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# BAP64-02

Silicon PIN diode

Rev. 10 — 12 May 2015

Product data sheet

## 1. Product profile

### 1.1 General description

Planar PIN diode in a SOD523 ultra small plastic SMD package.

### 1.2 Features and benefits

- High voltage, current controlled
- RF resistor for RF attenuators and switches
- Low diode capacitance
- Low diode forward resistance
- Very low series inductance
- For applications up to 6 GHz
- AEC-Q101 qualified

### 1.3 Applications

- RF attenuators and switches

## 2. Pinning information

Table 1. Discrete pinning

Pin	Description	Simplified outline	Symbol
1	cathode <sup>[1]</sup>		 sym006
2	anode		

[1] The marking bar indicates the cathode.

## 3. Ordering information

Table 2. Ordering information

Type number	Package		
	Name	Description	Version
BAP64-02	-	plastic surface-mounted package; 2 leads	SOD523



## 4. Marking

Table 3. Marking

Type number	Marking code
BAP64-02	S

## 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		-	175	V
$I_F$	forward current		-	100	mA
$P_{tot}$	total power dissipation	$T_{sp} = 90\text{ °C}$	-	715	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		85	K/W

## 7. Characteristics

Table 6. Characteristics

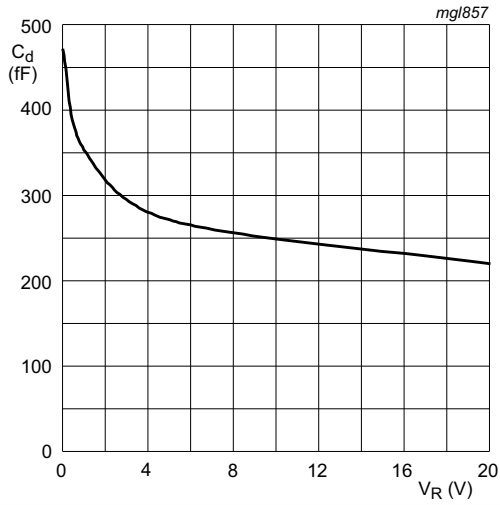
$T_j = 25\text{ °C}$  unless otherwise specified.

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	$V_R = 175\text{ V}$	-	-	10	$\mu\text{A}$
		$V_R = 20\text{ V}$	-	-	1	$\mu\text{A}$
$C_d$	diode capacitance	see <a href="#">Figure 1</a> ; $f = 1\text{ MHz}$ ;				
		$V_R = 0\text{ V}$	-	0.48	-	pF
		$V_R = 1\text{ V}$	-	0.35	-	pF
		$V_R = 20\text{ V}$	-	0.23	0.35	pF

**Table 6. Characteristics ...continued** $T_j = 25\text{ °C}$  unless otherwise specified.

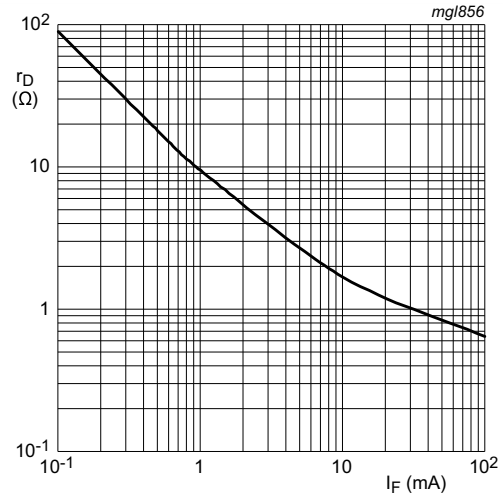
Symbol	Parameter	Conditions	Min	Typ	Max	Unit
$r_D$	diode forward resistance	see <a href="#">Figure 2</a> ; $f = 100\text{ MHz}$ ; <a href="#">[1]</a>				
		$I_F = 0.5\text{ mA}$	-	20	40	$\Omega$
		$I_F = 1\text{ mA}$	-	10	20	$\Omega$
		$I_F = 10\text{ mA}$	-	2.0	3.8	$\Omega$
		$I_F = 100\text{ mA}$	-	0.7	1.35	$\Omega$
$\tau_L$	charge carrier life time	when switched from $I_F = 10\text{ mA}$ to $I_R = 6\text{ mA}$ ; $R_L = 100\ \Omega$ ; measured at $I_R = 3\text{ mA}$	-	1.55	-	$\mu\text{s}$
$L_S$	series inductance		-	0.6	-	nH

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



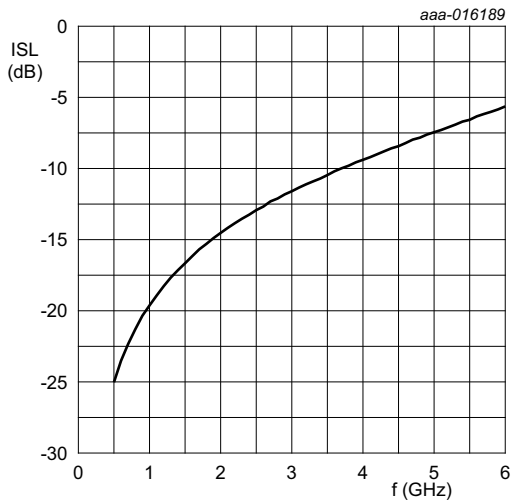
$f = 1 \text{ MHz}; T_j = 25 \text{ }^\circ\text{C}.$

