ON Semiconductor®

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

CM1408-08DE

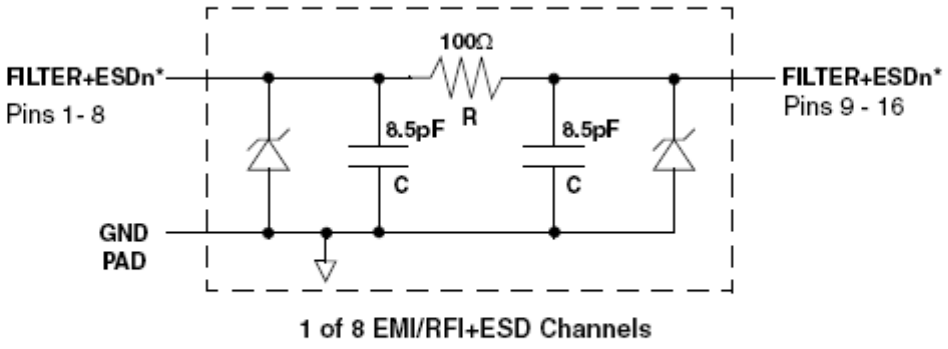
Features

- Eight channels of EMI filtering with integrated ESD protection
- Pi-style EMI filters in a capacitor-resistor-capacitor (C-R-C) network
- ±15kV ESD protection on each channel (IEC 61000-4-2 Level 4, contact discharge)
- ±30kV ESD protection on each channel (HBM)
- Greater than -35dB attenuation (typical) at 1GHz
- TDFN packaging with 0.5mm lead pitch:
  - 16-lead TDFN, 4.0mm x 1.60mm
- Increased robustness against vertical impacts during manufacturing process
- Lead-free finishing

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

Block Diagram



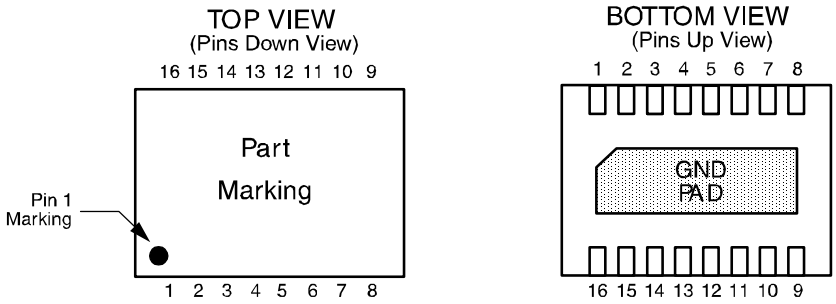
1 of 8 EMI/RFI+ESD Channels

* See Package/Pinout Diagram for expanded pin information.

April 2010 Rev. 2

Publication Order Number:
CM1408-08DE/D

PACKAGE / PINOUT DIAGRAMS



16 Lead TDFN Package

Note:
1) These drawings are not to scale.

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		-	-	-

Ordering Information

PART NUMBERING INFORMATION			
		Lead-free Finish	
Pins	Package	Ordering Part Number[1]	Part Marking
16	TDFN-16	CM1408-08DE	N088E

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	℃
DC Power per Resistor	100	mW
DC Package Power Rating	500	mW

STANDARD OPERATING CONDITIONS		
PARAMETER	RATING	UNITS
Operating Temperature Range	-40 to +85	℃

ELECTRICAL OPERATING CHARACTERISTICS (SEE NOTE1)

