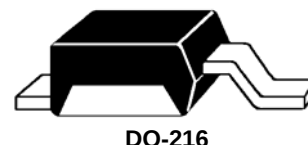


**DESCRIPTION**

This surface mountable 3.0 W Zener diode series in the JEDEC DO-216 package is similar in electrical features to the JEDEC registered 1N5913B thru 1N5956B axial-leaded package for 3.3 to 200 V. It is an ideal selection for applications requiring low profile and high-density mounting that are also RoHS Compliant. When properly heat sunk, these zener diodes provide power-handling capabilities only found in larger packages. In addition to its size advantages, Powermite<sup>®</sup> package features include a full metallic bottom that eliminates the possibility of solder flux entrapment during assembly, and a unique locking tab acts as an integral heat sink. Its innovative design makes this device ideal for use with automatic insertion equipment.

**APPEARANCE**


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

**FEATURES**

- Very low profile surface mount package (1.1 mm)
- Integral Heat Sink Locking Tabs
- Compatible with automatic insertion equipment
- Full metallic bottom eliminates flux entrapment
- RoHS Compliant
- Zener voltage 3.3 to 200 Volts
- Low reverse leakage
- Tight tolerance available

**APPLICATIONS / BENEFITS**

- Regulates voltage over a broad operating current and temperature range
- Wide selection from 3.3 to 200 V
- Flexible axial-lead mounting terminals
- Nonsensitive to ESD
- Moisture classification is Level 1 per IPC/JEDEC J-STD-020B with no dry pack required
- ESD Rating of >16kV per human body model

**MAXIMUM RATINGS**

- Junction and storage temperatures: -55°C to +150°C
- DC power dissipation: 3.0 watt with case bottom (TAB 1) ≤ 60°C (also see derating in Figure 1).
- Forward voltage @200 mA: 1.2 volts (maximum)
- Thermal Resistance: 30 °C/W junction to Case bottom (Tab 1), or 230 °C/W junction to ambient when mounted on FR4 PC board (1 oz Cu) with recommended footprint (see last page).
- Steady-State Power: 3.0 watts at T<sub>C</sub> ≤ 60°C, or 0.54 watts at T<sub>A</sub> = 25°C when mounted on FR4 PC board and recommended footprint as described for thermal resistance (see Figure 1 and last page)
- Solder Temperatures: 260 °C for 10 s (max)

**MECHANICAL AND PACKAGING**

- Terminals: Annealed matte-Tin plating over copper and readily solderable per MIL-STD-750 method 2026 (consult factory for Tin-Lead plating)
- Polarity: Cathode designated by TAB 1 (backside)
- Case: Molded epoxy package meets UL94V-0
- Marking: Last three numerical digits of part number (see device marking code in Electrical Characteristics table below with dot "•" suffix for RoHS Compliant)
- Weight: 0.016 gram (approximate)
- Tape & Reel option: Standard per EIA-481-B  
7 inch reel 3,000 pieces  
13 inch reel 12,000 pieces

**ELECTRICAL CHARACTERISTICS @ T<sub>L</sub> = 30°C**

| Microsemi Number | Device Marking (4) | Zener Voltage                  | Test Current          | Dynamic Impedance              | Knee Current          | Knee Impedance          | Maximum Reverse Current            | Reverse Voltage         | Maximum Zener Current        |
|------------------|--------------------|--------------------------------|-----------------------|--------------------------------|-----------------------|-------------------------|------------------------------------|-------------------------|------------------------------|
|                  |                    | V <sub>Z</sub><br>(1)<br>VOLTS | I <sub>ZT</sub><br>mA | Z <sub>ZT</sub><br>(2)<br>OHMS | I <sub>ZK</sub><br>mA | Z <sub>ZK</sub><br>OHMS | I <sub>R</sub><br>μA <sub>dc</sub> | V <sub>R</sub><br>VOLTS | I <sub>ZM</sub><br>(3)<br>mA |
| 1PMT5913B        | 913•               | 3.3                            | 113.6                 | 10                             | 1.0                   | 500                     | 100                                | 1.0                     | 749.1                        |
| 1PMT5914B        | 914•               | 3.6                            | 104.2                 | 9.0                            | 1.0                   | 500                     | 75                                 | 1.0                     | 686.4                        |
| 1PMT5915B        | 915•               | 3.9                            | 96.1                  | 7.5                            | 1.0                   | 500                     | 25                                 | 1.0                     | 633.6                        |
| 1PMT5916B        | 916•               | 4.3                            | 87.2                  | 6.0                            | 1.0                   | 500                     | 5                                  | 1.0                     | 547.2                        |
| 1PMT5917B        | 917•               | 4.7                            | 79.8                  | 5.0                            | 1.0                   | 500                     | 5                                  | 1.5                     | 526.4                        |
| 1PMT5918B        | 918•               | 5.1                            | 73.5                  | 4.0                            | 1.0                   | 350                     | 5                                  | 2.0                     | 481.8                        |
| 1PMT5919B        | 919•               | 5.6                            | 66.9                  | 2.0                            | 1.0                   | 250                     | 5                                  | 3.0                     | 432.3                        |
| 1PMT5920B        | 920•               | 6.2                            | 60.5                  | 2.0                            | 1.0                   | 200                     | 5                                  | 4.0                     | 397.7                        |

