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CM1426

LCD and Camera EMI Filter Array with ESD Protection

ON Semiconductor®

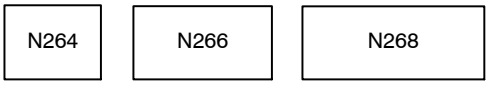
http://onsemi.com

WLCSP10
CP SUFFIX
CASE 567BL

WLCSP15
CP SUFFIX
CASE 567BL

WLCSP20
CP SUFFIX
CASE 567BX

MARKING DIAGRAM



CM1426−04 CM1426−06 CM1426−08

N264 = CM1426−04CP
N266 = CM1426−06CP
N268 = CM1426−08CP

ORDERING INFORMATION

Device	Package	Shipping†
CM1426−04CP	CSP−10 (Pb−Free)	3500/Tape & Reel
CM1426−06CP	CSP−15 (Pb−Free)	3500/Tape & Reel
CM1426−08CP	CSP−20 (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.

Product Description

The CM1426 is a family of pi−style EMI filter arrays with ESD protection, which integrates four, six and eight filters (C−R−C) in a Chip Scale Package with 0.50 mm pad pitch. The CM1426 has component values of 8.5 pF − 100 Ω − 8.5 pF per channel. The CM1426 has a cut−off frequency of 230 MHz and can be used in applications where the data rates are as high as 92 Mbps. The parts include avalanche−type ESD diodes on every pin that provide a very high level of protection for sensitive electronic components against possible ESD strikes. The ESD protection diodes safely dissipate ESD strikes of ±8 kV, well beyond the maximum requirement of the IEC61000−4−2 international standard. Using the MIL−STD−883 (Method 3015) specification for Human Body Model (HBM) ESD, the pins are protected for contact discharges at greater than ±15 kV.

These devices are particularly well−suited for portable electronics (e.g. wireless handsets, PDAs, notebook computers) because of their small package and easy−to−use pin assignments. In particular, the CM1426 is ideal for EMI filtering and protecting data and control lines for the I/O data ports, LCD display and camera interface in mobile handsets.

The CM1426 incorporates *OptiGuard™* which results in improved reliability at assembly. The CM1426 is available in a space−saving, low−profile Chip Scale Package with RoHS compliant lead−free finishing.

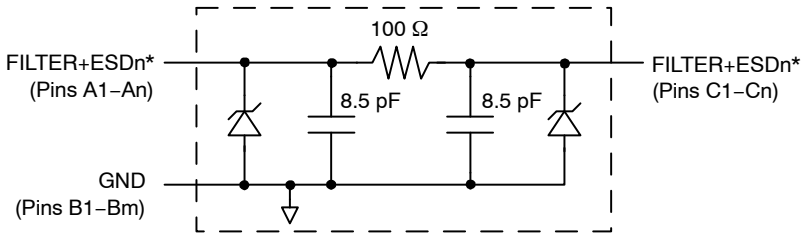
Features

- Four, Six and Eight Channels of EMI Filtering with Integrated ESD Protection
- 0.5 mm Pitch, 10−Bump, 1.96 mm x 1.33 mm Footprint Chip Scale Package (CM1426−04)
- 0.5 mm Pitch, 15−Bump, 2.96 mm x 1.33 mm Footprint Chip Scale Package (CM1426−06)
- 0.5 mm Pitch, 20−Bump, 3.96 mm x 1.33 mm Footprint Chip Scale Package (CM1426−08)
- Pi−Style EMI Filters in a Capacitor−Resistor−Capacitor (C−R−C) Network
- ±8 kV ESD Protection on Each Channel (IEC 61000−4−2 Level 4, Contact Discharge)
- ±15 kV ESD Protection on Each Channel (HBM)
- These Devices are Pb−Free and are RoHS Compliant
- Greater than 20 dB Attenuation (Typical) at 1 GHz
- *OptiGuard™* Coated for Improved Reliability at Assembly

Applications

- LCD and Camera Data Lines in Mobile Handsets
- I/O Port Protection for Mobile Handsets, Notebook Computers, PDAs, etc.
- EMI Filtering for Data Ports in Cell Phones, PDAs or Notebook Computers
- Wireless Handsets
- Handheld PCs/PDAs
- LCD and Camera Modules

