PDZ-B-Q series

Single Zener diodes

Rev. 1 — 23 June 2021 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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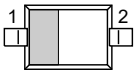
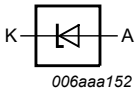
5. Pinning information

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		

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

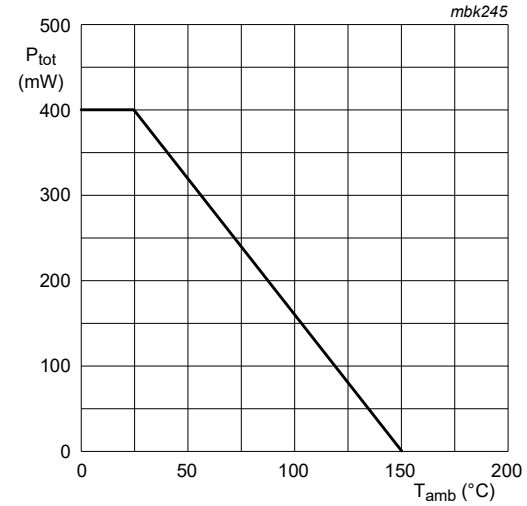
[1] Pulse test: $t_p \leq 300$ µs; $\delta \leq 0.02$.

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

T_j = 25 °C unless otherwise specified.

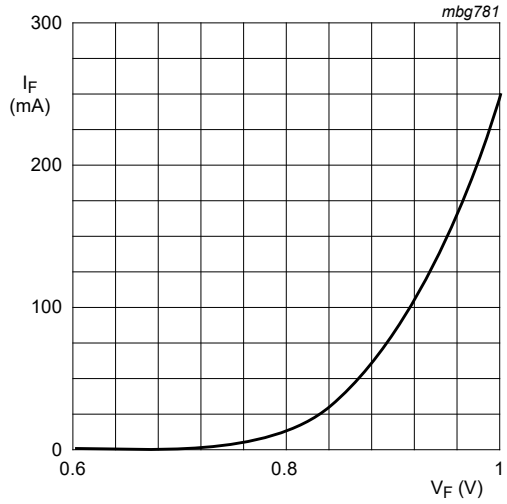
Type	Working voltage V_Z (V); I_Z = 5 mA		Maximum differential resistance r_{dif} (Ω)		Reverse current I_R (μA)		Temperature coefficient S_Z (mV/K); I_Z = 5 mA	Diode capacitance C_d (pF)[1]	Non-repetitive peak reverse current I_{ZSM} (A)[2]
	Min	Max	I_Z = 0.5 mA	I_Z = 5 mA	Max	V_R (V)	Typ	Max	Max
PDZ2.4B-Q	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.



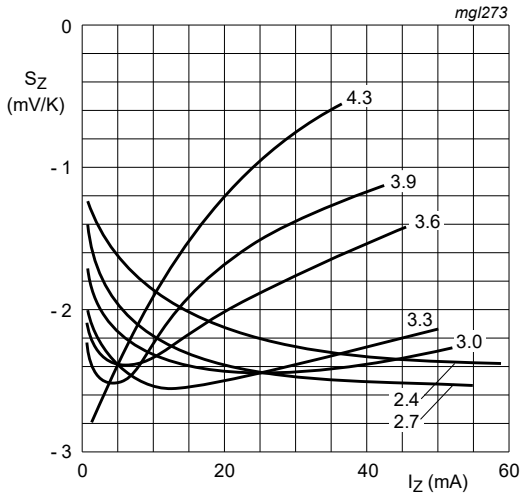
T_j = 25 °C (prior to surge)

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



T_j = 25 °C

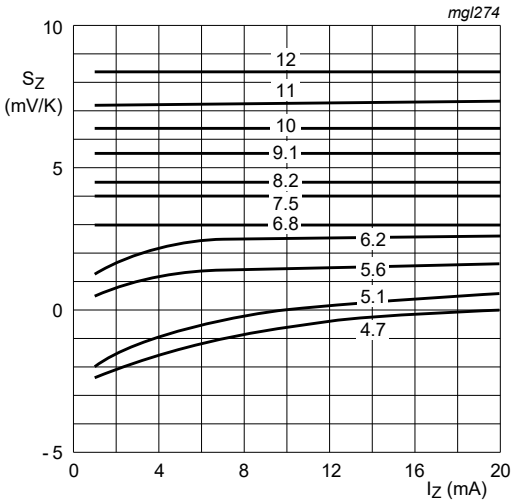
Fig. 2. Forward current as a function of forward voltage; typical values



