

**BOURNS®**

## Features

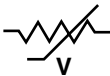
- 0603 package
- Rated for IEC 61000-4-2, level 4 ESD requirements for high speed USB 2.0 or IEEE1394 applications
- Withstands multiple ESD strikes
- Low capacitance and leakage currents for invisible load protection
- Tape and reel packaging

# ChipGuard® MLC Series Varistor ESD Clamp Protectors

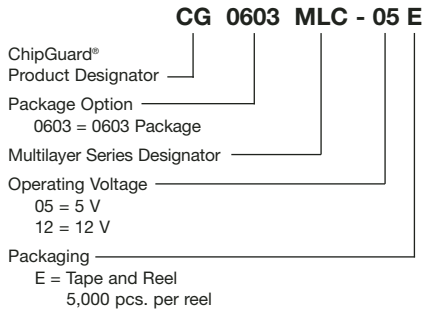
### Description

The ChipGuard® CG0603MLC Series has been specifically designed to protect sensitive electronic components from electrostatic discharge damage. The MLC family has been designed to protect equipment to IEC61000-4-2, level 4 ESD specifications targeted for high speed USB 2.0 or IEEE1394 applications. The ChipGuard® MLC Series has been manufactured to provide very low capacitance and leakage currents with excellent clamp qualities, making the family almost transparent under normal working conditions.

### Device Symbol



### How to Order



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



*Reliable Electronic Solutions*

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#### Europe:

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FAX +41-41 7685510

#### The Americas:

TEL +1-951 781-5500  
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[www.bourns.com](http://www.bourns.com)

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

Parameter	Device	Typ.	Max.	Unit
$V_{DC}$ Continuous operating voltage	CG0603MLC-05 CG0603MLC-12	5 12	6	V
$V_{CLAMP}$ Clamping voltage (see notes 1,2,3)	CG0603MLC-05 CG0603MLC-12	20 30	35 50	V
$C_{off}$ Off-state capacitance, $f = 1$ MHz, 1 Vrms bias			0.5	pF
$I_L$ Off-state current, $V_{DC} = \text{max. rating}$			50	nA
$V_T$ Trigger voltage (see notes 1,3,4)		150		V

- Notes: 1. Per IEC 61000-4-2, 30 A at 8 kV, level 4.  
2. Measurement made 30 ns after initiation of pulse.  
3. Test conducted in contact discharge mode.  
4. Measurement made at maximum pulse voltage.

### Environmental Characteristics

Response Time ..... <1 ns  
Operating Temperature ..... -55 °C to +85 °C  
Storage Temperature ..... -55 °C to +85 °C

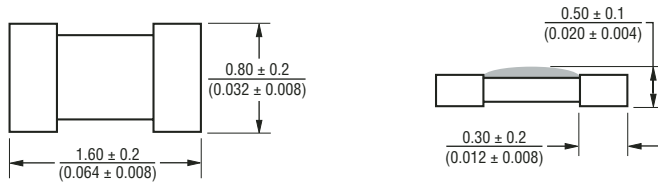
### Surge Withstand Ratings

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	

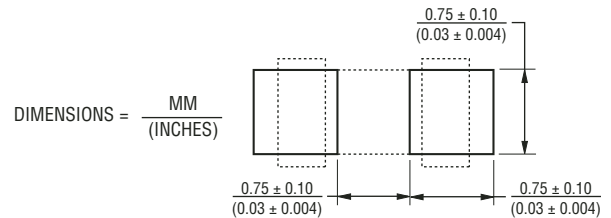
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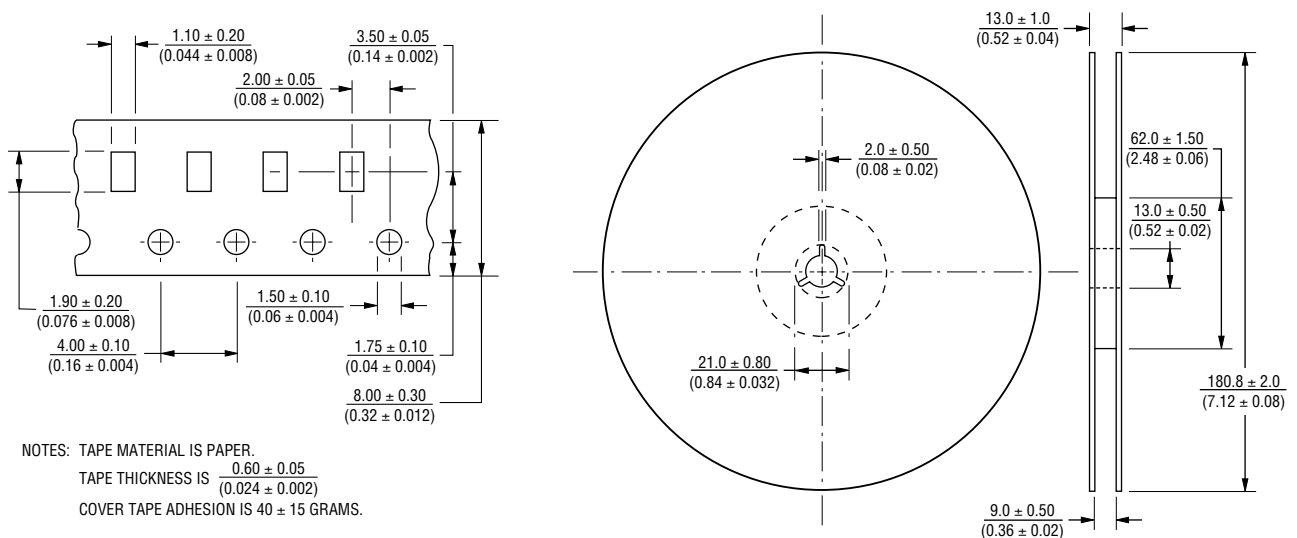
## Product Dimensions



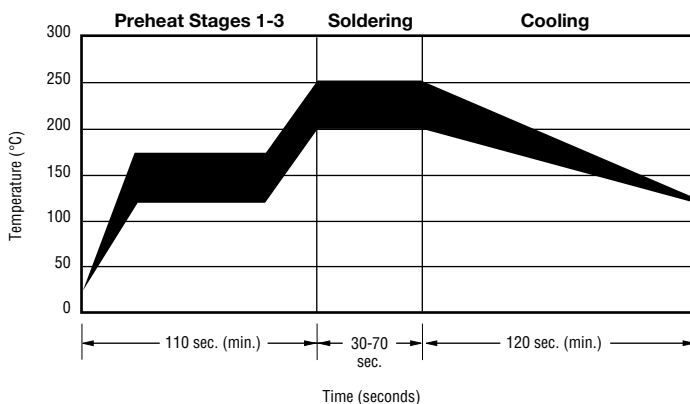
## Recommended Pad Layout



## Packaging Dimensions



## Solder Reflow Recommendations



Stage	Description	Temperature	Time
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.

REV. D 01/05

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