BAP55LX

Silicon PIN diode

Rev. 5 — 12 February 2019 Product data sheet

1 Product profile

1.1 General description

Planar PIN diode in a SOD882D leadless ultra small plastic SMD package.

1.2 Features and benefits

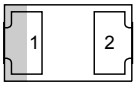
- High-speed switching for RF signals
- Low diode capacitance
- Low forward resistance
- Very low series inductance
- For applications up to 3 GHz
- AEC-Q101 qualified

1.3 Applications

- RF attenuators and switches

2 Pinning information

Table 1. Discrete pinning

Pin	Description		Simplified outline	Symbol
1	cathode	[1]	 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
BAP55LX	DFN1006D-2	leadless ultra small plastic package; 2 terminals; body 1 × 0.6 × 0.4 mm	SOD882D

4 Marking

Table 3. Marking codes

Type number	Marking code[1]
BAP55LX	1111 1101

[1] For SOD882D binary marking code description (see Figure 1) .

4.1 Binary marking code description

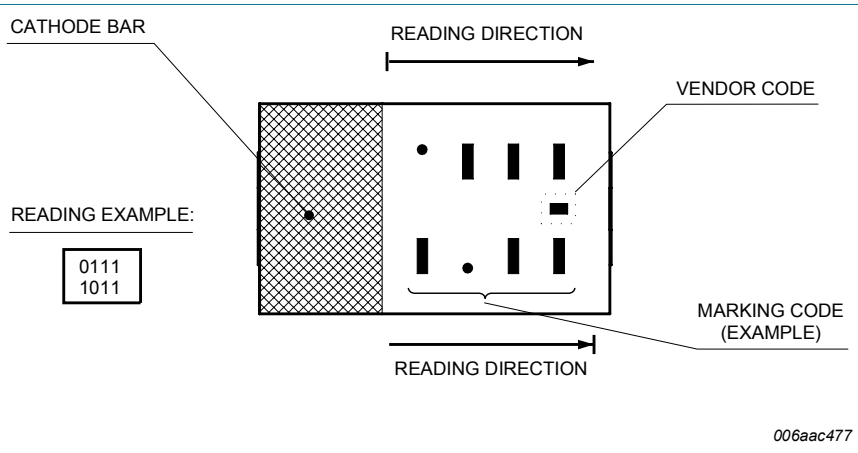


Figure 1. SOD882D binary marking code description example

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	$T_{sp} \leq 90$ °C	-	135	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
$R_{th(j\text{-}sp)}$	thermal resistance from junction to solder point		78	K/W

