# 1N5333B thru 1N5388B

ALSO AVAILABLE IN SURFACE MOUNT

**Microsemi Corp.**
The diode experts

*SCOTTSDALE, AZ*
For more information call:
(602) 941-6300

**SILICON 5 WATT ZENER DIODES**

## FEATURES

- ZENER VOLTAGE 3.3V to 200V
- HIGH SURGE CURRENT CAPABILITY
- FOR AVAILABLE TOLERANCES — SEE NOTE 1

## MAXIMUM RATINGS

Operating Temperature: -65°C to +200°C
DC Power Dissipation: 5 Watts
Power Derating: 40 mW/°C above 75°C
Forward Voltage @ 1.0 A: 1.2 Volts

Datasheet.Liv

## *ELECTRICAL CHARACTERISTICS @ 25°C

| TYPE NUMBER | REGULATOR VOLTAGE ($V_Z$) | TEST CURRENT ($I_Z$) | MAXIMUM DYNAMIC IMPEDANCE ($Z_Z$) (A&B Suffix) | MAXIMUM REVERSE CURRENT ($I_R$) | $I_R$ TEST VOLTAGE ($V_R$) (Non-Suffix & A Suffix) | $I_R$ TEST VOLTAGE ($V_R$) (B, C, D Suffix) | MAXIMUM REGULATOR CURRENT ($I_{ZM}$) (B, C, D Suffix) | MAXIMUM DYNAMIC KNEE IMPEDANCE $Z_{ZK}$ at 1.0 mA (A, B, C, D Suffix) | MAXIMUM SURGE CURRENT ($I_{ZSM}$) | MAXIMUM VOLTAGE REGULATION ($\Delta V_Z$) (A, B, C, D Suffix) |
|---|---|---|---|---|---|---|---|---|---|---|
| | V | mA dc | OHMS | μA | V | V | mA | OHMS | AMPS | VOLTS |
| 1N5333B | 3.3 | 380 | 3.0 | 300 | 1.0 | 1.0 | 1440 | 400 | 20 | 0.85 |
| 1N5334B | 3.6 | 350 | 2.5 | 150 | 1.0 | 1.0 | 1320 | 500 | 18.7 | 0.80 |
| 1N5335B | 3.9 | 320 | 2.0 | 50 | 1.0 | 1.0 | 1220 | 500 | 17.6 | 0.54 |
| 1N5336B | 4.3 | 290 | 2.0 | 10 | 1.0 | 1.0 | 1100 | 500 | 16.4 | 0.49 |
| 1N5337B | 4.7 | 260 | 2.0 | 5.0 | 1.0 | 1.0 | 1010 | 450 | 15.3 | 0.44 |
| 1N5338B | 5.1 | 240 | 1.5 | 1.0 | 1.0 | 1.0 | 930 | 400 | 14.4 | 0.39 |
| 1N5339B | 5.6 | 220 | 1.0 | 1.0 | 2.0 | 2.0 | 865 | 400 | 13.4 | 0.25 |
| 1N5340B | 6.0 | 200 | 1.0 | 1.0 | 3.0 | 3.0 | 790 | 300 | 12.7 | 0.19 |
| 1N5341B | 6.2 | 200 | 1.0 | 1.0 | 3.0 | 3.0 | 765 | 200 | 12.4 | 0.10 |
| 1N5342B | 6.8 | 175 | 1.0 | 10 | 4.9 | 5.2 | 700 | 200 | 11.5 | 0.15 |
| 1N5343B | 7.5 | 175 | 1.5 | 10 | 5.4 | 5.7 | 630 | 200 | 10.7 | 0.15 |
| 1N5344B | 8.2 | 150 | 1.5 | 10 | 5.9 | 6.2 | 580 | 200 | 10 | 0.20 |
| 1N5345B | 8.7 | 150 | 2.0 | 10 | 6.25 | 6.6 | 545 | 200 | 9.5 | 0.20 |
| 1N5346B | 9.1 | 150 | 2.0 | 7.5 | 6.6 | 6.9 | 520 | 150 | 9.2 | 0.22 |
| 1N5347B | 10 | 125 | 2.0 | 5.0 | 7.2 | 7.6 | 475 | 125 | 8.6 | 0.22 |
| 1N5348B | 11 | 125 | 2.5 | 5.0 | 8.0 | 8.4 | 430 | 125 | 8.0 | 0.25 |
| 1N5349B | 12 | 100 | 2.5 | 2.0 | 8.6 | 9.1 | 395 | 125 | 7.5 | 0.25 |
| 1N5350B | 13 | 100 | 2.5 | 1.0 | 9.4 | 9.9 | 365 | 100 | 7.0 | 0.25 |
| 1N5351B | 14 | 100 | 2.5 | 1.0 | 10.1 | 10.6 | 340 | 75 | 6.7 | 0.25 |
| 1N5352B | 15 | 75 | 2.5 | 1.0 | 10.8 | 11.5 | 315 | 75 | 6.3 | 0.25 |
