



# INTERNATIONAL SEMICONDUCTOR, INC.

## TRANSIENT VOLTAGE SUPPRESSORS

# 1.5KE6.8 thru 1.5KE440CA

6.8 to 440 VOLTS

1500 WATT PEAK POWER

3.0 WATT STEADY STATE

### MAXIMUM RATINGS AND CHARACTERISTICS

Ratings at 25 °C ambient unless otherwise specified

RATING	SYMBOL	VALUE	UNITS
Peak Power Dissipation at $T_A=25^{\circ}\text{C}$ , $T_p=1\text{ms}$ (Note 1)	$P_{PK}$	Minimum 1.5	kWatts
Steady State Power Dissipation at $T_A=75^{\circ}\text{C}$ Lead Lengths .375", (9.5 mm) (Note 2)	$P_D$	3.0	Watts
Peak Forward Surge Current, 8.3 ms, Single Half Sine-Wave Superimposed on Rated Load (JEDEC Method) (Note 3)	$I_{FSM}$	200	Amps
Operating and Storage Temperature Range	$T_J, T_{STG}$	-40 to +150	°C

### FEATURES

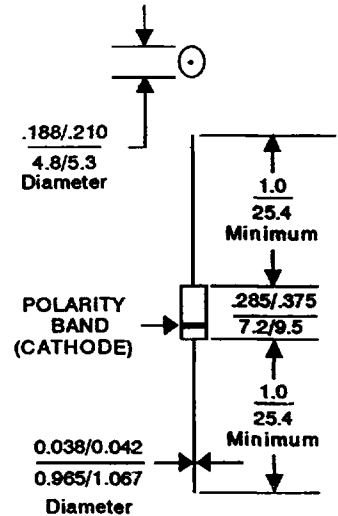
- Passivated junction in molded plastic package
- 1500 Watt surge capability at 1 millisecond
- Excellent clamping capability
- Fast response time: typically less than 1.0 psec from 0 volts to BV minimum
- Low zener impedance
- Typical  $I_R$  less than 1 ua above 10 volts
- High temperature soldering guaranteed: 300 °C for 10 seconds with .375" (9.5mm) lead length, and 5 lbs (2.3 kg) tension

### DEVICES FOR BIPOLAR APPLICATIONS

For Bidirectional use C or CA Suffix for types 1.5KE6.8C thru types 1.5KE440CA  
Electrical characteristics apply in both directions

### NOTES TO CHARACTERISTICS AND SPECIFICATIONS:

1. Non-repetitive current pulse, per Fig.3 and derated above  $T_A = 25^{\circ}\text{C}$  per Fig. 2
2. Mounted on Copper Leaf area of 0.79 sq in (20 sq mm)
3. 8.3 ms half sine-wave, duty cycle = 4 pulses per minute maximum
4.  $V_{BR}$  measured after  $I_T$  applied for 300 us.  $I_T =$  Square Wave Pulse or equivalent.
5. Surge current Waveform per Fig.3 and derated per Fig. 2.
6.  $V_F = 3.5\text{ V max}$ ,  $I_F = 50\text{ amps}$  for all types per 1/2 Square or Equivalent Sine Wave.  
PW = 8.3 ms, Duty Cycle - 4 Pulses per Minute Maximum.



All dimensions in  $\frac{\text{Inch}}{\text{mm}}$

DO-201

### MECHANICAL DATA

Case: Molded plastic over passivated junction

Terminals: Axial leads, solderable per MIL-STD-202, Method 28

Polarity: Color band denotes cathode (Except Bipolar)

Mounting Position: Any

Weight: 0.045 ounce (1.2 grams)

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# 1.5KE SERIES TRANSIENT VOLTAGE SUPPRESSORS

