

FrelTec GmbH

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Germany

Multi-Layer Power Inductor SMD

SMD

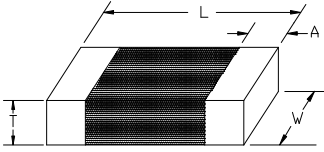
SPECIFICATION

Part Number

141	02*	101*	M	T04*
Type	Size	Value	Tolerance	Packing
141 : SMD Multi-Layer Power Inductor	05 : 0805	The value is given in μH and "U" indicates the decimal point. When higher than 100 μH then the last digit is the multiplier	M: $\pm 20\%$	T04: Tape and reel, for 4k pc available for 0805 with chip thickness 0,55mm (7"reel)
	07 : 0806	which denotes the number of zero following		E03: Embossed tape and reel for 3k pc for 0805 with chip thickness 1,0mm, 0806 and 1008 (7"reel)
	08 : 1008	Example:		
		U47 : 0,47 μH		
		3U3 : 3,3 μH		
		22U : 22 μH		
		101 : 100 μH		not all combination is possible

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Dimensions:



Size	L	W	T max.	A Min./Max.
0805	2,0±0,2	1,25±0,2	0,55	0,20/0,80
0805	2,0±0,2	1,25±0,2	1,0	0,20/0,80
0806	2,0±0,2	1,6±0,2	1,0	0,20/0,80
1008	2,5±0,2	2,0±0,2	1,0	0,20/0,80

unit: mm

Standard Electrical Specifications

Size: 0805

Ordering Code	Inductance (uH)	Inductance Tolerance	Measuring frequency (MHz)	DC Resistance (Ω)	Max. Rated Current (A)	Max. Thickness (mm)
U47 (chip thickness 0,55mm)	0,47	±20%	1	0,12±25%	1,1	0,55
1U0 (chip thickness 0,55mm)	1,00			0,19±25%	0,9	
2U2 (chip thickness 0,55mm)	2,20			0,34±25%	0,6	
U47 (chip thickness 1,0mm)	0,47	±20%	1	0,09±25%	1,2	1,0
1U0 (chip thickness 1,0mm)	1,00			0,12±25%	1,0	
1U5 (chip thickness 1,0mm)	1,50			0,17±25%	0,8	
2U2 (chip thickness 1,0mm)	2,20			0,17±25%	0,8	
3U3 (chip thickness 1,0mm)	3,30			0,22±25%	0,7	
4U7 (chip thickness 1,0mm)	4,70			0,25±25%	0,7	

Size: 0806

Ordering Code	Inductance (uH)	Inductance Tolerance	Measuring frequency (MHz)	DC Resistance (Ω)	Max, Rated Current (A)	Max, Thickness (mm)
U47	0,47	±20%	1	0,07±25%	1,6	1,0
1U0	1,00			0,11±25%	1,3	
1U5	1,50			0,12±25%	1,2	
2U2	2,20			0,13±25%	1,2	
3U3	3,30			0,15±25%	1,1	
4U7	4,70			0,18±25%	0,9	

Size: 1008

Ordering Code	Inductance (uH)	Inductance Tolerance	Measuring frequency (MHz)	DC Resistance (Ω)	Max, Rated Current (A)	Max, Thickness (mm)
1U0	1,00	±20%	1	0,08±25%	1,4	1,0
2U2	2,20	±20%	1	0,09±25%	1,3	
4U7	4,70	±20%	1	0,13±25%	1,1	

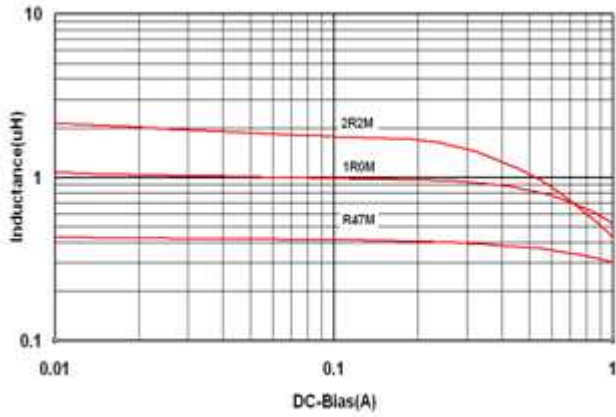
Rated current specifies that self-heat generation is below 40°C during DC loaded (at 20°C)

