



## 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 have 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)

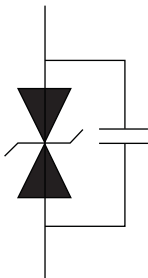
Model	Continuous Operating Voltage			Clamping Voltage	Off-state Current					Capacitance
	$V_{rms}$ (V)	$V_{DC}$ (V)		$V_{CLAMP}$ (V)	$I_L$ ( $\mu A$ )					$C_p$ (pF)
	Max.	Typ.	Max.	Typ.	Max.					Max.
				1 A @ 8/20 $\mu s$	3.5 V	5.5 V	9 V	12 V	18 V	1 $V_{rms}$ @ 1 MHz
CG0402MLE-18G	8.5	12	18	100	0.3	0.4	0.5	1	10	9
CG0603MLE-18E	8.5	12	18	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

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).

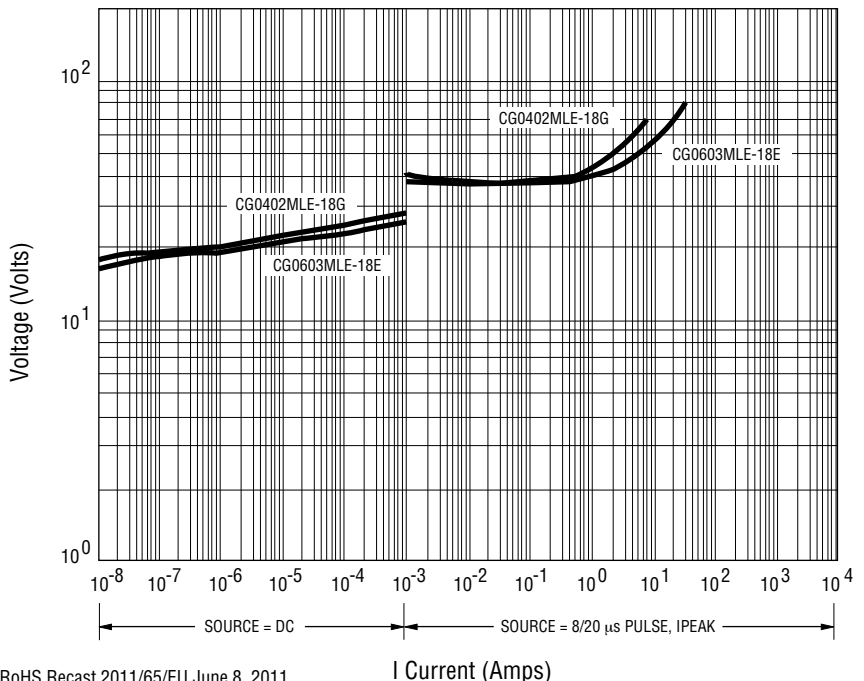
### Schematic



### Surge Withstand Ratings

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

### Voltage-Current Characteristics



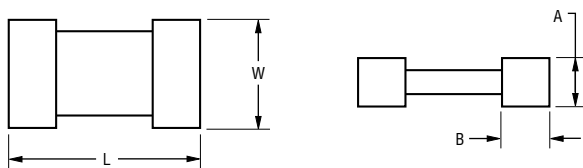
\*RoHS Directive 2002/95/EC Jan. 27, 2003 including annex and RoHS Recast 2011/65/EU June 8, 2011. Specifications are subject to change without notice. Customers should verify actual device performance in their specific applications.

I Current (Amps)

# ChipGuard® MLE Series Varistor ESD Clamp Protectors

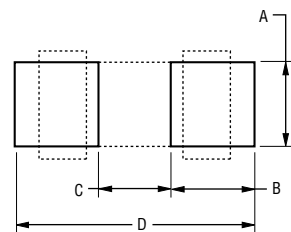
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## Product Dimensions



