

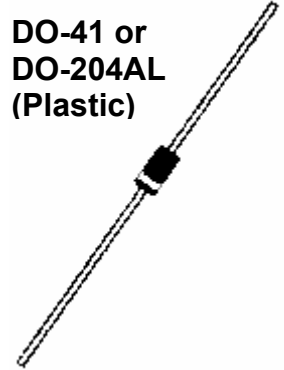
ALSO
AVAILABLE IN
SURFACE
MOUNT

DESCRIPTION

The 3EZ3.9D5 thru 3EZ200D5 series of axial-leaded 3.0 watt Zeners provides voltage regulation selections with 5% tolerances from 3.9 to 200 volts in a DO-41 plastic package size. Other Zener voltage tolerances are also available by changing the suffix number to the tolerance desired such as 1, 2 3, or 4 for tighter tolerances or 10 for wider tolerance. These plastic encapsulated Zeners are also available in various military equivalent screening levels by adding a prefix identifier as also described in the Features section. They may be operated at high maximum dc currents or full power rating with adequate heat. Microsemi also offers numerous other Zener products to meet higher and lower power applications.

APPEARANCE

**DO-41 or
DO-204AL
(Plastic)**



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

FEATURES

- Zener voltage available 3.9 V to 200 V
- Standard voltage tolerances are plus/minus 5% with a 5 suffix and 10 % with 10 suffix identification
- Tight tolerances available in plus or minus 4%, 3%, 2% or 1% with 4, 3, 2, or 1 suffix respectively
- Options for screening in accordance with MIL-PRF-19500 for JAN, JANTX, JANTXV, and JANS are available by adding MQ, MX, MV, or MSP prefixes respectively to part numbers.
- Surface mount equivalents available as SMBJ3EZ3.9D5 to SMBJ3EZ200D5 in the DO-214AA package, or SMBG3EZ3.9D5 to SMBG3EZ200D5 in the DO-215AA package
- RoHS compliant devices available by adding "e3" suffix

APPLICATIONS / BENEFITS

- Regulates voltage over a broad operating current and temperature range
- 3 W capability in relatively small DO-41 package size when adequately heat sunk (see Figure 1)
- Wide selection from 3.9 to 200 V
- Flexible axial-lead mounting terminals
- Nonsensitive to ESD per MIL-STD-750 Method 1020
- Withstands surge stresses
- High specified maximum current (I_{ZM}) when adequately heat sunk

MAXIMUM RATINGS

- Power dissipation at 25°C: 3.0 watts (also see derating in Figure 1).
- Operating and Storage temperature: -65°C to +150°C
- Thermal Resistance: 40 °C/W junction to lead at 3/8 (10 mm) lead length from body, or 100°C/W junction to ambient when mounted on FR4 PC board (1oz Cu) with 4 mm² copper pads and track width 1 mm, length 25 mm
- Steady-State Power: 3 watts at $T_L \leq 30^\circ\text{C}$ 3/8 inch (10 mm) from body, or 1.25 watts at $T_A = 25^\circ\text{C}$ when mounted on FR4 PC described for thermal resistance (also see Figure 1)
- Forward voltage @200 mA: 1.2 volts (maximum)
- Solder Temperatures: 260 °C for 10 s (max)

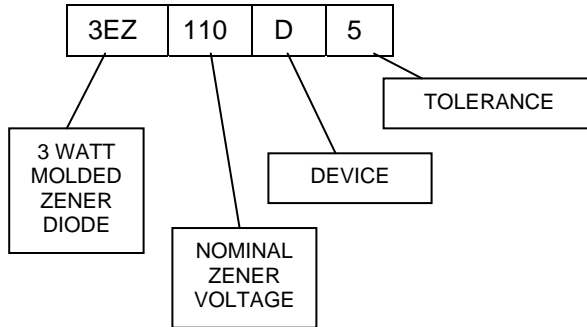
MECHANICAL AND PACKAGING

- CASE: Void-free transfer molded thermosetting epoxy body meeting UL94V-0
- TERMINALS: Leads, tin-lead or RoHS compliant annealed matte-Tin plating solderable per MIL-STD-750, method 2026
- POLARITY: Cathode indicated by band where diode is to be operated with the banded end positive with respect to the opposite end for Zener regulation
- MARKING: Part number
- TAPE & REEL option: Standard per EIA-296 (add "TR" suffix to part number)
- WEIGHT: 0.4 grams
- See package dimensions on last page

