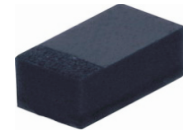


# SMD Zener Diode

## CZRER52C2 Thru CZRER52C39 (RoHS Device)

Voltage 2 to 39 Volts  
Power 150 mWatts

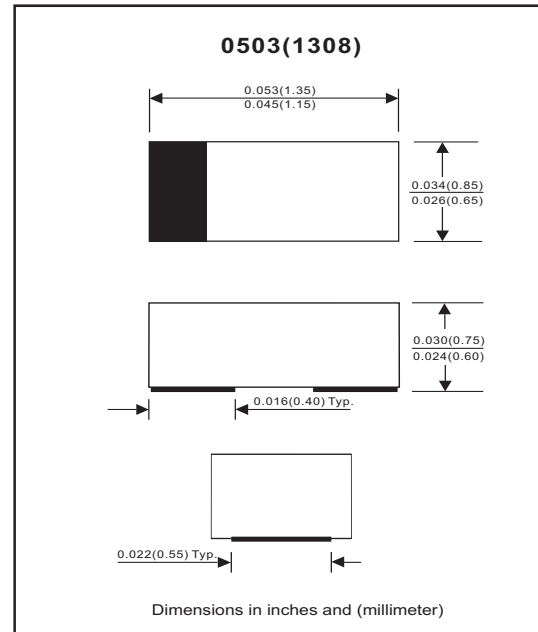


### Features

- 150mW Power Dissipation.
- High Voltages from 2 ~ 39 V.
- Designed for mounting on small surface.
- Extremely thin/leadless package.
- Pb free product.

### Mechanical data

- Case: 0503(1308) Standard package  
Molded plastic.
- Terminals: Gold plated, solderable per  
MIL-STD-750, method 2026.
- Polarity: Indicated by cathode band.
- Weight: 0.002 gram (approx.).



### Maximum Rating AND Electrical Characteristics

| Parameter   | Symbol    | Value       | Unit             |
|---|-----------|-------------|------------------|
| Maximum Forward Voltage Drop at $I_F = 10 \text{ mA}$   | $V_F$     | 0.9         | V                |
| Maximum Power Dissipation at $25^\circ\text{C}$   | $P_D$     | 150         | mW               |
| Forward current, surge peak<br>8.3 ms single half sine-wave superimposed<br>on rate load (JEDEC method) | $I_{FSM}$ | 2.0         | A                |
| Peak ESD voltage capability (IEC 61000-4-2)   | $V_{PV}$  | 8           | kV               |
| Operating Junction and Storage Temperature Range  | $T_J$     | -55 to +125 | $^\circ\text{C}$ |

