ON Semiconductor®

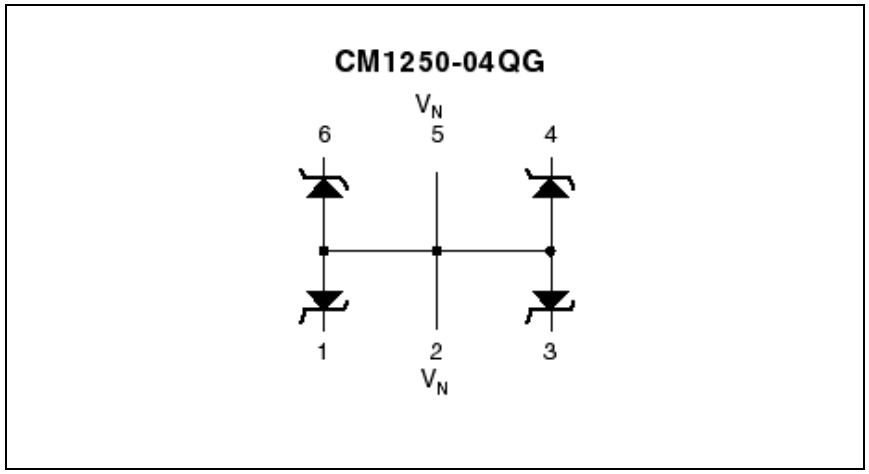
Low Capacitance Transient Voltage Suppressors / ESD Protectors

CM1250-04QG

Features

- Low I/O capacitance at 5pF at 0V
- In-system ESD protection to ±8kV 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*

Block Diagram



*Standard test condition is an IEC61000-4-2 level 4 test circuit with each pin subjected to ±8kV 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.

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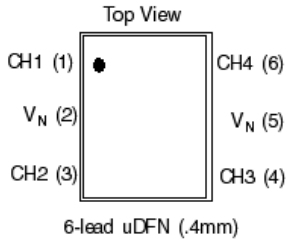
Publication Order Number:
CM1250-04QG/D

Pin Configuration



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_N	The anode of the TVS diodes.

Ordering Information

# of Pins	# of Channels	Package	Ordering Part Number[1]	Part Marking
6	4	uDFN-0.4mm	CM1250-04QG	LS

Note 1: Parts are shipped in Tape and Reel form unless otherwise specified.

Absolute Maximum Rating

PARAMETER	RATING	UNITS
Storage Temperature Range	-65 to +150	°C

Standard Operating Conditions

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

Electrical Operating Characteristics (see Note 1)

SYMBOL	PARAMETER	CONDITIONS	MIN	TYP	MAX	UNITS
C_{IN}	Channel Input Capacitance	T_A = 25°C, 0VDC, 1MHz		5	7	pF
		T_A = 25°C, 2.5VDC, 1MHz		3		pF
ΔC_{IN}	Differential Channel I/O to GND Capacitance	T_A = 25°C, 2.5VDC, 1MHz		0.14		pF
I_{LEAK}	Leakage Current	V_{IN} = 3.5VDC, T_A = 25°C			0.10	µA
V_{SIG}	Small Signal Clamp Voltage Positive Clamp Negative Clamp	 I = 5mA, T_A = 25°C I = –5mA, T_A = 25°C	 6.1 -1.5		 8.5 -0.4	 V V
V_{ESD}	ESD Withstand Voltage Contact Discharge per IEC 61000-4-2 standard Human Body Model, MIL-STD-883, Method 3015	 Notes 3 and 4; T_A = 25°C Notes 3 and 4 T_A = 25°C	 ±8 ±15			 kV kV
R_D	Diode Dynamic Resistance Forward Conduction Reverse Conduction	T_A = 25°C		 0.7 2.1		 Ω Ω

Note 1: All parameters specified at T_A = –40°C to +85°C unless otherwise noted.
Note 2: Human Body Model per MIL-STD-883, Method 3015, $C_{Discharge}$ = 100pF, $R_{Discharge}$ = 1.5KW, V_N grounded.
Note 3: Standard IEC 61000-4-2 with $C_{Discharge}$ = 150pF, $R_{Discharge}$ = 330W, 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.

