

500 WATT MULTI-LINE TVS ARRAY



DESCRIPTION

The SM16xx and SM16xxC Series are multi-line transient voltage suppressor arrays that provides board level protection for standard TTL and MOS bus line applications against the damaging effects of ESD, tertiary lightning and switching transients.

This 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, IEC 61000-4-4 and IEC 61000-4-5 requirements.

FEATURES

- Compatible with IEC 61000-4-2 (ESD): Air - 15kV, Contact - 8kV
- Compatible with IEC 61000-4-4 (EFT): 40A - 5/50ns
- Compatible with IEC 61000-4-5 (Surge): 12A, 8/20 μ s - Level 1(Line-Gnd) & Level 2(Line-Line)
- 500 Watts Peak Pulse Power per Line (tp = 8/20 μ s)
- Unidirectional and Bidirectional Configurations
- ESD Protection > 25 kilovolts
- Available in Multiple Voltages Ranging from 3.3V to 24V
- Protects up to 8 Lines
- RoHS Compliant
- REACH Compliant

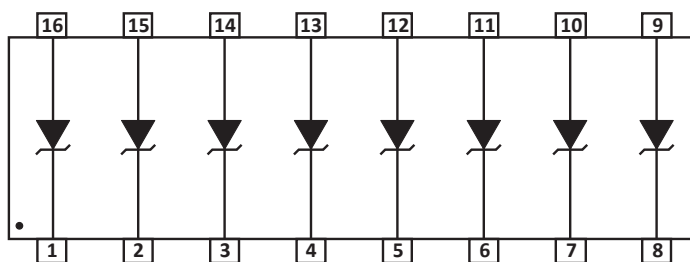
APPLICATIONS

- Wireless Communication Circuits
- RS-422, RS-432 & RS-485
- Low Voltage ASICs
- Portable Electronics

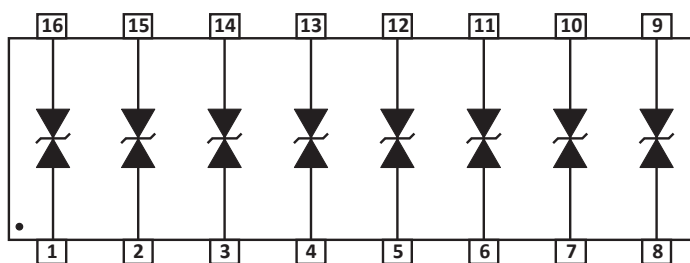
MECHANICAL CHARACTERISTICS

- Molded JEDEC SO-16 Package
- Approximate Weight: 0.15 grams
- Lead-Free Pure-Tin Plating (Annealed)
- Solder Reflow Temperature:
Pure-Tin - Sn, 100: 260-270°C
- 16mm Tape and Reel Per EIA Standard 481
- Flammability Rating UL 94V-0

