

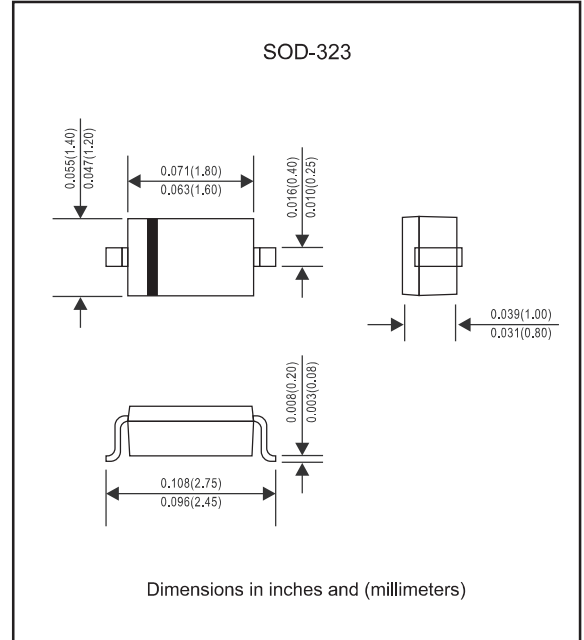
### Features

- Silicon epitaxial planar chip structure.
- Wide zener reverse voltage range 2.0V to 43V.
- Small package size for high density applications.
- Ideally suited for automated assembly processes.
- Pb-free package is available
- We declare that the material of product compliance with RoHS requirements.
- Compliant to Halogen-free.
- Suffix "-Q1" for AEC-Q101.

### Mechanical data

- Epoxy: UL94-V0 rated flame retardant
- Case : Molded plastic, SOD-323
- Terminals : Solder plated, solderable per MIL-STD-750, Method 2026
- Polarity : Indicated by cathode band
- Mounting Position : Any

### Package outline



### Maximum ratings (at $T_A=25^\circ\text{C}$ unless otherwise noted)

| PARAMETER                            | CONDITIONS                        | Symbol          | MIN. | TYP. | MAX. | UNIT               |
|--------------------------------------|-----------------------------------|-----------------|------|------|------|--------------------|
| Forward voltage                      | $I_F = 10 \text{ mA}$             | $V_F$           |      |      | 0.9  | V                  |
| Power dissipation                    | $T_A = 25^\circ\text{C}$ (note 1) | $P_D$           |      |      | 200  | mW                 |
| Thermal resistance                   | Junction to ambient (note 1)      | $R_{\theta JA}$ |      | 625  |      | $^\circ\text{C/W}$ |
|                                      | Junction to case (note 1)         | $R_{\theta JC}$ |      | 350  |      | $^\circ\text{C/W}$ |
| Operating junction temperature range |                                   | $T_J$           | -55  |      | +150 | $^\circ\text{C}$   |
| Storage temperature range            |                                   | $T_{STG}$       | -55  |      | +150 | $^\circ\text{C}$   |

Note 1: Mounted on FR-4 minimum pad

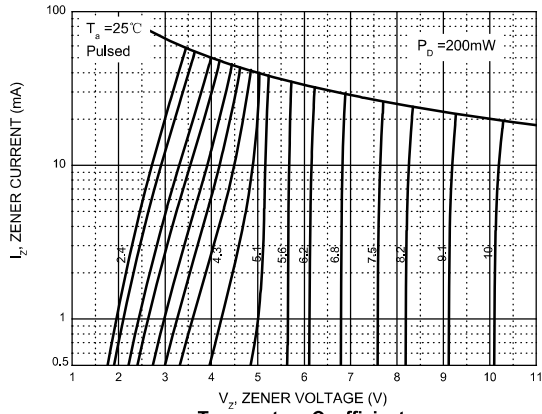
### Electrical characteristics (at $T_A=25^\circ\text{C}$ unless otherwise noted)

