



BZX58550-Q series

Low-current voltage regulator diodes

Rev. 1 — 24 August 2021

Product data sheet

1. General description

Low-current voltage regulator diodes in an SOD523 (SC-79) ultra small and flat lead Surface-Mounted Device (SMD) plastic package.

2. Features and benefits

- Total power dissipation: ≤ 300 mW
- Tolerance series: approximately $\pm 5\%$
- Working voltage range: nominal 1.8 V to 75 V
- Specified at a low test current (50 μ A), ideal for low bias and portable battery-powered applications
- Qualified according to AEC-Q101 and recommended for use in automotive applications

3. Applications

- Low-current general regulation functions

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] | - | - | 300 | mW |

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

[2] Device mounted on an FR4 Printed-Circuit Board (PCB), with approximately 35 mm² Cu area at cathode tab.

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 |
| BZX58550-Q series | SC-79 | plastic surface-mounted package; 2 leads | SOD523 |

7. Marking

Table 4. Marking Codes

| Type number | Marking Code | Type number | Marking Code | Type number | Marking Code | Type number | Marking Code |
|-----------------|--------------|-----------------|--------------|----------------|--------------|----------------|--------------|
| BZX58550-C1V8-Q | 1C | BZX58550-C4V7-Q | 1X | BZX58550-C12-Q | 2S | BZX58550-C33-Q | 3L |
| BZX58550-C2V0-Q | 1E | BZX58550-C5V1-Q | 1Y | BZX58550-C13-Q | 2T | BZX58550-C36-Q | 3N |
| BZX58550-C2V2-Q | 1F | BZX58550-C5V6-Q | 1Z | BZX58550-C15-Q | 2U | BZX58550-C39-Q | 3S |
| BZX58550-C2V4-Q | 1H | BZX58550-C6V2-Q | 2C | BZX58550-C16-Q | 2X | BZX58550-C43-Q | 3T |
| BZX58550-C2V7-Q | 1K | BZX58550-C6V8-Q | 2E | BZX58550-C18-Q | 2Y | BZX58550-C47-Q | 3U |
| BZX58550-C3V0-Q | 1L | BZX58550-C7V5-Q | 2F | BZX58550-C20-Q | 3C | BZX58550-C51-Q | 3X |
| BZX58550-C3V3-Q | 1N | BZX58550-C8V2-Q | 2H | BZX58550-C22-Q | 3E | BZX58550-C56-Q | 3Y |
| BZX58550-C3V6-Q | 1S | BZX58550-C9V1-Q | 2K | BZX58550-C24-Q | 3F | BZX58550-C62-Q | 3Z |
| BZX58550-C3V9-Q | 1T | BZX58550-C10-Q | 2L | BZX58550-C27-Q | 3H | BZX58550-C68-Q | 4C |
| BZX58550-C4V3-Q | 1U | BZX58550-C11-Q | 2N | BZX58550-C30-Q | 3K | BZX58550-C75-Q | 4E |

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 | forward current | | - | 200 | mA |
| P_{ZSM} | non-repetitive peak reverse power dissipation | $t_p = 100 \mu s$; square wave; $T_j = 25 \text{ }^\circ\text{C}$; prior to surge | - | 40 | W |
| P_{tot} | total power dissipation | $T_{amb} \leq 25 \text{ }^\circ\text{C}$ | [1] | 300 | mW |
| T_j | junction temperature | | - | 150 | $^\circ\text{C}$ |
| T_{amb} | ambient temperature | | -55 | +150 | $^\circ\text{C}$ |
| T_{stg} | storage temperature | | -65 | +150 | $^\circ\text{C}$ |

[1] Device mounted on an FR4 Printed-Circuit Board (PCB), with approximately 35 mm² Cu area at cathode tab.

9. Thermal characteristics

Table 6. Thermal characteristics

| Symbol | Parameter | Conditions | Min | Typ | Max | Unit |
|----------------|--|-----------------|-----|-----|-----|------|
| $R_{th(j-a)}$ | thermal resistance from junction to ambient | in free air [1] | - | - | 350 | K/W |
| $R_{th(j-sp)}$ | thermal resistance from junction to solder point | [2] | - | - | 65 | K/W |

[1] Device mounted on an FR4 Printed-Circuit Board (PCB), with approximately 35 mm² Cu area at cathode tab.

