

FrelTec GmbH

Mathildenstr. 10A
82319 Starnberg
Germany

SMD Inductors Beads for Signal Lines

SPECIFICATION

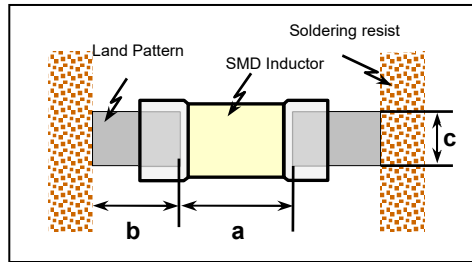
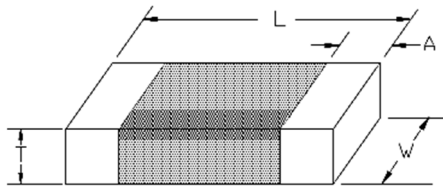
Part Number

15F	02*	151*	S	M	T10*	5
Type	Size	Impedance	Specificat- ion	Tolerance	Packing	Thick-ness
15F : SMD Inductor Bead for Signal Lines	02 : 0402 1,0x0,5mm	The value is given in Ohm. First two digits are significant The last digit is the multiplier which denotes the number of zero following	S: Standard Type	Q: ±25%	E03: Embossed plastic type and reel. For 3k pc available for 1206 (7"reel)	5: 0,5 mm
	03 : 0603 1,6x0,8mm		R: Low DRC		T04: Tape paper and reel. For 4k pc available for 0603, 0805 (7"reel)	8: 0,8 mm
	05 : 0805 2,0x1,2mm	Example: 670 : 670Ohm 371 : 370Ohm 222 : 2200 Ohm				9: 0,9 mm
	06 : 1206 3,2x1,6mm				T10: Tape paper and reel. For 10k pc available for 0402 (7"reel)	B: 1,1 mm

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

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Dimensions and land pattern:



Series	L	W	A (Min/Max)	Recommended Pad Dimensions			
				L x W	a	b	c
0402	1,00 ± 0,10	0,50 ± 0,10	0,25 ± 0,15	1,0 x 0,5	0,3 to 0,5	0,35 to 0,45	0,4 to 0,5
0603	1,60 ± 0,20	0,80 ± 0,20	0,30 ± 0,20	1,6 x 0,8	0,7 to 1,0	0,6 to 0,8	0,7 to 0,8
0805	2,00 ± 0,20	1,20 ± 0,20	0,50 ± 0,30	2,0 x 1,2	1,0 to 1,3	0,7 to 0,9	1,0 to 1,2
1206	3,20 ± 0,20	1,60 ± 0,20	0,50 ± 0,30	3,2 x 1,6	2,1 to 2,5	1,0 to 1,2	1,3 to 1,6

