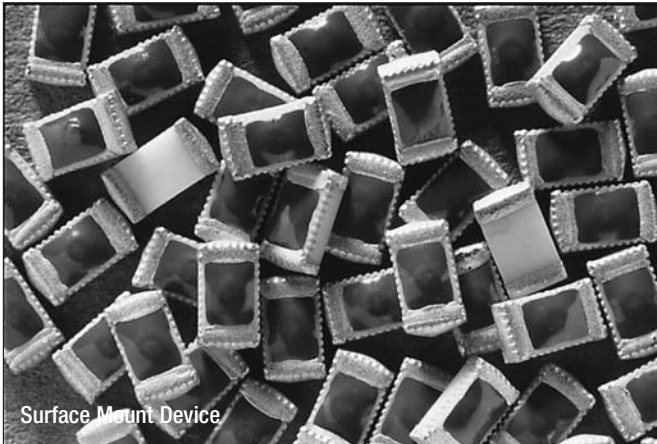


# 0603ESDA-TR1 ESD Suppressor

## PolySurg™ TR Series



### Description

The PolySurg™ 0603ESDA-TR1 ESD Suppressors protect valuable high-speed data circuits from ESD damage without distorting data signals as a result of its ultra-low (0.15pF maximum) capacitance.

### Features

- 0603/1608 footprint surface mount device
- Ideal ESD protection for high frequency, low voltage applications.
- Provides ESD protection with fast response time (<1ns) allowing equipment to pass IEC 61000-4-2 testing
- Very low leakage current
- Ultra low capacitance (0.15pF maximum)
- Bi-directional

Specifications				
Performance Characteristics	Units	Min	Typ	Max
Continuous operating voltage	Vdc	-	-	24
Clamping voltage <sup>2</sup>	V	-	35	60
Trigger voltage <sup>3</sup>	V	-	350	-
ESD Threat voltage capability <sup>4</sup>	kV	-	8	15
Capacitance (@ 1KHz ~ 1.8GHz)	pF	-	-	0.15
Leakage current (@ 12Vdc)	nA	0.01	<0.1	-
Peak current <sup>2</sup>	A	-	30	45
Operating temperature	°C	-56	+25	+105
ESD pulse withstand <sup>2</sup>	# pulses	20	>500 <sup>1</sup>	-

1. Some shifting in characteristics may occur when tested over several hundred ESD pulses at very rapid rate of 1 pulse per second or faster.
2. Per IEC 61000-4-2, 30A @ 8kV, level 4, clamp measurement made 30ns after initiation of pulse, all tests in contact discharge mode.
3. Trigger measurement made using Transmission Line Pulse (TLP) method.
4. PolySURG™ devices are capable of withstanding up to a 15kV, 45A ESD pulse. Device ratings are given at 8kV per Note 1, unless otherwise specified.

### Applications

- Computers and peripherals
- DVD Players
- Satellite radio
- PDAs
- Digital camcorders
- Set Top Boxes
- DSL Modems
- High speed data ports
  - USB 2.0/3.0
  - High speed ethernet
  - Infiniband®
- HDTV Equipment
- A/V Equipment
- Cell phones
- Digital still cameras
- MP3 / Multimedia players
- External Storage
- IEEE 1394
- DVI
- HDMI

### Packaging

- 5000 pieces in paper tape on 7 inch diameter (178mm) reel.

### Ordering Information

Catalog Number	Description
0603ESDA-TR1	5,000 pieces in paper tape on 7 inch diameter (178mm) reel.

### Device Marking

PolySurg™ ESD Suppressors are marked on the tape and reel packages, not individually. Since the product is bi-directional and symmetrical, no orientation marking is required.

### Design Consideration

The location in the circuit for the TR1 series 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).

### Processing Recommendations

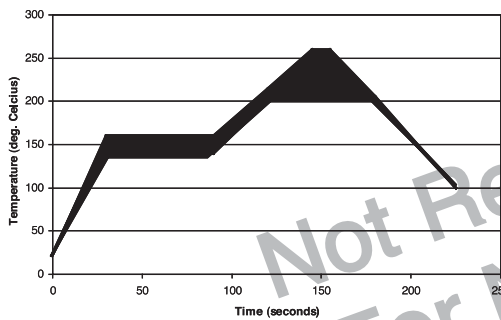
The TR series currently has a convex profile on the top surface of the part. This profile is a result of the construction of the device. They can be processed using standard pick-and-place equipment. The placement and processing techniques for these devices are similar to those used for chip resistors and chip capacitors.

