



# BAV74

## High-speed double diode

23 January 2024

Product data sheet

### 1. General description

The BAV74 consists of two high-speed switching diodes with common cathodes, fabricated in planar technology, and encapsulated in a small SOT23 Surface-Mounted Device (SMD) plastic package.

### 2. Features and benefits

- Small plastic SMD package
- High switching speed: max. 4 ns
- Continuous reverse voltage: max. 50 V
- Repetitive peak reverse voltage: max. 60 V
- Repetitive peak forward current: max. 450 mA
- AEC-Q101 qualified

### 3. Applications

- High-speed switching in thick and thin-film circuits

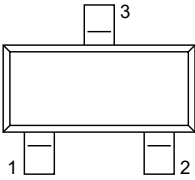
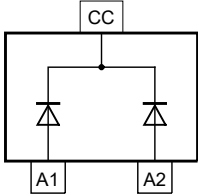
### 4. Quick reference data

Table 1. Quick reference data

| Symbol    | Parameter       | Conditions                                           | Min | Typ | Max | Unit          |
|-----------|-----------------|------------------------------------------------------|-----|-----|-----|---------------|
| Per diode |                 |                                                      |     |     |     |               |
| $V_R$     | reverse voltage |                                                      | -   | -   | 50  | V             |
| $I_R$     | reverse current | $V_R = 25\text{ V}; T_J = 25\text{ }^\circ\text{C}$  | -   | -   | 30  | nA            |
|           |                 | $V_R = 25\text{ V}; T_J = 150\text{ }^\circ\text{C}$ | -   | -   | 30  | $\mu\text{A}$ |

### 5. Pinning information

Table 2. Pinning information

| Pin | Symbol | Description     | Simplified outline                                                                           | Graphic symbol                                                                                      |
|-----|--------|-----------------|----------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------|
| 1   | A1     | anode (diode 1) | <br>SOT23 | <br>aaa-032141 |
| 2   | A2     | anode (diode 2) |                                                                                              |                                                                                                     |
| 3   | CC     | common cathode  |                                                                                              |                                                                                                     |

6. Ordering information

Table 3. Ordering information

| Type number | Package |                                                                                          |         |
|-------------|---------|------------------------------------------------------------------------------------------|---------|
|             | Name    | Description                                                                              | Version |
| BAV74       | SOT23   | plastic, surface-mounted package; 3 terminals; 1.9 mm pitch; 2.9 mm x 1.3 mm x 1 mm body | SOT23   |

7. Marking

Table 4. Marking codes

| Type number | Marking code[1] |
|-------------|-----------------|
| BAV74       | JA%             |

[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 |
|------------------|-------------------------------------|---------------------------------------------------------------------------|-----|-----|-----|------|
| Per diode        |                                     |                                                                           |     |     |     |      |
| V <sub>R</sub>   | reverse voltage                     |                                                                           |     | -   | 50  | V    |
| V <sub>RRM</sub> | repetitive peak reverse voltage     |                                                                           |     | -   | 60  | V    |
| I <sub>F</sub>   | forward current                     | single diode loaded                                                       | [1] | -   | 215 | mA   |
|                  |                                     | double diode loaded                                                       | [1] | -   | 125 | mA   |
| I <sub>FRM</sub> | repetitive peak forward current     |                                                                           |     | -   | 450 | mA   |
| I <sub>FSM</sub> | non-repetitive peak forward current | t <sub>p</sub> = 1 μs; square wave; T <sub>j</sub> = 25 °C prior to surge |     | -   | 4   | A    |
|                  |                                     | t <sub>p</sub> = 1 ms; square wave; T <sub>j</sub> = 25 °C prior to surge |     | -   | 1   | A    |
|                  |                                     | t <sub>p</sub> = 1 s; square wave; T <sub>j</sub> = 25 °C prior to surge  |     | -   | 0.5 | A    |
| P <sub>tot</sub> | total power dissipation             | T <sub>amb</sub> = 25 °C                                                  | [1] | -   | 250 | mW   |
| T <sub>j</sub>   | junction temperature                |                                                                           |     | -   | 150 | °C   |
| T <sub>amb</sub> | ambient temperature                 |                                                                           |     | -55 | 150 | °C   |
| T <sub>stg</sub> | storage temperature                 |                                                                           |     | -65 | 150 | °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

