

CZRQR52C2-HF Thru. CZRQR52C39-HF

Voltage 2 to 39 Volts

Power 125 mWatts

RoHS Device

Halogen Free

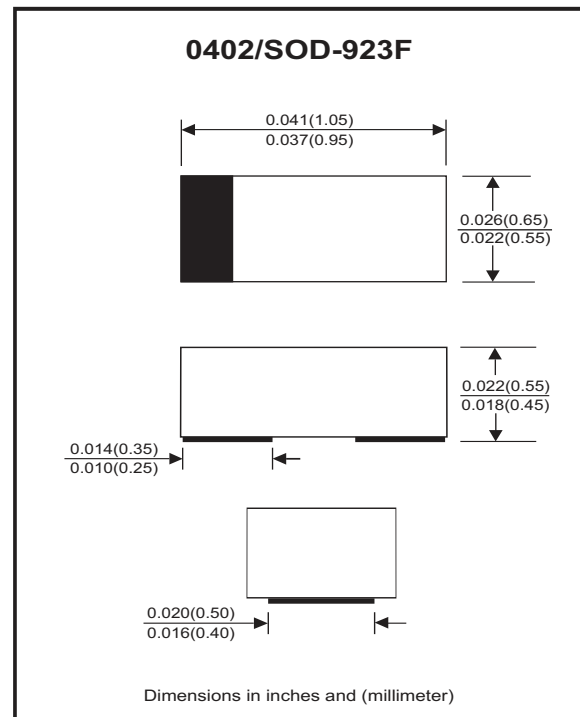


Features

- 125mW Power Dissipation.
- High Voltages from 2 ~ 39 V.
- Designed for mounting on small surface.
- Extremely thin/leadless package.
- Pb free product.

Mechanical data

- Case: 0402/SOD-923F standard package Molded plastic.
- Terminals: Gold plated, solderable per MIL-STD-750,method 2026.
- Polarity: Indicated by cathode band.
- Weight: 0.001 grams(approx.).



Circuit diagram



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 | 125 | mW |
| Forward current , surge peak 8.3 ms single half sine-wave superimposed 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 |

Electrical Characteristics (at TA=25°C unless otherwise noted)

