

BZV55 series

Voltage regulator diodes

Rev. 5 — 26 January 2011 Product data sheet

1. Product profile

1.1 General description

Low-power voltage regulator diodes in small hermetically sealed glass SOD80C Surface-Mounted Device (SMD) packages. The diodes are available in the normalized E24 ±2 % (BZV55-B) and approximately ±5 % (BZV55-C) tolerance range.
The series consists of 37 types with nominal working voltages from 2.4 V to 75 V.

1.2 Features and benefits

- Non-repetitive peak reverse power dissipation: ≤ 40 W
- Total power dissipation: ≤ 500 mW
- Two tolerance series: ±2 % and ±5 %
- Wide working voltage range: nominal 2.4 V to 75 V (E24 range)
- Low differential resistance
- Small hermetically sealed glass SMD package

1.3 Applications

- General regulation functions

1.4 Quick reference data

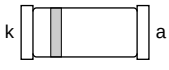
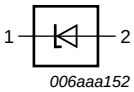
Table 1. Quick reference data

Symbol	Parameter	Conditions		Min	Typ	Max	Unit
V_F	forward voltage	I_F = 10 mA		-	-	0.9	V
P_{ZSM}	non-repetitive peak reverse power dissipation		[1]	-	-	40	W

[1] t_p = 100 μs; square wave; T_j = 25 °C prior to surge

2. Pinning information

Table 2. Pinning

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

[1] The marking band indicates the cathode.

3. Ordering information

Table 3. Ordering information

Type number	Package		
	Name	Description	Version
BZV55-B2V4 to BZV55-C75[1]	-	hermetically sealed glass surface-mounted package; 2 connectors	SOD80C

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

4. Marking

Table 4. Marking codes

Type number	Marking code
BZV55-B2V4 to BZV55-C75	marking band

5. 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 Table 8 and 9	
P_{ZSM}	non-repetitive peak reverse power dissipation		[1]	-	40	W
P_{tot}	total power dissipation	$T_{amb} \leq 50$ °C	[2]	-	400	mW
		$T_{tp} \leq 50$ °C	[2]	-	500	mW
T_{stg}	storage temperature			−65	+200	°C
T_j	junction temperature			−65	+200	°C

[1] $t_p = 100$ µs; square wave; $T_j = 25$ °C prior to surge

[2] Device mounted on a ceramic substrate of 10 × 10 × 0.6 mm.

6. 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]	-	-	380	K/W
$R_{th(j-sp)}$	thermal resistance from junction to solder point			-	-	300	K/W

[1] Device mounted on a ceramic substrate of 10 × 10 × 0.6 mm.

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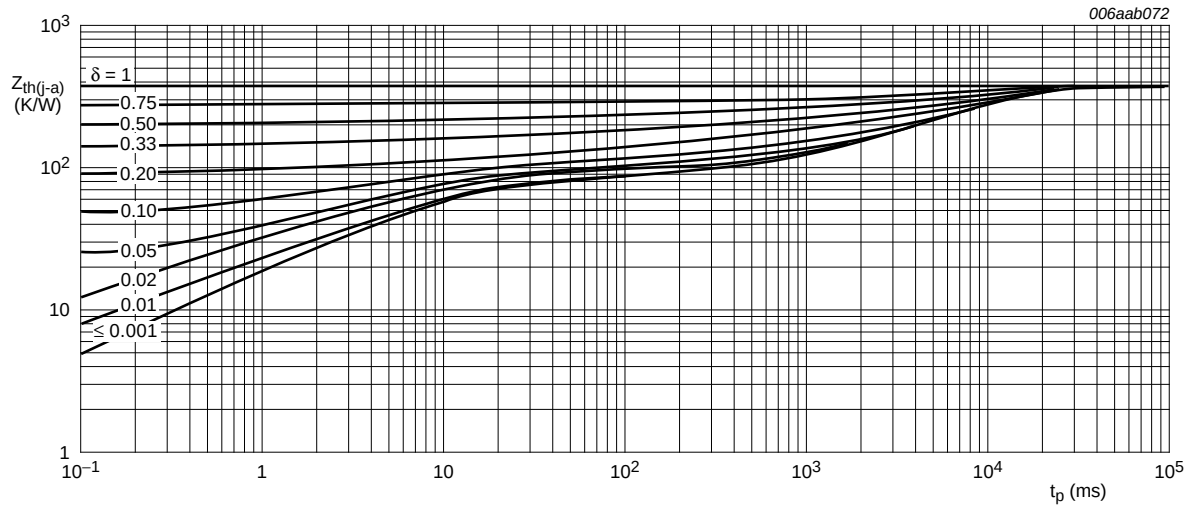


Fig 1. Transient thermal impedance from junction to ambient as a function of pulse duration; typical values

7. Characteristics

Table 7. Characteristics

T_j = 25 °C unless otherwise specified.

