

## 4-Channel ESD Array in CSP

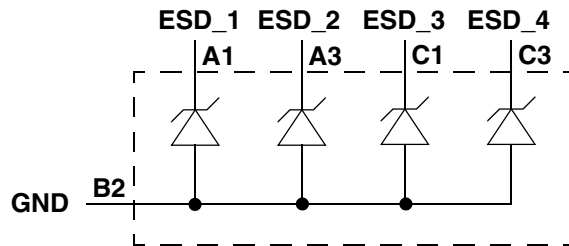
### Features

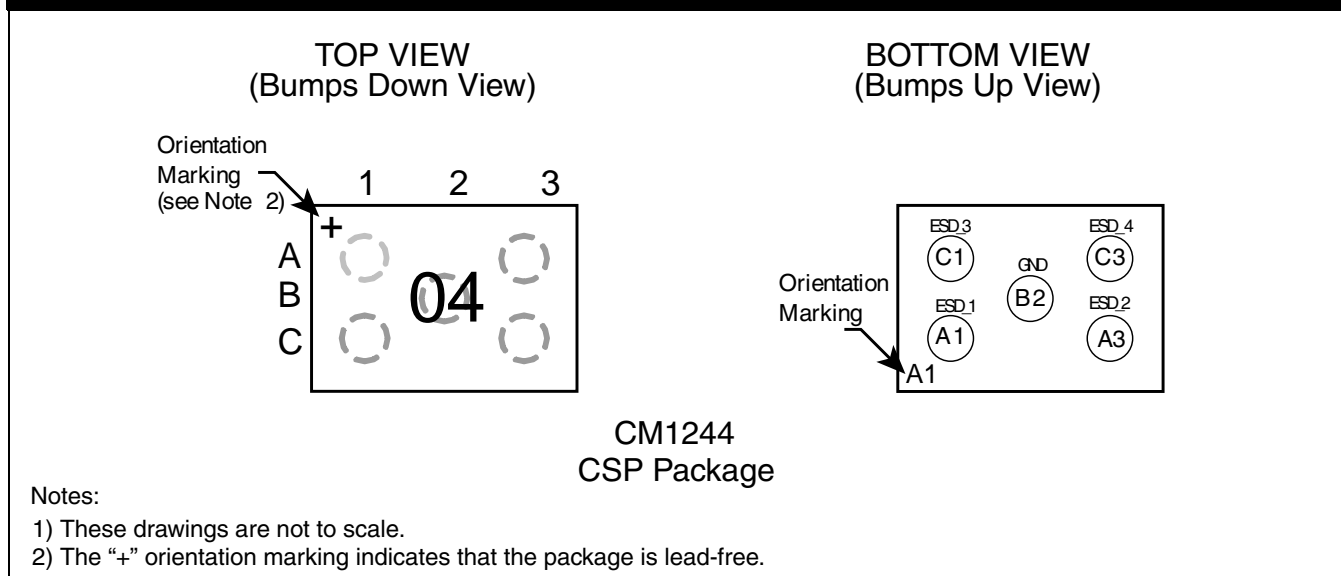
- Four channels of ESD protection
- $\pm 15\text{kV}$  ESD protection on each channel (IEC 61000-4-2 Level 4, contact discharge)
- $\pm 30\text{kV}$  ESD protection on each channel (HBM)
- Chip Scale Package features extremely low lead inductance for optimum ESD protection
- 5-bump, 0.760mm x 1.053mm footprint, 0.4mm pitch, Chip Scale Package (CSP)
- Lead-free
- *OptiGuard*<sup>TM</sup> coating for improved reliability at assembly

### Applications

- ESD protection for sensitive electronic equipment
- I/O port and keypad and button circuitry protection for portable devices
- Can be used for EMI filtering when combined with external series resistance
- Wireless handsets
- Handheld PCs/PDAs
- MP3 Players
- Digital Camcorders
- Notebooks
- Desktop PCs

### Electrical Schematic



**PACKAGE / PINOUT DIAGRAMS**

**PIN DESCRIPTIONS**

PIN	NAME	DESCRIPTION
A1	ESD_1	ESD Channel1
A3	ESD_2	ESD Channel 2
B2	GND	Device Ground
C1	ESD_3	ESD Channel 3
C3	ESD_4	ESD Channel 4

**Ordering Information**
**PART NUMBERING INFORMATION**

Bumps	Package	Lead-free Finish	
		Ordering Part Number <sup>1</sup>	Part Marking
5	CSP	CM1244-04CP	04

