

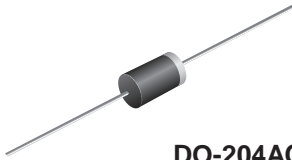


# P6KA6.8 thru P6KA43A

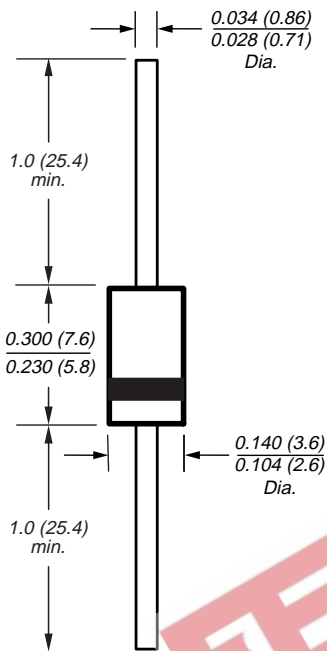
Vishay Semiconductors  
formerly General Semiconductor

## Automotive Transient Voltage Suppressors

**Breakdown Voltage** 6.8 to 43V  
**Peak Pulse Power** 600W



**DO-204AC (DO-15)**



Available in uni-directional only

Dimensions in inches and (millimeters)

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

### Features

- Designed for under the hood applications
- Plastic package has Underwriters Laboratory Flammability Classification 94V-0
- Exclusive patented PAR<sup>®</sup> oxide passivated chip construction
- 600W peak pulse power surge capability with a 10/1000ms waveform repetition rate (duty cycle): 0.01%
- Excellent clamping capability
- Low incremental surge resistance
- Very fast response time
- For devices with  $V_{(BR)} \geq 10V$ ,  $I_D$  are typically less than 1.0mA
- High temperature soldering guaranteed: 300°C/10 seconds, 0.375" (9.5mm) lead length, 5lbs. (2.3kg) tension

### Mechanical Data

**Case:** JEDEC DO-204AC molded plastic body over passivated junction

**Terminals:** Solder plated axial leads, solderable per MIL-STD-750, Method 2026

**Polarity:** For unidirectional types the color band denotes the cathode, which is positive with respect to the anode under normal TVS operation

**Mounting Position:** Any

**Weight:** 0.015 oz., 0.4 g

**Packaging codes/options:**

1/4K per Bulk Box, 40K/box

4/4K per 13" Reel, 16K/box

23/2K per Ammo mag., 18K/box

## Maximum Ratings and Thermal Characteristics ( $T_A = 25^\circ C$ unless otherwise noted)

Parameter	Symbol	Value	Unit
Peak pulse power dissipation with a 10/1000 $\mu s$ <sup>(1)</sup> (Fig. 1)	PPPM	Minimum 600	W
Pulse pulse current with a 10/1000 $\mu s$ waveform <sup>(1)</sup> (Fig. 3)	IPPM	See Next Table	A
Steady state power dissipation at $T_L = 75^\circ C$ lead lengths 0.375" (9.5mm) <sup>(2)</sup>	$P_{M(AV)}$	5.0	W
Peak forward surge current, 8.3ms single half sine-wave <sup>(3)</sup>	$I_{FSM}$	75	A
Maximum instantaneous forward voltage at 50A <sup>(3)</sup>	$V_F$	3.5	V
Operating junction and storage temperature range	$T_J, T_{STG}$	-65 to +185	$^\circ C$

### Notes:

(1) Non-repetitive current pulse, per Fig. 3 and derated above  $T_A = 25^\circ C$  per Fig. 2

