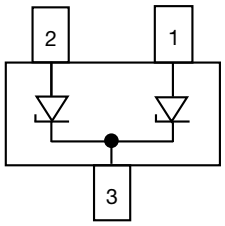
# Small Signal Zener Diodes




## FEATURES

- Silicon planar Zener diodes
- The Zener voltages are graded according to the international E24 standard. Standard Zener voltage tolerance is ± 5 %
- AEC-Q101 qualified available (part number on request)
- ESD capability acc. to AEC-Q101: human body model: > 8 kV, machine model: > 800 V
- Base P/N-G3 - green, commercial grade
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912

Pb-free

e3

RoHS COMPLIANT

HALOGEN FREE

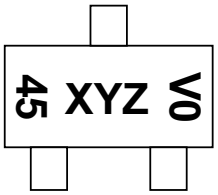
GREEN (5-2008)

## LINKS TO ADDITIONAL RESOURCES

3D Models

SPICE Models

## MARKING (example only)




XYZ = type code
45 = working week
0 = year
V = Vishay

| PRIMARY CHARACTERISTICS | | |
|---|---|---|
| PARAMETER | VALUE | UNIT |
| $V_Z$ range nom. | 2.2 to 75 | V |
| Test current $I_{ZT}$ | 2; 5 | mA |
| $V_Z$ specification | Pulse current | |
| Circuit configuration | Single | |

## ORDERING INFORMATION

| DEVICE NAME | ORDERING CODE | ZENER VOLTAGE TOLERANCE | AEC-Q101 QUALIFIED | TAPED UNITS PER REEL | MINIMUM ORDER QUANTITY |
|---|---|---|---|---|---|
| DZ23-G series | DZ23C2V4-G3-08 to DZ23C75-G3-08 | 5 % | no | 3000 (8 mm tape on 7" reel) | 15 000 |
| | DZ23C2V4-G3-18 to DZ23C75-G3-18 | 5 % | no | 10 000 (8 mm tape on 13" reel) | 10 000 |

## PACKAGE

| PACKAGE NAME | WEIGHT | MOLDING COMPOUND FLAMMABILITY RATING | MOISTURE SENSITIVITY LEVEL | SOLDERING CONDITIONS |
|---|---|---|---|---|
| SOT-23 | 9.2 mg | UL 94 V-0 | MSL level 1 (according J-STD-020) | Peak temperature max. 260 °C |

## ABSOLUTE MAXIMUM RATINGS

| PARAMETER | TEST CONDITION | SYMBOL | VALUE | UNIT |
|---|---|---|---|---|
| Power dissipation | $R_{thJL}$ = 250 K/W | $P_{tot}$ | 500 | mW |
| | On FR-4 board with recommended soldering footprint | $P_{tot}$ | 300 | mW |
| Thermal resistance junction to lead | | $R_{thJL}$ | 250 | K/W |
| Thermal resistance junction to ambient | According to JEDEC® 51-3 on FR-4 board with recommended soldering footprint | $R_{thJA}$ | 420 | K/W |
| Junction temperature | | $T_j$ | 150 | °C |
| Storage temperature range | | $T_{stg}$ | -65 to +150 | °C |
| Operating temperature range | | $T_{op}$ | -55 to +150 | °C |

