



BAP64-06W

Silicon PIN diode

Rev. 3.2 — 12 February 2019

Product data sheet

1 Product profile

1.1 General description

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

1.2 Features and benefits

- High voltage, current controlled
- RF resistor for RF attenuators and switches
- Low diode capacitance
- Low diode forward resistance
- Low series inductance
- For applications up to 3 GHz
- AEC-Q101 qualified

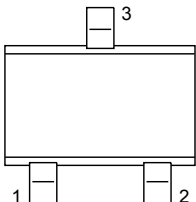
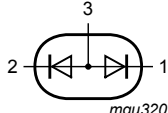
1.3 Applications

- RF attenuators and switches



2 Pinning information

Table 1. Discrete pinning

Pin	Description	Simplified outline	Graphic symbol
1	cathode 1	 Top view	
2	cathode 2		
3	common connection		

3 Ordering information

Table 2. Ordering information

Type number	Package		
	Name	Description	Version
BAP64-06W	-	plastic surface-mounted package; 3 leads	SOT323

4 Marking

Table 3. Marking code

Type number	Marking code
BAP64-06W	V4%

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		-	100	V
I_F	continuous forward current		-	100	mA
P_{tot}	total power dissipation	$T_{sp} \leq 90\text{ }^{\circ}\text{C}$	-	240	mW
T_{stg}	storage temperature		-65	+150	$^{\circ}\text{C}$
T_j	junction temperature		-65	+150	$^{\circ}\text{C}$

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

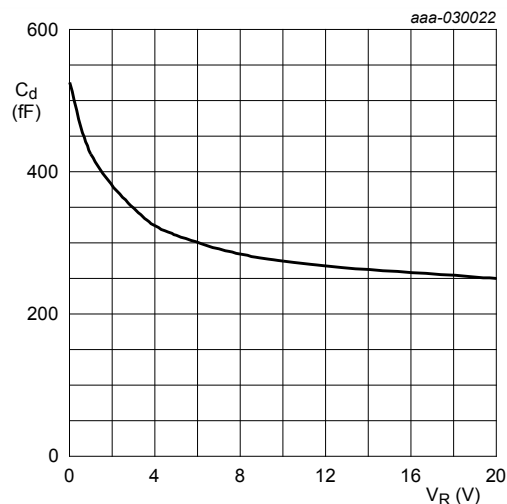
$T_j = 25\text{ }^{\circ}\text{C}$ unless otherwise specified.

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	$V_R = 60\text{ V}$	-	-	10	μA
		$V_R = 20\text{ V}$	-	-	1	μA
C_d	diode capacitance	$f = 1\text{ MHz}$ (see Figure 1)				
		$V_R = 0\text{ V}$	-	0.52	-	pF
		$V_R = 1\text{ V}$	-	0.37	-	pF
		$V_R = 20\text{ V}$	-	0.23	0.35	pF
r_D	diode forward resistance	$f = 100\text{ MHz}$ (see Figure 2)				
		$I_F = 0.5\text{ mA}$ [1]	-	20	40	Ω
		$I_F = 1\text{ mA}$ [1]	-	10	20	Ω
		$I_F = 10\text{ mA}$ [1]	-	2	3.8	Ω
		$I_F = 100\text{ mA}$ [1]	-	0.7	1.35	Ω
ISL	isolation	$V_R = 0\text{ V}$ (see Figure 4)				
		$f = 900\text{ MHz}$	-	18.5	-	dB
		$f = 1800\text{ MHz}$	-	13.5	-	dB
		$f = 2450\text{ MHz}$	-	10.9	-	dB
L_{ins}	insertion loss	$I_F = 0.5\text{ mA}$ (See Figure 3).				
		$f = 900\text{ MHz}$	-	1.86	-	dB
		$f = 1800\text{ MHz}$	-	2.06	-	dB
		$f = 2450\text{ MHz}$	-	2.23	-	dB
		$I_F = 1\text{ mA}$				
		$f = 900\text{ MHz}$	-	1.01	-	dB
		$f = 1800\text{ MHz}$	-	1.06	-	dB
		$f = 2450\text{ MHz}$	-	1.10	-	dB
		$I_F = 10\text{ mA}$				
		$f = 900\text{ MHz}$	-	0.19	-	dB
		$f = 1800\text{ MHz}$	-	0.21	-	dB
		$f = 2450\text{ MHz}$	-	0.27	-	dB
L_{ins}	insertion loss	$I_F = 100\text{ mA}$				
		$f = 900\text{ MHz}$	-	0.08	-	dB
		$f = 1800\text{ MHz}$	-	0.10	-	dB
		$f = 2450\text{ MHz}$	-	0.16	-	dB

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
τ_L	charge carrier life time	when switched from $I_F = 10$ mA to $I_R = 6$ mA; $R_L = 100\ \Omega$; measured at $I_R = 3$ mA	-	1.55	-	μs
L_S	series inductance	$I_F = 100$ mA; $f = 100$ MHz	-	1.6	-	nH

