



# BAP64-05W

Silicon PIN diode

Rev. 3.2 — 1 February 2019

Product data sheet

## 1 Product profile

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### 1.1 General description

Two planar PIN diodes in common cathode configuration in a SOT323 small plastic SMD 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

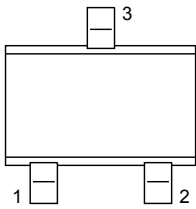
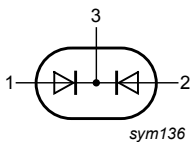
### 1.3 Applications

- RF attenuators and switches



## 2 Pinning information

Table 1. Discrete pinning

Pin	Description	Simplified outline	Symbol
1	anode (a1)	 <p>top view</p>	
2	anode (a2)		
3	common cathode		

## 3 Ordering information

Table 2. Ordering information

Type number	Package		
	Name	Description	Version
BAP64-05W	-	plastic surface-mounted package; 3 leads	SOT323

## 4 Marking

Table 3. Marking

Type number	Marking	Description
BAP64-05W	5W%	% = t: made in Malaysia
		% = W: made in China

Table 4. Marking

Type number	Marking code
BAP64-05W	5W-

## 5 Limiting values

Table 5. Limiting values

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

Values are specified per diode.

Symbol	Parameter	Conditions	Min	Max	Unit
$V_R$	reverse voltage		-	100	V
$I_F$	forward current		-	100	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 6. Thermal characteristics**

Symbol	Parameter	Conditions	Typ	Unit
$R_{th(j-sp)}$	thermal resistance from junction to solder point		250	K/W

## 7 Characteristics

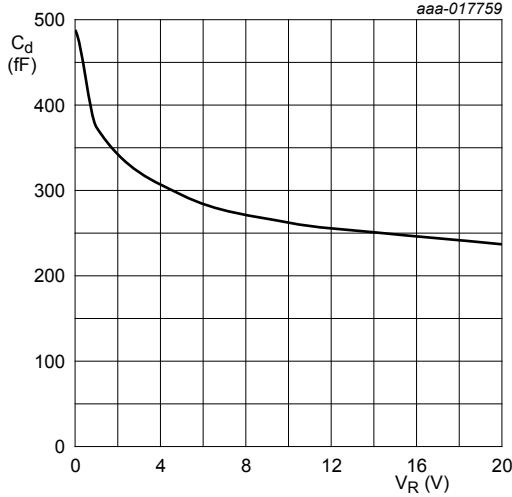
**Table 7. Characteristics**

Values are specified per diode;  $T_j = 25\text{ }^\circ\text{C}$  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	$\mu\text{A}$
		$V_R = 20\text{ V}$	-	-	1	$\mu\text{A}$
$C_d$	diode capacitance	see <a href="#">Figure 1</a> ; $f = 1\text{ MHz}$ ;				
		$V_R = 0\text{ V}$	-	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	see <a href="#">Figure 2</a> ; $f = 100\text{ MHz}$ ;	[1]			
		$I_F = 0.5\text{ mA}$	-	20	40	$\Omega$
		$I_F = 1\text{ mA}$	-	10	20	$\Omega$
		$I_F = 10\text{ mA}$	-	2.0	3.8	$\Omega$
		$I_F = 100\text{ mA}$	-	0.7	1.35	$\Omega$
$\tau_L$	charge carrier life time	when switched from $I_F = 10\text{ mA}$ to $I_R = 6\text{ mA}$ ; $R_L = 100\text{ }\Omega$ ; measured at $I_R = 3\text{ mA}$	-	1.55	-	$\mu\text{s}$
$L_S$	series inductance		-	1.2	-	nH

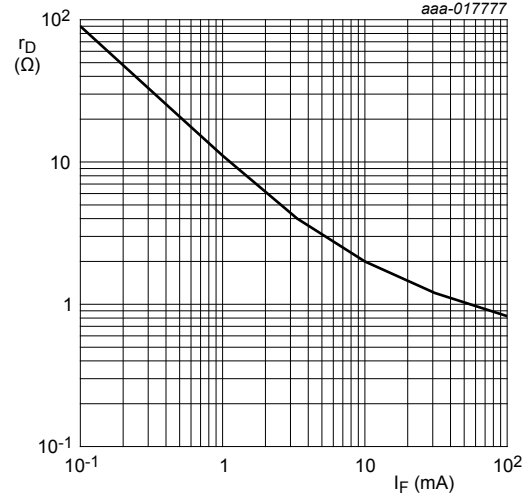
[1] Guaranteed on AQL basis: inspection level S4, AQL 1.0.

