



# BAV23A-Q

## Dual high-voltage switching diodes

4 April 2022

Product data sheet

### 1. General description

Dual high-voltage switching diodes, encapsulated in a small SOT23 (TO-236AB) Surface-Mounted Device (SMD) plastic package.

### 2. Features and benefits

- High switching speed:  $t_{rr} \leq 50$  ns
- Low leakage current
- Repetitive peak reverse voltage:  $V_{RRM} \leq 250$  V
- Low capacitance:  $C_d \leq 2$  pF
- Small SMD plastic package
- Qualified according to AEC-Q101 and recommended for use in automotive applications

### 3. Applications

- High-speed switching at high voltage
- High-voltage general-purpose switching

### 4. Quick reference data

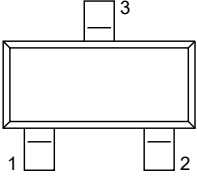
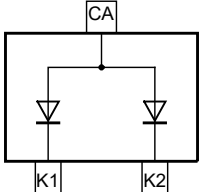
Table 1. Quick reference data

| Symbol           | Parameter             | Conditions  |     | Min | Typ | Max | Unit |
|------------------|-----------------------|---|-----|-----|-----|-----|------|
| <b>Per diode</b> |                       |   |     |     |     |     |      |
| $I_F$            | forward current       | Single diode loaded   | [1] | -   | -   | 225 | mA   |
| $V_R$            | reverse voltage       |   |     | -   | -   | 200 | V    |
| $I_R$            | reverse current       | $V_R = 200$ V   |     | -   | -   | 100 | nA   |
| $t_{rr}$         | reverse recovery time | $I_F = 10$ mA; $I_R = 10$ mA; $I_{R(meas)} = 1$ mA;<br>$R_L = 100$ $\Omega$ ; $T_{amb} = 25$ °C |     | -   | -   | 50  | ns   |

[1] Single diode loaded.

## 5. Pinning information

Table 2. Pinning information

| Pin | Symbol | Description       | Simplified outline  | Graphic symbol   |
|-----|--------|-------------------|---|--|
| 1   | K1     | cathode (diode 1) |  <p style="text-align: center;"><b>SOT23</b></p> |  <p style="text-align: center;">006aab099</p> |
| 2   | K2     | cathode (diode 2) |   |  |
| 3   | CA     | common anode      |   |  |

## 6. Ordering information

Table 3. Ordering information

| Type number | Package |  |         |
|-------------|---------|--|---------|
|             | Name    | Description  | Version |
| BAV23A-Q    | 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 <sup>[1]</sup> |
|-------------|-----------------------------|
| BAV23A-Q    | %V0                         |

[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             |
|-------------------|-------------------------------------|--|-----|-----|-----|------------------|
| <b>Per diode</b>  |                                     |  |     |     |     |                  |
| $V_R$             | reverse voltage                     |  |     | -   | 200 | V                |
| $V_{RRM}$         | repetitive peak reverse voltage     |  |     | -   | 250 | V                |
| $I_F$             | forward current                     | Single diode loaded                      | [1] | -   | 225 | mA               |
|                   |                                     |  | [2] | -   | 125 | mA               |
| $I_{FRM}$         | repetitive peak forward current     |  |     | -   | 625 | mA               |
| $I_{FSM}$         | non-repetitive peak forward current | $t_p = 1 \mu\text{s}$ ; square wave      | [3] | -   | 9   | A                |
|                   |                                     | $t_p = 100 \mu\text{s}$ ; square wave    | [3] | -   | 3   | A                |
|                   |                                     | $t_p = 10 \text{ms}$ ; square wave       | [3] | -   | 1.7 | A                |
| <b>Per device</b> |                                     |  |     |     |     |                  |
| $P_{tot}$         | total power dissipation             | $T_{amb} \leq 25 \text{ }^\circ\text{C}$ | [4] | -   | 250 | mW               |
| $T_j$             | junction temperature                |  |     | -   | 150 | $^\circ\text{C}$ |
| $T_{amb}$         | ambient temperature                 |  |     | -65 | 150 | $^\circ\text{C}$ |
| $T_{stg}$         | storage temperature                 |  |     | -65 | 150 | $^\circ\text{C}$ |

[1] Single diode loaded.

[2] Double diode loaded.

[3]  $T_j = 25 \text{ }^\circ\text{C}$  prior to surge.

