

# CM1248-04QG

## Low Capacitance Transient Voltage Suppressors / ESD Protectors

### Features

- Low I/O Capacitance at 10 pF at 0 V
- In-System ESD Protection to  $\pm 15$  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



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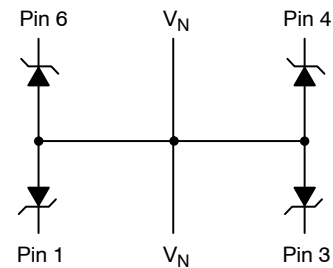
<http://onsemi.com>



UDFN-6  
QG SUFFIX  
CASE 517BM

### BLOCK DIAGRAM

CM1248-04QG



### MARKING DIAGRAM



LR = Specific Device Code

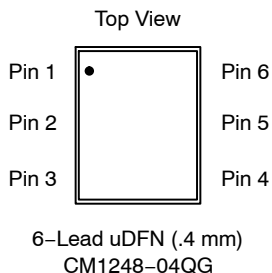
### ORDERING INFORMATION

Device	Package	Shipping†
CM1248-04QG	uDFN-0.4 mm (Pb-Free)	3000/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.

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## PACKAGE / PINOUT DIAGRAMS



**Table 1. PIN DESCRIPTIONS**

Pins	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.

## SPECIFICATIONS

**Table 2. ABSOLUTE MAXIMUM RATINGS**

Parameter	Rating	Units
Storage Temperature Range	-65 to +150	°C

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 3. STANDARD OPERATING CONDITIONS**

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

**Table 4. ELECTRICAL OPERATING CHARACTERISTICS** (Note 1)

Symbol	Parameter	Conditions	Min	Typ	Max	Units
C <sub>IN</sub>	Channel Input Capacitance	T <sub>A</sub> = 25°C, 0 VDC, 1 MHz; Note 2		10		pF
		0 VDC, 1 MHz; Note 1	7		15	pF
ΔC <sub>IN</sub>	Differential Channel I/O to GND Capacitance	T <sub>A</sub> = 25°C, 2.5 VDC, 1 MHz; Note 2		0.19		pF
V <sub>RSO</sub>	Reverse Stand-off Voltage	I <sub>R</sub> = 10 μA, T <sub>A</sub> = 25°C	5.5			V
		I <sub>R</sub> = 1 mA, T <sub>A</sub> = 25°C	6.1			V
I <sub>LEAK</sub>	Leakage Current	V <sub>IN</sub> = 5.0 VDC, T <sub>A</sub> = 25°C			0.25	μA
		V <sub>IN</sub> = 5.0 VDC, Note 1			0.75	μA
V <sub>SIG</sub>	Small Signal Clamp Voltage Positive Clamp Negative Clamp	I = 10 mA, T <sub>A</sub> = 25°C I = -10 mA, T <sub>A</sub> = 25°C		6.8 -0.89		V
V <sub>ESD</sub>	ESD Withstand Voltage Contact Discharge per IEC 61000-4-2 standard	T <sub>A</sub> = 25°C (Notes 2, 4 and 5)	±15			kV
R <sub>D</sub>	Diode Dynamic Resistance Forward Conduction Reverse Conduction	T <sub>A</sub> = 25°C (Notes 2 and 3)		0.57 1.36		Ω

1. All parameters specified at T<sub>A</sub> = -40°C to +85°C unless otherwise noted.
2. These parameters guaranteed by design and characterization.
3. Human Body Model per MIL-STD-883, Method 3015, C<sub>Discharge</sub> = 100 pF, R<sub>Discharge</sub> = 1.5 KΩ, V<sub>N</sub> grounded.
4. Standard IEC 61000-4-2 with C<sub>Discharge</sub> = 150 pF, R<sub>Discharge</sub> = 330 Ω, V<sub>N</sub> grounded.
5. These measurements performed with no external capacitor on Pin<sub>x</sub>.

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## 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.