PIN CONFIGURATIONS



UNIDIRECTIONAL



BIDIRECTIONAL

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 1-2) | RATED STAND-OFF VOLTAGE V_{WM} VOLTS | MINIMUM BREAKDOWN VOLTAGE @1mA $V_{(BR)}$ VOLTS | MAXIMUM CLAMPING VOLTAGE (Fig. 2) @ $I_P = 1A$ V_C VOLTS | MAXIMUM CLAMPING VOLTAGE (Fig. 2) @8/20µs $V_C @ I_{PP}$ | MAXIMUM LEAKAGE CURRENT @ V_{WM} I_D µA | MAXIMUM CAPACITANCE @0V, 1MHz C pF | TEMPERATURE COEFFICIENT OF $V_{(BR)}$ |
|---------------------------|--|--|---|--|--|---|---------------------------------------|
| | | | | | | | $qV_{(BR)}$ mV/°C |
| SM1603 | 3.3 | 4.0 | 7.0 | 10.9V @ 43A | 125 | 800 | -3 |
| SM1603C | 3.3 | 4.0 | 7.0 | 10.9V @ 43A | 125 | 450 | -3 |
| SM1605 | 5.0 | 6.0 | 9.8 | 13.5V @ 42A | 10 | 550 | 3 |
| SM1605C | 5.0 | 6.0 | 9.8 | 13.5V @ 42A | 10 | 310 | 3 |
| SM1608 | 8.0 | 8.5 | 13.4 | 16.9V @ 34A | 10 | 500 | 9 |
| SM1608C | 8.0 | 8.5 | 13.4 | 16.9V @ 34A | 10 | 280 | 9 |
| SM1612 | 12.0 | 13.3 | 19.0 | 25.9V @ 21A | 2 | 185 | 16 |
| SM1612C | 12.0 | 13.3 | 19.0 | 25.9V @ 21A | 2 | 105 | 16 |
| SM1615 | 15.0 | 16.7 | 25.5 | 30.0V @ 17A | 2 | 140 | 17 |
| SM1615C | 15.0 | 16.7 | 25.5 | 30.0V @ 17A | 2 | 80 | 17 |
| SM1624 | 24.0 | 26.7 | 40.0 | 49.0V @ 12A | 2 | 88 | 26 |
| SM1624C | 24.0 | 26.7 | 40.0 | 49.0V @ 12A | 2 | 50 | 26 |

NOTES

- Part numbers with a "C" suffix are bidirectional devices, i.e., SM1615C.
- $V_f = 1.5$ Volts @ 100mA, 300µs (square wave) unidirectional devices only.

