

## Automotive Transient Voltage Suppressors

High Temperature Stability and High Reliability Conditions



Case Style P600

Patented\*

\*Patent #s  
4,980,315  
5,166,769  
5,278,094

### FEATURES

- Patented PAR<sup>®</sup> construction
- Excellent clamping capability
- Low leakage current
- High surge capability
- Solder dip 260 °C, 40 seconds
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC



### TYPICAL APPLICATIONS

Use in sensitive electronics protection against voltage transients induced by inductive load switching and lighting, especially for automotive load dump protection application.

### MECHANICAL DATA

**Case:** P600, molded epoxy over passivated junction  
Epoxy meets UL 94V-0 flammability rating

**Terminals:** Matte tin plated leads, solderable per J-STD-002B and JESD22-B102D  
HE3 suffix for high reliability grade (AEC Q101 qualified)

**Polarity:** Color band denotes cathode end

PRIMARY CHARACTERISTICS	
$V_{WM}$	24 V
$P_{PPM}$ (10 x 1000 $\mu$ s)	6000 W
$P_{PPM}$ (10 $\mu$ s/50 ms)	2000 W
$P_D$	6.5 W
$I_{RSM}$	90 A
$I_{FSM}$	400 A
$T_J$ max.	185 °C

MAXIMUM RATINGS ( $T_A = 25$ °C unless otherwise noted)			
PARAMETER	SYMBOL	LIMIT	UNIT
Peak pulse power dissipation with 10/1000 $\mu$ s waveform <sup>(1)</sup> with 10 $\mu$ s/50 ms waveform <sup>(2)</sup>	$P_{PPM}$	6000 2000	W
Power dissipation on infinite heatsink at $T_L = 75$ °C (Fig. 3)	$P_D$	6.5	W
Maximum working stand-off voltage	$V_{WM}$	24	V
Peak forward surge current 8.3 ms single half sine-wave <sup>(3)</sup>	$I_{FSM}$	400	A
Operating junction and storage temperature range	$T_J, T_{STG}$	- 65 to + 185	°C

**Notes:**

(1) Non-repetitive current pulse, per Fig. 2, with a 10/1000  $\mu$ s waveform

(2) Non-repetitive current pulse, per Fig. 5, with a 10  $\mu$ s/50 ms waveform

(3) Measured on 8.3 ms half sine-wave, or equivalent square wave, duty cycle = 4 pulses per minute maximum

ELECTRICAL CHARACTERISTICS (T <sub>A</sub> = 25 °C unless otherwise noted)				
PARAMETER	TEST CONDITIONS	SYMBOL	LIMIT	UNIT
Maximum DC reverse leakage current	at V <sub>WM</sub> = 24 V, T <sub>A</sub> = 25 °C T <sub>A</sub> = 150 °C	I <sub>D</sub>	1.0 50	μA
Reverse breakdown voltage	at 100 mA, T <sub>A</sub> = 25 °C min. T <sub>A</sub> = 25 °C max. T <sub>A</sub> = 150 °C min. T <sub>A</sub> = 150 °C max.	V <sub>BR</sub>	26.7 32.6 29.7 36.7	V
Maximum clamping voltage	at I <sub>PP</sub> = 90 A <sup>(1)</sup> , T <sub>A</sub> = 25 °C T <sub>A</sub> = 150 °C	V <sub>C</sub>	40 45	V
Maximum instantaneous forward voltage	at 100 A <sup>(2)</sup>	V <sub>F</sub>	1.8	V

**Notes:**

- (1) Measured on 80 μs square pulse width
- (2) Measured on 300 μs square pulse width

ORDERING INFORMATION (Example)				
PREFERRED P/N	UNIT WEIGHT (g)	PREFERRED PACKAGE CODE	BASE QUANTITY	DELIVERY MODE
6KA24HE3/54 <sup>(1)</sup>	2.710	54	800	13" diameter paper tape and reel

**Note:**

- (1) Automotive grade AEC Q101 qualified

**RATINGS AND CHARACTERISTICS CURVES**

(T<sub>A</sub> = 25 °C unless otherwise noted)