| Type Number   | Type Code | Zener Voltage Range (Note 2) |        |        |          | Maximum Zener Impedance (Note 3) |                 |               | Maximum Reverse Current |       | Typical Temperature Coefficient @ $I_{ZTC}$ mV/ $^\circ\text{C}$ |      | Test Current $I_{ZTC}$ mA |
|---------------|-----------|------------------------------|--------|--------|----------|----------------------------------|-----------------|---------------|-------------------------|-------|--|------|---------------------------|
|               |           | $V_Z@I_{ZT}$                 |        |        | $I_{ZT}$ | $Z_{ZT}@I_{ZT}$                  | $Z_{ZK}@I_{ZK}$ | $I_{ZK}$      | $I_R$                   | $V_R$ | Min  | Max  |                           |
|               |           | Nom(V)                       | Min(V) | Max(V) | mA       | $\Omega$                         | mA              | $\mu\text{A}$ | V                       |       |  |      |                           |
| BZT52B2V4S-Q1 | 2WX       | 2.4                          | 2.35   | 2.45   | 5        | 100                              | 600             | 1.0           | 50                      | 1.0   | -3.5   | 0    | 5                         |
| BZT52B2V7S-Q1 | 2W1       | 2.7                          | 2.65   | 2.75   | 5        | 100                              | 600             | 1.0           | 20                      | 1.0   | -3.5   | 0    | 5                         |
| BZT52B3V0S-Q1 | 2W2       | 3.0                          | 2.94   | 3.06   | 5        | 95                               | 600             | 1.0           | 10                      | 1.0   | -3.5   | 0    | 5                         |
| BZT52B3V3S-Q1 | 2W3       | 3.3                          | 3.23   | 3.37   | 5        | 95                               | 600             | 1.0           | 5                       | 1.0   | -3.5   | 0    | 5                         |
| BZT52B3V6S-Q1 | 2W4       | 3.6                          | 3.53   | 3.67   | 5        | 90                               | 600             | 1.0           | 5                       | 1.0   | -3.5   | 0    | 5                         |
| BZT52B3V9S-Q1 | 2W5       | 3.9                          | 3.82   | 3.98   | 5        | 90                               | 600             | 1.0           | 3                       | 1.0   | -3.5   | 0    | 5                         |
| BZT52B4V3S-Q1 | 2W6       | 4.3                          | 4.21   | 4.39   | 5        | 90                               | 600             | 1.0           | 3                       | 1.0   | -3.5   | 0    | 5                         |
| BZT52B4V7S-Q1 | 2W7       | 4.7                          | 4.61   | 4.79   | 5        | 80                               | 500             | 1.0           | 3                       | 2.0   | -3.5   | 0.2  | 5                         |
| BZT52B5V1S-Q1 | 2W8       | 5.1                          | 5.00   | 5.20   | 5        | 60                               | 480             | 1.0           | 2                       | 2.0   | -2.7   | 1.2  | 5                         |
| BZT52B5V6S-Q1 | 2W9       | 5.6                          | 5.49   | 5.71   | 5        | 40                               | 400             | 1.0           | 1                       | 2.0   | -2.0   | 2.5  | 5                         |
| BZT52B6V2S-Q1 | 2WA       | 6.2                          | 6.08   | 6.32   | 5        | 10                               | 150             | 1.0           | 3                       | 4.0   | 0.4  | 3.7  | 5                         |
| BZT52B6V8S-Q1 | 2WB       | 6.8                          | 6.66   | 6.94   | 5        | 15                               | 80              | 1.0           | 2                       | 4.0   | 1.2  | 4.5  | 5                         |
| BZT52B7V5S-Q1 | 2WC       | 7.5                          | 7.35   | 7.65   | 5        | 15                               | 80              | 1.0           | 1                       | 5.0   | 2.5  | 5.3  | 5                         |
| BZT52B8V2S-Q1 | 2WD       | 8.2                          | 8.04   | 8.36   | 5        | 15                               | 80              | 1.0           | 0.7                     | 5.0   | 3.2  | 6.2  | 5                         |
| BZT52B9V1S-Q1 | 2WE       | 9.1                          | 8.92   | 9.28   | 5        | 15                               | 100             | 1.0           | 0.5                     | 6.0   | 3.8  | 7.0  | 5                         |
| BZT52B10S-Q1  | 2WF       | 10                           | 9.80   | 10.20  | 5        | 20                               | 150             | 1.0           | 0.2                     | 7.0   | 4.5  | 8.0  | 5                         |
| BZT52B11S-Q1  | 2WG       | 11                           | 10.78  | 11.22  | 5        | 20                               | 150             | 1.0           | 0.1                     | 8.0   | 5.4  | 9.0  | 5                         |
| BZT52B12S-Q1  | 2WH       | 12                           | 11.76  | 12.24  | 5        | 25                               | 150             | 1.0           | 0.1                     | 8.0   | 6.0  | 10.0 | 5                         |
| BZT52B13S-Q1  | 2WI       | 13                           | 12.74  | 13.26  | 5        | 30                               | 170             | 1.0           | 0.1                     | 8.0   | 7.0  | 11.0 | 5                         |
| BZT52B15S-Q1  | 2WJ       | 15                           | 14.70  | 15.30  | 5        | 30                               | 200             | 1.0           | 0.1                     | 10.5  | 9.2  | 13.0 | 5                         |
| BZT52B16S-Q1  | 2WK       | 16                           | 15.68  | 16.32  | 5        | 40                               | 200             | 1.0           | 0.1                     | 11.2  | 10.4   | 14.0 | 5                         |
| BZT52B18S-Q1  | 2WL       | 18                           | 17.64  | 18.36  | 5        | 45                               | 225             | 1.0           | 0.1                     | 12.6  | 12.4   | 16.0 | 5                         |
| BZT52B20S-Q1  | 2WM       | 20                           | 19.60  | 20.40  | 5        | 55                               | 225             | 1.0           | 0.1                     | 14.0  | 14.4   | 18.0 | 5                         |
| BZT52B22S-Q1  | 2WN       | 22                           | 21.56  | 22.44  | 5        | 55                               | 250             | 1.0           | 0.1                     | 15.4  | 16.4   | 20.0 | 5                         |
| BZT52B24S-Q1  | 2WO       | 24                           | 23.52  | 24.48  | 5        | 70                               | 250             | 1.0           | 0.1                     | 16.8  | 18.4   | 22.0 | 5                         |
| BZT52B27S-Q1  | 2WP       | 27                           | 26.46  | 27.54  | 2        | 80                               | 300             | 0.5           | 0.1                     | 18.9  | 21.4   | 25.3 | 2                         |
| BZT52B30S-Q1  | 2WQ       | 30                           | 29.40  | 30.60  | 2        | 80                               | 300             | 0.5           | 0.1                     | 21.0  | 24.4   | 29.4 | 2                         |
| BZT52B33S-Q1  | 2WR       | 33                           | 32.34  | 33.66  | 2        | 80                               | 325             | 0.5           | 0.1                     | 23.1  | 27.4   | 33.4 | 2                         |
| BZT52B36S-Q1  | 2WS       | 36                           | 35.28  | 36.72  | 2        | 90                               | 350             | 0.5           | 0.1                     | 25.2  | 30.4   | 37.4 | 2                         |
| BZT52B39S-Q1  | 2WT       | 39                           | 38.22  | 39.78  | 2        | 130                              | 350             | 0.5           | 0.1                     | 27.3  | 33.4   | 41.2 | 2                         |
| BZT52B43S-Q1  | 2WU       | 43                           | 42.14  | 43.86  | 2        | 130                              | 350             | 0.5           | 0.1                     | 29.4  | 36.4   | 45.2 | 2                         |

