BZX8450 series

Low-current voltage regulator diodes

Rev. 1 — 24 August 2021 Product data sheet

1. General description

Low-current voltage regulator diodes in a small SOT23 (TO-236AB) Surface-Mounted Device (SMD) plastic package.

2. Features and benefits

- Total power dissipation: ≤ 250 mW
- Tolerance series: approximately ± 5 %
- Working voltage range: nominal 1.8 V to 75 V
- Specified at a low test current (50 µA), ideal for low bias and portable battery-powered applications

3. Applications

- Low-current general regulation functions

4. Quick reference data

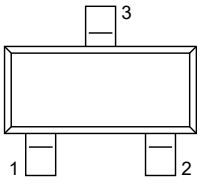
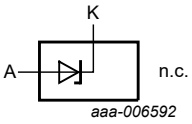
Table 1. Quick reference data

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} ≤ 25 °C	[2]	-	-	250	mW

[1] Pulse test: t_p ≤ 300 µs; δ ≤ 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	TO-236AB	plastic surface-mounted package; 3 leads	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-C1V8	2Q%	BZX8450-C4V7	E5%	BZX8450-C12	G2%	BZX8450-C33	JT%
BZX8450-C2V0	2R%	BZX8450-C5V1	E6%	BZX8450-C13	G3%	BZX8450-C36	K5%
BZX8450-C2V2	6Q%	BZX8450-C5V6	E7%	BZX8450-C15	G4%	BZX8450-C39	KQ%
BZX8450-C2V4	6V%	BZX8450-C6V2	E8%	BZX8450-C16	H8%	BZX8450-C43	L2%
BZX8450-C2V7	8D%	BZX8450-C6V8	E9%	BZX8450-C18	H9%	BZX8450-C47	L3%
BZX8450-C3V0	BU%	BZX8450-C7V5	F3%	BZX8450-C20	HX%	BZX8450-C51	LV%
BZX8450-C3V3	D5%	BZX8450-C8V2	F5%	BZX8450-C22	J4%	BZX8450-C56	Q9%
BZX8450-C3V6	D6%	BZX8450-C9V1	F6%	BZX8450-C24	J9%	BZX8450-C62	QS%
BZX8450-C3V9	D9%	BZX8450-C10	F7%	BZX8450-C27	JJ%	BZX8450-C68	QU%
BZX8450-C4V3	E3%	BZX8450-C11	F9%	BZX8450-C30	JQ%	BZX8450-C75	QV%

[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 µs; square wave; T_j = 25 °C; prior to surge		-	40	W
P_{tot}	total power dissipation	$T_{amb} \leq 25$ °C	[1]	-	250	mW
T_j	junction temperature			-	150	°C
T_{amb}	ambient temperature			−55	+150	°C
T_{stg}	storage temperature			−65	+150	°C

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

10. Characteristics

Table 7. Electrical characteristics

T_j = 25 °C unless otherwise specified.

Symbol	Parameter	Conditions		Max	Unit
V_F	forward voltage	I_F = 10 mA	[1]	0.9	V

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

Table 8. Electrical characteristics per type: BZX8450-C1V8 to BZX8450-C24

T_j = 25 °C unless otherwise specified.

