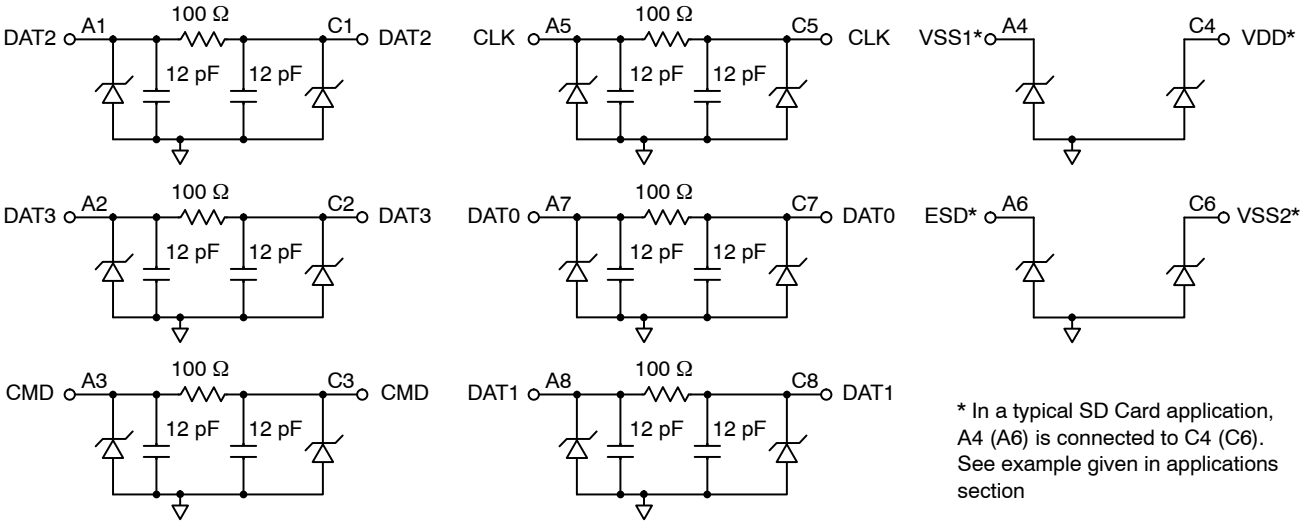
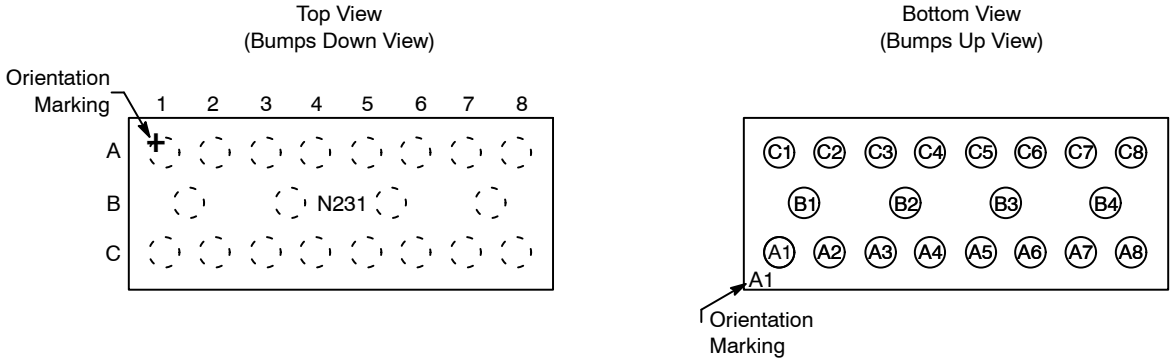
BLOCK DIAGRAM

