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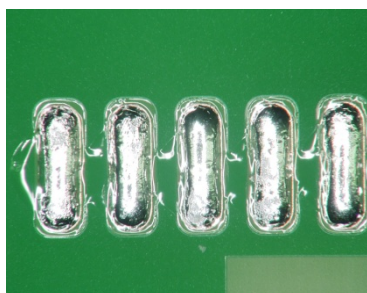
Handling guide

Koki cleanable no-clean

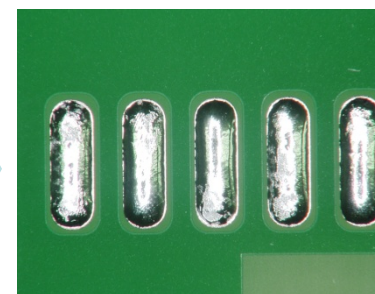
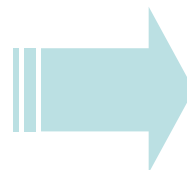
LEAD FREE solder paste

S3X48-A230

Product information



Before cleaning



After cleaning

This Product Information contains product performance assessed strictly according to our own test procedures and may not be compatible with results at end-users.



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Product Features

- Solder alloy composition is **Sn-3.0Ag-0.5Cu**.
- Flux residue is easy to **CLEAN** with chemistry
- **PERFECT MELTING** and wetting at fine pitch (0.4mm pitch) and micro components (0.3mm dia CSP, 1005 chip).
- Designed to prevent occurrence of **HIDDEN PILLOW DEFECTS**.



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Application		Printing – Stencil
Product		S3X48-A230
Alloy	Composition (%)	Sn96.5-Ag3.0-Cu0.5
	Melting point (°C)	217 — 219
	Shape	Spherical
	Particle size (μm)	20 – 45
Flux	Halide content (%)	0.06±0.01
	Flux type*3	ROL1
Product	Flux content (%)	12.0 ± 0.5
	Viscosity*1 (Pa.S)	210 ± 21
	Copper plate corrosion*2	Passed
	Tack time	> 24 hours
	Shelf life (below 10°C)	6 months

1. Viscosity : Malcom spiral type viscometer, PCU-205 at 25°C 10rpm
2. Copper plate corrosion : In accordance with JIS
3. Flux type : **According to IPC J-STD-004A**



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Specifications – Alloy selections

S3X - 48 - A 230

↓ ↓ ↓ ↓

Alloy composition Particle size Flux Type Flux number

Alloy composition (%)	S3X : Sn96.5 Ag3.0 Cu0.5
Particle size (μm)	48 : 20 ~ 45
Flux Type	A : Halide content
Flux number	Solids and solvent used



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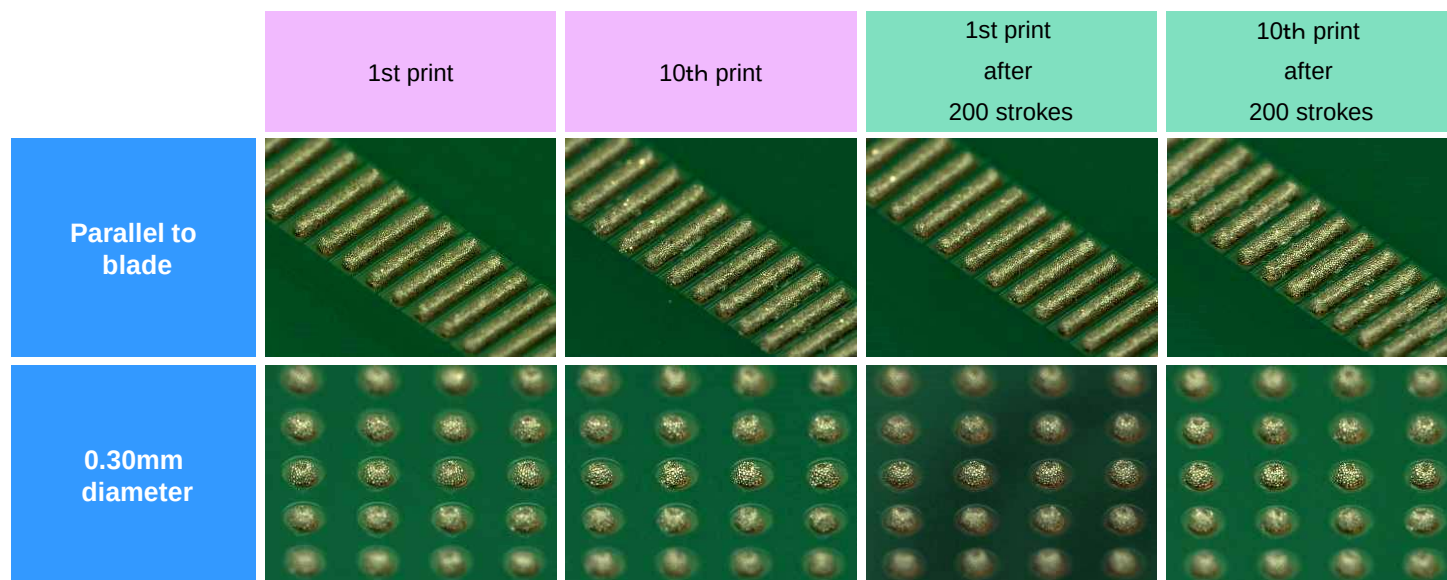
Continual printability

