



# 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:  $P_{\text{tot}} \leq 400$  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  $\pm 2\%$
- 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

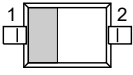
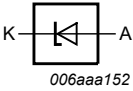
Symbol	Parameter	Conditions	Min	Typ	Max	Unit
$V_F$	forward voltage	$I_F = 10$ mA [1]	-	-	0.9	V
$P_{\text{tot}}$	total power dissipation	$T_{\text{amb}} \leq 25$ °C [2]	-	-	400	mW

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

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

## 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	$t_p = 100 \mu\text{s}$ ; square wave; $T_{\text{amb}} = 25 \text{ }^\circ\text{C}$ prior to surge	-	see characteristics table	
$P_{\text{tot}}$	total power dissipation	$T_{\text{amb}} = 25 \text{ }^\circ\text{C}$ [1]	-	400	mW
$T_{\text{stg}}$	storage temperature		-65	+150	$^\circ\text{C}$
$T_j$	junction temperature		-	+150	$^\circ\text{C}$

[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
$R_{\text{th}(j\text{-sp})}$	thermal resistance from junction to solder point	in free air	-	-	130	K/W
$R_{\text{th}(j\text{-a})}$	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**

$T_j = 25 \text{ }^\circ\text{C}$  unless otherwise specified.

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
$V_F$	forward voltage	$I_F = 10 \text{ mA}$ [1]	-	-	0.9	V
$V_F$	forward voltage	$I_F = 100 \text{ mA}$ [1]	-	-	1.1	V

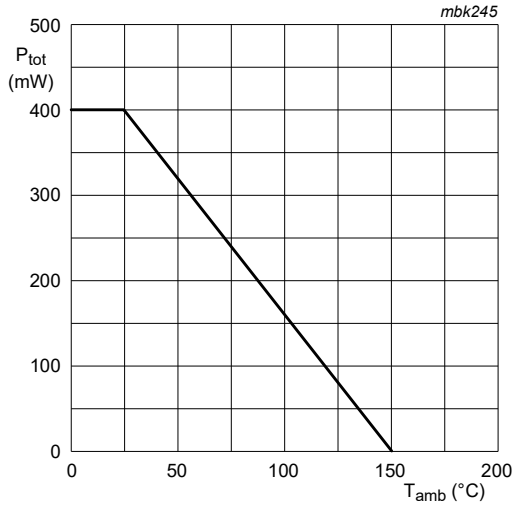
[1] Pulse test:  $t_p \leq 300 \mu\text{s}$ ;  $\delta \leq 0.02$ .

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

 $T_j = 25\text{ °C}$  unless otherwise specified.

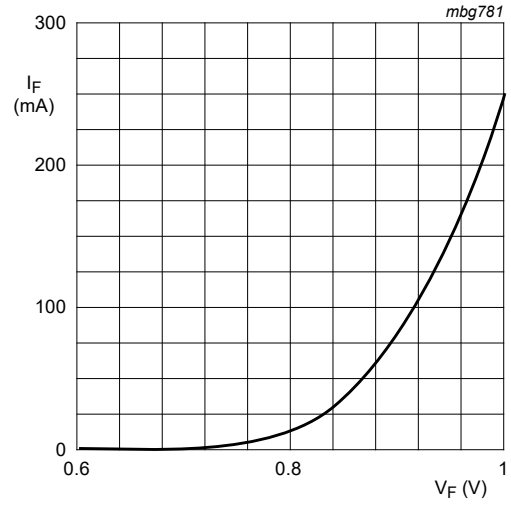
Type	Working voltage $V_Z$ (V); $I_Z = 5\text{ mA}$		Maximum differential resistance $r_{dif}$ ( $\Omega$ )		Reverse current $I_R$ ( $\mu\text{A}$ )		Temperature coefficient $S_Z$ (mV/K); $I_Z = 5\text{ mA}$	Diode capacitance $C_d$ (pF)[1]	Non- repetitive peak reverse current $I_{ZSM}$ (A)[2]
	Min	Max	$I_Z = 0.5\text{ mA}$	$I_Z = 5\text{ mA}$	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]  $f = 1\text{ MHz}$ ;  $V_R = 0\text{ V}$ .[2]  $t_p = 100\text{ }\mu\text{s}$ ;  $T_{amb} = 25\text{ °C}$ .