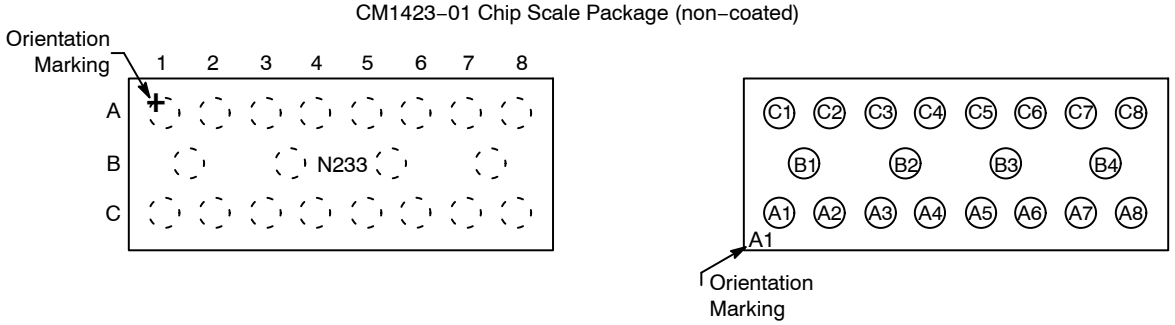


* In a typical SD Card application, A4 (A6) is connected to C4 (C6). See example given in applications section

PACKAGE / PINOUT DIAGRAMS



CM1423−01 Chip Scale Package (non−coated)



CM1423−03 Chip Scale Package (*OptiGuard*™ coated)

Table 1. PIN DESCRIPTIONS

Pin(s)	Name	Description	Pin(s)	Name	Description
A1	DAT2	DATA2 Filter + ESD Channel, System Side	C1	DAT2	DATA2 Filter + ESD Channel, SD Card Side
A2	DAT3	DATA3 Filter + ESD Channel, System Side	C2	DAT3	DATA3 Filter + ESD Channel, SD Card Side
A3	CMD	CMD Signal Filter + ESD Channel, System Side	C3	CMD	CMD Signal Filter + ESD Channel, SD Card Side
A4	VSS1	ESD − only Channel, Supply Voltage Ground	C4	VDD	ESD − only Channel, Supply Voltage
A5	CLK	Clock Filter + ESD Channel	C5	CLK	Clock Filter + ESD Channel
A6	ESD	ESD − only Channel	C6	VSS2	ESD − only Channel, Supply Voltage Ground
A7	DAT0	DATA0 Filter + ESD Channel, System Side	C7	DAT0	DATA0 Filter + ESD Channel, SD Card Side
A8	DAT1	DATA1 Filter + ESD Channel, System Side	C8	DAT1	DATA1 Filter + ESD Channel, SD Card Side
B1−B4	GND	Device Ground			

SPECIFICATIONS

Table 2. 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

Stresses exceeding Maximum Ratings may damage the device. Maximum Ratings are stress ratings only. Functional operation above the Recommended Operating Conditions is not implied. Extended exposure to stresses above the Recommended Operating Conditions may affect device reliability.

Table 3. STANDARD OPERATING CONDITIONS

Parameter	Rating	Units
Operating Temperature Range	−40 to +85	°C

Table 4. ELECTRICAL OPERATING CHARACTERISTICS (Note 1)

Symbol	Parameter	Conditions	Min	Typ	Max	Units
R	Resistance		80	100	120	Ω
C	Capacitance	At 2.5 V DC, 1 MHz, 30 mV AC	9	12	15	pF
V_{DIODE}	Diode Stand−off Voltage	I_{DIODE} = 10 μA		6.0		V
I_{LEAK}	Diode Leakage Current (Reverse Bias)	V_{DIODE} = 3.3 V		100	300	nA
V_{SIG}	Signal Voltage Positive Clamp Negative Clamp	 I_{LOAD} = 10 mA I_{LOAD} = −10 mA	 5.6 −1.5	 6.8 −0.8	 9.0 −0.4	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	(Note 2)	 ±30 ±15			kV
R_{DYN}	Dynamic Resistance Positive Negative			 1.6 0.4		Ω
f_C	Cut−off Frequency, Z_{SOURCE} = 50 Ω, Z_{LOAD} = 50 Ω	R = 100 Ω, C = 12 pF		145		MHz

1. T_A = 25°C unless otherwise specified.
2. ESD applied to input and output pins with respect to GND, one at a time.

PERFORMANCE INFORMATION

Typical Filter Performance (nominal conditions unless specified otherwise, 50 Ω Environment)

