



# BAV70W-Q

## High-speed switching double diode

14 June 2021

Product data sheet

### 1. General description

High-speed switching double diode, encapsulated in a very small SOT323 (SC-70) Surface-Mounted Device (SMD) plastic package.

### 2. Features and benefits

- High switching speed:  $t_{rr} \leq 4$  ns
- Low capacitance:  $C_d \leq 1.5$  pF
- Low leakage current
- Reverse voltage:  $V_R \leq 100$  V
- Very small SMD plastic package
- Qualified according to AEC-Q101 and recommended for use in automotive applications

### 3. Applications

- High-speed switching
- General-purpose switching

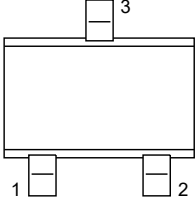
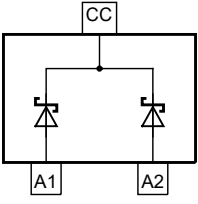
### 4. Quick reference data

Table 1. Quick reference data

| Symbol           | Parameter             | Conditions  | Min | Typ | Max | Unit |
|------------------|-----------------------|---|-----|-----|-----|------|
| <b>Per diode</b> |                       |   |     |     |     |      |
| $I_R$            | reverse current       | $V_R = 80$ V; $T_{amb} = 25$ °C   | -   | -   | 0.5 | µA   |
| $V_R$            | reverse voltage       |   | -   | -   | 100 | V    |
| $t_{rr}$         | reverse recovery time | $I_F = 10$ mA; $I_R = 10$ mA; $I_{R(meas)} = 1$ mA;<br>$R_L = 100$ Ω; $T_{amb} = 25$ °C | -   | -   | 4   | ns   |

## 5. Pinning information

Table 2. Pinning information

| Pin | Symbol | Description     | Simplified outline  | Graphic symbol   |
|-----|--------|-----------------|---|--|
| 1   | A1     | anode (diode 1) |  <p>SC-70 (SOT323)</p> |  <p>006aab034</p> |
| 2   | A2     | anode (diode 2) |   |  |
| 3   | CC     | common cathode  |   |  |

## 6. Ordering information

Table 3. Ordering information

| Type number | Package |  |         |
|-------------|---------|--|---------|
|             | Name    | Description  | Version |
| BAV70W-Q    | SC-70   | plastic, surface-mounted package; 3 leads; 1.3 mm pitch; 2 mm x 1.25 mm x 0.95 mm body | SOT323  |

## 7. Marking

Table 4. Marking codes

| Type number | Marking code[1] |
|-------------|-----------------|
| BAV70W-Q    | A4%             |

[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                     |                                      |     | -   | 100 | V    |
| $V_{RRM}$         | repetitive peak reverse voltage     |                                      |     | -   | 100 | V    |
| $I_F$             | forward current                     | $T_{amb} \leq 25\text{ °C}$          |     | -   | 175 | mA   |
| $I_{FRM}$         | repetitive peak forward current     |                                      |     | -   | 500 | mA   |
| $I_{FSM}$         | non-repetitive peak forward current | $t_p = 1\ \mu\text{s}$ ; square wave | [1] | -   | 4   | A    |
|                   |                                     | $t_p = 1\ \text{ms}$ ; square wave   | [1] | -   | 1   | A    |
|                   |                                     | $t_p = 1\ \text{s}$ ; square wave    | [1] | -   | 0.5 | A    |
| $P_{tot}$         | total power dissipation             | $T_{amb} \leq 25\text{ °C}$          | [2] | -   | 200 | mW   |
| <b>Per device</b> |                                     |                                      |     |     |     |      |
| $I_F$             | forward current                     | $T_{amb} \leq 25\text{ °C}$          |     | -   | 100 | mA   |
| $T_j$             | junction temperature                |                                      |     | -   | 150 | °C   |
| $T_{amb}$         | ambient temperature                 |                                      |     | -65 | 150 | °C   |
| $T_{stg}$         | storage temperature                 |                                      |     | -65 | 150 | °C   |

[1]  $t_j = 25\text{ °C}$  prior to surge

[2] Device mounted on an FR4 Printed-Circuit Board (PCB), single-sided copper, tin-plated and standard footprint.

