

BZX384C2V4-Q1 THRU BZX384C75-Q1**List**

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BZX384C2V4-Q1 THRU BZX384C75-Q1

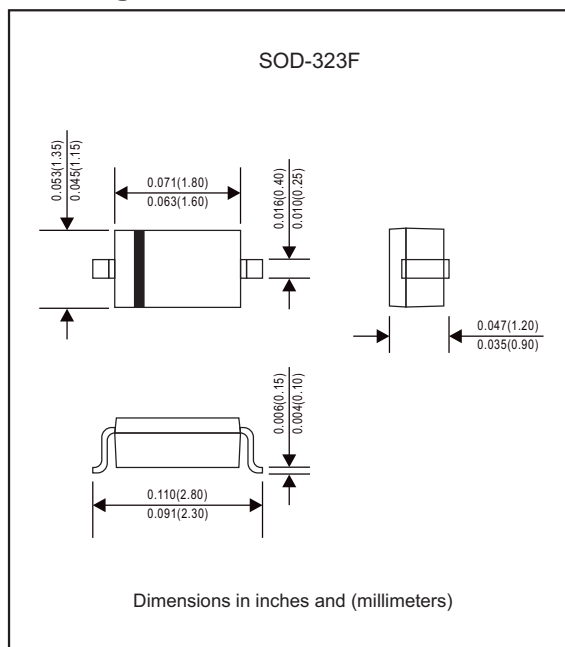
**200mW Surface Mount
Zener Diodes 2.4V-75V**

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
- Qualified to AEC-Q101 standards for high reliability.
- Suffix "-H" indicates Halogen-free part, ex.BZX384C2V4-Q1-H.

Mechanical data

- Epoxy:UL94-VO rated flame retardant
- Case : Molded plastic, SOD-323FL
- 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	$^{\circ}\text{C}$