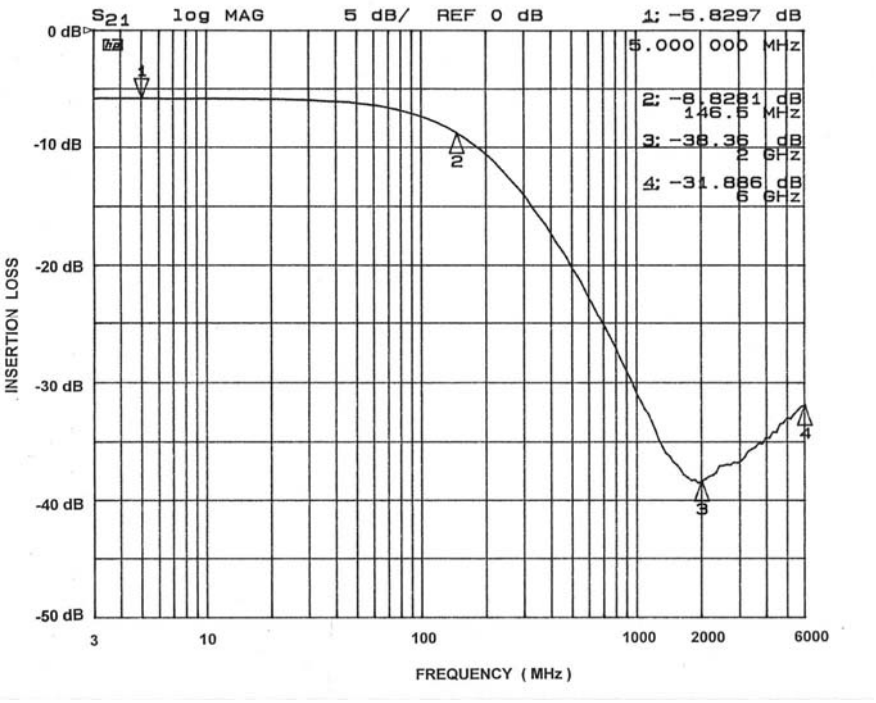


Figure 1. A1−C1 EMI Filter Performance

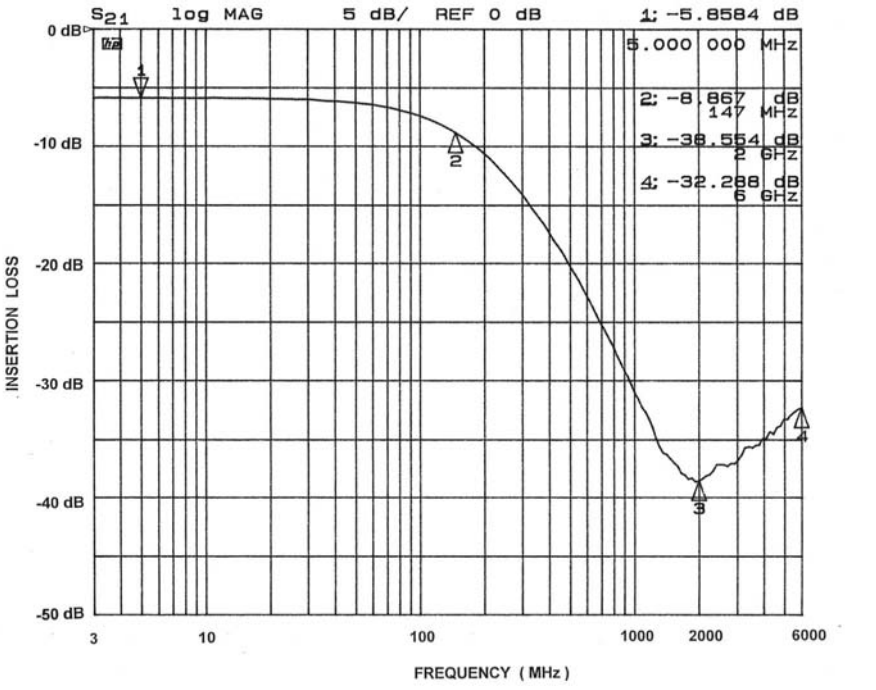


Figure 2. A2−C2 EMI Filter Performance

PERFORMANCE INFORMATION (Cont'd)

Typical Filter Performance (nominal conditions unless specified otherwise, 50 Ω Environment)

