



BZX58550-Q series

Low-current voltage regulator diodes

Rev. 2 — 17 January 2023

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 10 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 |
|-----------------|--------------|-----------------|--------------|
| BZX58550-C1V8-Q | 1C | BZX58550-C4V7-Q | 1X |
| BZX58550-C2V0-Q | 1E | BZX58550-C5V1-Q | 1Y |
| BZX58550-C2V2-Q | 1F | BZX58550-C5V6-Q | 1Z |
| BZX58550-C2V4-Q | 1H | BZX58550-C6V2-Q | 2C |
| BZX58550-C2V7-Q | 1K | BZX58550-C6V8-Q | 2E |
| BZX58550-C3V0-Q | 1L | BZX58550-C7V5-Q | 2F |
| BZX58550-C3V3-Q | 1N | BZX58550-C8V2-Q | 2H |
| BZX58550-C3V6-Q | 1S | BZX58550-C9V1-Q | 2K |
| BZX58550-C3V9-Q | 1T | BZX58550-C10-Q | 2L |
| BZX58550-C4V3-Q | 1U | - | - |

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 | $t_p = 100 \mu\text{s}$; 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

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

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

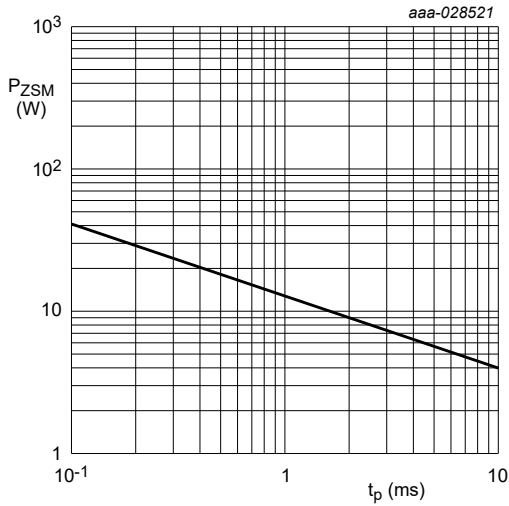
[1] Pulse test: $t_p \leq 300\text{ }\mu\text{s}$; $\delta \leq 0.02$

Table 8. Electrical characteristics per type: BZX58550-C1V8-Q to BZX58550-C10-Q

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

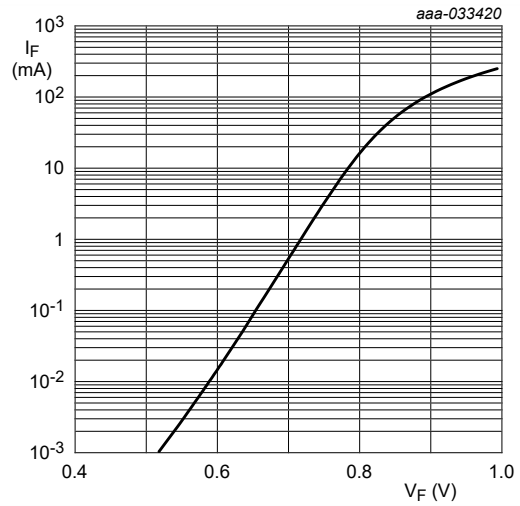
| BZX58550-C | Working voltage V_Z (V) | | Differential resistance r_{diff} (Ω) | | Reverse current I_R (μA) | | Temperature coefficient S_Z (mV/K) | | Diode capacit. C_d (pF)[1] |
|------------|-------------------------------|-------|--|---------------------|--|-----------|---|-----|---------------------------------|
| | $I_Z = 50\text{ }\mu\text{A}$ | | $I_Z = 1\text{ mA}$ | $I_Z = 5\text{ mA}$ | Max | V_R (V) | $I_Z = 5\text{ mA}$ | | |
| | Min | Max | Max | Max | | | 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 |

