

## 500 WATT MULTI-LINE ULTRA LOW CAPACITANCE TVS ARRAY



### DESCRIPTION

The USB508xx and USB508xxC Series are multi-line ultra low capacitance transient voltage suppressor arrays that provide board level protection for computing and telecommunications applications against the damaging effects of ESD, tertiary lightning and switching transients.

The USB508xx and USB508xxC Series has a peak pulse power rating of 500 Watts for an  $8/20\mu s$  waveshape. This device series meets the IEC 61000-4-2 requirements.

### **FEATURES**

- Compatible with IEC 61000-4-2 (ESD): Air 15kV, Contact 8kV
- 500 Watts Peak Pulse Power per Line (tp = 8/20μs)
- Unidirectional and Bidirectional Configurations
- Available in Multiple Voltages Ranging from 3V to 24V
- Ultra Low Capacitance: 3pF
- · RoHS Compliant
- REACH Compliant

## **MECHANICAL CHARACTERISTICS**

- Molded JEDEC SO-8 Package
- Approximate Weight: 70 milligrams
- Lead-Free Pure-Tin Plating (Annealed)
- Solder Reflow Temperature:

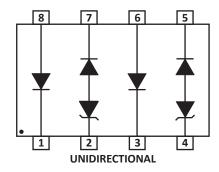
Pure-Tin - Sn, 100: 260-270°C

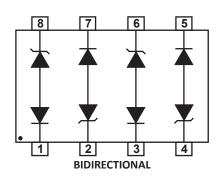
- 12mm Tape and Reel Per EIA Standard 481
- Flammability Rating UL 94V-0

### **APPLICATIONS**

- Ethernet 10/100/1000 Base T
- Computing Interfaces
- xDSL Interfaces
- Cellualr Phone Terminals

## **PIN CONFIGURATIONS**







# TYPICAL DEVICE CHARACTERISTICS

| MAXIMUM RATINGS @ 25°C Unless Otherwise Specified |                  |            |       |  |  |  |  |
|---|------------------|------------|-------|--|--|--|--|
| PARAMETER   | VALUE            | UNITS      |       |  |  |  |  |
| Operating Temperature                             | T <sub>L</sub>   | -55 to 150 | °C    |  |  |  |  |
| Storage Temperature                               | T <sub>stg</sub> | -55 to 150 | °C    |  |  |  |  |
| Peak Pulse Power (tp = 8/20μs) - See Figure 1     | P <sub>PP</sub>  | 500        | Watts |  |  |  |  |

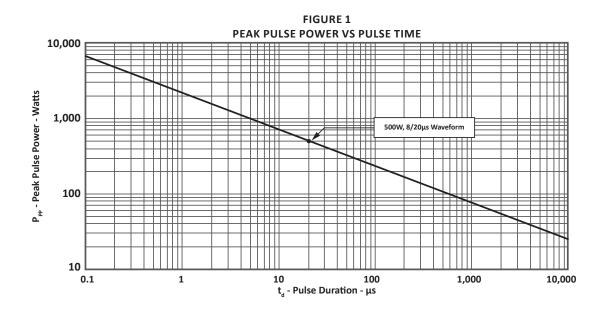
| ELECTRICAL CHARACTERISTICS PER LINE @ 25°C Unless Otherwise Specified |                   |                               |                                    |   |   |  |                        |  |
|---|-------------------|-------------------------------|------------------------------------|---|---|--|------------------------|--|
| PART<br>NUMBER<br>(Note 1-5)  | DEVICE<br>MARKING | RATED<br>STAND-OFF<br>VOLTAGE | MINIMUM<br>BREAKDOWN<br>VOLTAGE    | MAXIMUM<br>CLAMPING<br>VOLTAGE<br>(Fig. 2)      | MAXIMUM<br>CLAMPING<br>VOLTAGE<br>(Fig. 2)      | MAXIMUM<br>LEAKAGE<br>CURRENT            | MAXIMUM<br>CAPACITANCE |  |
|   |                   | V <sub>wM</sub><br>VOLTS      | @1mA<br>V <sub>(BR)</sub><br>VOLTS | @I <sub>P</sub> = 1A<br>V <sub>C</sub><br>VOLTS | @I <sub>p</sub> = 5A<br>V <sub>c</sub><br>VOLTS | @V <sub>wм</sub><br>Ι <sub>D</sub><br>μΑ | @0V, 1MHz<br>C<br>pF   |  |
| USB50803  | GA                | 3.3                           | 4.5                                | 8.0   | 11.0  | 125                                      | 3                      |  |
| USB50803C   | UGA               | 3.3                           | 4.5                                | 8.0   | 11.0  | 125                                      | 3                      |  |
| USB50805  | GB                | 5.0                           | 6.0                                | 10.8  | 13.0  | 20                                       | 3                      |  |
| USB50805C   | UGB               | 5.0                           | 6.0                                | 10.8  | 13.0  | 20                                       | 3                      |  |
| USB50812  | GC                | 12.0                          | 13.3                               | 19.0  | 26.0  | 1  | 3                      |  |
| USB50812C   | UGC               | 12.0                          | 13.3                               | 19.0  | 26.0  | 1  | 3                      |  |
| USB50815  | GD                | 15.0                          | 16.7                               | 24.0  | 32.0  | 1  | 3                      |  |
| USB50815C   | UGD               | 15.0                          | 16.7                               | 24.0  | 32.0  | 1  | 3                      |  |
| USB50824  | GE                | 24.0                          | 26.7                               | 43.0  | 57.0  | 1  | 3                      |  |
| USB50824C   | UGE               | 24.0                          | 26.7                               | 43.0  | 57.0  | 1  | 3                      |  |

