

# BZX84C2V4 THRU BZX84C75

## List

List..... 1

Package outline..... 2

Features..... 2

Mechanical data..... 2

Maximum ratings ..... 2

Electrical characteristics..... 3

Rating and characteristic curves..... 4~5

Pinning information..... 6

Suggested solder pad layout..... 6

Packing information..... 7

Reel packing..... 8

Suggested thermal profiles for soldering processes..... 8

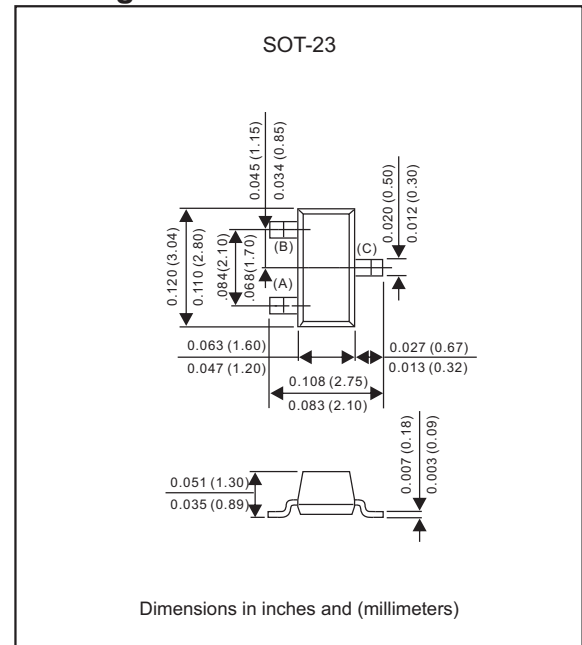
High reliability test capabilities..... 9

**BZX84C2V4 THRU BZX84C75****300mW Surface Mount Zener Diodes - 2.4V-75V****Features**

- Silicon epitaxial planar chip structure.
- Wide zener reverse voltage range 2.4V to 75V.
- Small package size for high density applications.
- Ideally suited for automated assembly processes.
- Lead-free parts meet environmental standards of MIL-STD-19500 /228
- Suffix "-H" indicates Halogen-free parts, ex.BZX84C2V4-H.

**Mechanical data**

- Epoxy : UL94-V0 rated flame retardant
- Case : Molded plastic, SOT-23
- Terminals :Plated terminals, solderable per MIL-STD-750, Method 2026
- Mounting Position : Any
- Weight : Approximated 0.008 gram

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

PARAMETER	CONDITIONS	Symbol	MIN.	TYP.	MAX.	UNIT
Power dissipation at $T_A=25^\circ\text{C}$	Mounted on Alumina = 0.4 x 0.3 x 0.024 in. 99.5% alumina.	$P_D$			300	mW
Thermal resistance	Junction to ambient	$R_{\theta JA}$		417		$^\circ\text{C}/\text{W}$
Operating junction temperature range		$T_J$	-55		+150	$^\circ\text{C}$
Storage temperature range		$T_{STG}$	-55		+150	$^\circ\text{C}$

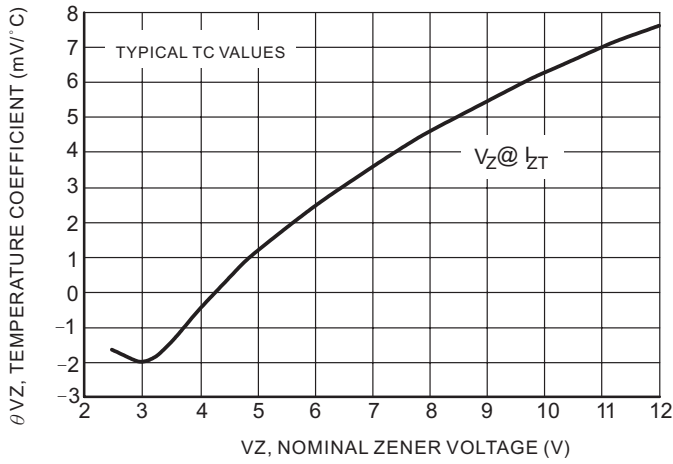
**BZX84C2V4 THRU BZX84C75****Electrical characteristics** (at  $T_A=25^\circ\text{C}$  unless otherwise noted)

