



# BAT720-Q

Schottky barrier diode

30 June 2022

Product data sheet

## 1. General description

Planar Schottky barrier diode with an integrated guard ring for stress protection, encapsulated in a small SOT23 (TO-236AB) Surface-Mounted Device (SMD) plastic package.

## 2. Features and benefits

- Low forward voltage
- Low capacitance
- Qualified according to AEC-Q101 and recommended for use in automotive applications

## 3. Applications

- Ultra high-speed switching
- Voltage clamping
- Line termination
- Reverse polarity protection

## 4. Quick reference data

Table 1. Quick reference data

| Symbol | Parameter       | Conditions  | Min | Typ | Max | Unit          |
|--------|-----------------|---|-----|-----|-----|---------------|
| $V_R$  | reverse voltage |   | -   | -   | 40  | V             |
| $V_F$  | forward voltage | $I_F = 500 \text{ mA}$ ; $t_p \leq 300 \text{ } \mu\text{s}$ ; $\delta \leq 0.02$ ; pulsed; $T_{\text{amb}} = 25 \text{ } ^\circ\text{C}$ | -   | -   | 550 | mV            |
| $I_R$  | reverse current | $V_R = 35 \text{ V}$ ; $t_p \leq 300 \text{ } \mu\text{s}$ ; $\delta \leq 0.02$ ; pulsed; $T_{\text{amb}} = 25 \text{ } ^\circ\text{C}$   | -   | -   | 100 | $\mu\text{A}$ |

## 5. Pinning information

Table 2. Pinning information

| Pin | Symbol | Description   | Simplified outline | Graphic symbol   |
|-----|--------|---------------|--------------------|------------------|
| 1   | A      | anode         | <p>SOT23</p>       | <p>006aaa436</p> |
| 2   | n.c.   | not connected |                    |                  |
| 3   | K      | cathode       |                    |                  |

## 6. Ordering information

Table 3. Ordering information

| Type number              | Package |  |                       |
|--------------------------|---------|--|-----------------------|
|                          | Name    | Description  | Version               |
| <a href="#">BAT720-Q</a> | SOT23   | plastic, surface-mounted package; 3 terminals; 1.9 mm pitch; 2.9 mm x 1.3 mm x 1 mm body | <a href="#">SOT23</a> |

## 7. Marking

Table 4. Marking codes

| Type number | Marking code[1] |
|-------------|-----------------|
| BAT720-Q    | L6%             |

[1] % = placeholder for manufacturing site code

## 8. Limiting values

Table 5. Limiting values

In accordance with the Absolute Maximum Rating System (IEC 60134).

| Symbol    | Parameter                           | Conditions                 |     | Min | Max | Unit |
|-----------|-------------------------------------|----------------------------|-----|-----|-----|------|
| $V_R$     | reverse voltage                     |                            |     | -   | 40  | V    |
| $I_F$     | forward current                     |                            |     | -   | 500 | mA   |
| $I_{FSM}$ | non-repetitive peak forward current | $t_p < 10$ ms; square wave | [1] | -   | 2   | A    |
| $P_{tot}$ | total power dissipation             | $T_{amb} \leq 25$ °C       | [2] | -   | 200 | mW   |
| $T_j$     | junction temperature                |                            |     | -   | 125 | °C   |
| $T_{amb}$ | ambient temperature                 |                            |     | -55 | 125 | °C   |
| $T_{stg}$ | storage temperature                 |                            |     | -65 | 150 | °C   |

[1]  $T_j = 25$  °C before surge.

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

## 9. Thermal characteristics

Table 6. Thermal characteristics

| Symbol        | Parameter                                   | Conditions  |     | Min | Typ | Max | Unit |
|---------------|---|-------------|-----|-----|-----|-----|------|
| $R_{th(j-a)}$ | thermal resistance from junction to ambient | in free air | [1] | -   | -   | 500 | K/W  |

[1] Device mounted on an FR4 PCB, single-sided copper, tin-plated and standard footprint.

