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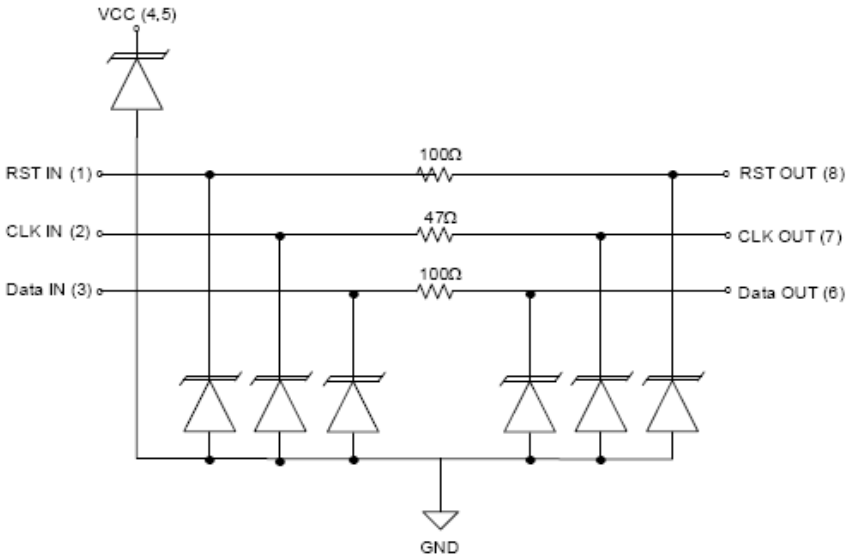
EMI Filter with ESD Protection for SIM Card Applications

CM1623

Features

- 4-channel 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)
- 8-lead UDFN package with 0.40mm pitch
- Tiny UDFN package size: 1.7mm x 1.35mm x 0.5mm
- Increased robustness against vertical impacts during manufacturing process
- RoHS compliant, lead-free finish

Electrical Schematic

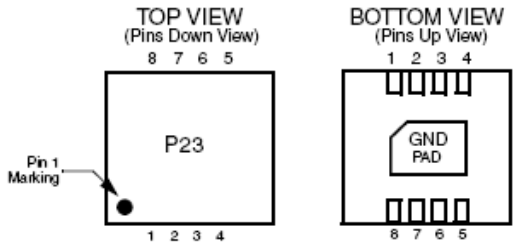


* See Package/Pinout Diagram for expanded pin information.

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May 2010 – Rev. 2

Publication Order Number:
CM1623/D

PACKAGE / PINOUT DIAGRAMS



CM1623-04DE
8-Lead UDFN Package

Notes:
1) These drawings are not to scale.

Pin Information

PIN DESCRIPTIONS

PIN	NAME	DESCRIPTION		PIN	NAME	DESCRIPTION
1	RST	Filter + ESD Channel 1		8	RST	Filter + ESD Channel 1
2	CLK	Filter + ESD Channel 2		7	CLK	Filter + ESD Channel 2
3	DATA	Filter + ESD Channel 3		6	DATA	Filter + ESD Channel 3
4	VCC	V External		5	VCC	V External
GND PAD	GND	Device Ground				

Ordering Information

PART NUMBERING INFORMATION

Pins	Package	Lead-free Finish	
		Ordering Part Number[1]	Part Marking
8	UDFN-8	CM1623-04DE	P23

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
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**
R1	Reset Channel Resistance		80	100	120	Ω
R2	Clock Channel Resistance		37.6	47	56.4	Ω
R3	Data Channel Resistance		80	100	120	Ω
C1	Capacitance on Pins 1, 2, and 3	At 1 MHz, V_{IN}=0V	16	20	24	pF
C2	Capacitance on Pins 4 and 5	At 1 MHz, V_{IN}=0V		18		pF
I_{LEAK}	Diode Leakage Current (Reverse Bias)	V_{DIODE}=3.3V		0.1	1.0	μA
V_{SIG}	Signal Clamp Voltage: a) Positive Clamp b) Negative Clamp	 I_{LOAD} = 10mA I_{LOAD} = -10mA	 5.6 -1.5	 6.8 -0.8	 9.0 -0.4	 V V
V_{ESD}	ESD Peak Discharge Voltage Protection on All Pins In-system ESD Withstand Voltage: a) Contact Discharge per IEC 61000-4-2 Level 4 b) Air Discharge per IEC 61000-4-2 Level 4	T_A=25°C; Note 2	 ±15 ±15	 ±15 ±15		kV kV kV

Note 1: All parameters specified at T_A=25°C unless otherwise noted.
Note 2: Standard IEC 61000-4-2 with $C_{Discharge}$ = 150pF, $R_{Discharge}$ = 330Ω.

