

## 1-Line, Bi-directional, Transient Voltage Suppressors

### Descriptions

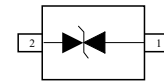
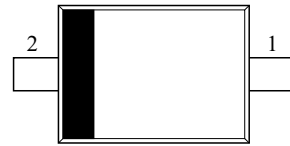
The ESD5C150TA-1 is a bi-directional TVS (Transient Voltage Suppressor). It is specifically designed to protect sensitive electronic components that may be subjected to ESD (Electrostatic Discharge), EFT (Electrical Fast Transients) and Lightning. It is particularly well-suited for cellular phones, portable device, digital cameras, power supplies and many other portable applications because of its small package and low weight.

The ESD5C150TA-1 may be used to provide ESD protection up to 30KV Air, 30KV contact compliance to IEC61000 -4-2, and withstand peak pulse current up to 8A (8/20 $\mu$ s) according to IEC61000-4-5.

The ESD5C150TA-1 is available in SOD-923 package. Standard products are Pb-free and Halogen-free.



SOD-923



Circuit diagram

### Features

- Stand-off voltage:  $\pm 5V$  Max
- Transient protection for each line according to  
IEC61000-4-2 (ESD): 30KV Air, 30KV contact compliance  
IEC61000-4-4 (EFT): 40A (5/50ns)  
IEC61000-4-5 (surge): 8A (8/20 $\mu$ s)
- Solid-state silicon technology
- Low leakage current

### Applications

- Cell phone handsets and accessories
- Personal Digital Assistants (PDAs)
- Notebooks, Desktops, and Servers
- Portable Instrumentation
- Digital Cameras
- MID/CAR DVD/MP3/MP4/PMP Players

### Order information

Device	Marking	Package	Shipping
ESD5C150TA-1	EF	SOD-923	8000/Tape&Reel

**Absolute maximum ratings**

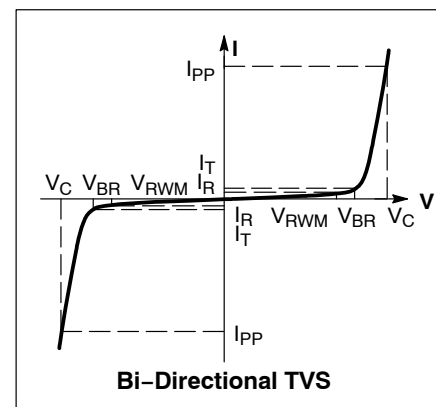
Parameter	Symbol	Rating	Unit
Peak pulse power ( $t_p = 8/20\mu s$ )	$P_{pk}$	96	W
Peak pulse current ( $t_p = 8/20\mu s$ )	$I_{PP}$	8	A
ESD according to IEC61000-4-2 air discharge	$V_{ESD}$	$\pm 30$	kV
ESD according to IEC61000-4-2 contact discharge		$\pm 30$	
Operation junction temperature	$T_J$	-55~150	$^{\circ}C$
Lead temperature	$T_L$	260	$^{\circ}C$
Storage temperature	$T_{STG}$	-55~150	$^{\circ}C$

**Electrical characteristics (TA=25 oC, unless otherwise noted)**

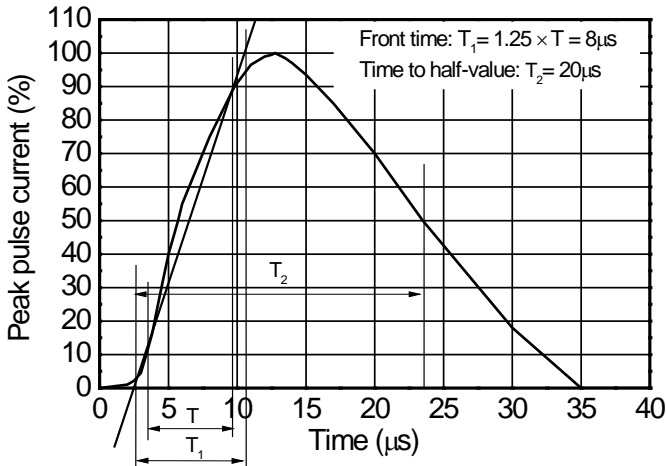
Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Reverse stand-off voltage	$V_{RWM}$				5.0	V
Reverse leakage current	$I_R$	$V_{RWM} = 5 V$			0.5	$\mu A$
Reveres breakdown voltage	$V_{BR}$	$I_T=1mA$	5.5	6.5	8.0	V
Clamping voltage	$V_C$	$I_{pp}=1.0A t_p=8/20us$			8.0	V
		$I_{pp}=8.0A t_p=8/20us$		8.5	11.5	V
Junction capacitance	$C_J$	$V_R = 0V, f = 1MHz$		15.0	25.0	pF

