

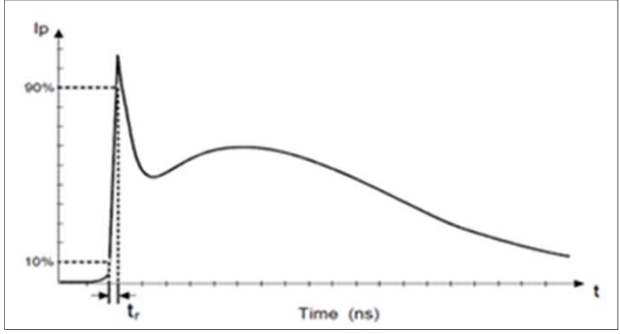
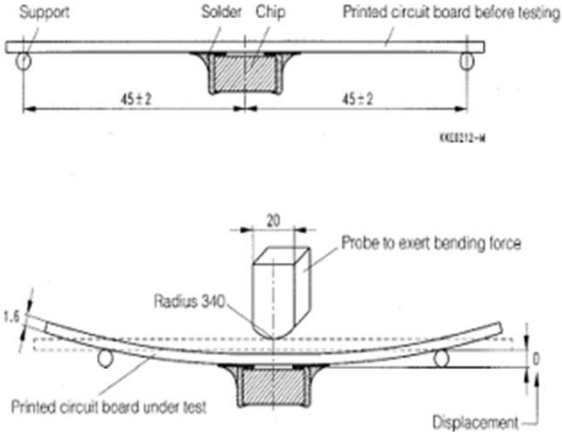
## Reliability and Test Condition

Item	Performance	Test Condition
<b>Electrical Performance Test</b>		
Inductance	Refer to standard electrical characteristics list.	HP4284A,CH11025,CH3302,CH1320,CH1320S LCR Meter.
DCR		CH16502,Agilent33420A Micro-Ohm Mete
Operating Temperature	-55°C~+125°C (Including self - temperature rise)	
Storage temperature and Humidity range	1. -10~+40°C,50~60%RH (Product with taping) 2. -55~+125°C (on board)	
Saturation Current (Isat)	Approximately $\Delta L30\%$	Saturation DC Current (Isat) will cause L0 to drop $\Delta L(\%)$
Heat Rated Current (Irms)	Approximately $\Delta T40^{\circ}\text{C}$	Heat Rated Current (Irms) will cause the coil temperature rise $\Delta T(^{\circ}\text{C})$ . 1.Applied the allowed DC current 2.Temperature measured by digital surface thermometer
<b>Reliability Test</b>		
High Temperature Exposure(Storage) AEC-Q200	Appearance : No damage. Impedance : within $\pm 15\%$ of initial value Inductance : within $\pm 10\%$ of initial value Q : Shall not exceed the specification value. RDC : within $\pm 15\%$ of initial value and shall not exceed the specification value.	Preconditioning: Run through IR reflow for 2 times. ( IPC/JEDEC J-STD-020D Classification Reflow Profiles) Temperature : $125\pm 2^{\circ}\text{C}$ Duration : 1000hrs Min. Measured at room temperature after placing for $24\pm 2$ hrs
Temperature Cycling AEC-Q200		Preconditioning: Run through IR reflow for 2 times. ( IPC/JEDEC J-STD-020D Classification Reflow Profiles) Condition for 1 cycle Step1 : $-55\pm 2^{\circ}\text{C}$ 30min Min. Step2 : $125\pm 2^{\circ}\text{C}$ transition time 1min MAX. Step3 : $125\pm 2^{\circ}\text{C}$ 30min Min. Step4 : Low temp. transition time 1min MAX. Number of cycles : 1000 Measured at room temperature after placing for $24\pm 2$ hrs
Moisture Resistance		Preconditioning: Run through IR reflow for 2 times. ( IPC/JEDEC J-STD-020D Classification Reflow Profiles) 1.Baked at $50^{\circ}\text{C}$ for 25hrs, measured at room temperature after placing for 4 hrs. 2.Raise temperature to $65\pm 2^{\circ}\text{C}$ 90-100%RH in 2.5hrs, and keep 3 hours, cool down to $25^{\circ}\text{C}$ in 2.5hrs. 3.Raise temperature to $65\pm 2^{\circ}\text{C}$ 90-100%RH in 2.5hrs, and keep 3 hours, cool down to $25^{\circ}\text{C}$ in 2.5hrs,keep at $25^{\circ}\text{C}$ for 2hrs then keep at $-10^{\circ}\text{C}$ for 3hrs 4.Keep at $25^{\circ}\text{C}$ 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.
Biased Humidity (AEC-Q200)		Preconditioning: Run through IR reflow for 2 times. ( IPC/JEDEC J-STD-020DClassification Reflow Profiles) Humidity : $85\pm 3\%$ R.H, Temperature : $85^{\circ}\text{C}\pm 2^{\circ}\text{C}$ Duration : 1000hrs Min with 100% rated current. Measured at room temperature after placing for $24\pm 2$ hrs

