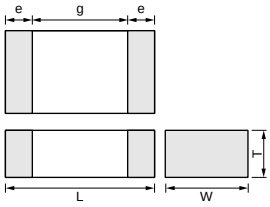
Chip Monolithic Ceramic Capacitors

AC250V Type (Which Meet Japanese Low)

■ Features

1. Chip monolitic ceramic capacitor for AC line.
2. A new monolithic structure for small, high-capacitance capable of operating at high-voltage levels.
3. Sn-plated external electrodes realize good solderability.
4. Only for Reflow soldering.
5. Capacitance 0.01 to 0.1 uF for connecting lines and 470 to 4700 pF for connecting line to earth.



Part Number	Dimensions (mm)				
	L	W	T	e min.	g min.
GA252D	5.7 ±0.4	2.8 ±0.3	2.0 ±0.3	0.3	3.5
GA255D		5.0 ±0.4			

■ Applications

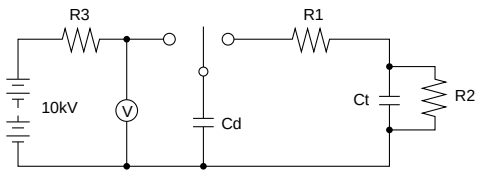
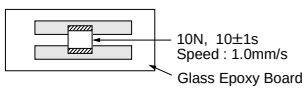
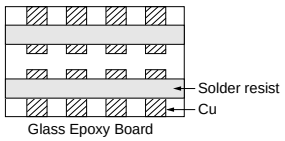
Noise suppression filters for switching power supplies, telephones, facsimiles, modems.

■ Refference srandard

JIS C 5102
JIS C 5150
The standards of the electrical appliance and material safety law of Japan, separated table 4.

Part Number	Rated Voltage (V)	TC Code	Capacitance	Length L (mm)	Width W (mm)	Thickness T (mm)	Electrode g (mm)	Electrode e (mm)
GA252DB3E2471MY02L	AC250 (r.m.s.)	B	470pF +20,-20%	5.7	2.8	2.0	3.5 min.	0.3 min.
GA252DB3E2102MY02L	AC250 (r.m.s.)	B	1000pF +20,-20%	5.7	2.8	2.0	3.5 min.	0.3 min.
GA252DB3E2222MY02L	AC250 (r.m.s.)	B	2200pF +20,-20%	5.7	2.8	2.0	3.5 min.	0.3 min.
GA252DB3E2472MY02L	AC250 (r.m.s.)	B	4700pF +20,-20%	5.7	2.8	2.0	3.5 min.	0.3 min.
GA252DB3E2103MY02L	AC250 (r.m.s.)	B	10000pF +20,-20%	5.7	2.8	2.0	3.5 min.	0.3 min.
GA252DB3E2223MY02L	AC250 (r.m.s.)	B	22000pF +20,-20%	5.7	2.8	2.0	3.5 min.	0.3 min.
GA252DB3E2473MY02L	AC250 (r.m.s.)	B	47000pF +20,-20%	5.7	2.8	2.0	3.5 min.	0.3 min.
GA255DB3E2104MY02L	AC250 (r.m.s.)	B	0.1μF +20,-20%	5.7	5.0	2.0	3.5 min.	0.3 min.

