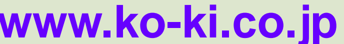

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Rev. 2014.06.23

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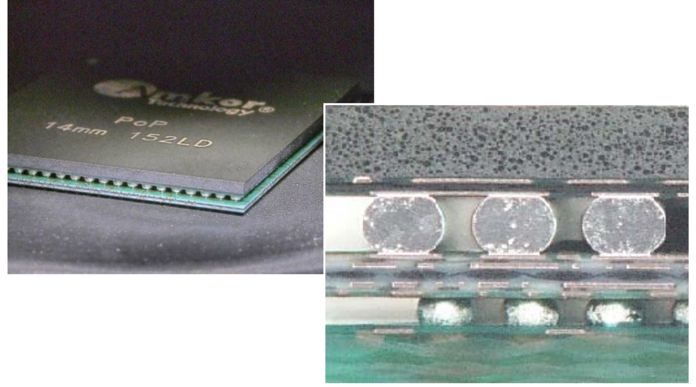
Koki no-clean **LEAD FREE** solder paste for

Package on Package application S3X70/811/812-NT2 series

Product information



This product information has been prepared with the cooperation of Fuji Machine Mfg. Co., Ltd.

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

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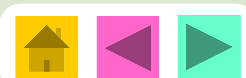
Product features

- Solder alloy composition is **Sn Ag3.0 Cu0.5**.
- Specially designed for the package on package (**PoP)** application.
- Enables **CONSISTENT** transfer of solder paste onto the component solder bumps.
- **HALOGEN FREE** (Cl + Br: 0 ppm) BS EN14582



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Product features - Solder paste vs. Tack flux

The use of a tack flux for the package on package (PoP) application shall be the most economical method. It, however, could often cause a poor soldering to the substrate/counter-bumps due to a deformation of the component, a poor coplarnarity of solder bumps, and etc.

The advantage to use a solder paste for the PoP application is that it helps successfully prevent the occurrence of an incomplete merger or, in worst case, head-in-pillow defect, as the solder paste fills a possible gap between the packages with a certain thickness.

Material	25ºC	180ºC	219ºC	230ºC
Tack flux				Incomplete wetting
Solder paste				wetting

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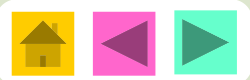
Specifications

	Application	Stamping		
	Product	S3X70-NT2	S3X811-NT2	S3X812-NT2
Alloy	Composition (%)	Sn Ag3.0 Cu0.5		
Alloy	Melting point (ºC)	217-219		
Alloy	Particle size (μm)	10-25	5-20	1-20
Flux	Halogen content*3 (ppm)	0		
Flux	Flux type*4	ROL0		
Product	Flux content (%)	20.2±1.0	20.0±1.0	20.0±1.0
Product	Viscosity*1 (Pa.S)	25±10		
Product	Copper plate corrosion*2	Passed		
Product	Tack time	>72hours		
Product	Shelf life (below 10ºC)	Jar : 3 months Syringe : 1 month		

*1. Viscosity: Malcom spiral viscometer, PCU-205 at 25°C 10rpm
*2. Copper plate corrosion: In accordance with IPC J-STD-004A
*3. Halogen content:: BS EN14582
*4. Flux type: According to IPC J-STD-004A



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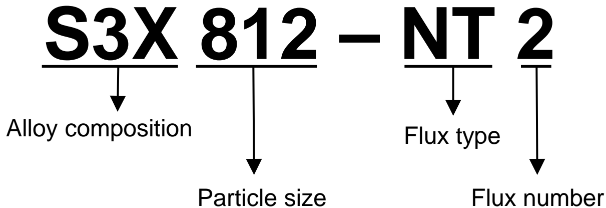
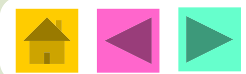
Specifications – Product code



Alloy composition (%)	S3X : Sn Ag3.0 Cu0.5
Particle size (μm)	70 : 10-25 811 : 5-20 812 : 1-20
Flux type	NT : N_2 use / Stamping application
Flux number	Solids and solvent used



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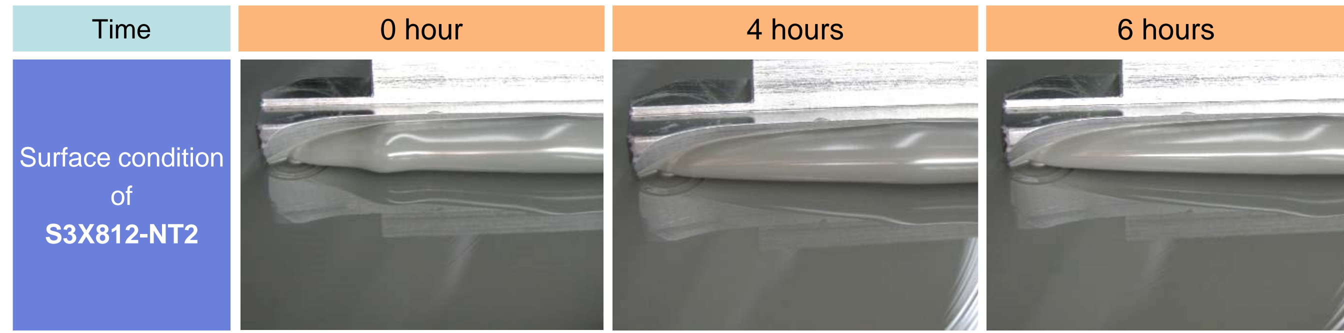
Smoothening

