



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	$T_{sp} = 90\text{ }^{\circ}\text{C}$	-	250	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		220	K/W

7 Characteristics

Table 6. Characteristics

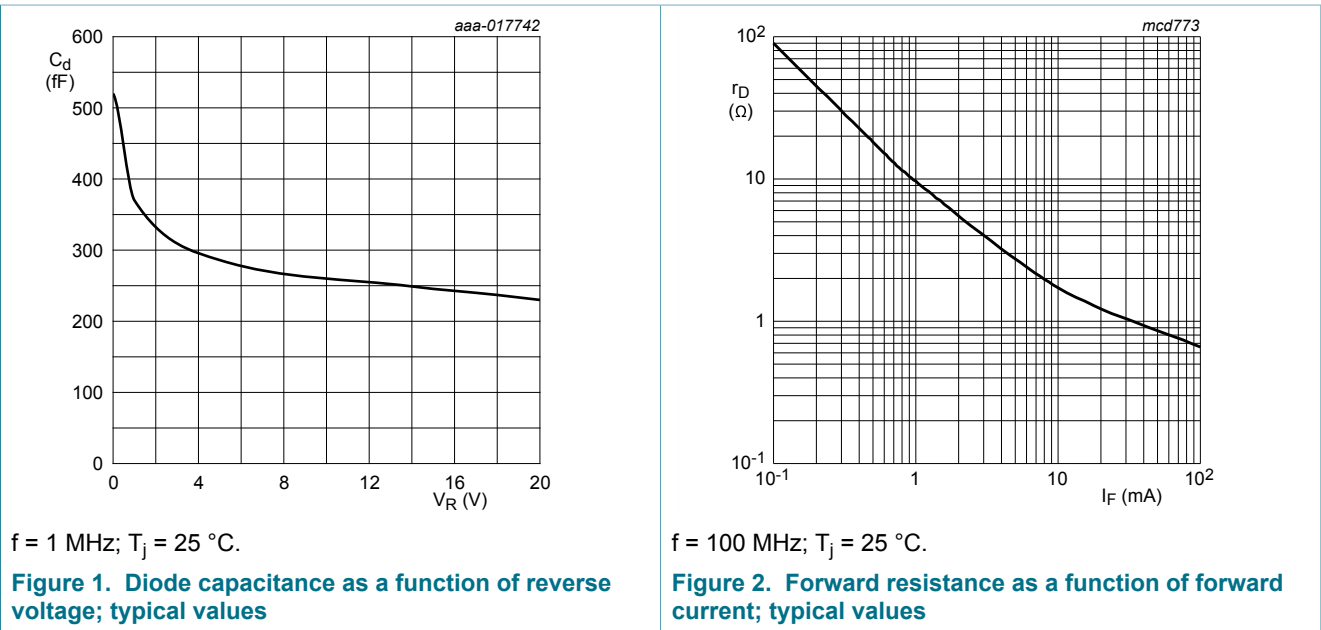
Values are specified per diode; $T_j = 25\text{ }^{\circ}\text{C}$ unless otherwise specified.

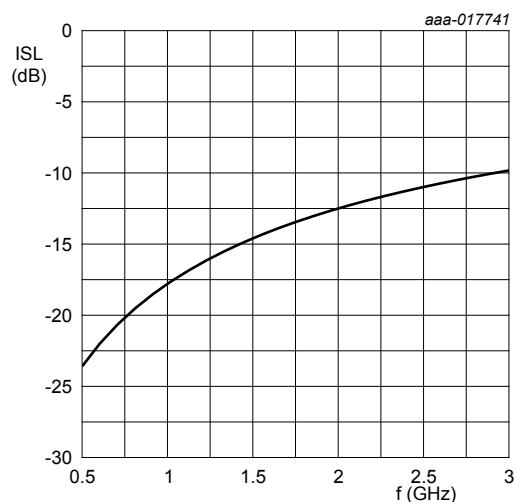
Symbol	Parameter	Conditions	Min	Typ	Max	Unit
V_F	forward voltage	$I_F = 50\text{ mA}$	-	0.95	1.1	V
I_R	reverse current	$V_R = 60\text{ V}$	-	-	10	μA
		$V_R = 20\text{ V}$	-	-	1	μA
C_d	diode capacitance	see Figure 1 ; $f = 1\text{ MHz}$;				
		$V_R = 0\text{ V}$	-	0.52	-	pF
		$V_R = 1\text{ V}$	-	0.37	-	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

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
		$I_F = 100\text{ mA}$	-	0.7	1.35	Ω
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	-	μs
L_S	series inductance		-	1.4	-	nH

