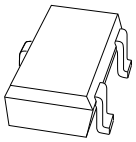


BAP65-05W

Silicon PIN diode

Rev. 2 — 27 September 2010 Product data sheet

1. Product profile

1.1 General description

Two planar PIN diodes in a SOT323 small SMD plastic package.

1.2 Features and benefits

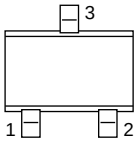
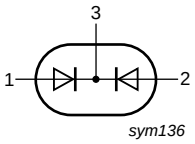
- Two elements in common cathode configuration
- High voltage, current controlled
- RF resistor for RF switches
- Low diode capacitance
- Low diode forward resistance (low loss)

1.3 Applications

- RF attenuators and switches
- Bandswitch for TV tuners
- Series diode for mobile communication transmit/receive switch

2. Pinning information

Table 1. Pinning

Pin	Description	Simplified outline	Graphic symbol
1	anode (a_1)		
2	anode (a_2)		
3	common cathode		

3. Ordering information

Table 2. Ordering information

Type number	Package		
	Name	Description	Version
BAP65-05W	-	plastic surface-mounted package; 3 leads	SOT323

4. Marking

Table 3. Marking codes

Type number	Marking code
BAP65-05W	V6-

5. Limiting values

Table 4. Limiting values

In accordance with the Absolute Maximum Rating System (IEC 60134).

Symbol	Parameter	Conditions	Min	Max	Unit
V_R	continuous reverse voltage		-	30	V
I_F	continuous forward current		-	100	mA
P_{tot}	total power dissipation	$T_s \leq 90$ °C	-	240	mW
T_{stg}	storage temperature		–65	+150	°C
T_j	junction temperature		–65	+150	°C
T_{amb}	ambient temperature		–40	+85	°C

6. Thermal characteristics

Table 5. Thermal characteristics

Symbol	Parameter	Conditions	Typ	Unit
$R_{th\ j\text{-}s}$	thermal resistance from junction to soldering point		250	K/W

7. Characteristics

Table 6. Characteristics

T_j = 25 °C unless otherwise specified.

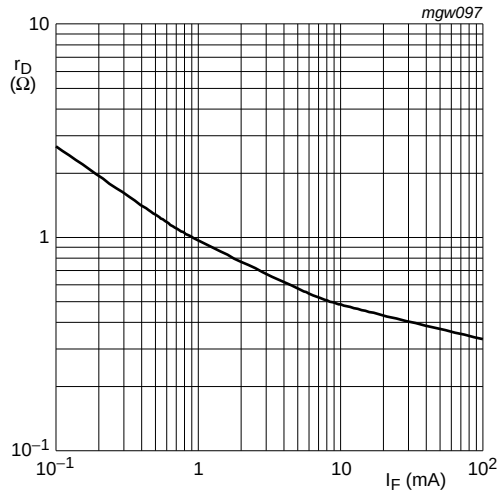
Symbol	Parameter	Conditions		Min	Typ	Max	Unit
V_F	forward voltage	I_F = 50 mA		-	0.9	1.1	V
I_R	reverse leakage current	V_R = 20 V		-	-	20	nA
C_d	diode capacitance	V_R = 0 V; f = 1 MHz		-	0.7	-	pF
		V_R = 1 V; f = 1 MHz		-	0.575	0.9	pF
		V_R = 3 V; f = 1 MHz		-	0.525	0.8	pF
		V_R = 20 V; f = 1 MHz		-	0.425	-	pF
r_D	diode forward resistance	I_F = 1 mA; f = 100 MHz		-	1	-	Ω
		I_F = 5 mA; f = 100 MHz	[1]	-	0.65	0.95	Ω
		I_F = 10 mA; f = 100 MHz	[1]	-	0.56	0.9	Ω
		I_F = 100 mA; f = 100 MHz		-	0.35	-	Ω
$\lvert s_{21}\rvert^2$	isolation	V_R = 0; f = 900 MHz		-	9.3	-	dB
		V_R = 0; f = 1800 MHz		-	5.3	-	dB
		V_R = 0; f = 2450 MHz		-	3.5	-	dB

Table 6. Characteristics *...continued*

T_j = 25 °C unless otherwise specified.

