

PDZ-B-Q series

Single Zener diodes

Rev. 2 — 21 December 2022 Product data sheet

1. General description

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

2. Features and benefits

- Total power dissipation: P_{tot} ≤ 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 %
- PDZ5.1B-Q - 10B-Q: Very low dynamic impedances at low currents, very low leakage current, hard breakdown knee
- Qualified according to AEC-Q101 and recommended for use in automotive applications

3. Applications

- General voltage regulation

4. Quick reference data

Table 1. Quick reference data

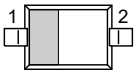
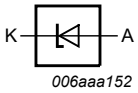
Symbol	Parameter	Conditions		Min	Typ	Max	Unit
V_F	forward voltage	I_F = 10 mA	[1]	-	-	0.9	V
P_{tot}	total power dissipation	T_{amb} ≤ 25 °C	[2]	-	-	400	mW

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

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5. 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.

6. Ordering information

Table 3. Ordering information

Type number	Package		
	Name	Description	Version
PDZ2.4B-Q to PDZ36B-Q[1]	SC-76	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.

7. Marking

Table 4. Marking Codes

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

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8. 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.

9. 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.

10. 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; $\delta \leq 0.02$.

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

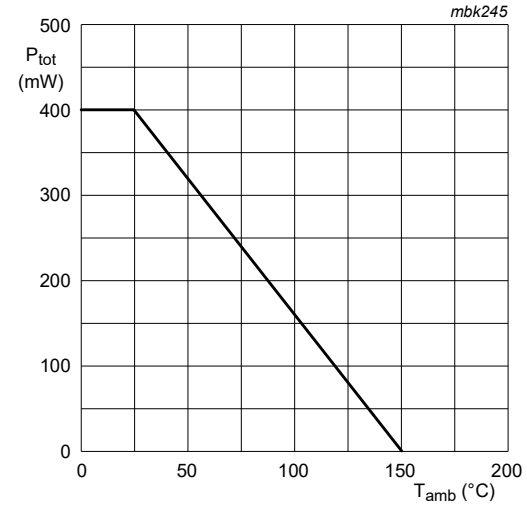
T_j = 25 °C unless otherwise specified.

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-Q	2.43	2.63	1000	100	50	1.0	−1.6	450	8.0
PDZ2.7B-Q	2.69	2.91	1000	100	20	1.0	−2.0	440	8.0
PDZ3.0B-Q	2.85	3.07	1000	95	10	1.0	−2.1	425	8.0
PDZ3.3B-Q	3.32	3.53	1000	95	5	1.0	−2.4	410	8.0
PDZ3.6B-Q	3.60	3.85	500 @ 1 mA	90	5	1.0	−2.4	390	8.0
PDZ3.9B-Q	3.89	4.16	500 @ 1 mA	90	3	1.0	−2.5	370	8.0
PDZ4.3B-Q	4.17	4.48	600 @ 1 mA	90	3	1.0	−2.5	350	8.0
PDZ4.7B-Q	4.55	4.75	600 @ 1 mA	90	2	1.0	−1.4	325	8.0
PDZ5.1B-Q	4.96	5.20	250	60	2	1.5	0.3	300	5.5
PDZ5.6B-Q	5.48	5.73	100	50	1	2.5	1.9	275	5.5
PDZ6.2B-Q	6.06	6.33	80	50	0.5	3.0	2.7	250	5.5
PDZ6.8B-Q	6.65	6.93	60	40	0.5	3.5	3.4	215	5.5
PDZ7.5B-Q	7.28	7.60	60	10	0.5	4.0	4.0	170	3.5
PDZ8.2B-Q	8.02	8.36	60	10	0.5	5.0	4.6	150	3.5
PDZ9.1B-Q	8.85	9.23	60	10	0.5	6.0	5.5	120	3.5
PDZ10B-Q	9.77	10.21	60	10	0.1	7.0	6.4	110	3.5
PDZ11B-Q	10.78	11.22	60	10	0.1	8.0	7.4	108	3.0
PDZ12B-Q	11.74	12.24	80	10	0.1	9.0	8.4	105	3.0
PDZ13B-Q	12.91	13.49	80	10	0.1	10.0	9.4	103	2.5
PDZ15B-Q	14.34	14.98	80	15	0.05	11.0	11.4	99	2.0
PDZ16B-Q	15.85	16.51	80	20	0.05	12.0	12.4	97	1.5
PDZ18B-Q	17.56	18.35	80	20	0.05	13.0	14.4	93	1.5
PDZ20B-Q	19.52	20.39	100	20	0.05	15.0	16.4	88	1.5
PDZ22B-Q	21.54	22.47	100	25	0.05	17.0	18.4	84	1.3
PDZ24B-Q	23.72	24.78	120	30	0.05	19.0	20.4	80	1.3
PDZ27B-Q	26.19	27.53	150	40	0.05	21.0	23.4	73	1.0
PDZ30B-Q	29.19	30.69	200	40	0.05	23.0	26.6	66	1.0
PDZ33B-Q	32.15	33.79	250	40	0.05	25.0	29.7	60	0.9
PDZ36B-Q	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.