JEDEC PART NUMBER	ISI PART NUMBER	BREAKDOWN VOLTAGE			WORKING PEAK REVERSE VOLTAGE $V_{RWM}$ (Volts)	MAXIMUM REVERSE LEAKAGE at $V_{RWM}$ $I_R$ (ua)	PEAK PULSE CURRENT (Note 5) $I_{PP}$ (Amps)	MAXIMUM CLAMPING VOLTAGE at $I_{PP}$ $V_C$ (Volts)	MAX VOLTAGE TEMPERATURE VARIATION of $V_{BR}$ (mv/°C)
		$V_{BR}$ (Volts) (Note 4)		at $I_T$ (ma)					
		Min	Max						
1N6267	1.5KE6.8	6.12	7.48	10	5.50	1000	139.0	10.8	5
1N6267A	1.5KE6.8A	6.46	7.14	10	5.80	1000	143.0	10.5	5
1N6268	1.5KE7.5	6.75	8.25	10	6.05	500	128.0	11.7	5
1N6268A	1.5KE7.5A	7.13	7.88	10	6.40	500	132.0	11.3	5
1N6269	1.5KE8.2	7.38	9.02	10	6.63	200	120.0	12.5	6
1N6269A	1.5KE8.2A	7.79	8.61	10	7.02	200	124.0	12.1	6
1N6270	1.5KE9.1	8.19	10.0	1.0	7.37	50	109.0	13.8	7
1N6270A	1.5KE9.1A	8.65	9.55	1.0	7.78	50	112.0	13.4	7
1N6271	1.5KE10	9.00	11.0	1.0	8.10	10	100.0	15.0	8
1N6271A	1.5KE10A	9.50	10.5	1.0	8.55	10	103.0	14.5	8
1N6272	1.5KE11	9.90	12.1	1.0	8.92	5.0	93.0	16.2	9
1N6272A	1.5KE11A	10.5	11.6	1.0	9.40	5.0	96.0	15.6	9
1N6273	1.5KE12	10.8	13.2	1.0	9.72	5.0	87.0	17.3	10
1N6273A	1.5KE12A	11.4	12.6	1.0	10.2	5.0	90.0	16.7	10
1N6274	1.5KE13	11.7	14.3	1.0	10.5	5.0	79.0	19.0	11
1N6274A	1.5KE13A	12.4	13.7	1.0	11.1	5.0	82.0	18.2	11
1N6275	1.5KE15	13.5	16.5	1.0	12.1	5.0	68.0	22.0	13
1N6275A	1.5KE15A	14.3	15.8	1.0	12.8	5.0	71.0	21.2	12
1N6276	1.5KE16	14.4	17.6	1.0	12.9	5.0	64.0	23.5	16
1N6276A	1.5KE16A	15.2	16.8	1.0	13.6	5.0	67.0	22.5	14
1N6277	1.5KE18	16.2	19.8	1.0	14.5	5.0	56.5	26.5	17
1N6277A	1.5KE18A	17.1	18.9	1.0	15.3	5.0	59.5	25.2	19
1N6278	1.5KE20	18.0	22.0	1.0	16.2	5.0	51.5	29.1	20
1N6278A	1.5KE20A	19.0	21.0	1.0	17.1	5.0	54.0	27.7	19
1N6279	1.5KE22	19.8	24.2	1.0	17.8	5.0	47.0	31.9	21
1N6279A	1.5KE22A	20.9	23.1	1.0	18.8	5.0	49.0	30.6	19
1N6280	1.5KE24	21.6	26.4	1.0	19.4	5.0	43.0	34.7	15
1N6280A	1.5KE24A	22.8	25.2	1.0	20.5	5.0	45.0	33.2	23
1N6281	1.5KE27	24.3	29.7	1.0	21.8	5.0	38.5	39.1	28
1N6281A	1.5KE27A	25.7	28.4	1.0	23.1	5.0	40.0	37.5	25
1N6282	1.5KE30	27.0	33.0	1.0	24.3	5.0	34.5	43.5	31
1N6282A	1.5KE30A	28.5	31.5	1.0	25.6	5.0	36.0	41.4	28
1N6283	1.5KE33	29.7	36.3	1.0	26.8	5.0	31.5	47.7	31
1N6283A	1.5KE33A	31.4	34.7	1.0	28.2	5.0	33.0	45.7	30
1N6284	1.5KE36	32.4	39.6	1.0	29.1	5.0	29.0	52.0	35
1N6284A	1.5KE36A	34.2	37.8	1.0	30.8	5.0	30.0	49.9	31
1N6285	1.5KE39	35.1	42.9	1.0	31.6	5.0	26.5	56.4	39
1N6285A	1.5KE39A	37.1	41.0	1.0	33.3	5.0	28.0	53.9	36
1N6286	1.5KE43	38.7	47.3	1.0	34.8	5.0	24.0	61.9	46
1N6286A	1.5KE43A	40.9	45.2	1.0	36.8	5.0	25.3	59.3	44
1N6287	1.5KE47	42.3	51.7	1.0	38.1	5.0	22.2	67.8	50
1N6287A	1.5KE47A	44.7	49.4	1.0	40.2	5.0	23.2	64.8	48
1N6288	1.5KE51	45.9	56.1	1.0	41.3	5.0	20.4	73.5	55
1N6288A	1.5KE51A	48.5	53.6	1.0	43.6	5.0	21.4	70.1	51

