## **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 < 1.0μA
- Ultra Low Capacitance: 3pF Typical
- RoHS Compliant
- REACH Compliant

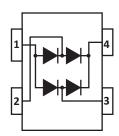
## **MECHANICAL CHARACTERISTICS**

- 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

#### **APPLICATIONS**

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

## **PIN CONFIGURATION**



# TYPICAL DEVICE CHARACTERISTICS

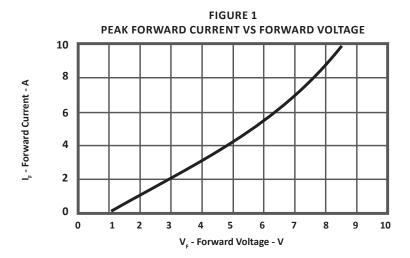
MAXIMUM RATINGS @ 25°C Unless Otherwise Specified							
PARAMETER	SYMBOL	VALUE	UNITS				
Operating Temperature	T <sub>A</sub>	-55 to 150	°C				
Storage Temperature	T <sub>stg</sub>	-55 to 150	°C				
Continuous Power Dissipation	P <sub>PC</sub>	225	mW				
Repetitive Peak Forward Current @ tp = 5µs, F = 50kHz (Pin 2-3)	I <sub>FRM</sub>	700	mA				

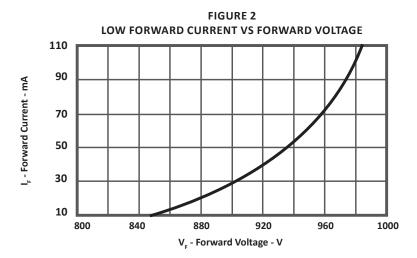
	ELECTRICAL CHARACTERISTICS PER LINE @ 25°C Unless Otherwise Specified									
	PART NUMBER	DEVICE MARKING	REPETITIVE PEAK REVERSE VOLTAGE (Note 1) @ 10µA V <sub>RRM</sub> VOLTS	MAXIMUM REVERSE LEAKAGE CURRENT (Note 2) @ V <sub>RRM</sub> @ 5V I <sub>R</sub> µA	MAXIMUM DIODE FORWARD VOLTAGE  @ 20mA V <sub>F</sub> VOLTS	MAXIMUM CAPACITANCE (Note 3)  C, pF				
İ	USB004	PSA	20	1	0.95	6				

## NOTES

- 1. V<sub>p</sub> V<sub>N</sub> = 20 Volts. 2. V<sub>p</sub> V<sub>N</sub> = 5.5 Volts. 3. Between line and ground V<sub>p</sub> = 5 Volts, f = 1 MHz, V<sub>1/0</sub> = 2.5 Volts, V<sub>N</sub> = 0 Volts.

# TYPICAL DEVICE CHARACTERISTICS







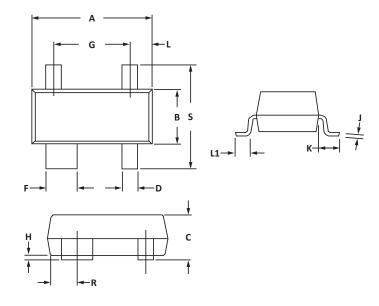


# **SOT-143 PACKAGE INFORMATION**

MILLIM		INC	HEC	
MIN		INCHES		
	MAX	MIN	MAX	
2.80	3.04	0.110	0.120	
1.20	1.39	0.047	0.055	
0.84	1.14	0.033	0.045	
0.39	0.50 0.015		0.020	
0.79	0.93	0.031	0.037	
1.78	2.03	0.070	0.080	
0.08	0.15	0.003	0.006	
0.46	0.60	0.018	0.024	
0.445	0.60	0.0175	0.024	
0.40	0.60	0.016	0.024	
0.72	0.83	0.028	0.033	
2.11	2.48	0.083	0.098	
	2.80 1.20 0.84 0.39 0.79 1.78 0.08 0.46 0.445 0.40 0.72	2.80     3.04       1.20     1.39       0.84     1.14       0.39     0.50       0.79     0.93       1.78     2.03       0.08     0.15       0.46     0.60       0.445     0.60       0.40     0.60       0.72     0.83	2.80         3.04         0.110           1.20         1.39         0.047           0.84         1.14         0.033           0.39         0.50         0.015           0.79         0.93         0.031           1.78         2.03         0.070           0.08         0.15         0.003           0.46         0.60         0.018           0.445         0.60         0.0175           0.40         0.60         0.016           0.72         0.83         0.028	



