

8-channel LCD & Camera EMI Filter with ESD Protection Chip Scale Packaging (CSP)

Features

- Eight (8) Low pass EMI filters with excellent attenuation at high frequencies
- ESD protection at 15KV per IEC61000
- 20-bump CSP device (3.160mm x 1.053mm)
- Special back coating for maximum durability
- RoHS Compliant in Lead-Free Versions

Applications

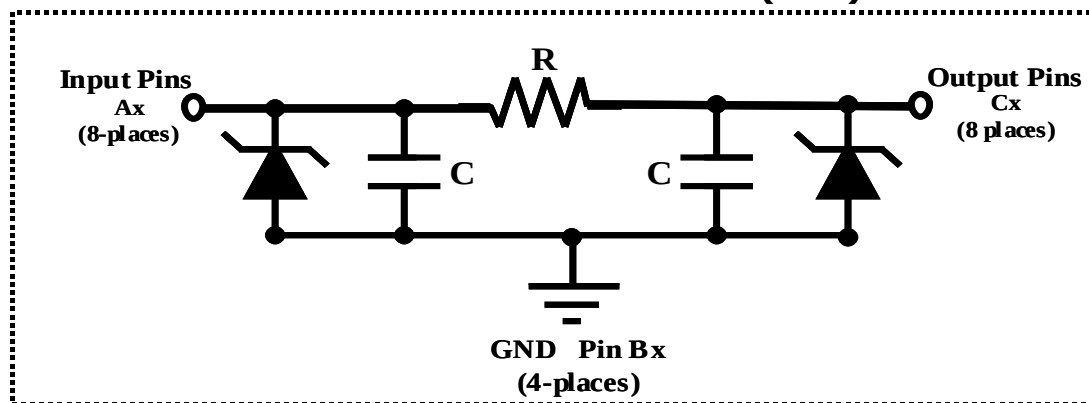
- Cellular Handsets
- PDA
- MP3 Players
- PC & Notebooks
- Smart Cards
- Digital Cameras

Product Description

The OC1442 is an 8-channel pi-style Capacitor-Resistor-Capacitor EMI/RFI Filter with integrated Diodes for electrostatic discharge (ESD) protection. This device offers greater than 30dB attenuation in the 800MHz to 3GHz. The diodes provide a 15kV contact-discharge ESD protection per IEC-61000 specifications.

The device is built in a 20-bump CSP format with 0.4mm pitch and is ideal for portable electronic systems.

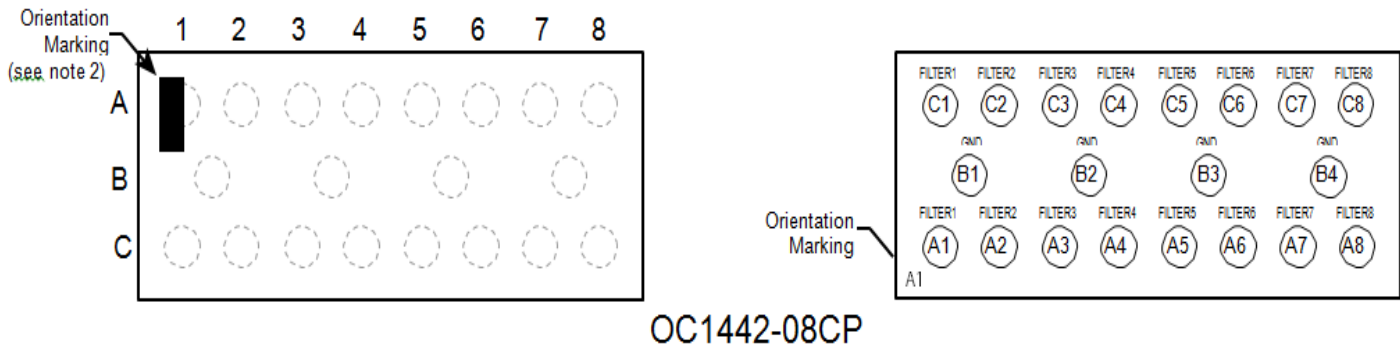
Schematic for Each Channel (Line)



ELECTRICAL CHARACTERISTICS PER LINE @ 25°C Unless Otherwise Specified

PART NUMBER	RATED STAND-OFF VOLTAGE	MINIMUM BREAKDOWN VOLTAGE	MAXIMUM REVERSE LEAKAGE CURRENT	TYPICAL FORWARD VOLTAGE	MINIMUM ATTENUATION @ 800 to 3,000 MHz	CUT-OFF FREQUENCY 50-OHMS SOURCE & LOAD	RESISTANCE R +/-20%	CAPACITANCE C +/-20%
OC1442-08CP	6 Volts	6.8 Volts	0.1 uA	0.8 Volts	-30dB	115 MHz	100-ohms	15-pF

PACKAGE / PINOUT DIAGRAMS



Note: These drawings are not to scale.

