FrelTec GmbH

Mathildenstr. 10A
82319 Starnberg
Germany

SMD Power Inductors
Shielded
Coating Inductor
High Current

SMD

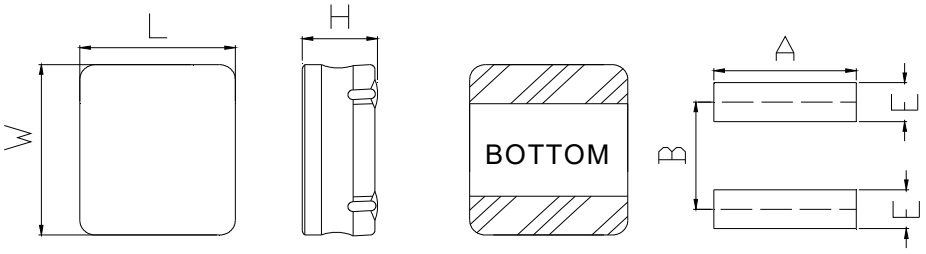
SPECIFICATION

Part Number

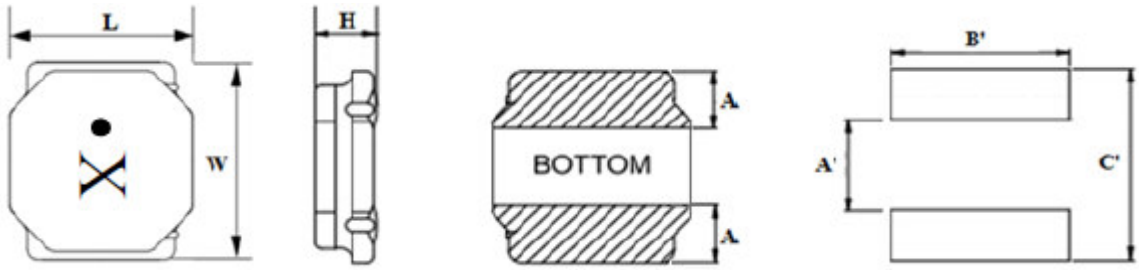
152	2520*	101*	S	M	E02**	5
Type	Size	Value	Specification	Tolerance	Packing	Thick-ness
152 : SMD Power Inductor Shielded Coating Inductor (High Current)	2520: 2,5x2,0mm	The value is given in µH and "u" indicates the decimal point. When higher than 100µH then l the last digit is the multiplier which denotes the number of zero following	S: Standard Type	M: ±20% (standard)	E02: Embossed tape and reel for 2k pcs (7"reel)	1: 0,1 mm
	4040: 4,0x4,0mm				L0Z: Embossed tape and reel for 3,5k pcs (13"reel)	2: 0,2 mm
						3: 0,3 mm
			H: High Current Type	Q: ±25%		4: 0,4 mm
						5: 0,5 mm
						6: 0,6 mm
			T: Specific Type	N: ±30%		7: 0,7 mm
						8: 0,8 mm
						9: 0,9 mm
						A: 1,0 mm
						B: 1,1 mm
						C: 1,2 mm
						D: 1,4 mm
						E: 1,5 mm
						F: 1,6 mm
						G: 1,8 mm
						H: 2,0 mm
						I: 2,4 mm
						J: 2,5 mm
						K: 2,8 mm
						L: 3,0 mm
		Example:				M: 3,5 mm
						N: 4,0 mm
		3U3 : 3,3 µH				P: 4,5 mm
						Q: 5,0 mm
						R: 6,0 mm
		220 : 22 µH				S: 6,5 mm
						T: 2,6 mm
						U: 7,0 mm
		151 : 150 µH				V: 9,0 mm
						W: 5,5 mm
						X: 13 mm
						Z: 3,2 mm

All products according to RoHS (2015/863/EU)

Dimensions and land pattern:



Series	Qantity per Reel (pcs)	L (mm)	W (mm)	H (mm)	A (mm)	Recommended Land Patterns		
						A‘ (mm)	B‘ (mm)	C‘ (mm)
1522520___S_E02A	2000	2,5±0,3	2,0±0,3	1,2+0,1 -0,2	0,85±0,2	2,6	2,1	0,8
1522520___S_E02C	2000	2,5±0,3	2,0±0,3	1,2+0,1 -0,2	0,85±0,2	2,6	2,1	0,8



Series	Qantity per Reel (pcs)	L (mm)	W (mm)	H (mm)	A (mm)	Recommended Land Patterns		
						A‘ (mm)	B‘ (mm)	C‘ (mm)
1524040___S_L0ZG	3500	2,5±0,3	2,0±0,3	1,2+0,1 -0,2	0,85±0,2	2,6	2,1	0,8

