AEC-Q200(Stress Test Qualification for Passive Components)無源器件應力測試標準

GRADE	TEMPERATURE RANGE		PASSIVE COMPONENT TYPE Maximum capability unless otherwise specified and qualified	TYPICAL/EXAMPLE APPLICATION
	MINIMUM	MAXIMUM		
0	-50°C	+150°C	Flat chip ceramic resistors, X8R ceramic capacitors	All automotive
1	-40°C	+125°C	Capacitor Networks, Resistors, Inductors, Transformers, Thermistors, Resonators, Crystals and Varistors, all other ceramic and tantalum capacitors	Most underhood
2	-40°C	+105°C	Aluminum Electrolytic capacitors	Passenger compartment hot spots
3	-40°C	+85°C	Film capacitors, Ferrites, R/R-C Networks and Trimmer capacitors	Most passenger compartment
4	0°C	+70°C		Non-automotive

AEC-Q200-002< Human Body Model Electrostatic Discharge Test >人體模式靜電放電測試

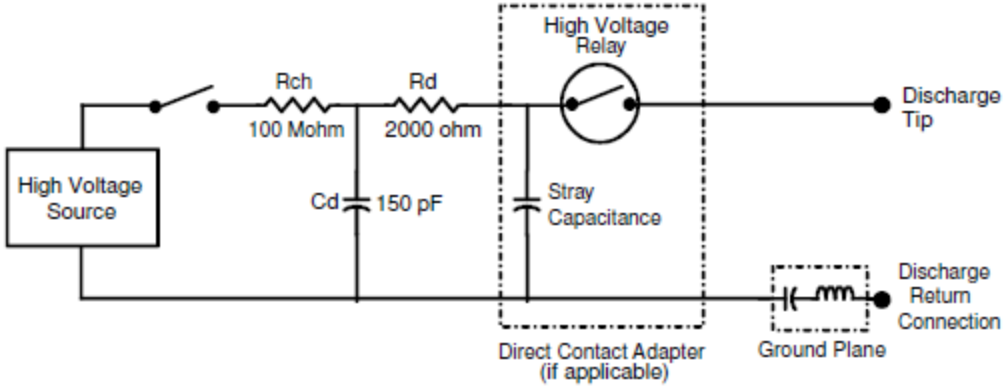


Figure 1: Equivalent *PASSIVE COMPONENT* HBM ESD simulator circuit

Table 1: Direct Contact and Air Discharge ESD Waveform Parameter Requirements

ESD Discharge Method	Indicated Voltage (kV)	First Peak Current, Ip (A)	Rise Time, tr (ns)
Direct Contact Discharge	0.5 ± 0.05	1.87 +0.60/-0	0.7 to 1.0
	1.0 ± 0.1	3.75 +1.12/-0	0.7 to 1.0
	2.0 ± 0.5	7.50 +2.25/-0	0.7 to 1.0
	4.0 ± 0.5	15.0 +4.50/-0	0.7 to 1.0
	8.0 ± 0.8	30.0 +9.0/-0	0.7 to 1.0
Air Discharge	25.0 ± 2.5	Not Specified	Not Specified

