Absolute Maximum Rating

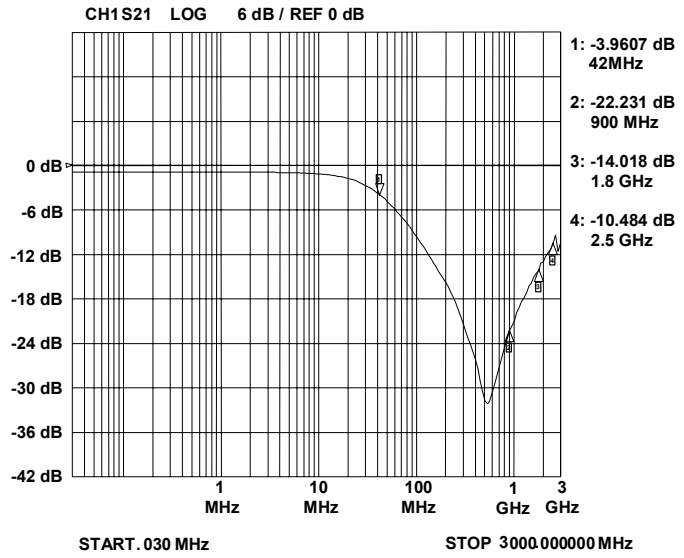
Rating	Symbol	Value	Units
Steady-State Power	P_{ss}	100	mW
ESD per IEC 61000-4-2 (Air) ESD per IEC 61000-4-2 (Contact)	V_{ESD}	>16 >10	kV
Operating Temperature	T_J	-55 to +125	°C
Storage Temperature	T_{STG}	-55 to +150	°C

Electrical Characteristics (T=25°C)

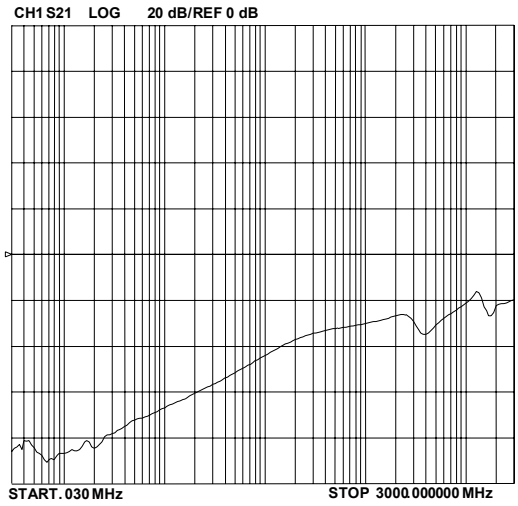
Parameter	Symbol	Conditions	Minimum	Typical	Maximum	Units
TVS Reverse Stand-Off Voltage	V_{RWM}				5	V
TVS Reverse Breakdown Voltage	V_{BR}	I_t = 1mA	6			V
TVS Reverse Leakage Current	I_R	V_{RWM} = 5V, T=25°C			5	µA
Series Resistance	R	Each Line	8.5	10	11.5	Ohms
Total Capacitance	C_{TOT}	Any I/O to Ground V_R = 0V, f = 1MHz			160	pF

