



BAP51-06W

Silicon PIN diode

Rev. 2.1 — 8 February 2019

Product data sheet

1 Product profile

1.1 General description

Two planar PIN diodes in common anode configuration in an SOT323 small SMD plastic package.

1.2 Features and benefits

- Two elements in common anode configuration in a small SMD plastic package
- Low diode capacitance
- Low diode forward resistance
- AEC-Q101 qualified

1.3 Applications

- General RF applications

2 Pinning information

Table 1. Discrete pinning

Pin	Description	Simplified outline	Graphic symbol
1	cathode 1	 sot323_so	 aaa-029922
2	cathode 2		
3	common cathode		

3 Ordering information

Table 2. Ordering information

Type number	Package		Version
	Name	Description	
BAP51-06W	-	plastic surface-mounted package; 3 leads	SOT323



4 Marking

Table 3. Marking

Type number	Marking code	Description
BAP51-06W	W7%	% = p: made in Hong Kong
		% = t: made in Malaysia

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	reverse voltage		-	50	V
I_F	forward current		-	50	mA
P_{tot}	total power dissipation	$T_{sp} \leq 90\text{ °C}$	-	240	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		250	K/W

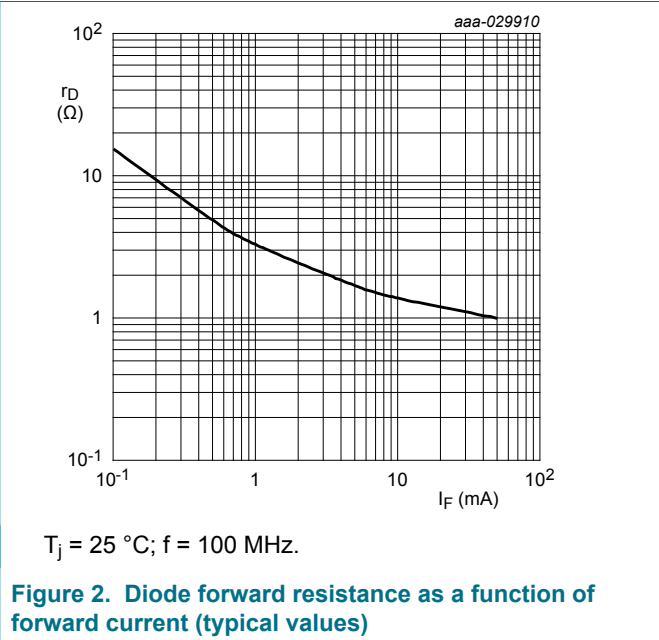
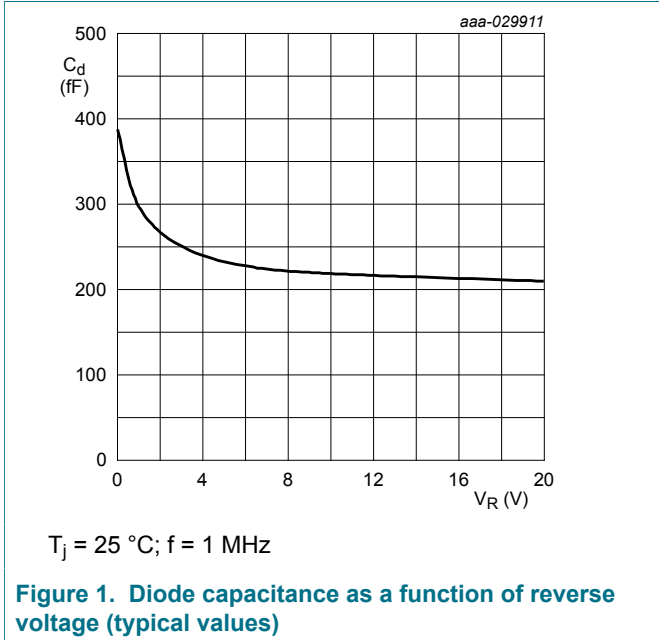
7 Characteristics

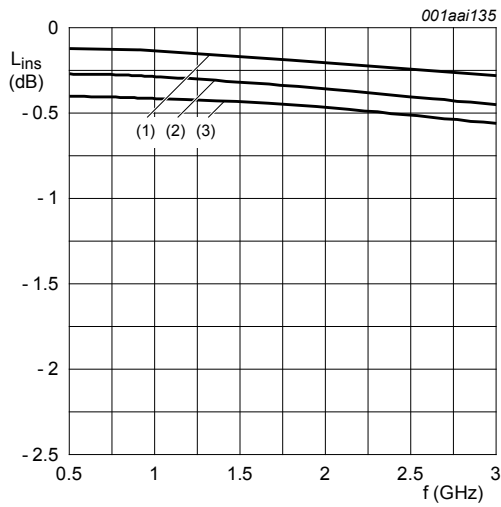
Table 6. Characteristics
 $T_j = 25\text{ }^\circ\text{C}$ unless otherwise specified.

