

Features

- Very low capacitance: 2.5 pF typical
- Ultra low leakage: nA level
- Low operating voltage: 5V
- Low clamping voltage
- 4-pin SOT-143 package
- Up to 3-line protects
- Complies with following standards:
 - IEC 61000-4-2 (ESD) immunity test
Air discharge: ±15kV
Contact discharge: ±12kV
 - IEC61000-4-4 (EFT) 40A (5/50ns)
- RoHS Compliant

Applications

- Cellular Handsets and Accessories
- Notebooks and Handhelds
- Personal Digital Assistants
- Portable Instrumentation
- Digital Cameras
- Peripherals
- Audio Players, Keypads, Side Keys, LCD
- USB 2.0

Mechanical Characteristics

- Package: SOT-143
- Lead Finish: Matte Tin
- Case Material: "Green" Molding Compound.
- UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 3 per J-STD-020
- Terminal Connections: See Diagram

Part Number Code

E	S	D	0	5	1	1	L	1
1	2	3	4	5	6	7	8	9

Product Type	
ESD	TSK Electrostatic suppressor ESD Type

Reverse Working Voltage (V)	
3V3	3.3V
05	5V
16	16V

Line	
1	1-Line
2	2-Line
3	3-Line

Capacitance Type	
L	Low
X	Normal

directional	
0	Bi
1	Uni

Size	
1	0201
2	0402
3	DFN0603
4	DFN1006

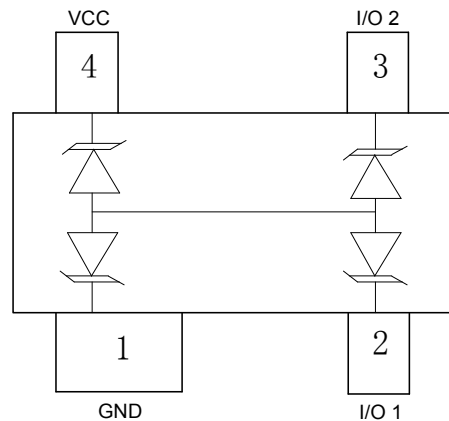
★ Code 4 to 9 is optional

Description

The ESD0531XJ is a 3-line ultra-low capacitance TVS diode array, utilizing leading monolithic silicon technology to provide fast response time and low ESD clamping voltage, making this device an ideal solution for protecting voltage sensitive high-speed data lines. The ESD0531XJ has a very low capacitance with a typical value at 2pF, and complies with the IEC 61000-4-2 (ESD) standard with ±15kV air and ±8kV contact discharge. It is assembled into a 4-pin SOT-143 lead-free package. The small size, very low capacitance and high ESD surge protection make ESD0531XJ an ideal choice to protect cell phone digital video interfaces, high speed data ports, and many other portable applications.



Dimensions and Pin Configuration



Circuit and Pin Schematic

Absolute Maximum Ratings ($T_A=25^\circ\text{C}$ unless otherwise specified)

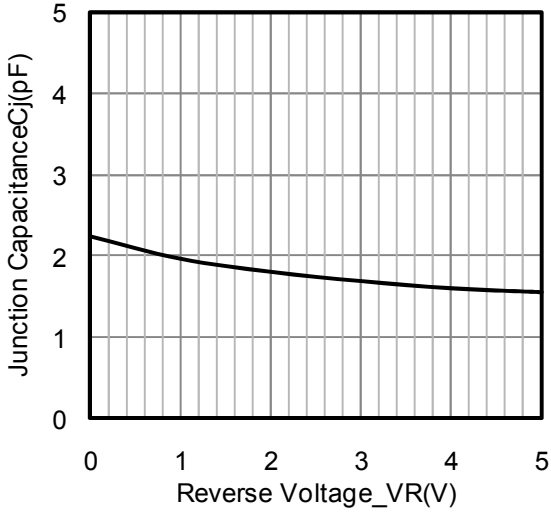
Parameter	Symbol	Value	Unit
ESD per IEC 61000-4-2 (Air)	VESD	± 15	kV
ESD per IEC 61000-4-2 (Contact)		± 12	
Operating Temperature Range	TJ	-55 to +125	$^\circ\text{C}$
Storage Temperature Range	Tstg	-55 to +150	$^\circ\text{C}$