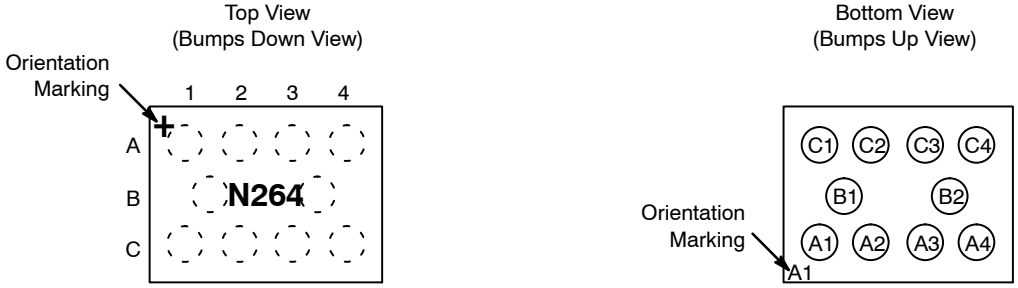
BLOCK DIAGRAM



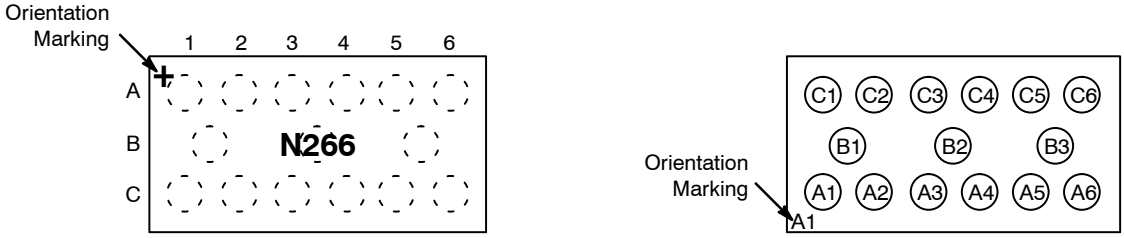
1 of 4, 6 or 8 EMI/RFI + ESD Channels

*See Package/Pinout Diagrams for expanded pin information.

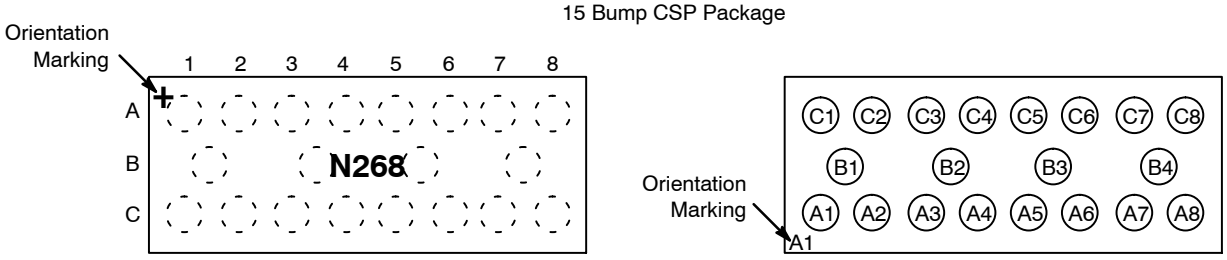
PACKAGE / PINOUT DIAGRAMS



CM1426−04CP
10 Bump CSP Package



CM1426−06CP
15 Bump CSP Package



CM1426−08CP
20 Bump CSP Package

Table 1. PIN DESCRIPTIONS

Pin(s)	Name	Description	Pin(s)	Name	Description
A1	FILTER1	Filter + ESD Channel 1	C1	FILTER1	Filter + ESD Channel 1
A2	FILTER2	Filter + ESD Channel 2	C2	FILTER2	Filter + ESD Channel 2
A3	FILTER3	Filter + ESD Channel 3	C3	FILTER3	Filter + ESD Channel 3
A4	FILTER4	Filter + ESD Channel 4	C4	FILTER4	Filter + ESD Channel 4
A5	FILTER5	Filter + ESD Channel 5	C5	FILTER5	Filter + ESD Channel 5
A6	FILTER6	Filter + ESD Channel 6	C6	FILTER6	Filter + ESD Channel 6
A7	FILTER7	Filter + ESD Channel 7	C7	FILTER7	Filter + ESD Channel 7
A8	FILTER8	Filter + ESD Channel 8	C8	FILTER8	Filter + ESD Channel 8
B1−B4	GND	Device Ground			

SPECIFICATIONS

Table 2. ABSOLUTE MAXIMUM RATINGS

Parameter	Rating	Units
Storage Temperature Range	−65 to +150	°C
DC Power per Resistor	100	mW
DC Package Power Rating	500	mW

Stresses exceeding Maximum Ratings may damage the device. Maximum Ratings are stress ratings only. Functional operation above the Recommended Operating Conditions is not implied. Extended exposure to stresses above the Recommended Operating Conditions may affect device reliability.

Table 3. STANDARD OPERATING CONDITIONS

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

Table 4. ELECTRICAL OPERATING CHARACTERISTICS (Note 1)

Symbol	Parameter	Conditions	Min	Typ	Max	Units
R	Resistance		80	100	120	Ω
C_{TOTAL}	Total Channel Capacitance	At 2.5 VDC Reverse Bias, 1 MHz, 30 mVAC	13.6	17	20.4	pF
C	Capacitance C1	At 2.5 VDC Reverse Bias, 1 MHz, 30 mVAC	6.8	8.5	10.2	pF
V_{DIODE}	Standoff Voltage	I_{DIODE} = 10 μA		6.0		V
I_{LEAK}	Diode Leakage Current (reverse bias)	V_{DIODE} = 3.3 V		0.1	1	μA
V_{SIG}	Signal Clamp Voltage Positive Clamp Negative Clamp	 I_{LOAD} = 10 mA I_{LOAD} = −10 mA	 5.6 −1.5	 6.8 −0.8	 9.0 −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)	 ±15 ±8			kV
R_{DYN}	Dynamic Resistance Positive Negative			 2.3 0.9		Ω
f_C	Cut−off Frequency Z_{SOURCE} = 50 Ω, Z_{LOAD} = 50 Ω	R = 100 Ω, C = 17 pF		 230		MHz