Symbol	Parameter	Conditions	Min	Typ	Max	Unit	
V_F	forward voltage	$I_F = 50\text{ mA}$	-	0.95	1.1	V	
I_R	reverse current	$V_R = 50\text{ V}$	-	-	100	nA	
C_d	diode capacitance	f = 1 MHz (see Figure 1)					
		$V_R = 0\text{ V}$	-	0.4	-	pF	
		$V_R = 1\text{ V}$	-	0.3	0.55	pF	
		$V_R = 5\text{ V}$	-	0.2	0.35	pF	
r_D	diode forward resistance	f = 100 MHz (see Figure 2)					
		$I_F = 0.5\text{ mA}$	[1]	-	5.3	9	Ω
		$I_F = 1\text{ mA}$	[1]	-	3.5	6.5	Ω
		$I_F = 10\text{ mA}$	[1]	-	1.5	2.5	Ω
ISL	isolation	$V_R = 0\text{ V}$ (see Figure 4)					
		f = 900 MHz	-	17	-	dB	
		f = 1800 MHz	-	13	-	dB	
		f = 2450 MHz	-	12	-	dB	
L_{ins}	insertion loss	$I_F = 0.5\text{ mA}$ (see Figure 3)					
		f = 900 MHz	-	0.44	-	dB	
		f = 1800 MHz	-	0.50	-	dB	
		f = 2450 MHz	-	0.54	-	dB	
		$I_F = 1\text{ mA}$					
		f = 900 MHz	-	0.33	-	dB	
		f = 1800 MHz	-	0.39	-	dB	
		f = 2450 MHz	-	0.43	-	dB	
		$I_F = 10\text{ mA}$					
		f = 900 MHz	-	0.19	-	dB	
		f = 1800 MHz	-	0.24	-	dB	
		f = 2450 MHz	-	0.28	-	dB	
		τ_L	charge carrier life time	when switched from $I_F = 10\text{ mA}$ to $I_R = 6\text{ mA}$; $R_L = 100\ \Omega$; measured at $I_R = 3\text{ mA}$	-	0.55	-
L_S	series inductance	$I_F = 100\text{ mA}$; f = 100 MHz	-	1.6	-	nH	

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

8 Graphical data



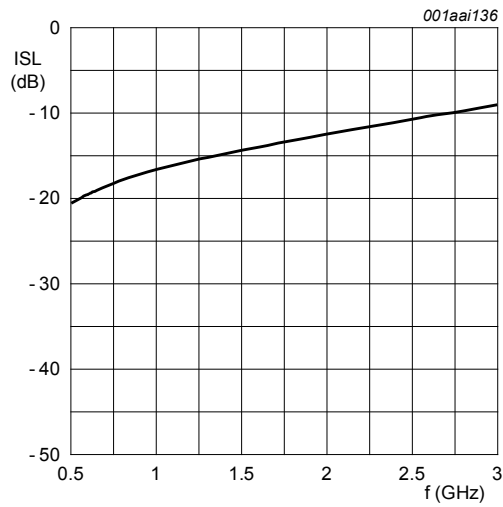


Diode inserted in series with a 50 Ω strip line circuit and biased via the analyzer T-network.

$T_{amb} = 25\text{ °C}$; $f = 1\text{ MHz}$

- (1) $I_F = 10\text{ mA}$
- (2) $I_F = 1\text{ mA}$
- (3) $I_F = 0.5\text{ mA}$

Figure 3. Insertion loss of the diode as a function of frequency (typical values)



Diode zero-biased and inserted in series with a 50 Ω strip line circuit $T_{amb} = 25\text{ °C}$

Figure 4. Isolation of the diode as a function of frequency (typical values)

