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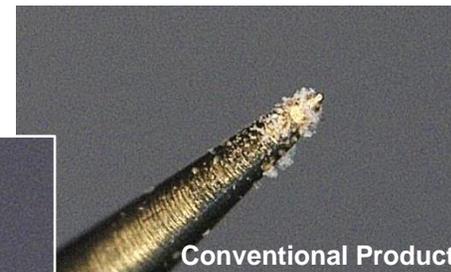
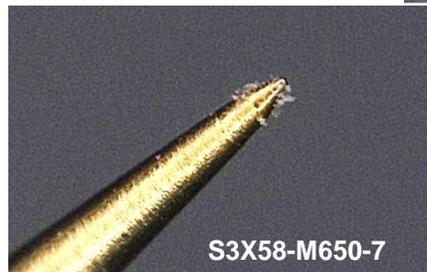
Koki no-clean **LEAD FREE** solder paste

ICT Compatible Lead Free Solder Paste

ICT Compatibility

S3X58-M650-7

Product Information



Picture of ICT Checker Probe

The product performances contained in this Technical Information are assessed strictly according to the test procedures and may not be compatible with results at the end-users. Please conduct thorough investigation to determine optimal process condition before mass production application.



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Features

- Alloy Composition: Sn 3.0Ag 0.5Cu
- Specially designed flux for improved performance on In-Circuit Testing (ICT)
- Low void occurrence on Area Array Package components such as BGA
- Displays good meltability on 0.25mm ϕ and 0603 chip component
- Complies with Halogen Free Standard (Br+Cl:<1500ppm) per BS EN 14582



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Application		Printing
Product Name		S3X58-M650-7
Alloy	Alloy Composition (%)	Sn 3.0Ag 0.5Cu
	Melt Point (°C)	217~219
	Shape	Sphere
	Grain Size (um)	20~38
Flux	Halide Content (%)	0
	Flux Type	ROL0*1
Solder Paste	Flux Content (%)	11.5±1.0
	Viscosity (Pa.s)	200±30*2
	Copper Plate Corrosion	Passed*3
	Tack Time	> 48 hours
	Shelf Life (10°C)	6 months

*1. Flux Type:

*2. Viscosity:

*3: Copper Plate Corrosion:

In compliance with IPC J-STD-004B

Measured at 25°C-10rpm by Malcom PCU-205

In compliance with IPC-TM-650-2.6.15



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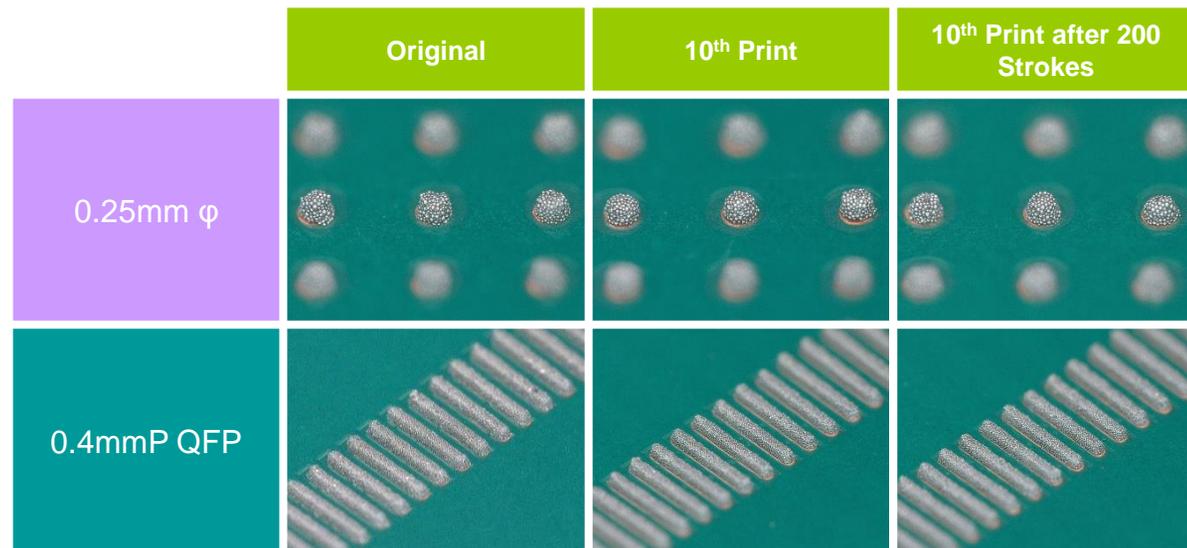
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Continual Printability