[4] 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 |
|-------------------|--|-------------|-----|-----|-----|-----|------|
| <b>Per device</b> |  |             |     |     |     |     |      |
| $R_{th(j-a)}$     | 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  |

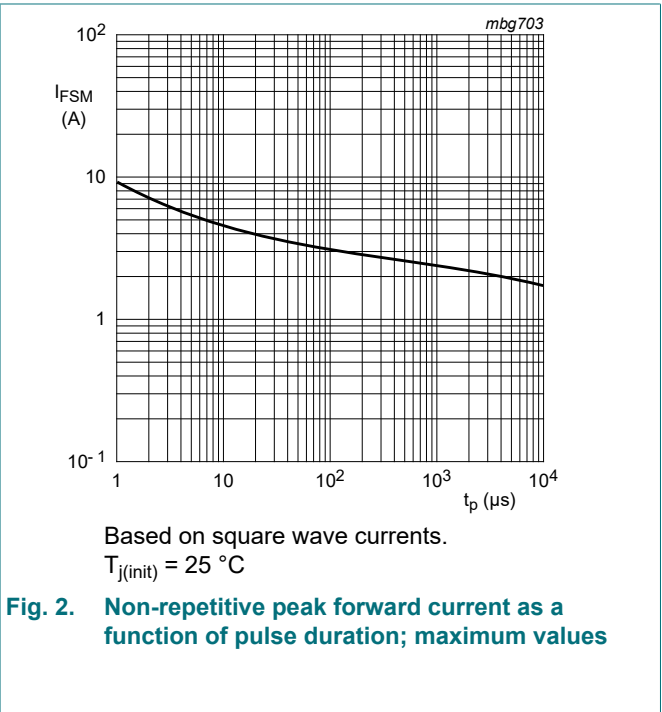
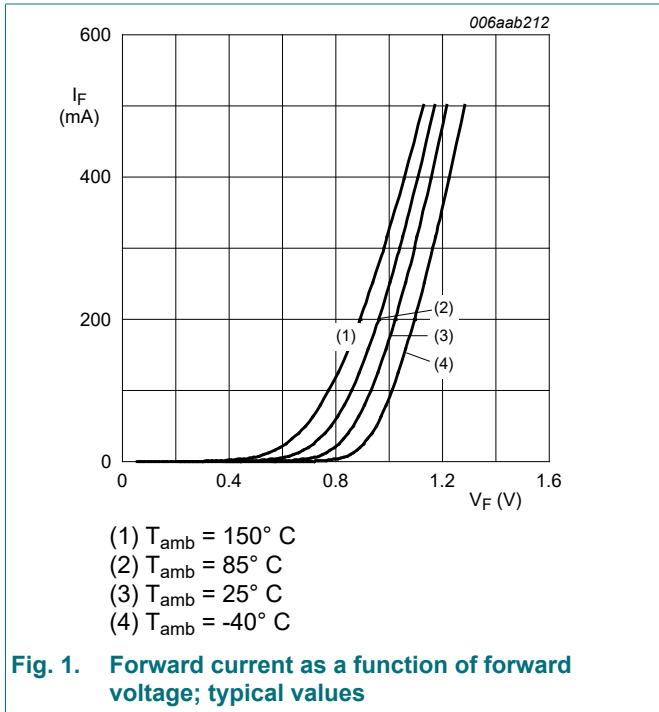
[1] Device mounted on an FR4 PCB, single-sided copper, tin-plated and standard footprint.

