

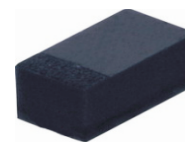
## CZRFR2V4B-HF Thru CZRFR39VB-HF

Voltage 2.4 to 39 Volts

Power 200 mWatts

RoHS Device

Halogen Free

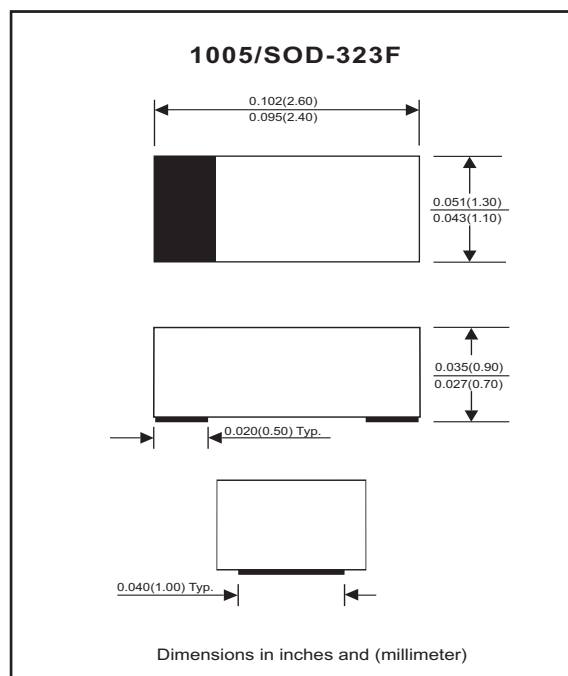


### Features

- 200mW Power Dissipation.
- High Voltages from 2.4 ~ 39 V.
- Designed for mounting on small surface.
- Extremely thin/leadless package.
- Constant voltage control.
- 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 $25^\circ \text{C}$                                                          | $P_D$     | 200         | 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 = 25C) °

