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Kind regards,

Team Nexperia



BAT720

Schottky barrier diode

Rev. 4 — 14 November 2012

Product data sheet

1. Product profile

1.1 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.

1.2 Features and benefits

- Low forward voltage
- Low capacitance
- AEC-Q101 qualified

1.3 Applications

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

1.4 Quick reference data

Table 1. Quick reference data

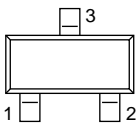
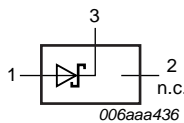
$T_{amb} = 25\text{ }^{\circ}\text{C}$ unless otherwise specified.

| Symbol | Parameter | Conditions | Min | Typ | Max | Unit |
|--------|-----------------|-----------------------|-----|-----|-----|---------------|
| V_R | reverse voltage | | - | - | 40 | V |
| V_F | forward voltage | $I_F = 500\text{ mA}$ | [1] | - | 550 | mV |
| I_R | reverse current | $V_R = 35\text{ V}$ | [1] | - | 100 | μA |

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

2. Pinning information

Table 2. Pinning

| Pin | Description | Simplified outline | Graphic symbol |
|-----|---------------|---|---|
| 1 | anode |  |  |
| 2 | not connected | | |
| 3 | cathode | | |



3. Ordering information

Table 3. Ordering information

| Type number | Package | | |
|-------------|---------|--|---------|
| | Name | Description | Version |
| BAT720 | - | plastic surface-mounted package; 3 leads | SOT23 |

4. Marking

Table 4. Marking codes

| Type number | Marking code ^[1] |
|-------------|-----------------------------|
| BAT720 | L6* |

[1] * = placeholder for manufacturing site code.

5. 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 | square wave; $t_p < 10$ ms | ^[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.

6. 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.

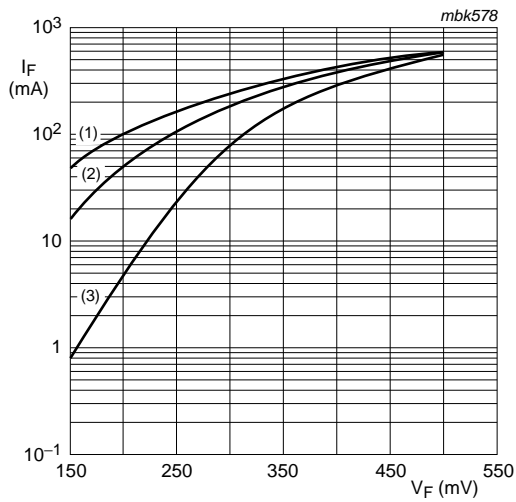
7. Characteristics

Table 7. Characteristics

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

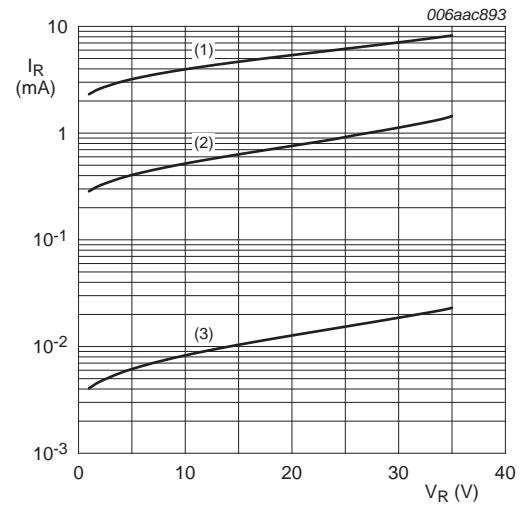
| Symbol | Parameter | Conditions | Min | Typ | Max | Unit |
|--------|-------------------|--|-----|-----|-----|---------------|
| V_F | forward voltage | $I_F = 500\text{ mA}$ | [1] | - | 550 | mV |
| I_R | reverse current | $V_R = 35\text{ V}$ | [1] | - | 100 | μA |
| | | $V_R = 35\text{ V}; T_j = 100\text{ °C}$ | [1] | - | 10 | mA |
| C_d | diode capacitance | $f = 1\text{ MHz}; V_R = 0\text{ V}$ | 60 | - | 90 | pF |

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



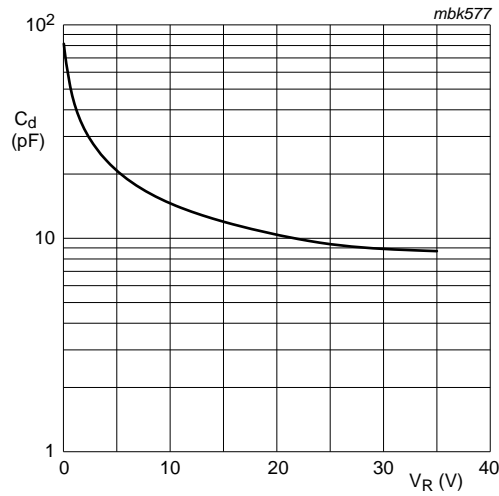
- (1) $T_{amb} = 125\text{ °C}$
- (2) $T_{amb} = 85\text{ °C}$
- (3) $T_{amb} = 25\text{ °C}$

