

## ULTRA LOW CAPACITANCE STEERING DIODE ARRAY



### DESCRIPTION

The USB004 is an ultra low capacitance (typically 3pF) steering diode array. This device provides circuit protection for interfaces and wireless bus applications and portable electronics. The USB004 is ideally suited to protect USB data I/O ports against the effects of ESD and EFT.

The USB004 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 USB004 offers a ultra low capacitance and low leakage current in a SOT-143 package.

### FEATURES

- Compatible with IEC 61000-4-2 (ESD): Air - 15kV, Contact - 8kV
- Compatible with IEC 61000-4-4 (EFT): 40A - 5/50ns
- Provides 2 Lines of Protection
- Low Leakage Current < 1.0 $\mu$ A
- Ultra Low Capacitance: 3pF Typical
- RoHS Compliant
- REACH Compliant

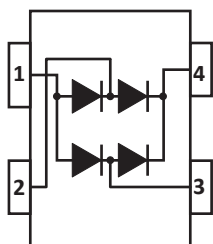
### APPLICATIONS

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

### MECHANICAL CHARACTERISTICS

- Molded JEDEC SOT-143 Package
- Approximate Weight: 9 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 2-3)	$I_{FRM}$	700	mA

**ELECTRICAL CHARACTERISTICS PER LINE @ 25°C Unless Otherwise Specified**

PART NUMBER	DEVICE MARKING	REPETITIVE PEAK REVERSE VOLTAGE (Note 1) @ 10 $\mu$ A $V_{RRM}$ VOLTS	MAXIMUM REVERSE LEAKAGE CURRENT (Note 2) @ $V_{RRM}$ @ 5V $I_R$ $\mu$ A	MAXIMUM DIODE FORWARD VOLTAGE @ 20mA $V_F$ VOLTS	MAXIMUM CAPACITANCE (Note 3)  $C_J$ pF
USB004	PSA	20	1	0.95	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

FIGURE 1  
PEAK FORWARD CURRENT VS FORWARD VOLTAGE

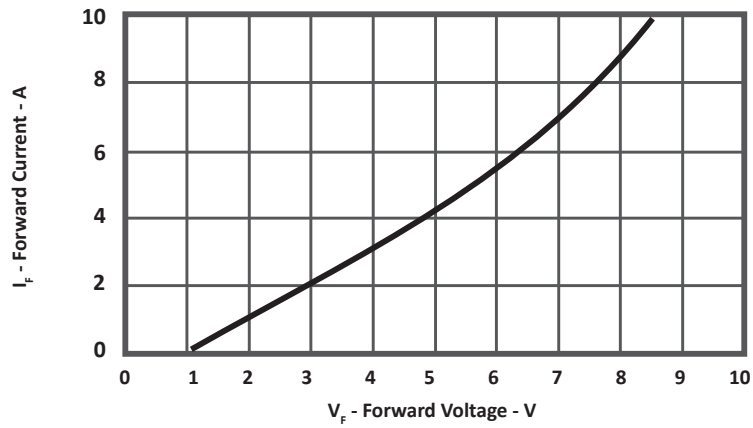
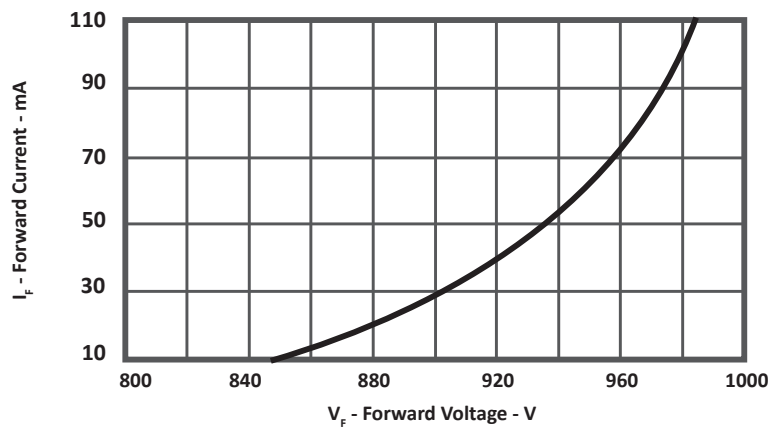


