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Raychem
Overvoltage Devices

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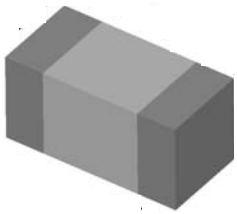
ESD Protector
PESD0603-140

Document: SCD 26107
Status: Released
Rev. E Date: JULY 14, 2005

BENEFITS

- Suitable for high speed data transmission applications
- Longer battery life, due to low leakage current
- Board space savings
- Help to protect sensitive electronic circuits against electrostatic discharge (ESD) events
- Assist equipment to pass IEC 61000-4-2, level 4 testing

FEATURES



- Thick film technology
- Low capacitance (0.25 pF typical)
- Low leakage current
- Low trigger voltage
- Low clamping voltage
- Capable of withstanding numerous ESD strikes
- Compatible with standard reflow installation procedures
- Bi-directional protection

APPLICATIONS

- Cellular phones
- Antennas (cell phones, GPS…)
- Portable devices (PDA, DSC, BlueTooth…)
- Printer ports
- High speed Ethernet
- USB 2.0 and IEEE 1394 interfaces
- DVI and HDMI interfaces

MATERIALS INFORMATION

ROHS Compliant

Directive 2002/95/EC Compliant

ELV Compliant

Directive 2000/53/EC Compliant

PART NUMBERING

PESD 0603 - 140

Series

EIA Size

Operating Voltage Designator
$14 \times 10^0 = 14V_{DC}$

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TYPICAL DEVICE RATINGS AND CHARACTERISTICS

	Continuous Max Operating Voltage	Typical IEC Trigger Voltage[1]	Typical IEC Clamping Voltage[1] after 30ns	Typical TLP Trigger Voltage[2]	Typical TLP Clamping Voltage[2] after 30ns	Typical TLP Clamping Voltage[2] after 60ns	Typical Capacitance, @ 1 MHz, $1V_{rms}$	Typical Leakage Current @$14V_{DC}$	Max Leakage Current @$14V_{DC}$
Symbol	V_{DC}	$V_{T(IEC)}$	$V_{C(IEC)}$	$V_{T(TLP)}$	$V_{C(TLP\ 30)}$	$V_{C(TLP\ 60)}$	Cp	$I_{L(Typ)}$	$I_{L(MAX)}$
Unit	V	V	V	V	V	V	pF	µA	µA
Value	14	350	30	320	75	65	0.25	<0.001	0.01

Note 1: IEC61000-4-2, level 4, 8kV contact test method
Note 2: TLP test method at 500V (refer to graph on next page)

GENERAL CHARACTERISTICS

Storage temperature: -40°C … +85°C

Operating temperature: -40°C … + 85°C

ESD voltage capability (tested per IEC 61000-4-2)

- Contact discharge mode: typical 8kV, max 15kV
- Air discharge mode: typical 15kV, max 25kV

ESD pulse withstand: Typically 1,000 pulses (tested per IEC 61000-4-2, level 4, contact method)

ENVIRONMENTAL SPECIFICATIONS

	Bias Humidity Test	Thermal Shock	Bias Heat Test	Bias Low Temp Test	Solderability	Solder Heat	Vibration	Solvent Resistance
Test Conditions	40ºC, 90% RH, MAX $V_{DC,}$ 1000 hrs	-40ºC to 85ºC, 30 min dwell, 5 cycles	85ºC, MAX V_{DC}, 1000 hrs	-40ºC, MAX V_{DC}, 1000 hrs	230ºC ± 5ºC, 3 ± 1s	260ºC, 10s	10 to 50Hz, 60s cycle, 2hrs each in X-Y-Z-direction	IPA ultrasonic 300s
Pass / Fail Criteria	$I_L \le 10$ µA	$I_L \le 10$ µA	$I_L \le 10$ µA	$I_L \le 10$ µA	95% coverage	90% coverage	No Physical Damage	No Physical Damage

