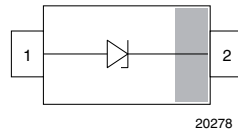
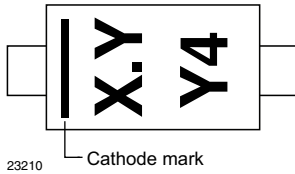


## Small Signal Zener Diodes



### MARKING (example only)



X.Y = type code  
Y4 = date code

### LINKS TO ADDITIONAL RESOURCES



### FEATURES

- Silicon planar Zener diodes
- The Zener voltages are graded according to the international E24 standard. Standard Zener voltage tolerance is  $\pm 5\%$ , indicated by the "C" in the ordering code. Replace "C" with "B" for 2% tolerance
- AEC-Q101 qualified available (part number on request)
- ESD capability according 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](http://www.vishay.com/doc?99912)



| 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 |
| BZT52-G series       | BZT52C2V2-G3-08 to BZT52C75-G3-08 | 5%                      | no                 | 3000<br>(8 mm tape on 7" reel)    | 15 000/box             |
|                      | BZT52B2V2-G3-08 to BZT52B75-G3-08 | 2%                      | no                 |                                   |                        |
|                      | BZT52C2V2-G3-18 to BZT52C75-G3-18 | 5%                      | no                 | 10 000<br>(8 mm tape on 13" reel) | 10 000/box             |
|                      | BZT52B2V2-G3-18 to BZT52B75-G3-18 | 2%                      | no                 |                                   |                        |

| PACKAGE      |         |                                      |                                   |                              |
|--------------|---------|--------------------------------------|-----------------------------------|------------------------------|
| PACKAGE NAME | WEIGHT  | MOLDING COMPOUND FLAMMABILITY RATING | MOISTURE SENSITIVITY LEVEL        | SOLDERING CONDITIONS         |
| SOD-123      | 10.6 mg | UL 94 V-0                            | MSL level 1 (according J-STD-020) | Peak temperature max. 260 °C |

| ABSOLUTE MAXIMUM RATINGS ( $T_{amb} = 25\text{ °C}$ , unless otherwise specified) |   |            |             |      |
|---|---|------------|-------------|------|
| PARAMETER   | TEST CONDITION  | SYMBOL     | VALUE       | UNIT |
| Power dissipation   | $R_{thJL} = 250\text{ K/W}$   | $P_{tot}$  | 500         | mW   |
|   | On FR-4 board with recommended soldering footprint                          | $P_{tot}$  | 300         | mW   |
| Zener current   | See table "Electrical Characteristics"                                      |            |             |      |
| 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   |



