1. Mounting Position
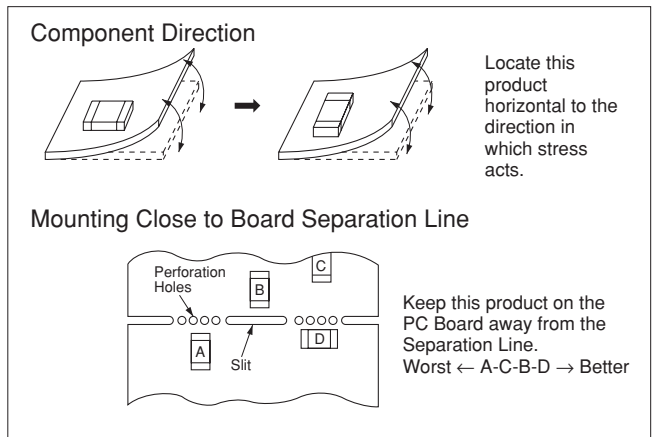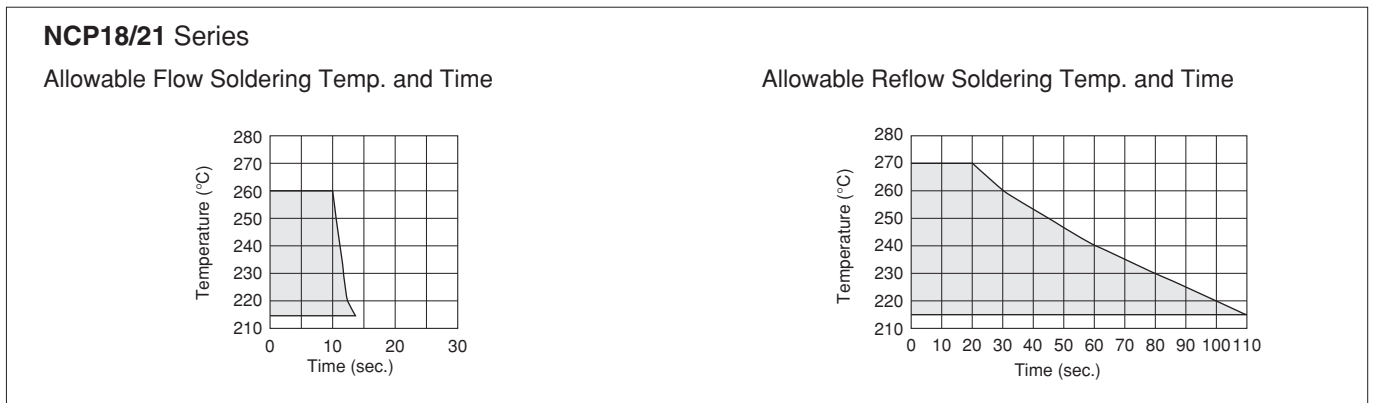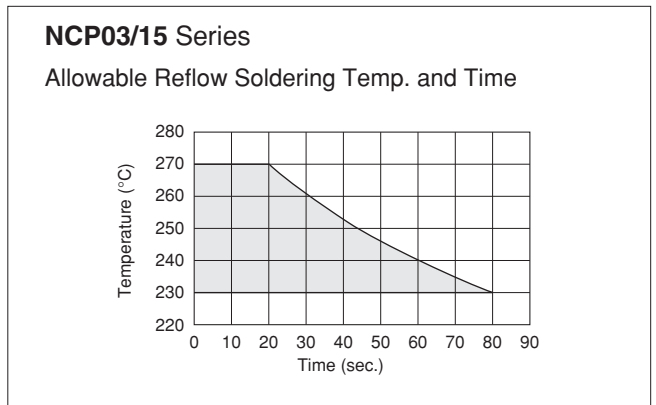
Choose a mounting position that minimizes the stress imposed on the chip during flexing or bending of the board.