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

| PART NUMBER | MARKING CODE | ZENER VOLTAGE RANGE | | | TEST CURRENT | | REVERSE LEAKAGE CURRENT | | DYNAMIC RESISTANCE f = 1 kHz | | TEMPERATURE COEFFICIENT | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | $V_Z$ at $I_{ZT1}$ | | | $I_{ZT1}$ | $I_{ZT2}$ | $I_R$ at $V_R$ | | $Z_Z$ at $I_{ZT1}$ | $Z_{ZK}$ at $I_{ZT2}$ | $\alpha_{VZ}$ at $I_{ZT1}$ | |
| | | V | | | mA | | µA | V | W | | $10^{-4}$/°C | |
| | | MIN. | NOM. | MAX. | | | MAX. | | MAX. | MAX. | MIN. | MAX. |
| DZ23C2V2-G | V77 | 2.09 | 2.2 | 2.31 | 5 | 1 | 100 | 1 | 120 | 600 | -9 | -4 |
| DZ23C2V4-G | V78 | 2.28 | 2.4 | 2.52 | 5 | 1 | 50 | 1 | 100 | 600 | -9 | -4 |
| DZ23C2V7-G | V41 | 2.57 | 2.7 | 2.84 | 5 | 1 | 20 | 1 | 83 | 500 | -9 | -4 |
| DZ23C3V0-G | V42 | 2.85 | 3.0 | 3.15 | 5 | 1 | 10 | 1 | 95 | 500 | -9 | -3 |
| DZ23C3V3-G | V43 | 3.14 | 3.3 | 3.47 | 5 | 1 | 5 | 1 | 95 | 500 | -8 | -3 |
| DZ23C3V6-G | V44 | 3.42 | 3.6 | 3.78 | 5 | 1 | 5 | 1 | 90 | 500 | -8 | -3 |
| DZ23C3V9-G | V45 | 3.71 | 3.9 | 4.10 | 5 | 1 | 3 | 1 | 90 | 500 | -7 | -3 |
| DZ23C4V3-G | V46 | 4.09 | 4.3 | 4.52 | 5 | 1 | 3 | 1 | 90 | 500 | -6 | -1 |
| DZ23C4V7-G | V47 | 4.47 | 4.7 | 4.94 | 5 | 1 | 3 | 2 | 78 | 500 | -5 | 2 |
| DZ23C5V1-G | V48 | 4.85 | 5.1 | 5.36 | 5 | 1 | 2 | 2 | 60 | 480 | -3 | 4 |
| | | | | | | | 0.1 | 0.8 | | | | |
| DZ23C5V6-G | V49 | 5.32 | 5.6 | 5.88 | 5 | 1 | 1 | 2 | 40 | 400 | -2 | 6 |
| | | | | | | | 0.1 | 1 | | | | |
| DZ23C6V2-G | V50 | 5.89 | 6.2 | 6.51 | 5 | 1 | 3 | 4 | 10 | 150 | -1 | 7 |
| | | | | | | | 0.1 | 2 | | | | |
| DZ23C6V8-G | V51 | 6.46 | 6.8 | 7.14 | 5 | 1 | 2 | 4 | 8 | 80 | 2 | 7 |
| | | | | | | | 0.1 | 3 | | | | |
| DZ23C7V5-G | V52 | 7.13 | 7.5 | 7.88 | 5 | 1 | 0.1 | 5 | 7 | 50 | 3 | 7 |
| DZ23C8V2-G | V53 | 7.79 | 8.2 | 8.61 | 5 | 1 | 0.1 | 6 | 7 | 50 | 4 | 7 |
| DZ23C9V1-G | V54 | 8.65 | 9.1 | 9.56 | 5 | 1 | 0.1 | 7 | 10 | 50 | 5 | 8 |
| DZ23C10-G | V55 | 9.50 | 10 | 10.50 | 5 | 1 | 0.1 | 7.5 | 15 | 70 | 5 | 8 |
| DZ23C11-G | V56 | 10.45 | 11 | 11.55 | 5 | 1 | 0.1 | 8.5 | 20 | 70 | 5 | 9 |
| DZ23C12-G | V57 | 11.40 | 12 | 12.60 | 5 | 1 | 0.1 | 9 | 20 | 90 | 6 | 9 |
| DZ23C13-G | V58 | 12.40 | 13 | 13.65 | 5 | 1 | 0.1 | 10 | 25 | 110 | 7 | 9 |
| DZ23C15-G | V59 | 14.25 | 15 | 15.60 | 5 | 1 | 0.05 | 11 | 30 | 110 | 7 | 9 |
| DZ23C16-G | V60 | 15.30 | 16 | 16.80 | 5 | 1 | 0.05 | 12 | 40 | 170 | 8 | 9.5 |
| DZ23C18-G | V61 | 17.10 | 18 | 18.90 | 5 | 1 | 0.05 | 14 | 45 | 170 | 8 | 9.5 |
| DZ23C20-G | V62 | 19.00 | 20 | 21.00 | 5 | 1 | 0.05 | 15 | 50 | 220 | 8 | 10 |
| DZ23C22-G | V63 | 20.90 | 22 | 23.10 | 5 | 1 | 0.05 | 17 | 55 | 220 | 8 | 10 |
| DZ23C24-G | V64 | 22.80 | 24 | 25.20 | 5 | 1 | 0.05 | 18 | 70 | 220 | 8 | 10 |
| DZ23C27-G | V65 | 25.65 | 27 | 28.35 | 2 | 0.5 | 0.05 | 20 | 80 | 250 | 8 | 10 |
| DZ23C30-G | V66 | 28.50 | 30 | 31.50 | 2 | 0.5 | 0.05 | 22.5 | 80 | 250 | 8 | 10 |
| DZ23C33-G | V67 | 31.35 | 33 | 34.65 | 2 | 0.5 | 0.05 | 25 | 80 | 250 | 8 | 10 |
| DZ23C36-G | V68 | 34.20 | 36 | 37.80 | 2 | 0.5 | 0.05 | 27 | 87 | 250 | 8 | 10 |
| DZ23C39-G | V69 | 37.05 | 39 | 40.95 | 2 | 0.5 | 0.05 | 29 | 87 | 300 | 10 | 12 |
| DZ23C43-G | V70 | 40.85 | 43 | 45.15 | 2 | 0.5 | 0.05 | 32 | 97 | 375 | 10 | 12 |
| DZ23C47-G | V71 | 44.65 | 47 | 49.35 | 2 | 0.5 | 0.05 | 35 | 97 | 375 | 10 | 12 |
| DZ23C51-G | V72 | 48.45 | 51 | 53.55 | 2 | 0.5 | 0.05 | 38 | 100 | 400 | 10 | 12 |
| DZ23C56-G | V73 | 53.20 | 56 | 58.80 | 2 | 0.5 | 0.05 | 42 | 135 | 425 | 9 | 11 |
| DZ23C62-G | V74 | 58.90 | 62 | 65.10 | 2 | 0.5 | 0.05 | 46.5 | 150 | 450 | 9 | 12 |
| DZ23C68-G | V75 | 64.60 | 68 | 71.40 | 2 | 0.5 | 0.05 | 51 | 200 | 475 | 10 | 12 |
| DZ23C75-G | V76 | 71.25 | 75 | 78.75 | 2 | 0.5 | 0.05 | 56 | 250 | 500 | 10 | 12 |

