

## Reliability and Test Condition

Item	Performance	Test Condition
Operating Temperature	-40°C~+125°C (Including self - temperature rise)	
Storage Temperature	1.-10~+40°C,50~60% RH (Product without taping) 2.-40~+125°C (on board)	
<b>Electrical Performance Test</b>		
Inductance	Refer to standard electrical characteristics list	HP4284A,CH11025,CH3302,CH1320,CH1320S LCR Meter
RDC		CH16502,Agilent33420A Micro-Ohm Meter
Saturation Current (Isat)	Approximately $\Delta L$ 30%.	Saturation DC Current (Isat) will cause L0 to drop $\Delta L$ (%)
Heat Rated Current (Irms)	Approximately $\Delta T$ 40°C	Heat Rated Current (Irms) will cause the coil temperature rise $\Delta T$ (°C) without core loss. 1.Applied the allowed DC current 2.Temperature measured by digital surface thermometer
<b>Reliability Test</b>		
Life Test	Appearance : No damage Inductance : within $\pm$ 10% of initial value RDC : within $\pm$ 15% of initial value and shall not exceed the specification value	Preconditioning: Run through IR reflow for 3 times. ( IPC/JEDEC J-STD-020E Classification Reflow Profiles) Temperature : 125 $\pm$ 2°C (Inductor) Applied current : rated current Duration : 1000 $\pm$ 12hrs Measured at room temperature after placing for 24 $\pm$ 2 hrs
Load Humidity		Preconditioning: Run through IR reflow for 3 times. ( IPC/JEDEC J-STD-020E Classification Reflow Profiles) Humidity : 85 $\pm$ 2% R.H Temperature : 85°C $\pm$ 2°C Duration : 1000hrs Min.(No load current) Measured at room temperature after placing for 24 $\pm$ 2 hrs
Moisture Resistance		Preconditioning: Run through IR reflow for 3 times. ( IPC/JEDEC J-STD-020E Classification Reflow Profiles) 1. Baked at 50°C for 25hrs, measured at room temperature after placing for 4 hrs. 2. Raise temperature to 65 $\pm$ 2°C 90-100%RH in 2.5hrs, and keep 3 hours, cool down to 25°C in 2.5hrs. 3. Raise temperature to 65 $\pm$ 2°C 90-100%RH in 2.5hrs, and keep 3 hours, cool down to 25°C in 2.5hrs, keep at 25°C for 2 hrs then keep at -10°C for 3 hrs 4. Keep at 25°C 80-100% RH for 15min and vibrate at the frequency of 10 to 55 Hz to 10 Hz, measure at room temperature after placing for 1~2 hrs.
Thermal shock		Preconditioning: Run through IR reflow for 3 times. ( IPC/JEDEC J-STD-020E Classification Reflow Profiles) Condition for 1 cycle Step1 : -40 $\pm$ 2°C 30 $\pm$ 5min Step2 : 125 $\pm$ 2°C $\leq$ 0.5min Step3 : 125 $\pm$ 2°C 30 $\pm$ 5min Step4 : -40 $\pm$ 2°C $\leq$ 20S Number of cycles : 500 Measured at room temperature after placing for 24 $\pm$ 2 hrs
Vibration		Preconditioning: Run through IR reflow for 3 times. ( IPC/JEDEC J-STD-020E Classification Reflow Profiles) Oscillation Frequency: 10Hz~2KHz~10Hz for 20 minutes Equipment : Vibration checker Total Amplitude: 10g Testing Time : 12 hours (20 minutes, 12 cycles each of 3 orientations)