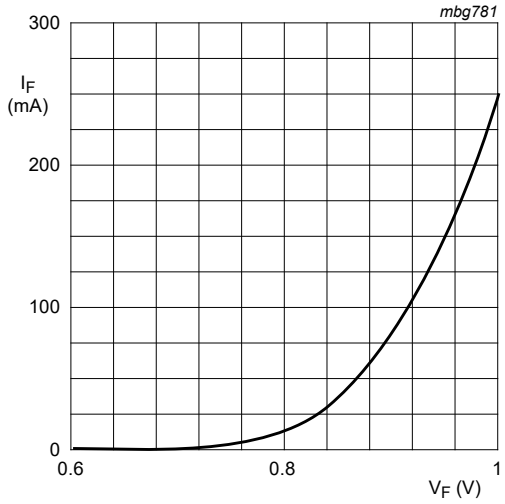
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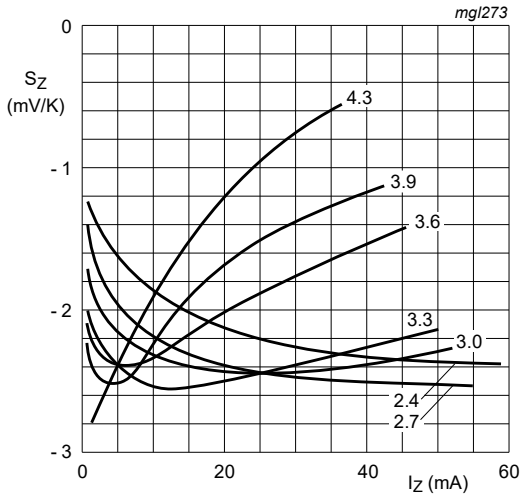
FR4 PCB, standard footprint

Fig. 1. Power derating curve



T_j = 25 °C

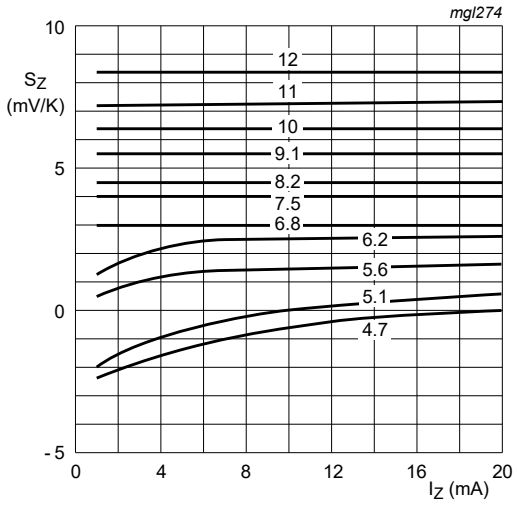
Fig. 2. Forward current as a function of forward voltage; typical values



