

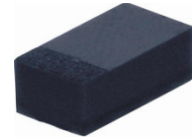
## CZRFR52C2-HF Thru CZRFR52C39-HF

Voltage 2 to 39 Volts

Power 350 mWatts

RoHS Device

Halogen Free

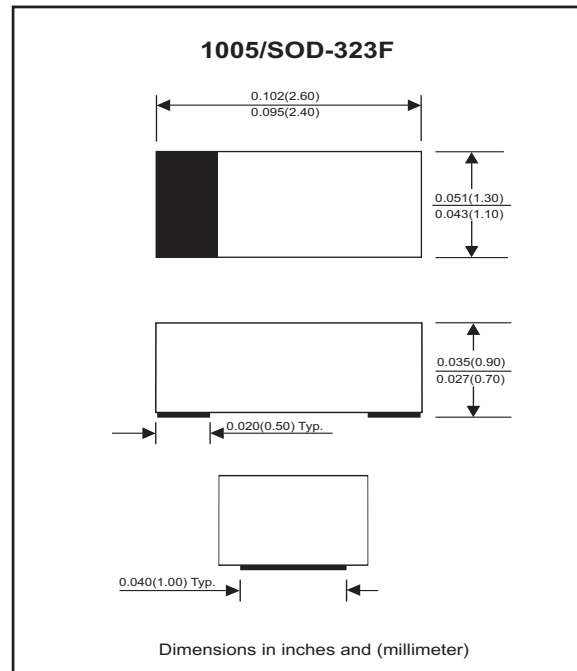


### Features

- 350mW Power Dissipation.
- High Voltages from 2 ~ 39 V.
- Designed for mounting on small surface.
- Extremely thin/leadless package.
- Pb free product.

### Mechanical data

- Case: 1005/SOD-323F Standard package  
Molded plastic.
- Terminals: Gold plated, solderable per MIL-STD-750,method 2026.
- Polarity: Indicated by cathode band.
- Weight: 0.006 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 °C  | $P_D$     | 350         | 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 | °C   |

Company reserves the right to improve product design , functions and reliability without notice.

