



BAT54H-Q

Schottky barrier single diode in small SOD123F package

17 May 2023

Product data sheet

1. General description

Planar Schottky barrier diode with an integrated guard ring for stress protection, encapsulated in a SOD123F small and flat lead 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
- Inverse-polarity protection

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 | $I_F = 10 \text{ mA}$; pulsed; $t_p \leq 300 \text{ }\mu\text{s}$; $\delta \leq 0.02$; $T_{\text{amb}} = 25 \text{ }^\circ\text{C}$ | - | - | 400 | mV |

5. Pinning information

Table 2. Pinning information

| Pin | Symbol | Description | Simplified outline | Graphic symbol |
|-----|--------|-------------|--------------------|----------------|
| 1 | K | cathode[1] | SOD123F | aaa-003679 |
| 2 | A | anode | | |

[1] The marking bar indicates the cathode.

6. Ordering information

Table 3. Ordering information

| Type number | Package | | |
|--------------------------|---------|--|-------------------------|
| | Name | Description | Version |
| BAT54H-Q | SOD123F | plastic, surface-mounted package; 2 leads; 2.6 mm x 1.6 mm x 1.1 mm body | SOD123F |

7. Marking

Table 4. Marking codes

| Type number | Marking code |
|-------------|--------------|
| BAT54H-Q | AG |

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 | | | - | 30 | V |
| I_F | forward current | | | - | 200 | mA |
| I_{FRM} | repetitive peak forward current | $t_p \leq 1 \text{ s}$; $\delta \leq 0.5$ | | - | 300 | mA |
| I_{FSM} | non-repetitive peak forward current | $t_p \leq 10 \text{ ms}$; $T_{j(\text{init})} = 25 \text{ }^\circ\text{C}$ | | - | 600 | mA |
| P_{tot} | total power dissipation | $T_{\text{amb}} = 25 \text{ }^\circ\text{C}$ | [1] | - | 375 | mW |
| T_j | junction temperature | | | - | 125 | $^\circ\text{C}$ |
| T_{amb} | ambient temperature | | | -65 | 125 | $^\circ\text{C}$ |
| T_{stg} | storage temperature | | | -65 | 150 | $^\circ\text{C}$ |

[1] 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 |
|-----------------------|--|-------------|-----|-----|-----|-----|------|
| $R_{\text{th}(j-a)}$ | thermal resistance from junction to ambient | in free air | [1] | - | - | 330 | K/W |
| $R_{\text{th}(j-sp)}$ | thermal resistance from junction to solder point | | [2] | - | - | 70 | K/W |

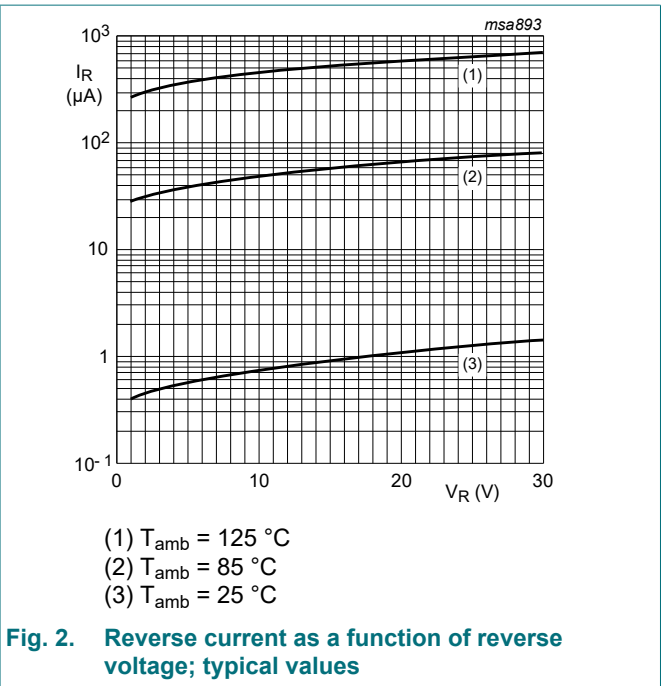
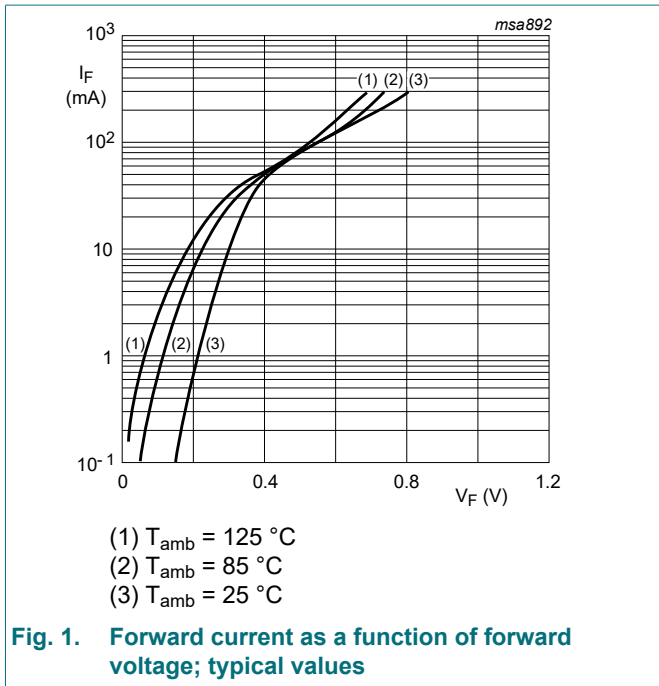
[1] Device mounted on an FR4 PCB, single-sided copper, tin-plated and standard footprint.