| 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) |
| CZRFR2V4B-HF | U2           | 2.34               | 2.46  | 5                   | 100                  | 5                   | 1800                        | 0.25                | 100             | 1                  |
| CZRFR2V7B-HF | U3           | 2.63               | 2.77  | 5                   | 100                  | 5                   | 1900                        | 0.25                | 75              | 1                  |
| CZRFR3V0B-HF | U4           | 2.93               | 3.08  | 5                   | 95                   | 5                   | 2000                        | 0.25                | 50              | 1                  |
| CZRFR3V3B-HF | U5           | 3.22               | 3.38  | 5                   | 95                   | 5                   | 2200                        | 0.25                | 25              | 1                  |
| CZRFR3V6B-HF | U6           | 3.51               | 3.69  | 5                   | 90                   | 5                   | 2300                        | 0.25                | 15              | 1                  |
| CZRFR3V9B-HF | U7           | 3.80               | 4.00  | 5                   | 90                   | 5                   | 2400                        | 0.25                | 10              | 1                  |
| CZRFR4V3B-HF | U8           | 4.19               | 4.41  | 5                   | 88                   | 5                   | 2500                        | 0.25                | 5               | 1                  |
| CZRFR4V7B-HF | U9           | 4.58               | 4.82  | 5                   | 70                   | 5                   | 2200                        | 0.25                | 3               | 1.5                |
| CZRFR5V1B-HF | UA           | 4.97               | 5.23  | 5                   | 50                   | 5                   | 2050                        | 0.25                | 2               | 2                  |
| CZRFR5V6B-HF | UB           | 5.46               | 5.74  | 5                   | 25                   | 5                   | 1800                        | 0.25                | 2               | 3                  |
| CZRFR6V2B-HF | UC           | 6.05               | 6.36  | 5                   | 10                   | 5                   | 1300                        | 0.25                | 1               | 4                  |
| CZRFR6V8B-HF | UE           | 6.63               | 6.97  | 5                   | 8                    | 5                   | 750                         | 0.25                | 1               | 5.2                |
| CZRFR7V5B-HF | UF           | 7.31               | 7.69  | 5                   | 7                    | 5                   | 600                         | 0.25                | 0.5             | 6                  |
| CZRFR8V2B-HF | UG           | 8.00               | 8.41  | 5                   | 7                    | 5                   | 600                         | 0.25                | 0.5             | 6.5                |
| CZRFR9V1B-HF | UH           | 8.87               | 9.33  | 5                   | 10                   | 5                   | 600                         | 0.25                | 0.1             | 7                  |
| CZRFR10VB-HF | UJ           | 9.75               | 10.25 | 5                   | 15                   | 5                   | 600                         | 0.25                | 0.1             | 8                  |
| CZRFR11VB-HF | UK           | 10.73              | 11.27 | 5                   | 18                   | 5                   | 600                         | 0.25                | 0.1             | 8.4                |
| CZRFR12VB-HF | UM           | 11.70              | 12.30 | 5                   | 22                   | 5                   | 600                         | 0.25                | 0.1             | 9.1                |
| CZRFR13VB-HF | UN           | 12.68              | 13.32 | 5                   | 25                   | 5                   | 600                         | 0.25                | 0.1             | 9.9                |
| CZRFR15VB-HF | UP           | 14.63              | 15.37 | 5                   | 32                   | 5                   | 600                         | 0.25                | 0.1             | 11                 |
| CZRFR16VB-HF | UQ           | 15.60              | 16.40 | 5                   | 36                   | 5                   | 600                         | 0.25                | 0.1             | 12                 |
| CZRFR18VB-HF | UR           | 17.55              | 18.45 | 5                   | 42                   | 5                   | 600                         | 0.25                | 0.1             | 14                 |
| CZRFR20VB-HF | US           | 19.50              | 20.50 | 5                   | 48                   | 5                   | 600                         | 0.25                | 0.1             | 15                 |
| CZRFR22VB-HF | UT           | 21.45              | 22.55 | 5                   | 55                   | 5                   | 600                         | 0.25                | 0.1             | 17                 |
| CZRFR24VB-HF | UU           | 23.40              | 24.60 | 5                   | 62                   | 5                   | 600                         | 0.25                | 0.1             | 18                 |
| CZRFR27VB-HF | UV           | 26.33              | 27.67 | 5                   | 70                   | 5                   | 600                         | 0.25                | 0.1             | 21                 |
| CZRFR30VB-HF | UW           | 29.25              | 30.75 | 5                   | 78                   | 5                   | 600                         | 0.25                | 0.1             | 23                 |
| CZRFR33VB-HF | UX           | 32.18              | 33.82 | 5                   | 88                   | 5                   | 700                         | 0.25                | 0.1             | 25                 |
| CZRFR36VB-HF | UY           | 35.10              | 36.90 | 5                   | 95                   | 5                   | 700                         | 0.25                | 0.1             | 27                 |
| CZRFR39VB-HF | UZ           | 38.03              | 39.97 | 5                   | 130                  | 5                   | 800                         | 0.25                | 0.1             | 30                 |

