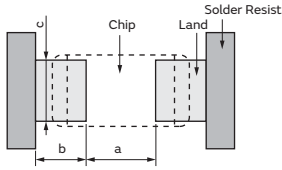


Standard Land Dimensions



Part Number	Soldering Methods	Dimensions (mm)			
		Chip (LxW)	a	b	c
NCP03	Reflow Soldering	0.6x0.3	0.25	0.3	0.3
NCP15/NCU15	Reflow Soldering	1.0x0.5	0.4	0.4-0.5	0.5
NCP18	Flow Soldering	1.6x0.8	0.6-1.0	0.8-0.9	0.6-0.8
	Reflow Soldering		0.6-0.8	0.6-0.7	0.6-0.8
NCU18	Flow Soldering	1.6x0.8	0.6-1.2	0.8-0.9	0.6-0.8
	Reflow Soldering		0.6-1.2	0.6-0.7	0.6-0.8
NCP21	Flow Soldering	2.0x1.25	1.0-1.1	0.9-1.0	1.0-1.2
	Reflow Soldering		1.0-1.1	0.6-0.7	1.0-1.2

Notice (Soldering and Mounting)

1. Mounting Position

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

Component Direction

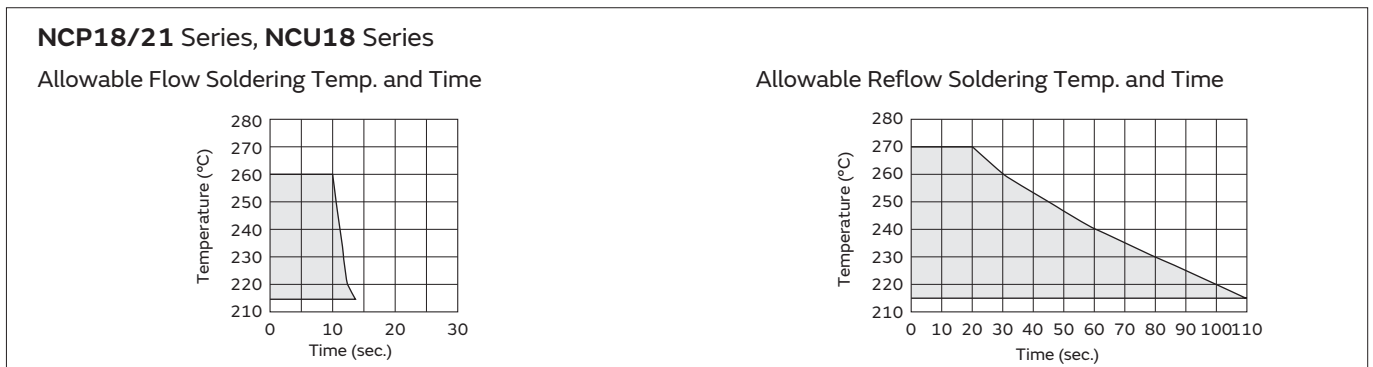
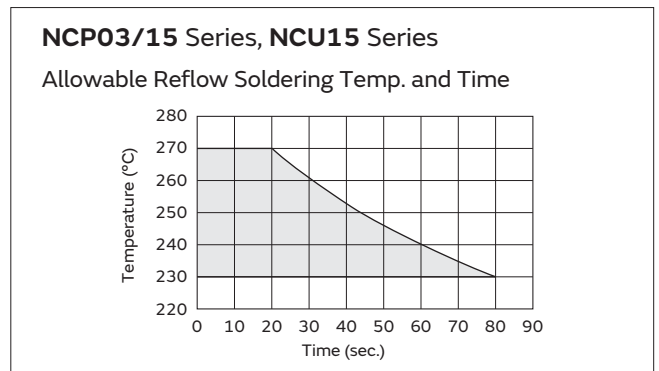
Locate this product horizontal to the direction in which stress acts.

Mounting Close to Board Separation Line

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.)