Typical Characteristics

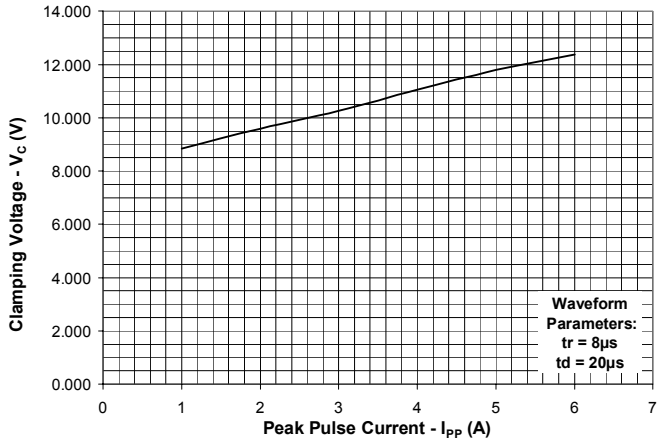
Typical Insertion loss



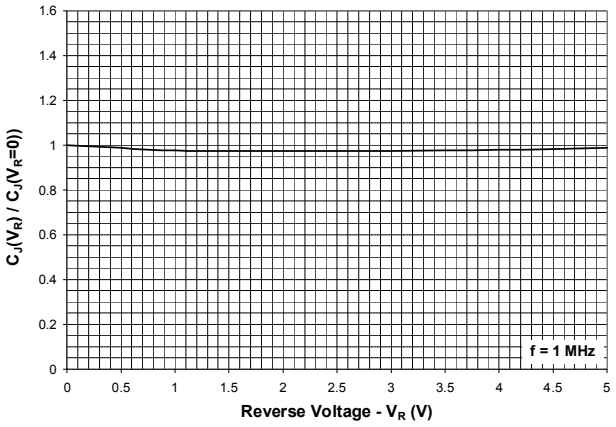
Analog Crosstalk



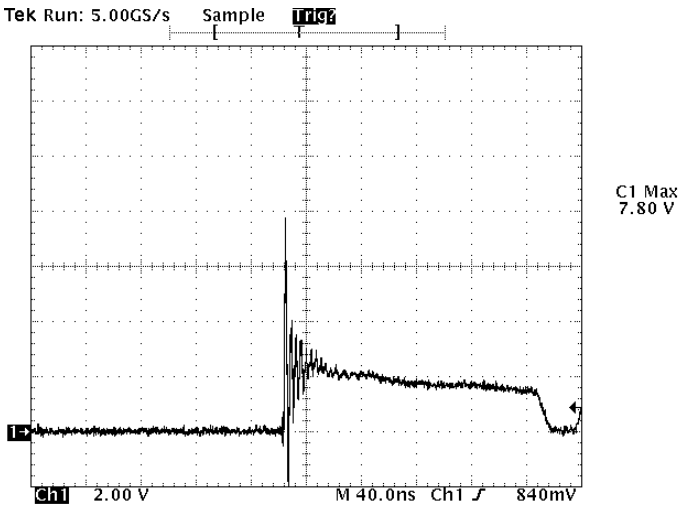
Clamping Voltage vs. Peak Pulse Current



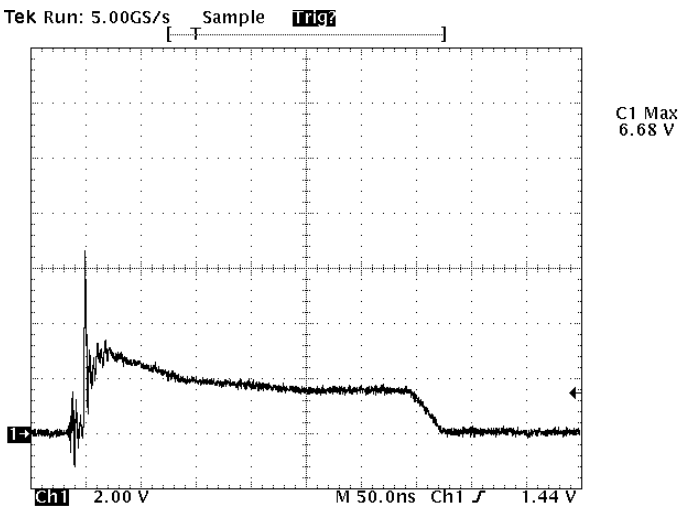
Capacitance vs. Reverse Voltage (Normalized to 0 volts)



ESD Clamping (8kV Contact)



ESD Clamping (15kV Air)



Applications Information

Device Connection Options

The EClamp1002A provides EMI filtering and ESD protection in a small SC-89 package for speaker port applications. The equivalent circuit diagram is shown below. The layout of the device is designed such that the data lines can be routed through the device. The first line pair enters at pins 1 and exits at pins 6. The second line pair enters at pins 3 and exits at pins 4. The device is symmetrical so the above connections may be reversed. Layout examples are shown to the right.

Circuit Board Layout Recommendations for Suppression of ESD.

