BZB984 series

Voltage regulator double diodes

Rev. 3 — 27 December 2022 Product data sheet

1. General description

Low-power voltage regulator diodes in a SOT663 ultra small plastic SMD package.

2. Features and benefits

- Total power dissipation: ≤ 425 mW
- Approximately 5% V_Z tolerance
- Ultra small flat plastic SMD package
- Working voltage range nominal 2.4 to 15 V (E24 range)

3. Applications

- General regulation functions
- ESD and surge protection

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	2 diodes loaded; T_{amb} ≤ 25 °C	[2]	-	-	425	mW
		1 diode loaded; T_{amb} ≤ 25 °C	[2]	-	-	265	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.

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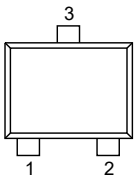
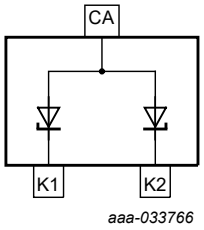
5. Pinning information

Table 2. Pinning

Pin	Symbol	Description	Simplified outline	Graphic symbol
1	K1	cathode 1		
2	K2	cathode 2		
3	CA	common anode		

6. Ordering information

Table 3. Ordering information

Type number	Package		
	Name	Description	Version
BZB984-C2V4 to BZB984-C15 [1]	-	plastic surface-mounted package; 3 leads	SOT663

[1] The series consists of 20 types with nominal working voltages from 2.4 V to 15 V.

7. Marking

Table 4. Marking codes

Type number	Marking code	Type number	Marking code	Type number	Marking code	Type number	Marking code
BZB984-C2V4	91	BZB984-C3V9	96	BZB984-C6V2	9B	BZB984-C10	9G
BZB984-C2V7	92	BZB984-C4V3	97	BZB984-C6V8	9C	BZB984-C11	9H
BZB984-C3V0	93	BZB984-C4V7	98	BZB984-C7V5	9D	BZB984-C12	9J
BZB984-C3V3	94	BZB984-C5V1	99	BZB984-C8V2	9E	BZB984-C13	9K
BZB984-C3V6	95	BZB984-C5V6	9A	BZB984-C9V1	9F	BZB984-C15	9L

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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
I_{ZSM}	non-repetitive peak reverse current	t_p = 100 µs; square wave; T_{amb} = 25 °C		see Table 1		
P_{ZSM}	non-repetitive peak reverse power dissipation	t_p = 100 µs; square wave; T_{amb} = 25 °C		-	40	W
P_{tot}	total power dissipation	T_{amb} ≤ 25 °C 2 diodes loaded	[1]	-	425	mW
		T_{amb} ≤ 25 °C 1 diode loaded	[1]	-	265	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 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; 2 diodes loaded	[1]	-	-	294	K/W
		in free air; 1 diode loaded	[1]	-	-	472	K/W
$R_{th(j-sp)}$	thermal resistance from junction to solder point	2 diodes loaded	[2]	-	-	125	K/W
		1 diode loaded	[2]	-	-	230	K/W

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

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10. 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	[1]	-	-	0.9	V

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

Table 8. Characteristics per type; BZB984-C2V4 to BZB984-C15

T_j = 25 °C unless otherwise specified.

BZB984 -xxx	Sel	Working voltage V_Z (V);		Maximum differential resistance r_{dif} (Ω)				Reverse current I_R (µA)		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 Tol. 5 %		I_Z = 1 mA		I_Z = 5 mA		I_F = 10 mA		I_{Ztest} = 5 mA		
		Min	Max	Typ	Max	Typ	Max	Max	V_R (V)	Typ	Max	Max
2V4	C	2.2	2.6	275	600	70	100	50	1	-1.3	450	6.0
2V7	C	2.5	2.9	300	600	75	100	20	1	-1.4	450	6.0
3V0	C	2.8	3.2	325	600	80	95	10	1	-1.6	450	6.0
3V3	C	3.1	3.5	350	600	85	95	5	1	-1.8	450	6.0
3V6	C	3.4	3.8	375	600	85	90	5	1	-1.9	450	6.0
3V9	C	3.7	4.1	400	600	85	90	3	1	-1.9	450	6.0
4V3	C	4.0	4.6	410	600	80	90	3	1	-1.7	450	6.0
4V7	C	4.4	5.0	425	500	50	80	3	2	-1.2	300	6.0
5V1	C	4.8	5.4	400	480	40	60	2	2	-0.5	300	6.0
5V6	C	5.2	6.0	80	400	15	40	1	2	1.0	300	6.0
6V2	C	5.8	6.6	40	150	6	10	3	4	2.2	200	6.0
6V8	C	6.4	7.2	30	80	6	15	2	4	3.0	200	6.0
7V5	C	7.0	7.9	30	80	6	15	1	5	3.6	150	4.0
8V2	C	7.7	8.7	40	80	6	15	0.7	5	4.3	150	4.0
9V1	C	8.5	9.6	40	100	6	15	0.5	6	5.2	150	3.0
10	C	9.4	10.6	50	150	8	20	0.2	7	6.0	90	3.0
11	C	10.4	11.6	50	150	10	20	0.1	8	6.9	90	2.5
12	C	11.4	12.7	50	150	10	25	0.1	8	7.9	85	2.5
13	C	12.4	14.1	50	170	10	30	0.1	8	8.8	80	2.5
15	C	13.8	15.6	50	200	10	30	0.05	10.5	10.7	75	2.0