Test conditions:

- Stencil Thickness: 0.12mm (Laser)
- Printer: Model YVP-Xg YAMAHA Motor
- Squeegee: Metal Squeegee (Squeegee Angle - 60°)
- Print Speed: 40 mm/sec
- Printing Environment: 24~26°C (50~60%RH)
- Tested Patterns: 0.25 mmφ, 0.4mmP QFP



Stable solder prints were obtained from the original print to after 200 strokes.



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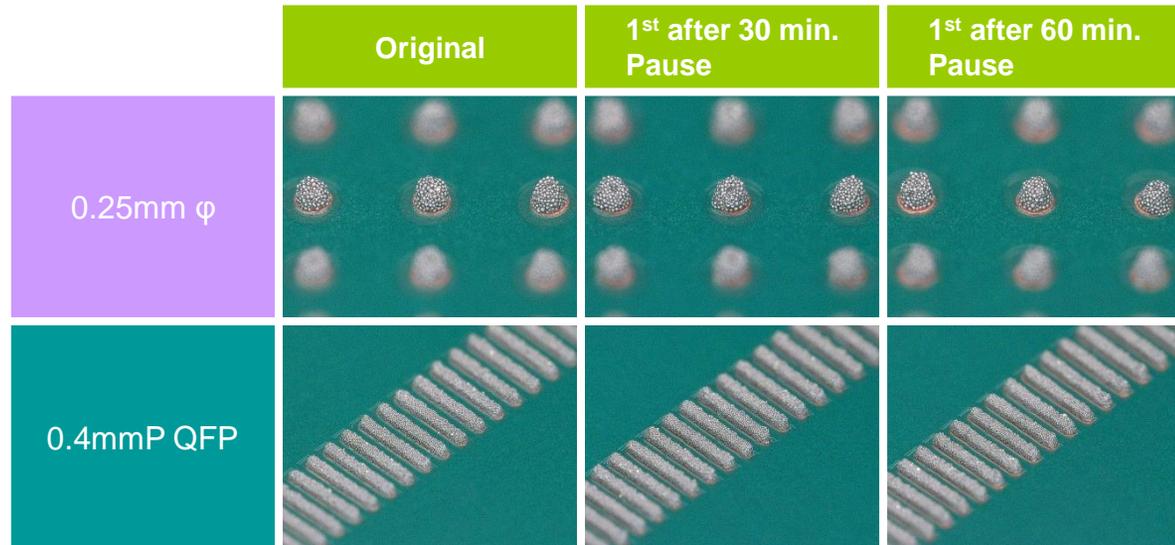
Handling Guide

Intermittent Printability

Test method:

Pause printing for 30 to 60 minutes, and then resume printing. Verify the print profile on the 1st print result to evaluate intermittent printability.

- Stencil Thickness: 0.12mm (Laser)
- Squeegee: Metal Squeegee (Squeegee Angle - 60°)
- Print Speed: 40mm/sec.
- Print Stroke: 300mm
- Printing Environment: 24~26°C, 40~60%RH
- Tested Patterns: 0.25 mmφ, 0.4mmP QFP



S3X58-M650-7 performs good intermittent printability up to 60 minutes pause.



