

# EMI6316FCTBG

## 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.



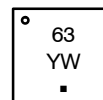
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### MARKING DIAGRAM



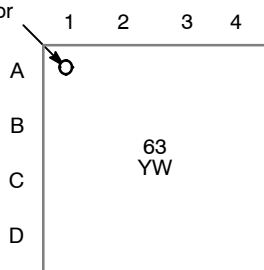
WLCSP15  
CASE 567FX



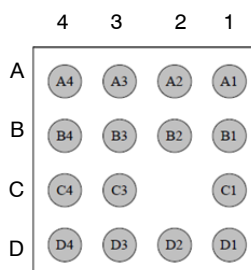
63 = Specific Device Code  
Y = Year  
W = Work Week  
▪ = Pb-Free Package

### PACKAGE / PINOUT DIAGRAMS

A1 Corner Indicator



Top View  
(Bumps Down View)



Bottom View  
(Bumps Up View)

### ORDERING INFORMATION

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

# EMI6316FCTBG

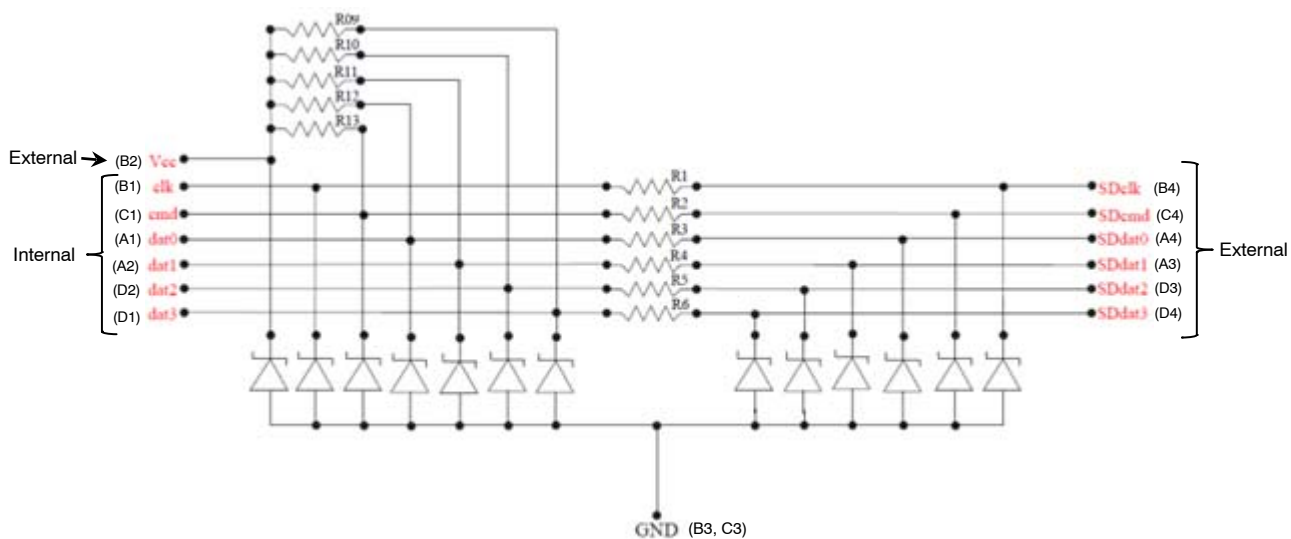


Figure 1. Electrical Schematic

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

# EMI6316FCTBG

## 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	Typ	Max	Unit
R <sub>1</sub> R <sub>2</sub> R <sub>3</sub> R <sub>4</sub> R <sub>5</sub> R <sub>6</sub>	Resistance		34	40	46	Ω
R <sub>9</sub> R <sub>10</sub> R <sub>11</sub> R <sub>12</sub>	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
C	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			

1. All parameters specified at T<sub>A</sub> = 25°C unless otherwise noted.
2. MicroSD version 3.0 SDR104 compliant.
3. 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†**

Part Number	Chip Size (mm)	Package	Shipping†
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.

