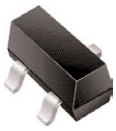
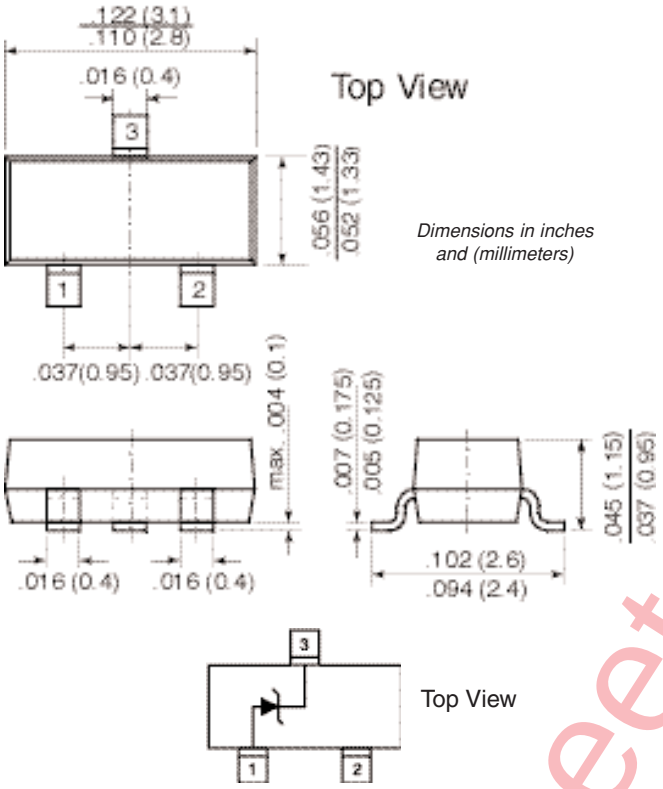
Zener Diodes

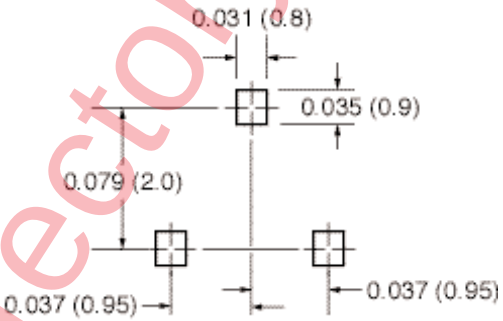


Vz Range 2.4 to 75V
Power Dissipation 300mW

TO-236AB (SOT-23)



Mounting Pad Layout



Features

- Silicon Planar Power Zener Diodes
- The Zener voltages are graded according to the international E 24 standard. Standard Zener voltage tolerance is ±5%. Replace “C” with “B” for ±2% tolerance. Other voltage tolerances and other Zener voltages are available upon request.
- These diodes are also available in other case styles and other configurations including: the SOD-123 case with type designation BZT52 series, the dual zener diode common anode configuration in the SOT-23 case with type designation AZ23 series and the dual zener diode common cathode configuration in the SOT-23 case with type designation DZ23 series.

Mechanical Data

Case: SOT-23 Plastic Package

Weight: Approx. 0.008g

Packaging Codes/Options:
E8/10K per 13” reel (8mm tape), 30K box
E9/3K per 7” reel (8mm tape), 30K box

Maximum Ratings and Thermal Characteristics (T_A = 25°C unless otherwise noted)

Parameter	Symbol	Value	Unit
Zener Current	I_{ZM}	250	mA
Power Dissipation at T_{amb} = 25°C	P_{tot}	300(1)	mW
Thermal Resistance Junction to Ambient Air	$R_{\Theta JA}$	420(1)	°C/W
Junction Temperature	T_j	150	°C
Storage Temperature Range	T_S	–65 to +150	°C

Notes: (1) Device on fiberglass substrate, see layout.

Electrical Characteristics (T_A = 25°C unless otherwise noted) Maximum V_F = 0.9V at I_F = 10mA

