Dual Channel EMI Filter with ESD Protection

Features

- Two 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 30dB attenuation (typical) at 1GHz
- 6-lead SOT-563 package
- Available with 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
- LCD and camera modules

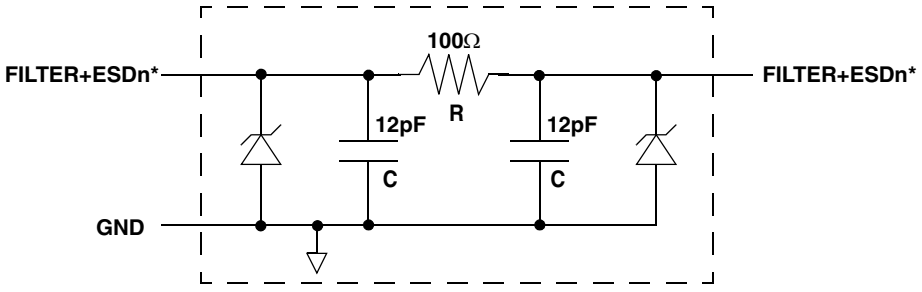
Product Description

The CM1485 is a 2 channel pi-style EMI filter array with ESD protection, housed in a 6-lead SOT-563 package. The CM1485 has component values of 12pF-100Ω-12pF per channel. The CM1485 has a cut-off frequency of 125MHz and can be used in applications with data rates up to 48Mbps. The parts include ESD diodes on every pin, which provide a very high level of protection for sensitive electronic components that may be subjected to electrostatic discharge (ESD). The ESD protection diodes safely dissipate ESD strikes of ±15kV, well beyond the maximum requirement of the IEC61000-4-2 international standard. Using the MIL-STD-883 (Method 3015) specification for Human Body Model (HBM) ESD, the pins are protected for contact discharges at greater than ±30kV.

This device is particularly well-suited for portable electronics (e.g. wireless handsets, PDAs, notebook computers) because of its small package and easy-to-use pin assignments. In particular, the CM1485 is ideal for EMI filtering and protecting data and control lines for the I/O data ports, LCD display and camera interface in mobile handsets.

The CM1485 is housed in a small, 6-lead SOT-563 package and is available with lead-free finishing.

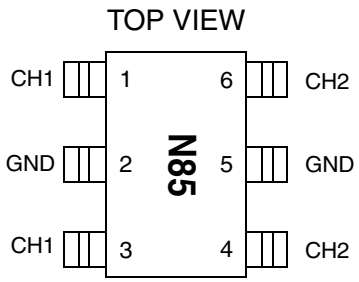
Electrical Schematic



1 of 2 EMI/RFI + ESD Channels

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

PACKAGE / PINOUT DIAGRAMS



6-lead SOT-563

Notes:
1) These drawings are not to scale.

PIN DESCRIPTIONS

Pin	NAME	DESCRIPTION
1	FILTER1	Filter + ESD Channel 1
2	GND	Ground (1)
3	FILTER1	Filter + ESD Channel 1
4	FILTER2	Filter + ESD Channel 2
5	GND	Ground (1)
6	FILTER2	Filter + ESD Channel 2

Note 1: Pin 2 and Pin 5 must be well grounded at the same time.

Ordering Information

PART NUMBERING INFORMATION

Pins	Package	Lead-free Finish	
		Ordering Part Number[1]	Part Marking
6	SOT-563	CM1485-02SE	N85

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	0.15	W

STANDARD OPERATING CONDITIONS		
PARAMETER	**RATING**	**UNITS**
Operating Temperature Range	–40 to +85	°C

ELECTRICAL OPERATING CHARACTERISTICS(1)						
SYMBOL	**PARAMETER**	**CONDITIONS**	**MIN**	**TYP**	**MAX**	**UNITS**
R	Resistance		90	100	110	Ω
C_{TOTAL}	Total Channel Capacitance	At 2.5VDC Reverse Bias, 1MHz, 30mVAC	19.2	24	28.8	pF
I_{LEAK}	Diode Leakage Current (reverse bias)	V_{DIODE} = +3.0V			1.0	µA
V_{BR}	Breakdown Voltage Positive Clamp	I_{LOAD} = 1mA	6.0	7.0		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	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} = 50Ω, Z_{LOAD} = 50Ω			125		MHz
A_{1GHz}	Absolute Attenuation @ 1GHz from 0dB Level	Z_{SOURCE} = 50Ω, Z_{LOAD} = 50Ω, DC Bias = 0V; See Notes 1, 4, & 5		35		dB
$A_{800MHz - 6GHz}$	Absolute Attenuation @ 800MHz to 6GHz from 0dB Level	Z_{SOURCE} = 50Ω, Z_{LOAD} = 50Ω, DC Bias = 0V; See Notes 1, 4, & 5		30		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°C, DC Bias = 0V, 50 Ohm Environment)