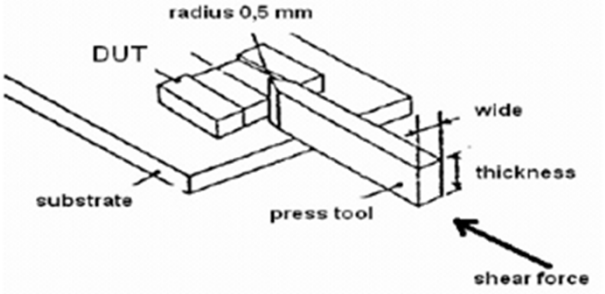
## Reliability and Test Condition

Item	Performance	Test Condition															
<b>Reliability Test</b>																	
High Temperature Operational Life (AEC-Q200)	Appearance : No damage. Impedance : within±15% of initial value Inductance : within±10% of initial value Q : Shall not exceed the specification value. RDC : within ±15% of initial value and shall not exceed the specification value.	Preconditioning: Run through IR reflow for 2 times. ( IPC/JEDEC J-STD-020D Classification Reflow Profiles) Temperature : 125±2°C Duration : 1000hrs Min. with 100% rated current. Measured at room temperature after placing for 24±2hrs															
External Visual	Appearance : No damage	Inspect device construction, marking and workmanship. Electrical Test not required.															
Physical Dimension	According to the product specification size measurement	According to the product specification size measurement															
Resistance to Solvents	Appearance : No damage.	Add aqueous wash chemical - OKEM clean or equivalent.															
Mechanical Shock	Appearance : No damage. Impedance : within±15% of initial value Inductance : within±10% of initial value Q : Shall not exceed the specification value. RDC : within ±15% of initial value and shall not exceed the specification value	<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 (Vi)ft/sec</th> </tr> </thead> <tbody> <tr> <td>SMD</td> <td>100</td> <td>6</td> <td>Half-sine</td> <td>12.3</td> </tr> <tr> <td>Lead</td> <td>100</td> <td>6</td> <td>Half-sine</td> <td>12.3</td> </tr> </tbody> </table> <p>shocks in each direction along 3 perpendicular axes.</p>	Type	Peak value (g's)	Normal duration (D) (ms)	Wave form	Velocity change (Vi)ft/sec	SMD	100	6	Half-sine	12.3	Lead	100	6	Half-sine	12.3
Type	Peak value (g's)	Normal duration (D) (ms)	Wave form	Velocity change (Vi)ft/sec													
SMD	100	6	Half-sine	12.3													
Lead	100	6	Half-sine	12.3													
Vibration		IPC/JEDEC J-STD-020D Classification Reflow Profiles Oscillation Frequency: 10~2K~10Hz for 20 minute Equipment : Vibration checker Total Amplitude:1.52mm±10% Testing Time : 12 hours (20 minutes, 12 cycles each of 3 orientations) °															
Resistance to Soldering Heat	Appearance : No damage. Impedance : within±15% of initial value Inductance : within±10% of initial value Q : Shall not exceed the specification value. RDC : within ±15% of initial value and shall not exceed the specification value	<p>Test condition :</p> <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>	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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260±5 (solder temp)	10±1	25mm/s ±6 mm/s	1														
Thermal shock (AEC-Q200)		Preconditioning: Run through IR reflow for 2 times. ( IPC/JEDEC J-STD-020D Classification Reflow Profiles) Condition for 1 cycle Step1 : -55±2°C 15±1min Step2 : 125±2°C within 20Sec. Step3 : 125±2°C 15±1min Number of cycles : 300 Measured at room fempraturc after placing fo24±2hrs															