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

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

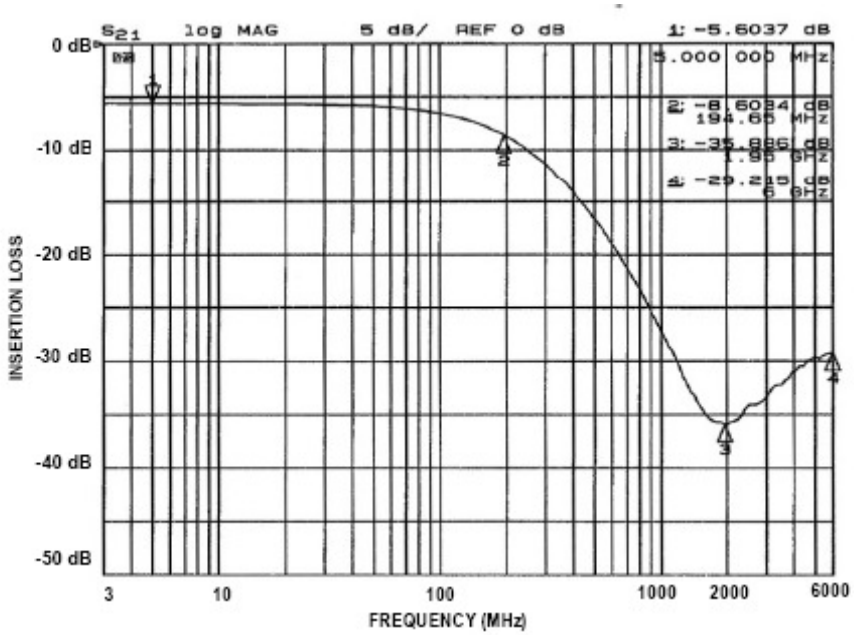


Figure 1. Insertion Loss vs. Frequency (Filter 1 Input – Pin 1 to Pin 16)

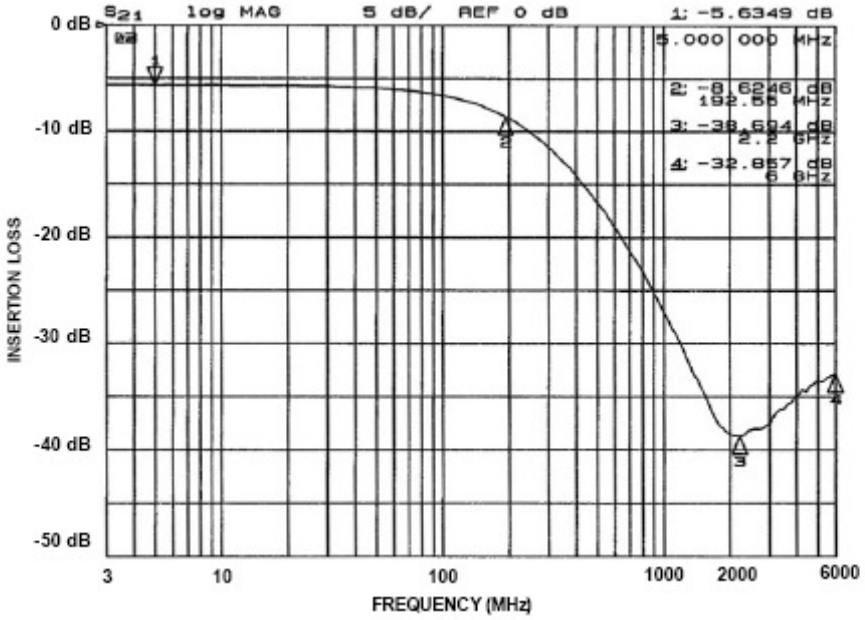


Figure 2. Insertion Loss vs. Frequency (Filter 2 Input – Pin 2 to Pin 15)

Performance Information (cont'd)

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

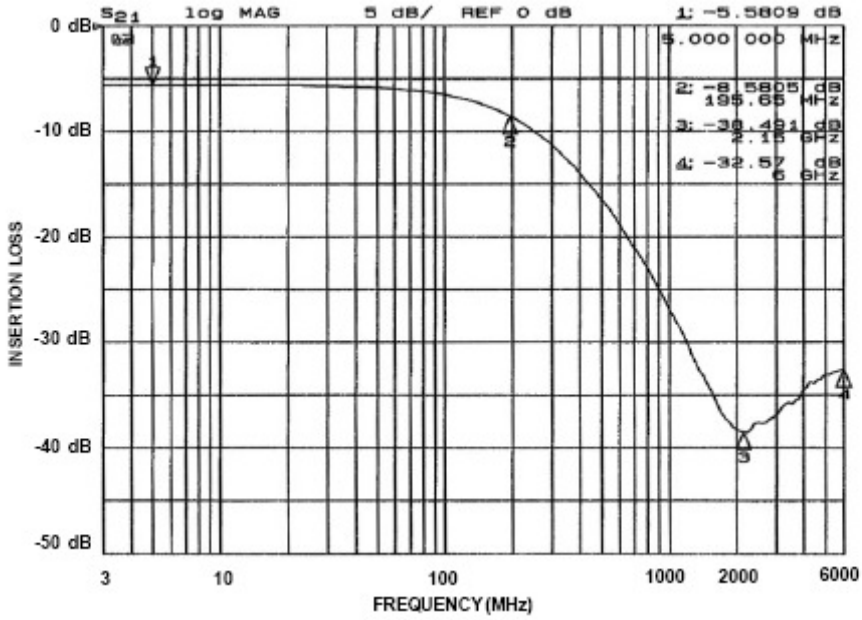


Figure 3. Insertion Loss vs. Frequency (Filter 3 Input – Pin 3 to Pin 14)

