SPE0532
2-Line ESD Protection Array

DESCRIPTION
The SPE0532 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. SPE0532 will protect 2-line, and may be used on line where the signal polarities swing above and below ground.

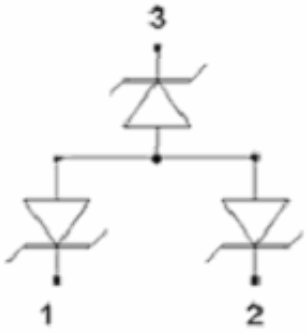
SPE0532 offer desirable characteristics for board level protection including fast response time, low operating and clamping voltage, and no device degradation.

SPE0532 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.

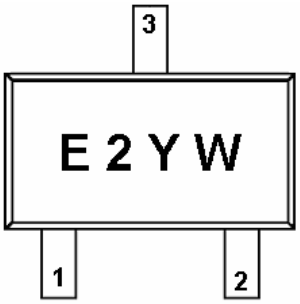
APPLICATIONS
- Cellular Handsets and Accessories
- Cordless Phone
- PDA
- Notebooks and Handhelds
- Portable Instrumentation
- Digital Cameras
- MP3 Player

FEATURES
- Transient protection for data lines to
  IEC 61000-4-2 (ESD) ±15kV (air), ±8kV (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



Y : Year Code
W : Week Code

SPE0532
2-Line ESD Protection Array

ORDERING INFORMATION

Part Number	Package	Part Marking
SPE0532S23RGB	SOT-23	E2YW

※ SPE0532S23RGB : Tape Reel ; Pb – Free; Halogen – Free

ABSOULTE MAXIMUM RATINGS

(T_A=25℃ Unless otherwise noted)

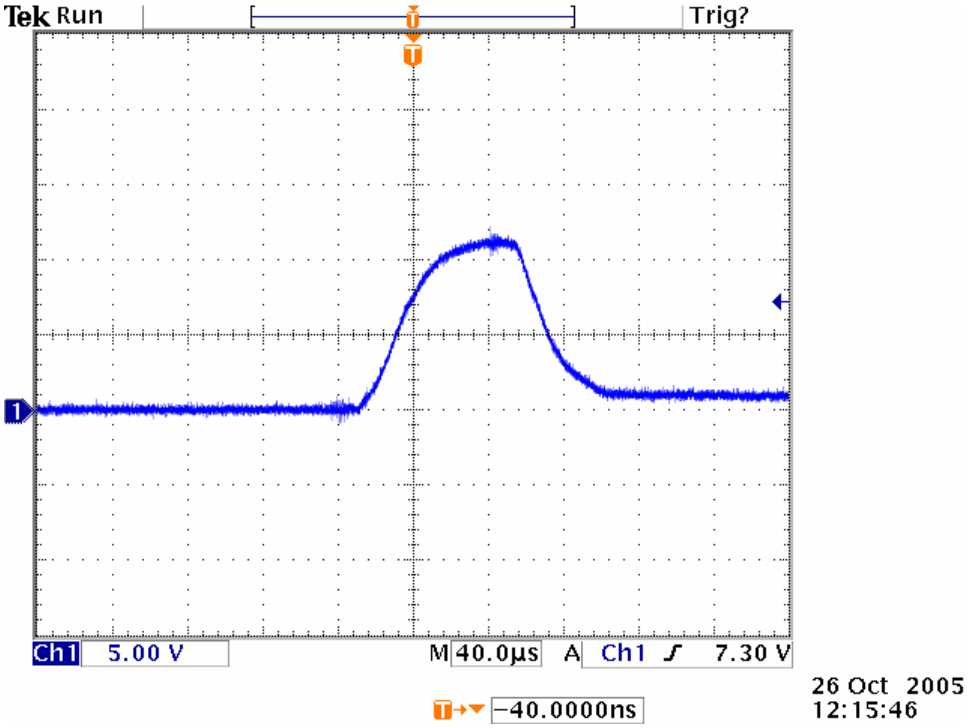
Parameter	Symbol	Typical	Unit
Peak Pulse Power (tp = 8/20 μs)	Ppk	250	W
Maximum Peak Pulse Current (tp = 8/20 μs)	Ipp	7	A
ESD per ICE 61000 – 4 – 2 (Air)	Vpp	±15	KV
ESD per ICE 61000 – 4 – 2 (Contact)	Vpp	±8	KV
Operating Junction Temperature	T_J	-55 ~ 150	℃
Storage Temperature Range	T_{STG}	-55 ~ 150	℃
Lead Soldering Temperature	T_L	260 (10sec)	℃

