# EMI Filter with ESD Protection for MicroSD Card Applications

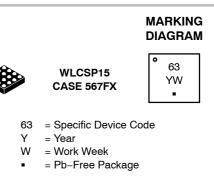
#### **Product Description**

The EMI6316 is a 4 x 4, 15–bump EMI filter with ESD protection device for MicroSD card applications in a 0.4 mm pitch CSP form factor. It is fully compliant with IEC 61000–4–2. The EMI6316 is also RoHS II compliant.



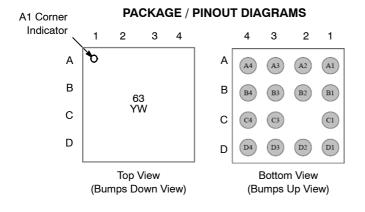
## **ON Semiconductor®**

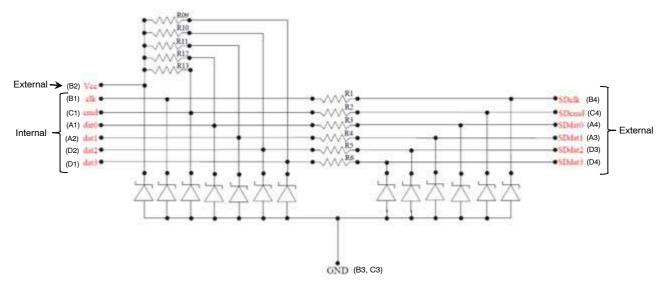
http://onsemi.com



### **ORDERING INFORMATION**

See detailed ordering, marking and shipping information in the package dimensions section on page 3 of this data sheet.







#### Table 1. PIN DESCRIPTIONS

Pin	Description	Pin	Description	Pin	Description	Pin	Description
A1	dat0 Internal	B1	clk Internal	C1	cmd Internal	D1	data3 Internal
A2	dat1 Internal	B2	V <sub>CC</sub> External			D2	data2 Internal
A3	SDdat1 External	B3	GND	C3	GND	D3	SDdata2 External
A4	SDdat0 External	B4	SDclk External	C4	SDcmd External	D4	SDdata3 External

## **ELECTRICAL SPECIFICATIONS AND CONDITIONS**

## **Table 2. PARAMETERS AND OPERATING CONDITIONS**

Parameter	Rating	Unit
Storage Temperature Range	–55 to +150	°C
Operating Temperature Range	-40 to +85	°C

### Table 3. ELECTRICAL OPERATING CHARACTERISTICS (Note 1)

Symbol	Parameter	Conditions	Min	Тур	Мах	Unit
$f R_1  R_2  R_3 \ R_4  R_5  R_6$	Resistance		34	40	46	Ω
$\begin{array}{c} {\sf R}_9{\sf R}_{10}{\sf R}_{11} \\ {\sf R}_{12} \end{array}$	Resistance		42.5	50	57.5	kΩ
R <sub>13</sub>	Resistance		12.75	15	17.25	kΩ
I <sub>LEAK</sub>	Leakage Current per Channel	V <sub>IN</sub> = 3.0 V		10	100	nA
С	Line Capacitance	At 1 MHz, V <sub>IN</sub> = 0 V	9	11.5	14	pF
		At 1 MHz, V <sub>IN</sub> = 1.8 V (Note 2)		8		pF
		At 1 MHz, V <sub>IN</sub> = 2.5 V		7		pF
V <sub>B</sub>	Breakdown Voltage (Positive)	I <sub>R</sub> = 1 mA	6	7	9	V
V <sub>ESD</sub>	ESD Protection Peak Discharge Voltage at A3, A4, B2, B4, C4, D3 and D4 pins a) Contact Discharge per IEC 61000-4-2 standard b) Air Discharge per IEC 61000-4-2 standard	(Note 3)	±8 ±15			kV
	ESD Protection Peak Discharge Voltage at A1, A2, B1, C1, D1 and D2 pins a) Contact Discharge per IEC 61000-4-2 standard b) Air Discharge per IEC 61000-4-2 standard	(Note 3)	±2 ±2			

All parameters specified at T<sub>A</sub> = 25°C unless otherwise noted.
MicroSD version 3.0 SDR104 compliant.
Standard IEC 61000-4-2 with C<sub>Discharge</sub> = 150 pF, R<sub>Discharge</sub> = 330 Ω.

#### Table 4. CSP TAPE AND REEL SPECIFICATIONS<sup>†</sup>

Part Number	Chip Size (mm)	Package	Shipping <sup>†</sup>
EMI6316FCTBG	1.56 x 1.56 x 0.50	WLCSP15 (Pb-Free)	5000 / 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.

## **RF CHARACTERISTICS**

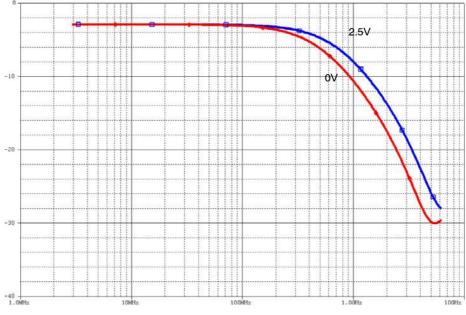
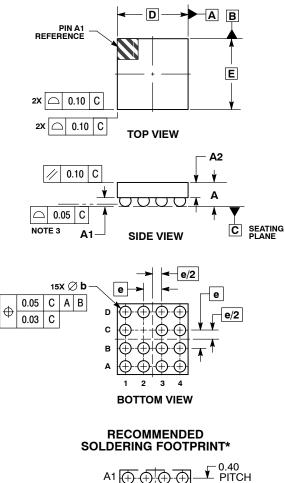


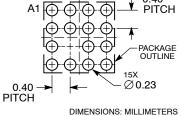
Figure 2. S21 Attenuation Simulation





SCALE 4.





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

DATE 07 JUN 2012

NOTES: 1. DIMENSIONING AND TOLERANCING PER

DIMENSIONING AND TOLLING.
ASME Y14.5M, 1994.
CONTROLLING DIMENSION: MILLIMETERS.
COPLANARITY APPLIES TO SPHERICAL COMMISS OF SOLDER BALLS.

CROWNS OF SOLDER B					
	MILLIMETERS				
DIM	MIN MAX				
Α	0.47 0.53				
A1	0.185 0.205				
A2	0.305 REF				
b	0.24 0.29				
D	1.56 BSC				
E	1.56 BSC				
е	0.40 BSC				

#### GENERIC **MARKING DIAGRAM\***



XX = Specific Device Code

= Year Y

W = Work Week

= Pb-Free Package

\*This information is generic. Please refer to device data sheet for actual part marking. Pb-Free indicator, "G" or microdot " .", may or may not be present.

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