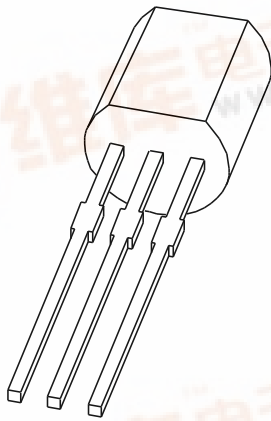


**DISCRETE SEMICONDUCTORS**

# DATA SHEET



**BB212**

**AM variable capacitance double diode**

Product specification

1996 May 03

Supersedes data of April 1992

File under Discrete Semiconductors, SC01

# 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)

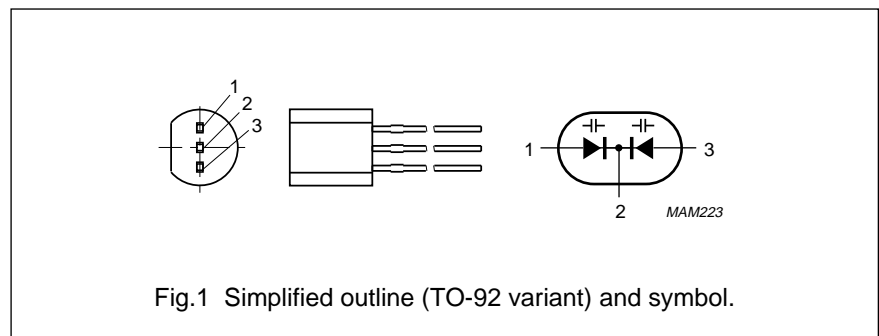


Fig.1 Simplified outline (TO-92 variant) and symbol.

**LIMITING VALUES**

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

SYMBOL	PARAMETER	MIN.	MAX.	UNIT
<b>Per diode</b>				
$V_R$	continuous reverse voltage	–	12	V
$I_F$	continuous forward current	–	100	mA
$T_{stg}$	storage temperature	–55	+100	°C
$T_j$	operating junction temperature	–55	+85	°C

## AM variable capacitance double diode

BB212

**ELECTRICAL CHARACTERISTICS** $T_j = 25\text{ }^\circ\text{C}$ ; unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
<b>Per diode</b>						
$I_R$	reverse current	$V_R = 10\text{ V}$ ; see Fig.3	–	–	50	nA
		$V_R = 10\text{ V}$ ; $T_j = 85\text{ }^\circ\text{C}$ ; see Fig.3	–	–	300	nA
$r_s$	diode series resistance	$f = 500\text{ MHz}$ ; note 1			2.5	$\Omega$
$C_d$	diode capacitance	see Figs 2 and 4				
		$V_R = 0.5\text{ V}$ ; $f = 1\text{ MHz}$	500	–	620	pF
		$V_R = 3\text{ V}$ ; $f = 1\text{ MHz}$	140	–	280	pF
		$V_R = 5.5\text{ V}$ ; $f = 1\text{ MHz}$	40	–	90	pF
		$V_R = 8\text{ V}$ ; $f = 1\text{ MHz}$	–	–	22	pF
$\frac{C_{d(0.5V)}}{C_{d(8V)}}$	capacitance ratio	$f = 1\text{ MHz}$	22.5	–	–	

**Note**

- $V_R$  is the value at which  $C_d = 500\text{ pF}$ .

