



# BAS321

## General purpose diode

18 June 2019

Product data sheet

## 1. General description

General purpose diode fabricated in planar technology and encapsulated in a very small plastic SOD323 (SC76) package.

## 2. Features and benefits

- Small plastic SMD package
- Switching speed: max. 50 ns
- General application
- Continuous reverse voltage: max. 200 V
- Repetitive peak reverse voltage: max. 250 V
- Repetitive peak forward current: max. 625 mA
- AEC-Q101 qualified

## 3. Applications

- General purpose switching in surface mounted circuits

## 4. Quick reference data

Table 1. Quick reference data

| Symbol    | Parameter               | Conditions                                |     | Min | Typ | Max  | Unit |
|-----------|-------------------------|-------------------------------------------|-----|-----|-----|------|------|
| $I_F$     | forward current         |                                           | [1] | -   | -   | 250  | mA   |
| $V_R$     | reverse voltage         |                                           |     | -   | -   | 200  | V    |
| $P_{tot}$ | total power dissipation | $T_{amb} = 25\text{ °C}$                  | [1] | -   | -   | 300  | mW   |
| $V_F$     | forward voltage         | $I_F = 200\text{ mA}; T_j = 25\text{ °C}$ |     | -   | -   | 1.25 | V    |

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

## 5. Pinning information

Table 2. Pinning information

| Pin | Symbol | Description | Simplified outline                                                                            | Graphic symbol                                                                                     |
|-----|--------|-------------|-----------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------|
| 1   | K      | Cathode     | <br>SOD323 | <br>001aaa020 |
| 2   | A      | Anode       |                                                                                               |                                                                                                    |

## 6. Ordering information

Table 3. Ordering information

| Type number | Package |                                          |         |
|-------------|---------|------------------------------------------|---------|
|             | Name    | Description                              | Version |
| BAS321      | SOD323  | plastic surface-mounted package; 2 leads | SOD323  |

## 7. Marking

Table 4. Marking codes

| Type number | Marking code |
|-------------|--------------|
| BAS321      | A7           |

## 8. Limiting values

Table 5. Limiting values

In accordance with the Absolute Maximum Rating System (IEC 60134).

| Symbol           | Parameter                           | Conditions                                                                                        |     | Min | Max | Unit             |
|------------------|-------------------------------------|---------------------------------------------------------------------------------------------------|-----|-----|-----|------------------|
| $V_{RRM}$        | repetitive peak reverse voltage     |                                                                                                   |     | -   | 250 | V                |
| $V_R$            | reverse voltage                     |                                                                                                   |     | -   | 200 | V                |
| $I_F$            | forward current                     |                                                                                                   | [1] | -   | 250 | mA               |
| $I_{FSM}$        | non-repetitive peak forward current | $t_p = 10 \text{ ms}$ ; $T_{j(\text{init})} = 25 \text{ }^\circ\text{C}$ ; square wave            |     | -   | 1.7 | A                |
|                  |                                     | $t_p = 1 \text{ } \mu\text{s}$ ; $T_{j(\text{init})} = 25 \text{ }^\circ\text{C}$ ; square wave   |     | -   | 9   | A                |
|                  |                                     | $t_p = 100 \text{ } \mu\text{s}$ ; $T_{j(\text{init})} = 25 \text{ }^\circ\text{C}$ ; square wave |     | -   | 3   | A                |
| $I_{FRM}$        | repetitive peak forward current     | $t_p \leq 0.5 \text{ ms}$ ; $\delta \leq 0.25$                                                    |     | -   | 625 | mA               |
| $P_{\text{tot}}$ | total power dissipation             | $T_{\text{amb}} = 25 \text{ }^\circ\text{C}$                                                      | [1] | -   | 300 | mW               |
| $T_j$            | junction temperature                |                                                                                                   |     | -   | 150 | $^\circ\text{C}$ |
| $T_{\text{stg}}$ | 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      |            | [1] | -   | -   | 366 | K/W  |
| $R_{\text{th}(j-sp)}$ | thermal resistance from junction to solder point |            | [2] | -   | -   | 130 | K/W  |

