

Pb-FREE SOLDER PASTE TLF-SERIES
LFSOLDER TLF-204-TNA23K

LFSOLDER TLF-204-TNA23K is the Pb-free solder paste which it used spherical Pb-free solder powder and halogen-free flux. As the paste contains no Pb, it will largely contribute to the protection of global environment. Furthermore, excellent reliability can be obtained with the flux without washing.

1. Outstanding Features

- 1) Pb-free (Sn/Ag/Cu series) solder alloy is used.
- 2) Stable printability and shape of the printed solder paste are obtained with little change in viscosity during continuous printing.
- 3) Halogen-free solder paste with type4 solder particle size .
- 4) Good solderability on small pads under long preheat time
- 5) Superior reliability is provided by no washing.

2. Characteristics

Characteristics of LFSOLDER TLF-204-TNA23K is shown in Table 1 and Table 2.

Table 1 - Characteristics of LFSOLDER TLF-204-TNA23K

Items	Characteristics	Test methods
Alloy composition	Sn 96.5 / Ag 3 / Cu 0.5	JIS Z 3282 (2006)
Melting point	216~220°C	According to DSC measurement
Particle size of solder powder	20~38μm	According to laser diffraction method
Shape of solder powder	Spherical	JIS Z 3284-2 (2014)
Flux content	12.2%	JIS Z 3197 (2012)
Chlorine content*	0.0%	JIS Z 3197 (2012)
Viscosity	190 Pa·s	JIS Z 3284-3 (2014) Viscometer, type PCU, manufactured by Malcom, at 25°C

* Inspected the flux itself only

Table 2 - Characteristics of LFSOLDER TLF-204-TNA23K

Items	Characteristics	Test methods
Water solution resistance test	More than $1 \times 10^4 \Omega \cdot \text{cm}$	JIS Z 3197 (2012)
Insulation resistance test	More than $1 \times 10^9 \Omega$	Board type 2, JIS Z 3197 (2012) Reflow: By reflow soldering system.
Slump test	Less than 0.2mm	Print the paste on ceramics board and heat for 60 seconds at 150°C. Measure slumping width from before and after heating. STD-092b※
Solder ball test	Solder balls seldom occur	Print the paste on ceramics board. After melting and heating, observe with a microscope of 50 times. STD-009e※
Solder spread test	More than 75%	JIS Z 3197 (1986) 6.10
Copper plate corrosion test	No corrosion	JIS Z 3197 (2012)

※ Test method of our company

(The written characteristics is not a guarantee value.)

3. Quality Guarantee Period

The quality guarantee period shall be 180 days after manufacture if the products are stored in sealed containers at temperature below 10°C.

4. Product Packaging Units

The standard of the packing unit of this product is 500g.

5. Cautions for Use

(1) Conditions for Printing

Printing conditions recommended for LFSOLDER TLF-204-TNA23K is shown in Table 3:

Table 3 - Printing conditions recommended

Items	Setting range
Metal mask	Laser machined, manufactured by additive (or those having flat opening side)
Squeegee	Metal
Squeegee angle	60°
Squeegee speed	20~80mm/s
Printing pressure	10~30 × 10 ⁻² N/mm

(2) Parts Mounting Time

Mount the parts within 12 hours after printing the solder paste. If left standing for a long time after printing, the surface of solder paste will dry up to cause mount error of parts.

(3) Reflow Conditions

Recommended temperature profile of air reflow is shown in Fig.1.

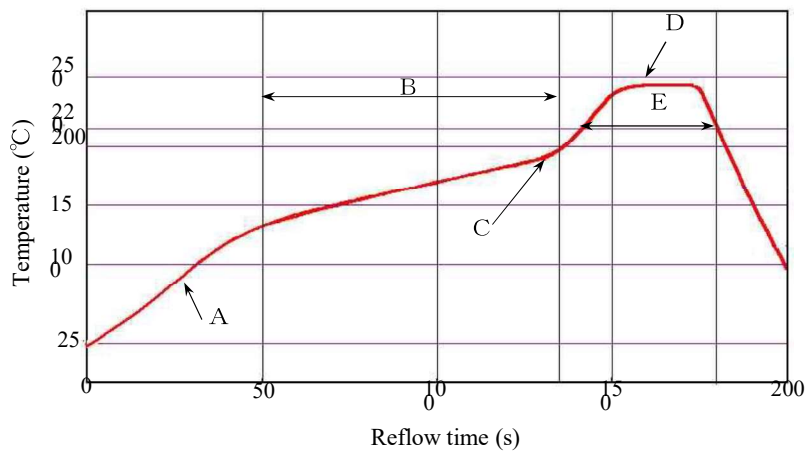


Fig.1 - Temperature profile of air reflow

[Precautions]

1) Preheat

- Set the temperature rising speed A at a rate of 0.8~3°C/s. Careful about rapid temperature rise in preheat zone as it may cause excessive slumping of the solder paste.
- Appropriate preheat time B will be from 60 to 150 seconds. If the preheat is insufficient, rather large solder balls tend to be generated. Conversely, if performed excessively, fine balls and large balls will generate in clusters at a time.
- Appropriate preheat ending temperature C will be from 150 to 200°C. If the temperature is too low, non-melting tends to be caused in the area with large heat capacity after reflow.

2) Heating

- Careful about sudden rise in temperature as it may worsen the slump of solder paste.
- Set the peak temperature D in the range from 235 to 255°C.
- Adjust the melting time that the time over 220°C will be from 30 to 120 seconds.

3) Cooling

- Careful about slow cooling as it may cause the positional shift of parts and decline in joining strength at times.

※ Perform adequate test in advance as the reflow temperature profile will vary according to the conditions of parts and boards, and the specifications of the reflow furnace.

6. Cautions from Standpoints of Safety and Sanitation

- 1) Physiological interaction varies by individuals. As a prudent policy, therefore, care, should be exercised not to inhale gas or fume of solvent emitted during operations and not to have your skin exposed (especially mucous membrane and other parts vulnerable to stimuli) for a long time.
- 2) This paste contains the organic solvent, but it is not flammable.
- 3) If the paste sticks to the skin, wipe it off with ethanol and the like, and wash thoroughly with soapy water.

※ The flux ingredients in the paste contain nonionic halogen based activator.

*The physical chemistry-character among written contents etc. is not a guarantee value. The evaluation of danger and noxiousness is based on material, information, and the data, etc. which can be acquired now. However, it is not because all material was covered and handled enough, please. As for notes, it is the one intended for usual handling. Special handling is not assumed. Please observe the restriction of related various regulations, and use after executing suitable safety measures for the usage.

Before starting using our paste, please kindly conduct sufficient examination on manufacturing process and credibility. We will not guarantee your product in case a problem occurs to your product while using our product.

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