

**BOURNS®**

## Features

- 0402 and 0603 package options
- Rated for IEC 61000-4-2, for applications requiring up to 18 V DC
- Withstands multiple ESD strikes
- Low capacitance and leakage currents for invisible load protection
- Tape and reel packaging

## ChipGuard® MLE Series Varistor ESD Clamp Protectors

### Description

The ChipGuard® CG0402MLE and CG0603MLE Series has been designed to provide high frequency attenuation, thereby providing suppression and filtering in a single device. The MLE family also offers protection to ESD standards such as IEC61000-4-2 for applications requiring up to 18 V DC and is available in the industry standard 0603 and 0402 type leadless surface mount packaging.

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

Model	Continuous Operating Voltage			Clamping Voltage			Off-state Current					Capacitance
	Vrms (V)	V <sub>DC</sub> (V)		V <sub>CLAMP</sub> (V)			I <sub>L</sub> (uA)					C <sub>P</sub> (pF)
		Max.	Typ.	Max.	Typ.			Max.				
				8 kV Contact	15 kV Air	1 A @ 8/20 μs	3.5 V	5.5 V	9 V	12 V	18 V	1 Vrms @ 1 MHz
CG0402MLE-18G	8.5	12	18	100	120	50	0.3	0.4	0.5	1	10	9
CG0603MLE-18E	8.5	12	18	40	60	60	0.3	0.4	0.5	1	10	50

### 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

### Surge Withstand Ratings

Model	Peak Current 8/20 μs (Max.)	Peak Current @ 8 kV (Max.)
CG0402MLE-18G	15 A	30 A
CG0603MLE-18E	20 A	45 A

### Device Symbol



### How to Order

**CG 0402 MLE - 18 G**

ChipGuard®  
 Product Designator

Package Option  
 0402 = 0402 Package  
 0603 = 0603 Package

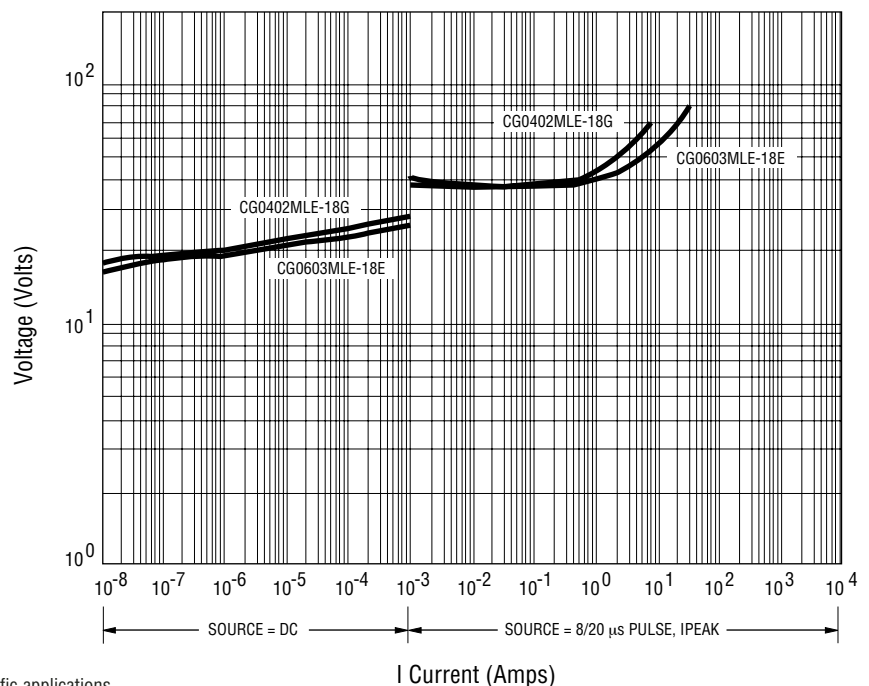
Multilayer Series Designator

Operating Voltage  
 18 = 18 V

Tape & Reel Packaging  
 E = 4,000 pcs. per reel (0603 package)  
 G = 10,000 pcs. per reel (0402 package)

Ni barrier terminations are standard on all ChipGuard® part numbers.

### Voltage-Current Characteristics

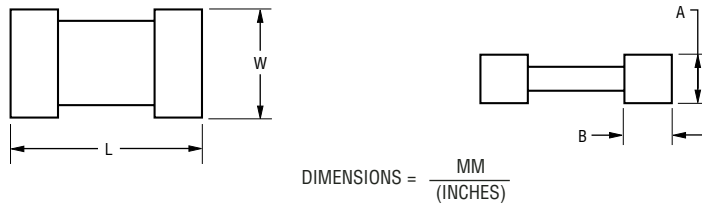


Specifications are subject to change without notice.  
 Customers should verify actual device performance in their specific applications.

