

500 mW LL-34 Hermetically Sealed Glass Zener Voltage Regulators



**SURFACE MOUNT
LL34**

DEVICE MARKING DIAGRAM



Cathode Band Color : Blue

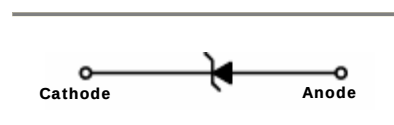
Absolute Maximum Ratings $T_A = 25^\circ\text{C}$ unless otherwise noted

Parameter	Value	Units
Power Dissipation	500	mW
Storage Temperature Range	-65 to +200	$^\circ\text{C}$
Operating Junction Temperature	+200	$^\circ\text{C}$

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

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 leads are readily solderable
- ♣ 1st 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 _R @V _R (uA) Max	V _R (V)
		Min	Nom	Max						
TCLZ2V2	A	2.12	2.21	2.30	20	35	400	1	55	0.7
	B	2.22	2.32	2.41						
TCLZ2V4	A	2.33	2.42	2.51	20	35	400	1	84	1
	B	2.44	2.53	2.62						
TCLZ2V7	A	2.54	2.64	2.74	20	35	450	1	70	1
	B	2.69	2.80	2.91						
TCLZ3V0	A	2.85	2.96	3.06	20	35	450	1	35	1
	B	3.01	3.12	3.22						
TCLZ3V3	A	3.16	3.27	3.37	20	35	450	1	14	1
	B	3.32	3.43	3.53						
TCLZ3V6	A	3.47	3.57	3.67	20	48	850	1	2.8	1
	B	3.63	3.73	3.82						
TCLZ3V9	A	3.77	3.88	3.98	20	40	850	1	1.4	1
	B	3.92	4.03	4.13						
TCLZ4V3	A	4.06	4.15	4.24	20	32	850	1	0.47	1
	B	4.21	4.30	4.38						
	C	4.33	4.44	4.54						
TCLZ4V7	A	4.46	4.56	4.66	20	21	770	1	0.19	1
	B	4.58	4.68	4.77						
	C	4.71	4.81	4.91						

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	Nom	Max						
TCLZ5V1	A	4.84	4.94	5.04	20	17	685	1	0.19	1.5
	B	4.97	5.08	5.18						
	C	5.11	5.23	5.35						
TCLZ5V6	A	5.29	4.41	5.52	20	10.5	425	1	0.75	2.5
	B	5.46	5.58	5.70						
	C	5.64	5.76	5.88						
TCLZ6V2	A	5.81	5.94	6.06	20	8.5	255	1	3.30	3.0
	B	5.99	6.12	6.24						
	C	6.16	6.28	6.40						
TCLZ6V8	A	6.31	6.45	6.59	20	6.6	123	0.5	1.10	3.5
	B	6.52	6.66	6.79						
	C	6.70	6.83	6.95						
TCLZ7V5	A	6.88	7.04	7.20	20	6.6	95	0.5	0.30	4.0
	B	7.11	7.26	7.42						
	C	7.32	7.49	7.65						
TCLZ8V2	A	7.55	7.73	7.91	20	6.6	95	0.5	0.30	5.0
	B	7.81	7.99	8.16						
	C	8.06	8.24	8.42						
TCLZ9V1	A	8.31	8.51	8.71	20	6.6	95	0.5	0.30	6.0
	B	8.60	8.80	9.00						
	C	8.88	9.09	9.30						
TCLZ10V	A	9.18	9.39	9.60	20	6.6	95	0.5	0.11	7.0
	B	9.47	9.69	9.91						
	C	9.81	10.06	10.32						
TCLZ11V	A	10.16	10.41	10.65	10	8.5	95	0.5	0.133	8.0
	B	10.49	10.73	10.96						
	C	10.81	11.04	11.27						
TCLZ12V	A	11.12	11.38	11.64	10	9.5	95	0.5	0.133	9.0
	B	11.49	11.71	11.93						
	C	11.79	12.05	12.31						
TCLZ13V	A	12.17	12.45	12.72	10	11.4	95	0.5	0.133	10
	B	12.58	12.87	13.17						
	C	13.02	13.33	13.63						
TCLZ15V	A	13.47	13.79	14.10	10	13.3	95	0.5	0.133	11
	B	13.94	14.26	14.57						
	C	14.40	14.72	15.04						
TCLZ16V	A	14.85	15.19	15.52	10	15.2	132	0.5	0.133	12
	B	15.30	15.65	15.99						
	C	15.77	16.14	16.51						
TCLZ18V	A	16.32	16.70	17.08	10	19.4	123	0.5	0.133	13
	B	16.90	17.29	17.67						
	C	17.50	17.90	18.30						
TCLZ20V	A	17.11	18.52	18.93	10	23.5	170	0.5	0.133	15
	B	17.71	19.13	19.55						
	C	19.35	19.80	20.25						
	D	19.86	20.30	20.74						
TCLZ22V	A	20.21	20.66	21.10	5	25.6	170	0.5	0.133	17
	B	20.75	21.21	21.67						
	C	21.22	21.66	22.10						
	D	21.67	22.15	22.62						
TCLZ24V	A	22.24	22.69	23.14	5	29.0	170	0.5	0.133	19
	B	22.73	23.24	23.75						
	C	23.27	23.78	24.29						
	D	23.79	24.31	24.84						
TCLZ27V	A	24.24	24.89	25.54	5	38.0	210	0.5	0.133	21
	B	24.95	25.62	26.28						
	C	25.60	26.29	26.97						
	D	26.28	26.97	27.67						

