

BAP51-06W

General purpose PIN diode

Rev. 01 — 26 May 2008

Product data sheet

1. Product profile

1.1 General description

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

1.2 Features

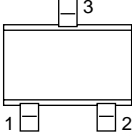
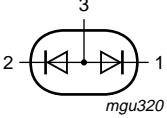
- Two elements in common anode configuration in a small SMD plastic package
- Low diode capacitance
- Low diode forward resistance

1.3 Applications

- general RF application

2. Pinning information

Table 1. Discrete pinning

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

3. Ordering information

Table 2. Ordering information

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

4. Marking

Table 3. Marking

Type number	Marking	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
Per diode					
V_R	reverse voltage		-	50	V
I_F	forward current		-	50	mA
P_{tot}	total power dissipation	$T_{sp} = 90\text{ °C}$	-	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 solder point		250	K/W

7. Characteristics

Table 6. Characteristics

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

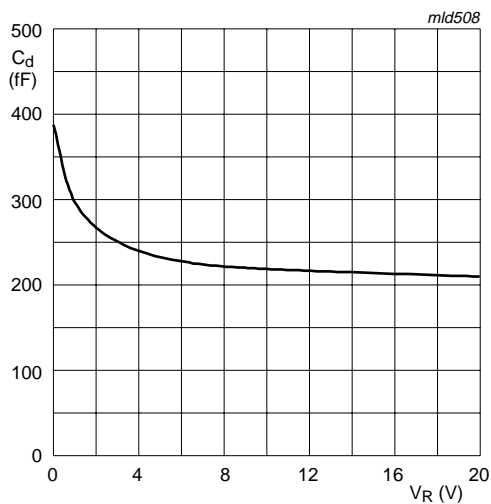
Symbol	Parameter	Conditions	Min	Typ	Max	Unit
V_F	forward voltage	$I_F = 50\text{ mA}$	-	0.95	1.1	V
I_R	reverse current	$V_R = 50\text{ V}$	-	-	100	nA
C_d	diode capacitance	see Figure 1 ; $f = 1\text{ MHz}$				
		$V_R = 0\text{ V}$	-	0.4	-	pF
		$V_R = 1\text{ V}$	-	0.3	0.55	pF
		$V_R = 5\text{ V}$	-	0.2	0.35	pF
r_D	diode forward resistance	see Figure 2 ; $f = 100\text{ MHz}$				
		$I_F = 0.5\text{ mA}$	[1] -	5.3	9	Ω
		$I_F = 1\text{ mA}$	[1] -	3.5	6.5	Ω
		$I_F = 10\text{ mA}$	[1] -	1.5	2.5	Ω

Table 6. Characteristics ...continued

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

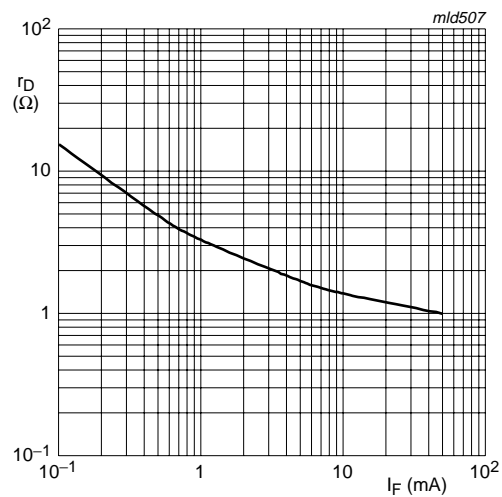
Symbol	Parameter	Conditions	Min	Typ	Max	Unit
ISL	isolation	$V_R = 0\text{ V}$				
		$f = 900\text{ MHz}$	-	17	-	dB
		$f = 1800\text{ MHz}$	-	13	-	dB
		$f = 2450\text{ MHz}$	-	12	-	dB
L_{ins}	insertion loss	$I_F = 0.5\text{ mA}$				
		$f = 900\text{ MHz}$	-	0.44	-	dB
		$f = 1800\text{ MHz}$	-	0.50	-	dB
		$f = 2450\text{ MHz}$	-	0.54	-	dB
		$I_F = 1\text{ mA}$				
		$f = 900\text{ MHz}$	-	0.33	-	dB
		$f = 1800\text{ MHz}$	-	0.39	-	dB
		$f = 2450\text{ MHz}$	-	0.43	-	dB
		$I_F = 10\text{ mA}$				
		$f = 900\text{ MHz}$	-	0.19	-	dB
		$f = 1800\text{ MHz}$	-	0.24	-	dB
		$f = 2450\text{ MHz}$	-	0.28	-	dB
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 $I_R = 3\text{ mA}$	-	0.55	-	μs
L_S	series inductance	$I_F = 100\text{ mA}$; $f = 100\text{ MHz}$	-	1.6	-	nH

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



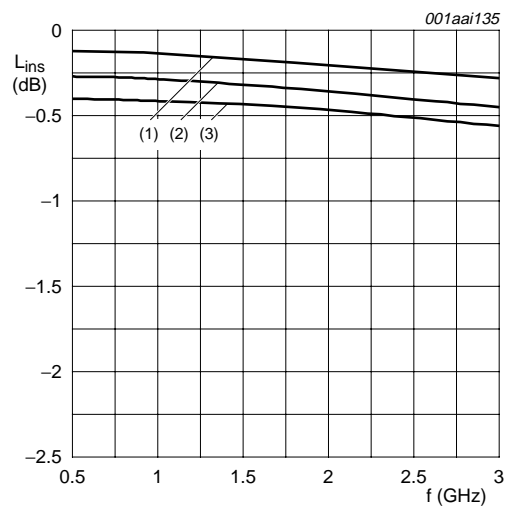
$f = 100\text{ MHz}$; $T_j = 25\text{ }^{\circ}\text{C}$.