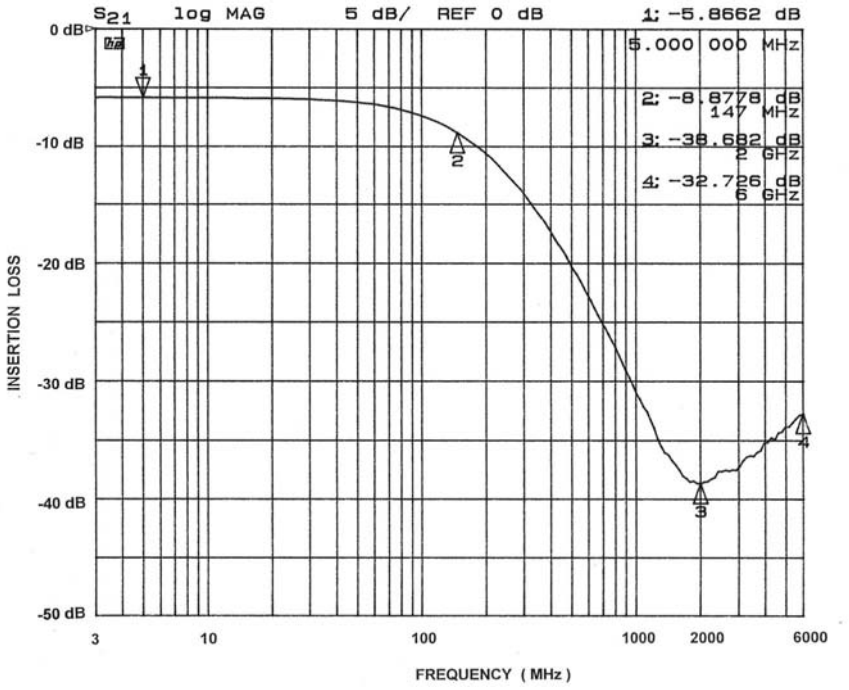


Figure 3. A3−C3 EMI Filter Performance

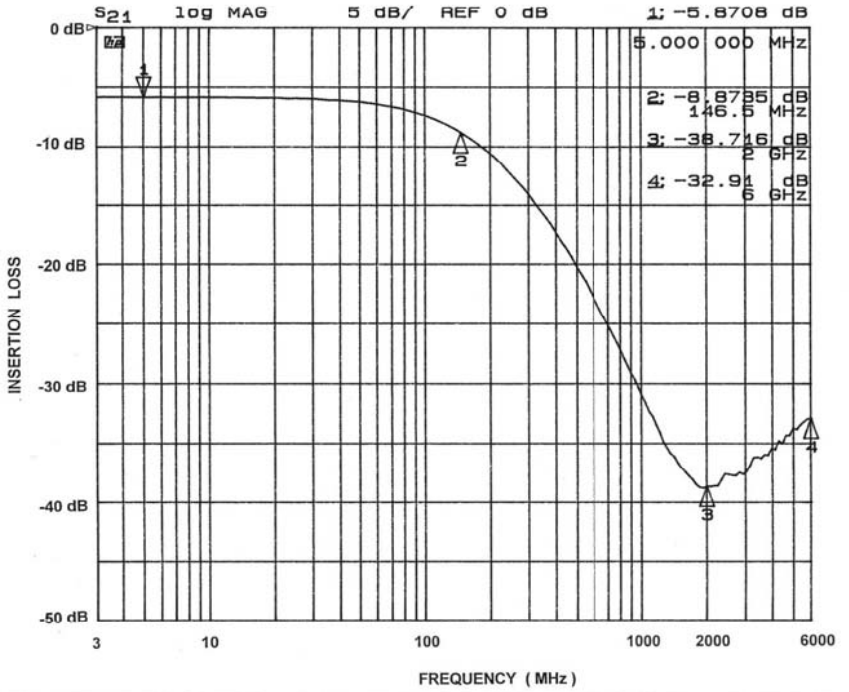


Figure 4. A5−C5 EMI Filter Performance

PERFORMANCE INFORMATION (Cont'd)

Typical Filter Performance (nominal conditions unless specified otherwise, 50 Ω Environment)