ELECTRICAL CHARACTERISTICS @ 25°C

| MICRO TYPE NUMBER (Note 1) | NOMINAL ZENER VOLTAGE (Note 2) | | MAXIMUM ZENER IMPEDANCE (Note 3) | | | MAXIMUM REVERSE CURRENT | | MAXIMUM ZENER CURRENT | MAXIMUM SURGE CURRENT (Note 4) |
|----------------------------|--------------------------------|-----|----------------------------------|-------------------|------|-------------------------|-------|-----------------------|--------------------------------|
| | $V_Z @ I_{ZT}$ | | $Z_{ZT} @ I_{ZT}$ | $Z_{ZK} @ I_{ZK}$ | | $I_R @ V_R$ | | | |
| | VOLTS | mA | OHMS | OHMS | mA | μA | VOLTS | mA | A |
| 3EZ3.9D5 | 3.9 | 192 | 4.5 | 400 | 1.0 | 80 | 1.0 | 630 | 4.4 |
| 3EZ4.3D5 | 4.3 | 174 | 4.5 | 400 | 1.0 | 30 | 1.0 | 590 | 4.1 |
| 3EZ4.7D5 | 4.7 | 160 | 4.0 | 500 | 1.0 | 20 | 1.0 | 550 | 3.8 |
| 3EZ5.1D5 | 5.1 | 147 | 3.5 | 550 | 1.0 | 5.0 | 1.0 | 520 | 3.5 |
| 3EZ5.6D5 | 5.6 | 134 | 2.5 | 600 | 1.0 | 5.0 | 2.0 | 480 | 3.3 |
| 3EZ6.2D5 | 6.2 | 121 | 1.5 | 700 | 1.0 | 5.0 | 3.0 | 435 | 3.1 |
| 3EZ6.8D5 | 6.8 | 110 | 2.0 | 700 | 1.0 | 5.0 | 4.0 | 393 | 2.9 |
| 3EZ7.5D5 | 7.5 | 100 | 2.0 | 700 | 0.5 | 5.0 | 5.0 | 360 | 2.66 |
| 3EZ8.2D5 | 8.2 | 91 | 2.3 | 700 | 0.5 | 5.0 | 6.0 | 330 | 2.44 |
| 3EZ9.1D5 | 9.1 | 82 | 2.5 | 700 | 0.5 | 3.0 | 7.0 | 297 | 2.2 |
| 3EZ10D5 | 10 | 75 | 3.5 | 700 | 0.25 | 3.0 | 7.6 | 270 | 2.0 |
| 3EZ11D5 | 11 | 68 | 4.0 | 700 | 0.25 | 1.0 | 8.4 | 225 | 1.82 |
| 3EZ12D5 | 12 | 63 | 4.5 | 700 | 0.25 | 1.0 | 9.1 | 246 | 1.66 |
| 3EZ13D5 | 13 | 58 | 4.5 | 700 | 0.25 | 0.5 | 9.9 | 208 | 1.54 |
| 3EZ14D5 | 14 | 53 | 5.0 | 700 | 0.25 | 0.5 | 10.6 | 193 | 1.43 |
| 3EZ15D5 | 15 | 50 | 5.5 | 700 | 0.25 | 0.5 | 11.4 | 180 | 1.33 |
| 3EZ16D5 | 16 | 47 | 5.5 | 700 | 0.25 | 0.5 | 12.2 | 169 | 1.25 |
| 3EZ17D5 | 17 | 44 | 6.0 | 750 | 0.25 | 0.5 | 13 | 150 | 1.18 |
| 3EZ18D5 | 18 | 42 | 6.0 | 750 | 0.25 | 0.5 | 13.7 | 159 | 1.11 |
| 3EZ19D5 | 19 | 40 | 7.0 | 750 | 0.25 | 0.5 | 14.4 | 142 | 1.05 |
