

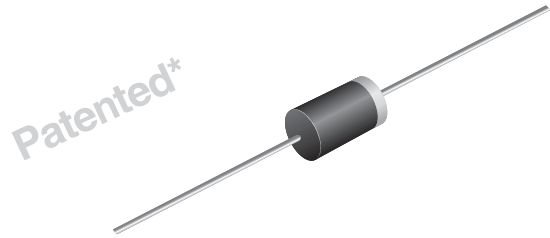


## Automotive Transient Voltage Suppressors

### High Temperature Stability & High Reliability Conditions

### Major Ratings and Characteristics

$V_{(BR)}$	6.8 V to 47 V
$P_{PPM}$	1500 W
$P_D$	5.0 W
$I_{FSM}$	200 A
$T_j$ max.	185 °C



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

Case Style 1.5KA

### Features

- Patented PAR<sup>®</sup> construction
- Available in Unidirectional polarity only
- 1500 W peak pulse power capability with a 10/1000  $\mu$ s waveform
- Excellent clamping capability
- Very fast response time
- Low incremental surge resistance
- Typical  $I_D$  less than 1.0  $\mu$ A above 15 V rating
- Solder Dip 260 °C, 40 seconds



### Typical Applications

Use in sensitive electronics protection against voltage transients induced by inductive load switching and lighting on ICs, MOSFET, signal lines of sensor units for consumer, computer, industrial, automotive, and Telecommunication

### Mechanical Data

**Case:** Molded plastic body over passivated junction  
Epoxy meets UL-94V-0 Flammability rating  
**Terminals:** Matte tin plated leads, solderable per J-STD-002B and JESD22-B102D  
E3 suffix for commercial grade, HE3 suffix for high reliability grade (AEC Q101 qualified)  
**Polarity:** Color band denotes cathode end

### Maximum Ratings

( $T_A = 25$  °C, unless otherwise noted)

Parameter	Symbol	Limit	Unit
Peak pulse power dissipation with a 10/1000 $\mu$ s waveform <sup>(1)</sup> (Fig. 1)	$P_{PPM}$	Minimum 1500	W
Peak pulse current at $T_A = 25$ °C with a 10/1000 $\mu$ s waveform <sup>(1)</sup> (Fig. 3)	$I_{PPM}$	See Next Table	A
Power dissipation on infinite heatsink at $T_L = 75$ °C (Fig. 5)	$P_D$	5.0	W
Peak forward surge current 8.3 ms single half sine-wave <sup>(2)</sup>	$I_{FSM}$	200	A
Maximum instantaneous forward voltage at 100 A <sup>(2)</sup>	$V_F$	3.5	V
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) 8.3 ms single half sine-wave or equivalent square wave, duty cycle = 4 pulses per minutes maximum

