



# BAP64-05

Silicon PIN diode

Rev. 5 — 28 April 2015

Product data sheet

## 1. Product profile

### 1.1 General description

Two planar PIN diodes in common cathode configuration in a SOT23 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)	 top view	 sym136
2	anode (a2)		
3	common cathode		

## 3. Ordering information

Table 2. Ordering information

Type number	Package		
	Name	Description	Version
BAP64-05	-	plastic surface-mounted package; 3 leads	SOT23



## 4. Marking

**Table 3. Marking**

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

## 5. Limiting values

**Table 4. 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		-	175	V
$I_F$	forward current		-	100	mA
$P_{tot}$	total power dissipation	$T_{sp} = 90\text{ °C}$	-	250	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		220	K/W

## 7. Characteristics

**Table 6. Characteristics**

Values are specified per diode;  $T_j = 25\text{ °C}$  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	$V_R = 175\text{ V}$	-	-	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

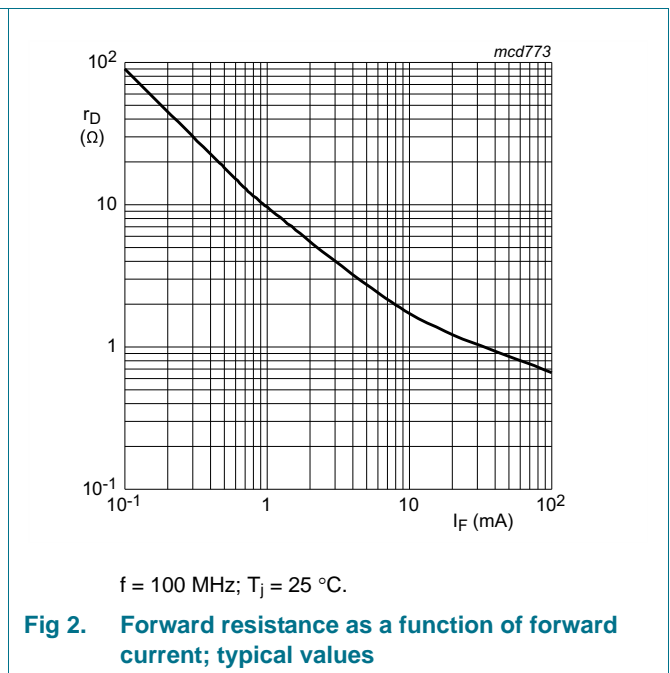
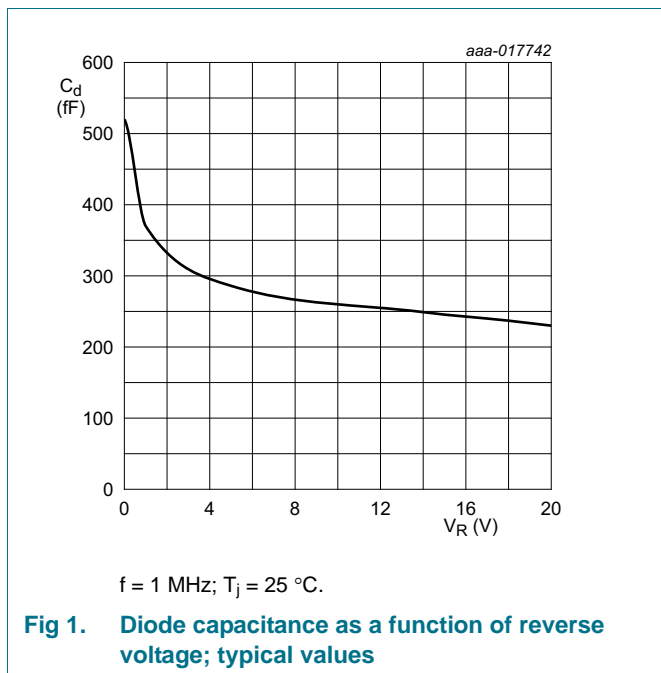
**Table 6. Characteristics ...continued**

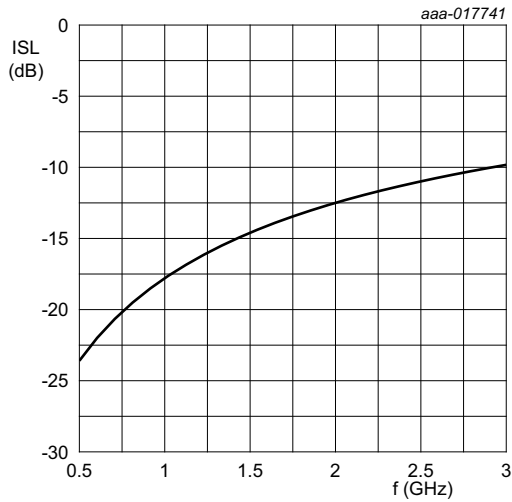
Values are specified per diode;  $T_j = 25\text{ }^\circ\text{C}$  unless otherwise specified.

