

Zener Diodes



SMA (DO-214AC)

ADDITIONAL RESOURCES



| PRIMARY CHARACTERISTICS | | |
|------------------------------|-----------------|------|
| PARAMETER | VALUE | UNIT |
| V _Z range nom. | 3.3 to 100 | V |
| Test current I _{ZT} | 2.7 to 80 | mA |
| V _{BR} | 5.49 to 98 | V |
| V _{WM} | 4.7 to 90 | V |
| P _{PPM} | 40 | W |
| T _J max. | 150 | °C |
| V _Z specification | Pulse current | |
| Circuit configuration | Single | |
| Polarity | Uni-directional | |

FEATURES

- High reliability
- Voltage range includes 37 breakdown voltages from 3.3 V to 100 V with ± 2 % for BZG05B-M-series
- Fits onto 5 mm SMD footpads
- Wave and reflow solderable
- AEC-Q101 qualified available
- Base P/N-M3 - halogen-free, RoHS-compliant, and commercial grade
- Base P/NHM3 - halogen-free, RoHS-compliant, and AEC-Q101 qualified
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912



RoHS
COMPLIANT
HALOGEN
FREE

APPLICATIONS

- Voltage stabilization

| ORDERING INFORMATION | | | |
|----------------------|------------------|----------------------|------------------------|
| DEVICE NAME | ORDERING CODE | TAPED UNITS PER REEL | MINIMUM ORDER QUANTITY |
| BZG05B-M-series | BZG05Bxxx-M3-08 | 1500 per 7" reel | 6000/box |
| BZG05B-M-series | BZG05Bxxx-M3-18 | 6000 per 13" reel | 6000/box |
| BZG05B-M-series | BZG05Bxxx-HM3-08 | 1500 per 7" reel | 6000/box |
| BZG05B-M-series | BZG05Bxxx-HM3-18 | 6000 per 13" reel | 6000/box |

| PACKAGE | | | | |
|----------------|--------|--------------------------------------|--------------------------------------|------------------------------|
| PACKAGE NAME | WEIGHT | MOLDING COMPOUND FLAMMABILITY RATING | MOISTURE SENSITIVITY LEVEL | SOLDERING CONDITIONS |
| SMA (DO-214AC) | 73 mg | UL 94 V-0 | MSL level 1 (according J-STD-020) | Peak temperature max. 260 °C |

| ABSOLUTE MAXIMUM RATINGS (T _{amb} = 25 °C, unless otherwise specified) | | | | | |
|---|--|-------------------|-------------|------|--|
| PARAMETER | TEST CONDITION | SYMBOL | VALUE | UNIT | |
| Power dissipation | R _{thJA} < 30 K/W, T _{amb} = 60 °C | P _{tot} | 3000 | mW | |
| | R _{thJA} < 100 K/W, T _{amb} = 25 °C | P _{tot} | 1250 | mW | |
| Non repetitive peak surge power dissipation | t _p = 100 μs sq. pulse, T _j = 25 °C prior to surge | P _{ZSM} | 60 | W | |
| Junction to lead | | R _{thJL} | 30 | K/W | |
| Junction to ambient air | Mounted on epoxy-glass hard tissue, fig. 1a | R _{thJA} | 150 | K/W | |
| | Mounted on epoxy-glass hard tissue, fig. 1b | R _{thJA} | 125 | K/W | |
| | Mounted on Al-oxide-ceramic (Al ₂ O ₃), fig. 1b | R _{thJA} | 100 | K/W | |
| Junction temperature | | T _j | 150 | °C | |
| Storage temperature range | | T _{stg} | -65 to +150 | °C | |
| Operating temperature range | | T _{op} | -65 to +150 | °C | |
| Forward voltage (max.) | I _F = 0.2 A | V _F | 1.2 | V | |



