

500 WATT MULTI-LINE ULTRA LOW CAPACITANCE TVS ARRAY



SO-8 PACKAGE

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 μ 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 ($t_p = 8/20\mu s$)
- Unidirectional and Bidirectional Configurations
- Available in Multiple Voltages Ranging from 3V to 24V
- Ultra Low Capacitance: 3pF
- RoHS Compliant
- REACH Compliant

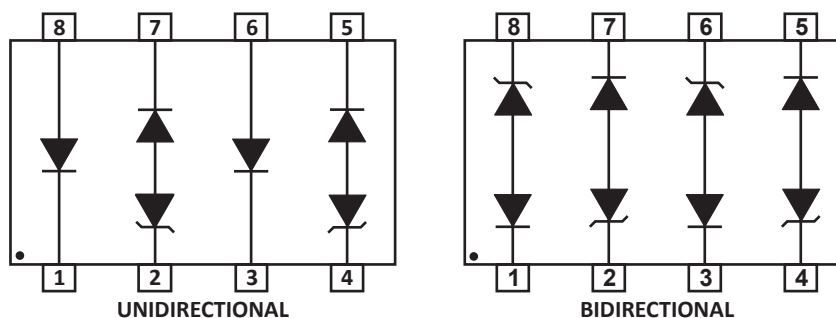
APPLICATIONS

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

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

PIN CONFIGURATIONS



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

| PARAMETER | SYMBOL | VALUE | UNITS |
|---|-----------|------------|-------|
| Operating Temperature | T_L | -55 to 150 | °C |
| Storage Temperature | T_{STG} | -55 to 150 | °C |
| Peak Pulse Power (tp = 8/20µs) - See Figure 1 | P_{PP} | 500 | Watts |

ELECTRICAL CHARACTERISTICS PER LINE @ 25°C Unless Otherwise Specified

| PART NUMBER (Note 1-5) | DEVICE MARKING | RATED STAND-OFF VOLTAGE | MINIMUM BREAKDOWN VOLTAGE | MAXIMUM CLAMPING VOLTAGE (Fig. 2) | MAXIMUM CLAMPING VOLTAGE (Fig. 2) | MAXIMUM LEAKAGE CURRENT | MAXIMUM CAPACITANCE |
|---------------------------|----------------|-------------------------|-----------------------------|-----------------------------------|-----------------------------------|---------------------------|----------------------|
| | | V_{WM} VOLTS | @1mA $V_{(BR)}$ VOLTS | @ $I_p = 1A$ V_C VOLTS | @ $I_p = 5A$ V_C VOLTS | @ V_{WM} I_D µA | @0V, 1MHz C 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., USB50803C.
2. Do not apply surge 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.

