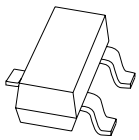


BBY39

UHF variable capacitance double diode

Rev. 02 — 30 June 2004 Product data sheet

1. Product profile

1.1 General description

The BBY39 is a variable capacitance double diode with a common cathode, fabricated in planar technology and encapsulated in the SOT23 small plastic SMD package.

1.2 Features

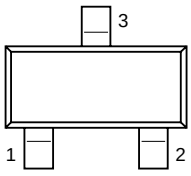
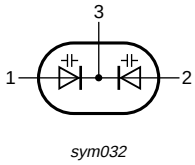
- Excellent linearity
- Small plastic SMD package
- C28: 1.9 pF; ratio: 8.3.

1.3 Applications

- Electronic tuning in UHF television tuners
- Voltage Controlled Oscillators (VCOs).

2. Pinning information

Table 1: Pinning

Pin	Description	Simplified outline	Symbol
1	anode (a1)	 SOT23	 sym032
2	anode (a2)		
3	common cathode		

3. Ordering information

Table 2: Ordering information

Type number	Package		
	Name	Description	Version
BBY39	-	plastic surface mounted package; 3 leads	SOT23

PHILIPS

4. Marking

Table 3: Marking

Type number	Marking code [1]
BBY39	18*

[1] * = p: made in Hong Kong.
* = t: made in Malaysia.
* = W: made in China.

5. Limiting values

Table 4: Limiting values

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

Symbol	Parameter	Conditions	Min	Max	Unit
Per diode					
V_R	continuous reverse voltage		-	30	V
I_F	continuous forward current		-	20	mA
T_{stg}	storage temperature		–55	+150	°C
T_j	junction temperature		–55	+125	°C

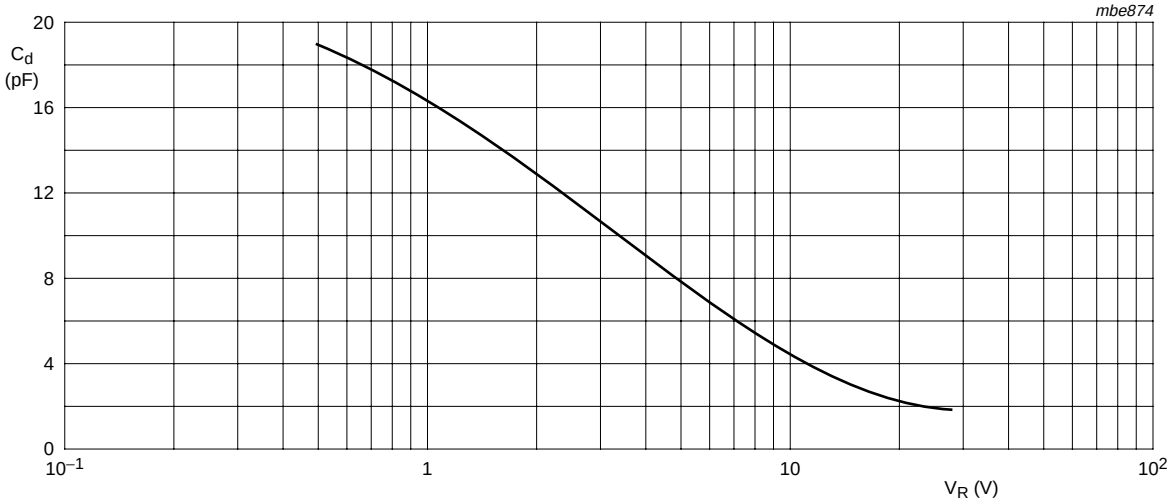
6. Characteristics

Table 5: Characteristics

T_j = 25 °C unless otherwise specified.