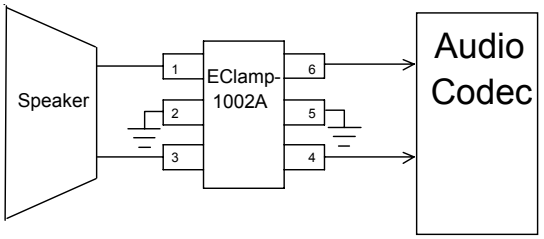
Good circuit board layout is critical for the suppression of ESD induced transients. The following guidelines are recommended:

- Place the TVS near the input terminals or connectors to restrict transient coupling.
- Minimize the path length between the TVS and the protected line.
- Minimize all conductive loops including power and ground loops.
- The ESD transient return path to ground should be kept as short as possible.
- Never run critical signals near board edges.
- Use ground planes whenever possible.

Matte Tin Lead Finish

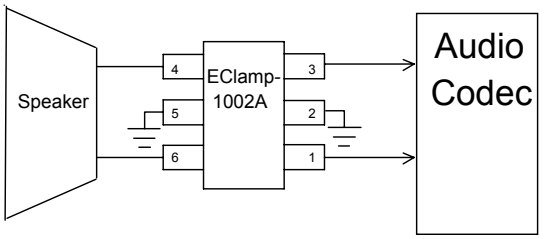
Matte tin has become the industry standard lead-free replacement for SnPb lead finishes. A matte tin finish is composed of 100% tin solder with large grains. Since the solder volume on the leads is small compared to the solder paste volume that is placed on the land pattern of the PCB, the reflow profile will be determined by the requirements of the solder paste. Therefore, these devices are compatible with both lead-free and SnPb assembly techniques. In addition, unlike other lead-free compositions, matte tin does not have any added alloys that can cause degradation of the solder joint.

Layout Examples



Option 1

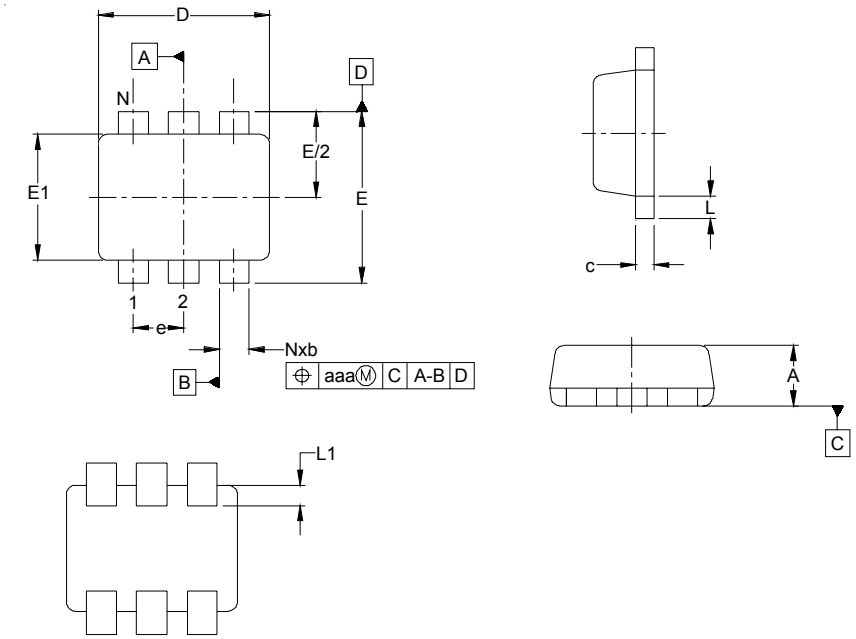
Pin	Identification
1	Line 1 In (From Speaker)
6	Line 1 Out (To Audio Circuit)
3	Line 2 In (From Speaker)
4	Line 2 Out (To Audio Circuit)
2, 5	Ground



Option 2

Pin	Identification
6	Line 1 In (From Speaker)
1	Line 1 Out (To Audio Circuit)
4	Line 2 In (From Speaker)
3	Line 2 Out (To Audio Circuit)
2, 5	Ground

Outline Drawing- SC-89 (SOT-666)

