CRACK-FREE residue, lead free solder paste employing new environmentally friendly technology

S3X58-N200E (SnAg3.0Cu0.5)

Secures long-term reliability by preventing cracks on post reflow flux residue.
May eliminate the use of conformal coating, contribute remarkable cost savings and reduce environmental impact.
Significant improvement in performance of continuous printability and void control is achieved in comparison with the existing products.

No clean ROL0	Powder Type 4	Crack-free feature	Fine pattern 0.4mm pitch CSP <0.3mm	Idle time > 60 min. CSP 0.3mm	Tack time > 24 hrs.	High heat slump resist	Low beading	Require nitrogen O_2 < 500ppm	High reliability

Crack-free feature

– Prevents residue cracks from thermal stress and exhibits an excellent moisture proof barrier effect!

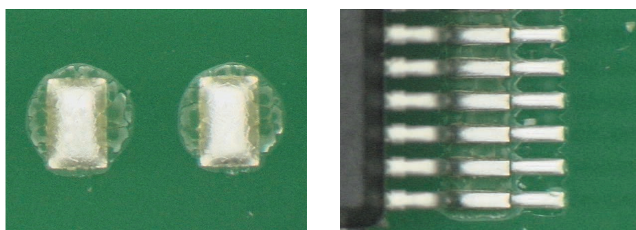
Amid the advances in the transition to the lead-free assemblies, demands for achieving even higher reliability are increasing. In particular, long-term maintenance of product reliability of in-vehicle products and industrial equipment, in addition to the change in strength characteristics by modification of the alloy composition, is a major problem to be solved. With existing solder pastes, the flux residue develops cracks due to cold temperature shocks and vibration, and accordingly, insulation reliability of the electric circuit is undermined and various problems occur because of vapor or moisture which enters through the uncovered electrode surface.

S3X58-N200E can prevent time decay of electric reliability by preventing residue cracks caused by cold temperature shocks and improving the moisture proof property by mixing a special resin into the flux ingredients, which maintains high reliability for an extended length of time. The residue cracks never occur in the thermal shock test (-30 to +80˚C, 30 min. each, 1,000 cycles).

S3X58-N200E's flux residue maintains a high moisture-proof coating effect in comparison to coating agents. Therefore, boards can be made without coatings, largely reducing cleaning and coating costs.
Reduction of the burden on the environment is also possible through the elimination of xylene and toluene.

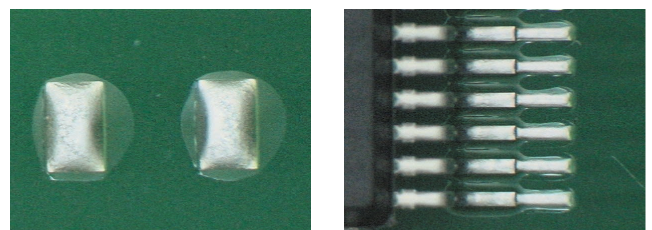
Crack test
(-30˚C~80˚C, 30min./cycle x 1000cycles)

Conventional product



Cracks occurred

S3X58-N200E



No cracking

Low temperature recovery test – *Moisture-proof flux residue, a new concept of reliability!*

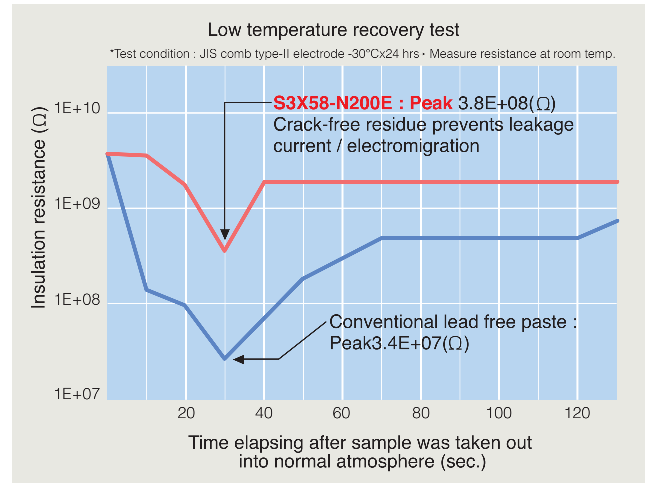
In this low temperature recovery test, when a sample board is taken out into an atmosphere of normal air and humidity after conditioning at - 30°Cx24 hours, a dew condensation appears on the surface of the board. If cracking in the flux residue has occurred water enters the surface of the board through the cracks and lowers the surface resistance.
This test enables us to examine the moisture-proof ability.