PIN DESCRIPTIONS					
PIN(s)	NAME	DESCRIPTION	PIN(s)	NAME	DESCRIPTION
A1	FILTER1	Filter + ESD Channel 1	C1	FILTER1	Filter + ESD Channel 1
A2	FILTER2	Filter + ESD Channel 2	C2	FILTER2	Filter + ESD Channel 2
A3	FILTER3	Filter + ESD Channel 3	C3	FILTER3	Filter + ESD Channel 3
A4	FILTER4	Filter + ESD Channel 4	C4	FILTER4	Filter + ESD Channel 4
A5	FILTER5	Filter + ESD Channel 5	C5	FILTER5	Filter + ESD Channel 5
A6	FILTER6	Filter + ESD Channel 6	C6	FILTER6	Filter + ESD Channel 6
A7	FILTER7	Filter + ESD Channel 7	C7	FILTER7	Filter + ESD Channel 7
A8	FILTER8	Filter + ESD Channel 8	C8	FILTER8	Filter + ESD Channel 8
B1-B4	GND	Device Ground			

ORDERING PART NUMBER					
PART NUMBER	NUMBER OF CHANNELS	PACKAGE TYPE	DEVICE MARKING	T & R Qty	ROHS COMPLIANCE
OC1442-08CP	8	CSP-20	OC1442	3,500/Reel or 6,000/Reel	YES

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
R	Resistance		80	100	120	Ω
C _{TOTAL}	Total Channel Capacitance	At 2.5VDC Reverse Bias, 1MHz, 30mVAC	24	30	36	pF
C	Capacitance C1	At 2.5VDC Reverse Bias, 1MHz, 30mVAC	12	15	18	pF
V _{DIODE}	Standoff Voltage	I _{DIODE} =10μA		6.0		V
I _{LEAK}	Diode Leakage Current (reverse bias)	V _{DIODE} = +3.3V		0.1	1	μA
V _{SIG}	Signal Clamp Voltage Positive Clamp Negative Clamp	I _{LOAD} = 10mA I _{LOAD} = -10mA	5.6 -1.5	6.8 -0.8	9.0 -0.4	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	Notes 2, 3 and 4	±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	R=100Ω, C=15pF		115		MHz

Note 1: T_A=25°C unless otherwise specified.

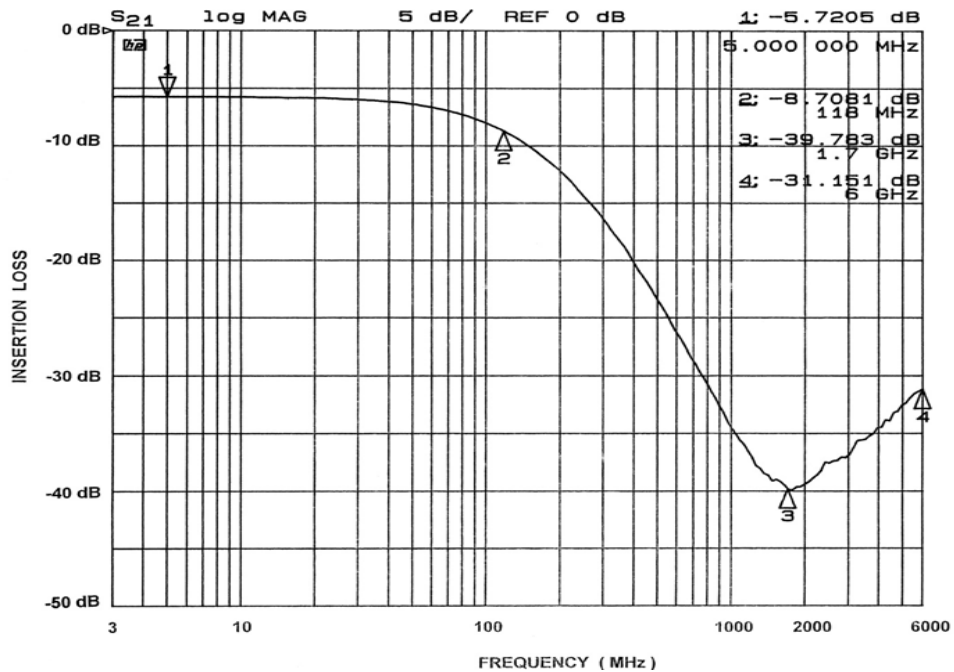
Note 2: ESD applied to input and output pins with respect to GND, one at a time.