**Electrical performance curve**

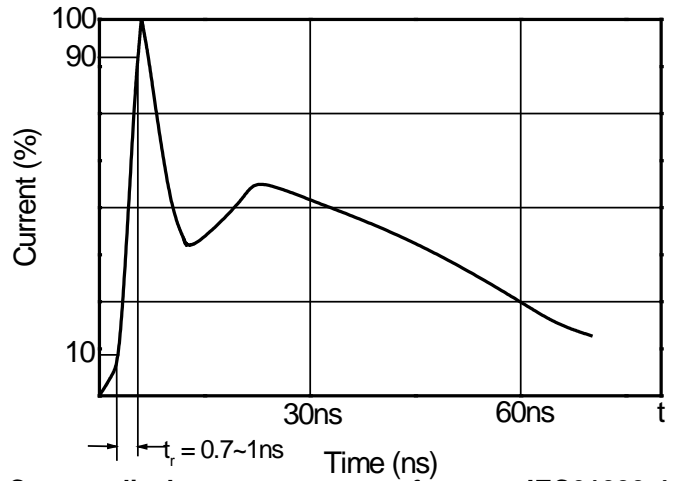
- $V_C$ : Maximum clamping voltage
- $V_{br}$ : Reverse breakdown voltage
- $V_{RWM}$ : Working voltage
- $I_{PP}$ : Maximum peak current



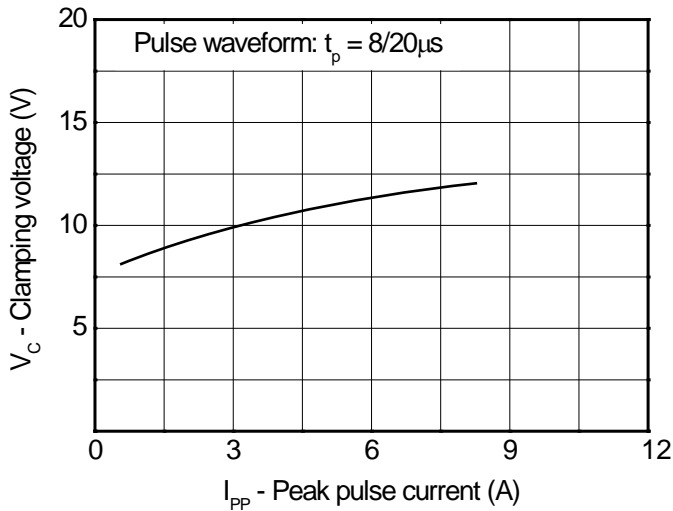
Typical characteristics ( $T_A=25^\circ\text{C}$ , unless otherwise noted)



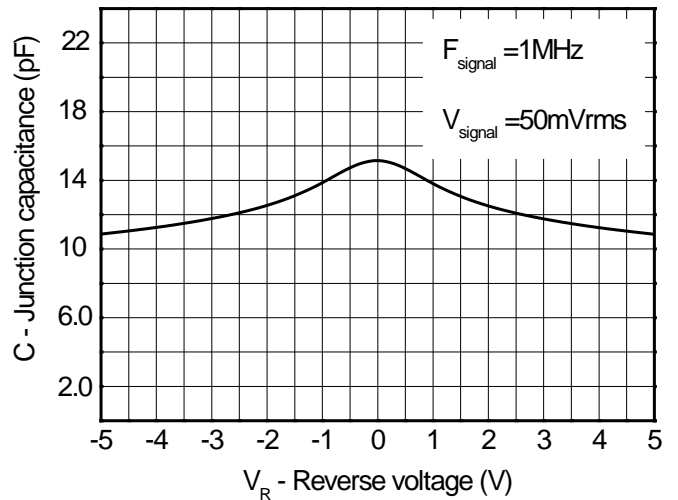
8/20 $\mu\text{s}$  waveform per IEC61000-4-5



