BZX38450 series

Low-current voltage regulator diodes

Rev. 3 — 18 January 2023 Product data sheet

1. General description

Low-current voltage regulator diodes in a small SOD323 (SC-76) Surface-Mounted Device (SMD) plastic package.

2. Features and benefits

- Total power dissipation: ≤ 300 mW
- Tolerance series: approximately ± 5 %
- Working voltage range: nominal 1.8 V to 10 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

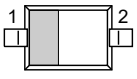
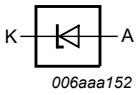
Table 1. Quick reference data

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]	-	-	300	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	K	cathode [1]		
2	A	anode		

[1] The marking bar indicates the cathode.

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6. Ordering information

Table 3. Ordering information

Type number	Package		
	Name	Description	Version
BZX38450 series	SC-76	plastic surface-mounted package; 2 leads	SOD323

7. Marking

Table 4. Marking Codes

Type number	Marking Code	Type number	Marking Code
BZX38450-C1V8	6R	BZX38450-C4V7	7B
BZX38450-C2V0	6S	BZX38450-C5V1	7C
BZX38450-C2V2	6T	BZX38450-C5V6	7D
BZX38450-C2V4	6U	BZX38450-C6V2	7E
BZX38450-C2V7	6V	BZX38450-C6V8	7F
BZX38450-C3V0	6W	BZX38450-C7V5	7G
BZX38450-C3V3	6X	BZX38450-C8V2	7H
BZX38450-C3V6	6Y	BZX38450-C9V1	7J
BZX38450-C3V9	6Z	BZX38450-C10	7K
BZX38450-C4V3	7A	-	-

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
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]	-	300	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]	-	-	415	K/W
$R_{th(j-sp)}$	thermal resistance from junction to solder point		[2]	-	-	110	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

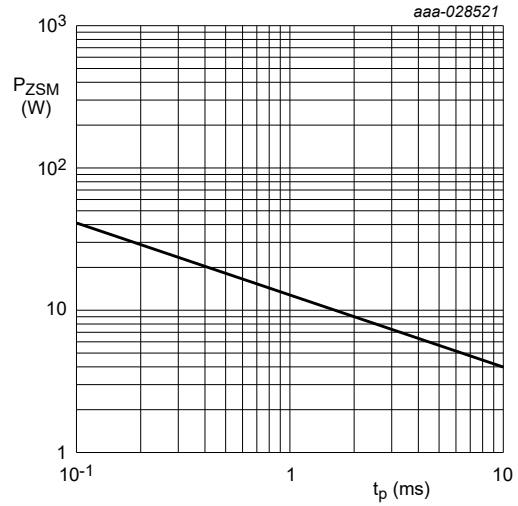
[1] Pulse test: $t_p \leq 300$ µs; $\delta \leq 0.02$

Table 8. Electrical characteristics per type: BZX38450-C1V8 to BZX38450-C10

T_j = 25 °C unless otherwise specified.

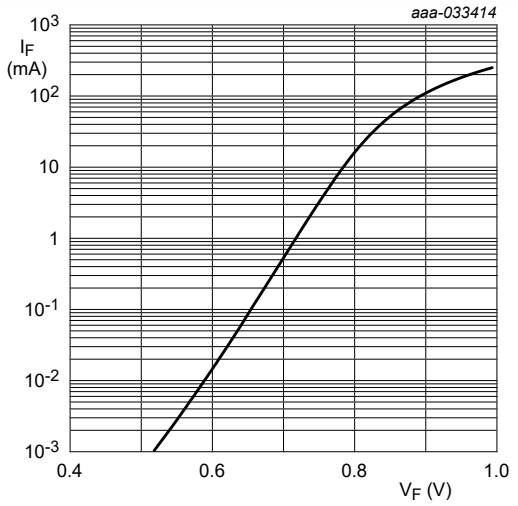
BZX38450-C	Working voltage V_Z (V)		Differential resistance r_{diff} (Ω)		Reverse current I_R (µA)		Temperature coefficient S_Z (mV/K)		Diode capacit. C_d (pF)[1]
	I_Z = 50 µA		I_Z = 1 mA	I_Z = 5 mA			I_Z = 5 mA		
	Min	Max	Max	Max	Max	V_R (V)	Min	Max	Max
1V8	1.71	1.89	600	100	7.5	1.0	-3.5	0	220
2V0	1.88	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

