

## Features

- AEC-Q200 compliant
- Meets IEC 61000-4-2 standard
- Multilayered varistor technology
- Proprietary insulating overcoat provides low and stable leakage current
- Quick response time (<0.5 ns)
- High transient current capability
- High reliability
- RoHS compliant\*

## Applications

- HDMI
- CANbus
- Ethernet
- GPS
- Camera links
- Sensors
- Touchscreen interfaces
- Circuits sensitive to ESD

# ChipGuard® Automotive MLA Series Varistor ESD Clamp Protectors

## Description

Bourns® ChipGuard® Automotive MLA Series is a multilayered varistor designed specifically for use in automotive circuits requiring ESD protection. The CGA-MLA series is available in industry standard 0603, 0805 and 1206 packages. These robust protectors exhibit extremely fast response times to ESD events making them ideal for protecting a wide array automotive electronics.

ChipGuard® Automotive MLA Series products are fully AEC-Q200 qualified and supported.

## Additional Information

Click these links for more information:



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

Model	Package	Vrms (V)	VDC (V)	VN Min. (V)	VN Max. (V)	VC (V)	ITM (Max.) (A)	WTM (Max.) (J)	CP (pF) Typ.
		<10 µA		1 mA DC		1 A @ 8/20 µs	@ 8/20 µs	10/1000 µs	@ 1 KHz
CGA0603MLA-16150E	0603	14	16	23.0	34.2	70	5	0.030	15
CGA0603MLA-16121E		14	16	22.0	28.0	46	30	0.200	120
CGA0603MLA-17300E		14	17	21.6	34.4	70	2	0.050	30
CGA0603MLA-18101E		14	18	19.8	25.2	44	30	0.200	100
CGA0603MLA-19161E		14	19	24.0	32.0	64	20	0.100	160
CGA0603MLA-22750E		17	22	25.0	41.0	54	30	0.075	75
CGA0603MLA-22500E		17	22	24.3	30.7	54	10	0.100	50
CGA0603MLA-22101E		17	22	24.3	30.7	50	30	0.200	100
CGA0603MLA-22161E		17	22	24.3	30.7	50	30	0.200	160
CGA0603MLA-26800E		20	26	30.0	43.0	67	30	0.100	80
CGA0603MLA-31900E		25	31	35.0	43.9	71	30	0.200	90
CGA0603MLA-32120E		25	32	51.9	71.0	124	5	0.250	12
CGA0805MLA-16401E	0805	14	16	22.0	28.0	46	120	0.3	400
CGA0805MLA-18351E		14	18	19.8	25.2	44	120	0.3	350
CGA0805MLA-22101E		17	22	25.0	34.0	54	30	0.1	100
CGA0805MLA-22401E		17	22	24.3	30.7	50	120	0.3	400
CGA0805MLA-26221E		20	26	29.7	37.3	56	80	0.4	220
CGA0805MLA-31251E		25	31	35.1	43.9	71	80	0.3	250
CGA0805MLA-38201E		30	38	42.3	52.7	81	80	0.3	200
CGA1206MLA-16801E	1206	14	16	22.0	28.0	44	200	0.60	800
CGA1206MLA-16701E		14	16	19.8	25.2	42	200	0.50	700
CGA1206MLA-22651E		17	22	24.3	30.7	48	200	0.30	650
CGA1206MLA-22841E		17	22	24.3	29.7	50	100	0.40	840
CGA1206MLA-26601E		20	26	29.7	37.3	58	200	0.70	600
CGA1206MLA-31551E		25	31	35.1	43.9	69	200	1.00	550
CGA1206MLA-38501E		30	38	42.3	52.7	81	200	1.10	500
CGA1206MLA-40181E		40	56	63.0	77.0	110	200	1.00	180

## General Characteristics

Operating Temperature..... -40 °C to +125 °C  
 Storage Temperature..... -40 °C to +125 °C  
 Response Time..... <1 ns  
 Performance Standard ..... IEC 61000-4-2