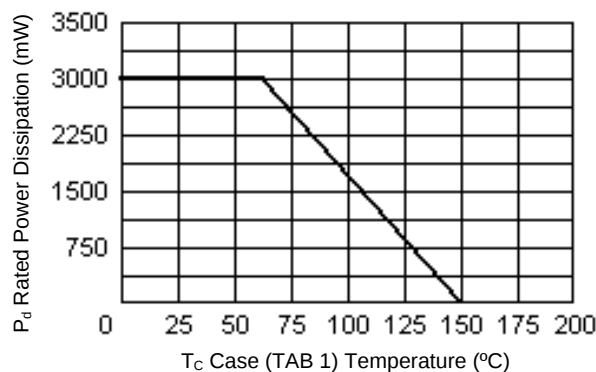
| Microsemi Number | Device Marking | Zener Voltage                  | Test Current          | Dynamic Impedance              | Knee Current          | Knee Impedance          | Maximum Reverse Current | Reverse Voltage         | Maximum Zener Current        |
|------------------|----------------|--------------------------------|-----------------------|--------------------------------|-----------------------|-------------------------|-------------------------|-------------------------|------------------------------|
|                  |                | V <sub>Z</sub><br>(1)<br>Volts | I <sub>ZT</sub><br>mA | Z <sub>ZT</sub><br>(2)<br>Ohms | I <sub>ZK</sub><br>mA | Z <sub>ZK</sub><br>Ohms | I <sub>R</sub><br>μA    | V <sub>R</sub><br>Volts | I <sub>ZM</sub><br>(3)<br>mA |
| 1PMT5921B        | 921•           | 6.8                            | 55.1                  | 2.5                            | 1.0                   | 200                     | 5                       | 5.2                     | 363.0                        |
| 1PMT5922B        | 922•           | 7.5                            | 50                    | 3.0                            | 0.5                   | 400                     | 5                       | 6.0                     | 330.0                        |
| 1PMT5923B        | 923•           | 8.2                            | 45.7                  | 3.5                            | 0.5                   | 400                     | 5                       | 6.5                     | 300.3                        |
| 1PMT5924B        | 924•           | 9.1                            | 41.2                  | 4.0                            | 0.5                   | 500                     | 5                       | 7.0                     | 270.6                        |
| 1PMT5925B        | 925•           | 10                             | 37.5                  | 4.5                            | 0.25                  | 500                     | 5                       | 8.0                     | 247.5                        |
| 1PMT5926B        | 926•           | 11                             | 34.1                  | 5.5                            | 0.25                  | 550                     | 1                       | 8.4                     | 224.4                        |
| 1PMT5927B        | 927•           | 12                             | 31.2                  | 6.5                            | 0.25                  | 550                     | 1                       | 9.1                     | 206.2                        |
| 1PMT5928B        | 928•           | 13                             | 28.8                  | 7.0                            | 0.25                  | 550                     | 1                       | 9.9                     | 189.8                        |
| 1PMT5929B        | 929•           | 15                             | 25                    | 9.0                            | 0.25                  | 600                     | 1                       | 11.4                    | 165.0                        |
| 1PMT5930B        | 930•           | 16                             | 23.4                  | 10                             | 0.25                  | 600                     | 1                       | 12.2                    | 153.5                        |
| 1PMT5931B        | 931•           | 18                             | 20.8                  | 12                             | 0.25                  | 650                     | 1                       | 13.7                    | 137.0                        |
| 1PMT5932B        | 932•           | 20                             | 18.7                  | 14                             | 0.25                  | 650                     | 1                       | 15.2                    | 123.8                        |
| 1PMT5933B        | 933•           | 22                             | 17                    | 17.5                           | 0.25                  | 650                     | 1                       | 16.7                    | 112.2                        |
| 1PMT5934B        | 934•           | 24                             | 15.6                  | 19                             | 0.25                  | 700                     | 1                       | 18.2                    | 102.3                        |
| 1PMT5935B        | 935•           | 27                             | 13.9                  | 23                             | 0.25                  | 700                     | 1                       | 20.6                    | 90.8                         |
| 1PMT5936B        | 936•           | 30                             | 12.5                  | 28                             | 0.25                  | 750                     | 1                       | 22.8                    | 82.5                         |
| 1PMT5941B        | 941•           | 47                             | 8.0                   | 67                             | 0.25                  | 1000                    | 1                       | 35.8                    | 51.2                         |
| 1PMT5942B        | 942•           | 51                             | 7.3                   | 70                             | 0.25                  | 1100                    | 1                       | 38.8                    | 47.9                         |
| 1PMT5943B        | 943•           | 56                             | 6.7                   | 86                             | 0.25                  | 1300                    | 1                       | 42.6                    | 42.9                         |
| 1PMT5944B        | 944•           | 62                             | 6.0                   | 100                            | 0.25                  | 1500                    | 1                       | 47.1                    | 38.6                         |
| 1PMT5945B        | 945•           | 68                             | 5.5                   | 120                            | 0.25                  | 1700                    | 1                       | 51.2                    | 36.3                         |
| 1PMT5946B        | 946•           | 75                             | 5.0                   | 140                            | 0.25                  | 2000                    | 1                       | 56                      | 33.0                         |
| 1PMT5947B        | 947•           | 82                             | 4.6                   | 160                            | 0.25                  | 2500                    | 1                       | 62.2                    | 29.7                         |
| 1PMT5948B        | 948•           | 91                             | 4.1                   | 200                            | 0.25                  | 3000                    | 1                       | 69.2                    | 26.4                         |
| 1PMT5949B        | 949•           | 100                            | 3.7                   | 250                            | 0.25                  | 3100                    | 1                       | 76                      | 24.8                         |
| 1PMT5950B        | 950•           | 110                            | 3.4                   | 300                            | 0.25                  | 4000                    | 1                       | 83.6                    | 21.5                         |
| 1PMT5951B        | 951•           | 120                            | 3.1                   | 380                            | 0.25                  | 4500                    | 1                       | 91.2                    | 19.8                         |
| 1PMT5952B        | 952•           | 130                            | 2.9                   | 450                            | 0.25                  | 5000                    | 1                       | 98.8                    | 18.1                         |
| 1PMT5953B        | 953•           | 150                            | 2.5                   | 600                            | 0.25                  | 6000                    | 1                       | 114                     | 16.5                         |
| 1PMT5954B        | 954•           | 160                            | 2.3                   | 700                            | 0.25                  | 6500                    | 1                       | 121.6                   | 14.9                         |
| 1PMT5955B        | 955•           | 180                            | 2.1                   | 900                            | 0.25                  | 7000                    | 1                       | 136.8                   | 13.2                         |
| 1PMT5956B        | 956•           | 200                            | 1.9                   | 1200                           | 0.25                  | 8000                    | 1                       | 152                     | 11.6                         |