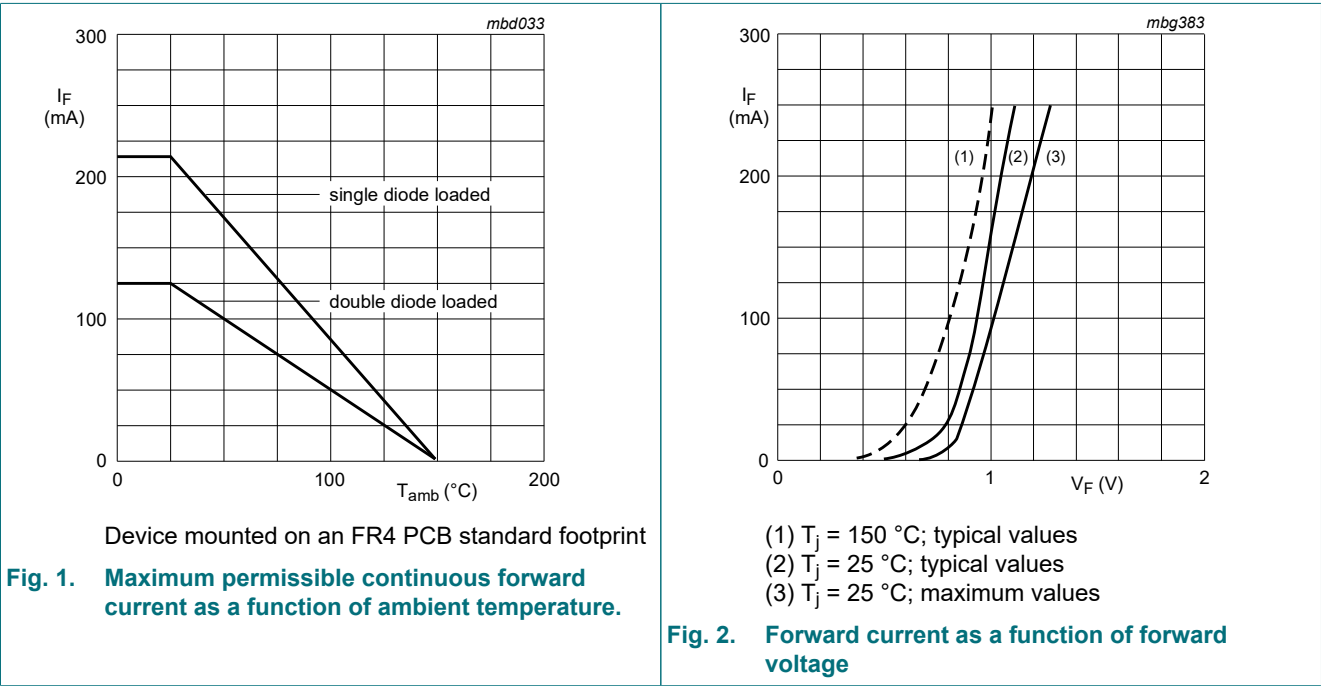
| Symbol         | Parameter                                        | Conditions  |     | Min | Typ | Max | Unit |
|----------------|--------------------------------------------------|-------------|-----|-----|-----|-----|------|
| $R_{th(j-a)}$  | thermal resistance from junction to ambient      | in free air | [1] | -   | -   | 500 | K/W  |
| $R_{th(j-sp)}$ | thermal resistance from junction to solder point |             |     | -   | -   | 360 | K/W  |

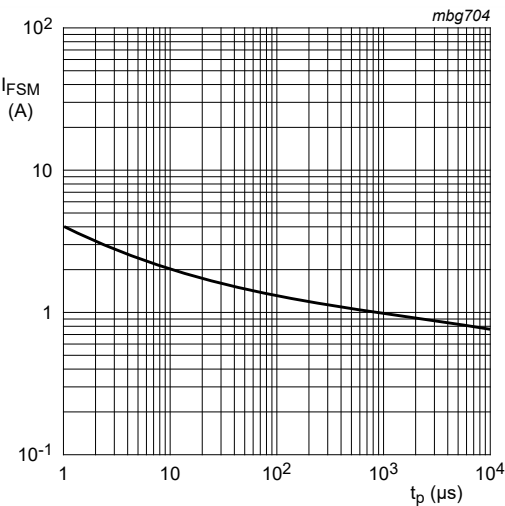
[1] Device mounted on an FR4 PCB, single-sided copper, tin-plated and standard footprint.