Print parameters

- Stencil : 0.12mm thickness, laser cut stencil
- Printer : Model Yamaha YVP-Xg
- Squeegee : Metal blade, Angle - 60°
- Print speed : 40 mm/sec
- Stencil separation speed : 10.0 mm/sec
- Atmosphere : 25+/-1°C, 60+/-10%RH

Test patterns

1. QFP pad pattern : Width 0.20 mm
Length 1.5 mm Distance 0.2 mm
2. MBGA pad pattern : Diameter 0.30 mm



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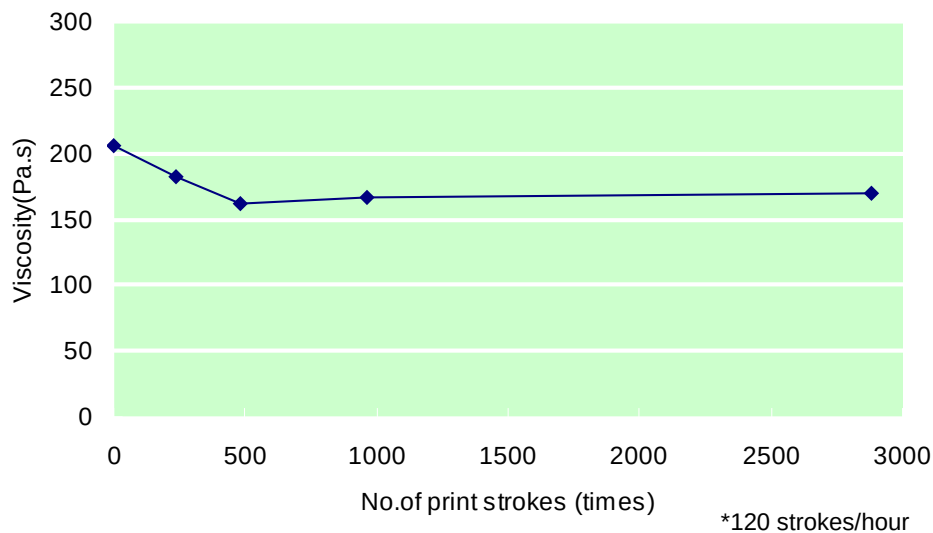
Cleaning

Voltage applied SIR

Handling guide

Viscosity variation in continual printing

- Print (knead) solder paste on the sealed-up stencil continually up 2880 strokes and observe viscosity variation.
- Squeegee : Metal blades
- Squeegee angle : 60°
- Squeegee speed : 30mm/sec.
- Print stroke : 300mm
- Printing environment : 23.0~26.0°C, 50~60%RH



