

FrelTec GmbH

Mathildenstr. 10A
82319 Starnberg
Germany

Multi-Layer Ferrite Inductor SMD

SMD

SPECIFICATION

Part Number

143	03*	101*	B	S	5	T04*
Type	Size	Value	Tolerance	Specification Code	Thickness	Packing
143 : SMD Multi-Layer Ferrite Inductor	02 : 0402 (1,0x0,5mm)	The value is given in μH "N" indicates the decimal point for nH and "U" indicates the decimal point for μH . When higher than 100 μH the last digit is the multiplier which denotes the number of zero following	M: $\pm 20\%$	S: Standard (for Near Field Communication Application)	5: 0,5	T10: Tape and reel for 10k pc for 0402 size
	03 : 0603 (1,6x0,8mm)		K: $\pm 10\%$	L: Light Loading Current (for General Circuit)	7: 0,7	T04: Tape and reel for 4k pc for 0603 size and 0805 size $\leq 15\mu\text{H}$
	05 : 0805 (2,0x1,25mm)		J: $\pm 5\%$		8: 0,8	E03: Embossed tape and reel for 3k pcs for 0805 $> 22\mu\text{H}$
		10N : 10 nH			9: 0,9	
		3U3 : 3300 nH			B: 1,1	
		U68 : 680 nH			C: 1,2	
		151 : 150 μH				* not all combination is possible

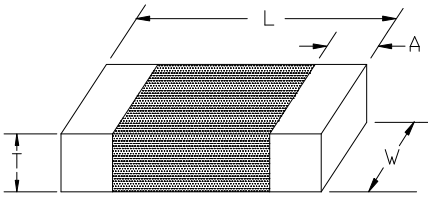
All products according to RoHS (2011/65/EU)

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Dimensions:



Size	L	W	T max.	A Min./Max.
0402	1,0±0,10	0,50±0,10	0,50±0,05	0,10/0,40
0603	1,6±0,15	0,80±0,15	0,80±0,15	0,10/0,50
0805	2,0±0,20	0,80±0,15	1,25±0,2	0,20/0,80

unit: mm

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Standard Electrical Specifications

0603

S Series

Ordering Code	Inductance [nH]	Inductance Tolerance	Measuring frequency [MHz]	DC Resistance [Ω]Max.	Rated Current (mA) Max.	Q (min)	SRF (min.)	Thickness [mm] (max.)
14303U56JS8T04	560	$\pm 5\%$	25	0,85	300	25	80	0,80 \pm 0,15

0402

L Series

Ordering Code	Inductance [μ H]	Inductance Tolerance	Measuring frequency [MHz]	DC Resistance [Ω] Max.	Rated Current (mA) (Max.)	Q (min)	SRF (min.)	Thickness [mm] (max.)
143021U0KL5T10	1,00	$\pm 10\%$	1,0	1,000	0,010	25	120	0,50 \pm 0,05

