ON Semiconductor®

8-Channel ESD Protection Array in Chip Scale Package

CM1205

Features

- Functionally and pin compatible with CMD's PACDN1408 ESD protection device
- Eight transient voltage suppressors in a single package
- *Optiguard*™ coated for improved reliability at assembly
- In-system Electrostatic Discharge (ESD) protection to ±25kV contact discharge per IEC 61000-4-2 international standard
- Compact Chip Scale Package (0.65mm pitch) format saves board space and eases layout in space critical applications compared to discrete solutions and traditional wire bonded packages
- RoHS compliant (lead-free) 10-bump CSP

Applications

- ESD protection for sensitive electronic equipment
- I/O port, keypad and button circuitry protection for portable devices
- Wireless Handsets
- Handheld PCs / PDAs
- MP3 Players
- Digital Cameras and Camcorders
- Notebooks
- Desktop PCs

Product Description

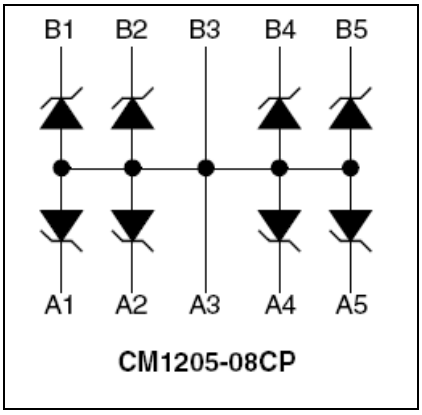
The CM1205 transient voltage suppressor array provides a very high level of protection for sensitive electronic components that may be subjected to ESD.

The CM1205 will safely dissipate ESD strikes at levels well beyond the maximum requirements set forth in the IEC 61000-4-2 international standard (Level 4, ±8kV contact discharge). All I/Os are rated at ±25kV 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 for contact discharges to greater than ±30kV.

The Chip Scale Package format of this device enables extremely small footprints that are necessary in portable electronics such as cellular phones, PDAs, internet appliances and PCs. The large solder bumps allow for standard attachment to laminate boards without the use of underfill.

The CM1205 features *OptiGuard*™ coating for improved reliability at assembly and is available with RoHS compliant lead-free finishing.

Block Diagram



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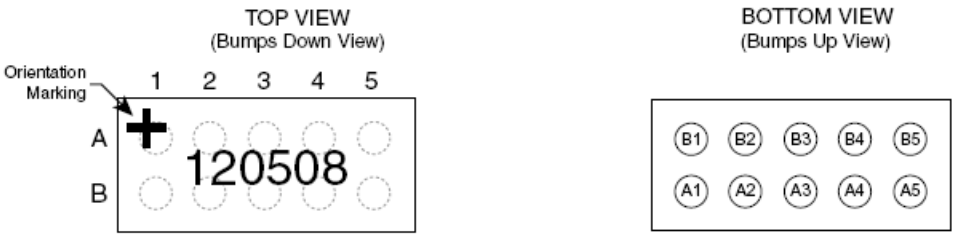
CM1205/D

PACKAGE / PINOUT DIAGRAMS



CM1205-08
10-bump CSP Package

Notes:
1) These drawings are not to scale.

Ordering Information

PART NUMBERING INFORMATION			
Bumps	**Package**	**Ordering Part Number[1]**	**Part Marking**
10	CSP	CM1205-08CP	120508

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	℃

STANDARD OPERATING CONDITIONS		
PARAMETER	**RATING**	**UNITS**
Operating Temperature Range	-40 to +85	℃

ELECTRICAL OPERATING CHARACTERISTICS[1]