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

7.1 Graphical data

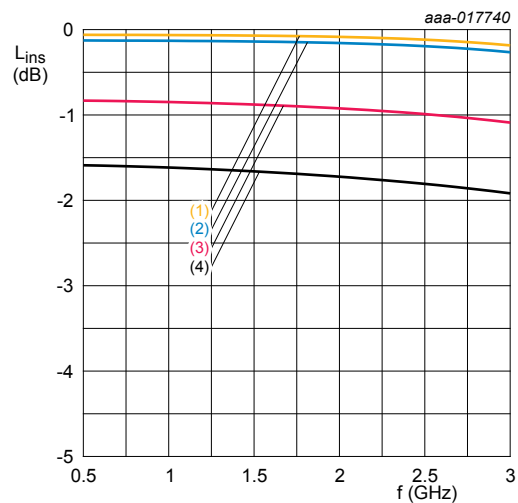




$T_{amb} = 25\text{ }^{\circ}\text{C}$

Diode zero biased and inserted in series with a $50\text{ }\Omega$ 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 $50\text{ }\Omega$ 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

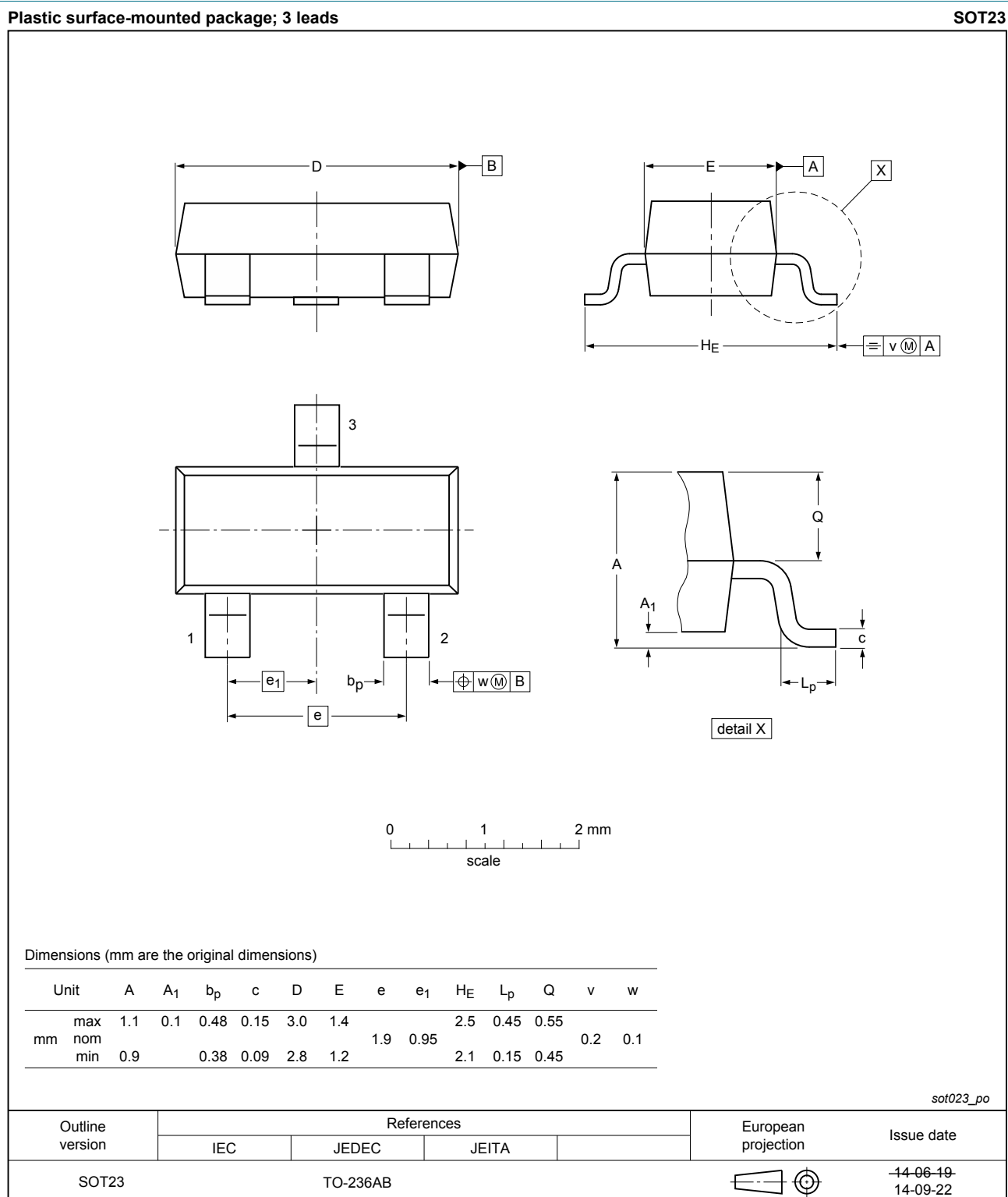


Figure 5. Package outline SOT23

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:	• changed V_R condition of I_R from 175 V to 60 V			
BAP64-04 v.5	20150428	Product data sheet	-	BAP64-04 v.4
Modifications:	- 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			
BAP64-04 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 ^{[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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