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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 _{TT} at I _{ZT1}	Z _{TK} 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.
BZX384C2V4-Q1	W1	2.2	2.4	2.6	5	1	50.0	1.0	70(≤ 100)	275	- 9	- 4
BZX384C2V7-Q1	W2	2.5	2.7	2.9	5	1	20.0	1.0	75(≤ 100)	300(≤ 600)	- 9	- 4
BZX384C3V0-Q1	W3	2.8	3.0	3.2	5	1	10.0	1.0	80(≤ 95)	325(≤ 600)	- 9	- 3
BZX384C3V3-Q1	W4	3.1	3.3	3.5	5	1	5.0	1.0	85(≤ 95)	350(≤ 600)	- 8	- 3
BZX384C3V6-Q1	W5	3.4	3.6	3.8	5	1	5.0	1.0	85(≤ 90)	375(≤ 600)	- 8	- 3
BZX384C3V9-Q1	W6	3.7	3.9	4.1	5	1	3.0	1.0	85(≤ 90)	400(≤ 600)	- 7	- 3
BZX384C4V3-Q1	W7	4.0	4.3	4.6	5	1	3.0	1.0	80(≤ 90)	410(≤ 600)	- 6	- 1
BZX384C4V7-Q1	W8	4.4	4.7	5.0	5	1	3.0	2.0	50(≤ 80)	425(≤ 500)	- 5	2
BZX384C5V1-Q1	W9	4.8	5.1	5.4	5	1	2.0	2.0	40(≤ 60)	400(≤ 480)	- 3	4
BZX384C5V6-Q1	WA	5.2	5.6	6.0	5	1	1.0	2.0	15(≤ 40)	80(≤ 400)	- 2	6
BZX384C6V2-Q1	WB	5.8	6.2	6.6	5	1	3.0	4.0	6(≤ 10)	40(≤ 150)	- 1	7
BZX384C6V8-Q1	WC	6.4	6.8	7.2	5	1	2.0	4.0	6(≤ 15)	30(≤ 80)	2	7
BZX384C7V5-Q1	WD	7.0	7.5	7.9	5	1	1.0	5.0	6(≤ 15)	30(≤ 80)	3	7
BZX384C8V2-Q1	WE	7.7	8.2	8.7	5	1	0.7	5.0	6(≤ 15)	40(≤ 80)	4	7
BZX384C9V1-Q1	WF	8.5	9.1	9.6	5	1	0.5	6.0	6(≤ 15)	40(≤ 100)	5	8
BZX384C10-Q1	WG	9.4	10	10.6	5	1	0.2	7.0	8(≤ 20)	50(≤ 150)	5	8
BZX384C11-Q1	WH	10.4	11	11.6	5	1	0.1	8.0	10(≤ 20)	50(≤ 150)	5	9
BZX384C12-Q1	WI	11.4	12	12.7	5	1	0.1	8.0	10(≤ 25)	50(≤ 150)	6	9
BZX384C13-Q1	WK	12.4	13	14.1	5	1	0.1	8.0	10(≤ 30)	50(≤ 170)	7	9
BZX384C15-Q1	WL	13.8	15	15.6	5	1	0.05	10.5	10(≤ 30)	50(≤ 200)	7	9
BZX384C16-Q1	WM	15.3	16	17.1	5	1	0.05	11.2	10(≤ 40)	50(≤ 200)	8	9.5
BZX384C18-Q1	WN	16.8	18	19.1	5	1	0.05	12.6	10(≤ 45)	50(≤ 225)	8	9.5
BZX384C20-Q1	WO	18.8	20	21.2	5	1	0.05	14.0	15(≤ 55)	60(≤ 250)	8	10
BZX384C22-Q1	WP	20.8	22	23.2	5	1	0.05	15.4	20(≤ 55)	60(≤ 250)	8	10
BZX384C24-Q1	WR	22.8	24	25.6	5	1	0.05	16.8	25(≤ 70)	60(≤ 250)	8	10
BZX384C27-Q1	WS	25.1	27	28.9	2	0.5	0.05	18.9	25(≤ 80)	65(≤ 300)	8	10
BZX384C30-Q1	WT	28	30	32	2	0.5	0.05	21.0	30(≤ 80)	70(≤ 300)	8	10
BZX384C33-Q1	WU	31	33	35	2	0.5	0.05	23.1	35(≤ 80)	75(≤ 325)	8	10
BZX384C36-Q1	WW	34	36	38	2	0.5	0.05	25.2	35(≤ 90)	80(≤ 350)	8	10
BZX384C39-Q1	WX	37	39	41	2	0.5	0.05	27.3	40(≤ 130)	80(≤ 350)	10	12
BZX384C43-Q1	WY	40	43	46	2	0.5	0.05	30.1	45(≤ 150)	85(≤ 375)	10	12
BZX384C47-Q1	WZ	44	47	50	2	0.5	0.05	32.9	50(≤ 170)	85(≤ 375)	10	12
BZX384C51-Q1	X1	48	51	54	2	0.5	0.05	35.7	60(≤ 180)	85(≤ 400)	8	10
BZX384C56-Q1	X2	52	56	60	2	0.5	0.05	39.2	70(≤ 200)	100(≤ 425)	10	12
BZX384C62-Q1	X3	58	62	66	2	0.5	0.05	43.4	80(≤ 215)	100(≤ 450)	10	12
BZX384C68-Q1	X4	64	68	72	2	0.5	0.05	47.6	90(≤ 240)	150(≤ 475)	10	12
BZX384C75-Q1	X5	70	75	79	2	0.5	0.05	52.5	95(≤ 255)	170(≤ 500)	10	12

Rating and characteristic curves (BZX384C2V4-Q1 THRU BZX384C75-Q1)

