



# BA591

## Band-switching diode

Rev. 4 — 26 November 2018

Product data sheet

## 1 Product profile

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### 1.1 General description

The BA591 is a planar, high performance band-switching diode in the very small SOD323 (SC-76) SMD plastic package.

### 1.2 Features and benefits

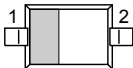
- Very small plastic SMD package
- Low diode capacitance: maximum 1.05 pF
- Low diode forward resistance: max. 0.7  $\Omega$
- Small inductance
- AEC-Q101 qualified

### 1.3 Applications

- Low loss band-switching in VHF television tuners
- Surface-mount band-switching circuits.

## 2 Pinning information

Table 1. Discrete pinning

| Pin | Description | Simplified outline                                                                              | Graphic symbol                                                                                |
|-----|-------------|-------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------|
| 1   | cathode     | <br>Top view | <br>sym006 |
| 2   | anode       |                                                                                                 |                                                                                               |

## 3 Ordering information

Table 2. Ordering information

| Type number | Package |                                          |         |
|-------------|---------|------------------------------------------|---------|
|             | Name    | Description                              | Version |
| BA591       | -       | plastic surface-mounted package; 2 leads | SOD323  |

## 4 Marking code

Table 3. Marking

| Type number | Marking code      |
|-------------|-------------------|
| BA591       | A1 <sup>[1]</sup> |

[1] The marking bar indicates the cathode (see simplified outline graphic in [Table 1](#))

## 5 Limiting values

Table 4. Limiting values

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

| Symbol    | Parameter                  | Conditions                 | Min | Max  | Unit |
|-----------|----------------------------|----------------------------|-----|------|------|
| $V_R$     | continuous reverse voltage |                            | -   | 35   | V    |
| $I_F$     | continuous forward current |                            | -   | 100  | mA   |
| $P_{tot}$ | total power dissipation    | $T_{sp} \leq 90\text{ °C}$ | -   | 500  | mW   |
| $T_{stg}$ | storage temperature        |                            | -65 | +150 | °C   |
| $T_j$     | junction temperature       |                            | -65 | +150 | °C   |

## 6 Thermal characteristics

Table 5. Thermal characteristics

| Symbol         | Parameter                                        | Conditions | Typ | Unit |
|----------------|--------------------------------------------------|------------|-----|------|
| $R_{th(j-sp)}$ | thermal resistance from junction to solder point |            | 120 | K/W  |