## 10. Characteristics

Table 7. Characteristics

| Symbol | Parameter         | Conditions   | Min | Typ | Max | Unit          |
|--------|-------------------|--|-----|-----|-----|---------------|
| $V_F$  | forward voltage   | $I_F = 500 \text{ mA}$ ; $t_p \leq 300 \text{ } \mu\text{s}$ ; $\delta \leq 0.02$ ; pulsed; $T_{\text{amb}} = 25 \text{ }^\circ\text{C}$ | -   | -   | 550 | mV            |
| $I_R$  | reverse current   | $V_R = 35 \text{ V}$ ; $t_p \leq 300 \text{ } \mu\text{s}$ ; $\delta \leq 0.02$ ; pulsed; $T_{\text{amb}} = 25 \text{ }^\circ\text{C}$   | -   | -   | 100 | $\mu\text{A}$ |
|        |                   | $V_R = 35 \text{ V}$ ; $t_p \leq 300 \text{ } \mu\text{s}$ ; $\delta \leq 0.02$ ; pulsed; $T_j = 100 \text{ }^\circ\text{C}$             | -   | -   | 10  | mA            |
| $C_d$  | diode capacitance | $V_R = 0 \text{ V}$ ; $f = 1 \text{ MHz}$ ; $T_{\text{amb}} = 25 \text{ }^\circ\text{C}$   | 60  | -   | 90  | pF            |

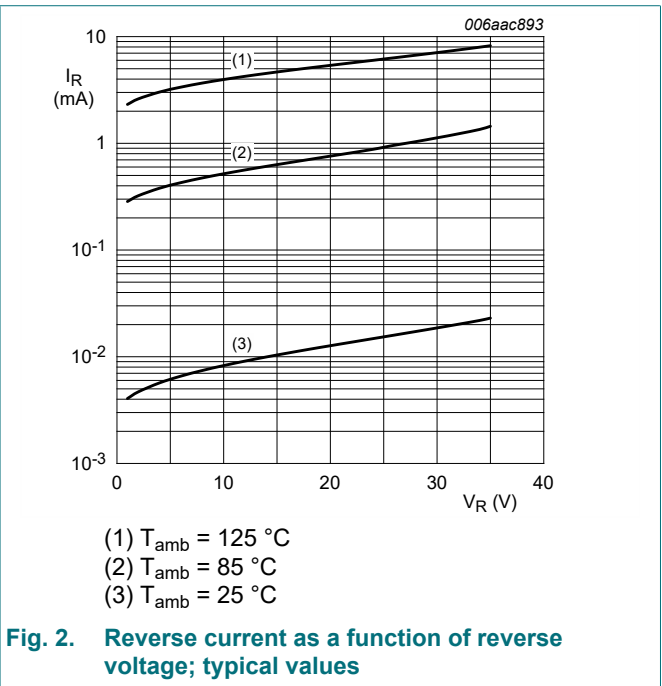
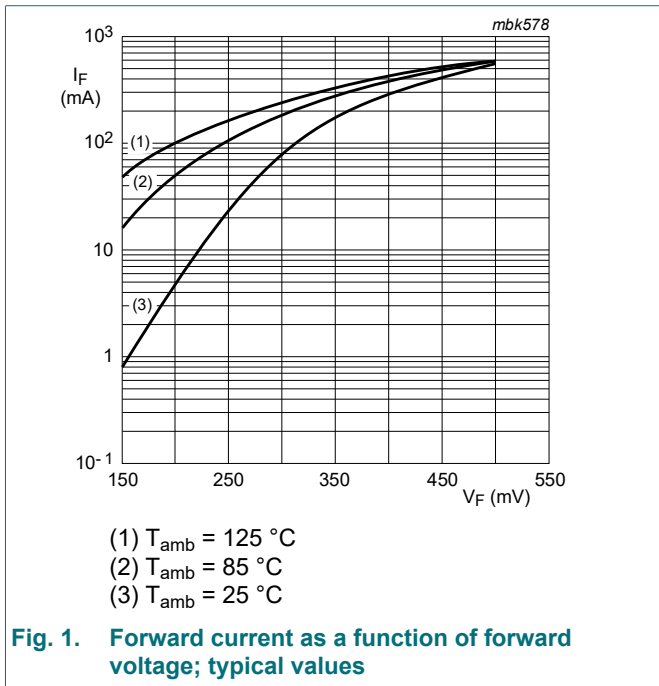