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



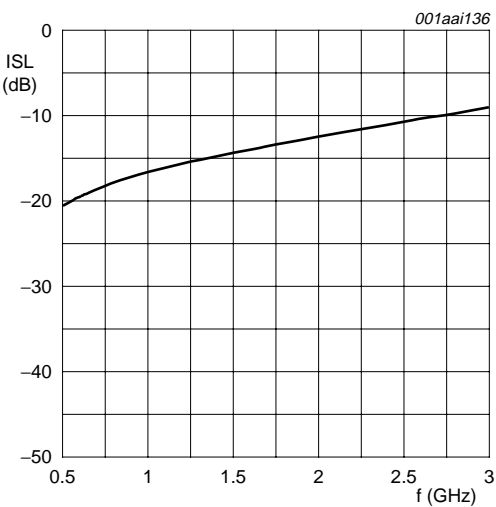
$f = 100\text{ MHz}$; $T_j = 25\text{ }^{\circ}\text{C}$.

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



(1) $I_F = 10$ mA
(2) $I_F = 1$ mA
(3) $I_F = 0.5$ mA
Diode inserted in series with a 50 Ω stripline circuit and biased via the analyzer Tee network.

Fig 3. Insertion loss of the diode as a function of frequency; typical values



Diode zero biased and inserted in series with a 50 Ω stripline circuit; $T_{amb} = 25$ $^{\circ}C$.

Fig 4. Isolation of the diode as a function of frequency; typical values

8. Package outline

Plastic surface-mounted package; 3 leadsSOT323

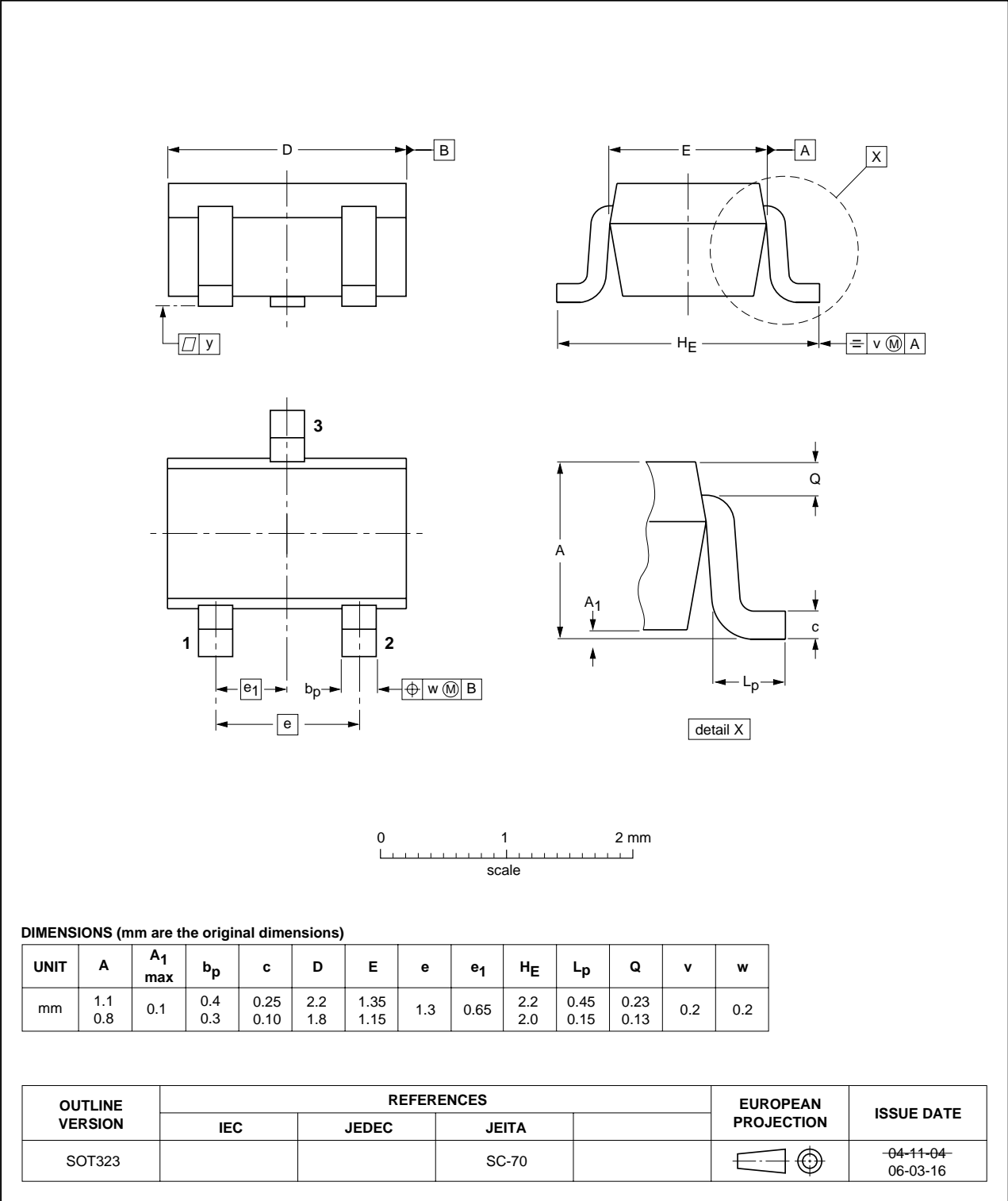


Fig 5. Package outline SOT323

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
BAP51-06W_1	20080526	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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