| Part Number | Marking Code | Zener Voltage | | | | Operating resistance | | Rising operating Resistance | | Reverse current | |
|----------------|--------------|---------------|-----|-------|---------|----------------------|---------|-----------------------------|---------|-----------------|--------|
| | | Vz (V) | | | | ZzT (Ω) | | Zzk (Ω) | | IR (uA) | |
| | | Min | Typ | Max | Iz (mA) | Max | Iz (mA) | Max | Iz (mA) | Max | VR (V) |
| CZRQR52C2-HF | Z0 | 1.90 | 2.0 | 2.10 | 5 | 100 | 5 | 600 | 1 | 100 | 1 |
| CZRQR52C2V2-HF | Z1 | 2.09 | 2.2 | 2.31 | 5 | 100 | 5 | 600 | 1 | 100 | 1 |
| CZRRQ52C2V4-HF | Z2 | 2.28 | 2.4 | 2.52 | 5 | 85 | 5 | 600 | 1 | 100 | 1 |
| CZRQR52C2V7-HF | Z3 | 2.57 | 2.7 | 2.84 | 5 | 83 | 5 | 500 | 1 | 75 | 1 |
| CZRQR52C3-HF | Z4 | 2.85 | 3.0 | 3.15 | 5 | 95 | 5 | 500 | 1 | 50 | 1 |
| CZRQR52C3V3-HF | Z5 | 3.14 | 3.3 | 3.47 | 5 | 95 | 5 | 500 | 1 | 25 | 1 |
| CZRQR52C3V6-HF | Z6 | 3.42 | 3.6 | 3.78 | 5 | 95 | 5 | 500 | 1 | 15 | 1 |
| CZRQR52C3V9-HF | Z7 | 3.71 | 3.9 | 4.10 | 5 | 95 | 5 | 500 | 1 | 10 | 1 |
| CZRQR52C4V3-HF | Z8 | 4.09 | 4.3 | 4.52 | 5 | 95 | 5 | 500 | 1 | 5 | 1 |
| CZRQR52C4V7-HF | Z9 | 4.47 | 4.7 | 4.94 | 5 | 78 | 5 | 500 | 1 | 5 | 2 |
| CZRQR52C5V1-HF | ZA | 4.85 | 5.1 | 5.36 | 5 | 60 | 5 | 480 | 1 | 0.1 | 0.8 |
| CZRQR52C5V6-HF | ZB | 5.32 | 5.6 | 5.88 | 5 | 40 | 5 | 400 | 1 | 0.1 | 1 |
| CZRQR52C6V2-HF | ZC | 5.89 | 6.2 | 6.51 | 5 | 10 | 5 | 200 | 1 | 0.1 | 2 |
| CZRQR52C6V8-HF | ZE | 6.46 | 6.8 | 7.14 | 5 | 8 | 5 | 150 | 1 | 0.1 | 3 |
| CZRQR52C7V5-HF | ZF | 7.13 | 7.5 | 7.88 | 5 | 7 | 5 | 50 | 1 | 0.1 | 5 |
| CZRQR52C8V2-HF | ZG | 7.79 | 8.2 | 8.61 | 5 | 7 | 5 | 50 | 1 | 0.1 | 6 |
| CZRQR52C9V1-HF | ZH | 8.65 | 9.1 | 9.56 | 5 | 10 | 5 | 50 | 1 | 0.1 | 7 |
| CZRQR52C10-HF | ZJ | 9.50 | 10 | 10.50 | 5 | 15 | 5 | 70 | 1 | 0.1 | 7.5 |
| CZRQR52C11-HF | ZK | 10.45 | 11 | 11.55 | 5 | 20 | 5 | 70 | 1 | 0.1 | 8.5 |
| CZRQR52C12-HF | ZM | 11.40 | 12 | 12.60 | 5 | 20 | 5 | 90 | 1 | 0.1 | 9 |
| CZRQR52C13-HF | ZN | 12.35 | 13 | 13.65 | 5 | 25 | 5 | 110 | 1 | 0.1 | 10 |
| CZRQR52C15-HF | ZP | 14.25 | 15 | 15.75 | 5 | 30 | 5 | 110 | 1 | 0.1 | 11 |
| CZRQR52C16-HF | ZQ | 15.20 | 16 | 16.80 | 5 | 40 | 5 | 170 | 1 | 0.1 | 12 |
| CZRQR52C18-HF | ZR | 17.10 | 18 | 18.90 | 5 | 50 | 5 | 170 | 1 | 0.1 | 14 |
| CZRQR52C20-HF | ZS | 19.00 | 20 | 21.00 | 5 | 50 | 5 | 220 | 1 | 0.1 | 15 |
| CZRQR52C22-HF | ZT | 20.90 | 22 | 23.10 | 5 | 55 | 5 | 220 | 1 | 0.1 | 17 |
| CZRQR52C24-HF | ZU | 22.80 | 24 | 25.20 | 5 | 80 | 5 | 220 | 1 | 0.1 | 18 |
| CZRQR52C27-HF | ZV | 25.65 | 27 | 28.35 | 5 | 80 | 5 | 250 | 1 | 0.1 | 20 |
| CZRQR52C30-HF | ZW | 28.50 | 30 | 31.50 | 5 | 80 | 5 | 250 | 1 | 0.1 | 23 |
| CZRQR52C33-HF | ZX | 31.35 | 33 | 34.65 | 5 | 80 | 5 | 250 | 1 | 0.1 | 25 |
| CZRQR52C36-HF | ZY | 34.20 | 36 | 37.80 | 5 | 90 | 5 | 250 | 1 | 0.1 | 27 |
| CZRQR52C39-HF | ZZ | 37.05 | 39 | 40.95 | 5 | 90 | 5 | 300 | 1 | 0.1 | 29 |

