BA591

Band-switching diode

Rev. 4 — 26 November 2018 Product data sheet

1 Product profile

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

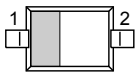
- Very small plastic SMD package
- Low diode capacitance: maximum 1.05 pF
- Low diode forward resistance: max. 0.7 Ω
- Small inductance
- AEC-Q101 qualified

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	 Top view	 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[1]

[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	$T_{sp} \leq 90$ °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

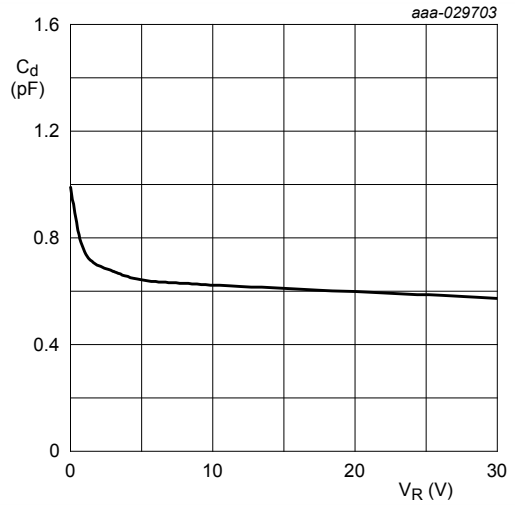
Table 6. Characteristics

T_j = 25 °C unless otherwise specified.

Symbol	Parameter	Conditions		Min	Typ	Max	Unit
V_F	forward voltage	I_F = 10 mA		-	-	1	V
I_R	reverse current	V_R = 20 V		-	-	20	nA
C_d	diode capacitance	f = 1 MHz (see Figure 1)					
		V_R = 1 V	[1]	-	0.8	1.05	pF
		V_R = 3 V	[1]	-	0.65	0.9	pF
r_D	diode forward resistance	f = 100 MHz (see Figure 2)					
		I_F = 3 mA	[1]	-	0.45	0.7	Ω
		I_F = 10 mA	[1]	-	0.36	0.5	Ω
$1/g_p$	reverse resistance	V_R = 1 V; f = 100 MHz	[1]	-	100	-	kΩ
L_S	series inductance			-	2	-	nH

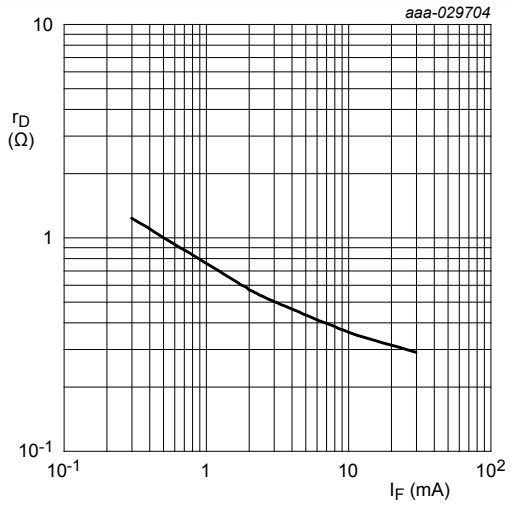
[1] Guaranteed on AQL basis; inspection level S4, AQL 1.0

8 Graphical data



T_j = 25 °C; f = 1 MHz

Figure 1. Diode capacitance as a function of reverse voltage (typical values)

