



Features

- Low I/O capacitance at 4pF typical
- In-system ESD protection to $\pm 8\text{kV}$ contact discharge, per the IEC 61000-4-2 international standard
- Five channels of ESD protection
- 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 version packaging

Applications

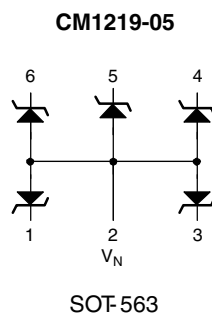
- High-speed consumer electronic ports
- ESD protection of PC ports, including USB ports, serial ports, parallel ports, IEEE1394 ports, docking ports, proprietary ports, etc.
- Protection of interface ports or IC pins which are exposed to high ESD levels

Product Description

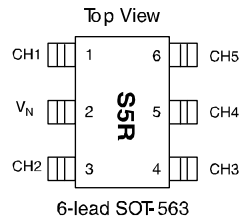
The CM1219 family of devices features transient voltage suppressor arrays that provide a very high level of protection for sensitive electronic components which may be subjected to electrostatic discharge (ESD).

All pins of the CM1219 are rated to withstand $\pm 8\text{kV}$ 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 $\pm 15\text{kV}$.

Electrical Schematics



*Standard test condition is IEC61000-4-2 level 4 test circuit with each pin subjected to $\pm 8\text{kV}$ contact discharge for 1000 pulses. Discharges are timed at 1 second intervals and all 1000 strikes are completed in one continuous test run. The part is then subjected to standard production test to verify that all of the tested parameters are within spec after the 1000 strikes.



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 |
| 6 | SOT-563 | CM1219-05SE | S5R |

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 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 | | 4 | | pF |
| ΔC_{IN} | Differential Channel I/O to GND Capacitance | $T_A = 25^\circ\text{C}$, 2.5VDC, 1MHz | | 0.14 | | pF |
| V_{RSO} | Reverse Stand-off Voltage | $I_R = 10\mu\text{A}$, $T_A = 25^\circ\text{C}$ | 5.5 | 6.8 | 8.5 | V |
| | | $I_R = 1\text{mA}$, $T_A = 25^\circ\text{C}$ | 6.1 | 6.8 | 8.8 | V |
| I_{LEAK} | Leakage Current | $V_{IN} = 5.0\text{VDC}$, $T_A = 25^\circ\text{C}$ | | | 1 | μA |
| V_{SIG} | Small Signal Clamp Voltage Positive Clamp Negative Clamp | $I = 10\text{mA}$, $T_A = 25^\circ\text{C}$ | 5.5 | 6.8 | 9.0 | V |
| | | $I = -10\text{mA}$, $T_A = 25^\circ\text{C}$ | -0.4 | -0.8 | -1.2 | V |
| V_{ESD} | ESD Withstand Voltage Contact Discharge per IEC 61000-4-2 standard Human Body Model, MIL-STD-883, Method 3015 | $T_A = 25^\circ\text{C}$; Notes 2 and 3 | ± 8 | | | kV |
| | | $T_A = 25^\circ\text{C}$; Notes 1 and 3 | ± 15 | | | kV |
| R_D | Diode Dynamic Resistance Forward Conduction Reverse Conduction | $T_A = 25^\circ\text{C}$; Note 1 | 0.5 | 0.7 | 0.9 | Ω |
| | | | 1.3 | 1.9 | 2.4 | Ω |

Note 1: 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 2: Standard IEC 61000-4-2 with $C_{Discharge} = 150\text{pF}$, $R_{Discharge} = 330\Omega$, V_N grounded.

Note 3: 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 Diode Capacitance vs. Reverse Voltage .

