

# 1.5KE Series

## TRANSIENT VOLTAGE SUPPRESSOR

Reverse Voltage: 6.8 to 440 V

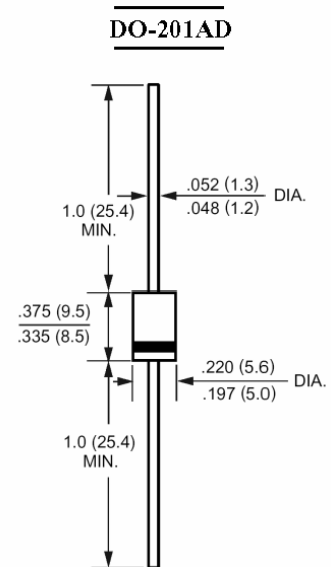
Peak Pulse Power: 1500 W

### Features

- Plastic package has UL flammability Classification 94V-0
- 600W peak pulse power capability on 10/1000  $\mu$ s waveform, repetition rate (duty cycle): 0.01%
- Excellent clamping capability
- Low incremental surge resistance
- Very fast response time

### Mechanical Data

- Case: Molded plastic, DO-201AD
- Epoxy: UL 94V-0 rate flame retardant
- Lead: Axial leads, solderable per MIL-STD-202, Method 208 guaranteed
- Polarity: Color band denotes cathode except bipolar
- Mounting Position: Any



### Description

- Devices for bidirectional applications
- For bi-directional use C or CA suffix for types 1.5KE6.8 thru types 1.5KE440(e.g. 1.5KE6.8C, 1.5KE440CA)
- Electrical characteristics apply in both directions

### Absolute Maximum Ratings and Characteristics

Ratings at 25 °C ambient temperature unless otherwise specified. Single phase, half wave, 60Hz, resistive or inductive load. For capacitive load, derate current by 20%.

Parameter	Symbol	Value	Unit
Peak Power Dissipation with a 10/1000 $\mu$ s waveform <sup>1)</sup>	P <sub>PPM</sub>	min.1500	W
Steady State Power Dissipation at T <sub>L</sub> = 75 °C Lead lengths 0.375"(9.5 mm) <sup>2)</sup>	P <sub>M(AV)</sub>	6.5	W
Peak Forward Surge Current, 8.3ms Single half sine-wave unidirectional only <sup>3)</sup>	I <sub>FSM</sub>	200	A
Maximum Instantaneous Forward Voltage at 100A for Unidirectional only <sup>4)</sup>	V <sub>F</sub>	3.5/5	V
Operating Junction and Storage Temperature Range	T <sub>J</sub> , T <sub>S</sub>	-55 to +150	°C

<sup>1)</sup> Non-repetitive current pulse, per Fig. 3 and derated above T<sub>A</sub> = 25 °C Fig. 2

<sup>2)</sup> Mounted on copper pad area of 1.6 X 1.6" (40 X 40 mm)

<sup>3)</sup> Measured on 8.3ms single half sine-wave or equivalent square wave, duty cycle = 4 pulses per minute maximum.

<sup>4)</sup> V<sub>F</sub> = 3.5 V max. for 1.5KE200A & below; V<sub>F</sub> = 5 V max. for 1.5KE220 & above.

