

## 500mW, 2.4V - 75V Surface Mount Zener Diode

### FEATURES

- Wide Zener voltage range selection: 2.4V to 75V
- $V_Z$  Tolerance Selection of  $\pm 2\%$
- Hermetically sealed glass
- RoHS Compliant

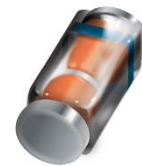
### APPLICATIONS

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

### MECHANICAL DATA

- Case: QMMELF
- Terminal: Matte tin plated leads, solderable per J-STD-002
- Polarity: Indicated by cathode band
- Weight: 30.80mg (approximately)

| KEY PARAMETERS               |            |                    |
|------------------------------|------------|--------------------|
| PARAMETER                    | VALUE      | UNIT               |
| $V_Z$                        | 2.4 - 75   | V                  |
| Test current $I_{ZT}$        | 2.5 - 5.0  | mA                 |
| $P_D$                        | 500        | mW                 |
| $V_F$ at $I_F = 10\text{mA}$ | 1          | V                  |
| $T_{J \text{ Max}}$          | 175        | $^{\circ}\text{C}$ |
| Package                      | QMMELF     |                    |
| Configuration                | Single die |                    |



QMMELF



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

| PARAMETER                             | SYMBOL    | VALUE       | UNIT               |
|---------------------------------------|-----------|-------------|--------------------|
| Power dissipation                     | $P_D$     | 500         | mW                 |
| Forward voltage @ $I_F = 10\text{mA}$ | $V_F$     | 1           | V                  |
| Junction temperature range            | $T_J$     | -65 to +175 | $^{\circ}\text{C}$ |
| Storage temperature range             | $T_{STG}$ | -65 to +175 | $^{\circ}\text{C}$ |

### THERMAL PERFORMANCE

| PARAMETER                              | SYMBOL          | LIMIT | UNIT                 |
|--|-----------------|-------|----------------------|
| Junction-to-ambient thermal resistance | $R_{\theta JA}$ | 500   | $^{\circ}\text{C/W}$ |

