

500 mW DO-35 Hermetically Sealed Glass Zener Voltage Regulators

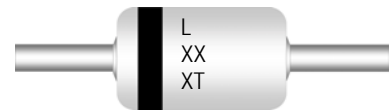


Absolute Maximum Ratings $T_A = 25^\circ\text{C}$ unless otherwise noted

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.

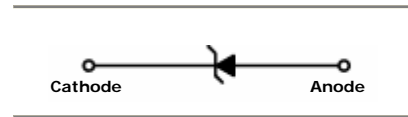
DEVICE MARKING DIAGRAM



L : Logo
 Voltage Code : TCRDXXX
 T : VZ tolerance A, B, C or D

Specification Features:

- Zener Voltage Range 2.0 to 39 Volts
- DO-35 Package (JEDEC)
- Through-Hole Device Type Mounting
- Hermetically Sealed Glass
- Compression Bonded Construction
- All External Surfaces Are Corrosion Resistant And Leads Are Readily Solderable
- RoHS Compliant
- Solder Hot Dip Tin (Sn) Terminal Finish
- Cathode Indicated By Polarity Band



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						
TCRD2V2	A	2.12	2.21	2.30	20	35	400	1	55	0.7
	B	2.22	2.32	2.41						
TCRD2V4	A	2.33	2.42	2.51	20	35	400	1	84	1
	B	2.44	2.53	2.62						
TCRD2V7	A	2.54	2.64	2.74	20	35	450	1	70	1
	B	2.69	2.80	2.91						
TCRD3V0	A	2.85	2.96	3.06	20	35	450	1	35	1
	B	3.01	3.12	3.22						
TCRD3V3	A	3.16	3.27	3.37	20	35	450	1	14	1
	B	3.32	3.43	3.53						
TCRD3V6	A	3.47	3.57	3.67	20	48	850	1	2.8	1
	B	3.63	3.73	3.82						
TCRD3V9	A	3.77	3.88	3.98	20	40	850	1	1.4	1
	B	3.92	4.03	4.13						
TCRD4V3	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						
TCRD4V7	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						
TCRD5V1	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						
TCRD5V6	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						
TCRD6V2	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						
TCRD6V8	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						
TCRD7V5	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						
TCRD8V2	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						
TCRD9V1	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						
TCRD10V	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						
TCRD11V	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						
TCRD12V	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						
TCRD13V	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						
TCRD15V	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						
TCRD16V	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						
TCRD18V	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						
TCRD20V	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						
TCRD22V	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						

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						
TCRD24V	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						
TCRD27V	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						
TCRD30V	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						
TCRD33V	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						
TCRD36V	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						
TCRD39V	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 @ $I_F = 200\text{mA}$ for all types

Notes:

1. TOLERANCE AND VOLTAGE DESIGNATION

The type numbers listed have zener voltage as shown.

2. SPECIALS AVAILABLE INCLUDE

Nominal zener voltages between the voltages shown and tighter voltage, for detailed information on price, availability and delivery, contact you nearest Tak Cheong representative.

3. ZENER VOLTAGE (V_Z) MEASUREMENT

The zener voltage is measured under pulse conditions such that T_J is no more than 2°C above T_A .

4. ZENER IMPEDANCE (Z_Z) DERIVATION

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}) is superimposed to I_{ZT} .

5. WHEN ORDERING, PLEASE SPECIFY TOLERANCE A, B, C OR D

Typical Characteristics

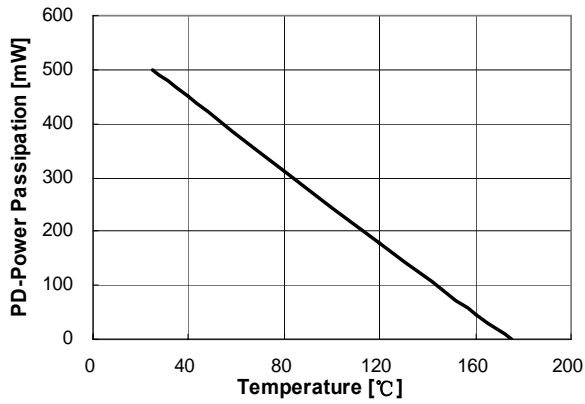


Figure 1. Power Dissipation vs Ambient Temperature
Valid provided leads at a distance of 0.8mm from case are kept at ambient temperature