| 1N5353B | 16 | 75 | 2.5 | 1.0 | 11.5 | 12.2 | 295 | 75 | 6.0 | 0.30 |
| 1N5354B | 17 | 70 | 2.5 | 0.5 | 12.2 | 12.9 | 280 | 75 | 5.8 | 0.35 |
| 1N5355B | 18 | 65 | 2.5 | 0.5 | 13 | 13.7 | 264 | 75 | 5.5 | 0.40 |
| 1N5356B | 19 | 65 | 3.0 | 0.5 | 13.7 | 14.4 | 250 | 75 | 5.3 | 0.40 |
| 1N5357B | 20 | 65 | 3.0 | 0.5 | 14.4 | 15.2 | 237 | 75 | 5.1 | 0.40 |
| 1N5358B | 22 | 50 | 3.5 | 0.5 | 15.8 | 16.7 | 216 | 75 | 4.7 | 0.45 |
| 1N5359B | 24 | 50 | 3.5 | 0.5 | 17.3 | 18.2 | 198 | 100 | 4.4 | 0.55 |
| 1N5360B | 25 | 50 | 4.0 | 0.5 | 18 | 19 | 190 | 110 | 4.3 | 0.55 |
| 1N5361B | 27 | 50 | 5.0 | 0.5 | 19.4 | 20.6 | 176 | 120 | 4.1 | 0.60 |
| 1N5362B | 28 | 50 | 6.0 | 0.5 | 20.1 | 21.2 | 170 | 130 | 3.9 | 0.60 |
| 1N5363B | 30 | 40 | 8.0 | 0.5 | 21.6 | 22.8 | 158 | 140 | 3.7 | 0.60 |
| 1N5364B | 33 | 40 | 10 | 0.5 | 23.8 | 25.1 | 144 | 150 | 3.5 | 0.60 |
| 1N5365B | 36 | 30 | 11 | 0.5 | 25.9 | 27.4 | 132 | 160 | 3.3 | 0.65 |
| 1N5366B | 39 | 30 | 14 | 0.5 | 28.1 | 29.7 | 122 | 170 | 3.1 | 0.65 |
| 1N5367B | 43 | 30 | 20 | 0.5 | 31 | 32.7 | 110 | 190 | 2.8 | 0.70 |
| 1N5368B | 47 | 25 | 25 | 0.5 | 33.8 | 35.8 | 100 | 210 | 2.7 | 0.80 |
| 1N5369B | 51 | 25 | 27 | 0.5 | 36.7 | 38.8 | 93 | 230 | 2.5 | 0.90 |
| 1N5370B | 56 | 20 | 35 | 0.5 | 40.3 | 42.6 | 86 | 280 | 2.3 | 1.00 |
| 1N5371B | 60 | 20 | 40 | 0.5 | 43 | 45.5 | 79 | 350 | 2.2 | 1.20 |
| 1N5372B | 62 | 20 | 42 | 0.5 | 44.6 | 47.1 | 76 | 400 | 2.1 | 1.35 |
| 1N5373B | 68 | 20 | 44 | 0.5 | 49 | 51.7 | 70 | 500 | 2.0 | 1.50 |
| 1N5374B | 75 | 20 | 45 | 0.5 | 54 | 56 | 63 | 620 | 1.9 | 1.60 |
| 1N5375B | 82 | 15 | 65 | 0.5 | 59 | 62.2 | 58 | 720 | 1.8 | 1.80 |
| 1N5376B | 87 | 15 | 75 | 0.5 | 63 | 66 | 54.5 | 760 | 1.7 | 2.00 |
| 1N5377B | 91 | 15 | 75 | 0.5 | 65.5 | 69.2 | 52.5 | 760 | 1.6 | 2.20 |
| 1N5378B | 100 | 12 | 90 | 0.5 | 72 | 76 | 47.5 | 800 | 1.5 | 2.30 |
| 1N5379B | 110 | 12 | 125 | 0.5 | 79.2 | 83.6 | 43 | 1000 | 1.4 | 2.50 |
| 1N5380B | 120 | 10 | 170 | 0.5 | 86.4 | 91.2 | 39.5 | 1150 | 1.3 | 2.50 |
| 1N5381B | 130 | 10 | 190 | 0.5 | 93.6 | 98.8 | 36.6 | 1250 | 1.2 | 2.50 |
| 1N5382B | 140 | 8.0 | 230 | 0.5 | 101 | 106 | 34 | 1500 | 1.2 | 2.50 |
| 1N5383B | 150 | 8.0 | 330 | 0.5 | 108 | 114 | 31.6 | 1500 | 1.1 | 3.00 |
| 1N5384B | 160 | 8.0 | 350 | 0.5 | 115 | 122 | 29.4 | 1650 | 1.1 | 3.00 |
| 1N5385B | 170 | 8.0 | 380 | 0.5 | 122 | 129 | 28 | 1750 | 1.0 | 3.00 |
| 1N5386B | 180 | 5.0 | 430 | 0.5 | 130 | 137 | 26.4 | 1750 | 1.0 | 4.00 |
| 1N5387B | 190 | 5.0 | 450 | 0.5 | 137 | 144 | 25 | 1850 | 0.9 | 5.00 |
| 1N5388B | 200 | 5.0 | 480 | 0.5 | 144 | 152 | 23.6 | 1850 | 0.9 | 5.00 |