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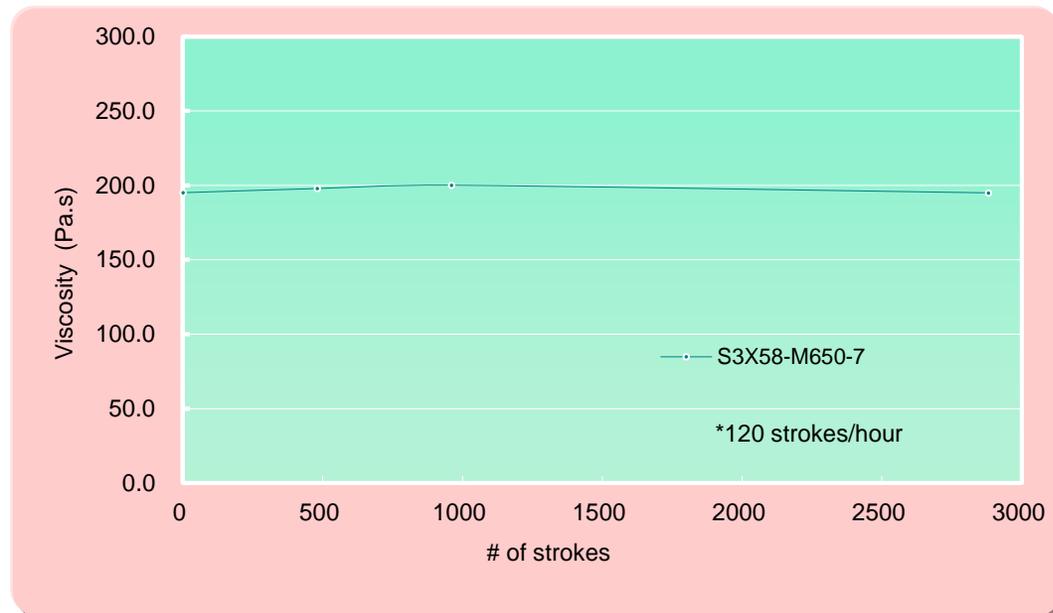
Handling Guide

Viscosity Change Property

Test method:

Mask the metal stencil and conduct continual rolling shear. Measure the viscosity after predetermined number of strokes.

- Squeegee: Metal Squeegee (Squeegee Angle: 60°)
- Squeegee Speed: 30mm/sec.
- Squeegee Stroke: 300mm
- Printing Environment: 24~26 °C, 40~60%RH



S3X58-M650-7 showed almost no viscosity change by rolling shear. It has good viscosity retention property.



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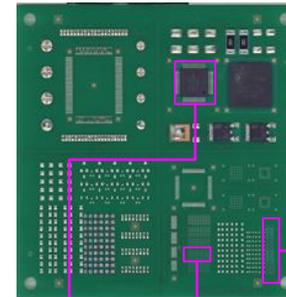
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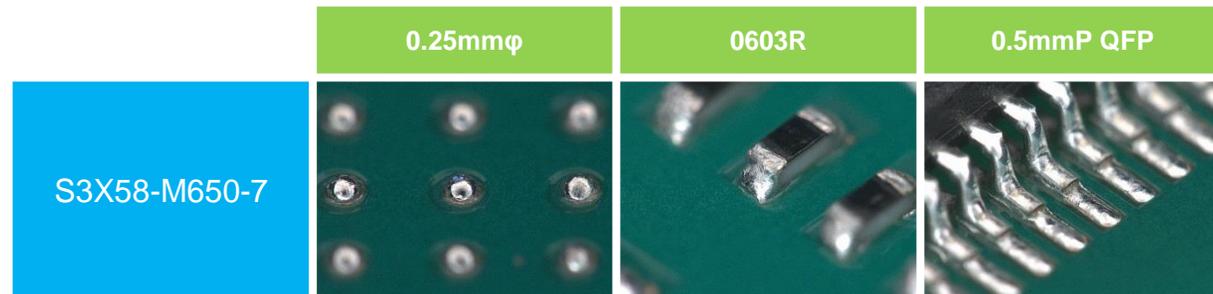
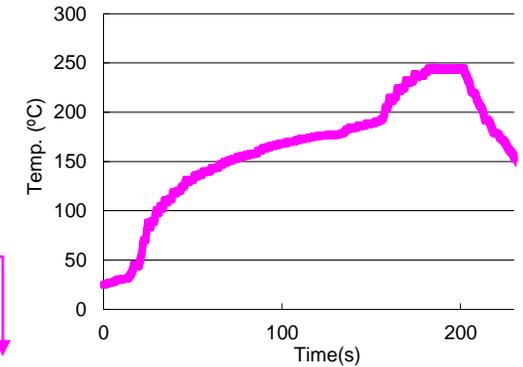
Meltability

Test conditions:

- Test Board: Glass Epoxy FR-4
- Surface Treatment: OSP
- Stencil Thickness: 0.12mm (Laser)
- Evaluated Locations: 0.25mm ϕ , 0.5mmP QFP (Sn plating) 0603R (Sn plating)
- Aperture: 100%
- Reflow: Hot Air Oven
- Atmosphere: Air Atmosphere
- Reflow Profile: See the chart to the right



0.5 mmP QFP 0.25mm ϕ 0603R



Even though S3X58-M650-7 is halogen free, it can be observed that the paste has wetted well on various different components and lands tested.



