

## 500 mW LL-34 Hermetically Sealed Glass Zener Voltage Regulators



SURFACE MOUNT  
LL34

### Absolute Maximum Ratings $T_A = 25^\circ\text{C}$ unless otherwise noted

| Parameter                      | Value       | Units            |
|--------------------------------|-------------|------------------|
| Power Dissipation              | 500         | mW               |
| Storage Temperature Range      | -65 to +175 | $^\circ\text{C}$ |
| Operating Junction Temperature | +175        | $^\circ\text{C}$ |

These ratings are limiting values above which the serviceability of the diode may be impaired.

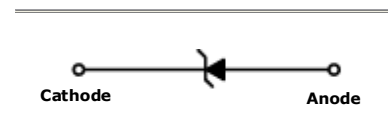
### DEVICE MARKING DIAGRAM



Cathode Band Color : Blue

### Specification Features:

- Zener Voltage Range 2.0 to 75 Volts
- LL-34 (Mini-MELF) Package
- Surface Device Type Mounting
- Hermetically Sealed Glass
- Compression Bonded Construction
- All External Surfaces Are Corrosion Resistant And Terminals Are Readily Solderable
- RoHS Compliant
- Matte Tin (Sn) Terminal Finish
- Color band Indicates Negative Polarity



ELECTRICAL SYMBOL

### Electrical Characteristics $T_A = 25^\circ\text{C}$ unless otherwise noted

| Device Type | $V_Z @ I_{ZT}$<br>(Volts)<br>Nominal | $I_{ZT}$<br>(mA) | $Z_{ZT} @ I_{ZT}$<br>( $\Omega$ )<br>Max | $I_R @ V_R$<br>( $\mu\text{A}$ )<br>Max | $V_R$<br>(Volts) |
|-------------|--------------------------------------|------------------|--|---|------------------|
| TCLLZ2V0    | 2.0                                  | 5                | 100                                      | 120                                     | 0.5              |
| TCLLZ2V2    | 2.2                                  | 5                | 100                                      | 120                                     | 0.7              |
| TCLLZ2V4    | 2.4                                  | 5                | 100                                      | 120                                     | 1                |
| TCLLZ2V7    | 2.7                                  | 5                | 110                                      | 100                                     | 1                |
| TCLLZ3V0    | 3.0                                  | 5                | 120                                      | 50                                      | 1                |
| TCLLZ3V3    | 3.3                                  | 5                | 120                                      | 20                                      | 1                |
| TCLLZ3V6    | 3.6                                  | 5                | 100                                      | 10                                      | 1                |
| TCLLZ3V9    | 3.9                                  | 5                | 100                                      | 5                                       | 1                |
| TCLLZ4V3    | 4.3                                  | 5                | 100                                      | 5                                       | 1                |
| TCLLZ4V7    | 4.7                                  | 5                | 80                                       | 5                                       | 1                |
| TCLLZ5V1    | 5.1                                  | 5                | 80                                       | 5                                       | 1.5              |
| TCLLZ5V6    | 5.6                                  | 5                | 60                                       | 5                                       | 2.5              |
| TCLLZ6V2    | 6.2                                  | 5                | 60                                       | 5                                       | 3                |
| TCLLZ6V8    | 6.8                                  | 5                | 20                                       | 2                                       | 3.5              |
| TCLLZ7V5    | 7.5                                  | 5                | 20                                       | 0.5                                     | 4                |
| TCLLZ8V2    | 8.2                                  | 5                | 20                                       | 0.5                                     | 5                |
| TCLLZ9V1    | 9.1                                  | 5                | 25                                       | 0.5                                     | 6                |
| TCLLZ10V    | 10                                   | 5                | 30                                       | 0.2                                     | 7                |
| TCLLZ11V    | 11                                   | 5                | 30                                       | 0.2                                     | 8                |
| TCLLZ12V    | 12                                   | 5                | 30                                       | 0.2                                     | 9                |

