

5-WATT  
ZENER REGULATOR  
DIODES  
3.3-200 VOLTS

1N5333A, B, C, D thru 1N5388A, B, C, D

ELECTRICAL CHARACTERISTICS ( $T_A = 25^\circ\text{C}$  unless otherwise noted,  $V_F = 1.2 \text{ Max @ } I_F = 1 \text{ A}$  for all types)

JEDEC Type No. (Note 1)	Nominal Zener Voltage $V_Z$ @ $I_Z$ Volts (Note 2)	Test Current $I_Z$ mA	Max Zener Impedance A & B Suffix Only		Max Reverse Leakage Current			Applies to all Suffix	A & B Suffix Only	Maximum Regulator Current $I_{ZM}$ mA (Note 5)
			$Z_{ZT}$ @ $I_Z$ Ohms (Note 2)	$Z_{ZK}$ @ $I_{ZK} = 1 \text{ mA}$ Ohms (Note 2)	$I_R$ $\mu\text{A}$	$V_R$ Volts				
						Non & A Suffix	B-Suffix			
1N5333A	3.3	380	3	400	300	1	1	20	0.85	1440
1N5334A	3.6	350	2.5	500	150	1	1	18.7	0.8	1320
1N5335A	3.9	320	2	500	50	1	1	17.6	0.54	1220
1N5336A	4.3	290	2	500	10	1	1	16.4	0.49	1100
1N5337A	4.7	260	2	450	5	1	1	15.3	0.44	1010
1N5338A	5.1	240	1.5	400	1	1	1	14.4	0.39	930
1N5339A	5.6	220	1	400	1	2	2	13.4	0.25	865
1N5340A	6	200	1	300	1	3	3	12.7	0.19	790
1N5341A	6.2	200	1	200	1	4	3	12.4	0.1	765
1N5342A	6.8	175	1	200	10	4.9	5.2	11.5	0.15	700
1N5343A	7.5	175	1.5	200	10	5.4	5.7	10.7	0.15	630
1N5344A	8.2	150	1.5	200	10	5.9	6.2	10	0.2	580
1N5345A	8.7	150	2	200	10	6.3	6.6	9.5	0.2	545
1N5346A	9.1	150	2	150	7.5	6.6	6.9	9.2	0.22	520
1N5347A	10	125	2	125	5	7.2	7.6	8.6	0.22	475
1N5348A	11	125	2.5	125	5	8	8.4	8	0.25	430
1N5349A	12	100	2.5	125	2	8.6	9.1	7.5	0.25	395
1N5350A	13	100	2.5	100	1	9.4	9.9	7	0.25	365
1N5351A	14	100	2.5	75	1	10.1	10.6	6.7	0.25	340
1N5352A	15	75	2.5	75	1	10.8	11.5	6.3	0.25	315
1N5353A	16	75	2.5	75	1	11.5	12.2	6	0.3	295
1N5354A	17	70	2.5	75	0.5	12.2	12.9	5.8	0.35	280
1N5355A	18	65	2.5	75	0.5	13	13.7	5.5	0.4	265
1N5356A	19	65	3	75	0.5	13.7	14.4	5.3	0.4	250
1N5357A	20	65	3	75	0.5	14.4	15.2	5.1	0.4	237
1N5358A	22	50	3.5	75	0.5	15.8	16.7	4.7	0.45	216
1N5359A	24	50	3.5	100	0.5	17.3	18.2	4.4	0.55	198
1N5360A	25	50	4	110	0.5	18	19	4.3	0.55	190
1N5361A	27	50	5	120	0.5	19.4	20.6	4.1	0.6	176
1N5362A	28	50	6	130	0.5	20.1	21.2	3.9	0.6	170
1N5363A	30	40	8	140	0.5	21.6	22.8	3.7	0.6	158
1N5364A	33	40	10	150	0.5	23.8	25.1	3.5	0.6	144
1N5365A	36	30	11	160	0.5	25.9	27.4	3.3	0.65	132
1N5366A	39	30	14	170	0.5	28.1	29.7	3.1	0.65	122
1N5367A	43	30	20	190	0.5	31	32.7	2.8	0.7	110
1N5368A	47	25	25	210	0.5	33.8	35.8	2.7	0.8	100
1N5369A	51	25	27	230	0.5	36.7	38.8	2.5	0.9	93
1N5370A	56	20	35	280	0.5	40.3	42.6	2.3	1	86
1N5371A	60	20	40	350	0.5	43	45.7	2.2	1.2	79
1N5372A	62	20	42	400	0.5	44.6	47.1	2.1	1.35	76
1N5373A	68	20	44	500	0.5	49	51.7	2	1.5	70
1N5374A	75	20	45	620	0.5	54	56	1.9	1.6	63
1N5375A	82	15	65	720	0.5	59	62.2	1.8	1.8	58
1N5376A	87	15	75	760	0.5	63	66	1.7	2	54.5
1N5377A	91	15	75	760	0.5	65.5	69.2	1.6	2.2	52.5
1N5378A	100	12	90	800	0.5	72	76	1.5	2.5	47.5
1N5379A	110	12	125	1000	0.5	79.2	83.6	1.4	2.5	43
1N5380A	120	10	170	1150	0.5	86.4	91.2	1.3	2.5	39.5
1N5381A	130	10	190	1250	0.5	93.6	98.8	1.2	2.5	36.6
1N5382A	140	8	230	1500	0.5	101	106	1.2	2.5	34
1N5383A	150	8	330	1500	0.5	108	114	1.1	3	31.6
1N5384A	160	8	350	1650	0.5	115	122	1.1	3	29.4
1N5385A	170	8	380	1750	0.5	122	129	1	3	28
1N5386A	180	5	430	1750	0.5	130	137	1	4	26.4
1N5387A	190	5	450	1850	0.5	137	144	0.9	5	25
1N5388A	200	5	480	1850	0.5	144	152	0.9	5	23.6

