



# SPE0582

## Ultra Low Capacitance 2-Line ESD Protection Array

### DESCRIPTION

The SPE0582 is 2-channel very low capacitance ESD transient voltage suppressor which provides a very high level of protection for sensitive electronic components that may be subjected to electrostatic discharge. It is particularly well-suited to protect systems with high speed communication lines from ESD, EFT, and lightning.

The SPE0582 consists of two low capacitance steering diodes and a TVS diode in SOT-353 package. Each channel of SPE0582 could safely dissipate ESD strikes of  $\pm 15\text{kV}$  air discharge as well as  $\pm 8\text{kV}$  contact discharge, meeting the requirement of the IEC 61000-4-2 international standard. Using the MIL-STD-883 (Method 3015) specification for Human Body Model (HBM) ESD, the device provides protection for contact discharges to greater than  $\pm 15\text{kV}$ .

### APPLICATIONS

- ◆ Cellular Handsets and Accessories
- ◆ Cordless Phone
- ◆ PDA
- ◆ Notebooks and Handhelds
- ◆ Portable Instrumentation
- ◆ Digital Cameras
- ◆ MP3 Player High Definition Multi-Media Interface Protection
- ◆ HDMI 1.2~2.1
- ◆ USB2.0/USB3.0 and Type C
- ◆ Monitors and Notebook Computers
- ◆ HDSL, IDSL Secondary IC Side Protection
- ◆ 10/100/1000 Ethernet

### FEATURES

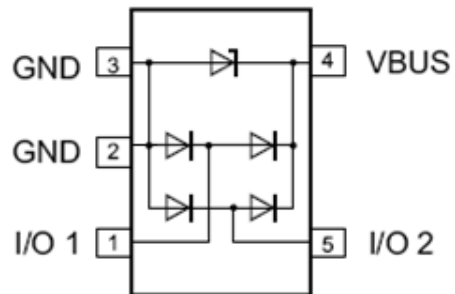
- ◆ Transient protection for data lines to

IEC 61000-4-2 (ESD)  
 $\pm 15\text{kV}$  (air)  
 $\pm 8\text{kV}$  (contact)

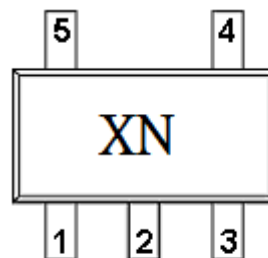
IEC 61000-4-4 (EFT)  
 30A (5/50ns)

- ◆ Protects five bidirectional I/O lines
- ◆ Working voltage: 5V
- ◆ Low leakage current
- ◆ Low operating and clamping voltages
- ◆ Low capacitance: 0.35 pF typical

### PIN CONFIGURATION ( SOT-353 )



### PART MARKING



**X=Month Code**  
**N=Specific Device Code**



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### ORDERING INFORMATION

Part Number	Package	Part Marking
SPE0582S35RGB	SOT-353	XN

※ SPE0582S35RGB : 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	100	W
Maximum Peak Pulse Current ( tp = 8/20 μs )	Ipp	4	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

(TA=25°C Unless otherwise noted)

Parameter	Symbol	Conditions	Min.	Typ	Max.	Unit
Reverse Stand – Off Voltage	VRWM				5	V
Forward Voltage @ IF	VF	IF = 15mA			1.15	V
Reverse Breakdown Voltage	VBR	It = 1mA	6.0	7.0		V
Reverse Leakage Current	IR	VRWM = 5V , T=25°C			1	μA
Clamping Voltage	VC	Ipp = 1A , tp = 8/20 μs			15	V
Junction Capacitance	Cj	VR = 0V, f = 1MHz Any I/O pin to Ground			0.8	pF
		VR = 0V, f = 1MHz Between I/O pins			0.35	

