

BZX584 Series

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BZX584 Series

**150mW Surface Mount Zener
Diodes 2.4V ~ 75V**

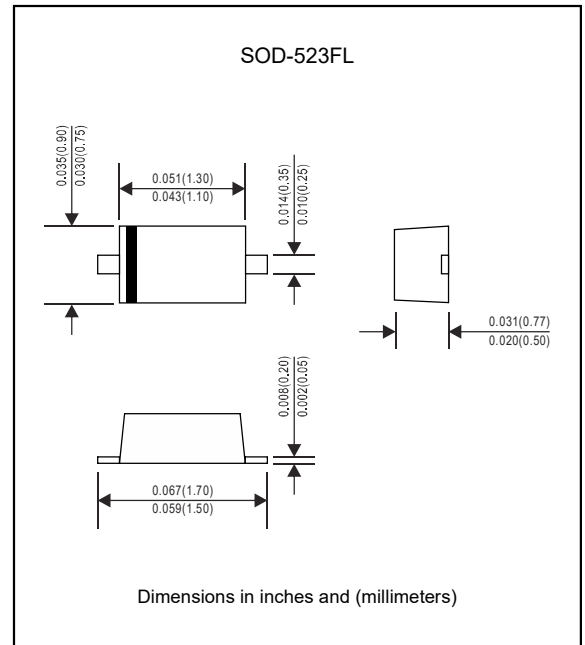
Features

- Planar die construction.
- 150mW power dissipation.
- Zener voltages from 2.4~39V ex. BZX584B (Standard V_z tolerance is $\pm 2\%$).
- Zener voltages from 2.4~75V ex. BZX584C (Standard V_z tolerance is $\pm 5\%$).
- Lead free parts meet RoHS requirements.
- Suffix "-H" indicates Halogen free parts, ex. BZX584B2V4-H.

Mechanical data

- Epoxy: UL94-V0 rated flame retardant.
- Case : Molded plastic, SOD-523FL.
- Terminals : Solder plated, solder able per MIL-STD-750, Method 2026.
- Polarity : Indicated by cathode band.
- Mounting Position : Any.
- Weight : Approximated 0.002 gram.

Package outline



Maximum ratings (At $T_A = 25^\circ\text{C}$ unless otherwise noted)

Parameter	Symbol	Value	Unit
Forward voltage @ $I_F = 10\text{mA}$	V_F	0.9	V
Maximum power dissipation	P_D	500	mW
Junction temperature range	T_J	-55 ~ 150	$^\circ\text{C}$
Storage temperature range	T_{STG}	-65 ~ 150	$^\circ\text{C}$
Thermal resistance junction to ambient	$R_{\theta JA}$	834	$^\circ\text{C/W}$

Note : These ratings are limiting values above which the serviceability of the diodes may be impaired.

BZX584 Series

Electrical characteristics & Marking code - BZX584B Series

(BZX584B2V4 Thru BZX584B39, Standard V_Z tolerance is $\pm 2\%$)