SYMBOL	PARAMETER	CONDITIONS	MIN	TYP	MAX	UNITS
V_{REV}	Reverse Standoff Voltage	I_{DIODE}=10μA		6.0		V
I_{LEAK}	Leakage Current	V_{IN}=3.3V DC			100	nA
V_{SIG}	Signal Clamp Voltage Positive Clamp Negative Clamp	I_{LOAD} = 10mA	 5.6 -1.2	 6.8 -0.8	 8.0 -0.4	 V V
V_{ESD}	In-system ESD Withstand Voltage a) Human Body Model, MIL-STD-883, Method 3015 b) Contact Discharge per IEC 61000-4-2 Level 4	Note 2	 ±30 ±25			 kV kV
V_{CL}	Clamping Voltage during ESD Discharge MIL-STD-883 (Method 3015), 8kV Positive Transients Negative Transients	Note 2		 +12 -8		 V V
C	Channel Capacitance	At 2.5V DC, *f* = 1MHz,		39	47	pF

Note 1: T_A=25°C unless otherwise specified. GND in this document refers to the lower supply voltage.
Note 2: ESD applied to channel pins with respect to GND, one at a time. All other channels are open. All GND pins tied to ground.

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.

PRINTED CIRCUIT BOARD RECOMMENDATIONS	
PARAMETER	**VALUE**
Pad Size on PCB	0.275mm
Pad Shape	Round
Pad Definition	Non-Solder Mask defined pads
Solder Mask Opening	0.325mm Round
Solder Stencil Thickness	0.125mm - 0.150mm
Solder Stencil Aperture Opening (laser cut, 5% tapered walls)	0.330mm Round
Solder Flux Ratio	50/50 by volume
Solder Paste Type	No Clean
Pad Protective Finish	OSP (Entek Cu Plus 106A)
Tolerance — Edge To Corner Ball	±50µm
Solder Ball Side Coplanarity	±20µm
Maximum Dwell Time Above Liquidous	60 seconds
Maximum Soldering Temperature	260ûC