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
V_F	forward voltage	I_F = 10 mA	-	-	0.9	V
I_R	reverse current					
	BZV55-B/C2V4	V_R = 1 V	-	-	50	µA
	BZV55-B/C2V7	V_R = 1 V	-	-	20	µA
	BZV55-B/C3V0	V_R = 1 V	-	-	10	µA
	BZV55-B/C3V3	V_R = 1 V	-	-	5	µA
	BZV55-B/C3V6	V_R = 1 V	-	-	5	µA
	BZV55-B/C3V9	V_R = 1 V	-	-	3	µA
	BZV55-B/C4V3	V_R = 1 V	-	-	3	µA
	BZV55-B/C4V7	V_R = 2 V	-	-	3	µA
	BZV55-B/C5V1	V_R = 2 V	-	-	2	µA
	BZV55-B/C5V6	V_R = 2 V	-	-	1	µA
	BZV55-B/C6V2	V_R = 4 V	-	-	3	µA
	BZV55-B/C6V8	V_R = 4 V	-	-	2	µA
	BZV55-B/C7V5	V_R = 5 V	-	-	1	µA
	BZV55-B/C8V2	V_R = 5 V	-	-	700	nA
	BZV55-B/C9V1	V_R = 6 V	-	-	500	nA
	BZV55-B/C10	V_R = 7 V	-	-	200	nA
	BZV55-B/C11	V_R = 8 V	-	-	100	nA
	BZV55-B/C12	V_R = 8 V	-	-	100	nA
	BZV55-B/C13	V_R = 8 V	-	-	100	nA
	BZV55-B/C15 to BZV55-B/C75	V_R = 0.7$V_{Z(nom)}$	-	-	50	nA

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Table 8. Characteristics per type; BZV55-B2V4 to BZV55-C24

T_j = 25 °C unless otherwise specified.

BZV55-xxx	Sel	Working voltage V_Z (V)		Differential resistance r_{dif} (Ω)				Temperature coefficient S_Z (mV/K)			Diode capacitance 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		I_Z = 5 mA				
		Min	Max	Typ	Max	Typ	Max	Min	Typ	Max	Max	Max
2V4	B	2.35	2.45	275	600	70	100	−3.5	−1.6	0	450	6.0
	C	2.2	2.6									
2V7	B	2.65	2.75	300	600	75	100	−3.5	−2.0	0	450	6.0
	C	2.5	2.9									
3V0	B	2.94	3.06	325	600	80	95	−3.5	−2.1	0	450	6.0
	C	2.8	3.2									
3V3	B	3.23	3.37	350	600	85	95	−3.5	−2.4	0	450	6.0
	C	3.1	3.5									
3V6	B	3.53	3.67	375	600	85	90	−3.5	−2.4	0	450	6.0
	C	3.4	3.8									
3V9	B	3.82	3.98	400	600	85	90	−3.5	−2.5	0	450	6.0
	C	3.7	4.1									
4V3	B	4.21	4.39	410	600	80	90	−3.5	−2.5	0	450	6.0
	C	4.0	4.6									
4V7	B	4.61	4.79	425	500	50	80	−3.5	−1.4	0.2	300	6.0
	C	4.4	5.0									
5V1	B	5.0	5.2	400	480	40	60	−2.7	−0.8	1.2	300	6.0
	C	4.8	5.4									
5V6	B	5.49	5.71	80	400	15	40	−2.0	1.2	2.5	300	6.0
	C	5.2	6.0									
6V2	B	6.08	6.32	40	150	6	10	0.4	2.3	3.7	200	6.0
	C	5.8	6.6									
6V8	B	6.66	6.94	30	80	6	15	1.2	3.0	4.5	200	6.0
	C	6.4	7.2									
7V5	B	7.35	7.65	30	80	6	15	2.5	4.0	5.3	150	4.0
	C	7.0	7.9									
8V2	B	8.04	8.36	40	80	6	15	3.2	4.6	6.2	150	4.0
	C	7.7	8.7									
9V1	B	8.92	9.28	40	100	6	15	3.8	5.5	7.0	150	3.0
	C	8.5	9.6									
10	B	9.8	10.2	50	150	8	20	4.5	6.4	8.0	90	3.0
	C	9.4	10.6									
11	B	10.8	11.2	50	150	10	20	5.4	7.4	9.0	85	2.5
	C	10.4	11.6									
12	B	11.8	12.2	50	150	10	25	6.0	8.4	10.0	85	2.5
	C	11.4	12.7									

