



DATA SHEET

SEMICONDUCTOR

BZX55C Series

500 mW DO-35 Hermetically Sealed Glass Zener Voltage Regulators



Maximum Ratings (Note 1)

Rating	Symbol	Value	Unit
Maximum Steady State Power Dissipation @ $T_L \leq 75^\circ\text{C}$, Lead Length = 3/8"	P_D	500	mW
Derate Above 75°C		4.0	mW/°C
Operating and Storage Temperature Range	T_J, T_{stg}	-65 to +200	°C

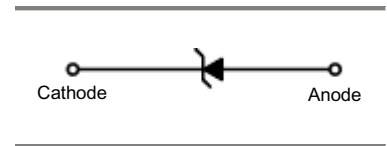
1. Some part number series have lower JEDEC registered ratings.



AXIAL LEAD
DO35

Specification Features

- Zener Voltage Range = 2.4 V to 91 V
- ESD Rating of Class 3 (>16 KV) per Human Body Model
- DO-35 Package (DO-204AH)
- Double Slug Type Construction
- Metallurgical Bonding



Mechanical Characteristics

- Case** : Double slug type, hermetically sealed glass
Finish : All external surfaces are corrosion resistant and leads are readily solderable.
Polarity : Cathode indicated by polarity band
Mounting: Any

MARKING DIAGRAM



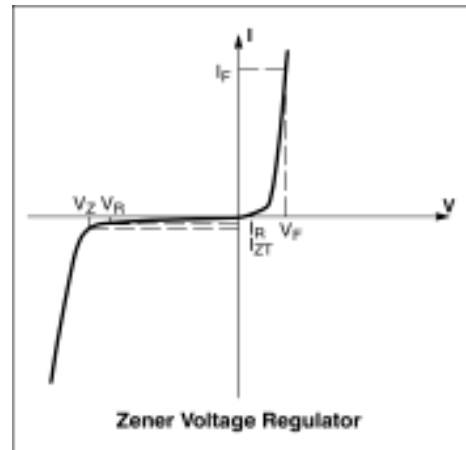
BZX55Cxxx = Device Code

Maximum Lead Temperature for Soldering Purposes
230°C, 1/16" from the case for 10 seconds

BZX55C Series

ELECTRICAL CHARACTERISTICS ($T_A = 25^\circ\text{C}$ unless otherwise noted. $V_F = 1.3\text{ V Max @ } I_F = 100\text{mA}$ for all types)

Symbol	Parameter
V_Z	Reverse Zener Voltage @ I_{ZT}
I_{ZT}	Reverse Zener Current
Z_{ZT}	Maximum Zener Impedance @ I_{ZT}
I_{ZM}	Maximum DC Zener Current
I_R	Reverse Leakage Current @ V_R
V_R	Reverse Voltage
I_F	Forward Current
V_F	Forward Voltage @ I_F



ELECTRICAL CHARACTERISTICS ($T_A = 25^\circ\text{C}$ unless otherwise noted, $V_F = 1.3\text{ V Max @ } I_F = 100\text{mA}$ for all types)

Device	Device Marking	$V_{ZT} @ I_{ZT}$ (Volts) (Note 2.)		Max Zener Impedance (Note 4) $Z_{ZT} @ I_{ZT}$	I_{ZT}	Max Reverse Leakage Current I_R at V_R		V_R	I_{ZM} (Note 3.)
		Min	Max			T_{amb} 25°C	T_{amb} 125°C		
		(Ω)	(mA)	(μA)	(μA)	(Volts)	(mA)		
BZX55C2V4	55C2V4	2.28	2.56	85	5	50	100	1	155
BZX55C2V7	55C2V7	2.5	2.9	85	5	10	50	1	135
BZX55C3V0	55C3V0	2.8	3.2	85	5	4	40	1	125
BZX55C3V3	55C3V3	3.1	3.5	85	5	2	40	1	115
BZX55C3V6	55C3V6	3.4	3.8	85	5	2	40	1	105
BZX55C3V9	55C3V9	3.7	4.1	85	5	2	40	1	95
BZX55C4V3	55C4V3	4	4.6	75	5	1	20	1	90
BZX55C4V7	55C4V7	4.4	5	60	5	0.5	10	1	85
BZX55C5V1	55C5V1	4.8	5.4	35	5	0.1	c	1	80
BZX55C5V6	55C5V6	5.2	6	25	5	0.1	2	1	70
BZX55C6V2	55C6V2	5.8	6.6	10	5	0.1	2	2	64
BZX55C6V8	55C6V8	6.4	7.2	8	5	0.1	2	3	58
BZX55C7V5	55C7V5	7	7.9	7	5	0.1	2	5	53
BZX55C8V2	55C8V2	7.7	8.7	7	5	0.1	2	6	47
BZX55C9V1	55C9V1	8.5	9.6	10	5	0.1	2	7	43
BZX55C10	55C10	9.4	10.6	15	5	0.1	2	7.5	40
BZX55C11	55C11	10.4	11.6	20	5	0.1	2	8.5	36
BZX55C12	55C12	11.4	12.7	20	5	0.1	2	9	32
BZX55C13	55C13	12.4	14.1	26	5	0.1	2	10	29
BZX55C15	55C15	13.8	15.6	30	5	0.1	2	11	27