| ELECTRICAL CHARACTERISTICS ($T_{amb} = 25\text{ }^{\circ}\text{C}$, unless otherwise specified) | | | | | | | | | | | |
|--|---------------------|------|--------|--------------|-----------|-------------------------|-----|--------------------|-----------------------|-------------------------|-------|
| PART NUMBER | ZENER VOLTAGE RANGE | | | TEST CURRENT | | REVERSE LEAKAGE CURRENT | | DYNAMIC RESISTANCE | | TEMPERATURE COEFFICIENT | |
| | V_Z at I_{ZT1} | | | I_{ZT1} | I_{ZT2} | I_R at V_R | | Z_Z at I_{ZT1} | Z_{ZK} at I_{ZT2} | TC_{VZ} at I_{ZT1} | |
| | V | | | mA | mA | μA | V | Ω | | %K | |
| | MIN. | NOM. | MAX. | | | MAX. | | MAX. | MAX. | MIN. | MAX. |
| BZG05B3V3-M | 3.23 | 3.3 | 3.37 | 80 | 1 | 40 | 1 | 20 | 400 | -0.08 | -0.05 |
| BZG05B3V6-M | 3.53 | 3.6 | 3.67 | 60 | 1 | 20 | 1 | 20 | 500 | -0.08 | -0.05 |
| BZG05B3V9-M | 3.82 | 3.9 | 3.98 | 60 | 1 | 10 | 1 | 15 | 500 | -0.07 | -0.02 |
| BZG05B4V3-M | 4.21 | 4.3 | 4.39 | 50 | 1 | 3 | 1 | 13 | 500 | -0.07 | -0.01 |
| BZG05B4V7-M | 4.61 | 4.7 | 4.79 | 45 | 1 | 3 | 1 | 13 | 600 | -0.03 | 0.04 |
| BZG05B5V1-M | 5.00 | 5.1 | 5.20 | 45 | 1 | 1 | 1.5 | 10 | 500 | -0.01 | 0.04 |
| BZG05B5V6-M | 5.49 | 5.6 | 5.71 | 45 | 1 | 1 | 2 | 7 | 400 | 0 | 0.045 |
| BZG05B6V2-M | 6.08 | 6.2 | 6.32 | 35 | 1 | 1 | 3 | 4 | 300 | 0.01 | 0.055 |
| BZG05B6V8-M | 6.66 | 6.8 | 6.94 | 35 | 1 | 1 | 4 | 3.5 | 300 | 0.015 | 0.06 |
| BZG05B7V5-M | 7.35 | 7.5 | 7.65 | 35 | 0.5 | 1 | 4.5 | 3 | 200 | 0.02 | 0.065 |
| BZG05B8V2-M | 8.04 | 8.2 | 8.36 | 25 | 0.5 | 1 | 6.2 | 5 | 200 | 0.03 | 0.07 |
| BZG05B9V1-M | 8.92 | 9.1 | 9.28 | 25 | 0.5 | 1 | 6.8 | 5 | 200 | 0.035 | 0.075 |
| BZG05B10-M | 9.80 | 10 | 10.20 | 25 | 0.5 | 0.5 | 7 | 7 | 200 | 0.04 | 0.08 |
| BZG05B11-M | 10.78 | 11 | 11.22 | 20 | 0.5 | 0.5 | 8.2 | 8 | 300 | 0.045 | 0.08 |
| BZG05B12-M | 11.76 | 12 | 12.24 | 20 | 0.5 | 0.5 | 9.1 | 9 | 350 | 0.045 | 0.085 |
| BZG05B13-M | 12.74 | 13 | 13.26 | 20 | 0.5 | 0.5 | 10 | 10 | 400 | 0.05 | 0.085 |
| BZG05B15-M | 14.70 | 15 | 15.30 | 15 | 0.5 | 0.5 | 11 | 15 | 500 | 0.055 | 0.09 |
| BZG05B16-M | 15.68 | 16 | 16.32 | 15 | 0.5 | 0.5 | 12 | 15 | 500 | 0.055 | 0.09 |
| BZG05B18-M | 17.64 | 18 | 18.36 | 15 | 0.5 | 0.5 | 13 | 20 | 500 | 0.06 | 0.09 |
| BZG05B20-M | 19.60 | 20 | 20.40 | 10 | 0.5 | 0.5 | 15 | 24 | 600 | 0.06 | 0.09 |
| BZG05B22-M | 21.56 | 22 | 22.44 | 10 | 0.5 | 0.5 | 16 | 25 | 600 | 0.06 | 0.095 |
| BZG05B24-M | 23.52 | 24 | 24.48 | 10 | 0.5 | 0.5 | 18 | 25 | 600 | 0.06 | 0.095 |
| BZG05B27-M | 26.46 | 27 | 27.54 | 8 | 0.25 | 0.5 | 20 | 30 | 750 | 0.06 | 0.095 |
| BZG05B30-M | 29.40 | 30 | 30.60 | 8 | 0.25 | 0.5 | 22 | 30 | 1000 | 0.06 | 0.095 |
| BZG05B33-M | 32.34 | 33 | 33.66 | 8 | 0.25 | 0.5 | 24 | 35 | 1000 | 0.06 | 0.095 |
| BZG05B36-M | 35.28 | 36 | 36.72 | 8 | 0.25 | 0.5 | 27 | 40 | 1000 | 0.07 | 0.11 |
| BZG05B39-M | 38.22 | 39 | 39.78 | 6 | 0.25 | 0.5 | 30 | 50 | 1000 | 0.07 | 0.11 |
| BZG05B43-M | 42.14 | 43 | 43.86 | 6 | 0.25 | 0.5 | 33 | 50 | 1000 | 0.07 | 0.11 |
| BZG05B47-M | 46.06 | 47 | 47.94 | 4 | 0.25 | 0.5 | 36 | 90 | 1500 | 0.07 | 0.11 |
| BZG05B51-M | 49.98 | 51 | 52.02 | 4 | 0.25 | 0.5 | 39 | 115 | 1500 | 0.08 | 0.12 |
| BZG05B56-M | 54.88 | 56 | 57.12 | 4 | 0.25 | 0.5 | 43 | 120 | 2000 | 0.08 | 0.12 |
| BZG05B62-M | 60.76 | 62 | 63.24 | 4 | 0.25 | 0.5 | 47 | 125 | 2000 | 0.08 | 0.12 |
| BZG05B68-M | 66.64 | 68 | 69.36 | 4 | 0.25 | 0.5 | 51 | 130 | 2000 | 0.08 | 0.12 |
| BZG05B75-M | 73.50 | 75 | 76.50 | 4 | 0.25 | 0.5 | 56 | 135 | 2000 | 0.08 | 0.12 |
| BZG05B82-M | 80.36 | 82 | 83.64 | 2.7 | 0.25 | 0.5 | 62 | 200 | 3000 | 0.08 | 0.12 |
| BZG05B91-M | 89.18 | 91 | 92.82 | 2.7 | 0.25 | 0.5 | 68 | 250 | 3000 | 0.08 | 0.12 |
| BZG05B100-M | 98.00 | 100 | 102.00 | 2.7 | 0.25 | 0.5 | 75 | 350 | 3000 | 0.08 | 0.12 |

