

BZX384B2V4 THRU BZX384B75**List**

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BZX384B2V4 THRU BZX384B75

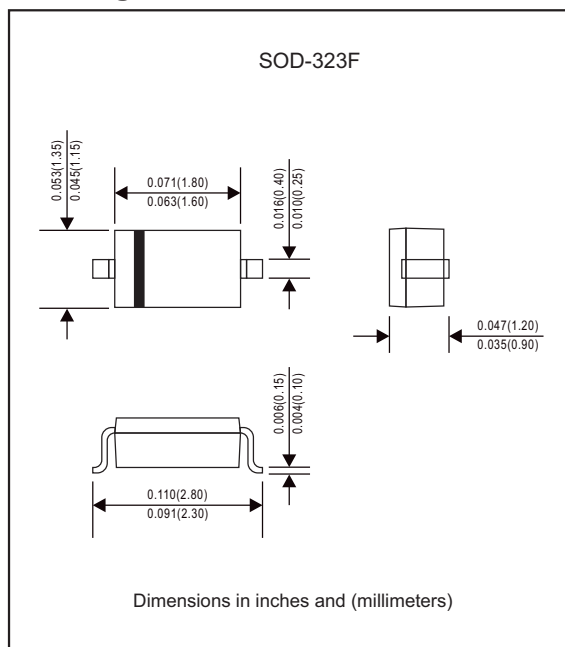
**200mW Surface Mount Zener
Diodes 2.4V-75V**

Features

- Silicon planar Zener diodes.
- High demand voltage range (2.4V-75V).
- This is a Pb-Free device.
- Lead-free parts meet environmental standards of MIL-STD-19500 /228
- Suffix "-H" indicates Halogen-free part, ex.BZX384B2V4-H.

Mechanical data

- Epoxy:UL94-VO rated flame retardant
- Case : Molded plastic, SOD-323F
- Terminals : Solder plated, solderable per MIL-STD-750, Method 2026
- Polarity : Indicated by cathode band
- Mounting Position : Any
- Weight : Approximated 0.004 gram

Package outline**Maximum ratings** (at $T_A=25^{\circ}\text{C}$ unless otherwise noted)

PARAMETER	CONDITIONS	Symbol	MIN.	TYP.	MAX.	UNIT
Forward Voltage	@ $I_F = 10\text{mA}$ @ $I_F = 100\text{mA}$	V_F			0.9 1.1	mW
Power Dissipation	Mounted on FR-4 board.	P_D			200	mW
Thermal Resistance from Junction to Ambient		$R_{\theta JA}$			625	mW
Operating junction temperature range		T_J	-55		+150	$^{\circ}\text{C}$
Storage temperature range		T_{STG}	-55		+150	$^{\circ}\text{C}$

BZX384B2V4 THRU BZX384B75**Electrical characteristics** (at $T_A=25^{\circ}\text{C}$ unless otherwise noted)