Part No.	Marking code	Zener voltage (Note 1)			Test current	Zener impedance (Note 2)			Leakage current		Typical temperature coefficient @ _{I_{ZT}} mV/°C	
		V _Z @ I _{ZT}				I _{ZT}	Z _{ZT} @ I _{ZT}	Z _{ZK} @ I _{ZK}	I _{ZK}	I _R		
		Min.(V)	Nom.(V)	Max.(V)	mA	(Ω)Max	(Ω)Max	mA	(uA)Max	Volts	Min.	Max.
BZX584B2V4	2V1	2.35	2.4	2.45	5	100	600	1.0	50	1.0	-3.5	0
BZX584B2V7	2V2	2.65	2.7	2.75	5	100	600	1.0	20	1.0	-3.5	0
BZX584B3V0	2V3	2.94	3.0	3.06	5	95	600	1.0	10	1.0	-3.5	0
BZX584B3V3	2V4	3.23	3.3	3.37	5	95	600	1.0	5.0	1.0	-3.5	0
BZX584B3V6	2V5	3.53	3.6	3.67	5	90	600	1.0	5.0	1.0	-3.5	0
BZX584B3V9	2V6	3.82	3.9	3.98	5	90	600	1.0	3.0	1.0	-3.5	0
BZX584B4V3	2V7	4.21	4.3	4.39	5	90	600	1.0	3.0	1.0	-3.5	0
BZX584B4V7	2Z1	4.61	4.7	4.79	5	80	500	1.0	3.0	2.0	-3.5	0.2
BZX584B5V1	2Z2	5.00	5.1	5.20	5	60	480	1.0	2.0	2.0	-2.7	1.2
BZX584B5V6	2Z3	5.49	5.6	5.71	5	40	400	1.0	1.0	2.0	-2.0	2.5
BZX584B6V2	2Z4	6.08	6.2	6.32	5	10	150	1.0	3.0	4.0	0.4	3.7
BZX584B6V8	2Z5	6.66	6.8	6.94	5	15	80	1.0	2.0	4.0	1.2	4.5
BZX584B7V5	2Z6	7.35	7.5	7.65	5	15	80	1.0	1.0	5.0	2.5	5.3
BZX584B8V2	2Z7	8.04	8.2	8.36	5	15	80	1.0	0.70	5.0	3.2	6.2
BZX584B9V1	2Z8	8.92	9.1	9.28	5	15	100	1.0	0.50	6.0	3.8	7.0
BZX584B10	2Z9	9.80	10	10.20	5	20	150	1.0	0.20	7.0	4.5	8.0
BZX584B11	2Y1	10.78	11	11.22	5	20	150	1.0	0.1	8.0	5.4	9.0
BZX584B12	2Y2	11.76	12	12.24	5	25	150	1.0	0.1	8.0	6.0	10
BZX584B13	2Y3	12.74	13	13.26	5	30	170	1.0	0.1	8.0	7.0	11
BZX584B15	2Y4	14.70	15	15.30	5	30	200	1.0	0.1	10.5	9.2	13
BZX584B16	2Y5	15.68	16	16.32	5	40	200	1.0	0.1	11.2	10.4	14
BZX584B18	2Y6	17.64	18	18.36	5	45	225	1.0	0.1	12.6	12.4	16
BZX584B20	2Y7	19.60	20	20.40	5	55	225	1.0	0.1	14.0	14.4	18
BZX584B22	2Y8	21.56	22	22.44	5	55	250	1.0	0.1	15.4	16.4	20
BZX584B24	2Y9	23.52	24	24.48	5	70	250	1.0	0.1	16.8	18.4	22
BZX584B27	2X1	26.46	27	27.54	2	80	300	0.5	0.1	18.9	21.4	25.3
BZX584B30	2X2	29.40	30	30.60	2	80	300	0.5	0.1	21.0	24.4	29.4
BZX584B33	2X3	32.34	33	33.66	2	80	325	0.5	0.1	23.1	27.4	33.4
BZX584B36	2X4	35.28	36	36.72	2	90	350	0.5	0.1	25.2	30.4	37.4
BZX584B39	2X5	38.22	39	39.78	2	130	350	0.5	0.1	27.3	33.4	41.2

Notes:

1. Tested with pulses, period=5ms, pulse width =300us.
2. $f = 1\text{KHz}$.
3. Electrical characteristics @ $T_A = 25^\circ\text{C}$ unless otherwise specified.

BZX584 Series

Electrical characteristics & Marking code - BZX584C Series

(BZX584C2V4 Thru BZX584C75, Standard V_Z tolerance is $\pm 5\%$)