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Table 8. Characteristics per type; BZV55-B2V4 to BZV55-C24 *…continued*

T_j = 25 °C unless otherwise specified.

BZV55-xxx	Sel	Working voltage V_Z (V)		Differential resistance r_{dif} (Ω)				Temperature coefficient S_Z (mV/K)			Diode capacitance 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		I_Z = 5 mA				
		Min	Max	Typ	Max	Typ	Max	Min	Typ	Max	Max	Max
13	B	12.7	13.3	50	170	10	30	7.0	9.4	11.0	80	2.5
	C	12.4	14.1									
15	B	14.7	15.3	50	200	10	30	9.2	11.4	13.0	75	2.0
	C	13.8	15.6									
16	B	15.7	16.3	50	200	10	40	10.4	12.4	14.0	75	1.5
	C	15.3	17.1									
18	B	17.6	18.4	50	225	10	45	12.4	14.4	16.0	70	1.5
	C	16.8	19.1									
20	B	19.6	20.4	60	225	15	55	12.3	15.6	18.0	60	1.5
	C	18.8	21.2									
22	B	21.6	22.4	60	250	20	55	14.1	17.6	20.0	60	1.25
	C	20.8	23.3									
24	B	23.5	24.5	60	250	25	70	15.9	19.6	22.0	55	1.25
	C	22.8	25.6									

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

[2] t_p = 100 µs; square wave; T_j = 25 °C prior to surge

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Table 9. Characteristics per type; BZV55-B27 to BZV55-C75

T_j = 25 °C unless otherwise specified.

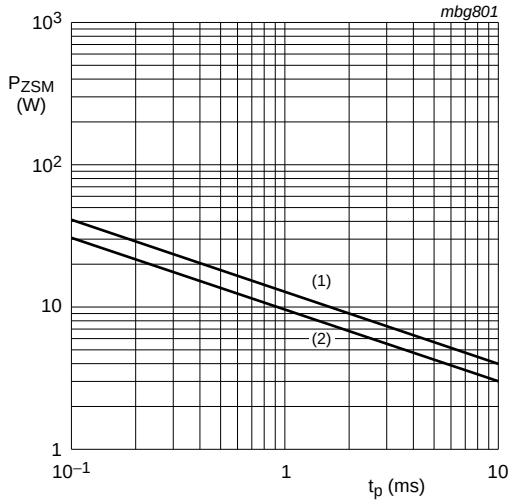
BZV55-xxx	Sel	Working voltage V_Z (V)		Differential resistance r_{dif} (Ω)				Temperature coefficient S_Z (mV/K)			Diode capacitance C_d (pF)[1]	Non-repetitive peak reverse current I_{ZSM} (A)[2]
		I_Z = 2 mA		I_Z = 0.5 mA		I_Z = 2 mA		I_Z = 2 mA				
		Min	Max	Typ	Max	Typ	Max	Min	Typ	Max	Max	Max
27	B	26.5	27.5	65	300	25	80	18.0	22.7	25.3	50	1.0
	C	25.1	28.9									
30	B	29.4	30.6	70	300	30	80	20.6	25.7	29.4	50	1.0
	C	28.0	32.0									
33	B	32.3	33.7	75	325	35	80	23.3	28.7	33.4	45	0.9
	C	31.0	35.0									
36	B	35.3	36.7	80	350	35	90	26.0	31.8	37.4	45	0.8
	C	34.0	38.0									
39	B	38.2	39.8	80	350	40	130	28.7	34.8	41.2	45	0.7
	C	37.0	41.0									
43	B	42.1	43.9	85	375	45	150	31.4	38.8	46.6	40	0.6
	C	40.0	46.0									
47	B	46.1	47.9	85	375	50	170	35.0	42.9	51.8	40	0.5
	C	44.0	50.0									
51	B	50.0	52.0	90	400	60	180	38.6	46.9	57.2	40	0.4
	C	48.0	54.0									
56	B	54.9	57.1	100	425	70	200	42.2	52.0	63.8	40	0.3
	C	52.0	60.0									
62	B	60.8	63.2	120	450	80	215	58.8	64.4	71.6	35	0.3
	C	58.0	66.0									
68	B	66.6	69.4	150	475	90	240	65.6	71.7	79.8	35	0.25
	C	64.0	72.0									
75	B	73.5	76.5	170	500	95	255	73.4	80.2	88.6	35	0.2
	C	70.0	79.0									

