BAP51-06W

Silicon PIN diode

Rev. 2.1 — 8 February 2019 Product data sheet

1 Product profile

1.1 General description

Two planar PIN diodes in common anode configuration in an SOT323 small SMD plastic package.

1.2 Features and benefits

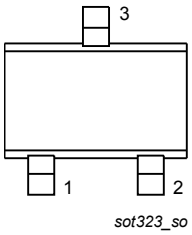
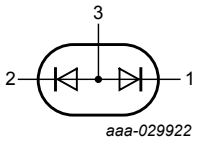
- Two elements in common anode configuration in a small SMD plastic package
- Low diode capacitance
- Low diode forward resistance
- AEC-Q101 qualified

1.3 Applications

- General RF applications

2 Pinning information

Table 1. Discrete pinning

Pin	Description	Simplified outline	Graphic symbol
1	cathode 1		
2	cathode 2		
3	common cathode		

3 Ordering information

Table 2. Ordering information

Type number	Package		
	Name	Description	Version
BAP51-06W	-	plastic surface-mounted package; 3 leads	SOT323

4 Marking

Table 3. Marking

Type number	Marking code	Description
BAP51-06W	W7%	% = p: made in Hong Kong
		% = t: made in Malaysia

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	reverse voltage		-	50	V
I_F	forward current		-	50	mA
P_{tot}	total power dissipation	$T_{sp} \leq 90$ °C	-	240	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
$R_{th(j\text{-}sp)}$	thermal resistance from junction to solder point		250	K/W

7 Characteristics

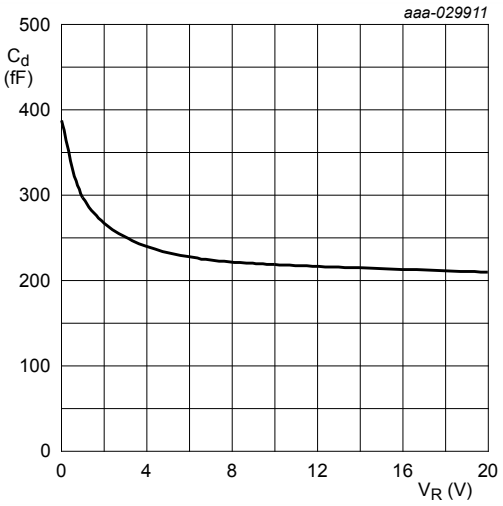
Table 6. Characteristics

T_j = 25 °C unless otherwise specified.

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
V_F	forward voltage	I_F = 50 mA	-	0.95	1.1	V
I_R	reverse current	V_R = 50 V	-	-	100	nA
C_d	diode capacitance	f = 1 MHz (see Figure 1)				
		V_R = 0 V	-	0.4	-	pF
		V_R = 1 V	-	0.3	0.55	pF
		V_R = 5 V	-	0.2	0.35	pF
r_D	diode forward resistance	f = 100 MHz (see Figure 2)				
		I_F = 0.5 mA [1]	-	5.3	9	Ω
		I_F = 1 mA [1]	-	3.5	6.5	Ω
		I_F = 10 mA [1]	-	1.5	2.5	Ω
ISL	isolation	V_R = 0 V (see Figure 4)				
		f = 900 MHz	-	17	-	dB
		f = 1800 MHz	-	13	-	dB
		f = 2450 MHz	-	12	-	dB
L_{ins}	insertion loss	I_F = 0.5 mA (see Figure 3)				
		f = 900 MHz	-	0.44	-	dB
		f = 1800 MHz	-	0.50	-	dB
		f = 2450 MHz	-	0.54	-	dB
		I_F = 1 mA				
		f = 900 MHz	-	0.33	-	dB
		f = 1800 MHz	-	0.39	-	dB
		f = 2450 MHz	-	0.43	-	dB
		I_F = 10 mA				
		f = 900 MHz	-	0.19	-	dB
		f = 1800 MHz	-	0.24	-	dB
		f = 2450 MHz	-	0.28	-	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	-	0.55	-	µs
L_S	series inductance	I_F = 100 mA; f = 100 MHz	-	1.6	-	nH

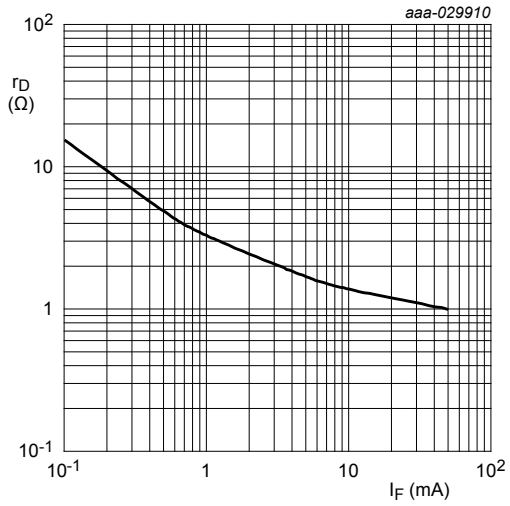
[1] Guaranteed on AQL basis; inspection level S4, AQL 1.0

8 Graphical data



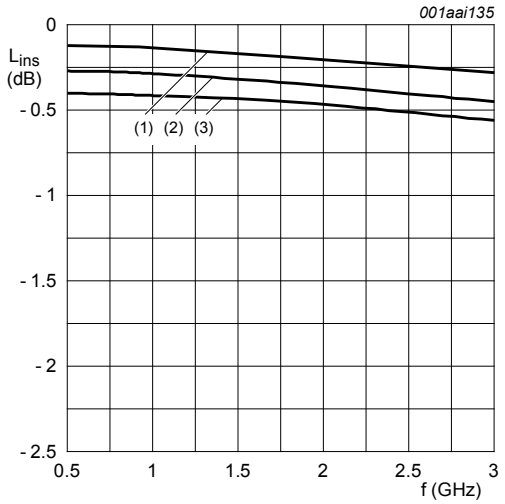
T_j = 25 °C; f = 1 MHz

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.