Part No.	Marking code	Zener voltage (Note 1)			Test current	Zener impedance (Note 2)			Leakage current		Typical temperature coefficient @I _{ZT} mV/°C	
		V _Z @ I _{ZT}				I _{ZT}	Z _{ZT} @ I _{ZT}	Z _{ZK} @ I _{ZK}	I _{ZK}	I _R		
		Min.(V)	Nom.(V)	Max.(V)	mA	(Ω)Max	(Ω)Max	mA	(uA)Max	Volts	Min.	Max.
BZX584C2V4	Z11	2.28	2.40	2.52	5	100	600	1.0	50	1.0	-3.5	0
BZX584C2V7	Z12	2.57	2.70	2.84	5	100	600	1.0	20	1.0	-3.5	0
BZX584C3V0	Z13	2.85	3.00	3.15	5	95	600	1.0	10	1.0	-3.5	0
BZX584C3V3	Z14	3.14	3.30	3.47	5	95	600	1.0	5.0	1.0	-3.5	0
BZX584C3V6	Z15	3.42	3.60	3.78	5	90	600	1.0	5.0	1.0	-3.5	0
BZX584C3V9	Z16	3.71	3.90	4.10	5	90	600	1.0	3.0	1.0	-3.5	0
BZX584C4V3	Z17	4.09	4.30	4.52	5	90	600	1.0	3.0	1.0	-3.5	0
BZX584C4V7	Z1	4.47	4.70	4.94	5	80	500	1.0	3.0	2.0	-3.5	0.2
BZX584C5V1	Z2	4.85	5.10	5.36	5	60	480	1.0	2.0	2.0	-2.7	1.2
BZX584C5V6	Z3	5.32	5.60	5.88	5	40	400	1.0	1.0	2.0	-2.0	2.5
BZX584C6V2	Z4	5.89	6.20	6.51	5	10	150	1.0	3.0	4.0	0.4	3.7
BZX584C6V8	Z5	6.46	6.80	7.14	5	15	80	1.0	2.0	4.0	1.2	4.5
BZX584C7V5	Z6	7.13	7.50	7.88	5	15	80	1.0	1.0	5.0	2.5	5.3
BZX584C8V2	Z7	7.79	8.20	8.61	5	15	80	1.0	0.70	5.0	3.2	6.2
BZX584C9V1	Z8	8.65	9.10	9.56	5	15	100	1.0	0.50	6.0	3.8	7.0
BZX584C10	Z9	9.50	10.00	10.50	5	20	150	1.0	0.20	7.0	4.5	8.0
BZX584C11	Y1	10.45	11.00	11.55	5	20	150	1.0	0.1	8.0	5.4	9.0
BZX584C12	Y2	11.40	12.00	12.60	5	25	150	1.0	0.1	8.0	6.0	10
BZX584C13	Y3	12.35	13.00	13.65	5	30	170	1.0	0.1	8.0	7.0	11
BZX584C15	Y4	14.25	15.00	15.75	5	30	200	1.0	0.1	10.5	9.2	13
BZX584C16	Y5	15.20	16.00	16.80	5	40	200	1.0	0.1	11.2	10.4	14
BZX584C18	Y6	17.10	18.00	18.90	5	45	225	1.0	0.1	12.6	12.4	16
BZX584C20	Y7	19.00	20.00	21.00	5	55	225	1.0	0.1	14.0	14.4	18
BZX584C22	Y8	20.90	22.00	23.10	5	55	250	1.0	0.1	15.4	16.4	20
BZX584C24	Y9	22.80	24.00	25.20	5	70	250	1.0	0.1	16.8	18.4	22
BZX584C27	Y10	25.65	27.00	28.35	2	80	300	0.5	0.1	18.9	21.4	25.3
BZX584C30	Y11	28.50	30.00	31.50	2	80	300	0.5	0.1	21.0	24.4	29.4
BZX584C33	Y12	31.35	33.00	34.65	2	80	325	0.5	0.1	23.1	27.4	33.4
BZX584C36	Y13	34.20	36.00	37.80	2	90	350	0.5	0.1	25.2	30.4	37.4
BZX584C39	Y14	37.05	39.00	40.95	2	130	350	0.5	0.1	27.3	33.4	41.2
BZX584C43	Y15	40.85	43.00	45.15	2	150	375	0.5	0.1	30.1	37.6	46.6
BZX584C47	Y16	44.65	47.00	49.35	2	170	375	0.5	0.1	32.9	42.0	51.8
BZX584C51	Y17	48.45	51.00	53.55	2	180	400	0.5	0.1	35.7	46.6	57.2
BZX584C56	Y18	53.20	56.00	58.80	2	200	400	0.5	0.045	39.2	52.2	63.8
BZX584C62	Y19	58.90	62.00	65.10	2	215	423	0.5	0.045	43.4	58.8	71.6
BZX584C68	Y20	64.60	68.00	71.40	2	240	447	0.5	0.045	47.6	65.6	79.8
BZX584C75	Y21	71.25	75.00	78.75	2	255	470	0.5	0.045	52.5	73.4	88.6