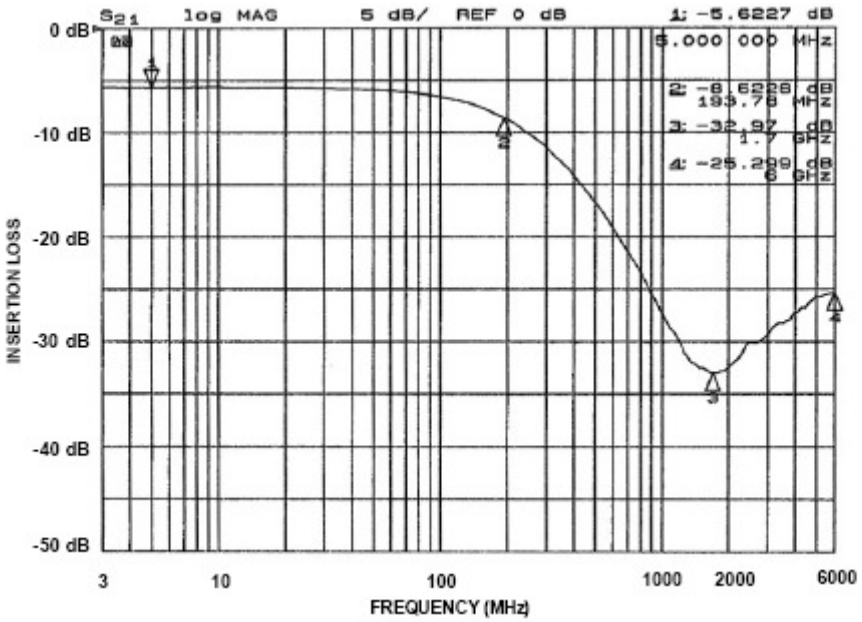


Figure 4. Insertion Loss vs. Frequency (Filter 4 Input – Pin 4 to Pin 13)

Performance Information (cont'd)

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

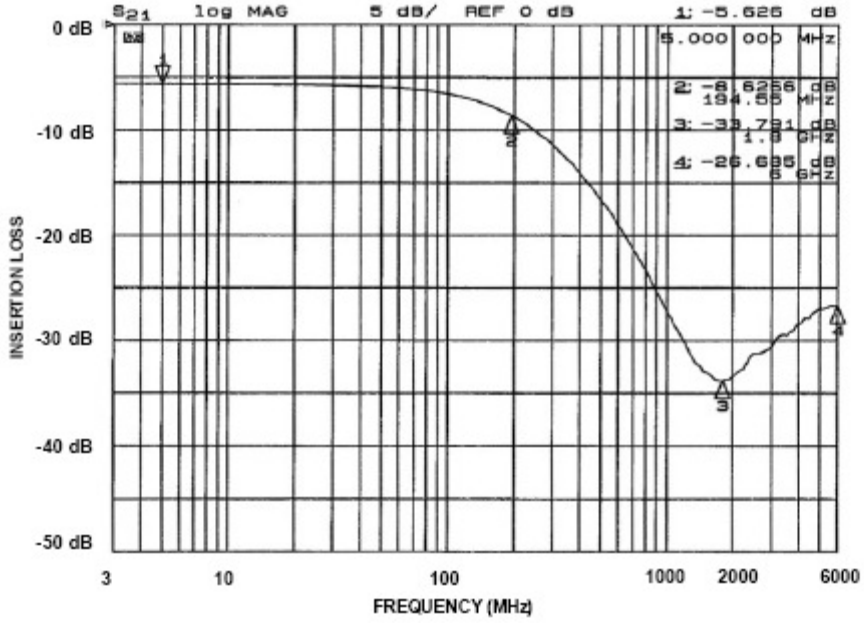


Figure 5. Insertion Loss vs. Frequency (Filter 5 Input – Pin 5 to Pin 12)

