PDZ-B series

Single Zener diodes

Rev. 3 — 5 March 2019 Product data sheet

1. Product profile

1.1. General description

Low-power general purpose voltage regulator diodes in a small plastic SMD SOD323 (SC-76) package.

1.2. Features and benefits

- Total power dissipation: $P_{tot} \leq 400$ mW
- Small plastic package suitable for surface mounted design
- Wide variety of voltage ranges: nominal 2.4 V to 36 V (E24 range)
- Tolerance approximately ± 2 %

1.3. Applications

- General voltage regulation

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	$T_{amb} \leq 25$ °C	[2]	-	-	400	mW

[1] Pulse test: $t_p \leq 300$ µs; $\delta \leq 0.02$.
[2] Device mounted on an FR4 Printed-Circuit Board (PCB), single-sided copper, tin-plated and standard footprint.

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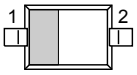
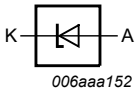
2. Pinning information

Table 2. Pinning

Pin	Symbol	Description	Simplified outline	Graphic symbol
1	K	cathode[1]		
2	A	anode		

[1] The marking bar indicates the cathode.

3. Ordering information

Table 3. Ordering information

Type number	Package		
	Name	Description	Version
PDZ2.4B to PDZ36B[1]	-	plastic surface-mounted package; 2 leads	SOD323

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

4. Marking

Table 4. Marking Codes

Type number	Marking Code	Type number	Marking Code	Type number	Marking Code
PDZ2.4B	Z0	PDZ6.2B	ZA	PDZ16B	ZL
PDZ2.7B	Z1	PDZ6.8B	ZB	PDZ18B	ZM
PDZ3.0B	Z2	PDZ7.5B	ZC	PDZ20B	ZN
PDZ3.3B	Z3	PDZ8.2B	ZD	PDZ22B	ZP
PDZ3.6B	Z4	PDZ9.1B	ZE	PDZ24B	ZQ
PDZ3.9B	Z5	PDZ10B	ZF	PDZ27B	ZR
PDZ4.3B	Z6	PDZ11B	ZG	PDZ30B	ZS
PDZ4.7B	Z7	PDZ12B	ZH	PDZ33B	ZT
PDZ5.1B	Z8	PDZ13B	ZJ	PDZ36B	ZU
PDZ5.6B	Z9	PDZ15B	ZK		

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	continuous forward current		-	200	mA
I_{ZSM}	non-repetitive peak reverse current	t_p = 100 µs; square wave; T_{amb} = 25 °C prior to surge	-	see characteristics table	
P_{tot}	total power dissipation	T_{amb} = 25 °C [1]	-	400	mW
T_{stg}	storage temperature		−65	+150	°C
T_j	junction temperature		-	+150	°C

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

6. Thermal characteristics

Table 6. Thermal characteristics

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
$R_{th(j-sp)}$	thermal resistance from junction to solder point	in free air	-	-	130	K/W
$R_{th(j-a)}$	thermal resistance from junction to ambient	[1]	-	-	340	K/W

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

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
V_F	forward voltage	I_F = 100 mA [1]	-	-	1.1	V

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

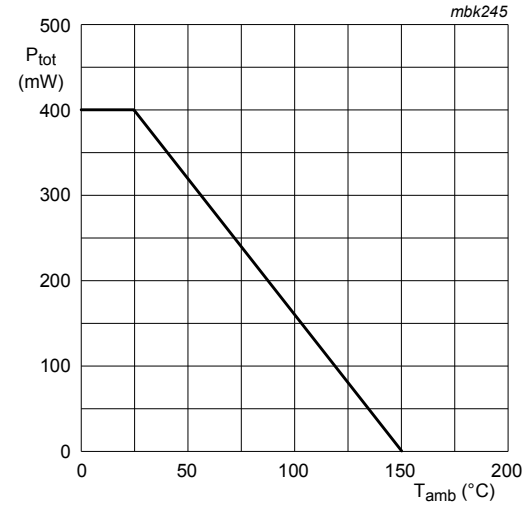
Table 8. Characteristics per type; PDZ2.4B to PDZ36B

T_j = 25 °C unless otherwise specified.