2. TOLERANCE AND VOLTAGE DESIGNATION (V_{ZT})

Tolerance designation – the type numbers listed have zener voltage min/max limits as shown. Device tolerance of $\pm 2\%$ are indicated by a "B" instead of a "C". Zener voltage is measured with the device junction thermal equilibrium at the temperature of $30^\circ\text{C} \pm 1^\circ\text{C}$ and 3/8" lead length.

3. MAXIMUM ZENER CURRENT RATINGS (I_{ZM})

This data was calculated using nominal voltages. The maximum current handling capability on a worst case basis is limited by the actual zener voltage at the operation point and the power derating curve.

4. ZENER IMPEDANCE (Z_Z) DERIVATION

Z_{ZT} and Z_{ZK} are measured by dividing the AC voltage drop across the device by the AC current applied. The specified limits are for $I_{Z(AC)} = 0.1 I_{Z(DC)}$ with AC frequency = 60Hz.

BZX55C Series

ELECTRICAL CHARACTERISTICS ($T_A = 25^\circ\text{C}$ unless otherwise noted, $V_F = 1.3\text{ V Max @ } I_F = 100\text{mA}$ for all types)

Device	Device Marking	$V_{ZT} @ I_{ZT}$ (Volts) (Note 5.)		Max Zener Impedance (Note 7) $Z_{ZT} @ I_{ZT}$	I_{ZT}	Max Reverse Leakage Current I_R at V_R		V_R	I_{ZM} (Note 6.)
						T_{amb} 25°C	T_{amb} 125°C		
		Min	Max	(Ω)	(mA)	(μA)	(μA)	(Volts)	(mA)
BZX55C16	55C16	15.3	17.1	40	5	0.1	2	12	24
BZX55C18	55C18	16.8	19.1	50	5	0.1	2	14	21
BZX55C20	55C20	18.8	21.1	55	5	0.1	2	15	20
BZX55C22	55C22	20.8	23.3	55	5	0.1	2	17	18
BZX55C24	55C24	22.8	25.6	80	5	0.1	2	18	16
BZX55C27	55C27	25.1	28.9	80	5	0.1	2	20	14
BZX55C30	55C30	28	32	80	5	0.1	2	22	13
BZX55C33	55C33	31	35	80	5	0.1	2	24	12
BZX55C36	55C36	34	38	80	5	0.1	2	27	11
BZX55C39	55C39	37	41	90	2.5	0.1	5	28	10
BZX55C43	55C43	40	46	90	2.5	0.1	5	32	9.2
BZX55C47	55C47	44	50	110	2.5	0.1	5	35	8.5
BZX55C51	55C51	48	54	125	2.5	0.1	10	38	7.8
BZX55C56	55C56	52	60	135	2.5	0.1	10	42	7
BZX55C62	55C62	58	66	150	2.5	0.1	10	47	6.4
BZX55C68	55C68	64	72	160	2.5	0.1	10	51	5.9
BZX55C75	55C75	70	80	170	2.5	0.1	10	56	5.3
BZX55C82	55C82	77	87	200	2.5	0.1	10	62	4.8
BZX55C91	55C91	85	96	250	1	0.1	10	69	4.3

5. TOLERANCE AND VOLTAGE DESIGNATION (V_{ZT})

Tolerance designation – the type numbers listed have zener voltage min/max limits as shown. Device tolerance of $\pm 2\%$ are indicated by a "B" instead of a "C". Zener voltage is measured with the device junction thermal equilibrium at the temperature of $30^\circ\text{C} \pm 1^\circ\text{C}$ and 3/8" lead length.

6. MAXIMUM ZENER CURRENT RATINGS (I_{ZM})

This data was calculated using nominal voltages. The maximum current handling capability on a worst case basis is limited by the actual zener voltage at the operation point and the power derating curve.