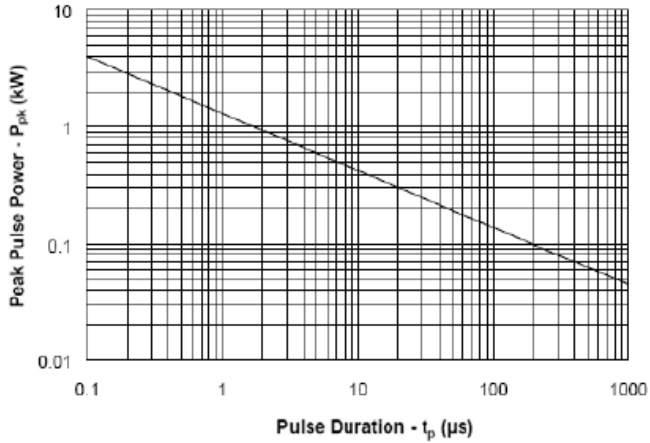


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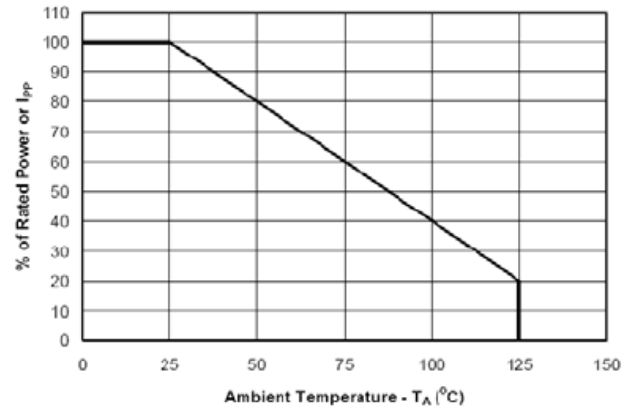
## Ultra Low Capacitance 2-Line ESD Protection Array

### TYPICAL CHARACTERISTICS

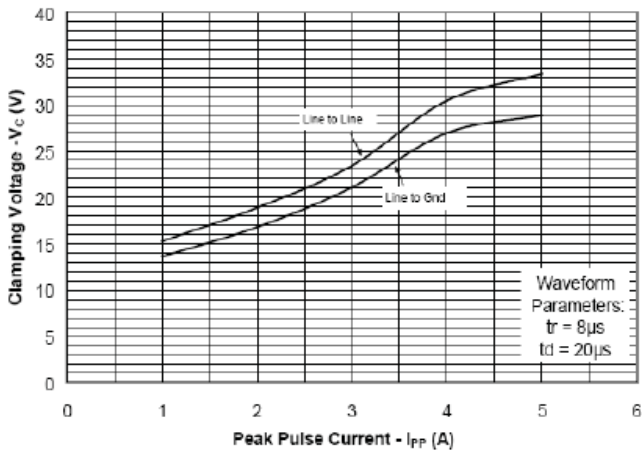
#### Non-Repetitive Peak Pulse Power vs. Pulse Time