**NOTE 1:** Product shown has a standard tolerance of  $\pm 5\%$  on the nominal zener voltage and is also available in 2% and 1% tolerance with suffix C and D respectively. V<sub>Z</sub> is measured at I<sub>ZT</sub> with T<sub>C</sub> (TAB 1) 30°C and 20 seconds after application of dc current.

**NOTE 2:** Zener impedance is derived by superimposing on I<sub>ZT</sub> a 60 Hz rms ac current equal to 10% of I<sub>ZT</sub>.

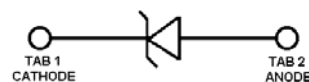
**NOTE 3:** Based upon 3 W maximum power dissipation. Allowance has been made for the higher voltage associated with operation at higher currents and temperature. For determination of voltage change with current deviations from I<sub>ZT</sub> see Micro Note 202.

## GRAPHS AND CIRCUIT

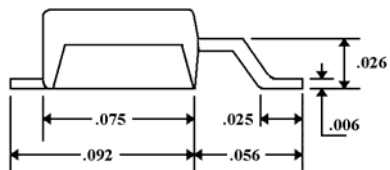
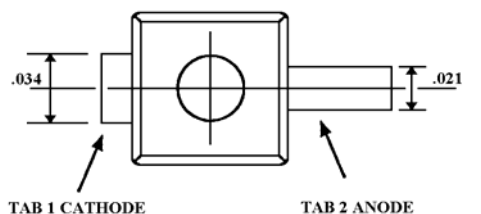


**FIGURE 1**

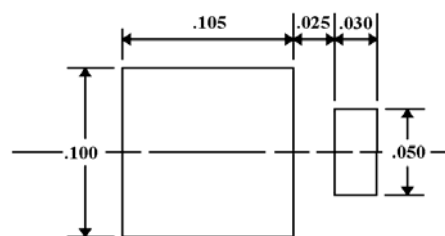
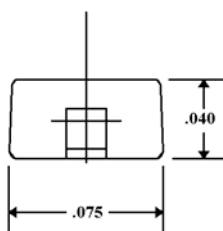
## CIRCUIT DIAGRAM



DIMENSIONS



All dimensions +/- .005 inches



MOUNTING PAD