Part Numbers & Characteristic - Series for High Current

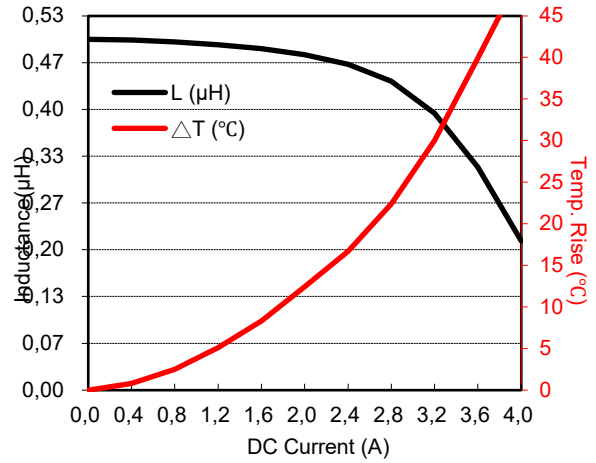
Order code	Inductance L (uH)	Tolerance	DC Resistance (mΩ)		Heat Rating Current DC Amps. Idc(A)		Saturation Current DC Amps. Isat(A)		Mar-king
			Typ.	Max.	Typ.	Max.	Typ.	Max.	
1522520U50SNE02A	0,50	± 30%	32,0	38,0	2,67	2,40	3,30	3,00	—
1522520U68SNE02A	0,68	± 30%	49,0	59,0	2,40	2,16	2,70	2,43	—
15225201U0SNE02A	1,0	± 30%	68,0	82,0	1,98	1,78	2,40	2,20	—
15225201U5SME02A	1,5	± 20%	95,0	114,0	1,80	1,49	1,75	1,58	—
15225202U2SME02A	2,2	± 20%	136,0	163,0	1,68	1,26	1,55	1,39	—
15225203U3SME02A	3,3	± 20%	207,0	248,0	1,15	1,04	1,30	1,17	—
15225204U7SME02A	4,7	± 20%	269,0	323,0	0,99	0,89	1,20	1,08	—
15225206U8SME02A	6,8	± 20%	404,0	485,0	0,81	0,73	0,85	0,77	—
152252010USME02A	10,0	± 20%	508,0	610,0	0,72	0,64	0,73	0,65	—
1522520U24SNE02C	0,24	± 30%	26	31	4,50	4,00	4,80	4,50	—
1522520U47SNE02C	0,47	± 30%	29	35	3,70	3,30	3,90	3,50	—
1522520U50SNE02C	0,50	± 30%	32	38	3,60	3,24	3,80	3,40	—
1522520U68SNE02C	0,68	± 30%	54	65	3,24	2,70	3,60	3,40	—
15225201U0SNE02C	1,0	± 30%	43	52	2,60	2,34	2,70	2,45	—
15225201U5SME02C	1,5	± 20%	72	86	2,20	1,98	2,30	2,07	—
15225202U2SME02C	2,2	± 20%	90	108	1,85	1,75	2,15	1,95	—
15225203U3SME02C	3,3	± 20%	155	186	1,45	1,31	1,70	1,60	—
15225204U7SME02C	4,7	± 20%	212	254	1,20	1,08	1,50	1,40	—
15225206U8SME02C	6,8	± 20%	370	444	1,00	0,90	1,15	1,04	—
152252010USME02C	10,0	± 20%	750	900	0,75	0,68	0,85	0,77	—
152404010USML0ZG	10,0	± 20%	150	180	1,25	1,20	1,44	1,30	K

Test Frequency: 1 MHz , 1,0V 4040-Size: 100kHz, 1,0V
All test data is referenced to 25°C ambient.
Operating Temperature Range -40°C to + 125°C.
Idc (Irms): DC current (A) that will cause an approximate △T of 40°C.
Isat: DC current (A) that will cause L to drop approximately 30%.

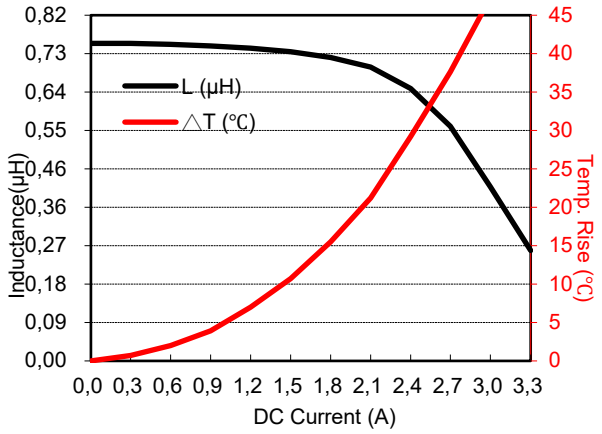
The part temperature (ambient + temp rise) should not exceed 125°C under worse case operating conditions. Circuit design, component placement, PWB trace and thickness, airflow and other cooling provision all the part temperature. Part temperature should be verified in the end application.
Test Instrument: Inductance (CH-3302+CH-1320); Rdc (CH 16502)
Caution Temperature Rise
Temperature rise of this inductor depends on the installed board condition.
It shall be confirmed in the actual end product that temperature rise of inductor is within operation temperature.

Current Characteristics

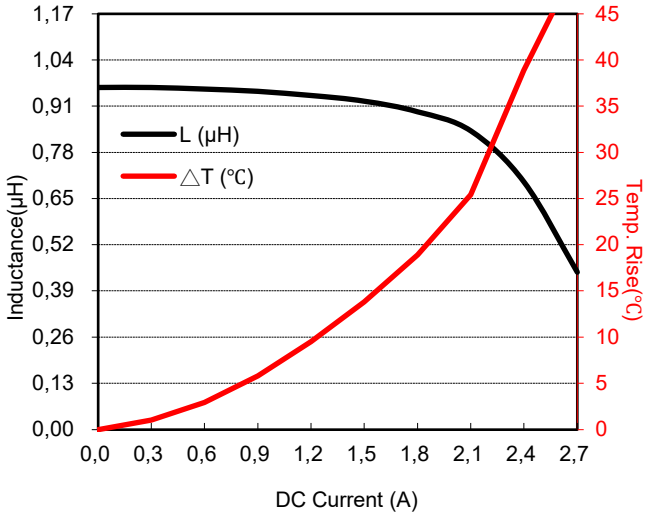
1522520U50SNE02A:



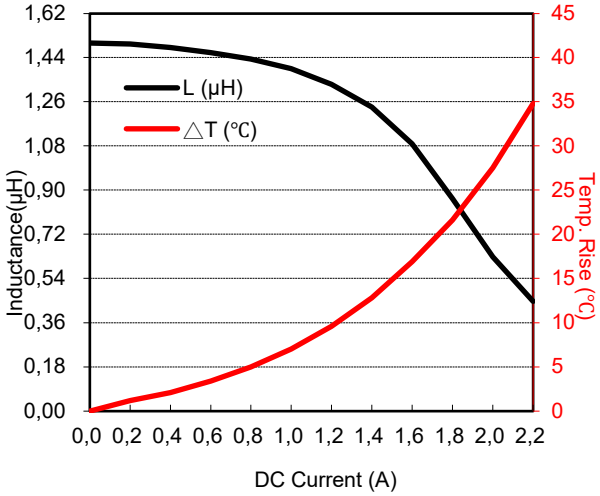
1522520U68SNE02A:



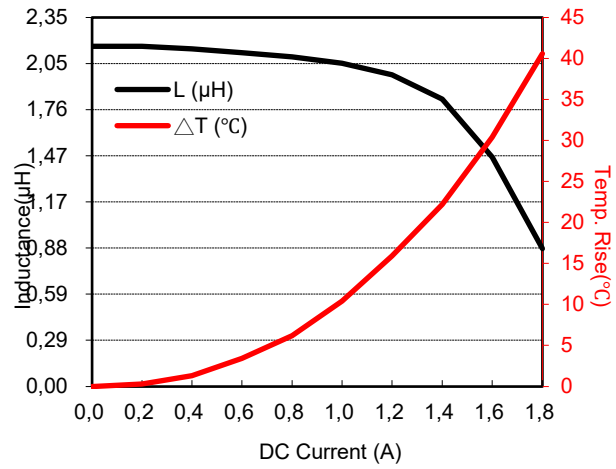
15225201U0SNE02A:



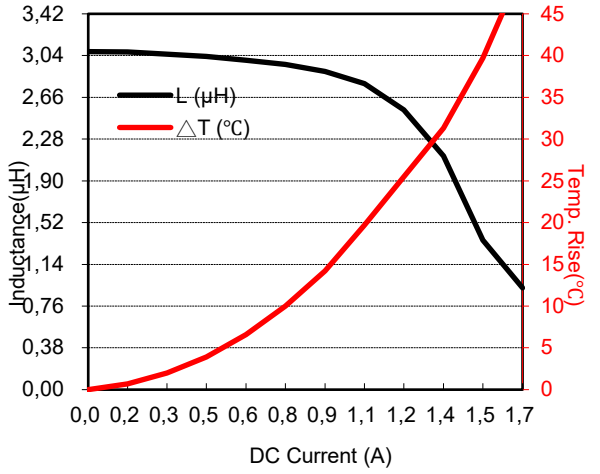
15225201U5SME02A:



15225202U2SME02A:

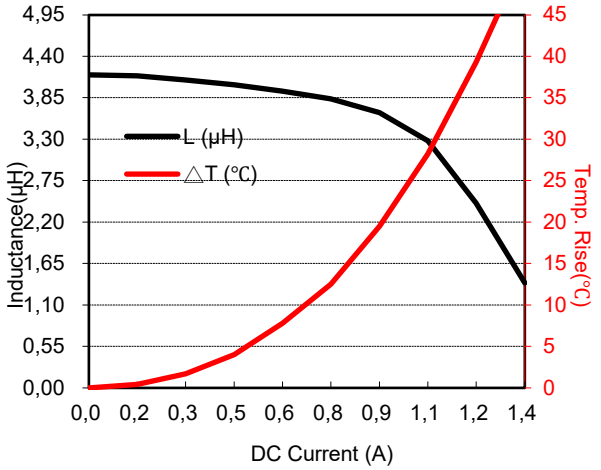


15225203U3SME02A:

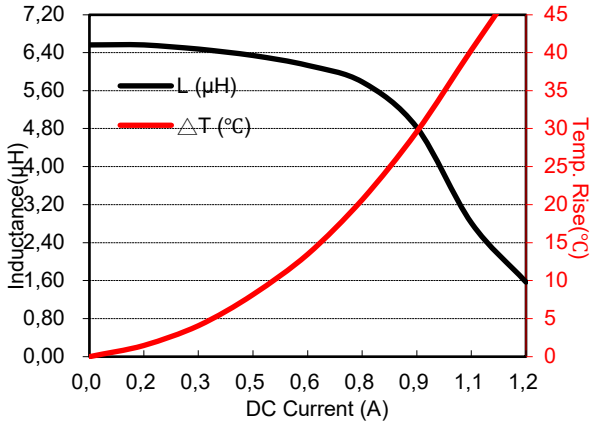


SMD

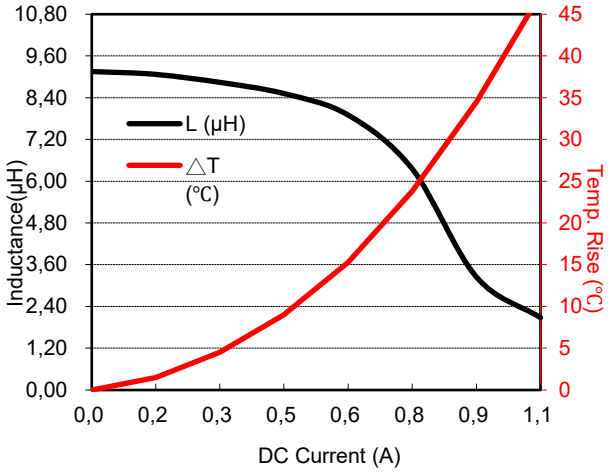
15225204U7SME02A:



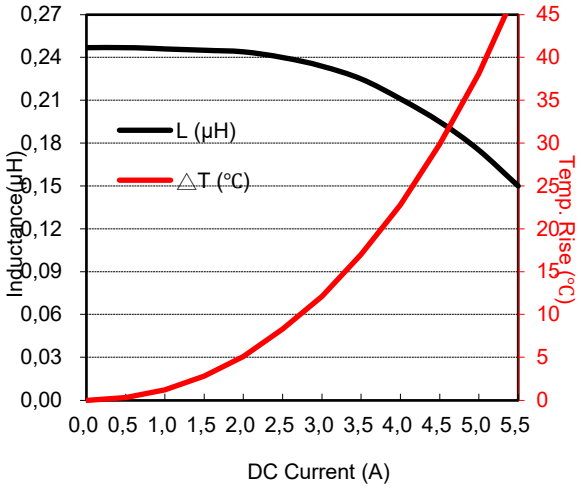
15225206U8SME02A:



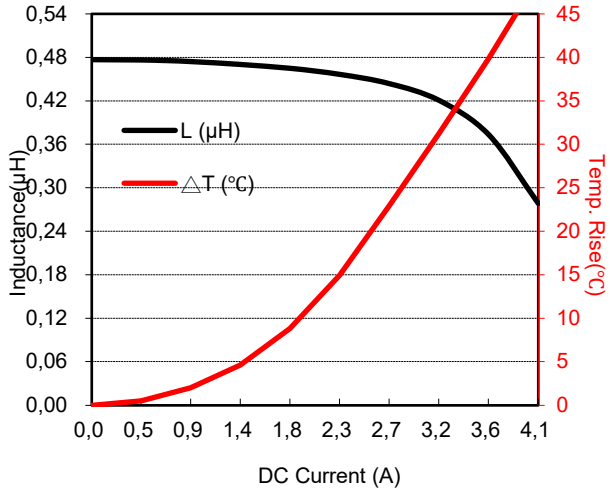
152252010USME02A:



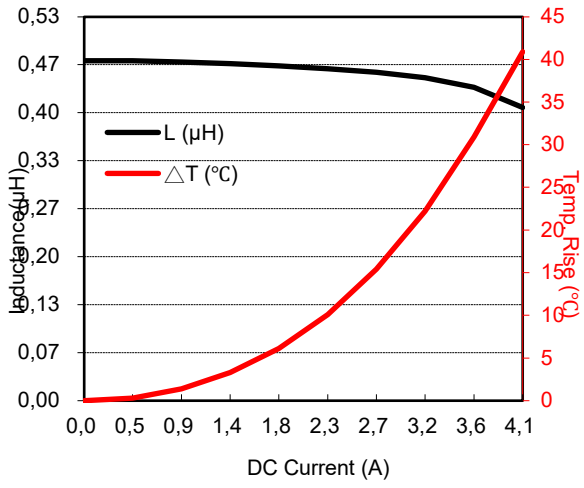
1522520U24SNE02C:



1522520U47SNE02C:



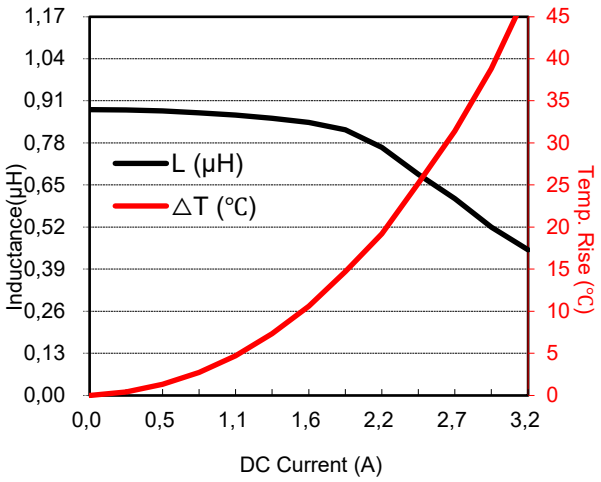
1522520U50SNE02C:



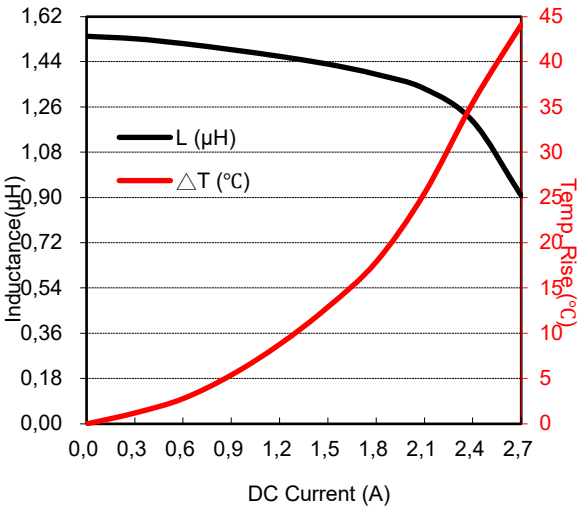
SMD

1522520U68SNE02C:

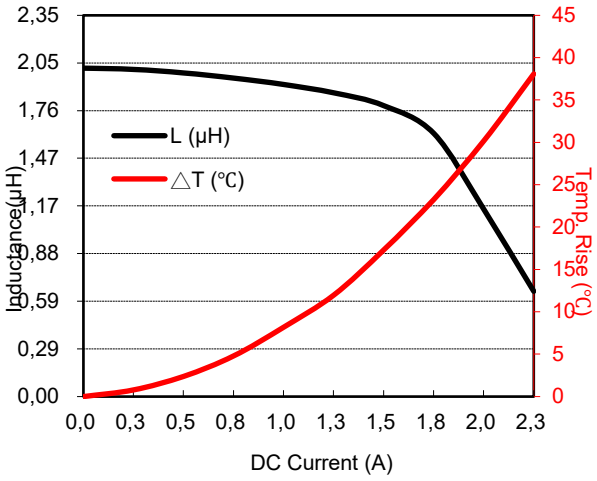
15225201U0SNE02C:



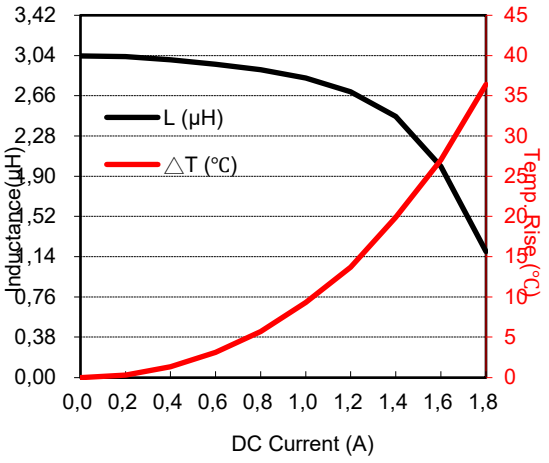
15225201U5SME02C:



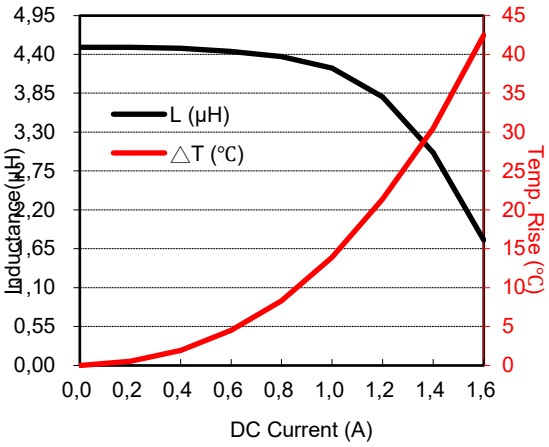
15225202U2SME02C:



15225203U3SME02C :

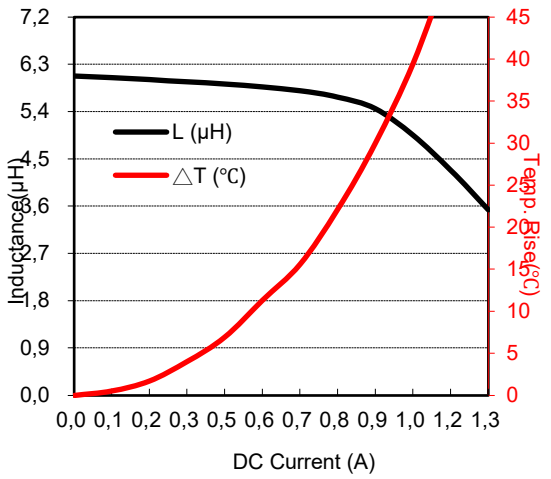


15225204U7SME02C :

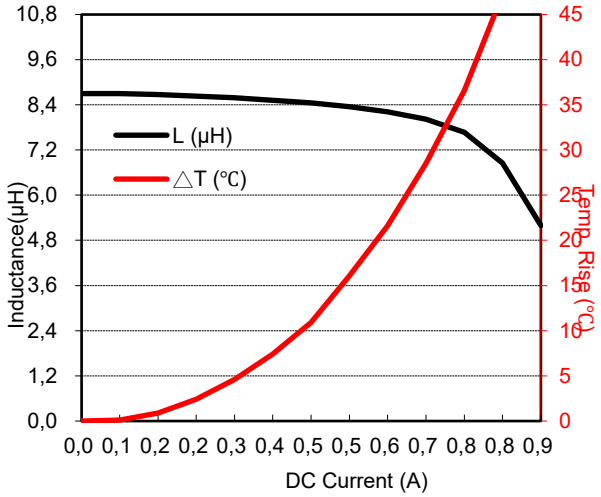


SMD

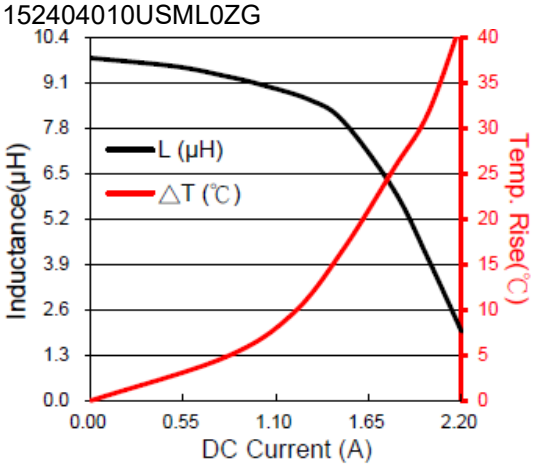
15225206U8SME02C :