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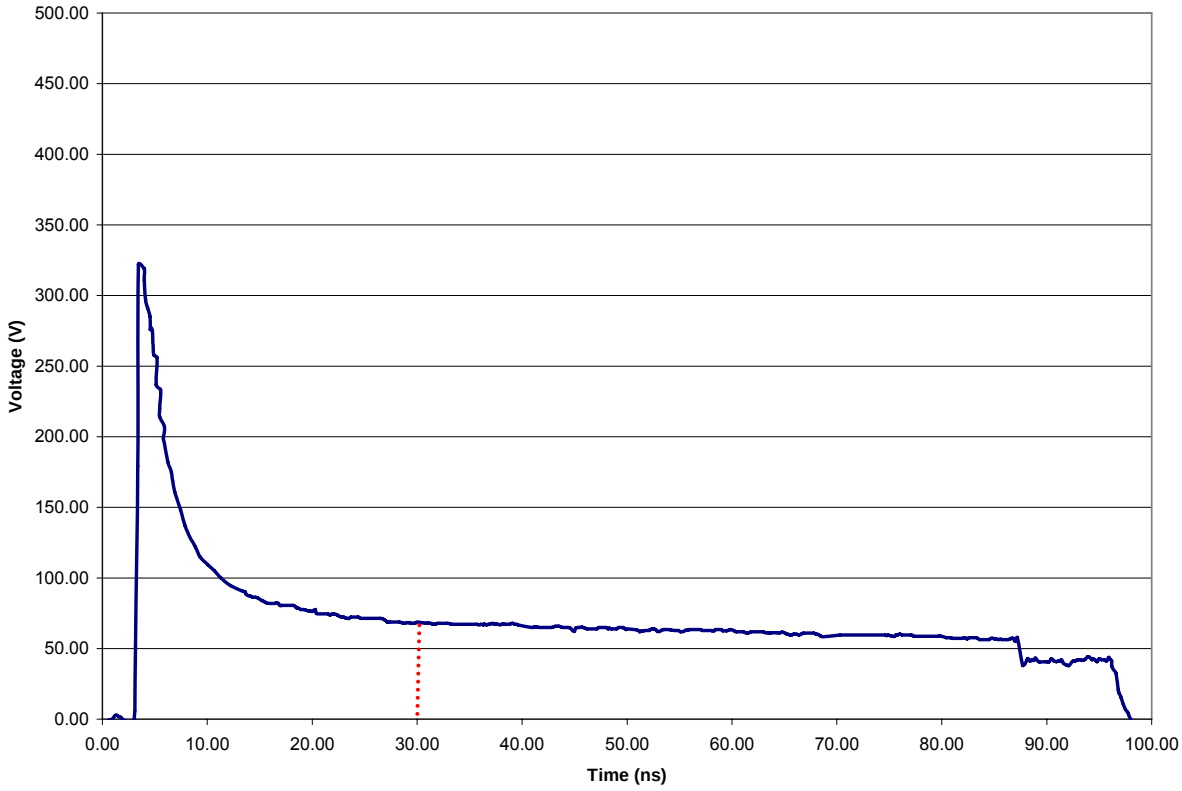
TYPICAL TRANSMISSION LINE PULSE RESPONSE GRAPH



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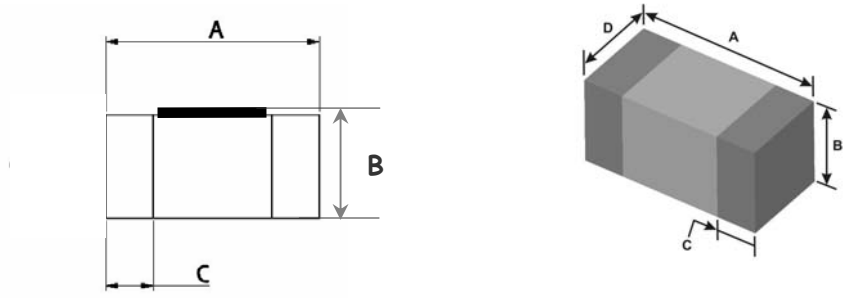
DIMENSIONS



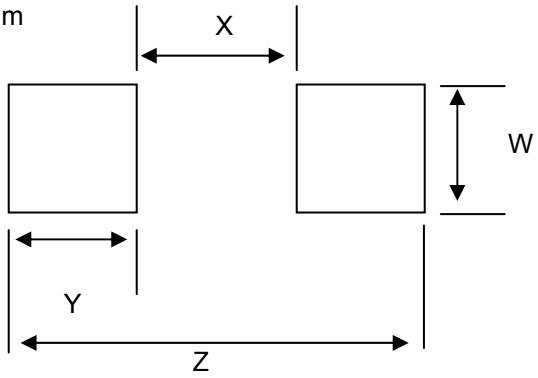
Drawing Not To Scale

	length A		Height B		Terminal Width C		Width D	
	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX
mm:	1.4	1.8	0.38	0.58	0.1	0.5	0.6	1.0
in*:	(0.06)	(0.07)	(0.01)	(0.02)	(0.004)	(0.02)	(0.02)	(0.04)

*Rounded off approximation

RECOMMENDED LAND PATTERN:

Solder thickness 0.15 to 0.2mm



	W		X		Y (Ref)		Z	
	Min	Max	Min	Max	Min	Max	Min	Max
mm:	0.9	1.0	0.5	0.6	1.0	1.1	2.7	2.8
in: *	(0.035)	(0.039)	(0.020)	(0.024)	(0.039)	(0.043)	(0.106)	(0.110)

*Rounded off approximation.

