

## 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 s
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC


**RoHS**  
 COMPLIANT

**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  
 Molding compound meets UL 94 V-0 flammability rating

Base P/NHE3 - RoHS compliant, high reliability/automotive grade (AEC Q101 qualified)

**Terminals:** Matte tin plated leads, solderable per J-STD-002 and JESD22-B102

HE3 suffix meets JESD 201 class 2 whisker test

**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

<b>ELECTRICAL CHARACTERISTICS</b> ( $T_A = 25\text{ }^\circ\text{C}$ unless otherwise noted)				
PARAMETER	TEST CONDITIONS	SYMBOL	LIMIT	UNIT
Maximum DC reverse leakage current	at $V_{WM} = 24\text{ V}$ , $T_A = 25\text{ }^\circ\text{C}$ $T_A = 150\text{ }^\circ\text{C}$	$I_D$	1.0 50	$\mu\text{A}$
Reverse breakdown voltage	at 100 mA, $T_A = 25\text{ }^\circ\text{C min.}$ $T_A = 25\text{ }^\circ\text{C max.}$ $T_A = 150\text{ }^\circ\text{C min.}$ $T_A = 150\text{ }^\circ\text{C max.}$	$V_{BR}$	26.7 32.6 29.7 36.7	V
Maximum clamping voltage	at $I_{PP} = 90\text{ A}^{(1)}$ , $T_A = 25\text{ }^\circ\text{C}$ $T_A = 150\text{ }^\circ\text{C}$	$V_C$	40 45	V
Maximum instantaneous forward voltage	at 100 A <sup>(2)</sup>	$V_F$	1.8	V

**Notes:**

- (1) Measured on 80  $\mu\text{s}$  square pulse width
- (2) Measured on 300  $\mu\text{s}$  square pulse width

<b>ORDERING INFORMATION</b> (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**

( $T_A = 25\text{ }^\circ\text{C}$  unless otherwise noted)

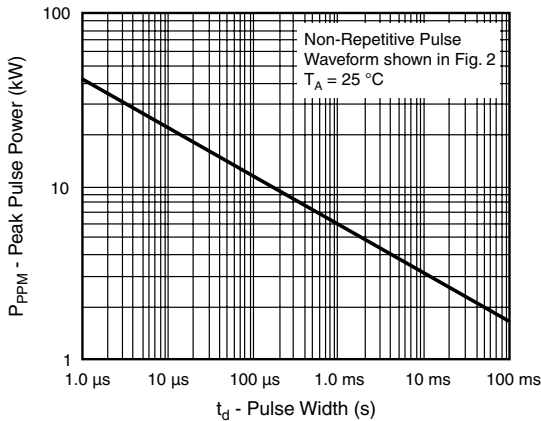


Figure 1. Peak Pulse Power Rating Curve

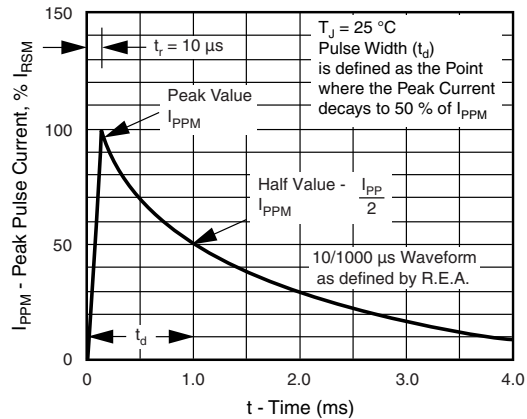


Figure 2. 10/1000  $\mu\text{s}$  Pulse Waveform

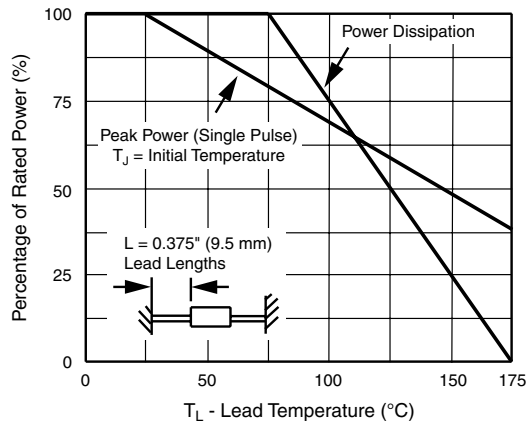


Figure 3. Pulse Derating Curve

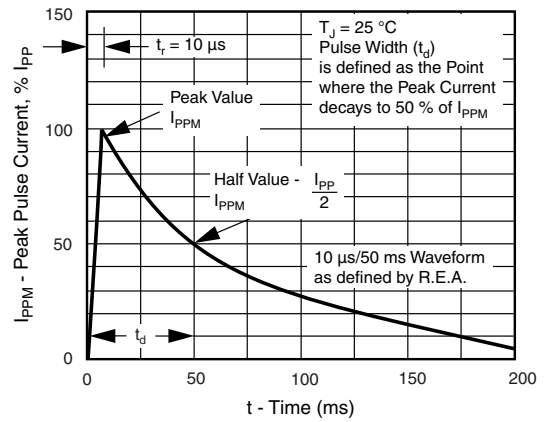


Figure 5. 10  $\mu$ s/50 ms Pulse Waveform

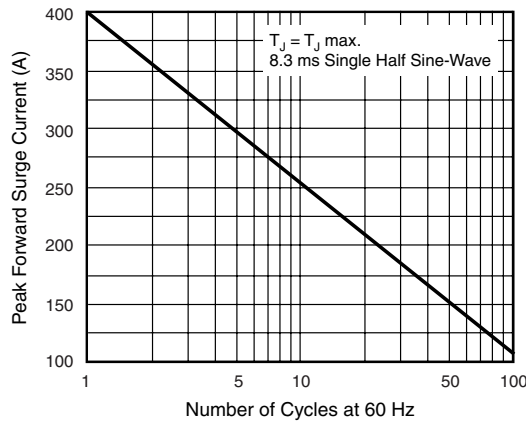
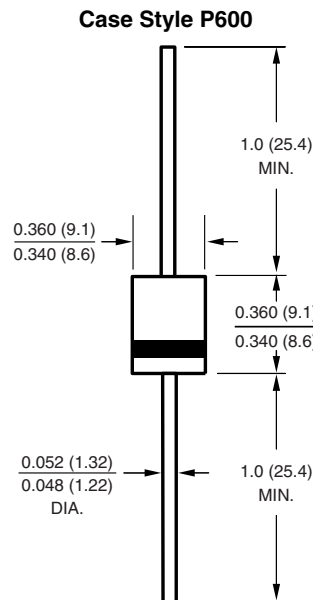


Figure 4. Maximum Non-Repetitive Peak Forward Surge Current

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





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