7. ZENER IMPEDANCE (Z_Z) DERIVATION

Z_{ZT} and Z_{ZK} are measured by dividing the AC voltage drop across the device by the AC current applied. The specified limits are for $I_{Z(AC)} = 0.1 I_{Z(DC)}$ with AC frequency = 60Hz.

DEVICE CHARACTERISTICS

BZX55C Series

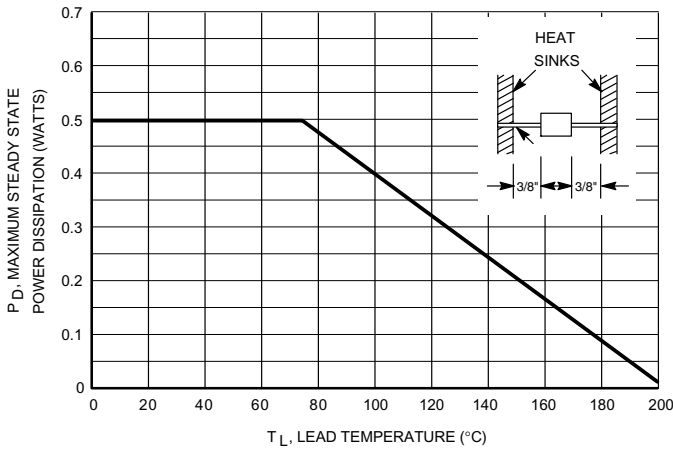


Figure 1. Steady State Power Derating

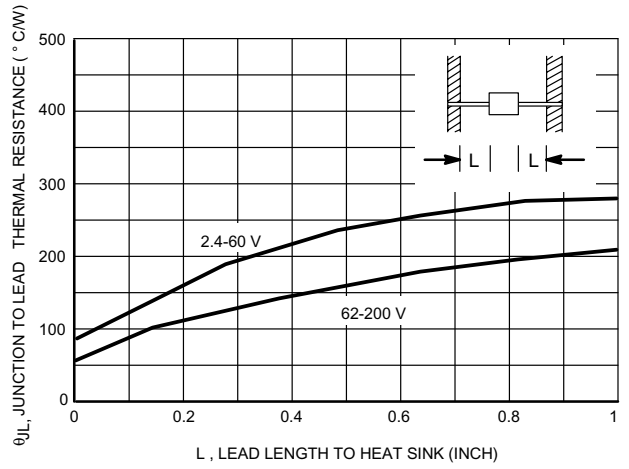


Figure 2. Typical Thermal Resistance

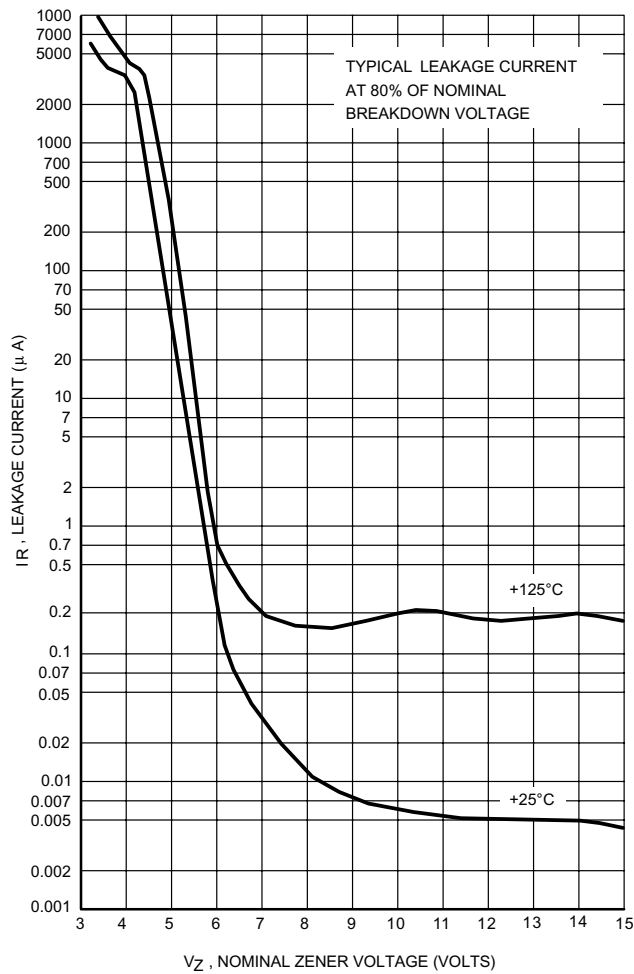


Figure 3. Typical Leakage Current

DEVICE CHARACTERISTICS

BZX55C Series

TEMPERATURE COEFFICIENTS

(-55°C to +150°C temperature range; 90% of the units are in the ranges indicated.)

