Product data sheet

1 Product profile

1.1 General description

Two planar PIN diodes in an SOT323 small SMD plastic package.

1.2 Features and benefits

- Two elements in common cathode configuration
- · High voltage, current controlled
- RF resistor for RF switches
- · Low diode capacitance
- · Low diode forward resistance
- AEC-Q101 qualified

1.3 Applications

- · RF attenuators and switches
- Bandswitch for TV tuners
- Series diode for mobile communication transmit/receive switch



2 Pinning information

Table 1. Discrete pinning

Pin	Description	Simplified outline	Graphic symbol
1	anode (a ₁)		
2	anode (a ₂)	3	
3	common cathode	1 2 sot323_so	1 2
		Top view	

3 Ordering information

Table 2. Ordering information

1					
	Type number	Package			
		Name	Description	Version	
	BAP65-05W	-	plastic surface-mounted package; 3 leads	SOT323	

4 Marking

Table 3. Marking

Type number	Marking code
BAP65-05W	V6%

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	continuous reverse voltage		-	30	V
I _F	continuous forward current		-	100	mA
P _{tot}	total power dissipation	T _{sp} ≤ 90 °C	-	240	mW
T _{stg}	storage temperature		-65	+150	°C
T _j	junction temperature		-65	+150	°C
T _{amb}	ambient temperature		-40	+85	°C

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6 Thermal characteristics

Table 5. Thermal characteristics

Symbol	Parameter	Conditions	Тур	Unit
$R_{th(j-sp)}$	thermal resistance from junction to solder point		250	K/W

7 Characteristics

Table 6. Characteristics

 T_i = 25 °C unless otherwise specified.

Symbol	Parameter	Conditions	Min	Тур	Max	Unit	
V _F	forward voltage	I _F = 50 mA	-	0.9	1.1	V	
I _R	reverse leakage current	V _R = 20 V	-	-	20	nA	
C _d	diode capacitance	f = 1 MHz (see <u>Figure 1</u>)		<u> </u>			
		V _R = 0 V	-	0.7	-	pF	
		V _R = 1 V	-	0.575	0.9	pF	
		V _R = 3 V	-	0.525	0.8	pF	
		V _R = 20 V	-	0.425	-	pF	
D.	diode forward resistance	f = 100 MHz (see Figure 2)		'			
		I _F = 1 mA	-	1	-	Ω	
		I _F = 5 mA	[1] _	0.65	0.95	Ω	
		I _F = 10 mA	[1] _	0.56	0.9	Ω	
		I _F = 100 mA	-	0.35	-	Ω	
ISL	isolation	V _R = 0 V (see <u>Figure 4</u>)		<u> </u>			
		f = 900 MHz	-	9.3	-	dB	
		f = 1800 MHz	-	5.3	-	dB	
		f = 2450 MHz	-	3.5	-	dB	
Lins	insertion loss	See <u>Figure 3</u> .					
		I _F = 1 mA					
		f = 900 MHz	-	0.11	-	dB	
		f = 1800 MHz	-	0.17	-	dB	
		f = 2450 MHz	-	0.24	-	dB	
		I _F = 5 mA			1		
		f = 900 MHz	-	0.08	-	dB	
		f = 1800 MHz	-	0.14	-	dB	
		f = 2450 MHz	-	0.21	-	dB	
		I _F = 10 mA					
		f = 900 MHz	-	0.08	-	dB	
		f = 1800 MHz	-	0.14	-	dB	
		f = 2450 MHz	-	0.21	-	dB	
-ins	insertion loss	I _F = 100 mA		1	1		
		f = 900 MHz	-	0.06	-	dB	
		f = 1800 MHz	-	0.13	-	dB	
		f = 2450 MHz	-	0.2	_	dB	

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Symbol	Parameter	Conditions	Min	Тур	Max	Unit
τι	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	-	0.17	-	μs
L _S	series inductance	I _F = 100 mA; f = 100 MHz	-	1.4	-	nH