1. T_A = 25°C unless otherwise specified.
2. ESD applied to input and output pins with respect to GND, one at a time.

PERFORMANCE INFORMATION

Typical Filter Performance (T_A = 25°C, DC Bias = 0 V, 50 Ω Environment)

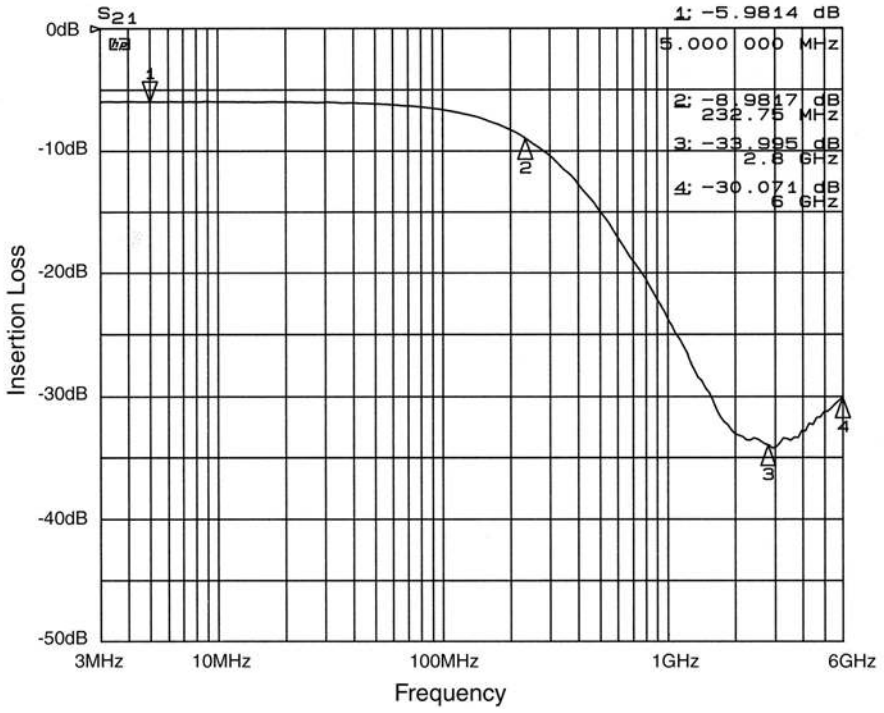


Figure 1. Insertion Loss vs. Frequency (A1−C1 to GND B1)

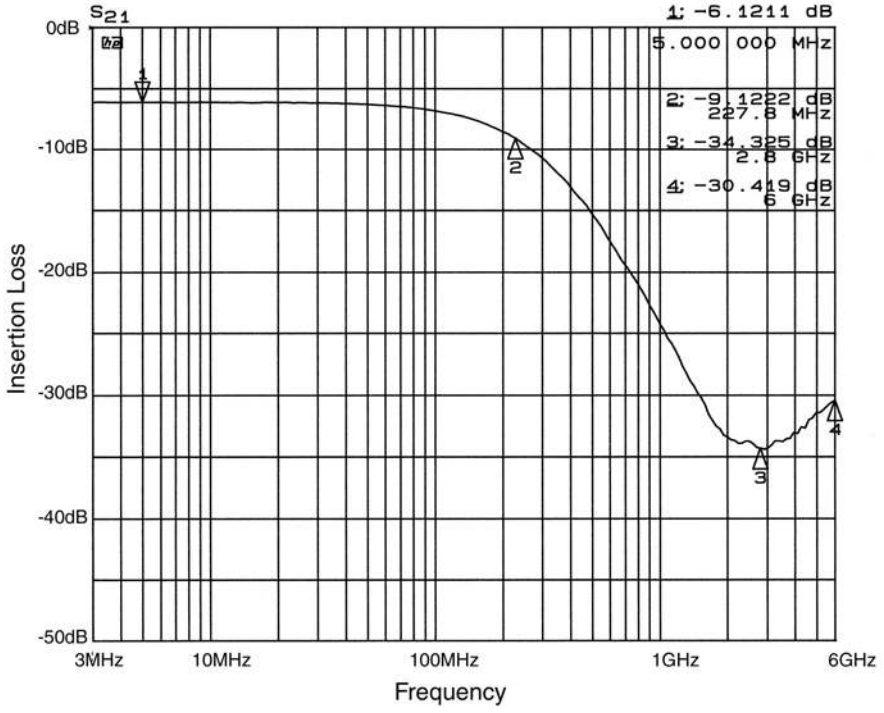


Figure 2. Insertion Loss vs. Frequency (A2−C2 to GND B1)

PERFORMANCE INFORMATION (Cont'd)

Typical Filter Performance (T_A = 25°C, DC Bias = 0 V, 50 Ω Environment)