in mm

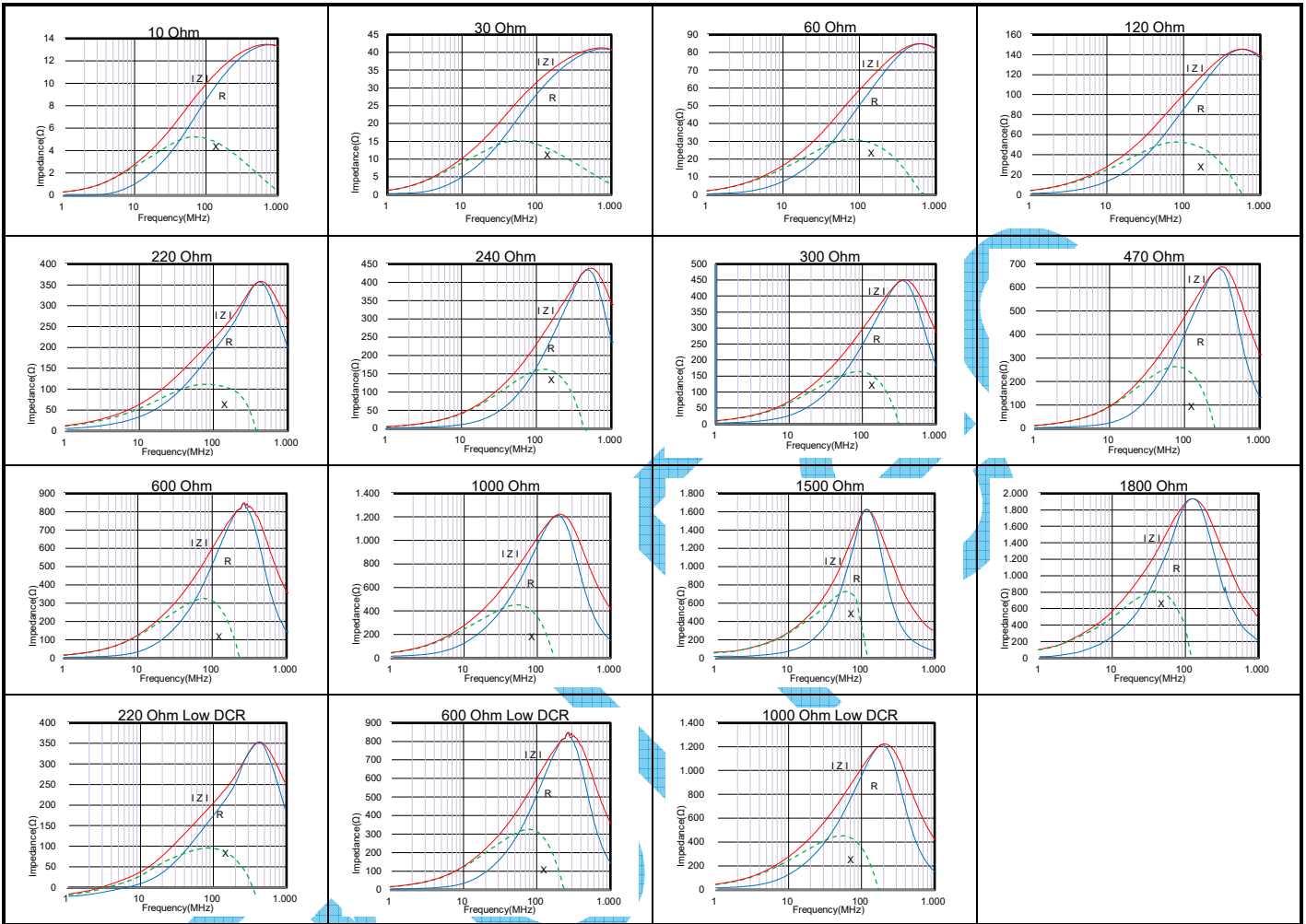
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SMD Characteristic

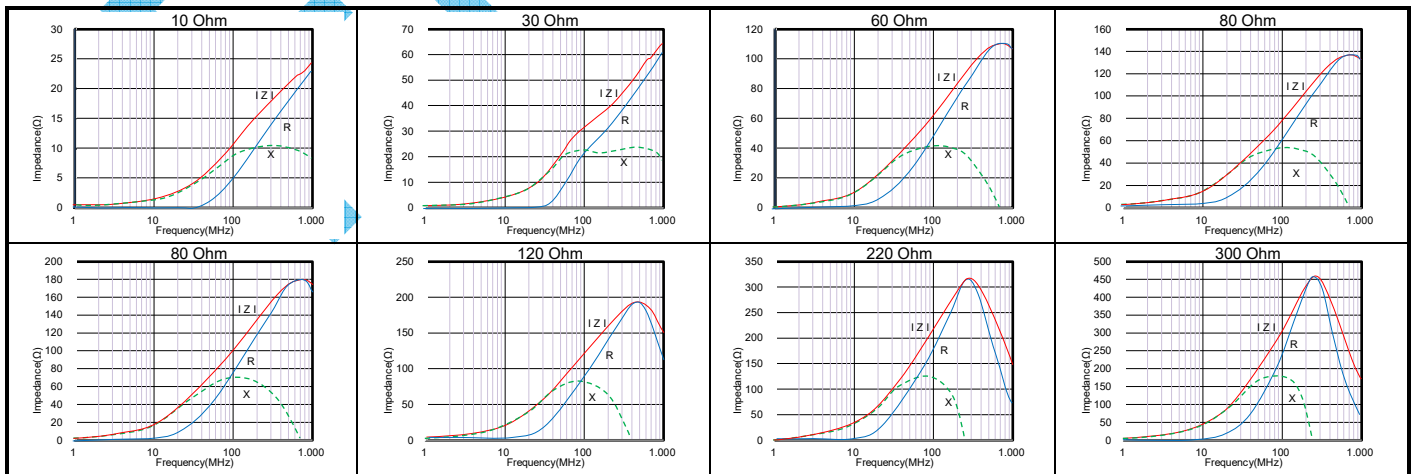
Size	Thickness(mm)		Impedance(Ω)		Impedance Tolerance %	DC Resistance m Ω (Max)	Rated Current mA (Max)	Measuring
	Max.	Tol.	Value	3-Digital				
0402	0,50	$\pm 0,10$	10	100	$\pm 25\%$	25,0	1,000	100MHz/0,5V
			30	300		80,0	1,000	
			60	600		150,0	500	
			120	121		190,0	550	
			220	221		280,0	700	
			240	241		280,0	700	
			300	301		280,0	700	
			470	471		340,0	420	
			600	601		520,0	300	
			1000	102		600,0	500	
	0,50	$\pm 0,05$	1500	152		800,0	250	
			1800	182		800,0	250	
			220	221		180,0	600	
			600	601		340,0	500	
0,50	$\pm 0,10$	1000	102	490,0	350			
		10	100	200,0	400			
		30	300	200,0	800			
		60	600	100,0	800			
0603	0,80	$\pm 0,20$	80	800	200,0	900		
			100	101	200,0	500		
			120	121	150,0	600		
			220	221	200,0	700		
			300	301	250,0	900		
			470	471	450,0	200		
			600	601	450,0	600		
			1000	102	450,0	800		
			32	320	150,0	400		
			80	800	150,0	800		
0805	0,90	$\pm 0,20$	120	121	150,0	800		
			150	151	250,0	300		
			220	221	300,0	700		
			300	301	200,0	600		
			600	601	200,0	500		
			1000	102	450,0	500		
			26	260	100,0	600		
1206	1,10	$\pm 0,20$	31	310	50,0	600		