Type y = C for 5% y = B for 2%	Dynamic Resistance at I_{ZT1} r_{zj} (Ω)	Temp. Coefficient of Zener Voltage at I_{ZT1} α_{VZ} (10^{-4}/°C)	Test Current I_{ZT1} (mA)	Dynamic Resistance at I_{ZT2} r_{zj} (Ω)	Test Current I_{ZT2} (mA)	Reverse Leakage Current I_R (μA)	 at V_R (V)
BZX84-y1V8	<100	–9.0 ... –4.0	5	< 600	1.0	<120	0.5
BZX84-y2V0	<100	–9.0 ... –4.0	5	< 600	1.0	<120	0.5
BZX84-y2V2	<100	–9.0 ... –4.0	5	< 600	1.0	<120	0.7
BZX84-y2V4	70 (≤100)	–9.0 … –4.0	5	275	1.0	50	1.0
BZX84-y2V7	75 (≤100)	–9.0 … –4.0	5	300 (≤600)	1.0	20	1.0
BZX84-y3	80 (≤95)	–9.0 … –3.0	5	325 (≤600)	1.0	10	1.0
BZX84-y3V3	85 (≤95)	–8.0 … –3.0	5	350 (≤600)	1.0	5.0	1.0
BZX84-y3V6	85 (≤90)	–8.0 … –3.0	5	375 (≤600)	1.0	5.0	1.0
BZX84-y3V9	85 (≤90)	–7.0 … –3.0	5	400 (≤600)	1.0	3.0	1.0
BZX84-y4V3	80 (≤90)	–6.0 … –1.0	5	410 (≤600)	1.0	3.0	1.0
BZX84-y4V7	50 (≤80)	–5.0 … +2.0	5	425 (≤500)	1.0	3.0	2.0
BZX84-y5V1	40 (≤60)	–3.0. … +4.0	5	400 (≤480)	1.0	2.0	2.0
BZX84-y5V6	15 (≤40)	–2.0 … +6.0	5	80 (≤400)	1.0	1.0	2.0
BZX84-y6V2	6.0 (≤10)	–1.0 … +7.0	5	40 (≤150)	1.0	3.0	4.0
BZX84-y6V8	6.0 (≤15)	+2.0 … +7.0	5	30 (≤80)	1.0	2.0	4.0
BZX84-y7V5	6.0 (≤15)	+3.0 … +7.0	5	30 (≤80)	1.0	1.0	5.0
BZX84-y8V2	6.0 (≤15)	+4.0 … +7.0	5	40 (≤80)	1.0	0.7	5.0
BZX84-y9V1	6.0 (≤15)	+5.0 … +8.0	5	40 (≤100)	1.0	0.5	6.0
BZX84-y10	8.0 (≤20)	+5.0 … +8.0	5	50 (≤150)	1.0	0.2	7.0
BZX84-y11	10 (≤20)	+5.0 … +9.0	5	50 (≤150)	1.0	0.1	8.0
BZX84-y12	10 (≤25)	+6.0 … +9.0	5	50 (≤150)	1.0	0.1	8.0
BZX84-y13	10 (≤30)	+7.0 … +9.0	5	50 (≤170)	1.0	0.1	8.0
BZX84-y15	10 (≤30)	+7.0 … +9.0	5	50 (≤200)	1.0	0.05	0.7 $V_{Znom.}$
BZX84-y16	10 (≤40)	+8.0 … +9.5	5	50 (≤200)	1.0	0.05	0.7 $V_{Znom.}$
BZX84-y18	10 (≤45)	+8.0 … +9.5	5	50 (≤225)	1.0	0.05	0.7 $V_{Znom.}$
BZX84-y20	15 (≤55)	+8.0 … +10	5	60 (≤225)	1.0	0.05	0.7 $V_{Znom.}$
BZX84-y22	20 (≤55)	+8.0 … +10	5	60 (≤250)	1.0	0.05	0.7 $V_{Znom.}$
BZX84-y24	25 (≤70)	+8.0 … +10	5	60 (≤250)	1.0	0.05	0.7 $V_{Znom.}$
BZX84-y27	25 (≤80)	+8.0 … +10	2	65 (≤300)	0.5	0.05	0.7 $V_{Znom.}$
BZX84-y30	30 (≤80)	+8.0 … +10	2	70 (≤300)	0.5	0.05	0.7 $V_{Znom.}$
BZX84-y33	35 (≤80)	+8.0 … +10	2	75 (≤325)	0.5	0.05	0.7 $V_{Znom.}$
BZX84-y36	35 (≤90)	+8.0 … +10	2	80 (≤350)	0.5	0.05	0.7 $V_{Znom.}$
BZX84-y39	40 (≤130)	+10 … +12	2	80 (≤350)	0.5	0.05	0.7 $V_{Znom.}$
BZX84-y43	45 (≤150)	+10 … +12	2	85 (≤375)	0.5	0.05	0.7 $V_{Znom.}$
BZX84-y47	50 (≤170)	+10 … +12	2	85 (≤375)	0.5	0.05	0.7 $V_{Znom.}$
BZX84-y51	60 (≤180)	+10 … +12	2	85 (≤400)	0.5	0.05	0.7 $V_{Znom.}$
BZX84-y56	70 (≤200)	+9.0 … +11	2	100 (≤425)	0.5	0.05	0.7 $V_{Znom.}$
BZX84-y62	80 (≤215)	+9.0 … +12	2	100 (≤450)	0.5	0.05	0.7 $V_{Znom.}$
BZX84-y68	90 (≤240)	+10 … +12	2	150 (≤475)	0.5	0.05	0.7 $V_{Znom.}$
BZX84-y75	95 (≤255)	+10 … +12	2	170 (≤500)	0.5	0.05	0.7 $V_{Znom.}$

Electrical Characteristics (T_A = 25°C unless otherwise noted) Maximum V_F = 0.9V at I_F = 10mA