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

T_j = 25 °C to 150 °C

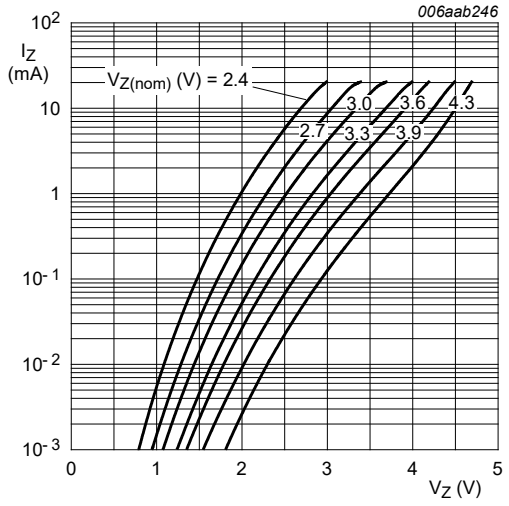
Fig. 3. Temperature coefficient as a function of working current; typical values



PDZ4.7B-Q to PDZ12B-Q

T_j = 25 °C to 150 °C

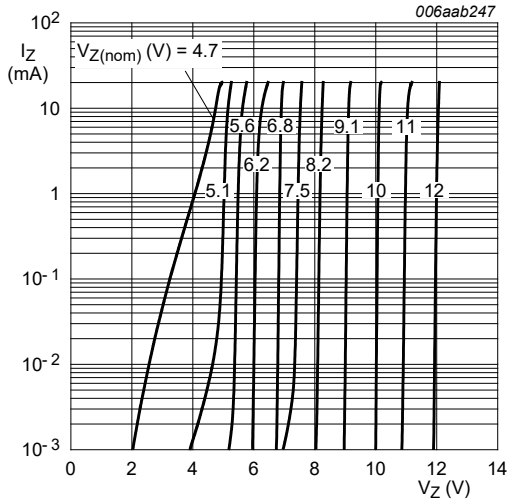
Fig. 4. Temperature coefficient as a function of working current; typical values



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

T_j = 25 °C

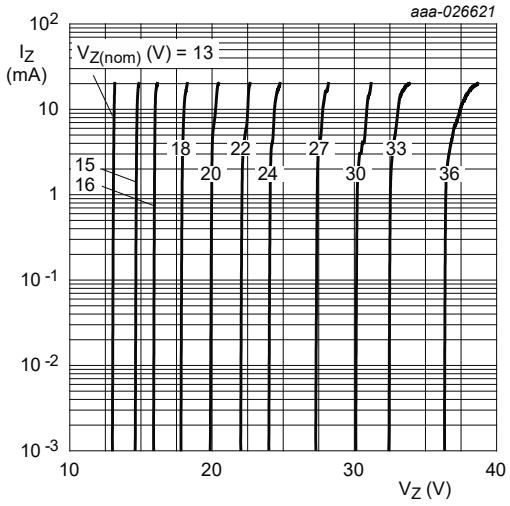
Fig. 5. Working current as a function of working voltage; typical values