ELECTRICAL CHARACTERISTICS

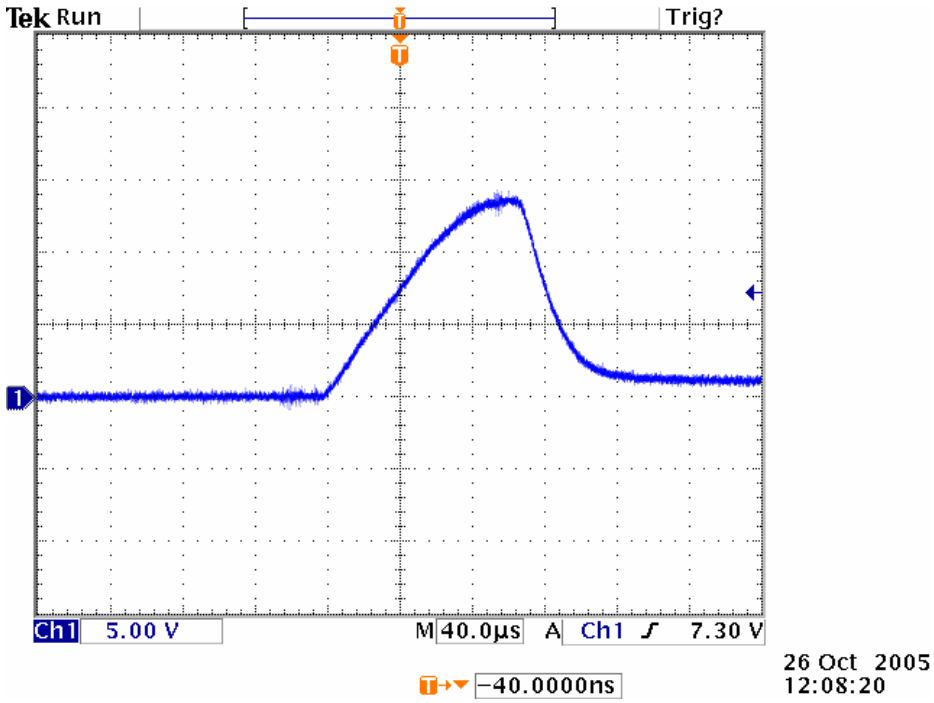
(T_A=25℃ Unless otherwise noted)

Parameter	Symbol	Conditions	Min.	Typ	Max.	Unit
Reverse Stand – Off Voltage	V_{RWM}				5	V
Reverse Breakdown Voltage	V_{BR}	It = 1mA	6		8.5	V
Reverse Leakage Current	I_R	V_{RWM} = 5V , T=25℃		0.01	1	μA
Reverse Leakage Current	I_R	V_{RWM} = 3V , T=25℃		0.01	0.5	μA
Clamping Voltage	V_C	Ipp = 1A , tp = 8/20 μs			11.5	V
Clamping Voltage	V_C	Ipp = 7A , tp = 8/20 μs			15	V
Junction Capacitance	Cj	Between I/O Pin and GND V_R = 0V , f = 1MHz		5	10	pF

TYPICAL CHARACTERISTICS



Clamping Voltage (Ipp = 1A , tp = 8/20 µs)



Clamping Voltage (Ipp = 7A , tp = 8/20 µs)