## Electrical Characteristics (TA=25°C)

| Part Number | Marking Code | Zener Voltage      |       |                     | Operating resistance |                     | Rising operating Resistance |                     | Reverse current |                    |
|-------------|--------------|--------------------|-------|---------------------|----------------------|---------------------|-----------------------------|---------------------|-----------------|--------------------|
|             |              | V <sub>Z</sub> (V) |       |                     | ZZT(Ohm)             |                     | ZZK(Ohm)                    |                     | IR(μA)          |                    |
|             |              | Min                | Max   | I <sub>Z</sub> (mA) | Max                  | I <sub>Z</sub> (mA) | Max                         | I <sub>Z</sub> (mA) | Max             | V <sub>R</sub> (V) |
| CZRER52C2   | Z0           | 1.90               | 2.10  | 5                   | 100                  | 5                   | 600                         | 1                   | 100             | 1                  |
| CZRER52C2V2 | Z1           | 2.09               | 2.31  | 5                   | 100                  | 5                   | 600                         | 1                   | 100             | 1                  |
| CZRER52C2V4 | Z2           | 2.28               | 2.52  | 5                   | 85                   | 5                   | 600                         | 1                   | 100             | 1                  |
| CZRER52C2V7 | Z3           | 2.57               | 2.84  | 5                   | 83                   | 5                   | 500                         | 1                   | 75              | 1                  |
| CZRER52C3   | Z4           | 2.85               | 3.15  | 5                   | 95                   | 5                   | 500                         | 1                   | 50              | 1                  |
| CZRER52C3V3 | Z5           | 3.14               | 3.47  | 5                   | 95                   | 5                   | 500                         | 1                   | 25              | 1                  |
| CZRER52C3V6 | Z6           | 3.42               | 3.78  | 5                   | 95                   | 5                   | 500                         | 1                   | 15              | 1                  |
| CZRER52C3V9 | Z7           | 3.71               | 4.10  | 5                   | 95                   | 5                   | 500                         | 1                   | 10              | 1                  |
| CZRER52C4V3 | Z8           | 4.09               | 4.52  | 5                   | 95                   | 5                   | 500                         | 1                   | 5               | 1                  |
| CZRER52C4V7 | Z9           | 4.47               | 4.94  | 5                   | 78                   | 5                   | 500                         | 1                   | 5               | 2                  |
| CZRER52C5V1 | ZA           | 4.85               | 5.36  | 5                   | 60                   | 5                   | 480                         | 1                   | 0.1             | 0.8                |
| CZRER52C5V6 | ZB           | 5.32               | 5.88  | 5                   | 40                   | 5                   | 400                         | 1                   | 0.1             | 1                  |
| CZRER52C6V2 | ZC           | 5.89               | 6.51  | 5                   | 10                   | 5                   | 200                         | 1                   | 0.1             | 2                  |
| CZRER52C6V8 | ZE           | 6.46               | 7.14  | 5                   | 8                    | 5                   | 150                         | 1                   | 0.1             | 3                  |
| CZRER52C7V5 | ZF           | 7.13               | 7.88  | 5                   | 7                    | 5                   | 50                          | 1                   | 0.1             | 5                  |
| CZRER52C8V2 | ZG           | 7.79               | 8.61  | 5                   | 7                    | 5                   | 50                          | 1                   | 0.1             | 6                  |
| CZRER52C9V1 | ZH           | 8.65               | 9.56  | 5                   | 10                   | 5                   | 50                          | 1                   | 0.1             | 7                  |
| CZRER52C10  | ZJ           | 9.50               | 10.50 | 5                   | 15                   | 5                   | 70                          | 1                   | 0.1             | 7.5                |
| CZRER52C11  | ZK           | 10.45              | 11.55 | 5                   | 20                   | 5                   | 70                          | 1                   | 0.1             | 8.5                |
| CZRER52C12  | ZM           | 11.40              | 12.60 | 5                   | 20                   | 5                   | 90                          | 1                   | 0.1             | 9                  |
| CZRER52C13  | ZN           | 12.35              | 13.65 | 5                   | 25                   | 5                   | 110                         | 1                   | 0.1             | 10                 |
| CZRER52C15  | ZP           | 14.25              | 15.75 | 5                   | 30                   | 5                   | 110                         | 1                   | 0.1             | 11                 |
| CZRER52C16  | ZQ           | 15.20              | 16.80 | 5                   | 40                   | 5                   | 170                         | 1                   | 0.1             | 12                 |
| CZRER52C18  | ZR           | 17.10              | 18.90 | 5                   | 50                   | 5                   | 170                         | 1                   | 0.1             | 14                 |
| CZRER52C20  | ZS           | 19.00              | 21.00 | 5                   | 50                   | 5                   | 220                         | 1                   | 0.1             | 15                 |
| CZRER52C22  | ZT           | 20.90              | 23.10 | 5                   | 55                   | 5                   | 220                         | 1                   | 0.1             | 17                 |
| CZRER52C24  | ZU           | 22.80              | 25.20 | 5                   | 80                   | 5                   | 220                         | 1                   | 0.1             | 18                 |
| CZRER52C27  | ZV           | 25.65              | 28.35 | 5                   | 80                   | 5                   | 250                         | 1                   | 0.1             | 20                 |
| CZRER52C30  | ZW           | 28.50              | 31.50 | 5                   | 80                   | 5                   | 250                         | 1                   | 0.1             | 23                 |
| CZRER52C33  | ZX           | 31.35              | 34.65 | 5                   | 80                   | 5                   | 250                         | 1                   | 0.1             | 25                 |
| CZRER52C36  | ZY           | 34.20              | 37.80 | 5                   | 90                   | 5                   | 250                         | 1                   | 0.1             | 27                 |
| CZRER52C39  | ZZ           | 37.05              | 40.95 | 5                   | 90                   | 5                   | 300                         | 1                   | 0.1             | 29                 |