9 Package outline

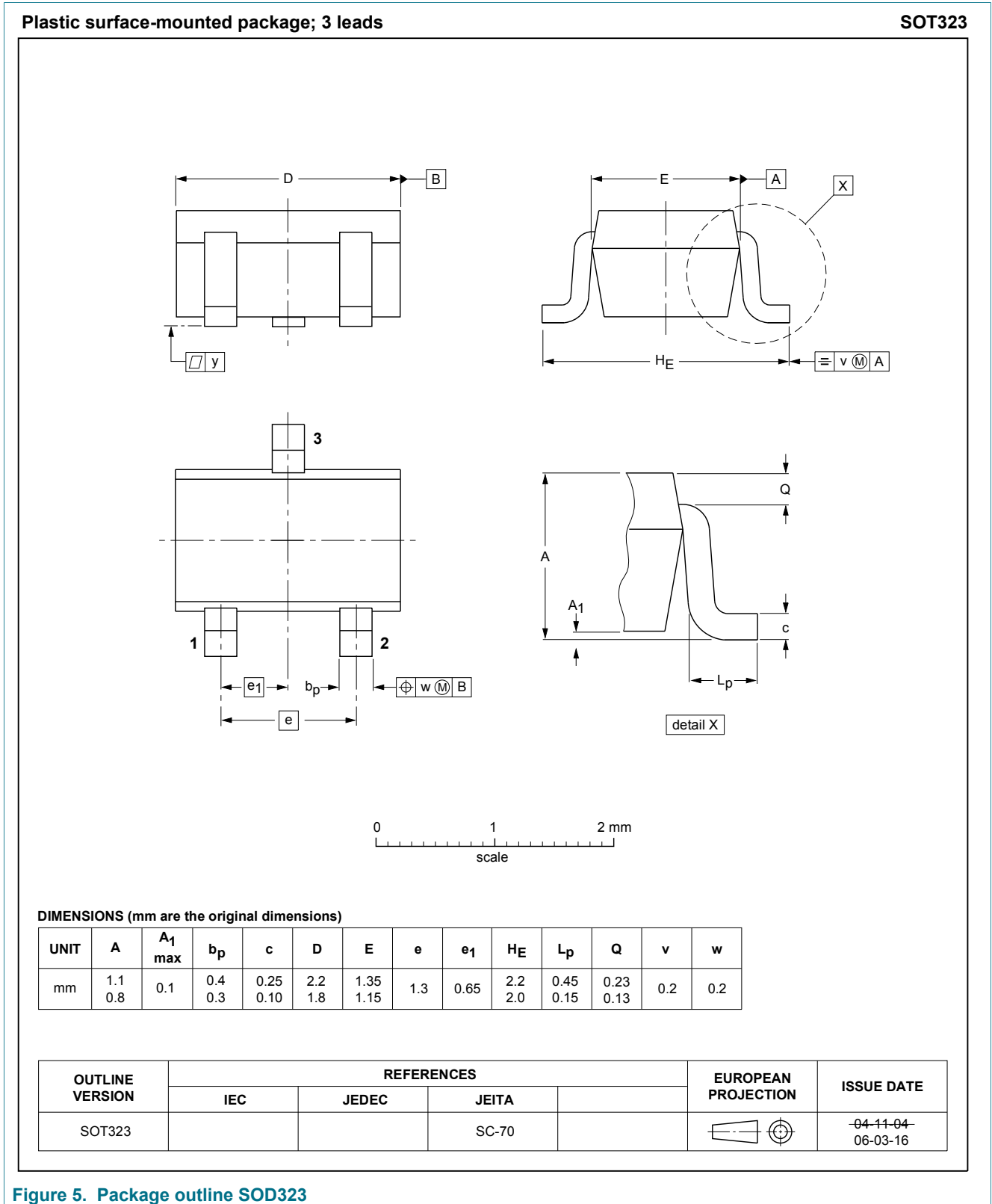


Figure 5. Package outline SOT323

10 Abbreviations

Table 7. Abbreviations

Acronym	Description
AQL	acceptable quality level
PIN	P-type, intrinsic, N-type
RF	radio frequency
S4	special inspection level 4
SMD	surface-mounted device

11 Revision history

Table 8. Revision history

Document ID	Release date	Data sheet status	Change notice	Supersedes
BAP51-06W v.2.1	20190208	Product data sheet	-	BAP51-06W v.2
Modifications:	<ul style="list-style-type: none"> aligned the title of the data sheet with the description on the Internet 			
BAP51-06W v.2	20181126	Product data sheet	-	BAP51-06W v.1
Modifications:	<ul style="list-style-type: none"> Section 1.2 "Features and benefits" has been updated. The "Legal information" pages have been updated. 			
BAP51-06W v.1	20080526	Product data sheet	-	-

12 Legal information

12.1 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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