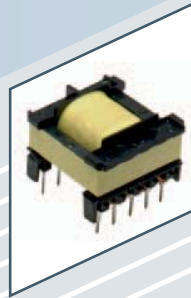
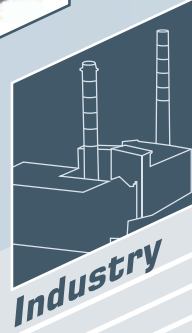
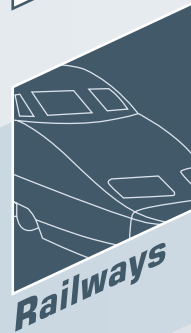
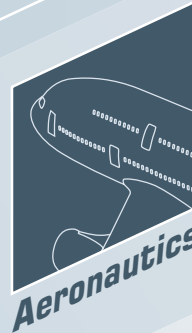
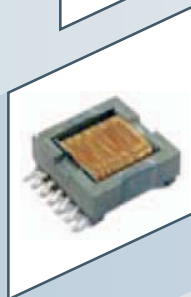


# microSpire

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

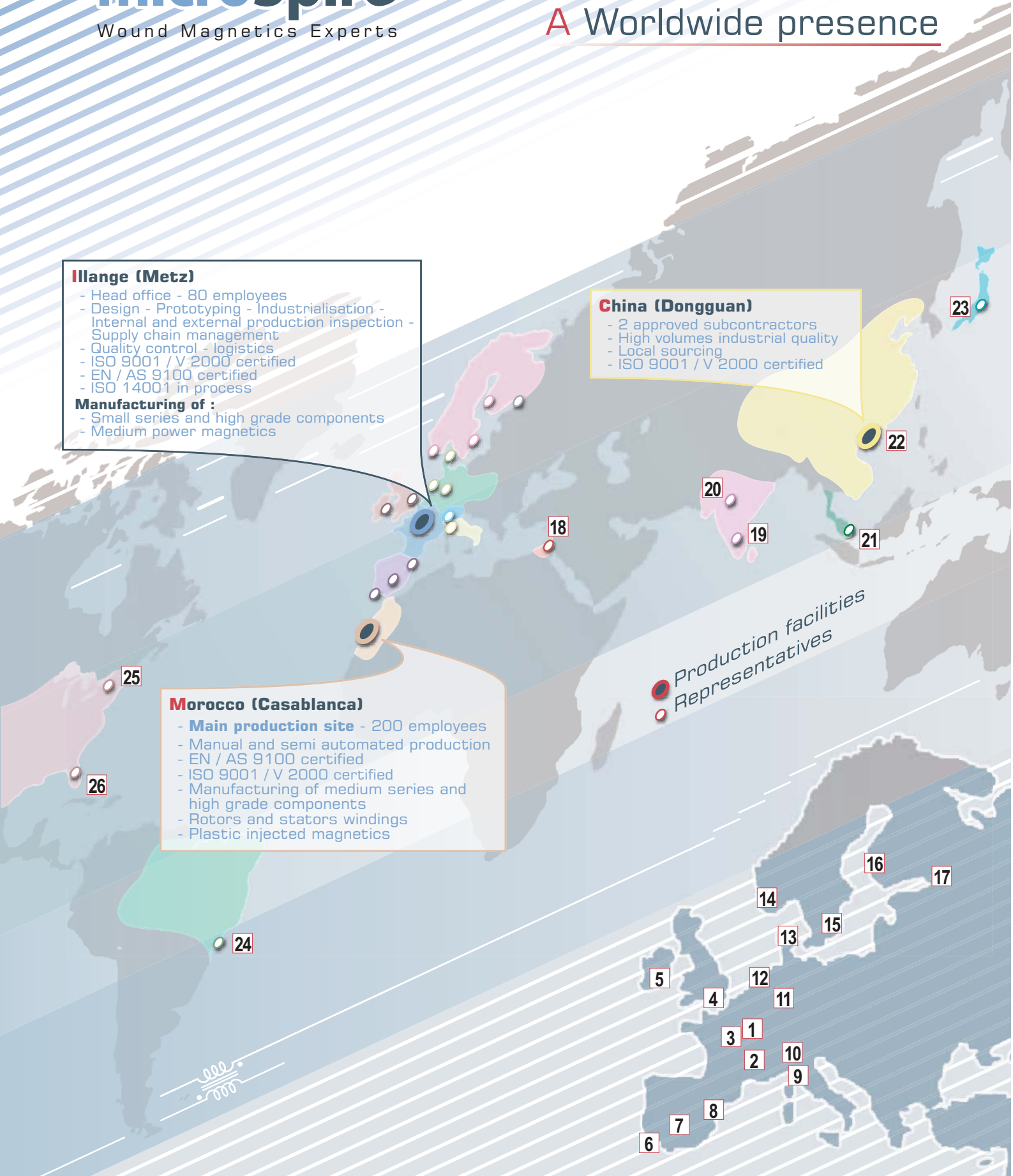
**China (Dongguan)**

- 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



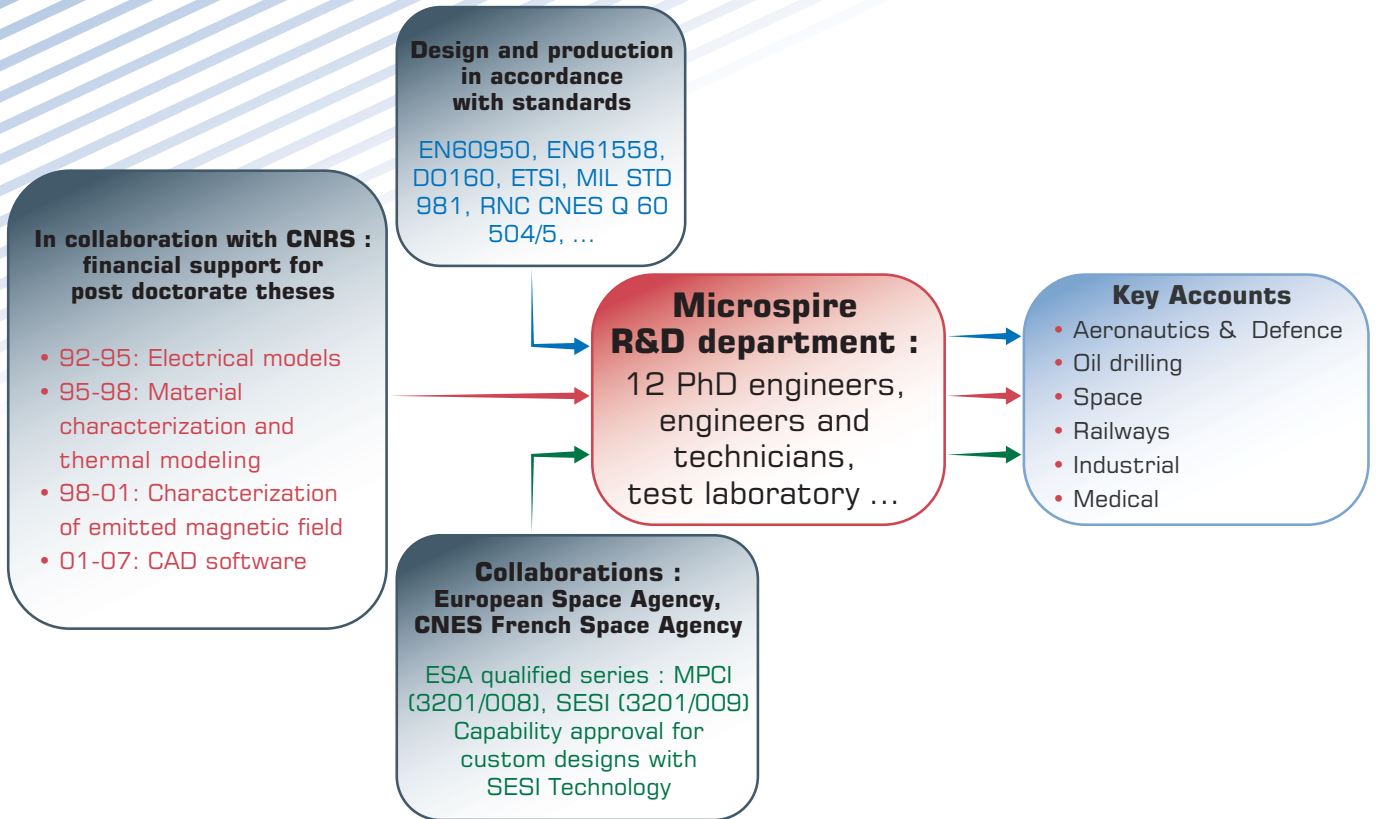
China (Dongguan)



- ISO 9001 / V2000



## Gathering expertise for your custom designs



## Our know-how in electronic functions



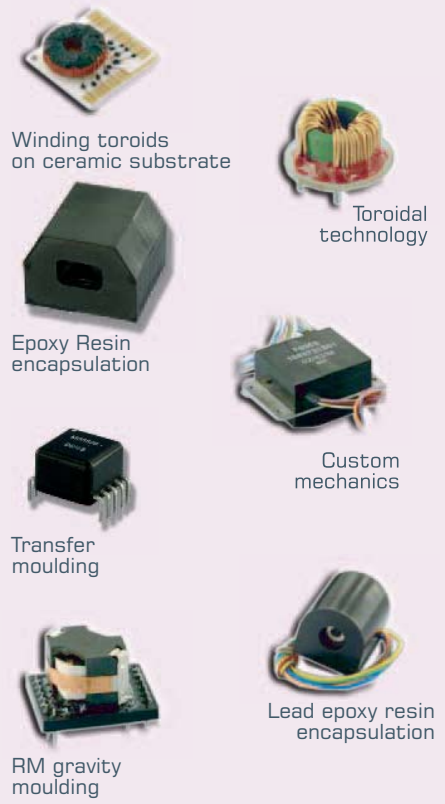
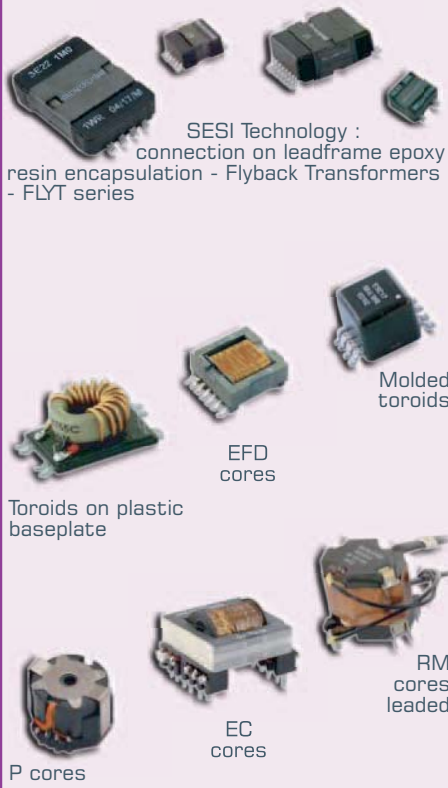
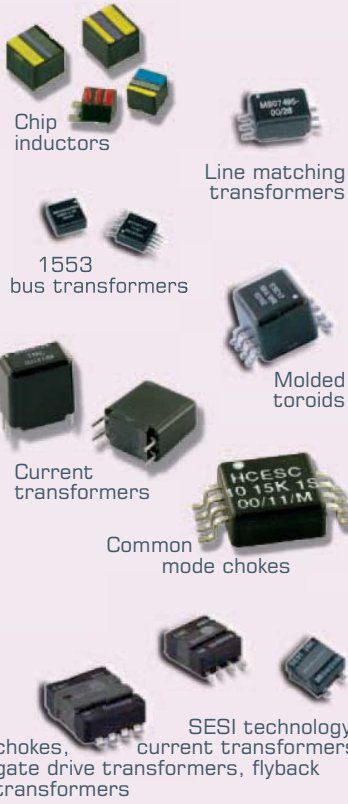
- HF signal, isolation, impedance matching transformers
- Power transformers up to several 10 KW Flyback, Forward, Push-pull topologies ...
- Chokes for active or passive PFC ...
- Integrated Magnetics
- Gate drive transformers
- Current sense or voltage measurement transformers
- 1553 Bus Transformers,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

**COTS**  
Components  
Off The Shelves

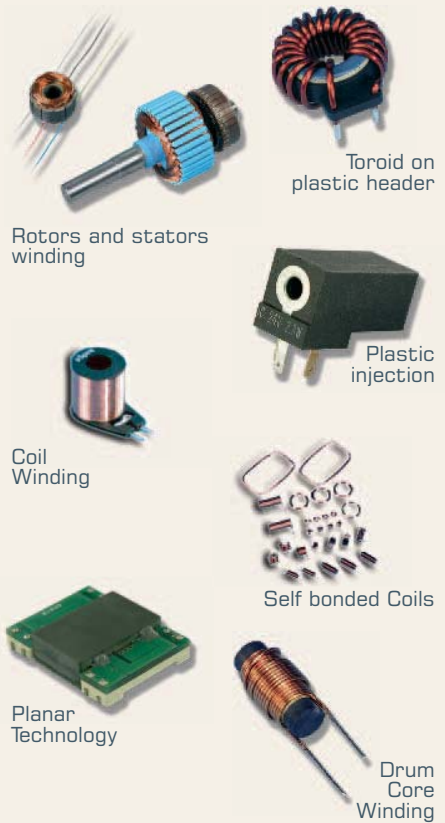
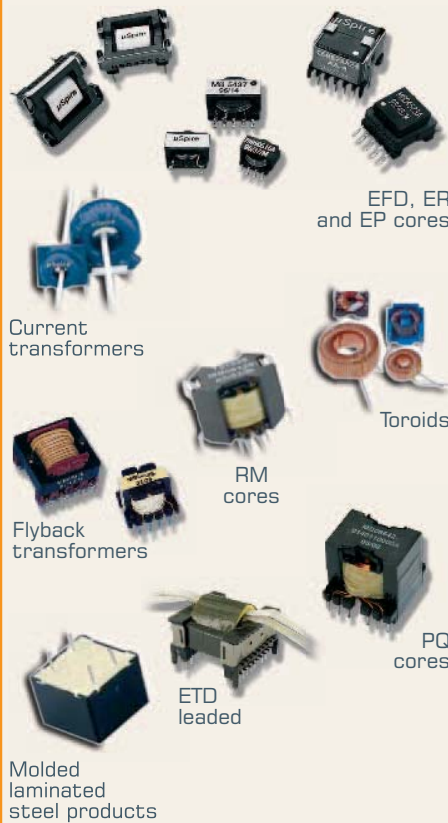
**Semi - Custom**  
Standard magnetic cores  
and Custom Functions

**Custom**  
Magnetic cores and  
Functions

High Grade Technologies



Standard Technologies

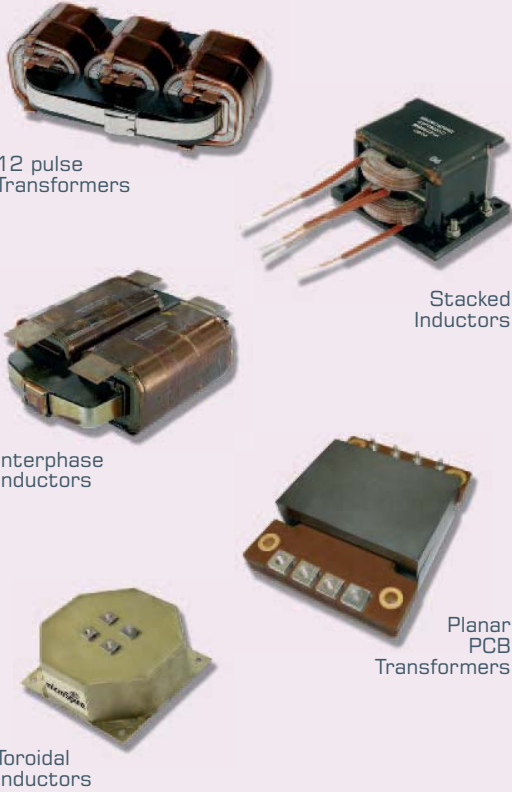




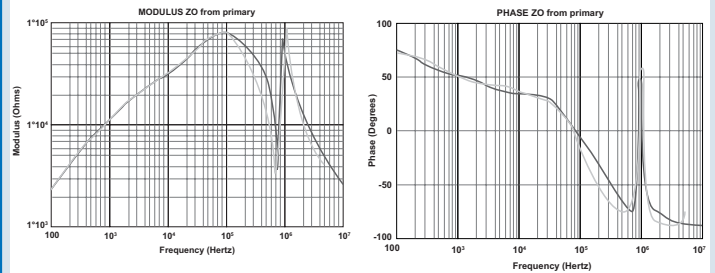
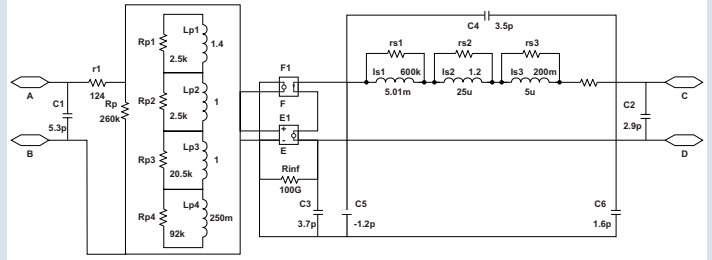
## Medium Power Flying terminations

## Engineering Support Dedicated Team

### High Grade Technologies

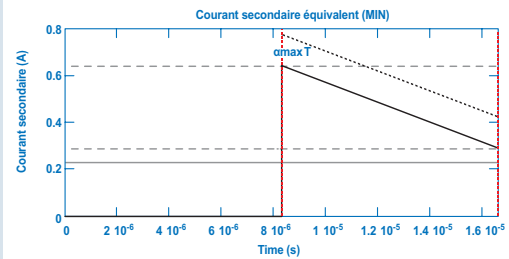


### Component optimisation through electrical model



### Transformer design and customer's functions support

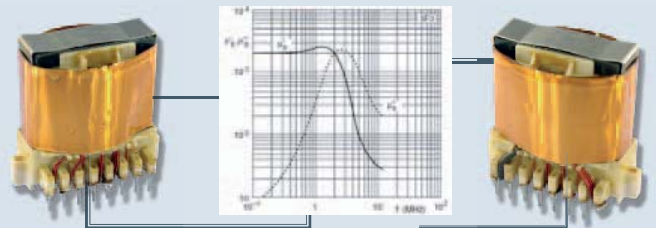
valeur efficace de ce courant :  $I_{seffMIN} = \sqrt{\frac{1}{T} \int_0^T I_{sMIN}(t)^2 dt}$   $I_{seffMIN} = 0.43$



### Standard Technologies



### 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 defect, 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.



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### Engineering Services

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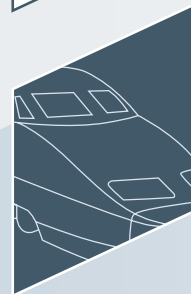
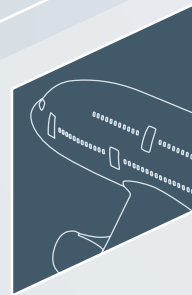
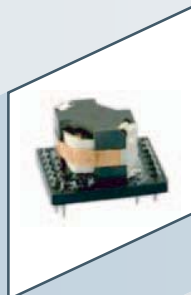
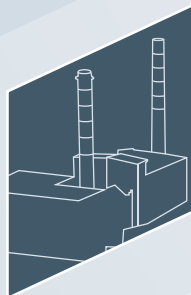
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## High\_Grade\_Technologies

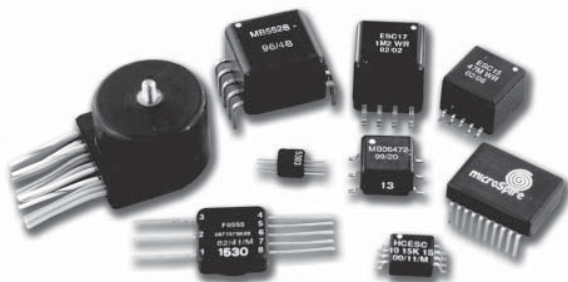
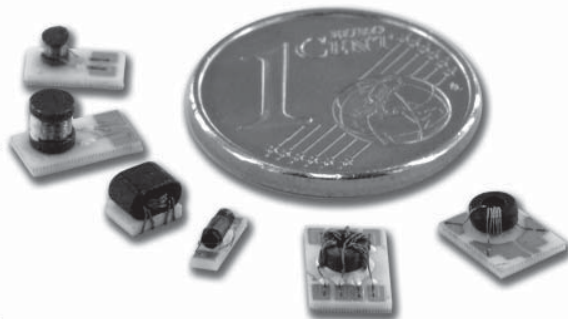
From Design to Production



## Custom Designs

### 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  $\mu\text{m}$ , bonded wire and their operating range is  $-55\text{ }^{\circ}\text{C}$  to  $+125\text{ }^{\circ}\text{C}$ .



### Transfer-Molded Components

Our transfer-molded inductive components are designed to meet the most stringent space and military requirements. The transfer-molded, ead-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. 300Hz-800Hz Inductors and Transformers, Twelve pulse Transformers (up to 150kW), Interphase Inductors.



### Customized rotors and stators

Manufacturing of: Stators from 30 to 120 mm DC and DC-brushless motors, resolvers with diameters from 10 to 80mm.





## Custom Designs

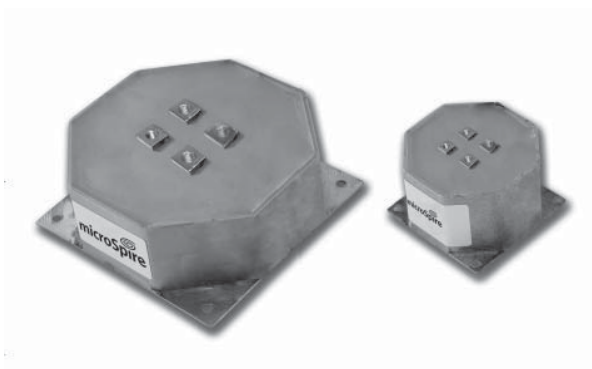


### Customized medium power C core Inductors

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.



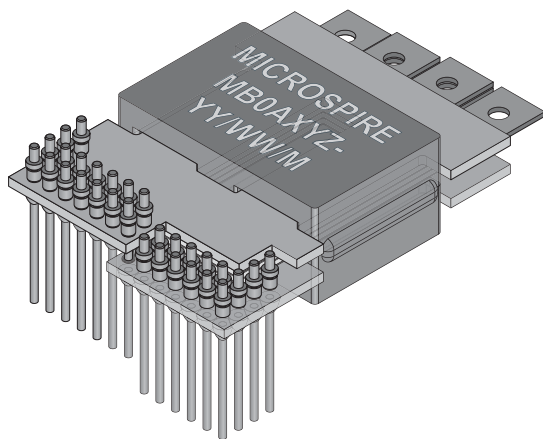
### Customized toroidal Inductors

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

### Customized planar PCB Transformers and Inductors

Power rating up to 10 KWatts,  
EE or PQ Cores.





## 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 10KWatts
- Input voltage: 12Vdc to 240-400Vdc
- Output voltage: 3Vdc to 60Vdc
- Frequency range: 50kHz to 1MHz
- Typical efficiency: 96-99%
- Temperature range: -40°C to +125°C
- Dielectric strength: up to 4000V<sub>RMS</sub>

### SMPS Topologies

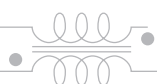
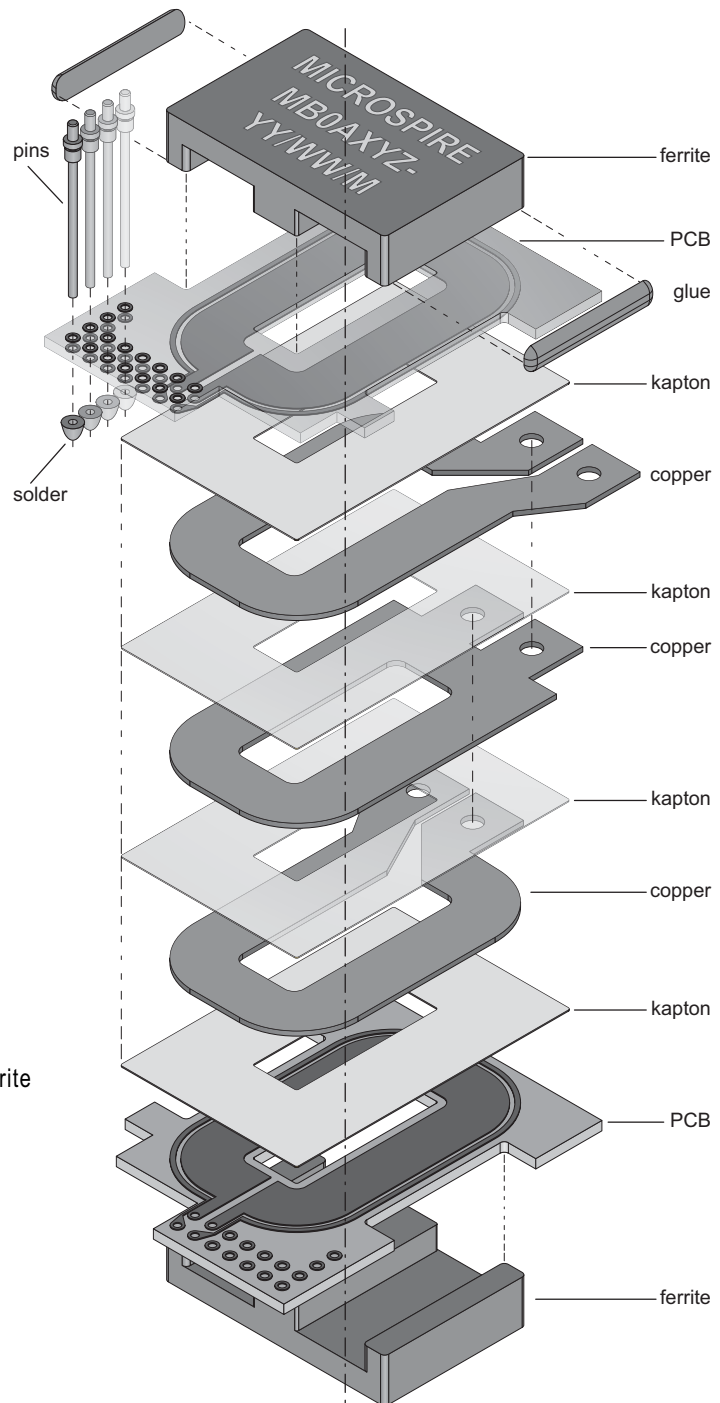
Full bridge ; Half bridge ; Push-pull ; Forward ; Flyback ; Boost ; Buck

### 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

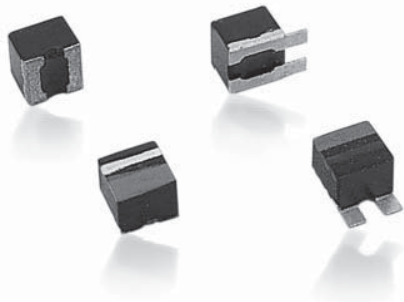
### Mounting, Connections

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









# 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	5
MPC1 10 000 022	0.022	51	100	1400	0.04	750	
MPC1 10 000 027	0.027	51	100	1200	0.04	750	
MPC1 10 000 033	0.033	47	100	1200	0.05	640	10
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	5
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	5
MPC1 10 000 220	0.22	51	50	380	0.20	350	
MPC1 10 000 270	0.27	51	50	340	0.25	310	
MPC1 10 000 330	0.33	51	50	280	0.30	280	10
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	5

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	
MPC1 10 001 200	1.20	42	7.9	110	0.75	180	2
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 : ±10 %

\*\* Tightest achievable tolerances.

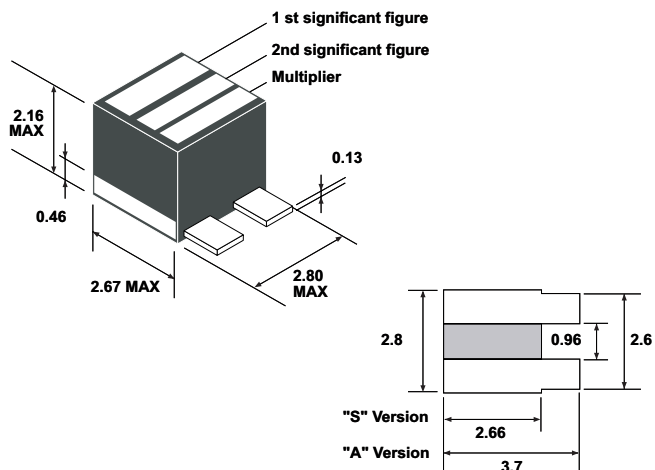
Other inductance values and S parameters on request.

Inductance variation : 35 PPM/°Cmax. in the range 0.01 to 1.2 μH  
80 PPM/°Cmax. in the range 1.5 to 10 μH

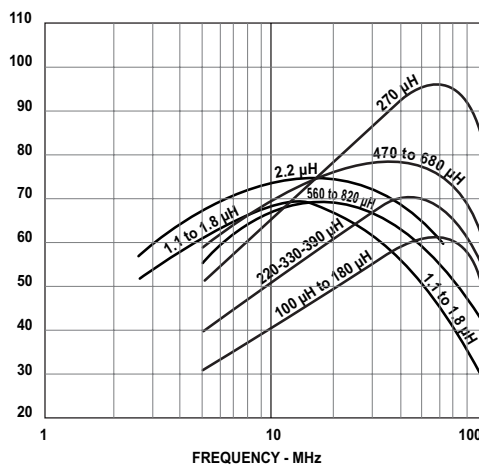
## Packaging

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 MSC10000

## QPL Components



MPCI 10000 series are usually installed on Military applications and breadboards for Space applications.