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



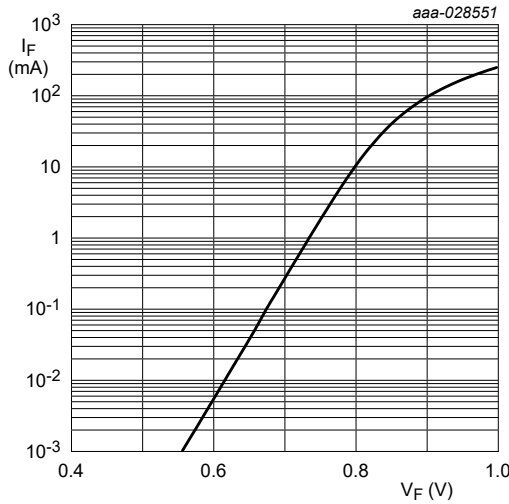
(1) $T_j = 25\text{ }^\circ\text{C}$ (before surge)

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



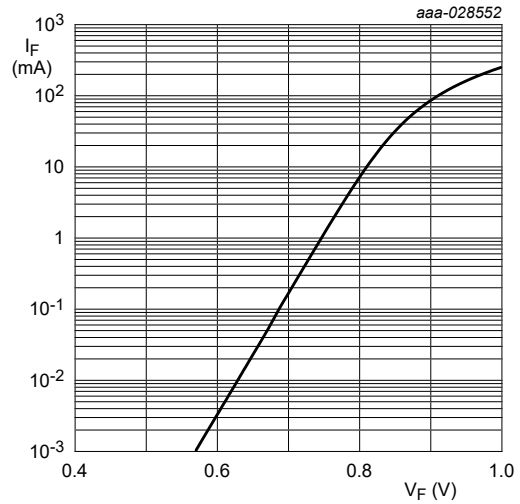
$T_j = 25\text{ }^\circ\text{C}$

Fig. 2. Forward current as a function of forward voltage; typical values (BZX58550-C1V8-Q)



$T_j = 25\text{ }^\circ\text{C}$

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



$T_j = 25\text{ }^\circ\text{C}$

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

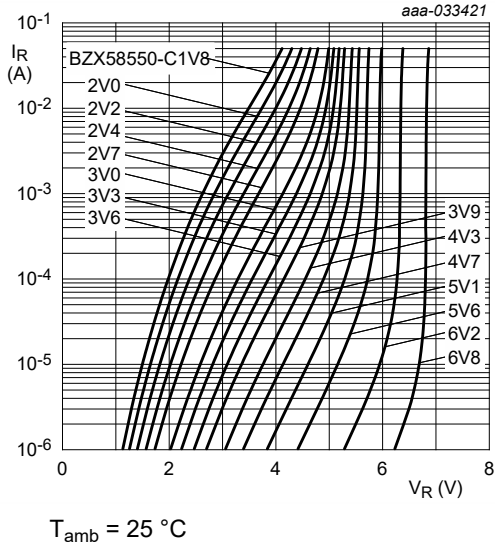


Fig. 5. Reverse current as a function of reverse voltage; typical values (BZX58550-C1V8-Q to BZX58550-C6V8-Q)

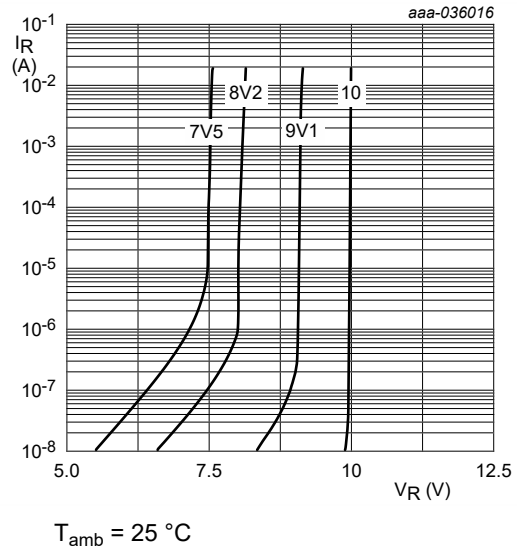


Fig. 6. Reverse current as a function of reverse voltage; typical values (BZX58550-C7V5-Q to BZX58550-C10-Q)