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		$V_{BR}$ (Volts) (Note 4)		at $I_T$ (ma)					
		Min	Max						
1N6289	1.5KE56	50.4	61.8	1.0	45.4	5.0	18.6	80.5	58
1N6289A	1.5KE56A	53.2	58.8	1.0	47.8	5.0	19.5	77.0	56
1N6290	1.5KE62	55.8	68.2	1.0	50.2	5.0	16.9	89.0	65
1N6290A	1.5KE62A	58.9	65.1	1.0	53.0	5.0	17.7	85.0	62
1N6291	1.5KE68	61.2	74.8	1.0	55.1	5.0	15.3	98.0	71
1N6291A	1.5KE68A	64.6	71.4	1.0	58.1	5.0	16.3	92.0	69
1N6292	1.5KE75	67.5	82.5	1.0	60.7	5.0	13.9	108.0	80
1N6292A	1.5KE75A	71.3	78.8	1.0	64.1	5.0	14.6	103.0	76
1N6293	1.5KE82	73.8	90.2	1.0	66.4	5.0	12.7	118.0	90
1N6293A	1.5KE82A	77.9	86.1	1.0	70.1	5.0	13.3	113.0	86
1N6294	1.5KE91	81.9	100.0	1.0	73.7	5.0	11.4	131.8	99
1N6294A	1.5KE91A	86.5	95.5	1.0	77.8	5.0	12.0	125.0	94
1N6295	1.5KE100	90.0	110.0	1.0	81.0	5.0	10.4	144.0	109
1N6295A	1.5KE100A	95.0	105.0	1.0	85.5	5.0	11.0	137.0	104
1N6296	1.5KE110	99.0	121.0	1.0	89.2	5.0	9.5	158.0	120
1N6296A	1.5KE110A	105.0	116.0	1.0	94.0	5.0	9.9	152.0	115
1N6297	1.5KE120	108.0	132.0	1.0	97.2	5.0	8.7	173.0	131
1N6297A	1.5KE120A	114.0	126.0	1.0	102.0	5.0	9.1	165.0	125
1N6298	1.5KE130	117.0	143.0	1.0	105.0	5.0	8.0	187.0	142
1N6298A	1.5KE130A	124.0	137.0	1.0	111.0	5.0	8.4	179.0	136
1N6299	1.5KE150	135.0	165.0	1.0	121.0	5.0	7.0	215.0	164
1N6299A	1.5KE150A	143.0	158.0	1.0	128.0	5.0	7.2	207.0	157
1N6300	1.5KE160	144.0	176.0	1.0	130.0	5.0	6.5	230.0	175
1N6300A	1.5KE160A	152.0	168.0	1.0	136.0	5.0	6.8	219.9	167
1N6301	1.5KE170	153.0	187.0	1.0	138.0	5.0	6.2	244.0	186
1N6301A	1.5KE170A	162.0	179.0	1.0	145.0	5.0	6.4	234.0	188
1N6302	1.5KE180	162.0	198.0	1.0	146.0	5.0	5.8	258.0	197
1N6302A	1.5KE180A	171.0	189.0	1.0	154.0	5.0	6.1	246.0	188
1N6303	1.5KE200	180.0	220.0	1.0	162.0	5.0	5.2	287.0	219
1N6303A	1.5KE200A	190.0	210.0	1.0	171.0	5.0	5.5	274.0	209
	1.5KE220	198.0	242.0	1.0	175.0	5.0	4.3	344.0	240
	1.5KE220A	209.0	231.0	1.0	185.0	5.0	4.6	328.0	230
	1.5KE250	225.0	275.0	1.0	202.0	5.0	5.0	360.0	270
	1.5KE250A	237.0	263.0	1.0	214.0	5.0	5.0	344.0	260
	1.5KE300	270.0	330.0	1.0	243.0	5.0	5.0	430.0	330
	1.5KE300A	285.0	315.0	1.0	256.0	5.0	5.0	414.0	315
	1.5KE350	315.0	385.0	1.0	284.0	5.0	4.0	504.0	385
	1.5KE350A	332.0	368.0	1.0	300.0	5.0	4.0	482.0	368
	1.5KE400	360.0	440.0	1.0	324.0	5.0	4.0	574.0	440
	1.5KE400A	380.0	420.0	1.0	342.0	5.0	4.0	548.0	420
	1.5KE440	396.0	484.0	1.0	356.0	5.0	4.0	631.0	460
	1.5KE440A	418.0	462.0	1.0	376.0	5.0	4.0	603.0	440

