



**THE DATASHEET OF  
BZX79-C33,133**



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Kind regards,

Team Nexperia

# DATA SHEET



## **BZX79 series** Voltage regulator diodes

Product data sheet  
Supersedes data of 1999 May 25

2002 Feb 27

# Voltage regulator diodes

# BZX79 series

### FEATURES

- Total power dissipation: max. 500 mW
- Two tolerance series:  $\pm 2\%$ , and approx.  $\pm 5\%$
- Working voltage range: nom. 2.4 to 75 V (E24 range)
- Non-repetitive peak reverse power dissipation: max. 40 W.

### APPLICATIONS

- Low voltage stabilizers or voltage references.

### DESCRIPTION

Low-power voltage regulator diodes in hermetically sealed leaded glass SOD27 (DO-35) packages. The diodes are available in the normalized E24  $\pm 2\%$  (BZX79-B) and approx.  $\pm 5\%$  (BZX79-C) tolerance range. The series consists of 37 types with nominal working voltages from 2.4 to 75 V.



### LIMITING VALUES

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

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
$I_F$	continuous forward current		–	250	mA
$I_{ZSM}$	non-repetitive peak reverse current	$t_p = 100 \mu s$ ; square wave; $T_j = 25 \text{ }^\circ\text{C}$ prior to surge	see Tables 1 and 2		A
$P_{tot}$	total power dissipation	$T_{amb} = 50 \text{ }^\circ\text{C}$ ; note 1	–	400	mW
		$T_{amb} = 50 \text{ }^\circ\text{C}$ ; note 2	–	500	mW
$P_{ZSM}$	non-repetitive peak reverse power dissipation	$t_p = 100 \mu s$ ; square wave; $T_j = 25 \text{ }^\circ\text{C}$ prior to surge; see Fig.3	–	40	W
$T_{stg}$	storage temperature		–65	+200	$^\circ\text{C}$
$T_j$	junction temperature		–65	+200	$^\circ\text{C}$

### Notes

1. Device mounted on a printed circuit-board without metallization pad; lead length max.
2. Tie-point temperature  $\leq 50 \text{ }^\circ\text{C}$ ; max. lead length 8 mm.

### ELECTRICAL CHARACTERISTICS

#### Total BZX79-B and BZX79-C series

$T_j = 25 \text{ }^\circ\text{C}$  unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MAX.	UNIT
$V_F$	forward voltage	$I_F = 10 \text{ mA}$ ; see Fig.4	0.9	V

## Voltage regulator diodes

## BZX79 series

SYMBOL	PARAMETER	CONDITIONS	MAX.	UNIT
$I_R$	reverse current			
	BZX79-B/C2V4	$V_R = 1\text{ V}$	50	$\mu\text{A}$
	BZX79-B/C2V7	$V_R = 1\text{ V}$	20	$\mu\text{A}$
	BZX79-B/C3V0	$V_R = 1\text{ V}$	10	$\mu\text{A}$
	BZX79-B/C3V3	$V_R = 1\text{ V}$	5	$\mu\text{A}$
	BZX79-B/C3V6	$V_R = 1\text{ V}$	5	$\mu\text{A}$
	BZX79-B/C3V9	$V_R = 1\text{ V}$	3	$\mu\text{A}$
	BZX79-B/C4V3	$V_R = 1\text{ V}$	3	$\mu\text{A}$
	BZX79-B/C4V7	$V_R = 2\text{ V}$	3	$\mu\text{A}$
	BZX79-B/C5V1	$V_R = 2\text{ V}$	2	$\mu\text{A}$
	BZX79-B/C5V6	$V_R = 2\text{ V}$	1	$\mu\text{A}$
	BZX79-B/C6V2	$V_R = 4\text{ V}$	3	$\mu\text{A}$
	BZX79-B/C6V8	$V_R = 4\text{ V}$	2	$\mu\text{A}$
	BZX79-B/C7V5	$V_R = 5\text{ V}$	1	$\mu\text{A}$
	BZX79-B/C8V2	$V_R = 5\text{ V}$	700	nA
	BZX79-B/C9V1	$V_R = 6\text{ V}$	500	nA
	BZX79-B/C10	$V_R = 7\text{ V}$	200	nA
	BZX79-B/C11	$V_R = 8\text{ V}$	100	nA
	BZX79-B/C12	$V_R = 8\text{ V}$	100	nA
	BZX79-B/C13	$V_R = 8\text{ V}$	100	nA
BZX79-B/C15 to BZX79-B/C75	$V_R = 0.7V_{Znom}$	50	nA	

