

42510ESDA-TR1

Four channel ultra low capacitance ESD Suppressor



Applications

- Laptops, notebooks, desktop
- HDTV, set top box
- GPS and Bluetooth communication antenna
- USB 2.0, 3.0 and 3.1
- HDMI 1.3, 1.4a, 2.0
- DisplayPort™
- SATA and eSATA

Product features

- Ultra low capacitance ESD suppressor ideally suited for protecting high speed data applications with virtually no signal distortion
- Four channel, bi-directional device helps provide significant PCB layout space savings and trace layout complexity
- Maintains an extremely low leakage current at rated voltage
- Provides ESD protection with fast response time (<1 ns) allowing equipment to pass IEC 61000-4-2 level 4 test
- Matches footprint of common higher capacitance DFN2510-10 TVS diode packages

Ordering part number

	4	2510	ESDA	-TR1
4 channel device	_____	_____	_____	_____
2.5 x 1.0 mm footprint	_____	_____	_____	_____
ESDA family	_____	_____	_____	_____
Packaging	_____	_____	_____	_____

Package suffix

-TR1: 5000 parts on a 7" diameter reel

Product specifications

Electrical specifications	Minimum	Typical	Maximum	Units
Rated voltage			12	Vdc
Trigger voltage ²		300		Vdc
Clamping voltage ¹		30		Vdc
Capacitance @ 1 MHz		0.1		pF
Leakage current @ 12 Vdc		0.01		uA
Response time		0.1		ns
ESD Voltage capability to IEC6100-4-2 (contact)	10			kV
ESD Voltage capability to IEC6100-4-2 (air)	15			kV
ESD withstand pulses		1000		Number of pulses

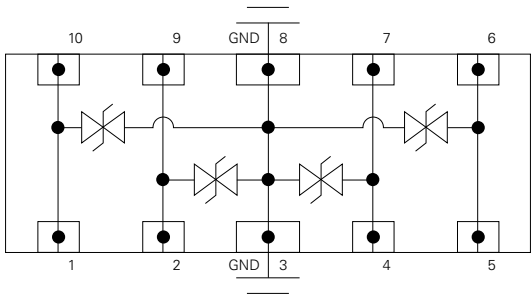
1. Maximum peak voltage with a 8/20 μ s waveform and a 1 A pulse current per IEC 61000-4-2 level 4