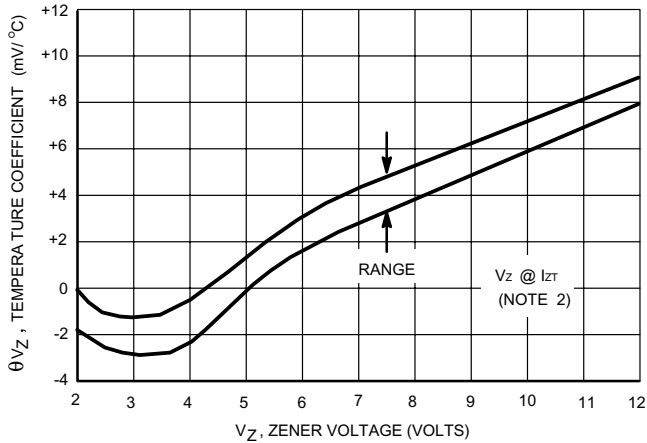


Figure 4a. Range for Units to 12 Volts

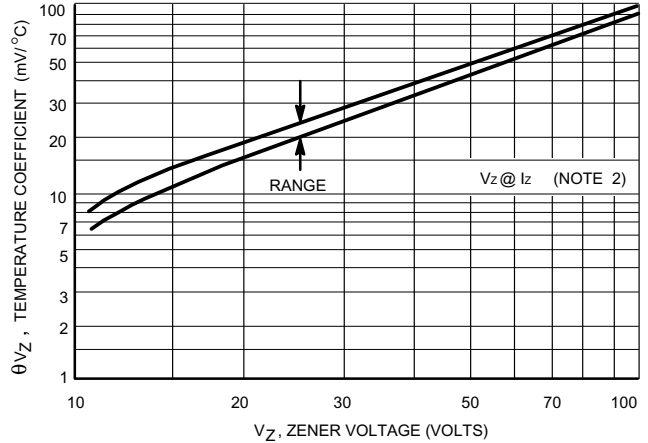


Figure 4b. Range for Units 12 to 100 Volts

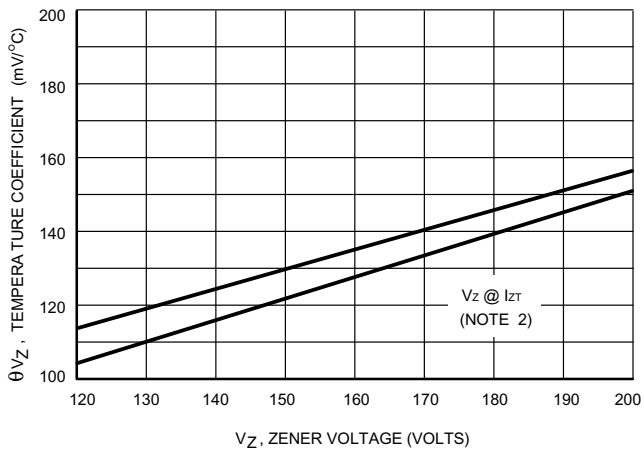


Figure 4c. Range for Units 120 to 200 Volts

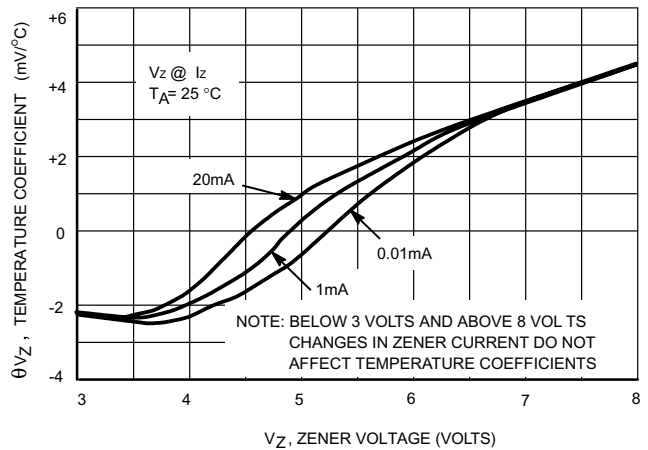


Figure 5. Effect of Zener Current

