

# SMD Zener Diode

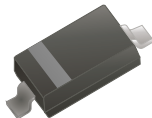
## CZRV52B2V4-HF Thru. CZRV52B51-HF

Voltage: 2.4 to 51 V

Power: 200 mW

RoHS Device

Halogen Free

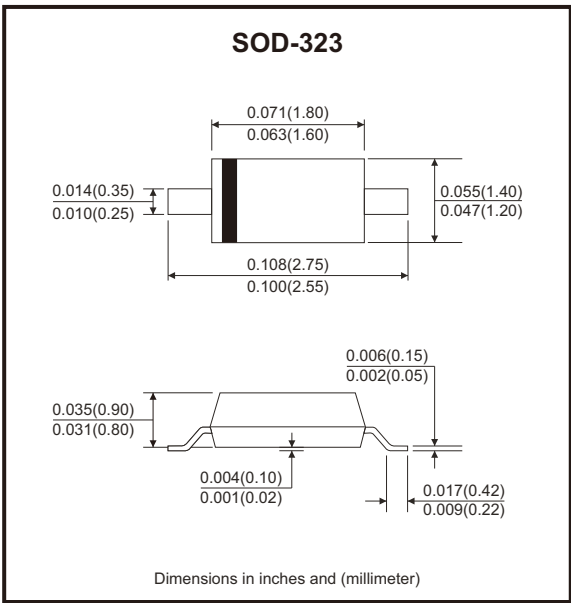


### Features

- large selection of zener voltages:2.4V~51V
- Tight voltage tolerance:  $\pm 2\%$  .
- Ultra low-profile package well suited for automated assembly.

### Mechanical data

- Case: SOD-323, molded plastic.
- Terminals: Solder plated, solderable per MIL-STD-750, method 2026.
- Mounting position: Any
- Polarity: Cathode line denotes the cathode end.



### Circuit Diagram



### Maximum Ratings (at Ta=25°C unless otherwise specified)

| Parameter                               | Symbol           | Value       | Unit |
|-----------------------------------------|------------------|-------------|------|
| Forward voltage @ If=10mA               | V <sub>F</sub>   | 0.9         | V    |
| Power dissipation                       | P <sub>D</sub>   | 200         | mW   |
| Thermal resistance, junction to ambient | R <sub>θJA</sub> | 625         | °C/W |
| Thermal resistance, junction to case    | R <sub>θJC</sub> | 337         | °C/W |
| Junction temperature range              | T <sub>J</sub>   | -55 to +150 | °C   |
| Storage temperature range               | T <sub>STG</sub> | -65 to +150 | °C   |

Notes: 1. These ratings are limiting values above which the serviceability of the diodes may be impaired.

