BAP65-03

Silicon Pin diode

Rev. 5.2 — 28 January 2019 Product data sheet

1 Product profile

1.1 General description

Planar PIN diode in a SOD323 small SMD plastic package.

1.2 Features and benefits

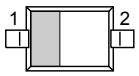
- High voltage, current controlled
- RF resistor for RF switches
- Low diode capacitance
- Low diode forward resistance
- Very low series inductance
- AEC-Q101 qualified

1.3 Applications

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

2 Pinning information

Table 1. Discrete pinning

Pin	Description	Simplified outline	Graphic symbol
1	cathode	 Top view	 sym006
2	anode		

3 Ordering information

Table 2. Ordering information

Type number	Package		
	Name	Description	Version
BAP65-03	-	plastic surface-mounted package; 2 leads	SOD323

4 Marking

Table 3. Marking

Type number	Marking code
BAP65-03	D3[1]

[1] The marking bar indicates the cathode (see simplified outline graphic in Table 1)

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	$T_{sp} \leq 90$ °C	-	500	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		120	K/W

7 Characteristics

Table 6. Characteristics

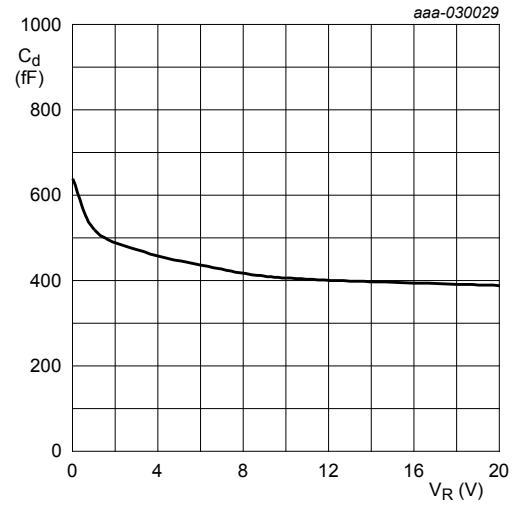
T_j = 25 °C unless otherwise specified.

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
V_F	forward voltage	I_F = 50 mA	-	0.9	1.1	V
I_R	reverse current	V_R = 20 V	-	-	20	nA
C_d	diode capacitance	f = 1 MHz (see Figure 1)				
		V_R = 0 V	-	0.65	-	pF
		V_R = 1 V	-	0.55	0.9	pF
		V_R = 3 V	-	0.5	0.8	pF
		V_R = 20 V	-	0.375	-	pF
r_D	diode forward resistance	f = 100 MHz (see Figure 2)				
		I_F = 1 mA	-	1	-	Ω
		I_F = 5 mA [1]	-	0.65	0.95	Ω
		I_F = 10 mA [1]	-	0.56	0.9	Ω
		I_F = 100 mA	-	0.35	-	Ω
ISL	isolation	V_R = 0 V (see Figure 4)				
		f = 900 MHz	-	10.2	-	dB
		f = 1800 MHz	-	5.8	-	dB
		f = 2450 MHz	-	4.1	-	dB
L_{ins}	insertion loss	See Figure 3.				
		I_F = 1 mA				
		f = 900 MHz	-	0.11	-	dB
		f = 1800 MHz	-	0.14	-	dB
		f = 2450 MHz	-	0.18	-	dB
		I_F = 5 mA				
		f = 900 MHz	-	0.06	-	dB
		f = 1800 MHz	-	0.10	-	dB
		f = 2450 MHz	-	0.14	-	dB
		I_F = 10 mA				
		f = 900 MHz	-	0.06	-	dB
		f = 1800 MHz	-	0.1	-	dB
		f = 2450 MHz	-	0.13	-	dB
L_{ins}	insertion loss	I_F = 100 mA				
		f = 900 MHz	-	0.05	-	dB
		f = 1800 MHz	-	0.1	-	dB
		f = 2450 MHz	-	0.14	-	dB

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
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	-	1.5	-	nH

