

## Low Capacitance Transient Voltage Suppressors / ESD Protectors

### Features

- Low I/O capacitance at 7pF typical
- Four channels of ESD protection
- In-system ESD protection to  $\pm 15\text{kV}$  contact discharge, per the IEC 61000-4-2 international standard
- Compact SMT package saves board space and facilitates layout in space-critical applications
- Each I/O pin can withstand over 1000 ESD strikes
- Lead-free

Note: For other versions of the CM1218, see the CM1218 datasheet or the CM1218-H4 datasheet.

### Product Description

The CM1218-C4 device features transient voltage suppressor arrays that provide a very high level of protection for sensitive electronic components which may be subjected to electrostatic discharge (ESD).

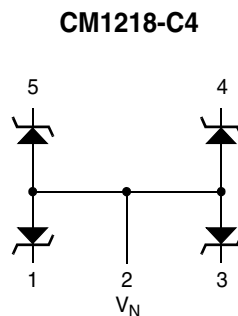
All pins of the CM1218-C4 are rated to withstand  $\pm 15\text{kV}$  ESD pulses using the IEC 61000-4-2 contact discharge method. Using the MIL-STD-883D (Method 3015) specification for Human Body Model (HBM) ESD, all pins are protected from contact discharges of greater than  $\pm 30\text{kV}$ .

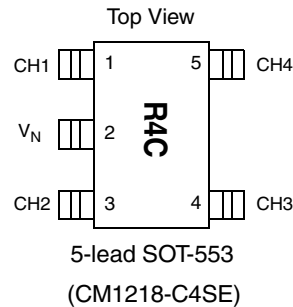
The CM1218-C4 is supplied in an SOT553 lead-free finished package.

### 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



**PACKAGE / PINOUT DIAGRAMS**


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 <sub>N</sub>	The anode of the TVS diodes.

**Ordering Information**
**PART NUMBERING INFORMATION**

Leads	Channels	Package	Lead-free Finish	
			Ordering Part Number	Part Marking
5	4	SOT-553	CM1218-C4SE	R4C

Notes : The maximum soldering reflow temperature for these packages is 260°C. Parts are shipped in tape and reel form unless otherwise specified.

## Specifications

### ABSOLUTE MAXIMUM RATINGS

PARAMETER	RATING	UNITS
Storage Temperature Range	-65 to +150	°C
Package Power Dissipation SOT-553, SOT-563	0.15	W

### STANDARD OPERATING CONDITIONS

PARAMETER	RATING	UNITS
Operating Temperature	-40 to +85	°C

### ELECTRICAL OPERATING CHARACTERISTICS

SYMBOL	PARAMETER	CONDITIONS	MIN	TYP	MAX	UNITS
$C_{IN}$	Channel Input Capacitance	$T_A = 25^\circ\text{C}$ , 2.5VDC, 1MHz; Note 1		7		pF
$\Delta C_{IN}$	Differential Channel I/O to GND Capacitance	$T_A = 25^\circ\text{C}$ , 2.5VDC, 1MHz; Note 1		0.19		pF
$V_{RSO}$	Reverse Stand-off Voltage	$I_R = 10\mu\text{A}$ , $T_A = 25^\circ\text{C}$	5.5			V
		$I_R = 1\text{mA}$ , $T_A = 25^\circ\text{C}$	6.1			V
$I_{LEAK}$	Leakage Current	$V_{IN} = 5.0\text{VDC}$ , $T_A = 25^\circ\text{C}$			1	$\mu\text{A}$
$V_{SIG}$	Small Signal Clamp Voltage Positive Clamp Negative Clamp	$I = 10\text{mA}$ , $T_A = 25^\circ\text{C}$		6.8		V
		$I = -10\text{mA}$ , $T_A = 25^\circ\text{C}$		-0.8		V
$V_{ESD}$	ESD Withstand Voltage Contact Discharge per IEC 61000-4-2 standard Human Body Model, MIL-STD-883, Method 3015	Notes 1, 3 & 4; $T_A = 25^\circ\text{C}$	$\pm 15$			kV
		Notes 1, 2 & 4; $T_A = 25^\circ\text{C}$	$\pm 30$			kV
$R_D$	Diode Dynamic Resistance Forward Conduction Reverse Conduction	$T_A = 25^\circ\text{C}$ ; Notes 1 & 2		0.57		$\Omega$
				1.36		$\Omega$

Note 1: These parameters guaranteed by design and characterization.

Note 2: Human Body Model per MIL-STD-883, Method 3015,  $C_{Discharge} = 100\text{pF}$ ,  $R_{Discharge} = 1.5\text{K}\Omega$ ,  $V_N$  grounded.

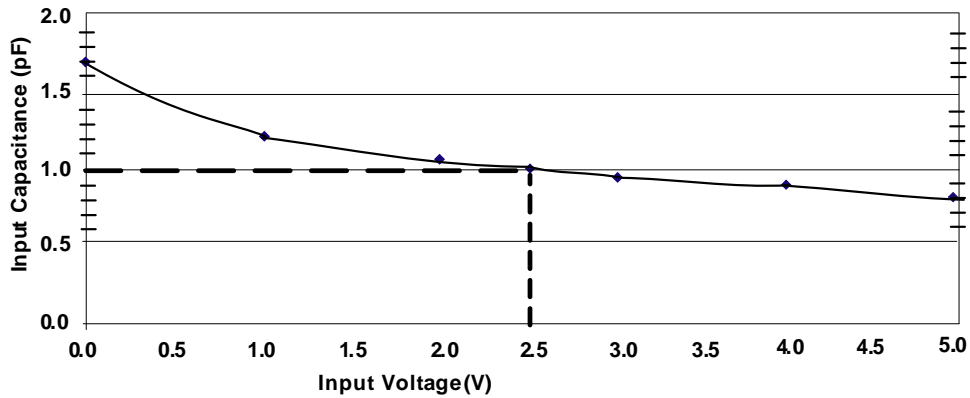
Note 3: Standard IEC 61000-4-2 with  $C_{Discharge} = 150\text{pF}$ ,  $R_{Discharge} = 330\Omega$ ,  $V_N$  grounded.

