

**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

## ChipGuard® MLA Series Varistor ESD Clamp Protectors

### Description

The ChipGuard® CG0402MLA and CG0603MLA Series is 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.

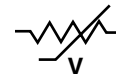
### Electrical Characteristics @ 25 °C (unless otherwise noted)

Model	V <sub>rms</sub> (V)	V <sub>DC</sub> (V)	V <sub>N</sub> Min. (V)	V <sub>N</sub> Max. (V)	V <sub>C</sub> (V)	I <sub>TM</sub> (Max.) (A)	W <sub>TM</sub> (Max.) (J)	C <sub>p</sub> (pF) Typ.
	<50 µA		1 mA DC		1 A @ 8/20 µs	@ 8/20 µs	10/1000 µs	1 V <sub>rms</sub> @ 1 MHz
CG0402MLA-5.5MG	4	5.5	6.4	9.6	19	20	0.05	300
CG0402MLA-14KG	11	14	16.2	19.8	38	20	0.05	100
CG0402MLA-18KG	14	18	19.8	24.2	45	20	0.05	95
CG0603MLA-5.5ME	4	5.5	6.4	9.6	19	30	0.1	300
CG0603MLA-14KE	11	14	16.2	19.8	35	30	0.1	160
CG0603MLA-18KE	14	18	19.8	24.2	40	30	0.1	140
CG0603MLA-26KE	20	26	27.9	34.1	58	30	0.1	120

### 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

### Device Symbol



### How to Order

**CG 0402 MLA - 5.5 M G**

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 %  
 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.



*Reliable Electronic Solutions*

#### Asia-Pacific:

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#### Europe:

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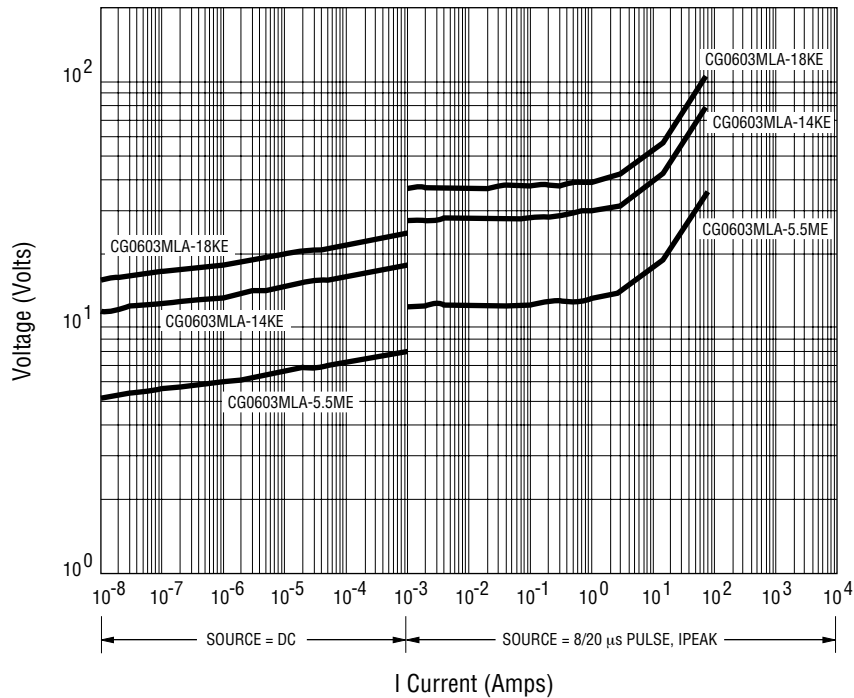
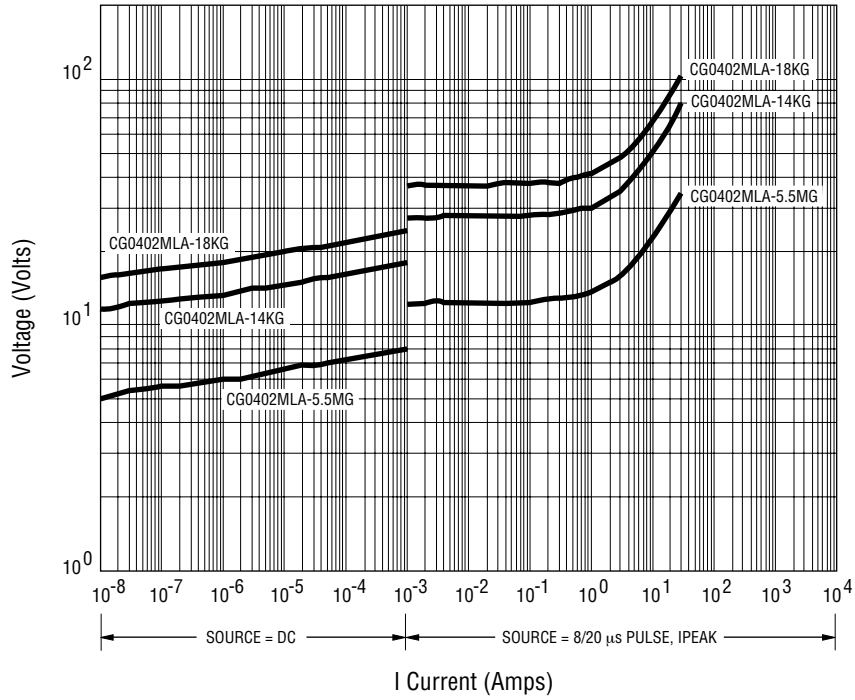
#### North America:

TEL +1-909 781-5500 • FAX +1-909 781-5700

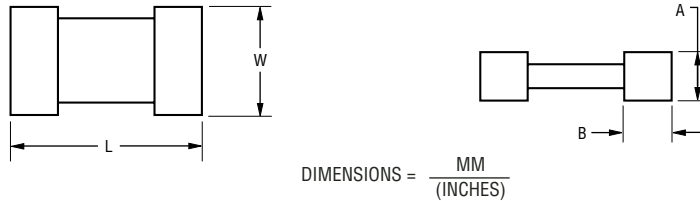
TEL +1-951 781-5500 • FAX +1-951 781-5700 (after 7/17/04)

[www.bourns.com](http://www.bourns.com)

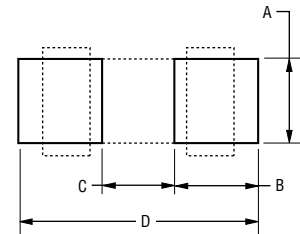
Voltage-Current Characteristics



## Product Dimensions



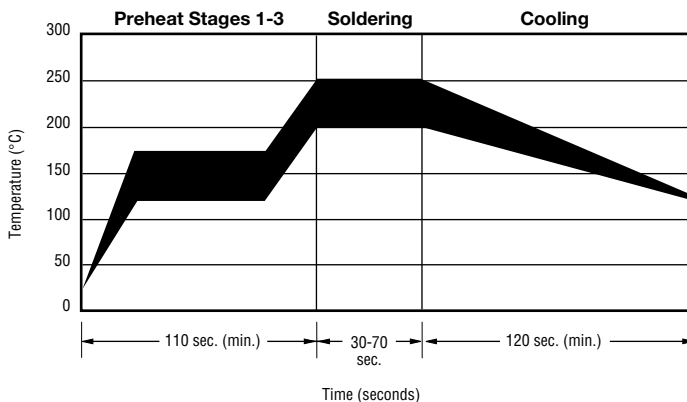
## Recommended Pad Layout



Dimension	CG0402MLA Series	CG0603MLA 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.	CG0402MLA Series	CG0603MLA 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



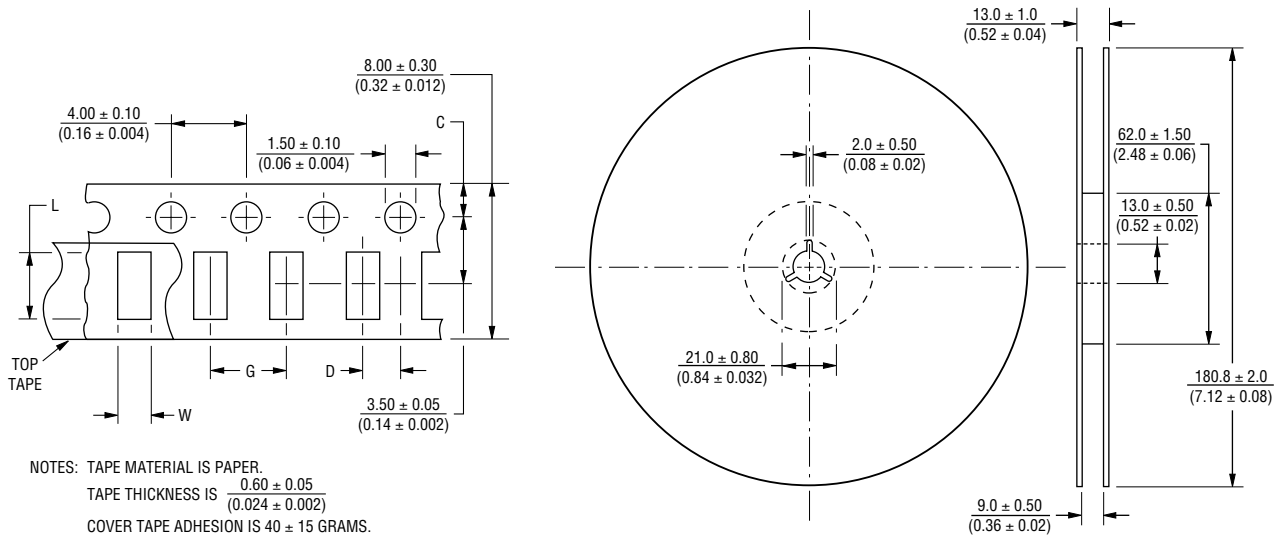
A	Stage 1 Preheat	Ambient to Preheating Temperature	30 s to 60 s
B	Stage 2 Preheat	140 °C to 160 °C	60 s to 120 s
C	Stage 3 Preheat	Preheat to 200 °C	20 s to 40 s
D	Main Heating	200 °C 210 °C 220 °C 230 °C 240 °C	60 s to 70 s 55 s to 65 s 50 s to 60 s 40 s to 50 s 30 s to 40 s
E	Cooling	200 °C to 100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

# ChipGuard® MLA Series Varistor ESD Clamp Protectors



## Packaging Dimensions



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

Dimension	CG0402MLA Series	CG0603MLA 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	$\frac{2.0 \pm 0.05}{(0.08 \pm 0.002)}$	