**Table 1** Per type, BZX79-B/C2V4 to BZX79-B/C24T<sub>j</sub> = 25 °C unless otherwise specified.

BZX79- Bxxx Cxxx	WORKING VOLTAGE V <sub>z</sub> (V) at I <sub>ztest</sub> = 5 mA			DIFFERENTIAL RESISTANCE r <sub>diff</sub> (Ω)			TEMP. COEFF. S <sub>z</sub> (mV/K) at I <sub>ztest</sub> = 5 mA (see Figs 5 and 6)			DIODECAP. C <sub>d</sub> (pF) at f = 1 MHz; V <sub>R</sub> = 0 V at t			
	Tol. ±2% (B)		Tol. approx. ±5% (C)	at I <sub>ztest</sub> = 1 mA		at I <sub>ztest</sub> = 5 mA	MIN.	TYP.	MAX.				
	MIN.	MAX.	MIN.	MAX.	TYP.	MAX.	MIN.	TYP.	MAX.				
2V4	2.35	2.45	2.2	2.6	275	600	70	100	-3.5	-1.6	0	450	6.0
2V7	2.65	2.75	2.5	2.9	300	600	75	100	-3.5	-2.0	0	450	6.0
3V0	2.94	3.06	2.8	3.2	325	600	80	95	-3.5	-2.1	0	450	6.0
3V3	3.23	3.37	3.1	3.5	350	600	85	95	-3.5	-2.4	0	450	6.0
3V6	3.53	3.67	3.4	3.8	375	600	85	90	-3.5	-2.4	0	450	6.0
3V9	3.82	3.98	3.7	4.1	400	600	85	90	-3.5	-2.5	0	450	6.0
4V3	4.21	4.39	4.0	4.6	410	600	80	90	-3.5	-2.5	0	450	6.0
4V7	4.61	4.79	4.4	5.0	425	500	50	80	-3.5	-1.4	0.2	300	6.0
5V1	5.00	5.20	4.8	5.4	400	480	40	60	-2.7	-0.8	1.2	300	6.0
5V6	5.49	5.71	5.2	6.0	80	400	15	40	-2.0	1.2	2.5	300	6.0
6V2	6.08	6.32	5.8	6.6	40	150	6	10	0.4	2.3	3.7	200	6.0
6V8	6.66	6.94	6.4	7.2	30	80	6	15	1.2	3.0	4.5	200	6.0
7V5	7.35	7.65	7.0	7.9	30	80	6	15	2.5	4.0	5.3	150	4.0
8V2	8.04	8.36	7.7	8.7	40	80	6	15	3.2	4.6	6.2	150	4.0
9V1	8.92	9.28	8.5	9.6	40	100	6	15	3.8	5.5	7.0	150	3.0
10	9.80	10.20	9.4	10.6	50	150	8	20	4.5	6.4	8.0	90	3.0
11	10.80	11.20	10.4	11.6	50	150	10	20	5.4	7.4	9.0	85	2.5
12	11.80	12.20	11.4	12.7	50	150	10	25	6.0	8.4	10.0	85	2.5
13	12.70	13.30	12.4	14.1	50	170	10	30	7.0	9.4	11.0	80	2.5
15	14.70	15.30	13.8	15.6	50	200	10	30	9.2	11.4	13.0	75	2.0
16	15.70	16.30	15.3	17.1	50	200	10	40	10.4	12.4	14.0	75	1.5
18	17.60	18.40	16.8	19.1	50	225	10	45	12.4	14.4	16.0	70	1.5
20	19.60	20.40	18.8	21.2	60	225	15	55	12.3	15.6	18.0	60	1.5
22	21.60	22.40	20.8	23.3	60	250	20	55	14.1	17.6	20.0	60	1.2
24	23.50	24.50	22.8	25.6	60	250	25	70	15.9	19.6	22.0	55	1.2