[1] Device mounted on an FR4 Printed-Circuit Board (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       | $I_F = 100\text{ mA}; T_j = 25\text{ }^{\circ}\text{C}$                                                                                    | -   | -   | 1    | V             |
|          |                       | $I_F = 200\text{ mA}; T_j = 25\text{ }^{\circ}\text{C}$                                                                                    | -   | -   | 1.25 | V             |
| $I_R$    | reverse current       | $V_R = 200\text{ V}; T_j = 25\text{ }^{\circ}\text{C}$                                                                                     | -   | -   | 100  | nA            |
|          |                       | $V_R = 200\text{ V}; T_j = 150\text{ }^{\circ}\text{C}$                                                                                    | -   | -   | 100  | $\mu\text{A}$ |
| $C_d$    | diode capacitance     | $V_R = 0\text{ V}; f = 1\text{ MHz}; T_j = 25\text{ }^{\circ}\text{C}$                                                                     | -   | -   | 2    | pF            |
| $t_{rr}$ | reverse recovery time | $I_F = 30\text{ mA}; I_R = 30\text{ mA}; R_L = 100\text{ }\Omega;$<br>$I_{R(\text{meas})} = 3\text{ mA}; T_j = 25\text{ }^{\circ}\text{C}$ | -   | -   | 50   | ns            |

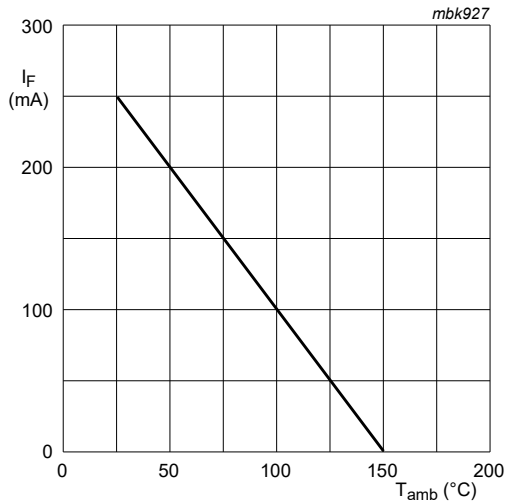


Fig. 1. Maximum permissible continuous forward current as a function of ambient temperature

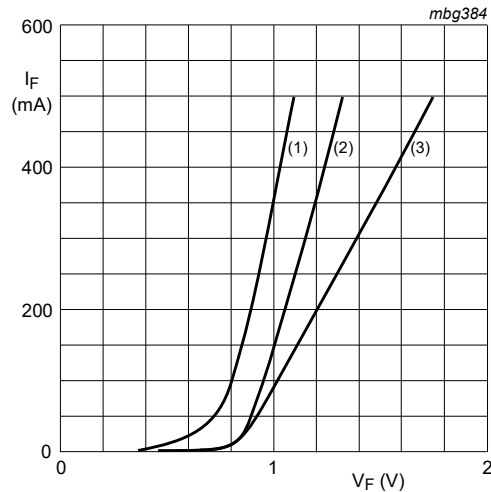


Fig. 2. Forward current as a function of forward voltage

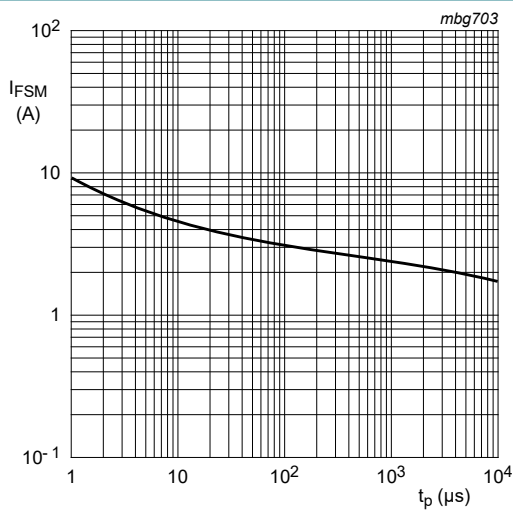


Fig. 3. Maximum permissible non-repetitive peak forward current as a function of pulse duration