Notes:

1. Tested with pulses, period=5ms, pulse width =300 μ s.

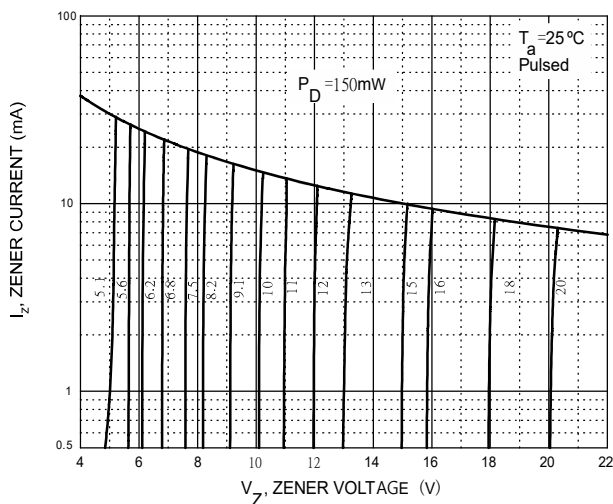
2. f = 1KHz

3. Electrical characteristics @ $T_A = 25^\circ\text{C}$ unless otherwise specified.

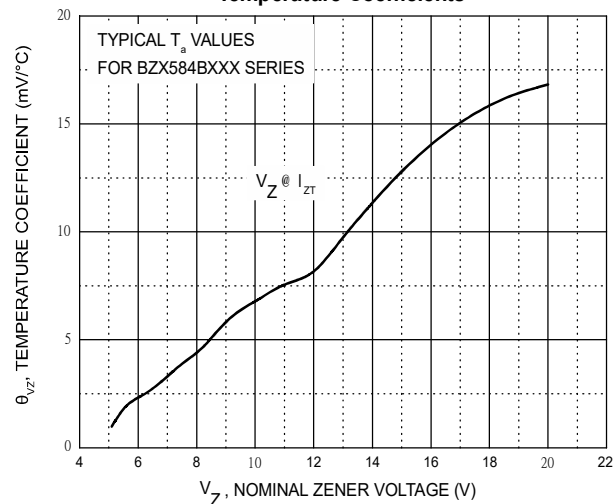
BZX584 Series

Rating and characteristic curves (BZX584B Series)

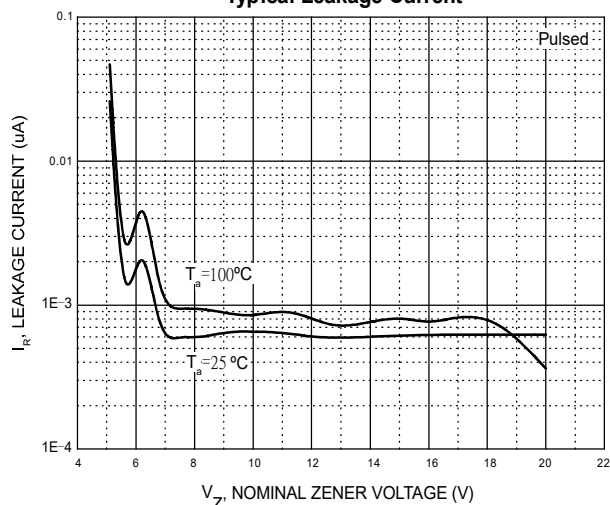
Zener Characteristics (V_Z 5.1V to 20 V)