| 3EZ20D5 | 20 | 37 | 7.0 | 750 | 0.25 | 0.5 | 15.2 | 135 | 1.0 |
| 3EZ22D5 | 22 | 34 | 8.0 | 750 | 0.25 | 0.5 | 16.7 | 123 | 0.91 |
| 3EZ24D5 | 24 | 31 | 9.0 | 750 | 0.25 | 0.5 | 18.2 | 112 | 0.83 |
| 3EZ27D5 | 27 | 28 | 10 | 750 | 0.25 | 0.5 | 20.6 | 100 | 0.74 |
| 3EZ28D5 | 28 | 27 | 12 | 750 | 0.25 | 0.5 | 21 | 96 | 0.71 |
| 3EZ30D5 | 30 | 25 | 16 | 1000 | 0.25 | 0.5 | 22.5 | 90 | 0.67 |
| 3EZ33D5 | 33 | 23 | 20 | 1000 | 0.25 | 0.5 | 25.1 | 82 | 0.61 |
| 3EZ36D5 | 36 | 21 | 22 | 1000 | 0.25 | 0.5 | 27.4 | 75 | 0.56 |
| 3EZ39D5 | 39 | 19 | 28 | 1000 | 0.25 | 0.5 | 29.7 | 69 | 0.51 |
| 3EZ43D5 | 43 | 17 | 33 | 1500 | 0.25 | 0.5 | 32.7 | 63 | 0.45 |
| 3EZ47D5 | 47 | 16 | 38 | 1500 | 0.25 | 0.5 | 35.6 | 57 | 0.42 |
| 3EZ51D5 | 51 | 15 | 45 | 1500 | 0.25 | 0.5 | 38.8 | 53 | 0.39 |
| 3EZ56D5 | 56 | 13 | 50 | 2000 | 0.25 | 0.5 | 42.6 | 48 | 0.36 |
| 3EZ62D5 | 62 | 12 | 55 | 2000 | 0.25 | 0.5 | 47.1 | 44 | 0.32 |
| 3EZ68D5 | 68 | 11 | 70 | 2000 | 0.25 | 0.5 | 51.7 | 40 | 0.29 |
| 3EZ75D5 | 75 | 10 | 85 | 2000 | 0.25 | 0.5 | 56 | 36 | 0.27 |
| 3EZ82D5 | 82 | 9.1 | 95 | 3000 | 0.25 | 0.5 | 62.2 | 33 | 0.24 |
| 3EZ91D5 | 91 | 8.2 | 115 | 3000 | 0.25 | 0.5 | 69.2 | 30 | 0.22 |
| 3EZ100D5 | 100 | 7.5 | 160 | 3000 | 0.25 | 0.5 | 76 | 27 | 0.20 |
| 3EZ110D5 | 110 | 6.8 | 225 | 4000 | 0.25 | 0.5 | 83.6 | 25 | 0.18 |
| 3EZ120D5 | 120 | 6.3 | 300 | 4500 | 0.25 | 0.5 | 91.2 | 22 | 0.16 |
| 3EZ130D5 | 130 | 5.8 | 375 | 5000 | 0.25 | 0.5 | 98.8 | 21 | 0.15 |
| 3EZ140D5 | 140 | 5.3 | 475 | 5000 | 0.25 | 0.5 | 106.4 | 19 | 0.14 |
| 3EZ150D5 | 150 | 5.0 | 550 | 6000 | 0.25 | 0.5 | 114 | 18 | 0.13 |
| 3EZ160D5 | 160 | 4.7 | 625 | 6500 | 0.25 | 0.5 | 121.6 | 17 | 0.12 |
| 3EZ170D5 | 170 | 4.4 | 650 | 7000 | 0.25 | 0.5 | 130.4 | 16 | 0.12 |
| 3EZ180D5 | 180 | 4.2 | 700 | 7000 | 0.25 | 0.5 | 136.8 | 15 | 0.11 |
| 3EZ190D5 | 190 | 4.0 | 800 | 8000 | 0.25 | 0.5 | 144.8 | 14 | 0.10 |
| 3EZ200D5 | 200 | 3.7 | 875 | 8000 | 0.25 | 0.5 | 152 | 13 | 0.10 |

