshold 1	1	-	1.5	m
d_{th2}	Distance threshold 2	-	-	1	-
Acc	Accuracy	-	0.5	-	%
N	Number of devices to detect at the same time	-	-	20	units
BL	Battery life (fully charged)	12	-	-	h
W	Weight	-	40	-	g

03

WIRELESS CHARGING ANTENNAS

ZWT-110-L10U

New



TX-Zaxis Multi-D-Coil 15W

WIRELESS CHARGING ANTENNAS

APPLICATIONS

› Wireless charging power units.

01 FEATURES

› Wireless Charging Transmitter 3 x Coils inductance 10 µH @125kHz.
› Ferrite MnZn shielding included.
› Shielding: MnZn Ferrite.
› Coils wire: Litz wire P155 200 x 0.06mm (Selbonding).
› Adhesive: Epoxy adhesive

› **Notes (*)**

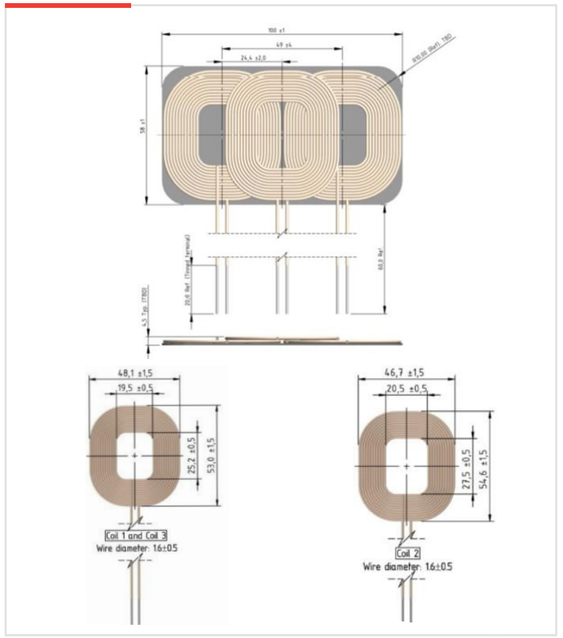
› **General tolerances according ISO 2768 -- 1 mm if not define.**

Measures at 25ºC + / - 2ºC.

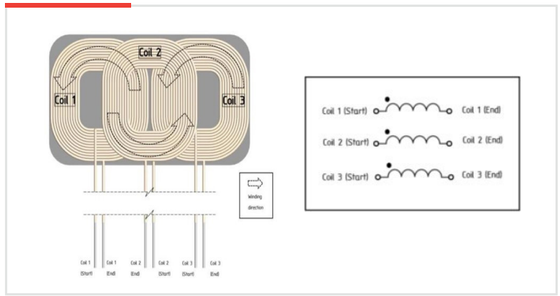
Sensitivity measured with Helmholtz coils 5 turns, 166 mm (contact Premo for measurements specifications).

02 DIMENSIONS

MECHANICAL DIMENSIONS (mm)



ELECTRICAL DIAGRAM



FUNCTIONAL PERFORMANCES

SYMBOL	PARAMETER	CONDITIONS	MIN	TYP	MAX	UNITS
F_work	Working frequency	I<Imax, V<Vmax	120	125	130	kHz
Imax	Max Current	V<Vmax	-	-	2	Arms
V_working	Working voltage	I<Imax	1	12	25	V
DC	Duty Cycle	I<Imax, V<Vmax	5	-	50	%

ELECTRICAL SPECIFICATIONS: ELECTRICAL PARAMETERS

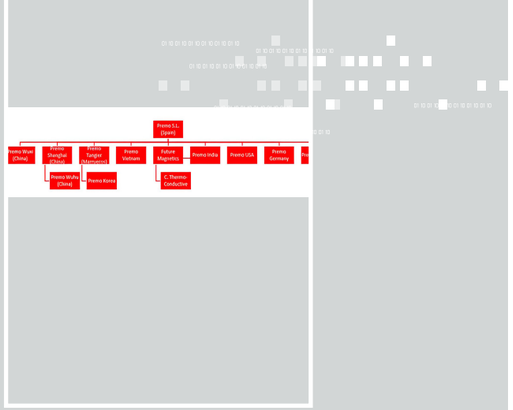
	SYMBOL	PARAMETER	CONDITIONS	MIN	TYP	MAX	UNITS	REMARKS
L	L_coil1-3	Inductance_coil_1-3	1 Vac, 125 kHz	8.82	9.80	10.78	µH	(*)
Q	Q_coil1-3	Quality_factor_coil_1-3	1 Vac, 125 kHz	80	-	-	-	-
DCR	DCR_coil1-3	DC_resistance_coil_1-3		80	-	-	mOhm	-
N	N_coil1	Number_of_turns_coil_1	-	-	12	-	-	-
	N_coil1	Number_of_turns_coil_1	-	-	11	-	-	-
	N_coil1	Number_of_turns_coil_1	-	-	12	-	-	-

New

ZWR-121210-8U

Small Receiving antenna (Rx) coil unit
Receiving on different electronic product

WIRELESS CHARGING ANTENNAS



FEATURES

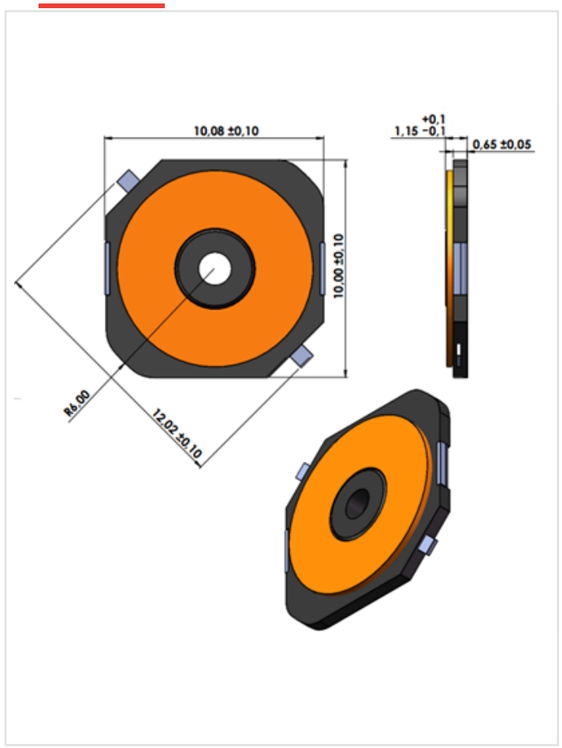
- Receiving coils for Wireless Power Transfer (WPT)
- Custom design is available based on each design requirements.
- Halogen - free
- Optimized coil design
- Different application field: Smartphones, cellular phones, handheld mobile terminals, DSCs and Wearable products.

01 CHARACTERISTICS

- Wireless charging on small power applications
- Wireless Power Transfer class 1 (1 W). Following QI normative.
- Based on Qi Wireless charging or customize.
- Compatible with WPC Qi protocol, with strong performance.
- High flexibility, peripheral functions can be changed according to different needs.

02 DIMENSIONS

DIMENSIONS (mm)



ELECTRICAL PARAMETERS

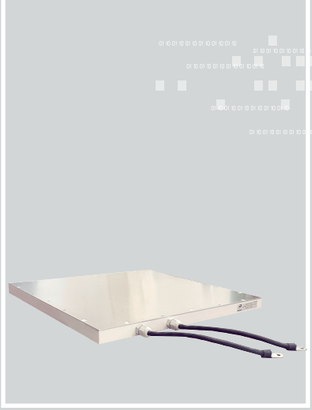
	min	max
Winding Inductance L [µH]	9.5	10.5
Q Factor	6	-
Resistance on DC	-	1

New

WC-RX-002-90K

Receiving antenna flexible-pad for the wireless power transfer in the electric vehicles

WIRELESS CHARGING ANTENNAS



FEATURES

- Electrical insulation, magnetic flexible-core and coil integrated in a single pad.
- Excellent dissipation of impact energy.
- The PBM increased coupling factor "K".
- Flexible magnetic core-shape.
- High electrically insulated.

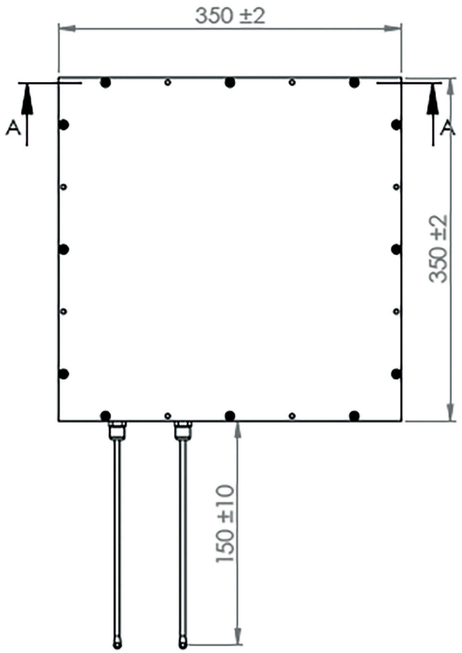
01 CHARACTERISTICS

The housing of this pad is made of magnetic powder in a polymer matrix or PBM (Polymer Bonded Magnetics).

- Resonance frequency around 85 kHz.
- Wireless Power Transfer class 2 (7.7 kW).
- Z-class:2 (VA coil ground clearance range: 140-210 mm).
- Interoperability with ground assembly classes WPT1 through WPT3.
- Compatibility with ground assembly classes Z2 and Z3.
- The mechanical dimensions have been designed based on SAE International WPT2/Z2 proposals.

02 DIMENSIONS

DIMENSIONS (mm)



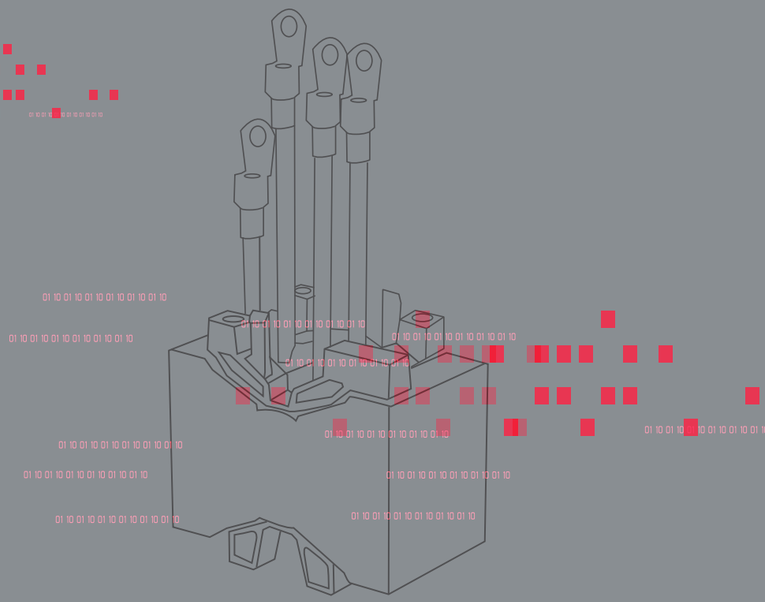
ELECTRICAL PARAMETERS

L_{GA} min[µH]	L_{GA} max [µH]
42.1	43.7

4.1

INDUCTIVE COMPONENTS

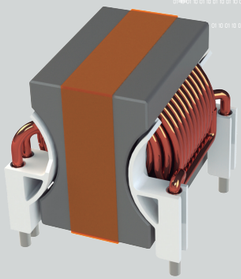
OBC TRANSFORMERS



BC3.5LHB0.5T

LLC Half-Bridge 1:2 Transformer 3.5kW 100-250kHz

INDUCTIVE COMPONENTS / **OBC TRANSFORMERS**



APPLICATIONS

- Automotive EV/PHV AC/DC onboard battery chargers

01 FEATURES

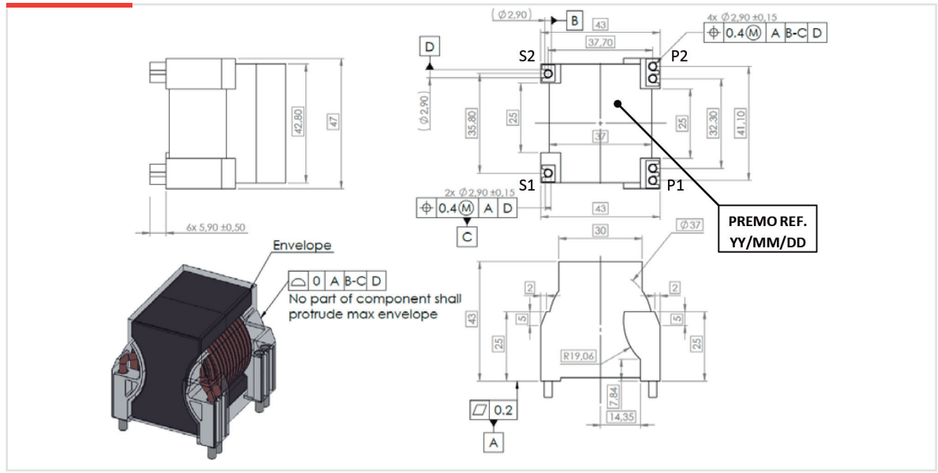
- LLC resonant 3.5 kW half-bridge transformer
- Works with Lr = 6.3µH and Cr = 312nF
- Frequency range 100-250kHz
- Reinforced insulation between prim/sec and with core
- UL94 and RoHS materials (F/155°C)
- Design based on AEC-Q200
- Weight : approx 200grams

02 OPERATION

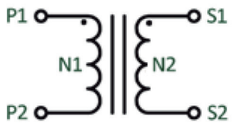
- Vin = 200-430Vdc / Vout = 200-430Vdc
- Ip = 25Arms MAX / Is = 13Arms MAX
- Operating temperature -40/+140°C with cooling (potting)

03 SPECIFICATIONS

DIMENSIONS (mm)



ELECTRICAL DIAGRAM



ELECTRICAL SPECIFICATIONS

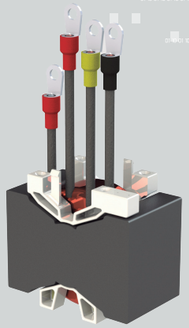
INDUCTANCE at 25°C	
L1 = Lp (100kHz/1Vac)	36µH ±5%
DC RESISTANCE at 25°C	
R1	5.3mΩ TYP (6.3mΩ MAX)
R2	26mΩ TYP (31mΩ MAX)
TURN-RATIO	
N1:N2	1:2
LEAKAGE INDUCTANCE	
L1lk (100kHz/1Vac, N2 shorted)	0.5µH MAX
DIELECTRIC STRENGTH	
{N1}/{N2+CORE}	4.3kVAc/50Hz/3mA/1min*
{N2}/{CORE}	2kVAc/50Hz/3mA/1min*

(*) 1min in qualification / 2sec in mass production

BC3.5LFB1.4

LLC Full-Bridge 1.4:1 Transformer 3.5kW 70-200kHz

INDUCTIVE COMPONENTS / **OBC TRANSFORMERS**



APPLICATIONS

- Automotive EV/PHV AC/DC onboard battery chargers

01 FEATURES

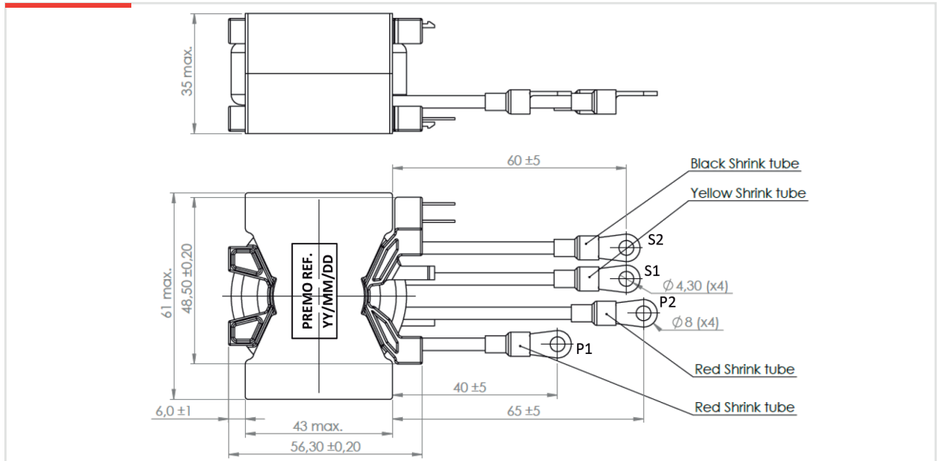
- LLC resonant 3.5 kW full-bridge transformer
- Works with Lr = 22µH and Cr = 33nF
- Frequency range 70-200kHz
- Reinforced insulation between prim/sec and with core
- UL94 and RoHS materials (F/155°C)
- Design based on AEC-Q200
- Weight : approx 350grams

02 OPERATION

- Vin = 220-420Vdc / Vout = 200-430Vdc
- Ip = 19Arms MAX / Is = 18.5Arms MAX
- Operating temperature -40/+140°C with cooling (potting)

03 SPECIFICATIONS

DIMENSIONS (mm)



ELECTRICAL DIAGRAM

ELECTRICAL SPECIFICATIONS

INDUCTANCE at 25°C	
L1 = Lp (100kHz/1Vac)	130µH ±7.5%
DC RESISTANCE at 25°C	
R1	17mΩ TYP (19mΩ MAX)
R2	13mΩ TYP (15mΩ MAX)
TURN-RATIO	
N1:N2	1.4:1
LEAKAGE INDUCTANCE	
L1lk (100kHz/1Vac, N2 shorted)	2µH MAX
DIELECTRIC STRENGTH	
{N1}/{N2}/{CORE}	4kVAc/50Hz/5mA/1min*
{N2}/{CORE}	2kVAc/50Hz/3mA/1min*

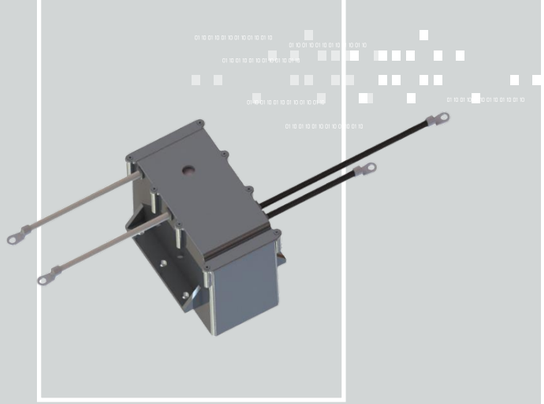
(*) 1min in qualification / 2sec in mass production

New

BCBM-7KW-001

DC-DC 7kW SET TRAFO + CHOKE 100kHz

INDUCTIVE COMPONENTS / **OBC TRANSFORMERS**



APPLICATIONS

- Automotive EV/PHV AC/DC onboard battery chargers

01 FEATURES

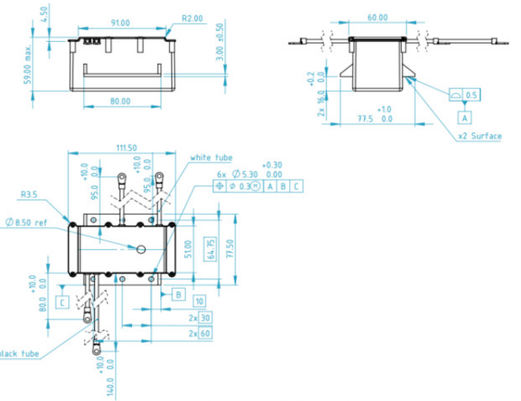
- Dual active bridge Transformer 7.2kW
- Operating Frequency up to 100kHz
- Reinforced insulation between prim/sec and with core
- UL94 and RoHS materials (F/155°C)
- Design based on AEC-Q200
- Weight: 1250 grams

02 OPERATION

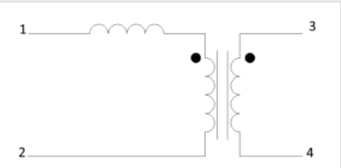
- Vin = 400Vdc / Vout = 240-408Vdc
- Ip = 39Arms MAX / Is = 45Arms MAX
- Operating temperature -30/+110°C with cooling 45°C

03 SPECIFICATIONS

DIMENSIONS (mm)



ELECTRICAL DIAGRAM



ELECTRICAL SPECIFICATIONS

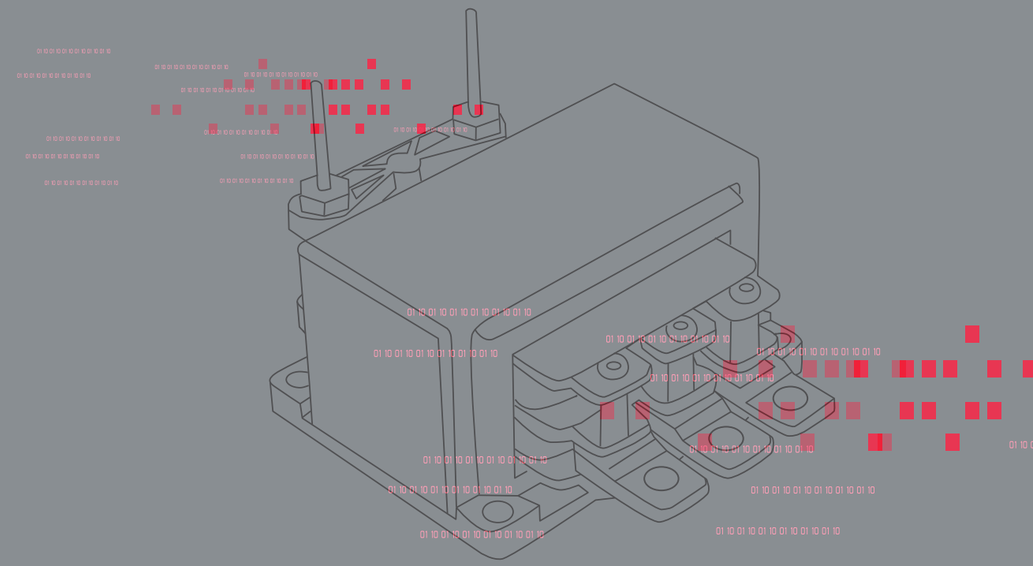
INDUCTANCE at 25°C	
L1 = Lp (100kHz/1Vac)	353µH ±20%
Lkl + Lr (100kHz/1Vac) (3-4 shorted, meas 1-2)	13.3µH ±20%
DC RESISTANCE at 25°C	
Rp	11mΩ MAX
Rs	8mΩ MAX
TURN-RATIO	
Np:Ns	1.15
DIELECTRIC STRENGTH	
{Primary+Choke}/{Secondary}	2.0kVac/50Hz/5mA/1min*
{Primary+Choke}/{BOX}	2.0kVac/50Hz/5mA/1min*
{Secondary}/{BOX}	2.0kVac/50Hz/5mA/1min*

(*) 1min in qualification / 2sec in mass production.

4.2

INDUCTIVE COMPONENTS

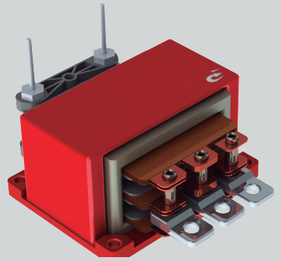
DCDC TRANSFORMERS



DCDC414-002

ZVS PSFB Transformer 3kW 100kHz 26:1+1

INDUCTIVE COMPONENTS / **DCDC TRANSFORMERS**



APPLICATIONS

- Automotive HV/LV DCDC onboard converters

01 FEATURES

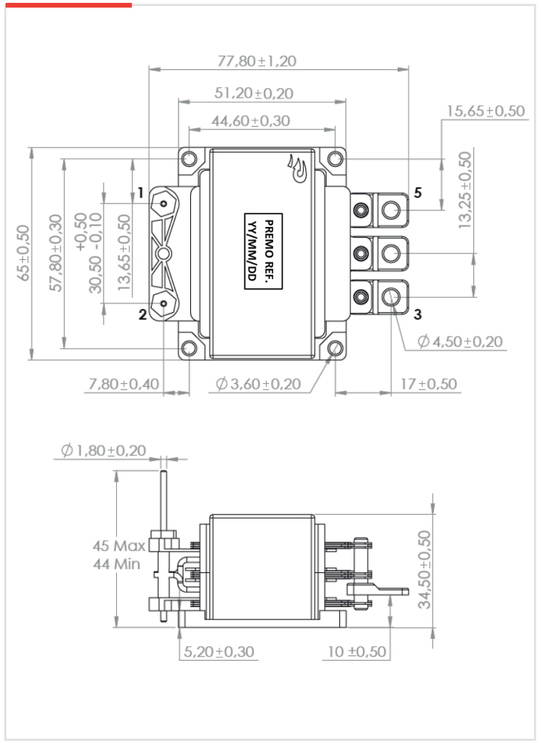
- ZVS Phase-Shift Full-bridge 3kW transformer
- Work with ZVS inductor 14µH / 14Apk
- Recommended output inductor 1µH / 180Adc
- Switching frequency 100kHz
- UL94 and RoHS materials (F/155°C)
- Design based on AEC-Q200
- Weight : approx 350grams

02 OPERATION

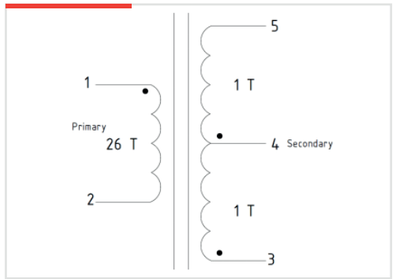
- Vin = 420-850Vdc / Vout = 14Vdc
- Operating temperature -40/+125°C with cooling

03 SPECIFICATIONS

DIMENSIONS (mm)



ELECTRICAL DIAGRAM



ELECTRICAL SPECIFICATIONS

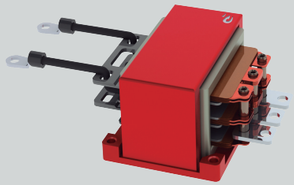
INDUCTANCE at 25°C	
L1-2 = Lp (100kHz/1Vac)	2,25mH ±20%
DC RESISTANCE at 25°C	
R1-2	30mΩ MAX
R3-5	0,30mΩ MAX
TURN-RATIO	
Np:Ns	26:1+1
LEAKAGE INDUCTANCE	
Llk1-2 (100kHz/1Vac, 3-4-5 shorted)	8µH MAX
DIELECTRIC STRENGTH	
{Np}/{Ns+CORE}	3kVAc/50Hz/5mA/1min*
{Ns}/{CORE}	500VAc/50Hz/5mA/1min*

(*) 1min in qualification / 2sec in mass production

DCDC214-002

ZVS PSFB Transformer 2,5kW 100kHz 30:1+1

INDUCTIVE COMPONENTS / **DCDC TRANSFORMERS**



APPLICATIONS

- Automotive HV/LV DCDC onboard converters

01 FEATURES

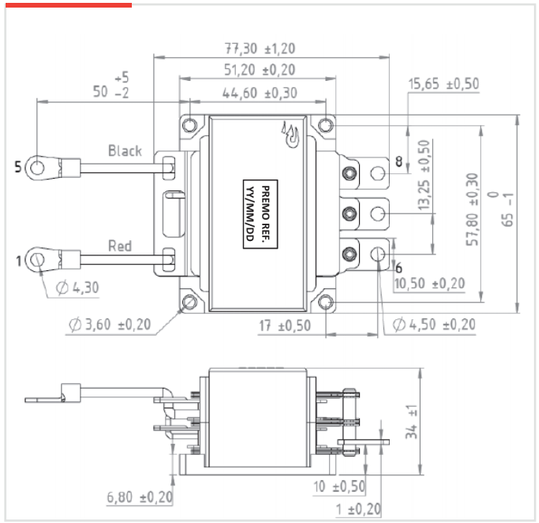
- ZVS Phase-Shift Full-bridge 2,5kW transformer
- Work with ZVS inductor 14µH / 14Apk
- Recommended output inductor 1µH / 180Adc
- Switching frequency 100kHz
- UL94 and RoHS materials (F/155°C)
- Design based on AEC-Q200
- Weight : approx 350grams

02 OPERATION

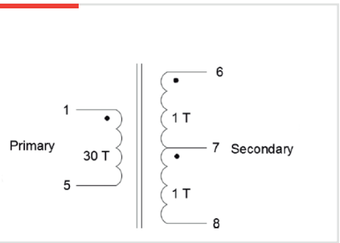
- Vin = 376-820Vdc / Vout = 14Vdc
- Operating temperature -40/+125°C with cooling

03 SPECIFICATIONS

DIMENSIONS (mm)



ELECTRICAL DIAGRAM



ELECTRICAL SPECIFICATIONS

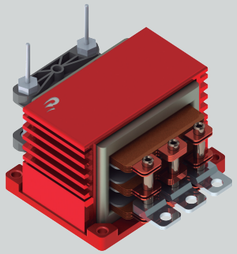
INDUCTANCE at 25°C	
L1-5 = Lp (100kHz/1Vac)	915µH ±25%
DC RESISTANCE at 25°C	
R1-5	95mΩ MAX
R6-8	0,25mΩ MAX
TURN-RATIO	
Np:Ns	30:1+1
LEAKAGE INDUCTANCE	
Llk1-5 (100kHz/1Vac, 6-7-8 shorted)	10µH MAX
DIELECTRIC STRENGTH	
{Np}/{Ns+CORE}	3kVAc/50Hz/5mA/1min*
{Ns}/{CORE}	500VAc/50Hz/5mA/1min*

(*) 1min in qualification / 2sec in mass production

DCDC2400-001

Push-Pull Transformer 2kW 100kHz 1+1:12

INDUCTIVE COMPONENTS / **DCDC TRANSFORMERS**



APPLICATIONS

- Automotive HV/LV DCDC onboard converters

01 FEATURES

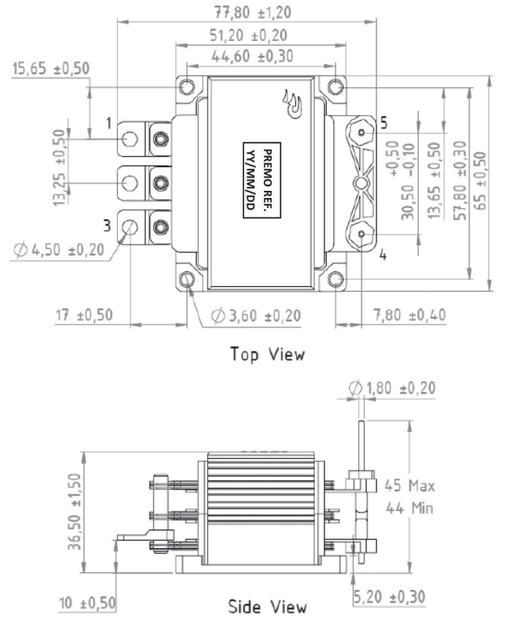
- Push-Pull 2kW transformer
- Switching frequency 100kHz
- UL94 and RoHS materials (F/155°C)
- Design based on AEC-Q200
- Weight: approx 350grams

02 OPERATION

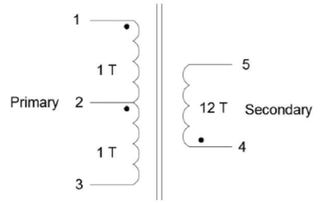
- Vin = 16-32Vdc / Vout = 400Vdc
- Operating temperature -40/+125°C with cooling

03 SPECIFICATIONS

DIMENSIONS (mm)



ELECTRICAL DIAGRAM



ELECTRICAL SPECIFICATIONS

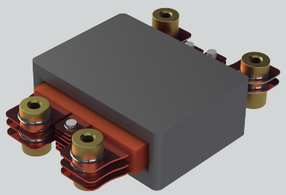
INDUCTANCE at 25°C	
L1-3 = Lp (100kHz/1Vac)	18,5µH ±20%
DC RESISTANCE at 25°C	
R1-3	0,30mΩ MAX
R4-5	25mΩ MAX
TURN-RATIO	
Np:Ns	1+1:12
LEAKAGE INDUCTANCE	
Llk4-5 (100kHz/1Vac, 1-3 shorted)	1,80µH MAX
DIELECTRIC STRENGTH	
{Np}/{CORE}	500VAc/50Hz/5mA/1min*
{Np}/{Ns+CORE}	3kVac/50Hz/5mA/1min*

(*) 1min in qualification / 2sec in mass production

NPT-001

Power Transformers for HEV Systems

INDUCTIVE COMPONENTS / **DCDC TRANSFORMERS**



APPLICATIONS

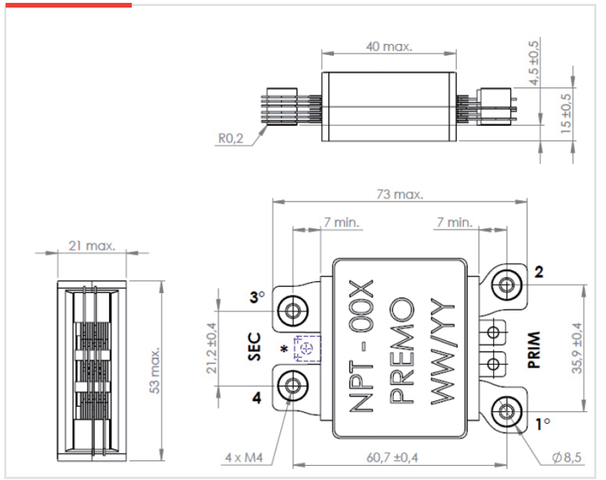
- Power Components for HEV Onboard Automotive SMPS