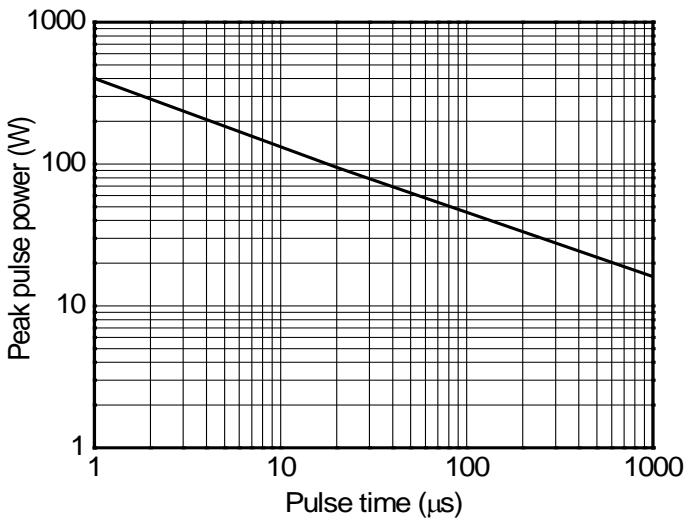
Contact discharge current waveform per IEC61000-4-2



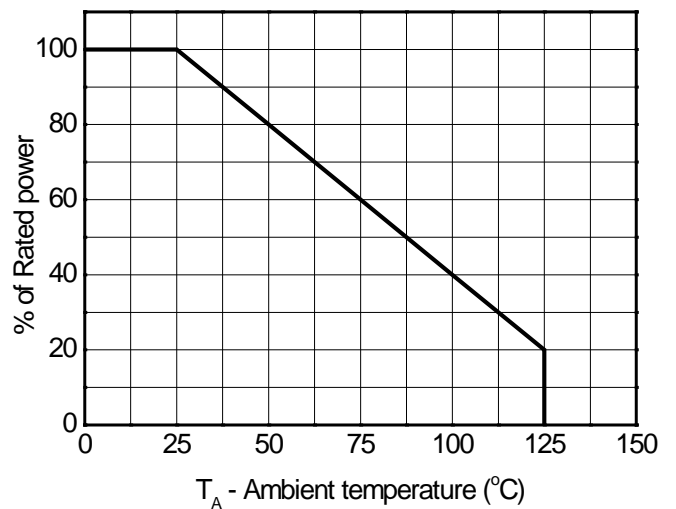
Clamping voltage vs. Peak pulse current



Capacitance vs. Reverse voltage

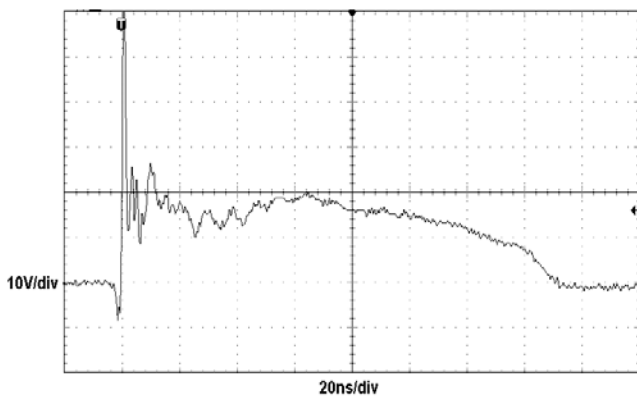
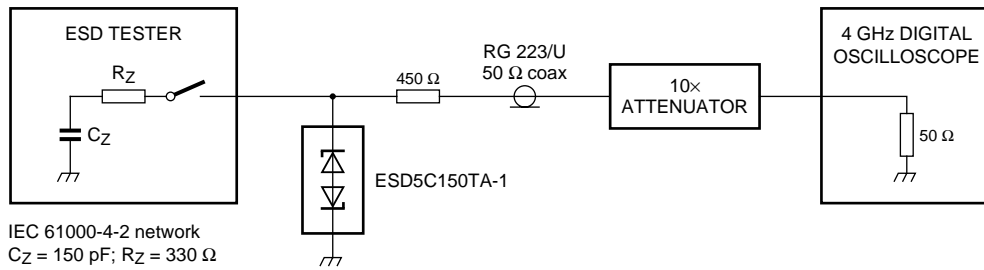


