ON Semiconductor®

LCD and Camera EMI Filter Array with ESD Protection

CM1621

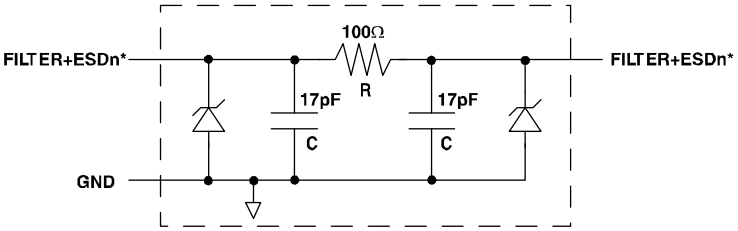
Features

- Six 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 40dB attenuation (typical) at 1GHz
- uDFN package with 0.40mm lead pitch:
  - 12-lead: 2.50mm x 1.20mm x 0.50mm
- Lead-free finishing, 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

Electrical Schematic



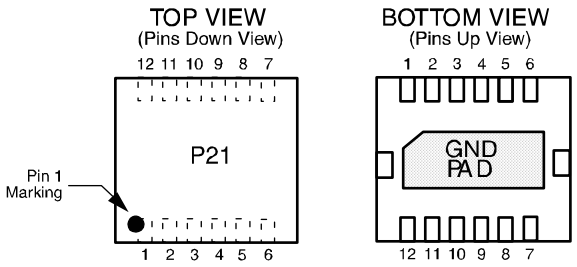
1 of 6 EMI/RFI + ESD Channels

*** See Package/Pinout Diagram for expanded pin information.**

June 2010 – Rev. 2

Publication Order Number:
CM1621/D

PACKAGE / PINOUT DIAGRAMS



12-Lead uDFN 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	uDFN-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} = 10μA		6.0		V
I_{LEAK}	Diode Leakage Current (reverse bias)	V_{DIODE} = +3.3V			100	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	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 = 15pF		90	135 Note 3	MHz
A_{1GHz}	Absolute Attenuation @ 1GHz from 0dB Level	Z_{SOURCE} = 50Ω, Z_{LOAD} = 50Ω, DC Bias = 0V; Notes 1 and 3		-40		dB
$A_{800MHz - 3 GHz}$	Absolute Attenuation @ 800MHz to 3GHz from 0dB Level	Z_{SOURCE} = 50Ω, Z_{LOAD} = 50Ω, DC Bias = 0V; Notes 1 and 3		-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: Attenuation / RF curves characterized by a network analyzer using microprobes.

Performance Information

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

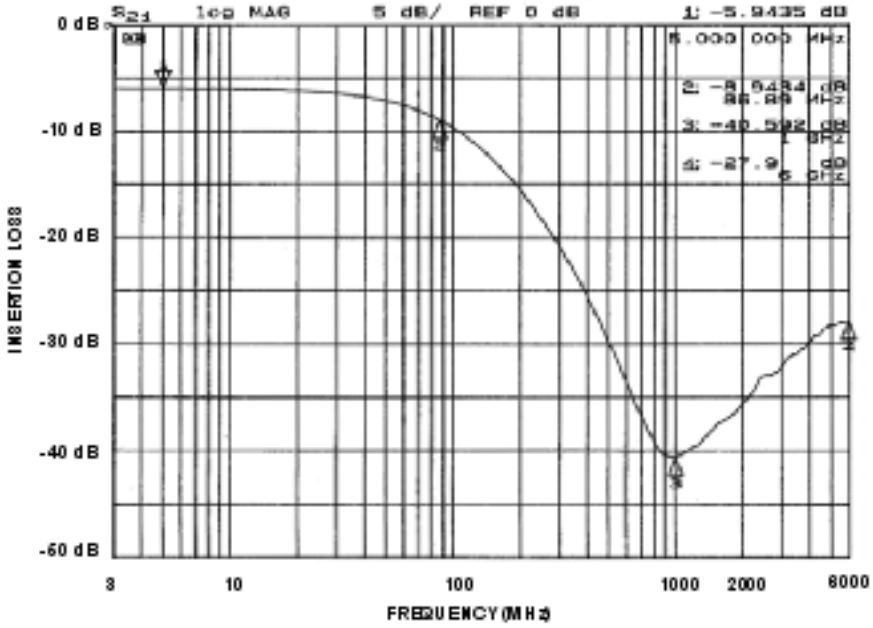


Figure 1. Insertion Loss vs. Frequency (FILTER1 Input to GND, CM1621-06DE)
Typical Diode Capacitance vs. Input Voltage