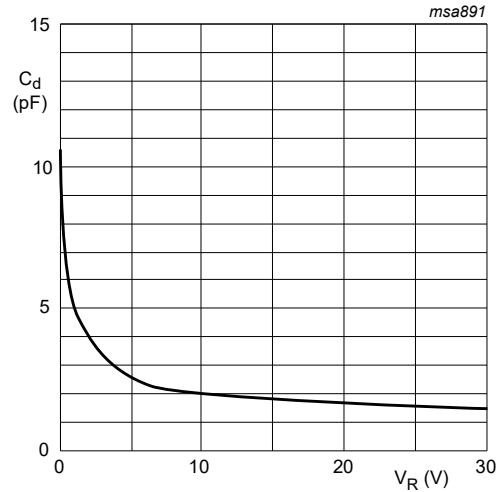
[2] Soldering point of cathode tab.

10. Characteristics

Table 7. Characteristics

| Symbol | Parameter | Conditions | Min | Typ | Max | Unit |
|----------------|-------------------|--|-----|-----|-----|------|
| V _F | forward voltage | I _F = 0.1 mA; pulsed; t _p ≤ 300 μs; δ ≤ 0.02; T _{amb} = 25 °C | - | - | 240 | mV |
| | | I _F = 1 mA; pulsed; t _p ≤ 300 μs; δ ≤ 0.02; T _{amb} = 25 °C | - | - | 320 | mV |
| | | I _F = 10 mA; pulsed; t _p ≤ 300 μs; δ ≤ 0.02; T _{amb} = 25 °C | - | - | 400 | mV |
| | | I _F = 30 mA; pulsed; t _p ≤ 300 μs; δ ≤ 0.02; T _{amb} = 25 °C | - | - | 500 | mV |
| | | I _F = 100 mA; pulsed; t _p ≤ 300 μs; δ ≤ 0.02; T _{amb} = 25 °C | - | - | 800 | mV |
| I _R | reverse current | V _R = 25 V; T _{amb} = 25 °C | - | - | 2 | μA |
| C _d | diode capacitance | V _R = 1 V; f = 1 MHz; T _{amb} = 25 °C | - | - | 10 | pF |