Part No.	Marking code	Zener voltage			Zener impedance				Leakage current		$\theta_{Vz}$ (mV/k) @ $I_{ZT}$		$C$ @ $V_R=0V$ $f=1MHz$
		$V_z$ @ $I_{ZT}$ (Volts)			$I_{ZT}$	$Z_{ZT}$ @ $I_{ZT}$	$Z_{ZK}$ @ $I_{ZK}$	$I_{ZK}$	$I_R$	$V_R$	Min.	Max.	pF
		Min.	Nom.	Max.	mA	( $\Omega$ )Max	( $\Omega$ )Max	mA	( $\mu A$ )Max	Volts			
BZX84C2V4	Z11	2.28	2.4	2.52	5.0	100	600	1	50	1.0	-3.5	0	450
BZX84C2V7	Z12	2.57	2.7	2.84	5.0	100	600	1	20	1.0	-3.5	0	450
BZX84C3V0	Z13	2.85	3.0	3.15	5.0	95	600	1	10	1.0	-3.5	0	450
BZX84C3V3	Z14	3.14	3.3	3.47	5.0	95	600	1	5	1.0	-3.5	0	450
BZX84C3V6	Z15	3.42	3.6	3.78	5.0	90	600	1	5	1.0	-3.5	0	450
BZX84C3V9	Z16	3.71	3.9	4.1	5.0	90	600	1	3	1.0	-3.5	-2.5	450
BZX84C4V3	W9	4.09	4.3	4.52	5.0	90	600	1	3	1.0	-3.5	0	450
BZX84C4V7	Z1	4.47	4.7	4.94	5.0	80	500	1	3	2.0	-3.5	0.2	260
BZX84C5V1	Z2	4.85	5.1	5.36	5.0	60	480	1	2	2.0	-2.7	1.2	225
BZX84C5V6	Z3	5.32	5.6	5.88	5.0	40	400	1	1	2.0	-2.0	2.5	200
BZX84C6V2	Z4	5.89	6.2	6.51	5.0	10	150	1	3	4.0	0.4	3.7	185
BZX84C6V8	Z5	6.46	6.8	7.14	5.0	15	80	1	2	4.0	1.2	4.5	155
BZX84C7V5	Z6	7.13	7.5	7.88	5.0	15	80	1	1	5.0	2.5	5.3	140
BZX84C8V2	Z7	7.79	8.2	8.61	5.0	15	80	1	0.7	5.0	3.2	6.2	135
BZX84C9V1	Z8	8.65	9.1	9.56	5.0	15	100	1	0.5	6.0	3.8	7.0	130
BZX84C10	Z9	9.50	10	10.50	5.0	20	150	1	0.2	7.0	4.5	8.0	130
BZX84C11	Y1	10.45	11	11.55	5.0	20	150	1	0.1	8.0	5.4	9.0	130
BZX84C12	Y2	11.40	12	12.60	5.0	25	150	1	0.1	8.0	6.0	10	130
BZX84C13	Y3	12.35	13	13.65	5.0	30	170	1	0.1	8.0	7.0	11	120
BZX84C15	Y4	14.25	15	15.75	5.0	30	200	1	0.1	10.5	9.2	13	110
BZX84C16	Y5	15.20	16	16.80	5.0	40	200	1	0.1	11.2	10.4	14	105
BZX84C18	Y6	17.10	18	18.90	5.0	45	225	1	0.1	12.6	12.4	16	100
BZX84C20	Y7	19.00	20	21.00	5.0	55	225	1	0.1	14.0	14.4	18	85
BZX84C22	Y8	20.90	22	23.10	5.0	55	250	1	0.1	15.4	16.4	20	85
BZX84C24	Y9	22.80	24	25.20	5.0	70	250	1	0.1	16.8	18.4	22	80
BZX84C27	Y10	25.65	27	28.35	2.0	80	300	0.5	0.1	18.9	21.4	25.3	70
BZX84C30	Y11	28.50	30	31.50	2.0	80	300	0.5	0.1	21.0	24.4	29.4	70
BZX84C33	Y12	31.35	33	34.65	2.0	80	325	0.5	0.1	23.1	27.4	33.4	70
BZX84C36	Y13	34.20	36	37.80	2.0	90	350	0.5	0.1	25.2	30.4	37.4	70
BZX84C39	Y14	37.05	39	40.95	2.0	130	350	0.5	0.1	27.3	33.4	41.2	45
BZX84C43	Y15	40.85	43	45.15	2.0	150	375	0.5	0.1	30.1	37.6	46.6	40
BZX84C47	Y16	44.65	47	49.35	2.0	170	375	0.5	0.1	32.9	42.0	51.8	40
BZX84C51	Y17	48.45	51	53.55	2.0	180	400	0.5	0.1	35.7	46.6	57.2	40
BZX84C56	Y18	53.20	56	58.80	2.0	200	425	0.5	0.1	39.2	52.2	63.8	40
BZX84C62	Y19	58.90	62	65.10	2.0	215	450	0.5	0.1	43.4	58.8	71.6	35
BZX84C68	Y20	64.60	68	71.40	2.0	240	475	0.5	0.1	47.6	65.6	79.8	35
BZX84C75	Y21	71.25	75	78.75	2.0	255	500	0.5	0.1	52.5	73.4	88.6	35