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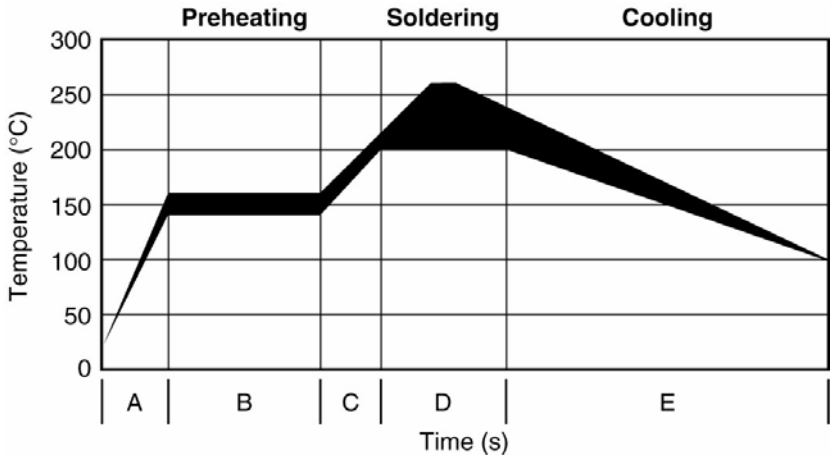
SOLDER REFLOW RECOMMENDATIONS:

A	Temperature ramp up 1	From ambient to Preheating temperature	30s to 60s
B	Preheating	140°C - 160°C	60s to 120s
C	Temperature ramp up 2	From Preheating to Main heating temperature	20s to 40s
D	Main heating	at 200°C at 220°C at 240°C at 260°C	60s ~ 70s 50s ~ 60s 30s ~ 40s 5s ~ 10s
E	Cooling	From main heating temperature to 100°C	max 4°C/s



PACKAGING

Packaging	Tape & Reel	Standard Box
PESD0603-140	5,000	25,000

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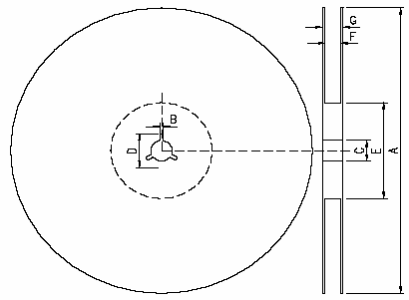
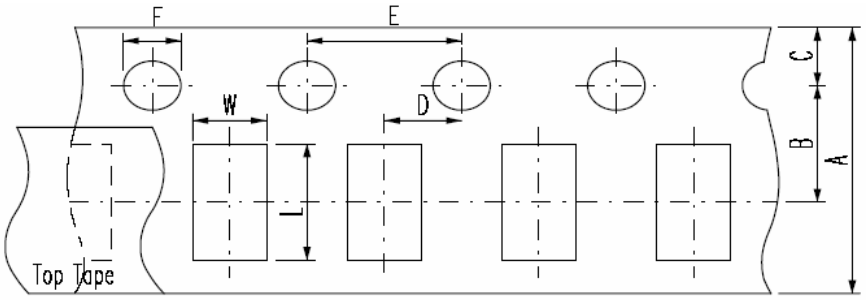
EIA referenced Reel Dimensions for PESD Devices



Reel Dimensions (mm):

	A	B	C	D	E	F	G
0603 Devices	178.0 ±2.0	2.0 ±0.5	13.0±0.5	21.0±0.8	62.0±1.5	9.0±0.5	13.0±1.0



Carrier Dimensions (mm):

	A	B	C	D	E	F	L	W	T[1]
0603 Devices	8.0±0.3	3.5±0.05	1.75±0.1	2.0±0.05	4.0±0.1	1.5±0.1	1.9±0.2	1.1±0.20	0.60±0.05

Product Orientation – always face up (meaning the substrate is at the bottom), but parts do not have polarity mark.

Leader & Trailer: The leader is 180mm in length & consists of empty cavities with sealed cover tape.
The trailer is 350mm in length & consists of empty cavities with sealed cover tape.