Performance Information

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

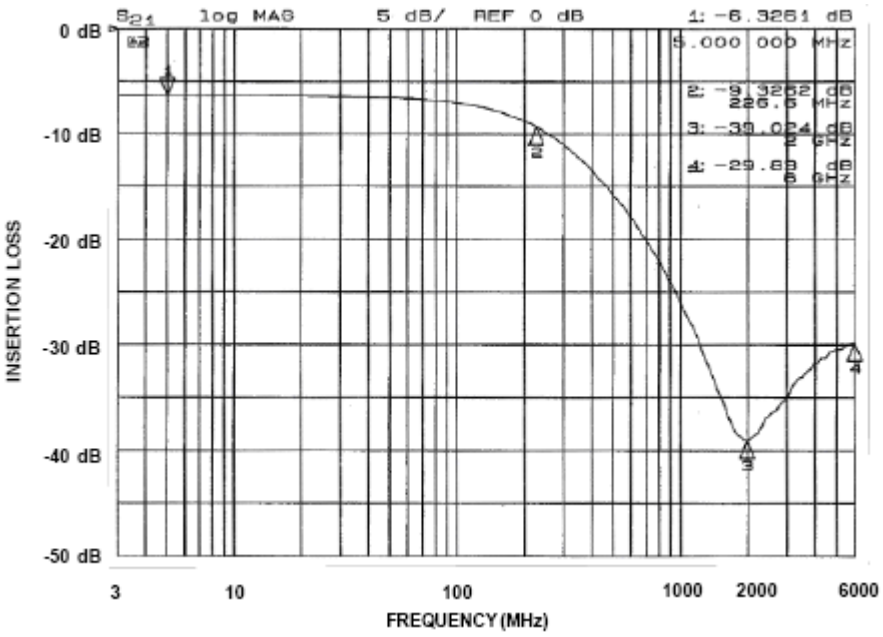


Figure 1. Insertion Loss vs. Frequency, Filter 1 (Pins 1 and 8)

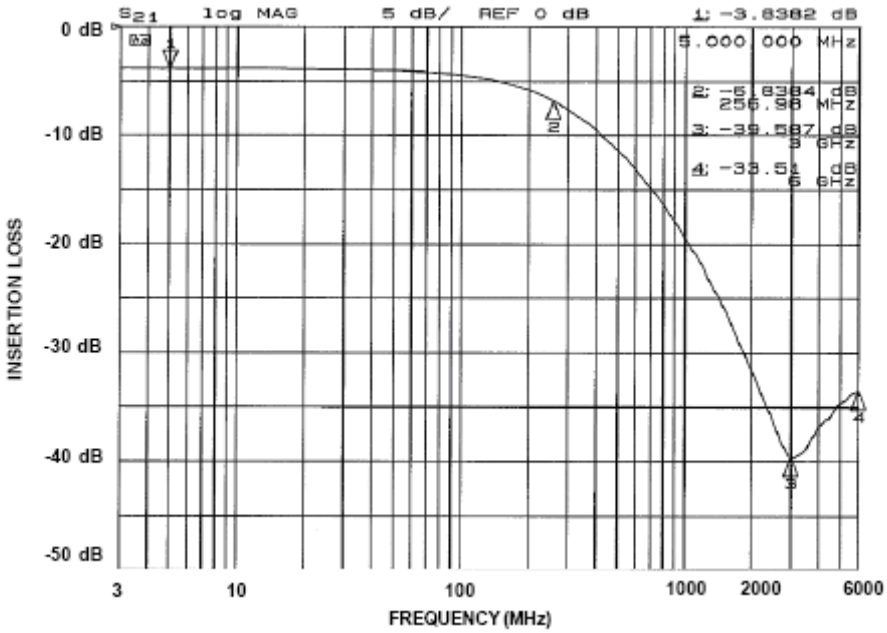


Figure 2. Insertion Loss vs. Frequency, Filter 2 (Pins 2 and 7)

Performance Information (Cont'd)

