



BZX84J series

Voltage regulator diodes

Rev. 3 — 27 February 2025

Product data sheet

1. General description

General-purpose Zener diodes in a SOD323F (SC-90) very small and flat lead Surface-Mounted Device (SMD) plastic package.

2. Features and benefits

- Non-repetitive peak reverse power dissipation: ≤ 100 W for types ≤ 6.8 V
- Non-repetitive peak reverse power dissipation: ≤ 40 W for types ≥ 7.5 V
- Total power dissipation: $P_{\text{tot}} \leq 550$ mW
- Wide working voltage range: nominal 2.4 V to 75 V (E24 range)
- Two tolerance series: $\pm 2\%$ and $\pm 5\%$
- Small plastic package suitable for surface-mounted design
- Low differential resistance
- AEC-Q101 qualified

3. Applications

- General regulation functions

4. Quick reference data

Table 1. Quick reference data

Symbol	Parameter	Conditions		Min	Typ	Max	Unit
V_F	forward voltage	$I_F = 100$ mA	[1]	-	-	1.1	V
P_{ZSM}	non-repetitive peak reverse power dissipation		[2]	-	-	100	W
			[3]	-	-	40	W

[1] pulsed; $t_p \leq 300$ μ s; $\delta \leq 0.02$

[2] pulsed; $t_p = 100$ μ s; square wave; $T_j = 25$ °C prior to surge; ≤ 6.8 V

[3] pulsed; $t_p = 100$ μ s; square wave; $T_j = 25$ °C prior to surge; ≥ 7.5 V

5. Pinning information

Table 2. Pinning

Pin	Symbol	Description	Simplified outline	Graphic symbol
1	K	cathode[1]		
2	A	anode		

[1] The marking bar indicates the cathode.

6. Ordering information

Table 3. Ordering information

Type number	Package		
	Name	Description	Version
BZX84J-B2V4 to BZX84J-C75 ^[1]	SC-90	plastic surface-mounted package; 2 leads	SOD323F

[1] The series consists of 74 types with nominal working voltages from 2.4 V to 75 V.

7. Marking

Table 4. Marking Codes

Type number	Mark. Code						
BZX84J-B2V4	SL	BZX84J-B15	SC	BZX84J-C2V4	U3	BZX84J-C15	TV
BZX84J-B2V7	SM	BZX84J-B16	SD	BZX84J-C2V7	U4	BZX84J-C16	TW
BZX84J-B3V0	ST	BZX84J-B18	SE	BZX84J-C3V0	U9	BZX84J-C18	TX
BZX84J-B3V3	SU	BZX84J-B20	SF	BZX84J-C3V3	UA	BZX84J-C20	TY
BZX84J-B3V6	SV	BZX84J-B22	SG	BZX84J-C3V6	UB	BZX84J-C22	TZ
BZX84J-B3V9	SW	BZX84J-B24	SH	BZX84J-C3V9	UC	BZX84J-C24	U1
BZX84J-B4V3	SZ	BZX84J-B27	SK	BZX84J-C4V3	UF	BZX84J-C27	U2
BZX84J-B4V7	TA	BZX84J-B30	SN	BZX84J-C4V7	UG	BZX84J-C30	U5
BZX84J-B5V1	TD	BZX84J-B33	SP	BZX84J-C5V1	UL	BZX84J-C33	U6
BZX84J-B5V6	TE	BZX84J-B36	SR	BZX84J-C5V6	UM	BZX84J-C36	U7
BZX84J-B6V2	TH	BZX84J-B39	SS	BZX84J-C6V2	UR	BZX84J-C39	U8
BZX84J-B6V8	TK	BZX84J-B43	SX	BZX84J-C6V8	US	BZX84J-C43	UD
BZX84J-B7V5	TM	BZX84J-B47	SY	BZX84J-C7V5	UU	BZX84J-C47	UE
BZX84J-B8V2	TN	BZX84J-B51	TB	BZX84J-C8V2	UV	BZX84J-C51	UH
BZX84J-B9V1	TP	BZX84J-B56	TC	BZX84J-C9V1	UW	BZX84J-C56	UK
BZX84J-B10	S8	BZX84J-B62	TF	BZX84J-C10	TR	BZX84J-C62	UN
BZX84J-B11	S9	BZX84J-B68	TG	BZX84J-C11	TS	BZX84J-C68	UP
BZX84J-B12	SA	BZX84J-B75	TL	BZX84J-C12	TT	BZX84J-C75	UT
BZX84J-B13	SB	-	-	BZX84J-C13	TU	-	-

8. Limiting values

Table 5. Limiting values

In accordance with the Absolute Maximum Rating System (IEC 60134).

