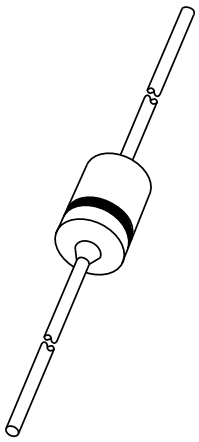
DATA SHEET



BA220
High-speed diode

Product specification
Supersedes data of April 1992
File under Discrete Semiconductors, SC01

1996 Apr 03

Philips
Semiconductors

PHILIPS

High-speed diode BA220

FEATURES

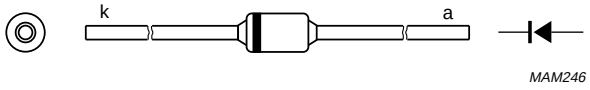
- Hermetically sealed leaded glass SOD27 (DO-35) package
- High switching speed: max. 4 ns
- General application
- Continuous reverse voltage: max. 10 V
- Repetitive peak reverse voltage: max. 10 V
- Repetitive peak forward current: max. 400 mA
- Forward voltage: max. 0.95 V.

APPLICATIONS

- High-speed switching.

DESCRIPTION

The BA220 is a high-speed switching diode fabricated in planar technology, and encapsulated in the hermetically sealed leaded glass SOD27 (DO-35) package.



The diode is type branded.

Fig.1 Simplified outline (SOD27; DO-35) and symbol.

LIMITING VALUES

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

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
V_{RRM}	repetitive peak reverse voltage		–	10	V
V_R	continuous reverse voltage		–	10	V
I_F	continuous forward current	see Fig.2; note 1	–	200	mA
I_{FRM}	repetitive peak forward current		–	400	mA
I_{FSM}	non-repetitive peak forward current	square wave; T_j = 25 °C prior to surge; see Fig.4			
		t = 1 μs	–	9	A
		t = 100 μs	–	3	A
		t = 1 s	–	1	A
P_{tot}	total power dissipation	T_{amb} = 25 °C; note 1	–	350	mW
T_{stg}	storage temperature		–65	+200	°C
T_j	junction temperature		–	200	°C

Note

1. Device mounted on an FR4 printed circuit-board; lead length 10 mm.

ELECTRICAL CHARACTERISTICS

T_j = 25 °C; unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
V_F	forward voltage	see Fig.3			
		I_F = 0.1 mA	460	520	mV
		I_F = 1 mA	560	620	mV
		I_F = 5 mA	640	700	mV
		I_F = 10 mA	680	750	mV
		I_F = 100 mA	825	950	mV
I_R	reverse current	see Fig.5			
		V_R = 10 V	–	1.5	μA
		V_R = 10 V; T_j = 150 °C	–	50	μA
C_d	diode capacitance	f = 1 MHz; V_R = 0; see Fig.6	–	2.5	pF
t_{rr}	reverse recovery time	when switched from I_F = 10 mA to I_R = 60 mA; R_L = 100 Ω; measured at I_R = 1 mA; see Fig.7	–	4	ns
V_{fr}	forward recovery voltage	when switched from I_F = 400 mA; t_r = 30 ns; see Fig.8	–	2.0	V

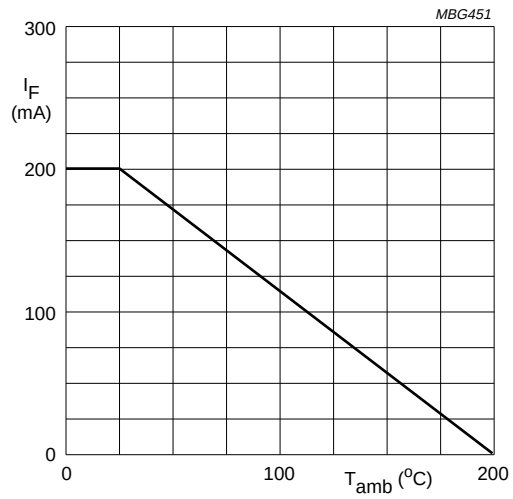
THERMAL CHARACTERISTICS

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
$R_{th\ j\text{-}tp}$	thermal resistance from junction to tie-point	lead length 10 mm	240	K/W
$R_{th\ j\text{-}a}$	thermal resistance from junction to ambient	lead length 10 mm; note 1	500	K/W

Note

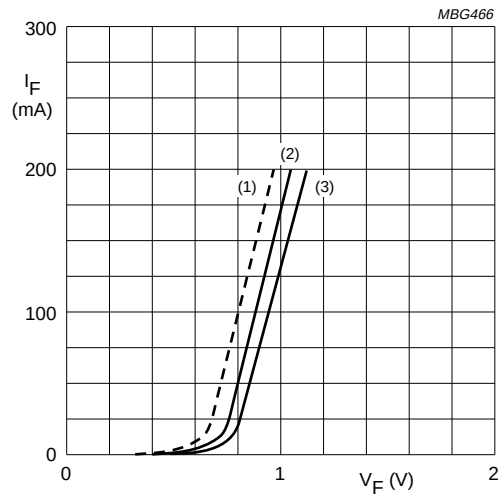
1. Device mounted on a printed circuit-board without metallization pad.