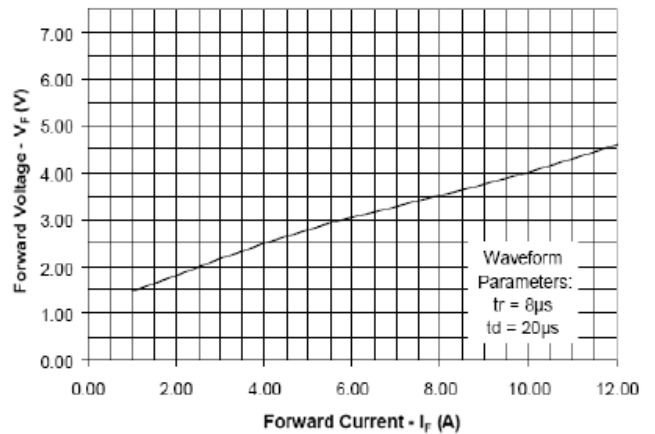
#### Power Derating Curve



#### Clamping Voltage vs. Peak Pulse Current



#### Forward Voltage vs. Forward Current





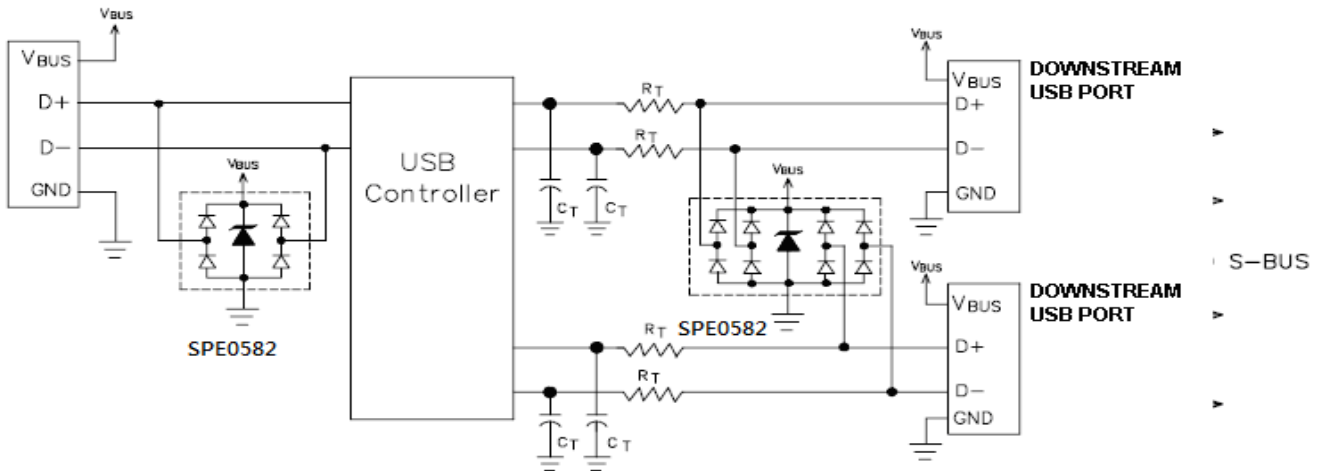
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### APPLICATION NOTE

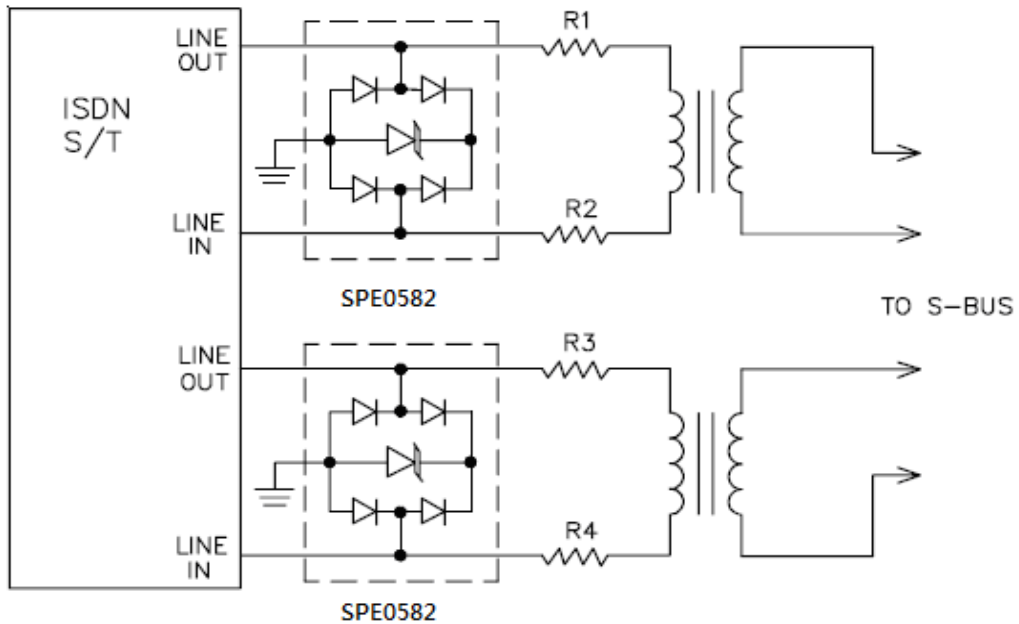
#### SPE0582 Device Connection for USB Port

