

## 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.

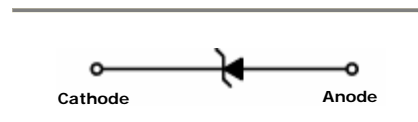
### DEVICE MARKING DIAGRAM



L : Logo  
 Device Code : TCZXxxxT  
 VZ Tolerance (T) : 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 <sub>R</sub> @V <sub>R</sub> (uA) Max	V <sub>R</sub> (V)
		Min	Nom	Max						
TCZX2V0	A	1.880	1.990	2.100	5	100	1000	0.5	120	0.5
	B	2.020	2.110	2.200						
TCZX2V2	A	2.120	2.210	2.300	5	100	1000	0.5	100	0.7
	B	2.220	2.315	2.410						
TCZX2V4	A	2.330	2.425	2.520	5	100	1000	0.5	120	1.0
	B	2.430	2.530	2.630						
TCZX2V7	A	2.540	2.645	2.750	5	110	1000	0.5	100	1.0
	B	2.690	2.800	2.910						
TCZX3V0	A	2.850	2.960	3.070	5	120	1000	0.5	50	1.0
	B	3.010	3.115	3.220						
TCZX3V3	A	3.160	3.270	3.380	5	120	1000	0.5	20	1.0
	B	3.320	3.425	3.530						
TCZX3V6	A	3.455	3.575	3.695	5	100	1000	1	10	1.0
	B	3.600	3.723	3.845						
TCZX3V9	A	3.740	3.875	4.010	5	100	1000	1	5	1.0
	B	3.890	4.025	4.160						
TCZX4V3	A	4.040	4.165	4.290	5	100	1000	1	5	1.0
	B	4.170	4.300	4.430						
	C	4.300	4.435	4.570						
TCZX4V7	A	4.44	4.56	4.68	5	80	900	1	5	1.0
	B	4.55	4.68	4.80						
	C	4.68	4.81	4.93						
TCZX5V1	A	4.81	4.94	5.07	5	80	800	1	5	1.5
	B	4.94	5.07	5.20						
	C	5.09	5.23	5.37						

**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)	$I_{R@V_R}$ ( $\mu\text{A}$ ) Max	$V_R$ (V)
		Min	Nom	Max						
TCZX5V6	A	5.28	5.41	5.55	5	60	500	1	5	2.5
	B	5.45	5.59	5.73						
	C	5.61	5.76	5.91						
TCZX6V2	A	5.78	5.94	6.09	5	60	300	1	5	3.0
	B	5.96	6.12	6.27						
	C	6.12	6.28	6.44						
TCZX6V8	A	6.29	6.46	6.63	5	20	150	0.5	2	3.5
	B	6.49	6.66	6.83						
	C	6.66	6.84	7.01						
TCZX7V5	A	6.85	7.04	7.22	5	20	120	0.5	0.5	4.0
	B	7.07	7.26	7.45						
	C	7.29	7.48	7.67						
TCZX8V2	A	7.53	7.73	7.92	5	20	120	0.5	0.5	5.0
	B	7.78	7.99	8.19						
	C	8.03	8.24	8.45						
TCZX9V1	A	8.29	8.51	8.73	5	25	120	0.5	0.5	6.0
	B	8.57	8.79	9.01						
	C	8.83	9.07	9.30						
TCZX10V	A	9.12	9.36	9.59	5	30	120	0.5	0.2	7.0
	B	9.41	9.66	9.90						
	C	9.70	9.95	10.20						
	D	9.94	10.19	10.44						
TCZX11V	A	10.18	10.45	10.71	5	30	120	0.5	0.2	8.0
	B	10.50	10.78	11.05						
	C	10.82	11.10	11.38						
TCZX12V	A	11.13	11.42	11.71	5	30	110	0.5	0.2	9.0
	B	11.44	11.74	12.03						
	C	11.74	12.05	12.35						
TCZX13V	A	12.11	12.43	12.75	5	35	110	0.5	0.2	10
	B	12.55	12.88	13.21						
	C	12.99	13.33	13.66						
TCZX15V	A	13.44	13.79	14.13	5	40	110	0.5	0.2	11
	B	13.89	14.26	14.62						
	C	14.35	14.72	15.09						
TCZX16V	A	14.80	15.19	15.57	5	40	150	0.5	0.2	12
	B	15.25	15.65	16.04						
	C	15.69	16.10	16.51						
TCZX18V	A	16.22	16.64	17.06	5	45	150	0.5	0.2	13
	B	16.82	17.26	17.70						
	C	17.42	17.88	18.33						
TCZX20V	A	18.02	18.49	18.96	5	55	200	0.5	0.2	15
	B	18.63	19.11	19.59						
	C	19.23	19.73	20.22						
	D	19.72	20.22	20.72						
TCZX22V	A	20.15	21.68	21.20	5	30	200	0.5	0.2	17
	B	20.64	21.18	21.71						
	C	21.08	21.63	22.17						
	D	21.52	22.08	22.63						
TCZX24V	A	22.05	22.62	23.18	5	35	200	0.5	0.2	19
	B	22.61	23.19	23.77						
	C	23.12	23.72	24.31						
	D	23.63	24.24	24.85						
TCZX27V	A	24.26	24.89	25.52	5	45	250	0.5	0.2	21
	B	24.97	25.62	26.26						
	C	25.63	26.29	26.95						
	D	26.29	26.97	27.64						
TCZX30V	A	26.99	27.69	28.39	5	55	250	0.5	0.2	23
	B	27.70	28.42	29.13						
	C	28.36	29.09	29.82						
	D	29.02	29.77	30.51						