Type	Working voltage V_Z (V); I_Z = 5 mA		Maximum differential resistance r_{dif} (Ω)		Reverse current I_R (µA)		Temperature coefficient S_Z (mV/K); I_Z = 5 mA	Diode capacitance C_d (pF)[1]	Non-repetitive peak reverse current I_{ZSM} (A)[2]
	Min	Max	I_Z = 0.5 mA	I_Z = 5 mA	Max	V_R (V)	Typ	Max	Max
PDZ2.4B	2.43	2.63	1000	100	50	1.0	−1.6	450	8.0
PDZ2.7B	2.69	2.91	1000	100	20	1.0	−2.0	440	8.0
PDZ3.0B	2.85	3.07	1000	95	10	1.0	−2.1	425	8.0
PDZ3.3B	3.32	3.53	1000	95	5	1.0	−2.4	410	8.0
PDZ3.6B	3.60	3.85	500 @ 1 mA	90	5	1.0	−2.4	390	8.0
PDZ3.9B	3.89	4.16	500 @ 1 mA	90	3	1.0	−2.5	370	8.0
PDZ4.3B	4.17	4.48	600 @ 1 mA	90	3	1.0	−2.5	350	8.0

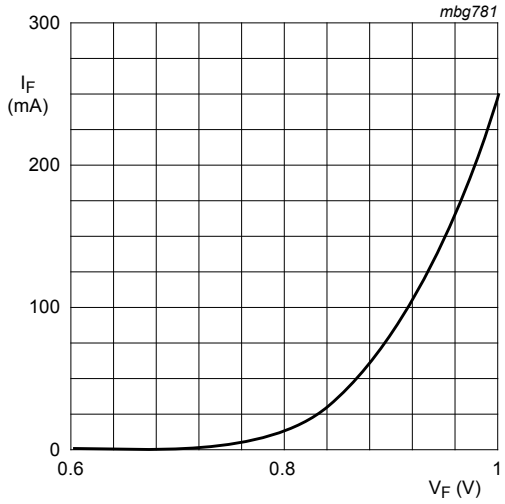
Type	Working voltage V_Z (V); I_Z = 5 mA		Maximum differential resistance r_{dif} (Ω)		Reverse current I_R (μA)		Temperature coefficient S_Z (mV/K); I_Z = 5 mA	Diode capacitance C_d (pF)[1]	Non-repetitive peak reverse current I_{ZSM} (A)[2]
	Min	Max	I_Z = 0.5 mA	I_Z = 5 mA	Max	V_R (V)	Typ	Max	Max
PDZ4.7B	4.55	4.75	600 @ 1 mA	90	2	1.0	−1.4	325	8.0
PDZ5.1B	4.96	5.20	250	60	2	1.5	0.3	300	5.5
PDZ5.6B	5.48	5.73	100	50	1	2.5	1.9	275	5.5
PDZ6.2B	6.06	6.33	80	50	0.5	3.0	2.7	250	5.5
PDZ6.8B	6.65	6.93	60	40	0.5	3.5	3.4	215	5.5
PDZ7.5B	7.28	7.60	60	10	0.5	4.0	4.0	170	3.5
PDZ8.2B	8.02	8.36	60	10	0.5	5.0	4.6	150	3.5
PDZ9.1B	8.85	9.23	60	10	0.5	6.0	5.5	120	3.5
PDZ10B	9.77	10.21	60	10	0.1	7.0	6.4	110	3.5
PDZ11B	10.78	11.22	60	10	0.1	8.0	7.4	108	3.0
PDZ12B	11.74	12.24	80	10	0.1	9.0	8.4	105	3.0
PDZ13B	12.91	13.49	80	10	0.1	10.0	9.4	103	2.5
PDZ15B	14.34	14.98	80	15	0.05	11.0	11.4	99	2.0
PDZ16B	15.85	16.51	80	20	0.05	12.0	12.4	97	1.5
PDZ18B	17.56	18.35	80	20	0.05	13.0	14.4	93	1.5
PDZ20B	19.52	20.39	100	20	0.05	15.0	16.4	88	1.5
PDZ22B	21.54	22.47	100	25	0.05	17.0	18.4	84	1.3
PDZ24B	23.72	24.78	120	30	0.05	19.0	20.4	80	1.3
PDZ27B	26.19	27.53	150	40	0.05	21.0	23.4	73	1.0
PDZ30B	29.19	30.69	200	40	0.05	23.0	26.6	66	1.0
PDZ33B	32.15	33.79	250	40	0.05	25.0	29.7	60	0.9
PDZ36B	35.07	36.87	300	60	0.05	27.0	33.0	59	0.8

[1] f = 1 MHz; V_R = 0 V.
[2] t_p = 100 μs; T_{amb} = 25 °C.



