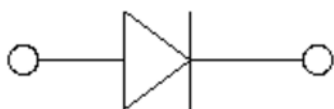


## Zener Diodes



### Features

- Moisture sensitivity level 1
- Zener voltage 2.4V~75V

### Application

- Linear voltage regulator
- DC regulator
- Small-signal surge protection

### Mechanical data

- **Package:** SOD-323
- **Terminals:** Tin plated leads, solderable per J-STD-002 and JEDEC-B102

### ■ Maximum Ratings ( $T_a=25^{\circ}\text{C}$ Unless otherwise specified)

| Parameter                           | Symbol    | Unit               | Value       |
|-------------------------------------|-----------|--------------------|-------------|
| Forward voltage @ $I_F=10\text{mA}$ | $V_F$     | V                  | 0.9         |
| Power dissipation                   | $P_D$     | mW                 | 300         |
| Maximum regulator current           | $I_{ZM}$  | mA                 | $P_D / V_Z$ |
| Junction temperature                | $T_J$     | $^{\circ}\text{C}$ | -55 to +150 |
| Storage temperature                 | $T_{STG}$ | $^{\circ}\text{C}$ | -55 to +150 |



# BZT52C2V4S THRU BZT52C75S

## ■ Electrical Characteristics (T<sub>a</sub>=25°C Unless otherwise specified)

| Type number | Device marking | V <sub>z</sub> @ I <sub>ZT</sub> (V) |      |      | Z <sub>zT</sub> (Ω)  |      | Z <sub>zK</sub> (Ω)  |      | I <sub>R</sub> (μA) @ V <sub>R</sub> |                    | Typical temperature coefficient @ I <sub>ZTC</sub> mV/°C |      |
|-------------|----------------|--------------------------------------|------|------|----------------------|------|----------------------|------|--------------------------------------|--------------------|----------------------------------------------------------|------|
|             |                | Min.                                 | Typ. | Max. | I <sub>ZT</sub> (mA) | Max. | I <sub>zK</sub> (mA) | Max. | Max                                  | V <sub>R</sub> (V) | Min                                                      | Max  |
| BZT52C2V4S  | WX             | 2.28                                 | 2.4  | 2.52 | 5                    | 100  | 1.0                  | 600  | 50                                   | 1.0                | -3.5                                                     | 0    |
| BZT52C2V7S  | W1             | 2.57                                 | 2.7  | 2.84 | 5                    | 100  | 1.0                  | 600  | 20                                   | 1.0                | -3.5                                                     | 0    |
| BZT52C3V0S  | W2             | 2.85                                 | 3.0  | 3.15 | 5                    | 95   | 1.0                  | 600  | 10                                   | 1.0                | -3.5                                                     | 0    |
| BZT52C3V3S  | W3             | 3.14                                 | 3.3  | 3.47 | 5                    | 95   | 1.0                  | 600  | 5                                    | 1.0                | -3.5                                                     | 0    |
| BZT52C3V6S  | W4             | 3.42                                 | 3.6  | 3.78 | 5                    | 90   | 1.0                  | 600  | 5                                    | 1.0                | -3.5                                                     | 0    |
| BZT52C3V9S  | W5             | 3.71                                 | 3.9  | 4.1  | 5                    | 90   | 1.0                  | 600  | 3                                    | 1.0                | -3.5                                                     | 0    |
| BZT52C4V3S  | W6             | 4.09                                 | 4.3  | 4.52 | 5                    | 90   | 1.0                  | 600  | 3                                    | 1.0                | -3.5                                                     | 0    |
| BZT52C4V7S  | W7             | 4.47                                 | 4.7  | 4.94 | 5                    | 80   | 1.0                  | 500  | 3                                    | 2.0                | -3.5                                                     | 0.2  |
| BZT52C5V1S  | W8             | 4.85                                 | 5.1  | 5.36 | 5                    | 60   | 1.0                  | 480  | 2                                    | 2.0                | -2.7                                                     | 1.2  |
| BZT52C5V6S  | W9             | 5.32                                 | 5.6  | 5.88 | 5                    | 40   | 1.0                  | 400  | 1                                    | 2.0                | -2.0                                                     | 2.5  |