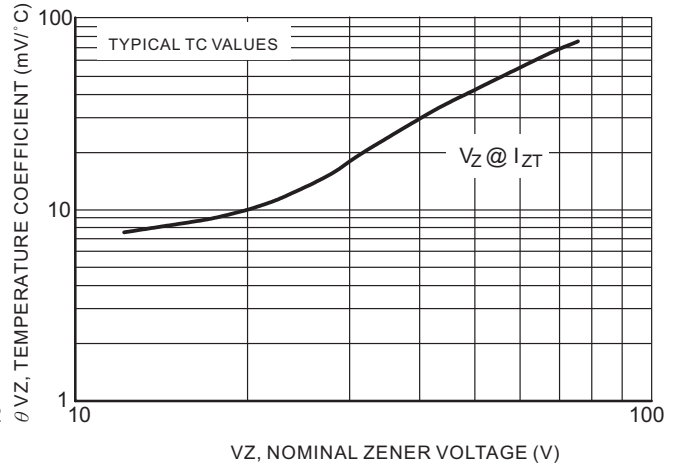
Note : 1. 5% tolerance of Zener voltage

2. Zener voltage is measured with a pulse test current  $I_Z$  at an ambient temperature of  $25^\circ\text{C}$ .

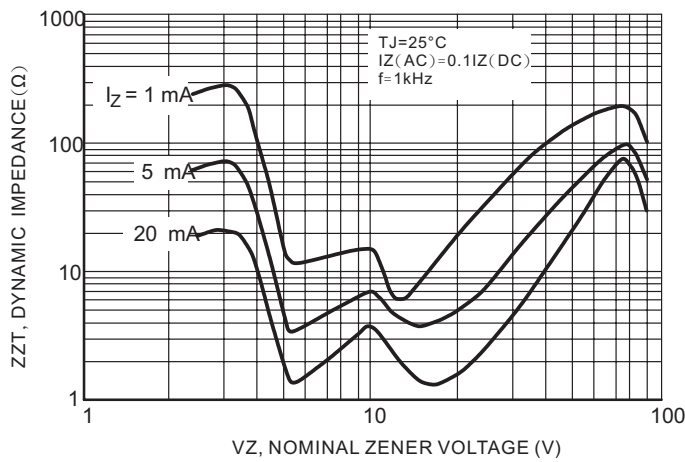
## Rating and characteristic curves (BZX84C2V4 THRU BZX84C75)



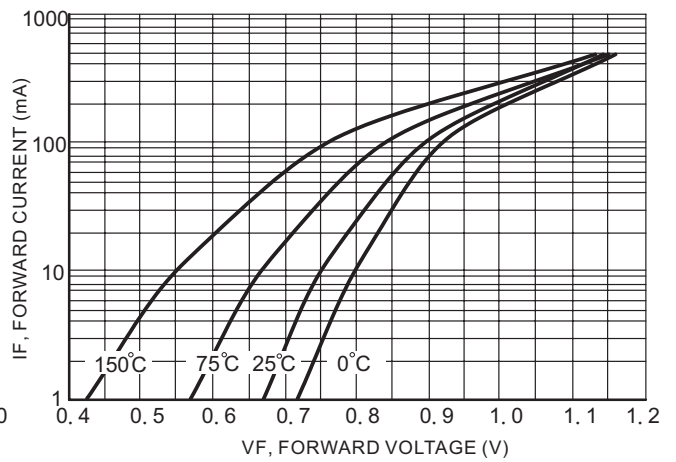
**Figure 1. Temperature Coefficients**  
(Temperature Range -55°C to +150°C)