OPERATING TEMPERATURE RANGE: -55°C TO +125°C

0402

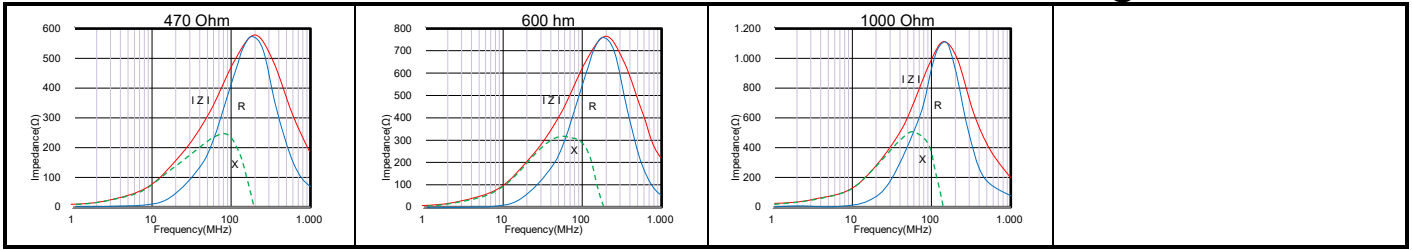


0603

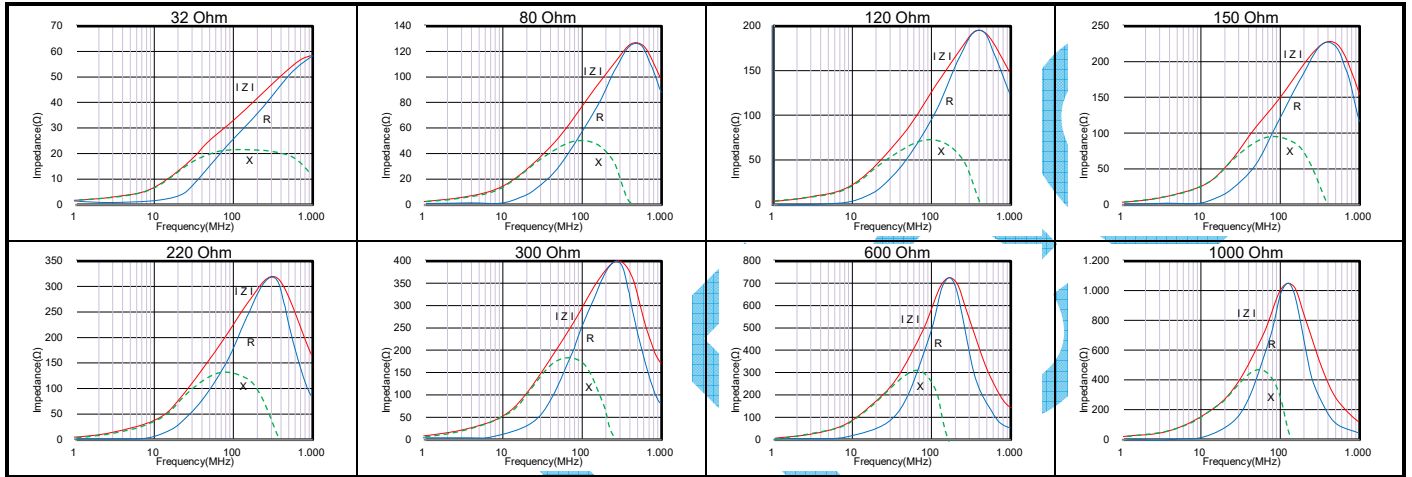


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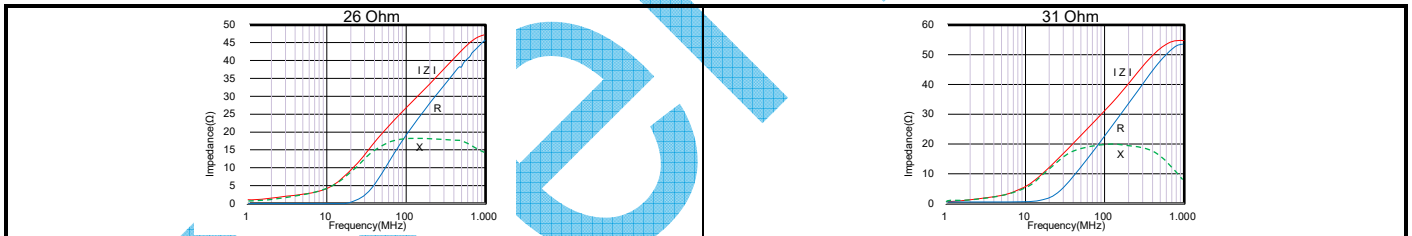
