Transient Voltage Suppressor Diode

P4KA9.1

(P4KA6.8 thru P4KA43A)

Break-Down Voltage 6.8 to 43Volts

Peak Pulse Power 400Watt

Automotive Applications

DATASHEET

from

www.web-bcs.com

OEM – General Semiconductor

Source: General Semiconductor Databook 1998

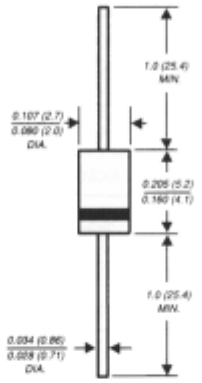
P4KA6.8 THRU P4KA43A

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_D 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)	P_{PPM}	Minimum 400	Watts
Peak pulse current with a 10/1000μs waveform (NOTE 1, FIG. 3)	I_{PPM}	SEE TABLE 1	Amps
Steady state power dissipation at T_L=75°C lead lengths 0.375" (9.5mm) (NOTE 2)	$P_{M(AV)}$	1.0	Watts
Peak forward surge current, 8.3ms single half sine-wave superimposed on rated load (JEDEC Method) (NOTE 3)	I_{FSM}	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°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) MIN	MAX	Test Current at I_T (mA)	Stand-off Voltage V_{WM} (Volts)	Maximum Reverse Leakage at V_{WM} I_D (µA)	Maximum Reverse Leakage at V_{WM}, T_J=150°C I_D (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)
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) MIN	MAX	Test Current at I_T (mA)	Stand-off Voltage V_{WM} (Volts)	Maximum Reverse Leakage at V_{WM} I_D (µA)	Maximum Reverse Leakage at V_{WM}, T_C=150°C I_D (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)
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_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

RATINGS AND CHARACTERISTIC CURVES P4KA6.8 THRU P4KA43A

FIG. 1 - PEAK PULSE POWER RATING CURVE

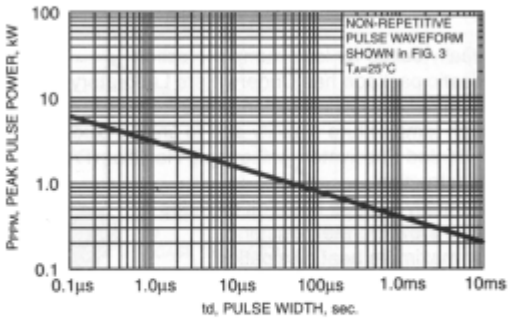


FIG. 2 - PULSE DERATING CURVE

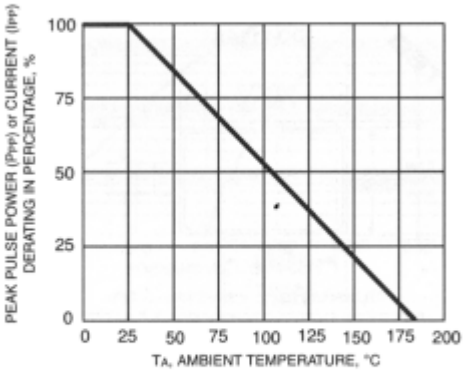


FIG. 3 - PULSE WAVEFORM

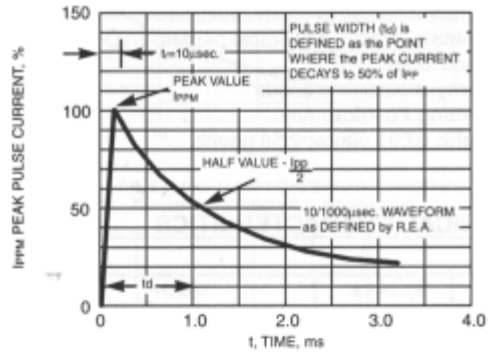


FIG. 4 - TYPICAL JUNCTION CAPACITANCE

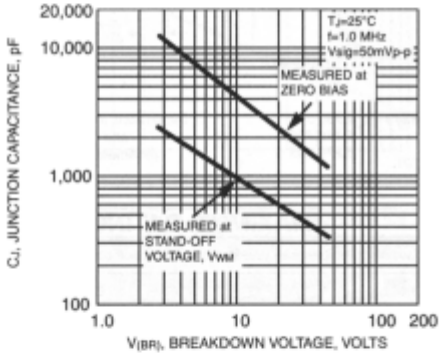


FIG. 5 - STEADY STATE POWER DERATING CURVE

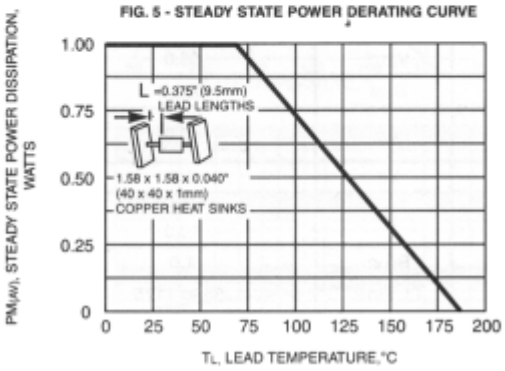


FIG. 6 - MAXIMUM NON-REPETITIVE PEAK FORWARD SURGE CURRENT