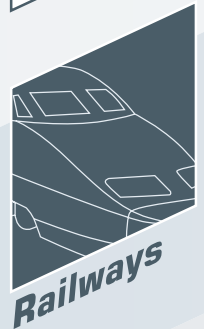
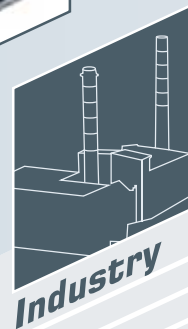
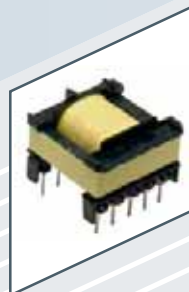
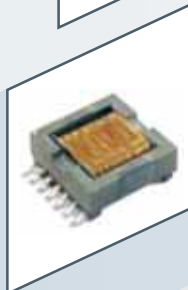


microSpire

Wound Magnetics Experts

High-Grade-and-Industrial-Technologies

From Design to Production



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Illange (Metz)

- Head office - 80 employees
- Design - Prototyping - Industrialisation - Internal and external production inspection - Supply chain management
- Quality control - logistics
- ISO 9001 / V 2000 certified
- EN / AS 9100 certified
- ISO 14001 in process

Manufacturing of :

- Small series and high grade components
- Medium power magnetics

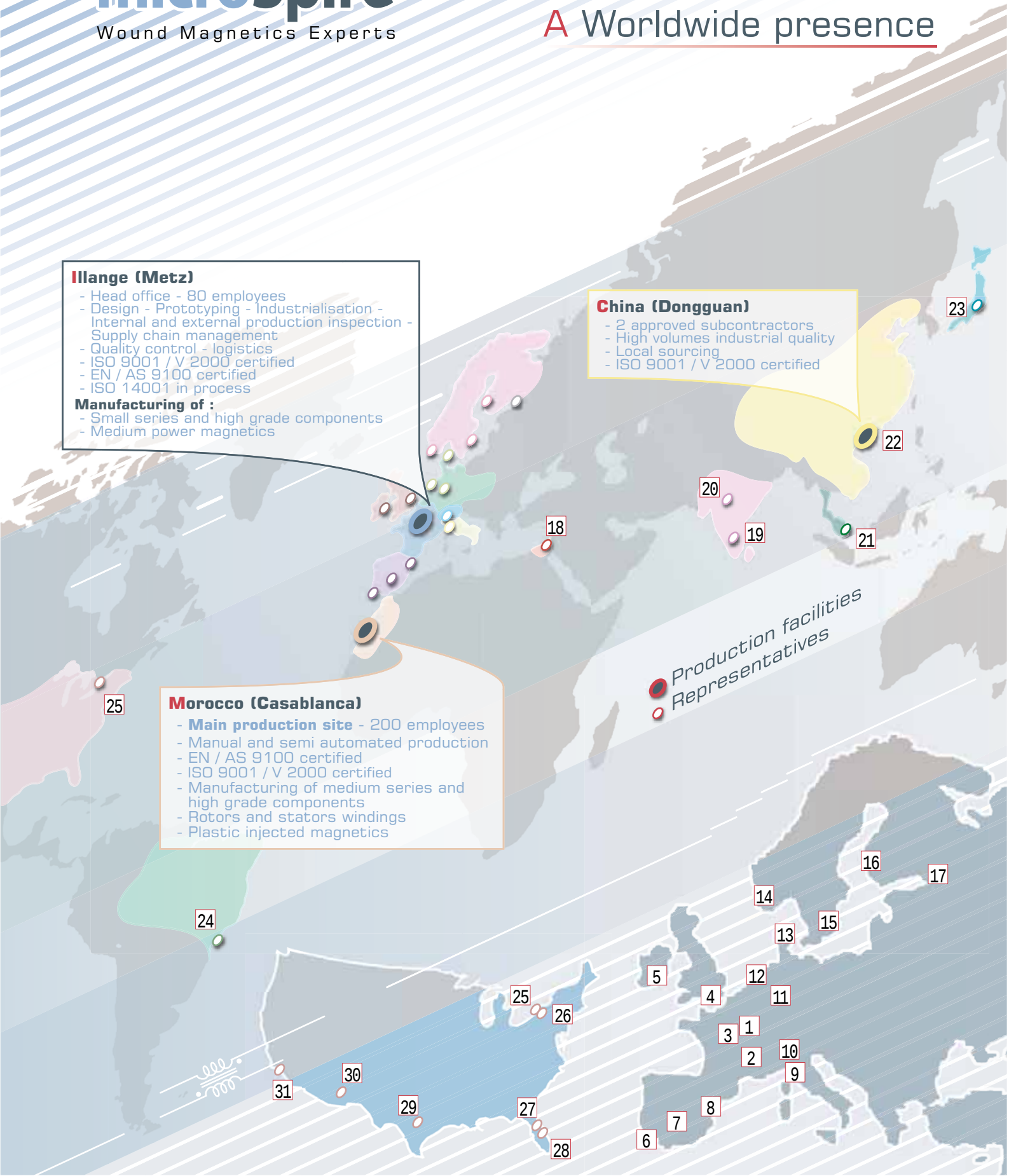
China (Dongguan)

- 2 approved subcontractors
- High volumes industrial quality
- Local sourcing
- ISO 9001 / V 2000 certified

Morocco (Casablanca)

- **Main production site** - 200 employees
- Manual and semi automated production
- EN / AS 9100 certified
- ISO 9001 / V 2000 certified
- Manufacturing of medium series and high grade components
- Rotors and stators windings
- Plastic injected magnetics

● Production facilities
○ Representatives



France (Illange)



- EN / AS 9100
- Qualifas



Morocco (Casablanca)



- EN / AS 9100
- Qualifas



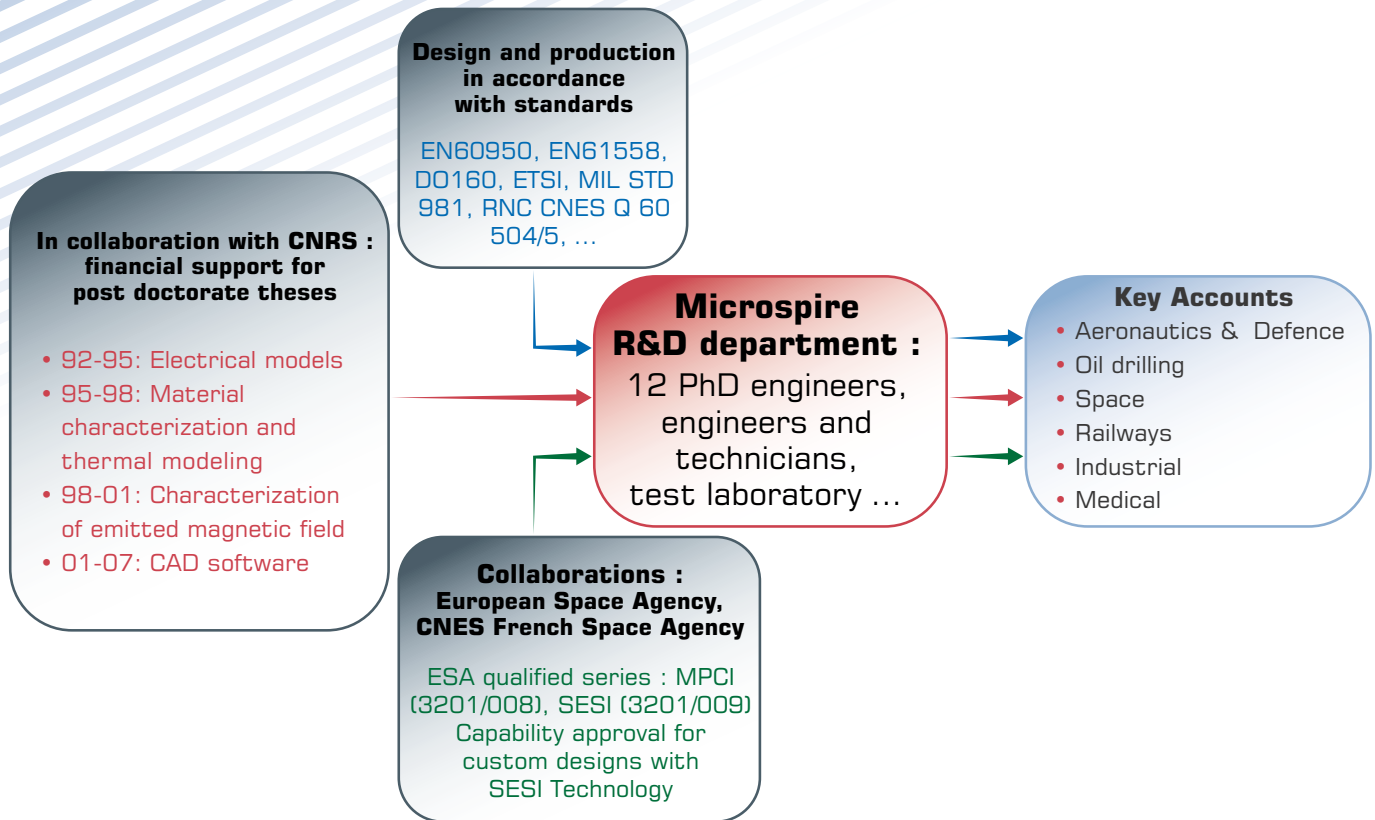
China (Dongguan)



- ISO 9001 / V2000



Gathering expertise for your custom designs



Our know-how in electronic functions



- HF signal, isolation, impedance matching transformers
- Power transformers up to several 10 KW
Flyback, Forward, Push-pull topologies ...
- Chokes for active or passive PFC ...
- Integrated Magnetics
- Gate drive transformers
- Current sense or voltage measurement transformers
- 1553 Bus Transformers, Telecom transformers (XDSL, ISDN, 600 Ω)
- Low/High frequency filtering
Power chokes up to I = 300 A
- ADSL, PLC, train detection filters ...
- Antennas, sensors, tags ...

COTS

Components
Off The Shelves

Semi - Custom

Standard magnetic cores
and Custom Functions

Custom

Magnetic cores and
Functions

High Grade Technologies

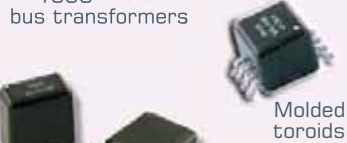


Chip inductors

Line matching transformers



1553 bus transformers



Molded toroids

Current transformers



Common mode chokes



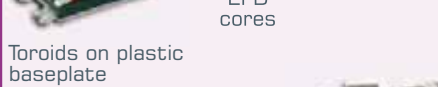
SESI technology :
chokes, current transformers,
gate drive transformers, flyback
transformers



SESI Technology :
connection on leadframe epoxy
resin encapsulation - Flyback Transformers
- FLYT series



Molded toroids



EFD
cores

Toroids on plastic
baseplate

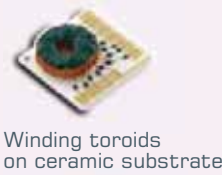


EC
cores

P cores



RM
cores
leaded



Winding toroids
on ceramic substrate



Epoxy Resin
encapsulation



Transfer
moulding



RM gravity
moulding



Toroidal
technology



Custom
mechanics



Lead epoxy resin
encapsulation

Standard Technologies



Line
Matching
Transformers



SMD
Coils



Current
Transformers



Common
mode chokes



Peaking coils

Wide Band
transformers



EFD, ER
and EP cores



Current
transformers



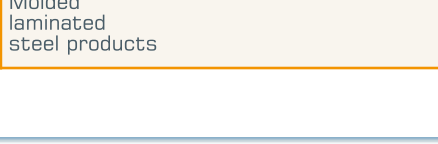
Toroids



RM
cores



Flyback
transformers



ETD
leaded

Molded
laminated
steel products



Toroid on
plastic header

Rotors and stators
winding



Coil
Winding



Planar
Technology



Plastic
injection



Self bonded Coils



Drum
Core
Winding

Medium Power Flying/Custom terminations

Engineering Support Dedicated Team

High Grade Technologies



Aluminium
Foil Winding Inductors and Transformers



Stacked
Inductors



Planar PCB
Transformers



Toroidal
Inductors

Standard Technologies



E Cores
assembly

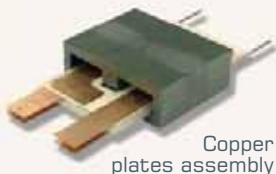
Double C
laminated
Steel cores



Triple
winding
inductors

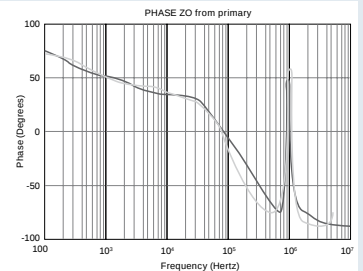
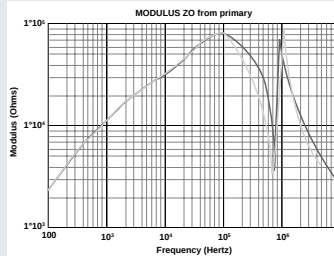
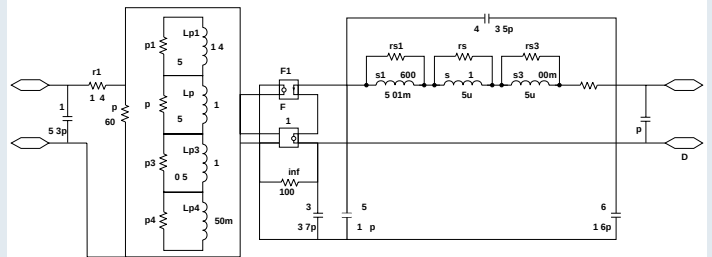


Foil winding

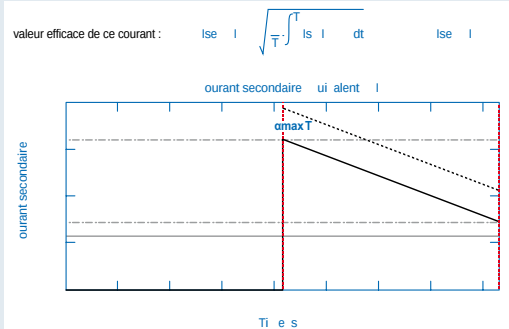


Copper
plates assembly

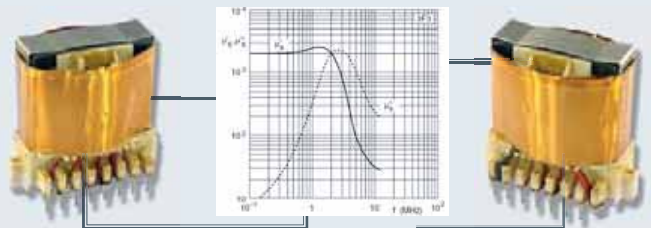
Component optimisation through electrical model



Transformer design and customer's functions support



Raw material or components obsolescence management

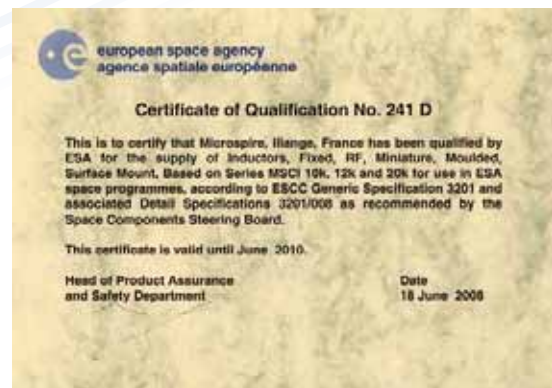


Mechanical design support





Certifications
&
Qualifications



EUROPEAN DIRECTIVES R.o.H.S. and W.E.E.E.

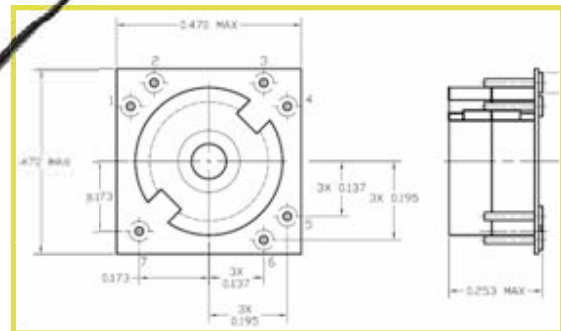
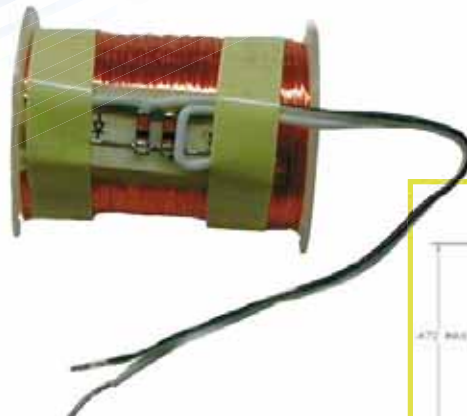
In order to meet the requirements of the R.o.H.S. and W.E.E.E directives issued by the European Union (2002/95/EC and 2002/96/EC), Microspire now removes the dangerous substances of its products.

As a consequence, Microspire upgraded its product lines:

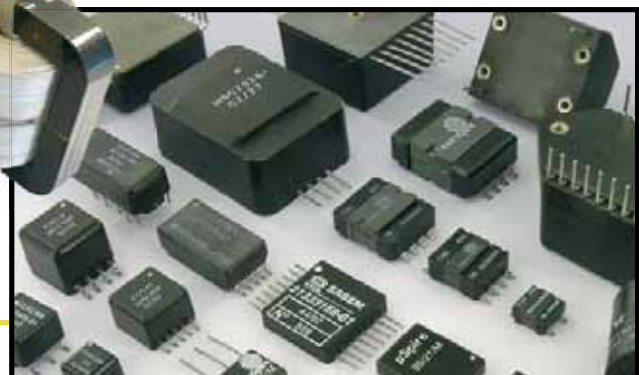
- by using pure tin matte as external coating for termination (leadframes or pins): this plating is done on a Nickel intermediate layer. Microspire has chosen these materials in order to allow leaded and non leaded soldering processes, and minimize the possibility of tin whisker growth.
- by privileging solder alloys like SnAg or SnAgCu for the soldering operations: some Microspire products use high temperature melting solder (containing more than 85% lead). These solders are exempted from WEEE and RoHS regulations, due to the lack of viable compliant solder alloys. This high temperature solder is used only for internal product solder connections. External pin plating for these component types use the one above mentioned.

All our wound magnetics are RoHS by default, the RoHS sign is indicated on the packaging of the products. For space market, the components are non RoHS by default and RoHS upon request.





« Creating Cost-Effective Customized Transformers & Inductors for the World's Leading Power Technology Companies »



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Deland, Florida, USA 32724-2118
888-876-6424
585-243-3831 FAX
INFO@RAFTABTRONICS.COM



• **VISION :** RAF Tabtronics is a global leader in the inductive components industry. They create advanced electromagnetic technologies and cost-effective customized solutions for the world's leading power technology companies. They produce innovative ultra-high power density and high-efficiency components which provide significant competitive advantage to our customers.

• **BUSINESS :** High-grade, high-reliability transformers, coils, and inductors in both low and high volumes produced globally.

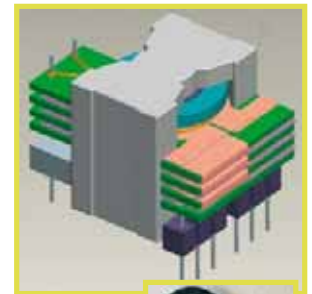
- | | | |
|------------------------|-----------------------|--------------|
| - Defense electronics | - Medical electronics | - Vetronics |
| - Aerospace / Avionics | - Telecom / IT | - Industrial |
| - Homeland security | - Railway | - Commercial |



• **QUALITY SYSTEMS :** Certified to AS9100, ISO9001:2000, and J-STD-001.

• **TECHNICAL EXPERTISE :**

- Power (up to 1000 Amps, up to 50 kW, up to 500MHz, up to 50 kV)
- Topologies (Flyback, Resonant, Buck, Boost, Forward; Bridge)
- Winding (planar, annular, hybrid, Litz, foil, specially wire; conventional)
- Core geometries (all standard shapes & sizes, custom shapes & sizes)
- Core materials (ferrites, powdered iron, MPP, silicon steel, nickel, cobalt, amorphous metals, nanocrystalline)
- Magnetics design experts (3D CAD, mechanical, thermal, electrical & magnetic design, computer simulation & optimization, design feasibility, verification testing)
- Specialties (Hyper-X Magnetic Technology™, SESI™, ultra-high power density / high-efficiency components, hybrid magnetics, transfer-molding, high-voltage, aluminium foil windings, customized rotors & stators, planar, rapid-prototyping, quick-turn production).



• **GLOBAL STANDARDS :**

- ITAR registered / DSP-5 licensed in Low-Cost Countries
- Military standards (MIL--PRF-27, MIL-STD-981, MIL-T-21038, MIL-STD-1533, MIL-STD-454)
- Safety standards (UL, CSA, TUV, VDE, BSI, CE)
- Quality & environmental standards (AS9100 / ISO9001, IEC, J-STD-001, RoHS)

• **GLOBAL POWER :** Companies look to them and their powerful global network to achieve continuous value creation through ongoing innovative practices and advanced business process management. Organizations depend on their scalability and their adaptability - technologically, geographically and culturally.



• **HISTORY :** RAF Tabtronics LLC combines the expertise and experience of multiple magnetics firm: RAF Tabtronics Inc., Tabtronics Inc., RAF Magnetics Inc., Microspire SAS, Chloride Electro Networks (CEN), and TomTer. From this heritage RAF Tabtronics LLC has earned the status of a world-class manufacturer of magnetic components, possessing the knowledge and expertise to provide quality service as well as quality product.

• **ORGANIZATION :** Over 200+ associates globally; non-union. Over 100 000 square feet in seven countries. Over 50 000 custom magnetics designs in Their portfolio.
RAF Tabtronics LLC - *Technology to the global power*™.



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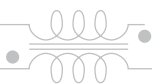
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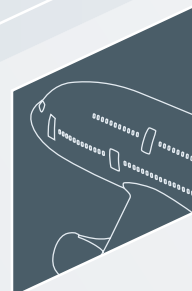
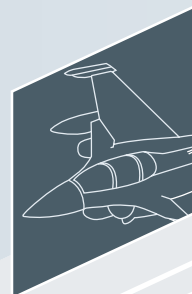
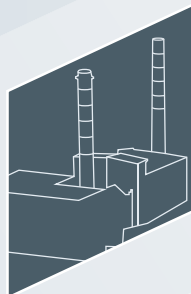
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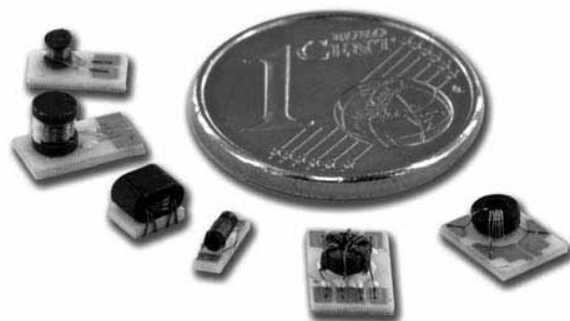
High-Grade Technologies
From **Design** to **Production**



Custom Design Technologies

Hybrid Magnetics

These mini and micro wound toroids on ceramic substrates show an excellent Q factor as well as highly stable electrical and dimensional characteristics. They are delivered with either copper or gold terminations, ultra-thin wire down to 20 μm , bonded wire and their operating range is -55°C to $+125^{\circ}\text{C}$.



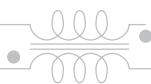
Transfer-Molded Components

Our transfer-molded inductive components are designed to meet the most stringent space and military requirements. The transfer-molded, lead-frame construction can withstand shock, moisture and vibration tests of MIL-T-55631 standard. The casing is made either of epoxy or silicon resin.



Aluminium foil winding components

Aluminium foil winding and Cut Core Technology for high grade applications. 300 Hz-800 Hz Inductors and Transformers, Twelve pulse Transformers (up to 150 kW), Interphase Inductors.



Custom Design Technologies



Customized medium power C-core Inductors

Cut Cores and flat copper wire,
current up to 300 A and frequency
<20 KHz.



Customized medium power EE core

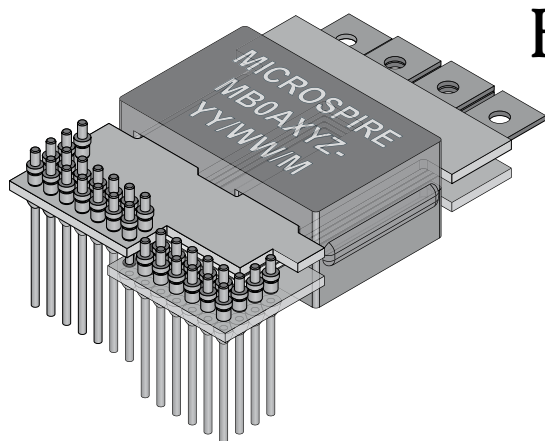
EE or U assembling for
Inductors or Transformers,
current <50 A, frequency <50 KHz.



Customized toroidal Inductors

Toroidal Inductor molded
into metal casing.
Current <50 A.





High Grade Custom Planar Magnetics

- Low profile construction
- Best repeatability of electric parameters
- Low leakage inductance
- Easy to cool with heatsink
- Multiple Topologies
- High efficiency and reliability
- High insulation between windings
- Excellent thermal characteristics
- Dimensional accuracy
- Customized pin positions

Electrical Data

Transformers and inductors will be designed and manufactured for all types of SMPS within these characteristics

- Power rating: up to 10 KWatts
- Input voltage: 12 Vdc to 240-400 Vdc
- Output voltage: 3 Vdc to 60 Vdc
- Frequency range: 50 kHz to 1 MHz
- Typical efficiency: 96-99%
- Temperature range: -40 °C to +125 °C
- Dielectric strength: up to 4000 V_{RMS}

SMPS Topologies

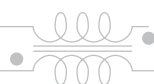
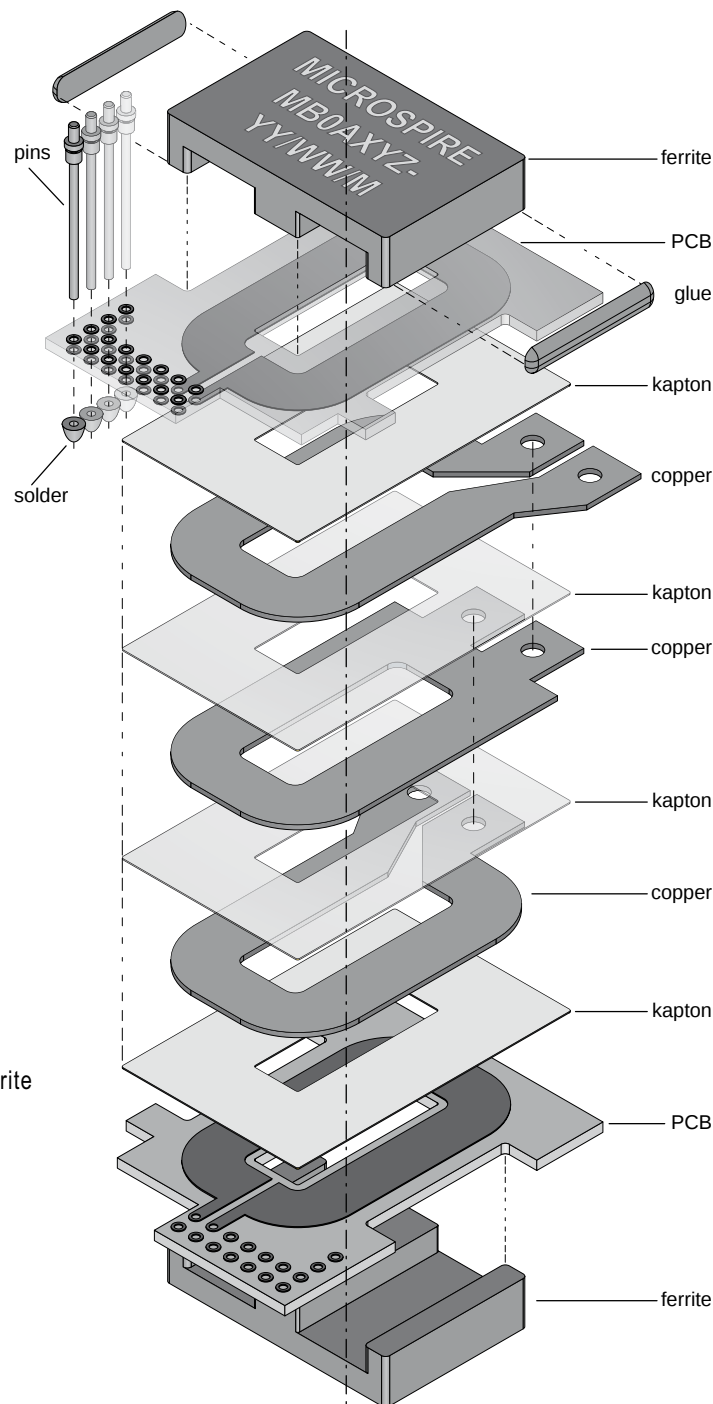
Full bridge ; Half bridge ; Push-pull ; Forward ;
Flyback ; Boost ; Buck

Construction

- Electrical circuit: Flat copper foil or spirals
- Multi-layer: up to 24 layers
- Multi-PCB: up to 5 boards
- Insulation: Kapton or Mylar
- Planar Core: E14 to E64 (E-E combination) ferrite
PLT14 to PLT64 (E-PLT combination) ferrite
RM4/ILP to RM14/ILP
- Cooling: heatsink or thermal pad

Mounting, Connections

Through-hole ; SMD, strips for cable shoes, eyelet
sleeved leads



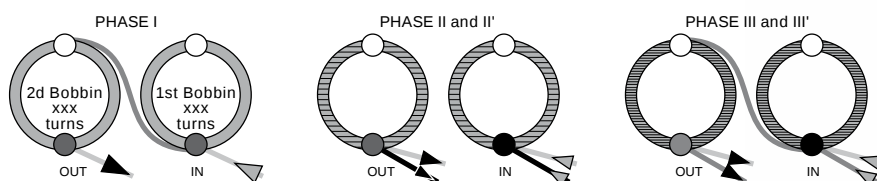
Build-to-print Rotors and Stators manufacturing



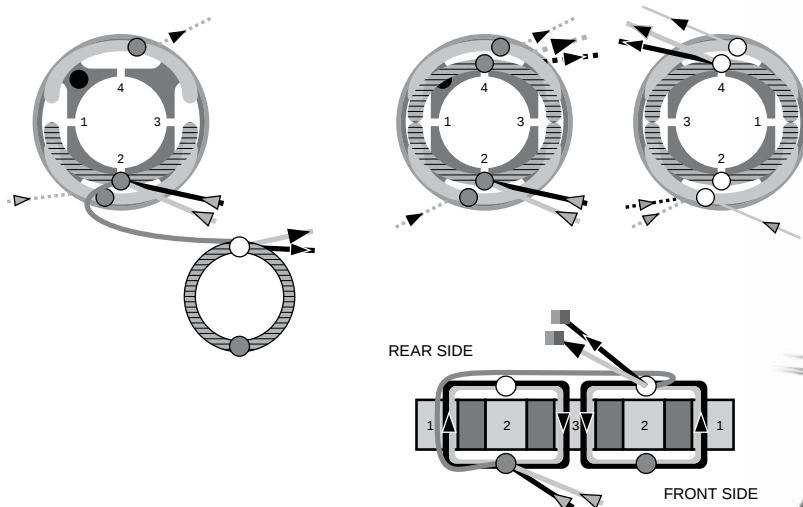
- Stators, rotors, from 10 to 120mm
- DC-brushless motors, servo motors, linear motors
- High temperature products:
 - Raw Material
 - Impregnation Process

Operations

1. Design and manufacturing of the specific armature tools
2. Armatures or stator stacks gluing under pressure and varnishing laminations on stacking fixtures
3. Sets of coil winding operations



4. Slot insulation positioning, winding insertion into the armature slot, cutting down and folding slot insulation and inserting wedges as each slot is filled.



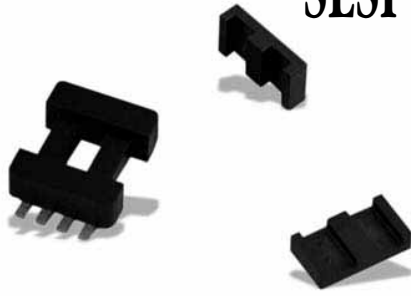
5. Cabling of leadwire with Teflon isolated and flexible sleeve wire, inter-connection of several windings
6. Windings binding and forming against final mechanical dimensions
7. Securing position with lancing tape
8. External rectifying of rotor stacks, internal eroding of stator stacks, notch milling, boring
9. Assembling of the collector and cabling of the winding wires



..... High Grade Technologies.....
..... Custom Designs.....



SESI SMD Power Inductors and Transformers



Microspire upgraded aircoil grid transfer + transfer moulding technology by using E-PLANAR ferrite cores ; which lead to the SESI product range (SMD Energy Storage Inductors).

Main advantages :

- Low profile component
- Ferrite cores external assembling.
- SMD placement (fixed terminations + tape & reel)
- Traceability

The SESI power inductors 9.1 to 22 are European Space Agency qualified. These components have been designed during the last 8 years in order to offer simple functions (SESI9 to 18 chokes).

Microspire also designs complex functions (current transformers, forward transformers, gate drive transformers, push-pull transformers, common mode chokes, multiple chokes...) in these packages.

The possible functions in the SESI design

ELECTRICAL FUNCTIONS / PACKAGE	SESI 9.1	SESI 15	SESI 18	SESI 22	SESI 32
Standard SESI Power Inductors Series	From 0.6 μ H / 6A to 0.7mH / 0.2A	From 0.75 μ H / 14A to 1.9mH / 0.3A	From 4.2 μ H / 9.8A to 231 μ H / 1.3A	From 3.8 μ H / 19A to 1.8mH / 0.8A	From 4.7 μ H to 4.7mH Current up to 27Arms / 38A peak
Multiple Coupled Inductors		Differential mode From 20kHz to 1MHz 2 x 4.2 μ H - 3.5Adc	122.4 μ H - 1.6A plus 27 μ H - 0.2A Turn ratio 2.1: 1		
Common Mode Choke (see CMC Series)		From 2 x 50 μ H / 6.7A to 2 x 4mH / 0.55A	From 2 x 60 μ H / 9.9A to 2 x 4.9mH / 0.9A	From 60 μ H / 14.3A to 3.3mH / 1.9A	
PFC Inductors				52W - 125kHz - L = 2.5mH - 0.9A Connected to 115V / 400Hz avionics on board supply	115W - 100kHz - L = 825 μ H - 1.5A Connected to 115V / 400Hz avionics on board supply
Forward Transformers ...				From 30W / 100kHz (1, 2 or 3 secondaries Vin = 14V - amax = 0.45) to 96W / 185kHz (2 secondaries Vin = 17V - amax = 0.50)	From 60W / 100kHz (2 secondaries Vin = 130V - amax = 0.4) to 300W / 500kHz (Vin = 350V - amax = 0.45 Output 12V - 25A)
... and associated Output Filtering Chokes			4.9 μ H - 9A Ripple at 250kHz	25.5 μ H - 6A Ripple at 100kHz	From 17.5 μ H / 12.5A to 220 μ H / 2A - Ripple at 100kHz
Push-Pull Transformers		Low-power applications	30W - 200kHz Vin = 10V peak-to-peak Output 3.3 or 5V	60W - 200kHz Input 17 to 32V Output 2 x 15V / 2A	150W - 200kHz Input 17 to 32V Output 5V / 30A (Specific package and pins)
Full-Bridge Transformers			80W - 200kHz Input 28V or 300V - Output 26V / 3A	160W - 200kHz Input 28V or 300V - Output 26V / 6A	High power applications
Flyback Transformers (see FLYT Series)	0.5W - 100kHz 1 secondary winding Vin = 30V - amax = 0.4 Continuous mode	15W - 250kHz 4 secondaries windings - Vin = 25V - amax = 0.27 - Shielded version - Insulation 500 Vdc Ri > 100M Ω	15.5W - 250kHz 6 secondaries Vin = 25V - amax = 0.45	18W - 100 kHz 2 secondaries windings Vin = 14V - amax = 0.5 Quasi-resonant discontinuous mode	Flyback - PFC 250W - 100kHz Vin = 28V - amax = 0.45 6 outputs
Standard Current Sense Transformers	See our CT91 series - Current up to 8Arms sine wave / 10.5A square or DC max	Standard series to be developed			
Pulse Transformers	20V μ s - 200kHz Turn ratio 1: 1 - Is = 1A peak max	60V μ s - 50/500kHz Turn ratio 1: 1.5 - L > 500 μ H			23 to 27V - 250 μ s Turn ratio 1: 1 - For a 100 Ω load

Notes : 1. Because of a wide range of possibilities according to working frequency, number of windings, insulation required, output currents... only examples of products already manufactured are presented

2. However, in most cases, our planar SESI technology can replace successfully linear and toroid wound component

The process tools have already been developed. The bill of material has been validated together with our design, and only pin assignment and windings number for the function required need to be defined.

No additional manual operation is to be performed on the component (component tearing add up on the board + wire soldering).

All the material used for SESI manufacturing is complying with the requirements of space or aerospace environments. For each material, several suppliers have been qualified. For aerospace, the SESI technology may be manufactured either in our French or our Moroccan factories .

For simple functions (chokes) the parts have been tested by the CNES according to Microspire test program :

- Thermal shock, life tests, overload
- Vibration and shock tests have been performed by a qualified testhouse.



SESI Custom Technologies

Upon request our Engineers can design custom transformers and inductors in the standard SESI9, 15, 18, 22 and 32 packages. These magnetics can be either surface mount or through-hole and can have up to 8 windings in the SESI32 package.

This design approach offers faster response, no tooling cost and competitive prices because of low materials costs obtained from high-volume standard parts production.



SES| 32



SES| 22



SESI 18



SESI 15



SESI 14



SES| 9.1



SES| 9

Shielded versions



SESI 15 WE



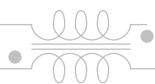
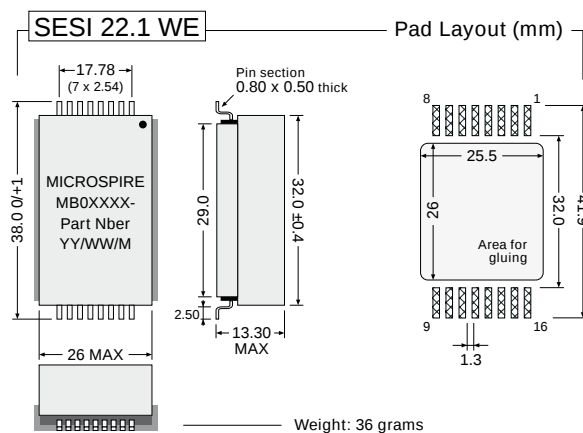
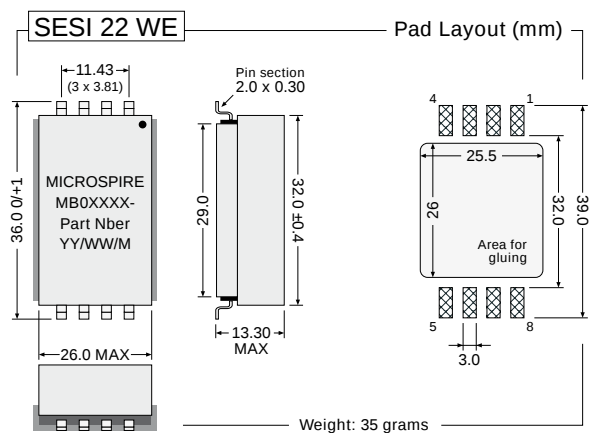
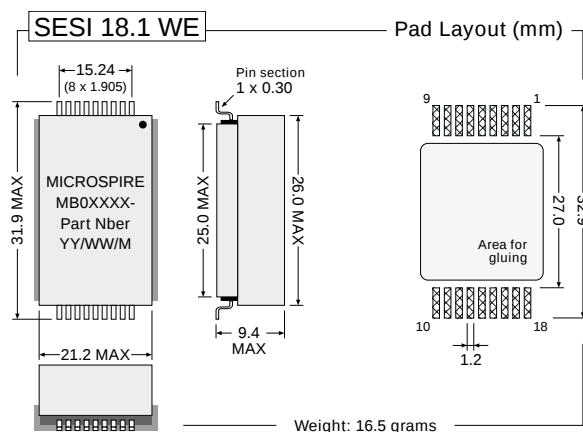
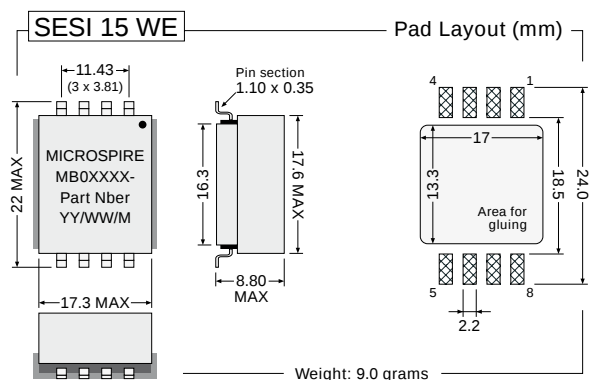
SESI 18.1 WE



SESI 22 WE

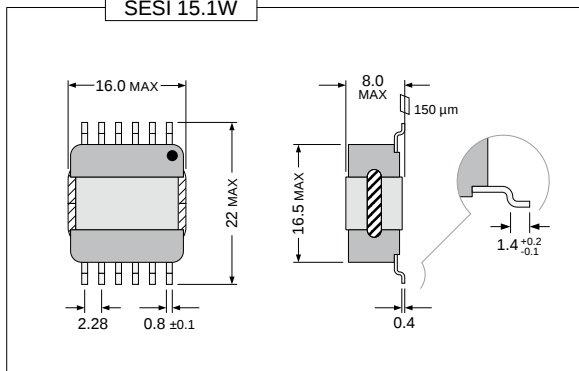


SESI 22.1 WE

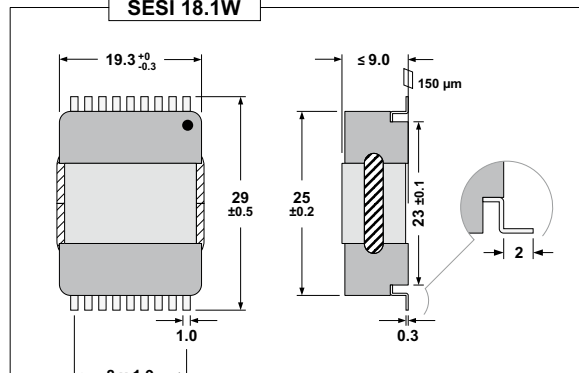


Custom packages with additional terminations

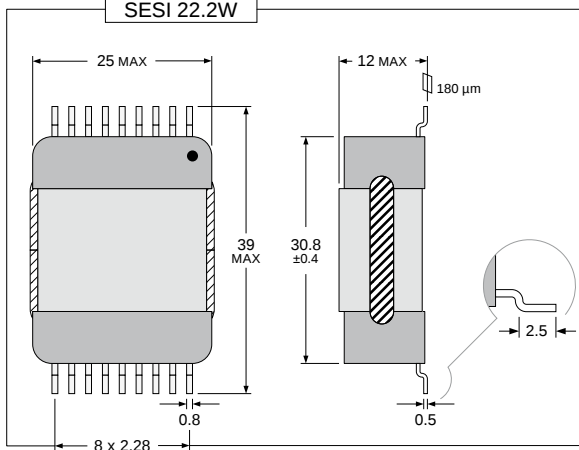
SESI 15.1W



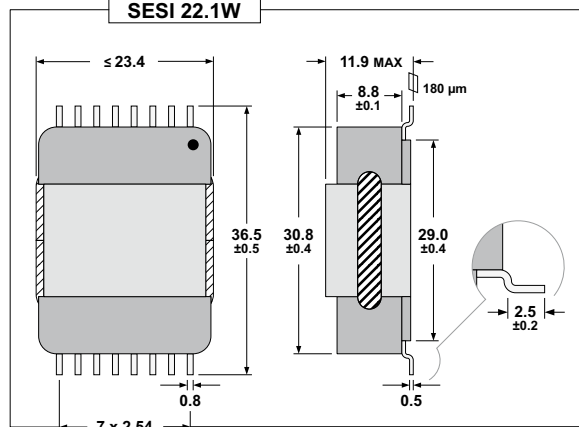
SESI 18.1W



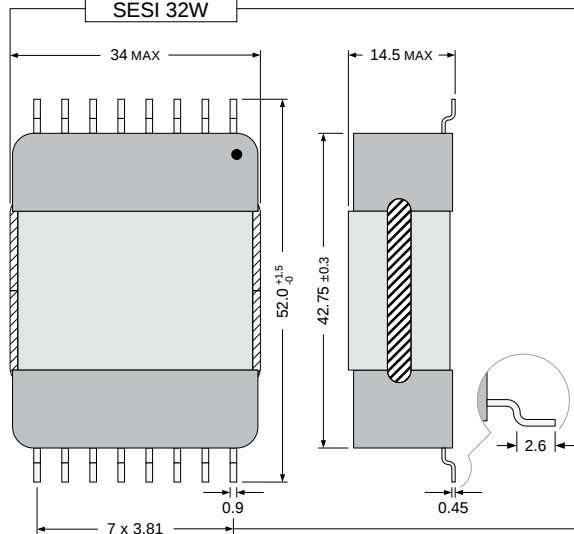
SESI 22.2W



SESI 22.1W



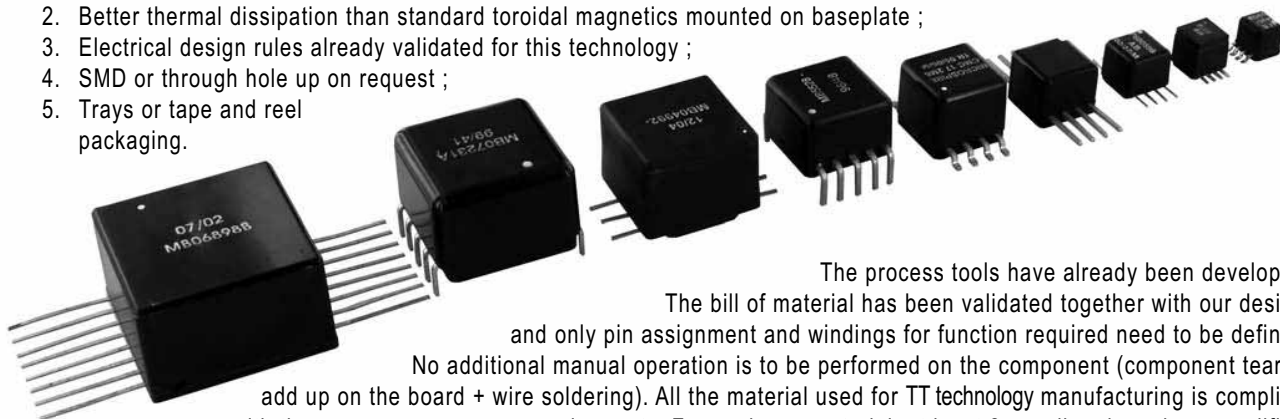
SESI 32W



Toroidal Transfer Custom Magnetics

Toroidal Transfer, the short time answer to your custom design with technology already qualified, without Non Recurent Cost

1. Strong space and aerospace history ;
2. Better thermal dissipation than standard toroidal magnetics mounted on baseplate ;
3. Electrical design rules already validated for this technology ;
4. SMD or through hole up on request ;
5. Trays or tape and reel packaging.



The process tools have already been developed.

The bill of material has been validated together with our design, and only pin assignment and windings for function required need to be defined.

No additional manual operation is to be performed on the component (component tearing add up on the board + wire soldering). All the material used for TT technology manufacturing is compliant with the space or aerospace requirements. For each raw material, at least 2 suppliers have been qualified.

All these packages have been undergoing to Microspire test programs :

1. Thermal shock, life tests, overload ;
2. Vibration and shock tests.

Technology characteristics

Operating / storage temperature : -55 °C / +125 °C

Soldering temperature : 260 °C (10smax)

Burn-in : +125 °C (+0/-3 °C) during 168H

Life test : +125 °C (+0/-3 °C) during 1000-2000H

Thermal shocks :

25-100 cycles -55 °C / +125 °C with 15min/stage

Moisture resistance : > as per MIL-STD-202 method 106

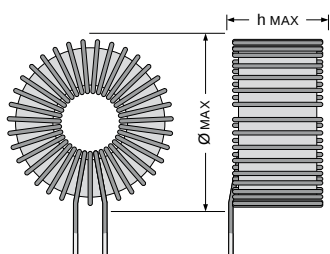
Heating : <25 °C above 90 °C

Applied standards : ESCC 3201 generic specification for space products

Max dimensions of your custom toroidal core into TT technology

Casing	Pin number	Connections	Wound core dimensions (max in mm) Ø x h
TT 05	6	SMD	4.1 x 2.3
TT 07	8	J, SMD	5.6 x 5.3
TT 08	4	SMD, Through-hole	13.8 x 6.3
TT 09	12	SMD	6.9 x 4.7
TT 12	8	SMD	9.35 x 4.9
TT 14	8	SMD	11.3 x 8.9
TT 17	8	SMD	14.2 x 11.6
TT 19	8	SMD	16.3 x 11.1
TT 20	16	SMD	16.5 x 11.1
TT 25	16	SMD	21.8 x 10.2
TT 26	16	Through-hole	21.8 x 23
TT 29	10	Through-hole	23.8 x 13.9
TT 33	10	Through-hole	27.1 x 14.6
TT 37	16	Through-hole	31.8 x 16.1
TT 40	16	Through-hole	34.8 x 21.8

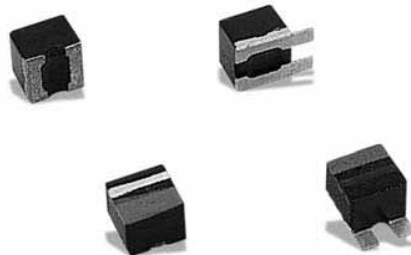
Other casings available upon request



Standard functions in TT technology

Casing	Standard functions	Family	Characteristics	
TT 05	Common mode chokes	DLEF42	-10dB @ 10MHz	-23dB @ 100MHz
TT 05	Wide band RF transformers	WRFT4x	50Ω : 50Ω	50Ω : 800Ω
TT 07	SMD energy storage inductors	ESI01	2,6μH / 2A	150μH / 0.25A
TT 08	Current Transformer	CT08	8A / 200kHz / 2%	-
TT 14	Common mode chokes	CMC14	140μH / 7.2A	2.2mH / 2.2A
TT 17	Common mode chokes	CMC17	0.45mH / 11.7A	69mH / 1.1A





Chip Inductors - MPC10000 Series

- Cesa qualified 3201/008 and as per Mil Spec M83446/5
- Excellent Q values even at high frequencies
- Very high self-resonant frequencies (SFRs)
- Extremely stable inductance values from -55 °C to +125 °C
- With or without tab terminations
- Tinned or gold plated terminations
- Frequency range: 7.9MHz to 500MHz
- Operating temperature range: -55 °C to +125 °C
- Weight: 0.07 gram

Electrical Data (25°C)

ID Code	Inductance* μH	Q Min	Test Freq. MHz	SFR Min. MHz	DCR Max. Ω	DC Current mA max	Tol** % Min
MPC1 10 000 010	0.010	60	150	2000	0.025	750	10
MPC1 10 000 012	0.012	60	150	2000	0.025	750	
MPC1 10 000 015	0.015	60	150	1800	0.04	750	
MPC1 10 000 018	0.018	60	150	1500	0.04	750	
MPC1 10 000 022	0.022	51	100	1400	0.04	750	5
MPC1 10 000 027	0.027	51	100	1200	0.04	750	
MPC1 10 000 033	0.033	47	100	1200	0.05	640	
MPC1 10 000 039	0.039	47	100	1200	0.07	600	
MPC1 10 000 047	0.047	47	100	1000	0.08	550	
MPC1 10 000 056	0.056	47	100	900	0.09	520	
MPC1 10 000 068	0.068	47	100	900	0.10	480	
MPC1 10 000 082	0.082	47	100	750	0.11	470	
MPC1 10 000 100	0.10	47	50	620	0.11	470	10
MPC1 10 000 120	0.12	47	50	540	0.11	470	
MPC1 10 000 150	0.15	47	50	450	0.12	450	
MPC1 10 000 180	0.18	51	50	400	0.14	430	
MPC1 10 000 220	0.22	51	50	380	0.20	350	5
MPC1 10 000 270	0.27	51	50	340	0.25	310	
MPC1 10 000 330	0.33	51	50	280	0.30	280	
MPC1 10 000 390	0.39	47	50	240	0.45	240	
MPC1 10 000 470	0.47	47	25	210	0.50	230	
MPC1 10 000 560	0.56	52	25	180	0.55	220	

ID Code	Inductance* μH	Q Min	Test Freq. MHz	SFR Min. MHz	DCR Max. Ω	DC Current mA max	Tol** % Min
MPC1 10 000 680	0.68	52	25	160	0.58	210	5
MPC1 10 000 820	0.82	52	25	130	0.60	200	
MPC1 10 001 000	1.00	52	25	110	0.65	190	2
MPC1 10 001 200	1.20	42	7.9	110	0.75	180	
MPC1 10 001 500	1.50	42	7.9	100	1.1	160	
MPC1 10 001 800	1.80	48	7.9	95	1.2	150	
MPC1 10 002 200	2.20	48	7.9	90	1.3	140	
MPC1 10 002 700	2.70	48	7.9	65	1.5	130	
MPC1 10 003 300	3.30	48	7.9	55	1.8	120	
MPC1 10 003 900	3.90	48	7.9	45	2.0	110	
MPC1 10 004 700	4.70	48	7.9	43	2.3	100	
MPC1 10 005 600	5.60	48	7.9	40	2.5	100	
MPC1 10 006 800	6.80	46	7.9	38	2.6	98	
MPC1 10 008 200	8.20	46	7.9	35	2.8	95	
MPC1 10 010 000	10.0	46	7.9	33	3.3	87	

* Standard inductance tolerance: $\pm 10\%$

** Tightest achievable tolerances.

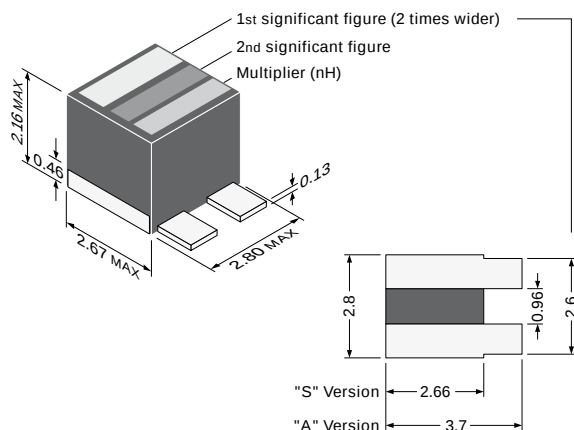
Other inductance values and S parameters on request.