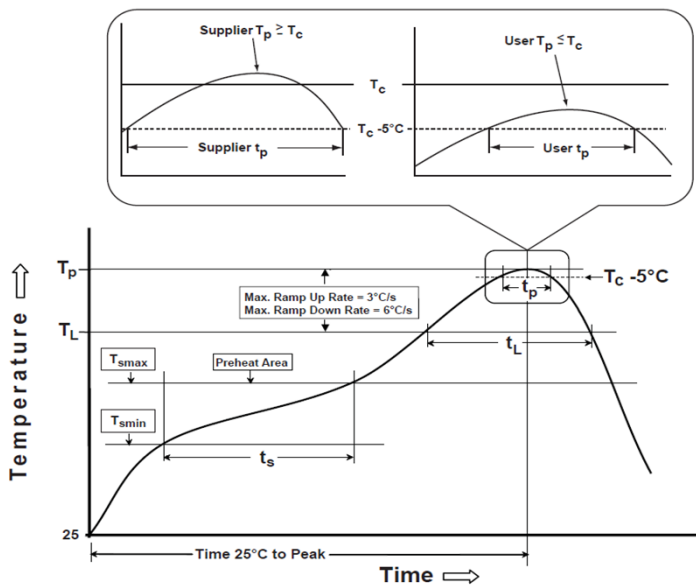
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<b>Reliability Test</b>																
Bending	Appearance : No damage. Inductance : within±10% of initial value RDC : within ±15% of initial value and shall not exceed the specification value	Shall be mounted on a FR4 substrate of the following dimensions: >=0805 inch(2012mm):40x100x1.2mm <0805 inch(2012mm):40x100x0.8mm Bending depth: >=0805 inch(2012mm):1.2mm <0805 inch(2012mm):0.8mm duration of 10 sec.														
Shock		<table border="1"> <thead> <tr> <th>Type</th> <th>Peak value (g's)</th> <th>Normal duration (D) (ms)</th> <th>Wave form</th> <th>Velocity change (V)ft/sec</th> </tr> </thead> <tbody> <tr> <td>SMD</td> <td>50</td> <td>11</td> <td>Half-sine</td> <td>11.3</td> </tr> <tr> <td>Lead</td> <td>50</td> <td>11</td> <td>Half-sine</td> <td>11.3</td> </tr> </tbody> </table> <p>3 shocks in each direction along 3 perpendicular axes (18 shocks).</p>	Type	Peak value (g's)	Normal duration (D) (ms)	Wave form	Velocity change (V)ft/sec	SMD	50	11	Half-sine	11.3	Lead	50	11	Half-sine
Type	Peak value (g's)	Normal duration (D) (ms)	Wave form	Velocity change (V)ft/sec												
SMD	50	11	Half-sine	11.3												
Lead	50	11	Half-sine	11.3												
Soderability	More than 95% of the terminal electrode should be covered with solder	a. Method B1, 4 hrs @155°C dry heat @255°C±5°C Test time:5 +0/-0.5 seconds.  b. Method D category 3. (steam aging 8 hours ± 15 min) @ 260°C±5°C Test time: 30 +0/-0.5 seconds.														
Resistance to Soldering Heat	Appearance : No damage. Inductance : within±10% of initial value RDC : within ±15% of initial value and shall not exceed the specification value	Depth: completely cover the termination														
Terminal Strength		<table border="1"> <thead> <tr> <th>Temperature(°C)</th> <th>Time(s)</th> <th>Temperature ramp/immersion and emersion rate</th> <th>Number of heat cycles</th> </tr> </thead> <tbody> <tr> <td>260 ±5 (solder temp)</td> <td>10 ±1</td> <td>25mm/s ±6 mm/s</td> <td>1</td> </tr> </tbody> </table> <p>Preconditioning:Run through IR reflow for 3 times ( IPC/JEDEC J-STD-020E Classification Reflow Profiles)                      With the component mounted on a PCB with the device to be tested, apply a force (&gt;0805:1kg , &lt;=0805:0.5kg) to the side of a device being tested. This force shall be applied for 60 +1 seconds. Also the force shall be applied gradually as not to apply a shock to the component being tested.</p>	Temperature(°C)	Time(s)	Temperature ramp/immersion and emersion rate	Number of heat cycles	260 ±5 (solder temp)	10 ±1	25mm/s ±6 mm/s	1						
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Note : When there are questions concerning measurement result measurement shall be made after 48 ± 2 hours Of recovery under the standard condition.																