## RATING AND CHARACTERISTIC CURVES (CZRER52C2 Thru CZRER52C39)

Fig.1 TEMPERATURE COEFFICIENTS

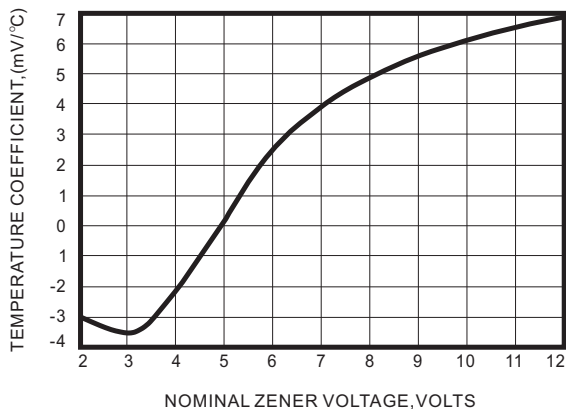


Fig.2 TEMPERATURE COEFFICIENTS

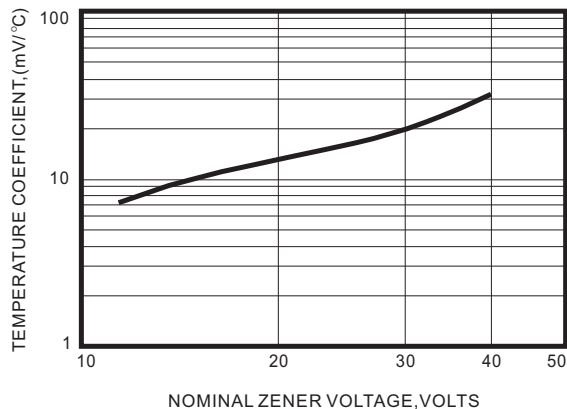


Fig.3 EFFECT OF ZENER VOLTAGE ON ZENER IMPEDANCE

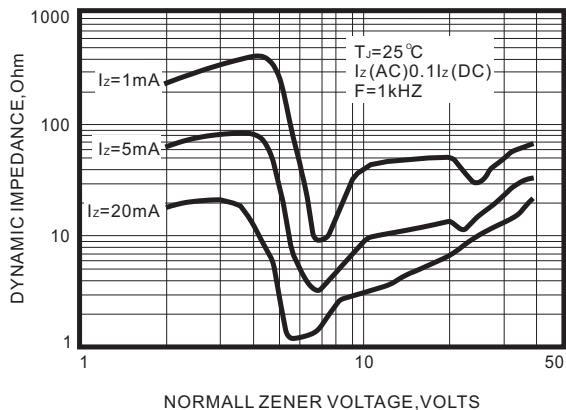


Fig.4 TYPICAL FORWARD VOLTAGE

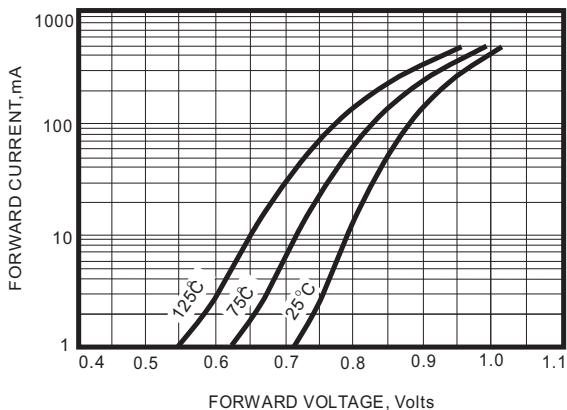


Fig.5 TYPICAL LEAKAGE CURRENT

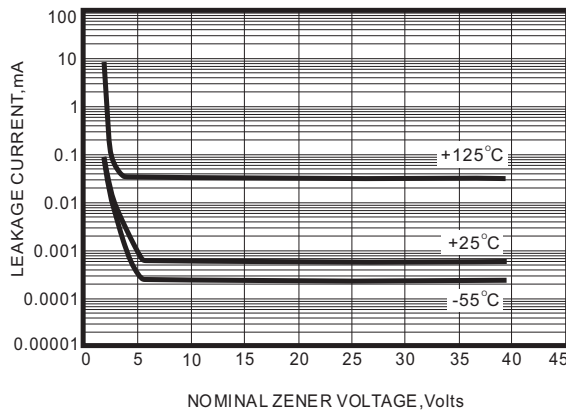
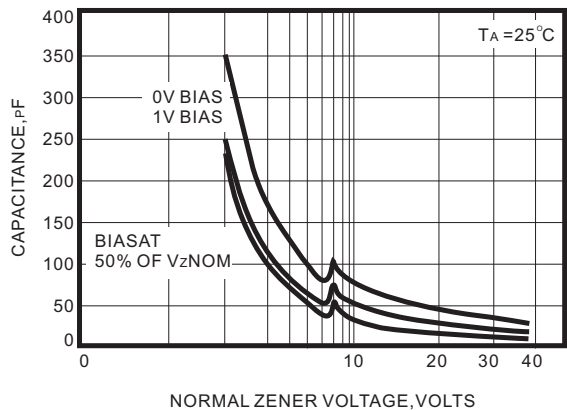