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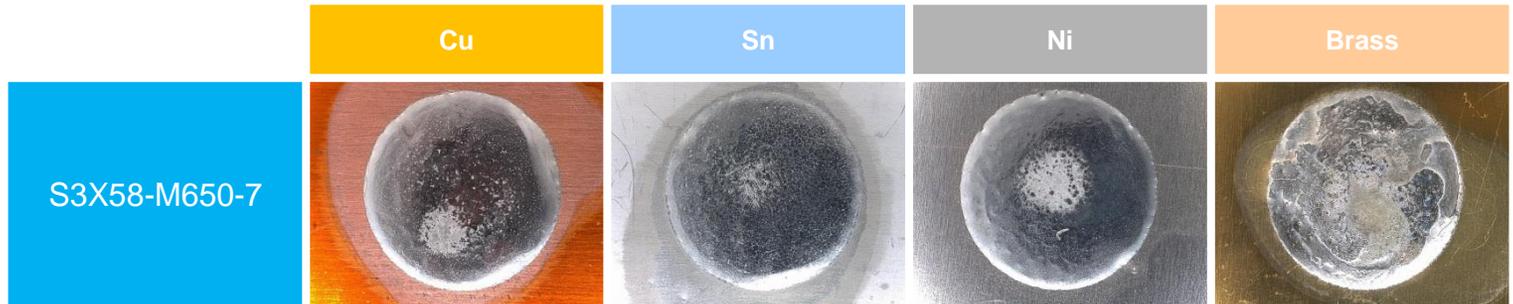
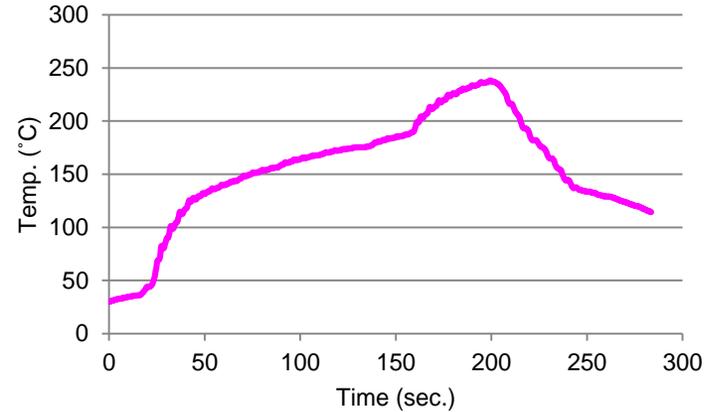
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Meltability (Dewetting Test)

Test conditions:

- Tested Substrate : Cu, Sn, Ni, Brass
- Stencil Thickness: 0.20mm (Laser)
- Aperture: 6.5mmφ
- Reflow: Hot Air Oven
- Atmosphere: Air Atmosphere
- Reflow Profile: See the chart to the right



S3X58-M650-7 shows good wettability to various substrates tested.

