

LCD and Camera EMI Filter Array with ESD Protection

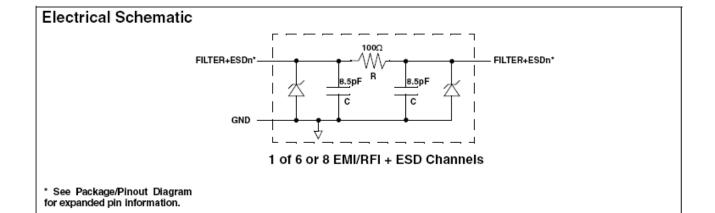
CM1620

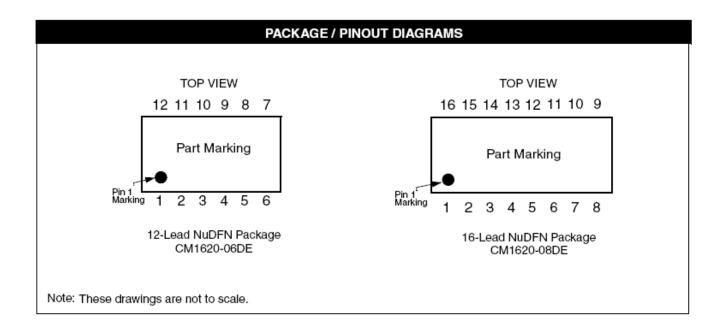
Features

- Six or eight channels of EMI filtering with integrated ESD protection
- Pi-style EMI filters in a capacitor-resistorcapacitor (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 -25dB attenuation (typical) at 1GHz
- NuDFN package with 0.40mm lead pitch:
 - 12-lead: 2.5mm x 1.20mm x 0.50mm
 - 16-lead: 3.5mm x 1.20mm x 0.50mm
- Lead-free finishing

Applications

- 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





16-PIN DESCRIPTIONS										
DEVICE PIN(s)					DEVICE PIN(s)					
-06	-08	NAME	DESCRIPTION		-06 -08		NAME	DESCRIPTION		
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							

Ordering Information

PART NUMBERING INFORMATION								
		Lead-free Finish						
Pins	Package	Ordering Part Number ¹	Part Marking					
12	NuDFN-12	CM1620 -06DE	P20					
16	NuDFN-16	CM1620 -08DE	P208					

b

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 (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				
С	Capacitance C	At 2.5VDC Reverse Bias, 1MHz, 30mVAC		8.5		pF				
$V_{\text{\tiny DIODE}}$	Standoff Voltage	$I_{\text{DIODE}} = 10 \mu A$		6.0		V				
I _{LEAK}	Diode Leakage Current (reverse bias)	V _{DIODE} = +3.3V		0.1	1.0	μА				
V _{SIG}	Signal Clamp Voltage	I _{LOAD} = 10mA	5.6	6.8	9.0	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	See Note 2	±30 ±15			kV kV				
R _{DYN}	Dynamic Resistance Positive Negative			2.3 0.9		Ω				
f _c	Cut-off Frequency $Z_{\text{SOURCE}} = 50\Omega$, $Z_{\text{LOAD}} = 50\Omega$	Channel R = 100Ω , Channel C = $17pF$		200		MHz				
A _{1GHz}	Absolute Attenuation @ 1GHz from 0dB Level	$\begin{split} &Z_{\text{SOURCE}} = 50\Omega, Z_{\text{LOAD}} = 50\Omega, \\ &\text{DC Bias} = \text{0V; See Notes 1 and 3} \end{split}$		-30		dB				
A _{800MHz - 6GHz}	Absolute Attenuation @ 800MHz to 6GHz from 0dB Level	$\begin{split} &Z_{\text{SOURCE}} = 50\Omega, Z_{\text{LOAD}} = 50\Omega, \\ &\text{DC Bias} = \text{0V; See Notes 1 and 3} \end{split}$		-25		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)

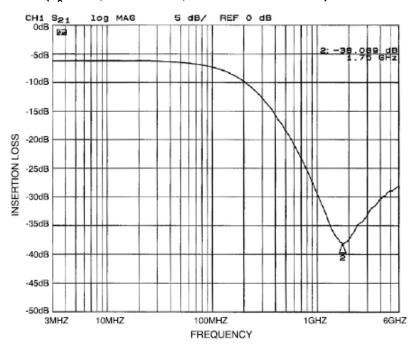


Figure 1. Insertion Loss vs. Frequency (FILTER1 Input to GND, CM1620-06DE)