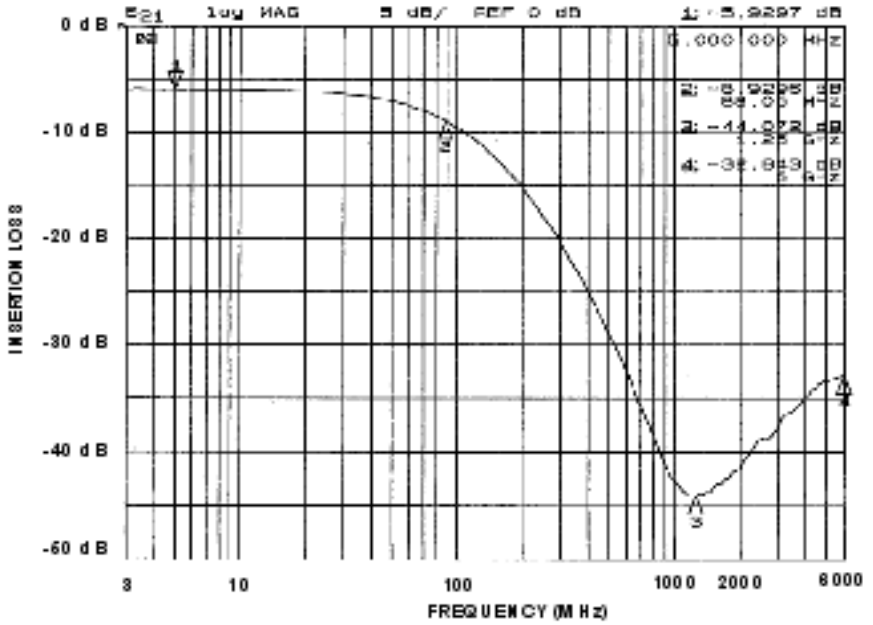


Figure 2. Insertion Loss vs. Frequency (FILTER2 Input to GND, CM1621-06DE)
Typical Diode Capacitance vs. Input Voltage

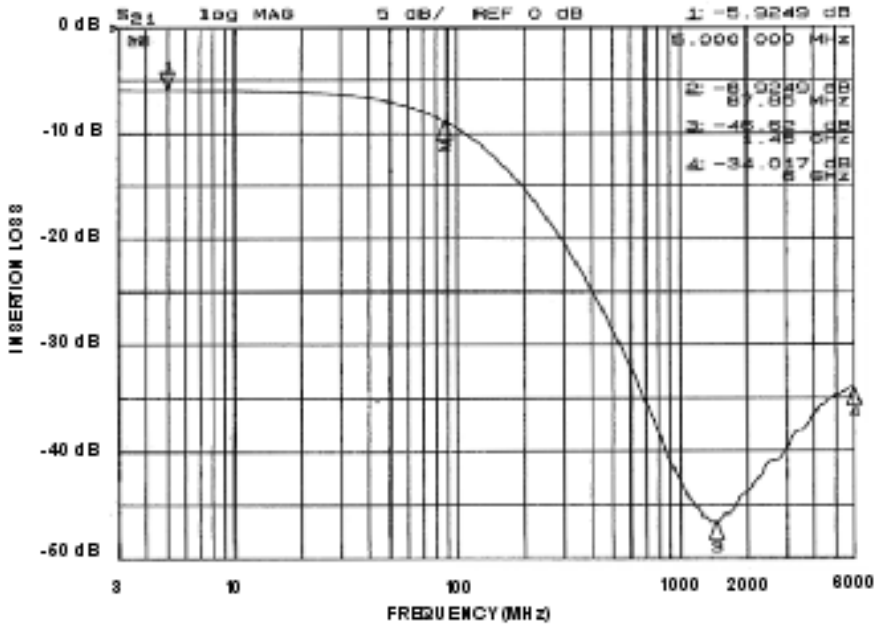


Figure 3. Insertion Loss vs. Frequency (FILTER3 Input to GND, CM1621-06DE)
Typical Diode Capacitance vs. Input Voltage