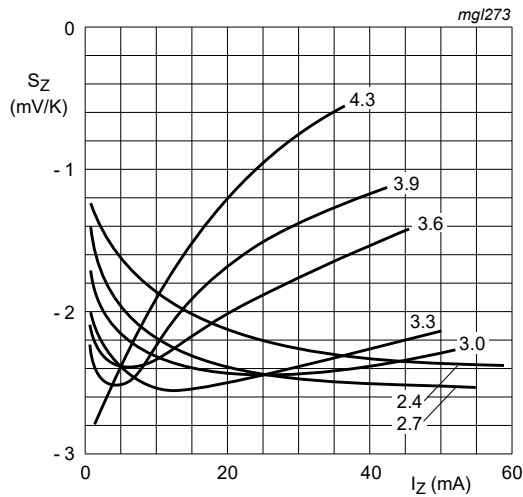
$T_j = 25\text{ °C}$  (prior to surge)

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



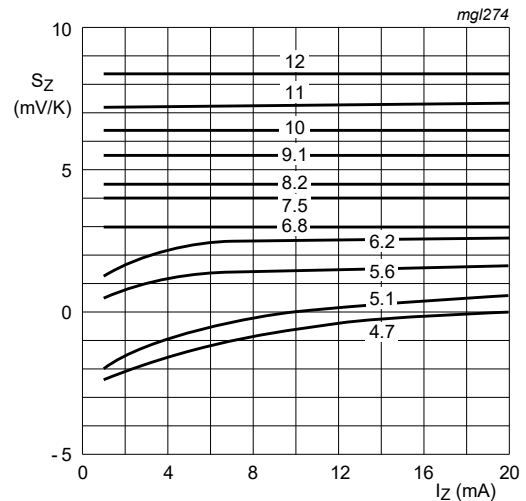
$T_j = 25\text{ °C}$

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



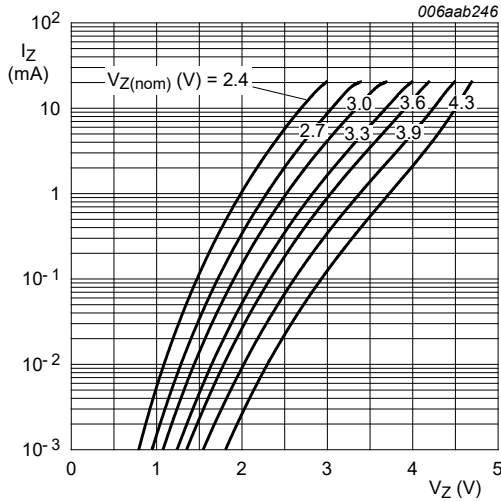
PDZ2.4B-Q to PDZ4.3B-Q  
 $T_j = 25\text{ °C}$  to  $150\text{ °C}$

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



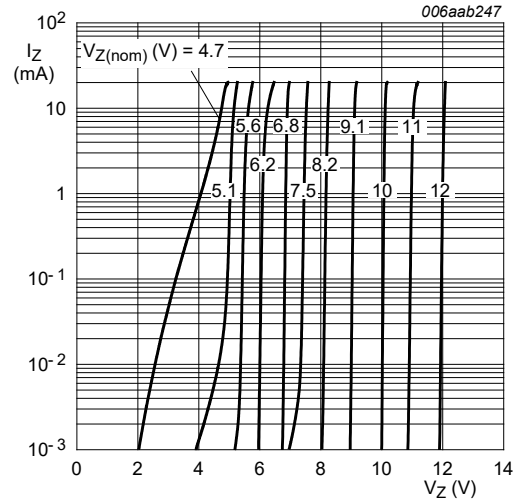
PDZ4.7B-Q to PDZ12B-Q  
 $T_j = 25\text{ °C}$  to  $150\text{ °C}$

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



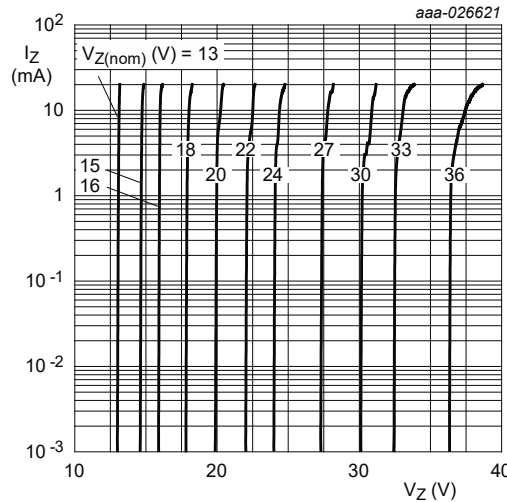
PDZ2.4B-Q to PDZ4.3B-Q  
 $T_j = 25\text{ }^\circ\text{C}$