Type ± 5% Tol.	Marking Code	Zener Voltage range[1] at I_{ZT1} V_Z (V) min.	max.	Test Current I_{ZT1} (mA)
BZX84-C1V8	TBD	1.70	2.00	5
BZX84-C2V0	TBD	1.90	2.20	5
BZX84-C2V2	TBD	2.10	2.40	5
BZX84-C2V4	Z11	2.20	2.60	5
BZX84-C2V7	Z12	2.50	2.90	5
BZX84-C3	Z13	2.80	3.20	5
BZX84-C3V3	Z14	3.10	3.50	5
BZX84-C3V6	Z15	3.40	3.80	5
BZX84-C3V9	Z16	3.70	4.10	5
BZX84-C4V3	Z17	4.00	4.60	5
BZX84-C4V7	Z1	4.40	5.00	5
BZX84-C5V1	Z2	4.80	5.40	5
BZX84-C5V6	Z3	5.20	6.00	5
BZX84-C6V2	Z4	5.80	6.60	5
BZX84-C6V8	Z5	6.40	7.20	5
BZX84-C7V5	Z6	7.00	7.90	5
BZX84-C8V2	Z7	7.70	8.70	5
BZX84-C9V1	Z8	8.50	9.60	5
BZX84-C10	Z9	9.4	10.6	5
BZX84-C11	Y1	10.4	11.6	5
BZX84-C12	Y2	11.4	12.7	5
BZX84-C13	Y3	12.4	14.1	5
BZX84-C15	Y4	13.8	15.6	5
BZX84-C16	Y5	15.3	17.1	5
BZX84-C18	Y6	16.8	19.1	5
BZX84-C20	Y7	18.8	21.2	5
BZX84-C22	Y8	20.8	23.3	5
BZX84-C24	Y9	22.8	25.6	5
BZX84-C27	Y10	25.1	28.9	2
BZX84-C30	Y11	28.0	32.0	2
BZX84-C33	Y12	31.0	35.0	2
BZX84-C36	Y13	34.0	38.0	2
BZX84-C39	Y14	37.0	41.0	2
BZX84-C43	Y15	40.0	46.0	2
BZX84-C47	Y16	44.0	50.0	2
BZX84-C51	Y17	48.0	54.0	2
BZX84-C56	Y18	52.0	60.0	2
BZX84-C62	Y19	58.0	66.0	2
BZX84-C68	Y20	64.0	72.0	2
BZX84-C75	Y21	70.0	79.0	2

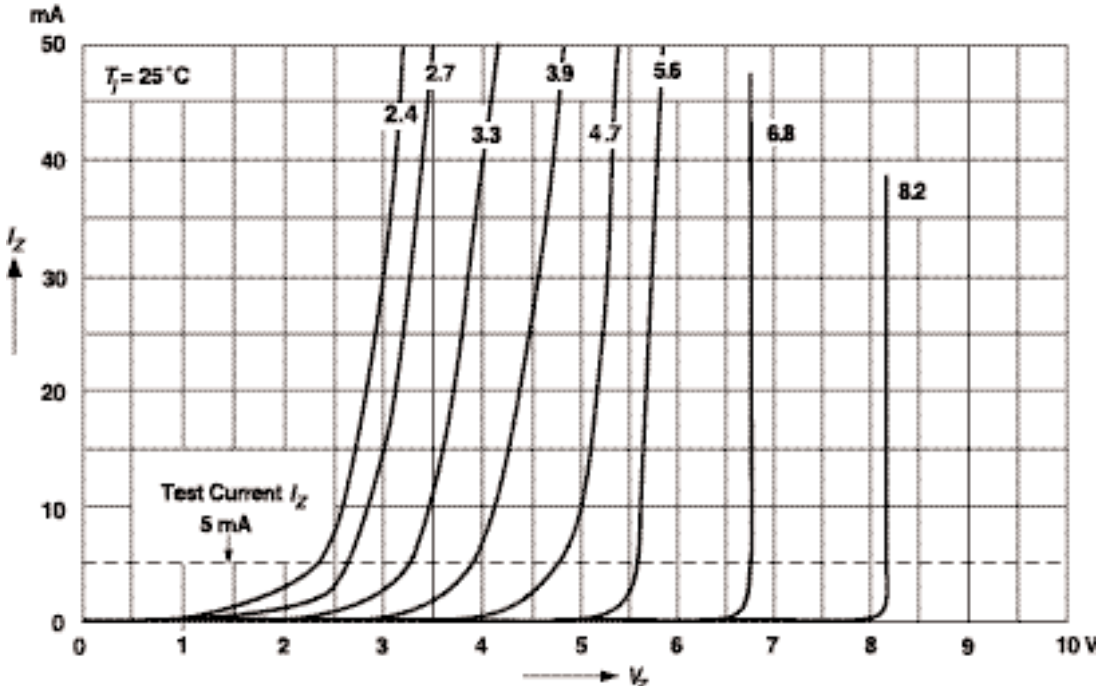
Type ± 2% Tol.	Marking Code	Zener Voltage range[1] at I_{ZT1} V_Z (V) min.	max.	Test Current I_{ZT1} (mA)
BZX84-B1V8	TBD	1.80	1.90	5
BZX84-B2V0	TBD	2.01	2.09	5
BZX84-B2V2	TBD	2.21	2.30	5
BZX84-B2V4	Z50	2.35	2.45	5
BZX84-B2V7	Z51	2.65	2.75	5
BZX84-B3	Z52	2.94	3.06	5
BZX84-B3V3	Z53	3.23	3.37	5
BZX84-B3V6	Z54	3.53	3.67	5
BZX84-B3V9	Z55	3.82	3.98	5
BZX84-B4V3	Z56	4.21	4.39	5
BZX84-B4V7	Z57	4.61	4.79	5
BZX84-B5V1	Z58	5.00	5.20	5
BZX84-B5V6	Z59	5.49	5.71	5
BZX84-B6V2	Z60	6.08	6.32	5
BZX84-B6V8	Z61	6.66	6.94	5
BZX84-B7V5	Z62	7.35	7.65	5
BZX84-B8V2	Z63	8.04	8.36	5
BZX84-B9V1	Z64	8.92	9.28	5
BZX84-B10	Z65	9.80	10.2	5
BZX84-B11	Z66	10.8	11.2	5
BZX84-B12	Z67	11.8	12.2	5
BZX84-B13	Z68	12.7	13.3	5
BZX84-B15	Z69	14.7	15.3	5
BZX84-B16	Z70	15.7	16.3	5
BZX84-B18	Z71	17.6	18.4	5
BZX84-B20	Z72	19.6	20.4	5
BZX84-B22	Z73	21.6	22.4	5
BZX84-B24	Z74	23.5	24.5	5
BZX84-B27	Z75	26.5	27.5	2
BZX84-B30	Z76	29.4	30.6	2
BZX84-B33	Z77	32.3	33.7	2
BZX84-B36	Z78	35.3	36.7	2
BZX84-B39	Z79	38.2	39.8	2
BZX84-B43	Z80	42.1	43.9	2
BZX84-B47	Z81	46.1	47.9	2
BZX84-B51	Z82	50.0	52.0	2
BZX84-B56	Z83	54.9	57.1	2
BZX84-B62	Z84	60.8	63.2	2
BZX84-B68	Z85	66.6	69.4	2
BZX84-B75	Z86	73.5	76.5	2