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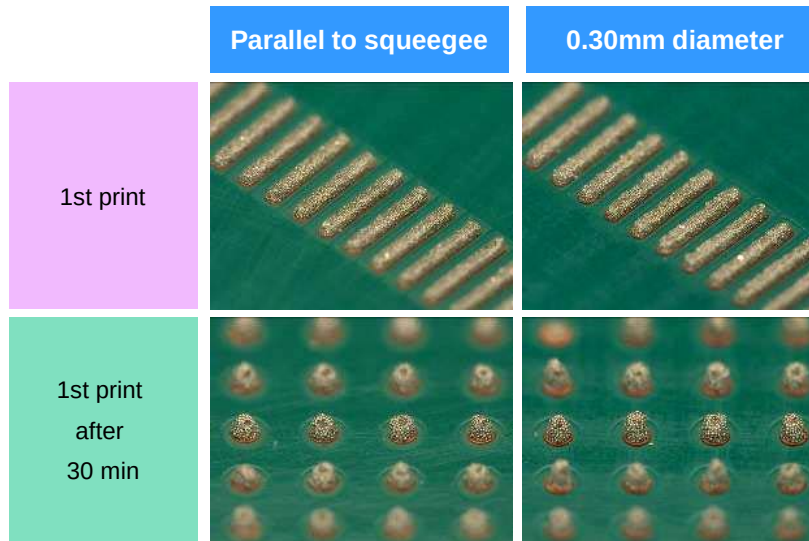
Cleaning

Voltage applied SIR

Handling guide

Intermittent printability (Stencil idle time)

- Print solder paste continuously and stop to idle the paste for 30 min. intervals, and resume the printing and observe the 1st print result to verify intermittent printability.
- Squeegee : Metal blades
- Squeegee angle : 60°
- Squeegee speed : 40mm/sec.
- Print stroke : 300mm
- Printing environment : 25+/-1°C, 60+/-10%RH
- Test pattern : QFP pad pattern - Width 0.20 mm Length 1.5 mm Distance 0.2 mm
MBGA pad pattern - Diameter 0.30 mm



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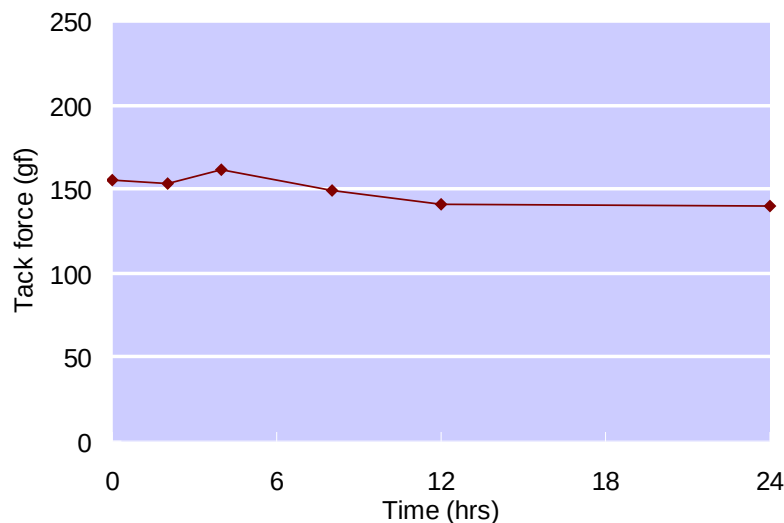
Cleaning

Voltage applied SIR

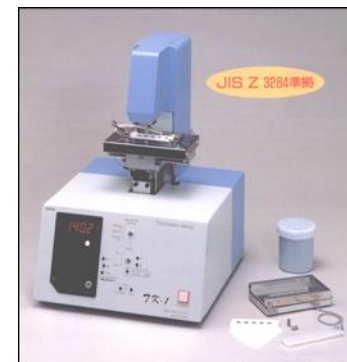
Handling guide

Tack time

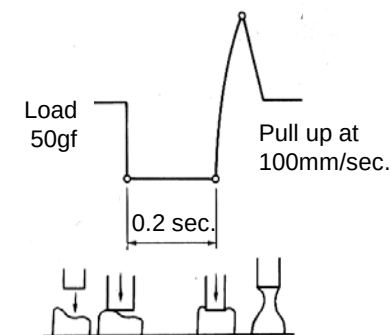
- Stencil : 0.2mm thick, 0.6mm dia. aperture
- Measurement instrument : Malcom tackimeter TK-1
- Probe pressure : 50gf
- Pressurizing time : 0.2sec
- Pull speed : 10mm/sec.
- Test method : In accordance with JIS Z 3284
- Test environment : 25+/-1°C, 60+/-10%RH



Unique solvent system successfully assures sufficient tack time.