RATING AND CHARACTERISTIC CURVES (CZRQR52C2-HF Thru CZRQR52C39-HF)

Fig.1 TEMPERATURE COEFFICIENTS

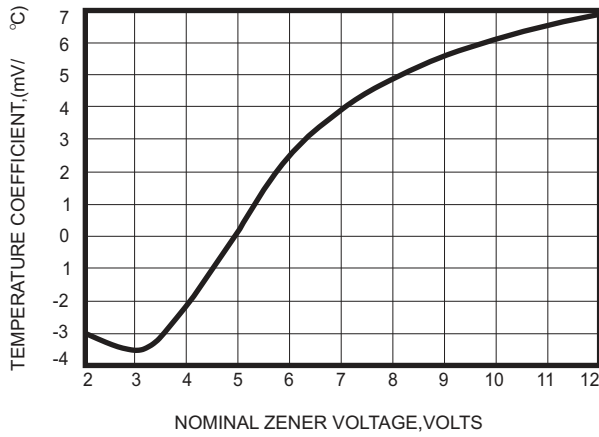


Fig.2 TEMPERATURE COEFFICIENTS

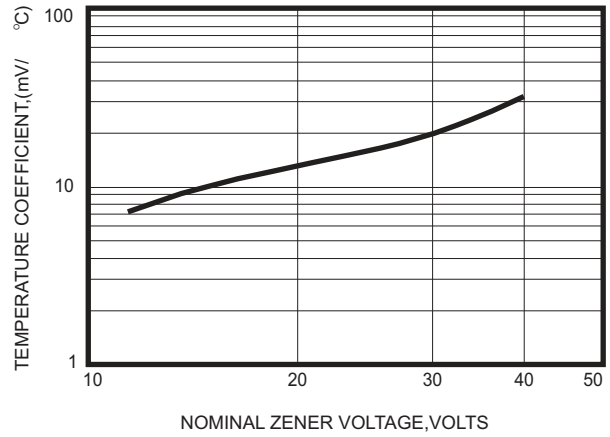


Fig.3 EFFECT OF ZENER VOLTAGE ON ZENER IMPEDANCE

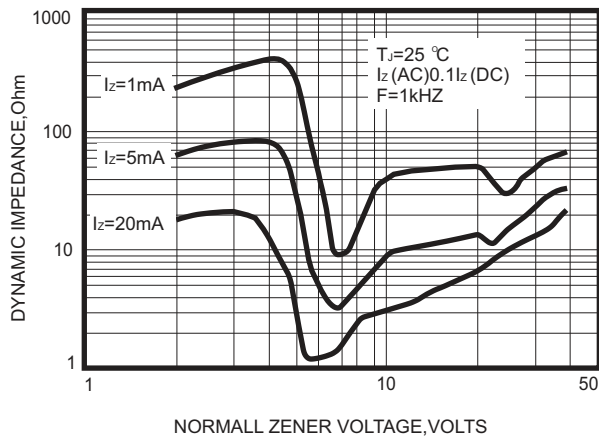


Fig.4 TYPICAL FORWARD VOLTAGE

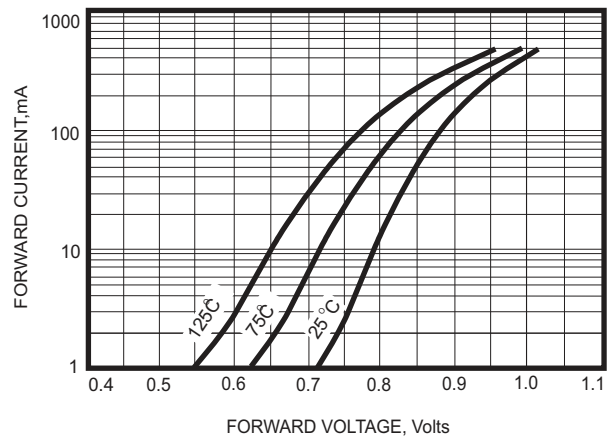


Fig.5 TYPICAL LEAKAGE CURRENT

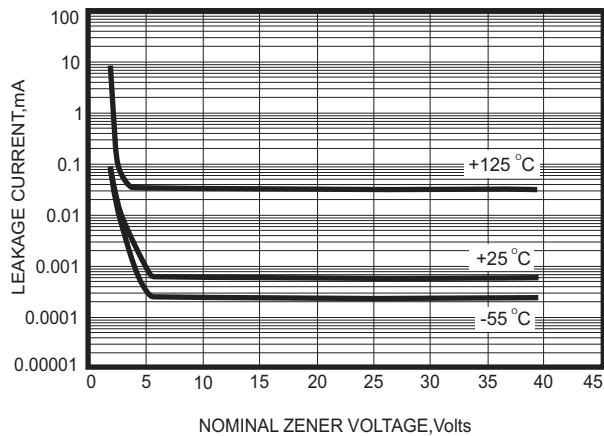
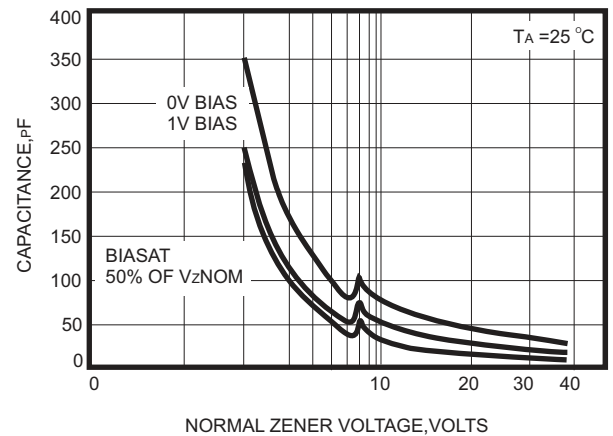


Fig.6 TYPICAL CAPACITANCE



RATING AND CHARACTERISTIC CURVES (CZRQR52C2-HF Thru CZRQR52C39-HF)

