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

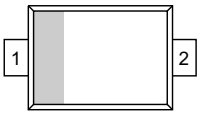
- High voltage, current controlled
- RF resistor for RF attenuators and switches
- Low diode capacitance
- Low diode forward resistance
- Very low series inductance
- For applications up to 6 GHz
- AEC-Q101 qualified

1.3 Applications

- RF attenuators and switches

2. Pinning information

Table 1. Discrete pinning

Pin	Description	Simplified outline	Symbol
1	cathode [1]		 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 °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 °C unless otherwise specified.

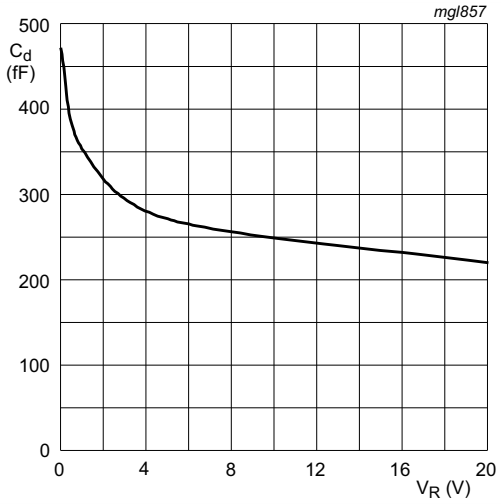
Symbol	Parameter	Conditions	Min	Typ	Max	Unit
V_F	forward voltage	I_F = 50 mA	-	0.95	1.1	V
I_R	reverse current	V_R = 175 V	-	-	10	µA
		V_R = 20 V	-	-	1	µA
C_d	diode capacitance	see Figure 1; f = 1 MHz;				
		V_R = 0 V	-	0.48	-	pF
		V_R = 1 V	-	0.35	-	pF
		V_R = 20 V	-	0.23	0.35	pF

Table 6. Characteristics *...continued*

T_j = 25 °C unless otherwise specified.

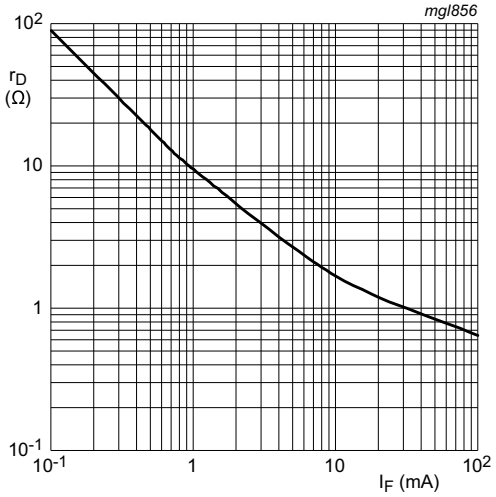
Symbol	Parameter	Conditions	Min	Typ	Max	Unit
r_D	diode forward resistance	see Figure 2; f = 100 MHz; [1]				
		I_F = 0.5 mA	-	20	40	Ω
		I_F = 1 mA	-	10	20	Ω
		I_F = 10 mA	-	2.0	3.8	Ω
		I_F = 100 mA	-	0.7	1.35	Ω
τ_L	charge carrier life time	when switched from I_F = 10 mA to I_R = 6 mA; R_L = 100 Ω; measured at I_R = 3 mA	-	1.55	-	µs
L_S	series inductance		-	0.6	-	nH

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



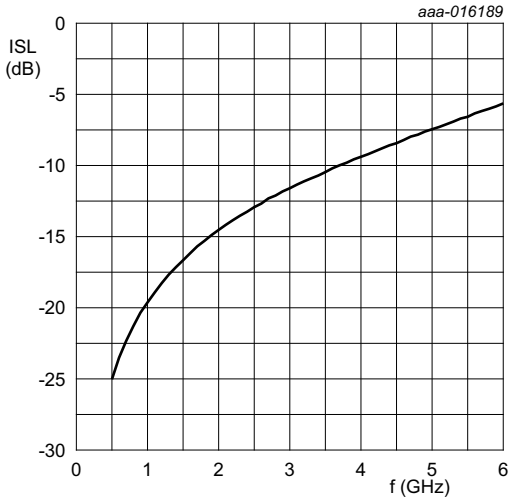
f = 1 MHz; T_j = 25 °C.

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



f = 100 MHz; T_j = 25 °C.

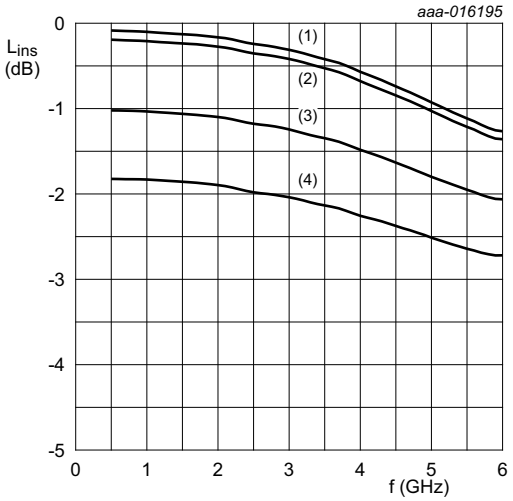
Fig 2. Forward resistance as a function of forward current; typical values



T_{amb} = 25 °C

Diode zero biased and inserted in series with a 50 Ω stripline circuit

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



T_{amb} = 25 °C

(1) I_F = 100 mA

(2) I_F = 10 mA

(3) I_F = 1 mA

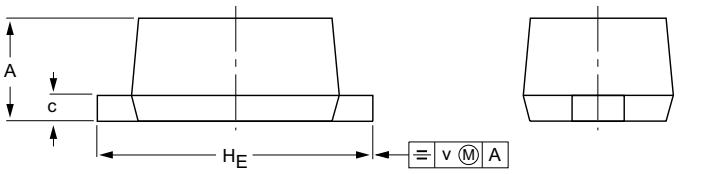
(4) I_F = 0.5 mA

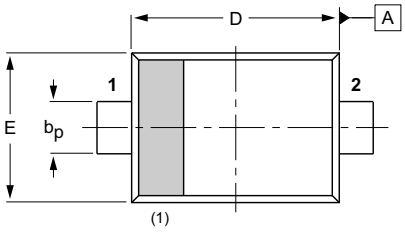
Diode inserted in series with a 50 Ω stripline circuit and biased via the analyzer Tee network

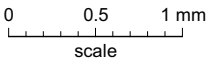
Fig 4. Insertion loss of the diode as a function of frequency; typical values

8. Package outline

Plastic surface-mounted package; 2 leads **SOD523**







DIMENSIONS (mm are the original dimensions)

UNIT	A	b_p	c	D	E	H_E	v
mm	0.65 0.58	0.34 0.26	0.17 0.11	1.25 1.15	0.85 0.75	1.65 1.55	0.1

Note

1. The marking bar indicates the cathode.

OUTLINE VERSION	REFERENCES				EUROPEAN PROJECTION	ISSUE DATE
	IEC	JEDEC	JEITA			
SOD523			SC-79			~~02-12-13~~ 06-03-16

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:	• AEC-Q101 qualified			
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[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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