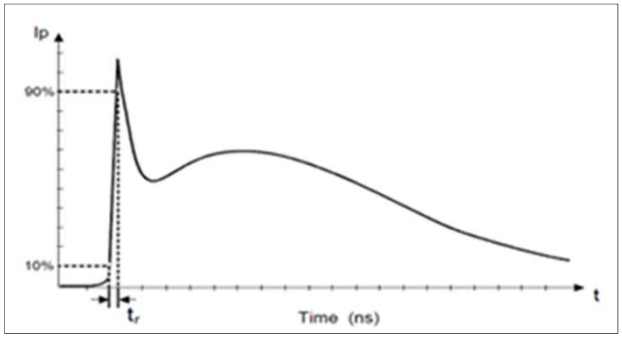
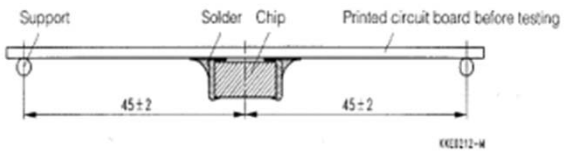
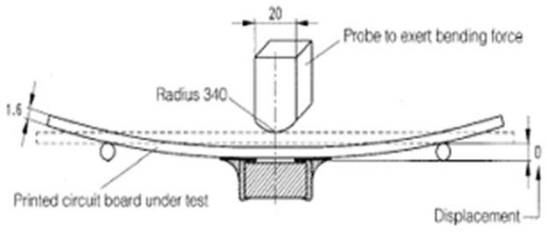
Reliability and Test Condition

Item	Performance	Test Condition
Electrical Performance Test		
Z(common mode)	Refer to standard electrical characteristics list.	Agilent-4291A+ Agilent -16197A
DCR		Agilent-4338B
I.R.		Agilent-4339
Operating Temperature	-55℃~+125℃ (Including self - temperature rise)	
Storage temperature and Humidity range	-55℃~+125℃ (on board)	
Temperature Rise Test	Rated Current, ΔT :40℃ typ.	1.Applied the allowed DC current. 2.Temperature measured by digital surface thermometer
Reliability Test		
High Temperature Exposure(Storage) 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℃ Duration ：1000hrs Min. Measured at room temperature after placing for 24±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±2℃ 30min Min. Step2：125±2℃ transition time 1min MAX. Step3：125±2℃ 30min Min. Step4：Low temp. transition time 1min MAX. Number of cycles： 1000 Measured at room temperature after placing for 24±2 hrs
Moisture Resistance		Preconditioning: Run through IR reflow for 2 times. (IPC/JEDEC J-STD-020D Classification Reflow Profiles) 1.Baked at50℃ for 25hrs, measured at room temperature after placing for 4 hrs. 2.Raise temperature to 65±2℃ 90-100%RH in 2.5hrs, and keep 3 hours, cool down to 25℃ in 2.5hrs. 3.Raise temperature to 65±2℃ 90-100%RH in 2.5hrs, and keep 3 hours, cool down to 25℃ in 2.5hrs,keep at 25℃ for 2hrs then keep at -10℃ for 3hrs 4.Keep at 25℃ 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±3% R.H, Temperature：85℃±2℃ Duration : 1000hrs Min with 100% rated current. Measured at room temperature after placing for 24±2hrs

