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

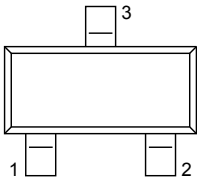
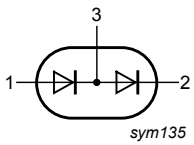
- High voltage, current controlled
- RF resistor for RF attenuators and switches
- Low diode capacitance
- Low diode forward resistance
- Low series inductance
- For applications up to 3 GHz
- AEC-Q101 qualified

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 °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

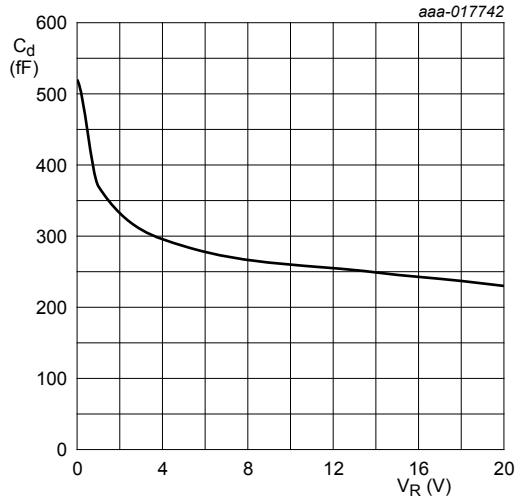
Values are specified per diode; T_j = 25 °C unless otherwise specified.

Symbol	Parameter	Conditions		Min	Typ	Max	Unit
V_F	forward voltage	I_F = 50 mA		-	0.95	1.1	V
I_R	reverse current	V_R = 60 V		-	-	10	µA
		V_R = 20 V		-	-	1	µA
C_d	diode capacitance	see Figure 1; f = 1 MHz;					
		V_R = 0 V		-	0.52	-	pF
		V_R = 1 V		-	0.37	-	pF
		V_R = 20 V		-	0.23	0.35	pF
r_D	diode forward resistance	see Figure 2; f = 100 MHz;	[1]				
		I_F = 0.5 mA		-	20	40	Ω
		I_F = 1 mA		-	10	20	Ω
		I_F = 10 mA		-	2.0	3.8	Ω

Symbol	Parameter	Conditions		Min	Typ	Max	Unit
		I_F = 100 mA		-	0.7	1.35	Ω
τ_L	charge carrier life time	when switched from I_F = 10 mA to I_R = 6 mA; R_L = 100 Ω; measured at I_R = 3 mA		-	1.55	-	µs
L_S	series inductance			-	1.4	-	nH

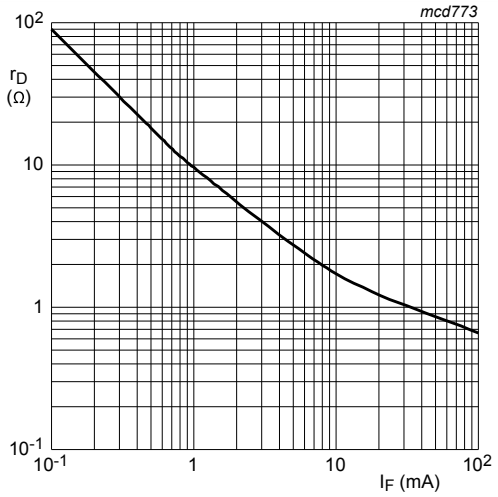
[1] Guaranteed on AQL basis: inspection level S4, AQL 1.0.

7.1 Graphical data



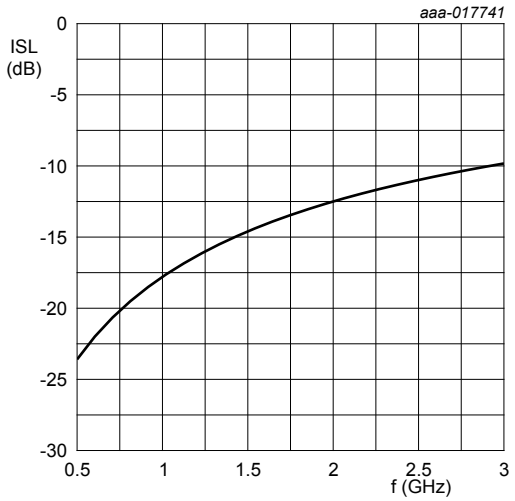
f = 1 MHz; T_j = 25 °C.

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



f = 100 MHz; T_j = 25 °C.

