

1N6267 thru 1N6303A 1.5KE6.8 thru 1.5KE440CA

Transient Voltage Suppressor

Breakdown Voltage 6.8 to 440 Volts
Peak Pulse Power 1500 Watts

Features

- Breakdown Voltages (V_{BR}) from 6.8 to 440V
- 1500W peak pulse power capability with a 10/1000 μ s waveform, repetitive rate (duty cycle):0.01%
- Fast Response Time
- Low incremental surge resistance
- Excellent clamping capability
- Available in uni-directional and bi-directional
- High temperature soldering guaranteed: 265 $^{\circ}$ C /10 seconds, 0.375" (9.5mm) lead length, 5lbs. (2.3kg) tension

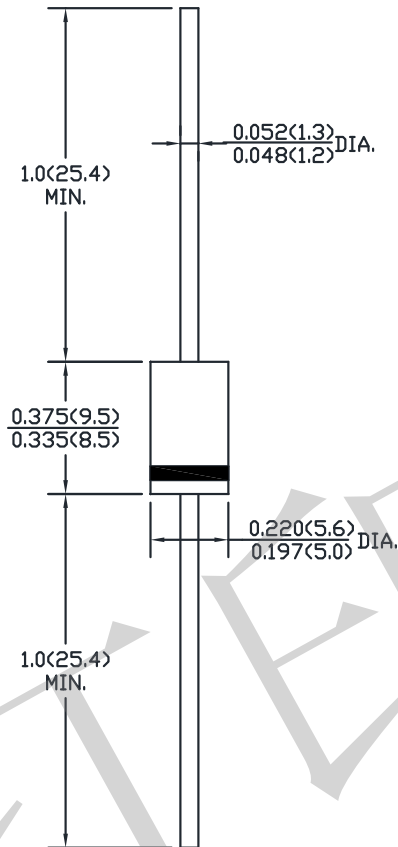
Application

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

Mechanical Data

- **Case:** Void-free transfer molded thermosetting epoxy body meeting UL94V-O
- **Terminals:** Tin-Lead or ROHS Compliant annealed matte-Tin plating readily solderable per MIL-STD-750, Method 2026
- **Marking:** Part number
- **Polarity:** Cathode indicated by band. No marking on bidirectional devices
- **Weight:** 1.2g (Approximately)

CASE: DO-201AD (DO-27)



Dimensions in inches and (millimeters)

Maximum Ratings and Electrical Characteristics @ 25 $^{\circ}$ C unless otherwise specified

Symbol	Conditions	Value	Unit
P_{PPM}	Peak pulse power capability with a 10/1000 μ s	1500	W
I_{PPM}	Peak pulse current with a 10/1000 μ s	SEE TABLE 1	A
$P_{M(AV)}$	Steady state power dissipation at $T_L=40^{\circ}$ C, Lead lengths 0.375" (10mm)	5	W
	Steady state power dissipation at $T_A=25^{\circ}$ C when mounted on FR4 PC described for thermal resistance	1.52	W
I_{FSM}	Peak forward surge current, 8.3ms single half sine-wave unidirectional only(1)	200	A
V_F	Maximum instantaneous forward voltage at 100A for unidirectional only(2)	3.5/5.0	V
$R_{\theta JL}$	Thermal resistance junction to lead	22	$^{\circ}$ C/W
$R_{\theta JA}$	Thermal resistance junction to ambient	82	$^{\circ}$ C/W
T_J, T_{STG}	Operating and Storage Temperature	-65 to +150	$^{\circ}$ C

Notes:

- (1) Measured on 8.3ms single half sine-wave or equivalent square wave, duty cycle=4 pulses per minute maximum
- (2) $V_F=3.5V$ for 1.5KE220(A) and below; $V_F=5.0V$ for 1.5KE250(A) and above

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Electrical Characteristics @ 25°C (Unless Otherwise Noted) TABLE1