**Figure 2. Temperature Coefficients**  
(Temperature Range -55°C to +150°C)

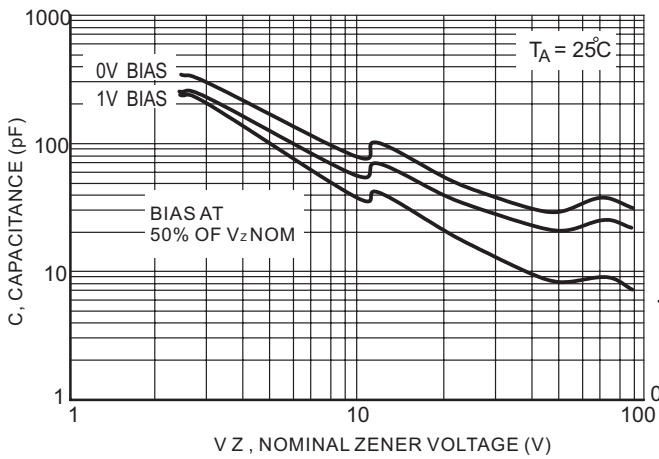


**Figure 3. Effect of Zener Voltage on Zener Impedance**

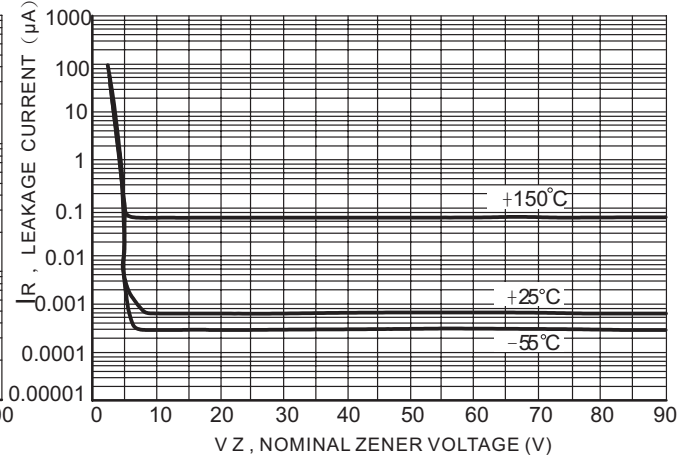


**Figure 4. Typical Forward Voltage**

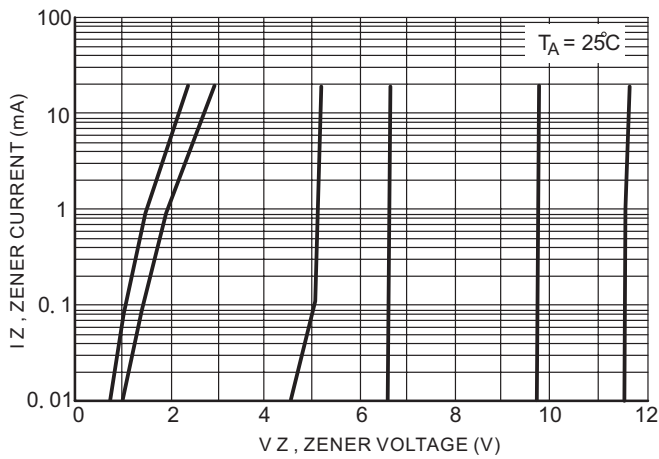
## Rating and characteristic curves (BZX84C2V4 THRU BZX84C75)



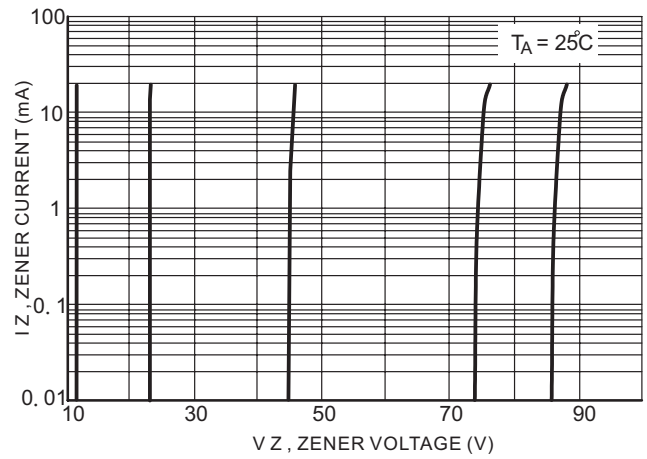
**Figure 5. Typical Capacitance**



**Figure 6. Typical Leakage Current**



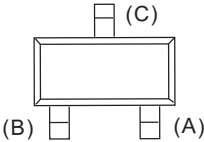
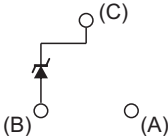
**Figure 7. Zener Voltage versus Zener Current  
(V<sub>Z</sub> Up to 12 V)**



