

BAP55L

Silicon PIN diode

Rev. 01 — 5 April 2005

Preliminary data sheet

1. Product profile

1.1 General description

Planar PIN diode in a SOD882 leadless ultra small plastic SMD package.

1.2 Features

- High speed switching for RF signals
- Low diode capacitance
- Low forward resistance
- Very low series inductance
- For applications up to 3 GHz

1.3 Applications

- RF attenuators and switches

2. Pinning information

Table 1: Discrete pinning

Pin	Description	Simplified outline	Symbol
1	cathode	 Transparent top view	 sym006
2	anode		

[1] The marking bar indicates the cathode.

3. Ordering information

Table 2: Ordering information

Type number	Package		
	Name	Description	Version
BAP55L	-	leadless ultra small plastic package; 2 terminals; body 1.0 × 0.6 × 0.5 mm	SOD882

4. Marking

Table 3: Marking

Type number	Marking code
BAP55L	E6

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		-	100	mA
P_{tot}	total power dissipation	$T_s = 90\text{ °C}$	-	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 soldering point		100	K/W

7. Characteristics

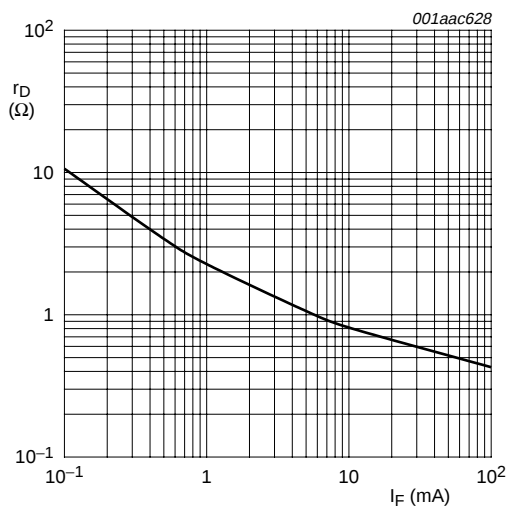
Table 6: Characteristics

$T_j = 25\text{ °C}$ 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	$V_R = 20\text{ V}$	-	-	10	nA
		$V_R = 50\text{ V}$	-	-	0.1	μA
C_d	diode capacitance	$f = 1\text{ MHz}$; Figure 2				
		$V_R = 0\text{ V}$	-	0.27	-	pF
		$V_R = 1\text{ V}$	-	0.23	-	pF
		$V_R = 20\text{ V}$	-	0.18	0.28	pF
r_D	diode forward resistance	$f = 100\text{ MHz}$; Figure 1				
		$I_F = 0.5\text{ mA}$	-	3.4	4.5	Ω
		$I_F = 1\text{ mA}$	-	2.3	3.3	Ω
		$I_F = 10\text{ mA}$	-	0.8	1.2	Ω
		$I_F = 100\text{ mA}$	-	0.4	0.7	Ω

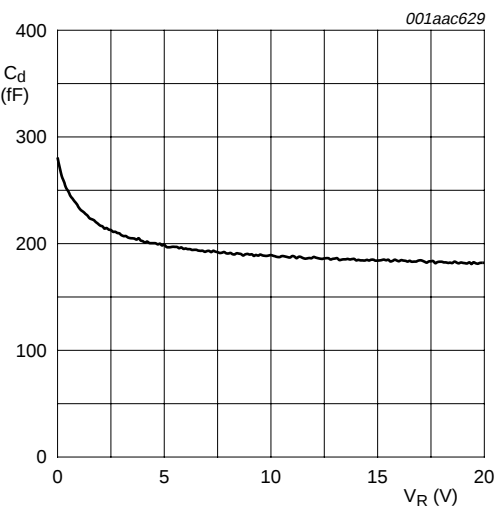
Table 6: Characteristics ...continued $T_j = 25^\circ\text{C}$ unless otherwise specified.