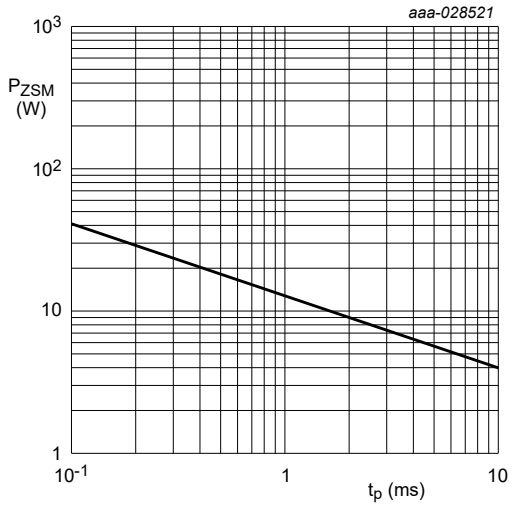
BZX8450-C	Working voltage V_Z (V)		Differential resistance r_{diff} (Ω)		Reverse current I_R (µA)		Temperature coefficient S_Z (mV/K)		Diode capacit. C_d (pF)[1]
	I_Z = 50 µA		I_Z = 1 mA	I_Z = 5 mA			I_Z = 5 mA		
	Min	Max	Max	Max	Max	V_R (V)	Min	Max	Max
1V8	1.71	1.89	600	100	7.5	1.0	-3.5	0	220
2V0	1.88	2.12	600	100	7	1.0	-3.5	0	220
2V2	2.09	2.31	600	100	4	1.0	-3.5	0	210
2V4	2.28	2.52	600	100	2	1.0	-3.5	0	200
2V7	2.565	2.835	600	100	1	1.0	-3.5	0	190
3V0	2.85	3.15	600	100	0.8	1.0	-3.5	0.2	170
3V3	3.13	3.47	600	100	7.5	1.5	-3.5	1.2	160
3V6	3.42	3.78	600	95	7.5	2.0	-3.5	1.2	160
3V9	3.70	4.10	600	95	5.0	2.0	-2.7	2.5	150
4V3	4.09	4.52	600	95	4.0	2.0	-2.7	2.5	150
4V7	4.47	4.94	600	80	5.0	3.0	-2.7	2.5	140
5V1	4.85	5.36	500	60	5.0	3.0	-2.0	3.7	130
5V6	5.32	5.88	400	40	2.0	4.0	-2.0	3.7	120
6V2	5.89	6.51	160	10	1.0	5.0	0.4	4.5	110
6V8	6.46	7.14	80	15	0.1	5.1	1.2	4.5	100
7V5	7.13	7.88	80	15	0.1	5.7	2.5	5.3	150
8V2	7.79	8.61	80	15	0.1	6.2	3.2	6.2	150
9V1	8.65	9.56	100	15	0.1	6.9	3.8	7.0	150
10	9.50	10.50	150	20	0.1	7.6	4.5	8.0	90
11	10.45	11.55	150	20	0.05	8.4	5.4	9.0	85
12	11.40	12.60	150	25	0.05	9.1	6.0	10.0	85
13	12.35	13.65	170	30	0.05	9.8	7.0	11.0	80
15	14.25	15.75	200	30	0.05	11.4	9.2	13.0	75
16	15.20	16.80	200	40	0.05	12.1	10.4	14.0	75
18	17.10	18.90	225	45	0.05	13.6	12.4	16.0	70
20	19.00	21.00	225	55	0.05	15.2	14.4	18.0	60
22	20.90	23.10	250	55	0.05	16.7	16.4	20.0	60
24	22.80	25.20	250	70	0.05	18.2	18.4	22.0	55

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

Table 9. Electrical characteristics per type: BZX8450-C27 to BZX8450-C75

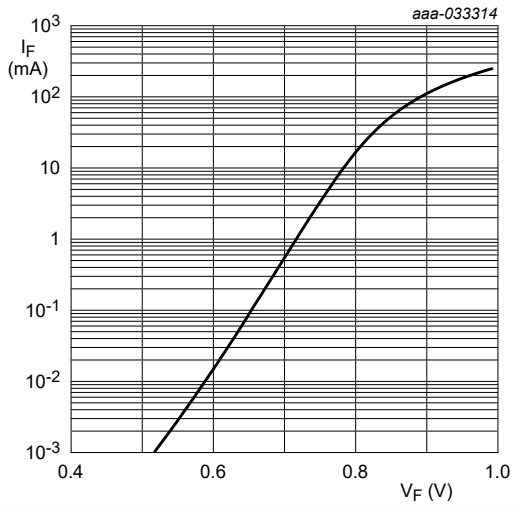
BZX8450-C	Working voltage V_Z (V)		Differential resistance r_{diff} (Ω)		Reverse current I_R (μA)		Temperature coefficient S_Z (mV/K)		Diode capacit. C_d (pF)[1]
	I_Z = 50 μA		I_Z = 0.5 mA	I_Z = 2 mA			I_Z = 2 mA		
	Min	Max	Max	Max	Max	V_R (V)	Min	Max	Max
27	25.65	28.35	300	80	0.05	20.4	21.4	25.3	50
30	28.50	31.50	300	80	0.05	22.8	24.4	29.4	50
33	31.35	34.65	325	80	0.05	25.0	27.4	33.4	45
36	34.20	37.80	350	90	0.05	27.3	30.4	37.4	45
39	37.05	40.95	350	130	0.05	29.6	33.4	41.2	45
43	40.85	45.15	375	150	0.05	32.6	37.6	46.6	40
47	44.00	50.00	375	170	0.05	32.9	42.0	51.8	40
51	48.00	54.00	400	180	0.05	35.7	46.6	57.2	40
56	52.00	60.00	425	200	0.05	39.2	52.2	63.8	40
62	58.00	66.00	450	215	0.05	43.4	58.8	71.6	35
68	64.00	72.00	475	240	0.05	47.6	65.6	79.8	35
75	70.00	79.00	500	255	0.05	52.5	73.4	88.6	35