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



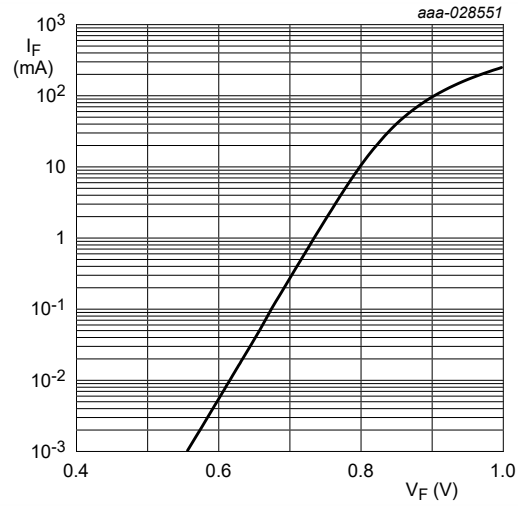
(1) T_j = 25 °C (before surge)

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



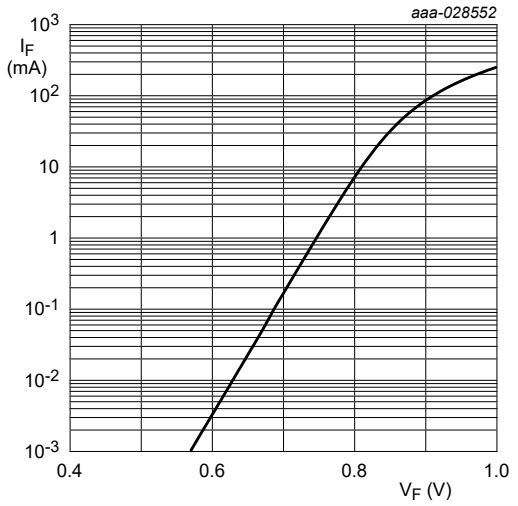
T_j = 25 °C

Fig. 2. Forward current as a function of forward voltage; typical values (BZX38450-C1V8)



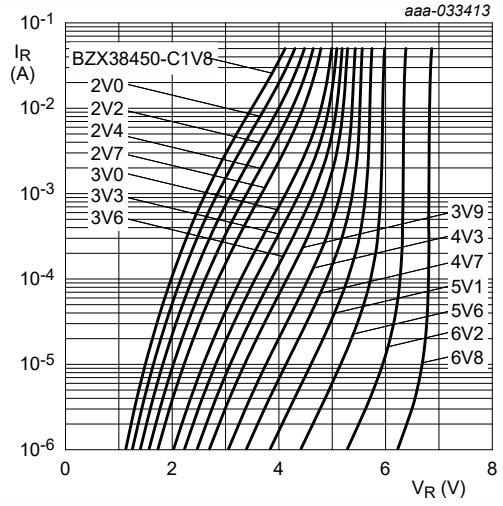
T_j = 25 °C

Fig. 3. Forward current as a function of forward voltage; typical values (BZX38450-C6V8)



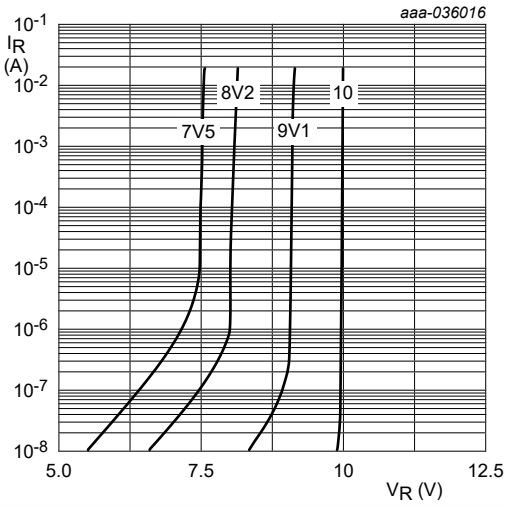
T_j = 25 °C

Fig. 4. Forward current as a function of forward voltage; typical values (BZX38450-C7V5)



T_{amb} = 25 °C

Fig. 5. Reverse current as a function of reverse voltage; typical values (BZX38450-C1V8 to BZX38450-C6V8)



T_{amb} = 25 °C

Fig. 6. Reverse current as a function of reverse voltage; typical values (BZX38450-C7V5 to BZX38450-C10)