Notes: (1) Measured with pulses t_p = 5 ms

Ratings and Characteristic Curves (TA = 25°C unless otherwise noted)

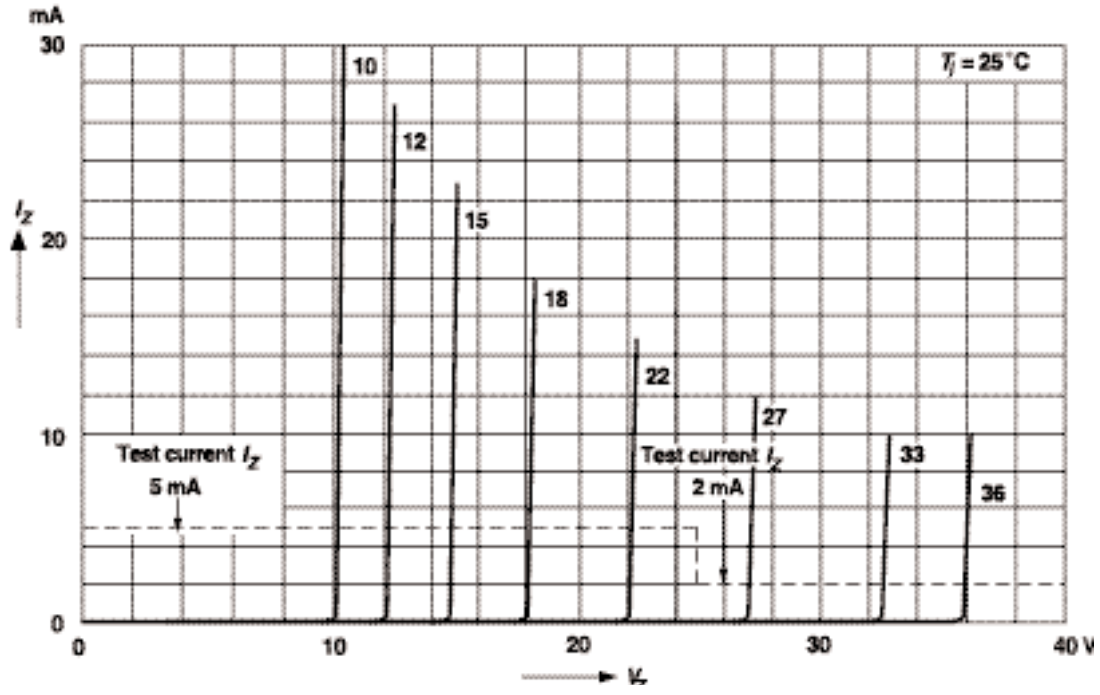
Breakdown characteristics

T_j = constant (pulsed)