# 1.5KA6.8 thru 1.5KA47A



Vishay Semiconductors

## Electrical Characteristics

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

Device Type	Breakdown Voltage $V_{(BR)}^{(1)}$ at $I_T$ (V)		Test Current $I_T$ (mA)	Stand-off Voltage $V_{WM}$ (Volts)	Maximum Reverse Leakage at $V_{WM}$ $I_D$ ( $\mu\text{A}$ )	$T_J = 150\text{ }^\circ\text{C}$	Peak Pulse Current $I_{PPM}^{(2)}$ (Amps)	Maximum Clamping Voltage at $I_{PPM}$ $V_C$ (Volts)	Maximum Temp. Coefficient of $V_{(BR)}$ (% / $^\circ\text{C}$ )
	Min	Max				Maximum Reverse Leakage at $V_{WM}$ $I_D$ ( $\mu\text{A}$ )			
1.5KA6.8	6.12	7.48	10	5.50	1000	10000	139	10.8	0.057
1.5KA6.8A	6.45	7.14	10	5.80	1000	10000	143	10.5	0.057
1.5KA7.5	6.75	8.25	10	6.05	500	5000	128	11.7	0.061
1.5KA7.5A	7.13	7.88	10	6.40	500	5000	133	11.3	0.061
1.5KA8.2	7.38	9.02	10	6.63	200	2000	120	12.5	0.065
1.5KA8.2A	7.79	8.61	10	7.02	200	2000	124	12.1	0.065
1.5KA9.1	8.19	10.0	1.0	7.37	50	500	109	13.8	0.068
1.5KA9.1A	8.65	9.55	1.0	7.78	50	500	112	13.4	0.068
1.5KA10	9.00	11.0	1.0	8.10	20	200	100	15.0	0.073
1.5KA10A	9.50	10.5	1.0	8.55	20	200	103	14.5	0.073
1.5KA11	9.90	12.1	1.0	8.92	5.0	50	92.6	16.2	0.075
1.5KA11A	10.5	11.6	1.0	9.40	5.0	50	96.2	15.6	0.076
1.5KA12	10.8	13.2	1.0	9.72	2.0	10	86.7	17.3	0.076
1.5KA12A	11.4	12.6	1.0	10.2	2.0	10	89.8	16.7	0.078
1.5KA13	11.7	14.3	1.0	10.5	2.0	10	78.9	19.0	0.081
1.5KA13A	12.4	13.7	1.0	11.1	2.0	10	82.4	18.2	0.081
1.5KA15	13.5	16.3	1.0	12.1	1.0	10	68.2	22.0	0.084
1.5KA15A	14.3	15.8	1.0	12.8	1.0	10	70.8	21.2	0.084
1.5KA16	14.4	17.6	1.0	12.9	1.0	10	63.8	23.5	0.086
1.5KA16A	15.2	16.8	1.0	13.6	1.0	10	66.7	22.5	0.086
1.5KA18	16.2	19.8	1.0	14.5	1.0	10	56.6	26.5	0.088
1.5KA18A	17.1	18.9	1.0	15.3	1.0	10	59.5	25.2	0.088
1.5KA20	18.0	22.0	1.0	16.2	1.0	10	51.5	29.1	0.090
1.5KA20A	19.0	21.0	1.0	17.1	1.0	10	54.2	27.7	0.090
1.5KA22	19.8	24.2	1.0	17.8	1.0	10	47.0	31.9	0.092
1.5KA22A	20.9	23.1	1.0	18.8	1.0	10	49.0	30.6	0.092
1.5KA24	21.6	26.4	1.0	19.4	1.0	10	43.2	34.7	0.094
1.5KA24A	22.8	25.2	1.0	20.5	1.0	10	45.2	33.2	0.094
1.5KA27	24.3	29.7	1.0	21.8	1.0	10	38.4	39.1	0.096
1.5KA27A	25.7	28.4	1.0	23.1	1.0	10	40.0	37.5	0.096
1.5KA30	27.0	33.0	1.0	24.3	1.0	10	34.5	43.5	0.097
1.5KA30A	28.5	31.5	1.0	25.6	1.0	10	36.2	41.4	0.097
1.5KA33	29.7	36.3	1.0	26.8	1.0	10	31.4	47.7	0.098
1.5KA33A	31.4	34.7	1.0	28.2	1.0	10	32.8	45.7	0.098
1.5KA36	32.4	39.6	1.0	29.1	1.0	10	28.8	52.0	0.099
1.5KA36A	34.2	37.8	1.0	30.8	1.0	10	30.1	49.9	0.099
1.5KA39	35.1	42.9	1.0	31.6	1.0	10	26.6	56.4	0.100
1.5KA39A	37.1	41.0	1.0	33.3	1.0	10	27.8	53.9	0.100
1.5KA43	38.7	47.3	1.0	34.8	1.0	20	24.2	61.9	0.101
1.5KA43A	40.9	45.2	1.0	36.8	1.0	20	25.3	59.3	0.101
1.5KA47	42.3	51.7	1.0	38.1	1.0	20	22.1	67.8	0.101
1.5KA47A	44.7	49.4	1.0	40.2	1.0	20	23.1	64.8	0.101

Notes:

- (1)  $V_{(BR)}$  measured after  $I_T$  applied for 300  $\mu\text{s}$  = 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

