TAK CHEONG®

SEMICONDUCTOR

500 mW LL-34 Hermetically Sealed Glass Zener Voltage Regulators



SURFACE MOUNT
LL34

Absolute Maximum Ratings

T_A = 25°C unless otherwise noted

Parameter	Value	Units
Power Dissipation	500	mW
Storage Temperature Range	-65 to +175	°C
Operating Junction Temperature	+175	°C

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

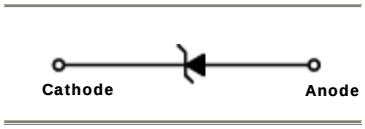
DEVICE MARKING DIAGRAM



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
- Matte Tin (Sn) Terminal Finish
- Color band Indicates Negative Polarity



ELECTRICAL SYMBOL

Ordering Information

Device	Description	Electrical Characteristic
TCLZ2V2A/B through TCLZ39VA/B/C/D	▪ RoHS Compliant	Both are compliant with below electrical characteristics
TCLZ2V2A/BHF through TCLZ39VA/B/C/DHF	▪ RoHS Compliant ▪ Halogen Free	

Electrical Characteristics

T_A = 25°C unless otherwise noted

Device Type	VZ Grade	VZ@IZT Min	VZ@IZT Max	Izt (mA)	Zzt@Izt (Ohms) Max	Zzk@Izk (Ohms) Max	Izk (mA)	I_R@V_R (uA) Max	V_R (V)
TCLZ2V2	A	2.12	2.3	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	3.7	20	48	850	1	2.8	1
	B	3.6	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	4.3	4.57						

Electrical Characteristics (T_A = 25°C unless otherwise noted)

Device Type	VZ Grade	V_Z@Izt Min	V_Z@Izt Max	Izt (mA)	Zzt@Izt (Ohms) Max	Zzk@Izk (Ohms) Max	Izk (mA)	I_R@V_R (uA) Max	V_R (V)
TCLZ4V7	A	4.44	4.68	20	21	770	1	0.19	1
	B	4.55	4.8						
	C	4.68	4.93						
TCLZ5V1	A	4.81	5.07	20	17	685	1	0.19	1.5
	B	4.94	5.2						
	C	5.09	5.37						
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	9.3						
TCLZ10V	A	9.12	9.59	20	6.6	95	0.5	0.11	7.0
	B	9.41	9.9						
	C	9.7	10.2						
TCLZ11V	A	10.18	10.71	10	8.5	95	0.5	0.133	8.0
	B	10.5	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	14.8	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	17.7						
	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						

Electrical Characteristics (T_A = 25°C unless otherwise noted)

Device Type	VZ Grade	V_Z@Izt		Izt (mA)	Zzt@Izt (Ohms) Max	Zzk@Izk (Ohms) Max	Izk (mA)	I_R@V_R (uA) Max	V_R (V)
		Min	Max						
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	27.7	29.13						
	C	28.36	29.82						
	D	29.02	30.51						
TCLZ33V	A	29.68	31.22	5	55.0	210	0.5	0.133	25
	B	30.32	31.88						
	C	30.9	32.5						
	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	33.4	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	37.85						
	D	36.63	38.52						

Notes:

1. The zener voltage subdivision (VZ) is measured 40mS after diode is powered up.
2. The operating resistance (Zzt and Zzk) is measured by superimposing a minute alternation current in the regulated current (Iz).
3. When ordering, please specify grade A, B, C or D.

Typical Characteristics

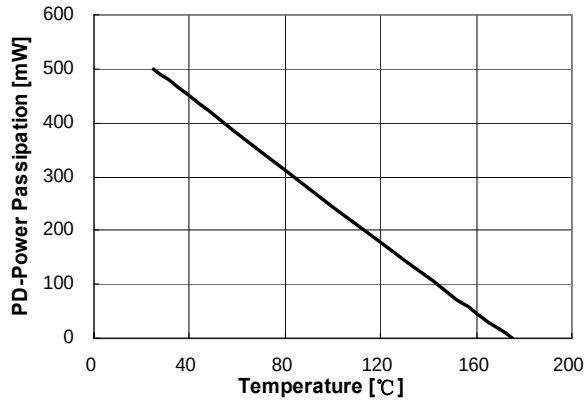


Figure 1. Power Dissipation vs Ambient Temperature
Valid provided leads at a distance of 0.8mm from case are kept at ambient temperature

