

TVS Diode Arrays

Upstream USB Port Terminator with ESD Suppression & EMI Filtering

SPUSB1 Series

The Littelfuse SPUSB1 Series is a multifunctional USB port protection network designed to provide ESD protection, EMI/RFI filtering and line termination for a single USB 1.1 port. The SPUSB1 can replace a minimum of ten typically larger “discrete” devices resulting in inventory and placement cost savings.

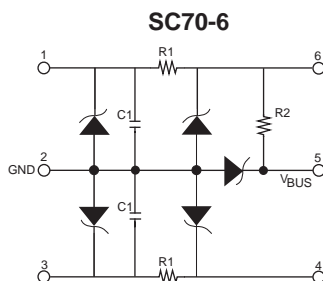
The SPUSB1 Series combines Transient Voltage Suppression (TVS) avalanche diodes, EMI/RFI filtering components (R1 and C1), and a 1.5kΩ termination resistor (R2). The filtering components are included to satisfy recommendations in the USB 1.1 specification, and the 1.5kΩ resistor (R2) is included as a pull-up resistor to VBUS.

The SPUSB1 Series can be used for termination and protection of “upstream” USB devices such as PDAs, digital cameras, scanners and hubs which are often at risk from transient voltage surges and electromagnetic interference from both internal and external sources.

To support a wide range of circuit conditions, Littelfuse offers three resistance values for the series resistor (R1). The series resistance plus the USB driver output resistance must be close to the USB cable’s characteristic impedance of 45Ω (90Ω balanced) to minimize transmission line reflections.



Circuit Diagram



Ordering Information

| PART NUMBER | R1 (Ohm) | R2 (KOhm) | C1 (pF) | DEVICE BRAND | PKG TYPE | #/REEL |
|-------------|----------|-----------|---------|--------------|----------|--------|
| SPUSB1AJT | 12 | 1.5 | 47 | UFA | SC70-6 | 3000 |
| SPUSB1BJT | 22 | 1.5 | 47 | UFB | SC70-6 | 3000 |
| SPUSB1CJT | 33 | 1.5 | 47 | UFC | SC70-6 | 3000 |

Features

- One upstream USB port terminator, EMI filter and transient overvoltage protector in a single surface-mount package
- Compact SC70 package saves board space and lowers manufacturing costs compared to discrete solutions
- ESD protection to 30kV contact discharge per MIL-STD- 883D, method 3015
- ESD protection to 15kV contact discharge per IEC 61000-4-2 international standard

Applications

- Desktop/Laptop PCs
- USB peripherals (printers, scanners, zip drives)
- PDAs / wireless handsets
- Digital cameras
- MP3 Players
- Cable Modems

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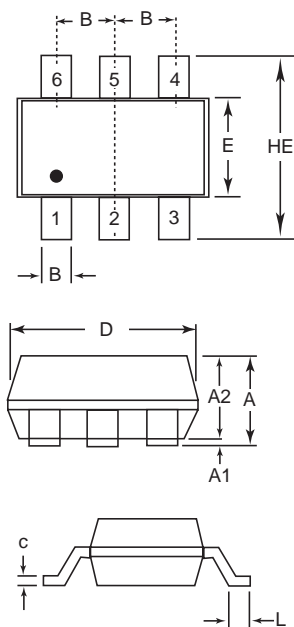
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PACKAGING INFORMATION

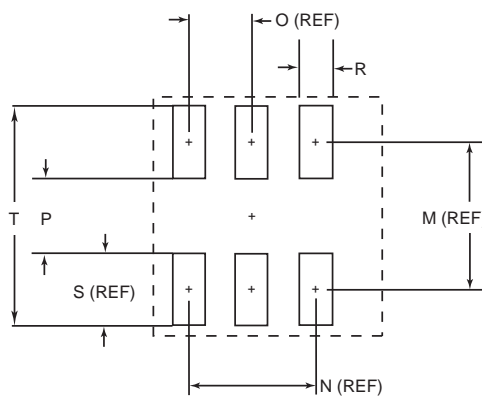
| Mechanical Specifications | |
|---------------------------|------------------------|
| Lead Plating | Tin-Lead |
| Lead Material | Copper Alloy |
| Lead Coplanarity | 0.004 inches (0.102mm) |
| Substrate Material | Silicon |
| Body Material | Molded Epoxy |
| Flammability | UL94-V-0 |

Outline Drawings



SPUSB1AJT - SC70-6
 SPUSB1BJT - SC70-6
 SPUSB1CJT - SC70-6

Recommended Pad Layout



| Package | SC70-6 | | | |
|----------------------------|------------------|------|-----------|-------|
| Pins | 6 | | | |
| JEDEC | MO-203 Issue A | | | |
| | mm | | inches | |
| | min | max | min | max |
| A | 0.80 | 1.10 | 0.031 | 0.043 |
| A1 | 0.00 | 0.10 | 0.000 | 0.004 |
| A2 | 0.70 | 1.00 | 0.028 | 0.039 |
| B | 0.15 | 0.30 | 0.006 | 0.012 |
| c | 0.08 | 0.25 | 0.003 | 0.010 |
| D | 1.85 | 2.25 | 0.073 | 0.089 |
| E | 1.15 | 1.35 | 0.045 | 0.053 |
| e | 0.65 BSC | | 0.026 BSC | |
| HE | 2.00 | 2.40 | 0.079 | 0.094 |
| L | 0.26 | 0.46 | 0.010 | 0.018 |
| M | - | 1.60 | - | 0.063 |
| N | - | 1.30 | - | 0.052 |
| O | - | 0.65 | - | 0.026 |
| P | - | 0.70 | - | 0.058 |
| R | - | 0.35 | - | 0.014 |
| S | - | 0.90 | - | 0.035 |
| T | - | 2.50 | - | 0.098 |
| P_D@70°C | 0.2W | | | |
| # / bag | 1000 pcs | | | |
| # / tape & reel | 3,000 pcs | | | |

*See device brand for marking information.

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