



BZX8450 series

Low-current voltage regulator diodes

Rev. 3 — 17 July 2024

Product data sheet

1. General description

Low-current voltage regulator diodes in a small SOT23 Surface-Mounted Device (SMD) plastic package.

2. Features and benefits

- Total power dissipation: ≤ 250 mW
- Two tolerance series: $\pm 2\%$ and approximately $\pm 5\%$
- Working voltage range: nominal 1.8 V to 51 V
- Specified at a low test current (50 μ A), ideal for low bias and portable battery-powered applications
- BZX8450-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

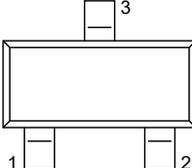
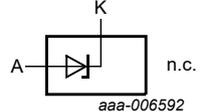
Symbol	Parameter	Conditions	Min	Typ	Max	Unit
V_F	forward voltage	$I_F = 10$ mA [1]	-	-	0.9	V
P_{tot}	total power dissipation	$T_{amb} \leq 25$ °C [2]	-	-	250	mW

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

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

5. Pinning information

Table 2. Pinning

Pin	Symbol	Description	Simplified outline	Graphic symbol
1	A	anode		
2	n.c.	not connected		
3	K	cathode		

6. Ordering information

Table 3. Ordering information

Type number	Package		
	Name	Description	Version
BZX8450 series	SOT23	plastic, surface-mounted package; 3 terminals; 1.9 mm pitch; 2.9 mm x 1.3 mm x 1 mm body	SOT23

7. Marking

Table 4. Marking Codes

Type number	Marking code[1]	Type number	Marking code[1]	Type number	Marking code[1]	Type number	Marking code[1]
BZX8450-B1V8	%P2	BZX8450-B10	%PL	BZX8450-C1V8	2Q%	BZX8450-C10	F7%
BZX8450-B2V0	%P3	BZX8450-B11	%PM	BZX8450-C2V0	2R%	BZX8450-C11	F9%
BZX8450-B2V2	%P4	BZX8450-B12	%PN	BZX8450-C2V2	6Q%	BZX8450-C12	G2%
BZX8450-B2V4	%P5	BZX8450-B13	%PP	BZX8450-C2V4	6V%	BZX8450-C13	G3%
BZX8450-B2V7	%P6	BZX8450-B15	%PQ	BZX8450-C2V7	8D%	BZX8450-C15	G4%
BZX8450-B3V0	%P7	BZX8450-B16	%PR	BZX8450-C3V0	BU%	BZX8450-C16	H8%
BZX8450-B3V3	%P8	BZX8450-B18	%PS	BZX8450-C3V3	D5%	BZX8450-C18	H9%
BZX8450-B3V6	%P9	BZX8450-B20	%PT	BZX8450-C3V6	D6%	BZX8450-C20	HX%
BZX8450-B3V9	%PA	BZX8450-B22	%PU	BZX8450-C3V9	D9%	BZX8450-C22	J4%
BZX8450-B4V3	%PB	BZX8450-B24	%PV	BZX8450-C4V3	E3%	BZX8450-C24	J9%
BZX8450-B4V7	%PC	BZX8450-B27	%PX	BZX8450-C4V7	E5%	BZX8450-C27	JJ%
BZX8450-B5V1	%PD	BZX8450-B30	%PY	BZX8450-C5V1	E6%	BZX8450-C30	JQ%
BZX8450-B5V6	%PE	BZX8450-B33	%PZ	BZX8450-C5V6	E7%	BZX8450-C33	JT%
BZX8450-B6V2	%PF	BZX8450-B36	%H8	BZX8450-C6V2	E8%	BZX8450-C36	K5%
BZX8450-B6V8	%PG	BZX8450-B39	%H9	BZX8450-C6V8	E9%	BZX8450-C39	KQ%
BZX8450-B7V5	%PH	BZX8450-B43	%HL	BZX8450-C7V5	F3%	BZX8450-C43	L2%
BZX8450-B8V2	%PJ	BZX8450-B47	%HM	BZX8450-C8V2	F5%	BZX8450-C47	L3%
BZX8450-B9V1	%PK	BZX8450-B51	%HN	BZX8450-C9V1	F6%	BZX8450-C51	LV%