## Electrical Characteristics (at Ta=25°C unless otherwise specified)

| Part Number   | Zener voltage      |     |       |                 | Max. Zener impedance             |                 |                  | Temperature coefficient                 |      | Max. Reverse current |                 | Marking code |
|---------------|--------------------|-----|-------|-----------------|----------------------------------|-----------------|------------------|-----------------------------------------|------|----------------------|-----------------|--------------|
|               | V <sub>Z</sub> (V) |     |       | @I <sub>Z</sub> | Z <sub>KT</sub> @I <sub>KT</sub> | Z <sub>KK</sub> | @I <sub>KK</sub> | @I <sub>KT</sub> T <sub>C</sub> (mV/°C) |      | I <sub>R</sub>       | @V <sub>R</sub> |              |
|               | Min                | Nom | Max   | (mA)            | (Ω)                              | (Ω)             | (mA)             | Min                                     | Max  | (μA)                 | (V)             |              |
| CZRV52B2V4-HF | 2.35               | 2.4 | 2.45  | 5               | 94                               | 564             | 1.0              | -3.5                                    | 0    | 45                   | 1.0             | 0Z           |
| CZRV52B2V7-HF | 2.65               | 2.7 | 2.75  | 5               | 94                               | 564             | 1.0              | -3.5                                    | 0    | 18                   | 1.0             | 1Z           |
| CZRV52B3V0-HF | 2.94               | 3.0 | 3.06  | 5               | 89                               | 564             | 1.0              | -3.5                                    | 0    | 9                    | 1.0             | 2Z           |
| CZRV52B3V3-HF | 3.23               | 3.3 | 3.37  | 5               | 89                               | 564             | 1.0              | -3.5                                    | 0    | 4.5                  | 1.0             | 3Z           |
| CZRV52B3V6-HF | 3.53               | 3.6 | 3.67  | 5               | 84                               | 564             | 1.0              | -3.5                                    | 0    | 4.5                  | 1.0             | 4Z           |
| CZRV52B3V9-HF | 3.82               | 3.9 | 3.98  | 5               | 84                               | 564             | 1.0              | -3.5                                    | 0    | 2.7                  | 1.0             | 5Z           |
| CZRV52B4V3-HF | 4.21               | 4.3 | 4.39  | 5               | 84                               | 564             | 1.0              | -3.5                                    | 0    | 2.7                  | 1.0             | 6Z           |
| CZRV52B4V7-HF | 4.61               | 4.7 | 4.79  | 5               | 75                               | 564             | 1.0              | -3.5                                    | 0.2  | 2.7                  | 2.0             | 7Z           |
| CZRV52B5V1-HF | 5.00               | 5.1 | 5.20  | 5               | 56                               | 470             | 1.0              | -2.7                                    | 1.2  | 1.8                  | 2.0             | 8Z           |
| CZRV52B5V6-HF | 5.49               | 5.6 | 5.71  | 5               | 37                               | 451             | 1.0              | -2.0                                    | 2.5  | 0.9                  | 2.0             | 9Z           |
| CZRV52B6V2-HF | 6.08               | 6.2 | 6.32  | 5               | 9                                | 376             | 1.0              | 0.4                                     | 3.7  | 2.7                  | 4.0             | AZ           |
| CZRV52B6V8-HF | 6.66               | 6.8 | 6.94  | 5               | 14                               | 141             | 1.0              | 1.2                                     | 4.5  | 1.8                  | 4.0             | BZ           |
| CZRV52B7V5-HF | 7.35               | 7.5 | 7.65  | 5               | 14                               | 75              | 1.0              | 2.5                                     | 5.3  | 0.9                  | 5.0             | CZ           |
| CZRV52B8V2-HF | 8.04               | 8.2 | 8.36  | 5               | 14                               | 75              | 1.0              | 3.2                                     | 6.2  | 0.63                 | 5.0             | DZ           |
| CZRV52B9V1-HF | 8.92               | 9.1 | 9.28  | 5               | 14                               | 94              | 1.0              | 3.8                                     | 7.0  | 0.45                 | 6.0             | EZ           |
| CZRV52B10-HF  | 9.80               | 10  | 10.20 | 5               | 18                               | 141             | 1.0              | 4.5                                     | 8.0  | 0.18                 | 7.0             | FZ           |
| CZRV52B11-HF  | 10.78              | 11  | 11.22 | 5               | 18                               | 141             | 1.0              | 5.4                                     | 9.0  | 0.09                 | 8.0             | GZ           |
| CZRV52B12-HF  | 11.76              | 12  | 12.24 | 5               | 23                               | 141             | 1.0              | 6.0                                     | 10.0 | 0.09                 | 8.0             | HZ           |
| CZRV52B13-HF  | 12.74              | 13  | 13.26 | 5               | 28                               | 160             | 1.0              | 7.0                                     | 11.0 | 0.09                 | 8.0             | JZ           |
| CZRV52B15-HF  | 14.70              | 15  | 15.30 | 5               | 28                               | 188             | 1.0              | 9.2                                     | 13.0 | 0.045                | 10.5            | KZ           |
| CZRV52B16-HF  | 15.68              | 16  | 16.32 | 5               | 37                               | 188             | 1.0              | 10.4                                    | 14.0 | 0.045                | 11.2            | LZ           |
| CZRV52B18-HF  | 17.64              | 18  | 18.36 | 5               | 42                               | 212             | 1.0              | 12.4                                    | 16.0 | 0.045                | 12.6            | MZ           |
| CZRV52B20-HF  | 19.60              | 20  | 20.40 | 5               | 51                               | 212             | 1.0              | 14.4                                    | 18.0 | 0.045                | 14.0            | NZ           |
| CZRV52B22-HF  | 21.56              | 22  | 22.44 | 5               | 51                               | 235             | 1.0              | 16.4                                    | 20.0 | 0.045                | 15.4            | PZ           |
| CZRV52B24-HF  | 23.52              | 24  | 24.48 | 5               | 65                               | 235             | 1.0              | 18.4                                    | 22.0 | 0.045                | 16.8            | RZ           |
| CZRV52B27-HF  | 26.46              | 27  | 27.54 | 2               | 75                               | 282             | 0.5              | 21.4                                    | 25.3 | 0.045                | 18.9            | SZ           |
| CZRV52B30-HF  | 29.40              | 30  | 30.60 | 2               | 75                               | 282             | 0.5              | 24.4                                    | 29.4 | 0.045                | 21.0            | TZ           |
| CZRV52B33-HF  | 32.34              | 33  | 33.66 | 2               | 75                               | 306             | 0.5              | 27.4                                    | 33.4 | 0.045                | 23.0            | UZ           |
| CZRV52B36-HF  | 35.28              | 36  | 36.72 | 2               | 84                               | 329             | 0.5              | 30.4                                    | 37.4 | 0.045                | 25.2            | VZ           |
| CZRV52B39-HF  | 38.22              | 39  | 39.78 | 2               | 122                              | 329             | 0.5              | 33.4                                    | 41.2 | 0.045                | 27.3            | WZ•          |
| CZRV52B43-HF  | 42.14              | 43  | 43.86 | 2               | 141                              | 353             | 0.5              | 37.6                                    | 46.6 | 0.045                | 30.1            | XZ           |
| CZRV52B47-HF  | 46.06              | 47  | 47.94 | 2               | 160                              | 353             | 0.5              | 42.0                                    | 51.8 | 0.045                | 33.0            | YZ           |
| CZRV52B51-HF  | 49.98              | 51  | 52.02 | 2               | 169                              | 376             | 0.5              | 46.6                                    | 57.2 | 0.045                | 35.7            | ZZ           |