Breakdown characteristics

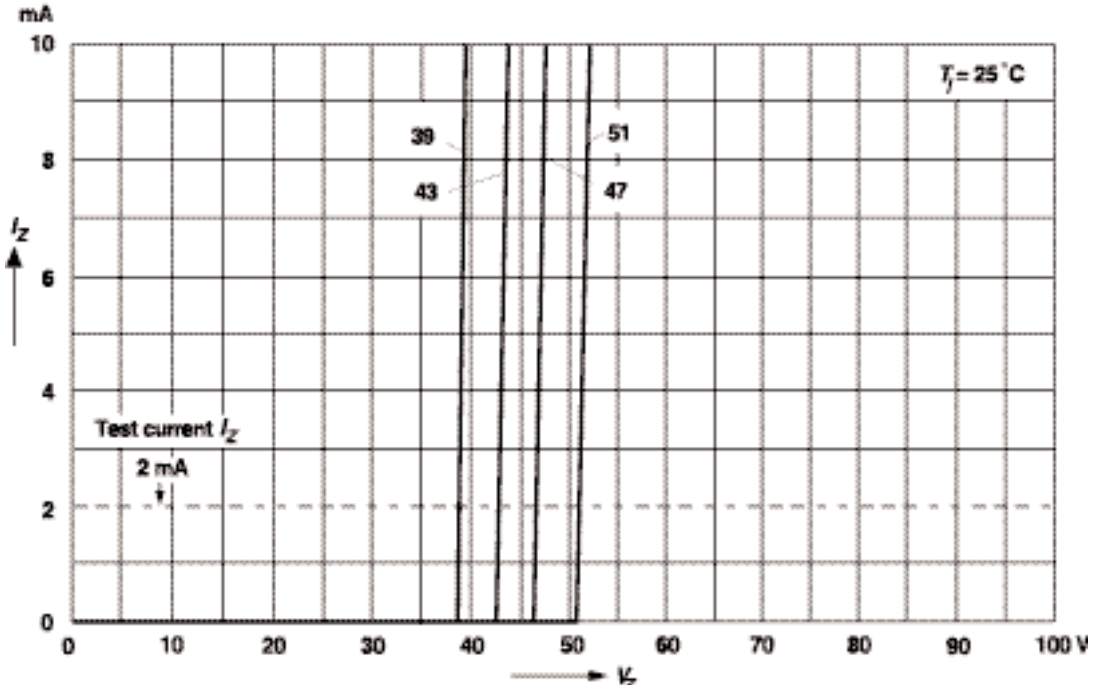
T_j = constant (pulsed)



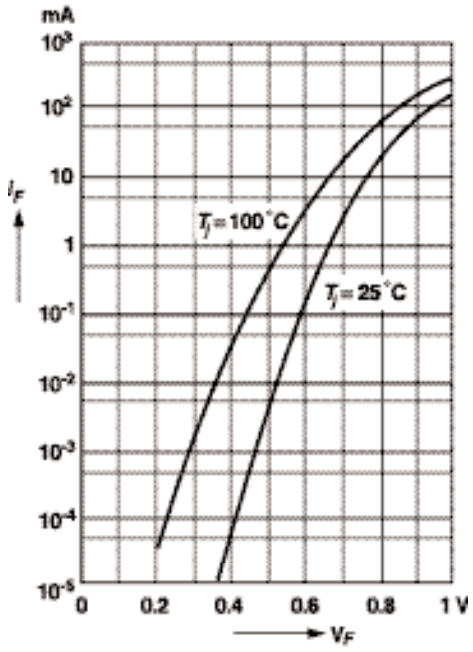
Ratings and Characteristic Curves (T_A = 25°C unless otherwise noted)

Breakdown characteristics

T_j = constant (pulsed)

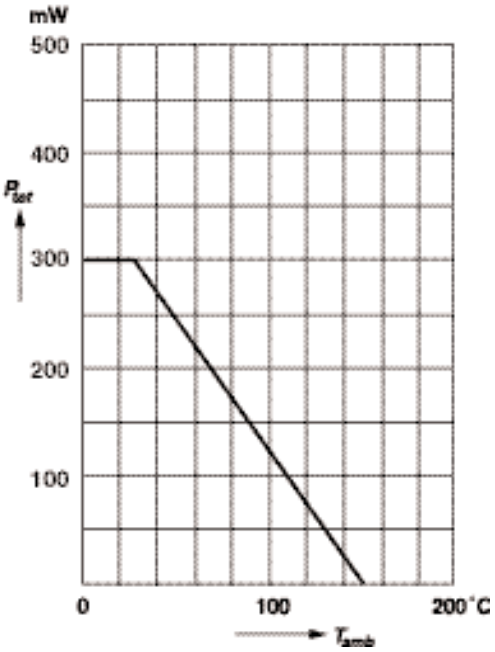


Forward characteristics



Admissible power dissipation versus ambient temperature

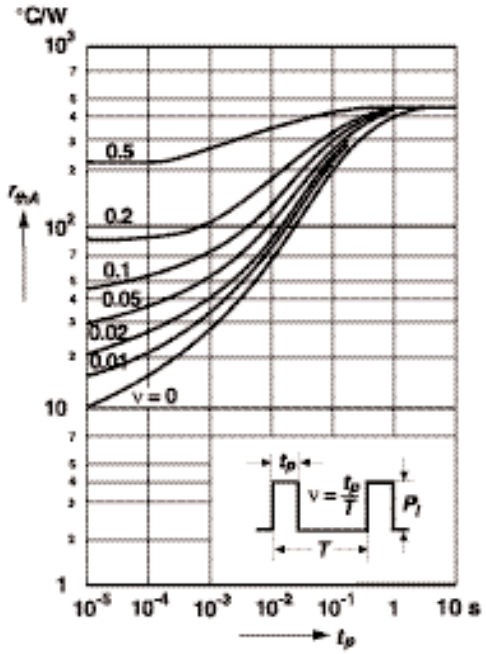
For conditions, see footnote in table "Absolute Maximum Ratings"