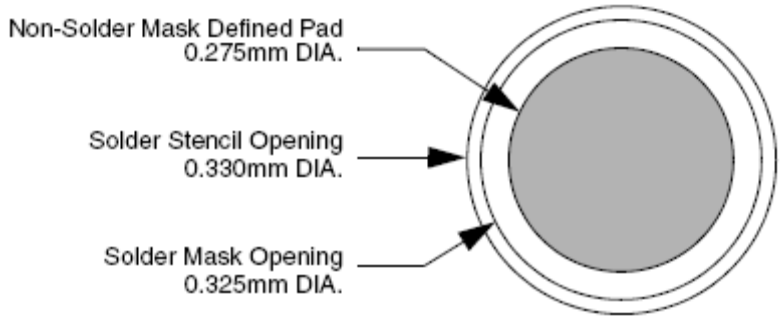


Figure 3. Recommended Non-Solder Mask Defined Pad Illustration

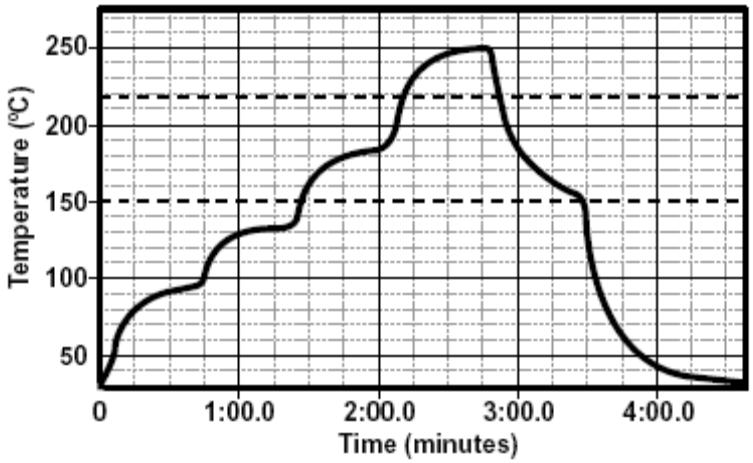


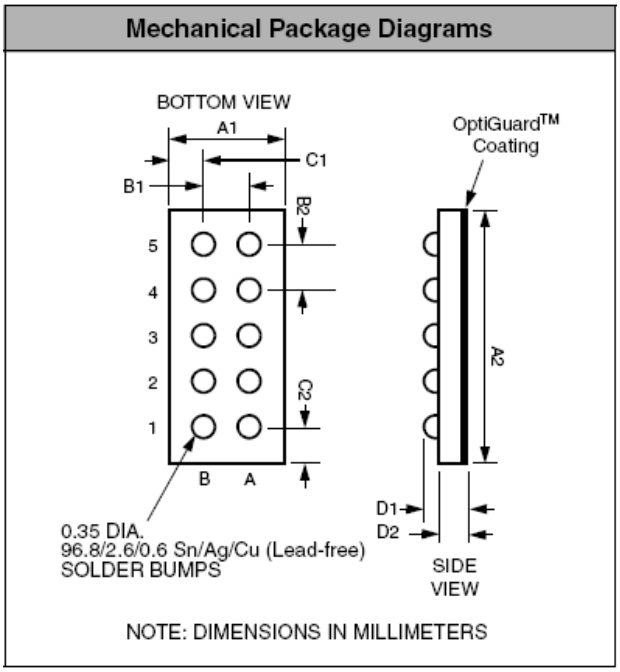
Figure 4. Lead-free (SnAgCu) Solder Ball Reflow Profile

Mechanical Details

The CM1205 is offered in a custom Chip Scale Package (CSP). Dimensions are presented below.

PACKAGE DIMENSions						
Package	Custom CSP					
Bumps	10					
Dim	**Millimeters**			**Inches**		
	Min	**Nom**	**Max**	**Min**	**Nom**	**Max**
A1	1.109	1.154	1.199	0.0437	0.0454	0.0472
A2	3.059	3.104	3.149	0.1204	0.1222	0.1240
B1	0.645	0.650	0.655	0.0254	0.0256	0.0258
B2	0.645	0.650	0.655	0.0254	0.0256	0.0258
C1	0.202	0.252	0.302	0.0080	0.0099	0.0119
C2	0.202	0.252	0.302	0.0080	0.0099	0.0119
D1	0.612	0.682	0.751	0.0241	0.0268	0.0296
D2	0.368	0.419	0.470	0.0145	0.0165	0.0185
# per tape and reel	3500 pieces					
Controlling dimension: millimeters						

Mechanical Package Diagrams



Package Dimensions for CM1205 Chip Scale Package

CSP Tape and Reel Specifications

PART NUMBER	CHIP 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
CM1205-08CP	3.104 X 1.154 X 0.682	3.28 X 1.32 X 0.81	8mm	178mm (7")	3500	4mm	4mm

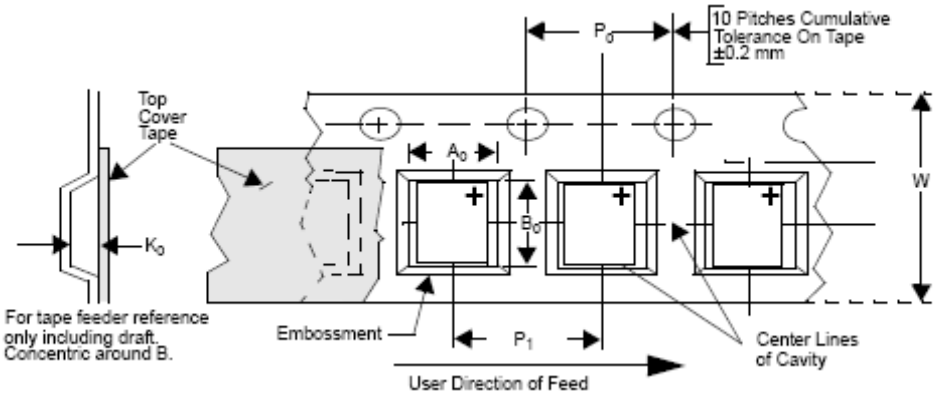


Figure 5. Tape and Reel Mechanical Data

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