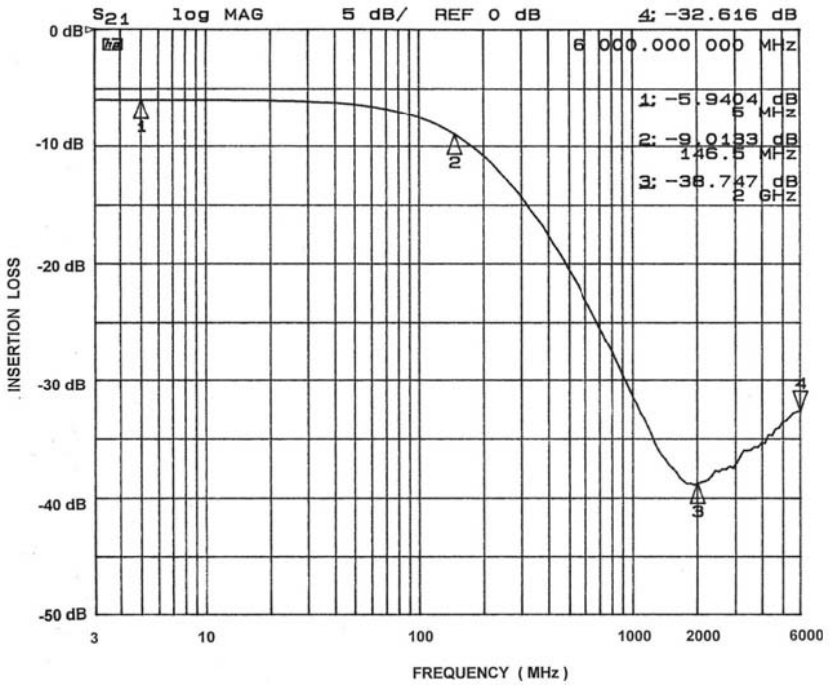


Figure 5. A7−C7 EMI Filter Performance

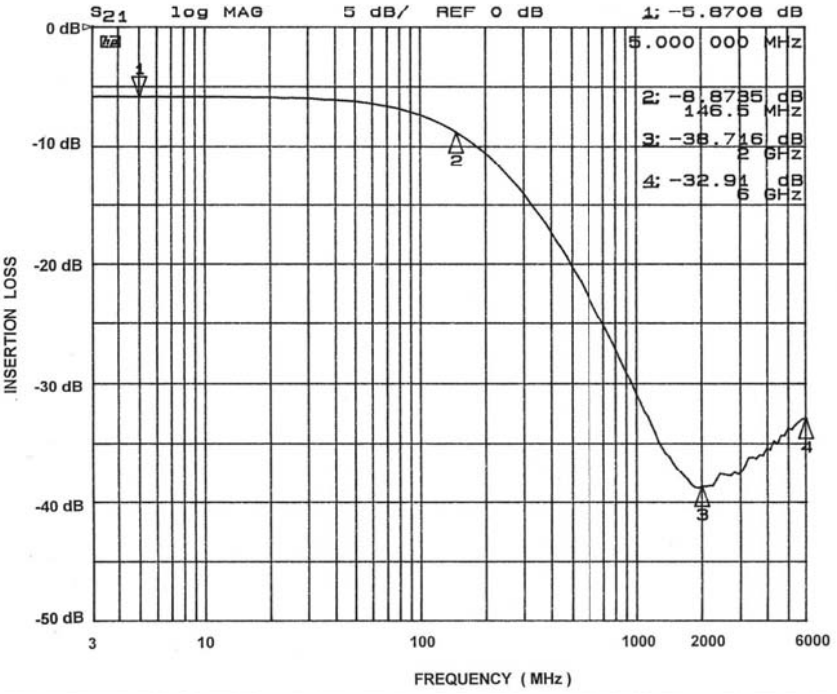


Figure 6. A8−C8 EMI Filter Performance

PERFORMANCE INFORMATION (Cont'd)

