ON Semiconductor®

Low Capacitance Transient Voltage Suppressors/ESD Protectors

CM1249-04S9

Features

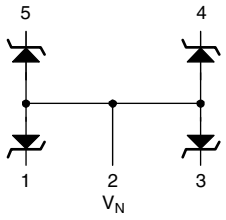
- Low I/O capacitance at 5pF typical
- In-system ESD protection to ±8kV contact discharge, per the IEC 61000-4-2 international standard
- Four channels of ESD protection
- Compact SOT-953 package saves board space and facilitates layout in space-critical applications
- Each I/O pin can withstand over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

Applications

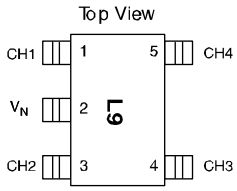
- High-speed consumer electronic ports
- ESD protection of PC ports, including USB ports, serial ports, parallel ports, IEEE1394 ports, docking ports, proprietary ports, etc.
- Protection of interface ports or IC pins which are exposed to high ESD levels

Electrical Schematic

CM1249-04



SOT-953



5-lead SOT-953

Note: This drawing is not to scale.

NMONTH 2009 – Rev. (whole #)

Publication Order Number:
MASTER/D

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			
		Lead-free Finish	
Leads	**Package**	**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

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°C, 0VDC, 1MHz		5	7	pF
ΔC_{IN}	Differential Channel I/O to GND Capacitance	T_A = 25°C, 2.5VDC, 1MHz		0.14		pF
I_{LEAK}	Leakage Current	V_{IN} = 3.5VDC, T_A = 25°C			0.75	μA
V_{SIG}	Small Signal Clamp Voltage Positive Clamp Negative Clamp	 I = 5mA, T_A = 25°C I = –5mA, T_A = 25°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 3 and 4; T_A = 25°C Notes 2 and 4; T_A = 25°C	 ±8 ±15			 kV kV
R_D	Diode Dynamic Resistance Forward Conduction Reverse Conduction	T_A = 25°C; Note 2		 0.7 2.1		 Ω Ω

Note 1: All parameters specified at T_A = –40°C to +85°C unless otherwise noted.
Note 2: Human Body Model per MIL-STD-883, Method 3015, $C_{Discharge}$ = 100pF, $R_{Discharge}$ = 1.5KΩ, V_N grounded.
Note 3: Standard IEC 61000-4-2 with $C_{Discharge}$ = 150pF, $R_{Discharge}$ = 330Ω, V_N grounded.
Note 4: These measurements performed with no external capacitor on CH.

Performance Information

Diode Capacitance

Typical diode capacitance with respect to positive TVS cathode voltage (reverse voltage across the diode) is given in Diode Capacitance vs. Reverse Voltage .

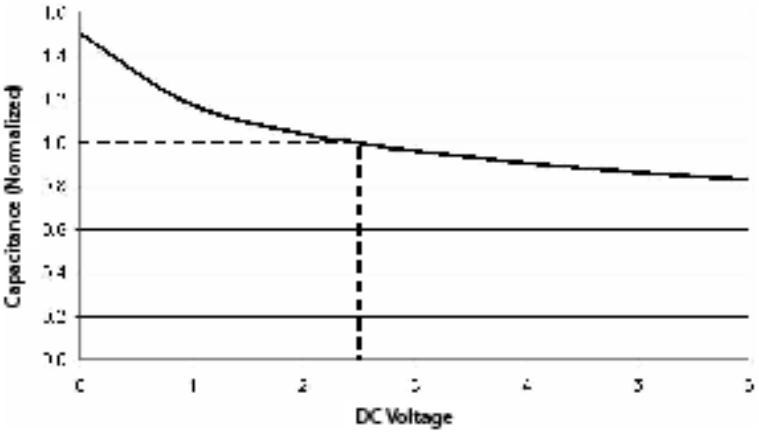
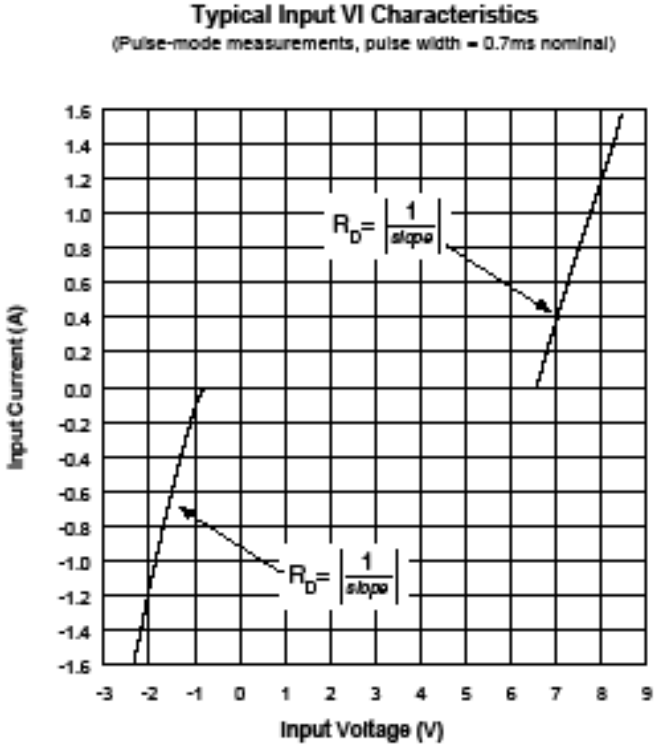


