

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



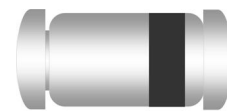
SURFACE MOUNT  
LL34

### 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.

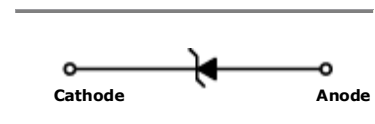
DEVICE MARKING DIAGRAM



Cathode Band Color : Blue

### Specification Features:

- Zener Voltage Range 2.4 to 75 Volts
- TCZMxxxB - VZ tolerance  $\pm 2\%$
- TCZMxxxC - VZ tolerance  $\pm 5\%$
- 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	$V_Z @ I_{ZT}$ (Volts)			$I_{ZT}$ (mA)	$Z_{ZT} @ I_{ZT}$ ( $\Omega$ ) Max	$I_{ZK}$ (mA)	$Z_{ZK} @ I_{ZK}$ ( $\Omega$ ) Max	$I_R @ V_R$ ( $\mu\text{A}$ ) Max	$V_R$ (Volts)
	Min	Nom	Max						
TCZM2V4B	2.35	2.4	2.45	5	94	1	564	45	1
TCZM2V7B	2.65	2.7	2.75	5	94	1	564	18	1
TCZM3V0B	2.94	3.0	3.06	5	89	1	564	9	1
TCZM3V3B	3.23	3.3	3.37	5	89	1	564	4.5	1
TCZM3V6B	3.53	3.6	3.67	5	84	1	564	4.5	1
TCZM3V9B	3.82	3.9	3.98	5	84	1	564	2.7	1
TCZM4V3B	4.21	4.3	4.39	5	84	1	564	2.7	1
TCZM4V7B	4.61	4.7	4.79	5	75	1	470	2.7	2
TCZM5V1B	5.00	5.1	5.20	5	56	1	451	1.8	2
TCZM5V6B	5.49	5.6	5.71	5	37	1	376	0.9	2
TCZM6V2B	6.08	6.2	6.32	5	9	1	141	2.7	4
TCZM6V8B	6.66	6.8	6.94	5	14	1	75	1.8	4
TCZM7V5B	7.33	7.5	7.63	5	14	1	75	0.9	5
TCZM8V2B	8.04	8.2	8.36	5	14	1	75	0.63	5
TCZM9V1B	8.92	9.1	9.28	5	14	1	94	0.45	6
TCZM10B	9.80	10	10.20	5	18	1	141	0.18	7
TCZM11B	10.78	11	11.22	5	18	1	141	0.09	8
TCZM12B	11.76	12	12.24	5	23	1	141	0.09	8
TCZM13B	12.74	13	13.26	5	28	1	160	0.09	8

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

Device Type	$V_Z @ I_{ZT}$ (Volts)			$I_{ZT}$ (mA)	$Z_{ZT} @ I_{ZT}$ ( $\Omega$ ) Max	$I_{ZK}$ (mA)	$Z_{ZK} @ I_{ZK}$ ( $\Omega$ ) Max	$I_R @ V_R$ ( $\mu\text{A}$ ) Max	$V_R$ (Volts)
	Min	Nom	Max						
TCZM15B	14.70	15	15.30	5	28	1	188	0.045	10.5
TCZM16B	15.68	16	16.32	5	37	1	188	0.045	11.2
TCZM18B	17.64	18	18.36	5	42	1	212	0.045	12.6
TCZM20B	19.60	20	20.40	5	51	1	212	0.045	14.0
TCZM22B	21.56	22	22.44	5	51	1	235	0.045	15.4
TCZM24B	23.52	24	24.48	5	65	1	235	0.045	16.8
TCZM27B	26.46	27	27.54	2	75	0.5	282	0.045	18.9
TCZM30B	29.40	30	30.60	2	75	0.5	282	0.045	21.0
TCZM33B	32.34	33	33.66	2	75	0.5	306	0.045	23.0
TCZM36B	35.28	36	36.72	2	84	0.5	329	0.045	25.2
TCZM39B	38.22	39	39.78	2	122	0.5	329	0.045	27.3
TCZM43B	42.14	43	43.86	2	141	0.5	353	0.045	30.1
TCZM47B	46.06	47	47.94	2	160	0.5	353	0.045	33.0
TCZM51B	49.98	51	52.02	2	169	0.5	376	0.045	35.7
TCZM56B	54.88	56	57.12	2	188	0.5	400	0.045	39.2
TCZM62B	60.76	62	63.24	2	202	0.5	423	0.045	43.4
TCZM68B	66.64	68	69.36	2	226	0.5	447	0.045	47.6
TCZM75B	73.50	75	76.50	2	240	0.5	470	0.045	52.5