Fig.6 TYPICAL CAPACITANCE



## RATING AND CHARACTERISTIC CURVES (CZRER52C2 Thru CZRER52C39)

Fig.7 ZENER VOLTAGE VERSUS ZENER CURRENT

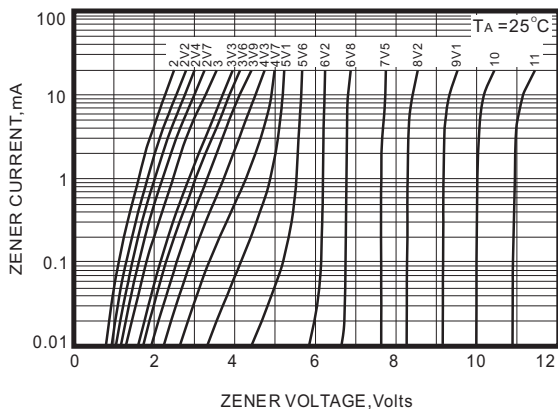


Fig.8 ZENER VOLTAGE VERSUS ZENER CURRENT

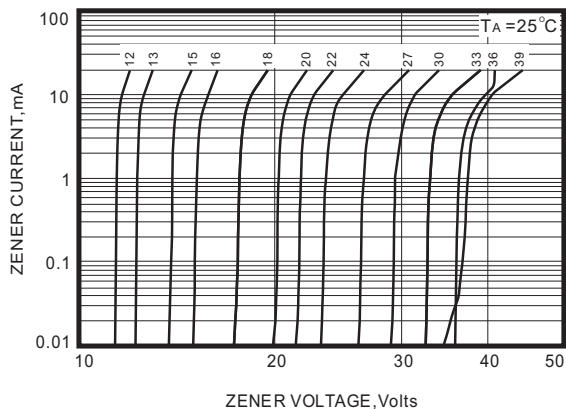
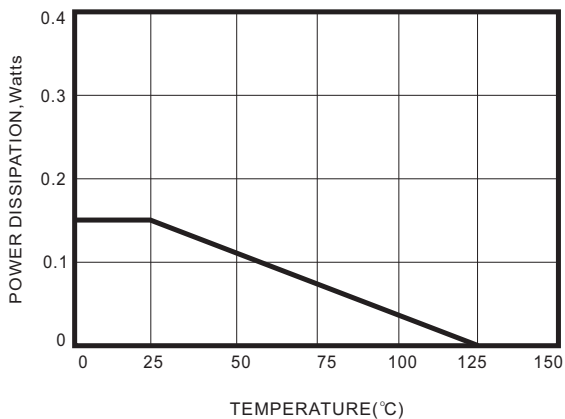
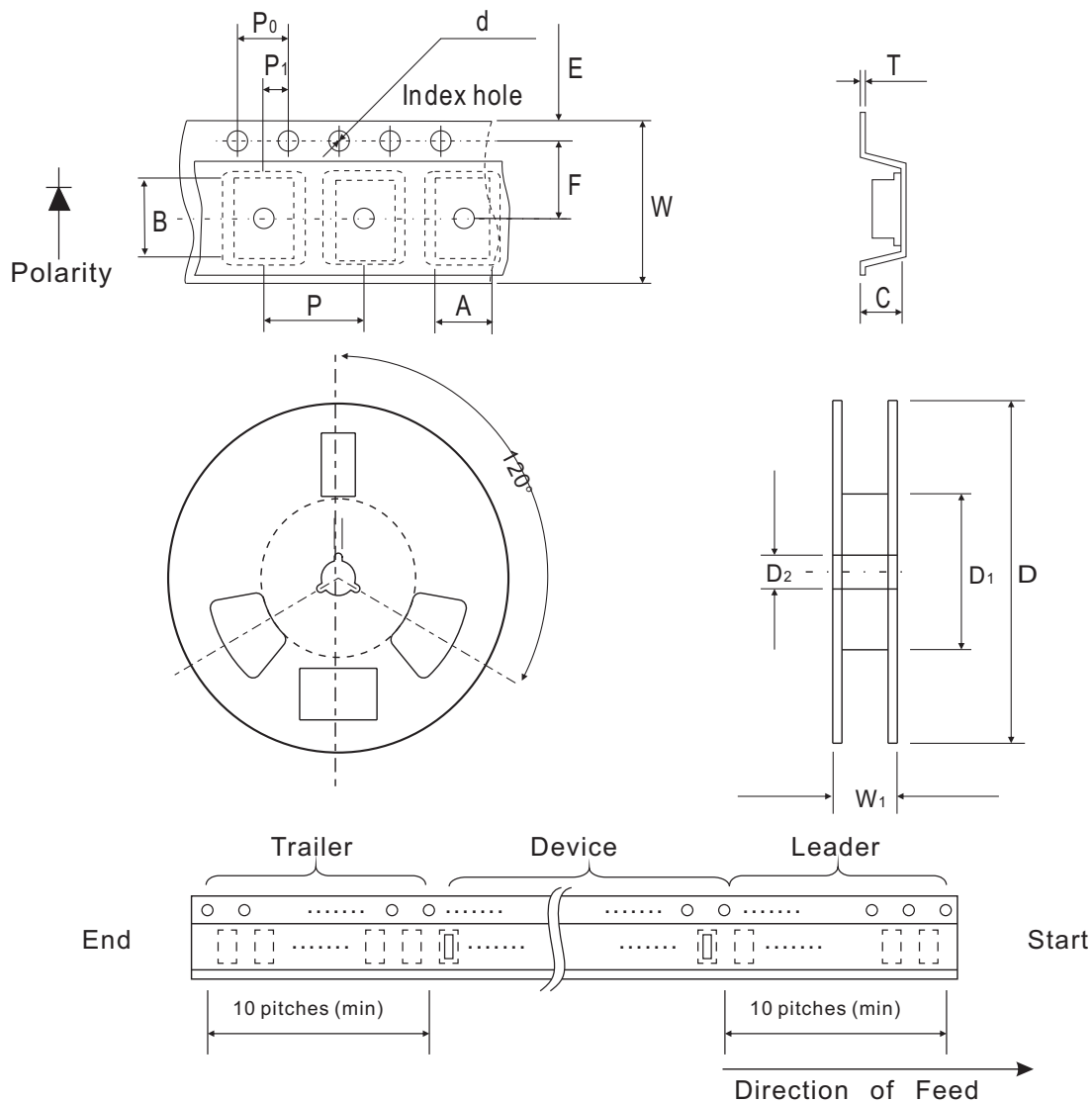