Symbol	Parameter	Conditions	Min	Max	Unit
I_F	forward current		-	250	mA
I_{ZSM}	non-repetitive peak reverse current		[1] -	see Tables 8 and 9	
P_{ZSM}	non-repetitive peak reverse power dissipation		[2] -	100	W
			[3] -	40	W
P_{tot}	total power dissipation	$T_{amb} \leq 25\text{ °C}$	[4] -	550	mW
T_j	junction temperature		-	150	°C
T_{amb}	ambient temperature		-55	+150	°C
T_{stg}	storage temperature		-65	+150	°C

[1] $t_p = 100\text{ }\mu\text{s}$; square wave; $T_j = 25\text{ °C}$ prior to surge.

[2] $t_p = 100\text{ }\mu\text{s}$; square wave; $T_j = 25\text{ °C}$ prior to surge; $\leq 6.8\text{ V}$.

[3] $t_p = 100\text{ }\mu\text{s}$; square wave; $T_j = 25\text{ °C}$ prior to surge; $\geq 7.5\text{ V}$.

[4] Device mounted on an FR4 PCB, single-sided copper, tin-plated, mounting pad for cathode 1 cm^2 .

9. Thermal characteristics

Table 6. Thermal characteristics

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
$R_{th(j-a)}$	thermal resistance from junction to ambient	in free air	[1]	-	230	K/W
$R_{th(j-sp)}$	thermal resistance from junction to solder point		[2]	-	55	K/W

[1] Device mounted on an FR4 Printed-Circuit Board (PCB), single-sided copper, tin-plated, mounting pad for cathode 1 cm^2

[2] Soldering point of cathode tab.

10. Characteristics

Table 7. Electrical characteristics

$T_j = 25\text{ °C}$ unless otherwise specified.

Symbol	Parameter	Conditions	Max	Unit
V_F	forward voltage	$I_F = 10\text{ mA}$	[1] 0.9	V
		$I_F = 100\text{ mA}$	1.1	V

[1] Pulse test: $t_p \leq 300\text{ }\mu\text{s}$; $\delta \leq 0.02$

Table 8. Electrical characteristics per type; BZX84J-B2V4 to BZX84J-C24

 $T_j = 25\text{ °C}$ unless otherwise specified.

BZX84J-x xx	Sel	Working voltage V_Z (V);		Differential resistance r_{diff} (Ω);		Reverse current I_R (μA);		Temperature coefficient S_Z (mV/K);		Diode capacit. C_d (pF)[1]	Non- repetitive peak reverse current I_{ZSM} (A)[2]
		$I_Z = 5\text{ mA}$		$I_Z = 1\text{ mA}$	$I_Z = 5\text{ mA}$	Max	V_R (V)	$I_{Ztest} = 5\text{ mA}$			
		Min	Max	Min	Max			Min	Max		
2V4	B	2.35	2.45	400	100	50	1	-3.5	0	450	12
	C	2.2	2.6								
2V7	B	2.65	2.75	450	100	20	1	-3.5	0	440	12
	C	2.5	2.9								
3V0	B	2.94	3.06	500	95	10	1	-3.5	0	425	12
	C	2.8	3.2								
3V3	B	3.23	3.37	500	95	5	1	-3.5	0	410	12
	C	3.1	3.5								
3V6	B	3.53	3.67	500	90	5	1	-3.5	0	390	12
	C	3.4	3.8								
3V9	B	3.82	3.98	500	90	3	1	-3.5	0	370	12
	C	3.7	4.1								
4V3	B	4.21	4.39	600	90	3	1	-3.5	0	350	12
	C	4.00	4.60								
4V7	B	4.61	4.79	500	80	3	2	-3.5	0.2	325	12
	C	4.40	5.00								
5V1	B	5.00	5.20	480	60	2	2	-2.7	1.2	300	12
	C	4.80	5.40								
5V6	B	5.49	5.71	400	40	1	2	-2.0	2.5	275	12
	C	5.20	6.00								
6V2	B	6.08	6.32	150	10	3	4	0.4	3.7	250	12
	C	5.80	6.60								
6V8	B	6.66	6.94	80	15	2	4	1.2	4.5	215	12
	C	6.40	7.20								
7V5	B	7.35	7.65	80	10	1	5	2.5	5.3	170	4
	C	7.00	7.90								
8V2	B	8.04	8.36	80	10	0.7	5	3.2	6.2	150	4
	C	7.70	8.70								
9V1	B	8.92	9.28	100	10	0.5	6	3.8	7.0	120	3
	C	8.50	9.60								
10	B	9.80	10.20	150	10	0.2	7	4.5	8.0	110	3
	C	9.40	10.60								
11	B	10.78	11.22	150	10	0.1	8	5.4	9	108	2.5
	C	10.40	11.60								
12	B	11.80	12.20	150	10	0.1	8	6.0	10	105	2.5
	C	11.40	12.70								

