ON Semiconductor®

4-Channel EMI Filter Arrays with ESD Protection

CM1436-04DE

Features

- Four channels of EMI filtering with ESD protection
- Greater than 30dB of attenuation from 800MHz to 3GHz
- ±15kV ESD protection (IEC 61000-4-2, contact discharge)
- ±30kV ESD protection (HBM)
- Fabricated with *Centurion*™ advanced low capacitance zener process technology
- Space saving, low-profile 8-lead 0.4mm pitch TDFN packages
- Lead-free finishing

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

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 15pF-200Ω-15pF. 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 ±15kV 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 ±30kV.

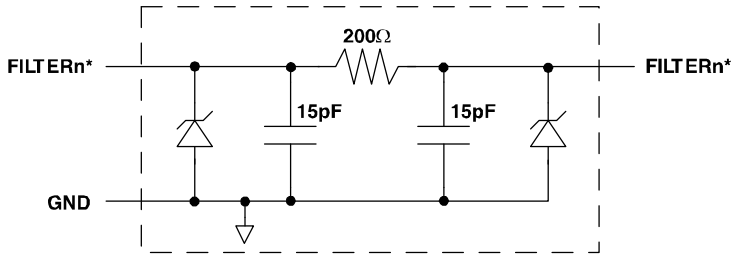
This device is particularly well-suited for portable electronics (e.g. mobile handsets, PDAs, notebook computers) because of its small package and easy-to-use pin assignments. In particular, the CM1436 is ideal for EMI filtering and protecting data lines from ESD in wireless handsets.

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

June 2010 Rev. 2

Publication Order Number:
CM1436-04DE/D

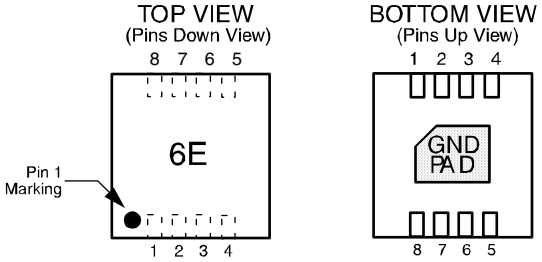
Electrical Schematic



1 of 4 EMI Filtering + ESD Channels

*** See Package/Pinout Diagram for expanded pin information.**

PACKAGE / PINOUT DIAGRAMS



CM1436-04DE
8 Lead TDFN Package

Note: This drawing is not to scale.

PIN DESCRIPTIONS

Pins	NAME	DESCRIPTION	Pins	NAME	DESCRIPTION
1	FILTER1	Filter Channel 1	8	FILTER1	Filter Channel 1
2	FILTER2	Filter Channel 2	7	FILTER2	Filter Channel 2
3	FILTER3	Filter Channel 3	6	FILTER3	Filter Channel 3
4	FILTER4	Filter Channel 4	5	FILTER4	Filter Channel 4
GND Pad	GND	Device Ground			

Ordering Information

PART NUMBERING INFORMATION			
		Lead-free Finish	
Leads/Pins	Package	Ordering Part Number[1]	Part Marking
8	TDFN-08	CM1436-04DE	6E

Note 1: Parts are shipped in Tape & Reel form unless otherwise specified.

Specifications

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

STANDARD OPERATING CONDITIONS		
PARAMETER	RATING	UNITS
Operating Temperature Range	–40 to +85	°C

ELECTRICAL OPERATING CHARACTERISTICS (SEE NOTE 1)

SYMBOL	PARAMETER	CONDITIONS	MIN	TYP	MAX	UNITS
R	Resistance		160	200	240	Ω
C_{TOTAL}	Total Channel Capacitance	At 2.5V DC, 1MHz, 30mV AC	24	30	36	pF
C	Capacitance C	At 2.5V DC, 1MHz, 30mV AC	12	15	18	pF
I_{LEAK}	Diode Leakage Current (reverse bias)	V_{DIODE} = +3.3V		0.1	1.0	μA
V_{SIG}	Signal Voltage Positive Clamp Negative Clamp	 I_{LOAD} = 10mA I_{LOAD} = –10mA	 5.6 –0.4	 6.8 –0.8		 V 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 kV