## 7 Characteristics

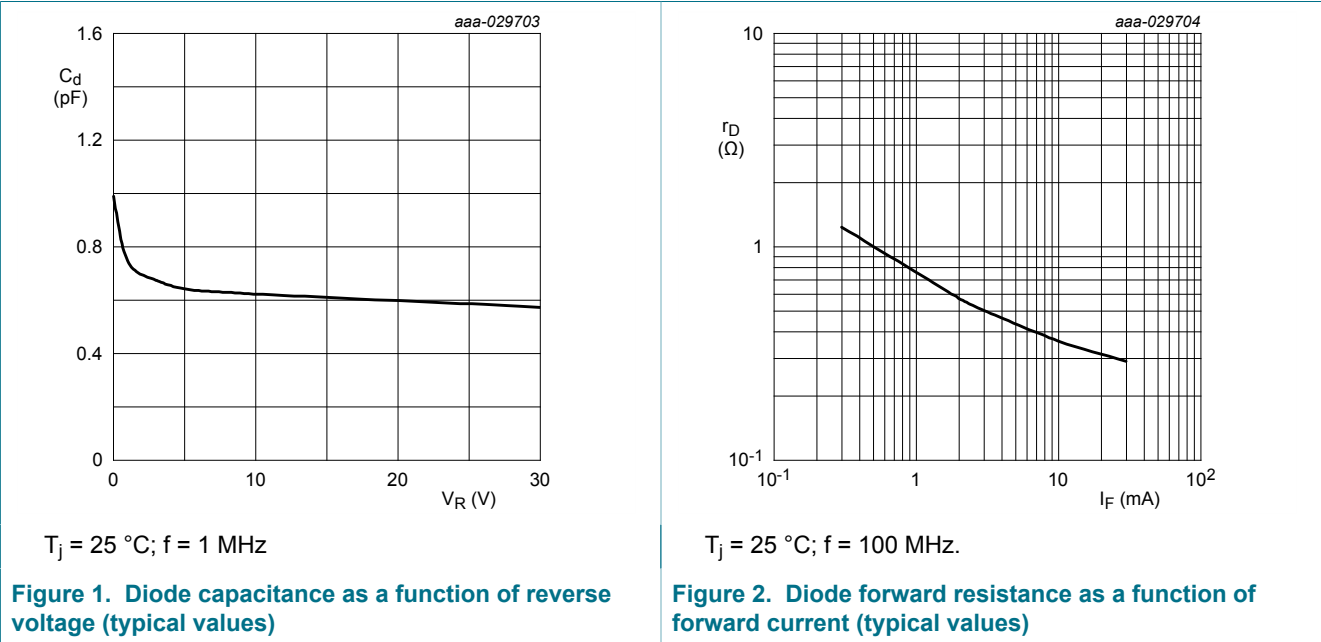
**Table 6. Characteristics**

$T_j = 25\text{ °C}$  unless otherwise specified.

| Symbol  | Parameter                | Conditions                                           | Min | Typ  | Max  | Unit       |
|---------|--------------------------|------------------------------------------------------|-----|------|------|------------|
| $V_F$   | forward voltage          | $I_F = 10\text{ mA}$                                 | -   | -    | 1    | V          |
| $I_R$   | reverse current          | $V_R = 20\text{ V}$                                  | -   | -    | 20   | nA         |
| $C_d$   | diode capacitance        | $f = 1\text{ MHz}$ (see <a href="#">Figure 1</a> )   |     |      |      |            |
|         |                          | $V_R = 1\text{ V}$ [1]                               | -   | 0.8  | 1.05 | pF         |
|         |                          | $V_R = 3\text{ V}$ [1]                               | -   | 0.65 | 0.9  | pF         |
| $r_D$   | diode forward resistance | $f = 100\text{ MHz}$ (see <a href="#">Figure 2</a> ) |     |      |      |            |
|         |                          | $I_F = 3\text{ mA}$ [1]                              | -   | 0.45 | 0.7  | $\Omega$   |
|         |                          | $I_F = 10\text{ mA}$ [1]                             | -   | 0.36 | 0.5  | $\Omega$   |
| $1/g_p$ | reverse resistance       | $V_R = 1\text{ V}; f = 100\text{ MHz}$ [1]           | -   | 100  | -    | k $\Omega$ |
| $L_S$   | series inductance        |                                                      | -   | 2    | -    | nH         |