01 FEATURES

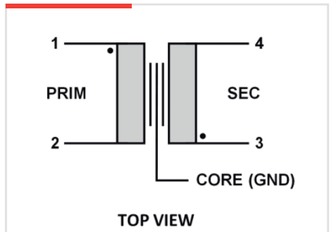
- Design for high-performance automotive 2kW SMPS
- Low-profile copper frames technology
- Dedicated to 48V battery systems
- Threaded M4 terminals ready for bus-bars
- 3:2 turn-ratios proposed as standard
- Working frequency from 80 to 150kHz
- Low leakage inductance value
- 2.5kV isolation between primary and secondary
- Creepage distance > 3mm
- High operating temperature range -40 to +155°C
- UL94V-0 and RoHS materials
- Design compliant with AEC-Q200 requirements
- No thermal aging effect
- Weight : approx. 210g

03 SPECIFICATIONS

DIMENSIONS (mm)



ELECTRICAL DIAGRAM



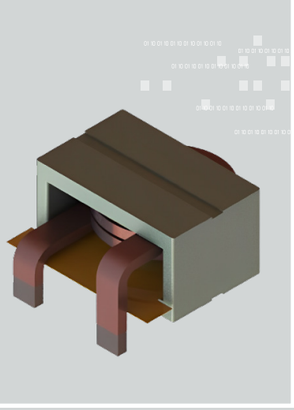
ELECTRICAL SPECIFICATIONS

IDC-link Input Voltage Vdc (V)	60-100
Typ Output Voltage (V)	36-60
Max Output Current (A)	55
Max Power(W)	2000
Switching Frequency (kHz)	80-100
Max Duty cycle	0.48
Recomended Topology	ZVS PS FB with current doubler
Mag. Inductance (µH)	> 90
Leakage Inductance (µH)	0.15
Turn Ratio (Pri:Sec)	3:2
Max Total Losses (W)	15

HPC1R0-200

Output Filtering Choke 1 uH/ 180- 200 Adc

INDUCTIVE COMPONENTS / **HIGH CURRENT DC CHOKE**



APPLICATIONS

- Automotive HV/LV DCDC onboard converters

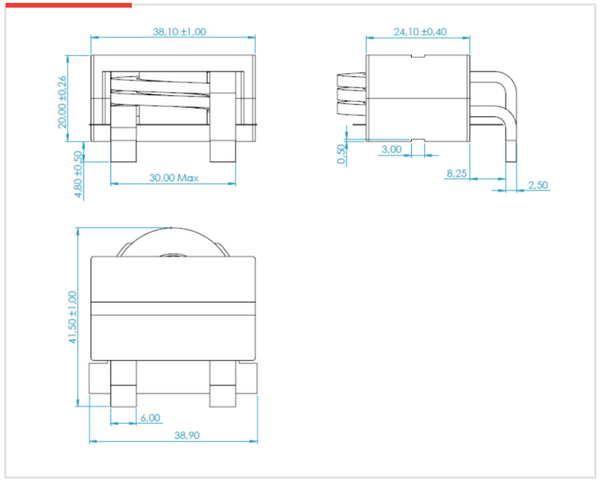
01 FEATURES

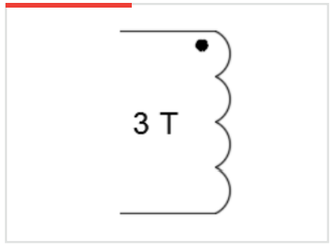
- Filtering choke
- UL94 and RoHS materials
- AEC-Q200 qualified
- Weight: approx 70grams

02 OPERATION

- Output filtering choke 1µH 200kHz
- Copper losses: 14W @100°C (@180Adc)
- Copper losses: 17W @100°C (@200Adc)
- Operating temperature -40/+125°C
- Mounting on cold plate @+65°C MAX

03 SPECIFICATIONS





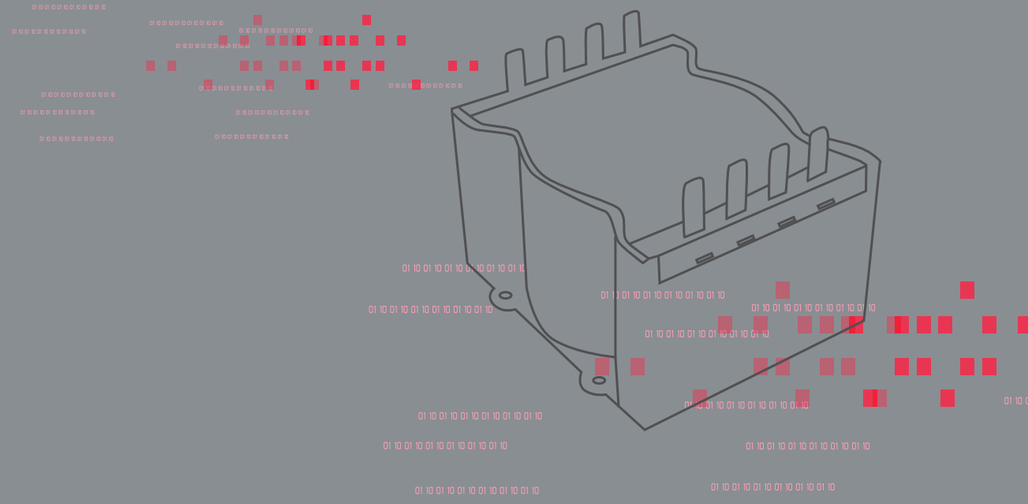
ELECTRICAL SPECIFICATIONS

INDUCTANCE at 25°C	
L (200kHz/1Vac)	1µH ±10%
DC RESISTANCE at 25°C	55
R	0,32mΩ TYP (0,37mΩ MAX)
DIELECTRIC STRENGHT	0.48
Between Winding / Core	500Vac (50/60Hz/3mA/2min)

4.3

INDUCTIVE COMPONENTS

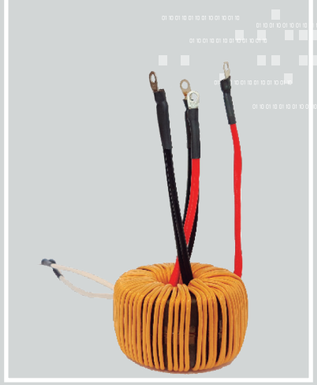
3D POWER



3DP-7kWHVHV-001

Full Bridge LLC Transformer + Resonant Choke

INDUCTIVE COMPONENTS / **3D POWER**



ABSTRACT

Premo 3DPower is a revolutionary concept in power magnetics integration. Existing magnetics within conventional HEV On-Board Chargers and DCDC converters are merged into one single and compact product. Maximum power density is achieved by reducing the size and increasing the power dissipation with the latest high thermal conductive materials.

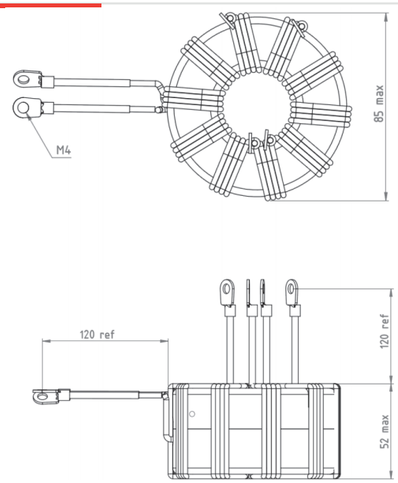
Designs can be fully customized to meet any customer requirement.

ELECTRICAL SPECIFICATIONS

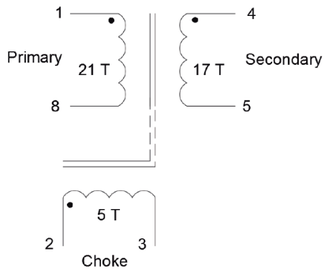
TOPOLOGY	Full Bridge LLC Resonant Converter Transformer + Resonant Choke
INPUT	
Primary Voltage	280 Vdc to 460 Vdc
OUTPUT	
Secondary	280 Vdc to 450 Vdc/ 24 Arms max
CURRENT RES. INDUCTOR	24 Arms (36Apk)
SWITCHING FREQUENCY	80 kHz to 300 kHz
DUTY CYCLE	50%
TOTAL OUTPUT POWER	7 kW
COUPLING	
N choke/N prim	0.057
N choke/N any sec	0.046

02 SPECIFICATIONS

DIMENSIONS (mm)

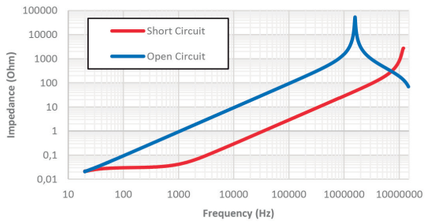


ELECTRICAL DIAGRAM

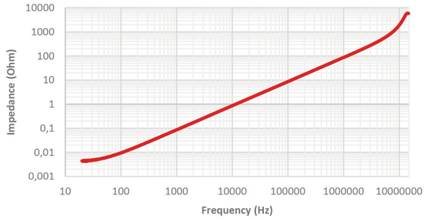


TYPICAL PERFORMANCE

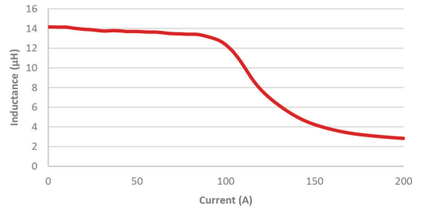
Transformer Primary Impedance



Choke Impedance



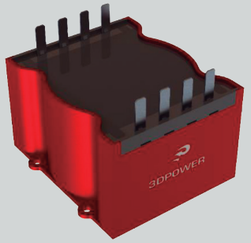
Choke Inductance vs Current (L vs I)



3DP-7kWHVHV-002

Full Bridge LLC Transformer + Resonant Choke

INDUCTIVE COMPONENTS / **3D POWER**



ABSTRACT

Premo 3 DPower is a revolutionary concept in power magnetics integration. Existing magnetics within conventional HEV On-Board Chargers and DCDC converters are merged into one single and compact product Maximum power density is achieved by reducing the size and increasing the power dissipation with the latest high thermal conductive materials.

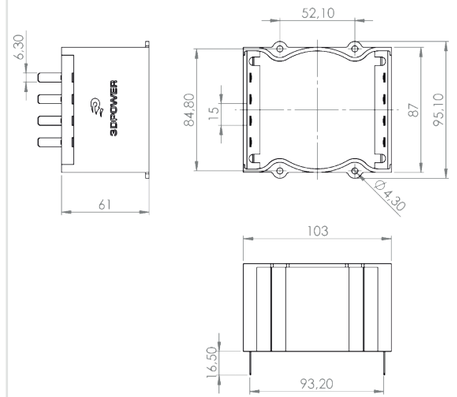
Designs can be fully customized to meet any customer requirement.

ELECTRICAL SPECIFICATIONS

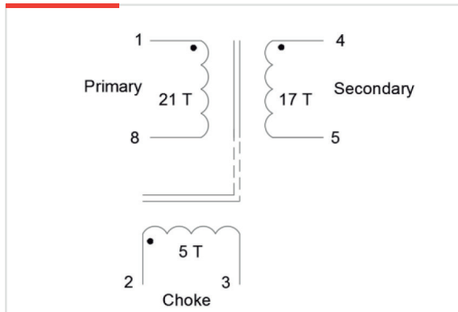
TOPOLOGY	Full Bridge LLC Resonant Converter Transformer + Resonant Choke
INPUT	
Primary Voltage	280 Vdc to 460 Vdc
OUTPUT	
Secondary	280 Vdc to 450 Vdc/ 24 Arms max
CURRENT RES. INDUCTOR	24 Arms (36Apk)
SWITCHING FREQUENCY	80 kHz to 300 kHz
DUTY CYCLE	50%
TOTAL OUTPUT POWER	7 kW
COUPLING	
N choke/N prim	0.057
N choke/N any sec	0.046

02 SPECIFICATIONS

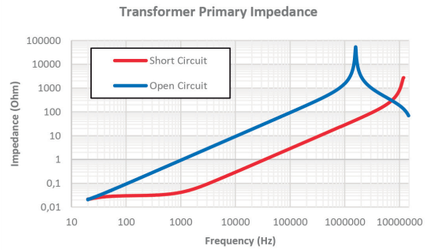
DIMENSIONS (mm)

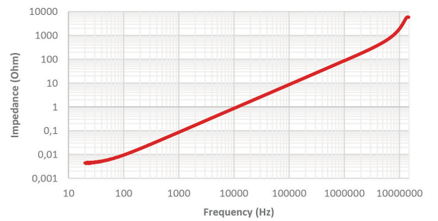


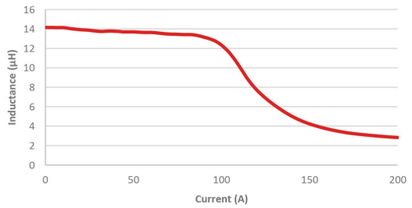
ELECTRICAL DIAGRAM



TYPICAL PERFORMANCE





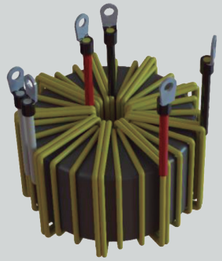


New

3DP-11kWHVHV-001

Full Bridge LLC Transformer + Resonant Choke

INDUCTIVE COMPONENTS / **3D POWER**



ABSTRACT

Premo 3DPower is a revolutionary concept in power magnetics integration. Existing magnetics within conventional HEV On-Board Chargers and DCDC converters are merged into one single and compact product. Maximum power density is achieved by reducing the size and increasing the power dissipation with the latest high thermal conductive materials.

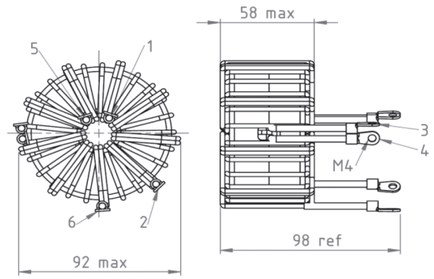
Designs can be fully customized to meet any customer requirement.

ELECTRICAL SPECIFICATIONS

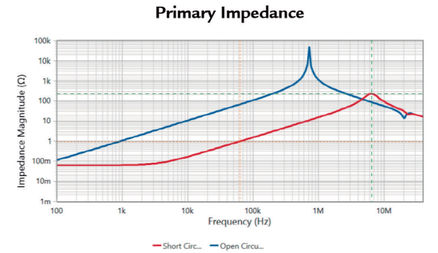
TOPOLOGY	Full Bridge LLC Resonant Converter Transformer + Resonant Choke
INPUT	
Primary Voltage	580 Vdc to 750 Vdc
OUTPUT	
Secondary	220 Vdc to 500 Vdc/ 36 Arms
CURRENT RES. INDUCTOR	30 Apk
SWITCHING FREQUENCY	70 kHz to 400 kHz
DUTY CYCLE	50%
TOTAL OUTPUT POWER	11 kW
COUPLING	
N choke/N prim	0.0015
N choke/N any sec	0.0021

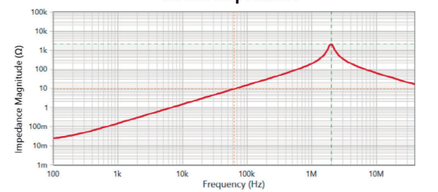
02 SPECIFICATIONS

DIMENSIONS (mm)

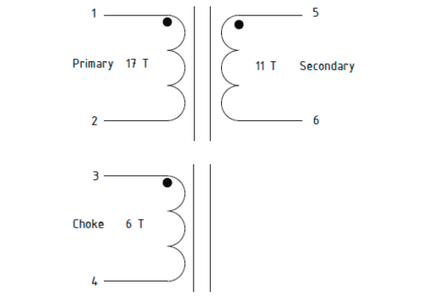


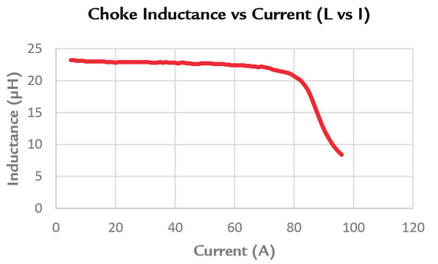
TYPICAL PERFORMANCE





ELECTRICAL DIAGRAM



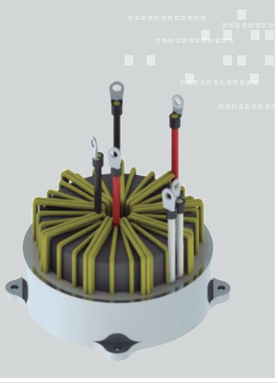


New

3DP-11kWHVHV-002

Full Bridge LLC Transformer + Resonant Choke

INDUCTIVE COMPONENTS / **3D POWER**



ABSTRACT

Premo 3DPower is a revolutionary concept in power magnetics integration. Existing magnetics within conventional HEV On-Board Chargers and DCDC converters are merged into one single and compact product. Maximum power density is achieved by reducing the size and increasing the power dissipation with the latest high thermal conductive materials.

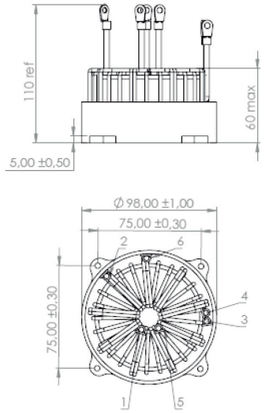
Designs can be fully customized to meet any customer requirement.

ELECTRICAL SPECIFICATIONS

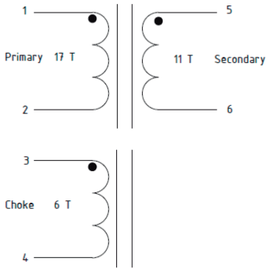
TOPOLOGY	Full Bridge LLC Resonant Converter Transformer + Resonant Choke
INPUT	
Primary Voltage	580 Vdc to 750 Vdc
OUTPUT	
Secondary	220 Vdc to 500 Vdc/ 36 Arms
CURRENT RES. INDUCTOR	30 Apk
SWITCHING FREQUENCY	70 kHz to 400 kHz
DUTY CYCLE	50%
TOTAL OUTPUT POWER	11 kW
COUPLING	
N choke/N prim	0.0015
N choke/N any sec	0.0021

02 SPECIFICATIONS

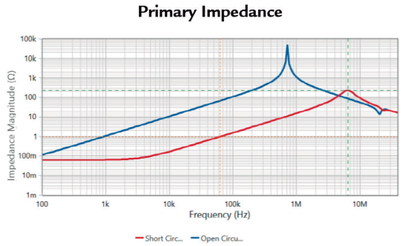
DIMENSIONS (mm)

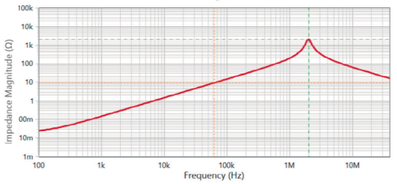


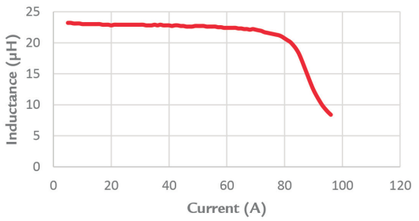
ELECTRICAL DIAGRAM



TYPICAL PERFORMANCE



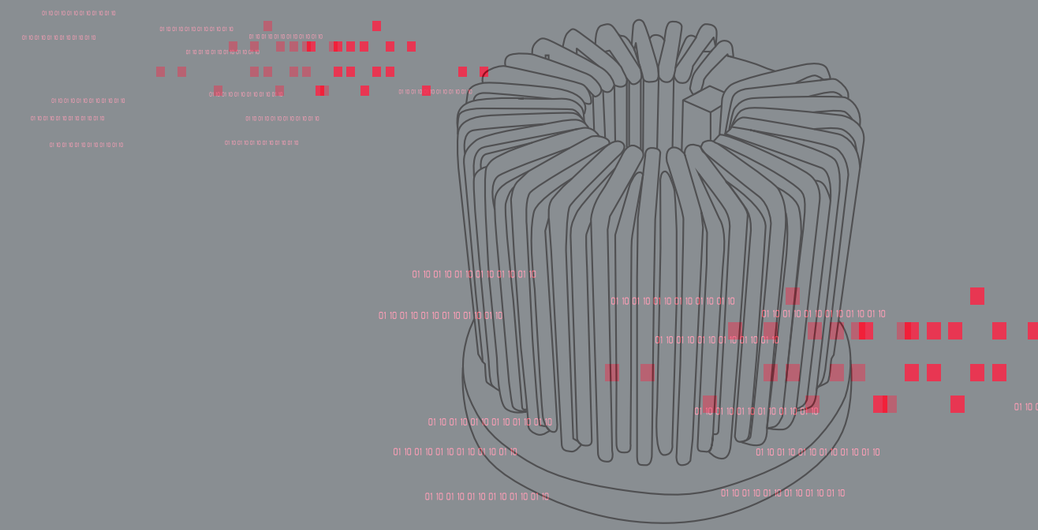




4.4

INDUCTIVE COMPONENTS

PFC CHOKES



PFC-001

PFC Choke 310µH / 17Arms / 6App / 67kHz

INDUCTIVE COMPONENTS / **PFC CHOKES**

APPLICATIONS

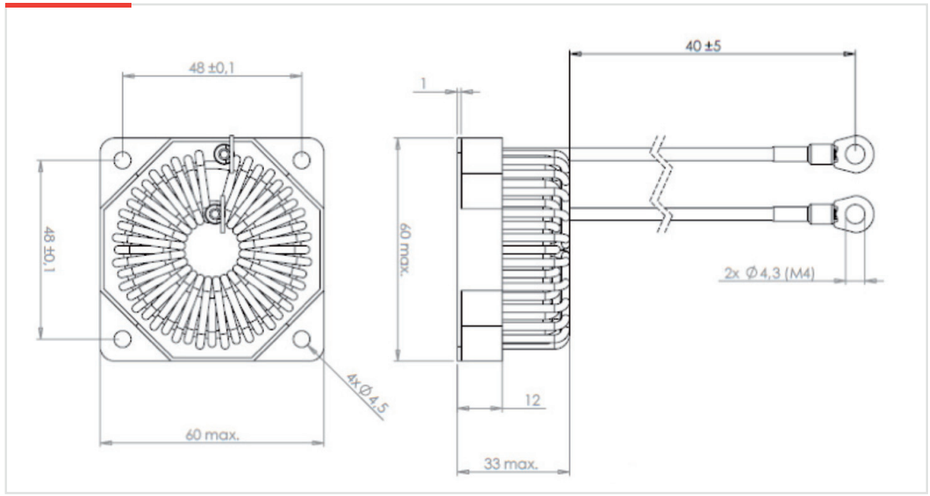
- Automotive embedded battery chargers
- Industrial high power SMPS

01 FEATURES

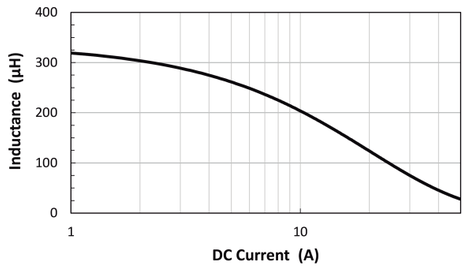
- Chokes for CCM PFC operation
- Can be used in a wide range of sinusoidal absorption rectifier circuits
- Mounting onto water-plate heatsinks
- Power rating : 4kW
- Inductance range : 80µH to 500µH
- Frequency range : 50-100kHz
- Very stable performances versus temperature
- No thermal aging effect
- Possibility of customized outputs
- UL94V-0 material
- RoHS compliant

03 SPECIFICATIONS

DIMENSIONS (mm)



TYPICAL PERFORMANCES



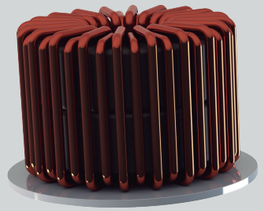
ELECTRICAL SPECIFICATIONS

Input Voltage	230Vac
Output Voltage	400Vdc TYP
Power	4kW
Switching Frequency	67kHz
L0 no load	310µH ±10%
Ldc MIN at Peak Current	> 80µH@27A
DCR MAX	25mΩ
Current Irms	17Amps
Ripple ΔIpp	6App
Losses @100°C	13W
Weight	Approx 0,4kg

PFCS260-8H

PFC Choke 260µH / 8Arms / 15Apk / 100kHz

INDUCTIVE COMPONENTS / **PFC CHOKES**



APPLICATIONS

- Automotive EV/PHV AC/DC onboard battery chargers

01 FEATURES

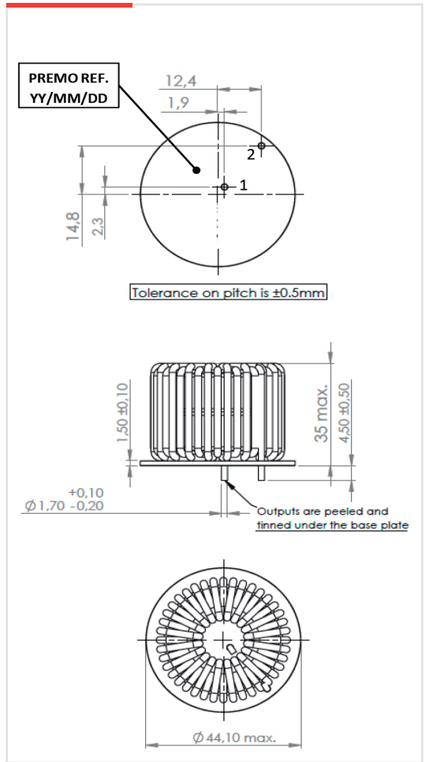
- PFC Choke for interleaved 3.5kW operation
- Sendust core performant and cost effective solution
- Wide operating temperature range -40 to +140°C
- UL94 and RoHS materials
- AEC-Q200 qualified
- Weight : approx 110grams

02 OPERATION

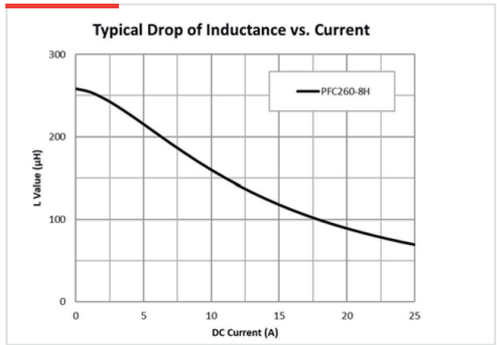
- Up to 8Arms / 15Apk
- Ripple up to 8App @100kHz
- Total losses < 6W @100°C/8Arms+ripple
- Estimated temperature rise on PCB < 40°C

03 SPECIFICATIONS

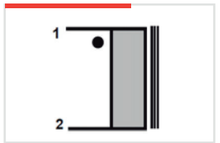
DIMENSIONS (mm)



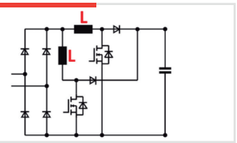
TYPICAL PERFORMANCES



ELECTRICAL DIAGRAM



PFC INTERLEAVED OPERATION



ELECTRICAL SPECIFICATIONS

INDUCTANCE at 25°C	
L0 (100kHz/1Vac)	260µH ±12%
L15A (100kHz/1Vac/15Adc)	90µH MIN
DC RESISTANCE at 25°C	
DCR	24mΩ TYP (30mΩ MAX)

PFCA500-8H

PFC Choke 500µH / 8Arms / 15Apk / 90kHz

INDUCTIVE COMPONENTS / **PFC CHOKES**

APPLICATIONS

- Automotive EV/PHV AC/DC onboard battery chargers

01 FEATURES

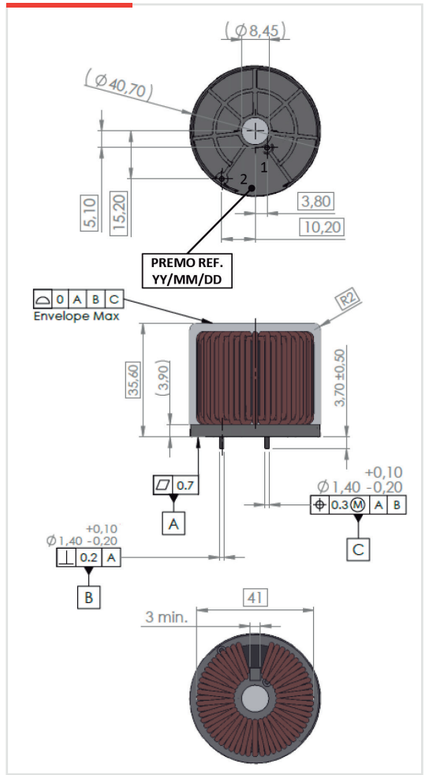
- PFC Choke for interleaved 3.5kW operation
- Amorphous core for higher efficiency
- Wide operating temperature range -40 to +140°C
- UL94 and RoHS materials
- AEC-Q200 qualified
- Weight : approx 120grams

02 OPERATION

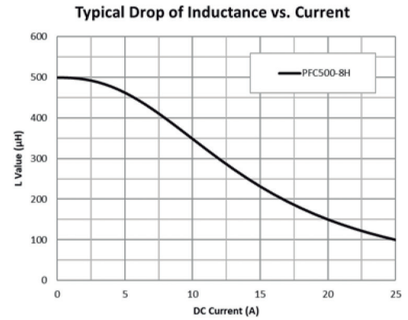
- Up to 8Arms / 15Apk
- Ripple up to 5App @90kHz
- Total losses < 5W @100°C/8Arms+ripple
- Estimated temperature rise on PCB < 35°C

03 SPECIFICATIONS

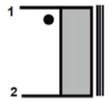
DIMENSIONS (mm)



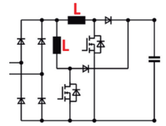
TYPICAL PERFORMANCES



ELECTRICAL DIAGRAM



PFC INTERLEAVED OPERATION



ELECTRICAL SPECIFICATIONS

INDUCTANCE at 25°C	
L0 (10kHz/0.3Vac)	500µH ±10%
L15A (10kHz/0.3Vac/15Adc)	175µH MIN
L22A (10kHz/0.3Vac/22Adc)	115µH MIN
DC RESISTANCE at 25°C	
DCR	50mΩ TYP (60mΩ MAX)

New

PFCA120-24H

PFC for OBC / 16Arms

INDUCTIVE COMPONENTS / **PFC CHOKES**

APPLICATIONS

- PFC Stage for OBC

01 FEATURES

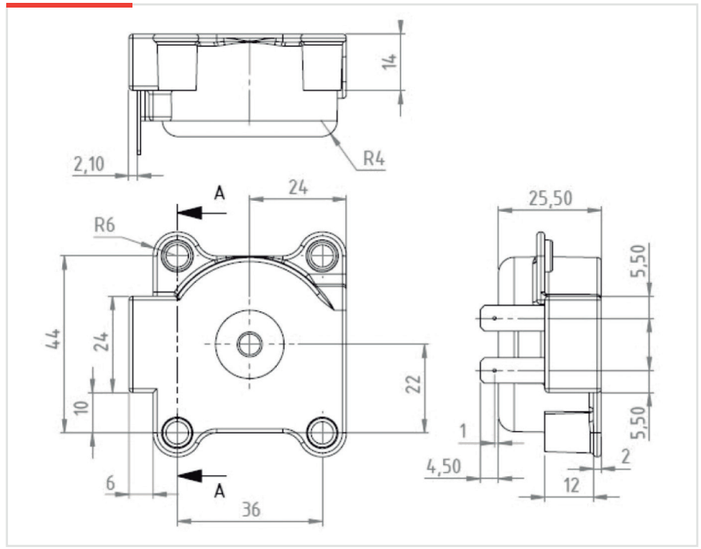
- Overmolded PFC with a modular structure.
- Good thermal conductivity through high thermal conductivity plastic
- Fixation to PCB by faston connexions
- Fixation between modules (puzzle basics) by plastic fasteners
- Weight : approx 52grams

02 OPERATION

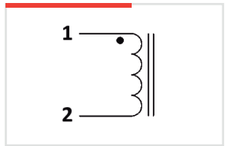
- Up to 16A (RMS or DC)
- Total losses < 16W @100°C/16Arms
- Cooling of the windings is needed

03 SPECIFICATIONS

DIMENSIONS (mm)



ELECTRICAL DIAGRAM



ELECTRICAL SPECIFICATIONS

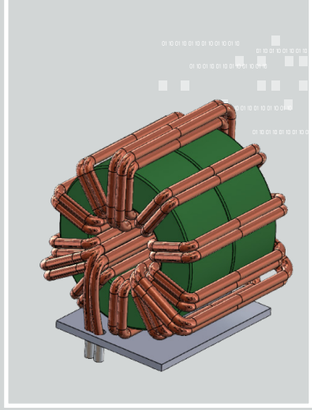
INDUCTANCE at 25°C	
L_{1-2} (10kHz/0.3Vac)	250µH TYP (230-270µH)
INDUCTANCE @ 16Arms	
L_{1-2} (10kHz/1Vac)	194,5µH
DC RESISTANCE at 25°C	
DCR_{1-2}	29,4mΩ TYP (35mΩ MAX)
DC RESISTANCE at 25°C	
Between Windings	1000Vac (50Hz/3mA/1min)

New

PFC-005

100kHz 36µH

INDUCTIVE COMPONENTS / **PFC CHOKES**



APPLICATIONS

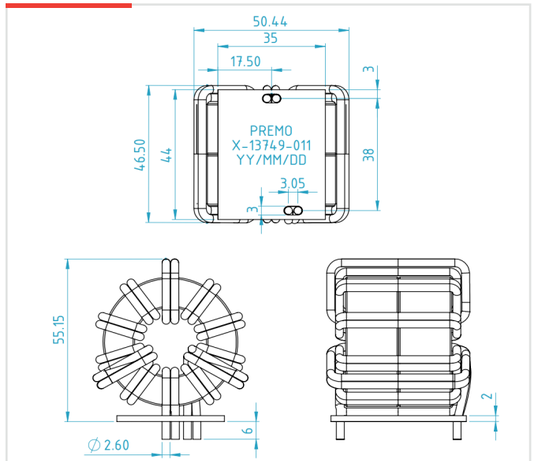
- PFC Choke inductor with FR4 Base.

