



SPE0599

Single -Line ESD Protection Array

DESCRIPTION

The SPE0599 are designed by TVS bi-direction 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. SPE0599 will protect 2-line, and may be used on line where the signal polarities swing above and below ground.

SPE0599 offer desirable characteristics for board level protection including fast response time, low operating and clamping voltage, and no device degradation.

SPE0599 may be used to meet the immunity requirements of IEC 61000-4-2, level 4. The small SOT-23 package makes them ideal for use in portable electronics such as cell phones, PDA's, notebook computers, and digital cameras.

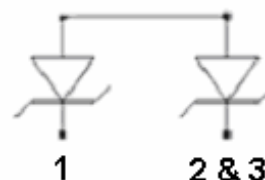
APPLICATIONS

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

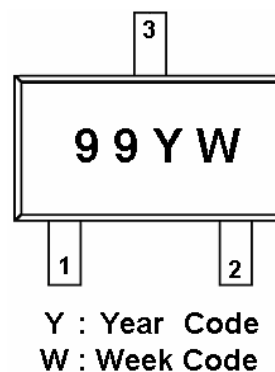
FEATURES

- ◆ 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: 5V
- ◆ Low leakage current
- ◆ Low operating and clamping voltages

PIN CONFIGURATION (SOT-23)



PART MARKING





SPE0599

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ORDERING INFORMATION

Part Number	Package	Part Marking
SPE0599S23RGB	SOT-23	99YW

※ SPE0599S23RGB : Tape Reel ; Pb – Free; Halogen – Free

ABSOLUTE MAXIMUM RATINGS

(T_A=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	7	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	-55 ~ 125	°C
Storage Temperature Range	TSTG	-55 ~ 150	°C
Lead Soldering Temperature	TL	260 (10sec)	°C

ELECTRICAL CHARACTERISTICS

(T_A=25°C Unless otherwise noted)

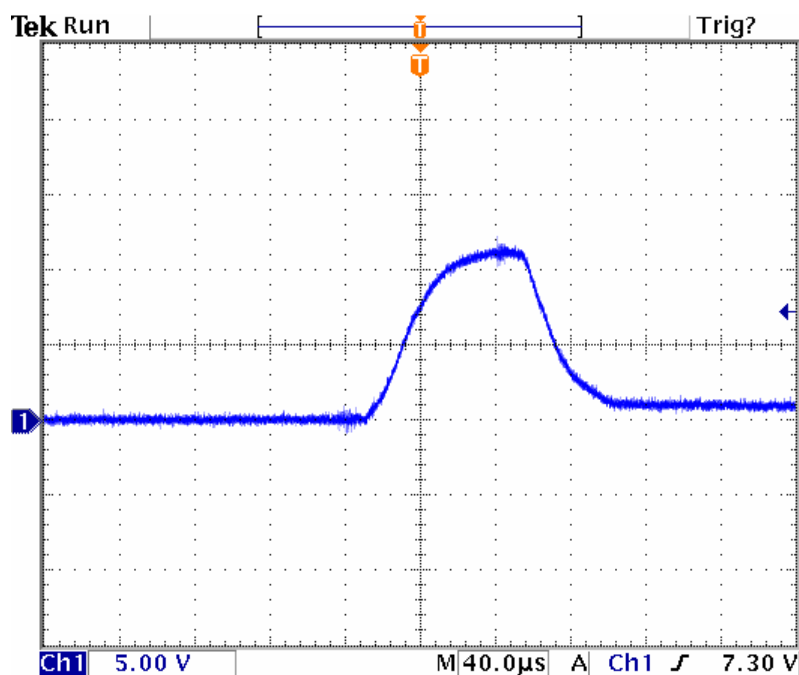
Parameter	Symbol	Conditions	Min.	Typ	Max.	Unit
Reverse Stand – Off Voltage	VRWM				5	V
Reverse Breakdown Voltage	VBR	It = 1mA	6		8.5	V
Reverse Leakage Current	IR	VRWM = 5V , T=25°C		0.01	1	μA
Reverse Leakage Current	IR	VRWM = 3V , T=25°C		0.01	0.5	μA
Clamping Voltage	VC	Ipp = 1A , tp = 8/20 μs			11.5	V
Clamping Voltage	VC	Ipp = 7A , tp = 8/20 μs			15	V
Junction Capacitance	Cj	Between I/O Pin and GND VR = 0V , f = 1MHz		5	10	pF