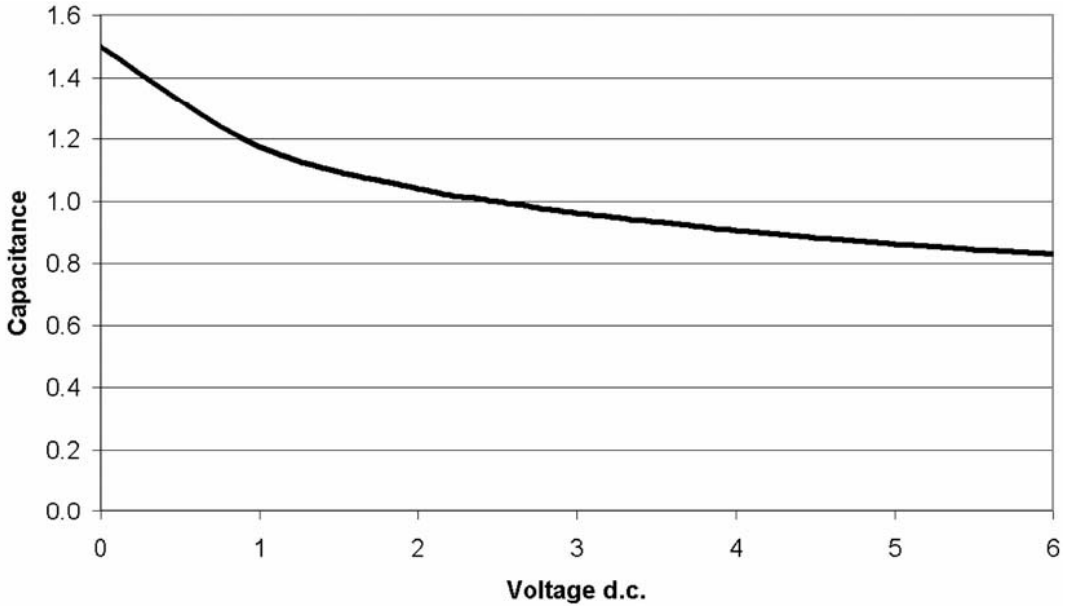
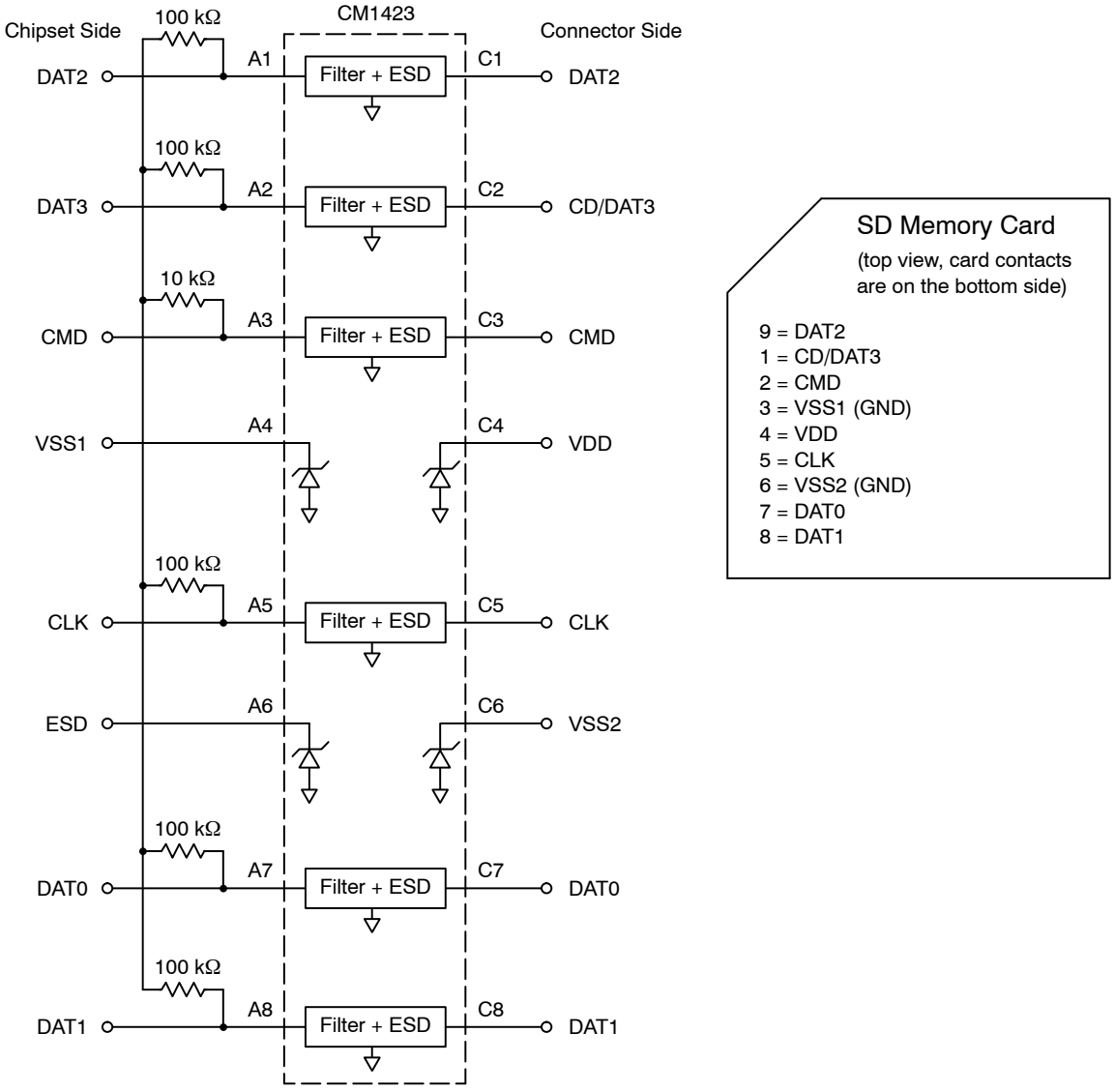