Inductance variation: 35 PPM/°Cmax. in the range 0.01 to 12 H
80 PPM/°Cmax. in the range 1.5 to 10 μH

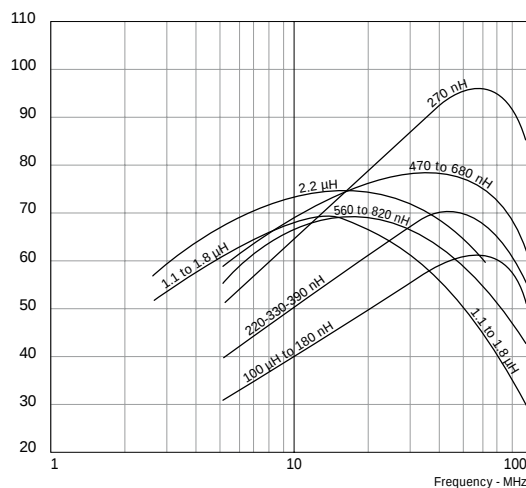
Packaging

Tape and Reel (without tab): 500 pieces
or Tray: 81 pieces without tab, 49 pieces with tab

Typical Dimensions (mm)



Q vs frequency



Miniature Chip Inductors MSCI 10000

MPCI10000 series are usually installed on Military applications and breadboards for Space applications.

Since January 2003, Microspire has been manufacturing Radio Frequency Fixed Coils, MPC1 10000 series fulfilling ESA ESCC Generic specification N° 3201 and detail specification N° 3201/008.

This range is named MSCI (S for space applications).

This qualification approval includes final production tests Chart II, burn-in and electrical measurements to testing level B Chart III and qualification testing Chart IV.

For procurement, different quality levels are offered :

- Final production tests Chart II
- Burn-in and electrical measurements Chart III with level B or C (as required)
- Lot acceptance testing Chart V if required

Components delivered through this specification need to be processed and inspected in accordance with the Microspire Process Identification Document (P.I.D.).

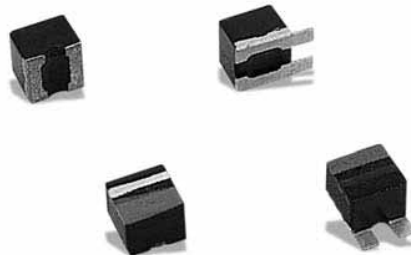
Each component delivered is traceable to its production lot.

Cross reference chart

Microspire Non-QPL ID Code	Microspire QPL ID Code	ESA SCC Component Part Number	Microspire Non-QPL ID Code	Microspire QPL ID Code	ESA SCC Component Part Number
MPCI 10 000 010 x y 10	MSCI 10 000 010 x y 10	3201008 aa b L010 K	MPCI 10 000 560 x y 10/5	MSCI 10 000 560 x y 10/5	3201008 aa b L56 K/J
MPCI 10 000 012 x y 10	MSCI 10 000 012 x y 10	3201008 aa b L012 K	MPCI 10 000 680 x y 10/5	MSCI 10 000 680 x y 10/5	3201008 aa b L68 K/J
MPCI 10 000 015 x y 10	MSCI 10 000 015 x y 10	3201008 aa b L015 K	MPCI 10 000 820 x y 10/5	MSCI 10 000 820 x y 10/5	3201008 aa b L82 K/J
MPCI 10 000 018 x y 10	MSCI 10 000 018 x y 10	3201008 aa b L018 K	MPCI 10 001 000 x y 10/5	MSCI 10 001 000 x y 10/5	3201008 aa b L10 K/J
MPCI 10 000 022 x y 10/5	MSCI 10 000 022 x y 10/5	3201008 aa b L022 K/J	MPCI 10 001 200 x y 10/5/2	MSCI 10 001 200 x y 10/5/2	3201008 aa b 1L2 K/J/G
MPCI 10 000 027 x y 10/5	MSCI 10 000 027 x y 10/5	3201008 aa b L027 K/J	MPCI 10 001 500 x y 10/5/2	MSCI 10 001 500 x y 10/5/2	3201008 aa b 1L5 K/J/G
MPCI 10 000 033 x y 10/5	MSCI 10 000 033 x y 10/5	3201008 aa b L033 K/J	MPCI 10 001 800 x y 10/5/2	MSCI 10 001 800 x y 10/5/2	3201008 aa b 1L8 K/J/G
MPCI 10 000 039 x y 10/5	MSCI 10 000 039 x y 10/5	3201008 aa b L039 K/J	MPCI 10 002 200 x y 10/5/2	MSCI 10 002 200 x y 10/5/2	3201008 aa b 2L2 K/J/G
MPCI 10 000 047 x y 10/5	MSCI 10 000 047 x y 10/5	3201008 aa b L047 K/J	MPCI 10 002 700 x y 10/5/2	MSCI 10 002 700 x y 10/5/2	3201008 aa b 2L7 K/J/G
MPCI 10 000 056 x y 10/5	MSCI 10 000 056 x y 10/5	3201008 aa b L056 K/J	MPCI 10 003 300 x y 10/5/2	MSCI 10 003 300 x y 10/5/2	3201008 aa b 3L3 K/J/G
MPCI 10 000 068 x y 10/5	MSCI 10 000 068 x y 10/5	3201008 aa b L068 K/J	MPCI 10 003 900 x y 10/5/2	MSCI 10 003 900 x y 10/5/2	3201008 aa b 3L9 K/J/G
MPCI 10 000 082 x y 10/5	MSCI 10 000 082 x y 10/5	3201008 aa b L082 K/J	MPCI 10 004 700 x y 10/5/2	MSCI 10 004 700 x y 10/5/2	3201008 aa b 4L2 K/J/G
MPCI 10 000 100 x y 10	MSCI 10 000 100 x y 10	3201008 aa b L10 K	MPCI 10 005 600 x y 10/5/2	MSCI 10 005 600 x y 10/5/2	3201008 aa b 5L6 K/J/G
MPCI 10 000 120 x y 10	MSCI 10 000 120 x y 10	3201008 aa b L12 K	MPCI 10 006 800 x y 10/5/2	MSCI 10 006 800 x y 10/5/2	3201008 aa b 6L8 K/J/G
MPCI 10 000 150 x y 10	MSCI 10 000 150 x y 10	3201008 aa b L15 K	MPCI 10 008 200 x y 10/5/2	MSCI 10 008 200 x y 10/5/2	3201008 aa b 8L2 K/J/G
MPCI 10 000 180 x y 10	MSCI 10 000 180 x y 10	3201008 aa b L18 K	MPCI 10 010 000 x y 10/5/2	MSCI 10 010 000 x y 10/5/2	3201008 aa b 100 K/J/G
MPCI 10 000 220 x y 10	MSCI 10 000 220 x y 10	3201008 aa b L22 K	aa = 01 for Au Termination aa = 02 for SnPb Termination	b = B for Chart III level B b = C for Chart III level C	K for ±10% J for ±5% G for ±2%
MPCI 10 000 270 x y 10	MSCI 10 000 270 x y 10	3201008 aa b L27 K			
MPCI 10 000 330 x y 10	MSCI 10 000 330 x y 10	3201008 aa b L33 K			
MPCI 10 000 390 x y 10	MSCI 10 000 390 x y 10	3201008 aa b L39 K			
MPCI 10 000 470 x y 10/5	MSCI 10 000 470 x y 10/5	3201008 aa b L47 K/J			

To Order

To Order					MPCI 10 ### ## x y z
MPCI	10	### ##	x	y	z
Radio Frequency Fixed Coils	Size	Inductance Value (nH) from 000 010 to 010 000	Terminations x = G for Gold x = T for Tinned	Terminations shape y = S without tab y = A with tab (Not valid for space use)	Tolerance : z = 10 for $\pm 10\%$ z = 5 for $\pm 5\%$ z = 2 for $\pm 2\%$



Chip Inductors - MPC12000 Series

- Cesa qualified 3201/008 and as per Mil Spec M83446/6
- Excellent Q values even at high frequencies
- Very high self-resonant frequencies (SFRs)
- Extremely stable inductance values from -55 °C to +125 °C
- With or without tab terminations
- Tinned or gold plated terminations
- Frequency range: 790 KHz to 30 MHz
- Operating temperature range: -55 °C to +125 °C
- Weight: 0.07 gram

Electrical Data (25°C)

ID Code	Inductance* μH	Q Min	Test Freq. MHz	SFR Min. MHz	DCR Max. Ω	DC Current mA max	Tol** % Min
MPC12 012 000	12	42	2.5	26	2.0	110	2
MPC12 015 000	15	44	2.5	24	2.2	105	
MPC12 018 000	18	44	2.5	21	2.8	100	
MPC12 022 000	22	48	2.5	20	3.5	85	
MPC12 027 000	27	49	2.5	19	4.3	75	
MPC12 033 000	33	50	2.5	14	5.5	68	
MPC12 039 000	39	52	2.5	12	6.5	61	
MPC12 047 000	47	53	2.5	11	8.5	54	
MPC12 056 000	56	56	2.5	10	12	46	
MPC12 068 000	68	53	2.5	9.0	13	42	
MPC12 082 000	82	49	2.5	8.0	15	40	
MPC12 100 000	100	49	2.5	7.0	18	36	
MPC12 120 000	120	37	0.79	6.0	21	34	5
MPC12 150 000	150	30	0.79	5.0	26	31	
MPC12 180 000	180	30	0.79	5.0	28	29	
MPC12 220 000	220	26	0.79	4.5	32	29	

ID Code	Inductance* μH	Q Min	Test Freq. MHz	SFR Min. MHz	DCR Max. Ω	DC Current mA max	Tol** % Min
MPC12 270 000	270	26	0.79	4.0	36	26	5
MPC12 330 000	330	24	0.79	3.7	42	24	
MPC12 390 000	390	24	0.79	3.5	46	23	
MPC12 470 000	470	24	0.79	3.0	68	19	
MPC12 560 000	560	22	0.79	2.8	77	18	
MPC12 680 000	680	20	0.79	2.5	85	17	
MPC12 820 000	820	16	0.79	2.0	100	16	
MPC12 1000 000	1000	12	0.79	1.5	120	15	

* Standard inductance tolerance: $\pm 10\%$

** Tightest achievable tolerances.

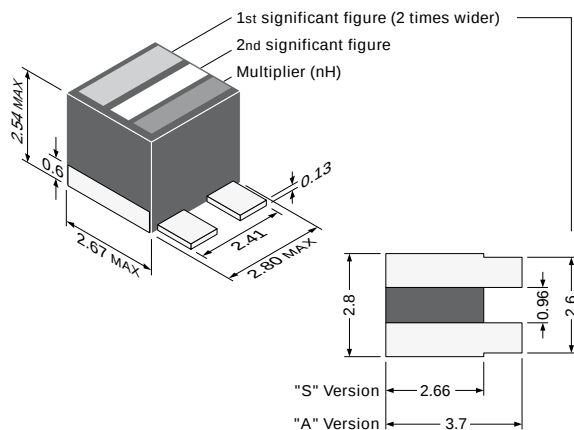
Other inductance values and S parameters on request.

Inductance variation: 80 PPM/°C max. in the range 12 to 100 μH
35 PPM/°C max. in the range 120 to 1000 μH

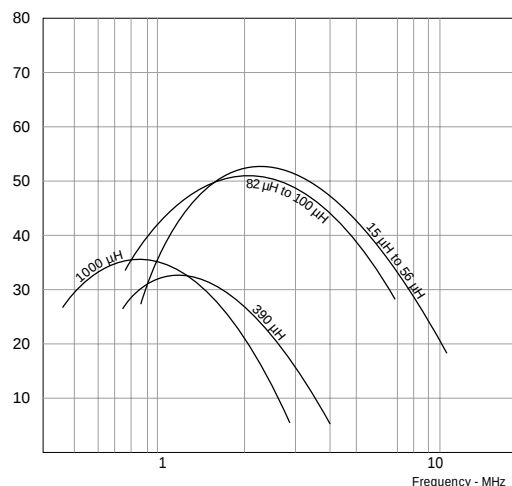
Packaging

Tape and Reel (without tab): 500 pieces
or Tray: 81 pieces without tab, 49 pieces with tab

Typical Dimensions (mm)



Q vs frequency



Miniature Chip Inductors MSCI 12000

QPL Components

MPCI 12000 series are usually installed on Military applications and breadboards for Space applications.

Since January 2003, Microspire has been manufacturing Radio Frequency Fixed Coils, MPCI 12000 series fulfilling ESA ESCC Generic specification N° 3201 and detail specification N° 3201/008.

This range is named MSCI (S for space applications).

This qualification approval includes final production tests Chart II, burn-in and electrical measurements to testing level B Chart III and qualification testing Chart IV.

For procurement, different quality levels are offered :

- Final production tests Chart II
- Burn-in and electrical measurements Chart III with level B or C (as required)
- Lot acceptance testing Chart V if required

Components delivered through this specification need to be processed and inspected in accordance with the Microspire Process Identification Document (P.I.D.).

Each component delivered is traceable to its production lot.

Cross reference chart

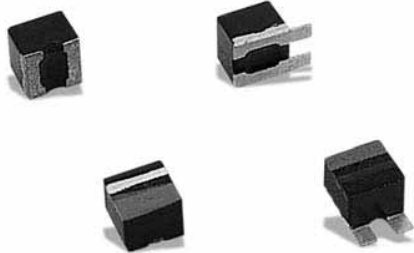
Microspire Non-QPL ID Code	Microspire QPL ID Code	ESA SCC Component Part Number	Microspire Non-QPL ID Code	Microspire QPL ID Code	ESA SCC Component Part Number
MPCI 12 012 000 x y 10/5/2	MSCI 12 012 000 x y 10/5/2	3201008 aa b 120 K/J/G	MPCI 12 220 000 x y 10/5	MSCI 12 220 000 x y 10/5	3201008 aa b 221 K/J
MPCI 12 015 000 x y 10/5/2	MSCI 12 015 000 x y 10/5/2	3201008 aa b 150 K/J/G	MPCI 12 270 000 x y 10/5	MSCI 12 270 000 x y 10/5	3201008 aa b 271 K/J
MPCI 12 018 000 x y 10/5/2	MSCI 12 018 000 x y 10/5/2	3201008 aa b 180 K/J/G	MPCI 12 330 000 x y 10/5	MSCI 12 330 000 x y 10/5	3201008 aa b 331 K/J
MPCI 12 022 000 x y 10/5/2	MSCI 12 022 000 x y 10/5/2	3201008 aa b 220 K/J/G	MPCI 12 390 000 x y 10/5	MSCI 12 390 000 x y 10/5	3201008 aa b 391 K/J
MPCI 12 027 000 x y 10/5/2	MSCI 12 027 000 x y 10/5/2	3201008 aa b 270 K/J/G	MPCI 12 470 000 x y 10/5	MSCI 12 470 000 x y 10/5	3201008 aa b 471 K/J
MPCI 12 033 000 x y 10/5/2	MSCI 12 033 000 x y 10/5/2	3201008 aa b 330 K/J/G	MPCI 12 560 000 x y 10/5	MSCI 12 560 000 x y 10/5	3201008 aa b 561 K/J
MPCI 12 039 000 x y 10/5/2	MSCI 12 039 000 x y 10/5/2	3201008 aa b 390 K/J/G	MPCI 12 680 000 x y 10/5	MSCI 12 680 000 x y 10/5	3201008 aa b 681 K/J
MPCI 12 047 000 x y 10/5/2	MSCI 12 047 000 x y 10/5/2	3201008 aa b 470 K/J/G	MPCI 12 820 000 x y 10/5	MSCI 12 820 000 x y 10/5	3201008 aa b 821 K/J
MPCI 12 056 000 x y 10/5/2	MSCI 12 056 000 x y 10/5/2	3201008 aa b 560 K/J/G	MPCI 12 1000 000 x y 10/5	MSCI 12 1000 000 x y 10/5	3201008 aa b 102 K/J
MPCI 12 068 000 x y 10/5/2	MSCI 12 068 000 x y 10/5/2	3201008 aa b 680 K/J/G			
MPCI 12 082 000 x y 10/5/2	MSCI 12 082 000 x y 10/5/2	3201008 aa b 820 K/J/G			
MPCI 12 100 000 x y 10/5/2	MSCI 12 100 000 x y 10/5/2	3201008 aa b 101 K/J/G			
MPCI 12 120 000 x y 10/5	MSCI 12 120 000 x y 10/5	3201008 aa b 121 K/J			
MPCI 12 150 000 x y 10/5	MSCI 12 150 000 x y 10/5	3201008 aa b 151 K/J			
MPCI 12 180 000 x y 10/5	MSCI 12 180 000 x y 10/5	3201008 aa b 181 K/J			
			aa	b	K/J/G (tolerance)
			aa = 01 for Au Termination	b = B for Chart III level B	K for ±10%
			aa = 02 for SnPb Termination	b = C for Chart III level C	J for ±5%
					G for ±2%

To Order

MPCI 12 ### ## x y z

MPCI	12	### ##	x	y	z
Radio Frequency Fixed Coils	Size	Inductance Value (nH) from 012 000 to 1000 000	Terminations x = G for Gold x = T for Tinned	Terminations shape y = S without tab y = A with tab (Not valid for space use)	Tolerance : z = 10 for ±10% z = 5 for ±5% z = 2 for ±2%





Chip Inductors - MPC20000 Series

- Cesa qualified 3201/008 and as per Mil Spec M83446/10
- Excellent Q values even at high frequencies
- Very high self-resonant frequencies (SFRs)
- Extremely stable inductance values from -55 °C to +125 °C
- With or without tab terminations
- Tinned or gold plated terminations
- Frequency range: 790 KHz to 500 MHz
- Operating temperature range: -55 °C to +125 °C
- Weight: 0.15 gram

Electrical Data (25°C)

ID Code	Inductance* μH	Q Min	Test Freq. MHz	SFR Min. MHz	DCR Max. Ω	DC Current mA max	Tol** % Min
MPC20 000 010	0.010	60	150	2000	0.04	1000	10
MPC20 000 012	0.012	70	150	1800	0.04	1000	
MPC20 000 015	0.015	75	150	1500	0.04	1000	
MPC20 000 018	0.018	75	150	1500	0.04	1000	
MPC20 000 022	0.022	60	100	1300	0.05	1000	
MPC20 000 027	0.027	60	100	1300	0.05	1000	5
MPC20 000 033	0.033	60	100	1000	0.05	1000	
MPC20 000 039	0.039	60	100	1000	0.06	900	
MPC20 000 047	0.047	65	100	800	0.06	900	
MPC20 000 056	0.056	65	100	760	0.06	900	
MPC20 000 068	0.068	65	100	700	0.07	840	10
MPC20 000 082	0.082	65	100	650	0.07	840	
MPC20 000 100	0.100	65	50	570	0.07	840	
MPC20 000 120	0.120	65	50	520	0.07	840	
MPC20 000 150	0.150	75	50	400	0.08	790	
MPC20 000 180	0.180	75	50	360	0.08	790	5
MPC20 000 220	0.220	70	50	320	0.08	790	
MPC20 000 270	0.270	70	50	270	0.10	700	
MPC20 000 330	0.330	70	50	240	0.10	700	
MPC20 000 390	0.390	70	50	220	0.10	700	
MPC20 000 470	0.470	70	25	190	0.14	590	2
MPC20 000 560	0.560	70	25	170	0.19	510	
MPC20 000 680	0.680	70	25	160	0.26	430	
MPC20 000 820	0.820	75	25	150	0.30	400	
MPC20 001 000	1.00	75	25	130	0.34	380	
MPC20 001 200	1.20	65	7.9	120	0.45	330	2
MPC20 001 500	1.50	65	7.9	110	0.57	290	
MPC20 001 800	1.80	65	7.9	100	0.72	260	
MPC20 002 200	2.20	65	7.9	80	0.90	230	
MPC20 002 700	2.70	65	7.9	60	1.10	210	
MPC20 003 300	3.30	60	7.9	50	1.20	200	2
MPC20 003 900	3.90	60	7.9	45	1.40	180	
MPC20 004 700	4.70	60	7.9	42	1.60	170	
MPC20 005 600	5.60	65	7.9	40	1.80	160	
MPC20 006 800	6.80	65	7.9	37	2.40	140	

ID Code	Inductance* μH	Q Min	Test Freq. MHz	SFR Min. MHz	DCR Max. Ω	DC Current mA max	Tol** % Min
MPC20 008 200	8.20	65	7.9	34	3.00	130	2
MPC20 010 000	10.0	65	7.9	29	3.50	120	
MPC20 012 000	12.0	60	2.5	27	3.60	118	
MPC20 015 000	15.0	60	2.5	22	3.70	115	
MPC20 018 000	18.0	60	2.5	17	3.80	114	
MPC20 022 000	22.0	60	2.5	16	3.90	113	
MPC20 027 000	27.0	65	2.5	15	4.00	110	
MPC20 033 000	33.0	65	2.5	14	5.00	100	
MPC20 039 000	39.0	65	2.5	13	7.00	84	
MPC20 047 000	47.0	70	2.5	12	8.00	79	
MPC20 056 000	56.0	70	2.5	11	10.0	70	
MPC20 068 000	68.0	65	2.5	10	11.0	67	
MPC20 082 000	82.0	60	2.5	9	12.0	64	
MPC20 100 000	100	60	2.5	8	13.0	62	
MPC20 120 000	120	40	0.79	7	14.0	59	
MPC20 150 000	150	40	0.79	6	16.0	56	
MPC20 180 000	180	40	0.79	5	18.0	52	
MPC20 220 000	220	40	0.79	4	24.0	45	
MPC20 270 000	270	40	0.79	3.3	25.0	44	
MPC20 330 000	330	40	0.79	3.1	29.0	41	
MPC20 390 000	390	40	0.79	2.9	32.0	39	
MPC20 470 000	470	35	0.79	2.4	35.0	37	
MPC20 560 000	560	35	0.79	2.1	45.0	33	
MPC20 680 000	680	35	0.79	1.9	55.0	30	
MPC20 820 000	820	30	0.79	1.8	70.0	26	
MPC20 1000 000	1000	30	0.79	1.7	80.0	25	

* Standard inductance tolerance: $\pm 10\%$

** Tightest achievable tolerances.

Other inductance values and S parameters on request.

Inductance variation: 60 PPM/°Cmax. in the range 0.01 to 1 μH

80 PPM/°Cmax. in the range 1.2 to 10 μH

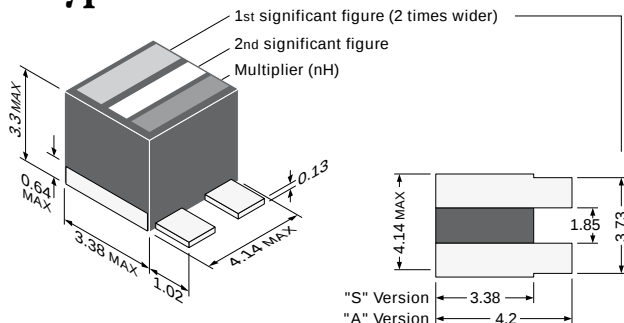
150 PPM/°Cmax. in the range 12 to 100 μH

300 PPM/°Cmax. in the range 120 to 1000 μH

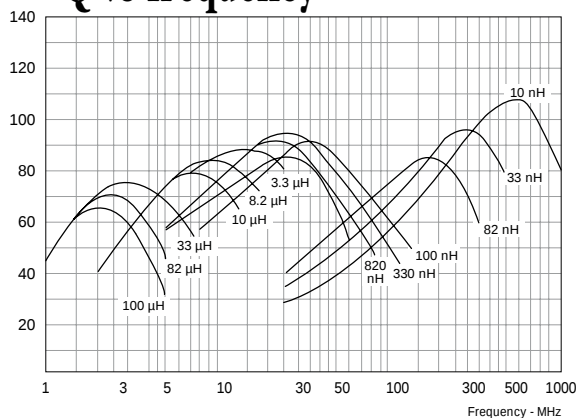
Packaging

Tape and Reel (without tab): 500 pieces
or Tray: 49 pieces

Typical Dimensions (mm)



Q vs frequency



Miniature Chip Inductors MSC120000

QPL Components

MPCI20000 series are usually installed on Military applications and breadboards for Space applications.

Since January 2003, Microspire has been manufacturing Radio Frequency Fixed Coils, MPCI20000 series fulfilling ESA ESCC Generic specification N° 3201 and detail specification N° 3201/008.

This range is named MSC1 (S for space applications).

This qualification approval includes final production tests Chart II, burn-in and electrical measurements to testing level B Chart III and qualification testing Chart IV.

For procurement, different quality levels are offered :

- Final production tests Chart II
- Burn-in and electrical measurements Chart III with level B or C (as required)
- Lot acceptance testing Chart V if required

Components delivered through this specification need to be processed and inspected in accordance with the Microspire Process Identification Document (P.I.D.).

Each component delivered is traceable to its production lot.

Cross reference chart

Microspire Non-QPL ID Code	Microspire QPL ID Code	ESA SCC Component Part Number	Microspire Non-QPL ID Code	Microspire QPL ID Code	ESA SCC Component Part Number
MPCI 20 000 010 x y 10	MSCI 20 000 010 x y 10	3201008 aa b L010 K	MPCI 20 005 600 x y 10/5/2	MSCI 20 005 600 x y 10/5/2	3201008 aa b 5L6 K/J/G
MPCI 20 000 012 x y 10	MSCI 20 000 012 x y 10	3201008 aa b L012 K	MPCI 20 006 800 x y 10/5/2	MSCI 20 006 800 x y 10/5/2	3201008 aa b 6L8 K/J/G
MPCI 20 000 015 x y 10	MSCI 20 000 015 x y 10	3201008 aa b L015 K	MPCI 20 008 200 x y 10/5/2	MSCI 20 008 200 x y 10/5/2	3201008 aa b 8L2 K/J/G
MPCI 20 000 018 x y 10	MSCI 20 000 018 x y 10	3201008 aa b L018 K	MPCI 20 010 000 x y 10/5/2	MSCI 20 010 000 x y 10/5/2	3201008 aa b 100 K/J/G
MPCI 20 000 022 x y 10/5	MSCI 20 000 022 x y 10/5	3201008 aa b L022 K/J	MPCI 20 012 000 x y 10/5/2	MSCI 20 012 000 x y 10/5/2	3201008 aa b 120 K/J/G
MPCI 20 000 027 x y 10/5	MSCI 20 000 027 x y 10/5	3201008 aa b L027 K/J	MPCI 20 015 000 x y 10/5/2	MSCI 20 015 000 x y 10/5/2	3201008 aa b 150 K/J/G
MPCI 20 000 033 x y 10/5	MSCI 20 000 033 x y 10/5	3201008 aa b L033 K/J	MPCI 20 018 000 x y 10/5/2	MSCI 20 018 000 x y 10/5/2	3201008 aa b 180 K/J/G
MPCI 20 000 039 x y 10/5	MSCI 20 000 039 x y 10/5	3201008 aa b L039 K/J	MPCI 20 022 000 x y 10/5/2	MSCI 20 022 000 x y 10/5/2	3201008 aa b 220 K/J/G
MPCI 20 000 047 x y 10/5	MSCI 20 000 047 x y 10/5	3201008 aa b L047 K/J	MPCI 20 027 000 x y 10/5/2	MSCI 20 027 000 x y 10/5/2	3201008 aa b 270 K/J/G
MPCI 20 000 056 x y 10/5	MSCI 20 000 056 x y 10/5	3201008 aa b L056 K/J	MPCI 20 033 000 x y 10/5/2	MSCI 20 033 000 x y 10/5/2	3201008 aa b 330 K/J/G
MPCI 20 000 068 x y 10/5	MSCI 20 000 068 x y 10/5	3201008 aa b L068 K/J	MPCI 20 039 000 x y 10/5/2	MSCI 20 039 000 x y 10/5/2	3201008 aa b 390 K/J/G
MPCI 20 000 082 x y 10/5	MSCI 20 000 082 x y 10/5	3201008 aa b L082 K/J	MPCI 20 047 000 x y 10/5/2	MSCI 20 047 000 x y 10/5/2	3201008 aa b 470 K/J/G
MPCI 20 000 100 x y 10	MSCI 20 000 100 x y 10	3201008 aa b L10 K	MPCI 20 056 000 x y 10/5/2	MSCI 20 056 000 x y 10/5/2	3201008 aa b 560 K/J/G
MPCI 20 000 120 x y 10	MSCI 20 000 120 x y 10	3201008 aa b L12 K	MPCI 20 068 000 x y 10/5/2	MSCI 20 068 000 x y 10/5/2	3201008 aa b 680 K/J/G
MPCI 20 000 150 x y 10	MSCI 20 000 150 x y 10	3201008 aa b L15 K	MPCI 20 082 000 x y 10/5/2	MSCI 20 082 000 x y 10/5/2	3201008 aa b 820 K/J/G
MPCI 20 000 180 x y 10	MSCI 20 000 180 x y 10	3201008 aa b L18 K	MPCI 20 100 000 x y 10/5/2	MSCI 20 100 000 x y 10/5/2	3201008 aa b 101 K/J/G
MPCI 20 000 220 x y 10	MSCI 20 000 220 x y 10	3201008 aa b L22 K	MPCI 20 120 000 x y 10/5/2	MSCI 20 120 000 x y 10/5/2	3201008 aa b 121 K/J/G
MPCI 20 000 270 x y 10	MSCI 20 000 270 x y 10	3201008 aa b L27 K	MPCI 20 150 000 x y 10/5/2	MSCI 20 150 000 x y 10/5/2	3201008 aa b 151 K/J/G
MPCI 20 000 330 x y 10	MSCI 20 000 330 x y 10	3201008 aa b L33 K	MPCI 20 180 000 x y 10/5/2	MSCI 20 180 000 x y 10/5/2	3201008 aa b 181 K/J/G
MPCI 20 000 390 x y 10	MSCI 20 000 390 x y 10	3201008 aa b L39 K	MPCI 20 220 000 x y 10/5/2	MSCI 20 220 000 x y 10/5/2	3201008 aa b 221 K/J/G
MPCI 20 000 470 x y 10/5	MSCI 20 000 470 x y 10/5	3201008 aa b L47 K/J	MPCI 20 270 000 x y 10/5/2	MSCI 20 270 000 x y 10/5/2	3201008 aa b 271 K/J/G
MPCI 20 000 560 x y 10/5	MSCI 20 000 560 x y 10/5	3201008 aa b L56 K/J	MPCI 20 330 000 x y 10/5/2	MSCI 20 330 000 x y 10/5/2	3201008 aa b 331 K/J/G
MPCI 20 000 680 x y 10/5	MSCI 20 000 680 x y 10/5	3201008 aa b L68 K/J	MPCI 20 390 000 x y 10/5/2	MSCI 20 390 000 x y 10/5/2	3201008 aa b 391 K/J/G
MPCI 20 000 820 x y 10/5	MSCI 20 000 820 x y 10/5	3201008 aa b L82 K/J	MPCI 20 470 000 x y 10/5/2	MSCI 20 470 000 x y 10/5/2	3201008 aa b 471 K/J/G
MPCI 20 001 000 x y 10/5	MSCI 20 001 000 x y 10/5	3201008 aa b L10 K/J	MPCI 20 560 000 x y 10/5/2	MSCI 20 560 000 x y 10/5/2	3201008 aa b 561 K/J/G
MPCI 20 001 200 x y 10/5/2	MSCI 20 001 200 x y 10/5/2	3201008 aa b 1L2 K/J/G	MPCI 20 680 000 x y 10/5/2	MSCI 20 680 000 x y 10/5/2	3201008 aa b 681 K/J/G
MPCI 20 001 500 x y 10/5/2	MSCI 20 001 500 x y 10/5/2	3201008 aa b 1L5 K/J/G	MPCI 20 820 000 x y 10/5/2	MSCI 20 820 000 x y 10/5/2	3201008 aa b 821 K/J/G
MPCI 20 001 800 x y 10/5/2	MSCI 20 001 800 x y 10/5/2	3201008 aa b 1L8 K/J/G	MPCI 20 1000 000 x y 10/5/2	MSCI 20 1000 000 x y 10/5/2	3201008 aa b 102 K/J/G
MPCI 20 002 200 x y 10/5/2	MSCI 20 002 200 x y 10/5/2	3201008 aa b 2L2 K/J/G			
MPCI 20 002 700 x y 10/5/2	MSCI 20 002 700 x y 10/5/2	3201008 aa b 2L7 K/J/G			
MPCI 20 003 300 x y 10/5/2	MSCI 20 003 300 x y 10/5/2	3201008 aa b 3L3 K/J/G			
MPCI 20 003 900 x y 10/5/2	MSCI 20 003 900 x y 10/5/2	3201008 aa b 3L9 K/J/G			
MPCI 20 004 700 x y 10/5/2	MSCI 20 004 700 x y 10/5/2	3201008 aa b 4L7 K/J/G			
			aa	b	K/J/G (tolerance)
			aa = 03 for Au Termination	b = B for Chart III level B	K for ±10%
			aa = 04 for SnPb Termination	b = C for Chart III level C	J for ±5%
					G for ±2%

To Order

MPCI 20 ### ## x y z

MPCI	20	### ##	x	y	z
Radio Frequency Fixed Coils	Size	Inductance Value (nH) from 000 010 to 010 000	Terminations x = T for Tinned x = G for Tinned	Terminations shape y = S without tab y = A with tab (Not valid for space use)	Tolerance : z = 10 for ±10% z = 5 for ±5% z = 2 for ±2%



Chip Inductors - MPC233 Series



- High temp. RF inductances
- Excellent Q values even at high frequencies
- Very high self-resonant frequencies (SFRs)
- Tinned or gold plated terminations
- Frequency range: 790 kHz to 500 MHz
- Operating temperature range: -55 °C to +175 °C
- Weight: 0.15 gram

Electrical Data (25°C)

ID Code	Inductance* μH	Q Min	Test Freq. MHz	SFR Min. MHz	DCR Max. Ω	DC Current mA max	Tol** % Min
MPC233 000 010	0.010	60	150	2000	0.04	1000	10
MPC233 000 012	0.012	70	150	1800	0.04	1000	
MPC233 000 015	0.015	75	150	1500	0.04	1000	
MPC233 000 018	0.018	75	150	1500	0.04	1000	
MPC233 000 022	0.022	60	100	1300	0.05	1000	
MPC233 000 027	0.027	60	100	1300	0.05	1000	5
MPC233 000 033	0.033	60	100	1000	0.05	1000	
MPC233 000 039	0.039	60	100	1000	0.06	900	
MPC233 000 047	0.047	65	100	800	0.06	900	
MPC233 000 056	0.056	65	100	760	0.06	900	
MPC233 000 068	0.068	65	100	700	0.07	840	10
MPC233 000 082	0.082	65	100	650	0.07	840	
MPC233 000 100	0.100	65	50	570	0.07	840	
MPC233 000 120	0.120	65	50	520	0.07	840	
MPC233 000 150	0.150	75	50	400	0.08	790	
MPC233 000 180	0.180	75	50	360	0.08	790	5
MPC233 000 220	0.220	70	50	320	0.08	790	
MPC233 000 270	0.270	70	50	270	0.10	700	
MPC233 000 330	0.330	70	50	240	0.10	700	
MPC233 000 390	0.390	70	50	220	0.10	700	
MPC233 000 470	0.470	70	25	190	0.14	590	2
MPC233 000 560	0.560	70	25	170	0.19	510	
MPC233 000 680	0.680	70	25	160	0.26	430	
MPC233 000 820	0.820	75	25	150	0.30	400	
MPC233 001 000	1.00	75	25	130	0.34	380	
MPC233 001 200	1.20	65	7.9	120	0.45	330	2
MPC233 001 500	1.50	65	7.9	110	0.57	290	
MPC233 001 800	1.80	65	7.9	100	0.72	260	
MPC233 002 200	2.20	65	7.9	80	0.90	230	
MPC233 002 700	2.70	65	7.9	60	1.10	210	
MPC233 003 300	3.30	60	7.9	50	1.20	200	2
MPC233 003 900	3.90	60	7.9	45	1.40	180	
MPC233 004 700	4.70	60	7.9	42	1.60	170	
MPC233 005 600	5.60	65	7.9	40	1.80	160	
MPC233 006 800	6.80	65	7.9	37	2.40	140	
MPC233 008 200	8.20	65	7.9	34	3.00	130	2
MPC233 010 000	10.0	65	7.9	29	3.50	120	
MPC233 012 000	12.0	60	2.5	27	3.60	118	
MPC233 015 000	15.0	60	2.5	22	3.70	115	

ID Code	Inductance* μH	Q Min	Test Freq. MHz	SFR Min. MHz	DCR Max. Ω	DC Current mA max	Tol** % Min
MPC233 018 000	18.0	60	2.5	17	3.80	114	2
MPC233 022 000	22.0	60	2.5	16	3.90	113	
MPC233 027 000	27.0	65	2.5	15	4.00	110	
MPC233 033 000	33.0	65	2.5	14	5.00	100	
MPC233 039 000	39.0	65	2.5	13	7.00	84	
MPC233 047 000	47.0	70	2.5	12	8.00	79	
MPC233 056 000	56.0	70	2.5	11	10.0	70	
MPC233 068 000	68.0	65	2.5	10	11.0	67	
MPC233 082 000	82.0	60	2.5	9	12.0	64	
MPC233 100 000	100	60	2.5	8	13.0	62	
MPC233 120 000	120	40	0.79	7	14.0	59	
MPC233 150 000	150	40	0.79	6	16.0	56	
MPC233 180 000	180	40	0.79	5	18.0	52	
MPC233 220 000	220	40	0.79	4	24.0	45	
MPC233 270 000	270	40	0.79	3.3	25.0	44	
MPC233 330 000	330	40	0.79	3.1	29.0	41	
MPC233 390 000	390	40	0.79	2.9	32.0	39	
MPC233 470 000	470	35	0.79	2.4	35.0	37	
MPC233 560 000	560	35	0.79	2.1	45.0	33	
MPC233 680 000	680	35	0.79	1.9	55.0	30	
MPC233 820 000	820	30	0.79	1.8	70.0	26	
MPC233 1000 000	1000	30	0.79	1.7	80.0	25	

* Standard inductance tolerance: $\pm 10\%$

** Tightest achievable tolerances.

Other inductance values and S parameters on request.

Inductance variation: 60 PPM/°Cmax. in the range 0.01 to 1 μH

80 PPM/°Cmax. in the range 1.2 to 10 μH

150 PPM/°Cmax. in the range 12 to 100 μH

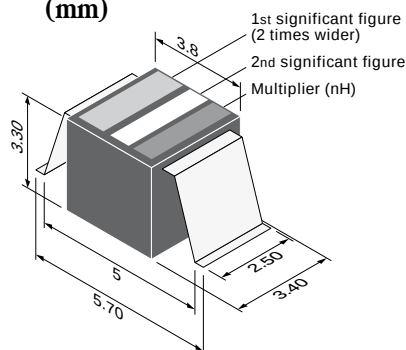
300 PPM/°Cmax. in the range 120 to 1000 μH

To Order

MPC233 ### ## xy

MPC233	### ##	x	y
Range	Inductance Value	Terminations x = G for Gold x = T for Tinned	Tolerance: y = 10 for $\pm 10\%$ y = 5 for $\pm 5\%$ y = 2 for $\pm 2\%$

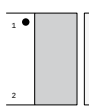
Typical Dimensions (mm)



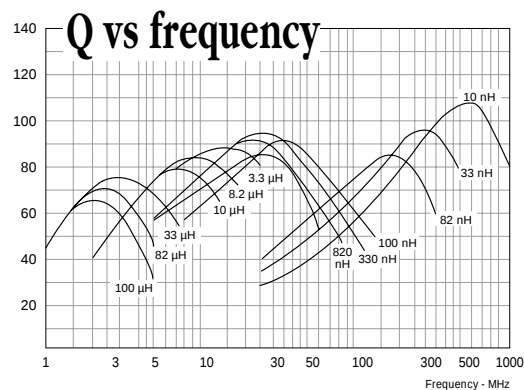
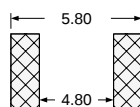
Packaging

Tray

Connections



PCB Layout (suggested)



Wide Band RF Transformers - WRFT 4x Series

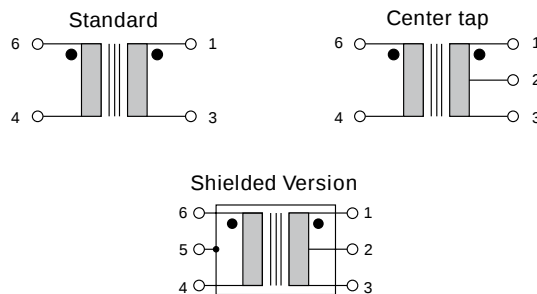


- Applied standards: ECSS-Q-ST-70-02C, MIL-STD-202, DO-160 and ESCC 3201 generic specification for space products
- Power input max. 250mW
- Isolation prim. to sec. 500V_{DC} minimum
- Suitable for IR and vapor reflow soldering
- SMD or through-hole cases
- Bandwidth: 100 KHz to 400 MHz
- Operating temperature -55 °C to +125 °C
- Weight: 1 gram
- Shielded version upon request

Electrical Data (25°C)

ID Code	Impedance ratio (Ω)	3 dB	Bandwidth (MHz) 2 dB	1 dB
WRFT41 1R0 1X	50 : 50	0.35 - 400	0.35 - 200	2 - 50
WRFT41 2R0 1X	50 : 100	0.30 - 300	0.5 - 250	2 - 230
WRFT42 2R0 1X	50 : 100 center tap	0.10 - 200	0.5 - 100	2 - 50
WRFT41 2R5 1X	50 : 125	0.10 - 100	0.1 - 50	0.1 - 20
WRFT41 4R0 1X	50 : 200	0.20 - 350	0.35 - 300	2 - 100
WRFT42 5R0 1X	50 : 250 center tap	0.30 - 300	0.6 - 200	0.5 - 100
WRFT42 8R0 1X	50 : 400 center tap	0.10 - 140	0.1 - 90	1 - 60
WRFT41 12R 1X	50 : 600	0.20 - 110	0.5 - 80	1 - 50
WRFT41 13R 1X	50 : 650	0.30 - 130	0.4 - 85	1 - 65
WRFT42 13R 1X	50 : 650 center tap	0.30 - 120	0.7 - 80	5 - 20
WRFT41 16R 1X	50 : 800	0.30 - 120	0.7 - 80	5 - 20
WRFT42 16R 1X	50 : 800 center tap	0.10 - 75	0.2 - 30	0.3 - 20

Connections

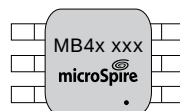


To Order

WRFT4# ### 1x

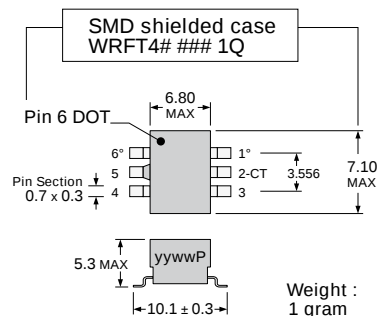
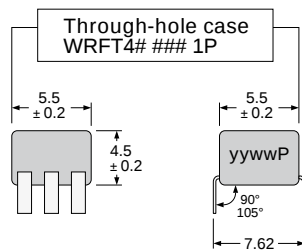
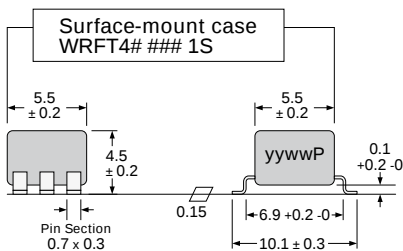
WRFT4	#	###	1	x
Range	1 = without center tap 2 = with center tap	Impedance ratio	Version	x = S surface mount x = P through hole x = Q Shielded

Marking

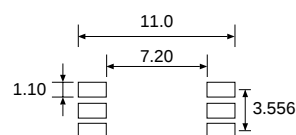
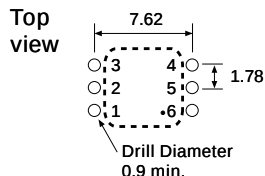
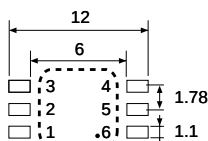


MB4x xxx:
Microspire part number
yyww : Date code

Typical Dimensions (mm)



PCB Layout (suggested)



Applications

Impedance matching, DC isolation, balanced-unbalanced mixing, power splitting, coupling and signal inversion

Packaging

Individually packed in a 160x137x55 cardboard box. 40 parts on 2 layers



Common-Mode Chokes - HCESC Series



These common-mode chokes provide excellent attenuation of asymmetric EMI on signal lines as well as in DC-DC converters, switch-mode power supplies and other high frequency applications

- Applied standards: ECSS-Q-ST-70-02C, MIL-STD-202, DO-160 and ESCC 3201 generic specification for space products
- Surface-mount and through-hole packages
- Suited for IR and vapor reflow soldering
- Frequency range up to 100 MHz
- Operation temperature range: -55 °C to +125 °C
- Weight: 0.7 gram

Electrical Data (25°C)

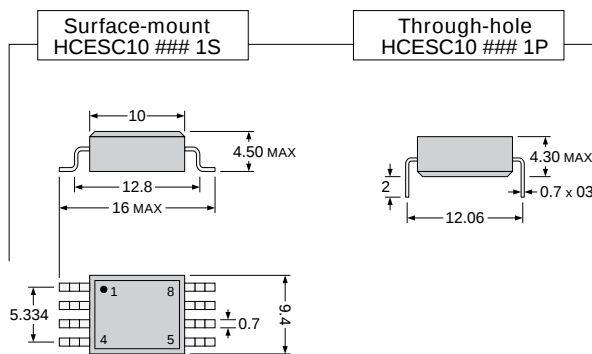
ID Code	Inductance (at 100kHz) μH	Rdc Max (at 80°C) mΩ	Impedance (at 100kHz) Ω	Rated Current max A	Isolation between windings Vrms	Max attenuation on 50Ω dB
HCESC10 15K 1x	15	15	115	2.5	1500	7 (10MHz)
HCESC10 56K 1x	56	55	350	1	1500	15 (8MHz)
HCESC10 M47 1x	470	400	440	0.4	1500	33 (5MHz)

To Order

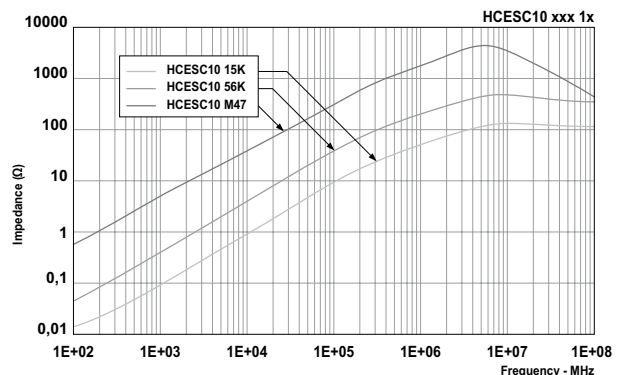
HCESC10 ### 1x

HCESC10	###	1	x
Range	Inductance Value	Version	x = S for Surface mount x = P for through hole

Typical Dimensions (mm)

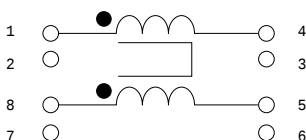


Response Curves



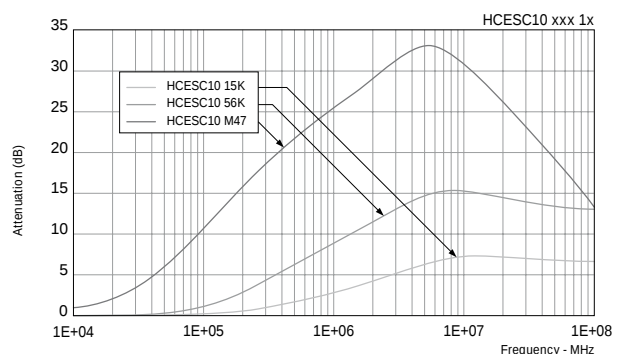
Typical Impedance versus Frequency (@100mV)

Connections



Packaging

Individually packed in a 160x137x55 cardboard box.
40 parts on 2 layers



Typical Attenuation versus Frequency on 50 Ohms (@100mV)



Data Line EMI Filters - DLEF 42 Series



These filters virtually eliminate conducted EMI in data lines. They provide excellent common-mode noise attenuation from 15 MHz to 300 MHz whilst passing data signals below 300 MHz without attenuation.

