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BAP50-04W

General purpose PIN diode

Rev. 2 — 25 October 2016

Product data sheet

1. Product profile

1.1 General description

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

1.2 Features and benefits

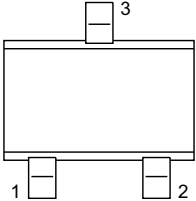
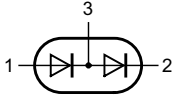
- Two elements in series configuration in a small SMD plastic package
- Low diode capacitance
- Low diode forward resistance
- AEC-Q101 qualified

1.3 Applications

- General RF application

2. Pinning information

Table 1. Discrete pinning

Pin	Description	Simplified outline	Graphic symbol
1	anode		 <i>aaa-025249</i>
2	cathode		
3	common connection		

3. Ordering information

Table 2. Ordering information

Type number	Package		
	Name	Description	Version
BAP50-04W	-	plastic surface-mounted package; 3 leads	SOT323



4. Marking

Table 3. Marking

Type number	Marking code
BAP50-04W	6W-

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

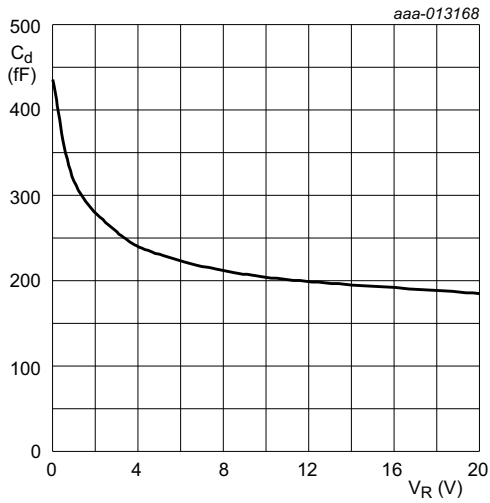
7. Characteristics

Table 6. Characteristics

$T_j = 25\text{ °C}$ unless otherwise specified.

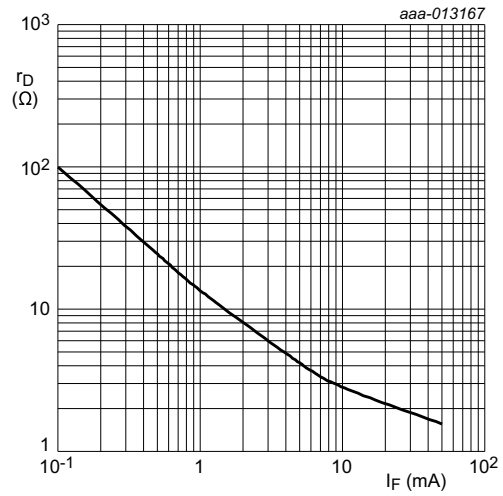
Symbol	Parameter	Conditions	Min	Typ	Max	Unit	
V_F	forward voltage	$I_F = 50\text{ mA}$	-	0.95	1.1	V	
V_R	reverse voltage	$I_R = 10\text{ }\mu\text{A}$	50	-	-	V	
I_R	reverse current	$V_R = 50\text{ V}$	-	-	100	nA	
C_d	diode capacitance	$f = 1\text{ MHz}$; see Figure 1					
		$V_R = 0\text{ V}$	-	0.45	-	pF	
		$V_R = 1\text{ V}$	-	0.35	0.6	pF	
		$V_R = 5\text{ V}$	-	0.30	0.5	pF	
r_D	diode forward resistance	$f = 100\text{ MHz}$; see Figure 2					
		$I_F = 0.5\text{ mA}$	[1]	-	25	40	Ω
		$I_F = 1\text{ mA}$	[1]	-	14	25	Ω
		$I_F = 10\text{ mA}$	[1]	-	3	5	Ω
τ_L	charge carrier life time	when switched from $I_F 10\text{ mA}$ to $I_R 6\text{ mA}$; $R_L 100\text{ }\Omega$; measured at $I_R 3\text{ mA}$	-	1.05	-	μS	
L_S	series inductance	$I_F = 10\text{ mA}$; $f = 100\text{ MHz}$	-	1.60	-	nH	