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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)	$I_{R@V_R}$ ( $\mu\text{A}$ ) Max	$V_R$ (V)
		Min	Nom	Max						
TCZX33V	A	29.68	30.45	31.22	5	65	250	0.5	0.2	25
	B	30.32	31.10	31.88						
	C	30.90	31.70	32.50						
	D	31.49	32.30	33.11						
TCZX36V	A	32.14	32.97	33.79	5	75	250	0.5	0.2	27
	B	32.79	33.64	34.49						
	C	33.40	34.27	35.13						
	D	34.01	34.89	35.77						
TCZX39V	A	34.68	35.58	36.47	5	85	250	0.5	0.2	30
	B	35.36	36.28	37.19						
	C	36.00	36.93	37.85						
	D	36.63	37.58	38.52						

VF (forward voltage) = 1.2 V maximum @ IF = 200mA 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**

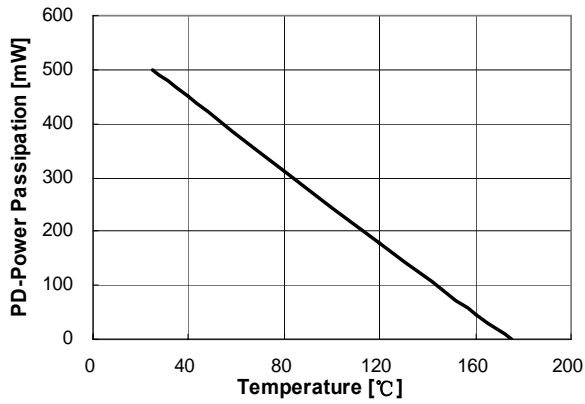
The zener voltage is measured under pulse conditions such that  $T_j$  is no more than  $2^\circ\text{C}$  above  $T_A$ .

**4. ZENER IMPEDANCE ( $Z_z$ ) DERIVATION**

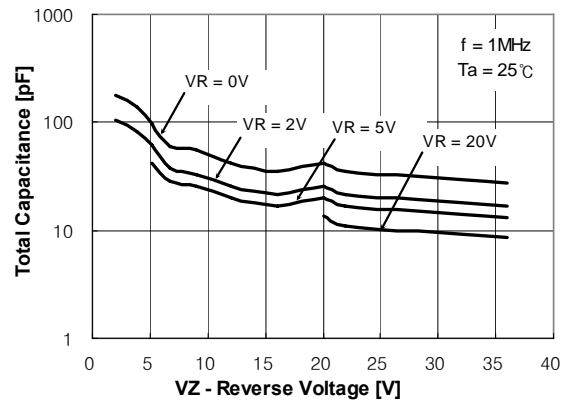
Zener impedance is derived from the 60-cycle ac voltage, which results when an ac current having an RMS value equal to 10% of the dc zener current ( $I_{ZT}$ ) is superimposed to  $I_{ZT}$ .