- Applied standards: ECSS-Q-ST-70-02C, MIL-STD-202, DO-160 and ESCC 3201 generic specification for space products
- Suited for IR and vapor reflow soldering
- Materials meet UL94-V0 rating
- Operation temperature range: -55°C to +110°C
- Weight: 1.5gram

Electrical Data

ID Code	Number of lines	Max. Current mA	L/winding μH	RDC max $\text{m}\Omega$	Isolation Vrms
DLEF42 020 1S	2	100	5	250	250

Application

Digital video signal filtering for CCD acquisition

To Order

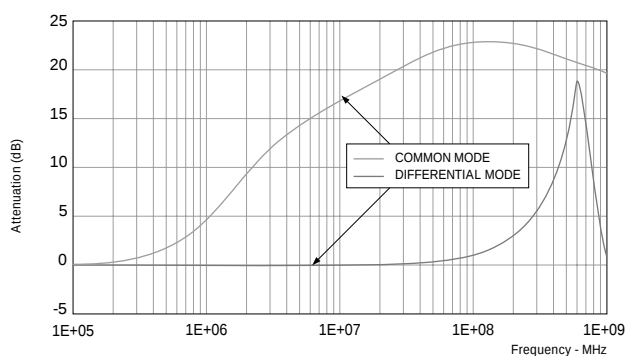
DLEF42 020 1S

DLEF42	020	1	S
Range	Number of windings	Version	S = for surface mount

Packaging

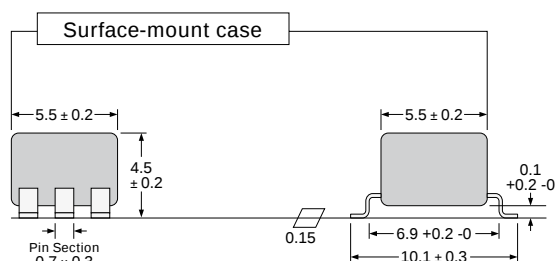
Individually packed in a 160x137x55mm cardboard box. 40 parts on 2 layers

Response Curves

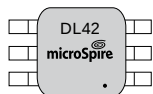


Typical Attenuation versus Frequency on 50hms (@100mV)

Typical Dimensions (mm)

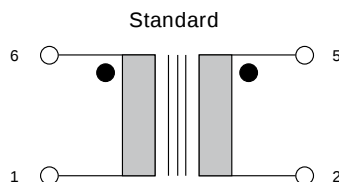


Marking

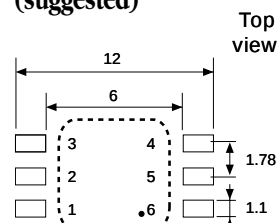


DL42 02 01 :
Microspire part number
yyww : Date code

Connections



PCB Layout (suggested)



Line-Matching Transformer - MTLM 1234 Mil



- Line isolation and impedance matching
- Transfer-moulded encapsulation
- Materials meet UL94-V0 rating
- Surface-mount package
- Frequency range 100 Hz to 10 kHz
- Operating temperature range: -55 °C to +125 °C
- Weight: 2.5 grams

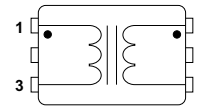
Electrical Data (25°C)

Parameter	Value
Primary Impedance (pins 1 - 3)	600Ω
Secondary Impedance (pins 4 - 6)	600Ω
Turns Ratio at 1kHz	1/1 ± 1%
Shunt Inductance at 200Hz, 0.15V	≥ 2.2 H
Shunt Resistance at 200Hz, 0.15V	≥ 4700Ω
Leakage Inductance (1kHz)	≤ 5.5mH
Primary Winding Resistance	115Ω ± 15%
Secondary Winding Resistance	115Ω ± 15%
Insertion Loss (at 1kHz; 600Ω)	1.75 dB ± 0.25
Frequency Response (0.1 - 4kHz)	± 0.25dB
Return Loss (0.2 - 4kHz)	≥ 24dB
Distorsion (600Hz; 10 dBm; 600Ω)	- 82dBm
Dielectric Strength (2s)	1.5kVrms
Isolation	1.5kVdc
Operating Temperature Range	-55°C to + 125°C
Storage Temperature Range	-55°C to + 125°C

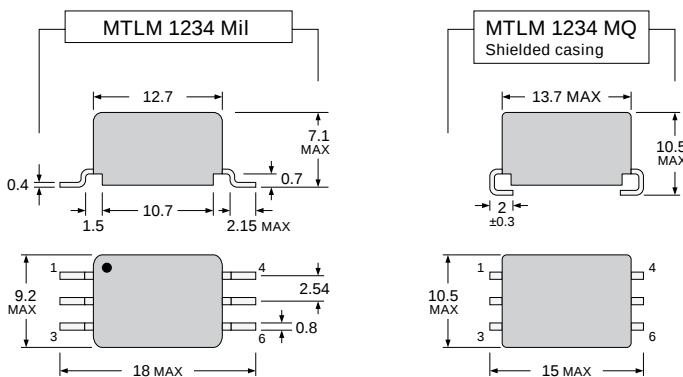
Application

Line isolation and impedance matching

Connections

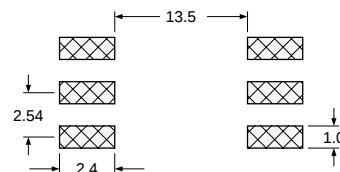


Typical Dimensions (mm)

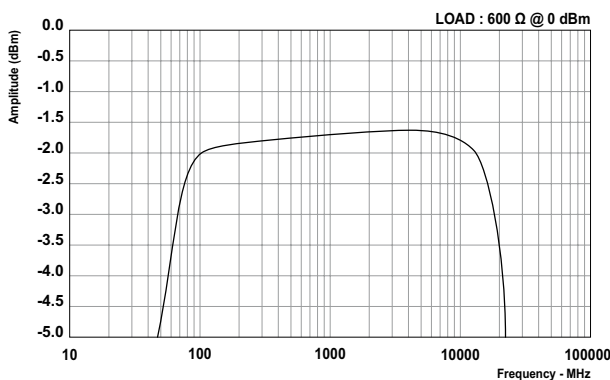


PCB Layout

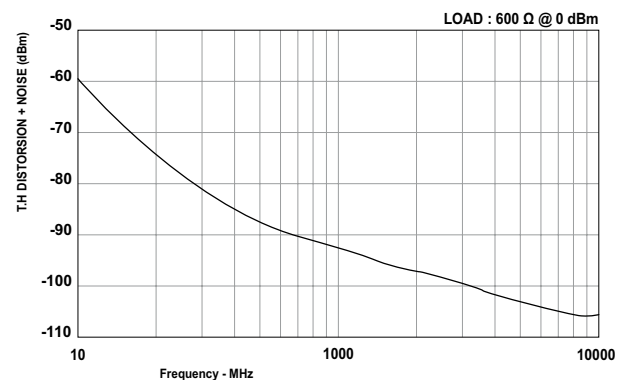
(suggested - only MTLM 1234 Mil)



Frequency Response



Distorsion



MIL-STD 1553 Interface Transformers - DBIT x 3 S



- As per MIL-STD 1553 A & B
- Meet all the electrical requirements of Manchester II serial bi-phase data transmission, 1 MHz operation
- Epoxy molding in accordance with outgassing requirements of ECSS-Q-ST-70-02C
- Applied standards: ESCC 3201 generic specification for space products
- Open-circuit impedance greater than $3\text{ k}\Omega$ ($4\text{ k}\Omega$ typical value) from 75 kHz to 1 MHz
- Frequency range 75 kHz to 1 MHz
- Operating temperature range: -55°C to $+125^\circ\text{C}$
- Weight: 3 to 3.5 grams

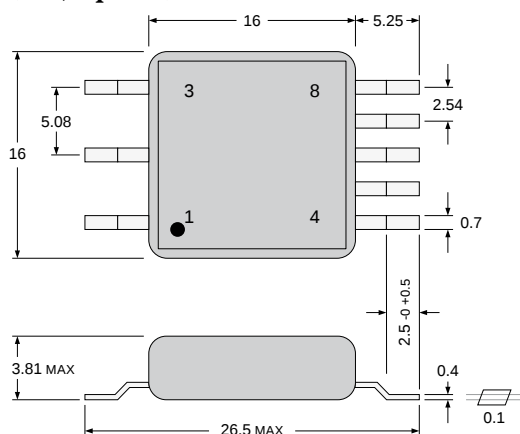
Electrical Data (25°C)

ID Code	Turn ratio 1-3 : 4-8	Turn ratio 1-3 : 5-7	DCR MAX (Ω) (1-3)	DCR MAX (Ω) (4-8)	Primary Inductance (mH) min at 75 kHz-1V
DBIT 1 3S	1.4 : 1	2 : 1	3	2.3	$L_{p(1-3)}$ 7
DBIT 2 3S	1 : 1	1 : 0.707	3	3.3	$L_{p(1-3)}$ 7
DBIT 3 3S	1.2 : 1	1.67 : 1	3	2.7	$L_{p(1-3)}$ 7
DBIT 4 3S	1 : 2.5	1 : 1.74	1.5	3.5	$L_{p(4-8)}$ 7
DBIT 5 3S	1 : 2.5	1 : 1.79	1.5	3.5	$L_{p(4-8)}$ 7
DBIT 6 3S	2.3 : 1	3.2 : 1	3	1.5	$L_{p(1-3)}$ 7
DBIT 7 3S	1.25 : 1	1.66 : 1	3	3.3	$L_{p(1-3)}$ 7
DBIT 8 3S	1 : 2.12	1 : 1.5	1.8	3.5	$L_{p(4-8)}$ 7

To Order

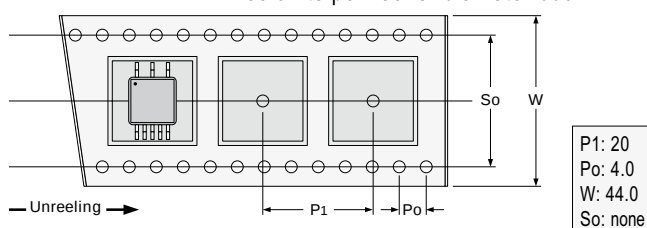
DBIT # 3S			
DBIT	#	3	S
Range	Transceiver type	Case height 3	S SMD

Typical Dimensions (mm, top view)



Packaging

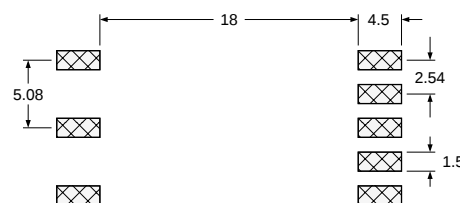
Individually packed : 32 parts on 2 layers.
Tape and Reel:
700 units per reel of diameter 330 mm



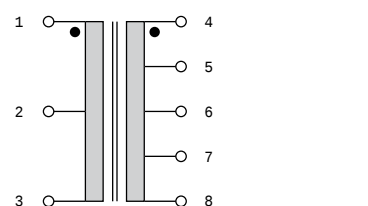
Notes

Common mode rejection : 45 dBmin.
Dielectric withstanding voltage : 100 Vrms.
Insulation resistance : 1000 M Ω min.
tolerance ratio $\pm 3\%$.

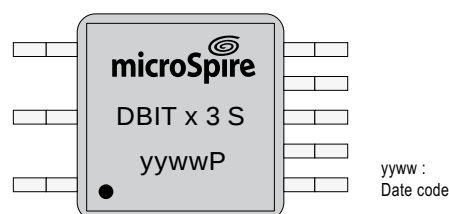
PCB Layout (suggested)



Connections



Marking



MIL-STD 1553 Interface Transformers - DBIT xx 4S



- Miniature package, less board space
- As per MIL-STD 1553 A&B
- Meet all the electrical requirements of Manchester II serial bi-phase data transmission, 1 MHz operation
- Epoxy molding in accordance with outgassing requirements of ECSS-Q-ST-70-02C
- Applied standards: ESCC 3201 generic specification for space products
- Frequency range 75 kHz to 1 MHz
- Operating temperature range: -55 °C to +125 °C
- Weight: 1.5 grams

Electrical Data (25°C)

ID Code	Turns ratio (±3%) P : S	Connections	DCR MAX (1-3)(Ω)	DCR MAX (4-8)(Ω)	DCR MAX (5-7)(Ω)	OUTPUT RISE TIME ns (MAX)	Impedance Ω (MIN) 75 kHz to 249 kHz	Impedance Ω (MIN) 250 kHz to 1 MHz
DBIT 91 4S	1 : 3.75	A	0.25	3.00	-	250 ns	(4-8) 4000	(4-8) 4000
DBIT 50 4S	1 : 2.50	A	1.5	3.5	-	250 ns	(4-8) 3000	(4-8) 4000
DBIT 70 4S	1.25 : 1	A	2.4	1.5	-	150 ns	(1-3) 3000	(1-3) 4000
DBIT 12 4S	1.41 : 1	A	2.7	2.2	-	150 ns	(1-3) 5000	(1-3) 7200
DBIT 90 4S	1 : 2.70	B	0.25	-	2.00	250 ns	(5-7) 2000	(5-7) 3000
DBIT 51 4S	1 : 1.79	B	1.5	-	2.5	150 ns	(5-7) 2000	(5-7) 4000
DBIT 71 4S	1.66 : 1	B	2.4	-	1.5	150 ns	(1-3) 3000	(1-3) 4000
DBIT 11 4S	2.00 : 1	B	2.6	-	1.3	150 ns	(1-3) 5000	(1-3) 7200

To Order

DBIT ## 4S

DBIT	##	4	S
Range	Code Turn Ratio	Case height 4.7	S SMD

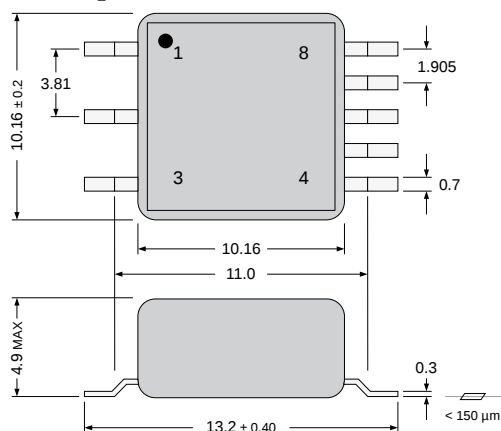
Notes

Common mode rejection: 45 dBmin.

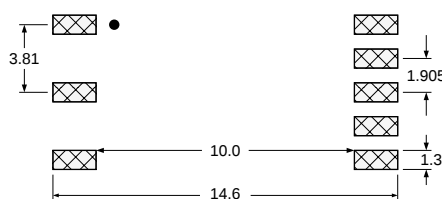
Dielectric withstanding voltage: 100 Vrms.

Insulation resistance: 1000 MΩmin.

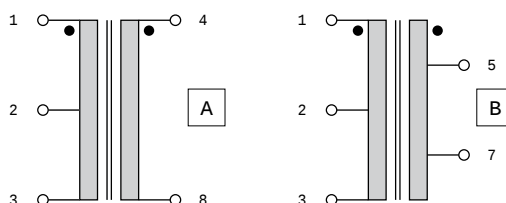
Typical Dimensions (mm, top view)



PCB Layout (suggested)

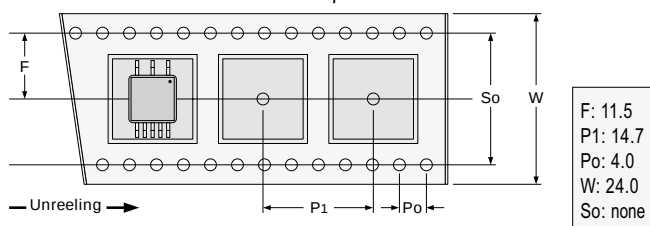


Connections

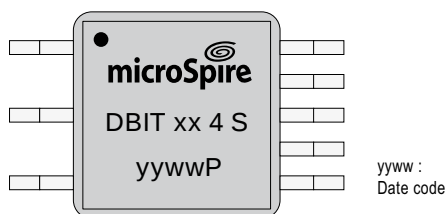


Packaging

Individually packed: 32 parts on 2 layers.
Tape and Reel:
700 units per reel of diameter 330 mm



Marking



MIL-STD 1553 Interface Transformers - DBIT x 5 S



- As per MIL-STD 1553 A&B
- Meet all the electrical requirements of Manchester II serial bi-phase data transmission, 1 MHz operation
- Epoxy molding in accordance with outgassing requirements of ECSS-Q-ST-70-02C
- Applied standards: ESCC 3201 generic specification for space products
- Open-circuit impedance greater than $3\text{ k}\Omega$ ($4\text{ k}\Omega$ typical value) from 75 KHz to 1 MHz
- Frequency range 75 KHz to 1 MHz
- Operating temperature range: -55°C to $+125^\circ\text{C}$
- Weight: 3 to 3.5 grams

Electrical Data (25°C)

ID Code	Turn ratio 1-3 : 4-8	Turn ratio 1-3 : 5-7	DCR MAX (Ω) (1-3)	DCR MAX (Ω) (4-8)	Primary Inductance (mH) min at 75 kHz-1V
DBIT 1 5S	1.4 : 1	2 : 1	2.2	1.2	Lp (1-3) 7
DBIT 2 5S	1 : 1	1 : 0.707	2.2	2.4	Lp (1-3) 7
DBIT 3 5S	1.2 : 1	1.67 : 1	2.2	2	Lp (1-3) 7
DBIT 4 5S	1 : 2.5	1 : 1.74	1.2	2.7	Lp (4-8) 7
DBIT 5 5S	1 : 2.5	1 : 1.79	1.2	2.7	Lp (4-8) 7
DBIT 6 5S	2.3 : 1	3.2 : 1	2.2	1.2	Lp (1-3) 7
DBIT 7 5S	1.25 : 1	1.66 : 1	2.2	2	Lp (1-3) 7
DBIT 8 5S	1 : 2.12	1 : 1.5	1.2	2.7	Lp (4-8) 7

Notes

Common mode rejection: 45 dBmin.

Dielectric withstanding voltage: 100 Vrms.

Insulation resistance: 1000 M Ω min.

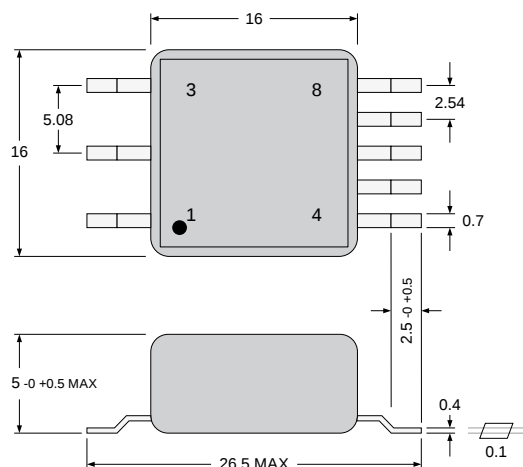
tolerance ratio $\pm 3\%$.

To Order

DBIT	#	5	S
Range	Part 1 to 8	Case height 5	S SMD

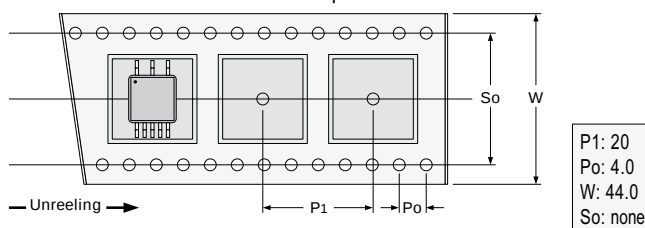
DBIT # 5S

Typical Dimensions (mm, top view)



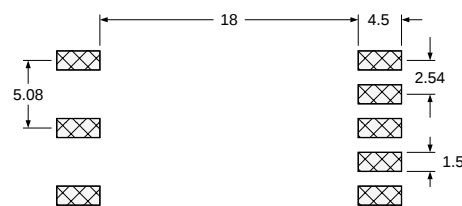
Packaging

Individually packed: 32 parts on 2 layers.
Tape and Reel:
200 units per reel of diameter 330 mm

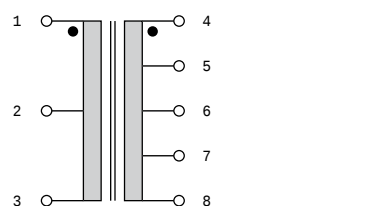


P1: 20
P0: 4.0
W: 44.0
So: none

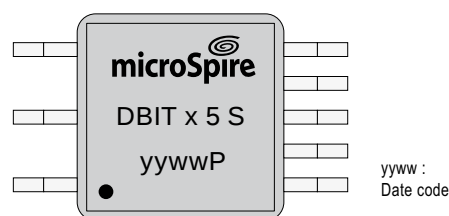
PCB Layout (suggested)



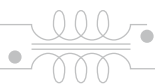
Connections



Marking



yyww :
Date code



MIL-STD 1553 Interface Transformers - DBIT x 7 P



- As per MIL-STD 1553 A & B
- Meet all the electrical requirements of Manchester II serial bi-phase data transmission, 1 MHz operation
- Epoxy molding in accordance with outgassing requirements of ECSS-Q-ST-70-02C
- Applied standards: ESCC 3201 generic specification for space products
- Open-circuit impedance greater than 3k Ω (4k Ω typical value) from 75KHz to 1MHz
- Frequency range 75KHz to 1MHz
- Operating temperature range: -55 °C to +125 °C
- Weight: <5grams

Electrical Data (25°C)

ID Code	Turn ratio 1-3 : 4-8	Turn ratio 1-3 : 5-7	DCR MAX (Ω) (1-3)	DCR MAX (Ω) (4-8)	Primary Inductance (mH) min at 75 kHz-1V
DBIT 1 7 P	1.4 : 1	2 : 1	2	1.6	L _p (1-3) 7
DBIT 2 7 P	1 : 1	1 : 0.707	2	2.2	L _p (1-3) 7
DBIT 3 7 P	1.2 : 1	1.67 : 1	2	2	L _p (1-3) 7
DBIT 4 7 P	1 : 2.5	1 : 1.74	1	2.2	L _p (4-8) 7
DBIT 5 7 P	1 : 2.5	1 : 1.79	1	2.2	L _p (4-8) 7
DBIT 6 7 P	2.3 : 1	3.2 : 1	2	1	L _p (1-3) 7
DBIT 7 7 P	1.25 : 1	1.66 : 1	2	2	L _p (1-3) 7
DBIT 8 7 P	1 : 2.12	1 : 1.5	1	2.2	L _p (4-8) 7

Notes

Common mode rejection : 45dBmin.

Dielectric withstanding voltage : 100 Vrms.

Insulation resistance : 1000 M Ω min.

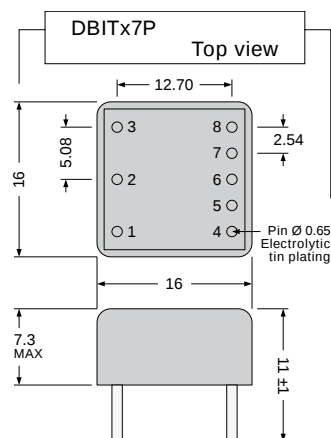
tolerance ratio $\pm 3\%$.

To Order

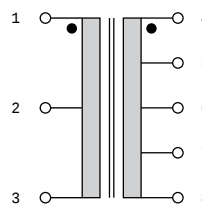
DBIT # 7P

DBIT	#	7	P
Range	Part 1 to 8	Case height 7	x = P Pins

Typical Dimensions (mm)



Connections



Marking



yyww :
Date code

MIL-STD 1553 Interface Transformers - DBIT x 7 P10



- As per MIL-STD 1553 A & B
- Meet all the electrical requirements of Manchester II serial bi-phase data transmission, 1MHz operation
- Epoxy molding in accordance with outgassing requirements of ECSS-Q-ST-70-02C
- Applied standards: ESCC 3201 generic specification for space products
- Open-circuit impedance greater than $3k\Omega$ ($4k\Omega$ typical value) from 75kHz to 1MHz
- Frequency range 75kHz to 1MHz
- Operating temperature range: -55°C to $+125^{\circ}\text{C}$
- Weight: <5grams

Electrical Data (25°C)

ID Code	Turn ratio 1-3 : 4-8	Turn ratio 1-3 : 5-7	DCR MAX (Ω) (1-3)	DCR MAX (Ω) (4-8)	Primary Inductance (mH) min at 75 kHz-1V
DBIT 1 7 P10	1.4 : 1	2 : 1	2	1.6	L_p (1-3) 7
DBIT 2 7 P10	1 : 1	1 : 0707	2	2.2	L_p (1-3) 7
DBIT 3 7 P10	1.2 : 1	1.67 : 1	2	2	L_p (1-3) 7
DBIT 4 7 P10	1 : 2.5	1 : 1.74	1	2	L_p (4-8) 7
DBIT 5 7 P10	1 : 2.5	1 : 1.79	1	2.2	L_p (4-8) 7
DBIT 6 7 P10	2.3 : 1	3.2 : 1	2	1	L_p (1-3) 7
DBIT 7 7 P10	1.25 : 1	1.66 : 1	2	2	L_p (1-3) 7
DBIT 8 7 P10	1 : 2.12	1 : 1.5	1	2.2	L_p (4-8) 7
DBIT 9 7 P10	1 : 2.38	1 : 1.666	1	2.2	L_p (1-3) 7
DBIT 10 7 P10	1 : 2.14	1 : 3.0	1	2.5	L_p (4-8) 7

Notes

Common mode rejection: 45dBmin.

Dielectric withstanding voltage: 100Vrms.

Insulation resistance: 1000M Ω min.

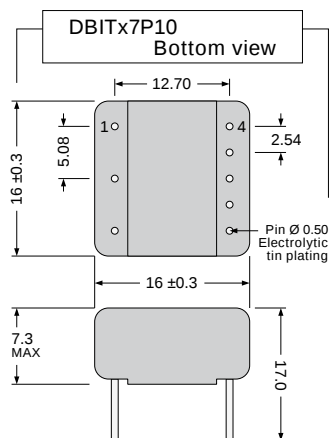
tolerance ratio $\pm 3\%$.

To Order

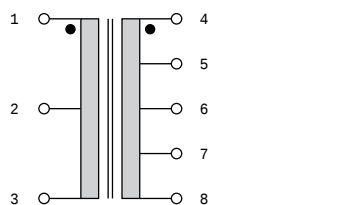
DBIT # 7 P10

DBIT	#	7	P10
Range	Part 1 to 10	Case height 7	x = P10 Pins (10 mm)

Typical Dimensions (mm)



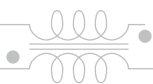
Connections



Marking



yyww :
Date code



MIL-STD 1553 Interface Transformers - DBIT x 7 S



- As per MIL-STD 1553 A & B
- Meet all the electrical requirements of Manchester II serial bi-phase data transmission, 1 MHz operation
- Epoxy molding in accordance with outgassing requirements of ECSS-Q-ST-70-02C
- Applied standards: ESCC 3201 generic specification for space products
- Open-circuit impedance greater than 3k Ω (4k Ω typical value) from 75KHz to 1MHz
- Frequency range 75KHz to 1MHz
- Operating temperature range: -55°C to +125°C
- Weight: <5grams

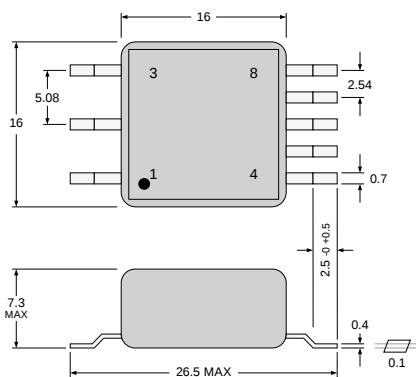
Electrical Data (25°C)

ID Code	Turn ratio 1-3 : 4-8	Turn ratio 1-3 : 5-7	DCR MAX (Ω) (1-3)	DCR MAX (Ω) (4-8)	Primary Inductance (mH) min at 75 kHz-1V
DBIT 17 S	1.4 : 1	2 : 1	2	1.6	L _p (1-3) 7
DBIT 27 S	1 : 1	1 : 0.707	2	2.2	L _p (1-3) 7
DBIT 37 S	1.2 : 1	1.67 : 1	2	2	L _p (1-3) 7
DBIT 47 S	1 : 2.5	1.67 : 1	2	2	L _p (1-3) 7
DBIT 57 S	1 : 2.5	1 : 1.74	1	2	L _p (4-8) 7
DBIT 67 S	2.3 : 1	3.2 : 1	2	1	L _p (1-3) 7
DBIT 77 S	1.25 : 1	1.66 : 1	2	2	L _p (1-3) 7
DBIT 87 S	1 : 2.12	1 : 1.5	1	2.2	L _p (4-8) 7

To Order

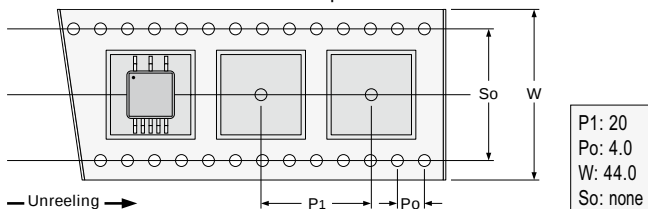
DBIT	#	7	x
Range	Part 1 to 8	Case height 7	x = S SMD

Typical Dimensions (mm)



Packaging

Individually packed : 32 parts on 2 layers.
Tape and Reel (DBIT x 7S) :
300 units per reel of diameter 330 mm



Notes

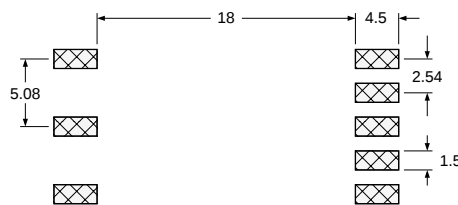
Common mode rejection : 45 dBmin.

Dielectric withstanding voltage : 100 Vrms.

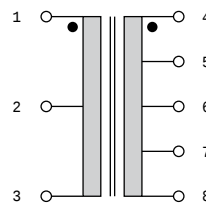
Insulation resistance : 1000 M Ω min.

tolerance ratio $\pm 3\%$.

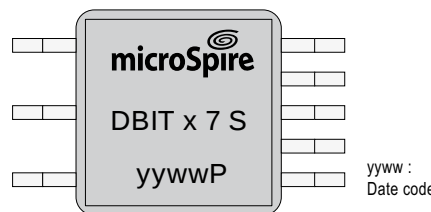
PCB Layout (suggested, DBIT x 7 S)



Connections



Marking



MIL-STD 1553 Interface Transformers - DBIT 57x400



- As per MIL-STD 1553 A&B
- Meet all the electrical requirements of Manchester II serial bi-phase data transmission, 1MHz operation
- Waveform integrity:
27V_{top} level at 250KHz - droop <20% into the lowest turn's wdg
- Encapsulated in accordance with MIL-T-21038 (DAP box)
- Applied standards: ESCC 3201 generic specification for space products
- Open-circuit impedance greater than 4k Ω from 75KHz to 1MHz
- Operating temperature range: -40°C to +125°C
- Weight: 3 to 3.5grams

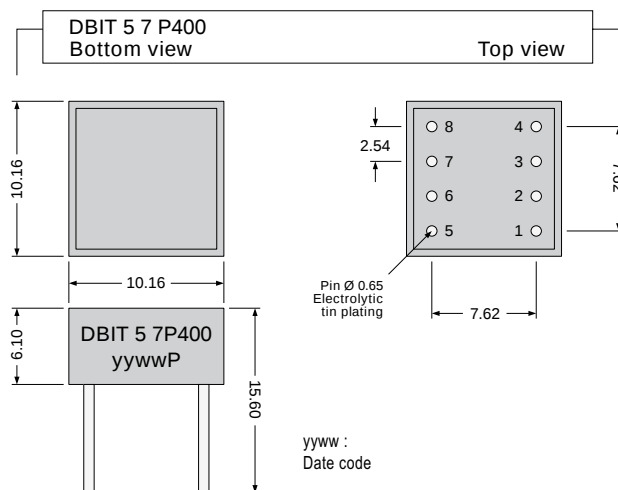
Electrical Data (25°C)

ID Code	Turn ratio 1-3 : 4-8	Turn ratio 1-3 : 5-7	DCR MAX (Ω) (1-3)	DCR MAX (Ω) (4-8)	Primary Inductance (mH) min at 75 kHz-1V
DBIT 57x400	1 : 2.5	1 : 1.79	1	3.5	L _{p(4-8)} 8.5

To Order

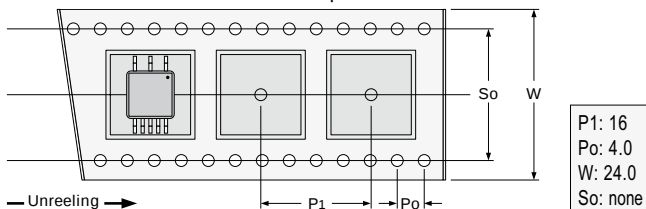
DBIT 57x400				
DBIT	5	7	P400	
Range	Code turn ratio	Case height 7	x = P for Pin through hole x = S for SMD	

Typical Dimensions (mm)



Packaging

Individually packed : 32 parts on 2 layers.
Tape and Reel (DBIT 57 S400):
400 units per reel of diameter 330 mm



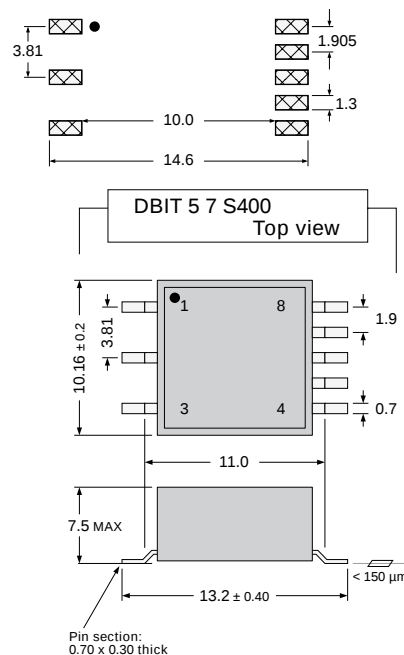
Notes

Common mode rejection: 45dBmin.

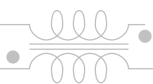
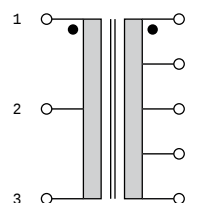
Dielectric withstanding voltage: 100Vrms.

Insulation resistance: 1000M Ω min - 500VDC
tolerance ratio $\pm 2\%$.

PCB Layout (suggested, DBIT 57 S400)



Connections



Dual staked MIL-STD 1553 Interface Transformers - SBIT x 7.5S



- As per MIL-STD 1553 B
- Meet all the electrical requirements of Manchester II serial bi-phase data transmission, 1 MHz operation
- Epoxy molding in accordance with outgassing requirements of ECSS-Q-ST-70-02C
- Applied standards: ESCC 3201 generic specification for space products
- Open-circuit impedance greater than 3k Ω (4k Ω typical value) from 75KHz to 1MHz
- Frequency range 75KHz to 1MHz
- Operating temperature range: -55 °C to +125 °C
- Weight: <5grams

Electrical Data (25°C)

Parameter	Unit	SBIT 1 7.5S	SBIT 2 7.5S	SBIT 3 7.5S	SBIT 4 7.5S	SBIT 5 7.5S	SBIT 6 7.5S	SBIT 7 7.5S	SBIT 8 7.5S
Frequency Response									
Operating Range	kHz	75 to 1000	75 to 1000	75 to 1000	75 to 1000	75 to 1000	75 to 1000	75 to 1000	75 to 1000
Common-Mode Rejection (min)	dB	45	45	45	45	45	45	45	45
Electrical Requirements									
Terminal Winding Resistance Rdc									
• 1-3 / (11-13) (max)	Ω	3.5	3	1.9	1	1	1.2	3.2	1
• 4-8 / (14-18) (max)	Ω	3	3	1.9	3	3	3	3	3
Interwinding Capacitance (max)	pF	70	30	70	45	45	70	70	70
Winding Inductance									
• LM (min)	mH	7.5	7.5	7.5	6.0	6.0	8.0	8.0	6.0
• LL (max)	μ H	6.0	6.0	6.0	8.0	6.0	8.0	6.0	7.0
Peak-to-Peak Voltage (max)									
Terminals 1-3 primary	Vpp	60	60	60	38	38	39	60	44
Droop (max)									
3 ms Pulse Duration									
140 Ω Load Across Terminals 4-8	%	10	10	10	10	10	10	10	10
Decay Time (max)									
140 Ω Load Across Terminals 4-8	ns	25	25	25	25	25	25	25	25
Backswing									
140 Ω Load Across Terminals 4-8	%	none	none	none	none	none	none	none	none
Turns Ratios									
Terminals									
• 1-3 : 4-8 / 11-13 : 14-18		1.4 : 1	1 : 1	1.20 : 1	1 : 2.5	1 : 2.5	1 : 3.2	1.25 : 1	1 : 2.12
• 1-3 : 5-7 / 11-13 : 15-13		2 : 1	1 : 0.707	1.67 : 1	1 : 1.75	1 : 1.79	1 : 2.3	1.66 : 1	1 : 1.5

To Order

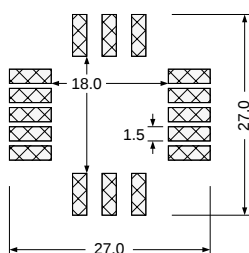
SBIT	#	7.5	S
Range	Part 1 to 8	Case height 7.5	S SMD

SBIT # 7.5S

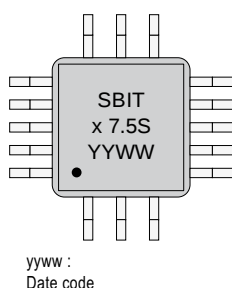
Notes

Interwinding insulation: 500Vrms-500 Hz.
Flammability compliance: UL94V0.

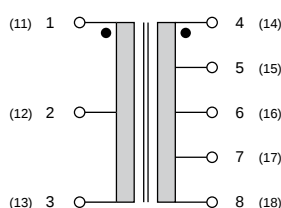
PCB Layout (suggested)



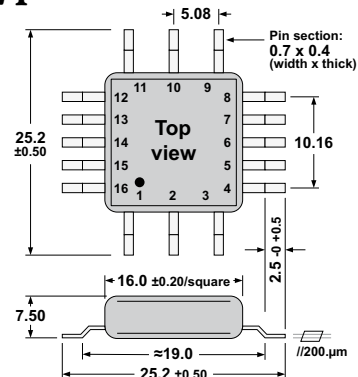
Marking



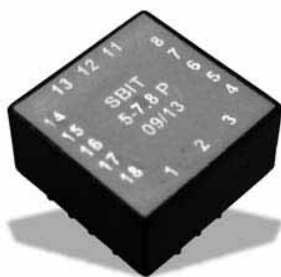
Connections



Typical Dimensions (mm)



Dual staked MIL-STD 1553 Interface Transformers - SBIT x 7.8P



- As per MIL-STD 1553 B
- Meet all the electrical requirements of Manchester II serial bi-phase data transmission, 1 MHz operation
- Epoxy molding in accordance with outgassing requirements of ECSS-Q-70-02, MILT 21038
- Open-circuit impedance greater than $3k\Omega$ ($4k\Omega$ typical value) from 75 kHz to 1 MHz
- Frequency range 75 kHz to 1 MHz
- Operating temperature range: -55°C to $+125^{\circ}\text{C}$
- Weight: <5 grams

Electrical Data (25°C)

Parameter	Unit	SBIT 1 7.8P	SBIT 2 7.8P	SBIT 3 7.8P	SBIT 5 7.8P	SBIT 7 7.8P	SBIT 8 7.8P
Frequency Response							
Operating Range	kHz	75 to 1000	75 to 1000	75 to 1000	75 to 1000	75 to 1000	75 to 1000
Common-Mode Rejection (min)							
	dB	45	45	45	45	45	45
Electrical Requirements							
Terminal Winding Resistance Rdc							
• 1-3 (max)	Ω	2.8	2.8	2.8	2	2.8	2.2
• 4-8 (max)	Ω	3	3.5	3	3.5	3	3.5
Interwinding Capacitance (max)							
	pF	50	50	50	50	50	50
Winding Inductance							
• LM (min) (1-3)	mH	7.0	7.0	7.0	7.0 (4-8)	8.0	7.0 (4-8)
• LL (max)	μH	6.0	6.0	6.0	6.0	6.0	6.0
Turns Ratios							
Terminals							
• 1-3 : 4-8		1.4 : 1	1 : 1	1.20 : 1	1 : 2.5	1.25 : 1	1 : 2.12
• 1-3 : 5-7		2 : 1	1 : 0.707	1.67 : 1	1 : 1.79	1.66 : 1	1 : 1.5

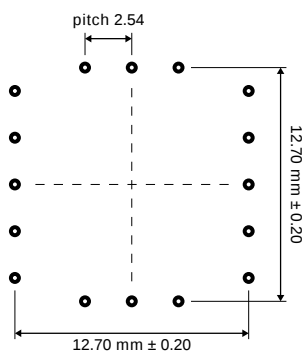
To Order

SBIT # 7.8P			
SBIT	#	7.8	P
Range	Part 1 to 8 except 4 and 6	Case height 7.8	P pins through hole

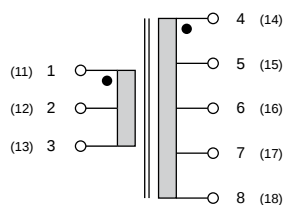
Notes

Interwinding insulation : 500 Vrms-500 Hz.
Flammability compliance : UL94V0

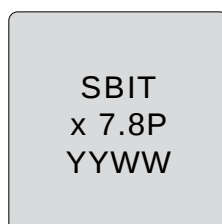
PCB Layout (suggested)



Connections

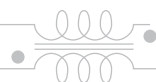
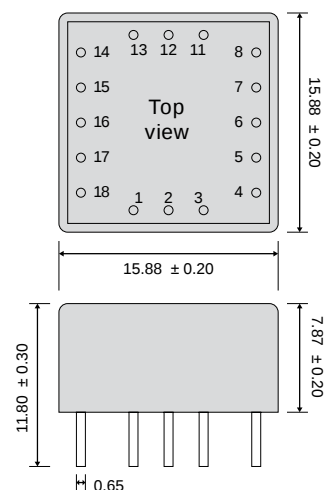


Marking



yyww :
Date code

Typical Dimensions (mm)



Miniature Fixed Chip Inductors - H01 Series



- With or without tab terminations
- Terminations with tin-lead coating
- Q factor ≥ 30 at 1 MHz
- SRF ≥ 8 MHz
- $\Delta L/L \pm 1000$ ppm/°C
- Materials meet UL94-V0 rating
- Weight: 0.12 gram

Electrical Data (25°C)

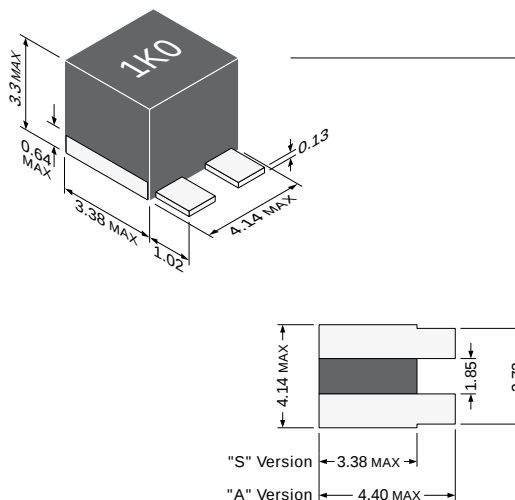
ID Code	Inductance $\mu\text{H} \pm 15\%$	IDC* Amps	DCR $\text{m}\Omega \pm 15\%$
MPCI H01 K38 1xy	0.38	1.5	29
MPCI H01 K67 1xy	0.67	1.25	39
MPCI H01 1K0 1xy	1.0	1.0	54
MPCI H01 1K5 1xy	1.5	0.85	73
MPCI H01 2K0 1xy	2.0	0.70	100
MPCI H01 2K7 1xy	2.7	0.62	120
MPCI H01 3K4 1xy	3.4	0.55	150
MPCI H01 4K6 1xy	4.6	0.49	190
MPCI H01 5K6 1xy	5.6	0.44	230
MPCI H01 7K1 1xy	7.1	0.41	270
MPCI H01 10K 1xy	10.0	0.34	390
MPCI H01 12K 1xy	12.0	0.29	530
MPCI H01 27K 1xy	27.0	0.20	1040
MPCI H01 M10 1xy	100.0	0.10	3800

* Max permanent DC current at +125 °C.

Ambient temperature: -40 °C/+100 °C

Storage temperature: -55 °C/+125 °C

Typical Dimensions (mm)



To Order

MPCI H01 ### 1xy

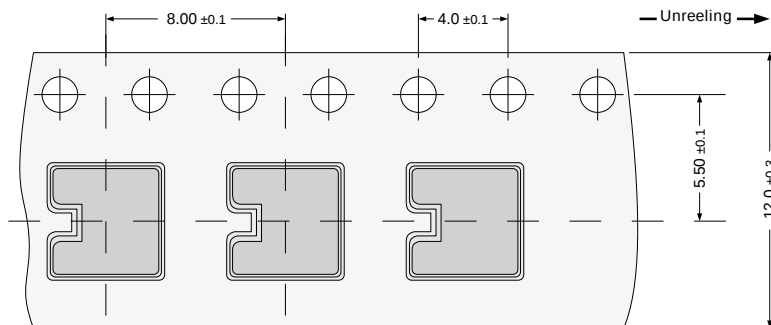
MPCI H01	###	1	x	y
Range	Inductance value	Version	Terminations x = G for Gold x = T for Tinned	y = S without tab y = A with tab

Application

Output filtering in low power DC / DC conversion

Packaging

Tape and Reel (without tab):
500 pieces ; or Tray: 49 pieces



Miniature Chip Inductors MSCIH01

 QPL Components

MPCIH01 series are usually installed on Military applications and breadboards for Space applications.

Since January 2003, Microspire has been manufacturing Radio Frequency Fixed Coils, MPCIH01 series fulfilling ESA ESCC Generic specification N° 3201 and detail specification N° 3201/008.

This range is named MSCI (S for space applications).

This qualification approval includes final production tests Chart II, burn-in and electrical measurements to testing level B Chart III and qualification testing Chart IV.

For procurement, different quality levels are offered :

- Final production tests Chart II
- Burn-in and electrical measurements Chart III with level B or C (as required)
- Lot acceptance testing Chart V if required

Components delivered through this specification need to be processed and inspected in accordance with the Microspire Process Identification Document (P.I.D.).

Each component delivered is traceable to its production lot.

Microspire Non-QPL ID Code	Microspire QPL ID Code	ESA SCC Component Part Number
MPCI H01 K38 1TS 15	MSCI H01 K38 1TS 15	3201008 05 b L38 L
MPCI H01 K67 1TS 15	MSCI H01 K67 1TS 15	3201008 05 b L67 L
MPCI H01 1K0 1TS 15	MSCI H01 1K0 1TS 15	3201008 05 b 1L0 L
MPCI H01 1K5 1TS 15	MSCI H01 1K5 1TS 15	3201008 05 b 1L5 L
MPCI H01 2K0 1TS 15	MSCI H01 2K0 1TS 15	3201008 05 b 2L0 L
MPCI H01 2K7 1TS 15	MSCI H01 2K7 1TS 15	3201008 05 b 2L7 L
MPCI H01 3K4 1TS 15	MSCI H01 3K4 1TS 15	3201008 05 b 3L4 L
MPCI H01 4K6 1TS 15	MSCI H01 4K6 1TS 15	3201008 05 b 4L6 L
MPCI H01 5K6 1TS 15	MSCI H01 5K6 1TS 15	3201008 05 b 5L6 L
MPCI H01 7K1 1TS 15	MSCI H01 7K1 1TS 15	3201008 05 b 7L1 L
MPCI H01 10K 1TS 15	MSCI H01 10K 1TS 15	3201008 05 b 100 L
MPCI H01 12K 1TS 15	MSCI H01 12K 1TS 15	3201008 05 b 120 L
MPCI H01 27K 1TS 15	MSCI H01 27K 1TS 15	3201008 05 b 270 L
MPCI H01 M10 1TS 15	MSCI H01 M10 1TS 15	3201008 05 b 101 L
05	b	L (tolerance)
05 for SnPb Termination	b = B for Chart III level B b = C for Chart III level C	L for ±15%



Miniature Fixed Chip Inductors - 233 H01 Series



- With or without tab terminations
- Terminations with tin-lead coating
- Q factor ≥ 30 at 1 MHz
- SRF ≥ 8 MHz
- $\Delta L/L \pm 1000$ ppm/°C
- Materials meet UL94-V0 rating
- Weight: 0.12 gram

Electrical Data (25°C)

ID Code	Inductance $\mu\text{H} \pm 15\%$	IDC* Amps	DCR $\text{m}\Omega \pm 15\%$
MPCI 233 K38 H01 1x	0.38	1.5	16.0
MPCI 233 K67 H01 1x	0.67	1.25	25.0
MPCI 233 1K0 H01 1x	1.0	1.0	38.0
MPCI 233 1K5 H01 1x	1.5	0.85	54.0
MPCI 233 2K0 H01 1x	2.0	0.70	79.0
MPCI 233 2K7 H01 1x	2.7	0.62	100
MPCI 233 3K4 H01 1x	3.4	0.55	129
MPCI 233 4K6 H01 1x	4.6	0.49	160
MPCI 233 5K6 H01 1x	5.6	0.44	200
MPCI 233 7K1 H01 1x	7.1	0.41	228
MPCI 233 10K H01 1x	10.0	0.34	335
MPCI 233 12K H01 1x	12.0	0.29	460
MPCI 233 27K H01 1x	27.0	0.20	900
MPCI 233 M10 H01 1x	100.0	0.10	3300

* Max permanent DC current at +125 °C.

