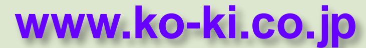

#50015E
Revised on Mar. 06, 2013

Koki no-clean & cleanable solder paste

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No-clean & Cleanable Lead Free Solder paste

SE(SS)48-A230

Product information

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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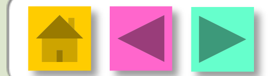
Product features

- Solder alloy composition is SE : 63Sn 37Pb SS : 62Sn 36Pb 2Ag
- Flux residue is washed easily with Vigon A250.
- PERFECT MELTING and wetting at fine pitch (>0.4mm pitch) and micro components (>0.25mm dia. CSP, 1005 chip).
- Designed to prevent occurrence of HIDDEN PILLOW DEFECTS.



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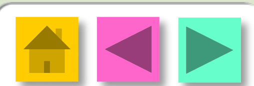

Specifications

Application		Printing - Stencil	
Product		**SE48-A230**	**SS48-A230**
Alloy	Alloy Composition (%)	63Sn37Pb	62Sn36Pb2Ag
	Melting Point (ºC)	183	179-190
	Shape	Spherical	
	Particle size (μm)	20-45	
Flux	Halide Content (%)	0.06 ±0.01	
	Flux Type	ROL1*3	
Product	Flux Content (%)	10.0±0.5	
	Viscosity*1 (Pa.s)	210±21	
	Cupper plate corrosion*2	Passed	
	Tack Time	>24 hours	
	Shelf Life (below 10ºC)	6 months	

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

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Continual printing

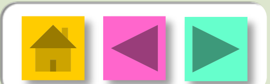
Evaluated using the SE48-A230

Test condition;

- Stencil : 0.12mm thickness, laser cut stencil
- Printer : Model YVP-Xg YAMAHA Motor
- Squeegee : Metal blade, Angle - 60º
- Print speed : 40 mm/sec
- Atmosphere : 24~26 ºC 40~60%RH
- Test pattern : BGA pad pattern - Diameter 0.30mm
  0.5mmp QFP pad pattern - Width 0.25 mm Length 1.75 mm Distance 0.25 mm

	1st print	10th print	After 200 stroke 10th print
BGA 0.3mm dia.			
0.5mm pitch QFP			

Assures excellent print quality with BGA.



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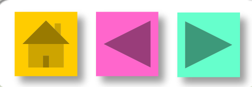
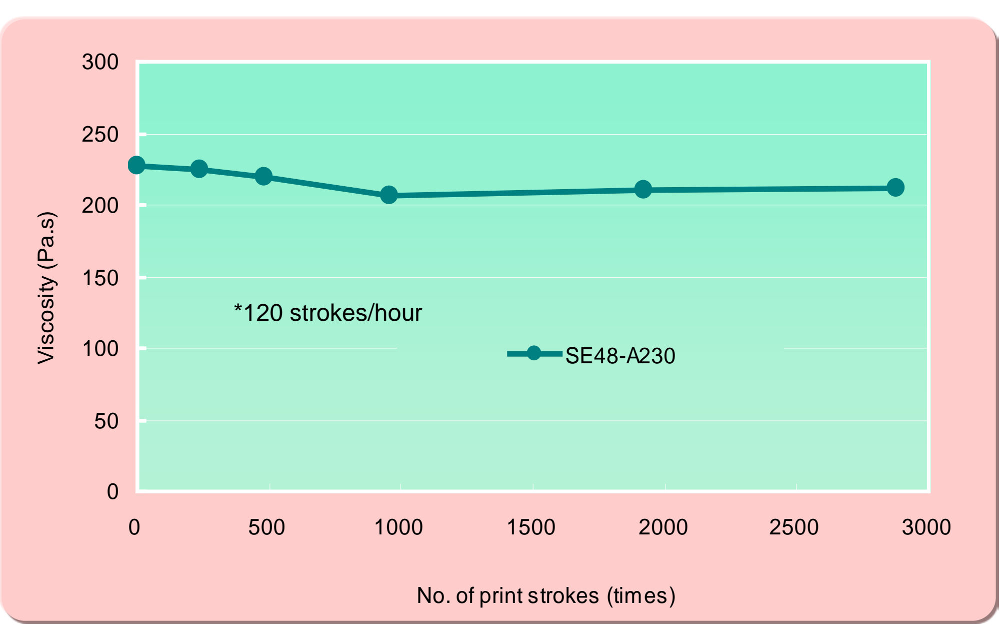