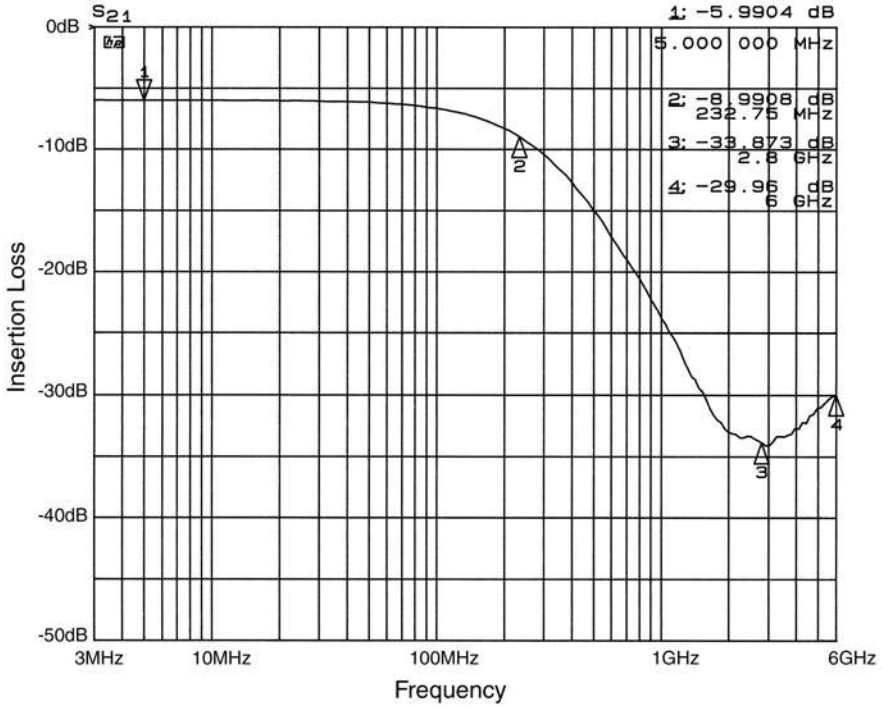


Figure 3. Insertion Loss vs. Frequency (A3−C3 to GND B2)

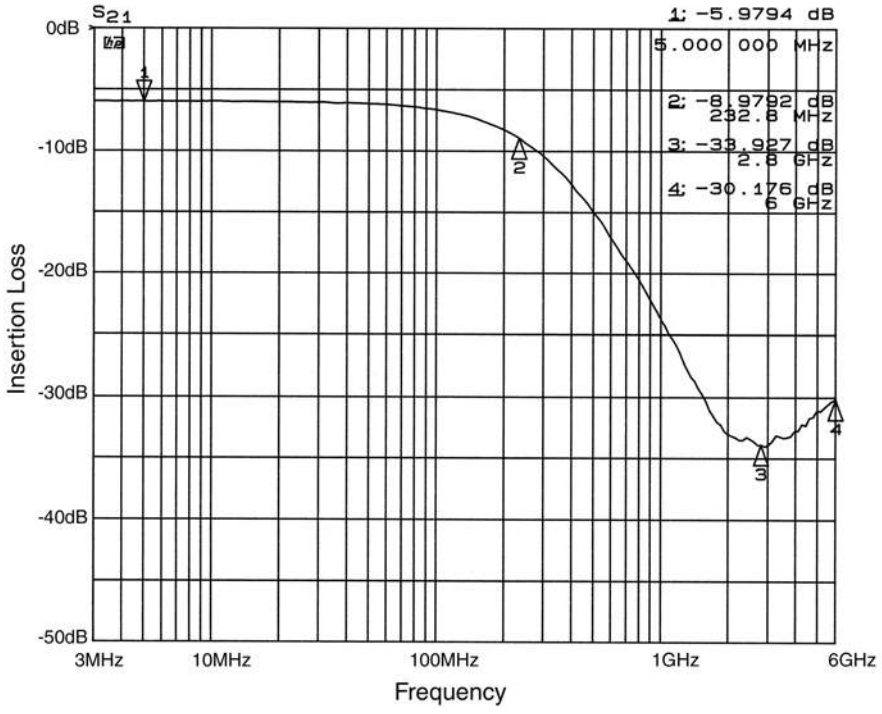


Figure 4. Insertion Loss vs. Frequency (A4−C4 to GND B2)

PERFORMANCE INFORMATION (Cont'd)

Typical Filter Performance (T_A = 25°C, DC Bias = 0 V, 50 Ω Environment)