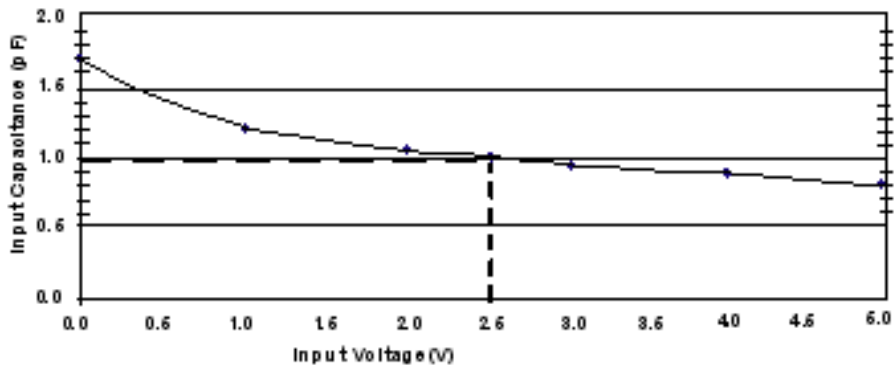
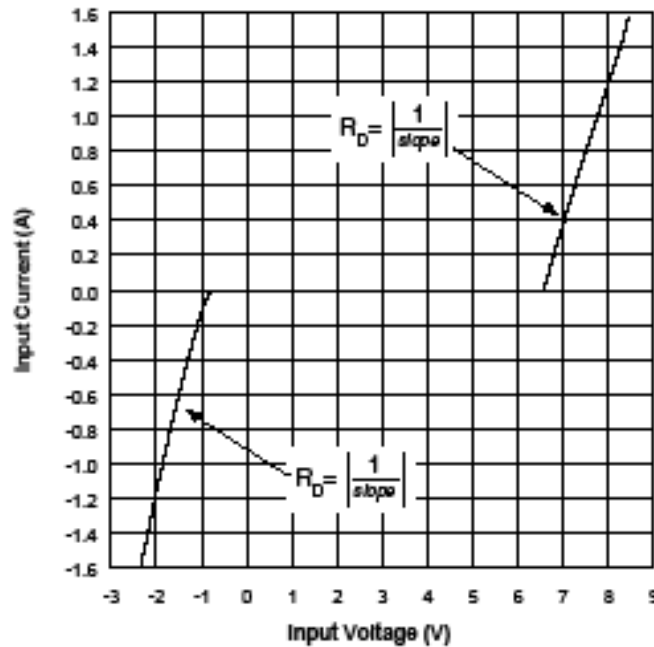


Figure 1. Diode Capacitance vs. Reverse Voltage

Typical High Current Diode Characteristics

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

Typical Input VI Characteristics
(Pulse-mode measurements, pulse width = 0.7ms nominal)