10. Characteristics

Table 7. Characteristics

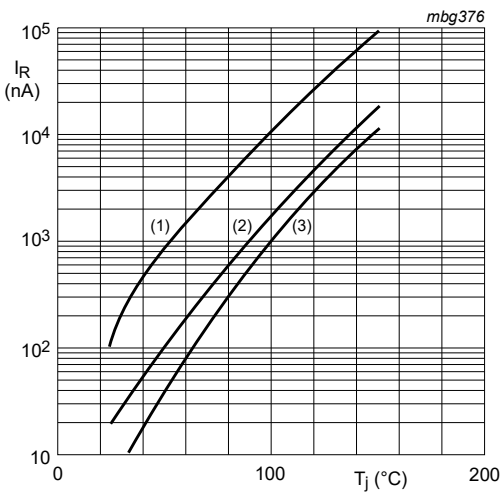
| Symbol    | Parameter                     | Conditions                                                                                                                         |  | Min | Typ | Max  | Unit          |
|-----------|-------------------------------|------------------------------------------------------------------------------------------------------------------------------------|--|-----|-----|------|---------------|
| Per diode |                               |                                                                                                                                    |  |     |     |      |               |
| $V_F$     | forward voltage               | $I_F = 1\text{ mA}; T_j = 25\text{ }^{\circ}\text{C}$                                                                              |  | -   | -   | 715  | mV            |
|           |                               | $I_F = 10\text{ mA}; T_j = 25\text{ }^{\circ}\text{C}$                                                                             |  | -   | -   | 855  | mV            |
|           |                               | $I_F = 100\text{ mA}; T_j = 25\text{ }^{\circ}\text{C}$                                                                            |  | -   | -   | 1    | V             |
| $I_R$     | reverse current               | $V_R = 25\text{ V}; T_j = 25\text{ }^{\circ}\text{C}$                                                                              |  | -   | -   | 30   | nA            |
|           |                               | $V_R = 50\text{ V}; T_j = 25\text{ }^{\circ}\text{C}$                                                                              |  | -   | -   | 0.1  | $\mu\text{A}$ |
|           |                               | $V_R = 25\text{ V}; T_j = 150\text{ }^{\circ}\text{C}$                                                                             |  | -   | -   | 30   | $\mu\text{A}$ |
|           |                               | $V_R = 50\text{ V}; T_j = 150\text{ }^{\circ}\text{C}$                                                                             |  | -   | -   | 100  | $\mu\text{A}$ |
| $C_d$     | diode capacitance             | $V_R = 0\text{ V}; f = 1\text{ MHz}; T_j = 25\text{ }^{\circ}\text{C}$                                                             |  | -   | -   | 1.5  | pF            |
| $t_{rr}$  | reverse recovery time         | $I_F = 10\text{ mA}; I_R = 10\text{ mA}; I_{R(meas)} = 1\text{ mA}; R_L = 100\text{ }\Omega; T_{amb} = 25\text{ }^{\circ}\text{C}$ |  | -   | -   | 4    | ns            |
| $V_{FRM}$ | peak forward recovery voltage | $I_F = 10\text{ mA}; t_r = 20\text{ ns}; T_j = 25\text{ }^{\circ}\text{C}$                                                         |  | -   | -   | 1.75 | V             |





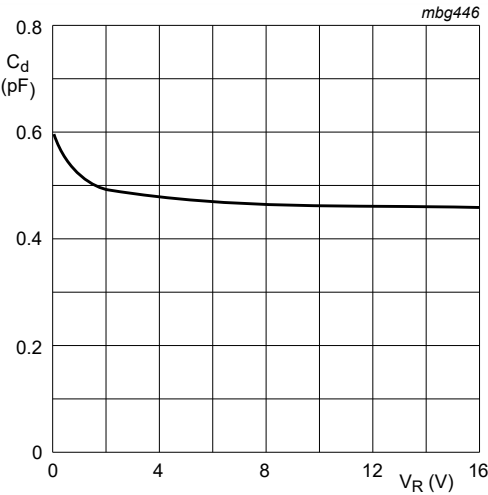
Based on square wave currents.  
 $T_{j(init)} = 25\text{ }^{\circ}\text{C}$