BZX84J-x xx	Sel	Working voltage V_Z (V);		Differential resistance r_{diff} (Ω);		Reverse current I_R (μ A);		Temperature coefficient S_Z (mV/K);		Diode capacit. C_d (pF)[1]	Non- repetitive peak reverse current I_{ZSM} (A)[2]
		$I_Z = 5$ mA		$I_Z = 1$ mA	$I_Z = 5$ mA	Max	V_R (V)	$I_{Ztest} = 5$ mA			
		Min	Max	Min	Max			Min	Max		
13	B	12.70	13.30	170	10	0.1	8	7.0	11	103	2.5
	C	12.40	14.10								
15	B	14.70	15.30	200	15	0.05	10.5	9.2	13	99	2.0
	C	13.80	15.60								
16	B	15.70	16.30	200	20	0.05	11.2	10.4	14	97	1.5
	C	15.30	17.1								
18	B	17.60	18.40	225	20	0.05	12.6	12.4	16	93	1.5
	C	16.80	19.10								
20	B	19.60	20.40	225	20	0.05	14.0	14.4	18	88	1.5
	C	18.80	21.20								
22	B	21.60	22.40	250	25	0.05	15.4	16.4	20	84	1.25
	C	20.80	23.30								
24	B	23.50	24.50	250	30	0.05	16.8	18.4	22	80	1.25
	C	22.80	25.6								

[1] $f = 1$ MHz; $V_R = 0$ V

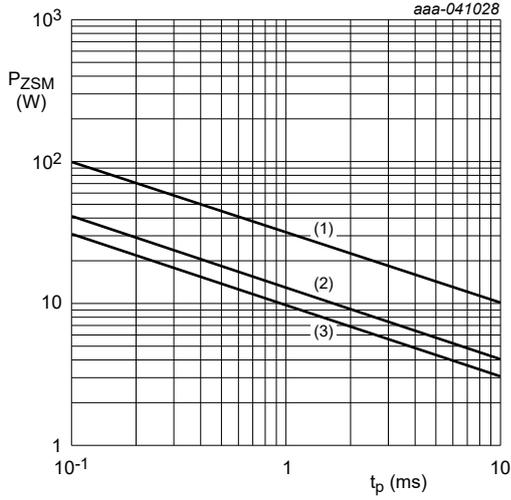
[2] $t_p = 100$ μ s; square wave; $T_j = 25$ °C prior to surge.

Table 9. Electrical characteristics per type; BZX84J-B27 to BZX84J-C75

 $T_j = 25\text{ °C}$ unless otherwise specified.

