

500mW, 2V - 56V Zener Diode

FEATURES

- Wide Zener voltage range selection: 2V to 56V
- Hermetically sealed glass
- RoHS Compliant

APPLICATIONS

- Low voltage stabilizers or voltage references
- Adapters
- Lighting application
- On-board DC/DC converter

MECHANICAL DATA

- Case: DO-34
- Terminal: Pure tin plated leads, solderable per J-STD-002
- Polarity: Indicated by cathode band
- Weight: 92.00mg (approximately)

| KEY PARAMETERS | | |
|-----------------------|------------|------|
| PARAMETER | VALUE | UNIT |
| V_Z | 2 - 56 | V |
| Test current I_{ZT} | 5 | mA |
| P_D | 500 | mW |
| $T_{J\ MAX}$ | 175 | °C |
| Package | DO-34 | |
| Configuration | Single die | |



DO-34



| ABSOLUTE MAXIMUM RATINGS ($T_A = 25^\circ\text{C}$ unless otherwise noted) | | | |
|---|-----------|-------------|------|
| PARAMETER | SYMBOL | VALUE | UNIT |
| Power dissipation | P_D | 500 | mW |
| Junction temperature range | T_J | -55 to +175 | °C |
| Storage temperature | T_{STG} | -55 to +175 | °C |

ELECTRICAL SPECIFICATIONS ($T_A = 25^\circ\text{C}$ unless otherwise noted)