(2) Mounted on copper pad area of 1.6 x 1.6" (40 x 40mm) per Fig. 5

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

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

Device Type	Breakdown Voltage V <sub>(BR)</sub> <sup>(1)</sup> at I <sub>T</sub> (V)		Test Current I <sub>T</sub> (A)	Stand-off Voltage V <sub>WM</sub> (V)	Maximum Reverse Leakage at V <sub>WM</sub> I <sub>D</sub> (μA)	T <sub>J</sub> = 150°C Maximum Reverse Leakage at V <sub>WM</sub> I <sub>D</sub> (μA)	Peak Pulse Current I <sub>PPM</sub> <sup>(2)</sup> (A)	Maximum Clamping Voltage at I <sub>PPM</sub> V <sub>C</sub> (V)	Maximum Temp. Coefficient of V <sub>(BR)</sub> (% / °C)
	Min	Max							
P6KA6.8	6.12	7.48	10	5.50	500	1000	55.6	10.8	0.057
P6KA6.8A	6.45	7.14	10	5.80	500	1000	57.1	10.5	0.057
P6KA7.5	6.75	8.25	10	6.05	250	500	51.3	11.7	0.061
P6KA7.5A	7.13	7.88	10	6.40	250	500	53.1	11.3	0.061
P6KA8.2	7.38	9.02	10	6.63	100	200	48.0	12.5	0.065
P6KA8.2A	7.79	8.61	10	7.02	100	200	49.6	12.1	0.065
P6KA9.1	8.19	10.0	1.0	7.37	25.0	50	43.5	13.8	0.068
P6KA9.1A	8.65	9.55	1.0	7.78	25.0	50	44.8	13.4	0.068
P6KA10	9.00	11.0	1.0	8.10	10.0	20	40.0	15.0	0.073
P6KA10A	9.50	10.5	1.0	8.55	10.0	20	41.4	14.5	0.073
P6KA11	9.90	12.1	1.0	8.92	5.0	5.0	37.0	16.2	0.075
P6KA11A	10.5	11.6	1.0	9.40	5.0	5.0	38.5	15.6	0.076
P6KA12	10.8	13.2	1.0	9.72	2.0	5.0	34.7	17.3	0.076
P6KA12A	11.4	12.6	1.0	10.2	2.0	5.0	35.9	16.7	0.078
P6KA13	11.7	14.3	1.0	10.5	2.0	5.0	31.6	19.0	0.081
P6KA13A	12.4	13.7	1.0	11.1	2.0	5.0	33.0	18.2	0.081
P6KA15	13.5	16.3	1.0	12.1	1.0	5.0	27.3	22.0	0.084
P6KA15A	14.3	15.8	1.0	12.8	1.0	5.0	28.3	21.2	0.084
P6KA16	14.4	17.6	1.0	12.9	1.0	5.0	25.5	23.5	0.086
P6KA16A	15.2	16.8	1.0	13.6	1.0	5.0	26.7	22.5	0.08
P6KA18	16.2	19.8	1.0	14.5	1.0	5.0	22.6	26.5	0.088
P6KA18A	17.1	18.9	1.0	15.3	1.0	5.0	23.8	25.2	0.088
P6KA20	18.0	22.0	1.0	16.2	1.0	5.0	20.6	29.1	0.090
P6KA20A	19.0	21.0	1.0	17.1	1.0	5.0	21.7	27.7	0.090
P6KA22	19.8	24.2	1.0	17.8	1.0	5.0	18.8	31.9	0.092
P6KA22A	20.9	23.1	1.0	18.8	1.0	5.0	19.6	30.6	0.092
P6KA24	21.6	26.4	1.0	19.4	1.0	5.0	17.3	34.7	0.094
P6KA24A	22.8	25.2	1.0	20.5	1.0	5.0	18.1	33.6	0.094
P6KA27	24.3	29.7	1.0	21.8	1.0	5.0	15.3	39.1	0.096
P6KA27A	25.7	28.4	1.0	23.1	1.0	5.0	16.0	37.5	0.096
P6KA30	27.0	33.0	1.0	24.3	1.0	5.0	13.8	43.5	0.097
P6KA30A	28.5	31.5	1.0	25.6	1.0	5.0	14.5	41.4	0.097
P6KA33	29.7	36.3	1.0	26.8	1.0	5.0	12.6	47.7	0.098
P6KA33A	31.4	34.7	1.0	28.2	1.0	5.0	13.1	45.7	0.098
P6KA36	32.4	39.6	1.0	29.1	1.0	5.0	11.5	52.0	0.099
P6KA36A	34.2	37.8	1.0	30.8	1.0	5.0	12.0	49.9	0.099
P6KA39	35.1	42.9	1.0	31.6	1.0	5.0	10.6	56.4	0.100
P6KA39A	37.1	41.0	1.0	33.3	1.0	5.0	11.1	53.9	0.100
P6KA43	38.7	47.3	1.0	34.8	1.0	5.0	9.7	61.9	0.101
P6KA43A	40.9	45.2	1.0	36.8	1.0	5.0	10.1	59.3	0.101

### Notes:

(1) V<sub>(BR)</sub> measured after I<sub>T</sub> applied for 300μs. I<sub>T</sub>=square wave pulse or equivalent

