



# 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

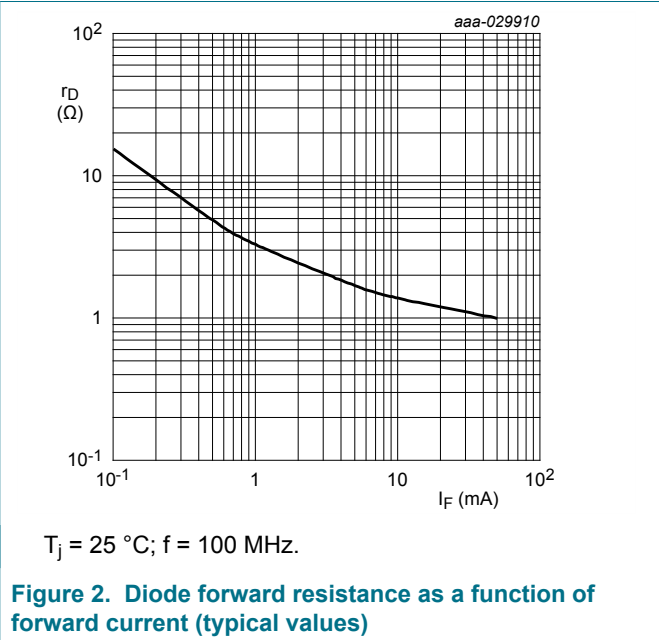
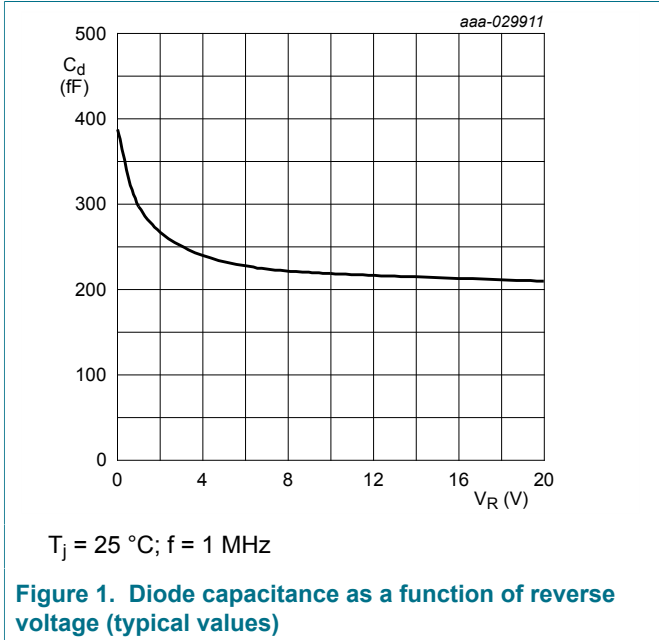
**Table 6. Characteristics**

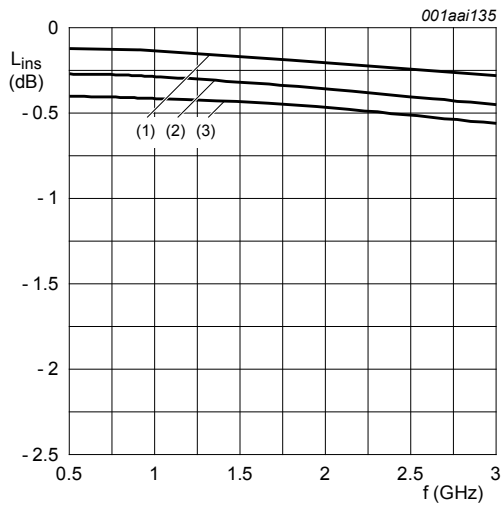
$T_j = 25\text{ }^\circ\text{C}$  unless otherwise specified.

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 <a href="#">Figure 1</a> )					
		$V_R = 0\text{ V}$	-	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 <a href="#">Figure 2</a> )					
		$I_F = 0.5\text{ mA}$	[1]	-	5.3	9	$\Omega$
		$I_F = 1\text{ mA}$	[1]	-	3.5	6.5	$\Omega$
		$I_F = 10\text{ mA}$	[1]	-	1.5	2.5	$\Omega$
ISL	isolation	$V_R = 0\text{ V}$ (see <a href="#">Figure 4</a> )					
		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 <a href="#">Figure 3</a> )					
		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	
		$\tau_L$	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**



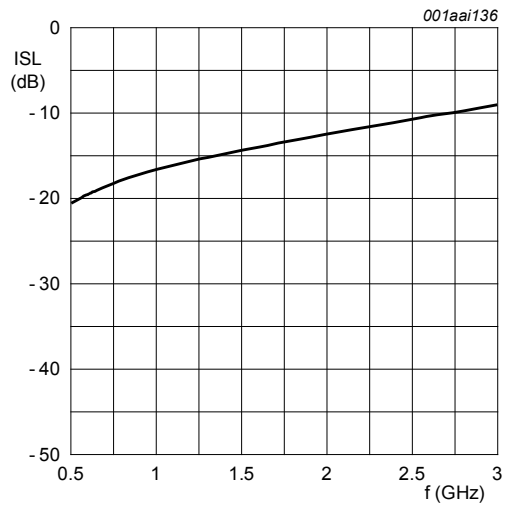


Diode inserted in series with a 50 Ω strip line circuit and biased via the analyzer T-network.

