

BB178LX

UHF variable capacitance diode

Rev. 01 — 14 April 2006

Preliminary data sheet

1. Product profile

1.1 General description

The BB178LX is a planar technology variable capacitance diode in a SOD882T ultra small leadless plastic SMD package. The excellent matching performance is achieved by gliding matching and a Direct Matching Assembly (DMA) procedure.

1.2 Features


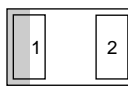
- Excellent linearity
- Excellent matching to 2 % DMA
- Ultra small leadless SMD package
- $C_{d(28V)}$: 2.6 pF; $C_{d(1V)}$ to $C_{d(28V)}$ ratio typical 15
- Low series resistance

1.3 Applications

- Voltage Controlled Oscillators (VCO)
- Electronic tuning in VHF television tuners, Band B up to 460 MHz

2. Pinning information

Table 1. Discrete pinning

Pin	Description	Simplified outline	Symbol
1	cathode	[1]	 <i>sym008</i>
2	anode	 Transparent top view	

[1] The marking bar indicates the cathode.

3. Ordering information

Table 2. Ordering information

Type number	Package		Version
	Name	Description	
BB178LX	-	leadless ultra small plastic package; 2 terminals; body 1.0 × 0.6 × 0.4 mm	SOD882T

PHILIPS

4. Marking

Table 3. Marking

Type number	Marking code
BB178LX	L3

5. Limiting values

Table 4. Limiting values

In accordance with the Absolute Maximum Rating System (IEC 60134).

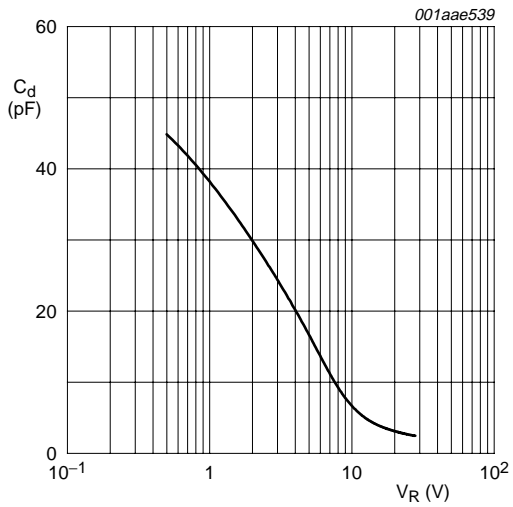
Symbol	Parameter	Conditions	Min	Max	Unit
V_R	reverse voltage		-	32	V
I_F	forward current		-	20	mA
T_{stg}	storage temperature		-55	+150	°C
T_j	junction temperature		-55	+125	°C

6. Characteristics

Table 5. Characteristics

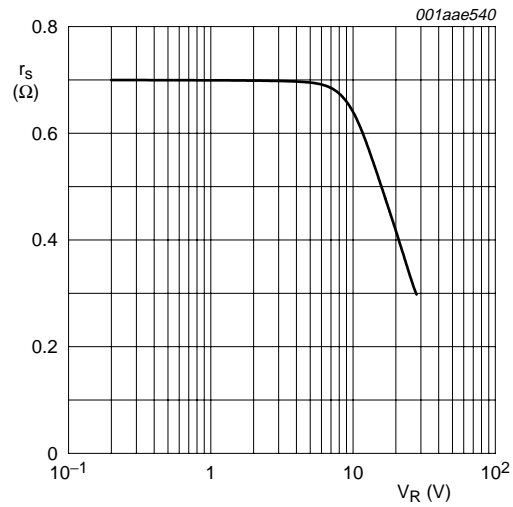
$T_j = 25\text{ °C}$ unless otherwise specified.

