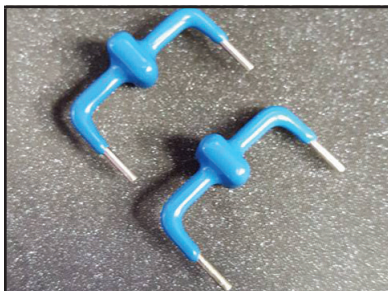


## HIGH POWERED TVS COMPONENT



**AXIAL LEAD**

### APPLICATIONS

- DC & AC Applications
- Remote Transmission Lines
- Industrial Wiring

Bidirectional



### FEATURES

- UL File Recognition #E208219
- Axial Lead Terminals
- High Current Capability
- Excellent Clamping Voltage
- Glass Passivated Junction
- Bidirectional Configuration
- Low Slope Resistance
- Repetition Rate (Duty Cycle): 0.01%
- Hazardous Substance Free
- RoHS Complaint (Exemption #7)

### MECHANICAL CHARACTERISTICS

- Epoxy Encapsulated Axial Lead Device
- Approximate Weight: 3.35 grams
- High Temperature Soldering: 260°C / 10 seconds at Terminals
- Flammability Rating UL 94V-0
- Marking: Part Number

#### MAXIMUM RATINGS @ 25°C Unless Otherwise Specified

| PARAMETER                                           | SYMBOL    | VALUE      | UNITS |
|-----------------------------------------------------|-----------|------------|-------|
| Operating Temperature                               | $T_J$     | -55 to 150 | °C    |
| Storage Temperature                                 | $T_{STG}$ | -55 to 150 | °C    |
| KA Series - Current Rating, Rated $I_{PP}$ @ 8/20μs | $I_{PP}$  | 3          | kA    |
| KB Series - Current Rating, Rated $I_{PP}$ @ 8/20μs | $I_{PP}$  | 6          | kA    |
| KC Series - Current Rating, Rated $I_{PP}$ @ 8/20μs | $I_{PP}$  | 10         | kA    |
| K1 Series - Current Rating, Rated $I_{PP}$ @ 8/20μs | $I_{PP}$  | 1          | kA    |
| KD Series - Current Rating, Rated $I_{PP}$ @ 8/20μs | $I_{PP}$  | 15         | kA    |