Non-repetitive peak pulse power vs. Pulse time

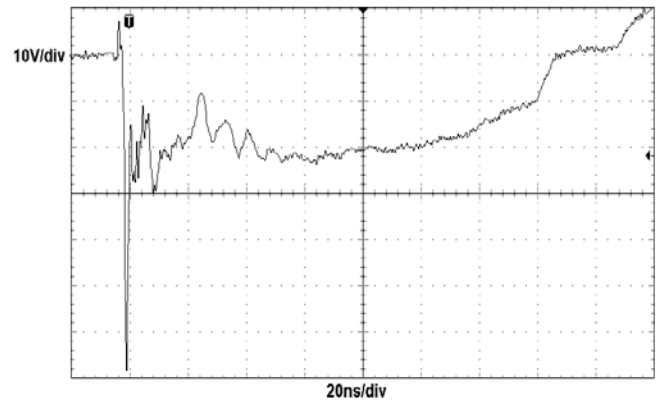


Power derating vs. Ambient temperature

ESD clamping test setup and waveforms

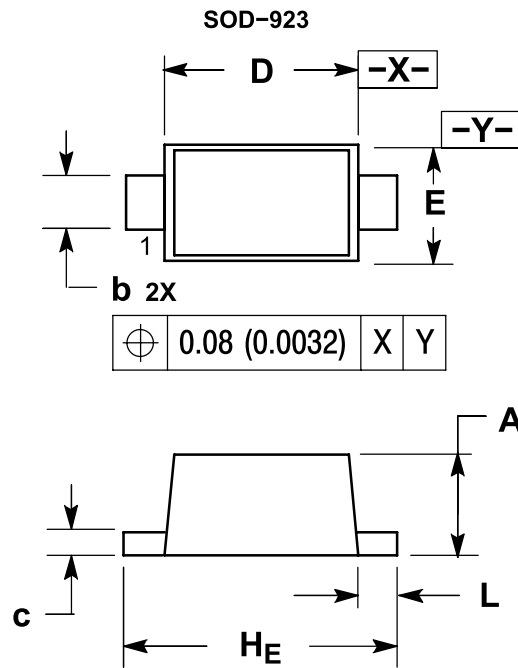


**ESD clamping**  
 (+8kV contact discharge per IEC61000-4-2)

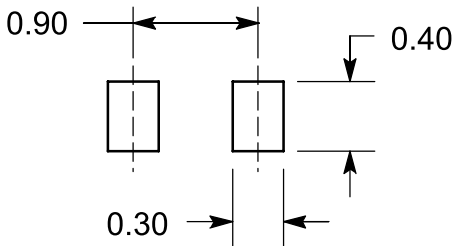


**ESD clamping**  
 (-8kV contact discharge per IEC61000-4-2)

Package outline dimensions



SOLDERING FOOTPRINT\*



NOTES:

1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 198 .
2. CONTROLLING DIMENSION: MILLIMETERS.
3. MAXIMUM LEAD THICKNESS INCLUDES LEAD FINISH THICKNESS. MINIMUM LEAD THICKNESS IS THE MINIMUM THICKNESS OF BASE MATERIAL.

DIM	MILLIMETERS			INCHES		
	MIN	NOM	MAX	MIN	NOM	MAX
A	0.34	0.37	0.40	0.013	0.015	0.016
b	0.15	0.20	0.25	0.006	0.008	0.010
c	0.07	0.12	0.17	0.003	0.005	0.007
D	0.75	0.80	0.85	0.030	0.031	0.033
E	0.55	0.60	0.65	0.022	0.024	0.026
H <sub>E</sub>	0.95	1.00	1.05	0.037	0.039	0.041
L	0.05	0.10	0.15	0.002	0.004	0.006