FIGURE 2  
LOW FORWARD CURRENT VS FORWARD VOLTAGE



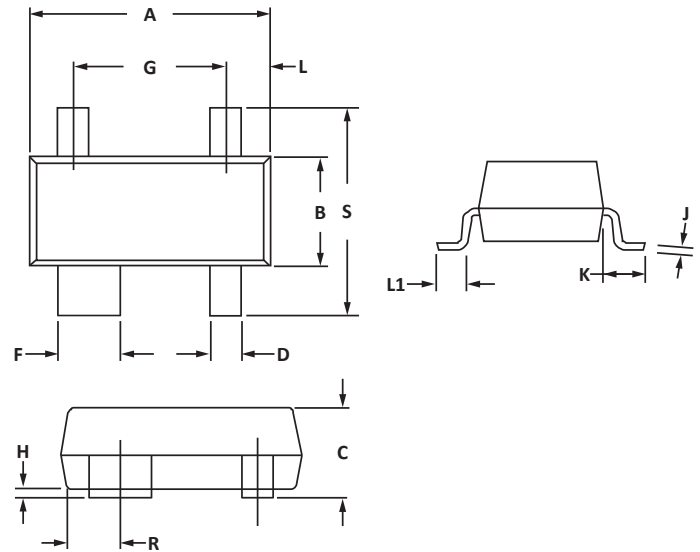
## SOT-143 PACKAGE INFORMATION

## OUTLINE DIMENSIONS

DIM	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	2.80	3.04	0.110	0.120
B	1.20	1.39	0.047	0.055
C	0.84	1.14	0.033	0.045
D	0.39	0.50	0.015	0.020
F	0.79	0.93	0.031	0.037
G	1.78	2.03	0.070	0.080
J	0.08	0.15	0.003	0.006
K	0.46	0.60	0.018	0.024
L	0.445	0.60	0.0175	0.024
L1	0.40	0.60	0.016	0.024
R	0.72	0.83	0.028	0.033
S	2.11	2.48	0.083	0.098

## NOTES

1. Dimensioning and tolerances per ANSI Y14.M, 1985.
2. Controlling dimension: inches.
3. Dimensions are exclusive of mold flash and metal burrs.

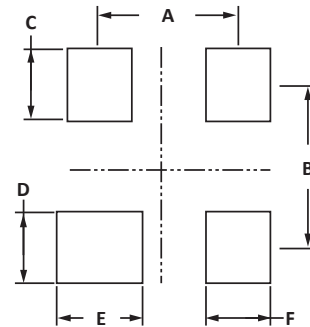


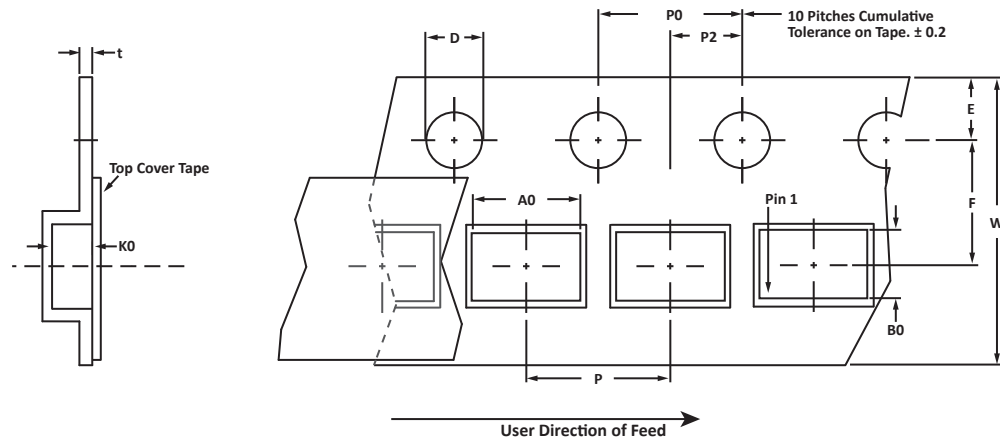
## PAD LAYOUT DIMENSIONS

DIM	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	1.88	2.13	0.074	0.084
B	1.80	2.06	0.071	0.081
C	0.71	0.97	0.028	0.038
D	0.76	1.02	0.030	0.040
E	1.07	1.32	0.042	0.052
F	0.71	0.97	0.028	0.038

## NOTES

1. 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	3.10 ± 0.10	2.70 ± 0.10	1.35 ± 0.10	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. Suffix - T13 = 13" Reel - 10,000 pieces per 8mm tape.
5. Marking on Part - marking code (see page 2) and date code.

Package outline, pad layout and tape specifications per document number 06011.R4 8/10.

**ORDERING INFORMATION**

BASE PART NUMBER	LEADFREE SUFFIX	TAPE SUFFIX	QTY/REEL	REEL SIZE	TUBE QTY
USB004	-LF	-T7	3000	7"	n/a
USB004	-LF	-T13	10,000	13"	n/a

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

## COMPANY INFORMATION

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### COMPANY PROFILE

In business more than 20 years, ProTek Devices™ is a privately-held company located in Tempe, Arizona, that offers a product line of transient voltage suppressors (TVS); avalanche breakdown diodes; steering diode TVS arrays and other surge suppressor component products. These TVS devices protect electronic systems from the effects of lightning, electrostatic discharge (ESD), nuclear electromagnetic pulses (NEMP), inductive switching and EMI / RFI. ProTek Devices also offers high performance interface and linear products that include analog switches; multiplexers; LED drivers; audio control ICs; RF and related high frequency products. The analog devices work in a host of consumer; industrial; automotive and other applications.

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