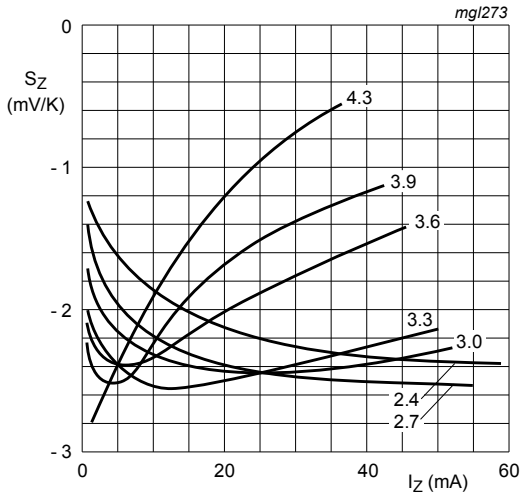
T_j = 25 °C (prior to surge)

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



T_j = 25 °C

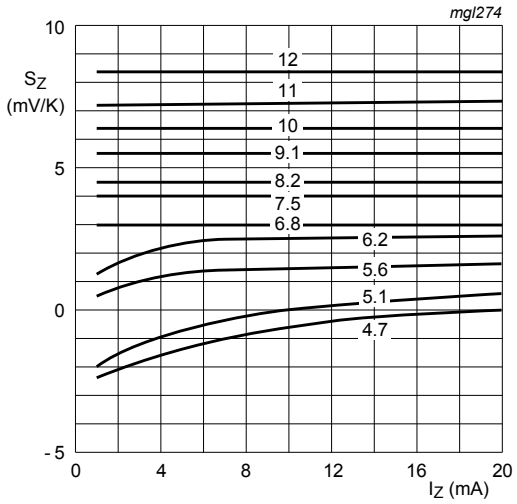
Fig. 2. Forward current as a function of forward voltage; typical values



PDZ2.4B to PDZ4.3B

T_j = 25 °C to 150 °C

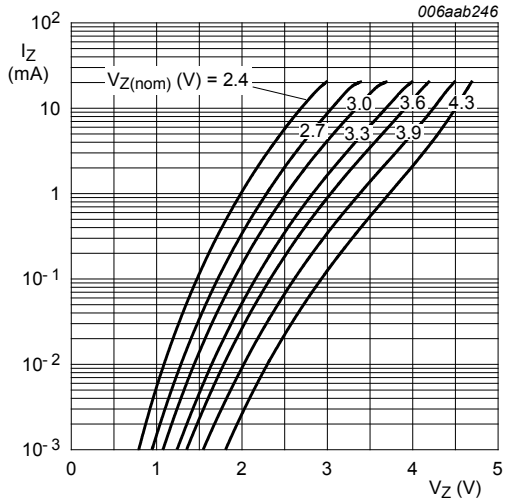
Fig. 3. Temperature coefficient as a function of working current; typical values



PDZ4.7B to PDZ12B

T_j = 25 °C to 150 °C

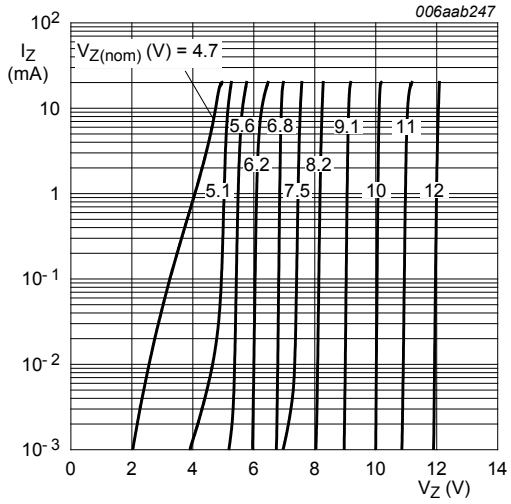
Fig. 4. Temperature coefficient as a function of working current; typical values