| <b>ELECTRICAL CHARACTERISTICS</b> ( $T_{amb} = 25\text{ }^{\circ}\text{C}$ , unless otherwise specified) |              |                                    |      |       |              |           |                 |         |                    |                       |                            |   |   |
|--|--------------|------------------------------------|------|-------|--------------|-----------|-----------------|---------|--------------------|-----------------------|----------------------------|---|---|
| PART NUMBER  | MARKING CODE | ZENER VOLTAGE RANGE <sup>(1)</sup> |      |       | TEST CURRENT |           | REVERSE VOLTAGE |         | DYNAMIC RESISTANCE |                       | TEMP. COEFFICIENT          | ADMISSIBLE ZENER CURRENT <sup>(2)</sup>         |   |
|  |              | $V_Z$ at $I_{ZT1}$                 |      |       | $I_{ZT1}$    | $I_{ZT2}$ | $V_R$ at $I_R$  |         | $Z_z$ at $I_{ZT1}$ | $Z_{zk}$ at $I_{ZT2}$ | $\alpha_{VZ}$              | $I_z$ at $T_{amb} = 45\text{ }^{\circ}\text{C}$ | $I_z$ at $T_{amb} = 25\text{ }^{\circ}\text{C}$ |
|  |              | V                                  |      |       | mA           |           | V               | nA      | $\Omega$           |                       | $10^{-4}/^{\circ}\text{C}$ | mA  |   |
|  |              | MIN.                               | NOM. | MAX.  |              |           |                 |         |                    |                       |                            |   |   |
| BZT52C2V2-G  | Z9           | 2.09                               | 2.2  | 2.31  | 5            | 1         | > 1             | 100 000 | 120                | 600                   | -9 to -4                   | 130   | 154   |
| BZT52C2V4-G  | Y1           | 2.28                               | 2.4  | 2.52  | 5            | 1         | > 1             | 50 000  | 100                | 600                   | -9 to -4                   | 124   | 146   |
| BZT52C2V7-G  | Y2           | 2.57                               | 2.7  | 2.84  | 5            | 1         | > 1             | 20 000  | 83                 | 500                   | -9 to -4                   | 111   | 131   |
| BZT52C3V0-G  | Y3           | 2.85                               | 3.0  | 3.15  | 5            | 1         | > 1             | 10 000  | 95                 | 500                   | -9 to -3                   | 106   | 123   |
| BZT52C3V3-G  | Y4           | 3.14                               | 3.3  | 3.47  | 5            | 1         | > 1             | 5000    | 95                 | 500                   | -8 to -3                   | 103   | 118   |
| BZT52C3V6-G  | Y5           | 3.42                               | 3.6  | 3.78  | 5            | 1         | > 1             | 5000    | 95                 | 500                   | -8 to -3                   | 100   | 114   |
| BZT52C3V9-G  | Y6           | 3.71                               | 3.9  | 4.10  | 5            | 1         | > 1             | 2000    | 95                 | 500                   | -7 to -3                   | 94  | 107   |
| BZT52C4V3-G  | Y7           | 4.09                               | 4.3  | 4.52  | 5            | 1         | > 1             | 1000    | 95                 | 500                   | -6 to -1                   | 91  | 103   |
| BZT52C4V7-G  | Y8           | 4.47                               | 4.7  | 4.94  | 5            | 1         | > 1             | 500     | 78                 | 500                   | -5 to +2                   | 87  | 99  |
| BZT52C5V1-G  | Y9           | 4.85                               | 5.1  | 5.36  | 5            | 1         | > 0.8           | 100     | 60                 | 480                   | -3 to +4                   | 84  | 101   |
| BZT52C5V6-G  | YA           | 5.32                               | 5.6  | 5.88  | 5            | 1         | > 1             | 100     | 40                 | 400                   | -2 to +6                   | 75  | 91  |
| BZT52C6V2-G  | YB           | 5.89                               | 6.2  | 6.51  | 5            | 1         | > 2             | 100     | 10                 | 150                   | -1 to +7                   | 67  | 80  |
| BZT52C6V8-G  | YC           | 6.46                               | 6.8  | 7.14  | 5            | 1         | > 3             | 100     | 8                  | 80                    | +2 to +7                   | 60  | 72  |
| BZT52C7V5-G  | YD           | 7.13                               | 7.5  | 7.88  | 5            | 1         | > 5             | 100     | 7                  | 50                    | +3 to +7                   | 54  | 64  |
| BZT52C8V2-G  | YE           | 7.79                               | 8.2  | 8.61  | 5            | 1         | > 6             | 100     | 7                  | 50                    | +4 to +7                   | 48  | 57  |
| BZT52C9V1-G  | YF           | 8.65                               | 9.1  | 9.56  | 5            | 1         | > 7             | 100     | 10                 | 50                    | +5 to +8                   | 42  | 50  |
