



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: $P_{\text{tot}} \leq 400$ 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

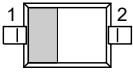
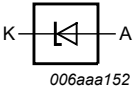
| Symbol | Parameter | Conditions | Min | Typ | Max | Unit |
|------------------|-------------------------|---------------------------------|-----|-----|-----|------|
| V_F | forward voltage | $I_F = 10$ mA [1] | - | - | 0.9 | V |
| P_{tot} | total power dissipation | $T_{\text{amb}} \leq 25$ °C [2]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

[1] Pulse test: $t_p \leq 300$ μ 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_{tot} | total power dissipation | $T_{\text{amb}} = 25 \text{ }^\circ\text{C}$ [1] | - | 400 | mW |
| T_{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 |

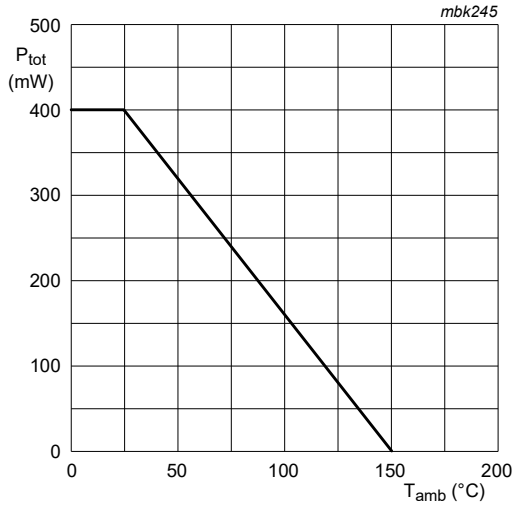
[1] Pulse test: $t_p \leq 300 \mu\text{s}$; $\delta \leq 0.02$.

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

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

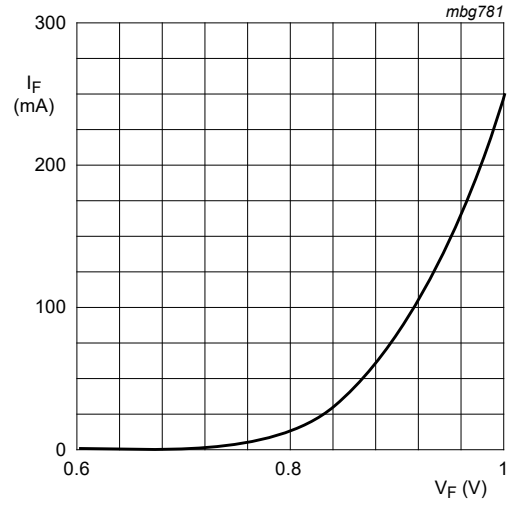
| Type | Working voltage V_Z (V); $I_Z = 5\text{ mA}$ | | Maximum differential resistance r_{dif} (Ω) | | Reverse current I_R (μA) | | Temperature coefficient S_Z (mV/K); $I_Z = 5\text{ mA}$ | Diode capacitance C_d (pF)[1] | Non- repetitive peak reverse current I_{ZSM} (A)[2] |
|-----------|--|-------|--|---------------------|---|-----------|--|-----------------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