# EMI6316FCTBG

## RF CHARACTERISTICS

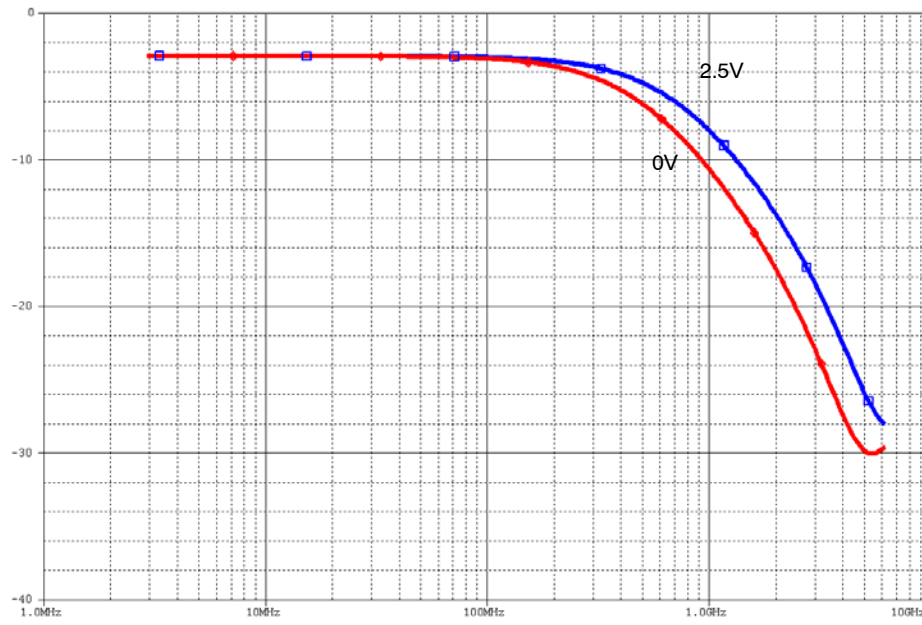


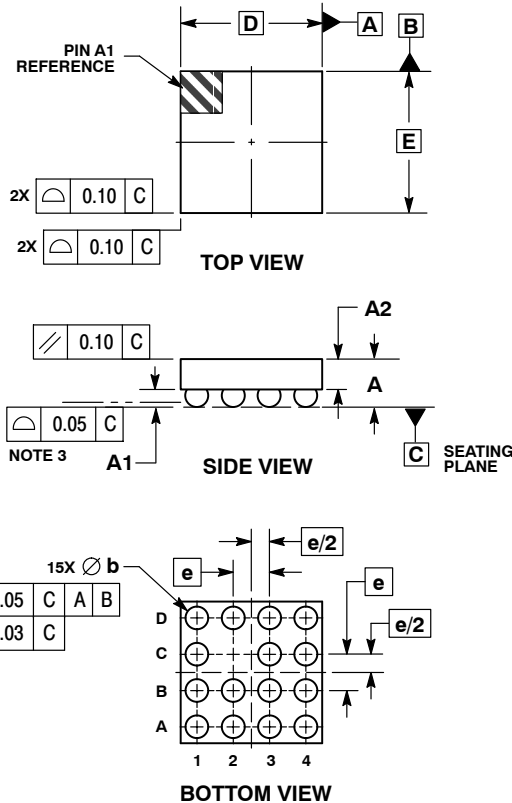
Figure 2. S21 Attenuation Simulation



SCALE 4:1

**WLCSP15, 1.56x1.56**  
CASE 567FX  
ISSUE O

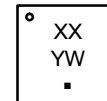
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## NOTES:

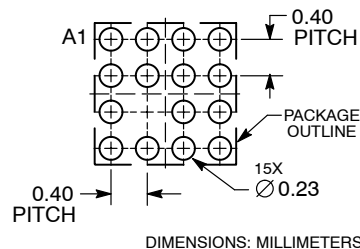
1. DIMENSIONING AND TOLERANCING PER ASME Y14.5M, 1994.
2. CONTROLLING DIMENSION: MILLIMETERS.
3. COPLANARITY APPLIES TO SPHERICAL CROWNS OF SOLDER BALLS.

DIM	MILLIMETERS	
	MIN	MAX
A	0.47	0.53
A1	0.185	0.205
A2	0.305 REF	
b	0.24	0.29
D	1.56 BSC	
E	1.56 BSC	
e	0.40 BSC	

**GENERIC MARKING DIAGRAM\***


XX = Specific Device Code  
Y = Year  
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.

**RECOMMENDED SOLDERING FOOTPRINT\***


DIMENSIONS: MILLIMETERS

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

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<b>DESCRIPTION:</b>	<b>WLCSP15, 1.56X1.56</b>	<b>PAGE 1 OF 1</b>

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