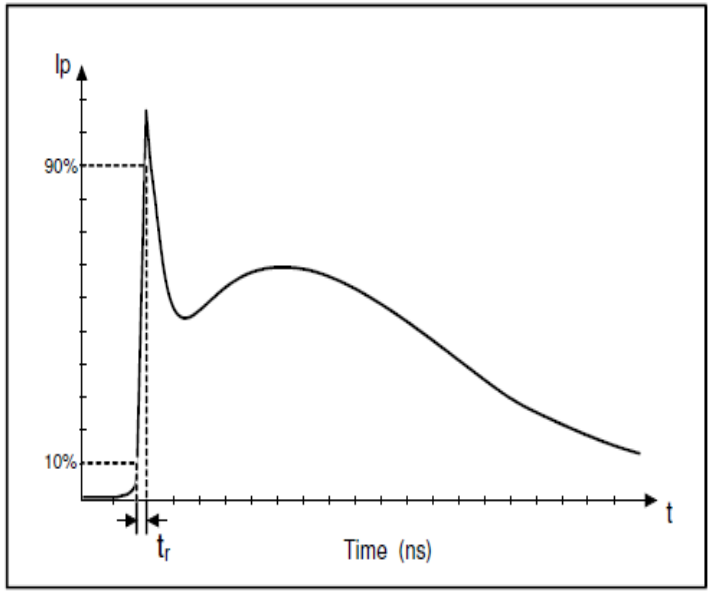


Figure 3: Typical Direct Contact and Air Discharge *PASSIVE COMPONENT* HBM ESD Discharge Waveform to a Coaxial Target

AEC-Q200-003<Beam Load (Break Strength) Test>

橫樑負載、斷裂強度

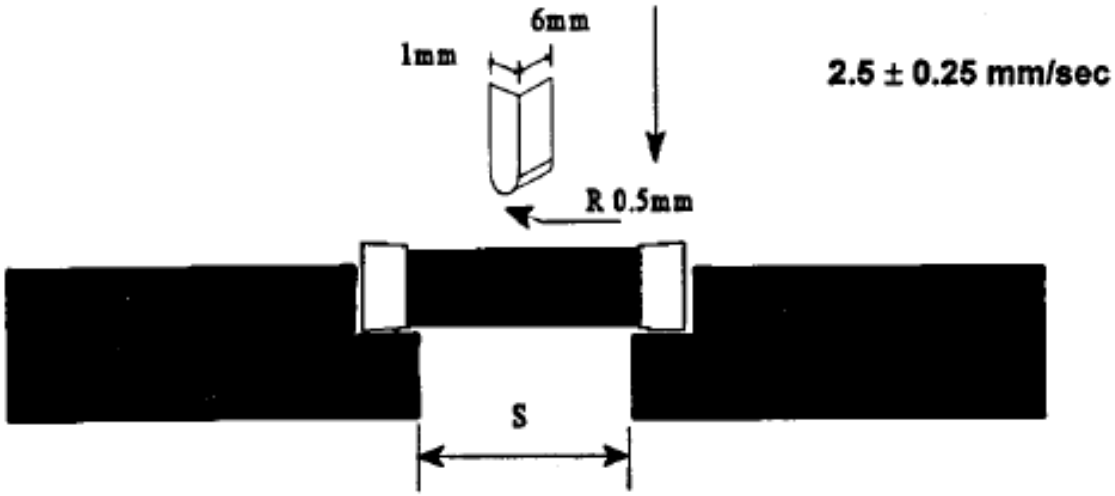


Figure 1: Typical equivalent circuit for Beam Load Test
Note: S = .55 ± 0.05 of the nominal length of Device under Test

100mm X 40mm FR4 PCB board, which is 1.6mm ± 0.2 mm thick and as a Layer-thickness 35µm ± 10µm.

AEC-Q200-004<Measurement Procedures for Resettable Fuses >自恢復保險絲測量程式

-001Resistance Measurement：

Method :2-Wire(20Ωmin)&4-Wire(＜20Ω)

Accuracy:at least 1%

Purpose:Used to measure resistance of PolySwitch devices while are in the off state.

-002 Time-to-trip Measurement：

Method :Supplying the trip current specified in the User Specification ,A system for measuring a function of time that the current(or voltage) across the test specimen.

Accuracy(voltage or current) :at least ±2%

Purpose: Verify that a test specimen will trip within a specified length of time at a specified current.

-003 Time-to-trip Measurement：

Method :Supplying the trip current specified in the User Specification, A system for measuring a function of time that the current(or voltage) across the test specimen.

Accuracy(voltage or current) :at least ±1%

Purpose: Verify that a test specimen will pass a specified current without tripping.