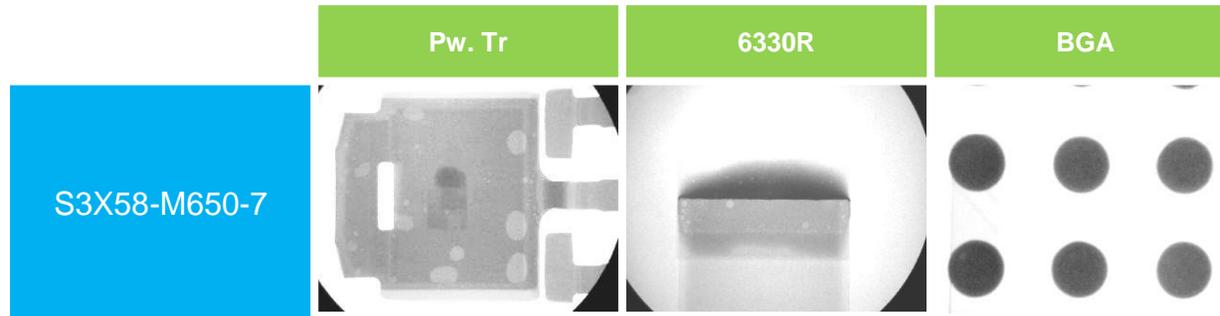
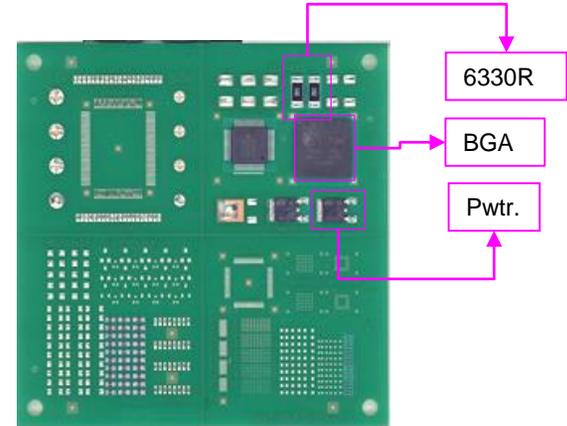


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Voiding Property

- Test Board: Glass Epoxy FR-4
- Surface Treatment: OSP
- Stencil Thickness: 0.12mm (Laser)
- Evaluation Locations: Power Transistor, 6330R (Sn plating)
BGA ball - SAC305
- Aperture: 100%
- Reflow: Hot Air Oven
- Reflow Atmosphere: Air Atmosphere
- Reflow Profile: Same profile as meltability test



S3X58-M650-7 showed less void occurrence. Void occurrence was especially low on BGA.



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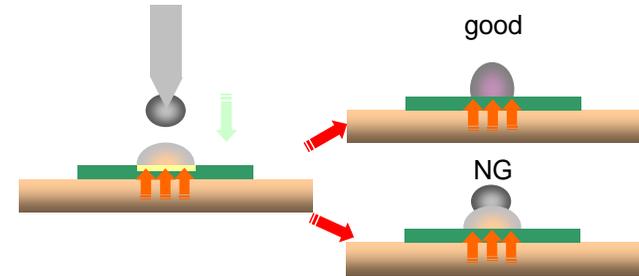
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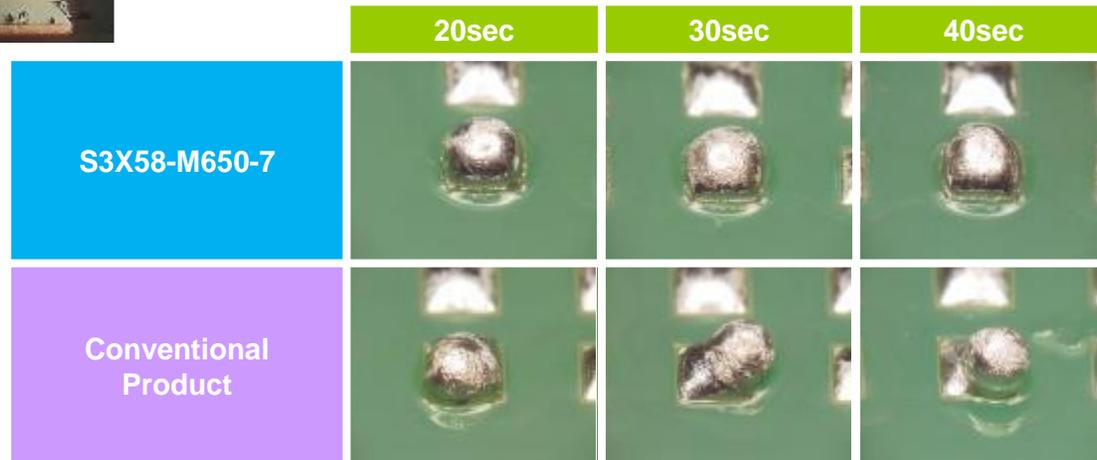
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Head-in-Pillow Property

- Test Board: Glass Epoxy FR-4
- Surface Treatment: OSP
- Stencil Thickness: 0.12mm (Laser)
- Pad Size: 0.8 x 0.8mm
- Component: 0.76mm Ball (SAC305)
- Stencil Aperture: 100%
- Heating: Solder Bath @285°C
- Mounting Interval: 10sec.



