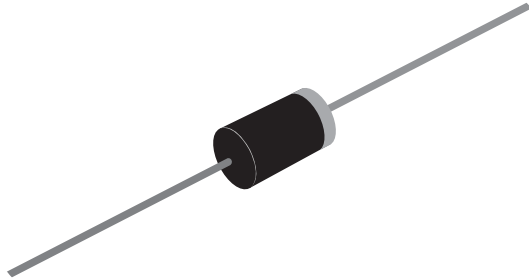


## PAR<sup>®</sup> Transient Voltage Suppressors

High Temperature Stability and High Reliability Conditions



Case Style 1.5KA

### PRIMARY CHARACTERISTICS

$V_{WM}$	5.5 V to 40.2 V
$V_{BR}$	6.8 V to 47 V
$P_{PPM}$	1500 W
$P_D$	6.5 W
$I_{FSM}$	200 A
$T_J$ max.	185 °C
Polarity	Uni-directional
Package	1.5KE

### 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.

### FEATURES

- Junction passivation optimized design passivated anisotropic rectifier technology
- $T_J = 185$  °C capability suitable for high reliability and automotive requirement
- Available in uni-directional 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
- Solder dip 275 °C max. 10 s, per JESD 22-B106
- AEC-Q101 qualified
- Material categorization: For definitions of compliance please see [www.vishay.com/doc?99912](http://www.vishay.com/doc?99912)



**RoHS**  
COMPLIANT

### MECHANICAL DATA

**Case:** Molded epoxy body over passivated junction  
Molding compound meets UL 94 V-0 flammability rating  
Base P/NHE3 - RoHS-compliant, AEC-Q101 qualified

**Terminals:** Matte tin plated leads, solderable per J-STD-002 and JESD 22-B102

HE3 suffix meets JESD 201 class 2 whisker test

**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)	$P_{PPM}$	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)	$P_D$	6.5	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

<sup>(1)</sup> Non-repetitive current pulse, per fig. 3 and derated above  $T_A = 25$  °C per fig. 2

<sup>(2)</sup> 8.3 ms single half sine-wave or equivalent square wave, duty cycle = 4 pulses per minute maximum



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)	PEAK PULSE 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.							
1.5KA6.8	6.12	7.48	10	5.50	1000	10 000	139	10.8	0.057
1.5KA6.8A	6.45	7.14	10	5.80	1000	10 000	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<sub>BR</sub> measured after I<sub>T</sub> applied for 300 µs = 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



ORDERING INFORMATION (Example)				
PREFERRED P/N	UNIT WEIGHT (g)	PREFERRED PACKAGE CODE	BASE QUANTITY	DELIVERY MODE
1.5KA6.8AHE3/54 (1)	0.916	54	1400	13" diameter paper tape and reel