Fig.7 ZENER VOLTAGE VERSUS ZENER CURRENT

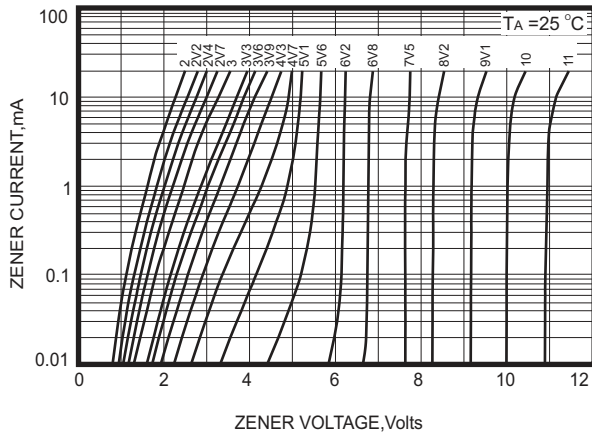


Fig.8 ZENER VOLTAGE VERSUS ZENER CURRENT

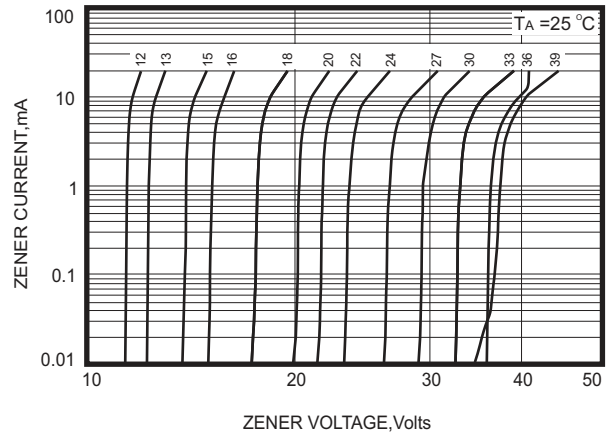
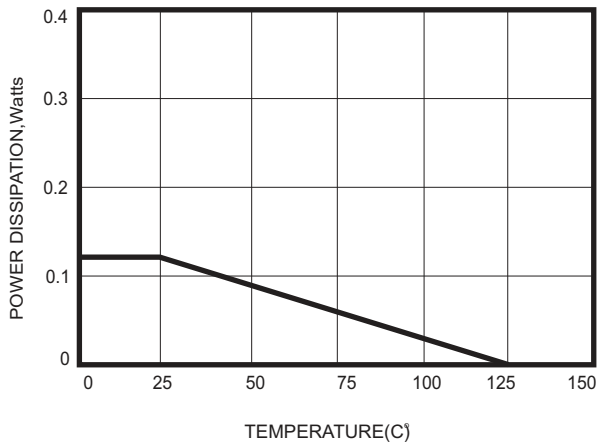
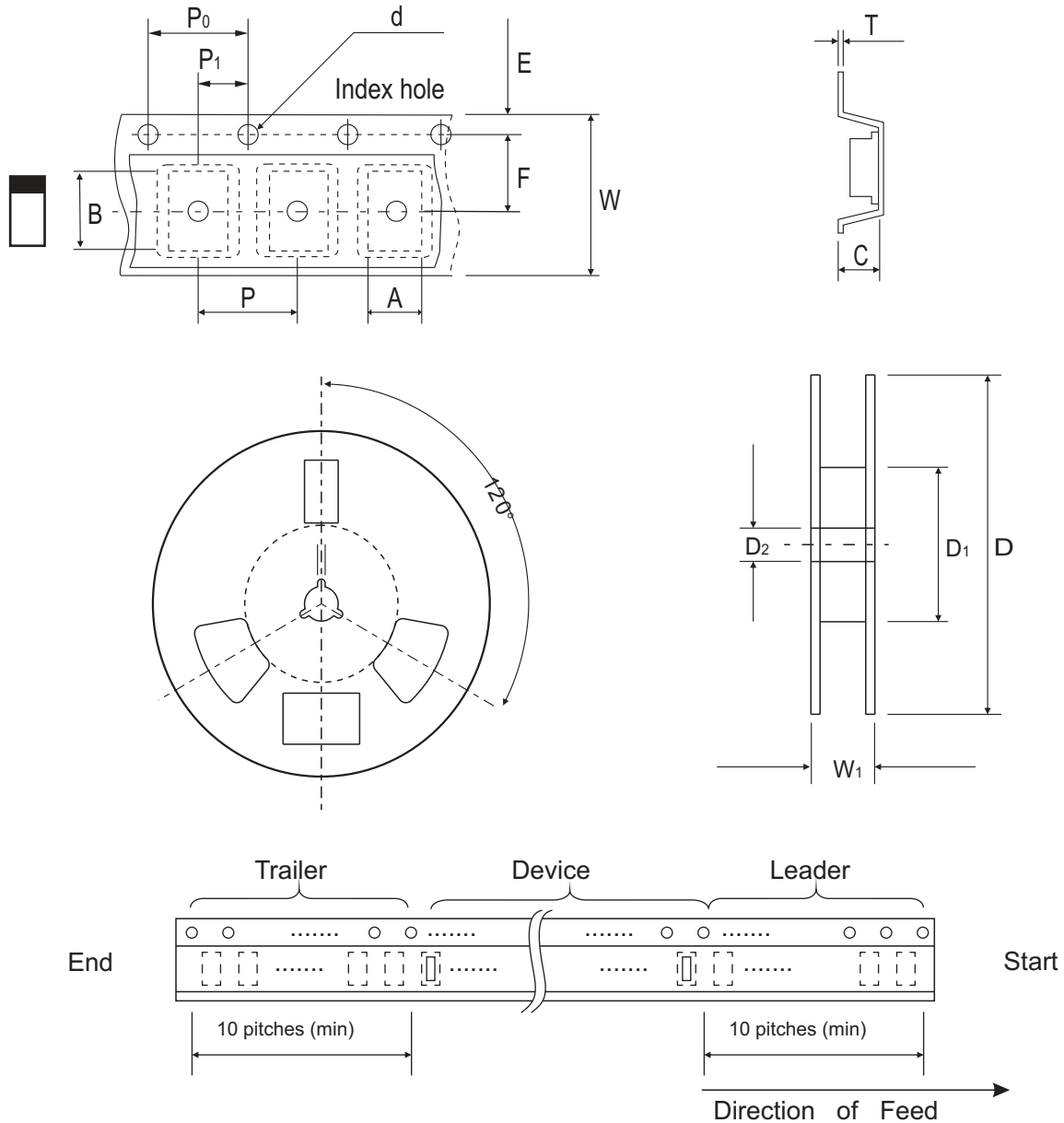