Drop a solder ball every 10 seconds after solder melt. The ball and solder stop merging when the flux activation is exhausted, no merger will occur.



S3X58-M650-7 retains good activation even at 40 seconds after solder melt. owing to adjusted flux fluidity and activators.



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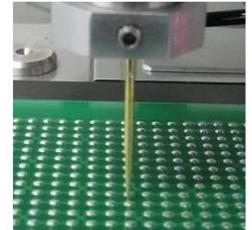
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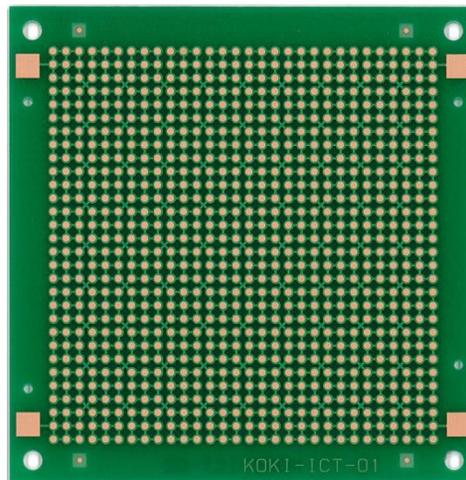
Test Method

Print an ICT Performance Test Board and reflow. Let the board stand for one day. Use ICT equipment and measure the resistance between the probe and PCB.

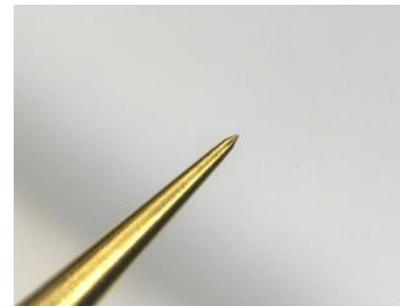
- | | | | |
|------------------------|------------------|----------------------|--------------------------|
| • Test Method: | Glass Epoxy FR-4 | • Reflow Atmosphere: | Air Atmosphere |
| • Surface Treatment: | OSP | • Reflow Profile: | Same as meltability test |
| • Stencil Thickness: | 0.15mm (Laser) | • # of Tests: | 900 times |
| • Evaluation Location: | 1.5mmφ | • Probe Pressure: | 3.0N |
| • Aperture: | 100% | • Probe Shape: | Crown and Straight |
| • Reflow: | Hot Air Oven | | |



