

ULTRA LOW CAPACITANCE STEERING DIODE ARRAY



SOT-543 PACKAGE

DESCRIPTION

The USB002 is an ultra low capacitance (0.6pF) steering diode array. This device provides circuit protection for interfaces and wireless bus applications and portable electronics. The USB002 is ideally suited to protect USB data I/O ports against the effects of ESD and EFT.

The USB002 meets the requirements of IEC 61000-4-2 (ESD) and IEC 61000-4-4 (EFT). At higher operating frequencies or faster edge rates, insertion loss and signal integrity are a major concern. The USB002 offers a ultra low capacitance and low leakage current in a SOT-543 package.

FEATURES

- Compatible with IEC 61000-4-2 (ESD): Air - 15kV, Contact - 8kV
- Compatible with IEC 61000-4-4 (EFT): 40A - 5/50ns
- ESD Protection > 25 kilovolts
- 225 Milliwatt Continuous Power Dissipation
- Provides 2 Lines of Protection
- Low Leakage Current < 1.0 μ A
- Ultra Low Capacitance: 0.6pF
- RoHS Compliant
- REACH Compliant

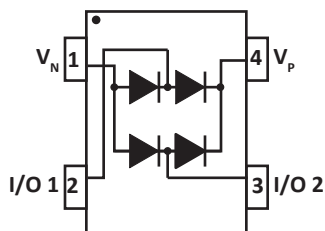
APPLICATIONS

- USB Interface Ports
- SMART Phones
- Video
- Portable Electronics
- Laptops

MECHANICAL CHARACTERISTICS

- Molded JEDEC SOT-543 Package
- Approximate Weight: 3 milligrams
- Lead-Free Pure-Tin Plating (Annealed)
- Solder Reflow Temperature:
Pure-Tin - Sn, 100: 260-270°C
- 8mm Tape and Reel Per EIA Standard 481
- Flammability Rating UL 94V-0

PIN CONFIGURATION



TYPICAL DEVICE CHARACTERISTICS
MAXIMUM RATINGS @ 25°C Unless Otherwise Specified

| PARAMETER | SYMBOL | VALUE | UNITS |
|--|-----------|------------|-------|
| Operating Temperature | T_A | -55 to 150 | °C |
| Storage Temperature | T_{STG} | -55 to 150 | °C |
| Continuous Power Dissipation | P_{PC} | 225 | mW |
| Repetitive Peak Forward Current @ $t_p = 5\mu s$, $F = 50kHz$ (Pin 1-2) | I_{FRM} | 700 | mA |

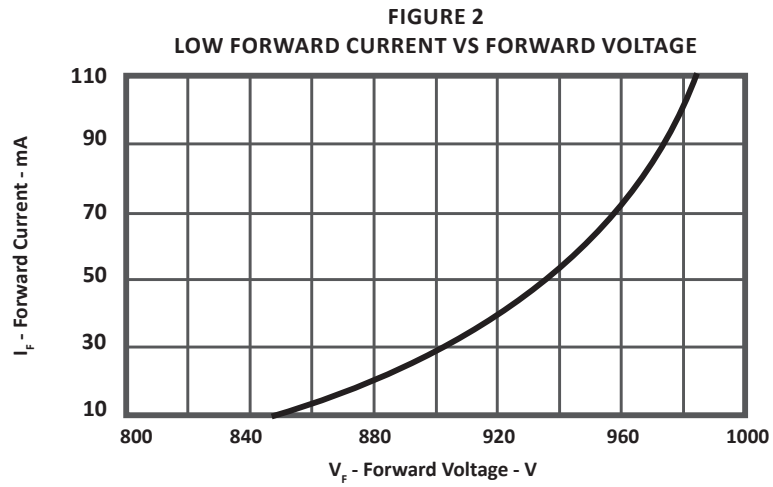
ELECTRICAL CHARACTERISTICS PER LINE @ 25°C Unless Otherwise Specified

| PART NUMBER | DEVICE MARKING | REPETITIVE PEAK REVERSE VOLTAGE (Note 1) @ 10 μ A V_{RRM} VOLTS | MAXIMUM REVERSE LEAKAGE CURRENT (Note 2) @ V_{RRM} @ 5V I_R μ A | MAXIMUM DIODE FORWARD VOLTAGE @ 10mA V_F VOLTS | MAXIMUM CAPACITANCE (Note 3) C_J pF |
|-------------|----------------|--|--|---|---|
| USB002 | U2 | 20 | 1 | 1.4 | 0.6 |

NOTES

- $V_p - V_N = 20$ Volts.
- $V_p - V_N = 5.5$ Volts.
- Between line and ground - $V_p = 5$ Volts, $f = 1$ MHz, $V_{IO} = 2.5$ Volts, $V_N = 0$ Volts.