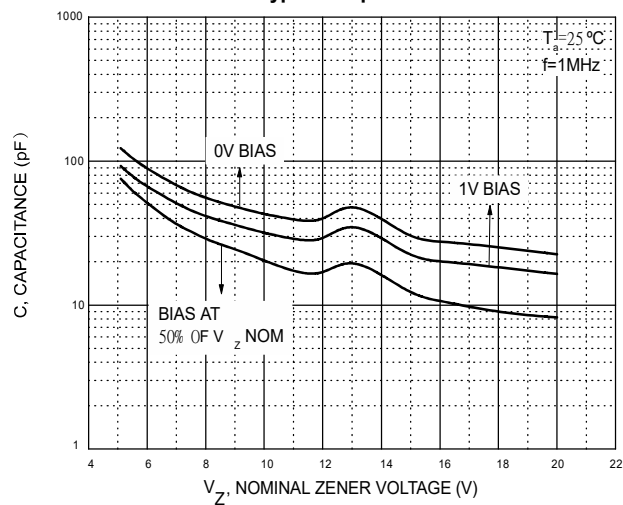
Temperature Coefficients



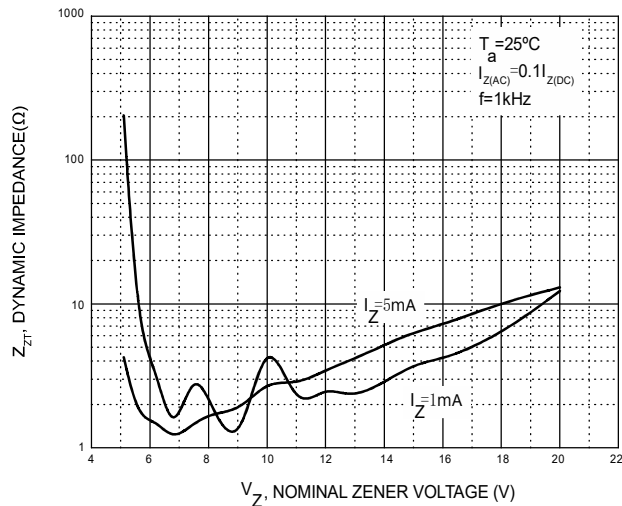
Typical Leakage Current



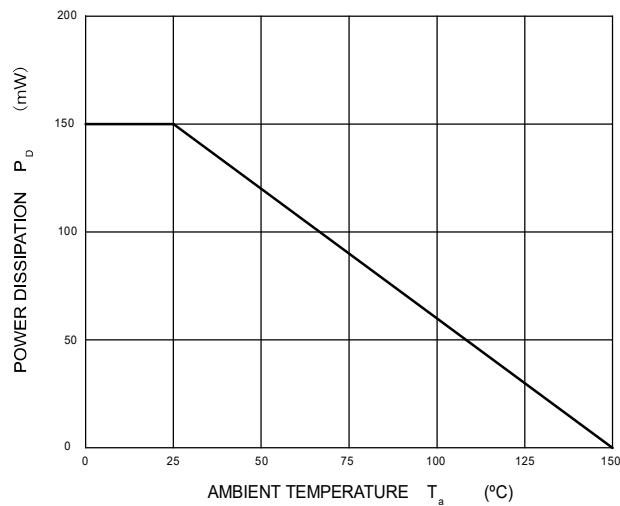
Typical Capacitance



Effect of Zener Voltage on Zener Impedance

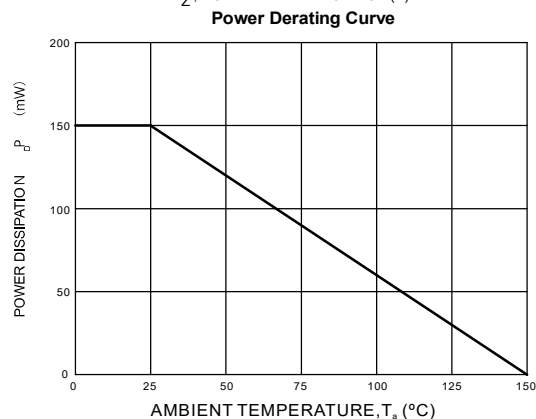
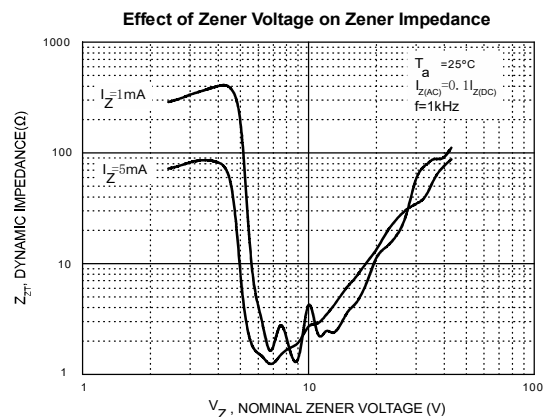
