

CM1436-04DE

4-Channel EMI Filter Arrays with ESD Protection

Product Description

The CM1436 is an EMI filter array with ESD protection, which integrates four pi filters (C-R-C). Each CM1436 filter has component values of 15 pF – 200 Ω – 15 pF. These parts include ESD protection diodes on every pin, providing a very high level of protection for sensitive electronic components that may be subjected to electrostatic discharge (ESD). The ESD diodes connected to the filter ports safely dissipate ESD strikes of ±15 kV contact discharge, twice the specification requirement of the IEC 61000-4-2, Level 4 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 ±30 kV.

This device is particularly well-suited for portable electronics (e.g. mobile handsets, PDAs, notebook computers) because of its small package and easy-to-use pin assignments. In particular, the CM1436 is ideal for EMI filtering and protecting data lines from ESD in wireless handsets.

The CM1436 is available in space-saving, low-profile, 8-lead 0.4 mm pitch WDFN packages. It is fabricated with the *Centurion*™ process and available with lead-free finishing.

Features

- Four Channels of EMI Filtering with ESD Protection
- Greater than 30 dB of Attenuation from 800 MHz to 3 GHz
- ±15 kV ESD Protection (IEC 61000-4-2, Contact Discharge)
- ±30 kV ESD Protection (HBM)
- Fabricated with *Centurion*™ Advanced Low Capacitance Zener Process Technology
- Space Saving, Low-Profile 8-Lead 0.4 mm Pitch WDFN Packages
- These Devices are Pb-Free and are RoHS Compliant

Applications

- I/O Port Protection for Mobile Handsets, Notebook Computers, PDAs, etc.
- EMI Filtering for Data Ports in Cell Phones, PDAs or Notebook Computers
- EMI Filtering for LCD, Camera and Chip-to-Chip Data Lines



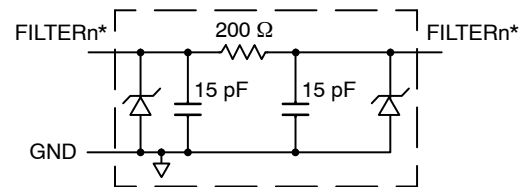
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WDFN8
DE SUFFIX
CASE 511BF

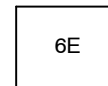
ELECTRICAL SCHEMATIC



1 of 4 EMI Filtering + ESD Channels

* See Package/Pinout Diagrams for expanded pin information.

MARKING DIAGRAM



6E = CM1436-04DE

ORDERING INFORMATION

| Device | Package | Shipping† |
|-------------|------------------|------------------|
| CM1436-04DE | WDFN-8 (Pb-Free) | 3000/Tape & Reel |

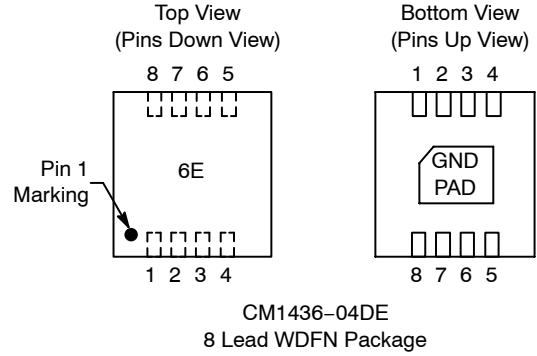
† For information on tape and reel specifications, including part orientation and tape sizes, please refer to our Tape and Reel Packaging Specification Brochure, BRD8011/D.