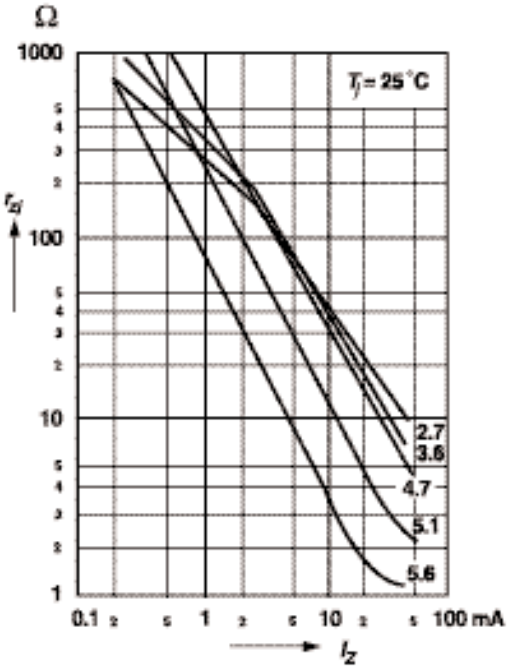
Ratings and Characteristic Curves (TA = 25°C unless otherwise noted)

Pulse thermal resistance versus pulse duration

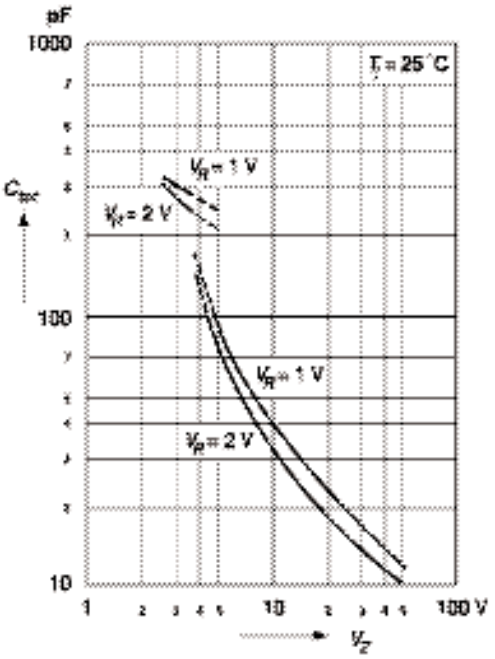
For conditions, see footnote in table "Absolute Maximum Ratings"



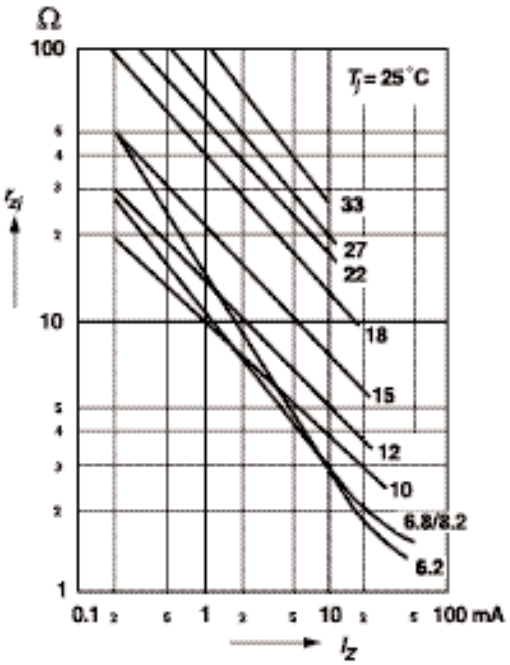
Dynamic resistance versus Zener current



Capacitance versus Zener voltage

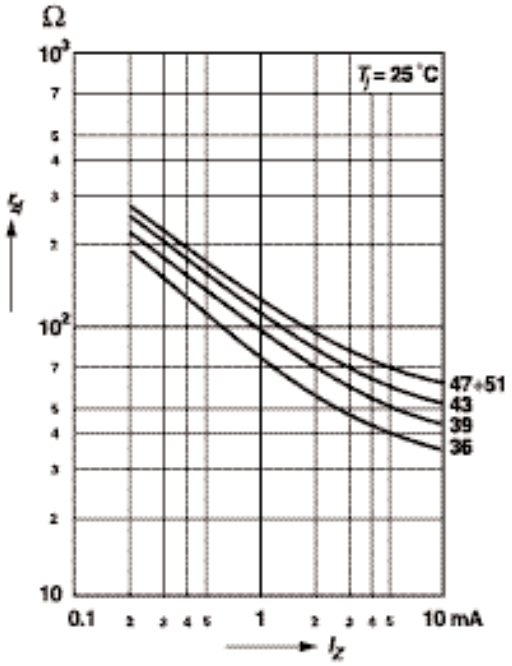


Dynamic resistance versus Zener current

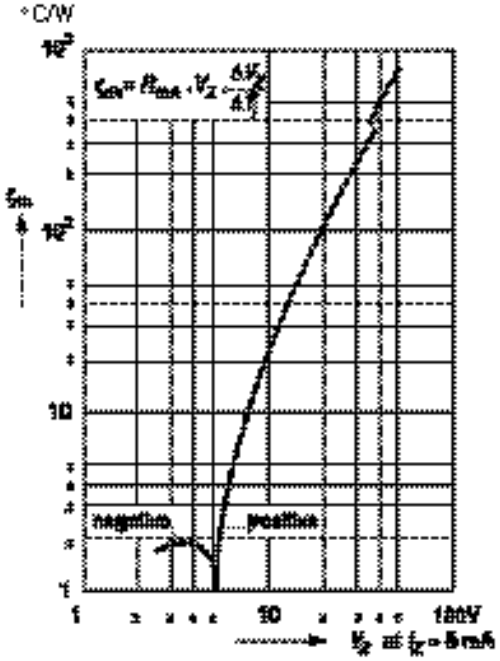


Ratings and Characteristic Curves (TA = 25°C unless otherwise noted)