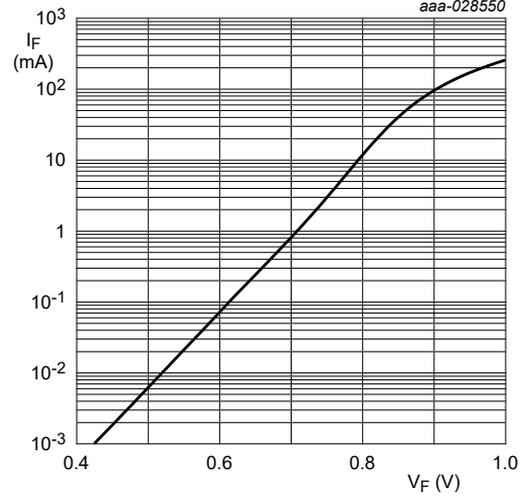
BZX84J-xx	Sel	Working voltage V_Z (V);		Differential resistance r_{diff} (Ω);		Reverse current I_R (μA);		Temperature coefficient S_Z (mV/K);		Diode capacit. C_d (pF)[1]	Non-repetitive peak reverse current I_{ZSM} (A) at $t_p = 100\ \mu\text{s}$; $T_{amb} = 25\text{ °C}$
		$I_Z = 2\text{ mA}$		$I_Z = 0.5\text{ mA}$	$I_Z = 2\text{ mA}$	Max	V_R (V)	$I_{Ztest} = 2\text{ mA}$			
		Min	Max	Min	Max			Min	Max		
27	B	26.5	27.5	250	40	0.05	18.9	21.4	25.3	73	1
	C	25.1	28.9								
30	B	29.4	30.6	250	40	0.05	21.0	24.4	29.4	66	1
	C	28.0	32.0								
33	B	32.3	33.7	275	40	0.05	23.1	27.4	33.4	60	0.9
	C	31.0	35.0								
36	B	35.3	36.7	300	60	0.05	25.2	30.4	37.4	59	0.8
	C	34.0	38.0								
39	B	38.2	39.8	300	75	0.05	27.3	33.4	41.2	58	0.7
	C	37.0	41.0								
43	B	42.1	43.9	325	80	0.05	30.1	37.6	46.6	56	0.6
	C	40.0	46.0								
47	B	46.1	47.9	325	90	0.05	32.9	42.0	51.8	55	0.5
	C	44.0	50.0								
51	B	50.0	52.0	350	110	0.05	35.7	46.6	57.2	52	0.4
	C	48.0	54.0								
56	B	54.9	57.1	375	120	0.05	39.2	52.2	63.8	49	0.3
	C	52.0	60.0								
62	B	60.8	63.2	400	140	0.05	43.4	58.8	71.6	44	0.3
	C	58.0	66.0								
68	B	66.6	69.4	400	160	0.05	47.6	65.6	79.8	40	0.25
	C	64.0	72.0								
75	B	73.5	76.5	400	175	0.05	52.5	73.4	88.6	35	0.2
	C	70.0	79.0								

[1] $f = 1\text{ MHz}$; $V_R = 0\text{ V}$



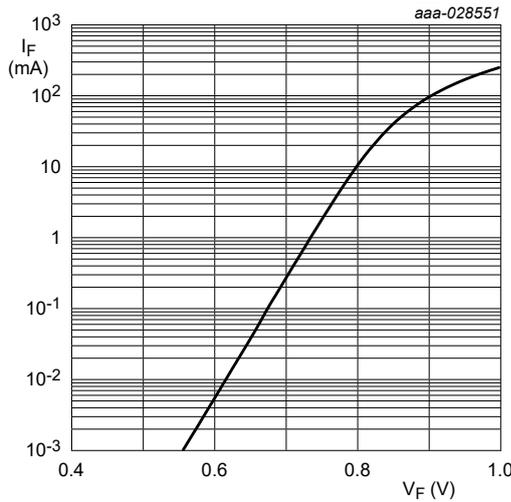
- (1) 2.4 V to 6.8 V ($T_j = 25\text{ °C}$)
- (2) 7.5 V to 75 V ($T_j = 25\text{ °C}$)
- (3) 2.4 V to 75 V ($T_j = 150\text{ °C}$)

Fig. 1. Non-repetitive peak reverse power dissipation as a function of pulse duration; maximum values



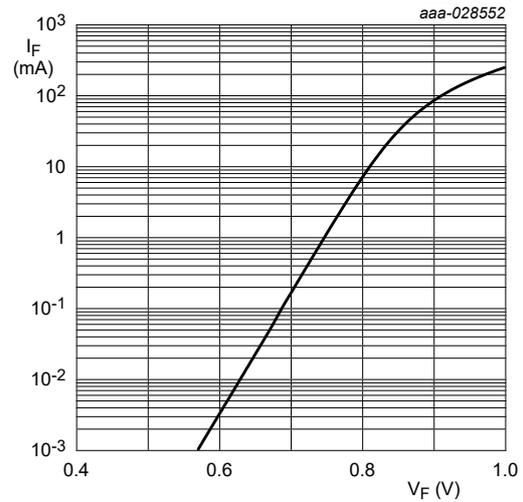
$T_j = 25\text{ °C}$

Fig. 2. Forward current as a function of forward voltage; typical values (BZX84J-B/C2V4-Q)