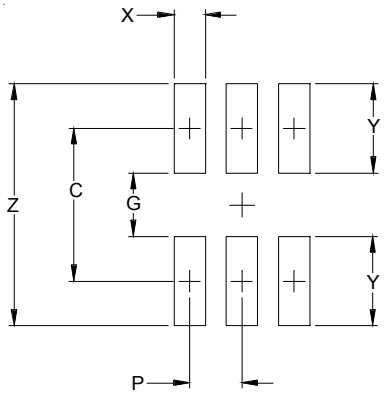


DIMENSIONS						
DIM	INCHES			MILLIMETERS		
	MIN	NOM	MAX	MIN	NOM	MAX
A	.019	-	.024	0.50	-	0.60
b	.005	-	.012	0.15	-	0.30
c	.003	-	.007	0.10	-	0.18
D	.059	.063	.067	1.50	1.60	1.70
E	.061	.063	.067	1.55	1.60	1.70
E1	.043	.047	.049	1.10	1.20	1.25
e	.020 BSC			0.50 BSC		
L	.003	.008	.012	0.10	0.20	0.30
L1	.003	.006	.008	0.10	0.15	0.20
N	6			6		
aaa	.004			0.10		

NOTES:

1. CONTROLLING DIMENSIONS ARE IN MILLIMETERS (ANGLES IN DEGREES).
2. DIMENSIONS "E1" AND "D" DO NOT INCLUDE MOLD FLASH, PROTRUSIONS OR GATE BURRS.

Land Pattern- SC-89 (SOT-666)

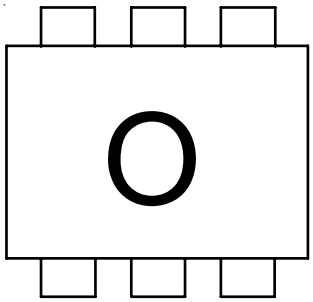


DIMENSIONS		
DIM	INCHES	MILLIMETERS
C	(.057)	(1.45)
P	.020	0.50
G	.024	0.60
X	.012	0.30
Y	.033	0.85
Z	.090	2.30

NOTES:

1. THIS LAND PATTERN IS FOR REFERENCE PURPOSES ONLY CONSULT YOUR MANUFACTURING GROUP TO ENSURE YOUR COMPANY'S MANUFACTURING GUIDELINES ARE MET

Marking Code



Note:
(1) Device is symmetrical so there is no pin 1 identifier.

Ordering Information

Part Number	Lead Finish	Device Marking	Qty per Reel	Reel Size
EClamp1002A.TCT	Pb Free	O	3,000	7 Inch

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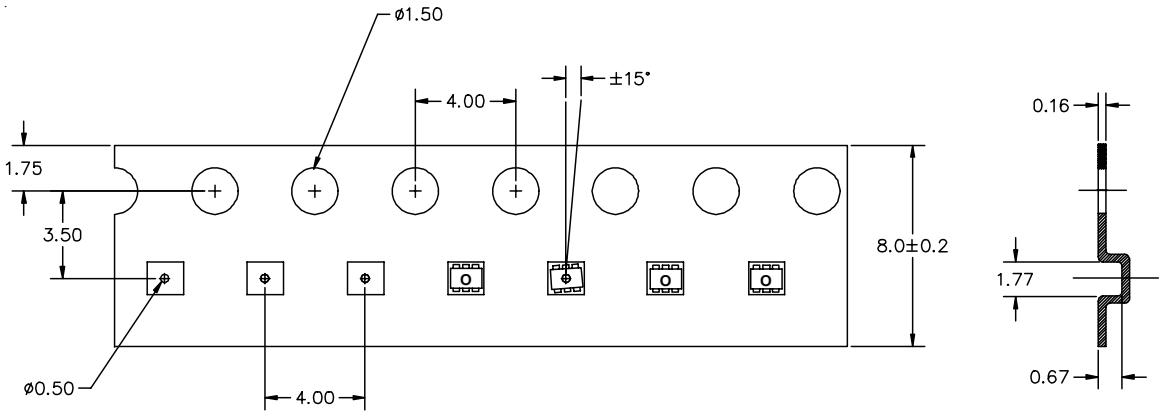
Tape and Reel Specification



Tape Specification and Device Orientation

Contact Information

Semtech Corporation
Protection Products Division
200 Flynn Rd., Camarillo, CA 93012
Phone: (805)498-2111 FAX (805)498-3804