

Low Capacitance Transient Voltage Suppressors / ESD Protectors

Features

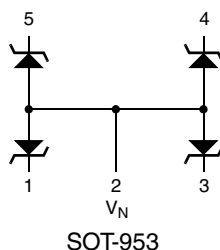
- Low I/O capacitance at 5pF typical
- In-system ESD protection to $\pm 8\text{kV}$ contact discharge, per the IEC 61000-4-2 international standard
- Four channels of ESD protection
- Compact SOT-953 package saves board space and facilitates layout in space-critical applications
- Each I/O pin can withstand over 1000 ESD strikes
- RoHS (Restriction of Hazard Substances) compliant

Applications

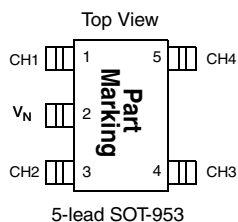
- High-speed consumer electronic ports
- ESD protection of PC ports, including USB ports, serial ports, parallel ports, IEEE1394 ports, docking ports, proprietary ports, etc.
- Protection of interface ports or IC pins which are exposed to high ESD levels

Electrical Schematic

CM1249-04



PACKAGE / PINOUT DIAGRAM



Note: This drawing is not to scale.

PIN DESCRIPTIONS		
LEADS	NAME	DESCRIPTION
(Refer to package / pinout diagrams)	CHx	The cathode of the respective TVS diode, which should be connected to the node requiring transient voltage protection.
(Refer to package / pinout diagrams)	V _N	The anode of the TVS diodes.

Ordering Information

PART NUMBERING INFORMATION			
Leads	Package	Lead-free Finish	
		Ordering Part Number ¹	Part Marking
5	SOT953	CM1249-04S9	L9

Note 1: Parts are shipped in Tape & Reel form unless otherwise specified.

Specifications

ABSOLUTE MAXIMUM RATINGS		
PARAMETER	RATING	UNITS
Storage Temperature Range	–65 to +150	°C
Package Power Dissipation	0.2	W
SOT953-5	0.225	W

STANDARD OPERATING CONDITIONS		
PARAMETER	RATING	UNITS
Operating Temperature	–40 to +85	°C

ELECTRICAL OPERATING CHARACTERISTICS (NOTE 1)						
SYMBOL	PARAMETER	CONDITIONS	MIN	TYP	MAX	UNITS
C_{IN}	Channel Input Capacitance	$T_A = 25^{\circ}\text{C}$, 0VDC, 1MHz; Note 2		5	7	pF
ΔC_{IN}	Differential Channel I/O to GND Capacitance	$T_A = 25^{\circ}\text{C}$, 2.5VDC, 1MHz; Note 2		0.14		pF
I_{LEAK}	Leakage Current	$V_{IN} = 3.5\text{VDC}$, $T_A = 25^{\circ}\text{C}$			0.75	μA
V_{SIG}	Small Signal Clamp Voltage Positive Clamp Negative Clamp	$I = 5\text{mA}$, $T_A = 25^{\circ}\text{C}$ $I = -5\text{mA}$, $T_A = 25^{\circ}\text{C}$	6.1 -1.5		8.5 -0.4	V V
V_{ESD}	ESD Withstand Voltage Contact Discharge per IEC 61000-4-2 standard Human Body Model, MIL-STD-883, Method 3015	Notes 2, 4 & 5; $T_A = 25^{\circ}\text{C}$ Notes 2, 3 & 5; $T_A = 25^{\circ}\text{C}$	± 8 ± 15			kV kV
R_D	Diode Dynamic Resistance Forward Conduction Reverse Conduction	$T_A = 25^{\circ}\text{C}$; Note 2		0.7 2.1		Ω Ω

Note 1: All parameters specified at $T_A = -40^{\circ}\text{C}$ to $+85^{\circ}\text{C}$ unless otherwise noted.

Note 2: These parameters guaranteed by design and characterization.

Note 3: Human Body Model per MIL-STD-883, Method 3015, $C_{Discharge} = 100\text{pF}$, $R_{Discharge} = 1.5\text{K}\Omega$, V_N grounded.

Note 4: Standard IEC 61000-4-2 with $C_{Discharge} = 150\text{pF}$, $R_{Discharge} = 330\Omega$, V_N grounded.

Note 5: These measurements performed with no external capacitor on CH_X .

Performance Information

Diode Capacitance

Typical diode capacitance with respect to positive TVS cathode voltage (reverse voltage across the diode) is given in Figure 1.