Ambient temperature: -55°C/+175 °C

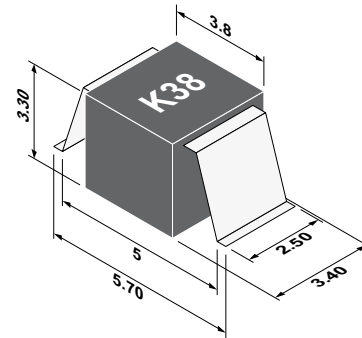
Storage temperature: -55°C/+125 °C

To Order

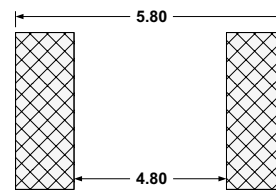
MPCI 233 H01 ### 1x

MPCI 233 H01	###	1	x
Range	Inductance value	Version	Terminations x = G for Gold x = T or S for Tinned

Typical Dimensions (mm)



PCB Layout (suggested)



Application

Output filtering in low power DC / DC conversion

Packaging

Tray



SMD Power Inductors - ESI01



- Energy storage, smoothing, filtering
- Applied standards: ECSS-Q-ST-70-02C, MIL-STD-202, DO-160 and ESCC 3201 generic specification for space products
- Materials meet UL94-V0 rating
- Suited for IR and vapor reflow soldering
- Frequency range up to 1 MHz
- Operating temperature range: -55 °C to +125 °C
- Weight: <2 grams

Electrical Data (25°C)

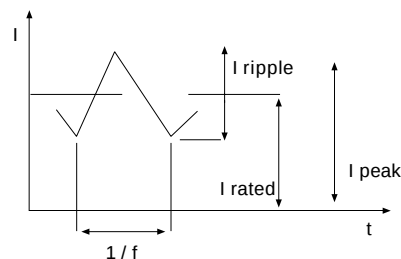
ID Code	Inductance (μH)	permanent (ADC)	DCR at 25°C (mΩ)	Tol.
ESI 01 2K7 1x	2.68	2.1	24	10
ESI 01 4K2 1x	4.20	1.7	35	
ESI 01 7K1 1x	7.10	1.2	65	
ESI 01 12K 1x	12	1.1	86	
ESI 01 17K 1x	16.8	0.93	124	
ESI 01 22K 1x	22	0.76	184	
ESI 01 31K 1x	31	0.63	270	
ESI 01 48K 1x	48	0.49	440	
ESI 01 64K 1x	64	0.41	630	
ESI 01 81K 1x	81	0.39	710	
ESI 01 M10 1x	100	0.33	1000	
ESI 01 M15 1x	151	0.26	1550	

To Order

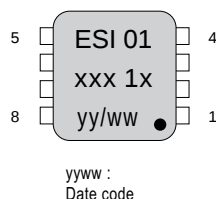
ESI01	###	1	x
SMD Energy Storage Inductor	Value code 2K7 = 2.7 μH M10 = 100 μH	Version	x = J J leaded x = W W Terminals

Notes

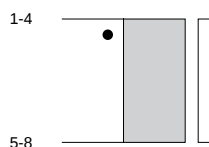
1. Inductance at 20 mV, 10 kHz with WK3260B impedance analyser
2. Typical inductance value at recommended full load
3. I_{peak} max = maximum peak value of current at +125 °C; L value not guaranteed
4. 10 % admissible I ripple over I rated at f = 200 kHz
5. Isolation voltage 150 Vdc
- 1 min - R_i > 100 MΩ between winding and magnetic core



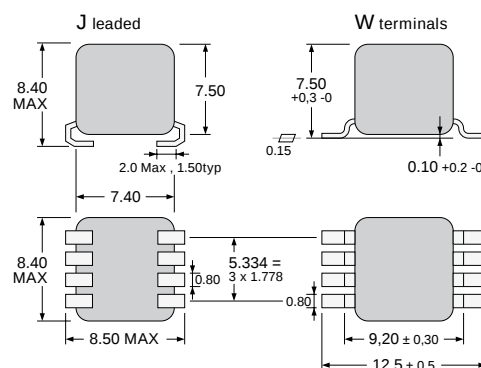
Marking



Connections



Dimensions (mm)

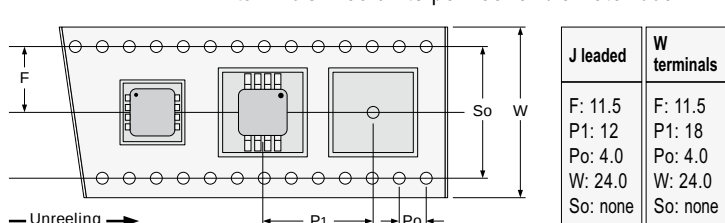


Packaging

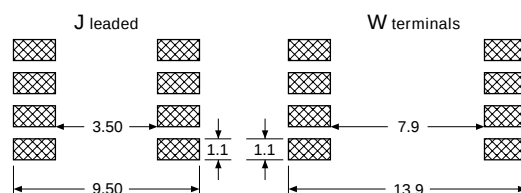
Tape and Reel:

J leaded - 600 units per reel of diameter 330 mm

W terminals - 400 units per reel of diameter 330 mm



PCB Layout (suggested)



SMD Power Inductors - ESI7



- Energy storage, smoothing, filtering
- Applied standards: ECSS-Q-ST-70-02C, MIL-STD-202, DO-160 and ESCC 3201 generic specification for space products
- Materials meet UL94-V0 rating
- Suited for IR and vapor reflow soldering
- Frequency range up to 1 MHz
- Operating temperature range: -55 °C to +125 °C
- Weight: ≤2 grams

Electrical Data (25°C)

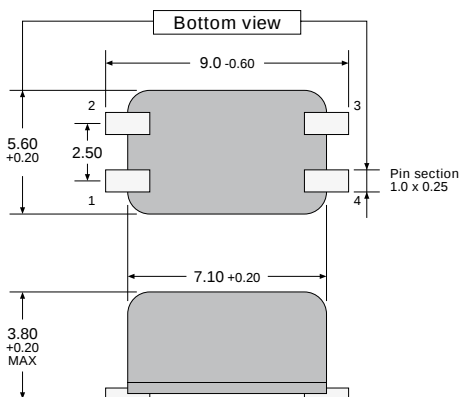
ID Code	Inductance (μH)	permanent (ADC)	I _{peak} A	DCR at 25°C (mΩ)	Tol.
ESI 7 K42 1S	0.42	2.9	6.0	7.5	25
ESI 7 K65 1S	0.65	2.4	5.0	11	
ESI 7 1K2 1S	1.27	1.6	3.6	23	
ESI 7 2K1 1S	2.10	1.3	2.8	36	
ESI 7 3K7 1S	3.74	1.0	2.0	59	
ESI 7 5K0 1S	5.09	0.78	1.8	107	
ESI 7 8K4 1S	8.42	0.60	1.4	177	

To Order

ESI 7 ### 1S

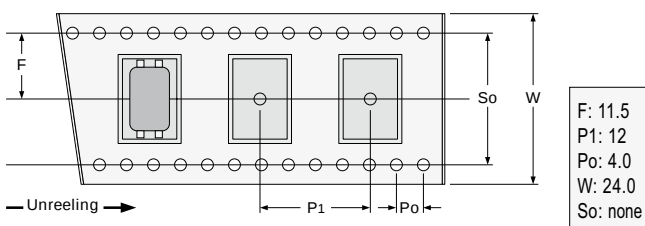
ESI7	###	1	S
SMD Energy Storage Inductor	Value code K42 = 0,42 μH 2K1 = 2.1 μH	Version	SMD Terminals

Dimensions (mm)



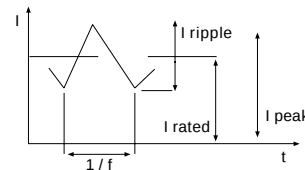
Packaging

Tape and Reel:
1300 units per reel of diameter 330 mm

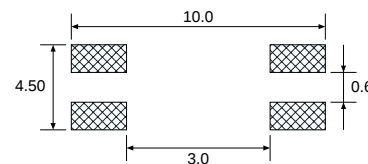


Notes

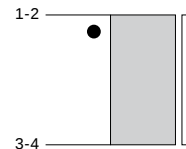
1. Inductance at 10 mV, 10 kHz with WK3260B impedance analyzer
2. Typical inductance value at recommended full load
3. I_{peak} max = maximum peak value of current at +125 °C; L value not guaranteed
4. 10 % admissible I ripple over I rated at f=200 kHz
5. Isolation voltage 150 Vdc
- 1 min - R_i > 100 MΩ between winding and magnetic core



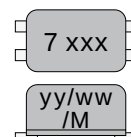
PCB Layout (suggested)



Connections

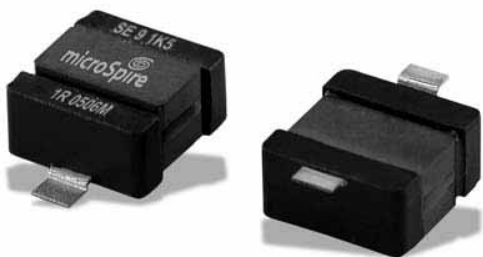


Marking



yyww : Date code
M : Microspire

SMD Power Inductors - SESI 9WR High Reliability Applications



- Energy storage, smoothing, filtering
- Applied standards: ECSS-Q-70-02, MIL-STD-202, DO-160
- Materials meet UL94-V0 rating
- Suited for IR and vapor reflow soldering
- Frequency range up to 1 MHz
- Operating temperature range: -55 °C to +125 °C
- Weight: 2 grams

Electrical Data (25°C)

ID Code	L^{12} no load μH	I^{35} rated A	L^{24} at rated I μH	I^5 peak max A	R_{dc} at 25°C m Ω Max	Tol.
SESI 9 1K0 1WR	1.0	6.0	0.6	11.0	8.5	30
SESI 9 1K5 1WR	1.5	5.4	0.9	9.5	11.5	
SESI 9 2K0 2WR	2.0	4.3	1.4	8.2	17.0	
SESI 9 2K6 2WR	2.6	3.6	1.8	7.0	23	20
SESI 9 3K4 2WR	3.4	3.0	2.4	6.2	35	
SESI 9 4K3 2WR	4.3	2.8	3.0	5.5	40	
SESI 9 6K2 2WR	6.2	2.3	4.3	4.3	59	
SESI 9 8K5 2WR	8.5	1.9	6.0	3.7	87	
SESI 9 10K 2WR	10	1.85	7.0	3.4	93	
SESI 9 15K 2WR	15	1.50	10.5	2.8	140	10
SESI 9 18K 2WR	18	1.27	12.6	2.5	192	
SESI 9 22K 2WR	22	1.21	15.4	2.3	215	
SESI 9 26K 2WR	26	1.03	18.2	2.14	290	
SESI 9 33K 2WR	33	0.92	23.1	1.9	350	
SESI 9 47K 2WR	47	0.80	32.9	1.6	470	
SESI 9 66K 2WR	66	0.73	46.2	1.3	565	
SESI 9 81K 2WR	81	0.63	56.7	1.21	745	
SESI 9 M10 2WR	100	0.60	70	1.1	795	
SESI 9 M15 1WR	150	0.53	105	0.8	750	
SESI 9 M22 1WR	220	0.43	154	0.7	1165	
SESI 9 M33 1WR	330	0.36	231	0.6	1475	
SESI 9 M47 1WR	470	0.30	329	0.5	2220	
SESI 9 M68 1WR	680	0.25	477	0.4	3255	
SESI 9 1M0 1WR	1000	0.20	700	0.34	5865	

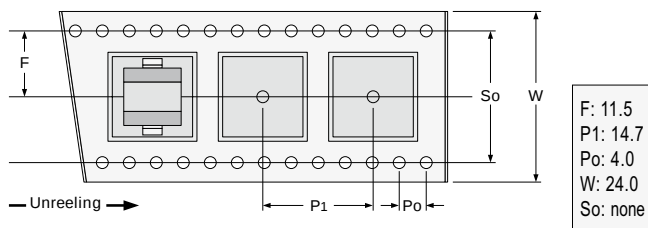
To Order

SESI	9	###	#	W	R
SMD Energy Storage Inductor	Size	Value code 4K3 = 4,3 μH M10 = 100 μH 1M0 = 1000 μH	Version	GW Terminals	High reliability

SESI 9 ### #WR

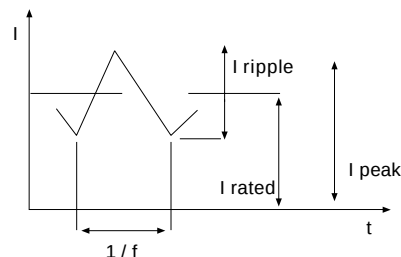
Packaging

Tape and Reel:
700 pieces per reel of diameter 330 mm



Notes

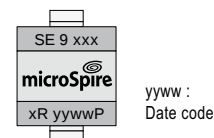
1. Inductance at 0.25 V, 100 kHz
2. I rated (permanent DC) without heatsink ; with heatsink $I = I_{\text{rated}} \times 1.4$
3. Typical inductance value at recommended full load
4. $I_{\text{peak max}}$ = maximum peak value of current at +125 °C; L value not guaranteed
5. 10 % admissible I ripple over I rated at $f = 200 \text{ kHz}$
6. Isolation voltage 150 Vdc
- 1 min - $R_i > 100 \text{ M}\Omega$ between winding and magnetic core



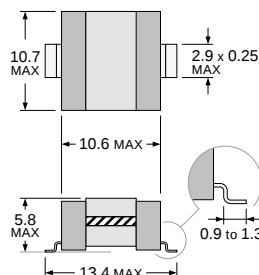
Connections



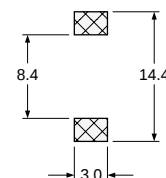
Marking



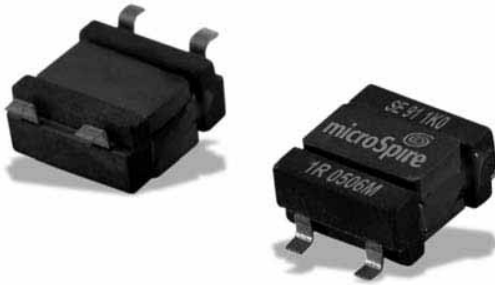
Dimensions (mm, top view)



PCB Layout (suggested)



SMD Power Inductors - SESI9.1WR High Reliability Applications



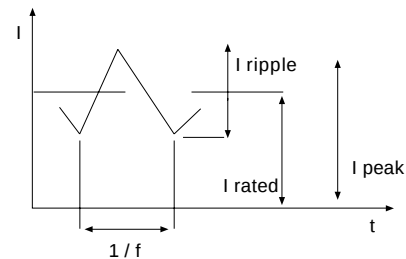
- Energy storage, smoothing, filtering
- Applied standards: ECSS-Q-70-02, MIL-STD-202, DO-160
- ESCC 3201/009 versions upon request
- Materials meet UL94-V0 rating
- Suited for IR and vapor reflow soldering
- Frequency range up to 1 MHz
- Operating temperature range: -55 °C to +125 °C
- Weight: 2 grams

Electrical Data (25°C)

ID Code	L^{12} no load μH	I^{35} rated A	L^{24} at rated I μH	I^5 peak max A	R_{dc} at 25°C $\text{m}\Omega$ Max	Tol.
SESI 9.1 1K0 1WR	1.0	6.0	0.6	11.0	8.5	30
SESI 9.1 1K5 1WR	1.5	5.4	0.9	9.5	11.5	
SESI 9.1 2K0 2WR	2.0	4.3	1.4	8.2	17	
SESI 9.1 2K6 2WR	2.6	3.6	1.8	7.0	23	20
SESI 9.1 3K4 2WR	3.4	3.0	2.4	6.2	35	
SESI 9.1 4K3 2WR	4.3	2.8	3.0	5.5	40	
SESI 9.1 6K2 2WR	6.2	2.3	4.3	4.3	59	
SESI 9.1 8K5 2WR	8.5	1.9	6.0	3.7	87	
SESI 9.1 10K 2WR	10	1.85	7.0	3.4	93	
SESI 9.1 15K 2WR	15	1.5	10.5	2.8	140	10
SESI 9.1 18K 2WR	18	1.27	12.6	2.5	192	
SESI 9.1 22K 2WR	22	1.21	15.4	2.3	215	
SESI 9.1 26K 2WR	26	1.03	18.2	2.14	290	
SESI 9.1 33K 2WR	33	0.92	23.1	1.9	350	
SESI 9.1 47K 2WR	47	0.8	32.9	1.6	470	
SESI 9.1 66K 2WR	66	0.73	46.2	1.3	565	
SESI 9.1 81K 2WR	81	0.63	56.7	1.21	745	
SESI 9.1 M10 2WR	100	0.6	70	1.1	795	
SESI 9.1 M15 1WR	150	0.53	105	0.8	750	
SESI 9.1 M22 1WR	220	0.43	154	0.7	1165	
SESI 9.1 M33 1WR	330	0.36	231	0.6	1475	
SESI 9.1 M47 1WR	470	0.3	329	0.5	2220	
SESI 9.1 M68 1WR	680	0.25	477	0.4	3255	
SESI 9.1 M100 1WR	1000	0.2	700	0.34	5865	

Notes

1. Inductance at 0.25 V, 100 kHz
2. I rated (permanent DC) without heatsink ;
with heatsink $I = I_{\text{rated}} \times 1.4$
3. Typical inductance value at recommended full load
4. $I_{\text{peak max}}$ = maximum peak value of current at
+125 °C; L value not guaranteed
5. 10 % admissible I ripple over I rated at $f = 200 \text{ kHz}$
6. Isolation voltage 150 Vdc
- 1 min - $R_i > 100 \text{ M}\Omega$ between winding and magnetic core



To Order

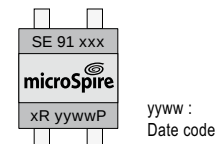
SESI 9.1 ### #WR

SESI	9.1	###	#	W	R
SMD Energy Storage Inductor	Size	Value code 4K3 = 4,3 μH M10 = 100 μH 1M0 = 1000 μH	Version	GW Terminals	High reliability

Connections

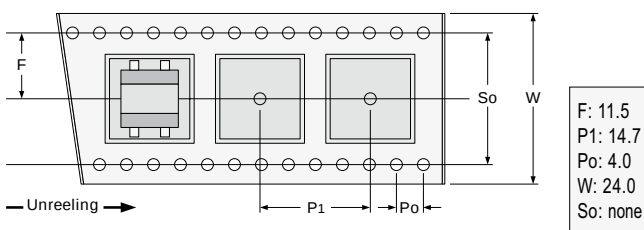


Marking

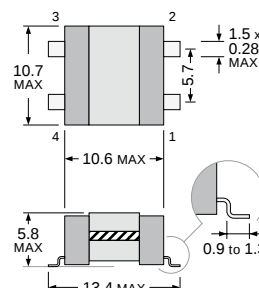


Packaging

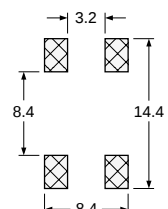
Tape and Reel:
700 pieces per reel of diameter 330 mm



Dimensions (mm, top view)



PCB Layout (suggested)



SMD Power Inductors SESI 9.1WR

QPL Components

SESI9.1WR series are usually installed on Military applications and breadboards for Space applications.

Since January 2003, Microspire has been manufacturing Radio Frequency Fixed Coils, SESI9.1WR series fulfilling ESA ESCC Generic specification N° 3201 and detail specification N° 3201/009.

This qualification approval includes final production tests Chart II, burn-in and electrical measurements to testing level B Chart III and qualification testing Chart IV.

For procurement, different quality levels are offered :

- Final production tests Chart II
- Burn-in and electrical measurements Chart III with level B or C (as required)
- Lot acceptance testing Chart V if required

Components delivered through this specification need to be processed and inspected in accordance with the Microspire Process Identification Document (P.I.D.).

Each component delivered is traceable to its production lot.

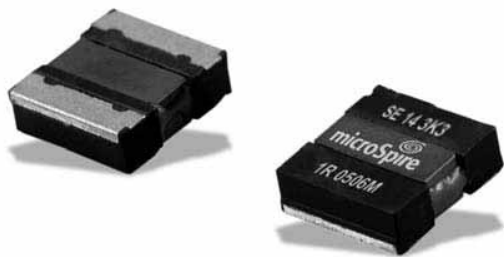
The terminal material and finish shall be brass, plated with 2 to 4 µm of Nickel, the finish shall be either Sn60Pb40 or Sn90Pb10.

Cross reference chart

Microspire Non-QPL ID Code	ESA SCC Component Part Number
SESI 9.1 1K0 1WR	3201009 05 x 1L0 N
SESI 9.1 1K5 1WR	3201009 05 x 1L5 N
SESI 9.1 2K0 2WR	3201009 05 x 2L0 N
SESI 9.1 2K6 2WR	3201009 05 x 2L6 M
SESI 9.1 3K4 2WR	3201009 05 x 3L4 M
SESI 9.1 4K3 2WR	3201009 05 x 4L3 M
SESI 9.1 6K2 2WR	3201009 05 x 6L2 M
SESI 9.1 8K5 2WR	3201009 05 x 8L5 M
SESI 9.1 10K 2WR	3201009 05 x 100 M
SESI 9.1 15K 2WR	3201009 05 x 150 M
SESI 9.1 18K 2WR	3201009 05 x 180 M
SESI 9.1 22K 2WR	3201009 05 x 220 M
SESI 9.1 26K 2WR	3201009 05 x 260 M
SESI 9.1 33K 2WR	3201009 05 x 330 K
SESI 9.1 47K 2WR	3201009 05 x 470 K
SESI 9.1 66K 2WR	3201009 05 x 660 K
SESI 9.1 81K 2WR	3201009 05 x 810 K
SESI 9.1 M10 2WR	3201009 05 x 101 K
SESI 9.1 M15 1WR	3201009 05 x 151 K
SESI 9.1 M22 1WR	3201009 05 x 221 K
SESI 9.1 M33 1WR	3201009 05 x 331 K
SESI 9.1 M47 1WR	3201009 05 x 471 K
SESI 9.1 M68 1WR	3201009 05 x 681 K
SESI 9.1 M10 1WR	3201009 05 x 102 K
3201009 05 x ### y	
x = B for Chart III level B	Tolerance :
x = C for Chart III level C	y = N for ±30%
	y = M for ±20%
	y = K for ±10%



SMD Power Inductors - SESI 14SR High Reliability Applications



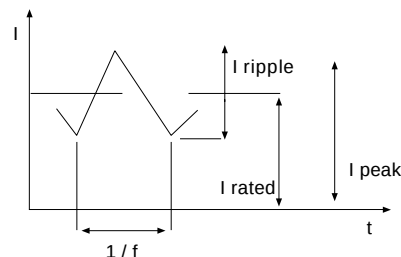
- Energy storage, smoothing, filtering
- Applied standards: ECSS-Q-70-02, MIL-STD-202, DO-160
- ESCC 3201/009 versions upon request
- Materials meet UL94-V0 rating
- Suited for IR and vapor reflow soldering
- Frequency range up to 1 MHz
- Operating temperature range: -55 °C to +125 °C
- Weight: 3.2 grams

Electrical Data (25°C)

ID Code	L^{12} no load μH	I^{15} rated A	L^{24} at rated I μH	I^5 peak max A	Rdc at 25°C m Ω Max	Tol.
SESI 14 3K3 1SR	3.3	5.8	2.3	8.0	15.0	20
SESI 14 4K7 1SR	4.7	5.4	3.3	6.9	17.5	
SESI 14 6K0 1SR	6.0	4.3	4.2	5.7	26.5	
SESI 14 8K2 1SR	8.2	3.7	5.7	5.2	42	
SESI 14 10K 1SR	10	3.3	7.0	4.6	47	
SESI 14 15K 1SR	15	2.7	10.5	3.8	90	
SESI 14 22K 1SR	22	2.2	15.4	3.0	110	
SESI 14 33K 1SR	33	1.8	23.1	2.5	170	10
SESI 14 47K 1SR	47	1.6	32.9	2.1	200	
SESI 14 56K 1SR	56	1.5	39.2	1.9	240	
SESI 14 68K 1SR	68	1.3	47.6	1.7	290	
SESI 14 82K 1SR	82	1.2	57.4	1.5	315	
SESI 14 M10 1SR	100	1.1	70	1.4	440	
SESI 14 M12 1SR	120	1.0	84	1.3	500	
SESI 14 M15 1SR	150	0.9	105	1.1	645	
SESI 14 M18 1SR	180	0.83	126	1.0	740	
SESI 14 M22 1SR	220	0.72	154	1.0	980	
SESI 14 M33 1SR	330	0.57	231	0.8	1575	

Notes

1. Inductance at 0.25 V, 100 kHz
2. I rated (permanent DC) without heatsink ;
with heatsink $I = I_{\text{rated}} \times 1.4$
3. Typical inductance value at recommended full load
4. I peak max = maximum peak value of current at
+125 °C; L value not guaranteed
5. 40 % admissible I ripple over I rated at $f = 200$ kHz
6. Isolation voltage 500 Vdc
- 1 min - $R_i > 1 \text{ G}\Omega$ between winding and magnetic core



To Order

SESI	14	###	1	S	R
SMD Energy Storage Inductor	Size	Value code 4K7 = 4,7 μH M10 = 100 μH 1M0 = 1000 μH	Version	SMD Terminals	High reliability

SESI 14 ### 1SR

Connections



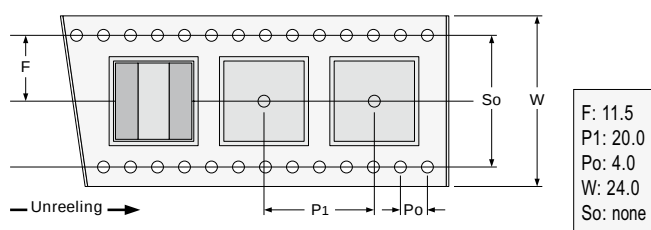
Marking

SE 14 xxx
microSpire
xR yywwP

yyww :
Date code

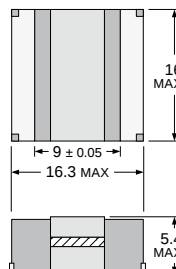
Packaging

Tape and Reel:
400 pieces per reel of diameter 330 mm

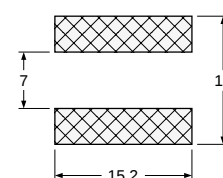


F: 11.5
P1: 20.0
P0: 4.0
W: 24.0
So: none

Dimensions (mm, bottom view)



PCB Layout (suggested)



SMD Power Inductors SESI 14SR

QPL Components

SESI 14SR series are usually installed on Military applications and breadboards for Space applications.

Since January 2003, Microspire has been manufacturing Radio Frequency Fixed Coils, SESI 14SR series fulfilling ESA ESCC Generic specification N° 3201 and detail specification N° 3201/009.

This qualification approval includes final production tests Chart II, burn-in and electrical measurements to testing level B Chart III and qualification testing Chart IV.

For procurement, different quality levels are offered :

- Final production tests Chart II
- Burn-in and electrical measurements Chart III with level B or C (as required)
- Lot acceptance testing Chart V if required

Components delivered through this specification need to be processed and inspected in accordance with the Microspire Process Identification Document (P.I.D.).

Each component delivered is traceable to its production lot.

The terminal material and finish shall be brass, plated with 2 to 4 µm of Nickel, the finish shall be either Sn60Pb40 or Sn90Pb10.

Cross reference chart

Microspire Non-QPL ID Code	ESA SCC Component Part Number
SESI 14 3K3 1SR	3201009 01 x 3L3 M
SESI 14 4K7 1SR	3201009 01 x 4L7 M
SESI 14 6K0 1SR	3201009 01 x 6L0 M
SESI 14 8K2 1SR	3201009 01 x 8L2 M
SESI 14 10K 1SR	3201009 01 x 100 M
SESI 14 15K 1SR	3201009 01 x 150 M
SESI 14 22K 1SR	3201009 01 x 220 M
SESI 14 33K 1SR	3201009 01 x 330 M
SESI 14 47K 1SR	3201009 01 x 470 K
SESI 14 56K 1SR	3201009 01 x 560 K
SESI 14 68K 1SR	3201009 01 x 680 K
SESI 14 82K 1SR	3201009 01 x 820 K
SESI 14 M10 1SR	3201009 01 x 101 K
SESI 14 M12 1SR	3201009 01 x 121 K
SESI 14 M15 1SR	3201009 01 x 151 K
SESI 14 M18 1SR	3201009 01 x 181 K
SESI 14 M22 1SR	3201009 01 x 221 K
SESI 14 M33 1SR	3201009 01 x 331 K
3201009 01 x ### y	
x = B for Chart III level B	Tolerance :
x = C for Chart III level C	y = M for ±20%
	y = K for ±10%



SMD Power Inductors - SESI 15WR High Reliability Applications



- Energy storage, smoothing, filtering
- Applied standards: ECSS-Q-70-02, MIL-STD-202, DO-160
- eesa ESCC 3201/009 versions upon request
- Materials meet UL94-V0 rating
- Suited for IR and vapor reflow soldering
- Frequency range up to 1 MHz
- Operating temperature range: -55 °C to +125 °C
- Weight: 5 grams
- Shielded version upon request

Electrical Data (25°C)

ID Code	L ¹² no load μH	I ¹⁸ rated A	L ²⁴ at rated I μH	I ⁵ peak max A	R _{dc} at 25°C mΩ Max	Tol.
SESI 15 1K5 2WR	1.5	14	0.9	19	5.0	30
SESI 15 1K8 1WR	1.8	10	1.05	14	5.0	
SESI 15 2K7 1WR	2.7	8.2	1.9	11.5	6.5	
SESI 15 4K9 1WR	4.9	6.0	3.4	8.5	11	
SESI 15 6K4 1WR	6.4	5.3	4.5	7.5	12	
SESI 15 8K0 1WR	8.0	4.8	5.6	6.5	16	20
SESI 15 12K 1WR	12	4.0	8.4	5.5	23	
SESI 15 16K 1WR	16	3.4	11.2	4.5	27	
SESI 15 18K 1WR	18	3.1	12.6	4.2	29	
SESI 15 21K 1WR	21	2.9	14.7	4.0	36	
SESI 15 27K 1WR	27	2.6	18.9	3.5	44	10
SESI 15 29K 2WR	30	2.6	20	3.5	72	
SESI 15 33K 1WR	33	2.3	23	3.2	59	
SESI 15 48K 1WR	48	1.9	33	2.7	72	
SESI 15 56K 1WR	56	1.8	39	2.5	82	
SESI 15 68K 1WR	68	1.6	47	2.2	110	
SESI 15 82K 1WR	82	1.5	57	2.1	120	
SESI 15 M10 1WR	100	1.35	70	1.9	155	
SESI 15 M12 1WR	120	1.2	84	1.7	180	
SESI 15 M15 1WR	150	1.1	105	1.5	230	
SESI 15 M22 1WR	220	0.9	154	1.3	355	
SESI 15 M33 1WR	330	0.74	231	1.0	630	
SESI 15 1M0 1WR	1000	0.38	800	0.5	2127.5	
SESI 15 2M3 1WR	2290	0.28	1900	0.36	4400	

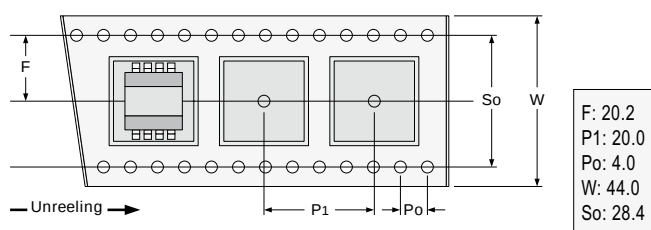
To Order

SESI	15	###	-	W	R
SMD Energy Storage Inductor	Size	Value code 4K9 = 4,9 μH M10 = 100 μH 1M0 = 1000 μH	Version	GW Terminals	High reliability

SESI 15 ### #WR

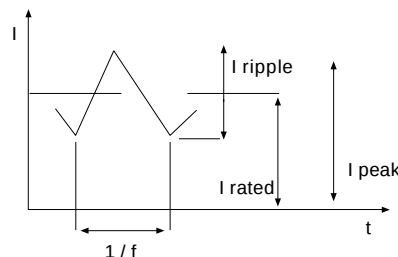
Packaging

Tape and Reel:
400 pieces per reel of diameter 330 mm

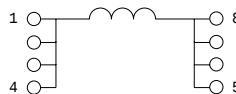


Notes

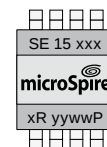
- Inductance at 0.25 V, 100 kHz
- I rated (permanent DC) without heatsink ;
with heatsink I = I rated x 1.4
- Typical inductance value at recommended full load
- I peak max = maximum peak value of current at
+125 °C; L value not guaranteed
- 40 % admissible I ripple over I rated at f = 200 kHz
- Isolation voltage 500 Vdc
- 1 min - Ri > 1 GΩ between winding and magnetic core



Connections

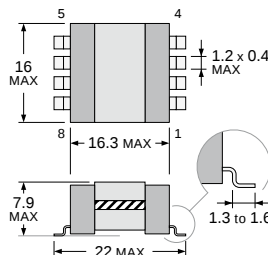


Marking

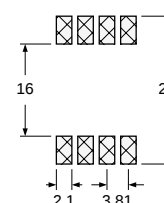


yyww :
Date code

Dimensions (mm, top view)



PCB Layout (suggested)



SMD Power Inductors SESI 15WR



QPL Components

SESI15WR series are usually installed on Military applications and breadboards for Space applications.

Since January 2003, Microspire has been manufacturing Radio Frequency Fixed Coils, SESI15WR series fulfilling ESA ESCC Generic specification N°3201 and detail specification N°3201/009.

This qualification approval includes final production tests Chart II, burn-in and electrical measurements to testing level B Chart III and qualification testing Chart IV.

For procurement, different quality levels are offered :

- Final production tests Chart II
- Burn-in and electrical measurements Chart III with level B or C (as required)
- Lot acceptance testing Chart V if required

Components delivered through this specification need to be processed and inspected in accordance with the Microspire Process Identification Document (P.I.D.).

Each component delivered is traceable to its production lot.

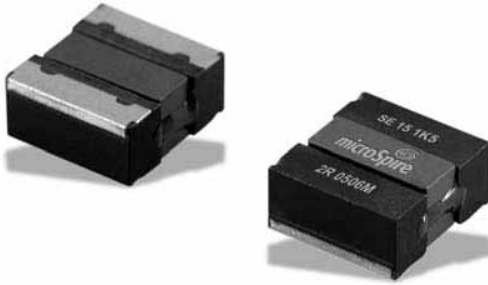
The terminal material and finish shall be brass, plated with 2 to 4 μm of Nickel, the finish shall be either Sn60Pb40 or Sn90Pb10.

Cross reference chart

Microspire Non-QPL ID Code	ESA SCC Component Part Number
SESI 15 1K5 2WR	3201009 03 x 1L5 N
SESI 15 1K8 1WR	3201009 03 x 1L8 N
SESI 15 2K7 1WR	3201009 03 x 2L7 M
SESI 15 4K9 1WR	3201009 03 x 4L9 M
SESI 15 6K4 1WR	3201009 03 x 6L4 M
SESI 15 8K0 1WR	3201009 03 x 8L0 M
SESI 15 12K 1WR	3201009 03 x 120 M
SESI 15 16K 1WR	3201009 03 x 160 M
SESI 15 18K 1WR	3201009 03 x 180 M
SESI 15 21K 1WR	3201009 03 x 210 M
SESI 15 27K 1WR	3201009 03 x 270 M
SESI 15 33K 1WR	3201009 03 x 330 M
SESI 15 48K 1WR	3201009 03 x 480 K
SESI 15 56K 1WR	3201009 03 x 560 K
SESI 15 68K 1WR	3201009 03 x 680 K
SESI 15 82K 1WR	3201009 03 x 820 K
SESI 15 M10 1WR	3201009 03 x 101 K
SESI 15 M12 1WR	3201009 03 x 121 K
SESI 15 M15 1WR	3201009 03 x 151 K
SESI 15 M22 1WR	3201009 03 x 221 K
SESI 15 M33 1WR	3201009 03 x 331 K
SESI 15 1M0 1WR	3201009 03 x 102 K
SESI 15 2M3 1WR	3201009 03 x 232 K
3201009 03 x ### y	
x = B for Chart III level B	
x = C for Chart III level C	
Tolerance :	
y = N for $\pm 30\%$	
y = M for $\pm 20\%$	
y = K for $\pm 10\%$	



SMD Power Inductors - SESI 15SR High Reliability Applications



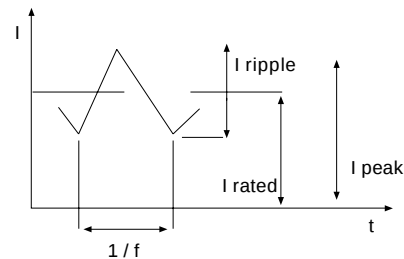
- Energy storage, smoothing, filtering
- Applied standards: ECSS-Q-70-02, MIL-STD-202, DO-160
- ESCC 3201/009 versions upon request
- Materials meet UL94-V0 rating
- Suited for IR and vapor reflow soldering
- Frequency range up to 1 MHz
- Operating temperature range: -55 °C to +125 °C
- Weight: 4.2 grams

Electrical Data (25°C)

ID Code	L^{12} no load μH	I^{35} rated A	L^{24} at rated I μH	I^{P} peak max A	Rdc at 25°C m Ω Max	Tol.
SESI 15 1K5 2SR	1.5	14	0.9	19	5.0	30
SESI 15 1K8 1SR	1.8	10	1.05	14	5.0	
SESI 15 2K7 1SR	2.7	8.2	1.9	11.5	6.5	
SESI 15 4K9 1SR	4.9	6.0	3.4	8.5	11	20
SESI 15 6K4 1SR	6.4	5.3	4.5	7.5	12	
SESI 15 8K0 1SR	8.0	4.8	5.6	6.5	16	
SESI 15 12K 1SR	12	4.0	8.4	5.5	23	
SESI 15 16K 1SR	16	3.4	11.2	4.5	27	
SESI 15 18K 1SR	18	3.1	12.6	4.2	29	
SESI 15 21K 1SR	21	2.9	14.7	4.0	36	10
SESI 15 27K 1SR	27	2.6	18.9	3.5	44	
SESI 15 29K 2SR	30	2.6	20	3.5	72	
SESI 15 33K 1SR	33	2.3	23	3.2	59	
SESI 15 48K 1SR	48	1.9	33	2.7	72	
SESI 15 56K 1SR	56	1.8	39	2.5	82	
SESI 15 68K 1SR	68	1.6	47	2.2	110	
SESI 15 82K 1SR	82	1.5	57	2.1	120	
SESI 15 M10 1SR	100	1.35	70	1.9	155	
SESI 15 M12 1SR	120	1.2	84	1.7	180	
SESI 15 M15 1SR	150	1.1	105	1.5	230	
SESI 15 M22 1SR	220	0.9	154	1.3	355	
SESI 15 M33 1SR	330	0.74	231	1.0	630	
SESI 15 M100 1SR	1000	0.38	800	0.5	2127.5	
SESI 15 M2M3 1SR	2290	0.28	1900	0.36	4400	

Notes

1. Inductance at 0.25 V, 100 kHz
2. I rated (permanent DC) without heatsink ;
with heatsink $I = I_{\text{rated}} \times 1.4$
3. Typical inductance value at recommended full load
4. $I_{\text{peak max}}$ = maximum peak value of current at
+125 °C; L value not guaranteed
5. 40 % admissible I ripple over I rated at $f = 200$ kHz
6. Isolation voltage 500 Vdc
- 1 min - $R_i > 1 \text{ G}\Omega$ between winding and magnetic core



To Order

SESI	15	###	#	S	R
SMD Energy Storage Inductor	Size	Value code 4K9 = 4,9 μH M10 = 100 μH 1M0 = 1000 μH	Version	GW Terminals	High reliability

SESI 15 ### #SR

Connections



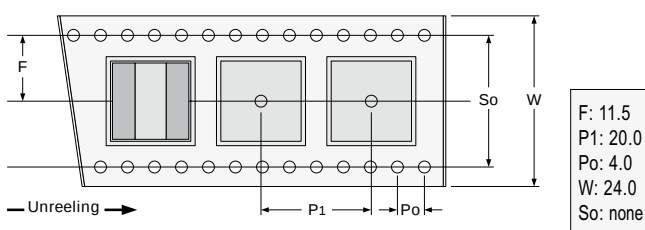
Marking

SE 15 xxx
xR yywwP

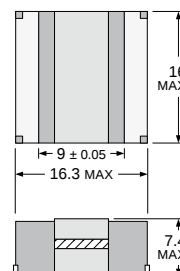
yyww :
Date code

Packaging

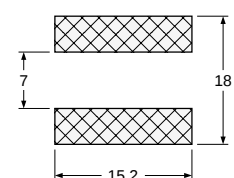
Tape and Reel:
400 pieces per reel of diameter 330 mm



Dimensions (mm, bottom view)



PCB Layout (suggested)



SMD Power Inductors SESI 15SR

QPL Components



SESI15SR series are usually installed on Military applications and breadboards for Space applications.

Since January 2003, Microspire has been manufacturing Radio Frequency Fixed Coils, SESI15SR series fulfilling ESA ESCC Generic specification N° 3201 and detail specification N° 3201/009.

This qualification approval includes final production tests Chart II, burn-in and electrical measurements to testing level B Chart III and qualification testing Chart IV.

For procurement, different quality levels are offered :

- Final production tests Chart II
- Burn-in and electrical measurements Chart III with level B or C (as required)
- Lot acceptance testing Chart V if required

Components delivered through this specification need to be processed and inspected in accordance with the Microspire Process Identification Document (P.I.D.).

Each component delivered is traceable to its production lot.

The terminal material and finish shall be brass, plated with 2 to 4 μm of Nickel, the finish shall be either Sn60Pb40 or Sn90Pb10.

Cross reference chart

Microspire Non-QPL ID Code	ESA SCC Component Part Number
SESI 15 1K5 2SR	3201009 02 x 1L5 N
SESI 15 1K8 1SR	3201009 02 x 1L8 N
SESI 15 2K7 1SR	3201009 02 x 2L7 M
SESI 15 4K9 1SR	3201009 02 x 4L9 M
SESI 15 6K4 1SR	3201009 02 x 6L4 M
SESI 15 8K0 1SR	3201009 02 x 8L0 M
SESI 15 12K 1SR	3201009 02 x 120 M
SESI 15 16K 1SR	3201009 02 x 160 M
SESI 15 18K 1SR	3201009 02 x 180 M
SESI 15 21K 1SR	3201009 02 x 210 M
SESI 15 27K 1SR	3201009 02 x 270 M
SESI 15 33K 1SR	3201009 02 x 330 M
SESI 15 48K 1SR	3201009 02 x 480 K
SESI 15 56K 1SR	3201009 02 x 560 K
SESI 15 68K 1SR	3201009 02 x 680 K
SESI 15 82K 1SR	3201009 02 x 820 K
SESI 15 M10 1SR	3201009 02 x 101 K
SESI 15 M12 1SR	3201009 02 x 121 K
SESI 15 M15 1SR	3201009 02 x 151 K
SESI 15 M22 1SR	3201009 02 x 221 K
SESI 15 M33 1SR	3201009 02 x 331 K
SESI 15 1M0 1SR	3201009 02 x 102 K
SESI 15 2M3 1SR	3201009 02 x 232 K
3201009 02 x ### y	
x = B for Chart III level B	
x = C for Chart III level C	
Tolerance :	
y = N for $\pm 30\%$	
y = M for $\pm 20\%$	
y = K for $\pm 10\%$	



SMD Power Inductors - SESI 18WR High Reliability Applications



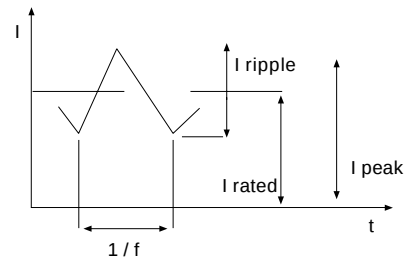
- Energy storage, smoothing, filtering
- Applied standards: ECSS-Q-70-02, MIL-STD-202, DO-160
- eesa ESCC 3201/009 versions upon request
- Materials meet UL94-V0 rating
- Suited for IR and vapor reflow soldering
- Frequency range up to 1 MHz
- Operating temperature range: -55 °C to +125 °C
- Weight: 10 grams
- Shielded version upon request

Electrical Data (25°C)

ID Code	L^{12} no load μH	I^{15} rated A	L^{24} at rated I μH	I^5 peak max A	Rdc at 25°C m Ω Max	Tol.
SESI 18 6K8 1WR	6.8	9.8	4.2	13.6	7.5	20
SESI 18 8K2 1WR	8.2	8.3	5.7	11.5	9.0	
SESI 18 11K 1WR	11	7.2	7.7	10	12	
SESI 18 15K 1WR	15	6.35	10.5	8.9	15	
SESI 18 18K 1WR	18	5.7	12.6	7.9	17	
SESI 18 22K 1WR	22	5.1	15.4	7.2	20	
SESI 18 22K 2WR	22.2	5.6	15.4	7.3	33	
SESI 18 27K 1WR	27	4.7	18.9	6.5	25	10
SESI 18 37K 1WR	37	4.0	25.9	5.6	29	
SESI 18 49K 1WR	49	3.5	34.3	4.8	45	
SESI 18 56K 1WR	56	3.3	39	4.6	48	
SESI 18 70K 1WR	70	2.9	49	4.1	65	
SESI 18 86K 1WR	86	2.6	60	3.7	72	
SESI 18 M10 1WR	100	2.4	70	3.3	75	
SESI 18 M12 1WR	120	2.2	84	3.1	115	
SESI 18 M15 1WR	150	1.95	105	2.7	125	
SESI 18 M18 1WR	180	1.8	126	2.6	175	
SESI 18 M22 1WR	220	1.6	154	2.3	210	
SESI 18 M33 1WR	330	1.34	231	1.9	250	

Notes

1. Inductance at 0.25 V, 100 kHz
2. I rated (permanent DC) without heatsink ;
with heatsink $I = I_{\text{rated}} \times 1.4$
3. Typical inductance value at recommended full load
4. I peak max = maximum peak value of current at
+125 °C; L value not guaranteed
5. 40 % admissible I ripple over I rated at $f = 200$ kHz
6. Isolation voltage 500 Vdc
- 1 min - $R_i > 1 \text{ G}\Omega$ between winding and magnetic core

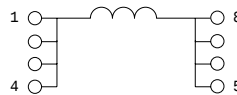


To Order

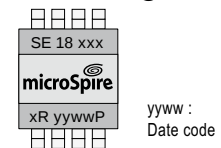
SESI	18	###	#	W	R
SMD Energy Storage Inductor	Size	Value code 4K9 = 4,9 μH M10 = 100 μH 1M0 = 1000 μH	Version	GW Terminals	High reliability

SESI 18 ### #WR

Connections

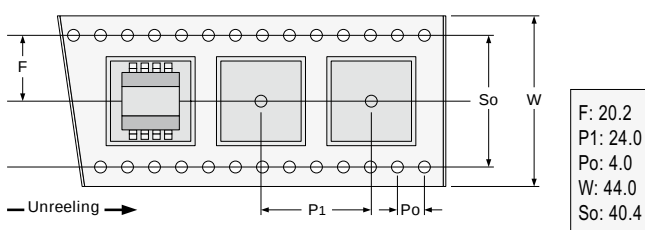


Marking

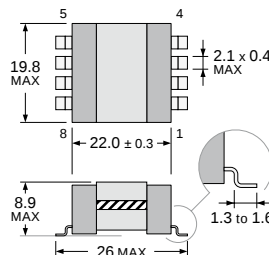


Packaging

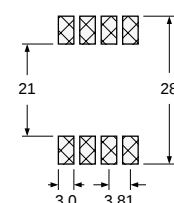
Tape and Reel:
300 pieces per reel of diameter 330 mm



Dimensions (mm, top view)



PCB Layout (suggested)



SMD Power Inductors SESI 18WR



SESI18WR series are usually installed on Military applications and breadboards for Space applications.

Since January 2003, Microspire has been manufacturing Radio Frequency Fixed Coils, SESI18WR series fulfilling ESA ESCC Generic specification N°3201 and detail specification N°3201/009.

This qualification approval includes final production tests Chart II, burn-in and electrical measurements to testing level B Chart III and qualification testing Chart IV.

For procurement, different quality levels are offered :

- Final production tests Chart II
- Burn-in and electrical measurements Chart III with level B or C (as required)
- Lot acceptance testing Chart V if required

Components delivered through this specification need to be processed and inspected in accordance with the Microspire Process Identification Document (P.I.D.).

Each component delivered is traceable to its production lot.

The terminal material and finish shall be brass, plated with 2 to 4 μm of Nickel, the finish shall be either Sn60Pb40 or Sn90Pb10.

Cross reference chart

Microspire Non-QPL ID Code	ESA SCC Component Part Number
SESI 18 6K8 1WR	3201009 04 x 6L8 M
SESI 18 8K2 1WR	3201009 04 x 8L2 M
SESI 18 11K 1WR	3201009 04 x 110 M
SESI 18 15K 1WR	3201009 04 x 150 M
SESI 18 18K 1WR	3201009 04 x 180 M
SESI 18 22K 1WR	3201009 04 x 220 M
SESI 18 27K 1WR	3201009 04 x 270 M
SESI 18 37K 1WR	3201009 04 x 370 K
SESI 18 49K 1WR	3201009 04 x 490 K
SESI 18 56K 1WR	3201009 04 x 560 K
SESI 18 70K 1WR	3201009 04 x 700 K
SESI 18 86K 1WR	3201009 04 x 860 K
SESI 18 M10 1WR	3201009 04 x 101 K
SESI 18 M12 1WR	3201009 04 x 121 K
SESI 18 M15 1WR	3201009 04 x 151 K
SESI 18 M18 1WR	3201009 04 x 181 K
SESI 18 M22 1WR	3201009 04 x 221 K
SESI 18 M33 1WR	3201009 04 x 331 K
3201009 04 x ### y	
x = B for Chart III level B	Tolerance :
x = C for Chart III level C	y = M for $\pm 20\%$
	y = K for $\pm 10\%$



SMD Power Inductors - SESI 22WR High Reliability Applications



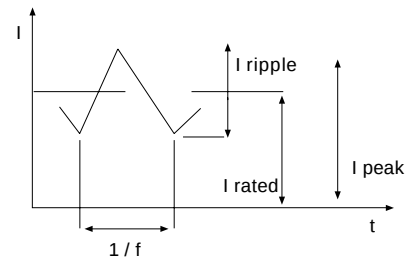
- Energy storage, smoothing, filtering
- Applied standards: ECSS-Q-70-02, MIL-STD-202, DO-160
- Materials meet UL94-V0 rating
- Suited for IR and vapor reflow soldering
- Frequency range up to 1 MHz
- Operating temperature range: -55 °C to +125 °C
- Weight: 26 grams
- Shielded version upon request

Electrical Data (25°C)

ID Code	L^{12} no load μH	L^{35} rated A	L^{24} at rated I μH	I^5 peak max A	Rdc at 25°C m Ω Max	Tol.
SESI 22 7K0 2WR	7	18.9	3.8	24.0	5.0	20
SESI 22 7K7 2WR	7.7	16.0	5.4	20.0	4.5	
SESI 22 10K 2WR	10.0	13.8	7.0	17.7	5.5	
SESI 22 13K 2WR	13.0	12.0	9.1	15.6	7.0	
SESI 22 19K 2WR	19.2	10.9	11.5	14.0	11	
SESI 22 24K 2WR	24.0	8.4	16.8	11.5	13	
SESI 22 33K 2WR	33.0	7.7	23.0	9.8	20	10
SESI 22 47K 1WR	47.0	5.7	37.6	8.0	16	
SESI 22 64K 1WR	64.0	5.0	51.2	7.0	21	
SESI 22 82K 1WR	82.0	4.3	65.6	6.1	24	
SESI 22 M10 1WR	100	3.9	80	5.5	30	
SESI 22 M15 1WR	150	3.2	120	4.7	44	
SESI 22 M21 1WR	210	2.7	168	3.8	70	
SESI 22 M34 1WR	340	2.1	272	3.0	120	
SESI 22 M47 1WR	470	1.8	376	2.5	180	
SESI 22 M68 1WR	680	1.5	544	2.1	220	
SESI 22 M82 1WR	820	1.4	656	2.0	300	
SESI 22 M10 1WR	1000	1.2	800	1.8	330	
SESI 22 M15 1WR	1500	1.1	1200	1.4	500	
SESI 22 M22 1WR	2200	0.8	1760	1.2	760	

Notes

1. Inductance at 0.25 V, 100 kHz
2. I rated (permanent DC) without heatsink ;
with heatsink $I = I_{\text{rated}} \times 1.4$
3. Typical inductance value at recommended full load
4. $I_{\text{peak max}}$ = maximum peak value of current at
+125 °C; L value not guaranteed
5. 35 % admissible I ripple over I rated at $f = 200 \text{ kHz}$
6. Isolation voltage 500 Vdc
- 1 min - $R_i > 1 \text{ G}\Omega$ between winding and magnetic core

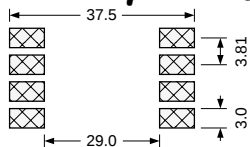


To Order

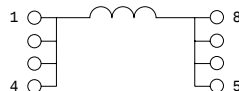
SESI	22	###	#	S	R
SMD Energy Storage Inductor	Size	Value code 7K7 = 7,7 μH M10 = 100 μH 1M0 = 1000 μH	Version	GW Terminals	High reliability

SESI 22 ### #WR

PCB Layout (suggested)

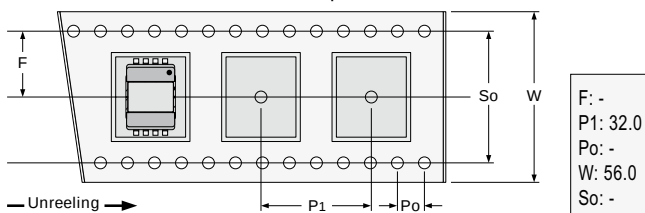


Connections



Packaging

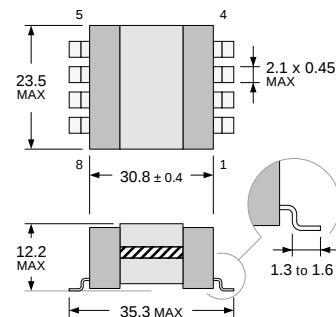
Tape and Reel:
100 units per reel of diameter 330 mm



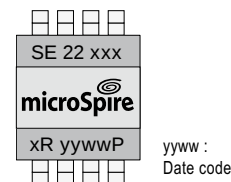
F: -
P1: 32.0
P0: -
W: 56.0
So: -

Dimensions

(mm, top view)



Marking



SMD Power Inductors SESI 22WR

QPL Components

SESI22WR series are usually installed on Military applications and breadboards for Space applications.