0603

L Series

Ordering Code	Inductance [μ H]	Inductance Tolerance	Measuring frequency [MHz]	DC Resistance [Ω] Max.	Rated Current (mA) (Max.)	Q (min)	SRF (min.)	Thickness [mm] (max.)
14303U10KL8T04	0,10	$\pm 10\%$	25,0	0,500	0,050	15	240	0,80 \pm 0,15
14303U12KL8T04	0,12	$\pm 10\%$	25,0	0,500	0,050	15	205	0,80 \pm 0,15
14303U15KL8T04	0,15	$\pm 10\%$	25,0	0,600	0,050	15	180	0,80 \pm 0,15
14303U18KL8T04	0,18	$\pm 10\%$	25,0	0,600	0,050	15	165	0,80 \pm 0,15
14303U22KL8T04	0,22	$\pm 10\%$	25,0	0,800	0,050	15	150	0,80 \pm 0,15
14303U27KL8T04	0,27	$\pm 10\%$	25,0	0,800	0,050	15	136	0,80 \pm 0,15
14303U33KL8T04	0,33	$\pm 10\%$	25,0	0,850	0,035	15	125	0,80 \pm 0,15
14303U39KL8T04	0,39	$\pm 10\%$	25,0	1,000	0,035	15	110	0,80 \pm 0,15
14303U47KL8T04	0,47	$\pm 10\%$	25,0	1,350	0,035	15	105	0,80 \pm 0,15
14303U56KL8T04	0,56	$\pm 10\%$	25,0	1,550	0,035	15	95	0,80 \pm 0,15
14303U68KL8T04	0,68	$\pm 10\%$	25,0	1,700	0,035	15	90	0,80 \pm 0,15
14303U82KL8T04	0,82	$\pm 10\%$	25,0	2,100	0,035	15	85	0,80 \pm 0,15
143031U0KL8T04	1,00	$\pm 10\%$	10,0	0,600	0,025	35	75	0,80 \pm 0,15
143031U5KL8T04	1,50	$\pm 10\%$	10,0	0,800	0,025	35	60	0,80 \pm 0,15
143032U2KL8T04	2,20	$\pm 10\%$	10,0	1,150	0,015	35	50	0,80 \pm 0,15
143034U7KL8T04	4,70	$\pm 10\%$	10,0	2,100	0,015	35	33	0,80 \pm 0,15
14303100KL8T04	10,00	$\pm 10\%$	2,0	1,850	0,003	30	17	0,80 \pm 0,15
14303150KL8T04	15,00	$\pm 10\%$	1,0	1,700	0,001	20	14	0,80 \pm 0,15
14303220KL8T04	22,00	$\pm 10\%$	1,0	2,100	0,001	15	11	0,80 \pm 0,15

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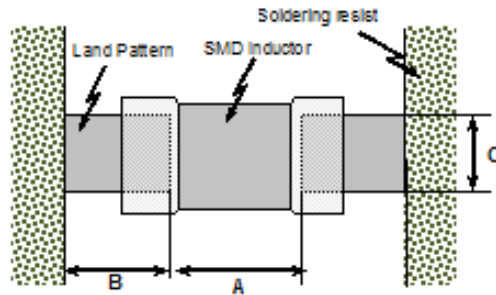
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0805
L Series

Ordering Code	Inductance [uH]	Inductance Tolerance	Measuring frequency [MHz]	DC Resistance [Ω]		Idc (mA) (max.)	Q (min)	SRF (min.)	Thickness [mm] (max.)
				Max.	Typ.				
143051U2KL9T04	1,2	$\pm 10\%$	10	0,50		30	45	65	0,85 \pm 0,20
143052U2_L9T04	2,2	$\pm 10\%$, $\pm 20\%$	10	0,65	0,28	30	45	50	
143054U7_L9T04	4,7	$\pm 10\%$, $\pm 20\%$	10	1,50	0,54	30	45	35	
14305100_L9T04	10,0	$\pm 10\%$, $\pm 20\%$	2	1,15	0,75	15	50	24	
14305220KLCE03	22,0	$\pm 10\%$	1	1,10		5	30	16	1,25 \pm 0,20

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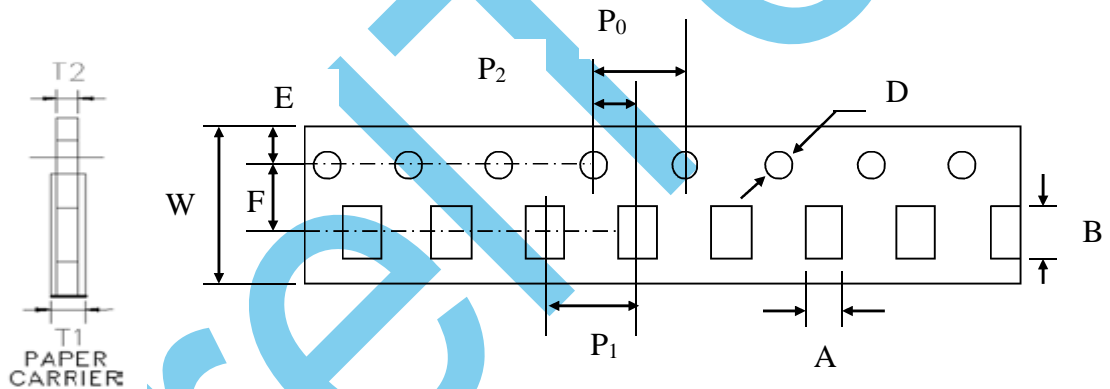
Recommended Land Pattern Design (for Reflow Soldering):