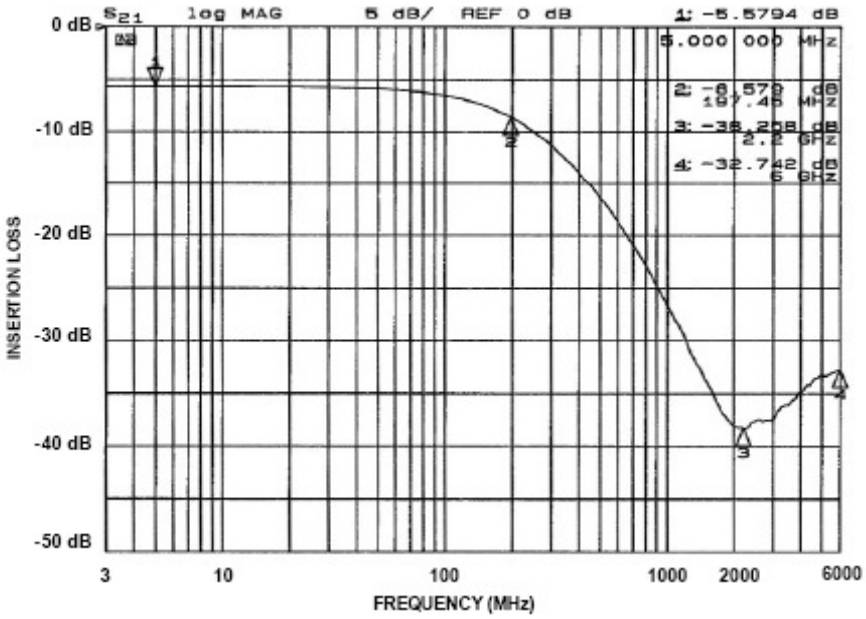


Figure 6. Insertion Loss vs. Frequency (Filter 6 Input – Pin 6 to Pin 11)

Performance Information (cont'd)

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

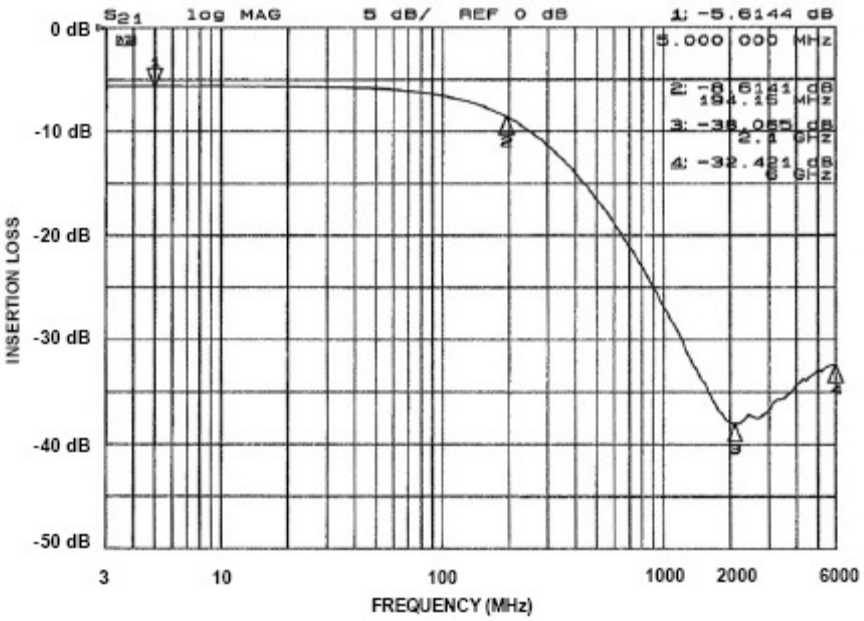


Figure 7. Insertion Loss vs. Frequency (Filter 7 Input – Pin 7 to Pin 10)