DIMENSIONS:  $\frac{\text{MM}}{\text{(INCHES)}}$

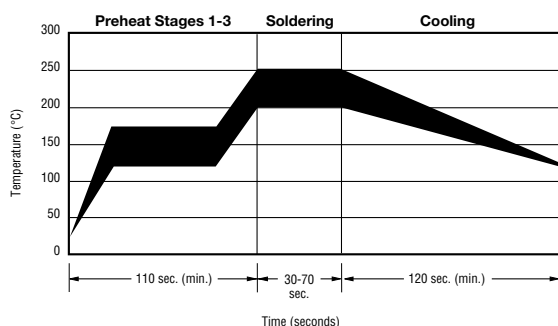
## Recommended Pad Layout



Dimension	CG0402MLE Series	CG0603MLE Series
L	$1.00 \pm 0.15$ ( $0.04 \pm 0.006$ )	$1.60 \pm 0.20$ ( $0.064 \pm 0.008$ )
W	$0.50 \pm 0.10$ ( $0.02 \pm 0.004$ )	$0.80 \pm 0.20$ ( $0.032 \pm 0.008$ )
A	$0.50 \pm 0.10$ ( $0.02 \pm 0.004$ )	$0.80 \pm 0.20$ ( $0.032 \pm 0.008$ )
B	$0.25 \pm 0.15$ ( $0.10 \pm 0.006$ )	$0.30 \pm 0.20$ ( $0.012 \pm 0.008$ )

Dim.	CG0402MLE Series	CG0603MLE 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.

## How to Order

### CG 0n0n MLE - 18 x

ChipGuard® Product Designator \_\_\_\_\_

Package Option \_\_\_\_\_

0402 = 0402 Package      0603 = 0603 Package

Multilayer Series Designator \_\_\_\_\_

Operating Voltage \_\_\_\_\_

18 = 18 V

Tape & Reel Packaging \_\_\_\_\_

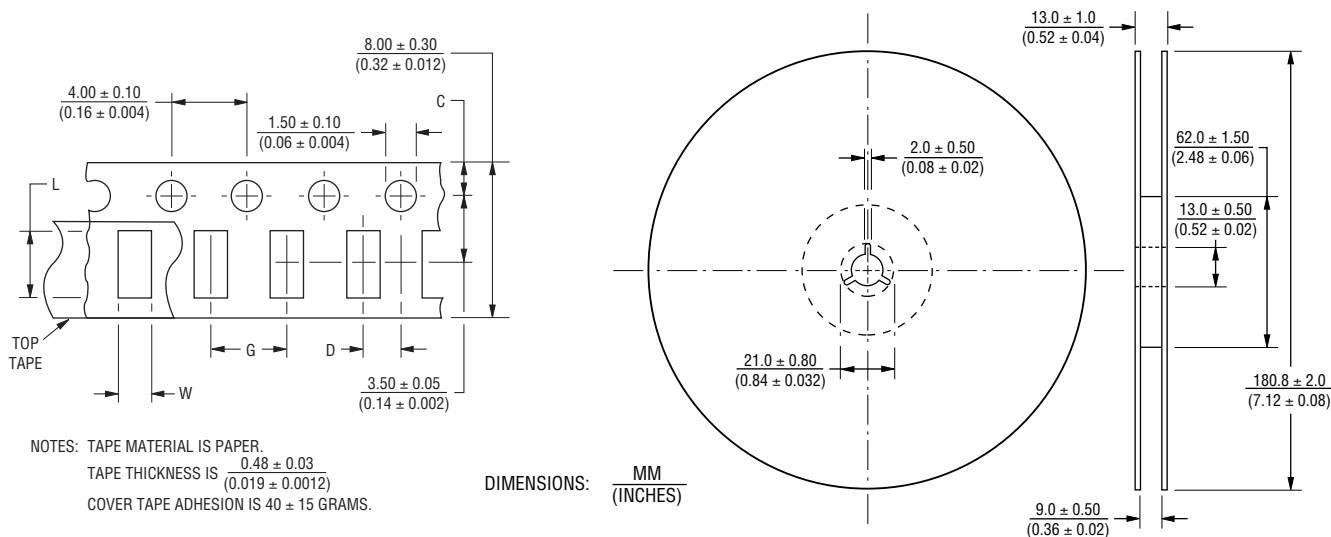
E = 4,000 pcs. per reel (0603 package)      G = 10,000 pcs. per reel (0402 package)

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

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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	$\frac{1.19 \pm 0.05}{(0.047 \pm 0.002)}$	$\frac{1.80 \pm 0.20}{(0.072 \pm 0.008)}$
W	$\frac{0.69 \pm 0.05}{(0.027 \pm 0.002)}$	$\frac{0.90 \pm 0.20}{(0.036 \pm 0.008)}$
G	$\frac{2.0 \pm 0.05}{(0.08 \pm 0.002)}$	$\frac{4.0 \pm 0.05}{(0.16 \pm 0.002)}$

**BOURNS®**

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