



# 2-Channel EMI Filter with ESD Protection for Headsets/Speakers

## CM1481

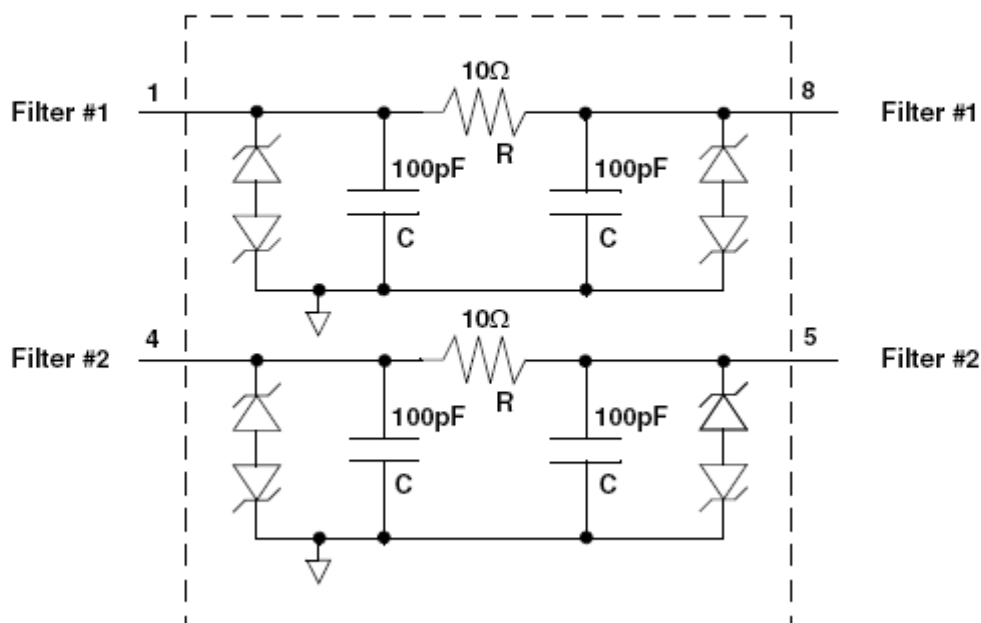
### Features

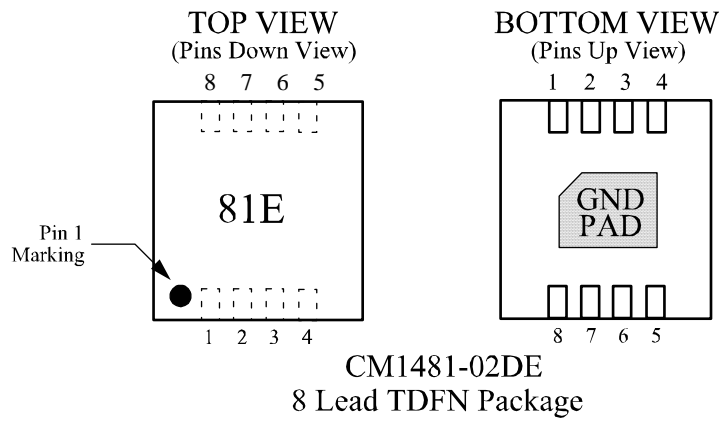
- Two channels of EMI filtering
- Pi-style filters in a capacitor-resistor-capacitor (C-R-C) network
- $\pm 8\text{kV}$  ESD protection (IEC 61000-4-2, contact discharge)
- $\pm 15\text{kV}$  ESD protection (HBM)
- Supports AC signals - ideal for audio applications
- Greater than 40dB of attenuation at 1GHz
- 8-lead, 2.00mm x 2.00mm footprint TDFN Package
- Low profile maximum height of 0.8mm
- RoHS-compliant, lead-free finishing

### Applications

- Headset speaker port 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.

### Electrical Schematic





Note: This drawing is not to scale.

### PIN DESCRIPTIONS

PIN	NAME	DESCRIPTION
1	Filter #1	Filter #1
2	NC	No connect
3	NC	No connect
4	Filter #2	Filter #2
5	Filter #2	Filter #2
6	NC	No connect
7	NC	No connect
8	Filter #1	Filter #1
DAP	GND	Ground

CM1481

## Ordering Information

### PART NUMBERING INFORMATION

Pins	Package	Lead-free Finish	
		Ordering Part Number <sup>1</sup>	Part Marking
8	TDFN	CM1481 -02DE	81E

