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Kind regards,

Team Nexperia



Dual Zener diodes Rev. 03 — 9 June 2009

Product data sheet

Small plastic package suitable for

Dual common anode configuration

surface-mounted design

AEC-Q101 qualified

1. Product profile

1.1 General description

General-purpose Zener diodes in a SOT23 (TO-236AB) small Surface-Mounted Device (SMD) plastic package.

1.2 Features

- Non-repetitive peak reverse power dissipation: ≤ 40 W
- Total power dissipation: ≤ 300 mW
- Two tolerance series: B = ±2 % and C = ±5 %
- Wide working voltage range: nominal 2.4 V to 75 V (E24 range)

1.3 Applications

General regulation functions

1.4 Quick reference data

Table 1. Quick reference data

Symbol	Parameter	Conditions	Min	Тур	Max	Unit
Per diode)					
V _F	forward voltage	I _F = 10 mA	<u>[1]</u> _	-	0.9	V
P _{ZSM}	non-repetitive peak reverse power dissipation		[2] _	-	40	W





Dual Zener diodes

2. Pinning information

Table 2.	Pinning		
Pin	Description	Simplified outline	Graphic symbol
1	cathode (diode 1)		_
2	cathode (diode 2)		3
3	common anode		1 2 006aaa154

3. Ordering information

Table 3. Ordering information									
Type number	Package								
	Name	Description	Version						
BZB84-B2V4 to BZB84-C75[1]	-	plastic surface-mounted package; 3 leads	SOT23						

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

4. Marking

Table 4. Marking co	odes		
Type number	Marking code ^[1]	Type number	Marking code ^[1]
BZB84-B2V4	V9*	BZB84-C2V4	U9*
BZB84-B2V7	VA*	BZB84-C2V7	UA*
BZB84-B3V0	VB*	BZB84-C3V0	UB*
BZB84-B3V3	VC*	BZB84-C3V3	UC*
BZB84-B3V6	VD*	BZB84-C3V6	UD*
BZB84-B3V9	VE*	BZB84-C3V9	UE*
BZB84-B4V3	VF*	BZB84-C4V3	UF*
BZB84-B4V7	VG*	BZB84-C4V7	UG*
BZB84-B5V1	VH*	BZB84-C5V1	UH*
BZB84-B5V6	VK*	BZB84-C5V6	UK*
BZB84-B6V2	VL*	BZB84-C6V2	UL*
BZB84-B6V8	VM*	BZB84-C6V8	UM*
BZB84-B7V5	VN*	BZB84-C7V5	UN*
BZB84-B8V2	VP*	BZB84-C8V2	UP*
BZB84-B9V1	VR*	BZB84-C9V1	UR*

Dual Zener diodes

Type number	Marking code ^[1]	Type number	Marking code ^[1]
BZB84-B10	VS*	BZB84-C10	US*
BZB84-B11	VT*	BZB84-C11	UT*
BZB84-B12	VU*	BZB84-C12	UU*
BZB84-B13	VV*	BZB84-C13	UV*
BZB84-B15	VW*	BZB84-C15	UW*
BZB84-B16	PT*	BZB84-C16	PB*
BZB84-B18	PU*	BZB84-C18	PC*
BZB84-B20	RP*	BZB84-C20	RQ*
BZB84-B22	PV*	BZB84-C22	PD*
BZB84-B24	PW*	BZB84-C24	PE*
BZB84-B27	PX*	BZB84-C27	PF*
BZB84-B30	PY*	BZB84-C30	PG*
BZB84-B33	PZ*	BZB84-C33	PH*
BZB84-B36	RA*	BZB84-C36	PJ*
BZB84-B39	RB*	BZB84-C39	PK*
BZB84-B43	RC*	BZB84-C43	PL*
BZB84-B47	RD*	BZB84-C47	PM*
BZB84-B51	RE*	BZB84-C51	PN*
BZB84-B56	RF*	BZB84-C56	PP*
BZB84-B62	RG*	BZB84-C62	PQ*
BZB84-B68	RH*	BZB84-C68	PR*
BZB84-B75	RJ*	BZB84-C75	PS*

Table 4. Marking codes ...continued

[1] * = -: made in Hong Kong

* = p: made in Hong Kong

* = t: made in Malaysia

* = W: made in China

5. Limiting values

Table 5. Limiting values

In accordance with the Absolute Maximum Rating System (IEC 60134).

