

BOURNS®

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

Chip Guard® MLD Series Varistor ESD Clamp Protectors

Description

The Chip Guard® CG0402MLD and CG0603MLD Series has been specifically designed to protect sensitive electronic components from electrostatic discharge damage. The MLD family has been designed to protect equipment to IEC61000-4-2, level 4 ESD specifications targeted for high speed data applications. The Chip Guard® MLD Series has been manufactured to provide very low capacitance with excellent clamp qualities, making the family almost transparent under normal working conditions.

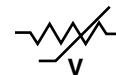
Electrical Characteristics @ 25 °C (unless otherwise noted)

| Model | Continuous Operating Voltage | Breakdown Voltage | Clamping Voltage | Off-state Current | Capacitance |
|---------------|------------------------------|---------------------------|----------------------------------|---------------------|-----------------------|
| | V _{DC} (V) | V _B @ 1 mA (V) | V _C @ 1 A 8/20 μs (V) | I _L (μA) | C _{OFF} (pF) |
| | Max. | Typ. | Max. | Max. | Max. |
| CG0402MLD-12G | 12 | 50 ~ 60 | 140 | 1 | 5 |
| CG0603MLD-12E | 12 | 50 ~ 60 | 140 | 1 | 5 |

Environmental Characteristics

Operating Temperature.....-30 °C to +85 °C
 Storage Temperature-30 °C to +85 °C
 StandardIEC 61000-4-2 Level 4

Device Symbol



Surge Withstand Ratings

| Parameter | Peak Voltage | Repetitions (Min.) |
|---|----------------------|--------------------|
| ESD Voltage Capability, Contact Discharge | 8 kV | 100 at 8 kV |
| ESD Voltage Capability, Air Discharge | 15 kV | 100 at 15 kV |
| Standard | IEC61000-4-2 Level 4 | |

How to Order

CG 0603 MLD - 12 E

Chip Guard®
 Product Designator _____
 Package Option _____
 0402 = 0402 Package
 0603 = 0603 Package
 Multilayer Series Designator _____
 Operating Voltage _____
 12 = 12 V
 Tape & Reel Packaging _____
 E = 4,000 pcs. per reel (CG0603MLD Series)
 G = 10,000 pcs. per reel (CG0402MLD Series)

Ni barrier terminations are standard on all Chip Guard® part numbers.



Reliable Electronic Solutions

Asia-Pacific:
 TEL +886-2 25624117 • FAX +886-2 25624116

Europe:
 TEL +41-41 7685555 • FAX +41-41 7685510

North America:
 TEL +1-909 781-5500 • FAX +1-909 781-5700
 TEL +1-951 781-5500 • FAX +1-951 781-5700 (after 7/17/04)

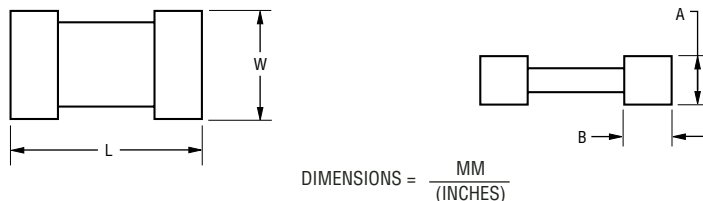
www.bourns.com

Specifications are subject to change without notice.
 Customers should verify actual device performance in their specific applications.

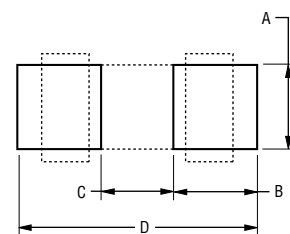
Chip Guard® MLD Series Varistor ESD Clamp Protectors



Product Dimensions



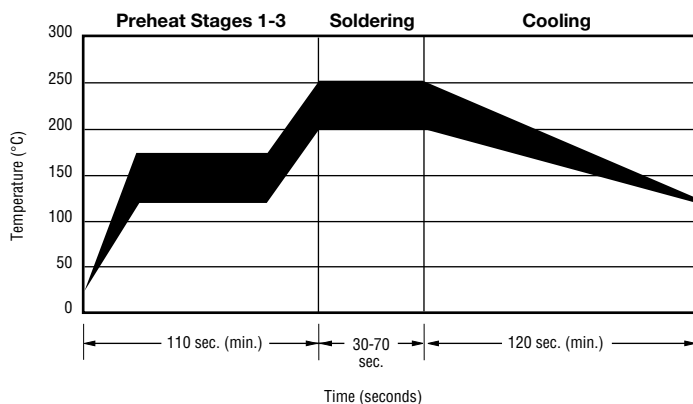
Recommended Pad Layout



| Dimension | CG0402MLD Series | CG0603MLD Series |
|-----------|---|---|
| L | $\frac{1.00 \pm 0.15}{(0.04 \pm 0.006)}$ | $\frac{1.60 \pm 0.20}{(0.064 \pm 0.008)}$ |
| W | $\frac{0.50 \pm 0.10}{(0.02 \pm 0.004)}$ | $\frac{0.80 \pm 0.20}{(0.032 \pm 0.008)}$ |
| A | $\frac{0.50 \pm 0.10}{(0.02 \pm 0.004)}$ | $\frac{0.80 \pm 0.20}{(0.032 \pm 0.008)}$ |
| B | $\frac{0.25 \pm 0.15}{(0.010 \pm 0.006)}$ | $\frac{0.30 \pm 0.20}{(0.012 \pm 0.008)}$ |

