ChipGuard® MLA Series Varistor ESD Clamp Protectors

Features
- 0402 and 0603 package options
- Rated for IEC 61000-4-2, level 4
- Withstands multiple ESD strikes
- Low capacitance and leakage currents for invisible load protection
- Tape and reel packaging
- Lead free

Description
The ChipGuard® CG0402MLA and CG0603MLA Series are based on a multilayer metal oxide technology. The MLA family is designed to protect sensitive electronic circuits from the threat of electrostatic discharge ESD. The MLA series is available from 5.5 V to 26 V DC working voltages.

The wide operating voltage and temperature range makes this family ideally suited to IC power supplies, signal and control line protection.

Electrical Characteristics @ 25 °C (unless otherwise noted)

<table>
<thead>
<tr>
<th>Model</th>
<th>Vrms (V)</th>
<th>VDC (V)</th>
<th>VN Min. (V)</th>
<th>VN Max. (V)</th>
<th>VC (V)</th>
<th>ITM (Max.) (A)</th>
<th>WTM (Max.) (J)</th>
<th>CP (pF) Typ.</th>
</tr>
</thead>
<tbody>
<tr>
<td>CG0402MLA-5.5MG</td>
<td>&lt;50 μA</td>
<td>4</td>
<td>5.5</td>
<td>8.0</td>
<td>18.0</td>
<td>24</td>
<td>0.05</td>
<td>270</td>
</tr>
<tr>
<td>CG0402MLA-14LG</td>
<td>11</td>
<td>14</td>
<td>15.3</td>
<td>20.7</td>
<td>30</td>
<td>20</td>
<td>0.05</td>
<td>100</td>
</tr>
<tr>
<td>CG0402MLA-18KG</td>
<td>14</td>
<td>18</td>
<td>23.0</td>
<td>33.0</td>
<td>45</td>
<td>20</td>
<td>0.05</td>
<td>85</td>
</tr>
<tr>
<td>CG0603MLA-5.5ME</td>
<td>4</td>
<td>5.5</td>
<td>8.0</td>
<td>18.0</td>
<td>24</td>
<td>30</td>
<td>0.1</td>
<td>270</td>
</tr>
<tr>
<td>CG0603MLA-18KE</td>
<td>14</td>
<td>18</td>
<td>23.0</td>
<td>33.0</td>
<td>54</td>
<td>30</td>
<td>0.1</td>
<td>130</td>
</tr>
<tr>
<td>CG0603MLA-26KE</td>
<td>20</td>
<td>26</td>
<td>32.0</td>
<td>42.0</td>
<td>70</td>
<td>30</td>
<td>0.1</td>
<td>100</td>
</tr>
</tbody>
</table>

Environmental Characteristics

Operating Temperature..........................................................-55 °C to +125 °C
Storage Temperature..........................................................-55 °C to +125 °C
Response Time......................................................................<1 ns
Standard...........................................................................IEC 61000-4-2 Level 4

These products are RoHS compliant. There is some lead contained within the glass of the ceramic. This is acceptable under exemption no. 5 of the RoHS directive (DIRECTIVE 2002/95/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 27 January 2003 on the restriction of the use of certain hazardous substances in electrical and electronic equipment).

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Additional Information
Click these links for more information:
PRODUCT SELECTOR TECHNICAL LIBRARY INVENTORY SAMPLES CONTACT

How to Order

CG 0n0n MLA - n.n x x

ChipGuard®
Product Designator
Package Option
0402 = 0402 Package
0603 = 0603 Package
Multilayer Series Designator
Operating Voltage**
5.5 = 5.5 V
14 = 14 V
18 = 18 V
26 = 26 V
Tolerance
K = 10 %
L = 15 %
M = 20 %

Tape & Reel Packaging
E = 4,000 pcs. per reel (CG0603MLA Series)
G = 10,000 pcs. per reel (CG0402MLA Series)
Ni barrier terminations are standard on all ChipGuard® part numbers.
** Only models lower than 10 volts require decimal point.
Voltage-Current Characteristics

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ChipGuard® MLA Series Varistor ESD Clamp Protectors

