THE DATASHEET OF

PZU3.9BL,315

PZUxBL series

Single Zener diodes in a SOD882 package

Rev. 2 — 11 November 2019 Product data sheet

1. Product profile

1.1. General description

General-purpose Zener diodes in a SOD882 leadless ultra small Surface-Mounted Device (SMD) plastic package.

1.2. Features

- Non-repetitive peak rerverse power dissipation: $P_{ZSM} \leq 40$ W
- Total power dissipation: $P_{tot} \leq 250$ mW
- Tolerance series: B: approximately ±5 %; B2: approximately ±2 %
- Wide working voltage range: nominal 2.4 V to 36 V (E24 range)
- Low reverse current I_R range
- Small plastic package suitable for surface-mounted design
- AEC-Q101 qualified

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 = 100 mA	[1]	-	-	1.1	V
P_{ZSM}	non-repetitive peak reverse power dissipation		[2]	-	-	40	W
P_{tot}	total power dissipation	$T_{amb} \leq 25$ °C	[3]	-	-	250	mW
			[4]	-	-	550	mW

[1] Pulse test: $t_p \leq 300$ µs; $\delta \leq 0.02$
[2] t_p = 100 µs; square wave; T_j = 25 °C prior to surge
[3] Device mounted on an FR4 Printed-Circuit Board (PCB), single-sided copper, tin-plated and standard footprint.
[4] Device mounted on an FR4 PCB, single-sided copper, tin-plated, mounting pad for cathode 1cm^2.

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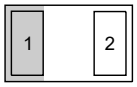
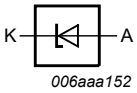
2. Pinning information

Table 2. Pinning

Pin	Description		Simplified outline	Symbol
1	cathode	[1]	 Transparent top view	
2	anode			

[1] The marking bar indicates the cathode

3. Ordering information

Table 3. Ordering information

Type number	Package		
	Name	Description	Version
PZU2.4BL to PZU36BL [1]	DFN1006-2	leadless ultra small plastic package; 2 terminals	SOD882
PZU2.7B2L to PZU24B2L [2]			

[1] The series consists of 29 types with nominal working voltages from 2.4 V to 36 V.
[2] The series consists of 25 types with nominal working voltages from 2.7 V to 24 V.

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4. Marking

Table 4. Marking codes

Type number	Marking code	Type number	Marking code
PZU2.4BL	H2	PZU2.7B2L	HZ
PZU2.7BL	H3	PZU3.0B2L	K1
PZU3.0BL	H4	PZU3.3B2L	K2
PZU3.3BL	H5	PZU3.6B2L	K3
PZU3.6BL	H6	PZU3.9B2L	K4
PZU3.9BL	H7	PZU4.3B2L	K5
PZU4.3BL	H8	PZU4.7B2L	K6
PZU4.7BL	H9	PZU5.1B2L	K7
PZU5.1BL	HA	PZU5.6B2L	K8
PZU5.6BL	HB	PZU6.2B2L	H1
PZU6.2BL	HC	PZU6.8B2L	K9
PZU6.8BL	HD	PZU7.5B2L	KA
PZU7.5BL	HE	PZU8.2B2L	KB
PZU8.2BL	HF	PZU9.1B2L	KC
PZU9.1BL	HG	PZU10B2L	KD
PZU10BL	HH	PZU11B2L	KE
PZU11BL	HK	PZU12B2L	KF
PZU12BL	HL	PZU13B2L	KG
PZU13BL	HM	PZU14B2L	KH
PZU15BL	HN	PZU15B2L	KK
PZU16BL	HP	PZU16B2L	KL
PZU18BL	HR	PZU18B2L	KM
PZU20BL	HS	PZU20B2L	KN
PZU22BL	HT	PZU22B2L	KP
PZU24BL	HU	PZU24B2L	KR
PZU27BL	HV	-	-
PZU30BL	HW	-	-
PZU33BL	HX	-	-
PZU36BL	HY	-	-

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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	
P_{ZSM}	non-repetitive peak reverse power dissipation		[1]	-	40	W
P_{tot}	total power dissipation	$T_{amb} \leq 25$ °C	[2]	-	250	mW
			[3]	-	500	mW
T_j	junction temperature			-	150	°C
T_{amb}	ambient temperature			-55	+150	°C
T_{stg}	storage temperature			-65	+150	°C

[1] t_p = 100 µs; square wave; T_j = 25 °C prior to surge
[2] Device mounted on an FR4 PCB, single-sided copper, tin-plated and standard footprint.
[3] Device mounted on an FR4 PCB, single-sided copper, tin-plated, mounting pad for cathode 1cm^2.

