CM1443-04CP

4-Channel EMI Filter Array with ESD Protection

Features

- Four Channels of EMI Filtering for Data Ports
- Pi−Style EMI Filters in a Capacitor−Resistor−Capacitor (C−R−C) Network
- ±15 kV ESD Protection on Each Channel (IEC 61000−4−2 Level 4, Contact Discharge)
- ±30 kV ESD Protection on Each Channel (HBM)
- Chip Scale Package (CSP) Features Extremely Low Lead Inductance for Optimum Filter and ESD Performance
- 10−Bump; 0.4 mm Pitch, 1.560 x 1.053 mm Footprint
- ™ Coating for Improved Reliability at Assembly
- These Devices are Pb−Free and are RoHS Compliant

Applications

- EMI Filtering and ESD Protection for Both Data and I/O Ports
- Wireless Handsets
- Handheld PCs / PDAs
- MP3 Players
- Notebooks
- Desktop PCs

BLOCK DIAGRAM

March, 2011 − Rev. 3

Publication Order Number:
CM1443−04CP/D

Table 4. ELECTRICAL OPERATING CHARACTERISTICS (Note 1)

Symbol	Parameter	Conditions	Min	Typ	Max	Units
R	Resistance		80	100	120	Ω
C_T	Total Capacitance	At 2.5 V DC	14	17	21	pF
C_S	Single Capacitor	At 2.5 V DC		8.5		pF
V_{DIODE}	Diode Voltage (reverse bias)	I_{DIODE} = 10 μA	5.5			V
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	 5.6 −0.4	 6.8 –0.8	 9.0 −1.5	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	(Notes 2 and 4)	 ±30 ±15			kV
V_{CL}	Clamping Voltage during ESD Discharge MIL−STD−883 (Method 3015), 8 kV Positive Transients Negative Transients	(Notes 2, 3 and 4)		 +10 –5		V
f_C	Cut−off Frequency Z_{SOURCE} = 50 Ω, Z_{LOAD} = 50 Ω	R = 100 Ω, C_S = 8.5 pF		220		MHz

1. T_A = 25°C unless otherwise specified.
2. ESD applied to input and output pins with respect to GND, one at a time.
3. Clamping voltage is measured at the opposite side of the EMI filter to the ESD pin. For example, if ESD is applied to Pin A1,

PERFORMANCE INFORMATION (Cont'd)

Typical Filter Performance (T_A = 25°C, DC Bias = 0 V, 50 Ω Environment)

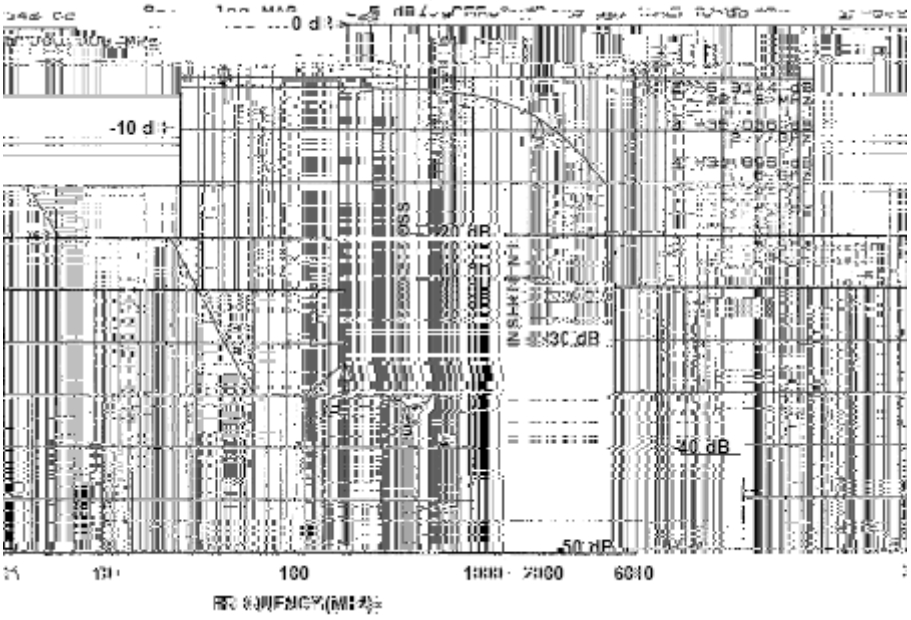

Figure 4. Insertion Loss vs. Frequency (A3−C3 to GND B2)

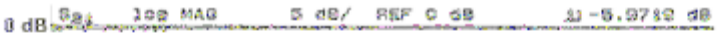

Figure 5. Insertion Loss vs. Frequency (A4−C4 to GND B2)

PERFORMANCE INFORMATION (Cont'd)

Typical Filter Performance (T_A = 25°C, DC Bias = 0 V, 50 Ω Environment)

Figure 6. Comparison of Filter Response Curves for CM1443 vs. DC Bias

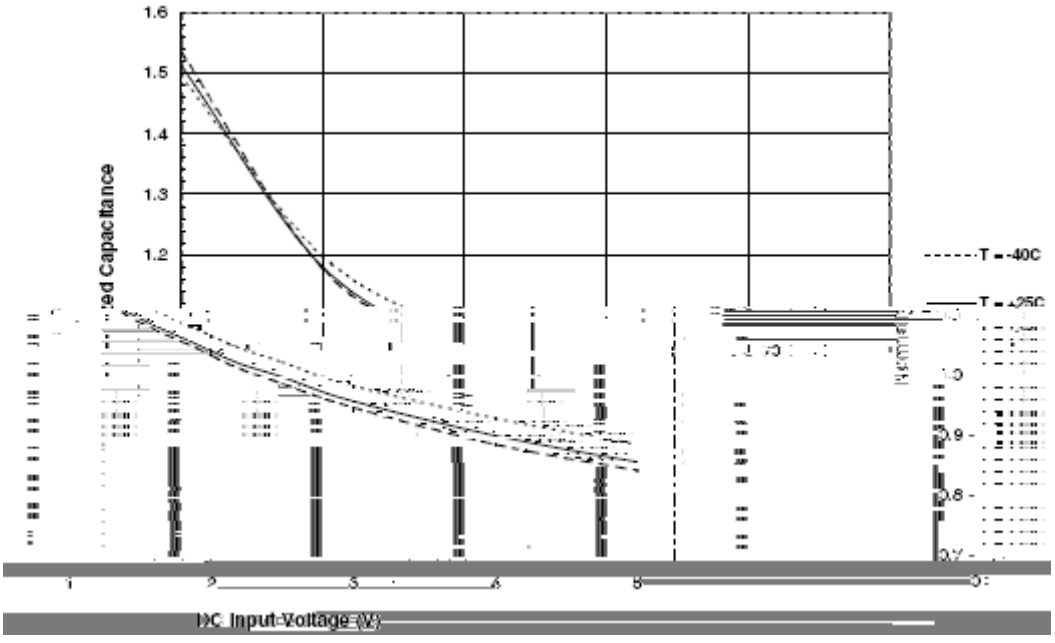

Figure 7. Filter Capacitance vs. Input Voltage over Temperature (normalized to capacitance at 2.5 VDC and 25°C)

WLCSP10, 1.56x1.05