

## VHF Variable Capacitance Diode

### FEATURES

- Excellent linearity
- Excellent matching to 0.7% DMA
- Very small plastic SMD package
- C28: 2.5 pF; ratio: 16.
- Low series resistance.

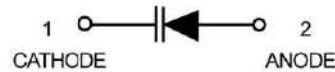
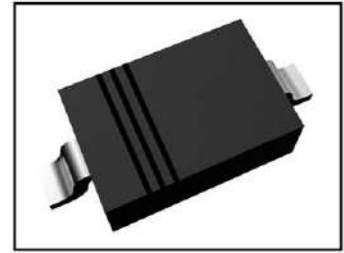
### APPLICATIONS

- Electronic tuning in VHF television tuners, band B up to 460 MHz
- VCO.

### DESCRIPTION

The BB133 is a variable capacitance diode fabricated in planar technology, and encapsulated in the SOD323 very small plastic SMD package.

The excellent matching performance is achieved by gliding matching and a direct matching assembly procedure. The unmatched type, BB150 has the same specification.



### LIMITING VALUES

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

| SYMBOL    | PARAMETER                      | MIN. | MAX. | UNIT |
|-----------|--------------------------------|------|------|------|
| $V_R$     | continuous reverse voltage     | —    | 30   | V    |
| $I_F$     | continuous forward current     | —    | 20   | mA   |
| $T_{stg}$ | storage temperature            | -55  | +150 | °C   |
| $T_j$     | operating junction temperature | -55  | +125 | °C   |

### ELECTRICAL CHARACTERISTICS

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

| SYMBOL                       | PARAMETER               | CONDITIONS                                                               | MIN. | MAX. | UNIT     |
|------------------------------|-------------------------|--------------------------------------------------------------------------|------|------|----------|
| $I_R$                        | reverse current         | $V_R = 30\text{ V}$ ; see Fig.2                                          | —    | 10   | nA       |
|                              |                         | $V_R = 30\text{ V}$ ; $T_j = 85\text{ °C}$ ; see Fig.2                   | —    | 200  | nA       |
| $r_s$                        | diode series resistance | $f = 100\text{ MHz}$ ; note 1                                            | —    | 0.9  | $\Omega$ |
| $C_d$                        | diode capacitance       | $V_R = 0.5\text{ V}$ ; $f = 1\text{ MHz}$ ; see Figs 1 and 3             | 38   | 46   | pF       |
|                              |                         | $V_R = 28\text{ V}$ ; $f = 1\text{ MHz}$ ; see Figs 1 and 3              | 2.2  | 2.6  | pF       |
| $\frac{C_d(0.5V)}{C_d(28V)}$ | capacitance ratio       | $f = 1\text{ MHz}$                                                       | 14   | 21   |          |
| $\frac{\square C_d}{C_d}$    | capacitance matching    | $V_R = 0.5\text{ to }28\text{ V}$ ; in a sequence of 4 diodes (gliding)  | —    | 0.7  | %        |
|                              |                         | $V_R = 0.5\text{ to }28\text{ V}$ ; in a sequence of 15 diodes (gliding) | —    | 2    | %        |

### Note

1.  $V_R$  is the value at which  $C_d = 30\text{ pF}$ .

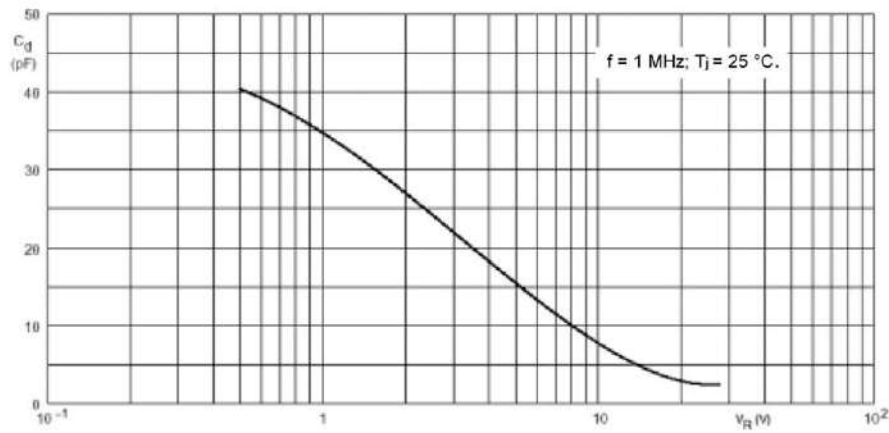


Fig.1 Diode capacitance as a function of reverse voltage; typical values.

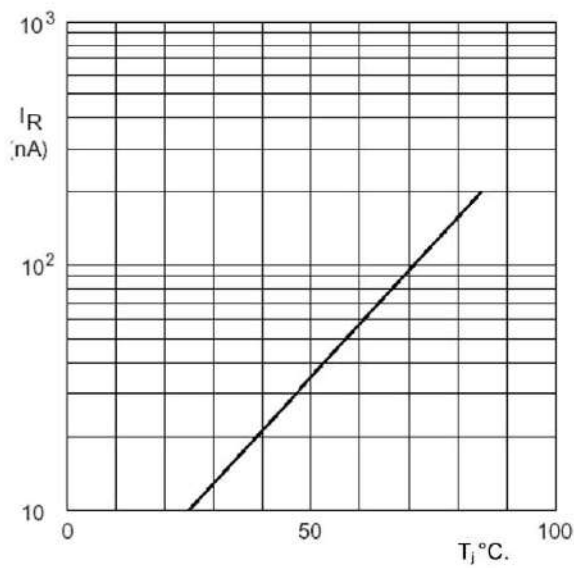


Fig.2 Reverse current as a function of junction temperature; maximum values.

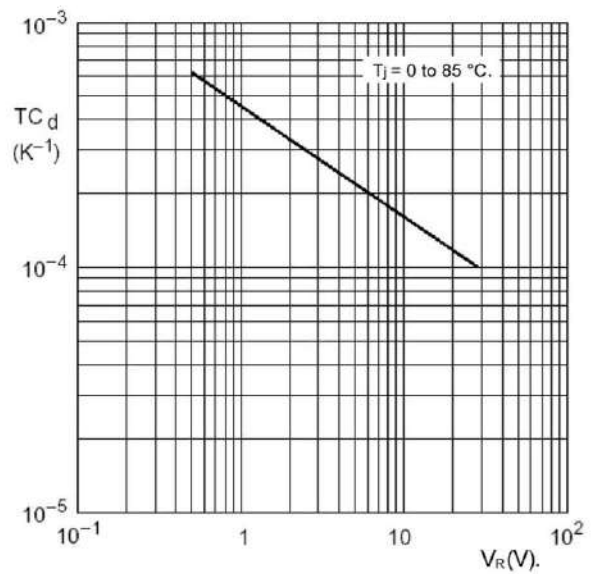


Fig.3 Temperature coefficient of diode capacitance as a function of reverse voltage; typical values.