BB174

VHF variable capacitance diode

Rev. 1 — 25 March 2013 Product data sheet

1. Product profile

1.1 General description

The BB174 is a variable capacitance diode, fabricated in planar technology, and encapsulated in the SOD523 (SC-79) ultra small SMD plastic package.

1.2 Features and benefits

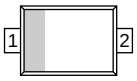
- Excellent linearity
- Ultra small SMD plastic package
- $C_{d(28V)}$ = 2.1 pF; $C_{d(1V)}$ to $C_{d(28V)}$ ratio = 9
- Low series resistance

1.3 Applications

- Voltage Controlled Oscillators (VCO)

2. Pinning information

Table 1. Pinning

Pin	Description	Simplified outline	Symbol
1	cathode [1]		 sym008
2	anode		

[1] The marking bar indicates the cathode.

3. Ordering information

Table 2. Ordering information

Type number	Package		
	Name	Description	Version
BB174	SC-79	plastic surface-mounted package; 2 leads	SOD523

4. Marking

Table 3. Marking

Type number	Marking code
BB174	CF

5. Limiting values

Table 4. Limiting values

In accordance with the Absolute Maximum Rating System (IEC 60134).

Symbol	Parameter	Conditions	Min	Max	Unit
V_R	reverse voltage		-	30	V
		peak value in series with a 10 kΩ resistor	-	35	V
I_F	forward current		-	20	mA
T_{stg}	storage temperature		–55	+150	°C
T_j	junction temperature		–55	+125	°C

6. Characteristics

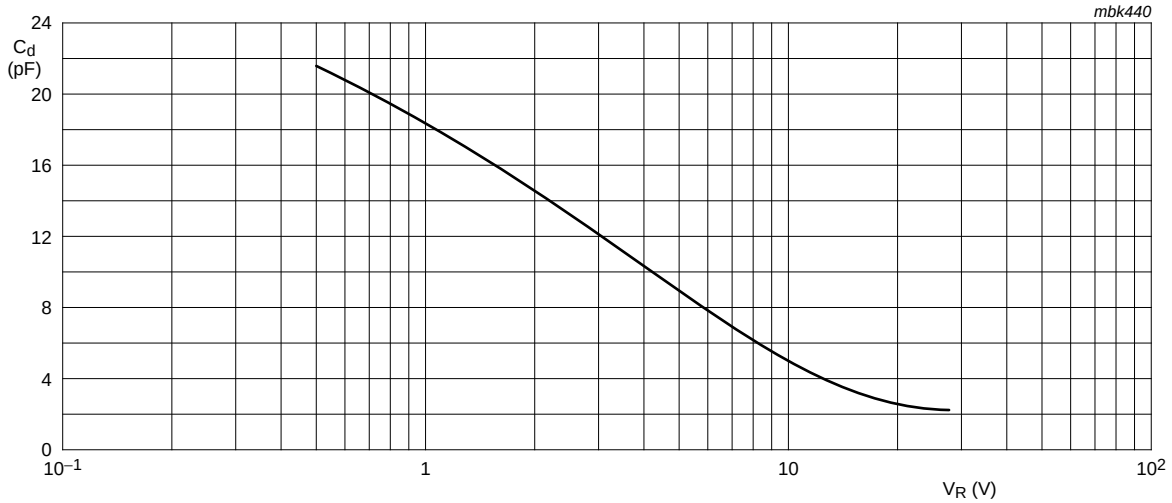
Table 5. Characteristics

T_j = 25 °C unless otherwise specified.

Symbol	Parameter	Conditions		Min	Typ	Max	Unit
I_R	reverse current	V_R = 30 V	[1]	-	-	10	nA
		V_R = 30 V; T_j = 85 °C	[1]	-	-	200	nA
r_s	diode series resistance	f = 470 MHz; C_d = 9 pF		-	0.6	0.75	Ω
C_d	diode capacitance	f = 1 MHz	[2]				
		V_R = 1 V		18.22	-	21.26	pF
		V_R = 28 V		1.951	2.1	2.225	pF
$C_{d(1V)}/C_{d(2V)}$	diode capacitance ratio (1 V to 2 V)	f = 1 MHz		-	1.27	-	
$C_{d(1V)}/C_{d(28V)}$	diode capacitance ratio (1 V to 28 V)	f = 1 MHz		8.45	9	10.9	
$C_{d(25V)}/C_{d(28V)}$	diode capacitance ratio (25 V to 28 V)	f = 1 MHz		-	1.05	-	

[1] See Figure 2.