Specifications and Test Methods

No.	Item		Specification	Test Method
1	Operating Temperature Range		−25 to +85℃	−
2	Appearance		No defects or abnormalities.	Visual inspection.
3	Dimensions		Within the specified dimensions.	Using calipers.
4	Dielectric Strength		No defects or abnormalities.	No failure shall be observed when voltage as table is applied between the terminations for 60±1 s, provided the charge/discharge current is less than 50mA. Nominal Capacitance: Test voltage C≧10,000pF: AC575V (r.m.s.) C<10,000pF: AC1500V (r.m.s.)
5	Insulation Resistance (I.R.)		More than 2,000MΩ	The insulation resistance shall be measured with 500±50V and within 60±5 s of charging.
6	Capacitance		Within the specified tolerance.	The capacitance/D.F. shall be measured at 20℃ at a frequency of 1±0.2kHz and a voltage of 1±0.2V (r.m.s.) •Pretreatment Perform a heat treatment at 150 $^{+0}_{-10}$℃ for 60±5 min and then let sit for 24±2 h at room condition.
7	Dissipation Factor (D.F.)		0.025 max.	
8	Capacitance Temperature Characteristics		Cap. Change Within ±10%	The range of capacitance change compared with the 20℃ value within −25 to +85℃ shall be within the specified range. •Pretreatment Perform a heat treatment at 150 $^{+0}_{-10}$℃ for 60±5 min and then let sit for 24±2 h at room condition.
9	Discharge Test (Application: Nominal Capacitance C<10,000pF)	Appearance	No defects or abnormalities.	As in Fig., discharge is made 50 times at 5 s intervals from the capacitor(Cd) charged at DC voltage of specified.  Ct : Capacitor under test Cd : 0.001μF R1 : 1,000Ω R2 : 100MΩ R3 : Surge resistance
10	Adhesive Strength of Termination		No removal of the terminations or other defects shall occur.	Solder the capacitor to the testing jig (glass epoxy board) shown in Fig.1 using a eutectic solder. Then apply 10N force in the direction of the arrow. The soldering shall be done either with an iron or using the reflow method and shall be conducted with care so that the soldering is uniform and free of defects such as heat shock.  Fig.1
11	Vibration Resistance	Appearance	No defects or abnormalities.	Solder the capacitor to the test jig (glass epoxy board). The capacitor shall be subjected to a simple harmonic motion having a total amplitude of 1.5mm, the frequency being varied uniformly between the approximate limits of 10 and 55Hz. The frequency range, from 10 to 55Hz and return to 10Hz, shall be traversed in approximately 1 min. This motion shall be applied for a period of 2 h in each 3 mutually perpendicular directions (total of 6 h). 
		Capacitance	Within the specified tolerance.	
		D.F.	0.025 max.	

"Room condition" Temperature : 15 to 35℃, Relative humidity : 45 to 75%, Atmosphere pressure : 86 to 106kPa

Continued on the following page.

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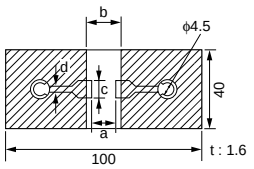
Specifications and Test Methods

Continued from the preceding page.

<table>
<tr><th>No.</th><th colspan="2">Item</th><th>Specification</th><th>Test Method</th></tr>
<tr><td>12</td><td colspan="2">Deflection</td><td>No cracking or marking defects shall occur.
 

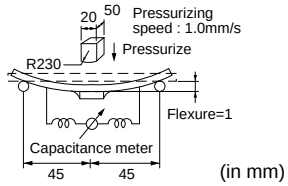
<table>
<tr><th rowspan="2">L×W (mm)</th><th colspan="4">Dimension (mm)</th></tr>
<tr><th>a</th><th>b</th><th>c</th><th>d</th></tr>
<tr><td>5.7×2.8</td><td>4.5</td><td>8.0</td><td>3.2</td><td rowspan="2">1.0</td></tr>
<tr><td>5.7×5.0</td><td>4.5</td><td>8.0</td><td>5.6</td></tr>
</table>
Fig.2</td><td>Solder the capacitor to the testing jig (glass epoxy board) shown in Fig.2 using a eutectic solder. Then apply a force in the direction shown in Fig. 3. The soldering shall be done either with an iron or using the reflow method and shall be conducted with care so that the soldering is uniform and free of defects such as heat shock.
 

Fig.3</td></tr>
<tr><td>13</td><td colspan="2">Solderability of Termination</td><td>75% of the terminations are to be soldered evenly and continuously.</td><td>Immerse the capacitor in a solution of ethanol (JIS-K-8101) and rosin (JIS-K-5902) (25% rosin in weight proportion).
Immerse in eutectic solder solution for 2±0.5 s at 235±5℃.
Immersing speed : 25±2.5mm/s</td></tr>
<tr><td rowspan="5">14</td><td rowspan="5">Humidity Insulation</td><td>Appearance</td><td>No marking defects.</td><td rowspan="5">The capacitor shall be subjected to 40±2℃, relative humidity of 90 to 98% for 8 h, and then removed in room condition for 16 h until 5 cycles.</td></tr>
<tr><td>Capacitance Change</td><td>Within ±15%</td></tr>
<tr><td>D.F.</td><td>0.05 max.</td></tr>
<tr><td>I.R.</td><td>More than 1,000MΩ</td></tr>
<tr><td>Dielectric Strength</td><td>Pass the item No.4.</td></tr>
<tr><td rowspan="5">15</td><td rowspan="5">Resistance to Soldering Heat</td><td>Appearance</td><td>No marking defects.</td><td rowspan="5">Preheat the capacitor as table.
Immerse the capacitor in eutectic solder solution at 260±5℃ for 10±1 s. Let sit at room condition for 24±2 h, then measure.
•Immersing speed : 25±2.5mm/s
•Pretreatment
Perform a heat treatment at 150 $^{+10}_{-0}$℃ for 60±5 min and then let sit for 24±2 h at room condition.