| BZT52C10-G   | YG           | 9.50                               | 10   | 10.50 | 5            | 1         | > 7.5           | 100     | 15                 | 70                    | +5 to +8                   | 38  | 45  |
| BZT52C11-G   | YH           | 10.45                              | 11   | 11.55 | 5            | 1         | > 8.5           | 100     | 20                 | 70                    | +5 to +9                   | 35  | 41  |
| BZT52C12-G   | YI           | 11.40                              | 12   | 12.60 | 5            | 1         | > 9             | 100     | 20                 | 90                    | +6 to +9                   | 32  | 37  |
| BZT52C13-G   | YK           | 12.40                              | 13   | 13.65 | 5            | 1         | > 10            | 100     | 25                 | 110                   | +7 to +9                   | 29  | 34  |
| BZT52C15-G   | YL           | 14.25                              | 15   | 15.60 | 5            | 1         | > 11            | 100     | 30                 | 110                   | +7 to +9                   | 25  | 29  |
| BZT52C16-G   | YM           | 15.30                              | 16   | 16.80 | 5            | 1         | > 12            | 100     | 40                 | 170                   | +8 to +9.5                 | 23  | 27  |
| BZT52C18-G   | YN           | 17.10                              | 18   | 18.90 | 5            | 1         | > 14            | 100     | 45                 | 170                   | +8 to +9.5                 | 21  | 24  |
| BZT52C20-G   | YO           | 19.00                              | 20   | 21.00 | 5            | 1         | > 15            | 100     | 50                 | 220                   | +8 to +10                  | 18  | 22  |
| BZT52C22-G   | YP           | 20.90                              | 22   | 23.10 | 5            | 1         | > 17            | 100     | 55                 | 220                   | +8 to +10                  | 17  | 20  |
| BZT52C24-G   | YR           | 22.80                              | 24   | 25.20 | 5            | 1         | > 18            | 100     | 70                 | 220                   | +8 to +10                  | 15  | 18  |
| BZT52C27-G   | YS           | 25.65                              | 27   | 28.35 | 2            | 0.5       | > 20            | 100     | 80                 | 250                   | +8 to +10                  | 14  | 16  |
| BZT52C30-G   | YT           | 28.50                              | 30   | 31.50 | 2            | 0.5       | > 22.5          | 100     | 80                 | 250                   | +8 to +10                  | 12  | 14  |
| BZT52C33-G   | YU           | 31.35                              | 33   | 34.65 | 2            | 0.5       | > 25            | 100     | 80                 | 250                   | +8 to +10                  | 11  | 13  |
| BZT52C36-G   | YW           | 34.20                              | 36   | 37.80 | 2            | 0.5       | > 27            | 100     | 87                 | 250                   | +8 to +10                  | 10  | 12  |
| BZT52C39-G   | YX           | 37.05                              | 39   | 40.95 | 2            | 0.5       | > 29            | 100     | 87                 | 300                   | +8 to +12                  | 9   | 11  |
| BZT52C43-G   | YY           | 40.85                              | 43   | 45.15 | 2            | 0.5       | > 32            | 100     | 97                 | 375                   | +8 to +12                  | 9   | 10  |
| BZT52C47-G   | YZ           | 44.65                              | 47   | 49.35 | 2            | 0.5       | > 35            | 100     | 97                 | 375                   | +8 to +12                  | 8   | 9   |
| BZT52C51-G   | Z1           | 48.45                              | 51   | 53.55 | 2            | 0.5       | > 38            | 100     | 100                | 400                   | +8 to +12                  | 7   | 8   |
| BZT52C56-G   | Z2           | 53.20                              | 56   | 58.80 | 2            | 0.5       | > 42            | 100     | 135                | 425                   | +8 to +12                  | 7   | 8   |
| BZT52C62-G   | Z3           | 58.90                              | 62   | 65.10 | 2            | 0.5       | > 46            | 100     | 150                | 450                   | +8 to +12                  | 6   | 7   |
| BZT52C68-G   | Z4           | 64.60                              | 68   | 71.40 | 2            | 0.5       | > 51            | 100     | 200                | 475                   | +8 to +12                  | 5   | 6   |
| BZT52C75-G   | Z5           | 71.25                              | 75   | 78.75 | 2            | 0.5       | > 56            | 100     | 250                | 500                   | +8 to +12                  | 5   | 6   |