[1] % = placeholder for manufacturing site code

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		-	200	mA
P_{ZSM}	non-repetitive peak reverse power dissipation	$t_p = 100 \mu\text{s}$; square wave; $T_j = 25 \text{ }^\circ\text{C}$; prior to surge	-	40	W
P_{tot}	total power dissipation	$T_{amb} \leq 25 \text{ }^\circ\text{C}$	[1]	250	mW
T_j	junction temperature		-	150	$^\circ\text{C}$
T_{amb}	ambient temperature		-55	+150	$^\circ\text{C}$
T_{stg}	storage temperature		-65	+150	$^\circ\text{C}$

[1] Device mounted on an FR4 Printed-Circuit Board (PCB), single sided 70 μm copper, tin-plated and standard footprint.

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]	-	-	500	K/W
$R_{th(j-sp)}$	thermal resistance from junction to solder point	[2]	-	-	330	K/W

[1] Device mounted on an FR4 Printed-Circuit Board (PCB), single sided 70 μm copper, tin-plated and standard footprint.

[2] Soldering point of cathode tab

10. Characteristics

Table 7. Electrical characteristics

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

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

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

Table 8. Electrical characteristics per type: BZX8450-B1V8 to BZX8450-C36

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

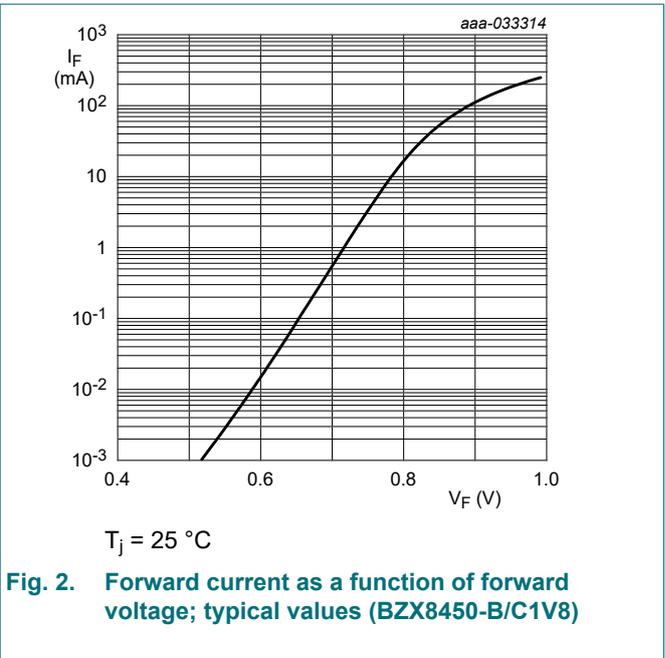
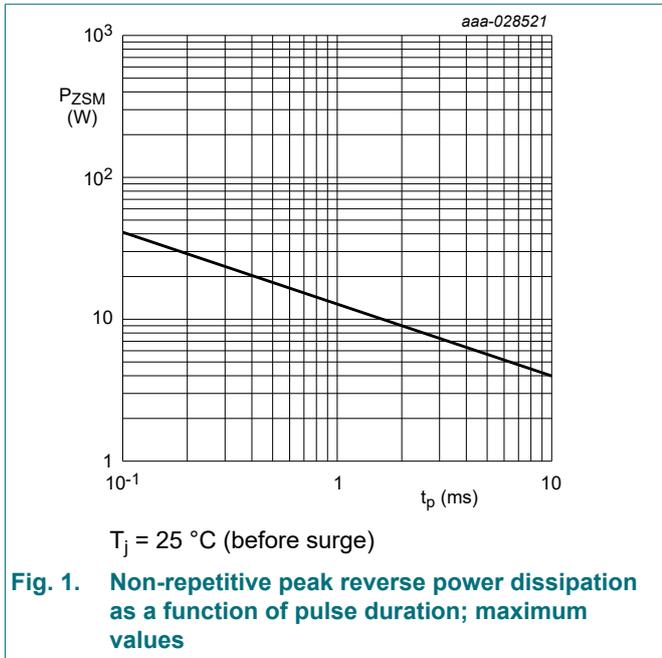
BZX8450-xxx	Sel.	Working voltage V_Z (V)		Differential resistance r_{diff} (Ω)		Reverse current I_R (μA)		Temperature coefficient S_Z (mV/K)		Diode capacitance C_d (pF)
		$I_Z = 50\ \mu\text{A}$		$I_Z = 1\ \text{mA}$	$I_Z = 5\ \text{mA}$	Max	V_R (V)	$I_Z = 5\ \text{mA}$		$f = 1\ \text{MHz}$ $V_R = 0\ \text{V}$
		Min	Max	Max	Max			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							