ICT Test Board



Probe: Straight



Probe: Crown



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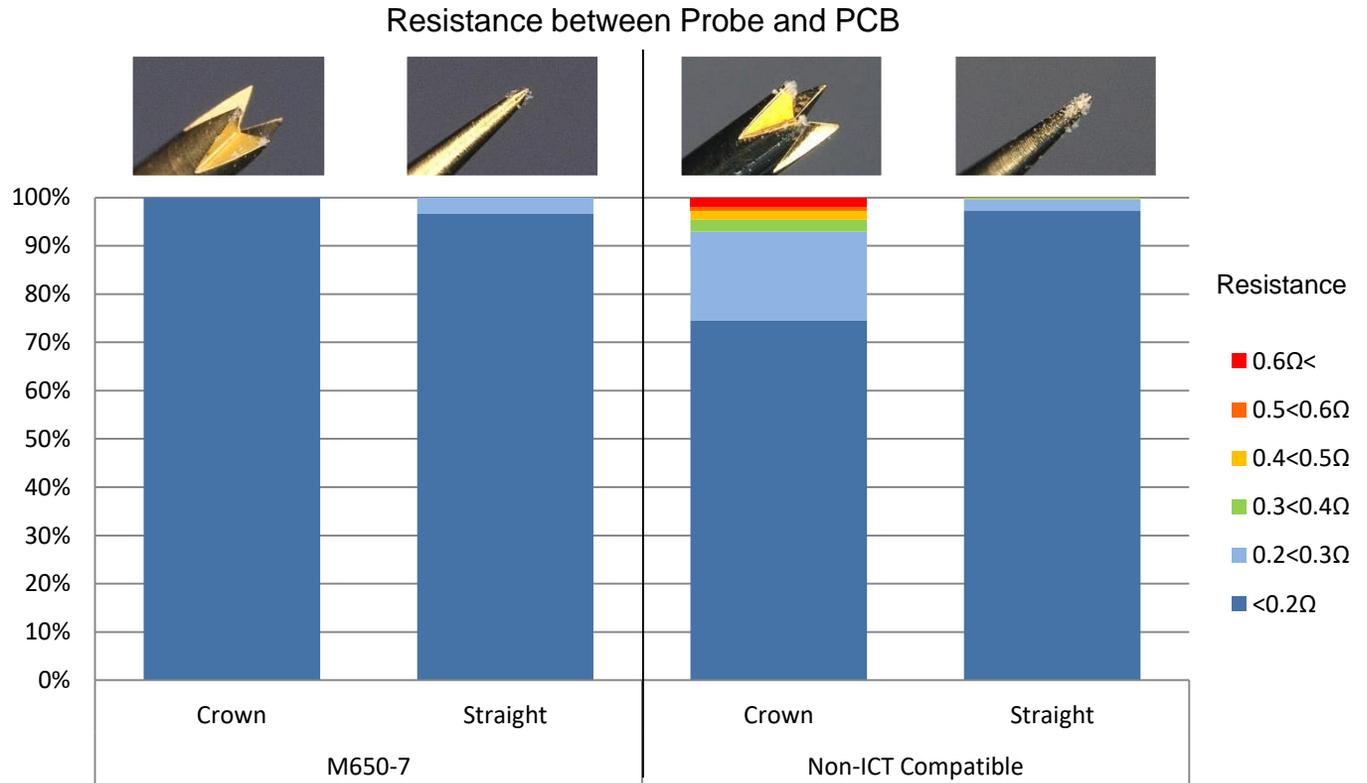


Image: Tip of the probe after 900 measurements

M650-7 shows lower contact resistance and leaves less residue left on the probes as compared to the conventional product tested. M650-7 should improve the straight pass rate at the ICT.



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Measurement Method: BS EN14582



Elements	Results
F	Not detected
Cl	Not detected
Br	Not detected
I	Not detected

Halogen Content (ppm)

S3X58-M650-7 complies with halogen free standard of BS EN14582 (Br+Cl <1500ppm)



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Item	Result	Method
Tack Time	> 48 hours	JIS Z 3284-3
Slump Property	0.3mm pass	JIS Z 3284-3 180°Cx 5min
Solder Ball Test	< Category 3	JIS Z 3284-4
Copper Mirror Corrosion Test	Type L	IPC-TM-650-2.3.32
Copper Plate Corrosion Test	Pass	IPC-TM-650-2.6.15 JIS Z 3197
SIR Test	>1E+9	IPC-TM650-2.6.14.1 JIS Z 3197



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1. Printing - Recommended Print Condition

(1) Squeegee

- | | |
|-------------------|-------------------------------|
| 1. Shape | : Flat |
| 2. Material | : Polyurethane or metal blade |
| 3. Squeegee Angle | : 60° |
| 4. Print Pressure | : Slightly Low |
| 5. Print Speed | : 20~80mm/sec. |

(2) Stencil

- | | |
|--------------------------|---|
| 1. Thickness | : For 0.65~0.4mm pitch patterns, 150~80μm |
| 2. Fabrication | : Laser or chemical etching |
| 3. Stencil Release Speed | : 7.0~10.0mm/sec. |
| 4. Clearance | : 0mm |

(3) Usage Condition

- | | |
|-----------------------|---|
| 1. Temperature | : 23~27°C |
| 2. Humidity | : 40~60%RH |
| 3. Air Conditioning | : Direct air blow on to the metal stencil dries solder paste quicker. Please adjust air flow direction by positioning a shield. |
| 4. Amount on stencil: | : Solder paste might stick to the squeegee in the case; <ul style="list-style-type: none"> 1) amount of solder paste placed on the stencil is insufficient, e.g. <350g 2) the squeegee blades are relatively long, e.g. >300mm In such cases, it is recommended to increase the amount of the solder paste on the stencil to be >400 – 500g so that it shall help smoother separation from the blades by its self-weight. |

