Features

- Ultra small package: 1.0x0.6x0.5mm
- Protects one data or power line
- Very low capacitance: 3pF typical
- Ultra low leakage: nA level
- Low operating voltage: 5V
- Low clamping voltage
- 2-pin leadless package
- Complies with following standards:
  – IEC 61000-4-2 (ESD) immunity test
    Air discharge: ±15kV
    Contact discharge: ±8kV
  – IEC61000-4-4 (EFT) 40A (5/50ns)
- RoHS compliant

Applications

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

Mechanical Characteristics

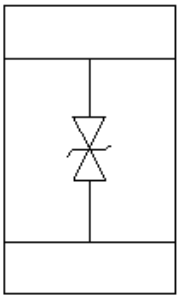
- Package: 0402
- Lead Finish: Sn
- Case Material: “Green” Molding Compound.
- UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 3 per J-STD-020

Description

The ESD0510X21 is a bi-directional TVS diode,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 data and power line.The ESD0510X21 complies with the IEC 61000-4-2 (ESD) standard with ±15 kV air and ±8 kV contact discharge. It is assembled into an ultra-small 1.0x0.6x0.5mm lead-free 0402 package. The small size and high ESD surge protection make ESD0510X21 an ideal choice to protect cell phone, digital cameras, audio players and many other portable applications.

Dimensions and Pin Configuration

Package Outline



Circuit Schematic

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

directional	
0	Bi
1	Uni

Capacitance Type	
L	Low
X	Normal

Size	
1	0201
2	0402
3	DFN0603
4	DFN1006

★ Code 4 to 9 is optional

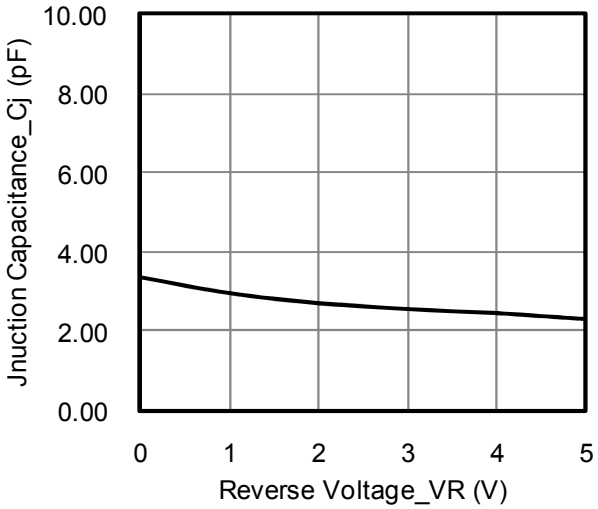
Absolute Maximum Ratings (T_A=25°C unless otherwise specified)

Parameter	Symbol	Value	Unit
ESD per IEC 61000−4−2 (Air) ESD per IEC 61000−4−2 (Contact)	V_{ESD}	±15 ±8	kV
Operating Temperature Range	T_J	−55 to +125	°C
Storage Temperature Range	Tstg	−55 to +150	°C

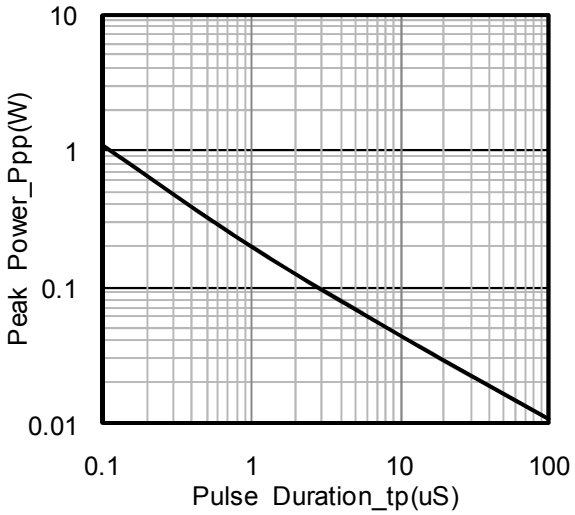
Electrical Characteristics (T_A=25°C unless otherwise specified)

Parameter	Symbol	Min	Typ	Max	Unit	Test Condition
Reverse Working Voltage	V_{RWM}			5	V	
Breakdown Voltage	V_{BR}	6		9	V	I_T = 1mA
Reverse Leakage Current	I_R			200	nA	V_{RWM} = 5V
Clamping Voltage	V_C			10	V	I_{PP} = 1A (8 x 20μs pulse)
Junction Capacitance	C_J			3.5	pF	VR = 0V, f = 1MHz