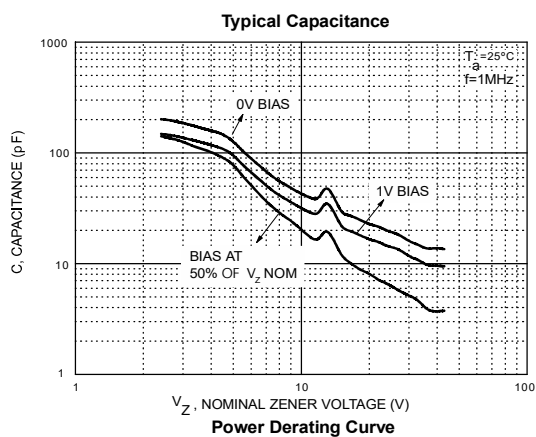
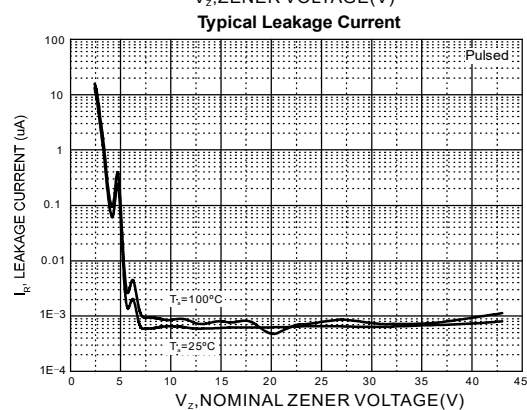
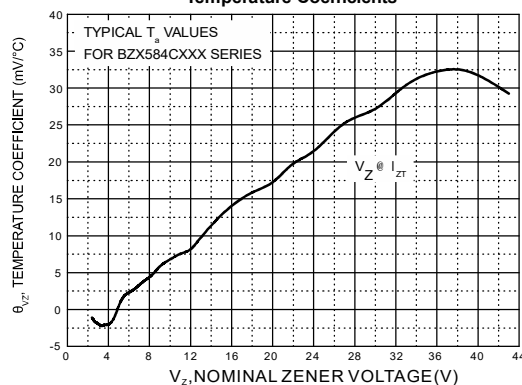
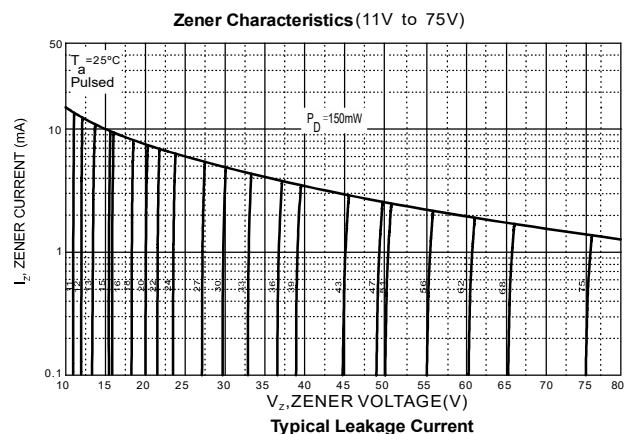
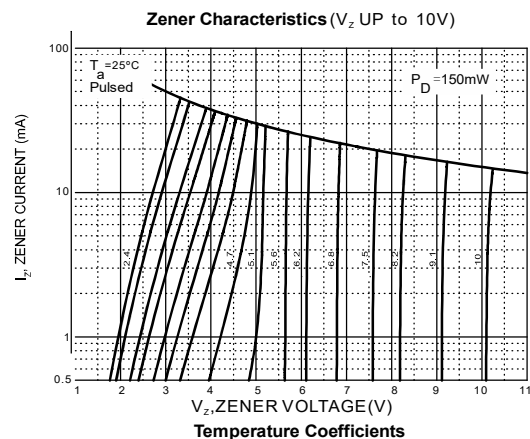


Power Derating Curve



BZX584 Series

Rating and characteristic curves (BZX584C Series)