**Table 2** Per type, BZX79-B/C27 to BZX79-B/C75T<sub>J</sub> = 25 °C unless otherwise specified.

BZX79- Bxxx Cxxx	WORKING VOLTAGE V <sub>Z</sub> (V) at I <sub>Ztest</sub> = 2 mA			DIFFERENTIAL RESISTANCE r <sub>diff</sub> (Ω)			TEMP. COEFF. S <sub>Z</sub> (mV/K) at I <sub>Ztest</sub> = 2 mA (see Figs 5 and 6)			DIODECAP. C <sub>d</sub> (pF) at f = 1 MHz; V <sub>R</sub> = 0 V at t			
	Tol. ±2% (B)		Tol. approx. ±5% (C)	at I <sub>Ztest</sub> = 0.5 mA		at I <sub>Ztest</sub> = 2 mA	MIN.	TYP.	MAX.				
	MIN.	MAX.	MIN.	MAX.	TYP.	MAX.	MIN.	TYP.	MAX.				
27	26.50	27.50	25.1	28.9	65	300	25	80	18.0	22.7	25.3	50	1.0
30	29.40	30.60	28.0	32.0	70	300	30	80	20.6	25.7	29.4	50	1.0
33	32.30	33.70	31.0	35.0	75	325	35	80	23.3	28.7	33.4	45	0.9
36	35.30	36.70	34.0	38.0	80	350	35	90	26.0	31.8	37.4	45	0.8
39	38.20	39.80	37.0	41.0	80	350	40	130	28.7	34.8	41.2	45	0.7
43	42.10	43.90	40.0	46.0	85	375	45	150	31.4	38.8	46.6	40	0.6
47	46.10	47.90	44.0	50.0	85	375	50	170	35.0	42.9	51.8	40	0.5
51	50.00	52.00	48.0	54.0	90	400	60	180	38.6	46.9	57.2	40	0.4
56	54.90	57.10	52.0	60.0	100	425	70	200	42.2	52.0	63.8	40	0.3
62	60.80	63.20	58.0	66.0	120	450	80	215	58.8	64.4	71.6	35	0.3
68	66.60	69.40	64.0	72.0	150	475	90	240	65.6	71.7	79.8	35	0.2
75	73.50	76.50	70.0	79.0	170	500	95	255	73.4	80.2	88.6	35	0.2