## 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(uA)          |                    |
|                |              | 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) |
| CZRFR52C2-HF   | Z0           | 1.90               | 2.10  | 5                   | 100                  | 5                   | 600                         | 1                   | 100             | 1                  |
| CZRFR52C2V2-HF | Z1           | 2.09               | 2.31  | 5                   | 100                  | 5                   | 600                         | 1                   | 100             | 1                  |
| CZRFR52C2V4-HF | Z2           | 2.28               | 2.52  | 5                   | 85                   | 5                   | 600                         | 1                   | 100             | 1                  |
| CZRFR52C2V7-HF | Z3           | 2.57               | 2.84  | 5                   | 83                   | 5                   | 500                         | 1                   | 75              | 1                  |
| CZRFR52C3-HF   | Z4           | 2.85               | 3.15  | 5                   | 95                   | 5                   | 500                         | 1                   | 50              | 1                  |
| CZRFR52C3V3-HF | Z5           | 3.14               | 3.47  | 5                   | 95                   | 5                   | 500                         | 1                   | 25              | 1                  |
| CZRFR52C3V6-HF | Z6           | 3.42               | 3.78  | 5                   | 95                   | 5                   | 500                         | 1                   | 15              | 1                  |
| CZRFR52C3V9-HF | Z7           | 3.71               | 4.10  | 5                   | 95                   | 5                   | 500                         | 1                   | 10              | 1                  |
| CZRFR52C4V3-HF | Z8           | 4.09               | 4.52  | 5                   | 95                   | 5                   | 500                         | 1                   | 5               | 1                  |
| CZRFR52C4V7-HF | Z9           | 4.47               | 4.94  | 5                   | 78                   | 5                   | 500                         | 1                   | 5               | 2                  |
| CZRFR52C5V1-HF | ZA           | 4.85               | 5.36  | 5                   | 60                   | 5                   | 480                         | 1                   | 0.1             | 0.8                |
| CZRFR52C5V6-HF | ZB           | 5.32               | 5.88  | 5                   | 40                   | 5                   | 400                         | 1                   | 0.1             | 1                  |
| CZRFR52C6V2-HF | ZC           | 5.89               | 6.51  | 5                   | 10                   | 5                   | 200                         | 1                   | 0.1             | 2                  |
| CZRFR52C6V8-HF | ZE           | 6.46               | 7.14  | 5                   | 8                    | 5                   | 150                         | 1                   | 0.1             | 3                  |
| CZRFR52C7V5-HF | ZF           | 7.13               | 7.88  | 5                   | 7                    | 5                   | 50                          | 1                   | 0.1             | 5                  |
| CZRFR52C8V2-HF | ZG           | 7.79               | 8.61  | 5                   | 7                    | 5                   | 50                          | 1                   | 0.1             | 6                  |
| CZRFR52C9V1-HF | ZH           | 8.65               | 9.56  | 5                   | 10                   | 5                   | 50                          | 1                   | 0.1             | 7                  |
| CZRFR52C10-HF  | ZJ           | 9.50               | 10.50 | 5                   | 15                   | 5                   | 70                          | 1                   | 0.1             | 7.5                |
| CZRFR52C11-HF  | ZK           | 10.45              | 11.55 | 5                   | 20                   | 5                   | 70                          | 1                   | 0.1             | 8.5                |
| CZRFR52C12-HF  | ZM           | 11.40              | 12.60 | 5                   | 20                   | 5                   | 90                          | 1                   | 0.1             | 9                  |
| CZRFR52C13-HF  | ZN           | 12.35              | 13.65 | 5                   | 25                   | 5                   | 110                         | 1                   | 0.1             | 10                 |
| CZRFR52C15-HF  | ZP           | 14.25              | 15.75 | 5                   | 30                   | 5                   | 110                         | 1                   | 0.1             | 11                 |
| CZRFR52C16-HF  | ZQ           | 15.20              | 16.80 | 5                   | 40                   | 5                   | 170                         | 1                   | 0.1             | 12                 |
| CZRFR52C18-HF  | ZR           | 17.10              | 18.90 | 5                   | 50                   | 5                   | 170                         | 1                   | 0.1             | 14                 |
| CZRFR52C20-HF  | ZS           | 19.00              | 21.00 | 5                   | 50                   | 5                   | 220                         | 1                   | 0.1             | 15                 |
| CZRFR52C22-HF  | ZT           | 20.90              | 23.10 | 5                   | 55                   | 5                   | 220                         | 1                   | 0.1             | 17                 |
| CZRFR52C24-HF  | ZU           | 22.80              | 25.20 | 5                   | 80                   | 5                   | 220                         | 1                   | 0.1             | 18                 |
| CZRFR52C27-HF  | ZV           | 25.65              | 28.35 | 5                   | 80                   | 5                   | 250                         | 1                   | 0.1             | 20                 |
| CZRFR52C30-HF  | ZW           | 28.50              | 31.50 | 5                   | 80                   | 5                   | 250                         | 1                   | 0.1             | 23                 |
| CZRFR52C33-HF  | ZX           | 31.35              | 34.65 | 5                   | 80                   | 5                   | 250                         | 1                   | 0.1             | 25                 |
| CZRFR52C36-HF  | ZY           | 34.20              | 37.80 | 5                   | 90                   | 5                   | 250                         | 1                   | 0.1             | 27                 |
| CZRFR52C39-HF  | ZZ           | 37.05              | 40.95 | 5                   | 90                   | 5                   | 300                         | 1                   | 0.1             | 29                 |

