

# 1N5338B - 1N5388B

# SILICON ZENER DIODES

**V<sub>Z</sub> : 5.1 - 200 Volts**

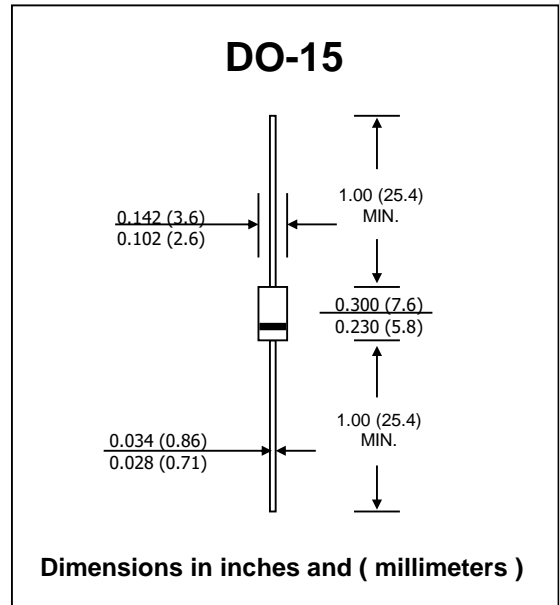
**P<sub>D</sub> : 5 Watts**

**FEATURES :**

- \* Complete Voltage Range 5.1 to 200 Volts
- \* High peak reverse power dissipation
- \* ESD Rating of Class 3 (>16 kV) per Human Body Model
- \* Surge Rating of up to 180 W @ 8.3 ms
- \* High reliability
- \* Low leakage current
- \* Pb / RoHS Free

**MECHANICAL DATA :**

- \* Case : DO-15 Molded plastic
- \* Epoxy : UL94V-0 rate flame retardant
- \* Lead : Axial lead solderable per MIL-STD-202, Method 208 guaranteed
- \* Polarity : Color band denotes cathode end
- \* Mounting position : Any
- \* Weight : 0.4 gram



**MAXIMUM RATINGS**

Rating at 25 °C ambient temperature unless otherwise specified

Rating	Symbol	Value	Unit
DC Power Dissipation at T <sub>L</sub> = 75 °C (Note1)	P <sub>D</sub>	5.0	W
Maximum Forward Voltage at I <sub>F</sub> = 1 A	V <sub>F</sub>	1.2	V
Junction Temperature Range	T <sub>J</sub>	- 55 to + 150	°C
Storage Temperature Range	T <sub>s</sub>	- 55 to + 150	°C
Typical thermal resistance Junction to Case	R <sub>θJC</sub>	8	°C/W
Typical thermal resistance Junction to Ambient	R <sub>θJA</sub>	85	°C/W
Typical thermal resistance Junction to Lead	R <sub>θJL</sub>	25	°C/W

