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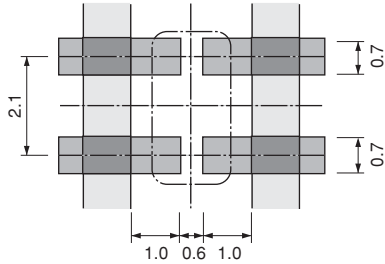


### 1. Standard Land Pattern Dimensions

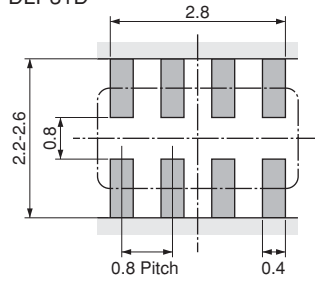
 Land Pattern + Solder Resist  
 Land Pattern  
 Solder Resist (in mm)

DLM11S  
 DLM11G  
 DLP0QS  
 DLP0NS  
 DLP11S  
 DLP11R  
 DLP11T  
 DLP1ND  
 DLP2AD  
 DLP31S  
 DLP31D  
 DLW21S  
 DLW21H  
 DLW31SN  
 DLW43S  
 DLW44S  
 DLW5A  
 DLW5B

●Reflow and Flow  
DLP31S

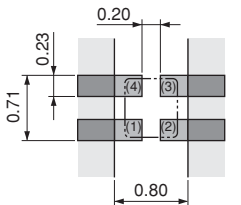


DLP31D

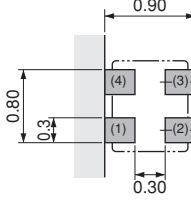


●Reflow Soldering

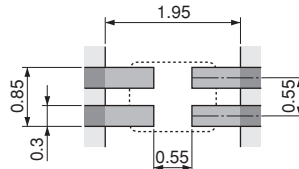
DLP0QS



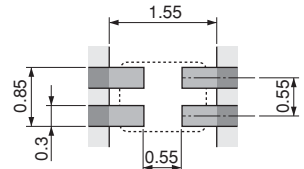
DLP0NS



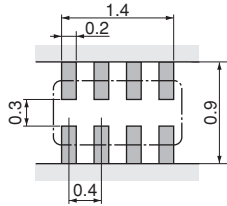
DLP11S/DLM11S



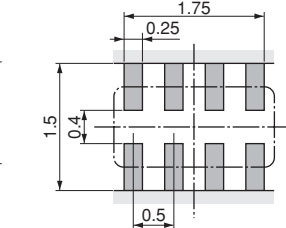
DLP11R/11T



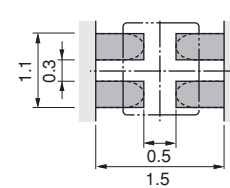
DLP1ND



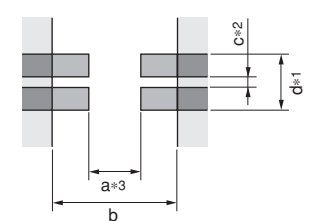
DLP2AD



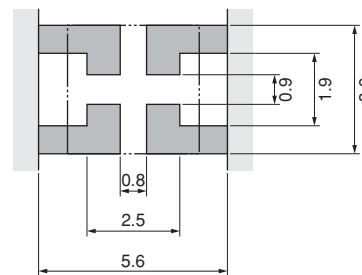
DLM11G



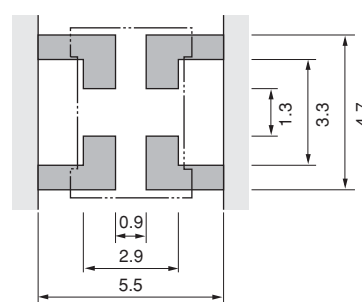
DLW21S/21H/31SN/43S



DLW44S



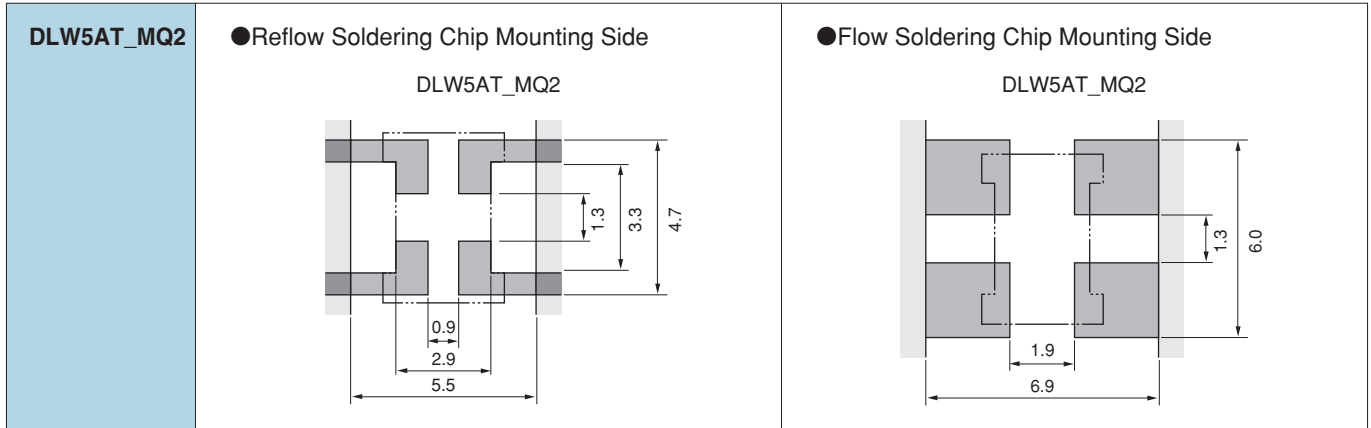
DLW5A/5B (Except for DLW5AT\_MQ2)



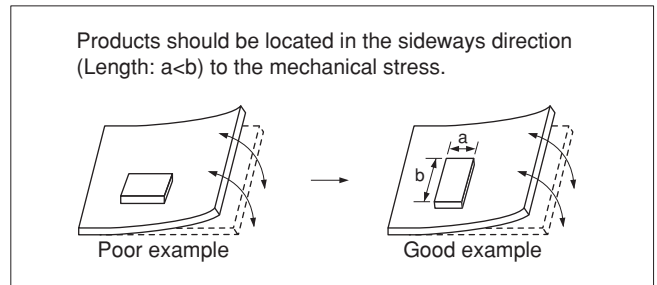
Series	a	b	c	d
DLW21S/H	0.8	2.6	0.4	1.2
DLW31SN	1.6	3.7	0.4	1.6
DLW43SH110/220/510	3.0	5.9	1.6	3.4
DLW43SH101	3.2	5.9	1.6	3.4

- \*1: If the pattern is made with wider than 1.2mm (DLW21) / 1.6mm (DLW31S) it may result in components turning around, because melting speed is different. In the worst case, short circuit between lines may occur.
- \*2: If the pattern is made with less than specified dimensions, in the worst case, short circuit between lines may occur due to spread of soldering paste or mount placing accuracy.
- \*3: If the pattern is made with wider than 0.8mm (DLW21) / 1.6mm (DLW31SN), the bending strength will be reduced. Do not use gild pattern; excess soldering heat may dissolve metal of a copper wire.

Land Pattern + Solder Resist  
 Land Pattern  
 Solder Resist (in mm)



- PCB Warping  
PCB should be designed so that products are not subjected to the mechanical stress caused by warping the board.



**2. Solder Paste Printing and Adhesive Application**

When reflow soldering the chip common mode choke coils, the printing must be conducted in accordance with the following cream solder printing conditions.

