

BZX84 series

Voltage regulator diodes

Rev. 6 — 6 March 2014 Product data sheet

1. Product profile

1.1 General description

Low-power voltage regulator diodes in a small SOT23 (TO-236AB) Surface-Mounted Device (SMD) plastic package.

The diodes are available in the normalized E24 ±1 % (BZX84-A), ±2 % (BZX84-B) and approximately ±5 % (BZX84-C) tolerance range. The series includes 37 breakdown voltages with nominal working voltages from 2.4 V to 75 V.

1.2 Features and benefits

- Total power dissipation: ≤ 250 mW
- Three tolerance series: ±1 %, ±2 % and approximately ±5 %
- AEC-Q101 qualified
- Working voltage range: nominal 2.4 V to 75 V (E24 range)
- Non-repetitive peak reverse power dissipation: ≤ 40 W

1.3 Applications

- General regulation functions

1.4 Quick reference data

Table 1. Quick reference data

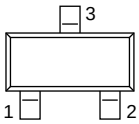
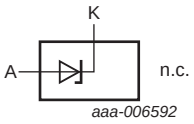
Symbol	Parameter	Conditions		Min	Typ	Max	Unit
V_F	forward voltage	I_F = 10 mA	[1]	-	-	0.9	V
P_{tot}	total power dissipation	T_{amb} ≤ 25 °C	[2]	-	-	250	mW

[1] Pulse test: $t_p \leq 100\ \mu s$; $\delta \leq 0.02$

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

2. Pinning information

Table 2. Pinning

Pin	Symbol	Description	Simplified outline	Graphic symbol
1	A	anode		
2	n.c.	not connected		
3	K	cathode		

3. Ordering information

Table 3. Ordering information

Type number	Package		
	Name	Description	Version
BZX84 series[1]	TO-236AB	plastic surface-mounted package; 3 leads	SOT23

[1] The series includes 37 breakdown voltages with nominal working voltages from 2.4 V to 75 V and ±1 %, ±2 % and ±5 % tolerances.

4. Marking

Table 4. Marking codes

Type number	Marking code[1]	Type number	Marking code[1]
BZX84-A2V4	*50	BZX84-A18	KF*
BZX84-A2V7	*51	BZX84-A20	*C2
BZX84-A3V0	*52	BZX84-A22	KG*
BZX84-A3V3	*53	BZX84-A24	KH*
BZX84-A3V6	*C1	BZX84-A27	*75
BZX84-A3V9	*55	BZX84-A30	KJ*
BZX84-A4V3	*56	BZX84-A33	KK*
BZX84-A4V7	*57	BZX84-A36	*C3
BZX84-A5V1	*58	BZX84-A39	*C4
BZX84-A5V6	*59	BZX84-A43	*C5
BZX84-A6V2	*60	BZX84-A51	*C6
BZX84-A6V8	*61	BZX84-A75	*86
BZX84-A7V5	*62	BZX84-B2V4	*Z0
BZX84-A8V2	*63	BZX84-B2V7	*Z1
BZX84-A9V1	*64	BZX84-B3V0	*S1
BZX84-A10	*65	BZX84-B3V3	*S2
BZX84-A11	*04	BZX84-B3V6	*S3
BZX84-A12	*67	BZX84-B3V9	*S4
BZX84-A13	*C0	BZX84-B4V3	*S7
BZX84-A15	*69	BZX84-B4V7	*S8
BZX84-A16	KE*	BZX84-B5V1	*R1

All information provided in this document is subject to legal disclaimers.

© NXP Semiconductors N.V. 2014. All rights reserved.

