

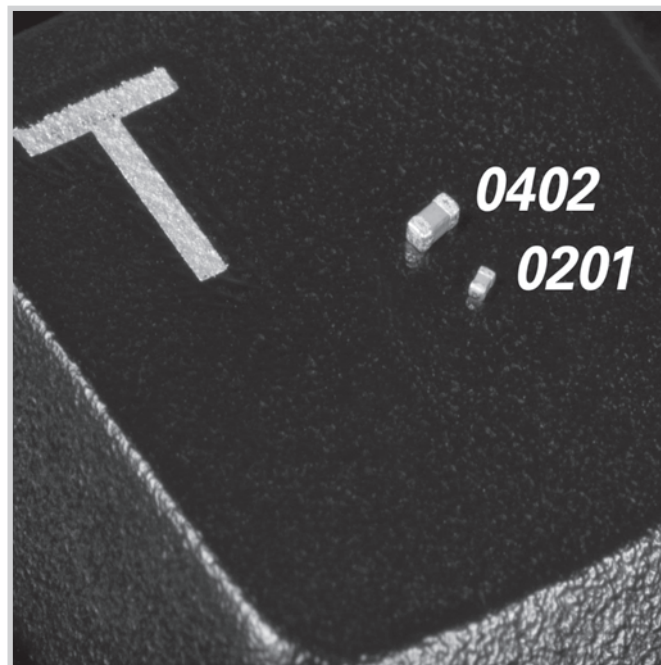
ChipSESD Devices

TE Circuit Protection's ChipSESD family of Silicon ESD devices, available in EIA-0201 and EIA-0602 sized rectangular SMT passive component packages, can help protect electronic circuits against damage from electrostatic discharge (ESD) events.

The SESD0201P1BN-0400-090, 0201-sized ChipSESD device's miniature footprint (0.6mm x 0.3mm x 0.3mm) is approximately 70% smaller than prior-generation devices. This offers designers flexibility in space-constrained applications.

The ChipSESD devices are high-capacitance, bi-directional devices that can be used for low-speed generic interfaces such as keypads, power buttons, speakers and microphone ports in a portable electronics. The bi-directional operation eliminates orientation constraints and the need for polarity inspections. The surface mount technology (SMT) passive component package allows the devices to be easily installed onto the printed circuit board using the standard PCB assembly process. Once soldered onto the boards, the ChipSESD's solder fillets at the end terminals can easily be visually inspected.

The ChipSESD devices offer 10kV contact and 16kV air discharge protection per the IEC61000-4-2, level 4 standard with a surge rating of 2A under 8x20μs pulse.



Benefits

- Silicon ESD devices in an EIA-0201 and EIA-0402 sized rectangular SMT passive component package
- Bi-directional operation eliminates orientation constraints
- Standard PCB assembly and rework process
- ESD protection in space-constrained portable electronics and mobile handsets
- Helps protect electronic circuits against damage from ESD
- Assists equipment to pass IEC61000-4-2, level 4 testing

Features

- Input capacitance - 4.5pF (typ)
- Low leakage current - 1.0μA (max)
- Low working reverse voltage - 6.0V (max)
- Capable of withstanding numerous ESD strikes
- RoHS compliant
- Halogen free
(refers to: Br≤900ppm, Cl≤900ppm, Br+Cl≤1500ppm)

Applications

- Mobile phones and portable electronics
- Digital cameras and camcorders
- Notebooks, set top boxes, motherboards
- USB 2.0 and computer I/O ports
- Applications requiring high ESD performance in a small package

Table CE1 Maximum Ratings for ChipSESD Devices

Part Number	IEC61000-4-2, level 4 (ESD Withstand)		Temperature	
	Contact (kV)	Air (kV)	Operating (°C)	Storage (°C)
SESD0201P1BN-0400-090	±10*	±16	-40 to +125	-40 to +125
SESD0402P1BN-0450-090	±10*	±16	-40 to +125	-40 to +125

