



Chipsmall Limited consists of a professional team with an average of over 10 year of expertise in the distribution of electronic components. Based in Hongkong, we have already established firm and mutual-benefit business relationships with customers from,Europe,America and south Asia,supplying obsolete and hard-to-find components to meet their specific needs.

With the principle of “Quality Parts,Customers Priority,Honest Operation,and Considerate Service”,our business mainly focus on the distribution of electronic components. Line cards we deal with include Microchip,ALPS,ROHM,Xilinx,Pulse,ON,Everlight and Freescale. Main products comprise IC,Modules,Potentiometer,IC Socket,Relay,Connector.Our parts cover such applications as commercial,industrial, and automotives areas.

We are looking forward to setting up business relationship with you and hope to provide you with the best service and solution. Let us make a better world for our industry!



Contact us

Tel: +86-755-8981 8866 Fax: +86-755-8427 6832

Email & Skype: info@chipsmall.com Web: www.chipsmall.com

Address: A1208, Overseas Decoration Building, #122 Zhenhua RD., Futian, Shenzhen, China



0402ESDA-MLP

ESD suppressor



Product description

- Ultra-low capacitance (0.05 pF) ideal for high speed data applications
- Provides Electro Static Discharge (ESD) protection with fast response time (<1 ns) allowing equipment to pass IEC 61000-4-2 Level 4 test
- Single-line, bi-directional device
- 0402 (1005 metric) compact design utilizes less board space
- Lead free, Halogen free and RoHS compliant

Applications

- ESD port protection for mobile/smart phones
- Game console ESD port protection
- High speed ESD data port protection
- Set-top-boxes
- Tablets, notebooks, netbooks, laptops
- High definition television (HDTV)
- Media players
- Digital cameras
- Medical equipment
- Computers and peripherals ESD port protection
- Consumer electronics

Ordering

- Specify part number and termination suffix (e.g. 0603ESDA-MLP1)
0603ESDA-MLP=part number,
1=Termination suffix

Termination suffixes

- 1 (Dip termination, Packaged: Tape and reel, 10 000 parts per 7" diameter reel)

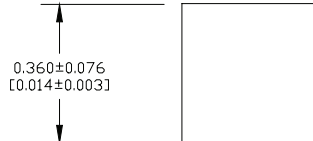
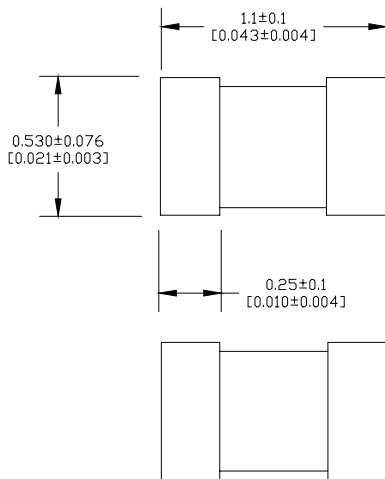
Product specifications

Part number ⁴	Rated voltage (V _{DC}) maximum	Clamping voltage ¹ (V) typical	Trigger voltage ² (V) typical	Capacitance @ 1 MHz (pF) typical	Capacitance @ 1 MHz (pF) maximum	Attenuation change (0–6 GHz) (dB) typical	Leakage current @ 12 V _{DC} (nA) typical	ESD capability IEC61000-4-2 Direct discharge (kV) typical	ESD capability IEC61000-4-2 Air discharge (kV) typical	ESD pulse withstand ³ typical
0402ESDA-MLP	30	35	300	0.05	0.15	-0.2	<0.1	8	15	>1000

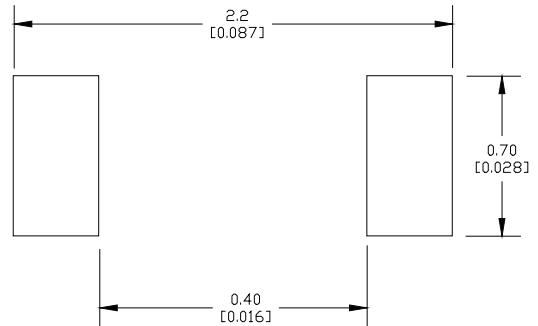
1. Clamping voltage: Per IEC61000-4-2, Level 4 waveform (8 kV direct 30 A) measured 30 ns after initial pulse.
2. Trigger voltage: Trigger measurement made using Transmission Line Pulse (TLP) method.