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Table 1. PIN DESCRIPTIONS

| Pins | Name | Description |
|---------|---------|------------------|
| 1 | FILTER1 | Filter Channel 1 |
| 2 | FILTER2 | Filter Channel 2 |
| 3 | FILTER3 | Filter Channel 3 |
| 4 | FILTER4 | Filter Channel 4 |
| 5 | FILTER4 | Filter Channel 4 |
| 6 | FILTER3 | Filter Channel 3 |
| 7 | FILTER2 | Filter Channel 2 |
| 8 | FILTER1 | Filter Channel 1 |
| GND PAD | GND | Device Ground |

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 |
| Package DC Power Rating | 300 | 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 | | 160 | 200 | 240 | Ω |
| C _{TOTAL} | Total Channel Capacitance | At 2.5 V DC, 1 MHz, 30 mV AC | 24 | 30 | 36 | pF |
| C | Capacitance C | At 2.5 V DC, 1 MHz, 30 mV AC | 12 | 15 | 18 | pF |
| I _{LEAK} | Diode Leakage Current (Reverse Bias) | V _{DIODE} = 3.3 V | | 0.1 | 1.0 | μA |
| V _{SIG} | Signal Voltage Positive Clamp Negative Clamp | I _{LOAD} = 10 mA I _{LOAD} = -10 mA | 5.6 -0.4 | 6.8 -0.8 | | V |
| V _{ESD} | In-system ESD Withstand Voltage a) Human Body Model, MIL-STD-883, Method 3015 b) Contact Discharge per IEC 61000-4-2 Level 4 | (Note 2) | ±30 ±15 | | | kV |

1. T_A = 25°C unless otherwise specified.
2. ESD applied to input and output pins with respect to GND, one at a time.

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PERFORMANCE INFORMATION

Typical Filter Performance (nominal conditions unless specified otherwise, 0 V DC Bias, 50 Ω Environment)