TYPICAL DEVICE CHARACTERISTICS

FIGURE 1
PEAK PULSE POWER VS PULSE TIME

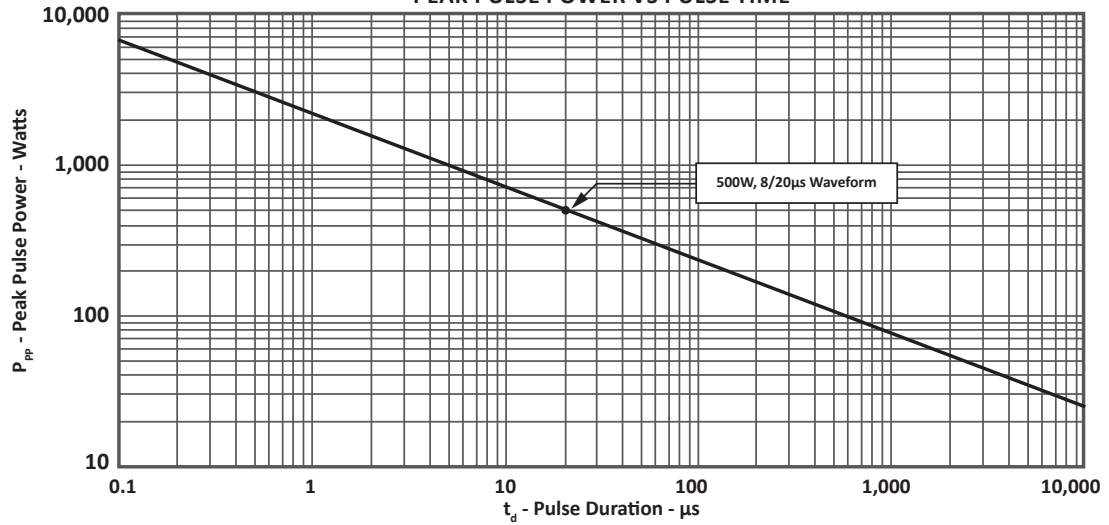


FIGURE 2
PULSE WAVE FORM

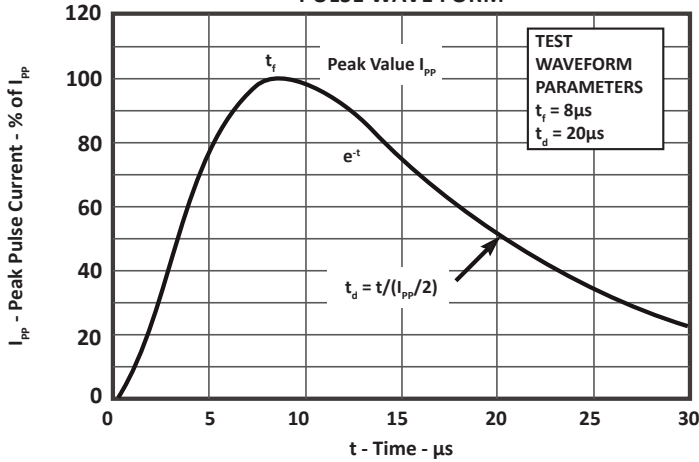
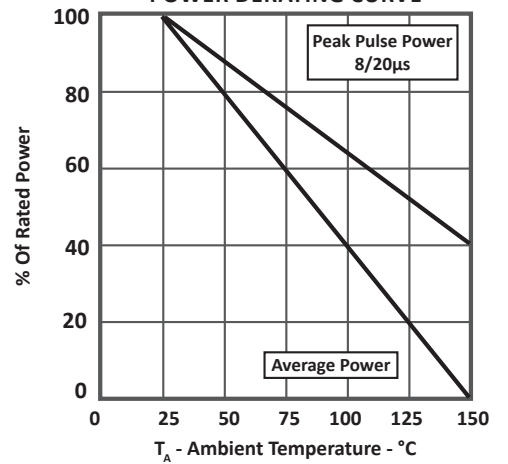


FIGURE 3
POWER DERATING CURVE



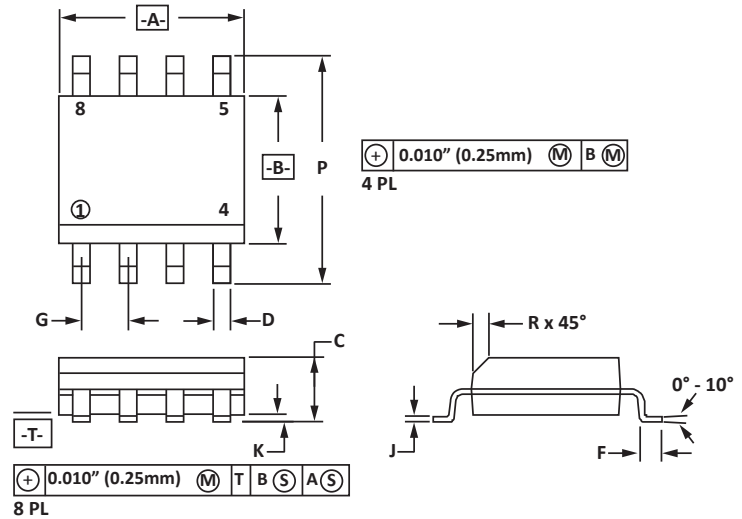
SO-8 PACKAGE INFORMATION

OUTLINE DIMENSIONS

| DIM | MILLIMETERS | | INCHES | |
|-----|-------------|------|----------|-------|
| | MIN | MAX | MIN | MAX |
| A | 4.80 | 5.00 | 0.189 | 0.196 |
| B | 3.80 | 4.00 | 0.150 | 0.157 |
| C | 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 |
| K | 0.10 | 0.25 | 0.004 | 0.008 |
| P | 5.80 | 6.20 | 0.229 | 0.244 |
| R | 0.25 | 0.50 | 0.010 | 0.019 |