Product Dimensions

<table>
<thead>
<tr>
<th>Dimension</th>
<th>CG0402MLA Series</th>
<th>CG0603MLA Series</th>
</tr>
</thead>
<tbody>
<tr>
<td>L</td>
<td>1.00 ± 0.15 (0.04 ± 0.006)</td>
<td>1.60 ± 0.20 (0.064 ± 0.008)</td>
</tr>
<tr>
<td>W</td>
<td>0.50 ± 0.10 (0.02 ± 0.004)</td>
<td>0.80 ± 0.20 (0.032 ± 0.008)</td>
</tr>
<tr>
<td>A</td>
<td>0.50 ± 0.10 (0.02 ± 0.004)</td>
<td>0.80 ± 0.20 (0.032 ± 0.008)</td>
</tr>
<tr>
<td>B</td>
<td>0.25 ± 0.15 (0.10 ± 0.006)</td>
<td>0.30 ± 0.20 (0.012 ± 0.008)</td>
</tr>
</tbody>
</table>

Recommended Pad Layout

<table>
<thead>
<tr>
<th>Dim.</th>
<th>CG0402MLA Series</th>
<th>CG0603MLA Series</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>0.51 (0.020)</td>
<td>0.76 (0.030)</td>
</tr>
<tr>
<td>B</td>
<td>0.61 (0.024)</td>
<td>1.02 (0.040)</td>
</tr>
<tr>
<td>C</td>
<td>0.51 (0.020)</td>
<td>0.50 (0.020)</td>
</tr>
<tr>
<td>D</td>
<td>1.70 (0.067)</td>
<td>2.54 (0.100)</td>
</tr>
</tbody>
</table>

Solder Reflow Recommendations

- Preheat Stages 1-3
- Soldering
- Cooling

<table>
<thead>
<tr>
<th>Time (seconds)</th>
<th>Temperature (°C)</th>
</tr>
</thead>
<tbody>
<tr>
<td>110 sec. (min.)</td>
<td>0</td>
</tr>
<tr>
<td>30-70 sec.</td>
<td>300</td>
</tr>
<tr>
<td>120 sec. (min.)</td>
<td>200</td>
</tr>
</tbody>
</table>

- A Stage 1 Preheat
  - Ambient to Preheating Temperature
  - 30 s to 60 s

- B Stage 2 Preheat
  - 140 °C to 160 °C
  - 60 s to 120 s

- C Stage 3 Preheat
  - Preheat to 200 °C
  - 20 s to 40 s

- D Main Heating
  - 200 °C
  - 60 s to 70 s
  - 55 s to 65 s
  - 50 s to 60 s
  - 40 s to 50 s
  - 30 s to 40 s

- E Cooling
  - 200 °C to 100 °C
  - 1 °C/s to 4 °C/s

- This product can be damaged by rapid heating, cooling or localized heating.
- Heat shocks should be avoided. Preheating and gradual cooling recommended.
- Excessive solder can damage the device. Print solder thickness of 150 to 200 um recommended.
- Solder gun tip temperature should be kept below 280 °C and should not touch the device directly. Contact should be less than 3 seconds.
- A solder gun under 30 watts is recommended.
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Packaging Dimensions

NOTES: TAPE MATERIAL IS PAPER.
TAPE THICKNESS IS 0.048 ± 0.003
COVER TAPE ADHESION IS 40 ± 15 GRAMS.

<table>
<thead>
<tr>
<th>Dimension</th>
<th>CG0402MLA Series</th>
<th>CG0603MLA Series</th>
</tr>
</thead>
<tbody>
<tr>
<td>C</td>
<td>1.75 ± 0.05</td>
<td>1.75 ± 0.10</td>
</tr>
<tr>
<td></td>
<td>(0.04 ± 0.002)</td>
<td>(0.04 ± 0.004)</td>
</tr>
<tr>
<td>D</td>
<td>2.00 ± 0.02</td>
<td>2.00 ± 0.05</td>
</tr>
<tr>
<td></td>
<td>(0.08 ± 0.0008)</td>
<td>(0.08 ± 0.002)</td>
</tr>
<tr>
<td>L</td>
<td>1.19 ± 0.05</td>
<td>1.80 ± 0.20</td>
</tr>
<tr>
<td></td>
<td>(0.047 ± 0.002)</td>
<td>(0.072 ± 0.008)</td>
</tr>
<tr>
<td>W</td>
<td>0.69 ± 0.05</td>
<td>0.90 ± 0.20</td>
</tr>
<tr>
<td></td>
<td>(0.027 ± 0.002)</td>
<td>(0.036 ± 0.008)</td>
</tr>
<tr>
<td>G</td>
<td>2.0 ± 0.05</td>
<td>4.0 ± 0.05</td>
</tr>
<tr>
<td></td>
<td>(0.08 ± 0.002)</td>
<td>(0.16 ± 0.002)</td>
</tr>
</tbody>
</table>

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