Tensile strength = Tack force



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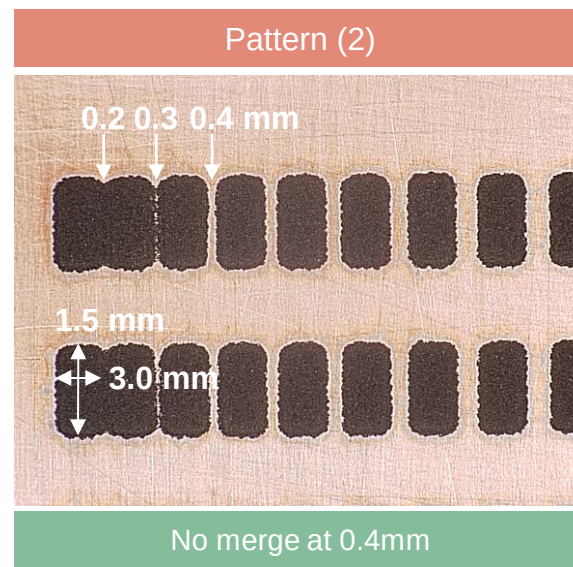
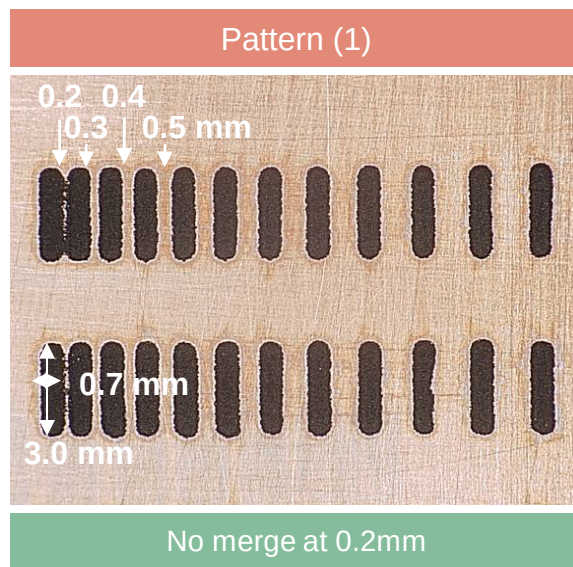
Cleaning

Voltage applied SIR

Handling guide

Heat slump

- Stencil thickness : 0.2mm
- Stencil aperture : Pattern (1) 3.0mm × 0.7mm
Pattern (2) 3.0mm × 1.5mm
- Spacing between apertures: 0.2mm to 1.2mm
- Heat profile : 180°C × 5min.



Improved heat slump property assures reduced soldering defects, such as solder beading and bridging.



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Solder balling (Residue cosmetics)

- Stencil : 0.2mm thick
- Stencil aperture : 6.5mm diameter
- Solder pot temperature : 250°C
- Test method : In accordance with JIS Z 3284

Category 1	2	3	4
			

1 hour after printing



Category 3

24 hour after printing



Category 3

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Handling guide

Fine pattern wetting

- Material : Glass epoxy FR-4
- Surface treatment : OSP
- Stencil thickness : 0.12mm (laser cut)
- Pad size : 0.30mm diameter
- Component: 0603 chip, 2125 chip, 0.65mm pitch QFP
- Stencil aperture : 100% aperture opening to pad
- Heat source : Hot air convection
- Zone structure : 5 pre-heat zones +2 peak zones
- Atmosphere : Air
- Reflow profile : See below

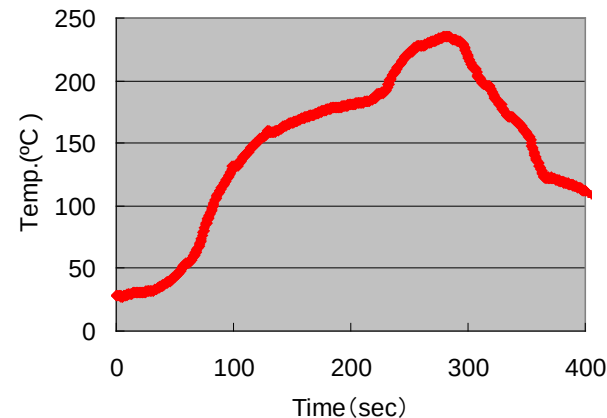
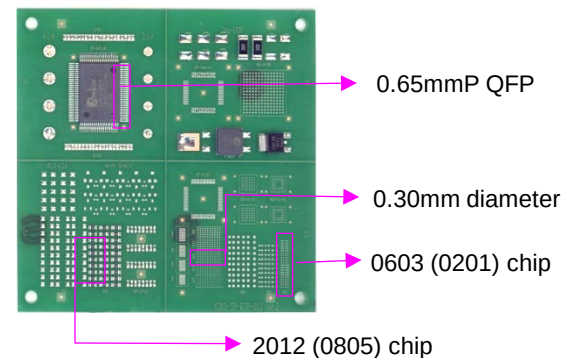
0.30mm diameter