Since January 2003, Microspire has been manufacturing Radio Frequency Fixed Coils, MPCI 10000 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 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 1L0 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 4L7 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			
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			

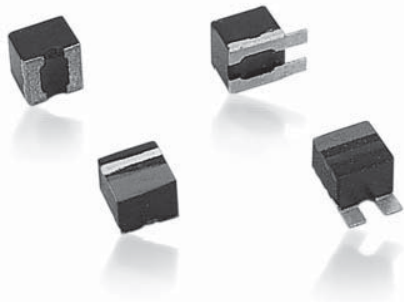
aa	b	K/J/G (tolerance)
aa = 01 for Au Termination	b = B for Chart III level B	K for ±10%
aa = 02 for SnPb Termination	b = C for Chart III level C	J for ±5%
		G for ±2%

## To Order

MPCI 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 ±10% z = 5 for ±5% z = 2 for ±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 : 790KHz to 30MHz
- Operating temperature range : -55°C to +125°C
- Weight : 0.07gram

## 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	
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	

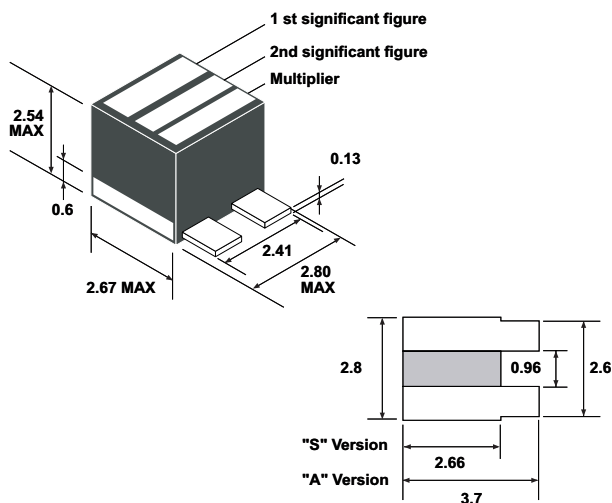
ID Code	Inductance* μH	Q Min	Test Freq. MHz	SFR Min. MHz	DCR Max. Ω	DC Current mA max	Tol** % Min
MPC12 270 000	270	26	0.79	4.0	36	26	5
MPC12 330 000	330	24	0.79	3.7	42	24	
MPC12 390 000	390	24	0.79	3.5	46	23	
MPC12 470 000	470	24	0.79	3.0	68	19	
MPC12 560 000	560	22	0.79	2.8	77	18	
MPC12 680 000	680	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: ±10%  
 \*\* Tightest achievable tolerances.  
 Other inductance values and S parameters on request.  
 Inductance variation : 80 PPM/°Cmax. in the range 12 to 100 μH  
 35 PPM/°Cmax. in the range 120 to 1000 μH

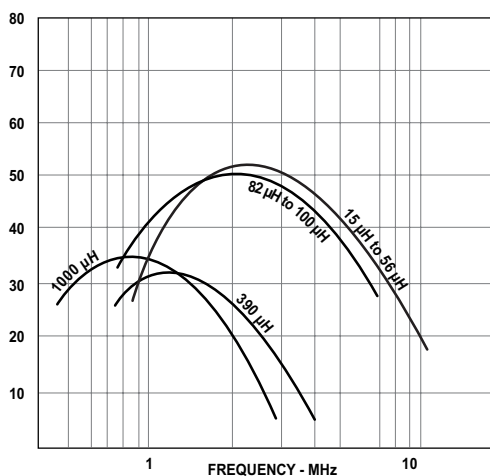
## Packaging

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 MSC12000

## 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 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 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			
			<b>aa</b>	<b>b</b>	<b>K/J/G (tolerance)</b>
			aa = <b>01</b> for Au Termination aa = <b>02</b> for SnPb Termination	b = <b>B</b> for Chart III level B b = <b>C</b> for Chart III level C	<b>K</b> for ±10% <b>J</b> for ±5% <b>G</b> for ±2%

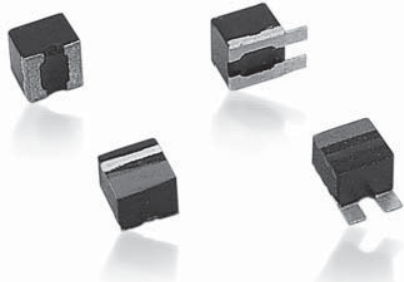
## To Order

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 = <b>G</b> for Gold x = <b>T</b> for Tinned	Terminations shape y = <b>S</b> without tab y = <b>A</b> with tab (Not valid for space use)	Tolerance : z = <b>10</b> for ±10% z = <b>5</b> for ±5% z = <b>2</b> for ±2%







# Chip Inductors - MPC20000 Series

- eesa 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	
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	
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	
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	
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	
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	
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 : ± 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

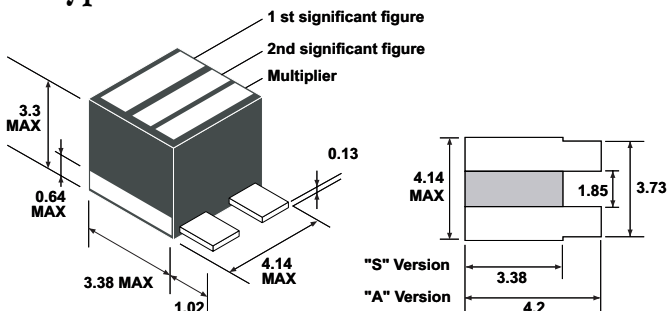
150 PPM/°Cmax. in the range 12 to 100 µH

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

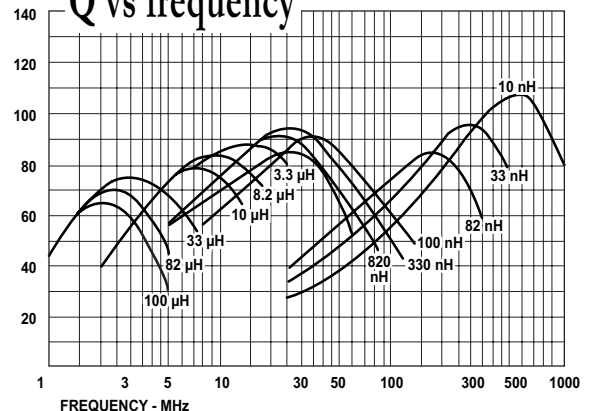
## Packaging

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

## Typical Dimensions (mm)



## Q vs frequency



# Miniature Chip Inductors MSC120000

## esa 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 L12 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 L15 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 L18 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 L22 K/J/G			
MPCI 20 002 700 x y 10/5/2	MSCI 20 002 700 x y 10/5/2	3201008 aa b L27 K/J/G			
MPCI 20 003 300 x y 10/5/2	MSCI 20 003 300 x y 10/5/2	3201008 aa b L33 K/J/G			
MPCI 20 003 900 x y 10/5/2	MSCI 20 003 900 x y 10/5/2	3201008 aa b L39 K/J/G			
MPCI 20 004 700 x y 10/5/2	MSCI 20 004 700 x y 10/5/2	3201008 aa b L47 K/J/G			

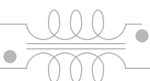
  

aa	b	K/J/G (tolerance)
aa = 03 for Au Termination	b = B for Chart III level B	K for ±10%
aa = 04 for SnPb Termination	b = C for Chart III level C	J for ±5%
		G for ±2%

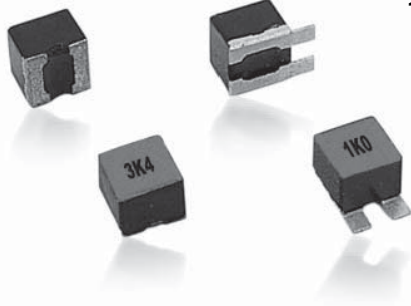
### To Order

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%



# Miniature Fixed Chip Inductors - H01 Series



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

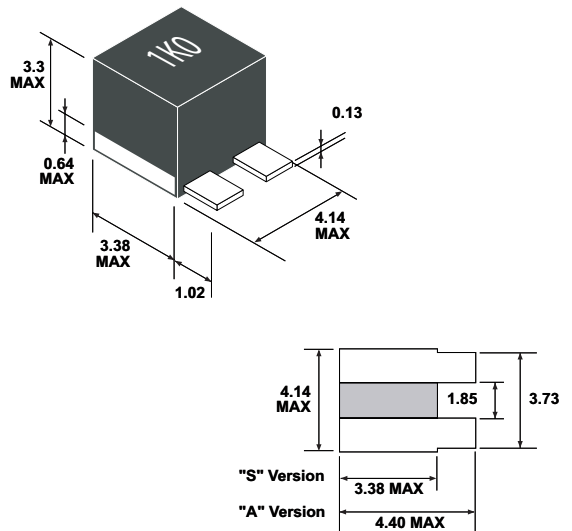
## Electrical Data (25°C)

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

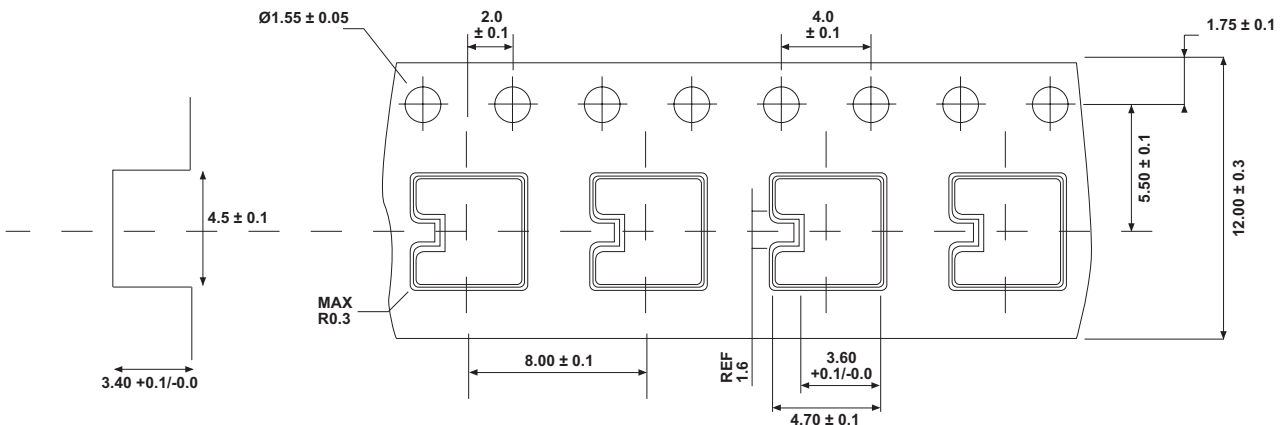
MPCI H01	###	1	x	y
Range	Inductance value	Version	Terminations x = G for Gold x = T for Tinned	y = S without tab y = A with tab

## 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.

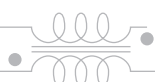
For procurement, different quality levels are offered :

- 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
<b>05</b>	<b>b</b>	<b>L (tolerance)</b>
<b>05 for SnPb Termination</b>	<b>b = B for Chart III level B b = C for Chart III level C</b>	<b>L for ±15%</b>







# Chip Inductors - MPC1233 Series

- High temp. RF inductances
- Excellent Q values even at high frequencies
- Very high self-resonant frequencies (SFRs)
- With or without tab terminations
- Tinned or gold plated terminations
- Frequency range : 1 MHz to 1 GHz
- 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
MPC1233 000 010	0.010	60	150	2000	0.04	1000	10
MPC1233 000 012	0.012	70	150	1800	0.04	1000	
MPC1233 000 015	0.015	75	150	1500	0.04	1000	
MPC1233 000 018	0.018	75	150	1500	0.04	1000	5
MPC1233 000 022	0.022	60	100	1300	0.05	1000	
MPC1233 000 027	0.027	60	100	1300	0.05	1000	
MPC1233 000 033	0.033	60	100	1000	0.05	1000	10
MPC1233 000 039	0.039	60	100	1000	0.06	900	
MPC1233 000 047	0.047	65	100	800	0.06	900	
MPC1233 000 056	0.056	65	100	760	0.06	900	5
MPC1233 000 068	0.068	65	100	700	0.07	840	
MPC1233 000 082	0.082	65	100	650	0.07	840	
MPC1233 000 100	0.100	65	50	570	0.07	840	10
MPC1233 000 120	0.120	65	50	520	0.07	840	
MPC1233 000 150	0.150	75	50	400	0.08	790	
MPC1233 000 180	0.180	75	50	360	0.08	790	5
MPC1233 000 220	0.220	70	50	320	0.08	790	
MPC1233 000 270	0.270	70	50	270	0.10	700	
MPC1233 000 330	0.330	70	50	240	0.10	700	10
MPC1233 000 390	0.390	70	50	220	0.10	700	
MPC1233 000 470	0.470	70	25	190	0.14	590	
MPC1233 000 560	0.560	70	25	170	0.19	510	5
MPC1233 000 680	0.680	70	25	160	0.26	430	
MPC1233 000 820	0.820	75	25	150	0.30	400	
MPC1233 001 000	1.00	75	25	130	0.34	380	10
MPC1233 001 200	1.20	65	7.9	120	0.45	330	
MPC1233 001 500	1.50	65	7.9	110	0.57	290	
MPC1233 001 800	1.80	65	7.9	100	0.72	260	5
MPC1233 002 200	2.20	65	7.9	80	0.90	230	
MPC1233 002 700	2.70	65	7.9	60	1.10	210	
MPC1233 003 300	3.30	60	7.9	50	1.20	200	10
MPC1233 003 900	3.90	60	7.9	45	1.40	180	
MPC1233 004 700	4.70	60	7.9	42	1.60	170	
MPC1233 005 600	5.60	65	7.9	40	1.80	160	5
MPC1233 006 800	6.80	65	7.9	37	2.40	140	
MPC1233 008 200	8.20	65	7.9	34	3.00	130	
MPC1233 010 000	10.0	65	7.9	29	3.50	120	10
MPC1233 012 000	12.0	60	2.5	27	3.60	118	
MPC1233 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
MPC1233 018 000	18.0	60	2.5	17	3.80	114	2
MPC1233 022 000	22.0	60	2.5	16	3.90	113	
MPC1233 027 000	27.0	65	2.5	15	4.00	110	
MPC1233 033 000	33.0	65	2.5	14	5.00	100	10
MPC1233 039 000	39.0	65	2.5	13	7.00	84	
MPC1233 047 000	47.0	70	2.5	12	8.00	79	
MPC1233 056 000	56.0	70	2.5	11	10.0	70	5
MPC1233 068 000	68.0	65	2.5	10	11.0	67	
MPC1233 082 000	82.0	60	2.5	9	12.0	64	
MPC1233 100 000	100	60	2.5	8	13.0	62	10
MPC1233 120 000	120	40	0.79	7	14.0	59	
MPC1233 150 000	150	40	0.79	6	16.0	56	
MPC1233 180 000	180	40	0.79	5	18.0	52	5
MPC1233 220 000	220	40	0.79	4	24.0	45	
MPC1233 270 000	270	40	0.79	3.3	25.0	44	
MPC1233 330 000	330	40	0.79	3;1	29.0	41	10
MPC1233 390 000	390	40	0.79	2.9	32.0	39	
MPC1233 470 000	470	35	0.79	2.4	35.0	37	
MPC1233 560 000	560	35	0.79	2.1	45.0	33	5
MPC1233 680 000	680	35	0.79	1.9	55.0	30	
MPC1233 820 000	820	30	0.79	1.8	70.0	26	
MPC1233 1000 000	1000	30	0.79	1.7	80.0	25	

\* Standard inductance tolerance : ±10 %

\*\* Tightest achievable tolerances.

Other inductance values and S parameters on request.

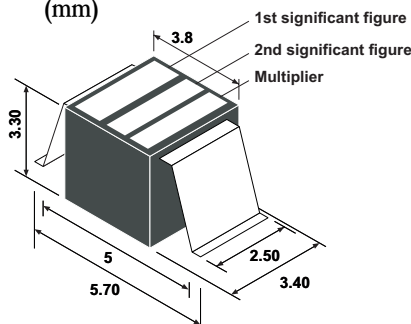
Inductance variation : 60 PPM/°Cmax. in the range 0.01 to 1 μH  
 80 PPM/°Cmax. in the range 1.2 to 10 μH  
 150 PPM/°Cmax. in the range 12 to 100 μH  
 300 PPM/°Cmax. in the range 120 to 1000 μH

## To Order

MPC1233 ### ## x y

MPC1233	### ##	x	y
Range	Inductance Value	Terminations x = G for Gold x = T for Tinned	Tolerance : y = 10 for ±10% y = 5 for ±5% y = 2 for ±2%

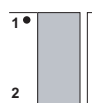
## Typical Dimensions (mm)



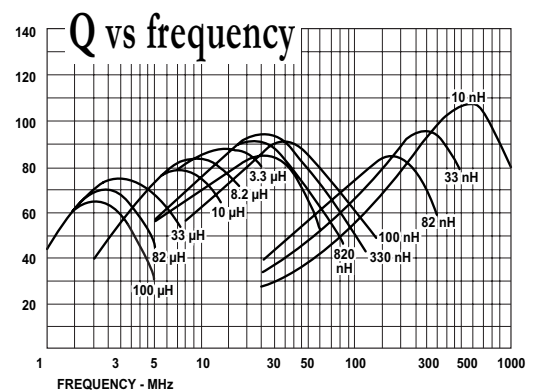
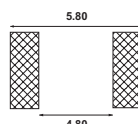
## Packaging

Tray

## Connections



## Pad Layout (mm)



# Miniature Fixed Chip Inductors - 233 H01 Series



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

## Electrical Data (25 $^{\circ}\text{C}$ )

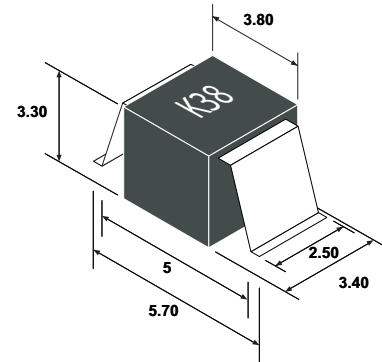
ID Code	Inductance $\mu\text{H} \pm 15\%$	IDC* Amps	DCR $\text{m}\Omega \pm 15\%$
MPCI 233 H01 K38 1x	0.38	1.5	16.0
MPCI 233 H01 K67 1x	0.67	1.25	25.0
MPCI 233 H01 1K0 1x	1.0	1.0	38.0
MPCI 233 H01 1K5 1x	1.5	0.85	54.0
MPCI 233 H01 2K0 1x	2.0	0.70	79.0
MPCI 233 H01 2K7 1x	2.7	0.62	100
MPCI 233 H01 3K4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

\* Max permanent DC current at +125  $^{\circ}\text{C}$ .

Ambient temperature: -55 $^{\circ}\text{C}$ /+175  $^{\circ}\text{C}$

Storage temperature: -55  $^{\circ}\text{C}$ /+125  $^{\circ}\text{C}$

## Typical Dimensions (mm)

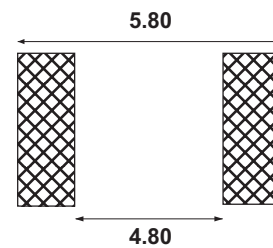


## To Order

MPCI 233 H01 ### 1x

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

## Pad Layout (mm)

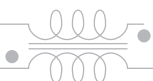


## Application

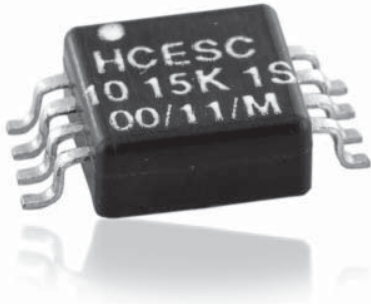
Output filtering in low power DC / DC conversion

## Packaging

Tray



# 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

- 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) $\mu$ H	Rdc Max (at 80°C) m $\Omega$	Impedance (at 100kHz) $\Omega$	Rated Current max A	Isolation between windings Vrms	Max attenuation on 50 $\Omega$ 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)

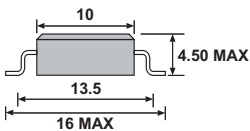
## To Order

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

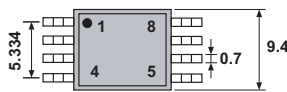
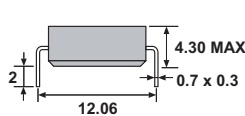
HCESC10 ### 1x

## Typical Dimensions (mm)

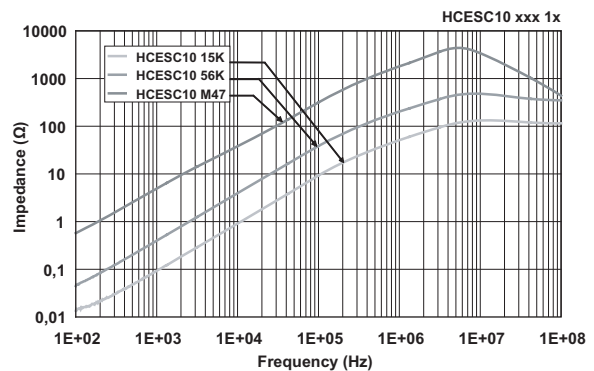
Surface-mount  
HCESC10 ### 1S



Through-hole  
HCESC10 ### 1P

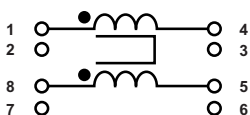


## Response Curves



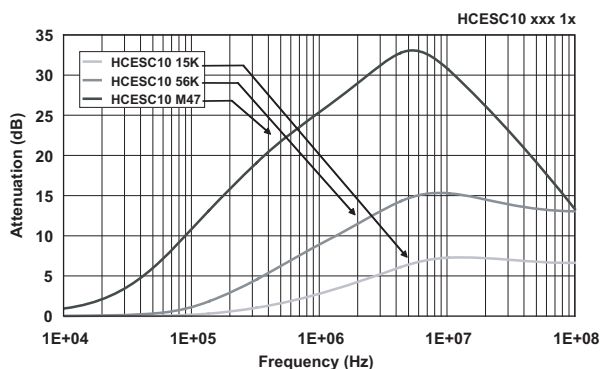
Typical Impedance versus Frequency (@100mV)

## 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.

- 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 $\mu\text{H}$	RDC max $\text{m}\Omega$	Isolation $\text{Vrms}$
DLEF42 020 1S	2	100	5	250	250

## Application

Digital video signal filtering for CCD acquisition

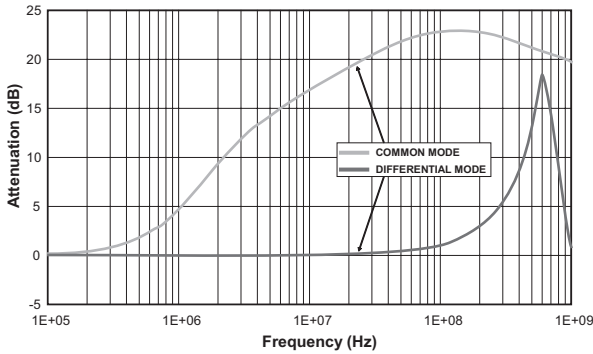
## To Order

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

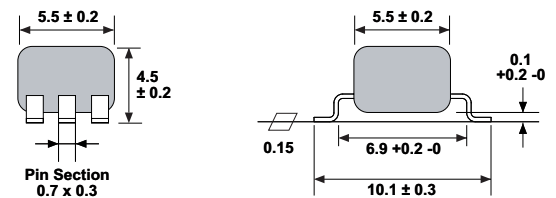
## Response Curves



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

## Typical Dimensions (mm)

Surface-mount case

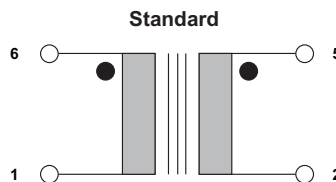


## Marking

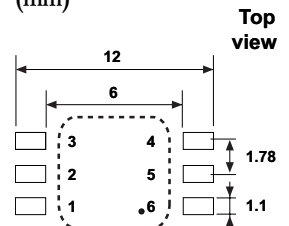


DL42 02 01 :  
Microspire part number  
yyww : Date code

## Connections



## Pad Layout (mm)





# Wide Band RF Transformers - WRFT 4x Series

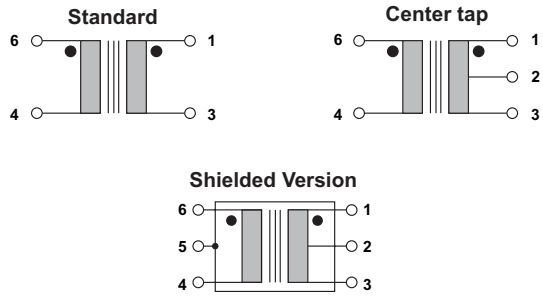


- Transfer-moulded encapsulation for higher reliability
- Power input max. 250mW
- Isolation prim. to sec. 500V<sub>DC</sub> minimum
- Suitable for IR and vapor reflow soldering
- SMD or through-hole cases
- Bandwidth: 100 KHz to 400 MHz
- Operating temperature -55 °C to +125 °C
- Weight: 1.5 grams
- Shielded version upon request

## Electrical Data (25°C)

ID Code	Impedance ratio (Ω)	Bandwidth (MHz)		
		3 dB	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

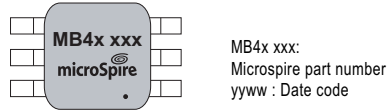
## Connections



## To Order

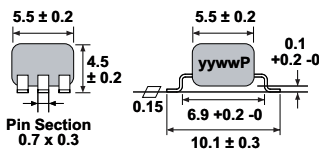
WRFT4	#	###	1	x
Range	1 = without center tap 2 = with center tap	Impedance ratio	Version	x = S surface mount x = P through hole x = Q Shielded

## Marking

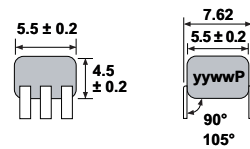


## Typical Dimensions (mm)

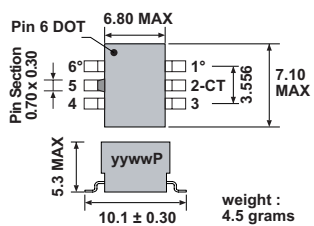
Surface-mount case  
WRFT4# ### 1S



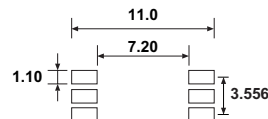
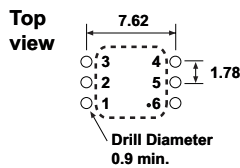
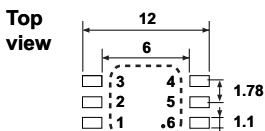
Through-hole case  
WRFT4# ### 1P



SMD shielded case  
WRFT4# ### 1Q



## Pad Layout (mm)



## Applications

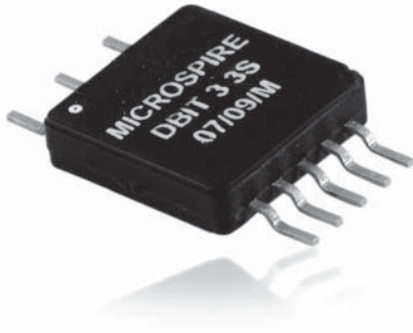
Impedance matching, DC isolation, balanced-unbalanced mixing, power splitting, coupling and signal inversion

## Packaging

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



# 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-70-02
- Open-circuit impedance greater than 3kΩ (4kΩ typical value) from 75KHz to 1MHz
- Frequency range 75KHz to 1MHz
- Operating temperature range: -55°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	DC MAX Resistance 1-3	DC MAX Resistance 4-8	Primary Inductance (mH) min at 75 kHz-1V
DBIT 2 3S	1 : 1	1 : 0.707	3	3.3	Lp (1-3) 7
DBIT 3 3S	1.2 : 1	1.67 : 1	3	2.7	Lp (1-3) 7
DBIT 6 3S	2.3 : 1	3.2 : 1	3	1.5	Lp (1-3) 7
DBIT 7 3S	1.25 : 1	1.66 : 1	3	3.3	Lp (1-3) 7
DBIT 8 3S	1 : 2.12	1 : 1.5	1.8	3.5	Lp (4-8) 7

## Notes

Common mode rejection : 45 dBmin.  
 Dielectric withstanding voltage : 100 Vrms.  
 Insulation resistance : 1000 MΩ min.  
 tolerance ratio ±3 %.

## To Order

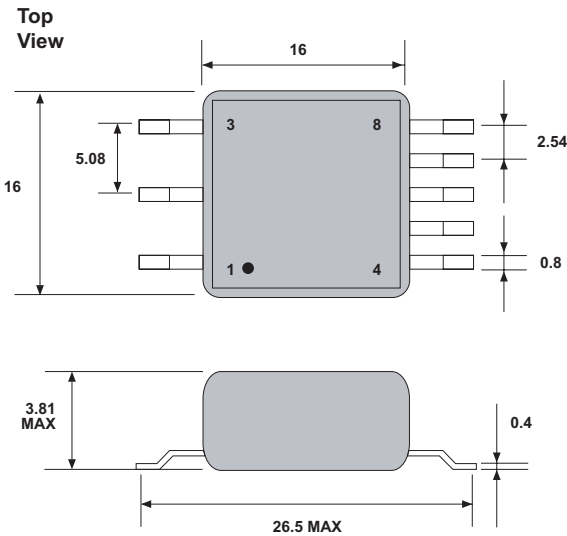
DBIT	#	3	S
Range	Transceiver type	Case height 3	S SMD

DBIT # 3S

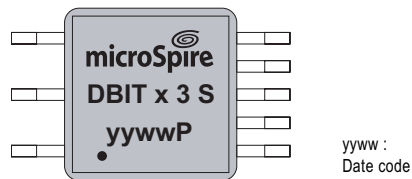
## Packaging

Individually packed : 32 parts on 2 layers.  
 Tape & reel up from 500 pieces minimum.

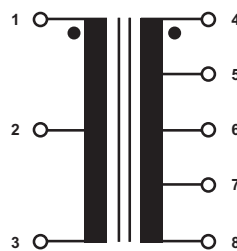
## Typical Dimensions (mm)



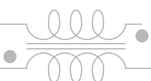
## Marking



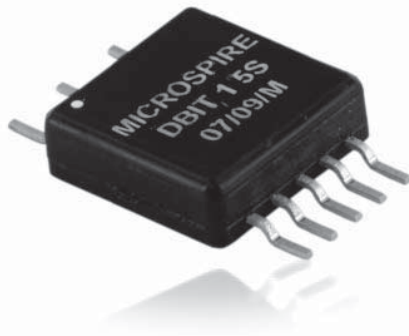
## Connections



High Grade Technologies...  
 RF and Data Magnetics...  
 Bus Transformers.



# 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-70-02
- Open-circuit impedance greater than  $3k\Omega$  ( $4k\Omega$  typical value) from 75KHz to 1MHz
- Frequency range 75KHz to 1MHz
- Operating temperature range:  $-55^{\circ}\text{C}$  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	DC MAX Resistance 1-3	DC MAX Resistance 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 : 0707	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 5 5S	1 : 2.5	1 : 1.79	1.2	2.7	Lp (4-8) 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 $\Omega$ min.  
tolerance ratio  $\pm 3\%$ .

## To Order

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

DBIT # 5S

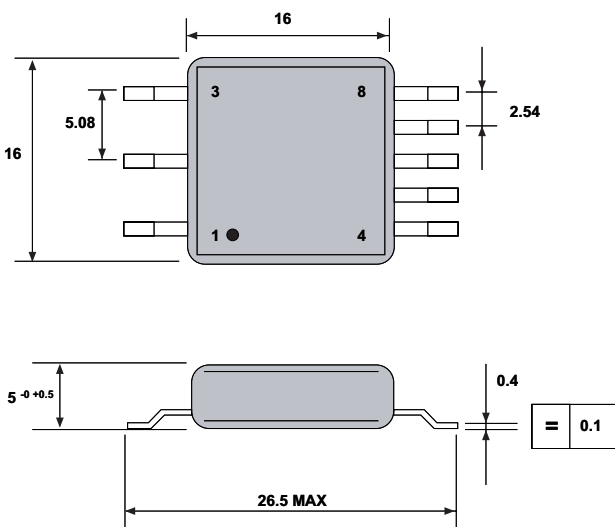
## Packaging

Individually packed: 32 parts on 2 layers.  
Tape & reel up from 500 pieces minimum.

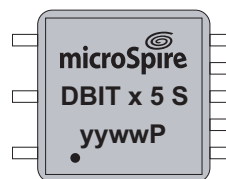
## Typical Dimensions (mm)

Low-profile design

Top View

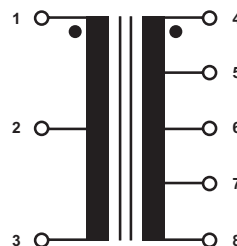


## Marking



yyww :  
Date code

## Connections



# MIL-STD 1553 Interface Transformers - DBIT x 7 x



- 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-70-02
- Open-circuit impedance greater than 3kΩ (4kΩ 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	DC MAX Resistance 1-3	DC MAX Resistance 4-8	Primary Inductance (mH) min at 75 kHz-1V
DBIT 17x	1.4 : 1	2 : 1	2	1.6	Lp (1-3) 7
DBIT 27x	1 : 1	1 : 0707	2	2.2	Lp (1-3) 7
DBIT 37x	1.2 : 1	1.67 : 1	2	2	Lp (1-3) 7
DBIT 57x	1 : 2.5	1 : 1.79	1	2.2	Lp (4-8) 7
DBIT 67x	2.3 : 1	3.2 : 1	2	1	Lp (1-3) 7
DBIT 77x	1.25 : 1	1.66 : 1	2	2	Lp (1-3) 7
DBIT 87x	1 : 2.12	1 : 1.5	1	2.2	Lp (4-8) 7

## Notes

Common mode rejection : 45dBmin.  
 Dielectric withstanding voltage : 100Vrms.  
 Insulation resistance : 1000MΩmin.  
 tolerance ratio ±3%.