**Notes**

- $I_{ZT1} = 5\text{ mA}$ ,  $I_{ZT2} = 1\text{ mA}$  or  $0.5\text{ mA}$
- <sup>(1)</sup> Measured with pulses  $t_p = 5\text{ ms}$
- <sup>(2)</sup> Valid provided that electrodes are kept at ambient temperature



| <b>ELECTRICAL CHARACTERISTICS</b> ( $T_{amb} = 25\text{ }^{\circ}\text{C}$ , unless otherwise specified) |              |                                    |      |       |              |           |                 |         |                    |                       |                            |   |   |
|--|--------------|------------------------------------|------|-------|--------------|-----------|-----------------|---------|--------------------|-----------------------|----------------------------|---|---|
| PART NUMBER  | MARKING CODE | ZENER VOLTAGE RANGE <sup>(1)</sup> |      |       | TEST CURRENT |           | REVERSE VOLTAGE |         | DYNAMIC RESISTANCE |                       | TEMP. COEFFICIENT          | ADMISSABLE ZENER CURRENT <sup>(2)</sup>         |   |
|  |              | $V_Z$ at $I_{ZT1}$                 |      |       | $I_{ZT1}$    | $I_{ZT2}$ | $V_R$ at $I_R$  |         | $Z_Z$ at $I_{ZT1}$ | $Z_{ZK}$ at $I_{ZT2}$ | $\alpha_{VZ}$              | $I_Z$ at $T_{amb} = 45\text{ }^{\circ}\text{C}$ | $I_Z$ at $T_{amb} = 25\text{ }^{\circ}\text{C}$ |
|  |              | V                                  |      |       | mA           |           | V               | nA      | $\Omega$           |                       | $10^{-4}/^{\circ}\text{C}$ | mA  |   |
|  |              | MIN.                               | NOM. | MAX.  |              |           |                 |         |                    |                       |                            |   |   |
| BZT52B2V2-G  | U6           | 2.16                               | 2.2  | 2.24  | 5            | 1         | > 1             | 100 000 | 120                | 600                   | -9 to -4                   | 130   | 154   |
| BZT52B2V4-G  | V1           | 2.35                               | 2.4  | 2.45  | 5            | 1         | > 1             | 50 000  | 100                | 600                   | -9 to -4                   | 124   | 146   |
| BZT52B2V7-G  | V2           | 2.65                               | 2.7  | 2.75  | 5            | 1         | > 1             | 20 000  | 83                 | 500                   | -9 to -4                   | 111   | 131   |
| BZT52B3V0-G  | V3           | 2.94                               | 3.0  | 3.06  | 5            | 1         | > 1             | 10 000  | 95                 | 500                   | -9 to -3                   | 106   | 123   |
| BZT52B3V3-G  | V4           | 3.23                               | 3.3  | 3.37  | 5            | 1         | > 1             | 5000    | 95                 | 500                   | -8 to -3                   | 103   | 118   |
| BZT52B3V6-G  | V5           | 3.53                               | 3.6  | 3.67  | 5            | 1         | > 1             | 5000    | 95                 | 500                   | -8 to -3                   | 100   | 114   |
| BZT52B3V9-G  | V6           | 3.82                               | 3.9  | 3.98  | 5            | 1         | > 1             | 2000    | 90                 | 500                   | -7 to -3                   | 94  | 107   |
| BZT52B4V3-G  | V7           | 4.21                               | 4.3  | 4.39  | 5            | 1         | > 1             | 1000    | 90                 | 500                   | -6 to -1                   | 91  | 103   |
| BZT52B4V7-G  | V8           | 4.61                               | 4.7  | 4.79  | 5            | 1         | > 1             | 500     | 78                 | 500                   | -5 to +2                   | 87  | 99  |
| BZT52B5V1-G  | V9           | 5.00                               | 5.1  | 5.20  | 5            | 1         | > 0.8           | 100     | 60                 | 480                   | -3 to +4                   | 84  | 101   |
| BZT52B5V6-G  | VA           | 5.49                               | 5.6  | 5.71  | 5            | 1         | > 1             | 100     | 40                 | 400                   | -2 to +6                   | 75  | 91  |
| BZT52B6V2-G  | VB           | 6.08                               | 6.2  | 6.32  | 5            | 1         | > 2             | 100     | 10                 | 150                   | -1 to +7                   | 67  | 80  |
| BZT52B6V8-G  | VC           | 6.66                               | 6.8  | 6.94  | 5            | 1         | > 3             | 100     | 8                  | 80                    | +2 to +7                   | 60  | 72  |
| BZT52B7V5-G  | VD           | 7.35                               | 7.5  | 7.65  | 5            | 1         | > 5             | 100     | 7                  | 50                    | +3 to +7                   | 54  | 64  |
| BZT52B8V2-G  | VE           | 8.04                               | 8.2  | 8.36  | 5            | 1         | > 6             | 100     | 7                  | 50                    | +4 to +7                   | 48  | 57  |