* 10kV @ 50 ± pulses under IEC61000-4-2; 8kV @ 1,000 pulses under IEC61000-4-2

Table CE2 Electrical Characteristics @T=25°C for ChipSESD Devices

Part Number	Input Capacitance*		Leakage Current (max) I_L @ $V_{RWM} = 6.0V$ (μA)	Breakdown Voltage (min) V_{br} @ $I_T^\dagger = 1mA$ (V)	Working Reverse Voltage V_{RWM} @ peak (V)	Clamping Voltage (typ) V_{CL} @ $I_{pp}=2A$, $t_p=(8/20\mu s)$ (V)*
	Typ (pF)	Max (pF)				
SESD0201P1BN-0400-090	4.0	5.0	1.0	9.0	6.0	+10.0
SESD0402P1BN-0450-090	4.5	5.5	1.0	9.0	6.0	+10.0

* @ $V_r=0V$, $f=1MHz$

† V_{br} is measured at test current I_T

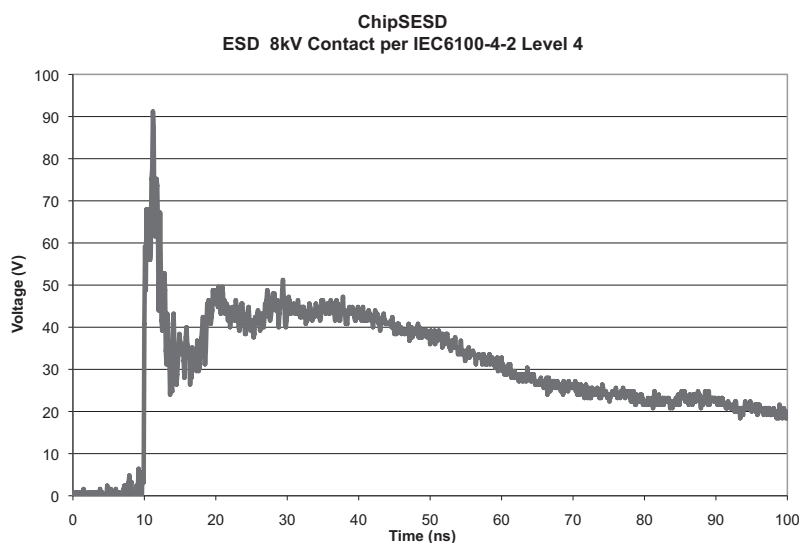
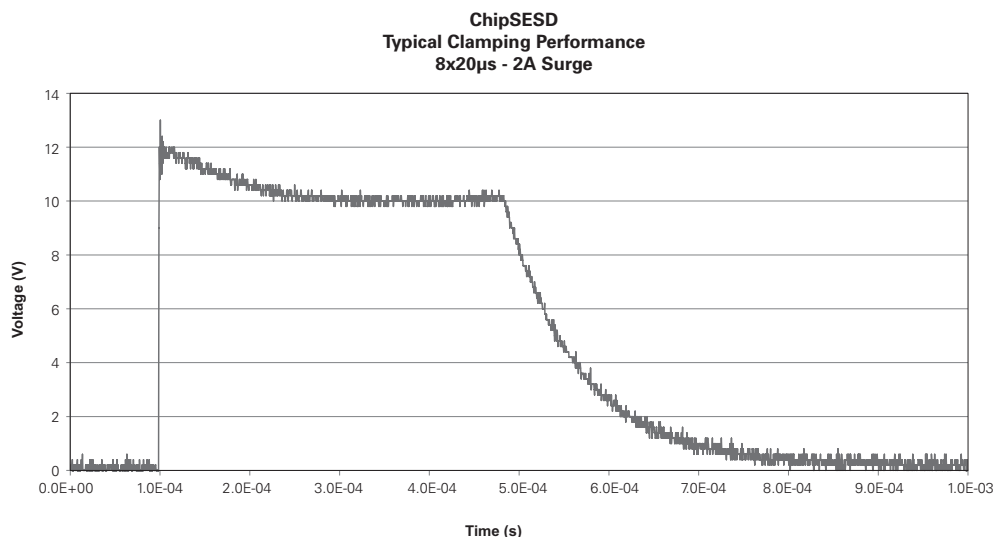
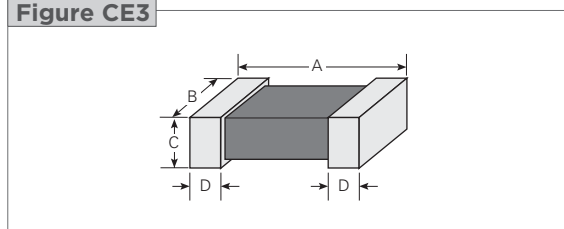
Figure CE1 ESD Clamping Voltage — 8kV Contact for ChipSESD Devices