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
$r_D$	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 $I_R = 6\text{ mA}$ ; $R_L = 100\ \Omega$ ; measured at $I_R = 3\text{ mA}$	-	1.55	-	$\mu\text{s}$
$L_S$	series inductance		-	1.4	-	nH

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

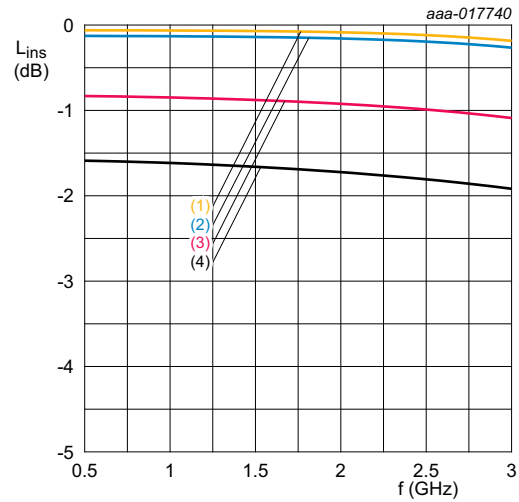
### 7.1 Graphical data





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

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



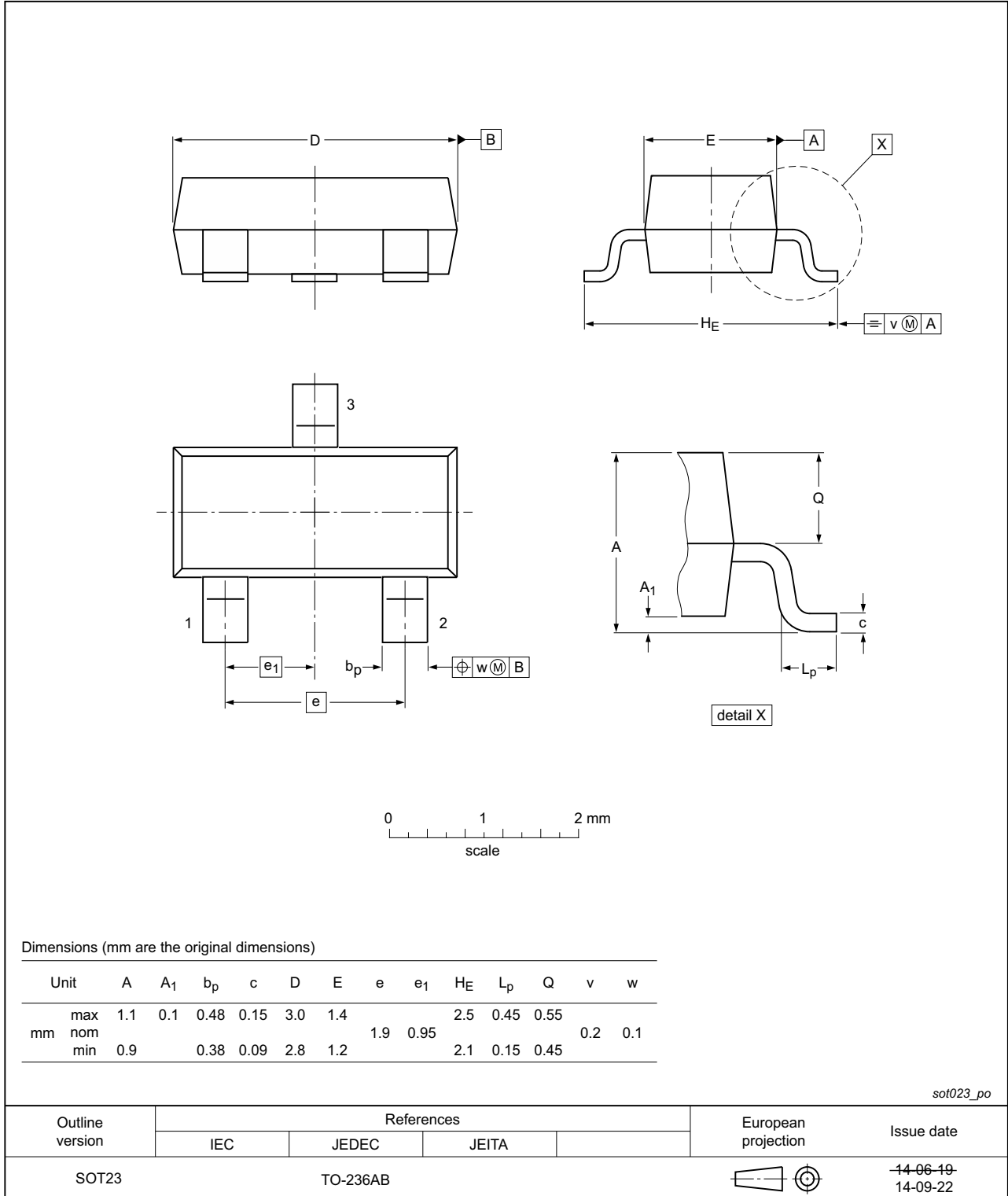
$T_{amb} = 25\text{ }^{\circ}\text{C}$   
 (1)  $I_F = 100\text{ mA}$   
 (2)  $I_F = 10\text{ mA}$   
 (3)  $I_F = 1\text{ mA}$   
 (4)  $I_F = 0.5\text{ mA}$   
 Diode inserted in series with a  $50\ \Omega$  stripline circuit and biased via the analyzer Tee network

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

**8. Package outline**

Plastic surface-mounted package; 3 leads

SOT23



**Fig 5. Package outline SOT23**

## 9. Abbreviations

Table 7. 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 8. Revision history

Document ID	Release date	Data sheet status	Change notice	Supersedes
BAP64-05 v.5	20150428	Product data sheet	-	BAP64-05 v.4.1
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>			
BAP64-05 v.4 (9397 750 06284)	19990819	Product specification	-	BAP64-05_N v.3
BAP64-05_N v.3 (9397 750 06089)	19990616	Preliminary specification	-	BAP64-05 v.2
BAP64-05 v.2 (9397 750 05561)	19990510	Preliminary specification	-	BAP64-05_N v.1
BAP64-05_N v.1 (9397 750 05494)	19981204	Objective 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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