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

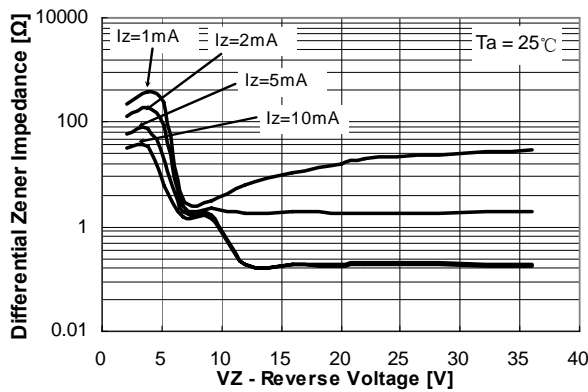
Typical Characteristics



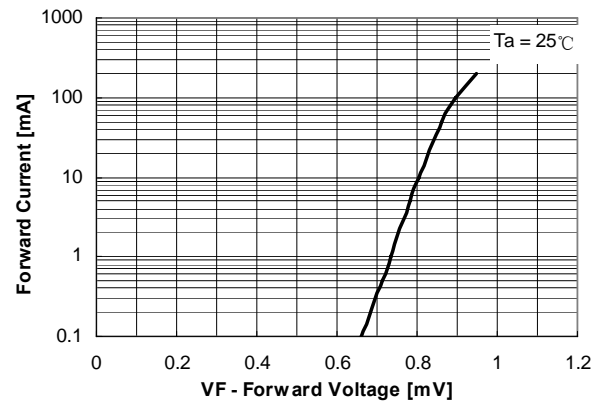
**Figure 1. Power Dissipation vs Ambient Temperature**  
Valid provided leads at a distance of 0.8mm from case are kept at ambient temperature



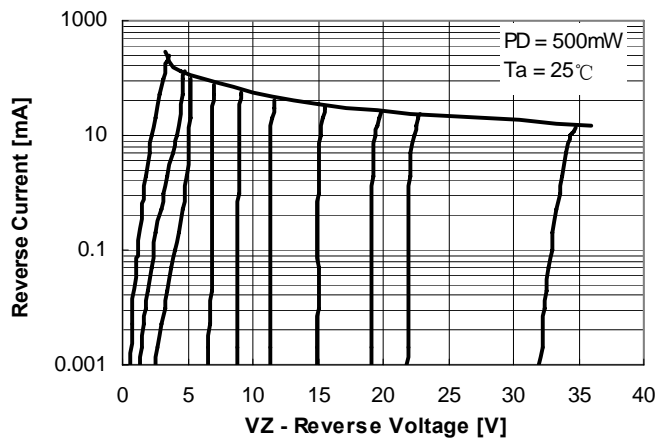
**Figure 2. Total Capacitance**



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

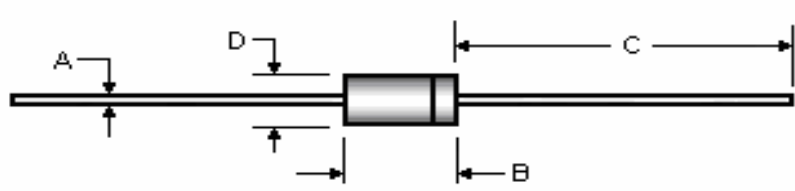


**Figure 4. Forward Current vs. Forward Voltage**



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

Package Outline

Package	Case Outline					
DO-35						
	DIM	DO-35				
		Millimeters		Inches		
		Min	Max	Min	Max	
	<b>A</b>	0.46	0.55	0.018	0.022	
	<b>B</b>	3.05	5.08	0.120	0.200	
<b>C</b>	25.40	38.10	1.000	1.500		
<b>D</b>	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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