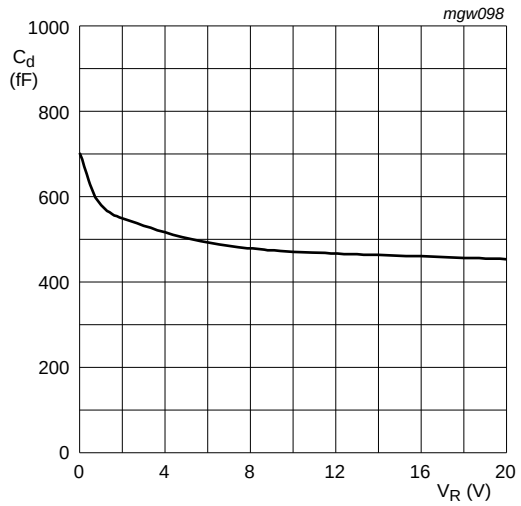
Symbol	Parameter	Conditions	Min	Typ	Max	Unit
$\|s_{21}\|^2$	insertion loss	I_F = 1 mA; f = 900 MHz	-	0.11	-	dB
		I_F = 1 mA; f = 1800 MHz	-	0.17	-	dB
		I_F = 1 mA; f = 2450 MHz	-	0.24	-	dB
$\|s_{21}\|^2$	insertion loss	I_F = 5 mA; f = 900 MHz	-	0.08	-	dB
		I_F = 5 mA; f = 1800 MHz	-	0.14	-	dB
		I_F = 5 mA; f = 2450 MHz	-	0.21	-	dB
$\|s_{21}\|^2$	insertion loss	I_F = 10 mA; f = 900 MHz	-	0.08	-	dB
		I_F = 10 mA; f = 1800 MHz	-	0.14	-	dB
		I_F = 10 mA; f = 2450 MHz	-	0.21	-	dB
$\|s_{21}\|^2$	insertion loss	I_F = 100 mA; f = 900 MHz	-	0.06	-	dB
		I_F = 100 mA; f = 1800 MHz	-	0.13	-	dB
		I_F = 100 mA; f = 2450 MHz	-	0.2	-	dB
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	-	0.17	-	µs
L_S	series inductance	I_F = 100 mA; f = 100 MHz	-	1.4	-	nH

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



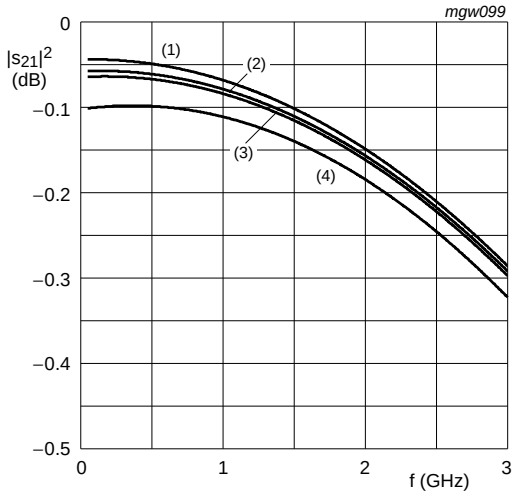
f = 100 MHz; T_j = 25 °C

Fig 1. Forward resistance as a function of forward current; typical values



f = 1 MHz; T_j = 25 °C

Fig 2. Diode capacitance as a function of reverse voltage; typical values



(1) I_F = 100 mA

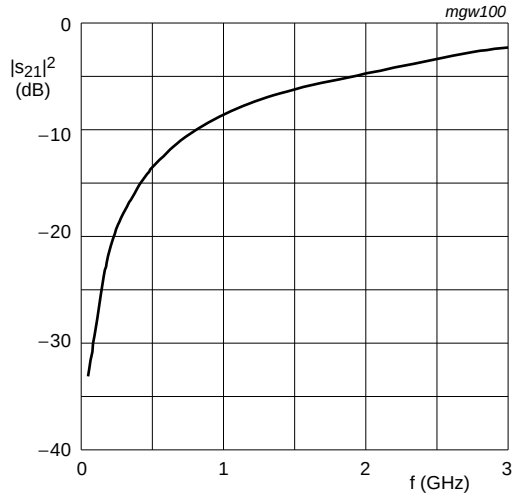
(2) I_F = 10 mA

(3) I_F = 5 mA

(4) I_F = 1 mA

Diode inserted in series with a 50 Ω stripline circuit and biased via the analyzer Tee network. T_{amb} = 25 °C.

