

A.M. VARIABLE CAPACITANCE DOUBLE DIODES

The BB212 is a double 9V variable capacitance diode with common cathode in a plastic TO-92 variant.

A special feature is the low tuning voltage which makes the device particularly suited to car and domestic receivers in the L.W., M.W. and S.W. bands.

QUICK REFERENCE DATA

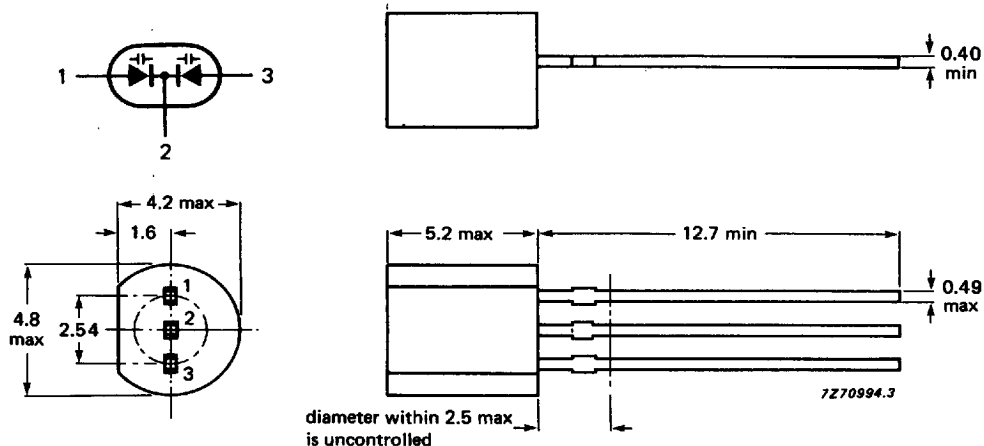
For each diode:

Continuous reverse voltage	V_R	max.	12 V
Operating junction temperature	T_j	max.	85 °C
Reverse current at $T_j = 25$ °C	I_R	<	50 nA
$V_R = 10$ V			
Diode capacitance at $f = 1$ MHz	C_d		500 to 620 pF
$V_R = 0,5$ V	C_d	<	22 pF
$V_R = 8,0$ V			
Capacitance ratio at $f = 1$ MHz	$\frac{C_d(V_R = 0,5 V)}{C_d(V_R = 8,0 V)}$	>	22,5
Series resistance at $f = 500$ kHz	r_s	<	2,5 Ω
V_R is that value at which $C_d = 500$ pF			

MECHANICAL DATA

Dimensions in mm

Fig. 1 TO-92 variant.



The anode of the diode with the higher capacitance C_1 at $V_R = 3$ V, i.e. a more positive mismatch, is identified by a white dot.

RATINGS (for each diode)

Limiting values in accordance with the Absolute Maximum System (IEC 134)

Continuous reverse voltage	V_R	max.	12 V
Forward current (d.c.)	I_F	max.	100 mA
Storage temperature	T_{stg}		-55 to + 100 °C
Operating junction temperature	T_j	max.	85 °C

CHARACTERISTICS (for each diode) $T_j = 25$ °C unless otherwise specified

Reverse current

$V_R = 10$ V	I_R	<	50 nA
$V_R = 10$ V; $T_{amb} = 60$ °C	I_R	<	200 nA

Diode capacitance at $f = 1$ MHz

$V_R = 0,5$ V	C_d		500 to 620 pF
$V_R = 3,0$ V	C_d		140 to 280 pF
$V_R = 5,5$ V	C_d		40 to 90 pF
$V_R = 8,0$ V	C_d	<	22 pF

Capacitance ratio at $f = 1$ MHz

$\frac{C_d(V_R = 0,5 \text{ V})}{C_d(V_R = 8,0 \text{ V})}$	>	22,5
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Series resistance at $f = 500$ MHz

V_R is that value at which $C_d = 500$ pF	r_s	<	2,5 Ω
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Temperature coefficient of the diode capacitance at $f = 1$ MHz; $T_{amb} = 25$ °C to 60 °C

$V_R = 0,5$ V	η	typ.	0,054 %/K
$V_R = 8,0$ V	η	typ.	0,050 %/K

MATCHING PROPERTIES

The capacitance of the two diodes in their common envelope may differ within certain limits. The total, relative capacitance difference between the two diodes in one envelope may be found in Fig. 2. The anode a1 or a2 with the higher capacitance at $V_R = 3$ V, is identified by a white dot.

