

Silicon Planar Zener Diodes

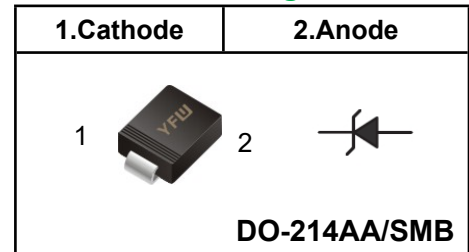
FEATURES

- ◆ Total power dissipation: Max. 3 W.
- ◆ Wide zener reverse voltage range 3.3V to 200V.
- ◆ plastic package suitable for surface mounted design.
- ◆ Lead free in comply with EU RoHS 2011/65/EU directives

MECHANICAL DATA

- ◆ Case: DO-214AA/SMB
- ◆ Terminals: Solderable per MIL-STD-750, Method 2026
- ◆ Approx. Weight: 0.95g / 0.003oz

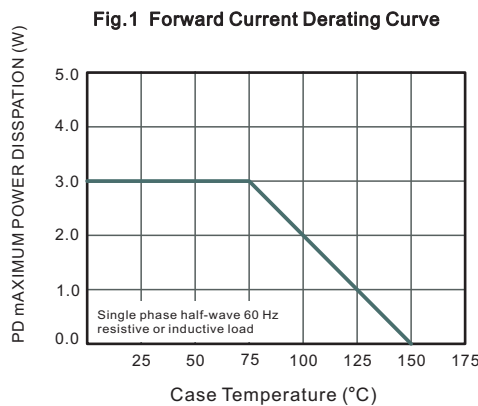
Pinning



Absolute Maximum Ratings And Characteristics (Ta = 25 °C)

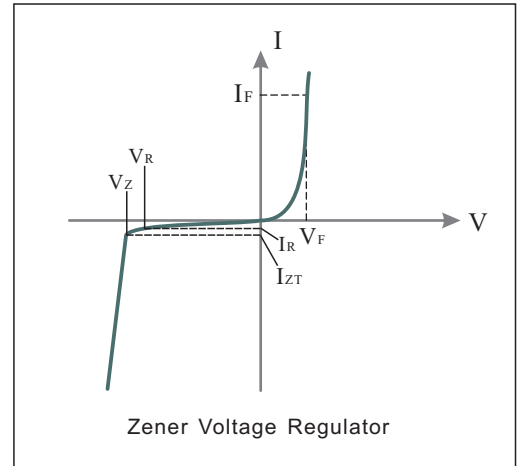
| Parameter | Symbol | Value | Unit |
|---|-------------------------|------------|--------------|
| DC power dissipation at TL=75°C, measure at zero lead length (Note 1) derate above 75°C | P_D | 3.0 | W |
| | | 40 | mW/°C |
| Maximum Steady State Power Dissipation @ TA=25°C Derate above 25°C | P_D | 550 | mW |
| | | 4.4 | mW/°C |
| Junction to ambient thermal resistance | R_{thJA} | 226 | °C/W |
| Junction to lead thermal resistance | R_{thJL} | 25 | °C/W |
| Junction Temperature Range | T_J | 55 ~ +150 | °C |
| Storage Temperature Range | T_{STG} | -55 ~ +150 | °C |

Note: 1. Mounted on Cu-Pad size 5mm x 5mm on PCB.



