

Small Signal Product

## 500mW, Hermetically Sealed Glass Zener Diodes

### FEATURES

- Zener voltage range: 2.0V to 56V
- Through-hole mount device type
- Hermetically sealed glass
- Compression bonded construction
- All external surfaces are corrosion resistant and leads are readily solderable
- Solder hot dip Tin (Sn) lead finish
- Cathode indicated by polarity band
- Packing code with suffix "G" means Halogen-free


**DO-34**


| MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS (T <sub>A</sub> =25°C unless otherwise noted) |                  |           |      |
|----------------------------------------------------------------------------------------------|------------------|-----------|------|
| PARAMETER                                                                                    | SYMBOL           | VALUE     | UNIT |
| Power dissipation                                                                            | P <sub>D</sub>   | 500       | mW   |
| Operating junction temperature                                                               | T <sub>J</sub>   | 175       | °C   |
| Storage temperature range                                                                    | T <sub>STG</sub> | -65 ~ 175 | °C   |

## Small Signal Product

### RATINGS AND CHARACTERISTICS CURVES

(T<sub>A</sub>=25°C unless otherwise noted)

| Type Number |   | Marking code | V <sub>Z</sub> @ I <sub>ZT</sub> (Volt) |       | I <sub>ZT</sub> (mA) | Z <sub>ZT</sub> @ I <sub>ZT</sub> (Ω)<br>Max | Z <sub>ZK</sub> @ I <sub>ZK</sub> (Ω)<br>Max | I <sub>ZK</sub> (mA) | I <sub>R</sub> (μA)<br>Max | V <sub>R</sub> (V) |
|-------------|---|--------------|-----------------------------------------|-------|----------------------|----------------------------------------------|----------------------------------------------|----------------------|----------------------------|--------------------|
|             |   |              | Min                                     | Max   |                      |                                              |                                              |                      |                            |                    |
| MTZJ2V0S    | A | 2V0A         | 1.88                                    | 2.10  | 5                    | 100                                          | 1000                                         | 0.5                  | 120                        | 0.5                |
|             | B | 2V0B         | 2.02                                    | 2.20  |                      |                                              |                                              |                      |                            |                    |
| MTZJ2V2S    | A | 2V2A         | 2.12                                    | 2.30  | 5                    | 100                                          | 1000                                         | 0.5                  | 120                        | 0.7                |
|             | B | 2V2B         | 2.22                                    | 2.41  |                      |                                              |                                              |                      |                            |                    |
| MTZJ2V4S    | A | 2V4A         | 2.33                                    | 2.52  | 5                    | 100                                          | 1000                                         | 0.5                  | 120                        | 1.0                |
|             | B | 2V4B         | 2.43                                    | 2.63  |                      |                                              |                                              |                      |                            |                    |
| MTZJ2V7S    | A | 2V7A         | 2.54                                    | 2.75  | 5                    | 110                                          | 1000                                         | 0.5                  | 100                        | 1.0                |
|             | B | 2V7B         | 2.69                                    | 2.91  |                      |                                              |                                              |                      |                            |                    |
| MTZJ3V0S    | A | 3V0A         | 2.85                                    | 3.07  | 5                    | 120                                          | 1000                                         | 0.5                  | 50                         | 1.0                |
|             | B | 3V0B         | 3.01                                    | 3.22  |                      |                                              |                                              |                      |                            |                    |
| MTZJ3V3S    | A | 3V3A         | 3.16                                    | 3.38  | 5                    | 120                                          | 1000                                         | 0.5                  | 20                         | 1.0                |
|             | B | 3V3B         | 3.32                                    | 3.53  |                      |                                              |                                              |                      |                            |                    |
| MTZJ3V6S    | A | 3V6A         | 3.455                                   | 3.695 | 5                    | 100                                          | 1000                                         | 1.0                  | 10                         | 1.0                |
|             | B | 3V6B         | 3.60                                    | 3.845 |                      |                                              |                                              |                      |                            |                    |
| MTZJ3V9S    | A | 3V9A         | 3.74                                    | 4.01  | 5                    | 100                                          | 1000                                         | 1.0                  | 5                          | 1.0                |
|             | B | 3V9B         | 3.89                                    | 4.16  |                      |                                              |                                              |                      |                            |                    |
| MTZJ4V3S    | A | 4V3A         | 4.04                                    | 4.29  | 5                    | 100                                          | 1000                                         | 1.0                  | 5                          | 1.0                |
|             | B | 4V3B         | 4.17                                    | 4.43  |                      |                                              |                                              |                      |                            |                    |