## To Order

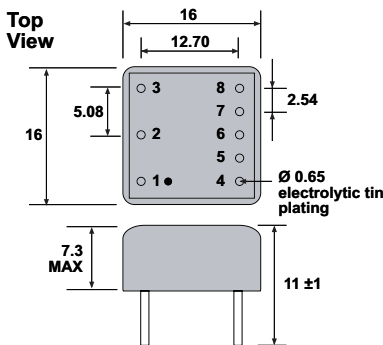
DBIT	#	7	x
Range	Part 1 to 8	Case height 7	x = P Pins x = P10 Pins (10 mm) x = S SMD

## Packaging

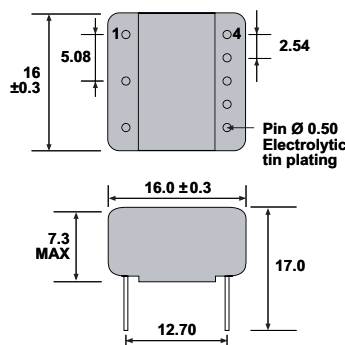
Individually packed : 32 parts on 2 layers.

## Typical Dimensions (mm)

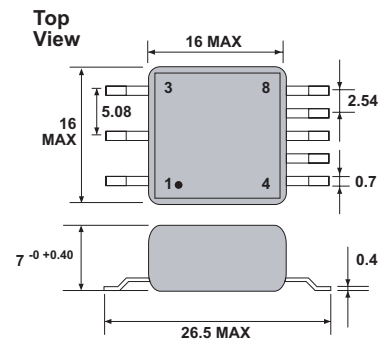
DBITx7P



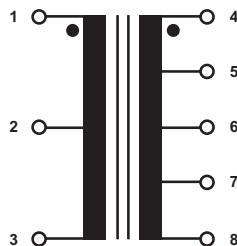
DBITx7P10 - Bottom view



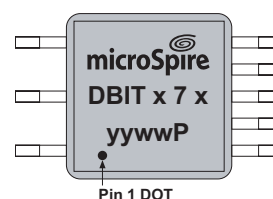
DBITx7S



## Connections

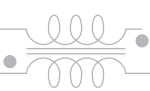


## Marking



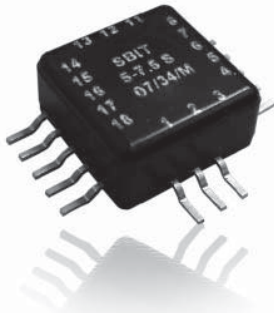
yyww :  
Date code

High Grade Technologies...  
RF and Data Magnetics...  
Bus Transformers.





# 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-70-02
- Open-circuit impedance greater than 3kΩ (4kΩ 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 1xx	SBIT 2xx	SBIT3xx	SBIT 4xx	SBIT 5xx	SBIT 6xx	SBIT 7xx	SBIT 8xx
<b>Frequency Response</b>									
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
<b>Common-Mode Rejection (min)</b>									
	dB	45	45	45	45	45	45	45	45
<b>Electrical Requirements</b>									
Terminal Winding Resistance Rdc									
• 1-3 (max)	Ω	3.5	3	1.9	1	1	1.2	3.2	1
• 4-8 (max)	Ω	3	3	1.9	3	3	3	3	3
Interwinding Capacitance (max)									
Winding Inductance	pF	70	30	70	45	45	70	70	70
• LM (min)	mH	7.5	7.5	7.5	6.0	6.0	8.0	8.0	6.0
• LL (max)	μH	6.0	6.0	6.0	8.0	6.0	8.0	6.0	7.0
<b>Peak-to-Peak Voltage (max)</b>									
Terminals 1-3 primary	Vpp	60	60	60	38	38	39	60	44
<b>Droop (max)</b>									
3 ms Pulse Duration									
140 Ω Load Across Terminals 4-8	%	10	10	10	10	10	10	10	10
<b>Decay Time (max)</b>									
140 Ω Load Across Terminals 4-8	ns	25	25	25	25	25	25	25	25
<b>Backswing</b>									
140 Ω Load Across Terminals 4-8	%	none	none	none	none	none	none	none	none
<b>Turns Ratios</b>									
Terminals									
• 1-3 : 4-8		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		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

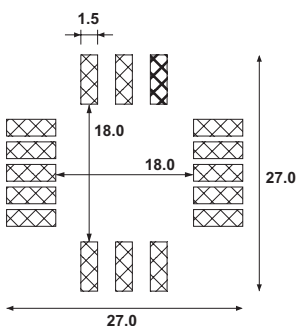
SBIT	#	7.5	S
Range	Part 1 to 8	Case height 7.5	S SMD

SBIT # 7.5S

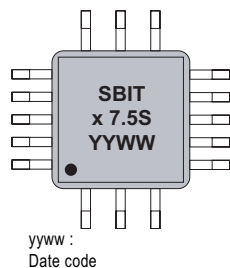
## Notes

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

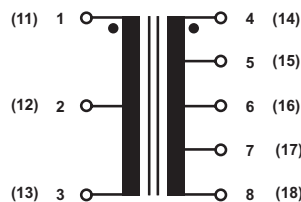
## Pad Layout



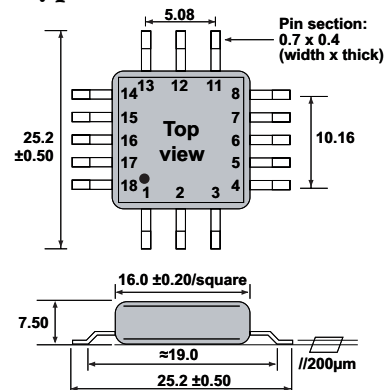
## Marking



## Connections



## Typical Dimensions (mm)



# Line-Matching Transformer - MTLM 1234 Mil

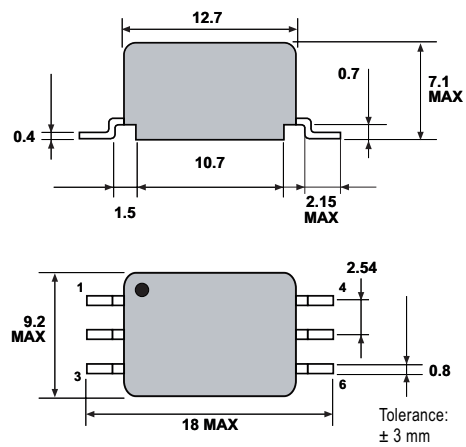


- Line isolation and impedance matching
- Transfer-moulded encapsulation
- Materials meet UL94-V0 rating
- Surface-mount package
- Frequency range 100 Hz to 10 kHz
- Operating temperature range : -55 °C to +125 °C
- Weight : 2.5 grams

## 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	≥ 3H
Shunt Resistance at 200Hz, 0.15V	≥ 6000Ω
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)	4kVrms
Isolation	6.5kVdc
Operating Temperature Range	-55°C to + 125°C
Storage Temperature Range	-55°C to + 125°C

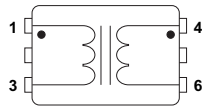
## Typical Dimensions (mm)



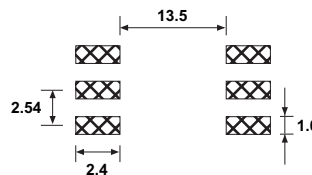
## Application

Line isolation and impedance matching

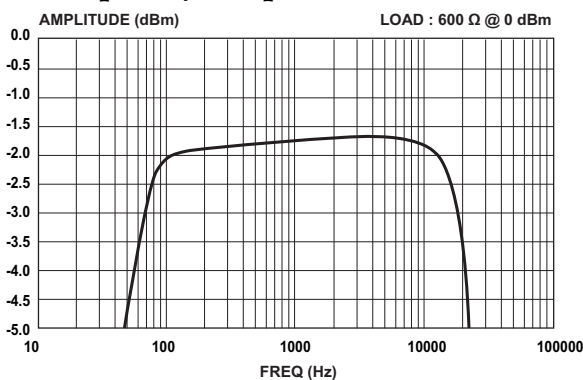
## Connections



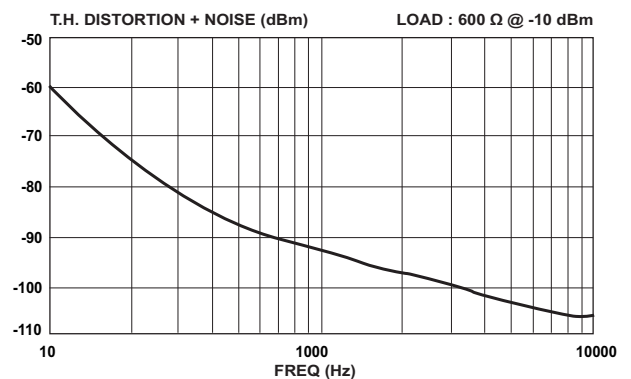
## Pad Layout (mm)



## Frequency Response

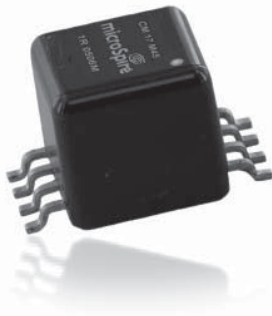


## Distorsion



# 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-70-02, DO-160
- 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

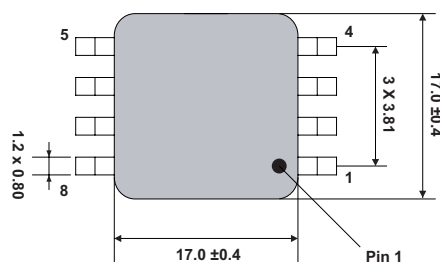
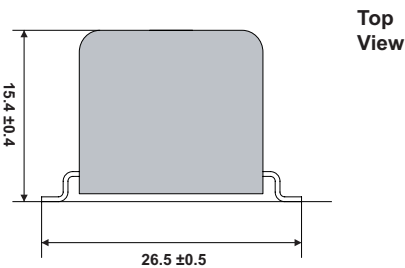
ID Code	Inductance Value at 25°C (-40/+35%)	Typical SRF	Max Impedance (Typical)	Max Attenuation (Z = 50Ω)	MAX RMS Current for ΔT = 40°C	MAX DC Resistance (25°C)	Typical Leakage Inductance (100kHz)
CMC17 M45 1WR	0.45 mH	32 MHz	1 kΩ	20 dB	11.7 A	5 mΩ	0.5 μH
CMC17 1M2 1WR	1.15 mH	15 MHz	1.9 kΩ	26 dB	8.3 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

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

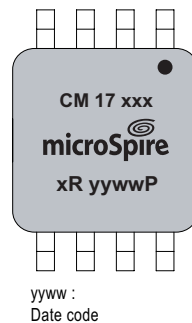
### Packaging

12 pieces per box, individually packed

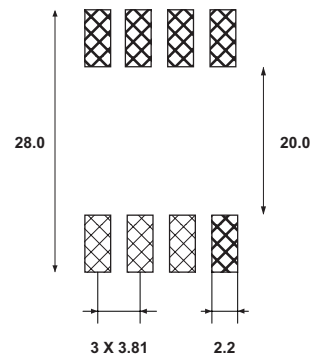
### Typical Dimensions (mm)



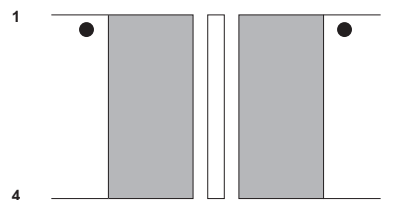
### Marking



### Pad Layout (mm)



### Connections



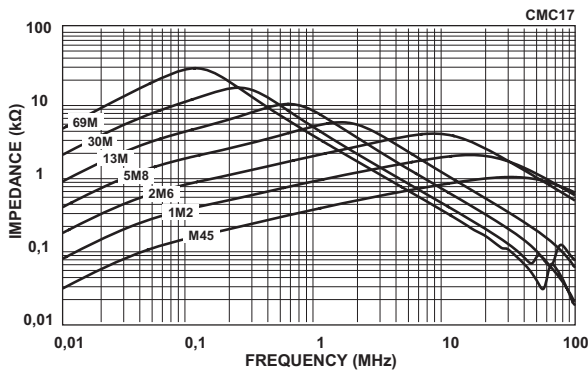
1:1 ratio  
(sector wound construction)



# CMC 17 Common Mode Chokes Series

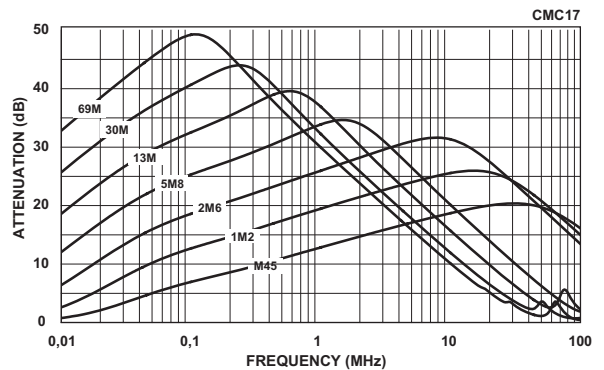
## High Grade - Improved Temperature Stability

### Impedance



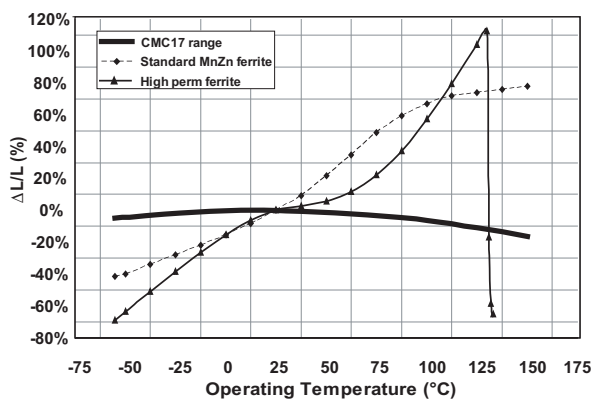
Typical values at 25°C with 1mT at 10kHz

### Attenuation



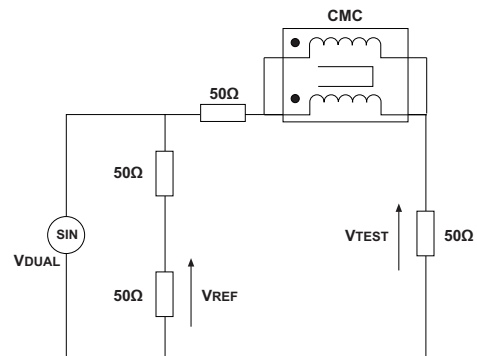
Typical values (Z=50Ω) at 25°C with 1mT at 10kHz

### Variation vs Temperature



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

### Attenuation Measurement Circuit



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

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

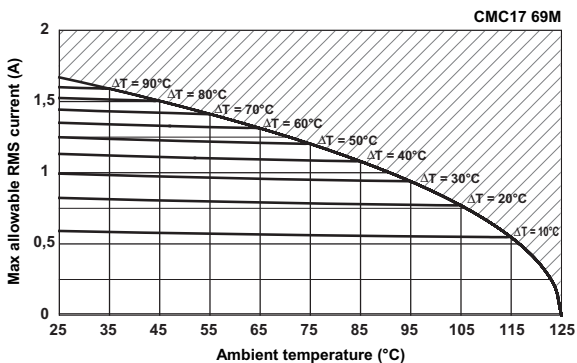
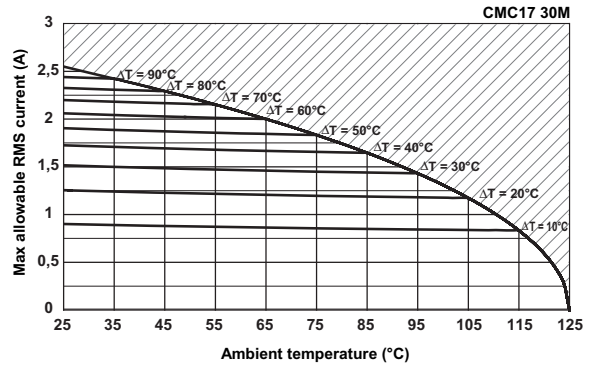
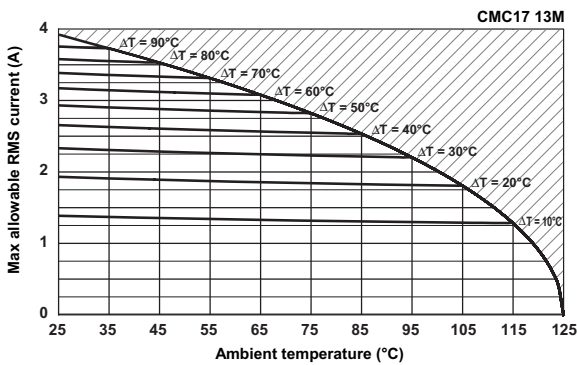
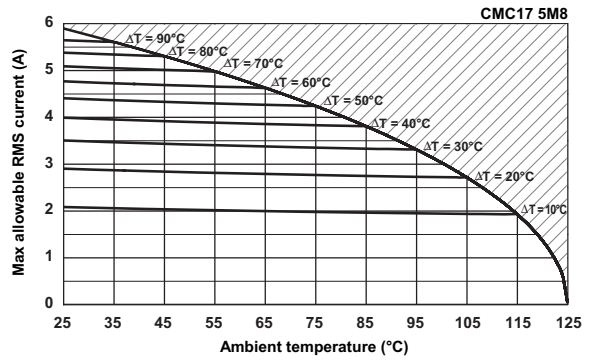
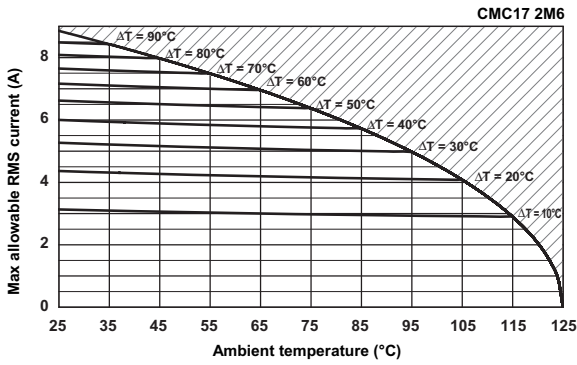
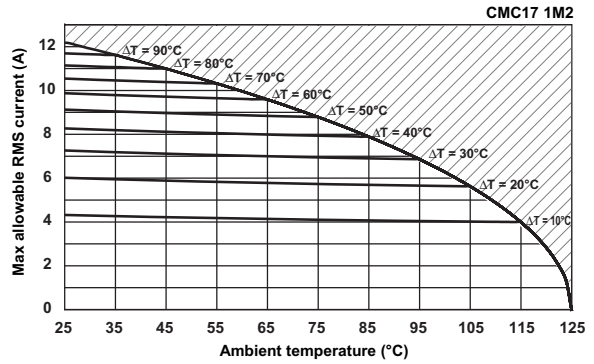
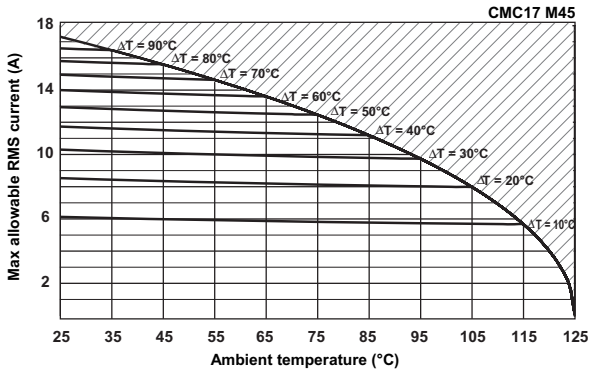
... High Grade Technologies...  
... Power Magnetics...  
... Common Mode Chokes...



# CMC 17 Common Mode Chokes Series

## High Grade - Improved Temperature Stability

### Derating Curves



All thermal measurements under atmospheric conditions with component mounted on 1 dm<sup>2</sup> PCB without cooling device. All above graphs indicate maximum RMS current allowed through component v. ambient temperature for a defined  $\Delta T$ . Maximum operating temperature is +125 °C.

**Example:**

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

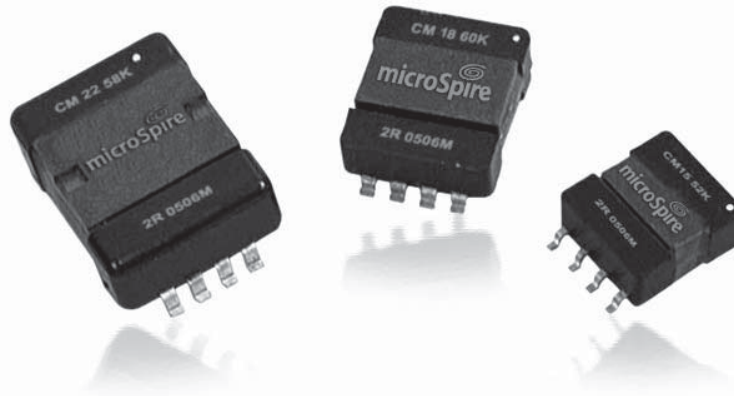
If temp increase allowed in application is limited to  $\Delta T < 20\text{ °C}$ , current must be reduced to 8 Ams.





# 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



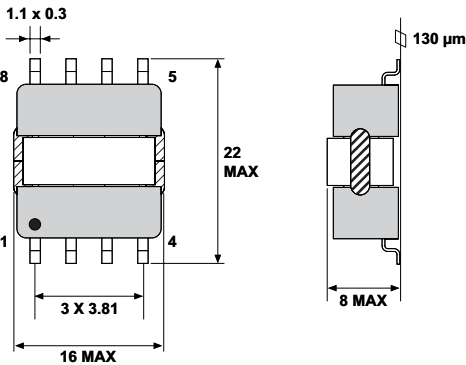
- Based on MicroSpire's «SESI15 Planar Technology»
- Low-profile SMD package (2x4 pins)
- Applied standards: MIL-STD-202, ECSS-Q-70-02, DO-160
- RMS current range: from 0.6A to 6.7A for 40 °C heating above 25 °C
- Excellent impedance attenuation >100 Ω from 300kHz to 65MHz
- Dielectric strength test up to 500V (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

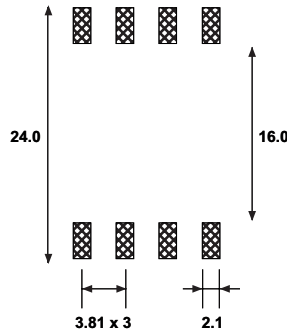
ID Code	Inductance Value at 25°C (±40%)	Typical SRF	Max Impedance (Typical)	Max Attenuation (Z = 50Ω)	MAX RMS Current for ΔT = 40°C	MAX DC Resistance (25°C)	Dielectric Strength (50Hz - 1min)
CMC15 52K 2WR	0.05 mH	7.3 MHz	1.6 kΩ	25 dB	6.7 A	15 mΩ	500 Vrms
CMC15 M11 2WR	0.11 mH	5.8 MHz	3.7 kΩ	32 dB	4.4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

### Typical Dimensions (mm)

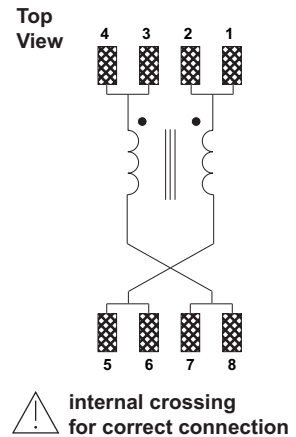
Top View



### Pad Layout (mm)

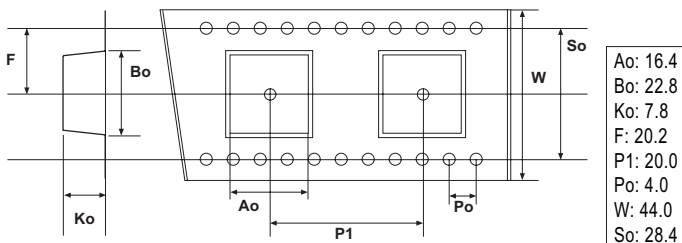


### Connections

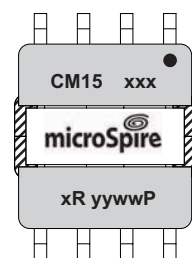


### Packaging

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



### Marking

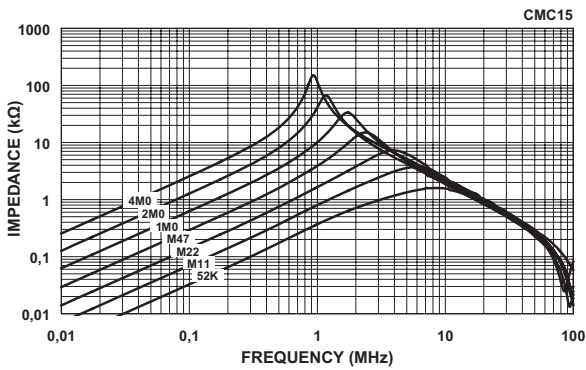


yyww :  
Date code



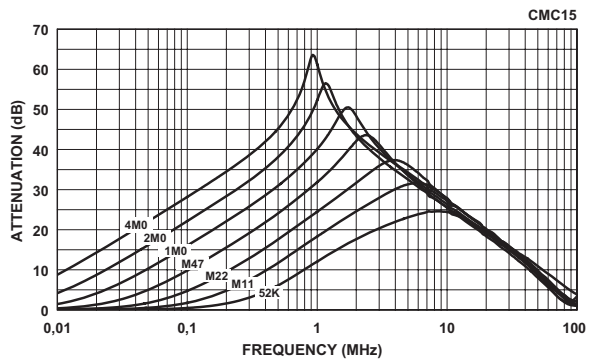
# Common Mode Chokes for DC/DC Embedded Applications CMC 15 xxx 2WR Series

## Impedance



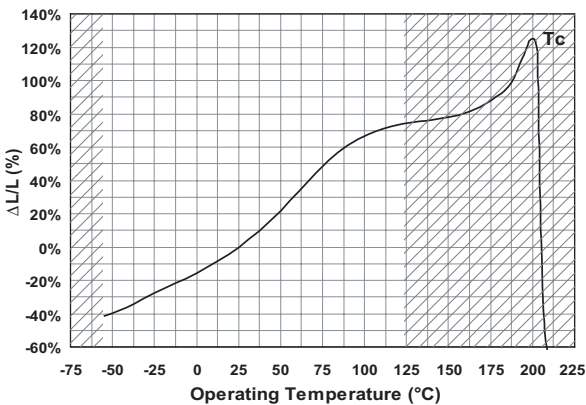
Typical values at 25°C with 1 mT at 10 kHz

## Attenuation



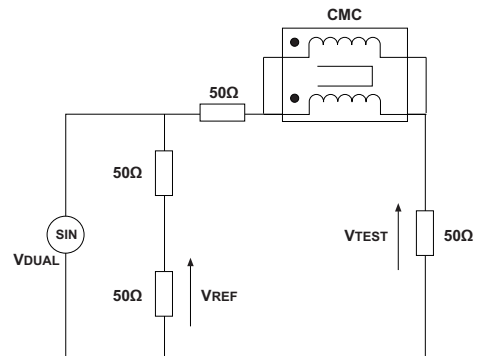
Typical values (Z=50Ω) at 25°C with 1 mT at 10 kHz

## Variation vs Temperature



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

## Attenuation Measurement Circuit



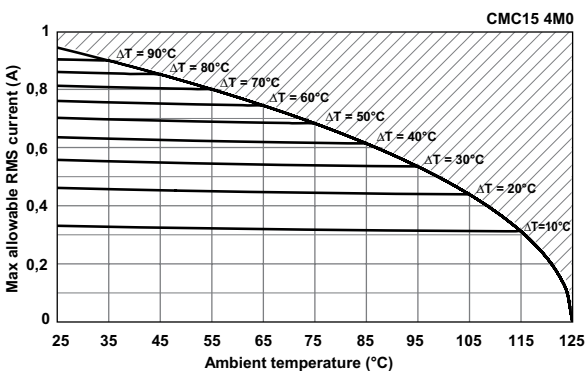
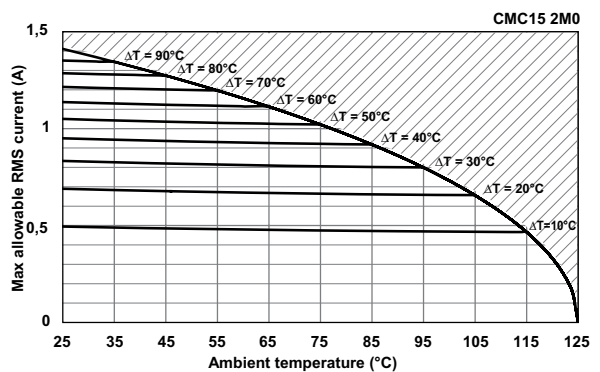
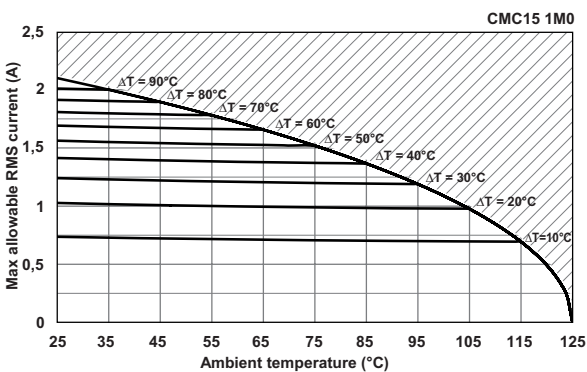
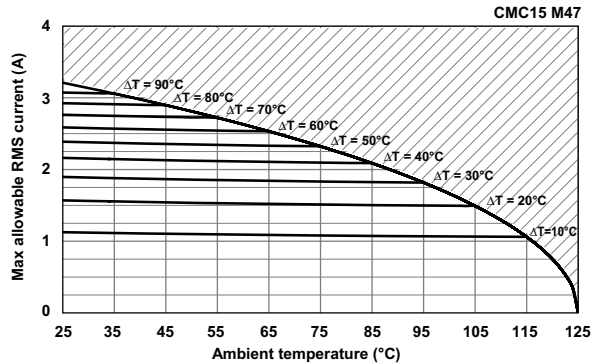
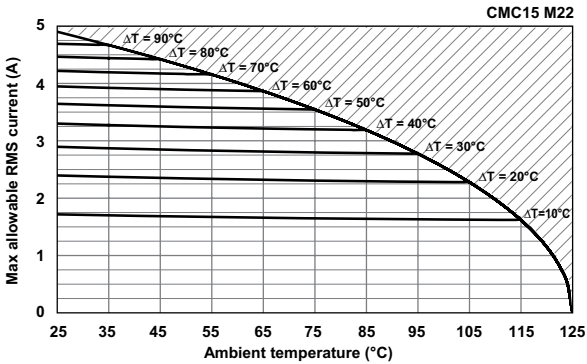
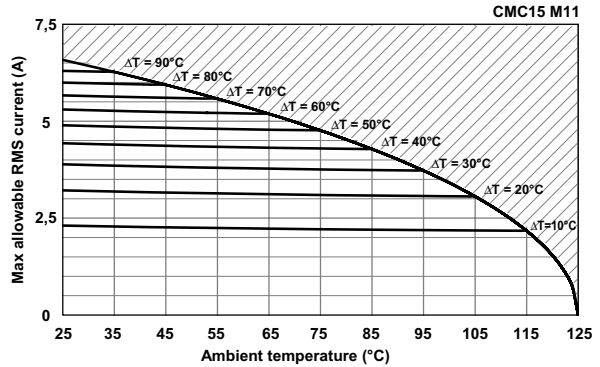
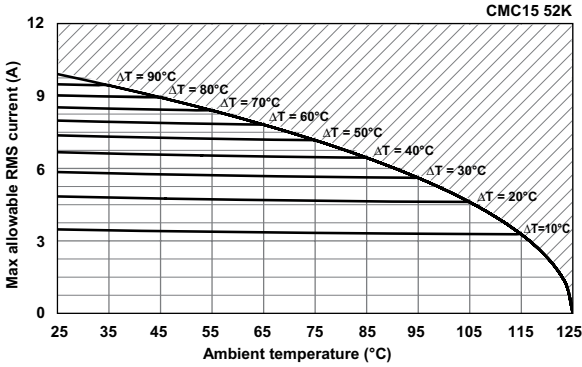
$$\text{Att. (dB)} = 20 \log_{10} \left| \frac{V_{\text{TEST}}}{V_{\text{REF}}} \right|$$

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



# 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 dm<sup>2</sup> 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<sub>amb</sub> = + 85 °C Max current allowed is <6.5 Arms with ΔT < 40 °C.