7 Characteristics

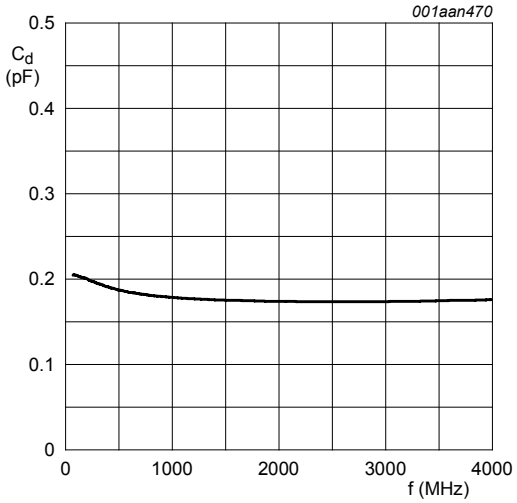
Table 6. Characteristics

T_{amb} = 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 = 20 V	-	-	10	nA
		V_R = 50 V	-	-	100	nA
C_d	diode capacitance	f = 1 MHz (see Figure 3)				
		V_R = 0 V	-	0.28	-	pF
		V_R = 1 V	-	0.23	-	pF
		V_R = 20 V	-	0.18	0.28	pF
r_D	diode forward resistance	f = 100 MHz (see Figure 4)				
		I_F = 0.5 mA	-	3.3	4.5	Ω
		I_F = 1 mA	-	2.2	3.3	Ω
		I_F = 10 mA	-	0.8	1.2	Ω
		I_F = 100 mA	-	0.5	0.8	Ω
ISL	isolation	V_R = 0 V (see Figure 5)				
		f = 900 MHz	-	19	-	dB
		f = 1800 MHz	-	14	-	dB
		f = 2450 MHz	-	12	-	dB
L_{ins}	insertion loss	(See Figure 6)				
		I_F = 0.5 mA				
		f = 900 MHz	-	0.24	-	dB
		f = 1800 MHz	-	0.25	-	dB
		f = 2450 MHz	-	0.26	-	dB
		I_F = 1 mA				
		f = 900 MHz	-	0.17	-	dB
		f = 1800 MHz	-	0.18	-	dB
		f = 2450 MHz	-	0.19	-	dB
		I_F = 10 mA;				
		f = 900 MHz	-	0.08	-	dB
		f = 1800 MHz	-	0.09	-	dB
		f = 2450 MHz	-	0.10	-	dB
		I_F = 100 mA;				
		f = 900 MHz	-	0.05	-	dB
		f = 1800 MHz	-	0.07	-	dB
		f = 2450 MHz	-	0.08	-	dB

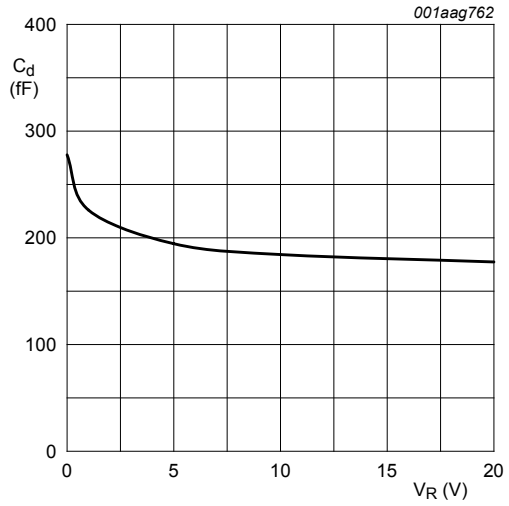
Symbol	Parameter	Conditions	Min	Typ	Max	Unit
τ_L	charge carrier life time	when switched from I_F = 10 mA to I_R = 6 mA; R_L = 100 Ω; measured at I_R = 3 mA	0.225	0.27	-	µs
L_S	series inductance	I_F = 100 mA; f = 100 MHz	-	0.4	-	nH

7.1 Graphical data



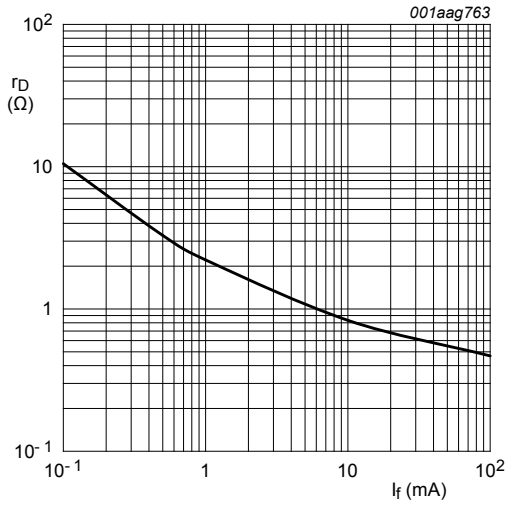
V_R = 0 V; T_j = 25 °C.

Figure 2. Diode capacitance as a function of frequency (typical values)



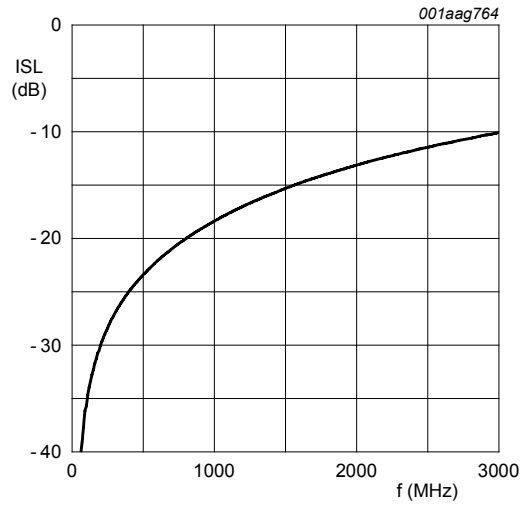
f = 1 MHz; T_j = 25 °C.

Figure 3. Diode capacitance as a function of reverse voltage (typical values)



f = 100 MHz; T_j = 25 °C.