Size	A	B	C
0402	0,3 to 0,5	0,35 to 0,45	0,4 to 0,5
0603	0,7 to 1,0	0,6 to 0,8	0,7 to 0,8
0805	1,0 to 1,3	0,7 to 0,9	1,0 to 1,2

in mm

Tape Dimensions

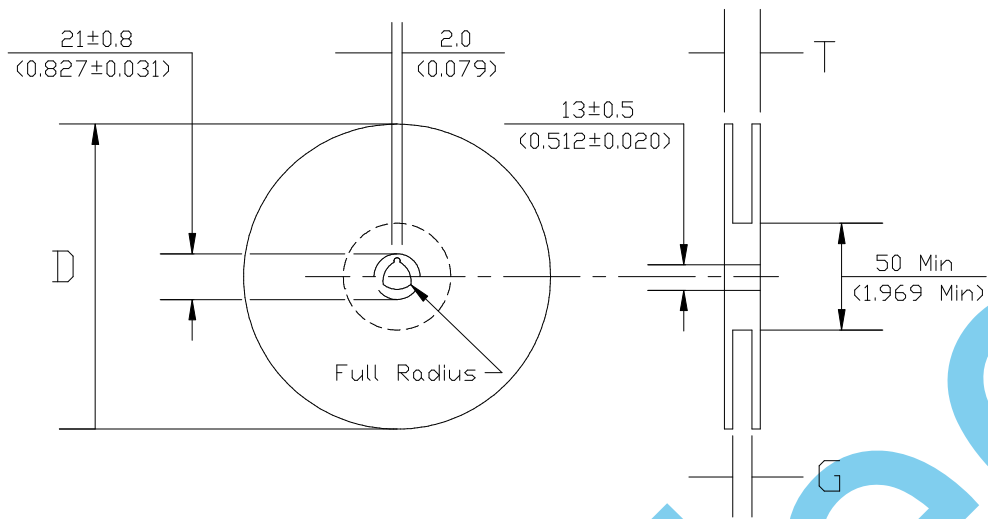


Packing	Size	A	B	W	F	E	P ₁	P ₂	P ₀	D	T ₁
Paper Tape	0402	0,62±0,03	1,12±0,03	8,0±0,3	3,5±0,05	1,75±0,1	2±0,1	2,0±0,05	4,0±0,1	1,5 +0,1/-0,0	1,1 max
	0603	1,0±0,2	1,8±0,2	8,0±0,3	3,5±0,05	1,75±0,1	4±0,1	2,0±0,05	4,0±0,1	1,5 +0,1/-0,0	1,1 max
	0805	1,5±0,2	2,3±0,2	8,0±0,3	3,5±0,05	1,75±0,1	4±0,1	2,0±0,05	4,0±0,1	1,5 +0,1/-0,0	0,8 max

Unit: mm

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Reel Dimensions



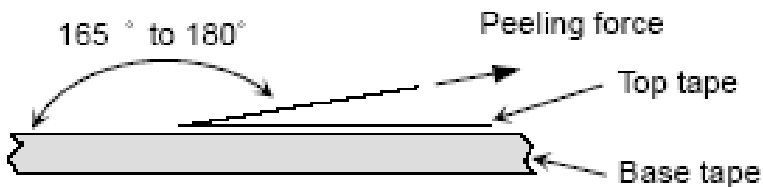
Tape Width	G	T MAX	D
8	10,0±1,5	14,5	178±2,0