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0805



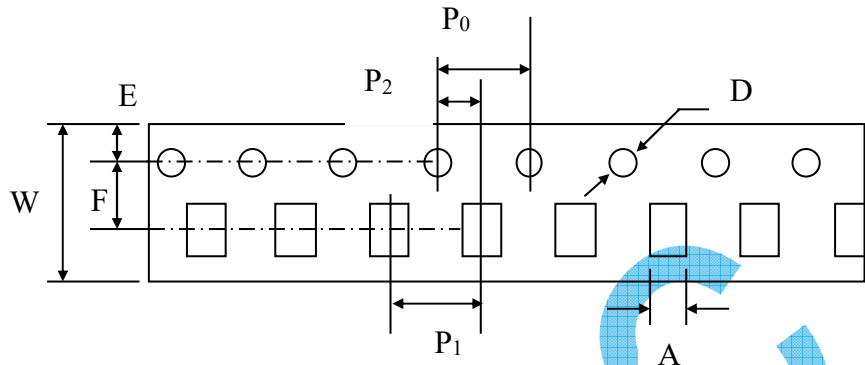
1206



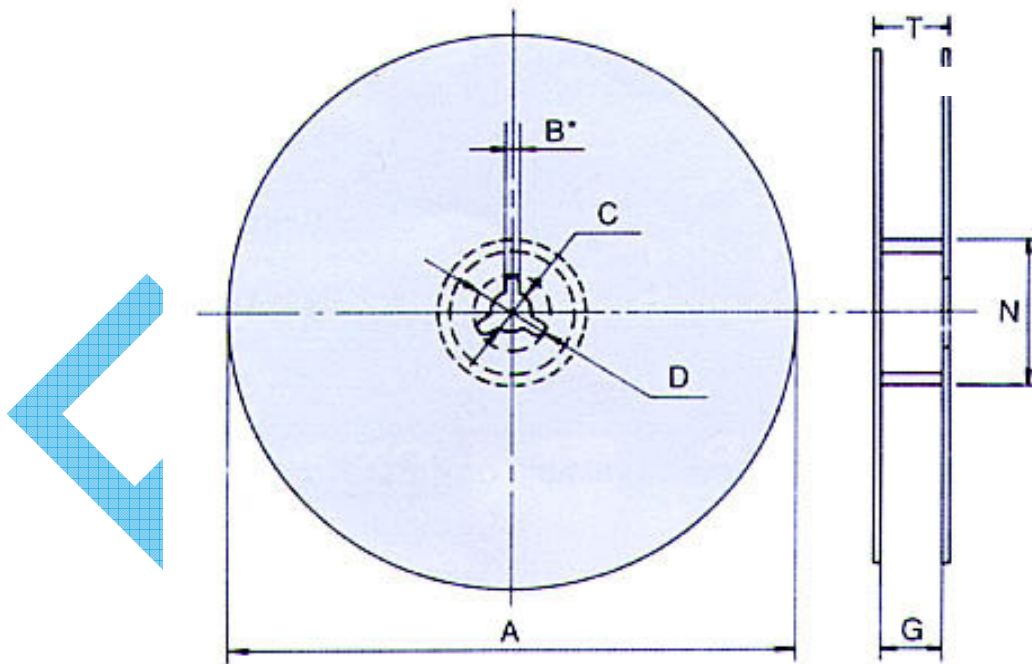
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SPECIFICATION