TYPICAL DEVICE CHARACTERISTICS

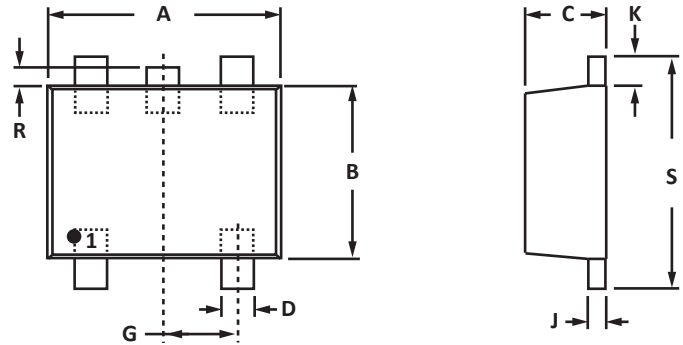


SOT-543 PACKAGE INFORMATION
OUTLINE DIMENSIONS

| DIM | MILLIMETERS | | INCHES | |
|-----|-------------|------|-----------|-------|
| | MIN | MAX | MIN | MAX |
| A | 1.50 | 1.70 | 0.059 | 0.067 |
| B | 1.10 | 1.30 | 0.043 | 0.051 |
| C | 0.50 | 0.60 | 0.020 | 0.024 |
| D | 0.17 | 0.27 | 0.007 | 0.011 |
| G | 0.50 BSC | | 0.020 BSC | |
| J | 0.08 | 0.18 | 0.003 | 0.007 |
| K | 0.10 | 0.30 | 0.004 | 0.012 |
| S | 1.50 | 1.70 | 0.059 | 0.067 |
| R | 0.05 | 0.15 | 0.002 | 0.006 |

NOTES

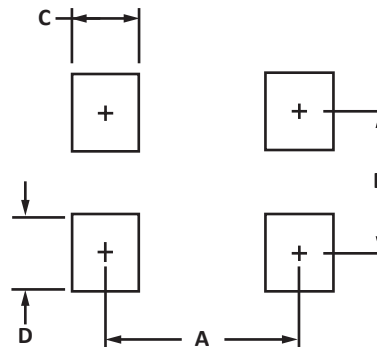
- Controlling dimension: inches.
- Dimensioning and tolerances per ANSI Y14.5M, 1985.
- Dimensions are exclusive of mold flash and metal burrs.
- Do not connect center stub.


PAD LAYOUT DIMENSIONS

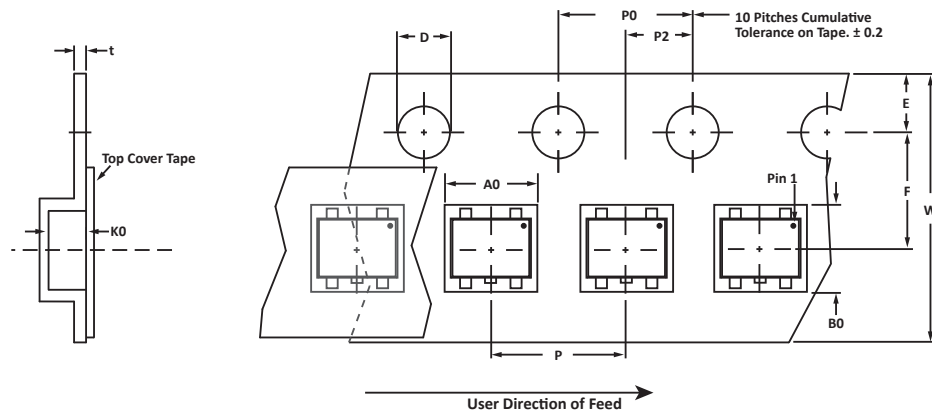
| DIM | MILLIMETERS | INCHES |
|-----|-------------|---------|
| | NOMINAL | NOMINAL |
| A | 1.02 | 0.040 |
| B | 1.40 | 0.055 |
| C | 0.30 | 0.012 |
| D | 0.51 | 0.020 |

NOTES

- Controlling dimension: inches.



TAPE AND REEL



SPECIFICATIONS

| REEL DIA. | TAPE WIDTH | A0 | B0 | K0 | D | E | F | W | P0 | P2 | P | tmax |
|------------|------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|------|
| 178mm (7") | 8mm | 1.78 ± 0.05 | 1.78 ± 0.05 | 0.69 ± 0.05 | 1.50 ± 0.10 | 1.75 ± 0.10 | 3.50 ± 0.05 | 8.00 ± 0.30 | 4.00 ± 0.10 | 2.00 ± 0.05 | 4.00 ± 0.10 | 0.25 |

NOTES

1. Dimensions are in millimeters.
2. Surface mount product is taped and reeled in accordance with EIA-481.
3. Suffix - T7 = 7" Reel - 3,000 pieces per 8mm tape.
4. Marking on Part - marking code (see page 2) and polarity dot.

ORDERING INFORMATION

| BASE PART NUMBER | LEADFREE SUFFIX | TAPE SUFFIX | QTY/REEL | REEL SIZE | TUBE QTY |
|------------------|-----------------|-------------|----------|-----------|----------|
| USB002 | -LF | -T7 | 3000 | 7" | n/a |

This device is only available in a Lead-Free configuration.

COMPANY INFORMATION

COMPANY PROFILE

In business more than 25 years, ProTek Devices™ is a privately held semiconductor company. The company offers a product line of overvoltage protection and overcurrent protection components. These include transient voltage suppressor array (TVS arrays) avalanche breakdown diode, steering diode TVS array and electronics SMD chip fuses. These components deliver circuit protection in electronic systems from numerous overvoltage and overcurrent events. They include lightning; electrostatic discharge (ESD); nuclear electromagnetic pulses (NEMP); inductive switching; and electromagnetic interference (EMI) / radio frequency interference (RFI). ProTek Devices also offers LED wafer die for ESD protection and related high frequency products. ProTek Devices is ISO 9001:2015 certified.

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