If temp increase allowed in application is limited to ΔT < 20 °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



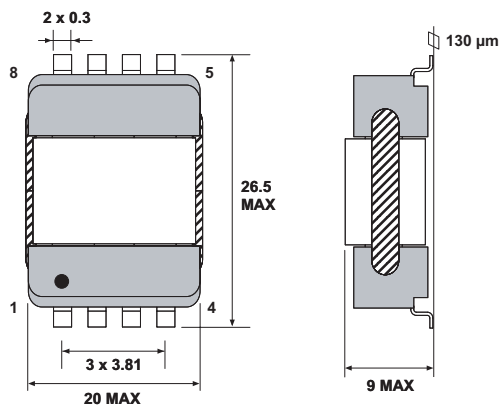
- Based on Microspire's «SES18 Planar Technology»
- Low-profile SMD package (2x4 pins)
- Applied standards: MIL-STD-202, ECSS-Q-70-02, DO-160
- RMS current range: from 0.9A to 9.9A for 40°C heating above 25°C
- Excellent impedance attenuation >100Ω from 300 kHz to 45 MHz
- Dielectric strength test up to 500V (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

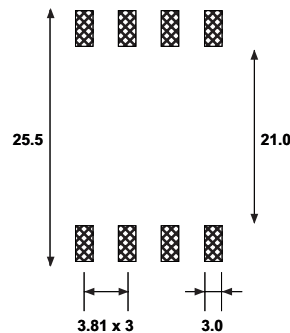
ID Code	Inductance Value at 25°C (±40%)	Typical SRF	Max Impedance (Typical)	Max Attenuation (Z = 50Ω)	MAX RMS Current for ΔT = 40°C	MAX DC Resistance (25°C)	Dielectric Strength (50Hz - 1min)
CMC18 60K 2WR	0.06 mH	4.5 MHz	1.4 kΩ	23 dB	9.9 A	7 mΩ	500 Vrms
CMC18 M13 2WR	0.13 mH	3.7 MHz	3 kΩ	30 dB	6.9 A	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)

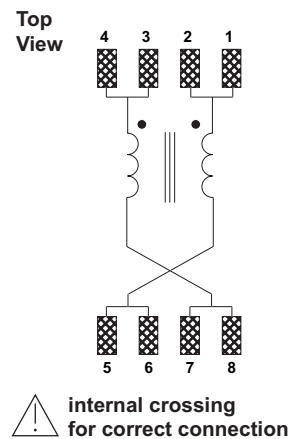
Top View



### Pad Layout (mm)

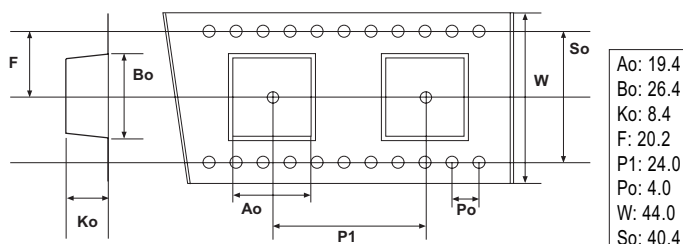


### Connections

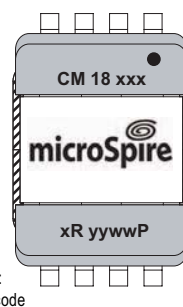


### Packaging

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



### Marking



yyww :  
Date code

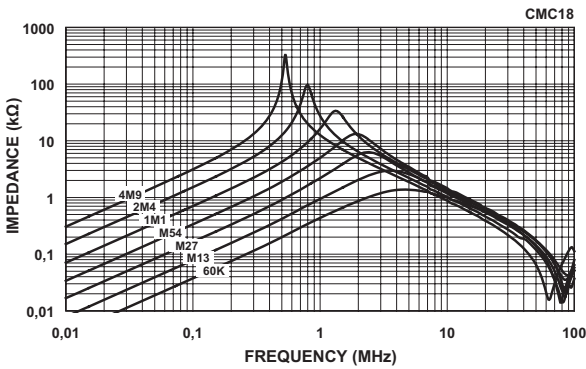




# Common Mode Chokes for DC/DC Embedded Applications CMC 18 xxx 2WR Series

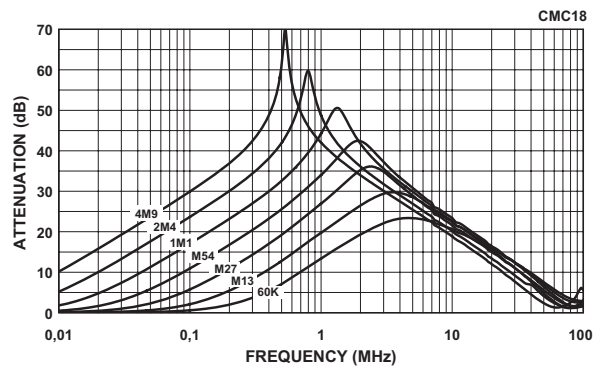
High Grade Technologies...  
Power Magnetics...  
Common Mode Chokes...

## Impedance



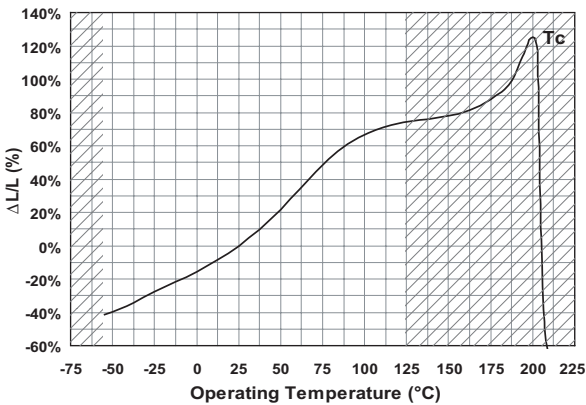
Typical values at 25°C with 1mT at 10 kHz

## Attenuation



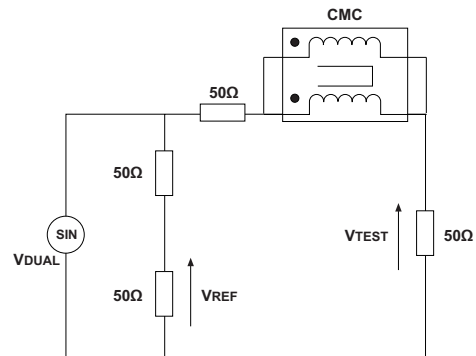
Typical values (Z=50Ω) at 25°C with 1mT at 10 kHz

## Variation vs Temperature



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

## Attenuation Measurement Circuit

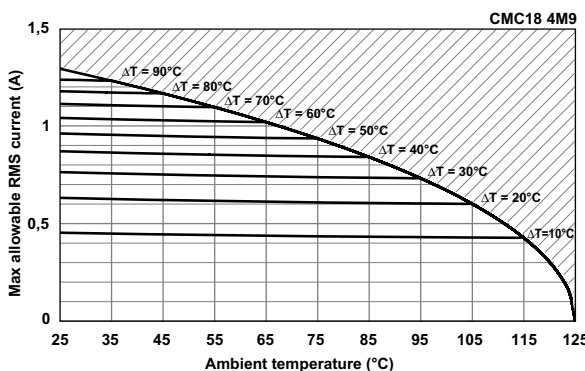
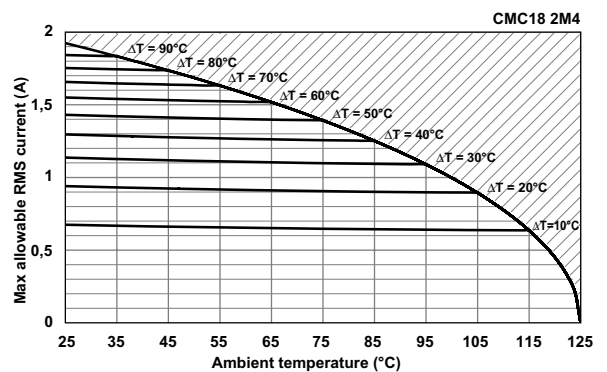
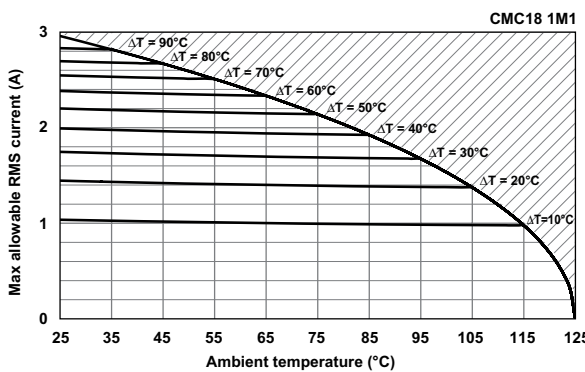
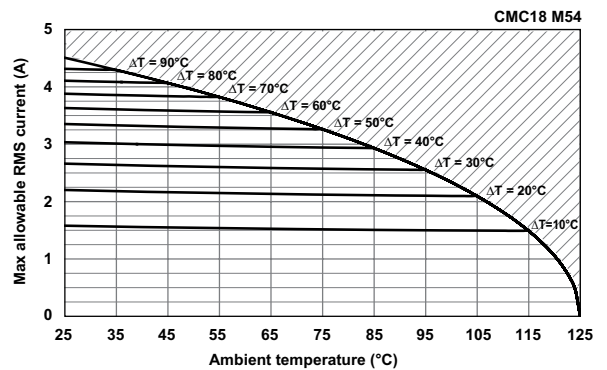
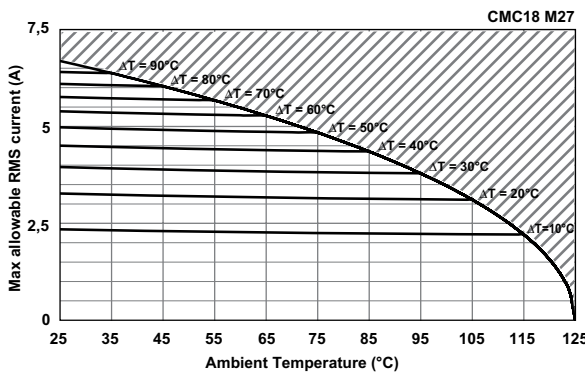
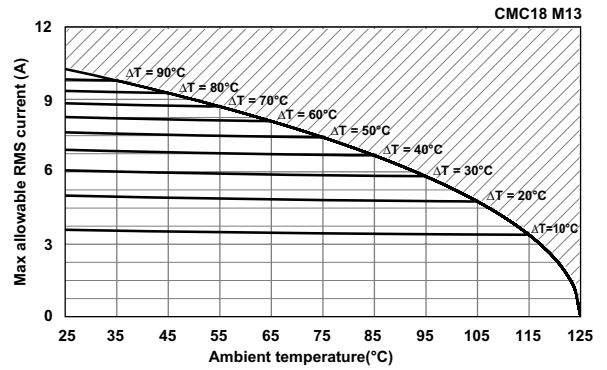
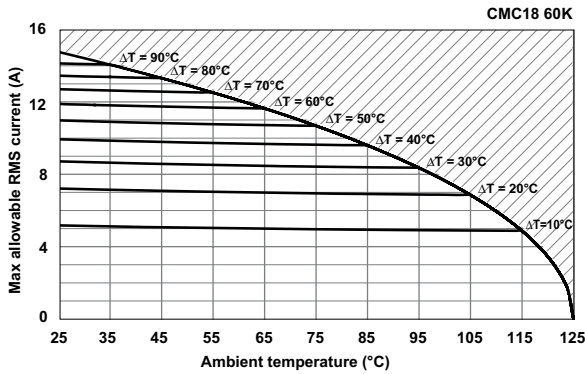


$$\text{Att. (dB)} = 20 \log_{10} \left| \frac{V_{\text{TEST}}}{V_{\text{REF}}} \right|$$



# 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 dm<sup>2</sup> PCB without cooling device. All above graphs indicate maximum RMS current allowed through component v. ambient temperature for a defined  $\Delta T$ . Maximum operating temperature is +125 °C.

**Example :**

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

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

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



# Common Mode Chokes for DC/DC Embedded Applications

## CMC 22 xxx 2WR Series



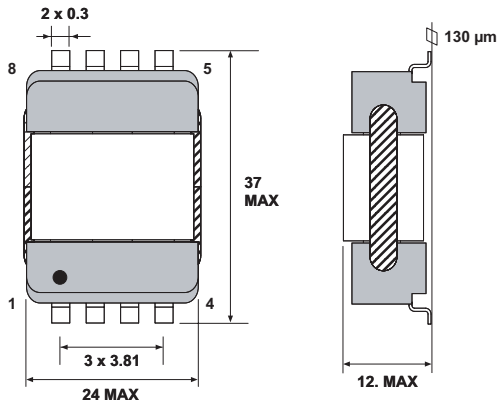
- Based on Microspire's «SESI22 Planar Technology»
- Low-profile SMD package (2x4 pins)
- Applied standards: MIL-STD-202, ECSS-Q-70-02, DO-160
- RMS current range: from 1.9A to 14.3A for 40 °C heating above 25 °C
- Excellent impedance attenuation > 100 Ω from 300 kHz to 35 MHz
- Dielectric strength test 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: 26 grams

### Electrical Data

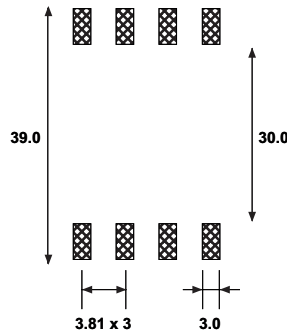
ID Code	Inductance Value at 25°C (±40%)	Typical SRF	Max Impedance (Typical)	Max Attenuation (Z = 50Ω)	MAX RMS Current for ΔT = 40°C Heating	MAX DC Resistance (25°C)	Dielectric Strength (50Hz - 1min)
CMC22 58K 2WR	0.06 mH	3 MHz	1.1 kΩ	22 dB	14.3 A	5 mΩ	500 Vrms
CMC22 M14 2WR	0.14 mH	2 MHz	2.9 kΩ	30 dB	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)

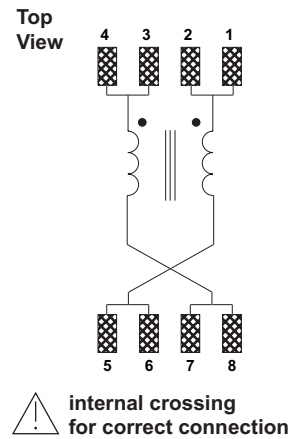
Top View



### Pad Layout (mm)



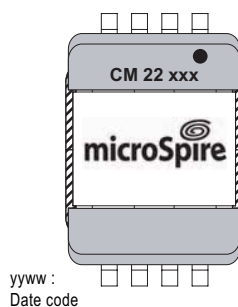
### Connections



### Packaging

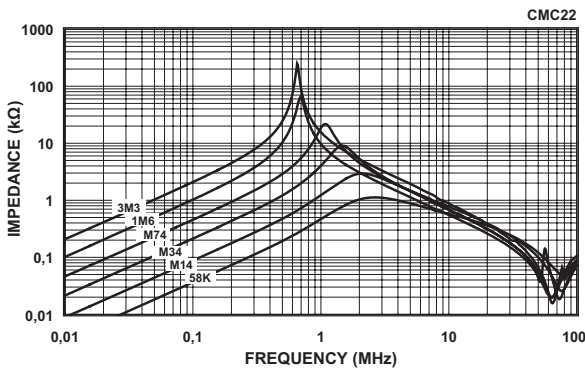
48 pieces per box, individually packed

### Marking



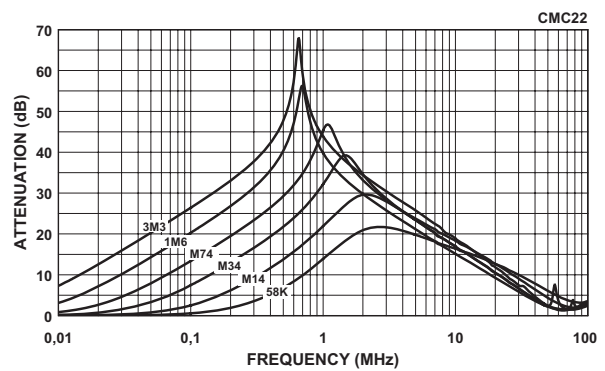
# Common Mode Chokes for DC/DC Embedded Applications CMC 22 xxx 2WR Series

## Impedance



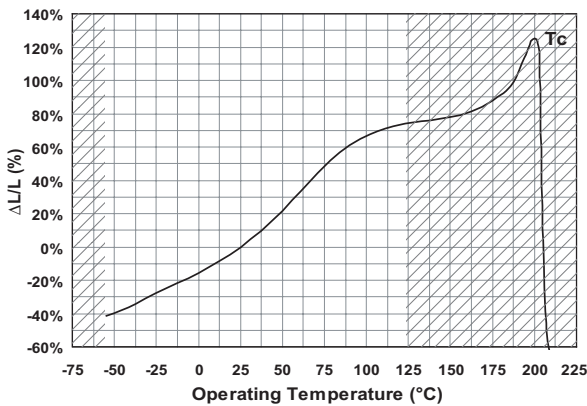
Typical values at 25°C with 1 mT at 10 kHz

## Attenuation



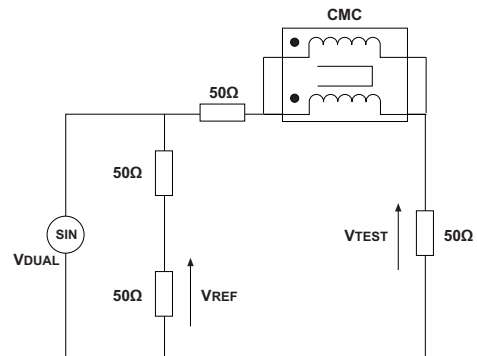
Typical values (Z=50Ω) at 25°C with 1 mT at 10 kHz

## Variation vs Temperature



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

## Attenuation Measurement Circuit



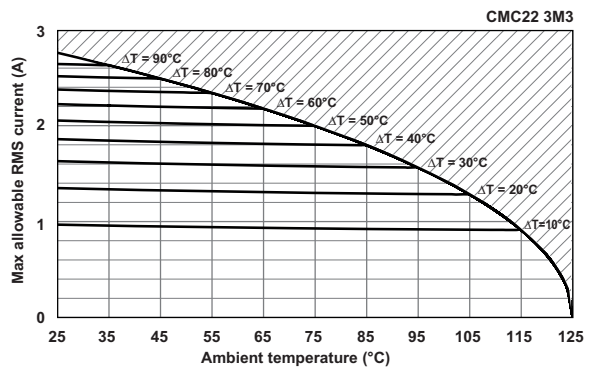
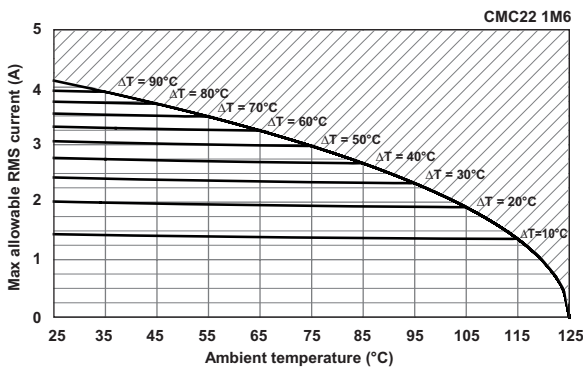
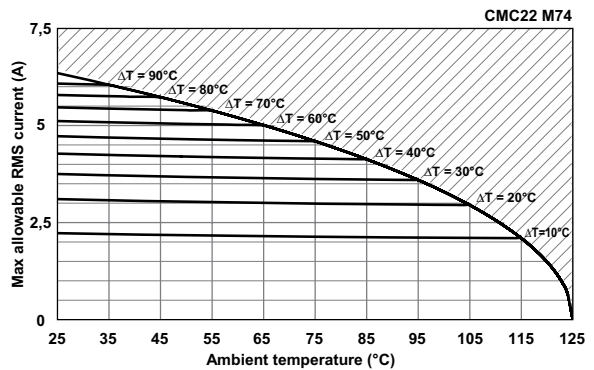
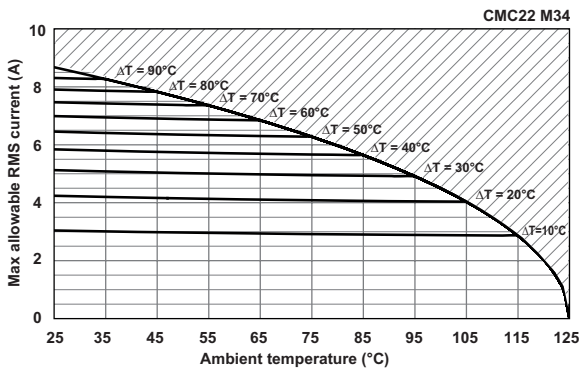
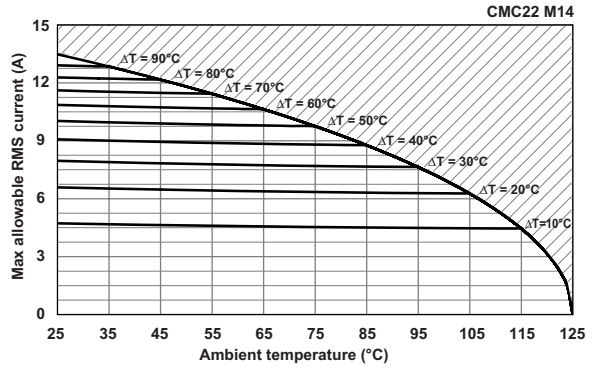
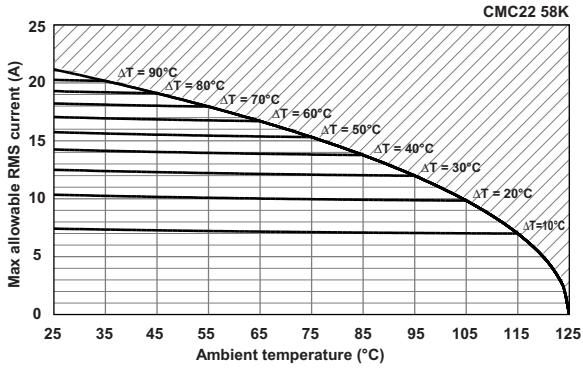
$$\text{Att. (dB)} = 20 \log_{10} \left| \frac{V_{\text{TEST}}}{V_{\text{REF}}} \right|$$

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..... Power Magnetics.....  
..... Common Mode Chokes.....



# 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 dm<sup>2</sup> 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.

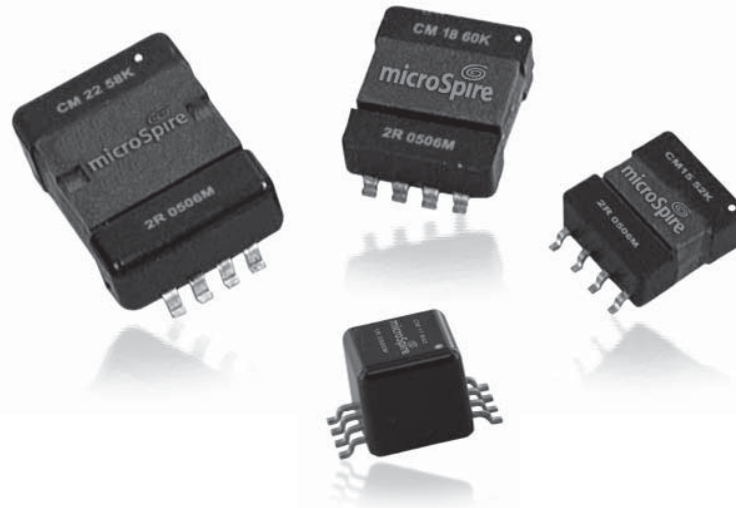
**Example :**  
CMC22 58K for application with T<sub>amb</sub> = +85°C. Max current allowed is <14 Arms with ΔT < 40°C. If temp increase allowed in application is limited to ΔT < 20°C, current must be reduced to 10 Arms.





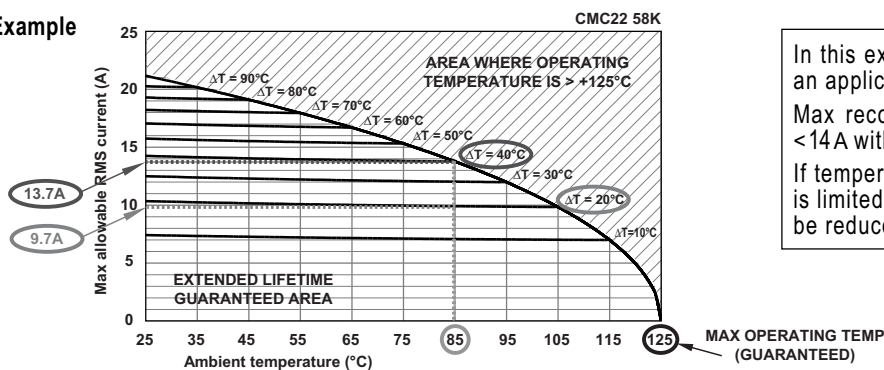
# Technical note - Appendix

## 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°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 20.000hours) and magnetic cores show a high Curie temperature value (T<sub>c</sub>>200°C).
- Typical values for admissible current at +25°C ambient for a 40°C nominal temperature increase are defined without any heatsink in our literature.
- 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



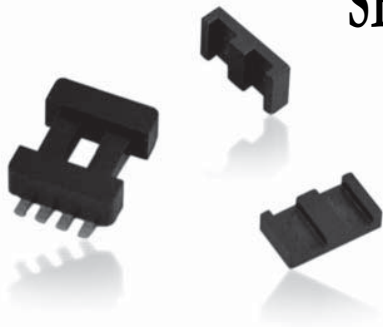
In this example, CMC2258K is chosen for an application at T<sub>amb</sub> = +85°C.  
 Max recommended RMS current is then <14 A with  $\Delta T < 40^\circ\text{C}$ .  
 If temperature increase in the application is limited to  $\Delta T < 20^\circ\text{C}$ , current value must be reduced to <10 A.

- With the above data, it is clear that the « theoretical » maximum possible current reaches zero for +125°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°C but in this case, extended lifetime for the product is not guaranteed any longer.
- Heating values versus current above +125°C operating temperature can still be calculated upon request.





# SESI SMD Power Inductors and Transformers



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

Main advantages :

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

The SESI power inductors 9.1 to 18 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) and/or to be adapted to big volumes in the automotive market.

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

No additional manual operation is to be performed on the 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 :

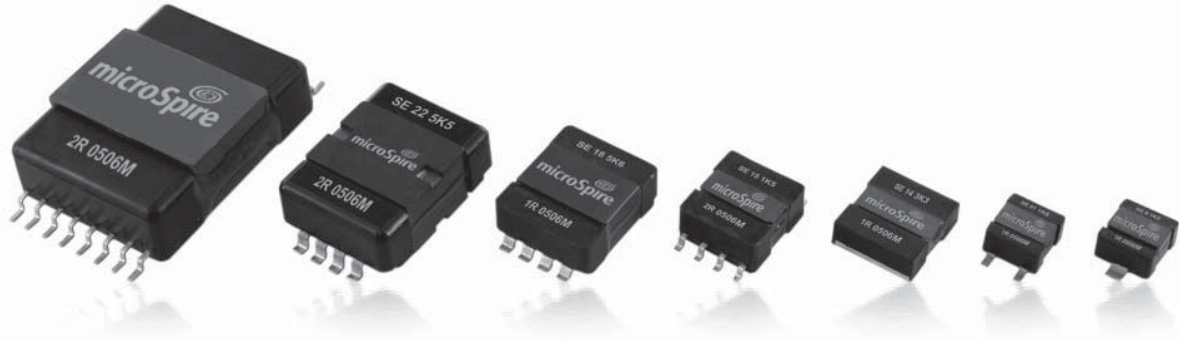
- Thermal shock, life tests, overload
- Vibration and shock tests have been performed by a qualified testhouse.



# SESI Custom Magnetics

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.