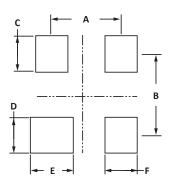
- 1. Dimensioning and tolerances per ANSI Y14.M, 1985.
- 2. Controlling dimension: inches.
- 3. Dimensions are exclusive of mold flash and metal burrs.



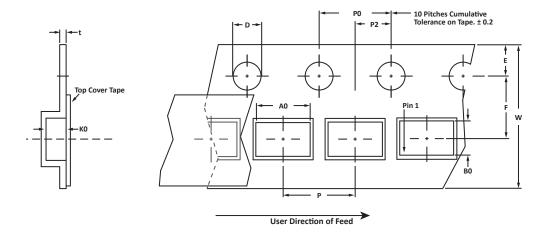
PAD LAYOUT DIMENSIONS							
DIM	MILLIN	IETERS	INCHES				
	MIN	MAX	MIN	MAX			
А	1.88	2.13	0.074	0.084			
В	1.80	2.06	0.071	0.081			
С	0.71	0.97	0.028	0.038			
D	0.76	1.02	0.030	0.040			
Е	1.07	1.32	0.042	0.052			
F	0.71	0.97	0.028	0.038			

#### NOTES

1. Controlling dimension: inches.



## **TAPE AND REEL**



SPECIFICATIONS												
REEL DIA.	TAPE WIDTH	A0	В0	КО	D	E	F	W	P0	P2	Р	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.

BASE PART NUMBER LEADFREE SUFFIX TAPE SUFFIX QTY/REEL REEL SIZE						
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.						

05140.R11 10/12 Page 5 <u>www.protekdevices.com</u>



### **COMPANY INFORMATION**

#### **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.

#### **CONTACT US**

#### **Corporate Headquarters**

2929 South Fair Lane Tempe, Arizona 85282 USA

### By Telephone

General: 602-431-8101

Sales: & Marketing: 602-414-5109 Customer Service: 602-414-5114

Product Technical Support: 602-414-5107

#### By Fax

General: 602-431-2288

### By E-mail:

Sales: sales@protekdevices.com

Customer Service: <a href="mailto:service@protekdevices.com">service@protekdevices.com</a>
Technical Support: <a href="mailto:support@protekdevices.com">support@protekdevices.com</a>

### ProTek Devices (Asia Pacific) Pte. Ltd.

8 Ubi Road 2, #06-19

Zervex

Singapore - 408538 Tel: +65-67488312 Fax: +65-67488313

#### Web

www.protekdevices.com

COPYRIGHT © ProTek Devices 2007 - This literature is subject to all applicable copyright laws and is not for resale in any manner.

SPECIFICATIONS: ProTek reserves the right to change the electrical and or mechanical characteristics described herein without notice

DESIGN CHANGES: ProTek reserves the right to discontinue product lines without notice and that the final judgement concerning selection and specifications is the buyer's and that in furnishing engineering and technical assistance. ProTek assumes no responsibility with respect to the selection or specifications of such products. ProTek makes no warranty, representation or guarantee regarding the suitability of its products for any particular purpose, nor does ProTek assume any liability arising out of the application or use of any product or circuit and specifically disclaims any and all liability without limitation special, consequential or incidental damages.

LIFE SUPPORT POLICY: ProTek Devices products are not authorized for use in life support systems without written consent from the factory.