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



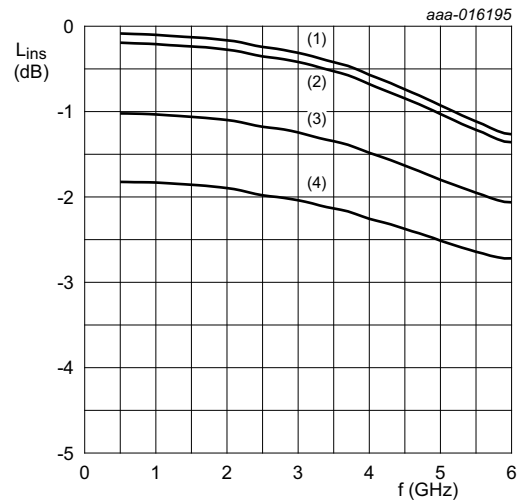
$f = 100 \text{ MHz}; T_j = 25 \text{ }^\circ\text{C}.$

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



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

**Fig 3. Isolation of the diode as a function of frequency; typical values**



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

**Fig 4. Insertion loss of the diode as a function of frequency; typical values**



## 8. Package outline

Plastic surface-mounted package; 2 leads

SOD523

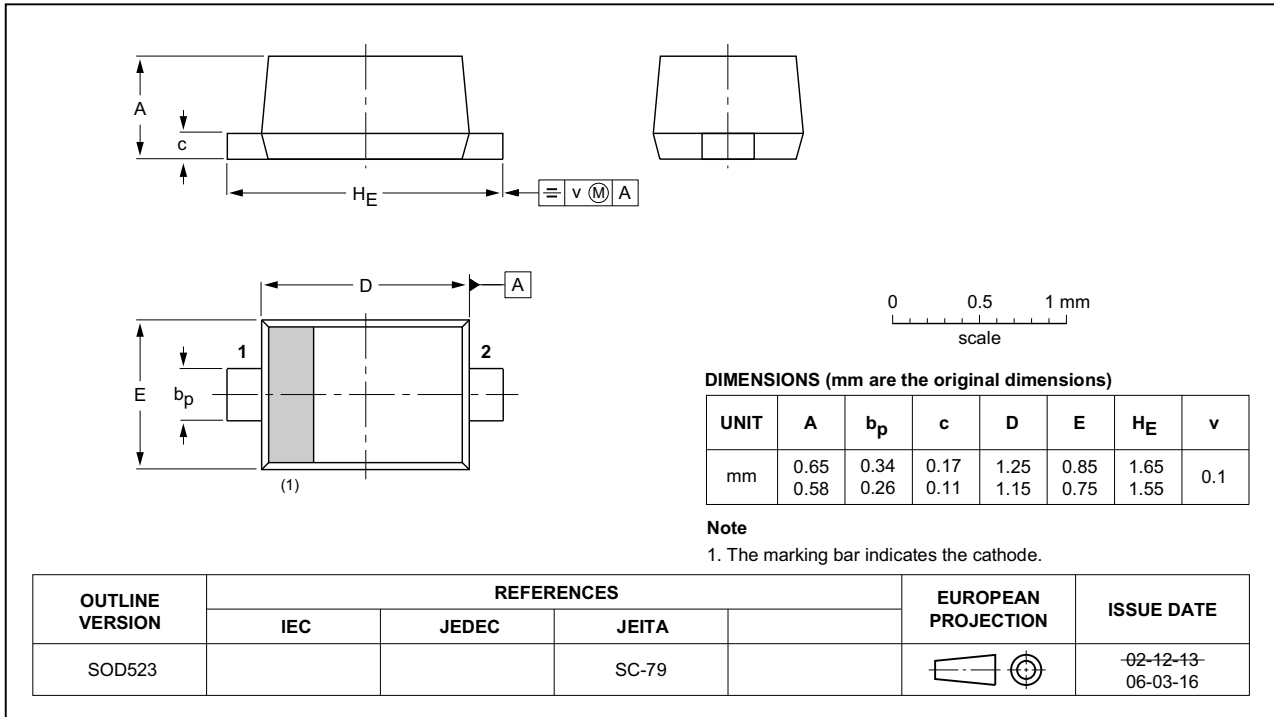


Fig 5. Package outline SOD523

## 9. Abbreviations

Table 7. Abbreviations

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

## 10. Revision history

Table 8. Revision history

Document ID	Release date	Data sheet status	Change notice	Supersedes
BAP64-02 v.10	20150512	Product data sheet	-	BAP64-02 v.9
Modifications:	<ul style="list-style-type: none"> <li>AEC-Q101 qualified</li> </ul>			
BAP64-02 v.9	20141215	Product data sheet	-	BAP64-02 v.8
BAP64-02 v.8	20140428	Product data sheet	-	BAP64-02 v.7
BAP64-02 v.7	20140211	Product data sheet	-	BAP64-02_N v.6
BAP64-02_N v.6	20080109	Product data sheet	-	BAP64-02 v.5
BAP64-02 v.5 (9397 750 06912)	20000323	Product specification	-	BAP64-02 v.4
BAP64-02 v.4 (9397 750 06418)	19990921	Preliminary specification	-	BAP64-02_N v.3
BAP64-02_N v.3 (9397 750 06086)	19990616	Preliminary specification	-	BAP64-02 v.2
BAP64-02 v.2 (9397 750 05556)	19990510	Objective specification	-	BAP64-02_N v.1
BAP64-02_N v.1 (9397 750 05492)	19981204	Objective specification	-	-

## 11. Legal information

### 11.1 Data sheet status

Document status <sup>[1][2]</sup>	Product status <sup>[3]</sup>	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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