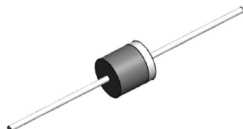


# 6KP

## Automotive grade 6600 W Transient voltage suppressor



### Product features

- Automotive grade (AEC-Q101 qualified)
- Excellent clamping capability
- High reliability application
- 6600 W peak pulse power capability at 10/1000  $\mu$ s waveform
- Typical  $I_R$  less than 5  $\mu$ A
- Fast response time: typically less than 1.0 ps from 0 V to  $V_{BR}$  minimum
- Plastic package meets UL 94 V-0 flammability rating
- Terminal: tin plated, solderable per J-STD-002
- UL 497B recognized.  
File No. : E198449 Guide QVGQ2

### Applications

- Automotive chassis and safety systems
- Advanced driver assistance systems (ADAS)
- Communication and infotainment systems
- Network systems and body electronics
- Power Train controls
- xEV and battery systems

### Environmental compliance and general specifications

- ISO16750-2 P5A: 12 V system (87 V/1  $\Omega$ /400 ms)
- ISO16750-2 P5A: 24 V system (174 V/4  $\Omega$ /350 ms)
- AEC-Q101 qualified



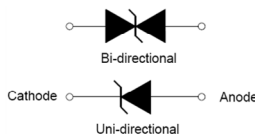
### Ordering part number

**6KP 15 C A H**  
 Family name \_\_\_\_\_  
 $V_R$  voltage \_\_\_\_\_  
 Bi-/Uni-Directional (Blank=Uni, C=Bi) \_\_\_\_\_  
 Voltage tolerance \_\_\_\_\_  
 High reliability application \_\_\_\_\_

### Alternate ordering part number

**6KPE 15 C A H**  
 Family name \_\_\_\_\_  
 $V_R$  voltage \_\_\_\_\_  
 Bi-/Uni-Directional (Blank=Uni, C=Bi) \_\_\_\_\_  
 Voltage tolerance \_\_\_\_\_  
 High reliability application \_\_\_\_\_

### PIN configuration



Powering Business Worldwide

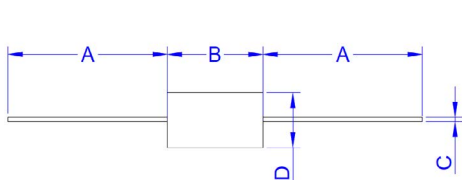
Absolute maximum ratings

(+25 °C, RH=45%-75%, unless otherwise noted)

| Parameter                                                             | Symbol          | Value       | Unit |
|-----------------------------------------------------------------------|-----------------|-------------|------|
| Storage operating junction temperature range                          | $T_{STG} / T_J$ | -55 to +175 | °C   |
| Steady state power dissipation at $T_L = +75$ °C                      | $P_{M(AV)}$     | 8.0         | W    |
| Peak pulse power dissipation on 10/1000 $\mu$ s waveform              | $P_{PP}$        | 6600        | W    |
| Maximum instantaneous forward voltage at 100 A for unidirectional     | $V_F$           | 3.5         | V    |
| Peak forward surge current, 8.3 ms single half sine wave <sup>1</sup> | $I_{FSM}$       | 600         | A    |
| Typical thermal resistance junction to lead                           | $R_{\theta JL}$ | 8.0         | °C/W |
| Typical thermal resistance junction to ambient                        | $R_{\theta JA}$ | 40          | °C/W |

1. Measured on 8.3 ms single half sine wave or equivalent square wave for unidirectional device only, duty cycle = 4 per minute maximum

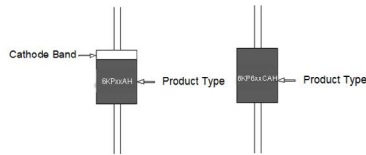
Mechanical parameters, pad layout- mm/inches



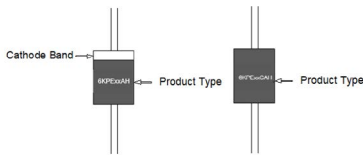
| Dimension | Millimeters |         | Inches  |         |
|-----------|-------------|---------|---------|---------|
|           | Minimum     | Maximum | Minimum | Maximum |
| A         | 25.40       | -       | 1.000   | -       |
| B         | 8.60        | 9.40    | 0.339   | 0.370   |
| C         | 1.20        | 1.40    | 0.047   | 0.055   |
| D         | 8.60        | 9.10    | 0.339   | 0.358   |