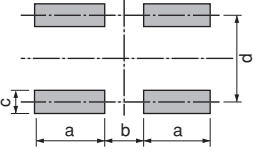
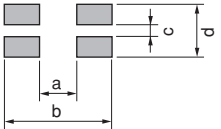
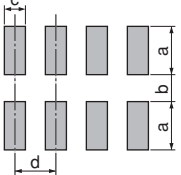
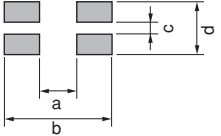
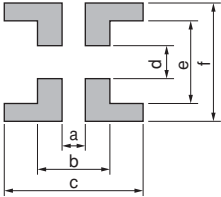
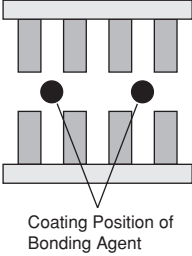
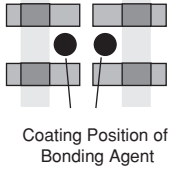
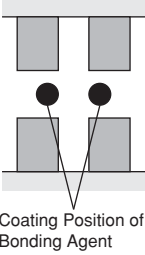
If too much solder is applied, the chip will be prone to damage by mechanical and thermal stress from the PCB and may crack.

Standard land dimensions should be used for resist and copper foil patterns.

When flow soldering the chip common mode choke coils, apply the adhesive in accordance with the following conditions.

If too much adhesive is applied, then it may overflow into the land or termination areas and yield poor solderability. In contrast, if insufficient adhesive is applied, or if the adhesive is not sufficiently hardened, then the chip may become detached during flow soldering process.

(in mm)