Fig.1 FORWARD CHARACTERISTICS

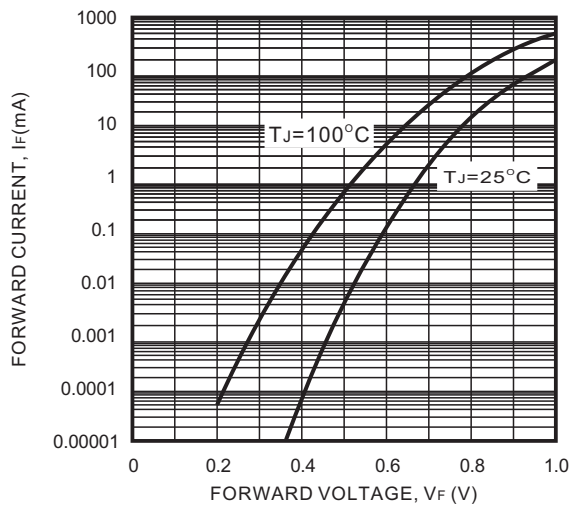


Fig.2 DERATING CURVE

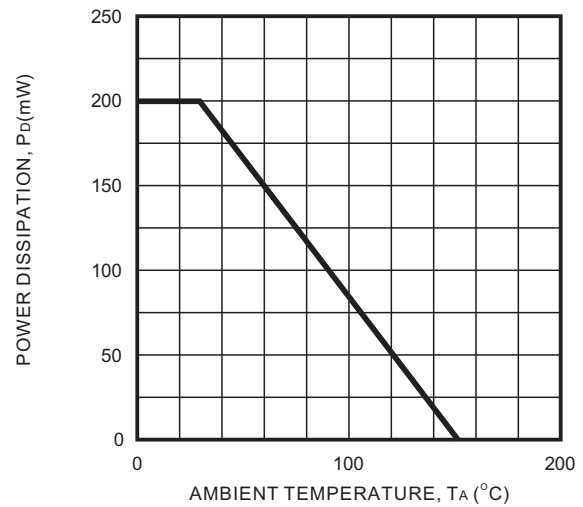


Fig.3 DYNAMIC RESISTANCE V.S. ZENER CURRENT

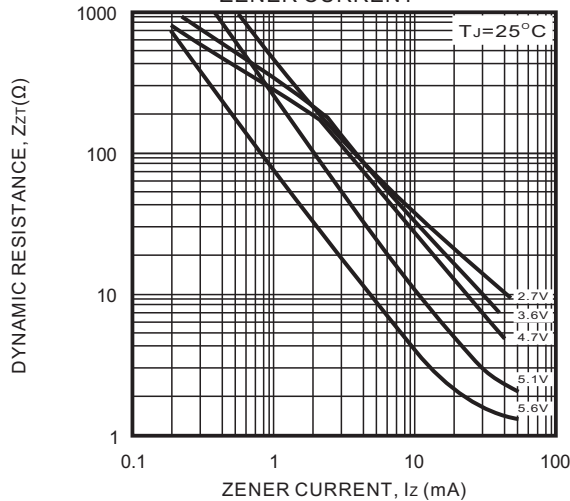


Fig.4 DYNAMIC RESISTANCE V.S. ZENER CURRENT

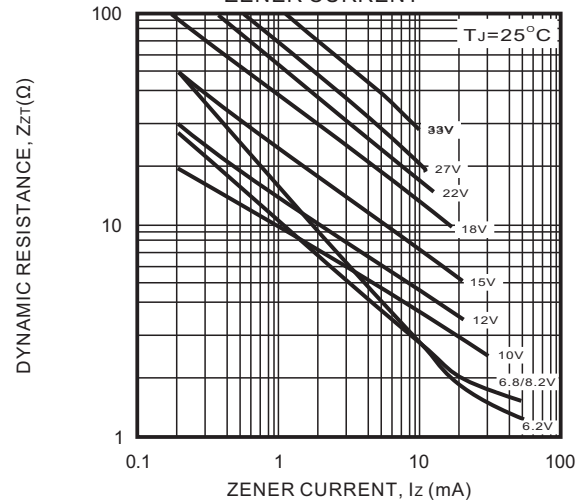


Fig.5 DYNAMIC RESISTANCE V.S. ZENER CURRENT

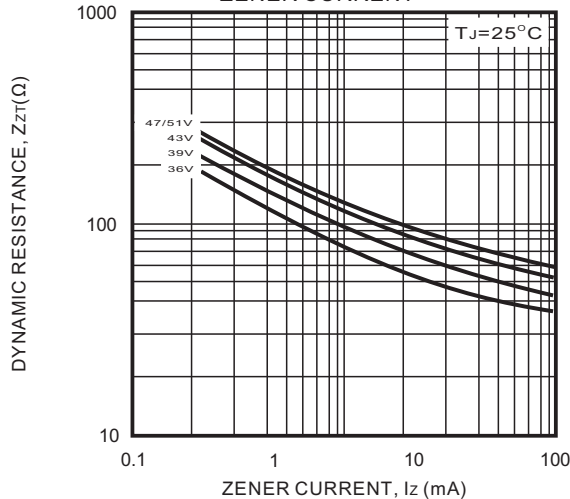
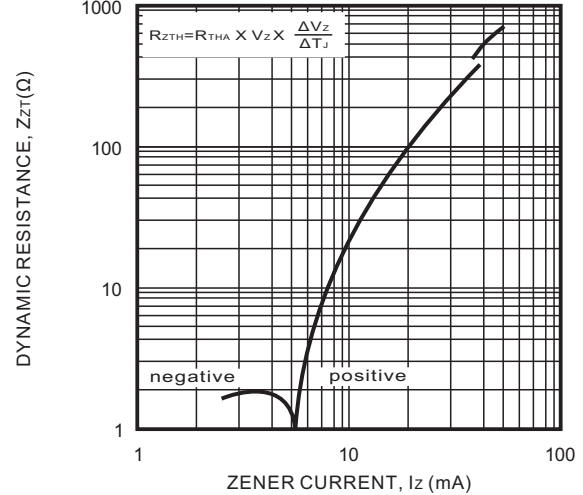


Fig.6 THERMAL DIFFERENTIAL RESISTANCE V.S. ZENER VOLTAGE



Rating and characteristic curves (BZX384C2V4-Q1 THRU BZX384C75-Q1)