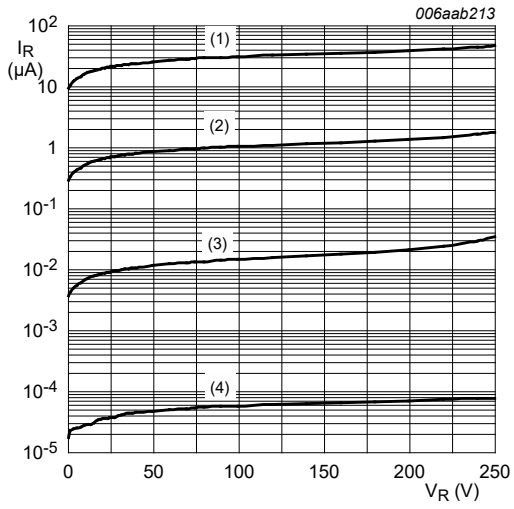
## 10. Characteristics

**Table 7. Characteristics**

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

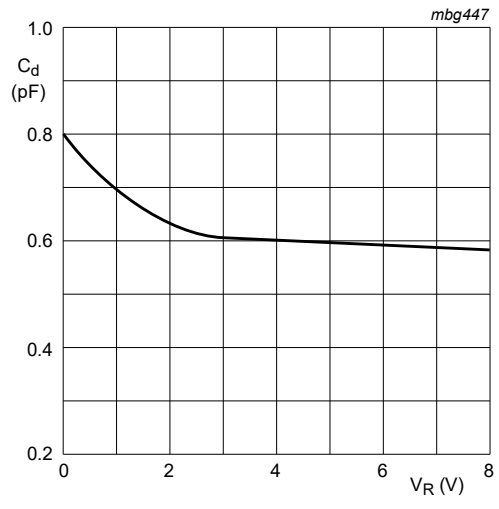
| Symbol           | Parameter             | Conditions  | Min | Typ | Max  | Unit          |
|------------------|-----------------------|---|-----|-----|------|---------------|
| <b>Per diode</b> |                       |   |     |     |      |               |
| $V_F$            | forward voltage       | $I_F = 100\text{ mA}$   | -   | -   | 1    | V             |
|                  |                       | $I_F = 200\text{ mA}$   | -   | -   | 1.25 | V             |
| $I_R$            | reverse current       | $V_R = 200\text{ V}$  | -   | -   | 100  | nA            |
|                  |                       | $V_R = 200\text{ V}; T_J = 150\text{ }^{\circ}\text{C}$   | -   | -   | 100  | $\mu\text{A}$ |
| $C_d$            | diode capacitance     | $V_R = 0\text{ V}; f = 1\text{ MHz}$  | -   | -   | 2    | pF            |
| $t_{rr}$         | reverse recovery time | $I_F = 10\text{ mA}; I_R = 10\text{ mA}; I_{R(\text{meas})} = 1\text{ mA}; R_L = 100\text{ }\Omega; T_{amb} = 25\text{ }^{\circ}\text{C}$ | -   | -   | 50   | ns            |





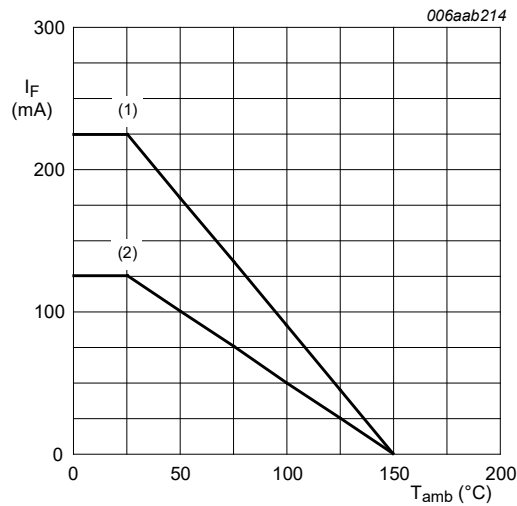
- (1)  $T_{\text{amb}} = 150^\circ\text{C}$
- (2)  $T_{\text{amb}} = 85^\circ\text{C}$
- (3)  $T_{\text{amb}} = 25^\circ\text{C}$
- (4)  $T_{\text{amb}} = -40^\circ\text{C}$

**Fig. 3. Reverse current as a function of reverse voltage; typical values**



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

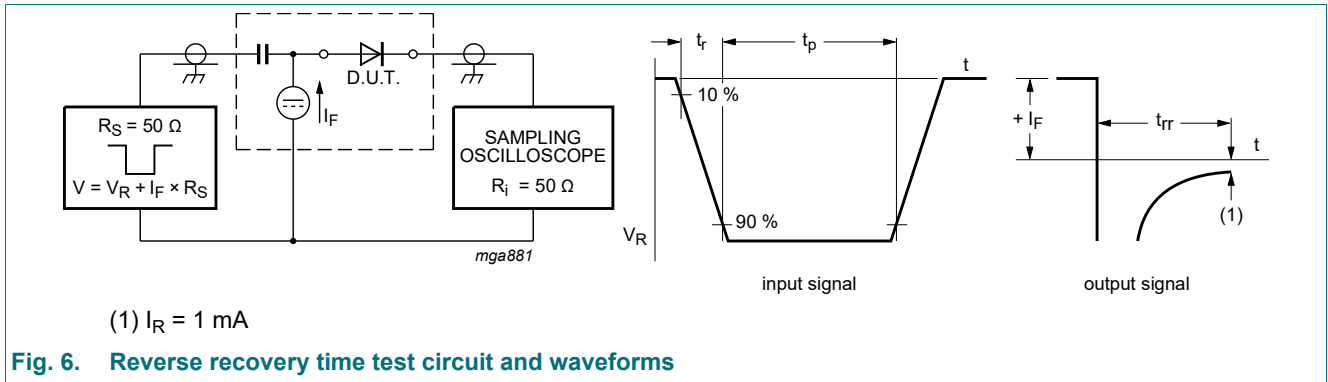
**Fig. 4. Diode capacitance as a function of reverse voltage; typical values.**