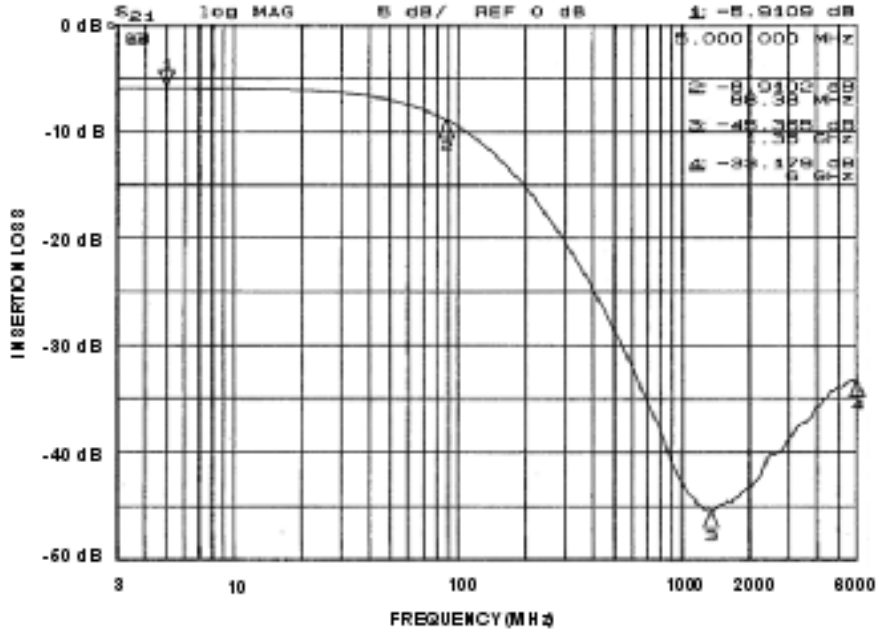


Figure 4. Insertion Loss vs. Frequency (FILTER4 Input to GND, CM1621-06DE)
Typical Diode Capacitance vs. Input Voltage

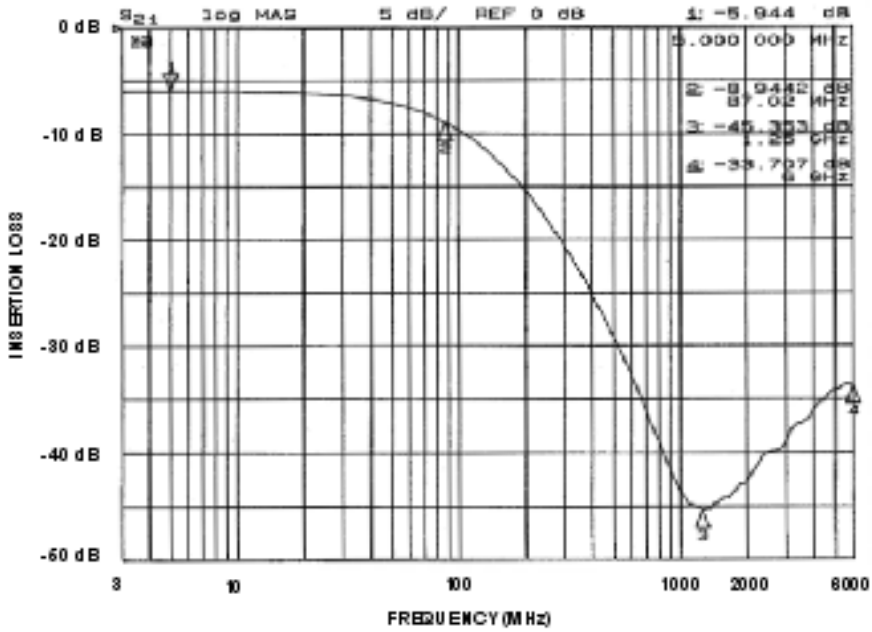


Figure 5. Insertion Loss vs. Frequency (FILTER5 Input to GND, CM1621-06DE)
Typical Diode Capacitance vs. Input Voltage