Since January 2003, Microspire has been manufacturing Radio Frequency Fixed Coils, SESI22WR series fulfilling ESA ESCC Generic specification N° 3201 and detail specification N° 3201/009.

This qualification approval includes final production tests Chart II, burn-in and electrical measurements to testing level B Chart III and qualification testing Chart IV.

For procurement, different quality levels are offered :

- Final production tests Chart II
- Burn-in and electrical measurements Chart III with level B or C (as required)
- Lot acceptance testing Chart V if required

Components delivered through this specification need to be processed and inspected in accordance with the Microspire Process Identification Document (P.I.D.).

Each component delivered is traceable to its production lot.

The terminal material and finish shall be brass, plated with 2 to 4 µm of Nickel, the finish shall be either Sn60Pb40 or Sn90Pb10.

Components must be glued to PCB in order to fulfil shock/vibration levels from detail specification N° 3201/009.

Cross reference chart

Microspire Non-QPL ID Code	ESA SCC Component Part Number
SESI 22 7K0 2WR	3201009 06 x 7L0 M
SESI 22 7K7 2WR	3201009 06 x 7L7 M
SESI 22 10K 2WR	3201009 06 x 100 M
SESI 22 13K 2WR	3201009 06 x 130 M
SESI 22 19K 2WR	3201009 06 x 190 M
SESI 22 24K 2WR	3201009 06 x 240 M
SESI 22 33K 2WR	3201009 06 x 330 M
SESI 22 47K 1WR	3201009 06 x 470 K
SESI 22 64K 1WR	3201009 06 x 640 K
SESI 22 82K 1WR	3201009 06 x 820 K
SESI 22 M10 1WR	3201009 06 x 101 K
SESI 22 M15 1WR	3201009 06 x 151 K
SESI 22 M21 1WR	3201009 06 x 211 K
SESI 22 M34 1WR	3201009 06 x 341 K
SESI 22 M47 1WR	3201009 06 x 471 K
SESI 22 M68 1WR	3201009 06 x 681 K
SESI 22 M82 1WR	3201009 06 x 821 K
SESI 22 1M0 1WR	3201009 06 x 102 K
SESI 22 1M5 1WR	3201009 06 x 152 K
SESI 22 2M2 1WR	3201009 06 x 222 K
3201009 06 x ### y	
x = B for Chart III level B x = C for Chart III level C	
Tolerance : y = M for ±20% y = K for ±10%	



SMD Power Inductors - SESI 32WR High Reliability Applications



- Inductance values: 4.7 μH to 4700 μH
- Current up to 27 Arms and 38 A peak
- Through-hole design
- Materials meet UL94-V0 rating
- Suited for IR and vapor reflow soldering
- Frequency range up to 1 MHz
- Operating temperature range: -55 °C to +85 °C
- Weight: 56 grams
- Shielded version upon request

Electrical Data (25°C)

ID Code	$L^{1,2}$ no load μH	$I^{3,5}$ rated A	$L^{2,4}$ at rated I μH	I^5 peak max A	Rdc at 25°C m Ω Max	Tol.
SESI 32 35K 1PR	35	17	26	20	11.5	30

To Order

SESI 32 ### 1PR

SESI	32	###	1	P	R
SMD Energy Storage Inductor	Size	Value code 35K = 35 μH	Version	Pins through hole	High reliability

Packaging

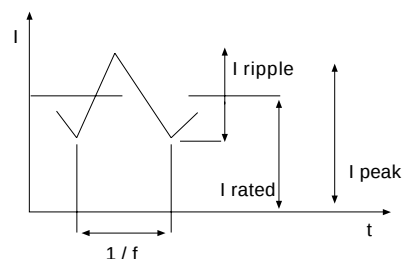
Individually packed 20 parts on 2 layers.

Applications

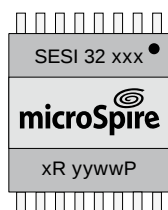
Energy storage, smoothing, filtering.

Notes

1. Inductance at 0.25 V, 100 kHz
2. I rated (permanent DC) without heatsink ;
with heatsink $I = I_{\text{rated}} \times 1.4$
3. Typical inductance value at recommended full load
4. $I_{\text{peak max}}$ = maximum peak value of current at
+85 °C; L value not guaranteed
5. 35% admissible I ripple over I rated at $f = 200 \text{ kHz}$
6. Isolation voltage 500 Vdc
- 1 min - $R_i > 1 \text{ G}\Omega$ between winding and magnetic core

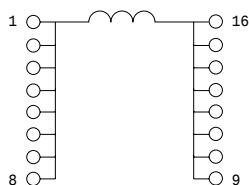


Marking

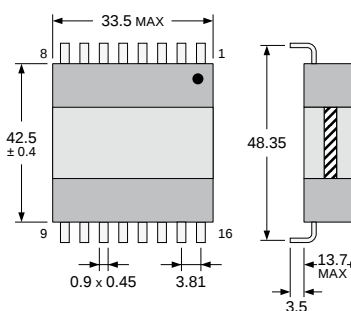


yyww :
Date code

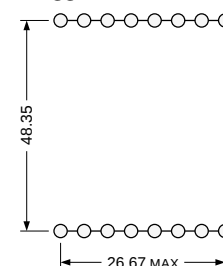
Connections



Dimensions (mm)



PCB Layout (suggested)



Differential Mode Chokes for DC/DC Embedded Applications

DMC 22 xxx 1WR Series

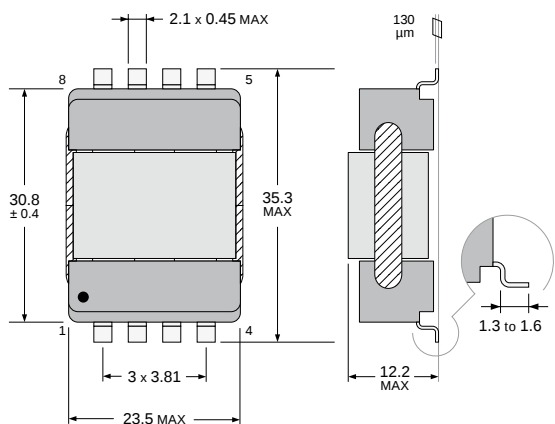


- Based on Microspire's «SESI22 Planar Technology»
- Low-profile SMD package (2x4 pins)
- Applied standards: MIL-STD-202, ECSS-Q-70-02, DO-160
- Dielectric strength test up to 500 V (50 Hz - 1 min)
- Materials meet UL94-V0 rating
- Thermal index according to IEC85: H (180 °C)
- Operating/storage temperature range: -55 °C to +125 °C
- Approx weight: 26 grams

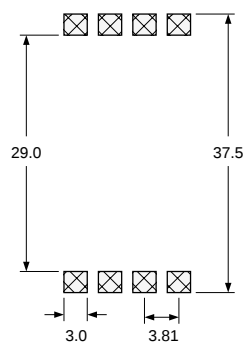
Electrical Data

ID Code	Inductance Value at 25°C (±40%) L ₁₋₃ = L ₅₋₇	DC Current MAX	MAX RMS Current for ΔT = 40°C Heating	MAX DC Resistance (25°C)	Dielectric Strength (50Hz - 1min)
DMC22 M25 1WR	25 μH	4 A	1 A	60 mΩ	500 Vrms

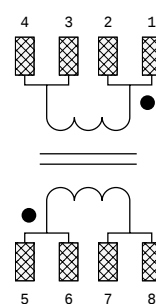
Typical Dimensions (mm, top view)



PCB Layout (suggested)

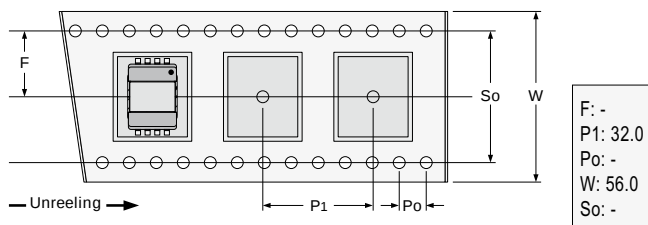


Connections (Top view)

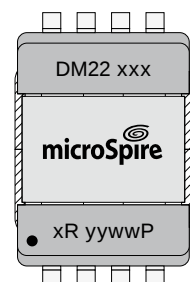


Packaging

Tape and Reel:
100 units per reel of diameter 330 mm



Marking



yyww :
Date code



CMC 14 Common Mode Chokes Series

High Grade - Improved Temperature Stability

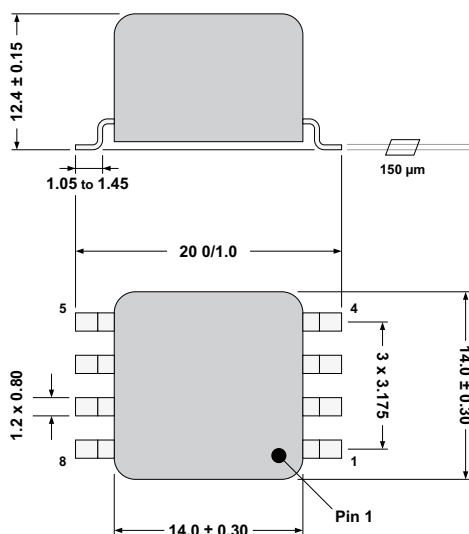


- Less than 20 % performance variations versus temperature (-55 °C / +125 °C)
- Minimum impedance attenuation : 100 Ω from 100 kHz to 30 MHz
- Compact SMD package (2x4 pins)
- Applied standards: MIL-STD-202, ECSS-Q-ST-70-02C, DO-160 and ESCC 3201 generic specification for space products
- Materials meet UL94-V0 rating
- Thermal index according to IEC85: H (180 °C)
- Operating/storage temperature range: -55 °C to +125 °C
- Approx weight: 5 grams

Electrical Data

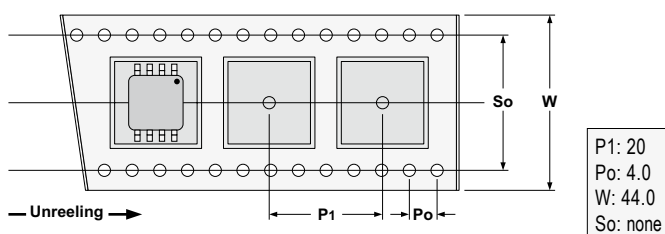
ID Code	Inductance Value at 25°C (-40/+35%)	MAX RMS Current for $\Delta T = 40^\circ\text{C}$	MAX DC Resistance (25°C)
CMC14 M14 2WR	140 μH	7.2 A	2.7 m Ω
CMC14 M25 2WR	248 μH	6.4 A	3.5 m Ω
CMC14 M39 2WR	387 μH	5.7 A	4.4 m Ω
CMC14 M56 2WR	558 μH	5.4 A	5.0 m Ω
CMC14 M76 2WR	760 μH	4.5 A	7.0 m Ω
CMC14 M99 2WR	992 μH	3.8 A	10.0 m Ω
CMC14 1M2 2WR	1255 μH	3.2 A	14.0 m Ω
CMC14 1M5 2WR	1550 μH	2.6 A	20.0 m Ω
CMC14 2M2 2WR	2232 μH	2.2 A	29.0 m Ω

Typical Dimensions (mm, top view)



Packaging

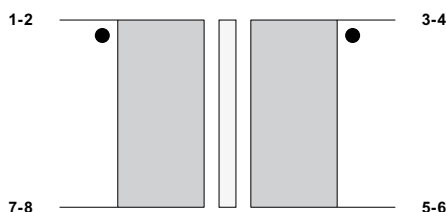
Tape and Reel:
200 units per reel of diameter 330 mm



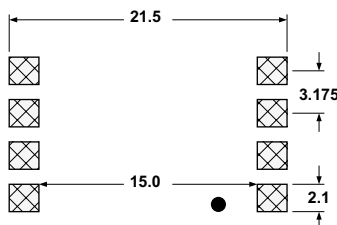
Notes

1. Dielectric strength test: 500v (50Hz-1min)
2. Max power dissipation at +125°C: 400mW
3. Heat increase at Max current $\leq 25^\circ\text{C}$
4. 1:1 ratio (sector wound construction)
5. Interwinding capacitances < 15 pF
6. Variation of «L» values over the working temperature range $\leq 15\%$
7. Admissible temp. during reflow soldering : +260°C / 30 seconds

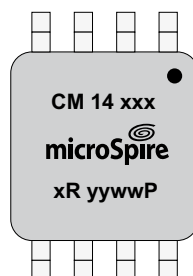
Connections



PCB Layout (suggested)



Marking



yyww :
Date code



CMC 17 Common Mode Chokes Series

High Grade - Improved Temperature Stability

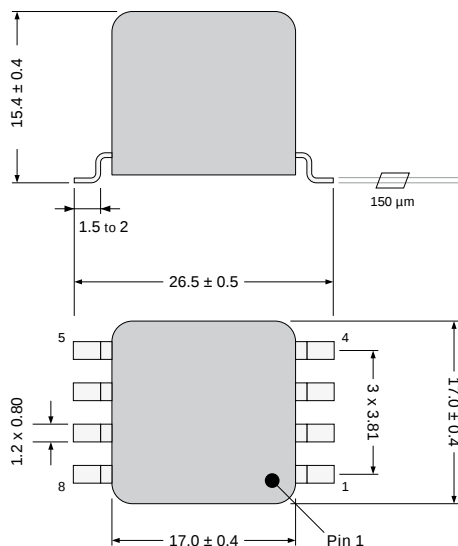


- Less than 20 % performance variations versus temperature (-55 °C/+125 °C)
- Minimum impedance attenuation : 100 Ω from 100 kHz to 30 MHz
- Compact SMD package (2x4 pins)
- Applied standards : MIL-STD-202, ECSS-Q-ST-70-02C, DO-160 and ESCC 3201 generic specification for space products
- RMS current range : from 1.1 A to 11.7 A for 40 °C heating above 25 °C
- Materials meet UL94-V0 rating
- Thermal index according to IEC85: H (180 °C)
- Operating/storage temperature range : -55 °C to +125 °C
- Approx weight : 10 grams

Electrical Data

ID Code	Inductance Value at 25°C (-40/+35%)	Typical SRF	Max Impedance (Typical)	Max Attenuation (Z = 50Ω)	MAX RMS Current for ΔT = 40°C	MAX DC Resistance (25°C)	Typical Leakage Inductance (100kHz)
CMC17 M45 1WR	0.45 mH	32 MHz	1 kΩ	20 dB	11.7 A	5 mΩ	0.5 μH
CMC17 1M2 1WR	1.15 mH	15 MHz	1.9 kΩ	26 dB	8.3 A	10 mΩ	1.1 μH
CMC17 2M6 1WR	2.59 mH	8 MHz	3.7 kΩ	32 dB	6 A	18 mΩ	2.3 μH
CMC17 5M8 1WR	5.83 mH	1.5 MHz	5.3 kΩ	35 dB	4 A	40 mΩ	6.3 μH
CMC17 13M 1WR	13.1 mH	0.6 MHz	9.4 kΩ	40 dB	2.7 A	90 mΩ	13.4 μH
CMC17 30M 1WR	30.3 mH	0.3 MHz	15.8 kΩ	44 dB	1.7 A	220 mΩ	32 μH
CMC17 69M 1WR	69.2 mH	0.1 MHz	29 kΩ	49 dB	1.1 A	500 mΩ	70 μH

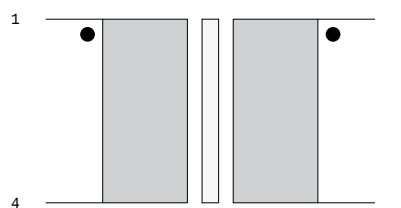
Typical Dimensions (mm, top view)



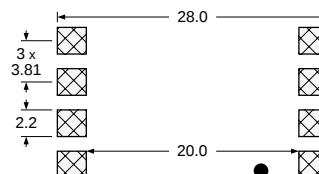
Notes

1. Dielectric strength test : 500v (50Hz - 1min)
2. 1:1 ratio (sector wound construction)

Connections

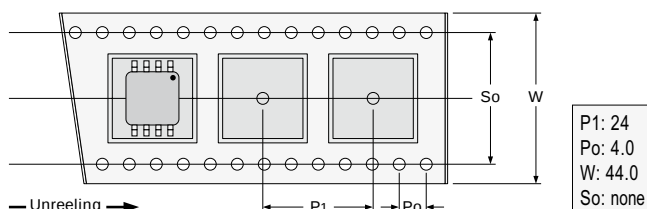


PCB Layout (suggested)

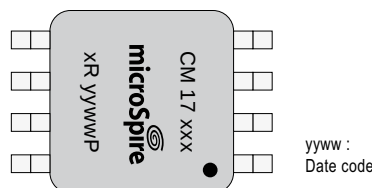


Packaging

Tape and Reel:
150 units per reel of diameter 330 mm



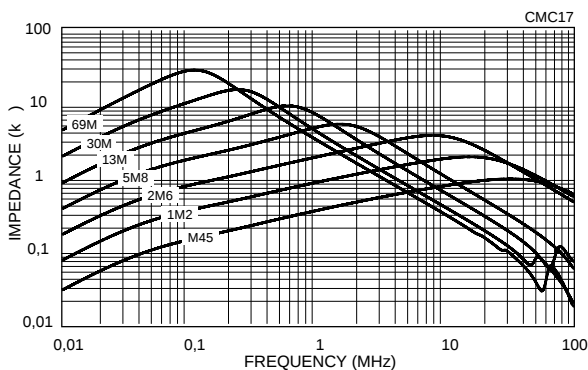
Marking



CMC 17 Common Mode Chokes Series

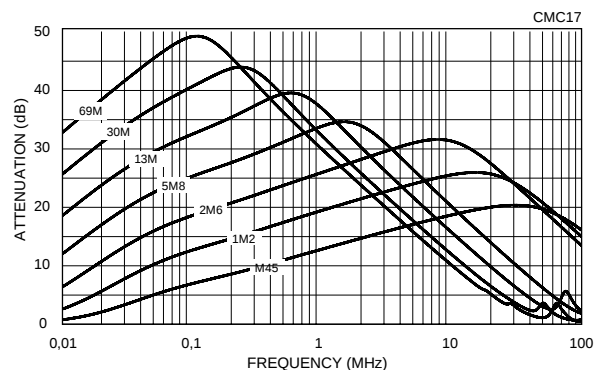
High Grade - Improved Temperature Stability

Impedance



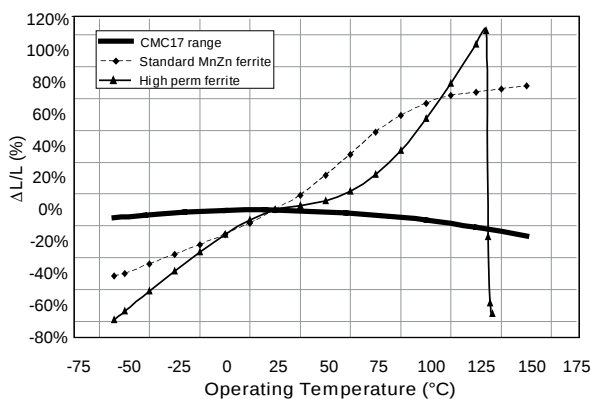
Typical values at 25°C with 1mT at 10 kHz

Attenuation



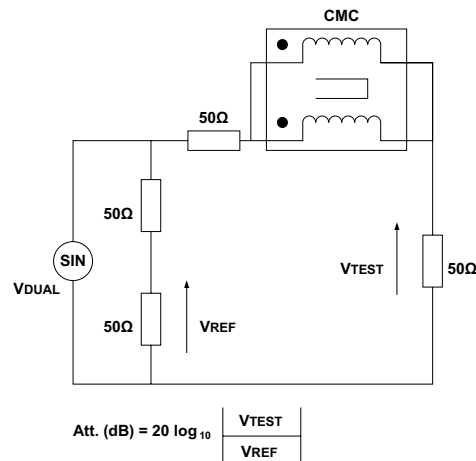
Typical values ($Z=50\Omega$) at 25°C with 1mT at 10 kHz

Variation vs Temperature



Change in inductance value (<1mT at 10 kHz)

Attenuation Measurement Circuit



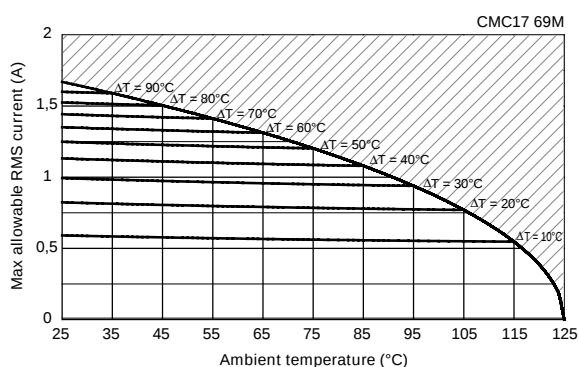
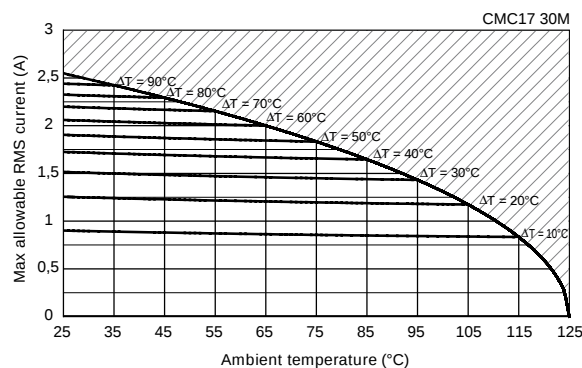
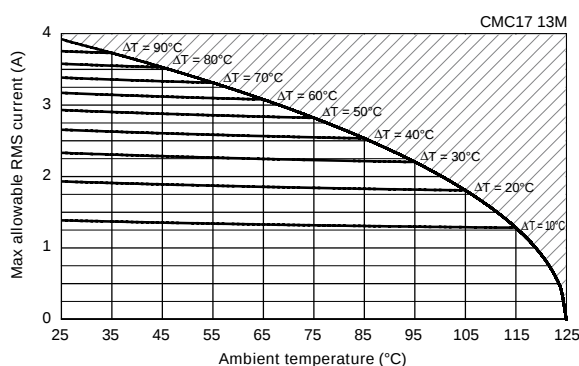
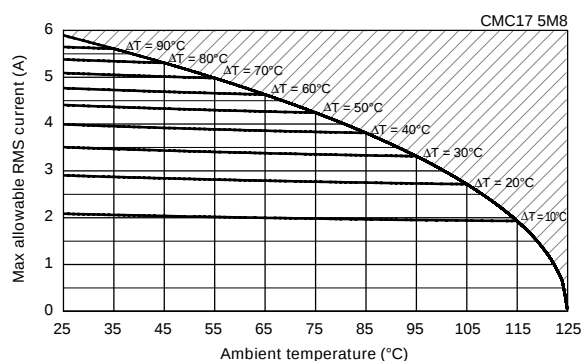
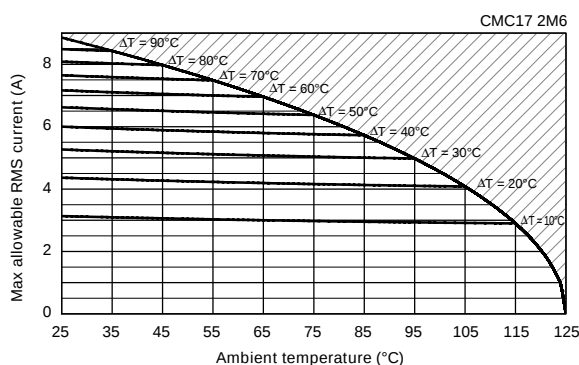
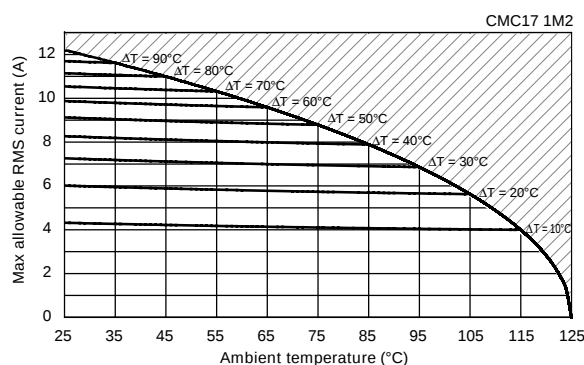
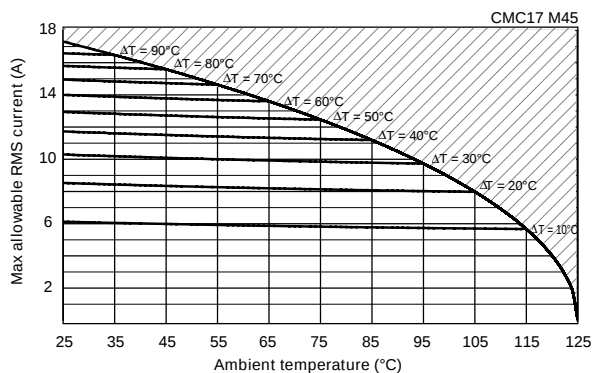
CMC17 range uses very high performance materials and therefore, offers remarkable temperature stability figures compared to standard or high-perm ferrite cores.



CMC 17 Common Mode Chokes Series

High Grade - Improved Temperature Stability

Derating Curves

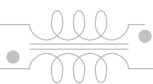


All thermal measurements under atmospheric conditions with component mounted on 1 dm² PCB without cooling device. All above graphs indicate maximum RMS current allowed through component v. ambient temperature for a defined ΔT . Maximum operating temperature is +125°C.

Example:

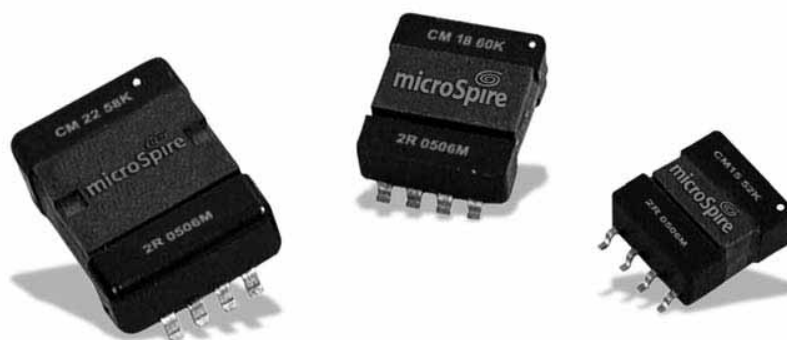
CMC17 M45 for application with $T_{amb} = +85^\circ\text{C}$ Max current allowed is <11 Arms with $\Delta T < 40^\circ\text{C}$.

If temp increase allowed in application is limited to $\Delta T < 20^\circ\text{C}$, current must be reduced to 8 Arms.



Common Mode Chokes for DC/DC Embedded Applications

CMC 2WR Series



Package	Indicative RMS Current for 40°C Heating* above 25°C	Max Dimensions (LxWxH in mm)	Number of Pins	Weight (grams)
CMC15	0.6A - 6.7A	22 x 16 x 8	2 x 4 SMD	5
CMC18	0.9A - 9.9A	26.5 x 20 x 9	2 x 4 SMD	10
CMC22	1.9A - 14.3A	37 x 24 x 12.5	2 x 4 SMD	26

* Values without heatsink; these values can be increased with appropriate cooling device

- MicroSpire's «SESI Technology» planar solution for high grade common mode chokes
- Three standard packages in a qualified technology for extreme working conditions
- Compliant with MIL-STD-202, ECSS-Q-70-02 (aerospace) and DO-160 (avionics) standards
- Already qualified by the CNES for space applications (ESCC Capability Approval in progress with the European Space Agency)
- Low profile and light design
- Highly efficient and reliable technology
- Extended operating temperature range from -55 °C to +125 °C
- Enlarged temperature stability of the performances
- SMD versions suited for IR and vapor reflow soldering

Shielded versions with thin six-face tinned copper box upon request
(3 times less EMI radiation)



Common Mode Chokes for DC/DC Embedded Applications

CMC 15 xxx 2WR Series

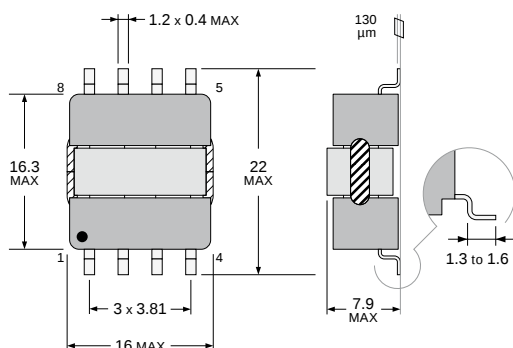


- Based on Microspire's «SESI15 Planar Technology»
- Low-profile SMD package (2x4 pins)
- Applied standards: MIL-STD-202, ECSS-Q-70-02, DO-160
- RMS current range: from 0.6 A to 6.7 A for 40 °C heating above 25 °C
- Excellent impedance attenuation >100 Ω from 300 kHz to 65 MHz
- Dielectric strength test up to 500 V (50 Hz - 1 min)
- Materials meet UL94-V0 rating
- Thermal index according to IEC85: H (180 °C)
- Operating/storage temperature range: -55 °C to +125 °C
- Approx weight: 5 grams

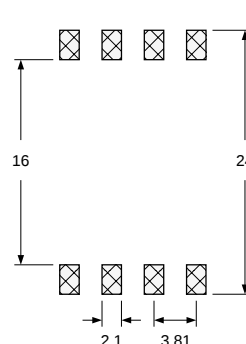
Electrical Data

ID Code	Inductance Value at 25°C ($\pm 40\%$)	Typical SRF	Max Impedance (Typical)	Max Attenuation ($Z = 50\Omega$)	MAX RMS Current for $\Delta T = 40^\circ\text{C}$	MAX DC Resistance (25°C)	Dielectric Strength (50Hz - 1min)
CMC15 52K 2WR	0.05 mH	7.3 MHz	1.6 k Ω	25 dB	6.7 A	15 m Ω	500 Vrms
CMC15 M11 2WR	0.11 mH	5.8 MHz	3.7 k Ω	32 dB	4.4 A	35 m Ω	500 Vrms
CMC15 M22 2WR	0.22 mH	3.9 MHz	7.3 k Ω	37 dB	3.3 A	65 m Ω	500 Vrms
CMC15 M47 2WR	0.47 mH	2.4 MHz	15 k Ω	44 dB	2.2 A	150 m Ω	500 Vrms
CMC15 1M0 2WR	1.0 mH	1.8 MHz	33.5 k Ω	51 dB	1.4 A	350 m Ω	500 Vrms
CMC15 2M0 2WR	2.0 mH	1.2 MHz	66.9 k Ω	57 dB	0.95 A	770 m Ω	500 Vrms
CMC15 4M0 2WR	4.0 mH	0.9 MHz	151 k Ω	64 dB	0.55 A	1750 m Ω	500 Vrms

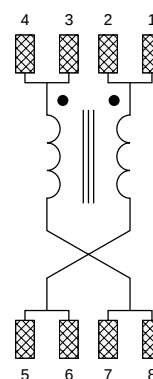
Typical Dimensions (mm, top view)



PCB Layout (suggested)



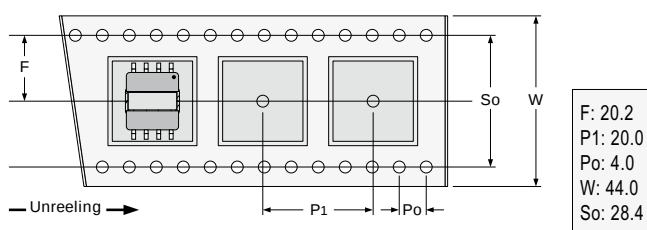
Connections (top view)



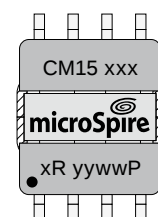
⚠ internal crossing
for correct connection

Packaging

Tape and Reel:
400 units per reel of diameter 330 mm



Marking



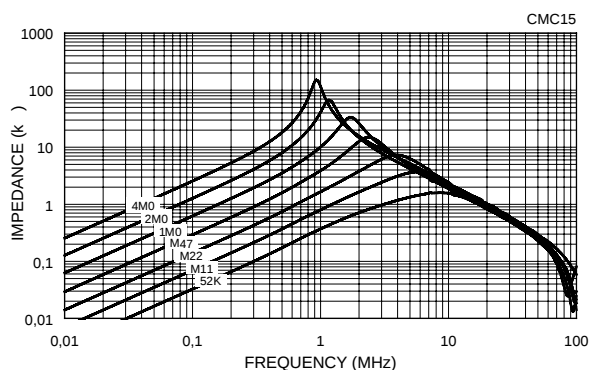
yyww :
Date code



Common Mode Chokes for DC/DC Embedded Applications

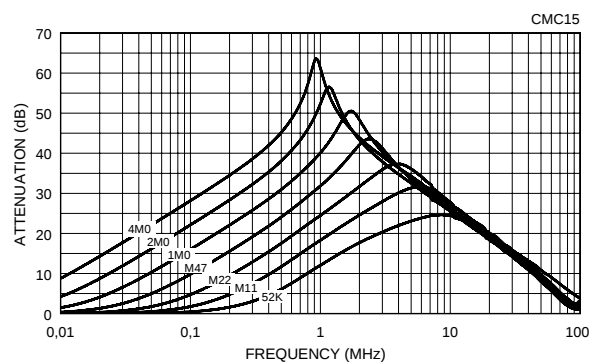
CMC 15 xxx 2WR Series

Impedance



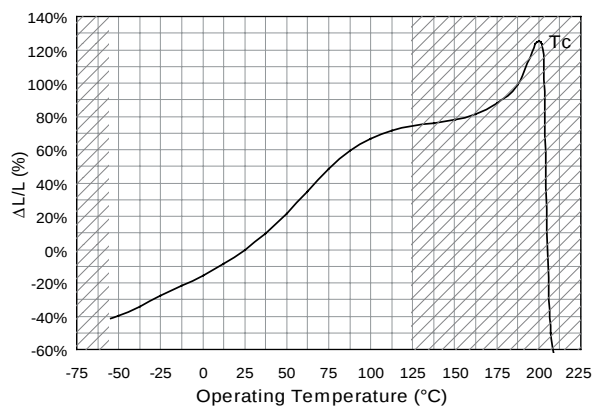
Typical values at 25°C with 1 mT at 10 kHz

Attenuation



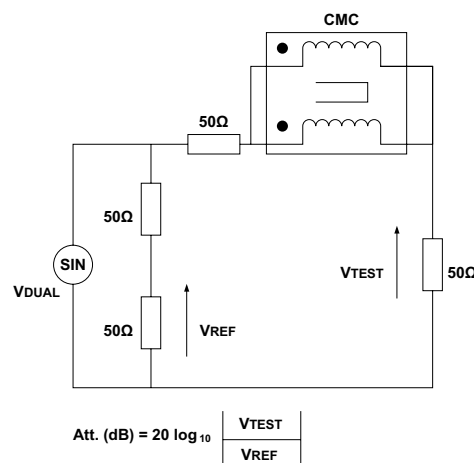
Typical values ($Z=50\Omega$) at 25°C with 1 mT at 10 kHz

Variation vs Temperature



Change in inductance value (<1 mT at 10 kHz)

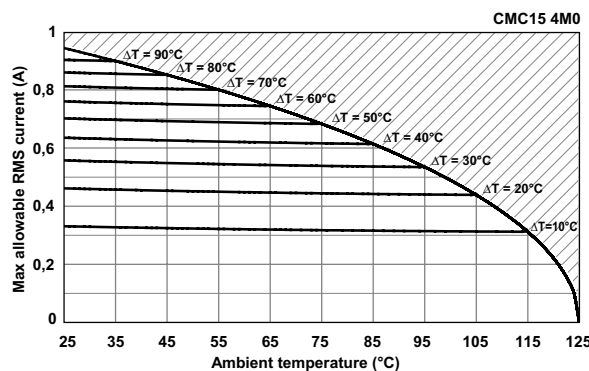
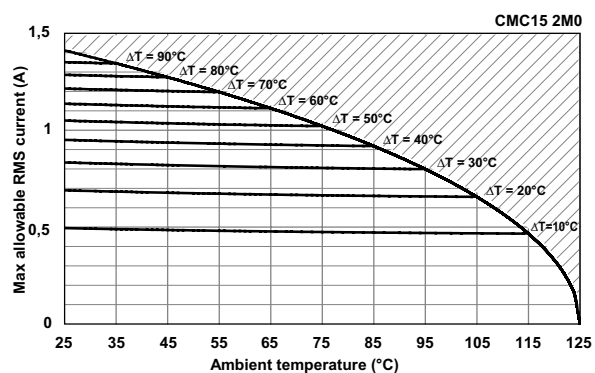
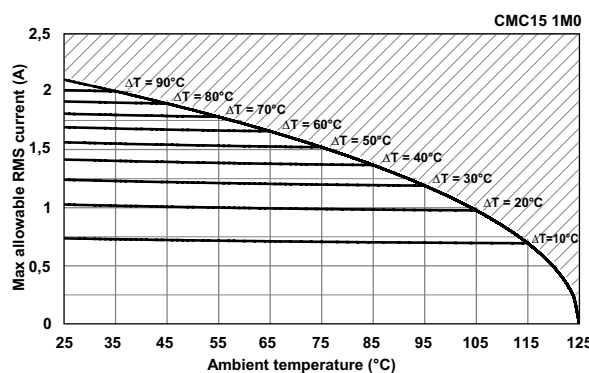
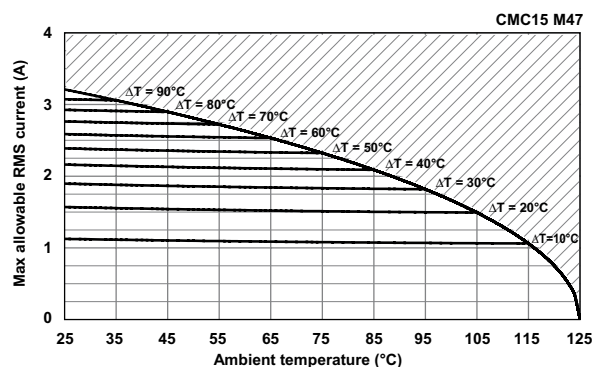
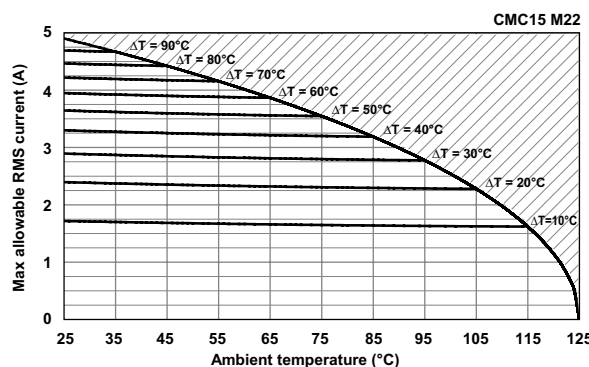
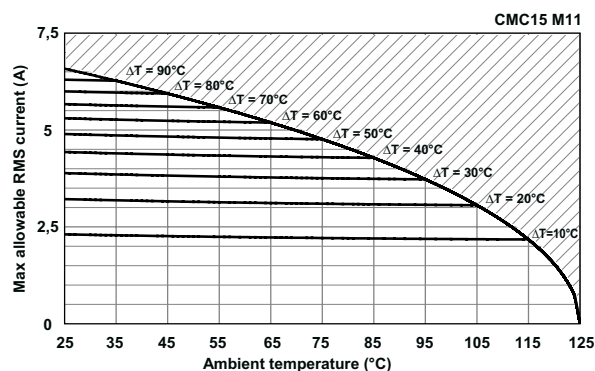
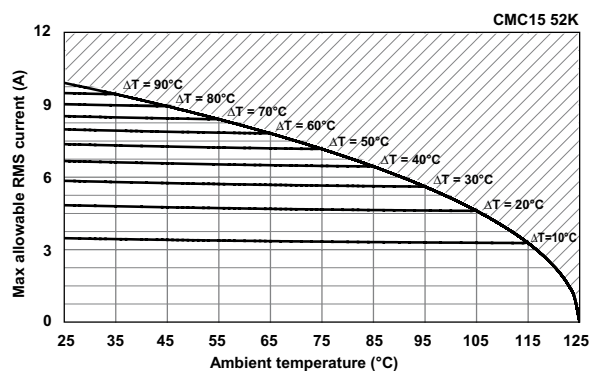
Attenuation Measurement Circuit



Common Mode Chokes for DC/DC Embedded Applications

CMC 15 xxx 2WR Series

Derating Curves



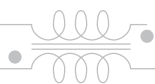
All thermal measurements under atmospheric conditions with component mounted on 1 dm² PCB without cooling device. All above graphs indicate maximum RMS current allowed through component v. ambient temperature for a defined ΔT . Maximum operating temperature is +125°C.

Example:

CMC15 52K for application with $T_{amb} = +85^\circ\text{C}$ Max current allowed is <6.5 Arms with $\Delta T < 40^\circ\text{C}$.

If temp increase allowed in application is limited to $\Delta T < 20^\circ\text{C}$, current must be reduced to 4.5 Arms.

High Grade Technologies...
Power Magnetics...
Common Mode Chokes...



Common Mode Chokes for DC/DC Embedded Applications

CMC 18 xxx 2WR Series

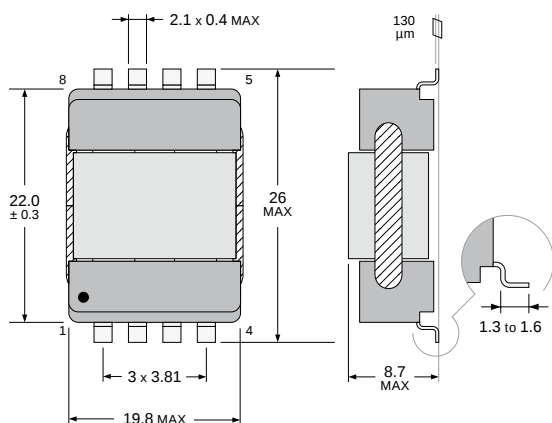


- Based on Microspire's «SESI18 Planar Technology»
- Low-profile SMD package (2x4 pins)
- Applied standards: MIL-STD-202, ECSS-Q-70-02, DO-160
- RMS current range: from 0.9A to 9.9A for 40°C heating above 25°C
- Excellent impedance attenuation >100 Ω from 300 kHz to 45 MHz
- Dielectric strength test up to 500 V (50 Hz - 1 min)
- Materials meet UL94-V0 rating
- Thermal index according to IEC85: H (180°C)
- Operating/storage temperature range: -55°C to +125°C
- Approx weight: 10 grams

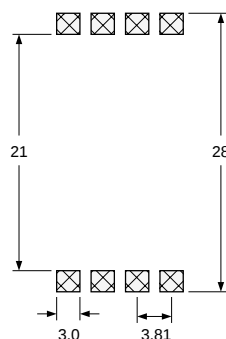
Electrical Data

ID Code	Inductance Value at 25°C (±40%)	Typical SRF	Max Impedance (Typical)	Max Attenuation (Z = 50Ω)	MAX RMS Current for ΔT = 40°C	MAX DC Resistance (25°C)	Dielectric Strength (50Hz - 1min)
CMC18 60K 2WR	0.06 mH	4.5 MHz	1.4 kΩ	23 dB	9.9 A	7 mΩ	500 Vrms
CMC18 M13 2WR	0.13 mH	3.7 MHz	3 kΩ	30 dB	6.9 A	15 mΩ	500 Vrms
CMC18 M27 2WR	0.27 mH	2.5 MHz	6.3 kΩ	36 dB	4.5 A	35 mΩ	500 Vrms
CMC18 M54 2WR	0.54 mH	2 MHz	13.2 kΩ	42 dB	3 A	75 mΩ	500 Vrms
CMC18 1M1 2WR	1.1 mH	1.4 MHz	33.7 kΩ	51 dB	2 A	175 mΩ	500 Vrms
CMC18 2M4 2WR	2.4 mH	0.8 MHz	96.8 kΩ	60 dB	1.3 A	415 mΩ	500 Vrms
CMC18 4M9 2WR	4.9 mH	0.55 MHz	325 kΩ	70 dB	0.9 A	920 mΩ	500 Vrms

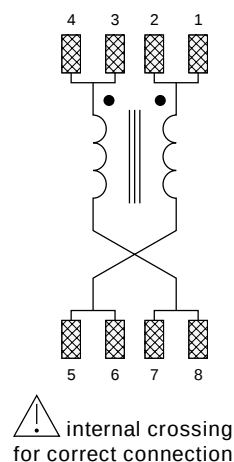
Typical Dimensions (mm, top view)



PCB Layout (suggested)

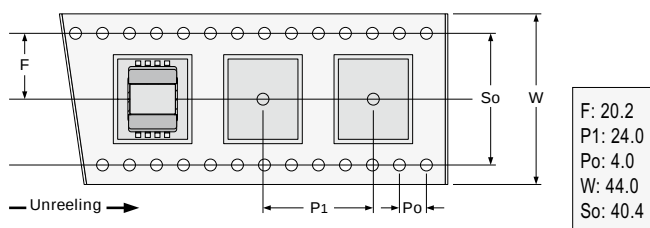


Connections (top view)

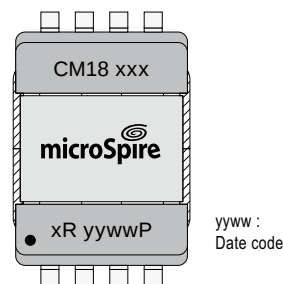


Packaging

Tape and Reel:
300 pieces per reel of diameter 330 mm



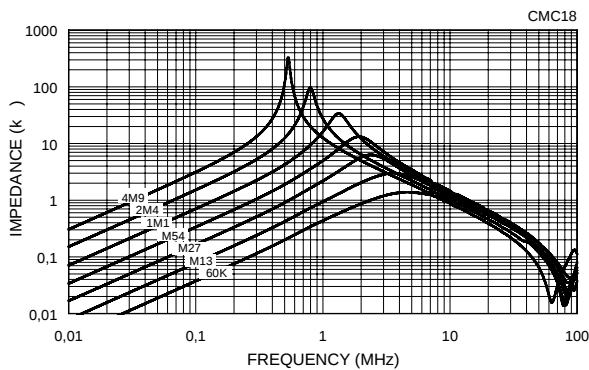
Marking



Common Mode Chokes for DC/DC Embedded Applications

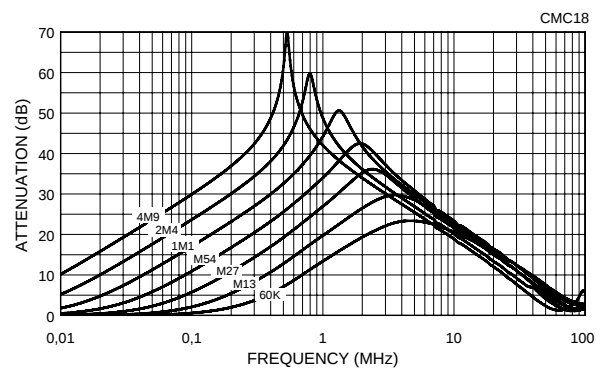
CMC 18 xxx 2WR Series

Impedance



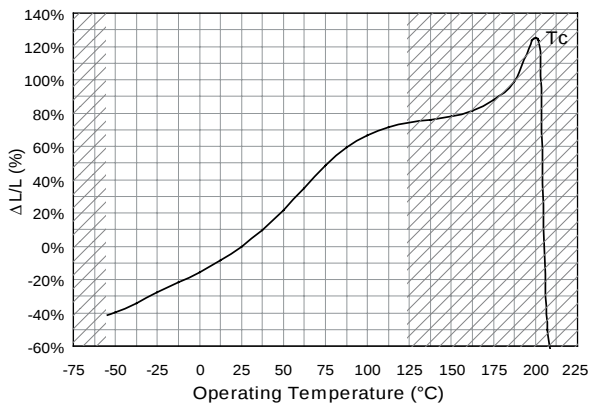
Typical values at 25°C with 1 mT at 10 kHz

Attenuation



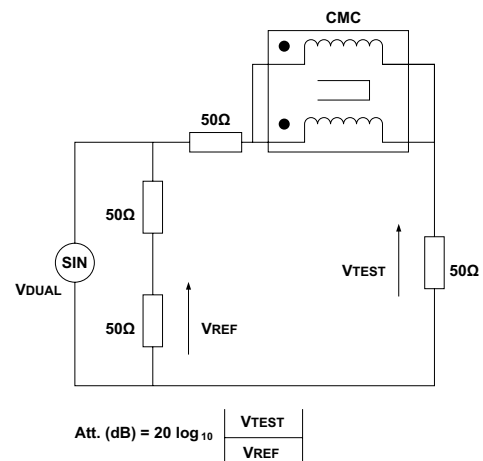
Typical values ($Z=50\Omega$) at 25°C with 1 mT at 10 kHz

Variation vs Temperature



Change in inductance value (<1 mT at 10 kHz)

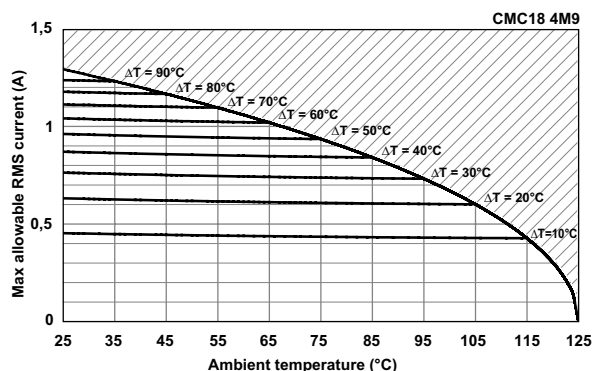
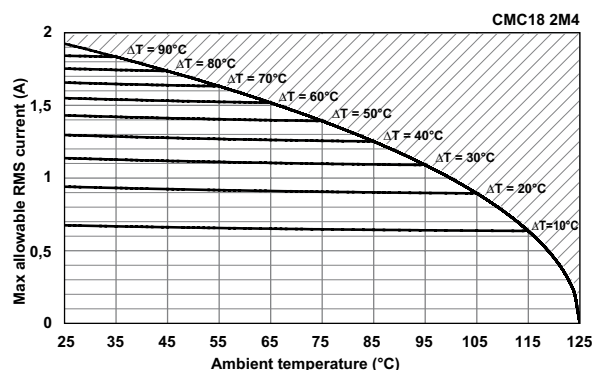
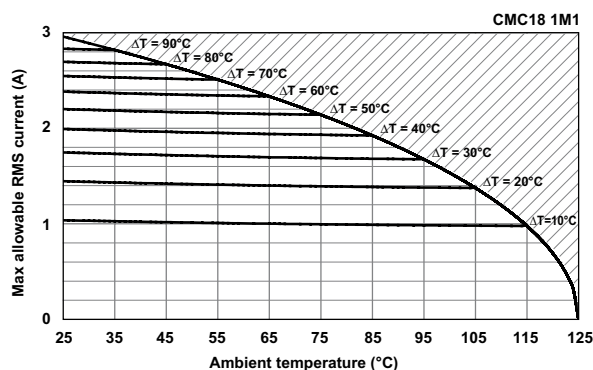
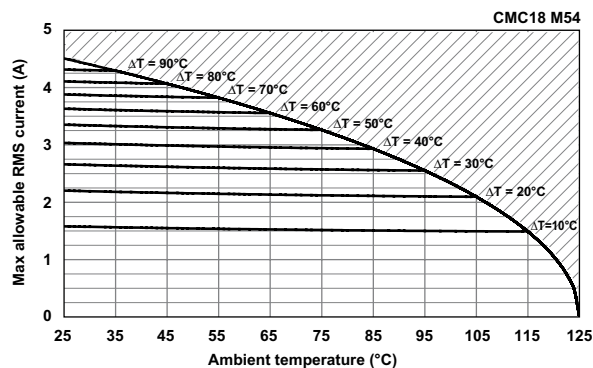
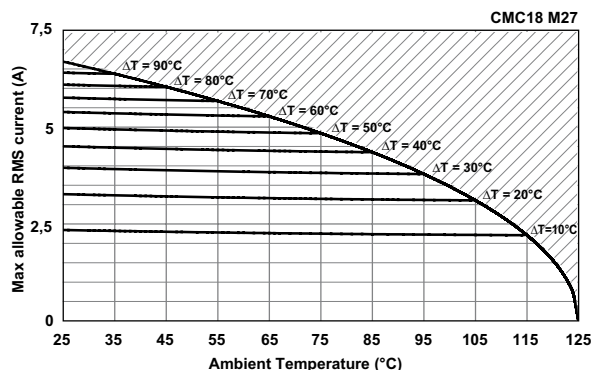
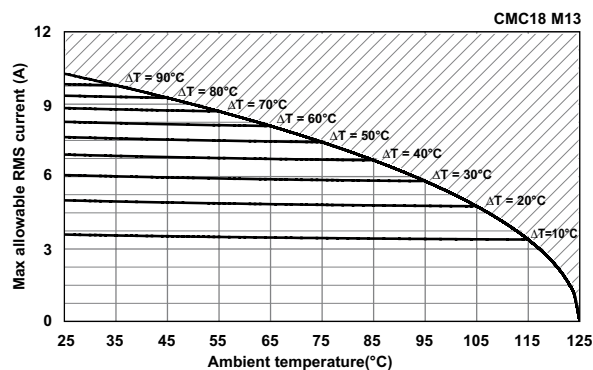
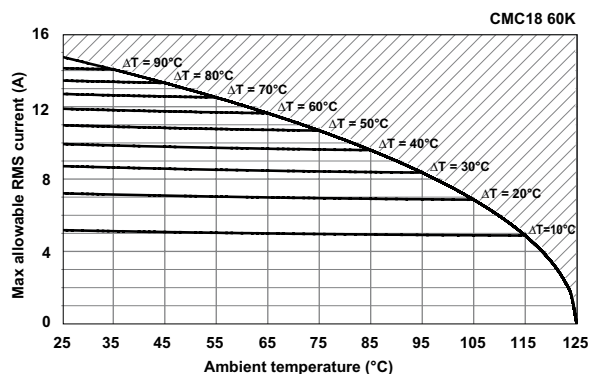
Attenuation Measurement Circuit



Common Mode Chokes for DC/DC Embedded Applications

CMC 18 xxx 2WR Series

Derating Curves

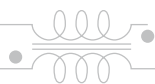


All thermal measurements under atmospheric conditions with component mounted on 1 dm² PCB without cooling device. All above graphs indicate maximum RMS current allowed through component v. ambient temperature for a defined ΔT . Maximum operating temperature is +125 °C.