01 FEATURES

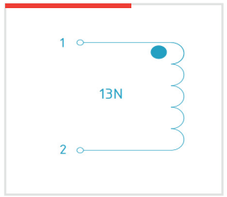
- Topology PFC Choke
- Rated current 70A
- Storage temperature -25C to +85C
- Working temperature -40C to +105C
- Est. Losses 13.5W

02 SPECIFICATIONS

DIMENSIONS (mm)



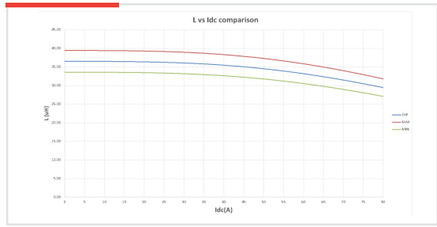
ELECTRICAL DIAGRAM



ELECTRICAL SPECIFICATIONS

OPERATING VOLTAGE	
Current	70Arms
INDUCTANCE	
Inductance	36µH typ.
Inductance (70Arms):	> 31µH.
DC RESISTANCE	
DCR	< 3.25mΩ
Isolation (Wind - Housing)	0.5kV
DIELECTRIC STRENGTH	
Winding-core, 500Vac 50Hz 2sec	3mA MAX

L VS IDC COMPARISON

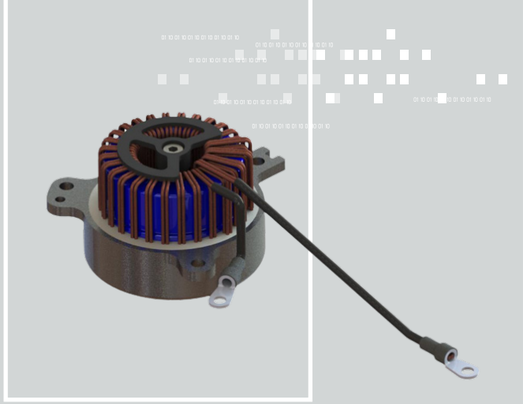


New

PFC-CM-003

50kHz 32A 120µH

INDUCTIVE COMPONENTS / **PFC CHOKE**



APPLICATIONS

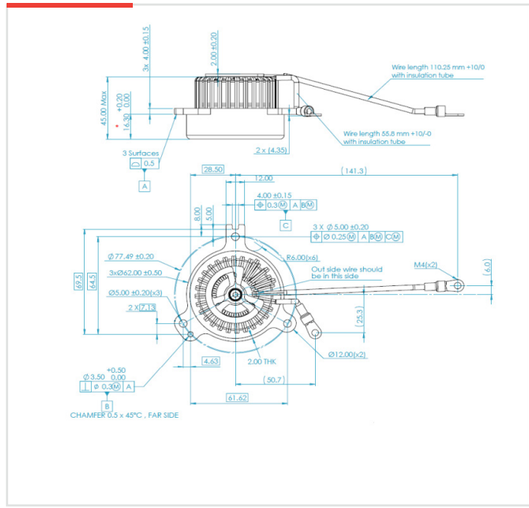
› PFC BOOST IND 120µH 32A.

01 FEATURES

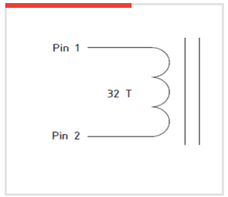
› PFC Boost Inductor
› Operating voltage 120/240 vdc
› Storage temperature -40°c to+105°c
› Power rating 7,7kW at 240v/1920w at 120v
› Frequency 50 khz
› Estimated total loses at 100°c
› Copper losses (I = 32Arms) 14.5 w
› Core losses (I = 32Arms) 15.5 W
› Total losses 30 W
› Weight: 465.5g

02 SPECIFICATIONS

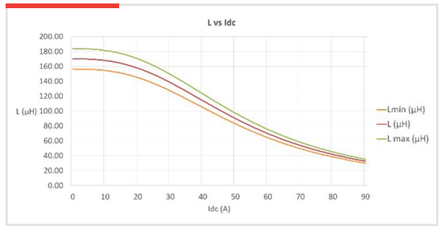
DIMENSIONS (mm)



ELECTRICAL DIAGRAM



L VS IDC COMPARISON



ELECTRICAL SPECIFICATIONS

OPERATING VOLTAGE	
Current	32Arms
INDUCTANCE	
Inductance (0Arms)	133.5 µH +/-10% µH
Inductance (70Arms):	170µH +/-10%
DC RESISTANCE @25°C	
DCR	25 mΩ Max
DIELECTRIC STRENGTH	
Winding to housing	4 mA (1800Vac 50Hz, 2s)

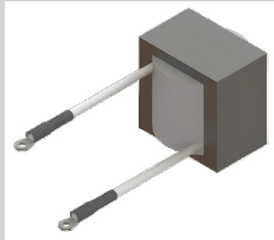
New

PBC-FESI-002

20kHz 32A 120µH

INDUCTIVE COMPONENTS / **OFFBOARD CHARGERS**

TRANSFORMERS



APPLICATIONS

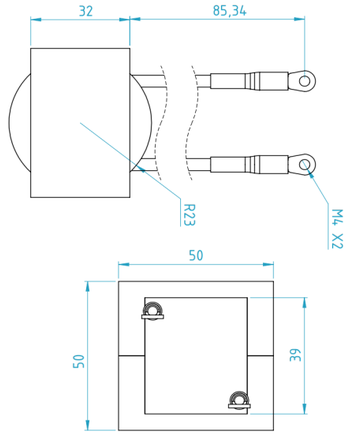
- PFC Boost inductor

01 FEATURES

- Fully aluminum base encapsulated and filled thermal compound for heat disipation.
- Working frequency: 20KHz
- Continuous current: 32 Arms
- Ripple current: 18.6 Appk
- Copper losses @100 °C (32 Arms): 16.6 W
- Core losses @100 °C (18.6 App, 20 kHz): 6.1 W
- Total losses: 22.7

02 SPECIFICATIONS

DIMENSIONS (mm)

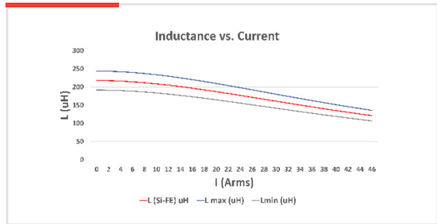


ELECTRICAL DIAGRAM

ELECTRICAL SPECIFICATIONS

Working Voltage	400V
Current	32Arms
Riple Current	18.6App
Inductance	218 µH ± 12%
Inductance: (32Arms)	218 µH ± 12%
Rdc @25°C	12.3 mOhm typ
DIELECTRIC STRENGTH	
Winding to core	3000 Vac 50/60Hz 1 min

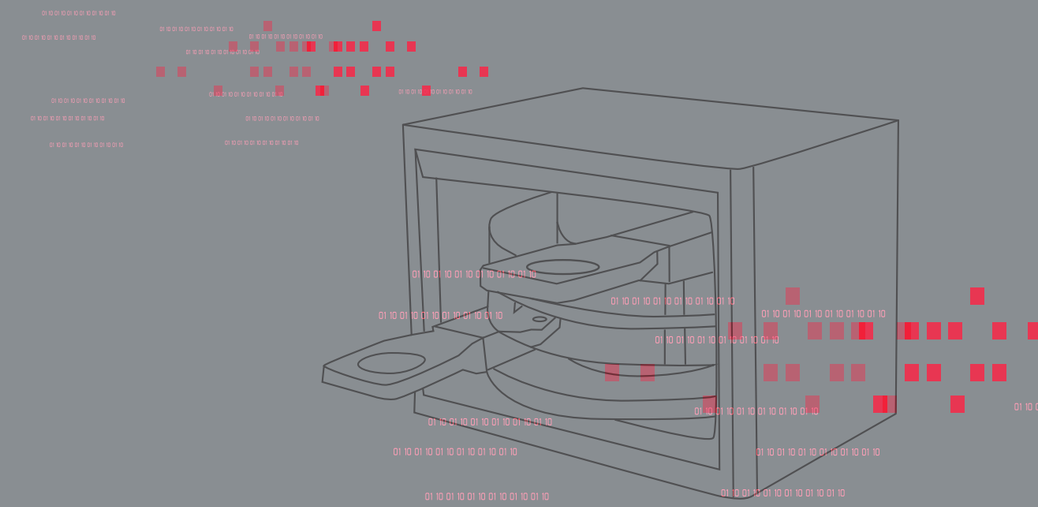
INDUCTANCE VS CURRENT



4.5

INDUCTIVE COMPONENTS

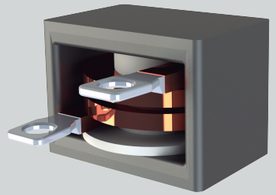
HIGH CURRENT DC CHOKE



HPC2R0-230

High Power Planar Choke 2µH / 230Adc

INDUCTIVE COMPONENTS / **HIGH CURRENT DC CHOKE**



APPLICATIONS

- Automotive HV/LV DCDC onboard converters

01 FEATURES

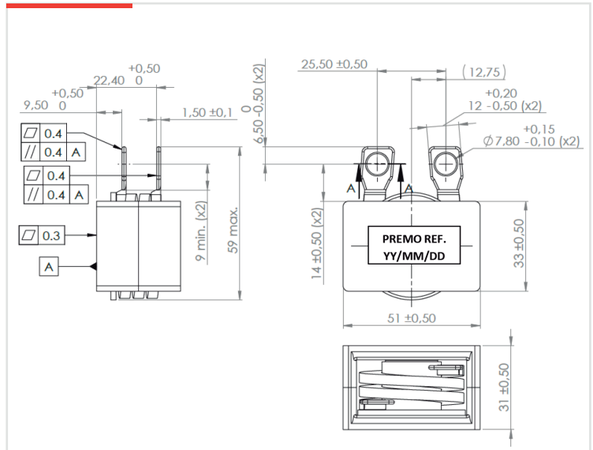
- High power planar output filtering choke
- Clearance greater than 2.5mm between outputs / core
- UL94 and RoHS materials
- AEC-Q200 qualified
- Weight : approx 280grams

02 OPERATION

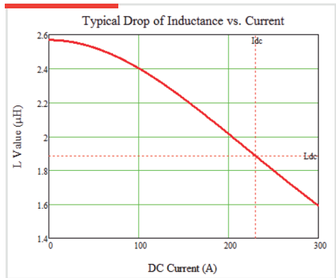
- Output filtering choke 2µH 230Adc 200kHz
- Inductance value at MAX current : 1.5µH < Ldc (1.9µH TYP) < 2.9µH
- Copper losses: 15W @100°C (@230Adc)
- Iron losses : 5W with MAX 14App ripple of current @200kHz
- Operating temperature -40/+125°C
- Mounting on cold plate @+75°C MAX

03 SPECIFICATIONS

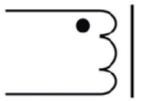
DIMENSIONS (mm)



TYPICAL PERFORMANCES



ELECTRICAL DIAGRAM



ELECTRICAL SPECIFICATIONS

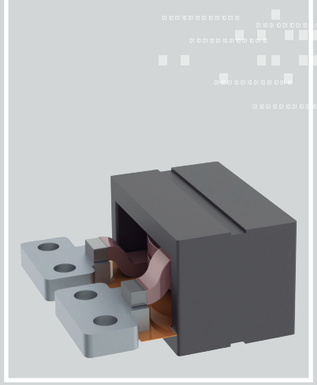
INDUCTANCE at 25°C	
L (100kHz/1Vac/0-14Adc)	2,6µH ±10%
DC RESISTANCE at 25°C	
R	0,25Ω TYP (0,3mΩ MAX)
DIELECTRIC STRENGTH	
{WDG}/{CORE}	500Vac (50Hz/3mA/1min*)

(*) 1min in qualification / 2sec in mass production

HPC1R0-180

High Power Planar Choke 1µH / 180Adc

INDUCTIVE COMPONENTS / **HIGH CURRENT DC CHOKE**



APPLICATIONS

- Automotive HV/LV DCDC onboard converters

01 FEATURES

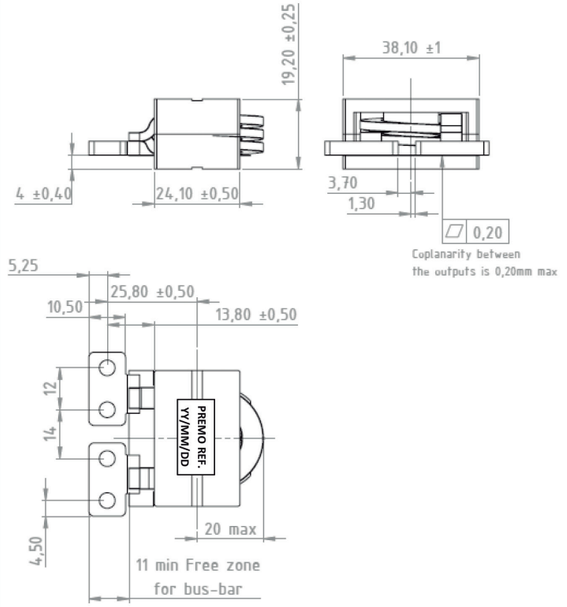
- High power planar output filtering choke
- UL94 and RoHS materials
- AEC-Q200 qualified
- Weight: approx 70grams

02 OPERATION

- Output filtering choke 1µH 180Adc 200kHz
- Inductance value at MAX current : Ldc > 0.9µH @200Adc
- Copper losses: 15W @100°C (@180Adc)
- Iron losses : negligible with MAX 35App ripple of current @200kHz
- Operating temperature -40/+125°C
- Mounting on cold plate @+75°C MAX

03 SPECIFICATIONS

DIMENSIONS (mm)



ELECTRICAL DIAGRAM

ELECTRICAL SPECIFICATIONS

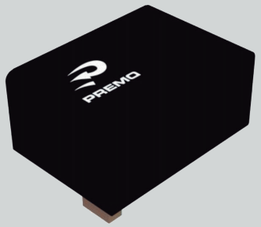
INDUCTANCE at 25°C	
L (100kHz/1Vac)	1µH ±10%
DC RESISTANCE at 25°C	
R	0,35mΩ TYP (0,45mΩ MAX)
DIELECTRIC STRENGHT	
Between Winding/ Core	500Vac (50Hz/3mA/1min)

New

HPMC-001

Hev 12V Choke 400nH / 261Adc

INDUSTRIVE COMPONENTS / **HIGH CURRENT DC CHOKE**



APPLICATIONS

- High current Output chokes

01 FEATURES

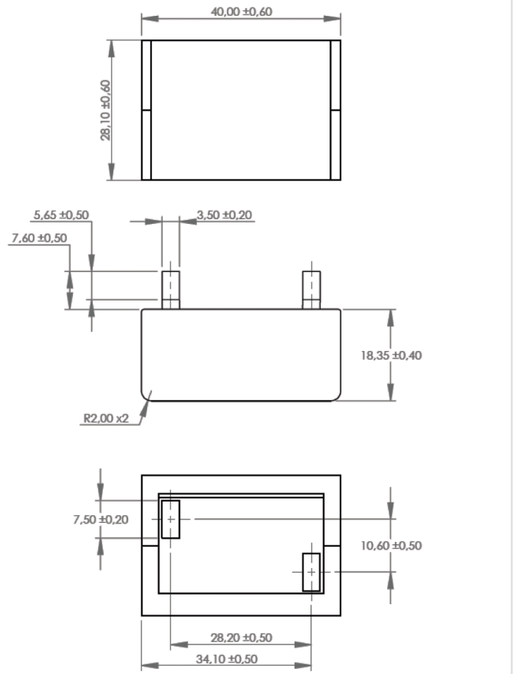
This HEV Premo current filter coil grants high reliability thanks to a great thermal performance. This filter coil is potted with CoolMag providing great heat dissipation helping to extract all the heat generated due to the high currents passing through the Choke.

Designs can be fully customized to meet any customer requirement.

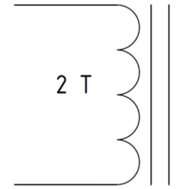
- Filtering Choke
- Pin Through Hole connection
- Working frequency 100kHz
- Total Output current up to 261Adc
- 500V insulation between core & winding
- Weight @145g
- Operating temperature – 40 to 150°C
- Storage temperature – 40 to 85°C

02 SPECIFICATIONS

DIMENSIONS (mm)



ELECTRICAL DIAGRAM



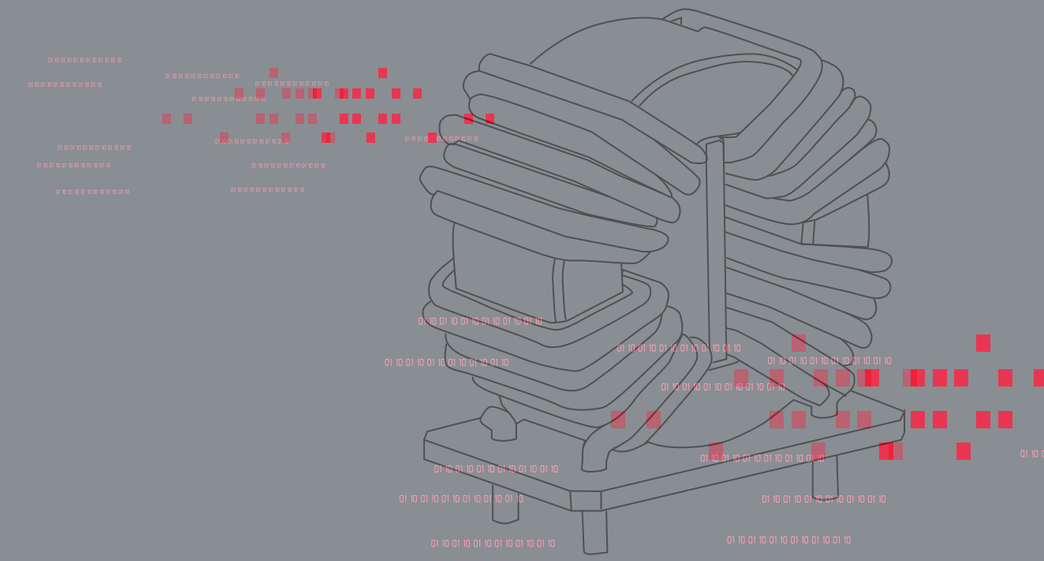
ELECTRICAL SPECIFICATIONS

TOPOLOGY	FILTER CHOKE
INPUT	
Voltage	50Vdc
OUTPUT	
Continuos Current	261 Apk
Peak Current (<10s)	311 Apk
Peak Current (<1s)	331 Apk
SWITCHING FREQUENCY	100 kHz
TOTAL OUTPUT POWER	3.5 kW

4.6

INDUCTIVE COMPONENTS

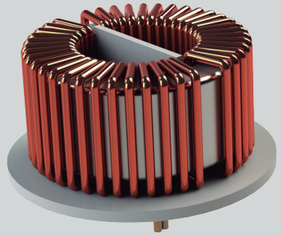
COMMON MODE CHOKES



CMCN4R0-12H

Common Mode Choke 2x4mH / 12Adc

INDUCTIVE COMPONENTS / **COMMON MODE CHOKES**



APPLICATIONS

- Automotive EV/PHV AC/DC onboard battery chargers
- Automotive HV/LV DC/DC converters

01 FEATURES

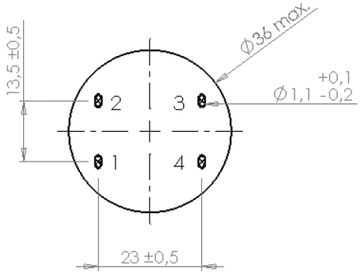
- High performance CMC using nanocrystalline core
- Optimized size for higher power density
- Wide operating temperature range -40 to +140°C
- UL94V and RoHS materials
- AEC-Q200 qualified
- Weight : approx 35grams

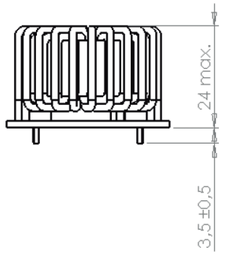
02 OPERATION

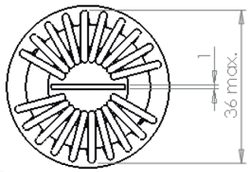
- Up to 12A (RMS or DC) per winding
- Total losses < 2.5W @100°C/2x12Arms
- Estimated temperature rise on PCB < 30°C

03 SPECIFICATIONS

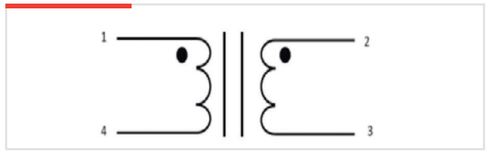
DIMENSIONS (mm)



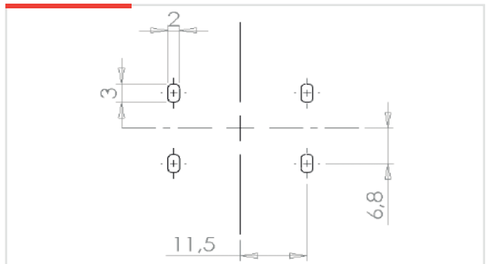




ELECTRICAL DIAGRAM



RECOMMENDED PAD-LAYOUT



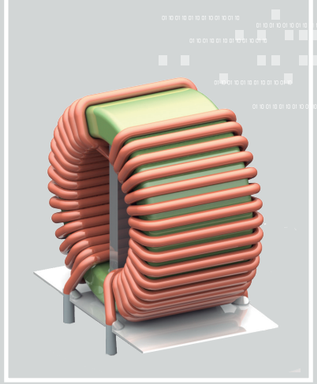
ELECTRICAL SPECIFICATIONS

INDUCTANCE at 25°C	
$L_{1-4} = L_{2-3}$ (10kHz/0.3Vac)	4.0mH TYP (2.2mH MIN)
$L_{1-4} = L_{2-3}$ (100kHz/0.3Vac)	0.5mH MIN
TURN-RATIO	
$N_{1-4} : N_{2-3}$ (10kHz/1Vac)	1:1
DC RESISTANCE at 25°C	
$DCR_{1-4} = DCR_{2-3}$	4mΩ TYP (6mΩ MAX)
DIELECTRIC STRENGHT	
Between Windings	2500Vac (50Hz/3mA/1min)

CMCF2R0-16V

Common Mode Choke 2x2mH / 16Arms

INDUCTIVE COMPONENTS / **COMMON MODE CHOKES**



APPLICATIONS

- Automotive EV/PHV AC/DC onboard battery chargers
- Automotive HV/LV DC/DC converters

01 FEATURES

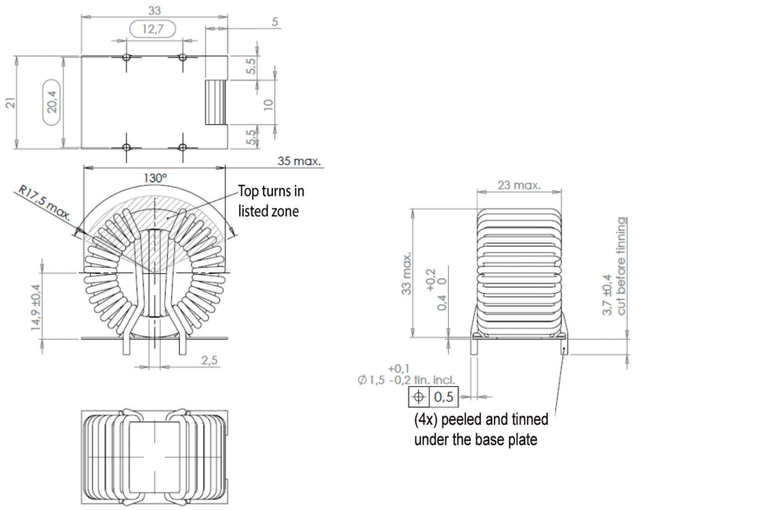
- High permeability MnZn ferrite core (Tc > 130°C)
- Optimized size for high power density vs. freq. attenuation
- Wide operating temperature range -40 to +125°C
- UL94V and RoHS materials
- AEC-Q200 qualified
- Weight : approx 52grams

02 OPERATION

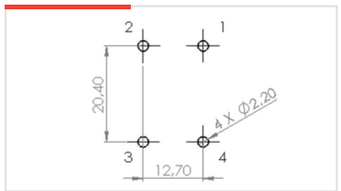
- Up to 16A (RMS or DC) per winding
- Total losses < 5W @100°C/2x16Arms
- Cooling of the windings is needed

03 SPECIFICATIONS

DIMENSIONS (mm)



RECOMMENDED PAD-LAYOUT



ELECTRICAL DIAGRAM

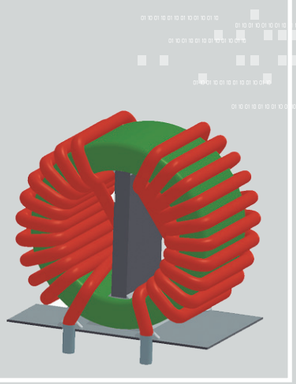
ELECTRICAL SPECIFICATIONS

INDUCTANCE at 25°C	
$L_{1-4} = L_{2-3}$ (10kHz/0.3Vac)	2.1 mH TYP (1.4-2.9mH)
TURN-RATIO	
$N_{1-4} : N_{2-3}$ (10kHz/1Vac)	1:1
DC RESISTANCE at 25°C	
$DCR_{1-4} = DCR_{2-3}$	7mΩ TYP (9.2mΩ MAX)
LEAKAGE INDUCTANCE	
$Llk_{1-4} = Llk_{2-3}$ (100kHz/1Vac)	12µH TYP (9-15µH)
DIELECTRIC STRENGHT	
Between Windings	1000Vac (50Hz/3mA/1min)

CMCF0R9-16V

Common Mode Choke 2x0.9mH / 16Adc

INDUCTIVE COMPONENTS / **COMMON MODE CHOKES**



APPLICATIONS

- Automotive EV/PHV AC/DC onboard battery chargers
- Automotive HV/LV DC/DC converters

01 FEATURES

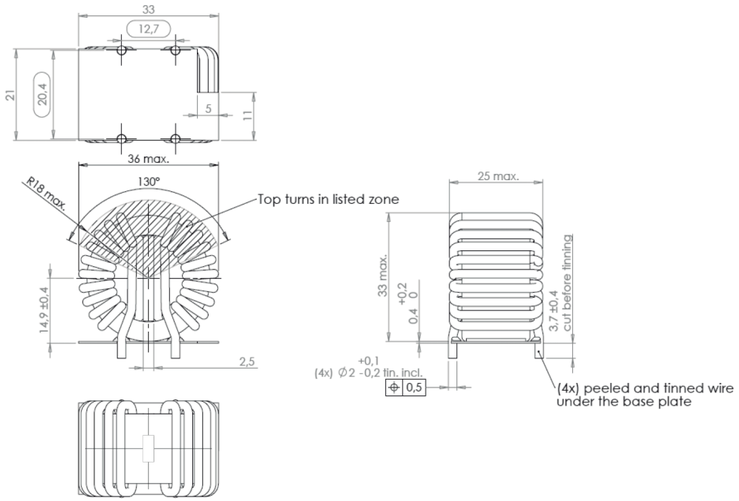
- Core made of high permeability MnZn ferrite (Tc > 130°C)
- Optimized size for high power density vs. freq. attenuation
- Wide operating temperature range -40 to +125°C
- UL94V and RoHS materials
- AEC-Q200 qualified
- Weight : approx 55grams

02 OPERATION

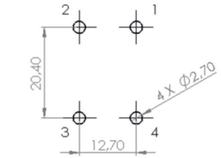
- Up to 16A (RMS or DC) per winding
- Total losses < 2W @100°C/2x16Adc
- Estimated temperature rise on PCB < 30°C

03 SPECIFICATIONS

DIMENSIONS (mm)



RECOMMENDED PAD-LAYOUT



ELECTRICAL DIAGRAM

ELECTRICAL SPECIFICATIONS

INDUCTANCE at 25°C	
$L_{1-4} = L_{2-3}$ (10kHz/0.3Vac)	0.86mH TYP (0.56-1.16mH)
TURN-RATIO	
$N_{1-4} : N_{2-3}$ (10kHz/1Vac)	1:1
DC RESISTANCE at 25°C	
$DCR_{1-4} = DCR_{2-3}$	2.8mΩ TYP (3.5mΩ MAX)
LEAKAGE INDUCTANCE	
$Llk_{1-4} = Llk_{2-3}$ (100kHz/1Vac)	5.5µH TYP (4-7µH)
DIELECTRIC STRENGHT	
Between Windings	1000Vac (50Hz/3mA/1min)

CMCN4R3-16H3

CMC 3P+N 4x4.3mH / 16+16+16+48Arms

INDUCTIVE COMPONENTS / **COMMON MODE CHOKES**

APPLICATIONS

- Automotive EV/PHV AC/DC onboard battery chargers

01 FEATURES

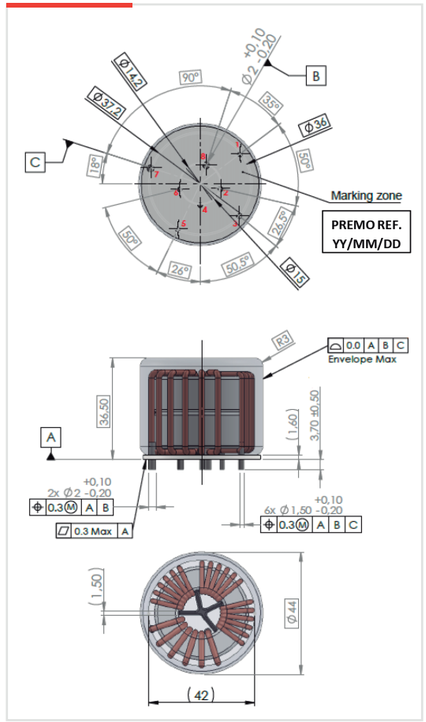
- 3-phase + neutral CMC using nanocrystalline core
- Optimized size for higher power density
- Wide operating temperature range -40 to +140°C
- UL94V and RoHS materials
- AEC-Q200 qualified
- Weight : approx 120grams

02 OPERATION

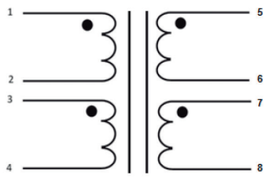
- Up to 3x16Arms+48Arms (or 2x48Arms single-phase)
- Total losses < 12W @100°C/3x16Arms+48Arms
- Cooling of the windings is required in the application

03 SPECIFICATIONS

DIMENSIONS (mm)



ELECTRICAL DIAGRAM



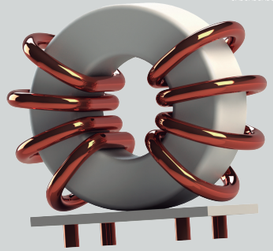
ELECTRICAL SPECIFICATIONS

INDUCTANCE at 25°C	
L (10kHz/0.3Vac)	4.3mH TYP (2.8-5.8mH)
TURN-RATIO	
N (10kHz/1Vac)	1:1:1:1
DC RESISTANCE at 25°C	
DCRPhase	4.3mΩ TYP (5.5mΩ MAX)
DCRNeutral	2.5mΩ TYP (3.2mΩ MAX)
DIELECTRIC STRENGHT	
Between Windings	1500Vac (50Hz/3mA/1min)

CMCN1R0-36V

Common Mode Choke 2x1mH / 36Adc

INDUCTIVE COMPONENTS / **COMMON MODE CHOKES**



APPLICATIONS

- Automotive EV/PHV AC/DC onboard battery chargers
- Automotive HV/LV DC/DC converters

01 FEATURES

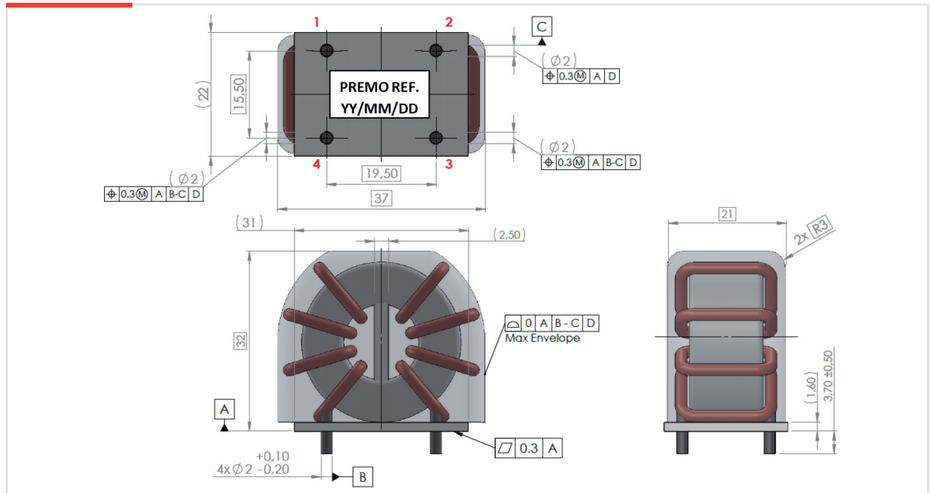
- High performance CMC using nanocrystalline core
- Optimized size for higher power density
- Wide operating temperature range -40 to +140°C
- UL94V and RoHS materials
- AEC-Q200 qualified
- Weight : approx 30grams

