# 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 lighting.

The SPE0582 is 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 ±15kV air discharge as well as ±8kV 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 ±15kV.

### APPLICATIONS

- Cellular Handsets and Accessories
- Cordless Phone
- PDA
- Notebooks and Handhelds
- Portable Instrumentation
- Digital Cameras
- MP3 Player High Definition Multi-Media Interface Protection
- USB 3.0 Power and Data Line
- Monitors and Notebook Computers
- HDSL, IDSL Secondary IC Side Protection
- 10/100/1000 Ethernet

### FEATURES

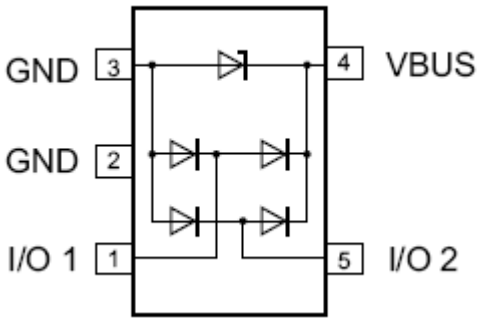
- Transient protection for data lines to

  IEC 61000-4-2 (ESD)
  ±15kV (air)
  ±8kV (contact)

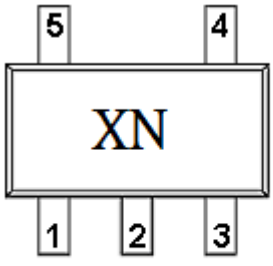
  IEC 61000-4-4 (EFT)
  30A (5/50ns)

- 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

# SPE0582

## Ultra Low Capacitance 2 -Line ESD Protection Array

**ORDERING INFORMATION**

| Part Number | Package | Part Marking |
|---|---|---|
| SPE0582S35RGB | SOT-353 | XN |

※ SPE0582S35RGB : 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 | 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 | $T_J$ | -55 ~ 125 | ℃ |
| Storage Temperature Range | $T_{STG}$ | -55 ~ 150 | ℃ |
| Lead Soldering Temperature | $T_L$ | 260 ( 10sec ) | ℃ |

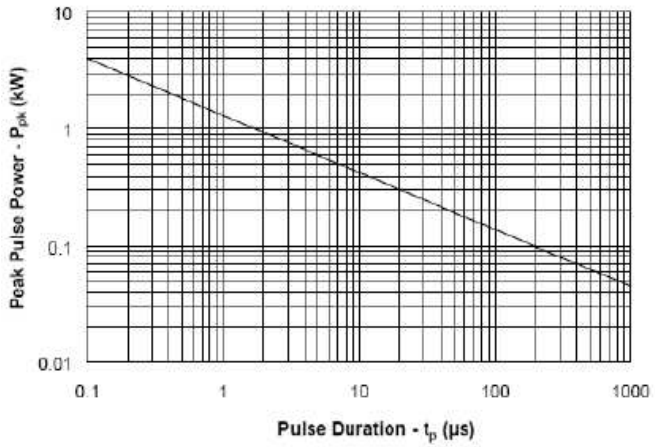
**ELECTRICAL CHARACTERISTICS**

($T_A$=25℃ Unless otherwise noted)

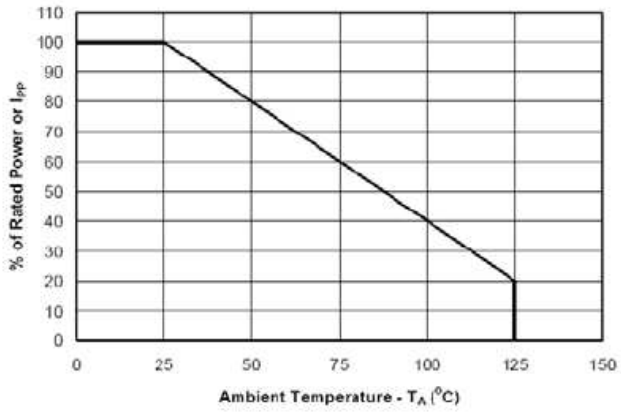
| Parameter | Symbol | Conditions | Min. | Typ | Max. | Unit |
|---|---|---|---|---|---|---|
| Reverse Stand – Off Voltage | $V_{RWM}$ | | | | 5 | V |
| Forward Voltage @ IF | $V_F$ | $I_F$ = 15mA | | | 1.15 | V |
| Reverse Breakdown Voltage | $V_{BR}$ | It = 1mA | 6.0 | 7.0 | | V |
| Reverse Leakage Current | $I_R$ | $V_{RWM}$ = 5V , T=25℃ | | | 1 | μA |
| Clamping Voltage | $V_C$ | Ipp = 1A , tp = 8/20 μs | | | 15 | V |
| Junction Capacitance | Cj | $V_R$ = 0V, f = 1MHz<br>Any I/O pin to Ground | | | 0.8 | pF |
| | | $V_R$ = 0V, f = 1MHz<br>Between I/O pins | | | 0.35 | |