By using a stamping unit Model NXT from Fuji Machine, observed the long term stability of the solder paste.

Test condition

- Solder paste : S3X812-NT2
- Stamping module : Motel: NXT II Fuji Machine Mfg. Co., Ltd.
- Squeegee speed : 80rpm
- Smoothening time : 6 hours continuously



S3X812-NT2 retains smooth and flat surface condition even after 6 hours of smoothening.
This ensures the consistent amount of solder paste transfer to the package.

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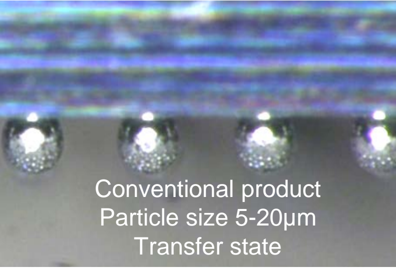
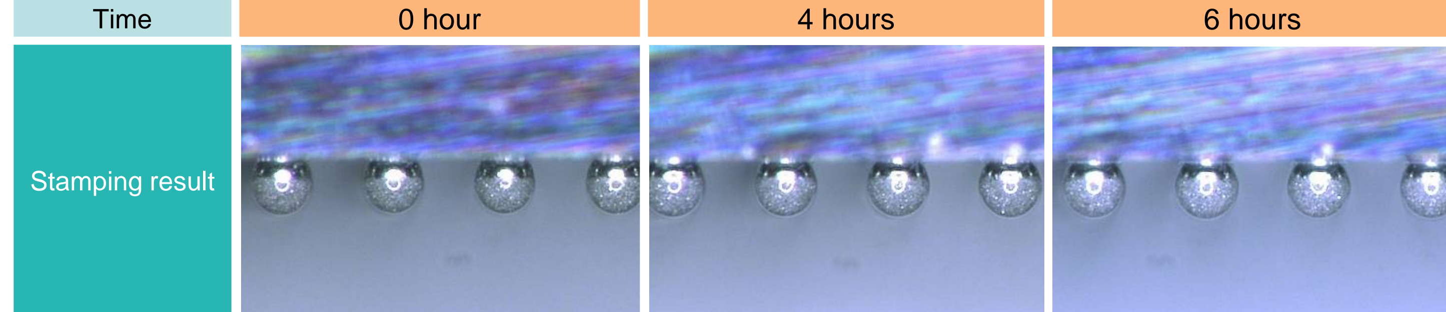
Solder paste transfer

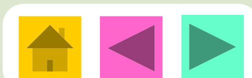
Test condition

- Solder paste : S3X812-NT2
- BGA : 0.20mm pitch, bump diameter 0.135mm, height of bump 0.10mm
- Stamping module : Model NXT II Fuji Machine Mfg. Co., Ltd.
- Squeegee speed : 80rpm
- Smoothening time : 6 hours continuously
- Stamping depth : 50 μm





S3X812-NT2 retains consistent transfer properties even after continual 6-hour smoothening.



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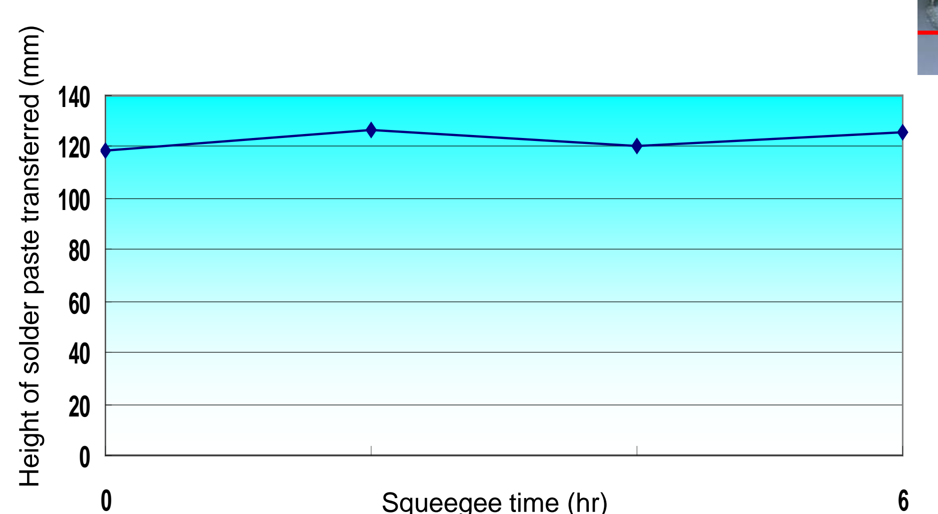
Solder paste transfer - Height