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

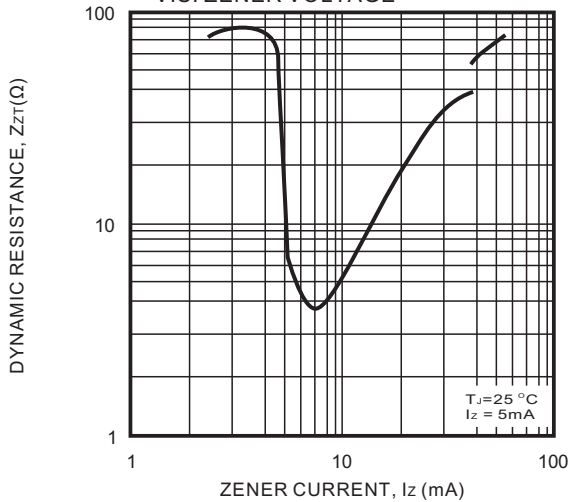


Fig.8 TEMPERATURE DEPENDENCE OF ZENER VOLTAGE V.S. ZENER VOLTAGE

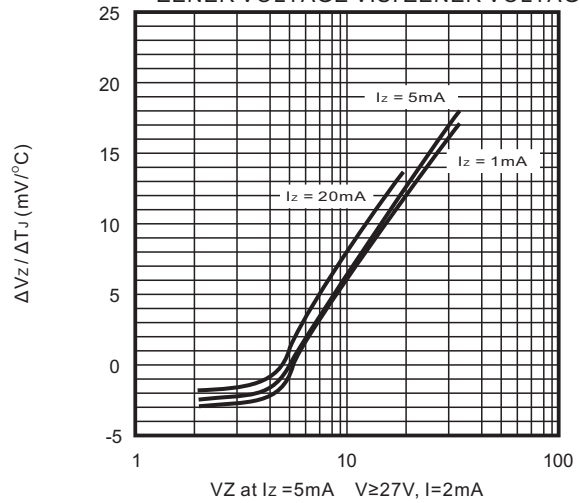


Fig.9 CHANGE OF ZENER VOLTAGE V.S. JUNCTION TEMPERATURE

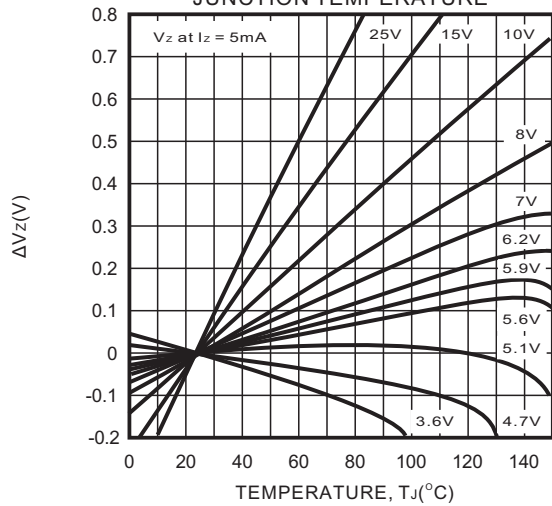


Fig.10 CHANGE OF ZENER VOLTAGE V.S. JUNCTION TEMPERATURE