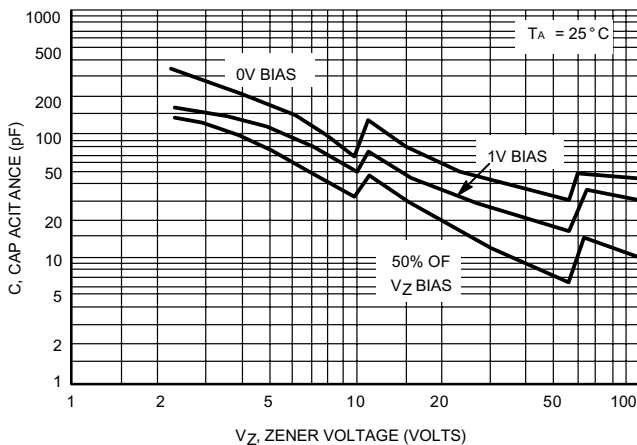


Figure 6a. Typical Capacitance 2.4-100 Volts

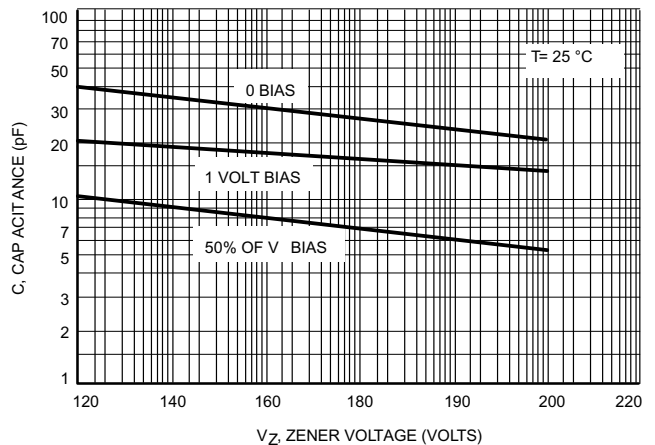


Figure 6b. Typical Capacitance 120-200 Volts

DEVICE CHARACTERISTICS

BZX55C Series

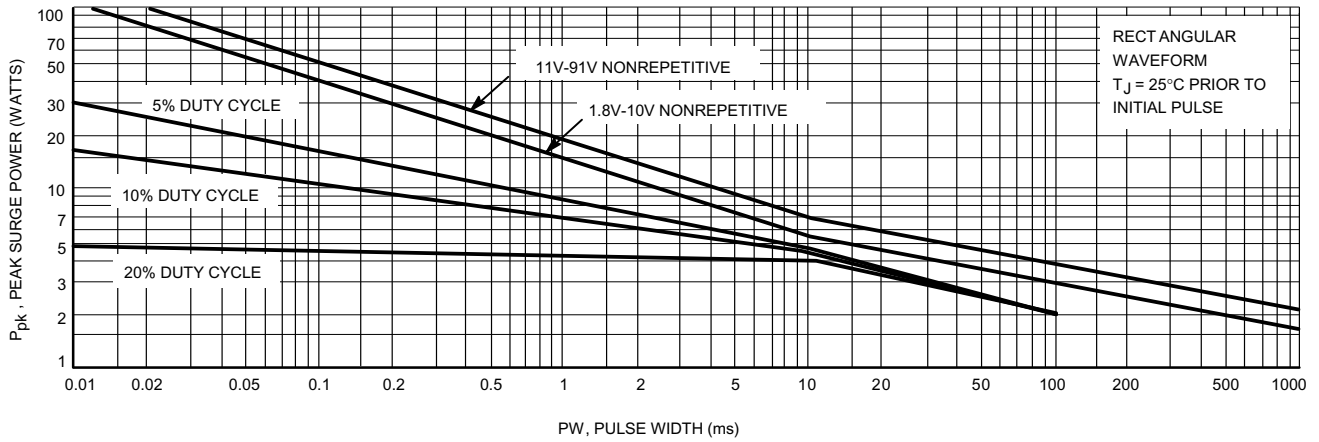


Figure 7a. Maximum Surge Power 1.8-91 Volts

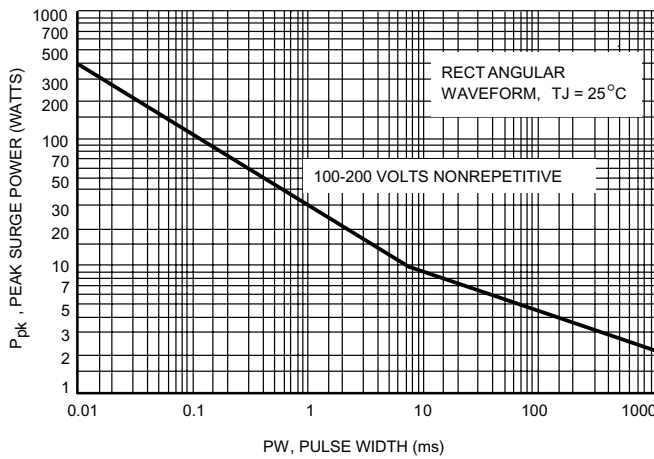