**Note :**

(1) T<sub>L</sub> = Lead temperature at 3/8 " (9.5mm) from body



**ELECTRICAL CHARACTERISTICS** (Rating at 25 °C ambient temperature unless otherwise specified)

Type No.	Zener Voltage				Maximum Zener Impedance			Maximum Reverse Leakage Current		Maximum DC Zener Current	Maximum SURGE Zener Current	Maximum Voltage Regulation
	V <sub>Z</sub> <sup>(1)</sup> (V) @ I <sub>ZT</sub>			I <sub>ZT</sub>	Z <sub>ZT</sub> @ I <sub>ZT</sub>	Z <sub>ZK</sub> @ I <sub>ZK</sub>	I <sub>ZK</sub>	I <sub>R</sub> @ V <sub>R</sub>		I <sub>ZM</sub> <sup>(2)</sup>	I <sub>ZSM</sub> <sup>(3)</sup>	ΔV <sub>Z</sub> <sup>(4)</sup>
	Min.	Nom.	Max.	(mA)	(Ω)	(Ω)	(mA)	(μA)	(V)	(mA)	(A)	(V)
1N5338B	4.8	5.1	5.4	240	1.5	400	1.0	1.0	1.0	930	14.4	0.39
1N5339B	5.3	5.6	5.9	220	1.0	400	1.0	1.0	2.0	865	13.4	0.25
1N5340B	5.7	6.0	6.3	200	1.0	300	1.0	1.0	3.0	790	12.7	0.19
1N5341B	5.9	6.2	6.5	200	1.0	200	1.0	1.0	3.0	765	12.4	0.10
1N5342B	6.5	6.8	7.1	175	1.0	200	1.0	10	5.2	700	11.5	0.15
1N5343B	7.1	7.5	7.9	175	1.5	200	1.0	10	5.7	630	10.7	0.15
1N5344B	7.8	8.2	8.6	150	1.5	200	1.0	10	6.2	580	10.0	0.20
1N5345B	8.3	8.7	9.1	150	2.0	200	1.0	10	6.6	545	9.5	0.20
1N5346B	8.6	9.1	9.6	150	2.0	150	1.0	7.5	6.9	520	9.2	0.22
1N5347B	9.5	10	10.5	125	2.0	125	1.0	5.0	7.6	475	8.6	0.22
1N5348B	10.5	11	11.6	125	2.5	125	1.0	5.0	8.4	430	8.0	0.25
1N5349B	11.4	12	12.6	100	2.5	125	1.0	2.0	9.1	395	7.5	0.25
1N5350B	12.4	13	13.7	100	2.5	100	1.0	1.0	9.9	365	7.0	0.25
1N5351B	13.3	14	14.7	100	2.5	75	1.0	1.0	10.6	340	6.7	0.25
1N5352B	14.3	15	15.8	75	2.5	75	1.0	1.0	11.5	315	6.3	0.25
1N5353B	15.2	16	16.8	75	2.5	75	1.0	1.0	12.2	295	6.0	0.30
1N5354B	16.2	17	17.9	70	2.5	75	1.0	0.5	12.9	280	5.8	0.35
1N5355B	17.1	18	18.9	65	2.5	75	1.0	0.5	13.7	265	5.5	0.40
1N5356B	18.1	19	20.0	65	3.0	75	1.0	0.5	14.4	250	5.3	0.40
1N5357B	19.0	20	21.0	65	3.0	75	1.0	0.5	15.2	237	5.1	0.40
1N5358B	20.9	22	23.1	50	3.5	75	1.0	0.5	16.7	216	4.7	0.45
1N5359B	22.8	24	25.2	50	3.5	100	1.0	0.5	18.2	198	4.4	0.55
1N5360B	23.8	25	26.3	50	4.0	110	1.0	0.5	19.0	190	4.3	0.55
1N5361B	25.7	27	28.4	50	5.0	120	1.0	0.5	20.6	176	4.1	0.60
1N5362B	26.6	28	29.4	50	6.0	130	1.0	0.5	21.2	170	3.9	0.60
1N5363B	28.5	30	31.5	40	8.0	140	1.0	0.5	22.8	158	3.7	0.60
1N5364B	31.4	33	34.7	40	10	150	1.0	0.5	25.1	144	3.5	0.60
1N5365B	34.2	36	37.8	30	11	160	1.0	0.5	27.4	132	3.3	0.65
1N5366B	37.1	39	41.0	30	14	170	1.0	0.5	29.7	122	3.1	0.65
1N5367B	40.9	43	45.2	30	20	190	1.0	0.5	32.7	110	2.8	0.70
1N5368B	44.7	47	49.4	25	25	210	1.0	0.5	35.8	100	2.7	0.80
1N5369B	48.5	51	53.6	25	27	230	1.0	0.5	38.8	93.0	2.5	0.90
1N5370B	53.2	56	58.8	20	35	280	1.0	0.5	42.6	86.0	2.3	1.00
1N5371B	57.0	60	63.0	20	40	350	1.0	0.5	45.5	79.0	2.2	1.20
1N5372B	58.9	62	65.1	20	42	400	1.0	0.5	47.1	76.0	2.1	1.35
1N5373B	64.6	68	71.4	20	44	500	1.0	0.5	51.7	70.0	2.0	1.50
1N5374B	71.3	75	78.8	20	45	620	1.0	0.5	56.0	63.0	1.9	1.60
1N5375B	77.9	82	86.1	15	65	720	1.0	0.5	62.2	58.0	1.8	1.80
1N5376B	82.7	87	91.4	15	75	760	1.0	0.5	66.0	54.5	1.7	2.00
1N5377B	86.5	91	95.6	15	75	760	1.0	0.5	69.2	52.5	1.6	2.20
1N5378B	95.0	100	105.0	12	90	800	1.0	0.5	76.0	47.5	1.5	2.30
1N5379B	104.5	110	115.5	12	125	1000	1.0	0.5	83.6	43.0	1.4	2.50
1N5380B	114.0	120	126.0	10	170	1150	1.0	0.5	91.2	39.5	1.3	2.50
1N5381B	123.5	130	136.5	10	190	1250	1.0	0.5	98.8	36.6	1.2	2.50
1N5382B	133.0	140	147.0	8.0	230	1500	1.0	0.5	106	34.0	1.2	2.50
1N5383B	142.5	150	157.5	8.0	330	1500	1.0	0.5	114	31.6	1.1	3.00
1N5384B	152.0	160	168.0	8.0	350	1650	1.0	0.5	122	29.4	1.1	3.00
1N5385B	161.5	170	178.5	8.0	380	1750	1.0	0.5	129	28.0	1.0	3.00
1N5386B	171.0	180	189.0	5.0	430	1750	1.0	0.5	137	26.4	1.0	4.00
1N5387B	180.5	190	199.5	5.0	450	1850	1.0	0.5	144	25.0	0.9	5.00
1N5388B	190.0	200	210.0	5.0	480	1850	1.0	0.5	152	23.6	0.9	5.00