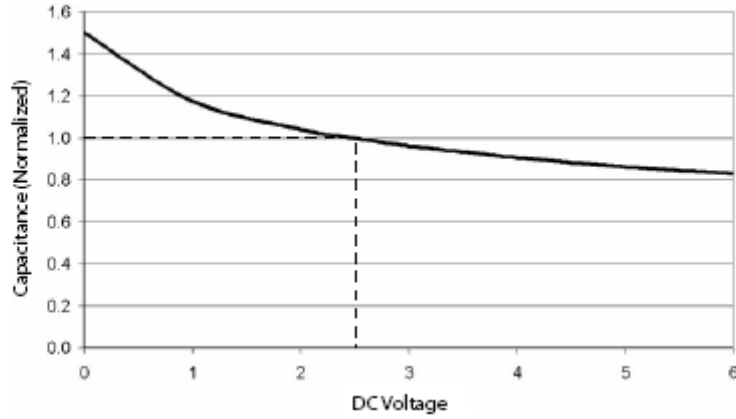


Figure 1. Diode Capacitance vs. Reverse Voltage

### Typical High Current Diode Characteristics

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

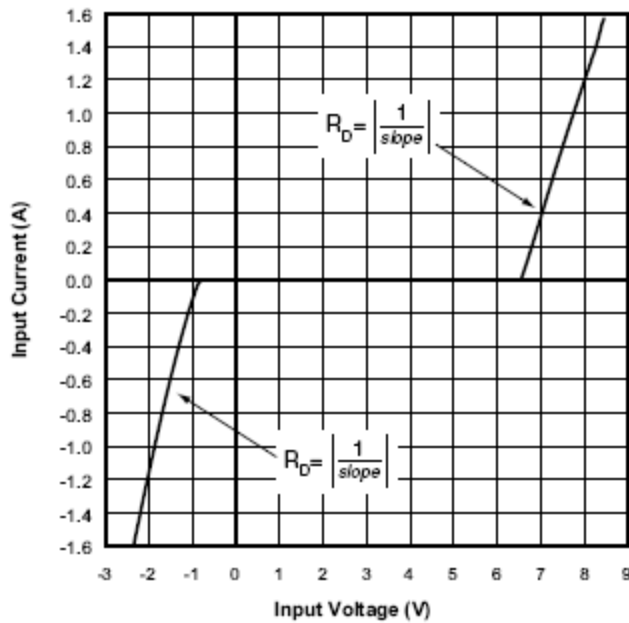
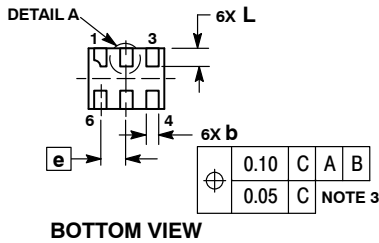
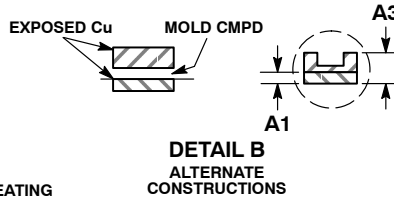
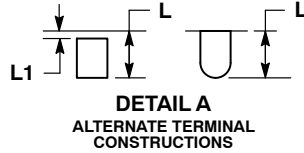
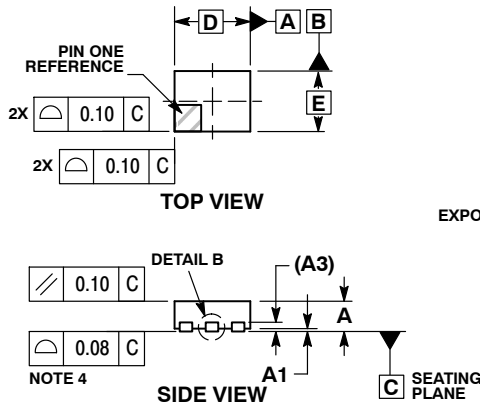


Figure 2. Typical Input VI Characteristics  
(Pulse-mode Measurements, Pulse Width = 0.7 ms nominal)

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## PACKAGE DIMENSIONS

UDFN6, 1.25x1, 0.4P  
CASE 517BM-01  
ISSUE O

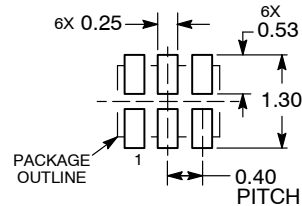


**NOTES:**

1. DIMENSIONING AND TOLERANCING PER ASME Y14.5M, 1994.
2. CONTROLLING DIMENSION: MILLIMETERS.
3. DIMENSION b APPLIES TO PLATED TERMINAL AND IS MEASURED BETWEEN 0.15 AND 0.30 MM FROM TERMINAL TIP.
4. COPLANARITY APPLIES TO THE EXPOSED PAD AS WELL AS THE TERMINALS.

DIM	MILLIMETERS	
	MIN	MAX
A	0.45	0.55
A1	0.00	0.05
A3	0.15 REF	
b	0.15	0.25
D	1.25 BSC	
E	1.00 BSC	
e	0.40 BSC	
L	0.20	0.40
L1	---	0.15

### RECOMMENDED SOLDERING FOOTPRINT\*



DIMENSION: MILLIMETERS

\*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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