

Whisker assessment of external plating

1. Product : IGBT with leadfree plating

2. Compliance standards : JEDEC STANDARD

3. Method : It has been evaluated as a method on the basis of JEDEC, JESD201A, JESD22A121 standard

(1) Sample size

A minimum of 96 terminations from a minimum quantity of 3 plating lots, 2 samples from each lot per each described precondition treatments per stress test.

* In case of big terminal component, it can be reduced a number of socket,

(2) Class level

Class 2: Pure tin and high tin content alloys are not typically acceptable

Class 2: Business critical applications such as Telecom Infrastructure equipment,
High-end Servers, Automotive, etc.

Class 1: Industrial / consumer products

Class 1A: Consumer products

(3) Test procedures

Stress Type		Precondition Treatment	Total Duration	
			Class 1 and 2 Products	Class 1A Products
Temperature Cycling	-55 +0/-10 °C 85 +10/-0 °C	Depend on Components	1500cyc	1000cyc
Temperature / Humidity Storage	30 ±2°C 60 ±3% RH		4000hr	1000hr
High Temperature Humidity Storage	55 ±3°C 85 ±3% RH		4000hr	1000hr

(4) Criteria

Component Type	Class 2	Class 1	Class 1A
2 Lead SMD Components	40 μ m for Temperature/Humidity Storage and High Temperature/Humidity Storage	67μ m	50 μ m for Temperature Cycling and High Temperature/Humidity Storage 20 μ m for Temperature/Humidity
Multi-Leaded Components		67μ m	
High Frequency Components		50μ m	
Components with a minimum lead-to-lead gap >320 μ m	45 μ m for Temperature Cycling	100μ m	75μ m

4. Whisker Test result

(1) Samples

Leadfree plating products were selected as samples.

The samples are selected for each kind of plating material, terminal material and plating method (electrical, dip)

(2) Criteria

It could be verified anti whisker or not, which is satisfied with criteria of JESD201A Class 2, 1, 1A.

(3) Result

It can be confirmed anti whisker which is satisfied by Class 2, 1, 1A as in the following next page.

Test result

Product	Package	Frame material		External lead treatment		NG Judge (pcs)
		Base material	Internal lead plating	Method	Composition ratio	
d. IGBT	TO-263S(LPDS)	Cu	-	Electricity plating	Sn	0
	TO-263L(LPDL)					
	TO-262					
	TO-220NFM					
	TO-252					
	TO-247N					
	TO-3PFM					

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