*JEDEC Registered Data.

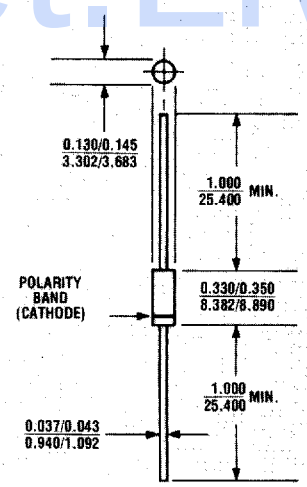


**FIGURE 1**
All dimensions in INCH / m.m.

## MECHANICAL CHARACTERISTICS

CASE: Void free, transfer molded, thermosetting plastic (T-18).

FINISH: Corrosion resistant, readily solderable.

POLARITY: Cathode Banded.

WEIGHT: 0.7 gram (approx.).

MOUNTING POSITION: Any.



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# 1N5333B thru 1N5388B

**NOTE 1** Devices listed have a ±5% tolerance on nominal $V_Z$. The suffix A denotes a ± 10%, C denotes ± 2%, D denotes ± 1%, and no suffix denotes a ±20% tolerance.

**NOTE 2** Nominal Zener Voltage ($V_Z$) is read with the device in standard test clips with 3/8 to 1/2 inch spacing between clip and case of the diode. Before reading the diode is allowed so stabilize for a period of 40 ±10 milliseconds at 25°C (+8, −2°C).

**NOTE 3** The Zener Impedance ($Z_{ZT}$ or $Z_{ZK}$) is derived from the 60 Hz ac voltage, which results when an ac current having a rms value equal to 10% of the DC zener current ($I_{ZT}$ or $I_{ZK}$) is superimposed on $I_{ZT}$ or $I_{ZK}$ respectively.

**NOTE 4** The Maximum Reverse (leakage) Current is specified for devices with ±20% and ±10% voltage tolerances on nominal $V_Z$ in another column.

**NOTE 5** The Maximum Zener Current ($I_{ZM}$) shown is for ±5% tolerance devices. $I_{ZM}$ for ±10% and ±20% devices can be calculated using the formula:

$$I_{ZM} = \frac{P}{V_{ZM}}$$

where "$V_{ZM}$" is $V_Z$ at the high end of the voltage tolerance specified and "P" is the rated power of the device.

**NOTE 6** The Surge Current ($I_{ZSM}$) is specified as the maximum peak of a nonrecurrent sine wave of 8.3 milliseconds duration.

