

CM1457

4-, 6-, 8-Channel EMI Filter Array with ESD Protection

Description

The CM1457 is an inductor-based (L-C) EMI filter array with ESD protection, which integrates four, six, or eight filters in a CSP form factor with 0.40 mm pitch. Each EMI filter channel of the CM1457 is implemented with the component value of 6 pF – 35 nH – 4.7 pF – 35 nH – 1.8 pF. The cut-off frequency at –3 dB attenuation is 300 MHz and can be used in applications where the data rates are as high as 160 Mbps, while providing greater than –35 dB attenuation over the 800 MHz to 2.7 GHz frequency range. The parts include ESD diodes on every I/O pin and provide a high level of protection against electrostatic discharge (ESD). The ESD protection diodes connected to the external filter ports are designed and characterized to safely dissipate ESD strikes of ± 15 kV, which is beyond the maximum requirement of the IEC61000–4–2 international standard.

This device is particularly well suited for wireless handsets, mobile LCD modules and PDAs because of its small package format and easy-to-use pin assignments. In particular, the CM1457 is ideal for EMI filtering and protecting data and control lines for the LCD display and camera interface in mobile handsets.

The CM1457 incorporates *OptiGuard* which results in improved reliability at assembly. It is manufactured with a 0.40 mm pitch and 0.25 mm CSP solder ball to provide up to 28% board space savings vs. competing CSP devices with 0.50 mm pitch and 0.30 mm CSP solder ball.

Features

- Four, Six or Eight Channels of EMI Filtering
- ± 15 kV ESD Protection (IEC 61000–4–2, Contact Discharge) at External Pins
- Greater than –40 dB of Attenuation at 1 GHz MIL–STD–883 International ESD Standard
- Chip Scale Package (CSP) with 0.40 mm Pitch and 0.25 mm CSP Solder Ball which Features Extremely Low Parasitic Inductance for Optimum Filter and ESD Performance
- *OptiGuard* Coating for Improved Reliability at Assembly
- These Devices are Pb–Free and are RoHS Compliant

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



ON Semiconductor®

<http://onsemi.com>



WLCSP10
CP SUFFIX
CASE 567BJ

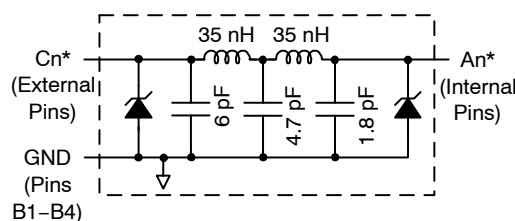


WLCSP15
CP SUFFIX
CASE 567BR

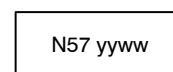
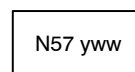


WLCSP20
CP SUFFIX
CASE 567BV

BLOCK DIAGRAM



MARKING DIAGRAM



CM1457–04
10–Bump CSP

CM1457–06
15–Bump CSP

CM1457–08
20–Bump CSP

N57 = CM1457–04CP
N57 = CM1457–06CP
N57 = CM1457–08CP
w/yyww/yyww = date code

ORDERING INFORMATION

Device	Package	Shipping†
CM1457–04CP	CSP–10 (Pb–Free)	3500/Tape & Reel
CM1457–06CP	CSP–15 (Pb–Free)	3500/Tape & Reel
CM1457–08CP	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.