Figure 1. Diode Capacitance vs. Reverse Voltage

Typical High Current Diode Characteristics

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

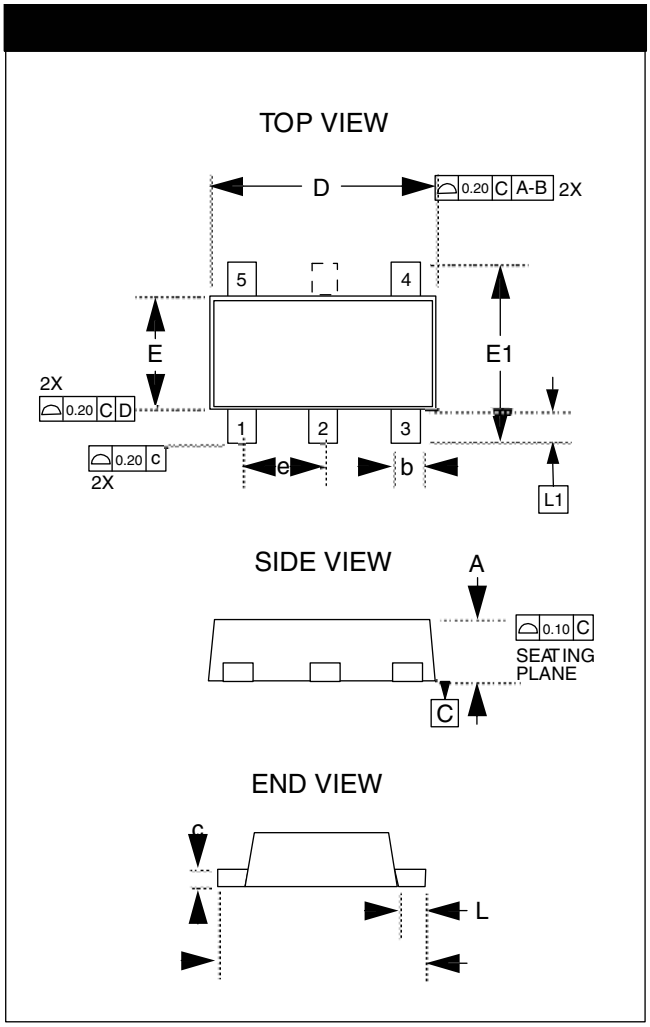


Mechanical Details

SOT-953 Mechanical Specifications

The 5-pin SOT-953 package dimensions are shown below.

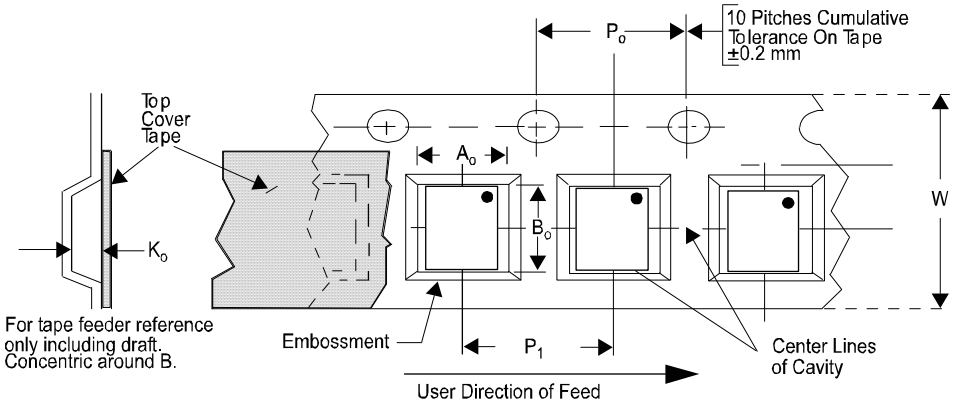
PACKAGE DIMENSIONS						
Package	SOT-953/963					
Leads	5					
Dim.	**Millimeters**			**Inches**		
	Min	**Nom**	**Max**	**Min**	**Nom**	**Max**
A	0.400	0.450	0.500	0.016	0.018	0.020
b	0.100	0.150	0.200	0.004	0.006	0.008
c	0.050	0.100	0.150	0.002	0.004	0.006
D	0.950	1.000	1.050	0.037	0.039	0.041
E	0.750	0.800	0.850	0.029	0.031	0.033
E1	0.950	1.000	1.050	0.037	0.039	0.041
e	0.350 BSC			0.014 BSC		
L	0.050	0.100	0.150	0.002	0.004	0.006
L1	0.125	0.150	0.175	0.005	0.006	0.007
# per tape and reel	8000 pieces					
Controlling dimension: millimeters						



Package Dimensions for SOT-953

Tape and Reel Specifications

PART NUMBER	PACKAGE SIZE (mm)	POCKET SIZE (mm) B_0 X A_0 X K_0	TAPE WIDTH W	REEL DIAMETER	QTY PER REEL	P_0	P_1
CM1249-04S9	1.00 X 0.80 X 0.45	1.16 X 1.16 X 0.63	8mm	178mm (7")	8000	4mm	4mm



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