[1] Guaranteed on AQL basis; inspection level S4, AQL 1.0

8 Graphical data



9 Package outline

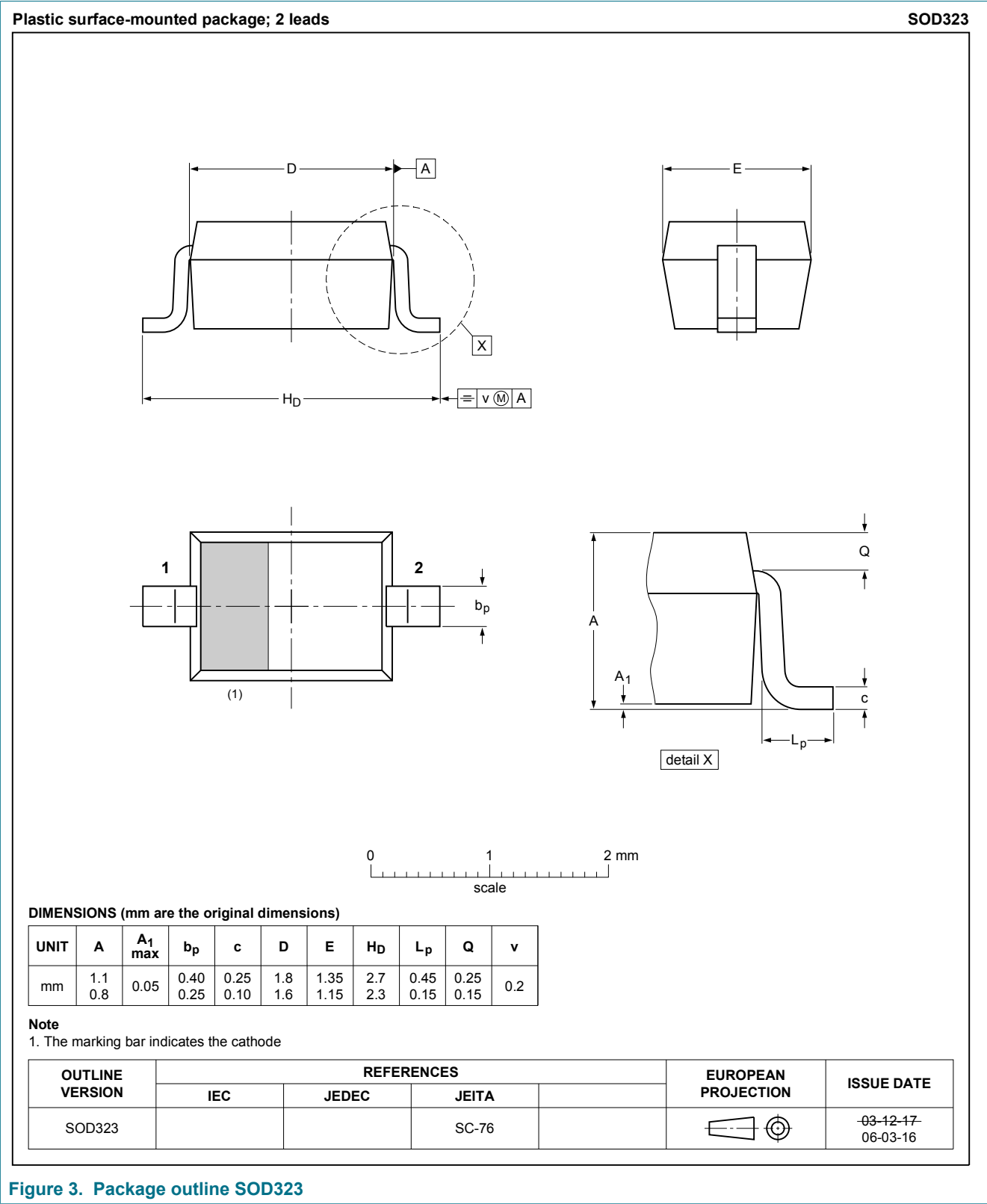


Figure 3. Package outline SOD323

## 10 Revision history

Table 7. Revision history

| Document ID    | Release date                                                                                                                                                                                                                                                                                                                                                  | Data sheet status  | Change notice | Supersedes  |
|----------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|---------------|-------------|
| BA591 v.4      | 20181126                                                                                                                                                                                                                                                                                                                                                      | Product data sheet | -             | BA591 v.3.1 |
| Modifications: | <ul style="list-style-type: none"><li>• <a href="#">Section 1.2</a> "Features and benefits" has been updated.</li><li>• The "Legal information" pages have been updated.</li><li>• sheet has been adapted to the latest NXP rules</li><li>• The condition under Limiting values is changed to <math>T_{j-sp} \leq 90\text{ }^{\circ}\text{C}</math></li></ul> |                    |               |             |
| BA591 v.3.1    | 20040217                                                                                                                                                                                                                                                                                                                                                      | Product data sheet | -             | -           |

## 11 Legal information

### 11.1 Data sheet status

| Document status <sup>[1][2]</sup> | Product status <sup>[3]</sup> | 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 URL <http://www.nxp.com>.

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