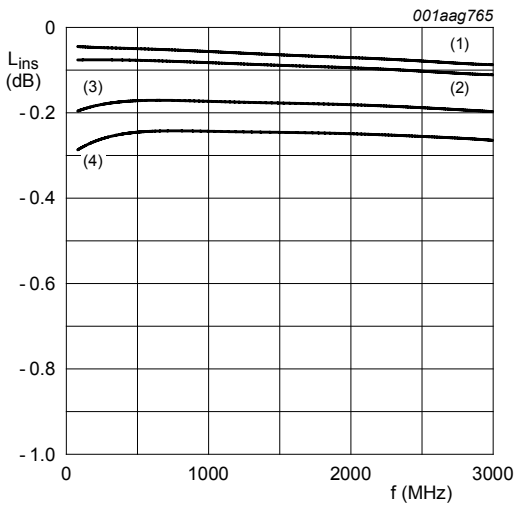
Figure 4. Forward resistance as a function of forward current (typical values)



T_{amb} = 25 °C

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

Figure 5. Isolation of the diode as a function of frequency (typical values)



T_{amb} = 25 °C

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

(1) I_F = 100 mA

(2) I_F = 10 mA

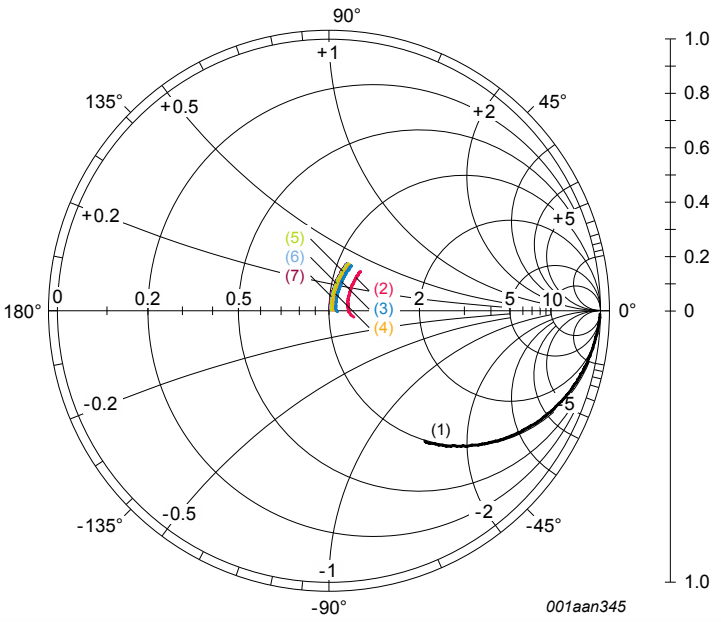
(3) I_F = 1 mA

(4) I_F = 0.5 mA

Figure 6. Insertion loss of the diode as a function of frequency (typical values)

7.2 S-parameters

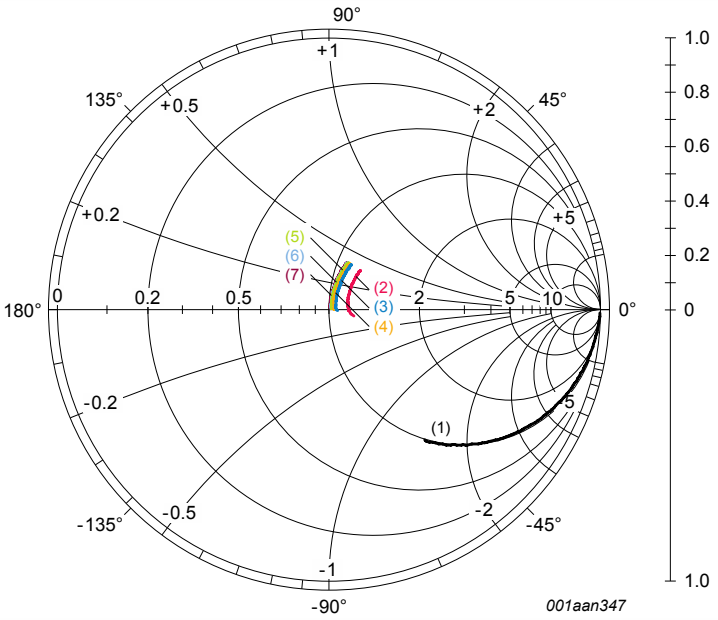
7.2.1 Diode in series configuration



Z_0 = 50 Ω; f = 100 MHz to 10 GHz.

