Low Capacitance Transient Voltage Suppressors / ESD Protectors

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 ± 15 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 ± 30 kV.

The CM1218-C4 is supplied in an SOT-553, RoHS-compliant, lead-free finished package.

Features*

- Low I/O Capacitance at 7 pF Typical
- Four Channels of ESD Protection
- In-system ESD Protection to ±15 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
- These Devices are Pb-Free and are RoHS 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



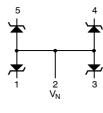
ON Semiconductor®

http://onsemi.com



SOT-553 SE SUFFIX CASE 463B





CM1218-C4

MARKING DIAGRAM



R4C = Specific Device Code

- M = Month Code
- = Pb-Free Package

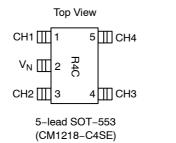
ORDERING INFORMATION

| Device | Package | Shipping [†] |
|-------------|----------------------|-----------------------|
| CM1218-C4SE | SOT–553 (Pb–Free) | 5000/Tape & Reel |

+For information on tape and reel specifications, including part orientation and tape sizes, please refer to our Tape and Reel Packaging Specification Brochure, BRD8011/D.

*For Other Versions of the CM1218, see the CM1218 datasheet or the CM1218-H4 datasheet.

PACKAGE / PINOUT DIAGRAM & PIN DESCRIPTIONS



| R4C | = Specific Device Code |
|-----|-----------------------------------------------------|
| CHx | = The Cathode of the Respective TVS Diode, which |
| | should be connected to the node requiring transient |
| | voltage protection |
| VN | = The Anode of the TVS Diodes |

SPECIFICATIONS

Table 1. ABSOLUTE MAXIMUM RATINGS

| Parameter | Rating | Units |
|-----------------------------------|-------------|-------|
| Storage Temperature Range | -65 to +150 | °C |
| Package Power Dissipation SOT-553 | 0.15 | W |

Stresses exceeding Maximum Ratings may damage the device. Maximum Ratings are stress ratings only. Functional operation above the Recommended Operating Conditions is not implied. Extended exposure to stresses above the Recommended Operating Conditions may affect device reliability.

Table 2. STANDARD OPERATING CONDITIONS

| Parameter | Rating | Units |
|-----------------------|------------|-------|
| Operating Temperature | -40 to +85 | °C |

Table 3. ELECTRICAL OPERATING CHARACTERISTICS

| Symbol | Parameter | Conditions | Min | Тур | Max | Units |
|-------------------|---------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------|------------|--------------|-----|-------|
| C _{IN} | Channel Input Capacitance | T _A = 25°C, 2.5 VDC, 1 MHz | | 7 | | pF |
| ΔC_{IN} | Differential Channel I/O to GND Capacitance | T _A = 25°C, 2.5 VDC, 1 MHz | | 0.19 | | pF |
| V _{RSO} | Reverse Stand-off Voltage | I _R = 10 μA, T _A = 25°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 VDC, T_A = 25°C | | | 1 | μA |
| V _{SIG} | Small Signal Clamp Voltage Positive Clamp Negative Clamp | I = 10 mA, T _A = 25°C I = -10 mA, T _A = 25°C | | 6.8 -0.8 | | 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°C; Notes 2 & 3 T _A = 25°C; Notes 1 & 3 | ±15 ±30 | | | kV |
| R _D | Diode Dynamic Resistance Forward Conduction Reverse Conduction | T _A = 25°C; Note 1 | | 0.57 1.36 | | Ω |

Human Body Model per MIL-STD-883, Method 3015, C_{Discharge} = 100 pF, R_{Discharge} = 1.5 KΩ, V_N grounded.
Standard IEC 61000-4-2 with C_{Discharge} = 150 pF, R_{Discharge} = 330 Ω, V_N grounded.
These measurements performed with no external capacitor on CH_X.

