

DESCRIPTION

These high power 50 W Zener diodes represented by the JEDEC registered 1N3305 thru 1N3350B and 1N4549 thru 1N4556B series provide voltage regulation in a selection over a 3.9 V to 200 V broad range of voltages. They may be operated up to 50 W with adequate mounting and heat sinking with their low thermal resistance. These Zeners are also available in JAN, JANTX, JANTXV military qualifications. Microsemi also offers numerous other Zener products to meet higher and lower power applications.

APPEARANCE



**DO-5
(DO-203AB)**

IMPORTANT: For the most current data, consult MICROSEMI's website: <http://www.microsemi.com>

FEATURES

- JEDEC registered 1N3305 thru 1N3350B and 1N4549 thru 1N4556B
- Internal solder bond construction
- Hermetically sealed (welded)
- Zener Voltage 3.9V to 200V.
- Also available in JAN, JANTX, and JANTXV qualifications per MIL-PRF-19500/358 by adding the JAN, JANTX, or JANTXV prefixes to part numbers for desired level of screening; (e.g. JANTX1N3305B, JANTXV1N3318B, etc.
- Standard polarity is anode to case
- Reverse polarity with cathode to case by designating R suffix in part number, e.g. 1N3305RB, etc.
- Consult factory for surface mount equivalents

APPLICATIONS / BENEFITS

- Regulates voltage over a broad operating current and temperature range
- Standard voltage tolerances are +/- 5% with B suffix, +/-10% with an A suffix, and +/-20% with no suffix
- Consult factory for +/-2% or +/-1% with a C or D suffix respectively
- Reverse polarity available
- Nonsensitive to ESD per MIL-STD-750 Method 1020
- Inherently radiation hard as described in Microsemi MicroNote 050

MAXIMUM RATINGS

- Junction & Storage Temperatures: -65°C to +175°C
- DC Power Dissipation: 50 watts at $T_C \leq 75^\circ\text{C}$
- Power Derating: 0.5 W/°C above 75°C
- Forward Voltage @ 10 A: 1.5 Volts
- THERMAL RESISTANCE: 2.0 °C/W maximum junction to hexagonal base (1.5 °C/W typical)
- Solder temperatures: 260 °C for 10 s (max)

MECHANICAL AND PACKAGING

- CASE: Industry Standard DO-5 (DO-203AB), 11/16 inch hexagonal stud with 1/4-28 threads welded hermetically sealed metal and glass
- FINISH: All external surfaces are corrosion resistant and terminal solderable.
- POLARITY: Standard Polarity units are connected anode to case. Reverse polarity (cathode to case) is indicated by Suffix R in part number
- WEIGHT: 15 grams
- MOUNTING HARDWARE: Consult factory for optional insulator, bushing, solder terminal, washers and nut
- See package dimensions on last page



