CM1409

LCD and Camera EMI Filter Array with ESD Protection

Product Description

The CM1409 is a family of pi−style EMI filter arrays with ESD protection, which integrates either six or eight filters (C−R−C) in a small form factor, WDFN 0.50 mm pitch package. The CM1409 has component values of 15 pF − 100 Ω − 15 pF per channel. The CM1409 has a cut−off frequency of 110 MHz and can be used in applications with data rates up to 44 Mbps. The parts include ESD diodes on every pin, which provide a very high level of protection for sensitive electronic components against electrostatic discharge (ESD). The ESD protected diodes safely dissipate ESD strikes of ±15 kV, which even exceeds 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 ±30 kV.

These devices are particularly well−suited for portable electronics (e.g. wireless handsets, PDAs, notebook computers) because of their

- Greater than −35 dB Attenuation (Typical) at 1 GHz
- WDFN Package with 0.50 mm Lead Pitch:
  - 6−ch. = 12−lead WDFN
  - 8−ch. = 16−lead WDFN
- Tiny WDFN Package Size:
  - 12−lead: 3.0 mm x 1.35 mm
  - 16−lead: 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

ON Semiconductor®

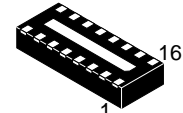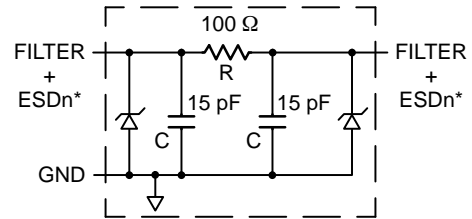**http://onsemi.com**

**WDFN12
DE SUFFIX
CASE 511AZ**

**WDFN16
DE SUFFIX
CASE 511AV**

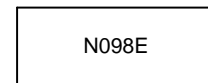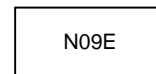## BLOCK DIAGRAM

1 of 6 or 8 EMI/RFI + ESD Channels

*See Package/Pinout Diagrams for Expanded Pin Information.

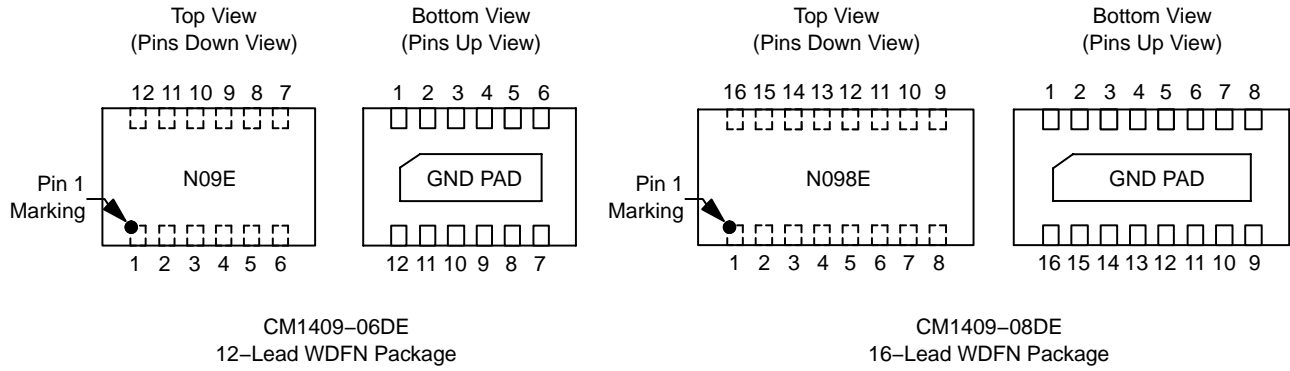## MARKING DIAGRAM

N09E   = CM1409−06DE
N098E   = CM1409−08DE

ORDERING INFORMATION

Device	Package	Shipping[†]
CM1409−06DE	WDFN12 (Pb−Free)	3000/Tape & Reel
CM1409−08DE	WDFN16 (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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PACKAGE / PINOUT DIAGRAMS

Top View
(Pins Down View)

Bottom View
(Pins Up View)

Top View
(Pins Down View)

Bottom View
(Pins Up View)

CM1409−06DE
12−Lead WDFN Package

CM1409−08DE
16−Lead WDFN Package

Table 1. PIN DESCRIPTIONS

Device Pin(s)		Name	Description	Device Pin(s)		Name	Description
−06	−08			−06	−08		
1	1	FILTER1	Filter + ESD Channel 1	12	16	FILTER1	Filter + ESD Channel 1
2	2	FILTER2	Filter + ESD Channel 2	11	15	FILTER2	Filter + ESD Channel 2
3	3	FILTER3	Filter + ESD Channel 3	10	14	FILTER3	Filter + ESD Channel 3
4	4	FILTER4	Filter + ESD Channel 4	9	13	FILTER4	Filter + ESD Channel 4
5	5	FILTER5	Filter + ESD Channel 5	8	12	FILTER5	Filter + ESD Channel 5
6	6	FILTER6	Filter + ESD Channel 6	7	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				