## RATING AND CHARACTERISTIC CURVES (CZRFR52C2-HF Thru CZRFR52C39-HF)

Fig.1 TEMPERATURE COEFFICIENTS

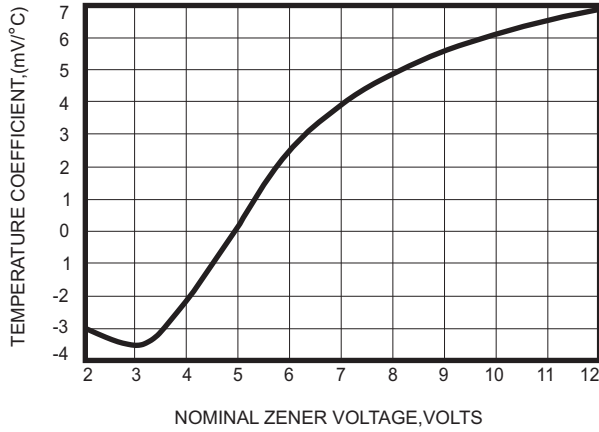


Fig.2 TEMPERATURE COEFFICIENTS

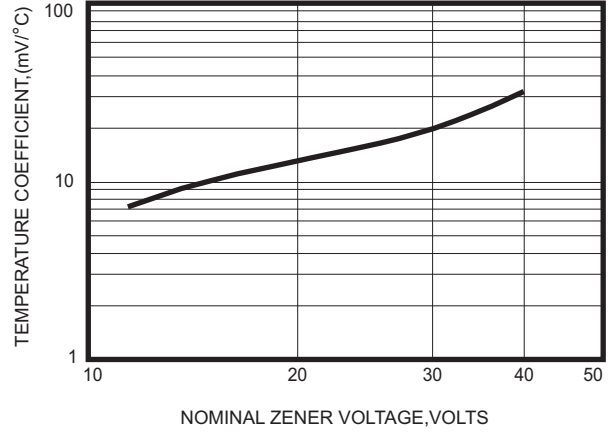


Fig.3 EFFECT OF ZENER VOLTAGE ON ZENER IMPEDANCE

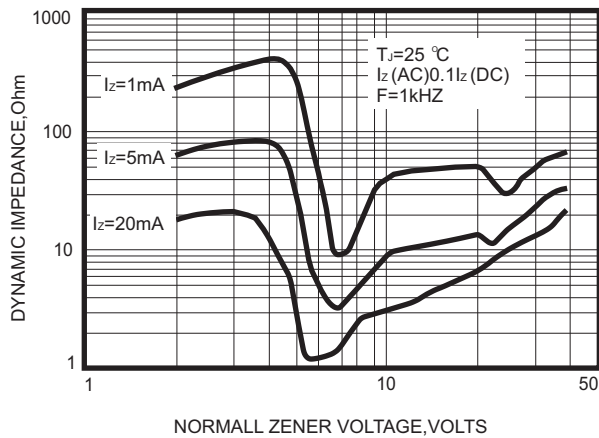


Fig.4 TYPICAL FORWARD VOLTAGE