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
			[2]	-	-	250	K/W
$R_{th(j-sp)}$	thermal resistance from junction to solder point		[3]	-	-	55	K/W

[1] Device mounted on an FR4 PCB, single-sided copper, tin-plated and standard footprint.
[2] Device mounted on an FR4 PCB, single-sided copper, tin-plated, mounting pad for cathode 1cm^2.
[3] 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
		I_F = 100 mA	[1]	-	-	1.1	V

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

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Table 8. Characteristics per type; PZU2.4BL to PZU36BL

T_j = 25 °C unless otherwise specified

PZU xBL	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) ; V_R = 0 V	Non-repetitive peak reverse current I_{ZSM} (A) t_p = 100 μs; square wave; T_j = 25 °C ; prior to surge
		I_Z = 5 mA		I_Z = 0.5 mA	I_Z = 5 mA			I_Z = 5 mA	f = 1 MHz;	
		Min	Max	Max	Max	Max	V_R (V)	Typ	Max	Max
2.4	B	2.3	2.6	1000	100	50	1	-1.6	450	8
2.7	B	2.5	2.9	1000	100	20	1	-2.0	440	8
	B2	2.65	2.9							
3.0	B	2.80	3.20	1000	95	10	1	-2.1	425	8
	B2	2.95	3.20							
3.3	B	3.10	3.50	1000	95	5	1	-2.4	410	8
	B2	3.25	3.50							
3.6	B	3.40	3.80	1000	90	5	1	-2.4	390	8
	B2	3.55	3.80							
3.9	B	3.70	4.10	1000	90	3	1	-2.5	370	8
	B2	3.87	4.10							
4.3	B	4.01	4.48	1000	90	3	1	-2.5	350	8
	B2	4.15	4.34							
4.7	B	4.42	4.90	800	80	2	1	-1.4	325	8
	B2	4.55	4.75							
5.1	B	4.84	5.37	250	60	2	1.5	0.3	300	5.5
	B2	4.98	5.20							
5.6	B	5.31	5.92	100	40	1	2.5	1.9	275	5.5
	B2	5.49	5.73							
6.2	B	5.86	6.53	80	30	0.5	3	2.7	250	5.5
	B2	6.06	6.33							
6.8	B	6.47	7.14	60	20	0.5	3.5	3.4	215	5.5
	B2	6.65	6.93							
7.5	B	7.06	7.84	60	10	0.5	4	4.0	170	3.5
	B2	7.28	7.60							
8.2	B	7.76	8.64	60	10	0.5	5	4.6	150	3.5
	B2	8.02	8.36							
9.1	B	8.56	9.55	60	10	0.5	6	5.5	120	3.5
	B2	8.85	9.23							
10	B	9.45	10.55	60	10	0.1	7	6.4	110	3.5
	B2	9.77	10.21							
11	B	10.44	11.56	60	10	0.1	8	7.4	108	3
	B2	10.76	11.22							
12	B	11.42	12.60	80	10	0.1	9	8.4	105	3
	B2	11.74	12.24							

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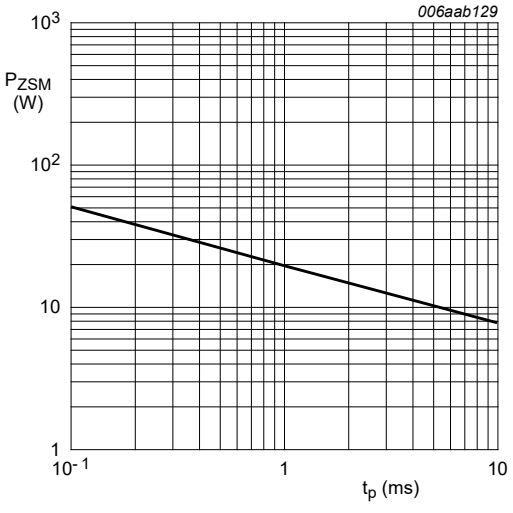
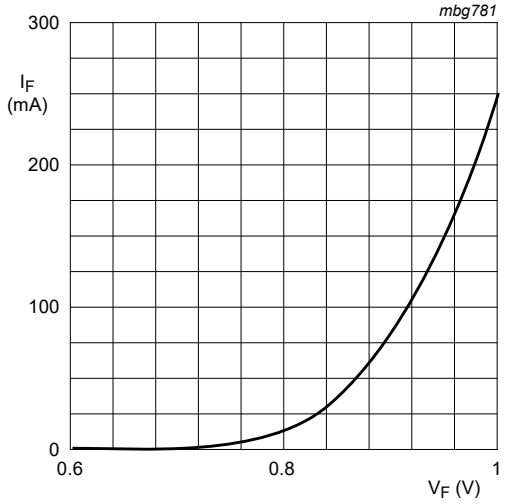
PZU xBL	Sel	Working voltage V_Z (V);		Maximum differential resistance r_{dif} (Ω)		Reverse current I_R (μA)		Temperature coefficient S_Z (mV/K);	Diode capacitance C_d (pF) ; V_R = 0 V	Non-repetitive peak reverse current I_{ZSM} (A) t_p = 100 μs; square wave; T_j = 25 °C ; prior to surge
		I_Z = 5 mA		I_Z = 0.5 mA	I_Z = 5 mA			I_Z = 5 mA	f = 1 MHz;	
		Min	Max	Max	Max	Max	V_R (V)	Typ	Max	Max
13	B	12.47	13.96	80	10	0.1	10	9.4	103	2.5
	B2	12.91	13.49							
14	B2	13.70	14.30	80	10	0.1	11	10.4	101	2
15	B	13.84	15.52	80	15	0.05	11	11.4	99	2
	B2	14.34	14.98							
16	B	15.37	17.09	80	20	0.05	12	12.4	97	1.5
	B2	15.85	16.51							
18	B	16.94	19.03	80	20	0.05	13	14.4	93	1.5
	B2	17.56	18.35							
20	B	18.86	21.08	100	20	0.05	15	16.4	88	1.5
	B2	19.52	20.39							
22	B	20.88	23.17	100	25	0.05	17	18.4	84	1.3
	B2	21.54	22.47							
24	B	22.93	25.57	120	30	0.05	19	20.4	80	1.3
	B2	23.72	24.78							
27	B	25.1	28.9	150	40	0.05	21	23.4	73	1
30	B	28	32	200	40	0.05	23	26.6	66	1
33	B	31	35	250	40	0.05	25	29.7	60	0.9
36	B	34	38	300	60	0.05	27	33.0	59	0.8