PDZ2.4B to PDZ4.3B

T_j = 25 °C

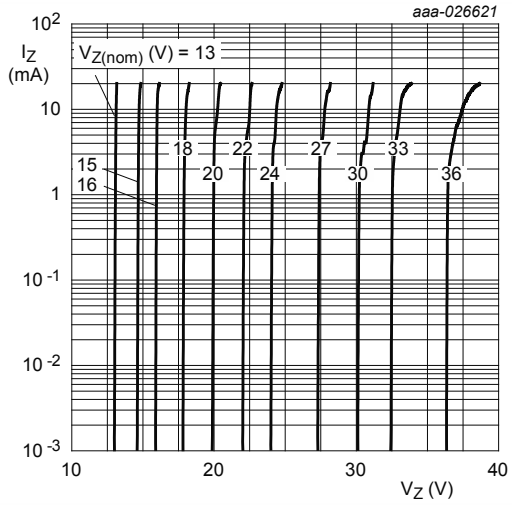
Fig. 5. Working current as a function of working voltage; typical values



PDZ4.7B to PDZ12B

T_j = 25 °C

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



PDZ13B to PDZ36B

T_j = 25 °C

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

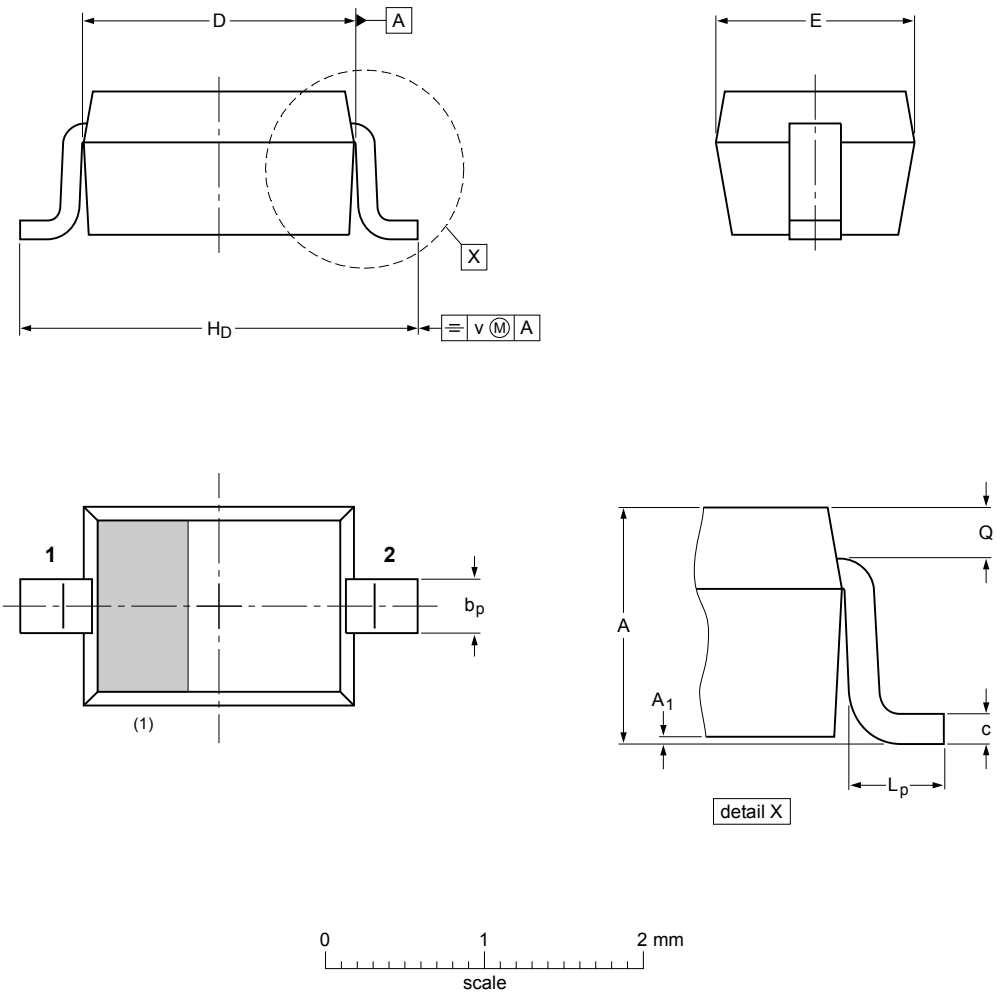
8. Test information

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

Plastic surface-mounted package; 2 leads **SOD323**



DIMENSIONS (mm are the original dimensions)