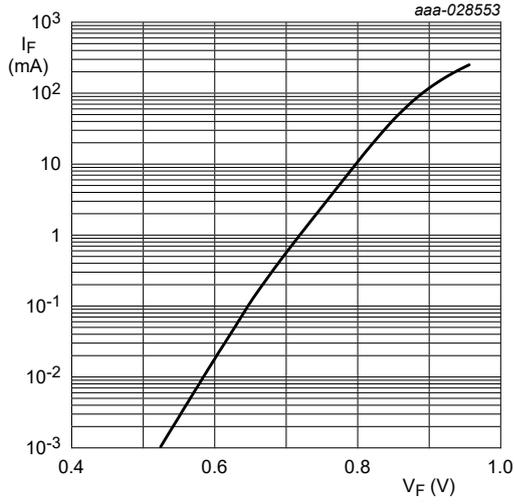
$T_j = 25\text{ °C}$

Fig. 3. Forward current as a function of forward voltage; typical values (BZX84J-B/C6V8)



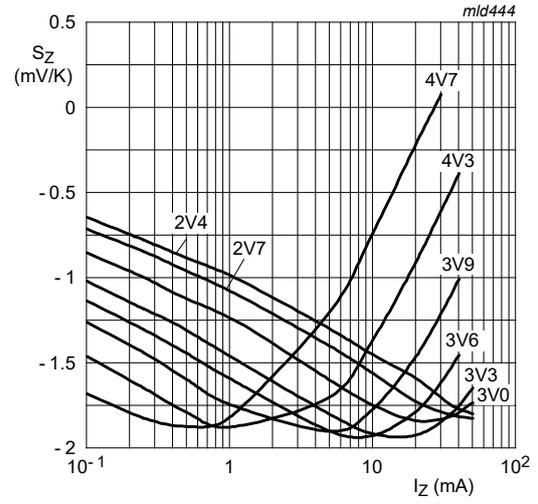
$T_j = 25\text{ °C}$

Fig. 4. Forward current as a function of forward voltage; typical values (BZX84J-B/C7V5)



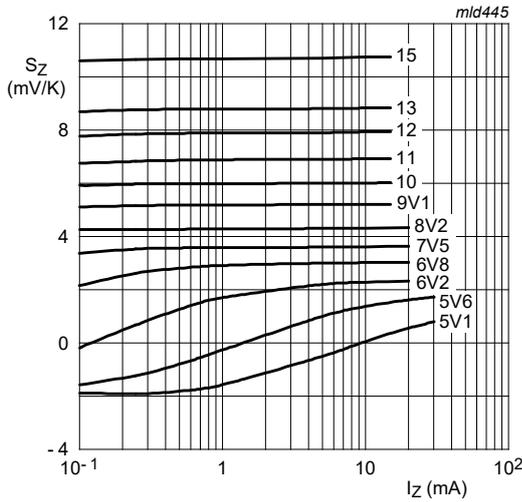
$T_j = 25\text{ °C}$

Fig. 5. Forward current as a function of forward voltage; typical values (BZX84J-B/C75)



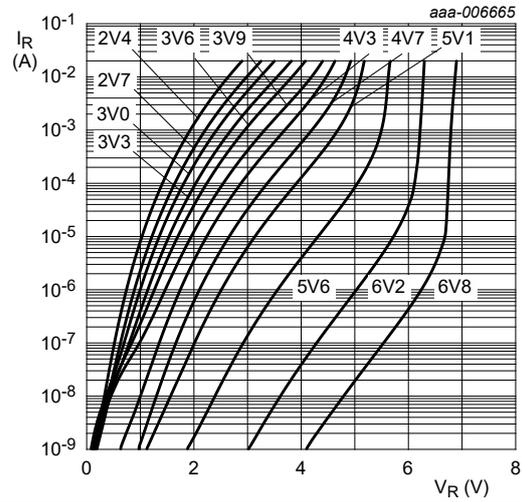
$T_j = 25\text{ °C to }150\text{ °C}$

Fig. 6. Temperature coefficient as a function of working current; typical values (BZX84J-B/C2V4 to B/C4V7)



