

Transient Voltage Suppressor Diode

P4KA6.8A

(P4KA6.8 thru P4KA43A)

Break-Down Voltage 6.8 to 43Volts

Peak Pulse Power 400Watt

Automotive Applications

DATASHEET

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OEM – General Semiconductor

Source: General Semiconductor Databook 1998

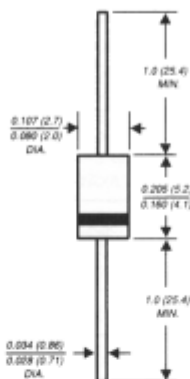
P4KA6.8 THRU P4KA43A

AUTOMOTIVE TRANSIENT VOLTAGE SUPPRESSOR

Breakdown Voltage - 6.8 to 43 Volts Peak Pulse Power - 400 Watts

PATENTED *

DO-204AL



Dimensions in inches and (millimeters)

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

Available in unidirectional only

FEATURES

- ◆ Plastic package has Underwriters Laboratory Flammability Classification 94V-0
- ◆ Designed for under the hood applications
- ◆ Exclusive GI patented Passivated Anisotropic Rectifier (PAR) chip construction
- ◆ 400W peak pulse power capability with a 10/1000µs waveform, repetition rate (duty cycle): 0.01%
- ◆ Excellent clamping capability
- ◆ Low incremental surge resistance
- ◆ Fast response time: typically less than 1.0ps from 0 Volts to $V_{(BR)}$
- ◆ For devices with $V_{(BR)} \geq 10V$, I_P are typically less than 1.0µA
- ◆ High temperature soldering guaranteed: 300°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: Color band denotes positive end (cathode)

Mounting Position: Any

Weight: 0.012 ounce, 0.3 gram

MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

Ratings at 25°C ambient temperature unless otherwise specified.

| | SYMBOL | VALUE | UNITS |
|--|-----------------------------------|-------------|-------|
| Peak pulse power dissipation with a 10/1000µs waveform (NOTE 1, FIG. 1) | PPPM | Minimum 400 | Watts |
| Peak pulse current with a 10/1000µs waveform (NOTE 1, FIG. 3) | IPPM | SEE TABLE 1 | Amps |
| Steady state power dissipation at $T_L=75^\circ C$ lead lengths 0.375" (9.5mm) (NOTE 2) | PM(AV) | 1.0 | Watts |
| Peak forward surge current, 8.3ms single half sine-wave superimposed on rated load (JEDEC Method) (NOTE 3) | IFSM | 40.0 | Amps |
| Maximum instantaneous forward voltage at 25A | V _F | 3.5 | Volts |
| Operating junction and storage temperature range | T _J , T _{STG} | -65 to +185 | °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

ELECTRICAL CHARACTERISTICS at (T_A=25°C unless otherwise noted)

| Device Type | Breakdown Voltage V _(BR) Volts (NOTE 1) | | Test Current at I _r (mA) | Stand-off Voltage V _{WM} (Volts) | Maximum Reverse Leakage at V _{WM} I _o (μA) | Maximum Reverse Leakage at V _{WM} , T _j =150°C I _o (μA) | Maximum Peak Pulse Current I _{PPM} (NOTE 2) (Amps) | Maximum Clamping Voltage at I _{PPM} V _c (Volts) | Maximum Temperature Coefficient of V _(BR) (% / °C) |
|-------------|--|------|--|--|--|---|--|--|--|
| | MIN | MAX | | | | | | | |
| P4KA6.8 | 6.12 | 7.48 | 10.0 | 5.50 | 300 | 1000 | 37.0 | 10.8 | 0.057 |
| P4KA6.8A | 6.45 | 7.14 | 10.0 | 5.80 | 300 | 1000 | 38.1 | 10.5 | 0.057 |
| P4KA7.5 | 6.75 | 8.25 | 10.0 | 6.05 | 150 | 500 | 34.2 | 11.7 | 0.060 |
| P4KA7.5A | 7.13 | 7.88 | 10.0 | 6.40 | 150 | 500 | 35.4 | 11.3 | 0.061 |
| P4KA8.2 | 7.38 | 9.02 | 10.0 | 6.63 | 50.0 | 200 | 32.0 | 12.5 | 0.065 |
| P4KA8.2A | 7.79 | 8.61 | 10.0 | 7.02 | 50.0 | 200 | 33.1 | 12.1 | 0.065 |
| P4KA9.1 | 8.19 | 10.0 | 1.0 | 7.37 | 10.0 | 50.0 | 29.0 | 13.8 | 0.068 |
| P4KA9.1A | 8.65 | 9.55 | 1.0 | 7.78 | 10.0 | 50.0 | 29.9 | 13.4 | 0.068 |
| P4KA10 | 9.00 | 11.0 | 1.0 | 8.10 | 5.0 | 20.0 | 26.7 | 15.0 | 0.073 |
| P4KA10A | 9.50 | 10.5 | 1.0 | 8.55 | 5.0 | 20.0 | 27.6 | 14.5 | 0.073 |
| P4KA11 | 9.90 | 12.1 | 1.0 | 8.92 | 2.0 | 10.0 | 24.7 | 16.2 | 0.075 |
| P4KA11A | 10.5 | 11.6 | 1.0 | 9.40 | 2.0 | 10.0 | 25.6 | 15.6 | 0.075 |
| P4KA12 | 10.8 | 13.2 | 1.0 | 9.72 | 1.0 | 10.0 | 23.1 | 17.3 | 0.076 |
| P4KA12A | 11.4 | 12.6 | 1.0 | 10.2 | 1.0 | 10.0 | 24.0 | 16.7 | 0.078 |
| P4KA13 | 11.7 | 14.3 | 1.0 | 10.5 | 1.0 | 10.0 | 21.1 | 19.0 | 0.081 |
| P4KA13A | 12.4 | 13.7 | 1.0 | 11.1 | 1.0 | 10.0 | 22.0 | 18.2 | 0.081 |
| P4KA15 | 13.5 | 16.3 | 1.0 | 12.1 | 1.0 | 10.0 | 18.2 | 22.0 | 0.084 |
| P4KA15A | 14.3 | 15.8 | 1.0 | 12.8 | 1.0 | 10.0 | 18.9 | 21.2 | 0.084 |
| P4KA16 | 14.4 | 17.6 | 1.0 | 12.9 | 1.0 | 10.0 | 17.0 | 23.5 | 0.086 |
| P4KA16A | 15.2 | 16.8 | 1.0 | 13.6 | 1.0 | 10.0 | 17.8 | 22.5 | 0.086 |
| P4KA18 | 16.2 | 19.8 | 1.0 | 14.5 | 1.0 | 10.0 | 15.1 | 26.5 | 0.088 |
| P4KA18A | 17.1 | 18.9 | 1.0 | 15.3 | 1.0 | 10.0 | 15.9 | 25.5 | 0.088 |
| P4KA20 | 18.0 | 22.0 | 1.0 | 16.2 | 1.0 | 10.0 | 13.7 | 29.1 | 0.090 |
| P4KA20A | 19.0 | 21.0 | 1.0 | 17.0 | 1.0 | 10.0 | 14.4 | 27.7 | 0.0903 |