**Figure 8. Zener Voltage versus Zener Current  
(12V to 91V)**

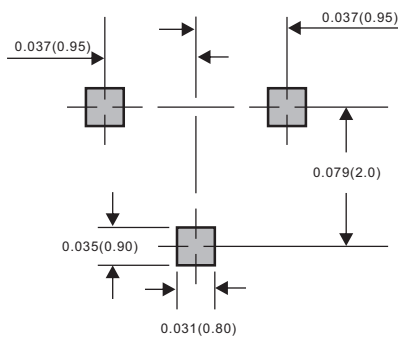
# BZX84C2V4 THRU BZX84C75

## Pinning information

Pin	Simplified outline	Symbol
PinA no connection PinB anode PinC cathode		

## Suggested solder pad layout

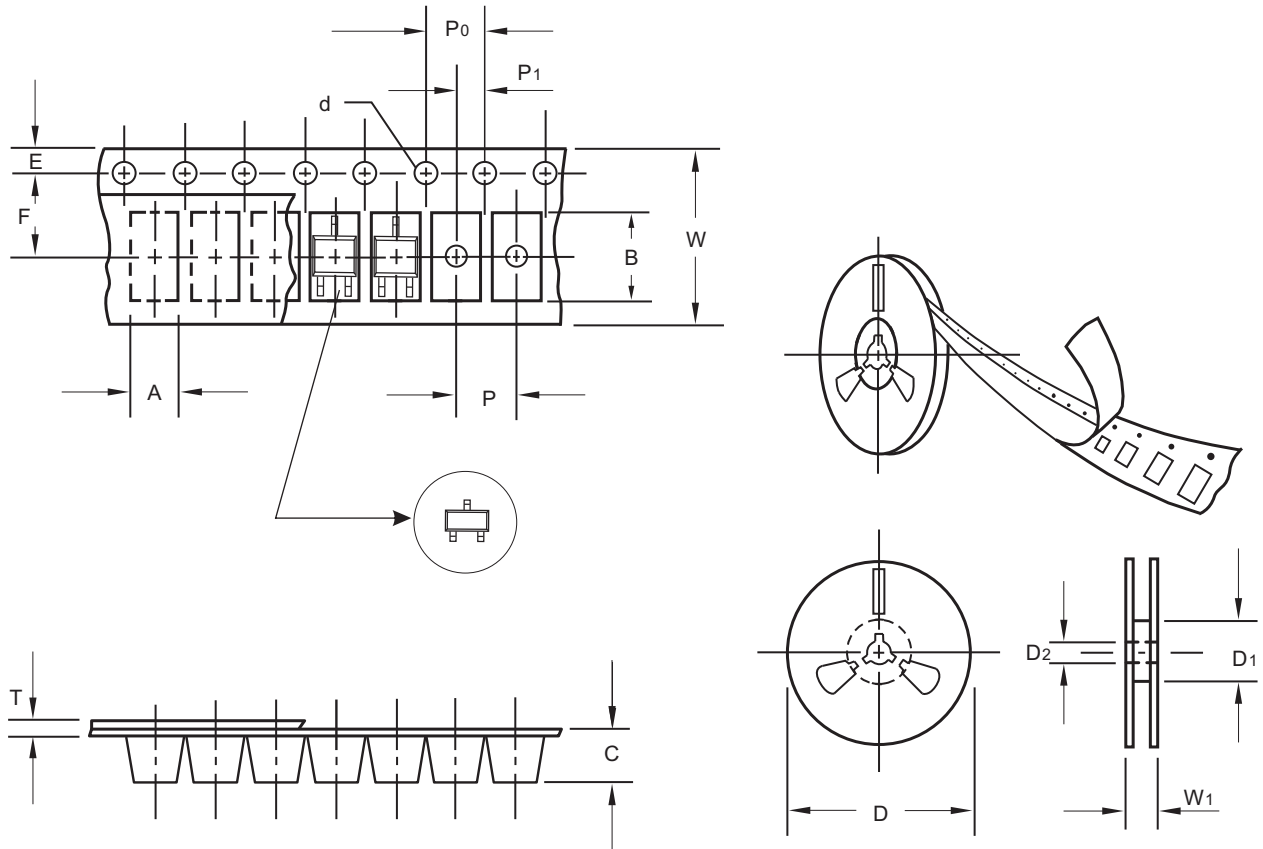
SOT-23



Dimensions in inches and (millimeters)

# BZX84C2V4 THRU BZX84C75

## Packing information



unit:mm

Item	Symbol	Tolerance	SOT-23
Carrier width	A	0.1	3.15
Carrier length	B	0.1	2.77
Carrier depth	C	0.1	1.22
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.