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

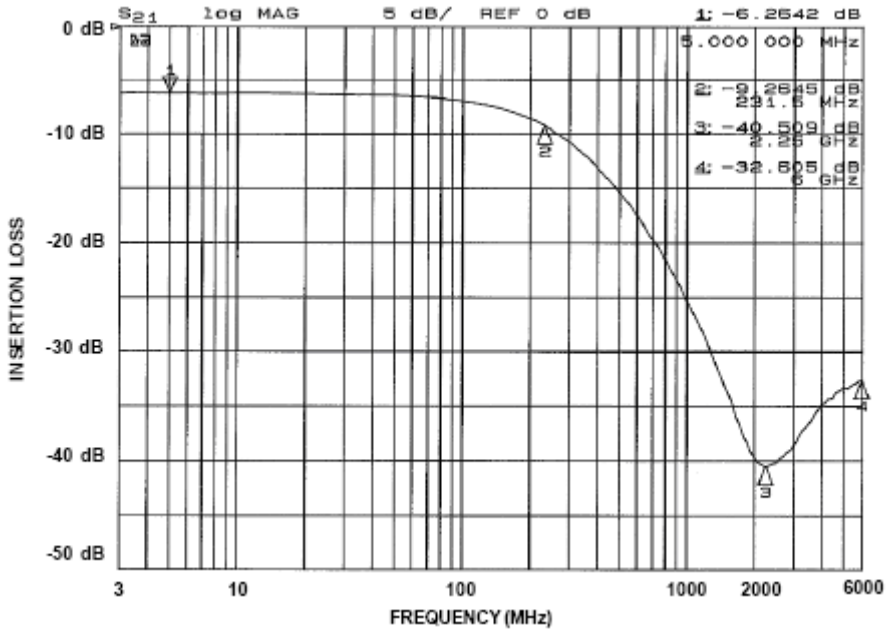


Figure 3. Insertion Loss vs. Frequency, Filter 3 (Pins 3 and 6)

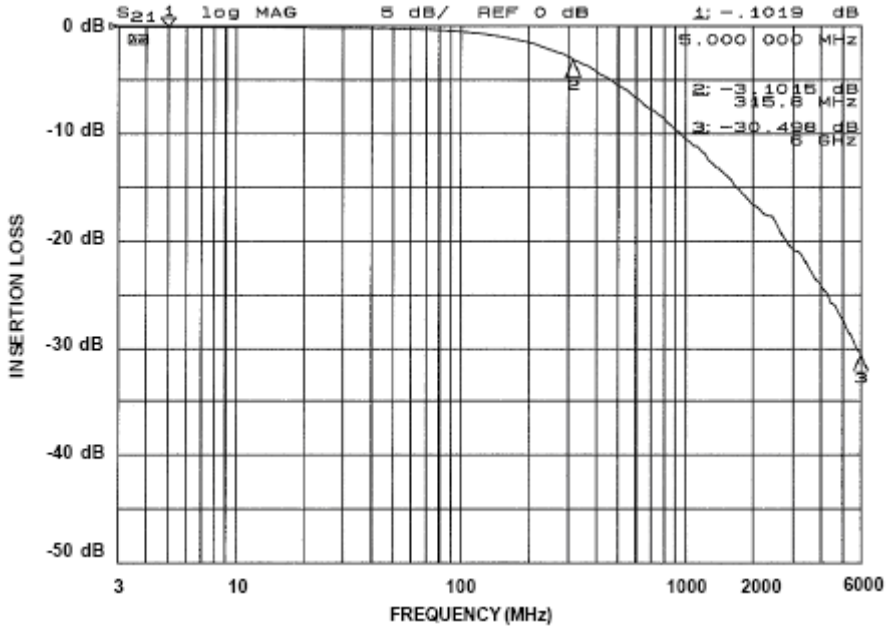


Figure 4. Insertion Loss vs. Frequency, Filter 4 (Pins 4 and 5)

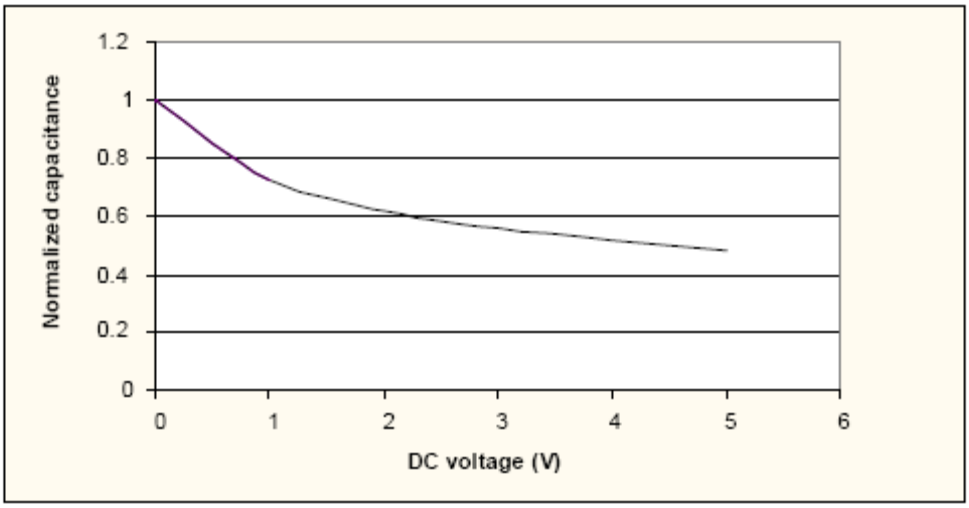


Figure 5. Diode Capacitance vs. Input Voltage (Normalized to Capacitance at 0VDC and 25°C)