Note : (1) Suffix " B " indicates ± 5% tolerance, suffix " A " indicates ± 10% tolerance.

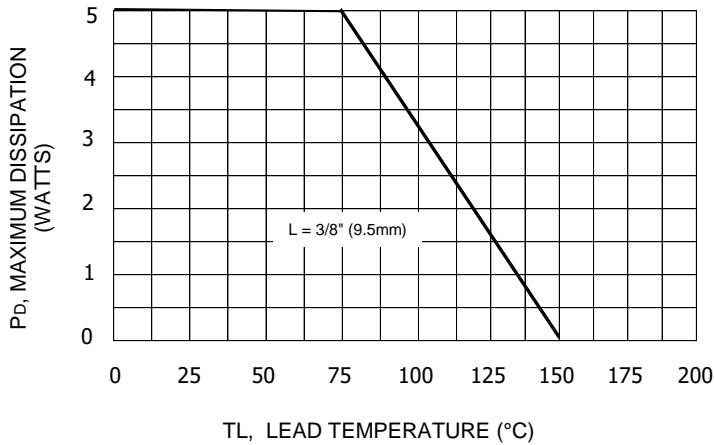
Note : (2) The maximum current (I<sub>ZM</sub>) shown is for a ±5% tolerance devices. The I<sub>ZM</sub> for other tolerances can be calculated using the formula: I<sub>ZM</sub> = P/V<sub>ZM</sub> where V<sub>ZM</sub> is the V<sub>Z</sub> at the high end of the voltage tolerance specified and P is the rated power for the method of mounting.

Note : (3) The surge current (I<sub>ZSM</sub>) is specified as the maximum peak of a non-recurrent half-sine wave of 8.3 ms duration.

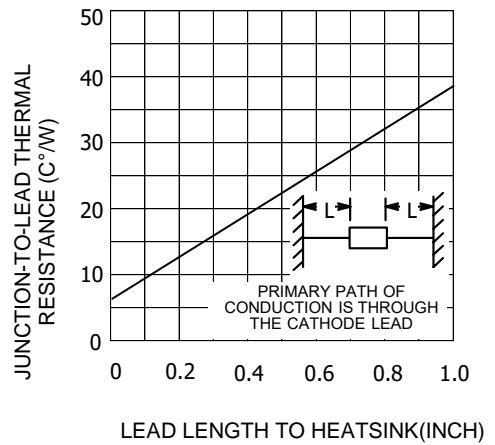
Note : (4) Voltage regulation (ΔV<sub>Z</sub>) is the difference between the voltage measured at 10% and 50% of I<sub>ZM</sub>.