Note 3: Unused pins are left open

Note 4: These parameters are guaranteed by design and characterization.

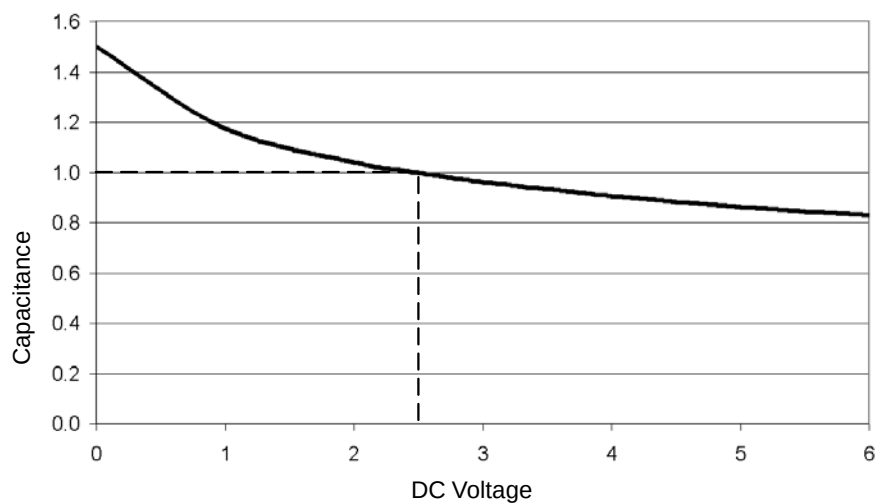
Performance Information

Typical Filter Performance ($T_A=25^\circ\text{C}$, DC Bias=0V, 50 Ohm Environment)



Insertion Loss vs. Frequency

Typical Diode Capacitance vs. Input Voltage

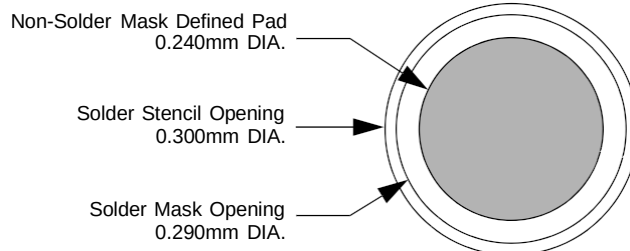


Filter Capacitance vs. Input Voltage
(Normalized to capacitance at 2.5VDC & 25°C)

