

# EMI7403

## EMI Filter with ESD Protection for MicroSD Card Applications

### Product Description

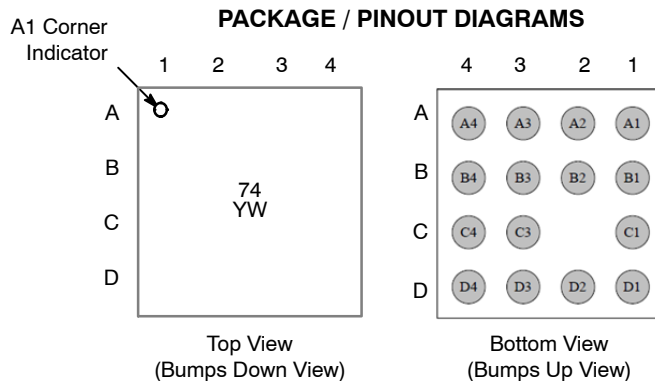
The EMI7403 is a combination EMI filter with integrated TVS diodes for use on Multimedia Card interfaces. This state-of-the-art device utilizes solid-state, silicon-avalanche technology for superior clamping performance and DC electrical characteristics. The EMI7403 has been optimized for protection of MicroSD interfaces in smart phones and other portable electronics.

### Features

- Provides ESD Protection to IEC61000-4-2: ±15 kV Contact Discharge
- Protection and Termination for 6 Lines + V<sub>CC</sub>
- These Devices are Pb-Free, Halogen Free/BFR Free and are RoHS Compliant

### Applications

- MicroSD Interfaces
- MMC Interfaces
- Feature Phones, Smart Phones



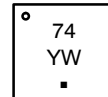
**ON Semiconductor®**

<http://onsemi.com>

### MARKING DIAGRAM



**WLCSP15  
CASE 567FX**



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

### ORDERING INFORMATION

| Device       | Package           | Shipping†          |
|--------------|-------------------|--------------------|
| EMI7403FCTBG | 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 Specifications Brochure, BRD8011/D.

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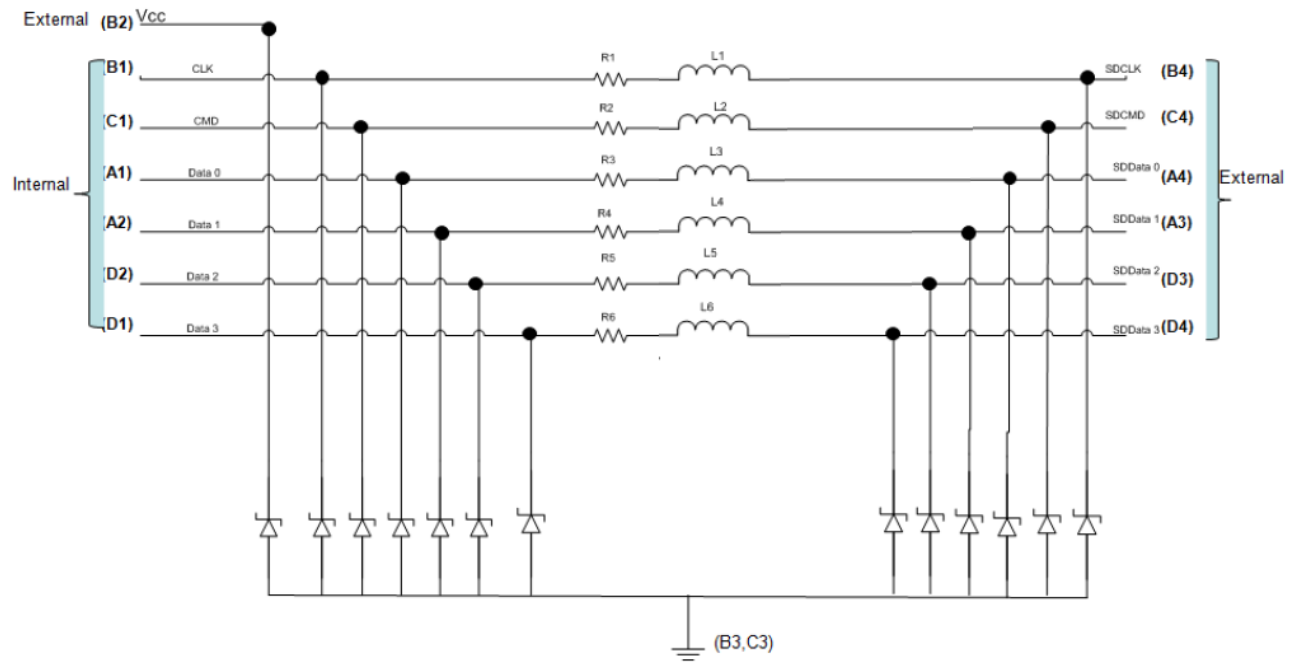


