

# CM1484

## Dual Channel EMI Filter with ESD Protection

### Product Description

The CM1484 is a two channel pi-style EMI filter array with ESD protection, housed in a 5-lead SC-70 package. The CM1484 has component values of 11 pF – 100  $\Omega$  – 11 pF per channel. The CM1484 has a cut-off frequency of 220 MHz and can be used in applications with data rates up to 80 Mbps. The parts include ESD diodes on every pin, which provide a very high level of protection for sensitive electronic components that may be subjected to electrostatic discharge (ESD). The ESD protection diodes safely dissipate ESD strikes of  $\pm 15$  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  $\pm 30$  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 CM1484 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 CM1484 is housed in a small, 5-lead SC-70 package and is available with lead-free finishing.

### Features

- Two Channels of EMI Filtering with Integrated ESD Protection
- Pi-Style EMI Filters in a Capacitor-Resistor-Capacitor (C-R-C) Network
- $\pm 15$  kV ESD Protection on Each Channel (IEC 61000-4-2 Level 4, Contact Discharge)
- $\pm 30$  kV ESD Protection on Each Channel (HBM)
- Greater than 20 dB Attenuation (Typical) at 1 GHz
- 5-lead SC-70 Package
- These Devices are Pb-Free and are RoHS Compliant

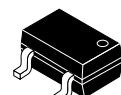
### Applications

- 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



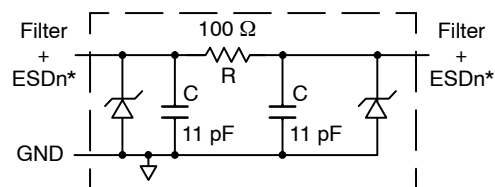
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SC-70  
S7 SUFFIX  
CASE 419AC

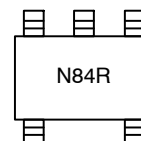
### ELECTRICAL SCHEMATIC



1 of 2 EMI/RFI Filter Channels  
with Integrated ESD Protection

\* See Package/Pinout Diagrams for expanded pin information.

### MARKING DIAGRAM



N84R = CM1484-02S7

### ORDERING INFORMATION

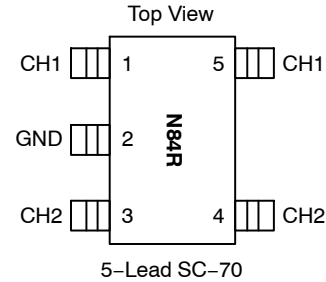
| Device      | Package            | Shipping†        |
|-------------|--------------------|------------------|
| CM1484-02S7 | SC-70<br>(Pb-Free) | 3000/Tape & Reel |

† 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.

Table 1. PIN DESCRIPTIONS

| 5-Lead SC-70 Package |         |                        |
|----------------------|---------|------------------------|
| Pin                  | Name    | Description            |
| 1                    | FILTER1 | Filter + ESD Channel 1 |
| 2                    | GND     | Ground                 |
| 3                    | FILTER2 | Filter + ESD Channel 2 |
| 4                    | FILTER2 | Filter + ESD Channel 2 |
| 5                    | FILTER1 | Filter + ESD Channel 1 |