**TYPICAL CHARACTERISTICS**

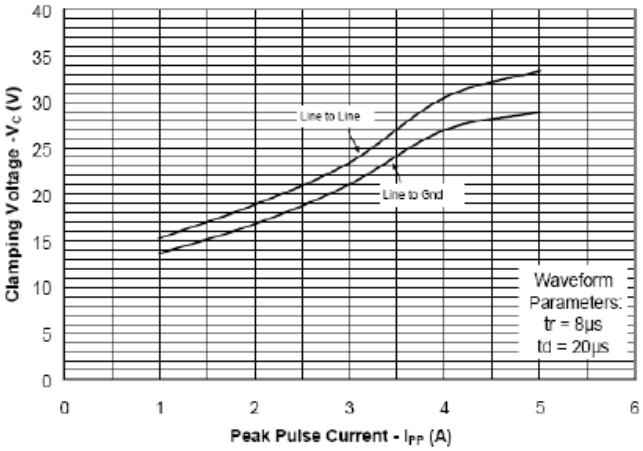
Non-Repetitive Peak Pulse Power vs. Pulse Time



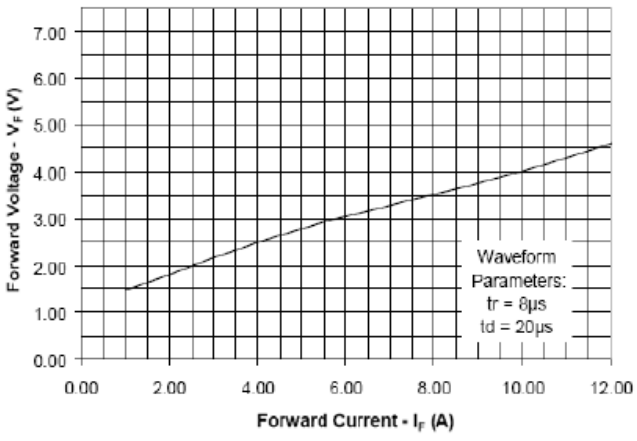

Power Derating Curve




Clamping Voltage vs. Peak Pulse Current

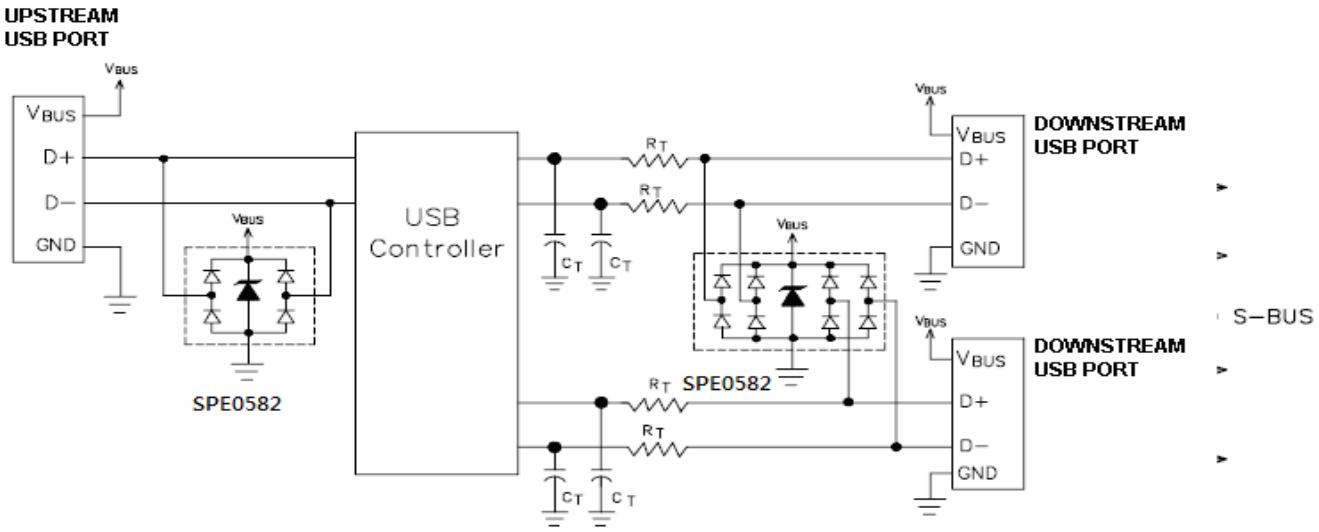



Forward Voltage vs. Forward Current



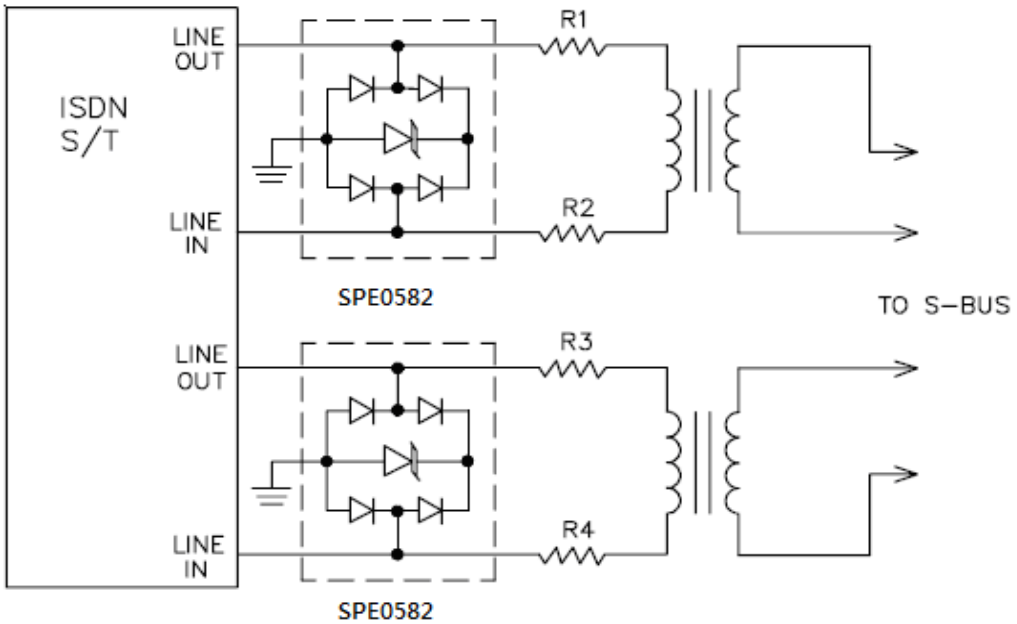