Component Direction

Locate this product horizontal to the direction in which stress acts.

Mounting Close to Board Separation Line

Perforation Holes

C

B

A

Slit

D

Keep this product on the PC Board away from the Separation Line.
Worst ← A-C-B-D → Better

2. Allowable Soldering Temperature and Time

(a) Solder within the temperature and time combinations indicated by the slanted lines in the following graphs.

(b) Excessive soldering conditions may cause dissolution of metallization or deterioration of solder-wetting on the external electrode.

(c) In case of repeated soldering, the accumulated soldering time should be within the range shown in the figure below. (For example, Reflow peak temperature: 260°C, twice -> The total accumulated soldering time at 260°C is within 30 seconds.)
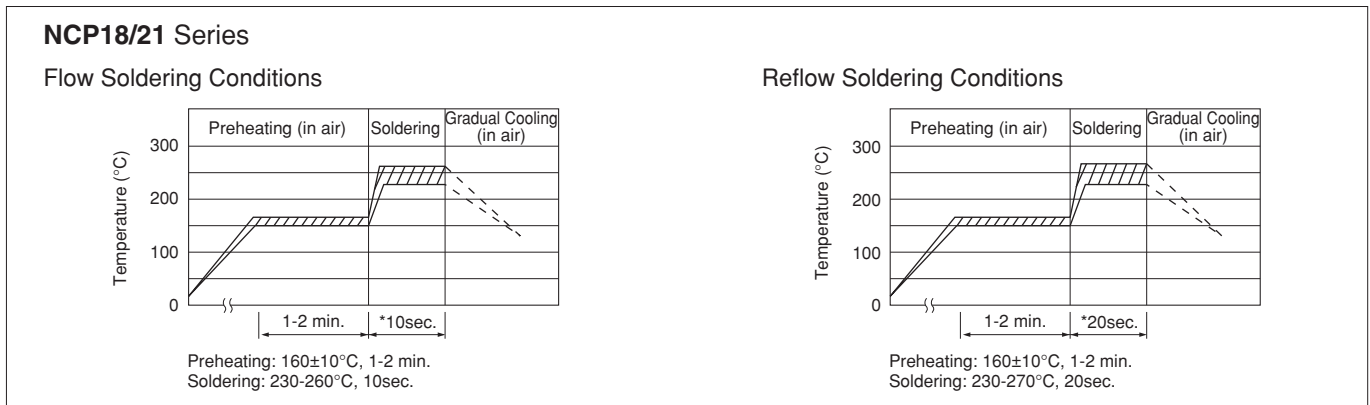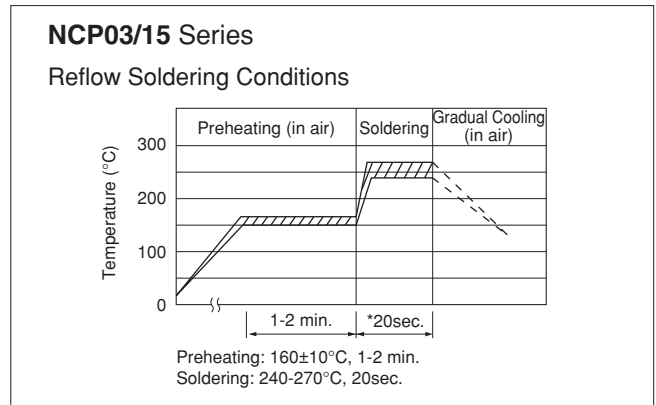
NCP03/15 Series

Allowable Reflow Soldering Temp. and Time

NCP18/21 Series

Allowable Flow Soldering Temp. and Time

Allowable Reflow Soldering Temp. and Time

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3. Recommended Temperature Profile for Soldering

(a) Insufficient preheating may cause a crack on the ceramic body. The difference between preheating temperature and maximum temperature in the profile shall be 100 °C.

