

# 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	<p>Transparent top view</p>	<p>sym008</p>
2	anode		

[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

## 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).*

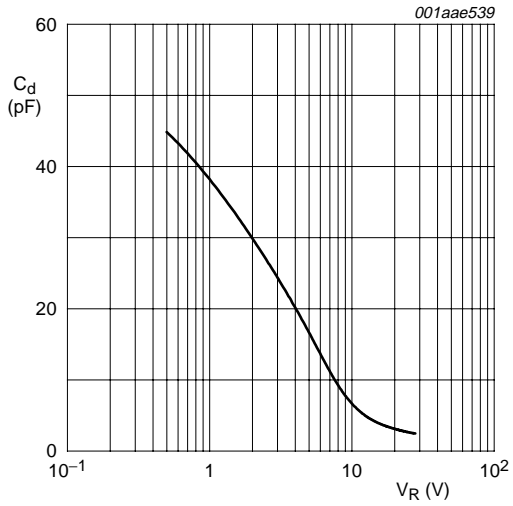
Symbol	Parameter	Conditions	Min	Max	Unit
$V_R$	reverse voltage		-	32	V
$I_F$	forward current		-	20	mA
$T_{stg}$	storage temperature		-55	+150	°C
$T_j$	junction temperature		-55	+125	°C

## 6. Characteristics

**Table 5. Characteristics**

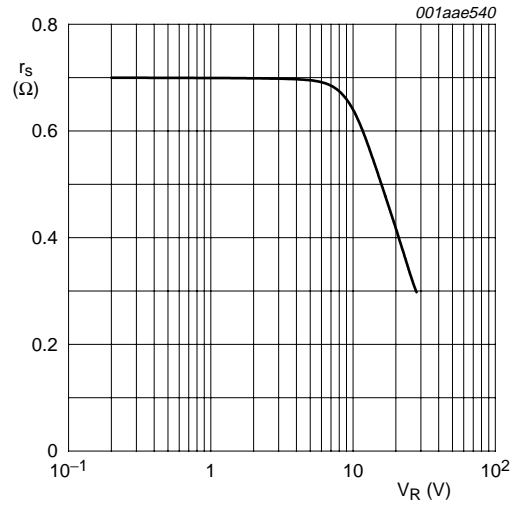
$T_j = 25\text{ °C}$  unless otherwise specified.

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
$I_R$	reverse current	see <a href="#">Figure 3</a>				
		$V_R = 30\text{ V}$	-	-	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 <a href="#">Figure 2</a>	-	0.7	-	$\Omega$
$C_d$	diode capacitance	see <a href="#">Figure 1</a> and <a href="#">Figure 4</a> ; $f = 1\text{ MHz}$ ;				
		$V_R = 1\text{ V}$	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	%



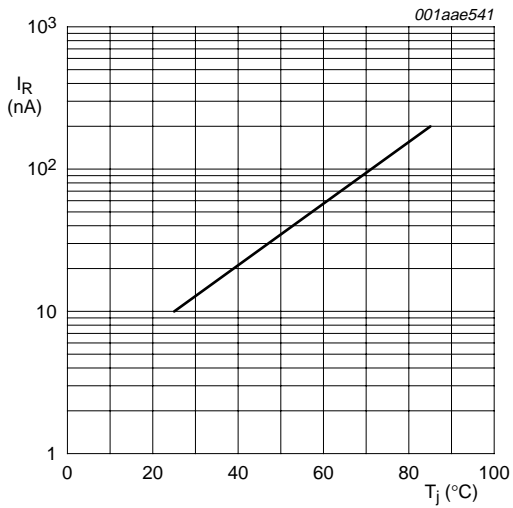
$f = 1 \text{ MHz}; T_j = 25 \text{ }^\circ\text{C}.$