2125 chip pattern



0.65 QFP pattern



Larger relative surface areas of solder paste exposed due to miniaturization of components often cause incomplete melting due to excess oxidation during the reflow. An improved flux formula ensures complete coalescence by minimum deterioration of flux barrier performances.



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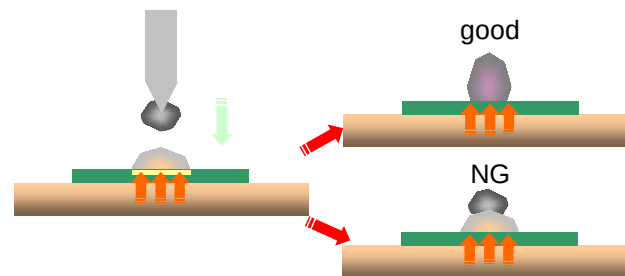
Cleaning

Voltage applied SIR

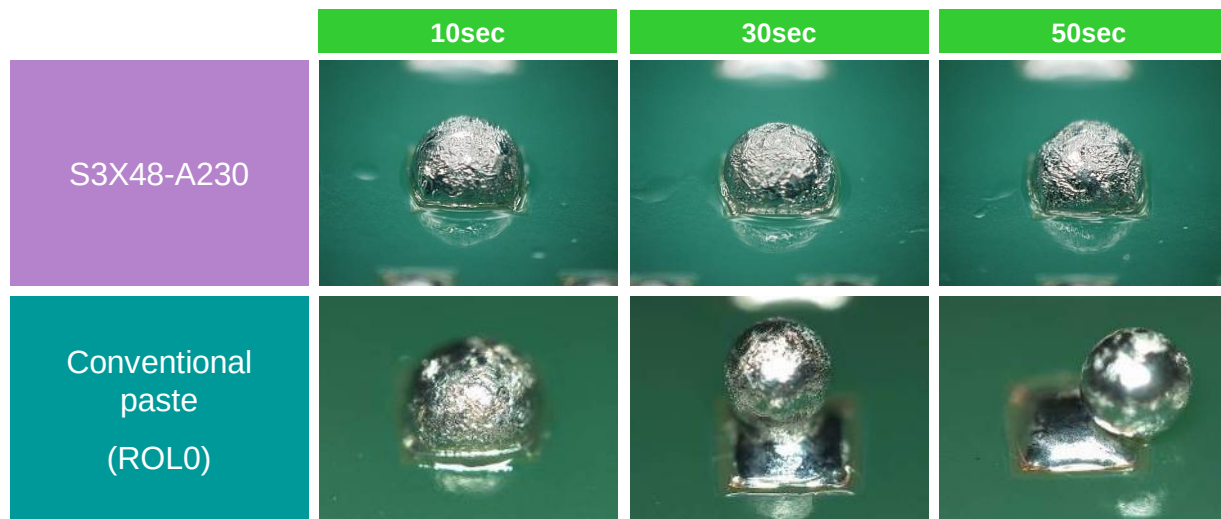
Handling guide

Anti-Pillow test

- Material : Glass epoxy FR-4
- Surface treatment : OSP
- Stencil thickness : 0.12mm (laser cut)
- Pad size : 0.8 × 0.8mm diameter
- Component : 0.76mm ball SAC305
- Stencil aperture : 100% aperture opening to pad
- Heat source : Solder pot 275°C
- Mount interval : 10sec



Drop solder ball every 10 sec. after the solder paste has melted to see heat durability of flux.



S3X48-A230 indicated sustained heat durability to 50sec., while the conventional solder paste lost activation less than 30 sec. after the solder paste started melting.



