

## 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.

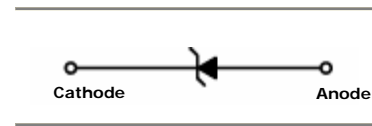
DEVICE MARKING DIAGRAM



Cathode Band Color : Blue

### Specification Features:

- Zener Voltage Range 2.0 to 39 Volts (Graded)
- 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	VZ Tolerance	VZ@IZT		Izt (mA)	Zzt@Izt (Ohms) Max	Zzk@Izk (Ohms) Max	Izk (mA)	I <sub>R</sub> @V <sub>R</sub> (uA) Max	V <sub>R</sub> (V)
		Min	Max						
TCLZ2V2	A	2.12	2.30	20	35	400	1	55	0.7
	B	2.22	2.41						
TCLZ2V4	A	2.33	2.52	20	35	400	1	84	1
	B	2.43	2.63						
TCLZ2V7	A	2.54	2.75	20	35	450	1	70	1
	B	2.69	2.91						
TCLZ3V0	A	2.85	3.07	20	35	450	1	35	1
	B	3.01	3.22						
TCLZ3V3	A	3.16	3.38	20	35	450	1	14	1
	B	3.32	3.53						
TCLZ3V6	A	3.46	3.70	20	48	850	1	2.8	1
	B	3.60	3.85						
TCLZ3V9	A	3.74	4.01	20	40	850	1	1.4	1
	B	3.89	4.16						
TCLZ4V3	A	4.04	4.29	20	32	850	1	0.47	1
	B	4.17	4.43						
	C	4.30	4.57						
TCLZ4V7	A	4.44	4.68	20	21	770	1	0.19	1
	B	4.55	4.80						
	C	4.68	4.93						
TCLZ5V1	A	4.81	5.07	20	17	685	1	0.19	1.5
	B	4.94	5.20						
	C	5.09	5.37						

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

Device Type	T Tolerance	$V_Z@I_{ZT}$		$I_{ZT}$ (mA)	$Z_{ZT}@I_{ZT}$ (Ohms) Max	$Z_{ZK}@I_{ZK}$ (Ohms) Max	$I_{ZK}$ (mA)	$I_{R@V_R}$ (uA) Max	$V_R$ (V)
		Min	Max						
TCLZ5V6	A	5.28	5.55	20	10.5	425	1	0.75	2.5
	B	5.45	5.73						
	C	5.61	5.91						
TCLZ6V2	A	5.78	6.09	20	8.5	255	1	3.30	3.0
	B	5.96	6.27						
	C	6.12	6.44						
TCLZ6V8	A	6.29	6.63	20	6.6	123	0.5	1.10	3.5
	B	6.49	6.83						
	C	6.66	7.01						
TCLZ7V5	A	6.85	7.22	20	6.6	95	0.5	0.30	4.0
	B	7.07	7.45						
	C	7.29	7.67						
TCLZ8V2	A	7.53	7.92	20	6.6	95	0.5	0.30	5.0
	B	7.78	8.19						
	C	8.03	8.45						
TCLZ9V1	A	8.29	8.73	20	6.6	95	0.5	0.30	6.0
	B	8.57	9.01						
	C	8.83	9.30						
TCLZ10V	A	9.12	9.59	20	6.6	95	0.5	0.11	7.0
	B	9.41	9.90						
	C	9.70	10.2						
TCLZ11V	A	10.18	10.71	10	8.5	95	0.5	0.133	8.0
	B	10.50	11.05						
	C	10.82	11.38						
TCLZ12V	A	11.13	11.71	10	9.5	95	0.5	0.133	9.0
	B	11.44	12.03						
	C	11.74	12.35						
TCLZ13V	A	12.11	12.75	10	11.4	95	0.5	0.133	10
	B	12.55	13.21						
	C	12.99	13.66						
TCLZ15V	A	13.44	14.13	10	13.3	95	0.5	0.133	11
	B	13.89	14.62						
	C	14.35	15.09						
TCLZ16V	A	14.80	15.57	10	15.2	132	0.5	0.133	12
	B	15.25	16.04						
	C	15.69	16.51						
TCLZ18V	A	16.22	17.06	10	19.4	123	0.5	0.133	13
	B	16.82	17.70						
	C	17.42	18.33						
TCLZ20V	A	18.02	18.96	10	23.5	170	0.5	0.133	15
	B	18.63	19.59						
	C	19.23	20.22						
	D	19.72	20.72						
TCLZ22V	A	20.15	21.2	5	25.6	170	0.5	0.133	17
	B	20.64	21.71						
	C	21.08	22.17						
	D	21.52	22.63						
TCLZ24V	A	22.05	23.18	5	29.0	170	0.5	0.133	19
	B	22.61	23.77						
	C	23.12	24.31						
	D	23.63	24.85						
TCLZ27V	A	24.26	25.52	5	38.0	210	0.5	0.133	21
	B	24.97	26.26						
	C	25.63	26.95						
	D	26.29	27.64						
TCLZ30V	A	26.99	28.39	5	46.0	210	0.5	0.133	23
	B	27.70	29.13						
	C	28.36	29.82						
	D	29.02	30.51						