**NOTE 7** Voltage Regulation ($\Delta V_Z$) is the difference between the voltage measured at 10% and 50% of $I_{ZM}$.

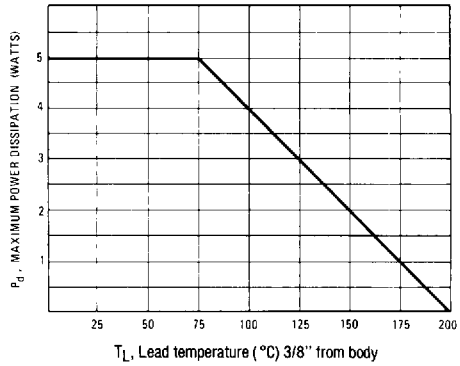


**FIGURE 2** POWER DERATING CURVE

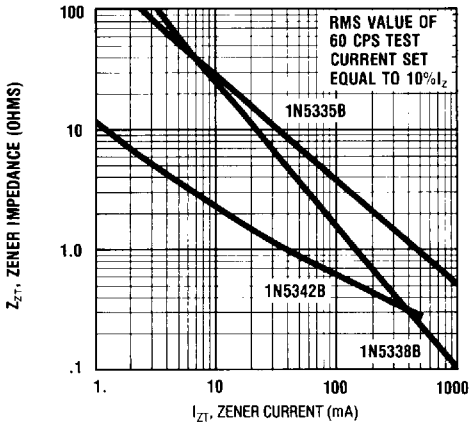


**FIGURE 3**
TYPICAL ZENER IMPEDANCE VS.
ZENER CURRENT FOR TYPES SHOWN

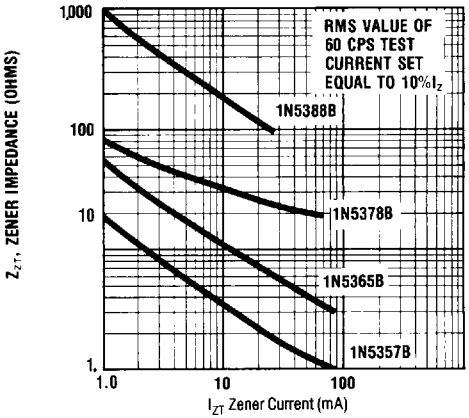


**FIGURE 4**
TYPICAL ZENER IMPEDANCE VS.
ZENER CURRENT FOR TYPES SHOWN

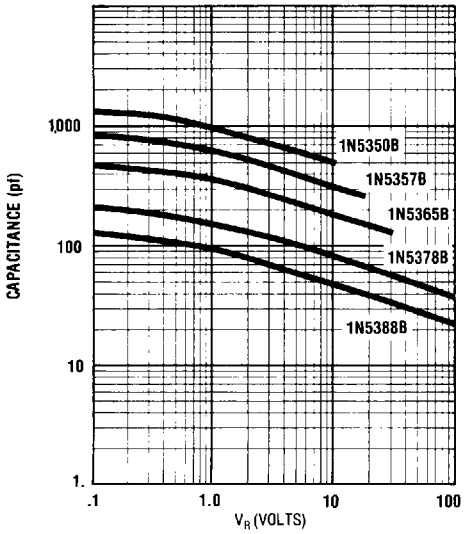


**FIGURE 5**
TYPICAL CAPACITANCE VS.
REVERSE VOLTAGE FOR 5 WATT ZENERS

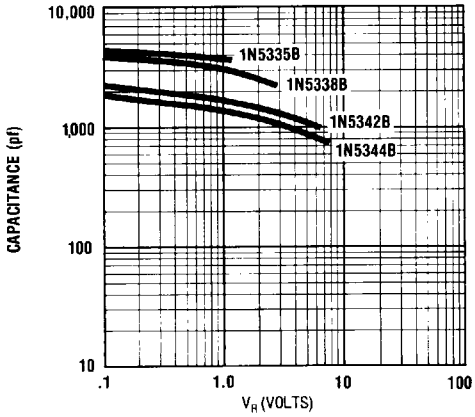


**FIGURE 6**
TYPICAL CAPACITANCE VS.
REVERSE VOLTAGE FOR 5 WATT ZENERS



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