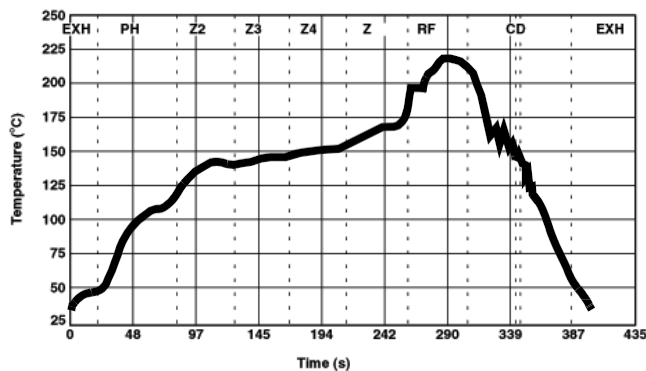
Application Information

PRINTED CIRCUIT BOARD RECOMMENDATIONS

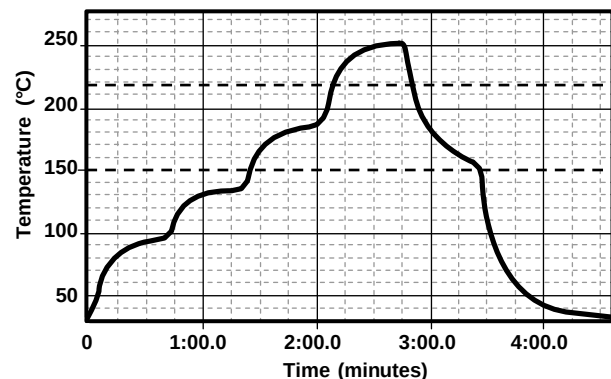
PARAMETER	VALUE
Pad Size on PCB	0.240mm
Pad Shape	Round
Pad Definition	Non-Solder Mask defined pads
Solder Mask Opening	0.290mm Round
Solder Stencil Thickness	0.125mm - 0.150mm
Solder Stencil Aperture Opening (laser cut, 5% tapered walls)	0.300mm Round
Solder Flux Ratio	50/50 by volume
Solder Paste Type	No Clean
Pad Protective Finish	OSP (Entek Cu Plus 106A)
Tolerance — Edge To Corner Ball	$\pm 50\mu\text{m}$
Solder Ball Side Coplanarity	$\pm 20\mu\text{m}$
Maximum Dwell Time Above Liquidous (183°C)	60 seconds
Maximum Soldering Temperature for Eutectic Device using a Eutectic Solder Paste	240°C
Maximum Soldering Temperature for Lead-free Devices using a Lead-free Solder Paste	260°C



Recommended Non-Solder Mask Defined Pad Illustration

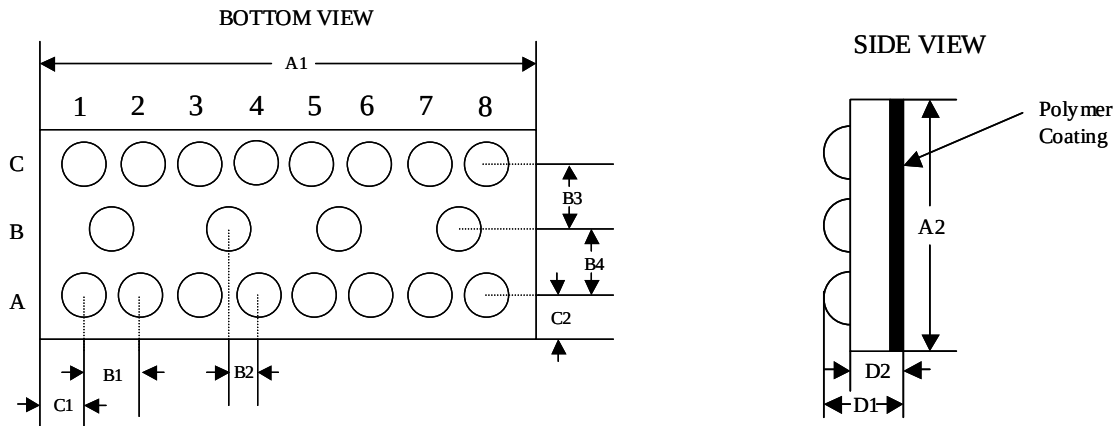


**Eutectic (SnPb) Solder
Ball Reflow Profile**



**Lead-free (SnAgCu) Solder
Ball Reflow Profile**

Mechanical Package Diagram



Package Dimensions						
Dimensions	Millimeters (mm)			Inches (")		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A1	3.115	3.160	3.205	0.1226	0.1244	0.1262
A2	1.008	1.053	1.098	0.0397	0.0415	0.0432
B1	0.395	0.400	0.405	0.0156	0.0157	0.0159
B2	0.195	0.200	0.205	0.0076	0.0078	0.0080
B3	0.342	0.347	0.352	0.0134	0.0136	0.0138
B4	0.342	0.347	0.352	0.0134	0.0136	0.0138
C1	0.130	0.180	0.230	0.0051	0.0071	0.0091
C2	0.130	0.180	0.230	0.0051	0.0071	0.0091
D1	0.575	0.644	0.714	0.0226	0.0254	0.0281
D2	0.368	0.419	0.470	0.0145	0.0165	0.0185
Parts/reel	6,000 or 3,500					
Controlling Dimension: mm						

CSP Tape and Reel Specifications (May Vary)

REEL DIAMETER	QTY PER REEL
330mm (13")	6,000
178mm (7")	3,500