TAK CHEONG®

SEMICONDUCTOR

500 mW LL-34 Hermetically Sealed Glass Zener Voltage Regulators

SURFACE MOUNT
LL34

DEVICE MARKING DIAGRAM

Cathode Band Color : Blue

Absolute Maximum Ratings

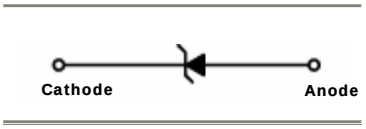
T_A = 25°C unless otherwise noted

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.

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°C unless otherwise noted

Device Type	VZ Tolerance	VZ@IZT Min	VZ@IZT Nom	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	2.21	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						
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						

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

Device Type	T Tolerance	V_Z@Izt Min	V_Z@Izt Nom	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)
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	18.11	18.52	18.93	10	23.5	170	0.5	0.133	15
	B	18.71	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						
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						

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

Device Type	T Tolerance	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	Nom	Max						
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						

VF (forward voltage) = 1.2 V maximum @ IF = 200mA for all types

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 tolerance A, B, C or D.

Typical Characteristics

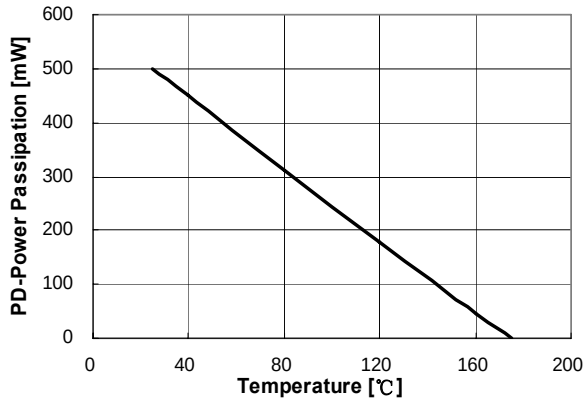


Figure 1. Power Dissipation vs Ambient Temperature
Valid provided leads at a distance of 0.8mm from case are kept at ambient temperature

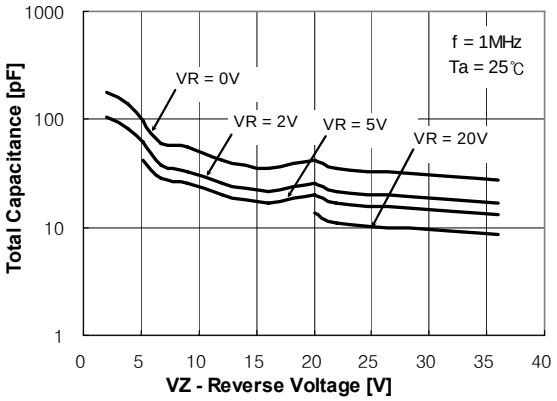


Figure 2. Total Capacitance

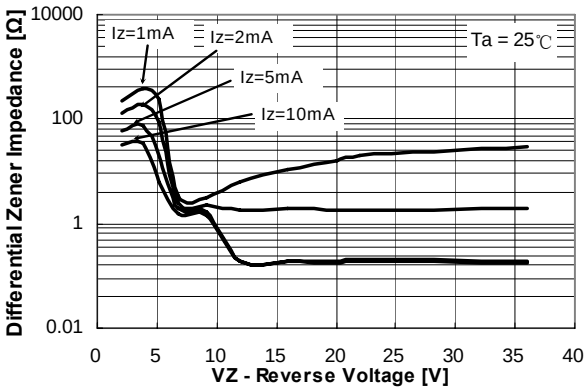


Figure 3. Differential Impedance vs. Zener Voltage

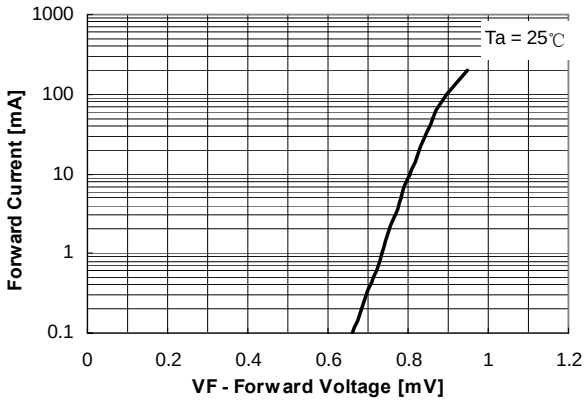


Figure 4. Forward Current vs. Forward Voltage

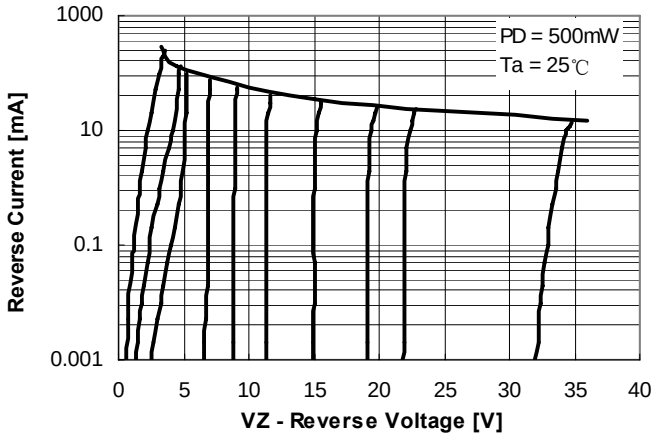
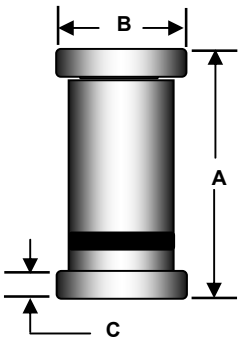


Figure 5. Reverse Current vs. Reverse Voltage

Package Outline

Package	Case Outline
LL34	

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

Notes:

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

NOTICE

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The product listed herein is designed to be used with ordinary electronic equipment or devices, and not designed to be used with equipment or devices which require high level of reliability and the malfunction of with would directly endanger human life (such as medical instruments, transportation equipment, aerospace machinery, nuclear-reactor controllers, fuel controllers and other safety devices), Tak Cheong Semiconductor Co., Ltd., or anyone on its behalf, assumes no responsibility or liability for any damagers resulting from such improper use of sale.

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