Symbol	Parameter	Conditions	Min	Max	Unit
Per diode					
I _F	forward current		-	200	mA
I _{ZSM}	non-repetitive peak reverse current		[1] _	see <u>Table 8, 9</u> <u>10</u> and <u>11</u>	
P _{ZSM}	non-repetitive peak reverse power dissipation		<u>[1]</u> -	40	W

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

Symbol	Parameter	Conditions	Min	Max	Unit
Per device	e				
P _{tot}	total power dissipation	$T_{amb} \le 25 \ ^{\circ}C$	[2] _	300	mW
Tj	junction temperature		-	150	°C
T _{amb}	ambient temperature		-55	+150	°C
T _{stg}	storage temperature		-65	+150	°C

[1] $t_p = 100 \ \mu s$; square wave; $T_j = 25 \ ^\circ C$ prior to surge

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

6. Thermal characteristics

Table 6.	Thermal characteristics					
Symbol	Parameter	Conditions	Min	Тур	Max	Unit
Per devic	e; single diode loaded					
R _{th(j-a)}	thermal resistance from junction to ambient	in free air	<u>[1]</u> _	-	417	K/W
R _{th(j-sp)}	thermal resistance from junction to solder point		<u>[2]</u> _	-	100	K/W

[1] Device mounted on an FR4 PCB, single-sided copper, tin-plated and standard footprint.

[2] Soldering points at pins 1 and 2.

7. Characteristics

Table 7. Characteristics

 $T_j = 25 \circ C$ unless otherwise specified.

Symbol	Parameter	Conditions	Min	Тур	Max	Unit
Per diod	le					
V _F	forward voltage	I _F = 10 mA	<u>[1]</u> _	-	0.9	V

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

Dual Zener diodes

BZB84- Bxxx	Working V _Z (V)	V _Z (V)				Revers I _R (μΑ)	I _R (μΑ)		erature cient //K)	Diode capacitance C _d (pF) <u>^[1]</u>	Non-repetitive peak reverse current I _{ZSM} (A) ^[2]
	I _Z = 5 mA		$I_Z = 1 \text{ mA}$ $I_Z = 5 \text{ mA}$				l _z = 5 mA		-		
	Min	Max	Max	Max	Max	V _R (V)	Min	Max	Max	Max	
2V4	2.35	2.45	600	100	50	1	-3.5	0	450	6.0	
2V7	2.65	2.75	600	100	20	1	-3.5	0	450	6.0	
3V0	2.94	3.06	600	95	10	1	-3.5	0	450	6.0	
3V3	3.23	3.37	600	95	5	1	-3.5	0	450	6.0	
3V6	3.53	3.67	600	90	5	1	-3.5	0	450	6.0	
3V9	3.82	3.98	600	90	3	1	-3.5	0	450	6.0	
4V3	4.21	4.39	600	90	3	1	-3.5	0	450	6.0	
4V7	4.61	4.79	500	80	3	2	-3.5	0.2	300	6.0	
5V1	5.00	5.20	480	60	2	2	-2.7	1.2	300	6.0	
5V6	5.49	5.71	400	40	1	2	-2.0	2.5	300	6.0	
6V2	6.08	6.32	150	10	3	4	0.4	3.7	200	6.0	
6V8	6.66	6.94	80	15	2	4	1.2	4.5	200	6.0	
7V5	7.35	7.65	80	15	1	5	2.5	5.3	150	4.0	
8V2	8.04	8.36	80	15	0.70	5	3.2	6.2	150	4.0	
9V1	8.92	9.28	100	15	0.50	6	3.8	7.0	150	3.0	
10	9.80	10.20	150	20	0.20	7	4.5	8.0	90	3.0	
11	10.80	11.20	150	20	0.10	8	5.4	9.0	85	2.5	
12	11.80	12.20	150	25	0.10	8	6.0	10.0	85	2.5	
13	12.70	13.30	170	30	0.10	8	7.0	11.0	80	2.5	
15	14.70	15.30	200	30	0.05	10.5	9.2	13.0	75	2.0	
16	15.70	16.30	200	40	0.05	11.2	10.4	14.0	75	1.5	
18	17.60	18.40	225	45	0.05	12.6	12.4	16.0	70	1.5	
20	19.6	20.4	225	55	0.05	14.0	14.4	18.0	60	1.5	
22	21.6	22.4	250	55	0.05	15.4	16.4	20.0	60	1.25	
24	23.5	24.5	250	70	0.05	16.8	18.4	22.0	55	1.25	