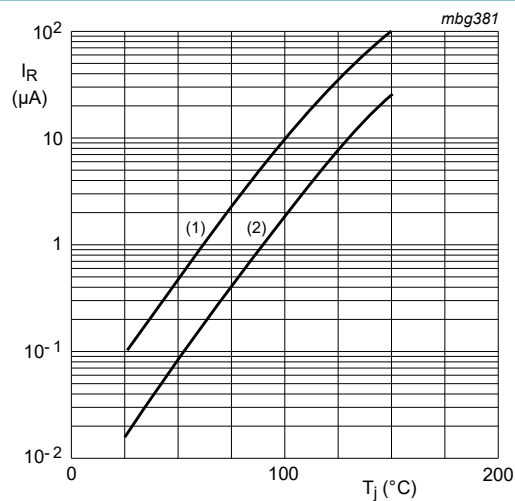


Fig. 4. Reverse current as a function of junction temperature

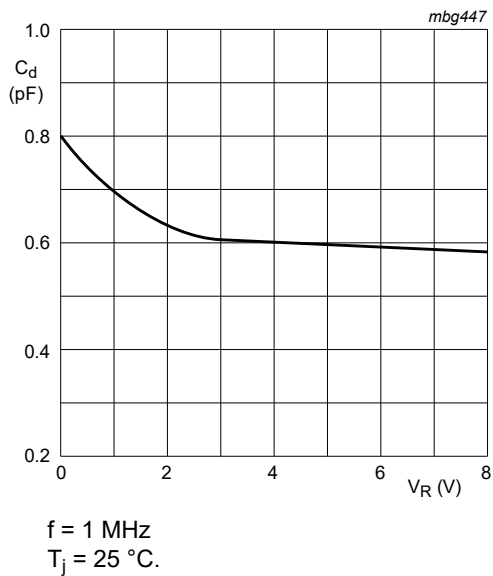


Fig. 5. Diode capacitance as a function of reverse voltage; typical values.

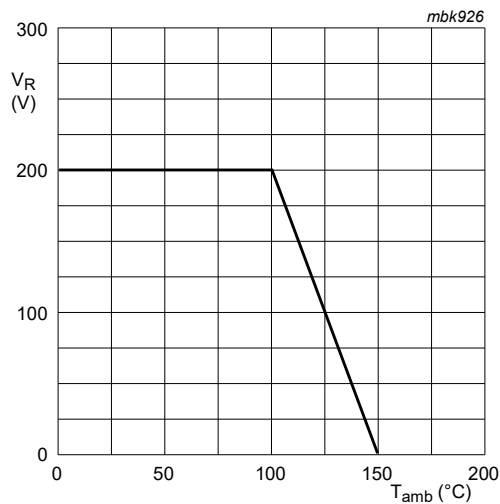


Fig. 6. Maximum permissible continuous reverse voltage as a function of the ambient temperature