## Typical Rating and Characteristic Curves (CZRV52Bxxx-HF Series)

Fig.1 - Power Dissipation Curve

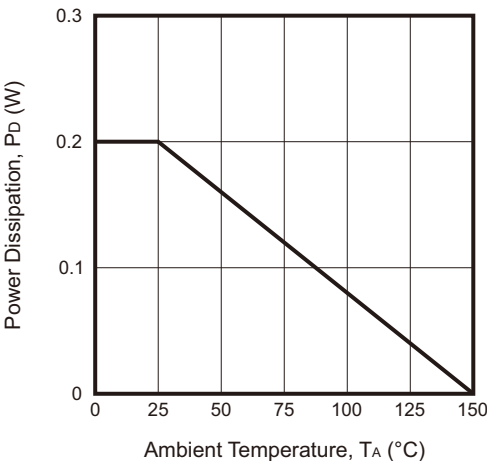


Fig.2 - Typical Zener Breakdown Capacitance

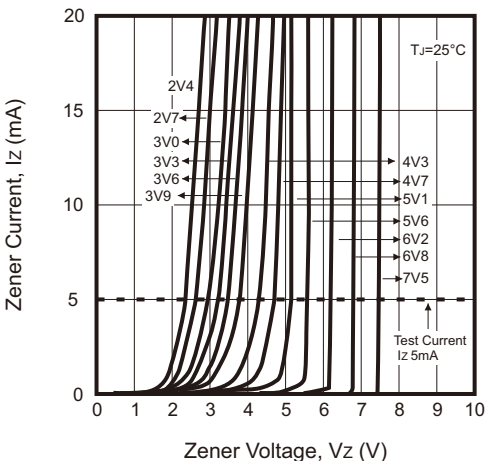


Fig.3 - Typical Zener Breakdown Capacitance