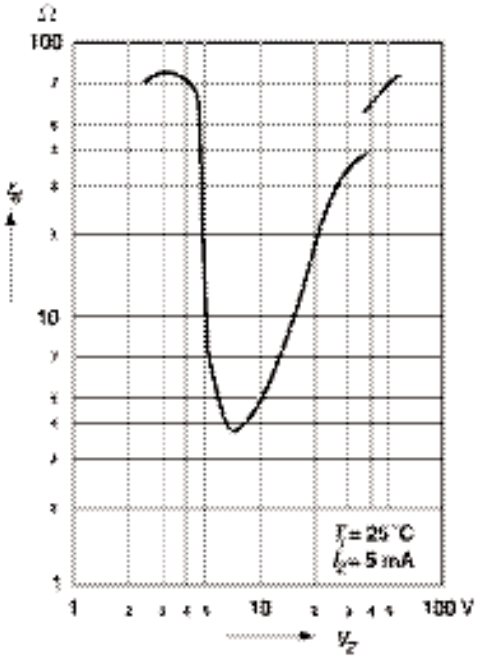
Dynamic resistance versus Zener current



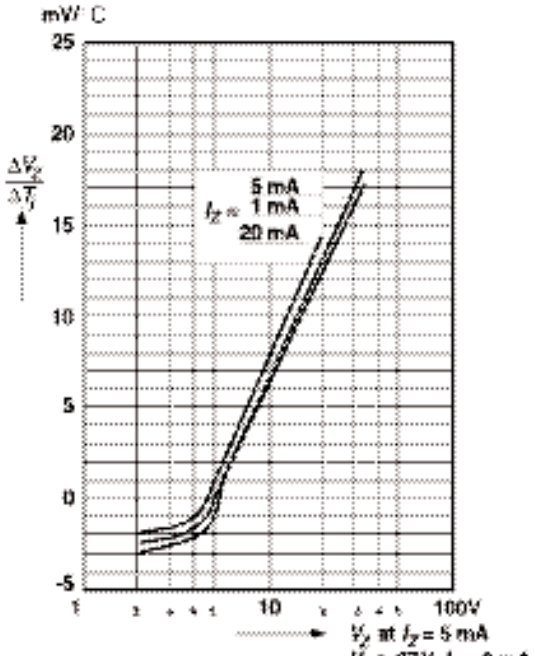
Thermal differential resistance versus Zener voltage



Dynamic resistance versus Zener voltage

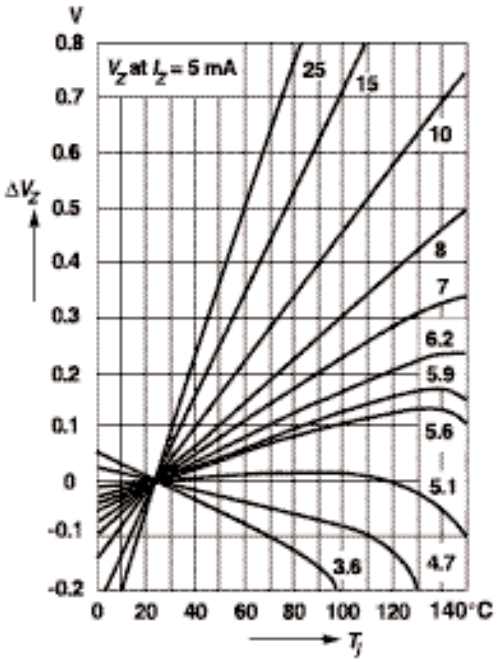


Temperature dependence of Zener voltage versus Zener voltage

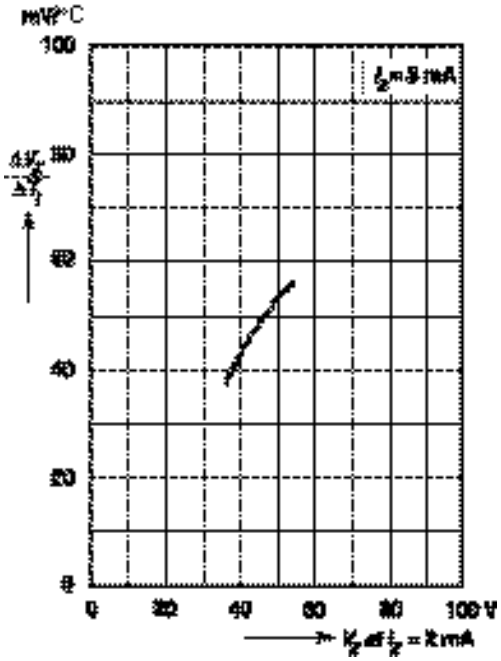


Ratings and Characteristic Curves (TA = 25°C unless otherwise noted)