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SPECIFICATIONS

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PERFORMANCE INFORMATION

Typical Filter Performance (T$_A$ = 25 C, DC Bias = 0 V, 50 Ω Environment)

S21   1: −5.6783 dB

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

S21   1: −5.6505 dB

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

PERFORMANCE INFORMATION (Cont'd)

Typical Filter Performance (T$_A$ = 25 C, DC Bias = 0 V, 50 Ω Environment)

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PERFORMANCE INFORMATION (Cont'd)
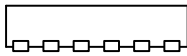
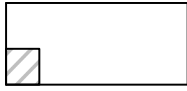**Typical Diode Capacitance vs. Input Voltage**
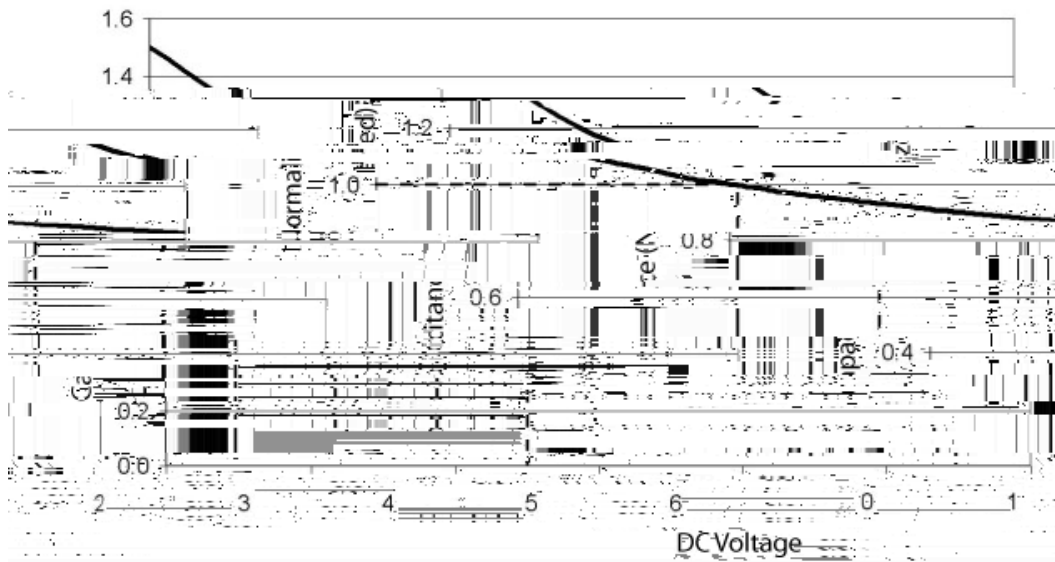
Figure 5. Filter Capacitance vs. Input Voltage
(normalized to capacitance at 2.5 VDC and 25 C)

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PACKAGE DIMENSIONS

WDFN12, 3x1.35, 0.5P
CASE 511AZ–01
ISSUE O
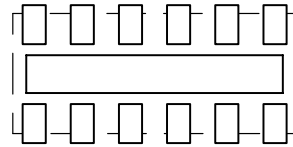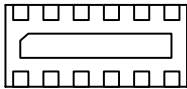
NOTES:
1. DIMENSIONING AND TOLERANCING PER ASME Y14.5M, 1994.
2. CONTROLLING DIMENSION: MILLIMETERS.
3. DIMENSION b APPLIES TO PLATED TERMINAL AND IS MEASURED BETWEEN 0.15 AND 0.30 MM FROM TERMINAL TIP.
4. COPLANARITY APPLIES TO THE EXPOSED PAD AS WELL AS THE TERMINALS.
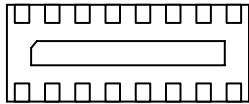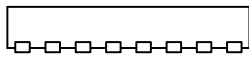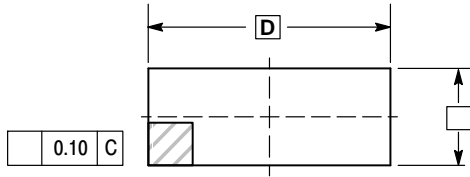
DIM	MILLIMETERS	
	MIN	MAX
A	0.70	0.80
A1	0.00	0.05
A3	0.20 REF	
b	0.20	0.30

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PACKAGE DIMENSIONS

WDFN16, 4x1.6, 0.5P
CASE 511AV–01
ISSUE O

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	0.20	0.30
D	4.00 BSC	
D2	3.10	3.30
E	1.60 BSC	
E2	0.30	0.50
e	0.50 BSC	
L	0.20	0.40