PACKAGE / PINOUT DIAGRAMS



## 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                                                                                                                         |                                                                | 90         | 100        | 110  | Ω     |
| C <sub>TOTAL</sub> | Total Channel Capacitance                                                                                                          | At 0 V DC Reverse Bias, 1 MHz, 30 mV AC                        | 17.6       | 22.0       | 26.4 | pF    |
| C                  | Capacitance C1                                                                                                                     | At 0 V DC Reverse Bias, 1 MHz, 30 mV AC                        | 8.8        | 11.0       | 13.2 | pF    |
| I <sub>LEAK</sub>  | Diode Leakage Current (Reverse Bias)                                                                                               | V <sub>DIODE</sub> = +3.0 V                                    |            |            | 1.0  | μA    |
| V <sub>Z</sub>     | Zener Breakdown Voltage<br>Positive Clamp                                                                                          | I <sub>LOAD</sub> = 1 mA                                       | 6.0        |            | 8.0  | V     |
| V <sub>F</sub>     | Zener Forward Voltage                                                                                                              | I <sub>F</sub> = 50 mA                                         |            |            | 1.5  | V     |
| V <sub>ESD</sub>   | In-system ESD Withstand Voltage<br>a) Human Body Model, MIL-STD-883, Method 3015<br>b) Contact Discharge per IEC 61000-4-2 Level 4 | (Note 2)                                                       | ±30<br>±15 |            |      | kV    |
| R <sub>DYN</sub>   | Dynamic Resistance<br>Positive<br>Negative                                                                                         |                                                                |            | 2.3<br>0.9 |      | Ω     |
| f <sub>C</sub>     | Cut-off Frequency<br>Z <sub>SOURCE</sub> = 50 Ω, Z <sub>LOAD</sub> = 50 Ω                                                          | Channel R = 100 Ω,<br>Channel C = 22 pF<br>at 0 V Reverse Bias |            | 220        |      | MHz   |

1. T<sub>A</sub> = 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 ( $T_A = 25^\circ\text{C}$ , DC Bias = 0 V, 50  $\Omega$  Environment)

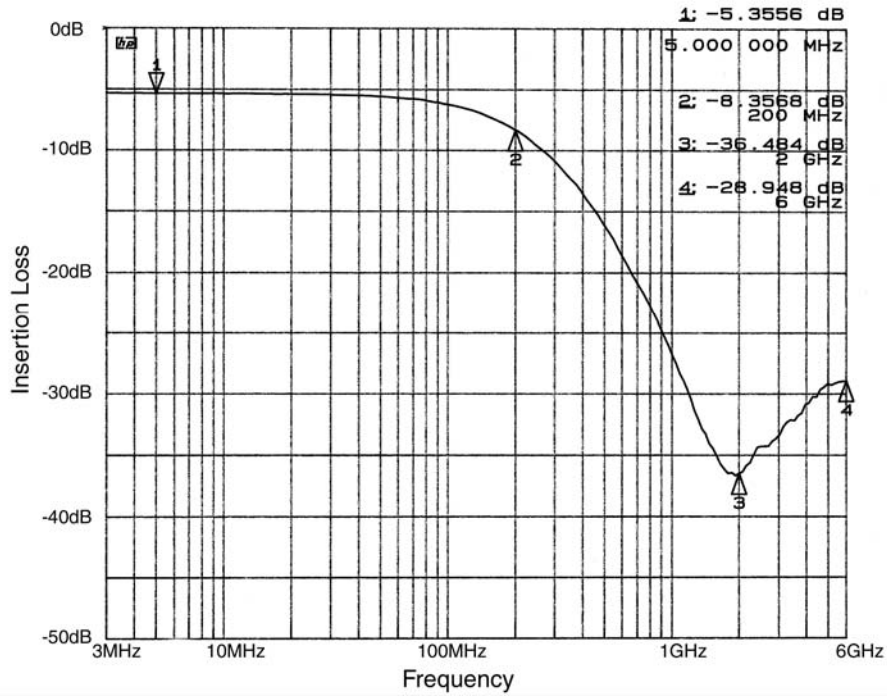


Figure 1. Insertion Loss vs. Frequency (FILTER1 Input to GND)