Tape And Reel Package



Size	W	P ₁	F	A	E	P ₂	P ₀	D
0402	8,00 ± 0,10	4,00 ± 0,10	3,50 ± 0,05	0,62 ± 0,03	1,12 ± 0,03	2,00 ± 0,05	2,00 ± 0,05	1,55 ± 0,05
0603	8,00 ± 0,10	4,00 ± 0,10	3,50 ± 0,10	1,05 ± 0,05	1,85 ± 0,05	2,00 ± 0,10	4,00 ± 0,10	1,56 ± 0,10
0805	8,00 ± 0,10	4,00 ± 0,10	3,50 ± 0,10	1,50 ± 0,05	2,30 ± 0,05	2,00 ± 0,10	4,00 ± 0,10	1,56 ± 0,10
1206	7,90 ± 0,30	4,00 ± 0,10	3,50 ± 0,10	1,85 ± 0,10	3,43 ± 0,10	2,00 ± 0,05	4,00 ± 0,10	1,55 ± 0,05



Symbol		A	N	C	D	G	T
Dimension	Paper Tape	178±2	75	13,0±0,8	21,0±0,8	5,0	8
	Embossed Tape					10,0	12,5

in mm

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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

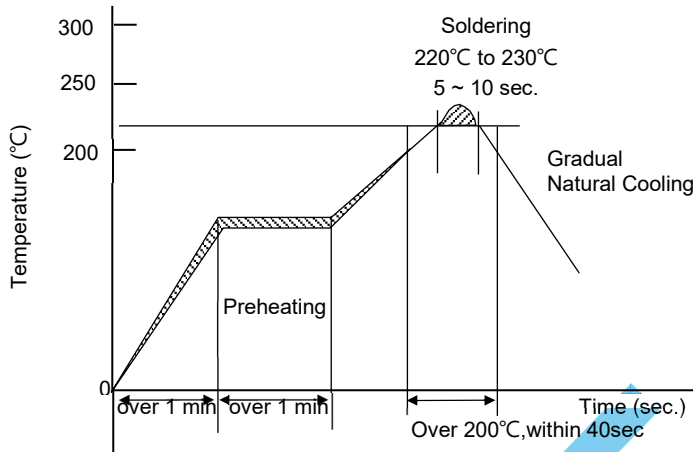
The solderability of the external electrode may be deteriorated if packages are stored where they are exposed to dust or harmful gas (hydrogen chloride, sulfurous acid gas or hydrogen sulfide).

Packaging material may be deformed if packages are stored where they are exposed to heat or direct sun—light.

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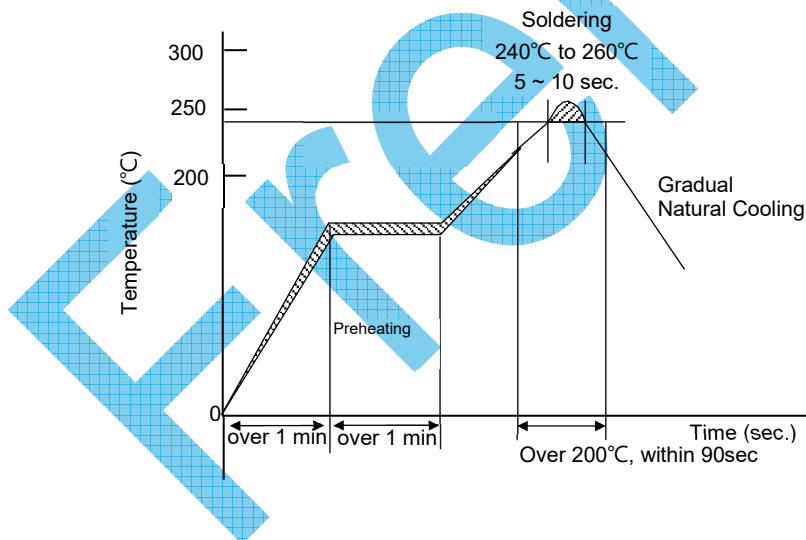
Soldering profile for SMT process with SNPB solder paste

