Mounting

Standard Land Dimensions

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Soldering Methods</th>
<th>Dimensions (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Chip (LxW)</td>
</tr>
<tr>
<td>NCP03</td>
<td>Reflow Soldering</td>
<td>0.6x0.3</td>
</tr>
<tr>
<td>NCP15/NCU15</td>
<td>Reflow Soldering</td>
<td>1.0x0.5</td>
</tr>
<tr>
<td>NCP18</td>
<td>Flow Soldering</td>
<td>1.6x0.8</td>
</tr>
<tr>
<td></td>
<td>Reflow Soldering</td>
<td></td>
</tr>
<tr>
<td>NCU18</td>
<td>Flow Soldering</td>
<td>1.6x0.8</td>
</tr>
<tr>
<td></td>
<td>Reflow Soldering</td>
<td></td>
</tr>
<tr>
<td>NCP21</td>
<td>Flow Soldering</td>
<td>2.0x1.25</td>
</tr>
<tr>
<td></td>
<td>Reflow Soldering</td>
<td></td>
</tr>
</tbody>
</table>

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.

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, NCU15 Series
Allowable Reflow Soldering Temp. and Time

NCP18/21 Series, NCU18 Series
Allowable Flow Soldering Temp. and Time

Continued on the following page.
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.)
- M705-221BMS-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.

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.

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Solder Paste Thickness</th>
<th>T</th>
</tr>
</thead>
<tbody>
<tr>
<td>NCP03</td>
<td>100μm</td>
<td>1/3E≤T≤E</td>
</tr>
<tr>
<td>NCP15, NCU15</td>
<td>150μm</td>
<td>1/3E≤T≤E</td>
</tr>
<tr>
<td>NCP18/NCP21, NCU18</td>
<td>200μm</td>
<td>0.2mm≤T≤E</td>
</tr>
</tbody>
</table>

Reference: Optimum Solder Amount

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.