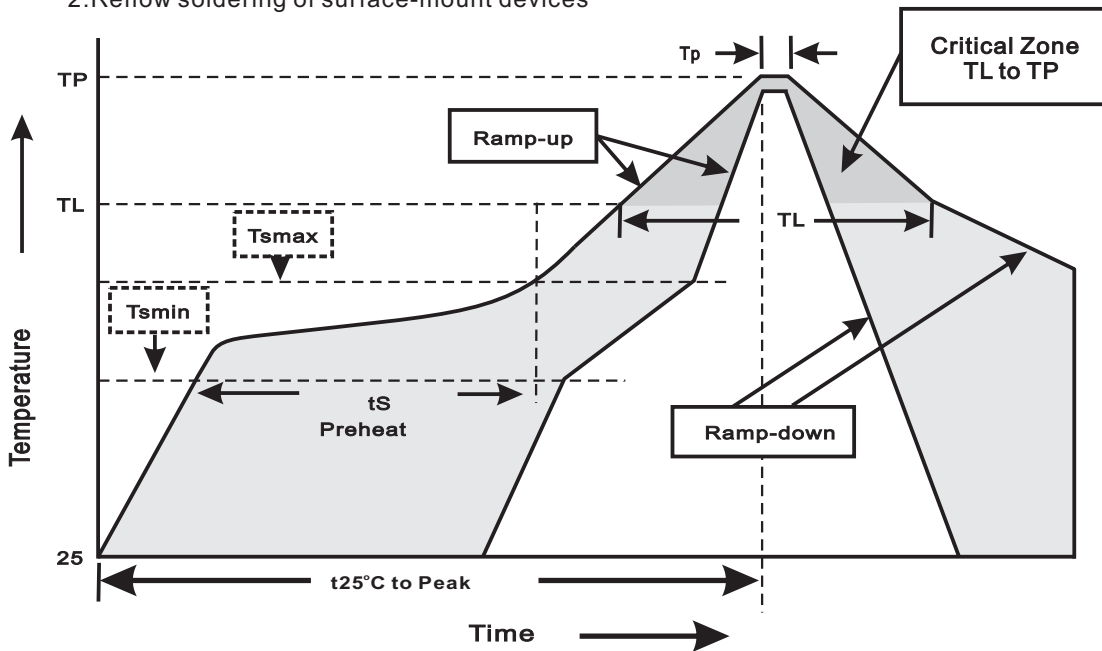
# BZX84C2V4 THRU BZX84C75

## 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)
SOT-23	7"	3,000	4.0	30,000	183*123*183	178	382*257*387	240,000	11.6

## 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 <sub>L</sub> to T <sub>P</sub> )	<3°C/sec
Preheat -Temperature Min(T <sub>min</sub> ) -Temperature Max(T <sub>max</sub> ) -Time(min to max)(t <sub>s</sub> )	150°C 200°C 60~120sec
T <sub>max</sub> to T <sub>L</sub> -Ramp-upRate	<3°C/sec
Time maintained above: -Temperature(T <sub>L</sub> ) -Time(t <sub>L</sub> )	217°C 60~260sec
Peak Temperature(T <sub>P</sub> )	255°C-0/+5°C
Time within 5°C of actual Peak Temperature(t <sub>P</sub> )	10~30sec
Ramp-down Rate	<6°C/sec
Time 25°C to Peak Temperature	<6minutes



**BZX84C2V4 THRU BZX84C75****High reliability test capabilities**

Item Test	Conditions	Reference
1. Solder Resistance	at 260±5°C for 10±2sec.	MIL-STD-750D METHOD-2031
2. Solderability	at 245±5°C for 5 sec.	MIL-STD-202F METHOD-208
3. High Temperature Reverse Bias	$V_z = V_{zN_{OM}} * 80\%$ at $T_j = 150^\circ\text{C}$ for 168 hrs.	MIL-STD-750D METHOD-1038
4. Pressure Cooker	15P <sub>sig</sub> at $T_A = 121^\circ\text{C}$ for 4 hrs.	JESD22-A102
5. Temperature Cycling	-55°C to +125°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