NOTES

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

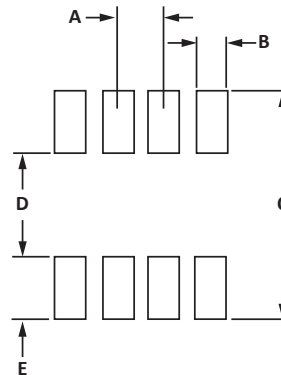


PAD LAYOUT DIMENSIONS

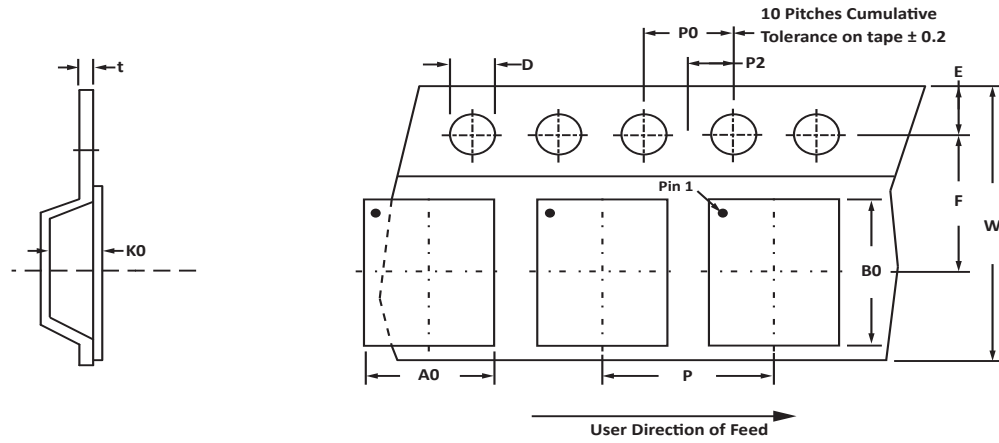
| DIM | MILLIMETERS | | INCHES | |
|-----|-------------|------|--------|-------|
| | MIN | MAX | MIN | MAX |
| A | 1.14 | 1.40 | 0.045 | 0.055 |
| B | 0.64 | 0.89 | 0.025 | 0.035 |
| C | 6.22 | - | 0.245 | - |
| D | 3.94 | 4.17 | 0.155 | 0.165 |
| E | 1.02 | 1.27 | 0.040 | 0.050 |

NOTES

- Controlling dimension: inches.



TAPE AND REEL



SPECIFICATIONS

| REEL DIA. | TAPE WIDTH | A0 | B0 | K0 | D | E | F | W | P0 | P2 | P | t _{max} |
|------------|------------|-------------|-------------|-------------|-------------|-------------|-------------|--------------|-------------|-------------|-------------|------------------|
| 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

- Dimensions are in millimeters.
- Surface mount product is taped and reeled in accordance with EIA-481.
- Suffix - T7 = 7" Reel - 1,000 pieces per 12mm tape.
- Suffix - T13 = 13" Reel - 2,500 pieces per 12mm tape.
- Bulk product shipped in tubes of 98 pieces per tube.
- 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 06011.R4 8/10.

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 |

COMPANY INFORMATION

COMPANY PROFILE

ProTek Devices, based in Tempe, Arizona USA, is a manufacturer of Transient Voltage Suppression (TVS) products designed specifically for the protection of electronic systems from the effects of lightning, Electrostatic Discharge (ESD), Nuclear Electromagnetic Pulse (NEMP), inductive switching and EMI/RFI. With over 25 years of engineering and manufacturing experience, ProTek designs TVS devices that provide application specific protection solutions for all electronic equipment/systems.

ProTek Devices Analog Products Division, also manufactures analog interface, control, RF and power management products.

CONTACT US

Corporate Headquarters

2929 South Fair Lane
Tempe, Arizona 85282
USA

By Telephone

General: 602-431-8101
Sales: 602-414-5109
Customer Service: 602-414-5114

By Fax

General: 602-431-2288

By E-mail:

Sales: sales@protekdevices.com
Customer Service: service@protekdevices.com
Technical Support: support@protekdevices.com

Web

www.protekdevices.com
www.protekanalog.com

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