ELECTRICAL CHARACTERISTICS at (T_A=25°C unless otherwise noted)

| Device Type | Breakdown Voltage V _(BR) Volts (NOTE 1) | | Test Current at I _r (mA) | Stand-off Voltage V _{SW} (Volts) | Maximum Reverse Leakage at V _{SW} I _o (μA) | Maximum Reverse Leakage at V _{WM} , T _c =150°C I _o (μA) | Maximum Peak Pulse Current I _{PPM} (NOTE 2) (Amps) | Maximum Clamping Voltage at I _{PPM} V _c (Volts) | Maximum Temperature Coefficient of V _(BR) (% / °C) |
|-------------|--|------|--|--|--|---|--|--|--|
| | MIN | MAX | | | | | | | |
| P4KA22 | 19.8 | 24.2 | 1.0 | 17.8 | 1.0 | 10.0 | 12.5 | 31.9 | 0.092 |
| P4KA22A | 20.9 | 23.1 | 1.0 | 18.8 | 1.0 | 10.0 | 13.1 | 30.6 | 0.092 |
| P4KA24 | 21.6 | 26.4 | 1.0 | 19.4 | 1.0 | 10.0 | 11.5 | 34.2 | 0.094 |
| P4KA24A | 22.8 | 25.2 | 1.0 | 20.5 | 1.0 | 10.0 | 12.0 | 33.2 | 0.094 |
| P4KA27 | 24.3 | 29.7 | 1.0 | 21.8 | 1.0 | 10.0 | 10.2 | 39.1 | 0.096 |
| P4KA27A | 25.7 | 28.4 | 1.0 | 23.1 | 1.0 | 10.0 | 10.7 | 37.5 | 0.096 |
| P4KA30 | 27.0 | 33.0 | 1.0 | 24.3 | 1.0 | 10.0 | 9.2 | 43.5 | 0.097 |
| P4KA30A | 28.5 | 31.5 | 1.0 | 25.6 | 1.0 | 10.0 | 9.7 | 41.4 | 0.097 |
| P4KA33 | 29.7 | 36.3 | 1.0 | 26.8 | 1.0 | 10.0 | 8.4 | 47.7 | 0.098 |
| P4KA33A | 31.4 | 34.7 | 1.0 | 28.2 | 1.0 | 10.0 | 8.8 | 45.7 | 0.098 |
| P4KA36 | 32.4 | 39.6 | 1.0 | 29.1 | 1.0 | 10.0 | 7.7 | 52.0 | 0.099 |
| P4KA36A | 34.2 | 37.8 | 1.0 | 30.8 | 1.0 | 10.0 | 8.0 | 49.9 | 0.099 |
| P4KA39 | 35.1 | 42.9 | 1.0 | 31.6 | 1.0 | 10.0 | 7.1 | 56.4 | 0.100 |
| P4KA39A | 37.1 | 41.0 | 1.0 | 33.3 | 1.0 | 10.0 | 7.4 | 53.9 | 0.100 |
| P4KA43 | 38.7 | 47.3 | 1.0 | 34.8 | 1.0 | 10.0 | 6.5 | 61.9 | 0.101 |
| P4KA43A | 40.9 | 45.2 | 1.0 | 36.8 | 1.0 | 10.0 | 6.7 | 59.3 | 0.101 |

NOTES:

- (1) V_(BR) measured after I_r applied for 300μs, I_r=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

RATINGS AND CHARACTERISTIC CURVES P4KA6.8 THRU P4KA43A