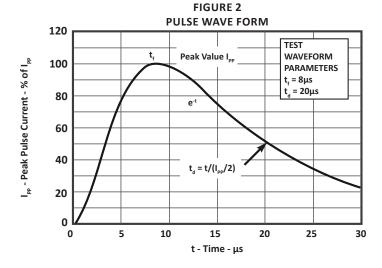
### NOTES

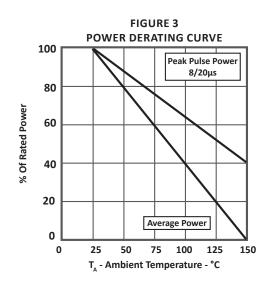
- 1. Part numbers with a "C" suffix are bidirectional devices, i.e., USB50803<u>C</u>.
- 2. Do not apply sureg in the forward direction of the TVS.
- 3. PIV typically greater than 100V for each rectifier diode.
- 4. Electrical characteristics apply to pins 8 to 1, 2 to 7, 6 to 3 and 4 to 5 for the bidirectional configuration.
   5. Electrical characteristics apply to pins 7 to 2 and 5 to 4 for the unidirectional configuration.

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## **TYPICAL DEVICE CHARACTERISTICS**







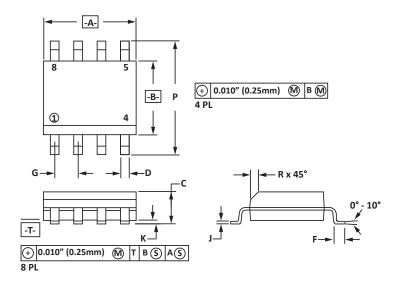


## **SO-8 PACKAGE INFORMATION**

| OUTLINE DIMENSIONS |        |        |        |       |  |  |  |  |
|--------------------|--------|--------|--------|-------|--|--|--|--|
| DIM                | MILLIN | IETERS | INCHES |       |  |  |  |  |
|                    | MIN    | MAX    | MIN    | MAX   |  |  |  |  |
| Α                  | 4.80   | 5.00   | 0.189  | 0.196 |  |  |  |  |
| В                  | 3.80   | 4.00   | 0.150  | 0.157 |  |  |  |  |
| С                  | 1.35   | 1.75   | 0.054  | 0.068 |  |  |  |  |
| D                  | 0.35   | 0.49   | 0.014  | 0.019 |  |  |  |  |
| F                  | 0.40   | 1.25   | 0.016  | 0.049 |  |  |  |  |
| G                  | 1.27   | BSC    | 0.05   | BSC   |  |  |  |  |
| J                  | 0.18   | 0.25   | 0.007  | 0.009 |  |  |  |  |
| К                  | 0.10   | 0.25   | 0.004  | 0.008 |  |  |  |  |
| Р                  | 5.80   | 6.20   | 0.229  | 0.244 |  |  |  |  |
| R                  | 0.25   | 0.50   | 0.010  | 0.019 |  |  |  |  |