| BZT52B9V1-G  | VF           | 8.92                               | 9.1  | 9.28  | 5            | 1         | > 7             | 100     | 10                 | 50                    | +5 to +8                   | 42  | 50  |
| BZT52B10-G   | VG           | 9.80                               | 10   | 10.20 | 5            | 1         | > 7.5           | 100     | 15                 | 70                    | +5 to +8                   | 38  | 45  |
| BZT52B11-G   | VH           | 10.78                              | 11   | 11.22 | 5            | 1         | > 8.5           | 100     | 20                 | 70                    | +5 to +9                   | 35  | 41  |
| BZT52B12-G   | VI           | 11.76                              | 12   | 12.24 | 5            | 1         | > 9             | 100     | 20                 | 90                    | +6 to +9                   | 32  | 37  |
| BZT52B13-G   | VK           | 12.74                              | 13   | 13.26 | 5            | 1         | > 10            | 100     | 25                 | 110                   | +7 to +9                   | 29  | 34  |
| BZT52B15-G   | VL           | 14.70                              | 15   | 15.30 | 5            | 1         | > 11            | 100     | 30                 | 110                   | +7 to +9                   | 25  | 29  |
| BZT52B16-G   | VM           | 15.68                              | 16   | 16.32 | 5            | 1         | > 12            | 100     | 40                 | 170                   | +8 to +9.5                 | 23  | 27  |
| BZT52B18-G   | VN           | 17.64                              | 18   | 18.36 | 5            | 1         | > 14            | 100     | 45                 | 170                   | +8 to +9.5                 | 21  | 24  |
| BZT52B20-G   | VO           | 19.60                              | 20   | 20.40 | 5            | 1         | > 15            | 100     | 50                 | 220                   | +8 to +10                  | 18  | 22  |
| BZT52B22-G   | VP           | 21.56                              | 22   | 22.44 | 5            | 1         | > 17            | 100     | 55                 | 220                   | +8 to +10                  | 17  | 20  |
| BZT52B24-G   | VR           | 23.52                              | 24   | 24.48 | 5            | 1         | > 18            | 100     | 70                 | 220                   | +8 to +10                  | 15  | 18  |
| BZT52B27-G   | VS           | 26.46                              | 27   | 27.54 | 2            | 0.5       | > 20            | 100     | 80                 | 250                   | +8 to +10                  | 14  | 16  |
| BZT52B30-G   | VT           | 29.40                              | 30   | 30.60 | 2            | 0.5       | > 22.5          | 100     | 80                 | 250                   | +8 to +10                  | 12  | 14  |
| BZT52B33-G   | VU           | 32.34                              | 33   | 33.66 | 2            | 0.5       | > 25            | 100     | 80                 | 250                   | +8 to +10                  | 11  | 13  |
| BZT52B36-G   | VW           | 35.28                              | 36   | 36.72 | 2            | 0.5       | > 27            | 100     | 87                 | 250                   | +8 to +10                  | 10  | 12  |
| BZT52B39-G   | VX           | 38.22                              | 39   | 39.78 | 2            | 0.5       | > 29            | 100     | 87                 | 300                   | +8 to +12                  | 9   | 11  |
| BZT52B43-G   | VY           | 42.14                              | 43   | 43.86 | 2            | 0.5       | > 32            | 100     | 97                 | 375                   | +8 to +12                  | 9   | 10  |
| BZT52B47-G   | VZ           | 46.06                              | 47   | 47.94 | 2            | 0.5       | > 35            | 100     | 97                 | 375                   | +8 to +12                  | 8   | 9   |
| BZT52B51-G   | U1           | 49.98                              | 51   | 52.02 | 2            | 0.5       | > 38            | 100     | 100                | 400                   | +8 to +12                  | 7   | 8   |
| BZT52B56-G   | U2           | 54.88                              | 56   | 57.12 | 2            | 0.5       | > 42            | 100     | 135                | 425                   | +8 to +12                  | 7   | 8   |
| BZT52B62-G   | U3           | 60.76                              | 62   | 63.24 | 2            | 0.5       | > 46            | 100     | 150                | 450                   | +8 to +12                  | 6   | 7   |
| BZT52B68-G   | U4           | 66.64                              | 68   | 69.36 | 2            | 0.5       | > 51            | 100     | 200                | 475                   | +8 to +12                  | 5   | 6   |
| BZT52B75-G   | U5           | 73.50                              | 75   | 76.50 | 2            | 0.5       | > 56            | 100     | 250                | 500                   | +8 to +12                  | 5   | 6   |