BASIC TOLERANCEThe 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 TOLERANCEIn the range of $V_R = 0,5$ to 8 V the following additional tolerances are valid.

$$S = \left| \left(\frac{C_1}{C_2} \right)_{V_R} - \left(\frac{C_1}{C_2} \right)_{0,5 \text{ V}} \right| \left. \begin{array}{l} S < 2\% \text{ for } V_R = 0,5 \text{ to } 3 \text{ V} \\ S < 4\% \text{ for } V_R = 3 \text{ to } 5,5 \text{ V} \\ S < 6\% \text{ for } V_R = 5,5 \text{ to } 8 \text{ V} \end{array} \right\} \text{ see Fig. 2}$$

 C_1 is the capacitance of a1 when $a_1 > a_2$ C_1 is the capacitance of a2 when $a_2 > a_1$

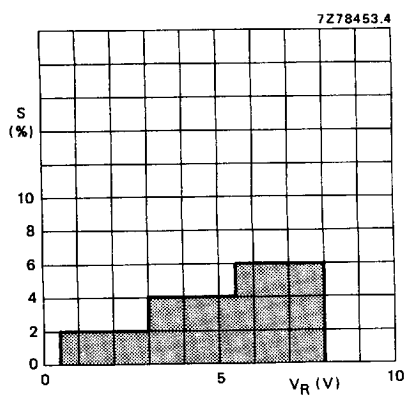


Fig. 2 The shaded area represents the maximum tolerance of the two diodes in one envelope as a function of the reverse voltage.

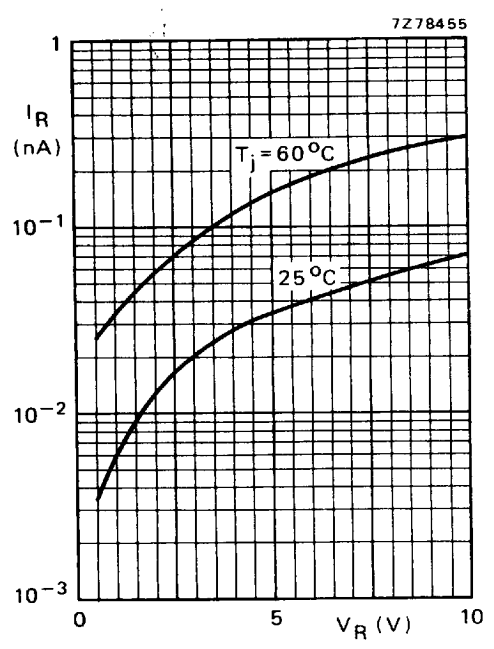


Fig. 3 Typical values.

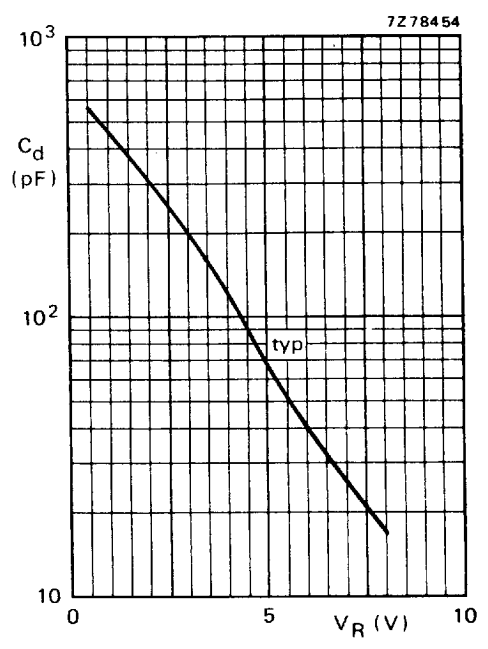


Fig. 4 $f = 1$ MHz.