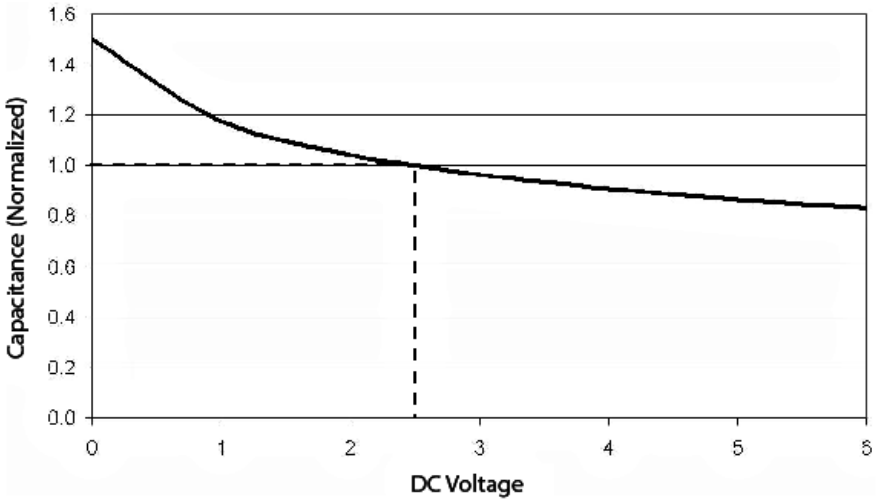
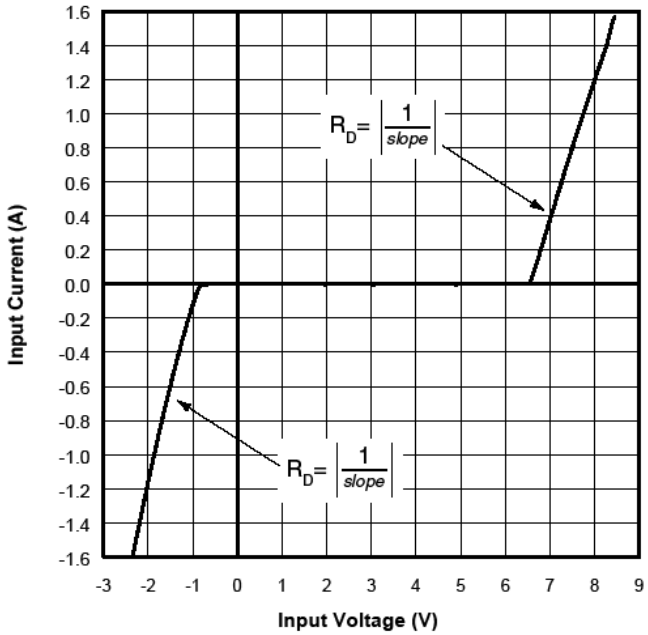