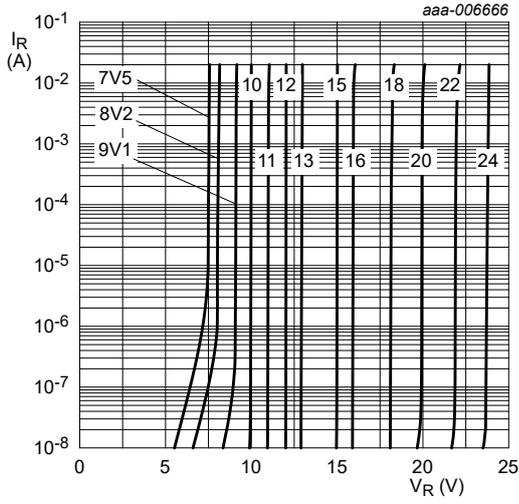
$T_j = 25\text{ °C to }150\text{ °C}$

Fig. 7. Temperature coefficient as a function of working current; typical values (BZX84J-B/C5V1 to B/C15)



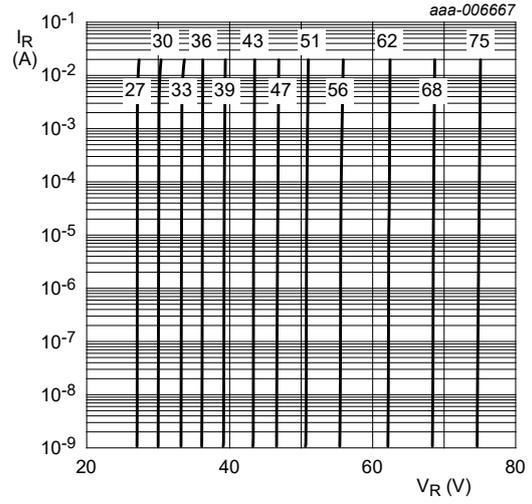
$T_j = 25\text{ °C}$

Fig. 8. Reverse current as a function of reverse voltage; typical values (BZX84J-B/C2V4 to B/C6V8)



T_j = 25 °C

Fig. 9. Reverse current as a function of reverse voltage; typical values (BZX84J-B/C7V5 to B/C24)



T_j = 25 °C

Fig. 10. Reverse current as a function of reverse voltage; typical values (BZX84J-B/C27 to B/C75)

11. Test information

11.1. Quality information

This product has been qualified in accordance with the Automotive Electronics Council (AEC) standard Q101 - *Stress test qualification for discrete semiconductors*, and is suitable for use in automotive applications.