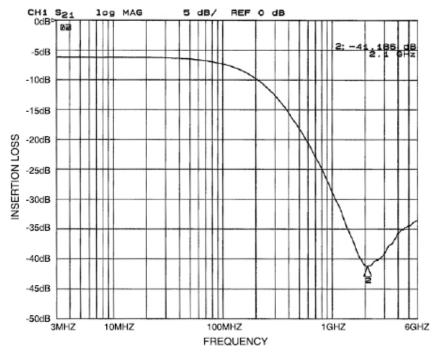


Figure 2. Insertion Loss vs. Frequency (FILTER2 Input to GND, CM1620-06DE)

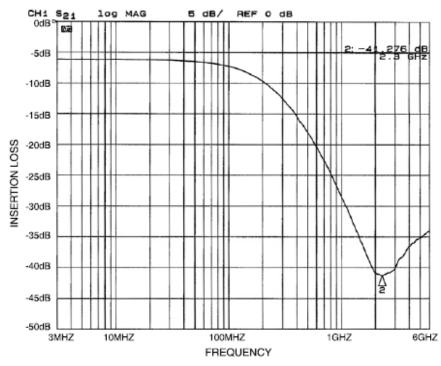


Figure 3. Insertion Loss vs. Frequency (FILTER3 Input to GND, CM1620-06DE)

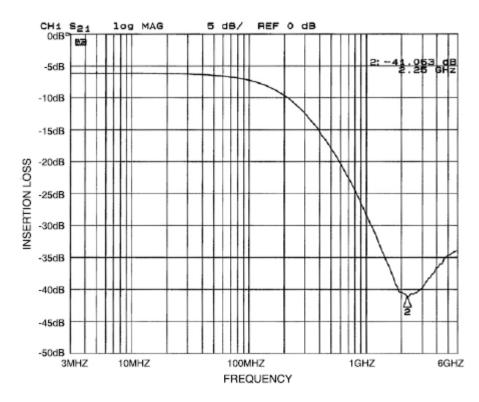


Figure 4. Insertion Loss vs. Frequency (FILTER4 Input to GND, CM1620-06DE)

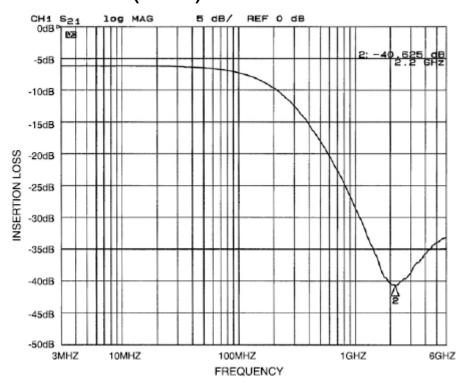


Figure 5. Insertion Loss vs. Frequency (FILTER5 Input to GND, CM1620-06DE)

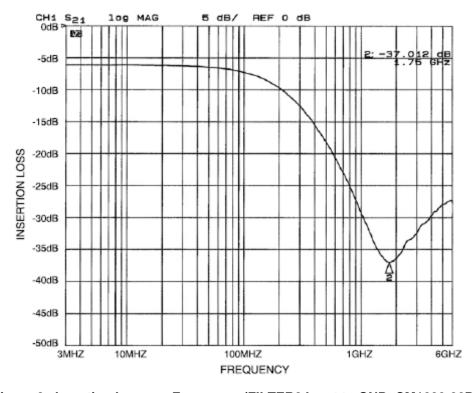


Figure 6. Insertion Loss vs. Frequency (FILTER6 Input to GND, CM1620-06DE)

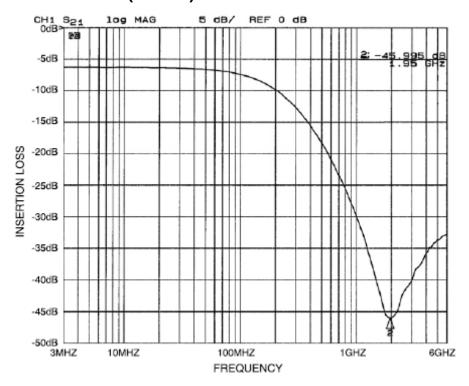


Figure 7. Insertion Loss vs. Frequency (FILTER1 Input to GND, CM1620-08DE)