Table 8. Characteristics per type; BZB84-B2V4 to BZB84-B24

[1] $f = 1 \text{ MHz}; V_R = 0 \text{ V}$

Dual Zener diodes

BZB84- Bxxx	Working V _Z (V)	voltage	Differential resistance r _{dif} (Ω)	resistance		ir (μ~)		rature ient //K)	Diode capacitance C _d (pF) <u>^[1]</u>	Non-repetitive peak reverse current I _{ZSM} (A) ^[2]
	I _Z = 2 mA		l _z = 0.5 mA	I _Z = 2 mA	-		I _Z = 2 n	nA	_	
	Min	Max	Max	Max	Max	V _R (V)	Min	Max	Max	Max
27	26.5	27.5	300	80	0.05	18.9	21.4	25.3	50	1.00
30	29.4	30.6	300	80	0.05	21.0	24.4	29.4	50	1.00
33	32.3	33.7	325	80	0.05	23.1	27.4	33.4	45	0.90
36	35.3	36.7	350	90	0.05	25.2	30.4	37.4	45	0.80
39	38.2	39.8	350	130	0.05	27.3	33.4	41.2	45	0.70
43	42.1	43.9	375	150	0.05	30.1	37.6	46.6	40	0.60
47	46.1	47.9	375	170	0.05	32.9	42.0	51.8	40	0.50
51	50.0	52.0	400	180	0.05	35.7	46.6	57.2	40	0.40
56	54.9	57.1	425	200	0.05	39.2	52.2	63.8	40	0.30
62	60.8	63.2	450	215	0.05	43.4	58.8	71.6	35	0.30
68	66.6	69.4	475	240	0.05	47.6	65.6	79.8	35	0.25
75	73.5	76.5	500	255	0.05	52.5	73.4	88.6	35	0.20

Table 9. Characteristics per type; BZB84-B27 to BZB84-B75

[1] $f = 1 \text{ MHz}; V_R = 0 \text{ V}$

Dual Zener diodes

BZB84- Cxxx	Working voltage V _Z (V) I _Z = 5 mA		$\begin{array}{c} \mbox{Differential} & & \\ \mbox{resistance} & & \\ \mbox{r}_{\rm dif}\left(\Omega\right) & & \\ \mbox{I}_{\rm Z}=1\mbox{ mA} & \mbox{I}_{\rm Z}=5\mbox{ mA} \end{array}$		Reverse current I _R (μΑ)		Temperature coefficient S _Z (mV/K) I _Z = 5 mA		Diode capacitance C _d (pF)[1]	Non-repetitive peak reverse current I _{ZSM} (A) ^[2]
	2V4	2.2	2.6	600	100	50	1	-3.5	0	450
2V7	2.5	2.9	600	100	20	1	-3.5	0	450	6.0
3V0	2.8	3.2	600	95	10	1	-3.5	0	450	6.0
3V3	3.1	3.5	600	95	5	1	-3.5	0	450	6.0
3V6	3.4	3.8	600	90	5	1	-3.5	0	450	6.0
3V9	3.7	4.1	600	90	3	1	-3.5	0	450	6.0
4V3	4.0	4.6	600	90	3	1	-3.5	0	450	6.0
4V7	4.4	5.0	500	80	3	2	-3.5	0.2	300	6.0
5V1	4.8	5.4	480	60	2	2	-2.7	1.2	300	6.0
5V6	5.2	6.0	400	40	1	2	-2.0	2.5	300	6.0
6V2	5.8	6.6	150	10	3	4	0.4	3.7	200	6.0
6V8	6.4	7.2	80	15	2	4	1.2	4.5	200	6.0
7V5	7.0	7.9	80	15	1	5	2.5	5.3	150	4.0
8V2	7.7	8.7	80	15	0.70	5	3.2	6.2	150	4.0
9V1	8.5	9.6	100	15	0.50	6	3.8	7.0	150	3.0
10	9.4	10.6	150	20	0.20	7	4.5	8.0	90	3.0
11	10.4	11.6	150	20	0.10	8	5.4	9.0	85	2.5
12	11.4	12.7	150	25	0.10	8	6.0	10.0	85	2.5
13	12.4	14.1	170	30	0.10	8	7.0	11.0	80	2.5
15	13.8	15.6	200	30	0.05	10.5	9.2	13.0	75	2.0
16	15.3	17.1	200	40	0.05	11.2	10.4	14.0	75	1.5
18	16.8	19.1	225	45	0.05	12.6	12.4	16.0	70	1.5
20	18.8	21.2	225	55	0.05	14.0	14.4	18.0	60	1.5
22	20.8	23.3	250	55	0.05	15.4	16.4	20.0	60	1.25
24	22.8	25.6	250	70	0.05	16.8	18.4	22.0	55	1.25