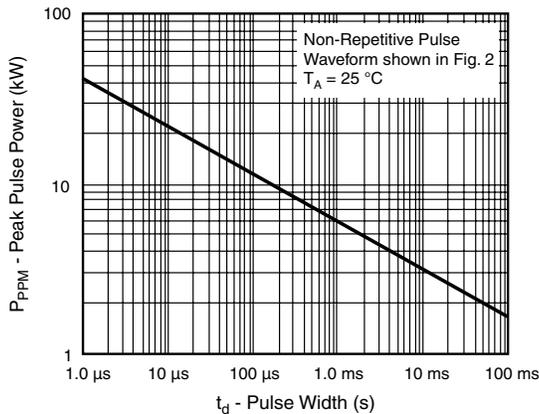


Figure 1. Peak Pulse Power Rating Curve

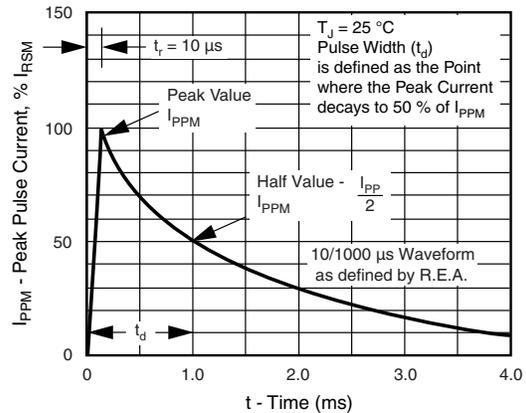


Figure 2. 10/1000 μs Pulse Waveform

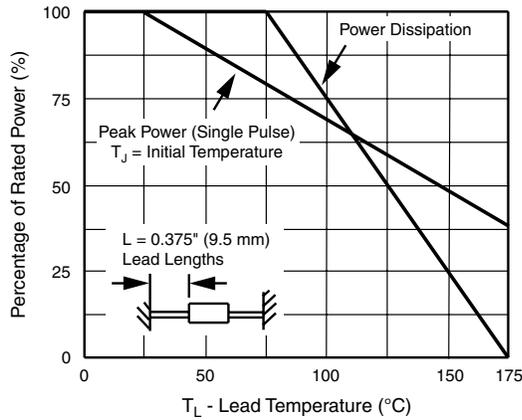


Figure 3. Pulse Derating Curve

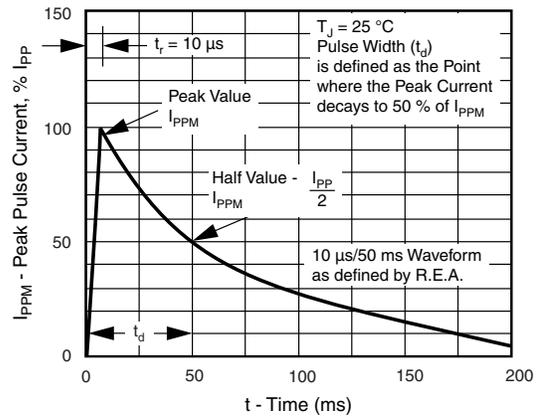


Figure 5. 10  $\mu$ s/50 ms Pulse Waveform

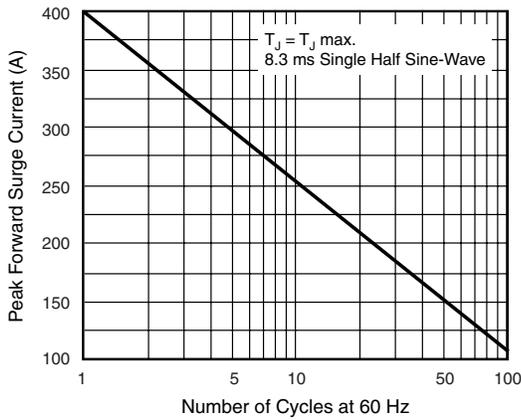
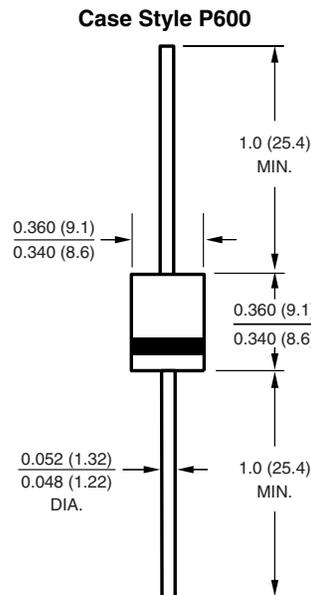


Figure 4. Maximum Non-Repetitive Peak Forward Surge Current

**PACKAGE OUTLINE DIMENSIONS** in inches (millimeters)





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