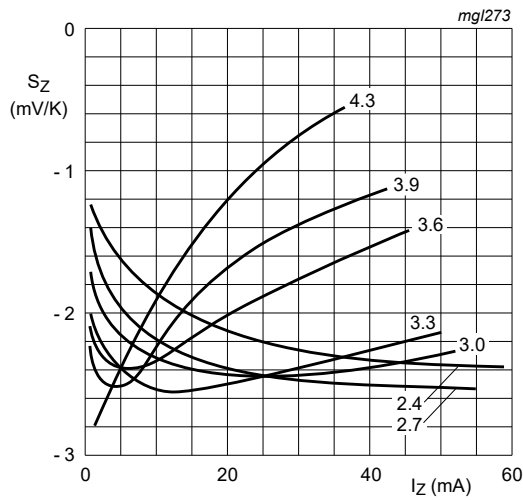
FR4 PCB, standard footprint

Fig. 1. Power derating curve



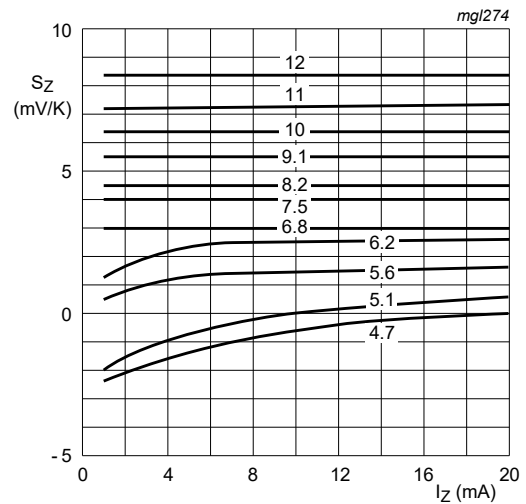
$T_j = 25\text{ °C}$

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



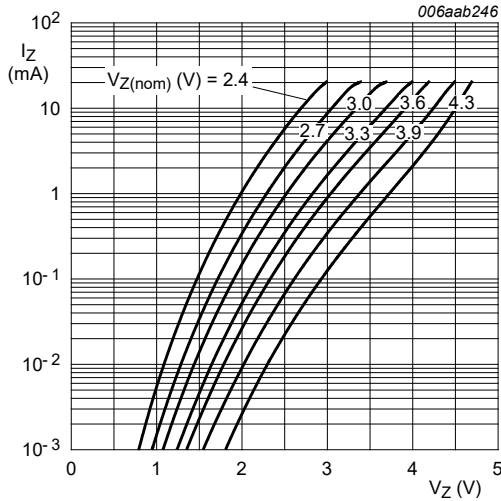
PDZ2.4B-Q to PDZ4.3B-Q
 $T_j = 25\text{ °C}$ to 150 °C

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



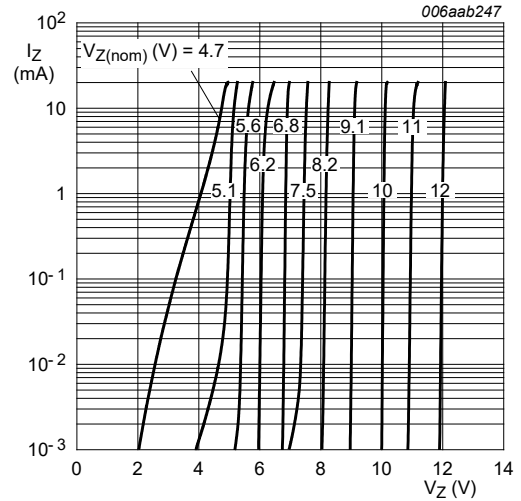
PDZ4.7B-Q to PDZ12B-Q
 $T_j = 25\text{ °C}$ to 150 °C

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



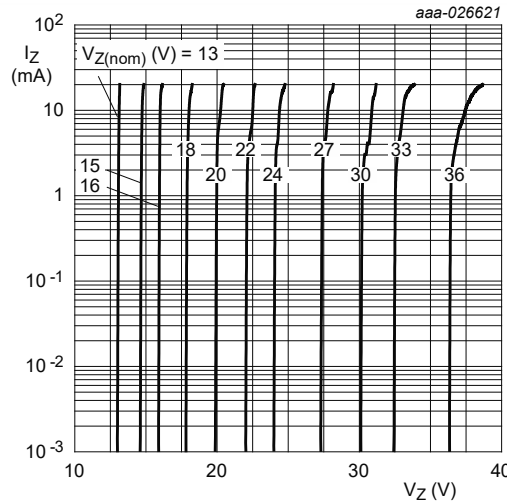
PDZ2.4B-Q to PDZ4.3B-Q
 $T_j = 25\text{ }^\circ\text{C}$