Example:

CMC18 60K for application with $T_{amb} = +85^\circ\text{C}$ Max current allowed is <9.6 Arms with $\Delta T < 40^\circ\text{C}$.

If temp increase allowed in application is limited to $\Delta T < 20^\circ\text{C}$, current must be reduced to 7 Arms.



Common Mode Chokes for DC/DC Embedded Applications

CMC 22 xxx 2WR Series

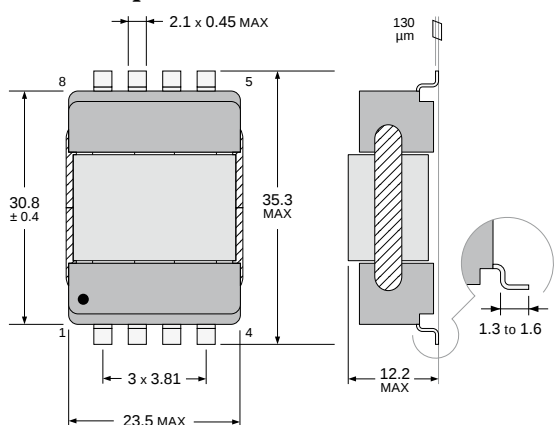


- Based on Microspire's «SESI22 Planar Technology»
- Low-profile SMD package (2x4 pins)
- Applied standards: MIL-STD-202, ECSS-Q-70-02, DO-160
- RMS current range: from 1.9A to 14.3A for 40 °C heating above 25 °C
- Excellent impedance attenuation >100 Ω from 300 kHz to 35 MHz
- Dielectric strength test up to 500 V (50 Hz - 1 min)
- Materials meet UL94-V0 rating
- Thermal index according to IEC85: H (180 °C)
- Operating/storage temperature range: -55 °C to +125 °C
- Approx weight: 26grams

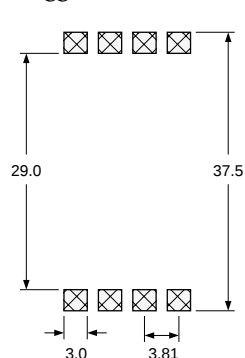
Electrical Data

ID Code	Inductance Value at 25°C (±40%)	Typical SRF	Max Impedance (Typical)	Max Attenuation (Z = 50Ω)	MAX RMS Current for ΔT = 40°C Heating	MAX DC Resistance (25°C)	Dielectric Strength (50Hz - 1min)
CMC22 58K 2WR	0.06 mH	3 MHz	1.1 kΩ	22 dB	14.3 A	5 mΩ	500 Vrms
CMC22 M14 2WR	0.14 mH	2 MHz	2.9 kΩ	30 dB	9.1 A	10 mΩ	500 Vrms
CMC22 M34 2WR	0.34 mH	1.5 MHz	9.1 kΩ	39 dB	5.8 A	20 mΩ	500 Vrms
CMC22 M74 2WR	0.74 mH	1.1 MHz	21.8 kΩ	47 dB	4.3 A	40 mΩ	500 Vrms
CMC22 1M6 2WR	1.6 mH	0.7 MHz	64.6 kΩ	56 dB	2.8 A	95 mΩ	500 Vrms
CMC22 3M3 2WR	3.3 mH	0.65 MHz	250 kΩ	68 dB	1.9 A	205 mΩ	500 Vrms

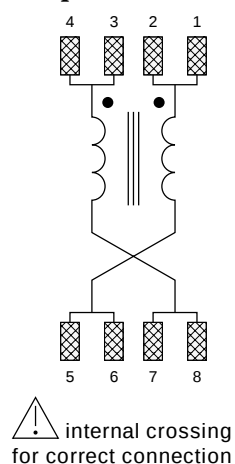
Typical Dimensions (mm, top view)



PCB Layout (suggested)

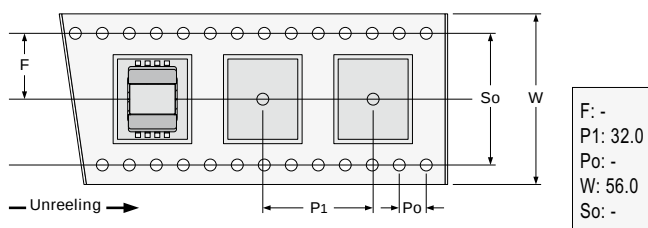


Connections (top view)

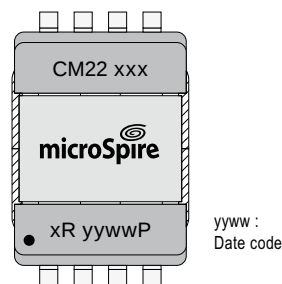


Packaging

Tape and Reel:
100 units per reel of diameter 330 mm



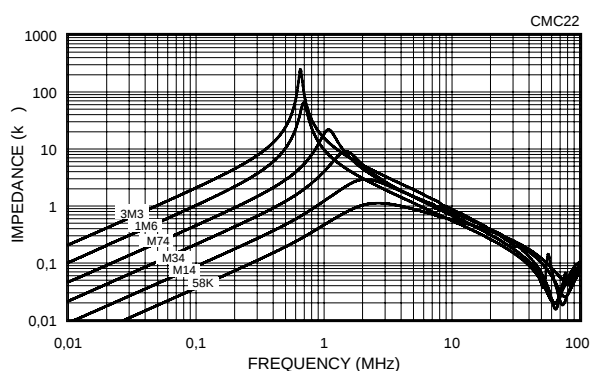
Marking



Common Mode Chokes for DC/DC Embedded Applications

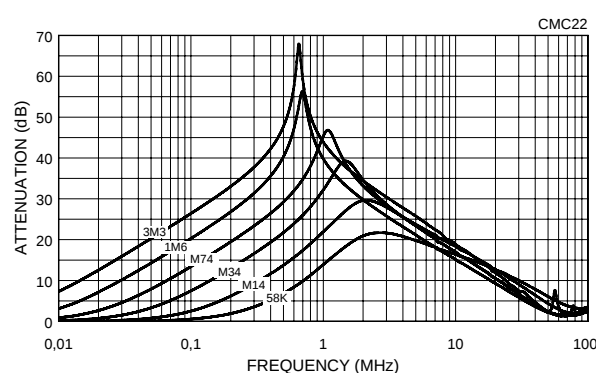
CMC 22 xxx 2WR Series

Impedance



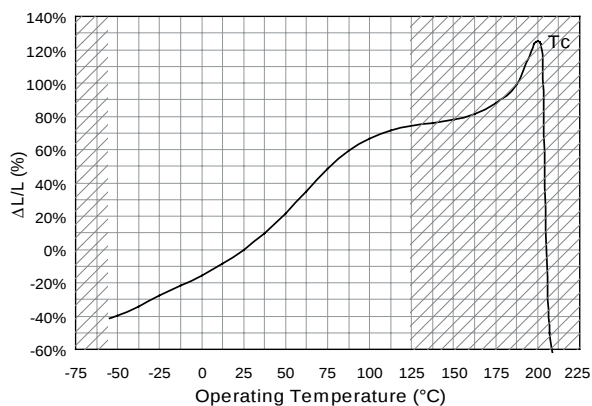
Typical values at 25°C with 1 mT at 10 kHz

Attenuation



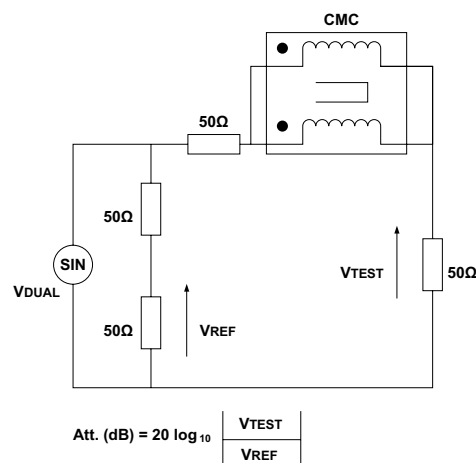
Typical values ($Z=50\Omega$) at 25°C with 1 mT at 10 kHz

Variation vs Temperature



Change in inductance value (<1 mT at 10 kHz)

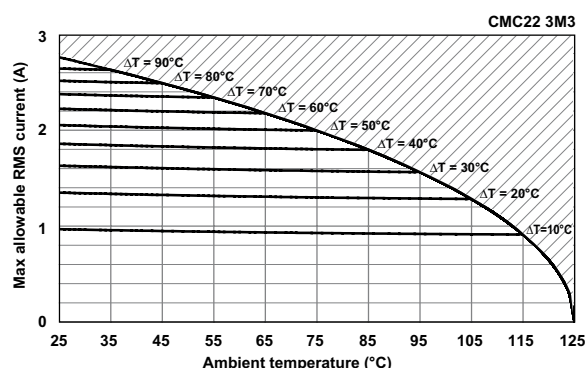
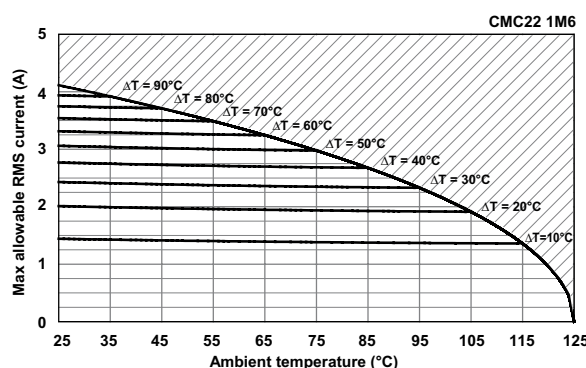
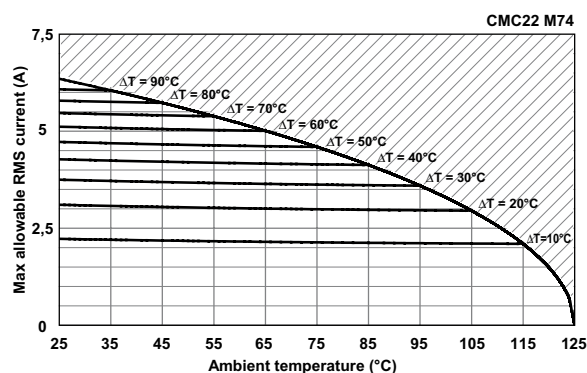
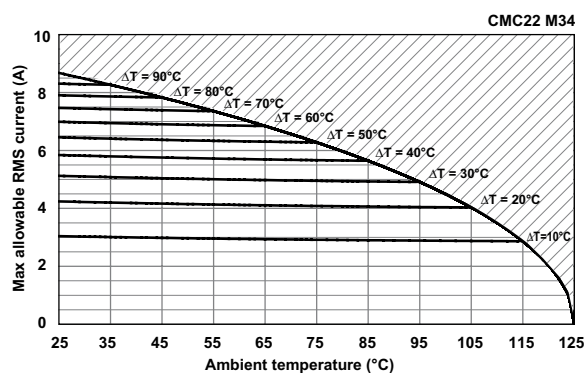
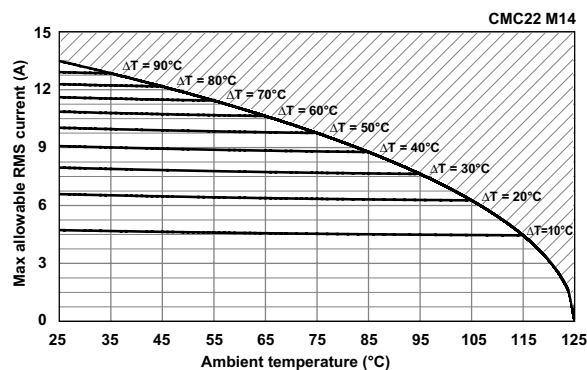
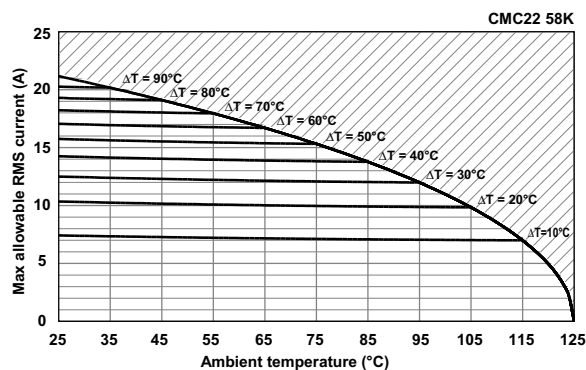
Attenuation Measurement Circuit



Common Mode Chokes for DC/DC Embedded Applications

CMC 22 xxx 2WR Series

Derating Curves

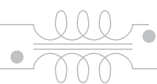


All thermal measurements under atmospheric conditions with component mounted on 1 dm² PCB without cooling device. All above graphs indicate maximum RMS current allowed through component v. ambient temperature for a defined ΔT . Maximum operating temperature is +125°C.

Example :

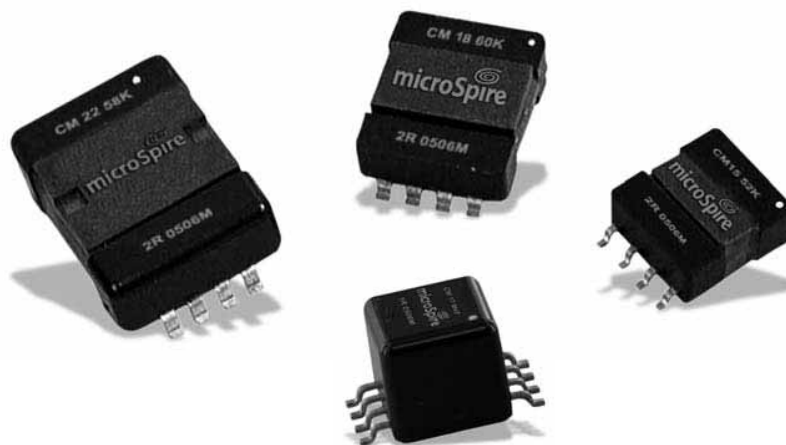
CMC22 58K for application with $T_{amb} = +85^\circ\text{C}$. Max current allowed is <14 Arms with $\Delta T < 40^\circ\text{C}$.

If temp increase allowed in application is limited to $\Delta T < 20^\circ\text{C}$, current must be reduced to 10 Arms.



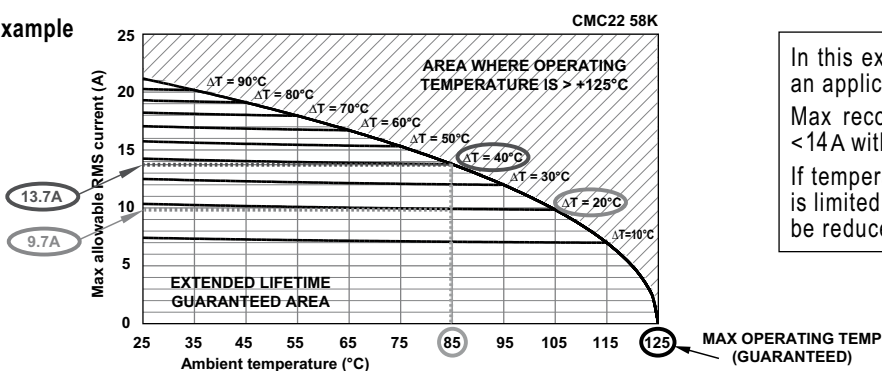
Technical note - Appendix

CMC 15 - 18 - 22 & CMC 17 Temperature Application



- The operating temperature announced in the datasheets takes into account maximum ambient temperature around the component + its self heating temperature in operation.
- Typical T° range is -55°C $+125^\circ\text{C}$ for usual embedded applications (avionics, defence, space...) in order to ensure a good ageing of the products.
- Microspire guarantees an extended lifetime in this operational T° range, because only high temperature class materials are used and offer sufficient safety margin: all plastic materials used are H class according to IEC85 standard (180°C during 20.000 hours) and magnetic cores show a high Curie temperature value ($T_c > 200^\circ\text{C}$).
- Typical values for admissible current at $+25^\circ\text{C}$ ambient for a 40°C nominal temperature increase are defined without any heatsink in our litterature.
- When using an appropriate cooling device, these values can be slightly increased
- The associated derating curves allow to check maximum current possible in the component versus acceptable temperature increase above ambient temperature of the application.

Example

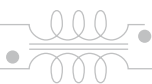


In this example, CMC22 58K is chosen for an application at $T_{\text{amb}} = +85^\circ\text{C}$.

Max recommended RMS current is then $< 14\text{A}$ with $\Delta T < 40^\circ\text{C}$.

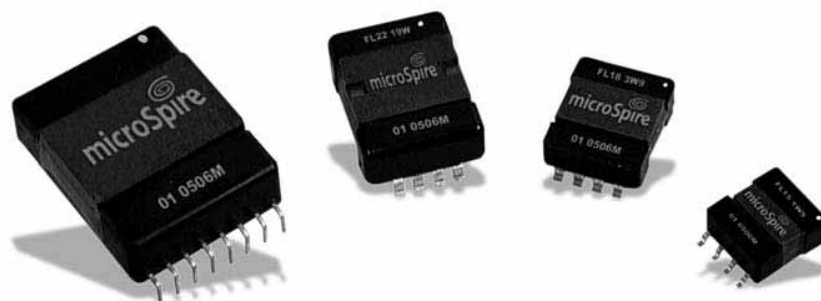
If temperature increase in the application is limited to $\Delta T < 20^\circ\text{C}$, current value must be reduced to $< 10\text{A}$.

- With the above data, it is clear that the « theoretical » maximum possible current reaches zero for $+125^\circ\text{C}$ ambient temperature (because heating above is not recommended) !
- However, it still remains possible to load the component with current leading to operating temperature greater than $+125^\circ\text{C}$ but in this case, extended lifetime for the product is not guaranteed any longer.
- Heating values versus current above $+125^\circ\text{C}$ operating temperature can still be calculated upon request.



Flyback Transformers for DC/DC Embedded Applications

FLYT Series



Package	Indicative Max Output Power at 100KHz (W)	Max Dimensions (LxWxH in mm)	Number of Pins	Weight (grams)	Permitted Losses* for 25°C heating above 100°C (W)
FLYT15	5	22 x 16 x 8	2 x 4 SMD	5	0.6
FLYT15.1***	5	22 x 16 x 8	2 x 6 SMD	5	0.6
FLYT18	15	26 x 20 x 8,9	2 x 4 SMD	10	0.8
FLYT18.1***	15	36 x 20 x 8,9	2 x 9 SMD	12	0.8
FLYT22	30	37 x 24 x 11,9	2 x 4 SMD	26	1.1
FLYT22.1***	30	39 x 24 x 11,9	2 x 8 SMD	26	1.1
FLYT32***	65	49 x 34 x 13,7	2 x 8 PTH**	56	1.7

* Values without heatsink ; these values can be increased with appropriate cooling device

** Through-hole terminations only

*** See Micromag N° 1 for more information

- MicroSpire's «SESI Technology» planar solution for DC/DC flyback converters
- Seven standard packages in a qualified technology for extreme working conditions
- Compliant with MIL-STD-202, ECSS-Q-70-02 (aerospace) and DO-160 (avionics) standards
- Already evaluated by the CNES for space applications (ESCC Capability Approval in process)
- Low profile and light, highly efficient and reliable
- Extended operating temperature range from -55°C to +125°C
- SMD versions suited for IR and vapor reflow soldering
- Packaging in Tape&Reel upon request for SMD versions

Shielded versions with thin six-face tinned copper box upon request (3 times less EMI radiation)



Flyback Transformers for DC/DC converters - FLYT 15 Series



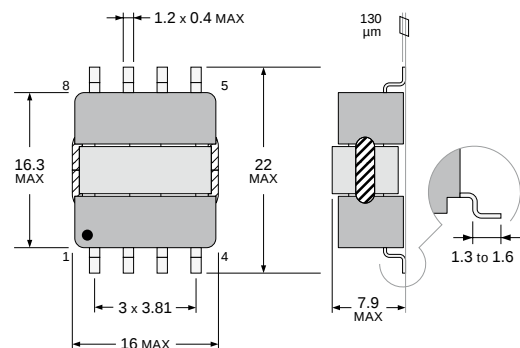
- Based on Microspire's « SESI15 Planar Technology »
- Low-profile SMD package (2x4 pins)
- Applied standards: MIL-STD-202, ECSS-Q-70-02, DO-160D
- Up to 5W at 100kHz in standard heating conditions
- Dielectric strength up to 1500V (50Hz-1min)
- Materials meet UL94-V0 rating
- Thermal index according to IEC85: H (180°C)
- Operating/storage temperature range: -55°C to +125°C
- Approx weight: 5grams

Electrical Data

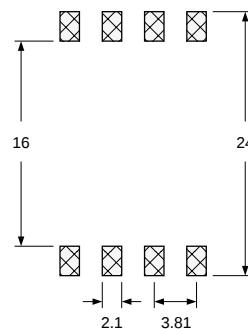
ID Code	DC Input Voltage Range (Vdc)	Output Power (W)	Designed Outputs	Working Frequency	Primary Inductance	Insulation > 100MΩ
FLYT15 1W5 01	12 - 20.5V (2° - 1)	1.5	5V / 280mA (7° - 8) -5V / 20mA (5° - 6)	80 - 120kHz	90μH	500Vdc
FLYT15 2W2 01	26 - 29V (2° - 1)	1.1 - 2.2	5.2V / 400mA (7/8° - 5/6) BIAS (3° - 4) optional	130kHz	256μH	500Vdc
FLYT15 2W4 01	26 - 29V (2° - 1)	2.1 - 2.4	9V / 250mA (7/8° - 5/6) BIAS (3° - 4) optional	130kHz	231μH	500Vdc
FLYT15 2W4 02	18 - 40V (1° - 2)	2.4	48V / 50mA (8° - 7)	500kHz	23μH	1500Vdc
FLYT15 3W3 01	18 - 40V (1° - 2)	3.3	3.3V / 0.5A (8° - 7) 3.3V / 0.5A (6° - 5)	500kHz	17.9μH	1500Vdc
FLYT15 4W5 01	18 - 40V (1° - 2)	4.5	15V / 0.3A (8° - 7)	500kHz	13μH	1500Vdc
FLYT15 10W 01	18 - 40V (1° - 2)	10.5	5.2V / 1A (8° - 7) 5.2V / 1A (6° - 5) BIAS (3° - 4) optional	500kHz	6.2μH	1500Vdc

Each Flyback Transformer shall be the result of a common definition after technical agreement between both engineering teams

Typical Dimensions (mm, top view)

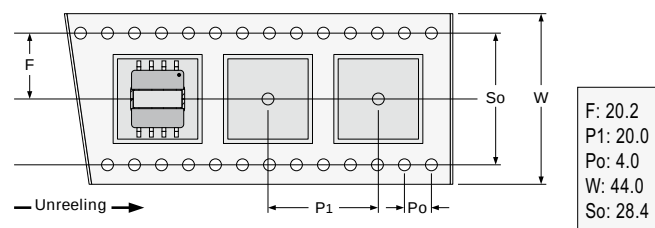


PCB Layout (suggested)

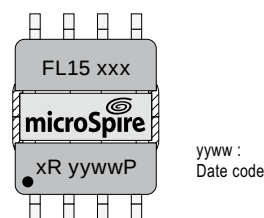


Packaging

Tape and Reel:
400 units per reel of diameter 330 mm



Marking



Flyback Transformers for DC/DC converters - FLYT 18 Series



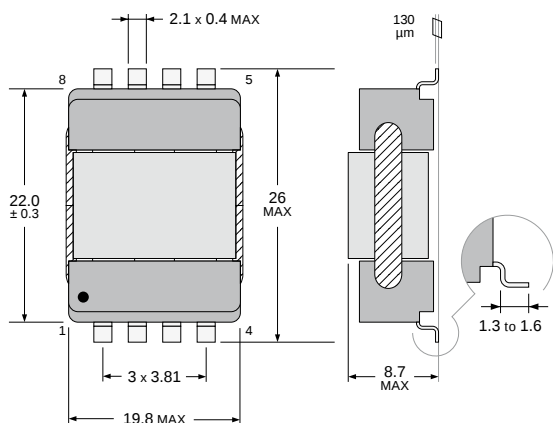
- Based on Microspire's « SESI18 Planar Technology »
- Low-profile SMD package (2x4 pins)
- Applied standards: MIL-STD-202, ECSS-Q-70-02, DO-160D
- Up to 15W at 100kHz in standard heating conditions
- Dielectric strength up to 1500V (50Hz-1min)
- Materials meet UL94-V0 rating
- Thermal index according to IEC85: H (180°C)
- Operating/storage temperature range: -55°C to +125°C
- Approx weight: 10grams

Electrical Data

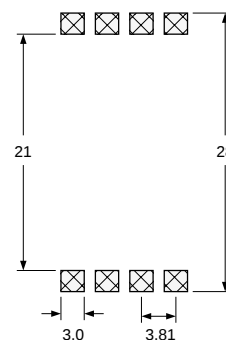
ID Code	DC Input Voltage Range (Vdc)	Output Power (W)	Designed Outputs	Working Frequency	Primary Inductance	Insulation > 100MΩ
FLYT18 3W9 01	23 - 37V (2° - 1)	3.85	3,55V / 1A (7/8° - 5/6) BIAS (3° - 4)	100kHz	152.5μH	500Vdc
FLYT18 4W6 01	23 - 37V (2° - 1)	4.56	-15,25V / 300mA (8° - 7) 15,25V / 50mA (6° - 5) BIAS (3° - 4)	100kHz	126μH	500Vdc
FLYT18 5W3 01	23 - 37V (2° - 1)	5.25	5,25V / 1A (7/8° - 5/6) BIAS (3° - 4)	100kHz	113.7μH	500Vdc
FLYT18 9W5 01	23 - 37V (2° - 1)	9.45	5,25V / 1,8A (7/8° - 5/6) BIAS (3° - 4)	100kHz	61.7μH	1500Vdc

Each Flyback Transformer shall be the result of a common definition after technical agreement between both engineering teams

Typical Dimensions (mm, top view)

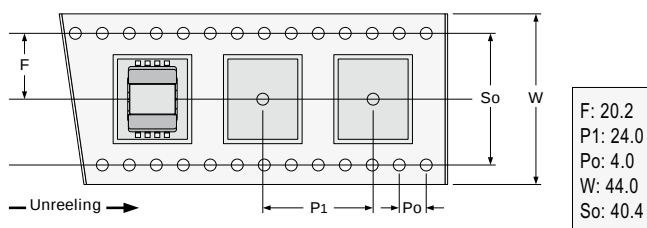


PCB Layout (suggested)

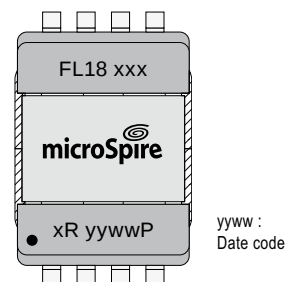


Packaging

Tape and Reel:
300 pieces per reel of diameter 330 mm



Marking



Flyback Transformers for DC/DC converters - FLYT 22 Series



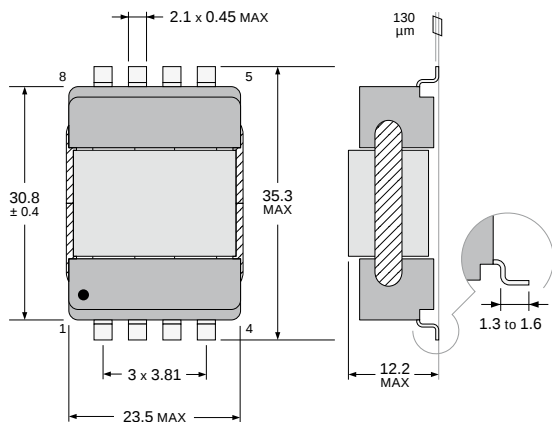
- Based on Microspire's « SESI22 Planar Technology »
- Low-profile SMD package (2x4 pins)
- Applied standards: MIL-STD-202, ECSS-Q-70-02, DO-160D
- Up to 30W at 100kHz in standard heating conditions
- Dielectric strength up to 1500V (50Hz-1min)
- Materials meet UL94-V0 rating
- Thermal index according to IEC85: H (180°C)
- Operating/storage temperature range: -55°C to +125°C
- Approx weight: 26grams

Electrical Data

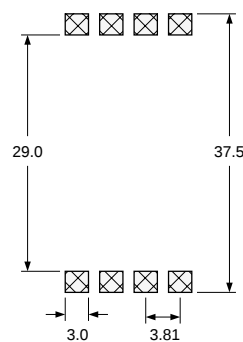
ID Code	DC Input Voltage Range (Vdc)	Output Power (W)	Designed Outputs	Working Frequency	Primary Inductance	Insulation > 100MΩ
FLYT22 19W 01	12 - 20.5V (2° - 1)	18.5	5V / 450mA (8° - 7) 22V / 600mA (6° - 5)	90 - 130kHz	13μH	500Vdc
FLYT22 20W 01	12 - 20.5V (3° - 4)	19.5	5V / 340mA (6° - 5) 12V / 1.2mA (8° - 7)	90 - 130kHz	13μH	500Vdc

Each Flyback Transformer shall be the result of a common definition after technical agreement between both engineering teams

Typical Dimensions (mm, top view)

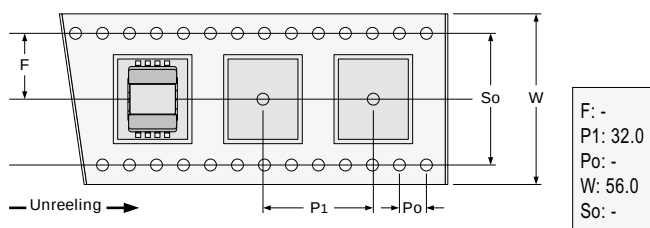


PCB Layout (suggested)



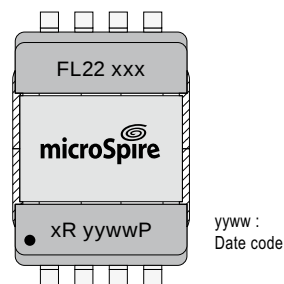
Packaging

Tape and Reel:
100 units per reel of diameter 330 mm



F: -
P1: 32.0
P0: -
W: 56.0
So: -

Marking



yyww :
Date code

Current sense Transformer - CT01 100 261x



- Materials meet UL94V-0 rating
- Global accuracy $\pm 10\%$
- Applied standards:
ESCC-3201 generic (including MIL-STD-202)/ECSS-Q-ST-70-02C
and ESCC 3201 generic specification for space products
- Frequency range 10 kHz to 250 kHz
- Operating temperature range: -55°C to $+125^{\circ}\text{C}$
- Suited for IR and vapor reflow soldering
- Weight: <2grams

Electrical Data (25°C)

ID Code	DCR _{1-3/2-4} m Ω $\pm 15\%$	DCR _{5-7/6-8} Ω $\pm 15\%$	L _{1-3/2-4} μH $\pm 40\%$	Insulation 500VDC
CT01 100 261 x	2.5	1	3.9	>1G Ω

Turn ratio	Schematic	I_p	I_s ($V_s=1\text{V}$)	Z load
1/100		3,5 A	35 mA	33 Ω
1/50		3,5 A	70 mA	15 Ω

Notes

Typical performances at $+25^{\circ}\text{C}$

Storage Temperature -55°C to $+170^{\circ}\text{C}$ - 10 mn Max

Application

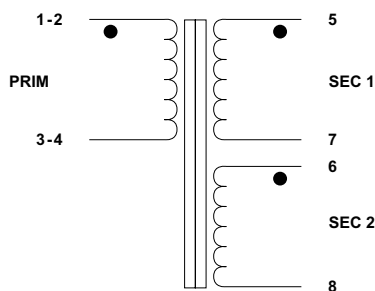
Current detection/measurement for PWM control (I_{sense}) in High-Rel. SMPS

To Order

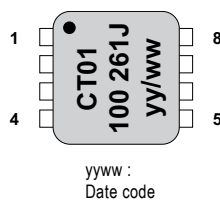
CT01 100	261	x
Range	Range	x = J J leaded x = W W Terminals

CT01 100 261 x

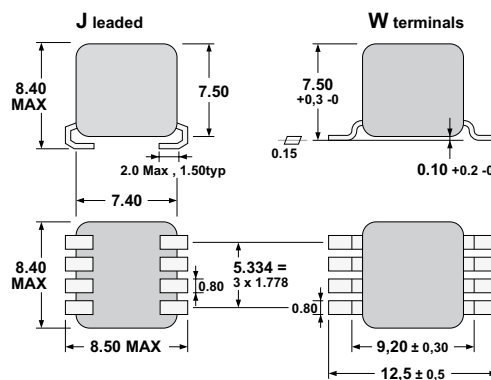
Connections



Marking



Dimensions (mm)

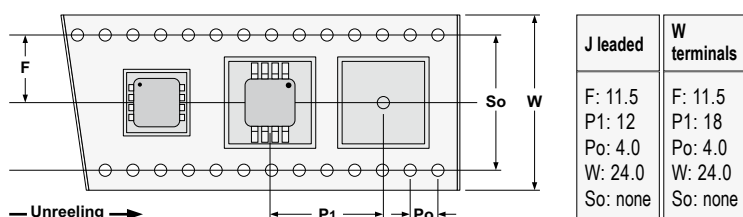


Packaging

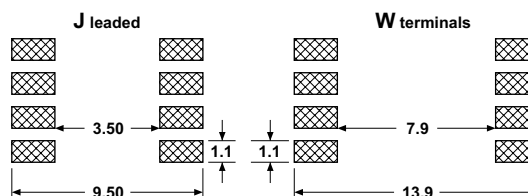
Tape and Reel:

J leaded - 600 units per reel of diameter 330 mm

W terminals - 400 units per reel of diameter 330 mm

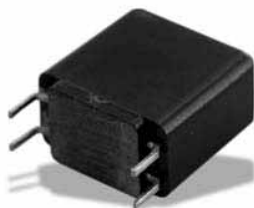


PCB Layout (mm)



Current Transformer for DC/DC Applications

CT08 200 221 PR

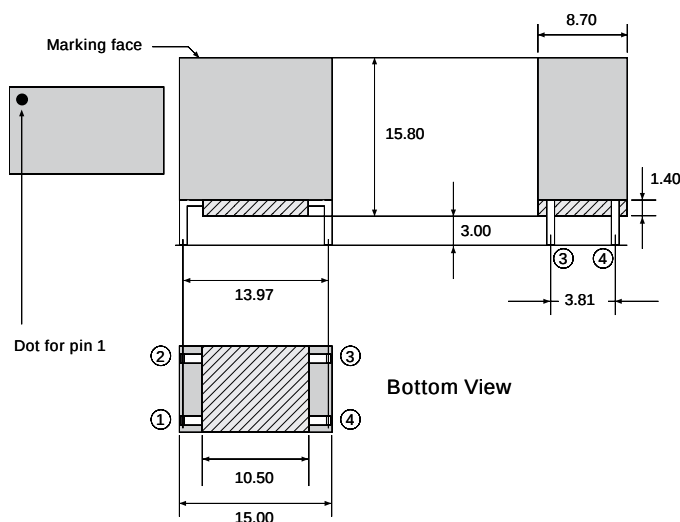


- Designed for DC/DC Converter Applications
- Measurement up to $5.4 A_{RMS}$ ($8 A_{PEAK}$ - $3.6 A_{DC}$ MAX) from 100 to 200 kHz with 2% Accuracy
- Applied standards:
MIL-STD-202, ECSS-Q-70-02
ESCC-3201, DO-160

Electrical Data (25°C)

ID Code	Accuracy (-40°C / +110°C)	Transformer ratio	Secondary Inductance	Secondary DC Resistance	Insulation
CT08 200 221R	< 2% with $R_L = 113 \Omega$ theoretical < 2% with $R_L = 113 \Omega$ at 1% (E96)	$V_{OUT} / I_{IN} = 0.56$ ($N_p / N_s = 1 : 200$)	$L_{3-4} = 11.0 \text{ mH}$ ($\pm 25\%$) (100 kHz - $1 V_{RMS}$)	$R_{3-4} = 5.8 \Omega$ ($\pm 10\%$)	500 V_{DC} - 1 min (RI $\geq 100 \text{ M}\Omega$) between windings

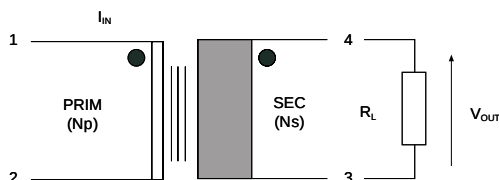
Typical Dimensions (mm)



Notes

- The component is dedicated to measure RMS current up to $I_{IN} = 5.4 A_{RMS}$ ($8 A_{PEAK}$ and $3.6 A_{DC}$ MAX) for a waveform of working frequency from 100 to 200 kHz. Image of this current is the voltage ($V_{OUT} = 3 V_{RMS}$ MAX) picked on a resistive load $R_L = 113 \Omega$ at 1% (E96 series).
- The component can also make the measurement keeping the same accuracy but with a ratio $V_{OUT} / I_{IN} = 1.00$. In this case, image of the current is the voltage ($V_s = 5.4 V_{RMS}$ MAX) picked on a resistive load $R_L = 200 \Omega$ at 1% (E96 series).
- Flammability compliance : UL94V0
- Insulation class (windings) : H (180 °C)
- Operating temperature : -40 °C to +110 °C
- Storage temperature : -55 °C to +125 °C

Connections

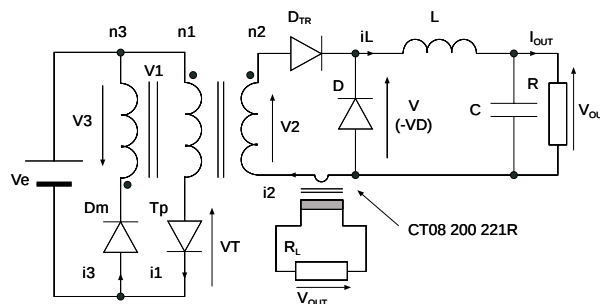


Marking

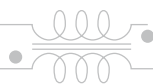


yyww :
Date code

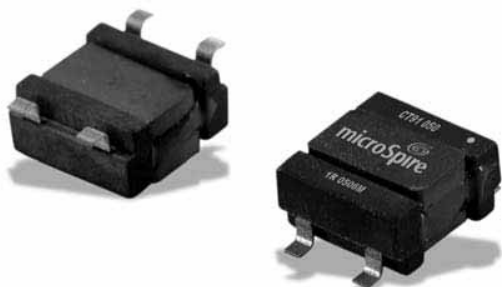
Application Schem.



CT08 200 221R can be used for measurement of secondary current (i_2) of a DC/DC forward converter (3.3V/8 A output and 100kHz working frequency example) for regulation and surveillance operations.



Current sense Transformer, up to 10Apk - CT91 xxx 231 WR



- Vout/Ipk ratio : 1V/8A
- Global accuracy $\pm 5\%$ on E96 series load resistor
- Low profile and light
- Materials meet UL94V-0 rating
- Applied standards:
ESCC-3201 generic (including MIL-STD-202)/ECSS-Q-70-02
- Frequency range 6kHz to 500kHz triangle wave
- Operating temperature range : -55°C to +125°C
- Suited for IR and vapor reflow soldering
- Weight : 2grams

Electrical Data (25°C)

ID Code	Turn ratio	DCR ₁₋₂ mΩ	DCR ₃₋₄ Ω $\pm 15\%$	L ₃₋₄ mH $\pm 15\%$	Frequency range triangle wave	I _{pk} = I _{DC} + ΔI /2 max	Z Load 1% ΔW	Insulation 500VDC
CT91 050 231 WR	1/50	<2	0.95	0.4	22kHz to 500kHz	10	6.81Ω	>1GΩ
CT91 075 231 WR	1/75	<2	2.15	0.9	15kHz to 300kHz	10	10.2Ω	>1GΩ
CT91 100 231 WR	1/100	<2	3.70	1.6	9kHz to 200kHz	10	13.7Ω	>1GΩ
CT91 200 231 WR	1/200	<2	14.6	6.4	6kHz to 70kHz	10	27.4Ω	>1GΩ

To Order

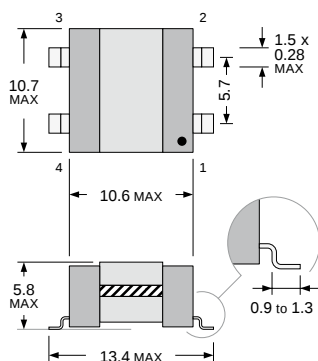
CT91 ### 231 WR

CT91	###	231	WR
Range	Turn ratio	Range	Gull wing highrel

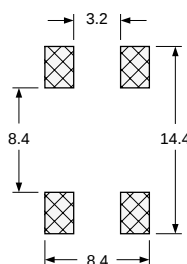
Notes

Typical performances at +25°C
Storage Temperature -55°C to +140°C

Dimensions (mm, top view)

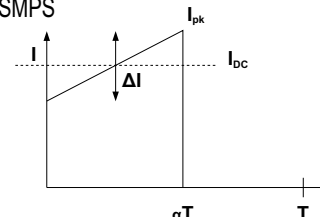


PCB Layout (suggested)

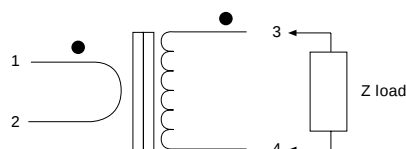


Application

Current detection/measurement for PWM control
(Isense) in High-Rel. SMPS

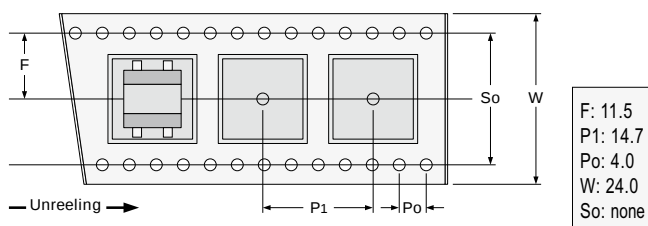


Connections



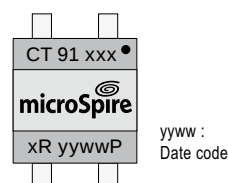
Packaging

Tape and Reel:
700 units per reel of diameter 330mm



F: 11.5
P1: 14.7
P0: 4.0
W: 24.0
So: none

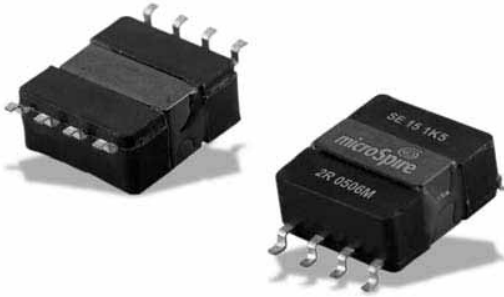
Marking



yyww :
Date code



Current sense Transformer, 1/200/200 up to 17Apk - CT15 200 231 WR



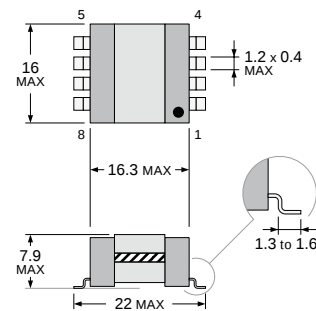
- Global accuracy $\pm 5\%$
- Low profile and light
- Materials meet UL94V-0 rating
- Applied standards:
ESCC-3201 generic (including MIL-STD-202)/ECSS-Q-70-02
- Frequency range 6 kHz to 100 kHz triangle wave
- Operating temperature range: -55°C to $+125^{\circ}\text{C}$
- Suited for IR and vapor reflow soldering
- Weight: 6 grams

Electrical Data (25°C)

ID Code	DCR ₁₋₂ mΩ	DCR _{5-6/7-8} Ω $\pm 15\%$	L _{5-6/7-8} mH $\pm 10\%$	Insulation 500VDC
CT15 200 231 WR	1.1	21.8	6.4	>1GΩ

Turn ratio	Schematic	I _p	I _s	Z load
1/400		17 A	42.5 mA	27 Ω
1/200		17 A	85 mA	15 Ω

Dimensions (mm, top view)



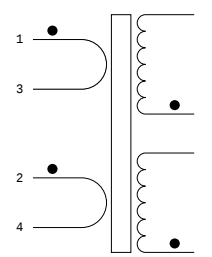
Notes

- Typical performances at $+25^{\circ}\text{C}$
- Storage Temperature: -55°C to $+170^{\circ}\text{C}$ / 7 mn
- Thermal index: 180°C

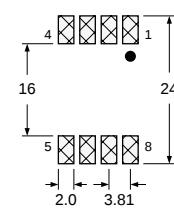
To Order

CT15	200	231	WR
Range	Turn ratio	Range	Gull wing highrel

Connections

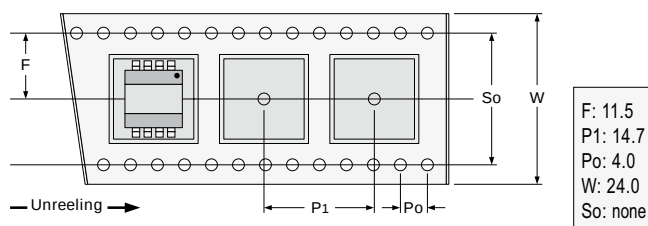


PCB Layout (suggested)



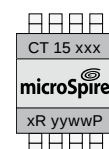
Packaging

Tape and Reel:
700 units per reel of diameter 330 mm



F: 11.5
P1: 14.7
Po: 4.0
W: 24.0
So: none

Marking



yyww :
Date code

Gate Drive Transformer GDT91 Series



- Excellent performances in low profile package
- Suited for Avionics and Space applications
- Frequency : 50 KHz - 200 KHz
- Applied standards : ECSS-Q-70-02 / ESCC-3201 screening flow applied / MIL-STD-202
- Materials meet UL94V-0 rating
- Weight : 2 grams

Electrical Data (25°C)

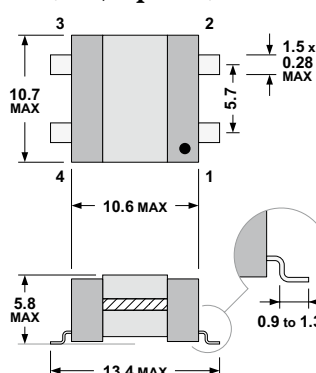
ID Code	ET (V _{μs})	Primary Inductance Max	Turn ratio ± 0,5%	DC Resistances	Isolation Voltage	Leakage Inductance	Interwinding Capacitance	Connection Type
GDT91 M50 20 1WR	20	$L_{1-2} > 500\mu\text{H}$ (10kHz - 1V _{RMS})	$N_{1-2} / N_{4-3} = 1$	$R_{1-2} \leq 1.25\Omega$ $R_{3-4} \leq 1.25\Omega$	500 VDC - 1 min (Ri ≥ 100MΩ)	$L_{f1-2} < 1\mu\text{H}$ (₃₋₄ in short circuit)	$C_{1-2/3-4} < 100\text{ pF}$	A
GDT91 M50 50 1WR	50	$L_{1-4} > 500\mu\text{H}$ (10kHz - 1V _{RMS})	$N_{1-4} / N_{2-3} = 1$	$R_{1-4} \leq 3.1\Omega$ $R_{2-3} \leq 3.1\Omega$	250 VDC - 1 min (Ri ≥ 100MΩ)	$L_{f1-4} < 1\mu\text{H}$ (₂₋₃ in short circuit)	$C_{1-4/2-3} < 150\text{ pF}$	B

ID Code	V peak Max	I peak Max	I average Max
GDT91 M50 20 1WR	7,5V	1A (100ns)	50 mA
GDT91 M50 50 1WR	2,4V	1A (100ns)	15 mA

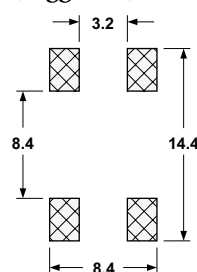
Notes

- Insulation class (windings) : Classe H2
- Operating temperature : -55°C to +125°C
- Storage temperature : -55°C to +140°C

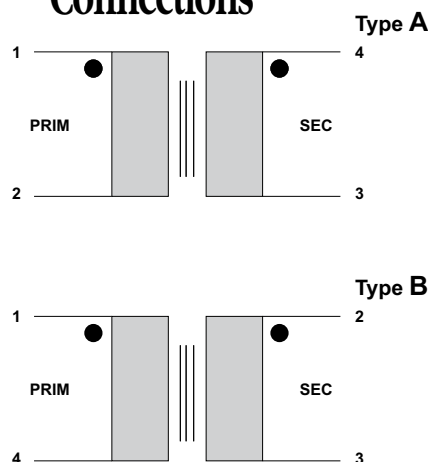
Dimensions (mm, top view)



PCB Layout (suggested)

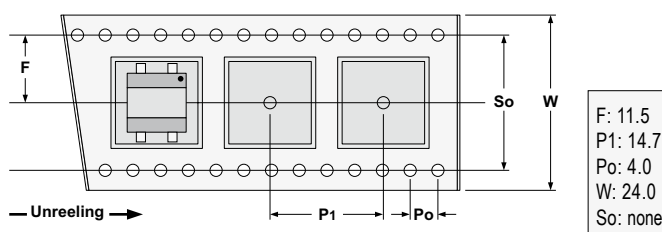


Connections



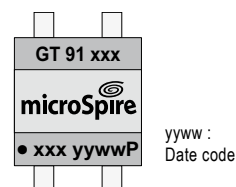
Packaging

Tape and Reel:
700 pieces per reel of diameter 330 mm



F: 11.5
P1: 14.7
P0: 4.0
W: 24.0
So: none

Marking

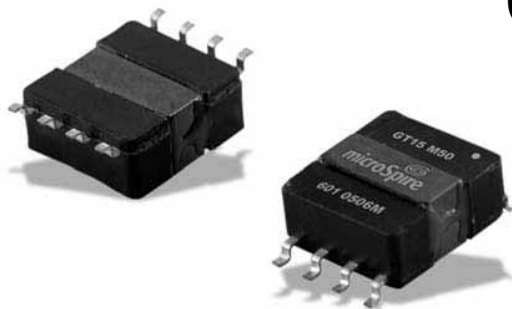


yyww :
Date code

High Grade Technologies...
Power Magnetics...
Gate Drive Transformers...



