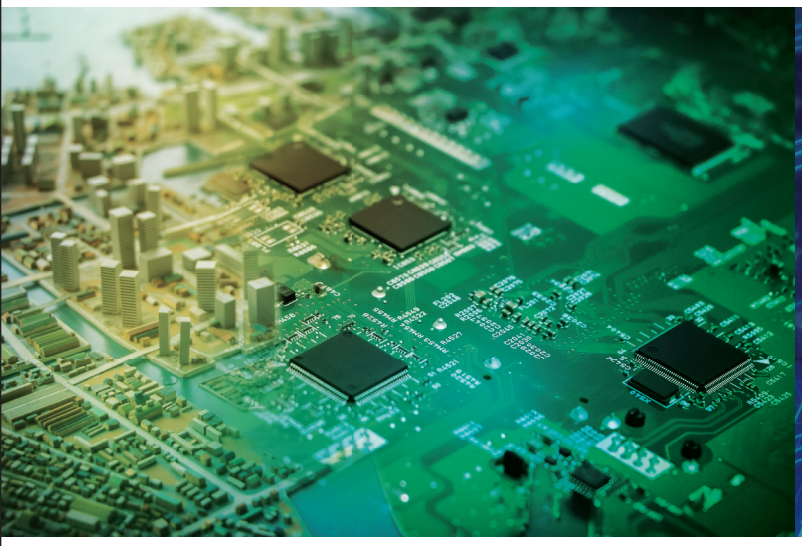


High Performance Lead Free Solder Pastes

HF1200 series

KOKI

Unprecedented fusion of powerful solder meltability and groundbreaking ultra-low void performance!

Multi-Feature Halogen Free Solder Pastes
HF1200 series

Standard
S3X58-HF1200

T5 powder
S3X70-HF1200

Low-cost high reliability alloy
S01XBIG / S1XBIG58-HF1200

Revolutionary **Core Flux Technologies** deliver soldering excellence beyond expectations!

As surface mount PCBs and their components continue to evolve in quality and performance, the demands on soldering materials have become increasingly diverse.

The S3X58-HF1200 integrates cutting-edge core technologies, the '2-Step Flux Gas Discharge Effect' and '2-Step Activation Boost Effect,' delivering exceptional soldering performance - all within a single, advanced formulation.

Unprecedented "Dual 2-Step" Flux Technology

The 2-step Flux Gas Discharge Effect

The technology is designed to reduce voids by rapidly discharging flux through the Active Coagulation Effect in the first step.
For the second step, the Extended Active Outflow Effect continues to discharge any remaining voids, realizing the lowest void performance ever achieved.

The 2-step Activation Boost Effect

This begins with Activation Stabilizer technology, which prevents premature chemical reactions during storage and transportation by stabilizing the activator system's reactivity. Upon exposure to reflow heating, the stabilizer is released, unlocking maximum activation power.
For the second step, the newly formulated high-temperature-resistant activator, with superior activation in high-temperature zones, ensures robust and powerful solder meltability and wetting, despite being halogen-free. This breakthrough significantly enhances the flexibility of the reflow profile design, providing a broad process window for a wide range of applications.

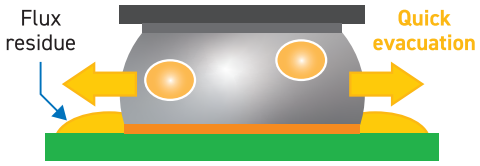
Feature Summary

- Solder alloy composition: Sn 3.0Ag 0.5Cu
- Realizes low voiding with BTCs (e.g., Pw.Tr., QFN, LGA) and BGA
- Powerful wetting as good as Halogen containing solder paste
- Wide process window and enhanced flexibility of reflow profile design
- Exhibits excellent print quality response with >1hour stencil idle time
- Excellent stability of shape retention and contour of each printed paste deposit helps to reduce stencil cleaning frequency
- Complies with Halogen Free standard (Cl+Br = 0ppm): BS EN14582
  No artificial addition of any halogen element
- Flux type: ROL0 (Cl+Br+I+F = <0.05% / IPC J-STD-004C)
- RoHS, REACH compliant product

2-Step Flux Gas Discharge Effect / New Low Void Technologies!