Voltage regulator diodes

BZX79 series

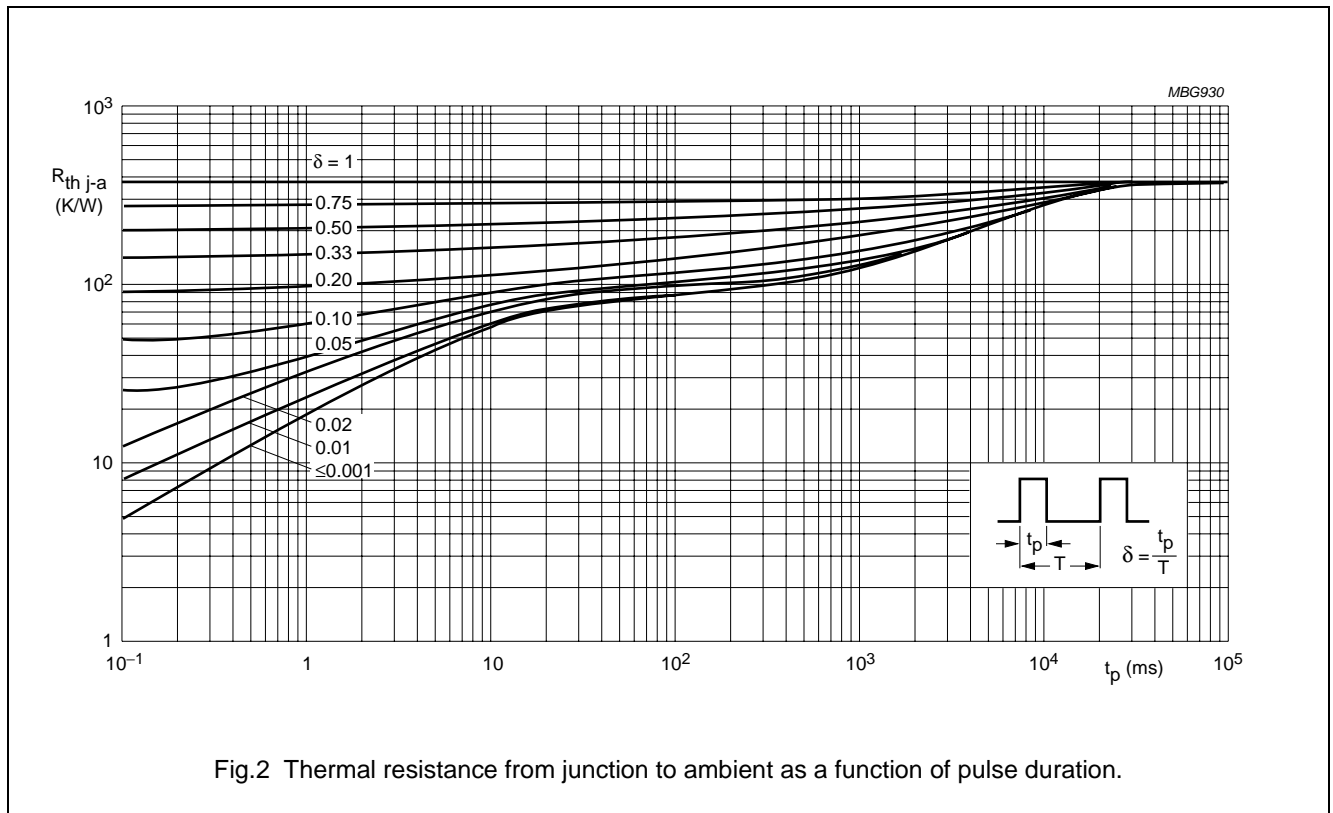
**THERMAL CHARACTERISTICS**

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
$R_{th\ j-tp}$	thermal resistance from junction to tie-point	lead length 8 mm.	300	K/W
$R_{th\ j-a}$	thermal resistance from junction to ambient	lead length max.; see Fig.2 and note 1	380	K/W

**Note**

1. Device mounted on a printed circuit-board without metallization pad.

**GRAPHICAL DATA**



Voltage regulator diodes

BZX79 series



Voltage regulator diodes

BZX79 series

**PACKAGE OUTLINE**

Hermetically sealed glass package; axial leaded; 2 leads

**SOD27**



**DIMENSIONS (mm are the original dimensions)**

UNIT	b max.	D max.	G <sub>1</sub> max.	L min.
mm	0.56	1.85	4.25	25.4



**Note**

1. The marking band indicates the cathode.

OUTLINE VERSION	REFERENCES				EUROPEAN PROJECTION	ISSUE DATE
	IEC	JEDEC	EIAJ			
SOD27	A24	DO-35	SC-40			97-06-09

Voltage regulator diodes

BZX79 series

**DATA SHEET STATUS**

DOCUMENT STATUS <sup>(1)</sup>	PRODUCT STATUS <sup>(2)</sup>	DEFINITION
Objective data sheet	Development	This document contains data from the objective specification for product development.
Preliminary data sheet	Qualification	This document contains data from the preliminary specification.
Product data sheet	Production	This document contains the product specification.

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