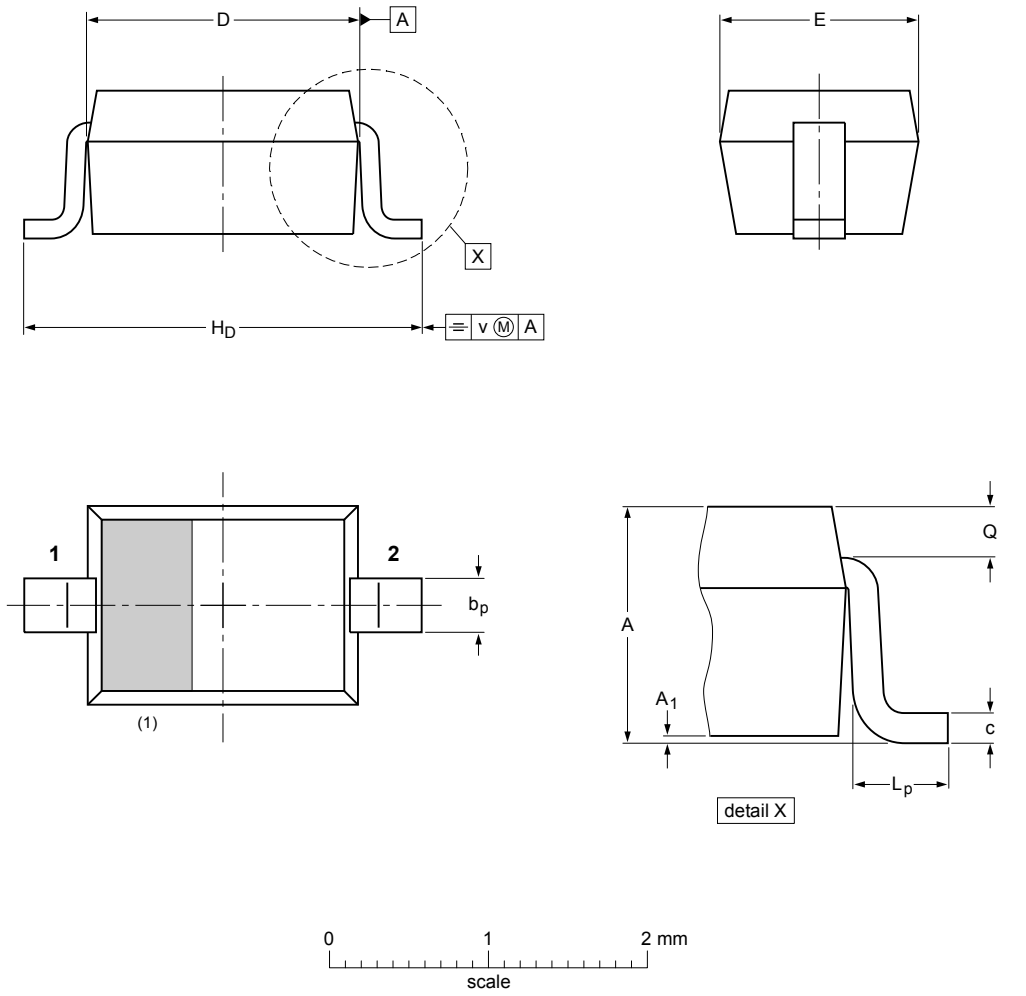


T_j = 25 °C; f = 100 MHz.

Figure 2. Diode forward resistance as a function of forward current (typical values)

9 Package outline

Plastic surface-mounted package; 2 leads **SOD323**



DIMENSIONS (mm are the original dimensions)

UNIT	A	A_1 max	b_p	c	D	E	H_D	L_p	Q	v
mm	1.1 0.8	0.05	0.40 0.25	0.25 0.10	1.8 1.6	1.35 1.15	2.7 2.3	0.45 0.15	0.25 0.15	0.2

Note

1. The marking bar indicates the cathode

OUTLINE VERSION	REFERENCES				EUROPEAN PROJECTION	ISSUE DATE
	IEC	JEDEC	JEITA			
SOD323			SC-76			~~03-12-17~~ 06-03-16

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:	• Section 1.2 "Features and benefits" has been updated. • The "Legal information" pages have been updated. • sheet has been adapted to the latest NXP rules • The condition under Limiting values is changed to $T_{j\text{-}sp} \leq 90$ °C			
BA591 v.3.1	20040217	Product data sheet	-	-

11 Legal information

11.1 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".
[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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