|             | C | 4V3C         | 4.30                                    | 4.57  |                      |                                              |                                              |                      |                            |                    |
| MTZJ4V7S    | A | 4V7A         | 4.44                                    | 4.68  | 5                    | 80                                           | 900                                          | 0.5                  | 5                          | 1.0                |
|             | B | 4V7B         | 4.55                                    | 4.80  |                      |                                              |                                              |                      |                            |                    |
|             | C | 4V7C         | 4.68                                    | 4.93  |                      |                                              |                                              |                      |                            |                    |
| MTZJ5V1S    | A | 5V1A         | 4.81                                    | 5.07  | 5                    | 80                                           | 1,200                                        | 0.5                  | 5.0                        | 1.5                |
|             | B | 5V1B         | 4.94                                    | 5.20  |                      |                                              |                                              |                      |                            |                    |
|             | C | 5V1C         | 5.09                                    | 5.37  |                      |                                              |                                              |                      |                            |                    |
| MTZJ5V6S    | A | 5V6A         | 5.28                                    | 5.55  | 5                    | 60                                           | 900                                          | 0.5                  | 5.0                        | 2.5                |
|             | B | 5V6B         | 5.45                                    | 5.73  |                      |                                              |                                              |                      |                            |                    |
|             | C | 5V6C         | 5.61                                    | 5.91  |                      |                                              |                                              |                      |                            |                    |
| MTZJ6V2S    | A | 6V2A         | 5.78                                    | 6.09  | 5                    | 60                                           | 500                                          | 0.5                  | 5.0                        | 3.0                |
|             | B | 6V2B         | 5.96                                    | 6.27  |                      |                                              |                                              |                      |                            |                    |
|             | C | 6V2C         | 6.12                                    | 6.44  |                      |                                              |                                              |                      |                            |                    |
| MTZJ6V8S    | A | 6V8A         | 6.29                                    | 6.63  | 5                    | 20                                           | 150                                          | 0.5                  | 2.0                        | 3.5                |
|             | B | 6V8B         | 6.49                                    | 6.83  |                      |                                              |                                              |                      |                            |                    |
|             | C | 6V8C         | 6.66                                    | 7.01  |                      |                                              |                                              |                      |                            |                    |
| MTZJ7V5S    | A | 7V5A         | 6.85                                    | 7.22  | 5                    | 20                                           | 120                                          | 0.5                  | 0.5                        | 4.0                |
|             | B | 7V5B         | 7.07                                    | 7.45  |                      |                                              |                                              |                      |                            |                    |
|             | C | 7V5C         | 7.29                                    | 7.67  |                      |                                              |                                              |                      |                            |                    |
| MTZJ8V2S    | A | 8V2A         | 7.53                                    | 7.92  | 5                    | 20                                           | 120                                          | 0.5                  | 0.5                        | 5.0                |
|             | B | 8V2B         | 7.78                                    | 8.19  |                      |                                              |                                              |                      |                            |                    |
|             | C | 8V2C         | 8.03                                    | 8.45  |                      |                                              |                                              |                      |                            |                    |
| MTZJ9V1S    | A | 9V1A         | 8.29                                    | 8.73  | 5                    | 25                                           | 120                                          | 0.5                  | 0.5                        | 6.0                |
|             | B | 9V1B         | 8.57                                    | 9.01  |                      |                                              |                                              |                      |                            |                    |
|             | C | 9V2C         | 8.83                                    | 9.30  |                      |                                              |                                              |                      |                            |                    |