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

Performance Information

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

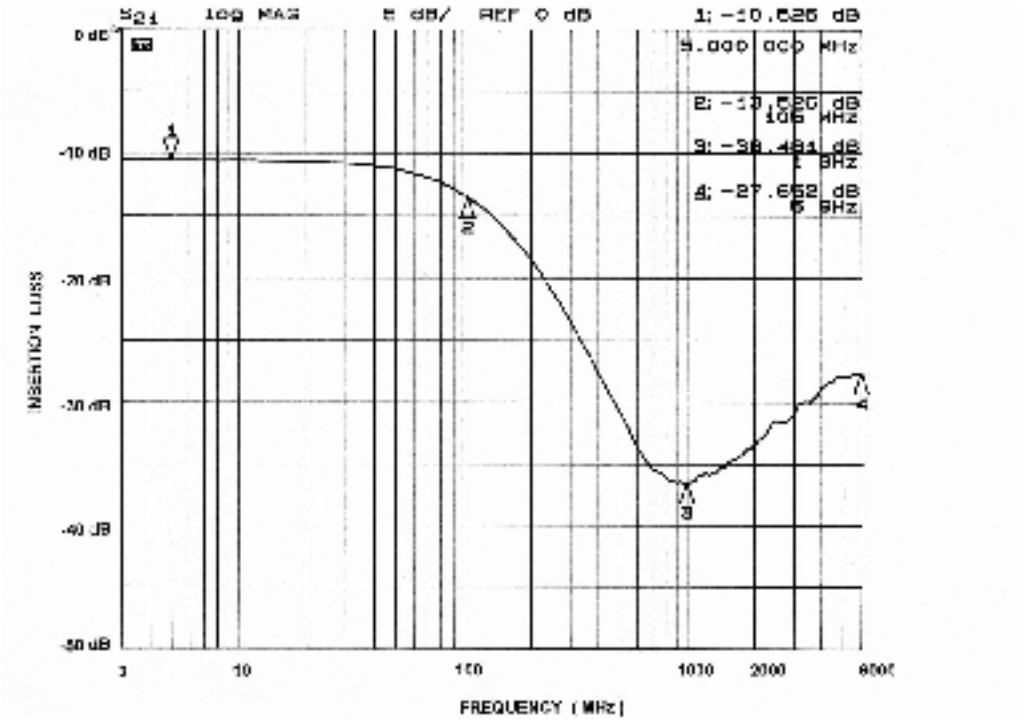


Figure 1. Channel 1 EMI Filter Performance

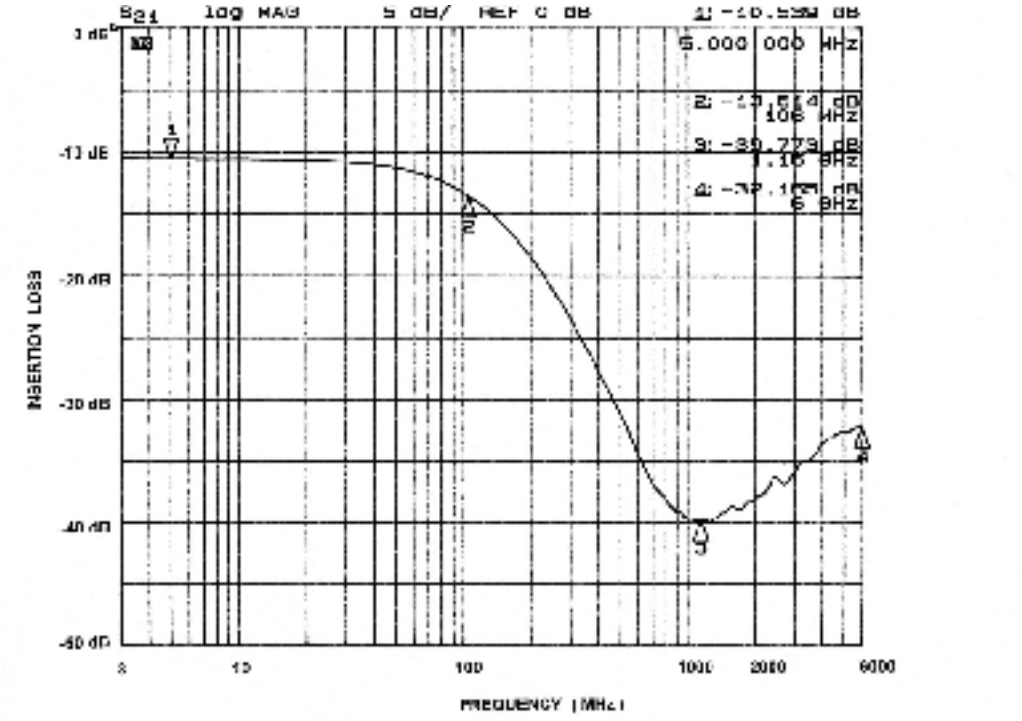


Figure 2. Channel 2 EMI Filter Performance

Performance Information (cont'd)