Part No.	Marking code	Zener voltage			Test current		Leakage current		Dynamic resistance		Temperature coefficient of Zener Voltage	
		V _Z @ I _{ZT1}			I _{ZT1}	I _{ZT2}	I _R	V _R	Z _{zT} at I _{ZT1}	Z _{zK} at I _{ZT2}	αV_Z at I _{ZT1} 10 ⁻⁴ /°C	
		Min.(V)	Nom.(V)	Max.(V)	mA		Max.(μA)	Volts	Typ.(Ω)	Typ.(Ω)	Min.	Max.
BZX384B2V4	C1	2.35	2.4	2.45	5	1	50.0	1.0	70(≤ 100)	275(≤ 600)	- 9	- 4
BZX384B2V7	C2	2.65	2.7	2.75	5	1	20.0	1.0	75(≤ 100)	300(≤ 600)	- 9	- 4
BZX384B3V0	C3	2.94	3.0	3.06	5	1	10.0	1.0	80(≤ 95)	325(≤ 600)	- 9	- 3
BZX384B3V3	C4	3.23	3.3	3.37	5	1	5.0	1.0	85(≤ 95)	350(≤ 600)	- 8	- 3
BZX384B3V6	C5	3.53	3.6	3.67	5	1	5.0	1.0	85(≤ 90)	375(≤ 600)	- 8	- 3
BZX384B3V9	C6	3.82	3.9	3.98	5	1	3.0	1.0	85(≤ 90)	400(≤ 600)	- 7	- 3
BZX384B4V3	C7	4.21	4.3	4.39	5	1	3.0	1.0	80(≤ 90)	410(≤ 600)	- 6	- 1
BZX384B4V7	C8	4.61	4.7	4.79	5	1	3.0	2.0	50(≤ 80)	425(≤ 500)	- 5	2
BZX384B5V1	C9	5.0	5.1	5.2	5	1	2.0	2.0	40(≤ 60)	400(≤ 480)	- 3	4
BZX384B5V6	CA	5.49	5.6	5.71	5	1	1.0	2.0	15(≤ 40)	80(≤ 400)	- 2	6
BZX384B6V2	CB	6.08	6.2	6.32	5	1	3.0	4.0	6(≤ 10)	40(≤ 150)	- 1	7
BZX384B6V8	CC	6.66	6.8	6.94	5	1	2.0	4.0	6(≤ 15)	30(≤ 80)	2	7
BZX384B7V5	CD	7.35	7.5	7.65	5	1	1.0	5.0	6(≤ 15)	30(≤ 80)	3	7
BZX384B8V2	CE	8.04	8.2	8.36	5	1	0.7	5.0	6(≤ 15)	40(≤ 80)	4	7
BZX384B9V1	CF	8.92	9.1	9.28	5	1	0.5	6.0	6(≤ 15)	40(≤ 100)	5	8
BZX384B10	CG	9.8	10	10.2	5	1	0.2	7.0	8(≤ 20)	50(≤ 150)	5	8
BZX384B11	CH	10.8	11	11.2	5	1	0.1	8.0	10(≤ 20)	50(≤ 150)	5	9
BZX384B12	CI	11.8	12	12.2	5	1	0.1	8.0	10(≤ 25)	50(≤ 150)	6	9
BZX384B13	CK	12.7	13	13.3	5	1	0.1	8.0	10(≤ 30)	50(≤ 170)	7	9
BZX384B15	CL	14.7	15	15.3	5	1	0.05	10.5	10(≤ 30)	50(≤ 200)	7	9
BZX384B16	CM	15.7	16	16.3	5	1	0.05	11.2	10(≤ 40)	50(≤ 200)	8	9.5
BZX384B18	CN	17.6	18	18.4	5	1	0.05	12.6	10(≤ 45)	50(≤ 225)	8	9.5
BZX384B20	CO	19.6	20	20.4	5	1	0.05	14.0	15(≤ 55)	60(≤ 250)	8	10
BZX384B22	CP	21.6	22	22.4	5	1	0.05	15.4	20(≤ 55)	60(≤ 250)	8	10
BZX384B24	CR	23.5	24	24.5	5	1	0.05	16.8	25(≤ 70)	60(≤ 250)	8	10
BZX384B27	CS	26.5	27	27.5	2	0.5	0.05	18.9	25(≤ 80)	65(≤ 300)	8	10
BZX384B30	CT	29.4	30	30.6	2	0.5	0.05	21.0	30(≤ 80)	70(≤ 300)	8	10
BZX384B33	CU	32.3	33	33.7	2	0.5	0.05	23.1	35(≤ 80)	75(≤ 325)	8	10
BZX384B36	CW	35.3	36	36.7	2	0.5	0.05	25.2	35(≤ 90)	80(≤ 350)	8	10
BZX384B39	CX	38.2	39	39.8	2	0.5	0.05	27.3	40(≤ 130)	80(≤ 350)	10	12
BZX384B43	CY	42.1	43	43.9	2	0.5	0.05	30.1	45(≤ 150)	85(≤ 375)	10	12
BZX384B47	CZ	46.1	47	47.9	2	0.5	0.05	32.9	50(≤ 170)	85(≤ 375)	10	12
BZX384B51	D1	50	51	52	2	0.5	0.05	35.7	60(≤ 180)	85(≤ 400)	8	10
BZX384B56	D2	54.9	56	57.1	2	0.5	0.05	39.2	70(≤ 200)	100(≤ 425)	10	12
BZX384B62	D3	60.8	62	63.2	2	0.5	0.05	43.4	80(≤ 215)	100(≤ 450)	10	12
BZX384B68	D4	66.6	68	69.4	2	0.5	0.05	47.6	90(≤ 240)	150(≤ 475)	10	12
BZX384B75	D5	73.5	75	76.5	2	0.5	0.05	52.5	95(≤ 255)	170(≤ 500)	10	12

Rating and characteristic curves (BZX384B2V4 THRU BZX384B75)