Figure CE2 ESD Clamping Voltage — 8x20μs, 2A Surge for ChipSESD Devices


Table CE3 Dimensions for ChipSESD Devices in Millimeters and (Mils)*

Part Number	A	B	C	D	Figure
SESD0201P	0.60 ± 0.05 (23.62 ± 2.00)	0.30 ± 0.05 (11.81 ± 2.00)	0.30 ± 0.05 (11.81 ± 2.00)	0.21 ± 0.07 (8.27 ± 2.80)	CE3
SESD0402P	1.10 ± 0.10 (43.31 ± 0.40)	0.50 ± 0.10 (19.69 ± 4.00)	0.50 ± 0.10 (19.69 ± 4.00)	0.25 ± 0.15 (9.84 ± 6.00)	CE3

* Round off approximation

Figure CE3

Table CE4 PCB Pad Layout for ChipSESD Devices in Millimeters and (Mils)*

Part Number	L	S	W	Figure
SESD0201P	0.28 ± 0.01 (11.00 ± 0.40)	0.19 ± 0.01 (7.50 ± 0.40)	0.30 ± 0.01 (11.80 ± 0.40)	CE4
SESD0402P	0.61 ± 0.05 (24.00 ± 2.00)	0.52 ± 0.05 (21.00 ± 2.00)	0.50 ± 0.05 (20.00 ± 2.00)	CE4

* Round off approximation

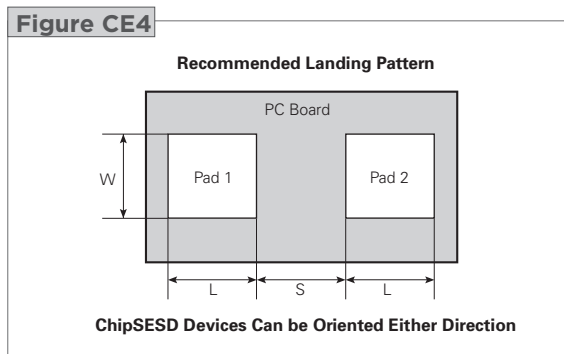
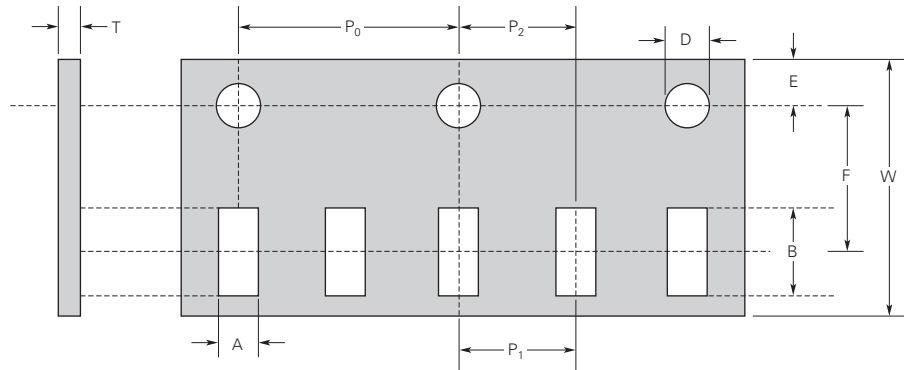
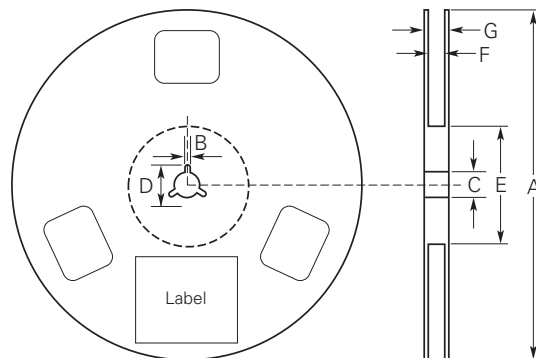
Figure CE4