[2] Soldering point of cathode tab

10. Characteristics

Table 7. Electrical characteristics
 $T_j = 25\text{ °C}$ unless otherwise specified.

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

 [1] Pulse test: $t_p \leq 300\text{ }\mu\text{s}$; $\delta \leq 0.02$
Table 8. Electrical characteristics per type: BZX58550-C1V8-Q to BZX58550-C24-Q
 $T_j = 25\text{ °C}$ unless otherwise specified.

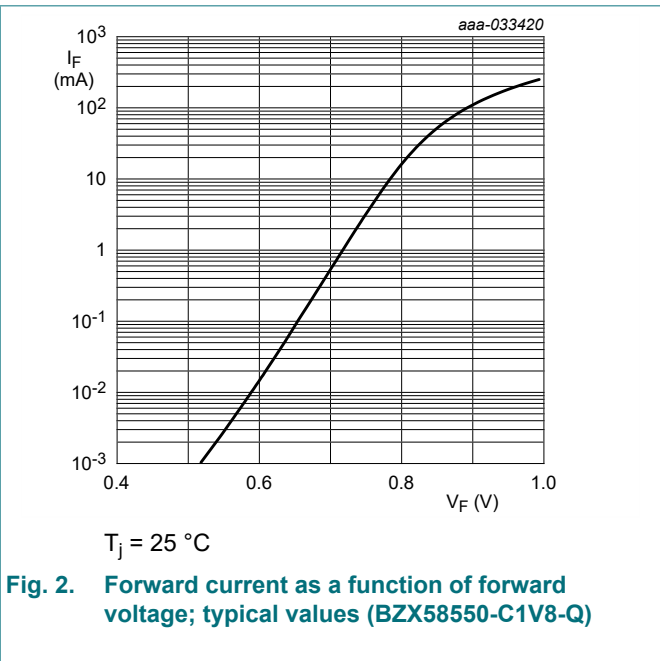
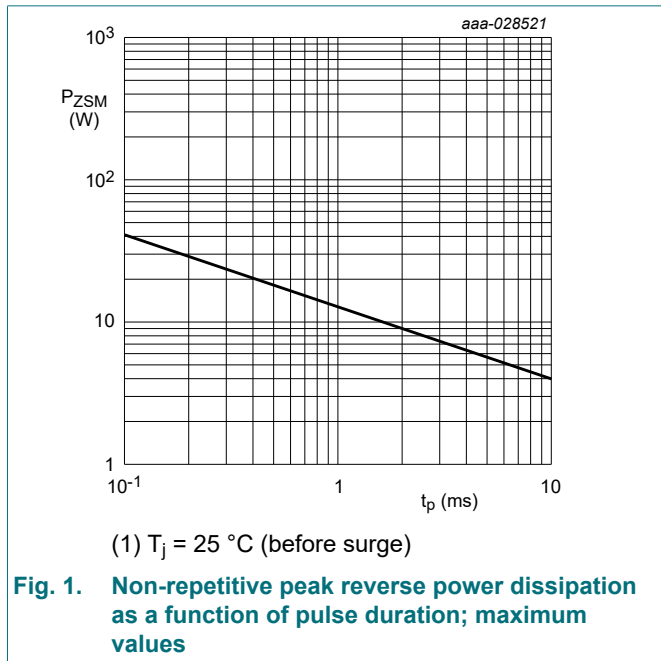
| BZX58550-C | Working voltage V_Z (V) | | Differential resistance r_{diff} (Ω) | | Reverse current I_R (μA) | | Temperature coefficient S_Z (mV/K) | | Diode capacit. C_d (pF)[1] |
|------------|-------------------------------|-------|--|---------------------|--|-----------|---|------|---------------------------------|
| | $I_Z = 50\text{ }\mu\text{A}$ | | $I_Z = 1\text{ mA}$ | $I_Z = 5\text{ mA}$ | | | $I_Z = 5\text{ mA}$ | | |
| | Min | Max | Max | Max | Max | V_R (V) | Min | Max | |
| 1V8-Q | 1.71 | 1.89 | 600 | 100 | 7.5 | 1.0 | -3.5 | 0 | 220 |
| 2V0-Q | 1.88 | 2.12 | 600 | 100 | 7 | 1.0 | -3.5 | 0 | 220 |
| 2V2-Q | 2.09 | 2.31 | 600 | 100 | 4 | 1.0 | -3.5 | 0 | 210 |
| 2V4-Q | 2.28 | 2.52 | 600 | 100 | 2 | 1.0 | -3.5 | 0 | 200 |
| 2V7-Q | 2.565 | 2.835 | 600 | 100 | 1 | 1.0 | -3.5 | 0 | 190 |
| 3V0-Q | 2.85 | 3.15 | 600 | 100 | 0.8 | 1.0 | -3.5 | 0.2 | 170 |
| 3V3-Q | 3.13 | 3.47 | 600 | 100 | 7.5 | 1.5 | -3.5 | 1.2 | 160 |