152252010USME02C :



152404010USML0ZG

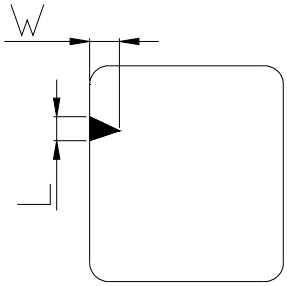


Appearance definition

Core chipping:

The appearance standard of the chipping size in top side, of bottom side ferrite core is following dimension.

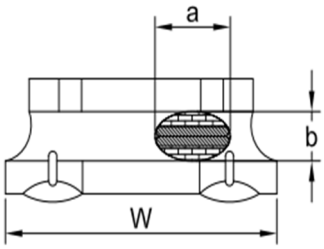
	L	W
2520	0,5mm Max	0,5mm Max
4040	1,0mm Max	1,0mm Max



Void appearance tolerance limit only

Size of voids occurring to coating resin is specified below.

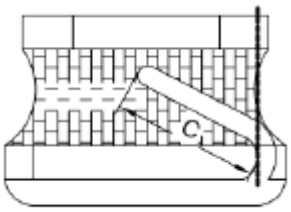
1) Width direction (i.e. a): Acceptable when a ≦w/2
   Nonconforming when a > w/2
2) Length direction (i.e. b): Dimension b is not specified.
3) When total area of voids (including one exposing coil) occurring to each sides is not greater than 50% of coating resin area, that is acceptable.



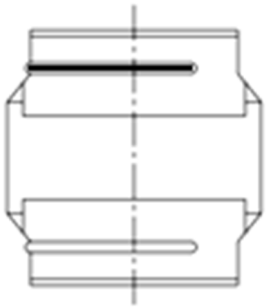
External appearance criterion for exposed wire

4040

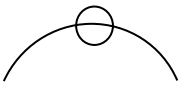
Exposed end of the winding wire at the secondary side should be 2mm and below. (i.e. c ≦2mm)



Electrode appearance criterion for exposed wire



Cross section of wire joint part



Only top side wire is exposed.
(Regardless of whole top side of wire exposed)

Appearance judgment

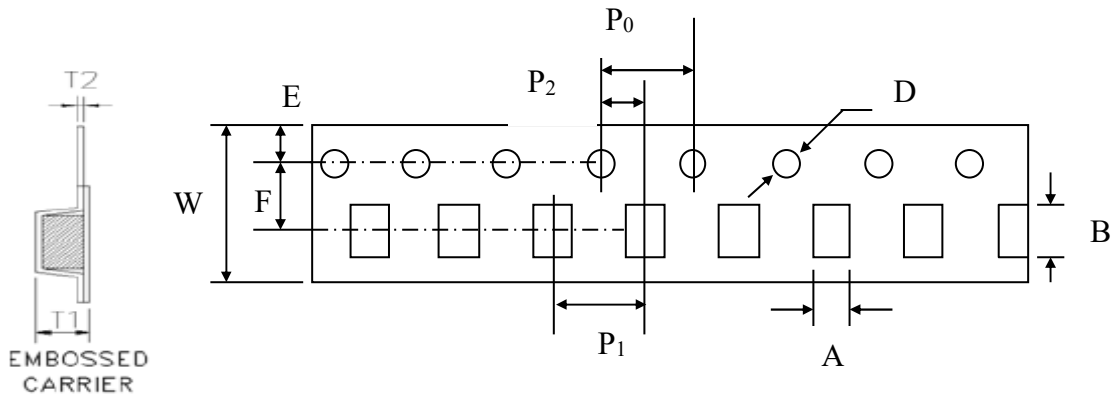
less than 1/2 of joint side length is good.

More than 1/2 is selected as defect

Wire is soldered insufficiently and less than half of outer diameter is covered with solder.

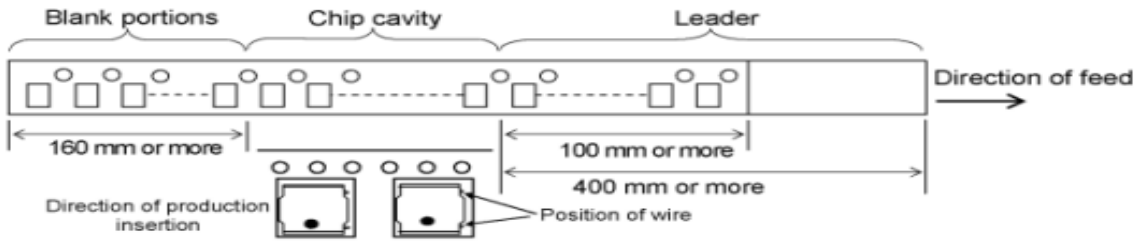
SPECIFICATION

Tape And Reel Package



Size	W	P_1	F	A	E	P_2	P_0	D
1522520___S_E02A	8,0 ± 0,3	4,0 ± 0,3	3,5 ± 0,1	4 ± 0,1	1,75 ±0,2	2,0 ±0,1	4 ±0,1	1,50 +0,1/-0
1522520___S_E02C	8,0 ± 0,3	4,0 ± 0,3	3,5 ± 0,1	4 ± 0,1				
1524040___S_L0ZG	12,0 ± 0,3	8,0 ± 0,3	5,5 ± 0,1	4 ± 0,1				

