# Zener Diodes



## FEATURES

- High reliability
- Voltage range 3.3 V to 100 V
- Fits onto 5 mm SMD footpads
- Wave and reflow solderable
- AEC-Q101 qualified available
- Base P/N-E3 - RoHS-compliant, commercial grade
- Base P/NHE3 - RoHS-compliant, AEC-Q101 qualified
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912

RoHS COMPLIANT

## APPLICATIONS

- Voltage stabilization

| PRIMARY CHARACTERISTICS | | |
|---|---|---|
| PARAMETER | VALUE | UNIT |
| $V_Z$ range nom. | 3.3 to 100 | V |
| Test current $I_{ZT}$ | 2.7 to 80 | mA |
| $V_{BR}$ | 5.2 to 95 | V |
| $V_{WM}$ | 4.7 to 90 | V |
| $P_{PPM}$ | 40 | W |
| $T_J$ max. | 150 | °C |
| $V_Z$ specification | Pulse current | |
| Int. construction | Single | |
| Polarity | Uni-directional | |

| ORDERING INFORMATION | | | |
|---|---|---|---|
| DEVICE NAME | ORDERING CODE | TAPED UNITS PER REEL | MINIMUM ORDER QUANTITY |
| BZG05C-series | BZG05C-series-E3-TR | 1500 per 7" reel | 6000/box |
| BZG05C-series | BZG05C-series-E3-TR3 | 6000 per 13" reel | 6000/box |
| BZG05C-series | BZG05C-series-HE3-TR | 1500 per 7" reel | 6000/box |
| BZG05C-series | BZG05C-series-HE3-TR3 | 6000 per 13" reel | 6000/box |

| PACKAGE | | | | |
|---|---|---|---|---|
| PACKAGE NAME | WEIGHT | MOLDING COMPOUND FLAMMABILITY RATING | MOISTURE SENSITIVITY LEVEL | SOLDERING CONDITIONS |
| DO-214AC | 77 mg | UL 94 V-0 | MSL level 1 (according J-STD-020) | 260 °C/10 s at terminals |

| 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-oxid-ceramic ($Al_2O_3$), fig. 1b | $R_{thJA}$ | 100 | K/W |
| Junction temperature | | $T_j$ | 150 | °C |
| Storage temperature range | | $T_{stg}$ | -65 to +150 | °C |
| Forward voltage (max.) | $I_F$ = 0.2 A | $V_F$ | 1.2 | V |



