



BAT54J

Schottky barrier single diode

Rev. 01 — 8 March 2007

Product data sheet

1. Product profile

1.1 General description

Planar Schottky barrier single diode with an integrated guard ring for stress protection, encapsulated in a SOD323F (SC-90) very small and flat lead Surface-Mounted Device (SMD) plastic package.

1.2 Features

- Low forward voltage
- Very small and flat lead SMD plastic package
- Low capacitance
- Flat leads: excellent coplanarity and improved thermal behavior

1.3 Applications

- Voltage clamping
- Line termination
- Reverse polarity protection

1.4 Quick reference data



Table 1. Quick reference data

| Symbol | Parameter | Conditions | Min | Typ | Max | Unit |
|--------|-----------------|----------------------|-----|-----|-----|------|
| I_F | forward current | | - | - | 200 | mA |
| V_R | reverse voltage | | - | - | 30 | V |
| V_F | forward voltage | $I_F = 1 \text{ mA}$ | [1] | - | 320 | mV |

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

2. Pinning information

Table 2. Pinning

| Pin | Description | Simplified outline | Symbol |
|-----|-------------|--------------------|---|
| 1 | cathode | [1] |  1  2 <i>sym001</i> |
| 2 | anode | | |

[1] The marking bar indicates the cathode.

3. Ordering information

Table 3. Ordering information

| Type number | Package | | |
|-------------|---------|--|---------|
| | Name | Description | Version |
| BAT54J | SC-90 | plastic surface-mounted package; 2 leads | SOD323F |

4. Marking

Table 4. Marking codes

| Type number | Marking code |
|-------------|--------------|
| BAT54J | AP |

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 | | - | 30 | V |
| I_F | forward current | | - | 200 | mA |
| I_{FRM} | repetitive peak forward current | $t_p \leq 1$ s; $\delta \leq 0.5$ | - | 300 | mA |
| I_{FSM} | non-repetitive peak forward current | square wave; $t_p < 10$ ms | - | 600 | mA |
| P_{tot} | total power dissipation | $T_{amb} \leq 25$ °C | [1] - | 550 | mW |
| T_j | junction temperature | | - | 150 | °C |
| T_{amb} | ambient temperature | | -65 | +150 | °C |
| T_{stg} | storage temperature | | -65 | +150 | °C |

[1] Device mounted on an FR4 Printed-Circuit Board (PCB), single-sided copper, tin-plated, mounting pad for cathode 1 cm².

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][2] | - | 230 | K/W |
| $R_{th(j-sp)}$ | thermal resistance from junction to solder point | | [3] | - | 55 | K/W |

[1] Device mounted on an FR4 PCB, single-sided copper, tin-plated, mounting pad for cathode 1 cm².

[2] Reflow soldering is the only recommended soldering method.

[3] Soldering point of cathode tab.

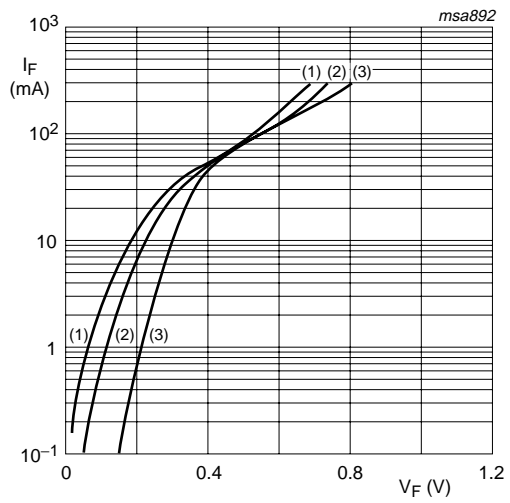
7. Characteristics

Table 7. Characteristics

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

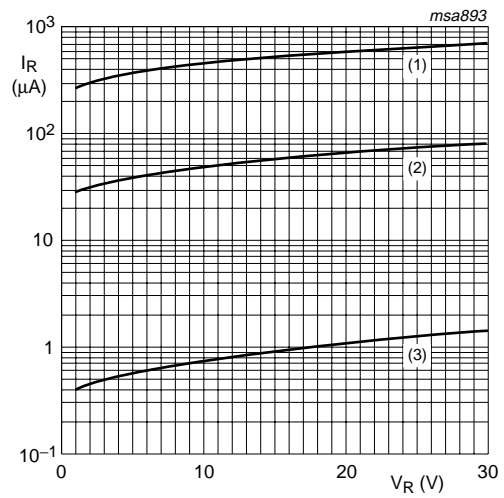
| Symbol | Parameter | Conditions | Min | Typ | Max | Unit |
|--------|-------------------|--------------------------------------|-----|-----|-----|---------------|
| V_F | forward voltage | | [1] | | | |
| | | $I_F = 0.1\text{ mA}$ | - | - | 240 | mV |
| | | $I_F = 1\text{ mA}$ | - | - | 320 | mV |
| | | $I_F = 10\text{ mA}$ | - | - | 400 | mV |
| | | $I_F = 30\text{ mA}$ | - | - | 500 | mV |
| | | $I_F = 100\text{ mA}$ | - | - | 800 | mV |
| I_R | reverse current | $V_R = 25\text{ V}$ | - | - | 2 | μA |
| C_d | diode capacitance | $V_R = 1\text{ V}; f = 1\text{ MHz}$ | - | - | 10 | pF |