Symbol	Parameter	Conditions		Min	Typ	Max	Unit
Per diode							
I_R	reverse current	see Figure 2					
		V_R = 28 V		-	-	10	nA
		V_R = 28 V; T_j = 85 °C		-	-	200	nA
r_s	diode series resistance	f = 470 MHz	[1]	-	-	1.2	Ω
C_d	diode capacitance	see Figure 1 and Figure 3					
		V_R = 1 V; f = 1 MHz		-	16.5	-	pF
		V_R = 28 V; f = 1 MHz		1.6	-	2	pF
$\frac{C_{d(1V)}}{C_{d(28V)}}$	capacitance ratio	f = 1 MHz		8	-	-	

[1] V_R is the value at which C_d = 9 pF.



f = 1 MHz; T_j = 25 °C.

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

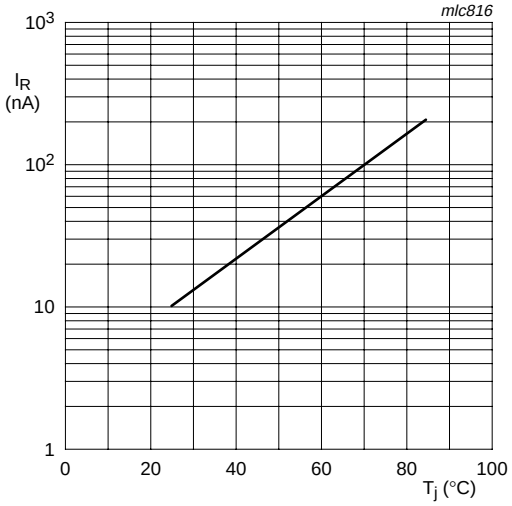


Fig 2. Reverse current as a function of junction temperature; maximum values.

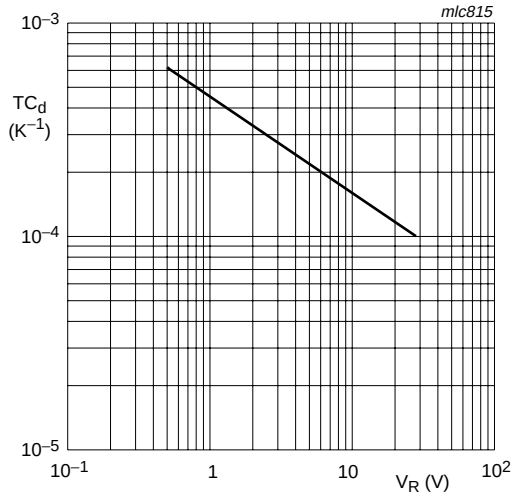
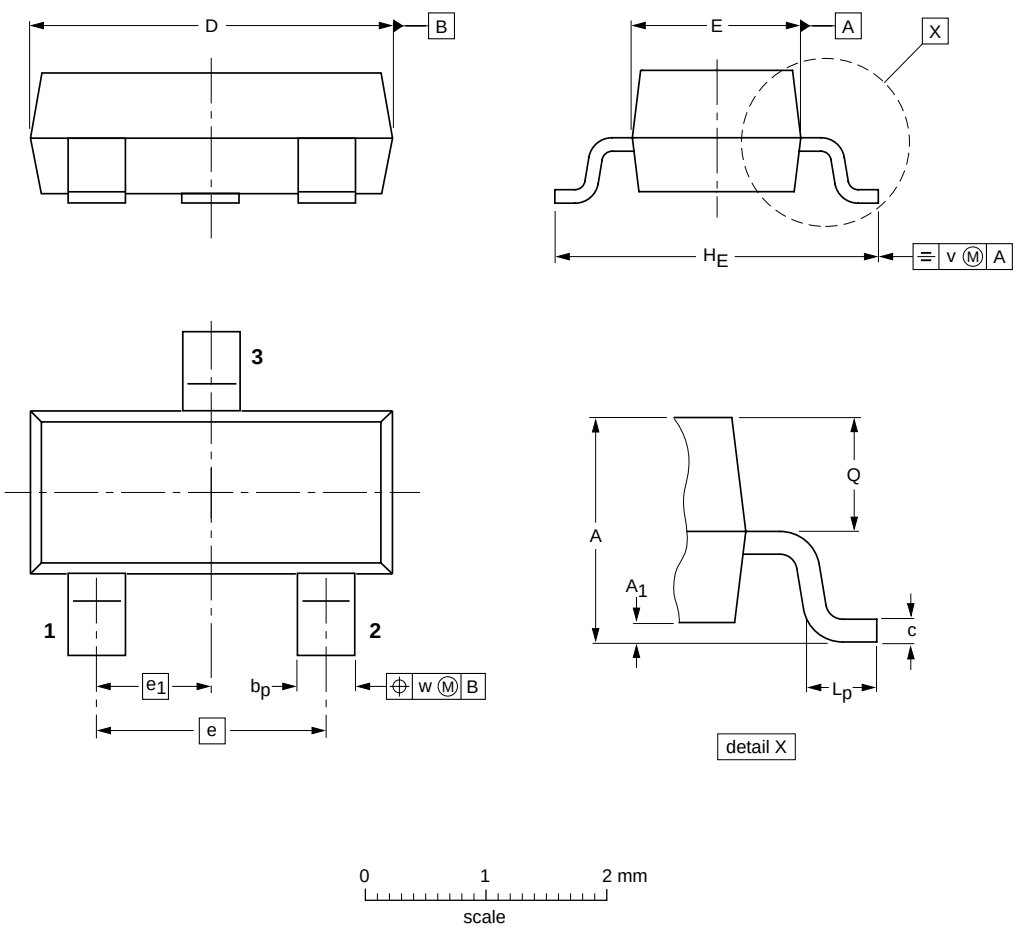