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



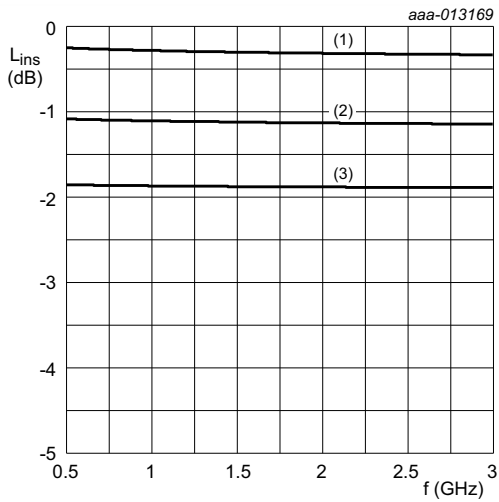
$f = 1 \text{ MHz}; T_j = 25 \text{ }^\circ\text{C}.$

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



$f = 100 \text{ MHz}; T_j = 25 \text{ }^\circ\text{C}.$

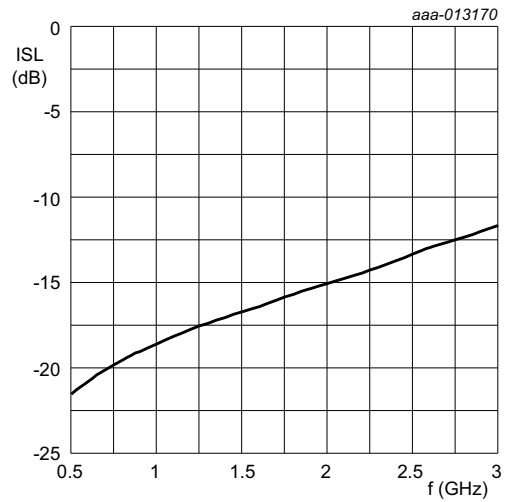
Fig 2. Diode forward resistance as a function of forward current; typical values



- (1) $I_F = 10 \text{ mA}$
 - (2) $I_F = 1 \text{ mA}$
 - (3) $I_F = 0.5 \text{ mA}$
- $T_{amb} = 25 \text{ }^\circ\text{C}.$

Diode inserted in series with a $50 \text{ } \Omega$ stripline circuit and biased via the analyzer Tee network.

Fig 3. Insertion loss of the diode in on-state as a function of frequency; typical values



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

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

Fig 4. Isolation of the diode in off-state as a function of frequency; typical values

