



# BZT5250H series

## Low-current voltage regulator diodes

Rev. 1 — 18 July 2024

Product data sheet

## 1. General description

General-purpose Zener diodes in an SOD123F small and flat lead Surface-Mounted Device (SMD) plastic package.

## 2. Features and benefits

- Total power dissipation:  $\leq 830$  mW
- Two tolerance series:  $\pm 2$  % and approximately  $\pm 5$  %
- Working voltage range: nominal 1.8 V to 51 V (E24 range)
- Specified at a low test current (50  $\mu$ A), ideal for low bias and portable battery-powered applications
- Small plastic package suitable for surface-mounted design
- BZT5250H-B11 to -C51: Intentional minor rise of leakage current for optimized fast switching and noise reduction [\[AN90031\]](#)

## 3. Applications

- Low-current general regulation functions

## 4. Quick reference data

Table 1. Quick reference data

Symbol	Parameter	Conditions		Min	Typ	Max	Unit
$V_F$	forward voltage	$I_F = 10$ mA	<a href="#">[1]</a>	-	-	0.9	V
$P_{tot}$	total power dissipation	$T_{amb} \leq 25$ °C	<a href="#">[2]</a>	-	-	375	mW
			<a href="#">[3]</a>	-	-	830	mW


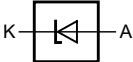
[1] Pulse test:  $t_p \leq 300$   $\mu$ s;  $\delta \leq 0.02$ .

[2] Device mounted on an FR4 Printed-Circuit Board (PCB), single-sided copper, tin-plated and standard footprint.

[3] Device mounted on an FR4 PCB, single-sided copper, tin-plated, mounting pad for cathode 1 cm<sup>2</sup>.

5. Pinning information

Table 2. Pinning

Pin	Symbol	Description		Simplified outline	Graphic symbol
1	K	cathode	[1]		 006aaa152
2	A	anode			

[1] The marking bar indicates the cathode.

6. Ordering information

Table 3. Ordering information

Type number	Package		
	Name	Description	Version
BZT5250H series	-	plastic, surface-mounted package; 2 leads; 2.6 mm x 1.6 mm x 1.1 mm body	SOD123F

7. Marking

Table 4. Marking Codes

Type number	Marking code	Type number	Marking code	Type number	Marking code	Type number	Marking code
BZT5250H-B1V8	U9	BZT5250H-B10	W9	BZT5250H-C1V8	X3	BZT5250H-C10	XM
BZT5250H-B2V0	V1	BZT5250H-B11	WA	BZT5250H-C2V0	X4	BZT5250H-C11	XN
BZT5250H-B2V2	V2	BZT5250H-B12	WB	BZT5250H-C2V2	X5	BZT5250H-C12	XP
BZT5250H-B2V4	V3	BZT5250H-B13	WC	BZT5250H-C2V4	X6	BZT5250H-C13	XQ
BZT5250H-B2V7	V4	BZT5250H-B15	WD	BZT5250H-C2V7	X7	BZT5250H-C15	XR
BZT5250H-B3V0	V5	BZT5250H-B16	WF	BZT5250H-C3V0	X8	BZT5250H-C16	XS
BZT5250H-B3V3	V6	BZT5250H-B18	WH	BZT5250H-C3V3	X9	BZT5250H-C18	XT
BZT5250H-B3V6	V7	BZT5250H-B20	WJ	BZT5250H-C3V6	XA	BZT5250H-C20	XU
BZT5250H-B3V9	V8	BZT5250H-B22	WL	BZT5250H-C3V9	XB	BZT5250H-C22	XV
BZT5250H-B4V3	V9	BZT5250H-B24	WN	BZT5250H-C4V3	XC	BZT5250H-C24	Y1
BZT5250H-B4V7	W1	BZT5250H-B27	WQ	BZT5250H-C4V7	XD	BZT5250H-C27	Y5
BZT5250H-B5V1	W2	BZT5250H-B30	WS	BZT5250H-C5V1	XE	BZT5250H-C30	Y6
BZT5250H-B5V6	W3	BZT5250H-B33	WU	BZT5250H-C5V6	XF	BZT5250H-C33	Y7
BZT5250H-B6V2	W4	BZT5250H-B36	WV	BZT5250H-C6V2	XG	BZT5250H-C36	Y8
BZT5250H-B6V8	W5	BZT5250H-B39	23	BZT5250H-C6V8	XH	BZT5250H-C39	Y9
BZT5250H-B7V5	W6	BZT5250H-B43	WX	BZT5250H-C7V5	XJ	BZT5250H-C43	Z2
BZT5250H-B8V2	W7	BZT5250H-B47	WY	BZT5250H-C8V2	XK	BZT5250H-C47	ZQ
BZT5250H-B9V1	W8	BZT5250H-B51	X2	BZT5250H-C9V1	XL	BZT5250H-C51	ZX

8. Limiting values

Table 5. Limiting values  
In accordance with the Absolute Maximum Rating System (IEC 60134).