**RATING AND CHARACTERISTIC CURVES ( 1N5338B - 1N5388B )**

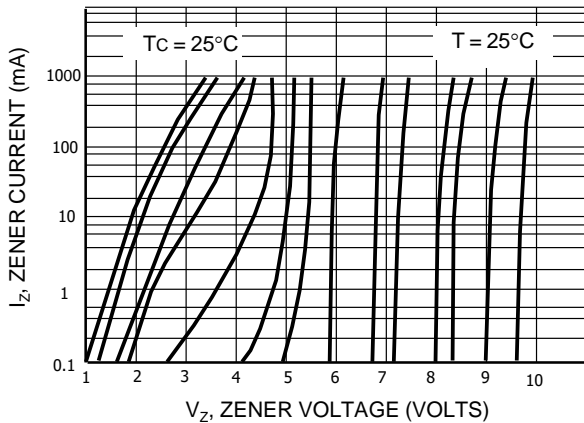
**Fig. 1 POWER TEMPERATURE DERATING CURVE**



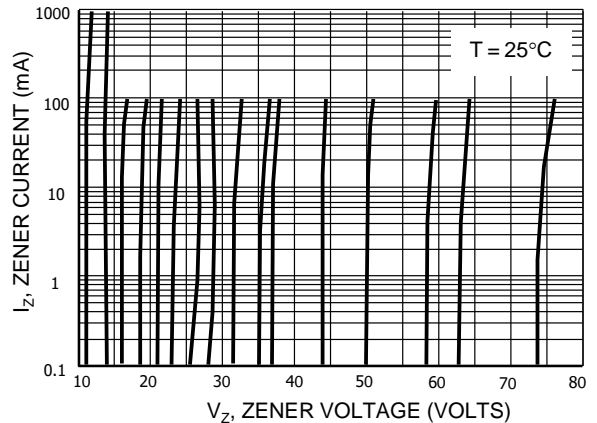
**Fig. 2 TYPICAL THERMAL RESISTANCE**



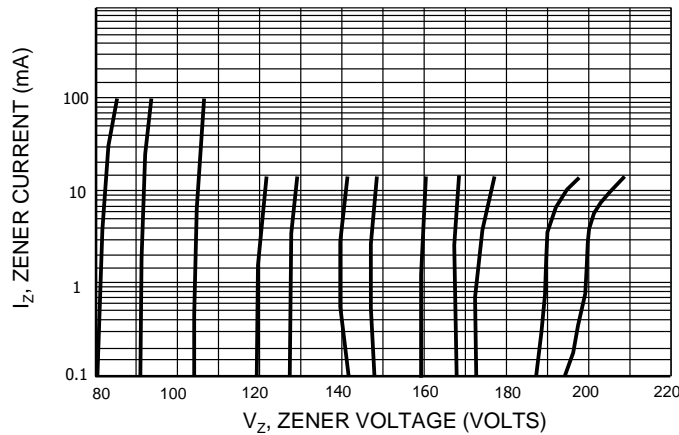
**FIG. 3 - ZENER VOLTAGE VS. ZENER CURRENT  
V<sub>Z</sub> = 3.3 thru 10 VOLTS**



**FIG. 4 - ZENER VOLTAGE VS. ZENER CURRENT  
V<sub>Z</sub> = 11 thru 75 VOLTS**



**FIG. 5 - ZENER VOLTAGE VS. ZENER CURRENT  
V<sub>Z</sub> = 82 thru 200 VOLTS**





RATING AND CHARACTERISTIC CURVES ( 1N5338B - 1N5388B )