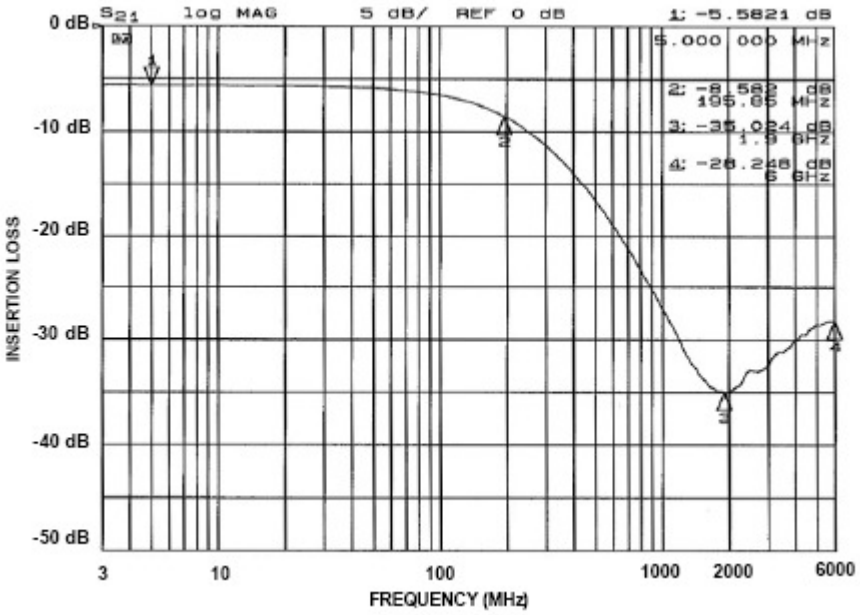


Figure 8. Insertion Loss vs. Frequency (Filter 8 Input – Pin 8 to Pin 9)

Performance Information (cont'd)