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

| PART NUMBER | 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           | $\Omega$          | $\Omega$          | mA           | $\mu\text{A}$   | V   |
|             | Min                  | Nom  | Max   |              | Max               | Max               |              | Max             |     |
| BZT55B2V4   | 2.35                 | 2.4  | 2.45  | 5            | 85                | 600               | 1.0          | 50              | 1   |
| BZT55B2V7   | 2.65                 | 2.7  | 2.75  | 5            | 85                | 600               | 1.0          | 10              | 1   |
| BZT55B3V0   | 2.94                 | 3.0  | 3.06  | 5            | 85                | 600               | 1.0          | 4               | 1   |
| BZT55B3V3   | 3.23                 | 3.3  | 3.37  | 5            | 85                | 600               | 1.0          | 2               | 1   |
| BZT55B3V6   | 3.53                 | 3.6  | 3.67  | 5            | 85                | 600               | 1.0          | 2               | 1   |
| BZT55B3V9   | 3.82                 | 3.9  | 3.98  | 5            | 85                | 600               | 1.0          | 2               | 1   |
| BZT55B4V3   | 4.21                 | 4.3  | 4.39  | 5            | 75                | 600               | 1.0          | 1               | 1   |
| BZT55B4V7   | 4.61                 | 4.7  | 4.79  | 5            | 60                | 600               | 1.0          | 0.5             | 1   |
| BZT55B5V1   | 5.00                 | 5.1  | 5.20  | 5            | 35                | 550               | 1.0          | 0.1             | 1   |
| BZT55B5V6   | 5.49                 | 5.6  | 5.71  | 5            | 25                | 450               | 1.0          | 0.1             | 1   |
| BZT55B6V2   | 6.08                 | 6.2  | 6.32  | 5            | 10                | 200               | 1.0          | 0.1             | 2   |
| BZT55B6V8   | 6.66                 | 6.8  | 6.94  | 5            | 8                 | 150               | 1.0          | 0.1             | 3   |
| BZT55B7V5   | 7.35                 | 7.5  | 7.65  | 5            | 7                 | 50                | 1.0          | 0.1             | 5   |
| BZT55B8V2   | 8.04                 | 8.2  | 8.36  | 5            | 7                 | 50                | 1.0          | 0.1             | 6.2 |
| BZT55B9V1   | 8.92                 | 9.1  | 9.28  | 5            | 10                | 50                | 1.0          | 0.1             | 6.8 |
| BZT55B10    | 9.80                 | 10.0 | 10.20 | 5            | 15                | 70                | 1.0          | 0.1             | 7.5 |
| BZT55B11    | 10.78                | 11.0 | 11.22 | 5            | 20                | 70                | 1.0          | 0.1             | 8.2 |
| BZT55B12    | 11.76                | 12.0 | 12.24 | 5            | 20                | 90                | 1.0          | 0.1             | 9.1 |
| BZT55B13    | 12.74                | 13.0 | 13.26 | 5            | 26                | 110               | 1.0          | 0.1             | 10  |
| BZT55B15    | 14.70                | 15.0 | 15.30 | 5            | 30                | 110               | 1.0          | 0.1             | 11  |
| BZT55B16    | 15.68                | 16.0 | 16.32 | 5            | 40                | 170               | 1.0          | 0.1             | 12  |
| BZT55B18    | 17.64                | 18.0 | 18.36 | 5            | 50                | 170               | 1.0          | 0.1             | 13  |
| BZT55B20    | 19.60                | 20.0 | 20.40 | 5            | 55                | 220               | 1.0          | 0.1             | 15  |
| BZT55B22    | 21.56                | 22.0 | 22.44 | 5            | 55                | 220               | 1.0          | 0.1             | 16  |
| BZT55B24    | 23.52                | 24.0 | 24.48 | 5            | 80                | 220               | 1.0          | 0.1             | 18  |
| BZT55B27    | 26.46                | 27.0 | 27.54 | 5            | 80                | 220               | 1.0          | 0.1             | 20  |
| BZT55B30    | 29.40                | 30.0 | 30.60 | 5            | 80                | 220               | 1.0          | 0.1             | 22  |
| BZT55B33    | 32.34                | 33.0 | 33.66 | 5            | 80                | 220               | 1.0          | 0.1             | 24  |
| BZT55B36    | 35.28                | 36.0 | 36.72 | 5            | 80                | 220               | 1.0          | 0.1             | 27  |
| BZT55B39    | 38.22                | 39.0 | 39.78 | 2.5          | 90                | 500               | 0.5          | 0.1             | 28  |
| BZT55B43    | 42.14                | 43.0 | 43.86 | 2.5          | 90                | 600               | 0.5          | 0.1             | 32  |
| BZT55B47    | 46.06                | 47.0 | 47.94 | 2.5          | 110               | 700               | 0.5          | 0.1             | 35  |
| BZT55B51    | 49.98                | 51.0 | 52.02 | 2.5          | 125               | 700               | 0.5          | 0.1             | 38  |
| BZT55B56    | 54.88                | 56.0 | 57.12 | 2.5          | 135               | 1000              | 0.5          | 0.1             | 42  |
| BZT55B62    | 60.76                | 62.0 | 63.24 | 2.5          | 150               | 1000              | 0.5          | 0.1             | 47  |
| BZT55B68    | 66.64                | 68.0 | 69.36 | 2.5          | 160               | 1000              | 0.5          | 0.1             | 51  |
| BZT55B75    | 73.50                | 75.0 | 76.50 | 2.5          | 170               | 1000              | 0.5          | 0.1             | 56  |

**Notes:**

1. The Zener Voltage ( $V_Z$ ) is tested under pulse condition of 30ms
2. The device numbers listed have a standard tolerance on the nominal Zener voltage of  $\pm 2\%$
3. For detailed information on price, availability and delivery of nominal Zener voltages between the voltages shown and tighter voltage tolerances, contact your nearest Taiwan Semiconductor representative
4. The Zener impedance is derived from the 60-cycle AC voltage, which results when an AC current having an  $R_{MS}$  value equal to 10% of the dc Zener current ( $I_{ZT}$  or  $I_{ZK}$ ) is superimposed to  $I_{ZT}$  or  $I_{ZK}$