Gate Drive Transformer GDT15 Series

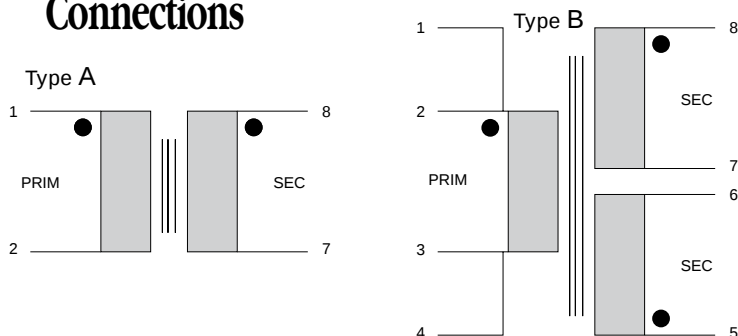


- Excellent performances in low profile package
- Suited for Avionics and Space applications
- Frequency range : 50Khz - 500Khz
- Applied standards: ECSS-Q-70-71 / ESCC-3201
screening flow applied / ABD-0100 / DO-160
- Materials meet UL94-V0 rating
- Approx. weight: 5grams

Electrical Data (25°C)

ID Code	ET (V μ s)	Primary Inductance Max	Turn ratio $\pm 1\%$	DC Resistances $\pm 15\%$ (m Ω)	Leakage Inductance	Interwinding Capacitance	Connection Type
GDT15 M50 60 1WR	60	$L_{1-4} > 500\mu\text{H}$ (10kHz - 1V _{RMS})	$N_{7-6} / N_{1-4} = 1.52$	$R_{1-4} = 170$ $R_{6-7} = 400$	$L_{f1-4} < 2.0\mu\text{H}$ (₆₋₇ in short circuit)	$C_{1-4/6-7} < 150 \text{ pF}$	A
GDT15 M85 80 2WR	80	$L_{1-4} > 850\mu\text{H}$ (10kHz - 1V _{RMS})	1/1/1	$R_{1-3} = 400$ $R_{8-7} = 400$ $R_{6-5} = 400$	$L_{f1-2/3-4} < 25\mu\text{H}$	$C_{1-4/6-7} < 150 \text{ pF}$	B

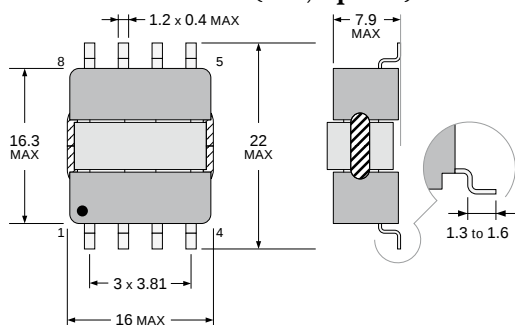
Connections



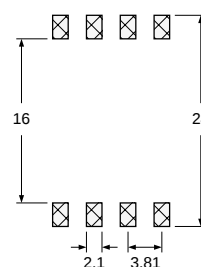
Notes

- Insulation class (windings) : Classe H
- Operating temperature : -55°C to +125°C
- Storage temperature : -55°C to +140°C
- Dielectric Strength : 500V_{RMS} -50 Hz
- Isolation Voltage : 500VDC-50 min ($R_i \geq 100\text{M}\Omega$)

Dimensions (mm, top view)

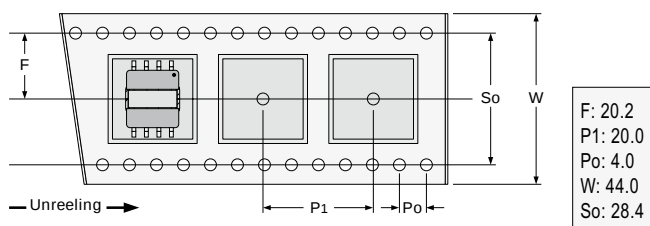


PCB Layout (suggested)

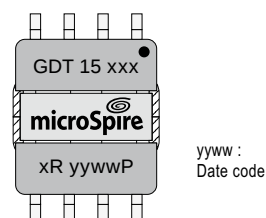


Packaging

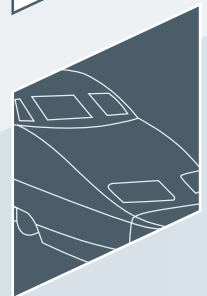
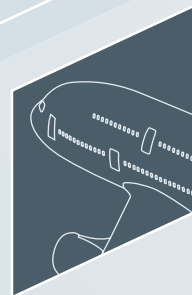
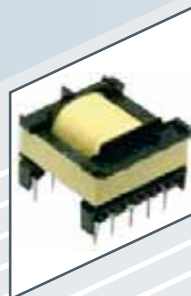
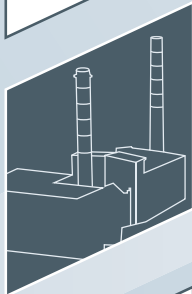
Tape and Reel:
400 units per reel of diameter 330 mm



Marking



Industrial Technologies
From **Design** to **Production**



Custom Power Magnetics

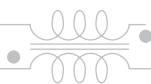
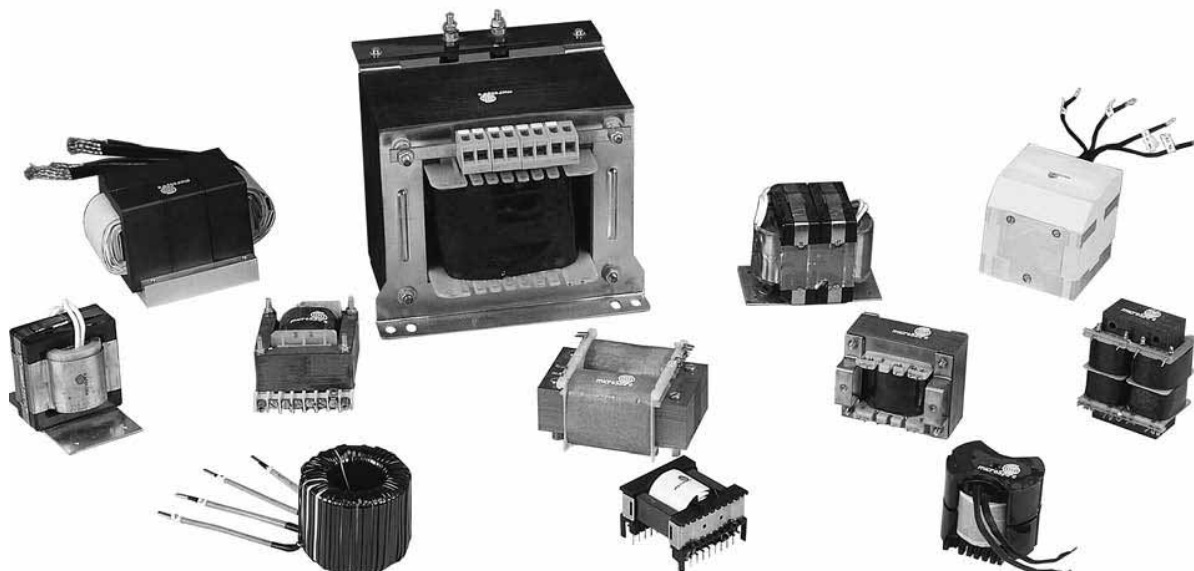
Microspire Engineers design compact yet powerful magnetics for a wide range of applications:

- All designs up to 10kVA
- All designs up to 1kHz
- All designs up to 500A peak



Microspire manufacture custom power magnetics using all materials and technologies available:

- Copper wire, flat, foil
- EI, EE, UI and C-cores



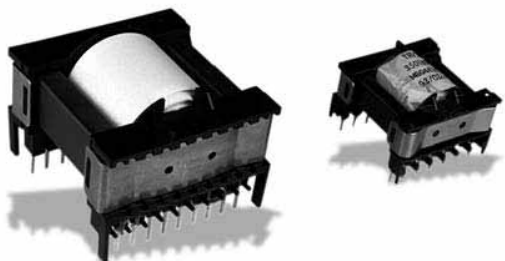
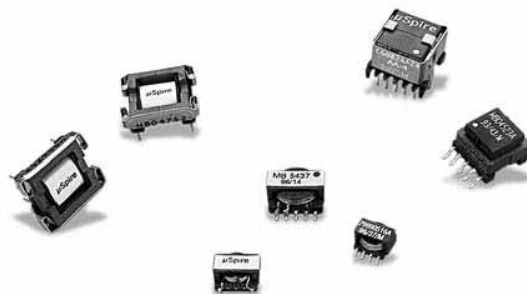
Custom Power Magnetics

EFD, ER and EP series

EFD cores with their optimised cross-sections are used to design compact transformers for DC-DC converters, isolation and pulse applications.

ER cores are low profile, SMT and high inductance components well suited for broadband applications and for power transformers up to 500 kHz.

EP coils are utilised for the design of pulse and line matching transformers and are increasingly being used for power applications up to 300 kHz such as in forward converters.



ETD Coils and Transformers

Ecores have the advantage of easy winding, compactness and wide openings on each side.

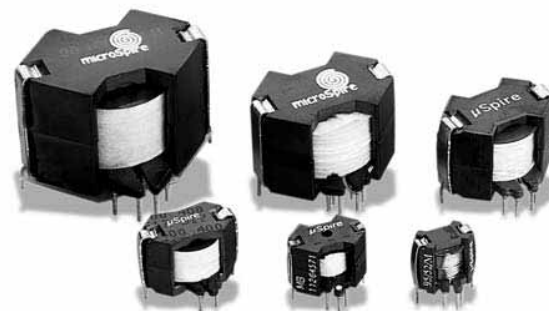
ETD cores have the additional benefit of an almost constant cross-section along the magnetic path.

ETD coils are suitable for designing transformers in forward and push-pull SMP supplies and converters. Power ratings of more than a 1000W can be transformed at frequencies up to 500 kHz.

RM series

RM coils are compact and well suited for PCB mounting. They are used in broadband transmission of signals, as filters in resonant circuits and as power transformers in SMP supplies.

Low profile RM coils are suitable for small-signal, interface and matching transformers as well as for transformer and energy storage inductors in DC-DC converters. The RM 14 core will handle a maximum power of 200 W at 100 kHz switching frequency.



Planar Magnetics

- Power up to 10 KWatts
- Input voltage 12 Vac to 240-400 Vac
- Output voltage 3 Vdc to 60 Vdc
- Frequency range 50 kHz to 1 MHz
- Typical isolation 3 kV
- Electrical circuit Copper foil or PCB
- Multi-layer up to 10 layers
- Core EE or E/PLT14 to EE or E/PLT64 ferrite
- Temperature range: -40 °C to +125 °C



Custom bobbins

Current and Voltage Transformers

- MicroSpire designs 50Hz transformers to measure currents up to 100 A, with an accuracy reaching 1% upon request, together with transformers to sense up to 20 A, $\pm 1\%$, at frequencies up to 1 MHz.
- We develop voltage measurement transformers with outputs of a few volts and in-out phase shifts of 0,1%.
- Applications include feedback control, overload sensing, detecting load drop or overload, and proportional output.



Electro-Magnetic Sensors

These sensors are made of self-bonded coils associated with ferrite cores to realise antennas and sensors with high electro-magnetic performance.

This performance is due to the excellent manufacturing repeatability of self-bonded coils and their proximity with the magnetic cores.



Self-Bonded Coils

Their windings are bonded by a strong adhesive and do not require the support of bobbins, which make these coils economical.

Self-bonded coils are used in numerous sensing and detection applications such as ID card systems, electro-mechanical displays, antennas and remote control devices.



Injection-Moulded Coils / Bobbin Coils

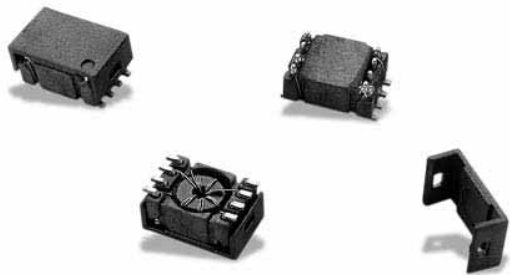
These coils are made of thermo-plastic bobbins wound by fast, fully automated multi-spin machines to keep production costs low.

Numerous applications require that bobbin coils be protected against shock, humidity and chemicals by an encapsulation made with injection-moulded thermoplastic.

We can design and manufacture various custom-designed injection-moulded coils and transformers.



Data Line EMI Filters - DLEF Series



These filters virtually eliminate conducted EMI in data lines. They provide excellent common-mode noise attenuation from 15MHz to 300MHz whilst passing data signals below 300MHz without attenuation.

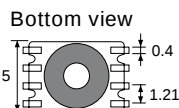
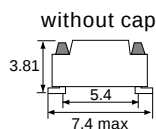
- Suited for IR and vapor reflow soldering
- Materials meet UL94-V0 rating
- Operating temperature range: -40°C to +100°C
- Weight: 0.5gram

Electrical Data

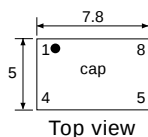
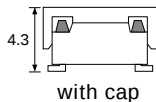
ID Code	Number of lines	Max. Current mA	L/winding μ H	RDC max m Ω	Isolation Vrms
DLEF12 020 1S	2	100	5	250	250
DLEF13 020 1S	3	100	5	250	250
DLEF14 020 1S	4	100	5	250	250

Typical Dimensions (mm)

DLEF0x xxx xS

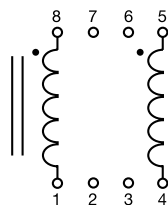


DLEF1x xxx xS

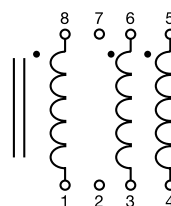


Connections

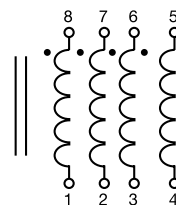
DLEF2 xxx xS



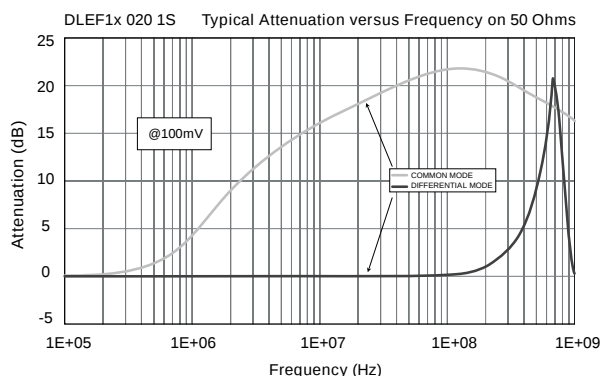
DLEF3 xxx xS



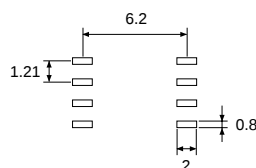
DLEF4 xxx xS



Response Curves



PCB Layout (suggested)



Packaging

Tape and Reel: 2200 pieces



EMI Suppression Chokes - ESC Series



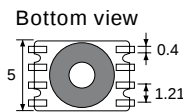
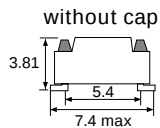
These common-mode chokes provide excellent attenuation of asymmetric EMI on signal lines and in switch-mode power supplies.

- Surface-mount package
- Suited for IR and vapor reflow soldering
- Materials meet UL94-V0 rating
- Frequency range up to 100 MHz
- Operating temperature range: -40 °C to +125 °C
- Weight: 0.5 gram

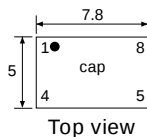
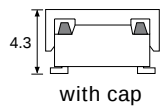
Electrical Data

Part Number (typical values)	Inductance at 100 kHz μH	Rdc Max (at 80°C) m	Impedance at 100 MHz Ω	Attenuation 50 Ω at 10MHz dB	Rated Current max mA	Isolation between windings Vrms
ESC X1 15K 1S	15	20	100	6,5	750	250
ESC X1 56K 1S	56	35	250	12	600	250
ESC X1 M47 1S	470	470	1200	27,5	250	250

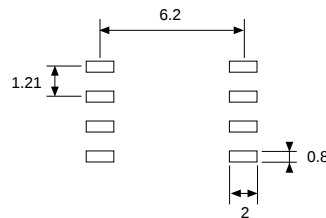
ESC0x xxx xS



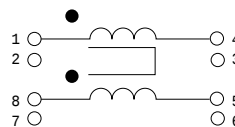
ESC1x xxx xS



PCB Layout (suggested)

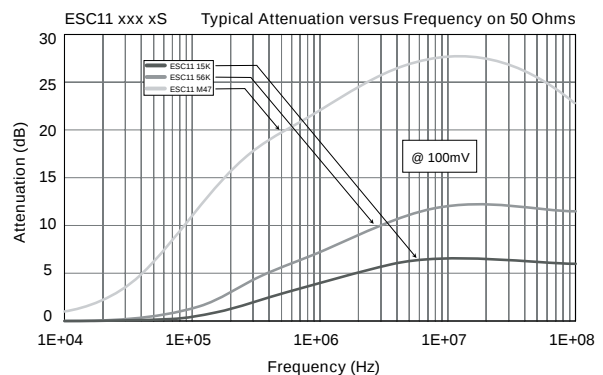
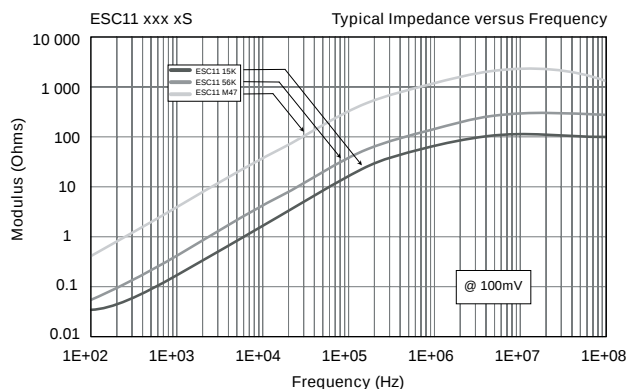


Connections



Packaging

Tape and Reel : 2200 pieces



Common-Mode Chokes - ICMC Series



- 2-fold Id current-compensated chokes
- 4-fold current-compensated chokes
- High insertion loss over a wide frequency range
- High inductance values
- Low total losses
- Amorphous and ferrite toroids, encapsulated in polymer materials listed in UL94-V0
- Flat or upright cases
- Operating temperature range -25°C +70°C

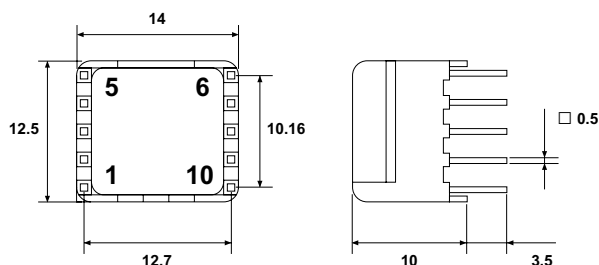
Electrical Data

Part Number	Ln mH	In A eff	LF μH	Rdc Ω
2-fold chokes				
ICMC12 1M0 1X	2x1	0.5	0.2	0.1
ICMC12 1M7 1X	2x1.7	0.5	0.2	0.15
ICMC12 3M3 1X	1x3.3	0.4	0.25	0.2
ICMC12 4M7 1X	2x4.7	0.4	0.3	0.25
ICMC12 6M8 1X	2x6.8	0.3	0.4	0.3
ICMC12 10M 1X	2x10	0.3	0.45	0.4
ICMC12 12M 1X	2x12.5	0.3	0.5	0.45
ICMC12 28M 1X	2x28	0.25	1	0.8
ICMC12 39M 1X	2x39	0.25	1.1	1
ICMC12 50M 1X	2x50	0.25	1.2	1.1
ICMC12 70M 1X	2x70	0.2	1.4	1.2
4-fold chokes				
ICMC14 1M0 1X	4x1	0.5	0.2	0.1
ICMC14 1M7 1X	4x1.7	0.5	0.25	0.15
ICMC14 3M6 1X	3x3.6	0.4	0.4	0.2
ICMC14 5M0 1X	4x5	0.3	0.45	0.25
ICMC14 6M0 1X	4x6	0.3	0.45	0.3
ICMC14 7M8 1X	4x7.8	0.25	0.5	0.4
ICMC14 10M 1X	4x10	0.25	0.5	0.45
ICMC14 11M 1X	4x11.5	0.2	0.5	0.6
ICMC14 40M 1X	4x40	0.15	0.9	1.2
ICMC14 58M 1X	4x58	0.15	0.5	0.9
ICMC14 90M 1X	4x90	0.15	0.5	1.4

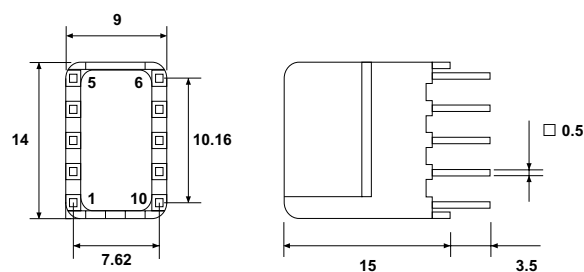
Dielectric strength 500 Vms for 2 seconds.

Typical Dimensions (mm)

Horizontal design ICMCxx xxx xH



Vertical design ICMCxx xxx xV

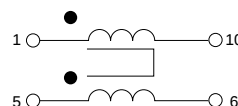


Symbols

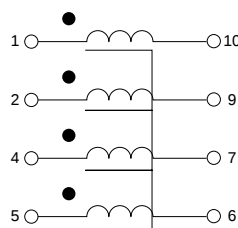
- In = permissible rated current of a winding
 Ln = rated inductance of a winding
 (tol. +50%/-30% ; f=10 kHz ; U=100 mVrms)
 LF = leakage inductance of a winding when all other windings short circuit (nominal value)
 Rdc = DC resistance of winding (nominal value)

Connections

2-fold chokes ICMC12 xxx xx



4-fold chokes ICMC14 xxx xx



Line Common Mode Choke - LCMC



- Improved EMI performance for FCC class B applications
- Maximum common mode attenuation at 1 MHz
- Well suited for many telecom applications
- Surface mount package
- Materials meet UL94-V0 rating
- Temperature range: 0 °C to +70 °C
- Weight <1 gram

Electrical Data

Part Number	OCL (mH +30%/-40%)	Common Mode Attenuation (db typ. @ 100kHz) (db typ. @ 1MHz) (db typ. @ 10MHz)			I max eff (mA)	Isolation (Vrms min)	DCR (Ω max)
LCMC 20 4M7 1S	2 x 4.7	29	40	24	35	500	1.15

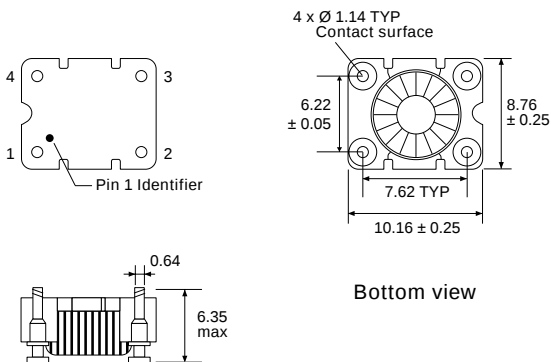
Note: values measured at 10 kHz, 100 mV_{RMS} at 25 °C. Dielectric strength : 500 V_{RMS} - 50 Hz - 1 min

To Order

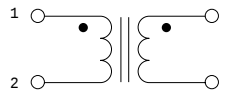
LCMC 20 4M7 1S

LCMC	20	4M7	1	S
Line Common Mode Chokes	Size	Value code 4M7 = 4,7 mH	Version	SMD

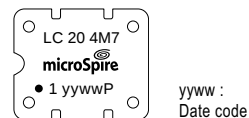
Typical Dimensions (mm)



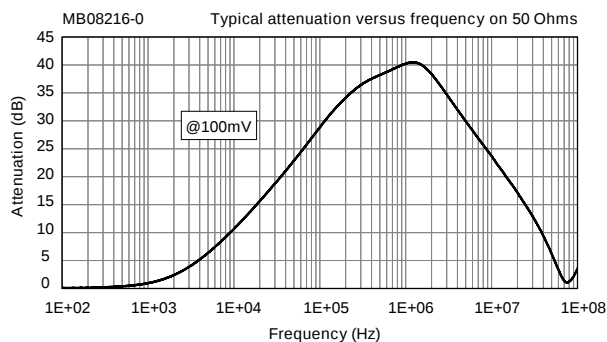
Connections



Marking

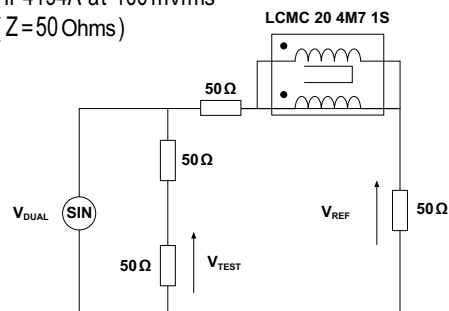


Frequency Response

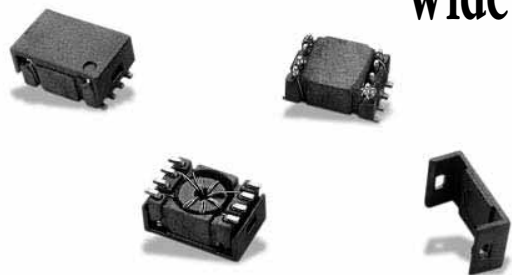


Measurement Circuit

Attenuation measured with
HP4194A at 100 mVrms
(Z = 50 Ohms)



Wide Band RF Transformers - WRFT Series



- Frequency bandpass 100 kHz to 500 MHz
- Power input max. 250 mW
- Isolation prim. to sec. 500 Vrms minimum
- Suited for IR and vapor reflow soldering
- Materials meet UL94-V0 rating
- Operating temperature range: -40 °C to +125 °C
- Weight: 0.5 gram

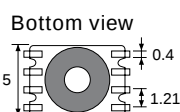
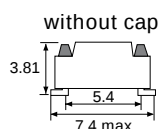
Electrical Data

ID Code	Impedance ratio (Ω)	3 dB	Bandwidth (MHz) 2 dB	1 dB
WRFTX1 1R0 1X	50:50	0.15-400	0.35-200	2-50
WRFTX1 2R0 1X	50:100	0.30-300	0.5-250	2-230
WRFTX2 2R0 1X	50:100 center tap	0.10-200	0.5-100	2-50
WRFTX1 2R5 1X	50:125	0.10-100	0.1-50	0.1-20
WRFTX1 4R0 1X	50:200	0.20-350	0.35-300	2-100
WRFTX2 5R0 1X	50:250 center tap	0.30-300	0.6-200	0.5-100
WRFTX2 8R0 1X	50:400 center tap	0.10-140	0.1-90	1-60
WRFTX1 12R 1X	50:600	0.20-110	0.5-80	1-50
WRFTX1 13R 1X	50:650	0.30-130	0.4-85	1-65
WRFTX2 13R 1X	5:650 center tap	0.30-120	0.7-80	5-20
WRFTX1 16R 1X	50:800	0.30-120	0.7-80	5-20
WRFTX2 16R 1X	50:800 center tap	0.10-75	0.2-30	0.3-20

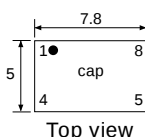
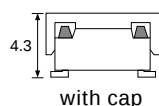
Typical Dimensions (mm)

WRFT0x xxx xS

Surface-mount case

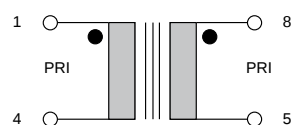


WRFT1x xxx xS

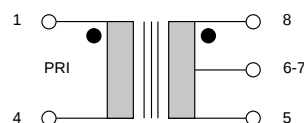


Connections

Standard



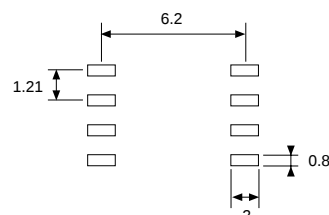
Center tap



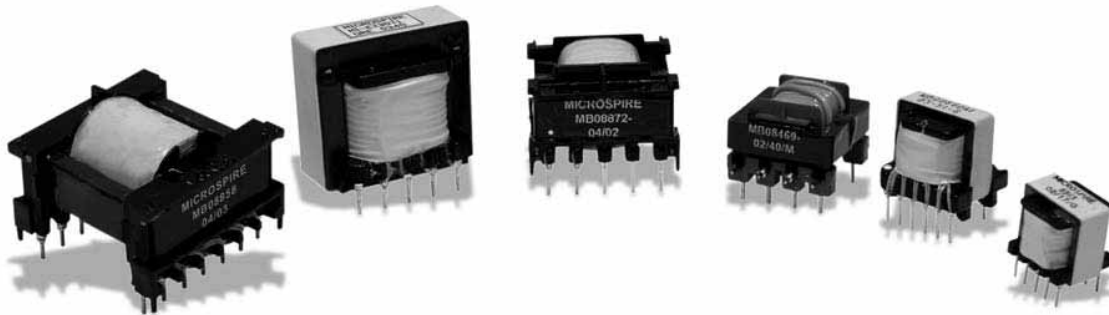
Packaging

Tape and Reel: 400 pieces

PCB Layout (suggested)



Flyback Safety Insulating Transformers FSIT Series



Package	Output Power (W)	Max Dimensions (LxWxH in mm)	Number of pins (through hole)	Connected ICs
FSIT 13	0-6	16 x 15 x 15,5	2 x 5	LNK501, TNY253-254-255, TNY264P/G, TOP242P/G, ICE3A/B0365, VIPer12A, NCP1200
FSIT 16	0-10	19 x 17 x 19,5	6 + 4	LNK501, TNY253-254-255, TNY264-266P/G, TOP242P/G, ICE3A/B0365, VIPer12A-20A, NCP1200
FSIT 20	10-20	22 x 21,5 x 16,5	2 x 4	TOP242-243Y/F, ICE3A/B1065-1565, VIPer22A-50A, NCP1200
FSIT 20.1	10-20	22 x 21,5 x 17	2 x 5	TOP242-243Y/F, ICE3A/B1065-1565, VIPer22A-50A, NCP1200
FSIT 25	20-35	28 x 28,5 x 20,5	2 x 5	TOP242-244Y/F, ICE3A/B2065-2565, VIPer50A-53-100A, NCP1200
FSIT 29	35-70	35,5 x 35,5 x 25,5	6 + 7	TOP244-245-246Y/F, ICE3A/B3065-4065P, VIPer100A, NCP1200

- Thermal index according to IEC85: from* class A (105 °C) to F (155 °C)

Other packages and connections available on demand according to your specification for power range up to 250 W

- Applied standards: EN60950-1, EN61558-1/-2-17, EN60335-1, EN60065
- Materials meet UL94-V0 rating
- Ambient temperature range: -25 °C +50 °C (+70 °C/+85 °C**)
- Storage temperature range: -40 °C +85 °C
- Associated to latest generation ICs, they replace with competitive pricing and lower size old linear power supplies
- Six standard packages for catalog or custom designs
- Compliant with basic/supplementary to reinforced insulation from the mains according to common applied standards
- Optimized construction of primary winding for low switching losses and low EMI
- Low leakage inductance for improved converter efficiency
- Utilization of triple insulated wire and high performance ferrites
- Increased performances based on optimized designs on accurate automatic software tools linked to transformer

datasheets proposed by ICs manufacturers

- Manufacturing in low-cost country

Our transformers can be associated to input common mode filtering chokes and output filtering chokes

* Depending on winding technique used for insulation requirements

** Depending on component heating and thermal class

Packaging to be defined according to batch size.



Flyback Safety Insulating Transformers

FSIT 13 Series & FSIT 16 Series



- 0 to 6W transformers for AC/DC converters connected to the mains
- Low cost and small package 2x5 pin through hole version
- Compliant with basic/supplementary insulation up to 265Vrms
- Clearance and creepage distance up to 4mm
- Dielectric strength up to 2kV (50Hz-1min)
- Approx weight: 5grams

Electrical Data - FSIT 13

ID Code	Mains Input Voltage Range (Vrms)	Output Power (W)	Designed Outputs	Connected IC(s)	Working Frequency	Applied standard(s)	Standard Requirements
FSIT13 W85 01	185 - 265V (5° - 1)	0.85W	5V / 50mA (8° - 6) 12V / 50mA (10° - 6)	LNK501	42kHz	EN60950	Basic / Supplementary 1500Vrms
FSIT13 2W5 01	85 - 265V (5° - 4)	2.44W	5V / 200mA (7° - 6) 15V / 80mA (8° - 6) 8V / 30mA (10° - 9)	TNY264	132kHz	-	Operationnal 1500Vrms
FSIT13 6W0 01	85V - 265V (4° - 2)	5.95W	5V / 350mA (8° - 6) 12V / 350mA (10° - 6)	TNY264, TNY266	132kHz	-	Operationnal 1500Vrms

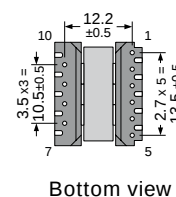
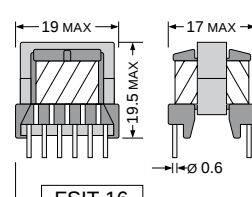
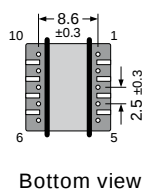
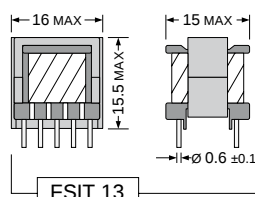


- 0 to 10W transformers for AC/DC converters connected to the mains (50/60Hz)
- Low cost and small package 6+4 pin through hole version (EE-16)
- Compliant with reinforced insulation up to 265Vrms working voltage
- Clearance and creepage distance up to 8mm
- Dielectric strength up to 4kV (50Hz-1min)
- Approx weight: 7grams

Electrical Data - FSIT 16

ID Code	Mains Input Voltage Range (Vrms)	Output Power (W)	Designed Outputs	Connected IC(s)	Working Frequency	Applied standard(s)	Standard Requirements
FSIT16 W80 01	180 - 265V (8° - 9)	0,8W	8V / 100mA (5° - 2)	LNK501	42kHz	EN60950	Reinforced 3750Vrms
FSIT16 1W2 01	180 - 265V (8° - 9)	1,2W	24V / 50mA (5° - 2)	LNK501	42kHz	EN60950	Reinforced 3750Vrms
FSIT16 2W5 01	90 - 264 (10° - 8)	2,35W	5V / 200mA (2° - 1) 15V / 80mA (3° - 1) -5V / 30mA (6° - 5) BIAS (3° - 1)	VIPer12A	60kHz	EN60335-1	Operationnal 1500Vrms
FSIT16 4W5 01	85 - 265V (9° - 10)	4,4W	1,8V / 600mA (2° - 1) 3,3V / 400mA (4° - 1) 6V / 300mA (5° - 1) 12V / 15mA (6° - 1) BIAS (7° - 8)	TOP242	132kHz	EN60950	Reinforced 4000Vrms
FSIT16 6W5 01	85 - 265V (9° - 10)	5,86W	12V / 80mA (2° - 1) 5V / 80mA (4° - 3) 5V / 900mA (6° - 5) BIAS (7° - 8)	VIPer12A	60kHz	EN60950	Reinforced 3750Vrms
FSIT16 8W5	85 - 265V (4° - 6)	8,3W	24V / 200mA (7° - 10) 15V / 200mA (8° - 10) 5V / 100mA (9° - 10) BIAS (2° - 1)	VIPer22A	60kHz	EN60950	Reinforced 3000Vrms
FSIT16 9W 01	85 - 265V (10° - 9)	9W	6V / 1,5A (5° - 2)	TNY268	132kHz	EN60950	Reinforced 3750Vrms
FSIT16 5W 01	85 - 265V (9° - 10)	5W	12V / 420mA (4° - 3) BIAS (7° - 8)	VIPer22A	50kHz	-	Operational 1500Vrms

Typical Dimensions (mm)



- ## Electrical Data FSIT 20

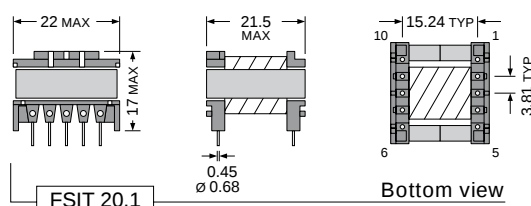
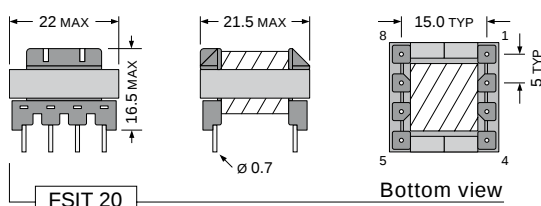


- 10 to 20W transformers for AC/DC converters connected to the mains (50/60Hz)
- 2x5 pin through hole version (EF20)
- Compliant with reinforced insulation up to 265Vrms working voltage
- Clearance and creepage distance up to 8mm
- Dielectric strength up to 4kV (50Hz-1min)
- Approx weight: 20grams

Electrical Data FSIT 20.1

ID Code	Mains Input Voltage Range (Vrms)	Output Power (W)	Designed Outputs	Connected IC(s)	Working Frequency	Applied standard(s)	Standard Requirements
FSIT20.1 3W5 01	50 - 500V (4° - 5)	3,35W	21V / 70mA (10° - 9) 10V / 100mA (7° - 6) 35V / 25mA (2° - 1)	TNY255 + external MOS	130kHz	EN60950	Reinforced 4000Vrms
FSIT20.1 7W2 01	180 - 265V (3° - 2)	7,2W	4,4V / 150mA (10° - 9) -35V / 80mA (8° - 7) -61,8V / 60mA (8° - 6) BIAS (5° - 4)	TOP243	132kHz	EN60950	Reinforced 4000Vrms
FSIT20.1 12W5 01	85 - 265V (3° - 1)	12,5W	5V / 1,25A (8° - 7) 5V / 1,25A (9° - 6)	TNY268	132kHz	EN60950	Reinforced 3750Vrms
FSIT20.1 13W 01	85 - 265V (3° - 1)	12,9W	48V / 270mA (10° - 6)	TNY268	132kHz	EN60950	Reinforced 3750Vrms
FSIT20.1 20W 01	185 - 265V (2° - 1)	19,25W	5V / 0,8A (9° - 10) 7,5V / 0,9A (8° - 8) 12V / 30mA (7° - 10) 65V / 125mA (6° - 10) BIAS (5° - 4)	VIPer20ASP	120kHz	EN60950	Reinforced 3000Vrms

Typical Dimensions (mm)



Flyback Safety Insulating Transformers

FSIT 25 Series & FSIT 29 Series



- 20 to 35W transformers for AC/DC converters connected to the mains
- 2x5 pin through hole version
- Compliant with reinforced insulation up to 265Vrms working voltage
- Clearance and creepage distance up to 8mm
- Dielectric strength up to 4kV (50Hz-1min)
- Approx weight : 25grams

Electrical Data FSIT 25

ID Code	Mains Input Voltage Range (Vrms)	Output Power (W)	Designed Outputs	Connected IC(s)	Working Frequency	Applied standard(s)	Standard Requirements
FSIT25 15W 01	85 - 265V (2° - 1)	14W	14,5V / 0.95A (10° - 9) 20V / 15mA (7° - 6) BIAS (4° - 5)	VIPer50	100kHz	EN60950	Reinforced 4000Vrms
FSIT25 15W 02	180V - 265V (3° - 1)	14,5W	2,4V / 1A (9° - 10) 3,3V / 2A (8° - 10) 5,1V / 300mA (7° - 10) 32,6V / 120mA (6° - 10) BIAS (5° - 4)	TOP242 TOP243	132kHz	EN60950	Reinforced 4000Vrms
FSIT25 25W 01	180 - 480V (2° - 1)	25W	19V / 300mA (9° - 10) 24V / 800mA (6° - 7)	NCP1200	40kHz	EN60950	Reinforced 4000Vrms
FSIT25 35W 01	185 - 265V (2° - 1)	35W	6,8V / 5A (6 / 7° - 9 / 10) BIAS (5° - 4)	TOP244	132kHz	EN60950	Reinforced 4000Vrms

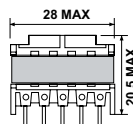


- 35 to 70W transformers for AC/DC converters connected to the mains (50/60Hz)
- 6+7 pin through hole version (ETD29)
- Compliant with reinforced insulation up to 265Vrms working voltage
- Clearance and creepage distance up to 8mm
- Dielectric strength up to 4kV (50Hz-1min)
- Approx weight : 50grams

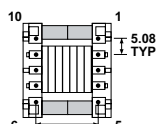
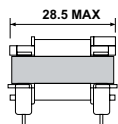
Electrical Data FSIT 29

ID Code	Mains Input Voltage Range (Vrms)	Output Power (W)	Designed Outputs	Connected IC(s)	Working Frequency	Applied standard(s)	Standard Requirements
FSIT29 48W 01	85 - 265V (3° - 1)	48W	48V / 1A (11° - 13) BIAS (5° - 4)	VIPer53	100Hz	EN60950	Reinforced 4000Vrms
FSIT29 48W 02	85 - 265V (3° - 1)	48W	24V / 1A (11° - 12) 24V / 1A (10° - 13) BIAS (5° - 4)	VIPer53	100Hz	EN60950	Reinforced 4000Vrms
FSIT29 55W 01	85 - 265V (3° - 1)	55,5W	20,5V / 1,5A (12/13° - 10/11) 60V / 400mA (8° - 7) 180V / 4mA (9° - 7) BIAS (5° - 6)	ICE2B765P2	67kHz	EN60950	Reinforced 4000Vrms
FSIT29 60W 01	85 - 480V (3° - 1)	60W	24V / 1,1A (13° - 12) 10V / 1,1A (11° - 10) 15V / 1,5A (9° - 8) -15V / 250mA (8° - 7) BIAS (5° - 6)	VIPer100	70kHz	EN60950	Reinforced 4000Vrms
FSIT29 70W 01	185 - 265V (4° - 6)	70W	14V / 2,5A (7° - 9) 14V / 2,5A (10° - 12) BIAS (3° - 2)	TOP245Y	132kHz	EN60950	Reinforced 4000Vrms

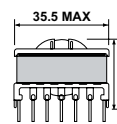
Typical Dimensions (mm)



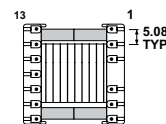
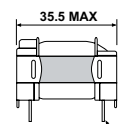
FSIT 25



Bottom View



FSIT 29



Bottom View



Common-Mode Chokes - CMESC 10-14



- Operating single phase voltage 250 Vrms
- Low strayfield winding structure
- Thermoplastic cases.
- Materials meet with UL94-V0 rating
- Through hole design
- Operating temperature range : -40 °C to +70 °C

Electrical Data

ID Code	In A	Ln mH $\pm 30\%$	Rdc Typ Ω
CMESC10 47M 1X	0.3	47	1.60
CMESC10 39M 1X	0.4	39	1.20
CMESC10 27M 1X	0.5	27	0.60
CMESC10 18M 1X	0.55	18	0.50
CMESC10 15M 1X	0.6	15	0.45
CMESC10 10M 1X	0.8	10	0.20
CMESC10 6M8 1X	1.2	6.8	0.15
CMESC10 3M3 1X	1.5	3.3	0.09
CMESC10 2M0 1X	2.0	2.0	0.06

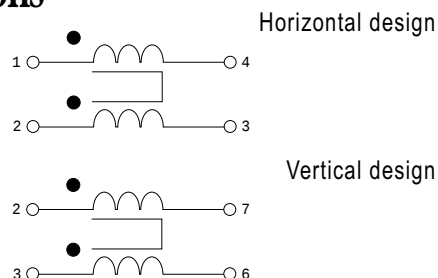
CMESC11 47M 1X	0.4	47	1.20
CMESC11 39M 1X	0.5	39	0.90
CMESC11 27M 1X	0.8	27	0.60
CMESC11 18M 1X	0.9	18	0.50
CMESC11 15M 1X	1.0	15	0.30
CMESC11 10M 1X	1.2	10	0.20
CMESC11 6M8 1X	1.5	6.8	0.10
CMESC11 3M3 1X	2.5	3.3	0.07
CMESC11 2M0 1X	3.0	2.0	0.04

CMESC12 47M 1X	0.6	47	0.90
CMESC12 39M 1X	0.7	39	0.70
CMESC12 27M 1X	0.8	27	0.50
CMESC12 18M 1X	1.0	18	0.35
CMESC12 15M 1X	1.2	15	0.25
CMESC12 10M 1X	1.5	10	0.15
CMESC12 6M8 1X	2.0	6.8	0.10
CMESC12 3M3 1X	4.0	3.3	0.04
CMESC12 2M0 1X	6.0	2.0	0.02

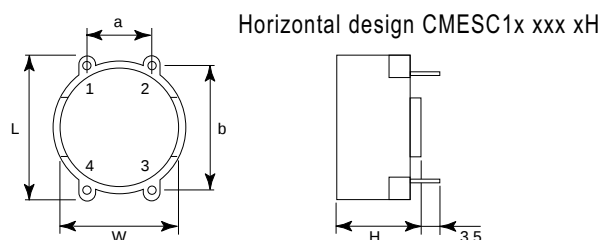
CMESC13 47M 1X	0.8	47	0.70
CMESC13 39M 1X	1.0	39	0.60
CMESC13 27M 1X	1.4	27	0.30
CMESC13 18M 1X	1.5	18	0.25
CMESC13 15M 1X	1.7	18	0.20
CMESC13 10M 1X	1.8	10	0.15
CMESC13 6M8 1X	2.2	6.8	0.10
CMESC13 3M3 1X	4.0	3.3	0.04
CMESC13 2M0 1X	6.0	2.0	0.02

CMESC14 47M 1X	2.0	47	0.35
CMESC14 39M 1X	2.3	39	0.25
CMESC14 27M 1X	2.5	27	0.20
CMESC14 18M 1X	3.0	18	0.15
CMESC14 15M 1X	3.5	15	0.10
CMESC14 10M 1X	4.0	10	0.09
CMESC14 6M8 1X	5.0	6.8	0.05
CMESC14 3M3 1X	8.0	3.3	0.02
CMESC14 2M0 1X	10.0	2.0	0.01

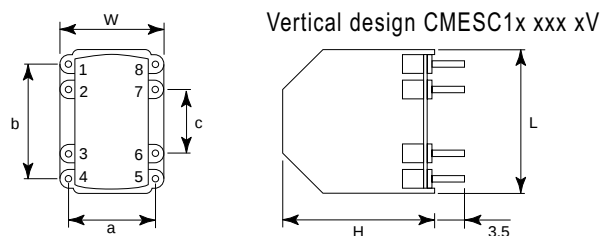
Connections



Typical Dimensions (mm)



ID Code	L	H	W	A	B	pins
CMESC10 xxx xH	17.5	12.5	17	10	15	0.9 x 0.6
CMESC11 xxx xH	22.5	15.0	22	12.5	20	0.9 x 0.6
CMESC12 xxx xH	27.5	17.5	27	15	25	0.9 x 0.6
CMESC13 xxx xH	33.5	19.2	33	20	30	0.7 x 0.7
CMESC14 xxx xH	42.5	24.3	42	15	40	0.7 x 0.7



ID Code	L	H	W	A	B	C	pins
CMESC10 xxx xV	17.8	20	12.8	10	15	5	0.9 x 0.6
CMESC11 xxx xV	23	25	15.5	12.5	20	10	0.9 x 0.6
CMESC12 xxx xV	27	30	18	15	22.5	12.5	0.9 x 0.6
CMESC13 xxx xV	32	35	18	15	27.5	12.5	0.9 x 0.6
CMESC14 xxx xV	42	45	28	25	40	25	1.1 x 0.8

Applications

Suppress asymmetric EMI voltages from 10kHz to 10MHz



Common-Mode Chokes - CMESC 17



- Less than 20% performance variations versus temperature (-40 °C/+125 °C)
- Minimum impedance attenuation: 100 Ω from 100 kHz to 30 MHz
- RMS current range: from 1.1 A to 11.7 A for 40 °C heating above 25 °C
- All plastics used meet UL94V-0 rating
- Operating/storage temperature range: -40 °C to +125 °C
- Approx weight: 10 grams

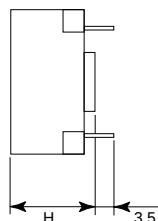
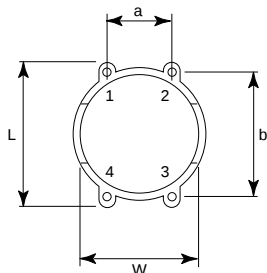
Electrical Data

ID Code	Inductance Value at 25°C (-40/+35%)	Typical SRF	Max Impedance (Typical)	MAX Attenuation (Z = 50Ω)	MAX RMS Current for ΔT = 40°C	MAX DC Resistance (25°C)	Typical Leakage Inductance (100kHz)
CMESC17 69M 1H	69.2 mH	0.1 MHz	29 kΩ	49 dB	1.1 A	500 mΩ	70 μH
CMESC17 30M 2H	30.3 mH	0.3 MHz	15.8 kΩ	44 dB	1.7 A	220 mΩ	32 μH
CMESC17 13M 1H	13.1 mH	0.6 MHz	9.4 kΩ	40 dB	2.7 A	90 mΩ	13.4 μH
CMESC17 5M8 1H	5.83 mH	1.5 MHz	5.3 kΩ	35 dB	4 A	40 mΩ	6.3 μH
CMESC17 2M6 1H	2.59 mH	8 MHz	3.7 kΩ	32 dB	6 A	18 mΩ	2.3 μH
CMESC17 1M2 1H	1.15 mH	15 MHz	1.9 kΩ	26 dB	8.3 A	10 mΩ	1.1 μH
CMESC17 M45 1H	0.45 mH	32 MHz	1 kΩ	20 dB	11.7 A	5 mΩ	0.5 μH

Dielectric strength test: 500 V (50 Hz-1 min)

Typical Dimensions (mm)

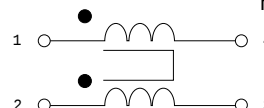
Horizontal design CMESC1x xxx xH



ID Code	L	H	W	A	B	pins
CMESC17 xxx xH	17.5	12.5	17	10	15	0.9 x 0.6

Connections

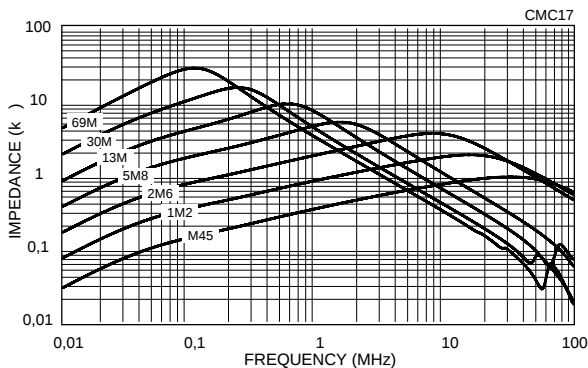
Horizontal design



CMESC 17 Common Mode Chokes Series

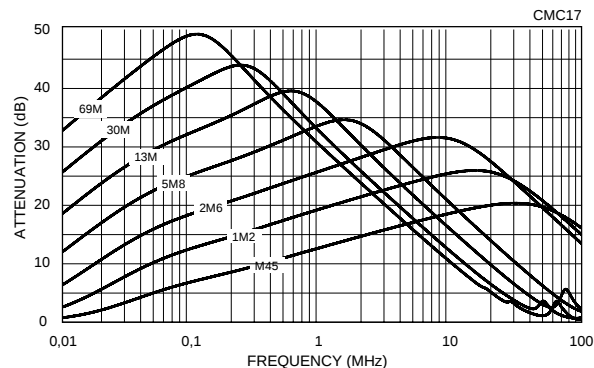
Improved Temperature Stability

Impedance



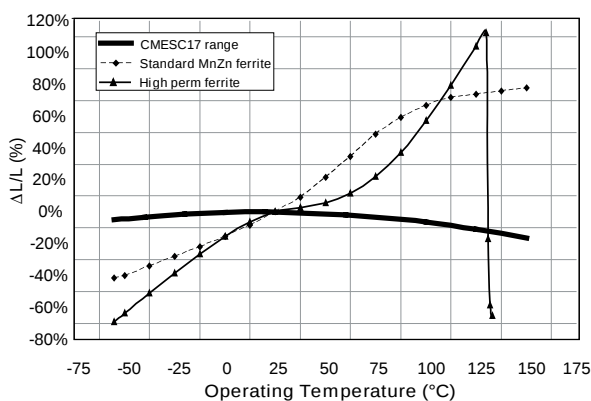
Typical values at 25°C with 1mT at 10 kHz

Attenuation



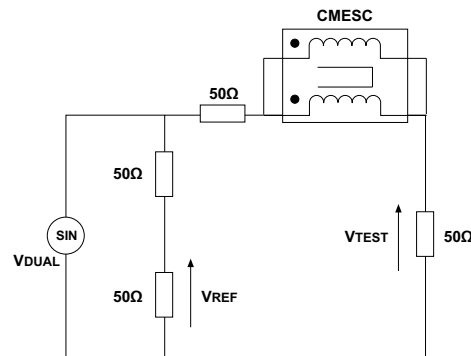
Typical values ($Z=50\Omega$) at 25°C with 1mT at 10 kHz

Variation vs Temperature



Change in inductance value (<1mT at 10 kHz)

Attenuation Measurement Circuit

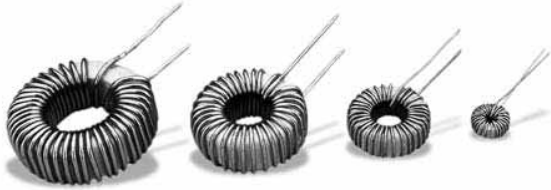


$$\text{Att. (dB)} = 20 \log_{10} \left| \frac{V_{\text{TEST}}}{V_{\text{REF}}} \right|$$

CMESC17 range uses very high performance materials and therefore, offers remarkable temperature stability figures compared to standard or high-perm ferrite cores.