Unit: mm

Cover Tape Peel off Strength

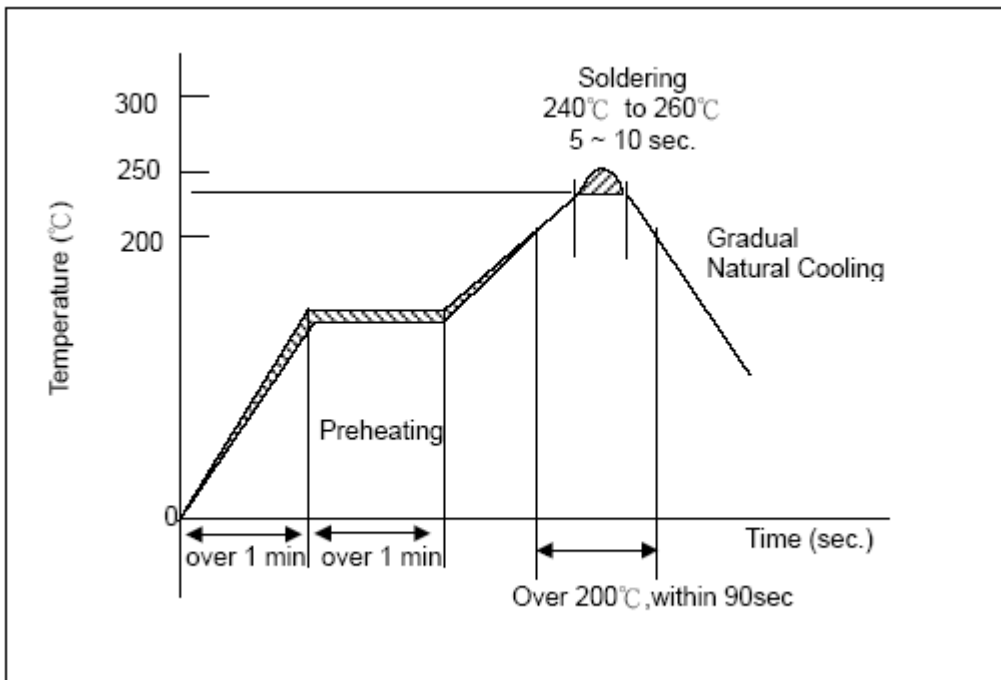
The peel speed shall be about 300 mm/min.

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



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Lead Free Solder Paste



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

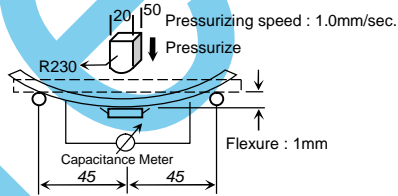
The storage atmosphere must be free of gas containing sulfur and chlorine. Also, avoid exposing the product to saline moisture. If the product is exposed to such atmospheres, the terminals will oxidize and solderability will be affected.

Handling

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. Temperature: 25±3°C b. Relative Humidity: 45 to 75%RH c. Measuring equipment: HP4286A, HP4287A Measuring Jig: HP42851-61100	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.
Solder-ability	Immerse a test sample into a methanol solution containing rosin and immerse into SAC305 (Sn96,5 Ag3,0 Cu0,5) solder of 245±3°C for 3±1 seconds.	90% of the termination is to be soldered evenly and continuously.
Resistance to Soldering Heat	Immerse a test sample into a methanol solution containing resin, preheat it at 120 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	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. 	No mechanical damage shall be observed.
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%

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High Humidity State Life Test	Keep a test sample in an atmosphere with a temperature of $40\pm 2^{\circ}\text{C}$, 90~95%RH for 500 +12/-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 $40\pm 2^{\circ}\text{C}$, 90~95%RH for 500+12/-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 $85\pm 2^{\circ}\text{C}$ for 500 ± 12 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 $85\pm 2^{\circ}\text{C}$ 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%.

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