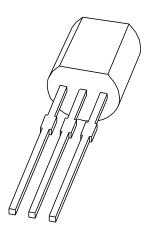
# **DISCRETE SEMICONDUCTORS**

# DATA SHEET



# BB212 AM variable capacitance double diode

Product specification Supersedes data of April 1992 File under Discrete Semiconductors, SC01 1996 May 03





# AM variable capacitance double diode

**BB212** 

#### **FEATURES**

- · Leaded plastic package
- C8: 19 pF; ratio: 29.

#### **APPLICATIONS**

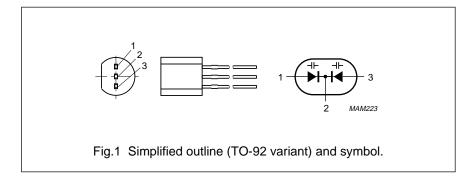
- Electronic tuning in AM radio applications
- VCO.

#### **DESCRIPTION**

The BB212 is a variable capacitance double diode with a common cathode, fabricated in planar technology, and encapsulated in the TO-92 variant leaded plastic package.

#### **PINNING**

PIN	DESCRIPTION
1	anode (a1)
2	common cathode
3	anode (a2)



#### **LIMITING VALUES**

In accordance with the Absolute Maximum Rating System (IEC 134).

SYMBOL	PARAMETER	MIN.	MAX.	UNIT		
Per diode						
V <sub>R</sub>	continuous reverse voltage	_	12	V		
I <sub>F</sub>	continuous forward current		100	mA		
T <sub>stg</sub>	storage temperature		+100	°C		
Tj	operating junction temperature	-55	+85	°C		

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#### **ELECTRICAL CHARACTERISTICS**

T<sub>i</sub> = 25 °C; unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT		
Per diode								
I <sub>R</sub>	reverse current	V <sub>R</sub> = 10 V; see Fig.3	_	_	50	nA		
		V <sub>R</sub> = 10 V; T <sub>j</sub> = 85 °C; see Fig.3	_	_	300	nA		
r <sub>s</sub>	diode series resistance	f = 500 MHz; note 1			2.5	Ω		
C <sub>d</sub>	diode capacitance	see Figs 2 and 4						
		V <sub>R</sub> = 0.5 V; f = 1 MHz	500	_	620	pF		
		V <sub>R</sub> = 3 V; f = 1 MHz	140	_	280	pF		
		V <sub>R</sub> = 5.5 V; f = 1 MHz	40	_	90	pF		
		V <sub>R</sub> = 8 V; f = 1 MHz	_	_	22	pF		
C <sub>d (0.5V)</sub>	capacitance ratio	f = 1 MHz	22.5	_	_			
C <sub>d (8V)</sub>								

#### Note

1.  $V_R$  is the value at which  $C_d = 500 pF$ .

#### **MATCHING PROPERTIES**

The capacitance of the two diodes in their common package may differ within certain limits. The total, relative capacitance difference between the two diodes in one package may be found in Fig.5. The anode a1 or a2 with the higher capacitance at  $V_R = 3\ V$ , is identified by a white dot.

#### **BASIC TOLERANCE**

The relative deviation of the capacitance value at  $V_R = 0.5 \ V$  is maximum 3.5%.

$$k = \left| \frac{C_1 (0.5 \, \text{V}) - C_2 (0.5 \, \text{V})}{C_2 (0.5 \, \text{V})} \right| = <3.5\%$$

#### **ADDITIONAL TOLERANCE** (see Fig.5)

In the range of  $V_R = 0.5 \text{ V}$  to 8 V the following additional tolerances are valid.

$$S = \left| \left( \frac{C_1}{C_2} \right) V_R - \left( \frac{C_1}{C_2} \right) 0.5 V \right|$$

S < 2% for  $V_R = 0.5$  to 3 V

S < 4% for  $V_R = 3$  to 5.5 V

S < 6% for  $V_R = 5.5$  to 8 V.

 $C_1$  is the capacitance of a1 when a1 > a2.