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 package power rating	0.5	W

### STANDARD OPERATING CONDITIONS

PARAMETER	RATING	UNITS
Operating Temperature Range	-40 to +85	°C

**ELECTRICAL OPERATING CHARACTERISTICS** (NOTE 1)

SYMBOL	PARAMETER	CONDITIONS	MIN	TYP	MAX	UNITS
R	Resistance R		8	10	12	$\Omega$
$R_{MATCH}$	Resistor-to-Resistor Matching				5	%
$C_{TOT}$	Total Channel Capacitance	2.5V DC; 1MHz, 30mV AC	160	200	240	pF
C	Capacitance C			100		pF
$I_{LEAK}$	Diode Leakage Current	$V_{IN} = \pm 5.0V$		0.1	1.0	$\mu A$
$V_{SIG}$	Signal Clamp Voltage Positive Clamp Negative Clamp	$I_{LOAD} = 10mA$ $I_{LOAD} = -10mA$	5 -15	7 -10	15 -5	V V
$V_{ESD}$	In-system ESD Withstand Voltage Human Body Model, MIL-STD-883, Method 3015 Contact Discharge per IEC 61000-4-2 Level 4	Note 2	$\pm 15$ $\pm 8$			kV kV
$f_C$	Cut-off frequency $Z_{SOURCE} = 50\Omega$ , $Z_{LOAD} = 50\Omega$	$R = 10\Omega$ , $C = 100pF$		31		MHz

Note 1:  $T_A = 25^\circ C$  unless otherwise specified.

Note 2: ESD applied to input and output pins with respect to GND, one at a time. Clamping voltage is measured at the opposite side of the EMI filter to the ESD pin (i.e. if ESD is applied to pin 1 then clamping voltage is measured at pin 8).

## Performance Information

Typical Filter Performance (nominal conditions unless specified otherwise, 50 ohm environment)

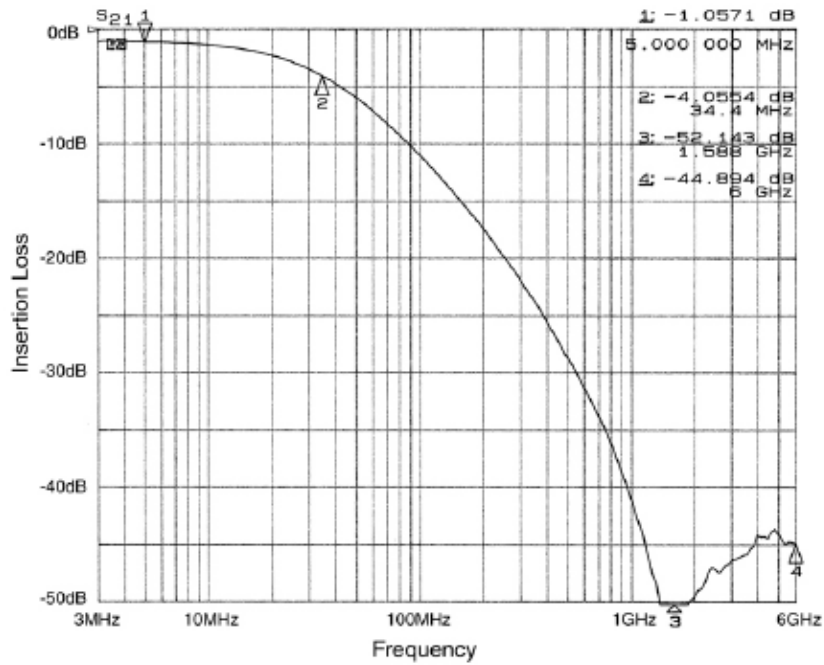


Figure 1. Insertion Loss vs. Frequency (Filter #1 to GND B2)

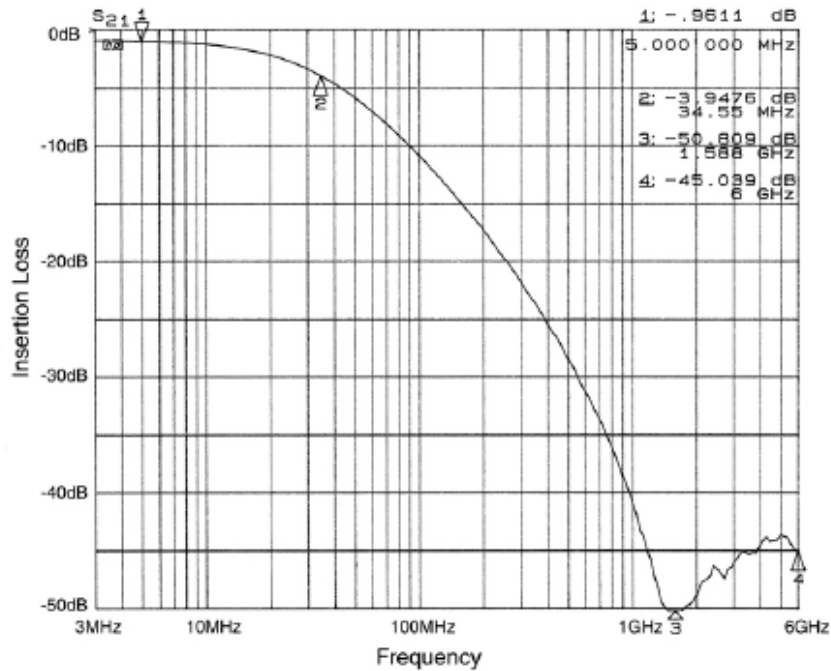


Figure 2. Insertion Loss vs. Frequency (Filter #2 to GND B2)