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



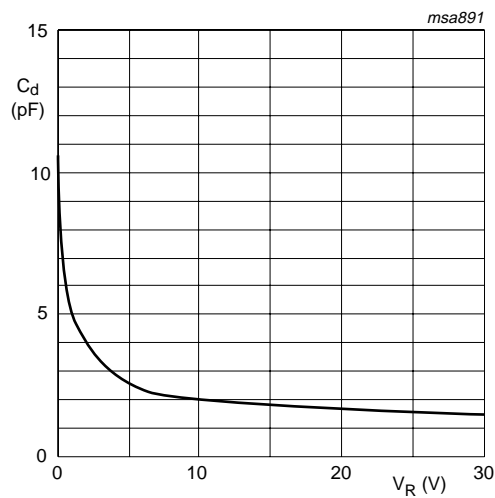
- (1) $T_{amb} = 125\text{ °C}$
- (2) $T_{amb} = 85\text{ °C}$
- (3) $T_{amb} = 25\text{ °C}$

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



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

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

8. Package outline

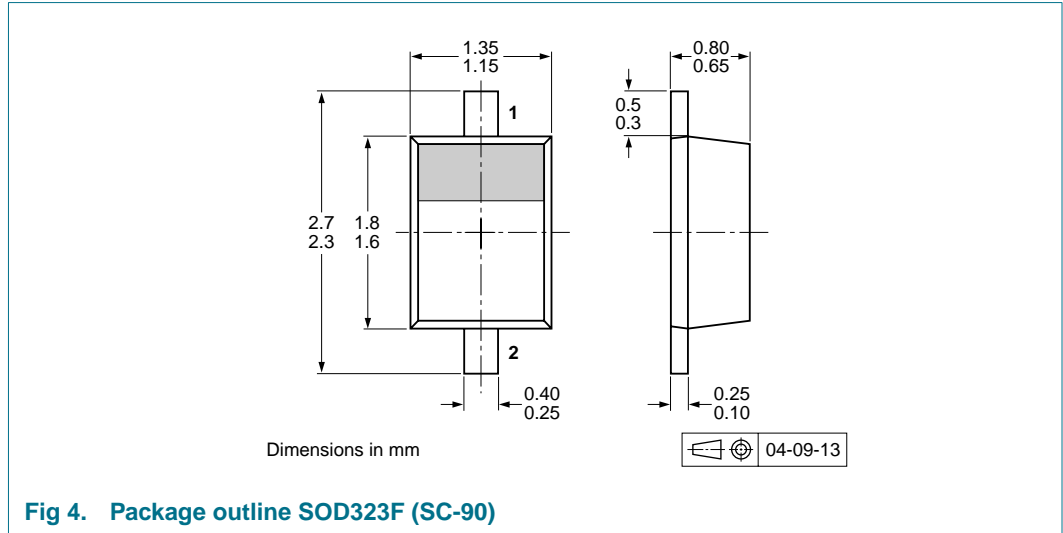


Fig 4. Package outline SOD323F (SC-90)

9. Packing information

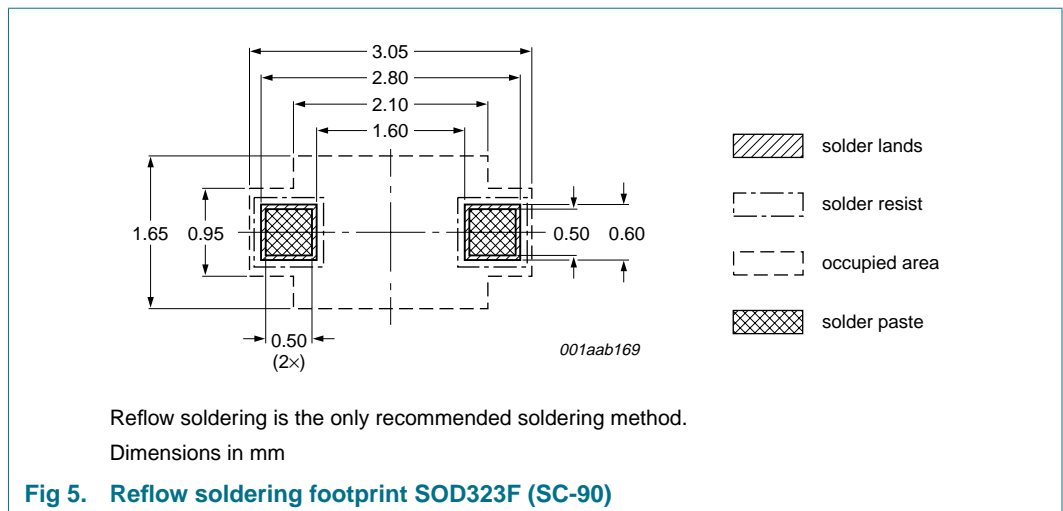
Table 8. Packing methods

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

| Type number | Package | Description | Packing quantity | |
|-------------|---------|--------------------------------|------------------|-------|
| | | | 3000 | 10000 |
| BAT54J | SOD323F | 4 mm pitch, 8 mm tape and reel | -115 | -135 |

[1] For further information and the availability of packing methods, see [Section 13](#).

10. Soldering



11. Revision history

Table 9. Revision history

| Document ID | Release date | Data sheet status | Change notice | Supersedes |
|-------------|--------------|--------------------|---------------|------------|
| BAT54J_1 | 20070308 | Product data sheet | - | - |

12. Legal information

12.1 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. |
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[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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