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| Type Number |   | Marking code | V <sub>Z</sub> @ I <sub>ZT</sub> (Volt) |       | I <sub>ZT</sub> (mA) | Z <sub>ZT</sub> @ I <sub>ZT</sub> (Ω)<br>Max | Z <sub>ZK</sub> @ I <sub>ZK</sub> (Ω)<br>Max | I <sub>ZK</sub> (mA) | I <sub>R</sub> (uA)<br>Max | V <sub>R</sub> (V) |
|-------------|---|--------------|-----------------------------------------|-------|----------------------|----------------------------------------------|----------------------------------------------|----------------------|----------------------------|--------------------|
|             |   |              | Min                                     | Max   |                      |                                              |                                              |                      |                            |                    |
| MTZJ10S     | A | 10A          | 9.12                                    | 9.59  | 5                    | 30                                           | 120                                          | 0.5                  | 0.2                        | 7                  |
|             | B | 10B          | 9.41                                    | 9.90  |                      |                                              |                                              |                      |                            |                    |
|             | C | 10C          | 9.70                                    | 10.20 |                      |                                              |                                              |                      |                            |                    |
|             | D | 10D          | 9.97                                    | 10.44 |                      |                                              |                                              |                      |                            |                    |
| MTZJ11S     | A | 11A          | 10.18                                   | 10.71 | 5                    | 30                                           | 120                                          | 0.5                  | 0.2                        | 8                  |
|             | B | 11B          | 10.50                                   | 11.05 |                      |                                              |                                              |                      |                            |                    |
|             | C | 11C          | 10.82                                   | 11.38 |                      |                                              |                                              |                      |                            |                    |
| MTZJ12S     | A | 12A          | 11.13                                   | 11.71 | 5                    | 30                                           | 110                                          | 0.5                  | 0.2                        | 9                  |
|             | B | 12B          | 11.44                                   | 12.03 |                      |                                              |                                              |                      |                            |                    |
|             | C | 12C          | 11.74                                   | 12.35 |                      |                                              |                                              |                      |                            |                    |
| MTZJ13S     | A | 13A          | 12.11                                   | 12.75 | 5                    | 35                                           | 110                                          | 0.5                  | 0.2                        | 10                 |
|             | B | 13B          | 12.55                                   | 13.21 |                      |                                              |                                              |                      |                            |                    |
|             | C | 13C          | 12.99                                   | 13.66 |                      |                                              |                                              |                      |                            |                    |
| MTZJ15S     | A | 15A          | 13.44                                   | 14.13 | 5                    | 40                                           | 110                                          | 0.5                  | 0.2                        | 11                 |
|             | B | 15B          | 13.89                                   | 14.62 |                      |                                              |                                              |                      |                            |                    |
|             | C | 15C          | 14.35                                   | 15.09 |                      |                                              |                                              |                      |                            |                    |
| MTZJ16S     | A | 16A          | 14.80                                   | 15.57 | 5                    | 40                                           | 150                                          | 0.5                  | 0.2                        | 12                 |
|             | B | 16B          | 15.25                                   | 16.04 |                      |                                              |                                              |                      |                            |                    |
|             | C | 16C          | 15.69                                   | 16.51 |                      |                                              |                                              |                      |                            |                    |
| MTZJ18S     | A | 18A          | 16.22                                   | 17.06 | 5                    | 45                                           | 150                                          | 0.5                  | 0.2                        | 13                 |
|             | B | 18B          | 16.82                                   | 17.70 |                      |                                              |                                              |                      |                            |                    |
|             | C | 18C          | 17.42                                   | 18.33 |                      |                                              |                                              |                      |                            |                    |
| MTZJ20S     | A | 20A          | 18.02                                   | 18.96 | 5                    | 55                                           | 200                                          | 0.5                  | 0.2                        | 15                 |
|             | B | 20B          | 18.63                                   | 19.59 |                      |                                              |                                              |                      |                            |                    |
|             | C | 20C          | 19.23                                   | 20.22 |                      |                                              |                                              |                      |                            |                    |
|             | D | 20D          | 19.72                                   | 20.72 |                      |                                              |                                              |                      |                            |                    |
| MTZJ22S     | A | 22A          | 20.15                                   | 21.2  | 5                    | 30                                           | 200                                          | 0.5                  | 0.2                        | 17                 |
|             | B | 22B          | 20.64                                   | 21.71 |                      |                                              |                                              |                      |                            |                    |
|             | C | 22C          | 21.08                                   | 22.17 |                      |                                              |                                              |                      |                            |                    |
|             | D | 22D          | 21.52                                   | 22.63 |                      |                                              |                                              |                      |                            |                    |
| MTZJ24S     | A | 24A          | 22.05                                   | 23.18 | 5                    | 35                                           | 200                                          | 0.5                  | 0.2                        | 19                 |
|             | B | 24B          | 22.61                                   | 23.77 |                      |                                              |                                              |                      |                            |                    |
|             | C | 24C          | 23.12                                   | 24.31 |                      |                                              |                                              |                      |                            |                    |
|             | D | 24D          | 23.63                                   | 24.85 |                      |                                              |                                              |                      |                            |                    |
| MTZJ27S     | A | 27A          | 24.26                                   | 25.52 | 5                    | 45                                           | 250                                          | 0.5                  | 0.2                        | 21                 |
|             | B | 27B          | 24.97                                   | 26.26 |                      |                                              |                                              |                      |                            |                    |
|             | C | 27C          | 25.63                                   | 26.95 |                      |                                              |                                              |                      |                            |                    |
|             | D | 27D          | 26.29                                   | 27.64 |                      |                                              |                                              |                      |                            |                    |
| MTZJ30S     | A | 30A          | 26.99                                   | 28.39 | 5                    | 55                                           | 250                                          | 0.5                  | 0.2                        | 23                 |
|             | B | 30B          | 27.70                                   | 29.13 |                      |                                              |                                              |                      |                            |                    |
|             | C | 30C          | 28.36                                   | 29.82 |                      |                                              |                                              |                      |                            |                    |
|             | D | 30D          | 29.02                                   | 30.51 |                      |                                              |                                              |                      |                            |                    |