Electrical Characteristics ($T_A=25^\circ\text{C}$ unless otherwise specified)

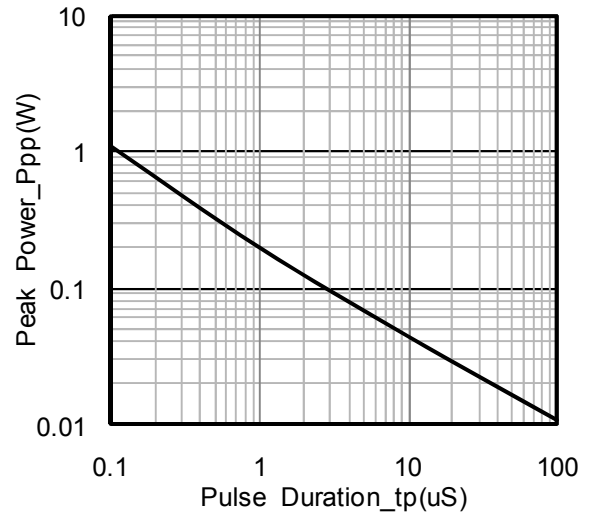
Parameter	Symbol	Min	Typ	Max	Unit	Test Condition
Reverse Working Voltage	VRWM			5	V	
Breakdown Voltage	VBR	6			V	$I_T = 1\text{mA}$
Reverse Leakage Current	I_R			50	nA	VRWM = 5V
Clamping Voltage	Vc			20	V	$I_{PP} = 1\text{A}$ (8 x 20 μs pulse), any I/O to pin 1
Junction Capacitance	CJ		2.5		pF	VR = 0V, f = 1MHz, any I/O pin to pin 1

Note 1: I/O pins are pin 2, 3

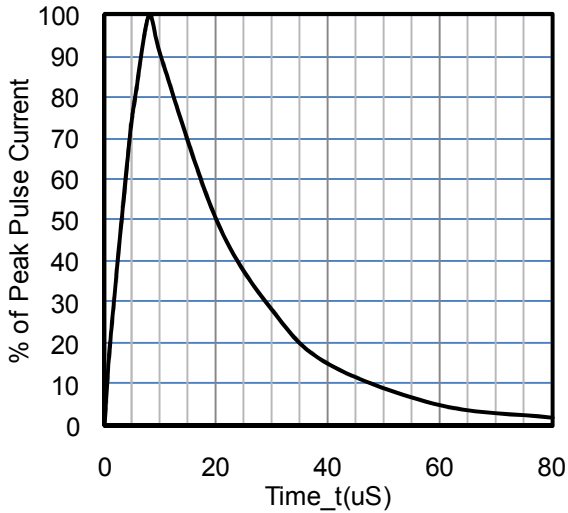
Typical Performance Characteristics (TA=25°C unless otherwise Specified)



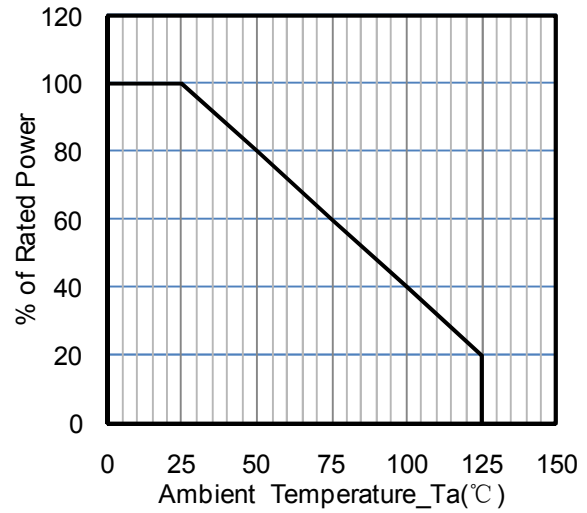
Junction Capacitance vs. Reverse Voltage