## TYPICAL DEVICE CHARACTERISTICS

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

| PART<br>NUMBER<br>(Note 1) | REVERSE<br>STAND-OFF<br>VOLTAGE |                   | MINIMUM<br>BREAKDOWN<br>VOLTAGE<br><br>$V_{(BR)} @ I_T$<br>VOLTS | TEST<br>CURRENT<br><br>$@ I_T$<br>mA | CURRENT<br>RATING<br><br>8/20 $\mu$ s<br>kA | MAXIMUM<br>CLAMPING<br>VOLTAGE<br><br>$@ I_{PP}$<br>$V_C$<br>VOLTS | REVERSE<br>LEAKAGE<br>CURRENT<br><br>$@ V_{DC}$<br>$I_R$<br>$\mu$ A |
|----------------------------|---------------------------------|-------------------|------------------------------------------------------------------|--------------------------------------|---------------------------------------------|--------------------------------------------------------------------|---------------------------------------------------------------------|
|                            | $V_{AC}$<br>VOLTS               | $V_{DC}$<br>VOLTS |                                                                  |                                      |                                             |                                                                    |                                                                     |
| K1-076                     | 54.0                            | 76.0              | 83.0                                                             | 10                                   | 1                                           | 135.0                                                              | 20                                                                  |
| KA-058*                    | 40.0                            | 58.0              | 64.0                                                             | 10                                   | 3                                           | 110.0                                                              | 20                                                                  |
| KA-076*                    | 54.0                            | 76.0              | 85.0                                                             | 10                                   | 3                                           | 140.0                                                              | 20                                                                  |
| KA-150                     | 106.0                           | 150.0             | 158.0                                                            | 10                                   | 3                                           | 230.0                                                              | 10                                                                  |
| KA-380*                    | 275.0                           | 380.0             | 401.0                                                            | 10                                   | 3                                           | 520.0                                                              | 20                                                                  |
| KA-430*                    | 310.0                           | 430.0             | 440.0                                                            | 10                                   | 3                                           | 652.0                                                              | 20                                                                  |
| KB-058*                    | 40.0                            | 58.0              | 64.0                                                             | 10                                   | 6                                           | 110.0                                                              | 20                                                                  |
| KB-076*                    | 54.0                            | 76.0              | 83.0                                                             | 10                                   | 6                                           | 135.0                                                              | 20                                                                  |
| KB-170*                    | 130.0                           | 170.0             | 180.0                                                            | 10                                   | 6                                           | 260.0                                                              | 20                                                                  |
| KB-190*                    | 145.0                           | 190.0             | 200.0                                                            | 10                                   | 6                                           | 290.0                                                              | 20                                                                  |
| KB-240*                    | 180.0                           | 240.0             | 250.0                                                            | 10                                   | 6                                           | 340.0                                                              | 20                                                                  |
| KB-380*                    | 275.0                           | 380.0             | 401.0                                                            | 10                                   | 6                                           | 520.0                                                              | 20                                                                  |
| KB-430*                    | 310.0                           | 430.0             | 440.0                                                            | 10                                   | 6                                           | 625.0                                                              | 20                                                                  |
| KC-058                     | 40.0                            | 58.0              | 64.0                                                             | 10                                   | 10                                          | 110.0                                                              | 20                                                                  |
| KC-076*                    | 54.0                            | 76.0              | 83.0                                                             | 10                                   | 10                                          | 135.0                                                              | 20                                                                  |
| KC-170                     | 130.0                           | 170.0             | 180.0                                                            | 10                                   | 10                                          | 260.0                                                              | 20                                                                  |
| KC-190*                    | 145.0                           | 190.0             | 200.0                                                            | 10                                   | 10                                          | 290.0                                                              | 20                                                                  |
| KC-200*                    | 150.0                           | 200.0             | 222.0                                                            | 10                                   | 10                                          | 330.0                                                              | 20                                                                  |
| KC-240                     | 180.0                           | 240.0             | 250.0                                                            | 10                                   | 10                                          | 340.0                                                              | 20                                                                  |
| KC-380*                    | 275.0                           | 380.0             | 401.0                                                            | 10                                   | 10                                          | 520.0                                                              | 20                                                                  |
| KC-430*                    | 310.0                           | 430.0             | 440.0                                                            | 10                                   | 10                                          | 625.0                                                              | 20                                                                  |
| KD-058                     | 40.0                            | 58.0              | 64.0                                                             | 10                                   | 15                                          | 110.0                                                              | 20                                                                  |
| KD-076                     | 54.0                            | 76.0              | 85.0                                                             | 10                                   | 15                                          | 145.0                                                              | 20                                                                  |

## NOTE

1. \*Contact factory for minimum order quantities.

## TYPICAL DEVICE CHARACTERISTICS

TABLE 1 - STANDARD PACKAGE, LEADED PROCESS, PACKAGE PEAK REFLOW TEMPERATURE

| Package Thickness | Volume mm <sup>3</sup> < 350 | Volume mm <sup>3</sup> ≥ 350 |
|-------------------|------------------------------|------------------------------|
| < 2.5mm           | 240 +0/-5°C                  | 225 +0/-5°C                  |
| ≥ 2.5mm           | 225 +0/-5°C                  | 225 +0/-5°C                  |

## NOTES:

1. The package thickness and volume dictates the maximum component temperature. The thermal gradients between packages can be reduced by using convection reflow processes.
2. Volume of the package does not account for the external terminals.
3. Package volume is the equivalent of package size multiplied by the height.