BZX8450-xxx	Sel.	Working voltage V_Z (V)		Differential resistance r_{diff} (Ω)		Reverse current I_R (μ A)		Temperature coefficient S_Z (mV/K)		Diode capacitance C_d (pF)
		$I_Z = 50 \mu$ A		$I_Z = 1$ mA	$I_Z = 5$ mA	Max	V_R (V)	$I_Z = 5$ mA		$f = 1$ MHz $V_R = 0$ V
		Min	Max	Max	Max			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: BZX8450-B39 to BZX8450-C51

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

BZX8450-xxx	Sel.	Working voltage V_Z (V)		Differential resistance r_{diff} (Ω)		Reverse current I_R (μ A)		Temperature coefficient S_Z (mV/K)		Diode capacitance C_d (pF)
		$I_Z = 50\ \mu$ A		$I_Z = 0.5$ mA	$I_Z = 2$ mA	Max	V_R (V)	$I_Z = 2$ mA		$f = 1$ MHz $V_R = 0$ V
		Min	Max	Max	Max			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							



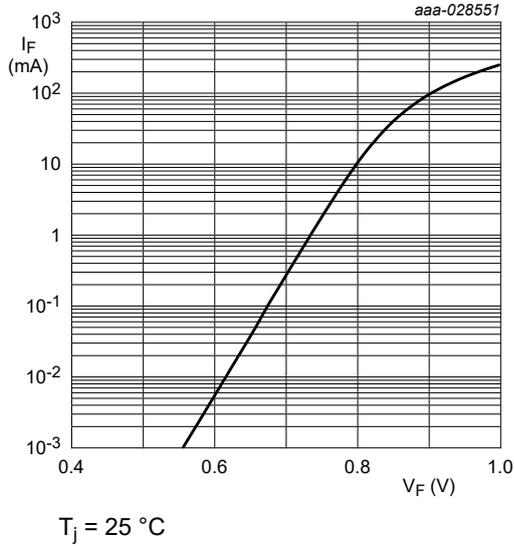


Fig. 3. Forward current as a function of forward voltage; typical values (BZX8450-B/C6V8)

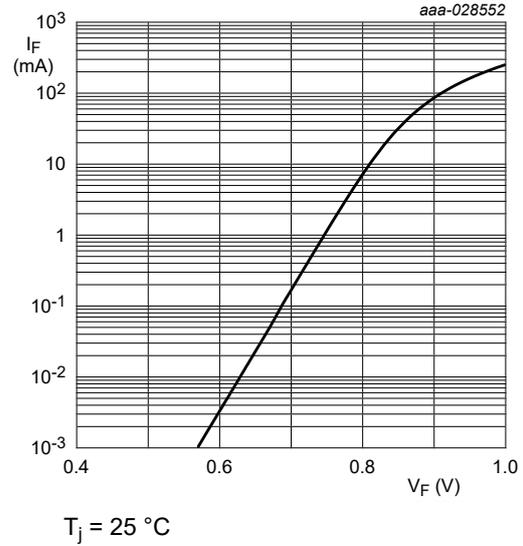


Fig. 4. Forward current as a function of forward voltage; typical values (BZX8450-B/C7V5)