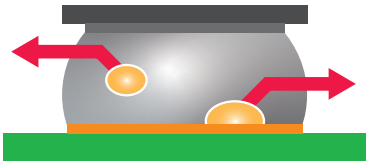
Step-1 Active Coagulation Effect

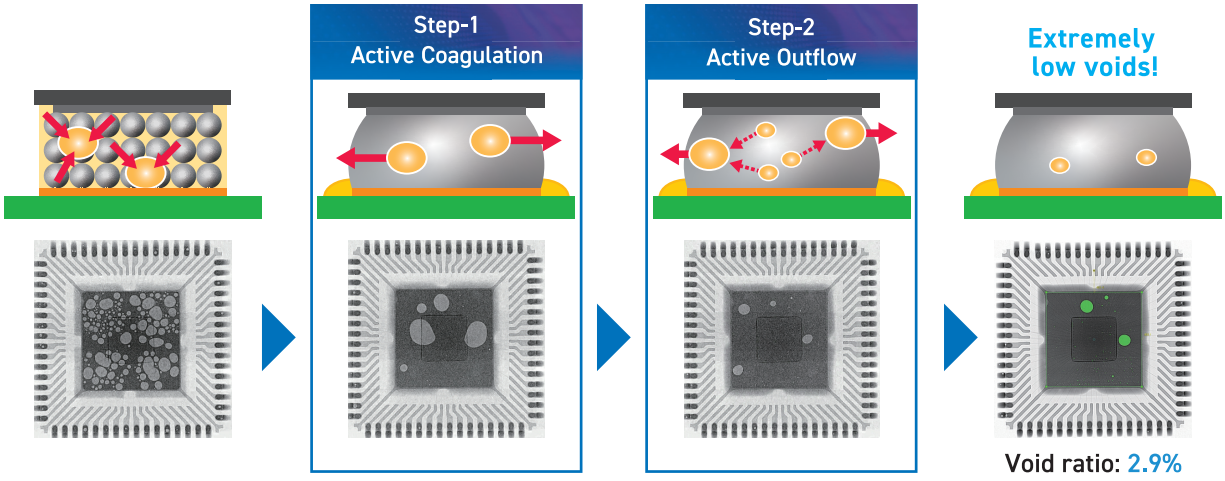
As solder powder melts, liquefied flux is designed to simultaneously enhance its coagulation and rapidly evacuate from the molten solder.



Step-2 Active Outflow Effect

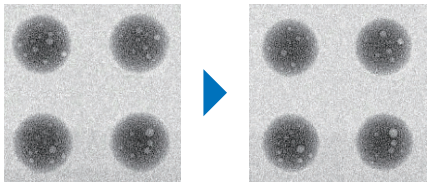
After the Step-1 process, an 'Outflow' effect actively continues to discharge the liquefied flux and flux gas while the solder is in a molten state.





Even in cases where Step-1 does not achieve sufficiently low void levels due to factors such as the surface treatment of the substrate, the effect of Step-2 makes it possible to further reduce voids more effectively.