**Notes**

- $I_{ZT1} = 5\text{ mA}$ ,  $I_{ZT2} = 1\text{ mA}$  or  $0.5\text{ mA}$
- (1) Measured with pulses  $t_p = 5\text{ ms}$
- (2) Valid provided that electrodes are kept at ambient temperature



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

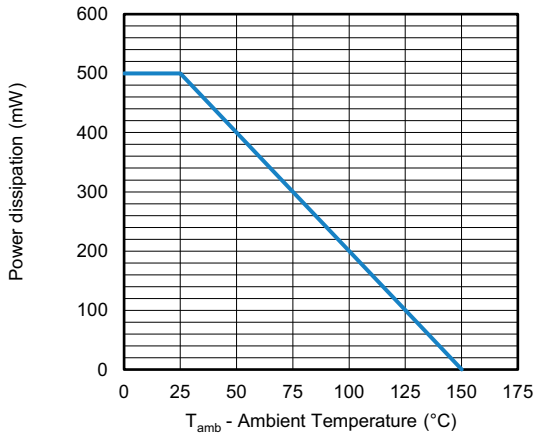


Fig. 1 - Admissible Power Dissipation vs. Ambient Temperature

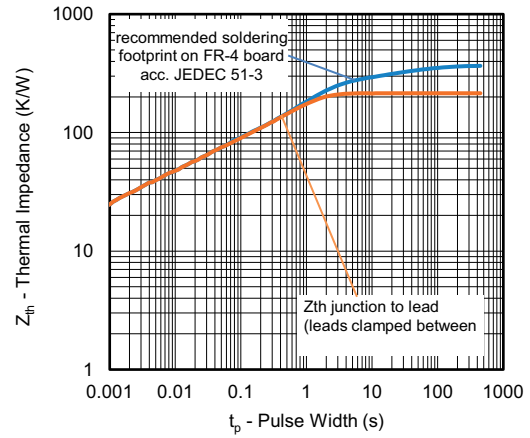
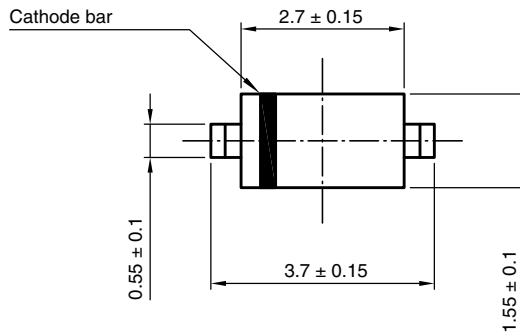
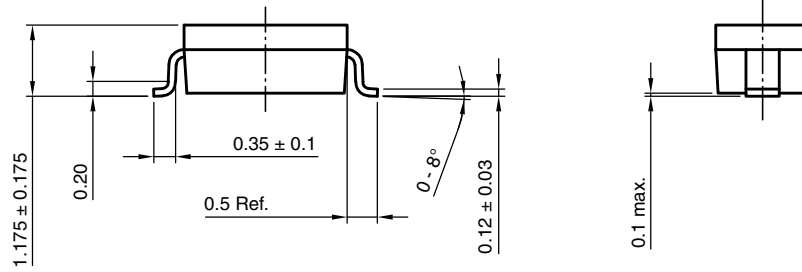