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
I_R	reverse current	see Figure 3				
		$V_R = 30\text{ V}$	-	-	10	nA
		$V_R = 30\text{ V}; T_j = 85\text{ °C}$	-	-	200	nA
r_s	diode series resistance	$f = 470\text{ MHz}; C_d = 30\text{ pF}$; see Figure 2	-	0.7	-	Ω
C_d	diode capacitance	see Figure 1 and Figure 4 ; $f = 1\text{ MHz}$;				
		$V_R = 1\text{ V}$	34.65	-	42.35	pF
		$V_R = 28\text{ V}$	2.36	2.6	2.75	pF
$\frac{C_{d(1V)}}{C_{d(2V)}}$	diode capacitance ratio	$f = 1\text{ MHz}$	-	1.3	-	
$\frac{C_{d(1V)}}{C_{d(28V)}}$	diode capacitance ratio	$f = 1\text{ MHz}$	13.5	15	-	
$\frac{C_{d(25V)}}{C_{d(28V)}}$	diode capacitance ratio	$f = 1\text{ MHz}$	-	1.08	-	
$\frac{\Delta C_d}{C_d}$	diode capacitance matching	$V_R = 1\text{ V to }28\text{ V}$; in sequence of 5 diodes (gliding)	-	-	2	%



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

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



$f = 470 \text{ MHz}; T_j = 25 \text{ }^\circ\text{C}.$

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

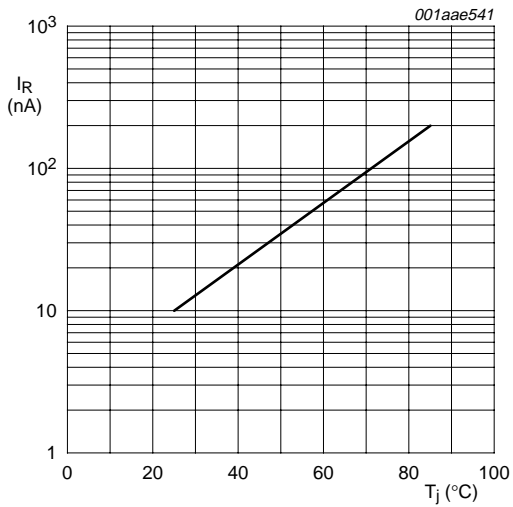
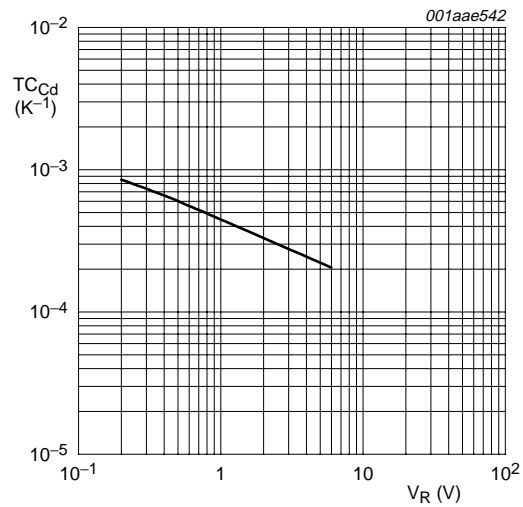