11. Test information

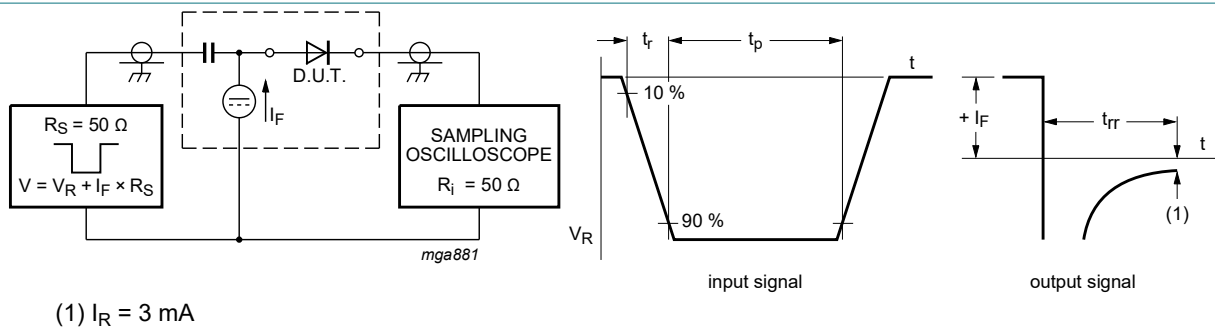


Fig. 7. Reverse recovery time test circuit and waveforms

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

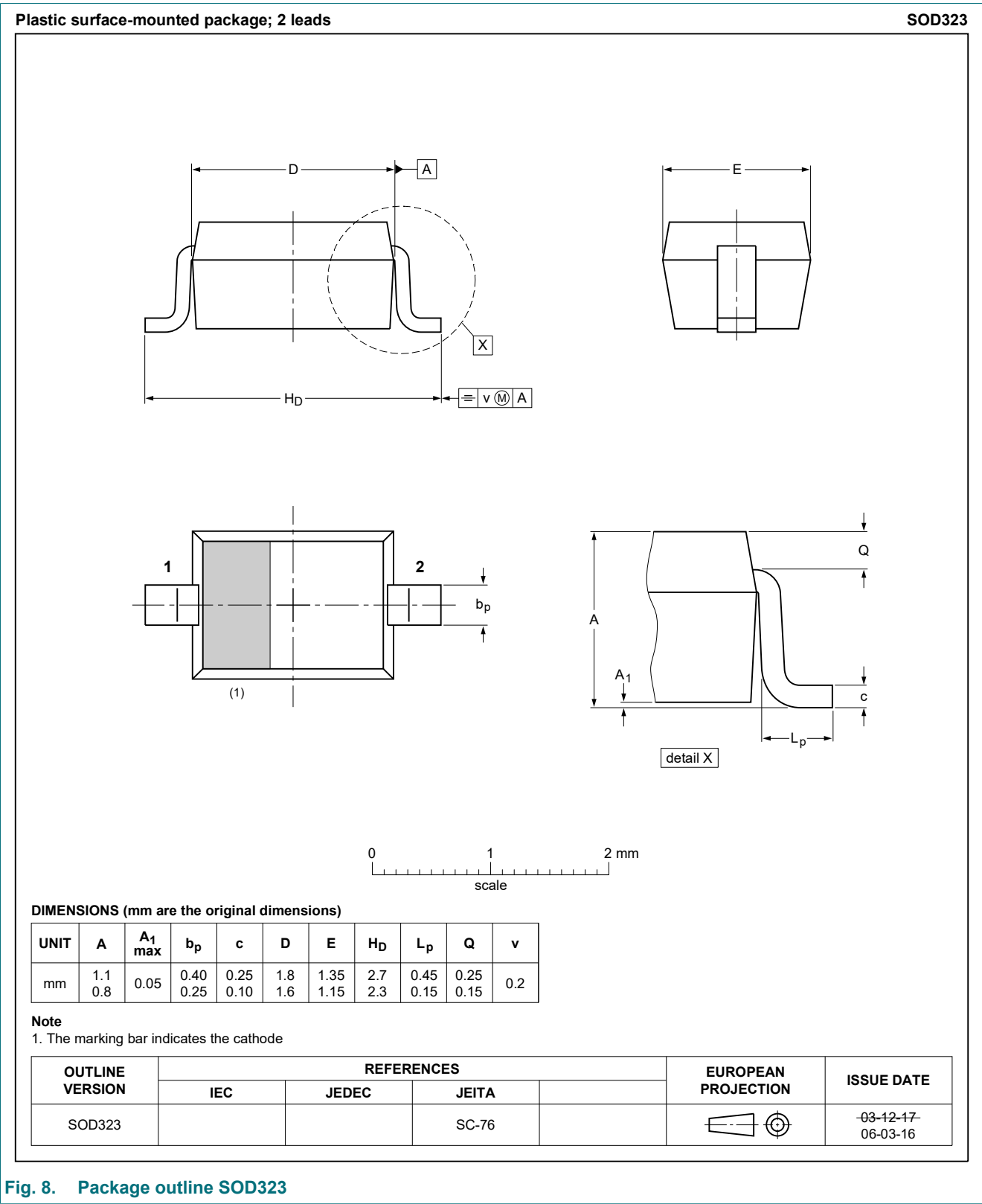


Fig. 8. Package outline SOD323

13. Soldering

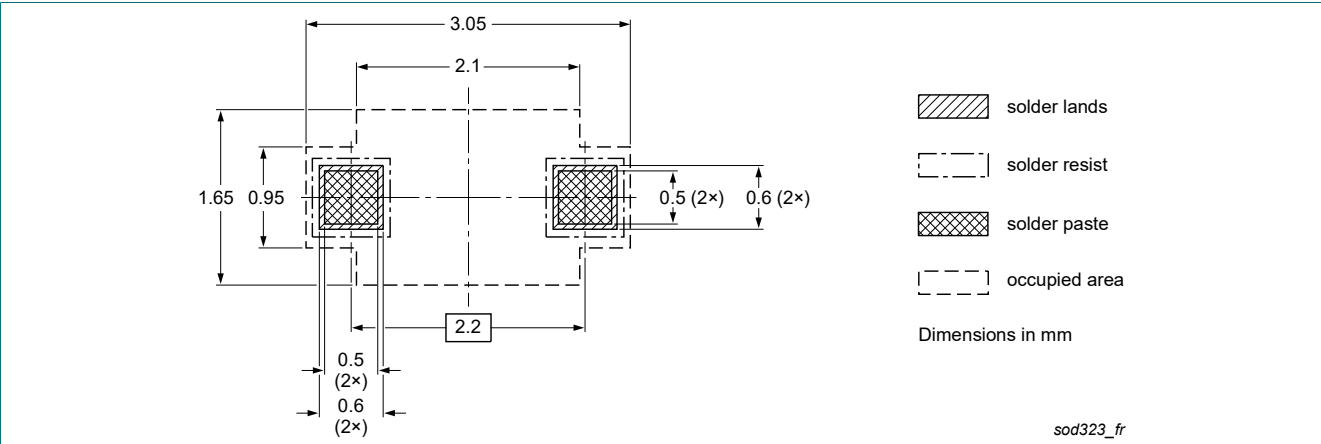


Fig. 9. Reflow soldering footprint for SOD323

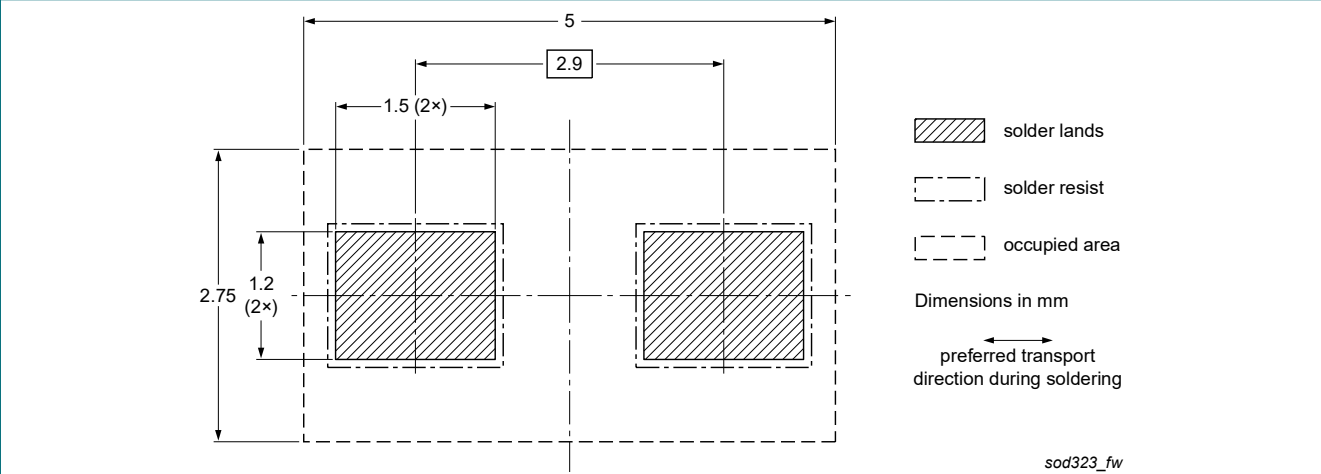


Fig. 10. Wave soldering footprint for SOD323

## 14. Revision history

**Table 8. Revision history**

| Data sheet ID  | Release date                                                                                                                                                                                                                                                                                                                  | Data sheet status  | Change notice | Supersedes |
|----------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|---------------|------------|
| BAS321 v.3     | 20190618                                                                                                                                                                                                                                                                                                                      | Product data sheet | -             | BAS321 v.2 |
| Modifications: | <ul style="list-style-type: none"><li>• Features and benefits and Test information: AEC-Q101 qualification added</li><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> |                    |               |            |
| BAS321 v.2     | 20040126                                                                                                                                                                                                                                                                                                                      | Product data sheet | -             | BAS321 v.1 |
| BAS321 v.1     | 19990209                                                                                                                                                                                                                                                                                                                      | Product data sheet | -             | -          |

## 15. Legal information

### Data sheet status

| Document status<br>[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".
- [3] The product status of device(s) described in this document may have changed since this document was published and may differ in case of multiple devices. The latest product status information is available on the internet at <https://www.nexperia.com>.

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