Mechanical Details

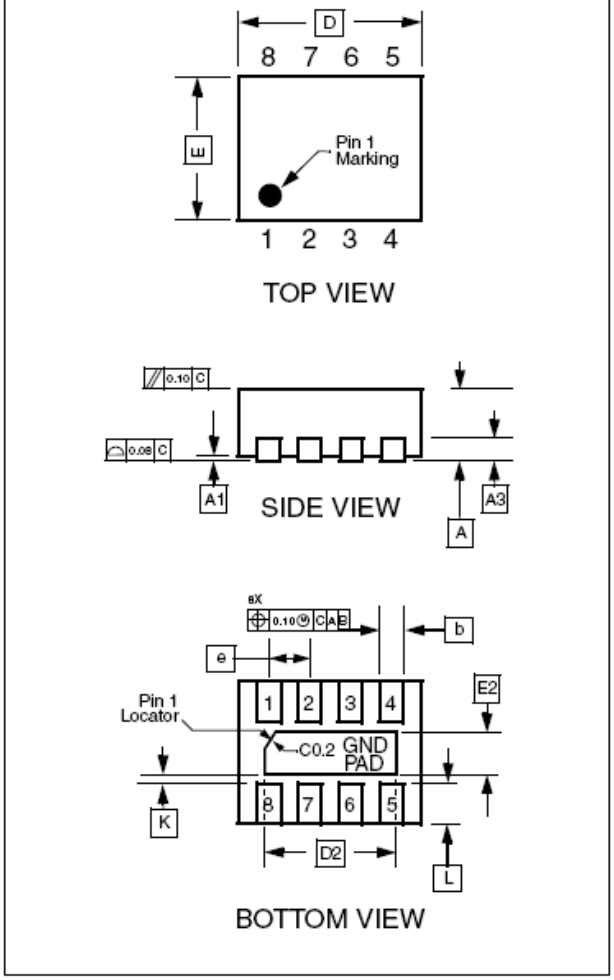
UDFN-08 Mechanical Specifications

Dimensions for the CM1623 supplied in a 8-lead, 0.4mm pitch UDFN package are presented below.

PACKAGE DIMENSIONS						
Package	UDFN					
JEDEC No.	MO-229C†					
Leads	8					
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	1.60	1.70	1.80	0.063	0.067	0.071
D2	1.10	1.20	1.30	0.043	0.047	0.051
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	0.22			0.009		
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.

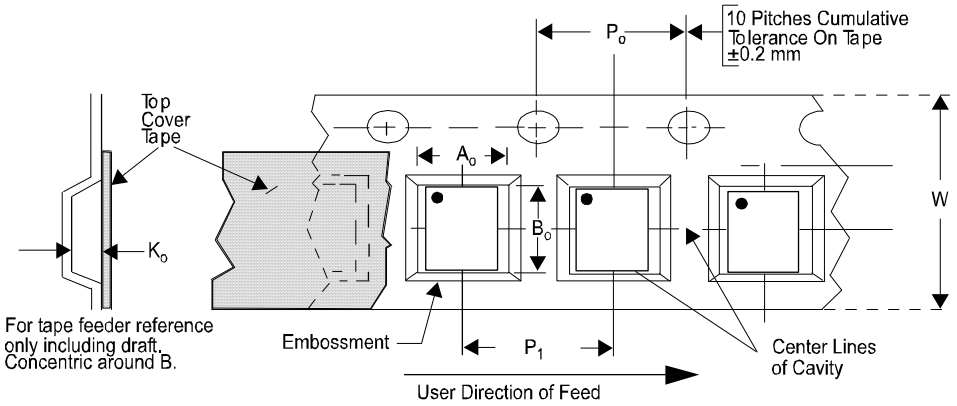
Mechanical Package Diagrams



Dimensions for 8-Lead, 0.4mm pitch UDFN Package

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
CM1623	1.70 X 1.35 X 0.50	1.95 X 1.60 X 0.60	8mm	178mm (7")	3000	4mm	4mm



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