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



PDZ4.7B-Q to PDZ12B-Q  
 $T_j = 25\text{ }^\circ\text{C}$

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



PDZ13B-Q to PDZ36B-Q  
 $T_j = 25\text{ }^\circ\text{C}$

**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

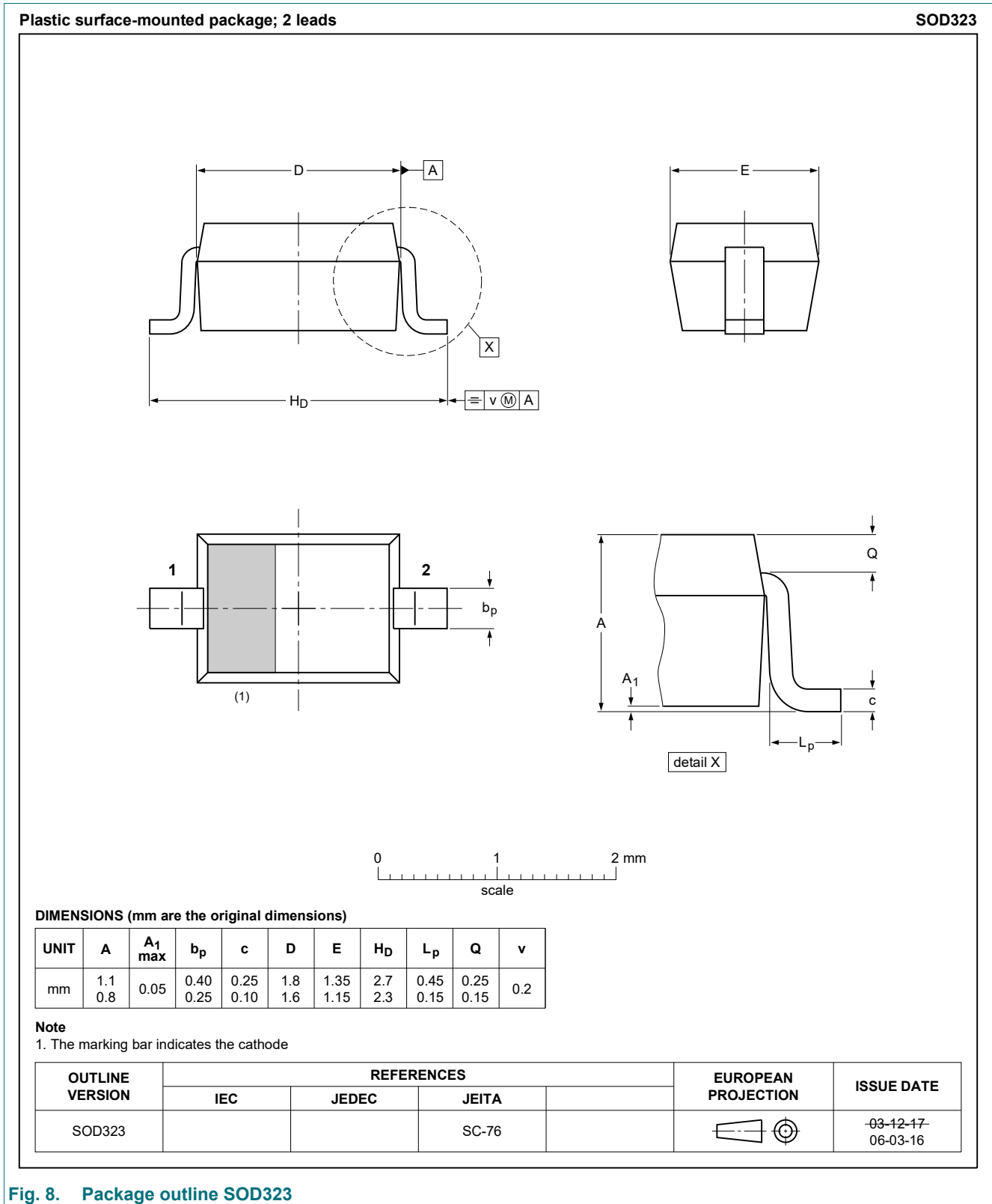


Fig. 8. Package outline SOD323