## 9. Thermal characteristics

**Table 6. Thermal characteristics**

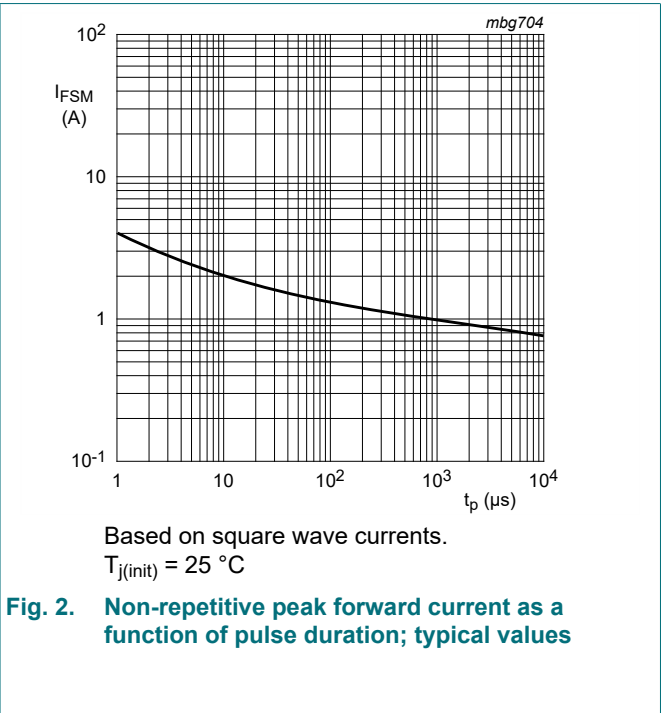
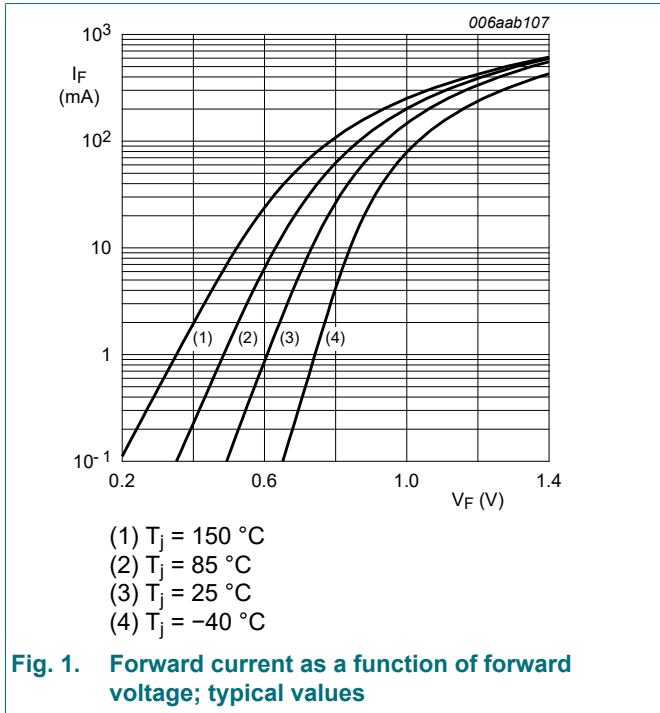
| Symbol        | Parameter                                   | Conditions  |     | Min | Typ | Max | Unit |
|---------------|---|-------------|-----|-----|-----|-----|------|
| $R_{th(j-a)}$ | thermal resistance from junction to ambient | in free air | [1] | -   | -   | 625 | K/W  |

