

## HIGH POWER TVS ARRAY



### APPLICATIONS

- Digital Audio Tuner for Automotive
- Automotive Entertainment Systems
- Automotive Navigation Systems



### FEATURES

- Junction Passivation Optimized Design Passivated Anisotropic Rectifier Technology
- $T_J = 175^\circ\text{C}$  Capability Suitable for High Reliability and Automotive Requirements
- Unidirectional Configuration
- Low Forward Voltage Drop
- High Surge Capability
- 3600 Watts Peak Pulse Power per Line ( $t_p = 10/1000\mu\text{s}$ )
- Meets ISO7637-2 Surge Specification (Varied by Test Condition)
- Meets MSL Level 1, Per J-STD-020, LF Maximum Peak of  $245^\circ\text{C}$
- Available in Multiple Voltages
- RoHS Compliant
- REACH Compliant

### MECHANICAL CHARACTERISTICS

- Case: DO-218AB Package
- Terminals: Matte Tin Plated Leads, Solderable Per J-STD-002 and JESD 22-B102
- Approximate Weight: 2.7 grams
- Solder Reflow Temperature -  $260^\circ\text{C}$  for 10 seconds at terminals
- 24mm Tape and Reel Per EIA Standard 481
- Flammability Rating UL 94V-0
- Polarity: Heatsink is Anode

#### MAXIMUM RATINGS @ $25^\circ\text{C}$ Unless Otherwise Specified

| PARAMETER                                                                   | SYMBOL                | VALUE      | UNITS              |
|-----------------------------------------------------------------------------|-----------------------|------------|--------------------|
| Operating Junction Temperature                                              | $T_J$                 | -55 to 175 | $^\circ\text{C}$   |
| Storage Temperature                                                         | $T_{\text{STG}}$      | -55 to 175 | $^\circ\text{C}$   |
| Peak Pulse Power Dissipation ( $t_p = 10/1000\mu\text{s}$ )                 | $P_{\text{PPM}}$      | 3600       | Watts              |
| Peak Pulse Power Dissipation ( $t_p = 10/10000\mu\text{s}$ )                | $P_{\text{PPM}}$      | 2800       | Watts              |
| Peak Forward Surge Current, 8.3ms single half sinewave                      | $I_{\text{FSM}}$      | 500        | Amps               |
| Power Dissipation on Infinite Heatsink, $T_c = 25^\circ\text{C}$ (Figure 2) | $P_D$                 | 5.0        | Watts              |
| Typical Thermal Resistance, Junction to Case                                | $R_{\theta\text{JC}}$ | 0.95       | $^\circ\text{C/W}$ |