Fig. 3. Non-repetitive peak forward current as a function of pulse duration; typical values



(1)  $V_R = 50\text{ V}$ ; maximum values  
(2)  $V_R = 50\text{ V}$ ; typical values  
(3)  $V_R = 25\text{ V}$ ; typical values

Fig. 4. Reverse current as a function of junction temperature



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

Fig. 5. Diode capacitance as a function of reverse voltage; typical values

11. Test information

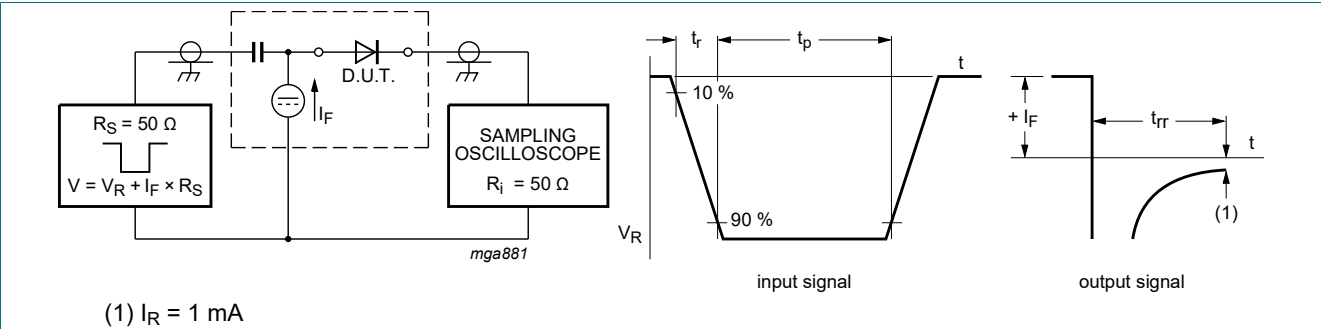


Fig. 6. Reverse recovery time test circuit and waveforms

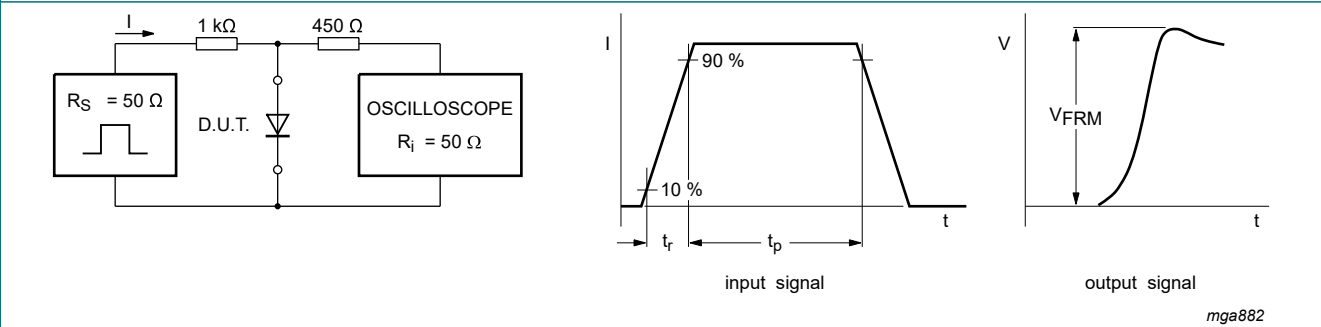


Fig. 7. Forward recovery voltage test circuit and waveforms

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

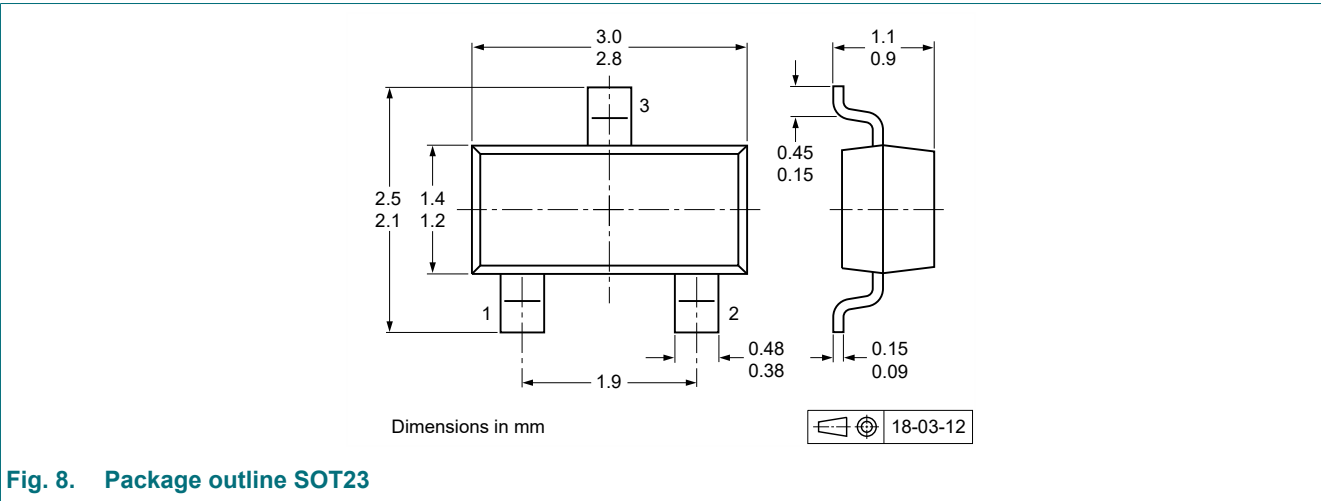
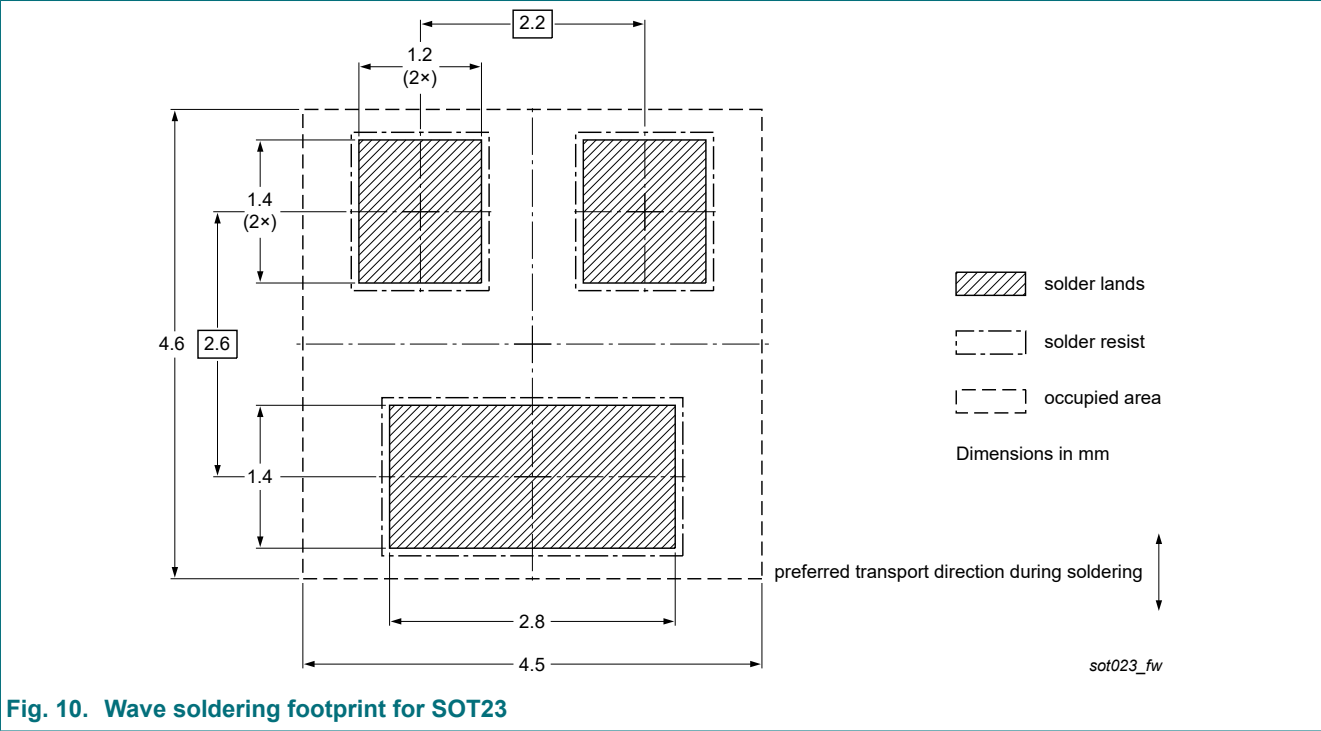
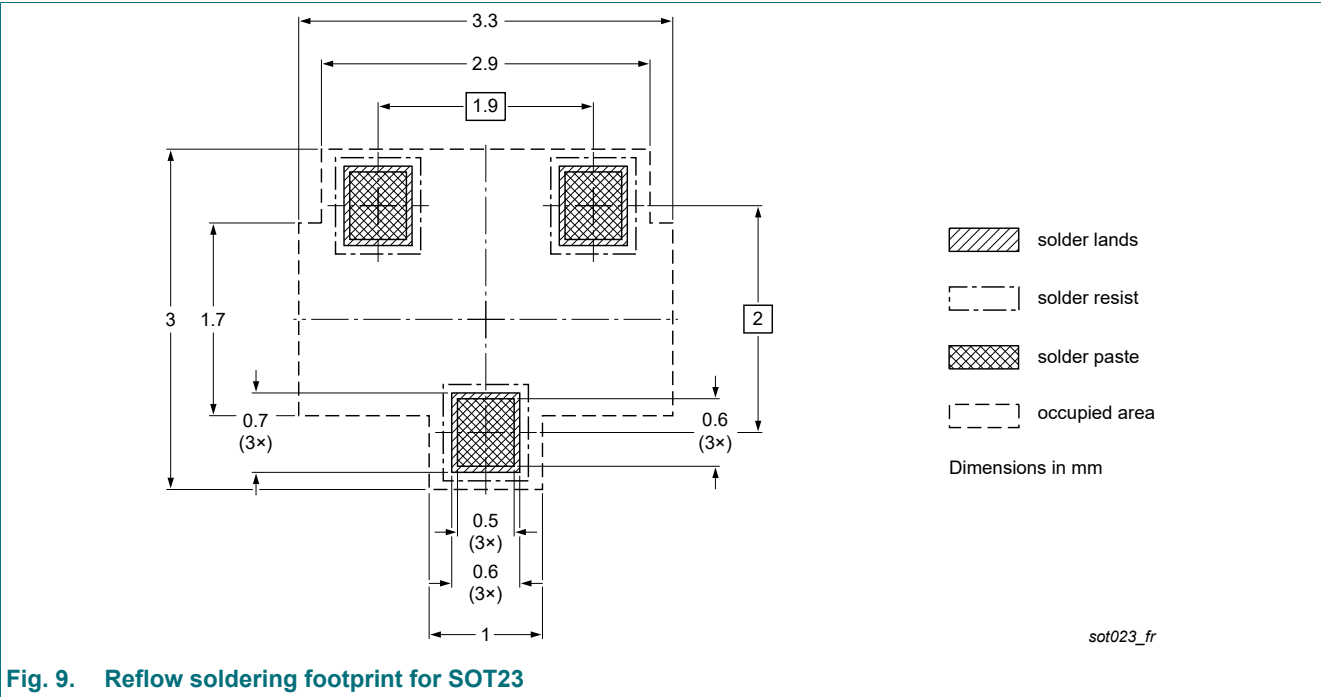


Fig. 8. Package outline SOT23

13. Soldering



14. Revision history

Table 8. Revision history

| Data sheet ID  | Release date                                                                                                                                                                                                                           | Data sheet status  | Change notice | Supersedes |
|----------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|---------------|------------|
| BAV74 v.3      | 20240123                                                                                                                                                                                                                               | Product data sheet | -             | BAV74 v.2  |
| Modifications: | <ul style="list-style-type: none"><li>The format of this data sheet has been redesigned to comply with the identity guidelines of Nexperia.</li><li>Legal texts have been adapted to the new company name where appropriate.</li></ul> |                    |               |            |
| BAV74 v.2      | 20040114                                                                                                                                                                                                                               | Product data sheet | -             | BAV74 v.1  |
| BAV74 v.1      | 19990511                                                                                                                                                                                                                               | 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.                                     |

- [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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