3. Minor shifting in characteristics may be observed over multiple ESD pulses at very rapid rate.
4. Part Number Definition: 0402ESDA-MLP
0402ESDA= Product code and size
-MLP= Form designation

Dimensions—mm [in]



Recommended Pad Layout



Design considerations

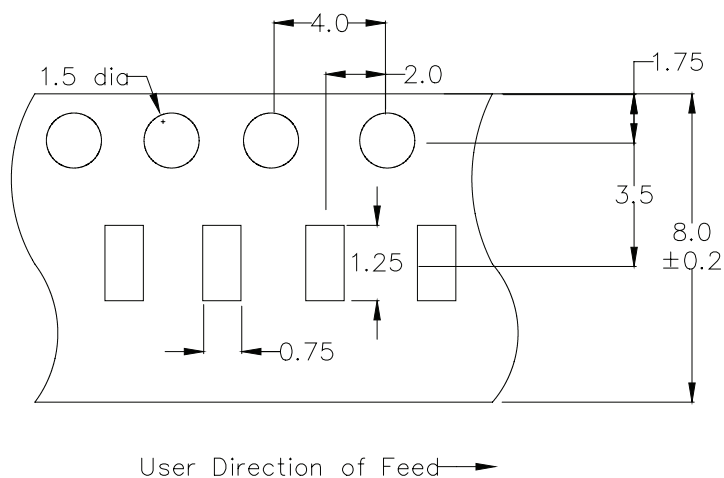
The location in the circuit for the 0402ESDA-MLP has to be carefully determined. For better performance, the device should be placed as close to the signal input as possible and ahead of any other component. Due to the high current associated with an ESD event, it is recommended to use a “0-stub” pad design (pad directly on the signal/data line and second pad directly on common ground).

Environmental data

Operating temperature: - 55 °C to +125 °C
Storage temperature (component): - 55 °C to +125 °C
Load humidity: 12 VDC per EIA/IS- 722 +85 °C, 85% relative humidity for 1000 hours
Thermal shock: 10 cycles, - 55 °C to +125 °C, 30 minute dwell time
Moisture resistance: MIL-STD-202G, method 106G, 10 cycles
Mechanical shock: EIA/IS- 722 paragraph 4.9
Mechanical vibration: EIA/IS- 722 paragraph 4.10
Resistance to solvent: EIA/IS- 722 paragraph 4.11

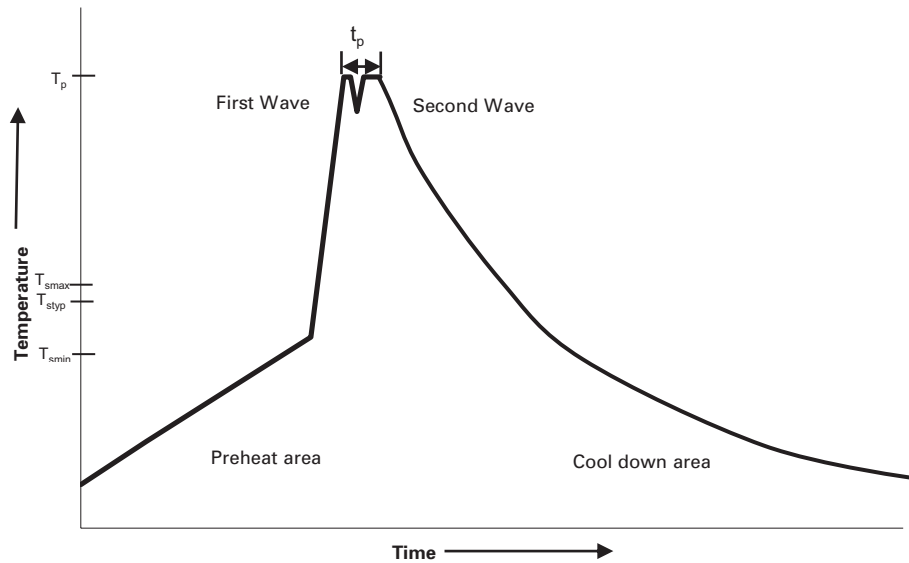
Packaging information

Supplied in tape-and-reel packaging, 10 000 parts per reel, 7" diameter reel.