Table 4. Marking codes *…continued*

Type number	Marking code[1]	Type number	Marking code[1]
BZX84-B5V6	*R2	BZX84-C3V9	*B3
BZX84-B6V2	*R5	BZX84-C4V3	*B6
BZX84-B6V8	*R6	BZX84-C4V7	Z1*
BZX84-B7V5	*R8	BZX84-C5V1	Z2*
BZX84-B8V2	*R9	BZX84-C5V6	Z3*
BZX84-B9V1	*T1	BZX84-C6V2	Z4*
BZX84-B10	*66	BZX84-C6V8	Z5*
BZX84-B11	*Z6	BZX84-C7V5	Z6*
BZX84-B12	*Z7	BZX84-C8V2	Z7*
BZX84-B13	*Z8	BZX84-C9V1	Z8*
BZX84-B15	*Z9	BZX84-C10	Z9*
BZX84-B16	*70	BZX84-C11	Y1*
BZX84-B18	*71	BZX84-C12	Y2*
BZX84-B20	*72	BZX84-C13	Y3*
BZX84-B22	*73	BZX84-C15	Y4*
BZX84-B24	*74	BZX84-C16	Y5*
BZX84-B27	*Z5	BZX84-C18	Y6*
BZX84-B30	*Z4	BZX84-C20	Y7*
BZX84-B33	*Y1	BZX84-C22	Y8*
BZX84-B36	*Y2	BZX84-C24	Y9*
BZX84-B39	*S0	BZX84-C27	*T2
BZX84-B43	*S5	BZX84-C30	*T5
BZX84-B47	*S6	BZX84-C33	*T6
BZX84-B51	*S9	BZX84-C36	*T7
BZX84-B56	*R0	BZX84-C39	*T8
BZX84-B62	*R3	BZX84-C43	*B4
BZX84-B68	*R4	BZX84-C47	*B5
BZX84-B75	*R7	BZX84-C51	*B7
BZX84-C2V4	*T3	BZX84-C56	*B8
BZX84-C2V7	*T4	BZX84-C62	*B9
BZX84-C3V0	*T9	BZX84-C68	*B0
BZX84-C3V3	*B1	BZX84-C75	*A1
BZX84-C3V6	*B2	-	-

[1] * = placeholder for manufacturing site code

All information provided in this document is subject to legal disclaimers.

© NXP Semiconductors N.V. 2014. All rights reserved.

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
P_{ZSM}	non-repetitive peak reverse power dissipation	[1]	-	40	W
P_{tot}	total power dissipation	$T_{amb} \leq 25$ °C [2]	-	250	mW
T_{amb}	ambient temperature		-	150	°C
T_{stg}	storage temperature		−55	+150	°C
T_j	junction temperature		−65	+150	°C

[1] $t_p = 100$ μs; square wave; $T_j = 25$ °C before surge

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

6. 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 [1]	-	-	500	K/W
$R_{th(j-sp)}$	thermal resistance from junction to solder point	[2]	-	-	330	K/W

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

[2] Soldering point of cathode tab.

7. 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: $t_p \leq 100$ μs; $\delta \leq 0.02$

All information provided in this document is subject to legal disclaimers.

© NXP Semiconductors N.V. 2014. All rights reserved.

Table 8. Characteristics per type; BZX84-A2V4 to BZX84-C24

T_j = 25 °C unless otherwise specified.