 $V_F$  Forward Voltage = 1 V Maximum @  $I_F = 100$  mA for all types

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

Device Type	$V_Z @ I_{ZT}$ (Volts)			$I_{ZT}$ (mA)	$Z_{ZT} @ I_{ZT}$ ( $\Omega$ ) Max	$I_{ZK}$ (mA)	$Z_{ZK} @ I_{ZK}$ ( $\Omega$ ) Max	$I_R @ V_R$ ( $\mu\text{A}$ ) Max	$V_R$ (Volts)
	Min	Nom	Max						
TCZM2V4C	2.28	2.4	2.52	5	94	1	564	45	1
TCZM2V7C	2.57	2.7	2.84	5	94	1	564	18	1
TCZM3V0C	2.85	3.0	3.15	5	89	1	564	9	1
TCZM3V3C	3.14	3.3	3.47	5	89	1	564	4.5	1
TCZM3V6C	3.42	3.6	3.78	5	84	1	564	4.5	1
TCZM3V9C	3.71	3.9	4.10	5	84	1	564	2.7	1
TCZM4V3C	4.09	4.3	4.52	5	84	1	564	2.7	1
TCZM4V7C	4.47	4.7	4.94	5	75	1	470	2.7	2
TCZM5V1C	4.85	5.1	5.36	5	56	1	451	1.8	2
TCZM5V6C	5.32	5.6	5.88	5	37	1	376	0.9	2
TCZM6V2C	5.89	6.2	6.51	5	9	1	141	2.7	4
TCZM6V8C	6.46	6.8	7.14	5	14	1	75	1.8	4
TCZM7V5C	7.11	7.5	7.86	5	14	1	75	0.9	5
TCZM8V2C	7.79	8.2	8.61	5	14	1	75	0.63	5
TCZM9V1C	8.65	9.1	9.56	5	14	1	94	0.45	6
TCZM10C	9.50	10	10.50	5	18	1	141	0.18	7
TCZM11C	10.45	11	11.55	5	18	1	141	0.09	8
TCZM12C	11.40	12	12.60	5	23	1	141	0.09	8
TCZM13C	12.35	13	13.65	5	28	1	160	0.09	8
TCZM15C	14.25	15	15.75	5	28	1	188	0.045	10.5
TCZM16C	15.20	16	16.80	5	37	1	188	0.045	11.2
TCZM18C	17.10	18	18.90	5	42	1	212	0.045	12.6
TCZM20C	19.00	20	21.00	5	51	1	212	0.045	14.0
TCZM22C	20.90	22	23.10	5	51	1	235	0.045	15.4
TCZM24C	22.80	24	25.20	5	65	1	235	0.045	16.8
TCZM27C	25.65	27	28.35	2	75	0.5	282	0.045	18.9
TCZM30C	28.50	30	31.50	2	75	0.5	282	0.045	21.0
TCZM33C	31.35	33	34.65	2	75	0.5	306	0.045	23.0
TCZM36C	34.20	36	37.80	2	84	0.5	329	0.045	25.2
TCZM39C	37.05	39	40.95	2	122	0.5	329	0.045	27.3
TCZM43C	40.85	43	45.15	2	141	0.5	353	0.045	30.1

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

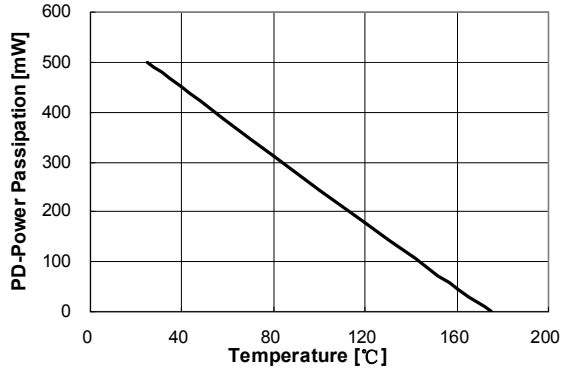
Device Type	$V_Z @ I_{ZT}$ (Volts)			$I_{ZT}$ (mA)	$Z_{ZT} @ I_{ZT}$ ( $\Omega$ ) Max	$I_{ZK}$ (mA)	$Z_{ZK} @ I_{ZK}$ ( $\Omega$ ) Max	$I_R @ V_R$ ( $\mu\text{A}$ ) Max	$V_R$ (Volts)
	Min	Nom	Max						
TCZM47C	44.65	47	49.35	2	160	0.5	353	0.045	33.0
TCZM51C	48.45	51	53.55	2	169	0.5	376	0.045	35.7
TCZM56C	53.20	56	58.80	2	188	0.5	400	0.045	39.2
TCZM62C	58.90	62	65.10	2	202	0.5	423	0.045	43.4
TCZM68C	64.60	68	71.40	2	226	0.5	447	0.045	47.6
TCZM75C	71.25	75	78.75	2	240	0.5	470	0.045	52.5