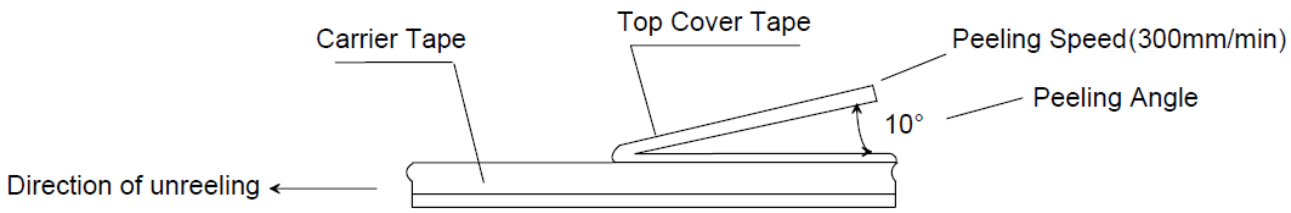
Lead Dimensions:

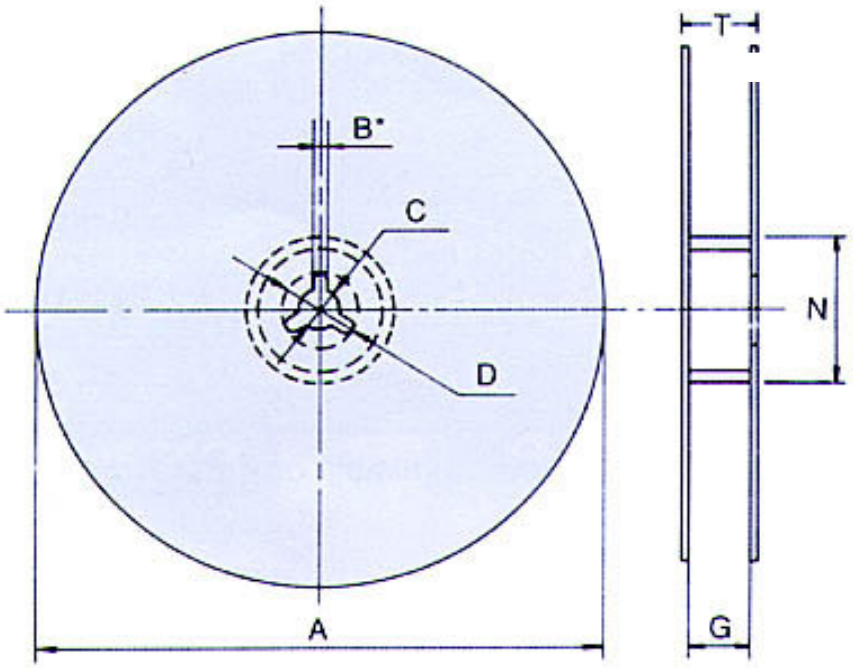


Cover Tape Peel off Strength

Specifications: 0,1N~1,3 N

Angle of between 165 and 180 degrees with the top of the carries tape. The cover tape, shall be pulled with a velocity of 300 mm minute.





Symbol	Reel Type / Tape	A	N	C	D	B	G	T
Dimension	152 2520	180±20	60,0±15	13,0±0,5	21,0±0,8	2,0±0,5	$8,4^{+0,2}_{-0,1}$	12,4±2,0
Dimension	152 4040	330±20	100,0±10				$12,4^{+0,2}_{-0,1}$	17,0±2,0

in mm

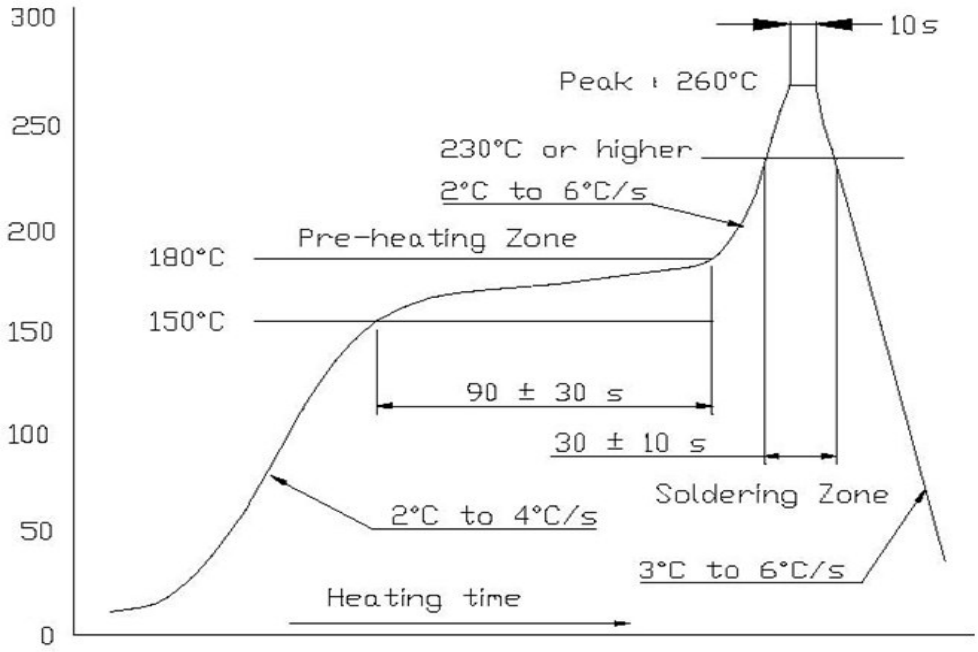
Stock period

The performance of these products, including the solderability, is guaranteed for 12 months after production date code, provided that they remain packed as they were when delivered and stored at a temperature of 5°C to 35°C and a relative humidity less than 45 to 70%RH

