

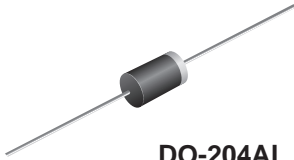


# P4KA6.8 thru P4KA43A

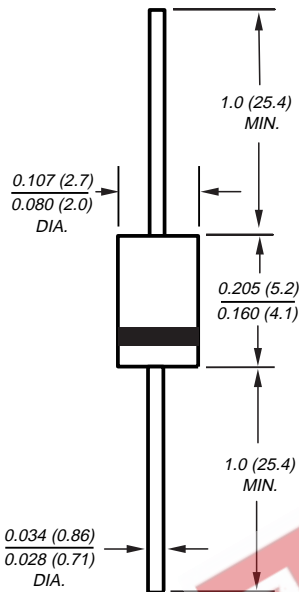
Vishay Semiconductors  
formerly General Semiconductor

## Automotive Transient Voltage Suppressors

**Breakdown Voltage** 6.8 to 43V  
**Peak Pulse Power** 400W



DO-204AL (DO-41)



Available in uni-directional only

Dimensions in inches and (millimeters)

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

Patented\*

### Features

- Plastic package has underwriters laboratory flammability classification 94V-0
- Designed for under the hood applications
- Exclusive patented PAR<sup>®</sup> oxide-passivated chip construction
- 400W peak pulse power capability with a 10/1000 $\mu$ s 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 1.0 $\mu$ A at  $T_A = 150^\circ C$
- High temperature soldering guaranteed: 300 $^\circ C$ /10 seconds, 0.375" (9.5mm) lead length, 5lbs. (2.3 kg) tension

### Mechanical Data

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

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

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

**Mounting Position:** Any

**Weight:** 0.012 oz., 0.3 g

**Packaging codes/options:**

- 1/5K per Bulk Box, 50K/box
- 4/5.5K per 13" Reel (52mm Tape), 22K/box
- 23/3K per Ammo Box (52mm Tape), 27K/box

## Maximum Ratings and Thermal Characteristics (T<sub>A</sub> = 25 $^\circ C$ unless otherwise noted)

Parameter	Symbol	Value	Unit
Peak pulse power dissipation with a 10/1000 $\mu$ s waveform <sup>(1)</sup> (Fig. 1)	PPPM	Minimum 400	W
Peak 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 <sub>L</sub> = 75 $^\circ C$ lead lengths 0.375" (9.5mm) <sup>(2)</sup>	P <sub>M(AV)</sub>	1.0	W
Peak forward surge current, 8.3ms single half sine-wave <sup>(3)</sup>	I <sub>FSM</sub>	40	A
Maximum instantaneous forward voltage at 25A	V <sub>F</sub>	3.5	V
Operating junction and storage temperature range	T <sub>J</sub> , T <sub>STG</sub>	-65 to +185	$^\circ C$