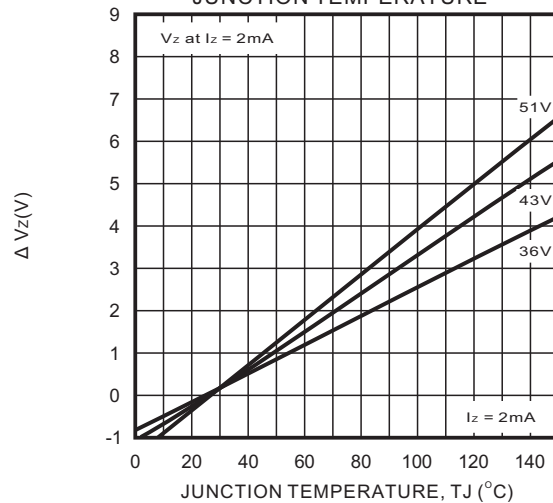


Fig.11 TEMPERATURE DEPENDENCE OF ZENER VOLTAGE V.S. ZENER VOLTAGE

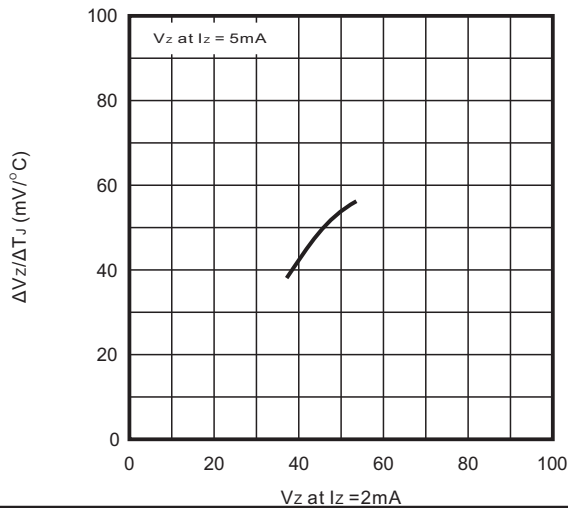
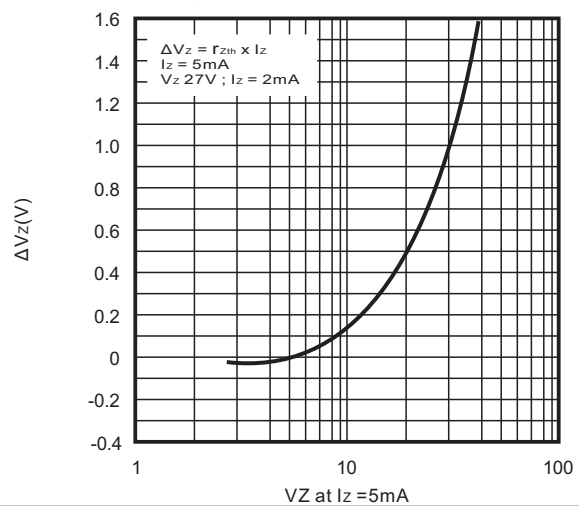


Fig.12 CHANGE OF ZENER VOLTAGE TURN-ON UP TO THE POINT OF THERMAL EQUILIBRIUM V.S. ZENER VOLTAGE



Rating and characteristic curves (BZX384C2V4-Q1 THRU BZX384C75-Q1)