### NOTES

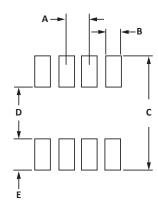
- 1. -T- = Seating plane and datum surface.
- 2. Dimensions "A" and "B" are datum.
- 3. Dimensions "A" and "B" do not include mold protrusion.
- 4. Maximum mold protrusion is 0.015" (0.380mm) per side.
- 5. Dimensioning and tolerances per ANSI Y14.5M, 1982.
- 6. Dimensions are exclusive of mold flash and metal burrs.



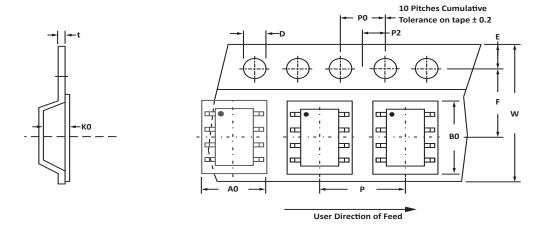
| PAD LAYOUT DIMENSIONS |        |        |        |       |  |  |  |  |
|-----------------------|--------|--------|--------|-------|--|--|--|--|
| DIM                   | MILLIN | IETERS | INCHES |       |  |  |  |  |
| DIM                   | MIN    | MAX    | MIN    | MAX   |  |  |  |  |
| Α                     | 1.14   | 1.40   | 0.045  | 0.055 |  |  |  |  |
| В                     | 0.64   | 0.89   | 0.025  | 0.035 |  |  |  |  |
| С                     | 6.22   | -      | 0.245  | -     |  |  |  |  |
| D                     | 3.94   | 4.17   | 0.155  | 0.165 |  |  |  |  |
| Е                     | 1.02   | 1.27   | 0.040  | 0.050 |  |  |  |  |

### NOTES

1. Controlling dimension: inches.



## **TAPE AND REEL**



| SPECIFICATIONS |               |             |             |             |             |             |             |              |             |             |             |      |
|----------------|---------------|-------------|-------------|-------------|-------------|-------------|-------------|--------------|-------------|-------------|-------------|------|
| REEL DIA.      | TAPE<br>WIDTH | A0          | В0          | ко          | D           | E           | F           | w            | P0          | P2          | Р           | tmax |
| 178mm (7")     | 12mm          | 6.50 ± 0.10 | 5.40 ± 0.10 | 2.00 ± 0.10 | 1.50 ± 0.10 | 1.75 ± 0.10 | 5.50 ± 0.05 | 12.00 ± 0.30 | 4.00 ± 0.12 | 2.00 ± 0.10 | 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 1,000 pieces per 12mm tape.
- 4. Suffix T13 = 13" Reel 2,500 pieces per 12mm tape.
- 5. Bulk product shipped in tubes of 98 pieces per tube.
- 6. Marking on Part marking code (see page 2), date code, logo and pin one defined by dot on top of package.

Package outline, pad layout and tape specifications per document number 06009.R3 9/10.

| ORDERING INFORMATION  |   |     |       |    |    |  |  |  |  |
|---|---|-----|-------|----|----|--|--|--|--|
| BASE PART NUMBER (xx = Voltage)                             | LEADFREE SUFFIX TAPE SUFFIX QTY/REEL REEL SIZE TUBE QTY |     |       |    |    |  |  |  |  |
| USB0508xx/USB0508xxC  | n/a   | -T7 | 1,000 | 7" | 98 |  |  |  |  |
| USB0508xx/USB0508xxC n/a -T13 2,500 13" 98                  |   |     |       |    |    |  |  |  |  |
| This device is only available in a Lead-Free configuration. |   |     |       |    |    |  |  |  |  |

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### 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

**Bv** 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

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