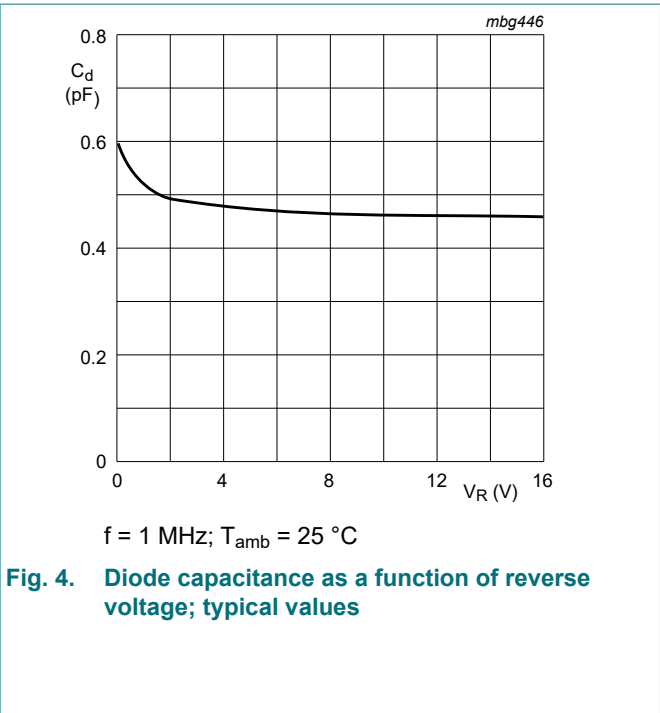
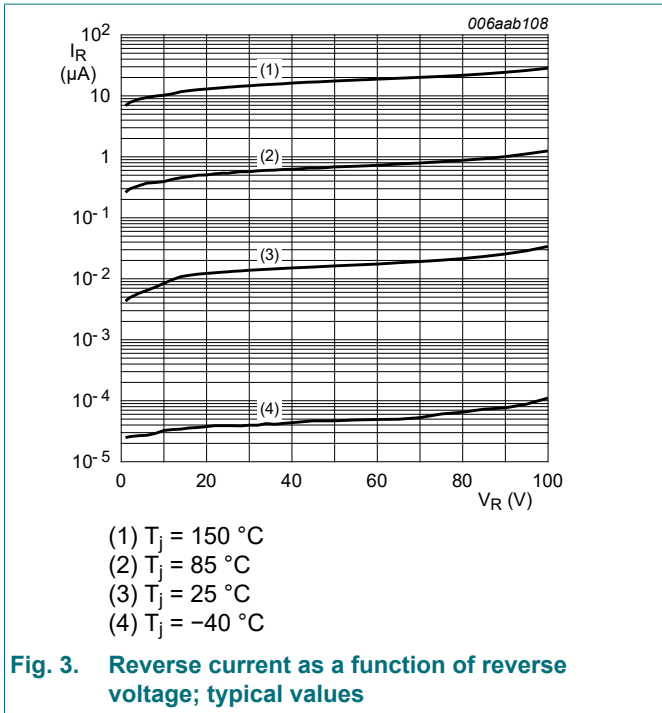
[1] Device mounted on an FR4 PCB, single-sided copper, tin-plated and standard footprint.