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

[2] t_p = 100 µs; square wave; T_j = 25 °C prior to surge

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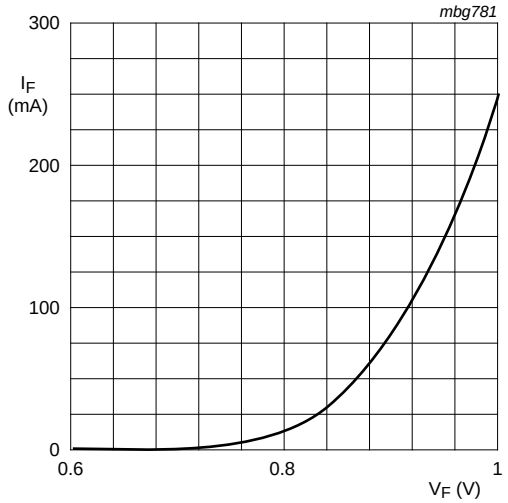
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(1) T_j = 25 °C (prior to surge)

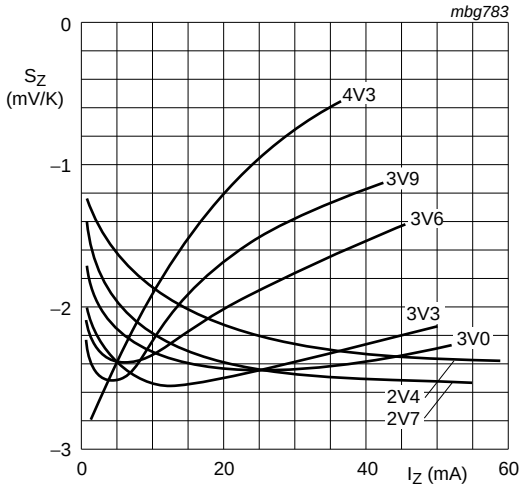
(2) T_j = 150 °C (prior to surge)

Fig 2. Non-repetitive peak reverse power dissipation as a function of pulse duration; maximum values



T_j = 25 °C

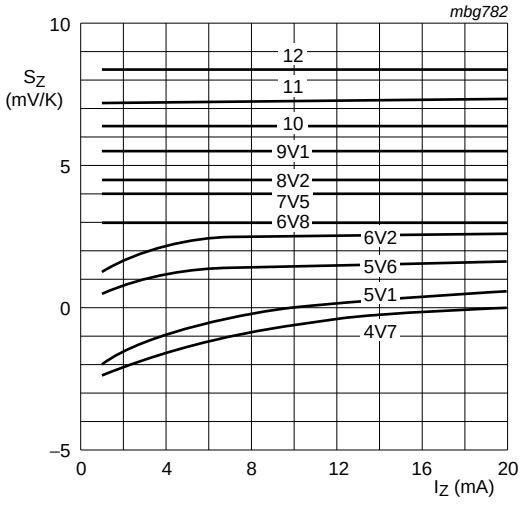
Fig 3. Forward current as a function of forward voltage; typical values



