

## 500 mW DO-35 Hermetically Sealed Glass Zener Voltage Regulators



### Absolute Maximum Ratings T<sub>A</sub> = 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.

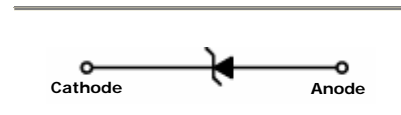
DEVICE MARKING DIAGRAM



L : Logo  
 Device Code : TCBZX55Txxx  
 T : VZ tolerance B or C

### Specification Features:

- Zener Voltage Range 2.0 to 75 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<sub>A</sub> = 25°C unless otherwise noted

Device Type	V <sub>Z</sub> @ I <sub>ZT</sub> (Volts)		I <sub>ZT</sub> (mA)	Z <sub>ZT</sub> @ I <sub>ZT</sub> (Ω) Max	I <sub>ZK</sub> (mA)	Z <sub>ZK</sub> @ I <sub>ZK</sub> (Ω) Max	I <sub>R</sub> @ V <sub>R</sub> (μA) Max	V <sub>R</sub> (Volts)
	Min	Max						
TCBZX55C 2V0	1.88	2.11	5	100	1	600	100	1
TCBZX55C 2V2	2.08	2.33	5	100	1	600	100	1
TCBZX55C 2V4	2.28	2.56	5	85	1	600	50	1
TCBZX55C 2V7	2.51	2.89	5	85	1	600	10	1
TCBZX55C 3V0	2.8	3.2	5	85	1	600	4	1
TCBZX55C 3V3	3.1	3.5	5	85	1	600	2	1
TCBZX55C 3V6	3.4	3.8	5	85	1	600	2	1
TCBZX55C 3V9	3.7	4.1	5	85	1	600	2	1
TCBZX55C 4V3	4.0	4.6	5	75	1	600	1	1
TCBZX55C 4V7	4.4	5.0	5	60	1	600	0.5	1
TCBZX55C 5V1	4.8	5.4	5	35	1	550	0.1	1
TCBZX55C 5V6	5.2	6.0	5	25	1	450	0.1	1
TCBZX55C 6V2	5.8	6.6	5	10	1	200	0.1	2
TCBZX55C 6V8	6.4	7.2	5	8	1	150	0.1	3
TCBZX55C 7V5	7.0	7.9	5	7	1	50	0.1	5
TCBZX55C 8V2	7.7	8.7	5	7	1	50	0.1	6.2
TCBZX55C 9V1	8.5	9.6	5	10	1	50	0.1	6.8
TCBZX55C 10	9.4	10.6	5	15	1	70	0.1	7.5
TCBZX55C 11	10.4	11.6	5	20	1	70	0.1	8.2
TCBZX55C 12	11.4	12.7	5	20	1	90	0.1	9.1
TCBZX55C 13	12.4	14.1	5	26	1	110	0.1	10

**Electrical Characteristics**  $T_A = 25^\circ\text{C}$  unless otherwise noted

Device Type	$V_Z @ I_{ZT}$ (Volts)		$I_{ZT}$ (mA)	$Z_{ZT} @ I_{ZT}$ ( $\Omega$ ) Max	$I_{ZK}$ (mA)	$Z_{ZK} @ I_{ZK}$ ( $\Omega$ ) Max	$I_R @ V_R$ ( $\mu\text{A}$ ) Max	$V_R$ (Volts)
	Min	Max						
TCBZX55C 15	13.8	15.6	5	30	1	110	0.1	11
TCBZX55C 16	15.3	17.1	5	40	1	170	0.1	12
TCBZX55C 18	16.8	19.1	5	50	1	170	0.1	13
TCBZX55C 20	18.8	21.1	5	55	1	220	0.1	15
TCBZX55C 22	20.8	23.3	5	55	1	220	0.1	16
TCBZX55C 24	22.8	25.6	5	80	1	220	0.1	18
TCBZX55C 27	25.1	28.9	5	80	1	220	0.1	20
TCBZX55C 30	28	32	5	80	1	220	0.1	22
TCBZX55C 33	31	35	5	80	1	220	0.1	24
TCBZX55C 36	34	38	5	80	1	220	0.1	27
TCBZX55C 39	37	41	2.5	90	0.5	500	0.1	28
TCBZX55C 43	40	46	2.5	90	0.5	600	0.1	32
TCBZX55C 47	44	50	2.5	110	0.5	700	0.1	35
TCBZX55C 51	48	54	2.5	125	0.5	700	0.1	38
TCBZX55C 56	52	60	2.5	135	0.5	1000	0.1	42
TCBZX55C 62	58	66	2.5	150	0.5	1000	0.1	47
TCBZX55C 68	64	72	2.5	160	0.5	1000	0.1	51
TCBZX55C 75	70	80	2.5	170	0.5	1000	0.1	56