PDZ2.4B-Q to PDZ4.3B-Q

T_j = 25 °C to 150 °C

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



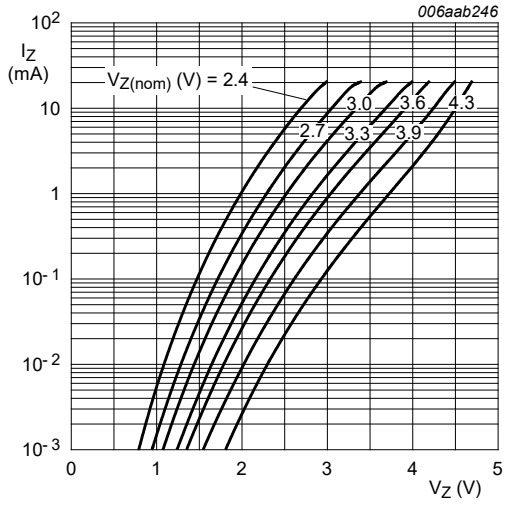
PDZ4.7B-Q to PDZ12B-Q

T_j = 25 °C to 150 °C

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

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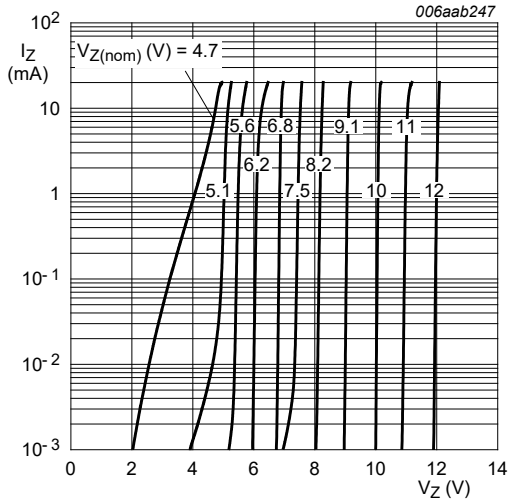
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PDZ2.4B-Q to PDZ4.3B-Q

T_j = 25 °C

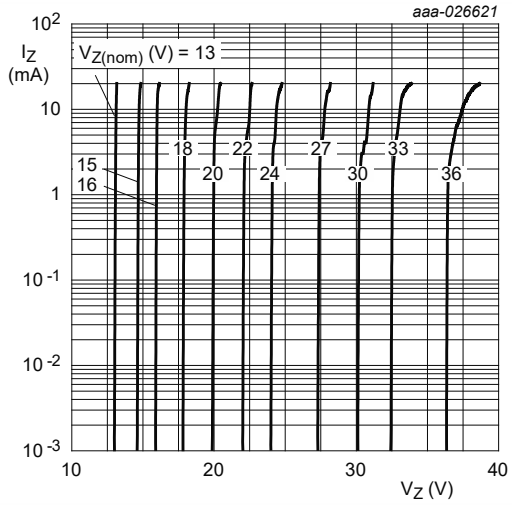
Fig. 5. Working current as a function of working voltage; typical values



PDZ4.7B-Q to PDZ12B-Q

T_j = 25 °C

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



PDZ13B-Q to PDZ36B-Q

T_j = 25 °C

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

11. Test information

Quality information

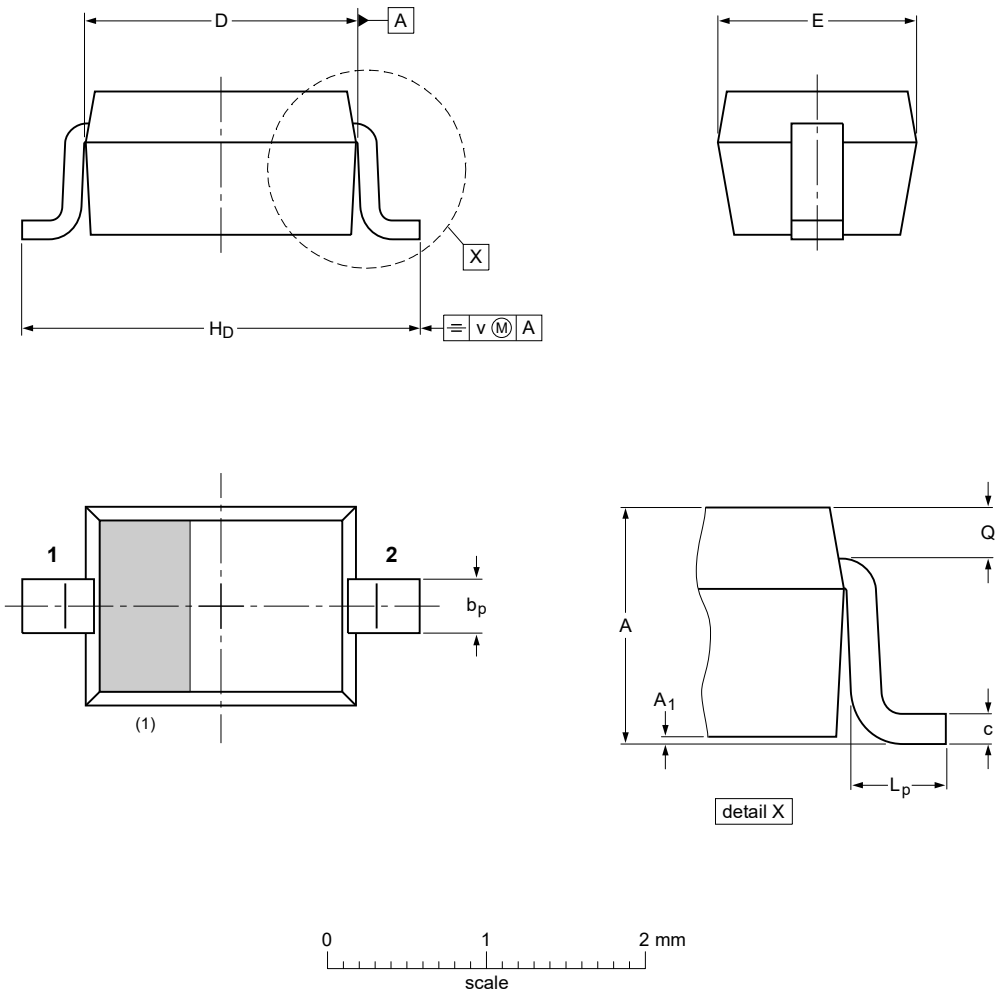
This product has been qualified in accordance with the Automotive Electronics Council (AEC) standard Q101 - Stress test qualification for discrete semiconductors, and is suitable for use in automotive applications.

