



# 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:  $\leq 425$  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

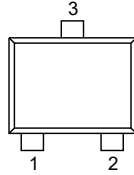
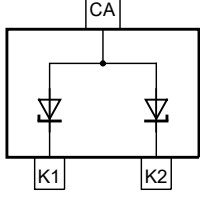
Symbol	Parameter	Conditions		Min	Typ	Max	Unit
$V_F$	forward voltage	$I_F = 10$ mA	[1]	-	-	0.9	V
$P_{tot}$	total power dissipation	2 diodes loaded; $T_{amb} \leq 25$ °C	[2]	-	-	425	mW
		1 diode loaded; $T_{amb} \leq 25$ °C	[2]	-	-	265	mW

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

[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	K1	cathode 1		 aaa-033766
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

## 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	$t_p = 100 \mu\text{s}$ ; square wave; $T_{amb} = 25 \text{ }^\circ\text{C}$	see Table 1		
$P_{ZSM}$	non-repetitive peak reverse power dissipation	$t_p = 100 \mu\text{s}$ ; square wave; $T_{amb} = 25 \text{ }^\circ\text{C}$	-	40	W
$P_{tot}$	total power dissipation	$T_{amb} \leq 25 \text{ }^\circ\text{C}$ 2 diodes loaded	[1] -	425	mW
		$T_{amb} \leq 25 \text{ }^\circ\text{C}$ 1 diode loaded	[1] -	265	mW
$T_j$	junction temperature		-	150	$^\circ\text{C}$
$T_{amb}$	ambient temperature		-55	+150	$^\circ\text{C}$
$T_{stg}$	storage temperature		-65	+150	$^\circ\text{C}$

[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.

## 10. Characteristics

**Table 7. Characteristics**
 $T_j = 25\text{ °C}$  unless otherwise specified.

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
$V_F$	forward voltage	$I_F = 10\text{ mA}$	[1] -	-	0.9	V

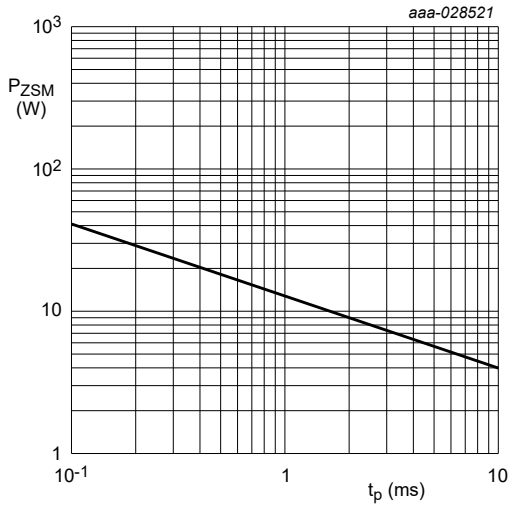
 [1] Pulse test:  $t_p \leq 300\text{ }\mu\text{s}$ ;  $\delta \leq 0.02$ .

**Table 8. Characteristics per type; BZB984-C2V4 to BZB984-C15**
 $T_j = 25\text{ °C}$  unless otherwise specified.

BZB984 -xxx	Sel	Working voltage $V_Z$ (V);		Maximum differential resistance $r_{dif}$ ( $\Omega$ )				Reverse current $I_R$ ( $\mu\text{A}$ )		Temperature coefficient $S_Z$ (mV/K);	Diode capacitance $C_d$ (pF) [1]	Non-repetitive peak reverse current $I_{ZSM}$ (A) [2]
		$I_Z = 5\text{ mA}$ Tol. 5 %		$I_Z = 1\text{ mA}$		$I_Z = 5\text{ mA}$		$I_F = 10\text{ mA}$		$I_{Ztest} = 5\text{ mA}$		
		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

