



# BAP64-04

Silicon PIN diode

Rev. 6 — 22 March 2019

Product data sheet

## 1 Product profile

### 1.1 General description

Two planar PIN diodes in series 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	 top view	
2	cathode		
3	common connection		

## 3 Ordering information

Table 2. Ordering information

Type number	Package		
	Name	Description	Version
BAP64-04	-	plastic surface-mounted package; 3 leads	SOT23



## 4 Marking

Table 3. Marking

Type number	Marking	Description
BAP64-04	4K*	* = 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

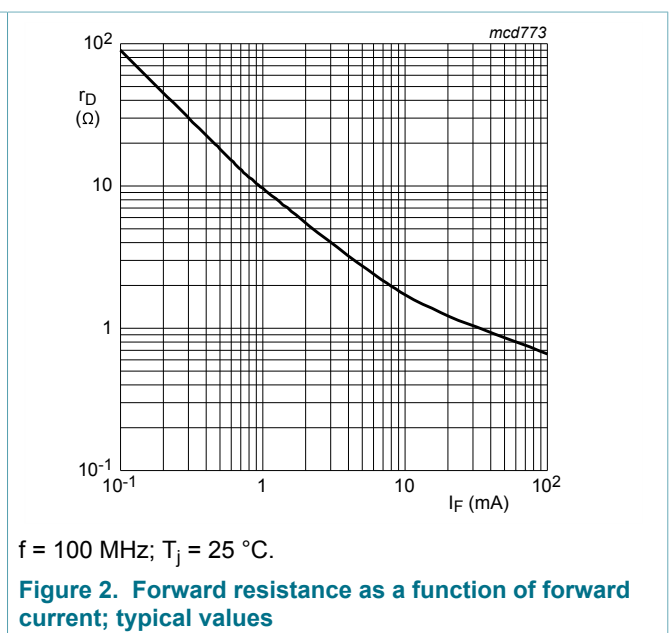
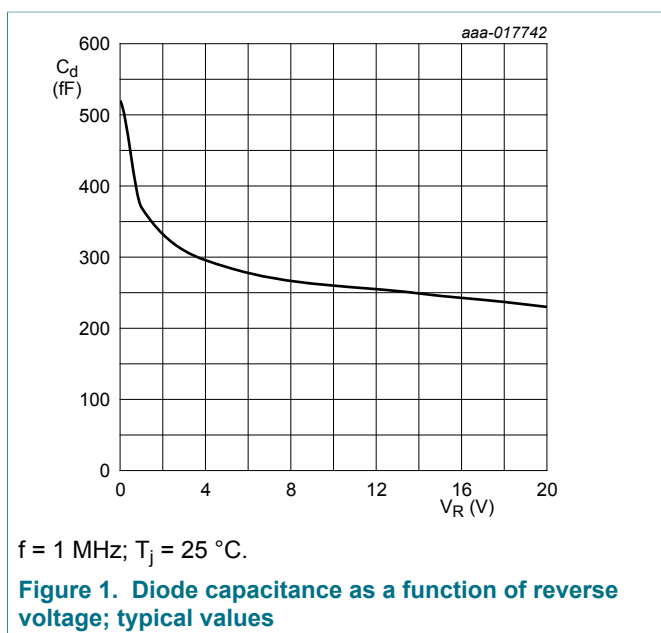
Values are specified per diode;  $T_j = 25\text{ °C}$  unless otherwise specified.

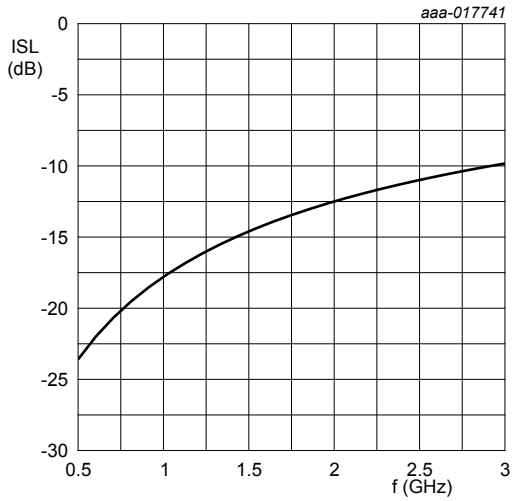
Symbol	Parameter	Conditions	Min	Typ	Max	Unit
$V_F$	forward voltage	$I_F = 50\text{ mA}$	-	0.95	1.1	V
$I_R$	reverse current	$V_R = 60\text{ V}$	-	-	10	$\mu\text{A}$
		$V_R = 20\text{ V}$	-	-	1	$\mu\text{A}$
$C_d$	diode capacitance	see <a href="#">Figure 1</a> ; $f = 1\text{ MHz}$ ;				
		$V_R = 0\text{ V}$	-	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	$\Omega$

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
		$I_F = 100 \text{ mA}$	-	0.7	1.35	$\Omega$
$T_L$	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