**ORDERING INFORMATION**

| <b>ORDERING CODE<sup>(1)(2)</sup></b> | <b>PACKAGE</b> | <b>PACKING</b>           |
|---------------------------------------|----------------|--------------------------|
| BZT55Bx L0                            | QMMELF         | 10,000 / 13" Tape & Reel |
| BZT55Bx L0G                           | QMMELF         | 10,000 / 13" Tape & Reel |

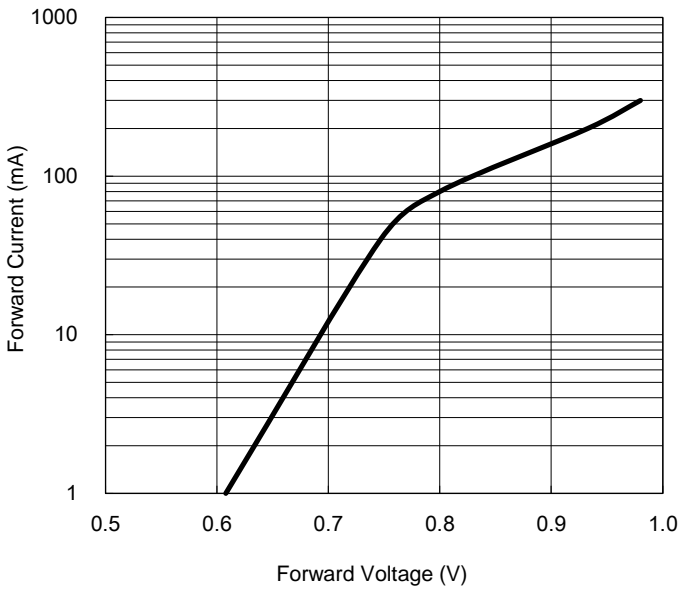
**Notes:**

1. "x" defines voltage from 2.4V (BZT55B2V4) to 75V (BZT55B75)
2. Above ordering codes L0/L0G refer to physically identical parts without any differences

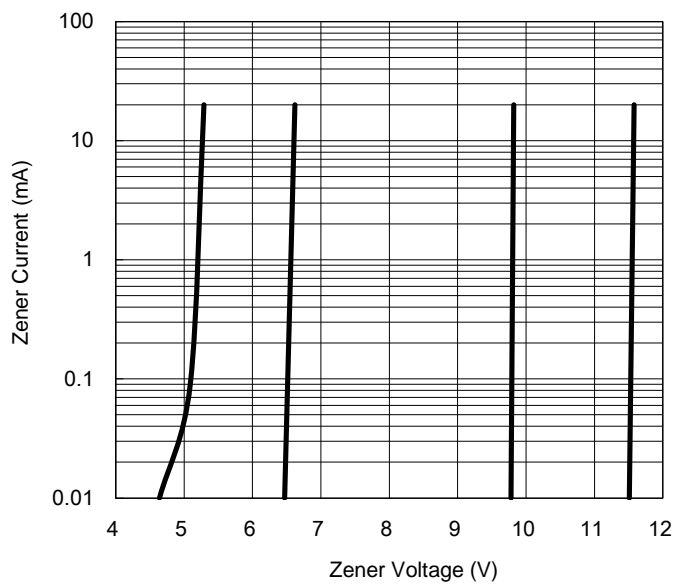
**CHARACTERISTICS CURVES**

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

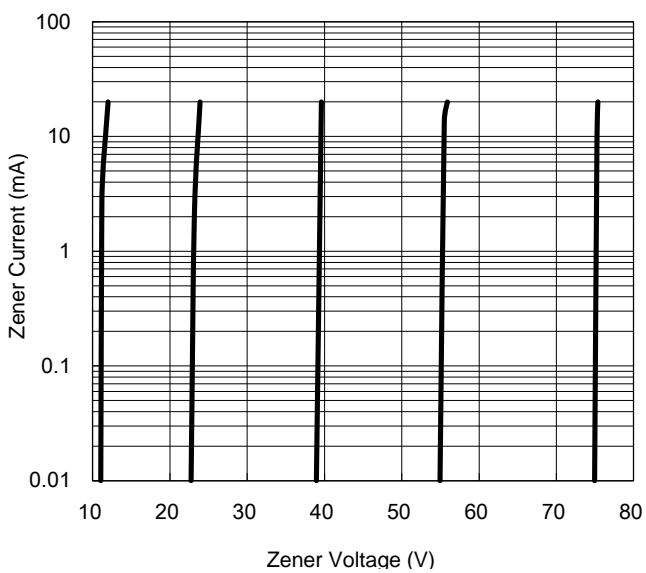
**Fig.1 Typical Forward Characteristics**