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
DC Package Power Rating	200	mW

### STANDARD OPERATING CONDITIONS

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

### ELECTRICAL OPERATING CHARACTERISTICS<sup>1</sup>

SYMBOL	PARAMETER	CONDITIONS	MIN	TYP	MAX	UNITS
V <sub>DIODE</sub>	Diode Reverse Breakdown Voltage	I <sub>DIODE</sub> = 10μA	5.5			V
I <sub>LEAK</sub>	Diode Leakage Current	V <sub>IN</sub> =3.3V, T <sub>A</sub> =25°C			100	nA
V <sub>SIG</sub>	Signal Voltage Positive Clamp Negative Clamp	I <sub>DIODE</sub> = 10mA	5.6 -1.5	6.8 -0.8	9.0 -0.4	V V
V <sub>ESD</sub>	In-system ESD Withstand Voltage a) Human Body Model, MIL-STD-883, Method 3015 b) Contact Discharge per IEC 61000-4-2	Notes 2 and 3	±30 ±15			kV kV
V <sub>CL</sub>	Clamping Voltage during ESD Discharge MIL-STD-883 (Method 3015), 8kV Positive Transients Negative Transients	Notes 2 and 3		+15 -8		V V
C <sub>DIODE</sub>	Diode Capacitance	At 2.5VDC Reverse Bias, 1MHz, 30mVAC	22	27	32	pF

Note 1: T<sub>A</sub> = -40 to +85°C unless otherwise specified.

Note 2: ESD applied to input and output pins with respect to GND, one at a time.

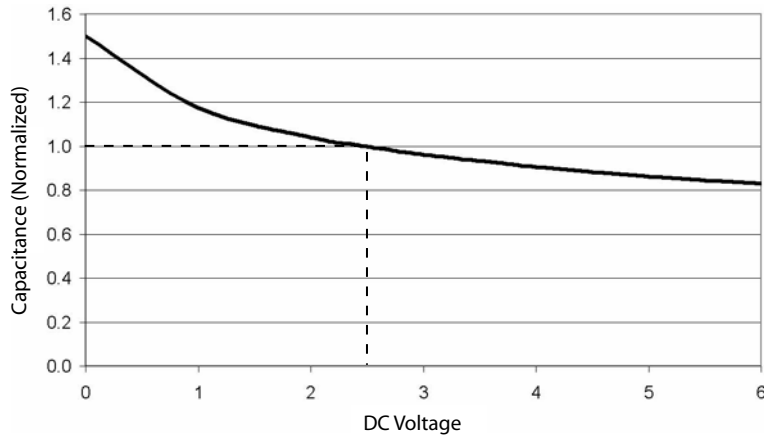
Note 3: These parameters are guaranteed by design and characterization.

## Application Information

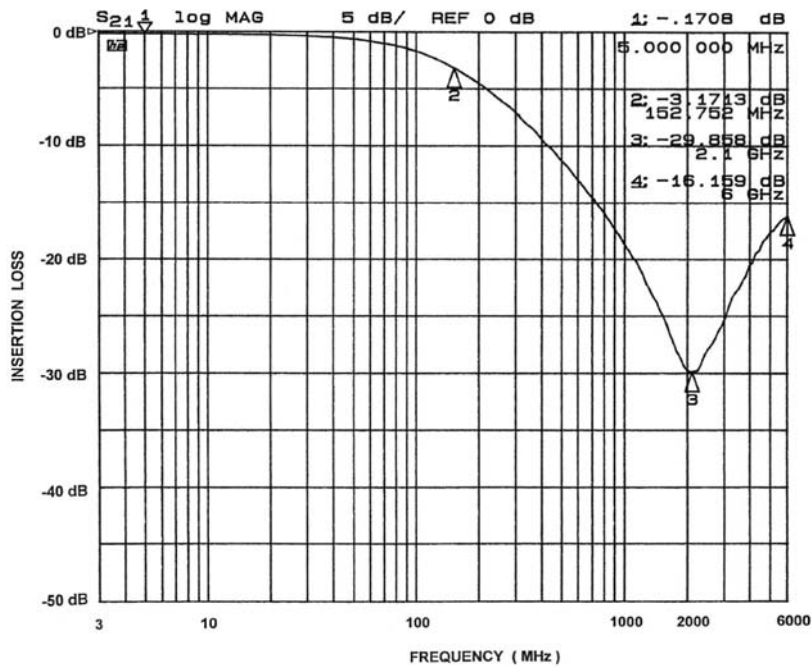
Refer to Application Note AP-217, "The Chip Scale Package," for a detailed description of Chip Scale Packages offered by California Micro Devices.