Symbol	Parameter	Conditions	Min	Max	Unit
I <sub>F</sub>	forward current		-	200	mA
P <sub>ZSM</sub>	non-repetitive peak reverse power dissipation	t <sub>p</sub> = 100 μs; square wave; T <sub>j</sub> = 25 °C; prior to surge	-	40	W
P <sub>tot</sub>	total power dissipation	T <sub>amb</sub> ≤ 25 °C	[1] -	375	mW
			[2] -	830	mW
T <sub>j</sub>	junction temperature		-	150	°C
T <sub>amb</sub>	ambient temperature		-55	+150	°C
T <sub>stg</sub>	storage temperature		-65	+150	°C

- [1] Device mounted on an FR4 PCB, single-sided copper, tin-plated and standard footprint.  
[2] Device mounted on an FR4 PCB, single-sided copper, tin-plated, mounting pad for cathode 1 cm<sup>2</sup>.

9. Thermal characteristics

Table 6. Thermal characteristics

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
R <sub>th(j-a)</sub>	thermal resistance from junction to ambient	in free air	[1] -	-	330	K/W
			[2] -	-	150	K/W
R <sub>th(j-sp)</sub>	thermal resistance from junction to solder point		[3] -	-	70	K/W

- [1] Device mounted on an FR4 PCB, single-sided copper, tin-plated and standard footprint.  
[2] Device mounted on an FR4 PCB, single-sided copper, tin-plated, mounting pad for cathode 1 cm<sup>2</sup>.  
[3] Soldering point of cathode tab.

10. Characteristics

Table 7. Electrical characteristics  
T<sub>j</sub> = 25 °C unless otherwise specified.

Symbol	Parameter	Conditions	Max	Unit
V <sub>F</sub>	forward voltage	I <sub>F</sub> = 10 mA	[1] 0.9	V

- [1] Pulse test: t<sub>p</sub> ≤ 300 μs; δ ≤ 0.02

Table 8. Electrical characteristics per type: BZT5250H-B1V8 to BZT5250H-C36

T<sub>j</sub> = 25 °C unless otherwise specified.