[2] See Figure 1 and Figure 3.



f = 1 MHz; T_j = 25 °C.

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

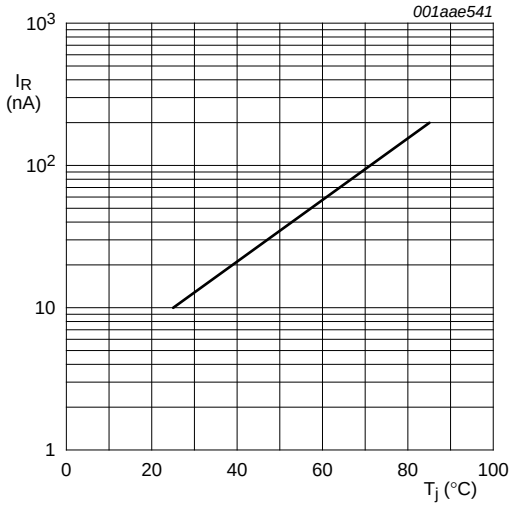
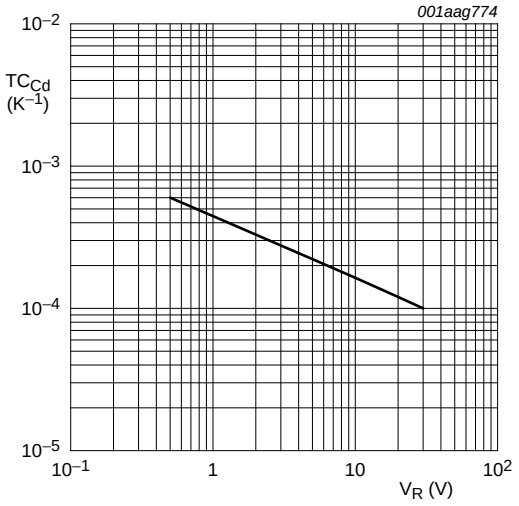


Fig 2. Reverse current as a function of junction temperature; maximum values.

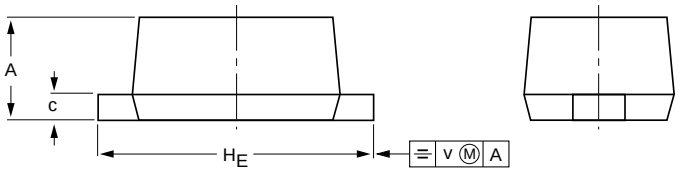


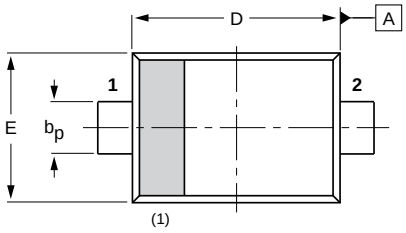
T_j = 0 °C to 85 °C.

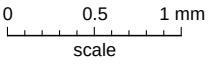
Fig 3. Diode capacitance temperature coefficient as a function of reverse voltage; typical values.

7. Package outline

Plastic surface-mounted package; 2 leads **SOD523**







DIMENSIONS (mm are the original dimensions)

UNIT	A	b_p	c	D	E	H_E	v
mm	0.65 0.58	0.34 0.26	0.17 0.11	1.25 1.15	0.85 0.75	1.65 1.55	0.1

Note

1. The marking bar indicates the cathode.

OUTLINE VERSION	REFERENCES				EUROPEAN PROJECTION	ISSUE DATE
	IEC	JEDEC	JEITA			
SOD523			SC-79			~~02-12-13~~ 06-03-16

Fig 4. Package outline SOD523 (SC-79)

8. Abbreviations

Table 6. Abbreviations

Acronym	Description
SMD	Surface Mounted Device
VHF	Very High Frequency

9. Revision history

Table 7. Revision history

Document ID	Release date	Data sheet status	Change notice	Supersedes
BB174 v.1	20130325	Product data sheet	-	-

10. Legal information

10.1 Data sheet status

Document status[1][2]	Product status[3]	Definition
Objective [short] data sheet	Development	This document contains data from the objective specification for product development.
Preliminary [short] data sheet	Qualification	This document contains data from the preliminary specification.
Product [short] data sheet	Production	This document contains the product specification.

[1] Please consult the most recently issued document before initiating or completing a design.

[2] The term 'short data sheet' is explained in section "Definitions".

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