| PART NUMBER | MARKING CODE | ZENER VOLTAGE | | | TEST CURRENT | REGULAR IMPEDANCE | | TEST CURRENT | LEAKAGE CURRENT | | |
|-------------|--------------|----------------------|-------|-------|--------------|-------------------|-------------------|--------------|-----------------|-----|-----|
| | | $V_Z @ I_{ZT}^{(1)}$ | | | I_{ZT} | $Z_{ZT} @ I_{ZT}$ | $Z_{ZK} @ I_{ZK}$ | I_{ZK} | $I_R @ V_R$ | | |
| | | V | | | mA | Ω | Ω | mA | μA | V | |
| | | Min | Nom | Max | | Max | Max | | Max | | |
| MTZJ2V0S | A | 2V0A | 1.88 | 1.99 | 2.10 | 5 | 100 | 1000 | 0.5 | 120 | 0.5 |
| | B | 2V0B | 2.02 | 2.11 | 2.20 | | | | | | |
| MTZJ2V2S | A | 2V2A | 2.12 | 2.21 | 2.30 | 5 | 100 | 1000 | 0.5 | 120 | 0.7 |
| | B | 2V2B | 2.22 | 2.32 | 2.41 | | | | | | |
| MTZJ2V4S | A | 2V4A | 2.33 | 2.43 | 2.52 | 5 | 100 | 1000 | 0.5 | 120 | 1.0 |
| | B | 2V4B | 2.43 | 2.53 | 2.63 | | | | | | |
| MTZJ2V7S | A | 2V7A | 2.54 | 2.65 | 2.75 | 5 | 110 | 1000 | 0.5 | 100 | 1.0 |
| | B | 2V7B | 2.69 | 2.80 | 2.91 | | | | | | |
| MTZJ3V0S | A | 3V0A | 2.85 | 2.96 | 3.07 | 5 | 120 | 1000 | 0.5 | 50 | 1.0 |
| | B | 3V0B | 3.01 | 3.12 | 3.22 | | | | | | |
| MTZJ3V3S | A | 3V3A | 3.16 | 3.27 | 3.38 | 5 | 120 | 1000 | 0.5 | 20 | 1.0 |
| | B | 3V3B | 3.32 | 3.43 | 3.53 | | | | | | |
| MTZJ3V6S | A | 3V6A | 3.45 | 3.58 | 3.695 | 5 | 100 | 1000 | 1.0 | 10 | 1.0 |
| | B | 3V6B | 3.60 | 3.72 | 3.845 | | | | | | |
| MTZJ3V9S | A | 3V9A | 3.74 | 3.88 | 4.01 | 5 | 100 | 1000 | 1.0 | 5 | 1.0 |
| | B | 3V9B | 3.89 | 4.03 | 4.16 | | | | | | |
| MTZJ4V3S | A | 4V3A | 4.04 | 4.17 | 4.29 | 5 | 100 | 1000 | 1.0 | 5 | 1.0 |
| | B | 4V3B | 4.17 | 4.30 | 4.43 | | | | | | |
| | C | 4V3C | 4.30 | 4.44 | 4.57 | | | | | | |
| MTZJ4V7S | A | 4V7A | 4.44 | 4.56 | 4.68 | 5 | 80 | 900 | 0.5 | 5 | 1.0 |
| | B | 4V7B | 4.55 | 4.68 | 4.80 | | | | | | |
| | C | 4V7C | 4.68 | 4.81 | 4.93 | | | | | | |
| MTZJ5V1S | A | 5V1A | 4.81 | 4.94 | 5.07 | 5 | 80 | 1200 | 0.5 | 5 | 1.5 |
| | B | 5V1B | 4.94 | 5.07 | 5.20 | | | | | | |
| | C | 5V1C | 5.09 | 5.23 | 5.37 | | | | | | |
| MTZJ5V6S | A | 5V6A | 5.28 | 5.42 | 5.55 | 5 | 60 | 900 | 0.5 | 5 | 2.5 |