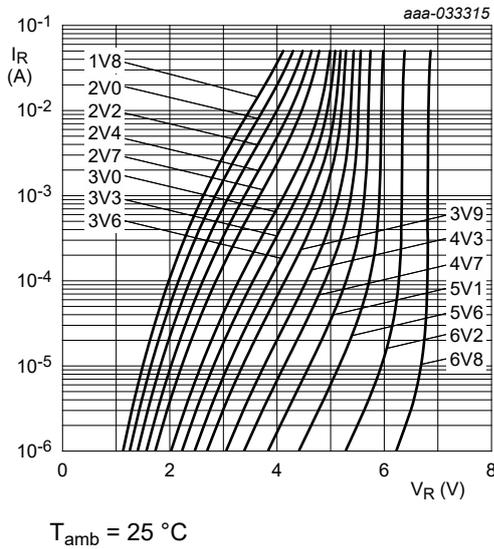


Fig. 5. Reverse current as a function of reverse voltage; typical values (BZX8450-B/C1V8 to BZX8450-B/C6V8)

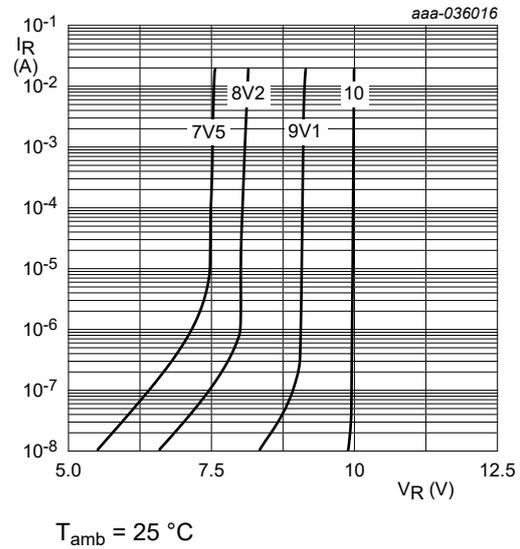
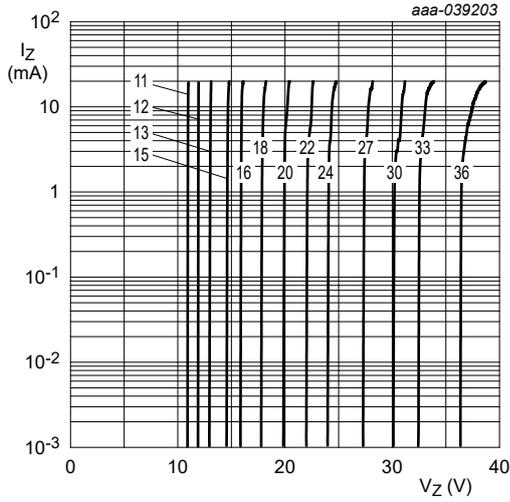
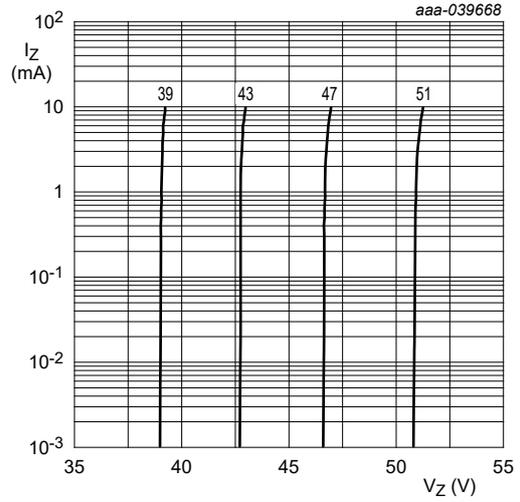


Fig. 6. Reverse current as a function of reverse voltage; typical values (BZX8450-B/C7V5 to BZX8450-B/C10)