| BZT52C6V2S  | WA             | 5.8                                  | 6.2  | 6.6  | 5                    | 10   | 1.0                  | 150  | 3                                    | 4.0                | 0.4                                                      | 3.7  |
| BZT52C6V8S  | WB             | 6.4                                  | 6.8  | 7.2  | 5                    | 15   | 1.0                  | 80   | 2                                    | 4.0                | 1.2                                                      | 4.5  |
| BZT52C7V5S  | WC             | 7.0                                  | 7.5  | 7.9  | 5                    | 15   | 1.0                  | 80   | 1                                    | 5.0                | 2.5                                                      | 5.3  |
| BZT52C8V2S  | WD             | 7.7                                  | 8.2  | 8.7  | 5                    | 15   | 1.0                  | 80   | 0.7                                  | 5.0                | 3.2                                                      | 6.2  |
| BZT52C9V1S  | WE             | 8.5                                  | 9.1  | 9.6  | 5                    | 15   | 1.0                  | 100  | 0.5                                  | 6.0                | 3.8                                                      | 7.0  |
| BZT52C10S   | WF             | 9.4                                  | 10   | 10.6 | 5                    | 20   | 1.0                  | 150  | 0.2                                  | 7.0                | 4.5                                                      | 8.0  |
| BZT52C11S   | WG             | 10.4                                 | 11   | 11.6 | 5                    | 20   | 1.0                  | 150  | 0.1                                  | 8.0                | 5.4                                                      | 9.0  |
| BZT52C12S   | WH             | 11.4                                 | 12   | 12.7 | 5                    | 25   | 1.0                  | 150  | 0.1                                  | 8.0                | 6.0                                                      | 10.0 |
| BZT52C13S   | WI             | 12.4                                 | 13   | 14.1 | 5                    | 30   | 1.0                  | 170  | 0.1                                  | 8.0                | 7.0                                                      | 11.0 |
| BZT52C15S   | WJ             | 14.25                                | 15   | 15.6 | 5                    | 30   | 1.0                  | 200  | 0.1                                  | 10.5               | 9.2                                                      | 13.0 |
| BZT52C16S   | WK             | 15.3                                 | 16   | 17.1 | 5                    | 40   | 1.0                  | 200  | 0.1                                  | 11.2               | 10.4                                                     | 14.0 |
| BZT52C18S   | WL             | 16.8                                 | 18   | 19.1 | 5                    | 45   | 1.0                  | 225  | 0.1                                  | 12.6               | 12.4                                                     | 16.0 |
| BZT52C20S   | WM             | 18.8                                 | 20   | 21.2 | 5                    | 55   | 1.0                  | 225  | 0.1                                  | 14.0               | 14.4                                                     | 18.0 |
| BZT52C22S   | WN             | 20.8                                 | 22   | 23.3 | 5                    | 55   | 1.0                  | 250  | 0.1                                  | 15.4               | 16.4                                                     | 20.0 |
| BZT52C24S   | WO             | 22.8                                 | 24   | 25.6 | 5                    | 70   | 1.0                  | 250  | 0.1                                  | 16.8               | 18.4                                                     | 22.0 |
| BZT52C27S   | WP             | 25.1                                 | 27   | 28.9 | 2                    | 80   | 0.5                  | 300  | 0.1                                  | 18.9               | 21.4                                                     | 25.3 |
| BZT52C30S   | WQ             | 28                                   | 30   | 32   | 2                    | 80   | 0.5                  | 300  | 0.1                                  | 21.0               | 24.4                                                     | 29.4 |