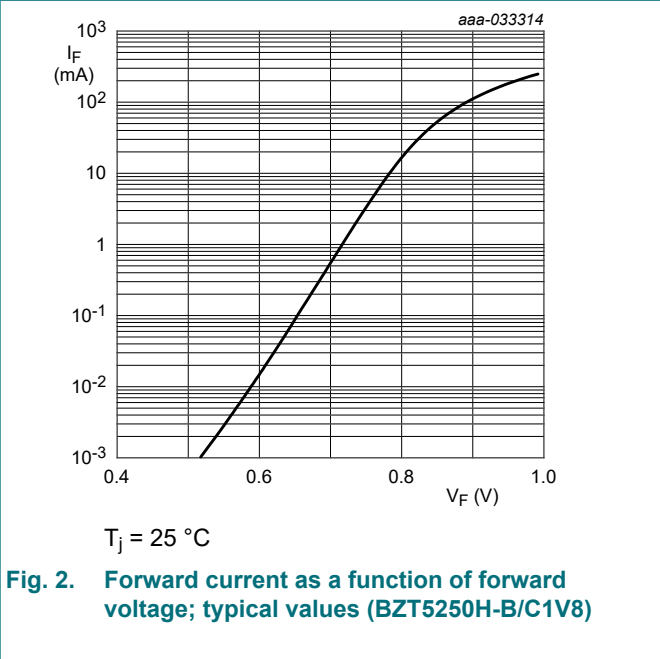
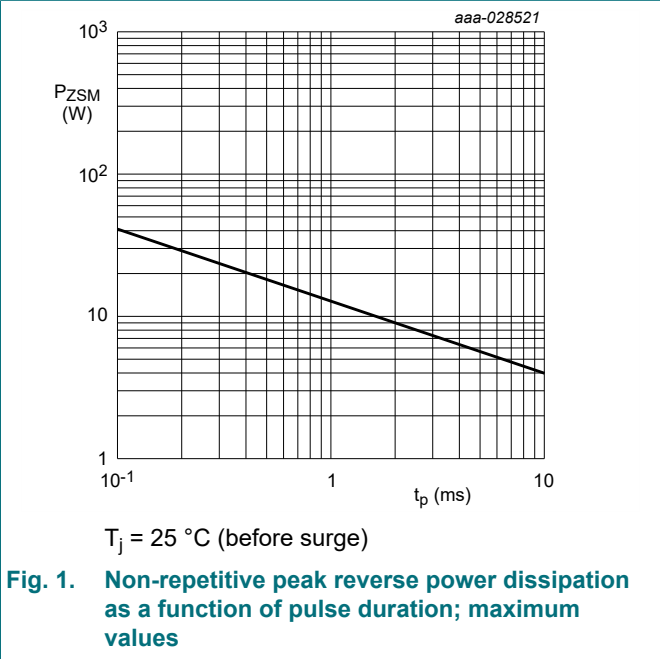
BZT5250H-xxx	Sel.	Working voltage V <sub>Z</sub> (V)		Differential resistance r <sub>diff</sub> (Ω)		Reverse current I <sub>R</sub> (μA)		Temperature coefficient S <sub>Z</sub> (mV/K)		Diode capacitance C <sub>d</sub> (pF)
		I <sub>Z</sub> = 50 μA		I <sub>Z</sub> = 1 mA	I <sub>Z</sub> = 5 mA			I <sub>Z</sub> = 5 mA		f = 1 MHz V <sub>R</sub> = 0 V
		Min	Max	Max	Max	Max	V <sub>R</sub> (V)	Min	Max	Max
1V8	B	1.76	1.84	600	100	7.5	1.0	-3.5	0	220
	C	1.71	1.89							
2V0	B	1.96	2.04	600	100	7	1.0	-3.5	0	220
	C	1.88	2.12							
2V2	B	2.15	2.25	600	100	4	1.0	-3.5	0	210
	C	2.09	2.31							
2V4	B	2.35	2.45	600	100	2	1.0	-3.5	0	200
	C	2.28	2.52							
2V7	B	2.65	2.75	600	100	1	1.0	-3.5	0	190
	C	2.565	2.835							
3V0	B	2.94	3.06	600	100	0.8	1.0	-3.5	0.2	170
	C	2.85	3.15							
3V3	B	3.23	3.37	600	100	7.5	1.5	-3.5	1.2	160
	C	3.13	3.47							
3V6	B	3.53	3.67	600	95	7.5	2.0	-3.5	1.2	160
	C	3.42	3.78							
3V9	B	3.82	3.98	600	95	5.0	2.0	-2.7	2.5	150
	C	3.70	4.10							
4V3	B	4.21	4.39	600	95	4.0	2.0	-2.7	2.5	150
	C	4.09	4.52							
4V7	B	4.61	4.79	600	80	5.0	3.0	-2.7	2.5	140
	C	4.47	4.94							
5V1	B	5.00	5.20	500	60	5.0	3.0	-2.0	3.7	130
	C	4.85	5.36							
5V6	B	5.49	5.71	400	40	2.0	4.0	-2.0	3.7	120
	C	5.32	5.88							
6V2	B	6.08	6.32	160	10	1.0	5.0	0.4	4.5	110
	C	5.89	6.51							
6V8	B	6.66	6.94	80	15	0.1	5.1	1.2	4.5	100
	C	6.46	7.14							
7V5	B	7.35	7.65	80	15	0.1	5.7	2.5	5.3	150
	C	7.13	7.88							
8V2	B	8.04	8.36	80	15	0.1	6.2	3.2	6.2	150
	C	7.79	8.61							
9V1	B	8.92	9.28	100	15	0.1	6.9	3.8	7.0	150
	C	8.65	9.56							
10	B	9.80	10.20	150	20	0.1	7.6	4.5	8.0	90
	C	9.50	10.50							

