

## Praetorian™ L-C LCD and Camera EMI Filter Array with ESD Protection in TDFN Package

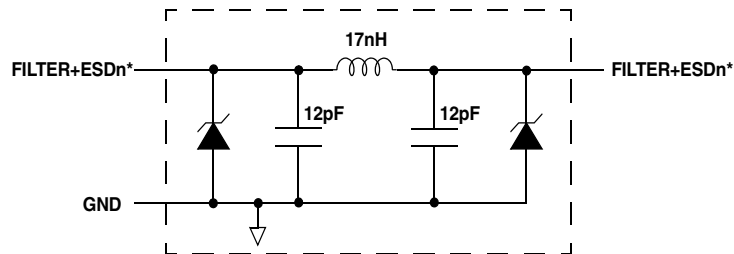
### Features

- Six channels of EMI filtering with integrated ESD protection
- Pi-style EMI filters in a capacitor-inductor-capacitor (C-L-C) network
- $\pm 15\text{kV}$  ESD protection on each channel (contact): IEC 61000-4-2 Level 4, contact discharge
- $\pm 30\text{kV}$  ESD protection on each channel (HBM)
- Greater than 30dB attenuation (typical) at 1GHz
- TDFN package with 0.40mm lead pitch:
  - 6-channel = 12-lead TDFN
- Tiny TDFN package size:
  - 12-lead: 2.5mm x 1.35mm
- Lead-free packaging

### Applications

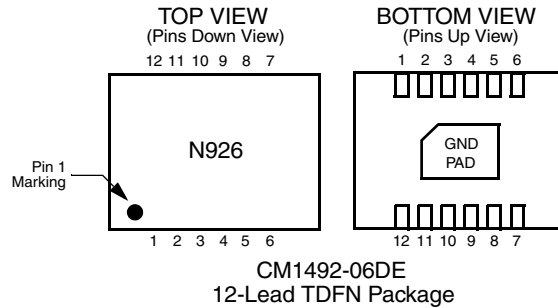
- LCD and camera data lines in mobile handsets
- Wireless handsets
- LCD and camera modules

### Electrical Schematic



\* See Package/Pinout Diagrams for expanded pin information.

**6 EMI/RFI Filter Channels  
with Integrated ESD Protection**

**PACKAGE / PINOUT DIAGRAMS**

**Notes:**

- 1) These drawings are not to scale.
- 2) Date code to be added to package.

**PIN DESCRIPTIONS**

PINS	NAME	DESCRIPTION
1	FILTER1	Filter + ESD Channel 1
2	FILTER2	Filter + ESD Channel 2
3	FILTER3	Filter + ESD Channel 3
4	FILTER4	Filter + ESD Channel 4
5	FILTER5	Filter + ESD Channel 5
6	FILTER6	Filter + ESD Channel 6
7	FILTER6	Filter + ESD Channel 6
8	FILTER5	Filter + ESD Channel 5
9	FILTER4	Filter + ESD Channel 4
10	FILTER3	Filter + ESD Channel 3
11	FILTER2	Filter + ESD Channel 2
12	FILTER1	Filter + ESD Channel 1
GND PAD	GND	Device Ground

**Ordering Information**
**PART NUMBERING INFORMATION**

Pins	Package	Lead-free Finish	
		Ordering Part Number <sup>1</sup>	Part Marking
12	TDFN-12	CM1492-06DE	N926

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

## Specifications

### ABSOLUTE MAXIMUM RATINGS

PARAMETER	RATING	UNITS
Storage Temperature Range	-65 to +150	°C
Current per Inductor	30	mA
DC Package Power Rating	500	mW