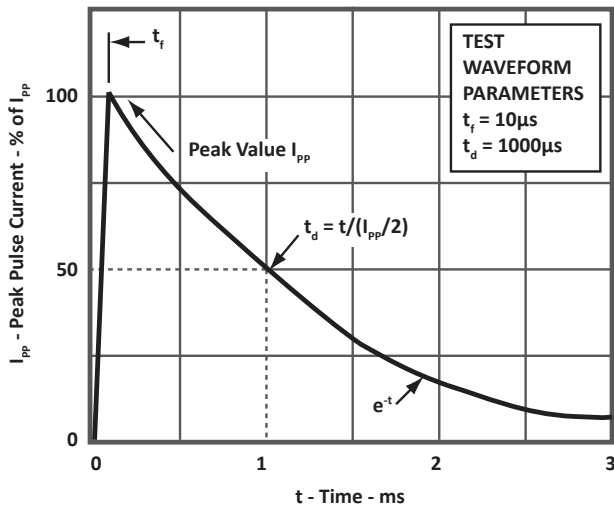
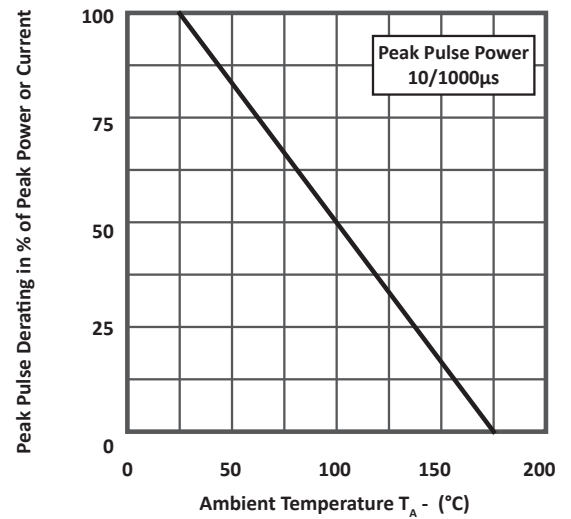
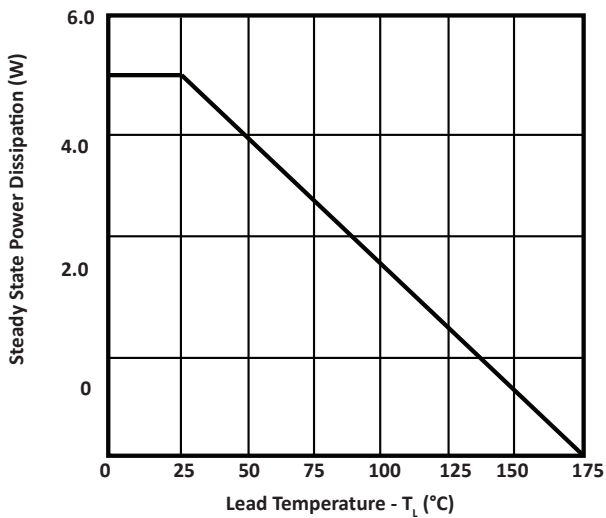
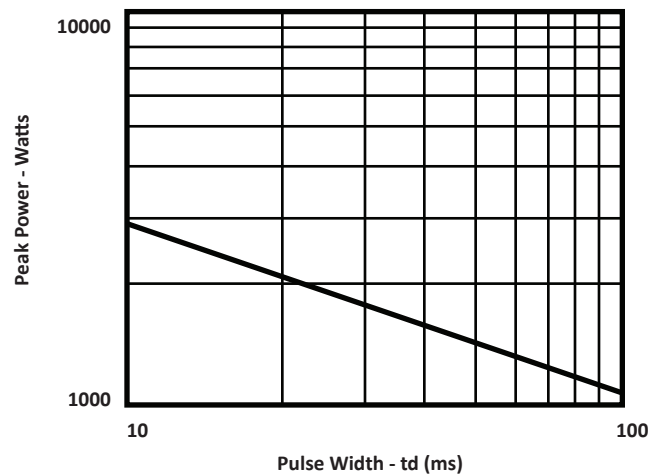
## TYPICAL DEVICE CHARACTERISTICS

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

| PART<br>NUMBER<br>(Note 1) | REVERSE<br>STAND-OFF<br>VOLTAGE<br><br>$V_{RWM}$<br>VOLTS | BREAKDOWN<br>VOLTAGE<br><br>$V_{(BR)} @ I_T$<br>VOLTS |      | TEST<br>CURRENT<br><br>$@ I_T$<br>mA | MAXIMUM<br>CLAMPING<br>VOLTAGE<br>(Fig. 1)<br>$@ I_P$<br>$V_C$<br>VOLTS | MAXIMUM<br>REVERSE<br>SURGE<br>CURRENT<br><br>$@ I_{PP}$<br>AMPS | MAXIMUM<br>REVERSE<br>LEAKAGE<br>CURRENT<br><br>$@ V_{RWM}$<br>$I_R$<br>$\mu A$ | MAXIMUM<br>REVERSE<br>LEAKAGE<br>CURRENT<br><br>$@ V_{RWM} 175^\circ C$<br>$I_R$<br>$\mu A$ |
|----------------------------|-----------------------------------------------------------|-------------------------------------------------------|------|--------------------------------------|-------------------------------------------------------------------------|------------------------------------------------------------------|---------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------|
|                            |                                                           | MIN                                                   | MAX  |                                      |                                                                         |                                                                  |                                                                                 |                                                                                             |
| SM5S14A                    | 14.0                                                      | 15.6                                                  | 17.2 | 5.0                                  | 23.2                                                                    | 155                                                              | 10                                                                              | 150                                                                                         |
| SM5S15A                    | 15.0                                                      | 16.7                                                  | 18.5 | 5.0                                  | 24.4                                                                    | 148                                                              | 10                                                                              | 150                                                                                         |
| SM5S16A                    | 16.0                                                      | 17.8                                                  | 19.7 | 5.0                                  | 26.0                                                                    | 138                                                              | 10                                                                              | 150                                                                                         |
| SM5S17A                    | 17.0                                                      | 18.9                                                  | 20.9 | 5.0                                  | 27.6                                                                    | 130                                                              | 10                                                                              | 150                                                                                         |
| SM5S18A                    | 18.0                                                      | 20.0                                                  | 22.1 | 5.0                                  | 29.2                                                                    | 123                                                              | 10                                                                              | 150                                                                                         |
| SM5S20A                    | 20.0                                                      | 22.2                                                  | 24.5 | 5.0                                  | 32.4                                                                    | 111                                                              | 10                                                                              | 150                                                                                         |
| SM5S22A                    | 22.0                                                      | 24.4                                                  | 26.9 | 5.0                                  | 35.5                                                                    | 101                                                              | 10                                                                              | 150                                                                                         |
| SM5S24A                    | 24.0                                                      | 26.7                                                  | 29.5 | 5.0                                  | 38.9                                                                    | 93                                                               | 10                                                                              | 150                                                                                         |
| SM5S26A                    | 26.0                                                      | 28.9                                                  | 31.9 | 5.0                                  | 42.1                                                                    | 86                                                               | 10                                                                              | 150                                                                                         |
| SM5S28A                    | 28.0                                                      | 31.1                                                  | 34.4 | 5.0                                  | 45.4                                                                    | 79                                                               | 10                                                                              | 150                                                                                         |
| SM5S30A                    | 30.0                                                      | 33.3                                                  | 36.8 | 5.0                                  | 48.4                                                                    | 74                                                               | 10                                                                              | 150                                                                                         |
| SM5S33A                    | 33.0                                                      | 36.7                                                  | 40.6 | 5.0                                  | 53.3                                                                    | 68                                                               | 10                                                                              | 150                                                                                         |
| SM5S36A                    | 36.0                                                      | 40.0                                                  | 44.2 | 5.0                                  | 58.1                                                                    | 62                                                               | 10                                                                              | 150                                                                                         |