BZT5250H- xxx	Sel.	Working voltage V <sub>Z</sub> (V)		Differential resistance r <sub>diff</sub> (Ω)		Reverse current I <sub>R</sub> (μA)		Temperature coefficient S <sub>Z</sub> (mV/K)		Diode capacitance C <sub>d</sub> (pF)
		I <sub>Z</sub> = 50 μA		I <sub>Z</sub> = 1 mA	I <sub>Z</sub> = 5 mA			I <sub>Z</sub> = 5 mA		f = 1 MHz V <sub>R</sub> = 0 V
		Min	Max	Max	Max	Max	V <sub>R</sub> (V)	Min	Max	Max
11	B	10.80	11.20	150	20	0.05	8.4	5.4	9.0	85
	C	10.45	11.55							
12	B	11.80	12.20	150	25	0.05	9.1	6.0	10	85
	C	11.40	12.60							
13	B	12.70	13.30	170	30	0.05	9.8	7.0	11	80
	C	12.35	13.65							
15	B	14.70	15.30	200	30	0.05	11.4	9.2	13	75
	C	14.25	15.75							
16	B	15.70	16.30	200	40	0.05	12.1	10.4	14	75
	C	15.20	16.80							
18	B	17.60	18.40	225	45	0.05	13.6	12.4	16	70
	C	17.10	18.90							
20	B	19.60	20.40	225	55	0.05	15.2	14.4	18	60
	C	19.00	21.00							
22	B	21.60	22.40	250	55	0.05	16.7	16.4	20	60
	C	20.90	23.10							
24	B	23.50	24.50	250	70	0.05	18.2	18.4	22	55
	C	22.80	25.20							
27	B	26.50	27.50	300	80	0.05	20.4	21.4	25.3	50
	C	25.65	28.35							
30	B	29.40	30.60	300	80	0.05	22.8	24.4	29.4	50
	C	28.50	31.50							
33	B	32.30	33.70	325	80	0.05	25.0	27.4	33.4	45
	C	31.35	34.65							
36	B	35.30	36.70	350	90	0.05	27.3	30.4	37.4	45
	C	34.20	37.80							

Table 9. Electrical characteristics per type: BZT5250H-B39 to BZT5250H-C51

T<sub>j</sub> = 25 °C unless otherwise specified.

BZT5250H-xxx	Sel.	Working voltage V <sub>Z</sub> (V)		Differential resistance r <sub>diff</sub> (Ω)		Reverse current I <sub>R</sub> (μA)		Temperature coefficient S <sub>Z</sub> (mV/K)		Diode capacitance C <sub>d</sub> (pF)
		I <sub>Z</sub> = 50 μA		I <sub>Z</sub> = 0.5 mA	I <sub>Z</sub> = 2 mA			I <sub>Z</sub> = 2 mA		f = 1 MHz V <sub>R</sub> = 0 V
		Min	Max	Max	Max	Max	V <sub>R</sub> (V)	Min	Max	Max
39	B	38.20	39.80	350	130	0.05	29.6	33.4	41.2	45
	C	37.05	40.95							
43	B	42.10	43.90	375	150	0.05	32.6	37.6	46.6	40
	C	40.85	45.15							
47	B	46.10	47.90	375	170	0.05	32.9	42.0	51.8	40
	C	44.00	50.00							
51	B	50.00	52.00	400	180	0.05	35.7	46.6	57.2	40
	C	48.00	54.00							



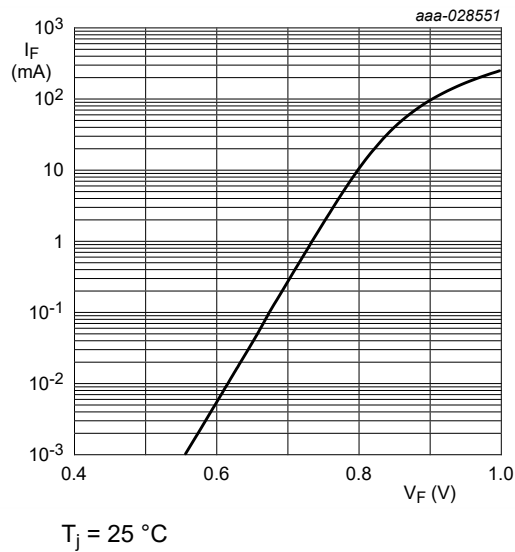


Fig. 3. Forward current as a function of forward voltage; typical values (BZT5250H-B/C6V8)