**1N3305 thru 1N3350B
and 1N4549B thru 1N4556B**
50 WATT ZENER DIODES

***ELECTRICAL CHARACTERISTICS @ 30°C Case Temperature**

| JEDEC TYPE NO. (Note 1) | NOMINAL ZENER VOLTAGE V _Z @ I _{ZT} Volts (Note 2) † | ZENER TEST CURRENT (I _{ZT}) mA † | MAX. DYNAMIC IMPEDANCE (Note 3) † | | MAX. DC ZENER CURRENT (I _{ZM}) mA | MAX. REVERSE CURRENT** I _R (max) @ V _R | | TYPICAL TEMP. COEFF. α _{VZ} %/°C |
|-------------------------------|--|---|---|--|---|--|-------|---|
| | | | Z _{ZT} @ I _{ZT} OHMS | Z _{ZK} @ I _{ZK} = 5 mA OHMS | | μA | VOLTS | |
| | | | | | | | | |
| †1N4549B | 3.9 | 3,200 | 0.16 | 400 | 11,900 | 150 | 0.5 | -0.046 |
| †1N4550B | 4.3 | 2,900 | 0.16 | 500 | 10,650 | 150 | 0.5 | -0.033 |
| †1N4551B | 4.7 | 2,650 | 0.12 | 600 | 9,700 | 100 | 1.0 | -0.015 |
| †1N4552B | 5.1 | 2,450 | 0.12 | 650 | 8,900 | 20 | 1.0 | +/-0.010 |
| †1N4553B | 5.6 | 2,250 | 0.12 | 900 | 8,100 | 20 | 1.0 | +0.030 |
| †1N4554B | 6.2 | 2,000 | 0.14 | 1,000 | 7,300 | 20 | 2.0 | +0.049 |
| 1N4555B | 6.8 | 1,850 | 0.16 | 200 | 6,650 | 10 | 2.0 | +0.053 |
| 1N4556B | 7.5 | 1,650 | 0.24 | 100 | 6,050 | 10 | 3.0 | +0.057 |
| †1N3305B | 6.8 | 1,850 | 0.20 | 70 | 6,600 | 300 | 4.5 | 0.040 |
| †1N3306B | 7.5 | 1,700 | 0.30 | 70 | 5,900 | 125 | 5.0 | 0.045 |
| †1N3307B | 8.2 | 1,500 | 0.40 | 70 | 5,200 | 50 | 5.4 | 0.048 |
| †1N3308B | 9.1 | 1,370 | 0.50 | 70 | 4,800 | 25 | 6.1 | 0.050 |
| †1N3309B | 10.0 | 1,200 | 0.60 | 80 | 4,300 | 25 | 6.7 | 0.055 |
| †1N3310B | 11.0 | 1,100 | 0.80 | 80 | 3,900 | 10 | 8.4 | 0.060 |
| †1N3311B | 12.0 | 1,000 | 1.00 | 80 | 3,800 | 10 | 9.1 | 0.065 |
| †1N3312B | 13.0 | 960 | 1.10 | 80 | 3,300 | 10 | 9.9 | 0.065 |
| 1N3313B | 14.0 | 890 | 1.20 | 80 | 3,000 | 10 | 11.4 | 0.070 |
| †1N3314B | 15.0 | 830 | 1.40 | 80 | 2,800 | 10 | 11.4 | 0.070 |
| †1N3315B | 16.0 | 780 | 1.60 | 80 | 2,650 | 10 | 12.2 | 0.070 |
| 1N3316B | 17.0 | 740 | 1.80 | 80 | 2,500 | 10 | 13.0 | 0.075 |
| †1N3317B | 18.0 | 700 | 2.00 | 80 | 2,300 | 10 | 13.7 | 0.075 |
| 1N3318B | 19.0 | 660 | 2.20 | 80 | 2,200 | 10 | 13.7 | 0.075 |
| †1N3319B | 20.0 | 630 | 2.40 | 80 | 2,100 | 10 | 15.2 | 0.075 |
| †1N3320B | 22.0 | 570 | 2.50 | 80 | 1,900 | 10 | 16.7 | 0.080 |
| †1N3321B | 24.0 | 520 | 2.60 | 80 | 1,750 | 10 | 18.2 | 0.080 |
| 1N3322B | 25.0 | 500 | 2.70 | 90 | 1,550 | 10 | 18.2 | 0.080 |
| †1N3323B | 27.0 | 460 | 2.80 | 90 | 1,500 | 10 | 20.6 | 0.085 |
| †1N3324B | 30.0 | 420 | 3.00 | 90 | 1,400 | 10 | 22.8 | 0.085 |
| †1N3325B | 33.0 | 380 | 3.20 | 90 | 1,300 | 10 | 25.1 | 0.085 |
| †1N3326B | 36.0 | 350 | 3.50 | 90 | 1,150 | 10 | 27.4 | 0.085 |
| †1N3327B | 39.0 | 320 | 4.00 | 90 | 1,050 | 10 | 29.7 | 0.090 |
| †1N3328B | 43.0 | 290 | 4.50 | 90 | 975 | 10 | 32.7 | 0.090 |
| 1N3329B | 45.0 | 280 | 4.50 | 100 | 930 | 10 | 32.7 | 0.090 |
| †1N3330B | 47.0 | 270 | 5.00 | 100 | 880 | 10 | 35.8 | 0.090 |
| 1N3331B | 50.0 | 250 | 5.00 | 100 | 830 | 10 | 38.8 | 0.090 |
| †1N3332B | 51.0 | 245 | 5.20 | 100 | 810 | 10 | 38.8 | 0.090 |
| 1N3333B | 52.0 | 240 | 5.50 | 100 | 790 | 10 | 42.6 | 0.090 |
| †1N3334B | 56.0 | 220 | 6.00 | 110 | 740 | 10 | 42.6 | 0.090 |
| †1N3335B | 62.0 | 200 | 7.00 | 120 | 660 | 10 | 47.1 | 0.090 |
| †1N3336B | 68.0 | 180 | 8.00 | 140 | 600 | 10 | 51.7 | 0.090 |
| †1N3337B | 75.0 | 170 | 9.00 | 150 | 540 | 10 | 56.0 | 0.090 |
| †1N3338B | 82.0 | 150 | 11.00 | 160 | 490 | 10 | 62.2 | 0.090 |
| †1N3339B | 91.0 | 140 | 15.00 | 180 | 420 | 10 | 69.2 | 0.090 |
| †1N3340B | 100.0 | 120 | 20.00 | 200 | 400 | 10 | 76.0 | 0.090 |
| 1N3341B | 105.0 | 120 | 25.00 | 210 | 380 | 10 | 83.0 | 0.095 |
| †1N3342B | 110.0 | 110 | 30.00 | 220 | 365 | 10 | 83.0 | 0.095 |
| †1N3343B | 120.0 | 100 | 40.00 | 240 | 335 | 10 | 91.2 | 0.095 |
| †1N3344B | 130.0 | 95 | 50.00 | 275 | 310 | 10 | 99.8 | 0.095 |
| 1N3345B | 140.0 | 90 | 60.00 | 325 | 290 | 10 | 114.0 | 0.095 |
| †1N3346B | 150.0 | 85 | 75.00 | 400 | 270 | 10 | 114.0 | 0.095 |
| †1N3347B | 160.0 | 80 | 80.00 | 450 | 250 | 10 | 121.6 | 0.095 |
| 1N3348B | 175.0 | 70 | 85.00 | 500 | 230 | 10 | 121.6 | 0.095 |
| †1N3349B | 180.0 | 68 | 90.00 | 525 | 220 | 10 | 136.8 | 0.095 |
| †1N3350B | 200.0 | 65 | 100.00 | 600 | 200 | 10 | 152.0 | 0.100 |