Operating temperature range: -55 °C TO +125 °C

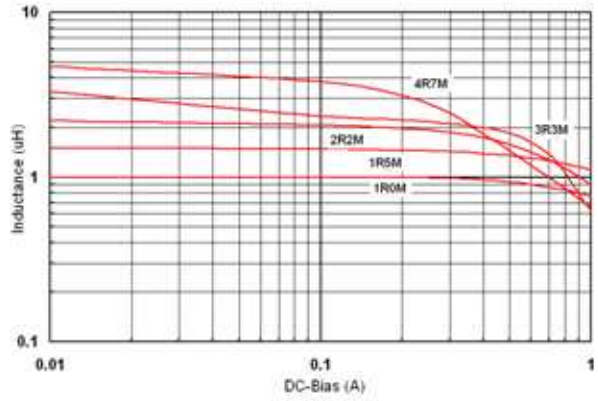
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Electric Properties

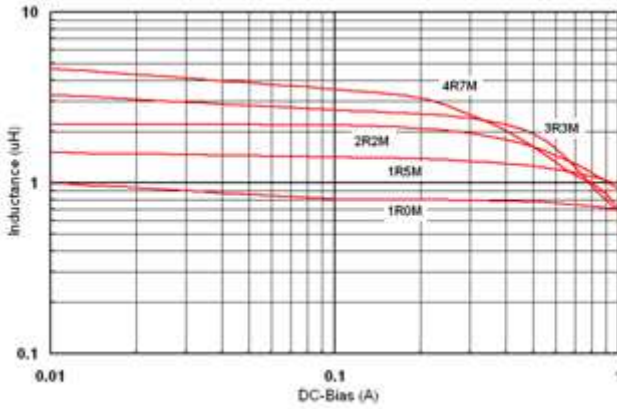
DC Bias characteristics



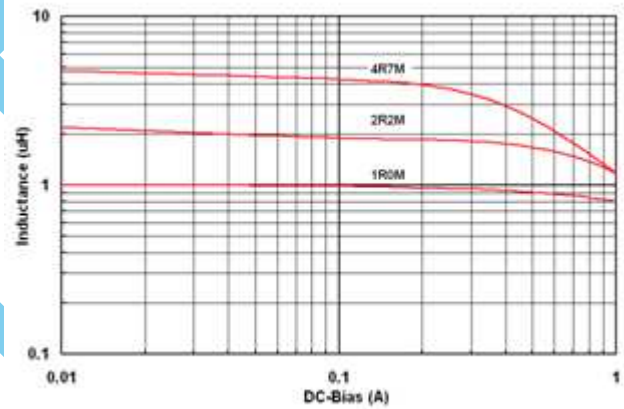
0805 (0,55 chip thickness)



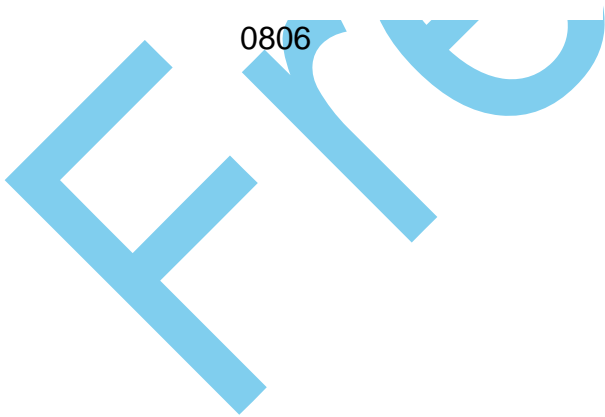
0805 (1,0 chip thickness)