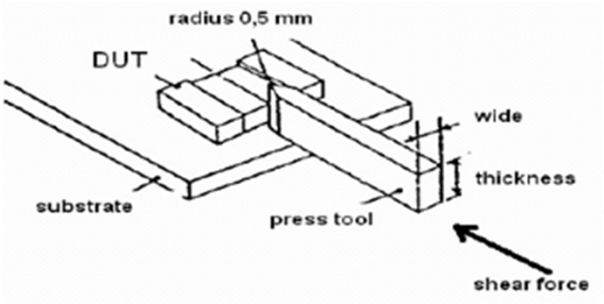
Reliability and Test Condition

<table>
<tr><th>Item</th><th>Performance</th><th>Test Condition</th></tr>
<tr><td colspan="3">Reliability Test</td></tr>
<tr><td>High Temperature Operational Life (AEC-Q200)</td><td>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.</td><td>Preconditioning: Run through IR reflow for 2 times.
(IPC/JEDEC J-STD-020D Classification Reflow Profiles)
Temperature：125±2℃
Duration ：1000hrs Min. with 100% rated current.
Measured at room temperature after placing for24±2hrs</td></tr>
<tr><td>External Visual</td><td>Appearance：No damage</td><td>Inspect device construction, marking and workmanship.
Electrical Test not required.</td></tr>
<tr><td>Physical Dimension</td><td>According to the product specification size measurement</td><td>According to the product specification size measurement</td></tr>
<tr><td>Resistance to Solvents</td><td>Appearance：No damage.</td><td>Add aqueous wash chemical - OKEM clean or equivalent.</td></tr>
<tr><td>Mechanical Shock</td><td>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.</td><td><table><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><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></table>shocks in each direction along 3 perpendicular axes.</td></tr>
<tr><td>Vibration</td><td rowspan="3">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.</td><td>IPC/JEDEC J-STD-020DClassification Reflow Profiles
Oscillation Frequency:10Hz～2KHz～10Hz for 20 minute
Equipment： Vibration checker
Total Amplitude:5g
Testing Time : 12 hours(20 minutes, 12 cycles each of 3 orientations)。
Test the quantity：30pcs</td></tr>
<tr><td>Resistance to Soldering Heat</td><td>Test condition ：<table><tr><th>Temperature(℃)</th><th>Time(s)</th><th>Temperature ramp/immersion and emersion rate</th><th>Number of heat cycles</th></tr><tr><td>250±5 (soldertemp)</td><td>30±5</td><td>1℃/s-4℃/s; time above 183℃, 90s-120s</td><td>3</td></tr></table></td></tr>
<tr><td>Thermal shock (AEC-Q200)</td><td>Preconditioning: Run through IR reflow for 2 times.
(IPC/JEDEC J-STD-020D Classification Reflow Profiles)
Condition for 1 cycle
Step1：-55±2℃ 15±1min
Step2：125±2℃ within 20Sec.
Step3：125±2℃ 15±1min
Number of cycles： 300
Measured at room fempraturc after placing fo24±2hrs</td></tr>
</table>

Reliability and Test Condition

Item	Performance	Test Condition
Reliability Test		
ESD	Appearance：No damage.	
Solderability	More than 95% of the terminal electrode should be covered with solder。	a. Method B, 4 hrs @155°C dry heat @235°C±5°C b. Method B @ 215°C±5°C category 3.(8hours ± 15 min) c. Method D category 3. (8hours ± 15 min)@ 260°C±°C Preheat: 150℃,60sec. Solder: Sn96.5% Ag3% Cu0. 5% Temperature: 245±5℃。 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.  

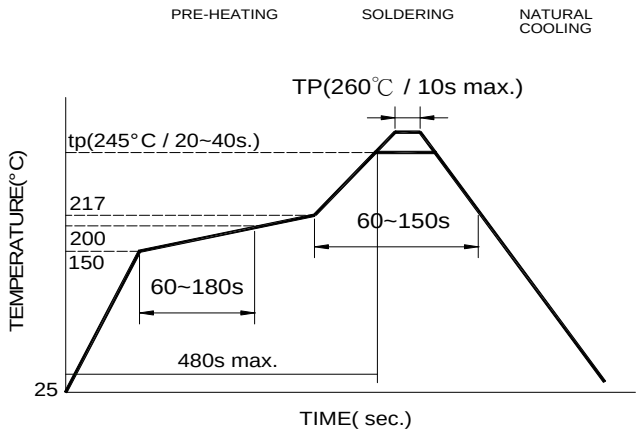
Reliability and Test Condition

Item	Performance	Test Condition
Reliability Test		
Terminal Strength(SMD)	Appearance：No damage	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. 

Reliability and Test Condition

Item	Performance	Test Condition
Soldering and Mounting		
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):	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. Note： ・Preheat circuit and products to 150℃ ・Never contact the ceramic with the iron tip ・Use a 20 watt soldering iron with tip diameter of 1.0mm ・350℃ tip temperature (max) ・1.0mm tip diameter (max) ・Limit soldering time to 4~5 sec	

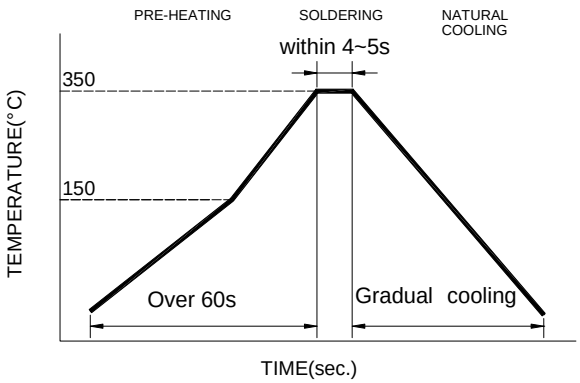
Reflow Soldering



Reflow times: 3 times max.

Fig.1

Iron Soldering



Iron Soldering times: 1 times max.

Fig.2