CM1205

ESD Protection Diode Array

Chip Scale Package, 8−Channel

Description

The CM1205 surge protection 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, ±8 kV contact discharge). All I/Os are rated at ±25 kV 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 ±30 kV.

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.

Features

- Functionally and Pin Compatible with ON Semiconductor's PACDN1408 ESD Protection Device
- 8 surge protection in a Single Package
- Optiguard™ Coated for Improved Reliability at Assembly
- In−system Electrostatic Discharge (ESD) Protection to ±25 kV Contact Discharge per IEC 61000−4−2 International Standard
- Compact Chip Scale Package (0.65 mm pitch) Format Saves Board Space and Eases Layout in Space Critical Applications Compared to Discrete Solutions and Traditional Wire Bonded Packages
- 10−bump CSP
- These Devices are Pb−Free and are RoHS Compliant

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

ON Semiconductor®

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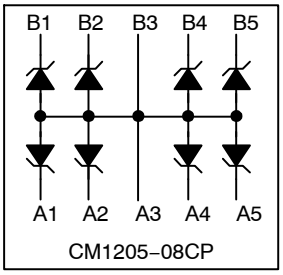
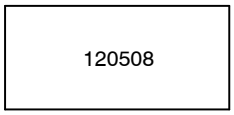
WLCSP10
CP SUFFIX
CASE 567BM

BLOCK DIAGRAM



MARKING DIAGRAM



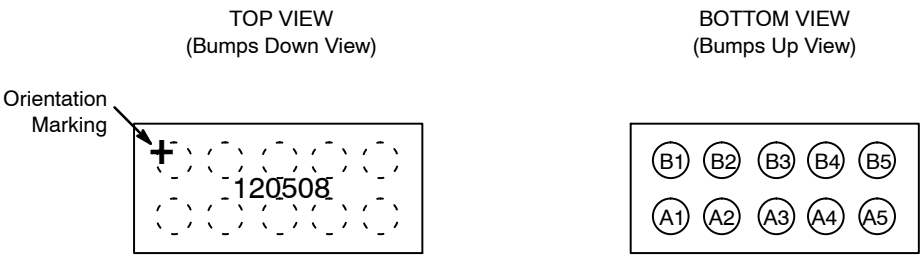
120508 = Specific Device Code

ORDERING INFORMATION

Device	Package	Shipping†
CM1205−08CP	CSP (Pb−Free)	3500/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.

PACKAGE / PINOUT DIAGRAMS



CM1205−08
10−bump CSP Package

SPECIFICATIONS

Table 1. 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 2. STANDARD OPERATING CONDITIONS

Parameter	Rating	Units
Operating Temperature Range	−40 to +85	°C

Table 3. ELECTRICAL OPERATING CHARACTERISTICS (Note 1)

Sym-bol	Parameter	Conditions	Min	Typ	Max	Units
V_{REV}	Reverse Standoff Voltage	I_{DIODE}= 10 μA		6.0		V
I_{LEAK}	Leakage Current	V_{IN}= 3.3 V 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_{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
V_{CL}	Clamping Voltage during ESD Discharge MIL−STD−883 (Method 3015), 8 kV Positive Transients Negative Transients	Note 2		 +12 −8		V
C	Channel Capacitance	At 2.5 V DC, f = 1 MHz		39	47	pF

1. T_A = 25 °C unless otherwise specified. GND in this document refers to the lower supply voltage.
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 ”The Chip Scale Package”, for a detailed description of Chip Scale Packages offered by ON Semiconductor.

Table 4. PRINTED CIRCUIT BOARD RECOMMENDATIONS

Parameter	Value
Pad Size on PCB	0.275 mm
Pad Shape	Round
Pad Definition	Non−Solder Mask defined pads
Solder Mask Opening	0.350 mm Round
Solder Stencil Thickness	0.125 − 0.150 mm
Solder Stencil Aperture Opening (laser cut, 5% tapered walls)	0.330 mm 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	±50 μm
Solder Ball Side Coplanarity	±20 μm
Maximum Dwell Time Above Liquidous	60 seconds
Maximum Soldering Temperature	260°C