ELECTRICAL CHARACTERISTICS
($T_L = 30^\circ\text{C}$ unless otherwise noted,
 $V_F = 1.5\text{ V Max. @ } I_F = 200\text{ mA(DC)}$ for all types)

| Symbol | Parameter |
|----------|------------------------------------|
| V_Z | Reverse Zener Voltage @ I_{ZT} |
| I_{ZT} | Reverse Current |
| Z_{ZT} | Maximum Zener Impedance @ I_{ZT} |
| I_{ZK} | Reverse Current |
| Z_{ZK} | Maximum Zener Impedance @ I_{ZK} |
| I_R | Reverse Leakage Current @ V_R |
| V_R | Reverse Voltage |
| I_F | Forward Current |
| V_F | Forward Voltage @ I_F |
| I_{ZM} | Maximum DC Zener Current |



Notes On Page 3:

1. Tolerance and type number designation the type numbers listed indicate a tolerance of 5%
2. Zener voltage (V_Z) measurement
Nominal Zener voltage is measured with the device junction in thermal equilibrium with ambient temperature 25°C
3. Zener impedance (Z_Z) derivation : Z_{ZT} and Z_{ZK} are measured by dividing the AC voltage drop across the device by the AC current applied.
The specified limits are for $I_Z(\text{AC}) = 0.1 I_Z(\text{DC})$ with the AC frequency = 60 Hz

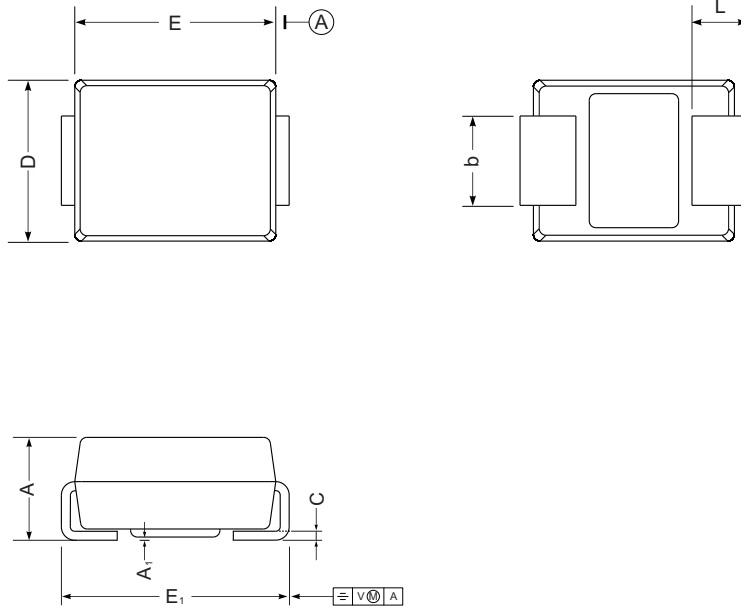
Characteristics at Ta = 25°C (Devices listed in bold, italic are ON Semiconductor Preferred devices.)
 (TL = 30°C unless otherwise noted, VF = 1.5 V Max. @ IF = 200 mA(DC) for all types)