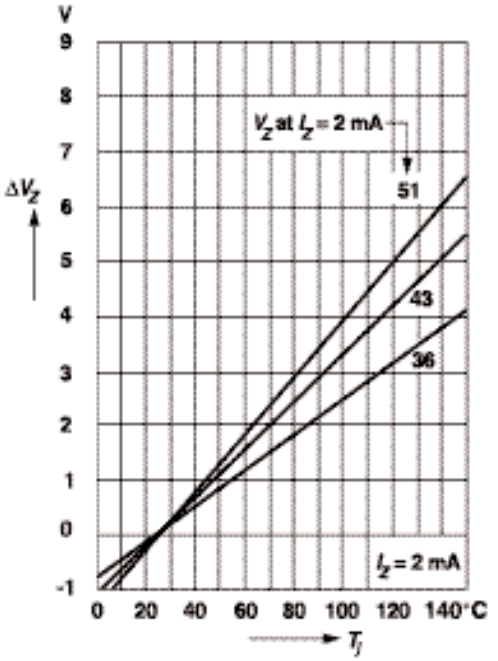
Change of Zener voltage versus junction temperature



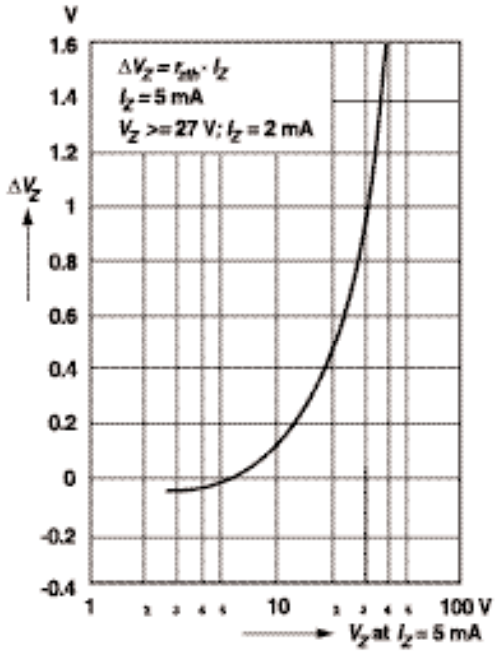
Temperature dependence of Zener voltage versus Zener voltage



Change of Zener voltage versus junction temperature

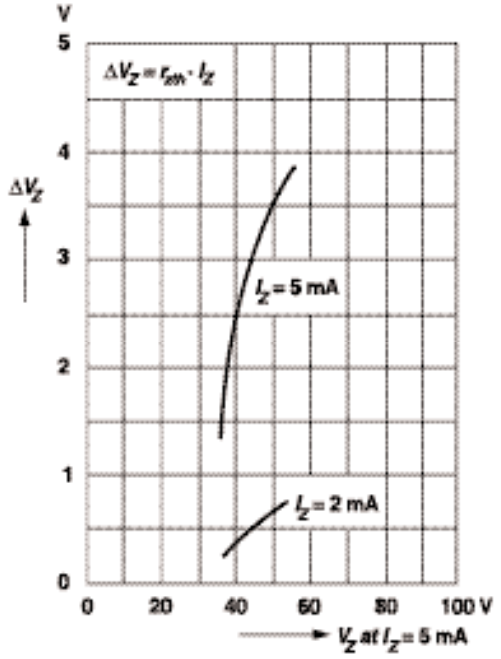


Change of Zener voltage from turn-on up to the point of thermal equilibrium versus Zener voltage

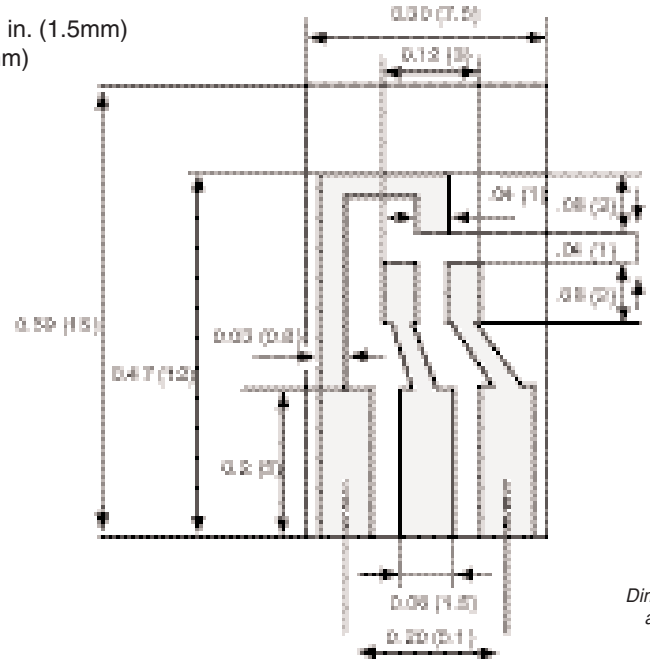


Ratings and Characteristic Curves (TA = 25°C unless otherwise noted)

Change of Zener voltage from turn-on up to the point of thermal equilibrium versus Zener voltage



Layout for $R_{\Theta JA}$ test
Thickness: Fiberglass 0.059 in. (1.5mm)
Copper leads 0.012 in. (0.3mm)



Dimensions in inches and (millimeters)