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
$ S_{12} ^2$	isolation	$V_R = 0\text{ V}$; Figure 4				
		$f = 900\text{ MHz}$	-	17.6	-	dB
		$f = 1800\text{ MHz}$	-	13	-	dB
		$f = 2450\text{ MHz}$	-	11.1	-	dB
$ S_{21} ^2$	insertion loss	$I_F = 0.5\text{ mA}$; Figure 3				
		$f = 900\text{ MHz}$	-	0.25	-	dB
		$f = 1800\text{ MHz}$	-	0.27	-	dB
		$f = 2450\text{ MHz}$	-	0.29	-	dB
		$I_F = 1\text{ mA}$; Figure 3				
		$f = 900\text{ MHz}$	-	0.17	-	dB
		$f = 1800\text{ MHz}$	-	0.19	-	dB
		$f = 2450\text{ MHz}$	-	0.21	-	dB
		$I_F = 10\text{ mA}$; Figure 3				
		$f = 900\text{ MHz}$	-	0.07	-	dB
		$f = 1800\text{ MHz}$	-	0.09	-	dB
		$f = 2450\text{ MHz}$	-	0.12	-	dB
		$I_F = 100\text{ mA}$; Figure 3				
		$f = 900\text{ MHz}$	-	0.05	-	dB
		$f = 1800\text{ MHz}$	-	0.07	-	dB
		$f = 2450\text{ MHz}$	-	0.09	-	dB
τ_L	charge carrier life time	when switched from $I_F = 10\text{ mA}$ to $I_R = 6\text{ mA}$; $R_L = 100\ \Omega$; measured at $I_R = 3\text{ mA}$	-	0.28	-	μs
L_S	series inductance		-	0.6	-	nH



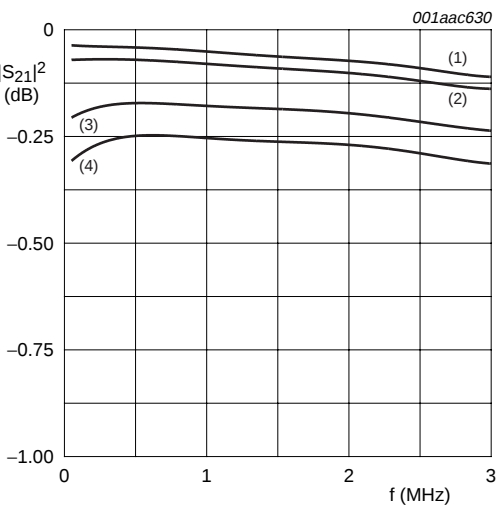
$f = 100 \text{ MHz}$; $T_j = 25 \text{ }^\circ\text{C}$.

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



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

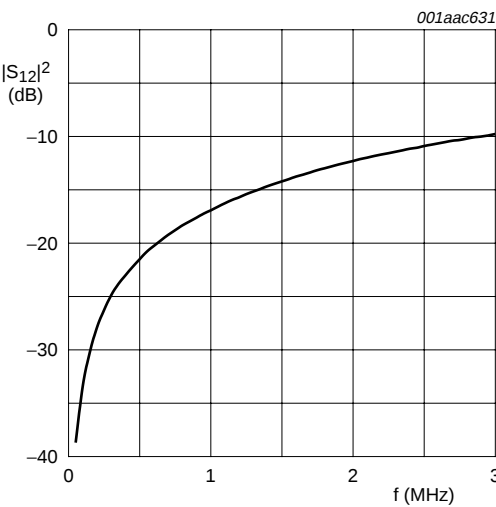
Fig 2. Diode capacitance as a function of reverse voltage; typical values



- (1) $I_F = 100 \text{ mA}$.
- (2) $I_F = 10 \text{ mA}$.
- (3) $I_F = 1 \text{ mA}$.
- (4) $I_F = 0.5 \text{ mA}$.

Diode inserted in series with a $50 \text{ } \Omega$ stripline circuit and biased via the analyzer Tee network.
 $T_{\text{amb}} = 25 \text{ }^\circ\text{C}$.