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

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

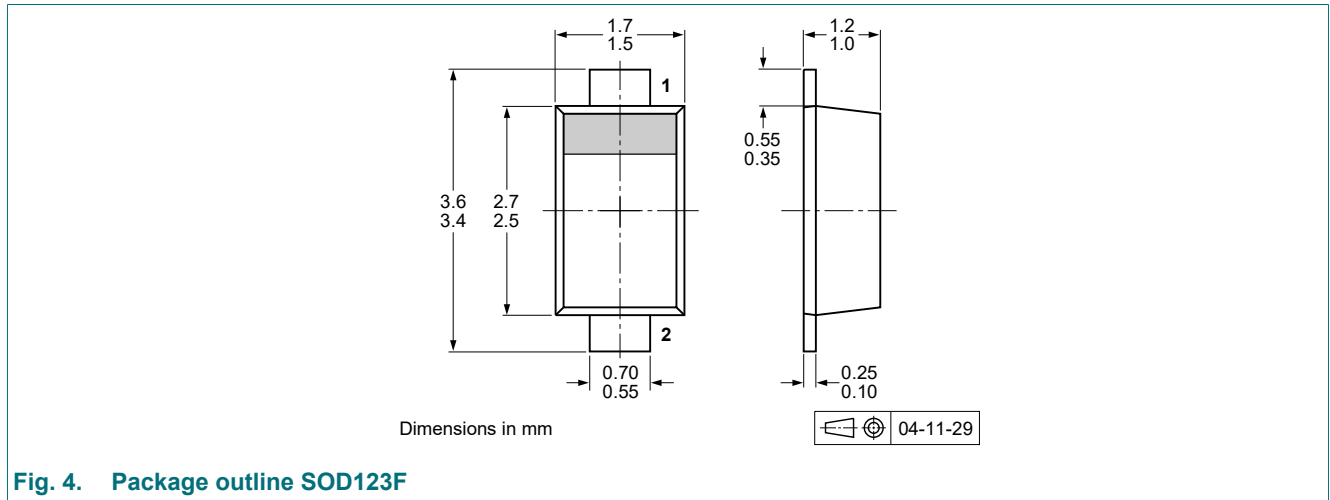


Fig. 4. Package outline SOD123F

13. Soldering

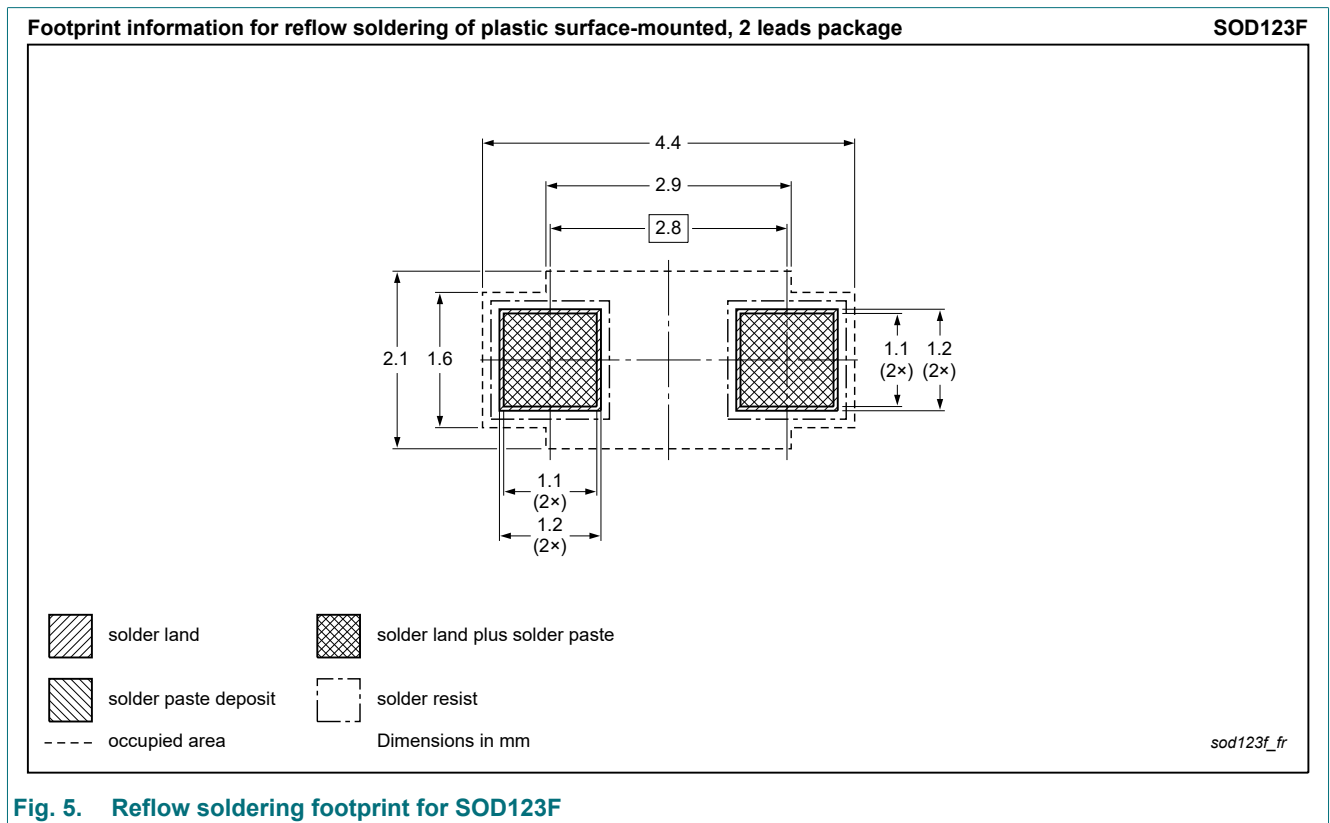


Fig. 5. Reflow soldering footprint for SOD123F

14. Revision history

Table 8. Revision history

| Data sheet ID | Release date | Data sheet status | Change notice | Supersedes |
|---------------|--------------|--------------------|---------------|------------|
| BAT54H-Q v.1 | 20230517 | 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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