## NOTES

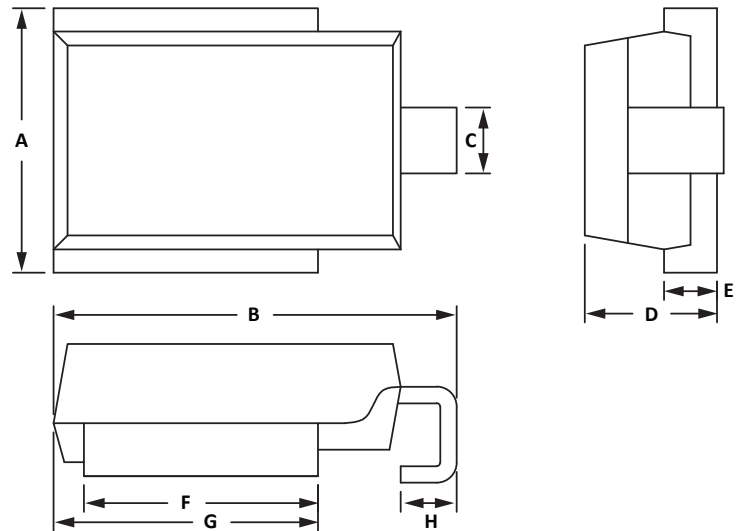
1. For all types, maximum VF = 2.0V at IF 100A, measured on 8.3ms single half-sine wave or equivalent square wave. Maximum duty cycle = 4 pulses per minute.


**TYPICAL DEVICE CHARACTERISTICS**
**FIGURE 1  
PULSE WAVEFORM**

**FIGURE 2  
PULSE DERATING CURVE**

**FIGURE 3  
STEADY STATE POWER DERATING CURVE**

**FIGURE 4  
PEAK PULSE POWER RATING CURVE**


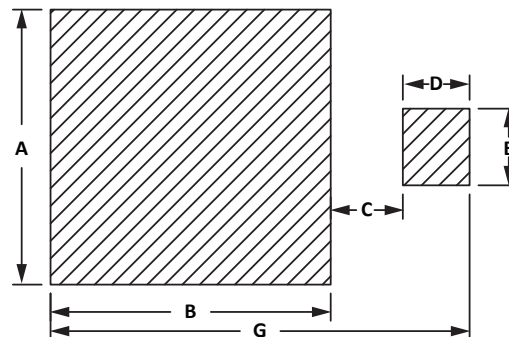

**PACKAGE INFORMATION**

| OUTLINE DIMENSIONS |             |       |        |       |
|--------------------|-------------|-------|--------|-------|
| DIM                | MILLIMETERS |       | INCHES |       |
|                    | MIN         | MAX   | MIN    | MAX   |
| A                  | 9.50        | 10.50 | 0.374  | 0.413 |
| B                  | 15.00       | 16.00 | 0.591  | 0.630 |
| C                  | 2.30        | 2.90  | 0.090  | 0.114 |
| D                  | 4.80        | 5.20  | 0.189  | 0.205 |
| E                  | 1.95        | 2.11  | 0.077  | 0.083 |
| F                  | 8.70        | 9.30  | 0.342  | 0.366 |
| G                  | 9.70        | 10.30 | 0.382  | 0.405 |
| H                  | 1.70        | 2.70  | 0.067  | 0.106 |