TABLE 2 - LEAD-FREE PROCESS, PACKAGE PEAK REFLOW TEMPERATURE

| Package Thickness | Volume mm <sup>3</sup> < 350 | Volume mm <sup>3</sup> 250 - 2000 | Volume mm <sup>3</sup> > 2000 |
|-------------------|------------------------------|-----------------------------------|-------------------------------|
| < 1.6mm           | 260 +0°C                     | 260 +0°C                          | 260 +0°C                      |
| 1.6mm - 2.5mm     | 260 +0°C                     | 250 +0°C                          | 245 +0°C                      |
| ≥ 2.5mm           | 250 +0°C                     | 245 +0°C                          | 245 +0°C                      |

## NOTES:

1. The profiling tolerance is +0, -X °C but at no time will it exceed -5°C.
2. Volume of the package does not account for the external terminals.
3. The package thickness and volume dictates the maximum component temperature. The thermal gradients between packages can be reduced by using convection reflow processes.
4. Components used in lead-free assembly shall be evaluated using the lead-free classification temperature and profiles as defined in the above table.
5. Table 3 will help determine if the components are lead-free or not.
6. The device manufacturer/supplier shall ensure process compatibility up to and including the stated classification temperature at the rated MSL level.

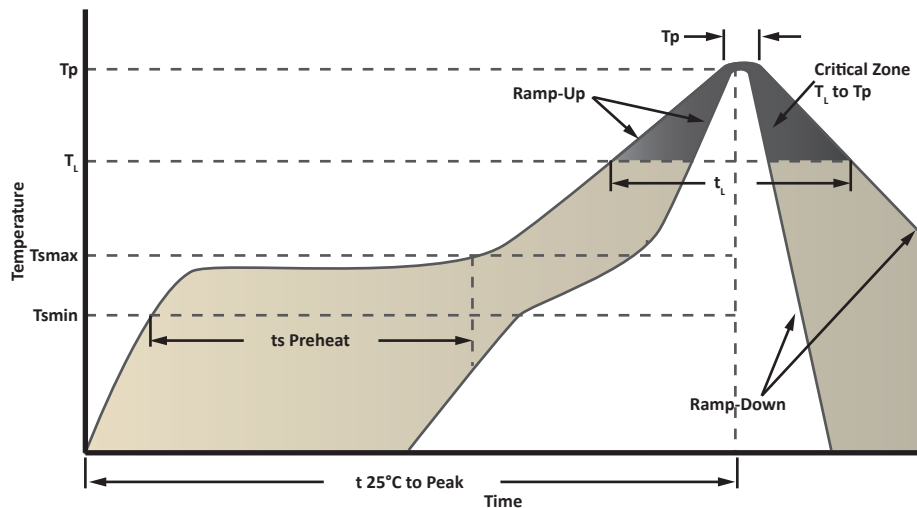
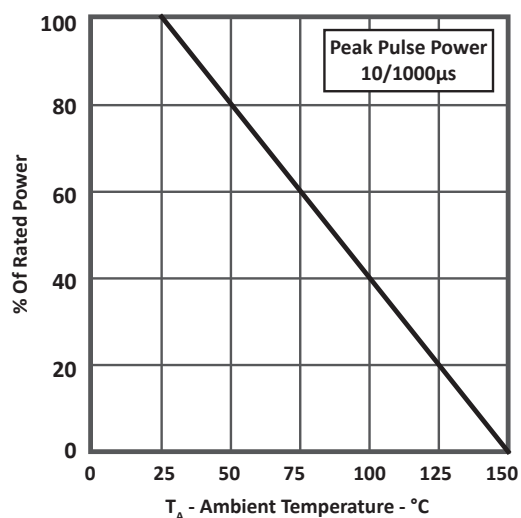
TABLE 3 - CLASSIFICATION REFLOW PROFILES