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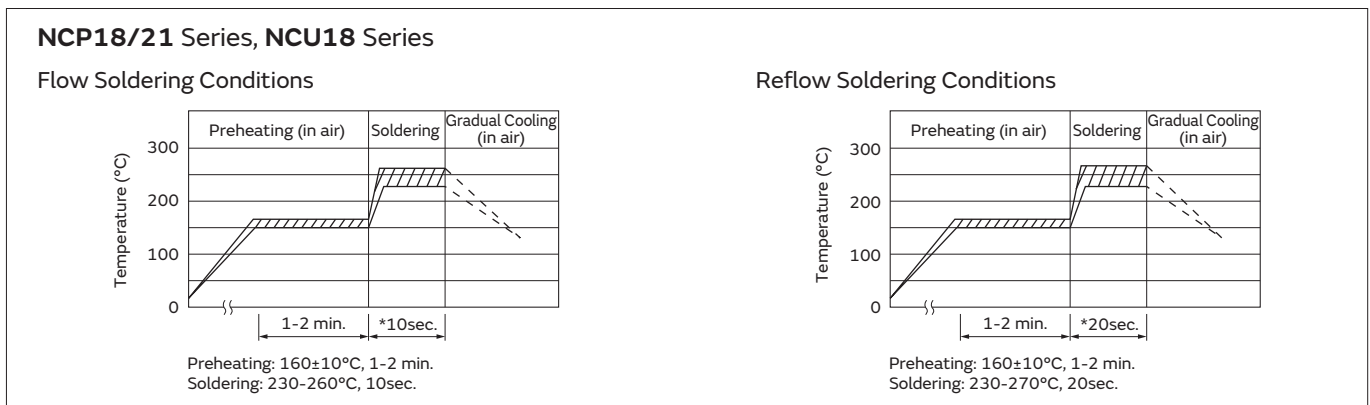
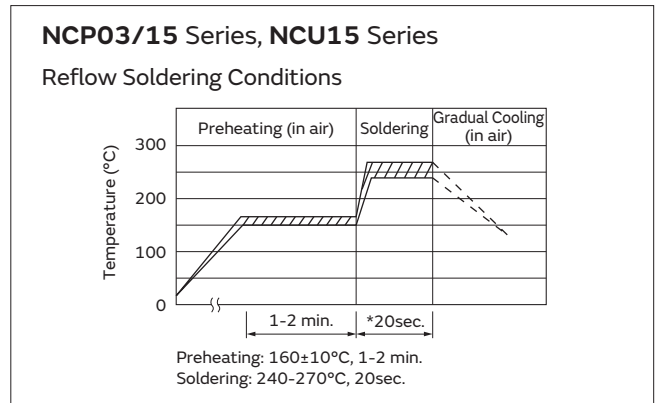
Mounting

Continued from the preceding page. ↘

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.



4. Solder and Flux

(1) Solder and Paste

(a) Reflow Soldering: NCP03/15/18/21 Series, NCU15/18 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, NCU15/18 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, NCU15	NCP18/21, NCU18
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.

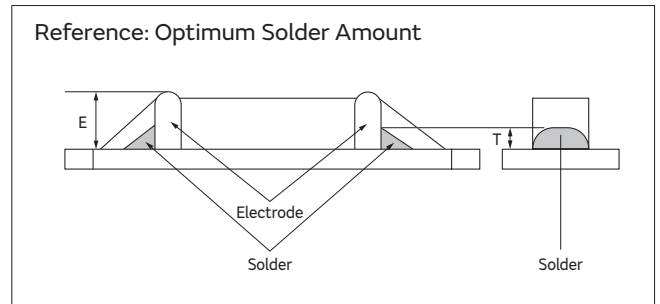
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Mounting

Continued from the preceding page. ↘

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.



Part Number	Solder Paste Thickness	T
NCP03	100 μ m	$1/3E \leq T \leq E$
NCP15, NCU15	150 μ m	$1/3E \leq T \leq E$
NCP18/NCP21, NCU18	200 μ m	$0.2\text{mm} \leq T \leq E$

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.