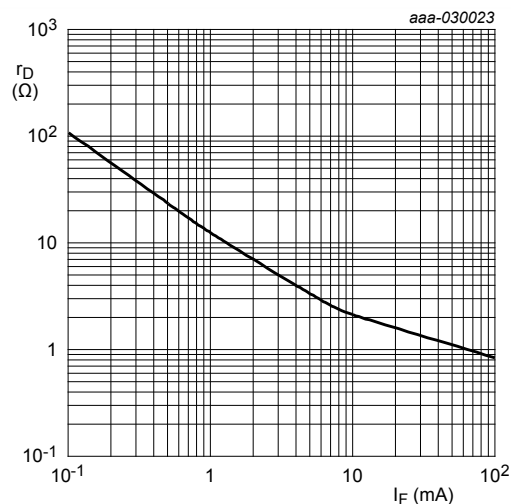
[1] Guaranteed on AQL basis; inspection level S4, AQL 1.0

8 Graphical data



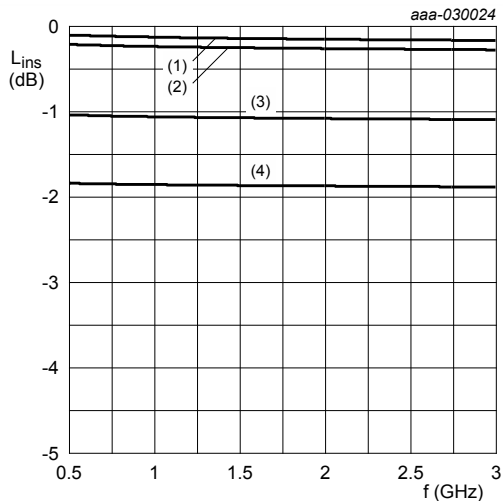
$T_j = 25\text{ }^{\circ}\text{C}$; $f = 1\text{ MHz}$

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



$T_j = 25\text{ }^{\circ}\text{C}$; $f = 100\text{ MHz}$

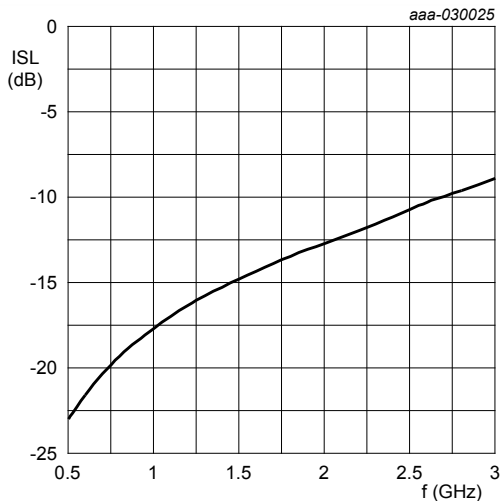
Figure 2. Diode forward resistance as a function of forward current (typical values)



Diode inserted in series with a $50\text{ }\Omega$ strip line circuit and biased via the analyzer T-network. $T_{\text{amb}} = 25\text{ }^{\circ}\text{C}$.

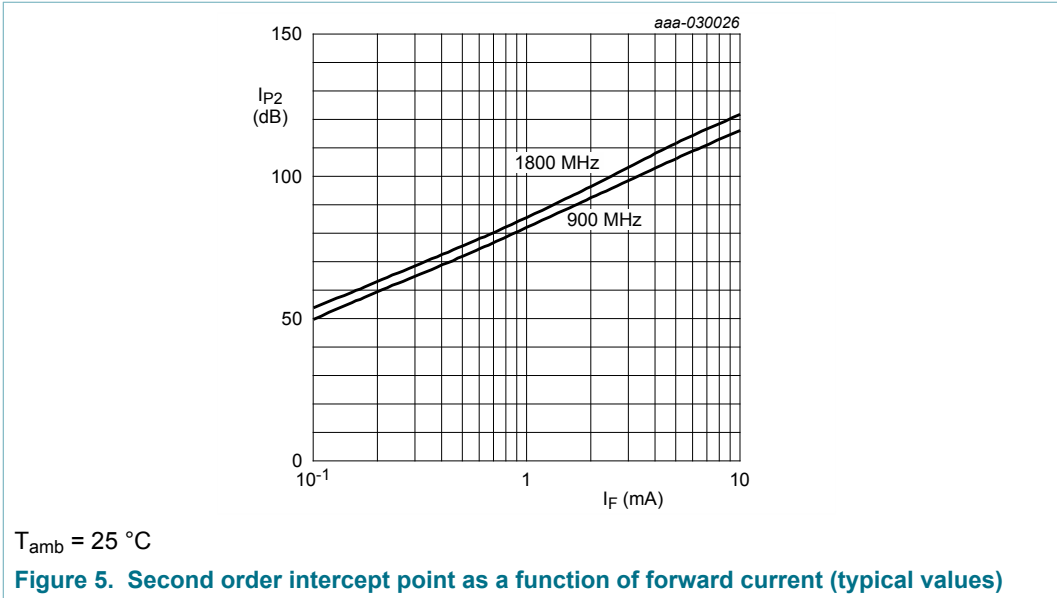
- (1) $I_F = 100\text{ mA}$
- (2) $I_F = 10\text{ mA}$
- (3) $I_F = 1\text{ mA}$
- (4) $I_F = 0.5\text{ mA}$