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



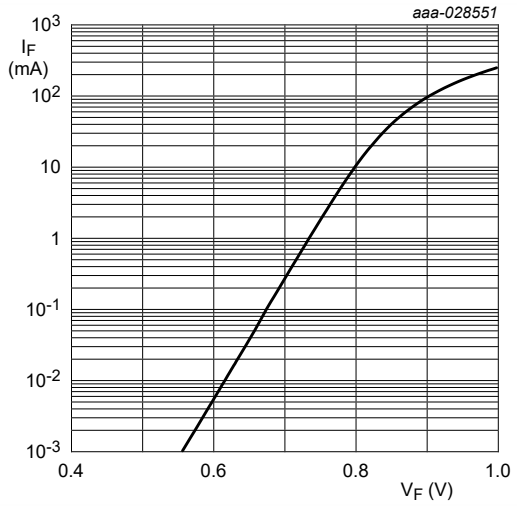
(1) T_j = 25 °C (before surge)

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



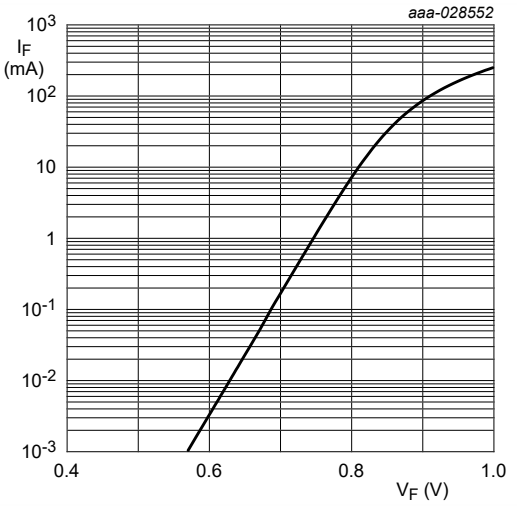
T_j = 25 °C

Fig. 2. Forward current as a function of forward voltage; typical values (BZX8450-C1V8)