### 13. Soldering

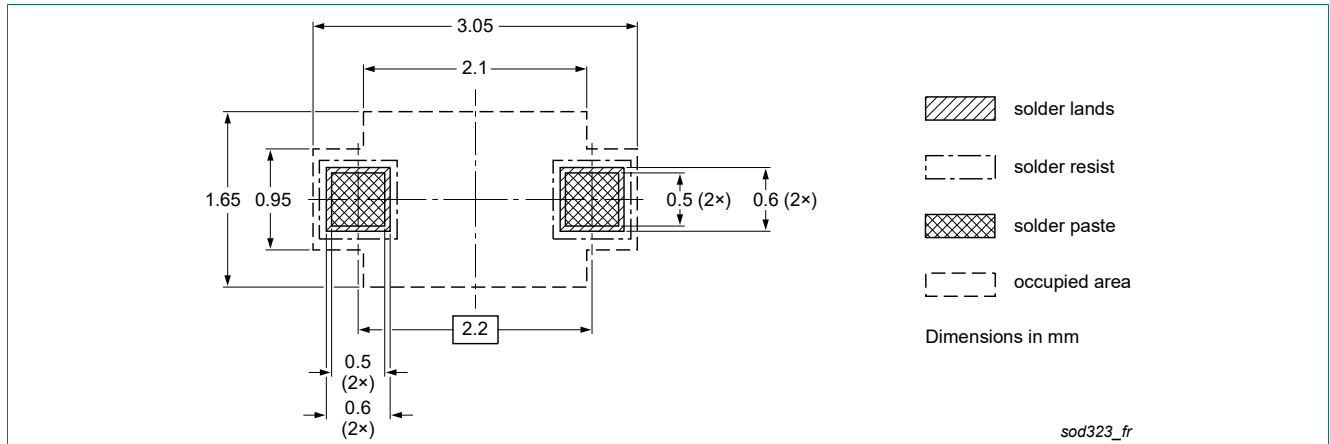


Fig. 9. Reflow soldering footprint SOD323

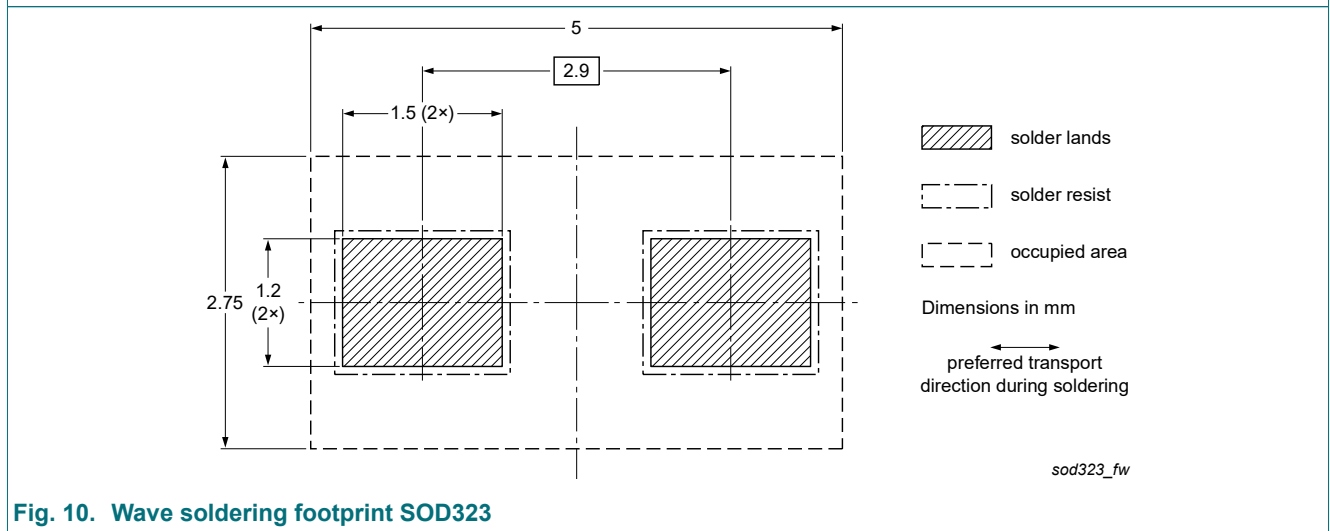


Fig. 10. Wave soldering footprint SOD323



## 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.

- [1] Please consult the most recently issued document before initiating or completing a design.
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