



california micro devices

CM1621

LCD and Camera EMI Filter Array with ESD Protection

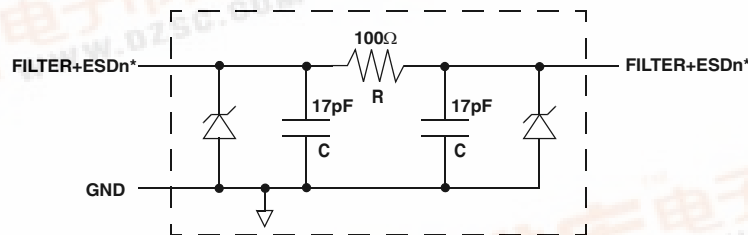
Features

- Six channels of EMI filtering with integrated ESD protection
- Pi-style EMI filters in a capacitor-resistor-capacitor (C-R-C) network
- $\pm 15\text{kV}$ ESD protection on each channel (IEC 61000-4-2 Level 4, contact discharge)
- $\pm 30\text{kV}$ ESD protection on each channel (HBM)
- Greater than 40dB attenuation (typical) at 1GHz
- NuDFN package with 0.40mm lead pitch:
 - 12-lead: 2.5mm x 1.20mm x 0.50mm
- 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

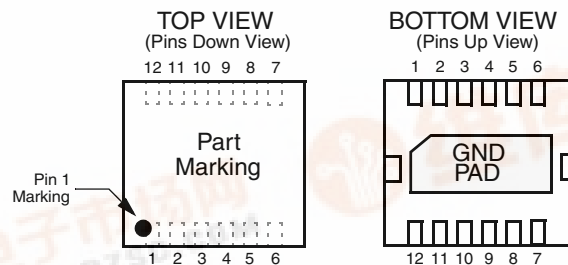
Electrical Schematic



* See Package/Pinout Diagram for expanded pin information.

1 of 6 EMI/RFI + ESD Channels

PACKAGE / PINOUT DIAGRAMS



12-Lead NuDFN Package

Note: This drawing is not to scale.





PIN DESCRIPTIONS

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

Ordering Information

PART NUMBERING INFORMATION

Pins	Package	Lead-free Finish	
		Ordering Part Number ¹	Part Marking
12	NuDFN-12	CM1621-06DE	P21

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	°C
DC Power per Resistor	100	mW
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
R	Resistance		85	100	115	Ω
C _{TOTAL}	Total Channel Capacitance	At 2.5VDC Reverse Bias, 1MHz, 30mVAC	27	34	41	pF
C	Capacitance C	At 2.5VDC Reverse Bias, 1MHz, 30mVAC		17		pF
V _{DIODE}	Standoff Voltage	I _{DIODE} = 10 μ A		6.0		V
I _{LEAK}	Diode Leakage Current (reverse bias)	V _{DIODE} = +3.3V			200	nA
V _{SIG}	Signal Clamp Voltage	I _{LOAD} = 1.0mA	6.0	7.0	8.0	V
V _{ESD}	In-system ESD Withstand Voltage a) Human Body Model (HBM), MIL-STD-883, Method 3015 b) Contact Discharge per IEC 61000-4-2 Level 4	Notes 2 and 3	± 30 ± 15			kV kV
R _{DYN}	Dynamic Resistance Positive Negative			2.3 0.9		Ω Ω
f _C	Cut-off Frequency Z _{SOURCE} = 50 Ω , Z _{LOAD} = 50 Ω	Channel R = 100 Ω , Channel C = 15pF		90	135 Note 3	MHz
A _{1GHz}	Absolute Attenuation @ 1GHz from 0dB Level	Z _{SOURCE} = 50 Ω , Z _{LOAD} = 50 Ω , DC Bias = 0V; Notes 1, 4, 5		-40		dB
A _{800MHz - 3 GHz}	Absolute Attenuation @ 800MHz to 3GHz from 0dB Level	Z _{SOURCE} = 50 Ω , Z _{LOAD} = 50 Ω , DC Bias = 0V; Notes 1, 4, 5		-35		dB

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.

Note 3: These parameters are guaranteed by design and characterization.

Note 4: Attenuation / RF curves characterized by a network analyzer using microprobes.

Note 5: These parameters are NOT guaranteed by design, characterization and production.

