

BZX585 series

Voltage regulator diodes Rev. 5 — 11 October 2016

Product data sheet

Product profile

1.1 General description

General-purpose Zener diodes in an SOD523 (SC-79) ultra small and flat lead Surface-Mounted Device (SMD) plastic package.

1.2 Features and benefits

- Non-repetitive peak reverse power dissipation: ≤ 40 W
- Total power dissipation: ≤ 300 mW
- AEC-Q101 qualified

- Wide working voltage range: nominal 2.4 V to 75 V (E24 range)
- Two tolerance series: ±2 % and ±5 %
- Low differential resistance

1.3 Applications

General regulation functions

1.4 Quick reference data

Table 1. Quick reference data

Symbol	Parameter	Conditions	Min	Тур	Max	Unit
V_{F}	forward voltage	$I_F = 100 \text{ mA}$ [1]	-	-	1.1	V
P _{ZSM}	non-repetitive peak reverse power dissipation	[2]	-	-	40	W

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

2. **Pinning information**

Table 2. **Pinning**

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

[1] The marking bar indicates the cathode.



^[2] $t_p = 100 \mu s$; square wave; $T_i = 25 \,^{\circ}C$ before surge

3. Ordering information

Table 3. Ordering information

Type number	Package							
	Name	Description	Version					
BZX585-B2V4 to BZX585-C75[1]	SC-79	plastic surface-mounted package; 2 leads	SOD523					

^[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						
BZX585-B2V4	C1	BZX585-B15	E0	BZX585-C2V4	F1	BZX585-C15	H0
BZX585-B2V7	C2	BZX585-B16	EA	BZX585-C2V7	F2	BZX585-C16	НА
BZX585-B3V0	C3	BZX585-B18	EB	BZX585-C3V0	F3	BZX585-C18	НВ
BZX585-B3V3	C4	BZX585-B20	EC	BZX585-C3V3	F4	BZX585-C20	НС
BZX585-B3V6	C5	BZX585-B22	ED	BZX585-C3V6	F5	BZX585-C22	HD
BZX585-B3V9	C6	BZX585-B24	EE	BZX585-C3V9	F6	BZX585-C24	HE
BZX585-B4V3	C7	BZX585-B27	EF	BZX585-C4V3	F7	BZX585-C27	HF
BZX585-B4V7	C8	BZX585-B30	EG	BZX585-C4V7	F8	BZX585-C30	HG
BZX585-B5V1	C9	BZX585-B33	EH	BZX585-C5V1	F9	BZX585-C33	НН
BZX585-B5V6	C0	BZX585-B36	EK	BZX585-C5V6	F0	BZX585-C36	HK
BZX585-B6V2	E1	BZX585-B39	EL	BZX585-C6V2	H1	BZX585-C39	HL
BZX585-B6V8	E2	BZX585-B43	EM	BZX585-C6V8	H2	BZX585-C43	НМ
BZX585-B7V5	E3	BZX585-B47	EN	BZX585-C7V5	H3	BZX585-C47	HN
BZX585-B8V2	E4	BZX585-B51	EP	BZX585-C8V2	H4	BZX585-C51	HP
BZX585-B9V1	E5	BZX585-B56	ER	BZX585-C9V1	H5	BZX585-C56	HR
BZX585-B10	E6	BZX585-B62	ES	BZX585-C10	H6	BZX585-C62	HS
BZX585-B11	E7	BZX585-B68	ET	BZX585-C11	H7	BZX585-C68	HT
BZX585-B12	E8	BZX585-B75	EU	BZX585-C12	H8	BZX585-C75	HU
BZX585-B13	E9	-	-	BZX585-C13	H9	-	-

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		-	200	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	$T_{amb} \le 25 ^{\circ}C$ [2]	-	300	mW
T _{amb}	ambient temperature		-65	+150	°C
Tj	junction temperature		-65	+150	°C
T _{stg}	storage temperature		-65	+150	°C

^[1] $t_p = 100 \mu s$; square wave; $T_i = 25 \, ^{\circ}C$ before surge

6. Thermal characteristics

Table 6. Thermal characteristics

Symbol	Parameter	Conditions	Min	Тур	Max	Unit	
R _{th(j-a)}	thermal resistance from junction to ambient	in free air [1]	-	-	350	K/W	
R _{th(j-sp)}	thermal resistance from junction to solder point	[2]	-	-	65	K/W	

^[1] Device mounted on an FR4 Printed-Circuit Board (PCB) with approximately 35 mm² Cu area at cathode tab.