Viscosity variation

Evaluated using the SE48-A230

Test condition

- Print (knead) solder paste on the sealed-up stencil continually up for 24 hours to observe viscosity variation.
- Squeegee : Metal blades
- Squeegee angle : 60°
- Squeegee speed : 30mm/sec.
- Print stroke : 300mm
- Printing environment : 24~26ºC, 40~60%RH



A newly developed flux formula has succeeded in delivering consistent long term printability by preventing excess viscosity drop due to shear thinning. Furthermore excessive increase of viscosity due to the chemical reaction between solder powder and flux during print rolling, is also eliminated.

Intermittent printability (Stencil idle time)

Evaluated using the SE48-A230

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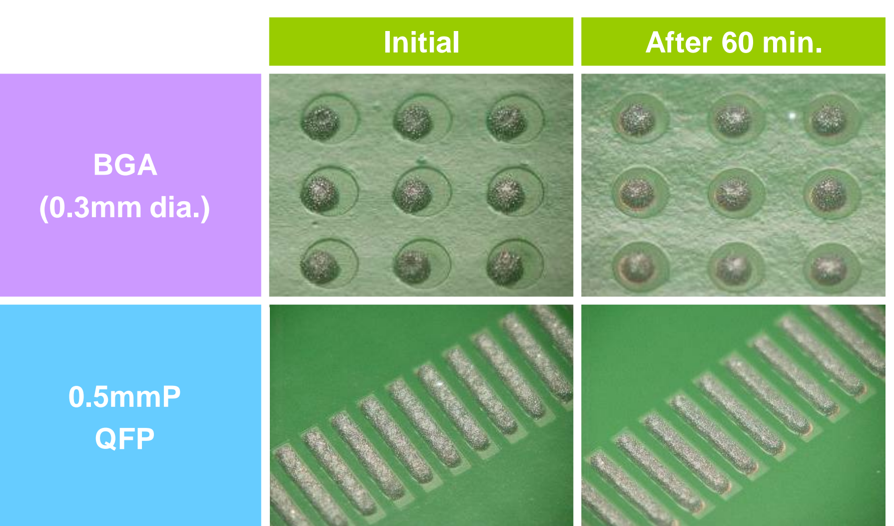
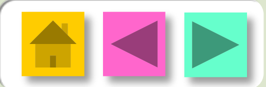
Print solder paste continuously and stop to idle the paste for 60min. intervals, and resume the printing and observe the 1st print result to verify intermittent printability.

Test condition

- Squeegee : Metal blades
- Squeegee angle : 60°
- Squeegee speed : 40mm/sec.
- Print stroke : 300mm
- Printing environment : 24~26ºC, 40~60%RH
- Test pattern : BGA pad pattern - Diameter 0.30mm
  0.5mmp QFP pad pattern - Width 0.25 mm Length 1.75 mm Distance 0.25 mm



Unique solvent formulation system assures extremely long stencil idle time, eliminating printing faults and improving the process window and production yields.