2. Shelf Life

0~10°C : 6 months from the date of production

* How to interpret the Lot #

ex. Lot No. 5 03 04 2

→	Batch #	: 2 nd batch
→	Date of production:	4th
→	Month of production:	March
→	Year of production:	2015



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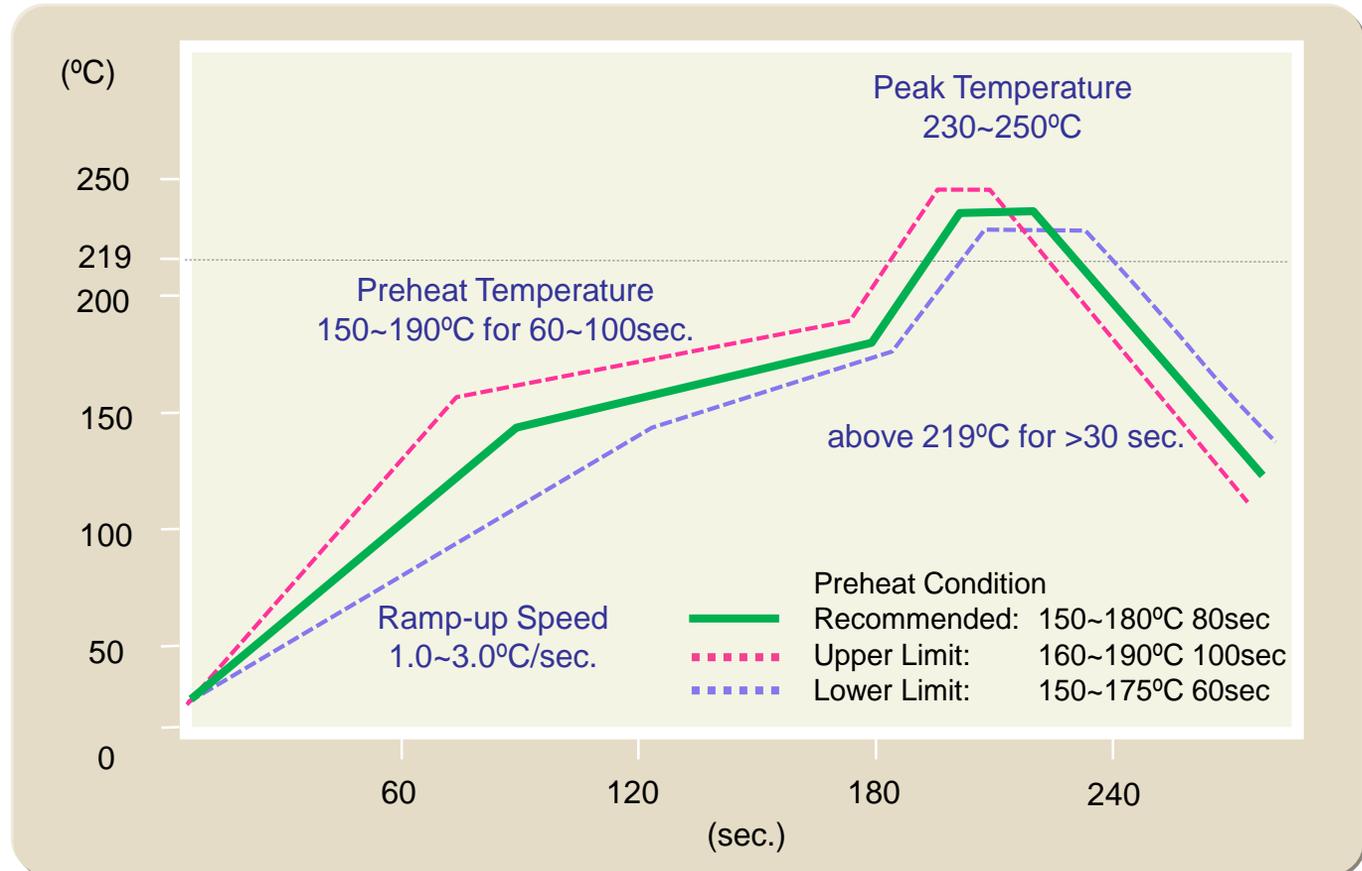
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