Fig 3. Temperature coefficient of diode capacitance as a function of reverse voltage; typical values.

7. Package outline

Plastic surface mounted package; 3 leads **SOT23**



DIMENSIONS (mm are the original dimensions)

UNIT	A	A_1 max.	b_p	c	D	E	e	e_1	H_E	L_p	Q	v	w
mm	1.1 0.9	0.1	0.48 0.38	0.15 0.09	3.0 2.8	1.4 1.2	1.9	0.95	2.5 2.1	0.45 0.15	0.55 0.45	0.2	0.1

OUTLINE VERSION	REFERENCES				EUROPEAN PROJECTION	ISSUE DATE
	IEC	JEDEC	EIAJ			
SOT23		TO-236AB				~~97-02-28~~ 99-09-13

Fig 4. Package outline.

8. Revision history

Table 6: Revision history

Document ID	Release date	Data sheet status	Change notice	Order number	Supersedes
BBY39_2	20040630	Product data sheet	-	9397 750 13387	BBY39_1
Modifications:	• The format of this data sheet has been redesigned to comply with the new presentation and information standard of Philips Semiconductors • Table 3: marking code changed.				
BBY39_1	19960503	Product data sheet	-	-	-

9. Data sheet status

Level	Data sheet status [1]	Product status [2] [3]	Definition
I	Objective data	Development	This data sheet contains data from the objective specification for product development. Philips Semiconductors reserves the right to change the specification in any manner without notice.
II	Preliminary data	Qualification	This data sheet contains data from the preliminary specification. Supplementary data will be published at a later date. Philips Semiconductors reserves the right to change the specification without notice, in order to improve the design and supply the best possible product.
III	Product data	Production	This data sheet contains data from the product specification. Philips Semiconductors reserves the right to make changes at any time in order to improve the design, manufacturing and supply. Relevant changes will be communicated via a Customer Product/Process Change Notification (CPCN).

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

[2] The product status of the device(s) described in this data sheet may have changed since this data sheet was published. The latest information is available on the Internet at URL http://www.semiconductors.philips.com.

[3] For data sheets describing multiple type numbers, the highest-level product status determines the data sheet status.

10. Definitions

Short-form specification — The data in a short-form specification is extracted from a full data sheet with the same type number and title. For detailed information see the relevant data sheet or data handbook.

Limiting values definition — Limiting values given are in accordance with the Absolute Maximum Rating System (IEC 60134). 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.

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13. Contents

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