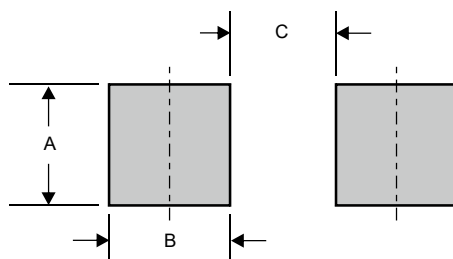


BZX584 Series

Pinning information

Pin	Simplified outline	Symbol
Pin1 Cathode Pin2 Anode		

Suggested solder pad layout

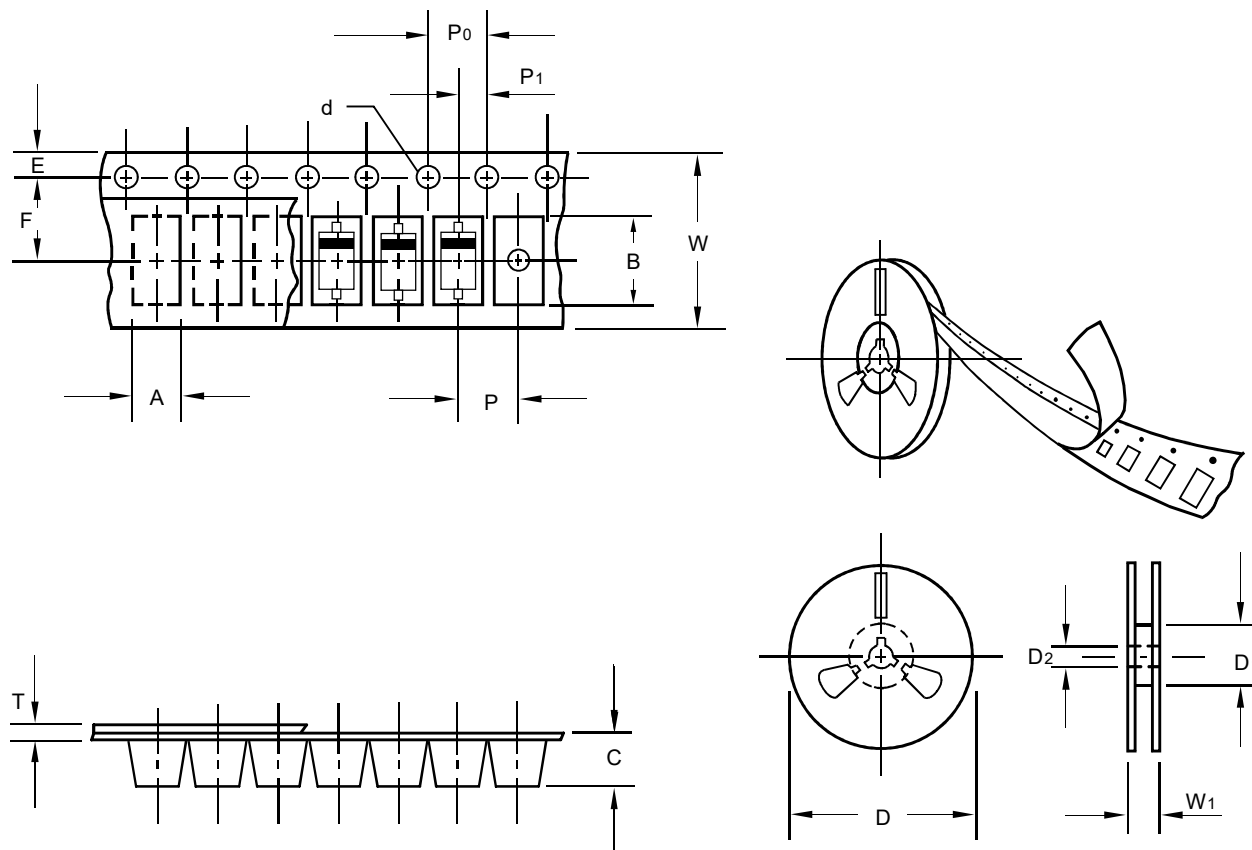


Dimensions in inches and (millimeters)

PACKAGE	A	B	C
SOD-523FL	0.032 (0.80)	0.024 (0.60)	0.044 (1.10)