| | B | 5V6B | 5.45 | 5.59 | 5.73 | | | | | | |
| | C | 5V6C | 5.61 | 5.76 | 5.91 | | | | | | |
| MTZJ6V2S | A | 6V2A | 5.78 | 5.94 | 6.09 | 5 | 60 | 500 | 0.5 | 5 | 3.0 |
| | B | 6V2B | 5.96 | 6.12 | 6.27 | | | | | | |
| | C | 6V2C | 6.12 | 6.28 | 6.44 | | | | | | |
| MTZJ6V8S | A | 6V8A | 6.29 | 6.46 | 6.63 | 5 | 20 | 150 | 0.5 | 2 | 3.5 |
| | B | 6V8B | 6.49 | 6.66 | 6.83 | | | | | | |
| | C | 6V8C | 6.66 | 6.84 | 7.01 | | | | | | |
| MTZJ7V5S | A | 7V5A | 6.85 | 7.04 | 7.22 | 5 | 20 | 120 | 0.5 | 0.5 | 4.0 |
| | B | 7V5B | 7.07 | 7.26 | 7.45 | | | | | | |
| | C | 7V5C | 7.29 | 7.48 | 7.67 | | | | | | |
| MTZJ8V2S | A | 8V2A | 7.53 | 7.73 | 7.92 | 5 | 20 | 120 | 0.5 | 0.5 | 5.0 |
| | B | 8V2B | 7.78 | 7.99 | 8.19 | | | | | | |
| | C | 8V2C | 8.03 | 8.24 | 8.45 | | | | | | |
| MTZJ9V1S | A | 9V1A | 8.29 | 8.51 | 8.73 | 5 | 25 | 120 | 0.5 | 0.5 | 6.0 |
| | B | 9V1B | 8.57 | 8.79 | 9.01 | | | | | | |
| | C | 9V1C | 8.83 | 9.07 | 9.30 | | | | | | |
| MTZJ10S | A | 10A | 9.12 | 9.36 | 9.59 | 5 | 30 | 120 | 0.5 | 0.2 | 7 |
| | B | 10B | 9.41 | 9.66 | 9.90 | | | | | | |
| | C | 10C | 9.70 | 9.95 | 10.20 | | | | | | |
| | D | 10D | 9.97 | 10.21 | 10.44 | | | | | | |
| MTZJ11S | A | 11A | 10.18 | 10.45 | 10.71 | 5 | 30 | 120 | 0.5 | 0.2 | 8 |
| | B | 11B | 10.50 | 10.78 | 11.05 | | | | | | |
| | C | 11C | 10.82 | 11.10 | 11.38 | | | | | | |
| MTZJ12S | A | 12A | 11.13 | 11.42 | 11.71 | 5 | 30 | 110 | 0.5 | 0.2 | 9 |
| | B | 12B | 11.44 | 11.74 | 12.03 | | | | | | |
| | C | 12C | 11.74 | 12.05 | 12.35 | | | | | | |
| MTZJ13S | A | 13A | 12.11 | 12.43 | 12.75 | 5 | 35 | 110 | 0.5 | 0.2 | 10 |
| | B | 13B | 12.55 | 12.88 | 13.21 | | | | | | |
| | C | 13C | 12.99 | 13.33 | 13.66 | | | | | | |
| MTZJ15S | A | 15A | 13.44 | 13.79 | 14.13 | 5 | 40 | 110 | 0.5 | 0.2 | 11 |
| | B | 15B | 13.89 | 14.26 | 14.62 | | | | | | |
| | C | 15C | 14.35 | 14.72 | 15.09 | | | | | | |
| MTZJ16S | A | 16A | 14.80 | 15.19 | 15.57 | 5 | 40 | 150 | 0.5 | 0.2 | 12 |
| | B | 16B | 15.25 | 15.65 | 16.04 | | | | | | |
| | C | 16C | 15.69 | 16.10 | 16.51 | | | | | | |