**7.1 Graphical data**



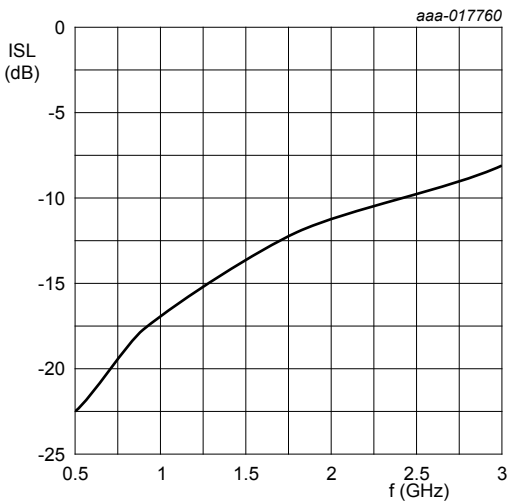
f = 1 MHz; T<sub>j</sub> = 25 °C.

**Figure 1. Diode capacitance as a function of reverse voltage; typical values**



f = 100 MHz; T<sub>j</sub> = 25 °C.

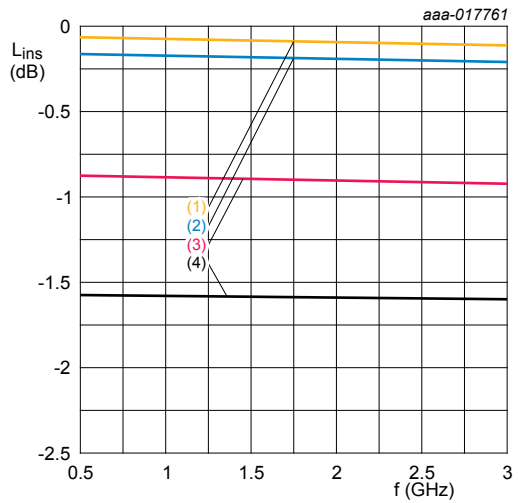
**Figure 2. Forward resistance as a function of forward current; typical values**



T<sub>amb</sub> = 25 °C

Diode zero biased and inserted in series with a 50 Ω stripline circuit

**Figure 3. Isolation of the diode as a function of frequency; typical values**

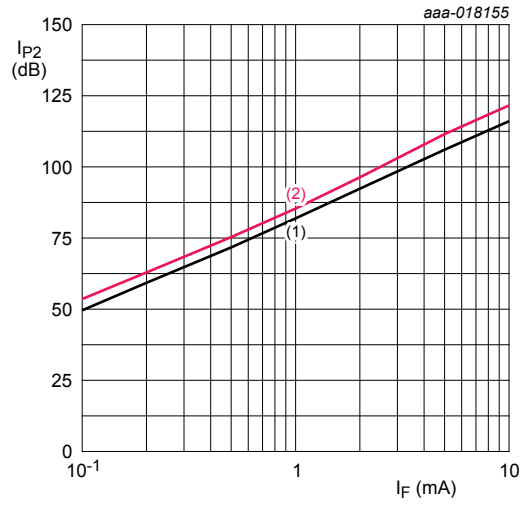


T<sub>amb</sub> = 25 °C

- 1. I<sub>F</sub> = 100 mA
- 2. I<sub>F</sub> = 10 mA
- 3. I<sub>F</sub> = 1 mA
- 4. I<sub>F</sub> = 0.5 mA

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

**Figure 4. Insertion loss of the diode as a function of frequency; typical values**



$T_{amb} = 25\text{ }^\circ\text{C}$

- 1.  $f = 900$  MHz
- 2.  $f = 1800$  MHz

Figure 5. Second-order intercept point as a function of forward current; typical values