02 OPERATION

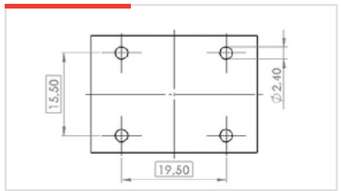
- Up to 36A (RMS or DC) per winding
- Total losses < 4W @100°C/2x36Adc
- Estimated temperature rise on PCB < 45°C (cooling needed)

03 SPECIFICATIONS

DIMENSIONS (mm)



RECOMMENDED PAD-LAYOUT



ELECTRICAL DIAGRAM

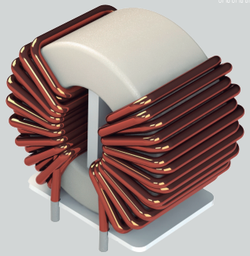
ELECTRICAL SPECIFICATIONS

INDUCTANCE at 25°C	
$L_{1-4} = L_{2-3}$ (10kHz/0.3Vac)	1.0mH TYP (0.56-1.5mH)
TURN-RATIO	
$N_{1-4} : N_{2-3}$ (10kHz/1Vac)	1:1
DC RESISTANCE at 25°C	
$DCR_{1-4} = DCR_{2-3}$	1.1mΩ TYP (1.4mΩ MAX)
LEAKAGE INDUCTANCE	
Llk1-4 = Llk2-3 (100kHz/1Vac)	0.7µH TYP (0.4-1µH)
DIELECTRIC STRENGHT	
Between Windings	1500Vac (50Hz/3mA/1min)

CMCN25R-16V

Common Mode Choke 2x25mH / 16Arms

INDUCTIVE COMPONENTS / **COMMON MODE CHOKES**



APPLICATIONS

- Automotive EV/PHV AC/DC onboard battery chargers
- Automotive HV/LV DC/DC converters

01 FEATURES

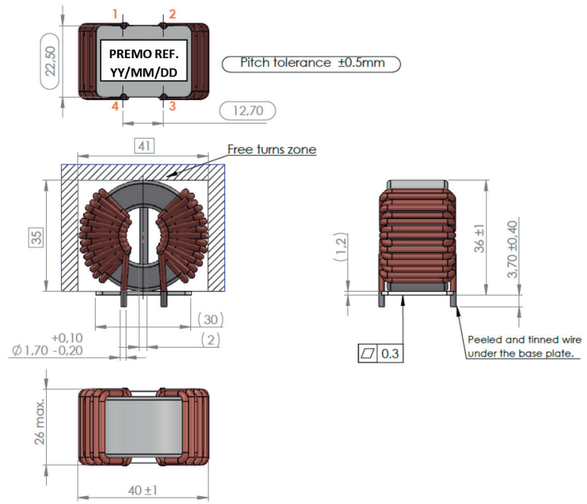
- High performance CMC using nanocrystalline core
- High frequency attenuation value in the MHz range
- Wide operating temperature range -40 to +140°C
- UL94V and RoHS materials
- AEC-Q200 qualified
- Weight : approx 90grams

02 OPERATION

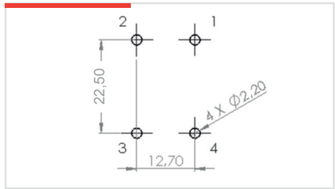
- Up to 16A (RMS or DC) per winding
- Total losses < 6W @100°C/2x16Arms
- Cooling of the windings is required

03 SPECIFICATIONS

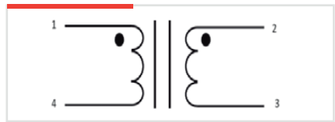
DIMENSIONS (mm)



RECOMMENDED PAD-LAYOUT



ELECTRICAL DIAGRAM



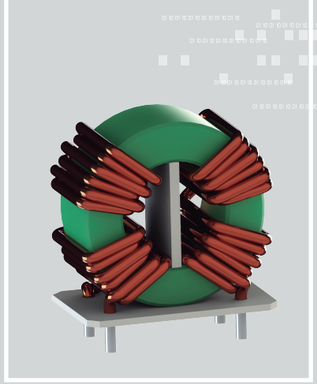
ELECTRICAL SPECIFICATIONS

INDUCTANCE at 25°C	
$L_{1-4} = L_{2-3}$ (10kHz/0.3Vac)	25mH TYP (19-40mH)
$L_{1-4} = L_{2-3}$ (100kHz/0.3Vac)	4.5mH MIN
TURN-RATIO	
$N_{1-4} : N_{2-3}$ (10kHz/1Vac)	1:1
DC RESISTANCE at 25°C	
$DCR_{1-4} = DCR_{2-3}$	8.6mΩ TYP (10mΩ MAX)
LEAKAGE INDUCTANCE	
$Llk_{1-4} = Llk_{2-3}$ (100kHz/1Vac)	18µH TYP (15-21µH)
DIELECTRIC STRENGHT	
Between Windings	1000Vac (50Hz/3mA/1min)

CMCN10R-16V

Common Mode Choke 2x10mH / 16Arms

INDUSTRIAL COMPONENTS / **COMMON MODE CHOKES**



APPLICATIONS

- Automotive EV/PHV AC/DC onboard battery chargers
- Automotive HV/LV DC/DC converters

01 FEATURES

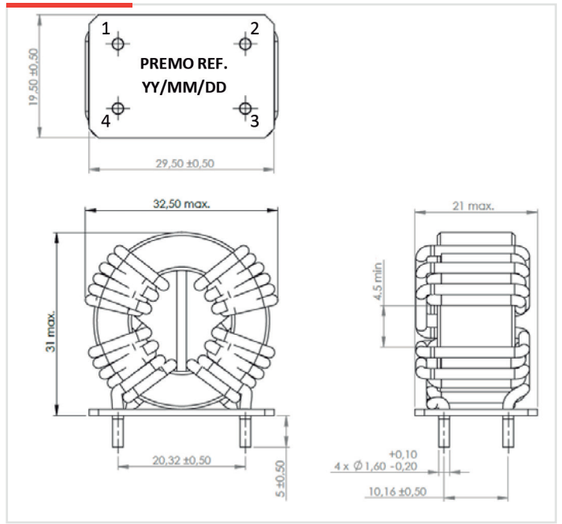
- High performance CMC using nanocrystalline core
- Optimized size for high power density vs. good attenuation
- Wide operating temperature range -40 to +140°C
- UL94V and RoHS materials
- AEC-Q200 qualified
- Weight : approx 30grams

02 OPERATION

- Up to 16A (RMS or DC) per winding
- Total losses < 3.5W @100°C/2x16Arms
- Cooling of the windings can be required

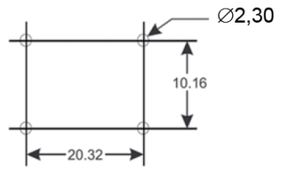
03 SPECIFICATIONS

DIMENSIONS (mm)



ELECTRICAL DIAGRAM

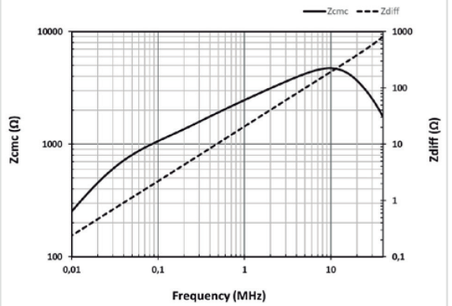
RECOMMENDED PAD-LAYOUT



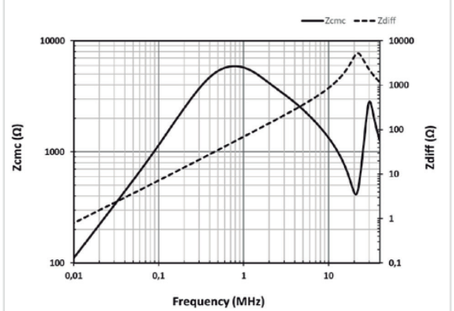
ELECTRICAL SPECIFICATIONS

INDUCTANCE at 25°C	
$L_{1-4} = L_{2-3}$ (10kHz/0.3Vac)	10mH TYP (6.2-14.6mH)
$L_{1-4} = L_{2-3}$ (100kHz/0.3Vac)	1.5mH MIN
TURN-RATIO	
$N_{1-4} : N_{2-3}$ (10kHz/1Vac)	1:1
DC RESISTANCE at 25°C	
$DCR_{1-4} = DCR_{2-3}$	5mΩ TYP (6mΩ MAX)
LEAKAGE INDUCTANCE	
$Llk_{1-4} = Llk_{2-3}$ (100kHz/1Vac)	6µH TYP (4.5-7.5µH)
DIELECTRIC STRENGHT	
Between Windings	1500Vac (50Hz/3mA/1min)

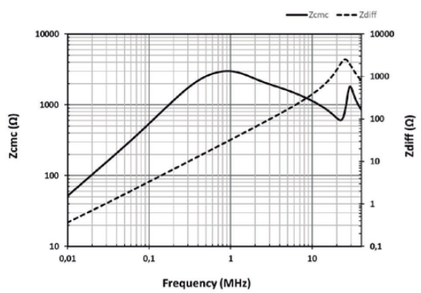
>> CMCN4R0-12H



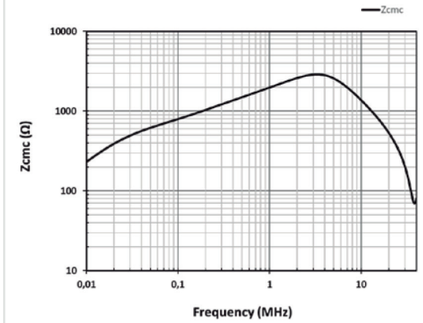
>> CMCF2R0-16V



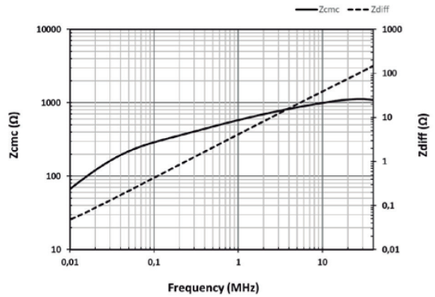
>> CMCF0R9-16V



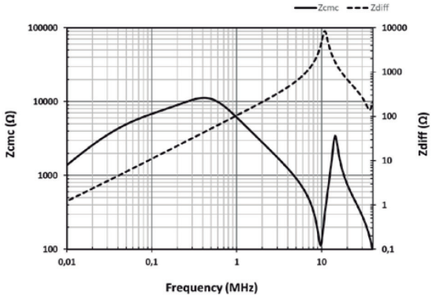
>> CMCN4R3-16H3



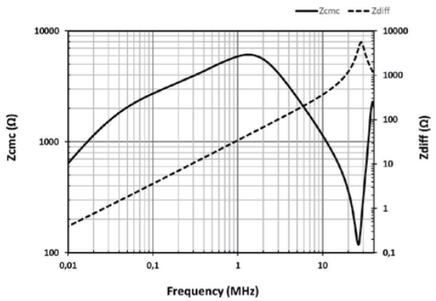
>> CMCN1R0-36V



>> CMCN25R-16V



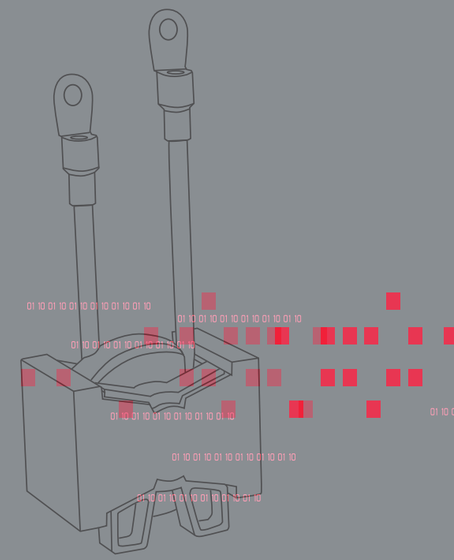
>> CMCN10R-16V



4.7

INDUCTIVE COMPONENTS

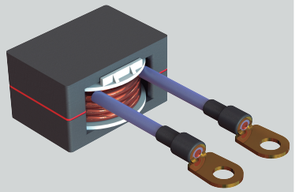
RESONANT CHOKES



RINDZ14R-14

ZVS Resonant Inductor 14µH 14Apk 100kHz

INDUCTIVE COMPONENTS / **RESONANT CHOKES**



APPLICATIONS

- Automotive DCDC onboard HV/LV converters

01 FEATURES

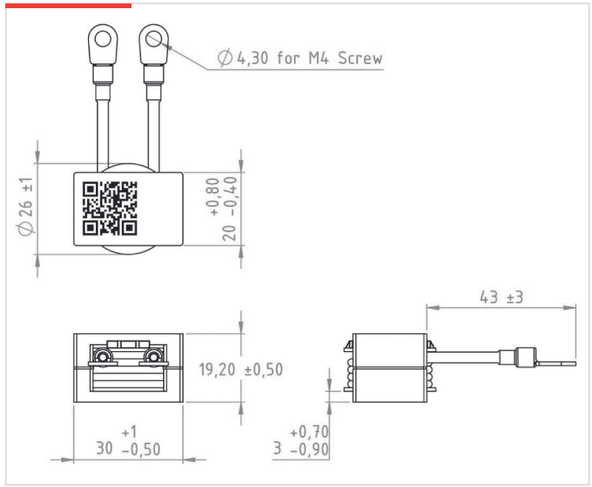
- Serial ZVS choke for 2-3kW full-bridge converter
- Typical switching frequency 100kHz
- Basic insulation level between winding and core up to 3kV
- UL94 and RoHS materials (F/155°C)
- AEC-Q200 qualified
- Weight : approx 60grams

02 OPERATION

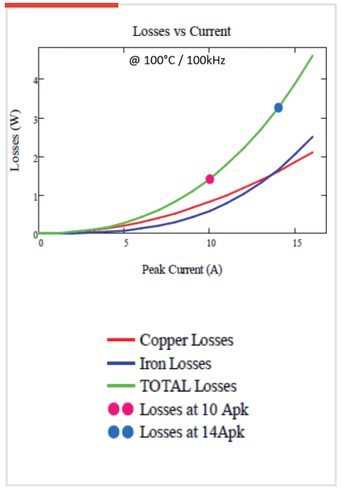
- Primary peak current up to 14A
- Total losses 3,3W @ 14Apk / 100kHz / 100°C
- Operating temperature -40/+150°C
- Expected temperature increase < 30°C with water cooling

03 SPECIFICATIONS

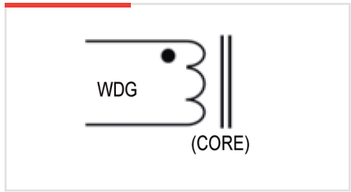
DIMENSIONS (mm)



TYPICAL PERFORMANCES



ELECTRICAL DIAGRAM



ELECTRICAL SPECIFICATIONS

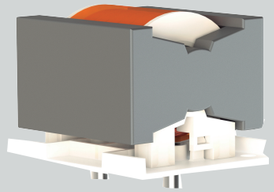
INDUCTANCE at 25°C	
L (100kHz/1Vac/0-14Adc)	14µH ±10%
DC RESISTANCE at 25°C	
R	10mΩ TYP (12mΩ MAX)
DIELECTRIC STRENGTH	
{WDG}/{CORE}	3kVac/50Hz/3mA/1min*

(*) 1min in qualification / 2sec in mass production

RINDLS6.3-30T

LLC Serial Resonant Inductor 6.3µH/30Apk 100-250kHz

INDUCTIVE COMPONENTS / **RESONANT CHOKES**



APPLICATIONS

- Automotive EV/PHV AC/DC onboard battery chargers

01 FEATURES

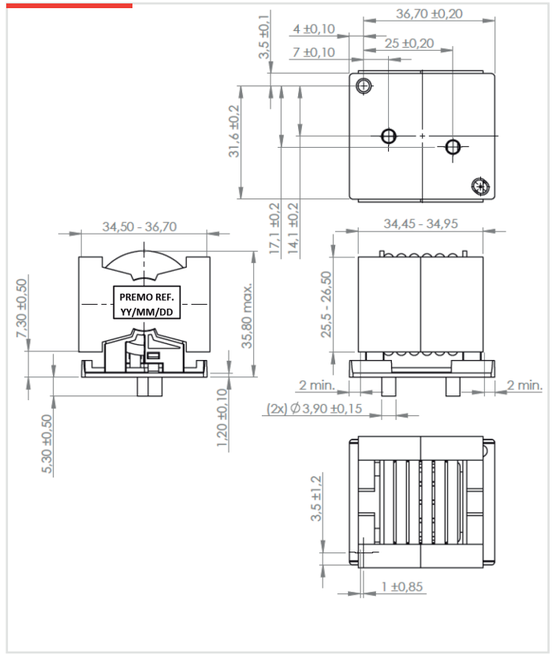
- Serial resonant choke for 3.5kW half-bridge LLC
- Works with Lp = 36µH and Cr = 312nF
- Frequency range 100-250kHz
- UL94 and RoHS materials (F/155°C)
- Design based on AEC-Q200
- Weight : approx 100grams
- High accuracy outputs position

02 OPERATION

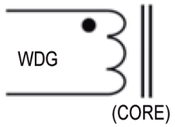
- Vin = 200-430Vdc / Vout = 200-430Vdc
- RMS current 28Arms MAX
- Operating temperature -40/+140°C with cooling (potting)

03 SPECIFICATIONS

DIMENSIONS (mm)



ELECTRICAL DIAGRAM



ELECTRICAL SPECIFICATIONS

INDUCTANCE at 25°C	
L (100kHz/1Vac)	6,4µH ±8%
DC RESISTANCE at 25°C	
R	4,6mΩ TYP (5,5mΩ MAX)
DIELECTRIC STRENGTH	
{WDG}/{CORE}	500Vac/50Hz/3mA/1min*

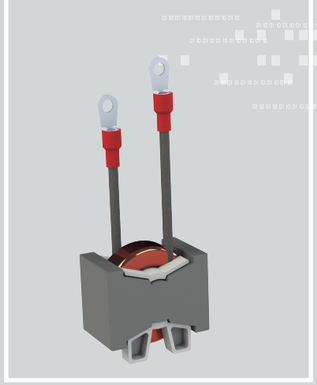
(*) 1min in qualification / 2sec in mass production

(*) 1min in qualification / 2sec in mass production

RINDLS22R-29

LLC Serial Resonant Ind. 22µH/29Apk 70-200kHz

INDUCTIVE COMPONENTS / **RESONANT CHOKES**



APPLICATIONS

- Automotive EV/PHV AC/DC onboard battery chargers

01 FEATURES

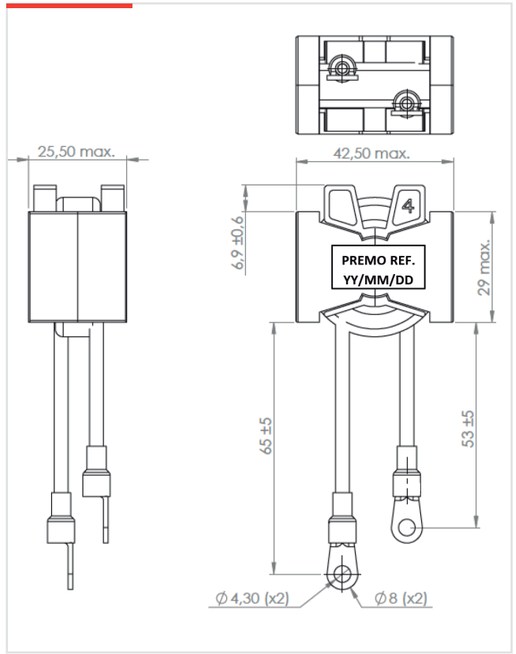
- Serial resonant choke for 3.5kW full-bridge LLC
- Works with Lp = 130µH and Cr = 100nF
- Frequency range 70-200kHz
- High insulation winding to core
- UL94 and RoHS materials (F/155°C)
- Design based on AEC-Q200
- Weight : approx 120grams

02 OPERATION

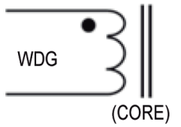
- Vin = 360-420Vdc / Vout = 200-450Vdc
- RMS current 20Arms MAX
- Operating temperature -40/+140°C with cooling (potting)

03 SPECIFICATIONS

DIMENSIONS (mm)



ELECTRICAL DIAGRAM



ELECTRICAL SPECIFICATIONS

INDUCTANCE at 25°C	
L(100kHz/1Vac/0-29Adc)	22µH ±5%
DC RESISTANCE at 25°C	
R	12mΩ TYP (14mΩ MAX)
DIELECTRIC STRENGHT	
Between Windings/Core	4000Vac (50Hz/3mA/1min) *

(*) 1min in qualification / 2sec in mass production

RINDLP36R-5

LLC Parallel Resonant Ind. 36µH/5Apk 100-250kHz

INDUCTIVE COMPONENTS / **RESONANT CHOKES**

APPLICATIONS

- Automotive EV/PHV AC/DC onboard battery chargers

01 FEATURES

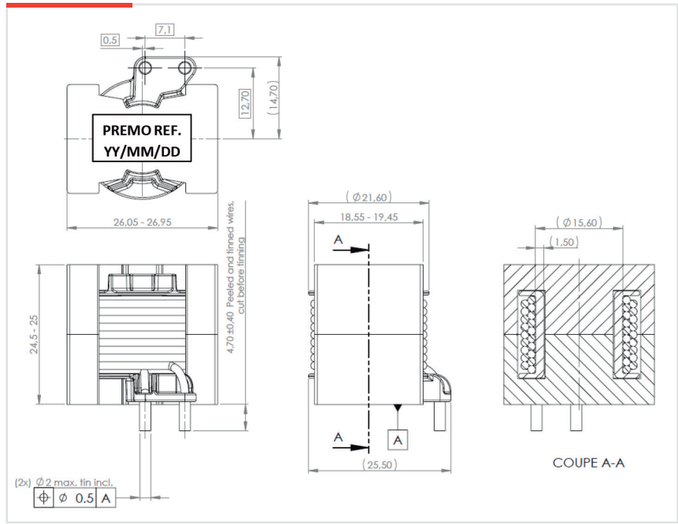
- Parallel resonant choke for 3,5kW half-bridge LLC
- Works with Lp = 36µH and Cr = 312nF
- Frequency range 100-250kHz
- UL94 and RoHS materials (F/155°C)
- AEC-Q200 qualified
- Weight : approx 45grams

02 OPERATION

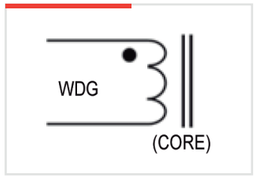
- Vin = 200-430Vdc / Vout = 200-430Vdc
- RMS current 3Arms MAX
- Operating temperature -40/+140°C with cooling (potting)

02 SPECIFICATIONS

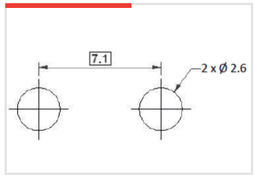
DIMENSIONS (mm)



ELECTRICAL DIAGRAM



RECOMMENDED PAD-LAYOUT



ELECTRICAL SPECIFICATIONS

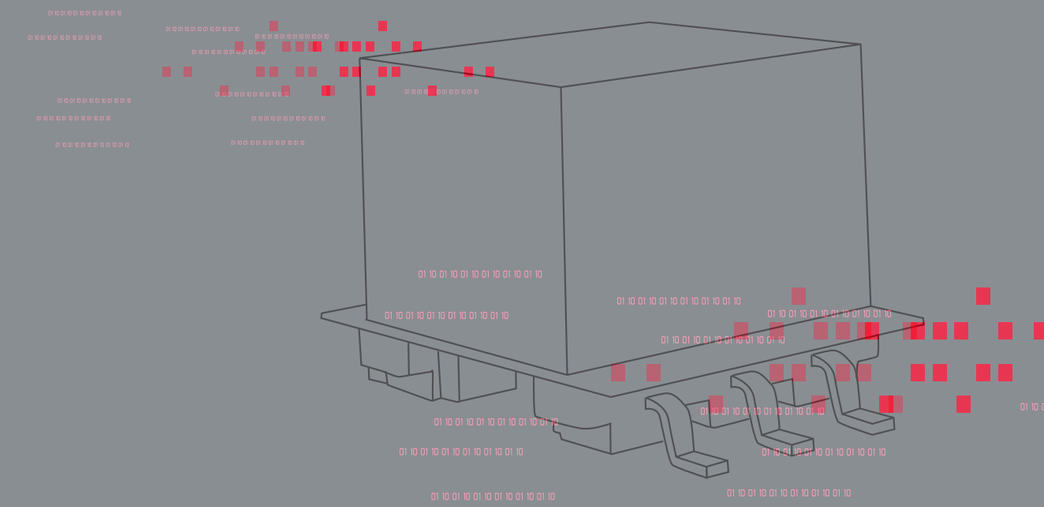
INDUCTANCE at 25°C	
L(100kHz/1Vac/0-29Adc)	36.1µH +/-5%
DC RESISTANCE at 25°C	
R	35mΩ TYP (42mΩ MAX)
DIELECTRIC STRENGHT	
Between Windings/Core	500Vac (50Hz/3mA/1min)*

(*) 1min in qualification / 2sec in mass production

4.8

INDUCTIVE COMPONENTS

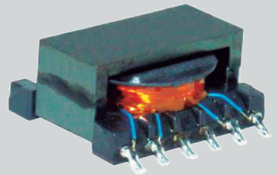
GATE-DRIVE TRANSFORMERS



GDAU-001

Isolated SMD Gate Drive Transformer up to 150Vμs

INDUCTIVE COMPONENTS / **GATE-DRIVE TRANSFORMER**



APPLICATIONS

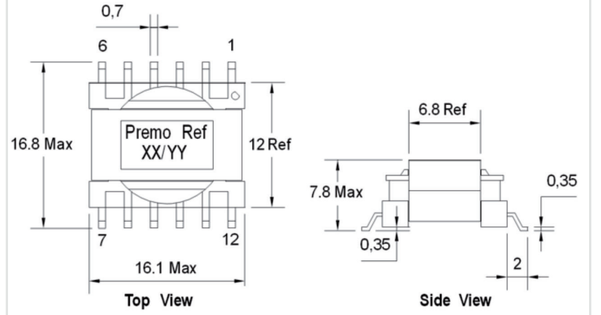
- Half- or full-bridge MOS transistors control in SMPS
- Automotive EV/HEV DC/DC converters and battery chargers
- Industrial high power SMPS

01 FEATURES

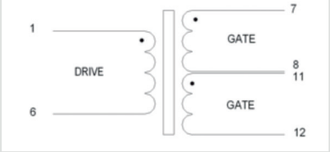
- 150Vμs MAX ET product
- Design for high performance EV/HEV onboard SMPS
- Height : 7.8mm MAX, Pick & Place compatible
- Footprint : SMD 18 x 14.5mm MAX
- RMS current rating : up to 0.5Arms
- 1:1+1 turn ratio for bridge control
- Working frequency from 90 to 125kHz
- 3kV isolation between primary and secondary
- High operating temperature range -40 to +155°C
- AOI (Automatic Optical Inspection) component
- UL94V-0 and RoHS material
- Design compliant with AEC-Q200 requirements
- No thermal aging effect
- Weight: less than 5g

02 SPECIFICATIONS

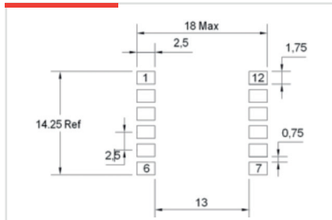
DIMENSIONS (mm)



ELECTRICAL DIAGRAM



RECOMMENDED PAD-LAYOUT



ELECTRICAL SPECIFICATIONS

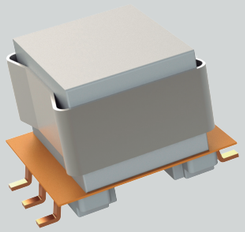
MAX ET Product (Vμs)	150
Turn-Ratio	1:1+1
Primary Inductance (uH)	400-800
Secondary DCR MAX (mΩ)	0.8
Primary DCR MAX (Ω)	0.5
Primary to Secondary Isolation (kVdc)	3

- (1) All test data are referenced to 25°C ambient temperature
- (2) The inductance value is measured at 100kHz/0.1Vac
- (3) The isolation is tested at DC/2sec (1min for qualification) ;
- (4) The creepage distance is guaranteed > 5mm
- (5) Continuous operating temperature range must be within -40/+155°C (including self-heating of the part)
- (6) Leakage inductance value is less than 2μH (viewed from primary side at 100kHz/0.1Vac)
- (7) Inter-winding stray capacitance is less than 12pF (between prim shorted and sec shorted at 100kHz/0.1Vac)

GDAU-002

Gate-Drive Transformer 1:1:5 16Vus

INDUCTIVE COMPONENTS / **GATE-DRIVE TRANSFORMER**



APPLICATION

- Automotive inverters for electrical motors in EV/PHV

01 FEATURES

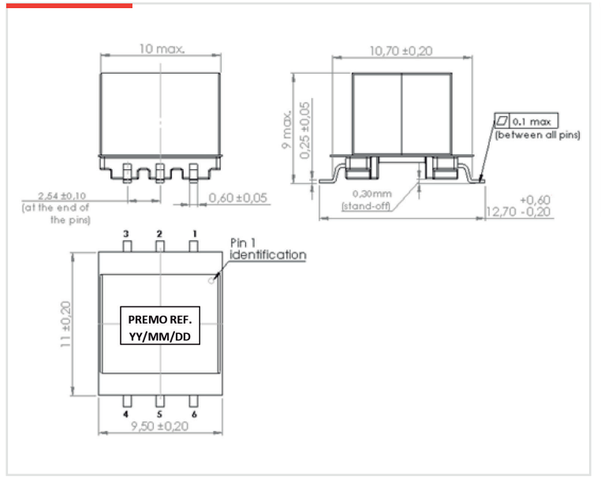
- Gate-Drive Transformer for IGBT control
- Forward operation (demagnetizing winding included)
- Working voltage up to 500Vdc
- Insulation 3kV
- ETmax product of 16Vμs
- Wide operating temperature range -40 to +125°C
- UL94 and RoHS materials
- AEC-Q200 qualified
- Weight : approx 2grams

02 OPERATION

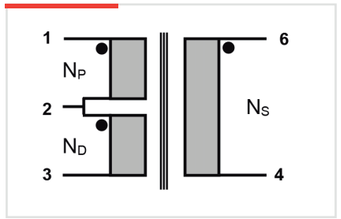
- IGBT control

03 SPECIFICATIONS

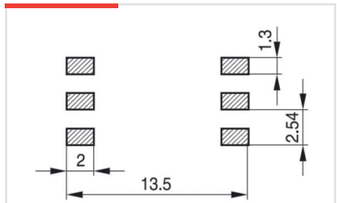
DIMENSIONS (mm)



ELECTRICAL DIAGRAM



RECOMMENDED PAD-LAYOUT



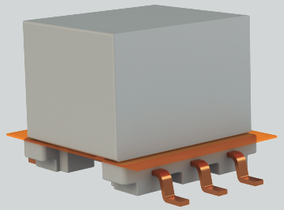
ELECTRICAL SPECIFICATIONS

INDUCTANCE at 25°C	
L_{1-2} (100kHz/0,1Vac)	60μH ≤ 90μH TYP ≤ 110μH
TURN-RATIO	
$N_{1-2} : N_{2-3} : N_{6-4}$ (10kHz/1Vac)	1:1:5
DC RESISTANCE at 25°C	
$DCR_{1-2} = DCR_{2-3}$	0.3Ω MAX (0.26Ω TYP)
DCR_{4-6}	0.55Ω MAX (0.45Ω TYP)
LEAKAGE INDUCTANCE	
Llk_{1-2} (100kHz/1Vac)	0.4μH MAX (0.15μH TYP)
STRAY CAPACITANCE	
CPS (100kHz/1Vac)	50pF MAX
DIELECTRIC STRENGTH	
Between Windings	3kVdc (3mA/1min)

GDAU-003

Gate-Drive Transformer 2:1 200Vus

INDUCTIVE COMPONENTS / **GATE-DRIVE TRANSFORMER**



APPLICATION

- Automotive PFC stage in onboard battery chargers

01 FEATURES

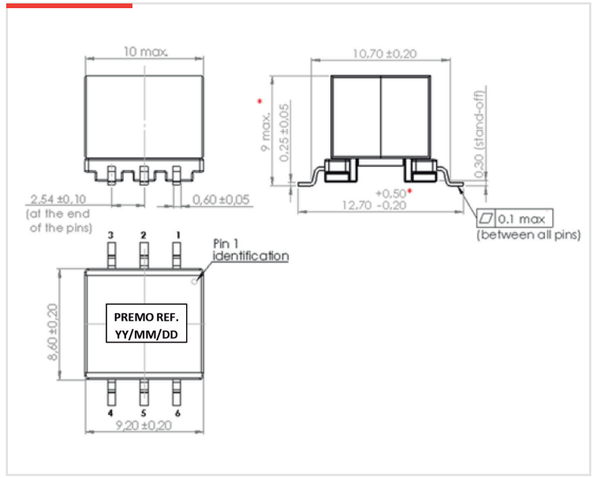
- Gate-Drive transformer for thyristors driver
- Working voltage up to 500Vdc
- Functional insulation at 500V
- ETmax product of 200Vμs
- Wide operating temperature range -40 to +105°C
- UL94 and RoHS materials
- AEC-Q200 qualified
- Weight : approx 2grams