ELECTRICAL SPECIFICATIONS ($T_A = 25^\circ\text{C}$ unless otherwise noted)

| PART NUMBER | MARKING CODE | ZENER VOLTAGE | | | TEST CURRENT | REGULAR IMPEDANCE | | TEST CURRENT | LEAKAGE CURRENT | | |
|-------------|--------------|----------------------|-------|-------|--------------|-------------------|-------------------|--------------|-----------------|-----|----|
| | | $V_Z @ I_{ZT}^{(1)}$ | | | I_{ZT} | $Z_{ZT} @ I_{ZT}$ | $Z_{ZK} @ I_{ZK}$ | I_{ZK} | $I_R @ V_R$ | | |
| | | V | | | mA | Ω | Ω | mA | μA | V | |
| | | Min | Nom | Max | | Max | Max | | Max | | |
| MTZJ18S | A | 18A | 16.22 | 16.64 | 17.06 | 5 | 45 | 150 | 0.5 | 0.2 | 13 |
| | B | 18B | 16.82 | 17.26 | 17.70 | | | | | | |
| | C | 18C | 17.42 | 17.88 | 18.33 | | | | | | |
| MTZJ20S | A | 20A | 18.02 | 18.49 | 18.96 | 5 | 55 | 200 | 0.5 | 0.2 | 15 |
| | B | 20B | 18.63 | 19.11 | 19.59 | | | | | | |
| | C | 20C | 19.23 | 19.73 | 20.22 | | | | | | |
| | D | 20D | 19.72 | 20.22 | 20.72 | | | | | | |
| MTZJ22S | A | 22A | 20.15 | 20.68 | 21.2 | 5 | 30 | 200 | 0.5 | 0.2 | 17 |
| | B | 22B | 20.64 | 21.18 | 21.71 | | | | | | |
| | C | 22C | 21.08 | 21.63 | 22.17 | | | | | | |
| | D | 22D | 21.52 | 22.08 | 22.63 | | | | | | |
| MTZJ24S | A | 24A | 22.05 | 22.62 | 23.18 | 5 | 35 | 200 | 0.5 | 0.2 | 19 |
| | B | 24B | 22.61 | 23.19 | 23.77 | | | | | | |
| | C | 24C | 23.12 | 23.72 | 24.31 | | | | | | |
| | D | 24D | 23.63 | 24.24 | 24.85 | | | | | | |
| MTZJ27S | A | 27A | 24.26 | 24.89 | 25.52 | 5 | 45 | 250 | 0.5 | 0.2 | 21 |
| | B | 27B | 24.97 | 25.62 | 26.26 | | | | | | |
| | C | 27C | 25.63 | 26.29 | 26.95 | | | | | | |
| | D | 27D | 26.29 | 26.97 | 27.64 | | | | | | |
| MTZJ30S | A | 30A | 26.99 | 27.69 | 28.39 | 5 | 55 | 250 | 0.5 | 0.2 | 23 |
| | B | 30B | 27.70 | 28.42 | 29.13 | | | | | | |
| | C | 30C | 28.36 | 29.09 | 29.82 | | | | | | |
| | D | 30D | 29.02 | 29.77 | 30.51 | | | | | | |
| MTZJ33S | A | 33A | 29.68 | 30.45 | 31.22 | 5 | 65 | 250 | 0.5 | 0.2 | 25 |
| | B | 33B | 30.32 | 31.10 | 31.88 | | | | | | |
| | C | 33C | 30.90 | 31.70 | 32.50 | | | | | | |
| | D | 33D | 31.49 | 32.30 | 33.11 | | | | | | |
| MTZJ36S | A | 36A | 32.14 | 32.97 | 33.79 | 5 | 75 | 250 | 0.5 | 0.2 | 27 |
| | B | 36B | 32.79 | 33.64 | 34.49 | | | | | | |
| | C | 36C | 33.40 | 34.27 | 35.13 | | | | | | |
| | D | 36D | 34.01 | 34.89 | 35.77 | | | | | | |
| MTZJ39S | A | 39A | 34.68 | 35.58 | 36.47 | 5 | 85 | 250 | 0.5 | 0.2 | 30 |
| | B | 39B | 35.36 | 36.28 | 37.19 | | | | | | |
| | C | 39C | 36.00 | 36.93 | 37.85 | | | | | | |
| | D | 39D | 36.63 | 37.58 | 38.52 | | | | | | |
| | E | 39E | 37.36 | 38.33 | 39.29 | | | | | | |
| | F | 39F | 38.14 | 39.13 | 40.11 | | | | | | |
| | G | 39G | 38.94 | 39.87 | 40.80 | | | | | | |
| MTZJ43S | - | 43S | 40.00 | 42.50 | 45.00 | 5 | 90 | 250 | 0.5 | 0.2 | 33 |
| MTZJ47S | - | 47S | 44.00 | 46.50 | 49.00 | | 90 | 250 | 0.5 | 0.2 | 36 |
| MTZJ51S | - | 51S | 48.00 | 51.00 | 54.00 | | 110 | 250 | 0.5 | 0.2 | 39 |
| MTZJ56S | - | 56S | 53.00 | 56.50 | 60.00 | | 110 | 250 | 0.5 | 0.2 | 43 |

Notes:

1. The Zener voltage subdivision (V_Z) is measured 30ms after diode is powered up
2. The operating resistance (Z_{ZT} or Z_{ZK}) is measured by superimposing a minute alternation current in the regulated current (I_Z)
3. When ordering, please specify tolerance A, B, C, D, E, F, G

ORDERING INFORMATION

| ORDERING CODE⁽¹⁾⁽²⁾ | PACKAGE | PACKING |
|---------------------------------------|----------------|-------------------|
| MTZJxSx R0 | DO-34 | 10,000 / 14" Reel |
| MTZJxSx A0 | DO-34 | 5,000 / Ammo Box |
| MTZJxSx R0G | DO-34 | 10,000 / 14" Reel |
| MTZJxSx A0G | DO-34 | 5,000 / Ammo Box |

Notes:

1. "x" defines voltage from 2V (MTZJ2V0SA) to 56V (MTZJ56S)
2. Above ordering codes A0/A0G/R0/R0G refer to physically identical parts without any differences

CHARACTERISTICS CURVES

($T_A = 25^\circ\text{C}$ unless otherwise noted)