UNIT	A	A_1 max	b_p	c	D	E	H_D	L_p	Q	v
mm	1.1 0.8	0.05	0.40 0.25	0.25 0.10	1.8 1.6	1.35 1.15	2.7 2.3	0.45 0.15	0.25 0.15	0.2

Note

1. The marking bar indicates the cathode

OUTLINE VERSION	REFERENCES				EUROPEAN PROJECTION	ISSUE DATE
	IEC	JEDEC	JEITA			
SOD323			SC-76			~~03-12-17~~ 06-03-16

Fig. 8. Package outline SOD323

10. Soldering

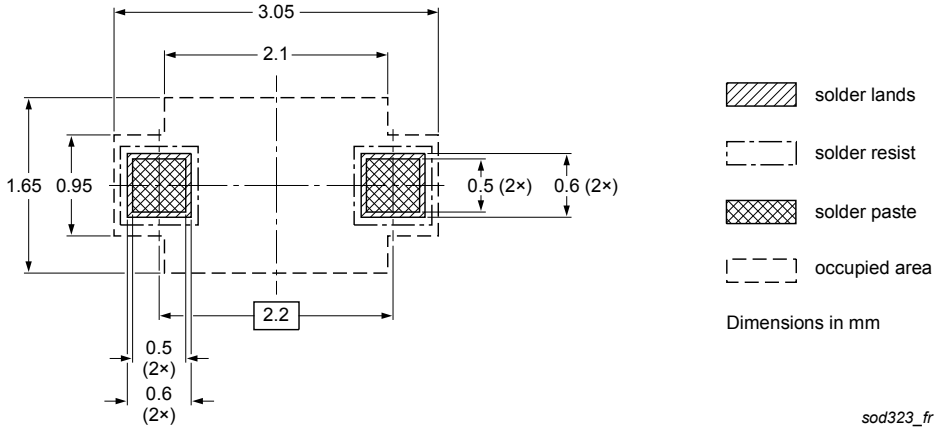


Fig. 9. Reflow soldering footprint SOD323

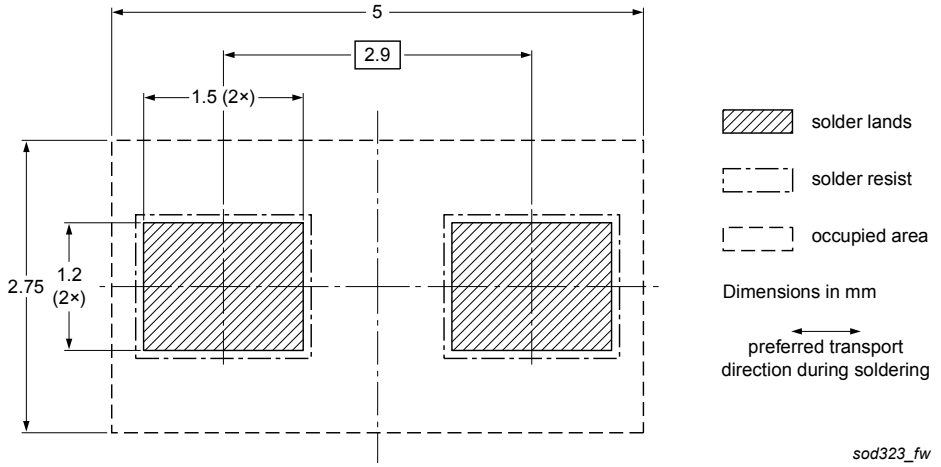


Fig. 10. Wave soldering footprint SOD323

11. Revision history

Table 9. Revision history

Document ID	Release date	Data sheet status	Change notice	Supersedes
PDZ-B_SER v.3	20190305	Product data sheet	-	PDZ-B_SER v.2
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.			
PDZ-B_SER v.2	20040322	Product data sheet	-	PDZ-B_SER v.1
PDZ-B_SER v.1	20020218	Product data sheet	-	-

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".
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