

# 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,  $\pm 8$  kV contact discharge). All I/Os are rated at  $\pm 25$  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  $\pm 30$  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*<sup>™</sup> 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<sup>™</sup> Coated for Improved Reliability at Assembly
- In-system Electrostatic Discharge (ESD) Protection to  $\pm 25$  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



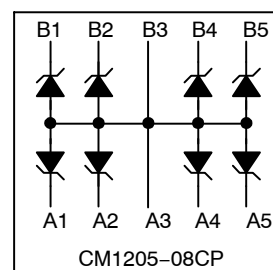
ON Semiconductor<sup>®</sup>

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

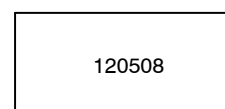


WLCSP10  
CP SUFFIX  
CASE 567BM

#### BLOCK DIAGRAM



#### MARKING DIAGRAM



120508 = Specific Device Code

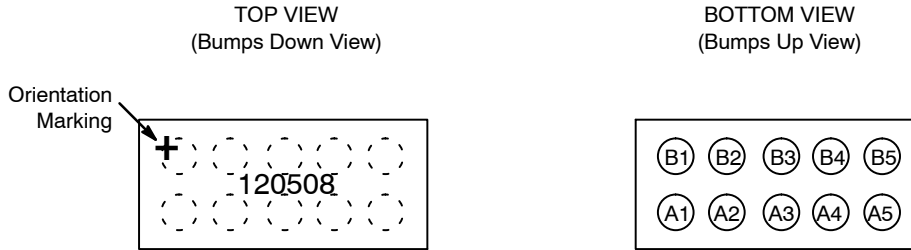
#### ORDERING INFORMATION

| Device      | Package          | Shipping <sup>†</sup> |
|-------------|------------------|-----------------------|
| CM1205-08CP | CSP<br>(Pb-Free) | 3500/Tape & Reel      |

<sup>†</sup>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.

# CM1205

## 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-<br>bol | Parameter  | Conditions               | Min                  | Typ         | Max         | Units |
|-------------|--|--------------------------|----------------------|-------------|-------------|-------|
| $V_{REV}$   | Reverse Standoff Voltage   | $I_{DIODE} = 10 \mu A$   |                      | 6.0         |             | V     |
| $I_{LEAK}$  | Leakage Current  | $V_{IN} = 3.3 V DC$      |                      |             | 100         | nA    |
| $V_{SIG}$   | Signal Clamp Voltage<br>Positive Clamp<br>Negative Clamp   | $I_{LOAD} = 10 mA$       | 5.6<br>-1.2          | 6.8<br>-0.8 | 8.0<br>-0.4 | V     |
| $V_{ESD}$   | In-system ESD Withstand Voltage<br>a) Human Body Model, MIL-STD-883, Method 3015<br>b) Contact Discharge per IEC 61000-4-2 Level 4 | Note 2                   | $\pm 30$<br>$\pm 25$ |             |             | kV    |
| $V_{CL}$    | Clamping Voltage during ESD Discharge<br>MIL-STD-883 (Method 3015), 8 kV<br>Positive Transients<br>Negative Transients             | Note 2                   |                      | +12<br>-8   |             | V     |
| C           | Channel Capacitance  | At 2.5 V DC, $f = 1 MHz$ |                      | 39          | 47          | pF    |

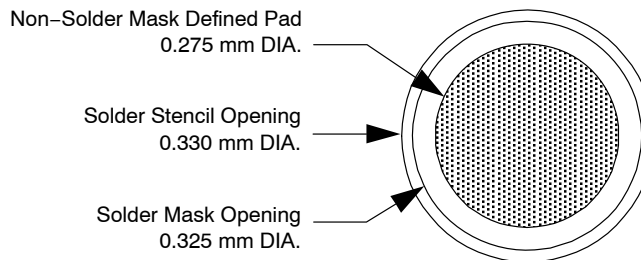
- $T_A = 25^\circ C$  unless otherwise specified. GND in this document refers to the lower supply voltage.
- ESD applied to channel pins with respect to GND, one at a time. All other channels are open. All GND pins tied to ground.