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12. 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

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13. Soldering

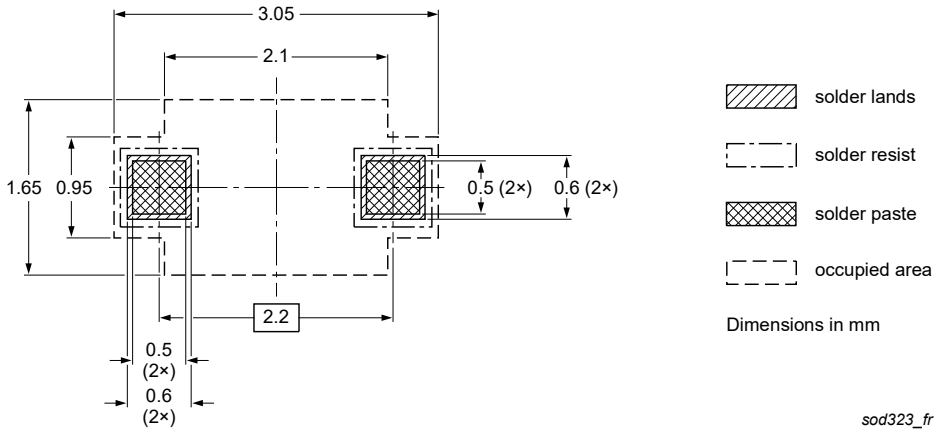


Fig. 9. Reflow soldering footprint SOD323

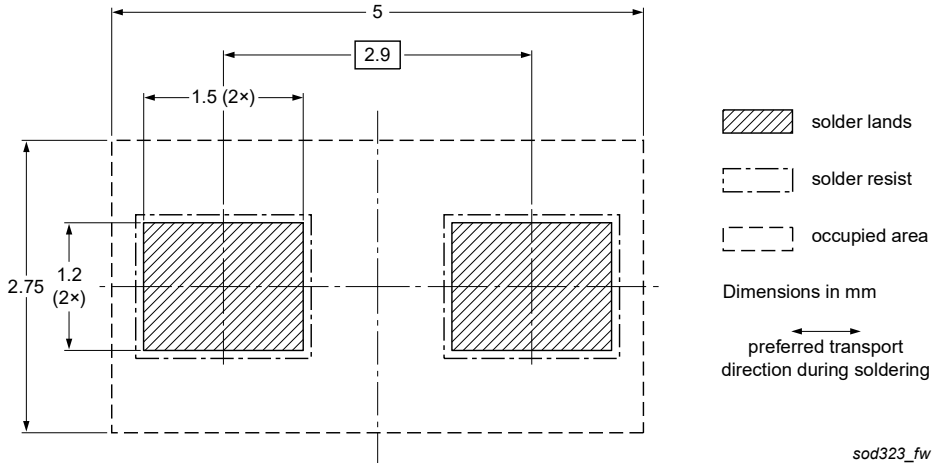


Fig. 10. Wave soldering footprint SOD323

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14. Revision history

Table 9. Revision history

Document ID	Release date	Data sheet status	Change notice	Supersedes
PDZ-B-Q_SER v.2	20221221	Product data sheet	-	PDZ-B-Q_SER v.1
Modifications:	• Figure 1: Notes and title corrected			
PDZ-B-Q_SER v.1	20210623	Product data sheet	-	-

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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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