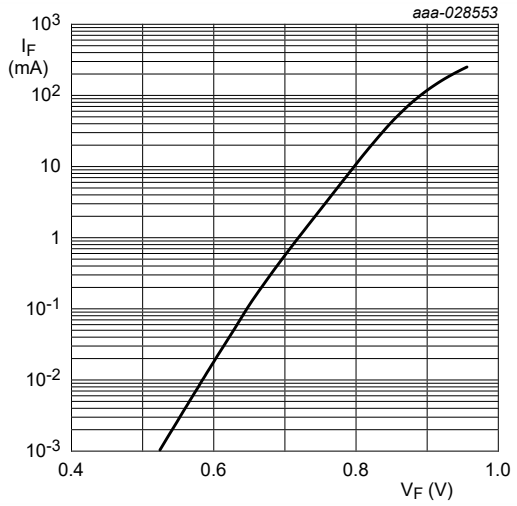
T_j = 25 °C

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



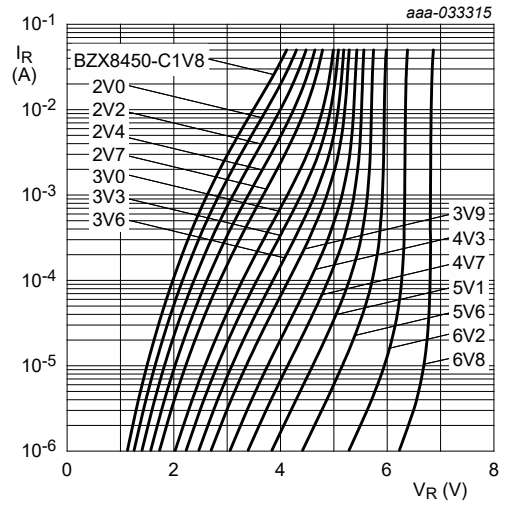
T_j = 25 °C

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



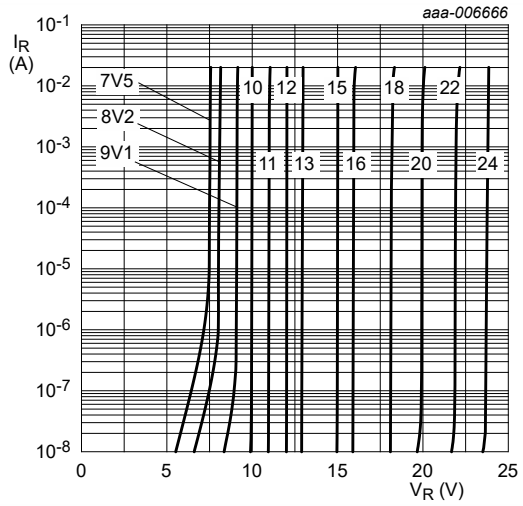
T_j = 25 °C

Fig. 5. Forward current as a function of forward voltage; typical values (BZX8450-C75)



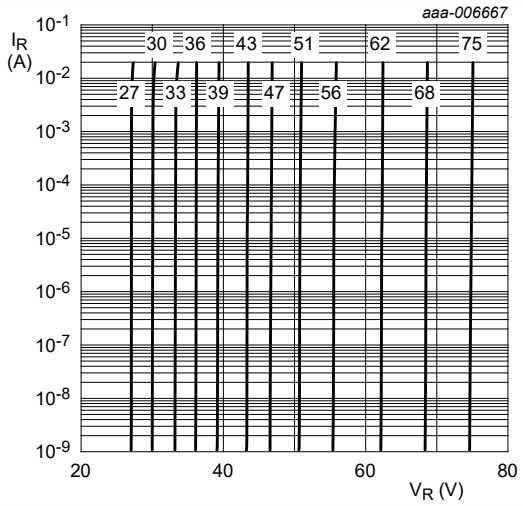
T_{amb} = 25 °C

Fig. 6. Reverse current as a function of reverse voltage; typical values (BZX8450-C1V8 to BZX8450-C6V8)



T_{amb} = 25 °C

Fig. 7. Reverse current as a function of reverse voltage; typical values (BZX8450-C7V5 to BZX8450-C24)



T_{amb} = 25 °C

Fig. 8. Reverse current as a function of reverse voltage; typical values (BZX8450-C27 to BZX8450-C75)

11. Package outline

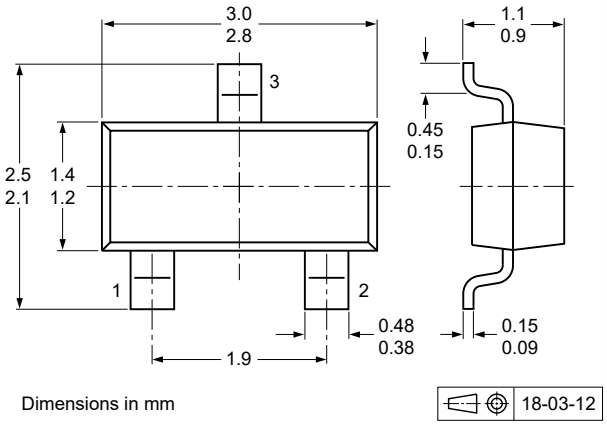


Fig. 9. Package outline SOT23 (TO-236AB)

