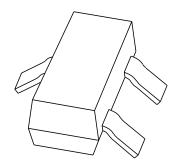
DISCRETE SEMICONDUCTORS

DATA SHEET



BAS678 High-speed diode

Product specification Supersedes data of April 1996 File under Discrete Semiconductors, SC01





High-speed diode

BAS678

FEATURES

- Small plastic SMD package
- High switching speed: max. 6 ns
- Continuous reverse voltage: max. 80 V
- Repetitive peak reverse voltage: max. 100 V
- Repetitive peak forward current: max. 600 mA.

APPLICATIONS

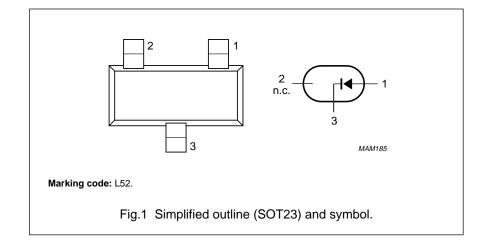
• High-speed switching in hybrid thick and thin-film circuits.

DESCRIPTION

The BAS678 is a high-speed switching diode fabricated in planar technology, and encapsulated in the small rectangular plastic SMD SOT23 package.

PINNING

PIN	DESCRIPTION
1	anode
2	not connected
3	cathode



LIMITING VALUES

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

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
V _{RRM}	repetitive peak reverse voltage		_	100	V
V _R	continuous reverse voltage		_	80	V
I _F	continuous forward current	see Fig.2; note 1	_	250	mA
I _{FRM}	repetitive peak forward current		_	600	mA
I _{FSM}	non-repetitive peak forward current	square wave; T _j = 25 °C prior to surge; see Fig.4			
		t = 1 μs	_	9	Α
		t = 100 μs	_	3	Α
		t = 10 ms	_	1.7	Α
P _{tot}	total power dissipation	T _{amb} = 25 °C; note 1	_	250	mW
T _{stg}	storage temperature		-65	+150	°C
Tj	junction temperature		_	150	°C

Note

1. Device mounted on an FR4 printed-circuit board.

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ELECTRICAL CHARACTERISTICS

 $T_j = 25$ °C; unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
V _F	forward voltage	see 3; I _F = 200 mA; d.c.; note 1	_	1.0	V
I _R	reverse current	see Fig.5			
		V _R = 10 V	_	15	nA
		V _R = 75 V	_	100	nA
		V _R = 75 V; T _j = 150 °C	_	50	μΑ
C _d	diode capacitance	f = 1 MHz; V _R = 0; see Fig.6	_	2	pF
t _{rr}	reverse recovery time	when switched from I_F = 400 mA to I_R = 400 mA; R_L = 100 Ω ; measured at I_R = 40 mA; see Fig.7	-	6	ns
V _{fr}	forward recovery voltage	when switched from $I_F = 10$ mA; $t_r = 20$ ns; see Fig.8	_	2	V

Note

1. $T_{amb} = 25$ °C; device has reached the thermal equilibrium when mounted on an FR4 printed-circuit board.

THERMAL CHARACTERISTICS

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
R _{th j-tp}	thermal resistance from junction to tie-point		330	K/W
R _{th j-a}	thermal resistance from junction to ambient	note 1	500	K/W

Note

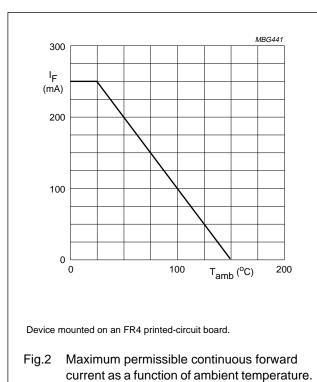
1. Device mounted on an FR4 printed-circuit board.

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GRAPHICAL DATA



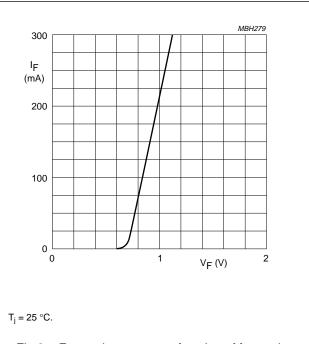
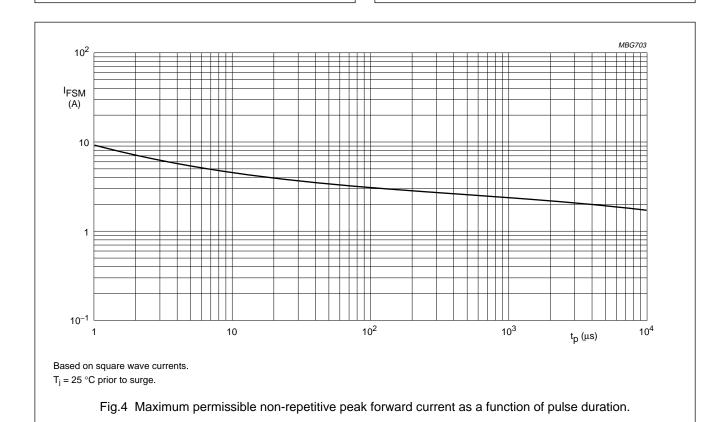