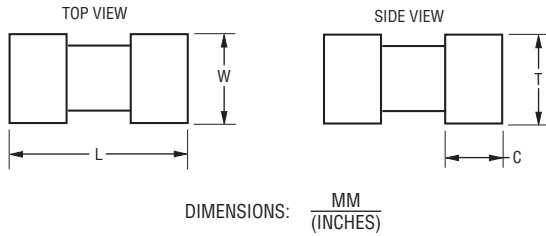
## Device Symbol



**WARNING**  
**Cancer and Reproductive Harm -**  
[www.P65Warnings.ca.gov](http://www.P65Warnings.ca.gov)

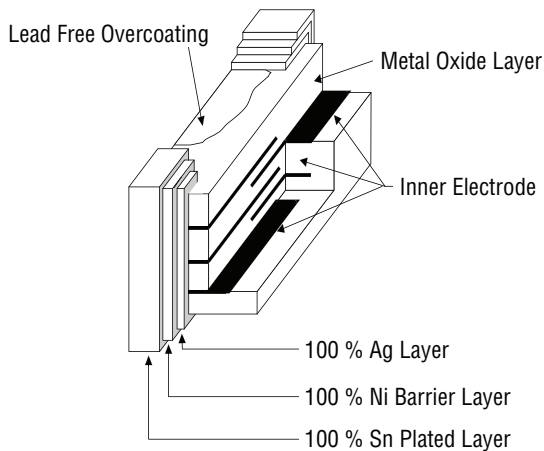
\*RoHS Directive 2015/863, Mar 31, 2015 and Annex.  
 Specifications are subject to change without notice.  
 Users should verify actual device performance in their specific applications.  
 The products described herein and this document are subject to specific legal disclaimers as set forth on the last page of this document, and at [www.bourns.com/docs/legal/disclaimer.pdf](http://www.bourns.com/docs/legal/disclaimer.pdf).

**Product Dimensions**



Dim.	CGA0603MLA Series	CGA0805MLA Series	CGA1206MLA Series
L	$\frac{1.60 \pm 0.15}{(0.063 \pm 0.006)}$	$\frac{2.00 \pm 0.20}{(0.079 \pm 0.008)}$	$\frac{3.20 \pm 0.30}{(0.126 \pm 0.012)}$
W	$\frac{0.80 \pm 0.10}{(0.031 \pm 0.004)}$	$\frac{1.25 \pm 0.20}{(0.049 \pm 0.008)}$	$\frac{1.60 \pm 0.20}{(0.063 \pm 0.008)}$
T	$\frac{0.80 \pm 0.10}{(0.031 \pm 0.004)}$	$\frac{0.90 \pm 0.10}{(0.035 \pm 0.004)}$	$\frac{0.80 \pm 0.10}{(0.031 \pm 0.004)}$
C	$\frac{0.30 \pm 0.15}{(0.012 \pm 0.006)}$	$\frac{0.50 \pm 0.25}{(0.020 \pm 0.010)}$	$\frac{0.50 \pm 0.25}{(0.020 \pm 0.010)}$

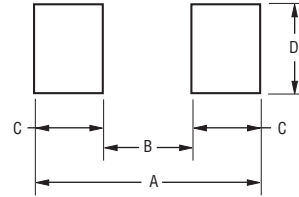
**Construction**



**Environmental Characteristics**

Moisture Sensitivity Level..... 1  
 ESD Classification (HBM)..... 3B

**Recommended Pad Layout**



Note: Print solder to a recommended thickness of 150 to 200 μm.

Dim.	CGA0603MLA Series	CGA0805MLA Series	CGA1206MLA Series
A	$\frac{2.54}{(0.100)}$	$\frac{3.50}{(0.137)}$	$\frac{4.06}{(0.160)}$
B	$\frac{0.50}{(0.020)}$	$\frac{1.10}{(0.043)}$	$\frac{2.02}{(0.080)}$
C	$\frac{1.02}{(0.040)}$	$\frac{1.20}{(0.047)}$	$\frac{1.02}{(0.040)}$
D	$\frac{0.76}{(0.030)}$	$\frac{1.20}{(0.047)}$	$\frac{1.65}{(0.065)}$

**How to Order**

**CG A xx0x MLA - xx yyy E**

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

Automotive Series \_\_\_\_\_

Package Option \_\_\_\_\_  
 0603 = 1608 Package  
 0805 = 2012 Package  
 1206 = 3216 Package

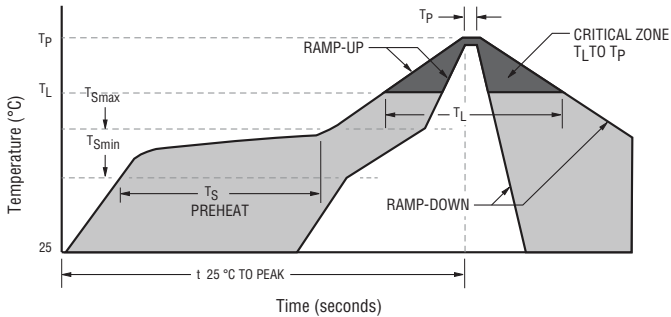
Multilayer Series Designator \_\_\_\_\_

Maximum DC Working Voltage, V \_\_\_\_\_  
 (Current <10 μA)

Capacitance, pF \_\_\_\_\_  
 (Example: 151 = 15x10<sup>1</sup> (150 pF))