02 OPERATION

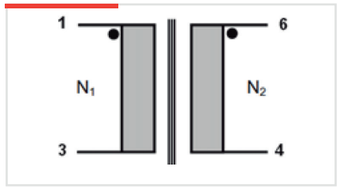
- Thyristors driver control where only functional insulation is needed

03 SPECIFICATIONS

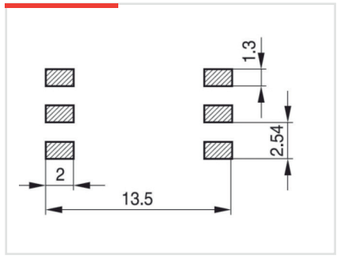
DIMENSIONS (mm)



ELECTRICAL DIAGRAM



RECOMMENDED PAD-LAYOUT



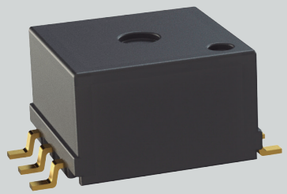
ELECTRICAL SPECIFICATIONS

INDUCTANCE at 25°C	
L_{1-3} (10kHz/50mVac)	3mH ≤ 5mH TYP ≤ 7mH
TURN-RATIO	
$N_{1-3} : N_{6-4}$ (10kHz/1Vac)	2:1
DC RESISTANCE at 25°C	
DCR_{1-3}	1.2Ω MAX (0.98Ω TYP)
DCR_{4-6}	0.6Ω MAX (0.45Ω TYP)
LEAKAGE INDUCTANCE	
Llk_{1-3} (100kHz/1Vac)	13μH MAX
STRAY CAPACITANCE	
CPS (100kHz/1Vac)	15pF MAX
DIELECTRIC STRENGTH	
Between Windings	500Vac (50Hz/3mA/1min)

GDAU-004

Push-pull Gate-Drive Transformer 1:1:1.3:1.3 2x11Vus

INDUCTIVE COMPONENTS / **GATE-DRIVE TRANSFORMER**



APPLICATION

- Automotive BMS in onboard battery chargers

01 FEATURES

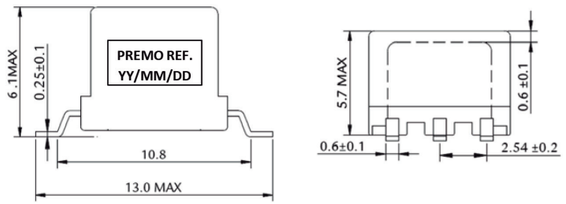
- Pulse transformer for battery management system
- Reinforced insulation at 3kV in pollution degree 2
- Creepage distance > 8mm
- ETmax product of 11Vµs across each half primary
- Maximum current 150mA
- Wide operating temperature range -40 to +125°C
- UL94 and RoHS materials
- AEC-Q200 qualified
- Weight : approx 2grams
- Tape&Reel packaging 13" W24mm

02 OPERATION

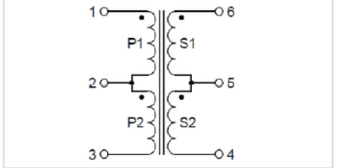
- Pulse transformer with high insulation level
- Push-pull mode

03 SPECIFICATIONS

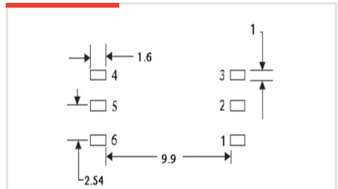
DIMENSIONS (mm)



ELECTRICAL DIAGRAM



RECOMMENDED PAD-LAYOUT



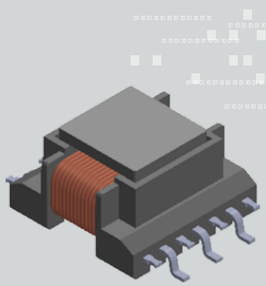
ELECTRICAL SPECIFICATIONS

INDUCTANCE at 25°C	
L_{1-3} (100kHz/10mVac)	430µH ±25%
L_{4-6} (100kHz/10mVac)	713µH ±25%
TURN-RATIO	
$N_{1-2} : N_{2-3} : N_{6-5} : N_{5-4}$	1:1:1.29:1.29
DC RESISTANCE at 25°C	
DCR_{1-3}	0.38Ω MAX
DCR_{4-6}	0.38Ω MAX
INSULATION RESISTANCE	
RINS Prim/Sec (500Vdc)	> 1GΩ
DIELECTRIC STRENGTH	
DWI Prim/Sec	3kVac (50Hz/1mA/1min)
DIELECTRIC STRENGTH	
Between Windings	500Vac (50Hz/3mA/1min)

GDAU-005

Forward Gate-Drive Isolated Transformer

INDUCTIVE COMPONENTS / **GATE-DRIVE TRANSFORMER**



APPLICATION

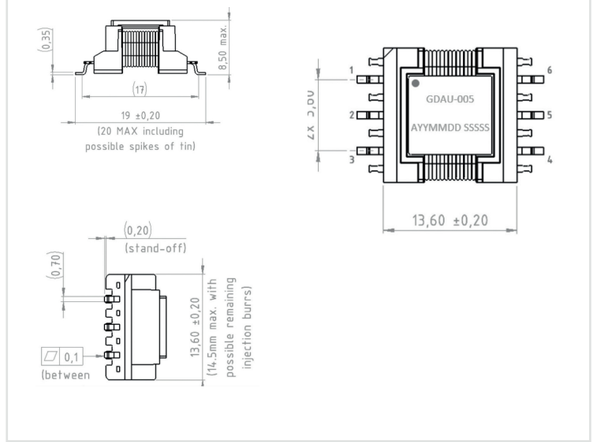
› Automotive xEV inverters (IGBT control)

01 FEATURES

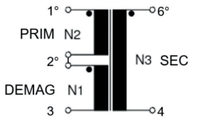
- Isolated gate-drive transformer for inverters in xEV
- 1:1:5 turn-ratio
- Input voltage 5Vdc TYP
- Switching frequency 120-160kHz (140KHz TYP)
- MAX Et product 22Vµs (unipolar 50%)
- MAX current 700mA PRIM / 140mA SEC
- Working voltage up to 1000Vdc MAX
- Basic isolation (PD3)
- Creepage distance > 10mm (CTI-I > 600V)
- Wide operating temperature range -40 to +125°C
- UL94 and RoHS materials
- Design based on AEC-Q200D
- Weight: approx. 3grams

02 SPECIFICATIONS

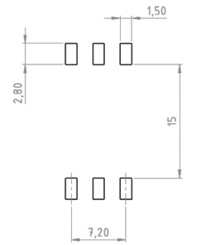
DIMENSIONS (mm)



ELECTRICAL DIAGRAM (Top View)



RECOMMENDED PAD-LAYOUT



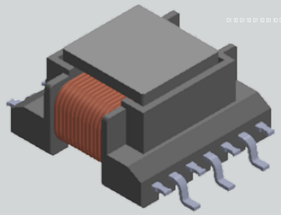
ELECTRICAL SPECIFICATIONS

INDUCTANCE at 25°C	
L_{1-2} (100kHz/0.1mVac)	70-150µH (110µH TYP)
TURN-RATIO	
N_{6-4} : N_{1-2} (1-10kHz/1Vac)	5:1
DC RESISTANCE at 25°C	
DCR_{1-2} / DCR_{2-3} / DCR_{4-6}	0.15Ω / 0.4Ω / 1.8Ω MAX
LEAKAGE INDUCTANCE	
L_{LK} (100kHz/1Vac)	1.5µH MAX (1µH TYP)
STRAY CAPACITANCE	
C_{PS} (100kHz/1Vac)	15pF MAX (10pF TYP)
DIELECTRIC STRENGTH	
Between PRIM/SEC Wdgs	2.5kVac (50Hz/3mA/1min)

PPTR - 001

Isolated Push-Pull Transformer

INDUCTIVE COMPONENTS / **PUSH - PULL TRANSFORMER**



APPLICATION

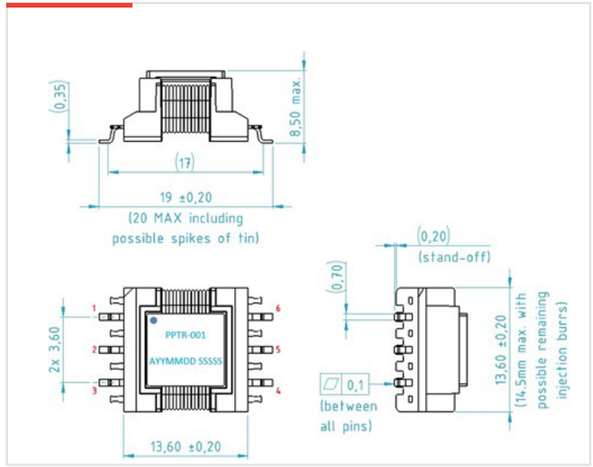
- Automotive BMS in xEV (ex: TI SN6505A/B chips)

01 FEATURES

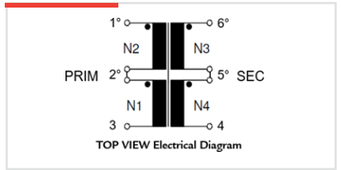
- Isolated push-pull transformer for BMS in xEV
- 1+1:2+2 turn-ratio
- Input voltage 5Vdc TYP
- Switching frequency 300-600kHz (450KHz TYP)
- MAX Et product 13Vµs (unipolar 50%)
- MAX current 300mA PRIM / 100mA SEC
- Working voltage up to 1000Vdc MAX
- Reinforced isolation IEC 61558-1/-2-16 (PD2)
- Creepage distance > 10mm (CTI-I > 600V)
- Wide operating temperature range -40 to +125°C
- UL94 and RoHS materials
- Design based on AEC-Q200D
- Weight : approx. 3grams

02 SPECIFICATIONS

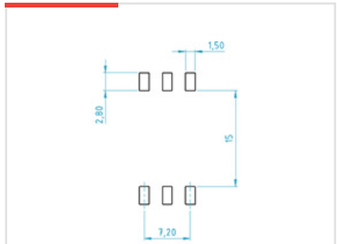
DIMENSIONS (mm)



ELECTRICAL DIAGRAM (Top View)



RECOMMENDED PAD-LAYOUT

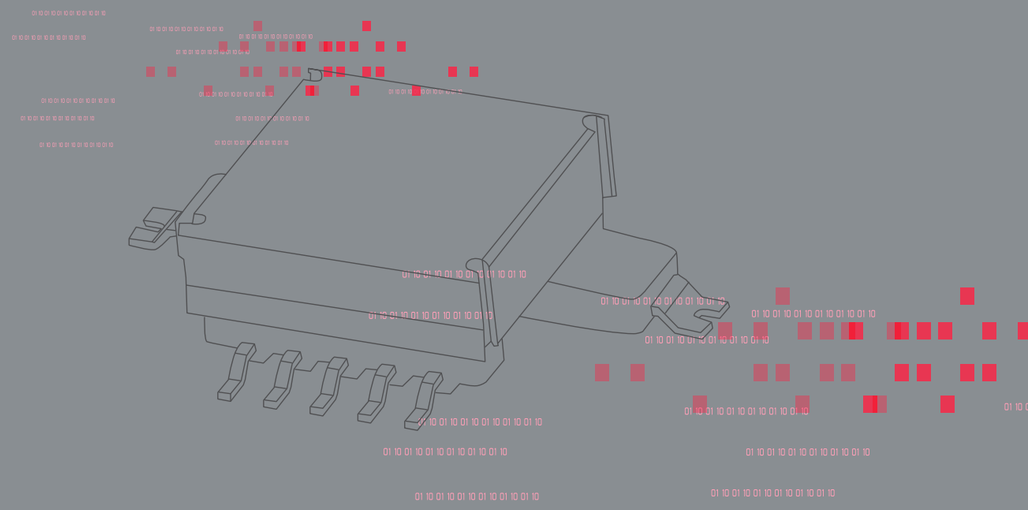


ELECTRICAL SPECIFICATIONS

INDUCTANCE at 25°C	
L_{1-2} (100kHz/0.1mVac)	90-170µH (130µH TYP)
TURN-RATIO	
$N_{6-4} : N_{1-2}$ (1-10kHz/1Vac)	2:1
DC RESISTANCE at 25°C	
DCR_{1-3} / DCR_{4-6}	0.6Ω MAX / 1.2Ω MAX
LEAKAGE INDUCTANCE	
L_{LK} (100kHz/1Vac)	0.6µH MAX (0.4µH TYP)
STRAY CAPACITANCE	
C_{PS} (100kHz/1Vac)	12pF MAX (8pF TYP)
DIELECTRIC STRENGTH	
Between PRIM/SEC Wdgs	5kVac (50Hz/3mA/1min)

4.9

INDUCTIVE COMPONENTS
CURRENT TRANSFORMERS



CSAU-100

Automotive HEV Current Transformer up to 35 Amps

INDUSTRIAL COMPONENTS / **CURRENT TRANSFORMERS**

APPLICATIONS

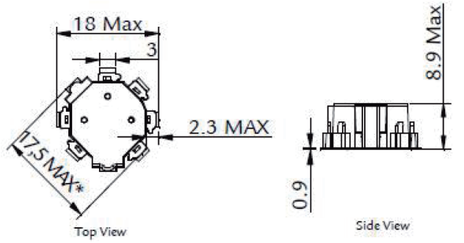
- Automotive HEV DC/DC Converters and Battery Chargers
- Industrial high power SMPS

01 FEATURES

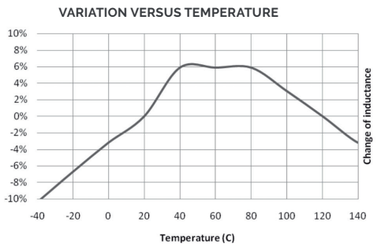
- Design for high performance 2-3kW SMPS
- Very low profile: 8.5mm max
- Primary current up to 35 Arms
- Working frequency from 100 to 250kHz
- High isolation between primary and secondary
- Potted solution assures safety creepage distance ≥5mm
- High Operating Temperature -40 to 155 °C.
- AOI (Automatic Optical Inspection) component
- Very stable performances versus temperature
- No thermal aging effect
- UL94V-0 material
- RoHS compliant

02 SPECIFICATIONS

DIMENSIONS (mm)



TYPICAL INDUCTANCE

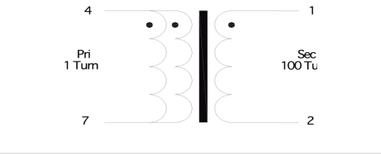


ELECTRICAL SPECIFICATIONS

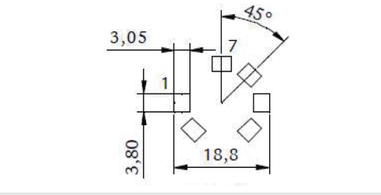
Primary Current Irms (A)	35
Seconday Turns	100
Secondary Inductance mH (Min)	4.0
DCR Primary typ (mOhm)	0.5
DCR Secondary typ (Ohm)	0.8
Primary to Secondary Isolation (kVdc)	3

- All test data are referenced to 25°C ambient temperature
- (2) Inductance values are measured at 100kHz/0.1V
- (3) See L vs. Idc curve beside
- (4) Burden resistor from 5 to 10 Ohms
- (5) Continues operating temperature range must be within -40/+155°C (ambient + self heating)

ELECTRICAL DIAGRAM



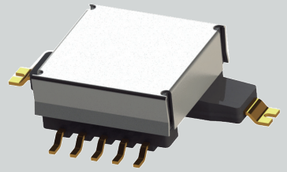
RECOMMENDED PAD-LAYOUT



CS-35A

Automotive EV/HEV Isolated SMD Current Transformer up to 35Amps

INDUCTIVE COMPONENTS / **CURRENT TRANSFORMERS**



APPLICATIONS

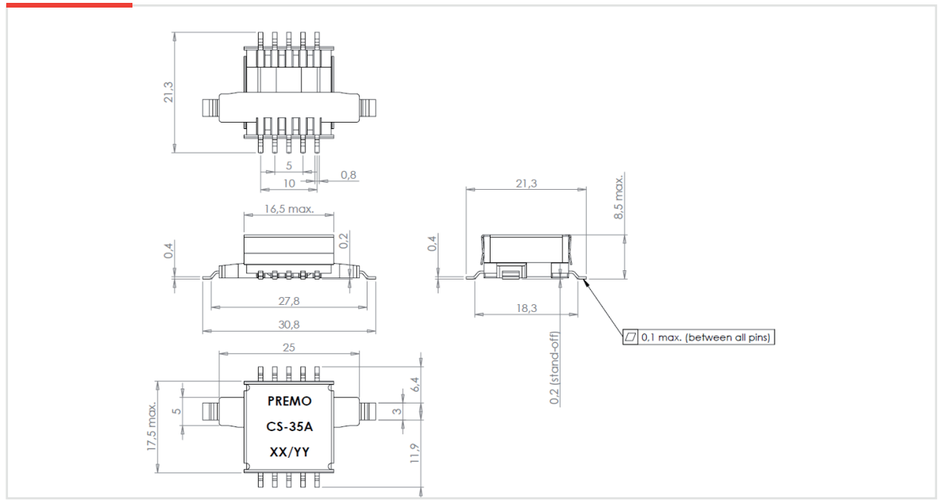
- Peak current sensing, current measurement for bridge control
- Automotive EV/HEV DC/DC converters and battery chargers
- Industrial high power SMPS

01 FEATURES

- Design for high performance 2-3kW SMPS
- Height : 8.5mm MAX, Pick & Place compatible
- Footprint : SMD 31 x 25.5mm MAX
- RMS current rating : up to 35A
- 1:100 turn ratio for 5-10Ω burden resistor
- Working frequency from 50 to 250kHz
- 3kV isolation between primary and secondary
- Creepage distance > 5mm
- High operating temperature range -40 to +155°C
- AOI (Automatic Optical Inspection) component
- UL94V-0 and RoHS material
- Design compliant with AEC-Q200 requirements
- No thermal aging effect
- Weight : approx. 5g

02 SPECIFICATIONS

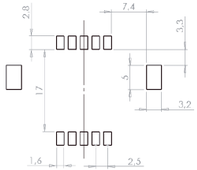
DIMENSIONS (mm)



ELECTRICAL SPECIFICATIONS

Primary Current (Arms)	35
Seconday Turns	100
Secondary Inductance mH (Min)	5
Secondary DCR MAX (Ω)	1.6
Primary DCR MAX (mΩ)	1
Primary to Secondary Isolation (kVac)	3

RECOMMENDED PAD-LAYOUT

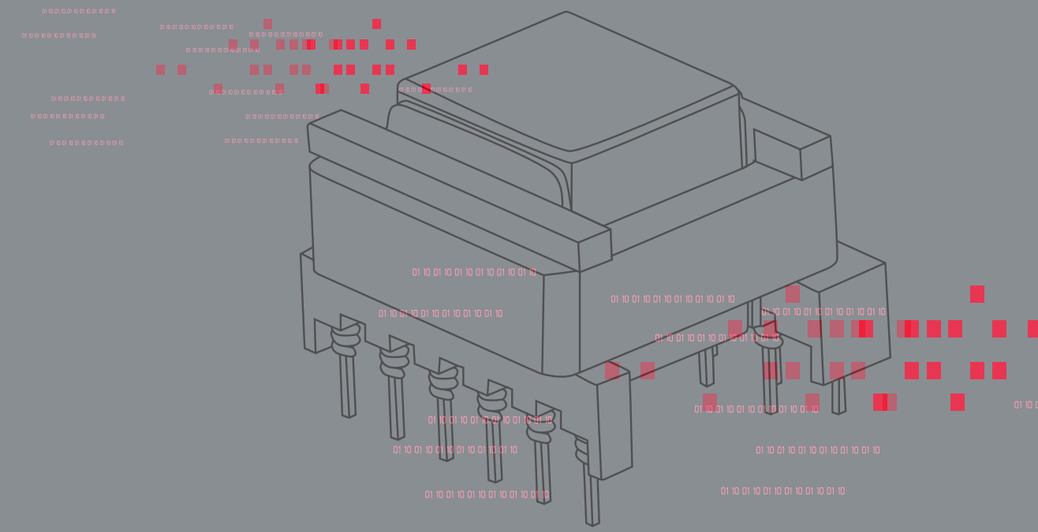


- (1) All test data are referenced to 25°C ambient temperature
- (2) The inductance value is measured at 100kHz/0.1Vac
- (3) The isolation is tested at 50Hz/2sec (1min for qualification)
- (4) The creepage distance is guaranteed > 5mm
- (5) Continuous operating temperature range must be within -40/+155°C (including self-heating of the part)
- (6) A burden resistor value from 5 to 10Ω is recommended
- (7) The amplitude error is estimated better than +/-2.5% on the 50-250kHz and -40/+155°C range (Rb = 5 to 10Ω)

4.10

INDUCTIVE COMPONENTS

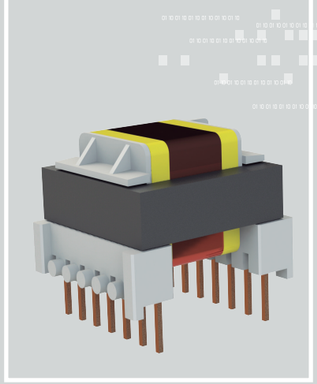
FLYBACK TRANSFORMERS



FLYT-001

Flyback Tr. 5W/100kHz 10:3:7+4:10+4

INDUCTIVE COMPONENTS / **FLYBACK TRANSFORMER**



APPLICATIONS

- Automotive EV/PHV AC/DC onboard battery chargers

01 FEATURES

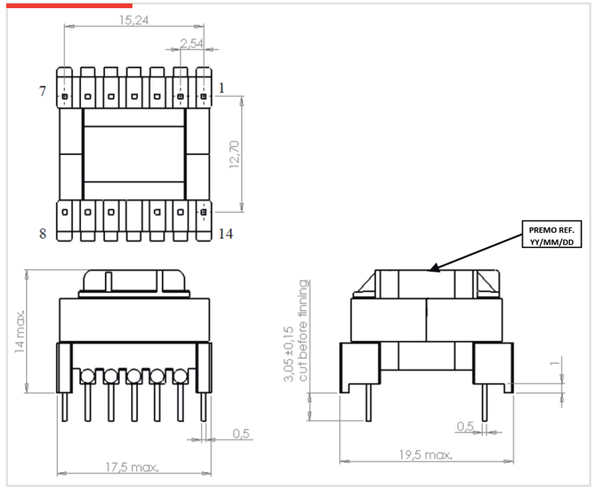
- Flyback Transformer for 3,5kW battery chargers
- Multi outputs with reinforced insulation (cr >5mm)
- Switching frequency 100kHz
- Insulation according to EN 60664-1
- UL94 and RoHS materials (F/155°C)
- Design based on AEC-Q200
- Weight : approx 6g.

02 OPERATION

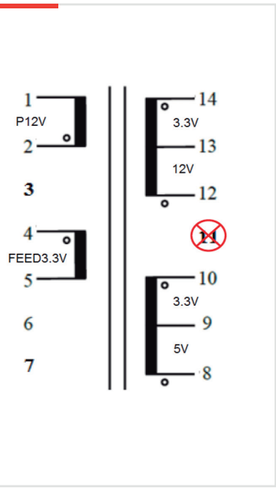
- Operating temperature -40/+125°C
- Vin = 7V MIN / Vout = 2x3,3V/0,2A 12V/0,2A 5V/0,2A
- Max duty cycle : = 0,50
- Primary current : Irms = 1,8Arms MAX @Vin = 7V (Ipk ≈ 4,7Apk)
- Estimated losses @Vin = 7V / 100°C : Copper = 0,3W / Iron = 0,1W

03 SPECIFICATIONS

DIMENSIONS (mm)



ELECTRICAL DIAGRAM



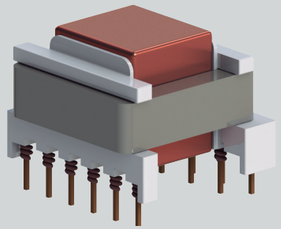
ELECTRICAL SPECIFICATIONS

MAG. INDUCTANCE at 25°C	
L_{P12V} = Lp (100kHz/0,1Vac)	6,3µH ±5%
LEAKAGE INDUCTANCE	
Lf_{P12V} (100kHz/1Vac)	600nH MAX
DIELECTRIC STRENGTH	
{1-2 + 4-5}/{8-9-10 + 12-13-14}	3kVac/50Hz/3mA/1min*
{8-9-10}/{12-13-14}	1,5kVac/50Hz/3mA/1min*
{1-2}/{4-5}	0,5kVac/50Hz/3mA/1min*
TURN RATIO (10kHz/1Vac)	
2-1 : 4-5 : 8-9 : 10-9 : 12-13 : 14-13	10:3:7+4:10+4

FLYT-002

Flyback Tr. 16W/100kHz 5:9:9:9:9

INDUCTIVE COMPONENTS / **FLYBACK TRANSFORMER**



APPLICATIONS

› Automotive EV/PHV AC/DC onboard 3-phase battery chargers

01 FEATURES

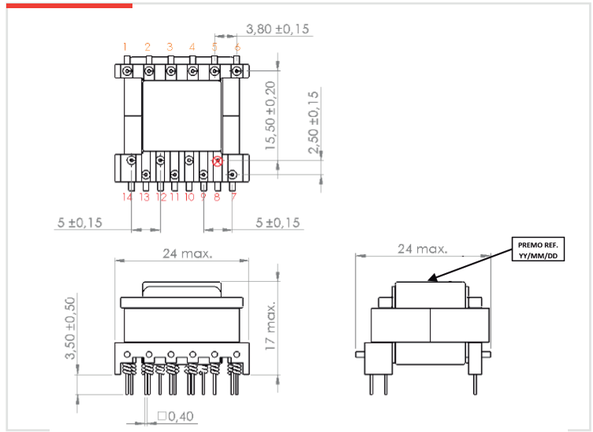
› Flyback Transformer for 11kW battery chargers
› 3 outputs +12V (PA / PB / PC) with reinforced insulation (cr >5mm)
› Switching frequency 100kHz
› Insulation according to EN 60664-1
› UL94 and RoHS materials (F/155°C)
› Design based on AEC-Q200
› Weight : approx 25g.

02 OPERATION

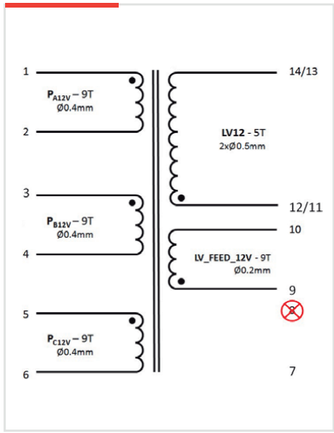
› Operating temperature -40/+125°C
› Vin = 7V MIN / Vout = 3x12V / 0,4A
› Max duty cycle : = 0,55
› Primary current : Irms = 4,5Arms MAX @Vin = 7V (Ipk ≈ 9Apk)
› Estimated losses @Vin = 7V / 100°C : Copper = 0,3W / Iron = 0,1W

03 SPECIFICATIONS

DIMENSIONS (mm)



ELECTRICAL DIAGRAM



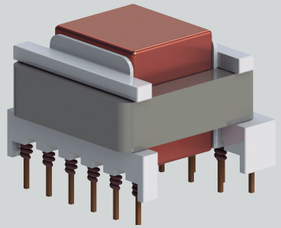
ELECTRICAL SPECIFICATIONS

MAG. INDUCTANCE at 25°C	
LLV12V = Lp (100kHz/0,1Vac)	5µH ±10%
LEAKAGE INDUCTANCE	
LfLV 12V (100kHz/1Vac)	250nH MAX
DC RESISTANCE at 25°C	
RLV12V	9mΩ TYP (11mΩ MAX)
RLVFEED12V	200 mΩ TYP (240mΩ MAX)
RPA12V / RPB12V / RPC12V	53mΩ TYP (60mΩ MAX)
DIELECTRIC STRENGTH	
{LV12V + LVFEED12V}/{PC12V + PB12V + PA12V}	4,5kVac/50Hz/3mA/1min*
Between other wdgs and with Core	1,5kVac/50Hz/3mA/1min*
TURN RATIO (10kHz/1Vac)	
LV:FEED:PA:PB:PC	5:9:9:9:9

FLYT-003

Flyback Tr. 5W/100kHz 7:5:7:5:5:5

INDUCTIVE COMPONENTS / **FLYBACK TRANSFORMER**



APPLICATIONS

› Automotive EV/PHV AC/DC onboard 3-phase battery chargers

01 FEATURES

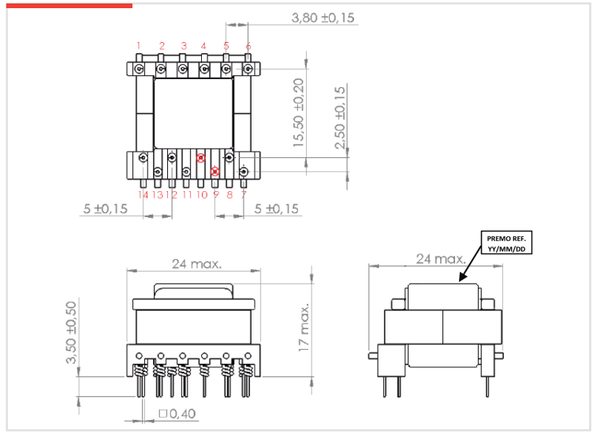
› Flyback Transformer for 11kW battery chargers
› 3 outputs +3,3V (PA / PB / PC) with reinforced insulation (cr >5mm)
› Switching frequency 100kHz
› Insulation according to EN 60664-1
› UL94 and RoHS materials (F/155°C)
› Design based on AEC-Q200
› Weight : approx 25g.

02 OPERATION

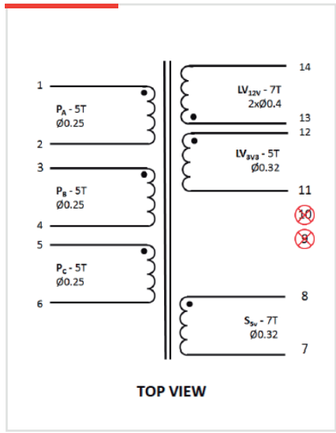
› Operating temperature -40/+125°C
› Vin = 6V MIN / Vout = 3x3,3V/0,1A 5V/0,4A 3,3V/0,4A
› Max duty cycle : = 0,55
› Primary current : Irms = 2Arms MAX @Vin = 6V (Ipk ≈ 3,8Apk)
› Estimated losses @Vin = 6V / 100°C : Copper = 0,3W / Iron = 0,05W

03 SPECIFICATIONS

DIMENSIONS (mm)



ELECTRICAL DIAGRAM

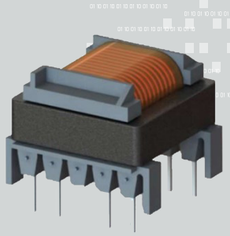


ELECTRICAL SPECIFICATIONS

MAG. INDUCTANCE at 25°C	
LLV12V =Lp (100kHz/0,1Vac)	12µH ±12%
LEAKAGE INDUCTANCE	
LfLV 12V (100kHz/1Vac)	350nH MAX
DC RESISTANCE at 25°C	
RLV12V	20mΩ TYP (25mΩ MAX)
RLV3V3	45mΩ TYP (55mΩ MAX)
RS5V	60mΩ TYP (80mΩ MAX)
RPA = PPB = PPC	84mΩ TYP (95mΩ MAX)
DIELECTRIC STRENGTH	
{LV12V + LV3V3}/{S5V}/{PA+PB+PC}	4,5kVac/50Hz/3mA/1min*
Between other wdgs and with core	1,5kVac/50Hz/3mA/1min*
TURN RATIO (10kHz/1Vac)	
LV:3,3V:5V:PA:PB:PC	7:5:7:5:5:5

FLYT-008

Flyback Tr. 510uH 63:8:8:5



INDUCTIVE COMPONENTS / **FLYBACK TRANSFORMER**

APPLICATIONS

- Automotive EV/PHV AC/DC onboard battery chargers

01 FEATURES

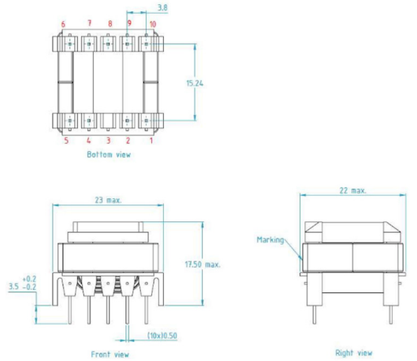
- Continuous-Conduction Mode Fly-back
- Weight : approx 13g.