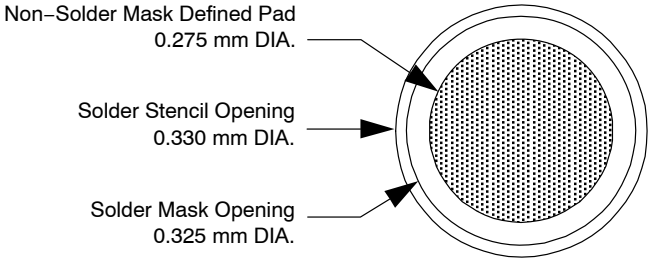


Figure 1. Recommended Non−Solder Mask Defined Pad Illustration

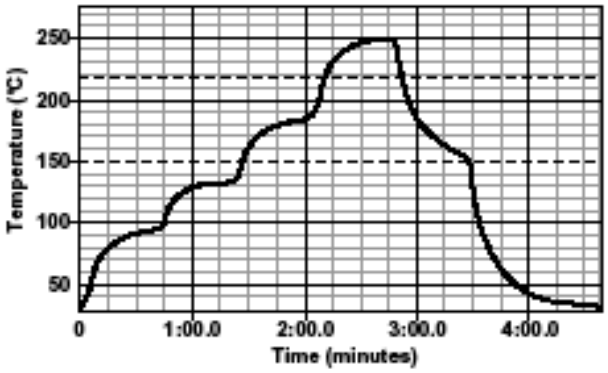


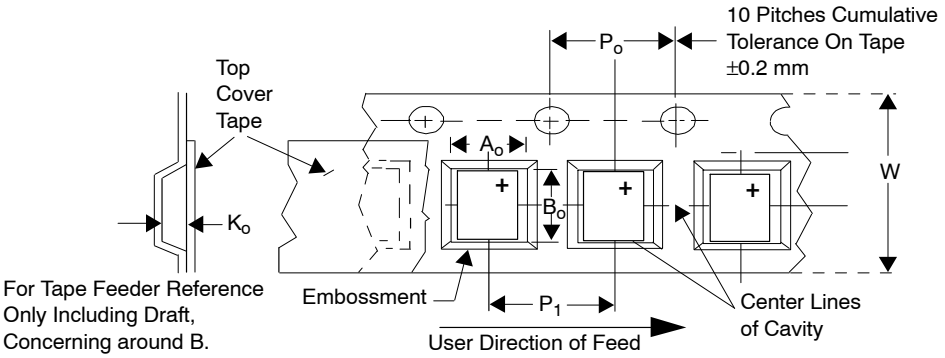
Figure 2. Lead−free (SnAgCu) Solder Ball Reflow Profile

MECHANICAL SPECIFICATIONS

The CM1205−08CP is offered in a 10−bump custom Chip Scale Package (CSP). Dimensions are presented below.

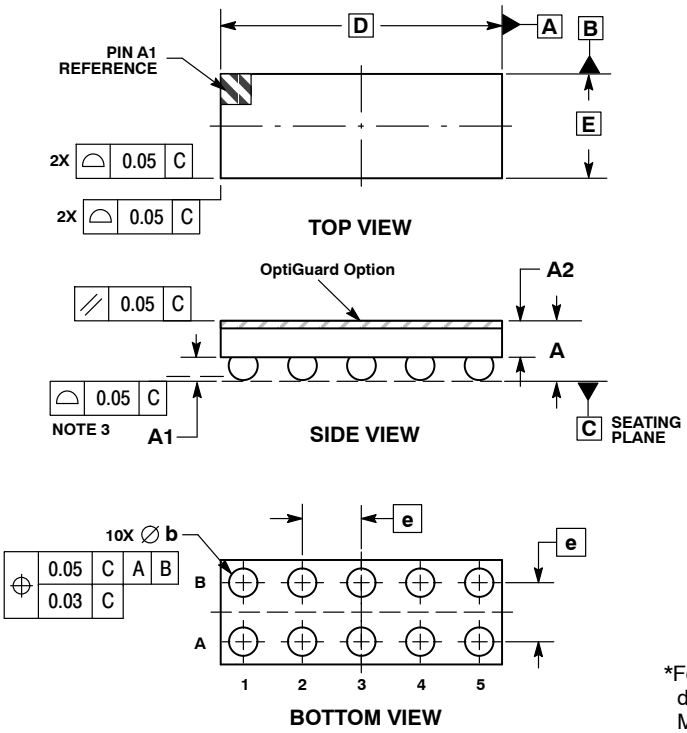
Table 5. CSP TAPE AND REEL SPECIFICATIONS

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	8 mm	178 mm (7″)	3500	4 mm	4 mm



PACKAGE DIMENSIONS

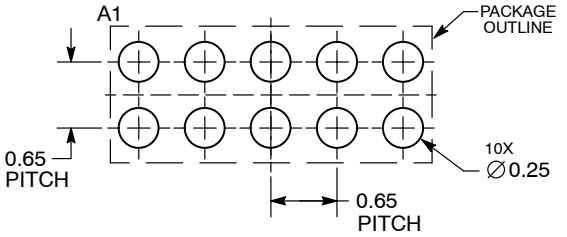
WLCSP10, 3.10x1.15
CASE 567BM−01
ISSUE O



NOTES:
1. DIMENSIONING AND TOLERANCING PER ASME Y14.5M, 1994.
2. CONTROLLING DIMENSION: MILLIMETERS.
3. COPLANARITY APPLIES TO SPHERICAL CROWNS OF SOLDER BALLS.

	MILLIMETERS	
DIM	MIN	MAX
A	0.60	0.75
A1	0.23	0.29
A2	0.40 REF	
b	0.34	0.39
D	3.10 BSC	
E	1.15 BSC	
e	0.65 BSC	

RECOMMENDED SOLDERING FOOTPRINT*



DIMENSIONS: 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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PUBLICATION ORDERING INFORMATION

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