Toroidal Chokes - TC Series



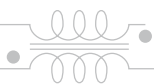
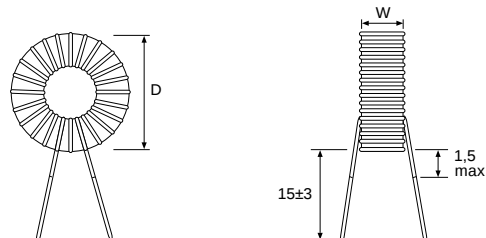
- Inductance range from 4,9 μ H to 1130 μ H
- Inductance tolerance: M: $\pm 20\%$, K: $\pm 10\%$
- Iron powder core material
- Operating temperature range: -55°C to $+105^{\circ}\text{C}$
- Weight: 0.2 to 82 grams

Electrical Data

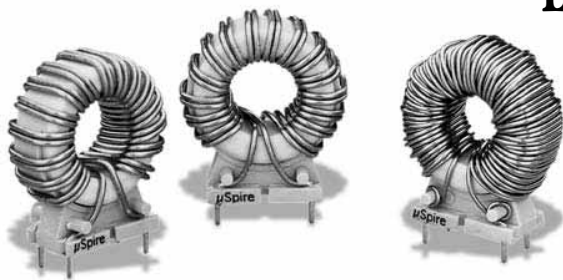
ID Code	DC Current (A)	Inductance (μ H) Idc : 0 rated Idc	Rdc (m Ω)	Dimensions D x W (mm)
TC-270M-0.1A-2026	0.1	27 27.0	33	7.5 x 4.5
TC-200M-0.2A-2026	0.2	20 19.8	198	7.5 x 4
TC-9R0M-0.3A-2026	0.3	9 8.8	11	8 x 4.5
TC-270M-0.3A-2026	0.3	27 25.5	31	8 x 4.5
TC-5R0M-0.5A-2026	0.5	5 4.9	7	7.5 x 4.5
TC-150M-0.5A-2026	0.5	15 13.5	70	7.5 x 4.5
TC-370M-0.5A-3026	0.5	37 33.7	134	10 x 5.5
TC-560M-0.5A-3726	0.5	56 53.0	181	12.5 x 5.5
TC-111M-0.5A-4426	0.5	110 100.0	250	14 x 6.5
TC-141M-0.5A-3026	0.5	140 107.0	265	10 x 6
TC-241M-0.5A-3726	0.5	240 190.0	360	13 x 6.5
TC-361M-0.5A-4426	0.5	360 285.0	460	14.5 x 7.5
TC-120M-1A-3026	1.0	12 10.7	40	10.5 x 6
TC-240M-1A-3726	1.0	24 22.0	55	13.5 x 6
TC-320M-1A-3026	1.0	32 25.0	65	12 x 7
TC-430M-1A-4426	1.0	43 37.0	74	14.5 x 7
TC-680M-1A-3726	1.0	68 53.0	95	13.5 x 6.5
TC-131M-1A-6026	1.0	68 60.0	101	16 x 7.5
TC-141M-1A-4426	1.0	130 116.0	146	19 x 9
TC-151M-1A-6826	1.0	140 104.0	140	15 x 7.5
TC-221M-1A-5026	1.0	150 137.0	159	21.5 x 7.5
TC-471M-1A-6026	1.0	220 162.0	190	16.5 x 8
TC-471M-1A-9026	1.0	470 310.0	286	21 x 11
TC-471M-1A-9426	1.0	470 398.0	354	26.5 x 13
TC-501M-1A-6826	1.0	470 400.0	342	27.5 x 11.5
TC-961M-1A-8026	1.0	500 355.0	300	22 x 9
TC-132M-1A-9426	1.0	960 625.0	438	25 x 11
TC-182M-1A-9026	1.0	1300 933.0	585	28.5 x 12.5
TC-8R2M-2A-3726	2.0	1800 1130.0	680	27.5 x 14
TC-100M-2A-3026	2.0	8.2 7.2	17	14.5 x 7
TC-120M-2A-3026	2.0	10 7.7	17	12 x 7
TC-150M-2A-4426	2.0	15 12.6	23	15.5 x 7.5
TC-220M-2A-3726	2.0	22 17	30	14.5 x 7.5
TC-300M-2A-5026	2.0	30 25.0	35	17 x 8.5
TC-580M-2A-6026	2.0	58 45.0	61	20 x 10
TC-650M-2A-6826	2.0	65 55.0	55	22 x 9
TC-680M-2A-4426	2.0	68 42.0	56	15.5 x 9
TC-101M-2A-5026	2.0	100 63.0	81	17 x 9
TC-111M-2A-6026	2.0	110 79.0	69	19.5 x 10
TC-111M-2A-8026	2.0	110 90.0	74	25 x 10
TC-201M-2A-9026	2.0	200 154.0	114	28 x 14
TC-221M-2A-9426	2.0	220 170.0	121	28.5 x 12
TC-231M-2A-6826	2.0	230 148.0	108	22.5 x 9.5
TC-301M-2A-10626	2.0	300 250.0	142	31.5 x 15.5
TC-321M-2A-8026	2.0	320 193.0	131	25 x 10.5
TC-431M-2A-8026	2.0	430 246.0	150	25 x 11
TC-451M-2A-9026	2.0	450 280.0	174	28 x 14
TC-781M-2A-9426	2.0	780 428.0	225	28.5 x 13.5
TC-851M-2A-10626	2.0	850 567.0	211	32.5 x 16.5
TC-200M-2A-5026	3.0	20 15.0	21	17.5 x 9
TC-350M-3A-6026	3.0	35 28.0	26	20.5 x 10.5
TC-430M-3A-6826	3.0	43 30.0	30.0	23 x 9.5

ID Code	DC Current (A)	Inductance (μ H) Idc : 0 rated Idc	Rdc (m Ω)	Dimensions D x W (mm)
TC-600M-3A-5026	3	60 30	38	18 x 10
TC-750M-3A-8026	3	75 54	39	25.5 x 11
TC-820M-3A-8026	3	82 60	42	24.5 x 10.5
TC-900M-3A-6026	3	90 52.5	44	20.5 x 12.5
TC-131M-3A-6826	3	130 77	55	23 x 10.5
TC-131M-3A-9426	3	130 96	61	29 x 13
TC-141M-3A-9026	3	140 98	64	28 x 14.5
TC-201M-3A-10626	3	200 157	78	32 x 16
TC-271M-3A-8026	3	270 140	81	26 x 12
TC-471M-3A-9026	3	470 225	118	28.5 x 15.5
TC-501M-3A-9426	3	500 242	124	29 x 14
TC-290M-4A-6026	4	29 20	20	21 x 11
TC-320M-4A-6826	4	32 24	21	23.5 x 10
TC-600M-4A-8026	4	60 42	30	26.5 x 11.5
TC-101M-4A-9426	4	100 69	42	29.5 x 13.5
TC-111M-4A-6826	4	110 56	42	23.5 x 11
TC-151M-4A-10626	4	150 110	53	32.5 x 16.5
TC-221M-4A-8026	4	220 105	59	26.5 x 13
TC-391M-4A-9426	4	390 165	88	29.5 x 15
TC-220M-5A-6026	5	22 15	14	21.5 x 11.5
TC-250M-5A-6826	5	25 18	16	24 x 10.5
TC-500M-5A-8026	5	50 33	22	26.5 x 12
TC-820M-5A-9426	5	82 52	33	31 x 15.5
TC-900M-5A-9026	5	90 54	34	29.5 x 15.5
TC-101M-5A-8026	5	100 53	33	26.5 x 12.5
TC-101M-5A-10626	5	100 75	36	33.5 x 17
TC-151M-5A-8026	5	150 68	42	27 x 13.5
TC-201M-5A-13026	5	200 134	56	39 x 17
TC-301M-5A-9426	5	300 120	64	30 x 15.5
TC-321M-5A-9026	5	320 120	68	29.5 x 17
TC-681M-5A-13026	5	680 295	105	39 x 18.5
TC-560M-7A-10626	7	56 41.5	20	34 x 18
TC-680M-7A-10626	7	68 46	21	34 x 18
TC-820M-7A-10626	7	82 53	23	34 x 18
TC-131M-7A-13026	7	130 79	31	41 x 18
TC-471M-7A-13026	7	470 190	64	40.5 x 19.5
TC-300M-10A-10626	10	30 21	9	36 x 19.5
TC-350M-10A-10626	10	35 25	10	36 x 19.5
TC-750M-10A-13026	10	75 43	14	42 x 19.5
TC-251M-10A-13026	10	250 105	27	42.5 x 21.5

Typical Dimensions (mm - see tables)



Energy Storage Inductors - ESI Series



- Energy storage, smoothing, filtering
- Low drop in inductance under load
- Low leakage and high efficiency
- Thermoplastic materials compliant with UL94-V0
- Frequency range up to 200 kHz
- Operating temperature range: -40 °C to +125 °C
- Possibility to use differential mode without trap

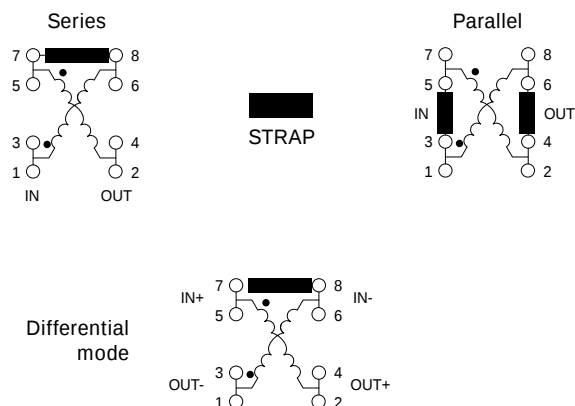
Electrical Data

ID Code	In Adc	Ln μH	Lo μH	Rdc Ω	Pin Ø mm	S series
500μJ						
ESI10 M37 1V	1.5	372	550	140	0.71	S
ESI10 M23 1V	2	230	348	112	0.71	S
ESI10 M14 1V	2.5	140	208	84	0.71	S
ESI10 M37 1V	3	93	137	35	0.71	P
ESI10 M10 1V	3	100	150	60	0.8	S
ESI10 45K 1V	4	45	64	26	1	S
ESI10 M23 1V	4	57	87	28	0.71	P
ESI10 M14 1V	5	35	52	21	0.71	P
ESI10 M10 1V	6	25	38	15	0.80	P
ESI10 45K 1V	8	11	16	6	1	P

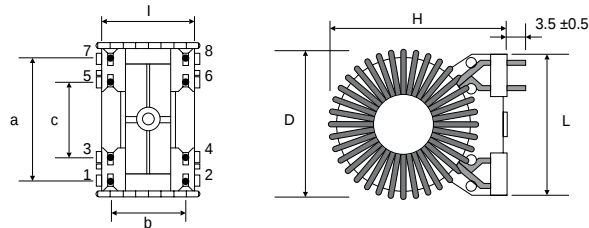
1500μJ						
ESI20 M72 1V	2	720	1140	192	0.80	S
ESI20 M47 1V	2.5	475	755	136	0.85	S
ESI20 M63 1V	2.8	632	1300	200	0.8	S
ESI20 M31 1V	3	310	476	78	1	S
ESI20 M42 1V	3.5	420	875	130	0.90	S
ESI20 M17 1V	4	170	262	48	1.12	S
ESI20 M72 1V	4	180	285	48	0.8	P
ESI20 M25 1V	4.5	254	540	84	1	S
ESI20 M47 1V	5	119	190	34	0.85	P
ESI20 M63 1V	5.6	158	325	50	0.80	P
ESI20 M31 1V	6	77	120	19	1	P
ESI20 M14 1V	6	144	310	52	1.12	S
ESI20 M42 1V	7	105	219	32	0.9	P
ESI20 M17 1V	8	42	66	12	1.12	P
ESI20 M25 1V	9	63	135	21	1	P
ESI20 M14 1V	12	36	77	13	1.12	P

2500μJ						
ESI30 80K 1V	6	80	128	21	1	S
ESI30 48K 1V	7.5	48	84	13	1.12	S
ESI30 70K 1V	8.5	70	144	17	1	S
ESI30 46K 1V	10.5	46	96	14	1.12	S
ESI30 80K 1V	12	20	32	5	1	P
ESI30 48K 1V	15	12	20	3	1.12	P
ESI30 70K 1V	17	17.5	36	4	1	P
ESI30 46K 1V	21	11.5	24	3.5	1.12	P

Connections



Typical Dimensions (mm)



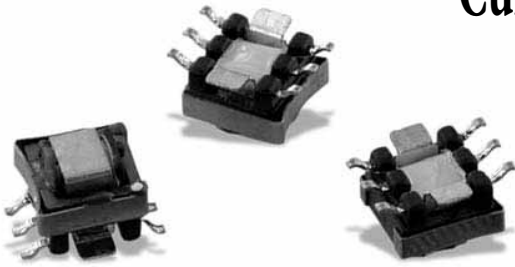
ID Code	L	I	H	D	a	b	c
ESI10	19.1	14	31.5	28	15.24	7.62	5.08
ESI20	29.1	22	40	36	25.4	15.24	15.24
ESI30	29.1	24	42	36	25.4	15.24	15.24

Symbols

- S = two single windings in series
 P = two single windings in parallel
 In = Rated DC current
 Ln = Inductance under DC bias by In
 Lo = Inductance without DC bias
 Rdc = DC resistance of windings
 Pin Ø = Diameter of connection pin

Current sense Transformer up to 2.2A

CT05 xxx 231 W

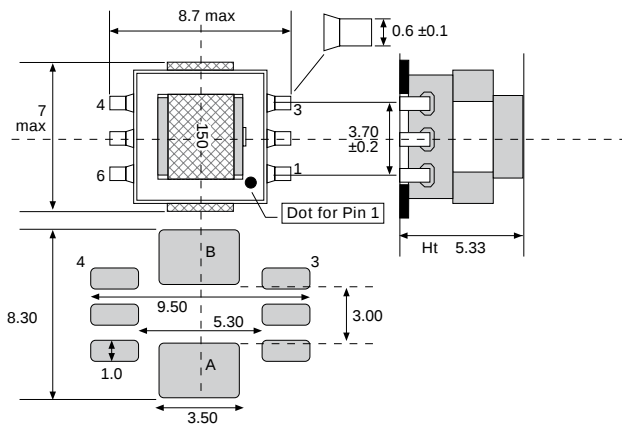


- Materials meet UL94-V0 rating
- Thermal index : classe B
- Max admissible current through primary winding: 2.2A (1.5ATYP)
- Insulation : $R_i > 100 \text{ M}\Omega$ between A-B/1-3 at 200VDC
- Dielectric strength : 150Vrms-50Hz between A-B/1-3
- Operating temperature range : -40°C to $+100^\circ\text{C}$
- Suited for IR and vapor reflow soldering
- Weight : 1 gram

Electrical Data (25°C)

ID Code	Turn ratio $\pm 1\%$ (A-B/1-3)	DCR (A-B) $\text{m}\Omega \pm 15\%$	DCR (1-3) $\Omega \pm 15\%$	L1-3
CT05 150 231W	1 : 150	6	9.6	$\geq 4.8 \text{ mH}$
CT05 100 231W	1 : 100	6	4	$\geq 2 \text{ mH}$
CT05 075 231W	1 : 75	6	2.8	$\geq 1.2 \text{ mH}$
CT05 050 231W	1 : 50	6	1	$\geq 540 \mu\text{H}$

Typical Dimensions (mm)

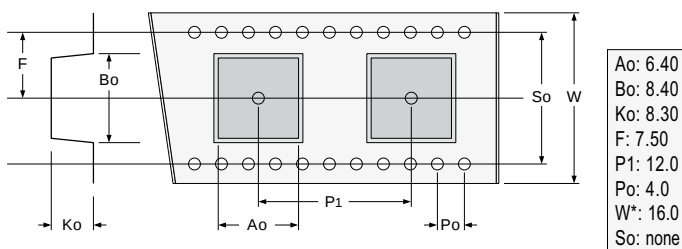


Notes

Typical performances at $+25^\circ\text{C}$
Storage Temperature -40°C to $+85^\circ\text{C}$

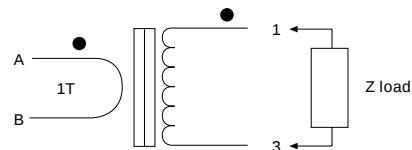
Packaging

Tape and Reel : 750 pieces per reel



general tolerances : $\pm 0.1 \text{ mm} / * \pm 0.3 \text{ mm}$

Connections



SMD Line-Matching Transformer - MTLM 1234



- V.34 data rate, 28800 bits/sec
- 7 mm seated height
- EN 41003 and EN 60950 compliant
- Reinforced insulation up to 250 Vrms
- LCIE approved
- Operating temperature range: -25°C to +70°C
- Weight: 2.3 grams

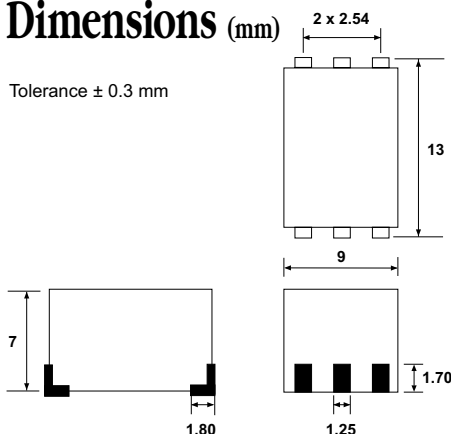
Electrical Data

Parameter	Value
Primary Impedance (pins 1-3)	600 Ω
Secondary Impedance (pins 6-4)	600 Ω
Turns Ratio at 1 kHz	1:1 $\pm$ 1%
Shunt Inductance at 200 Hz, 0.15 V	≥ 3 H
Shunt Loss at 200 Hz, 0.15 V	≥ 6000 Ω
Leakage Inductance (1 kHz)	≤ 5.5 mH
Primary Winding Resistance	115 $\Omega \pm 15\%$
Secondary Winding Resistance	115 $\Omega \pm 15\%$
Storage Temperature Range	-40°C to +85°C

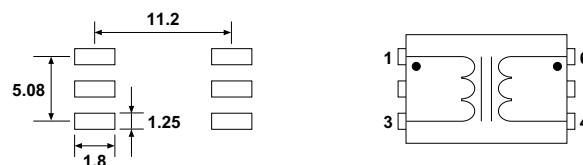
Parameter	Value
Insertion Loss (at 2 kHz)	≤ 2 dB
Frequency Response (0.2-4 kHz)	± 0.25 dB
Return Loss (0.2-4 kHz)	≥ 24 dB
Distorsion (0 db at 500 Hz)	$\leq 0.1\%$
Balance	≥ 80 dB
Power Level	3 dBm
Dielectric Strength (2s)	4 kVrms
Isolation	6.5 kVdc
Operating Temperature Range	-25°C to +70°C

Dimensions (mm)

Tolerance ± 0.3 mm



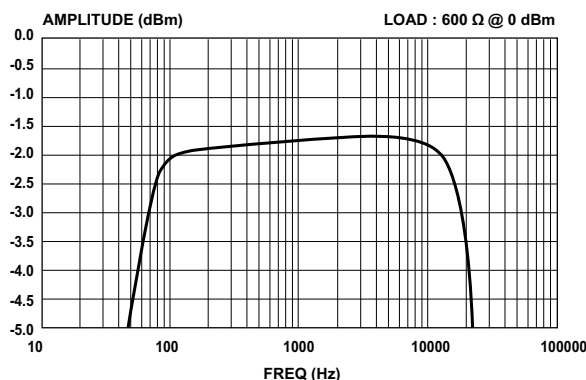
Connections



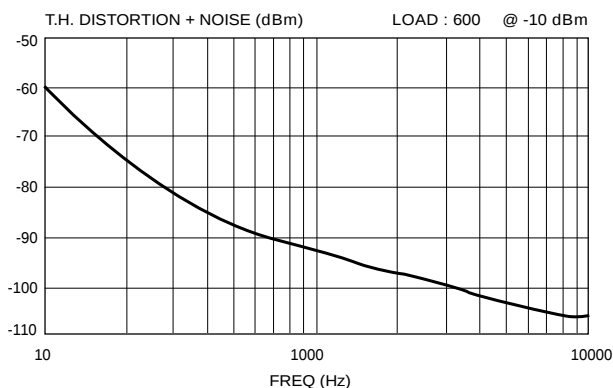
Packaging

Tape and Reel: 650 pieces

Frequency Response



Distorsion



Line-Matching Transformers - MTLM Series



MTLM 2001



MTLM 1200



MTLM 2010

Features

- Industry standards
- Low profile packages
- Meet, EN 60950
- Operating temperature range -25°C to +70°C
- Storage temperature range -40°C to +85°C

Electrical Data

ENCAPSULATED TRANSFORMERS													
V. series	ID Code	Impedance prim/sec Ω	Insertion loss, max dB	Frequency response $\pm$ dB	Return loss, min dB	Distortion max %	Balance min dB	Power max dB	Vd kVrms	Rdc prim/sec Ω	Ls max mH	Lp min H	
V.22bis	MTLM1200	600 / 600	1.5	0.4	24	0.1	80	10	4	56 / 56	19	2.8 / 1.6	
V.22bis	MTLM1201	600 / 600CT	1.5	0.4	24	0.1	80	10	4	56 / 56	17	2.8 / 1.6	
V.22bis	MTLM1200E	600 / 600	1.5	0.4	24	0.1	80	10	4	66 / 66	17	2.8 / 1.6	
V.22bis	MTLM1201E	600 / 600CT	1.5	0.4	24	0.1	80	10	4	66 / 66	17	2.8 / 1.6	
V.22bis	MTLM1200C	600 / 600	1.5	0.4	24	0.1	80	10	4	62 / 62	16	2.8 / 1.6	
V.22bis	MTLM1201B	600 / 600CT	1.5	0.4	24	0.1	80	10	4	62 / 62	16	2.8 / 1.6	
V.22bis	MTLM3027M	600 / 600	1.0	0.25	24	0.3	70	5	4	34 / 34	7	1.7 / 1.7	
V.22bis	MTLM6259	600 / 600	2.0	1	14	0.3	70	20	8	64 / 64	40	0.8 / 0.8	

SMD NON-ENCAPSULATED TRANSFORMERS													
V.22bis	MTLM3027S*	600 / 600	1	0.25	24	0.3	70	5	4	34 / 34	7	1.7 / 4.5	

*These transformers do not meet EN41003

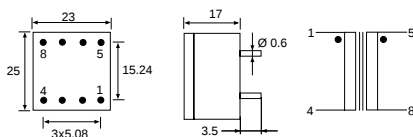
FAST DATA-RATE TRANSFORMERS													
V.32bis	MTLM2010	600 / 600	1	0.25	20	0.1	80	10	4	25 / 25	7	2 min.	
V.34	MTLM2001	600 / 600	1.5	0.5	24	0.1	80	20	4	56 / 56	19	4 / 3	

DC CURRENT TRANSFORMERS													
	MTLM4498	600 / 2x150	1	-2.5	14	-	45	-	3	91 / 2x8	8	0.45 min.	

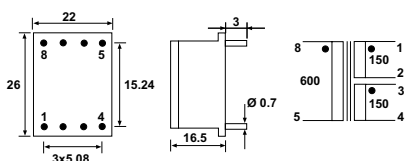
MTLM4763: Idc = 60 mA with turns ratio 2/1: 1

Dimensions and Connections

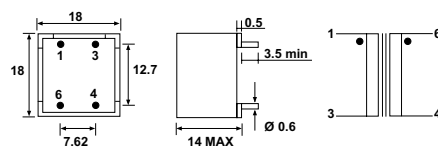
MTLM 6259



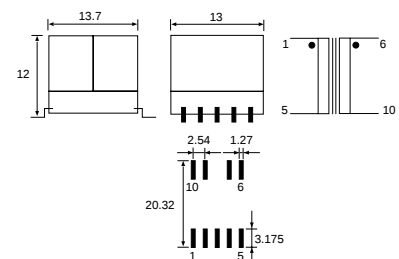
MTLM 4763



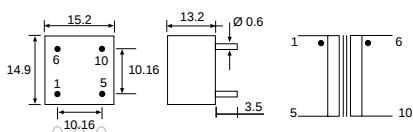
MTLM 1200 / 1200 E / 1200 C / 2001 / 2010



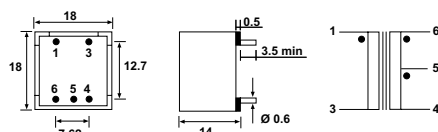
MTLM 3027S



MTLM 3027M



MTLM 1201 / 1201E / 1201B



Applications

- Modems, Fax, PABX
- EFTPOS terminals
- Multi-media cards
- Alarm communicators
- Instrumentation

56 kbps Line-Matching Transformer - MTLM 2056 series

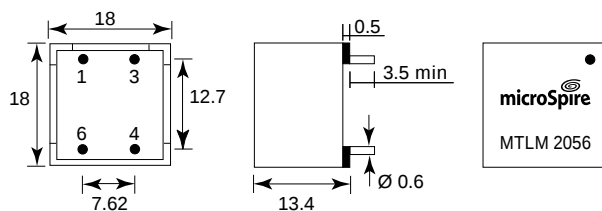


- Low signal distortion for 56 kbps transmission (V.90)
- Low leakage inductance
- Meet EN 41003 and EN 60950
- Operating temperature range: -25°C to +70°C
- Weight: 13 grams

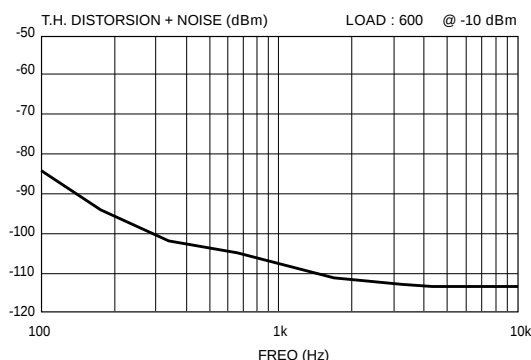
Electrical Data

Parameter	MTLM 2056	MTLM 2056C
Primary Impedance (pins 1-3)	600 ohms	600 ohms
Secondary Impedance (pins 4-6)	600 ohms	600 ohms
Turns Ratio @ 1 kHz	1 : 1 ± 1 %	1 : 1 ± 1 %
Shunt Inductance @ 200 Hz-10mV	≥ 7 H	≥ 9 H
Shunt Impedance @ 200 Hz-10mV	≥ 25 Kohms	≥ 7.5 Kohms
Leakage Inductance @ 1 KHz	≤ 25 mH	2.5 mH
Primary DC Resistance	100 ohms ± 15 %	86 ohms ± 15 %
Secondary DC Resistance	100 ohms ± 15 %	108 ohms ± 15 %

Dimensions (mm)



Distorsion



Construction

The MTLM 2056 is manufactured from materials conforming to flammability requirements of UL 94-V0 and EN 60950. It is constructed and fully encapsulated in accordance with EN 60950 and EN 41003 (reinforced), 250 Vrms maximum working voltage.

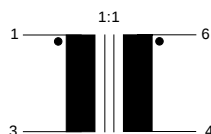
- Reinforced Isolation
- Frequency response 30 Hz to 5 kHz

The MTLM 2056C is manufactured from materials conforming to flammability requirements of UL 94-V0 and EN 60950. It is constructed and fully encapsulated in accordance with EN 60950 and EN 41003 (reinforced), 250 Vrms maximum working voltage.

- Extended bandwidth
- Frequency response 30 Hz to 15 kHz

Parameter	MTLM 2056	MTLM 2056C
Insertion Loss @ 1 kHz	1.5 dB ± 0.25	1.25 dB ± 0.25
Frequency Response (100 to 4000 Hz)	± 0.5 dB	± 0.10 dB
Return Loss (300 Hz to 4000 Hz)	16 dB min	24 dB min
Distorsion @ 200 Hz, -3dBm	-75 dB max	-75 dB max
Input DC current, max	0 mA	0 mA
Dielectric Strength (2 sec)	4 KVrms	3 KVrms
Storage Temperature Range	-40°C to +85°C	-40°C to +85°C
Operating Temperature Range	-25°C to +70°C	-25°C to +70°C

Connections

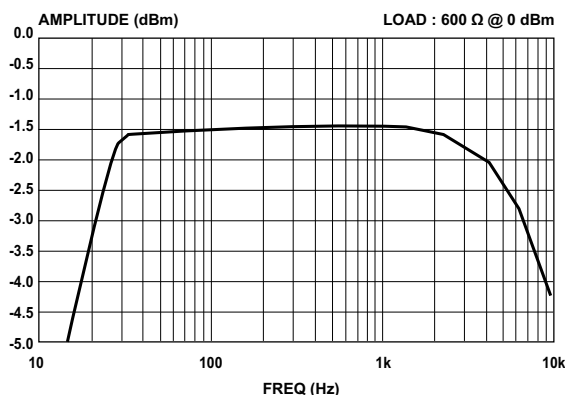


Packaging

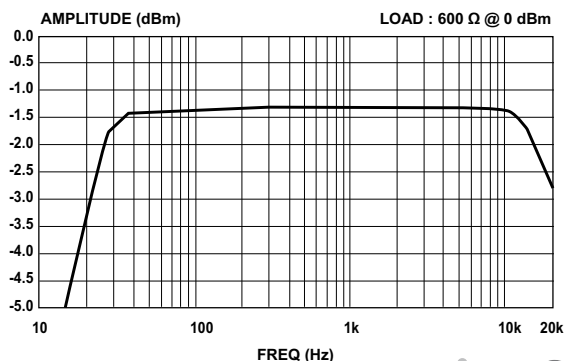
Waffle tray: 100 pieces

Frequency Response

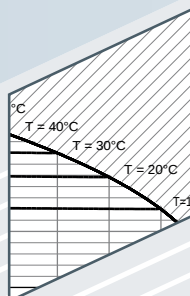
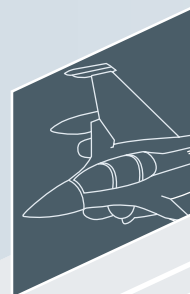
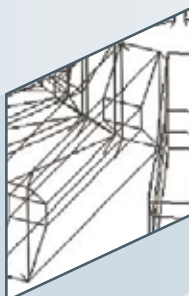
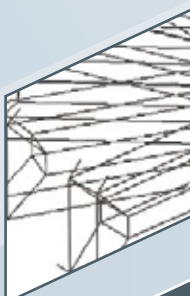
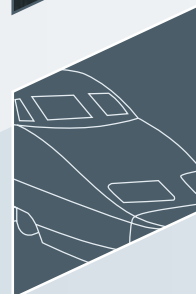
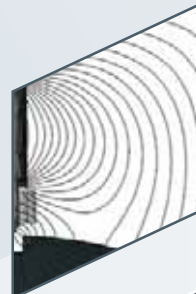
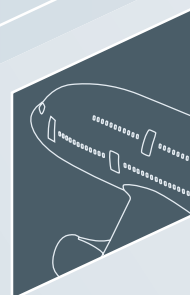
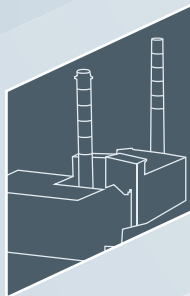
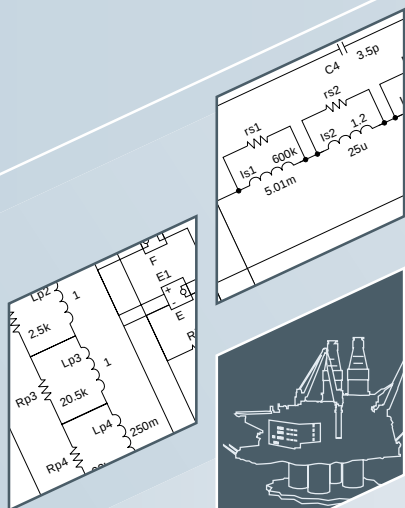
MTLM 2056



MTLM 2056C



Engineering Services
From **Design** to **Production**



Engineering Services

Electrical Modelling of Magnetics

Our 10 phd engineers, engineers and technicians use advanced engineering tools to model, analyse and optimise the electrical characteristics of wound magnetics.

Our electrical equivalent circuits are based on measurements of either a prototype or a production part and are compatible with simulation software such as PSPICE, SIMPLORER, SABER and CIRCUIT.

Modelling Principles

- Valid for wound magnetics up to 3 windings
- Independent of geometry and technology
- Assumption of linear materials behaviour
- Comparison of measured and model plots

Characteristics of an Electrical Model

- Composed of R, L, C and perfect couplers
- Taking into account:
 - magnetic coupling (magnetizing and leakage)
 - LF and HF copper and iron losses (Eddy currents)
 - electrical coupling (parasitic capacitances)
- Modelling at operating temperatures

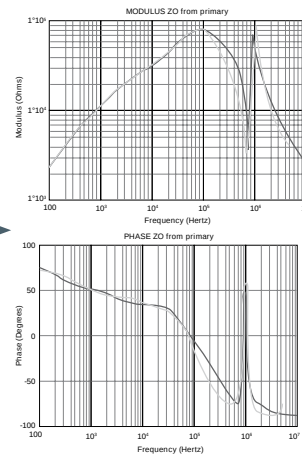
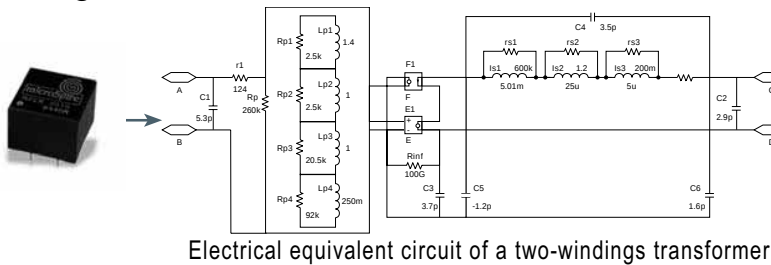
Uses

- Simulation of electronic circuits
- Computation of gains, losses, efficiencies
- Analysis of characteristics dispersion
- Approval of equivalent alternative parts
- Diagnosis of defective magnetics
- Optimisation of a part in its environment
- Design of passive filters

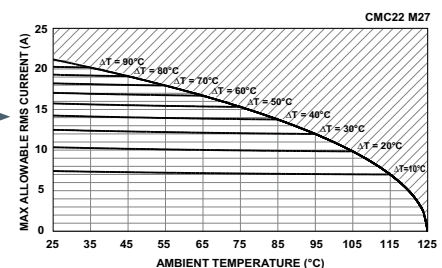
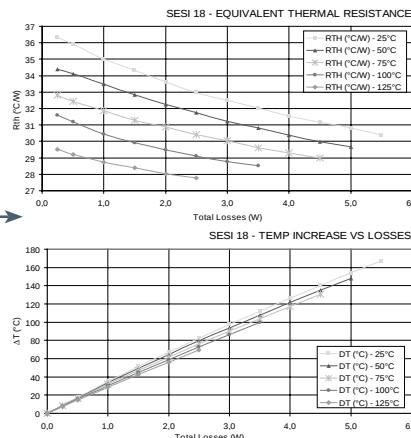
Applications

- Telecom and signal transformers
- Current and voltage measurement transformers
- Power supply inductors and transformers
- Inductive sensors

Component optimisation through electrical model



Thermal characterization of components/packages



Engineering Services

High Performance Passive Filters

MicroSpire designs and manufactures passive filters with a high performances and thermal stability for diverse applications such as ADSL telecom, public telephones, railway systems, home automation and so on.

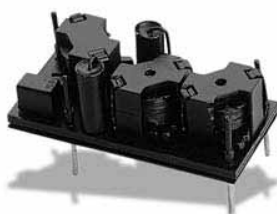
ADSL Central Office Splitters

The ACOPS splitter cards separate voice and ADSL data at the Central Office side. These cards have either 1, 4, 8 or 16 channels, each channel having a low-pass and a high-pass filter. All ADSL (TRT1) outputs have a supplementary 1500Vrms isolation with respect to the line voltage (TRT3) and the voice signal in accordance with the norm EN60950. The filters' impedances are adaptable hence they can operate with other ADSL equipment on the market.



Public Telephone Filters

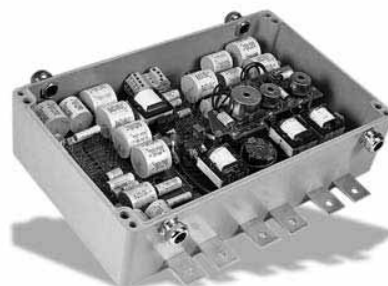
These filters are used to block either the 12, 18 or 22kHz billing count frequencies found in public telephones. They are highly selective with a -55dB attenuation at the centre frequency whilst passing without distortion the voice signals outside their narrow rejection band. As they are used in outdoor public telephones, these filters are of a rugged construction and operate between -25°C to +70°C.



Train Detection Filters

These medium-frequency filters are connected to rail tracks to detect the passage of trains by sensing the change in the impedance of a track segment at a given frequency.

These passive filters tune to and block frequencies as matched pairs to enable their operation in contiguous rail tracks. The filters are rugged to withstand train vibrations and outdoor temperatures between -25°C and +70°C.



Engineering Services

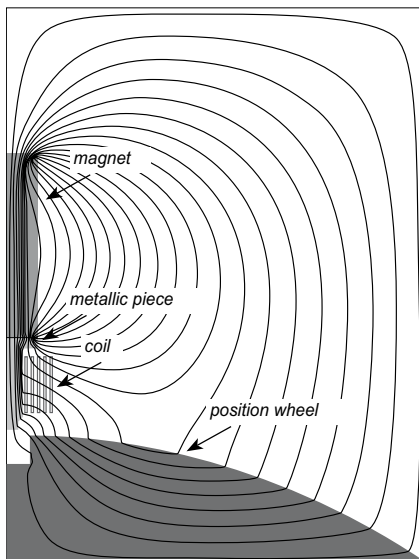
Electromagnetic Characteristics of Magnetics

Our Engineers use advanced finite-element simulation software such as Flux2D and Flux3D to model, analyse and optimise the electromagnetic behaviour of existing or to be designed magnetics.

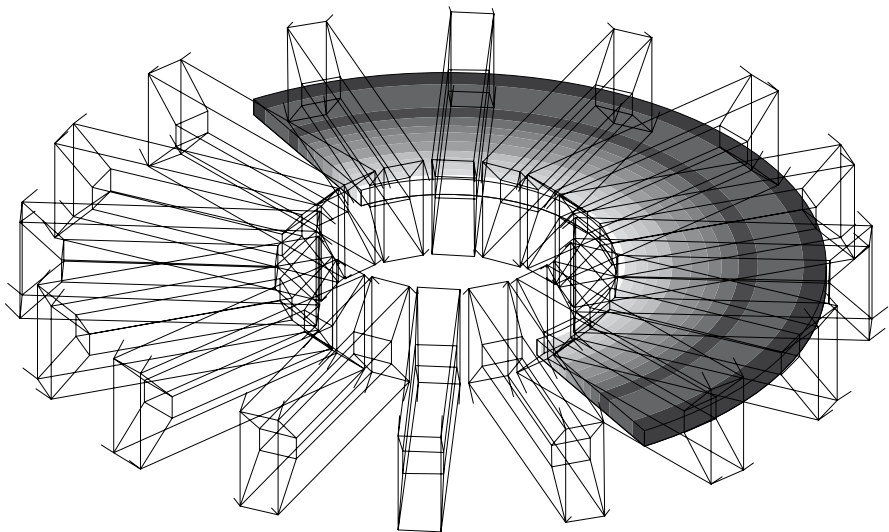
Typically, a given part optimisation project undergoes the following :

- 1- **Definition** of the mathematical problem: Taking into account the geometry and physical properties of the part
- 2- **Simulation** of the device's electromagnetic behaviour: Verification of the simulated device by comparison of results with experimental measurements
- 3- **Optimisation** of the simulated device: Functional analysis of the simulated model adjustments of its parameters
- 4- **Validation** of the model: Definition, making and test of prototypes

Examples of applications : Pulse detector for energy metering. Induction heating system. High-sensitivity presence detector in an EMI environment. Neutral position transducer for fuel injection.



Component optimisation through 2D/3D simulation



	DESIGN SPECIFICATION DATA	Sales Engineer : _____ Reference : _____ Date : _____																																															
Company Name : Contact :																																																	
Product PT-NR : Project : Yearly Quantities :																																																	
FLYBACK TRANSFORMERS																																																	
Market : ☐ AIRSPACE ☐ AVIONICS / DEFENCE ☐ RAILWAY SYSTEMS ☐ Other : ☐ TELECOM ☐ INDUSTRY ☐ AUTOMOTIVE ☐ CONSUMER																																																	
Environment : Vibrations and/or shocks : Acceleration : Humidity : Operating T° : Min/Max Storage T° : Min/Max																																																	
Applied Standards :																																																	
Functioning Mode : ☐ CONTINUOUS Max. permissible ripple current : ☐ DISCONTINUOUS Max. RMS primary current :																																																	
Magnetizing Inductance : Value : Tolerance :																																																	
Primary Voltage / Duty Cycle : Ve Min / δ Max : Ve Max / δ Min :																																																	
Secondary Characteristics : Output power range : Diode voltage drop : Working frequency : Rectified voltage (Vdc) : Vs 1 Vs 2 Vs 3 Vs 4 Current (Adc) : Is 1 Is 2 Is 3 Is 4																																																	
Shield : Prim. / Sec. : Sec. / Sec. :																																																	
Isolation : Prim. / Sec. : Sec. / Sec. : Windings / Shields : Windings / Ground :																																																	
Maximum Dimensions : Length : Width : Height :																																																	
Report Mode : ☐ SMD ☐ THROUGH-HOLE ☐ WIRES ☐ Other : _____																																																	
Finish : ☐ Box ☐ Gravity molding ☐ Transfer molding ☐ Coating ☐ None ☐ Dip impregnation ☐ Vacuum impregnation ☐ Injection																																																	
Marking : Sticker on Packing :																																																	
Packing : ☐ LOOSE ☐ STICK ☐ REEL ☐ TRAY ☐ UNITARY																																																	
MECHANICAL DRAWING	LAYOUT																																																





DESIGN SPECIFICATION DATA

Sales Engineer : _____

Reference : _____

Date : _____

Company Name : _____ Contact : _____

Product PT-NR : _____ Project : _____ Yearly Quantities : _____

STORAGE OR FILTERING INDUCTORS

Market : ☐ AIRSPACE ☐ AVIONICS / DEFENCE ☐ RAILWAY SYSTEMS
☐ Other : ☐ TELECOM ☐ INDUSTRY ☐ AUTOMOTIVE ☐ CONSUMER

Environment : Vibrations and/or shocks : _____ Acceleration : _____

Humidity : _____ Operating T° : Min/Max _____ Storage T° : Min/Max _____

Applied Standards : _____

Magnetic Circuit : ☐ NO (air coil) ☐ YES (to be defined) :Choke Value : Open : Value / Tolerance : _____On load : Value / Tolerance : _____Through current : ☐ SINUS A_{AC} (RMS) : _____☐ DC A_{DC} (AVG) : _____☐ With harmonics (please precise) : _____

DC Resistance : Value / Tolerance : _____

Working Frequency : _____ Quality Factor : _____

Isolation : _____

Maximum Dimensions : Length : _____ Width : _____ Height : _____

Report Mode : ☐ SMD ☐ THROUGH-HOLE ☐ WIRES ☐ Other :Finish : ☐ Box ☐ Gravity molding ☐ Transfer molding ☐ Coating☐ None ☐ Dip impregnation ☐ Vacuum impregnation ☐ Injection

Marking : _____ Sticker on Packing : _____

Packing : ☐ LOOSE ☐ STICK ☐ REEL ☐ TRAY ☐ UNITARY

MECHANICAL DRAWING

LAYOUT



DESIGN SPECIFICATION DATA

Sales Engineer : _____

Reference : _____

Date : _____

Company Name : _____ Contact : _____

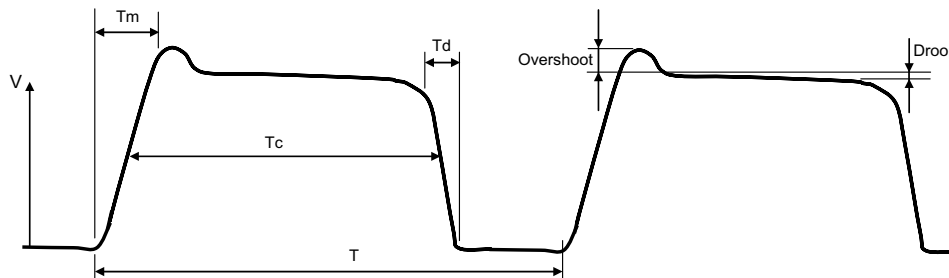
Product PT-NR : _____ Project : _____ Yearly Quantities : _____

PULSE TRANSFORMERS

Market : ☐ AIRSPACE ☐ AVIONICS / DEFENCE ☐ RAILWAY SYSTEMS
☐ Other : ☐ TELECOM ☐ INDUSTRY ☐ AUTOMOTIVE ☐ CONSUMER

Environment : Vibrations and/or shocks : _____ Acceleration : _____
 Humidity : _____ Operating T° : Min/Max _____ Storage T° : Min/Max _____

Applied Standards : _____



Tc (conduction time – lower frequency) : _____ Tm (rising time) : _____

Td (falling time – higher frequency) : _____ T (period) : _____

Prim. Voltage : _____ Sec. Voltage : _____ Max. Overshoot : _____

Prim. Current : _____ Sec. Current : _____ Max. Droop : _____

Secondary Load Impedance : _____ Source Impedance : _____

Prim. / Sec. Shield : _____ Prim. / Sec. Isolation : _____

Maximum Dimensions : Length : _____ Width : _____ Height : _____

Report Mode : ☐ SMD ☐ THROUGH-HOLE ☐ WIRE ☐ Other :Finish : ☐ Box ☐ Gravity molding ☐ Transfer molding ☐ Coating☐ None ☐ Dip impregnation ☐ Vacuum impregnation ☐ Injection

Marking : _____ Sticker on Packing : _____

Packing : ☐ LOOSE ☐ STICK ☐ REEL ☐ TRAY ☐ UNITARY

MECHANICAL DRAWING

LAYOUT

[illegible]



DESIGN SPECIFICATION DATA

Sales Engineer :

Reference :

Date :

Company Name : Contact : Product PT-NR : Project : Yearly Quantities :

SIGNAL TRANSFORMERS

Market : ☐ AIRSPACE ☐ AVIONICS / DEFENCE ☐ RAILWAY SYSTEMS
☐ Other : ☐ TELECOM ☐ INDUSTRY ☐ AUTOMOTIVE ☐ CONSUMER

Environment : Vibrations and/or shocks : Acceleration :

Humidity : Operating T° : Min/Max Storage T° : Min/Max

Applied Standards :

Application : ☐ AUDIO TRANSFORMER ☐ Other :

Primary Voltage : Vrms Min : Vrms Max :

Secondary Characteristics :

Output power range : THD+N : (dB) Working frequency : Bandwidth :

Output voltage (V_{AC} RMS) : Vs 1 Vs 2 Vs 3 Vs 4

Output current (A_{AC} RMS) : Is 1 Is 2 Is 3 Is 4

Shield : Prim. / Sec. : Sec. / Sec. :

Isolation : Prim. / Sec. : Sec. / Sec. :

Windings / Shields : Windings / Ground :

Maximum Dimensions : Length : Width : Height :

Report Mode : ☐ SMD ☐ THROUGH-HOLE ☐ WIRES ☐ Other :

Finish : ☐ Box ☐ Gravity molding ☐ Transfer molding ☐ Coating
☐ None ☐ Dip impregnation ☐ Vacuum Impregnation ☐ Injection

Marking : **Sticker on Packing :**

Packing : ☐ LOOSE ☐ STICK ☐ REEL ☐ TRAY ☐ UNITARY

MECHANICAL DRAWING

LAYOUT

IQ04/01/05a

Please return by fax this completely filled document at : +33.3.82.51.00.49

Notes



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