TYPICAL CHARACTERISTICS

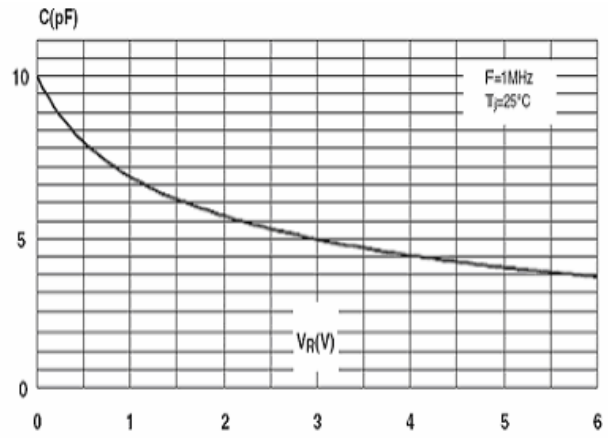


Fig 1 : Junction Capacitance V.S Reverse Voltage Applied

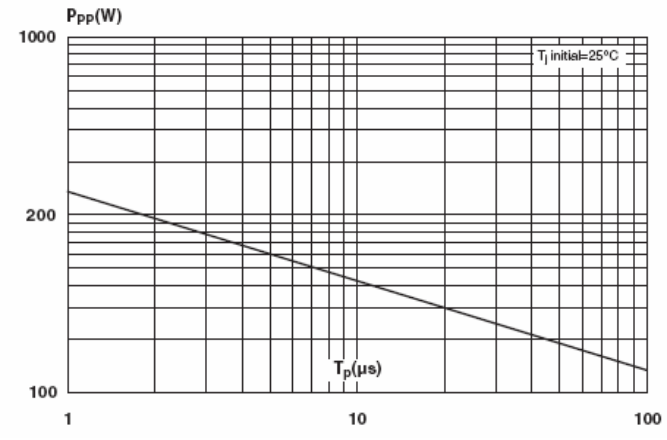


Fig 2 : Peak Plus Power V.S Exponential Plus Duration

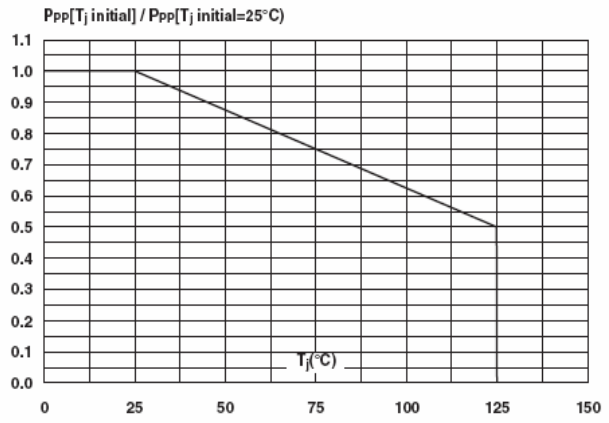


Fig 3 : Relative Variation of Peal Plus Power V.S Initial Junction Temperature

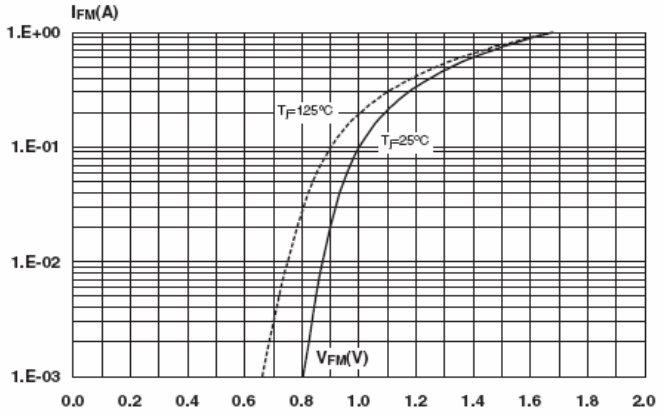


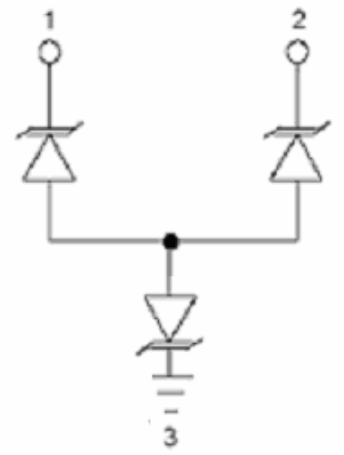
Fig 4 : Forward Voltage Drop V.S Peak Forward Current

APPLICATION NOTE

Device Connection for Protection of Two Data Lines

SPE0532 is designed to protect up to two data lines. The bidirection device is connected as follows:

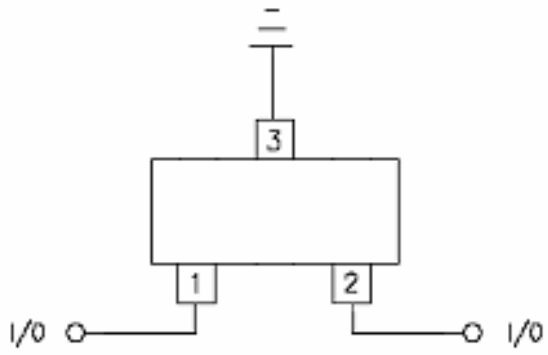
1. The TVS protection of two I/O lines is achieved by connecting pins 1 and 2 to the data lines. Pin 3 is connected to ground. The ground connection should be made directly to the ground plane for best results. The path length is kept as short as possible to reduce the effects of parasitic inductance.