0806

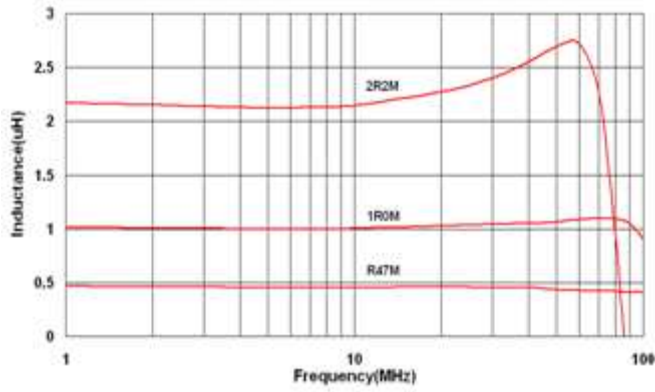


1008

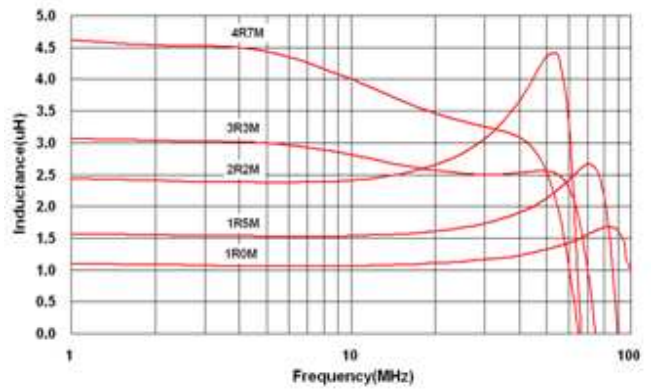


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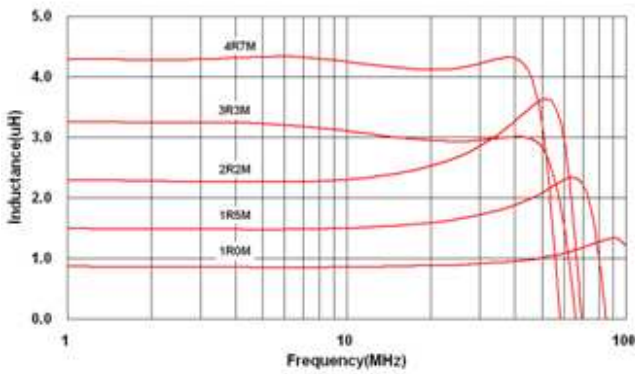
Inductance vs Frequency



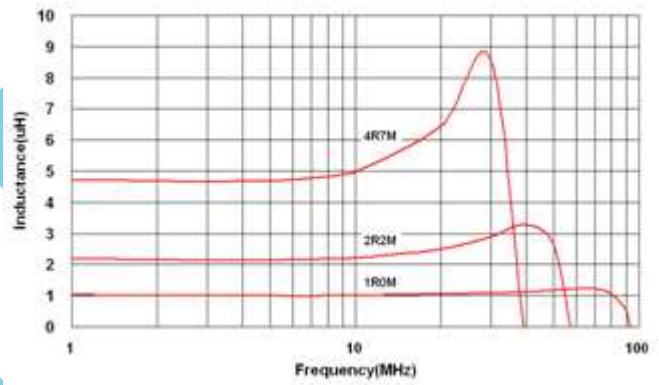
0805 (0,55 chip thickness)



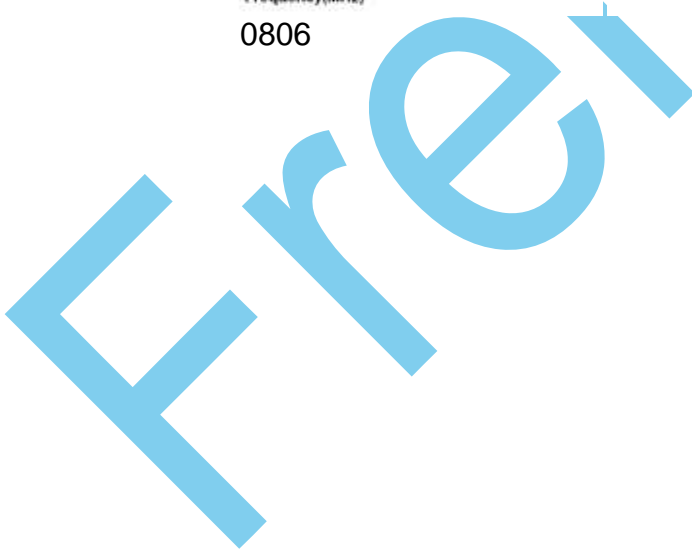
0805 (1,0 chip thickness)