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



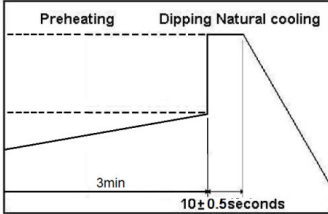
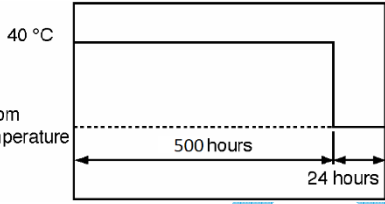
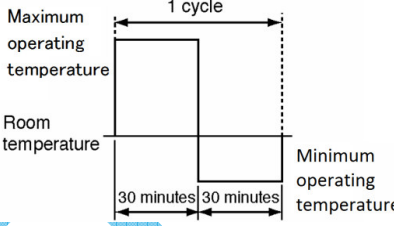
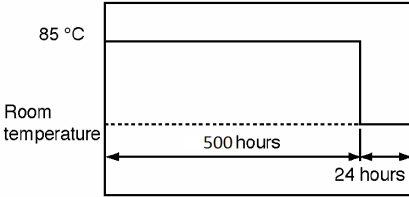
Soldering profile for SMT process with lead free solder paste.

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



Test Conditions and Requirements

Item	Test Condition		Requirements
Appearance	Ferrite Beads shall be visually inspected for visible evidence of defect.		In accordance with specification.
Impedance	Measuring frequency : $100 \pm 1\text{MHz}$ Applied Voltage : 500 mV Measuring equipment and fixture : 1005 : HP4291B + 16193A 1608 : HP4291B + 16192A 2012 : HP4291A + 16092A 3216 : HP4291A + 16092A		Within specified tolerance.
DC Resistance	a. Temperature: $25 \pm 3^\circ\text{C}$ b. Relative Humidity: 45~75%RH c. Measuring equipment: HP 4338		In accordance with electrical specification.
Dimension	Dimension shall be measured with caliper or micrometer		In accordance with dimension specification.
Solder-ability	Preheat: 150°C , 60 seconds Solder temperature: $245 \pm 5^\circ\text{C}$ Flux: Rosin Dip time: 4 ± 1 seconds		More than 75% of the terminal electrode part shall be covered with new solder.
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.
Resistance to Soldering Heat	Preheat: 150°C , 60 seconds Solder temperature: $270 \pm 5^\circ\text{C}$ Flux: Rosin Dip time: 10 ± 1 seconds		The chip shall not be cracks. More than 75% of terminal electrode shall be covered with solder.

Item	Test Condition		Requirements
	<p>Preheating temperature : 150 to 180°C Preheating time: 3 min. Preheat : 150°C, 60 seconds Solder temperature : 260±5°C Flux : Rosin Dip time: 10 ± 0,5 seconds</p>		
<p>High Humidity Load Life Test</p>	<p>Humidity: 90 to 95% RH. Temperature: 40±2°C Testing time: 500 ± 12 hours</p>		<p>No visible damage. Impedance: Within ± 30% of the initial value.</p>
<p>Thermal Shock</p>	<p>Temperature: Maximum and Minimum , kept stabilized for 30±3 minutes each Cycle: 5 cycles</p>		<p>No visible damage Impedance: Within ± 30% of the initial value.</p>
<p>High Temperature Load</p>	<p>Temperature: 125±3°C Testing time: 500±12 hours</p>		<p>No visible damage. Impedance: Within ± 30% of the initial value.</p>
	<p>Recovery: 2 to 3 hrs of recovery under the standard condition after the removal from test chamber. Measurement : After placing for 24 ± 2 hours min.</p>		

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