**Note**

(1) AEC-Q101 qualified

**RATINGS AND CHARACTERISTICS CURVES** ( $T_A = 25\text{ }^\circ\text{C}$  unless otherwise noted)

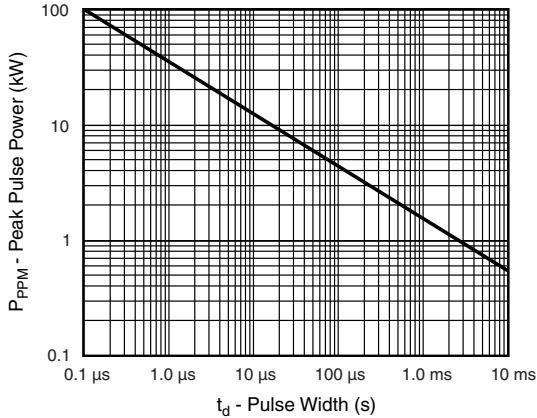


Fig. 1 - Peak Pulse Power Rating Curve

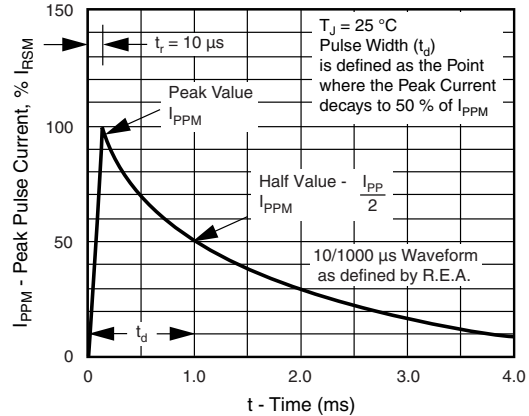


Fig. 3 - Pulse Waveform

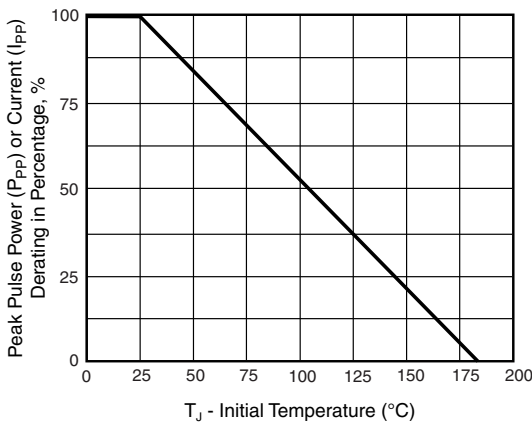


Fig. 2 - Pulse Power or Current vs. Initial Junction Temperature

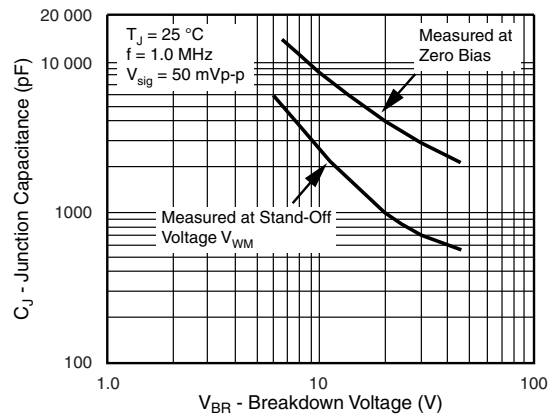


Fig. 4 - Typical Junction Capacitance Unidirectional

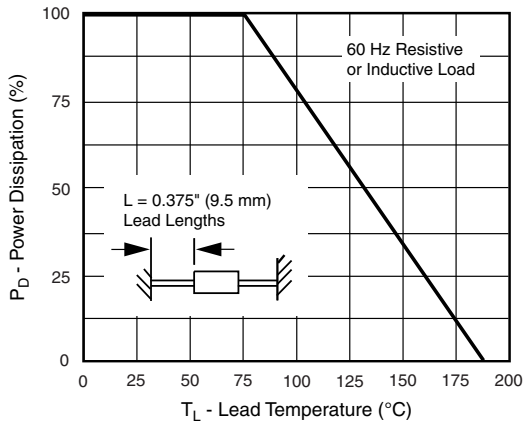


Fig. 5 - Power Derating Curve

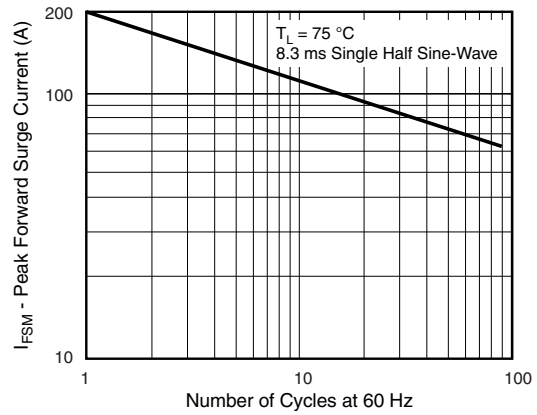
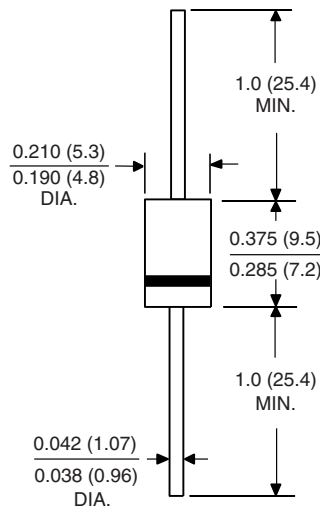


Fig. 6 - Maximum Non-Repetitive/Peak Forward Surge Current

**PACKAGE OUTLINE DIMENSIONS** in inches (millimeters)

**Case Style 1.5KA**





## **Disclaimer**

ALL PRODUCT, PRODUCT SPECIFICATIONS AND DATA ARE SUBJECT TO CHANGE WITHOUT NOTICE TO IMPROVE RELIABILITY, FUNCTION OR DESIGN OR OTHERWISE.

Vishay Intertechnology, Inc., its affiliates, agents, and employees, and all persons acting on its or their behalf (collectively, "Vishay"), disclaim any and all liability for any errors, inaccuracies or incompleteness contained in any datasheet or in any other disclosure relating to any product.

Vishay makes no warranty, representation or guarantee regarding the suitability of the products for any particular purpose or the continuing production of any product. To the maximum extent permitted by applicable law, Vishay disclaims (i) any and all liability arising out of the application or use of any product, (ii) any and all liability, including without limitation special, consequential or incidental damages, and (iii) any and all implied warranties, including warranties of fitness for particular purpose, non-infringement and merchantability.

Statements regarding the suitability of products for certain types of applications are based on Vishay's knowledge of typical requirements that are often placed on Vishay products in generic applications. Such statements are not binding statements about the suitability of products for a particular application. It is the customer's responsibility to validate that a particular product with the properties described in the product specification is suitable for use in a particular application. Parameters provided in datasheets and / or specifications may vary in different applications and performance may vary over time. All operating parameters, including typical parameters, must be validated for each customer application by the customer's technical experts. Product specifications do not expand or otherwise modify Vishay's terms and conditions of purchase, including but not limited to the warranty expressed therein.

Except as expressly indicated in writing, Vishay products are not designed for use in medical, life-saving, or life-sustaining applications or for any other application in which the failure of the Vishay product could result in personal injury or death. Customers using or selling Vishay products not expressly indicated for use in such applications do so at their own risk. Please contact authorized Vishay personnel to obtain written terms and conditions regarding products designed for such applications.

No license, express or implied, by estoppel or otherwise, to any intellectual property rights is granted by this document or by any conduct of Vishay. Product names and markings noted herein may be trademarks of their respective owners.