APPLICATION INFORMATION

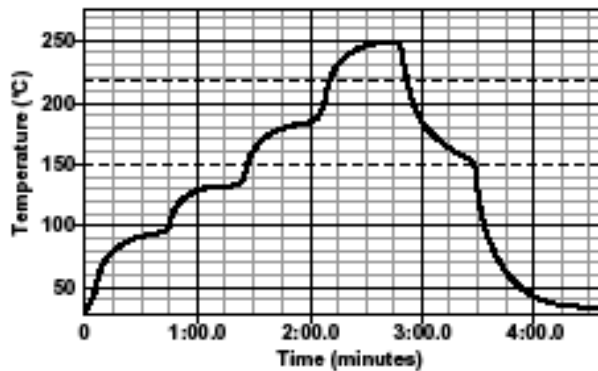
Refer to Application Note "The Chip Scale Package", for a detailed description of Chip Scale Packages offered by ON Semiconductor.

**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**

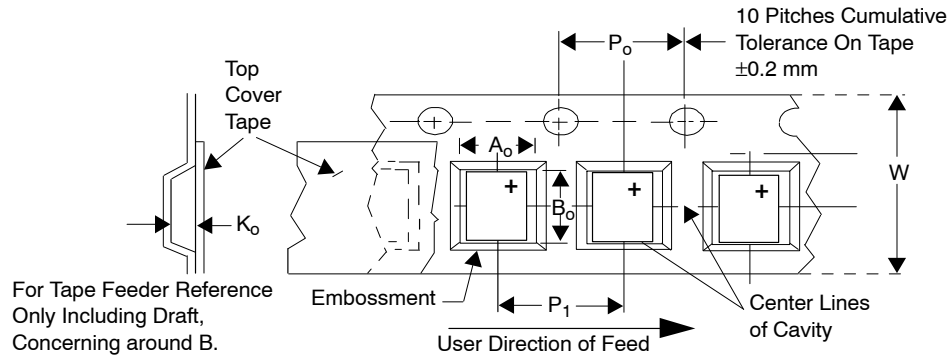
# CM1205

## 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)<br>$B_0 \times A_0 \times K_0$ | Tape Width<br>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  |



# MECHANICAL CASE OUTLINE

## PACKAGE DIMENSIONS

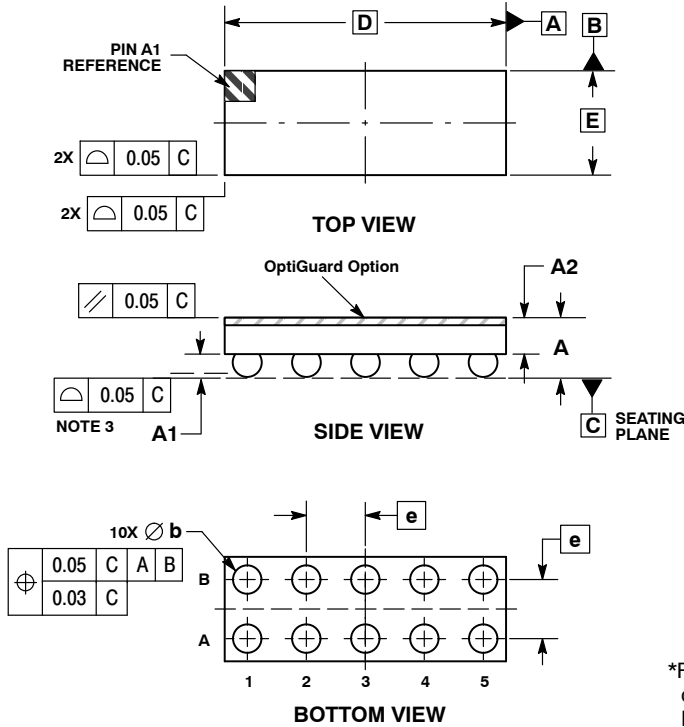
ON Semiconductor®



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

SCALE 4:1

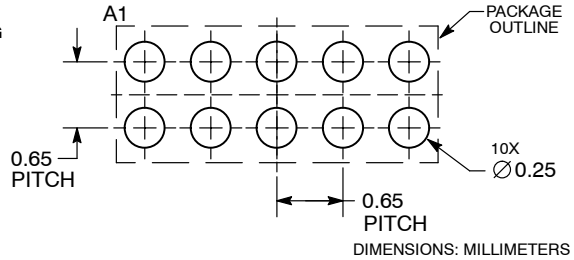
DATE 26 JUL 2010



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

| DIM | MILLIMETERS |      |
|-----|-------------|------|
|     | 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\*



\*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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| <b>DESCRIPTION:</b>     | <b>WLCSP10, 3.10X1.15</b> | <b>PAGE 1 OF 1</b>   |

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