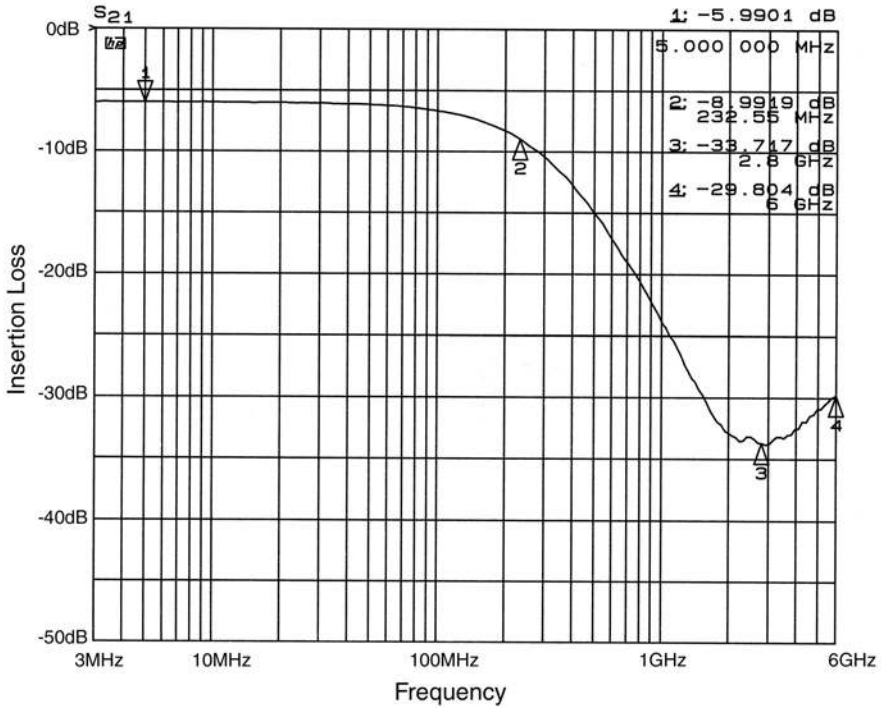


Figure 5. Insertion Loss vs. Frequency (A5−C5 to GND B3)

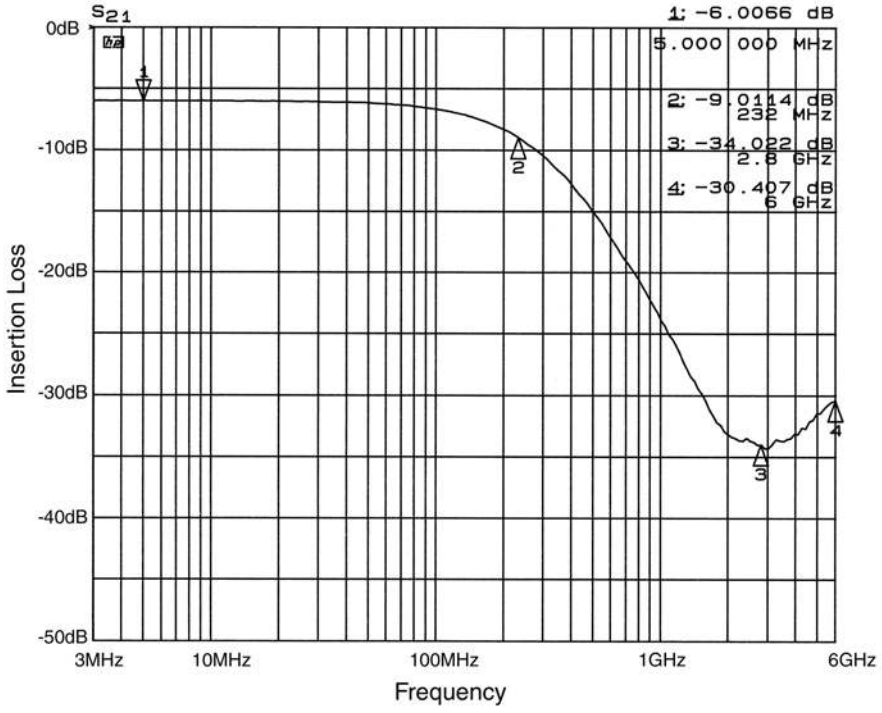


Figure 6. Insertion Loss vs. Frequency (A6−C6 to GND B3)

PERFORMANCE INFORMATION (Cont'd)

Typical Filter Performance (T_A = 25°C, DC Bias = 0 V, 50 Ω Environment)

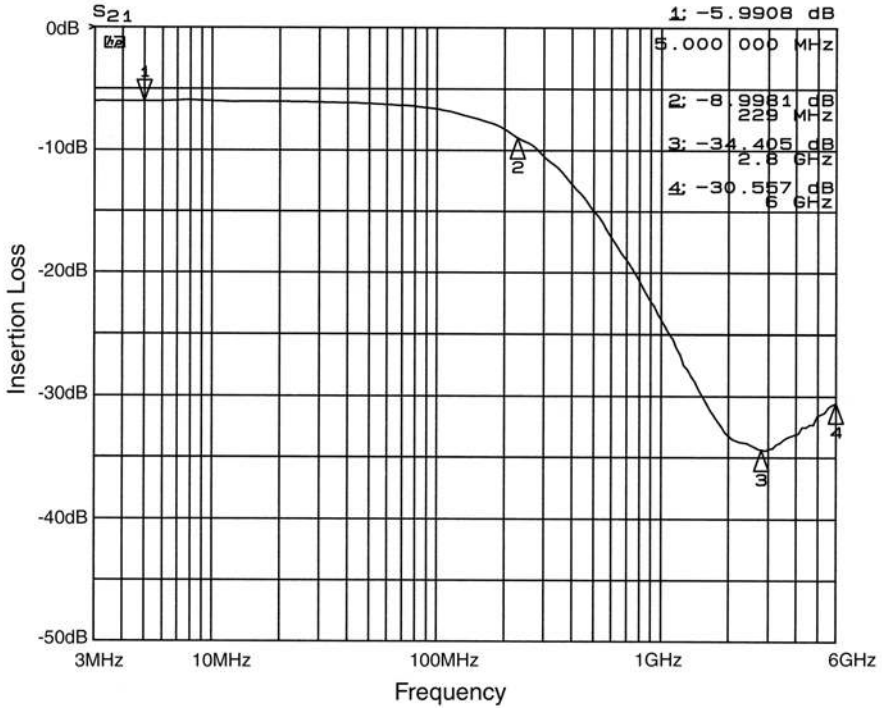


Figure 7. Insertion Loss vs. Frequency (A7−C7 to GND B4)