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| Type Number |   | Marking code | V <sub>Z</sub> @ I <sub>ZT</sub> (Volt) |       | I <sub>ZT</sub> (mA) | Z <sub>ZT</sub> @ I <sub>ZT</sub> (Ω)<br>Max | Z <sub>ZK</sub> @ I <sub>ZK</sub> (Ω)<br>Max | I <sub>ZK</sub> (mA) | I <sub>R</sub> (uA)<br>Max | V <sub>R</sub> (V) |
|-------------|---|--------------|-----------------------------------------|-------|----------------------|----------------------------------------------|----------------------------------------------|----------------------|----------------------------|--------------------|
|             |   |              | Min                                     | Max   |                      |                                              |                                              |                      |                            |                    |
| MTZJ33S     | A | 33A          | 29.68                                   | 31.22 | 5                    | 65                                           | 250                                          | 0.5                  | 0.2                        | 25                 |
|             | B | 33B          | 30.32                                   | 31.88 |                      |                                              |                                              |                      |                            |                    |
|             | C | 33C          | 30.90                                   | 32.50 |                      |                                              |                                              |                      |                            |                    |
|             | D | 33D          | 31.49                                   | 33.11 |                      |                                              |                                              |                      |                            |                    |
| MTZJ36S     | A | 36A          | 32.14                                   | 33.79 | 5                    | 75                                           | 250                                          | 0.5                  | 0.2                        | 27                 |
|             | B | 36B          | 32.79                                   | 34.49 |                      |                                              |                                              |                      |                            |                    |
|             | C | 36C          | 33.40                                   | 35.13 |                      |                                              |                                              |                      |                            |                    |
|             | D | 36D          | 34.01                                   | 35.77 |                      |                                              |                                              |                      |                            |                    |
| MTZJ39S     | A | 39A          | 34.68                                   | 36.47 | 5                    | 85                                           | 250                                          | 0.5                  | 0.2                        | 30                 |
|             | B | 39B          | 35.36                                   | 37.19 |                      |                                              |                                              |                      |                            |                    |
|             | C | 39C          | 36.00                                   | 37.85 |                      |                                              |                                              |                      |                            |                    |
|             | D | 39D          | 36.63                                   | 38.52 |                      |                                              |                                              |                      |                            |                    |
|             | E | 39E          | 37.36                                   | 39.29 |                      |                                              |                                              |                      |                            |                    |
|             | F | 39F          | 38.14                                   | 40.11 |                      |                                              |                                              |                      |                            |                    |
|             | G | 39G          | 38.94                                   | 40.80 |                      |                                              |                                              |                      |                            |                    |
| MTZJ43S     |   | 43S          | 40                                      | 45    | 5                    | 90                                           | 250                                          | 0.5                  | 0.2                        | 33                 |
| MTZJ47S     |   | 47S          | 44                                      | 49    |                      | 90                                           | 250                                          | 0.5                  | 0.2                        | 36                 |
| MTZJ51S     |   | 51S          | 48                                      | 54    |                      | 110                                          | 250                                          | 0.5                  | 0.2                        | 39                 |
| MTZJ56S     |   | 56S          | 53                                      | 60    |                      | 110                                          | 250                                          | 0.5                  | 0.2                        | 43                 |