BASIC CHARACTERISTICS ($T_{amb} = 25\text{ }^{\circ}\text{C}$, unless otherwise specified)

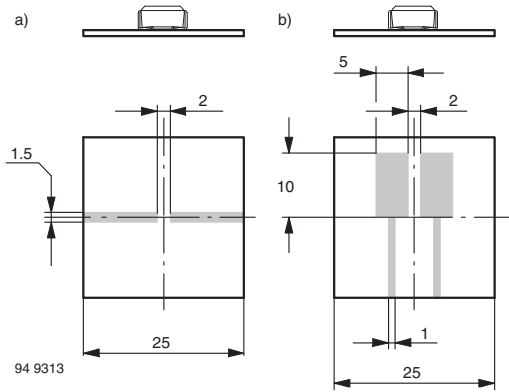


Fig. 1 - Boards for R_{thJA} Definition (Copper Overlay 35 μ)

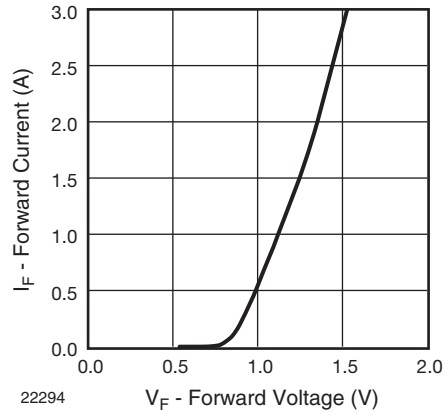


Fig. 3 - Forward Current vs. Forward Voltage

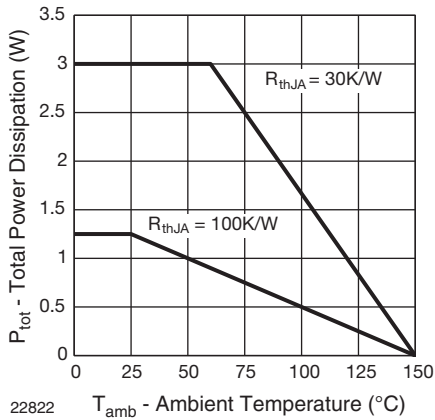


Fig. 2 - Typ. Total Power Dissipation vs. Ambient Temperature