**Electrical Characteristics**  $T_A = 25^\circ\text{C}$  unless otherwise noted

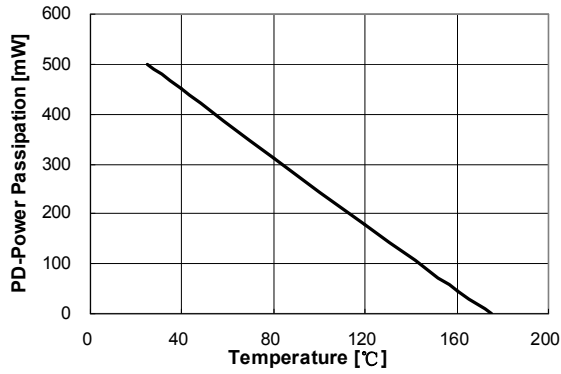
| Device Type | $V_Z @ I_{ZT}$<br>(Volts)<br>Nominal | $I_{ZT}$<br>(mA) | $Z_{ZT} @ I_{ZT}$<br>( $\Omega$ )<br>Max | $I_R @ V_R$<br>( $\mu\text{A}$ )<br>Max | $V_R$<br>(Volts) |
|-------------|--------------------------------------|------------------|--|---|------------------|
| TCLLZ13V    | 13                                   | 5                | 35                                       | 0.2                                     | 10               |
| TCLLZ15V    | 15                                   | 5                | 40                                       | 0.2                                     | 11               |
| TCLLZ16V    | 16                                   | 5                | 40                                       | 0.2                                     | 12               |
| TCLLZ18V    | 18                                   | 5                | 45                                       | 0.2                                     | 13               |
| TCLLZ20V    | 20                                   | 5                | 45                                       | 0.2                                     | 15               |
| TCLLZ22V    | 22                                   | 5                | 30                                       | 0.2                                     | 17               |
| TCLLZ24V    | 24                                   | 5                | 35                                       | 0.2                                     | 19               |
| TCLLZ27V    | 27                                   | 2                | 45                                       | 0.2                                     | 21               |
| TCLLZ30V    | 30                                   | 2                | 55                                       | 0.2                                     | 23               |
| TCLLZ33V    | 33                                   | 2                | 65                                       | 0.2                                     | 25               |
| TCLLZ36V    | 36                                   | 2                | 75                                       | 0.2                                     | 27               |
| TCLLZ39V    | 39                                   | 2                | 85                                       | 0.2                                     | 30               |
| TCLLZ43V    | 43                                   | 2                | 90                                       | 0.2                                     | 33               |
| TCLLZ47V    | 47                                   | 2                | 90                                       | 0.2                                     | 36               |
| TCLLZ51V    | 51                                   | 2                | 110                                      | 0.2                                     | 39               |
| TCLLZ56V    | 56                                   | 2                | 110                                      | 0.2                                     | 43               |
| TCLLZ62V    | 62                                   | 2                | 201                                      | 0.2                                     | 47               |
| TCLLZ68V    | 68                                   | 2                | 230                                      | 0.2                                     | 51               |
| TCLLZ75V    | 75                                   | 2                | 240                                      | 0.2                                     | 56               |

 $V_F$  Forward Voltage = 1.2 V Maximum @  $I_F = 200$  mA for all types

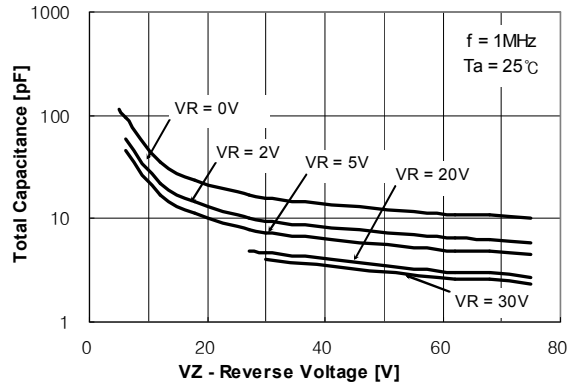
**Notes:**

1. The type numbers listed have zener voltage min/max limits as shown and have a standard tolerance on the nominal zener voltage of 5%.
2. For detailed information on price, availability and delivery of nominal zener voltages between the voltages shown and tighter voltage tolerances, contact your nearest Tak Cheong Electronics representative.
3. The zener impedance is derived from the 60-cycle ac voltage, which results when an ac current having an rms value equal to 10% of the dc zener current ( $I_{ZT}$  or  $I_{ZK}$ ) is superimposed to  $I_{ZT}$  or  $I_{ZK}$ .

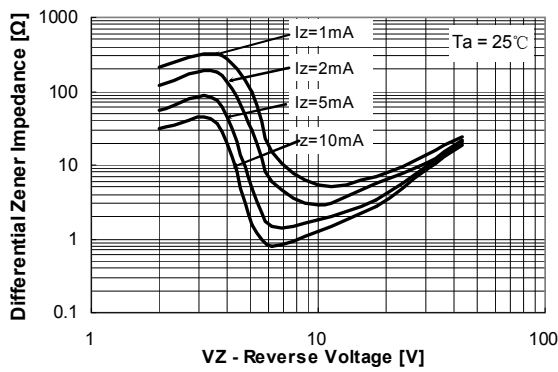
Typical Characteristics



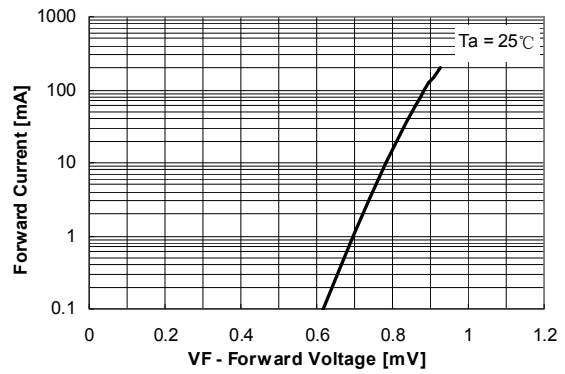
**Figure 1. Power Dissipation vs Ambient Temperature**  
Valid provided leads at a distance of 0.8mm from case are kept at ambient temperature