12. Soldering

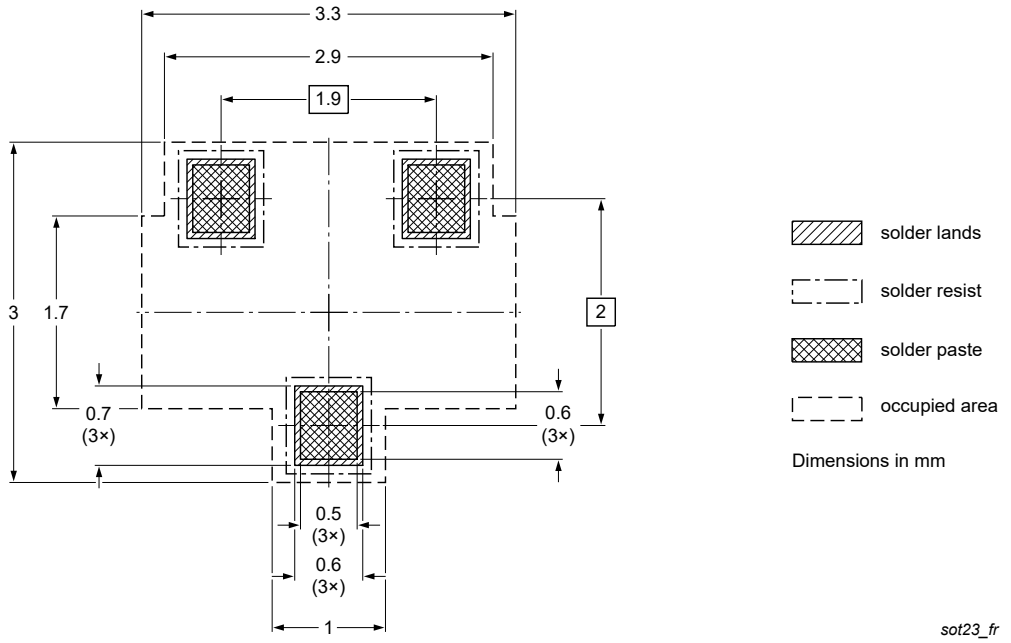


Fig. 10. Reflow soldering footprint SOT23 (TO-236AB)

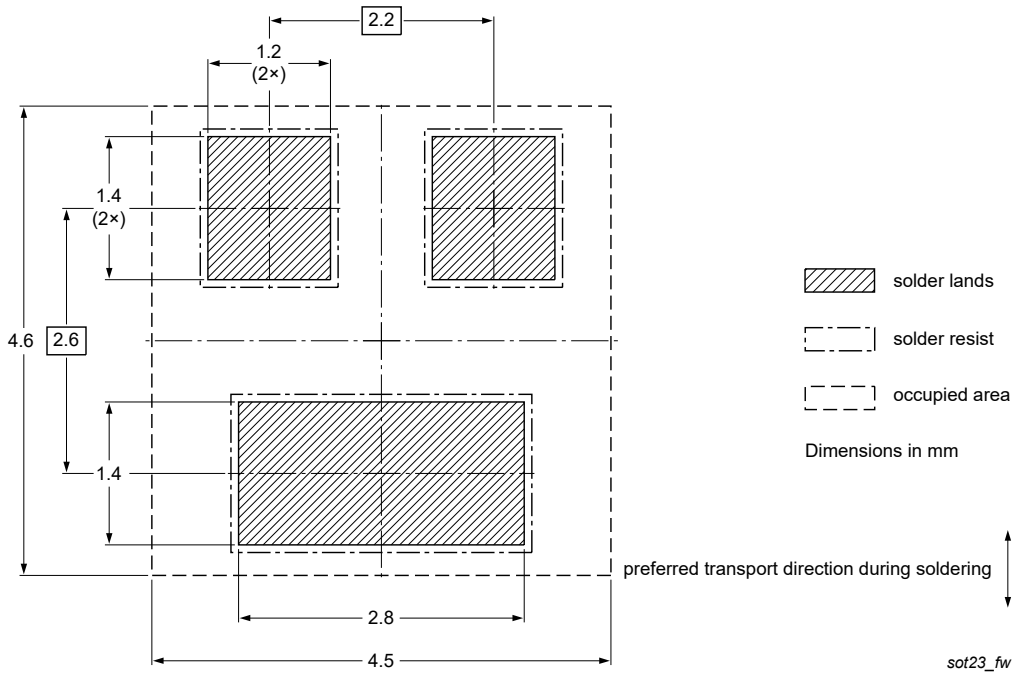


Fig. 11. Wave soldering footprint SOT23 (TO-236AB)

13. Revision history

Table 10. Revision history

Document ID	Release date	Data sheet status	Change notice	Supersedes
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.
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