Series	Solder Paste Printing	Adhesive Application																																																																																																						
<b>DLP</b> <b>DLW</b> <b>DLM</b>	<p>●Guideline of solder paste thickness:                      80-100µm: DLP0QS                      100-150µm: DLW21S/21H/31S, DLP0NS/11S/11R/11T/1ND/2AD/                      DLM11S/11G                      150µm: DLW43S                      150-200µm: DLP31D/31S, DLW44S/5A/5B</p> <p>*Solderability is subject to reflow conditions and thermal conductivity.                      Please make sure that your product has been evaluated in view of your specifications with our product being mounted to your product.</p> <p>DLP0QS/0NS/11S/11R/11T/31S/DLM11S/11G</p>  <table border="1"> <thead> <tr> <th>Series</th> <th>a</th> <th>b</th> <th>c</th> <th>d</th> </tr> </thead> <tbody> <tr> <td><b>DLP0QS</b></td> <td>0.3</td> <td>0.2</td> <td>0.23</td> <td>0.48</td> </tr> <tr> <td><b>DLP0NS</b></td> <td>0.3</td> <td>0.3</td> <td>0.3</td> <td>0.5</td> </tr> <tr> <td><b>DLM11S/DLP11S</b></td> <td>0.7</td> <td>0.55</td> <td>0.3</td> <td>0.55</td> </tr> <tr> <td><b>DLP11R/T</b></td> <td>0.5</td> <td>0.55</td> <td>0.3</td> <td>0.55</td> </tr> <tr> <td><b>DLP31S</b></td> <td>1.0</td> <td>0.6</td> <td>0.7</td> <td>2.1</td> </tr> <tr> <td><b>DLM11G</b></td> <td>0.5</td> <td>0.5</td> <td>0.4</td> <td>0.7</td> </tr> </tbody> </table> <p>DLW21S/21H/31S</p>  <table border="1"> <thead> <tr> <th>Series</th> <th>a</th> <th>b</th> <th>c</th> <th>d</th> </tr> </thead> <tbody> <tr> <td><b>DLW21S/H</b></td> <td>0.8</td> <td>2.6</td> <td>0.5</td> <td>1.2</td> </tr> <tr> <td><b>DLW31S</b></td> <td>1.6</td> <td>3.7</td> <td>0.4</td> <td>1.6</td> </tr> </tbody> </table> <p>DLP1ND/2AD/31D</p>  <table border="1"> <thead> <tr> <th>Series</th> <th>a</th> <th>b</th> <th>c</th> <th>d</th> </tr> </thead> <tbody> <tr> <td><b>DLP1ND</b></td> <td>0.3</td> <td>0.3</td> <td>0.2</td> <td>0.4</td> </tr> <tr> <td><b>DLP2AD</b></td> <td>0.55</td> <td>0.4</td> <td>0.25</td> <td>0.5</td> </tr> <tr> <td><b>DLP31D</b></td> <td>1.0</td> <td>0.8</td> <td>0.4</td> <td>0.8</td> </tr> </tbody> </table> <p>DLW43S</p>  <table border="1"> <thead> <tr> <th>Series</th> <th>a</th> <th>b</th> <th>c</th> <th>d</th> </tr> </thead> <tbody> <tr> <td rowspan="2"><b>DLW43S</b></td> <td>3.0 (110/220/510)</td> <td rowspan="2">5.9</td> <td rowspan="2">1.6</td> <td rowspan="2">3.4</td> </tr> <tr> <td>3.2 (101)</td> </tr> </tbody> </table> <p>DLW44S/5A/5B</p>  <table border="1"> <thead> <tr> <th>Series</th> <th>a</th> <th>b</th> <th>c</th> <th>d</th> <th>e</th> <th>f</th> </tr> </thead> <tbody> <tr> <td><b>DLW44S</b></td> <td>0.8</td> <td>2.5</td> <td>5.6</td> <td>0.9</td> <td>1.9</td> <td>3.9</td> </tr> <tr> <td><b>DLW5A/5B</b></td> <td>0.9</td> <td>2.9</td> <td>5.5</td> <td>1.3</td> <td>3.3</td> <td>4.7</td> </tr> </tbody> </table>	Series	a	b	c	d	<b>DLP0QS</b>	0.3	0.2	0.23	0.48	<b>DLP0NS</b>	0.3	0.3	0.3	0.5	<b>DLM11S/DLP11S</b>	0.7	0.55	0.3	0.55	<b>DLP11R/T</b>	0.5	0.55	0.3	0.55	<b>DLP31S</b>	1.0	0.6	0.7	2.1	<b>DLM11G</b>	0.5	0.5	0.4	0.7	Series	a	b	c	d	<b>DLW21S/H</b>	0.8	2.6	0.5	1.2	<b>DLW31S</b>	1.6	3.7	0.4	1.6	Series	a	b	c	d	<b>DLP1ND</b>	0.3	0.3	0.2	0.4	<b>DLP2AD</b>	0.55	0.4	0.25	0.5	<b>DLP31D</b>	1.0	0.8	0.4	0.8	Series	a	b	c	d	<b>DLW43S</b>	3.0 (110/220/510)	5.9	1.6	3.4	3.2 (101)	Series	a	b	c	d	e	f	<b>DLW44S</b>	0.8	2.5	5.6	0.9	1.9	3.9	<b>DLW5A/5B</b>	0.9	2.9	5.5	1.3	3.3	4.7	<p>■ <b>DLP31S/DLP31D/ DLW5AT_MQ2</b> Apply 0.3mg of bonding agent at each chip.</p> <p><b>DLP31D</b></p>  <p>Coating Position of Bonding Agent</p> <p><b>DLP31S</b></p>  <p>Coating Position of Bonding Agent</p> <p><b>DLW5AT_MQ2</b></p>  <p>Coating Position of Bonding Agent</p>
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**3. Standard Soldering Conditions**

(1) Soldering Methods

Use flow and reflow soldering methods only.  
 Use standard soldering conditions when soldering chip common mode choke coils.  
 In cases where several different parts are soldered, each having different soldering conditions, use those conditions requiring the least heat and minimum time.

Solder: Use Sn-3.0Ag-0.5Cu solder. Use of Sn-Zn based solder will deteriorate performance of products.  
 If using DLP/DLM series with Sn-Zn based solder, please contact Murata in advance.