Performance Information

Typical Filter Performance ($T_A=25^\circ\text{C}$, DC Bias=0V, 50 Ohm Environment)

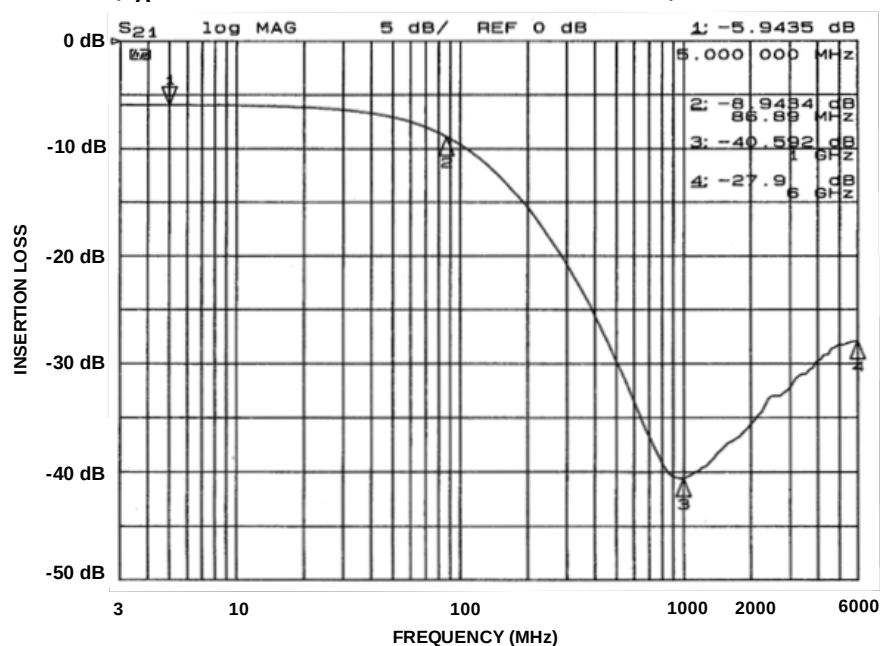


Figure 1. Insertion Loss vs. Frequency (FILTER1 Input to GND, CM1621-06DE)
Typical Diode Capacitance vs. Input Voltage

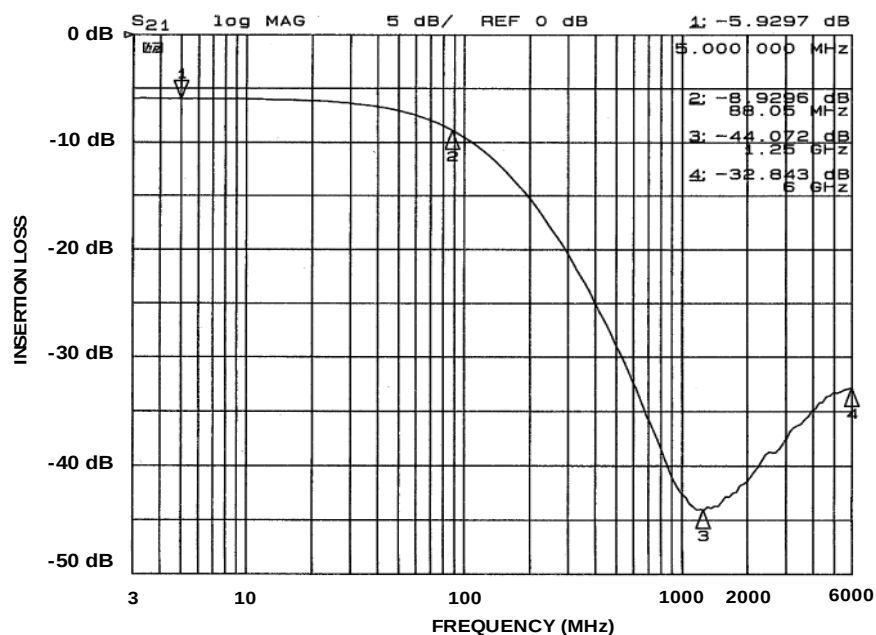


Figure 2. Insertion Loss vs. Frequency (FILTER2 Input to GND, CM1621-06DE)
Typical Diode Capacitance vs. Input Voltage