FR4 PCB, standard footprint  
 (1) Single diode loaded  
 (2) Double diode loaded

**Fig. 5. Forward current as a function of ambient temperature; derating curves**

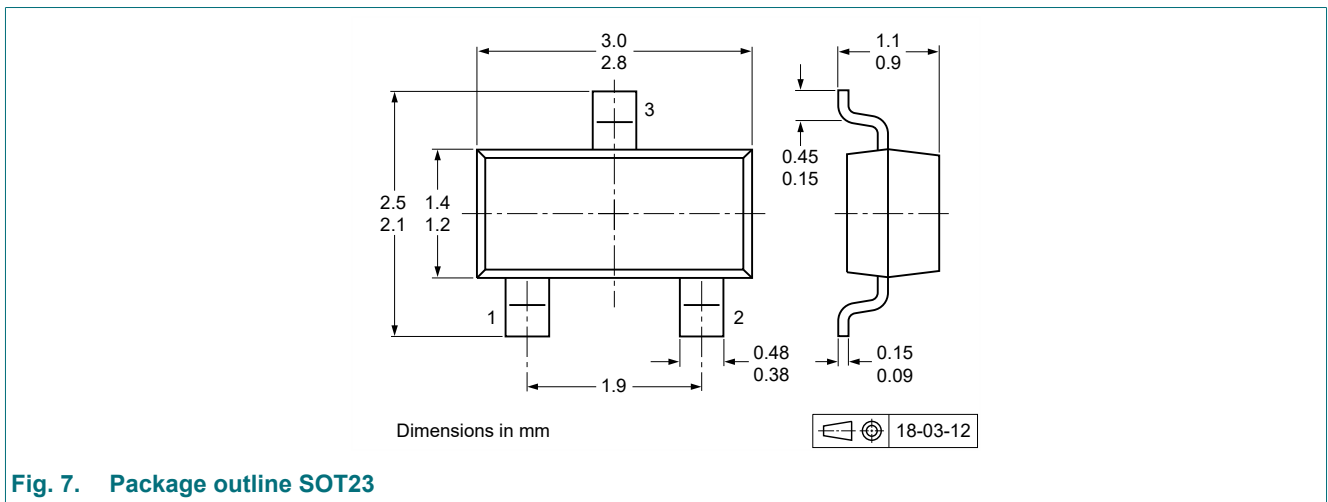
### 11. Test information



#### 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



### 13. Soldering

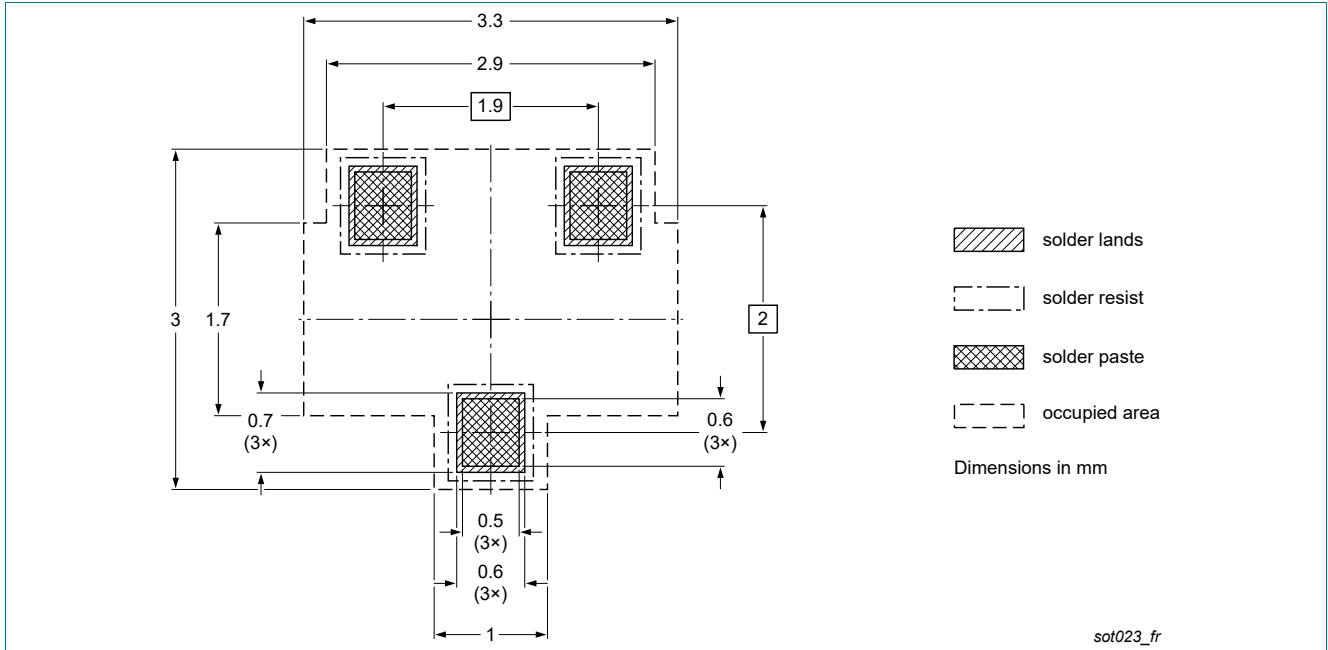


Fig. 8. Reflow soldering footprint for SOT23

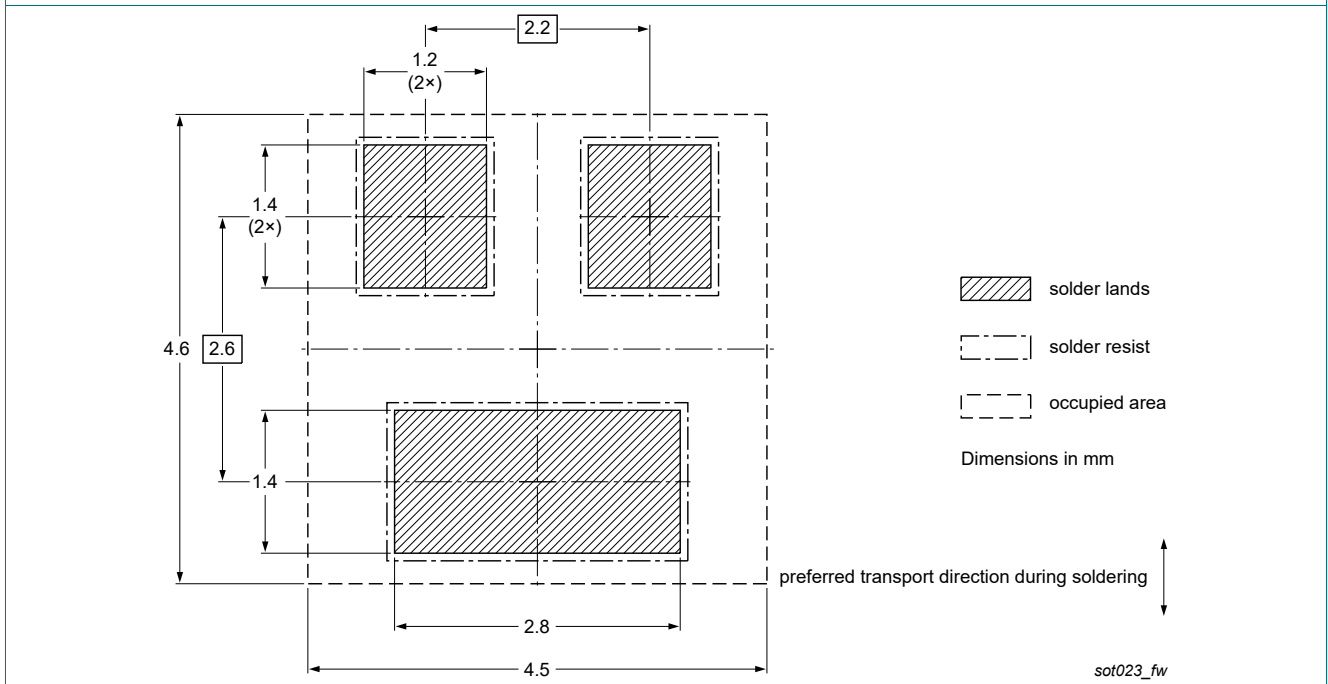


Fig. 9. Wave soldering footprint for SOT23

## 14. Revision history

Table 8. Revision history

| Data sheet ID  | Release date              | Data sheet status  | Change notice | Supersedes   |
|----------------|---------------------------|--------------------|---------------|--------------|
| BAV23A-Q v.2   | 20220404                  | Product data sheet | -             | BAV23A-Q v.1 |
| Modifications: | • Pinning table corrected |                    |               |              |
| BAV23A-Q v.1   | 20220202                  | 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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