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

Device Type	T Tolerance	$V_Z@I_{ZT}$		$I_{ZT}$ (mA)	$Z_{ZT}@I_{ZT}$ (Ohms) Max	$Z_{ZK}@I_{ZK}$ (Ohms) Max	$I_{ZK}$ (mA)	$I_{R@V_R}$ (uA) Max	$V_R$ (V)
		Min	Max						
TCLZ33V	A	29.68	31.22	5	55.0	210	0.5	0.133	25
	B	30.32	31.88						
	C	30.90	32.50						
	D	31.49	33.11						
TCLZ36V	A	32.14	33.79	5	63.0	210	0.5	0.133	27
	B	32.79	34.49						
	C	33.40	35.13						
	D	34.01	35.77						
TCLZ39V	A	34.68	36.47	5	72.0	210	0.5	0.133	30
	B	35.36	37.19						
	C	36.00	37.85						
	D	36.63	38.52						

**Notes:**
**1. TOLERANCE AND VOLTAGE DESIGNATION**

The type numbers listed have zener voltage as shown.

**2. SPECIALS AVAILABLE INCLUDE**

Nominal zener voltages between the voltages shown and tighter voltage, for detailed information on price, availability and delivery, contact you nearest Tak Cheong representative.

**3. ZENER VOLTAGE ( $V_Z$ ) MEASUREMENT**

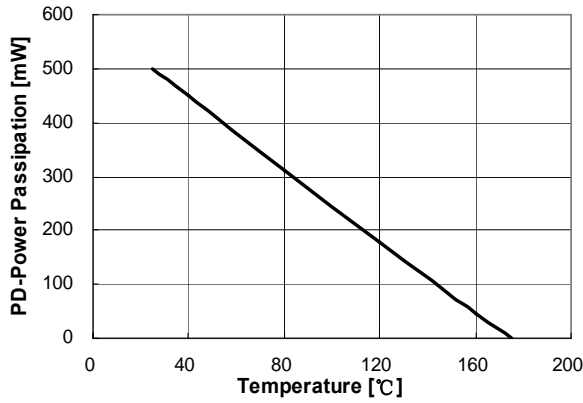
The zener voltage is measured under pulse conditions such that  $T_J$  is no more than  $2^\circ\text{C}$  above  $T_A$ .

**4. ZENER IMPEDANCE ( $Z_Z$ ) DERIVATION**

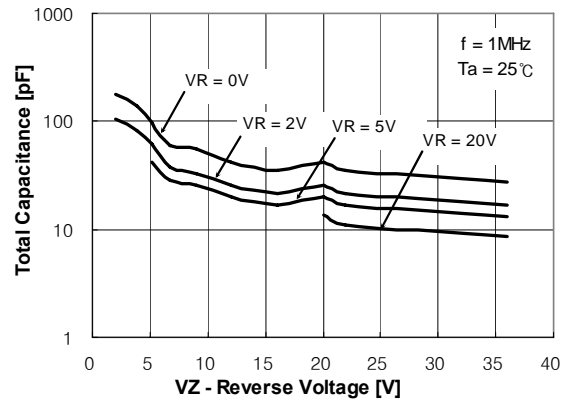
Zener impedance is derived from the 60-cycle ac voltage, which results when an ac current having an RMS value equal to 10% of the dc zener current ( $I_{ZT}$ ) is superimposed to  $I_{ZT}$ .