Figure 7. Filter Capacitance vs. Input Voltage over Temperature (normalized to capacitance at 2.5 V DC and 25°C)

APPLICATION INFORMATION



Note: 100 kΩ and 10 kΩ pull−up resistors are not included in CM1423. Designer will need to determine the appropriate pull−up resistor value for each design.

Figure 8. Typical SD Card Application

APPLICATION INFORMATION (Cont'd)

Parameter	Value
Pad Size on PCB	0.240 mm
Pad Shape	Round
Pad Definition	Non−Solder Mask defined pads
Solder Mask Opening	0.290 mm Round
Solder Stencil Thickness	0.125 mm − 0.150 mm
Solder Stencil Aperture Opening (laser cut, 5% tapered walls)	0.300 mm Round
Solder Flux Ratio	50/50 by volume
Solder Paste Type	No Clean
Pad Protective Finish	OSP (Entek Cu Plus 106A)
Tolerance − Edge To Corner Ball	±50 μm
Solder Ball Side Coplanarity	±20 μm
Maximum Dwell Time Above Liquidous	60 seconds
Maximum Soldering Temperature for Lead−free Devices using a Lead−free Solder Paste	260°C

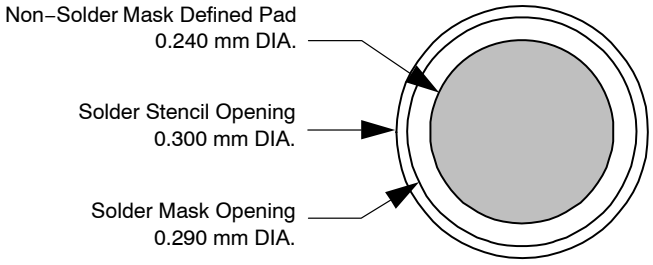