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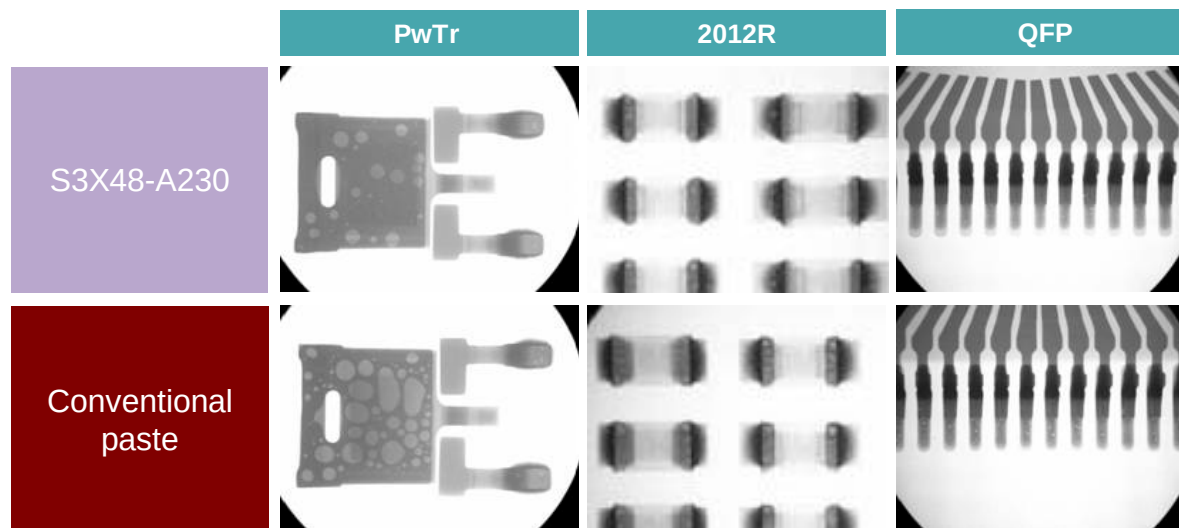
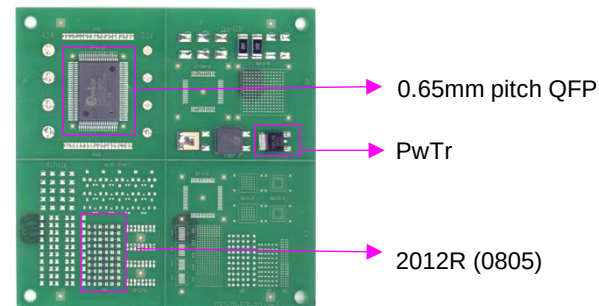
Copper corrosion

Voltage applied SIR

Handling guide

Voiding

- Material : Glass epoxy FR-4
- Surface treatment : OSP
- Stencil thickness : 0.12mm (laser cut)
- Stencil aperture : 100% aperture opening to pad
- Components : PwTr, 2012R, 0.65mm pitch QFP
- Heat source : Sn Plated
- Zone structure : Hot air convection
- Atmosphere : 5 pre-heat zones +2 peak zones
- Reflow profile : Air
- Same as "Super fine pattern wetting"



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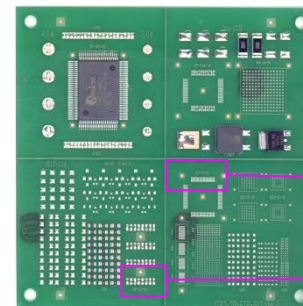
Cleaning