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Unidirectional Type	Reverse Stand-off Voltage $V_{WM}$ (V)	Breakdown Voltage <sup>1)</sup>		Test Current $I_T$ (mA)	Maximum Clamping Voltage $V_C(V) @ I_{PPM}$	Maximum Peak Pulse Current <sup>2)</sup> $I_{PPM}$ (A)	Maximum Reverse Leakage <sup>3)</sup> $I_D (\mu A) @ V_{WM}$
		$V_{BR}$ (V) Min. @ $I_T$	$V_{BR}$ (V) Max. @ $I_T$				
1.5KE6.8	5.5	6.12	7.48	10	10.8	139	1000
1.5KE6.8A	5.8	6.45	7.14	10	10.5	143	1000
1.5KE7.5	6.05	6.75	8.25	10	11.7	128	500
1.5KE7.5A	6.4	7.13	7.88	10	11.3	133	500
1.5KE8.2	6.63	7.38	9.02	10	12.5	120	200
1.5KE8.2A	7.02	7.79	8.61	10	12.1	124	200
1.5KE9.1	7.37	8.19	10	1	13.8	109	50
1.5KE9.1A	7.78	8.65	9.55	1	13.4	112	50
1.5KE10	8.1	9	11	1	15	100	10
1.5KE10A	8.55	9.5	10.5	1	14.5	103	10
1.5KE11	8.92	9.9	12.1	1	16.2	92.6	5
1.5KE11A	9.4	10.5	11.6	1	15.6	96.2	5
1.5KE12	9.72	10.8	13.2	1	17.3	86.7	5
1.5KE12A	10.2	11.4	12.6	1	16.7	89.8	5
1.5KE13	10.5	11.7	14.3	1	19	78.9	5
1.5KE13A	11.1	12.40	13.7	1	18.2	82.4	5
1.5KE15	12.1	13.5	16.5	1	22	68.2	5
1.5KE15A	12.8	14.3	15.8	1	21.2	70.8	5
1.5KE16	12.9	14.4	17.6	1	23.5	63.8	5
1.5KE16A	13.6	15.2	16.8	1	22.5	66.7	5
1.5KE18	14.5	16.2	19.8	1	26.5	56.6	5
1.5KE18A	15.3	17.1	18.9	1	25.2	59.5	5
1.5KE20	16.2	18	22	1	29.1	51.5	5
1.5KE20A	17.1	19	21	1	27.7	54.2	5
1.5KE22	17.8	19.8	24.2	1	31.9	47	5
1.5KE22A	18.8	20.9	23.1	1	30.6	49	5
1.5KE24	19.4	21.6	26.4	1	34.7	43.2	5
1.5KE24A	20.5	22.8	25.2	1	33.2	45.2	5
1.5KE27	21.8	24.3	29.7	1	39.1	38.4	5
1.5KE27A	23.1	25.7	28.4	1	37.5	40	5
1.5KE30	24.3	27	33	1	43.5	34.5	5
1.5KE30A	25.6	28.5	31.5	1	41.4	36.2	5
1.5KE33	26.8	29.7	36.3	1	47.7	31.4	5
1.5KE33A	28.2	31.4	34.7	1	45.7	32.8	5
1.5KE36	29.1	32.4	39.6	1	52	28.8	5
1.5KE36A	30.8	34.2	37.8	1	49.9	30.1	5
1.5KE39	31.6	35.1	42.9	1	56.4	26.6	5
1.5KE39A	33.3	37.1	41	1	53.9	27.8	5
1.5KE43	34.8	38.7	47.3	1	61.9	24.2	5
1.5KE43A	36.8	40.9	45.2	1	59.3	25.3	5
1.5KE47	38.1	42.3	51.7	1	67.8	22.1	5
1.5KE47A	40.2	44.7	49.4	1	64.8	23.1	5
1.5KE51	41.3	45.9	56.1	1	73.5	20.4	5
1.5KE51A	43.6	48.5	53.6	1	70.1	21.4	5

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Unidirectional Type	Reverse Stand-off Voltage $V_{WM}$ (V)	Breakdown Voltage <sup>1)</sup>		Test Current $I_T$ (mA)	Maximum Clamping Voltage $V_C$ (V) @ $I_{PPM}$	Maximum Peak Pulse Current <sup>2)</sup> $I_{PPM}$ (A)	Maximum Reverse Leakage <sup>3)</sup> $I_D$ ( $\mu$ A) @ $V_{WM}$
		$V_{BR}$ (V) Min. @ $I_T$	$V_{BR}$ (V) Max. @ $I_T$				
1.5KE56	45.4	50.4	61.8	1	80.5	18.6	5
1.5KE56A	47.8	53.2	58.8	1	77	19.5	5
1.5KE62	50.2	55.8	68.2	1	89	16.9	5
1.5KE62A	53	58.9	65.1	1	85	17.6	5
1.5KE68	55.1	61.2	74.8	1	98	15.3	5
1.5KE68A	58.1	64.6	71.4	1	92	16.3	5
1.5KE75	60.7	67.5	82.5	1	108	13.9	5
1.5KE75A	64.1	71.3	78.8	1	103	14.6	5
1.5KE82	66.4	73.8	90.2	1	118	12.7	5
1.5KE82A	70.1	77.9	86.1	1	113	13.3	5
1.5KE91	73.7	81.9	100	1	131	11.5	5
1.5KE91A	77.8	86.5	95.5	1	125	12	5
1.5KE100	81	90	110	1	144	10.4	5
1.5KE100A	85.5	95	105	1	137	10.9	5
1.5KE110	89.2	99	121	1	158	9.5	5
1.5KE110A	94	105	116	1	152	9.9	5
1.5KE120	97.2	108	132	1	173	8.7	5
1.5KE120A	102	114	126	1	165	9.1	5
1.5KE130	105	117	143	1	187	8	5
1.5KE130A	111	124	137	1	179	8.4	5
1.5KE150	121	135	165	1	215	7	5
1.5KE150A	128	143	158	1	207	7.2	5
1.5KE160	130	144	176	1	230	6.5	5
1.5KE160A	136	152	168	1	219	6.8	5
1.5KE170	138	153	187	1	244	6.1	5
1.5KE170A	145	162	179	1	234	6.4	5
1.5KE180	146	162	198	1	258	5.8	5
1.5KE180A	154	171	189	1	246	6.1	5
1.5KE200	162	180	220	1	287	5.2	5
1.5KE200A	171	190	210	1	274	5.5	5
1.5KE220	175	198	242	1	344	4.4	5
1.5KE220A	185	209	231	1	328	4.6	5
1.5KE250	202	225	275	1	360	4.2	5
1.5KE250A	214	237	263	1	344	4.4	5
1.5KE300	243	270	330	1	430	3.5	5
1.5KE300A	256	285	315	1	414	3.6	5
1.5KE350	284	315	385	1	504	3	5
1.5KE350A	300	333	368	1	482	3.1	5
1.5KE400	324	360	440	1	574	2.6	5
1.5KE400A	342	380	420	1	548	2.7	5
1.5KE440	356	396	484	1	631	2.4	5
1.5KE440A	376	418	462	1	602	2.5	5