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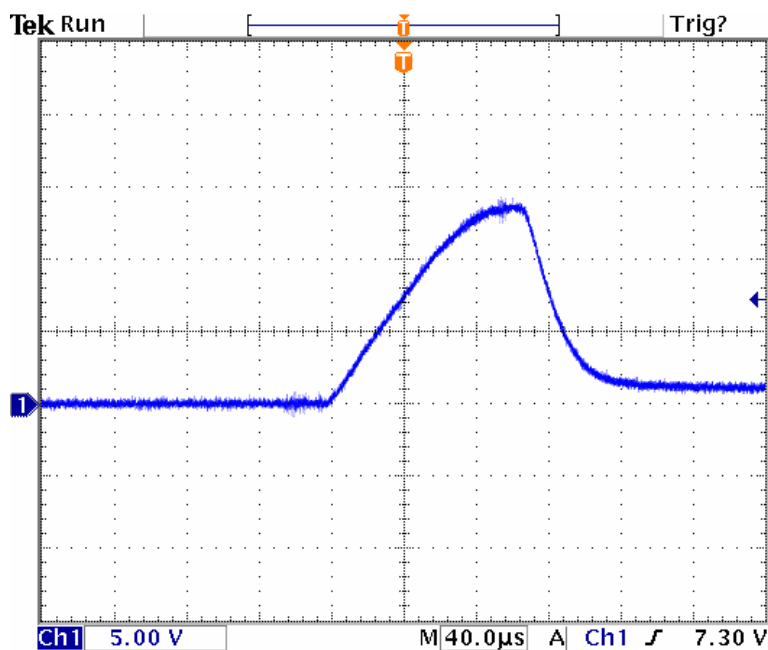
TYPICAL CHARACTERISTICS



40.0000ns

Clamping Voltage ($I_{pp} = 1A$, $t_p = 8/20 \mu s$)

26 Oct 2005
12:15:46



40.0000ns

Clamping Voltage ($I_{pp} = 7A$, $t_p = 8/20 \mu s$)