- Notes: 1. The Zener Voltage subdivision (V<sub>Z</sub>) is measured 40ms after diode is powered up.
2. The operating resistance (Z<sub>ZT</sub> or Z<sub>ZK</sub>) is measured by superimposing a minute alternation current in the regulated current (I<sub>Z</sub>).
3. When ordering, please specify tolerance A, B, C, D, E, F, G

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Fig. 1  $V_Z - I_Z$  Characteristics

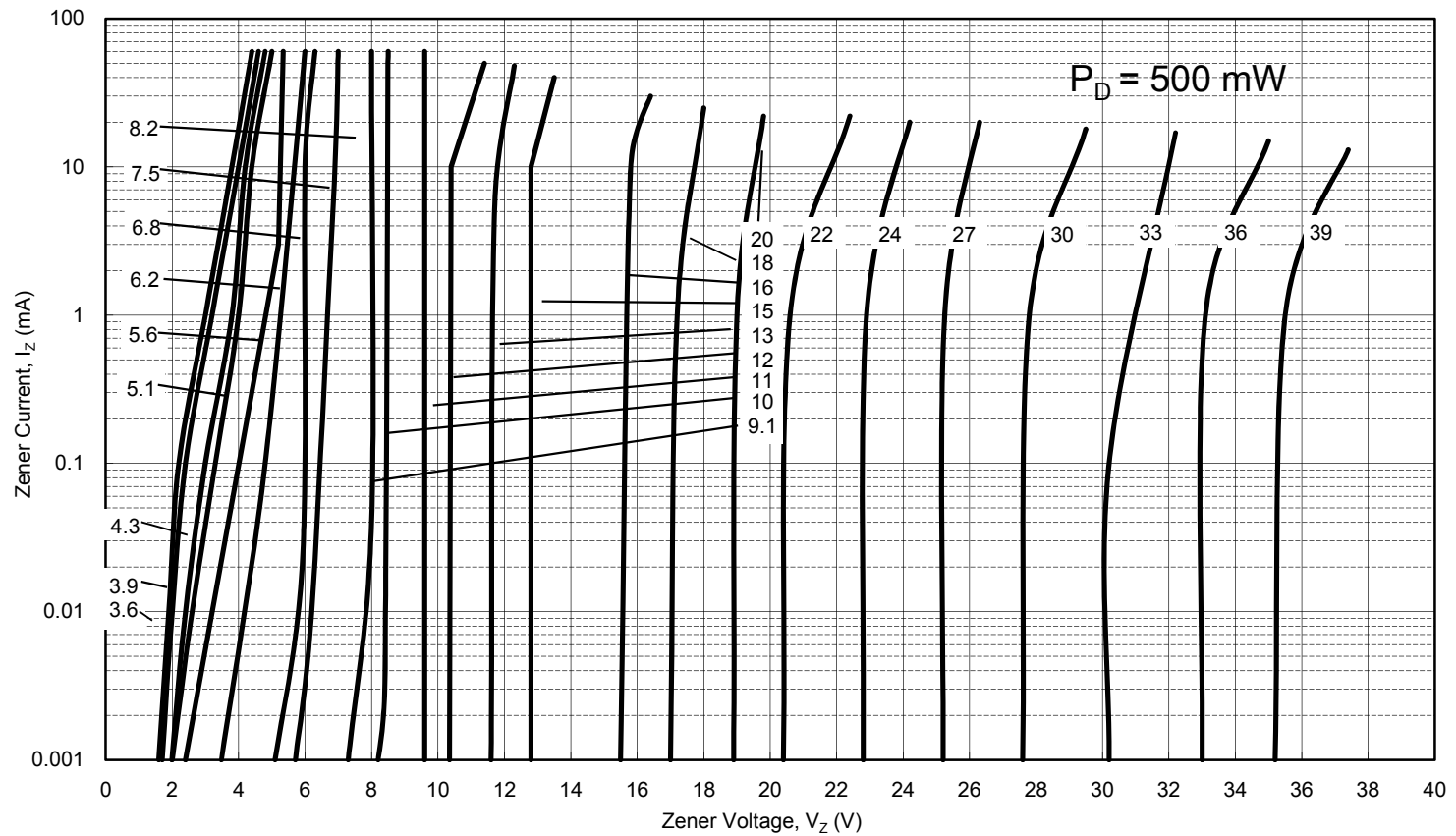


Fig. 2  $P_D - T_A$  Characteristics

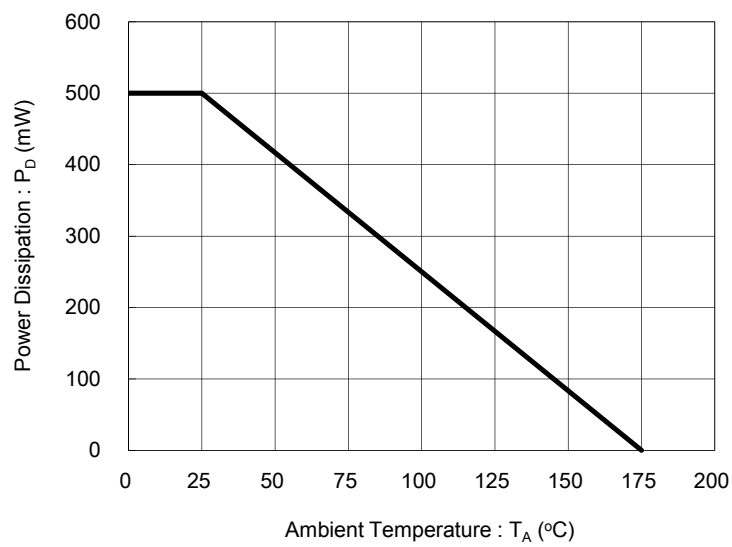
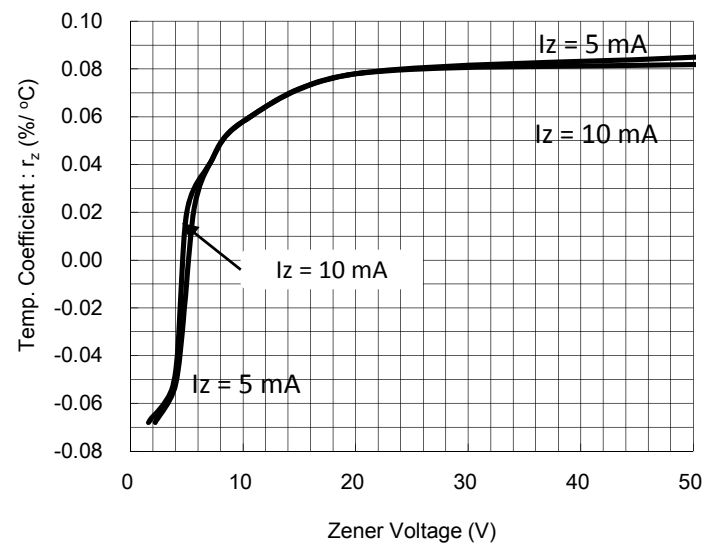