7. Characteristics

Table 7. Characteristics

 $T_i = 25$ °C unless otherwise specified.

Symbol	Parameter	Conditions	Min	Тур	Max	Unit
V_{F}	forward voltage	[1]				
		I _F = 10 mA	-	-	0.9	V
		I _F = 100 mA	-	-	1.1	V

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

^[2] Device mounted on an FR4 Printed-Circuit Board (PCB) with approximately 35 mm² Cu area at cathode tab

^[2] Soldering point of cathode tab.

Table 8. Characteristics per type; BZX585-B2V4 to BZX585-C24 $T_j = 25$ °C unless otherwise specified.

BZX585- xxx	Sel	Worki voltag V _Z (V)	oltage $r_{dif}(\Omega)$		Rever currer I _R (μΑ	nt		eratur icient nV/K)	е	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	Тур	Max	Тур	Max	Max	V _R (V)	Min	Тур	Max	Max	Мах
2V4	В	2.35	2.45	275	400	70	100	50	1	-3.5	-1.3	0	450	6
	С	2.28	2.52											
2V7	В	2.65	2.75	300	450	75	100	20	1	-3.5	-1.4	0	440	6
	С	2.57	2.84											
3V0	В	2.94	3.06	325	500	80	95	10	1	-3.5	-1.6	0	425	6
	С	2.85	3.15											
3V3	В	3.23	3.37	350	500	85	95	5	1	-3.5	-1.8	0	410	6
	С	3.14	3.47											
3V6	В	3.53	3.67	375	500	85	90	5	1	-3.5	-1.9	0	390	6
	С	3.42	3.78											
3V9	В	3.82	3.98	400	500	85	90	3	1	-3.5	-1.9	0	370	6
	С	3.71	4.10											
4V3	В	4.21	4.39	410	600	80	90	3	1	-3.5	-1.7	0	350	6
	С	4.09	4.52											
4V7	В	4.61	4.79	425	500	50	80	3	2	-3.5	-1.2	0.2	325	6
	С	4.47	4.94											
5V1	В	5.00	5.20	400	480	40	60	2	2	-2.7	-0.5	1.2	300	6
	С	4.85	5.36											
5V6	В	5.49	5.71	80	400	15	40	1	2	-2	1.0	2.5	275	6
	С	5.32	5.88											
6V2	В	6.08	6.32	40	150	6	10	3	4	0.4	2.2	3.7	250	6
	С	5.89	6.51											
6V8	В	6.66	6.94	30	80	6	15	2	4	1.2	3.0	4.5	215	6
	С	6.46	7.14											
7V5	В	7.35	7.65	15	80	2	10	1	5	2.5	3.6	5.3	170	4
	С	7.13	7.88											
8V2	В	8.04	8.36	20	80	2	10	0.7	5	3.2	4.3	6.2	150	4
	С	7.79	8.61											
9V1	В	8.92	9.28	20	100	2	10	0.5	6	3.8	5.2	7	120	3
	С	8.65	9.56	1										
10	В	9.80	10.20	20	150	2	10	0.2	7	4.5	6.0	8	110	3
	С	9.50	10.50											
11	В	10.78	11.22	25	150	2	10	0.1	8	5.4	6.9	9	110	2.5
	С	10.45	11.55	1										
12	В	11.76	12.24	25	150	2	10	0.1	8	6	7.9	10	105	2.5
	С	11.40	12.60											

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Table 8. Characteristics per type; BZX585-B2V4 to BZX585-C24 ...continued

 $T_i = 25$ °C unless otherwise specified.

BZX585- xxx	Sel	Workii voltag V _Z (V)	e	Diffe		l resis	tance	curre	Reverse Temperature coefficient S_Z (mV/K)		pefficient capacitano		capacitance	Non-repetitive peak reverse current I _{ZSM} (A)[2]
		I _Z = 5 ı	mA	I _Z = 1	l mA	I _Z = 5	mA			I _Z = 5 mA			_	
		Min	Max	Тур	Max	Тур	Max	Max	V _R (V)	Min	Тур	Max	Max	Max
13	В	12.74	13.26	25	170	2	10	0.1	8	7	8.8	11	105	2.5
	С	12.35	13.65											
15	В	14.70	15.30	25	200	3	15	0.05	10.5	9.2	10.7	13	100	2
	С	14.25	15.75											
16	В	15.68	16.32	50	200	10	40	0.05	11.2	10.4	12.4	14	90	1.5
	С	15.20	16.80											
18	В	17.64	18.36	50	225	10	45	0.05	12.6	12.4	14.4	16	80	1.5
	С	17.10	18.90											
20	В	19.60	20.40	60	225	15	55	0.05	14	14.4	16.4	18	70	1.5
	С	19.00	21.00											
22	В	21.56	22.44	60	250	20	55	0.05	15.4	16.4	18.4	20	60	1.25
	С	20.90	23.10											
24	В	23.52	24.48	60	250	25	70	0.05	16.8	18.4	20.4	22	55	1.25
	С	22.80	25.20											