02 OPERATION

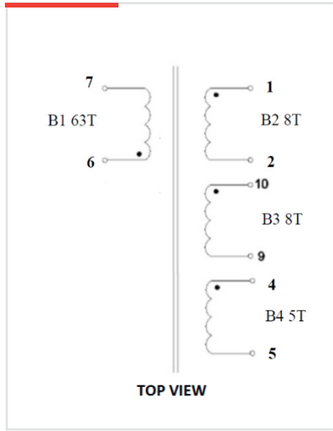
- Operating temperature -25/+125°C
- ESTIMATED TOTAL LOSSES (@132kHz, Pout=25W, Vin=210V, 100°C):
- Copper losses (DC) 210 mW
- Core losses 300 mW
- Total losses 0.51 W

03 SPECIFICATIONS

DIMENSIONS (mm)



ELECTRICAL DIAGRAM



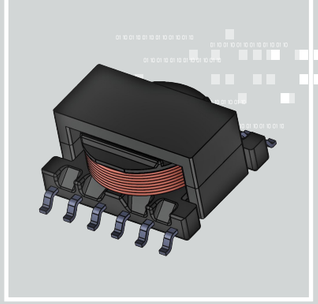
ELECTRICAL SPECIFICATIONS

MAG. INDUCTANCE at 25°C	
L (6 – 7)	510uH TYP (578uH Max)
LEAKAGE INDUCTANCE	
PRIMARY (6 – 7) (All secondary windings are shorted)	12 uH MAX
DC RESISTANCE at 25°C	
PRI (B1), pin 6 to 7	730 mΩ TYP (912 mΩ MAX)
SEC (B2), pin 1 to 2	35 mΩ TYP (43.5 mΩ MAX)
SEC (B3), pin 9 to 10	38.6 mΩ TYP (48.2 mΩ MAX)
SEC (B4), pin 4 to 5	150 mΩ TYP (188 mΩ MAX)

DIELECTRIC STRENGTH	
Between PRI (B1) and SEC (B2,B3,B4)	3000V (50/60Hz; 3 mA; 2 sec)
Between SEC(B2) and SEC (B4)	1000V (50/60Hz; 3 mA; 2 sec)
Between all windings and CORE	1500V (50/60Hz; 3 mA; 2 sec
TURN RATIO (10kHz/1Vac)	
B1 : B2 : B3 : B4	63 : 8 : 8 : 5

FLYT-009

Flyback Tr. 25uH 10 : 25 : 25 : 25



INDUCTIVE COMPONENTS / **FLYBACK TRANSFORMER**

APPLICATIONS

- AC/DC and DC/DC main boards in xEV converters, low power applications

01 FEATURES

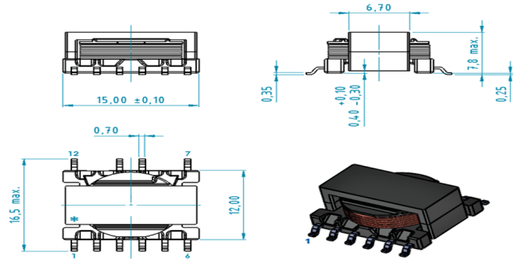
- Power: 1.5W
- Switching Frequency: (60-100) kHz
- Weight: < 5g.

02 OPERATION

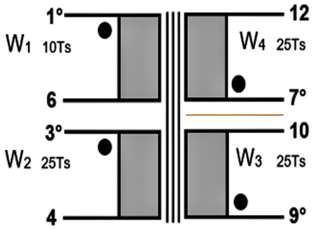
- Vin Range=(8-18)V, Vout/Iout =(2x) 15V/60mA, 15 V/13mA
- Operating temperature -40/+125°C
- ESTIMATED TOTAL LOSSES (@60kHz, Pout=1.5W, Vin=8V, 100°C):
- Copper losses (DC) 150 mW
- Core losses 50 mW
- Total losses 0.2 W

03 SPECIFICATIONS

DIMENSIONS (mm)



ELECTRICAL DIAGRAM



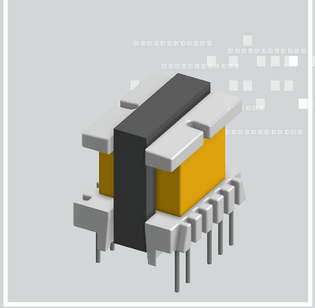
ELECTRICAL SPECIFICATIONS

MAG. INDUCTANCE at 25°C	
L(1-6) (60kHz, 0.1 Vac)	25 µH ±12%
LEAKAGE INDUCTANCE	
PRIMARY Llk (1-6) (60kHz, 0.1Vac)	500 nH MAX
DC RESISTANCE at 25°C	
DC RESISTANCE R1-6	110 mΩ Max
DC RESISTANCE R3-4	2.0 Ω Max
DC RESISTANCE R9-10	1.5 Ω Max
DC RESISTANCE R7-12	1.5 Ω Max

DIELECTRIC STRENGTH	
Between PRI, SEC1 (W1, W2) and SEC2, SEC3 (W3, W4)	2700Vac (50Hz; 1 mA; 60 sec)
Between PRI (W1) and SEC1 (W2)	500Vac (50Hz; 1 mA; 60 sec)
Between SEC 3 (W3) and SEC3 (W4)	1000Vac (50Hz; 0.04 mA; 60 sec)
TURN RATIO (10kHz/1Vac)	
W1 : W2 : W3 : W4	10 : 25 : 25 : 25

FLYT-010

Flyback Tr. 2.7mH 1 : 4.76 : 7.14



INDUCTIVE COMPONENTS / **FLYBACK TRANSFORMER**

APPLICATIONS

- Mains Isolated flyback transformer for industrial / white goods use

01 FEATURES

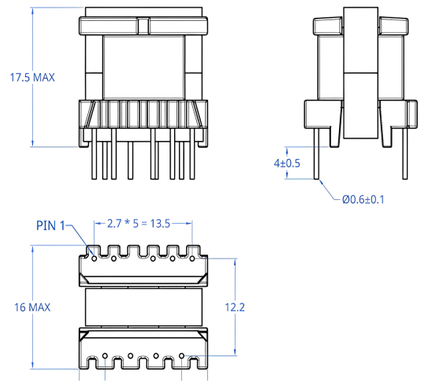
- Power: 10W
- Switching Frequency: 60kHz
- Weight : <15 g.

02 OPERATION

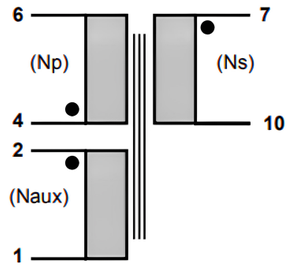
- Vin Range =(200-380)V, Vaux/Iaux =18.3 V/10mA, Vout/Iout =12V/800mA
- Operating temperature -40/+125°C

03 SPECIFICATIONS

DIMENSIONS (mm)



ELECTRICAL DIAGRAM



ELECTRICAL SPECIFICATIONS

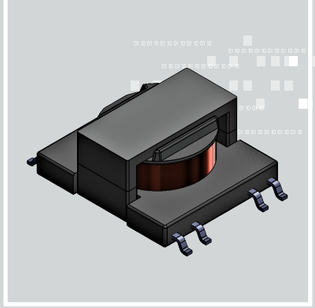
MAG. INDUCTANCE at 25°C	
L(4 – 6)	2.7 mH Typ
LEAKAGE INDUCTANCE	
PRIMARY (4 – 6)	75 µH MAX
DC RESISTANCE at 25°C	
DC RESISTANCE R1-6	8.6 Ω Max
DC RESISTANCE R2-1	1.5 Ω Max
DC RESISTANCE R7-10	152 mΩ Max

DIELECTRIC STRENGTH	
Between PRI (Np) and AUX (Naux)	1 1.5kV (50Hz; 3 mA; 2 sec)
Between PRI, AUX (Np , Naux) and SEC (Ns)	4kV (50Hz; 3 mA; 2 sec)
TURN RATIO (10kHz/1Vac)	
Np : Naux : Ns	1 :4.76 : 7.14

FLYT-011

Flyback Tr. 14.4uH 8:5:14:14

INDUCTIVE COMPONENTS / **FLYBACK TRANSFORMER**



APPLICATIONS

- AC/DC and DC/DC main boards in xEV converters, Low power applications

01 FEATURES

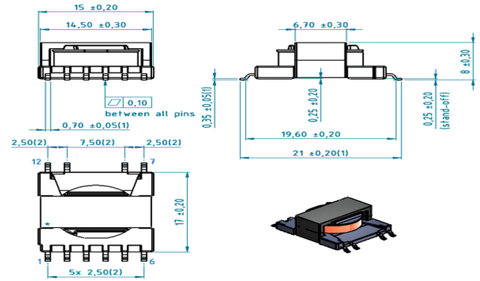
- Power: 1.75 W
- Switching Frequency: 115 ±15 kHz
- Weight: < 5g.

02 OPERATION

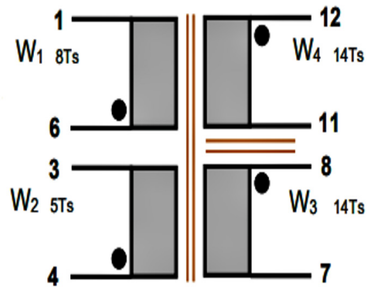
- Vin Range =(7-8)V, Vout/Iout = 5V/50mA, (2x) 15V/50mA
- Operating temperature -40/+125°C
- ESTIMATED TOTAL LOSSES (@115kHz, Pout=1.75W, Vin=12V, 100°C):
- Copper losses (DC) 50 mW
- Core losses 50 mW
- Total losses 0.1 W

03 SPECIFICATIONS

DIMENSIONS (mm)



ELECTRICAL DIAGRAM



ELECTRICAL SPECIFICATIONS

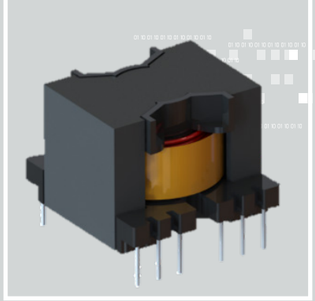
MAG. INDUCTANCE at 25°C	
L (1-6) (100kHz, 0.1Vac)	14.4µH ±10%
LEAKAGE INDUCTANCE	
PRIMARY Llk (1-6) (60kHz, 0.1Vac)	380 nH MAX
DC RESISTANCE at 25°C	
DC RESISTANCE R1-6	90 mΩ Max
DC RESISTANCE R3-4	0.3 Ω Max
DC RESISTANCE R7-8	0.61 Ω Max
DC RESISTANCE R11-12	0.61 Ω Max

DIELECTRIC STRENGTH	
Between (W1, W2) and (W3, W4)	3kVac (50Hz; 1 mA; 60 sec)
Between (W1, W2) / (W3, W4)	1.5kVac (50Hz; 1 mA; 60 sec)
TURN RATIO (10kHz/1Vac)	
W1: W2 : W3 : W4	8 : 5 : 14 : 14

FLYT-012

Flyback DCM Prim:100-400V Sec:3x12V 80kHz

INDUSTRIAL COMPONENTS / **FLYBACK TRANSFORMER**



APPLICATIONS

- Automotive EV/PHV AC/DC onboard battery chargers

01 FEATURES

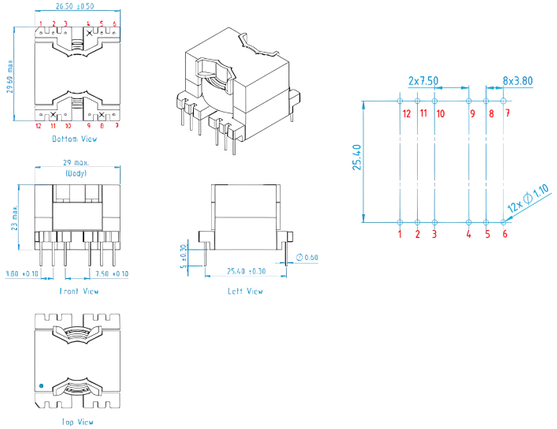
- DCM Flyback
- THT mounting
- Weight : approx 37g.

02 OPERATION

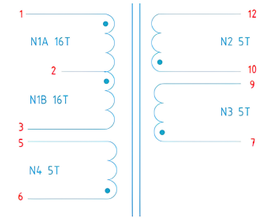
- Operating temperature -40/+125°C
- Switching frequency 80kHz
- Input Prim: 100-400V/0.6Arms/1.4Apk
- Output Sec1: 12V/1.5A; Sec2: 12V/0.4A; Sec3: 12V/0.1A
- ESTIMATED TOTAL LOSSES:
- DC-Copper losses (Vin=100V/100°C) 0.8 W
- Core losses (Vin=400V/132kHz/100°C) 0.13 W

03 SPECIFICATIONS

DIMENSIONS (mm)



ELECTRICAL DIAGRAM



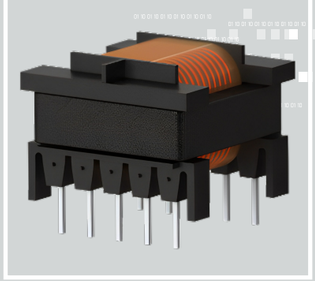
ELECTRICAL SPECIFICATIONS

MAG. INDUCTANCE at 25°C	
L(4 – 6)	2.7 mH Typ
LEAKAGE INDUCTANCE	
PRIMARY (1 – 3) All Secondary shorted	10 µH MAX
DIELECTRIC STRENGTH	
Between PRI (N1A, N1B) and SEC (N2,N3,N4)	3000Vac (50/60Hz; 3 mA; 2 sec)
Between SEC-N2 and SEC-N3	3000Vac (50/60Hz; 3 mA; 2 sec)
Between windings and core	500Vac (50/60Hz; 3 mA; 2 sec)
TURN RATIO (10kHz/1Vac)	
(N1A+N1B) : N2 : N3 : N4	32 : 5 : 5 : 5

FLYT-013

Flyback Trafo 3.4W 84kHz DCM

INDUCTIVE COMPONENTS / **FLYBACK TRANSFORMER**



APPLICATIONS

- Automotive EV/PHV AC/DC onboard battery chargers

01 FEATURES

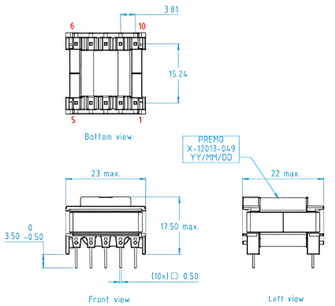
- DCM Flyback
- THT mounting
- Weight : approx 15g.

02 OPERATION

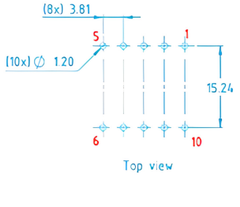
- Operating temperature -40/+125°C
- Switching frequency 84kHz
- Input Prim: 9-16V
- Output Sec1: 15V/0.1-0.16A; Sec2: +5V / 0.03 to 0.05 A
- ESTIMATED TOTAL LOSSES (@100kHz, Pout=2.8W, Vin=9V, 150°C):
- Total losses 0.08 W

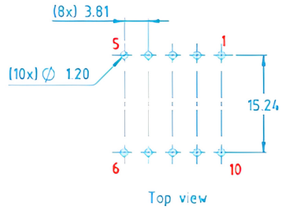
03 SPECIFICATIONS

DIMENSIONS (mm)



ELECTRICAL DIAGRAM





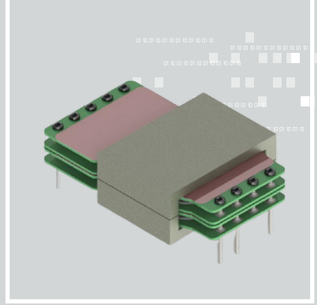
ELECTRICAL SPECIFICATIONS

MAG. INDUCTANCE at 25°C	
L(1,2 – 4,5)	22.5 µH Min < 25 µH Typ < 27.5 µH Max
LEAKAGE INDUCTANCE	
PRIMARY (1,2 – 4,5) All Secondary shorted	0.5 µH MAX
DIELECTRIC STRENGTH	
Between PRI (B1, B2) and SEC (B3, B4)	2000Vac (50/60Hz; 3 mA; 2 sec)
Between windings and core	2000Vac (50/60Hz; 3 mA; 2 sec)
TURN RATIO (10kHz/1Vac)	
(N1A+N1B) : N2 : N3 : N4	32 : 5 : 5 : 5
DC RESISTANCE at 25°C	
B1 : B2 : B3 : B4	10 : 10 : 20 : 7

FLYT-014

Flyback Tr. 645uH 32:3:2+4

INDUCTIVE COMPONENTS / **FLYBACK TRANSFORMER**



APPLICATIONS

- Medical and industrial applications

01 FEATURES

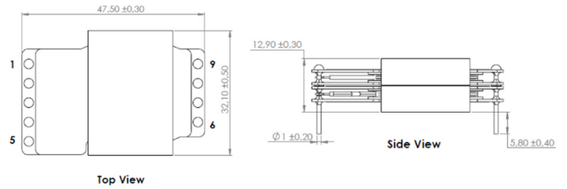
- DCM Flyback
- Input Voltage 300 to 400 Vdc
- Output Voltage (Sec 1 + Sec2) 25 Vdc / 1,80 A
- Auxiliary 15 Vdc / 5 mA
- Switching Frequency 130 kHz

02 OPERATION

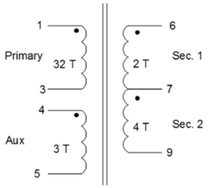
- Operating temperature -50/+85°C
- ESTIMATED TOTAL LOSSES (@ 100°C):
- Copper losses (DC) 1,50 mW
- Core losses 0,50 W
- Total losses 2 W

03 SPECIFICATIONS

DIMENSIONS (mm)



ELECTRICAL DIAGRAM

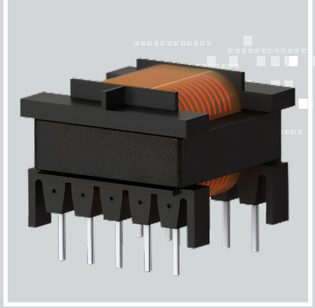


ELECTRICAL SPECIFICATIONS

MAG. INDUCTANCE at 25°C	
L(1,3)	645 uH ± 10%
LEAKAGE INDUCTANCE	
PRIMARY (1,3 – 5,6 shorted)	7 uH MAX
DIELECTRIC STRENGTH	
Between PRI - AUX (1-3, 4,5) and Sec (6,9)	2kV (50/60Hz; 1 mA; 2 sec)
Between PRI (1,3) and CORE	1KV (50/60Hz; 1 mA; 2 sec)
Between PRI (6,9) and CORE	1KV (50/60Hz; 1 mA; 2 sec)
TURN RATIO (10kHz/1Vac)	
PRIM : AUX : SEC	32 : 3 : 2 + 4

FLYT-015

Flyback Trafo EF20 14W 250kHz



APPLICATIONS

- Automotive EV/PHV AC/DC onboard battery chargers

01 FEATURES

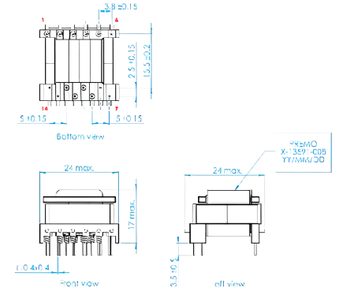
- CCM Flyback
- THT mounting
- Weight : approx 12g.

02 OPERATION

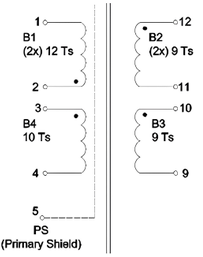
- Operating temperature -40/+125°C
- Switching frequency 250kHz
- Input Prim: 10-26V
- Output Sec1: 12V/1A; Sec2: 12V/100mA; Sec3: 14V/30mA
- ESTIMATED TOTAL LOSSES
- DC-Copper losses (Vin=10V/100°C) 0.5 W
- Core losses (Vin=26V/250kHz/100°C) 0.1 W

03 SPECIFICATIONS

DIMENSIONS (mm)



ELECTRICAL DIAGRAM



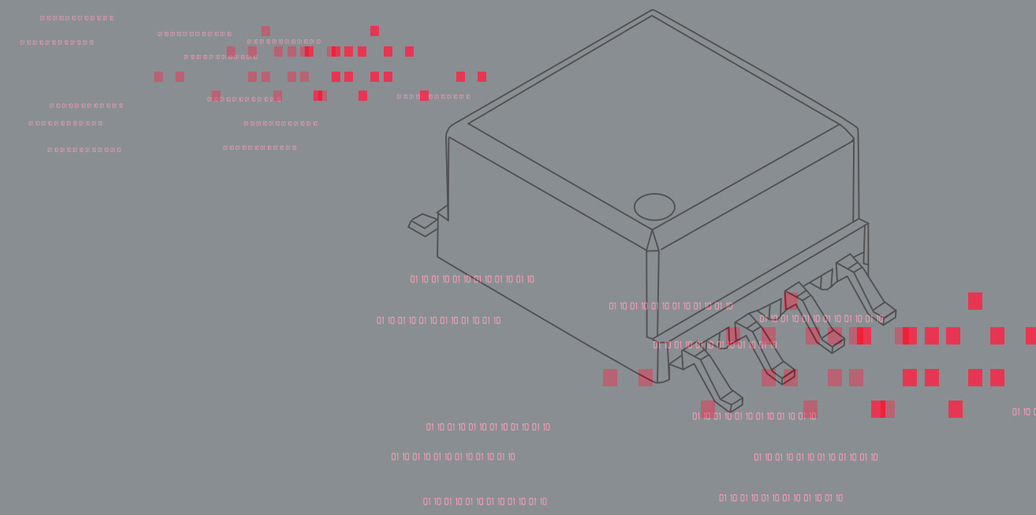
ELECTRICAL SPECIFICATIONS

MAG. INDUCTANCE at 25°C	
L(1 – 2)	25 µH MIN < 29 µH TYP < 32 µH MAX
LEAKAGE INDUCTANCE	
PRIMARY (1–2) All Secondary shorted	1 µH MAX
DIELECTRIC STRENGTH	
Between PRI-B1/SEC-B4 and SEC (B2, B3)	5000Vdc (5 mA; 2 sec)
Between PRIM-B1 and SEC-B4	100Vdc (5 mA; 2 sec)
Between SEC-B2 and SEC-B3	100Vdc (5 mA; 2 sec)
Between PRI-B1 and Shield-PS	100Vdc (5 mA; 2 sec)
Between SEC-B4 and Shield-PS	100Vdc (5 mA; 2 sec)
TURN RATIO (10kHz/1Vac)	
B1 : B2 : B3 : B4	12 : 9 : 9 : 10

4.11

INDUCTIVE COMPONENTS

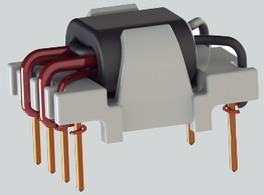
PLC TRANSFORMERS



PLC-001

2-30MHz 1:1:1 6µH

INDUCTIVE COMPONENTS / **PLC TRANSFORMERS**



APPLICATIONS

- Automotive EV/PHV AC/DC onboard battery chargers

01 FEATURES

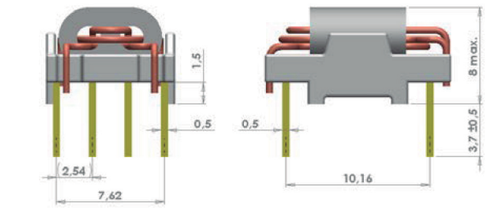
- Signal transformer for HPGP (HomePlug Green PHY™) PLC modems
- For power line communication devices acc. to IEC 15118 standard
- For charging systems according to IEC 61851-1
- PTH technology
- Wide operating temperature range -40 to +125°C
- UL94 and RoHS materials
- AEC-Q200 qualified
- Weight : approx 1gram

02 OPERATION

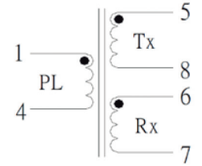
- PLC signal transmission
- OBC with communication with the charging station

03 SPECIFICATIONS

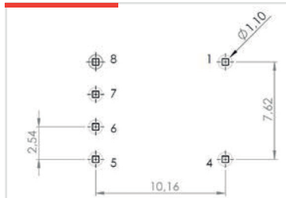
DIMENSIONS (mm)



ELECTRICAL DIAGRAM



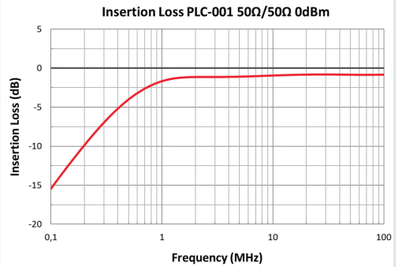
RECOMMENDED PAD-LAYOUT



ELECTRICAL SPECIFICATIONS

INDUCTANCE at 25°C	
$L_{1-4} = L_{5-8} = L_{6-7}$ (100kHz/20mVac)	3.5µH < 5µH TYP < 6.5µH
TURN-RATIO	
$N_{1-4} : N_{5-8} : N_{6-7}$ (10kHz/1Vac)	1:1:1
DC RESISTANCE at 25°C	
$DCR_{1-4} = DCR_{5-8} = DCR_{6-7}$	25mΩ MAX
DIELECTRIC STRENGTH	
Between Windings	500Vac (50Hz/1mA/1min)

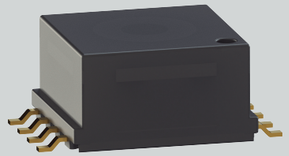
CURVES OF PERFORMANCES



PLC-002

2-30MHz 1:1 15µH

INDUCTIVE COMPONENTS / **PLC TRANSFORMERS**



APPLICATIONS

- Automotive EV/PHV AC/DC onboard battery chargers

01 FEATURES

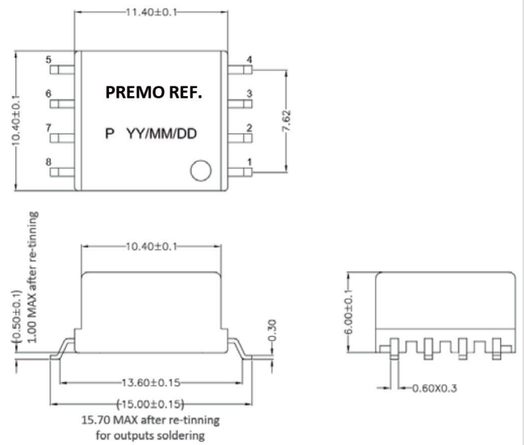
- Signal transformer for HPGP (HomePlug Green PHY™) PLC modems
- For power line communication devices acc. to IEC 15118 standard
- For charging systems according to IEC 61851-1
- PTH technology
- Wide operating temperature range -40 to +125°C
- UL94 and RoHS materials
- AEC-Q200 qualified
- Weight : approx 2grams

02 OPERATION

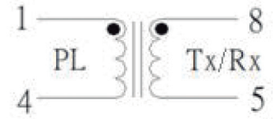
- PLC signal transmission
- OBC with communication with the charging station

03 SPECIFICATIONS

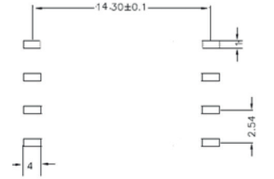
DIMENSIONS (mm)



ELECTRICAL DIAGRAM



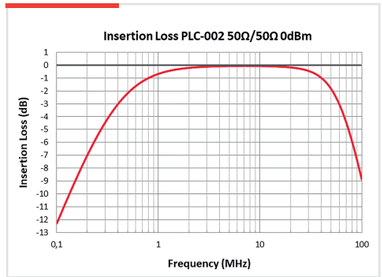
RECOMMENDED PAD-LAYOUT



ELECTRICAL SPECIFICATIONS

INDUCTANCE at 25°C	
$L_{1-4} = L_{5-8}$ (2MHz/1Vac)	10µH MIN (15µH TYP)
TURN-RATIO	
$N_{1-4} : N_{8-5}$ (10kHz/1Vac)	1:1
DC RESISTANCE at 25°C	
$DCR_{1-4} = DCR_{5-8}$	60mΩ MAX (41mΩ TYP)
LEAKAGE INDUCTANCE	
L_{LK} (100kHz/1Vac)	0.25µH MAX (0.1µH TYP)
STRAY CAPACITANCE	
C_{PS} (100kHz/1Vac)	2pF MAX (0.3pF TYP)
DIELECTRIC STRENGTH	
Between Windings	500Vac (50Hz/1mA/1min)

TYPICAL INDUCTANCE

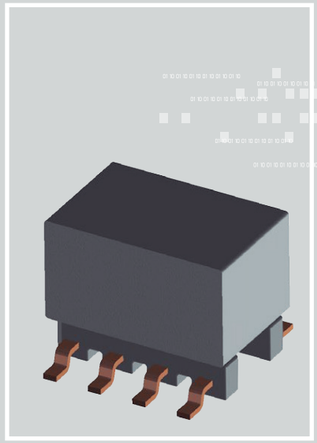


New

PLC-LW-001

2-30MHz 1:1 15µH

INDUCTIVE COMPONENTS / **PLC TRANSFORMERS**



APPLICATIONS

› Automotive EV/PHV AC/DC onboard battery chargers

01 FEATURES

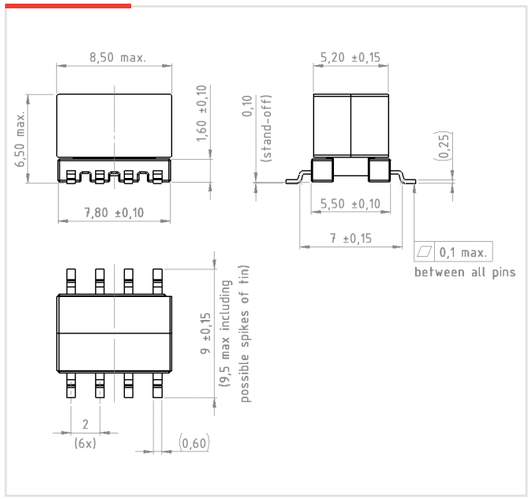
› Signal transformer for HPGP (HomePlug Green PHY™) PLC modems
› For power line communication devices acc. to IEC 15118 standard
› For charging systems according to IEC 61851-1
› Insertion loss < 1dB on 2-30MHz (100-120 Ohms)
› SMD coil-former technology
› Wide operating temperature range -40 to +125˚C
› UL94 and RoHS materials
› Designed for AEC-Q200
› Weight: approx 3grams

02 OPERATION

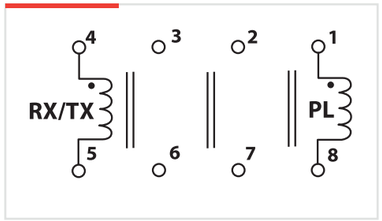
› PLC signal transmission
› OBC with communication with the charging station

03 SPECIFICATIONS

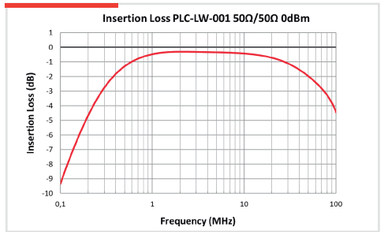
DIMENSIONS (mm)



ELECTRICAL DIAGRAM



TYPICAL INDUCTANCE



ELECTRICAL SPECIFICATIONS

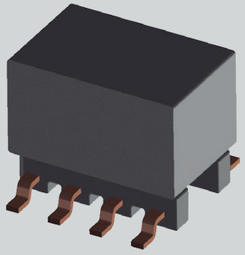
INDUCTANCE at 25°C	
$L_{1-8} = L_{4-5}$ (2MHz/1Vac)	9µH MIN (15µH TYP)
TURN-RATIO	
$N_{1-8} : N_{4-5}$ (10kHz/1Vac)	1:1
DC RESISTANCE at 25°C	
$DCR_{1-8} = DCR_{4-5}$	80mΩ MAX (65mΩ TYP)
LEAKAGE INDUCTANCE	
L_{LK} (100kHz/1Vac)	0.25µH MAX (0.1µH TYP)
STRAY CAPACITANCE	
C_{PS} (100kHz/1Vac)	7pF MAX (5pF TYP)
DIELECTRIC STRENGTH	
Between Windings	500Vac (50Hz/1mA/1min)

New

PLC-LW-002

2-30MHz 1:1:1 15µH

INDUCTIVE COMPONENTS / **PLC TRANSFORMERS**



APPLICATIONS

- Automotive EV/PHV AC/DC onboard battery chargers

01 FEATURES

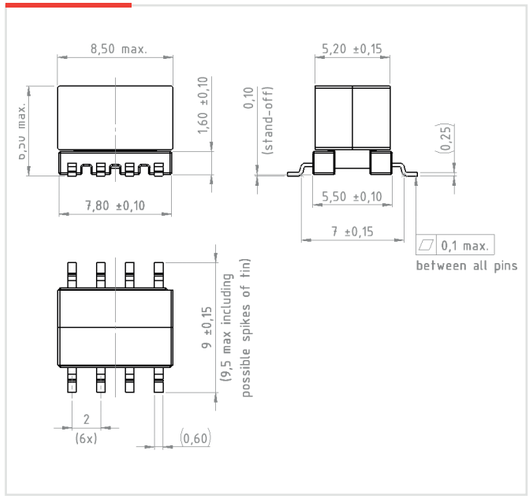
- Signal transformer for HPGP (HomePlug Green PHY™) PLC modems
- For power line communication devices acc. to IEC 15118 standard
- For charging systems according to IEC 61851-1
- Insertion loss < 1dB on 2-30MHz (100-120 Ohms)
- SMD coil-former technology
- Wide operating temperature range -40 to +125°C
- UL94 and RoHS materials
- Designed for AEC-Q200
- Weight: approx 3grams