Fig. 1. Forward current as a function of forward voltage; typical values

Fig. 2. Reverse current as a function of reverse voltage; typical values

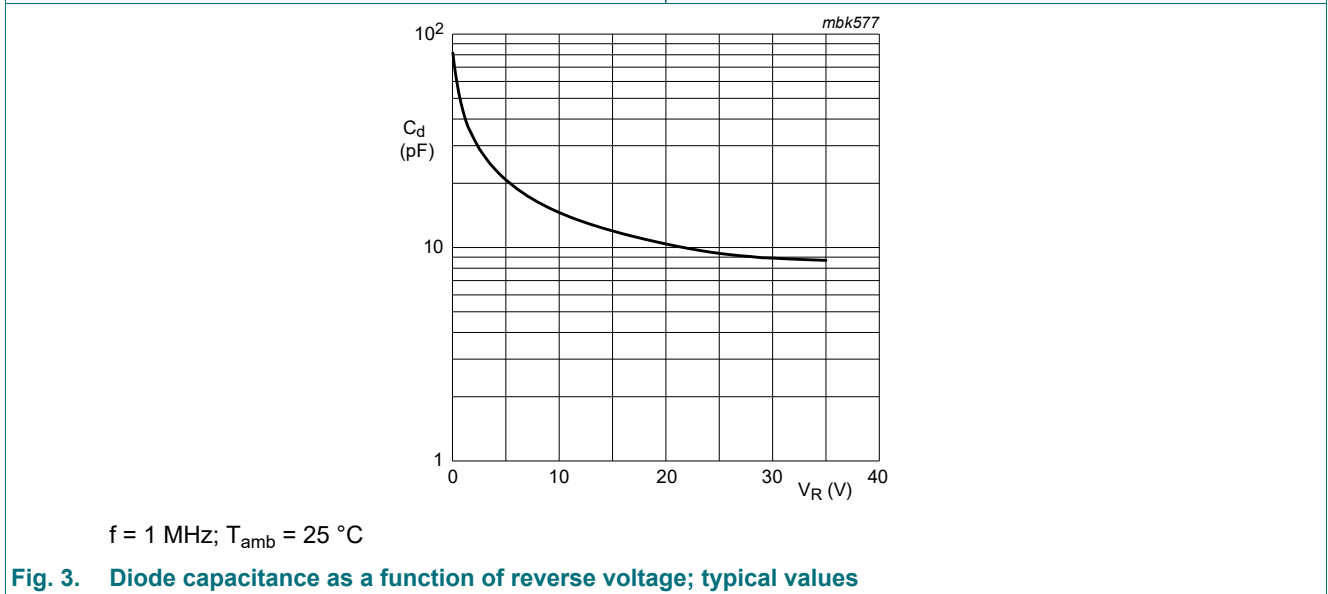


Fig. 3. Diode capacitance as a function of reverse voltage; typical values

## 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