By using a stamping unit Model NXT from Fuji Machine, observed the long term stability of the solder paste.
The solder paste was kept in the rotary tray and stamping process was done at specified time to observe the consistency of the solder paste attachment.
Actual height of solder paste transferred on to bumps was measured at specified time after the solder paste stamping process.

Test condition

- Solder paste : S3X812-NT2
- BGA : 0.20mm pitch, bump diameter 0.135mm, height of bump 0.10mm
- Stamping module : Model NXT II Fuji Machine Mfg. Co., Ltd.
- Squeegee speed : 80rpm
- Smoothening time : 6 hours continuously
- Stamping depth : 50µm



Transfer height remained stable and consistent even after continual 6-hour smoothening.

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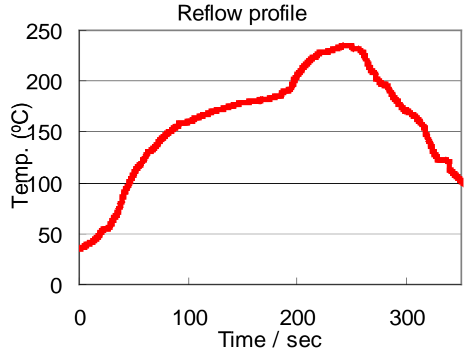
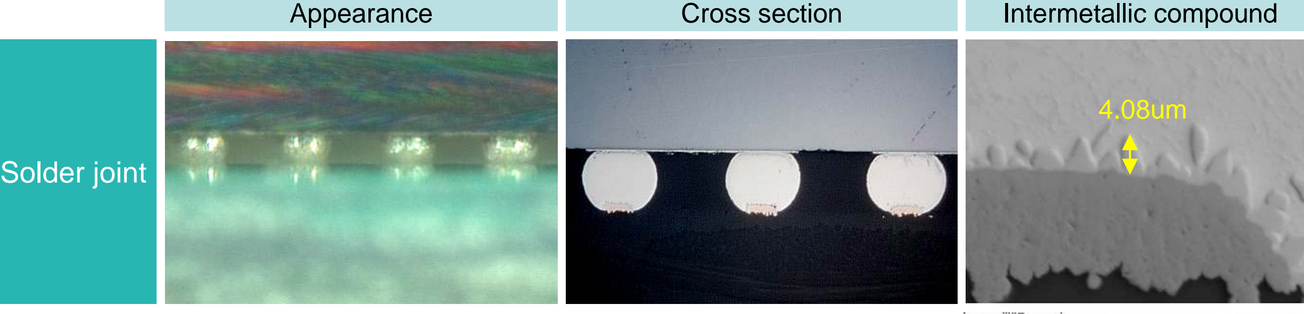
Solder wetting

By using a stamping unit Model NXT from Fuji Machine, observed the long term stability of the solder paste.
The solder paste was kept in the rotary tray and stamping process was done at specified time.
The solder paste transferred on to bumps was reflowed at specified time after the solder paste stamping process and bump collapsing state was observed.

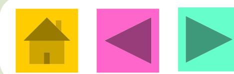
Test condition

- Solder paste : S3X812-NT2
- BGA : 0.20mm pitch, bump diameter .135mm, height of bump 0.10mm
- Stamping module : NXT II Fuji Machine Mfg. Co., Ltd.
- Squeegee speed : 80rpm
- Stamping depth : 50µm
- Reflow machine : 5 pre-heat zones + 2 peak zones
- Reflow profile : As shown
- Atmosphere : N_2 (O_2 density below 200ppm)





Quality solder joint was formed.



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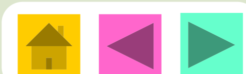
Halide,Halogen content

- Test method : IPC TM650 2.3.28.1
  BS EN14582
- Measurement instrument : ICS-1500 (DIONEX)
  AQF-100 (MITSUBISHI CHEMICAL ANALYTECH)

Halogen content (ppm)

Method	IPC TM650	BS EN14582
Cl	Not detected	Not detected
Br	Not detected	Not detected

None of the above halide substances were detected.