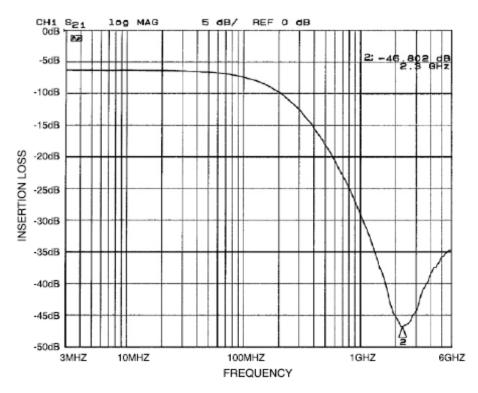


Figure 8. Insertion Loss vs. Frequency (FILTER2 Input to GND, CM1620-08DE)

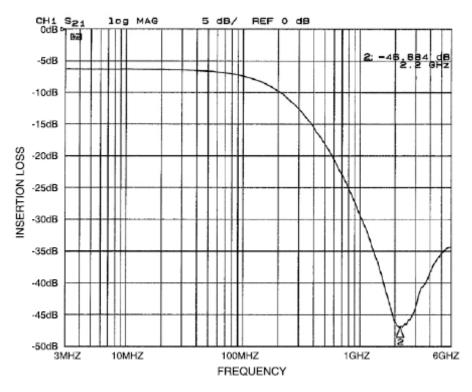


Figure 9. Insertion Loss vs. Frequency (FILTER3 Input to GND, CM1620-08DE)

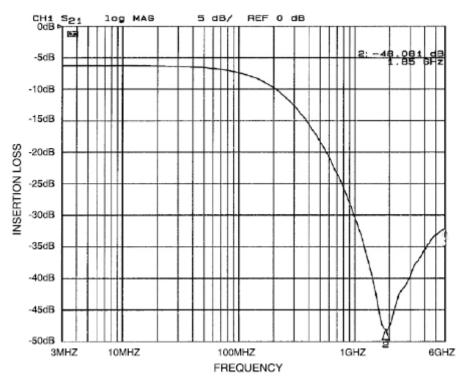


Figure 10. Insertion Loss vs. Frequency (FILTER4 Input to GND, CM1620-08DE)

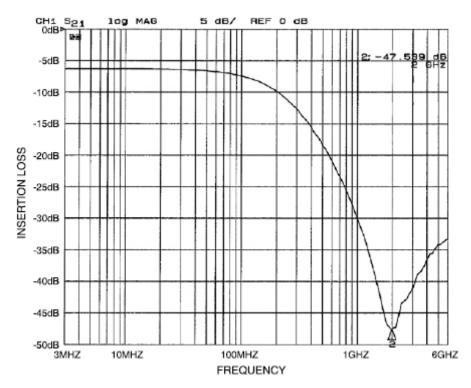


Figure 11. Insertion Loss vs. Frequency (FILTER5 Input to GND, CM1620-08DE)

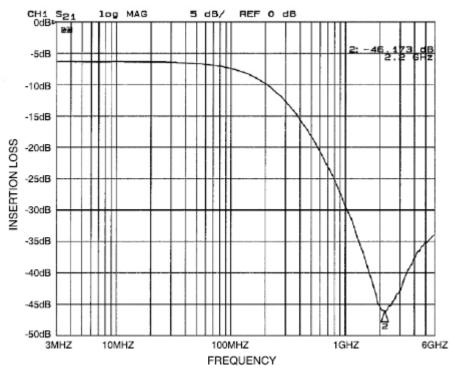


Figure 12. Insertion Loss vs. Frequency (FILTER6 Input to GND, CM1620-08DE)

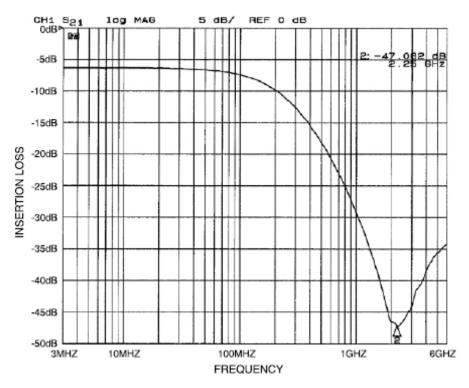


Figure 13. Insertion Loss vs. Frequency (FILTER7 Input to GND, CM1620-08DE)

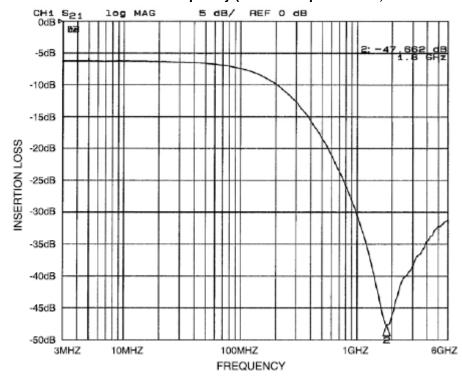


Figure 14. Insertion Loss vs. Frequency (FILTER8 Input to GND, CM1620-08DE)