Fig 6. Typical Thermal Response L, Lead Length = 3/8 Inch

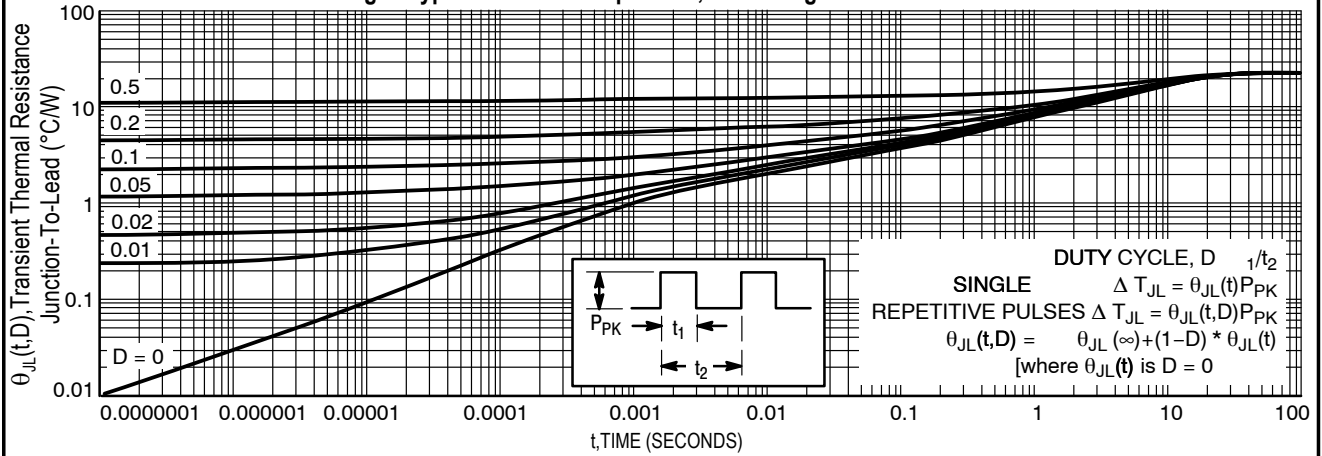


Fig.7 Maximum Non-Repetitive Surg Current versus Nominal Zener Voltage

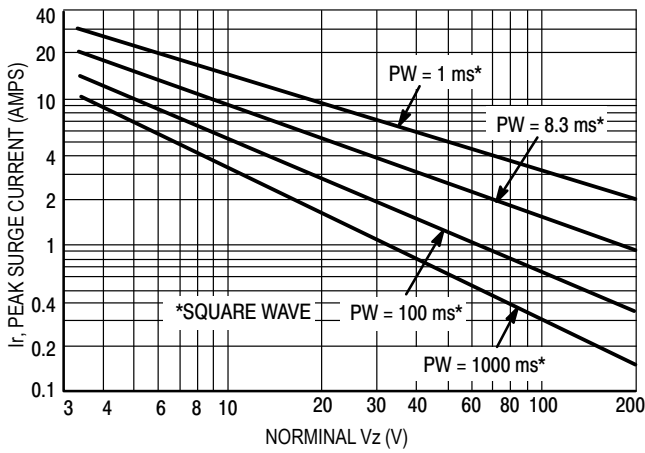


Fig. 8 Peak Surg Current versus Pulse Width

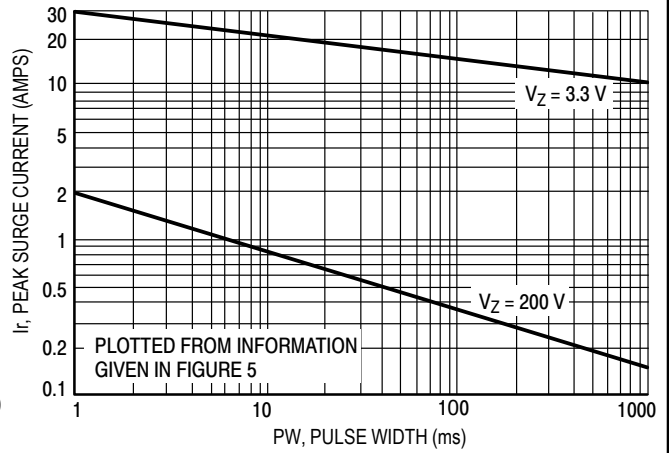


Fig.9 Temperature Coefficient-Range for Units 3 to 10 Volts

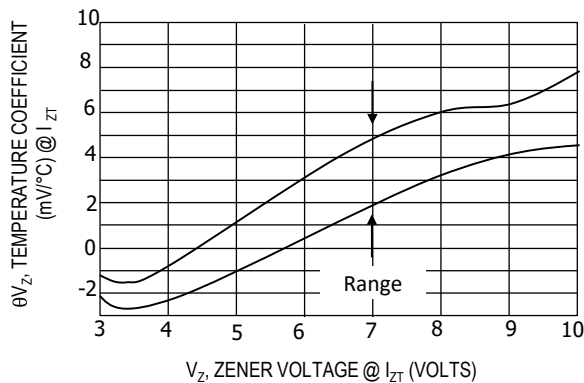


Fig.10 Temperature Coefficient-Range for Units 10 to 220 Volts