SESI 32

SESI 22

SESI 18

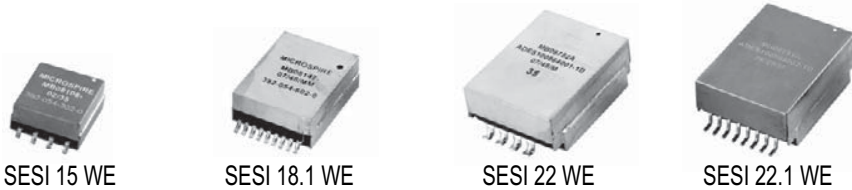
SESI 15

SESI 14

SESI 9.1

SESI 9

## Shielded versions



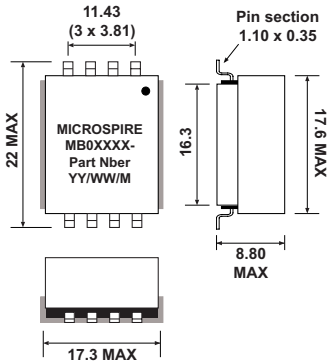
SESI 15 WE

SESI 18.1 WE

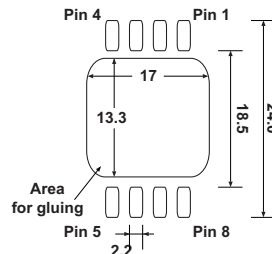
SESI 22 WE

SESI 22.1 WE

### • SESI 15 WE

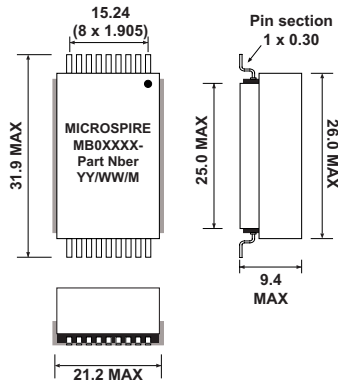


### Pad Layout (mm)

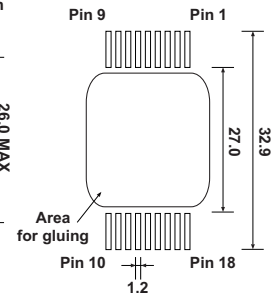


Weight: 9.0 grams

### • SESI 18.1 WE

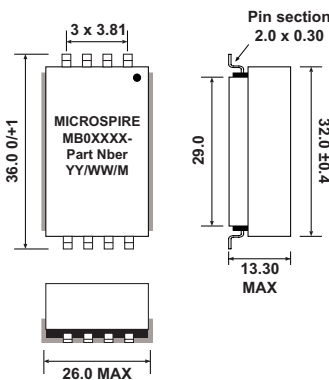


### Pad Layout (mm)

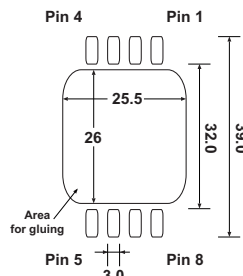


Weight: 16.5 grams

### • SESI 22 WE

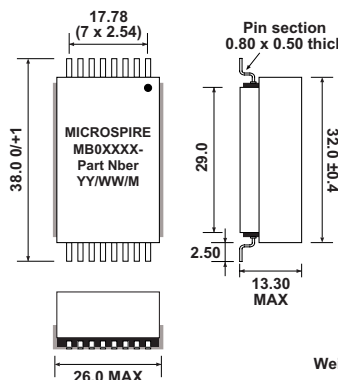


### Pad Layout (mm)

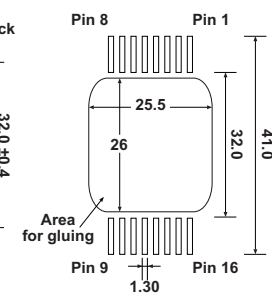


Weight: 35 grams

### • SESI 22.1 WE

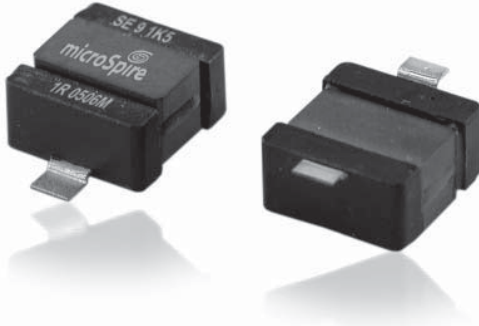


### Pad Layout (mm)



Weight: 36 grams

# 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 <sup>12</sup> no load μH	I <sup>38</sup> rated A	L <sup>24</sup> at rated I μH	I <sup>5</sup> peak max A	Rdc at 25°C mΩ 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

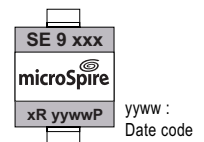
SESI	9	###	#	W	R
SMD Energy Storage Inductor	Size	Value code 4K3 = 4,3 μH M10 = 100 μH 1M0 = 1000 μH	Version	GW Terminals	High reliability

SESI 9 ### #WR

## Connections

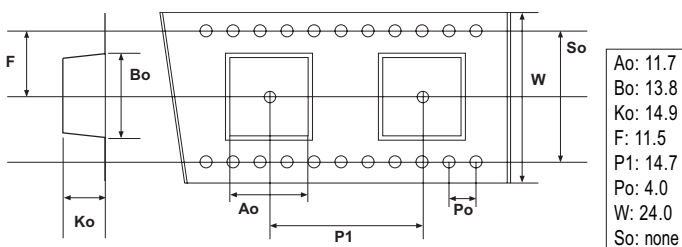


## Marking

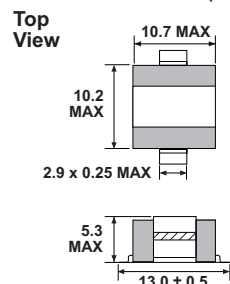


## Packaging

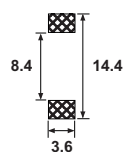
Tape and Reel:  
700 pieces per reel of diameter 330 mm



## Dimensions (mm)

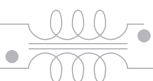
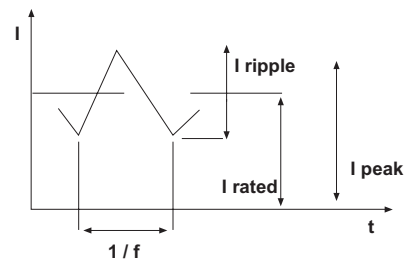


## Pad Layout (mm)



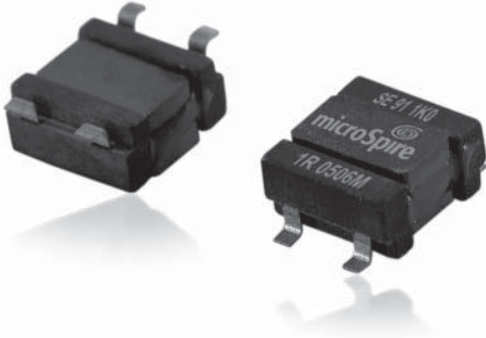
## Notes

1. Inductance at 0.25 V, 100 kHz
2. I rated (permanent DC) without heatsink ; with heatsink I = I rated x 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. 10% admissible I ripple over I rated at f=200 kHz
6. Isolation voltage 150 Vdc  
- 1 min - Ri > 100 MΩ between winding and magnetic core





# SMD Power Inductors - SESI 9.1WR High Reliability Applications



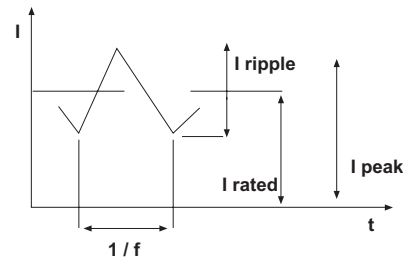
- Energy storage, smoothing, filtering
- Applied standards: ECSS-Q-70-02, MIL-STD-202, DO-160
- EESA ESCC 3201/009 versions upon request
- Materials meet UL94-V0 rating
- Suited for IR and vapor reflow soldering
- Frequency range up to 1 MHz
- Operating temperature range: -55 °C to +125 °C
- Weight: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

## Electrical Data (25°C)

ID Code	L <sup>12</sup> no load µH	I <sup>36</sup> rated A	L <sup>24</sup> at rated I µH	I <sup>5</sup> peak max A	Rdc at 25°C mΩ 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 0.25V, 100 kHz
2. I rated (permanent DC) without heatsink ;  
with heatsink I = I rated x 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. 10 % admissible I ripple over I rated at f=200 kHz
6. Isolation voltage 150 Vdc  
- 1 min - Ri > 100 MΩ between winding and magnetic core



## To Order

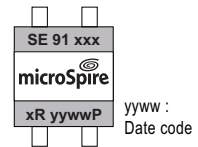
SESI	9.1	###	#	W	R
SMD Energy Storage Inductor	Size	Value code 4K3 = 4,3 µH M10 = 100 µH 1M0 = 1000 µH	Version	GW Terminals	High reliability

SESI 9.1 ### #WR

## Connections

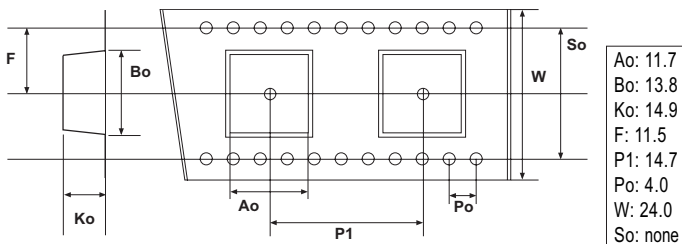


## Marking

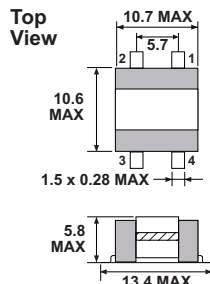


## Packaging

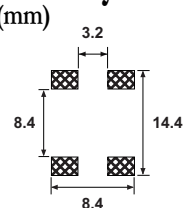
Tape and Reel:  
700 pieces per reel of diameter 330 mm



## Dimensions (mm)



## Pad Layout (mm)



# 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.

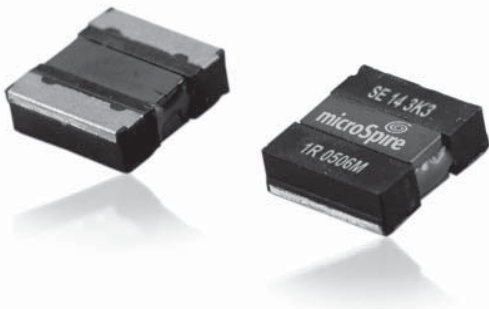
The terminal material and finish shall be brass, plated with 2 to 4  $\mu\text{m}$  of Nickel, the finish shall be either Sn60Pb40 or Sn90Pb10.

## 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
<b>3201009 05 x ### y</b>	
x = <b>B</b> for Chart III level B	Tolerance :
x = <b>C</b> for Chart III level C	y = <b>N</b> for $\pm 30\%$
	y = <b>M</b> for $\pm 20\%$
	y = <b>K</b> for $\pm 10\%$



# SMD Power Inductors - SESI 14SR High Reliability Applications



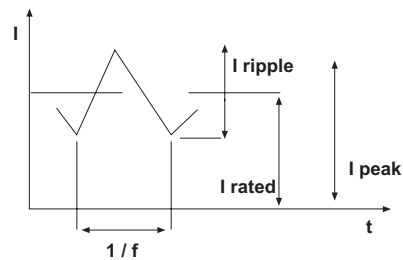
- Energy storage, smoothing, filtering
- Applied standards: ECSS-Q-70-02, MIL-STD-202, DO-160
- EESA ESCC 3201/009 versions upon request
- Materials meet UL94-V0 rating
- Suited for IR and vapor reflow soldering
- Frequency range up to 1 MHz
- Operating temperature range: -55 °C to +125 °C
- Weight: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

## Electrical Data (25°C)

ID Code	L <sup>12</sup> no load µH	I <sup>36</sup> rated A	L <sup>24</sup> at rated I µH	I <sup>5</sup> peak max A	Rdc at 25°C mΩ 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	
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	
						10

## Notes

1. Inductance at 0.25V, 100 kHz
2. I rated (permanent DC) without heatsink ;  
with heatsink I = I rated x 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 - Ri > 1 GΩ between winding and magnetic core



## To Order

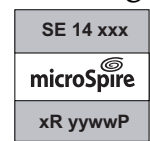
SESI	14	###	1	S	R
SMD Energy Storage Inductor	Size	Value code 4K7 = 4,7 µH M10 = 100 µH 1M0 = 1000 µH	Version	SMD Terminals	High reliability

SESI 14 ### 1SR

## Connections



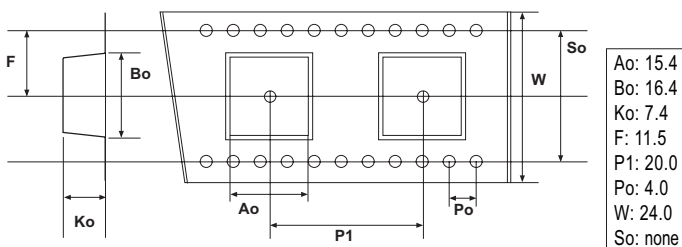
## Marking



yyww :  
Date code

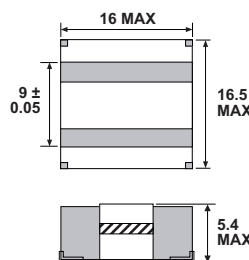
## Packaging

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

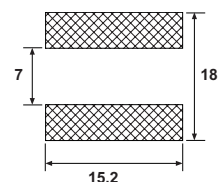


## Dimensions (mm)


Bottom View



## Pad Layout (mm)



# 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.

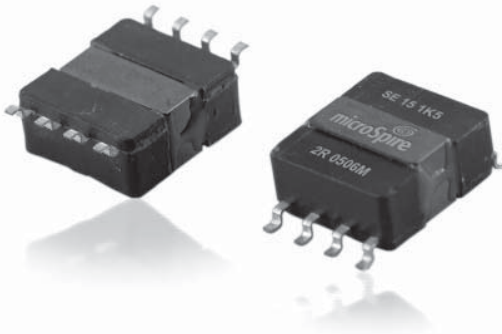
The terminal material and finish shall be brass, plated with 2 to 4  $\mu\text{m}$  of Nickel, the finish shall be either Sn60Pb40 or Sn90Pb10.

## 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
<b>3201009 01 x ### y</b>	
x = <b>B</b> for Chart III level B x = <b>C</b> for Chart III level C	Tolerance : y = <b>M</b> for $\pm 20\%$ y = <b>K</b> for $\pm 10\%$



# SMD Power Inductors - SESI 15WR High Reliability Applications



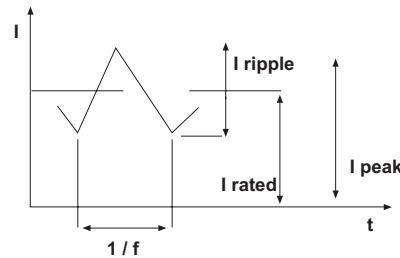
- Energy storage, smoothing, filtering
- Applied standards: ECSS-Q-70-02, MIL-STD-202, DO-160
- **esa** ESCC 3201/009 versions upon request
- Materials meet UL94-V0 rating
- Suited for IR and vapor reflow soldering
- Frequency range up to 1 MHz
- Operating temperature range: -55 °C to +125 °C
- Weight: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

## Electrical Data (25°C)

ID Code	L <sup>12</sup> no load μH	I <sup>36</sup> rated A	L <sup>24</sup> at rated I μH	I <sup>5</sup> peak max A	R <sub>dc</sub> 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	

## Notes

- Inductance at 0.25V, 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 - R<sub>i</sub> > 1 GΩ between winding and magnetic core

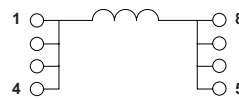


## To Order

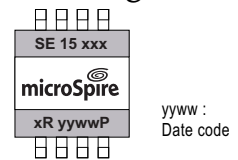
SESI	15	###	-	W	R
SMD Energy Storage Inductor	Size	Value code 4K9 = 4.9 μH M10 = 100 μH 1M0 = 1000 μH	Version	GW Terminals	High reliability

SESI 15 ### #WR

## Connections

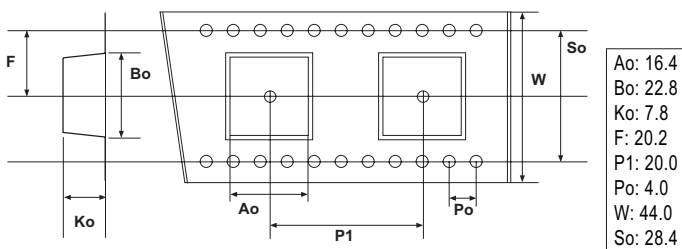


## Marking

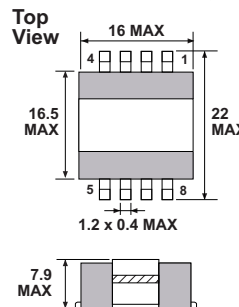


## Packaging

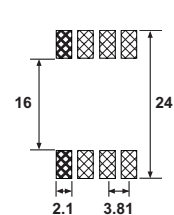
Tape and Reel:  
400 pieces per reel of diameter 330 mm



## Dimensions (mm)



## Pad Layout (mm)



# SMD Power Inductors SESI 15WR

 QPL Components

SESI 15WR series are usually installed on Military applications and breadboards for Space applications.

Since January 2003, Microspire has been manufacturing Radio Frequency Fixed Coils, SESI 15WR 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

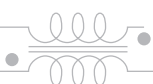
Components delivered through this specification need to be processed and inspected in accordance with the Microspire Process Identification Document (P.I.D.).

Each component delivered is traceable to its production lot.

The terminal material and finish shall be brass, plated with 2 to 4  $\mu\text{m}$  of Nickel, the finish shall be either Sn60Pb40 or Sn90Pb10.

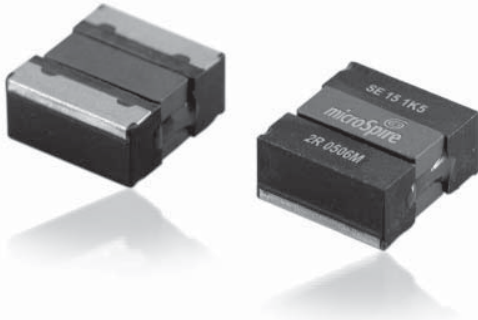
## Cross reference chart

Microspire Non-QPL ID Code	ESA SCC Component Part Number
SESI 15 1K5 2WR	3201009 03 x 1L5 M
SESI 15 1K8 1WR	3201009 03 x 1L8 M
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 710 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
<b>3201009 03 x ### y</b>	
x = B for Chart III level B x = C for Chart III level C	Tolerance : y = M for $\pm 20\%$ y = K for $\pm 10\%$





# SMD Power Inductors - SESI 15SR High Reliability Applications



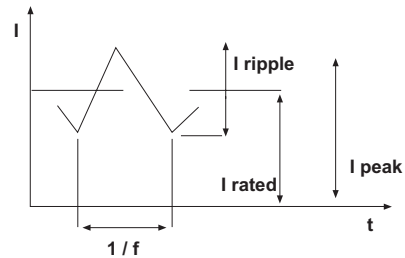
- Energy storage, smoothing, filtering
- Applied standards: ECSS-Q-70-02, MIL-STD-202, DO-160
- EESA ESCC 3201/009 versions upon request
- Materials meet UL94-V0 rating
- Suited for IR and vapor reflow soldering
- Frequency range up to 1 MHz
- Operating temperature range: -55 °C to +125 °C
- Weight: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

## Electrical Data (25°C)

ID Code	L <sup>12</sup> no load μH	I <sup>36</sup> rated A	L <sup>24</sup> at rated I μH	I <sup>5</sup> peak max A	R <sub>dc</sub> at 25°C mΩ 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	
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	
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 1M0 1SR	1000	0.38	800	0.5	2127.5	
SESI 15 2M3 1SR	2290	0.28	1900	0.36	4400	
						10

## Notes

1. Inductance at 0.25 V, 100 kHz
2. I rated (permanent DC) without heatsink ; with heatsink I = I rated x 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 - Ri > 1 GΩ between winding and magnetic core



## To Order

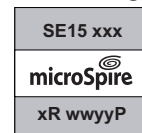
SESI	15	###	#	S	R
SMD Energy Storage Inductor	Size	Value code 4K9 = 4.9 μH M10 = 100 μH 1M0 = 1000 μH	Version	GW Terminals	High reliability

SESI 15 ### #SR

## Connections



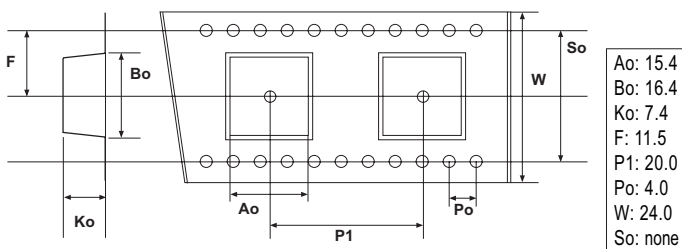
## Marking



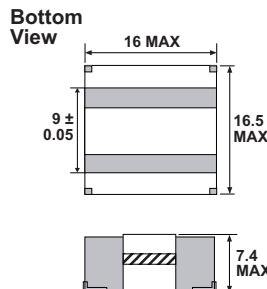
yyww :  
Date code

## Packaging

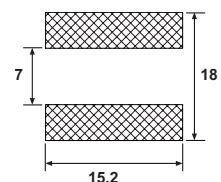
Tape and Reel:  
400 pieces per reel of diameter 330 mm




## Dimensions (mm)



## Pad Layout (mm)



# SMD Power Inductors SESI 15SR



## QPL Components

SESI 15SR series are usually installed on Military applications and breadboards for Space applications.

Since January 2003, Microspire has been manufacturing Radio Frequency Fixed Coils, SESI 15SR 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  $\mu\text{m}$  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 M
SESI 15 1K8 1SR	3201009 02 x 1L8 M
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 710 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
<b>3201009 02 x ### y</b>	
x = B for Chart III level B x = C for Chart III level C	Tolerance : y = M for $\pm 20\%$ y = K for $\pm 10\%$



# SMD Power Inductors - SESI 18WR High Reliability Applications



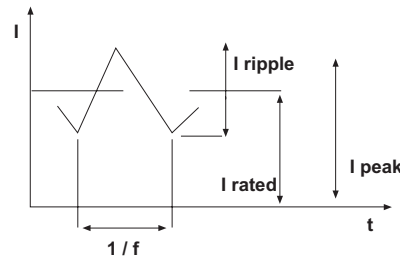
- Energy storage, smoothing, filtering
- Applied standards: ECSS-Q-70-02, MIL-STD-202, DO-160
- **esa** ESCC 3201/009 versions upon request
- Materials meet UL94-V0 rating
- Suited for IR and vapor reflow soldering
- Frequency range up to 1 MHz
- Operating temperature range: -55 °C to +125 °C
- Weight: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

## Electrical Data (25°C)

ID Code	L <sup>12</sup> no load μH	I <sup>36</sup> rated A	L <sup>24</sup> at rated I μH	I <sup>5</sup> peak max A	Rdc at 25°C mΩ 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	
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 rated x 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 - Ri > 1 GΩ between winding and magnetic core

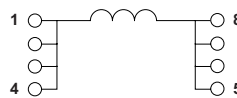


## To Order

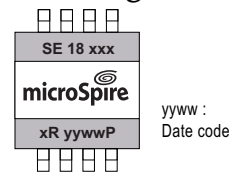
SESI	18	###	#	W	R
SMD Energy Storage Inductor	Size	Value code 4K9 = 4,9 μH M10 = 100 μH 1M0 = 1000 μH	Version	GW Terminals	High reliability

SESI 18 ### #WR

## Connections

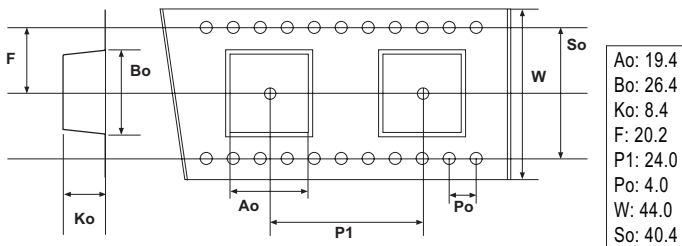


## Marking

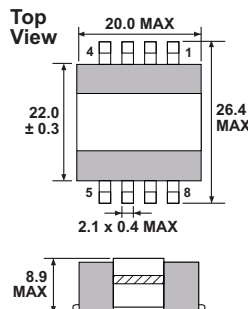


## Packaging

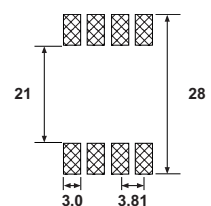
Tape and Reel:  
300 pieces per reel of diameter 330 mm



## Dimensions (mm)



## Pad Layout (mm)



# SMD Power Inductors SESI 18WR

 QPL Components

SESI 18WR series are usually installed on Military applications and breadboards for Space applications.

Since January 2003, Microspire has been manufacturing Radio Frequency Fixed Coils, SESI 18WR 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.

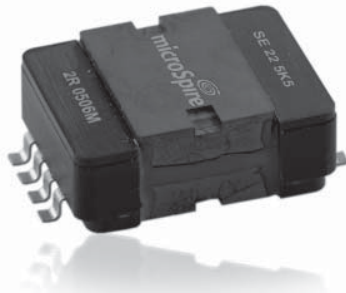
The terminal material and finish shall be brass, plated with 2 to 4  $\mu\text{m}$  of Nickel, the finish shall be either Sn60Pb40 or Sn90Pb10.

## 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 K
SESI 18 18K 1WR	3201009 04 x 180 K
SESI 18 22K 1WR	3201009 04 x 220 K
SESI 18 27K 1WR	3201009 04 x 270 K
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
<b>3201009 04 x ### y</b>	
x = B for Chart III level B	Tolerance :
x = C for Chart III level C	y = <b>M</b> for $\pm 20\%$
	y = <b>K</b> for $\pm 10\%$



# SMD Power Inductors - SESI 22WR High Reliability Applications



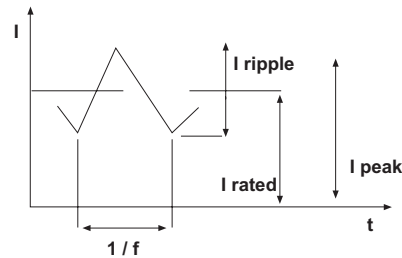
- Energy storage, smoothing, filtering
- Applied standards: ECSS-Q-70-02, MIL-STD-202, DO-160
- Materials meet UL94-V0 rating
- Suited for IR and vapor reflow soldering
- Frequency range up to 1 MHz
- Operating temperature range: -55 °C to +125 °C
- Weight: 26 grams
- Shielded version upon request

## Electrical Data (25°C)

ID Code	L <sup>1,2</sup> no load µH	I <sup>3,6</sup> rated A	L <sup>2,4</sup> at rated I µH	I <sup>5</sup> peak max A	R <sub>dc</sub> at 25°C mΩ Max	Tol.
SESI 22 5K5 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 16K 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	
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	10
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 1M0 1WR	1000	1.2	800	1.8	330	
SESI 22 1M5 1WR	1500	1.1	1200	1.4	500	
SESI 22 2M2 1WR	2200	0.8	1760	1.2	760	

## Notes

1. Inductance at 0.25V, 100 kHz
2. I rated (permanent DC) without heatsink ;  
with heatsink I = I rated x 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. 35% admissible I ripple over I rated at f = 200 kHz
6. Isolation voltage 500 Vdc  
- 1 min - Ri > 1 GΩ between winding and magnetic core

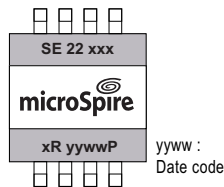


## To Order

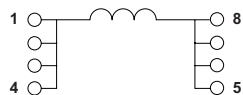
SESI	22	###	#	S	R
SMD Energy Storage Inductor	Size	Value code 7K7 = 7,7 µH M10 = 100 µH 1M0 = 1000 µH	Version	GW Terminals	High reliability

SESI 22 ### #WR

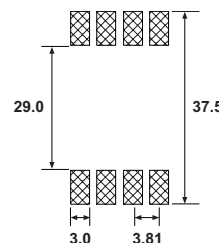
## Marking



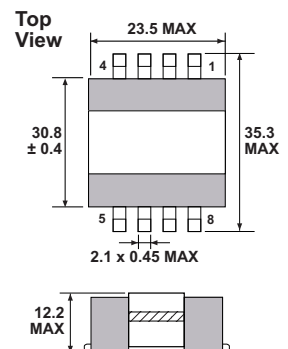
## Connections



## Pad Layout (mm)



## Dimensions (mm)



**Packaging** 48 pieces per box, individually packed.

# SMD Power Inductors - SESI 32WR High Reliability Applications



- Inductance values : 4.7  $\mu$ H to 4700  $\mu$ H
- Current up to 27 Arms and 38A 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 <sup>1,2</sup> no load $\mu$ H	I <sup>3,6</sup> rated A	L <sup>2,4</sup> at rated I $\mu$ H	I <sup>5</sup> peak max A	R <sub>dc</sub> at 25°C m $\Omega$ 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 $\mu$ H	Version	Pins through hole	High reliability

## Packaging

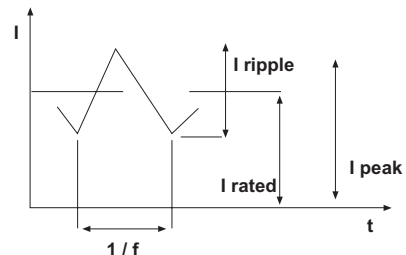
Individually packed 20 parts on 2 layers.

## Applications

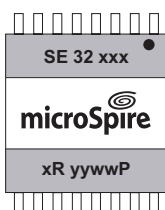
Energy storage, smoothing, filtering.

## Notes

1. Inductance at 0.25 V, 100 kHz
2. I rated (permanent DC) without heatsink ; with heatsink I = I rated x 1.4
3. Typical inductance value at recommended full load
4. I 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 kHz
6. Isolation voltage 500 Vdc  
- 1 min - Ri > 1 G $\Omega$  between winding and magnetic core

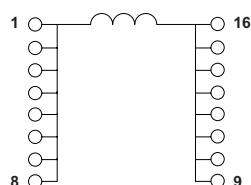


## Marking

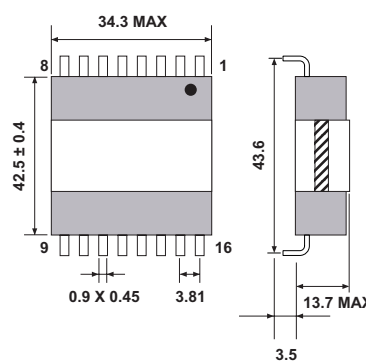


yyww :  
Date code

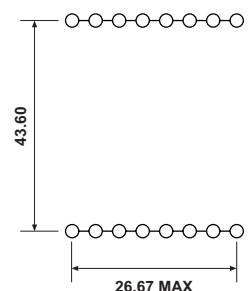
## Connections



## Dimensions (mm)



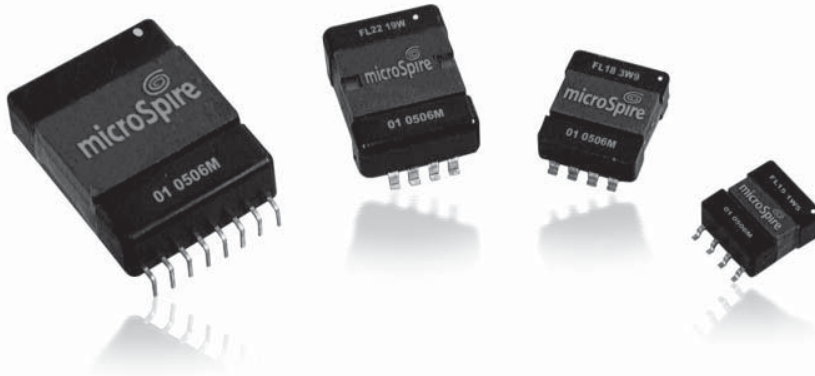
## Pad Layout





# 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 - FLYT15 Series



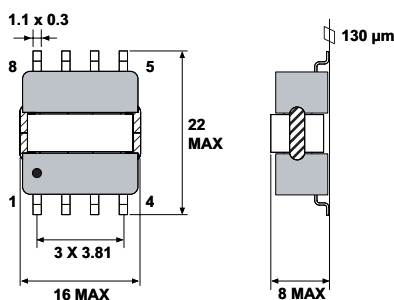
- Based on Microspire's «SESI15 Planar Technology»
- Low-profile SMD package (2x4 pins)
- Applied standards : MIL-STD-202, ECSS-Q-70-02, DO-160D
- Up to 15W at 100kHz in standard heating conditions
- Dielectric strength up to 1500V (50Hz-1min)
- Materials meet UL94-V0 rating
- Thermal index according to IEC85: H (180°C)
- Operating/storage temperature range: -55°C to +125°C
- Approx weight : 5grams

## Electrical Data

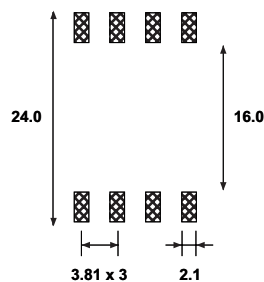
ID Code	DC Input Voltage Range (Vdc)	Output Power (W)	Designed Outputs	Working Frequency	Primary Inductance	Insulation >100MΩ
FLYT15 1W5 01	12 - 0.5V (2° - 1)	1.5	5V / 280mA (7° - 8) -5V / 280mA (5° - 6)	80 - 100kHz	90μH	500Vdc
FLYT15 2W2 01	26 - 29V (2° - 1)	1.1 - 2.2	5,2V / 400mA (7/8° - 5/6) BIAS (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

## Typical Dimensions (mm)

Top View

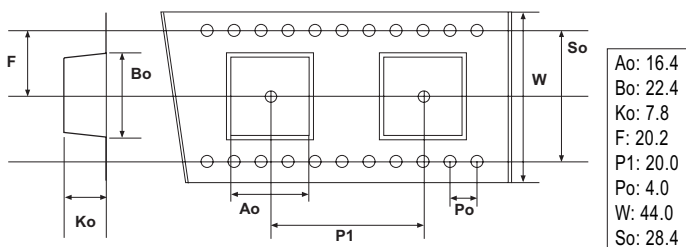


## Pad Layout (mm)

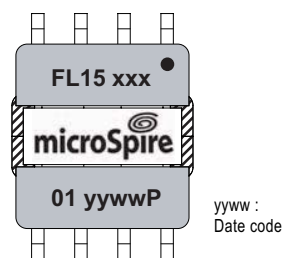


## Packaging

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



## Marking



High Grade Technologies...  
Power Magnetics...  
Flyback Transformers...