### STANDARD OPERATING CONDITIONS

PARAMETER	RATING	UNITS
Operating Temperature Range	-40 to +85	°C

### ELECTRICAL OPERATING CHARACTERISTICS (SEE NOTE1)

SYMBOL	PARAMETER	CONDITIONS	MIN	TYP	MAX	UNITS
L	Channel Inductance			17		nH
C <sub>TOTAL</sub>	Total Channel Capacitance	At 2.5VDC Reverse Bias, 1MHz, 30mVAC	19	24	29	pF
C	Capacitance C1	At 2.5VDC Reverse Bias, 1MHz, 30mVAC		12		pF
V <sub>DIODE</sub>	Standoff Voltage	I <sub>DIODE</sub> = 10μA		6.0		V
I <sub>LEAK</sub>	Diode Leakage Current (reverse bias)	V <sub>DIODE</sub> = +3.3V		0.1	1.0	μA
V <sub>SIG</sub>	Signal Clamp Voltage Positive Clamp Negative Clamp	I <sub>LOAD</sub> = 10mA I <sub>LOAD</sub> = -10mA	5.6 -1.5	6.8 -0.8	9.0 -0.4	V V
V <sub>ESD</sub>	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, 3 and 4	±30 ±15			kV kV
R <sub>DYN</sub>	Dynamic Resistance Positive Negative			2.3 0.9		Ω Ω
f <sub>C</sub>	Roll-off Frequency at -6dB Attenuation Z <sub>SOURCE</sub> = 50Ω, Z <sub>LOAD</sub> = 50Ω			400		MHz

Note 1: T<sub>A</sub>=25°C unless otherwise specified.

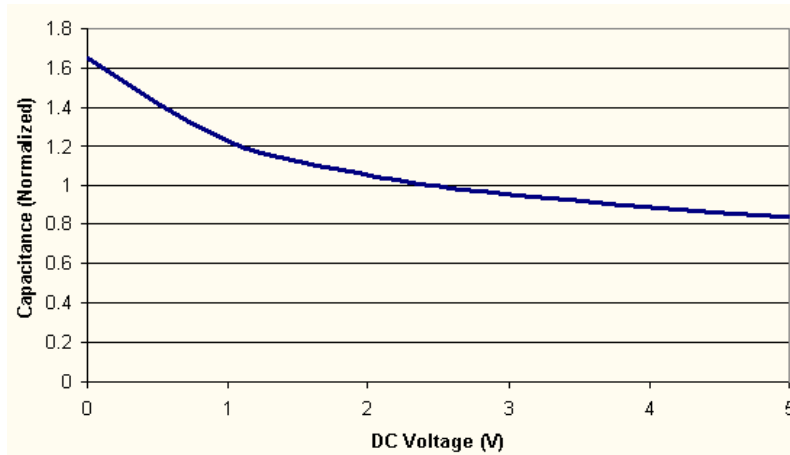
Note 2: ESD applied to input and output pins with respect to GND, one at a time.

Note 3: Clamping voltage is measured at the opposite side of the EMI filter to the ESD pin (i.e. if ESD is applied to pin A1 then clamping voltage is measured at pin C1). Unused pins are left open.

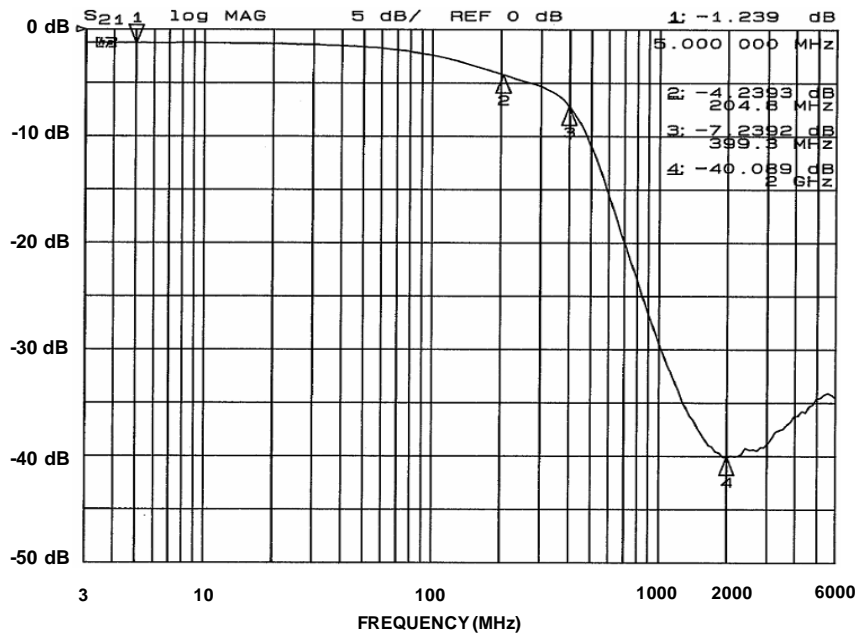
Note 4: These parameters are guaranteed by design and characterization.