Tape & Reel Packaging \_\_\_\_\_  
 E = 4,000 pcs. per reel

**Solder Reflow Recommendations**

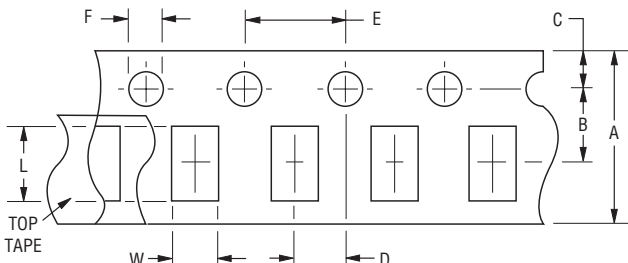


A	Stage 1 Preheat Ramp	Ambient to Preheating Temperature	30 °C/s max.
B	Stage 2 Preheat	Preheat min./max. Temperature Range	150 °C to 200 °C 60 s to 180 s
C	Stage 3 Preheat to Main Heating	Max. Time Above Stated Temperature	217 °C 60 s to 150 s
D	Main Heating	Max. Time Within 5 °C of Peak Temperature (260 °C)	255 °C 20 s to 4 s
E	Cool Down	Rate from Peak Temperature	6 °C/s max.

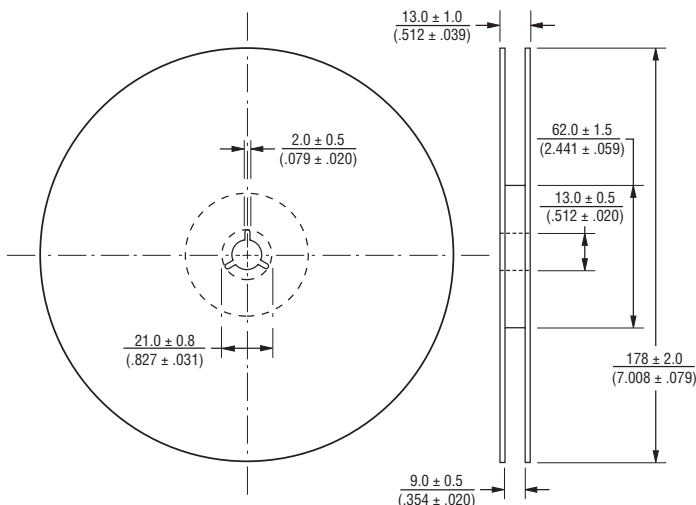
**CAUTION:**

- Rapid heating and cooling in excess of stated maximum rates will easily damage this product.
- Localized heating can also damage product.
- Do not thermally shock product in excess of 100 °C.
- Use a 30 W or less solder gun/iron for product repairs. Tip temperature maximum is 280 °C for less than 3 seconds.
- Do not touch the component directly with the soldering gun/iron.
- Excess solder volumes can damage the body of the product.

**Packaging Dimensions**



NOTES: TAPE MATERIAL IS PAPER. TAPE THICKNESS IS:  $\frac{0.95 \pm 0.05}{(0.037 \pm 0.002)}$



Dim.	CGA0603MLA Series	CGA0805MLA Series	CGA1206MLA Series
A	$\frac{8.00 \pm 0.30}{(0.315 \pm 0.012)}$		
B	$\frac{3.50 \pm 0.05}{(0.138 \pm 0.002)}$		
C	$\frac{1.75 \pm 0.10}{(0.069 \pm 0.004)}$		
D	$\frac{2.00 \pm 0.05}{(0.079 \pm 0.002)}$		
E	$\frac{4.00 \pm 0.10}{(0.157 \pm 0.004)}$		
F	$\frac{1.50 \pm 0.10}{(0.059 \pm 0.004)}$		
L	$\frac{1.90 \pm 0.15}{(0.075 \pm 0.006)}$	$\frac{2.30 \pm 0.15}{(0.091 \pm 0.006)}$	$\frac{3.50 \pm 0.15}{(0.138 \pm 0.006)}$
W	$\frac{1.05 \pm 0.15}{(0.041 \pm 0.006)}$	$\frac{1.55 \pm 0.15}{(0.061 \pm 0.006)}$	$\frac{1.90 \pm 0.15}{(0.075 \pm 0.006)}$

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

REV. E 09/12/24

Specifications are subject to change without notice. Users should verify actual device performance in their specific applications. The products described herein and this document are subject to specific legal disclaimers as set forth on the last page of this document, and at [www.bourns.com/docs/legal/disclaimer.pdf](http://www.bourns.com/docs/legal/disclaimer.pdf).

This legal disclaimer applies to purchasers and users of Bourns® products manufactured by or on behalf of Bourns, Inc. and its affiliates (collectively, "Bourns").