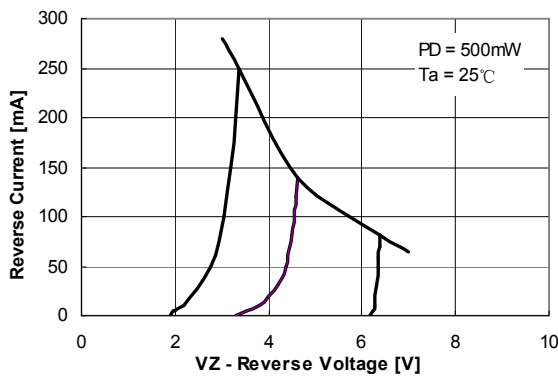
**Figure 2. Total Capacitance**



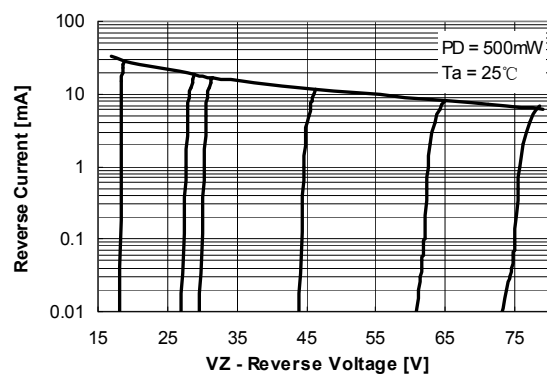
**Figure 3. Differential Impedance vs. Zener Voltage**



**Figure 4. Forward Current vs. Forward Voltage**

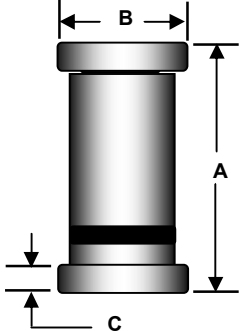


**Figure 5. Reverse Current vs. Reverse Voltage**



**Figure 6. Reverse Current vs. Reverse Voltage**

**Package Outline**

| Package  | Case Outline  |  |        |       |  |     |       |  |  |  |             |  |        |  |     |     |     |     |          |      |      |       |       |          |      |      |       |       |          |      |      |       |       |
|----------|---|--|--------|-------|--|-----|-------|--|--|--|-------------|--|--------|--|-----|-----|-----|-----|----------|------|------|-------|-------|----------|------|------|-------|-------|----------|------|------|-------|-------|
| LL34     |  | <table border="1"> <thead> <tr> <th rowspan="3">DIM</th> <th colspan="4">LL-34</th> </tr> <tr> <th colspan="2">Millimeters</th> <th colspan="2">Inches</th> </tr> <tr> <th>Min</th> <th>Max</th> <th>Min</th> <th>Max</th> </tr> </thead> <tbody> <tr> <td><b>A</b></td> <td>3.30</td> <td>3.60</td> <td>0.130</td> <td>0.142</td> </tr> <tr> <td><b>B</b></td> <td>1.40</td> <td>1.50</td> <td>0.055</td> <td>0.059</td> </tr> <tr> <td><b>C</b></td> <td>0.35</td> <td>0.50</td> <td>0.014</td> <td>0.020</td> </tr> </tbody> </table> |        |       |  | DIM | LL-34 |  |  |  | Millimeters |  | Inches |  | Min | Max | Min | Max | <b>A</b> | 3.30 | 3.60 | 0.130 | 0.142 | <b>B</b> | 1.40 | 1.50 | 0.055 | 0.059 | <b>C</b> | 0.35 | 0.50 | 0.014 | 0.020 |
| DIM      | LL-34   |  |        |       |  |     |       |  |  |  |             |  |        |  |     |     |     |     |          |      |      |       |       |          |      |      |       |       |          |      |      |       |       |
|          | Millimeters   |  | Inches |       |  |     |       |  |  |  |             |  |        |  |     |     |     |     |          |      |      |       |       |          |      |      |       |       |          |      |      |       |       |
|          | Min   | Max  | Min    | Max   |  |     |       |  |  |  |             |  |        |  |     |     |     |     |          |      |      |       |       |          |      |      |       |       |          |      |      |       |       |
| <b>A</b> | 3.30  | 3.60   | 0.130  | 0.142 |  |     |       |  |  |  |             |  |        |  |     |     |     |     |          |      |      |       |       |          |      |      |       |       |          |      |      |       |       |
| <b>B</b> | 1.40  | 1.50   | 0.055  | 0.059 |  |     |       |  |  |  |             |  |        |  |     |     |     |     |          |      |      |       |       |          |      |      |       |       |          |      |      |       |       |
| <b>C</b> | 0.35  | 0.50   | 0.014  | 0.020 |  |     |       |  |  |  |             |  |        |  |     |     |     |     |          |      |      |       |       |          |      |      |       |       |          |      |      |       |       |

**Notes:**

1. All dimensions are within DO213AC JEDEC standard.
2. LL-34 polarity denoted by cathode band.

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