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



- (1) $T_{amb} = 125\text{ °C}$
- (2) $T_{amb} = 85\text{ °C}$
- (3) $T_{amb} = 25\text{ °C}$

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



$f = 1 \text{ MHz}; T_{\text{amb}} = 25 \text{ }^\circ\text{C}$

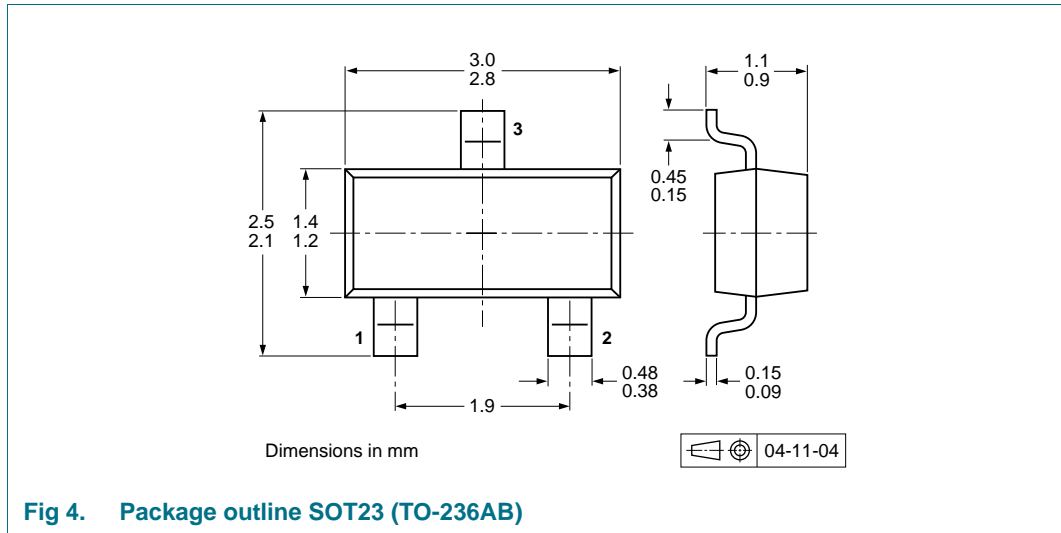
Fig 3. Diode capacitance as a function of reverse voltage; typical values

8. Test information

8.1 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.

9. Package outline



10. Packing information

Table 8. Packing methods

The indicated -xxx are the last three digits of the 12NC ordering code.^[1]

| Type number | Package | Description | Packing quantity | |
|-------------|---------|--------------------------------|------------------|-------|
| | | | 3000 | 10000 |
| BAT720 | SOT23 | 4 mm pitch, 8 mm tape and reel | -215 | -235 |

[1] For further information and the availability of packing methods, see [Section 14](#).

