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

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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 cpacitance with excellent clamp qualities, making the family almost transparent under normal working conditions.

Electrical Characteristics @ 25 °C (unless otherwise noted)

Model	Continuous Operating Voltage V_{DC} (V)	Breakdown Voltage V_B @ 1 mA (V)	Clamping Voltage V_C @ 1 A 8/20 µs (V)	Off-state Current I_L (µA)	Capacitance 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
Standard ....IEC 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.

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Chip Guard® MLD Series Varistor ESD Clamp Protectors   BOURNS®

Product Dimensions

$$\text{DIMENSIONS} = \frac{\text{MM}}{\text{(INCHES)}}$$
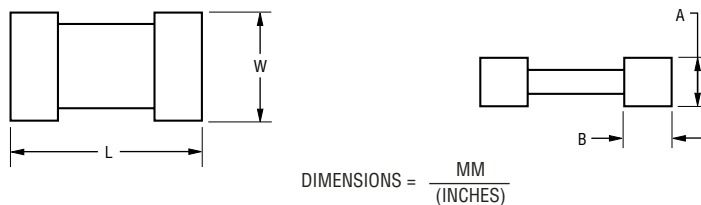
Dimension	CG0402MLD Series	CG0603MLD Series
L	1.00 ± 0.15 (0.04 ± 0.006)	1.60 ± 0.20 (0.064 ± 0.008)
W	0.50 ± 0.10 (0.02 ± 0.004)	0.80 ± 0.20 (0.032 ± 0.008)
A	0.50 ± 0.10 (0.02 ± 0.004)	0.80 ± 0.20 (0.032 ± 0.008)
B	0.25 ± 0.15 (0.010 ± 0.006)	0.30 ± 0.20 (0.012 ± 0.008)

Recommended Pad Layout
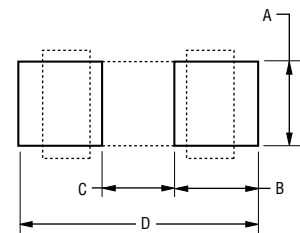
Dim.	CG0402MLD Series	CG0603MLD Series
A	0.51 (0.020)	0.76 (0.030)
B	0.61 (0.024)	1.02 (0.040)
C	0.51 (0.020)	0.50 (0.020)
D	1.70 (0.067)	2.54 (0.100)

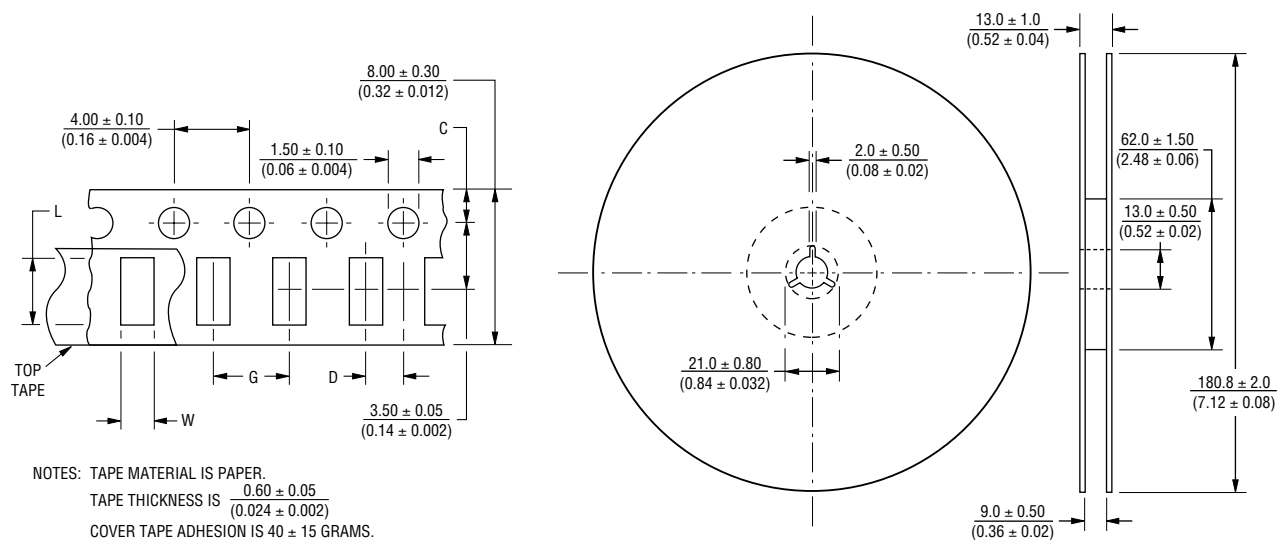## Solder Reflow Recommendations
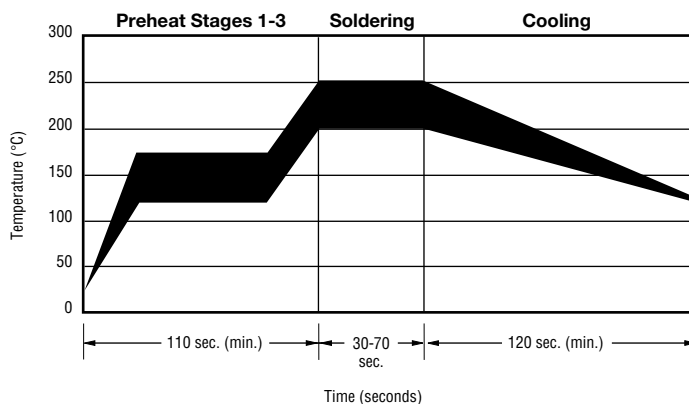
A	Stage 1 Preheat	Ambient to Preheating Temperature	30 s to 60 s
B	Stage 2 Preheat	140 °C to 160 °C	60 s to 120 s
C	Stage 3 Preheat	Preheat to 200 °C	20 s to 40 s
D	Main Heating	200 °C 210 °C 220 °C 230 °C 240 °C	60 s to 70 s 55 s to 65 s 50 s to 60 s 40 s to 50 s 30 s to 40 s
E	Cooling	200 °C to 100 °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.

Packaging Dimensions

8.00 ± 0.30
(0.32 ± 0.012)

4.00 ± 0.10
(0.16 ± 0.004)

1.50 ± 0.10
(0.06 ± 0.004)

C

L

TOP
TAPE

G   D

W

3.50 ± 0.05
(0.14 ± 0.002)

NOTES: TAPE MATERIAL IS PAPER.
TAPE THICKNESS IS $\dfrac{0.60 \pm 0.05}{(0.024 \pm 0.002)}$
COVER TAPE ADHESION IS 40 ± 15 GRAMS.

13.0 ± 1.0
(0.52 ± 0.04)

2.0 ± 0.50
(0.08 ± 0.02)

62.0 ± 1.50
(2.48 ± 0.06)

13.0 ± 0.50
(0.52 ± 0.02)

21.0 ± 0.80
(0.84 ± 0.032)

180.8 ± 2.0
(7.12 ± 0.08)

9.0 ± 0.50
(0.36 ± 0.02)

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