2. Trigger voltage: Trigger measurement made using Transmission Line Pulse (TLP) method.

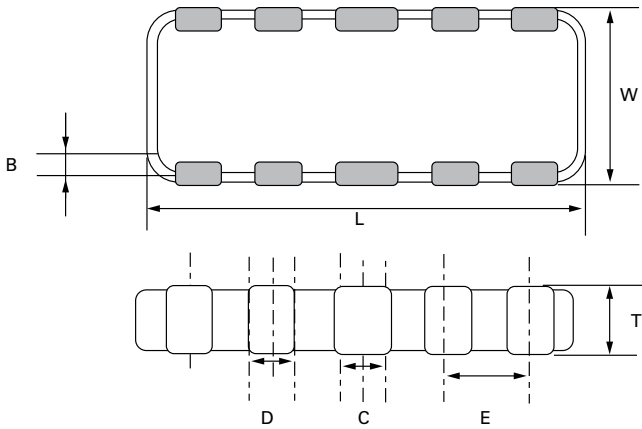


Powering Business Worldwide

Equivalent circuit

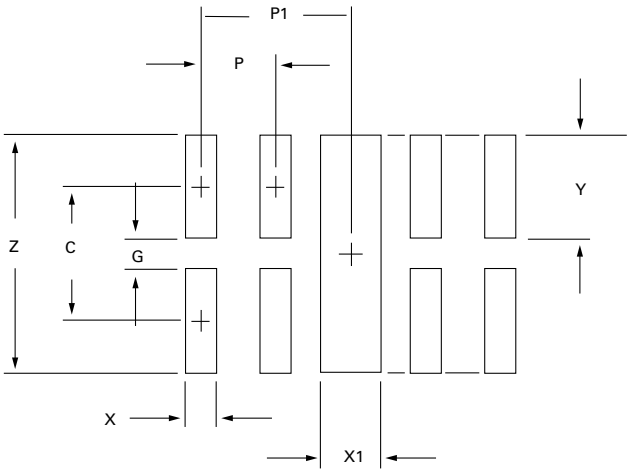


Dimensions—mm



L	W	T	B	C	D	E
2.5 ±0.1	1.0 ±0.1	0.5 ±0.1	0.2 ±0.1	0.3 ±0.05	0.2 ±0.05	0.5 ±0.05

Recommended pad layout



Y	G	Z	X	X1	P	P1	C
0.6	0.2	1.4	0.2	0.3	0.5	1.0	0.8

General specifications

Operating temperature: - 55 °C to +125 °C

Storage temperature (component): - 55 °C to +125 °C

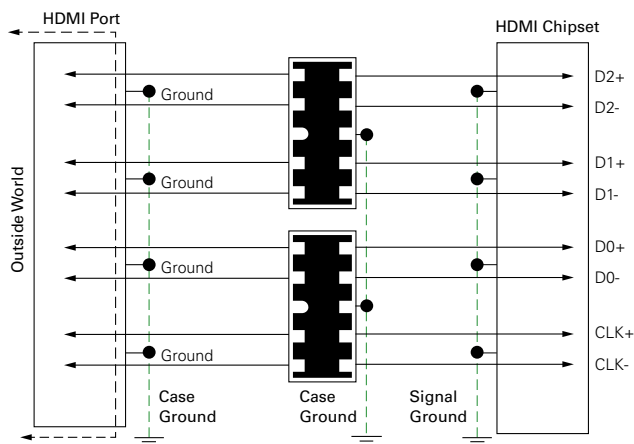
High temperature load voltage: +125 °C for 1000 hours at rated voltage

Thermal shock: 100 cycles, -55 °C to +125 °C, 30 minuets dwell time

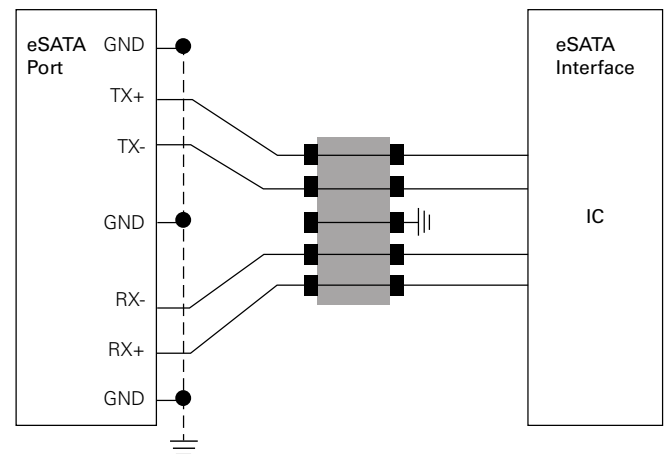
Resistance to solder heat: +260 °C \pm 5 °C 10 seconds