TYPICAL DEVICE CHARACTERISTICS

FIGURE 1
PEAK PULSE POWER VS PULSE TIME

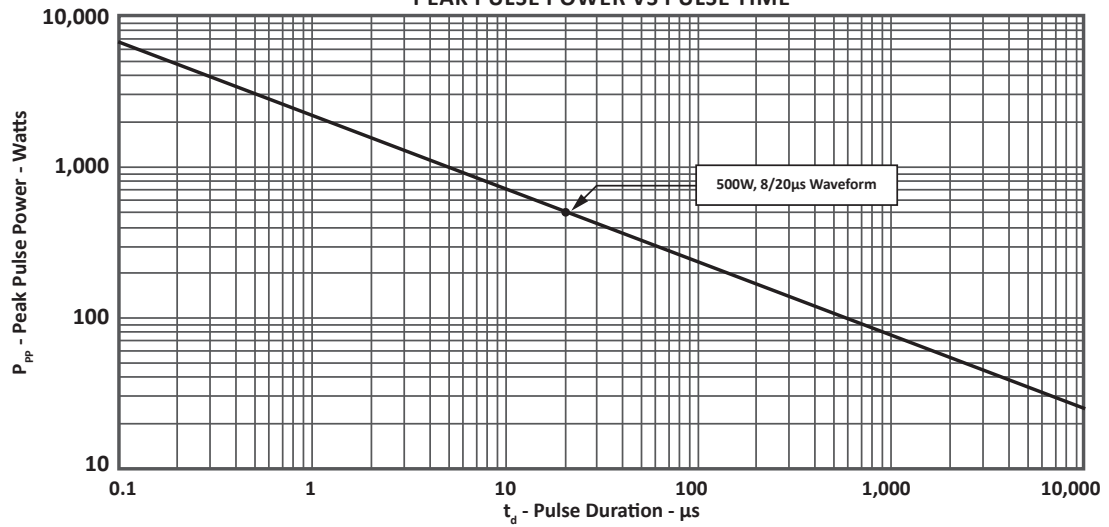


FIGURE 2
PULSE WAVE FORM

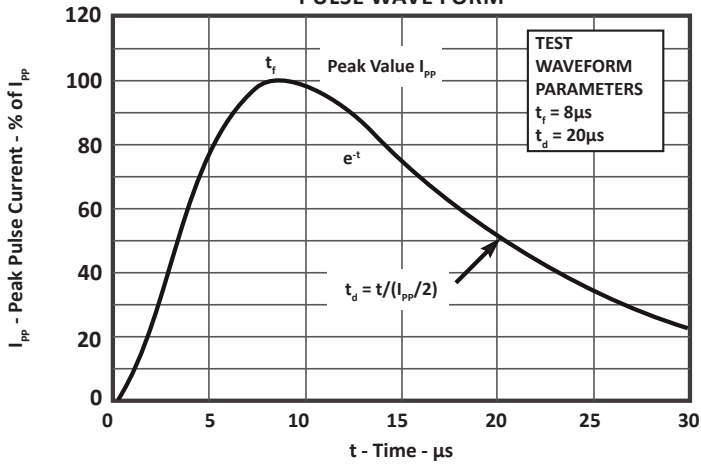
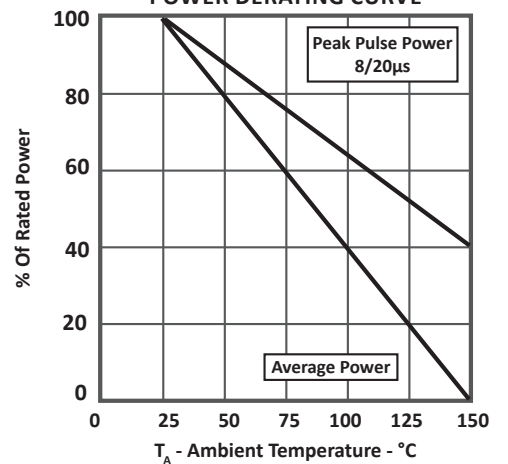


FIGURE 3
POWER DERATING CURVE



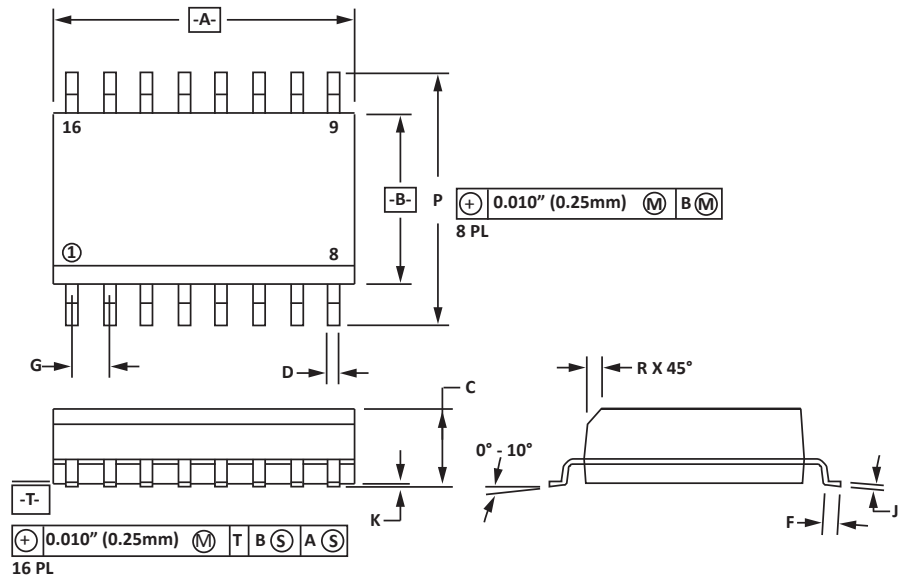
SO-16 PACKAGE INFORMATION

OUTLINE DIMENSIONS

| DIM | MILLIMETERS | | INCHES | |
|-----|-------------|-------|----------|-------|
| | MIN | MAX | MIN | MAX |
| A | 9.80 | 10.00 | 0.386 | 0.393 |
| 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.