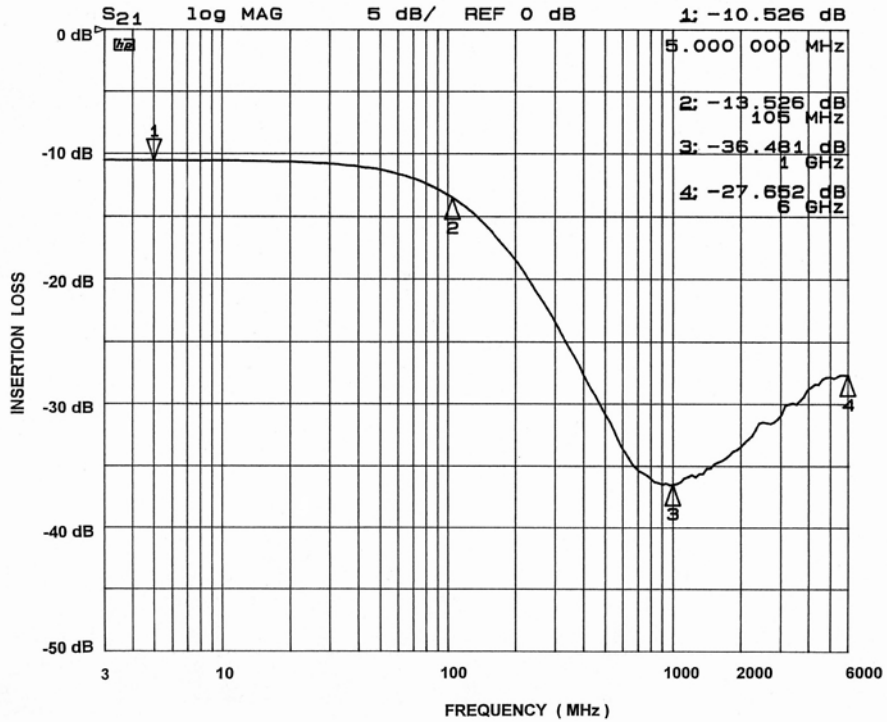


Figure 1. Channel 1 EMI Filter Performance

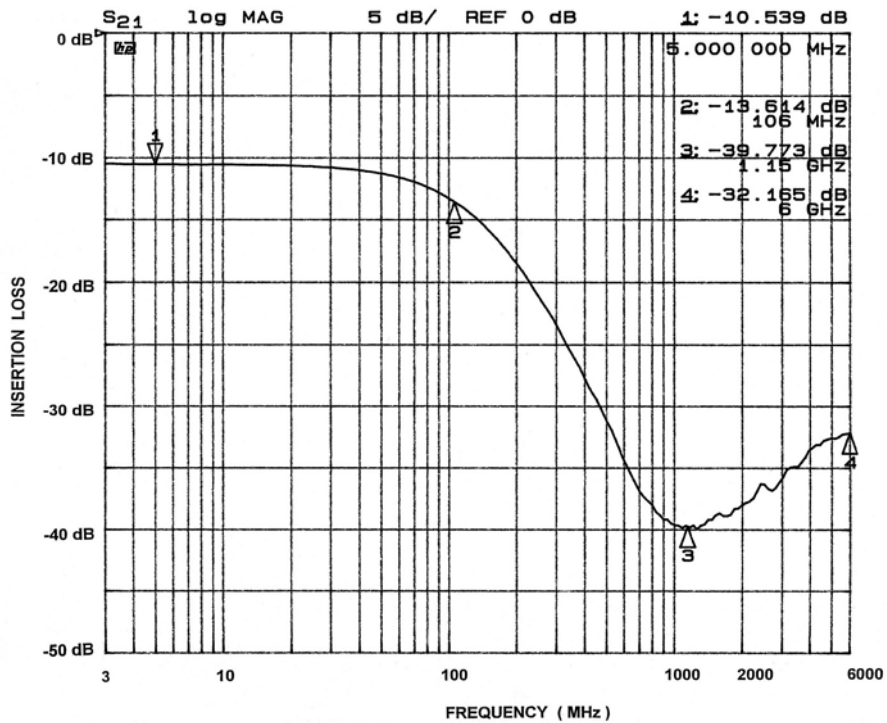


Figure 2. Channel 2 EMI Filter Performance

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PERFORMANCE INFORMATION (Cont'd)

Typical Filter Performance (nominal conditions unless specified otherwise, 0 V DC Bias, 50 Ω Environment)