Industry Type Number	JEDEC Type Number	Breakdown Voltage V_{BR} @ I_{BR}			Rated Stand Off Voltage (Note1)	Maximum Standby current I_D @ V_{WM}	Maximum Peak Pulse Current	Maximum Clamping Voltage V_C @ I_{PP}	Maximum Temperature Coefficient of $V_{(BR)}$
		MIN	MAX	I_{BR}					
		$V_{BR}(V)$		(mA)	$V_{WM}(V)$	$I_D(\mu A)$	$I_{PP}(A)$	$V_C(V)$	$\alpha_{V(BR)} (\%/^{\circ}C)$
-	1N5908	6.00	-	1	5.00	300	30	7.6	.057
1.5KE6.8	1N6267	6.12	7.48	10	5.50	1000	139.0	10.8	.057
1.5KE6.8A	1N6267A	6.45	7.14	10	5.80	1000	143.0	10.5	.057
1.5KE7.5	1N6268	6.75	8.25	10	6.05	500	128.0	11.7	.061
1.5KE7.5A	1N6268A	7.13	7.88	10	6.40	500	132.0	11.3	.061
1.5KE8.2	1N6269	7.38	9.02	10	6.63	200	120.0	12.5	.065
1.5KE8.2A	1N6269A	7.79	8.61	10	7.02	200	124.0	12.1	.065
1.5KE9.1	1N6270	8.19	10.0	1	7.37	50	109.0	13.8	.068
1.5KE9.1A	1N6270A	8.65	9.55	1	7.78	50	112.0	13.4	.068
1.5KE10	1N6271	9.0	11.0	1	8.10	10	100.0	15.0	.073
1.5KE10A	1N6271A	9.5	10.5	1	8.55	10	103.0	14.5	.073
1.5KE11	1N6272	9.9	12.1	1	8.92	5	93.0	16.2	.075
1.5KE11A	1N6272A	10.5	11.6	1	9.40	5	96.0	15.6	.075
1.5KE12	1N6273	10.8	13.2	1	9.72	5	87.0	17.3	.078
1.5KE12A	1N6273A	11.4	12.6	1	10.2	5	90.0	16.7	.078
1.5KE13	1N6274	11.7	14.3	1	10.5	5	79.0	19.0	.081
1.5KE13A	1N6274A	12.4	13.7	1	11.1	5	82.0	18.2	.081
1.5KE15	1N6275	13.5	16.5	1	12.1	1	68.0	22.0	.084
1.5KE15A	1N6275A	14.3	15.8	1	12.8	1	71.0	21.2	.084
1.5KE16	1N6276	14.4	17.6	1	12.9	1	64.0	23.5	.086
1.5KE16A	1N6276A	15.2	16.8	1	13.6	1	67.0	22.5	.086
1.5KE18	1N6277	16.2	19.8	1	14.5	1	56.5	26.5	.088
1.5KE18A	1N6277A	17.1	18.9	1	15.3	1	59.5	25.2	.088
1.5KE20	1N6278	18.0	22.0	1	16.2	1	51.5	29.1	.090
1.5KE20A	1N6278A	19.0	21.0	1	17.1	1	54.0	27.7	.090
1.5KE22	1N6279	19.8	24.2	1	17.8	1	47.0	31.9	.092
1.5KE22A	1N6279A	20.9	23.1	1	18.8	1	49.0	30.6	.092
1.5KE24	1N6280	21.6	26.4	1	19.4	1	43.0	34.7	.094
1.5KE24A	1N6280A	22.8	25.2	1	20.5	1	45.0	33.2	.094
1.5KE27	1N6281	24.3	29.7	1	21.8	1	38.5	39.1	.096
1.5KE27A	1N6281A	25.7	28.4	1	23.1	1	40.0	37.5	.096
1.5KE30	1N6282	27.0	33.0	1	24.3	1	34.5	43.5	.097
1.5KE30A	1N6282A	28.5	31.5	1	25.6	1	36.0	41.4	.097
1.5KE33	1N6283	29.7	36.3	1	26.8	1	31.5	47.7	.098
1.5KE33A	1N6283A	31.4	34.7	1	28.2	1	33.0	45.7	.098
1.5KE36	1N6284	32.4	39.6	1	29.1	1	29.0	52.0	.099
1.5KE36A	1N6284A	34.2	37.8	1	30.8	1	30.0	49.9	.099
1.5KE39	1N6285	35.1	42.9	1	31.6	1	26.5	56.4	.100
1.5KE39A	1N6285A	37.1	41.0	1	33.3	1	28.0	53.9	.100
1.5KE43	1N6286	38.7	47.3	1	34.8	1	24.0	61.9	.101
1.5KE43A	1N6286A	40.9	45.2	1	36.8	1	25.3	59.3	.101
1.5KE47	1N6287	42.3	51.7	1	38.1	1	22.2	67.8	.101
1.5KE47A	1N6287A	44.7	49.4	1	40.2	1	23.2	64.8	.101
1.5KE51	1N6288	45.9	56.1	1	41.3	1	20.4	73.5	.102
1.5KE51A	1N6288A	48.5	53.6	1	43.6	1	21.4	70.1	.102
1.5KE56	1N6289	50.4	61.6	1	45.4	1	18.6	80.5	.103
1.5KE56A	1N6289A	53.2	58.8	1	47.8	1	19.5	77.0	.103
1.5KE62	1N6290	55.8	68.2	1	50.2	1	16.9	89.0	.104
1.5KE62A	1N6290A	58.9	65.1	1	53.0	1	17.7	85.0	.104