Typical Diode Capacitance vs. Input Voltage

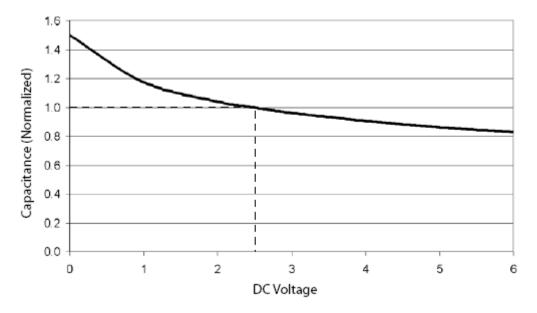


Figure 15. Filter Capacitance vs. Input Voltage (Normalized to Capacitance at 2.5VDC and 25°C)

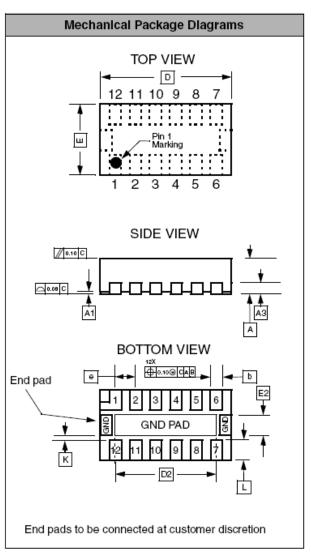
Mechanical Details

NuDFN-12 Mechanical Specifications

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

	PAC	KAGE	DIME	NSIO	NS			
Package	NuDFN							
JEDEC No.	MO-229C*							
Leads			-	12				
Dim.	Millimeters			Inches				
Diiii.	Min	Nom	Max	Min	Nom	Max		
Α	0.45	0.50	0.55	0.018	0.020	0.022		
A 1	0.00	0.02	0.05	0.000	0.001	0.002		
А3	0.127 REF 0.005				.005 RE	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		
е	0.40 BSC 0.016 BSC					С		
К	0.20			0.008				
L	0.20	0.25	0.30	0.008	0.010	0.012		
# per 3000 pieces tape and reel								
	Contro	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

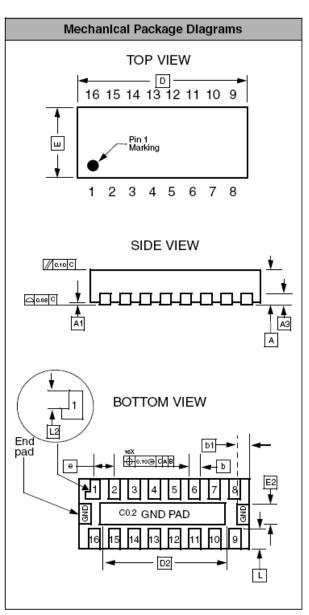
Mechanical Details

NuDFN-16 Mechanical Specifications, 0.4mm

Dimensions for the 16-lead, 0.4mm pitch NuDFN package are presented below.

PACKAGE DIMENSIONS									
Package	ckage NuDFN								
JEDEC No.	MO-229C*								
Leads			1	16					
Dim.	Millimeters			Inches					
Dilli.	Min	Nom	Max	Min	Nom	Max			
Α	0.45	0.50	0.55	0.018	0.020	0.022			
A 1	0.00	0.02	0.05	0.000	0.001	0.002			
А3	0).127 RE	27 REF 0.005 REF			F			
b	0.15	0.20	0.25	0.006	0.008	0.010			
b1		.20 BSC	;	0.008 BSC					
D	3.40 3.50 3.60 0.134 0.		0.138	0.142					
D2	2.70	2.80	2.90	0.106	0.110	0.114			
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			
е	0.400 BSC 0.016 BSC					С			
L	0.20 0.25 0.30		0.008	0.010	0.012				
L2	0.15 REF 0.006 REF					F			
# per tape and reel	tape and								
Controlling dimension: millimeters									

^{*}This package is compliant with JEDEC standard MO-229C with the exception of the D, D2, E, E2, and L dimensions as called out in the table above.



Dimensions for 16-Lead, 0.4mm pitch NuDFN package

CM1620

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