SEIKO EPSON CORPORATION
Microdevices Operations Division
http://www.epson.com

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Doc.1

January 2015

Dear Valued Customer,

[NOTICE] Terminal Plating Change

First of all, we would like to take this opportunity to thank you for the excellent business relationship between the two companies and we look forward to a successful continuous partnership in the future.

1. Change Item **: Terminal plating (Sn-Bi to Pure-Sn)**

Please refer to attached presentation for details of the change and evaluation results.

2. Reason and Background

In order to unify specification of plating and to promote “Pure-Sn” terminal plating.

As you know, demand for environmentally friendly semiconductor products is rising day by day. The number of customers who demand “Bismuth-free terminal plating” is also increasing. We have individually reacted to this demand. By these individual correspondences, the number of individual specifications of Pure-Sn plating has increased and made working efficiency worse. We like to unify the specifications of terminal plating, promoting “Pure Sn” plating.

3. Applicable Products : Please see attached Excel file.

4. Schedule : Sep, 1, 2015 ~

We will start shipment of pure Sn plated products from Sep 2015.

Actual timing of each product will be fixed, depending on order volume & inventory status.

5. Request

If you have any questions, please let us know by Mar, 31, 2015.

I appreciate your understanding and cooperation.

Sincerely yours,

Tom Sakashita

General Manager,

Device Sales & Marketing Dep.

Micro Devices Operations Division

Engineering Change Notice of Pure-Sn plating for QFP

Package : QFP

SEIKO EPSON Corporation

Micro Devices Operation Div.

Background

In order to unify specifications of plating and to promote “Pure-Sn” plating of terminal.

As you know, demand for environmentally friendly semiconductor products has risen day by day. Number of customers who demand “Bismuth -free terminal plating” is also increasing.

We have individually corresponded about the demand.

By the individual correspondences, number of specification of the Pure-Sn plating has increased and the specifications made working efficiency worse.

We like to unify specifications of terminal plating, promoting “Pure-Sn” plating.

Please refer to following pages for detail of the change and evaluation result.

Details of engineering change

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Details of engineering change as follows,

Items	Current	New
Plating material	Sn-(1-3%)Bi	Pure-Sn

Reliability test results

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Reliability results is as follows,

Test Items	Test condition	n	Terms of Test	Failure count	Judgment
Solder ability1	Steam aging 4H→Solder dipping 245℃, 5sec	22	1 Time	0	Pass
Solder ability2	150℃,16H →Solder dipping 245℃, 5sec	22	1 Time	0	Pass
Solder ability3	-40℃～125℃ each 30 minute （After board assembly）	10	1,000 cyc.	0	Pass
Whisker test 1	Normal temp storage：30℃60%RH	22	4,000 H	0	Pass
Whisker test 2	High temp high humidity storage：60℃90%RH	22	2,000 H	0	Pass
Whisker test 3	Temp cycle：-40℃～85℃	22	1,000 cyc.	0	Pass

No defective confirmation in evaluation.

Solder ability test results　Pure-Sn plating

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■Solder ability1

Steam aging	:	4hrs
Flux dipping time	:	5～10sec
Solder temp.	:	245℃
Solder dipping time	:	5sec

■Solder ability2

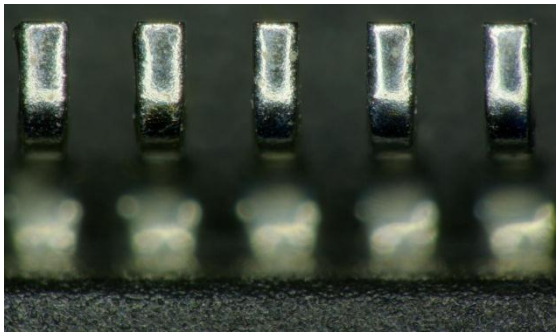
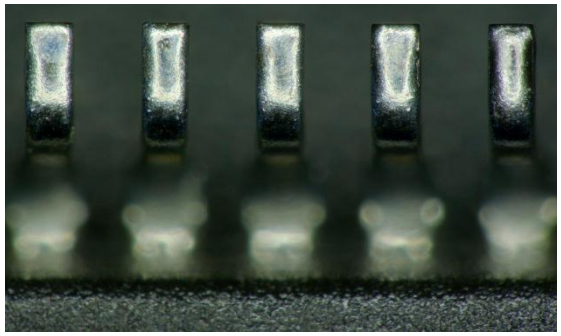
High temp. storage	:	150℃16hrs
Flux dipping time	:	5～10sec
Solder temp.	:	245℃
Solder dipping time	:	5sec

■Criteria

Solder wet rate more than 95%

■Result

Pass. All terminal solder wets rate more than 95%

	Solder ability1 Steam aging	Solder ability2 High temp storage
Photo after solder dipping		

Board assembling test result　Pure-Sn plating

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■Sample : P-LQFP048-0707-0.50（QFP12-48Pin） N=10

■Board spec.