CM1457

PACKAGE / PINOUT DIAGRAMS

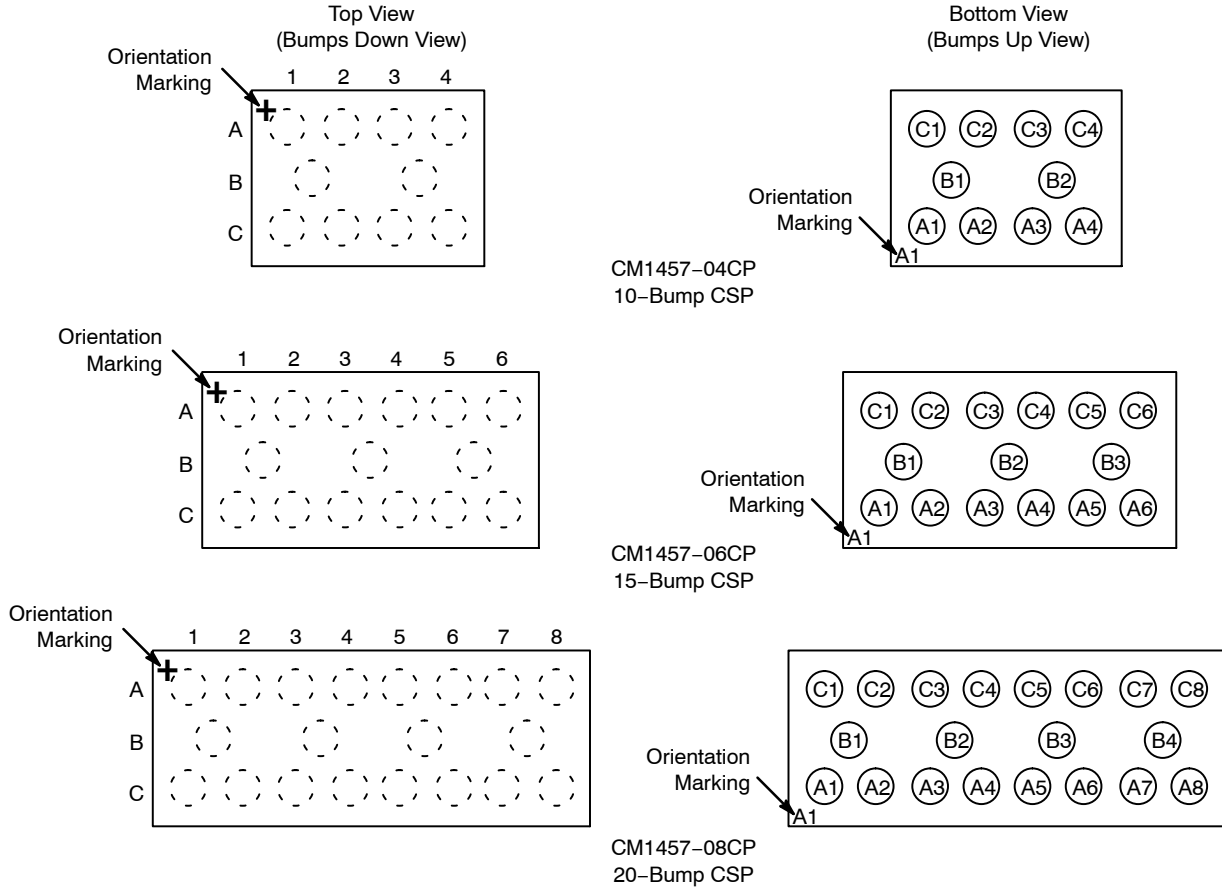


Table 1. PIN DESCRIPTIONS

Pin Number			Pin Description	Pin Number			Pin Description
-04	-06	-08		-04	-06	-08	
A1	A1	A1	Filter #1 (Internal)	C1	C1	C1	Filter #1 (External)
A2	A2	A2	Filter #2 (Internal)	C2	C2	C2	Filter #2 (External)
A3	A3	A3	Filter #3 (Internal)	C3	C3	C3	Filter #3 (External)
A4	A4	A4	Filter #4 (Internal)	C4	C4	C4	Filter #4 (External)
-	A5	A5	Filter #5 (Internal)	-	C5	C5	Filter #5 (External)
-	A6	A6	Filter #6 (Internal)	-	C6	C6	Filter #6 (External)
-	-	A7	Filter #7 (Internal)	-	-	C7	Filter #7 (External)
-	-	A8	Filter #8 (Internal)	-	-	C8	Filter #8 (External)
B1, B2	B1-B3	B1-B4	GND				

CM1457

SPECIFICATIONS

Table 2. ABSOLUTE MAXIMUM RATINGS

Parameter	Rating	Units
Storage Temperature Range	–65 to +150	°C
DC current per Inductor	15	mA
DC Package Power Rating	0.5	W