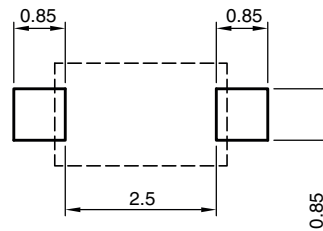
Fig. 2 - Thermal Impedance vs. Time



**PACKAGE DIMENSIONS** in millimeters (inches): **SOD-123**



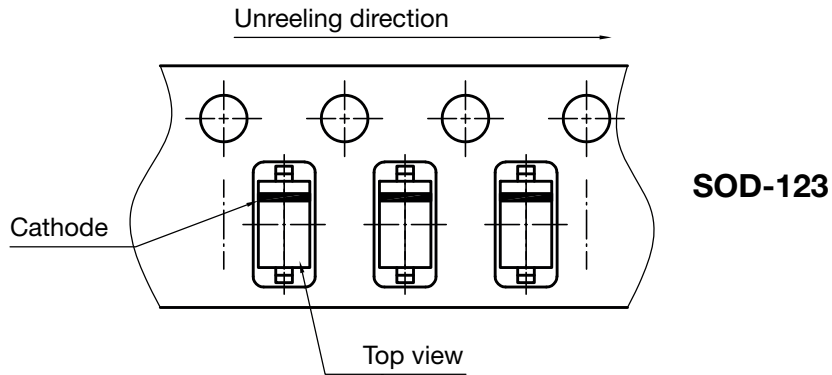
Footprint recommendation:



Created - Date: 18 Oct. 2021  
Rev. 01 - Date: 18 Jan. 2022  
Document no.: S8-V-3910.01-003 (4)

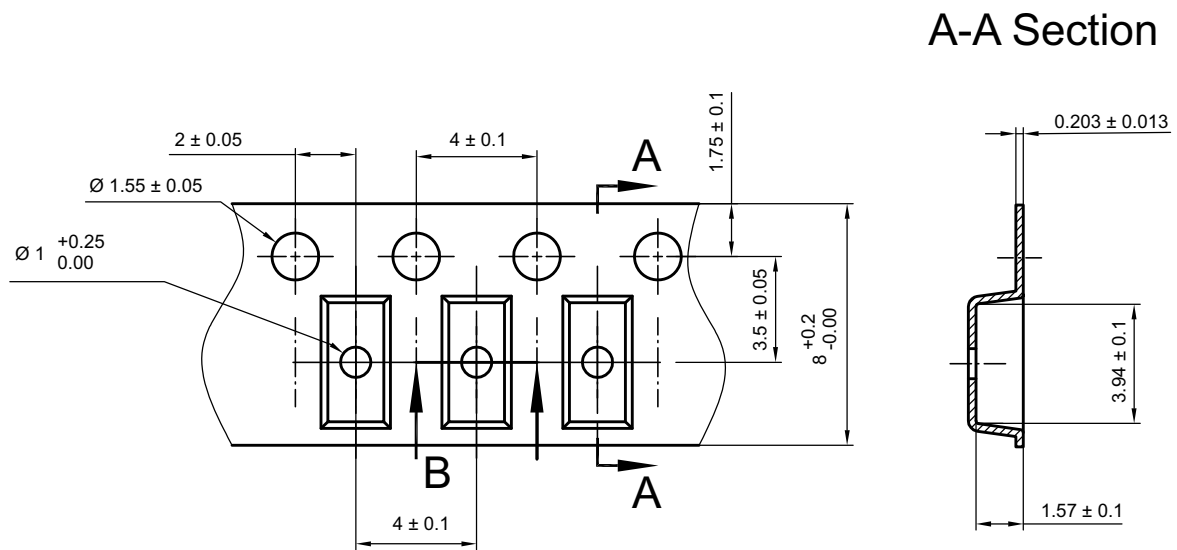


**ORIENTATION IN CARRIER TAPE**

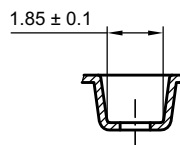


Created - Date: 09. Feb. 2016  
Rev. 01 - Date: 07. Nov. 2022  
Document no.: S8-V-3717.10-003 (4)

**CARRIER TAPE**



**B-B Section**



Created - Date: 07. Feb. 2013  
Rev. 01 - Date: 01. Mar. 2014  
Document no.: S8-V-3717.10-003 (4)



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