Part marking

Standard part number marking



Alternate part number marking



Packaging information

300 parts per box

Electrical specifications (+25 °C)

| Part number |          | Marking |          | $V_R$ | $I_R @ V_R$ | $V_{BR} @ I_T$ |         | $I_T$ | $V_C @ I_{PP}$ | $I_{PP}$ | UL497B<br>recognized |
|-------------|----------|---------|----------|-------|-------------|----------------|---------|-------|----------------|----------|----------------------|
| Uni-polar   | Bi-polar | Uni     | Bi       | (V)   | ( $\mu A$ ) | min (V)        | max (V) | (mA)  | max (V)        | (A)      |                      |
| 6KP15AH     | 6KP15CAH | 6KP15AH | 6KP15CAH | 15    | 5           | 16.7           | 18.5    | 5     | 24.4           | 270.5    |                      |
| 6KP16AH     | 6KP16CAH | 6KP16AH | 6KP16CAH | 16    | 5           | 17.8           | 19.7    | 5     | 26             | 253.8    |                      |
| 6KP18AH     | 6KP18CAH | 6KP18AH | 6KP18CAH | 18    | 5           | 20             | 22.1    | 5     | 29.2           | 226      |                      |
| 6KP20AH     | 6KP20CAH | 6KP20AH | 6KP20CAH | 20    | 5           | 22.2           | 24.5    | 5     | 32.4           | 203.7    | x                    |
| 6KP22AH     | 6KP22CAH | 6KP22AH | 6KP22CAH | 22    | 5           | 24.4           | 26.9    | 5     | 35.5           | 186      | x                    |
| 6KP24AH     | 6KP24CAH | 6KP24AH | 6KP24CAH | 24    | 5           | 26.7           | 29.5    | 5     | 38.9           | 169.7    | x                    |
| 6KP26AH     | 6KP26CAH | 6KP26AH | 6KP26CAH | 26    | 5           | 28.9           | 31.9    | 5     | 42.1           | 156.8    | x                    |
| 6KP28AH     | 6KP28CAH | 6KP28AH | 6KP28CAH | 28    | 5           | 31.1           | 34.4    | 5     | 45.4           | 145.4    | x                    |
| 6KP30AH     | 6KP30CAH | 6KP30AH | 6KP30CAH | 30    | 5           | 33.3           | 36.8    | 5     | 48.4           | 136.4    | x                    |
| 6KP33AH     | 6KP33CAH | 6KP33AH | 6KP33CAH | 33    | 5           | 36.7           | 40.6    | 5     | 53.3           | 123.8    | x                    |
| 6KP36AH     | 6KP36CAH | 6KP36AH | 6KP36CAH | 36    | 5           | 40             | 44.2    | 5     | 58.1           | 113.6    | x                    |
| 6KP40AH     | 6KP40CAH | 6KP40AH | 6KP40CAH | 40    | 5           | 44.4           | 49.1    | 5     | 64.5           | 102.3    | x                    |
| 6KP43AH     | 6KP43CAH | 6KP43AH | 6KP43CAH | 43    | 5           | 47.8           | 52.8    | 5     | 69.4           | 95.1     | x                    |

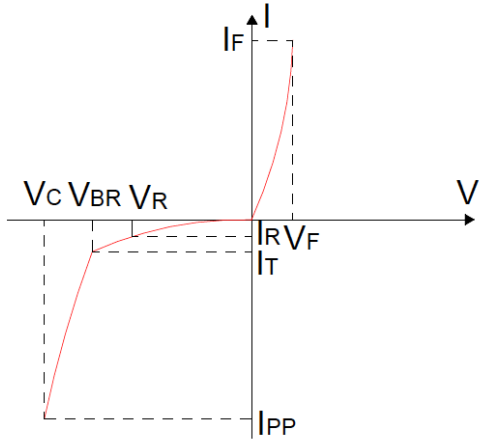
Note: Standard part numbers listed

Alternate part numbers have the addition of an E and a "-" for the "." where applicable.

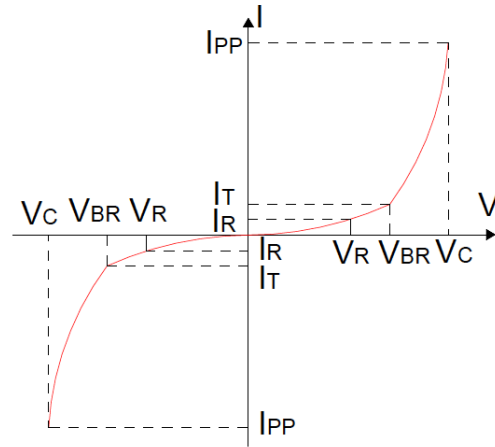
Example standard part number 6KP15AH, alternate part number 6KPE15AH

**Ratings and V-I characteristic curves** (+25 °C unless otherwise noted)

**V- I curve characteristics (Uni-directional)**



**V- I curve characteristics (Bi-directional)**



Surge waveform: 10/1000  $\mu$ s

$V_R$ : Stand-off voltage – Maximum voltage that can be applied

$V_{BR}$ : Breakdown voltage

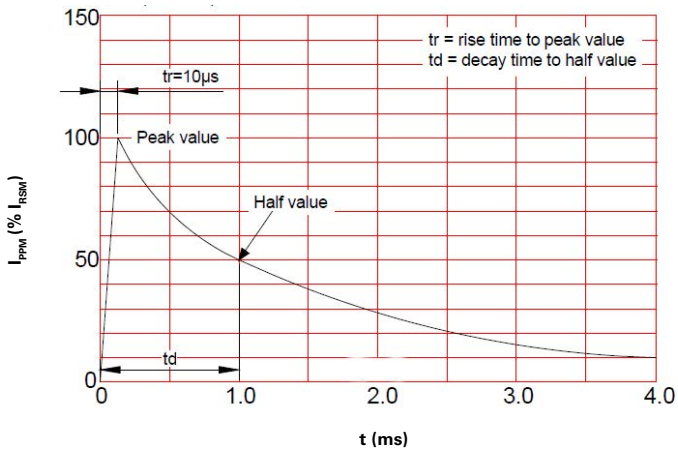
$V_C$ : Clamping voltage – Peak voltage measured across the suppressor at a specified  $I_{PP}$