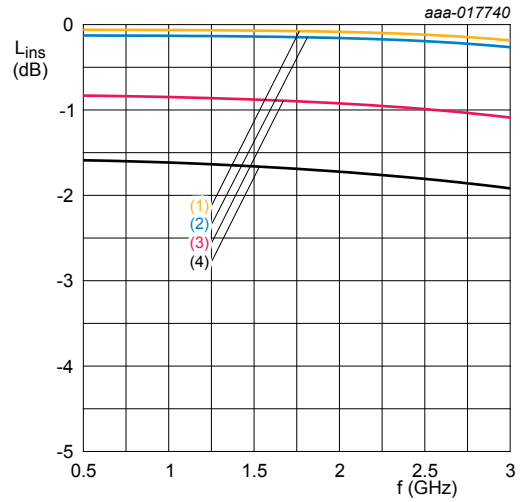




$T_{amb} = 25\text{ }^{\circ}\text{C}$

Diode zero biased and inserted in series with a 50  $\Omega$  stripline circuit

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



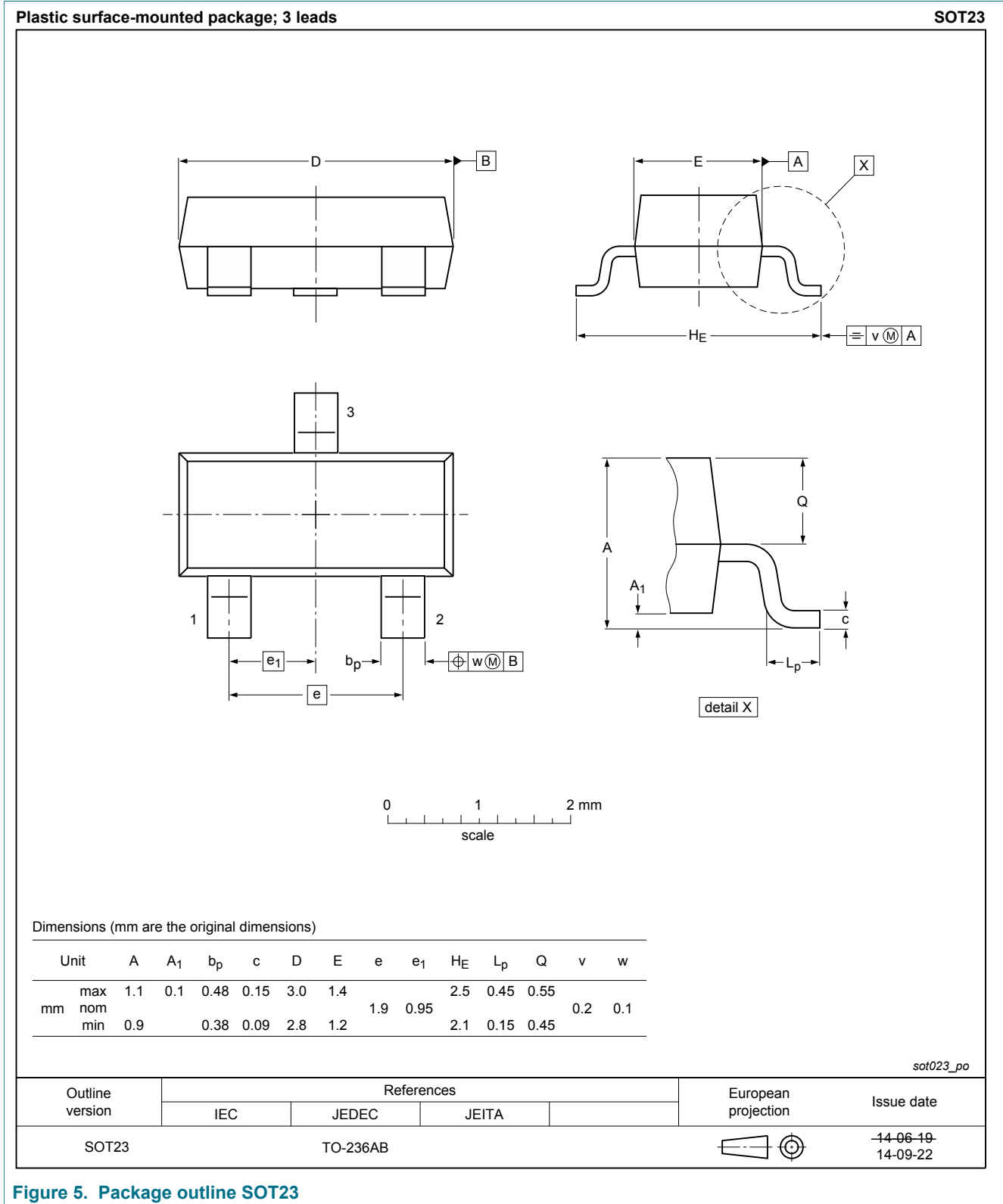
$T_{amb} = 25\text{ }^{\circ}\text{C}$

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

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

**8 Package outline**



**Figure 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
BAP64-04 v.6	20190311	Product data sheet	-	BAP64-04 v.5
Modifications:	<ul style="list-style-type: none"> <li>changed <math>V_R</math> condition of <math>I_R</math> from 175 V to 60 V</li> </ul>			
BAP64-04 v.5	20150428	Product data sheet	-	BAP64-04 v.4
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>			
BAP64-04 v.4 (9397 750 06424)	19990921	Product specification	-	BAP64-04 v.3
BAP64-04 v.3 (9397 750 06282)	19990827	Product specification	-	BAP64-04_N v.2
BAP64-04_N v.2 (9397 750 06088)	19990616	Preliminary specification	-	BAP64-04 v.1
BAP64-04 v.1 (9397 750 05559)	19990510	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".

[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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