BZX584 Series

Packing information



unit:mm

Item	Symbol	Tolerance	SOD-523FL
Carrier width	A	0.1	0.90
Carrier length	B	0.1	1.94
Carrier depth	C	0.1	0.73
Sprocket hole	d	0.1	1.50
7" Reel outside diameter	D	2.0	178.00
7" Reel inner diameter	D ₁	min	54.40
Feed hole diameter	D ₂	0.2	13.00
Sprocket hole position	E	0.1	1.75
Punch hole position	F	0.1	3.50
Punch hole pitch	P	0.1	2.00
Sprocket hole pitch	P ₀	0.1	4.00
Embossment center	P ₁	0.1	2.00
Overall tape thickness	T	0.1	0.23
Tape width	W	0.3	8.00
Reel width	W ₁	1.0	12.3

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

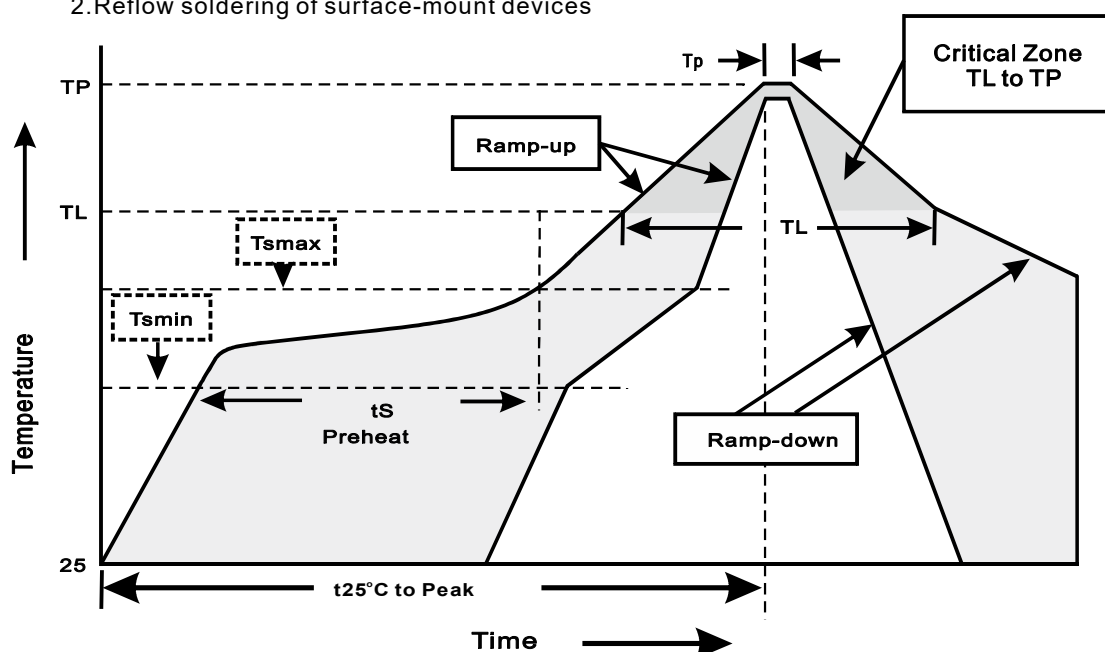
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Reel packing

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-523FL	7"	3,000	4.0	30,000	183*123*183	178	382*257*387	240,000	9.5
		8,000	2.0	80,000				640,000	13.5

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

BZX584 Series

High reliability test capabilities

Item Test	Conditions	Reference
1. Solder Resistance	at $260 \pm 5^{\circ}\text{C}$ for $10 \pm 2\text{sec.}$	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	$V_z = V_z \text{ Nom} * 80\%$ at $T_j = 150^{\circ}\text{C}$ for 168 hrs.	MIL-STD-750D METHOD-1038
4. Pressure Cooker	$15P_{\text{SIG}}$ 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. Humidity	at $T_A = 85^{\circ}\text{C}$, RH=85% for 1000hrs.	MIL-STD-750D METHOD-1021
7. High Temperature Storage Life	at 175°C for 1000 hrs.	MIL-STD-750D METHOD-1031