Whisker Test Report

Report Number： Rel-whisker-SOT23-2019

Device Description:

Package	SOT23
Assembly Site	APS
Plating finish	Matte Sn
Plating line	1BP01/1BP02/1BP04
Test Start Date	2019/7/2
Test End Date	2020/1/7
Lot Numbers	LA19232726/LA19240335 /LA19226320

Scope: Mark(√)the scope on the following

Process	
New plating process	
Modified plating process	
Process Monitor	√
Metarial	
New plating metarial	
Modified plating metarial	
Alternate source of metarial	
Alternate manufacturing site of metarial	

Conclusion:

Whisker testing demonstration SOT23 package built at APS met whisker test requirements per Technology Acceptance whisker level class2.

1. No whisker was observed in all 3 lots after 4000hrs exposure at 55℃/85%RH HTH conditions ,met the requirements per Technology Acceptance whisker level class2.

2.Post 500cyc,1000cyc&1500cyc exposure at -55℃/85℃ TC conditions showed whisker growth in all lots. Longest whisker observed post 1500cyc was 36.76um, met the requirements per Technology Acceptance whisker level class2.

Prepared By	Reviewed By	Approved By
Yang Min	**Wang Rui**	**CP**
Date:2020/2/17	**Date: 2020/2/17**	**Date: 2020/2/17**

Test Condition

Tin Whisker Test Conditions

Stress Type	Ref. Spec	Test Condition
Temperature Cycling	JESD22-A104 Conditions A or N	Min Temperature -55 or -40 (+0/-10) ℃ Max Temperature +85 (+10/-0) ℃, air to air; 10 minute soak; ~3 cycles/hour
High Temperature / Humidity Storage		55 ±3 ℃, 85 ±3% RH

Acceptance Criteria

Technology Acceptance Criteria for Maximum Allowable Tin Whisker Length

Considerations (Component Type, Lead	Maximum Allowable Whisker Length			
	Class 3	Class 2	Class 2A	Class 1
2 Lead SMD Components	Pure tin and high tin content alloys are not typically allowed	40 µm for Temperature/Humidity Storage and High Temperature/Humidity Storage 45 µm for Temperature Cycling	67 µm[1]	50 µm for Temperature Cycling and High Temperature/Humidity Storage 20 µm for Temperature/Humidity Storage
Multi-Leaded Components			67 µm[1]	
High Frequency Components 2			50 µm	
Components with a minimum lead-to-lead gap >320 µm			100 µm	75 µm

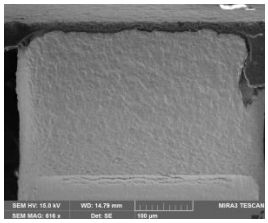
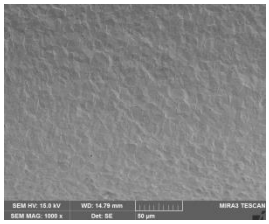
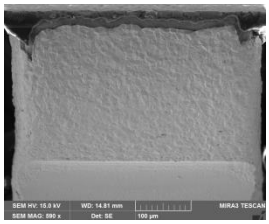
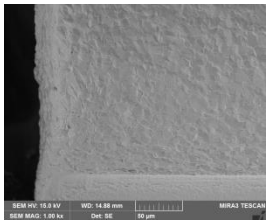
NOTE 1 This spacing accounts for up to 0.05 mm bent leads. The maximum of the 67 µm accounts for adjacent discrete components.

NOTE 2 It is reported that the susceptibility to electricalperformance degradation associated with tin whiskers increases with frequency. (RF Components >6 GHz, or Digital Components Trise<59 ps).

Whisker test summary

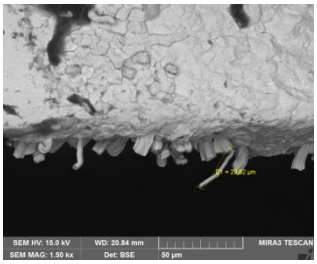
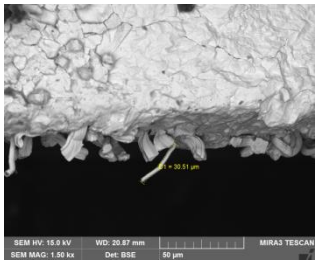
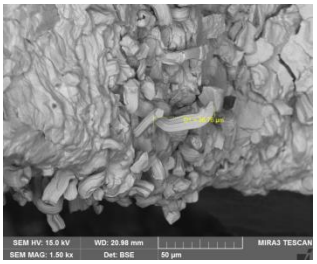
High Temperature/ Humidity Storage（55±3℃，85±3%RH）

LOT #	Read points				
	0hr	1000hr	2000hr	3000hr	4000hr
LA19232726	none	none	none	none	none
LA19240335	none	none	none	none	none
LA19226320	none	none	none	none	none

SEM photo @1000hrs	SEM photo @2000hrs	SEM photo @3000hrs	SEM photo @4000hrs
			
No whisker observed	**No whisker observed**	**No whisker observed**	**No whisker observed**

Temperature Cycling（-55 /85℃ ,air to air; 10 minute soak;~3 cycles/hour）

LOT #	Readpoints			
	0cyc	500cyc	1000cyc	1500cyc
LA19232726	none	15.32um	12.29um	33.7um
LA19240335	none	29.62um	30.51um	36.76um
LA19226320	none	10.35um	19.34um	27.95um

SEM photo@500cycles	SEM photo@1000cycles	SEM photo@1500cycles
		
Longest whisker growth of 29.62um	**Longest whisker growth of 30.51um**	**Longest whisker growth of 36.76um**

End Report