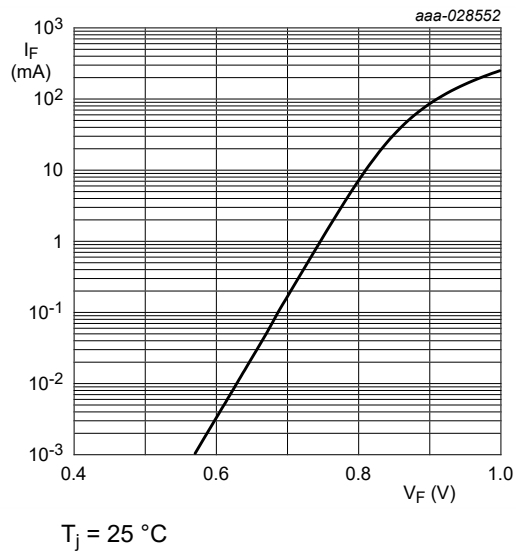


Fig. 4. Forward current as a function of forward voltage; typical values (BZT5250H-B/C7V5)

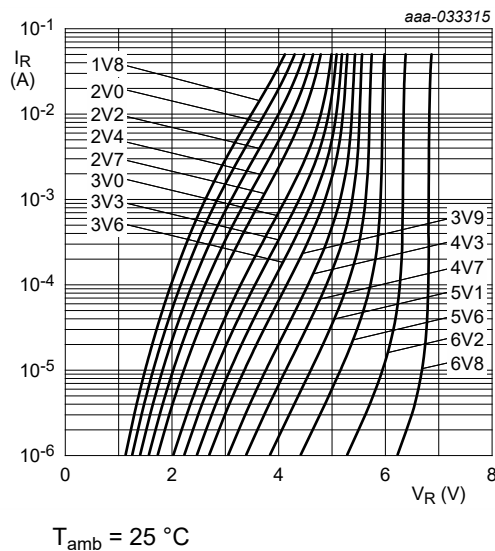


Fig. 5. Reverse current as a function of reverse voltage; typical values (BZT5250H-B/C1V8 to BZT5250H-B/C6V8)

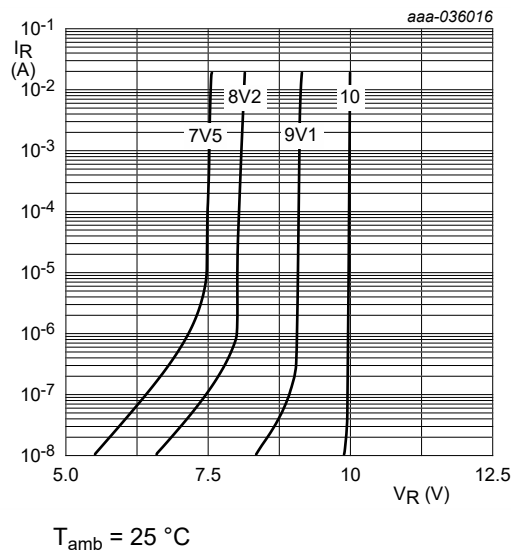


Fig. 6. Reverse current as a function of reverse voltage; typical values (BZT5250H-B/C7V5 to BZT5250H-B/C10)

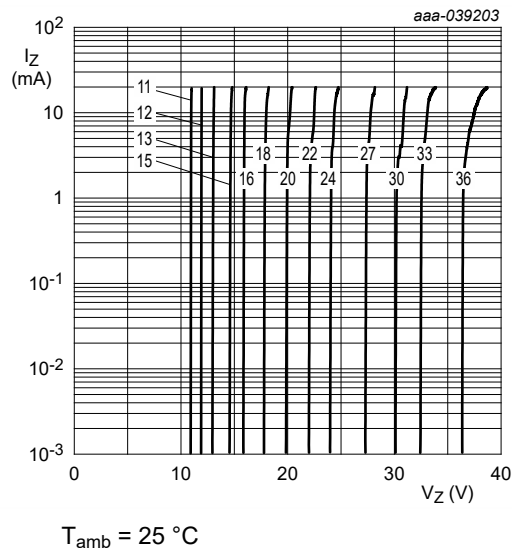


Fig. 7. Reverse current as a function of reverse voltage; typical values (BZT5250H-B/C11 to BZT5250H-B/C36)