Table 10. Characteristics per type; BZB84-C2V4 to BZB84-C24

[1] $f = 1 \text{ MHz}; V_R = 0 \text{ V}$

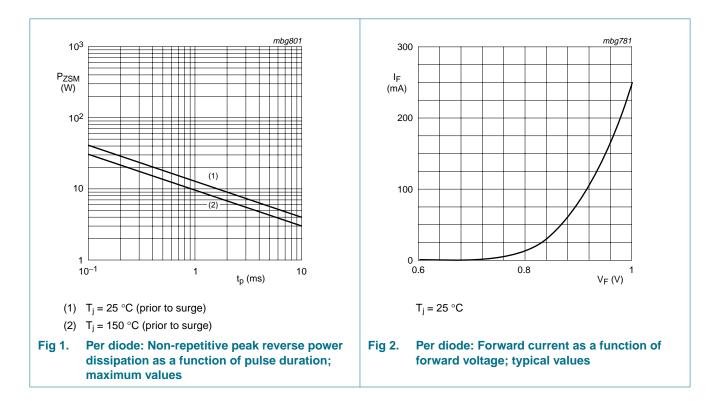
Dual Zener diodes

BZB84- Cxxx	Working voltage V _Z (V) I _Z = 2 mA		Differential resistance $r_{dif} (\Omega)$ $I_Z = 0.5 \text{ mA}$ $I_Z = 2 \text{ mA}$		Reverse current I _R (μΑ)		Temperature coefficient S _Z (mV/K) I _Z = 2 mA		Diode capacitance C _d (pF) <u>[1]</u>	Non-repetitive peak reverse current I _{ZSM} (A) ^[2]
27	25.1	28.9	300	80	0.05	18.9	21.4	25.3	50	1.00
30	28.0	32.0	300	80	0.05	21.0	24.4	29.4	50	1.00
33	31.0	35.0	325	80	0.05	23.1	27.4	33.4	45	0.90
36	34.0	38.0	350	90	0.05	25.2	30.4	37.4	45	0.80
39	37.0	41.0	350	130	0.05	27.3	33.4	41.2	45	0.70
43	40.0	46.0	375	150	0.05	30.1	37.6	46.6	40	0.60
47	44.0	50.0	375	170	0.05	32.9	42.0	51.8	40	0.50
51	48.0	54.0	400	180	0.05	35.7	46.6	57.2	40	0.40
56	52.0	60.0	425	200	0.05	39.2	52.2	63.8	40	0.30
62	58.0	66.0	450	215	0.05	43.4	58.8	71.6	35	0.30
68	64.0	72.0	475	240	0.05	47.6	65.6	79.8	35	0.25
75	70.0	79.0	500	255	0.05	52.5	73.4	88.6	35	0.20

Table 11. Characteristics per type; BZB84-C27 to BZB84-C75

[1] $f = 1 \text{ MHz}; V_R = 0 \text{ V}$

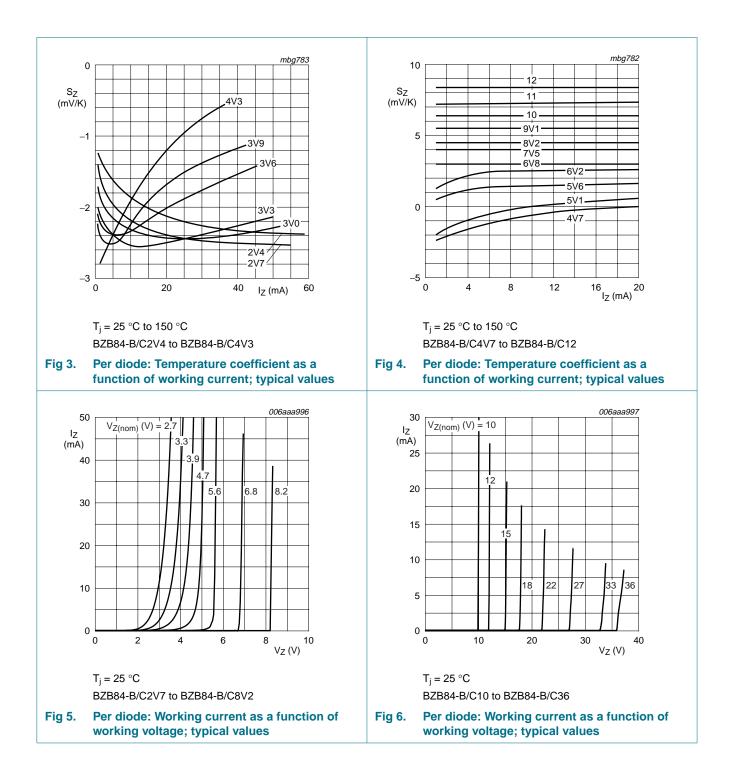
[2] $t_p = 100 \ \mu s$; square wave; $T_j = 25 \ ^\circ C$ prior to surge