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
L_{TOT}	Total Channel Inductance			70		nH
R_{TOT}	Total Channel DC Resistance			45		Ω
C_{TOT_0V}	Total Channel Capacitance, 0 V bias	0 V dc; 1 MHz, 30 mV rms		20	24	pF
$C_{TOT_2.5V}$	Total Channel Capacitance, 2.5 V bias	2.5 V dc; 1 MHz, 30 mV rms		12.5		pF
V_{ST}	Stand-off Voltage	$I = 10 \mu A$	5.5			V
I_{LEAK}	Diode Leakage Current	$V_{IN} = +3.3 V$		0.1	0.5	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) Contact Discharge per IEC 61000–4–2 standard, Level 4 (External Pins) b) Contact Discharge per IEC 61000–4–2 standard, Level 4 (Internal Pins)	(Notes 2 and 3)	± 15 ± 2			kV
f_C	Cut-off Frequency $Z_{SOURCE} = 50 \Omega$, $Z_{LOAD} = 50 \Omega$			300		MHz

1. $T_A = 25^\circ C$ unless otherwise specified.
2. ESD applied to input and output pins with respect to GND, one at a time.
3. Unused pins are left open.

APPLICATION INFORMATION

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

PERFORMANCE INFORMATION

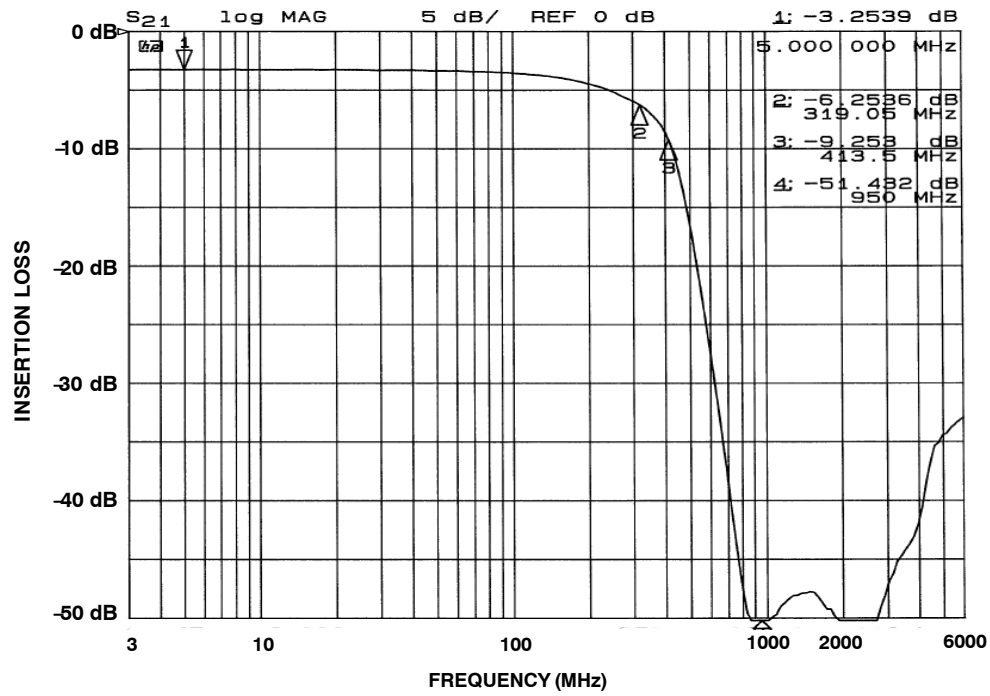


Figure 1. Insertion Loss vs. Frequency (0 V Bias)