BZV55-B/C2V4 to BZV55-B/C4V3

T_j = 25 °C to 150 °C

Fig 4. Temperature coefficient as a function of working current; typical values



BZV55-B/C4V7 to BZV55-B/C12

T_j = 25 °C to 150 °C

Fig 5. Temperature coefficient as a function of working current; typical values

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8. Package outline

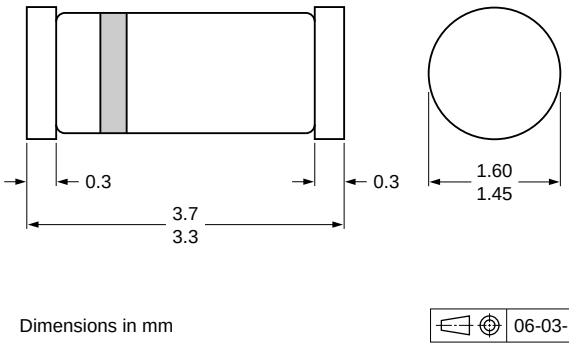


Fig 6. Package outline SOD80C

9. Packing information

Table 10. Packing methods

The indicated -xxx are the last three digits of the 12NC ordering code.[1]

Type number	Package	Description	Packing quantity	
			2500	10000
BZV55-B2V4 to BZV55-C75	SOD80C	4 mm pitch, 8 mm tape and reel	-115	-135

[1] For further information and the availability of packing methods, see Section 13.

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10. Soldering

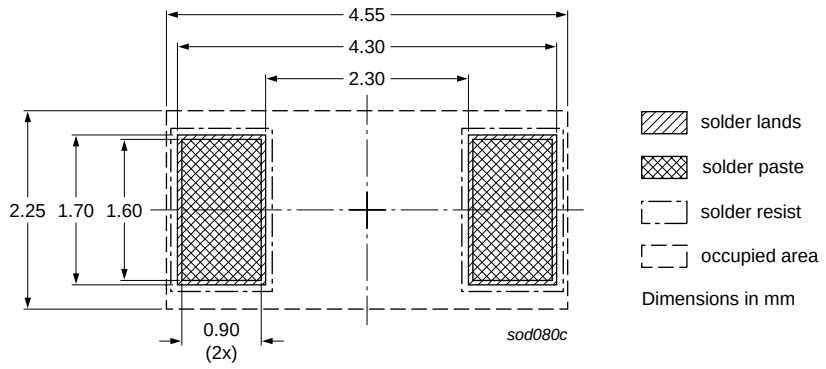


Fig 7. Reflow soldering footprint SOD80C

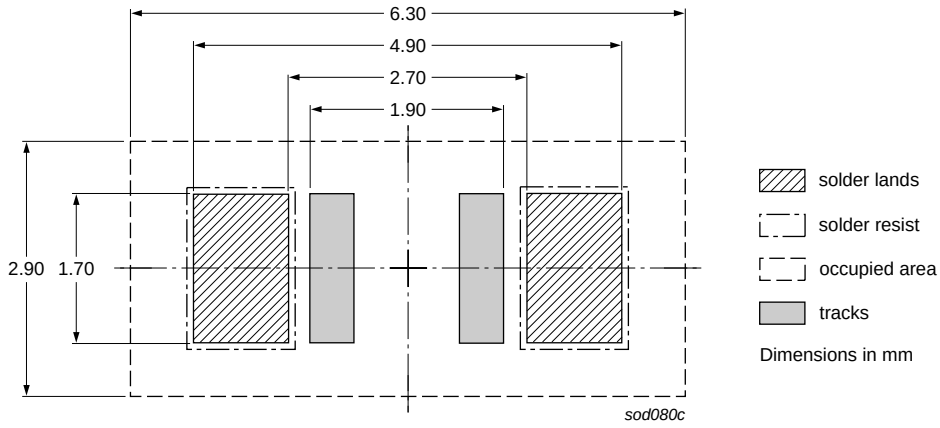


Fig 8. Wave soldering footprint SOD80C

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11. Revision history

Table 11. Revision history

Document ID	Release date	Data sheet status	Change notice	Supersedes
BZV55_SER v.5	20110126	Product data sheet	-	BZV55_SER v.4
Modifications:	• Section 4 “Marking”: updated • Table 6 “Thermal characteristics”: changed $R_{th(j-t)}$ for $R_{th(j-sp)}$ • Figure 6: superseded by minimized outline drawing • Section 12 “Legal information”: updated			
BZV55_SER v.4	20070719	Product data sheet	CPCN200508022F	BZV55 v.3
BZV55 v.3	20020228	Product specification	-	BZV55 v.2
BZV55 v.2	19990521	Product specification	-	BZV55 v.1
BZV55 v.1	19960426	Product specification	-	-

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12. Legal information

12.1 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 URL http://www.nxp.com.

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