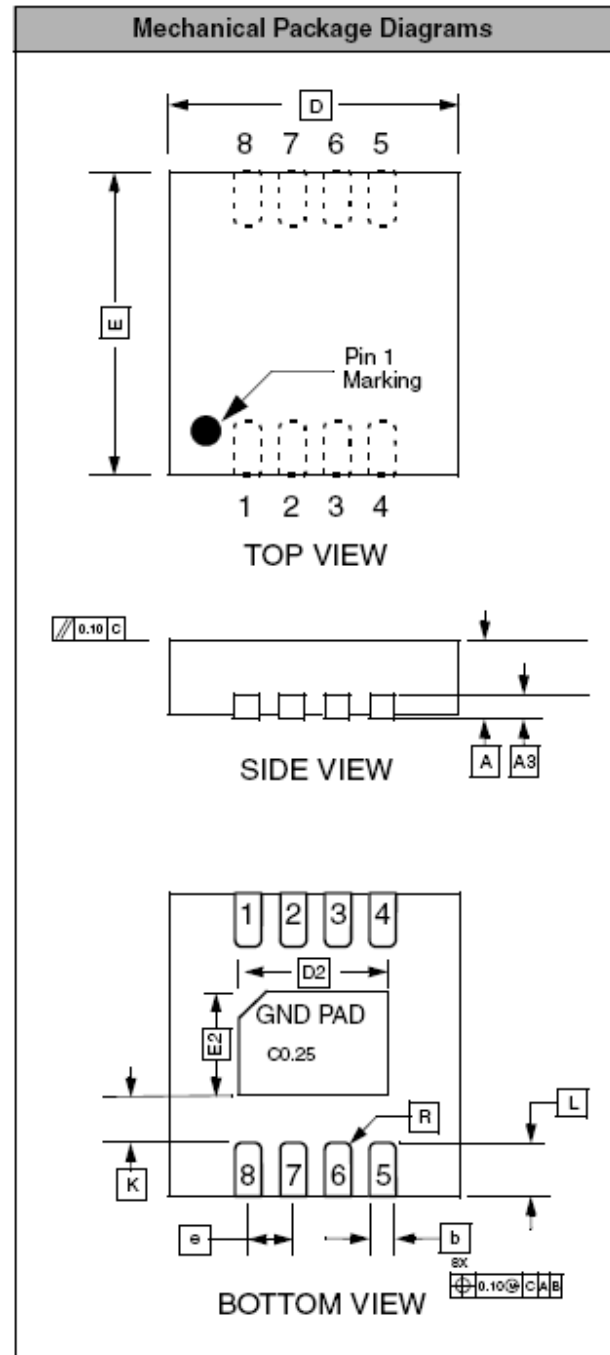
## Mechanical Details

### TDFN-08 Mechanical Specifications, 0.5mm


The CM1481 is supplied in an 8-lead 0.5mm TDFN package. Dimensions are presented below.

PACKAGE DIMENSIONS						
Package	TDFN					
JEDEC No.	MO-229 (Var. VCCD-3)*					
Leads	8					
Dim.	Millimeters			Inches		
	Min	Nom	Max	Min	Nom	Max
A	0.70	0.75	0.80	0.028	0.030	0.031
A3	0.20 REF			0.008 REF		
b	0.20	0.25	0.30	0.008	0.010	0.012
D	1.90	2.00	2.10	0.075	0.079	0.083
D2	1.50	1.60	1.70	0.059	0.063	0.067
E	1.90	2.00	2.10	0.075	0.079	0.083
E2	0.80	0.90	1.00	0.031	0.035	0.039
e	0.50 BSC			0.020 BSC		
K	0.25 REF			0.10 REF		
L	0.20	0.30	0.40	0.008	0.012	0.016
# per tape and reel	3000 pieces					
Controlling dimension: millimeters						

\* This package is compliant with JEDEC standard MO-229, variation VCCD-3 with exception of the D2 and E2 dimensions as called out in the table above which are not specified in the MO-229 standard.



Package Dimensions for 8-Lead, 0.5mm pitch TDFN package

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