Fig. 4  $r_z - V_Z$  Characteristics



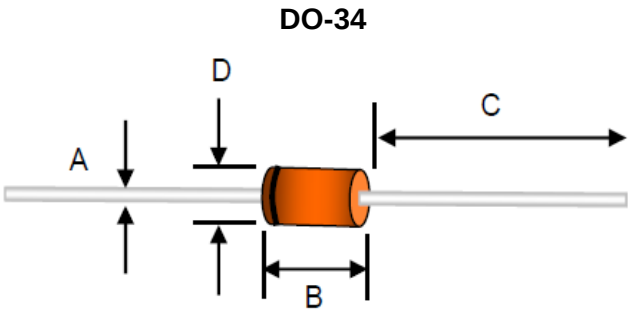
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| ORDERING INFORMATION |                          |              |                     |         |                   |
|----------------------|--------------------------|--------------|---------------------|---------|-------------------|
| PART NO.             | PART NO. SUFFIX (Note 2) | PACKING CODE | PACKING CODE SUFFIX | PACKAGE | PACKING           |
| MTZJxxxSx (Note 1)   | -xx                      | R0           | G                   | DO-34   | 10K / 14" Reel    |
|                      |                          | A0           |                     |         | 5K / Box ( Ammo ) |

Note 1: "xxxSx" is device code from "2V0SA" to "56S"  
 Note 2: Part No. Suffix „-xx “ would be used for special requirement

| EXAMPLE            |           |                 |              |                     |                                               |
|--------------------|-----------|-----------------|--------------|---------------------|-----------------------------------------------|
| PREFERRED PART NO. | PART NO.  | PART NO. SUFFIX | PACKING CODE | PACKING CODE SUFFIX | DESCRIPTION                                   |
| MTZJ2V0SA R0G      | MTZJ2V0SA |                 | R0           | G                   | Multiple manufacture source<br>Green compound |
| MTZJ2V0SA-B0 R0G   | MTZJ2V0SA | B0              | R0           | G                   | Defined manufacture source<br>Green compound  |

PACKAGE OUTLINE DIMENSIONS



| DIM. | Unit (mm) |       | Unit (inch) |       |
|------|-----------|-------|-------------|-------|
|      | Min       | Max   | Min         | Max   |
| A    | 0.30      | 0.55  | 0.012       | 0.022 |
| B    | 2.16      | 3.04  | 0.085       | 0.120 |
| C    | 25.40     | 38.10 | 1.000       | 1.500 |
| D    | 1.27      | 2.00  | 0.050       | 0.079 |

## Small Signal Product

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