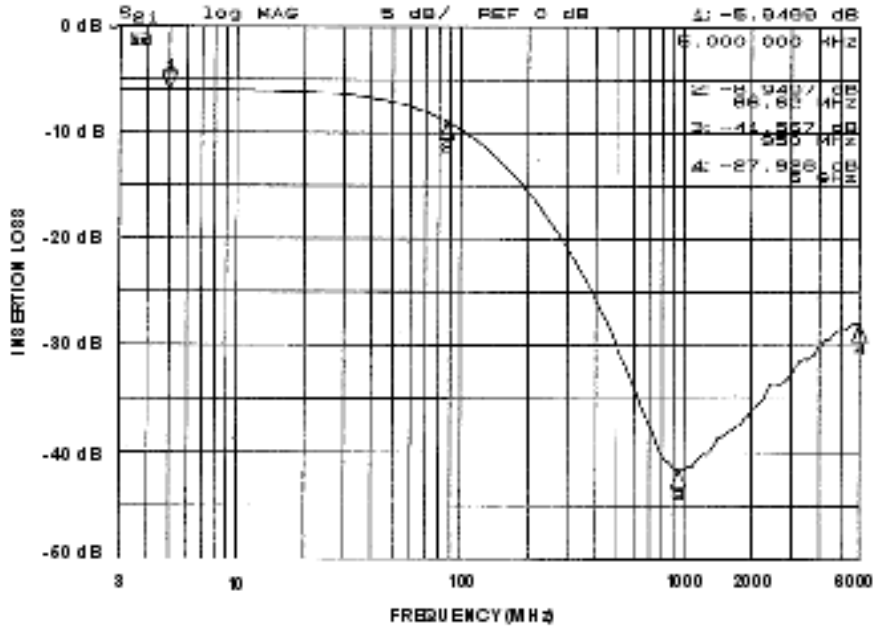


Figure 6. Insertion Loss vs. Frequency (FILTER6 Input to GND, CM1621-06DE)
Typical Diode Capacitance vs. Input Voltage