Fig.1 FORWARD CHARACTERISTICS

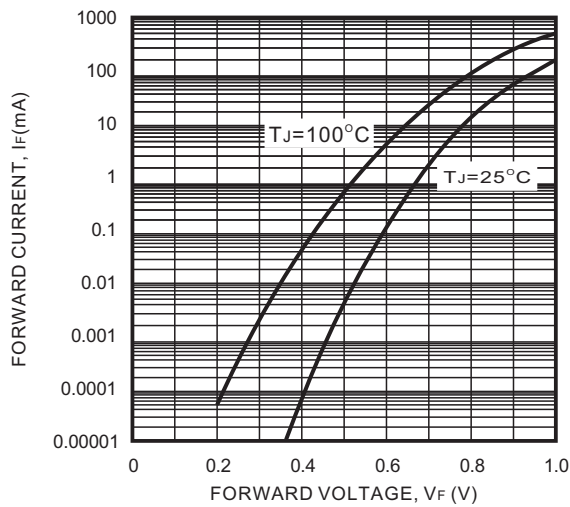


Fig.2 DERATING CURVE

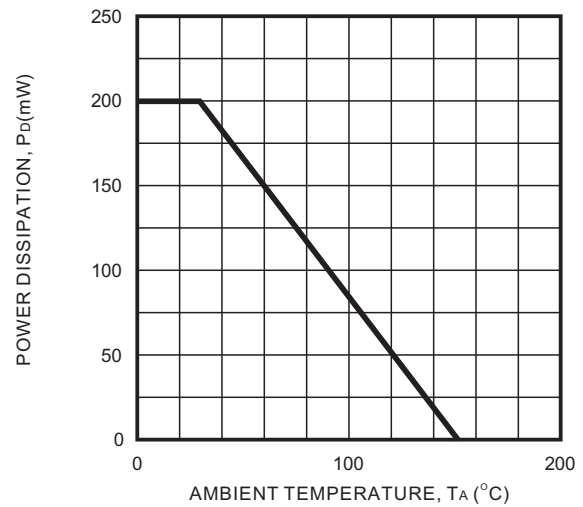


Fig.3 DYNAMIC RESISTANCE V.S. ZENER CURRENT

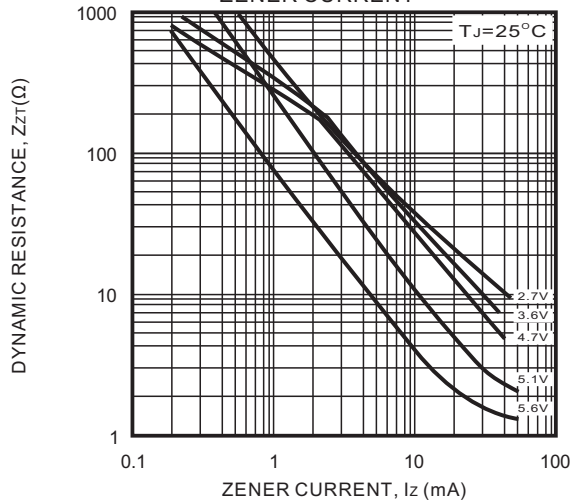


Fig.4 DYNAMIC RESISTANCE V.S. ZENER CURRENT

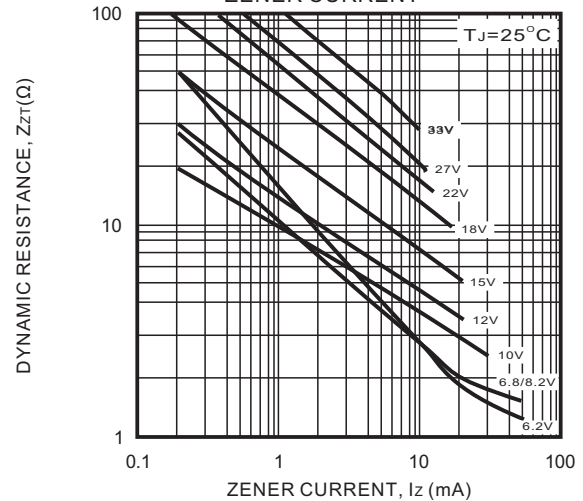


Fig.5 DYNAMIC RESISTANCE V.S. ZENER CURRENT

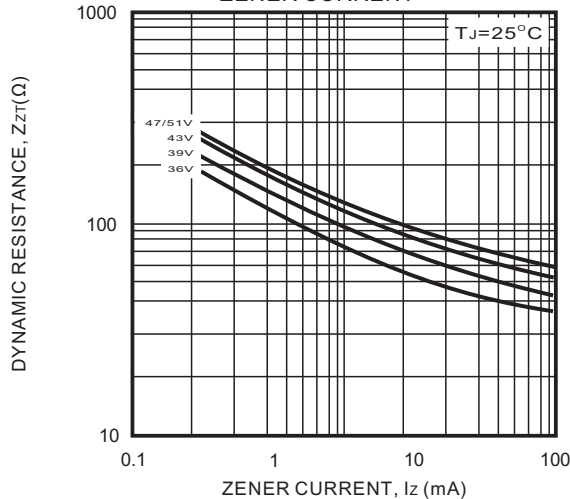
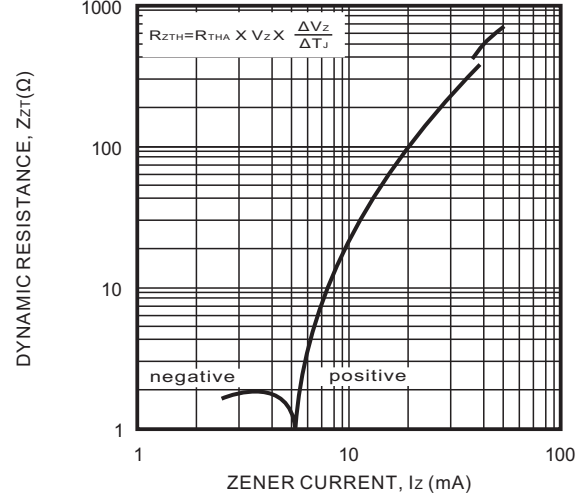


Fig.6 THERMAL DIFFERENTIAL RESISTANCE V.S. ZENER VOLTAGE



Rating and characteristic curves (BZX384B2V4 THRU BZX384B75)