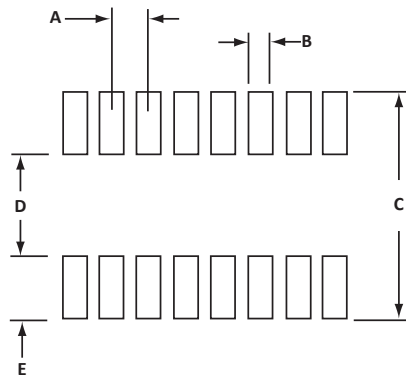


PAD LAYOUT DIMENSIONS

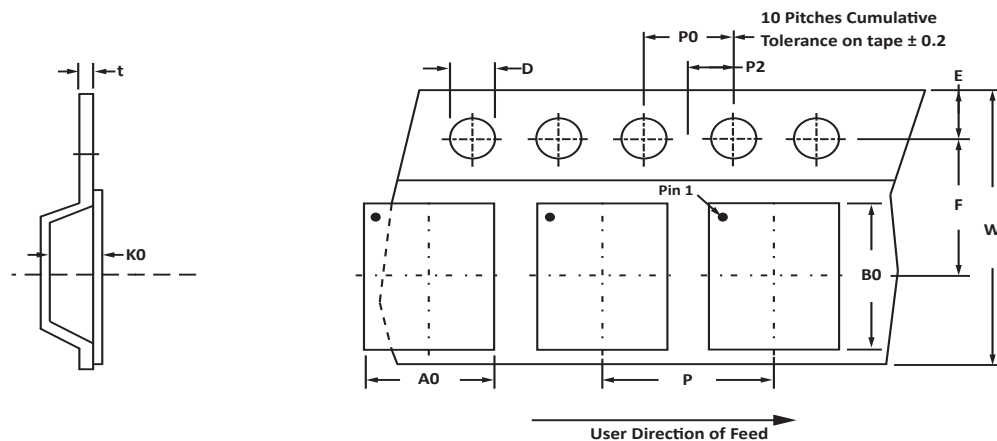
| DIM | MILLIMETERS | | INCHES | |
|-----|-------------|------|--------|-------|
| | MIN | MAX | MIN | MAX |
| A | 1.14 | 1.40 | 0.045 | 0.055 |
| B | 0.64 | 0.89 | 0.025 | 0.035 |
| C | 6.22 | - | 0.245 | - |
| D | 3.94 | 4.17 | 0.155 | 0.165 |
| E | 1.02 | 1.27 | 0.040 | 0.050 |

NOTES

- Controlling dimension: inches.



TAPE AND REEL



SPECIFICATIONS

| REEL DIA. | TAPE WIDTH | A0 | B0 | K0 | D | E | F | W | P0 | P2 | P | tmax |
|------------|------------|-----------------|------------------|-----------------|-----------------|-----------------|-----------------|------------------|-----------------|-----------------|-----------------|------|
| 178mm (7") | 16mm | 6.50 ± 0.10 | 10.30 ± 0.10 | 2.10 ± 0.10 | 1.50 ± 0.10 | 1.75 ± 0.10 | 3.50 ± 0.05 | 16.00 ± 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 16mm tape.
- Suffix - T13 = 13" Reel - 2,500 pieces per 16mm tape.
- Bulk product shipped in tubes of 48 pieces per tube.
- Marking on Part - part number, date code, logo and pin one defined by dot on top of package.

Package outline per document number 06007.R3 1/11.

ORDERING INFORMATION

| BASE PART NUMBER (xx = Voltage) | LEADFREE SUFFIX | TAPE SUFFIX | QTY/REEL | REEL SIZE | TUBE QTY |
|------------------------------------|-----------------|-------------|----------|-----------|----------|
| SM16xx/SM16xxC | -LF | -T7 | 1,000 | 7" | 48 |
| SM16xx/SM16xxC | -LF | -T13 | 2,500 | 13" | 48 |

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.

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