11. Package outline

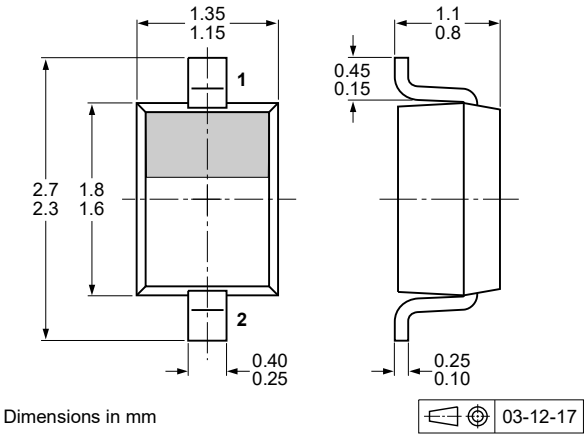


Fig. 7. Package outline SOD323 (SC-76)

12. Soldering

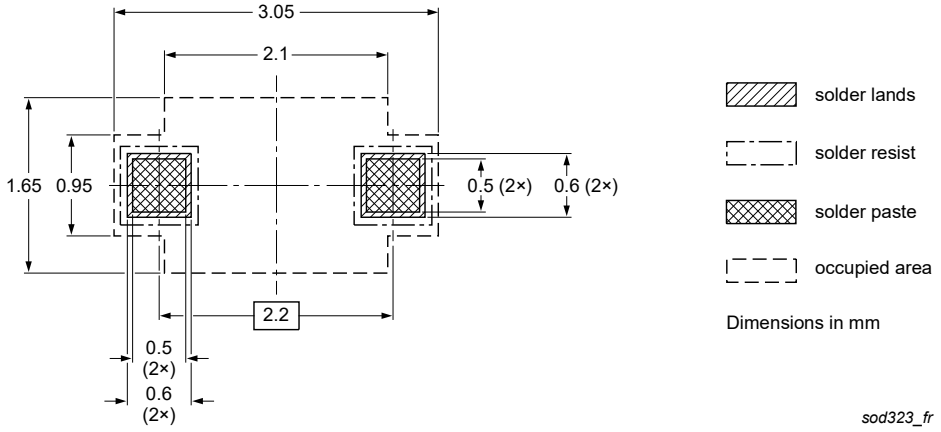


Fig. 8. Reflow soldering footprint SOD323 (SC-76)

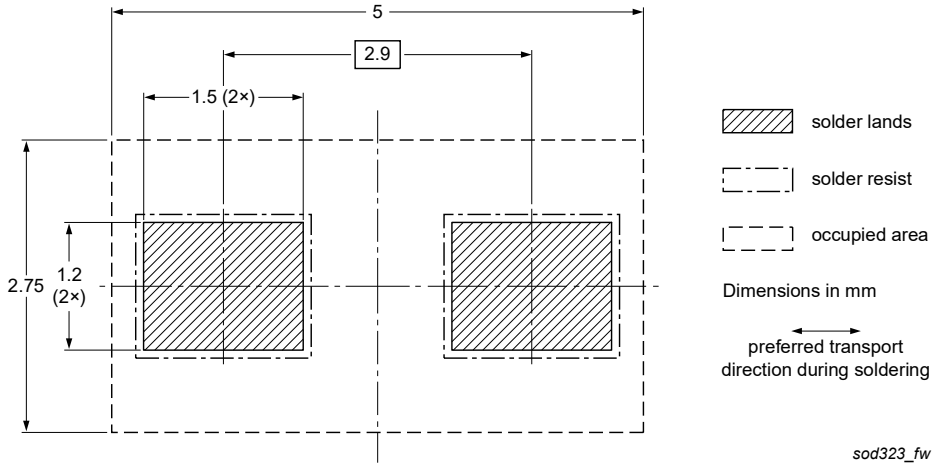


Fig. 9. Wave soldering footprint SOD323 (SC-76)

13. Revision history

Table 9. Revision history

Document ID	Release date	Data sheet status	Change notice	Supersedes
BZX38450_SER v.3	20230118	Product data sheet	-	BZX38450_SER v.2
Modifications:	• Products removed: 11 V and higher			
BZX38450_SER v.2	20210825	Product data sheet	-	BZX38450_SER v.1
BZX38450_SER v.1	20210427	Objective 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".
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