**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  $V_R = 3\text{ V}$ , is identified by a white dot.

**BASIC TOLERANCE**

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

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

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

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

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

$$S < 2\% \text{ for } V_R = 0.5 \text{ to } 3\text{ V}$$

$$S < 4\% \text{ for } V_R = 3 \text{ to } 5.5\text{ V}$$

$$S < 6\% \text{ for } V_R = 5.5 \text{ to } 8\text{ V}.$$

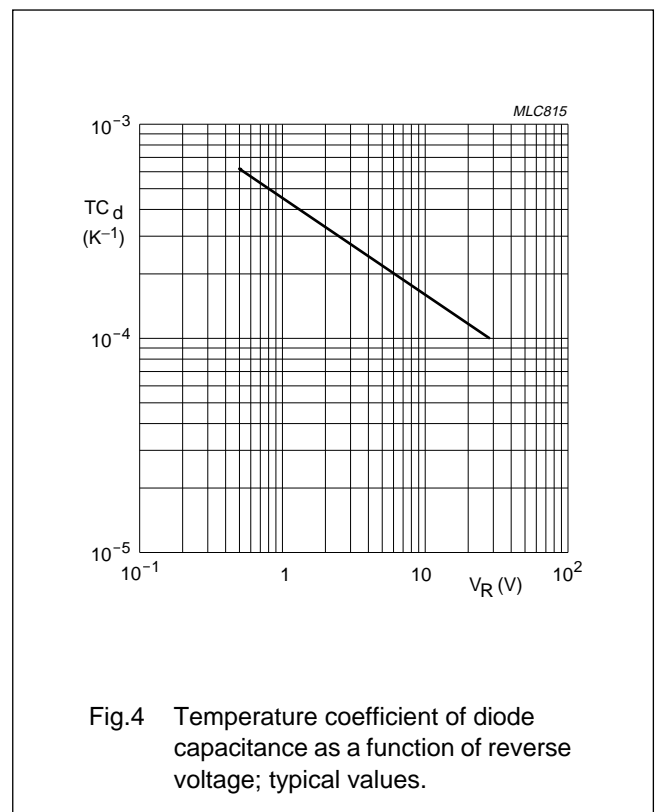
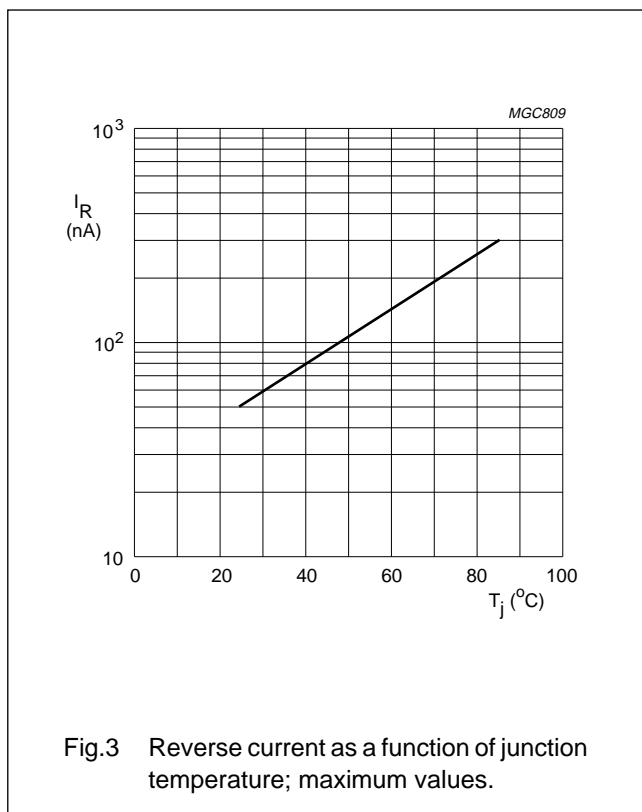
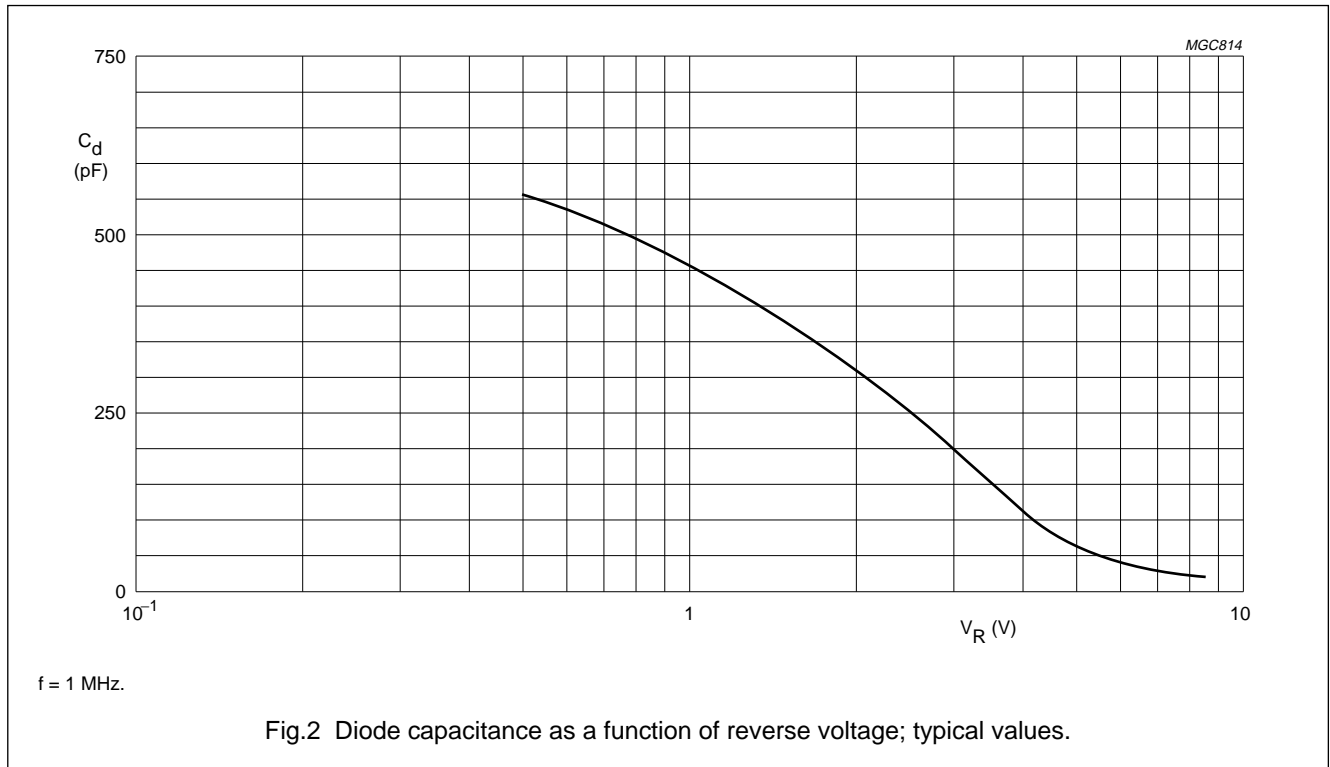
$C_1$  is the capacitance of a1 when  $a1 > a2$ .