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

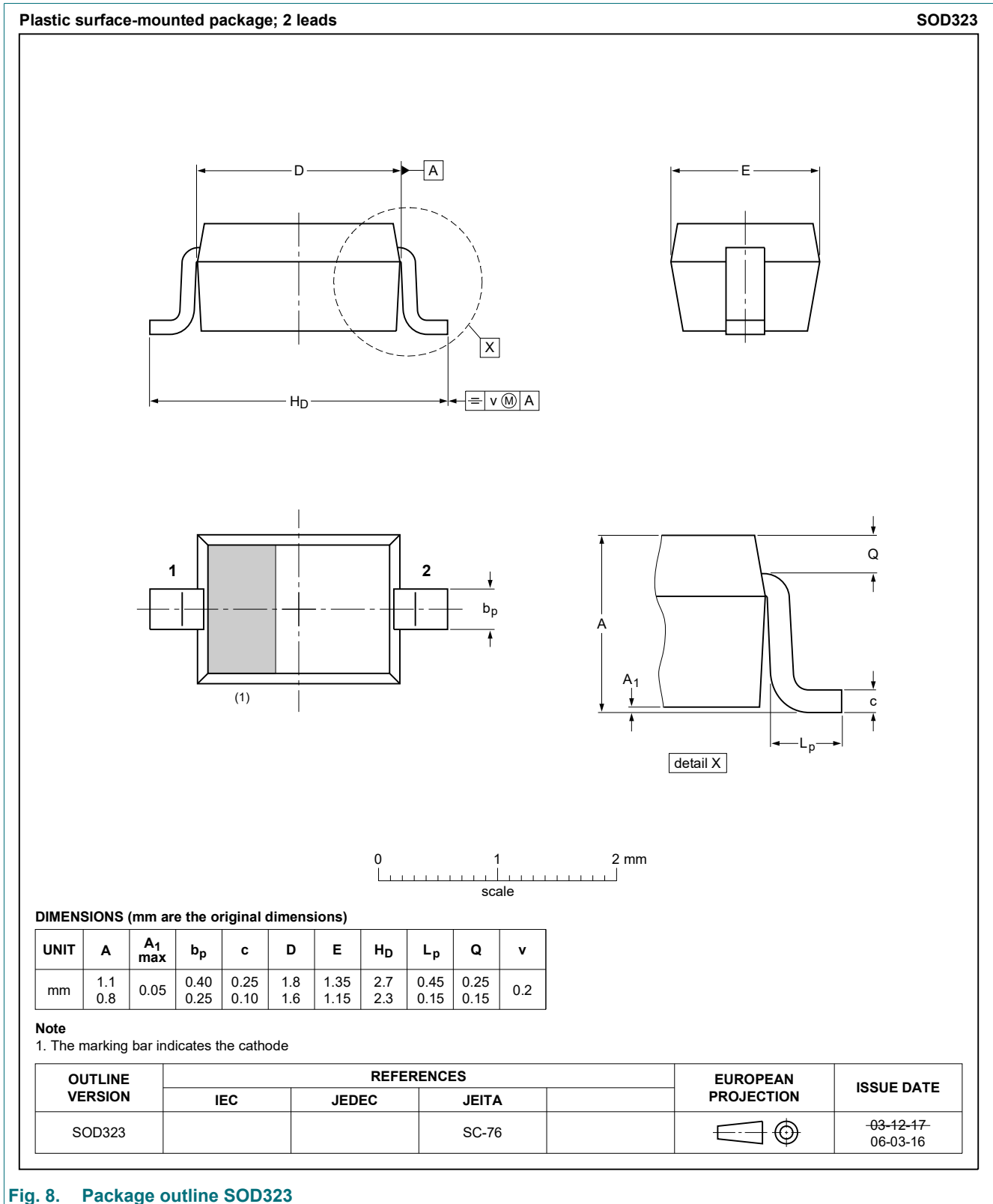


Fig. 8. Package outline SOD323

13. Soldering

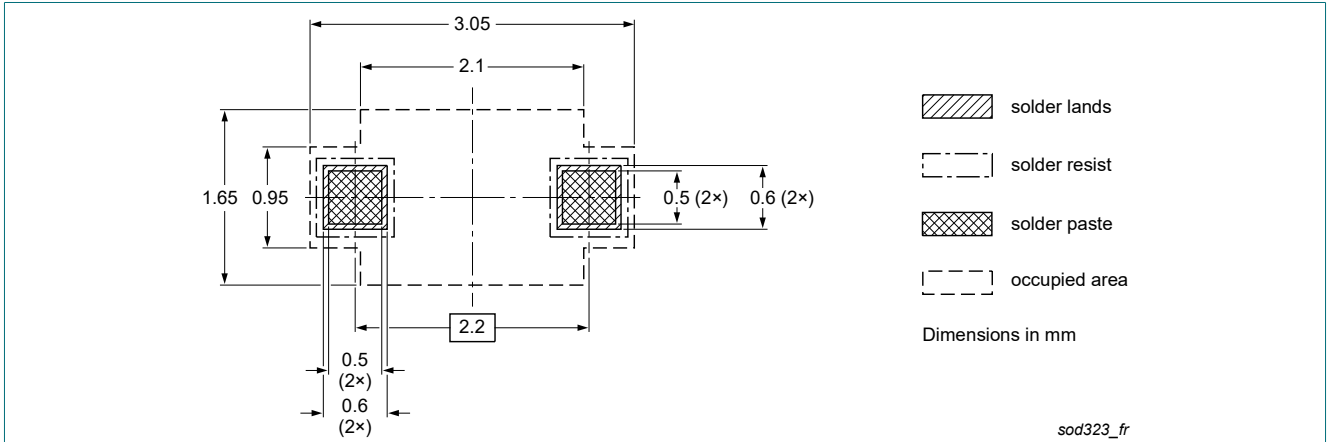


Fig. 9. Reflow soldering footprint SOD323

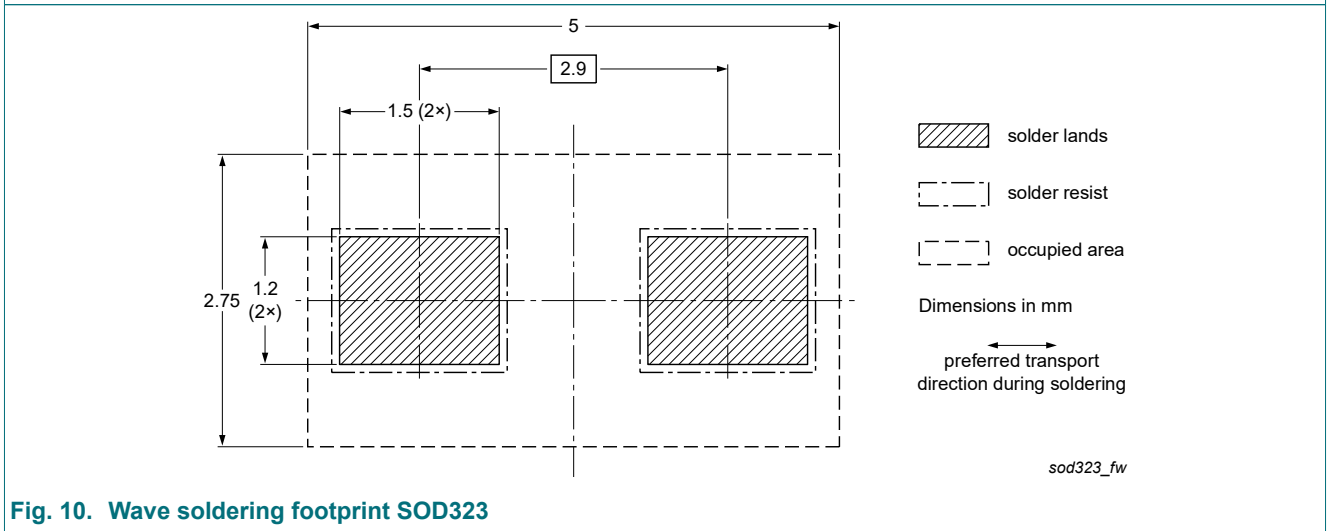


Fig. 10. Wave soldering footprint SOD323

14. Revision history

Table 9. Revision history

| Document ID | Release date | Data sheet status | Change notice | Supersedes |
|-----------------|---------------------------------------|--------------------|---------------|-----------------|
| PDZ-B-Q_SER v.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 | - | - |

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. |
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| Product [short] data sheet | Production | This document contains the product specification. |

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