Figure 7b. Maximum Surge Power DO-35
100-200Volts

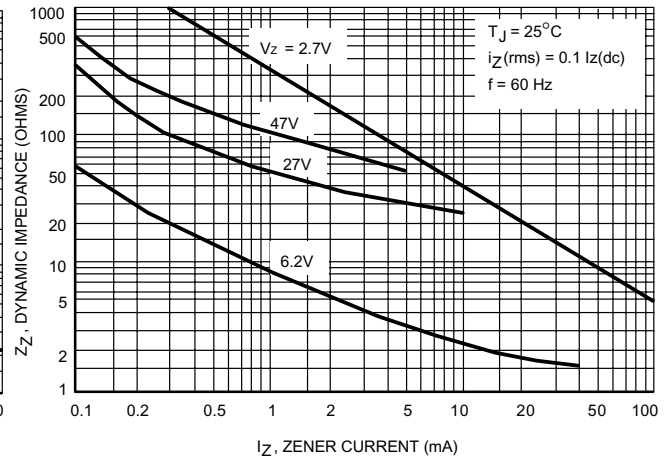


Figure 8. Effect of Zener Current on
Zener Impedance

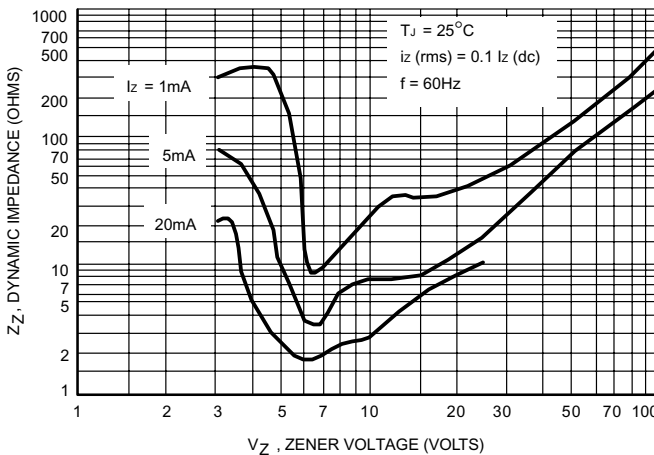


Figure 9. Effect of Zener Voltage on Zener Impedance

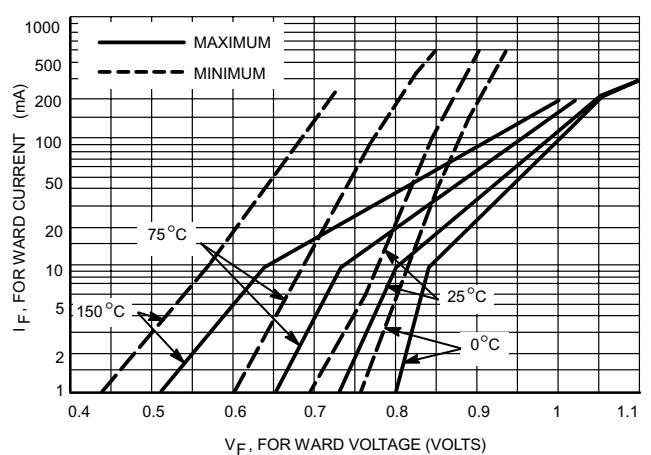


Figure 10. Typical Forward Characteristics