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Industry Type Number	JEDEC Type Number	Breakdown Voltage V_{BR} @ I_{BR}			Rated Stand Off Voltage	Maximum Standby current I_D @ V_{WM}	Maximum Peak Pulse Current	Maximum Clamping Voltage V_C @ I_{PP}	Maximum Temperature Coefficient of $V_{(BR)}$
		MIN	MAX	I_{BR} (mA)					
		$V_{BR}(V)$			$V_{WM}(V)$	$I_D(\mu A)$	$I_{PP}(A)$	$V_C(V)$	$\alpha_{V(BR)} (\%/^{\circ}C)$
1.5KE68	1N6291	61.2	74.8	1	55.1	1	15.3	98.0	.104
1.5KE68A	1N6291A	64.6	71.4	1	58.1	1	16.3	92.0	.104
1.5KE75	1N6292	67.5	82.5	1	60.7	1	13.9	108.0	.105
1.5KE75A	1N6292A	71.3	78.8	1	64.1	1	14.6	103.0	.105
1.5KE82	1N6293	73.8	90.2	1	66.4	1	12.7	118.0	.105
1.5KE82A	1N6293A	77.9	86.1	1	70.1	1	13.3	113.0	.105
1.5KE91	1N6294	81.9	100.0	1	73.7	1	11.4	131.0	.106
1.5KE91A	1N6294A	86.5	95.0	1	77.8	1	12.0	125.0	.106
1.5KE100	1N6295	90.0	110.0	1	81.0	1	10.4	144.0	.106
1.5KE100A	1N6295A	95.0	105.0	1	85.5	1	11.0	137.0	.106
1.5KE110	1N6296	99.0	121.0	1	89.2	1	9.5	158.0	.107
1.5KE110A	1N6296A	105.0	116.0	1	94.0	1	9.9	152.0	.107
1.5KE120	1N6297	108.0	132.0	1	97.2	1	8.7	173.0	.107
1.5KE120A	1N6297A	114.0	126.0	1	102.0	1	9.1	165.0	.107
1.5KE130	1N6298	117.0	143.0	1	105.0	1	8.0	187.0	.107
1.5KE130A	1N6298A	124.0	137.0	1	111.0	1	8.4	179.0	.107
1.5KE150	1N6299	135.0	165.0	1	121.0	1	7.0	215.0	.108
1.5KE150A	1N6299A	143.0	158.0	1	128.0	1	7.2	207.0	.108
1.5KE160	1N6300	144.0	176.0	1	130.0	1	6.5	230.0	.108
1.5KE160A	1N6300A	152.0	168.0	1	136.0	1	6.8	219.0	.108
1.5KE170	1N6301	153.0	187.0	1	138.0	1	6.2	244.0	.108
1.5KE170A	1N6301A	162.0	179.0	1	145.0	1	6.4	234.0	.108
1.5KE180	1N6303	162.0	198.0	1	146.0	1	5.8	258.0	.108
1.5KE180A	1N6303A	171.0	189.0	1	154.0	1	6.1	246.0	.108
1.5KE200	-	180.0	220.0	1	162.0	1	5.2	287.0	.108
1.5KE200A	-	190.0	210.0	1	171.0	1	5.5	274.0	.108
1.5KE220	-	198.0	242.0	1	175.0	1	4.3	344.0	.110
1.5KE220A	-	209.0	231.0	1	185.0	1	4.6	328.0	.110
1.5KE250	-	225.0	275.0	1	202.0	1	5.0	360.0	.110
1.5KE250A	-	237.0	263.0	1	214.0	1	5.0	344.0	.110
1.5KE300	-	270.0	330.0	1	243.0	1	5.0	430.0	.111
1.5KE300A	-	285.0	315.0	1	256.0	1	5.0	414.0	.111
1.5KE350	-	315.0	385.0	1	284.0	1	4.0	504.0	.111
1.5KE350A	-	332.0	368.0	1	300.0	1	4.0	482.0	.111
1.5KE400	-	360.0	440.0	1	324.0	1	4.0	574.0	.111
1.5KE400A	-	380.0	420.0	1	342.0	1	4.0	548.0	.111
1.5KE440	-	396.0	484.0	1	356.0	1	2.4	631.0	.111
1.5KE440A	-	418.0	462.0	1	376.0	1	2.5	602.0	.111