### 10. Characteristics

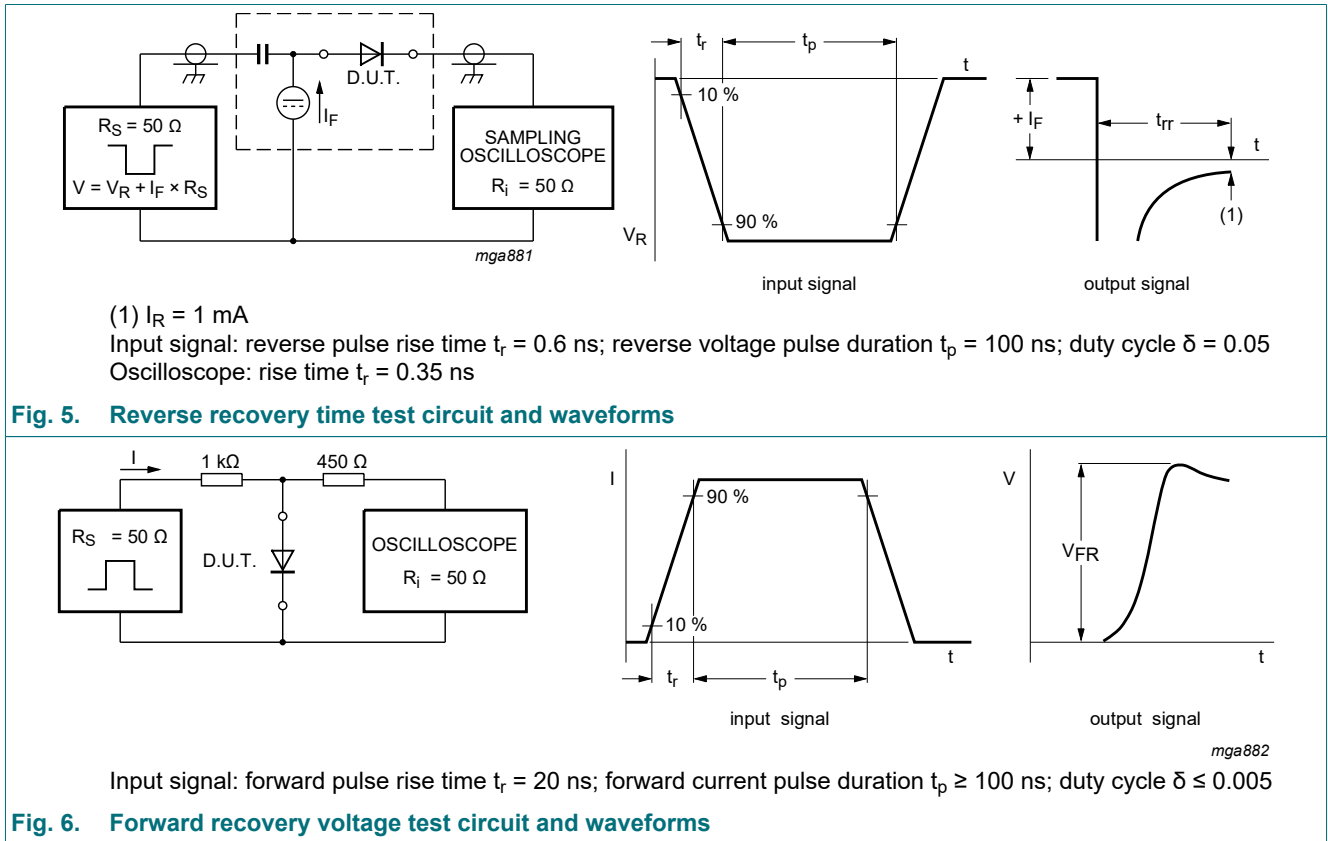
Table 7. Characteristics

| Symbol           | Parameter                     | Conditions  | Min | Typ | Max  | Unit |
|------------------|-------------------------------|---|-----|-----|------|------|
| <b>Per diode</b> |                               |   |     |     |      |      |
| V <sub>F</sub>   | forward voltage               | I <sub>F</sub> = 1 mA; t <sub>p</sub> ≤ 300 μs; δ ≤ 0.02; pulsed; T <sub>amb</sub> = 25 °C                                    | -   | -   | 715  | mV   |
|                  |                               | I <sub>F</sub> = 10 mA; t <sub>p</sub> ≤ 300 μs; δ ≤ 0.02; pulsed; T <sub>amb</sub> = 25 °C                                   | -   | -   | 855  | mV   |
|                  |                               | I <sub>F</sub> = 50 mA; t <sub>p</sub> ≤ 300 μs; δ ≤ 0.02; pulsed; T <sub>amb</sub> = 25 °C                                   | -   | -   | 1    | V    |
|                  |                               | I <sub>F</sub> = 150 mA; t <sub>p</sub> ≤ 300 μs; δ ≤ 0.02; pulsed; T <sub>amb</sub> = 25 °C                                  | -   | -   | 1.25 | V    |
| I <sub>R</sub>   | reverse current               | V <sub>R</sub> = 25 V; T <sub>amb</sub> = 25 °C   | -   | -   | 30   | nA   |
|                  |                               | V <sub>R</sub> = 80 V; T <sub>amb</sub> = 25 °C   | -   | -   | 0.5  | μA   |
|                  |                               | V <sub>R</sub> = 25 V; T <sub>j</sub> = 150 °C  | -   | -   | 30   | μA   |
|                  |                               | V <sub>R</sub> = 80 V; T <sub>j</sub> = 150 °C  | -   | -   | 100  | μA   |
| C <sub>d</sub>   | diode capacitance             | V <sub>R</sub> = 0 V; f = 1 MHz; T <sub>amb</sub> = 25 °C   | -   | -   | 1.5  | pF   |
| t <sub>rr</sub>  | reverse recovery time         | I <sub>F</sub> = 10 mA; I <sub>R</sub> = 10 mA; I <sub>R(meas)</sub> = 1 mA; R <sub>L</sub> = 100 Ω; T <sub>amb</sub> = 25 °C | -   | -   | 4    | ns   |
| V <sub>FRM</sub> | peak forward recovery voltage | I <sub>F</sub> = 10 mA; t <sub>r</sub> = 20 ns; T <sub>amb</sub> = 25 °C  | -   | -   | 1.75 | V    |