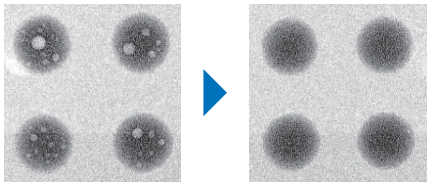
Conventional product



- BGA: SAC305
- Pad: 0.4mm dia.
- Reflow: Air

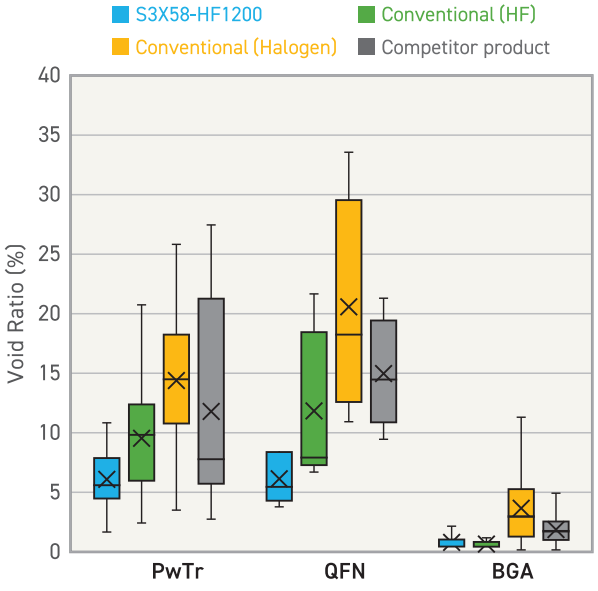
BGA patterns without solder spheres

S3X58-HF1200



While BGA patterns without solder spheres do not generate wetting tension, and the mechanism for expelling flux gas does not occur, with the S3X58-HF1200, the flux gas generated is actively and effectively expelled due to the active coagulation effect of the flux.

Void Ratio



2-Step Activation Boost Effect / Halogen Free Yet Powerful Wetting!

Step-1 Activation Stabilizer

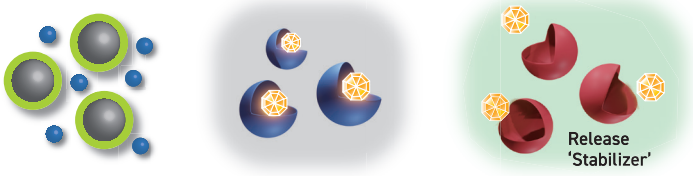
The newly designed activator system inhibits the chemical reaction with solder during storage and even during the pre-heating stage and exerts maximum activation strength during the time above liquidus temperature.

S3X58-HF1200 / New Activator formulation

Stable oxidation prevention layer with antioxidant

Inactive activator

Majority of the amount of activator remains for solder melting/wetting



Solder particles are protected from oxidation by a removable layer, and antioxidants further prevent it over time. This reduces the activator needed and enhances activation strength when the solder is molten.

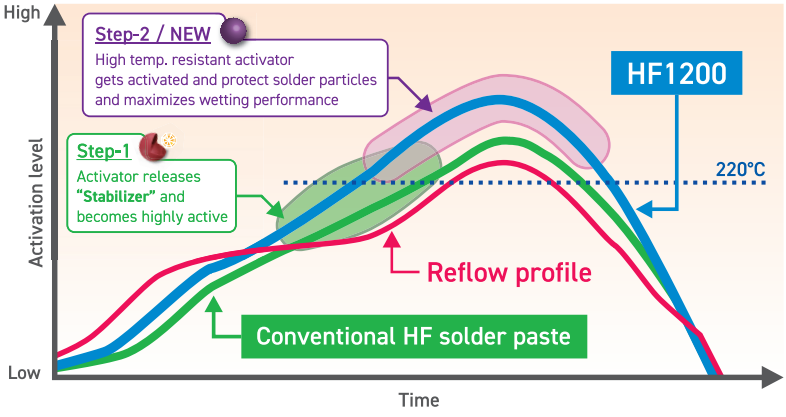
Primary oxidation prevention layer
easily removable but prone to be oxidized

Secondary antioxidant
traps O_2 that continues being generated over time

Activator holding "Stabilizer"
keeps activator **inactive**

Activator releasing "Stabilizer"
turns **active** only when heated

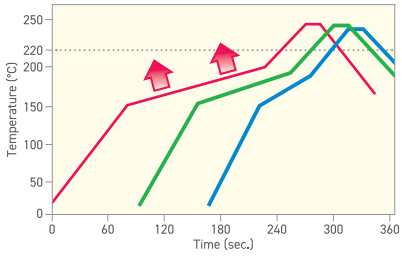
Step-2 High Temperature Activation Boost