(1) I_F = 0 mA
(2) I_F = 0.1 mA
(3) I_F = 0.5 mA
(4) I_F = 1 mA
(5) I_F = 5 mA
(6) I_F = 10 mA
(7) I_F = 100 mA

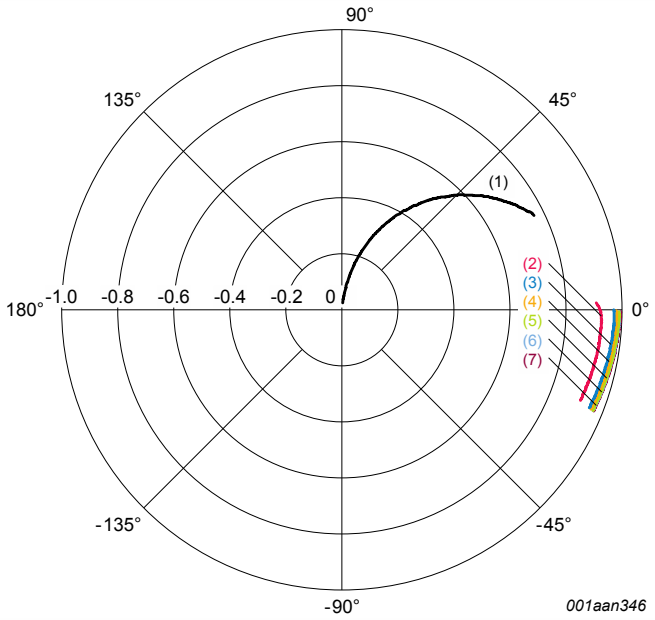
Figure 7. Input reflection coefficient (S_{11}; typical values)



Z_0 = 50 Ω; f = 100 MHz to 10 GHz.

(1) I_F = 0 mA
(2) I_F = 0.1 mA
(3) I_F = 0.5 mA
(4) I_F = 1 mA
(5) I_F = 5 mA
(6) I_F = 10 mA
(7) I_F = 100 mA

Figure 8. Output reflection coefficient (S_{22}; typical values)

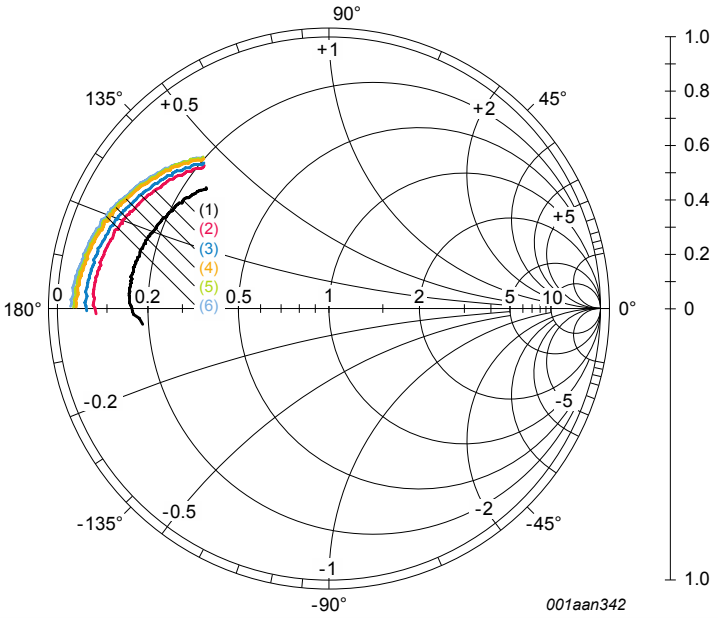


Z_0 = 50 Ω; f = 100 MHz to 10 GHz.