Figure 1. Electrical Schematic

Table 1. PIN DESCRIPTIONS

| Pin | Description      | Pin | Description              | Pin | Description    | Pin | Description      |
|-----|------------------|-----|--------------------------|-----|----------------|-----|------------------|
| A1  | data0 Internal   | B1  | clk Internal             | C1  | cmd Internal   | D1  | data3 Internal   |
| A2  | data1 Internal   | B2  | V <sub>CC</sub> External |     |                | D2  | data2 Internal   |
| A3  | SDdata1 External | B3  | GND                      | C3  | GND            | D3  | SDdata2 External |
| A4  | SDdata0 External | B4  | SDclk External           | C4  | SDcmd External | D4  | SDdata3 External |

# EMI7403

## 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   |

Functional operation above the stresses listed in the Recommended Operating Ranges is not implied. Extended exposure to stresses beyond the Recommended Operating Ranges limits may affect device reliability.

### ELECTRICAL CHARACTERISTICS (T<sub>A</sub> = 25°C unless otherwise noted)

| Symbol             | Parameter   | Test Conditions                  | Min       | Typ      | Max | Unit |
|--------------------|---|----------------------------------|-----------|----------|-----|------|
| V <sub>RWM</sub>   | Reverse Working Voltage   | (Note 3)                         |           | 3.3      |     | V    |
| V <sub>BR</sub>    | Breakdown Voltage   | I <sub>T</sub> = 1 mA; (Note 4)  | 6.0       |          | 9.0 | V    |
| I <sub>LEAK</sub>  | Channel Leakage Current   | V <sub>IN</sub> = 3.3 V          |           | 0.1      | 0.5 | μA   |
| R <sub>CH</sub>    | Channel Resistance (R1 to R6)   |                                  |           | 40       |     | Ω    |
| f <sub>3dB</sub>   | Cut-off Frequency   | 50 Ω Source and Load Termination |           | 300      |     | MHz  |
| F <sub>atten</sub> | Stop Band Attenuation   | @ 700 MHz<br>@ 900 MHz           |           | 20<br>35 |     | dB   |
| V <sub>ESD</sub>   | In-system ESD Withstand Voltage<br>a) Contact discharge per IEC 61000-4-2 standard, Level 4<br><b>(External Pins)</b><br>b) Contact discharge per IEC 61000-4-2 standard, Level 1<br><b>(Internal Pins)</b> | (Notes 1 and 2)                  | ±15<br>±2 |          |     | kV   |

Product parametric performance is indicated in the Electrical Characteristics for the listed test conditions, unless otherwise noted. Product performance may not be indicated by the Electrical Characteristics if operated under different conditions.