$V_F$  Forward Voltage = 1.0 V Maximum @  $I_F = 100$  mA for all types

Device Type	$V_Z @ I_{ZT}$ (Volts)		$I_{ZT}$ (mA)	$Z_{ZT} @ I_{ZT}$ ( $\Omega$ ) Max	$I_{ZK}$ (mA)	$Z_{ZK} @ I_{ZK}$ ( $\Omega$ ) Max	$I_R @ V_R$ ( $\mu\text{A}$ ) Max	$V_R$ (Volts)
	Min	Max						
TCBZX55B 2V4	2.35	2.45	5	85	1	600	50	1
TCBZX55B 2V7	2.65	2.75	5	85	1	600	10	1
TCBZX55B 3V0	2.94	3.06	5	85	1	600	4	1
TCBZX55B 3V3	3.23	3.37	5	85	1	600	2	1
TCBZX55B 3V6	3.53	3.67	5	85	1	600	2	1
TCBZX55B 3V9	3.82	3.98	5	85	1	600	2	1
TCBZX55B 4V3	4.21	4.39	5	75	1	600	1	1
TCBZX55B 4V7	4.61	4.79	5	60	1	600	0.5	1
TCBZX55B 5V1	5.00	5.20	5	35	1	550	0.1	1
TCBZX55B 5V6	5.49	5.71	5	25	1	450	0.1	1
TCBZX55B 6V2	6.08	6.32	5	10	1	200	0.1	2
TCBZX55B 6V8	6.66	6.94	5	8	1	150	0.1	3
TCBZX55B 7V5	7.33	7.63	5	7	1	50	0.1	5
TCBZX55B 8V2	8.04	8.36	5	7	1	50	0.1	6.2
TCBZX55B 9V1	8.92	9.28	5	10	1	50	0.1	6.8
TCBZX55B 10	9.80	10.20	5	15	1	70	0.1	7.5
TCBZX55B 11	10.78	11.22	5	20	1	70	0.1	8.2
TCBZX55B 12	11.76	12.24	5	20	1	90	0.1	9.1
TCBZX55B 13	12.74	13.26	5	26	1	110	0.1	10
TCBZX55B 15	14.70	15.30	5	30	1	110	0.1	11
TCBZX55B 16	15.68	16.32	5	40	1	170	0.1	12
TCBZX55B 18	17.64	18.36	5	50	1	170	0.1	13
TCBZX55B 20	19.60	20.40	5	55	1	220	0.1	15
TCBZX55B 22	21.56	22.44	5	55	1	220	0.1	16
TCBZX55B 24	23.52	24.48	5	80	1	220	0.1	18
TCBZX55B 27	26.46	27.54	5	80	1	220	0.1	20
TCBZX55B 30	29.40	30.60	5	80	1	220	0.1	22
TCBZX55B 33	32.34	33.66	5	80	1	220	0.1	24
TCBZX55B 36	35.28	36.72	5	80	1	220	0.1	27
TCBZX55B 39	38.22	39.78	2.5	90	0.5	500	0.1	28
TCBZX55B 43	42.14	43.86	2.5	90	0.5	600	0.1	32
TCBZX55B 47	46.06	47.94	2.5	110	0.5	700	0.1	35

**Electrical Characteristics**  $T_A = 25^\circ\text{C}$  unless otherwise noted

Device Type	$V_Z @ I_{ZT}$ (Volts)		$I_{ZT}$ (mA)	$Z_{ZT} @ I_{ZT}$ ( $\Omega$ ) Max	$I_{ZK}$ (mA)	$Z_{ZK} @ I_{ZK}$ ( $\Omega$ ) Max	$I_R @ V_R$ ( $\mu\text{A}$ ) Max	$V_R$ (Volts)
	Min	Max						
TCBZX55B 51	49.98	52.02	2.5	125	0.5	700	0.1	38
TCBZX55B 56	54.88	57.12	2.5	135	0.5	1000	0.1	42
TCBZX55B 62	60.76	63.24	2.5	150	0.5	1000	0.1	47
TCBZX55B 68	66.64	69.36	2.5	160	0.5	1000	0.1	51
TCBZX55B 75	73.50	76.50	2.5	170	0.5	1000	0.1	56

$V_F$  Forward Voltage = 1.0 V Maximum @  $I_F = 100$  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.

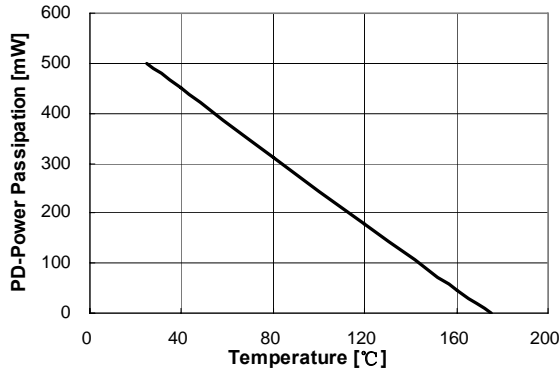
**3. ZENER VOLTAGE ( $V_Z$ ) MEASUREMENT**