11. Soldering

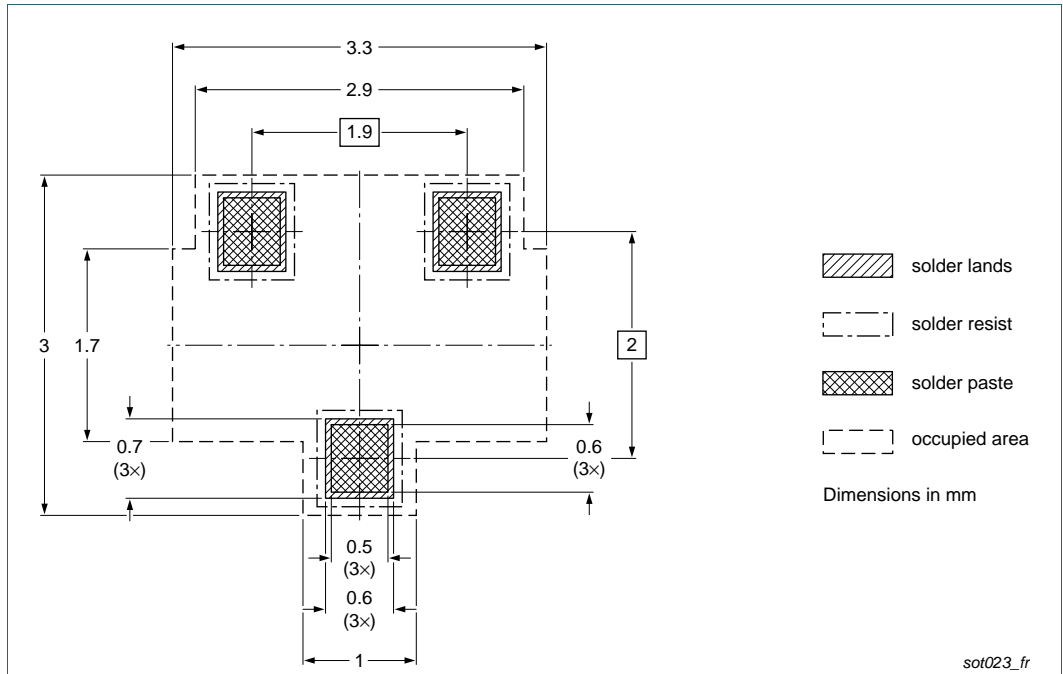


Fig 5. Reflow soldering footprint SOT23 (TO-236AB)

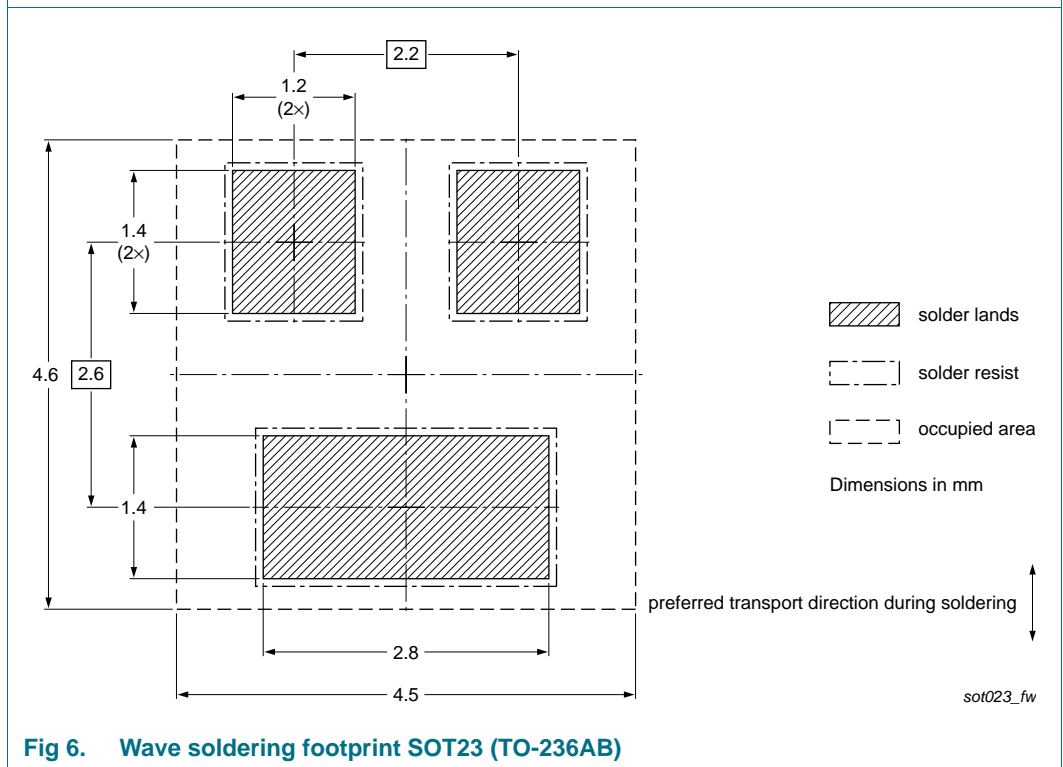


Fig 6. Wave soldering footprint SOT23 (TO-236AB)

12. Revision history

Table 9. Revision history

| Document ID | Release date | Data sheet status | Change notice | Supersedes |
|----------------|---|-----------------------|---------------|------------|
| BAT720 v.4 | 20121114 | Product data sheet | - | BAT720 v.3 |
| Modifications: | <ul style="list-style-type: none"> • The format of this document has been redesigned to comply with the new identity guidelines of NXP Semiconductors. • Legal texts have been adapted to the new company name where appropriate. • Section 1: updated • Section 4: updated • Table 5: added ambient temperature T_{amb} and total power dissipation P_{tot} • Figure 2: updated • Section 8 "Test information": added • Figure 4: replaced by minimized package outline drawing • Section 10 "Packing information": added • Section 11 "Soldering": added • Section 13 "Legal information": updated | | | |
| BAT720 v.3 | 20030325 | Product data sheet | - | BAT720 v.2 |
| BAT720 v.2 | 19990526 | Product specification | - | BAT720 v.1 |
| BAT720 v.1 | 19980121 | Product specification | - | - |

13. Legal information

13.1 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.

[2] The term 'short data sheet' is explained in section "Definitions".

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