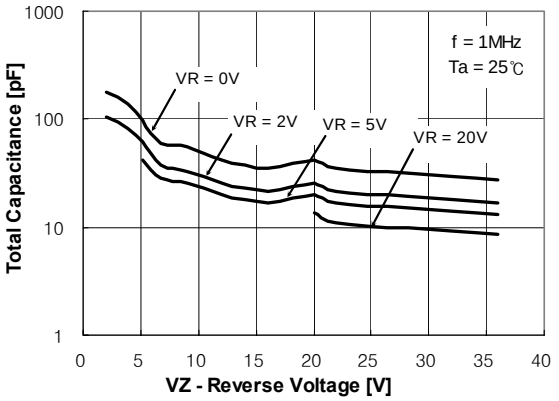


Figure 2. Total Capacitance

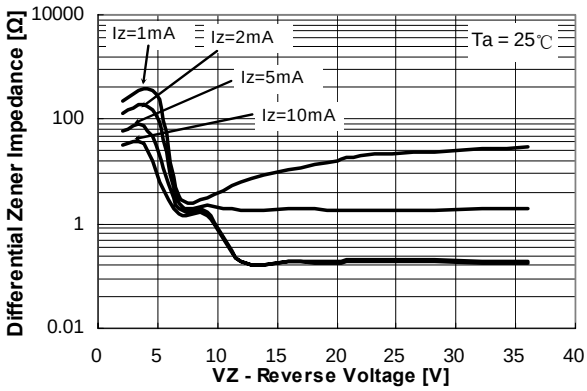


Figure 3. Differential Impedance vs. Zener Voltage

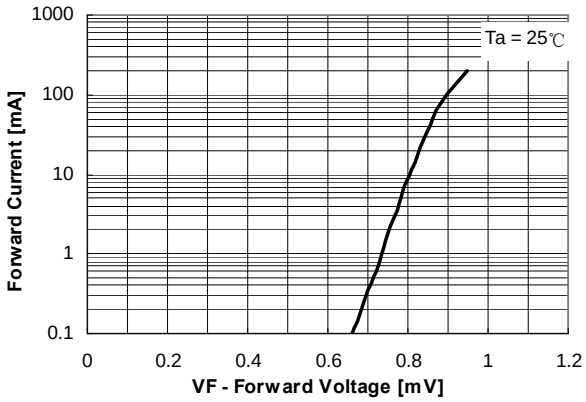


Figure 4. Forward Current vs. Forward Voltage

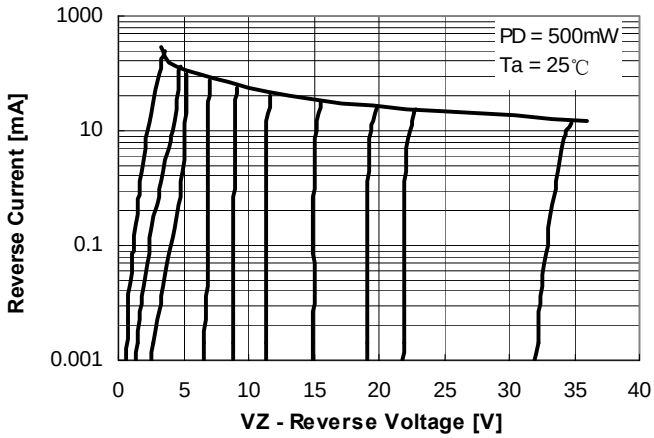
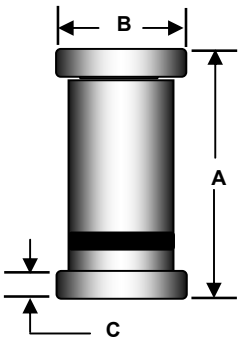


Figure 5. Reverse Current vs. Reverse Voltage

Package Outline

Package	Case Outline
LL34	

DIM	LL-34			
	Millimeters		Inches	
	Min	Max	Min	Max
A	3.302	3.600	0.130	0.142
B	1.397	1.499	0.055	0.059
C	0.350	0.500	0.014	0.020

Notes:

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