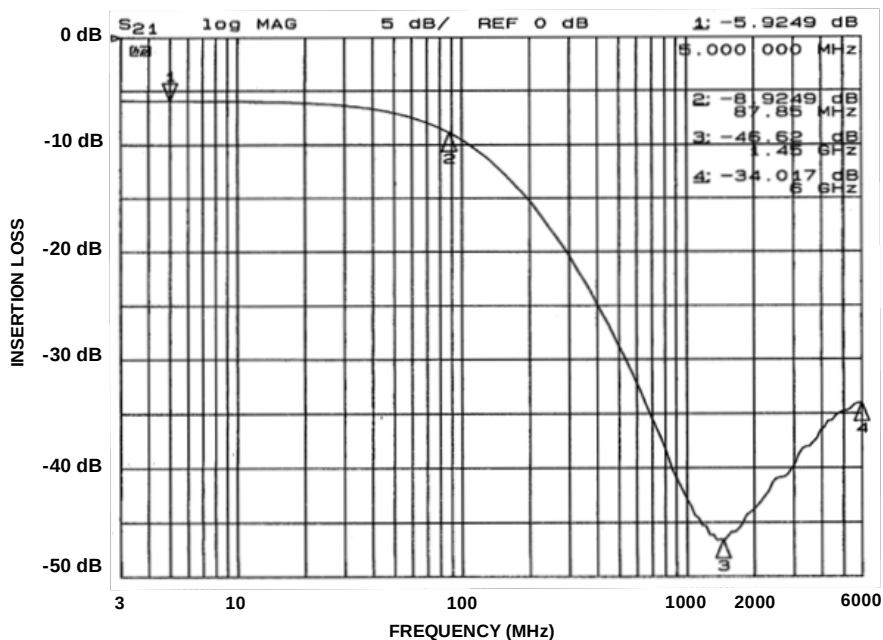


Figure 3. Insertion Loss vs. Frequency (FILTER3 Input to GND, CM1621-06DE)
Typical Diode Capacitance vs. Input Voltage

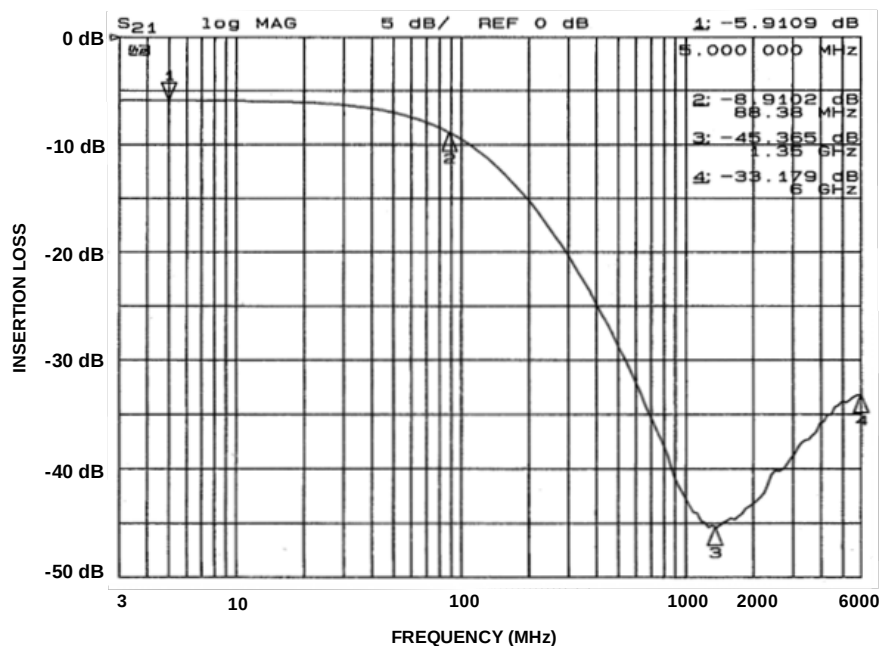


Figure 4. Insertion Loss vs. Frequency (FILTER4 Input to GND, CM1621-06DE)
Typical Diode Capacitance vs. Input Voltage