BZX84-xxx	Sel	Working voltage V_Z (V)		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		I_Z = 1 mA		I_Z = 5 mA				I_Z = 5 mA				
		Min	Max	Typ	Max	Typ	Max	Max	V_R (V)	Min	Typ	Max	Max	Max
2V4	A	2.37	2.43	275	600	70	100	50	1	−3.5	−1.6	0	450	6.0
	B	2.35	2.45											
	C	2.2	2.6											
2V7	A	2.67	2.73	300	600	75	100	20	1	−3.5	−2.0	0	450	6.0
	B	2.65	2.75											
	C	2.5	2.9											
3V0	A	2.97	3.03	325	600	80	95	10	1	−3.5	−2.1	0	450	6.0
	B	2.94	3.06											
	C	2.8	3.2											
3V3	A	3.26	3.34	350	600	85	95	5	1	−3.5	−2.4	0	450	6.0
	B	3.23	3.37											
	C	3.1	3.5											
3V6	A	3.56	3.64	375	600	85	90	5	1	−3.5	−2.4	0	450	6.0
	B	3.53	3.67											
	C	3.4	3.8											
3V9	A	3.86	3.94	400	600	85	90	3	1	−3.5	−2.5	0	450	6.0
	B	3.82	3.98											
	C	3.7	4.1											
4V3	A	4.25	4.35	410	600	80	90	3	1	−3.5	−2.5	0	450	6.0
	B	4.21	4.39											
	C	4.0	4.6											
4V7	A	4.65	4.75	425	500	50	80	3	2	−3.5	−1.4	0.2	300	6.0
	B	4.61	4.79											
	C	4.4	5.0											
5V1	A	5.04	5.16	400	480	40	60	2	2	−2.7	−0.8	1.2	300	6.0
	B	5.0	5.2											
	C	4.8	5.4											
5V6	A	5.54	5.66	80	400	15	40	1	2	−2.0	1.2	2.5	300	6.0
	B	5.49	5.71											
	C	5.2	6.0											
6V2	A	6.13	6.27	40	150	6	10	3	4	0.4	2.3	3.7	200	6.0
	B	6.08	6.32											
	C	5.8	6.6											
6V8	A	6.73	6.87	30	80	6	15	2	4	1.2	3.0	4.5	200	6.0
	B	6.66	6.94											
	C	6.4	7.2											

All information provided in this document is subject to legal disclaimers.

© NXP Semiconductors N.V. 2014. All rights reserved.

Table 8. Characteristics per type; BZX84-A2V4 to BZX84-C24 *…continued*

T_j = 25 °C unless otherwise specified.

BZX84-xxx	Sel	Working voltage V_Z (V)		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		I_Z = 1 mA		I_Z = 5 mA				I_Z = 5 mA				
		Min	Max	Typ	Max	Typ	Max	Max	V_R (V)	Min	Typ	Max	Max	Max
7V5	A	7.42	7.58	30	80	6	15	1	5	2.5	4.0	5.3	150	4.0
	B	7.35	7.65											
	C	7.0	7.9											
8V2	A	8.11	8.29	40	80	6	15	0.7	5	3.2	4.6	6.2	150	4.0
	B	8.04	8.36											
	C	7.7	8.7											
9V1	A	9	9.2	40	100	6	15	0.5	6	3.8	5.5	7.0	150	3.0
	B	8.92	9.28											
	C	8.5	9.6											
10	A	9.9	10.1	50	150	8	20	0.2	7	4.5	6.4	8.0	90	3.0
	B	9.8	10.2											
	C	9.4	10.6											
11	A	10.8	11.11	50	150	10	20	0.1	8	5.4	7.4	9.0	85	2.5
	B	10.8	11.2											
	C	10.4	11.6											
12	A	11.88	12.12	50	150	10	25	0.1	8	6.0	8.4	10.0	85	2.5
	B	11.8	12.2											
	C	11.4	12.7											
13	A	12.87	13.13	50	170	10	30	0.1	8	7.0	9.4	11.0	80	2.5
	B	12.7	13.3											
	C	12.4	14.1											
15	A	14.85	15.15	50	200	10	30	0.05	10.5	9.2	11.4	13.0	75	2.0
	B	14.7	15.3											
	C	13.8	15.6											
16	A	15.84	16.16	50	200	10	40	0.05	11.2	10.4	12.4	14.0	75	1.5
	B	15.7	16.3											
	C	15.3	17.1											
18	A	17.82	18.18	50	225	10	45	0.05	12.6	12.4	14.4	16.0	70	1.5
	B	17.6	18.4											
	C	16.8	19.1											
20	A	19.8	20.2	60	225	15	55	0.05	14	14.4	16.4	18.0	60	1.5
	B	19.6	20.4											
	C	18.8	21.2											
22	A	21.78	22.22	60	250	20	55	0.05	15.4	16.4	18.4	20.0	60	1.25
	B	21.6	22.4											
	C	20.8	23.3											

All information provided in this document is subject to legal disclaimers.

© NXP Semiconductors N.V. 2014. All rights reserved.