CM1408-08DE

8-Channel LCD and Camera EMI Filter Array with ESD Protection

Features

- Eight Channels of EMI Filtering with Integrated ESD Protection
- 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)
- Greater than 35 dB Attenuation (Typical) at 1 GHz
- WDFN Packaging with 0.5 mm Lead Pitch:
  - 16 Lead WDFN, 4.0 mm x 1.60 mm
- Increased Robustness Against Vertical Impacts During Manufacturing Process
- These Devices are Pb Free and are RoHS Compliant

Applications

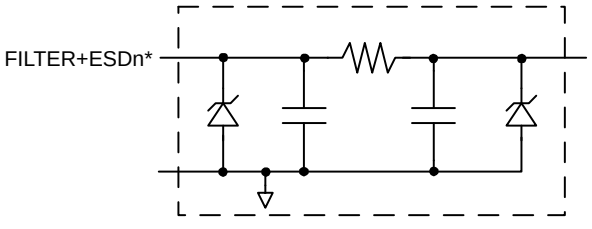
- LCD and Camera Data Lines in Mobile Handsets
- I/O Port Protection for Mobile Handsets, Notebook Computers, PDAs, etc.
- EMI Filtering for Data Ports in Cell Phones, PDAs or Notebook Computers
- Wireless Handsets
- Handheld PCs/PDAs
- LCD and Camera Modules

N088E

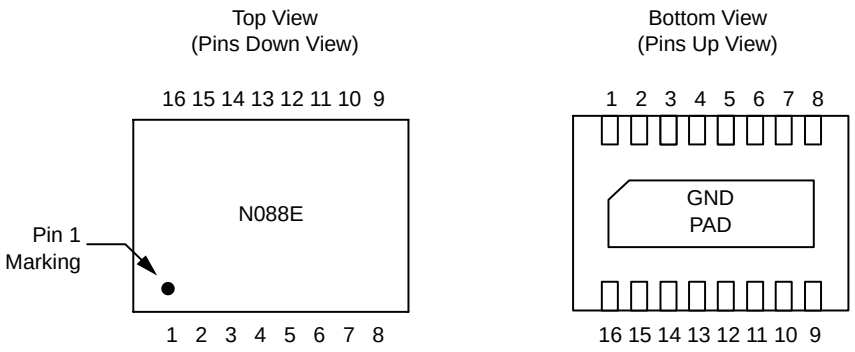
N088E = CM1408−08DE

CM1408−08DE	WDFN−16 (Pb−Free)	3000/Tape & Reel

BLOCK DIAGRAM



PACKAGE / PINOUT DIAGRAMS



16−Lead WDFN Package

Table 1. PIN DESCRIPTIONS

Device Pin(s)	Name	Description		Device Pin(s)	Name	Description
1	FILTER1	Filter + ESD Channel 1		16	FILTER1	Filter + ESD Channel 1
2	FILTER2	Filter + ESD Channel 2		15	FILTER2	Filter + ESD Channel 2
3	FILTER3	Filter + ESD Channel 3		14	FILTER3	Filter + ESD Channel 3
4	FILTER4	Filter + ESD Channel 4		13	FILTER4	Filter + ESD Channel 4
5	FILTER5	Filter + ESD Channel 5		12	FILTER5	Filter + ESD Channel 5
6	FILTER6	Filter + ESD Channel 6		11	FILTER6	Filter + ESD Channel 6
7	FILTER7	Filter + ESD Channel 7		10	FILTER7	Filter + ESD Channel 7
8	FILTER8	Filter + ESD Channel 8		9	FILTER8	Filter + ESD Channel 8
GND PAD	GND	Device Ground				

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		80	100	120	Ω
C_{TOTAL}	Total Channel Capacitance	At 2.5 VDC Reverse Bias, 1 MHz, 30 mVAC	14	17	22	pF
C	Capacitance C	At 2.5 VDC Reverse Bias, 1 MHz, 30 mVAC		8.5		pF
V_{DIODE}	Standoff Voltage	I_{DIODE} = 10 μA		6.0		V
I_{LEAK}	Diode Leakage Current (reverse bias)	V_{DIODE} = 3.3 V		0.1	1.0	μA
V_{SIG}	Signal Clamp Voltage Positive Clamp Negative Clamp	 I_{LOAD} = 10 mA I_{LOAD} = −10 mA	 5.6 −1.5	 6.8 −0.8	 9.0 −0.4	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
R_{DYN}	Dynamic Resistance Positive Negative			 2.3 0.9		Ω
f_C	Cut−off Frequency Z_{SOURCE} = 50 Ω, Z_{LOAD} = 50 Ω	Channel R = 100 Ω, Channel C_{SINGLE} = 8.5 pF		 200		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.

PERFORMANCE INFORMATION

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

PERFORMANCE INFORMATION (Cont'd)

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

Figure 3. Insertion Loss vs. Frequency (Filter 3 Input Pin 3 to Pin 14)

Figure 4. Insertion Loss vs. Frequency (Filter 4 Input Pin 4 to Pin 13)

PERFORMANCE INFORMATION (Cont'd)

Typical EMI Filter Performance (T_A = 25°C, DC Bias = 0 V, 50 Ω Df7lOD29d7TJTTinR3L0 TD'r1o

PERFORMANCE INFORMATION (Cont'd)

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

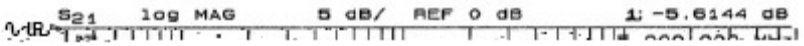


Figure 7. Insertion Loss vs. Frequency (Filter 7 Input Pin 7 to Pin 10)

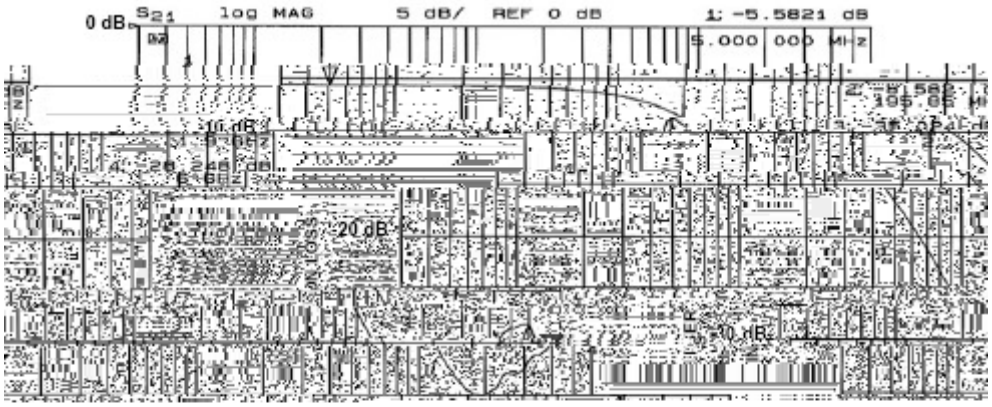


Figure 8. Insertion Loss vs. Frequency (Filter 8 Input Pin 8 to Pin 9)

PERFORMANCE INFORMATION (Cont'd)

Typical Diode Capacitance vs. Input Voltage

**Figure 9. Filter Capacitance vs. Input Voltage
(normalized to capacitance at 2.5 VDC and 25°C)**