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# RATINGS AND CHARACTERISTICS FOR 1.5KE SERIES

FIGURE 1 - PULSE RATING CURVE

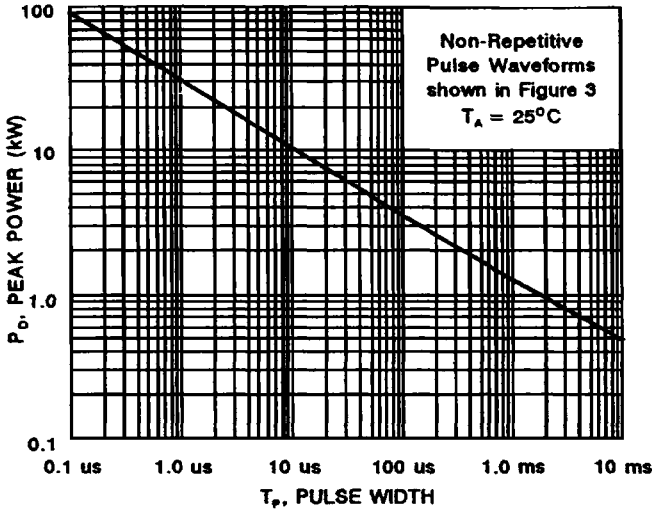


FIGURE 2 - PULSE DERATING CURVE

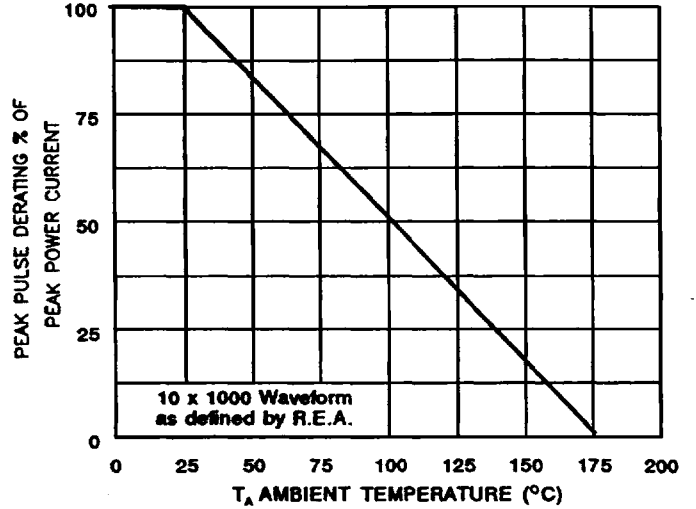


FIGURE 3 - PULSE WAVEFORM