(2) Surge current waveform per Fig. 3 and derate per Fig. 2

(3) All terms and symbols are consistent with ANSI/IEEE C62.35

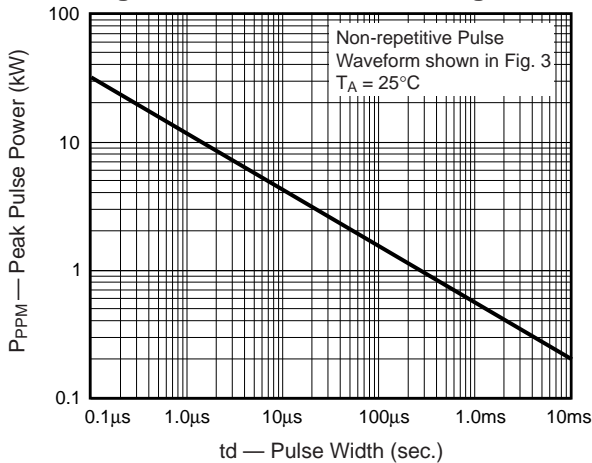


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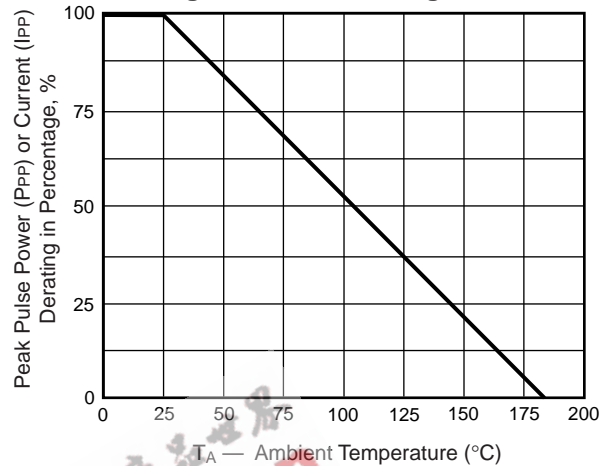
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## Ratings and Characteristic Curves ( $T_A = 25^\circ\text{C}$ unless otherwise noted)

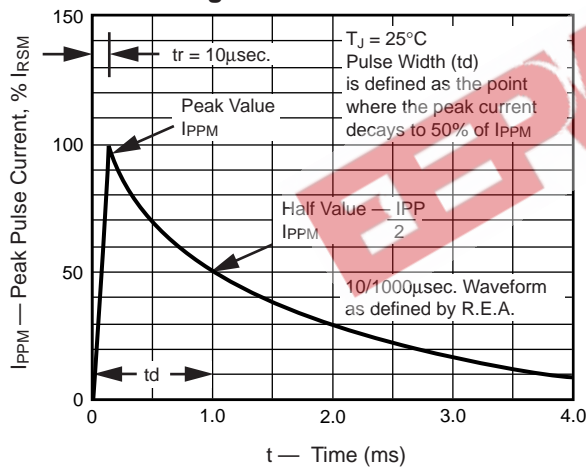
**Fig. 1 – Peak Pulse Power Rating Curve**



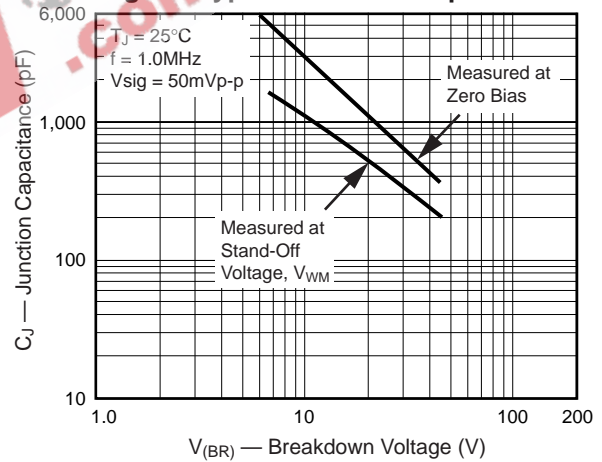
**Fig. 2 – Pulse Derating Curve**



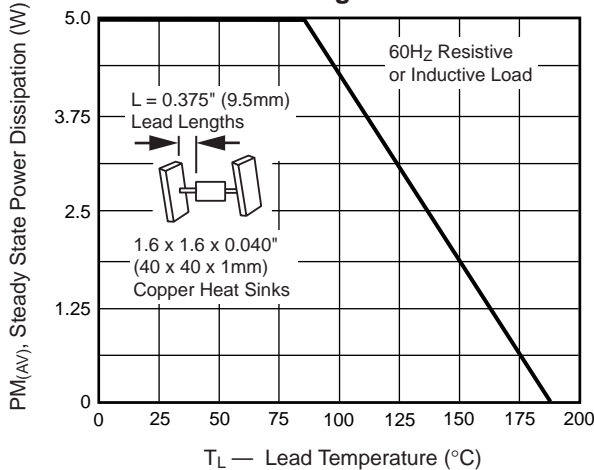
**Fig. 3 – Pulse Waveform**



**Fig. 4 – Typical Junction Capacitance**



**Fig. 5 – Steady State Power Derating Curve**



**Fig. 6 - Maximum Non-Repetitive/Peak Forward Surge Current**