Fig 3. Insertion loss ($|s_{21}|^2$) of the diode in on-state as a function of frequency; typical values

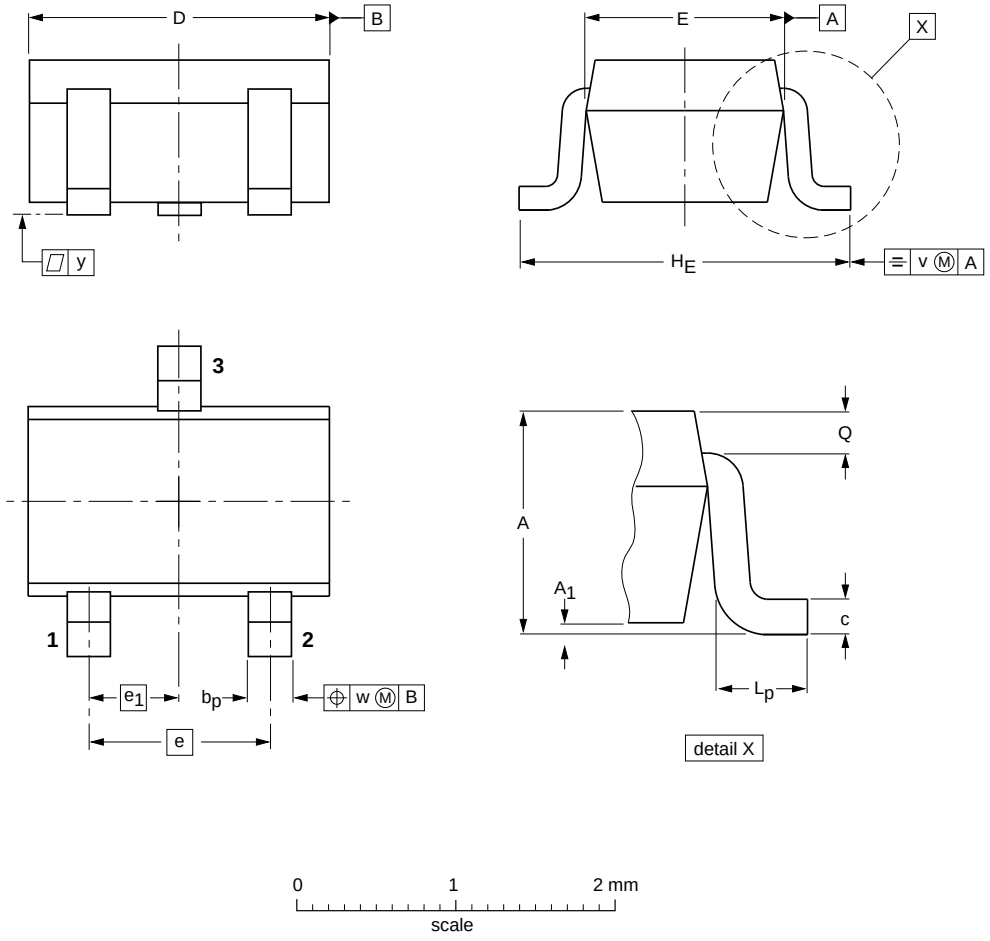


Diode zero biased and inserted in series with a 50 Ω stripline circuit. T_{amb} = 25 °C.

Fig 4. Isolation ($|s_{21}|^2$) of the diode in off-state as a function of frequency; typical values

8. Package outline

Plastic surface-mounted package; 3 leads **SOT323**



DIMENSIONS (mm are the original dimensions)

UNIT	A	A_1 max	b_p	c	D	E	e	e_1	H_E	L_p	Q	v	w
mm	1.1 0.8	0.1	0.4 0.3	0.25 0.10	2.2 1.8	1.35 1.15	1.3	0.65	2.2 2.0	0.45 0.15	0.23 0.13	0.2	0.2

OUTLINE VERSION	REFERENCES				EUROPEAN PROJECTION	ISSUE DATE
	IEC	JEDEC	JEITA			
SOT323			SC-70			~~04-11-04~~ 06-03-16

Fig 5. Package outline SOT323

9. Revision history

Table 7. Revision history

Document ID	Release date	Data sheet status	Change notice	Supersedes
BAP65-05W v.2	20100927	Product data sheet	-	BAP65-05W v.1
Modifications:	• The format of this data sheet has been redesigned to comply with the new identity guidelines of NXP Semiconductors. • Legal texts have been updated. • Figure 5: package outline drawing has been updated to the latest version. • Table 4 “Limiting values”: added T_{amb} (ambient temperature).			
BAP65-05W v.1 (9397 750 08115)	20010507	Product specification	-	-

10. Legal information

10.1 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".

[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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12. Contents

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