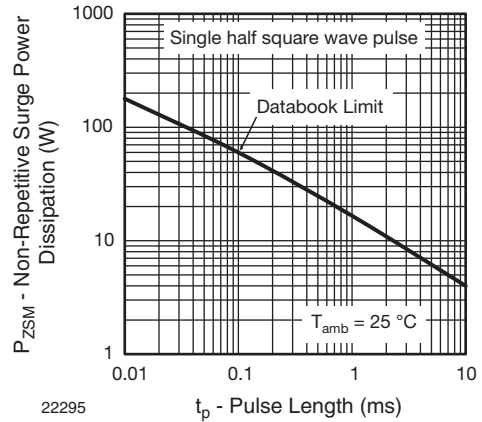


Fig. 4 - Non Repetitive Surge Power Dissipation vs. Pulse Length

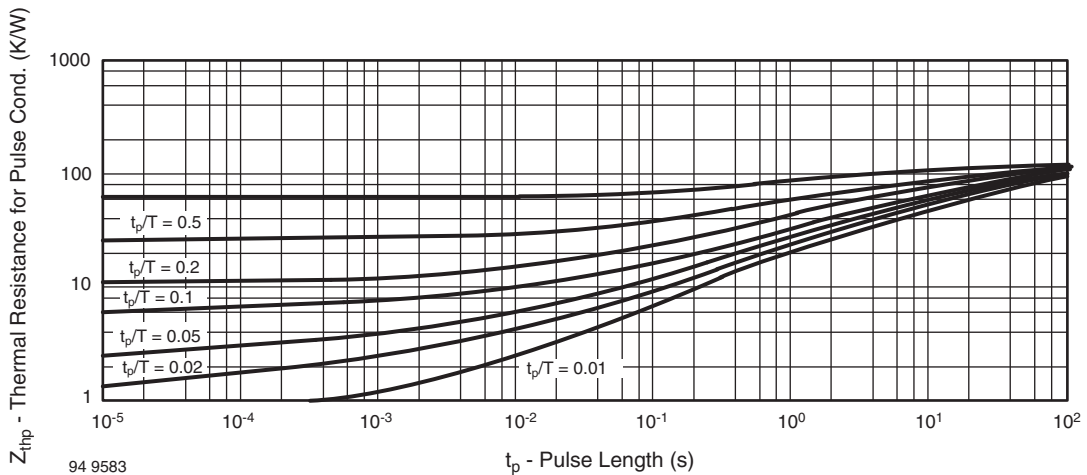
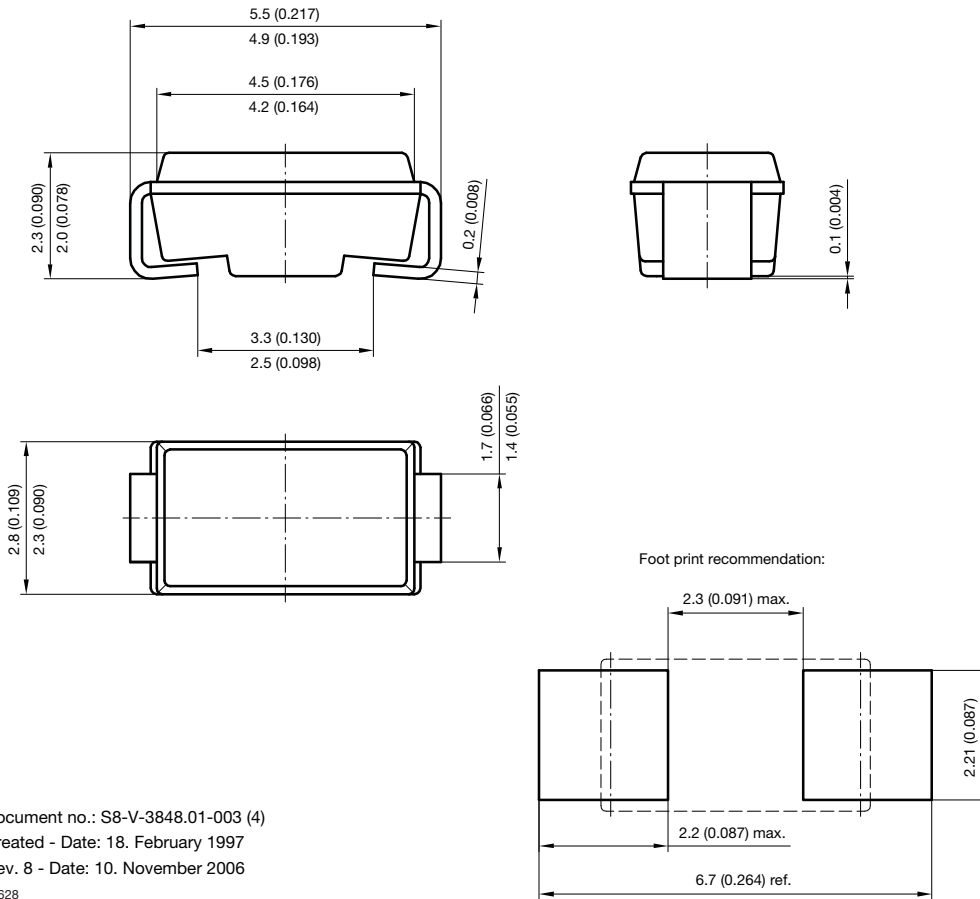


Fig. 5 - Thermal Response



PACKAGE DIMENSIONS in millimeters (inches): **SMA (DO-214AC)**



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