**8 Package outline**

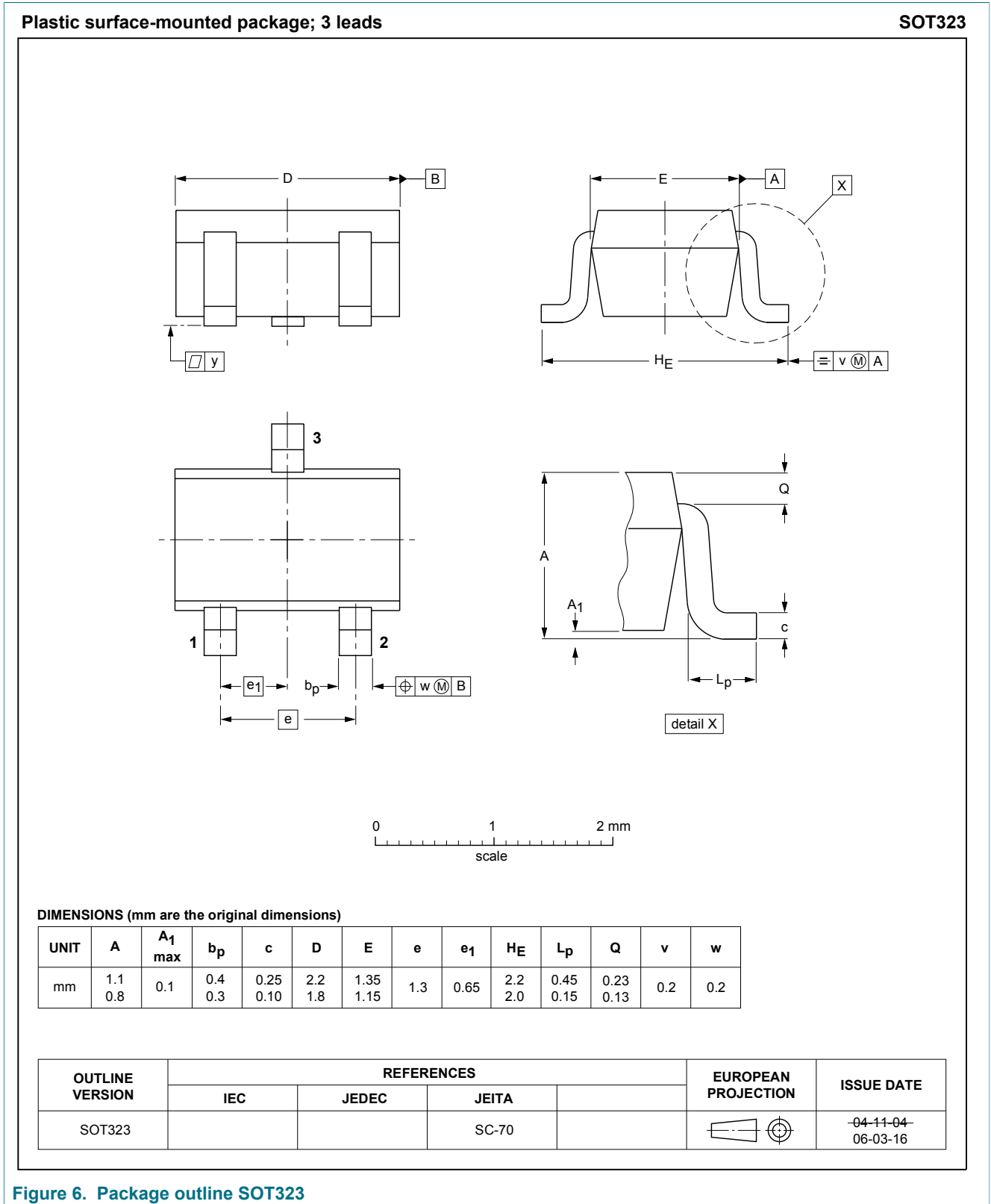


Figure 6. Package outline SOT323

## 9 Abbreviations

Table 8. Abbreviations

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

## 10 Revision history

Table 9. Revision history

Document ID	Release date	Data sheet status	Change notice	Supersedes
BAP64-05W v.3.2	20190201	Product data sheet	-	BAP64-05W v.3.1
Modifications	<ul style="list-style-type: none"> <li>changed condition for reverse current for <math>V_R</math> from 100 V to 60 V</li> </ul>			
BAP64-05W v.3.1	20181211	Product data sheet	-	BAP64-05W v.3
Modifications	<ul style="list-style-type: none"> <li>adapted marking code</li> </ul>			
BAP64-05W v.3	20180713	Product data sheet	-	BAP64-05W v.2
Modifications	<ul style="list-style-type: none"> <li>changed <math>I_R</math> conditions at characteristics</li> <li>adapted the layout of the data sheet</li> </ul>			
BAP64-05W v.2	20150428	Product data sheet	-	BAP64-05W v.1
Modifications	<ul style="list-style-type: none"> <li>The format of this data sheet has been redesigned to comply with the new identity guidelines of NXP Semiconductors.</li> <li>Legal texts have been adapted to the new company name where appropriate.</li> <li>AEC-Q101 qualified</li> </ul>			
BAP64-05W v.1 (9397 750 07192)	20000713	Product specification	-	-



## 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".

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