| 3V6-Q | 3.42 | 3.78 | 600 | 95 | 7.5 | 2.0 | -3.5 | 1.2 | 160 |
| 3V9-Q | 3.70 | 4.10 | 600 | 95 | 5.0 | 2.0 | -2.7 | 2.5 | 150 |
| 4V3-Q | 4.09 | 4.52 | 600 | 95 | 4.0 | 2.0 | -2.7 | 2.5 | 150 |
| 4V7-Q | 4.47 | 4.94 | 600 | 80 | 5.0 | 3.0 | -2.7 | 2.5 | 140 |
| 5V1-Q | 4.85 | 5.36 | 500 | 60 | 5.0 | 3.0 | -2.0 | 3.7 | 130 |
| 5V6-Q | 5.32 | 5.88 | 400 | 40 | 2.0 | 4.0 | -2.0 | 3.7 | 120 |
| 6V2-Q | 5.89 | 6.51 | 160 | 10 | 1.0 | 5.0 | 0.4 | 4.5 | 110 |
| 6V8-Q | 6.46 | 7.14 | 80 | 15 | 0.1 | 5.1 | 1.2 | 4.5 | 100 |
| 7V5-Q | 7.13 | 7.88 | 80 | 15 | 0.1 | 5.7 | 2.5 | 5.3 | 150 |
| 8V2-Q | 7.79 | 8.61 | 80 | 15 | 0.1 | 6.2 | 3.2 | 6.2 | 150 |
| 9V1-Q | 8.65 | 9.56 | 100 | 15 | 0.1 | 6.9 | 3.8 | 7.0 | 150 |
| 10-Q | 9.50 | 10.50 | 150 | 20 | 0.1 | 7.6 | 4.5 | 8.0 | 90 |
| 11-Q | 10.45 | 11.55 | 150 | 20 | 0.05 | 8.4 | 5.4 | 9.0 | 85 |
| 12-Q | 11.40 | 12.60 | 150 | 25 | 0.05 | 9.1 | 6.0 | 10.0 | 85 |
| 13-Q | 12.35 | 13.65 | 170 | 30 | 0.05 | 9.8 | 7.0 | 11.0 | 80 |
| 15-Q | 14.25 | 15.75 | 200 | 30 | 0.05 | 11.4 | 9.2 | 13.0 | 75 |
| 16-Q | 15.20 | 16.80 | 200 | 40 | 0.05 | 12.1 | 10.4 | 14.0 | 75 |
| 18-Q | 17.10 | 18.90 | 225 | 45 | 0.05 | 13.6 | 12.4 | 16.0 | 70 |
| 20-Q | 19.00 | 21.00 | 225 | 55 | 0.05 | 15.2 | 14.4 | 18.0 | 60 |
| 22-Q | 20.90 | 23.10 | 250 | 55 | 0.05 | 16.7 | 16.4 | 20.0 | 60 |
| 24-Q | 22.80 | 25.20 | 250 | 70 | 0.05 | 18.2 | 18.4 | 22.0 | 55 |