| Type | Marking | Nominal Zener Voltage ⁽³⁾ | | | | Zener Impedance ⁽⁴⁾ | | | Leakage Current | | Maximum DC Zener Current |
|-----------|---------|--------------------------------------|------------------------|---------|-----------------|-----------------------------------|-----------------------------------|------|---------------------------------|-------|--------------------------|
| | | V _Z | | | I _{ZT} | Z _{ZT} @ I _{ZT} | Z _{ZK} @ I _{ZK} | | I _R @ V _R | | |
| | | Min (V) | Nom (V) ⁽²⁾ | Max (V) | (mA) | (Ω) | (Ω) | (mA) | (μA) | (V) | |
| 1SMB5913B | 913B | 3.13 | 3.3 | 3.47 | 113.6 | 10 | 500 | 1 | 100 | 1 | 454 |
| 1SMB5914B | 914B | 3.42 | 3.6 | 3.78 | 104.2 | 9 | 500 | 1 | 75 | 1 | 416 |
| 1SMB5915B | 915B | 3.70 | 3.9 | 4.10 | 96.1 | 7.5 | 500 | 1 | 25 | 1 | 384 |
| 1SMB5916B | 916B | 4.08 | 4.3 | 4.52 | 87.2 | 6 | 500 | 1 | 5 | 1 | 348 |
| 1SMB5917B | 917B | 4.46 | 4.7 | 4.94 | 79.8 | 5 | 500 | 1 | 5 | 1.5 | 319 |
| 1SMB5918B | 918B | 4.84 | 5.1 | 5.36 | 73.5 | 4 | 350 | 1 | 5 | 2 | 294 |
| 1SMB5919B | 919B | 5.32 | 5.6 | 5.88 | 66.9 | 2 | 250 | 1 | 5 | 3 | 267 |
| 1SMB5920B | 920B | 5.89 | 6.2 | 6.51 | 60.5 | 2 | 200 | 1 | 5 | 4 | 241 |
| 1SMB5921B | 921B | 6.46 | 6.8 | 7.14 | 55.1 | 2.5 | 200 | 1 | 5 | 5.2 | 220 |
| 1SMB5922B | 922B | 7.12 | 7.5 | 7.88 | 50 | 3 | 400 | 0.5 | 5 | 6 | 200 |
| 1SMB5923B | 923B | 7.79 | 8.2 | 8.61 | 45.7 | 3.5 | 400 | 0.5 | 5 | 6.5 | 182 |
| 1SMB5924B | 924B | 8.64 | 9.1 | 9.56 | 41.2 | 4 | 500 | 0.5 | 5 | 7 | 164 |
| 1SMB5925B | 925B | 9.5 | 10 | 10.5 | 37.5 | 4.5 | 500 | 0.25 | 5 | 8 | 150 |
| 1SMB5926B | 926B | 10.45 | 11 | 11.55 | 34.1 | 5.5 | 550 | 0.25 | 1 | 8.4 | 136 |
| 1SMB5927B | 927B | 11.4 | 12 | 12.6 | 31.2 | 6.5 | 550 | 0.25 | 1 | 9.1 | 125 |
| 1SMB5928B | 928B | 12.35 | 13 | 13.65 | 28.8 | 7 | 550 | 0.25 | 1 | 9.9 | 115 |
| 1SMB5929B | 929B | 14.25 | 15 | 15.75 | 25 | 9 | 600 | 0.25 | 1 | 11.4 | 100 |
| 1SMB5930B | 930B | 15.2 | 16 | 16.8 | 23.4 | 10 | 600 | 0.25 | 1 | 12.2 | 93 |
| 1SMB5931B | 931B | 17.1 | 18 | 18.9 | 20.8 | 12 | 650 | 0.25 | 1 | 13.7 | 83 |
| 1SMB5932B | 932B | 19 | 20 | 21 | 18.7 | 14 | 650 | 0.25 | 1 | 15.2 | 75 |
| 1SMB5933B | 933B | 20.9 | 22 | 23.1 | 17 | 17.5 | 650 | 0.25 | 1 | 16.7 | 68 |
| 1SMB5934B | 934B | 22.8 | 24 | 25.2 | 15.6 | 19 | 700 | 0.25 | 1 | 18.2 | 62 |
| 1SMB5935B | 935B | 25.65 | 27 | 28.35 | 13.9 | 23 | 700 | 0.25 | 1 | 20.6 | 55 |
| 1SMB5936B | 936B | 28.5 | 30 | 31.5 | 12.5 | 28 | 750 | 0.25 | 1 | 22.8 | 50 |
| 1SMB5937B | 937B | 31.35 | 33 | 34.65 | 11.4 | 33 | 800 | 0.25 | 1 | 25.1 | 45 |
| 1SMB5938B | 938B | 34.2 | 36 | 37.8 | 10.4 | 38 | 850 | 0.25 | 1 | 27.4 | 41 |
| 1SMB5939B | 939B | 37.05 | 39 | 40.95 | 9.6 | 45 | 900 | 0.25 | 1 | 29.7 | 38 |
| 1SMB5940B | 940B | 40.85 | 43 | 45.15 | 8.7 | 53 | 950 | 0.25 | 1 | 32.7 | 34 |
| 1SMB5941B | 941B | 44.65 | 47 | 49.35 | 8 | 67 | 1000 | 0.25 | 1 | 35.8 | 31 |
| 1SMB5942B | 942B | 48.45 | 51 | 53.55 | 7.3 | 70 | 1100 | 0.25 | 1 | 38.8 | 29 |
| 1SMB5943B | 943B | 53.2 | 56 | 58.8 | 6.7 | 86 | 1300 | 0.25 | 1 | 42.6 | 26 |
| 1SMB5944B | 944B | 58.9 | 62 | 65.1 | 6 | 100 | 1500 | 0.25 | 1 | 47.1 | 24 |
| 1SMB5945B | 945B | 64.6 | 68 | 71.4 | 5.5 | 120 | 1700 | 0.25 | 1 | 51.7 | 22 |
| 1SMB5946B | 946B | 71.25 | 75 | 78.75 | 5 | 140 | 2000 | 0.25 | 1 | 56 | 20 |
| 1SMB5947B | 947B | 77.9 | 82 | 86.1 | 4.6 | 160 | 2500 | 0.25 | 1 | 62.2 | 18 |
| 1SMB5948B | 948B | 86.45 | 91 | 95.55 | 4.1 | 200 | 3000 | 0.25 | 1 | 69.2 | 16 |
| 1SMB5949B | 949B | 95 | 100 | 105 | 3.7 | 250 | 3100 | 0.25 | 1 | 76 | 15 |
| 1SMB5950B | 950B | 104.5 | 110 | 115.5 | 3.4 | 300 | 4000 | 0.25 | 1 | 83.6 | 13 |
| 1SMB5951B | 951B | 114 | 120 | 126 | 3.1 | 380 | 4500 | 0.25 | 1 | 91.2 | 12 |
| 1SMB5952B | 952B | 123.5 | 130 | 136.5 | 2.9 | 450 | 5000 | 0.25 | 1 | 98.8 | 11 |
| 1SMB5953B | 953B | 142.5 | 150 | 157.5 | 2.5 | 600 | 6000 | 0.25 | 1 | 114 | 10 |
| 1SMB5954B | 954B | 152 | 160 | 168 | 2.3 | 700 | 6500 | 0.25 | 1 | 121.6 | 9 |
| 1SMB5955B | 955B | 171 | 180 | 189 | 2.1 | 900 | 7000 | 0.25 | 1 | 136.8 | 8 |
| 1SMB5956B | 956B | 190 | 200 | 210 | 1.9 | 1200 | 8000 | 0.25 | 1 | 152 | 7 |