UPSTREAM  
USB PORT



### Universal Serial Bus ESD Protection

#### SPE0582 Device Connection for ISDN S/T



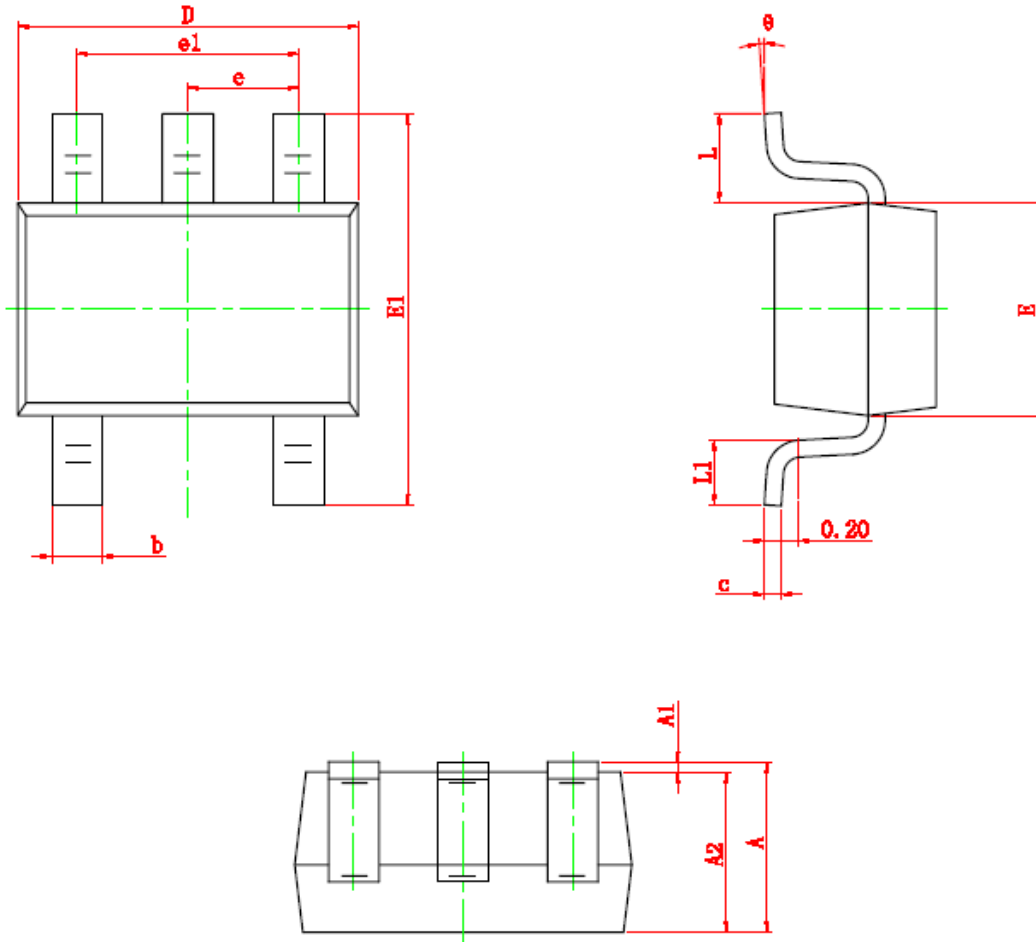
### ISDN S/T Interface Protection



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### SOT-353 PACKAGE OUTLINE



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	0.900	1.100	0.035	0.043
A1	0.000	0.100	0.000	0.004
A2	0.900	1.000	0.035	0.039
b	0.150	0.350	0.006	0.014
c	0.080	0.150	0.003	0.006
D	2.000	2.200	0.079	0.087
E	1.150	1.350	0.045	0.053
E1	2.150	2.450	0.085	0.096
e	0.650 TYP		0.026 TYP	
e1	1.200	1.400	0.047	0.055
L	0.525 REF		0.021 REF	
L1	0.260	0.460	0.010	0.018
$\theta$	0°	8°	0°	8°



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