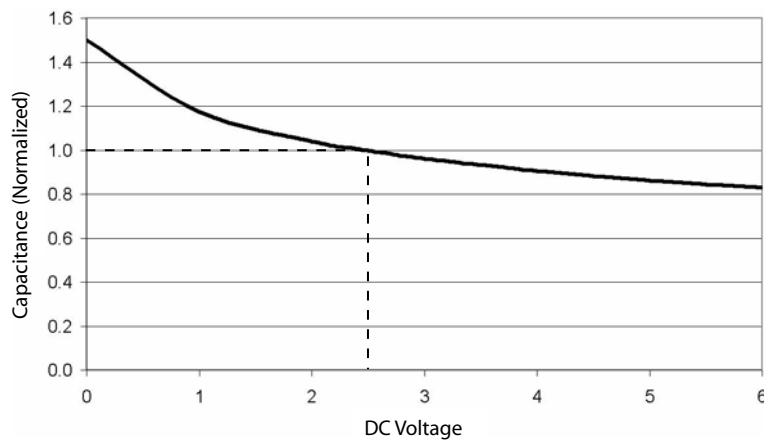


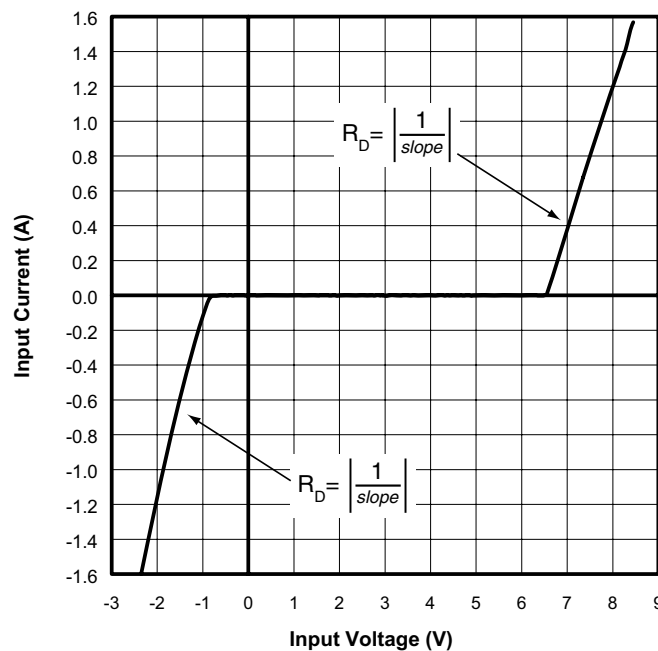
Figure 1. Diode Capacitance vs. Reverse Voltage

Typical High Current Diode Characteristics

Measurements are made in pulsed mode with a nominal pulse width of 0.7ms.

Typical Input VI Characteristics

(Pulse-mode measurements, pulse width = 0.7ms nominal)

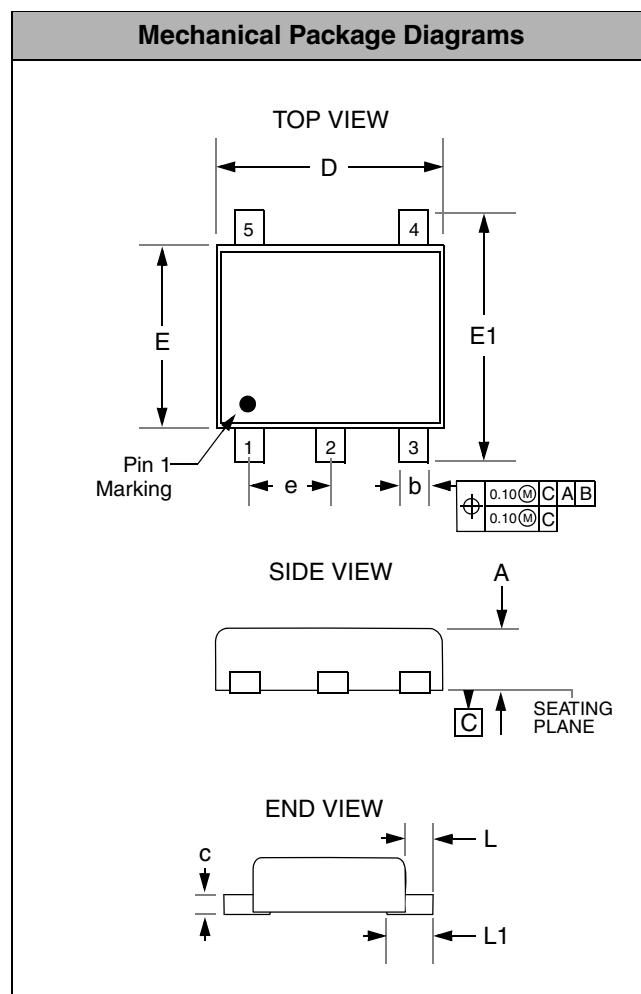


Mechanical Details

SOT-953 Mechanical Specifications

Dimensions for the CM1249, supplied in a 5-pin SOT-953 package are presented below.

PACKAGE DIMENSIONS						
Package	SOT-953					
Leads	5					
Dim.	Millimeters			Inches		
	Min	Nom	Max	Min	Nom	Max
A	0.40	0.45	0.50	0.016	0.018	0.020
b	0.10	0.15	0.20	0.004	0.006	0.008
c	0.05	0.10	0.15	0.002	0.004	0.006
D	0.95	1.00	1.05	0.037	0.039	0.041
E	0.75	0.80	0.85	0.029	0.031	0.033
E1	0.95	1.00	1.05	0.037	0.039	0.041
e	0.35 BSC			0.014 BSC		
L	0.05	0.10	0.15	0.002	0.004	0.006
L1	0.125	0.150	0.175	0.005	0.006	0.007
# per tape and reel	5000 pieces					
Controlling dimension: millimeters						



Package Dimensions for SOT-953