**Performance Information**

Diode Characteristics (nominal conditions unless specified otherwise)



**Figure 1. Typical Diode Capacitance VS. Input Voltage (normalized to 2.5VDC)**



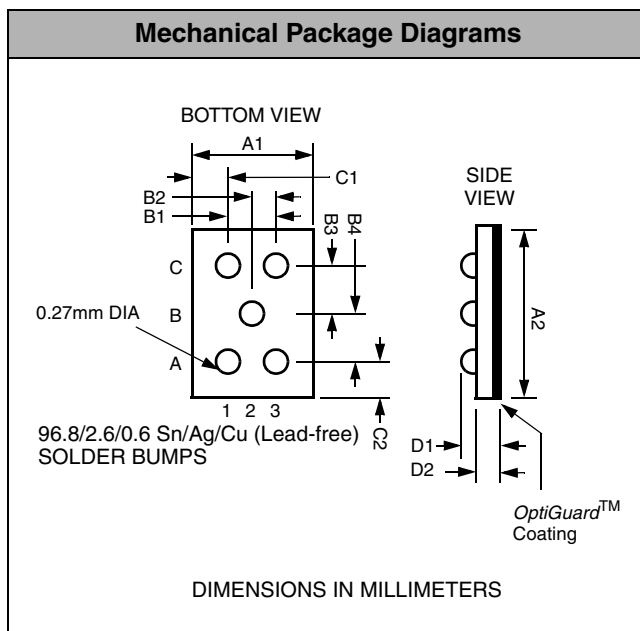
**Figure 2. Frequency Response (single channel vs. GND, in 50Ω system)**

## Mechanical Details

### CSP Mechanical Specifications

The CM1244 is available in a custom Chip Scale Package (CSP). Dimensions are presented below.

PACKAGE DIMENSIONS						
Package	Custom CSP					
Bumps	5					
Dim	Millimeters			Inches		
	Min	Nom	Max	Min	Nom	Max
A1	0.715	0.760	0.805	0.0281	0.0299	0.0317
A2	1.008	1.053	1.098	0.0397	0.0415	0.0432
B1	0.395	0.400	0.405	0.0156	0.0157	0.0159
B2	0.195	0.200	0.205	0.0076	0.0078	0.080
B3	0.342	0.347	0.352	0.0134	0.0136	0.0138
B4	0.342	0.347	0.352	0.0134	0.0136	0.0138
C1	0.130	0.180	0.230	0.0051	0.0071	0.0091
C2	0.130	0.180	0.230	0.0051	0.0071	0.0091
D1	0.545	0.615	0.685	0.0215	0.0242	0.0268
D2	0.368	0.419	0.470	0.0145	0.0165	0.0185
# per tape and reel	3500 pieces					
Controlling dimension: millimeters						



Package Dimensions for CM1244 Chip Scale Package

### CSP Tape and Reel Specifications

PART NUMBER	CHIP SIZE (mm)	POCKET SIZE (mm) B <sub>0</sub> X A <sub>0</sub> X K <sub>0</sub>	TAPE WIDTH W	REEL DIAMETER	QTY PER REEL	P <sub>0</sub>	P <sub>1</sub>
CM1244	1.05 X 0.76 X 0.615	1.42 X 1.07 X 0.74	8mm	178mm (7")	3500	4mm	4mm

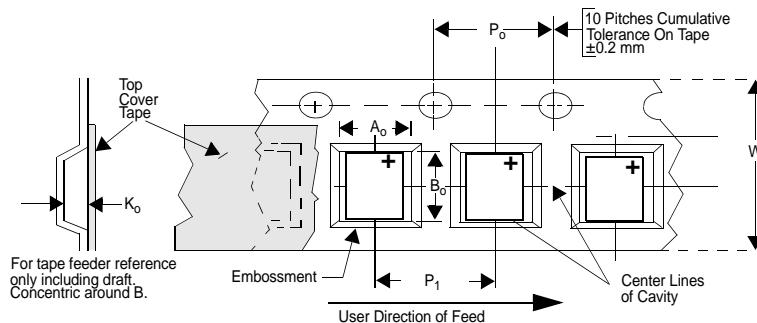


Figure 3. Tape and Reel Mechanical Data