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

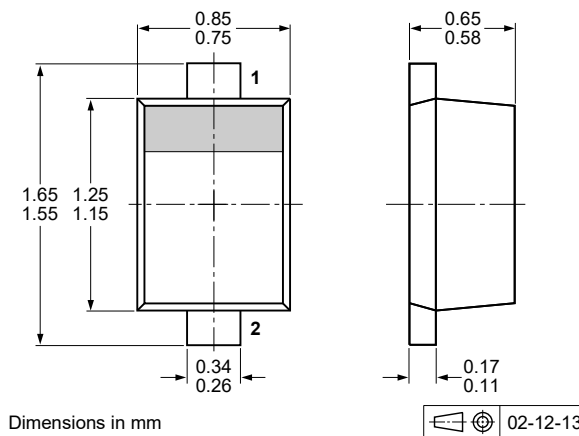


Fig. 7. Package outline SOD523 (SC-79)

13. Soldering

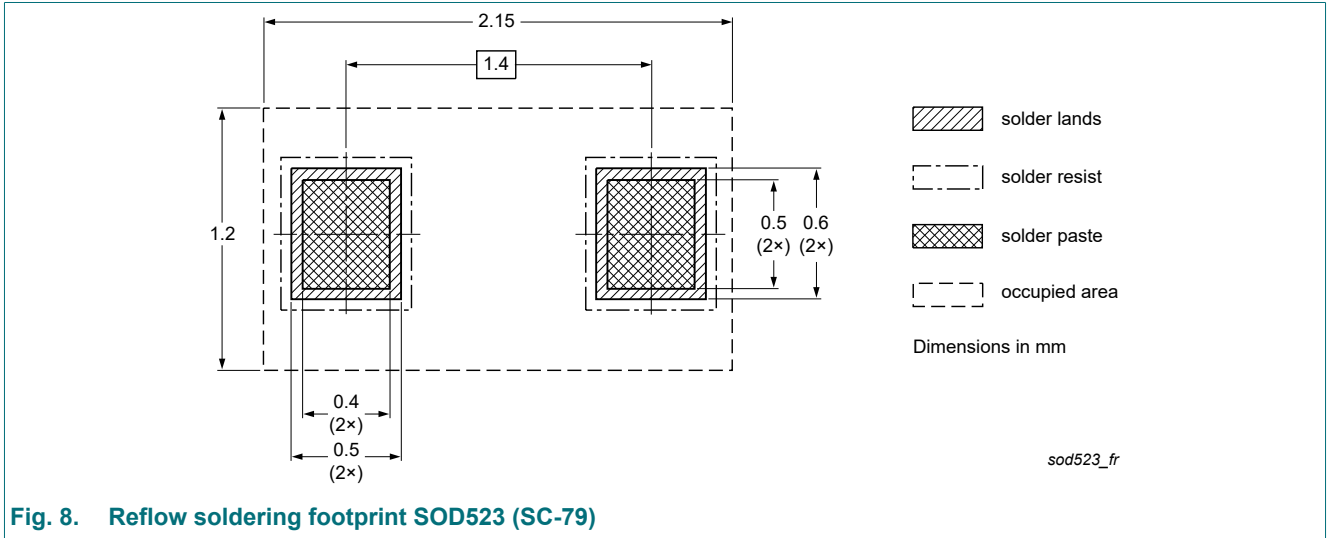


Fig. 8. Reflow soldering footprint SOD523 (SC-79)

14. Revision history

Table 9. Revision history

| Document ID | Release date | Data sheet status | Change notice | Supersedes |
|--------------------|-------------------------------------|--------------------|---------------|--------------------|
| BZX58550-Q_SER v.2 | 20230117 | Product data sheet | - | BZX58550-Q_SER v.1 |
| Modifications: | • Products removed: 11 V and higher | | | |
| 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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- [2] The term 'short data sheet' is explained in section "Definitions".
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