## BZT52C2V4S THRU BZT52C75S

| Type number | Device marking | V <sub>Z</sub> @ I <sub>ZT</sub> (V) |      |      | Z <sub>ZT</sub> (Ω)  |      | Z <sub>ZK</sub> (Ω)  |      | I <sub>R</sub> (μA) @ V <sub>R</sub> |                    | Typical temperature coefficient @ I <sub>ZTC</sub> mV/°C |      |
|-------------|----------------|--------------------------------------|------|------|----------------------|------|----------------------|------|--------------------------------------|--------------------|----------------------------------------------------------|------|
|             |                | Min.                                 | Typ. | Max. | I <sub>ZT</sub> (mA) | Max. | I <sub>ZK</sub> (mA) | Max. | Max                                  | V <sub>R</sub> (V) | Min                                                      | Max  |
| BZT52C33S   | WR             | 31                                   | 33   | 35   | 2                    | 80   | 0.5                  | 325  | 0.1                                  | 23.1               | 27.4                                                     | 33.4 |
| BZT52C36S   | WS             | 34                                   | 36   | 38   | 2                    | 90   | 0.5                  | 350  | 0.1                                  | 25.2               | 30.4                                                     | 37.4 |
| BZT52C39S   | WT             | 37                                   | 39   | 41   | 2                    | 130  | 0.5                  | 350  | 0.1                                  | 27.3               | 33.4                                                     | 41.2 |
| BZT52C43S   | WU             | 40                                   | 43   | 46   | 5                    | 100  | 1.0                  | 750  | 0.1                                  | 32                 | 37.6                                                     | 46.6 |
| BZT52C47S   | WV             | 44                                   | 47   | 50   | 5                    | 100  | 1.0                  | 750  | 0.1                                  | 35                 | 42.0                                                     | 51.8 |
| BZT52C51S   | X1             | 48                                   | 51   | 54   | 2                    | 180  | 0.5                  | 400  | 0.05                                 | 35.7               | 46.6                                                     | 57.2 |
| BZT52C56S   | X2             | 53                                   | 56   | 59   | 2                    | 200  | 1                    | 1000 | 0.1                                  | 42                 | 52.2                                                     | 63.8 |
| BZT52C62S   | X3             | 58                                   | 62   | 66   | 2                    | 215  | 0.5                  | 450  | 0.05                                 | 43.4               | 58.8                                                     | 71.6 |
| BZT52C68S   | X4             | 64                                   | 68   | 72   | 2                    | 240  | 0.5                  | 475  | 0.05                                 | 47.6               | 65.6                                                     | 79.8 |
| BZT52C75S   | X5             | 70                                   | 75   | 79   | 2                    | 255  | 0.5                  | 500  | 0.05                                 | 52.5               | 73.4                                                     | 88.6 |

### ■ Thermal Characteristics

| Parameter                               | Symbol                           | Unit | Value |
|-----------------------------------------|----------------------------------|------|-------|
| Thermal resistance, junction-to-ambient | R <sub>θJ-A</sub> <sup>(1)</sup> | °C/W | 417   |
| Thermal resistance, junction-to-case    | R <sub>θJ-C</sub> <sup>(1)</sup> | °C/W | 334   |

#### Note:

(1) Thermal resistance from junction to ambient and from junction to case mounted on P.C.B. with 8mm\*9mm copper pad areas