- NOTES:**
- Suffix 1 indicates +/-1% tolerance, suffix 2 indicates +/-2% tolerance, suffix 3 indicates +/-3% tolerance, suffix 4 indicates +/-4% tolerance, suffix 5 indicates +/-5% tolerance. Suffix 10 indicates +/-10%, no suffix indicates +/-20%.
 - The V_Z is measured by applying I_Z 40 ms +/-10 ms prior to reading. Mounting contacts are located 3/8" to 1/2" from inside edge of mounting clips. Ambient temperature, $T_A = 25^\circ\text{C}$ (+8°C/-2°C).
 - The zener impedance is derived from the 60 cycle ac voltage resulting from 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} .
 - Maximum Surge Current is a non-recurrent maximum peak reverse surge with a pulse width of 8.3 ms.



GRAPHS

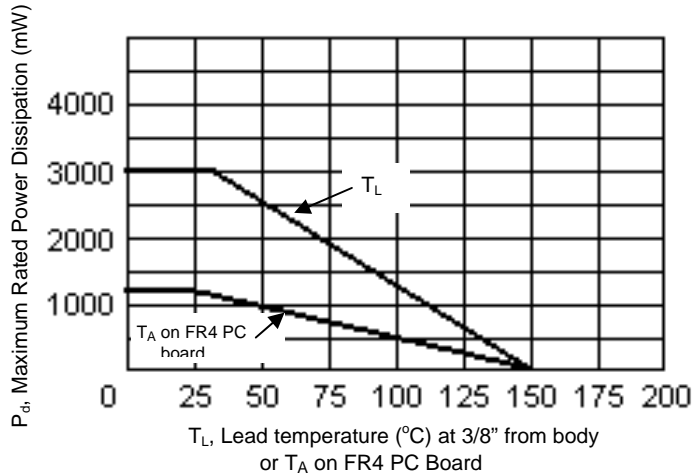
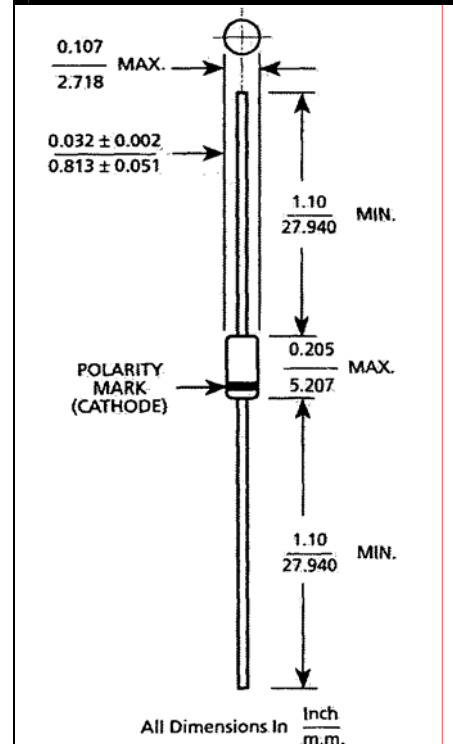


FIGURE 1
POWER DERATING CURVE

PACKAGE DIMENSIONS



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