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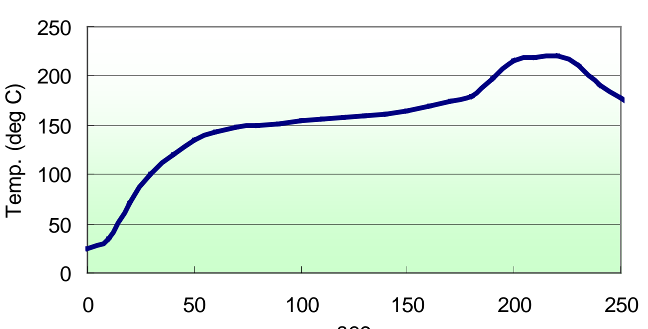
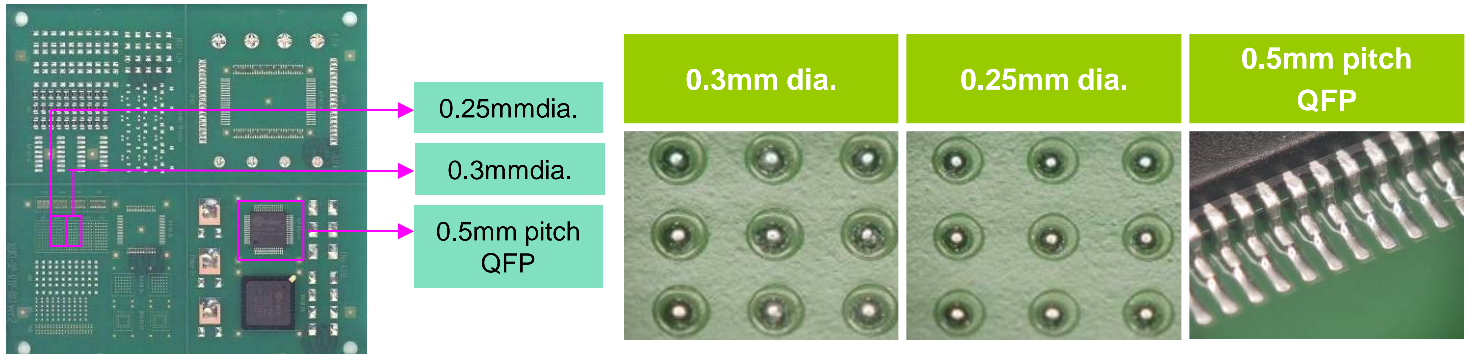
Wetting test

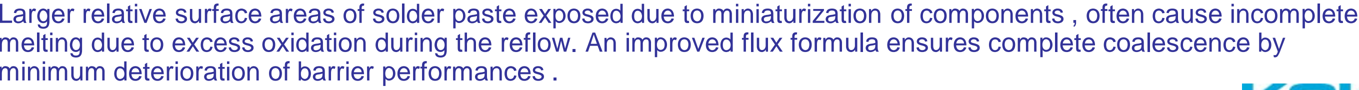
Evaluated using the SE48-A230

Test conditions

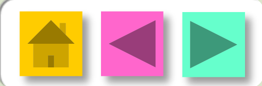
- Material : Glass epoxy FR-4
- Surface treatment : OSP,
- Stencil thickness : 0.12mm (laser cut)
- Pad size : 0.30mm diameter
  0.25mm diameter
- Component: 0.5mmP QFP(Sn100)
- Stencil aperture : 100% aperture opening to pad
- Heat source : Hot air convection
- Zone structure : 5 pre-heat zones +2 peak zones
- Atmosphere : Air
- Reflow profile : See the reflow profile on the right







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 barrier performances .



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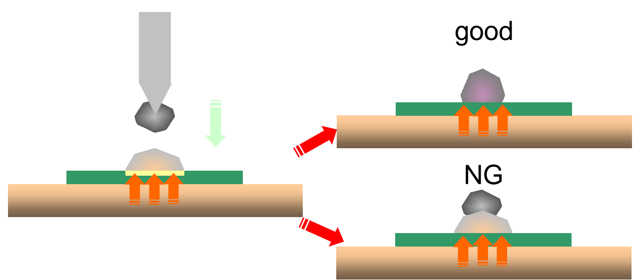
Anti-pillow test

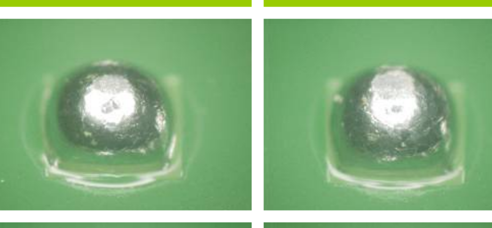
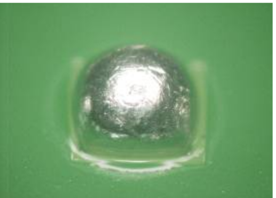
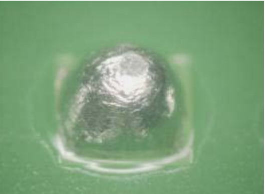
Evaluated using the SE48-A230

Test condition

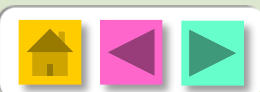
- Material : Glass epoxy FR-4
- Surface treatment : OSP
- Stencil thickness : 0.12mm (laser cut)
- Pad size : 0.8 x 0.8mm diameter
- Component: 0.76mm ball Sn-Pb
- Stencil aperture : 100% aperture opening to pad
- Heat source : Solder pod 250ºC
- mount interval: 10sec.



