

# CM1248-04QG

## EDS Protection Diode

### Low Capacitance

#### 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



ON Semiconductor®

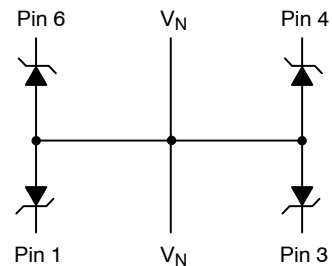
[www.onsemi.com](http://www.onsemi.com)



UDFN-6  
QG SUFFIX  
CASE 517BM

#### BLOCK DIAGRAM

CM1248-04QG



#### MARKING DIAGRAM



LR = Specific Device Code

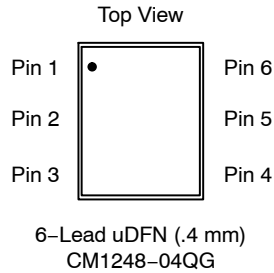
#### ORDERING INFORMATION

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.

# CM1248-04QG

## PACKAGE / PINOUT DIAGRAMS



**Table 1. PIN DESCRIPTIONS**

Pins	Name	Description
(Refer to package / pinout diagrams)	CHx	The cathode of the respective surge protection 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 surge protection diodes.

## SPECIFICATIONS

**Table 2. ABSOLUTE MAXIMUM RATINGS**

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

Stresses exceeding those listed in the Maximum Ratings table may damage the device. If any of these limits are exceeded, device functionality should not be assumed, damage may occur and reliability may be affected.

**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

- All parameters specified at T<sub>A</sub> = -40°C to +85°C unless otherwise noted.
- These parameters guaranteed by design and characterization.
- 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.
- Standard IEC 61000-4-2 with C<sub>Discharge</sub> = 150 pF, R<sub>Discharge</sub> = 330 Ω, V<sub>N</sub> grounded.
- These measurements performed with no external capacitor on Pin<sub>x</sub>.

PERFORMANCE INFORMATION

**Diode Capacitance**

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

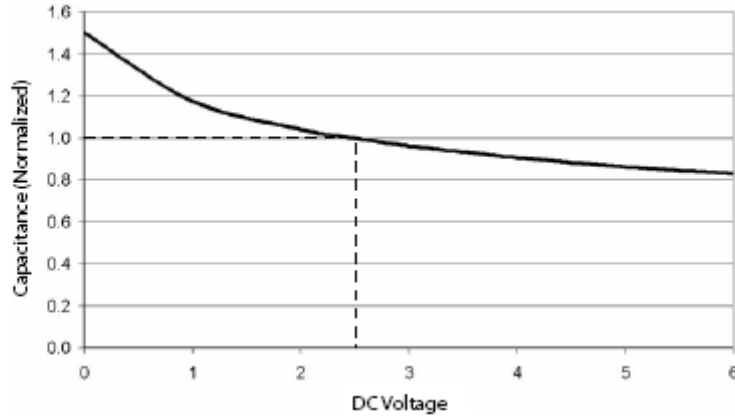


Figure 1. Diode Capacitance vs. Reverse Voltage

**Typical High Current Diode Characteristics**

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

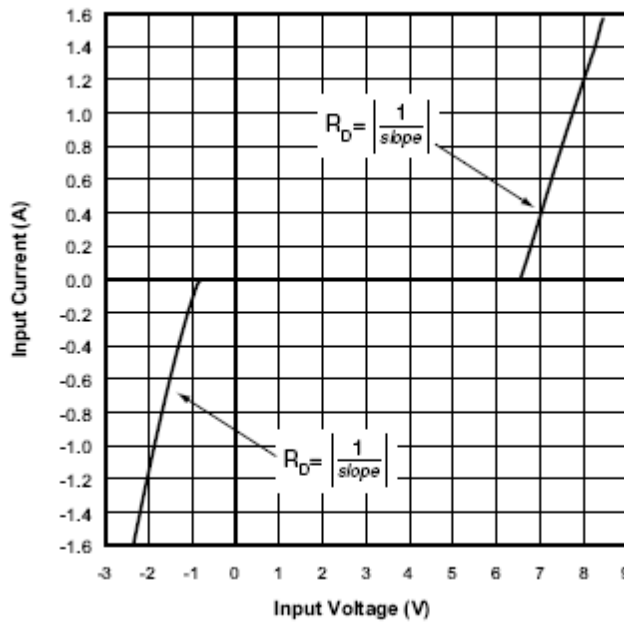


Figure 2. Typical Input VI Characteristics  
(Pulse-mode Measurements, Pulse Width = 0.7 ms nominal)

# MECHANICAL CASE OUTLINE

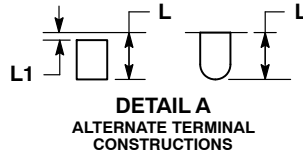
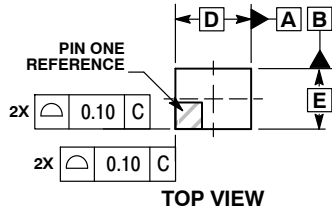
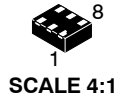
## PACKAGE DIMENSIONS