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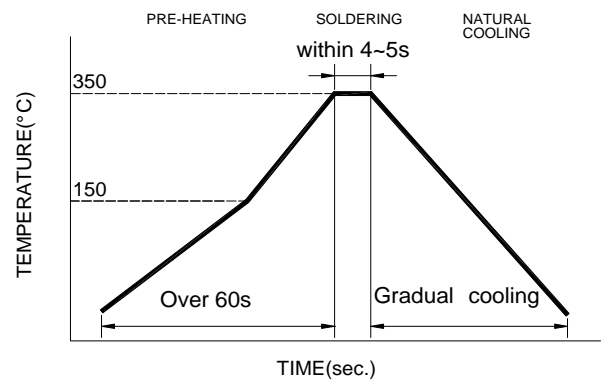
Item	Performance	Test Condition
<b>Soldering Specifications</b>		
Soldering	Mildly activated rosin fluxes are preferred. JANTEK terminations are suitable for all wave and re-flow soldering systems. If hand soldering cannot be avoided, the preferred technique is the utilization of hot air soldering tools.	
Solder re-flow:	Recommended temperature profiles for lead free re-flow soldering in Figure 1. Table 1.1&1.2 (J-STD-020E)	
Iron Reflow:	<p>Products attachment with a soldering iron is discouraged due to the inherent process control limitations. In the event that a soldering iron must be employed the following precautions are recommended. (Fig. 2)</p> <p>Note :</p> <ul style="list-style-type: none"> <li>• Preheat circuit and products to 150°C</li> <li>• Never contact the ceramic with the iron tip</li> <li>• Use a 20 watt soldering iron with tip diameter of 1.0mm</li> <li>• 355°C tip temperature (max)</li> <li>• 1.0mm tip diameter (max)</li> <li>• Limit soldering time to 4~5 sec</li> </ul>	

Fig.1 Soldering Reflow



Reflow times: 3 times max

Fig.2 Iron soldering temperature profiles



Iron Soldering times : 1 times max

Soldering iron Method : 350± 5°C max

## Soldering Specifications

**Table (1.1): Reflow Profiles**

Profile Type:	Pb-Free Assembly
Preheat	
-Temperature Min( $T_{smin}$ )	150°C
-Temperature Max( $T_{smax}$ )	200°C
-Time( $t_s$ )from( $T_{smin}$ to $T_{smax}$ )	60-120seconds
Ramp-up rate( $T_L$ to $T_p$ )	3°C/second max.
Liquidus temperature( $T_L$ )	217°C
Time( $t_L$ )maintained above $T_L$	60-150 seconds
Classification temperature( $T_c$ )	See Table (1.2)
Time( $t_p$ ) at $T_c - 5^\circ\text{C}$ ( $T_p$ should be equal to or less than $T_c$ .)	* < 30 seconds
Ramp-down rate( $T_p$ to $T_L$ )	6°C /second max.
Time 25°C to peak temperature	8 minutes max.

**T<sub>p</sub>**: maximum peak package body temperature, **T<sub>c</sub>**: the classification temperature.

For user (customer) **T<sub>p</sub>** should be equal to or less than **T<sub>c</sub>**.

\* Tolerance for peak profile temperature ( $T_p$ ) is defined as a supplier minimum and a user maximum.

**Table (1.2) Package Thickness/Volume and Classification Temperature( $T_c$ )**

	Package Thickness	Volume mm <sup>3</sup> <350	Volume mm <sup>3</sup> 350-2000	Volume mm <sup>3</sup> >2000
PB-Free Assembly	<1.6mm	260°C	260°C	260°C
	1.6-2.5mm	260°C	250°C	245°C
	≥2.5mm	250°C	245°C	245°C

Reflow is referred to standard IPC/JEDEC J-STD-020E

## Notes

- (1) When there are questions concerning measurement result : measurement shall be made after  $48 \pm 2$  hours of recovery under the standard condition
- (2) This power choke coil itself does not have any protective function in abnormal condition such as overload, short-circuit and open-circuit conditions, etc. Therefore, it shall be confirmed as the end product that there is no risk of smoking, fire, dielectric withstand voltage, insulation resistance, etc. in abnormal conditions to provide protective devices and/or protection circuit in the end product.
- (3) When this power choke coil was used in a similar or new product to the original one, sometimes it might not be able to satisfy the specifications due to different condition of use.
- (4) Dielectric withstanding test with higher voltage than specific value will damage insulating material and shorten its life.
- (5) This power choke coil must not be used in wet condition by water, coffee or any liquid because insulation strength becomes very low in this condition.
- (6) Please consult our company to confirm the reliability of the process required to wash or use or exposure to a chemical solvent used in this product. PCB washing tested to MIL-STD-202 Method · and dry it off immediately ◦
- (7) The rated current as listed is either the saturation current or the heating current depending on which value is lower.
- (8) If this power choke is dipped in the cleaning agent, such as toluene, xylene, ketone, and ether system, there is a possibility that the performance decreases greatly · and marking disappearanc ◦
- (9) The high power ultrasonic washing may damage the choke body ◦
- (10) Before use · the user should determine whether this product is suitable for their own design · Our company only guarantees that the product meets the requirements of this specification ◦