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Contact us

Tel: +86-755-8981 8866 Fax: +86-755-8427 6832

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BAP64-05W

Silicon PIN diode
Rev. 3 — 13 July 2018

Product data sheet

1 Product profile

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

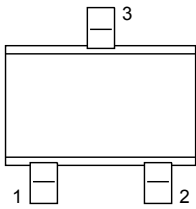
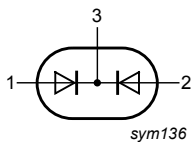
1.3 Applications

- RF attenuators and switches



2 Pinning information

Table 1. Discrete pinning

Pin	Description	Simplified outline	Symbol
1	anode (a1)	 <p>top view</p>	 <p>sym136</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	$T_{sp} = 90\text{ °C}$	-	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

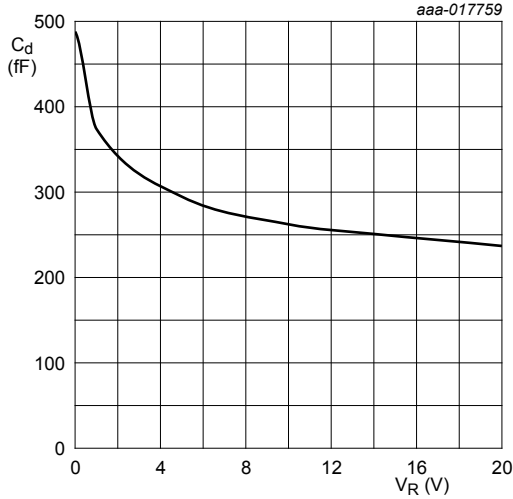
Table 7. Characteristics

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	$V_R = 100\text{ V}$	-	-	10	μA
		$V_R = 20\text{ V}$	-	-	1	μA
C_d	diode capacitance	see Figure 1 ; $f = 1\text{ MHz}$;				
		$V_R = 0\text{ V}$	-	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 Figure 2 ; $f = 100\text{ MHz}$;	[1]			
		$I_F = 0.5\text{ mA}$	-	20	40	Ω
		$I_F = 1\text{ mA}$	-	10	20	Ω
		$I_F = 10\text{ mA}$	-	2.0	3.8	Ω
		$I_F = 100\text{ mA}$	-	0.7	1.35	Ω
τ_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	-	μs
L_S	series inductance		-	1.2	-	nH

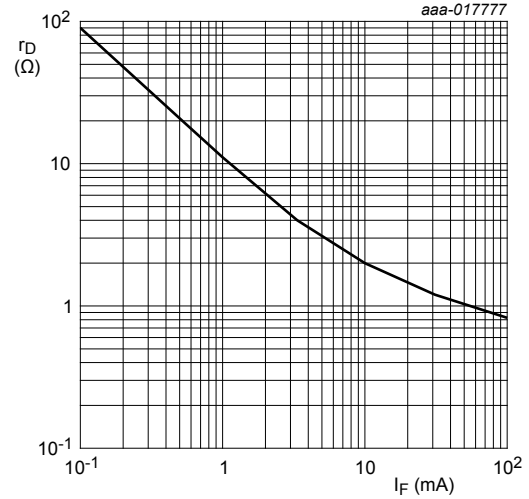
[1] Guaranteed on AQL basis: inspection level S4, AQL 1.0.

7.1 Graphical data



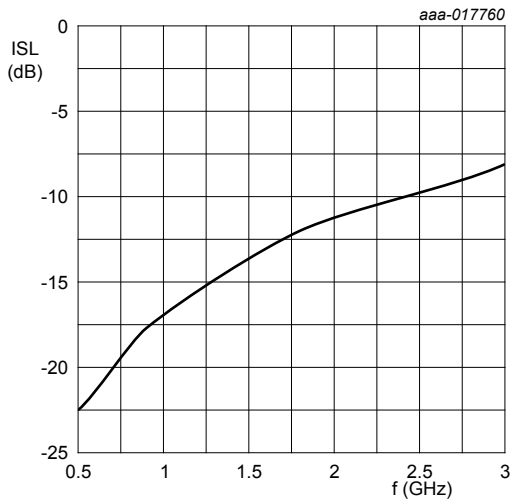
f = 1 MHz; T_j = 25 °C.

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



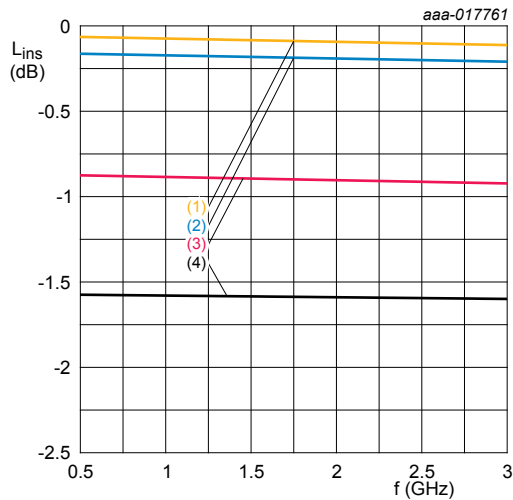
f = 100 MHz; T_j = 25 °C.