DEVICE CHARACTERISTICS

BZX55C Series

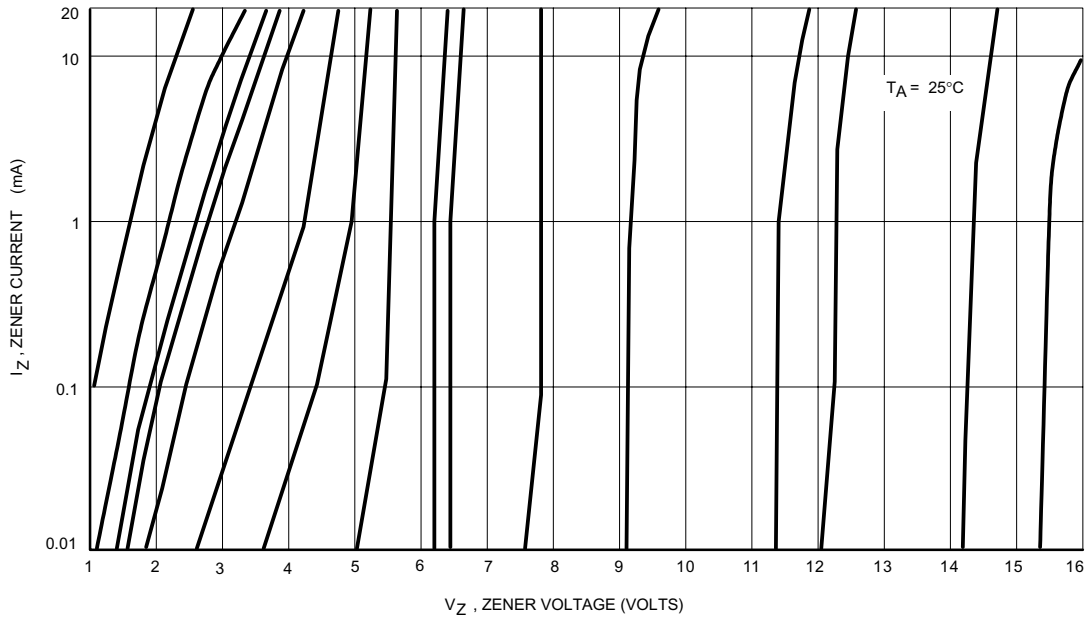


Figure 1 1. Zener Voltage versus Zener Current - $V_Z = 1$ thru 16 Volts

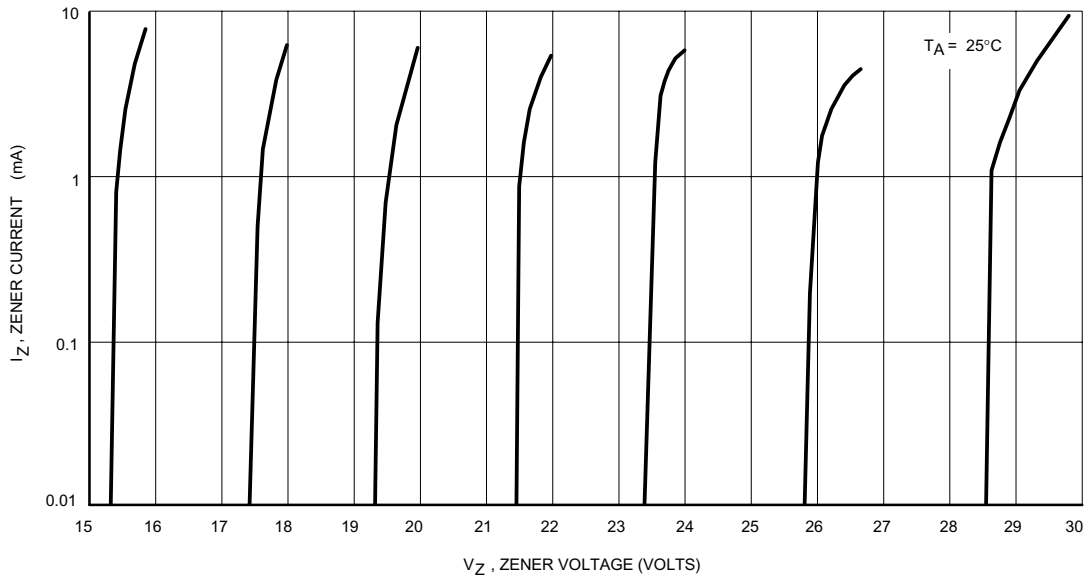


Figure 12. Zener Voltage versus Zener Current - $V_Z = 15$ thru 30 Volts

DEVICE CHARACTERISTICS

BZX55C Series

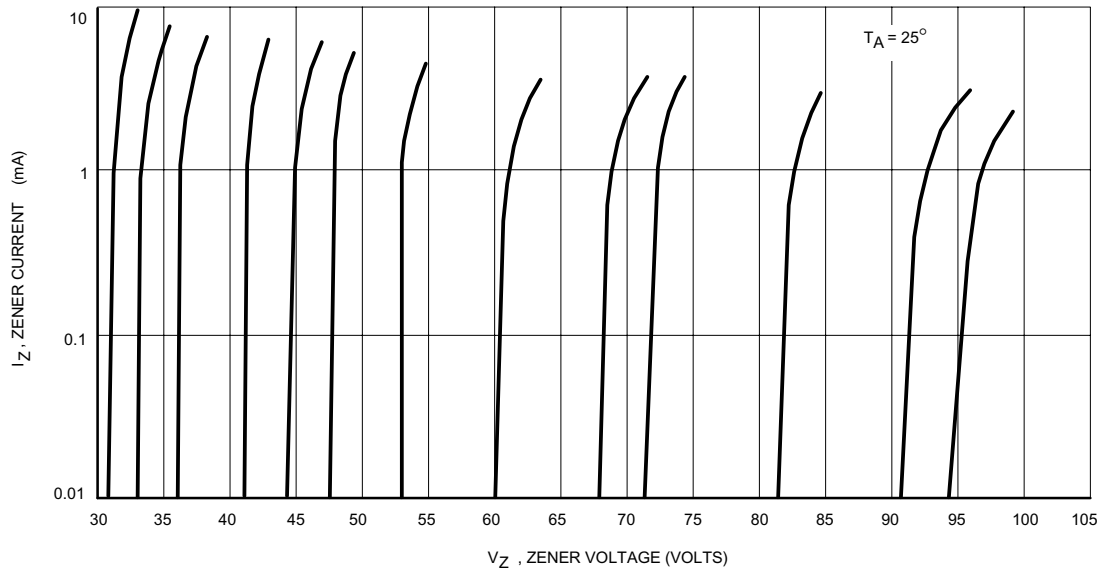