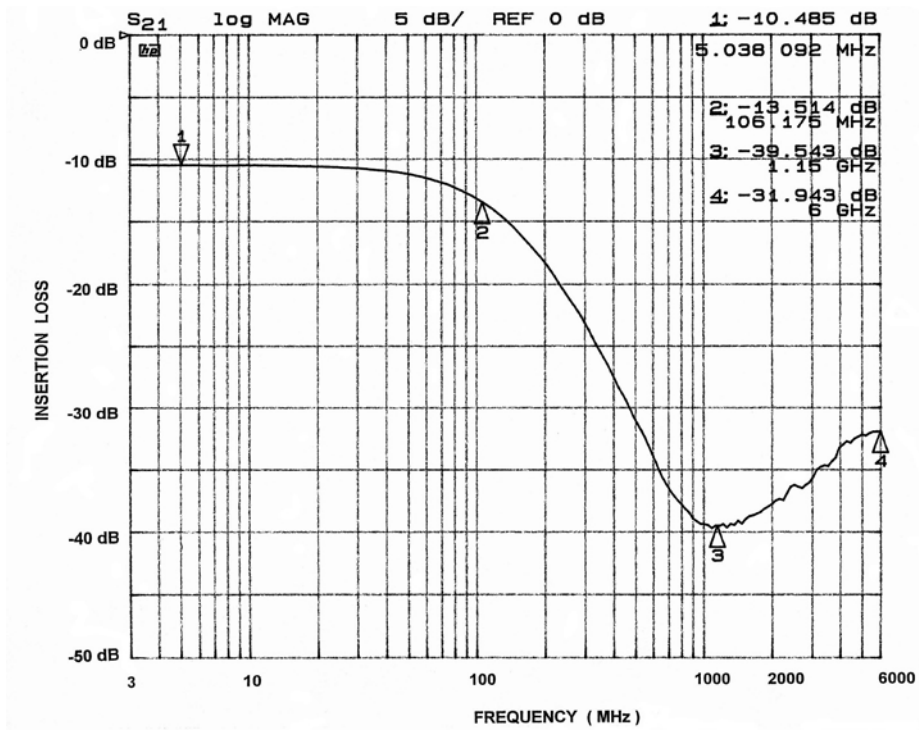


Figure 3. Channel 3 EMI Filter Performance

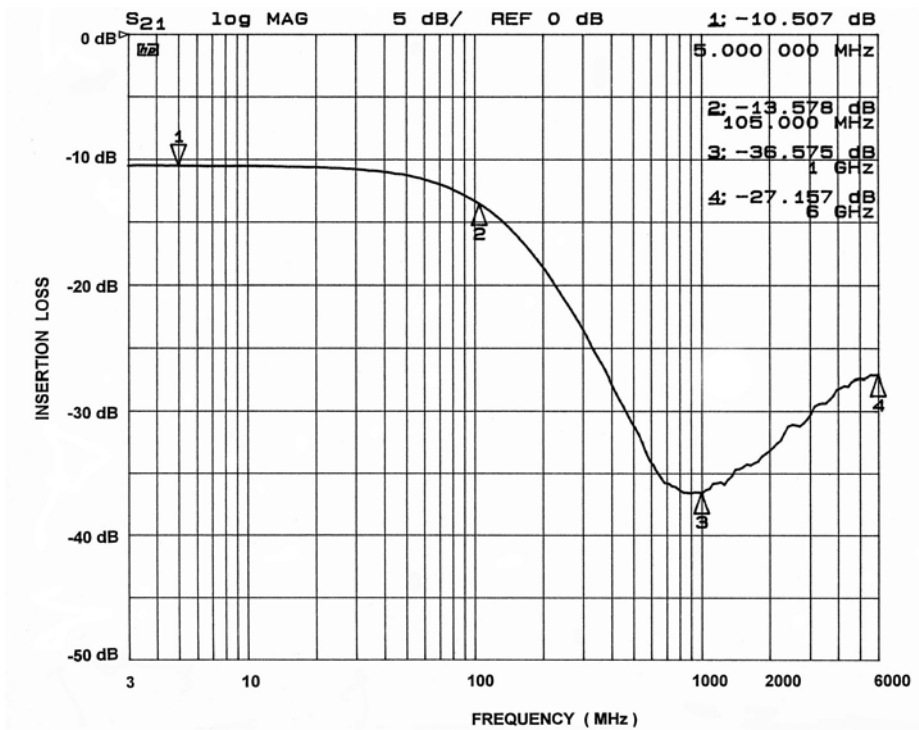


Figure 4. Channel 4 EMI Filter Performance

PERFORMANCE INFORMATION (Cont'd)

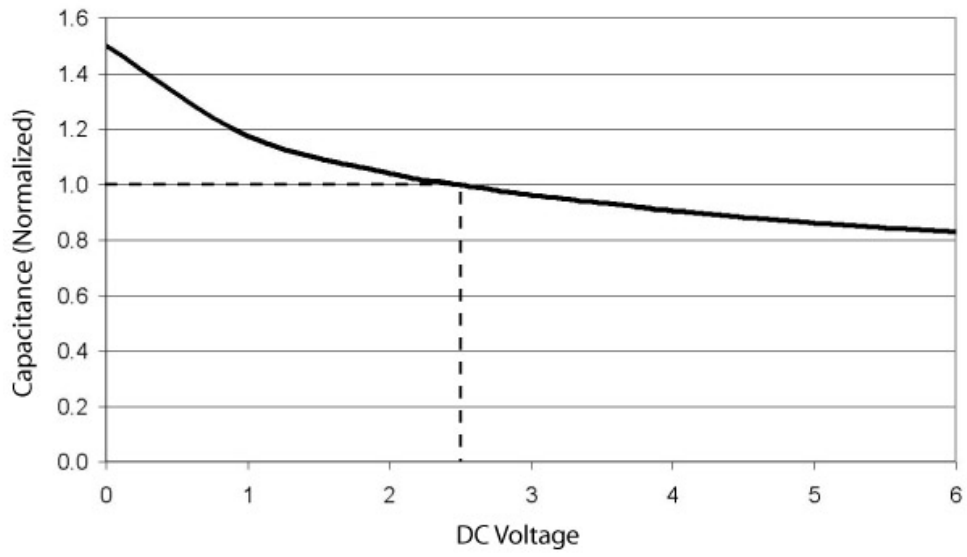
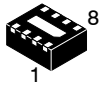