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

- (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**

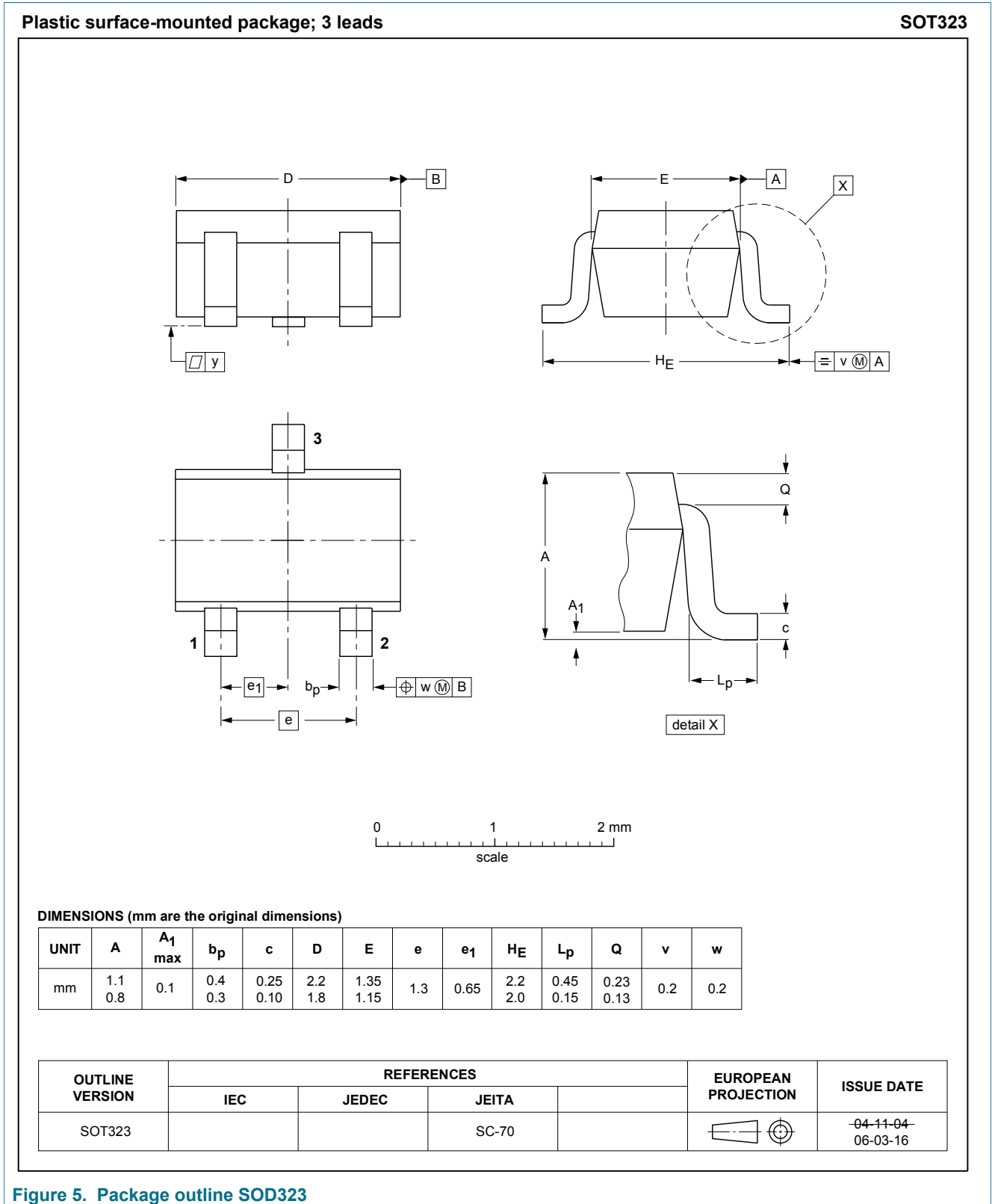


Figure 5. Package outline SOT323

## 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"> <li>aligned the title of the data sheet with the description on the Internet</li> </ul>			
BAP51-06W v.2	20181126	Product data sheet	-	BAP51-06W v.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> </ul>			
BAP51-06W v.1	20080526	Product data sheet	-	-

## 12 Legal information

### 12.1 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".

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