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



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

Fig 4. Isolation ($|S_{12}|^2$) of the diode as a function of frequency; typical values

8. Package outline

Leadless ultra small plastic package; 2 terminals; body 1.0 x 0.6 x 0.5 mm

SOD882

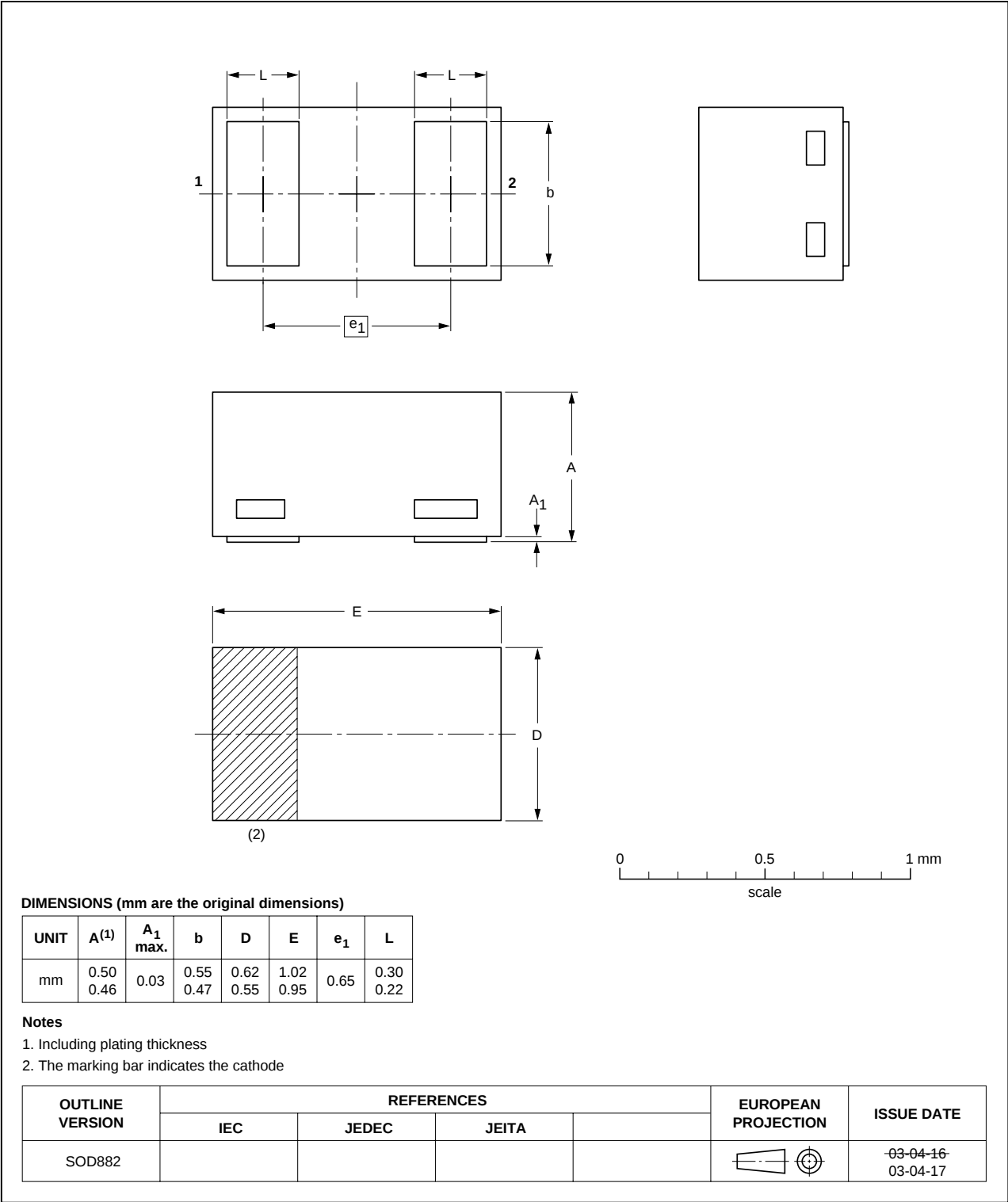


Fig 5. Package outline SOD882

9. Revision history

Table 7: Revision history

Document ID	Release date	Data sheet status	Change notice	Doc. number	Supersedes
BAP55L_1	20050405	Preliminary data sheet	-	9397 750 14811	-

10. Data sheet status

Level	Data sheet status ^[1]	Product status ^{[2] [3]}	Definition
I	Objective data	Development	This data sheet contains data from the objective specification for product development. Philips Semiconductors reserves the right to change the specification in any manner without notice.
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