-Dimension : 100mm × 100mm t = 1.6mm

-Material : FR-4

-Layer count : 1 layer（ One side board ）

-Cu layer : 35μm

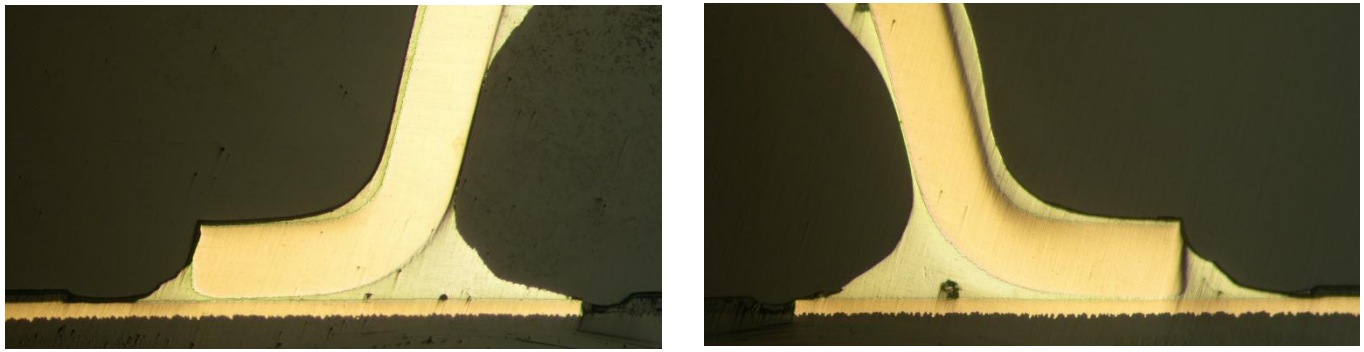
-Surface processing : Water-soluble pre-flux processing

■Solder paste : Sn-3.0Ag-0.5Cu

■Test condition : -40℃ ⇔ 125℃ （each 30 minute）

■Judgment criteria : A conduction part being left in the section part by section observation

■Test result : Pass. Because a conduction part is left in the section part after 1000cycle



＜Representative photo after 1000 cycle ＞

Whisker test result　Pure-Sn plating

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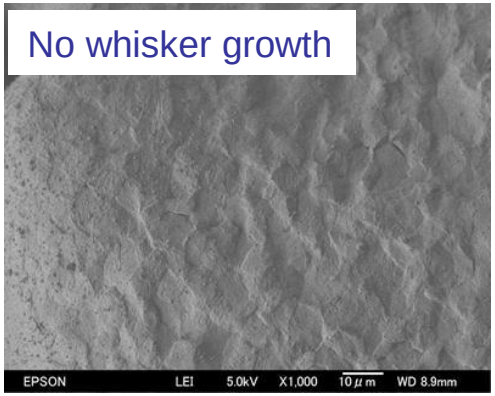
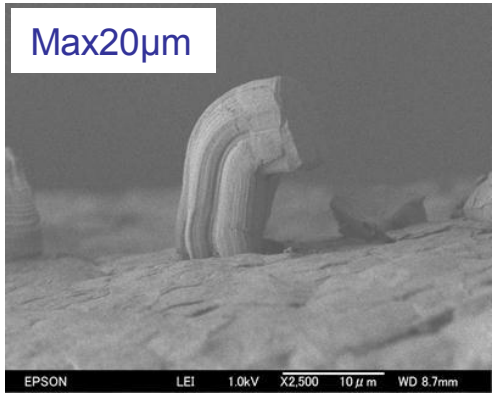
Sample : Pure-Sn plating

Test condition :
1. Normal temp. storage : 30℃60%RH, 4000 hours
2. High temp high humidity : 60℃90%RH, 2000 hours
3. Temperature cycle : -40℃～85℃, 1000 cycle

Judgment criteria : Whisker length under 50μm

Test result :
1. Normal temp. storage : Pass No whisker growth
2. High temp high humidity : Pass No whisker growth
3. Temperature cycle : Pass Under criteria

	Normal temp. 4000hrs	HT/HH 2000hrs	Temp. cycle 1000cyc
SEM photo			

Conclusion

- EPSON will change Terminal plating of QFP products, in order to unify specifications of “Pure-Sn” plating.
- Heat-resistance and Reliability level are same as current products.
- No difference of Terminal-strength and Soldering conditions.
- There is no difference in storage condition and handling conditions at customer side that is same as current products.

Standard Parts

S1A15001F0A0000
S1C17554F00B100
S1C17564F111100
S1C17601F101100
S1C17602F101100
S1C17604F101100
S1C17611F101100
S1C17621F101100
S1C17624F101100
S1C17656F00A100
S1C17656F00B100
S1C17701F101100
S1C17702F101100
S1C17703F101100
S1C17704F101100
S1C17706F00B100
S1C17711F101100
S1C17803F101100
S1C17F57F00E300
S1C17F57F401100
S1C17W14F00A100
S1C17W15F004100
S1C17W15F00A300
S1C17W22F00B100
S1C17W22F101100
S1C6F016F101100
S1C6F016F401100
S1D13503F00A200
S1D13504F00A200
S1D13504F01A200
S1D13505F00A200
S1D13506F00A200
S1D13513F00A200
S1D13513F01A100
S1D13515F00A100
S1D13517F00A100
S1D13700F01A100
S1D13700F02A100
S1D13704F00A200
S1D13705F00A200
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S1D13717F00A200
S1D13719F00A100
S1D13742F01A200
S1D13743F00A200
S1D13746F01A600
S1D13748F00A100
S1D13781F00A100

S1D13781F01A100
S1D13A04F00A100
S1D13A05F00A100
S1D13L01F00A100
S1D13L02F00A100
S1D13L03F00A100
S1D13T03F10A100
S1D13T04F10E100
S1D13U11F00A100
S1R72U16F14E200
S1S60000F00A500
S1S65010F00A000
S1V30120F01A100
S2D13515F00A100
S2D13A05F00A10B
S2D13P04F00A100
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