## RATING AND CHARACTERISTIC CURVES (CZRFR2V4B-HF Thru CZRFR39VB-HF)

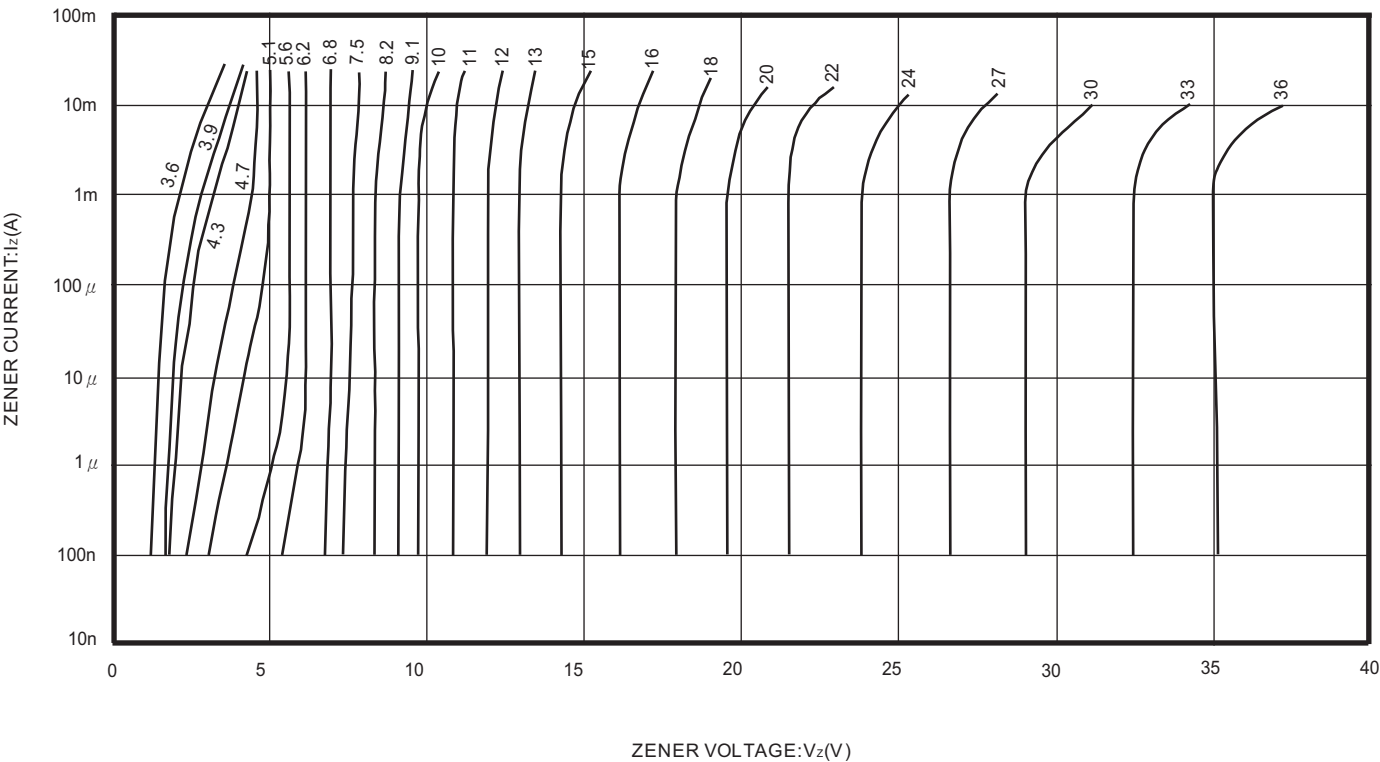


Fig.1 Zener voltage characteristics