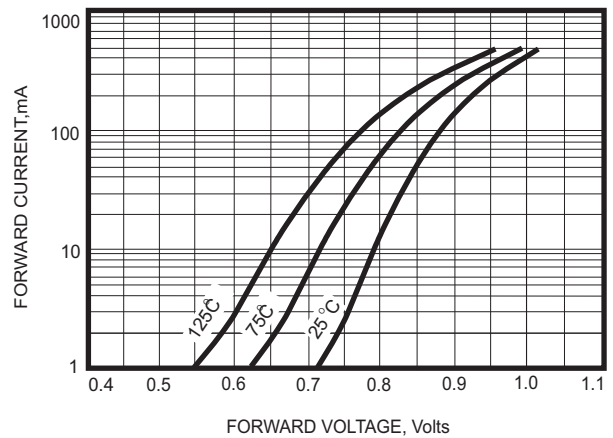


Fig.5 TYPICAL LEAKAGE CURRENT

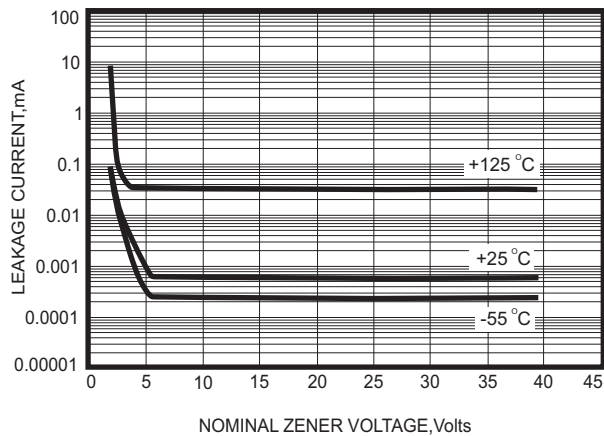
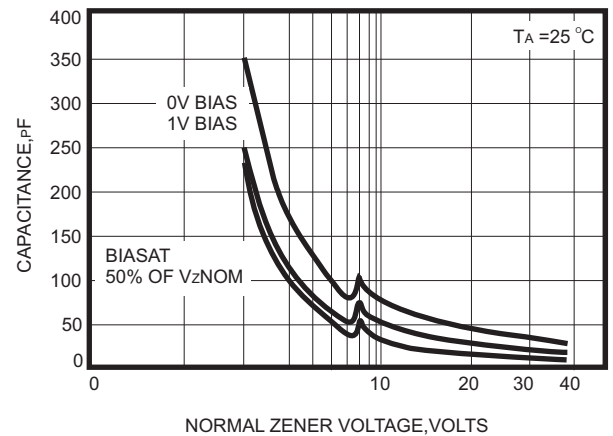


Fig.6 TYPICAL CAPACITANCE



## RATING AND CHARACTERISTIC CURVES (CZRFR52C2-HF Thru CZRFR52C39-HF)

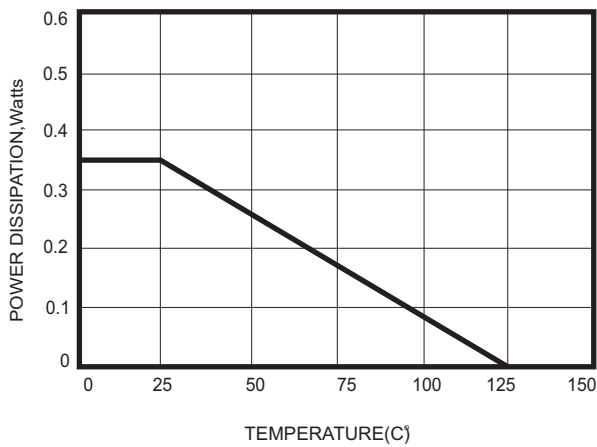
Fig.7 ZENER VOLTAGE VERSUS ZENER CURRENT