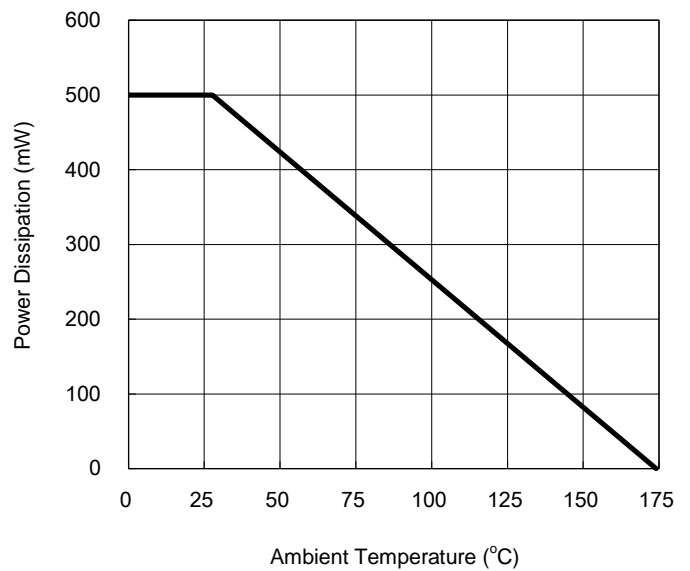
**Fig.2 Zener Breakdown Characteristics**



**Fig.3 Zener Breakdown Characteristics**



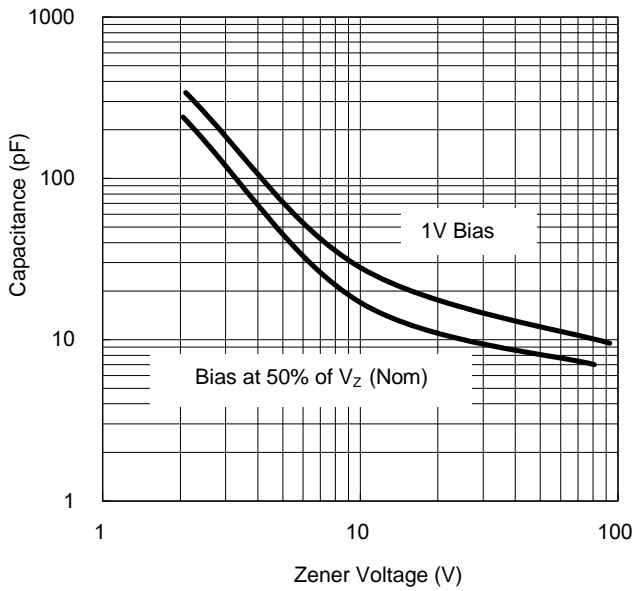
**Fig.4 Admissible Power Dissipation Curve**