Fig.7 THERMAL DIFFERENTIAL RESISTANCE V.S. ZENER VOLTAGE

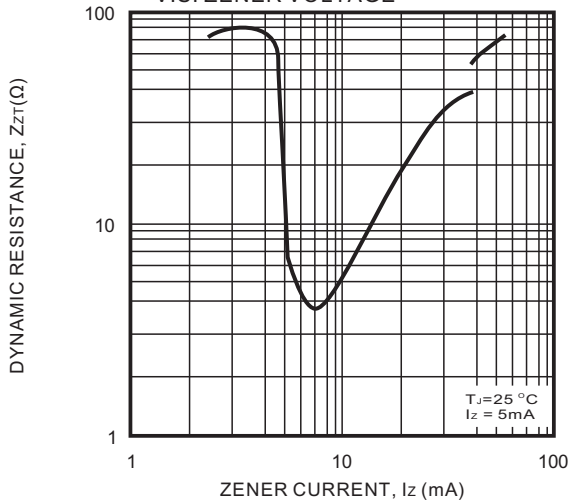


Fig.8 TEMPERATURE DEPENDENCE OF ZENER VOLTAGE V.S. ZENER VOLTAGE

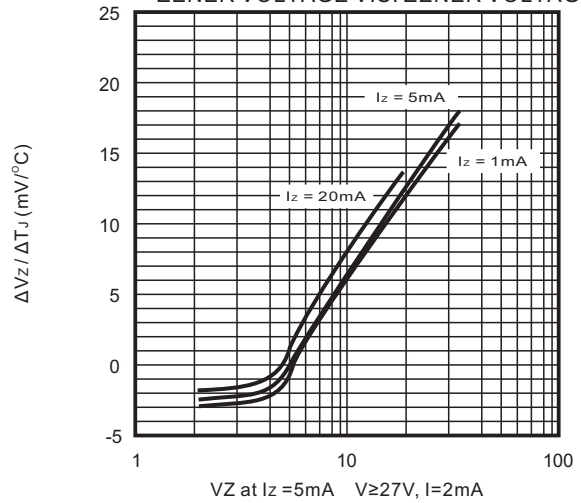


Fig.9 CHANGE OF ZENER VOLTAGE V.S. JUNCTION TEMPERATURE

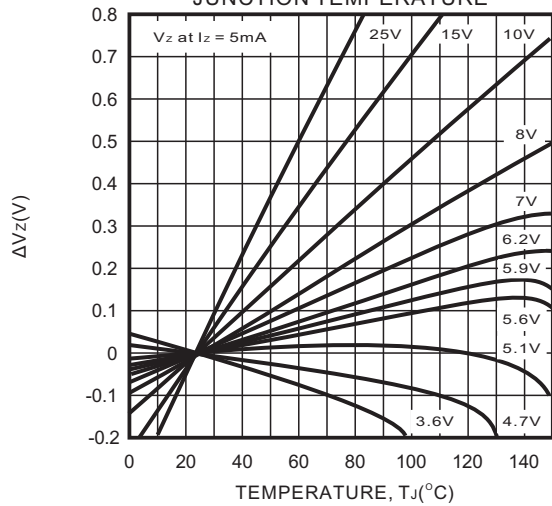


Fig.10 CHANGE OF ZENER VOLTAGE V.S. JUNCTION TEMPERATURE