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

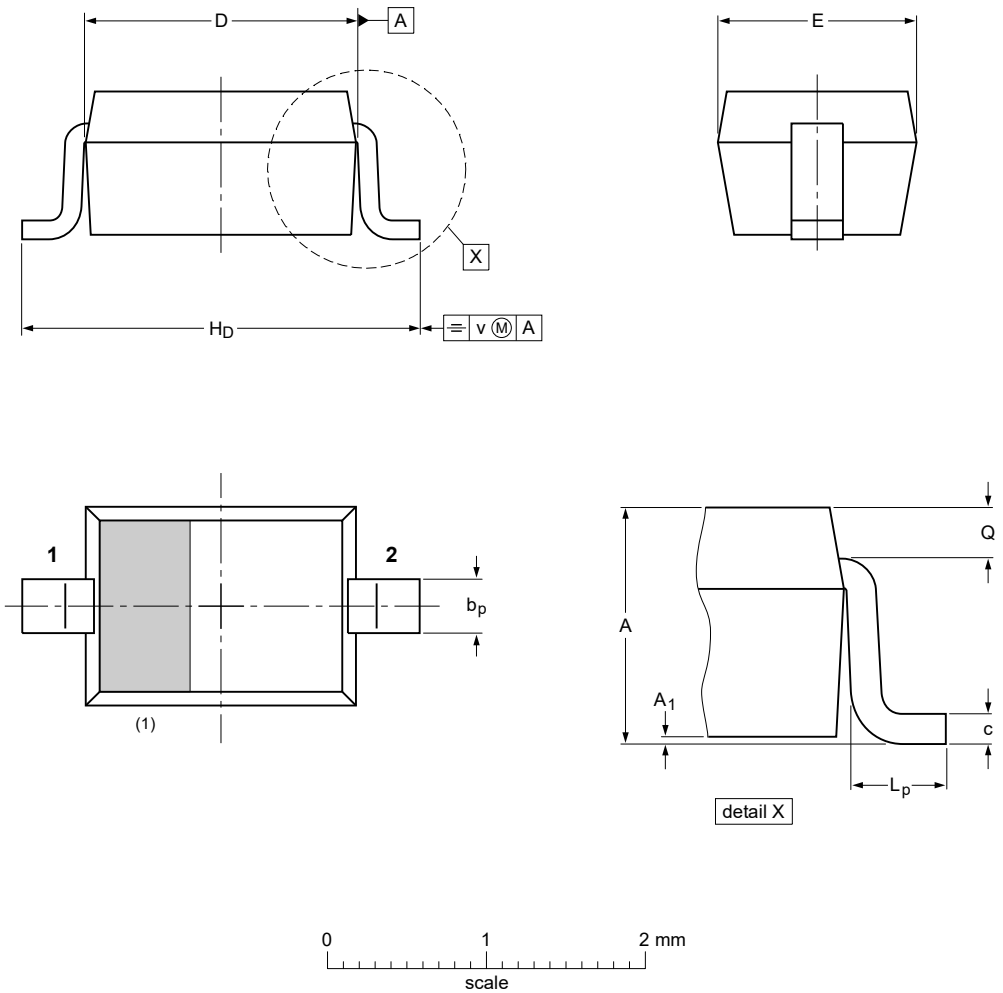
11. Test information

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.

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

13. Soldering

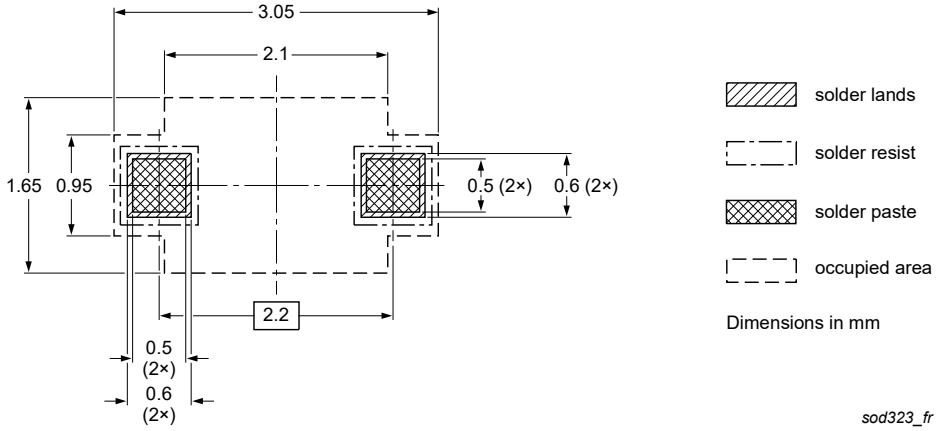


Fig. 9. Reflow soldering footprint SOD323

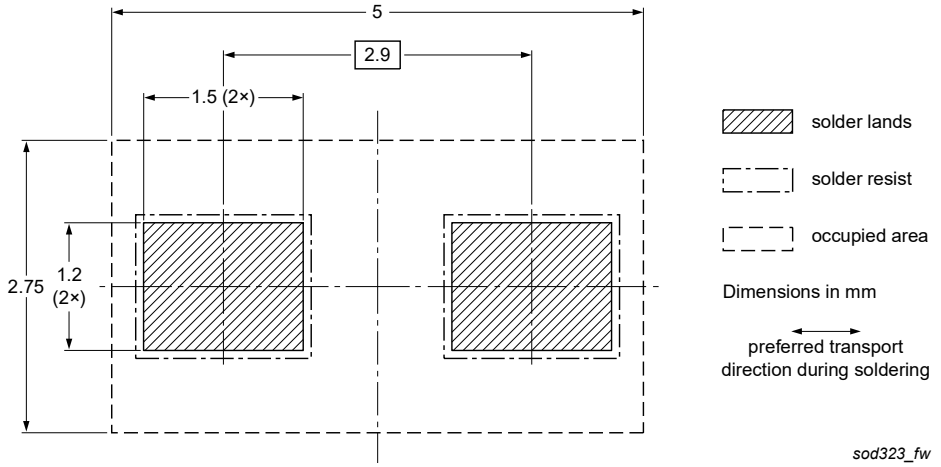


Fig. 10. Wave soldering footprint SOD323

14. Revision history

Table 9. Revision history

Document ID	Release date	Data sheet status	Change notice	Supersedes
PDZ-B-Q_SER v.1	20210623	Product data sheet	-	-

15. 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.

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[2] The term 'short data sheet' is explained in section "Definitions".
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