



SPE0311

Single-Line ESD Protection Array

DESCRIPTION

The SPE0311 are designed by TVS device that is to protect sensitive electronics from damage or latch-up due to ESD. They are designed for use in applications where board space is at a premium. SPE0311 will protect single line, and may be used on line where the signal polarities swing above and below ground.

SPE0311 offer desirable characteristics for board level protection including fast response time, low operating and clamping voltage, and no device degradation.

SPE0311 may be used to meet the immunity requirements of IEC 61000-4-2, level 4. The small SOD-523 package makes them ideal for use in portable electronics such as cell phones, PDA's, notebook computers, and digital cameras.

APPLICATIONS

- ◆ Cellular Handsets and Accessories
- ◆ Cordless Phone
- ◆ PDA
- ◆ Notebooks and Handhelds
- ◆ Portable Instrumentation
- ◆ Digital Cameras
- ◆ MP3 Player

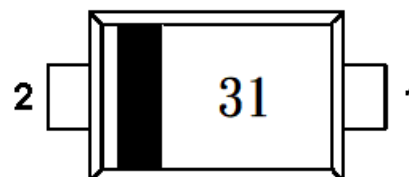
FEATURES

- ◆ Transient protection for data lines to IEC 61000-4-2 (ESD) $\pm 15\text{kV}$ (air), $\pm 8\text{kV}$ (contact)
IEC 61000-4-4 (EFT) 40A (5/50ns)
- ◆ Protects single I/O lines
- ◆ Working voltage: 3.3V
- ◆ Low leakage current
- ◆ Low operating and clamping voltages

PIN CONFIGURATION (SOD-523)



PART MARKING





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ORDERING INFORMATION

Part Number	Package	Part Marking
SPE0311D52RGB	SOD-523	31

※ SPE0311D52RGB : Tape Reel ; Pb – Free ; Halogen – Free

ABSOLUTE MAXIMUM RATINGS

(TA=25°C Unless otherwise noted)

Parameter	Symbol	Typical	Unit
Peak Pulse Power (tp = 8/20 μs)	Ppk	250	W
Maximum Peak Pulse Current (tp = 8/20 μs)	Ipp	15	A
ESD per IEC 61000 – 4 – 2 (Air)	Vpp	±15	KV
ESD per IEC 61000 – 4 – 2 (Contact)	Vpp	±8	KV
Operating Junction Temperature	TJ	-65 ~ 150	°C
Storage Temperature Range	TSTG	-65 ~ 150	°C
Lead Soldering Temperature	TL	260 (10sec)	°C

ELECTRICAL CHARACTERISTICS

(TA=25°C Unless otherwise noted)

Parameter	Symbol	Conditions	Min.	Typ	Max.	Unit
Reverse Stand – Off Voltage	VRWM				3.3	V
Reverse Breakdown Voltage	VBR	It=5mA	5.8	6.4	6.9	V
Reverse Leakage Current	IRM	VRWM=3.3V , TA=25°C		0.09	2	μA
Differential Resistance	rdif	IR=1mA			400	Ω
Clamping Voltage	VCL	Ipp=1A , tp = 8/20 μs			8	V
Clamping Voltage	VCL	Ipp=15A , tp = 8/20 μs			26	V
Junction Capacitance	Cj	Between I/O Pin and GND VR=0V , f=1MHz		202		pF



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TYPICAL CHARACTERISTICS

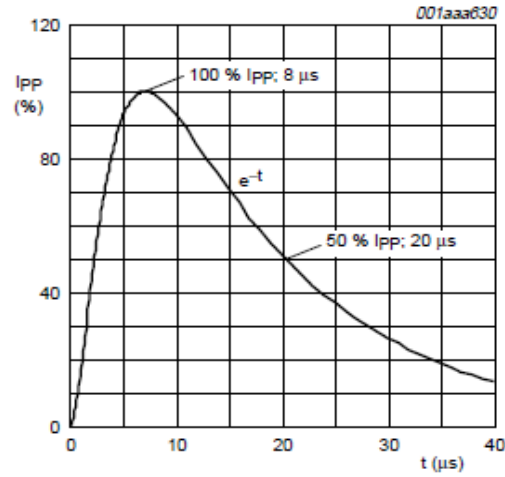


Fig 1. 8/20 μs pulse waveform according to IEC 61000-4-5

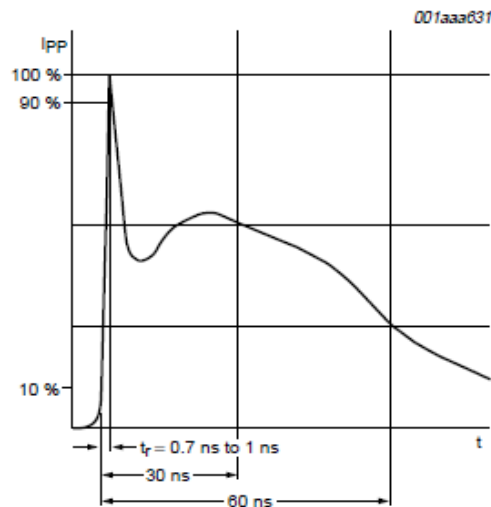


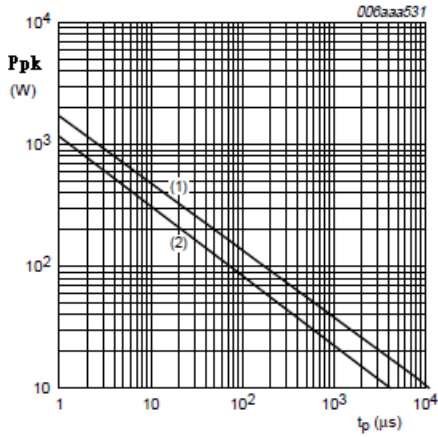
Fig 2. ESD pulse waveform according to IEC 61000-4-2