## Reliability and Test Condition

Item	Performance	Test Condition
<b>Reliability Test</b>		
ESD	Appearance : No damage.	
Solderability	More than 95% of the terminal electrode should be covered with solder ◦	Steam Aging: 16 hours ± 15 min Preheat: 150°C, 60sec. Solder: Sn96.5% Ag3% Cu0. 5% Temperature: 245±5°C ◦ Flux for lead free: Rosin. 9.5% ◦ Dip time: 4±1sec. Depth: completely cover the termination
Electrical Characterization	Refer Specification for Approval	Summary to show Min, Max, Mean and Standard deviation
Flammability	Electrical Test not required	V-0 or V-1 are acceptable.
Board Flex	Appearance : No damage	Preconditioning: Run through IR reflow for 2 times. ( IPC/JEDEC J-STD-020D Classification Reflow Profiles) Place the 100mm X 40mm board into a fixture similar to the one shown in below Figure with the component facing down. The apparatus shall consist of mechanical means to apply a force which will bend the board (D) x = 2 mm minimum. The duration of the applied forces shall be 60 (+ 5) sec. The force is to be applied only once to the board. 

## Reliability and Test Condition

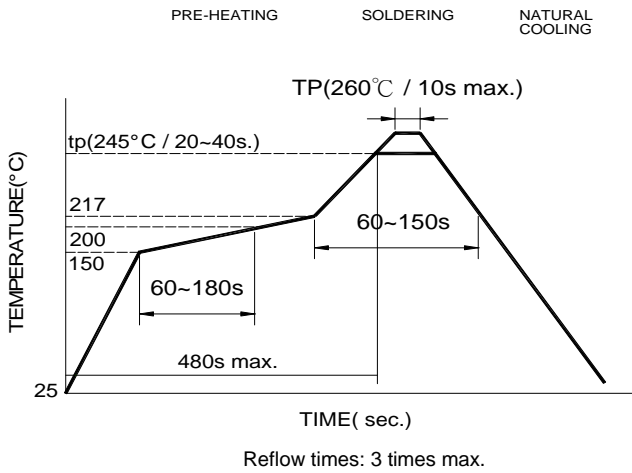
Item	Performance	Test Condition
<b>Reliability Test</b>		
Terminal Strength(SMD)	Appearance : No damage	<p>Preconditioning: Run through IR reflow for 2 times.            ( IPC/JEDEC J-STD-020D Classification Reflow Profiles)            With the component mounted on a PCB with the device to be tested, apply a 17.7 N (1.8 Kg) force 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> 

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

## Reliability and Test Condition

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<b>Reliability Test</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.	
Lead Free Solder re-flow:	Recommended temperature profiles for re-flow soldering in Figure 1.	
Soldering Iron(Figure 2):	<p>Products attachment with a soldering iron is discouraged due to the inherent process control limitations.</p> <p>In the event that a soldering iron must be employed the following precautions are recommended.</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>	

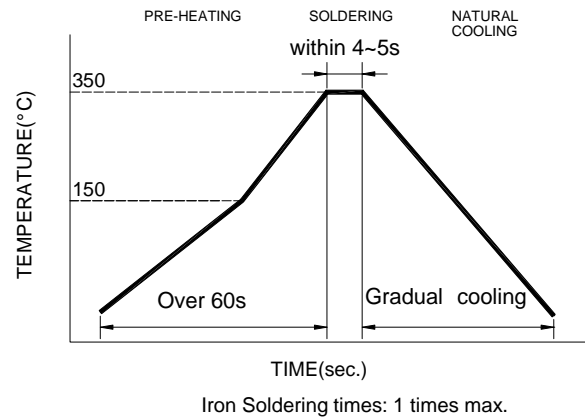
Reflow Soldering



Reflow times: 3 times max.

Fig.1

Iron Soldering



Iron Soldering times: 1 times max.

Fig.2