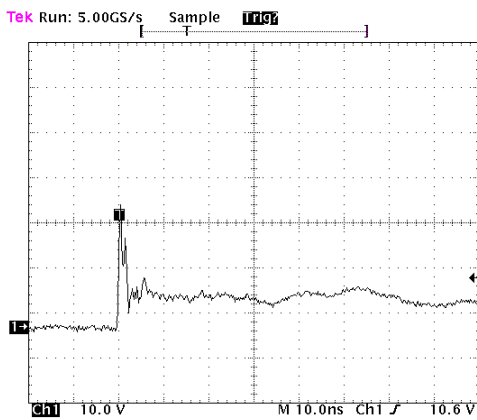
Peak Pulse Power vs. Pulse Time



8 X 20us Pulse Waveform



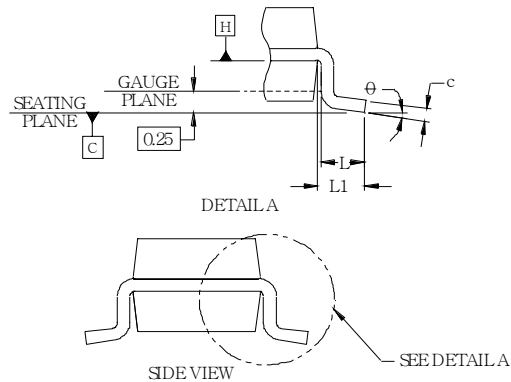
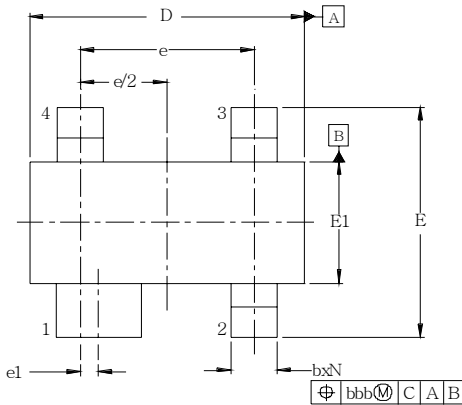
Power Derating Curve



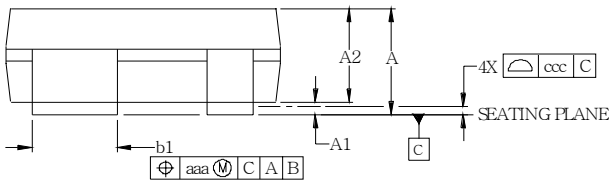
ESD Clamping Voltage

8 kV Contact per IEC61000-4-2

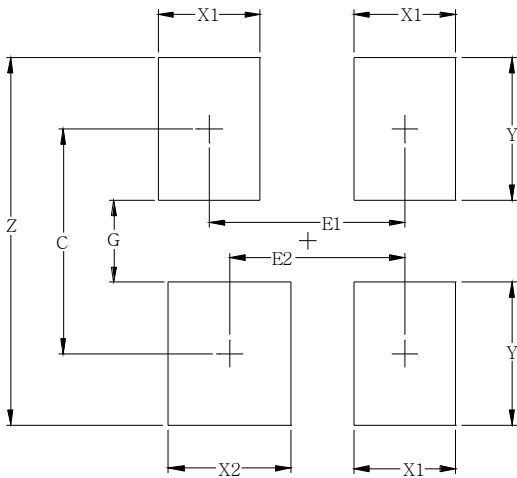
SOT-143 Package Outline Drawing



DIM	INCHES		MILLIMETERS	
	MIN	NOMMAX	MIN	NOMMAX
A	.081	-.098	0.80	1.22
A1	.000	-.006	0.013	-.015
A2	.029	.035	.042	0.75
b	.011	-.020	0.30	-.094
b1	.029	-.037	0.76	-.094
c	.003	-.008	0.08	-.020
D	.110	.114	.120	2.80
E	.082	.093	.104	2.10
E1	.047	.051	.055	1.20
e		.075		1.92BSC
e1		.008		0.20BSC
L	.015	.020	.024	0.40
L1		(.021)		(0.54)
N		4		4
theta	0°	8°	0°	8°
aaa		.006		0.15
bbb		.008		0.20
ccc		.004		0.10



Suggested Land Pattern



SYM	DIMENSIONS	
	MILLIMETERS	INCHES
C	2.20	0.087
E1	1.92	0.076
E2	1.72	0.068
G	0.80	0.031
X1	1.00	0.039
X2	1.20	0.047
Y	1.40	0.055
Z	3.60	0.141

Ordering Information

Part Number	Packaging	Reel Size
ESD0531XJ	3000/Tape & Reel	7 inch