AEC-Q200-004<Measurement Procedures for Resettable Fuses >自恢復保險絲測量程式

-004 Trip Current Measurement：

Method : Supplying the trip current specified in the User Specification ,A system for measuring a function of time that the current (or voltage) across the test specimen

Accuracy(voltage or current) :at least 2%

Purpose: Verify that a test specimen will trip at a specified current.

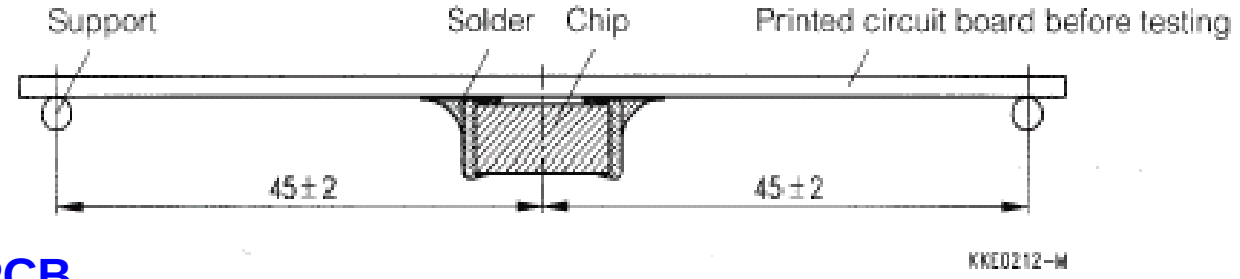
-005 Power Dissipation Measurement：

Method :Supplying the trip current and the voltage specified in the User Specification, A system for measuring the current&the voltage across the test specimen.

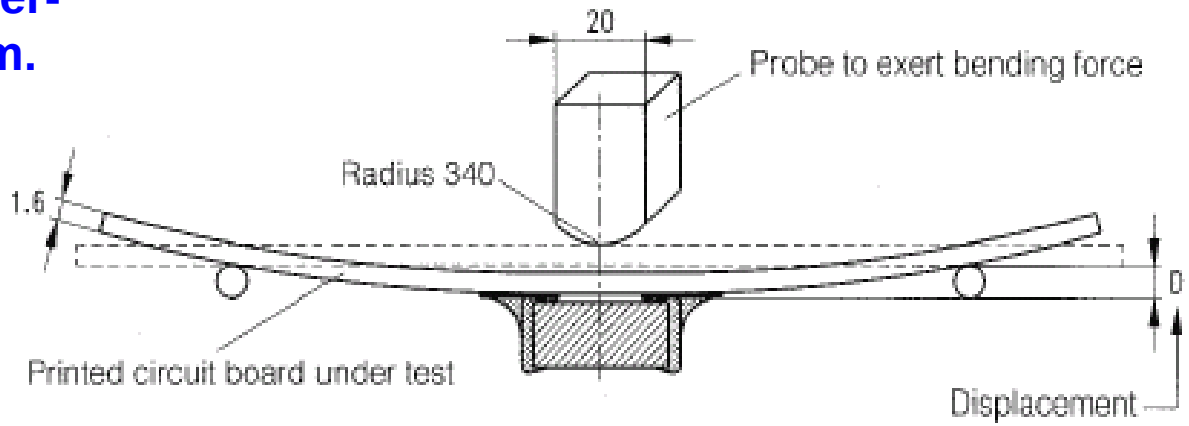
Accuracy(voltage or current) :at least ±2%

Purpose: Determine the amount of power dissipated by a devive in a standard environment after it has stabilized in the tripped state.