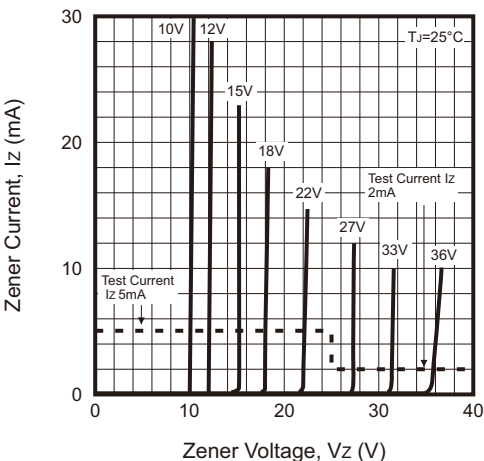


Fig.4 - Typical Zener Breakdown Capacitance

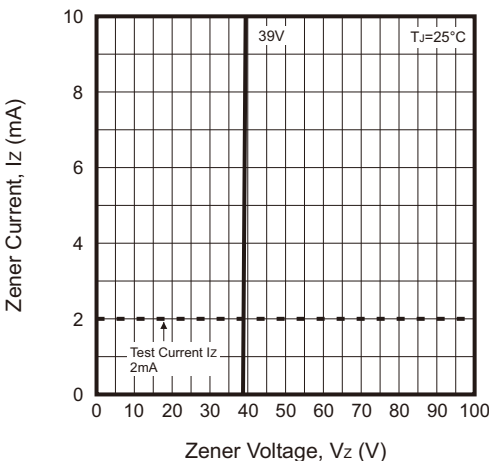


Fig.5 - Typical Temperature Coefficient of Zener Voltage

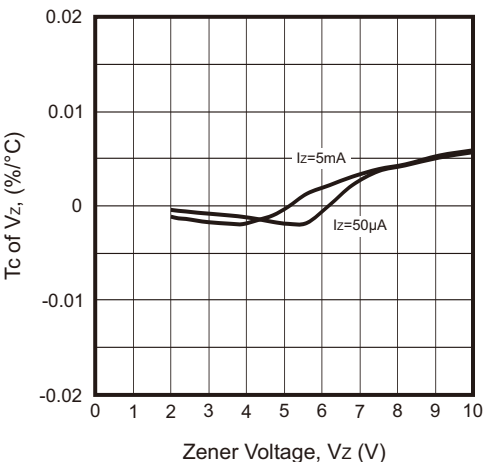
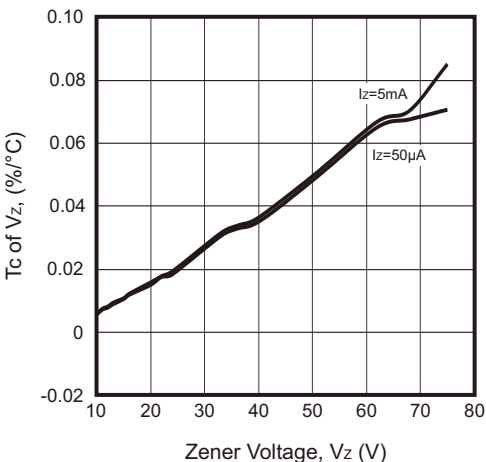
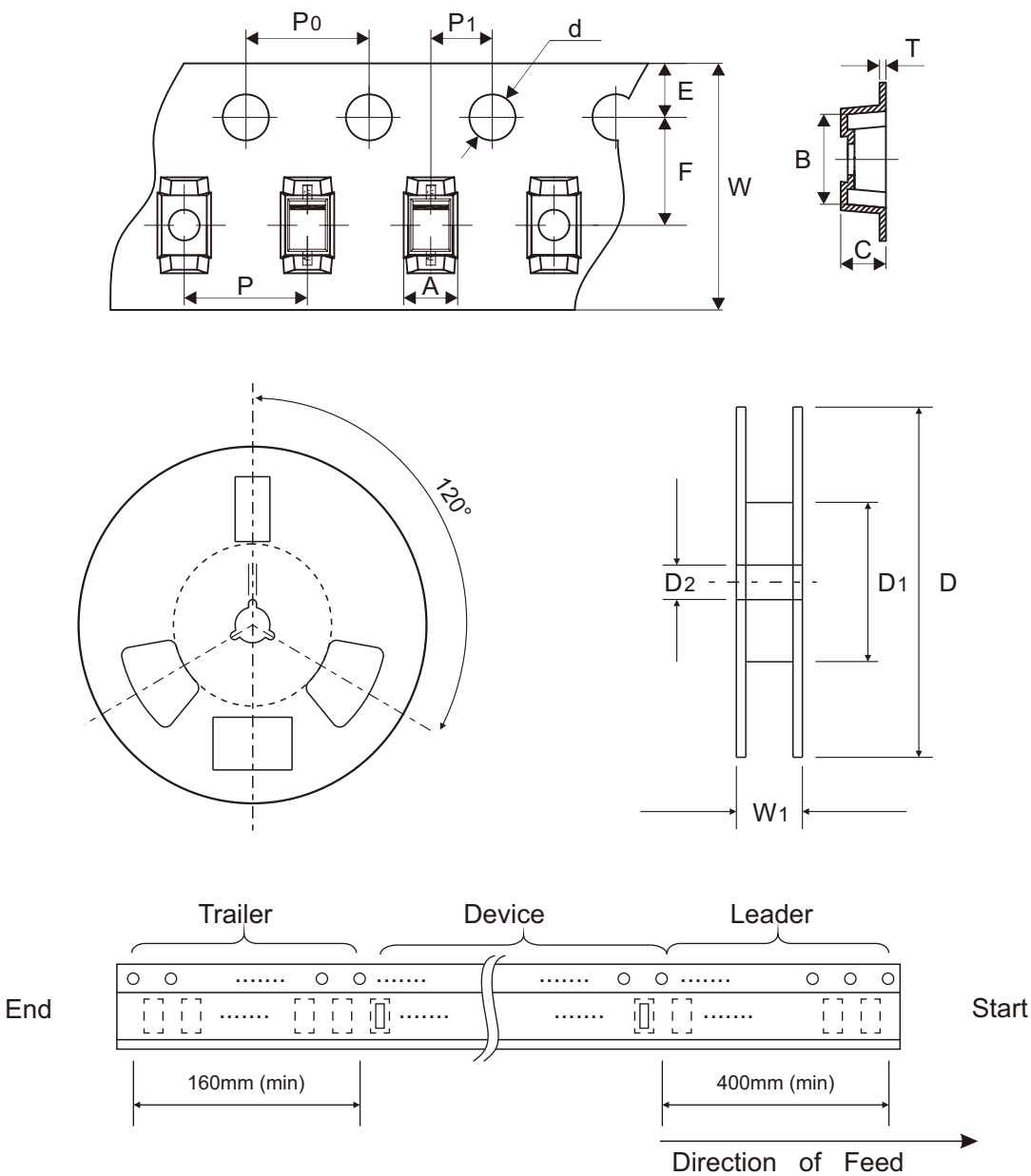