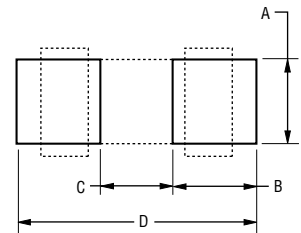
# ChipGuard® MLE Series Varistor ESD Clamp Protectors



## Product Dimensions



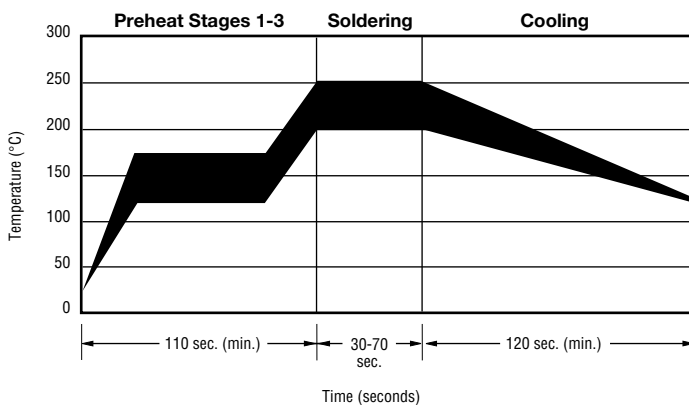
## Recommended Pad Layout



Dimension	CG0402MLE Series	CG0603MLE 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.	CG0402MLE Series	CG0603MLE 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



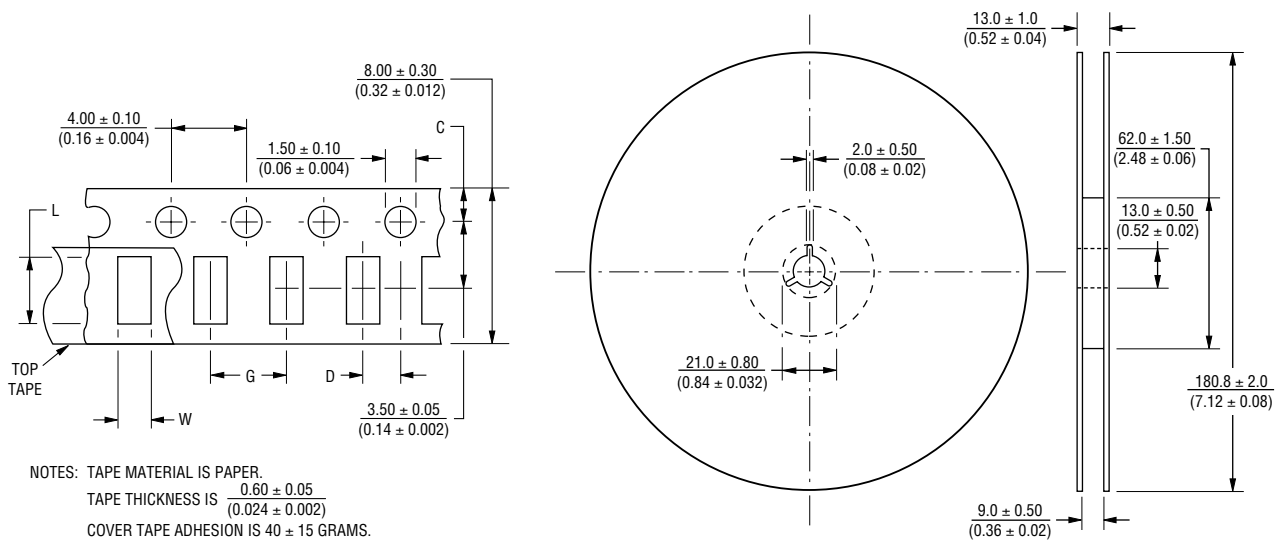
A	Stage 1 Preheat	Ambient to Preheating Temperature	30 s to 60 s
B	Stage 2 Preheat	140 °C to 160 °C	60 s to 120 s
C	Stage 3 Preheat	Preheat to 200 °C	20 s to 40 s
D	Main Heating	200 °C 210 °C 220 °C 230 °C 240 °C	60 s to 70 s 55 s to 65 s 50 s to 60 s 40 s to 50 s 30 s to 40 s
E	Cooling	200 °C to 100 °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	CG0402MLE Series	CG0603MLE 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	$\frac{2.0 \pm 0.05}{(0.08 \pm 0.002)}$	



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