Voltage applied SIR

Handling guide

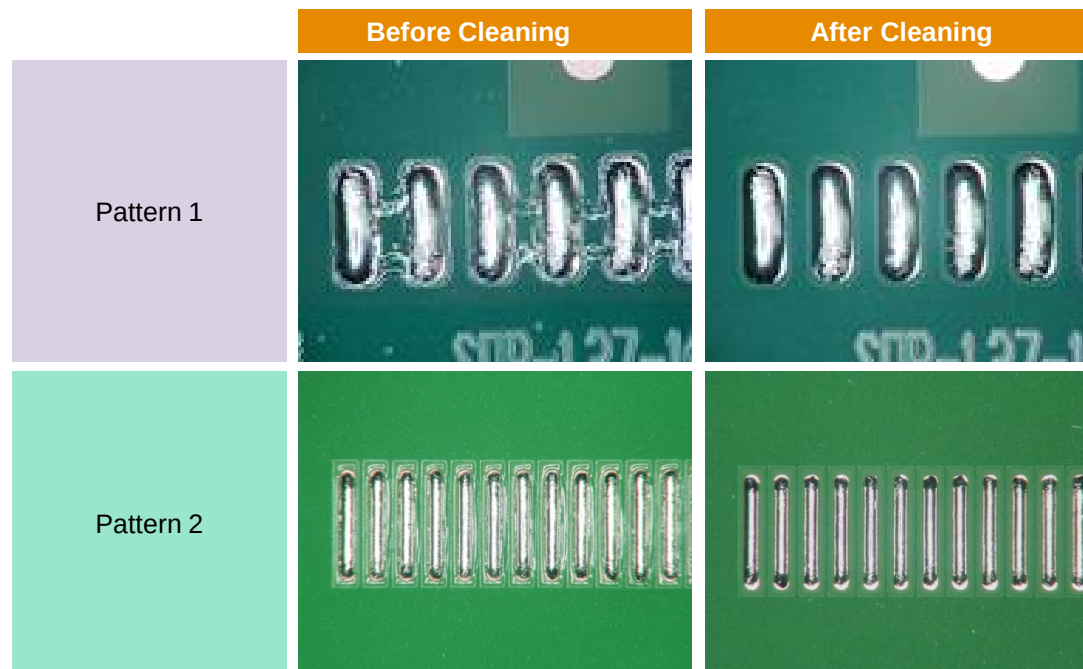
Cleaning

- Material : Glass epoxy FR-4
- Surface treatment : OSP
- Stencil thickness : 0.12mm (laser cut)
- Stencil aperture : 100% aperture opening to pad
- Pattern: 1(SOP), 2(0.4QFP)
- Heat source : Hot air convection
- Zone structure : 5 pre-heat zones +2 peak zones
- Atmosphere : Air
- Reflow profile : Same as "Fine pattern wetting"
- Cleaning method: Dipping and stirring for 4 mins in Vigon A250



Pattern 2
(0.4QFP)

Pattern 1



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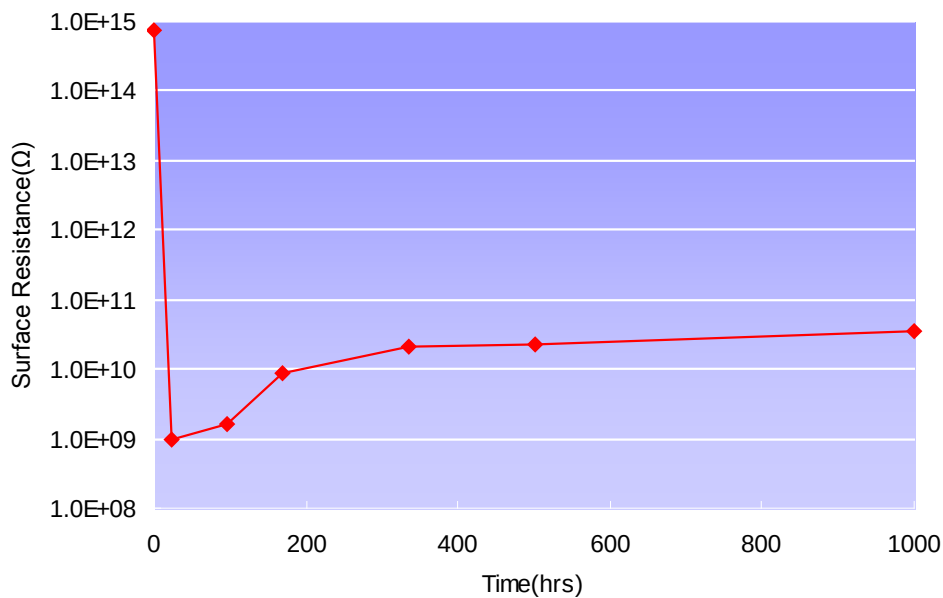
Cleaning

Voltage applied SIR

Handling guide

Voltage applied surface insulation resistance

- Test conditions : 85±2°C × 85%RH × 1000 hours
- Stencil thickness : 100 micron
- Comb type electrode : JIS type-II
- Measurement voltage : DC100V
- Voltage applied : DC50V
- Test method : JIS Z 3197



No evidence of electromigration can be observed.