*JEDEC Registered Data. **Not JEDEC Data.

†Have JAN and JANTX and TXV Qualifications to MIL-S-19500/358.

See further notes on following page

- NOTES:**
1. When using JEDEC numbers an R suffix should be used to signify reversed polarity. The suffixes A and B indicate tolerances of 10% and 5% respectively. No suffix or just R denotes +/-20% tolerance. Example: 1N3319RB is a REVERSED polarity, 20 volt unit having a +/-5% tolerance on Zener Voltage.
 2. Zener Voltage (V_Z) is measured with junction in thermal equilibrium with 30°C stud temperature.
 3. The Zener impedance is derived from the 60 cycle ac voltage, which results when an ac current having an rms value equal to 10% of the dc zener current (I_{ZT} or I_{ZK}) is superimposed on I_{ZT} or I_{ZK} . Zener impedance is measured at 2 points to ensure a sharp knee on the breakdown curve and to eliminate unstable units. A curve showing the variation of zener impedance vs. zener current for three representative types is shown in Figure 2. Also see Microsemi MicroNote 202.

OUTLINE AND CIRCUIT



FIGURE 1
Power Derating Curve



FIGURE 2
Typical Zener Impedance vs. Zener Current

PACKAGE DIMENSIONS



All Dimensions in: INCH
mm