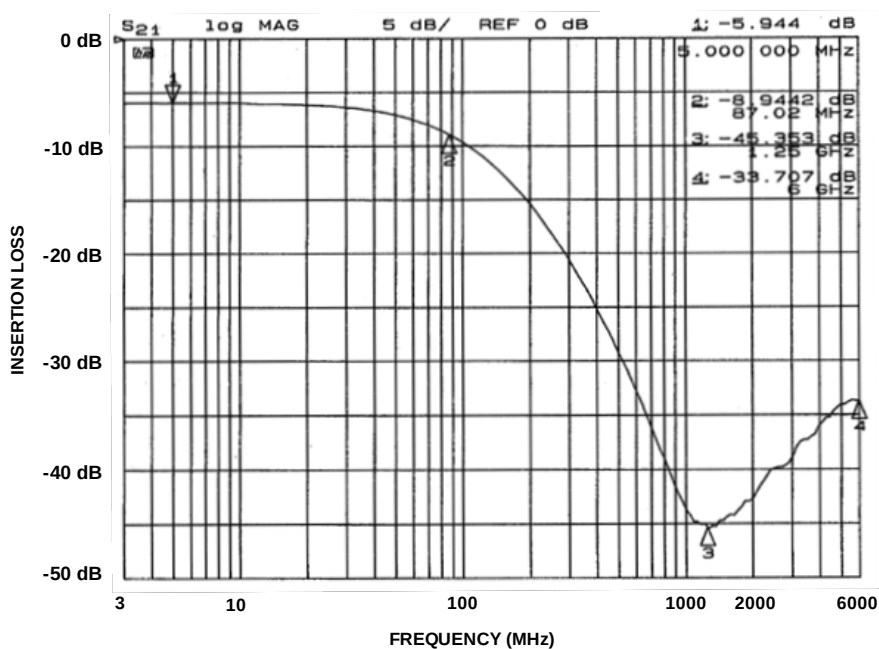


Figure 5. Insertion Loss vs. Frequency (FILTER5 Input to GND, CM1621-06DE)
Typical Diode Capacitance vs. Input Voltage

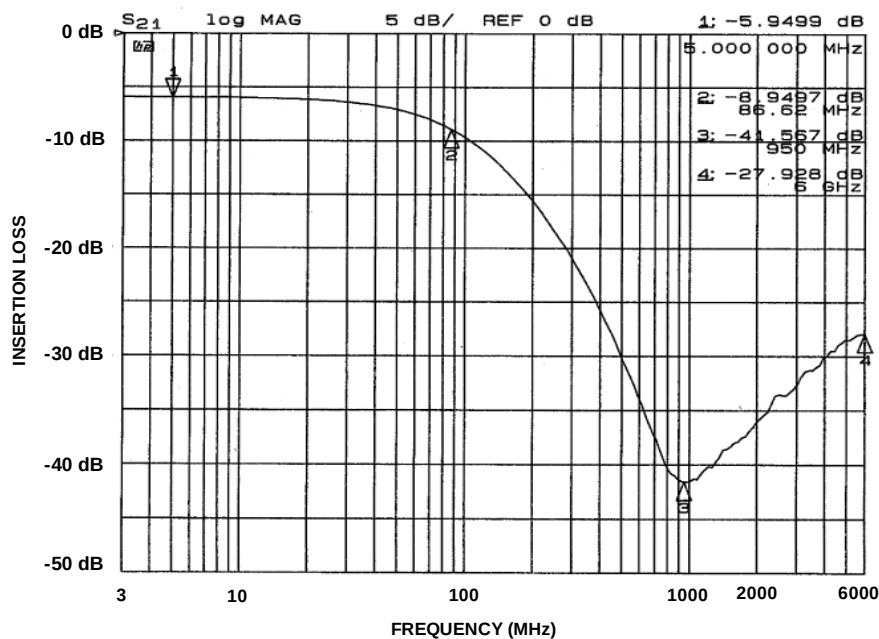
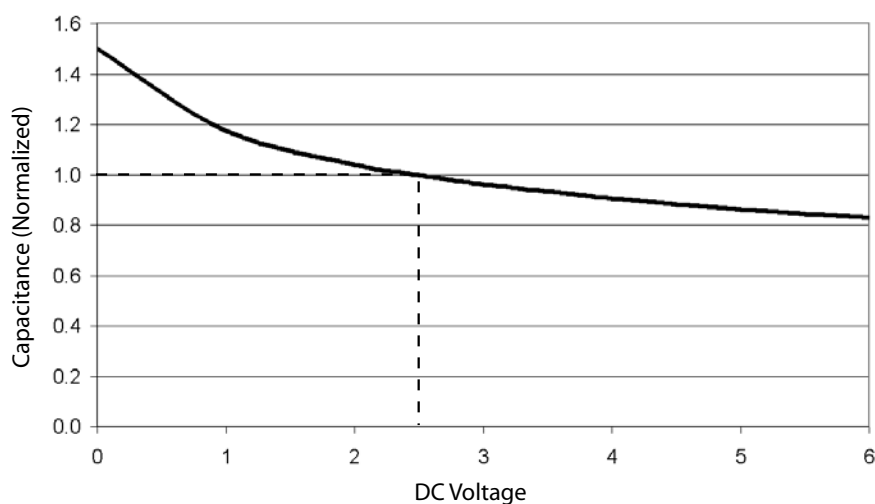