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	Nom	Max						
TCLZ30V	A	26.98	27.69	28.41	5	46.0	210	0.5	0.133	23
	B	27.67	28.41	29.15						
	C	28.34	29.09	29.84						
	D	29.00	29.77	30.54						
TCLZ33V	A	29.66	30.45	31.25	5	55.0	210	0.5	0.133	25
	B	30.29	31.10	31.91						
	C	30.88	31.70	32.52						
	D	31.46	32.30	33.15						
TCLZ36V	A	32.19	32.96	33.74	5	63.0	210	0.5	0.133	27
	B	32.83	33.63	34.42						
	C	33.46	34.27	35.07						
	D	34.07	34.89	35.71						
TCLZ39V	A	34.74	35.57	36.41	5	72.0	210	0.5	0.133	30
	B	35.41	36.26	37.12						
	C	36.05	36.92	37.79						
	D	36.69	37.58	38.46						

V_F (forward voltage) = 1.2 V maximum @ I_F = 200mA for all types

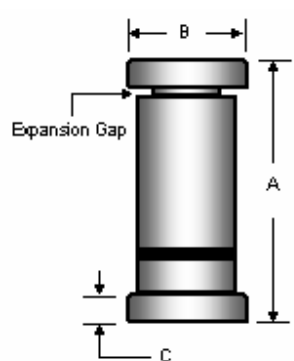
Notes:

1. The zener voltage subdivision (V_Z) is measured 40mS after diode is powered up.
2. The operating resistance (Z_{zt} and Z_{zk}) is measured by superimposing a minute alternation current in the regulated current (I_z).
3. When ordering, please specify tolerance A, B, C or D.

Ordering Information

Device	Pack Option	Package	Quantity
TCLZxxx	7" Reel	Tape and Reel	2500
TCLZxxxR13	13" Reel	Tape and Reel	10,000
TCLZxxx	Others	(...contact Tak Cheong sales representatives)	

Package Outline

Package	Case Outline																												
LL34	 <table><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><tr><td>A</td><td>3.302</td><td>3.505</td><td>0.130</td><td>0.138</td></tr><tr><td>B</td><td>1.397</td><td>1.499</td><td>0.055</td><td>0.059</td></tr><tr><td>C</td><td>0.350</td><td>0.500</td><td>0.014</td><td>0.020</td></tr></table>	DIM	LL-34				Millimeters		Inches		Min	Max	Min	Max	A	3.302	3.505	0.130	0.138	B	1.397	1.499	0.055	0.059	C	0.350	0.500	0.014	0.020
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Notes:

1. LL34 polarity denoted by a band.
2. 'Expansion Gap' has no relation to the location of polarity.