T_{amb} = 25 °C

Fig. 7. Reverse current as a function of reverse voltage; typical values (BZX8450-B/C11 to BZX8450-B/C36)



T_{amb} = 25 °C

Fig. 8. Reverse current as a function of reverse voltage; typical values (BZX8450-B/C39 to BZX8450-B/C51)

11. Package outline

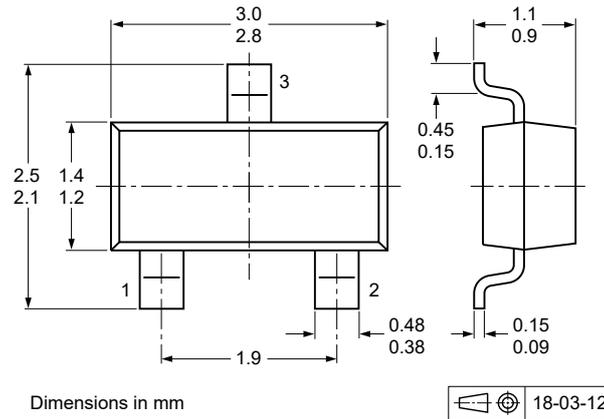


Fig. 9. Package outline SOT23

12. Soldering

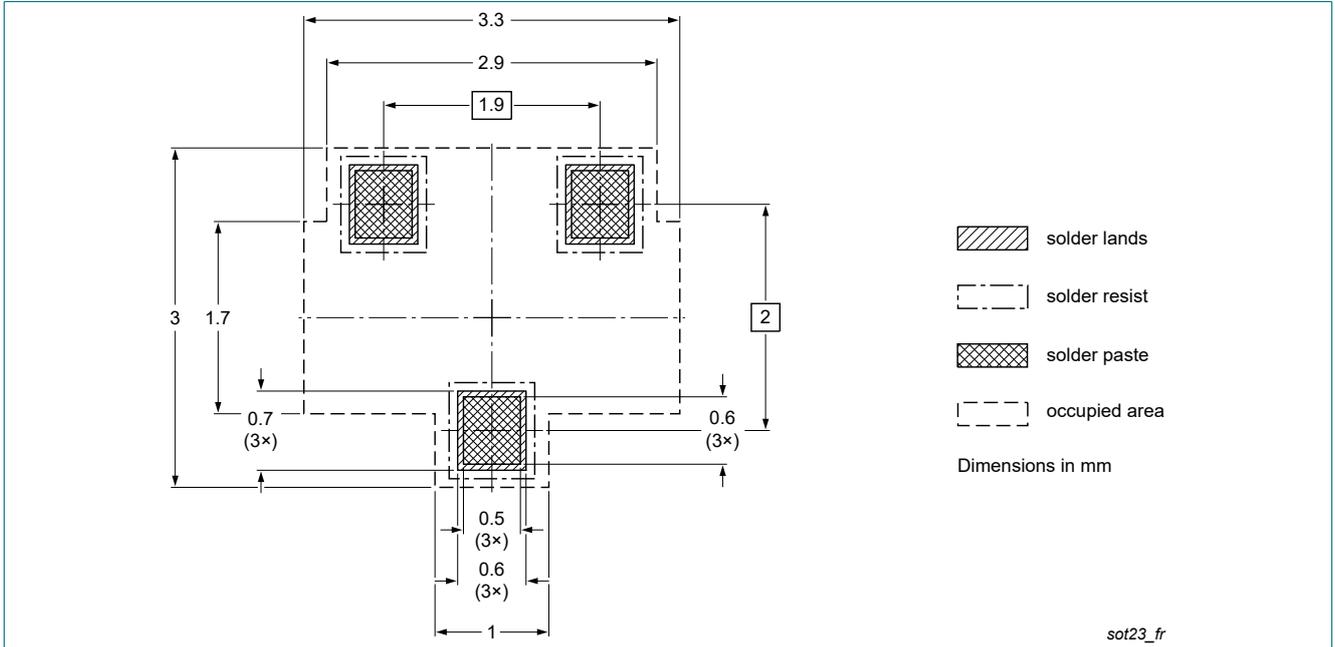


Fig. 10. Reflow soldering footprint for SOT23

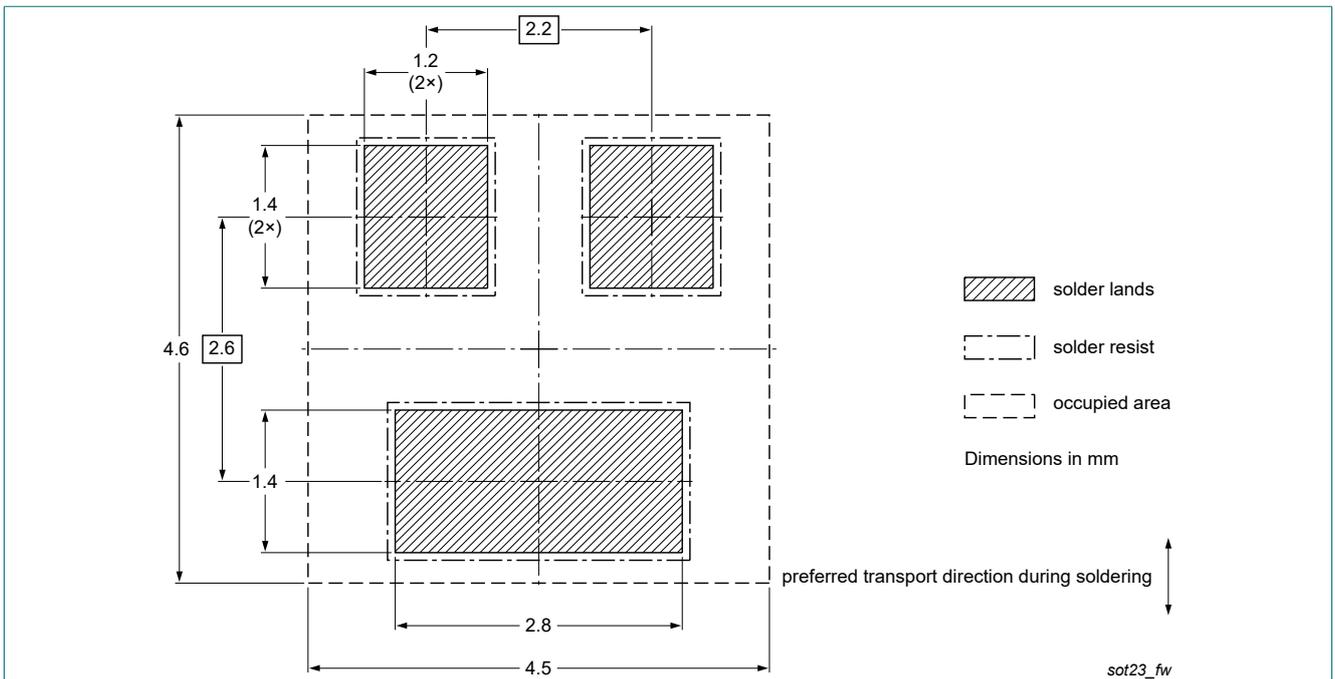


Fig. 11. Wave soldering footprint for SOT23

13. Revision history

Table 10. Revision history

Document ID	Release date	Data sheet status	Change notice	Supersedes
BZX8450_SER v.3	20240717	Product data sheet	-	BZX8450_SER v.2
Modifications:	• Products added: B selections 1V8 to 51 V and C selections 11V to 51 V			
BZX8450_SER v.2	20230118	Product data sheet	-	BZX8450_SER v.1
BZX8450_SER v.1	20210824	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.

- [1] Please consult the most recently issued document before initiating or completing a design.
- [2] The term 'short data sheet' is explained in section "Definitions".
- [3] The product status of device(s) described in this document may have changed since this document was published and may differ in case of multiple devices. The latest product status information is available on the internet at <https://www.nexperia.com>.

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