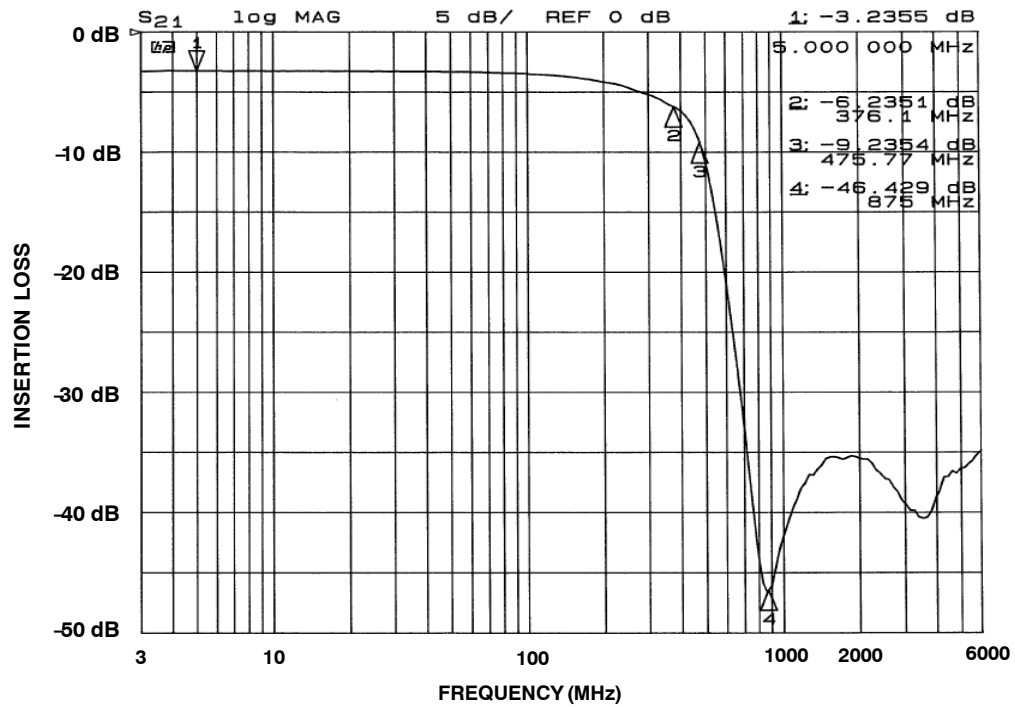
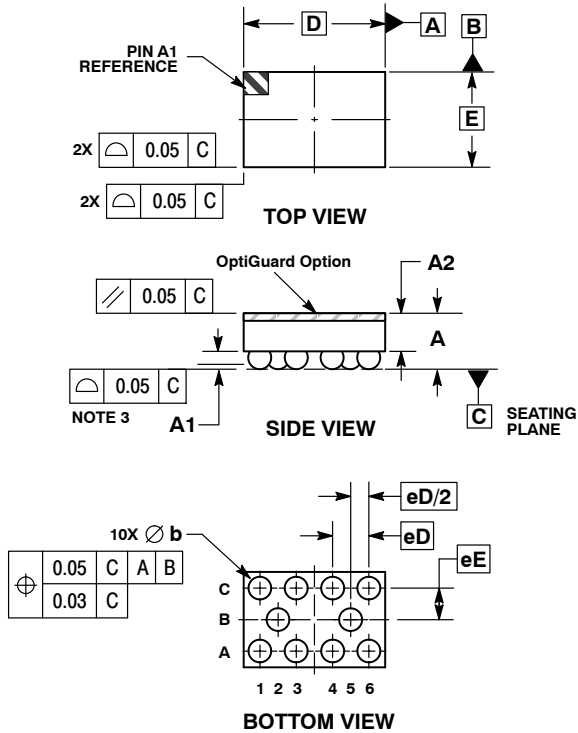


Figure 2. Insertion Loss vs. Frequency (2.5 V Bias)

CM1457

PACKAGE DIMENSIONS

WLCSP10, 1.67x1.05
CASE 567BJ-01
ISSUE O

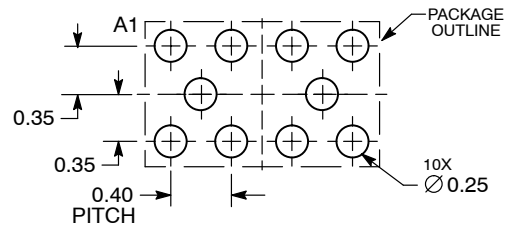


NOTES:

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

DIM	MILLIMETERS	
	MIN	MAX
A	0.54	0.69
A1	0.17	0.24
A2	0.42	REF
b	0.24	0.29
D	1.67	BSC
E	1.05	BSC
eD	0.400	BSC
eE	0.347	BSC

