Headset/Speaker EMI Filter with ESD Protection

CM1416

Features

- Functionally and pin compatible with the CSPEMI201A and CM1411
- *OptiGuard*™ coated for improved reliability at assembly
- Two channels of EMI filtering for 8Ω speakers
- Pi-style EMI filters in a capacitor-resistor-capacitor (C-R-C) network
- Greater than 30dB attenuation at 1GHz
- ±30kV ESD protection on each channel per IEC 61000-4-2 Level 4, contact discharge
- Extremely low lead inductance for optimum filter and ESD performance
- 5-bump, 0.96mm X 1.33mm footprint Chip Scale Package (CSP)
- 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.

Product Description

The CM1416 is an EMI filter array with ESD protection, which integrates two Pi-filters (C-R-C). The CM1416 has component values of 117pF-2 - 117pF. The parts include avalanche-type ESD diodes on every pin, which provide a very high level of

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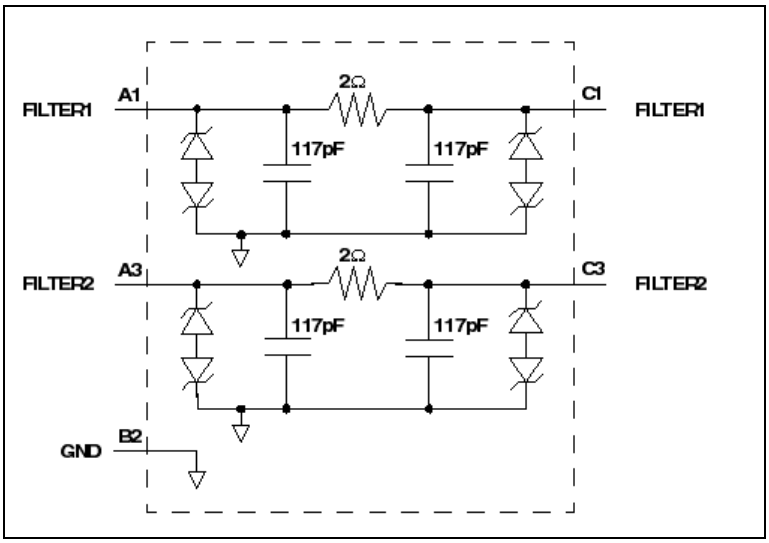
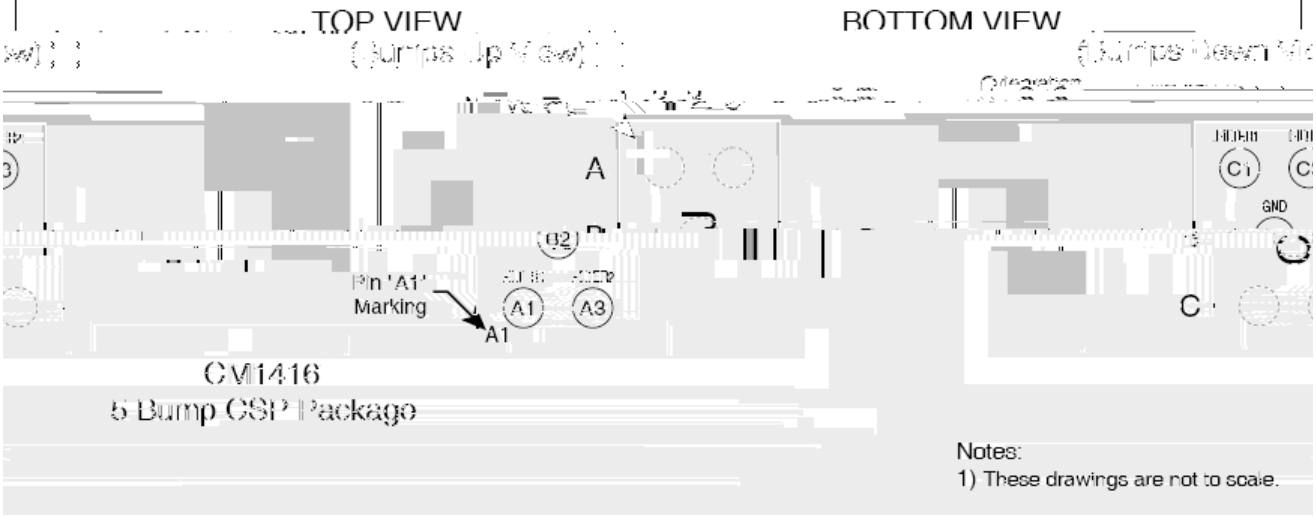
Publication Order Number:
CM1416/D

Block Diagram



PACKAGE / PINOUT DIAGRAMS



PIN DESCRIPTIONS		
PIN	**NAME**	**DESCRIPTION**
A1	FILTER1	EMI FIlter 1
A3	FILTER2	EMI FIlter 2
B2	GND	Device Ground
C1	FILTER1	EMI FIlter 1
C3	FILTER2	EMI FIlter 2

Ordering Information

PART NUMBERING INFORMATION			
		Lead-free Finish	
Pins	**Package**	**Ordering Part Number[1]**	**Part Marking**
5	CSP	CM1416-03CP	CJ

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 (note 5)	100	mW
DC Package Power Rating (note 5)	500	mW

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

ELECTRICAL OPERATING CHARACTERISTICS (SEE NOTE 1)

SYMBOL	PARAMETER	CONDITIONS	MIN	TYP	MAX	UNITS
R	R1 Resistance			2		Ω
C_{TOT}	Total Channel Capacitance	At 2.5VDC, 1MHz, 30mVAC	187	234	281	pF
C_1	C1 Capacitance	At 2.5VDC, 1MHz, 30mVAC	93	117	140	pF
V_{DIODE}	Diode Standoff Voltage	I_{DIODE} = 10 A		6.0		V
I_{LEAK}	Diode Leakage Current	V_{IN}= 3.3V (reverse bias voltage)		0.1	2	μA
V_{SIG}	Signal Clamp Voltage Positive Clamp Negative Clamp	 I_{LOAD} = 10mA I_{LOAD} = -10mA	 6.4 -9.8	 7.6 -7.6	 9.8 -6.4	 V 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 ±30			

Application Information

PARAMETER	VALUE
Pad Size on PCB	0.240mm
Pad Shape	Round
Pad Definition	Non-Solder Mask defined pads
Solder Mask Opening	0.290mm Round
Solder Stencil Thickness	0.125mm - 0.150mm
Solder Stencil Aperture Opening (laser cut, 5% tapered walls)	0.300mm Round

Mechanical Details

CSP Mechanical Specifications

The CM1416 is supplied in a custom Chip Scale Package (CSP). Dimensions are presented below.

PACKAGE DIMENSIONS						
Package	Custom CSP					
Bumps	5					
Dim	**Millimeters**			**Inches**		
	Min	**Nom**	**Max**	**Min**	**Nom**	**Max**