**Notes:** (1) Non-repetitive current pulse, per Fig. 3 and derated above T<sub>A</sub> = 25 $^\circ C$  per Fig. 2

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

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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> (mA)	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)	Maximum Peak Pulse Surge 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							
P4KA6.8	6.12	7.48	10	5.50	300	1000	37.0	10.8	0.057
P4KA6.8A	6.45	7.14	10	5.80	300	1000	38.1	10.5	0.057
P4KA7.5	6.75	8.25	10	6.05	150	500	34.2	11.7	0.060
P4KA7.5A	7.13	7.88	10	6.40	150	500	35.4	11.3	0.061
P4KA8.2	7.38	9.02	10	6.63	50	200	32.0	12.5	0.065
P4KA8.2A	7.79	8.61	10	7.02	50	200	33.1	12.1	0.065
P4KA9.1	8.19	10.0	1.0	7.37	10	50	29.0	13.8	0.068
P4KA9.1A	8.65	9.55	1.0	7.78	10	50	29.9	13.4	0.068
P4KA10	9.00	11.0	1.0	8.10	5.0	20	26.7	15.0	0.073
P4KA10A	9.50	10.5	1.0	8.55	5.0	20	27.6	14.5	0.073
P4KA11	9.90	12.1	1.0	8.92	1.0	5.0	24.7	16.2	0.075
P4KA11A	10.5	11.6	1.0	9.40	1.0	5.0	25.6	15.6	0.075
P4KA12	10.8	13.2	1.0	9.72	1.0	5.0	23.1	17.3	0.076
P4KA12A	11.4	12.6	1.0	10.2	1.0	5.0	24.0	16.7	0.078
P4KA13	11.7	14.3	1.0	10.5	1.0	5.0	21.1	19.0	0.081
P4KA13A	12.4	13.7	1.0	11.1	1.0	5.0	22.0	18.2	0.081
P4KA15	13.5	16.3	1.0	12.1	1.0	5.0	18.2	22.0	0.084
P4KA15A	14.3	15.8	1.0	12.8	1.0	5.0	18.9	21.2	0.084
P4KA16	14.4	17.6	1.0	12.9	1.0	5.0	17.0	23.5	0.086
P4KA16A	15.2	16.8	1.0	13.6	1.0	5.0	17.8	22.5	0.086
P4KA18	16.2	19.8	1.0	14.5	1.0	5.0	15.1	26.5	0.088
P4KA18A	17.1	18.9	1.0	15.3	1.0	5.0	15.9	25.5	0.088
P4KA20	18.0	22.0	1.0	16.2	1.0	5.0	13.7	29.1	0.090
P4KA20A	19.0	21.0	1.0	17.0	1.0	5.0	14.4	27.7	0.090
P4KA22	19.8	24.2	1.0	17.8	1.0	5.0	12.5	31.9	0.092
P4KA22A	20.9	23.1	1.0	18.8	1.0	5.0	13.1	30.6	0.092
P4KA24	21.6	26.4	1.0	19.4	1.0	5.0	11.5	34.2	0.094
P4KA24A	22.8	25.2	1.0	20.5	1.0	5.0	12.0	33.2	0.094
P4KA27	24.3	29.7	1.0	21.8	1.0	5.0	10.2	39.1	0.096
P4KA27A	25.7	28.4	1.0	23.1	1.0	5.0	10.7	37.5	0.096
P4KA30	27.0	33.0	1.0	24.3	1.0	5.0	9.2	43.5	0.097
P4KA30A	28.5	31.5	1.0	25.6	1.0	5.0	9.7	41.4	0.097
P4KA33	29.7	36.3	1.0	26.8	1.0	5.0	8.4	47.7	0.098
P4KA33A	31.4	34.7	1.0	28.2	1.0	5.0	8.8	45.7	0.098
P4KA36	32.4	39.6	1.0	29.1	1.0	5.0	7.7	52.0	0.099
P4KA36A	34.2	37.8	1.0	30.8	1.0	5.0	8.0	49.9	0.099
P4KA39	35.1	42.9	1.0	31.6	1.0	5.0	7.1	56.4	0.100
P4KA39A	37.1	41.0	1.0	33.3	1.0	5.0	7.4	53.9	0.100
P4KA43	38.7	47.3	1.0	34.8	1.0	5.0	6.5	61.9	0.101
P4KA43A	40.9	45.2	1.0	36.8	1.0	5.0	6.7	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 derated per Fig. 2