02 OPERATION

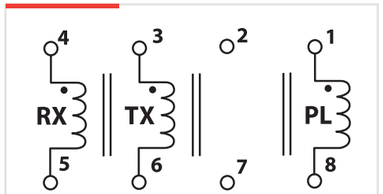
- PLC signal transmission
- OBC with communication with the charging station

03 SPECIFICATIONS

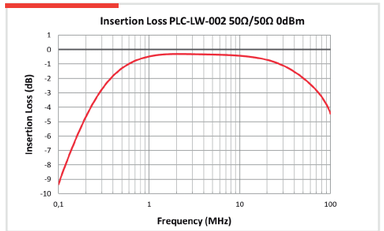
DIMENSIONS (mm)



ELECTRICAL DIAGRAM



TYPICAL INDUCTANCE

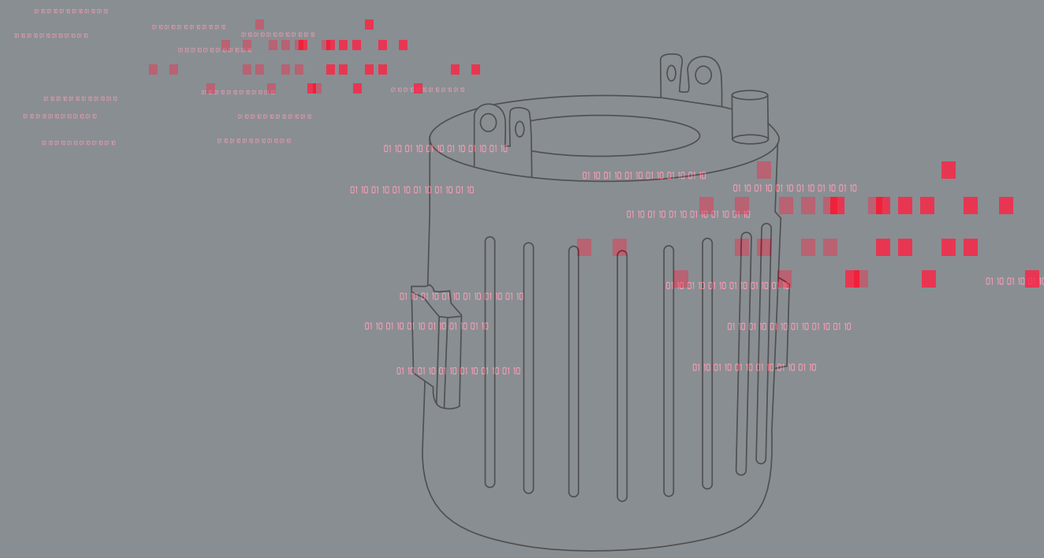


ELECTRICAL SPECIFICATIONS

INDUCTANCE at 25°C	
$L_{1-8} = L_{3-6} = L_{4-5}$ (2MHz/1Vac)	9µH MIN (15µH TYP)
TURN-RATIO	
$N_{1-8} : N_{3-6} : N_{4-5}$ (10kHz/1Vac)	1:1:1
DC RESISTANCE at 25°C	
$DCR_{1-8} = DCR_{3-6} = DCR_{4-5}$	90mΩ MAX (70mΩ TYP)
LEAKAGE INDUCTANCE	
L_{LK} (100kHz/1Vac)	0.25µH MAX (0.1µH TYP)
STRAY CAPACITANCE	
C_{PS} (100kHz/1Vac)	7pF MAX (5pF TYP)
DIELECTRIC STRENGTH	
Between Windings	500Vac (50Hz/1mA/1min)

4.12

COOLED MAGNETICS
INDUCTIVE COUPLERS

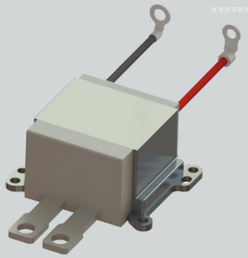


New

BCBM-1.8KW-001

100KHz 20:1 25µH

INDUCTIVE COMPONENTS / **COOLED MAGNETICS**



APPLICATIONS

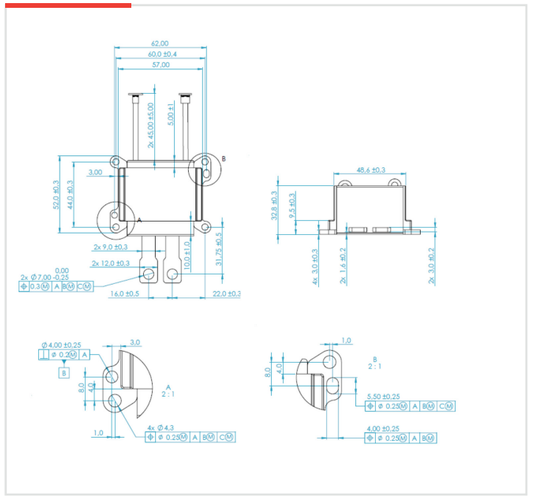
- 1.8kW transformer for Dual Active Bridge DC-DC converter

01 FEATURES

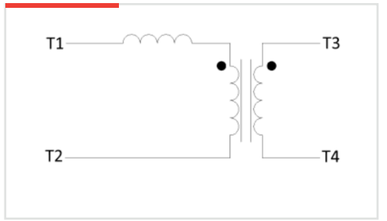
- Aluminum enclosure and covered with high thermal conductivity compound.
- Integrated leakage.
- High voltage to Low voltage.
- Approx weight: 255g
- Topology Dual active bridge Trafo
- Total Output Power 1,8 kW
- Input Voltage 240-410 Vdc
- Output Voltage 8-16 Vdc
- Switching Frequency: 100kHz
- Max Duty Cycle 48.5%
- Operating Temperature: -30°C to +110°C

02 SPECIFICATIONS

DIMENSIONS (mm)



ELECTRICAL DIAGRAM



ELECTRICAL SPECIFICATIONS

INDUCTANCE	
PRIMARY INDUCTANCE	1mH min
Leakage Inductance	25µH ±20%
TURN-RATIO	
Prim (1-2) : Sec (3-5)	20:1
DC RESISTANCE @25°C	
(1-2)	30 mΩ MAX
(3-4)	0,35 mΩ MAX

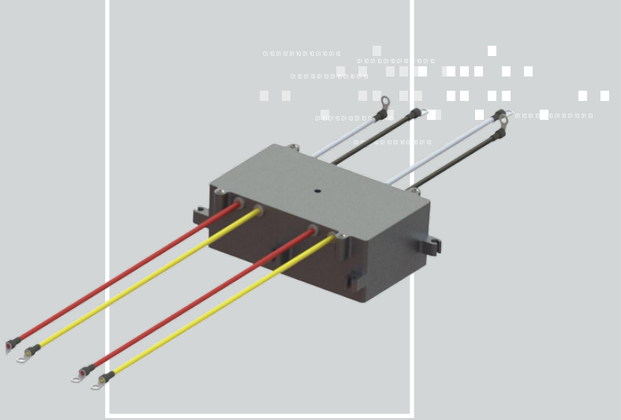
DIELECTRIC STRENGTH (1)	
1-2 TO 3-4 5mA	2000, Vac 50/60kHz
1-2 TO BOX 5mA	1000, Vac 50/60kHz
3-4 TO BOX 5mA	500, Vac 50/60kHz
IMPULSE WINDING	
PRIMARY (1-2)	2000 Vac (10 pulse, area <5%)

New

BCBM-11KW-001

145-200KHz 4+16:16 66.2µH

INDUCTIVE COMPONENTS / **COOLED MAGNETICS**



APPLICATIONS

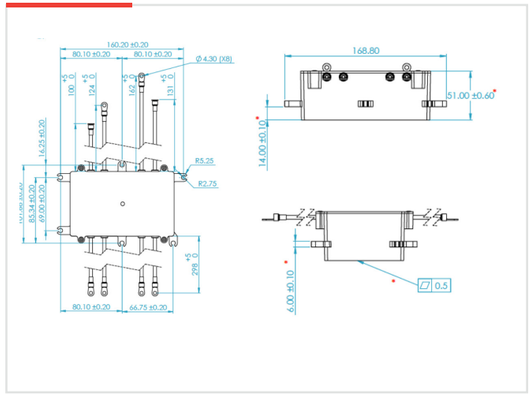
- Double 5.5kW LLC set with transformer and resonance inductor

01 FEATURES

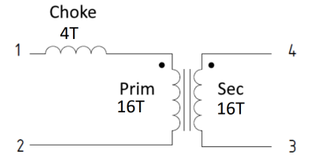
- A total 11kW part enclosed in a whole aluminum housing and filled with themal compound
- Recommended coolant temp: 65°C or less
- Approx weight: 1600g
- Input: 850-400V / <16.3Arms
- Output: 850-400V / <12.5Arms
- Switching Frequency: 145-200KHz
- Duty: 47%
- AMBIENT TEMPERATURE - 40 to 85 °C

02 SPECIFICATIONS

DIMENSIONS (mm)



ELECTRICAL DIAGRAM



ELECTRICAL SPECIFICATIONS

INDUCTANCE	
PRIMARY INDUCTANCE	66.2 µH ± 8 %
Leakage Inductance	12.4µH
TURN-RATIO	
1-2 : 3-4	4+16:16
DC RESISTANCE at 25°C	
(1-2)	43 mOhms Max
(3-4)	37 mOhms Max

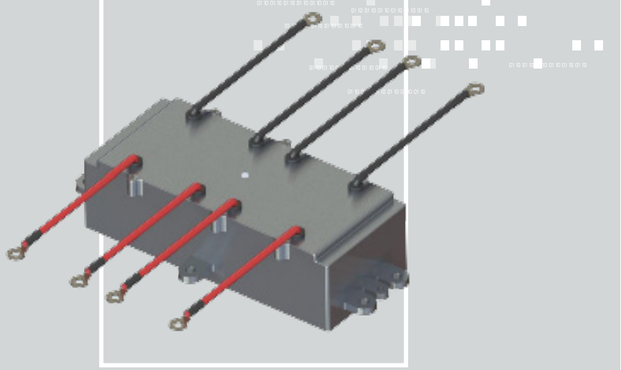
DIELECTRIC STRENGTH (1)	
PRIMARY/CHOKE TO BOX	2500 Vac (50/60Hz; 3 mA; 2 sec)
PRIMARY/CHOKE TO SECONDARY	2500 Vac (50/60Hz; 3 mA; 2 sec)
SECONDARY TO BOX	2500 Vac (50/60Hz; 3 mA; 2 sec)
Isolation (Prim - Sec)	2.5kV
Isolation (Prim - Box)	2.5kV
Isolation (Box - Sec)	2.5kV

New

BCBM-22KW-002

145-250 KHz 6 + 16 : 12 20µH

INDUCTIVE COMPONENTS / **COOLED MAGNETICS**



APPLICATIONS

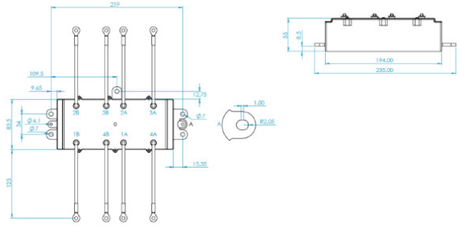
- Double 11.6kW LLC set with transformer and resonance inductor

01 FEATURES

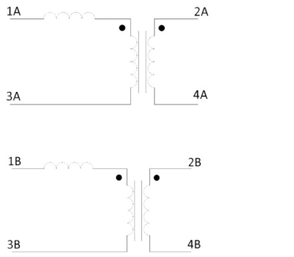
- A total 23.2kW part enclosed in a whole aluminum housing and filled with thermal compound.
- Recommended coolant temp: 65°C or less
- Approx weight: 1600g
- Resonant inductance 20µH
- Input <1255V / <16.8Arms
- Output 850-400V / <12.5Arms
- Switching frequency: 145-250KHz
- Extended frequency 250-500KHz
- Duty: 50%

02 SPECIFICATIONS

DIMENSIONS (mm)



ELECTRICAL DIAGRAM



ELECTRICAL SPECIFICATIONS

INDUCTANCE	
Leakage Inductance	20µH ±10% (2)
TURN-RATIO	
Turns Ratio	6 + 16 : 12
DC RESISTANCE @25°C	
(1A – 3A) (1B – 3B)	55 mΩ MAX (3)
(2A – 4A) (2B – 4B)	30 mΩ MAX (3)

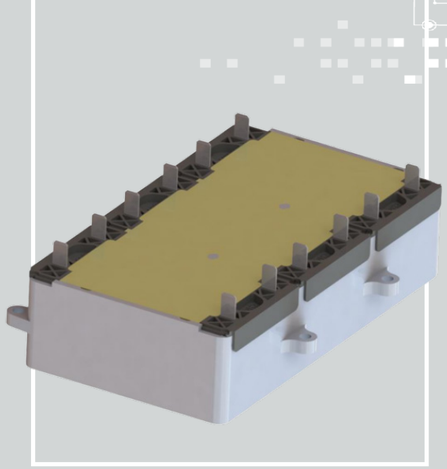
DIELECTRIC STRENGTH (1)	
Primary + Choke to Secondary	5mA, 2500, Vac 50/60Hz
Primary + Choke to Box	5mA, 2500, Vac 50/60Hz
Secondary to Box	5mA, 2500, Vac 50/60Hz
Isolation (Prim - Sec)	2.5kV
Isolation (Prim - Box)	2.5kV
Isolation (Box - Sec)	2.5kV

New

BCBM-11KW-004

115uH 14:15 98-150KHz

INDUCTIVE COMPONENTS / **COOLED MAGNETICS**



APPLICATIONS

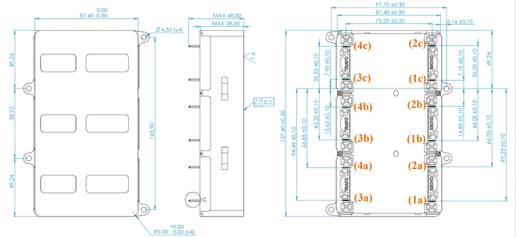
- Triple 3.6 KW LLC set with transformer and resonance inductor

01 FEATURES

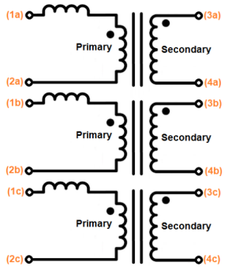
- A total 11kW part enclosed in a whole aluminum housing and filled with themal compound.
- Recommended coolant temp: 65°C or less
- Input 400V
- Output 240-460V / <14.7Arms
- Switching frequency 98-150KHz
- Duty 50%
- Approx weight: 1500g

02 SPECIFICATIONS

DIMENSIONS (mm)



ELECTRICAL DIAGRAM



ELECTRICAL SPECIFICATIONS

INDUCTANCE	
Resonant Inductance	20μH
TURN-RATIO	
Turn Ratio	14 : 15
DC PRIM RESISTANCE	
(1a)-(2a)	20.5Typ mΩ
(1b)-(2b)	20.5Typ mΩ
(1c)-(2c)	20.5Typ mΩ

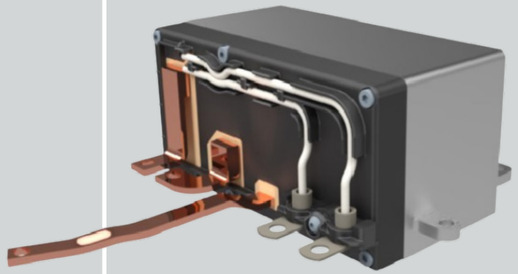
DIELECTRIC STRENGTH	
Isolation (Prim - Sec)	2.0kV
Isolation (Prim - Box)	4.0kV
Isolation (Box - Sec)	2.0kV

New

BCBM-7KW-002

22:1+1:5 400uH

INDUCTIVE COMPONENTS / **COOLED MAGNETICS**



APPLICATIONS

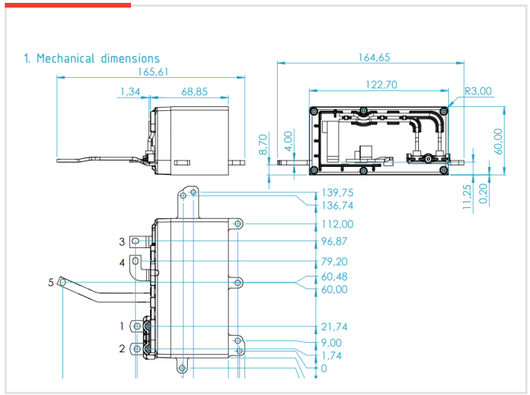
- 4.5kW Phase-shifted transformer plus inductor

01 FEATURES

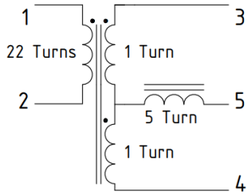
- Inductor Inductance at 295Abias 1.5µH ± 10%
- Inductor Resistance 0.32mΩ typ.
- Operating temperature -40 to 125°C

02 SPECIFICATIONS

DIMENSIONS (mm)



ELECTRICAL DIAGRAM



ELECTRICAL SPECIFICATIONS

INDUCTANCE	
Primary Inductance	1-2: 400µH
Primary leakage inductance	1-2: 14.5µH
Inductance 3-4 (1V / 100kHz)	3.31µH
Inductance 3-5 (1V / 100kHz)	4.26µH
Inductor at 295A	1.5µH
RESISTANCE	
Primary Resistance 1-2	26mΩ typ
Secondary Resistance	3-4: 0.145mΩ typ.
Inductor Resistance 3-5:	0.544mΩ typ.
Inductor Resistance 4-5	0.531mΩ typ.

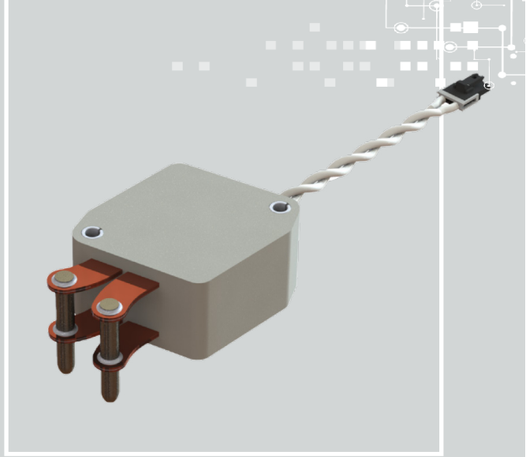
DIELECTRIC STRENGTH	
Isolation (Prim - Sec)	3kV
Isolation (Prim - Box)	2.5kV
Isolation (Box - Sec)	3kV

New

BCBM-2KW-001

2kW 83:1 800V

INDUCTIVE COMPONENTS / **COOLED MAGNETICS**



APPLICATIONS

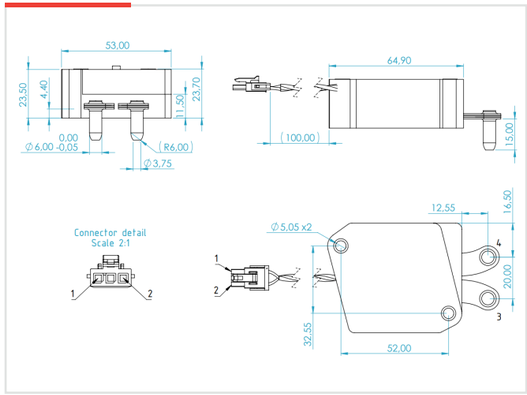
- 2kW transformer for Dual Active Bridge DC-DC converter

01 FEATURES

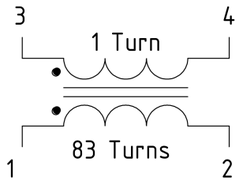
- Rated Voltage / Rated Power 800V / 2kW
- Primary losses AC+DC (3.2Arms, 100kHz) 11.2W
- Secondary losses AC+DC (200Arms, 100kHz) 8.0W
- Core losses (800Vrms, 100kHz) 1.4W
- Estimated mass 343g
- Operating temperature -40°C to 125°C
- Inductor Inductance at 295Abias 1.5µH ± 10%
- Inductor Resistance 0.32mΩ typ.
- Operating temperature -40 to 125°C

02 SPECIFICATIONS

DIMENSIONS (mm)



ELECTRICAL DIAGRAM



ELECTRICAL SPECIFICATIONS

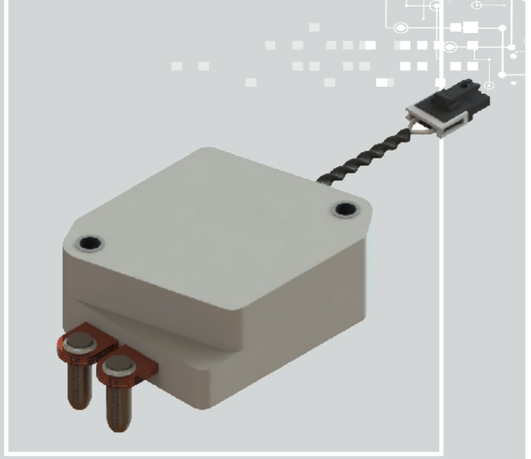
INDUCTANCE	
Magnetizing inductance (1Vac/ 100kHz)	10mH min.
Leakage inductance (1Vac/ 100kHz)	230µH ± 10µH
RESISTANCE	
Primary Resistance 1-2	380mΩ typ.
Secondary Resistance 3-4	0.12mΩ typ.
DIELECTRIC STRENGTH	
Primary winding to core	2500 Vac 50/60Hz (3mA; 1min*)
Secondary winding to core	500 Vac 50/60Hz (3mA; 1min*)
Primary to secondary winding	2500 Vac 50/60Hz (3mA; 1min*)

New

BCBM-0.85KW-001

0.85kW 83:1 850V

INDUCTIVE COMPONENTS / **COOLED MAGNETICS**



APPLICATIONS

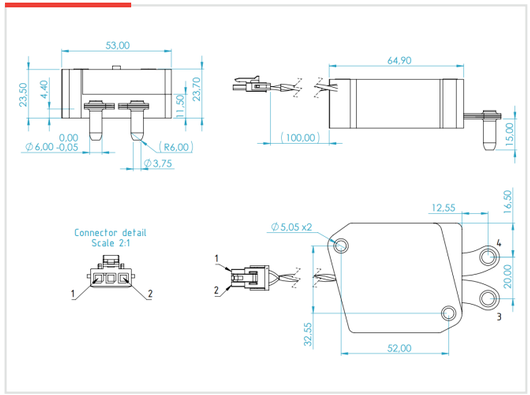
› 0.85kW Transformer for Dual Active Bridge DC-DC converter

01 FEATURES

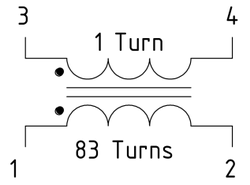
› Estimated Primary losses (1.17Arms, 22°C, without AC effects): 1.24W
› Estimated Secondary losses (100Arms, 22°C, without AC effects): 1.65W
› Estimated Core losses (840Vrms, 100kHz, 22°C): 1.12W
› Estimated mass: 266 grams
› Operating temperature -40 to 125°C
› Storage temperature -40 to 125°C
› Ambient temperature -40 to 85°C

02 SPECIFICATIONS

DIMENSIONS (mm)



ELECTRICAL DIAGRAM



ELECTRICAL SPECIFICATIONS

INDUCTANCE	
Magnetizing inductance (1V/ 100kHz)	10mH min.
Leakage inductance (1V / 100kHz) (3-4 shorted)	460µH ± 5%
RESISTANCE	
Primary Resistance 1-2	420mΩ typ.
Secondary Resistance 3-4	0.13mΩ typ.
DIELECTRIC STRENGTH	
Primary winding to core	2500 Vac 50/60Hz (3mA; 1min*)
Secondary winding to core	500 Vac 50/60Hz (3mA; 1min*)
Primary to secondary winding	2500 Vac 50/60Hz (3mA; 1min*)

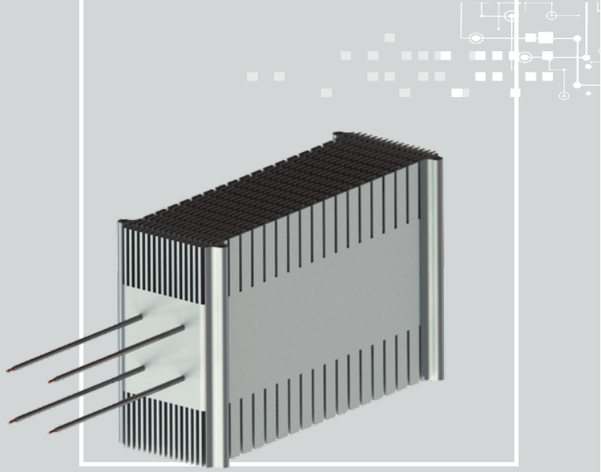
› ***Dielectric strength: 1min for qualification / 2sec in mass production**

New

BCBM-50KW-001

50kW 8:4 620µH

INDUCTIVE COMPONENTS / **OFFBOARD CHARGER TRANSFORMERS**



APPLICATIONS

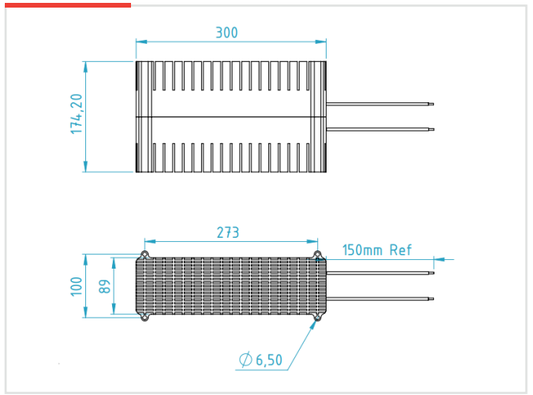
- TRSET 50kW 8:4 Lp620UH Lkp/Lks 32µH/8µH

01 FEATURES

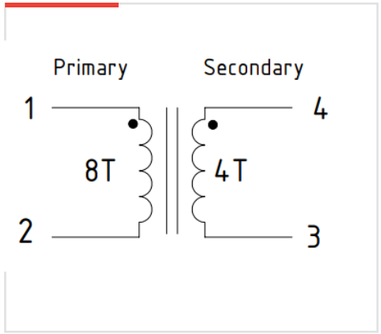
- A total 50 kW part enclosed in a whole aluminum housing and filled with thermal compound.
- Operating temperature -40 to 150°C
- Approx weight: 740g

02 SPECIFICATIONS

DIMENSIONS (mm)



ELECTRICAL DIAGRAM



ELECTRICAL SPECIFICATIONS

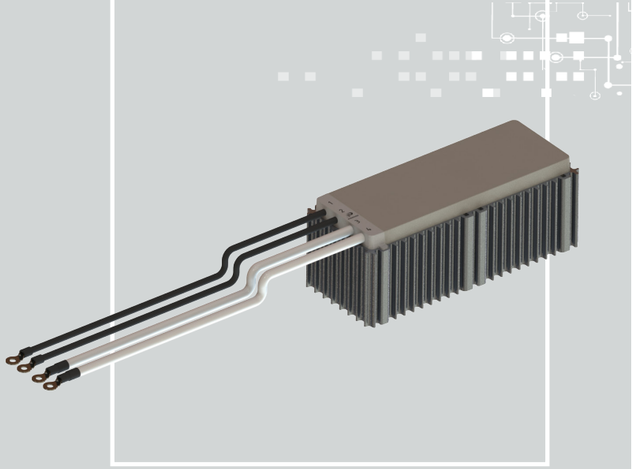
TURN RATIO	**8:4**
INDUCTANCE	
Primary Inductance	(1-2): 620 µH ± 10%
Secondary inductance	(3-4): 155 µH ± 10%
LEAKAGE INDUCTANCE	
(1-2, 3-4 shorted)	32 µH ± 5%
DC RESISTANCE	
1-2	4 mOhm typ
3-4	2 mOhm typ
DIELECTRIC STRENGTH	
Primary to secondary winding	4000 Vac (50/60Hz; 5mA; 2sec)

New

BCBM-12.5KW-001

2kW 2:1 3400µH

INDUCTIVE COMPONENTS / **OFFBOARD CHARGER TRANSFORMERS**



APPLICATIONS

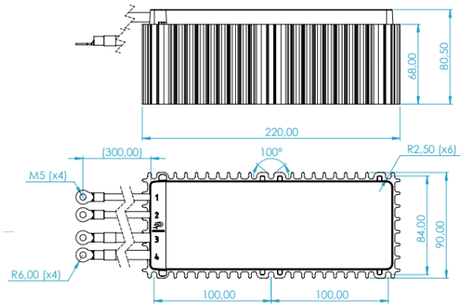
- 12kW 2:1 CLLC Bidirectional Transformer Natural Cooling

01 FEATURES

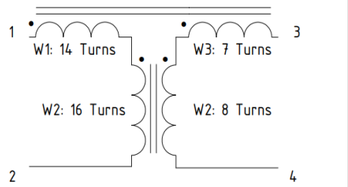
- A total 12.5 kW part enclosed in a whole aluminum housing.
- Operating temperature -40 to 150°C
- Primary Currnent 40Arms
- Secundary Current 80Arms
- Approx weight: 4710g

02 SPECIFICATIONS

DIMENSIONS (mm)



ELECTRICAL DIAGRAM



ELECTRICAL SPECIFICATIONS

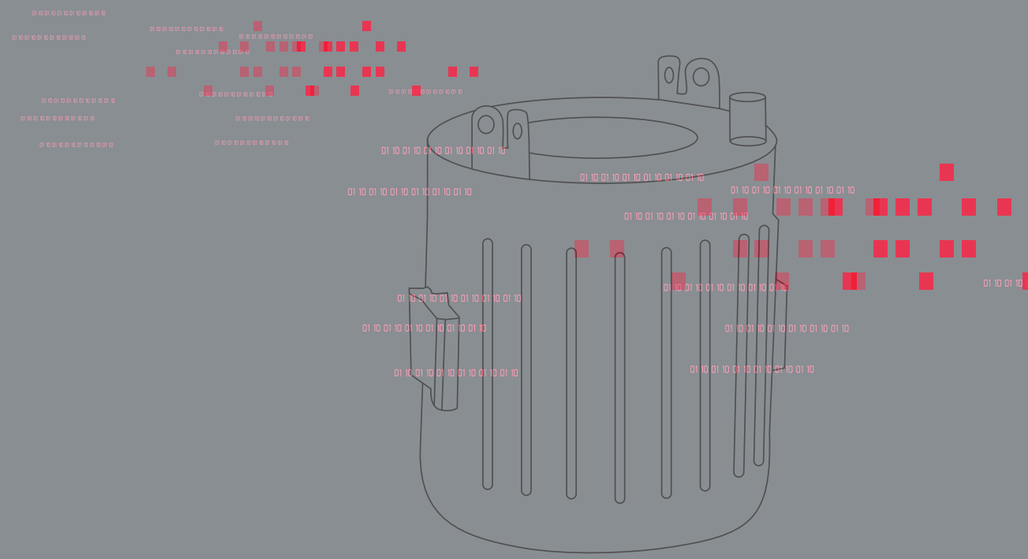
TURN RATIO	**2:1**
PRIMARY INDUCTANCE	
(1V / 100kHz)(1-2, 3-4 open)	3400µH min.
SECONDARY INDUCTANCE	
(1V / 100kHz) (3-4, 1-2 open)	850µH min.
LEAKAGE INDUCTANCE	
(1V / 100kHz) 1-2, 3-4 shorted	119µH ± 5%
3- 4, 1-2 open	29.8µH ± 5%
DC RESISTANCE	
1-2	20mΩ typ.
3-4	6mΩ typ.
DIELECTRIC STRENGTH	
Primary to secondary winding	1500 Vac 50/60Hz (0.5mA; 1min)

05

PLC COMPONENTS

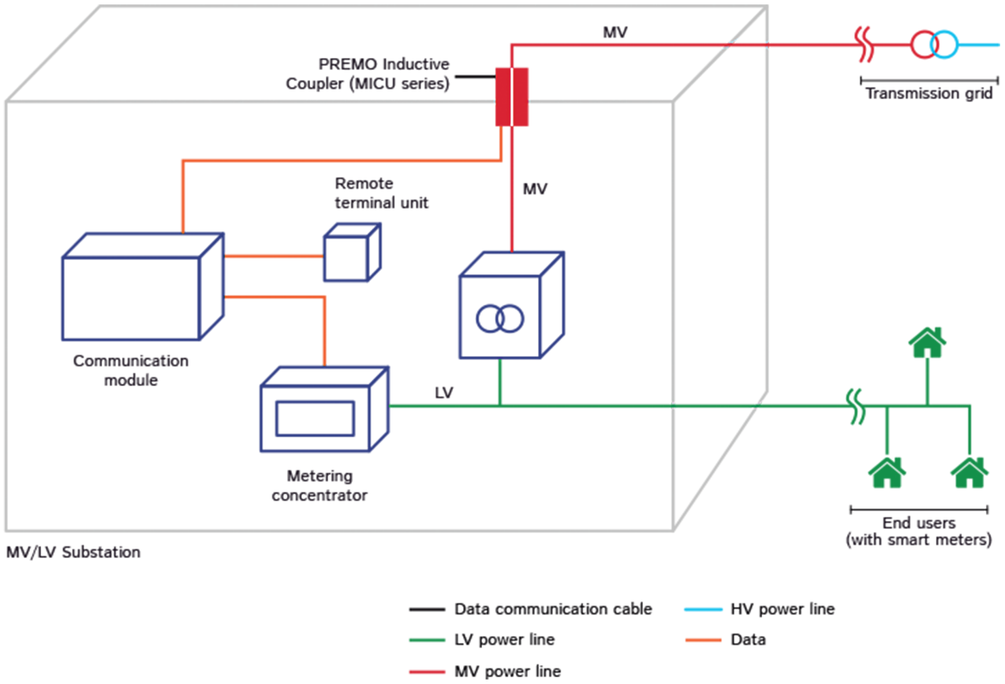
5.1

PLC COMPONENTS
INDUCTIVE COUPLERS

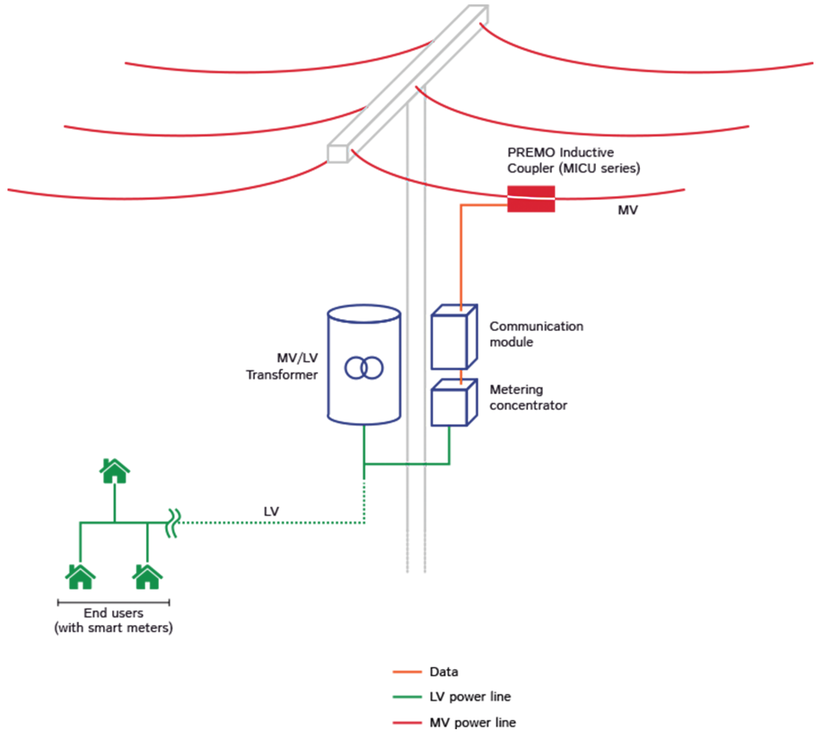


>> MICU

Inductive coupler in MV/LV substation



Inductive coupler in MV/LV overhead transformer

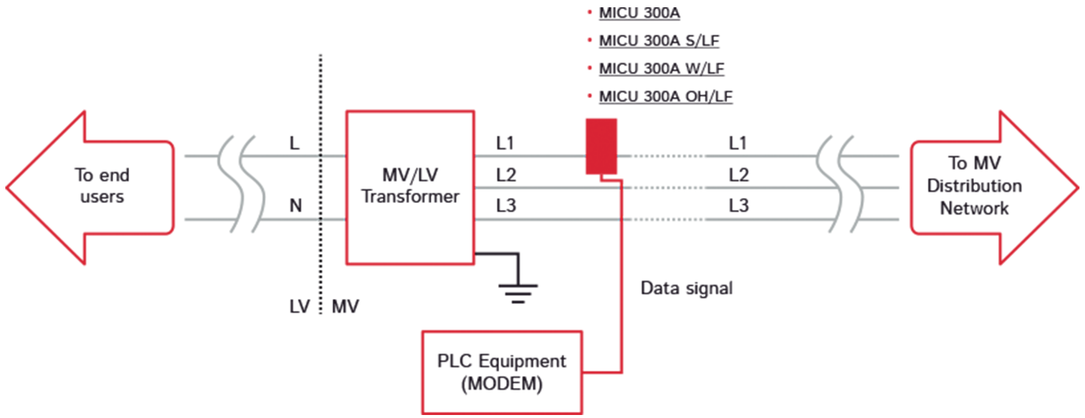


In smart grids inductive couplers are playing a big role as it's transmit the communication signals between powerline and PLC data transceiver without introducing any new wires or cables, being a competitive solution compared with capacitive coupling.