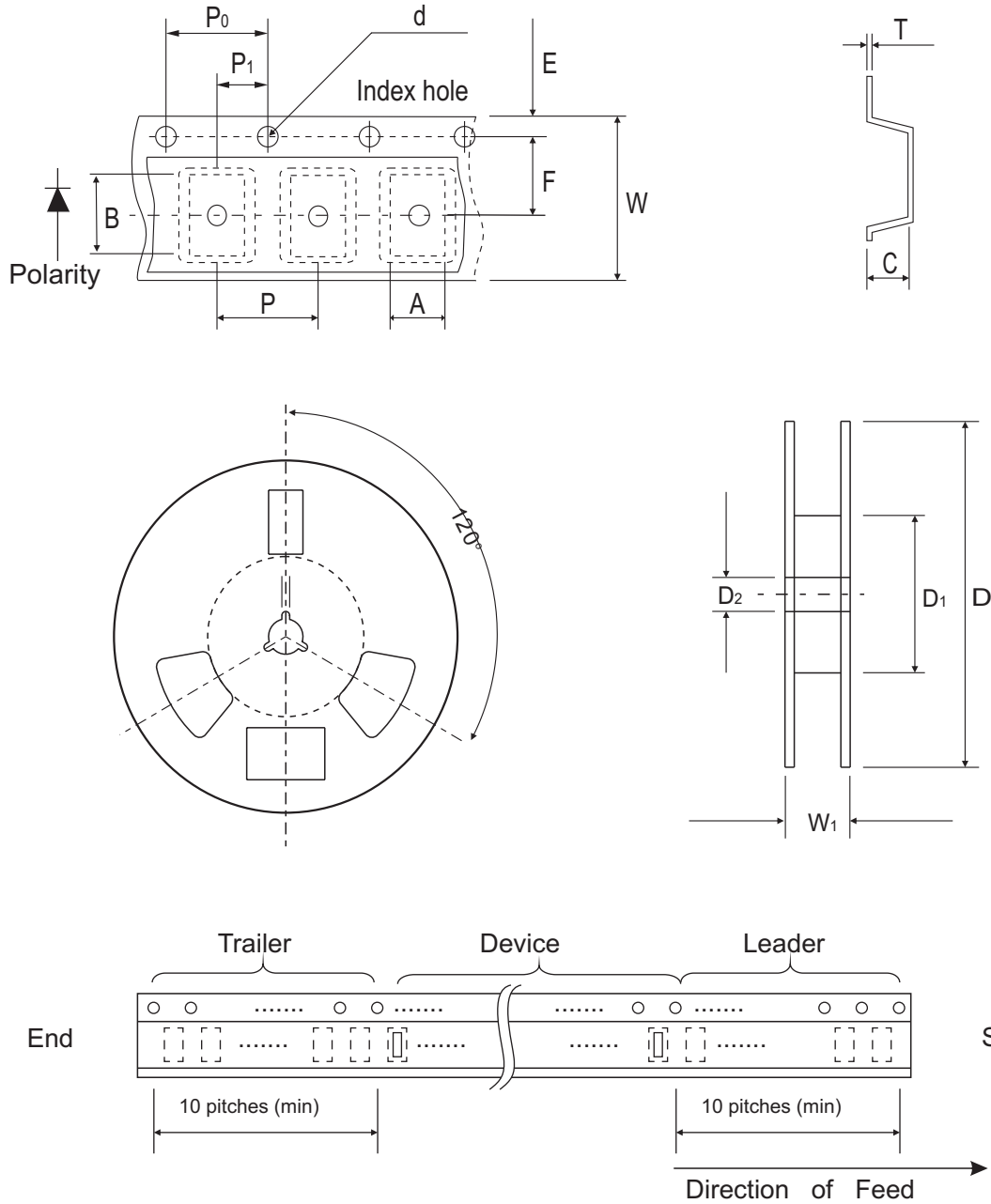
Fig.8 ZENER VOLTAGE VERSUS ZENER CURRENT



Fig.9 STEADY STATE POWER DERATING



## Reel Taping Specification



| 1005<br>(SOD-323F) | SYMBOL | A             | B             | C             | d             | D            | D <sub>1</sub> | D <sub>2</sub> |
|--------------------|--------|---------------|---------------|---------------|---------------|--------------|----------------|----------------|
|                    | (mm)   | 1.55 ± 0.10   | 2.65 ± 0.10   | 1.05 ± 0.10   | 1.55 ± 0.05   | 178 ± 1      | 60.0 MIN.      | 13.0 ± 0.20    |
|                    | (inch) | 0.061 ± 0.004 | 0.104 ± 0.004 | 0.041 ± 0.004 | 0.061 ± 0.002 | 7.008 ± 0.04 | 2.362 MIN.     | 0.512 ± 0.008  |

| 1005<br>(SOD-323F) | 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 ± 0.05    | 0.23 ± 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  | 0.009 ± 0.002 | 0.315 ± 0.008 | 0.531 MAX.     |