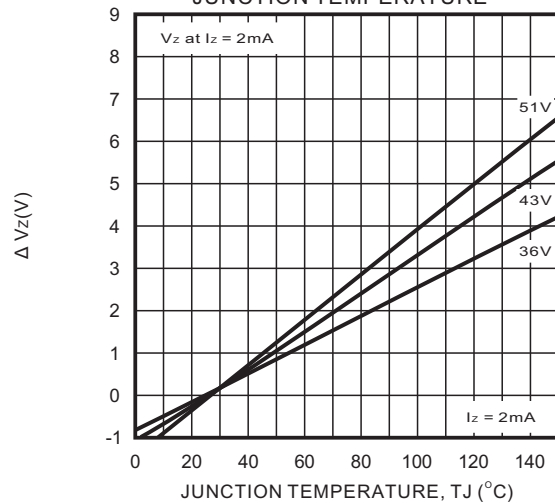


Fig.11 TEMPERATURE DEPENDENCE OF ZENER VOLTAGE V.S. ZENER VOLTAGE

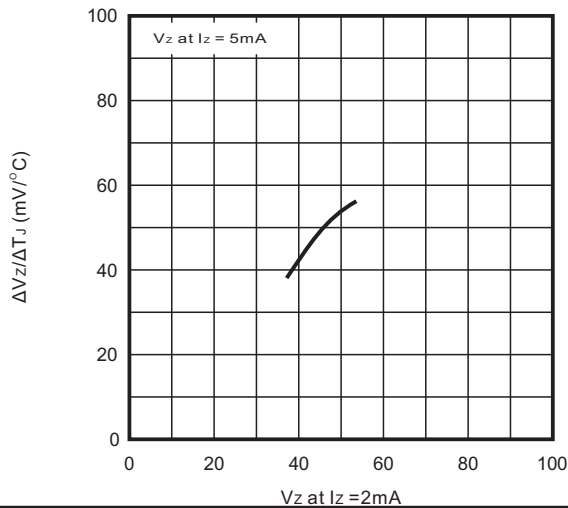
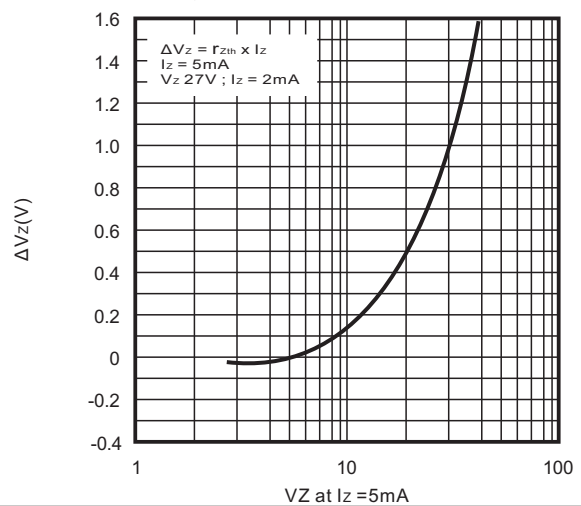


Fig.12 CHANGE OF ZENER VOLTAGE TURN-ON UP TO THE POINT OF THERMAL EQUILIBRIUM V.S. ZENER VOLTAGE



Rating and characteristic curves (BZX384B2V4 THRU BZX384B75)