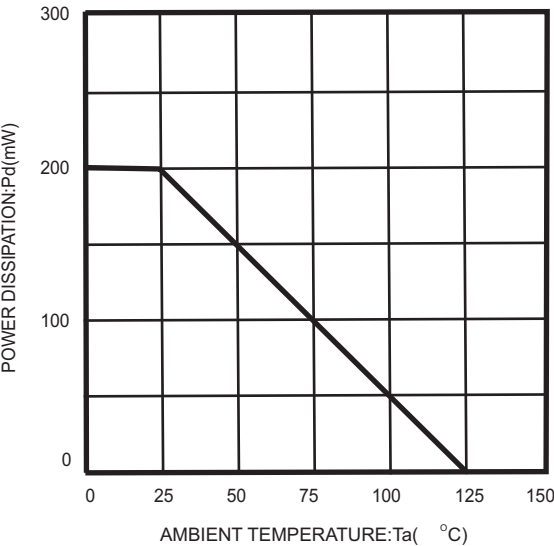


Fig.2 Derating curve

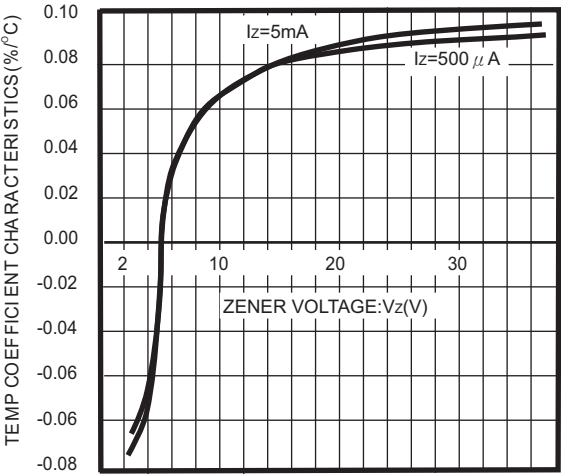
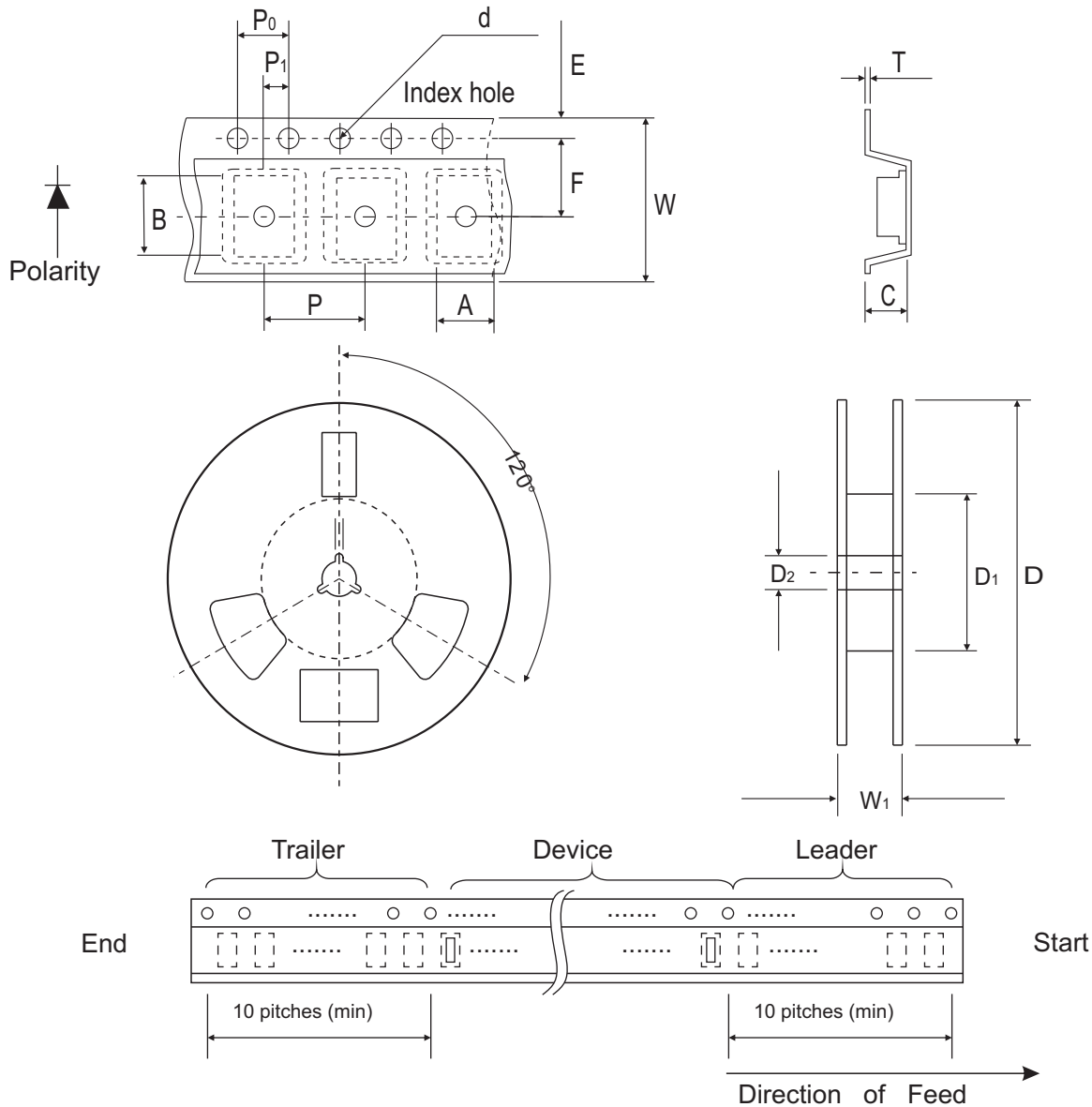