# BZT52C2V4S THRU BZT52C75S

## ■ Characteristics

Fig 1:  $P_D$ -Ta Curve

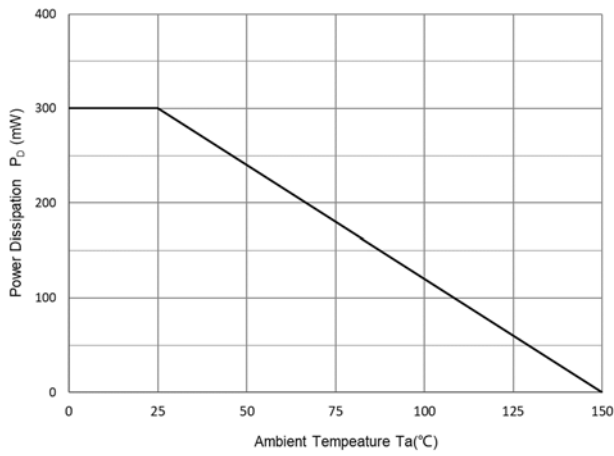


Fig 2: Zener Breakdown Characteristics

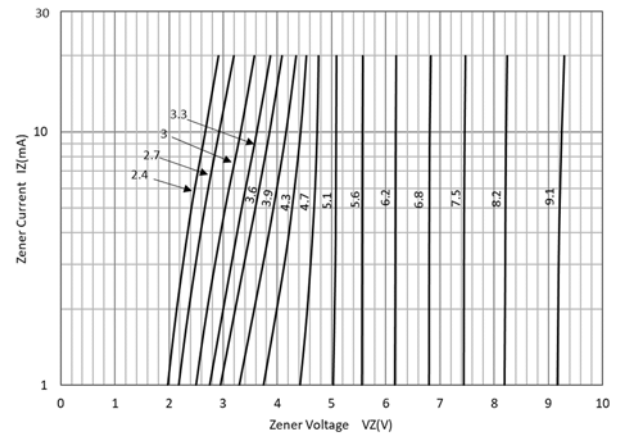


Fig 3: Zener Breakdown Characteristics

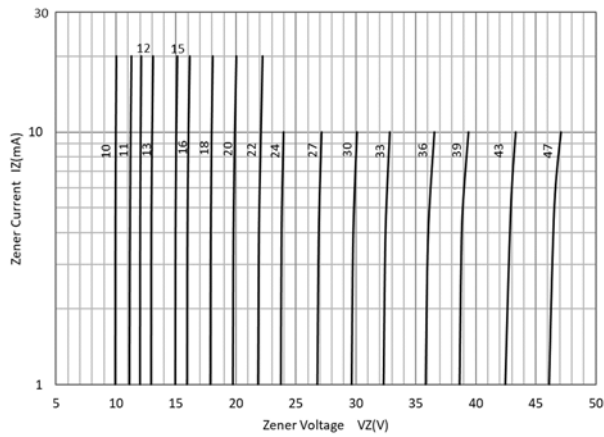


Fig 4: Zener Breakdown Characteristics

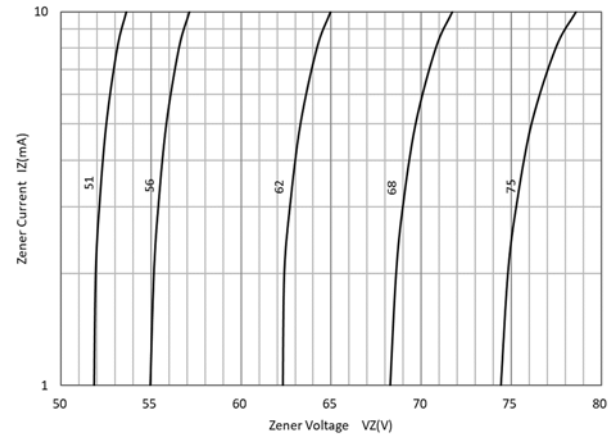


Fig 5: Typical Temperature Coefficient

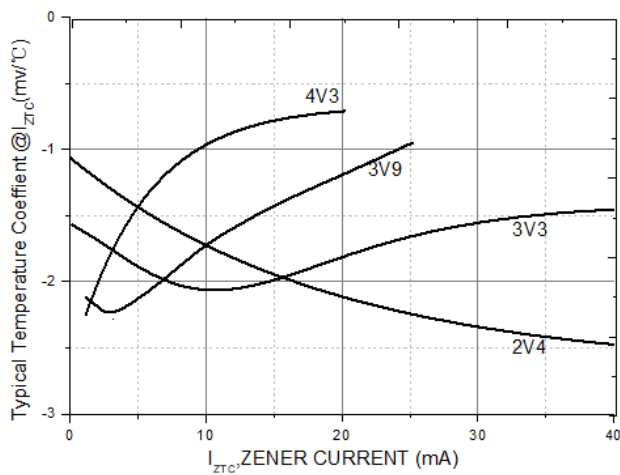
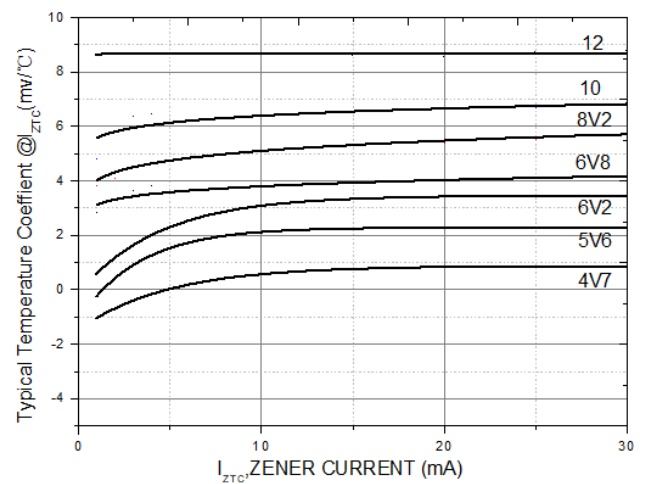