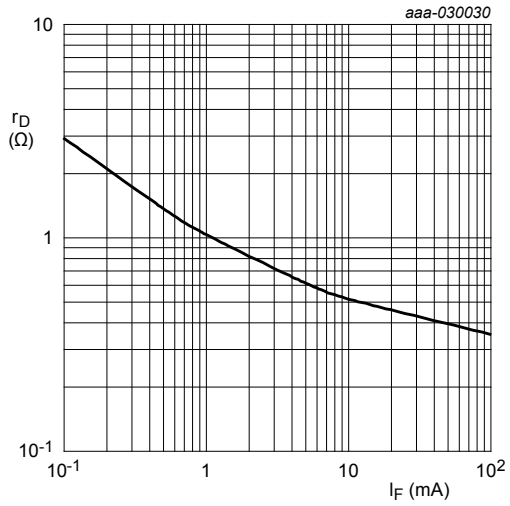
[1] Guaranteed on AQL basis; inspection level S4, AQL 1.0

8 Graphical data



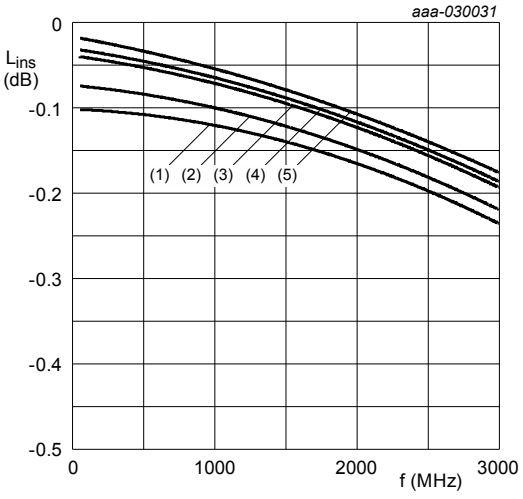
T_j = 25 °C; f = 1 MHz

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



T_j = 25 °C; f = 100 MHz.

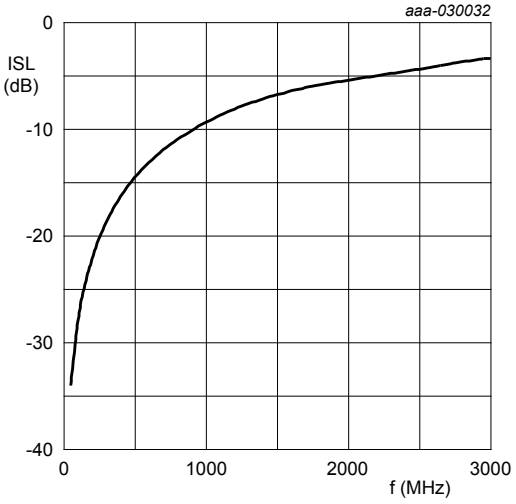
Figure 2. Diode forward resistance as a function of forward current (typical values)



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

(1) I_F = 0.5 mA
(2) I_F = 1 mA
(3) I_F = 5 mA
(4) I_F = 10 mA
(5) I_F = 100 mA

Figure 3. Insertion loss of the diode in on-state as a function of frequency (typical values)