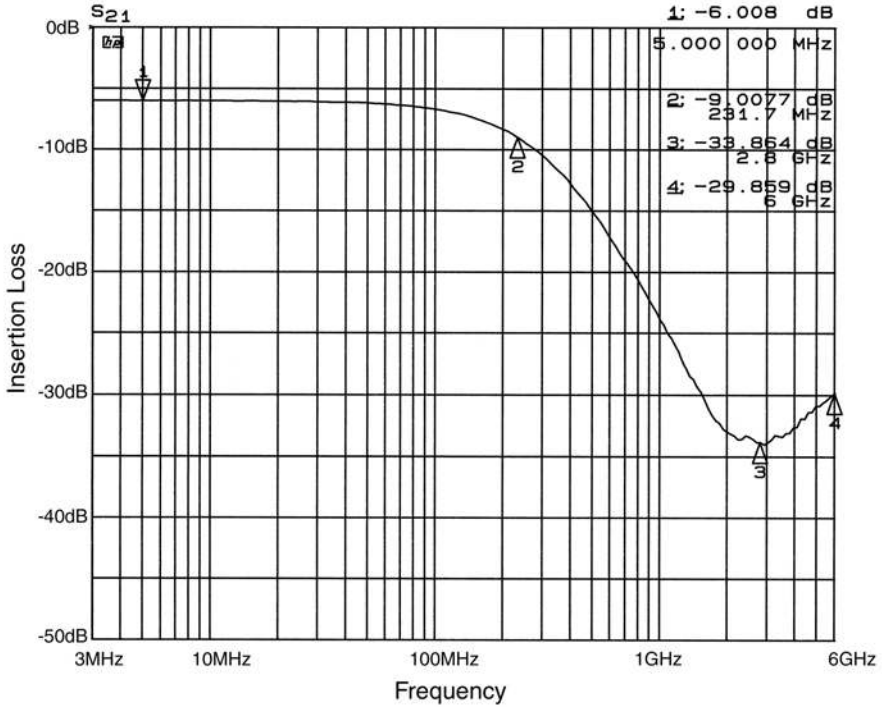


Figure 8. Insertion Loss vs. Frequency (A8−C8 to GND B4)

PERFORMANCE INFORMATION (Cont'd)

Typical Diode Capacitance vs. Input Voltage

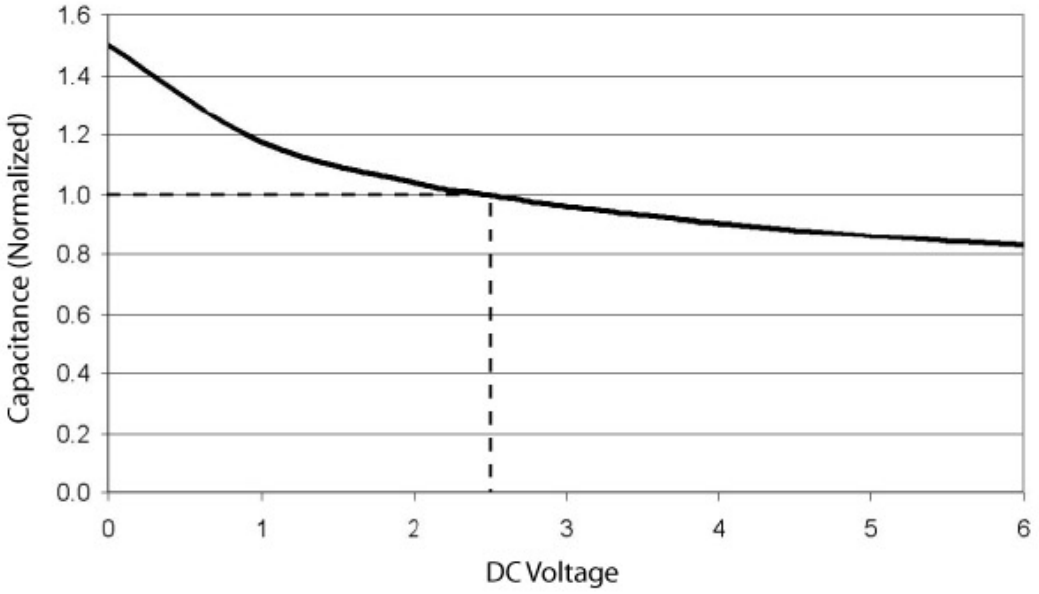


Figure 9. Filter Capacitance vs. Input Voltage over Temperature (normalized to capacitance at 2.5 VDC and 25°C)