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

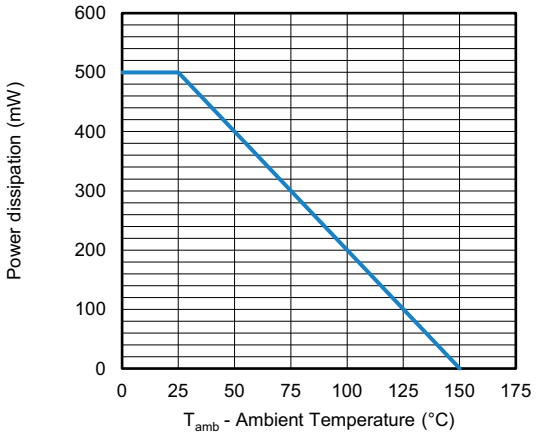



Fig. 1 - Admissible Power Dissipation vs. Ambient Temperature

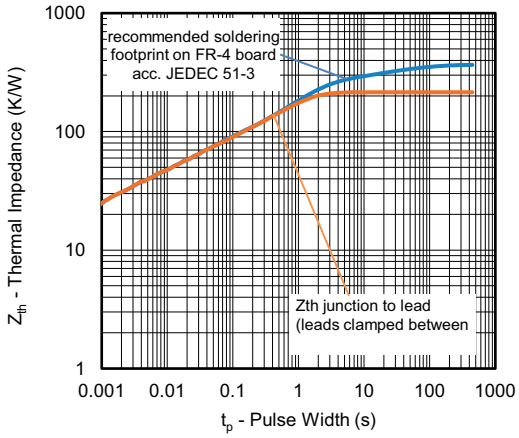
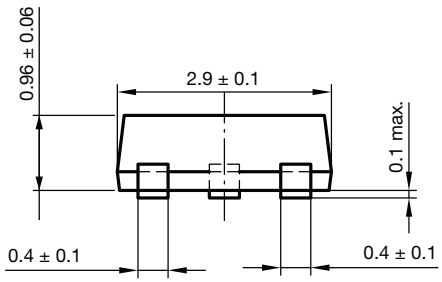
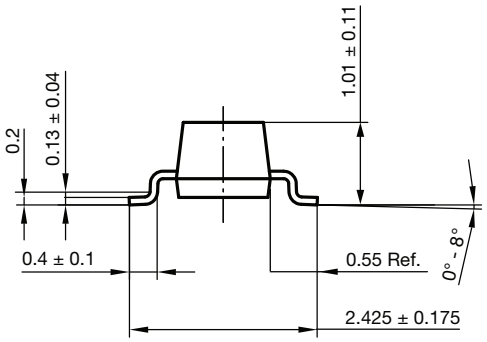
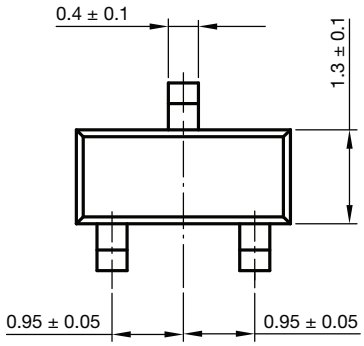