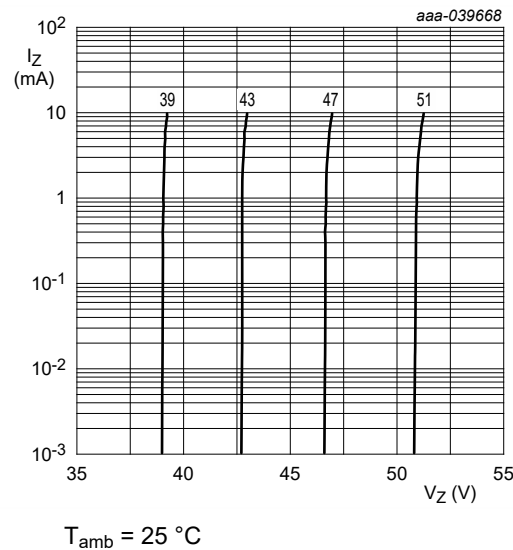


Fig. 8. Reverse current as a function of reverse voltage; typical values (BZT5250H-B/C39 to BZT5250H-B/C51)

11. Package outline

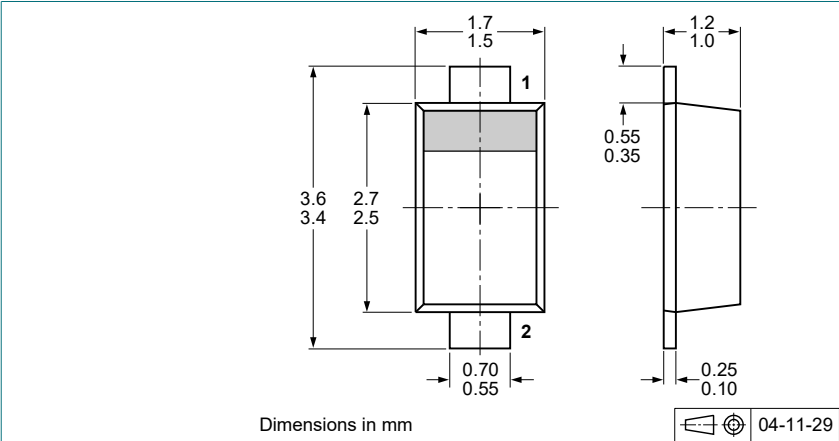
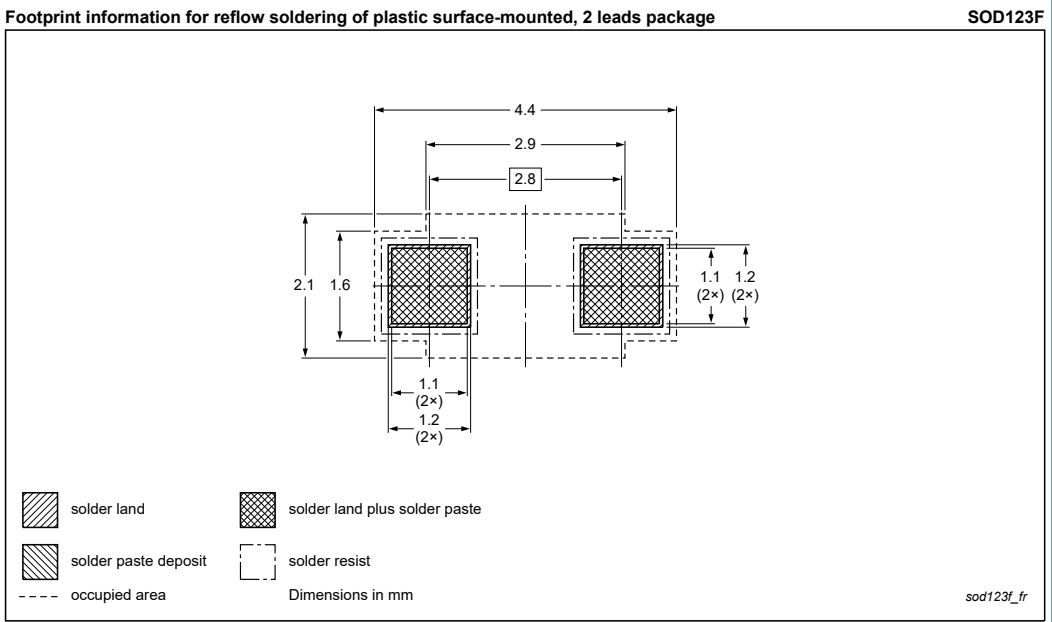


Fig. 9. Package outline SOD123F



12. Soldering



Reflow soldering is the only recommended soldering method.

Fig. 10. Reflow soldering footprint SOD123F

13. Revision history

Table 10. Revision history

Document ID	Release date	Data sheet status	Change notice	Supersedes
BZT5250H_SER v.1	20240718	Product data sheet	-	-

## 14. 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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