Figure 13. Zener Voltage versus Zener Current - $V_Z = 30$ thru 105 Volts

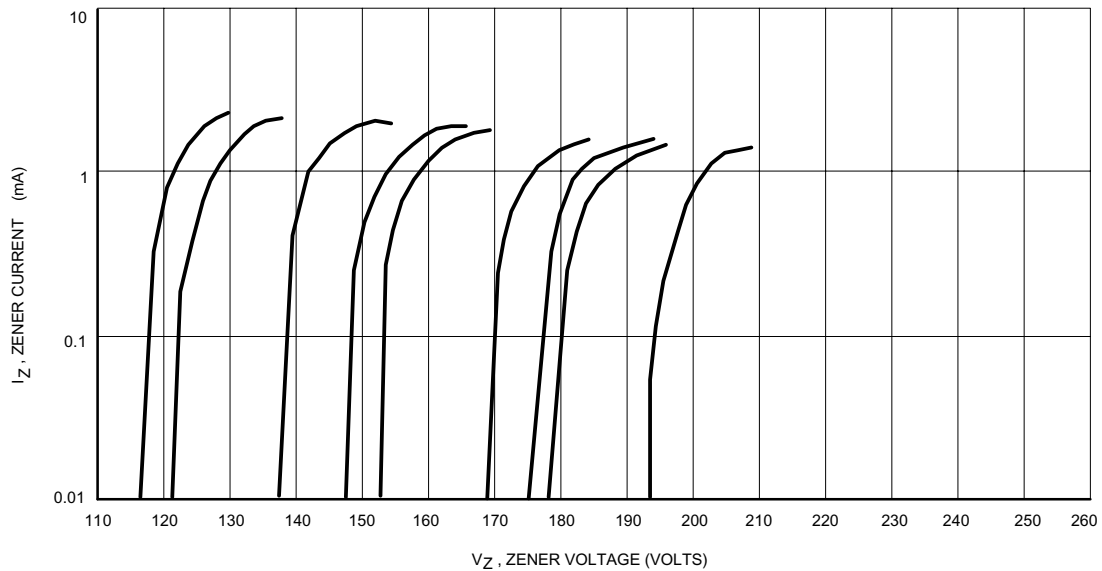
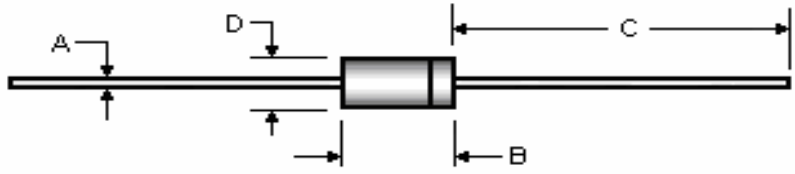


Figure 14. Zener Voltage versus Zener Current - $V_Z = 110$ thru 220 Volts

PACKAGE OUTLINE AND DIMENSIONS

BZX55C Series

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.