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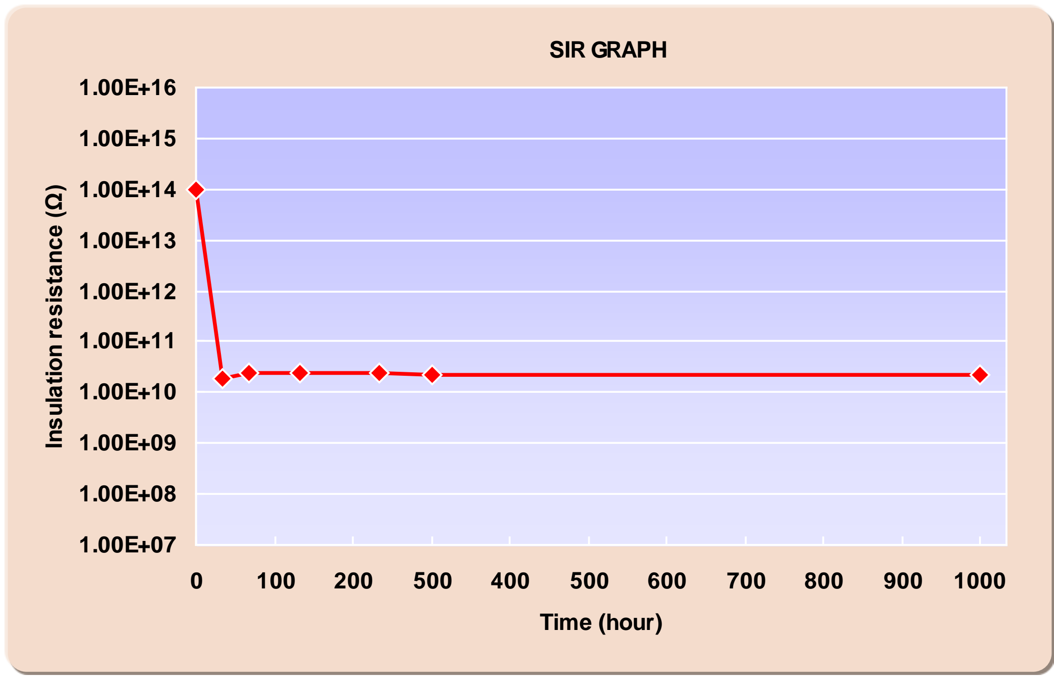
Voltage applied SIR

- Test condition : 85±2ºC × 85±2%RH for 1008 hours
- Stencil thickness : 100 μm
- Comb type electrode : JIS type-II
- Measurement voltage : DC100V
- Voltage applied : DC50V
- Test method : JIS Z 3197



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Handling guide

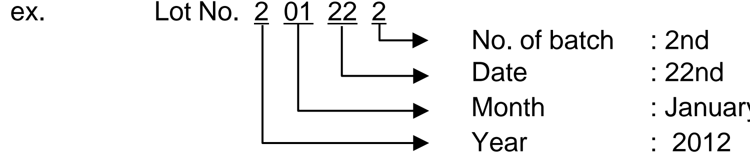
1. Soaking depth : 40 ~ 60% of BGA bump
2. Minimum bump size : >450μm → S3X70-NT2
   : >300μm → S3X811-NT2
   : >100μm → S3X812-NT2
3. Rolling
   Temperature : 22~25ºC
   Humidity : 40~60%RH
4. Contents : 250g/Jar
   100g/30cc syringe, 30g/10cc syringe, 15g/5cc syringe
5. Shelf life
   1) 0~10ºC (jar) : 3 months from manufacturing date
   2) 0~10ºC (syringe) : 1 month from manufacturing date

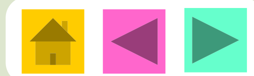
*Continual usage of 6 hours or shorter is recommended. Clean the dip tray every 6 hours.

*In some cases, the constituents of the product might separate from each other during its shelf life, but product quality itself shall remain intact. When this happens, mix it well before use.

* Manufacturing date can be obtained from the lot number

ex. Lot No. 2 01 22 2





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Handling guide – Recommended reflow profile

N2 atmosphere recommended

S3X70-NT2 : O_2 density <2000ppm
S3X811-NT2 : O_2 density <500ppm
S3X812-NT2 : O_2 density <200ppm

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Product for PoP	Product No.	Average solder particle size (approx.)	0.65mm pitch package (bump dia. >450μm)	0.5mm pitch package (bump dia. 300μm)	0.2mm pitch package (bump dia. 100μm)	Recommended reflow condition
Tack flux	TF-MP1	---	Applicable	Applicable	Not applicable	Air or N2 (O2 density: <2000ppm)
Solder paste	S3X70-NT2	17 μm	Applicable	Not applicable	Not applicable	N2 reflow O2 density: <2000ppm
	S3X811-NT2	11 μm	Applicable	Applicable	Not applicable	N2 reflow O2 density: <500ppm
	S3X812-NT2	5.6 μm	Applicable	Applicable	Applicable	N2 reflow O2 density: <200ppm

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