Fig.3 Zener voltage-temp. Coefficient characteristics

## Reel Taping Specification

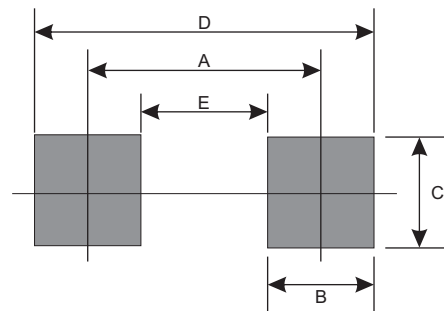


|                    |        |               |               |               |               |              |                |                |
|--------------------|--------|---------------|---------------|---------------|---------------|--------------|----------------|----------------|
| 1005<br>(SOD-323F) | 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.     |

## Suggested PAD Layout

| SIZE | 1005/SOD-323F |        |
|------|---------------|--------|
|      | (mm)          | (inch) |
| A    | 2.00          | 0.079  |
| B    | 0.70          | 0.028  |
| C    | 1.30          | 0.051  |
| D    | 2.70          | 0.106  |
| E    | 1.30          | 0.051  |



## Standard Package

| Case Type     | Qty per Reel | Reel Size |
|---------------|--------------|-----------|
|               | (Pcs)        | (inch)    |
| 1005/SOD-323F | 4000         | 7         |

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|                                     |                                     |                                     |                                     |                                     |                                     |
|-------------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|
| <a href="#"><u>CZRFR5V1B-HF</u></a> | <a href="#"><u>CZRFR5V6B-HF</u></a> | <a href="#"><u>CZRFR6V2B-HF</u></a> | <a href="#"><u>CZRFR6V8B-HF</u></a> | <a href="#"><u>CZRFR7V5B-HF</u></a> | <a href="#"><u>CZRFR8V2B-HF</u></a> |
| <a href="#"><u>CZRFR9V1B-HF</u></a> | <a href="#"><u>CZRFR10VB-HF</u></a> | <a href="#"><u>CZRFR11VB-HF</u></a> | <a href="#"><u>CZRFR12VB-HF</u></a> | <a href="#"><u>CZRFR13VB-HF</u></a> | <a href="#"><u>CZRFR15VB-HF</u></a> |
| <a href="#"><u>CZRFR16VB-HF</u></a> | <a href="#"><u>CZRFR18VB-HF</u></a> | <a href="#"><u>CZRFR20VB-HF</u></a> | <a href="#"><u>CZRFR22VB-HF</u></a> | <a href="#"><u>CZRFR24VB-HF</u></a> | <a href="#"><u>CZRFR27VB-HF</u></a> |
| <a href="#"><u>CZRFR2V4B-HF</u></a> | <a href="#"><u>CZRFR2V7B-HF</u></a> | <a href="#"><u>CZRFR30VB-HF</u></a> | <a href="#"><u>CZRFR33VB-HF</u></a> | <a href="#"><u>CZRFR36VB-HF</u></a> | <a href="#"><u>CZRFR39VB-HF</u></a> |
| <a href="#"><u>CZRFR3V0B-HF</u></a> | <a href="#"><u>CZRFR3V3B-HF</u></a> | <a href="#"><u>CZRFR3V6B-HF</u></a> | <a href="#"><u>CZRFR3V9B-HF</u></a> | <a href="#"><u>CZRFR4V3B-HF</u></a> | <a href="#"><u>CZRFR4V7B-HF</u></a> |