Figure 9. Recommended Non−Solder Mask Defined Pad Illustration

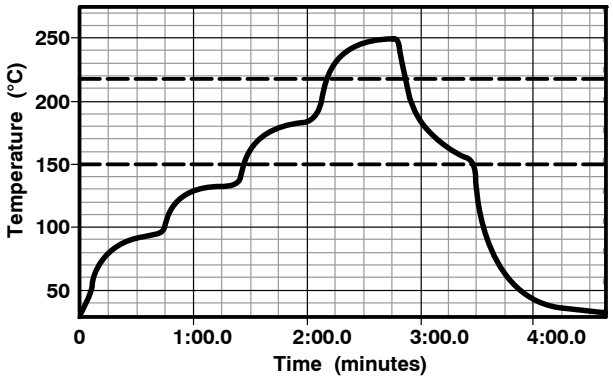
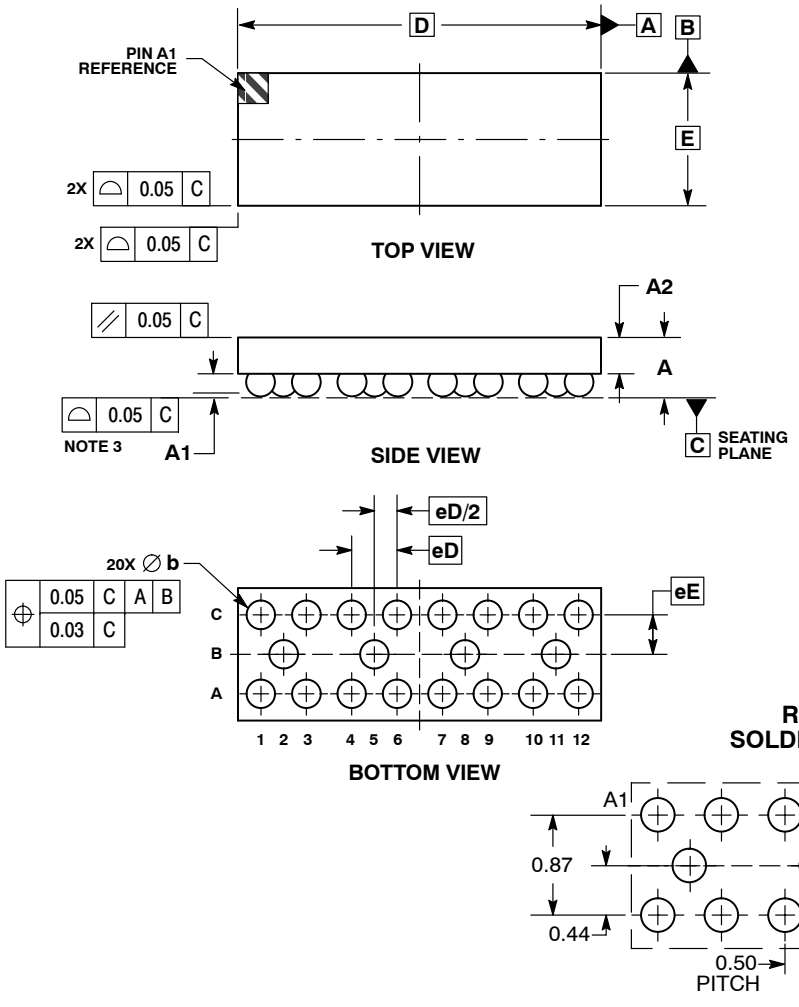


Figure 10. Lead−free (SnAgCu) Solder Ball Reflow Profile

PACKAGE DIMENSIONS

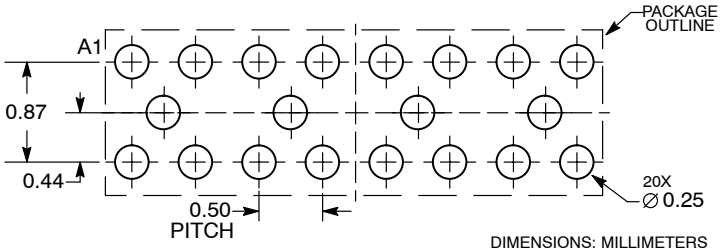
WLCSP20, 4.00x1.46
CASE 567BZ−01
ISSUE O



NOTES:
1. DIMENSIONING AND TOLERANCING PER ASME Y14.5M, 1994.
2. CONTROLLING DIMENSION: MILLIMETERS.
3. COPLANARITY APPLIES TO SPHERICAL CROWNS OF SOLDER BALLS.

	MILLIMETERS	
DIM	MIN	MAX
A	0.56	0.65
A1	0.21	0.27
A2	0.40 REF	
b	0.29	0.35
D	4.00 BSC	
E	1.46 BSC	
eD	0.50 BSC	
eE	0.435 BSC	

RECOMMENDED SOLDERING FOOTPRINT*



DIMENSIONS: MILLIMETERS

*For additional information on our Pb−Free strategy and soldering details, please download the ON Semiconductor Soldering and Mounting Techniques Reference Manual, SOLDERRM/D.

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PUBLICATION ORDERING INFORMATION

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