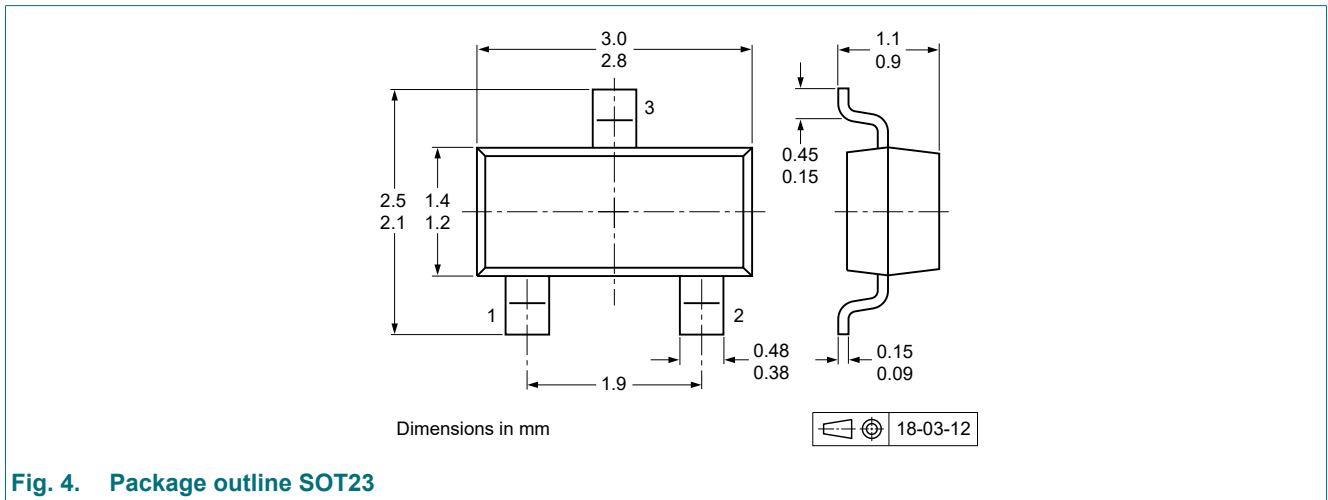


Fig. 4. Package outline SOT23

## 13. Soldering

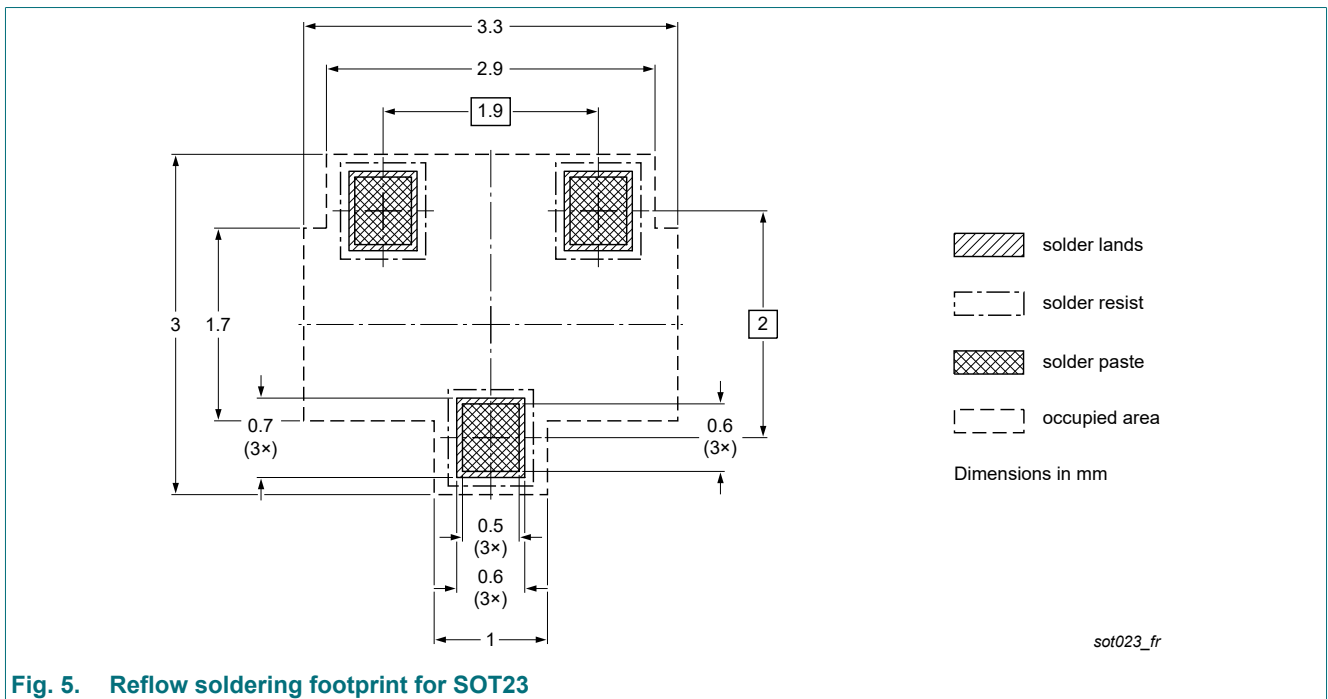


Fig. 5. Reflow soldering footprint for SOT23

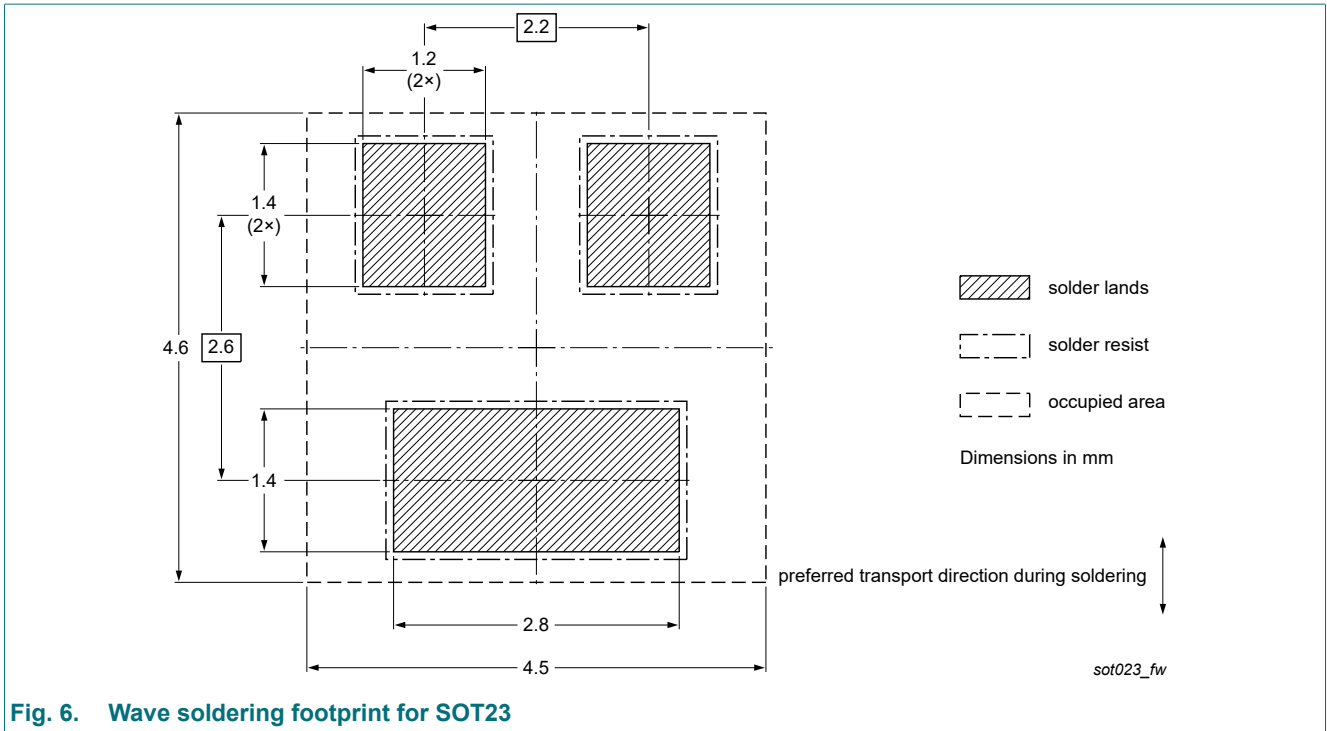


Fig. 6. Wave soldering footprint for SOT23

## 14. Revision history

Table 8. Revision history

| Data sheet ID | Release date | Data sheet status  | Change notice | Supersedes |
|---------------|--------------|--------------------|---------------|------------|
| BAT720-Q v.1  | 20220630     | 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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