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

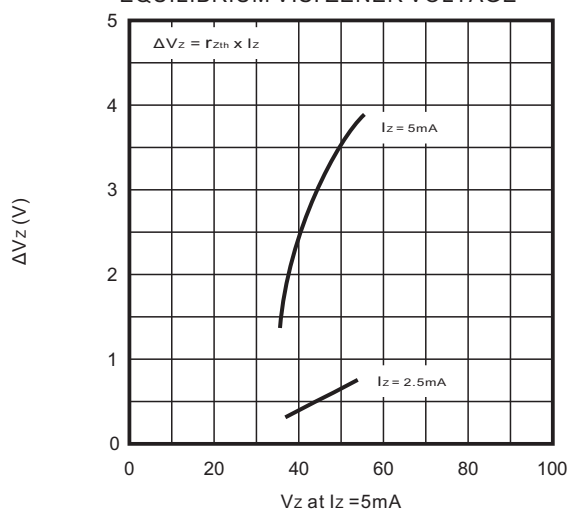


Fig.14 ZENER VOLTAGE CHARACTERISTICS

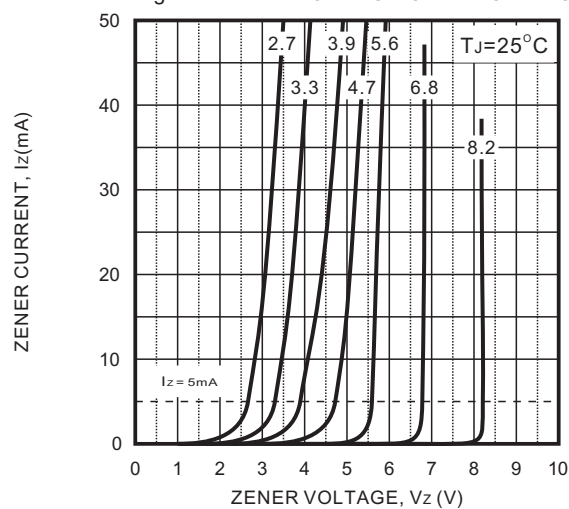


Fig.15 ZENER VOLTAGE CHARACTERISTICS

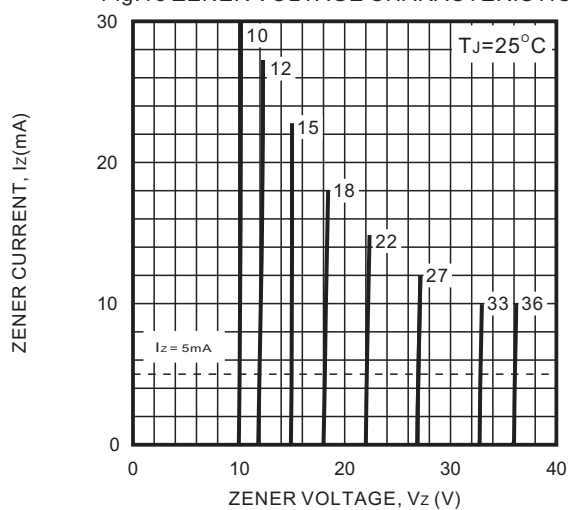
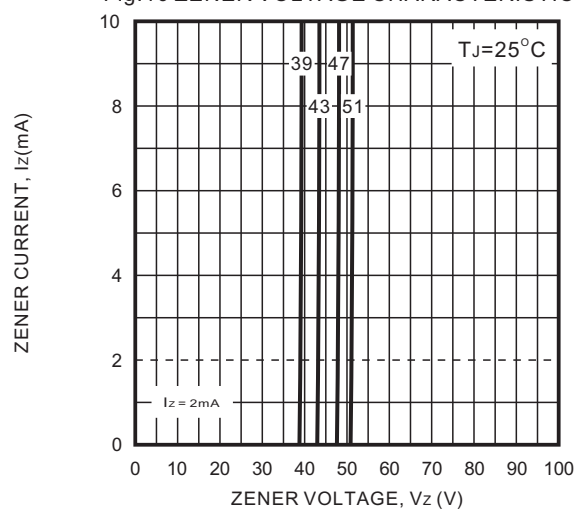


Fig.16 ZENER VOLTAGE CHARACTERISTICS



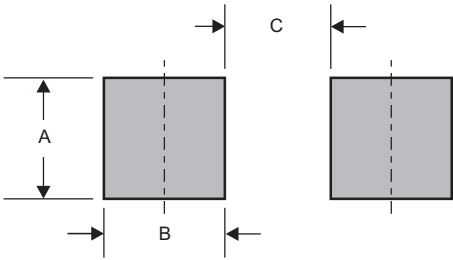
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Pinning information