 [1] $f = 1\text{ MHz}$; $V_R = 0\text{ V}$

Table 9. Electrical characteristics per type: BZX58550-C27-Q to BZX58550-C75-Q

| BZX58550-C | Working voltage V_Z (V) | | Differential resistance r_{diff} (Ω) | | Reverse current I_R (μA) | | Temperature coefficient S_Z (mV/K) | | Diode capacit. C_d (pF)[1] |
|------------|------------------------------|-------|--|--------------|--------------------------------------|-----------|---|------|---------------------------------|
| | $I_Z = 50 \mu A$ | | $I_Z = 0.5 mA$ | $I_Z = 2 mA$ | Max | V_R (V) | $I_Z = 2 mA$ | | |
| | Min | Max | Max | Max | | | Min | Max | |
| 27-Q | 25.65 | 28.35 | 300 | 80 | 0.05 | 20.4 | 21.4 | 25.3 | 50 |
| 30-Q | 28.50 | 31.50 | 300 | 80 | 0.05 | 22.8 | 24.4 | 29.4 | 50 |
| 33-Q | 31.35 | 34.65 | 325 | 80 | 0.05 | 25.0 | 27.4 | 33.4 | 45 |
| 36-Q | 34.20 | 37.80 | 350 | 90 | 0.05 | 27.3 | 30.4 | 37.4 | 45 |
| 39-Q | 37.05 | 40.95 | 350 | 130 | 0.05 | 29.6 | 33.4 | 41.2 | 45 |
| 43-Q | 40.85 | 45.15 | 375 | 150 | 0.05 | 32.6 | 37.6 | 46.6 | 40 |
| 47-Q | 44.00 | 50.00 | 375 | 170 | 0.05 | 32.9 | 42.0 | 51.8 | 40 |
| 51-Q | 48.00 | 54.00 | 400 | 180 | 0.05 | 35.7 | 46.6 | 57.2 | 40 |
| 56-Q | 52.00 | 60.00 | 425 | 200 | 0.05 | 39.2 | 52.2 | 63.8 | 40 |
| 62-Q | 58.00 | 66.00 | 450 | 215 | 0.05 | 43.4 | 58.8 | 71.6 | 35 |
| 68-Q | 64.00 | 72.00 | 475 | 240 | 0.05 | 47.6 | 65.6 | 79.8 | 35 |
| 75-Q | 70.00 | 79.00 | 500 | 255 | 0.05 | 52.5 | 73.4 | 88.6 | 35 |

[1] $f = 1 MHz$; $V_R = 0 V$



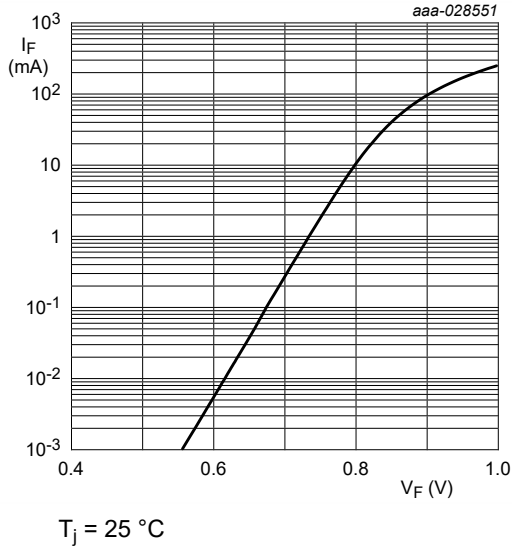


Fig. 3. Forward current as a function of forward voltage; typical values (BZX58550-C6V8-Q)

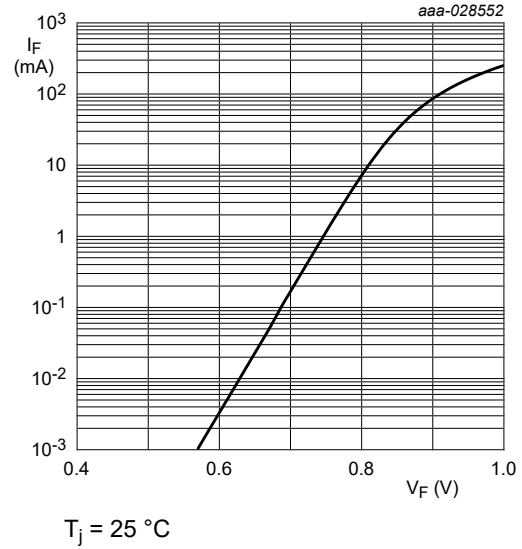


Fig. 4. Forward current as a function of forward voltage; typical values (BZX58550-C7V5-Q)