- Standard IEC61000-4-2 with C<sub>Discharge</sub> = 150 pF, R<sub>Discharge</sub> = 330, GND grounded.
- These measurements performed with no external capacitor.
- TVS devices are normally selected according to the working peak reverse voltage (V<sub>RWM</sub>), which should be equal to or greater than the DC or continuous peak operating voltage level.
- V<sub>BR</sub> is measured at pulse test current I<sub>T</sub>.

# EMI7403

## RF CHARACTERISTICS

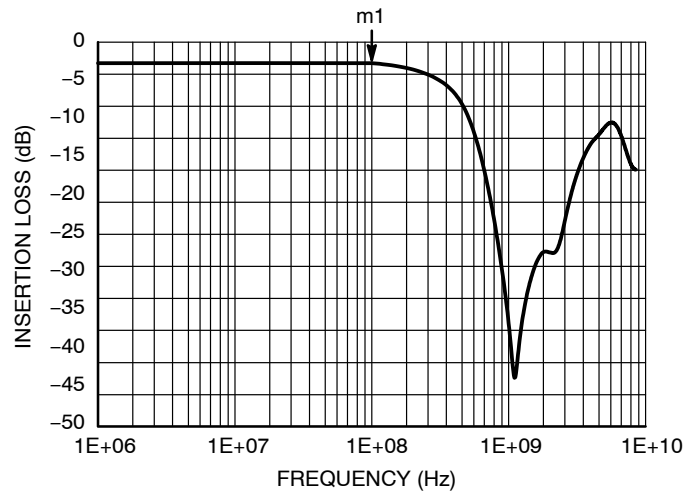


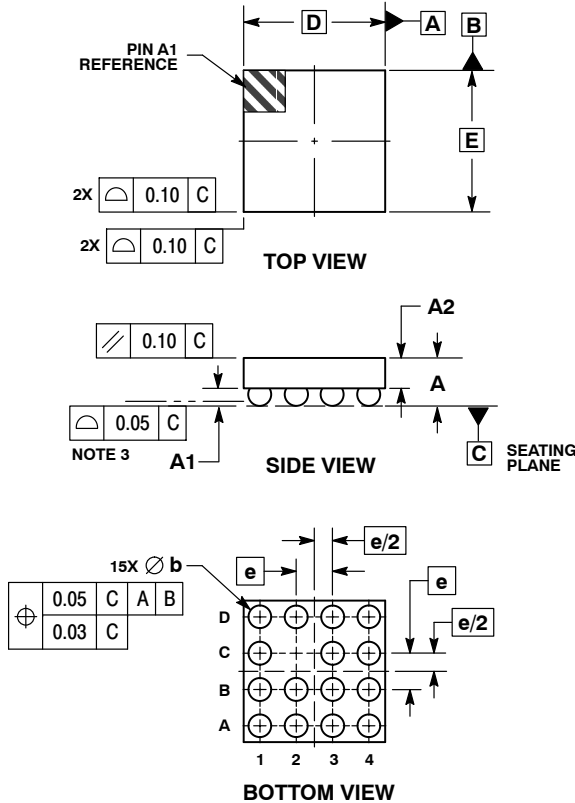
Figure 2. S21 Attenuation Simulation

| Interface   | Data Rate (Mbyte/s) | Fundamental Frequency (MHz) | EMI7403 Insertion Loss (dB) |
|-------------|---------------------|-----------------------------|-----------------------------|
| DDR50/SDR50 | 50                  | 100 (m1)                    | m1 = 3.27                   |

# EMI7403

## PACKAGE DIMENSIONS

WLCSP15, 1.56x1.56  
CASE 567FX  
ISSUE O

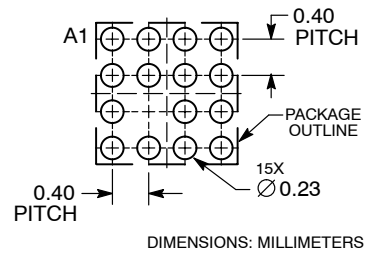


### NOTES:


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   | 0.47        | 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    |       |

### 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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