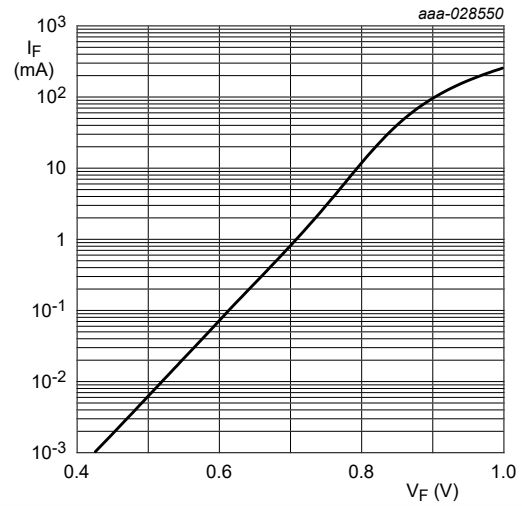
 [1]  $f = 1\text{ MHz}$ ;  $V_R = 0\text{ V}$ 

 [2]  $t_p = 100\text{ }\mu\text{s}$ ;  $T_{amb} = 25\text{ °C}$



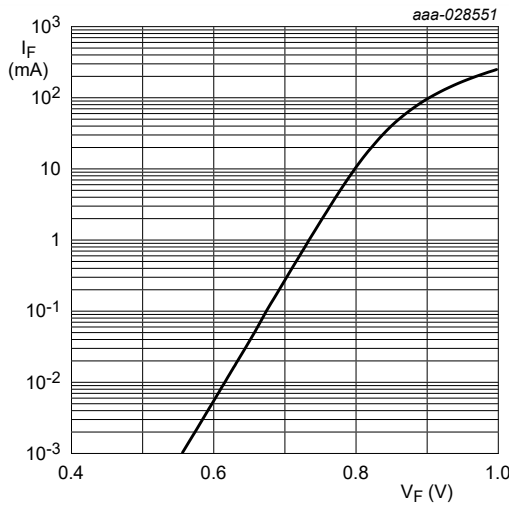
(1)  $T_j = 25\text{ }^\circ\text{C}$  (before surge)