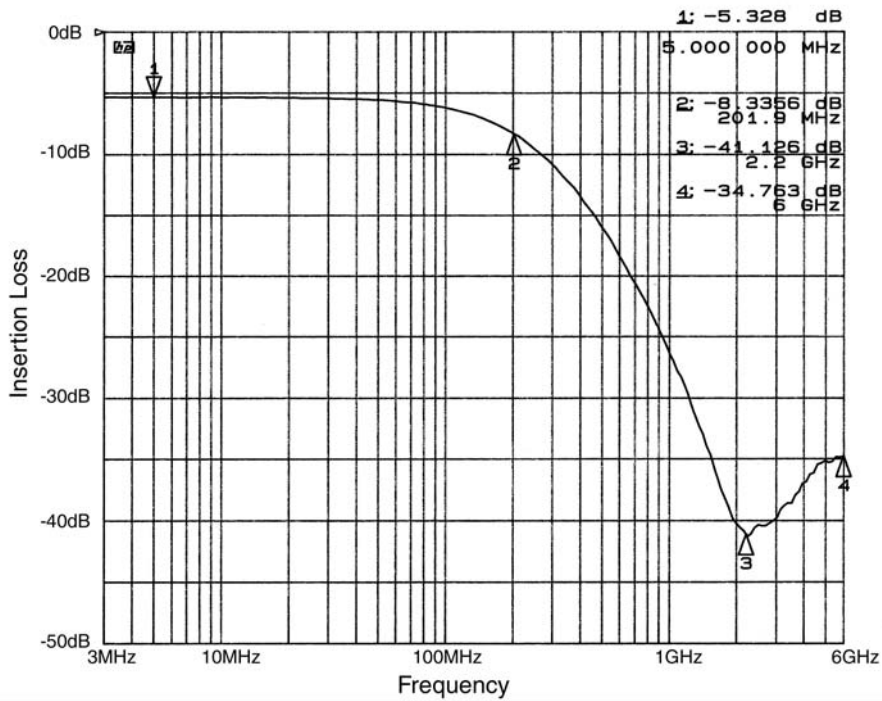
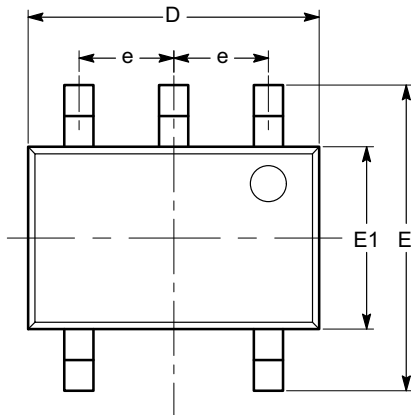


Figure 2. Insertion Loss vs. Frequency (FILTER2 Input to GND)

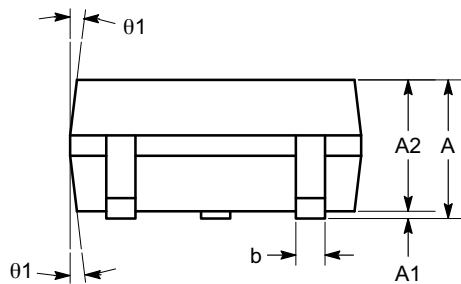
**SC-88A (SC-70 5 Lead), 1.25x2**  
CASE 419AC-01  
ISSUE A

DATE 29 JUN 2010

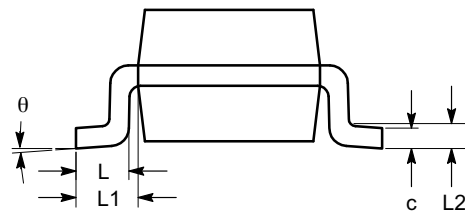


**TOP VIEW**

| SYMBOL | MIN      | NOM  | MAX  |
|--------|----------|------|------|
| A      | 0.80     |      | 1.10 |
| A1     | 0.00     |      | 0.10 |
| A2     | 0.80     |      | 1.00 |
| b      | 0.15     |      | 0.30 |
| c      | 0.10     |      | 0.18 |
| D      | 1.80     | 2.00 | 2.20 |
| E      | 1.80     | 2.10 | 2.40 |
| E1     | 1.15     | 1.25 | 1.35 |
| e      | 0.65 BSC |      |      |
| L      | 0.26     | 0.36 | 0.46 |
| L1     | 0.42 REF |      |      |
| L2     | 0.15 BSC |      |      |
| θ      | 0°       |      | 8°   |
| θ1     | 4°       |      | 10°  |



**SIDE VIEW**



**END VIEW**

**Notes:**

- (1) All dimensions are in millimeters. Angles in degrees.
- (2) Complies with JEDEC MO-203.

|                         |                                      |                                                                                                                                                                                  |
|-------------------------|--------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
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| <b>DESCRIPTION:</b>     | <b>SC-88A (SC-70 5 LEAD), 1.25X2</b> | <b>PAGE 1 OF 1</b>                                                                                                                                                               |

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