T_j = 25 °C

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

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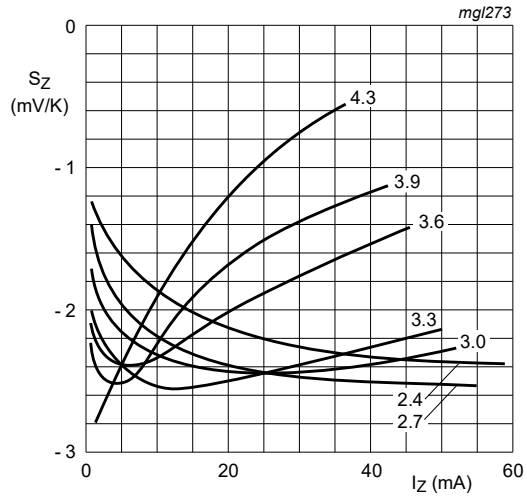
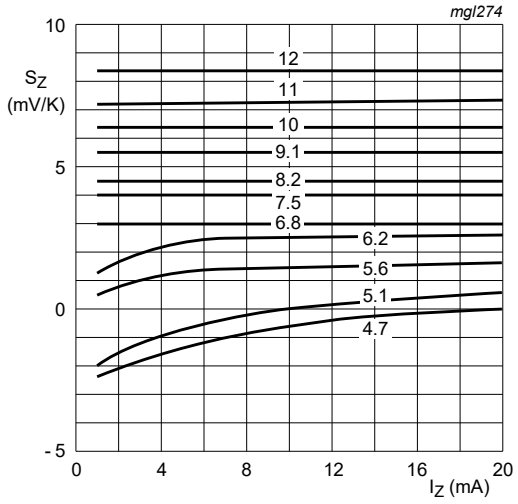


PZU2.4BL to PZU4.3B2L

T_j = 25 °C to 150 °C

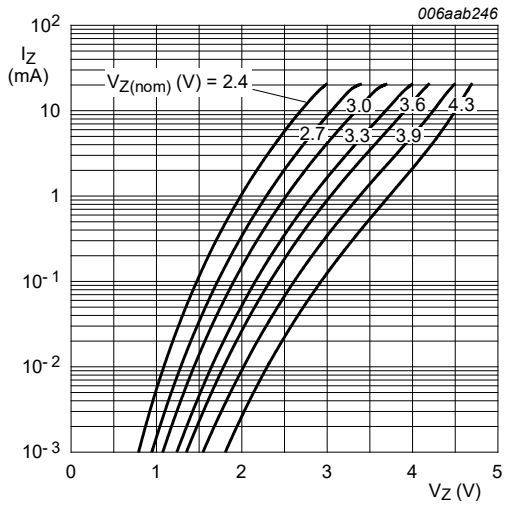
Fig. 3. Temperature coefficient as a function of working current; typical values