| Profile Feature                                                                                                                              | Sn - Pb Eutectic Assembly        | Pb-Free Assembly                 |
|----------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------|----------------------------------|
| Average Ramp Up Rate (T <sub>S MAX</sub> to T <sub>p</sub> )                                                                                 | 3°C/seconds Max.                 | 3°C/seconds Max.                 |
| Preheat<br>Temperature Min T <sub>S MIN</sub><br>Temperature MAX T <sub>S MAX</sub><br>Time (T <sub>S MIN</sub> to T <sub>S MAX</sub> ) (ts) | 100°C<br>150°C<br>60-120 seconds | 150°C<br>200°C<br>60-180 seconds |
| Time Maintained Above<br>Temperature (T <sub>L</sub> )<br>Time(t <sub>L</sub> )                                                              | 183°C<br>60-150 seconds          | 217°C<br>60-150 seconds          |
| Peak/Classification Temperature (T <sub>p</sub> )                                                                                            | See Table 1                      | See Table 2                      |
| Time Within 5°C of Actual Temperature (t <sub>p</sub> )                                                                                      | 10-30 seconds                    | 20-40 seconds                    |
| Ramp-Down Rate                                                                                                                               | 6°C/seconds Max.                 | 6°C/seconds Max.                 |
| Time 25°C to Peak Temperature                                                                                                                | 6 Minutes Max.                   | 8 Minutes Max.                   |

## NOTES:

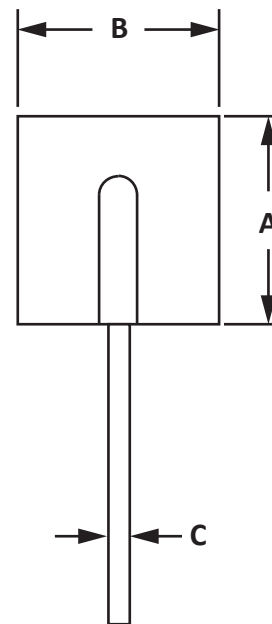
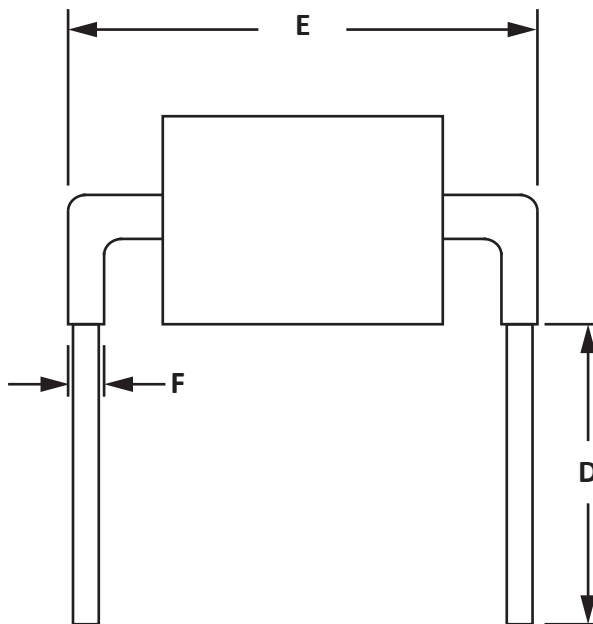
1. All temperatures refer to topside of the package, measured on the package body surface.
2. Time within 5°C of the actual peak temperature (T<sub>p</sub>) specified for the reflow profiles is "supplier" minimum and "user" maximum.

## TYPICAL DEVICE CHARACTERISTICS

 FIGURE 1  
 SOLDER WAVEFORM

 FIGURE 2  
 POWER DERATING CURVE


**AXIAL LEAD PACKAGE INFORMATION**

| OUTLINE DIMENSIONS |             |       |        |       |
|--------------------|-------------|-------|--------|-------|
| DIM                | MILLIMETERS |       | INCHES |       |
|                    | MIN         | MAX   | MIN    | MAX   |
| A                  | -           | 14.5  | -      | 0.57  |
| B                  | -           | 12.7  | -      | 0.50  |
| C                  | 1.28        | 1.32  | 0.050  | 0.052 |
| D                  | 5.0         | 7.0   | 0.20   | 0.28  |
| E                  | 23.45       | 24.85 | 0.92   | 0.98  |
| F                  | -           | 2.5   | -      | 0.10  |



## COMPANY INFORMATION

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### 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 high performance interface and linear products. They include analog switches; multiplexers; LED drivers; LED wafer die for ESD protection; audio control ICs; RF and related high frequency products.

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