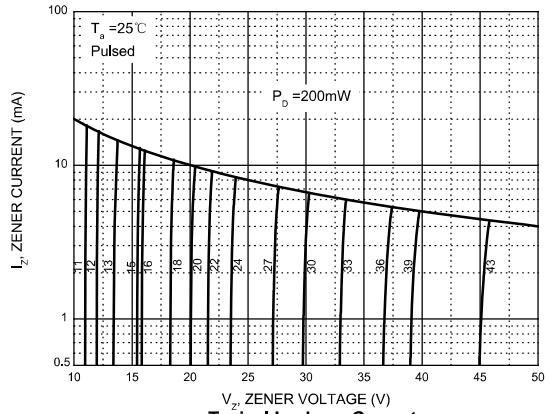
Notes: 1. Device mounted on ceramic PCB:7.6mm x 9.4mm x 0.87mm with pad areas 25mm<sup>2</sup>  
 2. Short duration test pulse used to minimize self-heating effect  
 3 f = 1kHz

# Rating and characteristic curves (BZT52BxxxS-Q1 Series)

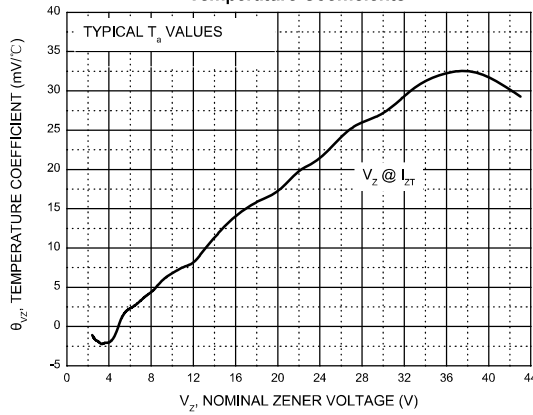
Zener Characteristics ( $V_z$  Up to 10 V)