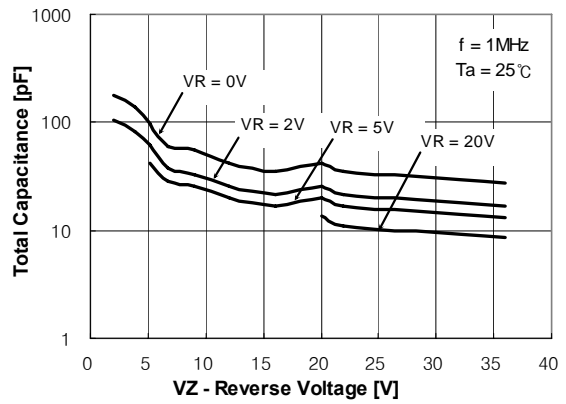


Figure 2. Total Capacitance

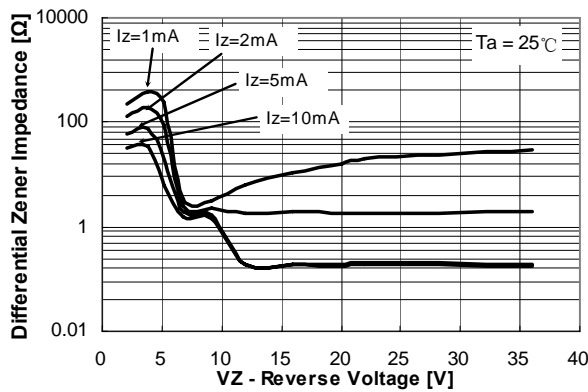


Figure 3. Differential Impedance vs. Zener Voltage

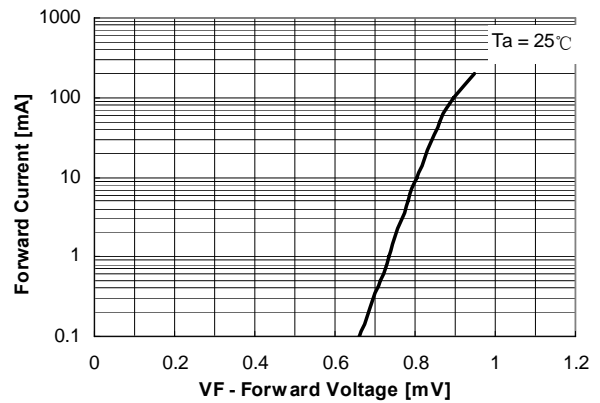


Figure 4. Forward Current vs. Forward Voltage

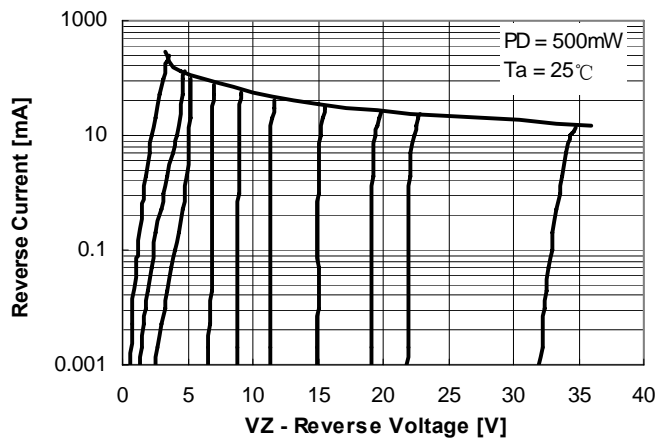
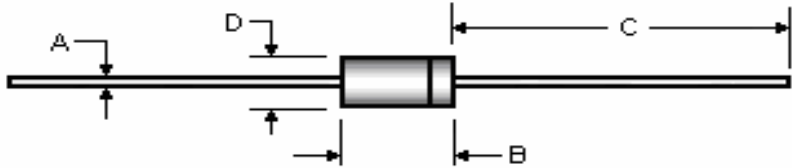


Figure 5. Reverse Current vs. Reverse Voltage

Package Outline

Package	Case Outline				
DO-35					
	DO-35				
	DIM	Millimeters		Inches	
		Min	Max	Min	Max
	A	0.46	0.55	0.018	0.022
	B	3.05	5.08	0.120	0.200
C	25.40	38.10	1.000	1.500	
D	1.53	2.28	0.060	0.090	

Notes:

1. All dimensions are within JEDEC standard.
2. DO35 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 which 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 damages resulting from such improper use of sale.

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