[1] f = 1 MHz; V_R = 0 V
[2] t_p = 100 µs; T_{amb} = 25 °C

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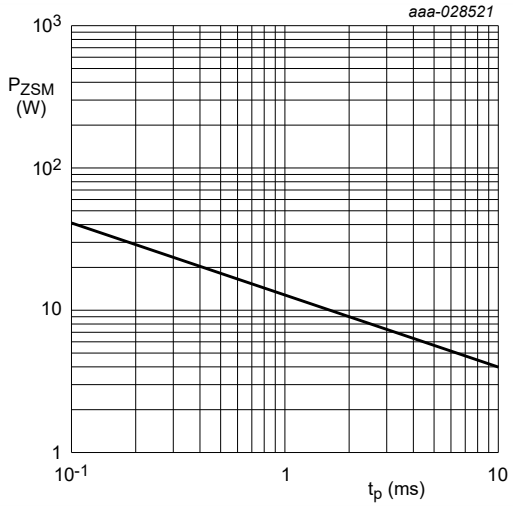
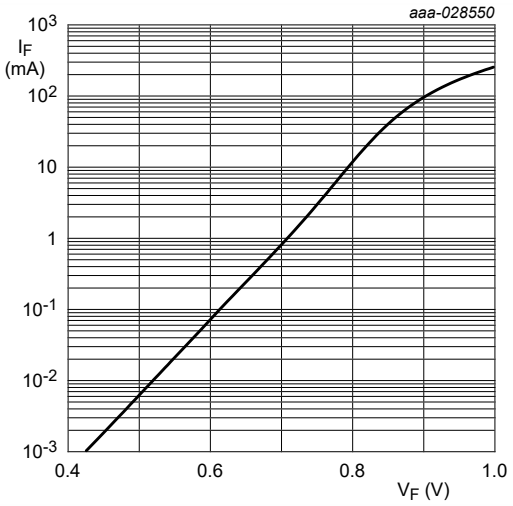


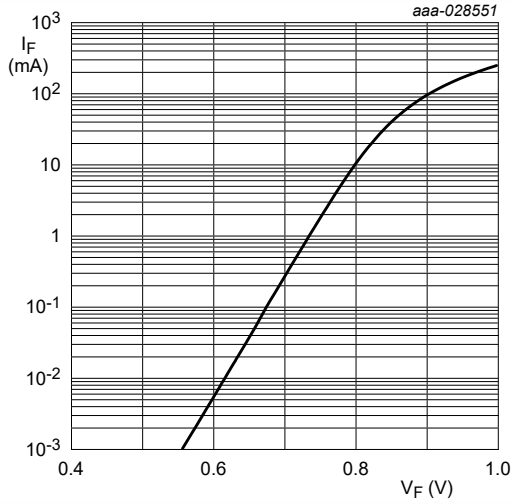
(1) T_j = 25 °C (before surge)