# Flyback Transformers for DC/DC converters - FLYT18 Series

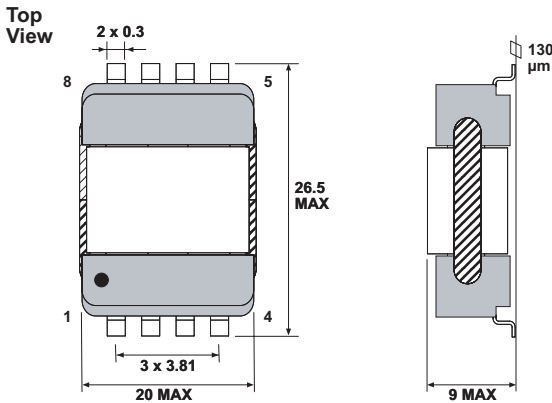


- Based on Microspire's « SESI18 Planar Technology »
- Low-profile SMD package (2x4 pins)
- Applied standards : MIL-STD-202, ECSS-Q-70-02, DO-160D
- Up to 15W at 100kHz in standard heating conditions
- Dielectric strength up to 1500V (50Hz-1min)
- Materials meet UL94-V0 rating
- Thermal index according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

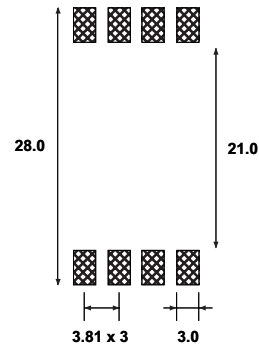
## Electrical Data

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
FLYT15 9W5 01	23 - 37V (2° - 1)	9.45	5,25V / 1,8A (7/8° - 5/6) BIAS (3° - 4)	100kHz	61.7μH	1500Vdc

## Typical Dimensions (mm)

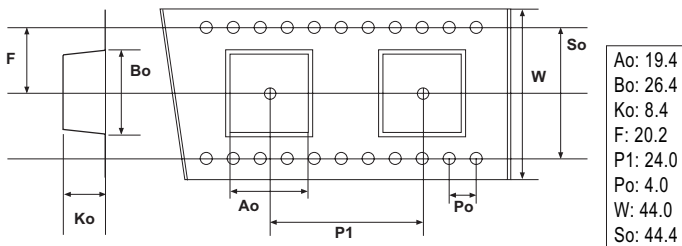


## Pad Layout (mm)

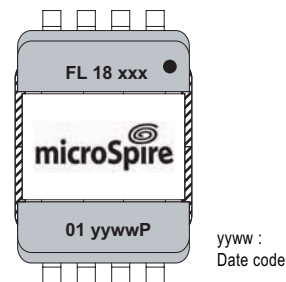


## Packaging

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



## Marking



High Grade Technologies... Power Magnetics... Flyback Transformers...

# Flyback Transformers for DC/DC converters - FLYT 22 Series

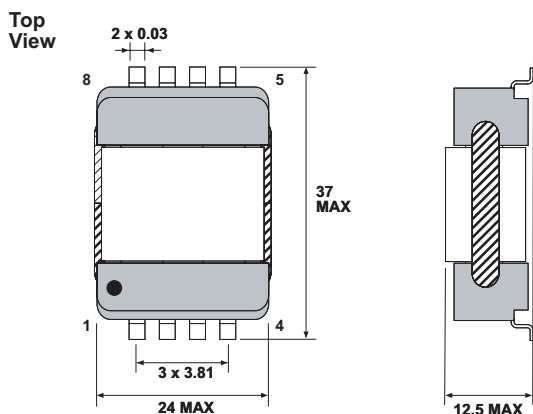


- Based on Microspire's «SESI22 Planar Technology»
- Low-profile SMD package (2x4 pins)
- Applied standards : MIL-STD-202, ECSS-Q-70-02, DO-160D
- Up to 25W at 100kHz in standard heating conditions
- Dielectric strength up to 1500V (50Hz-1min)
- Materials meet UL94-V0 rating
- Thermal index according to IEC85: H (180°C)
- Operating/storage temperature range: -55°C to +125°C
- Approx weight : 26grams

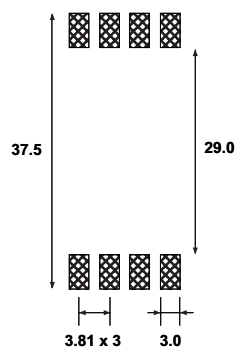
## Electrical Data

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

## Typical Dimensions (mm)

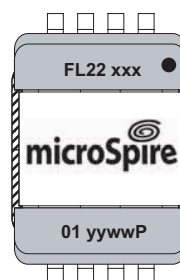


## Pad Layout (mm)



**Packaging** 48 pieces per box, individually packed

## Marking

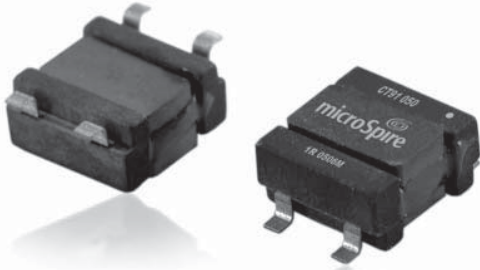


yyww :  
Date code

..... High Grade Technologies.....  
..... Power Magnetics.....  
..... Flyback Transformers.....



# 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:  $-55^{\circ}\text{C}$  to  $+125^{\circ}\text{C}$
- Suited for IR and vapor reflow soldering
- Weight: 2grams

## Electrical Data (25°C)

ID Code	Turn ratio	DCR1-2 m $\Omega$	DCR3-4 $\Omega \pm 15\%$	L3-4 mH $\pm 15\%$	Frequency range triangle wave	Ipk = I <sub>bc</sub> + $\Delta I$ / 2 max	Z Load 1% 1/2W	Insulation 500VDC
CT91 050 231 WR	1/50	<2	0.95	0.4	22kHz to 500kHz	10	6.81 $\Omega$	>1G $\Omega$
CT91 075 231 WR	1/75	<2	2.15	0.9	15kHz to 300kHz	10	10.2 $\Omega$	>1G $\Omega$
CT91 100 231 WR	1/100	<2	3.70	1.6	9kHz to 200kHz	10	13.7 $\Omega$	>1G $\Omega$
CT91 200 231 WR	1/200	<2	14.6	6.4	6kHz to 70kHz	10	27.4 $\Omega$	>1G $\Omega$

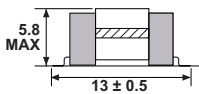
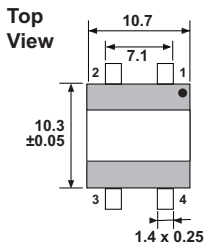
## To Order

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

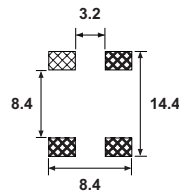
## Notes

Typical performances at  $+25^{\circ}\text{C}$   
Storage Temperature  $-55^{\circ}\text{C}$  to  $+140^{\circ}\text{C}$

## Dimensions (mm)

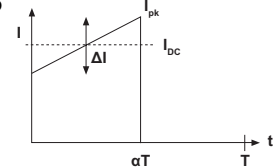


## Pad Layout

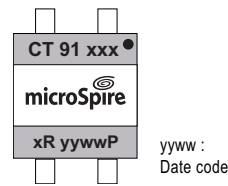


## Application

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

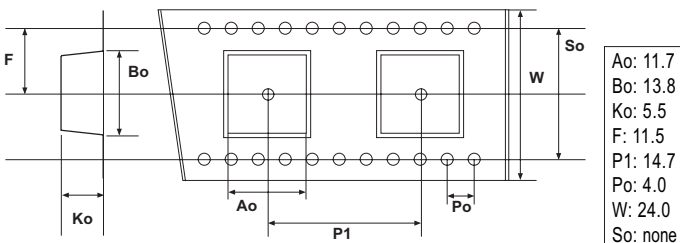


## Marking

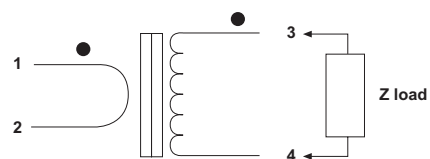


## Packaging

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

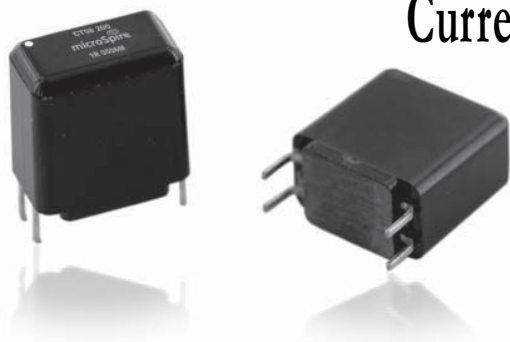


## Connections



High Grade Technologies... Power Magnetics... Current Transformers...

# Current Transformer for DC/DC Applications CT08 200 221 PR

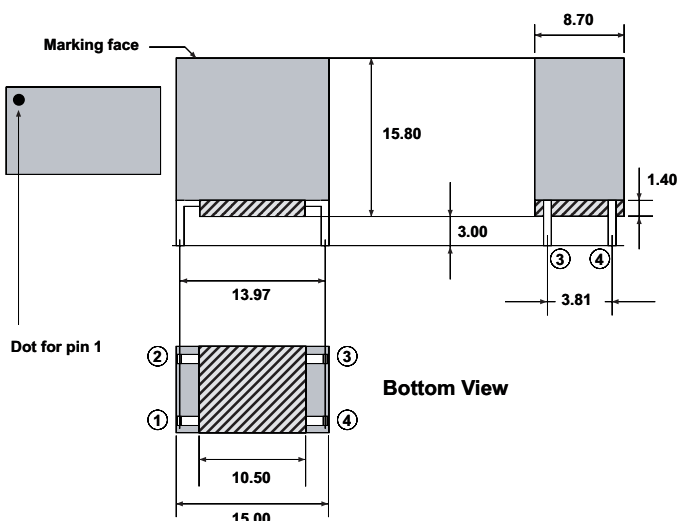


- Designed for DC/DC Converter Applications
- Measurement up to  $5.4 A_{RMS}$  ( $8 A_{PEAK} - 3.6 A_{DC MAX}$ ) from 100 to 200 kHz with 2% Accuracy
- Applied standards:  
MIL-STD-202, ECSS-Q-70-02  
ESCC-3201, DO-160

## 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 - $1V_{RMS}$ )	$R_{3-4} = 5.8 \Omega$ ( $\pm 10\%$ )	500 $V_{DC}$ - 1 min (RI $\geq 100 \text{ M}\Omega$ ) between windings

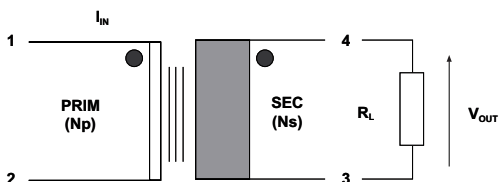
## Typical Dimensions (mm)



## 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 ( $V_{OUT} = 3V_{RMS MAX}$ ) 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 ( $V_s = 5.4V_{RMS MAX}$ ) 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

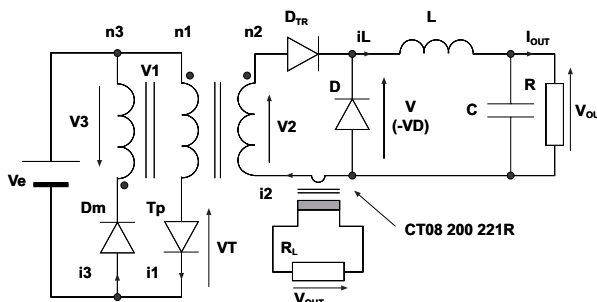


## Marking



yyww :  
Date code

## Application Schem.

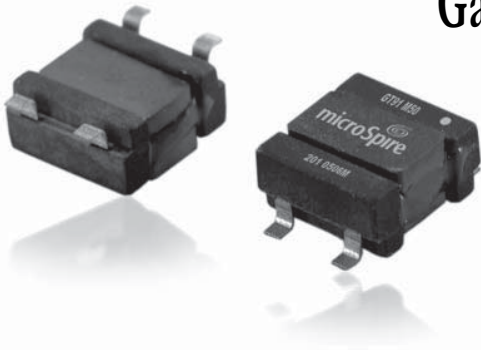


CT08 200 221R can be used for measurement of secondary current ( $i_2$ ) of a DC/DC forward converter (3.3V/8 A output and 100 kHz working frequency example) for regulation and surveillance operations.





# Gate Drive Transformer GDT91 M50 20 1WR

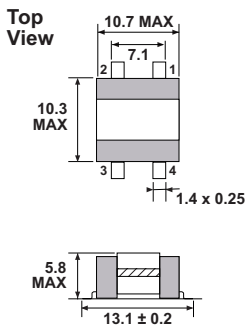


- Excellent performances in low profile package
- Suited for Avionics and Space applications
- ET: 20V<sub>μs</sub> Nominal
- Frequency: 200 KHz
- Applied standards: ECSS-Q-70-02 / ESCC-3201 screening flow applied / MIL-STD-202
- Materials meet UL94V-0 rating
- Weight: 2grams

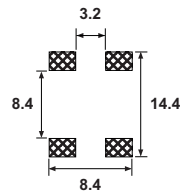
## Electrical Data (25°C)

ID Code	Primary Inductance Max	Turn ratio ± 0,5%	DC Resistances	Isolation Voltage	Leakage Inductance	Interwinding Capacitance
GDT91 M50 20 1WR	$L_{1-4} > 500\mu\text{H}$ (10kHz - 1V <sub>RMS</sub> )	$N_{7-6} / N_{1-4} = 1.00$	$R_{1-2} < 1.25\Omega$ $R_{3-4} < 1.25\Omega$	500 VDC - 1 min (Ri ≥ 100MΩ)	$L_{f1-2} < 1\mu\text{H}$ ( <sub>3-4</sub> in short circuit)	$C_{1-2/3-4} < 100\text{ pF}$

## Dimensions (mm)



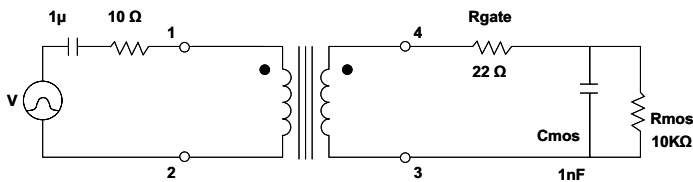
## Pad Layout



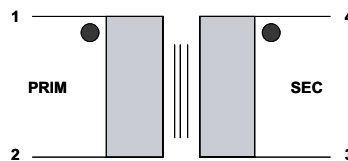
## Notes

- Insulation class (windings) : Classe H2
- Operating temperature: -55 °C to +125 °C
- Storage temperature: -55 °C to +140 °C
- I peak : <1A ( 100 ns)
- Average I : <50 mA
- V primary : 7.5V peak
- Q : <60 mC

## Application Schem.

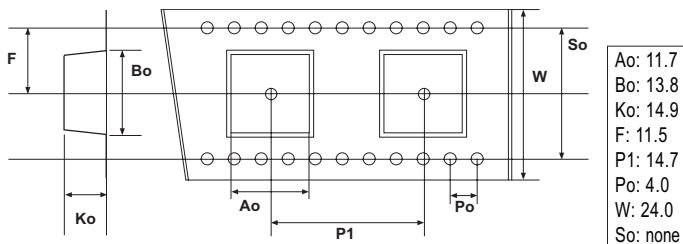


## Connections

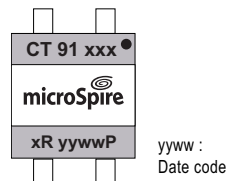


## Packaging

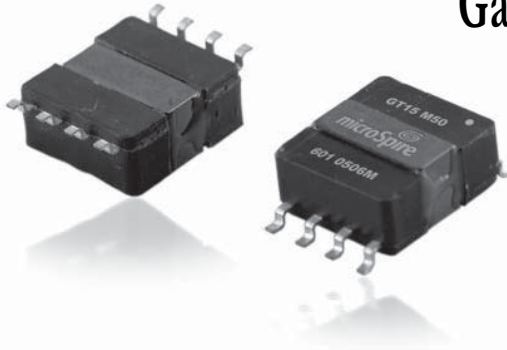
Tape and Reel:  
700 pieces per reel of diameter 330 mm



## Marking



# Gate Drive Transformer GDT15 M50 60 1WR



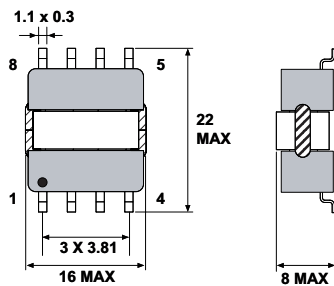
- Excellent performances in low profile package
- Suited for Avionics and Space applications
- ET : 60 V<sub>μs</sub> Nominal
- Frequency range : 50 KHz - 500 KHz
- Applied standards : ECSS-Q-70-71 / ESCC-3201 screening flow applied / ABD-0100 / DO-160
- Materials meet UL94-V0 rating
- Approx. weight : 5 grams

## Electrical Data (25°C)

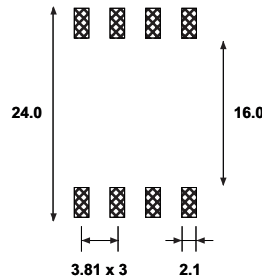
ID Code	Primary Inductance Max	Turn ratio ± 1%	DC Resistances ± 15%	Isolation Voltage	Leakage Inductance	Interwinding Capacitance
GDT15 M50 60 1WR	L <sub>1-4</sub> > 500 μH (10kHz - 1V <sub>RMS</sub> )	N <sub>7-6</sub> / N <sub>1-4</sub> = 1.52	R <sub>1-4</sub> = 170 mΩ R <sub>6-7</sub> = 400 mΩ	500 VDC - 1 min (R <sub>i</sub> ≥ 100 MΩ)	L <sub>f1-4</sub> < 2.0 μH ( <sub>6-7</sub> in short circuit)	C <sub>1-4/6-7</sub> < 150 pF

## Dimensions (mm)

Top View



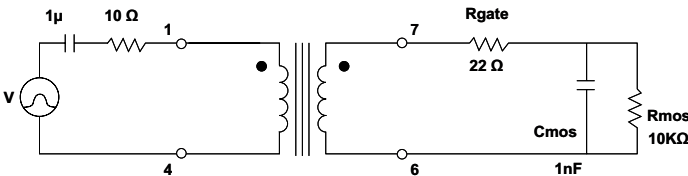
## Pad Layout



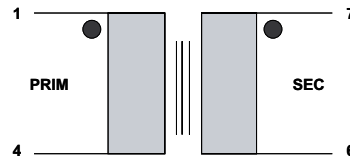
## Notes

- Insulation class (windings): Classe H
- Operating temperature : -55 °C to +125 °C
- Storage temperature : -55 °C to +140 °C
- Dielectric Strength : 500 V<sub>RMS</sub> - 50 Hz

## Application Schem.

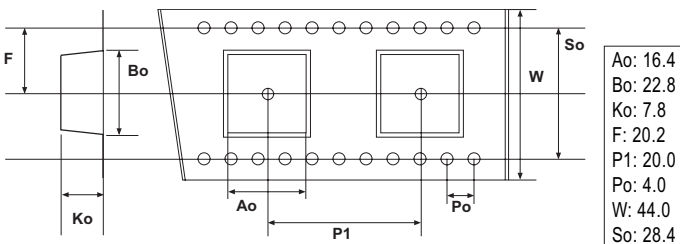


## Connections

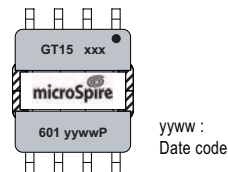


## Packaging

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



## Marking

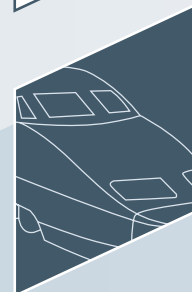
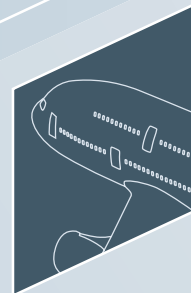
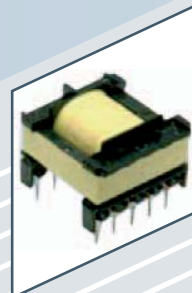
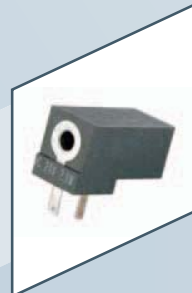
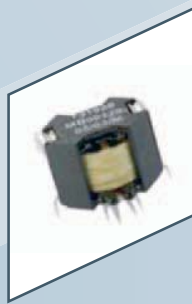
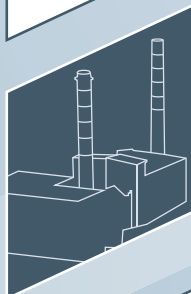


High Grade Technologies...  
Power Magnetics...  
Gate Drive Transformers...





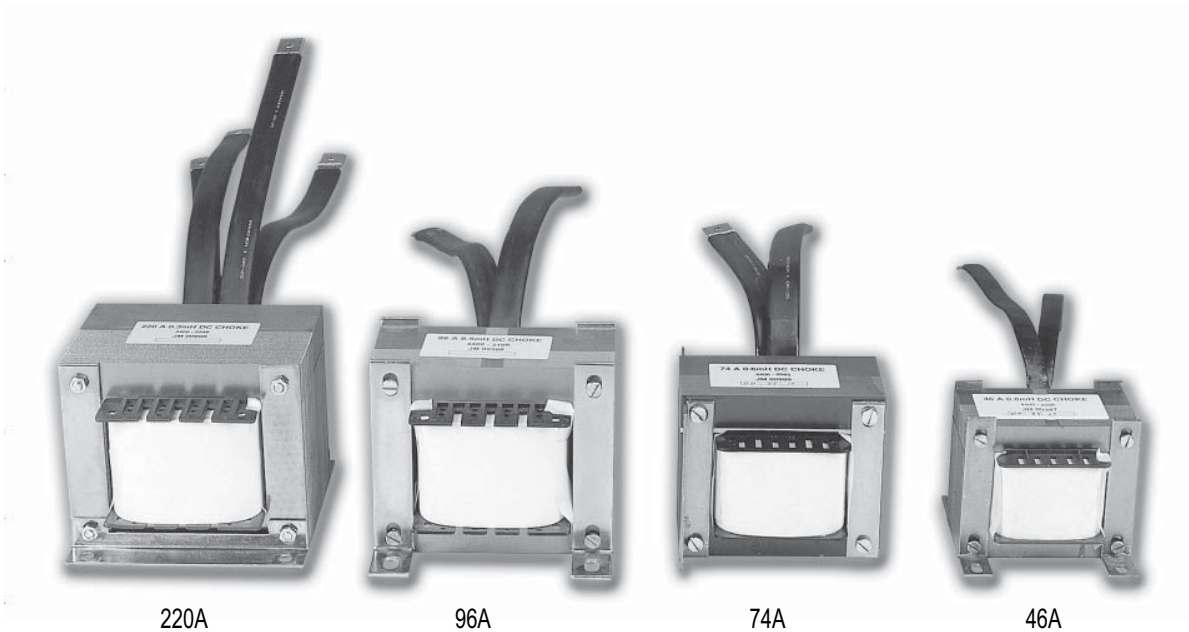
**Industrial Technologies**  
From Design to Production



# Power Magnetics

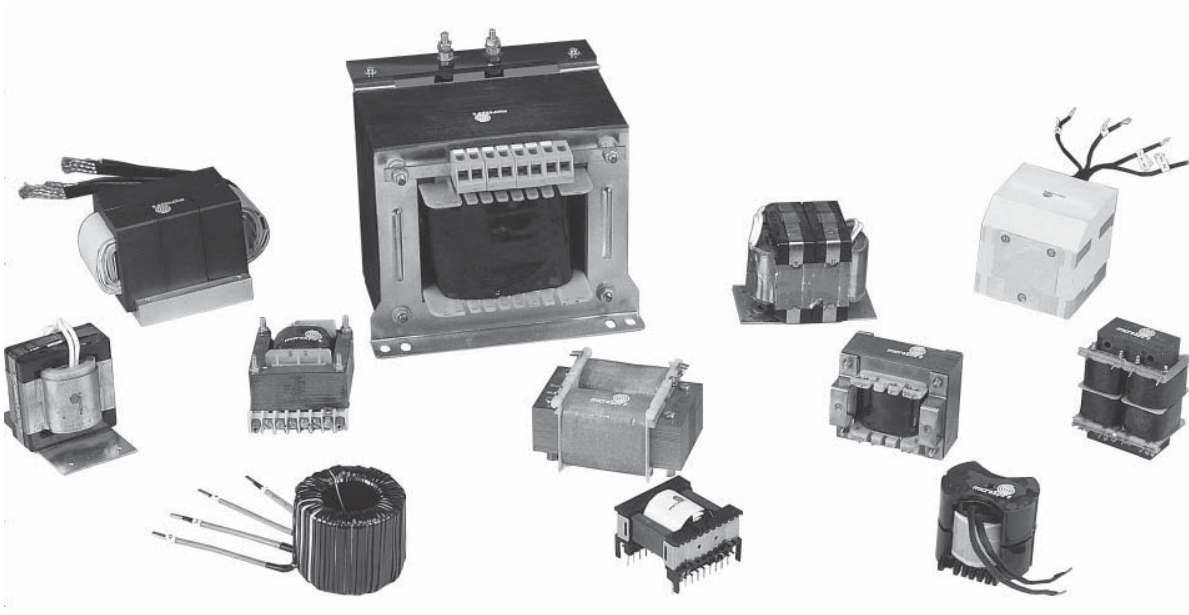
Microspire Engineers design compact yet powerful magnetics for a wide range of applications:

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



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

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



## Custom bobbins

### Current and Voltage Transformers

MicroSpire designs 50Hz transformers to measure currents up to 100A, with an accuracy reaching 1% upon request, together with transformers to sense up to 20A,  $\pm 1\%$ , at frequencies up to 1MHz.

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.





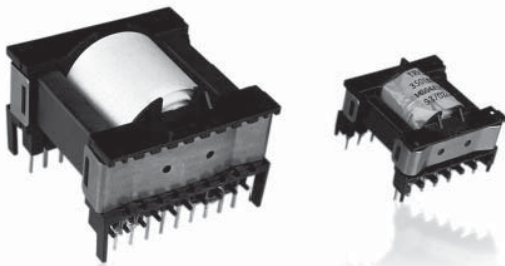
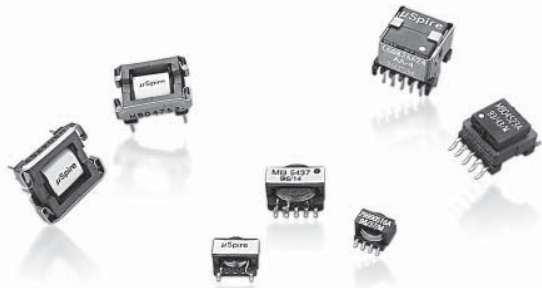
## Custom Designs

### 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 500kHz.

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



### ETD Coils and Transformers

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

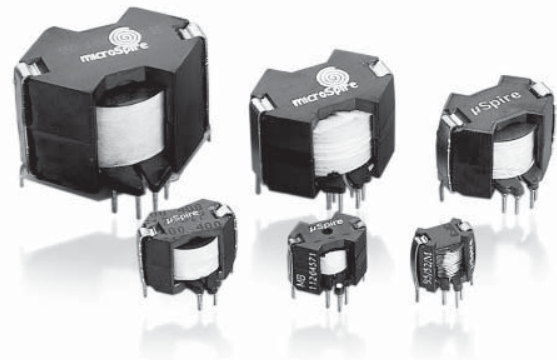
ETD cores have the additional benefit of an almost constant cross-section along the magnetic path.

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 500kHz.

### RM series

RMcoils 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.

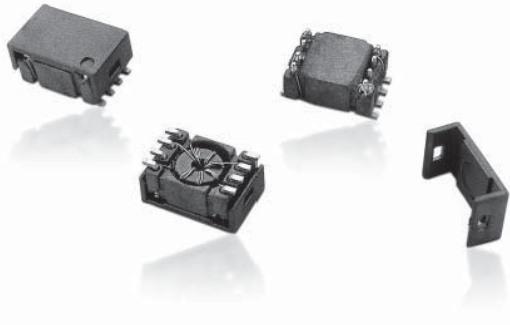


### Planar Magnetics

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



# 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.

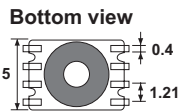
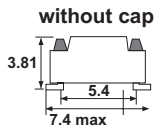
- Suited for IR and vapor reflow soldering
- Materials meet UL94-V0 rating
- Operating temperature range: -40°C to +100°C
- Weight: 0.5gram

## Electrical Data

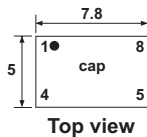
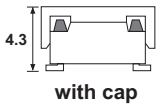
ID Code	Number of lines	Max. Current mA	L/winding $\mu$ H	RDC max m $\Omega$	Isolation Vrms
DLEF12 020 1S	2	100	5	250	250
DLEF13 020 1S	3	100	5	250	250
DLEF14 020 1S	4	100	5	250	250

## Typical Dimensions (mm)

DLEF0x xxx xS

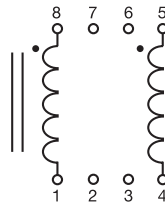


DLEF1x xxx xS

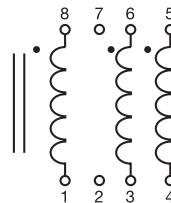


## Connections

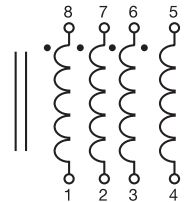
DLEF2x xxx xS



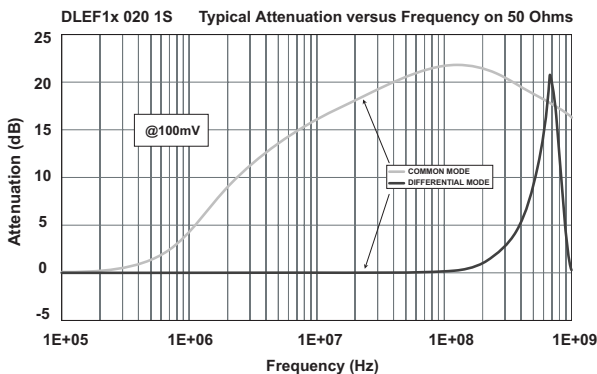
DLEF3x xxx xS



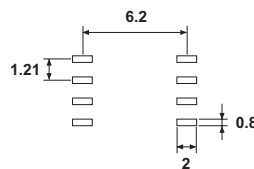
DLEF4x xxx xS



## Response Curves



## Pad Layout

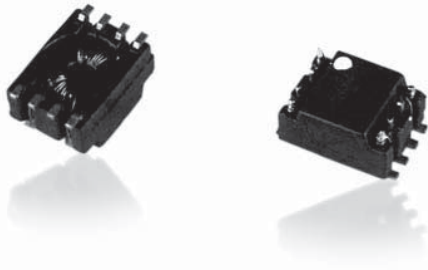


**Packaging** Tape and Reel : 2200 pieces

Industrial Technologies...  
RF and Data Magnetics...  
Filtering & EMI Suppression Chokes...