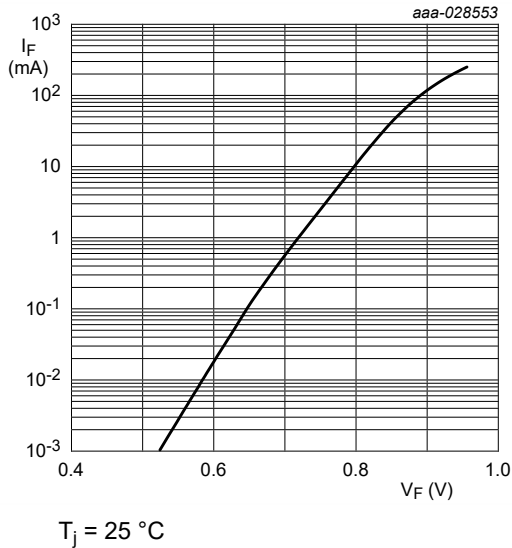


Fig. 5. Forward current as a function of forward voltage; typical values (BZX58550-C75-Q)

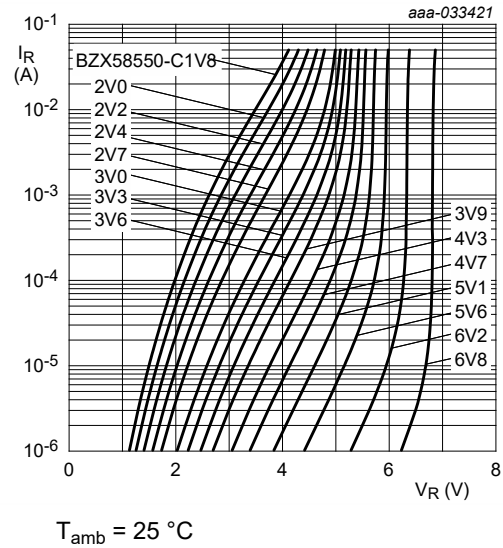
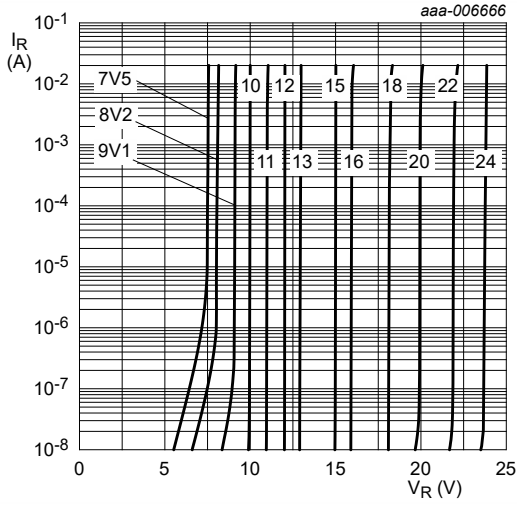
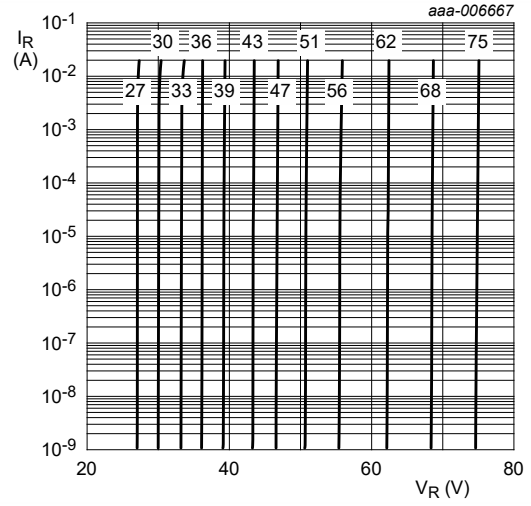