PZU4.7BL to PZU12B2L

T_j = 25 °C to 150 °C

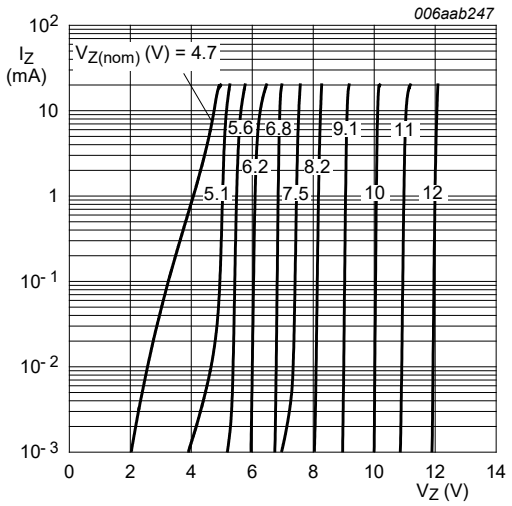
Fig. 4. Temperature coefficient as a function of working current; typical values



PZU2.4BL to PZU4.3B2L

T_j = 25 °C

Fig. 5. Working current as a function of working voltage; typical values



PZU4.7BL to PZU12B2L

T_j = 25 °C

Fig. 6. Working current as a function of working voltage; typical values

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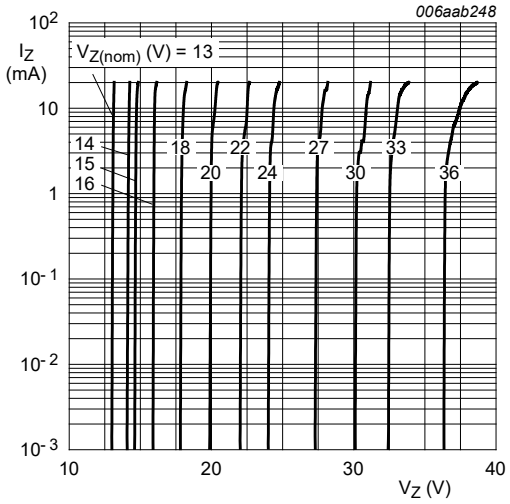

PZU13BL to PZU36BL

T_j = 25 °C

Fig. 7. Working current as a function of working voltage; typical values

8. Test information

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

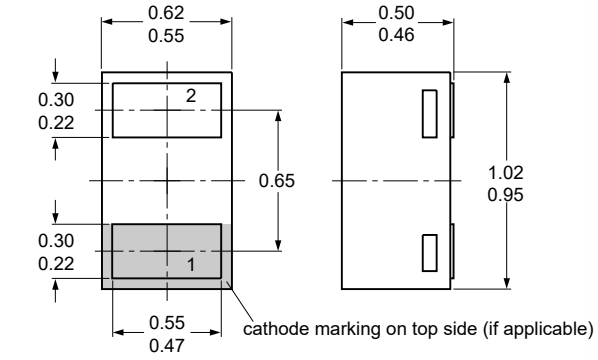

Fig. 8. Package outline SOD882

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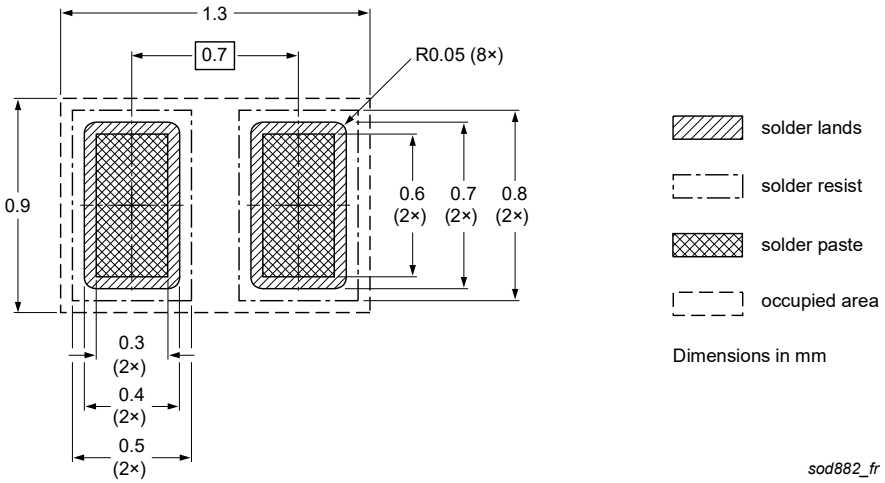
10. Soldering



Reflow soldering is the only recommended soldering method.

Fig. 9. Reflow soldering footprint for SOD882

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11. Revision history

Table 9. Revision history

Document ID	Release date	Data sheet status	Change notice	Supersedes
PZUXBL_SER v. 2	20191111	Product data sheet	-	PZUXBL_SER v. 1
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.			
PZUXBL_SER v. 1	20080506	Product data sheet	-	-

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12. 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.
[2] The term 'short data sheet' is explained in section "Definitions".
[3] The product status of device(s) described in this document may have changed since this document was published and may differ in case of multiple devices. The latest product status information is available on the internet at https://www.nexperia.com.

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Date of release: 11 November 2019

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