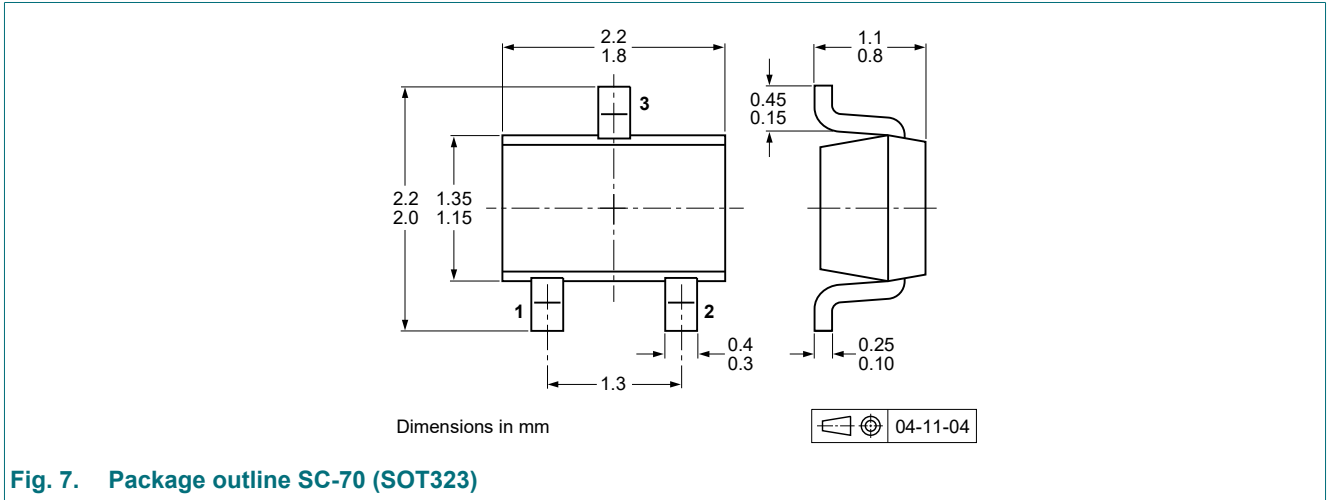
### 11. Test information



#### 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

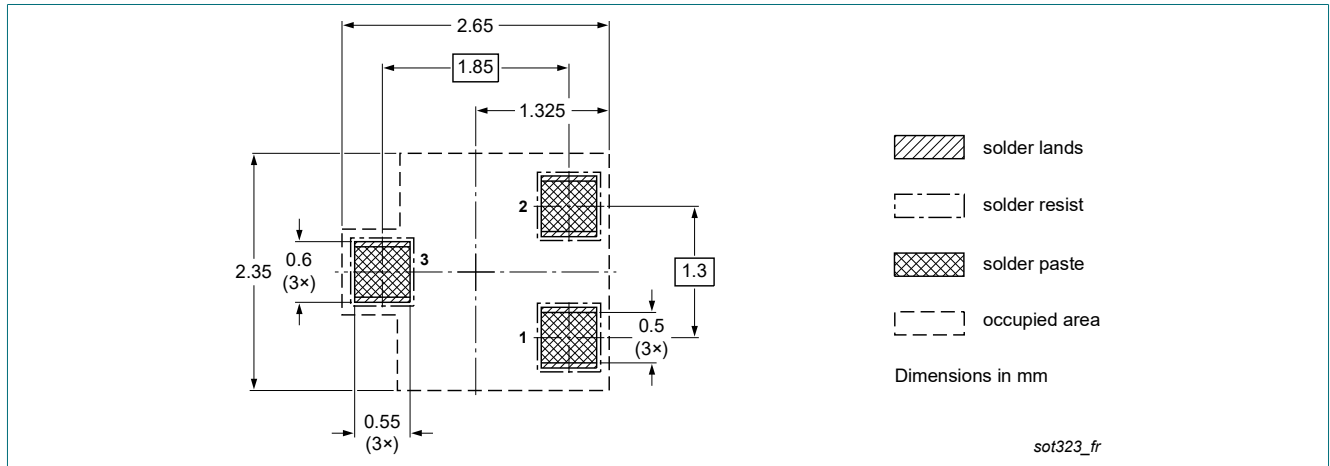


Fig. 8. Reflow soldering footprint for SC-70 (SOT323)

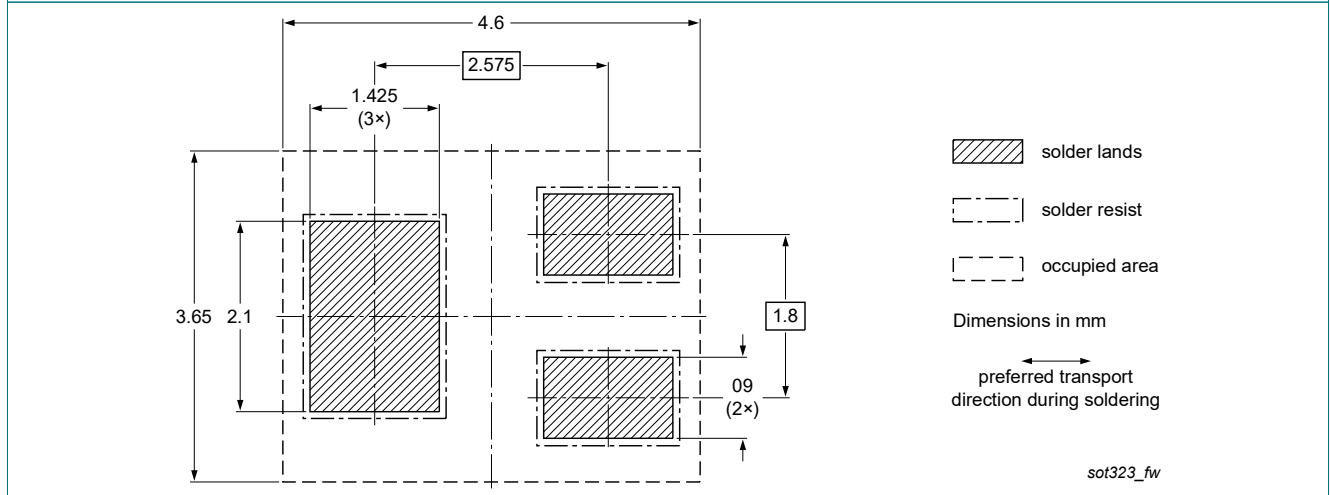


Fig. 9. Wave soldering footprint for SC-70 (SOT323)



## 14. Revision history

Table 8. Revision history

| Data sheet ID | Release date | Data sheet status  | Change notice | Supersedes |
|---------------|--------------|--------------------|---------------|------------|
| BAV70W-Q v.1  | 20210614     | 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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