Pre-heat conditions

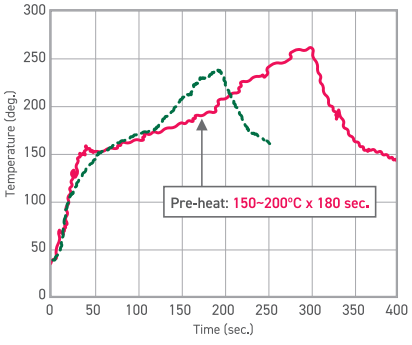
Conventional HF
- Upper limit: 160~180°C for 100 sec.

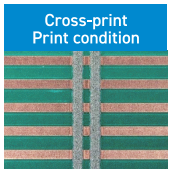
S3X58-HF1200
- Upper limit: 150~200°C for 150 sec.
- Lower limit: 150~180°C for 60 sec.



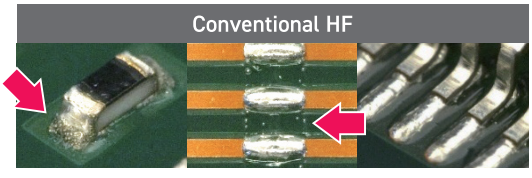
Stabilizer + **High temp. resistant activator** = Powerful activation yet halogen free

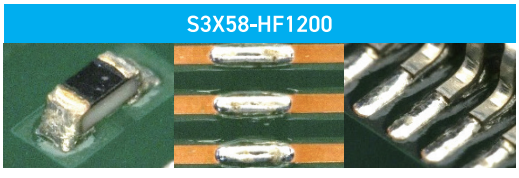
High temp. reflow profile





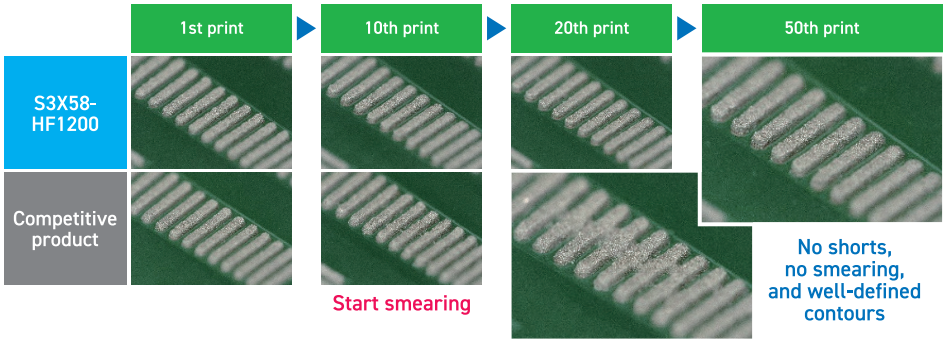
- Material: Glass epoxy FR-4
- Surface finish: OSP
- Stencil thickness: 0.12mm (laser cut)
- Component: 0603R (Sn plating)
  0.5mm QFP





Enhanced Stability during Continuous Paste Printing Leads to Faster Cycle Times!

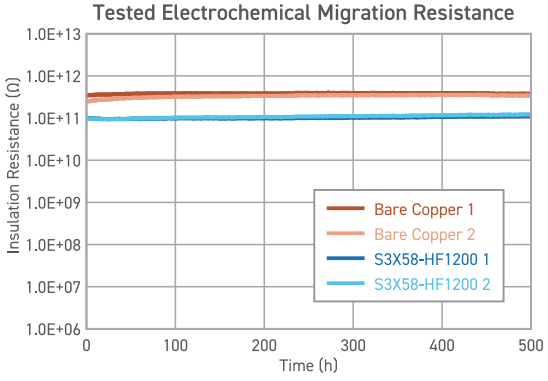
The newly designed flux formulation prevents viscosity degradation even during long continuous use, achieving excellent shape retention and stable paste print deposit contour stability. As a result, issues such as slumping, smearing, and bleeding are minimized, significantly reducing the frequency of stencil underside cleaning and contributing to shorter cycle times.