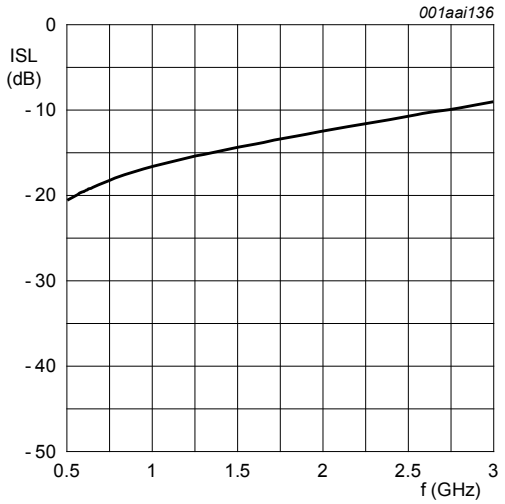
T_{amb} = 25 °C; f = 1 MHz

(1) I_F = 10 mA

(2) I_F = 1 mA

(3) I_F = 0.5 mA

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

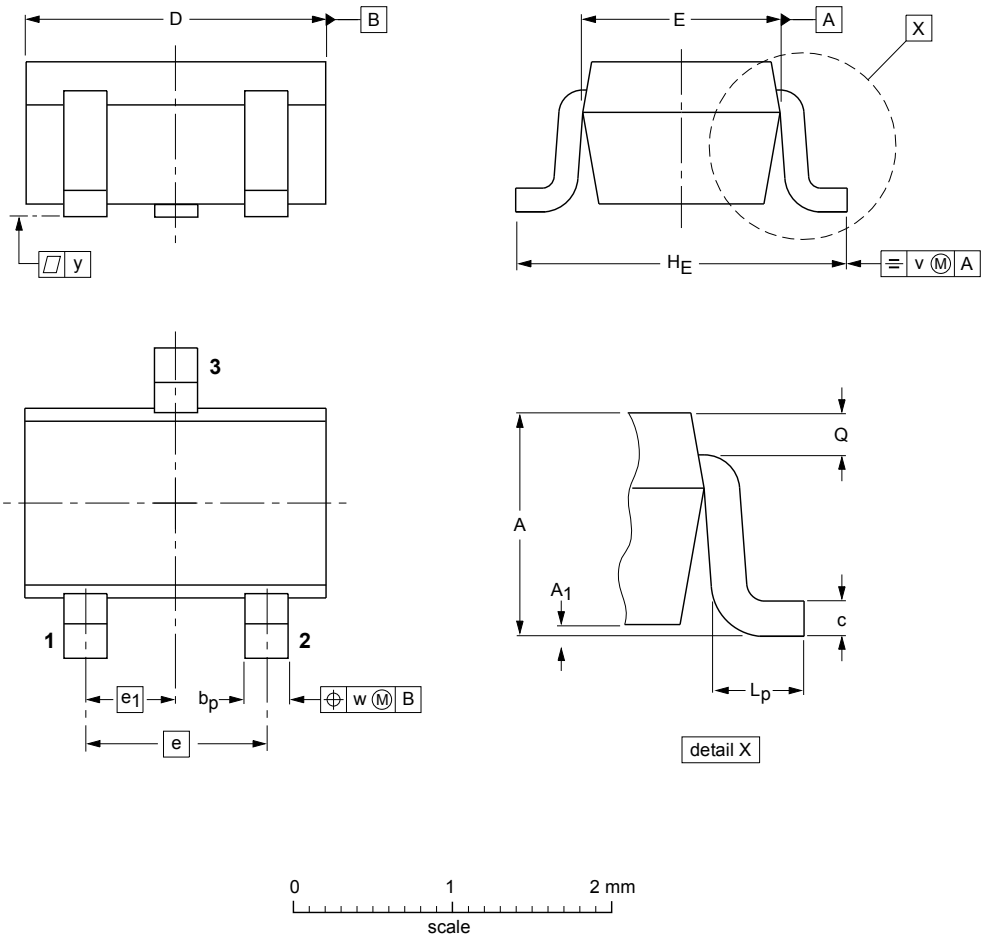


Diode zero-biased and inserted in series with a 50 Ω strip line circuit T_{amb} = 25 °C

Figure 4. Isolation of the diode as a function of frequency (typical values)

9 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

Figure 5. Package outline SOD323

10 Abbreviations

Table 7. Abbreviations

Acronym	Description
AQL	acceptable quality level
PIN	P-type, intrinsic, N-type
RF	radio frequency
S4	special inspection level 4
SMD	surface-mounted device

11 Revision history

Table 8. Revision history

Document ID	Release date	Data sheet status	Change notice	Supersedes
BAP51-06W v.2.1	20190208	Product data sheet	-	BAP51-06W v.2
Modifications:	• aligned the title of the data sheet with the description on the Internet			
BAP51-06W v.2	20181126	Product data sheet	-	BAP51-06W v.1
Modifications:	• Section 1.2 "Features and benefits" has been updated. • The "Legal information" pages have been updated.			
BAP51-06W v.1	20080526	Product data sheet	-	-

12 Legal information

12.1 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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