(1) I_F = 0 mA
(2) I_F = 0.1 mA
(3) I_F = 0.5 mA
(4) I_F = 1 mA
(5) I_F = 5 mA
(6) I_F = 10 mA
(7) I_F = 100 mA

Figure 9. Forward transmission coefficient (S_{21}; typical values)

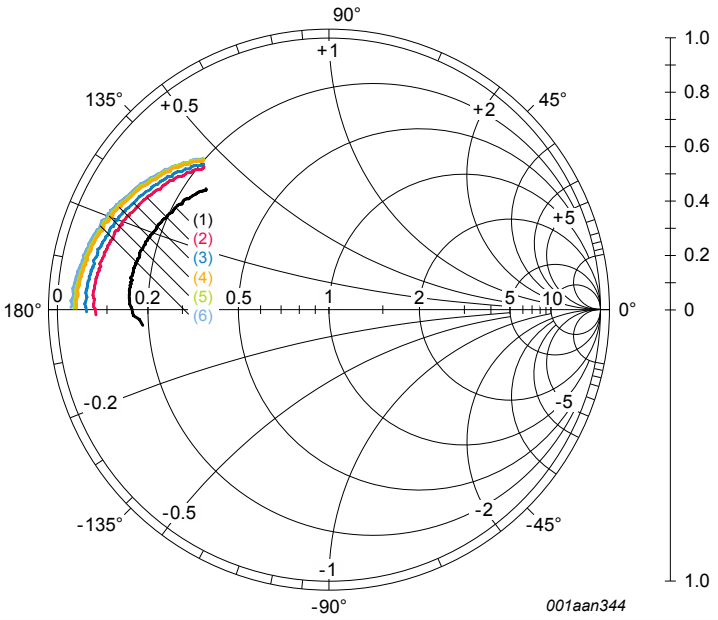
7.2.2 Diode in parallel configuration



Z_0 = 50 Ω; f = 100 MHz to 10 GHz.

(1) I_F = 0.1 mA
(2) I_F = 0.5 mA
(3) I_F = 1 mA
(4) I_F = 5 mA
(5) I_F = 10 mA
(6) I_F = 100 mA

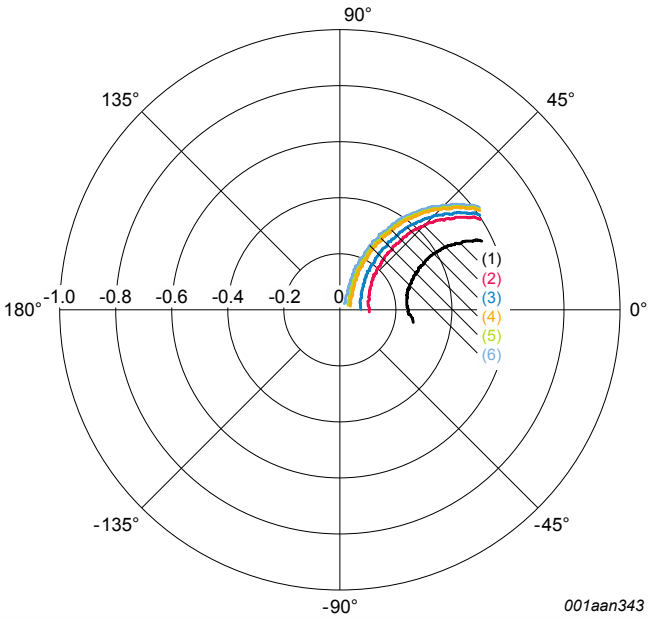
Figure 10. Input reflection coefficient (S_{11}; typical values)



Z_0 = 50 Ω; f = 100 MHz to 10 GHz.

(1) I_F = 0.1 mA
(2) I_F = 0.5 mA
(3) I_F = 1 mA
(4) I_F = 5 mA
(5) I_F = 10 mA
(6) I_F = 100 mA

Figure 11. Output reflection coefficient (S_{22}; typical values)