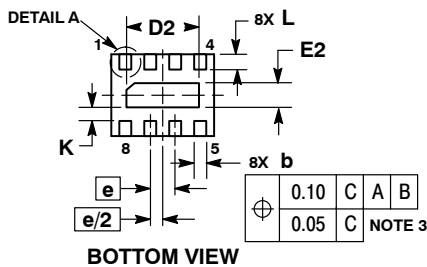
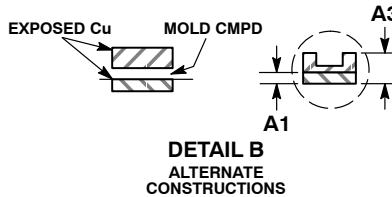
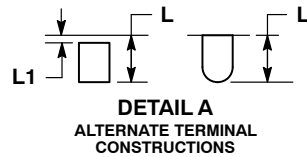
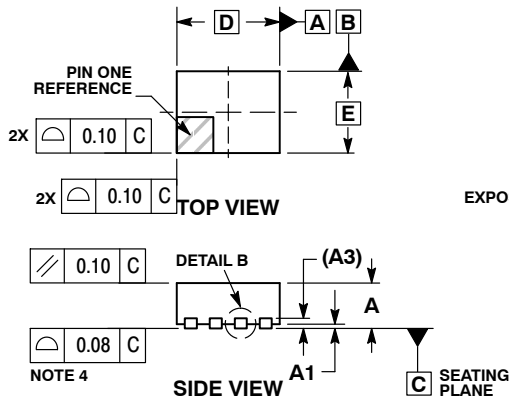
Figure 5. Filter Capacitance vs. Input Voltage over Temperature (normalized to capacitance at 2.5 V DC and 25°C)



SCALE 4:1

WDFN8, 1.7x1.35, 0.4P
CASE 511BF
ISSUE O

DATE 21 JUL 2010

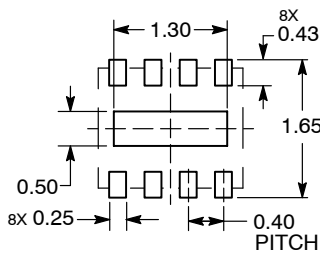


NOTES:

1. DIMENSIONING AND TOLERANCING PER ASME Y14.5M, 1994.
2. CONTROLLING DIMENSION: MILLIMETERS.
3. DIMENSION b APPLIES TO PLATED TERMINAL AND IS MEASURED BETWEEN 0.15 AND 0.30 MM FROM TERMINAL TIP.
4. COPLANARITY APPLIES TO THE EXPOSED PAD AS WELL AS THE TERMINALS.

| DIM | MILLIMETERS | |
|-----|-------------|------|
| | MIN | MAX |
| A | 0.70 | 0.80 |
| A1 | 0.00 | 0.05 |
| A3 | 0.20 | REF |
| b | 0.15 | 0.25 |
| D | 1.7 BSC | |
| D2 | 1.10 | 1.30 |
| E | 1.35 BSC | |
| E2 | 0.30 | 0.50 |
| e | 0.40 BSC | |
| K | 0.22 REF | |
| L | 0.15 | 0.35 |
| L1 | --- | 0.15 |

**RECOMMENDED
SOLDERING FOOTPRINT***



DIMENSION: 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.

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