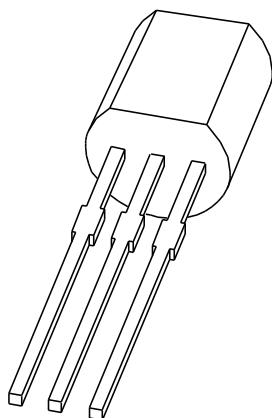


DATA SHEET



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)

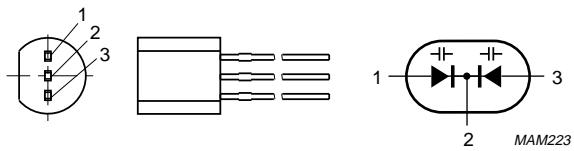


Fig.1 Simplified outline (TO-92 variant) and symbol.

LIMITING VALUES

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

SYMBOL	PARAMETER	MIN.	MAX.	UNIT
Per diode				
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

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ELECTRICAL CHARACTERISTICS

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

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
Per diode						
I_R	reverse current	$V_R = 10\text{ V}$; see Fig.3	—	—	50	nA
		$V_R = 10\text{ V}; T_j = 85^\circ\text{C}$; see Fig.3	—	—	300	nA
r_s	diode series resistance	$f = 500\text{ MHz}$; note 1			2.5	Ω
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

1. 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 V the following additional tolerances are valid.

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

$S < 2\%$ 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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GRAPHICAL DATA

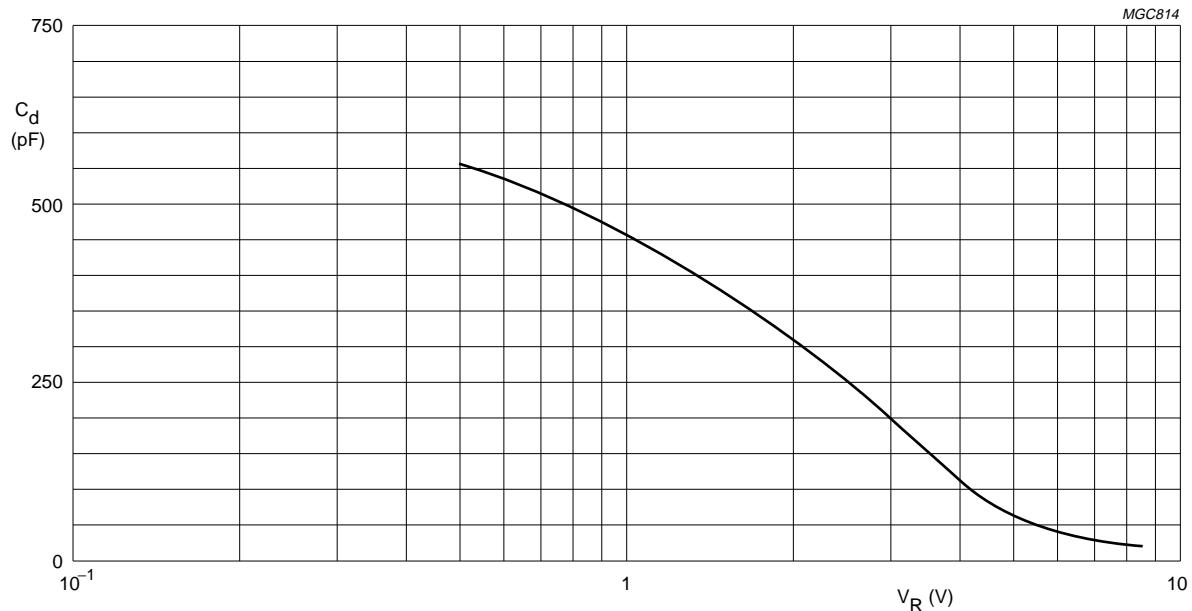
 $f = 1$ MHz.