Figure 6. Insertion Loss vs. Frequency (FILTER6 Input to GND, CM1621-06DE)
Typical Diode Capacitance vs. Input Voltage



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

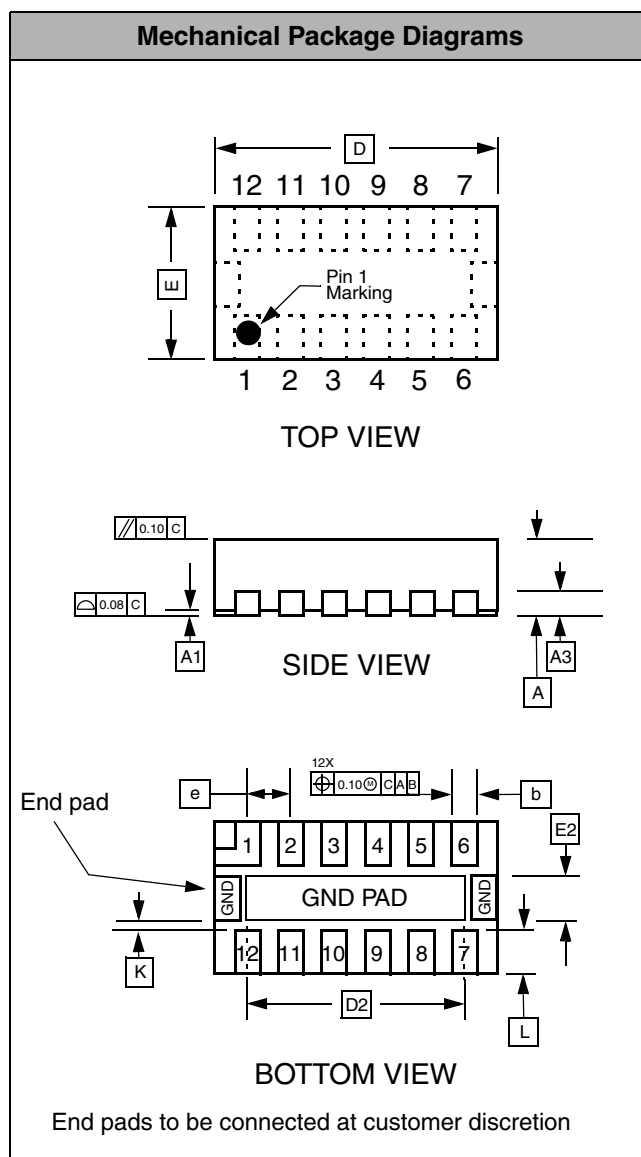
Mechanical Details

NuDFN-12 Mechanical Specifications

Dimensions for the CM1621 supplied in a 12-lead, 0.4mm pitch NuDFN package are presented below.

PACKAGE DIMENSIONS						
Package	NuDFN					
JEDEC No.	MO-229C					
Leads	12					
Dim.	Millimeters			Inches		
	Min	Nom	Max	Min	Nom	Max
A	0.45	0.50	0.55	0.018	0.020	0.022
A1	0.00	0.02	0.05	0.000	0.001	0.002
A3	0.127 REF			0.005 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	1.70	1.80	1.90	0.067	0.071	0.075
E	1.10	1.20	1.30	0.043	0.047	0.051
E2	0.20	0.30	0.40	0.008	0.012	0.016
e	0.40 BSC			0.016 BSC		
K	0.20			0.008		
L	0.20	0.25	0.30	0.008	0.010	0.012
# 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 NuDFN package

Tape and Reel Specifications

PART NUMBER	PACKAGE SIZE (mm)	POCKET SIZE (mm) $B_0 \times A_0 \times K_0$	TAPE WIDTH W	REEL DIAMETER	QTY PER REEL	P_0	P_1
CM1621	2.50 X 1.20 X 0.55	2.80 X 1.45 X 0.70	8mm	178mm (7")	3000	4mm	4mm