Note 4: 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.



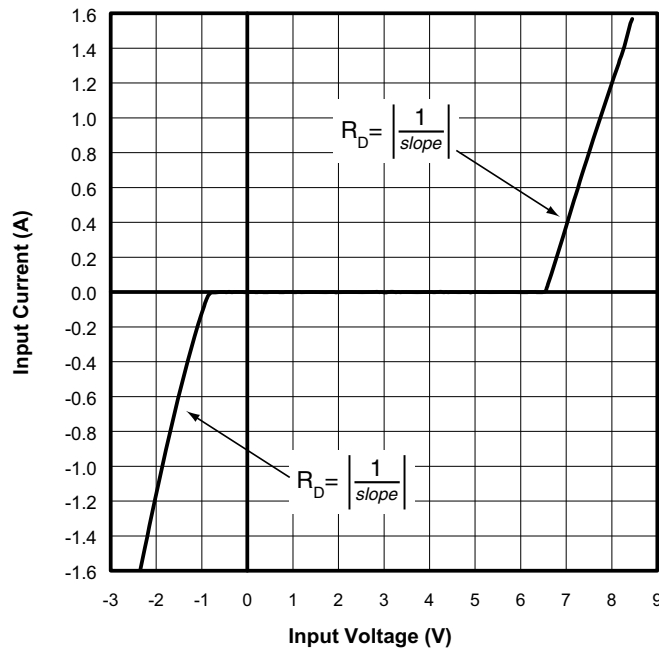
**Figure 1. Diode Capacitance vs. Reverse Voltage**

### 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)

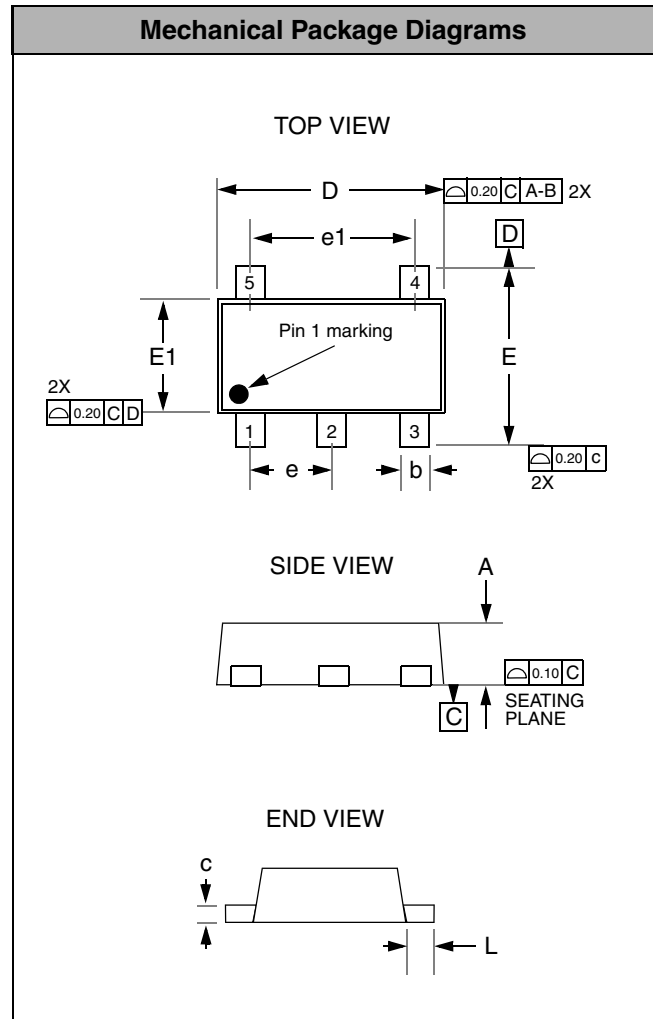


## Mechanical Details

### SOT-553 Mechanical Specifications

The CM1218-C4SE is supplied in a 5-pin SOT-553 package. Dimensions are presented below.

PACKAGE DIMENSIONS						
Package	SOT-553					
Leads	5					
Dim.	Millimeters			Inches		
	Min	Nom	Max	Min	Nom	Max
A	0.50	0.55	0.60	0.020	0.022	0.024
b	0.17		0.27	0.007		0.011
c	0.08		0.18	0.003		0.007
D	1.60 BSC			0.063 BSC		
E	1.50	1.60	1.70	0.059	0.063	0.067
E1	1.20 BSC			0.047 BSC		
e	0.50 BSC			0.020 BSC		
e1	1.00 BSC			0.040 BSC		
L	0.14	0.20	0.27	0.006	0.008	0.011
# per tape and reel	5000 pieces					
Controlling dimension: millimeters						



Package Dimensions for SOT-553