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

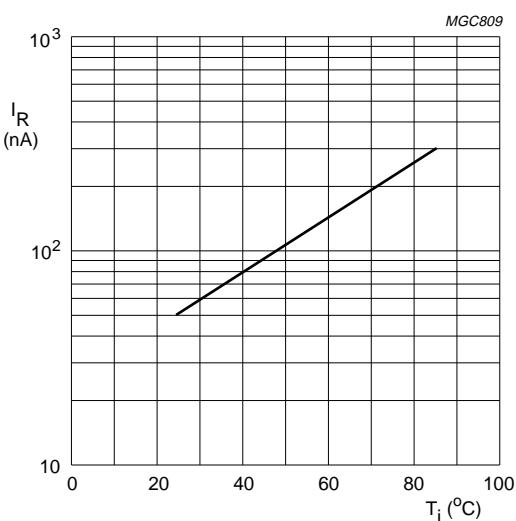


Fig.3 Reverse current as a function of junction temperature; maximum values.

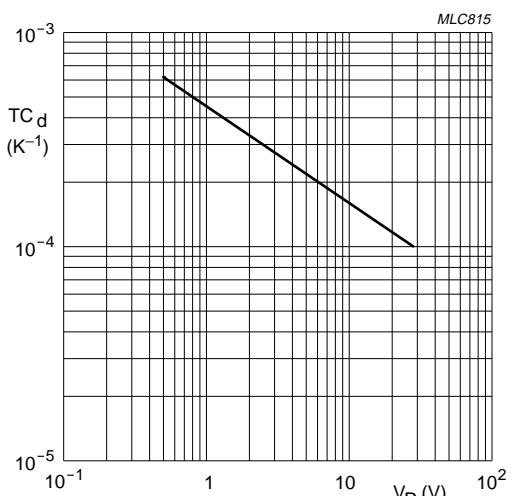


Fig.4 Temperature coefficient of diode capacitance as a function of reverse voltage; typical values.

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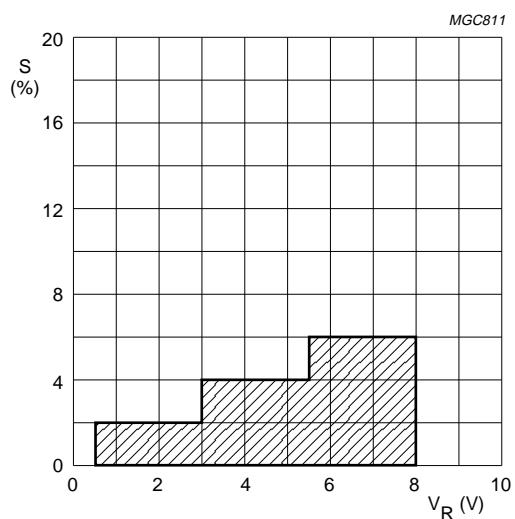
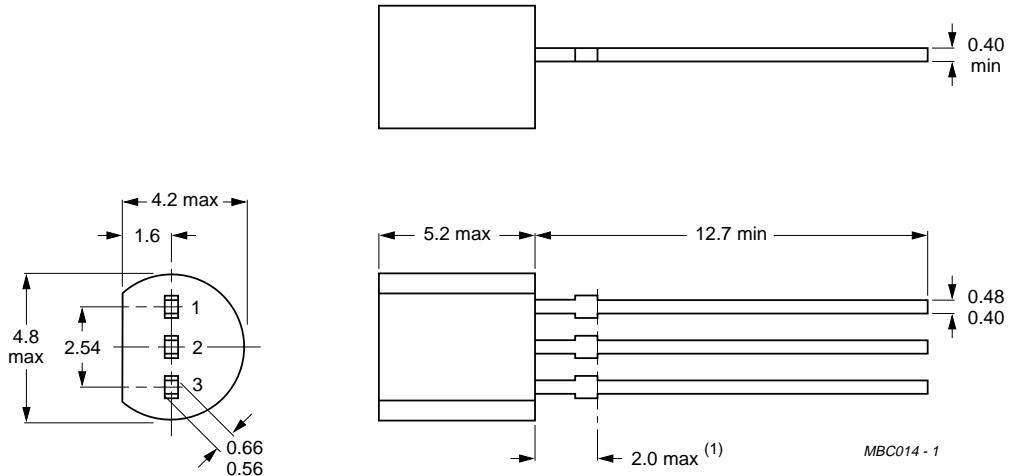


Fig.5 Capacitance matching as a function of reverse voltage; typical values.

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PACKAGE OUTLINE



Dimensions in mm.

(1) Terminal dimensions within this zone are uncontrolled to allow for flow of plastic and terminal irregularities.

Fig.6 TO-92 variant.

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 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

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