AEC-Q200-005<Board Flex Test>板彎曲度測試



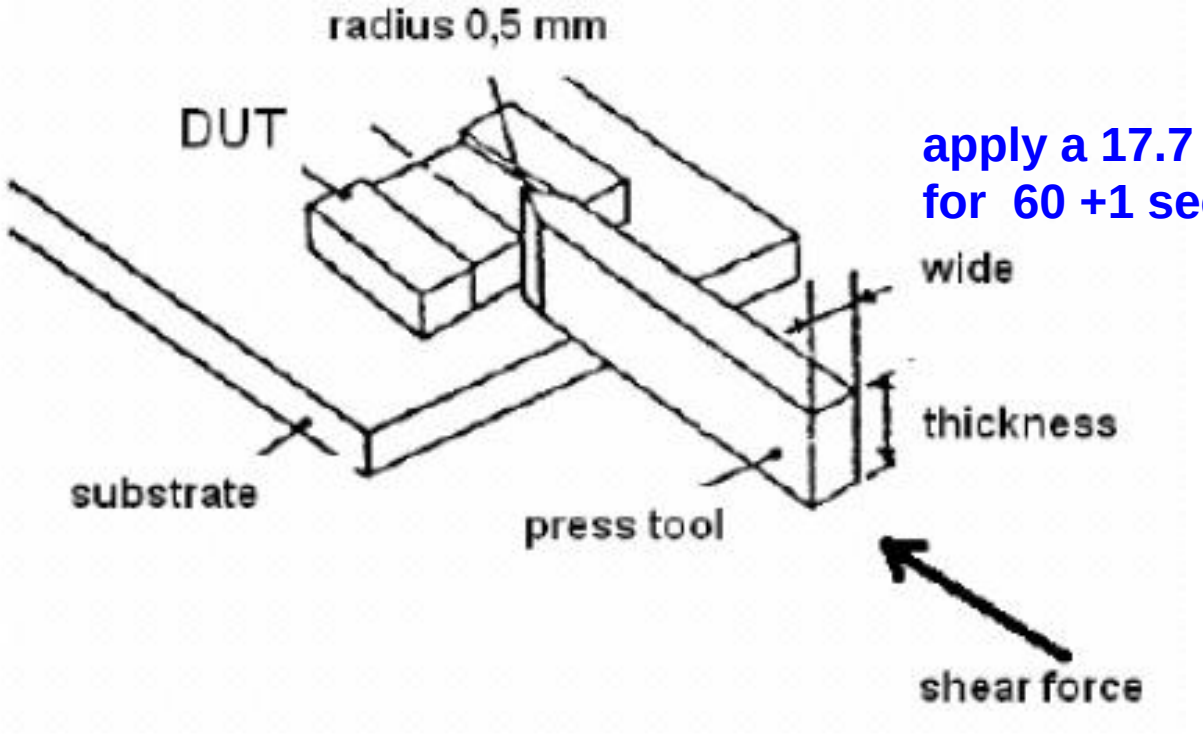
100mm X 40mm FR4 PCB board, which is 1.6mm ± 0.2 mm thick and as a Layer-thickness 35µm ± 10µm.



The apparatus shall consist of mechanical means to apply a force which will bend the board (D) x = **2 mm minimum** (or as defined in the customer specification or Q200). The duration of the applied forces shall be **60 (+ 5) Sec.** The force is to be applied only **once** to the board.

AEC-Q200-006<PASSIVE COMPONENT Terminal Strength (SMD) / Shear Stress Test>

表面貼裝後的剪切強度測試



apply a 17.7 N (1.8 Kg) force, for 60 +1 seconds

Magnification of 20X or greater may be employed for inspection of the mechanical integrity of the device body, terminals and body/terminal junction. Before, during and after the test, the device shall comply with all electrical requirements stated in this specification.

AEC-Q200-007<Voltage Surge Test>電湧測試

Aluminum Electrolytic Capacitors

Figure 1 - Test Circuit.