Typical Diode Capacitance vs. Input Voltage

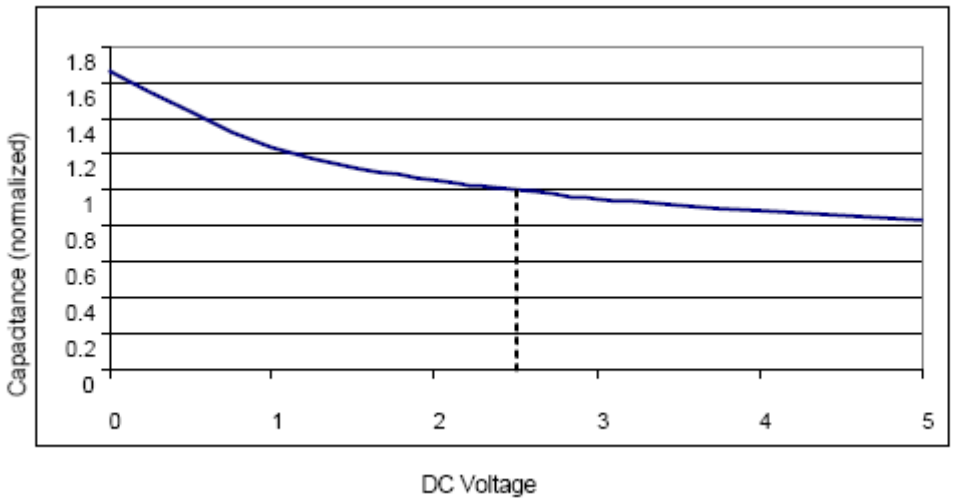


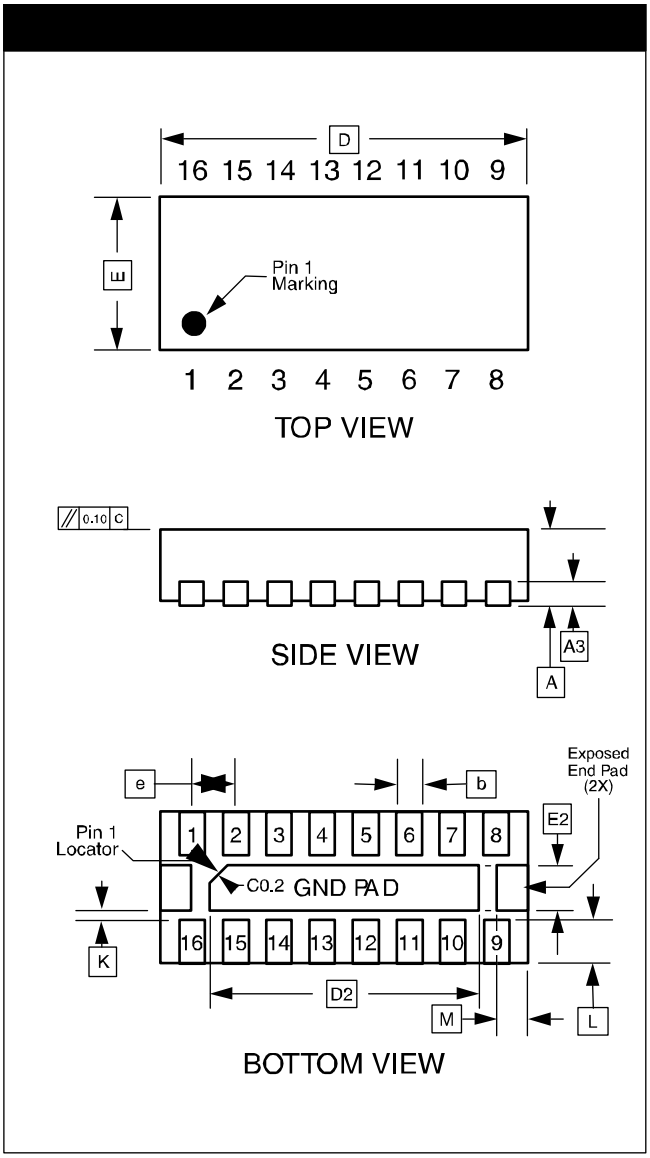
Figure 9. Filter Capacitance vs. Input Voltage (normalized to capacitance at 2.5VDC and 25°C)

Mechanical Details

TDFN-16EEP Mechanical Specifications

The CM1408-08DE is supplied in a 16-lead, 0.5mm pitch TDFN package with Exposed End Pads (EEP). Dimensions are presented below.

PACKAGE DIMENSIONS						
Package	TDFN					
JEDEC No.	MO-229C†					
Leads	16					
Dim.	**Millimeters**			**Inches**		
	Min	**Nom**	**Max**	**Min**	**Nom**	**Max**
A	0.70	0.75	0.80	0.028	0.030	0.031
A3	0.20 REF			0.008 REF		
b	0.20	0.25	0.30	0.008	0.010	0.012
D	3.90	4.00	4.10	0.153	0.157	0.161
D2	3.10	3.20	3.30	0.122	0.126	0.130
E	1.50	1.60	1.70	0.059	0.063	0.067
E2	0.30	0.40	0.50	0.012	0.016	0.020
e	0.50 BSC			0.020 BSC		
K	0.20			0.008		
L	0.20	0.30	0.40	0.008	0.010	0.012
M	0.25 REF			0.010 REF		
# per tape and reel	3000 pieces					
Controlling dimension: millimeters						

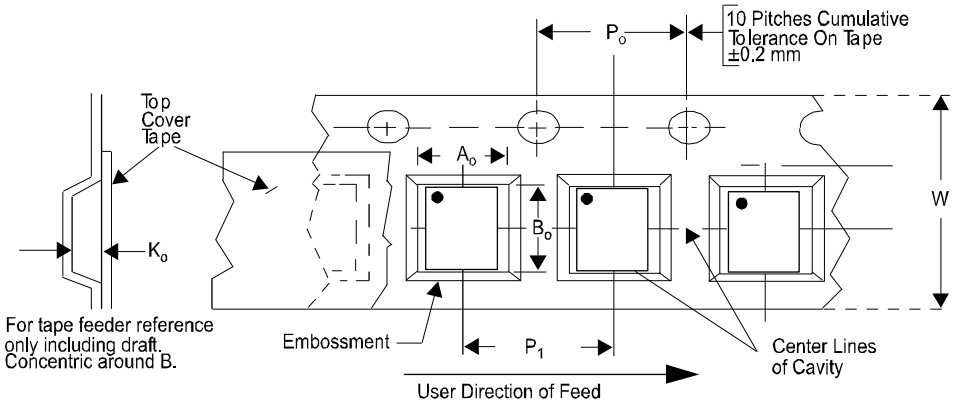


Dimensions for 16-Lead, 0.5mm pitch TDFN package with Exposed End Pads (EEP)

†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.

Tape and Reel Specifications

PART NUMBER	PACKAGE SIZE (mm)	POCKET SIZE (mm) B_0 X A_0 X K_0	TAPE WIDTH W	REEL DIAMETER	QTY PER REEL	P_0	P_1
CM1408-08DE	4.00 X 1.60 X 0.75	4.30 X 1.90 X 1.20	12mm	178mm (7")	3000	4mm	4mm



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