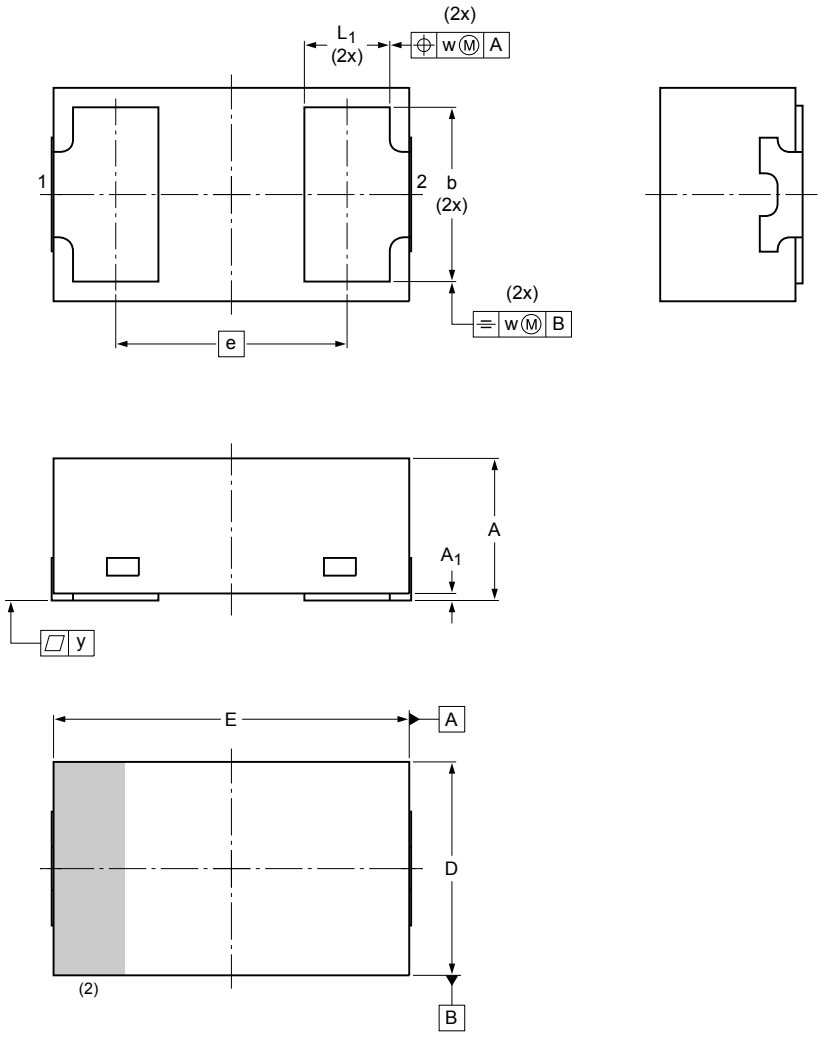
Z_0 = 50 Ω; f = 100 MHz to 10 GHz.

(1) I_F = 0.1 mA
(2) I_F = 0.5 mA
(3) I_F = 1 mA
(4) I_F = 5 mA
(5) I_F = 10 mA
(6) I_F = 100 mA

Figure 12. Forward transmission coefficient (S_{21}); typical values

8 Package outline

DFN1006D-2: Leadless ultra small plastic package; 2 terminals; body 1 x 0.6 x 0.4 mm **SOD882D**



Dimensions

Unit		$A^{(1)}$	A_1	b	D	E	e	L_1	w	y
mm	max	0.4	0.04	0.55	0.65	1.05		0.30	0.1	0.03
	nom			0.50	0.60	1.00	0.65	0.25		
	min			0.45	0.55	0.95		0.22		

0 0.5 1 mm
scale

Note
1. Dimension including plating thickness.
2. The marking bar indicates the cathode (if applicable).

sod882d_po

Outline version	References				European projection	Issue date
	IEC	JEDEC	JEITA			
SOD882D						~~10-09-27~~ 12-05-01

Figure 13. Package outline SOD882D (DFN1006D-2)

9 Abbreviations

Table 7. Abbreviations

Acronym	Description
PIN	P-type, intrinsic, N-type
SMD	surface-mounted device
RF	radio frequency

10 Revision history

Table 8. Revision history

Document ID	Release date	Data sheet status	Change notice	Supersedes
BAP55LX v.5	20190212	Product data sheet	-	BAP55LX v.4
Modifications:	• Section 1.2 "Features and benefits" has been updated. • The "Legal information" pages have been updated.			
BAP55LX v.4	20130806	Product data sheet	-	BAP55LX v.3
BAP55LX v.3	20110113	Product data sheet	-	BAP55LX v.2
BAP55LX v.2	20101216	Product data sheet	-	BAP55LX v.1
BAP55LX v.1	20070730	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".
[3] The product status of device(s) described in this document may have changed since this document was published and may differ in case of multiple devices. The latest product status information is available on the Internet at URL http://www.nxp.com.

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