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

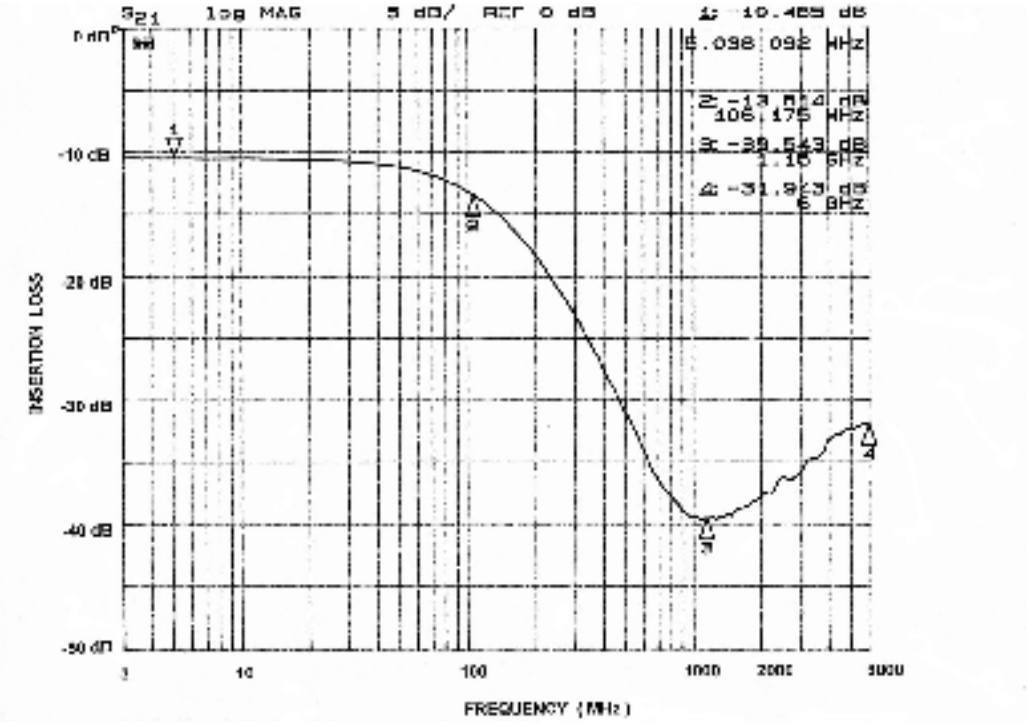


Figure 3. Channel 3 EMI Filter Performance

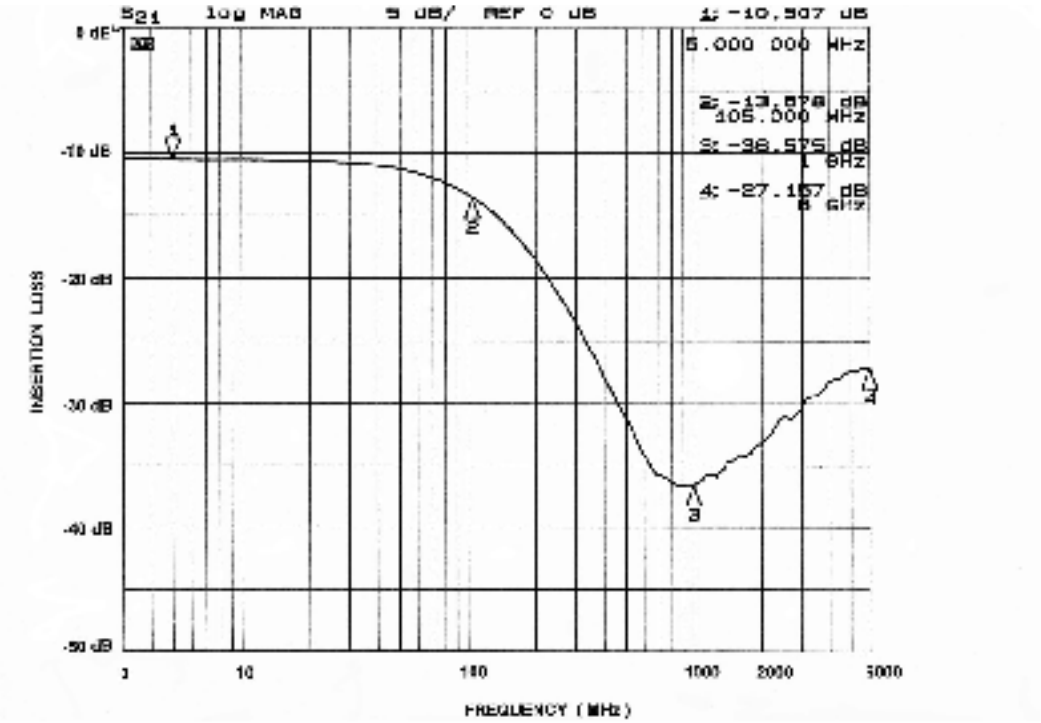


Figure 4. Channel 4 EMI Filter Performance

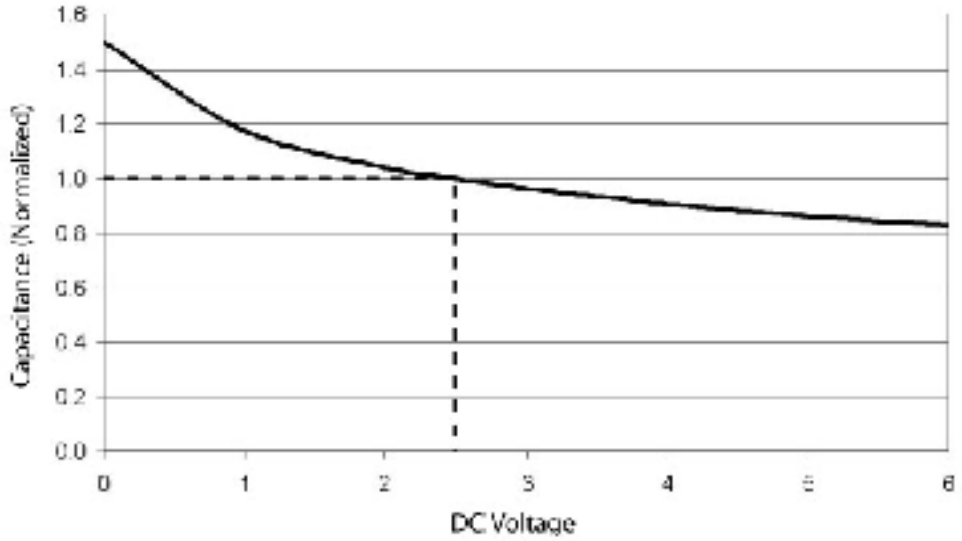


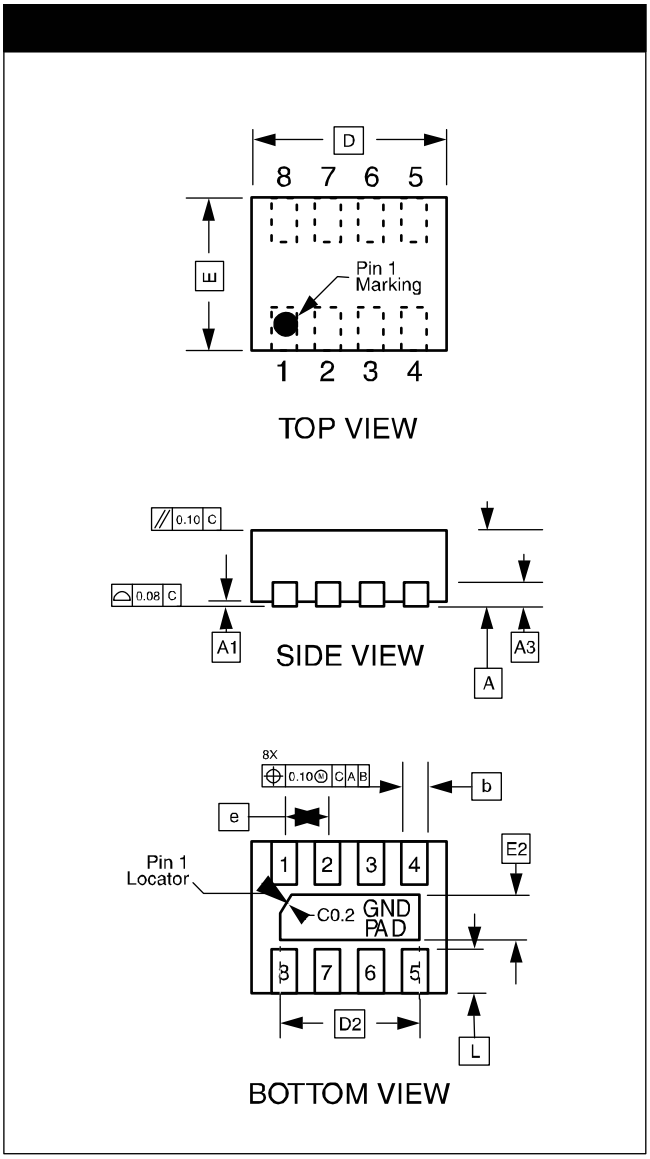
Figure 5. Filter Capacitance vs. Input Voltage over Temperature (normalized to capacitance at 2.5VDC and 25°C)

Mechanical Details

CM1436-04DE Mechanical Specifications