26 Oct 2005
12:08:20



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TYPICAL CHARACTERISTICS

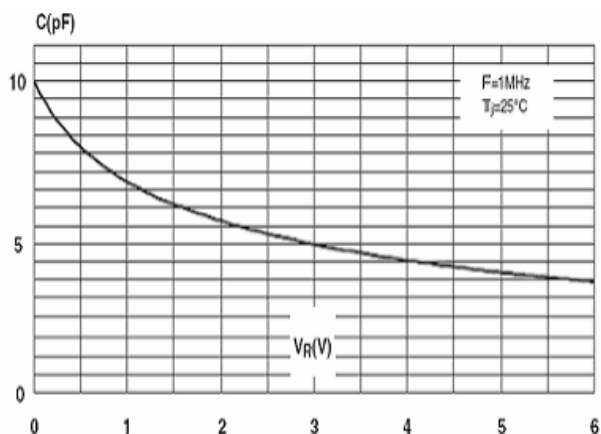


Fig 1 : Junction Capacitance V.S Reverse Voltage Applied

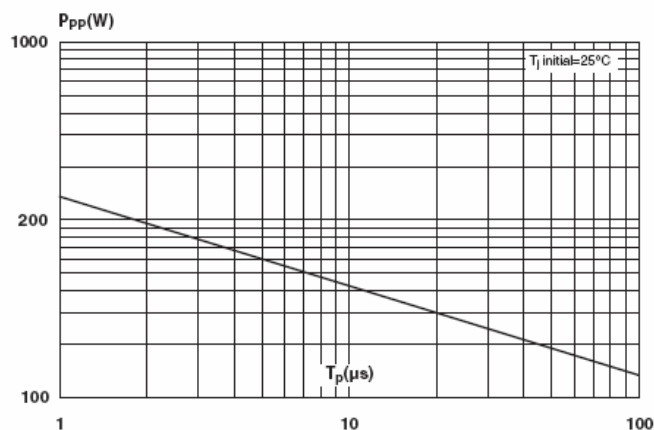


Fig 2 : Peak Plus Power V.S Exponential Plus Duration

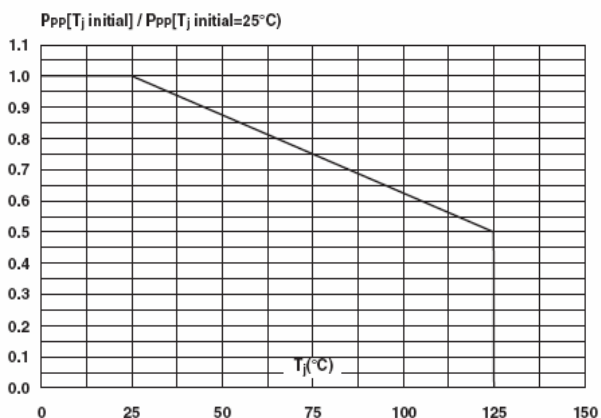


Fig 3 : Relative Variation of Peak Plus Power V.S Initial Junction Temperature

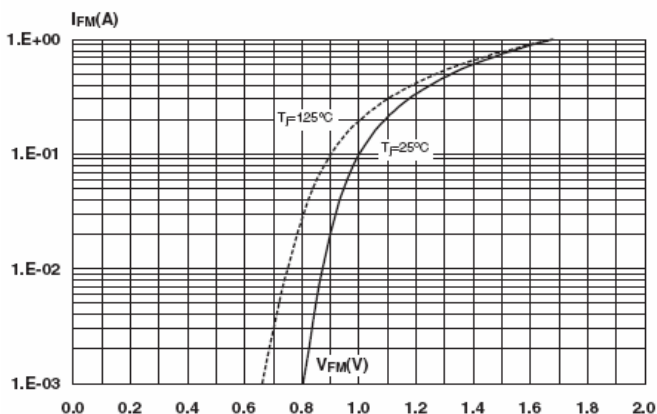


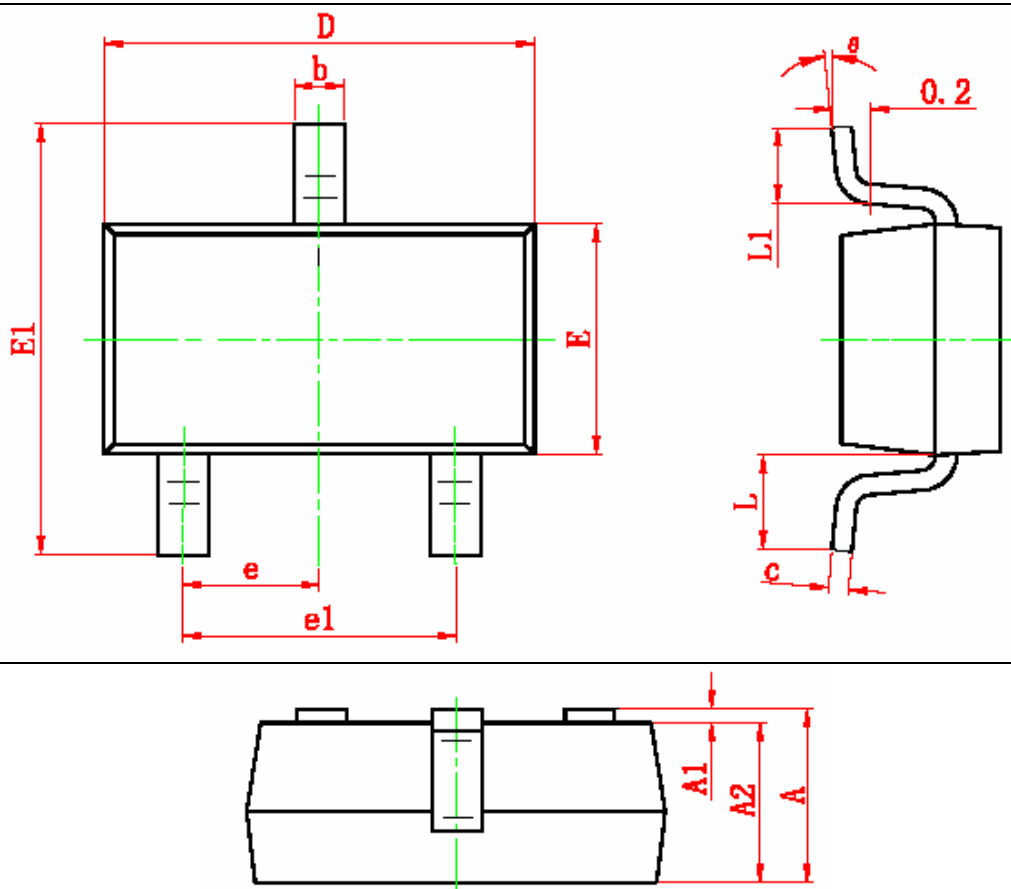
Fig 4 : Forward Voltage Drop V.S Peak Forward Current



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SOT-23 PACKAGE OUTLINE



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	0.900	1.200	0.035	0.043
A1	0.000	0.100	0.000	0.004
A2	0.900	1.100	0.035	0.039
b	0.300	0.500	0.012	0.020
c	0.080	0.150	0.003	0.006
D	2.800	3.000	0.110	0.118
E	1.200	1.400	0.047	0.055
E1	2.250	2.550	0.089	0.100
e	0.950 TYP		0.037 TYP	
e1	1.800	2.000	0.071	0.079
L	0.550 REF		0.022 REF	
L1	0.300	0.500	0.012	0.020
θ	0°	8°	0°	6°



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