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TYPICAL CHARACTERISTICS



$T_{amb} = 25^\circ C$

Fig 3. Peak pulse power as a function of exponential pulse duration t_p ; typical values

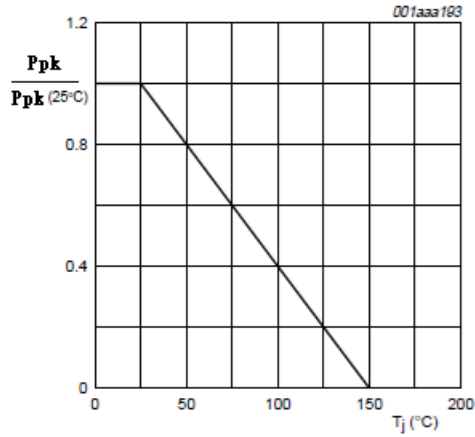
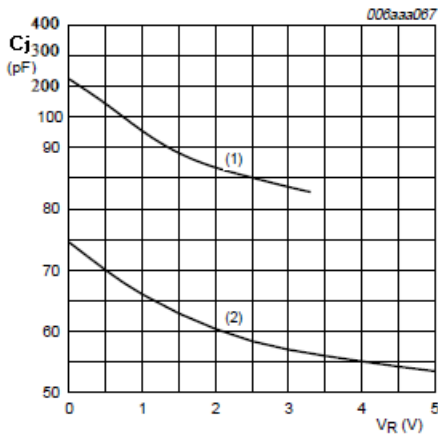


Fig 4. Relative variation of peak pulse power as a function of junction temperature; typical values



$T_{amb} = 25^\circ C$; $f = 1$ MHz

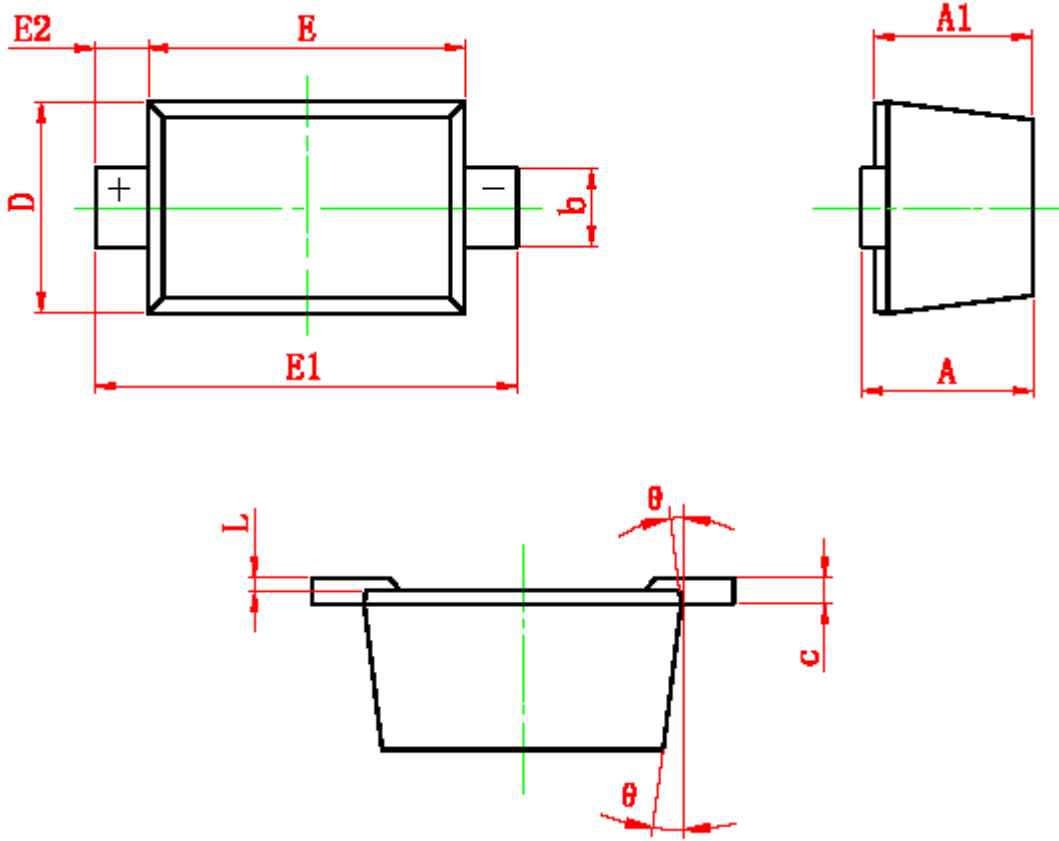
Fig 5. Diode capacitance as a function of reverse voltage; typical values



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SOD-523 PACKAGE OUTLINE



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	0.510	0.770	0.020	0.031
A1	0.500	0.700	0.020	0.028
b	0.250	0.350	0.010	0.014
c	0.080	0.150	0.003	0.006
D	0.750	0.850	0.030	0.033
E	1.100	1.300	0.043	0.051
E1	1.500	1.700	0.059	0.067
E2	0.200 REF		0.008 REF	
L	0.010	0.070	0.001	0.003
θ	7° REF		7° REF	



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