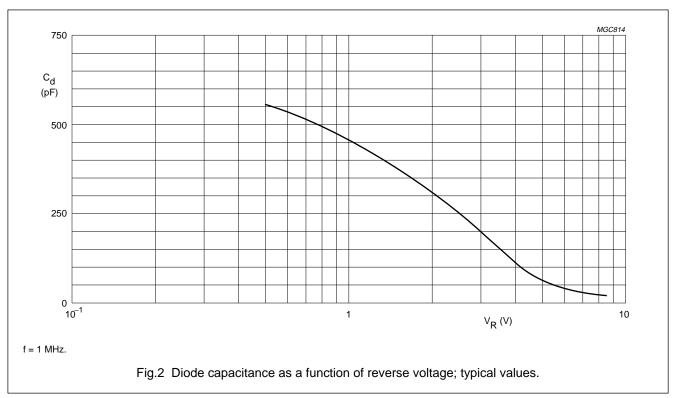
 $C_1$  is the capacitance of a2 when a2 > a1.

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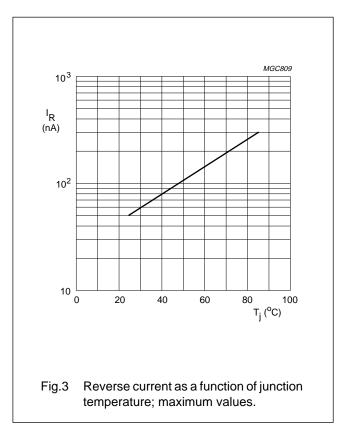
# AM variable capacitance double diode

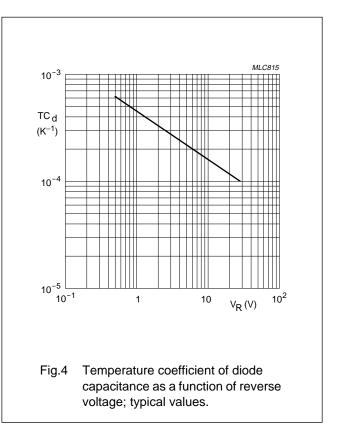
**BB212** 

#### **GRAPHICAL DATA**



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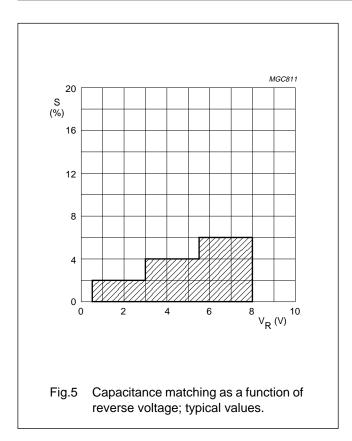


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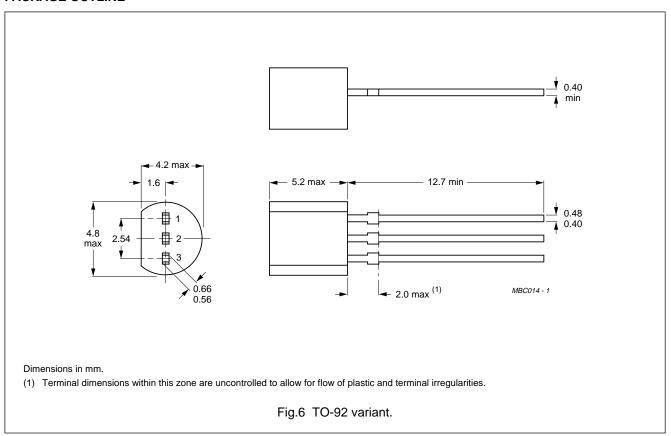
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#### **PACKAGE OUTLINE**



#### **DEFINITIONS**

Data sheet status		
Objective specification	This data sheet contains target or goal specifications for product development.	
Preliminary specification	This data sheet contains preliminary data; supplementary data may be published later.	
Product specification	This data sheet contains final product specifications.	
Limiting values		
Limiting values given are in accordance with the Absolute Maximum Rating System (IEC 134). Stress above one or		

Limiting values given are in accordance with the Absolute Maximum Rating System (IEC 134). Stress above one or more of the limiting values may cause permanent damage to the device. These are stress ratings only and operation of the device at these or at any other conditions above those given in the Characteristics sections of the specification is not implied. Exposure to limiting values for extended periods may affect device reliability.

#### **Application information**

Where application information is given, it is advisory and does not form part of the specification.

#### LIFE SUPPORT APPLICATIONS

These products are not designed for use in life support appliances, devices, or systems where malfunction of these products can reasonably be expected to result in personal injury. Philips customers using or selling these products for use in such applications do so at their own risk and agree to fully indemnify Philips for any damages resulting from such improper use or sale.

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