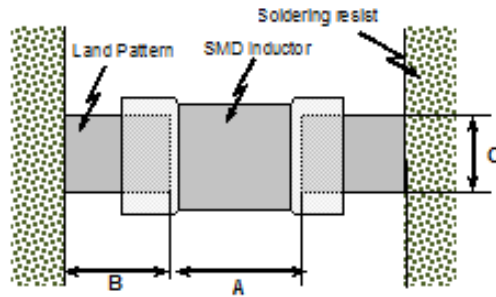
0806



1008



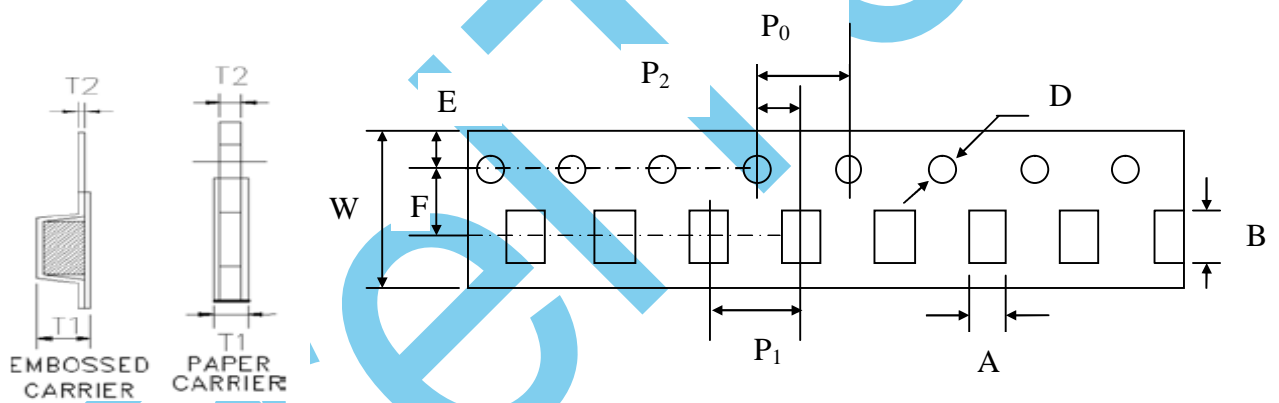
Recommended Land Pattern Design (for Reflow Soldering):



Size	A	B	C
0805	0,8 to 1,2	0,8 to 1,2	0,9 to 1,6
0806	0,8 to 1,2	0,8 to 1,2	0,9 to 1,6
1008	1,0 to 1,4	0,6 to 1,0	1,8 to 2,2

in mm

Tape Dimensions

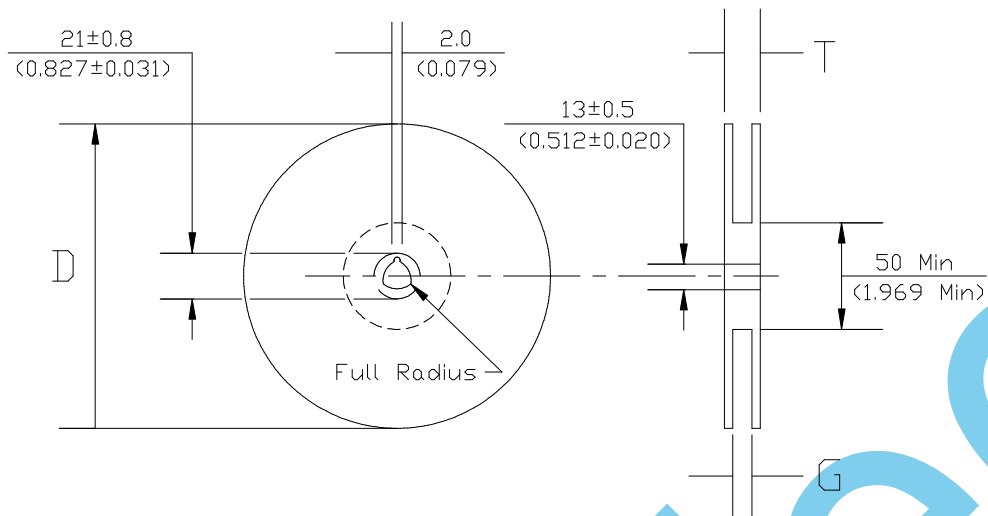


Packing	Size	A	B	W	F	E	P ₁	P ₂	P ₀	D	T ₁	T ₂
Paper Tape	0805	1,5±0,2	2,3±0,2	8±0,2	3,5±0,05	1,75±0,10	4±0,1	2±0,05	4±0,1	1,5 +0,1/-0,0	1,1 max	-
Embossed Tape	0805	1,55±0,2	2,3±0,2	8±0,3	3,5±0,05	1,75±0,10	4±0,1	2±0,05	4±0,1	1,5 +0,1/-0,0	1,3±0,1	0,3 max
	0806	1,8±0,1	2,2±0,1									
	1008	2,3±0,1	2,8±0,1									