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



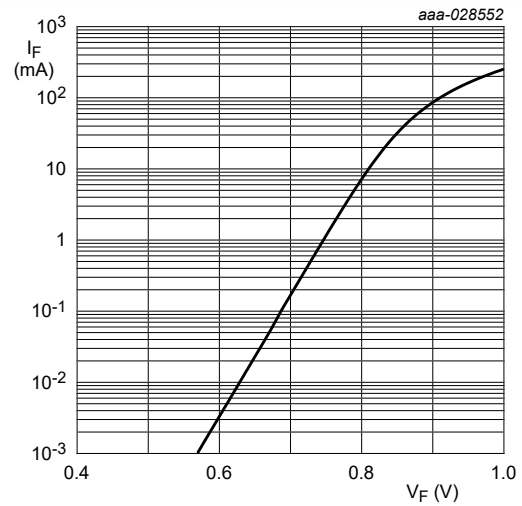
$T_j = 25\text{ }^\circ\text{C}$

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



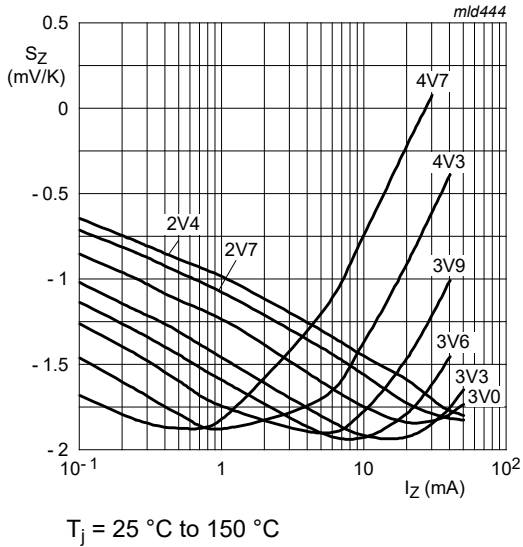
$T_j = 25\text{ }^\circ\text{C}$

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

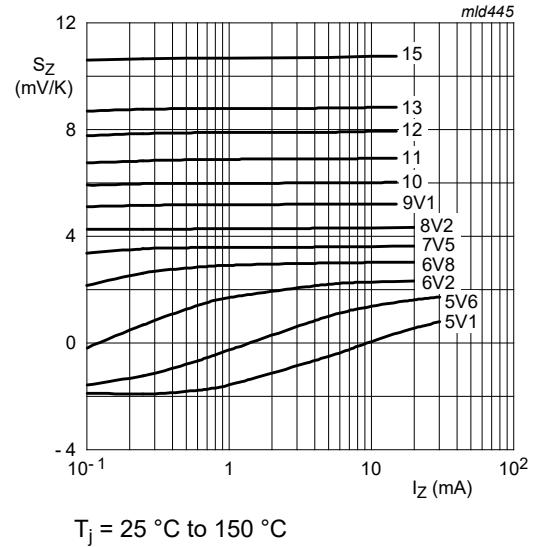


$T_j = 25\text{ }^\circ\text{C}$

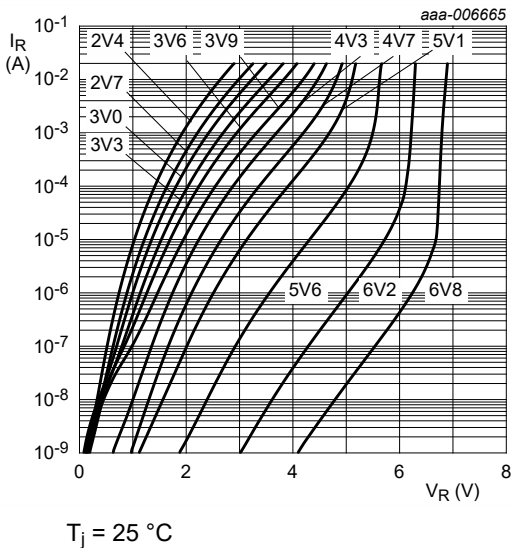
**Fig. 4. Forward current as a function of forward voltage; typical values (BZB984-C7V5)**



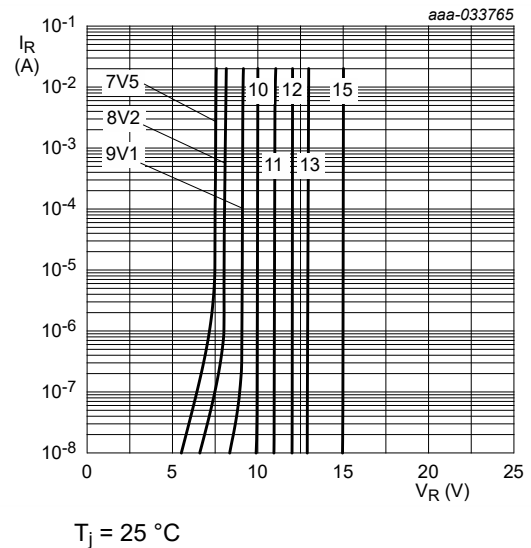
**Fig. 5. Temperature coefficient as a function of working current; typical values (BZB984-C2V4 to C4V7)**