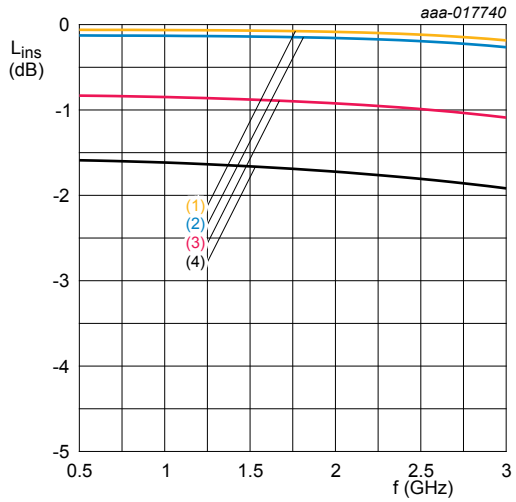
Figure 2. Forward resistance as a function of forward current; typical values



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

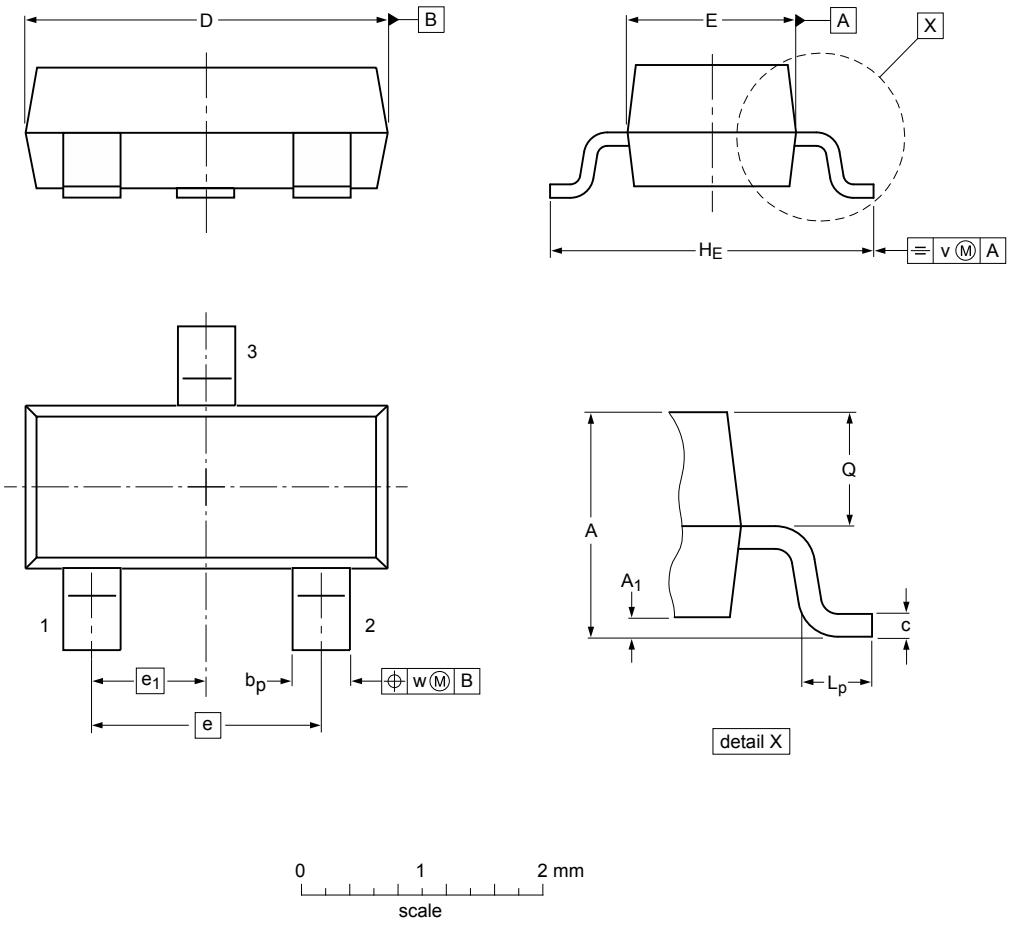
1. I_F = 100 mA
2. I_F = 10 mA
3. I_F = 1 mA
4. I_F = 0.5 mA

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

8 Package outline

Plastic surface-mounted package; 3 leads **SOT23**



Dimensions (mm are the original dimensions)

Unit		A	A_1	b_p	c	D	E	e	e_1	H_E	L_p	Q	v	w
mm	max	1.1	0.1	0.48	0.15	3.0	1.4			2.5	0.45	0.55		
	nom							1.9	0.95				0.2	0.1
	min	0.9		0.38	0.09	2.8	1.2			2.1	0.15	0.45		

sot023_po

Outline version	References				European projection	Issue date
	IEC	JEDEC	JEITA			
SOT23		TO-236AB				~~14-06-19~~ 14-09-22

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.
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[1] Please consult the most recently issued document before initiating or completing a design.
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