Unit: mm

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Reel Dimensions



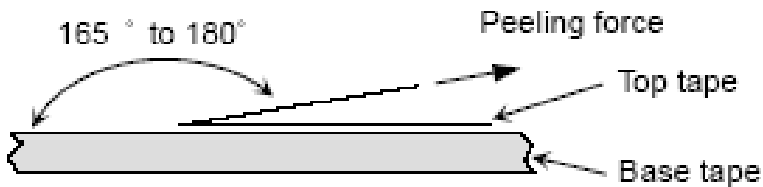
Tape Width	G	T MAX	D
8	10,0+/-1,5	14,5	180

Unit: mm

Cover Tape Peel off Strength

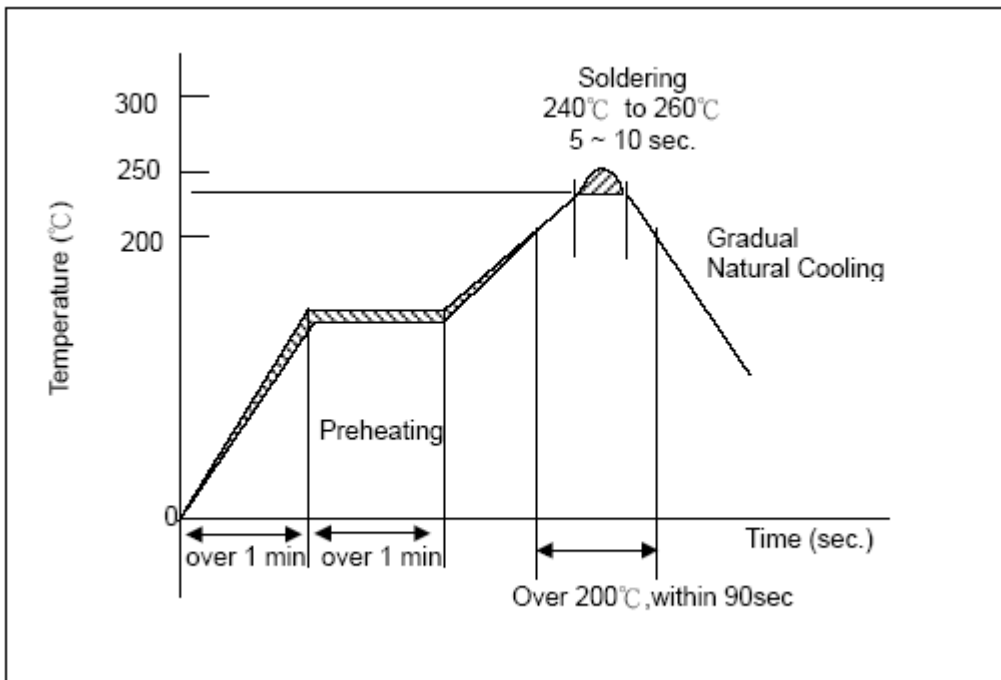
The peel speed shall be about 300 mm/min.

The peel strength of top cover tape shall be between 0,1 to 1,0N.



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Lead Free Reflow Soldering Profile



The rate of preheat should not exceed 4°C per sec and a target of 2°C per sec is preferred. Ceramic chip components should be preheated to within 100 to 130 °C of the soldering.

Stock period

The performance of these products, including the solderability, is guaranteed for 12 month, provided that they remain packed as they were when delivered and stored at a temperature from +5 to 35°C and a relative humidity 45% to 70%RH

The storage atmosphere must be free of gas containing sulfur and chlorine. Also, avoid exposing the product to saline moisture. If the product is exposed to such atmospheres, the terminals will oxidize and solderability will be affected.

Handling

Chip inductor should be handled with care to avoid contamination or damage. The use of vacuum pick-up or plastic tweezers is recommended for manual placement. Tape and reeled packages are suitable for automatic pick and placement machine.