APPLICATION INFORMATION

Table 5. PRINTED CIRCUIT BOARD RECOMMENDATIONS

Parameter	Value
Pad Size on PCB	0.240 mm
Pad Shape	Round
Pad Definition	Non−Solder Mask defined pads
Solder Mask Opening	0.290 mm Round
Solder Stencil Thickness	0.125 − 0.150 mm
Solder Stencil Aperture Opening (laser cut, 5% tapered walls)	0.300 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 for Lead−free Devices using a Lead−free Solder Paste	260°C

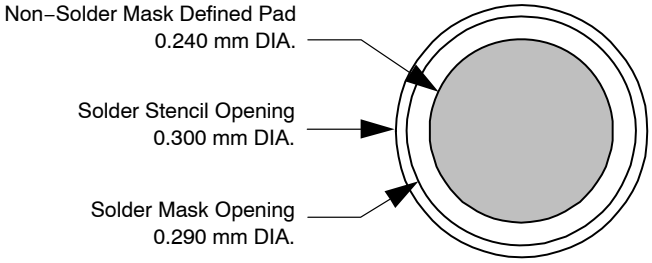


Figure 10. Recommended Non−Solder Mask Defined Pad Illustration

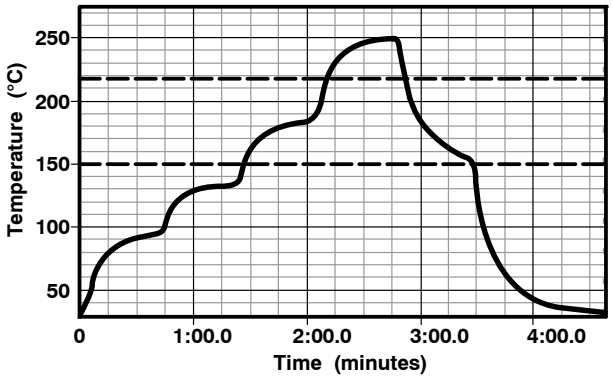
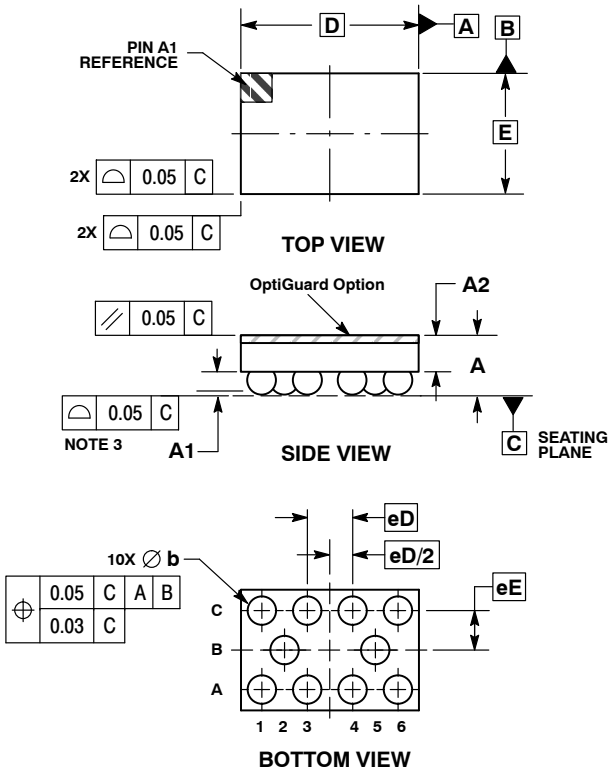


Figure 11. Lead−free (SnAgCu) Solder Ball Reflow Profile

PACKAGE DIMENSIONS

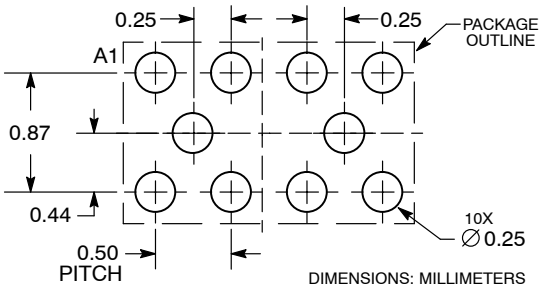
WLCSP10, 1.96x1.33
CASE 567BL−01
ISSUE O



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	0.56	0.72
A1	0.21	0.27
A2	0.40 REF	
b	0.29	0.35
D	1.96 BSC	
E	1.33 BSC	
eD	0.50 BSC	
eE	0.435 BSC	