**Environmental Specifications:**

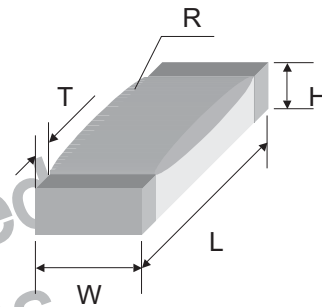
- Moisture Resistance per EIA/IS-722 Paragraph 4.4.2. This standard is based upon MIL-STD-202G Method 103B but with temperature and relative humidity at +85°C and 85% RH respectively. Test condition 'A' (240Hr) per MIL-STD-202G.
- Thermal shock: MIL-STD-202, Method 107G, -55°C to 125°C, 30 min. cycle, 10 cycles.
- Vibration: MIL-STD-202F, Method 201A, (10 to 55 to 10 Hz, 1 min. cycle, 2 hrs each in X-Y-Z).
- Chemical resistance: ASTM D-543, 4 hrs @ 40°C, 3 solutions (H2O, detergent solution, defluxer).
- Operating temperature characteristics, measurement at +25°C, +105°C and -56°C.
- Full load voltage: 14.4Vdc, 18Vdc & 24Vdc for 1000 hrs, 25°C.
- Solder leach resistance and terminal adhesion: Per EIA-576.
- Solderability: MIL-STD-202, Method 208 (95% coverage).

**Soldering Recommendations**

- Compatible with lead and lead-free solder reflow processes
- Peak reflow temperatures and durations:
  - IR Reflow = 260°C max for 10 sec. max.
  - Wave Solder = 260°C max. for 10 sec. max.
- Recommended IR Reflow Profile:



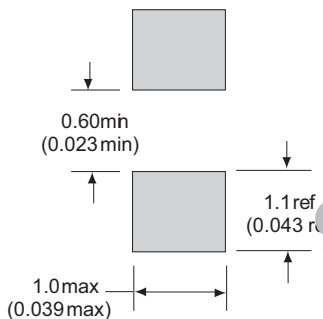
**Dimensions - mm (in)**



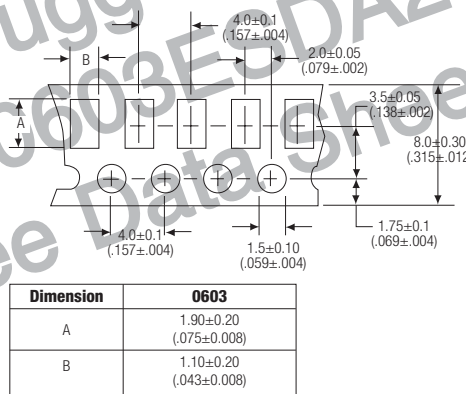
EIA Size	L	W	H	T	R
0603ESDA	1.60±0.10 (0.063±0.004)	0.80±0.10 (0.031±0.004)	0.50±0.10 (0.020±0.004)	0.30±0.20 (0.012±0.008)	0.70±0.10 (0.028±0.004)

**Recommended Pad Layout - in (mm)**

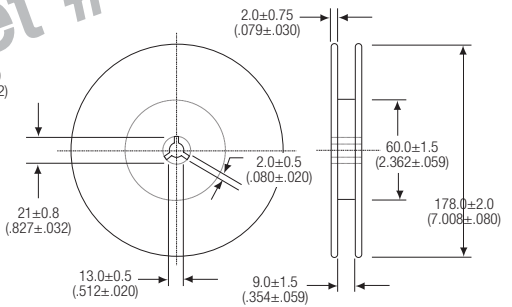
(per IPC-SM-782)



**Tape and Reel Specifications - mm (in)**



Dimension	0603
A	1.90±0.20 (.075±0.008)
B	1.10±0.20 (.043±0.008)



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