Package Outline

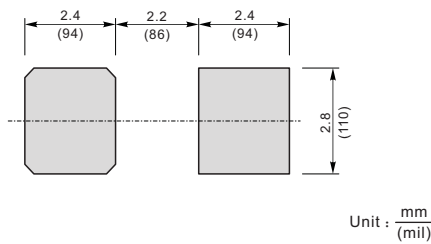
DO-214AA SMB

Plastic surface mounted package; 2 leads



| UNIT | | A | E | D | E ₁ | A ₁ | L | C | b |
|------|-----|------|------|------|----------------|----------------|-----|-------|-----|
| mm | max | 2.44 | 4.70 | 3.94 | 5.59 | 0.20 | 1.5 | 0.305 | 2.2 |
| | min | 2.13 | 4.06 | 3.3 | 5.08 | 0.05 | 0.8 | 0.152 | 1.9 |
| mil | max | 96 | 185 | 155 | 220 | 7.9 | 59 | 12 | 87 |
| | min | 84 | 160 | 130 | 200 | 2.0 | 32 | 6 | 75 |

The recommended mounting pad size



Summary of Packing Options

| Package | Packing Description | Packing Quantity | Industry Standard |
|--------------|---------------------|------------------|-------------------|
| DO-214AA SMB | Tape/Reel, 13" reel | 3000 | EIA-481-1 |