ON Semiconductor®



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

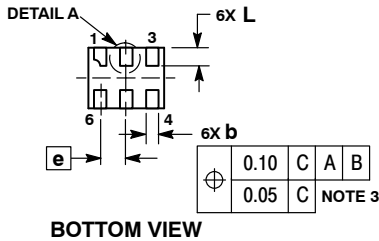
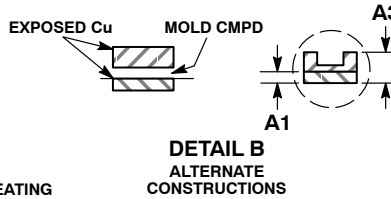
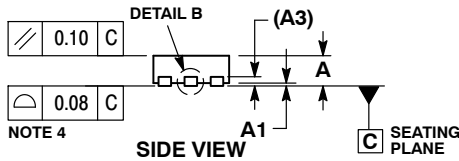
DATE 20 JUL 2010



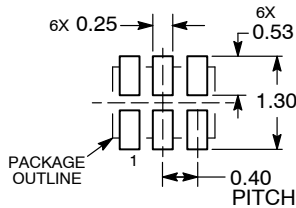
NOTES:

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.

<b>DOCUMENT NUMBER:</b>	<b>98AON48939E</b>	Electronic versions are uncontrolled except when accessed directly from the Document Repository. Printed versions are uncontrolled except when stamped "CONTROLLED COPY" in red.
<b>DESCRIPTION:</b>	<b>UDFN6, 1.25X1, 0.4P</b>	<b>PAGE 1 OF 1</b>

ON Semiconductor and are trademarks of Semiconductor Components Industries, LLC dba ON Semiconductor or its subsidiaries in the United States and/or other countries. ON Semiconductor reserves the right to make changes without further notice to any products herein. ON Semiconductor makes no warranty, representation or guarantee regarding the suitability of its products for any particular purpose, nor does ON Semiconductor assume any liability arising out of the application or use of any product or circuit, and specifically disclaims any and all liability, including without limitation special, consequential or incidental damages. ON Semiconductor does not convey any license under its patent rights nor the rights of others.

**onsemi**, **Onsemi**, and other names, marks, and brands are registered and/or common law trademarks of Semiconductor Components Industries, LLC dba "**onsemi**" or its affiliates and/or subsidiaries in the United States and/or other countries. **onsemi** owns the rights to a number of patents, trademarks, copyrights, trade secrets, and other intellectual property. A listing of **onsemi**'s product/patent coverage may be accessed at [www.onsemi.com/site/pdf/Patent-Marking.pdf](http://www.onsemi.com/site/pdf/Patent-Marking.pdf). **onsemi** reserves the right to make changes at any time to any products or information herein, without notice. The information herein is provided "as-is" and **onsemi** makes no warranty, representation or guarantee regarding the accuracy of the information, product features, availability, functionality, or suitability of its products for any particular purpose, nor does **onsemi** assume any liability arising out of the application or use of any product or circuit, and specifically disclaims any and all liability, including without limitation special, consequential or incidental damages. Buyer is responsible for its products and applications using **onsemi** products, including compliance with all laws, regulations and safety requirements or standards, regardless of any support or applications information provided by **onsemi**. "Typical" parameters which may be provided in **onsemi** data sheets and/or specifications can and do vary in different applications and actual performance may vary over time. All operating parameters, including "Typicals" must be validated for each customer application by customer's technical experts. **onsemi** does not convey any license under any of its intellectual property rights nor the rights of others. **onsemi** products are not designed, intended, or authorized for use as a critical component in life support systems or any FDA Class 3 medical devices or medical devices with a same or similar classification in a foreign jurisdiction or any devices intended for implantation in the human body. Should Buyer purchase or use **onsemi** products for any such unintended or unauthorized application, Buyer shall indemnify and hold **onsemi** and its officers, employees, subsidiaries, affiliates, and distributors harmless against all claims, costs, damages, and expenses, and reasonable attorney fees arising out of, directly or indirectly, any claim of personal injury or death associated with such unintended or unauthorized use, even if such claim alleges that **onsemi** was negligent regarding the design or manufacture of the part. **onsemi** is an Equal Opportunity/Affirmative Action Employer. This literature is subject to all applicable copyright laws and is not for resale in any manner.

## ADDITIONAL INFORMATION

### TECHNICAL PUBLICATIONS:

Technical Library: [www.onsemi.com/design/resources/technical-documentation](http://www.onsemi.com/design/resources/technical-documentation)  
onsemi Website: [www.onsemi.com](http://www.onsemi.com)

### ONLINE SUPPORT: [www.onsemi.com/support](http://www.onsemi.com/support)

For additional information, please contact your local Sales Representative at [www.onsemi.com/support/sales](http://www.onsemi.com/support/sales)