Handling:

Keep the products away from all magnets and magnetic objects.
Be careful not to subject the products to excessive mechanical shocks.
Please avoid applying impact to the products after mounted on pc board.
Avoid ultrasonic cleaning

Reflow Soldering Profile



Reliability Test

Mechanical

Item	Specification & Requirement	Test Method
Solder ability	The surface of terminal immersed shall be minimum of 90% covered with a new coating of solder	Solder heat proof: 1. Preheating: 160±10°C 90s 2. Retention time: 245±5°C for 3 ± 1 sec
Vibration	No mechanical damage. Inductance change within±10%.	1. Frequency: 10Hz to 55Hz to 10Hz in 60 sec as a period 2. Vibration time: period cycled for 2 hours in each of 3 mutual perpendicular directions 3. Amplitude: 1,5mm max.
Terminal strength	No detachment of terminal pin and no breakage of wire	Add static load 4,9N (500gf) to inductor through hole of test board for 10 ± 2 sec

Endurance

Item	Specification & Requirement	Test Method
Thermal Shock	No mechanical damage. Inductance change within±10%.	1. Repeat 100 cycles as follow : -40°C ± 2°C, 30±3 minutes Room temperature, 5 minutes +125°C ± 2°C, 30±3 minutes Room temperature, 5 minutes 2. Recovery: 48+4/-0 hours of recovery under the standard condition after the test see note
High Temperature resistance	No mechanical damage. Inductance change within±10%.	1. Environment condition: 85°C±2°C Applied Current: Rated current **2.** Duration: 500 +4/-0 hours see note
Humidity resistance	No mechanical damage. Inductance change within±10%.	1. Environment condition: 60°C±2°C Humidity: 90~95% Applied Current: Rated current **2.** Duration: 500 +4/-0 hours see note
Low Temperature Storge	No mechanical damage. Inductance change within±10%.	1. Store temperature: -40°C ± 2°C 2. Duration: 500 +4/-0 hours
High Temperature Storge	No mechanical damage. Inductance change within±10%.	1. Store temperature: +125°C ± 2°C **2.** Duration: 500 +4/-0 hours

Note:
When there are questions concerning measurement result: measurement shall be made after 48 ± 2 hours of recovery under the standard condition.

Published by FrelTec® GmbH
Mathildenstr. 10A; 82319 Starnberg; Germany

The following applies to all products named in this publication:

1. The information describes the type of component and shall not be considered as assured characteristics.
2. Terms of delivery and rights to change design reserved.
3. Some parts of this publication contain statements about the suitability of our products for certain areas of application. These statements are based on our knowledge of typical requirements that are often placed on our products in the areas of application concerned. Nevertheless, we explicitly point out that such statements cannot be regarded as binding statements about the suitability of our products for a particular customer application. As a rule, FrelTec® is either unfamiliar with individual customer applications or less familiar with them than the customers themselves. For these reasons, it is always ultimately incumbent on the customer to check and decide whether a FrelTec® product with the properties described in the product specification is suitable for use in a particular customer application.
4. We also point out that in individual cases, a malfunction of electronic components or failure before the end of their usual service life cannot be completely ruled out in the current state of the art, even if they are operated as specified. In customer applications requiring a very high level of operational safety and especially in customer applications in which the malfunction or failure of an electronic component could endanger human life or health (e.g. in accident prevention or life-saving systems), it must therefore be ensured by means of suitable design of the customer application or other action taken by the customer (e.g. installation of protective circuitry or redundancy) that no injury or damage is sustained by third parties in the event of malfunction or failure of an electronic component.
5. The warnings, cautions and product-specific notes must be observed.
6. In order to satisfy certain technical requirements, some of the products described in this publication may contain substances subject to restrictions in certain jurisdictions (e.g. because they are classed as “hazardous”). Useful information on this will be found in our Material Data Sheets. Should you have any more detailed questions, please contact our sales offices.
7. We constantly strive to improve our products. Consequently, the products described in this publication may change from time to time. The same is true for the corresponding product specifications. Please check therefore to what extent product descriptions and specifications contained in this publication are still applicable before or when you place an order. We also reserve the right to discontinue production and delivery of products. Consequently, we cannot guarantee that all products named in this publication will always be available.
8. Unless otherwise agreed in individual contracts, all orders are subject to the current version of the “General conditions for the supply of products and services of the electrical and electronics industry” published by the German Electrical and Electronics Industry Association (ZVEI), available at www.freltec.com.
9. As far as patents or other rights of third parties are concerned, liability is only assumed for components per se, not for applications, processes and circuits implemented within components or assemblies.
10. The trade name FrelTec® is a trademark registered or pending in Europe and in other countries.