Fig. 2 - Thermal Impedance vs. Time

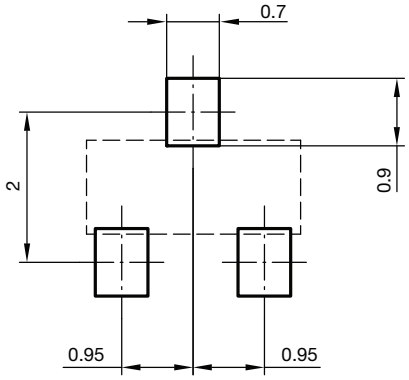
## PACKAGE DIMENSIONS in millimeters (inches): SOT-23




Foot print recommendation:

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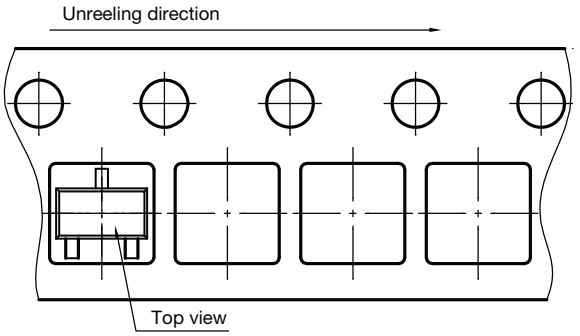
## ORIENTATION IN CARRIER TAPE




SOT-23

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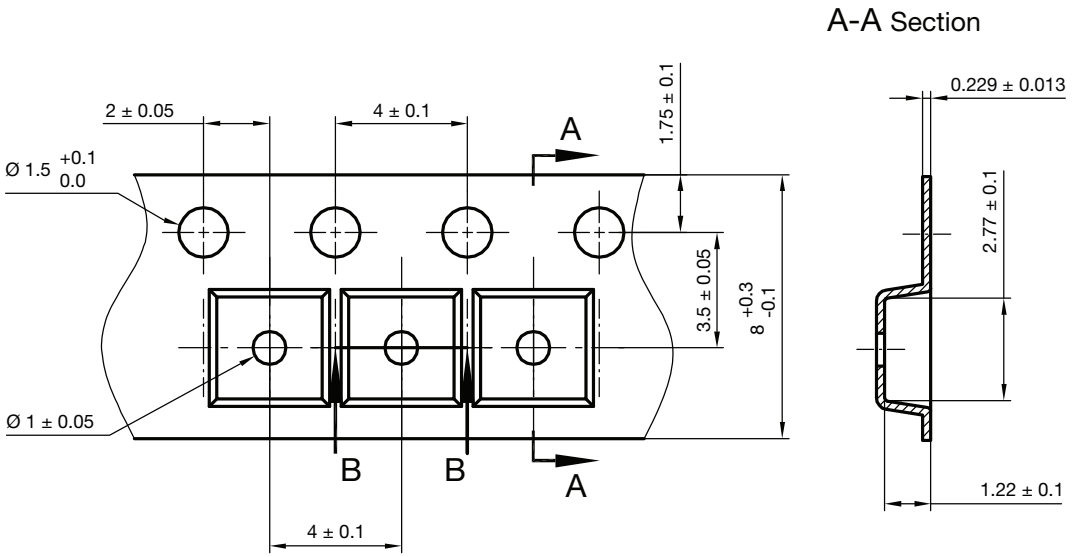
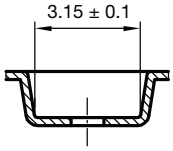
## CARRIER TAPE




B-B Section

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