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

AM variable capacitance double diode

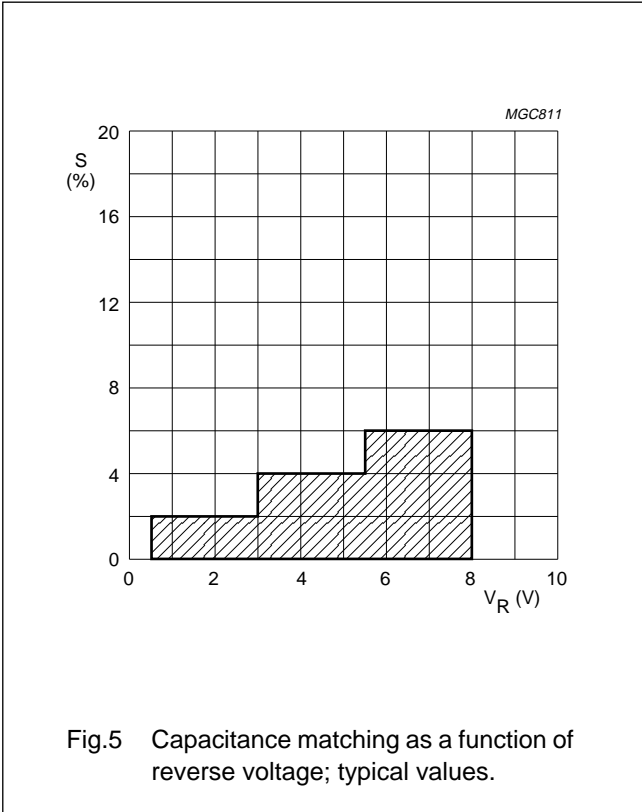
BB212

GRAPHICAL DATA



AM variable capacitance double diode

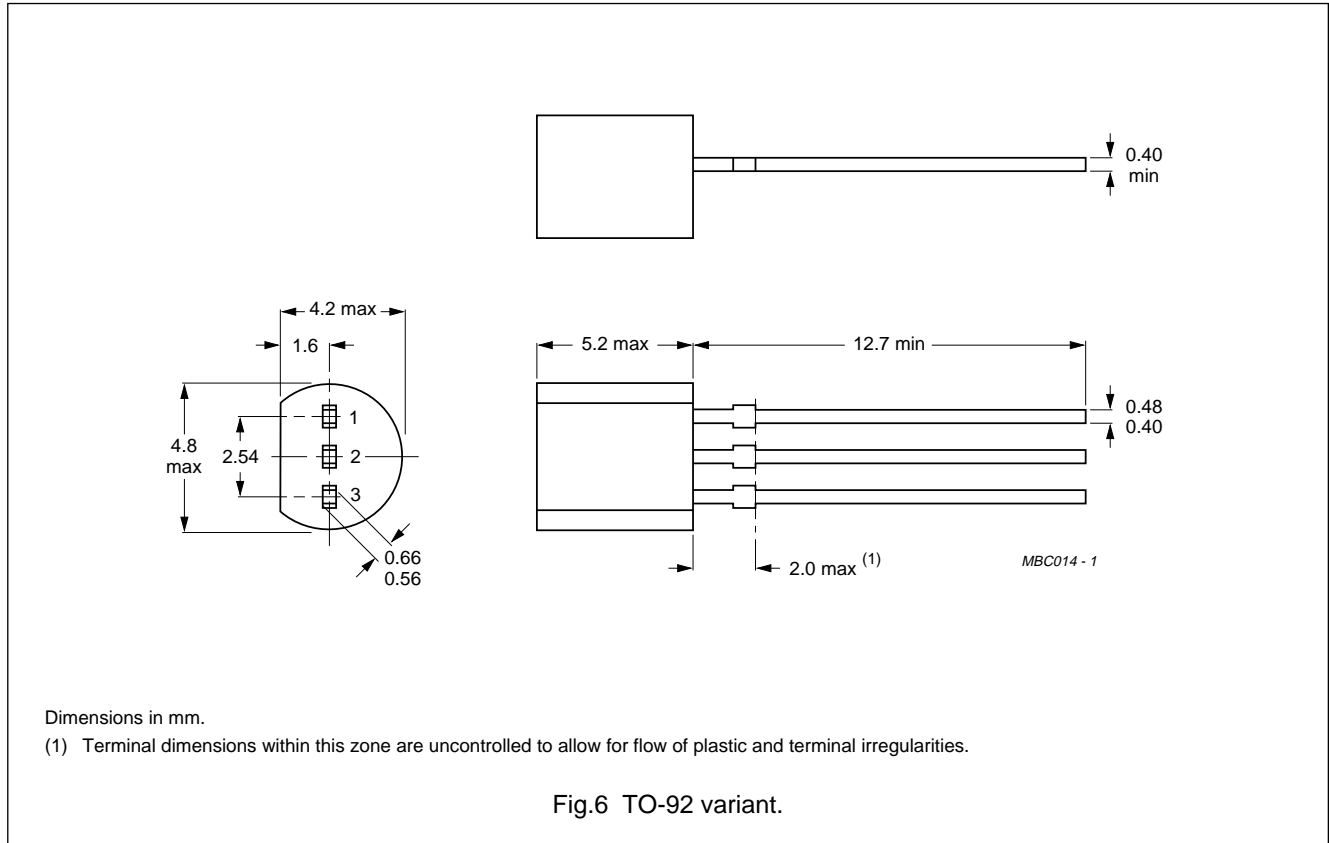
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AM variable capacitance double diode

BB212

PACKAGE OUTLINE



DEFINITIONS

<b>Data sheet status</b>	
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.
<b>Limiting values</b>	
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.	
<b>Application information</b>	
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.