S3X58-N200E has actually been implemented in various automotive electronics applications and proven to pass high-level reliability criteria, such as;

- Heat shock test (-30°C~80°C, 30 min./cycle x 3000cycles)
  Engine control, Body ECU, Mission control............**Pass**

- High temperature & High humidity bias test
  (65°C, 95%RH, 16V, 1000 hours)
  Engine control, Security ECU, Body ECH...............**Pass**

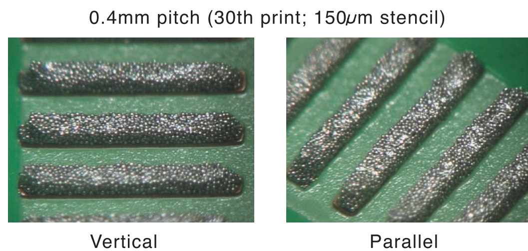
Since cracks in the flux residue of **S3X58-N200E** do not occur even when a thermal shock test is applied, it secures insulation between patterns due to the high moisture-proof property of the residue even when water condenses on the surface of the board.



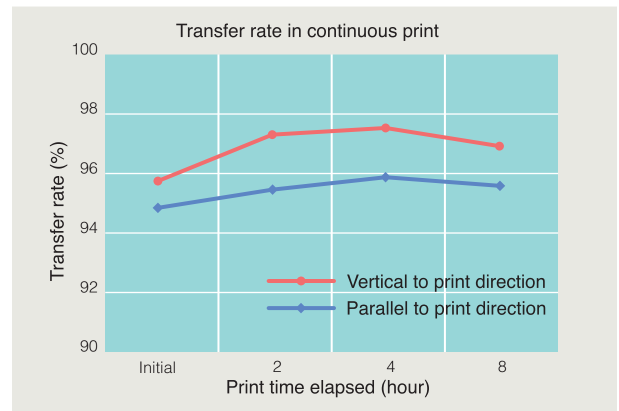
Continuous printability – *Ensures more stable printability!*

S3X58-N200E minimizes changes in viscosity during continuous printing, and excels in printability with fine patterns.
Viscosity never increases even after 10-hour continuous printing, maintaining a high rate of print transcription.

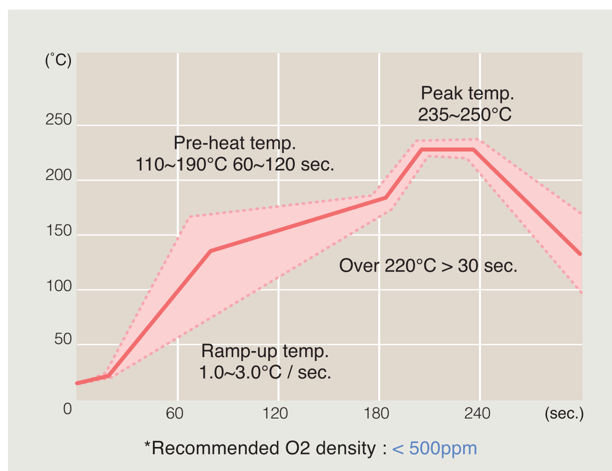
0.4mm pitch (30th print; 150μm stencil)



Vertical Parallel



Recommended reflow profile



*Recommended O2 density : < 500ppm

Specifications

	Application	Printing - Stencil
Alloy	Composition (%)	SnAg3.0Cu0.5
	Melting point (°C)	217 - 218
	Shape	Spherical
	Particle size (μm)	20 - 38
Flux	Halide content (%)	0.0
	Flux type	ROL0
Product	Flux content (%)	9.6
	Viscosity*1 (Pa.S)	180
	Copper plate corrosion*2	Passed
	Solder spread factor (%)	> 80
	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.

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