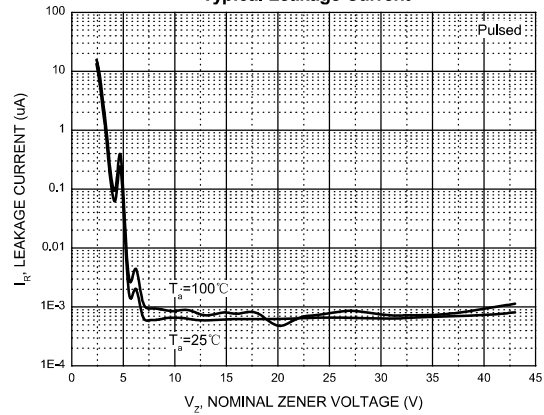
Zener Characteristics (11 V to 43 V)



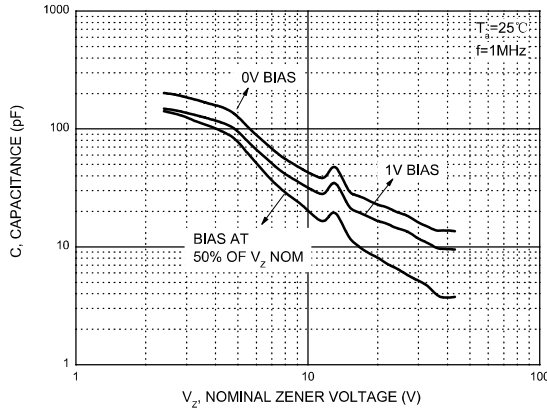
Temperature Coefficients



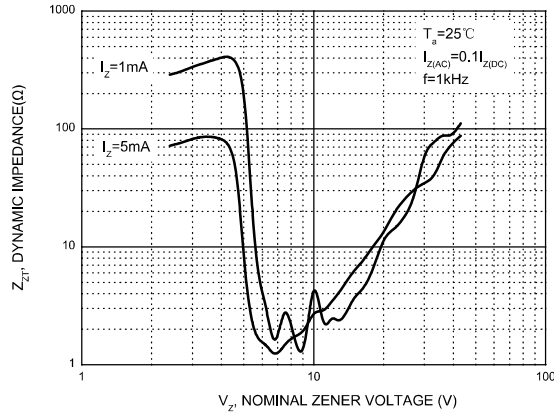
Typical Leakage Current



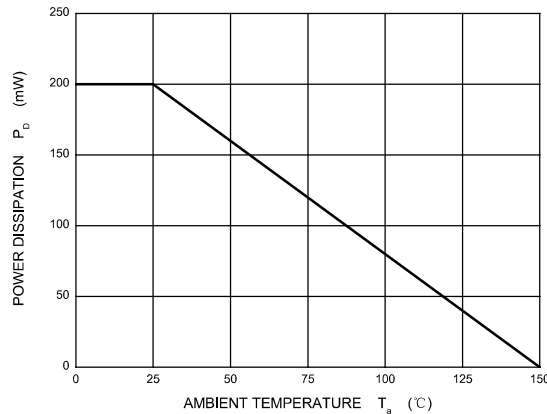
Typical Capacitance





Effect of Zener Voltage on Zener Impedance



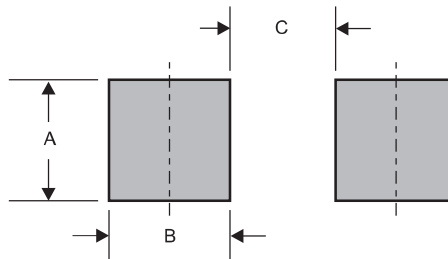
Power Derating Curve



## Pinning information

| Pin                        | Simplified outline   | Symbol  |
|----------------------------|--|---|
| Pin1 cathode<br>Pin2 anode |  |  |

## Suggested solder pad layout



Dimensions in inches and (millimeters)

| PACKAGE | A            | B            | C            |
|---------|--------------|--------------|--------------|
| SOD-323 | 0.033 (0.83) | 0.025 (0.63) | 0.063 (1.60) |