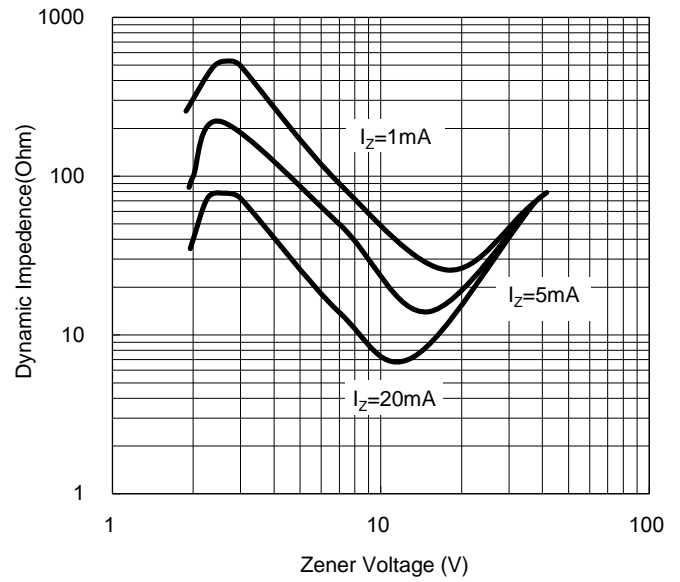
**CHARACTERISTICS CURVES**

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

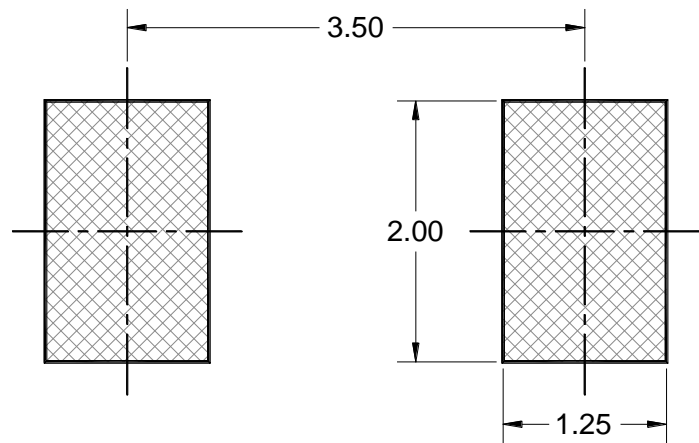
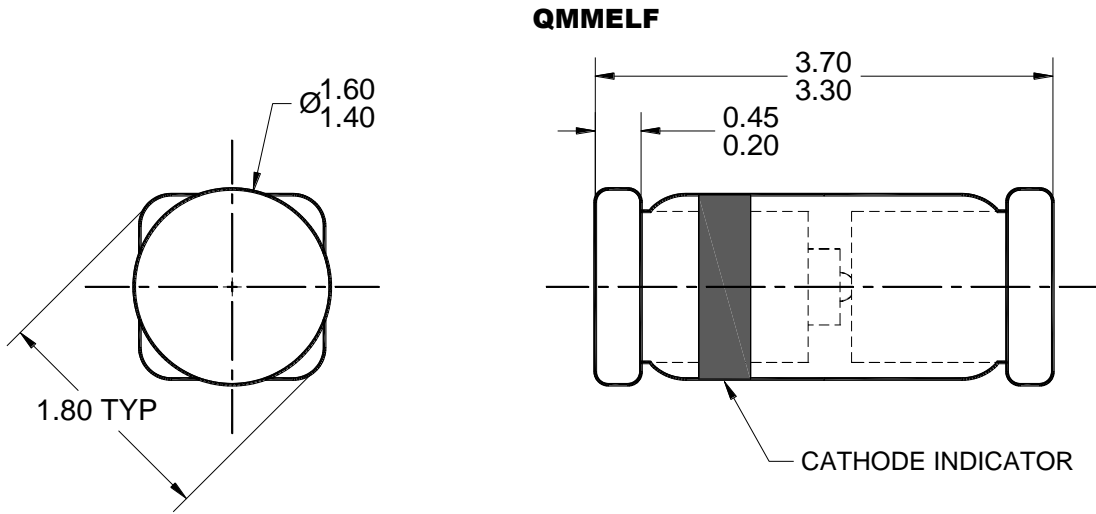
**Fig.5 Typical Capacitance**



**Fig.6 Effect of Zener Voltage on Impedance**



**PACKAGE OUTLINE DIMENSIONS**



**SUGGESTED PAD LAYOUT**

**NOTES: UNLESS OTHERWISE SPECIFIED**

1. ALL DIMENSIONS ARE IN MILLIMETERS.
2. DIMENSIONING AND TOLERANCING PER ASME Y14.5M-1994.
3. PACKAGE OUTLINE REFERENCE: JEDEC DO-213, VARIATION AA, ISSUE D.
4. DWG NO. REF: HQ2SD07-QMMELF-061 REV A.

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