Pin	Simplified outline	Symbol
Pin1 cathode Pin2 anode		

Suggested solder pad layout

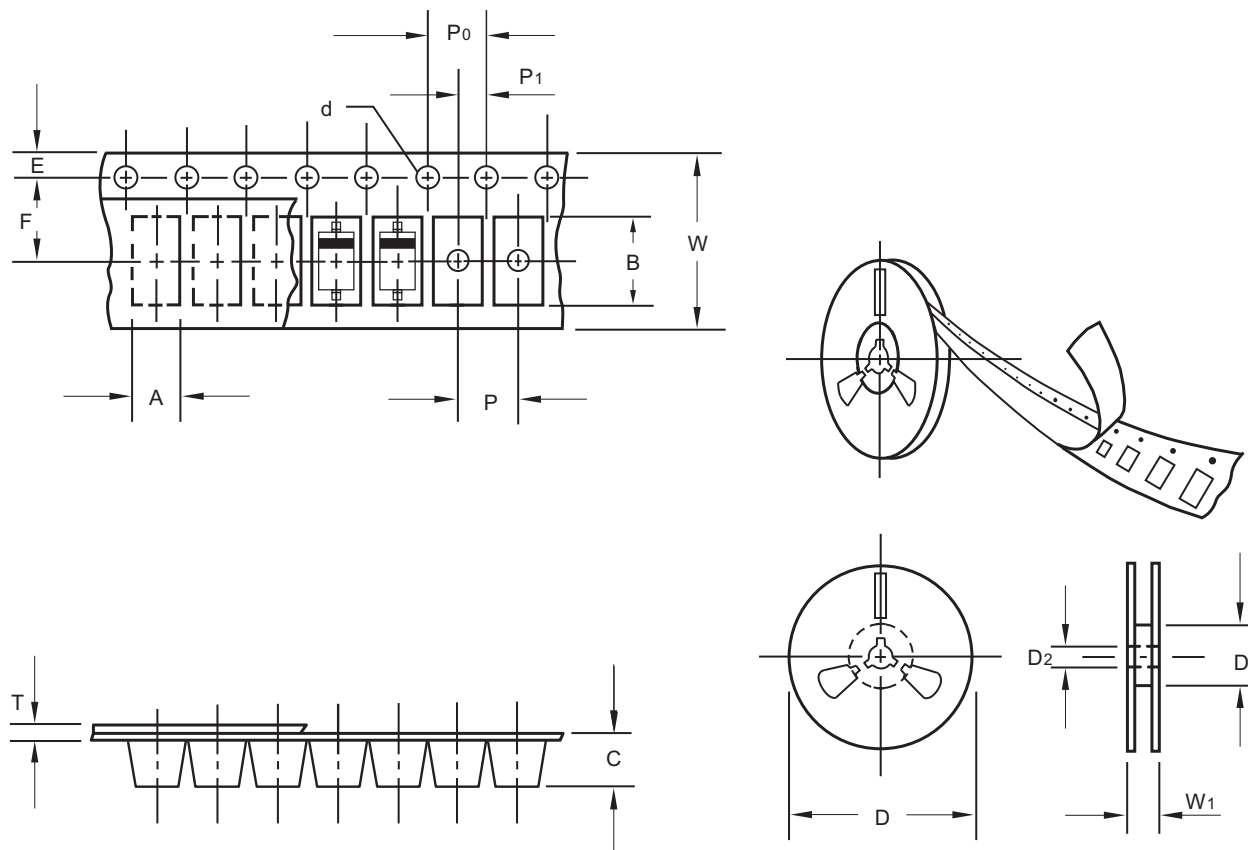


Dimensions in inches and (millimeters)

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

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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.