RECOMMENDED SOLDERING FOOTPRINT*



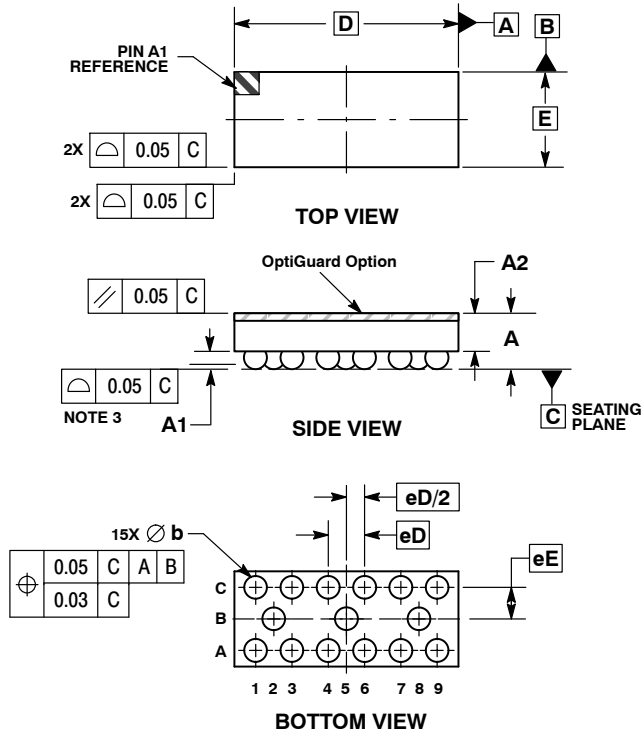
DIMENSIONS: MILLIMETERS

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

CM1457

PACKAGE DIMENSIONS

WLCSP15, 2.47x1.05
CASE 567BR-01
ISSUE O

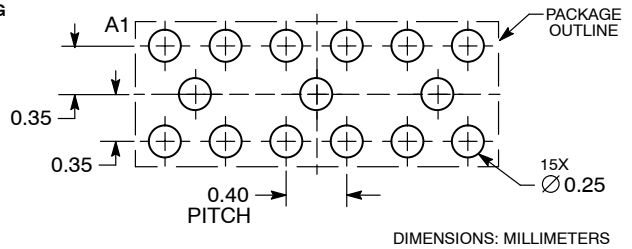


NOTES:

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

DIM	MILLIMETERS	
	MIN	MAX
A	0.54	0.69
A1	0.17	0.24
A2	0.42	REF
b	0.24	0.29
D	2.47	BSC
E	1.05	BSC
eD	0.400	BSC
eE	0.347	BSC

RECOMMENDED SOLDERING FOOTPRINT*

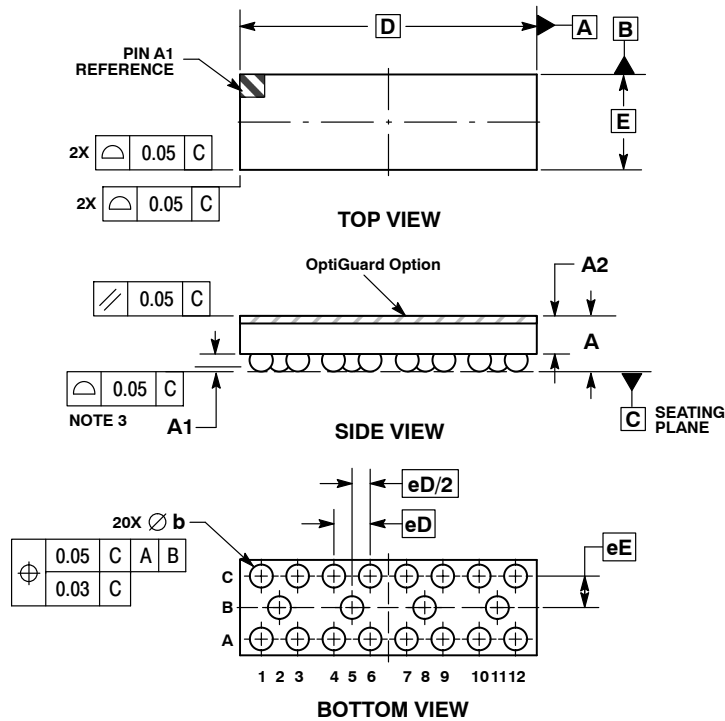


*For additional information on our Pb-Free strategy and soldering details, please download the ON Semiconductor Soldering and Mounting Techniques Reference Manual, SOLDERRM/D.