Fig 6: Typical Temperature Coefficient



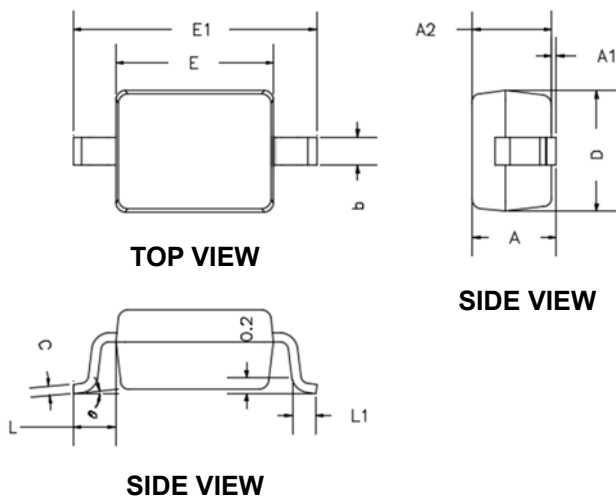


## BZT52C2V4S THRU BZT52C75S

### ■ Ordering Information

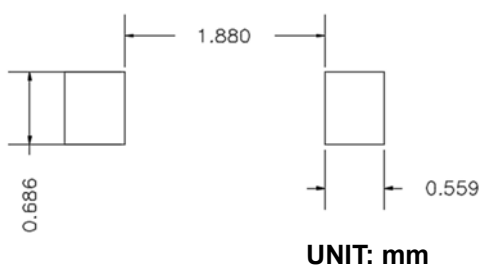
| Preferred P/N             | Packing code | Unit weight(g)     | Minimum package(pcs) | Inner box quantity(pcs) | Outer carton quantity(pcs) | Delivery mode |
|---------------------------|--------------|--------------------|----------------------|-------------------------|----------------------------|---------------|
| BZT52C2V4S THRU BZT52C75S | F2           | Approximate 0.0048 | 3000                 | 30000                   | 120000                     | 7" reel       |
| BZT52C2V4S THRU BZT52C75S | F3           | Approximate 0.0048 | 10000                | /                       | 210000                     | 13" reel      |

### ■ Outline Dimensions



| DIMENSIONS |           |        |          |        |
|------------|-----------|--------|----------|--------|
| DIM        | INCHES    |        | MM       |        |
|            | MIN       | MAX    | MM       | MAX    |
| A          | ---       | 0.0393 | ---      | 1.0000 |
| A1         | 0.0000    | 0.0039 | 0.0000   | 0.1000 |
| A2         | 0.0314    | 0.0354 | 0.8000   | 0.9000 |
| b          | 0.0098    | 0.0157 | 0.2500   | 0.4000 |
| c          | 0.0031    | 0.0059 | 0.0800   | 0.1500 |
| D          | 0.0472    | 0.0551 | 1.2000   | 1.4000 |
| E          | 0.0629    | 0.0709 | 1.6000   | 1.8000 |
| E1         | 0.0984    | 0.1063 | 2.5000   | 2.7000 |
| L          | 0.0187TYP |        | 0.475TYP |        |
| L1         | 0.0098    | 0.0157 | 0.250    | 0.400  |
| θ          | 0°        | 8°     | 0°       | 8°     |

### ■ Suggested Pad Layout





## BZT52C2V4S THRU BZT52C75S

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