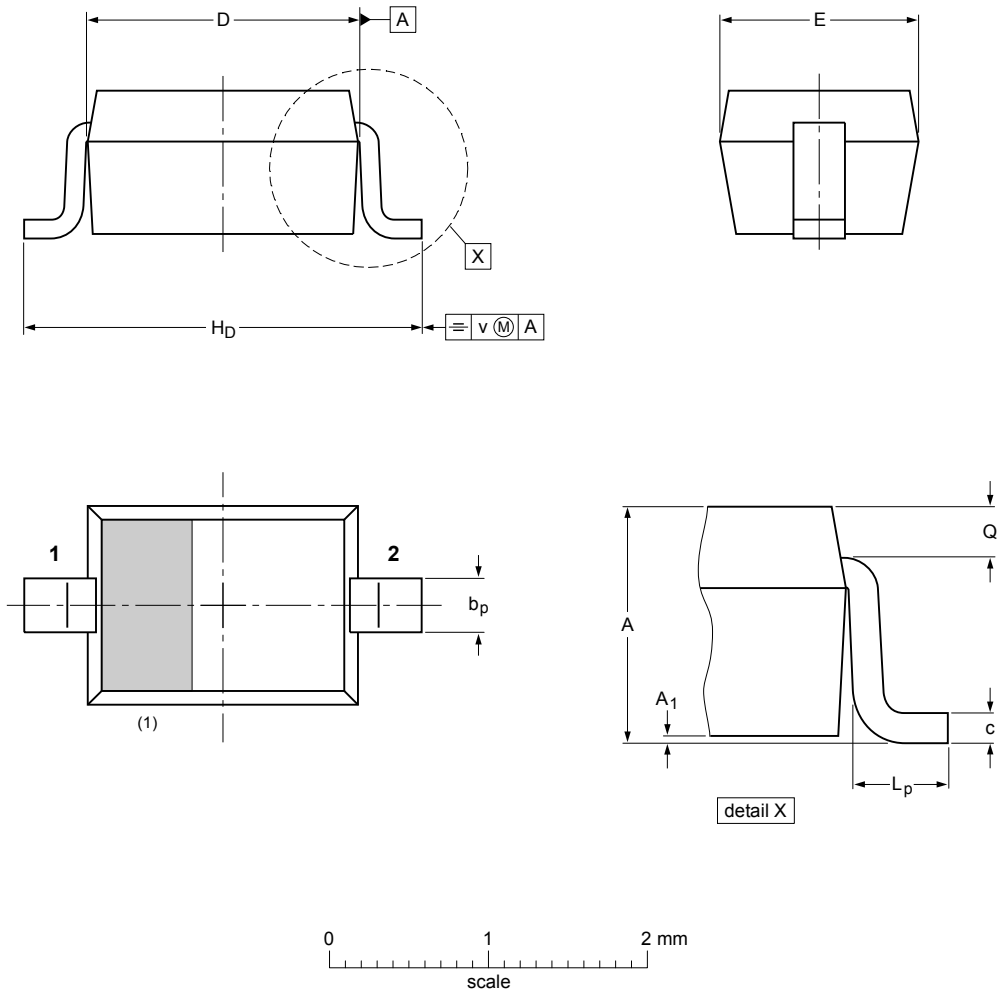


Diode zero-biased and inserted in series with a 50 Ω strip line circuit. T_{amb} = 25 °C.

Figure 4. Isolation of the diode in off-state as a function of frequency (typical values)

9 Package outline

Plastic surface-mounted package; 2 leads **SOD323**



DIMENSIONS (mm are the original dimensions)

UNIT	A	A_1 max	b_p	c	D	E	H_D	L_p	Q	v
mm	1.1 0.8	0.05	0.40 0.25	0.25 0.10	1.8 1.6	1.35 1.15	2.7 2.3	0.45 0.15	0.25 0.15	0.2

Note

1. The marking bar indicates the cathode

OUTLINE VERSION	REFERENCES				EUROPEAN PROJECTION	ISSUE DATE
	IEC	JEDEC	JEITA			
SOD323			SC-76			~~03-12-17~~ 06-03-16

Figure 5. Package outline SOD323

10 Revision history

Table 7. Revision history

Document ID	Release date	Data sheet status	Change notice	Supersedes
BAP65-03 v.5.2	20190128	Product data sheet	-	BAP65-03 v.5.1
Modifications:	• Changed title to Silicon PIN diode			
BAP65-03 v.5.1	20181211	Product data sheet	-	BAP65-03 v.5
Modifications:	• changed Typ value off L_{ins} at 2450 MHz to 0.18 dB • Changed condition I_F on $L_S$from 10 mA to 100 mA			
BAP65-03 v.5	20180802	Product data sheet	-	BAP65-03 v.4
Modifications:	• Section 1.2 "Features and benefits" has been updated. • The "Legal information" pages have been updated.			
BAP65-03 v.4	20040211	Product data sheet	-	BAP65-03 v.3

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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