

## 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.

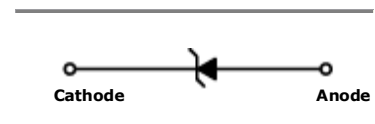
DEVICE MARKING DIAGRAM



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

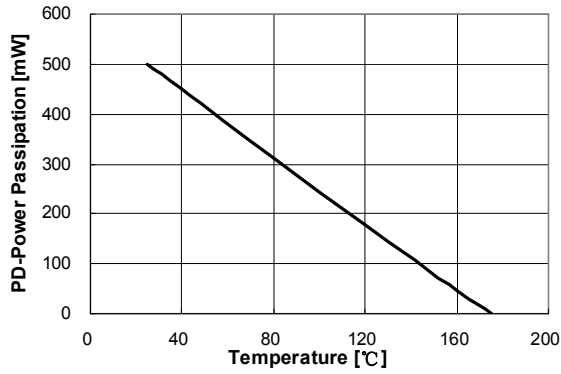
Device Type	$V_Z @ I_{ZT}$ (Volts)			$I_{ZT}$ (mA)	$Z_{ZT} @ I_{ZT}$ ( $\Omega$ ) Max	$I_{ZK}$ (mA)	$Z_{ZK} @ I_{ZK}$ ( $\Omega$ ) Max	$I_R @ V_R$ ( $\mu\text{A}$ ) Max	$V_R$ (Volts)
	Min	Nom	Max						
TCZM47C	44.65	47	49.35	2	160	0.5	353	0.045	33.0
TCZM51C	48.45	51	53.55	2	169	0.5	376	0.045	35.7
TCZM56C	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

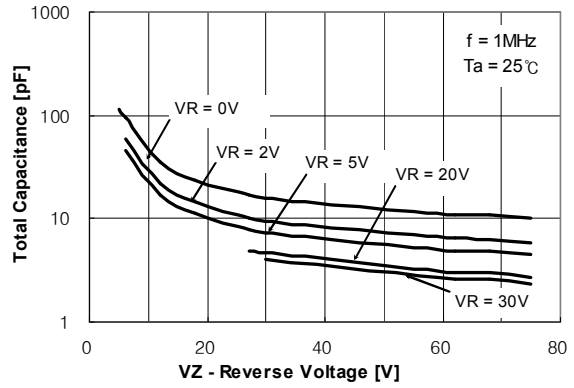
**Notes:**

1. 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.
2. 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  $I_{ZK}$ .

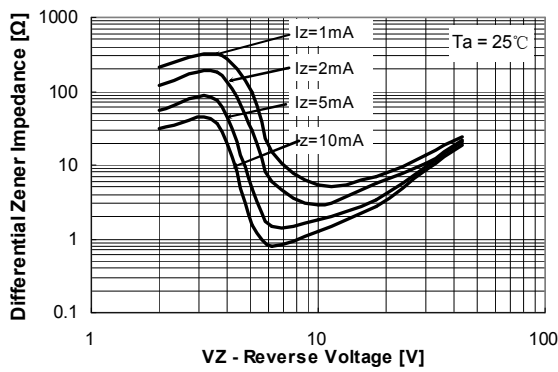
Typical Characteristics



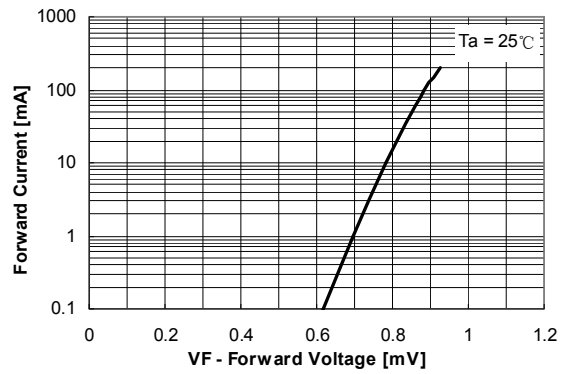
**Figure 1. Power Dissipation vs Ambient Temperature**  
Valid provided leads at a distance of 0.8mm from case are kept at ambient temperature



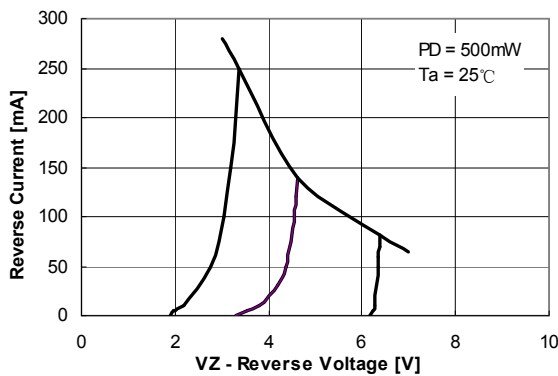
**Figure 2. Total Capacitance**



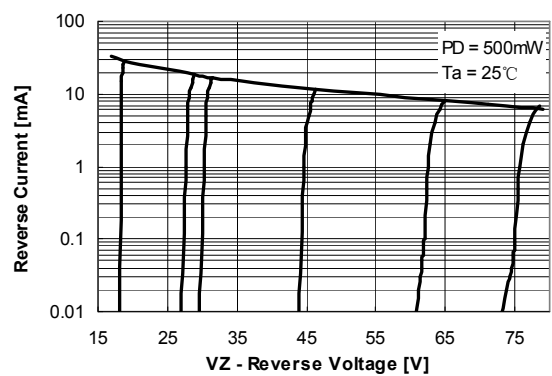
**Figure 3. Differential Impedance vs. Zener Voltage**



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

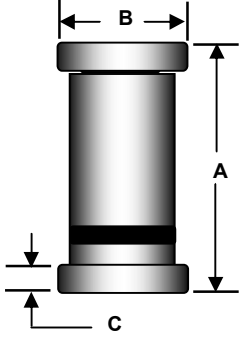


**Figure 5. Reverse Current vs. Reverse Voltage**



**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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