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



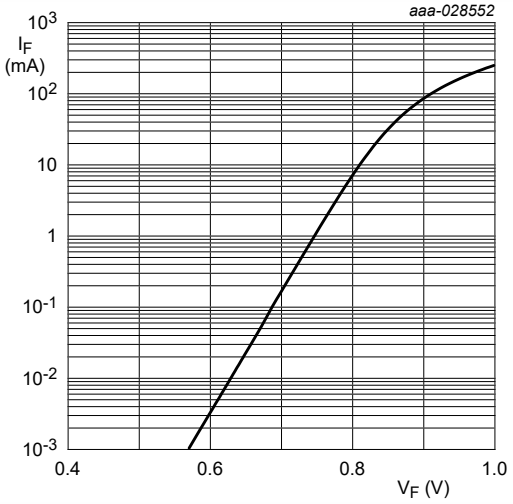
T_j = 25 °C

Fig. 2. Forward current as a function of forward voltage; typical values (BZB984-C2V4)



T_j = 25 °C

Fig. 3. Forward current as a function of forward voltage; typical values (BZB984-C6V8)



T_j = 25 °C

Fig. 4. Forward current as a function of forward voltage; typical values (BZB984-C7V5)

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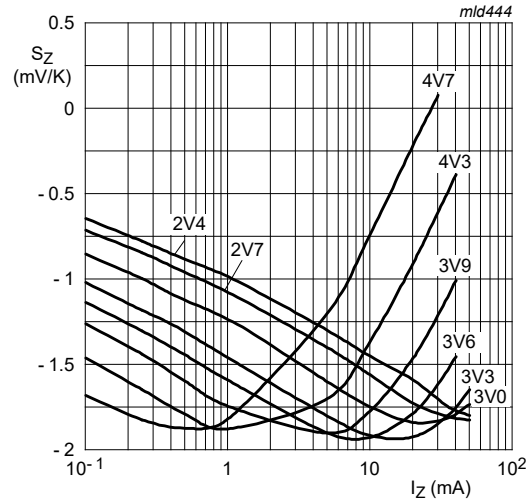
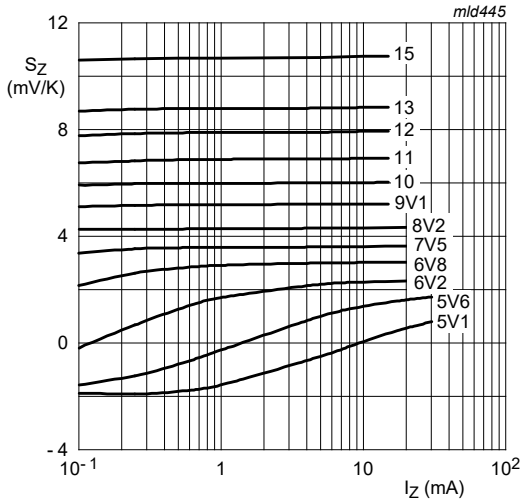


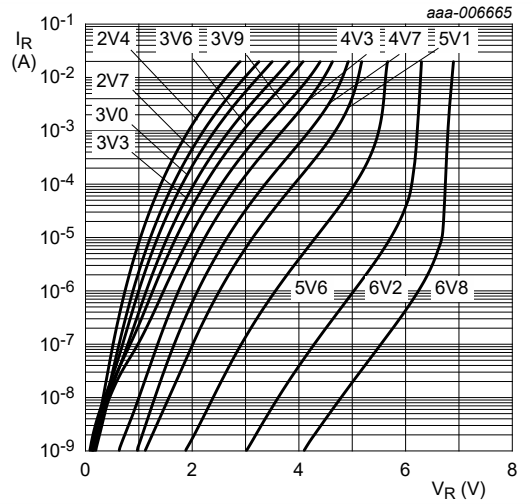
T_j = 25 °C to 150 °C

Fig. 5. Temperature coefficient as a function of working current; typical values (BZB984-C2V4 to C4V7)



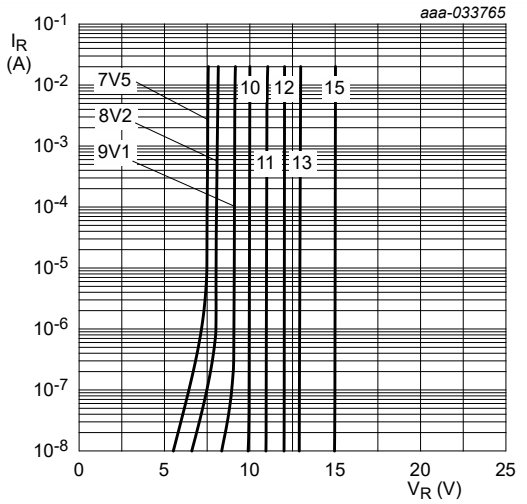
T_j = 25 °C to 150 °C

Fig. 6. Temperature coefficient as a function of working current; typical values (BZB984-C5V1 to C15)