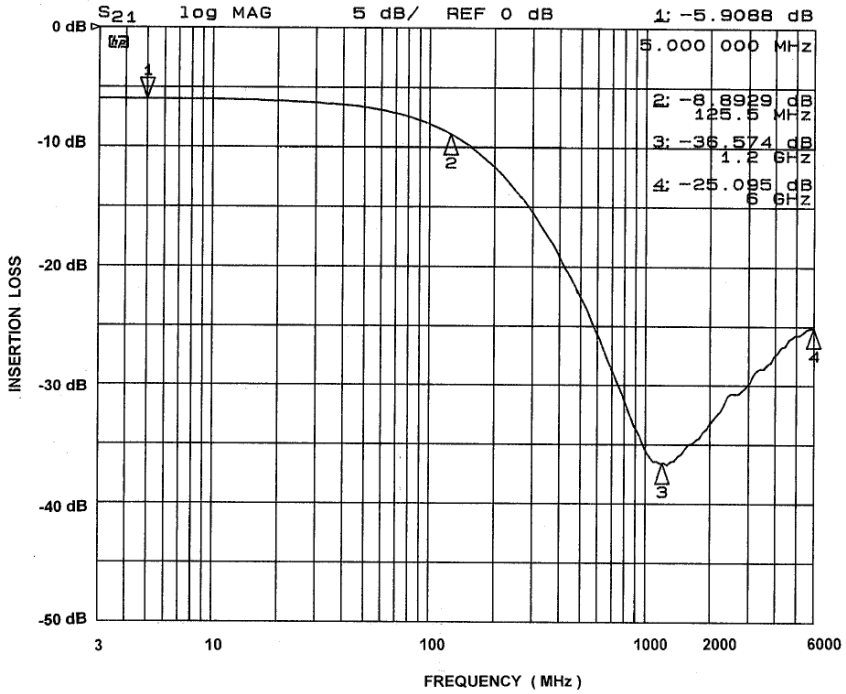


Figure 1. Insertion Loss vs. Frequency (FILTER1 Input to GND)

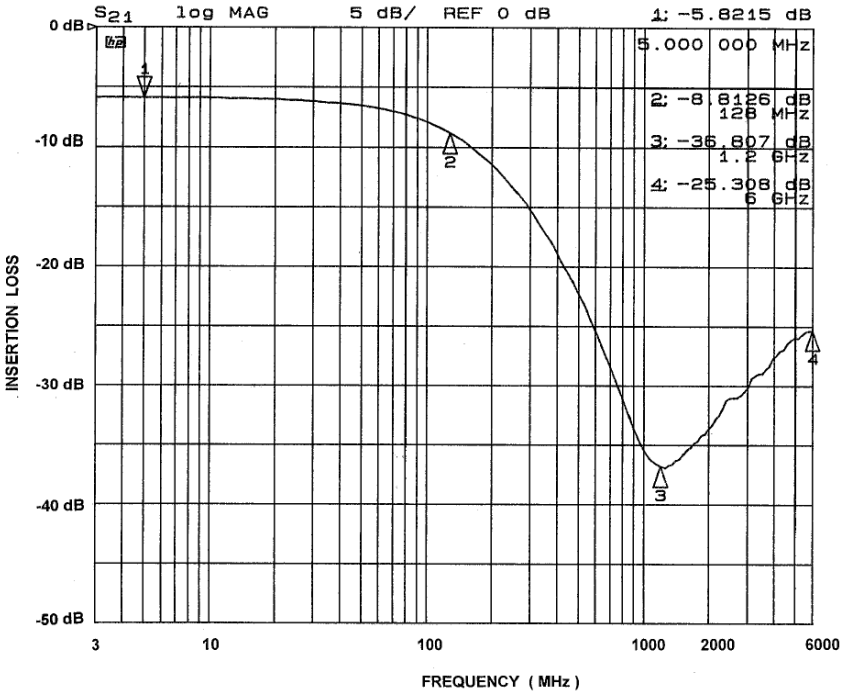


Figure 2. Insertion Loss vs. Frequency (FILTER2 Input to GND)