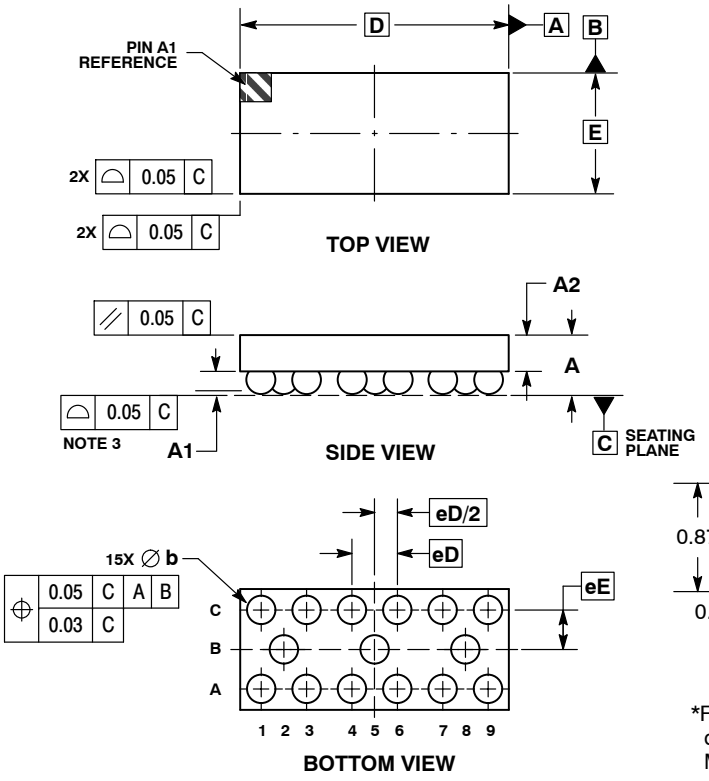
RECOMMENDED SOLDERING FOOTPRINT*



*For additional information on our Pb−Free strategy and soldering details, please download the ON Semiconductor Soldering and Mounting Techniques Reference Manual, SOLDERRM/D.

PACKAGE DIMENSIONS

WLCSP15, 2.96x1.33
CASE 567BS−01
ISSUE O



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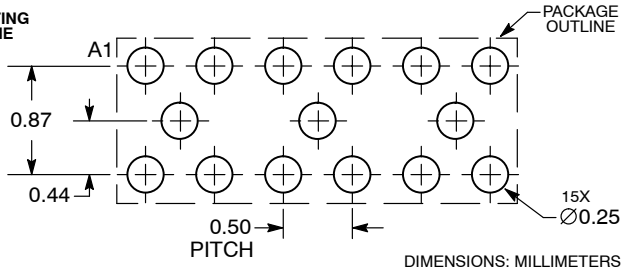
D	2.96 BSC	
E	1.33 BSC	
eD	0.50 BSC	
eE	0.435 BSC	

RECOMMENDED SOLDERING FOOTPRINT*



DIMENSIONS: MILLIMETERS

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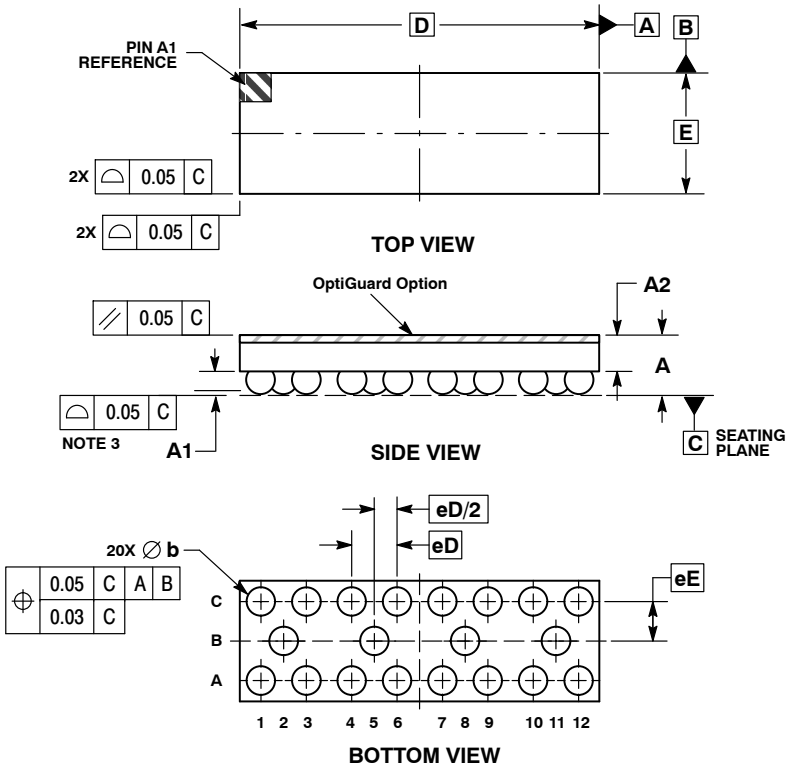
PACKAGE DIMENSIONS

WLCSP20, 3.96x1.33
CASE 567BX−01
ISSUE O



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1. DIMENSIONING AND TOLERANCING PER ASME Y14.5M, 1994.
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	MILLIMETERS	
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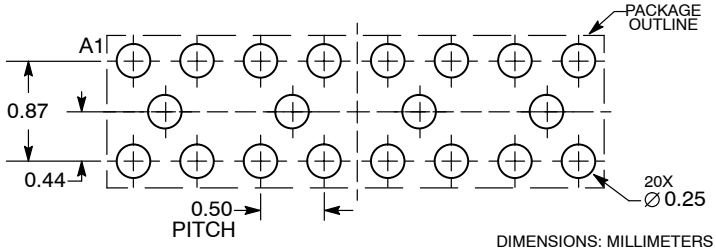
eD	0.50 BSC	
eE	0.435 BSC	

RECOMMENDED SOLDERING FOOTPRINT*



DIMENSIONS: MILLIMETERS

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