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

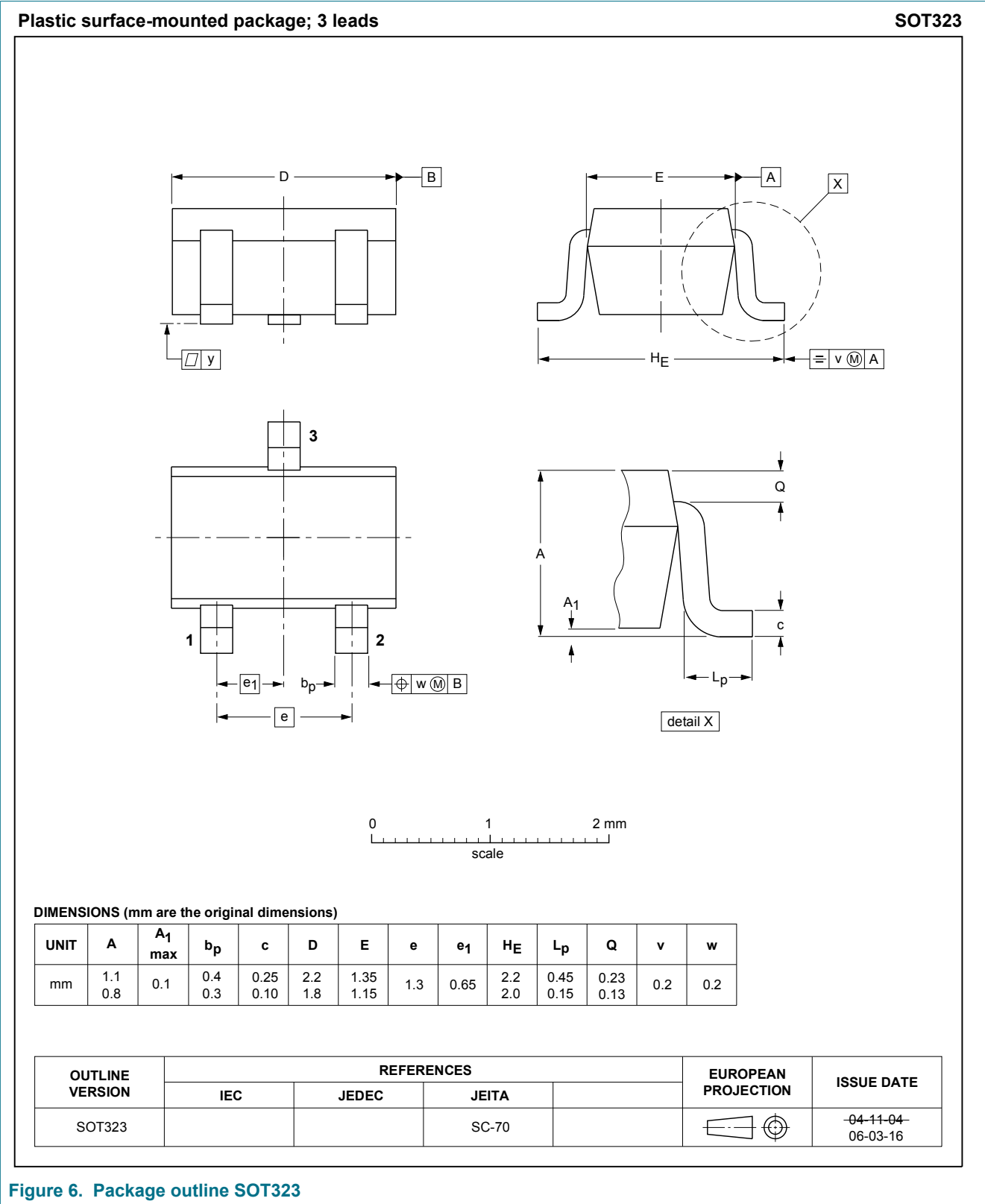


Diode zero-biased and inserted in series with a $50\text{ }\Omega$ strip line circuit $T_{\text{amb}} = 25\text{ }^{\circ}\text{C}$.

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



9 Package outline



10 Revision history

Table 7. Revision history

Document ID	Release date	Data sheet status	Change notice	Supersedes
BAP64-06W v.3.2	20190212	Product data sheet	-	BAP64-06W v.3.1
Modifications:	• aligned the last graphic with the look and feel of the other graphics			
BAP64-06W v.3.1	20190201	Product data sheet	-	BAP64-06W v.3
Modifications:	• changed condition for reverse current for V_R from 100 V to 60 V			
BAP64-06W v.3	20181211	Product data sheet	-	BAP64-06W v.2
Modifications:	• Section 1.2 "Features and benefits" has been updated. • The "Legal information" pages have been updated.			
BAP64-06W v.2	20010417	Product data sheet	-	BAP64-06W v.1

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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