T_j = 25 °C

Fig. 7. Reverse current as a function of reverse voltage; typical values (BZB984-C2V4 to BZB984-C6V8)



T_j = 25 °C

Fig. 8. Reverse current as a function of reverse voltage; typical values (BZB984-C7V5 to BZB984-C15)

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11. Package outline

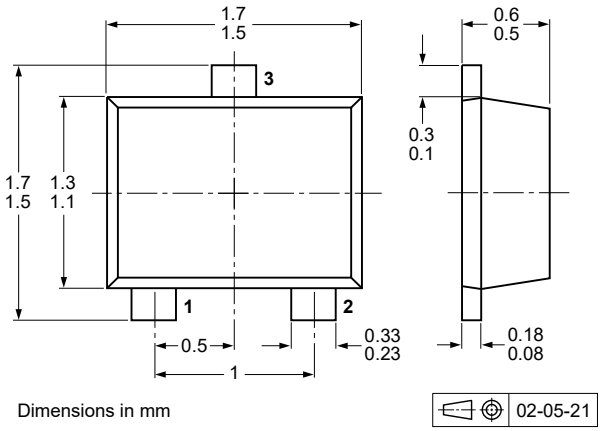
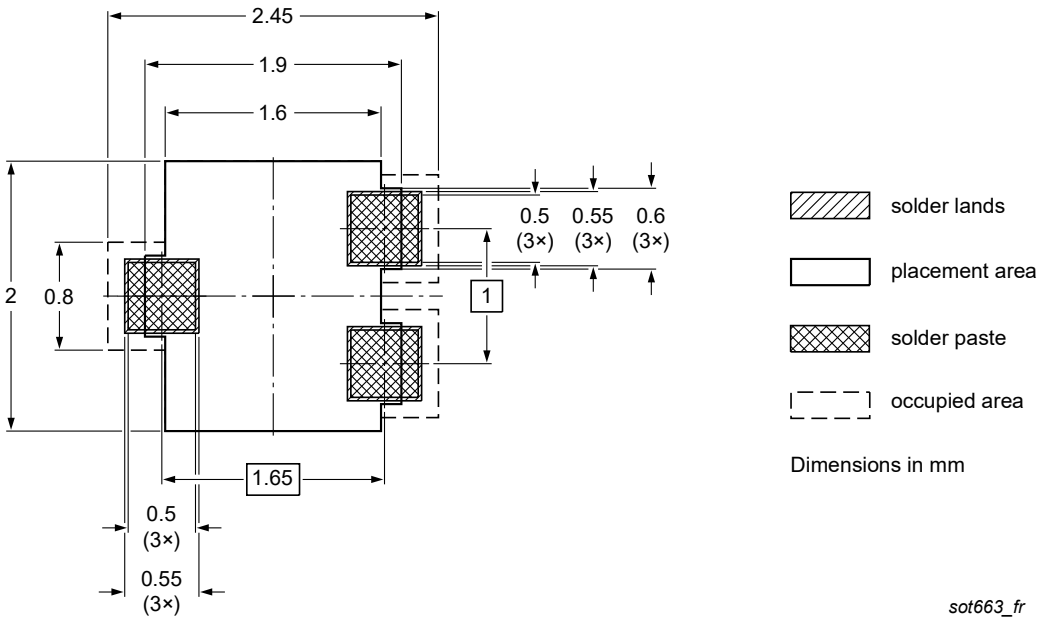


Fig. 9. Package outline SOT663

12. Soldering



Reflow soldering is the only recommended soldering method.

Fig. 10. Reflow soldering footprint SOT663

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13. Revision history

Table 9. Revision history

Document ID	Release date	Data sheet status	Change notice	Supersedes
BZB984_SER v.3	20221227	Product data sheet	-	BZB984_SER v.2
Modifications:	• The format of this data sheet has been redesigned to comply with the identity guidelines of Nexperia. • Legal texts have been adapted to the new company name where appropriate. • Product changed to non-automotive qualification.			
BZB984_SER v.2	2002062	Product data sheet	-	BZB984_SER v.1
BZB984_SER v.1	20011128	Product data sheet	-	-

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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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