

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) Max.	VDC (V)		VCLAMP (V)			IL (uA)					Cp (pF)
		Typ.	Max.	Typ.			Max.					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

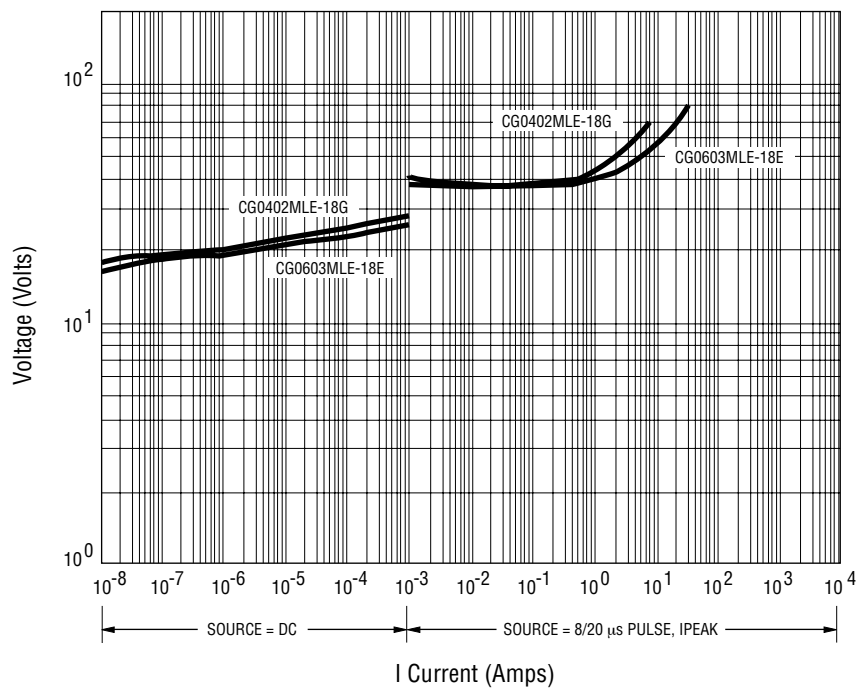
Operating Temperature ...-55 °C to +125 °C
 Storage Temperature.....-55 °C to +125 °C
 Response Time<1 ns
 Standard.....IEC 61000-4-2 Level 4

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).

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

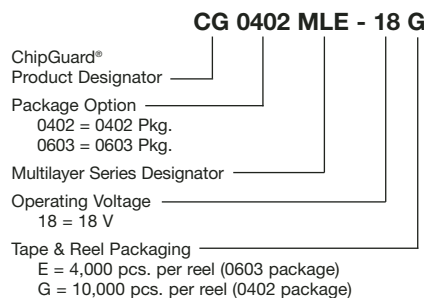
Voltage-Current Characteristics



Device Symbol



How to Order



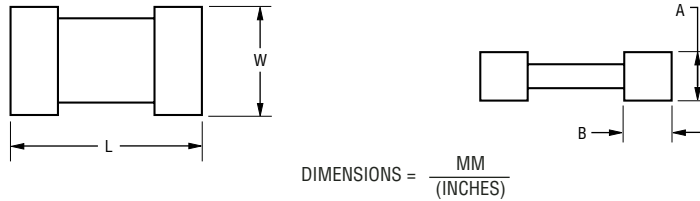
Ni barrier terminations are standard on all ChipGuard® part numbers.

*RoHS Directive 2002/95/EC Jan 27 2003 including Annex. Specifications are subject to change without notice. Customers should verify actual device performance in their specific applications.