# EMI Suppression Chokes - ESC Series



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

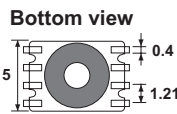
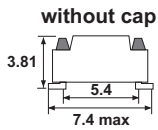
- Surface-mount package
- Suited for IR and vapor reflow soldering
- Materials meet UL94-V0 rating
- Frequency range up to 100 MHz
- Operating temperature range: -40 °C to +125 °C
- Weight: 0.5 gram

## Electrical Data

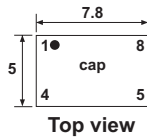
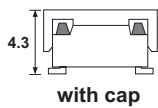
Part Number (typical values)	Inductance at 100 kHz $\mu\text{H}$	Rdc Max (at 80°C) m	Impedance at 100 MHz $\Omega$	Attenuation 50 $\Omega$ at 10MHz dB	Rated Current max mA	Isolation between windings Vrms
ESC X1 15K 1S	15	20	100	6,5	750	250
ESC X1 56K 1S	56	35	250	12	600	250
ESC X1 M47 1S	470	470	1200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

## Typical Dimensions (mm)

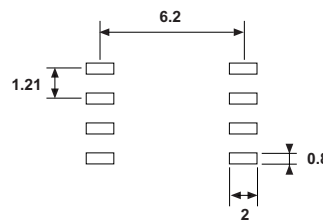
### ESC0x xxx xS



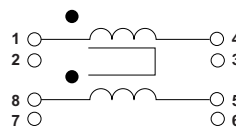
### ESC1x xxx xS



## Pad Layout



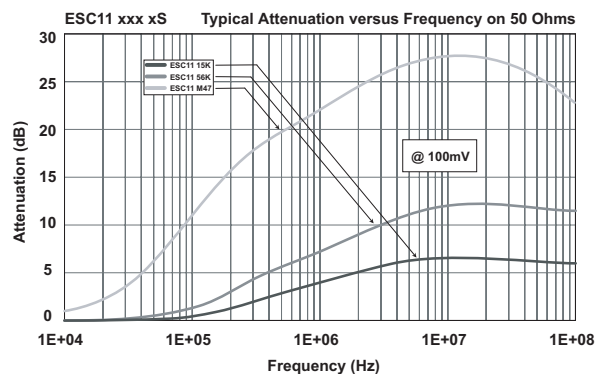
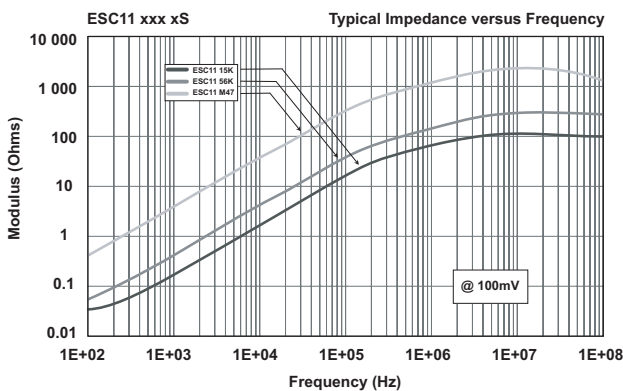
## Connections



## Packaging

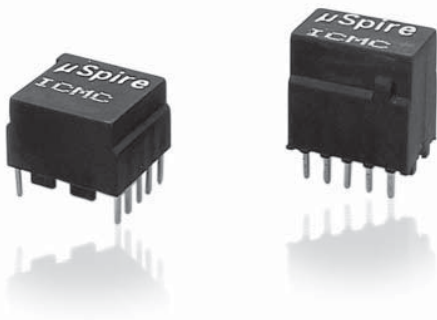
Tape and Reel: 2200 pieces

## Response Curves



Industrial Technologies... RF and Data Magnetics... Filtering & EMI Suppression Chokes.

# 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

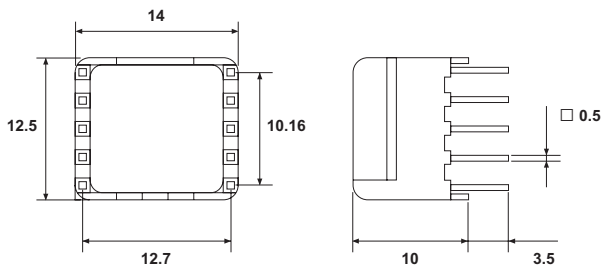
## Electrical Data

Part Number	Ln mH	In A eff	LF μH	Rdc Ω
<b>2-fold chokes</b>				
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
<b>4-fold chokes</b>				
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

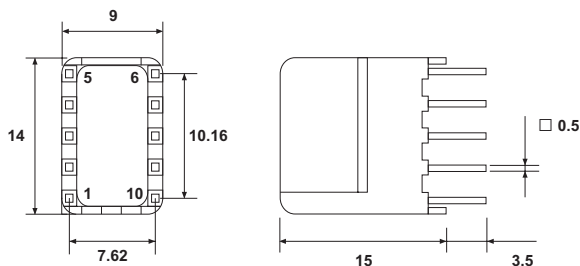
Dielectric strength 500 Vrms for 2 seconds.

## Typical Dimensions (mm)

Horizontal design ICMCxx xxx xH



Vertical design ICMCxx xxx xV

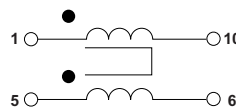


## Symbols

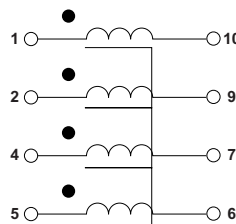
- In = permissible rated current of a winding
- Ln = rated inductance of a winding (tol. +50%/-30% ; f=10 kHz ; U=100mVrms)
- LF = leakage inductance of a winding when all other windings short circuit (nominal value)
- Rdc = DC resistance of winding (nominal value)

## Connections

2-fold chokes ICMC12 xxx xx



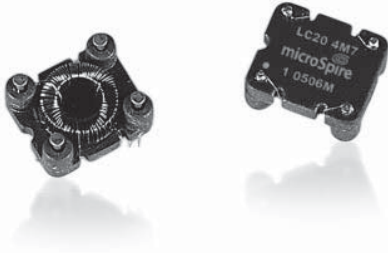
4-fold chokes ICMC14 xxx xx



Industrial Technologies...  
RF and Data Magnetics...  
Common Mode Chokes...



# 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

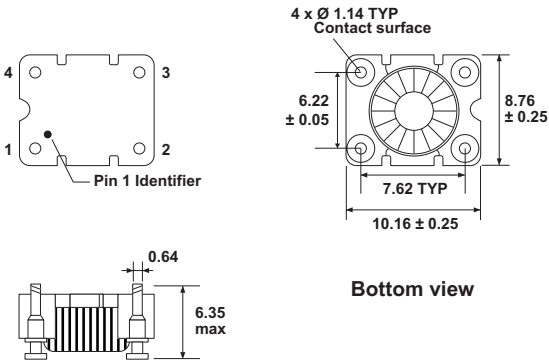
Part Number	OCL (mH +30%/-40%)	Common Mode Attenuation			I max eff (mA)	Isolation (Vrms min)	DCR (Ω max)
		(db typ. @ 100kHz)	(db typ. @ 1MHz)	(db typ. @ 10MHz)			
LCMC 20 4M7 1S	2 x 4.7	29	40	24	35	500	1.15

Note: values measured at 10 kHz, 100 mV<sub>RMS</sub> at 25 °C. Dielectric strength : 500V<sub>RMS</sub> - 50Hz - 1min

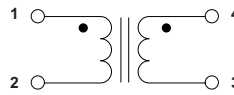
## To Order

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

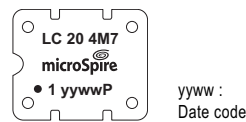
## Typical Dimensions (mm)



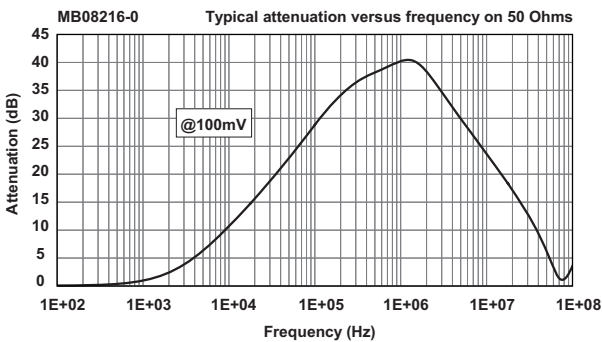
## Connections



## Marking

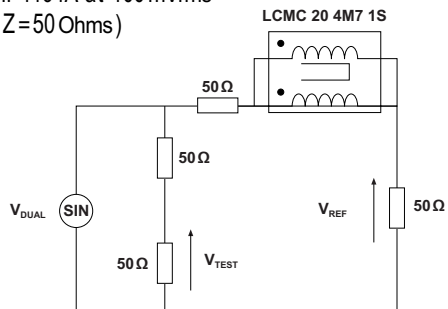


## Frequency Response

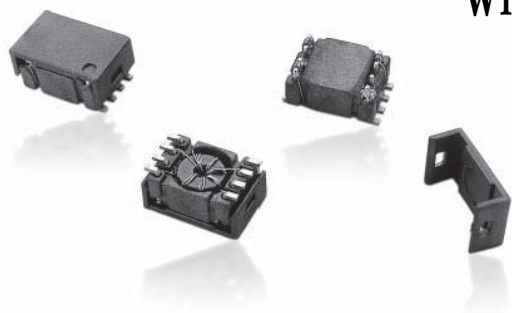


## Measurement Circuit

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



# Wide Band RF Transformers - WRFT Series



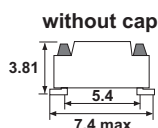
- Frequency bandpass 100kHz to 500 MHz
- Power input max. 250mW
- Isolation prim. to sec. 500Vrms minimum
- Suited for IR and vapor reflow soldering
- Materials meet UL94-V0 rating
- Operating temperature range: -40°C to +125°C
- Weight: 0.5gram

## Electrical Data

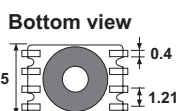
ID Code	Impedance ratio ( $\Omega$ )	Bandwidth (MHz)		
		3 dB	2 dB	1 dB
WRFTX1 1R0 1X	50:50	0.15-400	0.35-200	2-50
WRFTX1 2R0 1X	50:100	0.30-300	0.5-250	2-230
WRFTX2 2R0 1X	50:100 center tap	0.10-200	0.5-100	2-50
WRFTX1 2R5 1X	50:125	0.10-100	0.1-50	0.1-20
WRFTX1 4R0 1X	50:200	0.20-350	0.35-300	2-100
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)

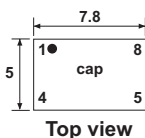
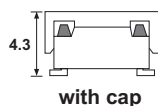
WRFT0x xxx xS



Surface-mount case

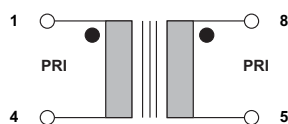


WRFT1x xxx xS

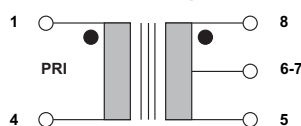


## Connections

Standard

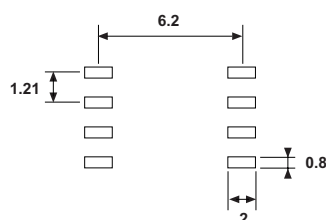


Center tap



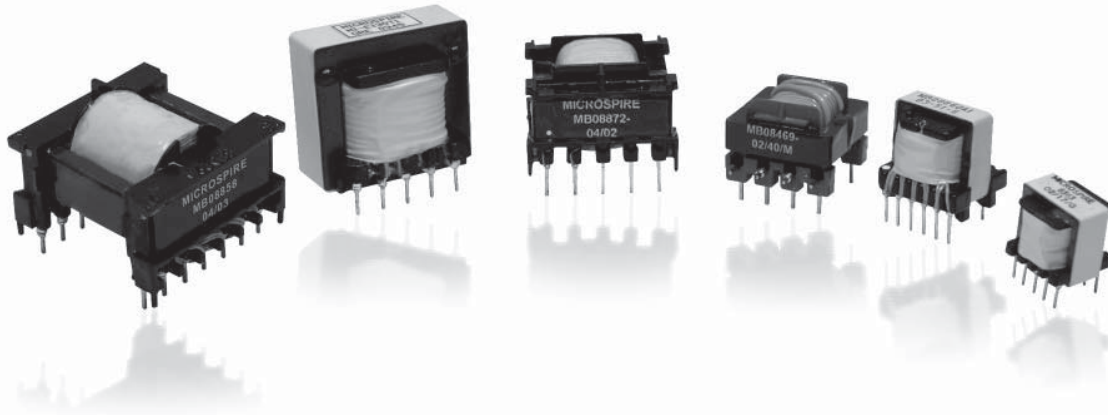
**Packaging** Tape and Reel: 400 pieces

## Pad Layout





# 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 250W

- 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

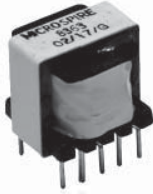
\*\* Depending on component heating and thermal class

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 4 mm
- Dielectric strength up to 2kV (50 Hz-1 min)
- 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	-	Operational 1500Vrms
FSIT13 6W0 01	85V - 265V (4° - 2)	5.95W	5V / 350mA (8° - 6) 12V / 350mA (10° - 6)	TNY264, TNY266	132kHz	-	Operational 1500Vrms

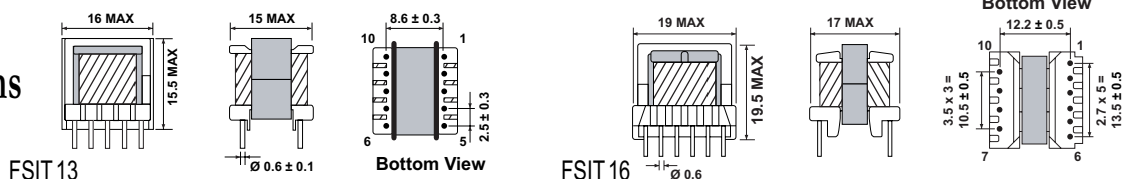


- 0 to 10W transformers for AC/DC converters connected to the mains (50/60Hz)
- Low cost and small package 6+4 pin through hole version (EE-16)
- Compliant with reinforced insulation up to 265Vrms working voltage
- Clearance and creepage distance up to 8mm
- Dielectric strength up to 4kV (50 Hz-1 min)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



# Flyback Safety Insulating Transformers

## FSIT 20 Series & FSIT 20.1 Series



- 10 to 20W transformers for AC/DC converters connected to the mains
- 2x4 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: 20 grams

### Electrical Data FSIT 20

ID Code	Mains Input Voltage Range (Vrms)	Output Power (W)	Designed Outputs	Connected IC(s)	Working Frequency	Applied standard(s)	Standard Requirements
FSIT20 20W 01	85 - 265V (3° - 4)	20W	15V / 1.35A (5° - 8) BIAS (2° - 1)	TOP244G	132kHz	EN60950	Reinforced 4000Vrms
FSIT20 20W 02	85V - 265V (2° - 3)	20W	15V / 1.35A (5° - 8)	NCP1200	60kHz	EN60950	Reinforced 4000Vrms

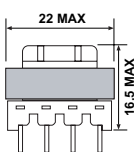


- 10 to 20W transformers for AC/DC converters connected to the mains (50/60Hz)
- 2x5 pin through hole version (EF20)
- Compliant with reinforced insulation up to 265Vrms working voltage
- Clearance and creepage distance up to 8mm
- Dielectric strength up to 4kV (50Hz-1min)
- Approx weight: 20 grams

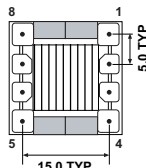
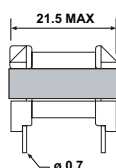
### Electrical Data FSIT 20.1

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° - 10) 12V / 30mA (7° - 10) 65V / 125mA (6° - 10) BIAS (5° - 4)	VIPer20ASP	120kHz	EN60950	Reinforced 3000Vrms

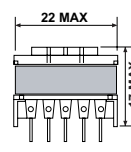
### Typical Dimensions (mm)



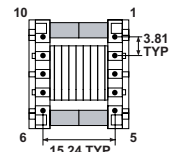
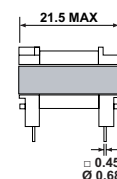
FSIT 20



Bottom View



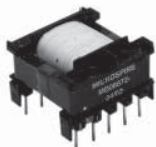
FSIT 20.1



Bottom View

# 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

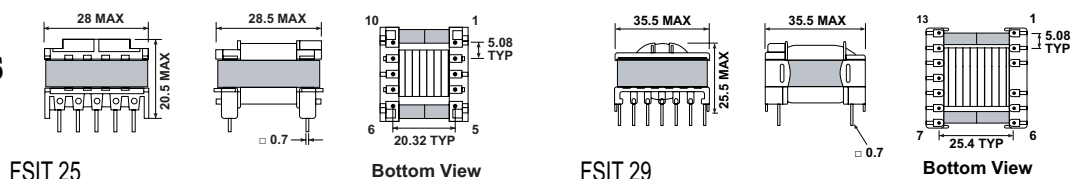


- 35 to 70W transformers for AC/DC converters connected to the mains (50/60Hz)
- 6+7 pin through hole version (ETD29)
- Compliant with reinforced insulation up to 265Vrms working voltage
- Clearance and creepage distance up to 8mm
- Dielectric strength up to 4kV (50Hz-1min)
- Approx weight : 50grams

### 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

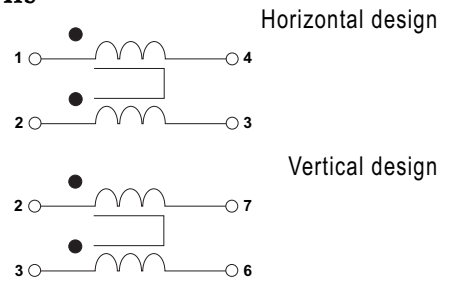


- Operating single phase voltage 250 Vrms
- Low strayfield winding structure
- Thermoplastic cases.
- Materials meet with UL94-V0 rating
- Through hole design
- Operating temperature range: -40 °C to +70 °C

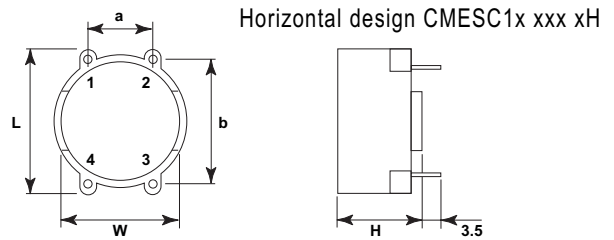
## Electrical Data

ID Code	In A	Ln mH ± 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

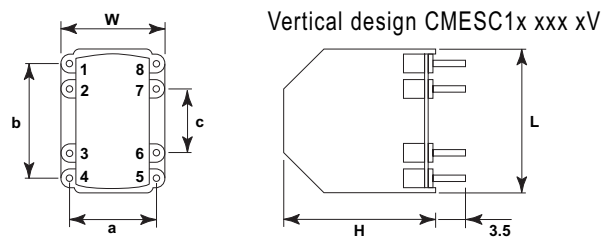
## Connections



## 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

Industrial Technologies... Power Magnetics... Common Mode EMI Suppression Chokes...



# 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

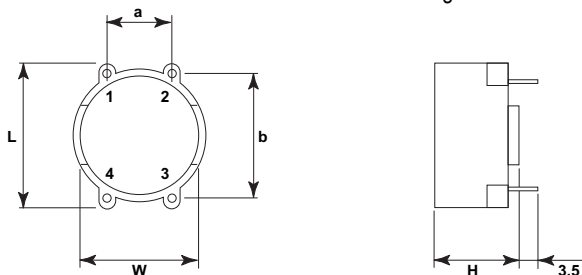
## Electrical Data

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 : 500V (50 Hz-1 min)

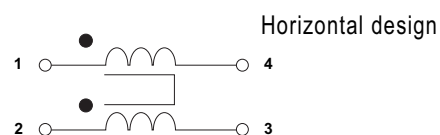
## Typical Dimensions (mm)

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

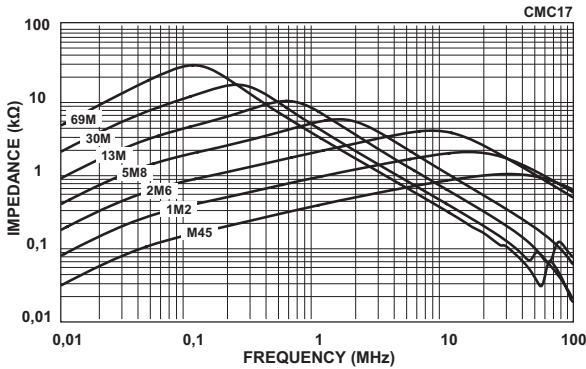




# CMESC 17 Common Mode Chokes Series

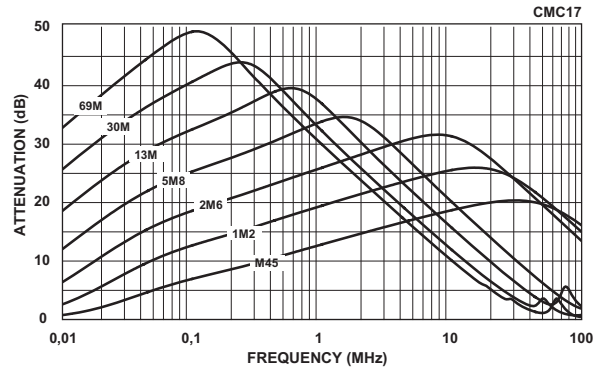
## Improved Temperature Stability

### Impedance



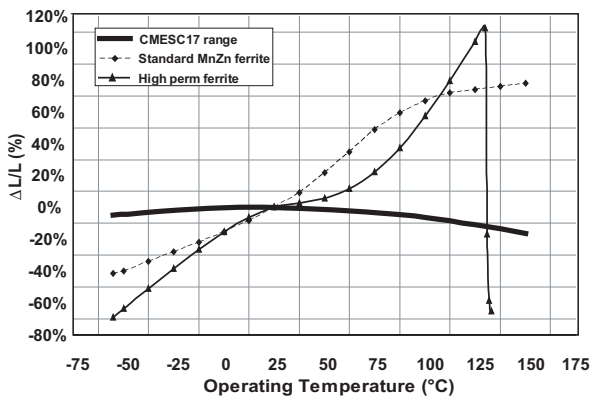
Typical values at 25°C with 1mT at 10kHz

### Attenuation



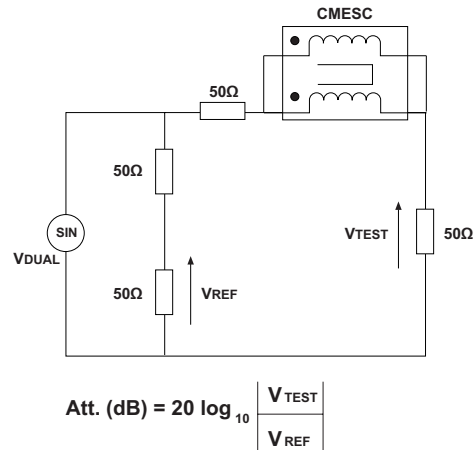
Typical values (Z=50Ω) at 25°C with 1mT at 10kHz

### Variation vs Temperature



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

### Attenuation Measurement Circuit

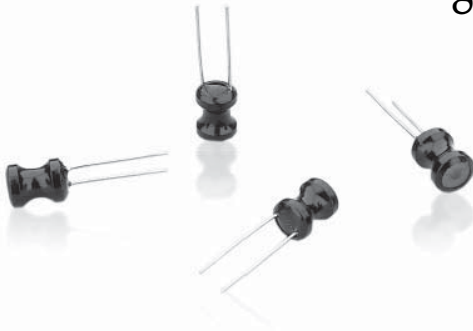


CMESC17 range uses very high performance materials and therefore, offers remarkable temperature stability figures compared to standard or high-perm ferrite cores.

Industrial Technologies... Power Magnetics... Common Mode EMI Suppression Chokes...



# RF Peaking Coils - PK 0608 - PK 0810 - PK1012 Series



- Excellent Q, high SFR
- Radial mounting
- Small size
- PVC sleeving or UL tube
- Operating temperature range: -20°C to +80°C

## Specifications

- Inductance range: 1.0 to 100mH
- Current rating: Based on max temp rise not exceeding 20°C
- Terminal strength: 0.5Kg min

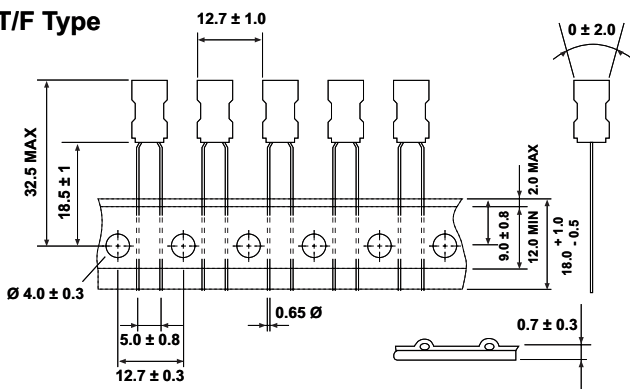
## Electrical Data

Part Number	L @ 1kHz (mH ± 10%)	Q min	Q Test freq (MHz)	Rdc (Ω) max	Idc (mA) max
PK0608-122K-S	1.2	70	252	3.5	120
PK0608-152K-S	1.5	70	252	4.5	100
PK0608-182K-S	1.8	70	252	5.0	100
PK0608-222K-S	2.2	70	252	6.2	90
PK0608-272K-S	2.7	70	252	7.2	90
PK0608-332K-S	3.3	70	252	10.5	60
PK0608-392K-S	3.9	70	252	11.7	60
PK0608-472K-S	4.7	70	252	13.6	60
PK0608-562K-S	5.6	70	252	16.6	50
PK0608-682K-S	6.8	70	252	19.6	50
PK0608-822K-S	8.2	70	252	25.2	40
PK0608-103K-S	10	70	79.6	29.5	40
PK0608-123K-S	12	70	79.6	33.8	40
PK0608-153K-S	15	70	79.6	45.4	30
PK0608-183K-S	18	70	79.6	50.4	30
PK0608-223K-S	22	70	79.6	60	30
PK0608-303K-S	30	70	79.6	91.5	20
PK0608-333K-S	33	70	79.6	98.5	20
PK0608-393K-S	39	70	79.6	140	15
PK0608-473K-S	47	70	79.6	160	15
PK0608-503K-S	50	70	79.6	170	15
PK0608-563K-S	56	70	79.6	181	15
PK0608-683K-S	68	50	79.6	282	15
PK0608-823K-S	82	50	79.6	312	10
PK0608-104K-S	100	30	25.2	380	10
PK0608-124K-S	120	30	25.2	430	10
PK0608-154K-S	150	30	25.2	520	10

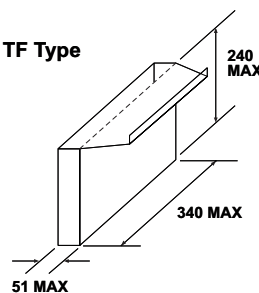
Part Number	L @ 1kHz (mH ± 10%)	Q min	Q Test freq (MHz)	SRF (MHz) min	Rdc (Ω) max	Idc (mA) max
PK0810-102K-S	1.0	65	0.252	1.4	6.0	450
PK0810-122K-S	1.2	140	0.252	1.2	6.0	450
PK0810-152K-S	1.5	130	0.252	1.1	7.0	400
PK0810-162K-S	1.6	150	0.252	1.1	10	400
PK0810-182K-S	1.8	150	0.252	1.1	10	400
PK0810-222K-S	2.2	150	0.252	1.0	12	360
PK0810-272K-S	2.7	140	0.252	0.9	14	360
PK0810-302K-S	3.0	140	0.252	0.9	15	280
PK0810-332K-S	3.3	140	0.252	0.86	16	280
PK0810-392K-S	3.9	130	0.252	0.81	18	280
PK0810-472K-S	4.7	120	0.252	0.77	20	260
PK0810-562K-S	5.6	120	0.252	0.72	22	260
PK0810-682K-S	6.8	110	0.252	0.54	29	260
PK0810-752K-S	7.5	110	0.252	0.52	30	240
PK0810-822K-S	8.2	100	0.252	0.50	30	240
PK1012-103K-S	10	140	79.6	0.35	12	280
PK1012-123K-S	12	140	79.6	0.31	13	280
PK1012-153K-S	15	140	79.6	0.28	18	280
PK1012-183K-S	18	130	79.6	0.26	25	280
PK1012-223K-S	22	130	79.6	0.22	30	240
PK1012-273K-S	27	130	79.6	0.20	35	240
PK1012-333K-S	33	110	79.6	0.19	40	200
PK1012-393K-S	39	110	79.6	0.17	50	140
PK1012-473K-S	47	110	79.6	0.15	50	140
PK1012-563K-S	56	100	79.6	0.13	65	140
PK1012-683K-S	68	80	79.6	0.12	70	120
PK1012-823K-S	82	65	79.6	0.10	85	120
PK1012-104K-S	100	60	79.6	0.10	100	120

	ØA max	B max	C	D max	ØE +/-0.05	F
PK0608	7.0	10.0	15.0	1.5	0.65	2.5 ±0.5
PK0810	9.0	12.5	15.0	1.5	0.65	5 ±1.0
PK1012	12.0	14.0	15.0	1.5	0.80	6 ±1.0

### T/F Type

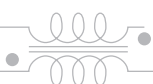


### TF Type



Part Number	Packaging quantity
PK0608	1300 pcs
PK0810	600 pcs
PK1012	500 pcs

.....Industrial Technologies.....  
 .....Power Magnetics.....  
 .....Leaded Energy Storage and Filtering Inductors.....