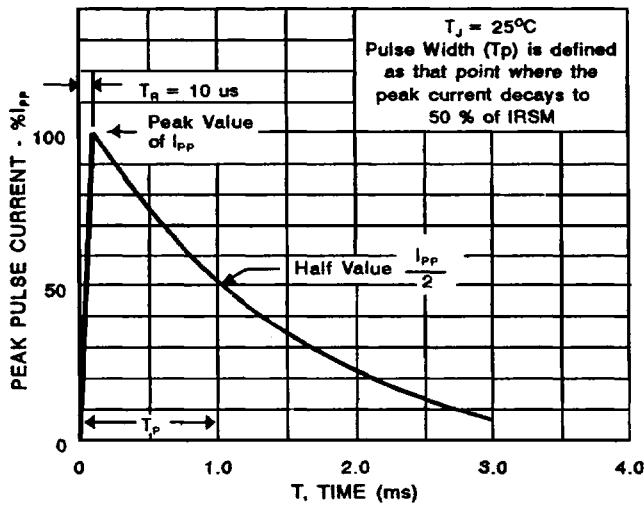


FIGURE 4 - TYPICAL JUNCTION CAPACITANCE

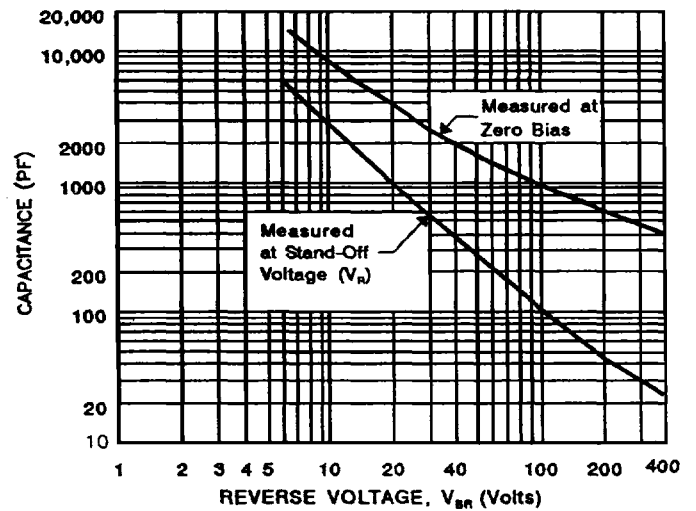


FIGURE 5 - STEADY STATE POWER DERATING

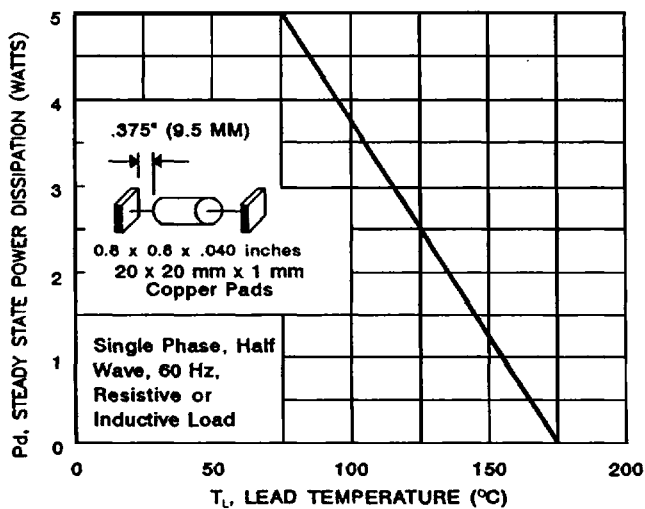


FIGURE 6 - MAXIMUM NON-REPETITIVE SURGE CURRENT