Fig. 3. Reverse current as function of junction temperature; maximum values



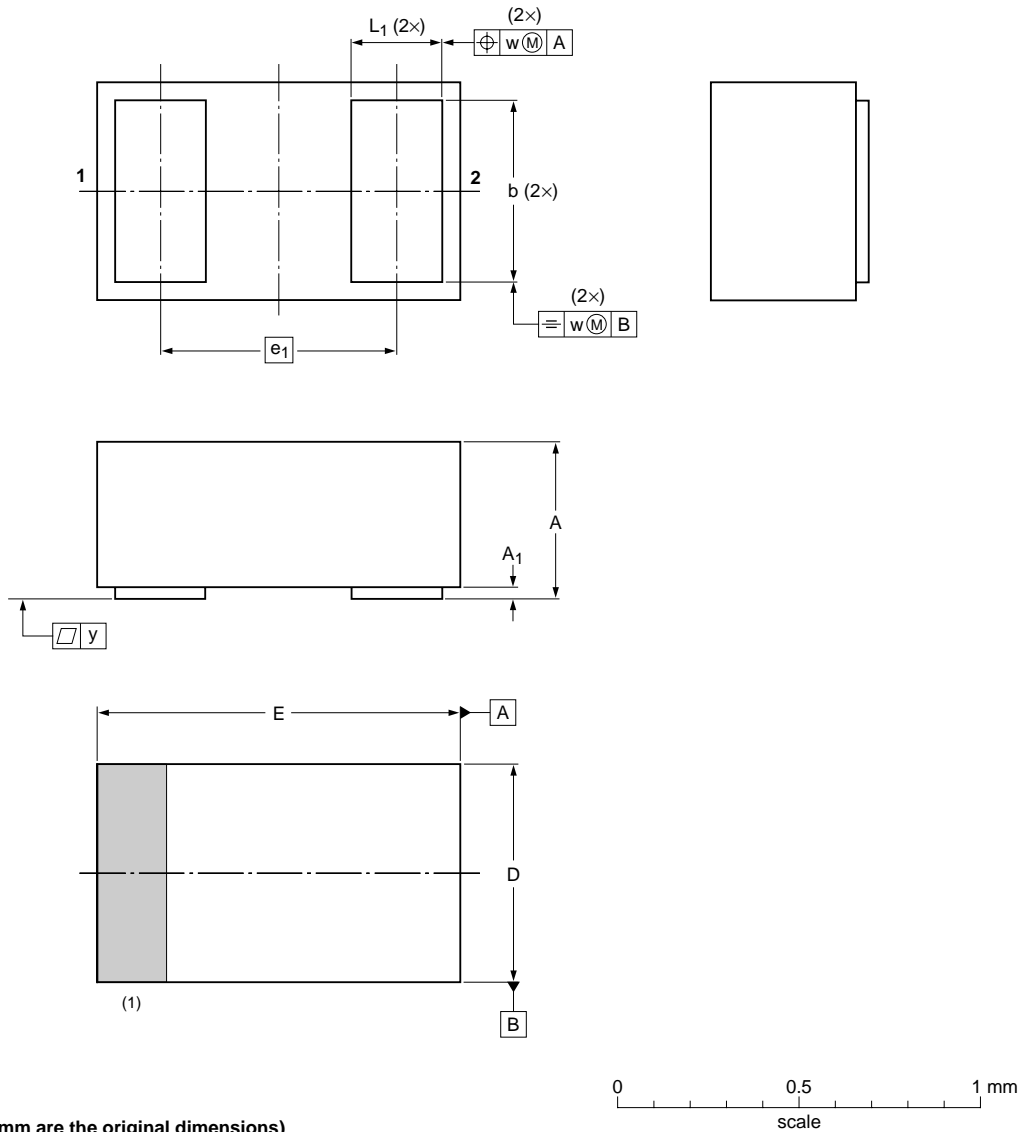
$T_j = 0 \text{ }^\circ\text{C} \text{ to } 85 \text{ }^\circ\text{C}.$

Fig. 4. Temperature coefficient of diode capacitance as a function of reverse voltage; typical values

7. Package outline

Leadless ultra small plastic package; 2 terminals; body 1 x 0.6 x 0.4 mm

SOD882T



DIMENSIONS (mm are the original dimensions)

UNIT	A	A ₁ max	b	D	E	e ₁	L ₁	w	y
mm	0.40 0.36	0.04	0.55 0.45	0.65 0.55	1.05 0.95	0.65	0.30 0.22	0.1	0.03

Note

1. The marking bar indicates the cathode

OUTLINE VERSION	REFERENCES			EUROPEAN PROJECTION	ISSUE DATE
	IEC	JEDEC	JEITA		
SOD882T					04-12-14 06-04-12

Fig 5. Package outline SOD882T

8. Revision history

Table 6. Revision history

Document ID	Release date	Data sheet status	Change notice	Supersedes
BB178LX_1	20060414	Preliminary data sheet	-	-

9. Legal information

9.1 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.semiconductors.philips.com>.

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