## Ratings and Characteristics Curves

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

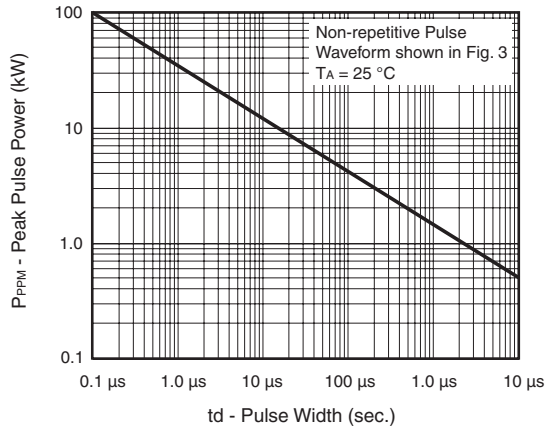


Figure 1. Peak Pulse Power Rating Curve

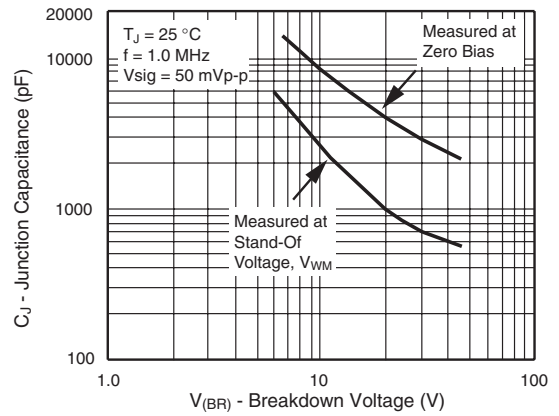


Figure 4. Typical Junction Capacitance Unidirectional

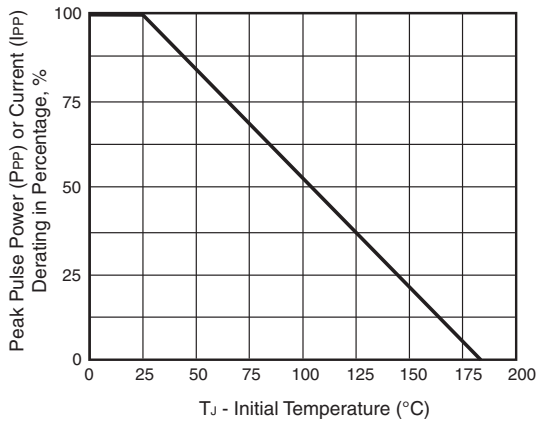


Figure 2. Pulse Power or Current versus Initial Junction Temperature

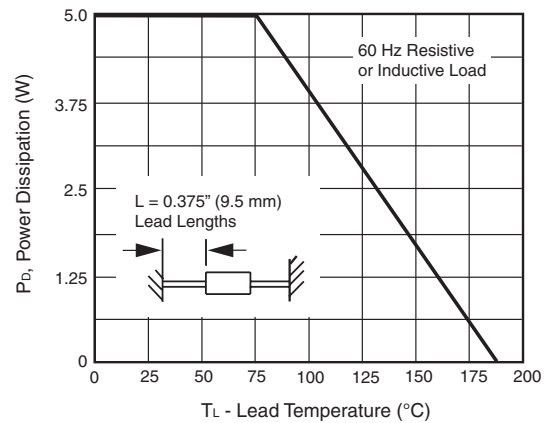


Figure 5. Power Derating Curve

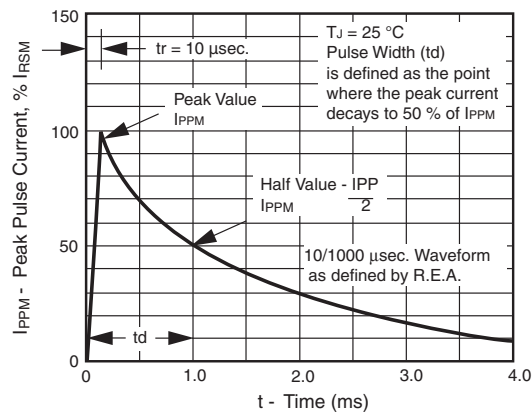


Figure 3. Pulse Waveform

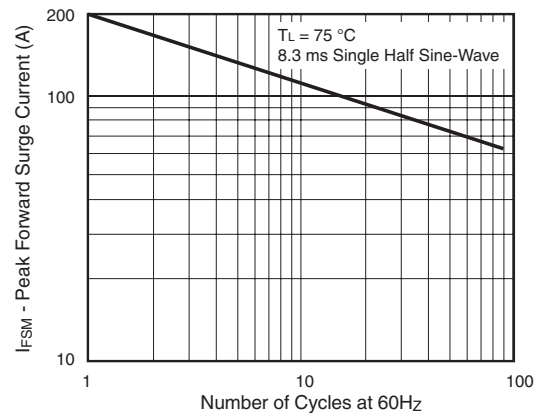


Figure 6. Maximum Non-Repetitive/Peak Forward Surge Current

# 1.5KA6.8 thru 1.5KA47A

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## Package outline dimensions in inches (millimeters)