CM1457

PACKAGE DIMENSIONS

WLCSP20, 3.27x1.05
CASE 567BV-01
ISSUE O

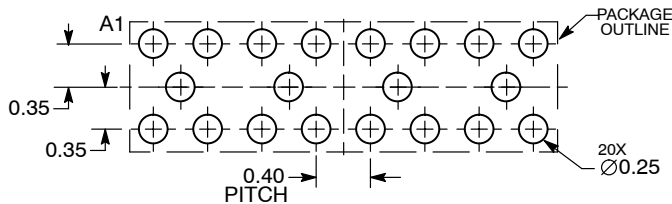


NOTES:

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

DIM	MILLIMETERS	
	MIN	MAX
A	0.54	0.69
A1	0.17	0.24
A2	0.42	REF
b	0.24	0.29
D	3.27	BSC
E	1.05	BSC
eD	0.400	BSC
eE	0.347	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.

ON Semiconductor and are registered trademarks of Semiconductor Components Industries, LLC (SCILLC). SCILLC owns the rights to a number of patents, trademarks, copyrights, trade secrets, and other intellectual property. A listing of SCILLC's product/patent coverage may be accessed at www.onsemi.com/site/pdf/Patent-Marketing.pdf. SCILLC reserves the right to make changes without further notice to any products herein. SCILLC makes no warranty, representation or guarantee regarding the suitability of its products for any particular purpose, nor does SCILLC assume any liability arising out of the application or use of any product or circuit, and specifically disclaims any and all liability, including without limitation special, consequential or incidental damages. "Typical" parameters which may be provided in SCILLC data sheets and/or specifications can and do vary in different applications and actual performance may vary over time. All operating parameters, including "Typicals" must be validated for each customer application by customer's technical experts. SCILLC does not convey any license under its patent rights nor the rights of others. SCILLC products are not designed, intended, or authorized for use as components in systems intended for surgical implant into the body, or other applications intended to support or sustain life, or for any other application in which the failure of the SCILLC product could create a situation where personal injury or death may occur. Should Buyer purchase or use SCILLC products for any such unintended or unauthorized application, Buyer shall indemnify and hold SCILLC and its officers, employees, subsidiaries, affiliates, and distributors harmless against all claims, costs, damages, and expenses, and reasonable attorney fees arising out of, directly or indirectly, any claim of personal injury or death associated with such unintended or unauthorized use, even if such claim alleges that SCILLC was negligent regarding the design or manufacture of the part. SCILLC is an Equal Opportunity/Affirmative Action Employer. This literature is subject to all applicable copyright laws and is not for resale in any manner.

PUBLICATION ORDERING INFORMATION

LITERATURE FULFILLMENT:

Literature Distribution Center for ON Semiconductor
P.O. Box 5163, Denver, Colorado 80217 USA
Phone: 303-675-2175 or 800-344-3860 Toll Free USA/Canada
Fax: 303-675-2176 or 800-344-3867 Toll Free USA/Canada
Email: orderlit@onsemi.com

N. American Technical Support: 800-282-9855 Toll Free
USA/Canada
Europe, Middle East and Africa Technical Support:
Phone: 421 33 790 2910
Japan Customer Focus Center
Phone: 81-3-5817-1050

ON Semiconductor Website: www.onsemi.com

Order Literature: <http://www.onsemi.com/orderlit>

For additional information, please contact your local Sales Representative

AMEYA360

Components Supply Platform

Authorized Distribution Brand :



Website :

Welcome to visit www.ameya360.com

Contact Us :

➤ Address :

401 Building No.5, JiuGe Business Center, Lane 2301, Yishan Rd
Minhang District, Shanghai , China

➤ Sales :

Direct +86 (21) 6401-6692
Email amall@ameya360.com
QQ 800077892
Skype ameyasales1 ameyasales2

➤ Customer Service :

Email service@ameya360.com

➤ Partnership :

Tel +86 (21) 64016692-8333
Email mkt@ameya360.com