Fig.1 $V_Z - I_Z$ Characteristics

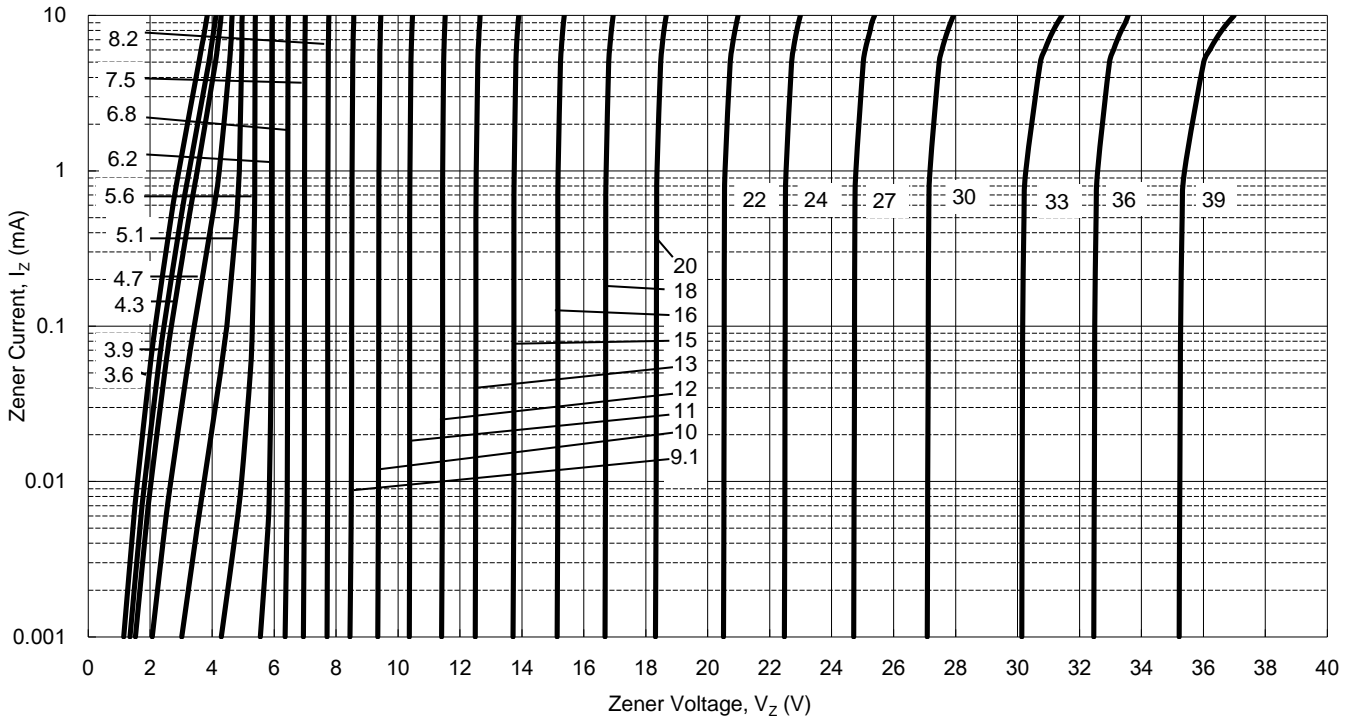


Fig.2 $P_D - T_A$ Characteristics

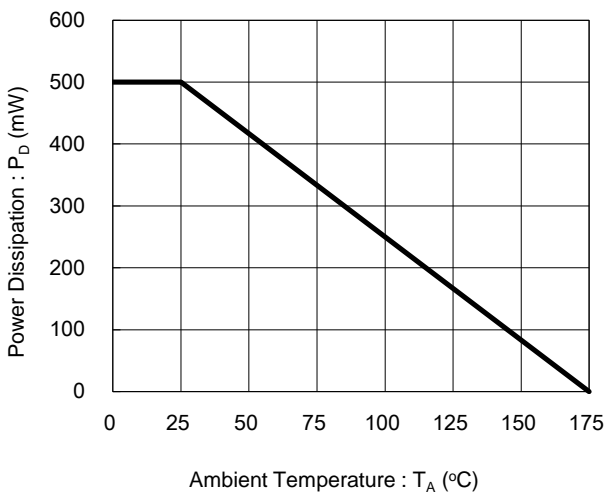
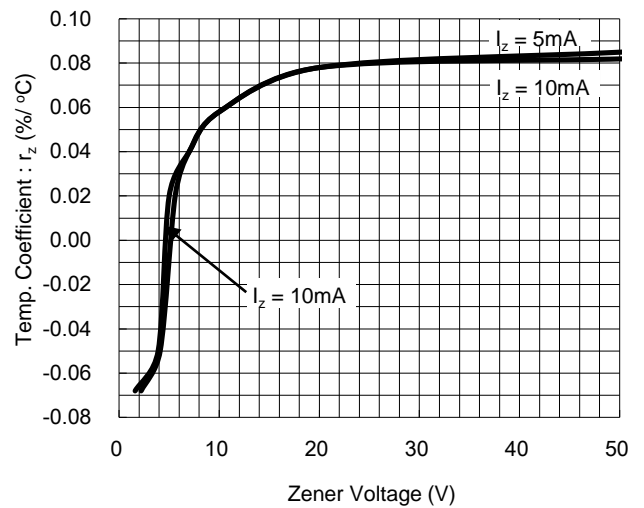
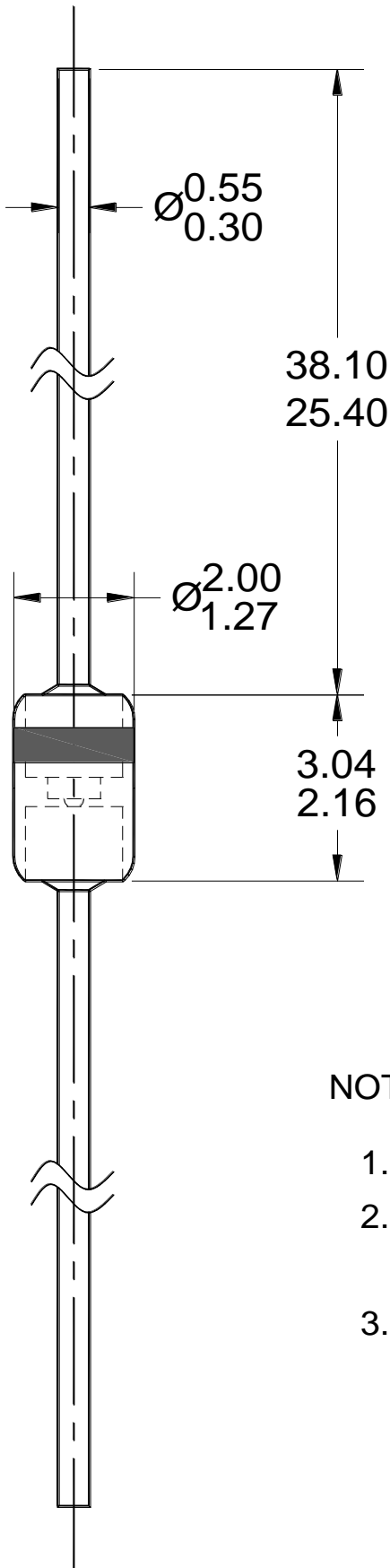


Fig.3 $r_z - V_Z$ Characteristics



PACKAGE OUTLINE DIMENSIONS

DO-34



XX = MARKING CODE

MARKING DIAGRAM

NOTES: UNLESS OTHERWISE SPECIFIED

1. ALL DIMENSIONS ARE IN MILLIMETERS.
2. DIMENSIONING AND TOLERANCING PER ASME Y14.5M-1994.
3. DWG NO. REF: HQ2SD07-DO34-057 REV A.

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