(b) Rapid cooling by dipping in solvent or by other means is not recommended.

* In case of repeated soldering, the accumulated soldering time should be within the range shown in the figure of section 2.

NCP03/15 Series
Reflow Soldering Conditions

Preheating: 160±10°C, 1-2 min.
Soldering: 240-270°C, 20sec.

NCP18/21 Series

Flow Soldering Conditions

Preheating: 160±10°C, 1-2 min.
Soldering: 230-260°C, 10sec.

Reflow Soldering Conditions

Preheating: 160±10°C, 1-2 min.
Soldering: 230-270°C, 20sec.

4. Solder and Flux

(1) Solder and Paste

(a) Reflow Soldering: NCP03/15/18/21 Series
Use RA/RMA type or equivalent type of solder paste. For your reference, we use the solder paste below for any internal tests of this product.
•RMA9086 90-4-M20 (Sn:Pb=63wt%:37wt%)
(Manufactured by Alpha Metals Japan Ltd.)
•M705-221BM5-42-11 (Sn:Ag:Cu=96.5wt%:3.0wt%:0.5wt%)
(Manufactured by Senju Metal Industry Co., Ltd.)

(b) Flow Soldering: NCP18/21 Series
We use the solder paste below for any internal tests of this product.

•Sn:Pb=63wt%:37wt%
•Sn:Ag:Cu=96.5wt%:3.0wt%:0.5wt%

(2) Flux
Use rosin type flux in the soldering process.
If the flux listed below is used, some problems might be caused in the product characteristics and reliability.
Please do not use the following flux.
• Strong acidic flux (with halide content exceeding 0.1wt%).
• Water-soluble flux
(*Water-soluble flux can be defined as non-rosin type flux including wash-type flux and non-wash-type flux.)

5. Cleaning Conditions

For removing the flux after soldering, observe the following points in order to avoid deterioration of the characteristics or any change of the external electrodes' quality.
• Please keep mounted parts and a substrate from an occurrence of resonance in ultrasonic cleaning.
• Please do not clean the products in the case of using a non-wash-type flux.

|	NCP03/15	NCP18/21
Solvent	Isopropyl Alcohol	Isopropyl Alcohol
Dipping Cleaning	Less than 5 minutes at room temp. or less than 2 minutes at 40°C max.	Less than 5 minutes at room temp. or less than 2 minutes at 40°C max.
Ultrasonic Cleaning	Less than 5 minutes and 20W/ℓ Frequency of 28kHz to 40kHz	Less than 1 minute and 20W/ℓ Frequency of several 10kHz to 100kHz

6. Drying

After cleaning, promptly dry this product.

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7. Printing Conditions of Solder Paste

● The amount of solder is critical. Standard height of fillet is shown in the table below.

● Too much solder may cause mechanical stress, resulting in cracking, mechanical and/or electronic damage.

Reference: Optimum Solder Amount
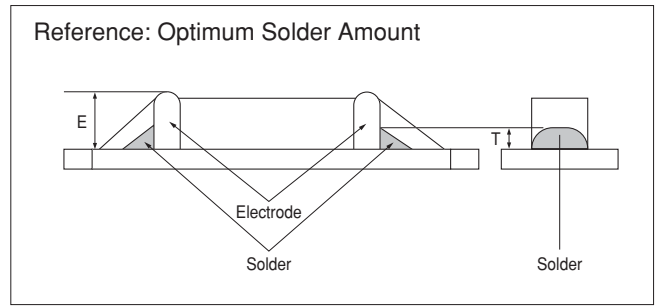
Part Number	Solder Paste Thickness	T
NCP03	100μm	1/3E≦T≦E
NCP15	150μm	1/3E≦T≦E
NCP18/NCP21	200μm	0.2mm≦T≦E

8. Adhesive Application and Curing

● Thin or insufficient adhesive may result in loose component contact with land during flow soldering.

● Low viscosity adhesive causes chips to slip after mounting.

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