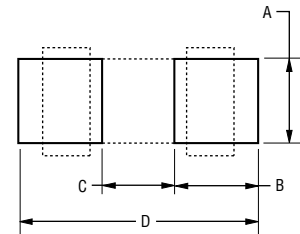
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Product Dimensions



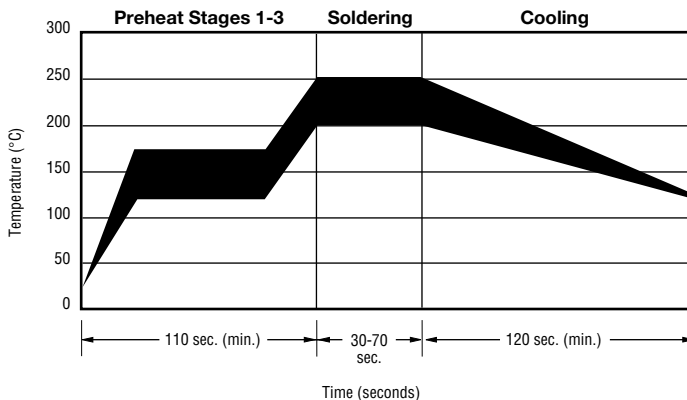
Recommended Pad Layout



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



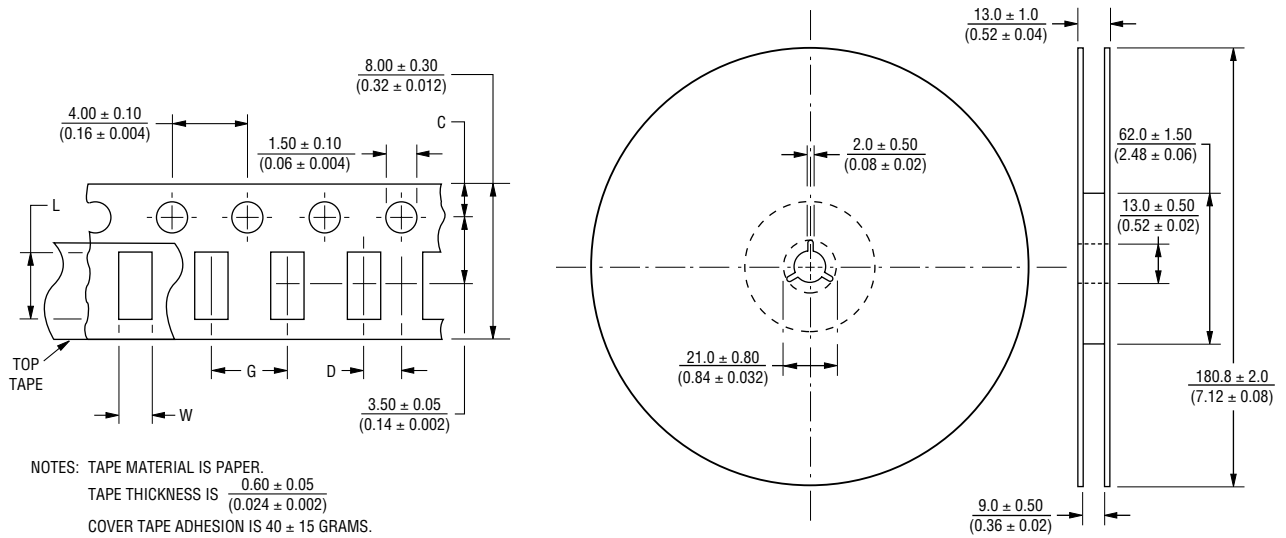
A	Stage 1 Preheat	Ambient to Preheating Temperature	30 s to 60 s
B	Stage 2 Preheat	140 °C to 160 °C	60 s to 120 s
C	Stage 3 Preheat	Preheat to 200 °C	20 s to 40 s
D	Main Heating	200 °C 210 °C 220 °C 230 °C 240 °C	60 s to 70 s 55 s to 65 s 50 s to 60 s 40 s to 50 s 30 s to 40 s
E	Cooling	200 °C to 100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



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	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	$\frac{2.0 \pm 0.05}{(0.08 \pm 0.002)}$	



Reliable Electronic Solutions

Asia-Pacific:

TEL +886-2 25624117 • FAX +886-2 25624116

Europe:

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

The Americas:

TEL +1-951 781-5500 • FAX +1-951 781-5700

www.bourns.com