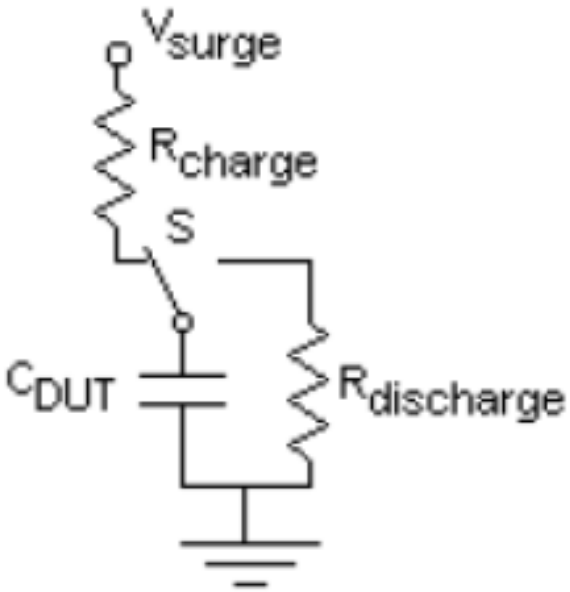
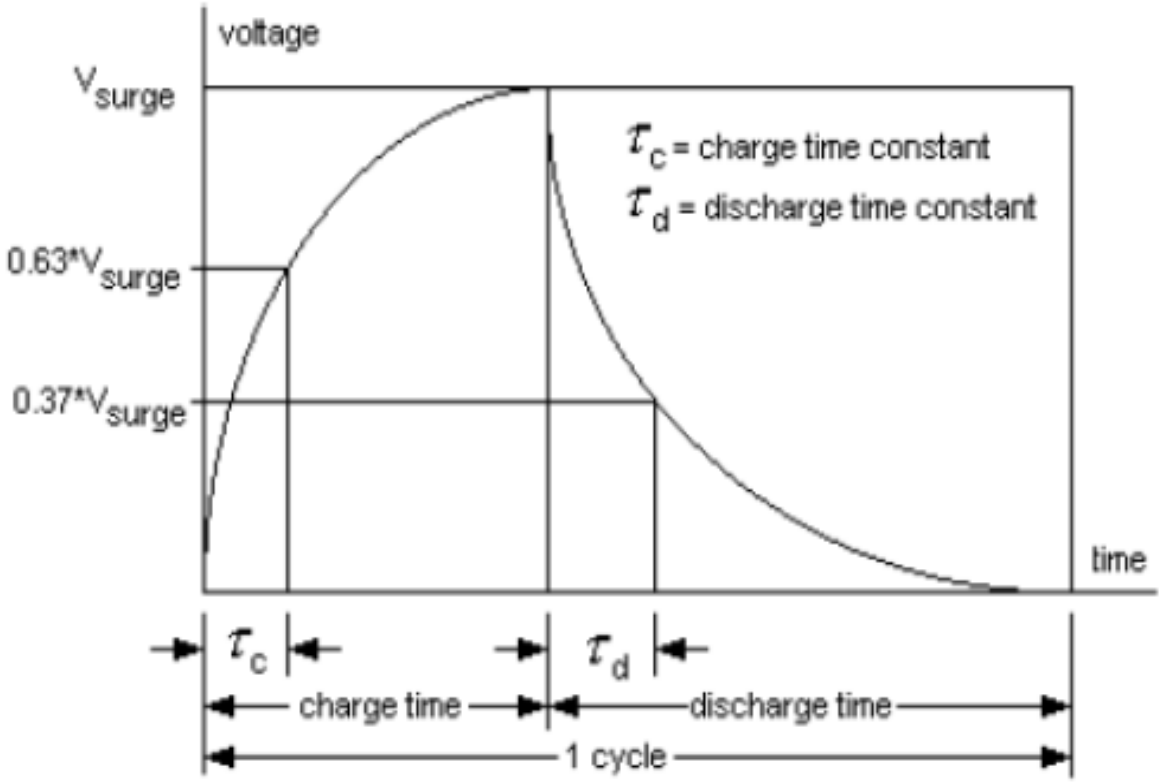


Figure 2. Voltage waveform across capacitor under test, C_{DUT}.



Charge time:30s+/-5s,Discharge time:5.5+/-0.5Min,

V_{surge}浪涌電壓大約為1.2倍電容的額定電壓，25度，1000個cycle