Fig.13 CHANGE OF ZENER VOLTAGE FROM TURN-ON
UP TO THE POINT OF THERMAL
EQUILIBRIUM V.S. ZENER VOLTAGE

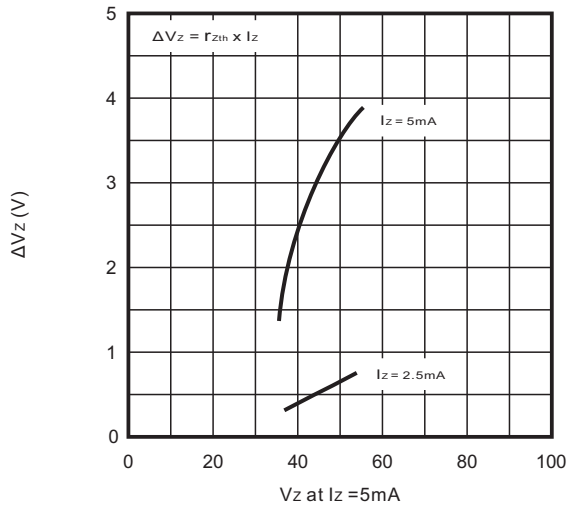


Fig.14 ZENER VOLTAGE CHARACTERISTICS

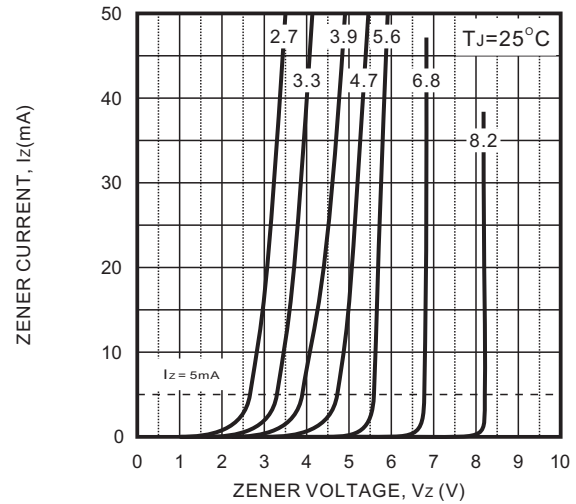


Fig.15 ZENER VOLTAGE CHARACTERISTICS

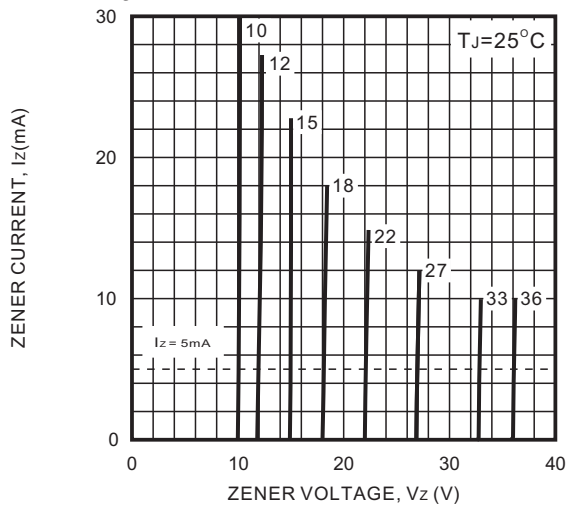
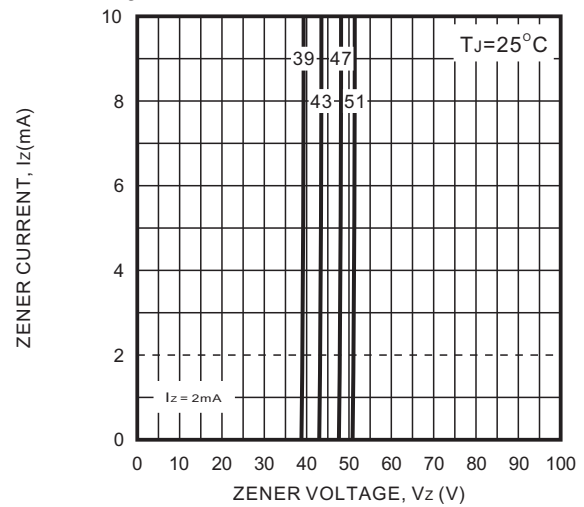