**5. WHEN ORDERING, PLEASE SPECIFY TOLERANCE A, B, C OR D**

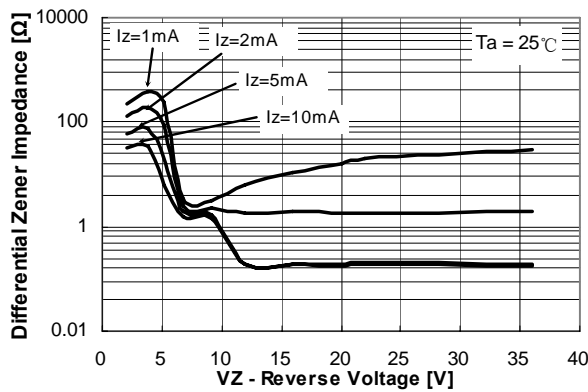
Typical Characteristics



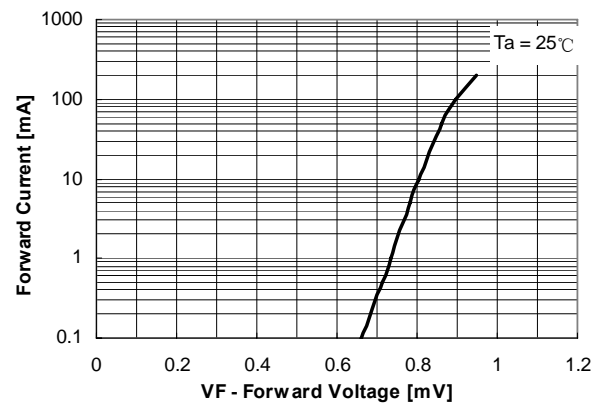
**Figure 1. Power Dissipation vs Ambient Temperature**  
Valid provided leads at a distance of 0.8mm from case are kept at ambient temperature



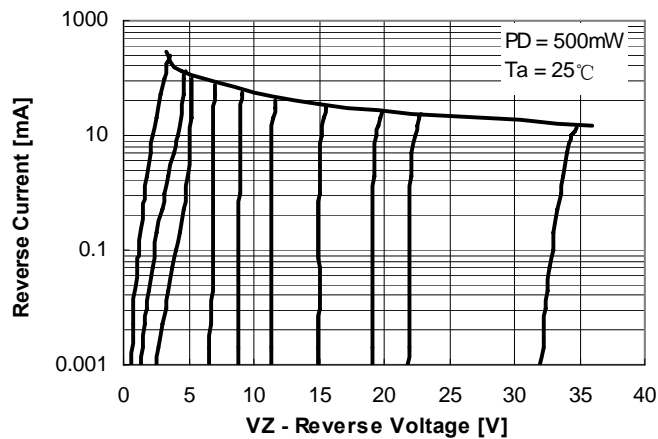
**Figure 2. Total Capacitance**



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

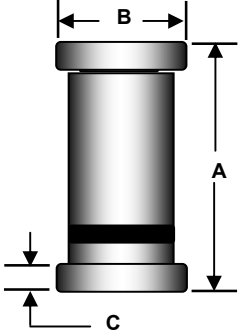


**Figure 4. Forward Current vs. Forward Voltage**



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

**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>A</td> <td>3.30</td> <td>3.50</td> <td>0.130</td> <td>0.138</td> </tr> <tr> <td>B</td> <td>1.40</td> <td>1.50</td> <td>0.055</td> <td>0.059</td> </tr> <tr> <td>C</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	A	3.30	3.50	0.130	0.138	B	1.40	1.50	0.055	0.059	C	0.35	0.50	0.014	0.020
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**Notes:**

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

**NOTICE**

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