8. Package outline

Plastic surface-mounted package; 3 leads

SOT323

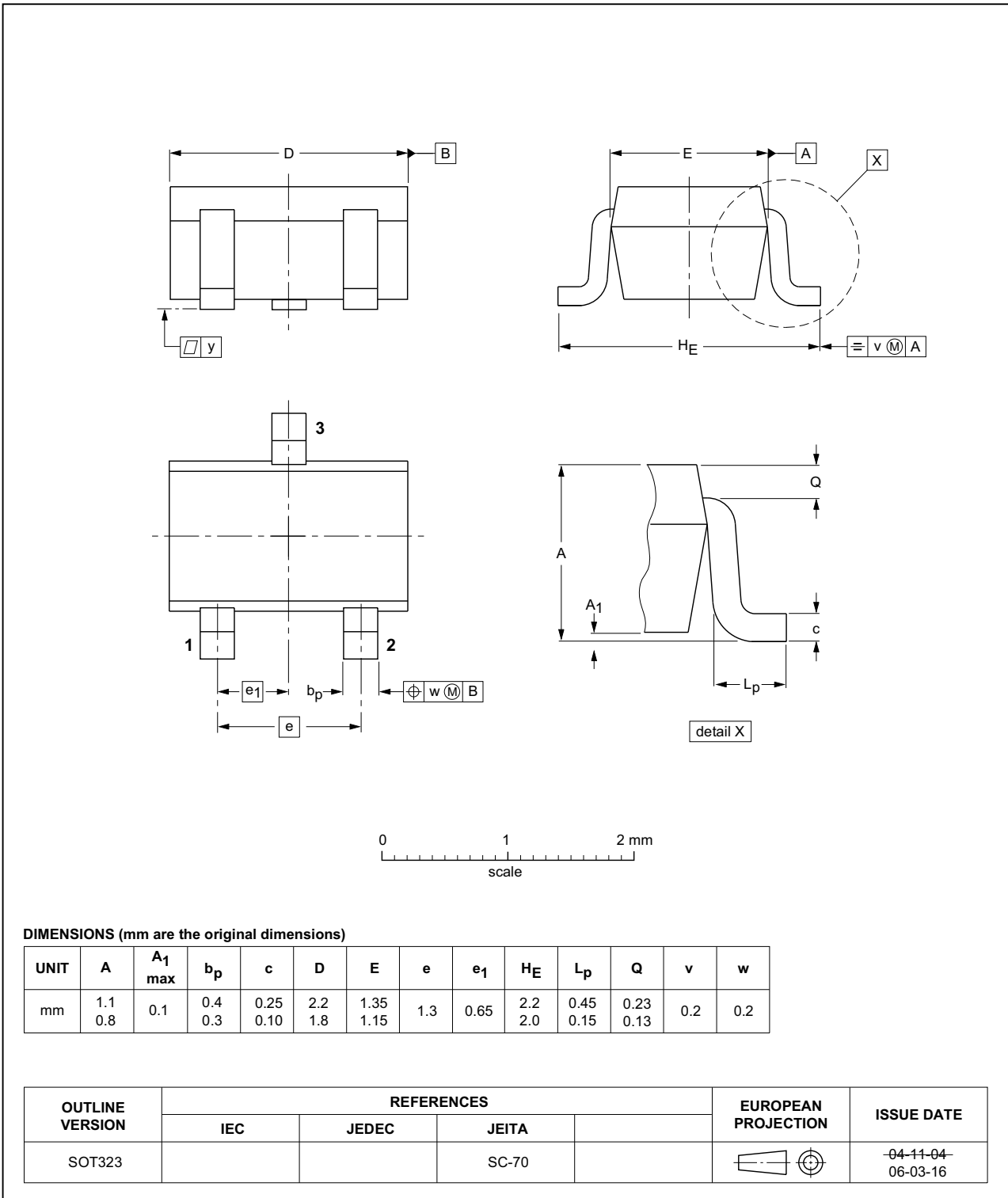


Fig 5. Package outline SOT323

9. Abbreviations

Table 7. Abbreviations

Acronym	Description
AQL	Acceptable Quality Level
PIN	P-type, Intrinsic, N-type
SMD	Surface Mounted Device
RF	Radio Frequency
S4	Special inspection level 4

10. Revision history

Table 8. Revision history

Document ID	Release date	Data sheet status	Change notice	Supersedes
BAP50-04W v.2	20161025	Product data sheet	-	BAP50-04W_1
Modification:	• AEC-Q101-qualified			
BAP50-04W_1	20010129	Product data sheet	-	-

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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13. Contents

1	Product profile	1
1.1	General description	1
1.2	Features and benefits	1
1.3	Applications	1
2	Pinning information	1
3	Ordering information	1
4	Marking	2
5	Limiting values	2
6	Thermal characteristics	2
7	Characteristics	2
8	Package outline	4
9	Abbreviations	5
10	Revision history	5
11	Legal information	6
11.1	Data sheet status	6
11.2	Definitions	6
11.3	Disclaimers	6
11.4	Trademarks	7
12	Contact information	7
13	Contents	8

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