^[1] Guaranteed on AQL basis; inspection level S4, AQL 1.0

8 Graphical data

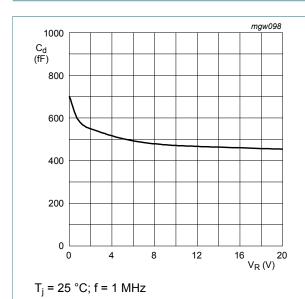
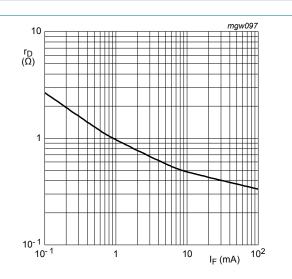
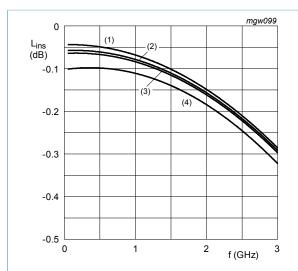


Figure 1. Diode capacitance as a function of reverse voltage (typical values)



 $T_i = 25 \, ^{\circ}C; f = 100 \, MHz.$

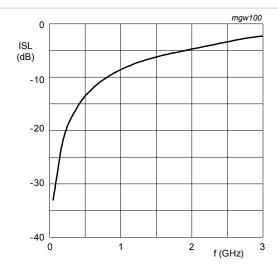
Figure 2. Diode forward resistance as a function of forward current (typical values)



Diode inserted in series with a 50 Ω strip line circuit and biased via the analyzer T-network. T_i = 25 °C

- (1) $I_F = 100 \text{ mA}$
- (2) $I_F = 10 \text{ mA}$
- (3) $I_F = 5 \text{ mA}$
- (3) $I_F = 1 \text{ mA}$

Figure 3. Insertion loss of the diode in on-state as a function of frequency (typical values)



Diode zero-biased and inserted in series with a 50 Ω strip line circuit. T $_{amb}$ = 25 $^{\circ}C$

Figure 4. Isolation of the diode in off-state as a function of frequency (typical values)

9 Package outline

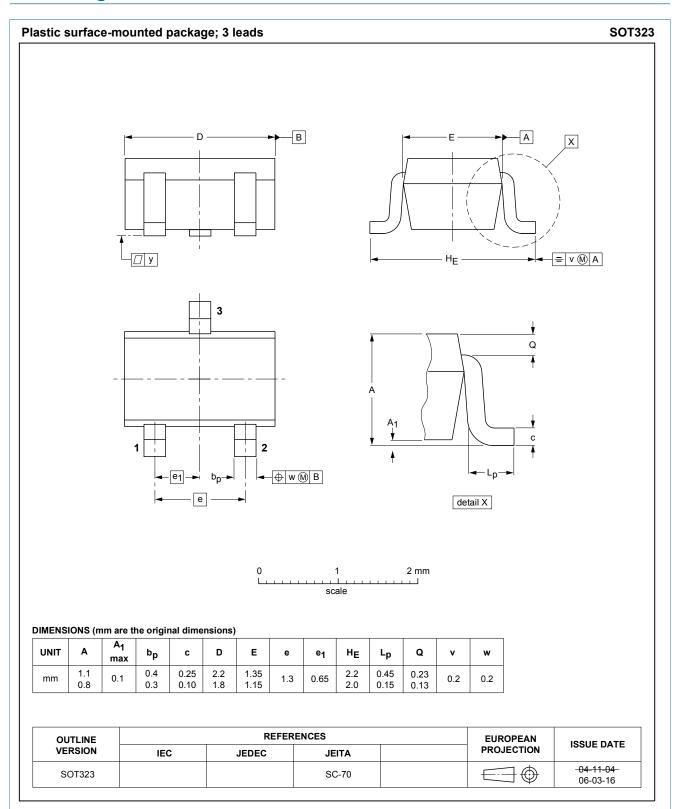


Figure 5. Package outline SOT323

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10 Revision history

Table 7. Revision history

Document ID	Release date	Data sheet status	Change notice	Supersedes	
BAP65-05W v.3.1	20190128	Product data sheet	-	BAP65-05W v.3	
Modifications:	Changed title to S	Silicon PIN diode			
BAP65-05W v.3	20181211	Product data sheet	-	BAP65-05W v.2	
Modifications:	 Section 1.2 "Features and benefits" has been updated. The "Legal information" pages have been updated. 				
BAP65-05W v.2	20100927	Product data sheet	-	BAP65-05W v.1	

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.

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- [2] The term 'short data sheet' is explained in section "Definitions".
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