NOTES:

- TOLERANCE AND VOLTAGE DESIGNATION — The JEDEC type numbers shown indicate a tolerance of  $\pm 10\%$  with guaranteed limits on only  $V_Z$ ,  $I_R$ ,  $I_F$ , and  $V_F$  as shown in the electrical characteristics table. Units with guaranteed limits on all seven parameters are indicated by suffix "A" for  $\pm 10\%$  tolerance and suffix "B" for  $\pm 5\%$ , C for  $\pm 2\%$  and D for  $\pm 1\%$ .
- ZENER VOLTAGE ( $V_Z$ ) AND IMPEDANCE ( $Z_{ZT}$  &  $Z_{ZK}$ ) — Test conditions for Zener voltage and impedance are as follows:  $I_Z$  is applied  $40 \pm 10$  ms prior to reading. Mounting contacts are located  $3/8"$  to  $1/2"$  from the inside edge of mounting clips to the body of the diode. ( $T_A = 25^\circ\text{C}$ ).
- SURGE CURRENT ( $I_F$ ) — Surge current is specified as the maximum allowable peak, non-recurrent square-wave current with a pulse width, PW, of 8.3 ms. The data given in Figure 6 may be used to find the maximum surge current for a square wave of any pulse width between 1 ms and 1000 ms by plotting the

applicable points on logarithmic paper. Examples of this, using the 3.3 V and 200 V zeners, are shown in Figure 7. Mounting contact located as specified in Note 3. ( $T_A = 25^\circ\text{C}$ ).

- VOLTAGE REGULATION ( $\Delta V_Z$ ) — Test conditions for voltage regulation are as follows:  $V_Z$  measurements are made at 10% and then at 50% of the  $I_Z$  max value listed in the electrical characteristics table. The test currents are the same for the 5% and 10% tolerance devices. The test current time duration for each  $V_Z$  measurement is  $40 \pm 10$  ms. ( $T_A = 25^\circ\text{C}$ ). Mounting contact located as specified in Note 2.
- MAXIMUM REGULATOR CURRENT ( $I_{ZM}$ ) — The maximum current shown is based on the maximum voltage of a 5% type unit, therefore, it applies only to the B-suffix device. The actual  $I_{ZM}$  for any device may not exceed the value of 5 watts divided by the actual  $V_Z$  of the device.  $T_L = 75^\circ\text{C}$  at  $3/8"$  maximum from the device body.

