

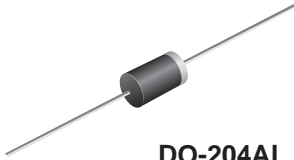


P4KA6.8 thru P4KA43A

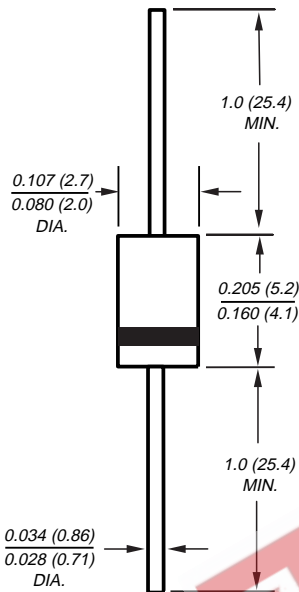
Vishay Semiconductors
formerly General Semiconductor

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[®] oxide-passivated chip construction
- 400W peak pulse power capability with a 10/1000 μ 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 μ 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 ($T_A = 25^\circ C$ unless otherwise noted)

| Parameter | Symbol | Value | Unit |
|---|----------------|----------------|------------|
| Peak pulse power dissipation with a 10/1000 μ s waveform ⁽¹⁾ (Fig. 1) | PPPM | Minimum 400 | W |
| Peak pulse current with a 10/1000 μ s waveform ⁽¹⁾ (Fig.3) | IPPM | See Next Table | A |
| Steady state power dissipation at $T_L = 75^\circ C$ lead lengths 0.375" (9.5mm) ⁽²⁾ | $P_{M(AV)}$ | 1.0 | W |
| Peak forward surge current, 8.3ms single half sine-wave ⁽³⁾ | I_{FSM} | 40 | A |
| Maximum instantaneous forward voltage at 25A | 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

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Electrical Characteristics (T_A = 25°C unless otherwise noted)

| Device Type | Breakdown Voltage V _(BR) ⁽¹⁾ at I _T (V) | | Test Current I _T (mA) | Stand-off Voltage V _{WM} (V) | Maximum Reverse Leakage at V _{WM} I _D (μA) | T _J = 150°C Maximum Reverse Leakage at V _{WM} I _D (μA) | Maximum Peak Pulse Surge Current I _{PPM} ⁽²⁾ (A) | Maximum Clamping Voltage at I _{PPM} V _C (V) | Maximum Temp. Coefficient of V _(BR) (% / °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_(BR) measured after I_T applied for 300μs, I_T = 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



P4KA6.8 thru P4KA43A

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

Fig. 1 – Peak Pulse Power Rating Curve

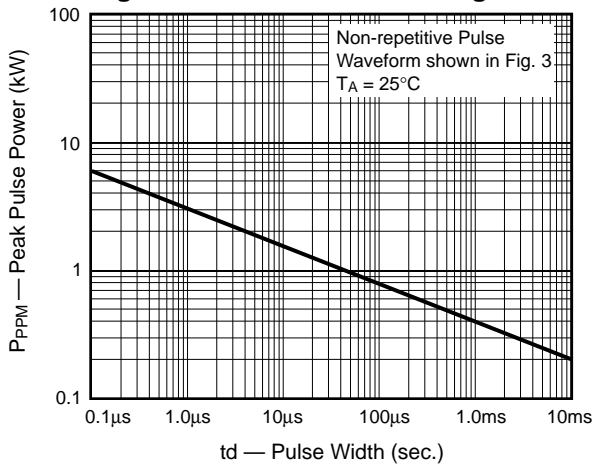


Fig. 2 – Pulse Derating Curve

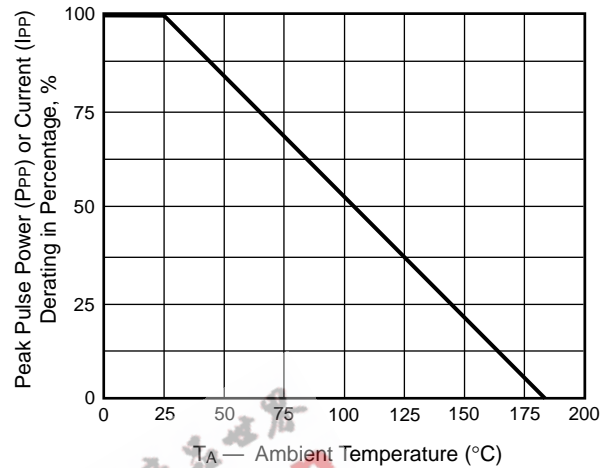


Fig. 3 – Pulse Waveform

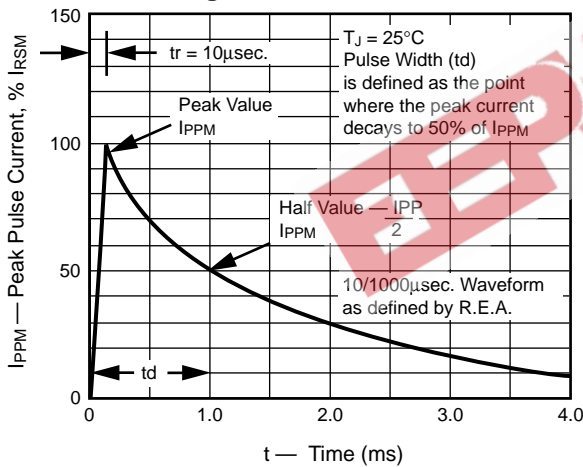


Fig. 4 – Typical Junction Capacitance

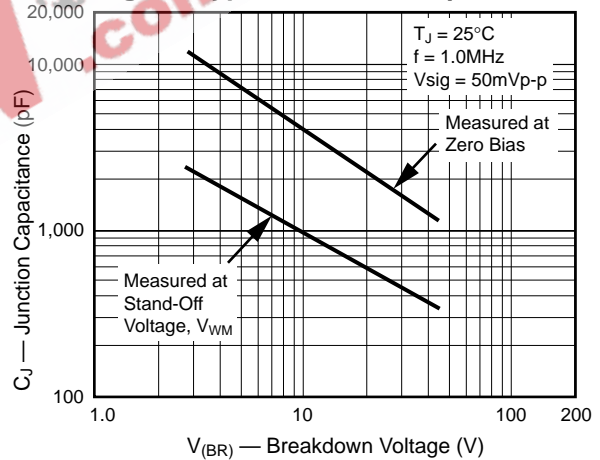


Fig. 5 – Steady State Power Derating Curve

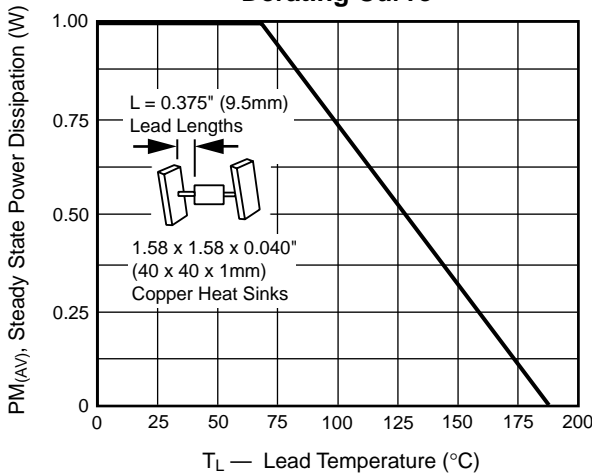


Fig. 6 - Maximum Non-Repetitive/Peak Forward Surge Current