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



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



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

## 11. Package outline

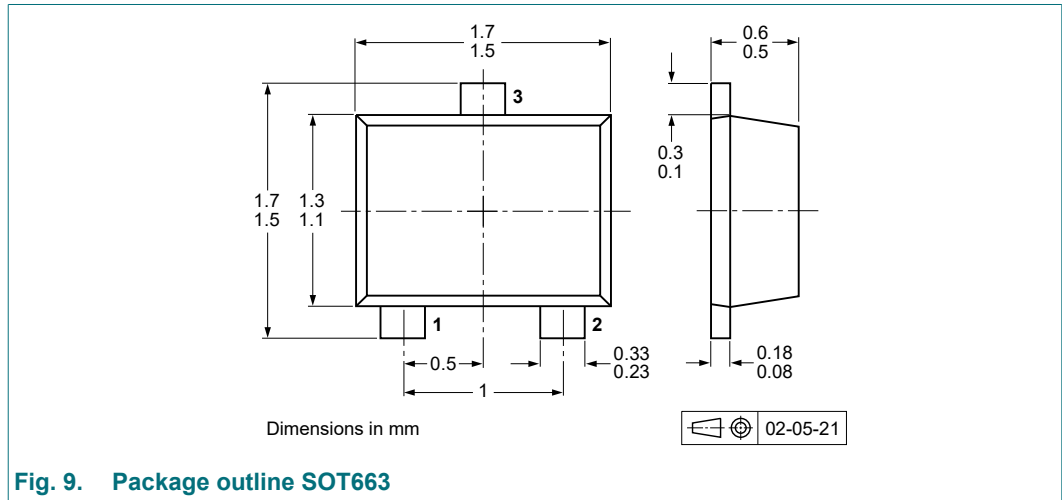


Fig. 9. Package outline SOT663

## 12. Soldering

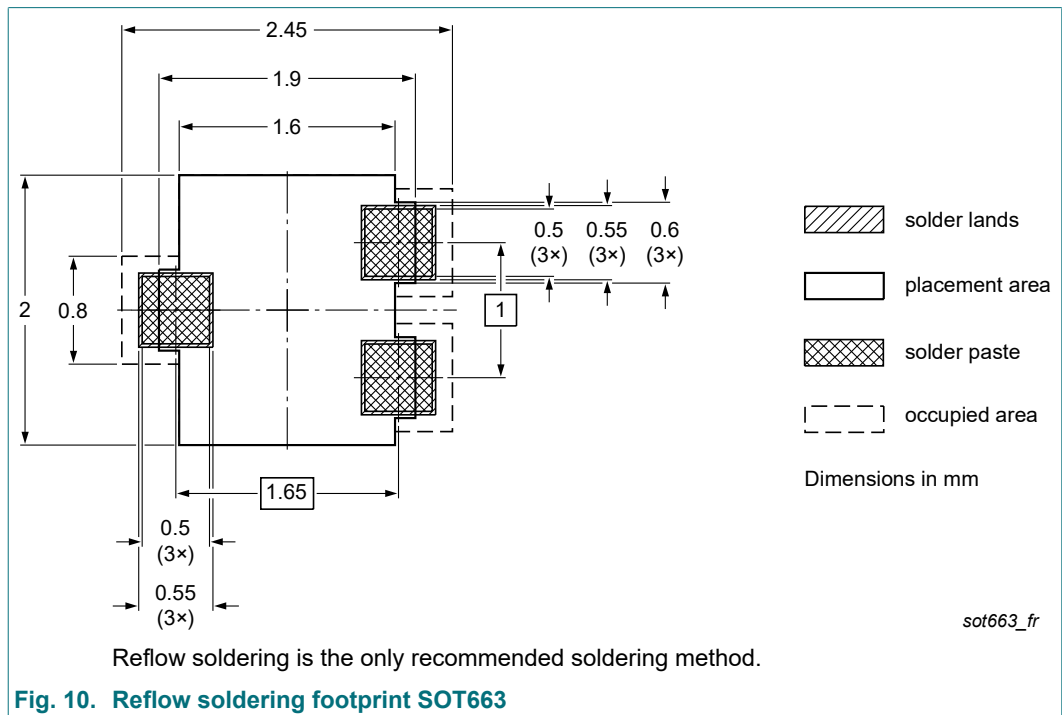


Fig. 10. Reflow soldering footprint SOT663

## 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:	<ul style="list-style-type: none"><li>• The format of this data sheet has been redesigned to comply with the identity guidelines of Nexperia.</li><li>• Legal texts have been adapted to the new company name where appropriate.</li><li>• Product changed to non-automotive qualification.</li></ul>			
BZB984_SER v.2	2002062	Product data sheet	-	BZB984_SER v.1
BZB984_SER v.1	20011128	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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