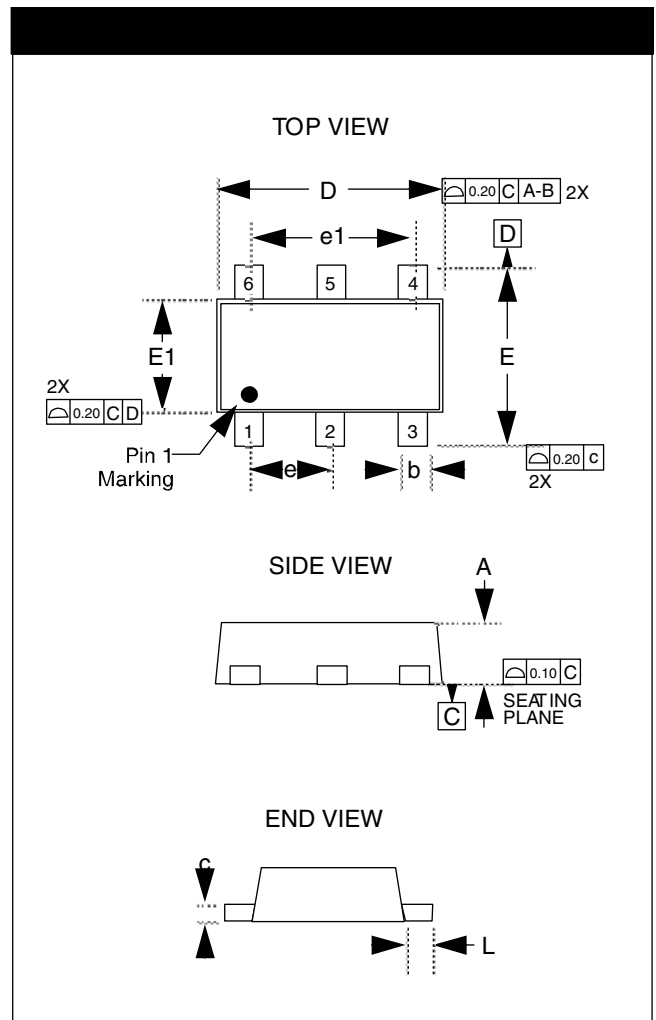
CM1219

Mechanical Details

SOT-563 Mechanical Specifications

The CM1219-05SE is supplied in a 5-pin SOT-563 package. Dimensions are presented below.

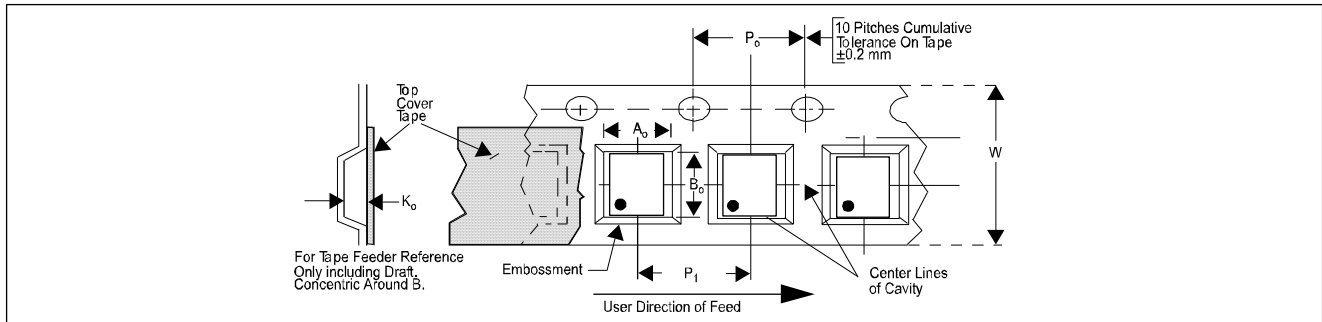
| PACKAGE DIMENSIONS | | | | | | |
|------------------------------------|-------------|------|------|-----------|-------|-------|
| Package | SOT-563 | | | | | |
| Leads | 6 | | | | | |
| Dim. | Millimeters | | | Inches | | |
| | Min | Nom | Max | Min | Nom | Max |
| A | 0.50 | 0.55 | 0.60 | 0.020 | 0.022 | 0.024 |
| b | 0.17 | 0.22 | 0.27 | 0.007 | 0.009 | 0.011 |
| c | 0.08 | 0.13 | 0.18 | 0.003 | 0.005 | 0.007 |
| D | 1.60 BSC | | | 0.063 BSC | | |
| E | 1.60 BSC | | | 0.063 BSC | | |
| E1 | 1.20 BSC | | | 0.047 BSC | | |
| e | 0.50 BSC | | | 0.020 BSC | | |
| e1 | 1.00 BSC | | | 0.040 BSC | | |
| L | 0.20 BSC | | | 0.008 BSC | | |
| # per tape and reel | 5000 pieces | | | | | |
| Controlling dimension: millimeters | | | | | | |




Package Dimensions for SOT-563

Tape and Reel Specifications

| PART NUMBER | PACKAGE SIZE (mm) | POCKET SIZE (mm) $B_0 \times A_0 \times K_0$ | TAPE WIDTH W | REEL DIAMETER | QTY PER REEL | P_0 | P_1 |
|-------------|--------------------|---|-----------------|---------------|--------------|-------|-------|
| CM1219 | 1.60 X 1.60 X 0.55 | 1.78 X 1.78 X 0.69 | 8mm | 178mm (7") | 5000 | 4mm | 4mm |



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