Table CE5 Tape Specifications for ChipSESD Devices

Tape Dimension EIA Mark	SESD0201P1BN-0400-090 Dimension (mm)	SESD0402P1BN-0450-090 Dimension (mm)
A	0.35 ± 0.02	0.58 ± 0.03
B	0.67 ± 0.02	1.20 ± 0.03
D	1.55 ± 0.05	1.55 ± 0.05
E	1.75 ± 0.05	1.75 ± 0.05
F	3.50 ± 0.05	3.50 ± 0.05
W	8.00 ± 0.10	8.00 ± 0.10
P ₀	4.00 ± 0.10	4.00 ± 0.10
P ₁	2.00 ± 0.05	2.00 ± 0.05
P ₂	2.00 ± 0.05	2.00 ± 0.05
T	0.42 ± 0.03	0.60 ± 0.03

Figure CE5

Table CE6 Reel Specifications for ChipSESD Devices

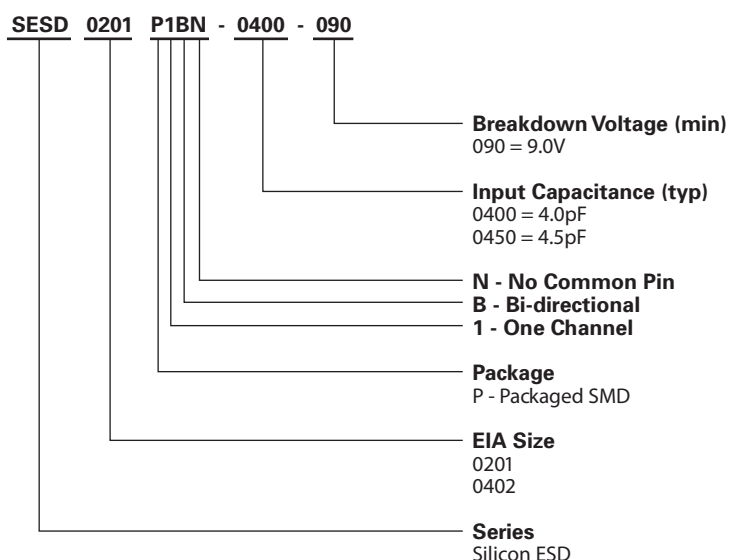
Reel Dimension EIA Mark	Dimension (mm)
A	178.0 ± 2.0
B	2.0 ± 0.5
C	13.0 ± 0.5
D	21.0 ± 0.8
E	62.0 ± 1.5
F	9.0 ± 0.5
G	13.0 ± 1.0

Figure CE6


Definition of Terms for ChipSESD Devices

I_L	Reverse Leakage Current @ V_{RWM}
V_{RWM}	Working Peak Reverse Voltage
V_{br}	Breakdown Voltage @ I_T
I_T	Test Current
V_{CL}	Clamping Voltage

Part Numbering System for ChipSESD Devices



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