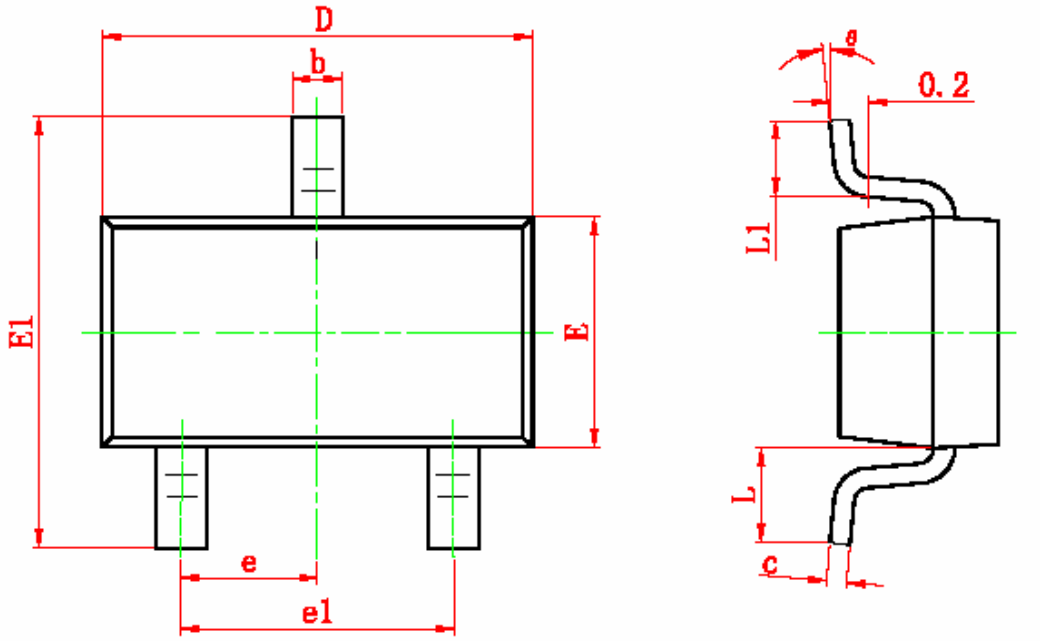
Circuit Board Layout Recommendations for Suppression of ESD

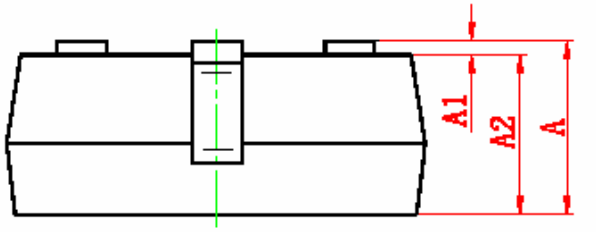
Good circuit board layout is critical for the suppression of ESD induced transients. The following guidelines are recommended:

1. Place the TVS near the input terminals or connectors to restrict transient coupling.
2. Minimize the path length between the TVS and the protected line.
3. Minimize all conductive loops including power and ground loops.
4. The ESD transient return path to ground should be kept as short as possible.
5. Never run critical signals near board edges.
6. Use ground planes whenever possible.



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°

Information provided is alleged to be exact and consistent. SYNC Power Corporation presumes no responsibility for the penalties of use of such information or for any violation of patents or other rights of third parties which may result from its use. No license is granted by allegation or otherwise under any patent or patent rights of SYNC Power Corporation. Conditions mentioned in this publication are subject to change without notice. This publication surpasses and replaces all information previously supplied. SYNC Power Corporation products are not authorized for use as critical components in life support devices or systems without express written approval of SYNC Power Corporation.

©The SYNC Power logo is a registered trademark of SYNC Power Corporation
©2004 SYNC Power Corporation – Printed in Taiwan – All Rights Reserved
SYNC Power Corporation
7F-2, No.3-1, Park Street
NanKang District (NKSP), Taipei, Taiwan, 115, R.O.C
Phone: 886-2-2655-8178
Fax: 886-2-2655-8468
©http://www.syncpower.com