Wave solder profile

Reflow soldering not recommended



Reference EN 61760-1:2006

Profile Feature	Standard SnPb Solder	Lead (Pb) Free Solder
Preheat	• Temperature min. (T_{smin})	100 °C
	• Temperature typ. (T_{styp})	120 °C
	• Temperature max. (T_{smax})	130 °C
	• Time (T_{smin} to T_{smax}) (t_s)	70 seconds
Δ preheat to max Temperature	150 °C max.	150 °C max.
Peak temperature (T_p)*	235 °C – 260 °C	250 °C – 260 °C
Time at peak temperature (t_p)	10 seconds max 5 seconds max each wave	10 seconds max 5 seconds max each wave
Ramp-down rate	~ 2 K/s min ~3.5 K/s typ ~5 K/s max	~ 2 K/s min ~3.5 K/s typ ~5 K/s max
Time 25 °C to 25 °C	4 minutes	4 minutes

Manual solder

350 °C, 4-5 seconds (by soldering iron), generally manual hand soldering is not recommended.

Solder reflow profile

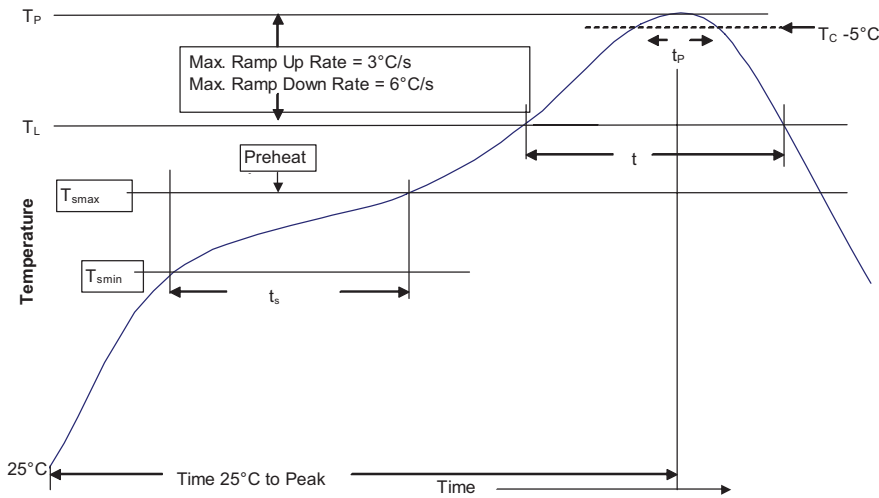


Table 1 - Standard SnPb Solder (T_C)

Package Thickness	Volume mm ³ <350	Volume mm ³ ≥350
<2.5mm)	235°C	220°C
≥2.5mm	220°C	220°C

Table 2 - Lead (Pb) Free Solder (T_C)

Package Thickness	Volume mm ³ <350	Volume mm ³ 350 - 2000	Volume mm ³ >2000
<1.6mm	260°C	260°C	260°C
1.6 - 2.5mm	260°C	250°C	245°C
>2.5mm	250°C	245°C	245°C

Reference JDEC J-STD-020D

Profile Feature	Standard SnPb Solder	Lead (Pb) Free Solder
Preheat and Soak		
• Temperature min. (T_{smin})	100 °C	150 °C
• Temperature max. (T_{smax})	150 °C	200 °C
• Time (T_{smin} to T_{smax}) (t_s)	60-120 Seconds	60-120 Seconds
Average ramp up rate T_{smax} to T_p	3 °C/ Second Max.	3 °C/ Second Max.
Liquidous temperature (T_L)	183 °C	217 °C
Time at liquidous (t_L)	60-150 Seconds	60-150 Seconds
Peak package body temperature (T_p)*	Table 1	Table 2
Time (t_p)** within 5 °C of the specified classification temperature (T_C)	20 Seconds**	30 Seconds**
Average ramp-down rate (T_p to T_{smax})	6 °C/ Second Max.	6 °C/ Second Max.
Time 25 °C to Peak Temperature	6 Minutes Max.	8 Minutes Max.

* Tolerance for peak profile temperature (T_p) is defined as a supplier minimum and a user maximum.
 ** Tolerance for time at peak profile temperature (t_p) is defined as a supplier minimum and a user maximum.

Life Support Policy: Eaton does not authorize the use of any of its products for use in life support devices or systems without the express written approval of an officer of the Company. Life support systems are devices which support or sustain life, and whose failure to perform, when properly used in accordance with instructions for use provided in the labeling, can be reasonably expected to result in significant injury to the user.

Eaton reserves the right, without notice, to change design or construction of any products and to discontinue or limit distribution of any products. Eaton also reserves the right to change or update, without notice, any technical information contained in this bulletin.

Eaton
Electronics Division
 1000 Eaton Boulevard
 Cleveland, OH 44122
 United States
 www.eaton.com/elx

© 2016 Eaton
 All Rights Reserved
 Printed in USA
 Publication No. 4367 BU-SB101153
 February 2016



Eaton is a registered trademark.
 All other trademarks are property of their respective owners.