Fig.6 - Typical Temperature Coefficient of Zener Voltage



Reel Taping Specification



|         | SYMBOL | A             | B             | C             | d                        | D             | D1            | D2            |
|---------|--------|---------------|---------------|---------------|--------------------------|---------------|---------------|---------------|
| SOD-323 | (mm)   | 1.46 ± 0.05   | 3.30 ± 0.05   | 1.25 ± 0.05   | 1.50 + 0.10<br>- 0.00    | 178.00 ± 1.00 | 54.00 ± 0.50  | 13.00 ± 0.50  |
|         | (inch) | 0.057 ± 0.002 | 0.130 ± 0.002 | 0.049 ± 0.002 | 0.059 + 0.004<br>- 0.000 | 7.008 ± 0.039 | 2.126 ± 0.020 | 0.512 ± 0.020 |

|         | SYMBOL | E             | F             | P             | P0            | P1            | T             | W                        | W1            |
|---------|--------|---------------|---------------|---------------|---------------|---------------|---------------|--------------------------|---------------|
| SOD-323 | (mm)   | 1.75 ± 0.10   | 3.50 ± 0.05   | 4.00 ± 0.10   | 4.00 ± 0.10   | 2.00 ± 0.05   | 0.25 ± 0.02   | 8.00 + 0.30<br>- 0.10    | 12.50 ± 1.00  |
|         | (inch) | 0.069 ± 0.004 | 0.138 ± 0.002 | 0.157 ± 0.004 | 0.157 ± 0.004 | 0.079 ± 0.002 | 0.010 ± 0.001 | 0.315 + 0.012<br>- 0.004 | 0.492 ± 0.039 |

Marking Code

| Part Number          | Marking Code |
|----------------------|--------------|
| CZRV52Bxxx-HF Series | See Page 2   |

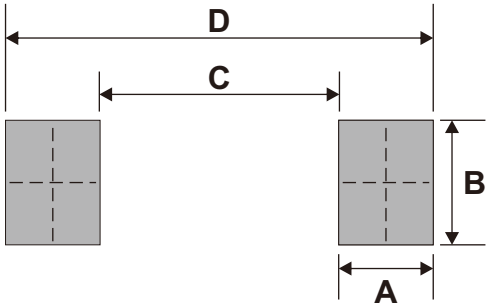


XX/ XX• = Product type marking code

█ = Cathode band

Suggested P.C.B. PAD Layout

| SIZE | SOD-323 |        |
|------|---------|--------|
|      | (mm)    | (inch) |
| A    | 0.63    | 0.025  |
| B    | 0.83    | 0.033  |
| C    | 1.60    | 0.063  |
| D    | 2.85    | 0.112  |



Standard Packaging

| Case Type | REEL PACK  |                  |
|-----------|------------|------------------|
|           | REEL (pcs) | Reel Size (inch) |
| SOD-323   | 3,000      | 7                |