 $V_F$  Forward Voltage = 1 V Maximum @  $I_F = 100$  mA for all types

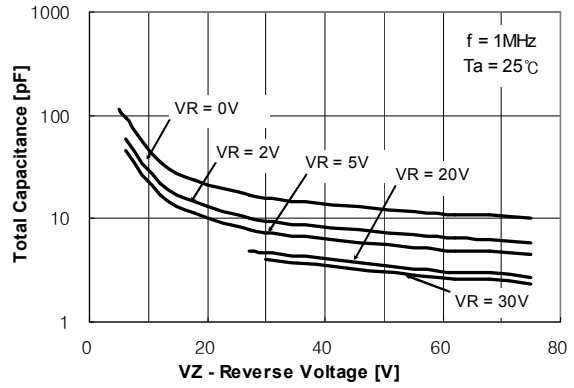
**Notes:**

- 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.
- 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  $I_{ZK}$ .

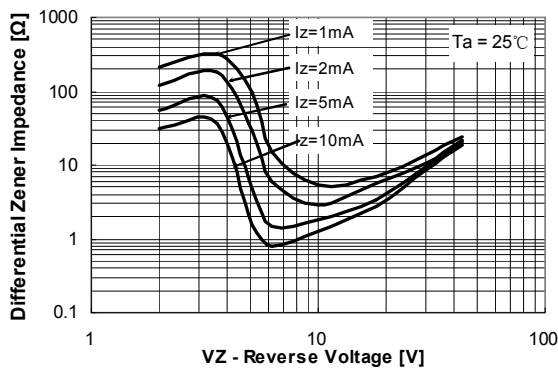
Typical Characteristics



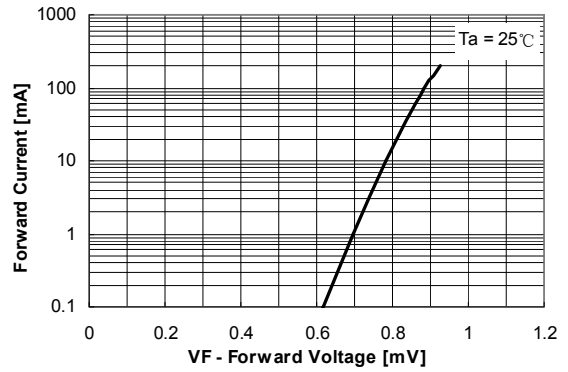
**Figure 1. Power Dissipation vs Ambient Temperature**  
Valid provided leads at a distance of 0.8mm from case are kept at ambient temperature



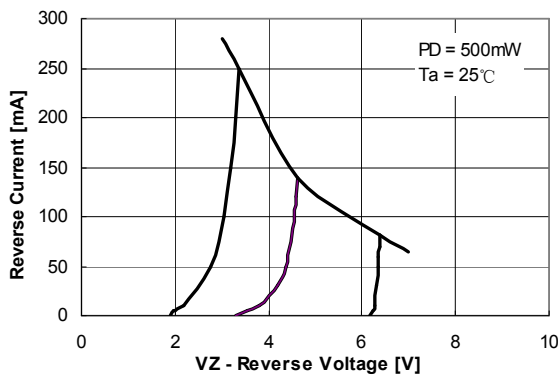
**Figure 2. Total Capacitance**



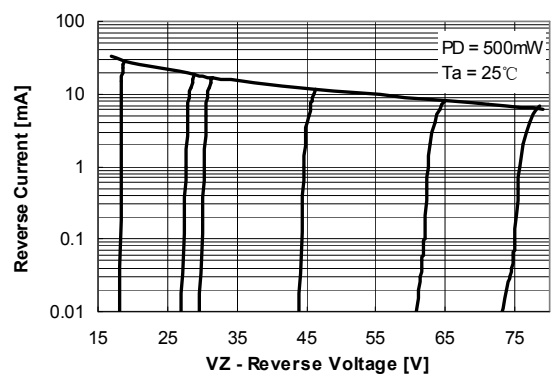
**Figure 3. Differential Impedance vs. Zener Voltage**



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

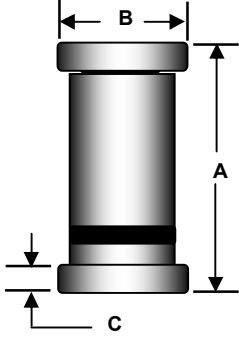


**Figure 5. Reverse Current vs. Reverse Voltage**



**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
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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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