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

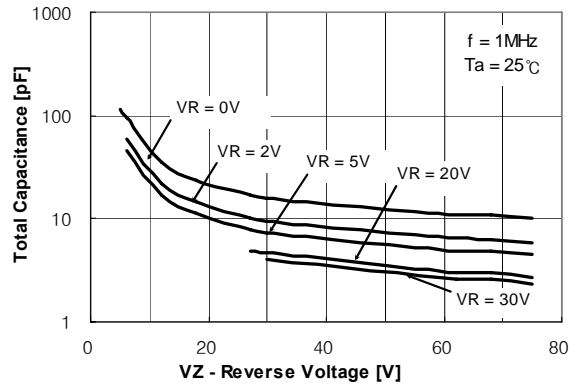
**4. ZENER IMPEDANCE ( $Z_Z$ ) DERIVATION**

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  $I_{ZT}$ .

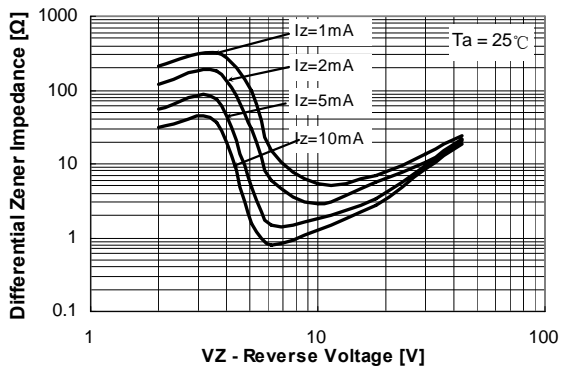
Typical Characteristics



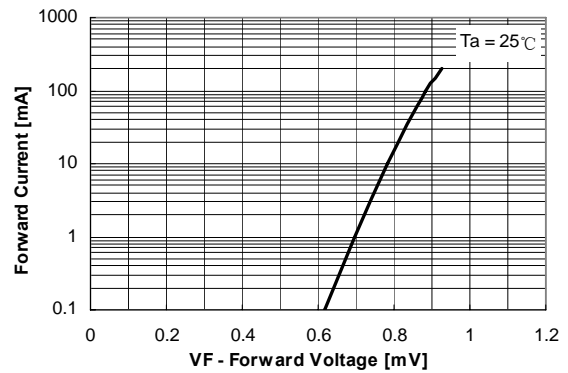
**Figure 1. Power Dissipation vs Ambient Temperature**  
Valid provided leads at a distance of 0.8mm from case are kept at ambient temperature



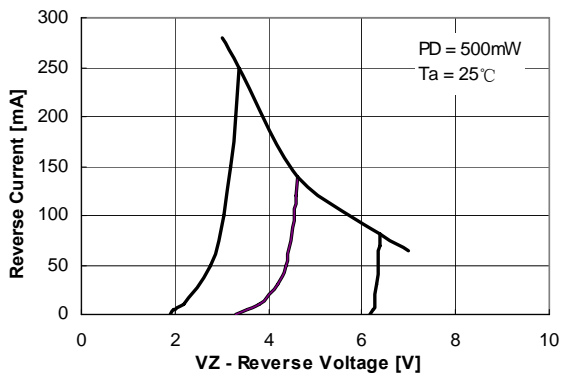
**Figure 2. Total Capacitance**



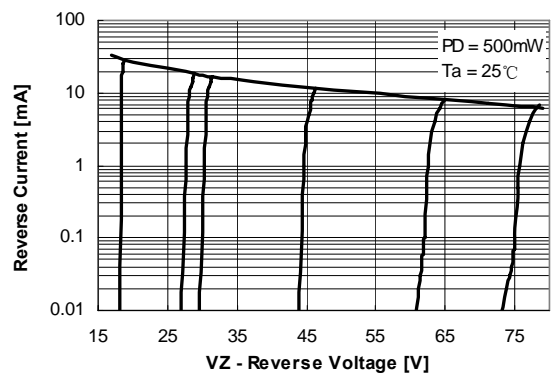
**Figure 3. Differential Impedance vs. Zener Voltage**



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

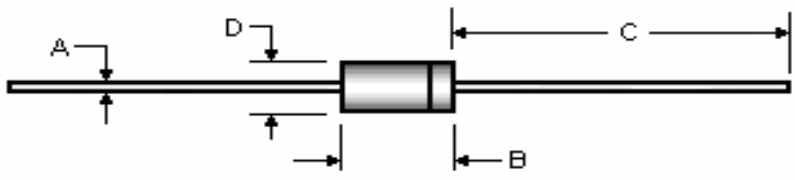


**Figure 5. Reverse Current vs. Reverse Voltage**



**Figure 6. Reverse Current vs. Reverse Voltage**

Package Outline

Package	Case Outline				
DO-35					
	DIM	DO-35		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**

The information presented in this document is for reference only. Tak Cheong reserves the right to make changes without notice for the specification of the products displayed herein.

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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