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



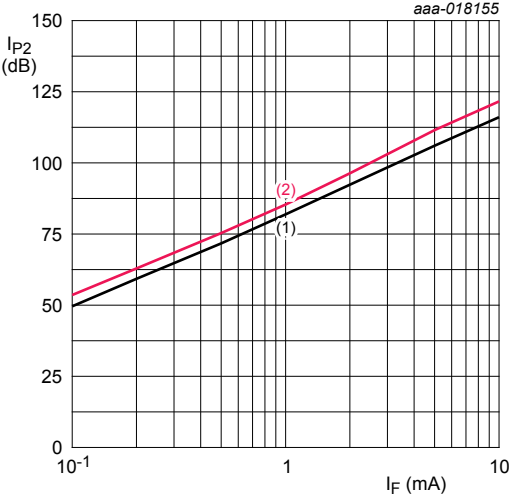
T_{amb} = 25 °C
Diode zero biased and inserted in series with a 50 Ω stripline circuit

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



T_{amb} = 25 °C
1. I_F = 100 mA
2. I_F = 10 mA
3. I_F = 1 mA
4. I_F = 0.5 mA
Diode inserted in series with a 50 Ω stripline circuit and biased via the analyzer Tee network

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



$T_{amb} = 25\text{ }^\circ\text{C}$
1. $f = 900\text{ MHz}$
2. $f = 1800\text{ MHz}$

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

8 Package outline

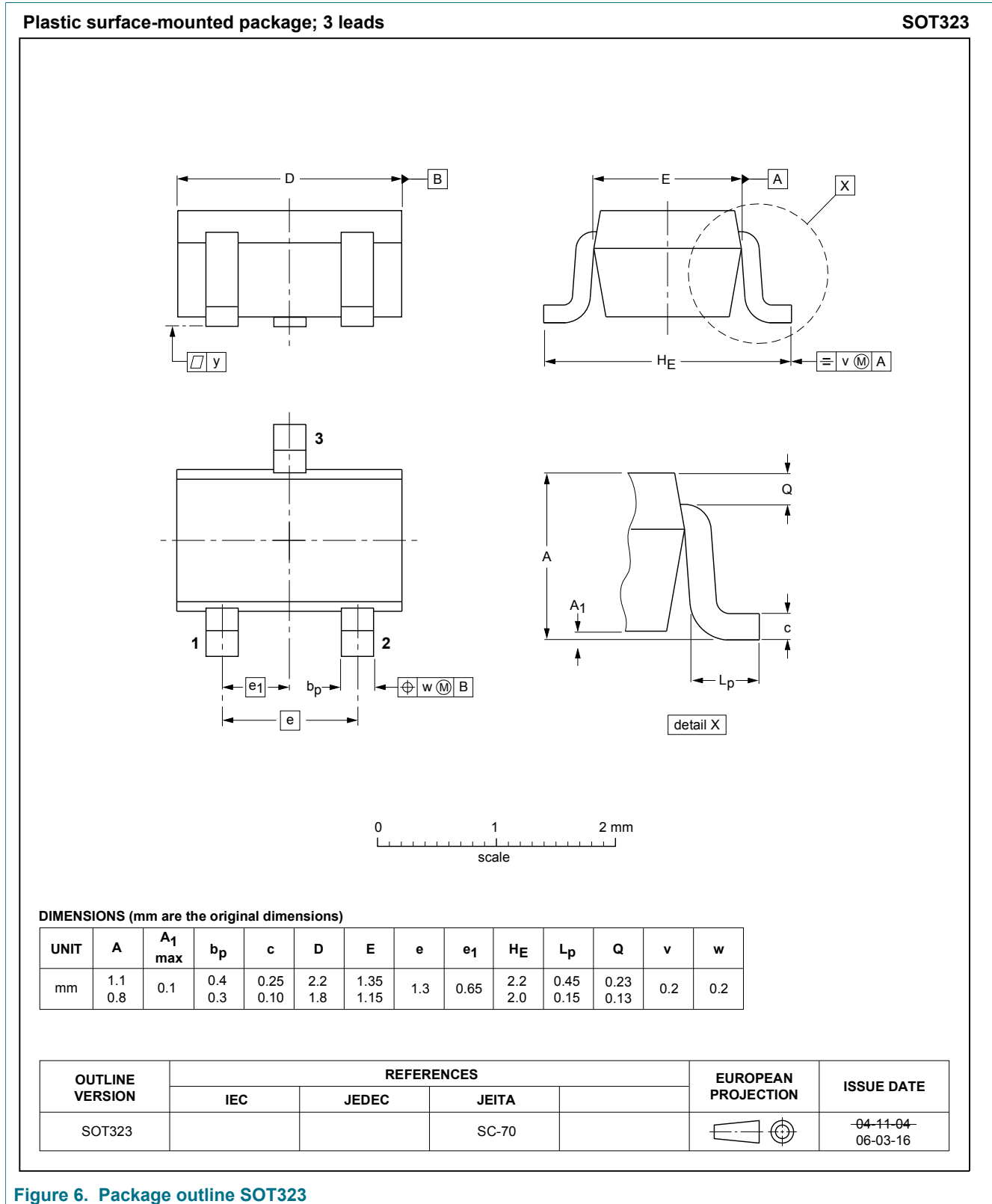


Figure 6. Package outline SOT323

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	20180713			BAP64-05W v.2
Modifications	<ul style="list-style-type: none"> changed I_R conditions at characteristics adapted the layout of the data sheet 			
BAP64-05W v.2	20150428	Product data sheet	-	BAP64-05W v.1
Modifications	<ul style="list-style-type: none"> The format of this data sheet has been redesigned to comply with the new identity guidelines of NXP Semiconductors. Legal texts have been adapted to the new company name where appropriate. AEC-Q101 qualified 			
BAP64-05W v.1 (9397 750 07192)	20000713	Product specification	-	-

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".

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For sales office addresses, please send an email to: salesaddresses@nxp.com

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