# Axial Lead Power Chokes - VC 0513 Series



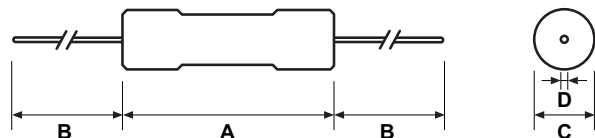
- PVC heat-shrink insulation 2.5kV isolation
- Low DC resistance
- DC current rating up to 1.28A
- Inductance range 3.9  $\mu$ H to 18000  $\mu$ H  $\pm$  10 %
- Ferrite core, rugged construction
- Tape and reel 1000 pcs/reel, or bulk
- Operating temperature range: -40 °C to +105 °C

Construction Isolated enamelled copper wire over ferrite core with PVC shrink sleeving.

## Electrical Data

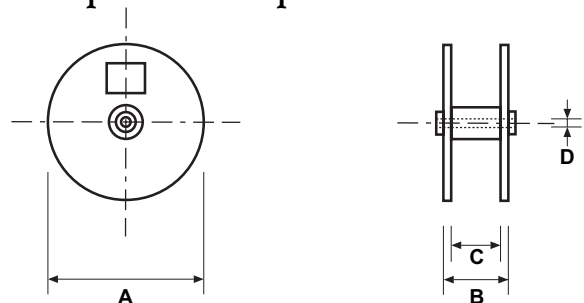
Part Number	Inductance at 1 KHz (mH $\pm$ 10%)	Rdc Max ( $\Omega$ )	Saturation Current (A)	dc Current (A)
VC-0513-3R9K-PVC	3.9	0.019	7.3	1.28
VC-0513-4R7K-PVC	4.7	0.022	6.3	1.28
VC-0513-5R6K-PVC	5.6	0.024	5.6	1.28
VC-0513-6R8K-PVC	6.8	0.026	5.3	1.28
VC-0513-8R2K-PVC	8.2	0.028	4.5	1.28
VC-0513-100K-PVC	10	0.033	4.1	1.28
VC-0513-120K-PVC	12	0.037	3.6	1.28
VC-0513-150K-PVC	15	0.040	3.3	1.28
VC-0513-180K-PVC	18	0.044	3.0	1.28
VC-0513-220K-PVC	22	0.050	2.7	1.28
VC-0513-270K-PVC	27	0.058	2.5	1.28
VC-0513-330K-PVC	33	0.075	2.2	1.008
VC-0513-390K-PVC	39	0.094	2.0	0.804
VC-0513-470K-PVC	47	0.109	1.8	0.804
VC-0513-560K-PVC	56	0.140	1.7	0.804
VC-0513-680K-PVC	68	0.145	1.5	0.804
VC-0513-820K-PVC	82	0.152	1.4	0.804
VC-0513-101K-PVC	100	0.208	1.2	0.632
VC-0513-121K-PVC	120	0.283	1.1	0.508
VC-0513-151K-PVC	150	0.340	1.0	0.508
VC-0513-181K-PVC	180	0.362	0.95	0.508
VC-0513-221K-PVC	220	0.430	0.86	0.508
VC-0513-271K-PVC	270	0.557	0.77	0.400
VC-0513-331K-PVC	330	0.665	0.70	0.400
VC-0513-391K-PVC	390	0.772	0.64	0.400
VC-0513-471K-PVC	470	1.15	0.59	0.315
VC-0513-561K-PVC	560	1.27	0.54	0.315
VC-0513-681K-PVC	680	1.61	0.49	0.250
VC-0513-821K-PVC	820	1.96	0.44	0.200
VC-0513-102K-PVC	1000	2.30	0.40	0.200
VC-0513-122K-PVC	1200	2.65	0.35	0.200
VC-0513-152K-PVC	1500	3.45	0.33	0.158
VC-0513-182K-PVC	1800	4.03	0.29	0.158
VC-0513-222K-PVC	2200	4.48	0.27	0.158
VC-0513-272K-PVC	2700	5.90	0.24	0.125
VC-0513-332K-PVC	3300	6.56	0.22	0.125
VC-0513-392K-PVC	3900	8.63	0.20	0.100
VC-0513-472K-PVC	4700	10.5	0.18	0.100
VC-0513-562K-PVC	5600	13.9	0.166	0.082
VC-0513-682K-PVC	6800	16.3	0.151	0.082
VC-0513-822K-PVC	8200	20.8	0.136	0.065
VC-0513-103K-PVC	10000	26.4	0.125	0.050
VC-0513-123K-PVC	12000	29.2	0.114	0.050
VC-0513-153K-PVC	15000	42.5	0.098	0.039
VC-0513-183K-PVC	18000	48.3	0.091	0.039

## Typical Dimensions (mm)



A	B	$\varnothing$ C	$\varnothing$ D
16.5 max	38 min	6.6 max	0.85 max

## Tape and reel specifications



A	B	$\varnothing$ C	$\varnothing$ D
355	78	71	17

## To Order

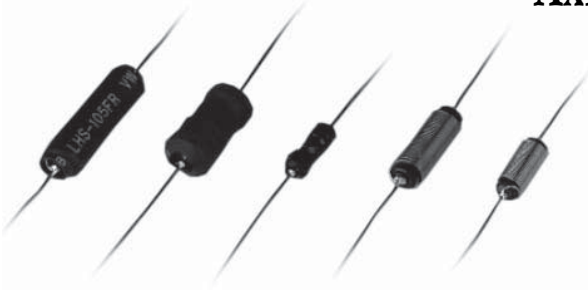
VC	0513	###	K	PVC
Type	Core size	Inductance	Tolerance K for $\pm$ 10%	PVC sleeving

VC 0513 ###K PVC

**Packaging** Tape and Reel: 1000 pieces



# Axial Lead Power Chokes - VC 1019 Series

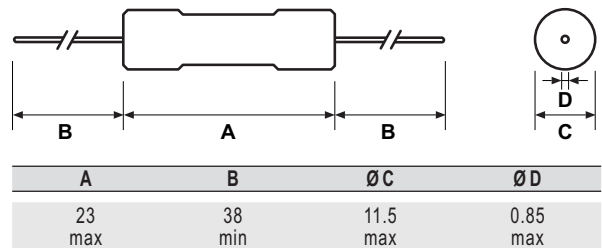


- PVC (UL) heat-shrink insulation 2.5kV isolation
- Low DC resistance
- DC current range to 4A
- 3.9 $\mu$ H to 100000 $\mu$ H
- Ferrite core, rugged construction
- Operating temperature range: -40 °C to +105 °C

## Electrical Data

Part Number	Inductance at 1 KHz (mH $\pm$ 10%)	Rdc Max ( $\Omega$ )	Saturation Current (A)	dc Current (A)
VC-1019-3R9K-UL	3.9	0.007	15.5	4.0
VC-1019-4R7K-UL	4.7	0.008	13.9	4.0
VC-1019-6R8K-UL	6.8	0.011	11.6	4.0
VC-1019-100K-UL	10	0.017	8.70	4.0
VC-1019-150K-UL	15	0.022	7.34	4.0
VC-1019-220K-UL	22	0.026	6.07	4.0
VC-1019-270K-UL	27	0.027	5.36	4.0
VC-1019-330K-UL	33	0.032	4.82	4.0
VC-1019-390K-UL	39	0.033	4.36	4.0
VC-1019-470K-UL	47	0.035	3.98	4.0
VC-1019-560K-UL	56	0.037	3.66	3.2
VC-1019-680K-UL	68	0.047	3.31	2.5
VC-1019-820K-UL	82	0.060	3.10	2.0
VC-1019-101K-UL	100	0.090	2.79	1.6
VC-1019-121K-UL	120	0.113	2.54	1.6
VC-1019-151K-UL	150	0.129	2.22	1.6
VC-1019-181K-UL	180	0.150	1.98	1.6
VC-1019-221K-UL	220	0.162	1.89	1.6
VC-1019-271K-UL	270	0.208	1.63	1.6
VC-1019-331K-UL	330	0.212	1.51	1.6
VC-1019-391K-UL	390	0.281	1.39	1.6
VC-1019-471K-UL	470	0.380	1.24	1.2
VC-1019-561K-UL	560	0.420	1.17	1.0
VC-1019-681K-UL	680	0.548	1.05	1.0
VC-1019-821K-UL	820	0.655	0.97	0.8
VC-1019-102K-UL	1000	0.884	0.87	0.8
VC-1019-122K-UL	1200	1.04	0.79	0.6
VC-1019-152K-UL	1500	1.18	0.70	0.6
VC-1019-182K-UL	1800	1.56	0.64	0.6
VC-1019-222K-UL	2200	2.00	0.58	0.5
VC-1019-272K-UL	2700	2.06	0.53	0.4
VC-1019-332K-UL	3300	2.53	0.47	0.4
VC-1019-392K-UL	3900	2.75	0.43	0.4
VC-1019-472K-UL	4700	3.19	0.39	0.4
VC-1019-562K-UL	5600	3.92	0.359	0.315
VC-1019-682K-UL	6800	5.69	0.322	0.250
VC-1019-822K-UL	8200	6.32	0.293	0.250
VC-1019-103K-UL	10000	7.30	0.266	0.250
VC-1019-153K-UL	15000	10.5	0.214	0.200
VC-1019-223K-UL	22000	21.8	0.180	0.125
VC-1019-333K-UL	33000	25.7	0.146	0.125
VC-1019-473K-UL	47000	36.1	0.122	0.100
VC-1019-683K-UL	68000	57.3	0.101	0.082
VC-1019-104K-UL	100000	89.7	0.081	0.065

## Typical Dimensions (mm)



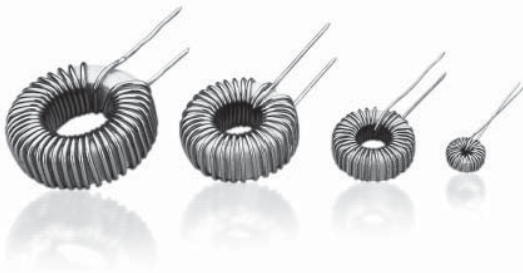
## To Order

VC	1019	###	K	UL
Type	Core size	Inductance	Tolerance K for $\pm$ 10%	UL sleeving

Packaging Bulk



# Toroidal Chokes - TC Series



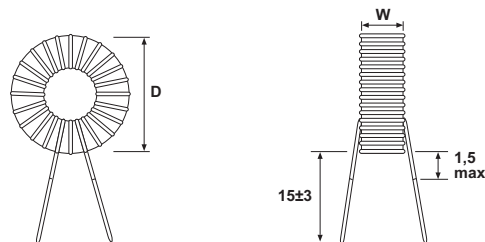
- Inductance range from 4,9  $\mu$ H to 1130  $\mu$ H
- Inductance tolerance: M:  $\pm 20\%$ , K:  $\pm 10\%$
- Iron powder core material
- Operating temperature range:  $-55^\circ\text{C}$  to  $+105^\circ\text{C}$
- Weight: 0.2 to 82 grams

## Electrical Data

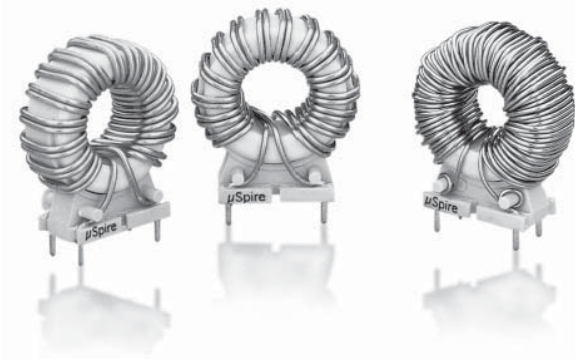
ID Code	DC Current (A)	Inductance ( $\mu$ H) Idc : 0	Inductance ( $\mu$ H) rated Idc	Rdc (m $\Omega$ )	Dimensions D x W (mm)
TC-270M-0.1A-2026	0.1	27	27.0	33	7.5 x 4.5
TC-200M-0.2A-2026	0.2	20	19.8	198	7.5 x 4
TC-9R0M-0.3A-2026	0.3	9	8.8	11	8 x 4.5
TC-270M-0.3A-2026	0.3	27	25.5	31	8 x 4.5
TC-5R0M-0.5A-2026	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 ( $\mu$ H) Idc : 0	Inductance ( $\mu$ H) rated Idc	Rdc (m $\Omega$ )	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

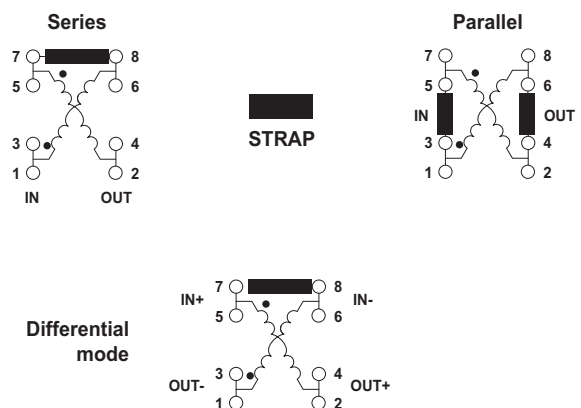
## Electrical Data

ID Code	In Adc	Ln μH	Lo μH	Rdc Ω	Pin Ø mm	S series
<b>500μJ</b>						
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

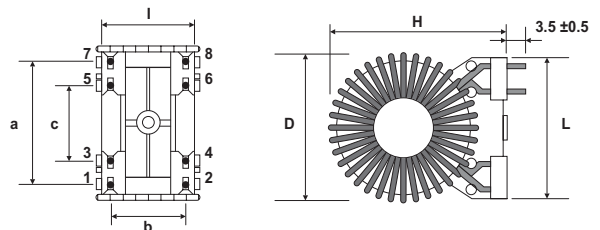
<b>1500μJ</b>						
ESI20 M72 1V	2	720	1140	192	0.80	S
ESI20 M47 1V	2.5	475	755	136	0.85	S
ESI20 M63 1V	2.8	632	1300	200	0.8	S
ESI20 M31 1V	3	310	476	78	1	S
ESI20 M42 1V	3.5	420	875	130	0.90	S
ESI20 M17 1V	4	170	262	48	1.12	S
ESI20 M72 1V	4	180	285	48	0.8	P
ESI20 M25 1V	4.5	254	540	84	1	S
ESI20 M47 1V	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

<b>2500μJ</b>						
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

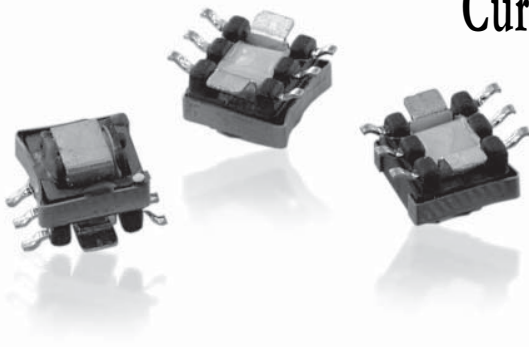
## Symbols

- 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<sup>1</sup>xxx 231W

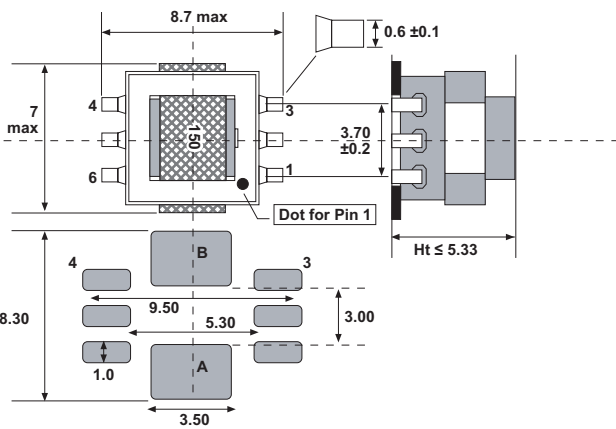


- Materials meet UL94-V0 rating
- Thermal index : classe B
- Max admissible current through primary winding : 2.2A (1.5ATYP)
- Insulation : Ri > 100 MΩ between A-B/ 1-3 at 200VDC
- Dielectric strength : 150 Vrms-50 Hz between A-B/ 1-3
- Operating temperature range : -40 °C to +100 °C
- Suited for IR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

## Electrical Data (25°C)

ID Code	Turn ratio ± 1% (A-B/1-3)	DCR (A-B) mΩ ± 15%	DCR (1-3) Ω ± 15%	L1-3
CT05 150 231W	1 : 150	6	9.6	≥ 4.8 μH
CT05 100 231W	1 : 100	6	4	≥ 2 μH
CT05 075 231W	1 : 75	6	2.8	≥ 1.2 μH
CT05 050 231W	1 : 50	6	1	≥ 540 μH

## Typical Dimensions (mm)

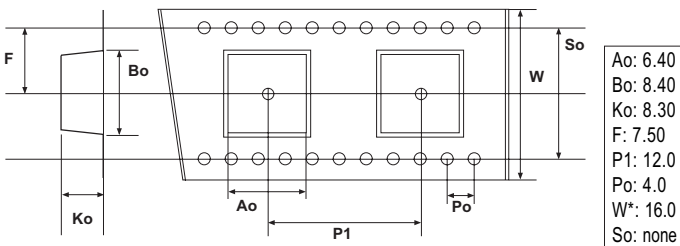


## Notes

Typical performances at +25 °C  
Storage Temperature -40 °C to +85 °C

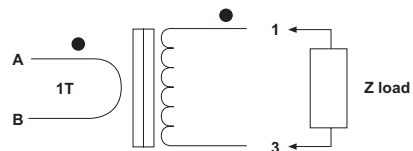
## Packaging

Tape and Reel : 750 pieces per reel



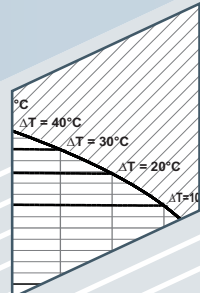
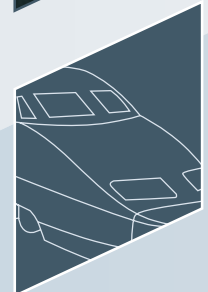
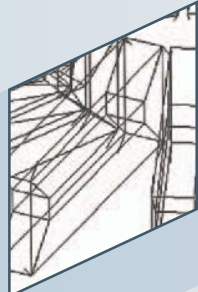
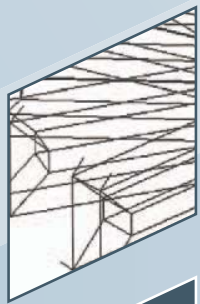
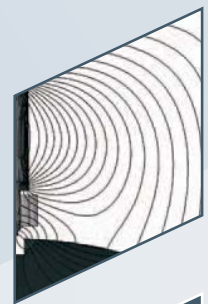
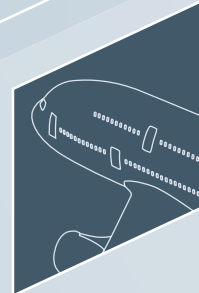
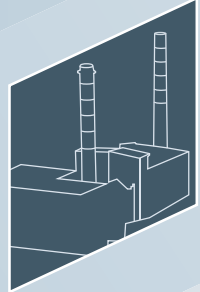
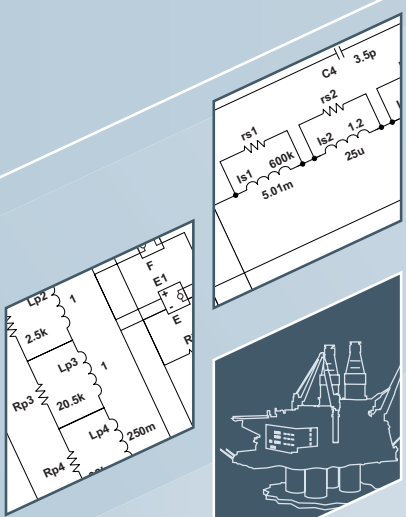
general tolerances : ±0.1 mm / \*±0.3 mm

## Connections



Industrial Technologies... Power Magnetics... Custom and Voltage Transformers...

**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

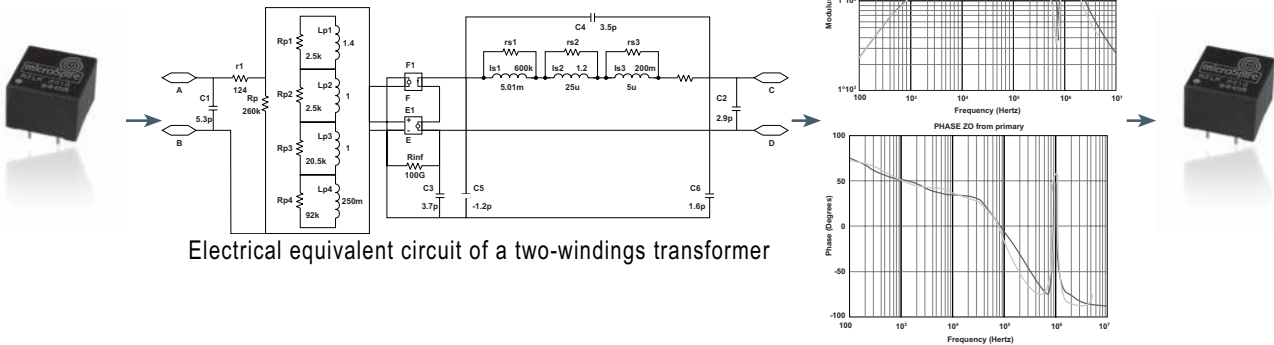
### Uses

- 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

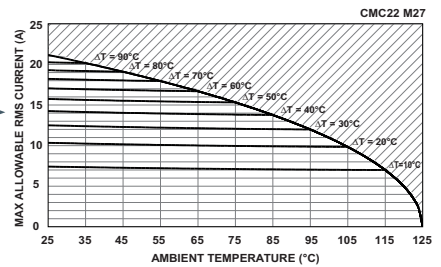
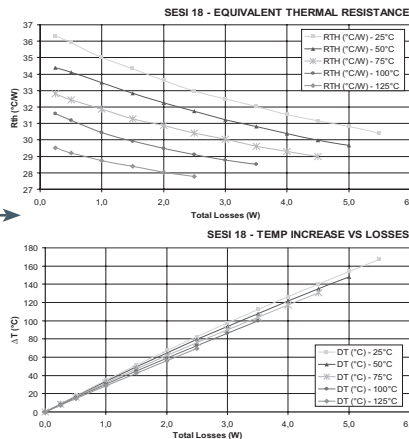
- Telecom and signal transformers
- Current and voltage measurement transformers
- Power supply inductors and transformers
- Inductive sensors

## Component optimisation through electrical model



Electrical equivalent circuit of a two-windings transformer

## Thermal characterization of components/packages



Engineering Services...  
Engineering Services...  
Electrical Modelling...



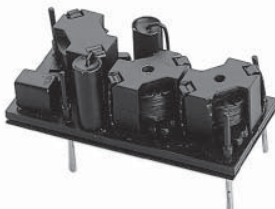
# Engineering Services

## 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.



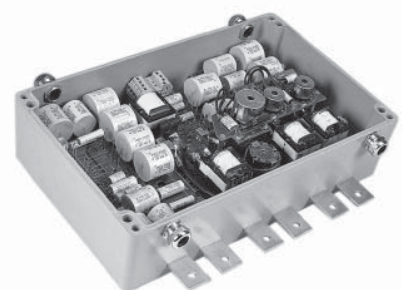
### Public Telephone Filters

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

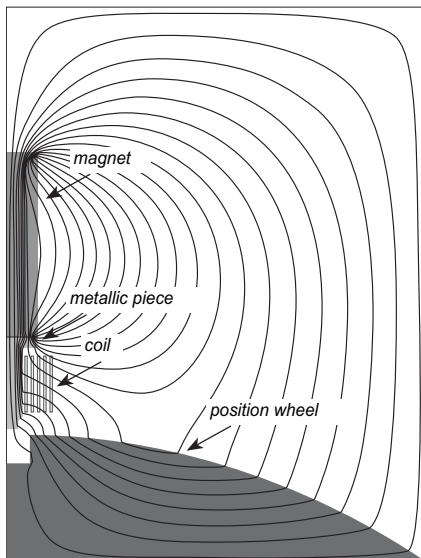
## Electromagnetic Characteristics of Magnetics

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.

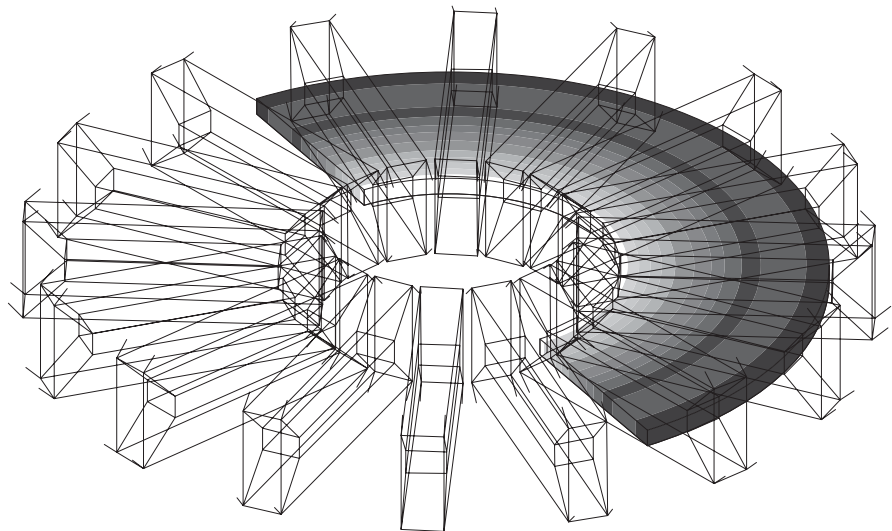
Typically, a given part optimisation project undergoes the following :

- 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 (A<sub>dc</sub>) : 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

<b>MECHANICAL DRAWING</b>												<b>LAYOUT</b>											
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IQ04/01/05a

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**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

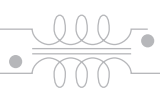
**Marking :**  **Sticker on Packing :**

**Packing :**  LOOSE  STICK  REEL  TRAY  UNITARY

MECHANICAL DRAWING										LAYOUT									

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Engineering Services... Design Specification Data... DSD Storage or Filtering Inductors...





DESIGN SPECIFICATION DATA

Sales Engineer :
Reference :
Date :

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

POWER TRANSFORMERS

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

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

Applied Standards :

Power Supply Type : FORWARD PUSH PULL 50 / 400 Hz Other :

Output Inductor (μH) :

Primary Voltage / Duty Cycle : Ve Min / δ Max :
Ve Max / δ Min :

Secondary Characteristics :

Output power range :
Diode voltage drop :
Working frequency :

Voltage / Current : AC DC Vs1 / Is1 :
Vs2 / Is2 :
Vs3 / Is3 :
Vs4 / Is4 :

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

Grid area for MECHANICAL DRAWING and LAYOUT

IQ04/01/05a

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**DESIGN SPECIFICATION DATA**

Sales Engineer : \_\_\_\_\_  
 Reference : \_\_\_\_\_  
 Date : \_\_\_\_\_

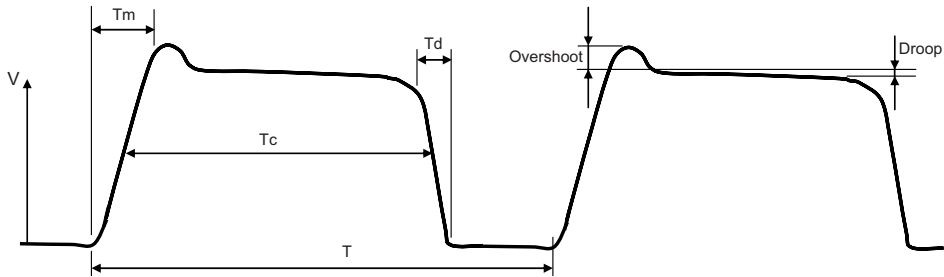
Company Name : \_\_\_\_\_ Contact : \_\_\_\_\_  
 Product PT-NR : \_\_\_\_\_ Project : \_\_\_\_\_ Yearly Quantities : \_\_\_\_\_

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 :

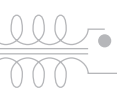
Finish :     Box     Gravity molding     Transfer molding     Coating  
 None     Dip impregnation     Vacuum impregnation     Injection

Marking : \_\_\_\_\_ Sticker on Packing : \_\_\_\_\_

Packing :     LOOSE     STICK     REEL     TRAY     UNITARY

<b>MECHANICAL DRAWING</b>										<b>LAYOUT</b>									

Engineering Services... Design Specification Data... DSD Pulse Transformers...





**DESIGN  
SPECIFICATION DATA**

Sales Engineer : \_\_\_\_\_  
Reference : \_\_\_\_\_  
Date : \_\_\_\_\_

Company Name:  Contact :

Product PT-NR :  Project :  Yearly Quantities :

**SELF - BOUNDED COILS**

**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) :

**Geometry :** Ø Wire (mm) :   
Dimensions / Tolerances :

**Mechanical Strength (grms) :**  **Number of turns :**

**Working Frequency :**

**Inductance :** Nominal value / Tolerance :

**Quality Factor :** Nominal Value / Tolerance :

**Maximum RMS Current (mA) :**

**Isolation :**

**Maximum Dimensions :** Length :  Width :  Height :

**Report Mode :**  SMD  THROUGH-HOLE  WIRES (length + tolerance) :

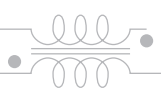
**Finish :**  Box  Gravity molding  Transfer molding  Coating  
 None  Dip impregnation  Vacuum impregnation  Injection

**Marking :**  **Sticker on Packing :**

**Packing :**  LOOSE  STICK  REEL  TRAY  UNITARY

MECHANICAL DRAWING										LAYOUT									

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...Engineering Services...  
 ...Design Specification Data...  
 ...DSD Self-Bounded Coils...



### 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<sub>AC</sub> RMS) : Vs 1  Vs 2  Vs 3  Vs 4   
Output current (I<sub>AC</sub> 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 :

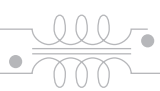
**Finish :**  Box  Gravity molding  Transfer molding  Coating  
 None  Dip impregnation  Vacuum Impregnation  Injection

**Marking :**  **Sticker on Packing :**

**Packing :**  LOOSE  STICK  REEL  TRAY  UNITARY

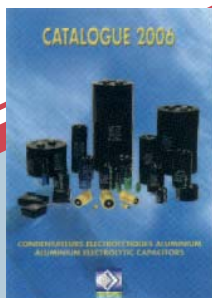
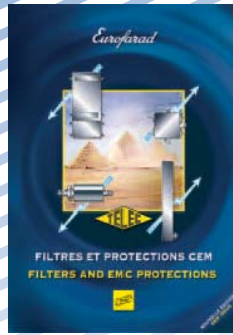
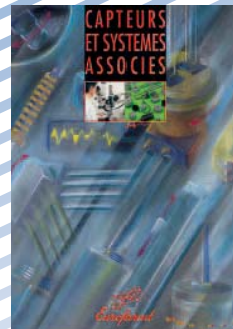
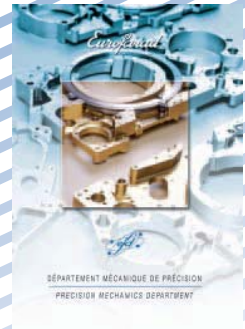
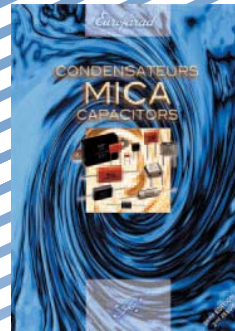
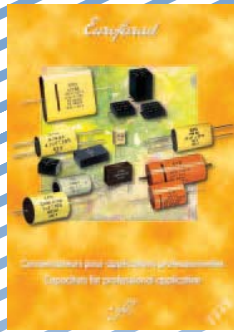
MECHANICAL DRAWING											

LAYOUT											









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