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Test conditions and requirements

Item	Test Condition	Requirements
Appearance	Inductors shall be visually inspected for visible evidence of defect.	No harmful defect for piratical use.
Inductance	a. Frequency: 1 ± 0.01 MHz b. Temperature: 25 ± 3 °C c. Relative Humidity: 45 to 75%RH d. Measuring equipment: HP4286A, HP4287A Measuring Jig: HP42851-61100	In Within specified tolerance.
DC Resistance	Measuring instrument: HP4338B, HIOKI IM-3570	In accordance with electrical specification.
Dimension	Dimension shall be measured with caliper or micrometer	In accordance with dimension specification.
Solderability	Immerse a test sample into a methanol solution containing rosin and immerse into SAC305(Sn 96,5 Ag 3,0 Cu 0,5) solder of 245 ± 5 °C for 4 ± 1 seconds.	More than 75% of the terminal electrode part shall be covered with fresh solder.
Resistance to Soldering Heat	Immerse a test sample into a methanol solution containing resin, preheat it at 150 to 180 °C for 2~3 minutes and immerse into molten solder of 260 ± 5 °C for 10 ± 1 second so that both terminal electrodes are completely submerged. After this test samples shall be taken out and measured after kept at room temperature for 2 to 3 hours.	No visible damage Remained terminal electrode : 70% min. Inductance variation within 30%
Bending Strength	<p>Solder the chip to test jig then apply a force in the direction shown in below. The soldering shall be done with the reflow method and shall be conducted with care so that the soldering is uniform and free of defects such as heat shock.</p> <p style="text-align: center;">Mounting Samples</p> <p style="text-align: center;">No mechanical damage shall be observed.</p>	

Thermal Shock	Solder a test sample to printed circuit board, and conduct 5 cycles of test under the conditions shown as below. Condition for 1 cycle Step1:-55+0 / -2°C 30±3 min. Step2:Room temperature within 2 to 3 min. Step3:+125 +2 / -0°C 30±3 min. Measured at room temperature after placing for 2 to 3 hrs.	No visible damage Inductance variation within 30%
High Humidity State Life Test	Keep a test sample in an atmosphere with a temperature of 40±2°C, 90~95%RH for 500 +24/-0 hours. After the removal from test chamber, 2 to 3 hours of recovery under standard condition, and measurement shall be made after 24±2 hrs of recovery under standard condition.	No visible damage. Inductance variation within 30%.
High Humidity Load Life Test	Solder a test sample to printed circuit board then keep the test sample in an atmosphere with a temperature of 40±2°C, 90~95%RH for 500+24/-0 hours while supplying the rated current. After the removal from test chamber, 2 to 3 hours of recovery under standard condition, and measurement shall be made after 24±2 hrs of recovery under standard condition.	No visible damage. Inductance variation within 30%.
High Temperature State Life Test	Keep a test sample in an atmosphere with a temperature of 85±2°C for 500+24/-0 hours. After the removal from test chamber, 2 to 3 hours of recovery under standard condition, and measurement shall be made after 24±2 hrs of recovery under standard condition.	No visible damage. Inductance variation within 30%.
High Temperature Load	Solder a test sample to printed circuit board then keep the test sample in an atmosphere with a temperature of 85±2°C for 500+24/-0 hours while supplying the rated current. After the removal from test chamber, 2 to 3 hours of recovery under standard condition, and measurement shall be made after 24±2 hrs of recovery under standard condition.	No visible damage. Inductance variation within 30%.

For this part: It does not use the materials that include the substances specified in RoHS, the detail refer to the part of prohibition or exclusion items in RoHS (2002/95/EC).

Cadmium and cadmium compounds (permissive content < 100 ppm)

Lead and lead compounds (permissive content < 1000 ppm)

Exceptions specified:

Lead contained in the glass of cathode ray tubes, electronic components and fluorescent tubes.

The glass material used in the electronic components, which includes resistor elements, conductive pastes (silver or copper ones), adhesives, glass frit and sealing materials.

Mercury and its mercury compounds (permissive content < 1000 ppm)

Hexavalent chromium compounds (permissive content < 1000 ppm)

Polybrominated biphenyls (PBB) (permissive content < 1000 ppm)

Polybrominated diphenylethers (PBDE) (permissive content < 1000 ppm)

FrelTec

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