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1. Printing

1) Recommended printing parameters

(1) Squeegee

- | | |
|-------------------|----------------------------------|
| 1. Kind | : Flat |
| 2. Material | : Rubber or metal blade |
| 3. Angle | : 60~70° (rubber) or metal blade |
| 4. Pressure | : Lowest |
| 5. Squeegee speed | : 20~80mm/sec. |

(2) Stencil

- | | |
|----------------------|--|
| 1. Thickness | : 150~100μm for 0.65~0.4mm pitch pattern |
| 2. Type : | : Laser or electroform |
| 3. Separation speed | : 7.0~10.0mm/sec. |
| 4. Snap-off distance | : 0mm |

(3) Ambiance

- | | |
|----------------|---|
| 1. Temperature | : 22~25°C |
| 2. Humidity | : 40~60%RH |
| 3. Air flow | : Excessive air flow in the printer from air conditioning units can badly affects the stencil life and tack performance of solder pastes. |

2. Shelf life

0~10°C : 6 months from manufacturing date

* By using a stainless or plastic spatula, stir up the paste before use.

* Manufacturing date can be obtained from the lot number

ex. Lot No. 0 10 19 2

→	No. of lot	: 2nd
→	Date	: 19th
→	Month	: October
→	Year	: 2010



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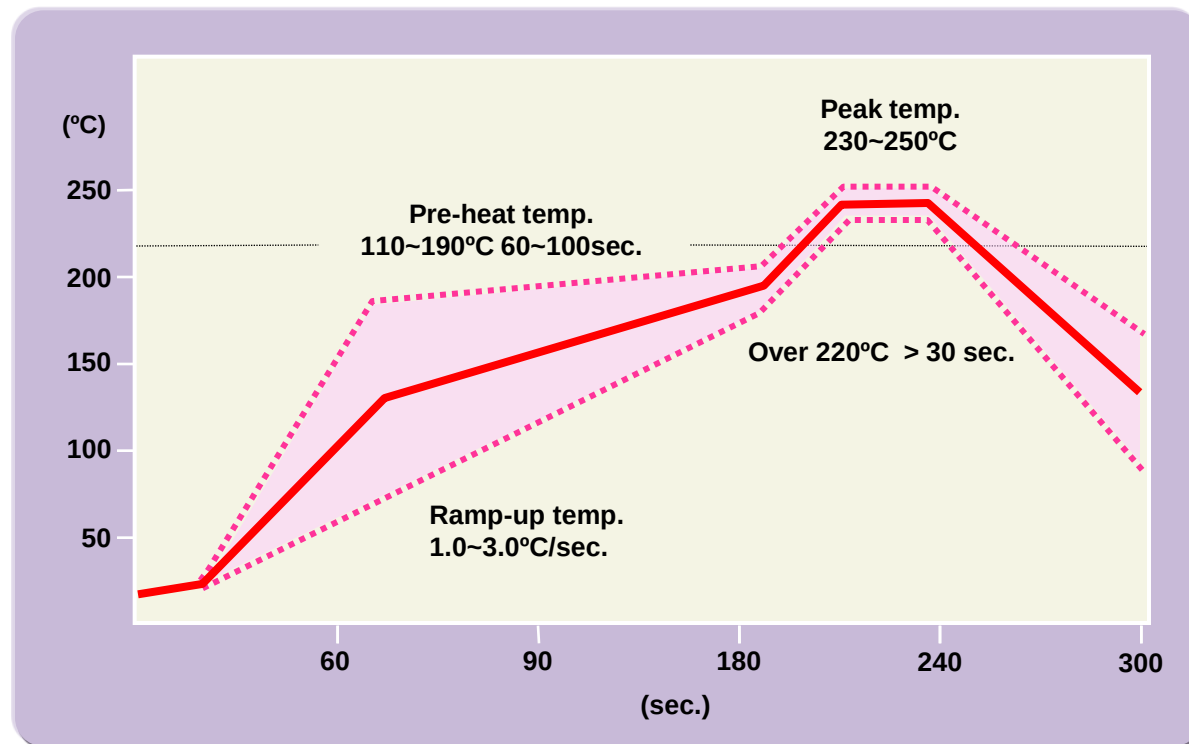
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Handling guide - Recommended reflow profile



Excess pre-heating (time & temperature) may cause too much oxidation.

Relatively short and low pre-heat may be preferable, especially for fine pitch/micro pattern components .