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**ELECTRICAL CHARACTERISTICS** ($T_{amb}$ = 25 °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. |
| BZG05C3V3 | 3.1 | 3.3 | 3.5 | 80 | 1 | 40 | 1 | 20 | 400 | -0.08 | -0.05 |
| BZG05C3V6 | 3.4 | 3.6 | 3.8 | 60 | 1 | 20 | 1 | 20 | 500 | -0.08 | -0.05 |
| BZG05C3V9 | 3.7 | 3.9 | 4.1 | 60 | 1 | 10 | 1 | 15 | 500 | -0.07 | -0.02 |
| BZG05C4V3 | 4 | 4.3 | 4.6 | 50 | 1 | 3 | 1 | 13 | 500 | -0.07 | -0.01 |
| BZG05C4V7 | 4.4 | 4.7 | 5 | 45 | 1 | 3 | 1 | 13 | 600 | -0.03 | 0.04 |
| BZG05C5V1 | 4.8 | 5.1 | 5.4 | 45 | 1 | 1 | 1.5 | 10 | 500 | -0.01 | 0.04 |
| BZG05C5V6 | 5.2 | 5.6 | 6 | 45 | 1 | 1 | 2 | 7 | 400 | 0 | 0.045 |
| BZG05C6V2 | 5.8 | 6.2 | 6.6 | 35 | 1 | 1 | 3 | 4 | 300 | 0.01 | 0.055 |
| BZG05C6V8 | 6.4 | 6.8 | 7.2 | 35 | 1 | 1 | 4 | 3.5 | 300 | 0.015 | 0.06 |
| BZG05C7V5 | 7 | 7.5 | 7.9 | 35 | 0.5 | 1 | 4.5 | 3 | 200 | 0.02 | 0.065 |
| BZG05C8V2 | 7.7 | 8.2 | 8.7 | 25 | 0.5 | 1 | 6.2 | 5 | 200 | 0.03 | 0.07 |
| BZG05C9V1 | 8.5 | 9.1 | 9.6 | 25 | 0.5 | 1 | 6.8 | 5 | 200 | 0.035 | 0.075 |
| BZG05C10 | 9.4 | 10 | 10.6 | 25 | 0.5 | 0.5 | 7 | 7 | 200 | 0.04 | 0.08 |
| BZG05C11 | 10.4 | 11 | 11.6 | 20 | 0.5 | 0.5 | 8.2 | 8 | 300 | 0.045 | 0.08 |
| BZG05C12 | 11.4 | 12 | 12.7 | 20 | 0.5 | 0.5 | 9.1 | 9 | 350 | 0.045 | 0.085 |
| BZG05C13 | 12.4 | 13 | 14.1 | 20 | 0.5 | 0.5 | 10 | 10 | 400 | 0.05 | 0.085 |
| BZG05C15 | 13.8 | 15 | 15.6 | 15 | 0.5 | 0.5 | 11 | 15 | 500 | 0.055 | 0.09 |
| BZG05C16 | 15.3 | 16 | 17.1 | 15 | 0.5 | 0.5 | 12 | 15 | 500 | 0.055 | 0.09 |
| BZG05C18 | 16.8 | 18 | 19.1 | 15 | 0.5 | 0.5 | 13 | 20 | 500 | 0.06 | 0.09 |
| BZG05C20 | 18.8 | 20 | 21.2 | 10 | 0.5 | 0.5 | 15 | 24 | 600 | 0.06 | 0.09 |
| BZG05C22 | 20.8 | 22 | 23.3 | 10 | 0.5 | 0.5 | 16 | 25 | 600 | 0.06 | 0.095 |
| BZG05C24 | 22.8 | 24 | 25.6 | 10 | 0.5 | 0.5 | 18 | 25 | 600 | 0.06 | 0.095 |
| BZG05C27 | 25.1 | 27 | 28.9 | 8 | 0.25 | 0.5 | 20 | 30 | 750 | 0.06 | 0.095 |
| BZG05C30 | 28 | 30 | 32 | 8 | 0.25 | 0.5 | 22 | 30 | 1000 | 0.06 | 0.095 |
| BZG05C33 | 31 | 33 | 35 | 8 | 0.25 | 0.5 | 24 | 35 | 1000 | 0.06 | 0.095 |
| BZG05C36 | 34 | 36 | 38 | 8 | 0.25 | 0.5 | 27 | 40 | 1000 | 0.07 | 0.11 |
| BZG05C39 | 37 | 39 | 41 | 6 | 0.25 | 0.5 | 30 | 50 | 1000 | 0.07 | 0.11 |
| BZG05C43 | 40 | 43 | 46 | 6 | 0.25 | 0.5 | 33 | 50 | 1000 | 0.07 | 0.11 |
| BZG05C47 | 44 | 47 | 50 | 4 | 0.25 | 0.5 | 36 | 90 | 1500 | 0.07 | 0.11 |
| BZG05C51 | 48 | 51 | 54 | 4 | 0.25 | 0.5 | 39 | 115 | 1500 | 0.08 | 0.12 |
| BZG05C56 | 52 | 56 | 60 | 4 | 0.25 | 0.5 | 43 | 120 | 2000 | 0.08 | 0.12 |
| BZG05C62 | 58 | 62 | 66 | 4 | 0.25 | 0.5 | 47 | 125 | 2000 | 0.08 | 0.12 |
| BZG05C68 | 64 | 68 | 72 | 4 | 0.25 | 0.5 | 51 | 130 | 2000 | 0.08 | 0.12 |
| BZG05C75 | 70 | 75 | 79 | 4 | 0.25 | 0.5 | 56 | 135 | 2000 | 0.08 | 0.12 |
| BZG05C82 | 77 | 82 | 87 | 2.7 | 0.25 | 0.5 | 62 | 200 | 3000 | 0.08 | 0.12 |
| BZG05C91 | 85 | 91 | 96 | 2.7 | 0.25 | 0.5 | 68 | 250 | 3000 | 0.08 | 0.12 |
| BZG05C100 | 95 | 100 | 106 | 2.7 | 0.25 | 0.5 | 75 | 350 | 3000 | 0.08 | 0.12 |


