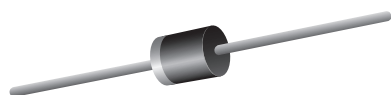


# **PAR<sup>®</sup> Transient Voltage Suppressors**

## High Temperature Stability and High Reliability Conditions


**P600**

### **FEATURES**

- Junction passivation optimized design passivated anisotropic rectifier technology
- $T_J = 185\text{ }^{\circ}\text{C}$  capability suitable for high reliability and automotive requirement
- Excellent clamping capability
- Low leakage current
- High surge capability
- Solder dip  $275\text{ }^{\circ}\text{C}$  max. 10 s, per JESD 22-B106
- AEC-Q101 qualified
- Material categorization: for definitions of compliance please see [www.vishay.com/doc?99912](http://www.vishay.com/doc?99912)


**RoHS**  
COMPLIANT

### **PRIMARY CHARACTERISTICS**

|                                      |                               |
|--------------------------------------|-------------------------------|
| $V_{WM}$                             | 24 V                          |
| $V_{BR}$                             | 26.7 V to 32.6 V              |
| $P_{PPM}$ (10 x 1000 $\mu\text{s}$ ) | 6000 W                        |
| $P_{PPM}$ (10 $\mu\text{s}$ /50 ms)  | 2000 W                        |
| $P_D$                                | 6.5 W                         |
| $I_{RSM}$                            | 90 A                          |
| $I_{FSM}$                            | 400 A                         |
| $T_J$ max.                           | $185\text{ }^{\circ}\text{C}$ |
| Polarity                             | Unidirectional                |
| Package                              | P600                          |

### **TYPICAL APPLICATIONS**

Use in sensitive electronics protection against voltage transients induced by inductive load switching and lightning, 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\_X - RoHS-compliant and AEC-Q101 qualified  
("X" denotes revision code e.g. A, B, ....)

**Terminals:** matte tin plated leads, solderable per J-STD-002 and JESD 22-B102

HE3 suffix meets JESD 201 class 2 whisker test

**Polarity:** color band denotes cathode end

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

| PARAMETER                                                                             | SYMBOL         | LIMIT       | UNIT               |
|---------------------------------------------------------------------------------------|----------------|-------------|--------------------|
| Peak pulse power dissipation                                                          | $P_{PPM}$      | 6000        | W                  |
|                                                                                       |                | 2000        |                    |
| Power dissipation on infinite heatsink at $T_L = 75\text{ }^{\circ}\text{C}$ (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 | $^{\circ}\text{C}$ |

#### **Notes**

<sup>(1)</sup> Non-repetitive current pulse, per fig. 2, with a 10/1000 $\mu\text{s}$  waveform

<sup>(2)</sup> Non-repetitive current pulse, per fig. 5, with a 10  $\mu\text{s}$ /50 ms waveform

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

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

| DEVICE TYPE | BREAKDOWN VOLTAGE<br>$V_{BR}$ AT $I_T$<br>(V) |      | TEST CURRENT<br>$I_T$<br>(mA) | STAND-OFF VOLTAGE<br>$V_{WM}$<br>(V) |
|-------------|-----------------------------------------------|------|-------------------------------|--------------------------------------|
|             | MIN.                                          | MAX. |                               |                                      |
| 6KA24       | 26.7                                          | 32.6 | 100                           | 24                                   |

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

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

**Notes**
<sup>(1)</sup> Measured on 80  $\mu\text{s}$  square pulse width

<sup>(2)</sup> Measured on 300  $\mu\text{s}$  square pulse width

**ORDERING INFORMATION** (Example)

| PREFERRED P/N               | UNIT WEIGHT (g) | PREFERRED PACKAGE CODE | BASE QUANTITY | DELIVERY MODE                    |
|-----------------------------|-----------------|------------------------|---------------|----------------------------------|
| 6KA24HE3_B/C <sup>(1)</sup> | 2.710           | C                      | 800           | 13" diameter paper tape and reel |