PREMO medium voltage inductive coupler family (MICU 300A-S/LF/OH/W-LF) have been developed for installation in smart grids deployments that requires different levels of isolation, in overhead medium voltage installation (>24kV), or inside cabinets of MV/LV substations (>4.7kV). These compacts and weightless solution if fully compatible with mature and consolidated PRIME PLC standard and G3 popular standard, managed by the G3-PLC Alliance.

These family of products support CENELEC band (Europe) and FCC (USA), which permits the use of frequencies less than 500kHz for narrow band PLC.

PREMO inductive couplers are made with high permeability and performance materials that avoid saturation problems at high currents, allowing long reading distances between MV base transformers. This helps to increase the broadband and to improve the communication efficiency as its offers low insertion losses: 12±2dB (@100-250kHz); 5±2dB (@250kHz-600kHz). These family products offer different connectors (including standards BNC connectors, and also IP67 waterproof connectors).



MICU 300A

Medium Voltage Inductive Coupling Units

PLC COMPONENTS / **INDUCTIVE COUPLERS**

FEATURES

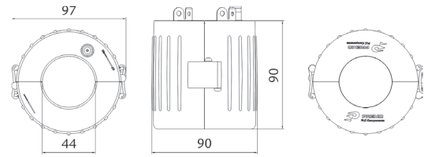
- High current solution made with high permeability high performance nanocrystaline material avoids saturation problems at high currents.
- Low insertion losses –4dB ±2dB (@2MHz a 40MHz range).
- More electrical safety: High insulation: 5 kV.
- Compact equipment: BNC connector integrated in the coupler (other connections available under request).

01 CHARACTERISTICS

- Inner diameter: 44mm
- Height: 90mm
- Height including ground connector: <115mm
- Connection to PLC-modern: female BCN connector
- Connection to Earth: M5 screw
- Typical installation time: 10 minutes
- Operating conditions: indoor services

02 SPECIFICATIONS

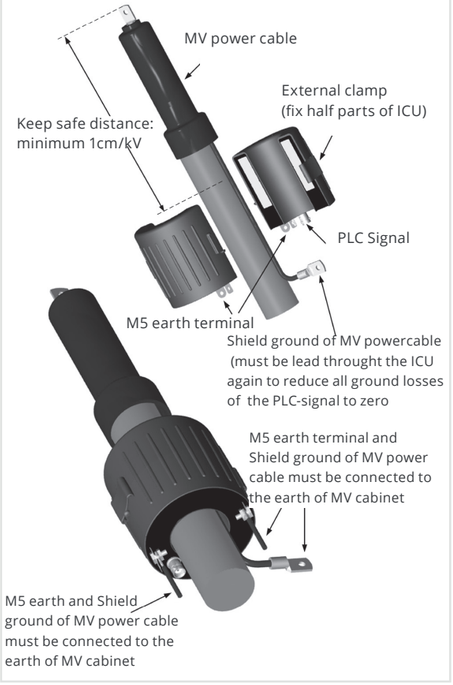
DIMENSIONS (mm)



ELECTRICAL SPECIFICATIONS

Nominal current	**300 A**
Rated Voltage	Only depends on the insulation evel of the cable
Rated AC withstand voltage	Only depends on the insulation evel of the cable
Rated lightning withstand voltage (1.2/50s)	Only depends on the insulation evel of the cable
Insulation resistance	Only depends on the insulation evel of the cable
Partial discharge level at 1.2 UN	No discharges possible, coupler is completely at ground potential
Nominal impedance	-12dB±2dB @100 to 250 kHz
Coupling side	20 to 50
Equipment side	50
Average power in permanence	> +40 dBmW
Harmonic distortion and intermodulation	< -60 dB
Dielectric strength	5 kV
Working temperature	-20°C to 60°C
Storage temperature	-40°C to 85°C
Weight	<2.5 kg
Climatic category	25/100/21 according to IEC 60068-1
Safety isolation	According to IEC 60950

INSTALLATION



MICU 300A-S/LF

Low Frequency (30-500kHz)

PLC COMPONENTS / **INDUCTIVE COUPLERS**

APPLICATIONS

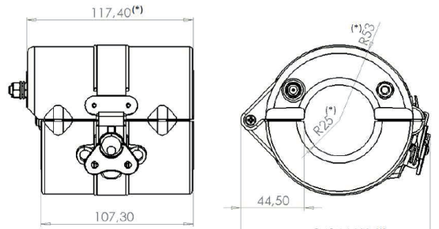
- AMR (Automatic Meter Recording)
- Automation of Electric Power Distribution System
- Outdoors Bare Overhead Power Lines

01 CHARACTERISTICS

- High current solution made with high permeability high performance materials avoid saturation problems at high currents
- Low insertion losses 12dB±2dB (@100- 250kHz); 5dB±2dB (@250-600kHz)
- More electrical safety: High insulation > 4.7 kV
- Compact equipment: BNC connector integrated in the coupler (other connections available under request)
- Water resistant (IP65)

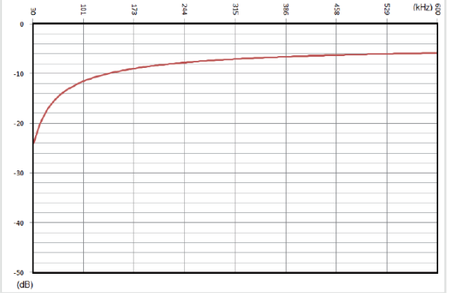
02 SPECIFICATIONS

DIMENSIONS (mm)



- Tolerances unless specified: ±1,0mm
- Critical dimensions (*)

ATTENUATION (DB) IN WORKING FREQUENCY RANGE



ELECTRICAL SPECIFICATIONS

Nominal current	300 A
Rated Voltage	Only depends on the insulation evel of the cable
Rated AC withstand voltage	Only depends on the insulation evel of the cable
Rated lightning withstand voltage (1.2/50s)	Only depends on the insulation evel of the cable
Partial discharge level at 1.2 U_N	Only depends on the insulation evel of the cable
Insulation resistance	
Transmission frequency range and attenuation	-12dB±2dB @100 to 250 kHz - 5dB±2dB @250 to 600 kHz
Nominal impedance	**Coupling side:** 20 to 50 Ω **Equipment side:** 50 Ω
Average power in permanence	> +40 dBmW
Harmonic distortion and intermodulation	< -60 dB
Dielectric strength	>4.7kV
Working temperature	-20°C to 60°C
Storage temperature	-40°C to 85°C
Weight	<2.5 kg
Climatic category	25/100/21 according to IEC 60068-1
Safety isolation	IEC 60950
Normative	IEC 61869

PLC BAND
EUROPE
CENELEC B (95-125kHz)
CENELEC C (125-140kHz)
CENELEC D (140-148.5kHz)
USA
FCC (10kHz-490kHz)

MICU 300A OH/LF

Low Freq. (30-500kHz)

PLC COMPONENTS / **INDUCTIVE COUPLERS**

APPLICATIONS

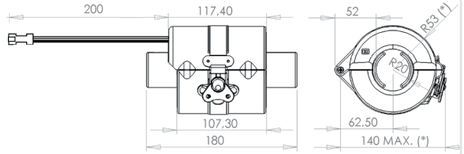
- AMR (Automatic Meter Recording)
- Automation of Electric Power Distribution System
- Outdoors Bare Overhead Power Lines

01 CHARACTERISTICS

- High current solution made with high permeability high performance materials avoidsaturation problems at high currents
- Low insertion losses 12dB±2dB (@100- 250kHz); 5dB±2dB (@250-600kHz)
- More electrical safety: High insulation > 24 kV
- Compact equipment: IP67 waterproof cable assembly integrated in the coupler (other connections available under request)
- Water resistant (IP65)

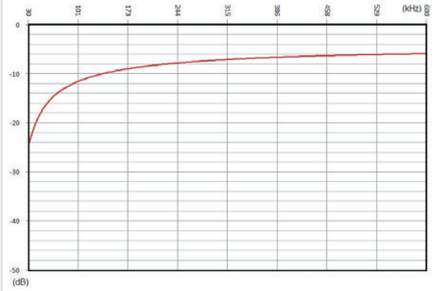
02 SPECIFICATIONS

DIMENSIONS (mm)



- Tolerances unless specified: ±1,0mm
- Critical dimensions (*)

ATTENUATION (DB) IN WORKING FREQUENCY RANGE



ELECTRICAL SPECIFICATIONS

Nominal current	300 A
Rated Voltage	Rated voltage up to 24kV
Rated AC withstand voltage	Rated voltage up to 24kV
Rated lightning withstand voltage (1.2/50s)	Rated voltage up to 24kV
Partial discharge level at 1.2 U_N	Rated voltage up to 24kV
Insulation resistance	Rated voltage up to 24kV
Transmission frequency range and attenuation	-12dB±2dB @100 to 250 kHz - 5dB±2dB @250 to 600 kHz
Nominal impedance	**Coupling side:** 20 to 50 Ω **Equipment side:** 50 Ω
Average power in permanence	> +40 dBmW
Harmonic distortion and intermodulation	< -60 dB
Dielectric strength	>24kV
Working temperature	-20°C to 60°C
Storage temperature	-40°C to 85°C
Weight	<2.5 kg
Climatic category	25/100/21 according to IEC 60068-1
Safety isolation	According to IEC 60950
Normative	IEC 61869

PLC BAND
EUROPE
CENELEC B (95-125kHz)
CENELEC C (125-140kHz)
CENELEC D (140-148.5kHz)
USA
FCC (10kHz-490kHz)

MICU 300A W/LF

MV ICU / Low Freq. (30-500kHz) Underground WR Immersion

PLC COMPONENTS / **INDUCTIVE COUPLERS**

APPLICATIONS

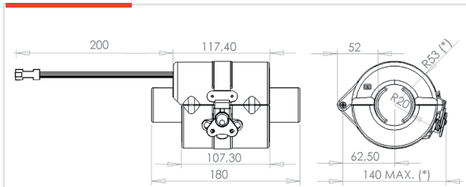
- Automatic Metering Reading
- Powerline Monitoring Systems
- Automation of Electric Power Distribution
- Overhead Powerlines

01 CHARACTERISTICS

- High current solution made with high permeability high performance materials avoid saturation problems at high currents
- Low insertion losses 12dB±2dB (@100-250kHz); 5dB±2dB (@250-600kHz)
- More electrical safety: High insulation > 4.7 kV
- Compact equipment: IP 67 Waterproof cable assembly integrated in the coupler (other connections available under request)
- Waterproof (Ip67)

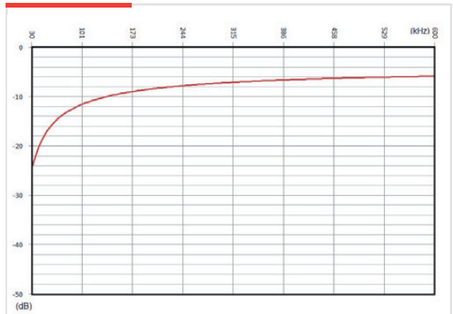
02 SPECIFICATIONS

DIMENSIONS (mm)



- Tolerances unless specified: ±1,0mm
- Critical dimensions (*)

ATTENUATION (DB) IN WORKING FREQUENCY RANGE



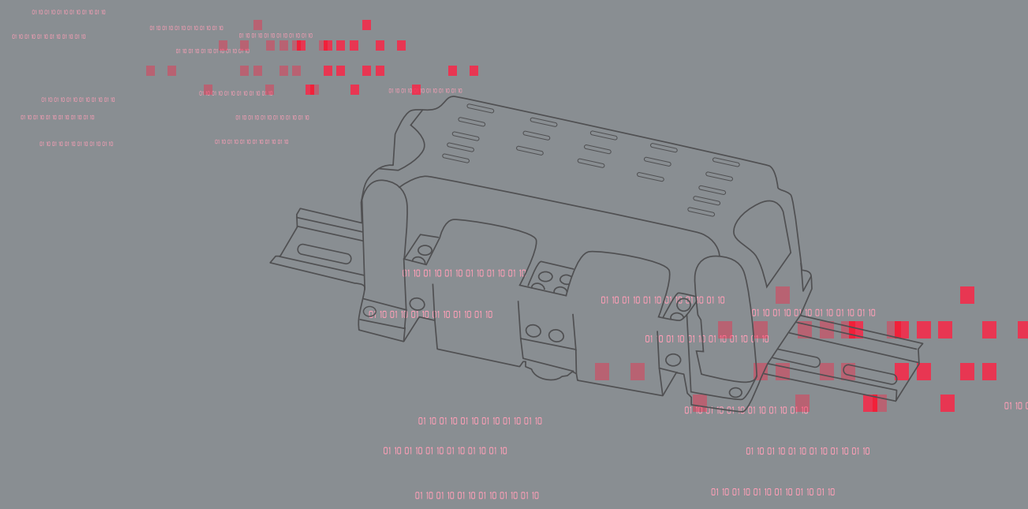
ELECTRICAL SPECIFICATIONS

Nominal current	300 A
Rated Voltage	Only depends on the insulation level of the cable
Rated AC withstand voltage	Only depends on the insulation level of the cable
Rated lightning withstand voltage (1.2/50s)	Only depends on the insulation level of the cable
Partial discharge level at 1.2 U_N	Only depends on the insulation level of the cable
Insulation resistance	Only depends on the insulation level of the cable
Transmission frequency range and attenuation	-12dB±2dB @100 to 250 kHz - 5dB±2dB @250 to 600 kHz
Nominal impedance	**Coupling side:** 20 to 50 Ω **Equipment side:** 50 Ω
Average power in permanence	> +40 dBmW
Harmonic distortion and intermodulation	< -60 dB
Dielectric strength	>4.7kV
Working temperature	-20°C to 60°C
Storage temperature	-40°C to 85°C
Weight	<2.5 kg
Climatic category	25/100/21 according to IEC 60068-1
Safety isolation	According to IEC 60950
Normative	IEC 61869

PLC BAND
EUROPE
CENELEC B (95-125kHz)
CENELEC C (125-140kHz)
CENELEC D (140-148.5kHz)
USA
FCC (10kHz-490kHz)

5.2

PLC COMPONENTS
BLOCKING FILTERS

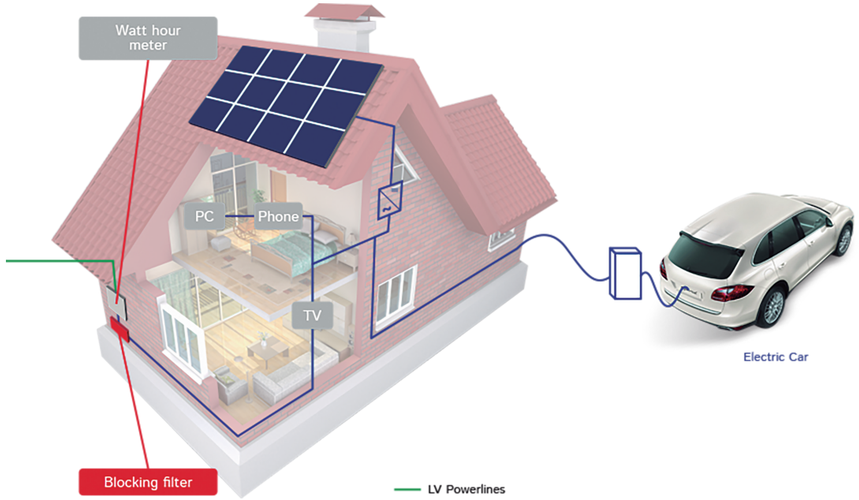


Nowadays energy distribution grids are becoming more complex systems. A reliable and efficient management of these systems involve a deep managing and control of the power grid elements (software and hardware) to allow its balanced and reliable operation.

Smart grids means that not only the hardware connection for energy distribution is needed; also smart elements for network management are getting involved in this new paradigm. These elements include elements for load balance, management of generation/consumption peaks, fails and blackout proactive prevention, remote monitoring of consumption (Automatic Remote Metering), managing and connection of backup energy storages or energy generation stations (renewable energy systems – solar panels, windmills, etc.-)

In smart grids inductive couplers are playing a big role as it's transmit the communication signals between powerline and PLC data transceiver without introducing any new wires or cables, being a competitive solution compared with capacitive coupling.

Filters



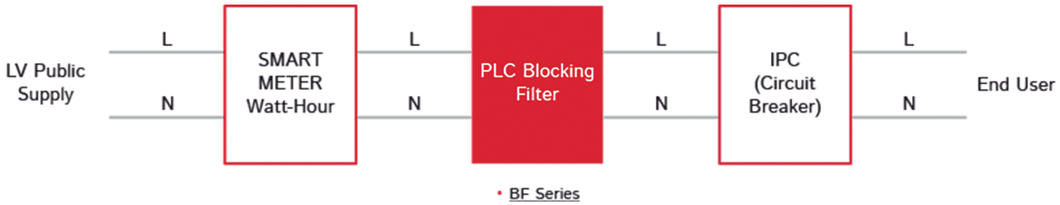
PREMO Group is introducing a new generation of blocking filters for smart grid applications. The innovative PREMO BF Series allows a proper and more reliable PLC Communication.

The challenge:

All the European utility companies are changing Old Electricity meter to Smart meters which works by PLC systems using low frequency signals, such as PRIME (42-89Khz), G3 (35-91Khz) & CENELEC Band A (9-95Khz). The noise is coming from the end-user equipments via household wiring which is too close to PLC frequency ranges. It blocks the communication between Smart meters and Concentrators. Also the noise is transmitted immediately to the rest of the smart meters nearby and can even affect more distant smart meters in a more attenuated way.

PREMO is offering a new generation of blocking filters with 3 kind of attenuation level for reducing all kind of noise from the end user equipments. The BF-xx-MM models are designed especially for smart meters with Re-connection mechanism which has auto connect / disconnect based on load impedance.

ing standards BNC connectors, and also IP67 waterproof connectors).



• BF Series

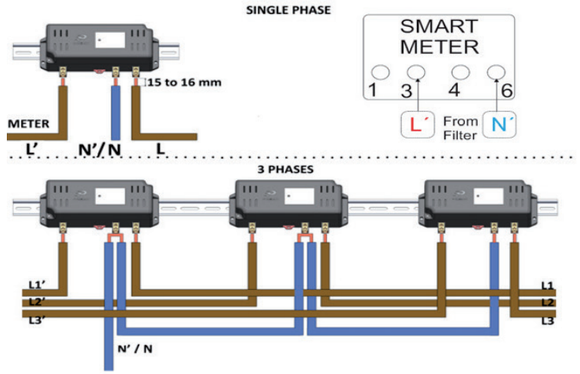
BF

Plc Blocking filters-single phase

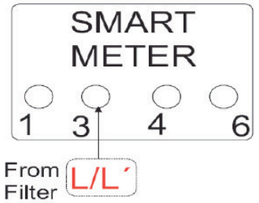
PLC COMPONENTS / **BLOCKING FILTERS**

- Specially designed for Smart meters which comply with PLC G3 , PRIME & CENELEC Band A technology
- Designed to meet according to EN 50065-1 regulations
- MM models Support Smart meters with re-connection mechanism
- Safe terminal with double screws connection
- Good attenuation level without GROUND or PE system and designed with 3 different level of attenuation
- Patent Pending for BF-xx-MM series

01 CONNECTION DIAGRAM



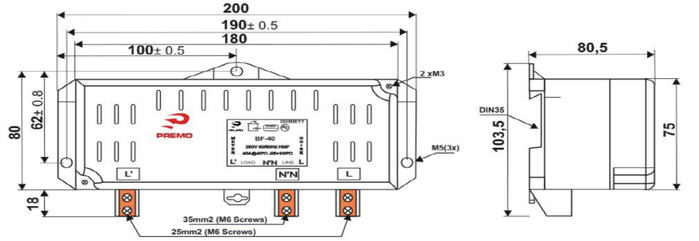
- Applicable for BF-40 /
- BF-40-MM and BF-40S /
- BF-40S-MM



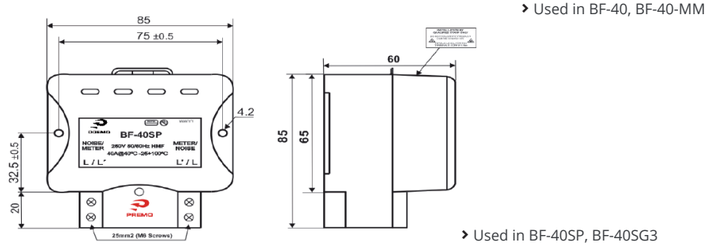
- Applicable for BF-40SP & BF-40SG3

02 SPECIFICATIONS

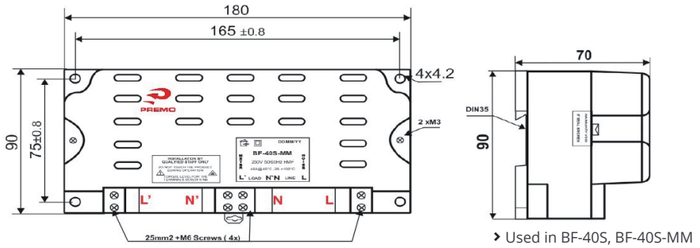
DIMENSIONS (mm)



- Used in BF-40, BF-40-MM



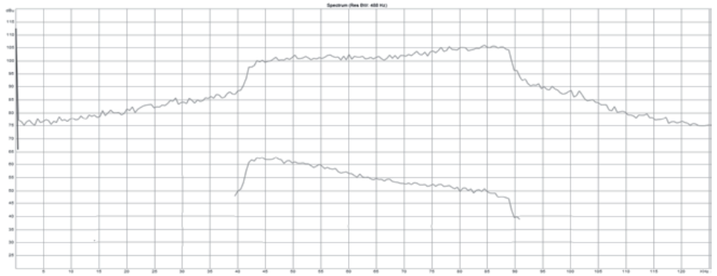
- Used in BF-40SP, BF-40SG3



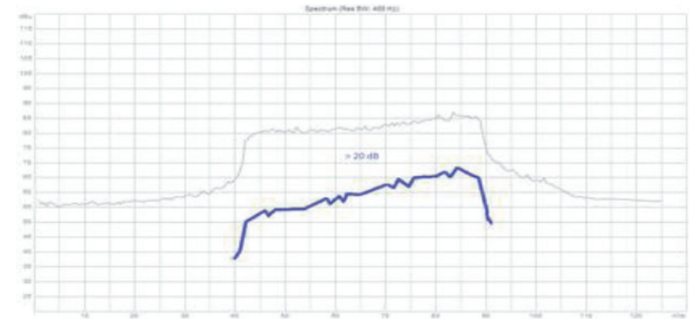
- Used in BF-40S, BF-40S-MM

Note: PREMO BF Series developed with IP30, becuase our products designed to fit inside of Meter cabinets. In this case, Meter cabient has better Ingress Protection (IP54 to IP67), so Filter is not necessary to have better Ingress Protection thus avoid high cost for the filter.

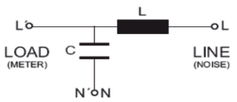
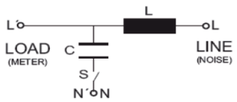
EXAMPLE- METER WITH FILTER- NORMAL VERSION



EXAMPLE- METER WITH FILTER-MM VERSION



PARAMETERS

PARAMETERS	VERY HIGH PERFORMANCE TYPE	HIGH PERFORMANCE TYPE	GENERAL TYPE
Equivalent electric schematic			
Operating Voltage (Max)	250Vac (275Vac)	250Vac (275Vac)	250Vac (275Vac)
Operating Frequency	50 / 60 Hz	50 / 60 Hz	50 / 60 Hz
Operating Current at ambient	40A @ 40°C	40A @ 40°C	40A @ 40°C
Supporting current for Hours & Min´s	45A and 63A	45A and 63A	45A and 63A
PREMO Part Number	BF-40 & BF-40-MM	BF-40S & BF-40S-MM	BF-40SP & BF-40SG3
Operating Temperature Range	(-25°C to +100°C)	(-25°C to +100°C)	(-25°C to +100°C)
Storage Temperature Range	(-25°C to +85°C)	(-25°C to +85°C)	(-25°C to +85°C)
Filter Characterictics (CENELEC Band)	9 to 150KHz (Band A,B,C,D)	9 to 150KHz (Band A,B,C,D)	35 to 90Khz (Band A)
Attenuation Level (mainly 35- 90Khz)	> 40 dB & > 20dBfor-MM	> 30 dB & > 18dB for-MM	>20 dB
High Surge Protection (Phase- Neu.)	10000 A, 8/ 20µs	10000 A, 8/ 20µs	NA
MTBF at 25°C, 230Vac, 40A (ref.)	Minimum 20 years	Minimum 20 years	Minimum 20 years
Dielectric strength for 60 sec´s	Phase-Housing = 2.5KVac	Phase-Housing = 2.5KVac	Phase-Housing = 2.5KVac
without surge protection	Phase-Neutral = 1.7KVdc	Phase-Neutral = 1.7KVdc	Phase-Neutral = 1.7KVdc
Leakage Current	Nil (no PE insisted)	Nil (no PE insisted)	Nil (no PE insisted)
Installing in 3 Phase system	Max. Voltage P-P = 480Vac	Max. Voltage P-P = 480Vac	NA
Dimensions in mm	200L x 103W x 80H	180L x 90W x 70H	85L x 85W x 60H
Weight Approx. In Kg +/-	< 2.2 Kg	< 1.5Kg	< 0.6Kg
Ingress Protection	IP 30	IP 30	IP 30
Mounting Style	Din-Rail 35 + Panel	Din-Rail 35 + Panel	Panel
Safety Regulation Followed	EMC Directive 2004/108/EC, UL1283, EN60939-2, IEC 60950-1 & RoHS 2011/65/EU		
Suitable for Compliance	EN 50065-1	EN 50065-1	EN 50065-1

PREMO HEADQUARTERS

SPAIN
Severo Ochoa 47
Parque Tecnológico de Andalucía
29590 Campanillas - Málaga - Spain

T. +34 951 231 320
www.grupopremo.com
https://3dcoil.grupopremo.com
3dpower.grupopremo.com
info@grupopremo.com

MANUFACTURING PLANTS

CHINA
PREMO Electronic Wuhu
Building No.33, Shuangqiao Road,
Anhui Xinwu Economic Development Zone
241000 Wuhu City, Anhui Province, China

MOROCCO
PREMO MEDITERRANEE S.A.R.L.
Ilot 11 lot n 4
90000 - ZONE FRANCHE D'EXPORTATION
TANGER (Morocco)
Tel. +212 5 39 39 45 41/42

VIETNAM
PREMO Vietnam Co. Ltd
Lot 21 Dien Nam-Dien Ngoc IZ
Dien Ngoc Ward, Dien Ban Town,
Quang Nam Province (Vietnam)
Tel: 084 510 394 9567

Lot 17 Dien Nam-Dien Ngoc IZ
Dien Ngoc Ward, Dien Ban Town,
Quang Nam Province (Vietnam)
Tel: +842353949010

PREMO WORLDWIDE

Find your local partner within PREMO's global sales network at: https://www.grupopremo.com/tiendas

R&D CENTERS

SPAIN

MALAGA
PREMO S.L.
C / Severo Ochoa 47 PTA
29590 Campanillas, Málaga - España
Teléfono: +34 951 23 13 20

BARCELONA
PREMO S.L.
C/ PEDRO i PONS, 9-11, Floor12, Doors 1-2
08034 Barcelona, Spain
Teléfono: +34 934 098 980

VIETNAM
PREMO Vietnam Co. Ltd
Lot 21 Dien Nam-Dien Ngoc IZ
Dien Ngoc Ward, Dien Ban Town,
Quang Nam Province (Vietnam)
Tel: 084 510 394 9567

USA
PREMO USA Inc.
625 The City Drive South, Suite 380. Orange, CA 92868
Tel: +1 714 501 3532

INDIA
INNOVATING MAGNETICS PREMO INDIA PVT LTD
3C-708, 2nd floor, 3rd cross rd, hrbr layout,1st block,banasavadi, Bangalore -560043, Karnataka, India
Tel: +91-9108969478

FRANCE
PREMO France S.A.R.L.
Centre d'Affaires LE CONCORDE 24, rue Lamartine
38320 EYBENS (Grenoble) - Francia
Tel.: +33 (0) 456 38 13 37 GSM: +33 (0) 637 28 62 46

KOREA
PREMO Korea Co., Ltd.
Room 1010, 10th Floor, ACE HighTechCity-Pyeongchon
457-27, Heungan-daero, Dongan-gu, Anyang-si,
Gyeonggi-do,
Republic of Korea 14058
M.: +82 10 3635 6101

GERMANY
PREMO Germany GmbH
Würzburger Straße 152
63743 Aschaffenburg - Germany
Mob: +49 6021 444 08 10

CHINA

SHANGHAI
Premo Electronic Shanghai
Room A506A, No. 268 TongXie Road, ChangNing District,
Shanghai,China
Mob: +86 15618991612

WUXI (SALES CENTER)
Premo Electronic (Wuxi) Co.,Ltd Shenzhen Branch
Room 1501, Building A, well link financial center,
Intersection of Dongbin Road and Yueliangwan Avenue,
Nanshan District, Shenzhen, Guangdong ,China
Mob: +86 13554857903

PREMO

PREMO S.L.

CONTACT US

If you have **any questions on our products,** need technical support or have any suggestions or criticism on this book please contact us:

PREMO SPAIN
Severo Ochoa 47
Parque Tecnológico de Andalucía
29590 Campanillas - Málaga - Spain

T. +34 951 231 320
www.grupopremo.com
https://3dcoil.grupopremo.com
info@grupopremo.com