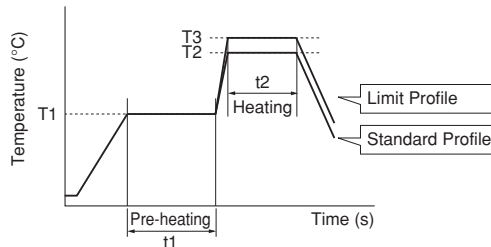
Flux:

- Use Rosin-based flux.  
 In case of DLW21/31 series, use Rosin-based flux with converting chlorine content of 0.06 to 0.1wt%.  
 In case of using RA type solder, products should be cleaned completely with no residual flux.
- Do not use strong acidic flux (with chlorine content exceeding 0.20wt%)
- Do not use water-soluble flux.

For additional mounting methods, please contact Murata.

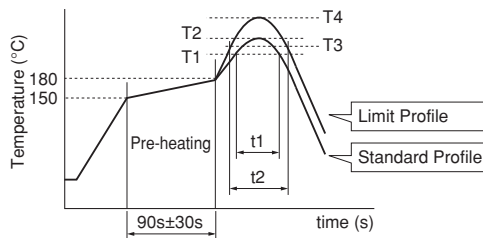
(2) Soldering Profile

● Flow Soldering Profile  
 (Sn-3.0Ag-0.5Cu Solder)



Series	Pre-heating		Standard Profile			Limit Profile		
	Temp. (T1)	Time. (t1)	Heating		Cycle of Flow	Heating		Cycle of Flow
			Temp. (T2)	Time. (t2)		Temp. (T3)	Time. (t2)	
<b>DLW5AT_MQ2</b> <b>DLP31D/31S</b>	150°C	60s min.	250°C	4 to 6s	2 times max.	265±3°C	5s max.	2 times max.

● Reflow Soldering Profile  
 (Sn-3.0Ag-0.5Cu Solder)



Series	Standard Profile				Limit Profile			
	Heating		Peak Temperature (T2)	Cycle of Reflow	Heating		Peak Temperature (T4)	Cycle of Reflow
	Temp. (T1)	Time. (t1)			Temp. (T3)	Time. (t2)		
<b>DLM/DLP</b> <b>DLW21/31</b>	220°C min.	30 to 60s	245±3°C	2 times max.	230°C min.	60s max.	260°C/10s	2 times max.
<b>DLW43S</b>	220°C min.	30 to 60s	245±3°C	2 times max.	240°C min.	30s max.	260°C/10s	2 times max.
<b>DLW44S/5A/5B</b>	220°C min.	30 to 60s	250±3°C	2 times max.	230°C min.	60s max.	260°C/10s	2 times max.

**(3) Reworking with Solder Iron**

The following conditions must be strictly followed when using a soldering iron.

Pre-heating: 150°C 60s min.

Soldering iron power output / Tip diameter:

30W max. / ø3mm max.

Temperature of soldering iron tip / Soldering time / Times:

350°C max. / 3-4s / 2 times\*<sup>1</sup>

\*<sup>1</sup> DLP0QS, DLP0NS, DLP11S, DLP11T, DLP1ND,

DLP2AD: 380°C max. / 3-4s / 2 times

DLW43S: 350°C max. / 3s / 2 times

Do not allow the tip of the soldering iron to directly contact the chip.

For additional methods of reworking with a soldering iron, please contact Murata engineering.

**4. Cleaning**

Following conditions should be observed when cleaning chip EMI filter.

(1) Cleaning Temperature: 60°C max. (40°C max. for alcohol type cleaner)

(2) Ultrasonic

Output: 20W/liter max.

Duration: 5 minutes max.

Frequency: 28 to 40kHz

(3) Cleaning agent

The following list of cleaning agents have been tested on the individual components. Evaluation of final assembly should be completed prior to production.

Do not clean DLW (Except for DLW21H) series.

Before cleaning, please contact Murata engineering.

(a) Alcohol cleaning agent

Isopropyl alcohol (IPA)

(b) Aqueous cleaning agent

Pine Alpha ST-100S

(4) Ensure that flux residue is completely removed.

Component should be thoroughly dried after aqueous agent has been removed with deionized water.