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

^[2] $t_p = 100 \mu s$; square wave; $T_j = 25 \, ^{\circ}C$ before surge

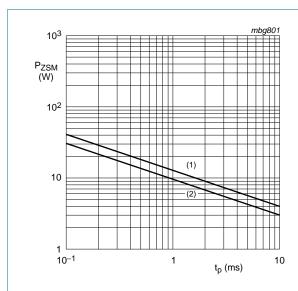
Table 9. Characteristics per type; BZX585-B27 to BZX585-C75

 $T_i = 25$ °C unless otherwise specified.

BZX585 -xxx	Sel	Workii voltag V _Z (V)		Differ	rential 2)	resist	ance	currer	Reverse Temperature coefficient $I_R (\mu A)$ $S_Z (mV/K)$ $I_Z = 2 mA$		Diode capacitance C _d (pF) ^[1]	Non-repetitive peak reverse current I _{ZSM} (A) ^[2]		
		I _Z = 2 ı	nΑ	I _Z = 0	.5 mA	I _Z = 2	mA				mA		_	
		Min	Max	Тур	Max	Тур	Max	Max	V _R (V)	Min	Тур	Max	Max	Мах
27	В	26.46	27.54	65	300	25	80	0.05	18.9	21.4	23.4	25.3	50	1.0
	С	25.65	28.35											
30	В	29.40	30.60	70	300	30	80	0.05	21	24.4	26.6	29.4	50	1.0
	С	28.50	31.50											
33	В	32.34	33.66	75	325	35	80	0.05	23.1	27.4	29.7	33.4	45	0.9
	С	31.35	34.65											
36	В	35.28	36.72	80	350	35	90	0.05	25.2	30.4	33.0	37.4	45	0.8
	С	34.20	37.80											
39	В	38.22	39.78	80	350	40	130	0.05	27.3	33.4	36.4	41.2	45	0.7
	С	37.05	40.95											
43	В	42.14	43.86	85	375	45	150	0.05	30.1	37.6	41.2	46.6	40	0.6
	С	40.85	45.15											
47	В	46.06	47.94	85	375	50	170	0.05	32.9	42.0	46.1	51.8	40	0.5
	С	44.65	49.35											
51	В	49.98	52.02	90	400	60	180	0.05	35.7	46.6	51.0	57.2	40	0.4
	С	48.45	53.55											
56	В	54.88	57.12	100	425	70	200	0.05	39.2	52.2	57.0	63.8	40	0.3
	С	53.20	58.80											
62	В	60.76	63.24	120	450	80	215	0.05	43.4	58.8	64.4	71.6	35	0.3
	С	58.90	65.10											
68	В	66.64	69.36	150	475	90	240	0.05	47.6	65.6	71.7	79.8	35	0.25
	С	64.60	71.40											
75	В	73.50	76.50	170	500	95	255	0.05	52.5	73.4	80.2	88.6	35	0.2
	С	71.25	78.75											

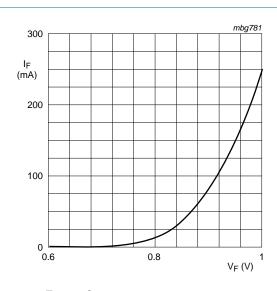
^[1] $f = 1 \text{ MHz}; V_R = 0 \text{ V}$

^[2] $t_p = 100 \mu s$; square wave; $T_j = 25 \, ^{\circ}C$ before surge



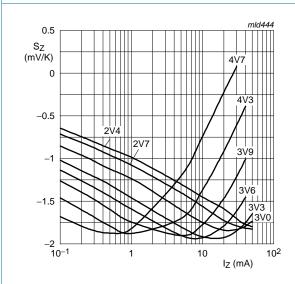
- (1) $T_j = 25$ °C (before surge)
- (2) $T_i = 150 \,^{\circ}\text{C}$ (before surge)