Material: Glass epoxy FR-4
Stencil: 0.12mmt (laser cut)
Condition: Continual printing without stencil cleaning
Pattern: QFP (Width/Gap = 0.25mm/0.15mm)

High Electrical Reliability – Insulation resistance

The S3X58-HF1200 is a halogen-free flux formulation with no artificial halogens added. The S3X58-HF1200, in combination with carefully selected chemical components, provides high electrical reliability and in combination with different conformal coating materials, electrochemical migration can be reliability prevented.



Coupon	IR_{avg}(Ω)
Bare Copper 1	3.97E+11
Bare Copper 2	3.44E+11
S3X58-HF1200 1	1.05E+11
S3X58-HF1200 2	1.12E+11

Test condition

- Test standard: IPC TM-650 2.6.14.1
- Test coupon: IPC-B-25
- Surface finish: OSP
- Chamber condition: 65°C / 88.5%RH
- Voltage: Applied 10V / measurement 100V
- Reflow: Hot air convection in air atmosphere
- Reflow profile: Recommended reflow profile

$$IR_{avg} = 10\left[\frac{1}{N}\sum_{1}^{N}\log IR_i\right]$$

N = number of test points (10 minimum)
IR_i = individual insulation resistance measurements

HF1200 Series Product Line-Up

Product name	S3X58-HF1200	S3X70-HF1200	S01XBIG58-HF1200	S1XBIG58-HF1200
Alloy composition	Sn 3.0Ag 0.5Cu		Sn 0.1Ag 0.7Cu 1.6Bi Ni	Sn 1.1Ag 0.7Cu 1.8Bi Ni
Melting point (°C)	217 - 219		211 - 227	211 - 223
Powder size (μm)	20 - 38	10 - 25	20 - 38	
Halide content (%)	0			
Flux type	ROL0 (IPC J-STD-004C)			

Koki's Global Network

Production factory | Sales office | Distribution center | Licensee production (liquid flux) | Distributor

Europe

Poland 1
Germany 1 / Hungary 2
Norway / Finland / Sweden
Russia / Lithuania / Poland
Czech / Slovakia / Austria
Serbia / Romania / Bulgaria
Turkey / Italy / Malta
Switzerland / Netherland
Belgium / France / Spain
Portugal / UK / Ireland

Middle East

Israel / Iran

Africa

South Africa / Tunisia
Algeria / Morocco

Asia

Korea 2 / China 3
Philippines 3
Taiwan / Hong Kong
Thailand / Vietnam
Indonesia / Singapore
Malaysia / India

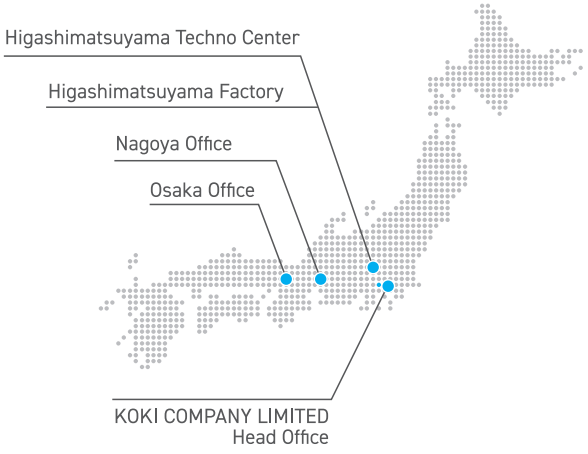
Americas

U.S.A. 4 5
Canada / Mexico / Brazil

Oceania

Australia

Locations in Japan



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