**Note**
<sup>(1)</sup> AEC-Q101 qualified

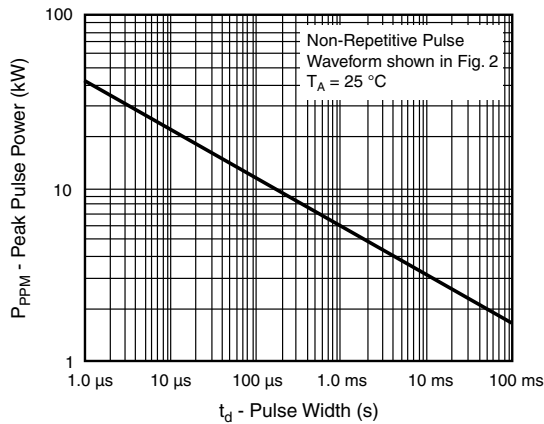
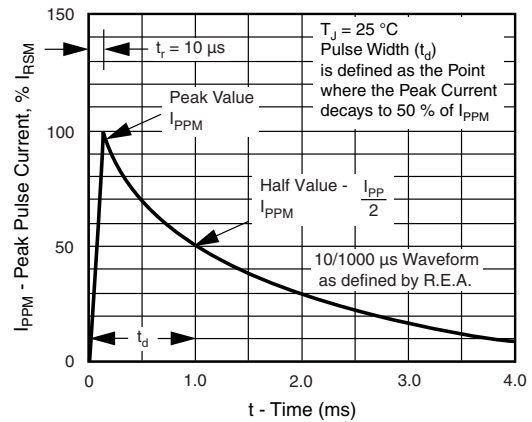
**RATINGS AND CHARACTERISTICS CURVES** ( $T_A = 25\text{ }^{\circ}\text{C}$  unless otherwise noted)


Fig. 1 - Peak Pulse Power Rating Curve


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

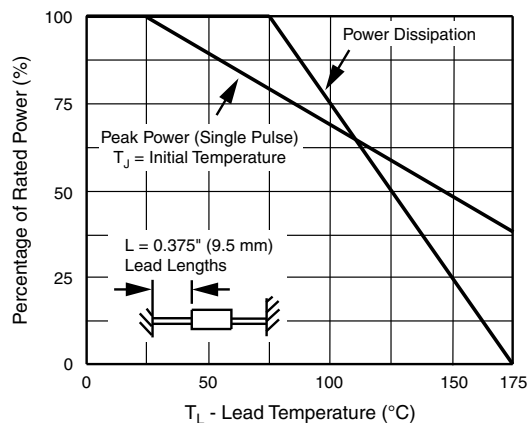


Fig. 3 - Pulse Derating Curve

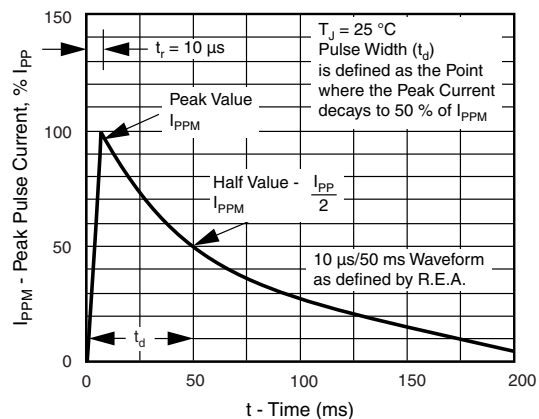
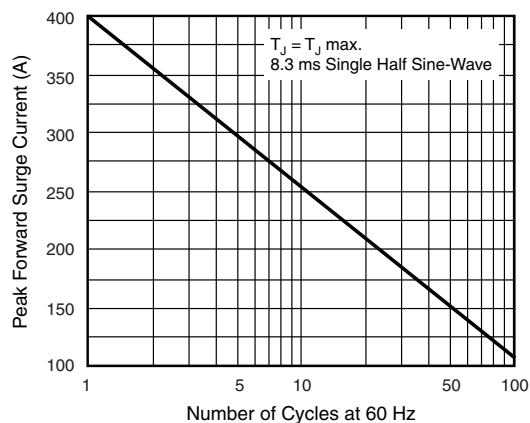
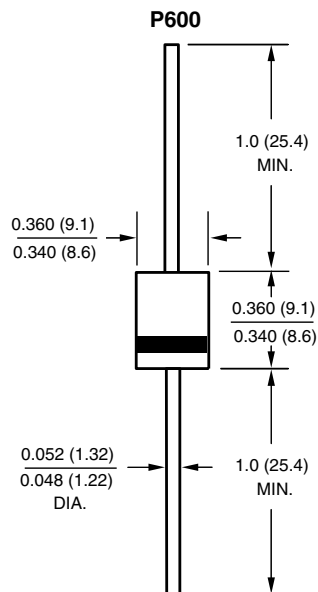

Fig. 5 - 10  $\mu$ s/50 ms Pulse Waveform


Fig. 4 - Maximum Non-Repetitive Peak Forward Surge Current

## PACKAGE OUTLINE DIMENSIONS in inches (millimeters)





## Disclaimer

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