12. Package outline

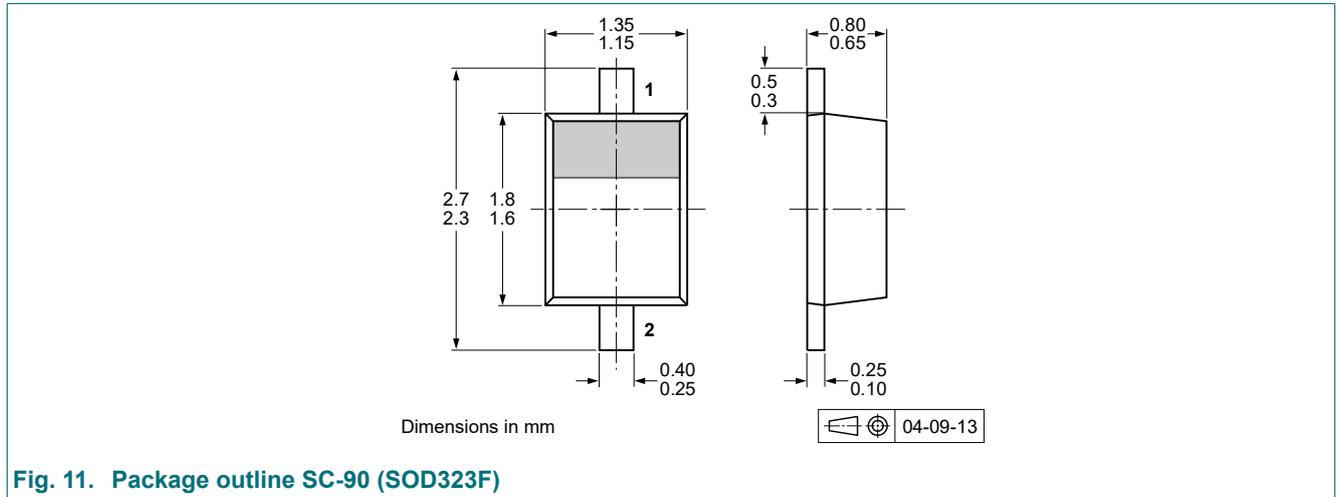


Fig. 11. Package outline SC-90 (SOD323F)

13. Soldering

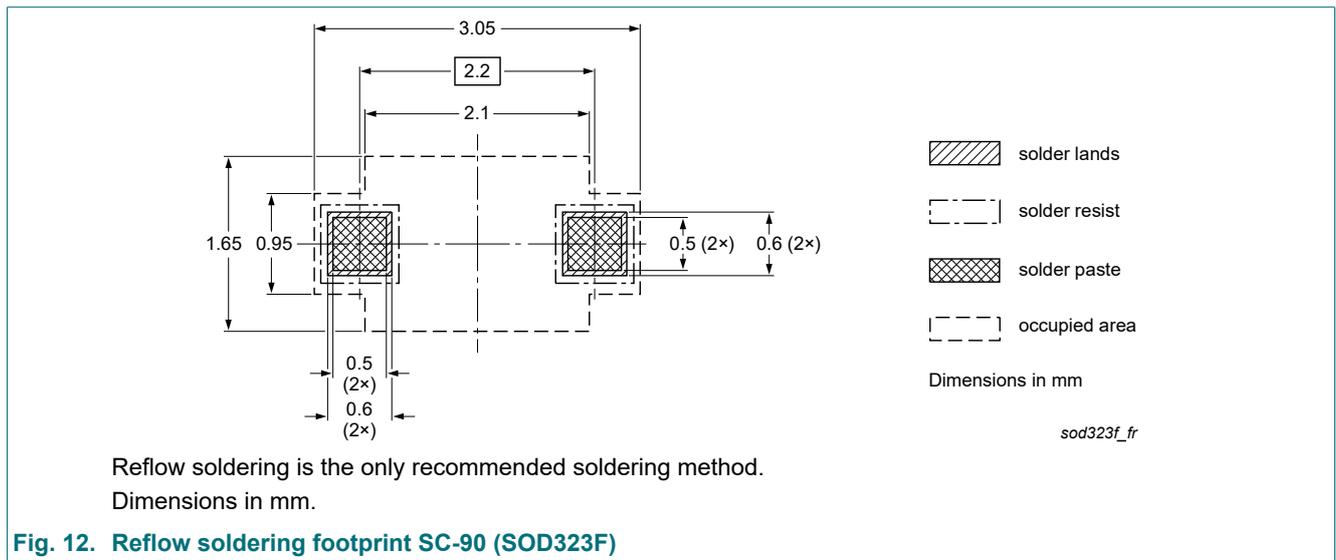


Fig. 12. Reflow soldering footprint SC-90 (SOD323F)

14. Revision history

Table 10. Revision history

Document ID	Release date	Data sheet status	Change notice	Supersedes
BZX84J_SER v.3	20250227	Product data sheet	-	BZX84J_SER v.2
Modifications:	<ul style="list-style-type: none">• Quick reference data and Limiting values: Values at P_{ZSM} improved• Characteristics: Figures adapted to newest improved versions if applicable			
BZX84J_SER v.2	20110801	Product data sheet	-	BZX84J_SER v.1
BZX84J_SER v.1	20070301	Product data sheet	-	-

15. Legal information

Data sheet status

Document status [1][2]	Product status [3]	Definition
Objective [short] data sheet	Development	This document contains data from the objective specification for product development.
Preliminary [short] data sheet	Qualification	This document contains data from the preliminary specification.
Product [short] data sheet	Production	This document contains the product specification.

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- [2] The term 'short data sheet' is explained in section "Definitions".
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Date of release: 27 February 2025
