# HIGH POWERED TVS COMPONENT



## **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,	-55 to 150	°C	
Storage Temperature	T <sub>STG</sub>	-55 to 150	°C	
KA Series - Current Rating, Rated I <sub>pp</sub> @ 8/20μs	I <sub>PP</sub>	3	kA	
KB Series - Current Rating, Rated I <sub>PP</sub> @ 8/20μs	I <sub>PP</sub>	6	kA	
KC Series - Current Rating, Rated I <sub>PP</sub> @ 8/20μs	I <sub>PP</sub>	10	kA	
K1 Series - Current Rating, Rated I <sub>PP</sub> @ 8/20μs	I <sub>PP</sub>	1	kA	
KD Series - Current Rating, Rated I <sub>pp</sub> @ 8/20μs	I <sub>pp</sub>	15	kA	

# **TYPICAL DEVICE CHARACTERISTICS**

ELECTRICAL CHARACTERISTICS PER LINE @ 25°C Unless Otherwise Specified							
PART NUMBER (Note 1)	STAN	ERSE D-OFF TAGE	MINIMUM BREAKDOWN VOLTAGE	TEST CURRENT	CURRENT RATING	MAXIMUM CLAMPING VOLTAGE	REVERSE LEAKAGE CURRENT
	V <sub>AC</sub> VOLTS	V <sub>DC</sub>	V <sub>(BR)</sub> @ I <sub>т</sub> VOLTS	@ I <sub>т</sub> mA	8/20μs kA	@ I <sub>pp</sub> V <sub>c</sub> VOLTS	@V <sub>DC</sub> I <sub>R</sub> μΑ
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

<sup>1. \*</sup>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 mm³ >= 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 multipled by the height.

TABLE 2 - LEAD-FREE PROCESS, PACKAGE PEAK REFLOW TEMPERATURE				
Package Thickness	Volume mm <sup>3</sup> < 350	Volume mm³ 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  $^{\circ}\text{C}$  but at no time will it exceed -5  $^{\circ}\text{C}.$
- 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 Eutetectic Assembly	Pb-Free Assembly		
Average Ramp Up Rate (T <sub>SMAX</sub> to T <sub>p</sub> )	3°C/seconds Max.	3°C/seconds Max.		
Preheat Temperature Min T <sub>SMIN</sub> Temperature MAX T <sub>SMAX</sub> Time (T <sub>SMIN</sub> to T <sub>SMAX</sub> ) (ts)	100°C 150°C 60-120 seonds	150°C 200°C 60-180 seconds		
Time Maintained Above Temperature $(T_L)$ Time $(t_L)$	183°C 60-150 seconds	217°C 60-150 seconds		
Peak/Classification Temperature (T <sub>P</sub> )	See Table 1	See Table 2		
Time Within 5°C of Actual Temperature (t,)	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  $(T_p)$  specified for the reflow profiles is "supplier" minimum and "user" maximum.

# TYPICAL DEVICE CHARACTERISTICS

FIGURE 1 SOLDER WAVEFORM

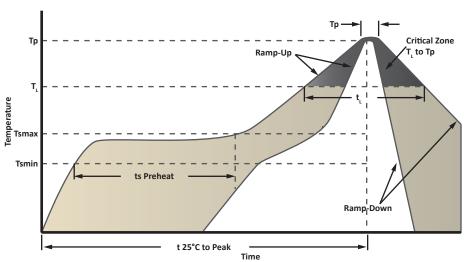
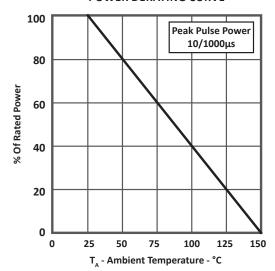


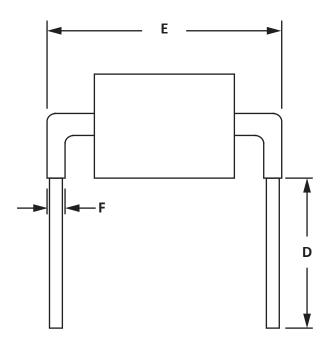
FIGURE 2
POWER DERATING CURVE

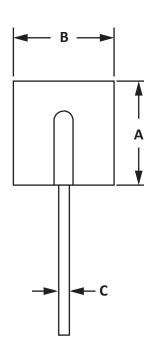




# **AXIAL LEAD PACKAGE INFORMATION**

OUTLINE DIMENSIONS					
DIM	MILLIMETERS		INCHES		
	MIN	MAX	MIN	MAX	
А	-	14.5	-	0.57	
В	-	12.7	-	0.50	
С	1.28	1.32	0.050	0.052	
D	5.0	7.0	0.20	0.28	
Е	23.45	24.85	0.92	0.98	
F	-	2.5	-	0.10	





## **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 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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