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



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

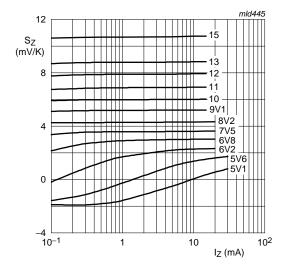
Fig 2. Forward current as a function of forward voltage; typical values



BZX585-B/C2V4 to BZX585-B/C4V7

 $T_i = 25 \,^{\circ}\text{C}$ to 150 $^{\circ}\text{C}$

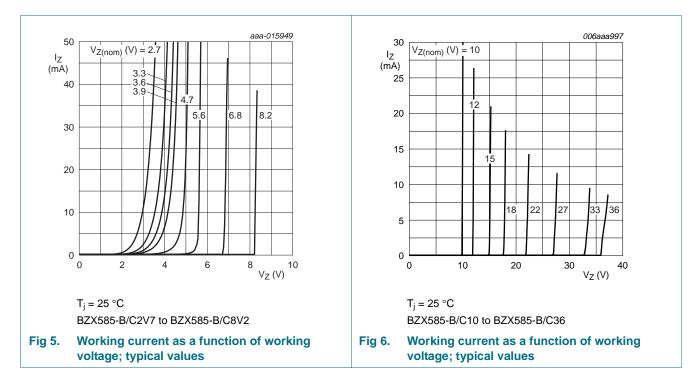
Fig 3. Temperature coefficient as a function of working current; typical values



BZX585-B/C5V1 to BZX585-B/C15

 $T_i = 25 \,^{\circ}\text{C}$ to 150 $^{\circ}\text{C}$

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

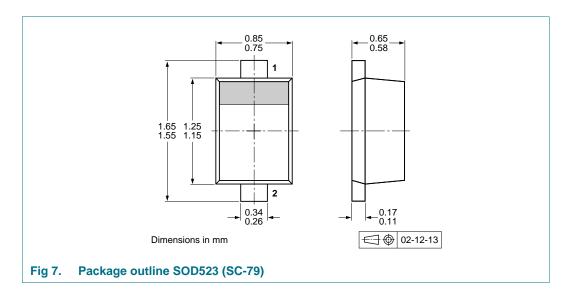


8. Test information

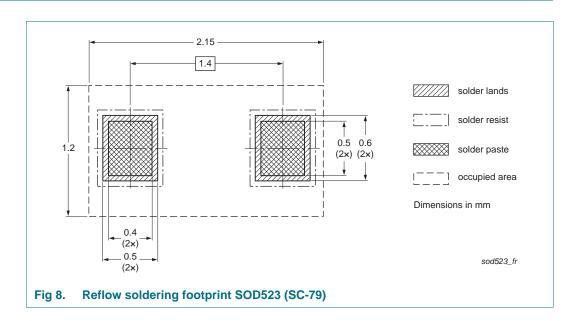
8.1 Quality information

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. Soldering



11. Revision history

Table 10. Revision history

Document ID	Release date	Data sheet status	Change notice	Supersedes					
BZX585_SER v.5	20161011	Product data sheet	-	BZX585_SER v.4					
Modifications:		of this document has been ref NXP Semiconductors	redesigned to comply v	with the new identity					
	 Legal texts h 	nave been adapted to the n	ew company name wh	ere appropriate.					
	 Section 1 "P 	roduct profile": enhanced.							
	• <u>Table 5</u> : T _{am}	_b added.							
	• <u>Table 8</u> and	Table 9: updated							
	• Figure 1, Fig	ure 5 and Figure 6: added							
	Section 8 "Te	est information": added.							
	• Figure 7: rep	placed by minimized packag	ge outline						
	• <u>Section 10 "S</u>	Soldering": added							
	Section 12 "I	Legal information": updated	I						
BZX585_SER v.4	20040622	20040622 Product data sheet - BZX585_SER v.3							
BZX585_SER v.3	20040326	20040326 Product specification - BZX585_SER v.2							
BZX585_SER v.2	20001020	Product specification	-	BZX585_SER v.1					
BZX585_SER v.1	20000606 Product specification								

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"
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BZX585 series

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BZX585 series

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Voltage regulator diodes

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BZX585-C27F BZX585-C36F

NXP:

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