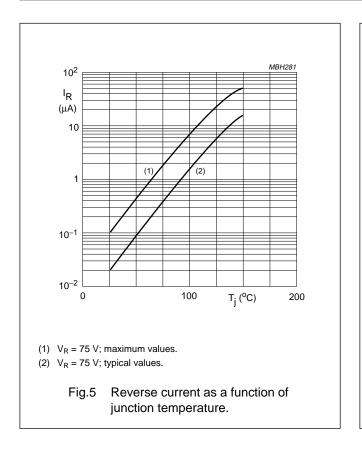
Fig.3 Forward current as a function of forward voltage; typical values.



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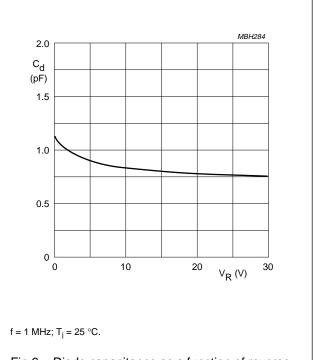


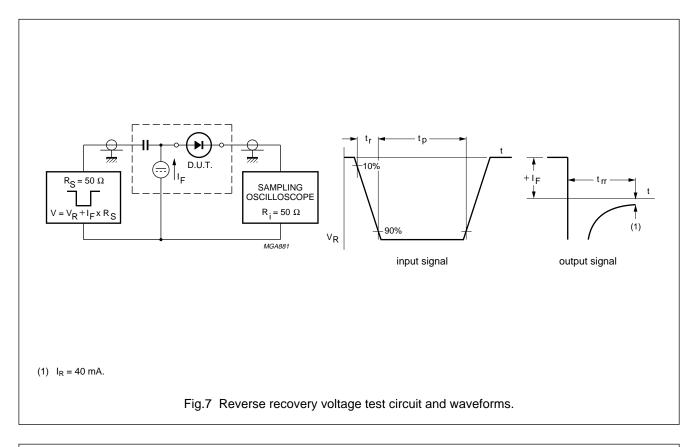
Fig.6 Diode capacitance as a function of reverse voltage; typical values.

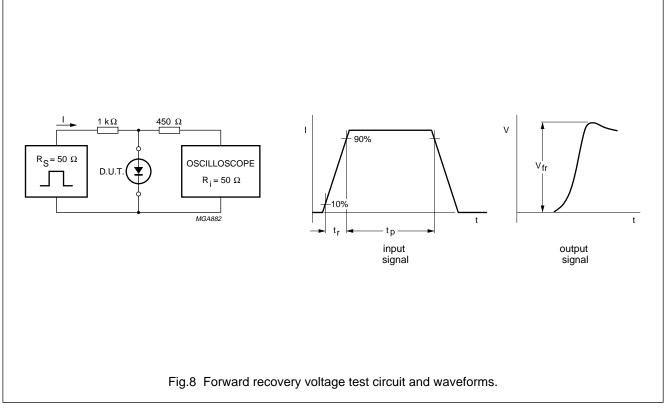
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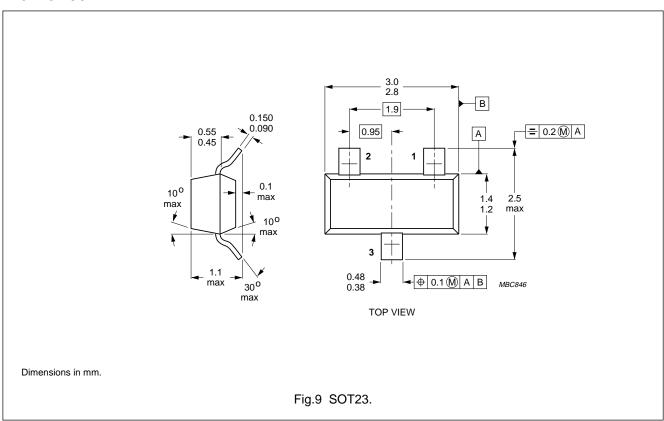


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PACKAGE OUTLINE



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

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

These products are not designed for use in life support appliances, devices, or systems where malfunction of these products can reasonably be expected to result in personal injury. Philips customers using or selling these products for use in such applications do so at their own risk and agree to fully indemnify Philips for any damages resulting from such improper use or sale.