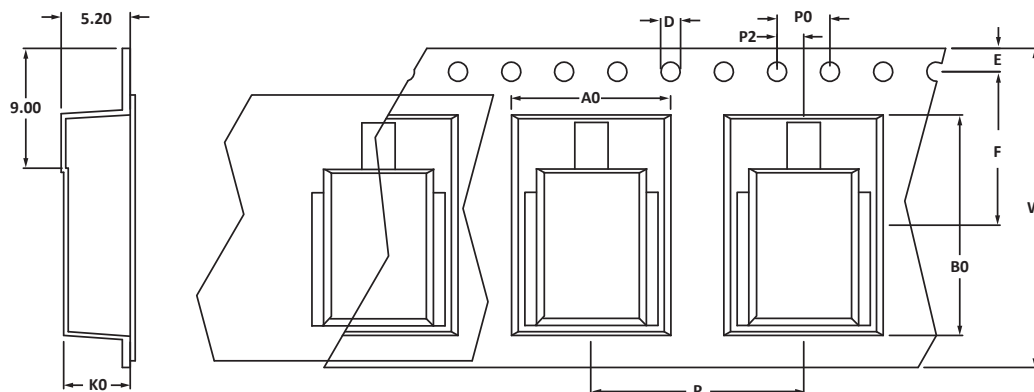
**NOTES**  
 1. Dimensions are exclusive of mold flash and metal burrs.



| PAD LAYOUT DIMENSIONS |             |        |
|-----------------------|-------------|--------|
| DIM                   | MILLIMETERS | INCHES |
|                       | NOM         | NOM    |
| A                     | 11.0        | 0.433  |
| B                     | 9.5         | 0.374  |
| C                     | 3.3         | 0.130  |
| D                     | 3.0         | 0.118  |
| E                     | 3.5         | 0.137  |
| G                     | 15.8        | 0.662  |



## TAPE AND REEL



## SPECIFICATIONS

| REEL DIA.   | TAPE WIDTH | A0           | B0           | K0          | D           | E           | F            | W            | P0          | P2          | P            |
|-------------|------------|--------------|--------------|-------------|-------------|-------------|--------------|--------------|-------------|-------------|--------------|
| 330mm (13") | 24mm       | 12.00 ± 0.10 | 16.60 ± 0.10 | 5.00 ± 0.10 | 1.50 ± 0.10 | 1.75 ± 0.10 | 11.55 ± 0.05 | 24.00 ± 0.30 | 4.00 ± 0.12 | 2.00 ± 0.10 | 16.00 ± 0.10 |

## NOTES

1. Dimensions are in millimeters.
2. Surface mount product is taped and reeled in accordance with EIA-481.
3. Suffix - T13 = 13" Reel - 750 pieces per 16mm tape.
4. Marking on Part - part number, date code, logo and polarity band.

## ORDERING INFORMATION

| BASE PART NUMBER | LEADFREE SUFFIX | TAPE SUFFIX | QTY/REEL | REEL SIZE | TUBE QTY |
|------------------|-----------------|-------------|----------|-----------|----------|
| SM5Sxx           | N/A             | -T13        | 750      | 13"       | N/A      |

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

## COMPANY INFORMATION

---

### COMPANY PROFILE

In business more than 20 years, ProTek Devices™ is a privately held semiconductor company. The company offers a product line of overvoltage protection and overcurrent protection components. These include transient voltage suppressor array (TVS arrays) avalanche breakdown diode, steering diode TVS array and electronics SMD chip fuses. These components deliver circuit protection in electronic systems from numerous overvoltage and overcurrent events. They include lightning; electrostatic discharge (ESD); nuclear electromagnetic pulses (NEMP); inductive switching; and electromagnetic interference (EMI) / radio frequency interference (RFI). ProTek Devices also offers LED wafer die for ESD protection and related high frequency products.

### 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:

Asia Sales: [asiasales@protekdevices.com](mailto:asiasales@protekdevices.com)  
Europe Sales: [europesales@protekdevices.com](mailto:europesales@protekdevices.com)  
U.S. Sales: [ussales@protekdevices.com](mailto:ussales@protekdevices.com)  
Distributor Sales: [distysales@protekdevices.com](mailto:distysales@protekdevices.com)  
Customer Service: [service@protekdevices.com](mailto:service@protekdevices.com)  
Technical Support: [support@protekdevices.com](mailto:support@protekdevices.com)

#### 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](http://www.protekdevices.com)

COPYRIGHT © ProTek Devices 2016 - 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.