Unless otherwise expressly indicated in writing, Bourns® products and data sheets relating thereto are subject to change without notice. Users should check for and obtain the latest relevant information and verify that such information is current and complete before placing orders for Bourns® products.

The characteristics and parameters of a Bourns® product set forth in its data sheet are based on laboratory conditions, and statements regarding the suitability of products for certain types of applications are based on Bourns' knowledge of typical requirements in generic applications. The characteristics and parameters of a Bourns® product in a user application may vary from the data sheet characteristics and parameters due to (i) the combination of the Bourns® product with other components in the user's application, or (ii) the environment of the user application itself. The characteristics and parameters of a Bourns® product also can and do vary in different applications and actual performance may vary over time. Users should always verify the actual performance of the Bourns® product in their specific devices and applications, and make their own independent judgments regarding the amount of additional test margin to design into their device or application to compensate for differences between laboratory and real world conditions.

Unless Bourns has explicitly designated an individual Bourns® product as meeting the requirements of a particular industry standard (e.g., IATF 16949) or a particular qualification (e.g., UL listed or recognized), Bourns is not responsible for any failure of an individual Bourns® product to meet the requirements of such industry standard or particular qualification. Users of Bourns® products are responsible for ensuring compliance with safety-related requirements and standards applicable to their devices or applications.

Bourns® products are not recommended, authorized or intended for use in nuclear, lifesaving, life-critical or life-sustaining applications, nor in any other applications where failure or malfunction may result in personal injury, death, or severe property or environmental damage. Unless expressly and specifically approved in writing by two authorized Bourns representatives on a case-by-case basis, use of any Bourns® products in such unauthorized applications might not be safe and thus is at the user's sole risk. Life-critical applications include devices identified by the U.S. Food and Drug Administration as Class III devices and generally equivalent classifications outside of the United States.

Bourns expressly identifies those Bourns® standard products that are suitable for use in automotive applications on such products' data sheets in the section entitled "Applications." Unless expressly and specifically approved in writing by two authorized Bourns representatives on a case-by-case basis, use of any other Bourns® standard products in an automotive application might not be safe and thus is not recommended, authorized or intended and is at the user's sole risk. If Bourns expressly identifies a sub-category of automotive application in the data sheet for its standard products (such as infotainment or lighting), such identification means that Bourns has reviewed its standard product and has determined that if such Bourns® standard product is considered for potential use in automotive applications, it should only be used in such sub-category of automotive applications. Any reference to Bourns® standard product in the data sheet as compliant with the AEC-Q standard or "automotive grade" does not by itself mean that Bourns has approved such product for use in an automotive application.

Bourns® standard products are not tested to comply with United States Federal Aviation Administration standards generally or any other generally equivalent governmental organization standard applicable to products designed or manufactured for use in aircraft or space applications. Bourns expressly identifies Bourns® standard products that are suitable for use in aircraft or space applications on such products' data sheets in the section entitled "Applications." Unless expressly and specifically approved in writing by two authorized Bourns representatives on a case-by-case basis, use of any other Bourns® standard product in an aircraft or space application might not be safe and thus is not recommended, authorized or intended and is at the user's sole risk.

The use and level of testing applicable to Bourns® custom products shall be negotiated on a case-by-case basis by Bourns and the user for which such Bourns® custom products are specially designed. Absent a written agreement between Bourns and the user regarding the use and level of such testing, the above provisions applicable to Bourns® standard products shall also apply to such Bourns® custom products.

Users shall not sell, transfer, export or re-export any Bourns® products or technology for use in activities which involve the design, development, production, use or stockpiling of nuclear, chemical or biological weapons or missiles, nor shall they use Bourns® products or technology in any facility which engages in activities relating to such devices. The foregoing restrictions apply to all uses and applications that violate national or international prohibitions, including embargos or international regulations. Further, Bourns® products and Bourns technology and technical data may not under any circumstance be exported or re-exported to countries subject to international sanctions or embargoes. Bourns® products may not, without prior authorization from Bourns and/or the U.S. Government, be resold, transferred, or re-exported to any party not eligible to receive U.S. commodities, software, and technical data.

To the maximum extent permitted by applicable law, Bourns disclaims (i) any and all liability for special, punitive, consequential, incidental or indirect damages or lost revenues or lost profits, and (ii) any and all implied warranties, including implied warranties of fitness for particular purpose, non-infringement and merchantability.

*For your convenience, copies of this Legal Disclaimer Notice with German, Spanish, Japanese, Traditional Chinese and Simplified Chinese bilingual versions are available at:*

*Web Page:* <http://www.bourns.com/legal/disclaimers-terms-and-policies>

*PDF:* <http://www.bourns.com/docs/Legal/disclaimer.pdf>