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

	10sec	30sec	50sec
SE48-A230			
Other company Product			

SE(SS)48-A230 indicates much longer heat durability up to 50sec.The results demonstrates that SE(SS)48-A230 effectively prevents the occurrence of head-in-pillow defects.



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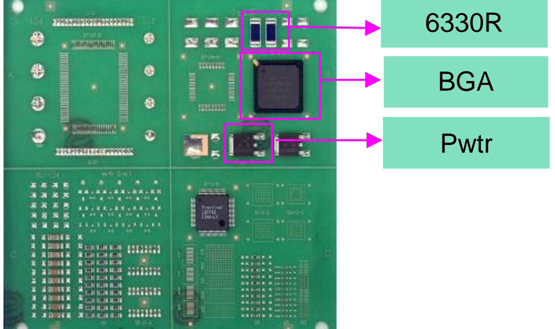
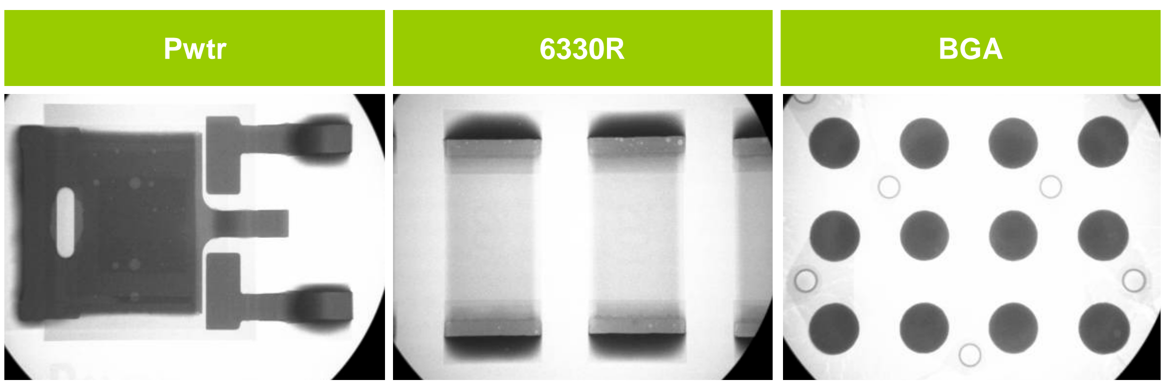
Voiding

Evaluated using the SE48-A230

Test condition

- Material : Glass epoxy FR-4
- Surface treatment : OSP
- Stencil thickness : 0.12mm (laser cut)
- Components PwTr,6330R (Sn 100)
  BGA ball – SnPb
- Heat source : Hot air convection
- Atmosphere : Air
- Reflow profile : Same as *"Wetting test"*





Specially formulated flux chemistry ensures extremely Low Voiding with BGA and broad contact area components.