CM1218-C4

Performance Information

Diode Capacitance

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

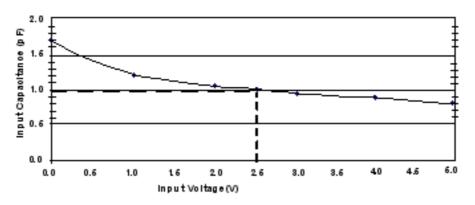
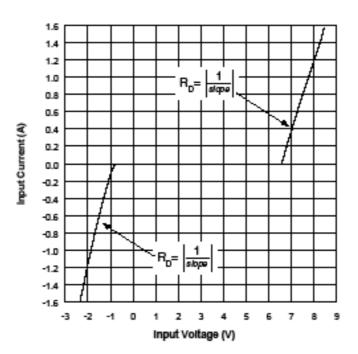
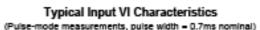


Figure 1. Diode Capacitance vs. Reverse Voltage

Typical High Current Diode Characteristics

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



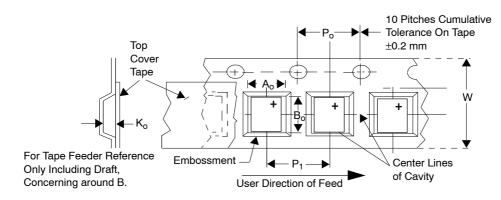


CM1218-C4

MECHANICAL SPECIFICATIONS

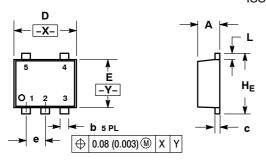
The CM1218-C4SE is supplied in a 5-pin SOT-553 package. Dimensions are presented below.

| Part Number | Chip Size (mm) | Pocket Size (mm) B ₀ X A ₀ X K ₀ | Tape Width W | Reel Diameter | Qty per Reel | Po | P ₁ |
|-------------|--------------------|----------------------------------------------------------------------|-----------------|---------------|-----------------|------|----------------|
| CM1218-C4SE | 1.60 X 1.60 X 0.55 | 1.78 X 1.78 X 0.69 | 8 mm | 178 mm (7″) | 5000 | 4 mm | 4 mm |

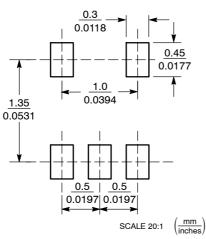


PACKAGE DIMENSIONS

SOT-553, 5 LEAD CASE 463B-01 ISSUE B



SOLDERING FOOTPRINT*



NOTES: 1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982. 2. CONTROLLING DIMENSION: MILLIMETERS

 CONTROLLING DIMENSION: MILLIMETERS
MAXIMUM LEAD THICKNESS INCLUDES LEAD FINISH THICKNESS. MINIMUM LEAD THICKNESS IS THE MINIMUM THICKNESS OF BASE MATERIAL.

| | MILLIMETERS | | | INCHES | | | |
|-----|----------------|------|------|-----------|-------|-------|--|
| DIM | MIN | NOM | MAX | MIN | NOM | MAX | |
| Α | 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 | |
| С | 0.08 | 0.13 | 0.18 | 0.003 | 0.005 | 0.007 | |
| D | 1.50 | 1.60 | 1.70 | 0.059 | 0.063 | 0.067 | |
| Е | 1.10 | 1.20 | 1.30 | 0.043 | 0.047 | 0.051 | |
| е | 0.50 BSC 0.020 | | | 0.020 BSC |) | | |
| Ĺ | 0.10 | 0.20 | 0.30 | 0.004 | 0.008 | 0.012 | |
| ΗE | 1.50 | 1.60 | 1.70 | 0.059 | 0.063 | 0.067 | |

STYLE 2: PIN 1. CATHODE 2. COMMON ANODE

3. CATHODE 2

4. CATHODE 3 5. CATHODE 4

*For additional information on our Pb–Free strategy and soldering details, please download the ON Semiconductor Soldering and Mounting Techniques Reference Manual, SOLDERRM/D.

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