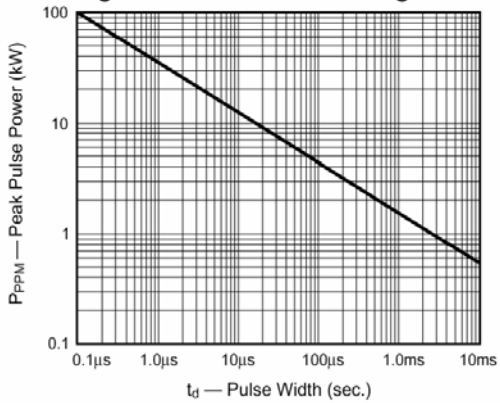
<sup>1)</sup> Pulse test:  $t_p \leq 50$  ms

<sup>2)</sup> Surge current waveform per Fig. 3 and derated per Fig. 2

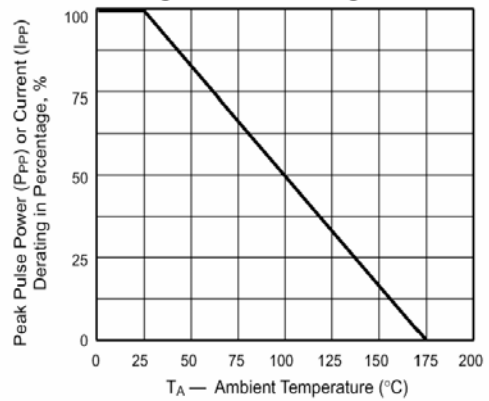
<sup>3)</sup> For bidirectional types having  $V_{WM}$  of 10 V and less, the  $I_D$  limited is doubled

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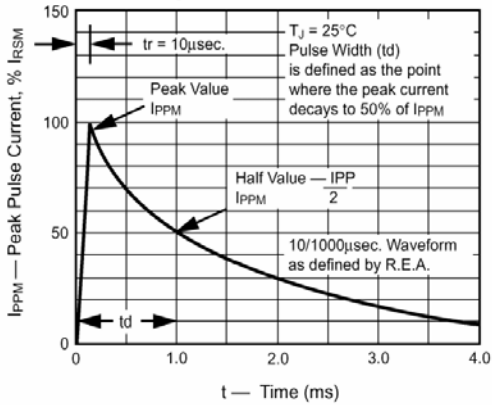
**Fig. 1 – Peak Pulse Power Rating Curve**



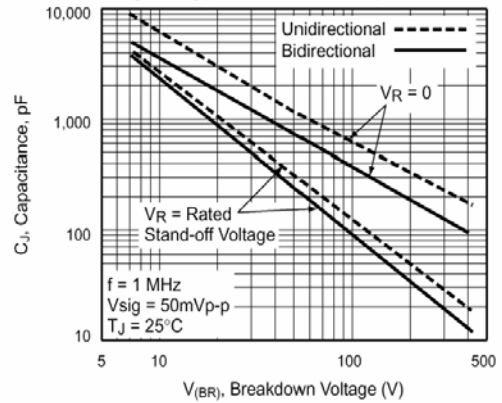
**Fig. 2 – Pulse Derating Curve**



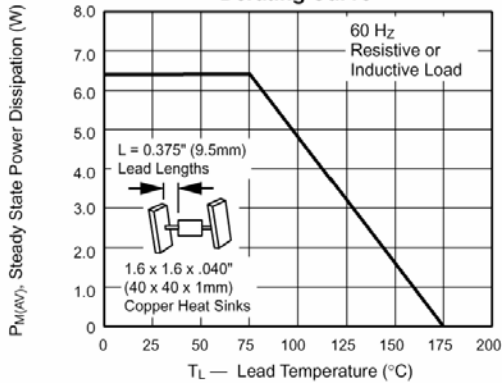
**Fig. 3 – Pulse Waveform**



**Fig. 4 - Typical Junction Capacitance**



**Fig. 5 – Steady State Power Derating Curve**



**Fig. 6 - Maximum Non-repetitive Peak Forward Surge Current Unidirectional Only**