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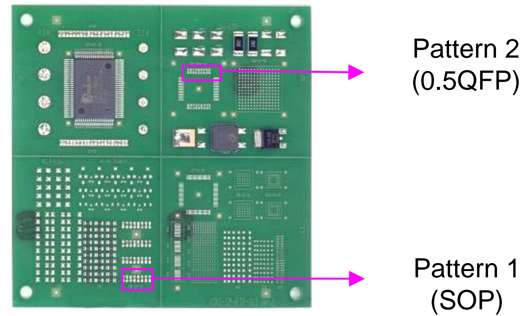
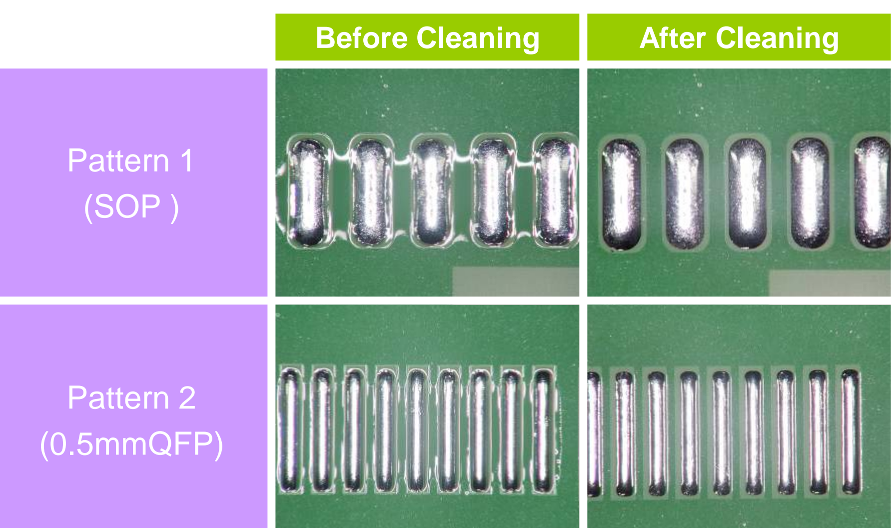
Cleaning

Evaluated using the SE48-A230

Test condition

- Material : Glass epoxy FR-4
- Surface treatment : OSP
- Stencil thickness : 0.12mm (laser cut)
- Confirmative pattern : SOP pad pattern
  0.5mmp QFP pad pattern
- 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 : Same as *"Wetting test"*
- Cleaning test : Dipping and stirring for 4 min in Vigon A250





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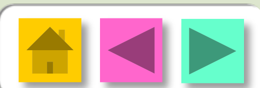
Item	Result	Method
Tack time	> 24 hours	JIS Z 3284
Heat slump	Pattern(1) 0.2mm pass Pattern(2) 0.3mm pass	JIS Z 3284
Solder balling	Category 3	JIS Z 3284
Copper mirror corrosion	Type L	IPC-JSTD-004
Copper plate corrosion	Pass	IPC-JSTD-004 JIS Z 3194
Voltage applied SIR	> 1E+9	IPC-JSTD-004 JIS Z 3194



Handling guide

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1. Printing

1) Recommended printing parameters

(1) Squeegee

1. Kind	:	Flat
2. Material	:	Rubber or metal blade
3. Angle	:	60~70º (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	:	3.0~10.0mm/sec.
4. Snap-off distance	:	0mm

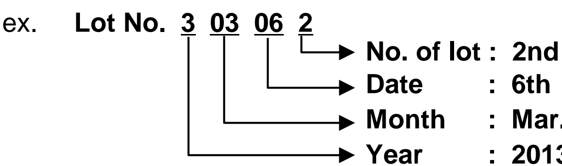
(3) Ambiance

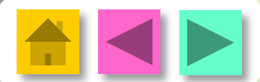
1. Temperature	:	23~27ºC
2. Humidity	:	40~60%RH
3. Air Flow	:	Excessive air flow in the printer badly affects stencil life and tack performance of solder pastes.

2. Shelf life

0~10ºC	:	6 months from manufacturing date

* Manufacturing date can be obtained from the lot number





Handling guide - Recommended reflow profile

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Handling guide - reflow profile supplement

(ºC)
200
150
100
50
0
60
120
180
240
(sec)

Shorter TAL and lower peak temperature may become a cause of voiding.
In case relatively larger volume of voiding is observed, it is recommended either to increase the peak temperature or extend TAL (for >45sec.).

Higher pre-heating temperature may lead to grainy solder fillet or de-wetting by accelerating oxidization of the solder alloy and exhaustion of the flux activation. It is recommended to decrease pre-heating temperature in case poor solder wetting is observed.

Similarly to the pre-heating, slow temperature elevation between pre-heating to the peak is prone to cause grainy solder fillet and/or de-wetting to the pad due to excessive oxidization of the solder alloy, pad surface and exhaustion of the flux activation.
It is recommended to quicken temperature elevation speed in case the poor solder wetting is observed.

Fast ramp-up speed is prone to cause bridging , mid-chip balling or solder beading by promoting heat slumping. It is recommended to slow down ramp-up temperature to alleviate the degree of heat slump of the solder paste.