Performance Information (cont'd)

Typical Diode Capacitance vs. Input Voltage

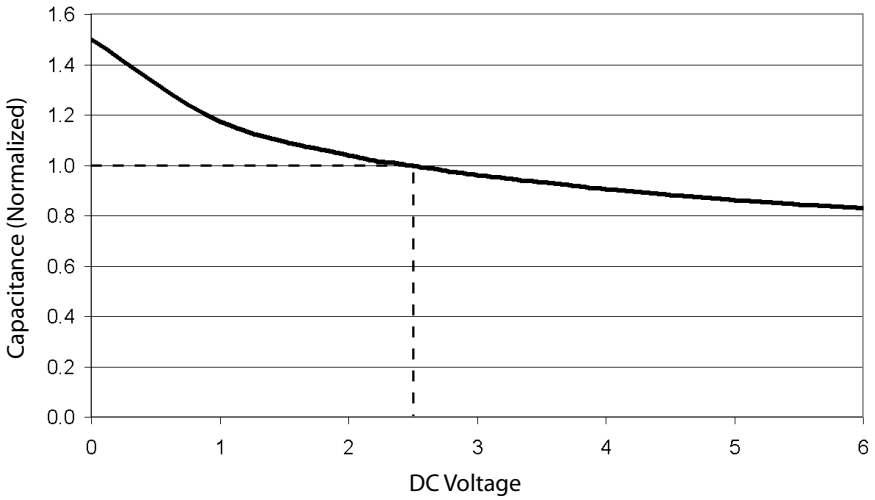


Figure 3. Filter Capacitance vs. Input Voltage (normalized to capacitance at 2.5VDC and 25°C)

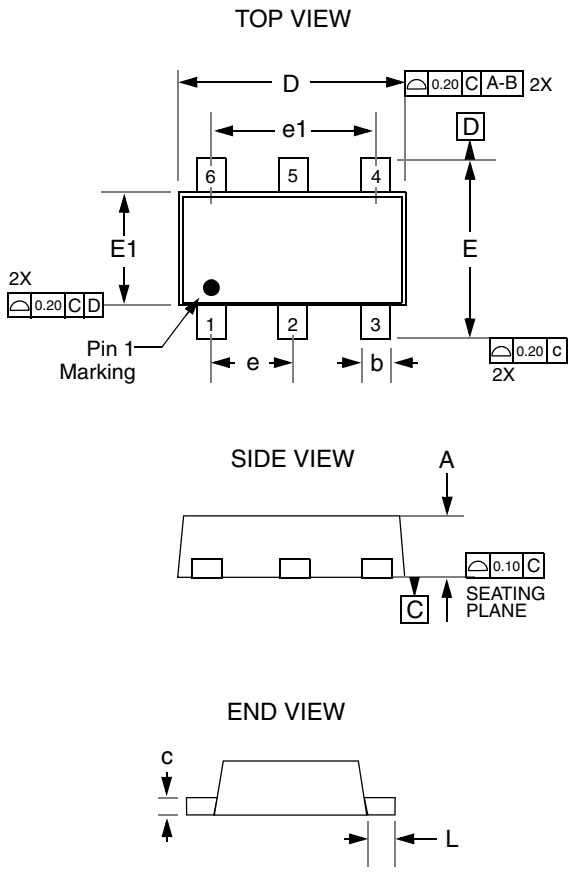
Mechanical Details

SOT-563 Mechanical Specifications

The CM1485 is supplied in a 6-pin SOT-563 package. Dimensions are presented below.

PACKAGE DIMENSIONS						
Package	SOT-563					
Leads	6					
Dim.	**Millimeters**			**Inches**		
	Min	**Nom**	**Max**	**Min**	**Nom**	**Max**
A	0.50	0.55	0.60	0.020	0.022	0.024
b	0.17		0.27	0.007		0.011
c	0.08		0.18	0.003		0.007
D	1.60 BSC			0.063 BSC		
E	1.50	1.60	1.70	0.059	0.063	0.067
E1	1.20 BSC			0.047 BSC		
e	0.50 BSC			0.020 BSC		
e1	1.00 BSC			0.040 BSC		
L	0.20 BSC			0.008 BSC		
# per tape and reel	5000 pieces					
Controlling dimension: millimeters						

Mechanical Package Diagrams



* For best results, both grounds should be connected

Package Dimensions for SOT-563