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

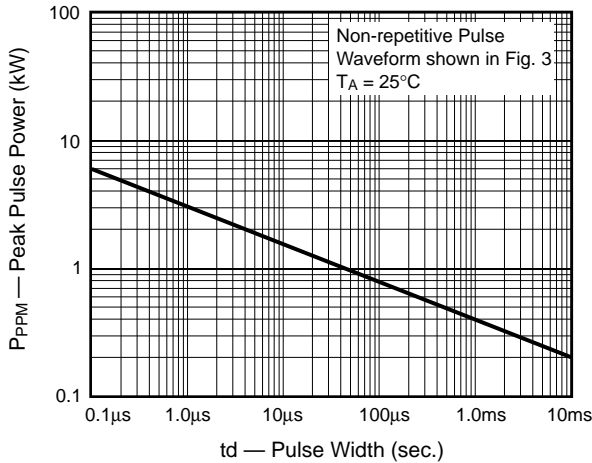


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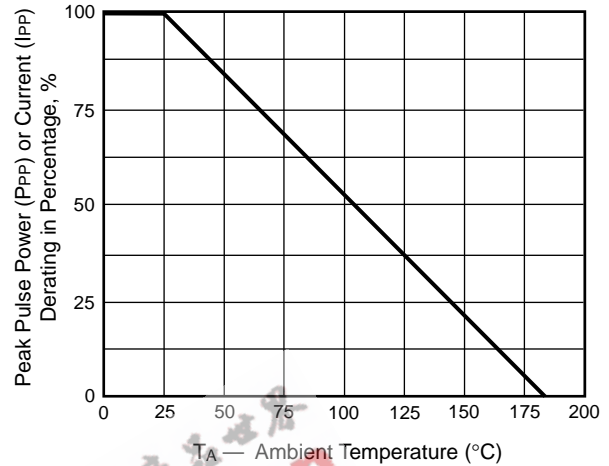
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## Ratings and Characteristic Curves ( $T_A = 25^\circ\text{C}$ unless otherwise noted)

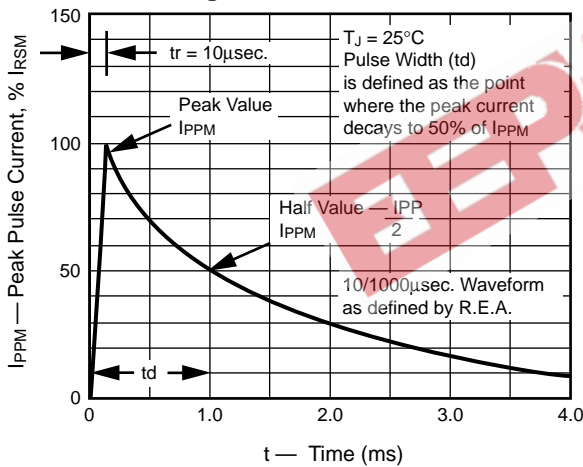
**Fig. 1 – Peak Pulse Power Rating Curve**



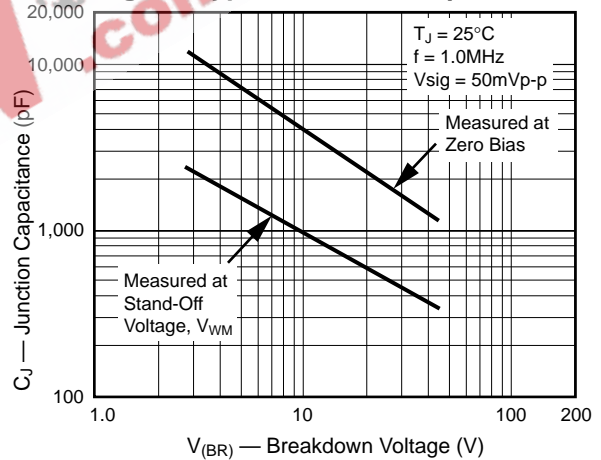
**Fig. 2 – Pulse Derating Curve**



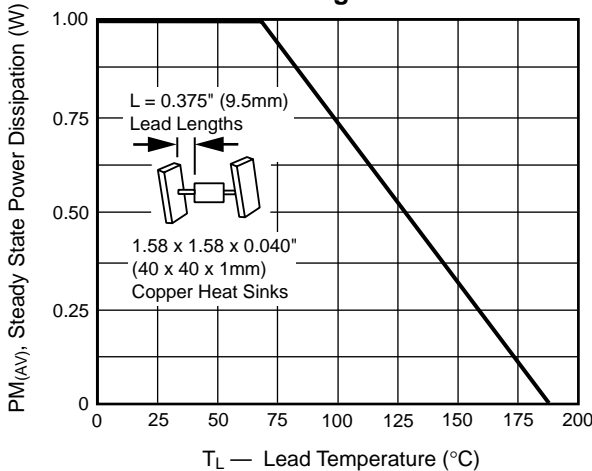
**Fig. 3 – Pulse Waveform**



**Fig. 4 – Typical Junction Capacitance**



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



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