Dimensions for the CM1436-04DE supplied in a 8-lead, 0.4mm pitch TDFN package are presented below. For complete information on the TDFN-8, see the California Micro Devices TDFN Package Information document.

PACKAGE DIMENSIONS						
Package	TDFN					
JEDEC No.	MO-229C[*]					
Leads	8					
Dim.	**Millimeters**			**Inches**		
	Min	**Nom**	**Max**	**Min**	**Nom**	**Max**
A	0.70	0.75	0.80	0.028	0.030	0.031
A1	0.00	0.02	0.05	0.000	0.001	0.002
A3	0.15	0.20	0.25	0.006	0.008	0.010
b	0.15	0.20	0.25	0.006	0.008	0.010
D	1.60	1.70	1.80	0.063	0.067	0.071
D2	1.10	1.20	1.30	0.043	0.047	0.051
E	1.25	1.35	1.45	0.049	0.053	0.057
E2	0.30	0.40	0.50	0.012	0.016	0.020
e	0.40 BSC			0.016 BSC		
L	0.15	0.25	0.35	0.006	0.010	0.014
# per tape and reel	3000 pieces					
Controlling dimension: millimeters						



Dimensions for 8-Lead, 0.4mm pitch TDFN package

[*] This package is compliant with JEDEC standard MO-229C with the exception of the D, D2, E, E2, K and L dimensions as called out in the table above.

PUBLICATION ORDERING INFORMATION

LITERATURE FULFILLMENT:
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