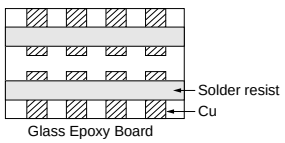
✻Preheating
<table>
<tr><th>Step</th><th>Temperature</th><th>Time</th></tr>
<tr><td>1</td><td>100℃ to 120℃</td><td>1 min</td></tr>
<tr><td>2</td><td>170℃ to 200℃</td><td>1 min</td></tr>
</table></td></tr>
<tr><td>Capacitance Change</td><td>Within ±10%</td></tr>
<tr><td>D.F.</td><td>0.025 max.</td></tr>
<tr><td>I.R.</td><td>More than 2,000MΩ</td></tr>
<tr><td>Dielectric Strength</td><td>Pass the item No.4.</td></tr>
<tr><td rowspan="5">16</td><td rowspan="5">Temperature Cycle</td><td>Appearance</td><td>No marking defects.</td><td rowspan="5">Fix the capacitor to the supporting jig (glass epoxy board) shown in Fig.4 using a eutectic solder.
Perform the five cycles according to the four heat treatments listed in the following table.
Let sit for 24±2 h at room condition, then measure.
<table>
<tr><th>Step</th><th>Temperature (℃)</th><th>Time (min)</th></tr>
<tr><td>1</td><td>Min. Operating Temp.±3</td><td>30±3</td></tr>
<tr><td>2</td><td>Room Temp.</td><td>2 to 3</td></tr>
<tr><td>3</td><td>Max. Operating Temp.±2</td><td>30±3</td></tr>
<tr><td>4</td><td>Room Temp.</td><td>2 to 3</td></tr>
</table>
•Pretreatment
Perform a heat treatment at 150 $^{+10}_{-0}$℃ for 60±5 min and then let sit for 24±2 h at room condition.
 

Fig.4</td></tr>
<tr><td>Capacitance Change</td><td>Within ±7.5%</td></tr>
<tr><td>D.F.</td><td>0.025 max.</td></tr>
<tr><td>I.R.</td><td>More than 2,000MΩ</td></tr>
<tr><td>Dielectric Strength</td><td>Pass the item No.4.</td></tr>
</table>

"Room condition" Temperature : 15 to 35℃, Relative humidity : 45 to 75%, Atmosphere pressure : 86 to 106kPa

Continued on the following page.

Specifications and Test Methods

Continued from the preceding page.

No.	Item		Specification	Test Method
17	Humidity (Steady State)	Appearance	No marking defects.	Sit the capacitor at 40±2℃ and relative humidity 90 to 95% for 500^{+24}_{0} h. Remove and let sit for 24±2 h at room condition, then measure. •Pretreatment Perform a heat treatment at 150^{+0}_{-10}℃ for 60±5 min and then let sit for 24±2 h at room condition.
		Capacitance Change	Within ±15%	
		D.F.	0.05 max.	
		I.R.	More than 1,000MΩ	
		Dielectric Strength	Pass the item No.4.	
18	Life	Appearance	No marking defects.	Apply voltage and time as Table at 85±2℃. Remove and let sit for 24 ±2 h at room condition, then measure. The charge / discharge current is less than 50mA. Nominal Capacitance / Test Time / Test voltage C≧10,000pF / $1,000^{+48}_{0}$ h / AC300V (r.m.s.) C<10,000pF / $1,500^{+48}_{0}$ h / AC500V (r.m.s.) * * Except that once each hour the voltage is increased to AC1,000V (r.m.s.) for 0.1 s •Pretreatment Apply test voltage for 60±5 min at test temperature. Remove and let sit for 24±2 h at room condition.
		Capacitance Change	Within ±15%	
		D.F.	0.05 max.	
		I.R.	More than 1,000MΩ	
		Dielectric Strength	Pass the item No.4.	
19	Humidity Loading	Appearance	No marking defects.	Apply the rated voltage at 40±2℃ and relative humidity 90 to 95% for 500^{+24}_{0} h. Remove and let sit for 24±2 h at room condition, then measure. •Pretreatment Apply test voltage for 60±5 min at test temperature. Remove and let sit for 24±2 h at room condition.
		Capacitance Change	Within ±15%	
		D.F.	0.05 max.	
		I.R.	More than 1,000MΩ	
		Dielectric Strength	Pass the item No.4.	

"Room condition" Temperature : 15 to 35℃, Relative humidity : 45 to 75%, Atmosphere pressure : 86 to 106kPa