Fig. 6. Reverse current as a function of reverse voltage; typical values (BZX58550-C1V8-Q to BZX58550-C6V8-Q)



T_{amb} = 25 °C

Fig. 7. Reverse current as a function of reverse voltage; typical values (BZX58550-C7V5-Q to BZX58550-C24-Q)



T_{amb} = 25 °C

Fig. 8. Reverse current as a function of reverse voltage; typical values (BZX58550-C27-Q to BZX58550-C75-Q)

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

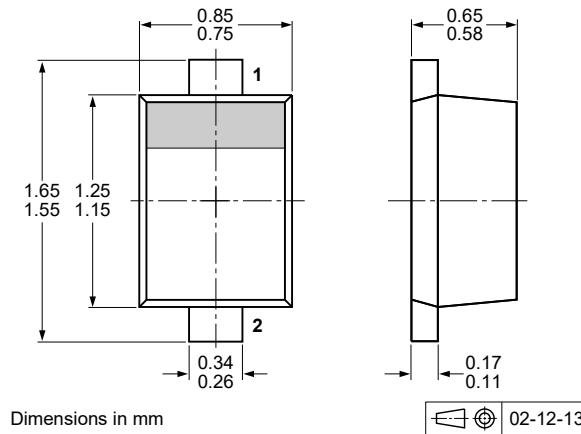
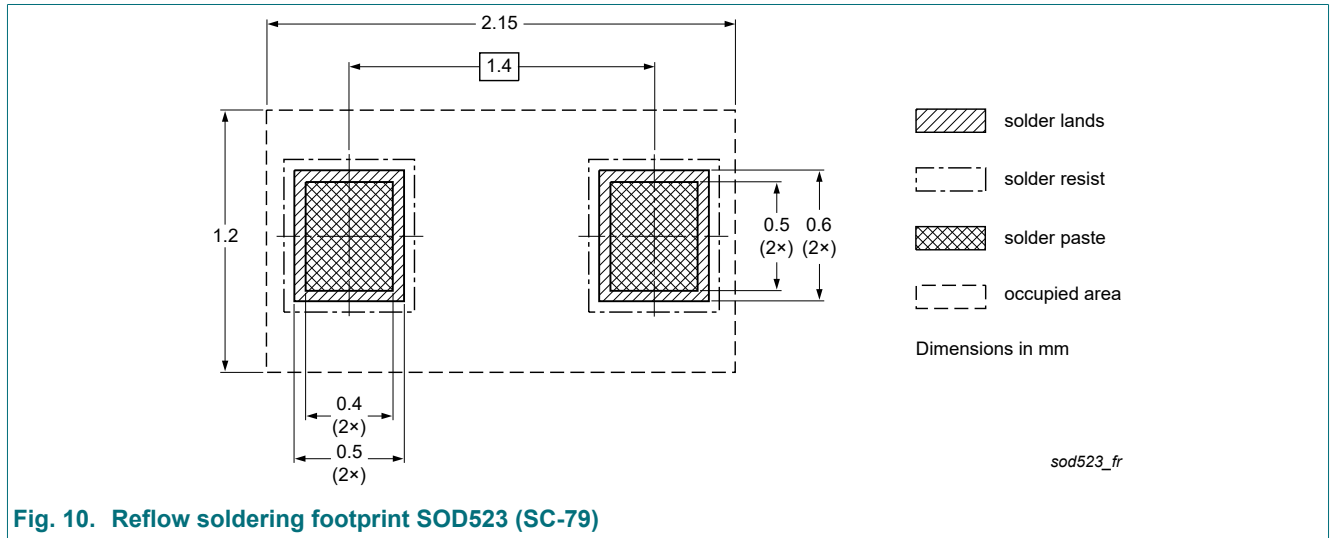


Fig. 9. Package outline SOD523 (SC-79)

13. Soldering



14. Revision history

Table 10. Revision history

| Document ID | Release date | Data sheet status | Change notice | Supersedes |
|--------------------|--------------|--------------------|---------------|------------|
| BZX58550-Q_SER v.1 | 20210824 | 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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