Fig.9 STEADY STATE POWER DERATING



## Reel Taping Specification

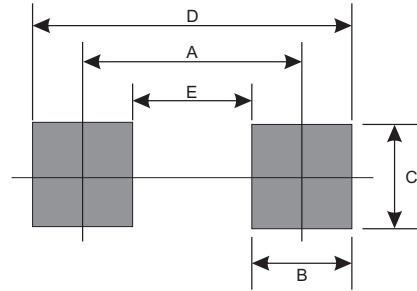


| ER/0503 | SYMBOL | A             | B             | C             | d             | D            | D <sub>1</sub> | D <sub>2</sub> |
|---------|--------|---------------|---------------|---------------|---------------|--------------|----------------|----------------|
|         | (mm)   | 0.90 ± 0.10   | 1.46 ± 0.10   | 0.80 ± 0.10   | 1.55 ± 0.05   | 178 ± 1      | 60.0 MIN.      | 13.0 ± 0.20    |
|         | (inch) | 0.035 ± 0.004 | 0.057 ± 0.004 | 0.031 ± 0.004 | 0.061 ± 0.002 | 7.008 ± 0.04 | 2.362 MIN.     | 0.512 ± 0.008  |

| ER/0503 | SYMBOL | E             | F             | P             | P <sub>0</sub> | P <sub>1</sub> | T             | W             | W <sub>1</sub> |
|---------|--------|---------------|---------------|---------------|----------------|----------------|---------------|---------------|----------------|
|         | (mm)   | 1.75 ± 0.10   | 3.50 ± 0.05   | 4.00 ± 0.10   | 4.00 ± 0.10    | 2.00 ± 0.10    | 0.22 ± 0.05   | 8.00 ± 0.20   | 13.5 MAX.      |
|         | (inch) | 0.069 ± 0.004 | 0.138 ± 0.002 | 0.157 ± 0.004 | 0.157 ± 0.004  | 0.079 ± 0.004  | 0.008 ± 0.002 | 0.315 ± 0.008 | 0.531 MAX.     |

## Suggested PAD Layout

| SIZE | ER/0503 |        |
|------|---------|--------|
|      | (mm)    | (inch) |
| A    | 0.85    | 0.033  |
| B    | 0.55    | 0.022  |
| C    | 0.85    | 0.033  |
| D    | 1.40    | 0.055  |
| E    | 0.30    | 0.012  |



## Standard Package

| Case Type | Qty per Reel | Reel Size |
|-----------|--------------|-----------|
|           | (Pcs)        | (inch)    |
| ER/0503   | 4000         | 7         |