Fig.16 ZENER VOLTAGE CHARACTERISTICS

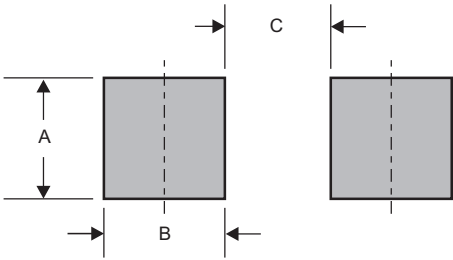


BZX384B2V4 THRU BZX384B75

Pinning information

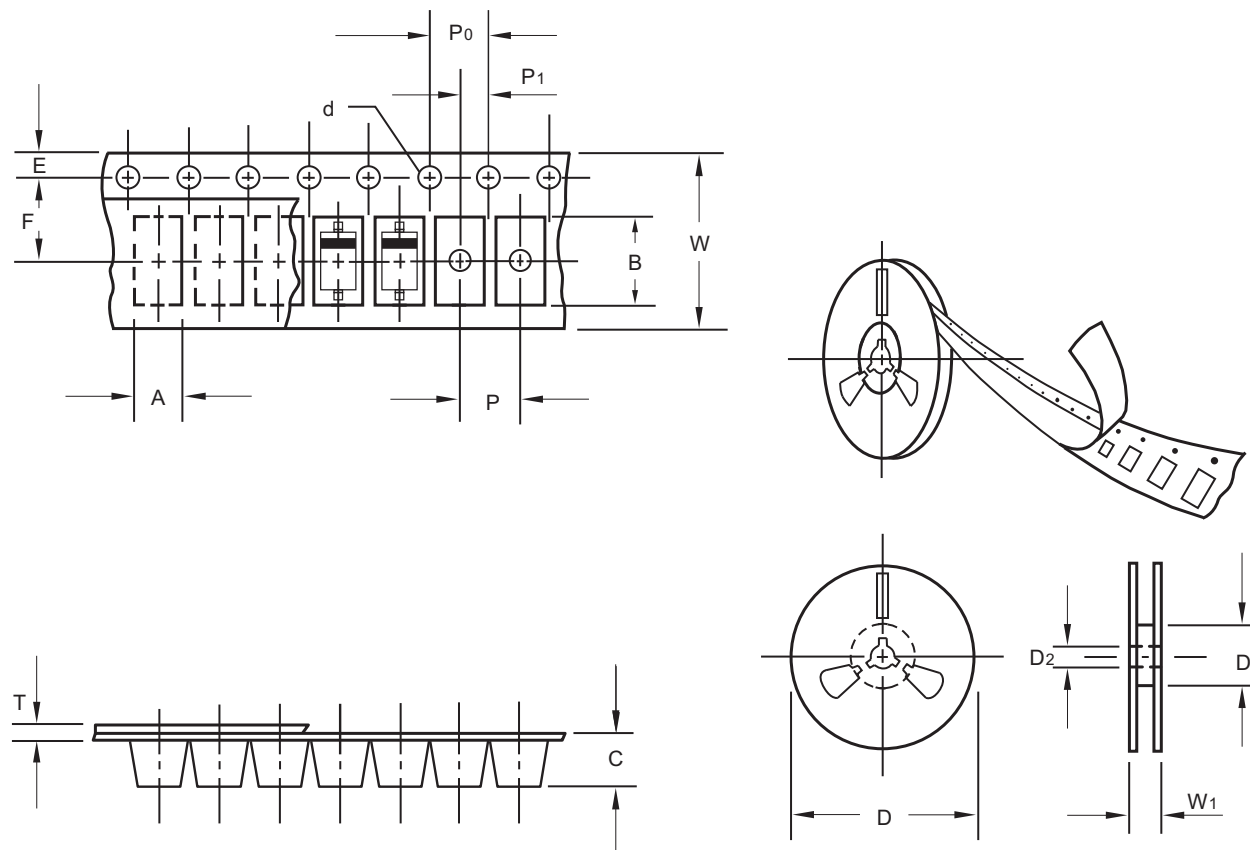
Pin	Simplified outline	Symbol
Pin1 cathode Pin2 anode		

Suggested solder pad layout



Dimensions in inches and (millimeters)

PACKAGE	A	B	C
SOD-323F	0.033 (0.83)	0.025 (0.63)	0.063 (1.60)

BZX384B2V4 THRU BZX384B75**Packing information**

unit:mm

Item	Symbol	Tolerance	SOD-323F
Carrier width	A	0.1	1.46
Carrier length	B	0.1	2.95
Carrier depth	C	0.1	1.25
Sprocket hole	d	0.1	1.50
13" Reel outside diameter	D	2.0	-
13" Reel inner diameter	D1	min	-
7" Reel outside diameter	D	2.0	178.00
7" Reel inner diameter	D1	min	62.00
Feed hole diameter	D2	0.5	13.00
Sprocket hole position	E	0.1	1.75
Punch hole position	F	0.1	3.50
Punch hole pitch	P	0.1	4.00
Sprocket hole pitch	P0	0.1	4.00
Embossment center	P1	0.1	2.00
Overall tape thickness	T	0.1	0.23
Tape width	W	0.3	8.00
Reel width	W1	1.0	11.40