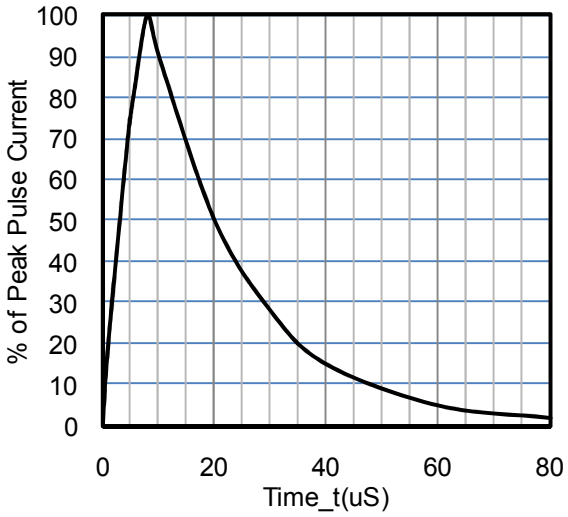
Typical Performance Characteristics (TA=25°C unless otherwise Specified)



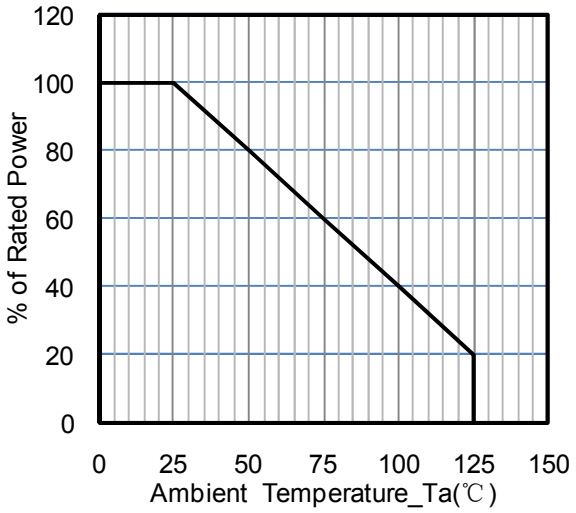
Junction Capacitance vs. Reverse Voltage



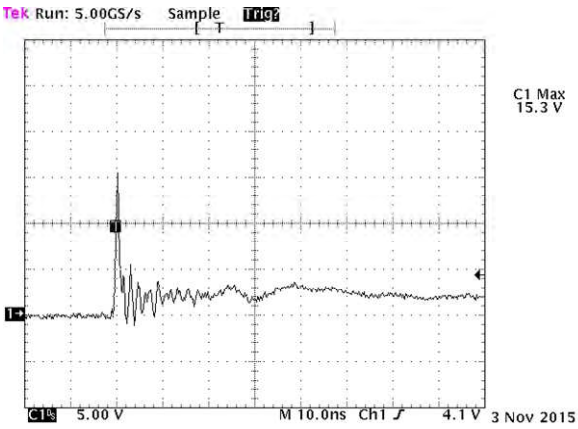
Peak Pulse Power vs. Pulse Time



8 X 20uS Pulse Waveform



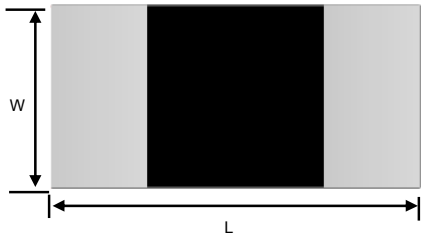
Power Derating Curve



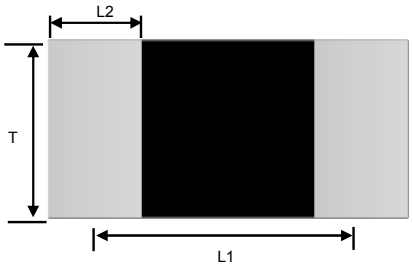
ESD Clamping Voltage

8 kV Contact per IEC61000−4−2

0402 Package Outline Drawing



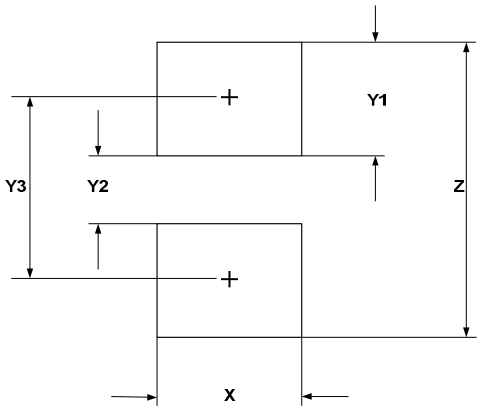
Top View



Side View

SYM	DIMENSIONS					
	MILLIMETERS			INCHES		
	MIN	NOM	MAX	MIN	NOM	MAX
W	0.50	0.60	0.70	0.020	0.024	0.028
L	0.95	1.00	1.05	0.038	0.040	0.042
T	0.40	0.50	0.60	0.016	0.020	0.024
L1	0.75 BSC			0.030 BSC		
L2	0.15	0.20	0.25	0.006	0.008	0.010

Suggested Land Pattern



SYM	DIMENSIONS	
	MILLIMETERS	INCHES
X	0.60	0.024
Y1	0.50	0.020
Y2	0.30	0.012
Y3	0.80	0.032
Z	1.30	0.052

Ordering Information

Part Number	Packaging	Reel Size
ESD0510X21	10000/Tape & Reel	7 inch