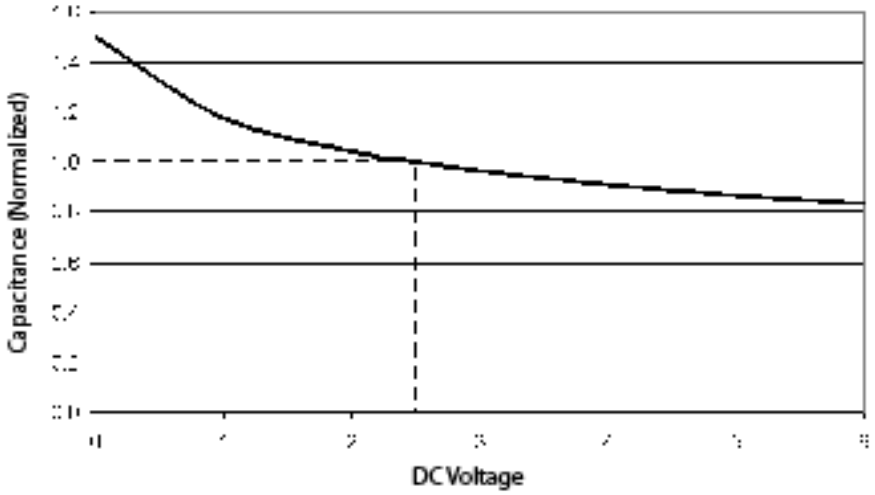


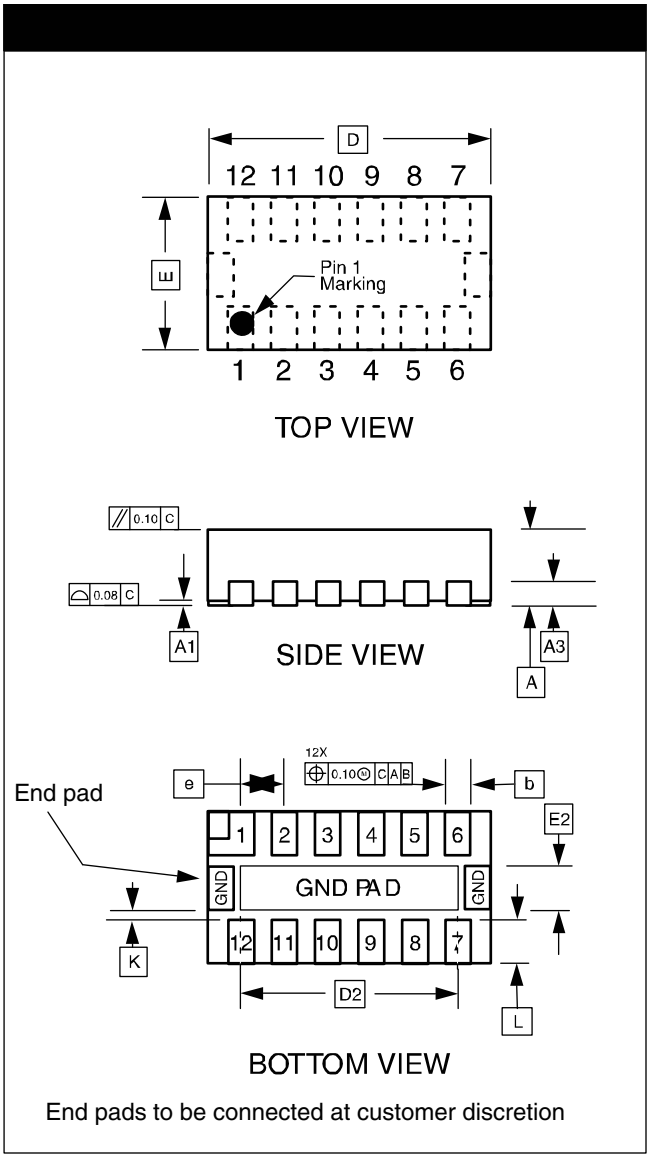
Figure 7. Filter Capacitance vs. Input Voltage (normalized to capacitance at 2.5VDC and 25°C)

Mechanical Details

uDFN-12 Mechanical Specifications

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

PACKAGE DIMENSIONS						
Package	uDFN					
JEDEC No.	MO-229C[1]					
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	0.22 REF			0.009 REF		
L	0.20	0.25	0.30	0.008	0.010	0.012
# per tape and reel	3000 pieces					
Controlling dimension: millimeters						

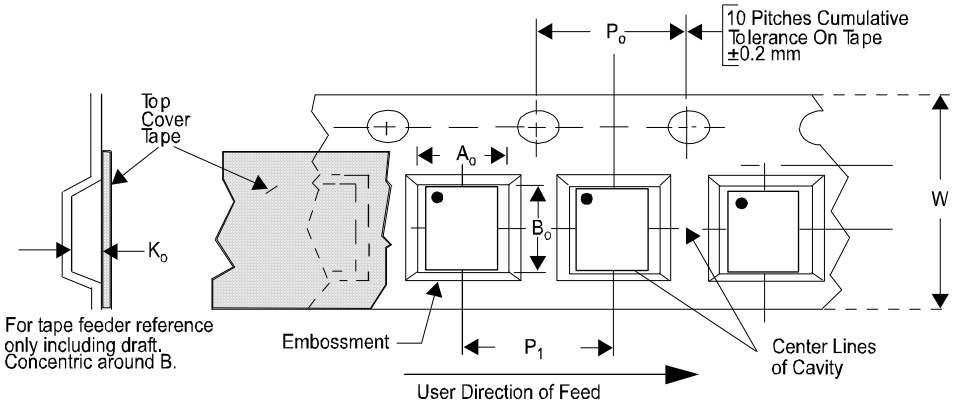


Dimensions for 12-Lead, 0.4mm pitch uDFN package

[1] 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
CM1621	2.50 X 1.20 X 0.50	2.80 X 1.45 X 0.70	8mm	178mm (7")	3000	4mm	4mm



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