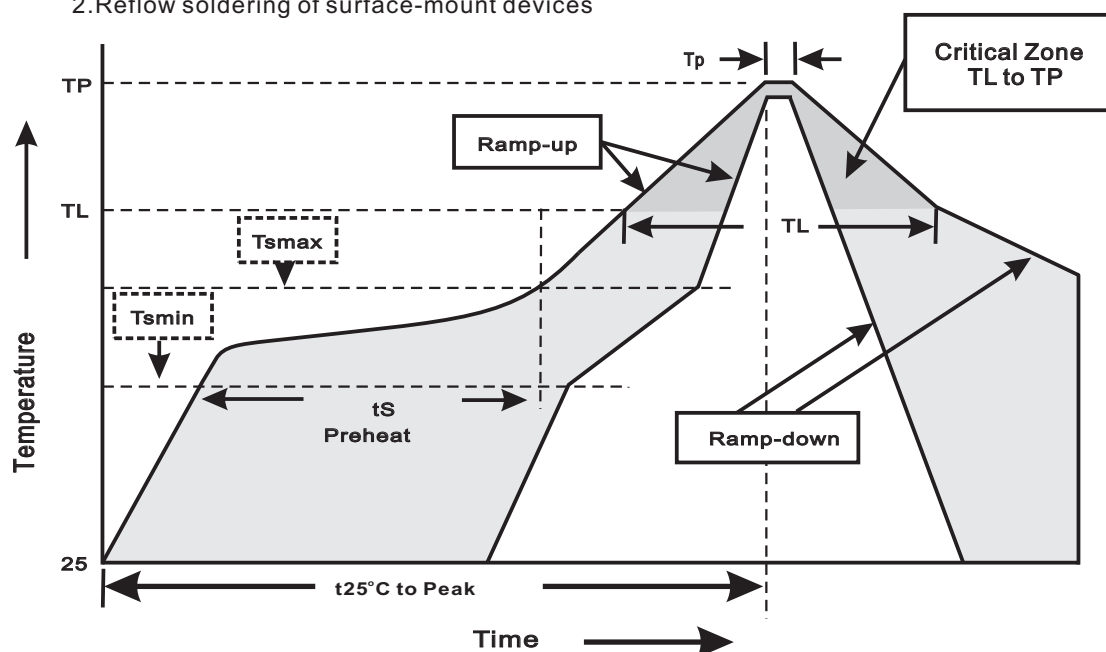
Note: Devices are packed in accordance with EIA standard RS-481-A and specifications listed above.

BZX384B2V4 THRU BZX384B75**Reel packing**

PACKAGE	REEL SIZE	REEL (pcs)	COMPONENT SPACING (m/m)	BOX (pcs)	INNER BOX (m/m)	REEL DIA, (m/m)	CARTON SIZE (m/m)	CARTON (pcs)	APPROX. GROSS WEIGHT (kg)
SOD-323F	7"	3,000	4.0	30,000	183*123*183	178	382*257*387	240,000	8.0

Suggested thermal profiles for soldering processes

- 1.Storage environment: Temperature=5°C~40°C Humidity=55%±25%
- 2.Reflow soldering of surface-mount devices

**3.Reflow soldering**

Profile Feature	Soldering Condition
Average ramp-up rate(T _L to T _P)	<3°C/sec
Preheat -Temperature Min(T _{smmin}) -Temperature Max(T _{smmax}) -Time(min to max)(t _s)	150°C 200°C 60~120sec
T _{smmax} to T _L -Ramp-upRate	<3°C/sec
Time maintained above: -Temperature(T _L) -Time(t _L)	217°C 60~260sec
Peak Temperature(T _P)	255°C-0/+5°C
Time within 5°C of actual Peak Temperature(t _P)	10~30sec
Ramp-down Rate	<6°C/sec
Time 25°C to Peak Temperature	<6minutes

BZX384B2V4 THRU BZX384B75**High reliability test capabilities**

Item Test	Conditions	Reference
1. Solder Resistance	at $260 \pm 5^\circ\text{C}$ for 10 ± 2 sec. immerse body into solder $1/16'' \pm 1/32''$	MIL-STD-750D METHOD-2031
2. Solderability	at $245 \pm 5^\circ\text{C}$ for 5 sec.	MIL-STD-202F METHOD-208
3. High Temperature Reverse Bias	$V_R = 80\%$ rate at $T_J = 150^\circ\text{C}$ for 168 hrs.	MIL-STD-750D METHOD-1038
4. Pressure Cooker	$15P_{SIG}$ at $T_A = 121^\circ\text{C}$ for 4 hrs.	JESD22-A102
5. Temperature Cycling	-55°C to $+125^\circ\text{C}$ dwelled for 30 min. and transferred for 5min. total 10 cycles.	MIL-STD-750D METHOD-1051
6. Thermal Shock	0°C for 5 min. rise to 100°C for 5 min. total 10 cycles.	MIL-STD-750D METHOD-1056
7. Humidity	at $T_A = 85^\circ\text{C}$, RH=85% for 1000hrs.	MIL-STD-750D METHOD-1021
8. High Temperature Storage Life	at 150°C for 1000 hrs.	MIL-STD-750D METHOD-1031