**APPLICATION NOTE**

**SPE0582 Device Connection for USB Port**



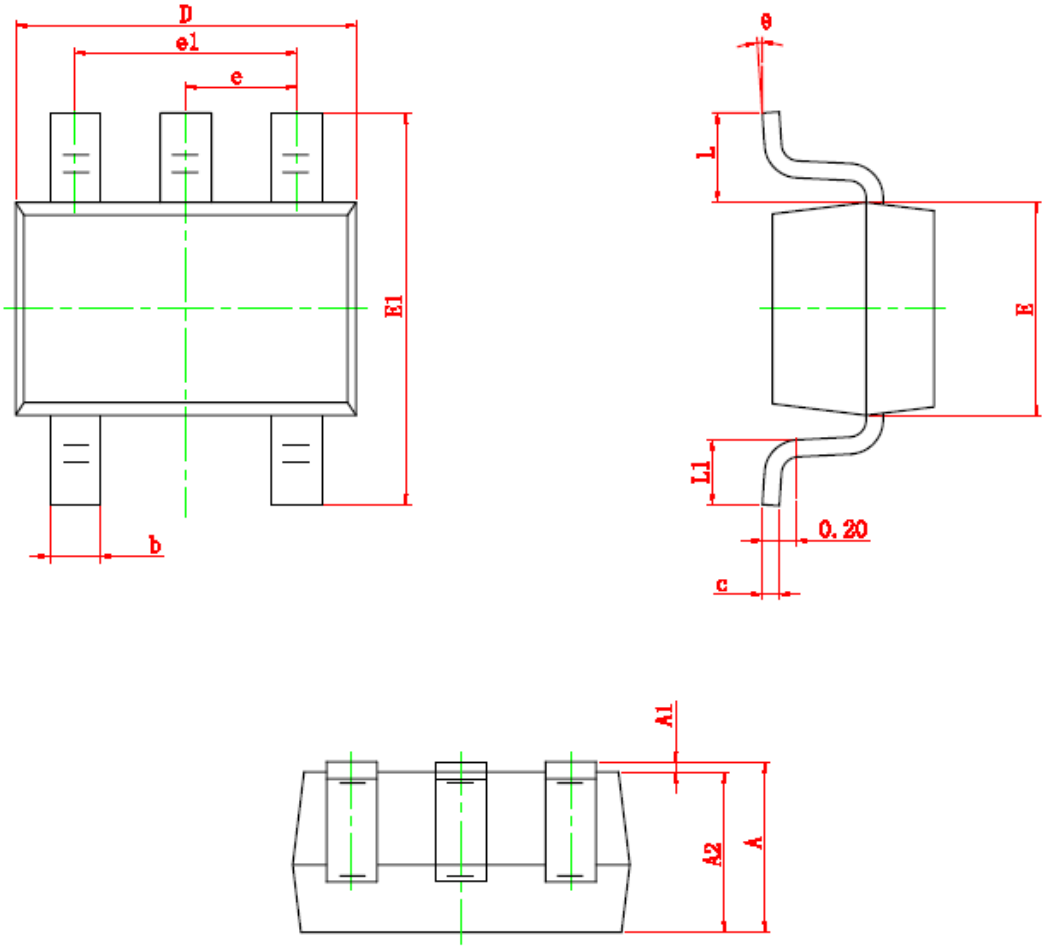

**Universal Serial Bus ESD Protection**

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




**ISDN S/T Interface Protection**

**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 |
| θ | 0° | 8° | 0° | 8° |

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