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

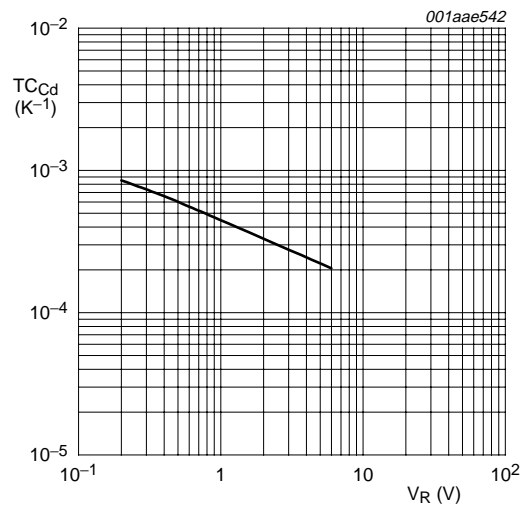


$f = 470 \text{ MHz}; T_j = 25 \text{ }^\circ\text{C}.$

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



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



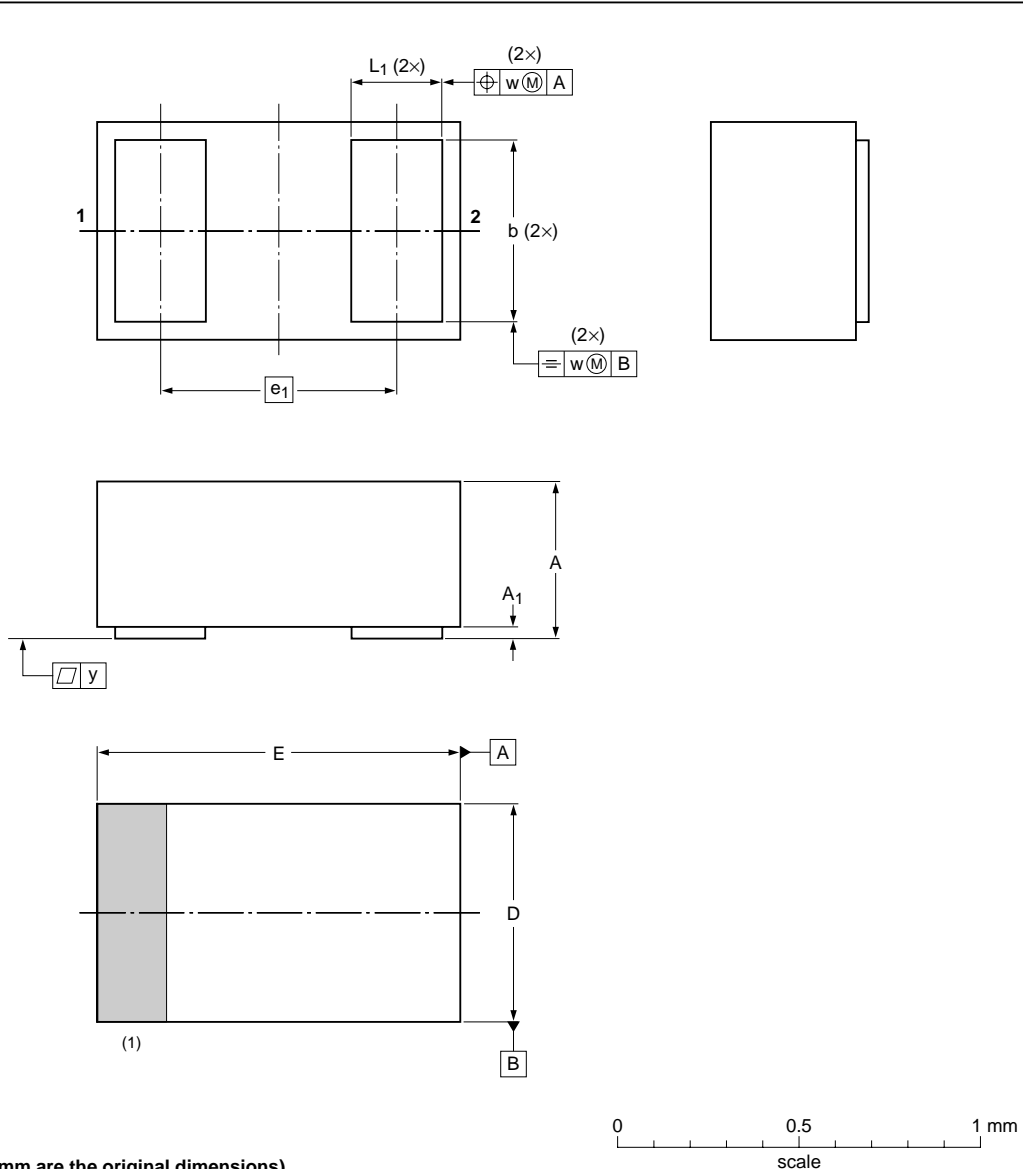
$T_j = 0 \text{ }^\circ\text{C} \text{ to } 85 \text{ }^\circ\text{C}.$

**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 <sub>1</sub> max	b	D	E	e <sub>1</sub>	L <sub>1</sub>	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 <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.

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