**Performance Information**

**Typical Diode Capacitance vs. Input Voltage**



**Figure 1. Filter Capacitance vs. Input Voltage (normalized to capacitance at 2.5VDC and 25°C)**



**Figure 2. Typical Performance Curve**

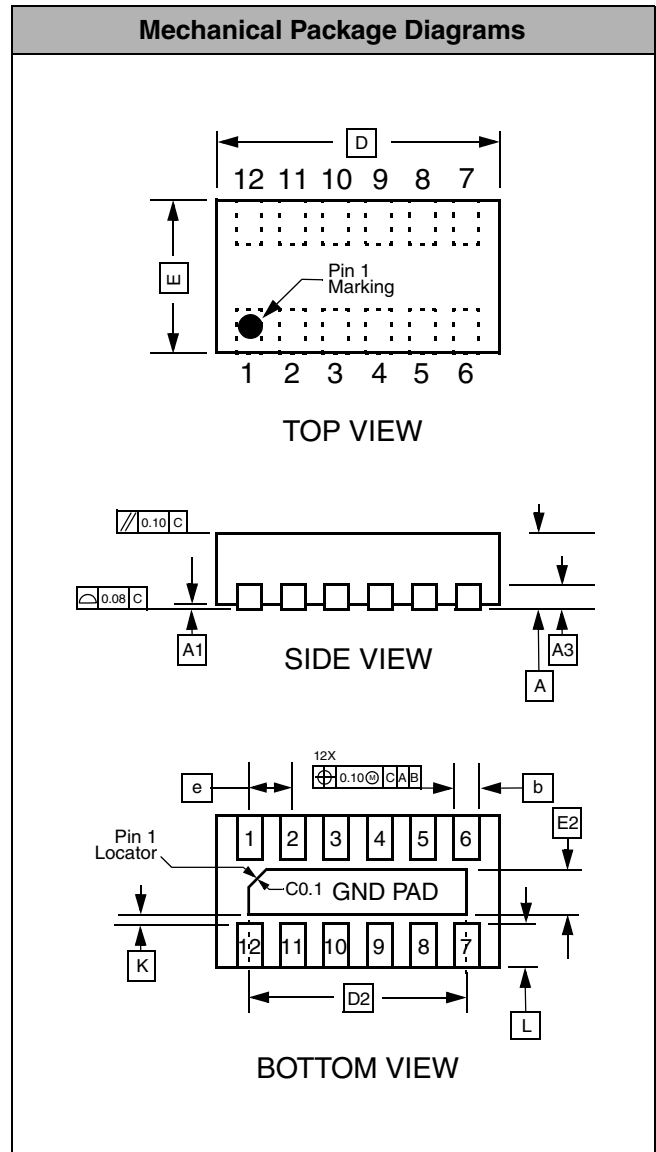
## Mechanical Details

### TDFN-12 Mechanical Specifications, 0.4mm

Dimensions for the CM1492-06DE supplied in a 12-lead, 0.4mm pitch TDFN package are presented below.

PACKAGE DIMENSIONS						
Package	TDFN					
JEDEC No.	MO-229C*					
Leads	12					
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	0.200 REF			0.008 REF		
b	0.15	0.20	0.25	0.006	0.008	0.010
D	2.40	2.50	2.60	0.094	0.098	0.102
D2	1.90	2.00	2.10	0.075	0.079	0.083
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		
K	0.20			0.008		
L	0.15	0.25	0.35	0.006	0.010	0.014
# per tape and reel	3000 pieces					
Controlling dimension: millimeters						

\* 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.



Dimensions for 12-Lead, 0.4mm pitch TDFN package