| Dim. | CG0402MLD Series | CG0603MLD Series |
|------|------------------------|------------------------|
| A | $\frac{0.51}{(0.020)}$ | $\frac{0.76}{(0.030)}$ |
| B | $\frac{0.61}{(0.024)}$ | $\frac{1.02}{(0.040)}$ |
| C | $\frac{0.51}{(0.020)}$ | $\frac{0.50}{(0.020)}$ |
| D | $\frac{1.70}{(0.067)}$ | $\frac{2.54}{(0.100)}$ |

Solder Reflow Recommendations



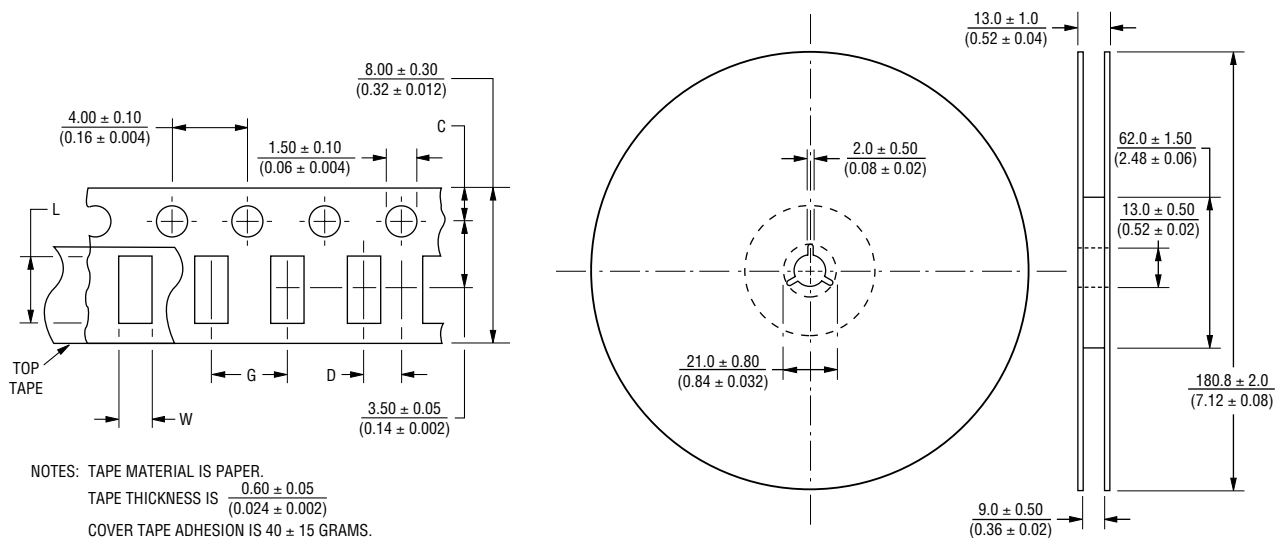
| | | | |
|---|-----------------|--|--|
| A | Stage 1 Preheat | Ambient to Preheating Temperature | 30 s to 60 s |
| B | Stage 2 Preheat | 140 °C to 160 °C | 60 s to 120 s |
| C | Stage 3 Preheat | Preheat to 200 °C | 20 s to 40 s |
| D | Main Heating | 200 °C 210 °C 220 °C 230 °C 240 °C | 60 s to 70 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



| Dimension | CG0402MLD Series | CG0603MLD Series |
|-----------|--|---|
| C | $\frac{1.75 \pm 0.05}{(0.04 \pm 0.002)}$ | $\frac{1.75 \pm 0.10}{(0.04 \pm 0.004)}$ |
| D | $\frac{2.00 \pm 0.02}{(0.08 \pm 0.0008)}$ | $\frac{2.00 \pm 0.05}{(0.08 \pm 0.002)}$ |
| L | $\frac{1.12 \pm 0.03}{(0.045 \pm 0.0012)}$ | $\frac{1.80 \pm 0.20}{(0.072 \pm 0.008)}$ |
| W | $\frac{0.62 \pm 0.03}{(0.025 \pm 0.0012)}$ | $\frac{0.90 \pm 0.20}{(0.036 \pm 0.008)}$ |
| G | $\frac{2.0 \pm 0.05}{(0.08 \pm 0.002)}$ | |