$I_R$ : Reverse leakage current

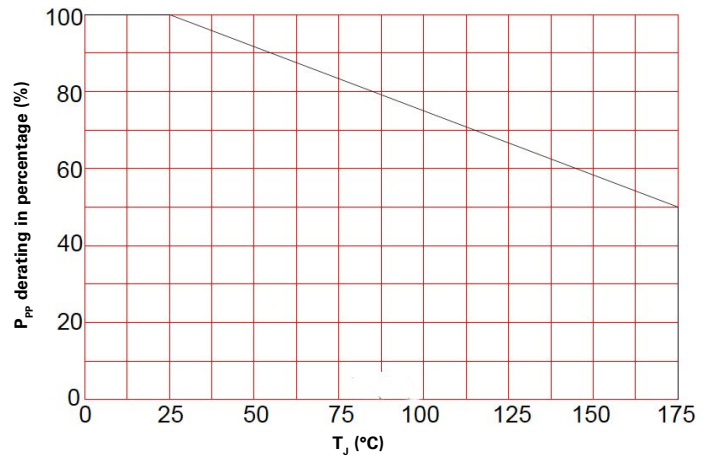
$I_T$ : Test current

$V_F$ : Forward voltage drop for Uni-directional

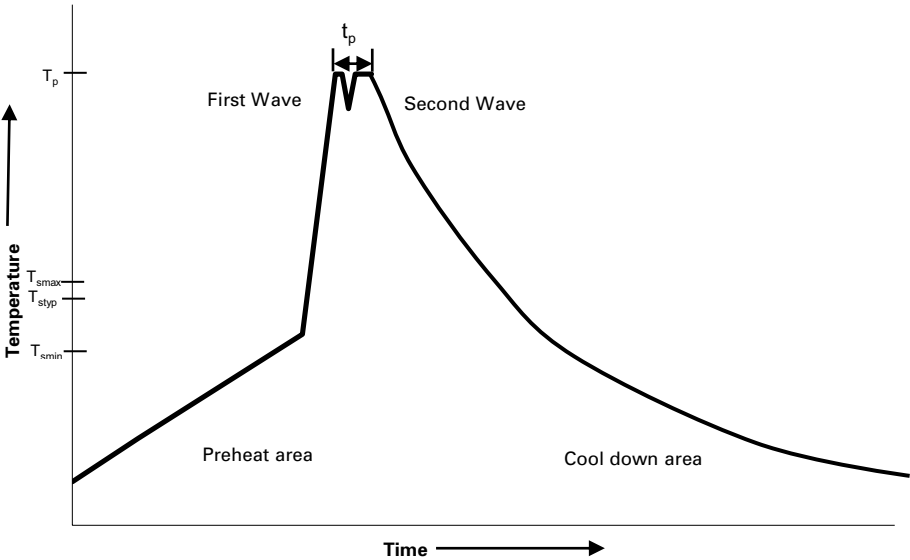
**Pulse waveform**



**Pulse derating curve**



Wave solder profile



Reference EN 61760-1:2006

| Profile feature                                                    | Standard SnPb solder                      | Lead (Pb) free solder                     |
|--------------------------------------------------------------------|-------------------------------------------|-------------------------------------------|
| Preheat                                                            |                                           |                                           |
| • Temperature min. (T <sub>smin</sub> )                            | 100 °C                                    | 100 °C                                    |
| • Temperature typ. (T <sub>styp</sub> )                            | 120 °C                                    | 120 °C                                    |
| • Temperature max. (T <sub>smax</sub> )                            | 130 °C                                    | 130 °C                                    |
| • Time (T <sub>smin</sub> to T <sub>smax</sub> ) (t <sub>s</sub> ) | 70 seconds                                | 70 seconds                                |
| Δ preheat to max Temperature                                       | 150 °C max.                               | 150 °C max.                               |
| Peak temperature (T <sub>p</sub> )*                                | 235 °C – 260 °C                           | 250 °C – 260 °C                           |
| Time at peak temperature (t <sub>p</sub> )                         | 10 seconds max<br>5 seconds max each wave | 10 seconds max<br>5 seconds max each wave |
| Ramp-down rate                                                     | ~ 2 K/s min<br>~3.5 K/s typ<br>~5 K/s max | ~ 2 K/s min<br>~3.5 K/s typ<br>~5 K/s max |
| Time 25 °C to 25 °C                                                | 4 minutes                                 | 4 minutes                                 |

Manual solder

+350 °C (4-5 seconds by soldering iron), generally manual/hand soldering is not recommended

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