Note1. Normal selection criterion for TVS devices is by rated stand-off voltage (V_{WM}) and should be equal or greater than dc or continuous peak operating voltage.

- For Bi-directional Construction, indicate a C or CA suffix after part number, i.e. 1.5KE400C or 1.5KE400CA. For Bidirectional types having VWM of 8 volts and under, the I_D leakage current is doubled. 1N62XX or 1N5908 not available as Bidirectional.
- For unidirectional, the forward voltage (V_F) is 3.5 volts maximum at 100Amps peak for 8.3ms half-sine wave.
- TVS devices are tested to maximum peak pulse current (I_{PP}) with clamping voltage monitored. This surge capability is one of the most significant electrical characteristics of the device and should be considered as part of customer quality inspections.

Characteristic Curve

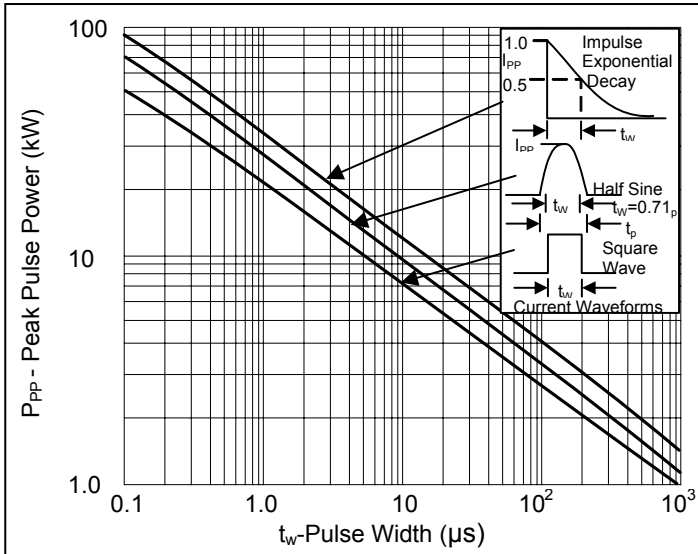


Fig. 1 Peak Pulse Power vs. Pulse Time

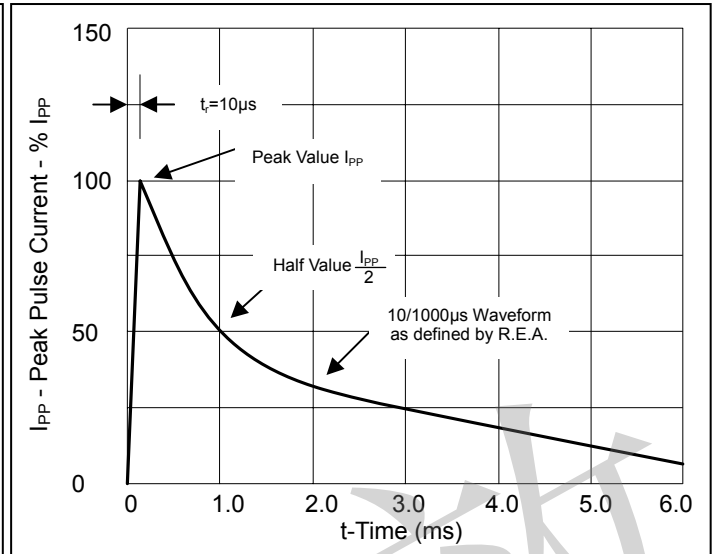


Fig. 2 Pulse Waveform for Exponential Surge

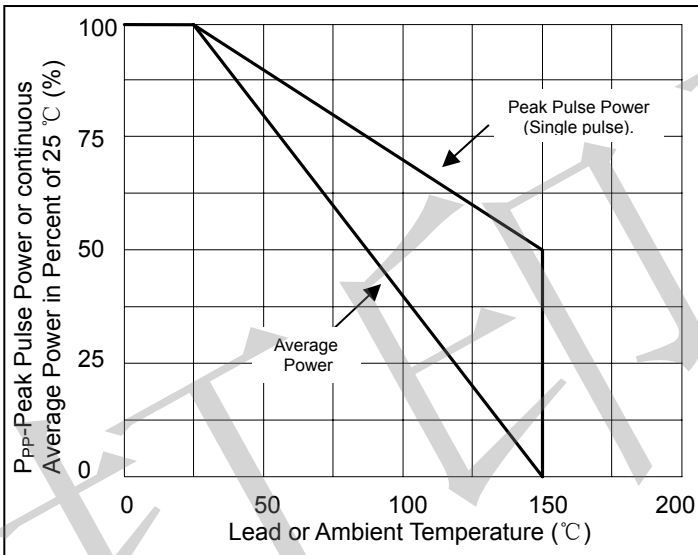


Fig. 3 Derating Curve

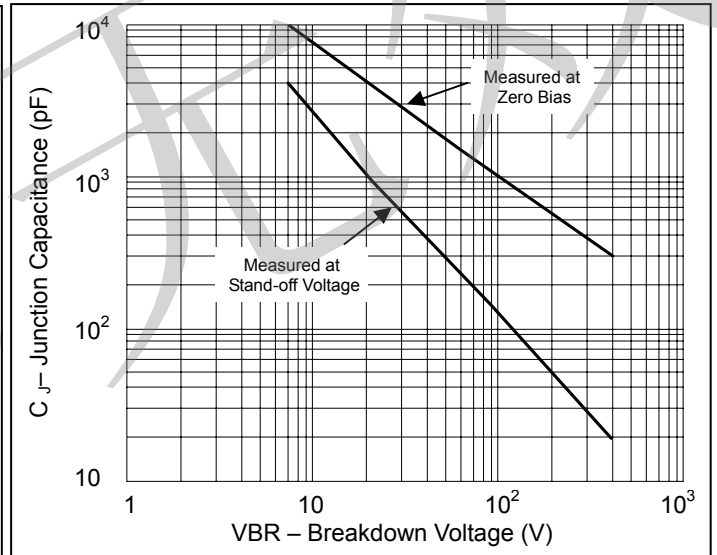


Fig. 4 Typical Capacitance vs. Breakdown Voltage (Unipolar)

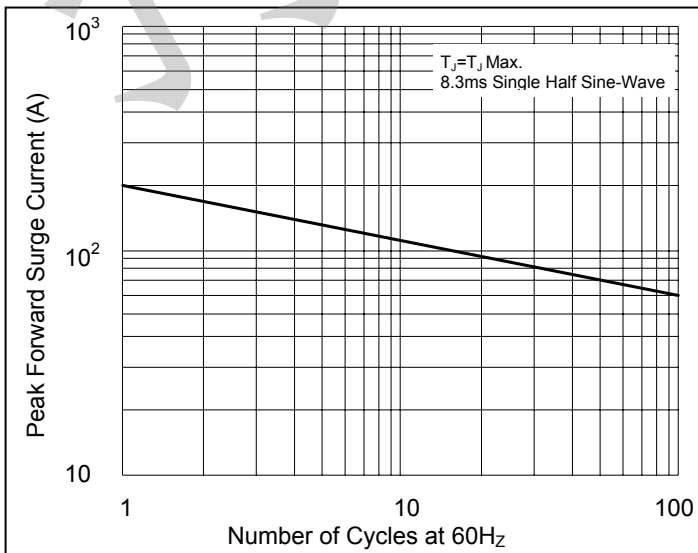


Fig. 5 Max. Non-Repetitive Forward Surge Current Uni-Directional Only