Figure 1. Diode Capacitance vs. Reverse Voltage

Typical High Current Diode Characteristics

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

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

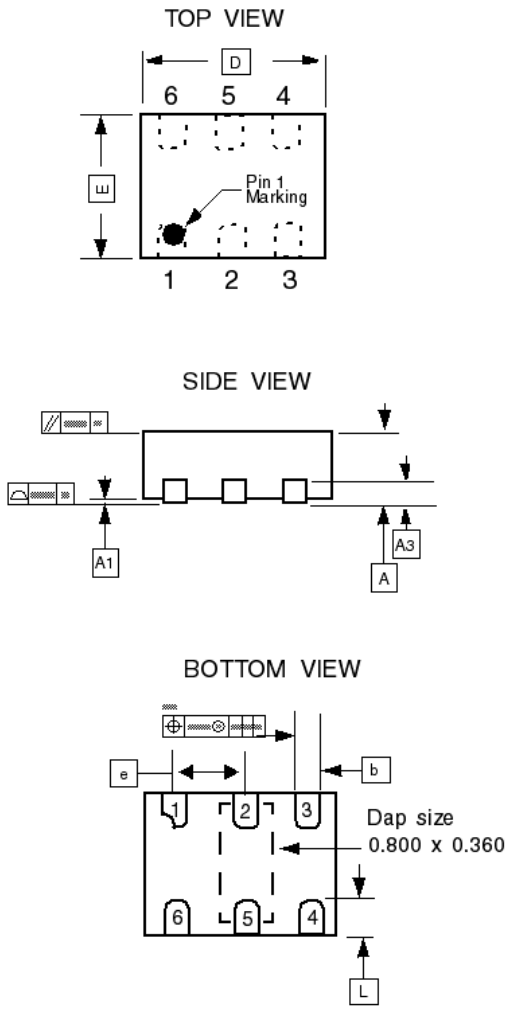


CM1250-04QG Mechanical Specifications

The 6-lead uDFN-0.4mm CM1250-04QG package dimensions are shown below.

Package Specifications						
Package	uDFN					
JEDEC No.	MO-229C*					
Leads	6					
Dim	**Millimeters**			**Inches**		
	Min	**Nom**	**Max**	**Min**	**Nom**	**Max**
A	0.450	0.500	0.550	0.018	0.020	0.022
A1	0.000	0.020	0.050	0.000	0.001	0.002
A3	0.100	0.150	0.200	0.004	0.006	0.008
b	0.150	0.200	0.250	0.006	0.008	0.010
D	1.150	1.250	1.350	0.045	0.049	0.053
E	0.900	1.000	1.100	0.035	0.039	0.043
e	0.350	0.400	0.450	0.014	0.016	0.018
L	0.200	0.300	0.400	0.008	0.012	0.016
# per tape and reel	3000 pieces					
Controlling dimension: millimeters						

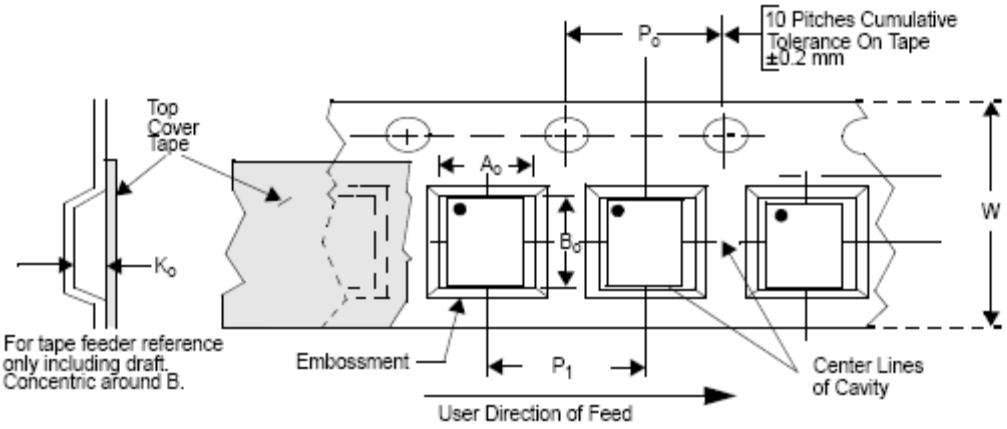
Mechanical Package Diagrams



Dimensions for 6-Lead, 0.4mm Pitch uDFN-0.4 Package

Tape and Reel Specifications

PART NUMBER	PACKAGE SIZE (mm)	POCKET SIZE (mm) B_0 X A_0 X K_0	TAPE WIDTH W	REEL DIAMETER	QTY PER REEL	P_0	P_1
CM1250-04QG	1.25 X 1.00 X 0.50	1.55 X 1.25 X 0.65	8mm	178mm (7")	3000	4mm	4mm



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