Fig.9 STEADY STATE POWER DERATING



Reel Taping Specification

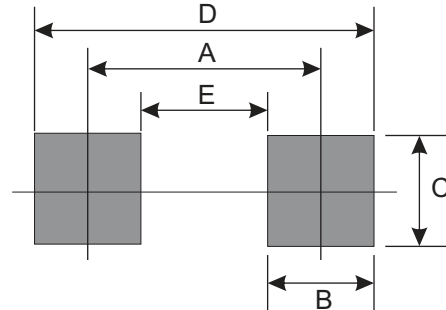


| 0402 (SOD-923F) | SYMBOL | A | B | C | d | D | D ₁ | D ₂ |
|--------------------|--------|---------------|---------------|---------------|----------------------|---------------|----------------------|----------------|
| | (mm) | 0.75 ± 0.05 | 1.17 ± 0.05 | 0.65 ± 0.05 | 1.50 + 0.10 - 0 | 178 ± 1 | 60.0 + 0.50 - 0 | 13.0 ± 0.20 |
| | (inch) | 0.030 ± 0.002 | 0.046 ± 0.002 | 0.026 ± 0.002 | 0.059 + 0.004 - 0 | 7.008 ± 0.039 | 2.362 + 0.020 - 0 | 0.512 ± 0.008 |

| 0402 (SOD-923F) | SYMBOL | E | F | P | P ₀ | P ₁ | T | W | W ₁ |
|--------------------|--------|---------------|---------------|---------------|----------------|----------------|--------------------------|---------------|----------------|
| | (mm) | 1.75 ± 0.10 | 3.50 ± 0.10 | 4.00 ± 0.10 | 4.00 ± 0.10 | 2.00 ± 0.10 | 0.20 + 0.02 - 0.05 | 8.00 ± 0.20 | 12.0 ± 0.15 |
| | (inch) | 0.069 ± 0.004 | 0.138 ± 0.004 | 0.157 ± 0.004 | 0.157 ± 0.004 | 0.079 ± 0.004 | 0.008 + 0.001 - 0.002 | 0.315 ± 0.008 | 0.472 ± 0.006 |

Suggested PAD Layout

| SIZE | 0402/SOD-923F | |
|------|---------------|--------|
| | (mm) | (inch) |
| A | 0.750 | 0.030 |
| B | 0.500 | 0.020 |
| C | 0.700 | 0.028 |
| D | 1.250 | 0.049 |
| E | 0.250 | 0.010 |



Standard Packaging

| Case Type | Qty Per Reel | Reel Size |
|---------------|--------------|-----------|
| | (Pcs) | (inch) |
| 0402/SOD-923F | 5,000 | 7 |