NXP Semiconductors

BZB84 series

Dual Zener diodes





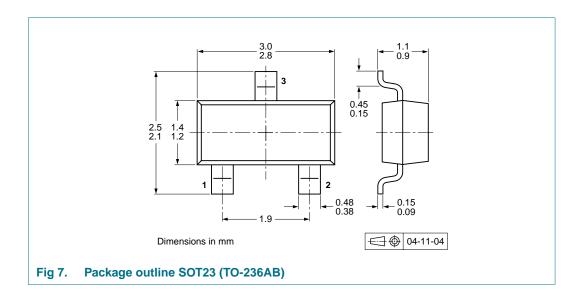
Dual Zener diodes

8. Test information

8.1 Quality information

This product has been qualified in accordance with the Automotive Electronics Council (AEC) standard *Q101* - *Stress test qualification for discrete semiconductors*, and is suitable for use in automotive applications.

9. Package outline



10. Packing information

Table 12. Packing methods

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

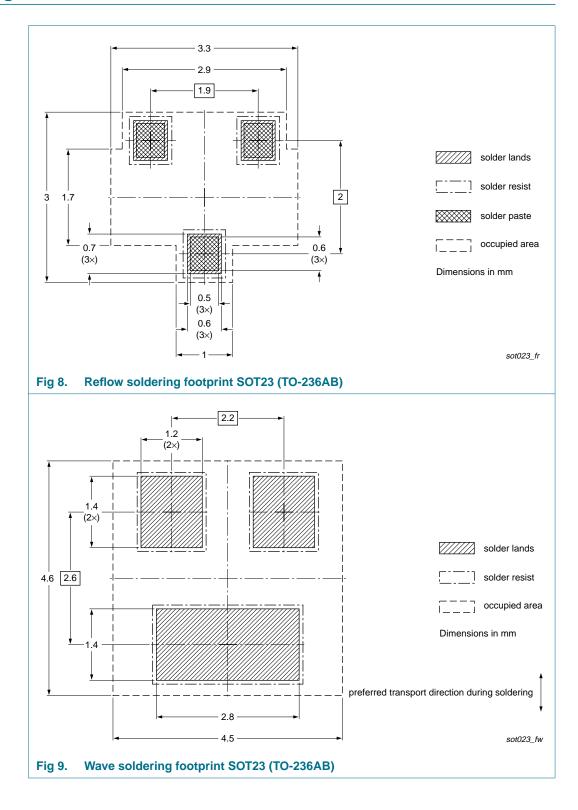
Type number	Package	Description	Packing	quantity
			3000	10000
BZB84-B2V4 to BZB84-C75 ^[2]	SOT23	4 mm pitch, 8 mm tape and reel	-215	-235

[1] For further information and the availability of packing methods, see <u>Section 14</u>.

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

Dual Zener diodes

11. Soldering





Dual Zener diodes

12. Revision history

Document ID	Release date	Data sheet status	Change notice	Supersedes
BZB84_SER_3	20090609	Product data sheet	-	BZB84_SER_2
Modifications:	• Table 6: R _{th}	hiting values": P _{tot} maximun maximum values amended "Legal information": update	b	
BZB84_SER_2	20090223	Product data sheet	-	BZB84_SER_1
BZB84_SER_1	20080514	Product data sheet	-	-

13. Legal information

13.1 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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14. Contact information

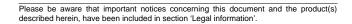
For more information, please visit: http://www.nxp.com

For sales office addresses, please send an email to: salesaddresses@nxp.com

BZB84_SER_3 Product data sheet

15. Contents

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