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**BASIC CHARACTERISTICS** ($T_{amb}$ = 25 °C, unless otherwise specified)

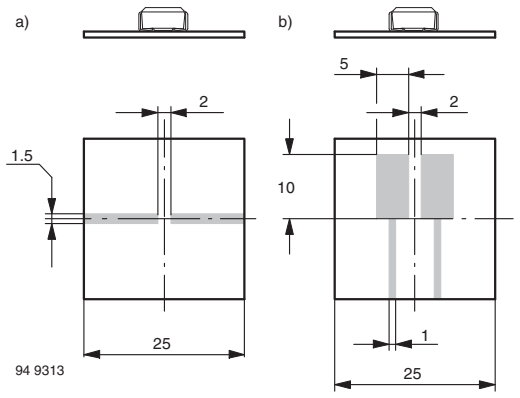



Fig. 1 - Boards for $R_{thJA}$ Definition (Copper Overlay 35 µ)

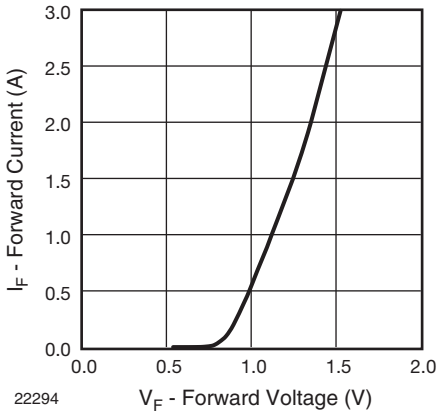



Fig. 3 - Forward Current vs. Forward Voltage

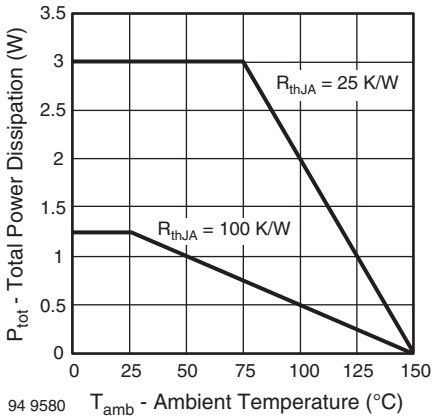