Moisture sensitivity level (MSL): 1

HDMI layout

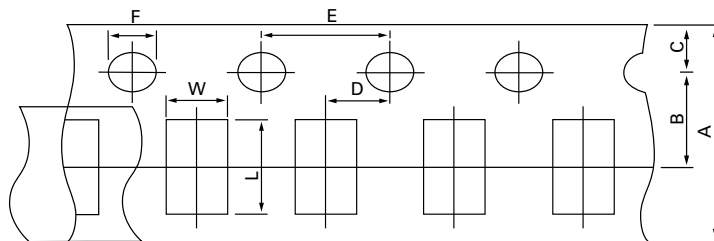


eSATA layout



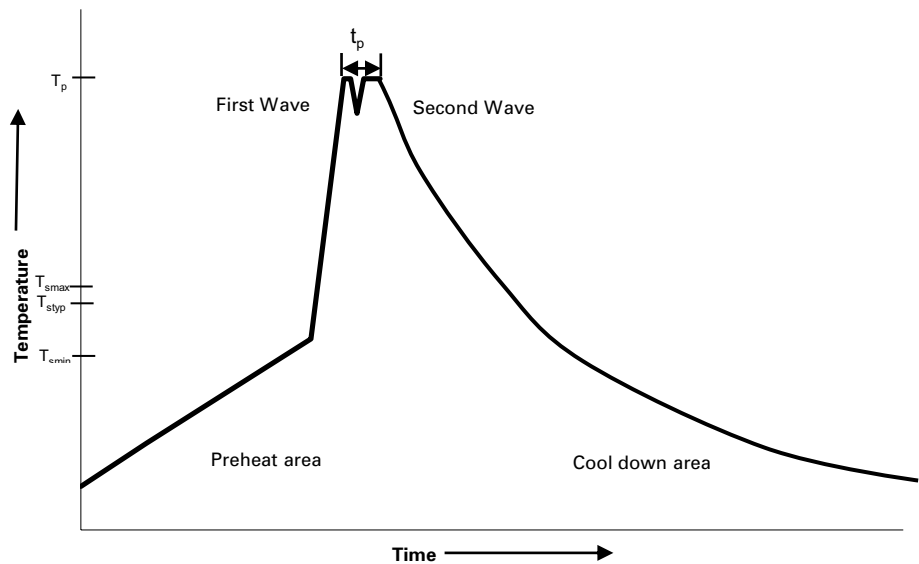
Packaging information- mm

Supplied in tape and reel packaging, 5000 parts per seven inch (178 mm) reel per EIA Standard 481-1



A	B	C	D	E	F	L	W
8.0 \pm 0.30	3.50 \pm 0.05	1.75 \pm 0.10	2.00 \pm 0.05	4.00 \pm 0.10	1.5 \pm 0.10	2.9 \pm 0.20	1.40 \pm 0.20

Wave solder profile



Reference EN 61760-1:2006

Profile feature	Standard SnPb solder	Lead (Pb) free solder
Preheat		
• Temperature min. (T_{smin})	100 °C	100 °C
• Temperature typ. (T_{styp})	120 °C	120 °C
• Temperature max. (T_{smax})	130 °C	130 °C
• Time (T_{smin} to T_{smax}) (t_s)	70 seconds	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

+280 °C (3 seconds maximum by soldering iron), generally manual/hand soldering is not recommended.

Solder reflow profile

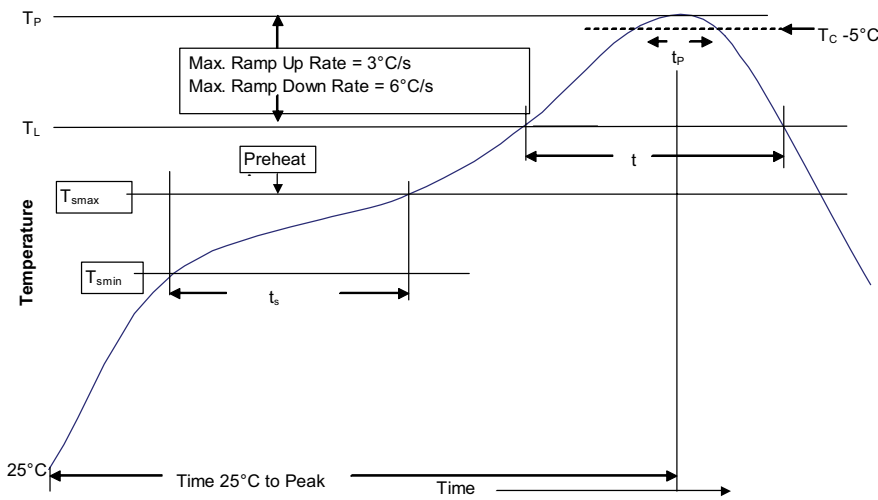


Table 1 - Standard SnPb solder (T_C)

Package thickness	Volume mm ³ <350	Volume mm ³ ≥350
<2.5 mm)	235 °C	220 °C
≥2.5 mm	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
<1.6 mm	260 °C	260 °C	260 °C
1.6 – 2.5 mm	260 °C	250 °C	245 °C
>2.5 mm	250 °C	245 °C	245 °C

Reference J-STD-020

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
Ramp up rate T_L to T_p	3 °C/ second max.	3 °C/ second max.
Liquidous temperature (T_L)	183 °C	217 °C
Time (t_L) maintained above 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*
Ramp-down rate (T_p to T_L)	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.

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