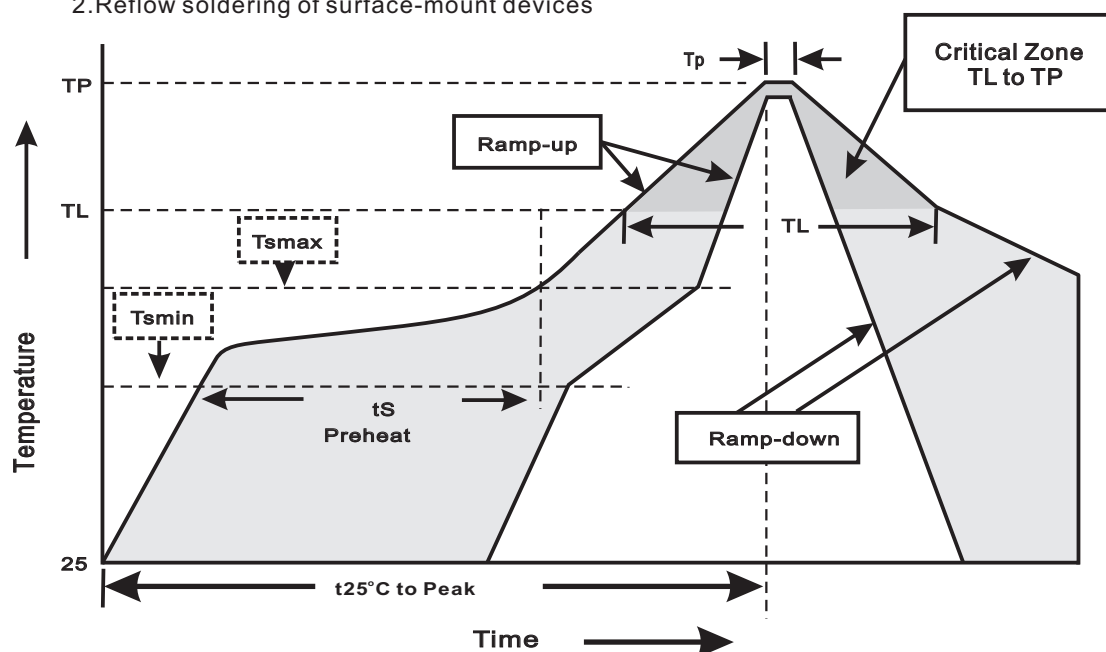
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Reel packing

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)	$<3^{\circ}\text{C}/\text{sec}$
Preheat -Temperature Min(T_{min}) -Temperature Max(T_{max}) -Time(min to max)(t_s)	150°C 200°C $60\sim 120\text{sec}$
T_{max} to T_L -Ramp-upRate	$<3^{\circ}\text{C}/\text{sec}$
Time maintained above: -Temperature(T_L) -Time(t_L)	217°C $60\sim 260\text{sec}$
Peak Temperature(T_P)	$255^{\circ}\text{C}-0/+5^{\circ}\text{C}$
Time within 5°C of actual Peak Temperature(t_P)	$10\sim 30\text{sec}$
Ramp-down Rate	$<6^{\circ}\text{C}/\text{sec}$
Time 25°C to Peak Temperature	$<6\text{minutes}$

BZX384C2V4-Q1 THRU BZX384C75-Q1**High reliability test capabilities**

Item Test	Conditions	Reference
1. MSL Preconditioning	24hr bake@125°C+168hrs@85°C /85%RH+3xIR@260°C+1flux immersion+alcohol+DI H2O rinse	JESD22-A113
2. High Temperature Reverse Bias	Vz=Vz Nom*80% (Tj=150°C)Test Duration:1000hrs	JESD22-A108
3. High Temperature Storage Life	Ta=125°C Test Duration: 1000hrs	JESD22 A-103
4. Temperature Cycle	-55°C (15min) to 150°C (15min)Test Cycles: 1000cycles	JESD22 A-104
5. Autoclave	P=2atm Ta=121°C RH=100% Test Duration:96hrs	JESD22 A-102
6. Solderability	245±5°C for 5sec	J-STD-002
7. Moisture Resistance	Ta=85°C/85% Relative humidity Test Duration:1000hrs	MIL-STD-750E METHOD 1021.2
8. Resistance To Solder Heat	260±5°C for 10sec	JESD22 B-106
9. High Temperature High Humidity Reverse Bias	Ta=85°C, 85%RH, with device reverse biased at 80% of rated breakdown voltage up to a maximum of 100V or limit of chamber Test Duration:1000hrs	JESD22-A101