Fig. 2 - Typ. Total Power Dissipation vs. Ambient Temperature

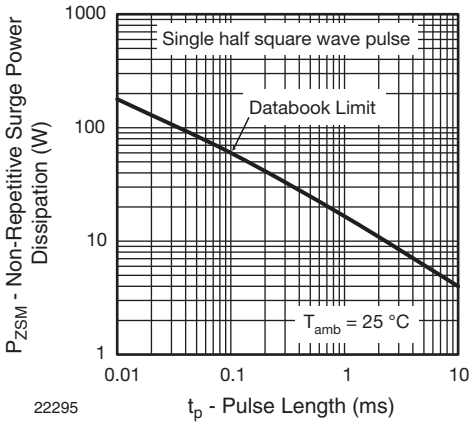



Fig. 4 - Non Repetitive Surge Power Dissipation vs. Pulse Length

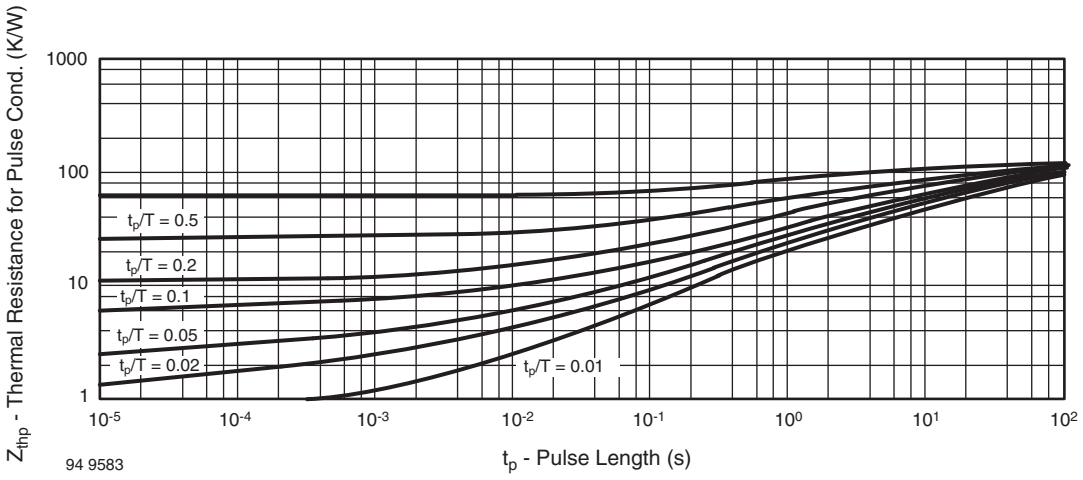
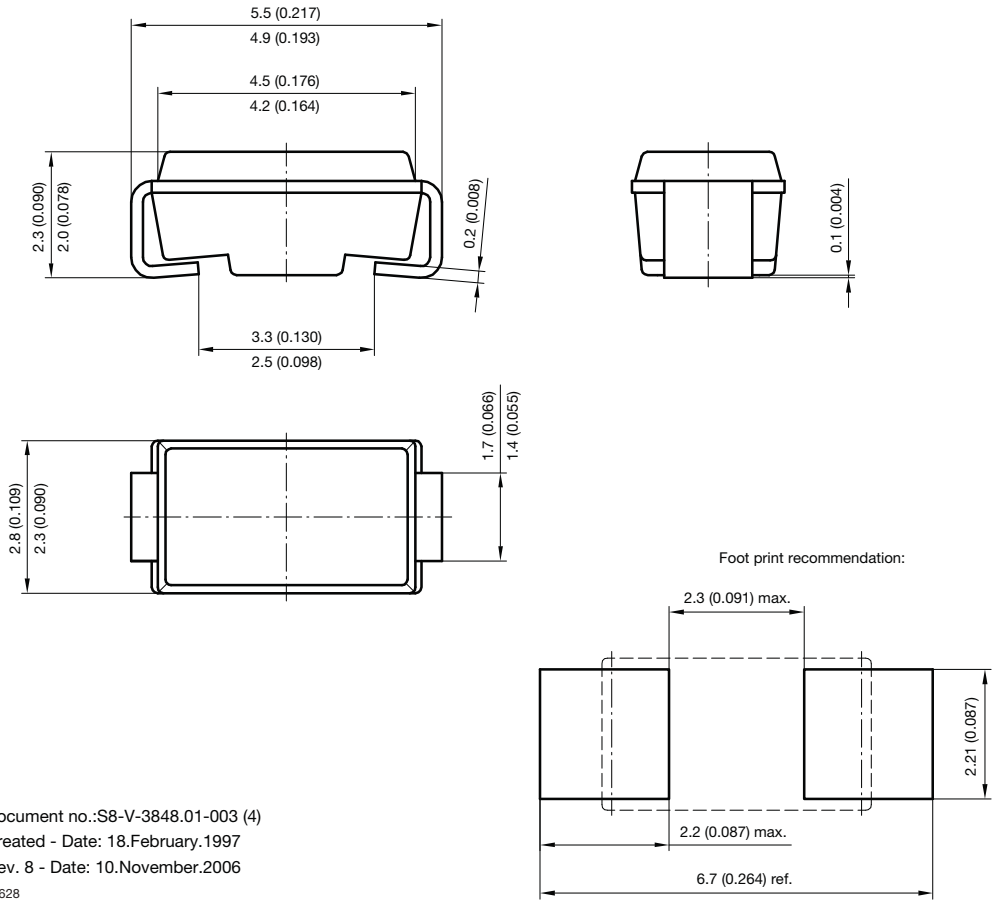



Fig. 5 - Thermal Response


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




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