GRAPHICAL DATA



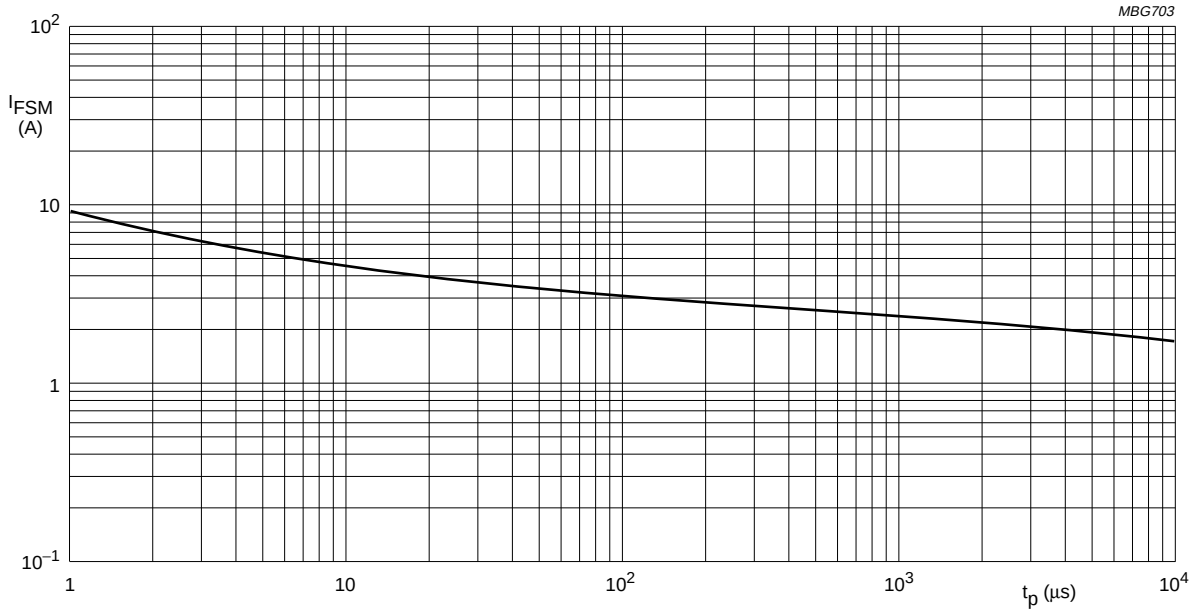
Device mounted on an FR4 printed-circuit board; lead length 10 mm.

Fig.2 Maximum permissible continuous forward current as a function of ambient temperature.



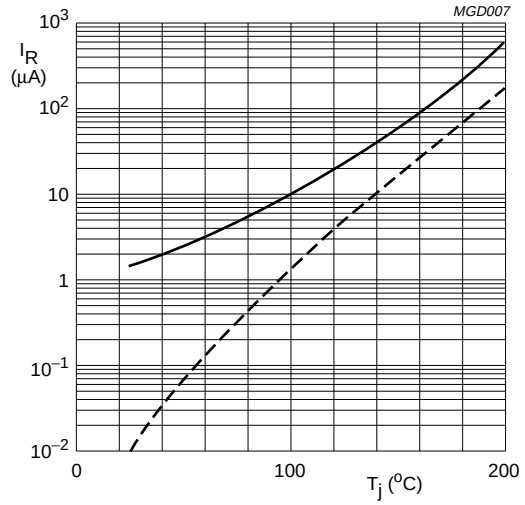
(1) T_j = 175 °C; typical values.
(2) T_j = 25 °C; typical values.
(3) T_j = 25 °C; maximum values.

Fig.3 Forward current as a function of forward voltage.



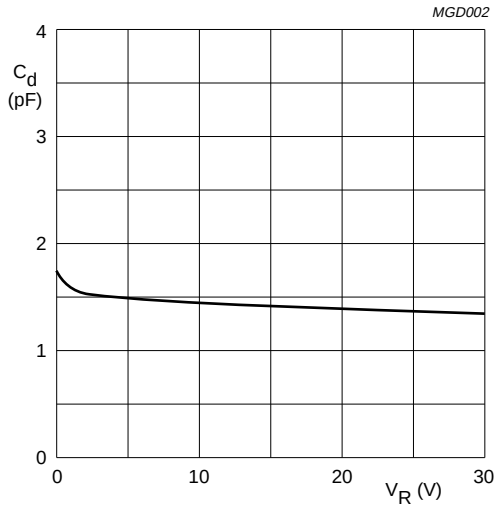
Based on square wave currents.
T_j = 25 °C prior to surge.

Fig.4 Maximum permissible non-repetitive peak forward current as a function of pulse duration.



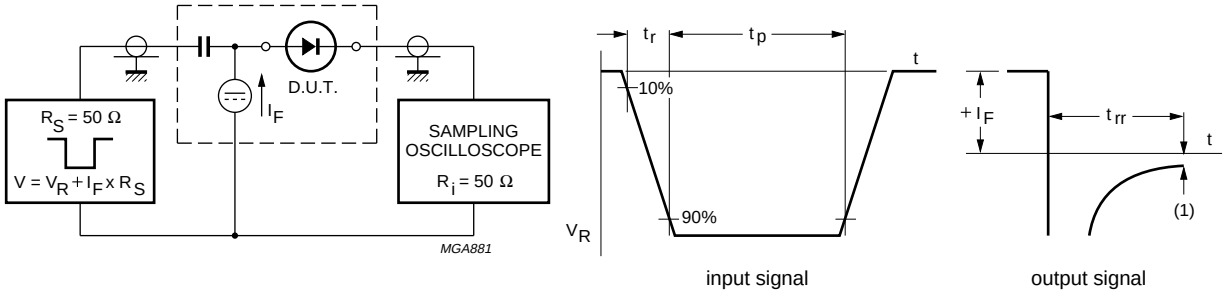
V_R = 10 V.
Solid line; maximum values.
Dotted line; typical values.

Fig.5 Reverse current as a function of junction temperature.



f = 1 MHz; T_j = 25 °C.

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



(1) I_R = 1 mA.

Fig.7 Reverse recovery voltage test circuit and waveforms.

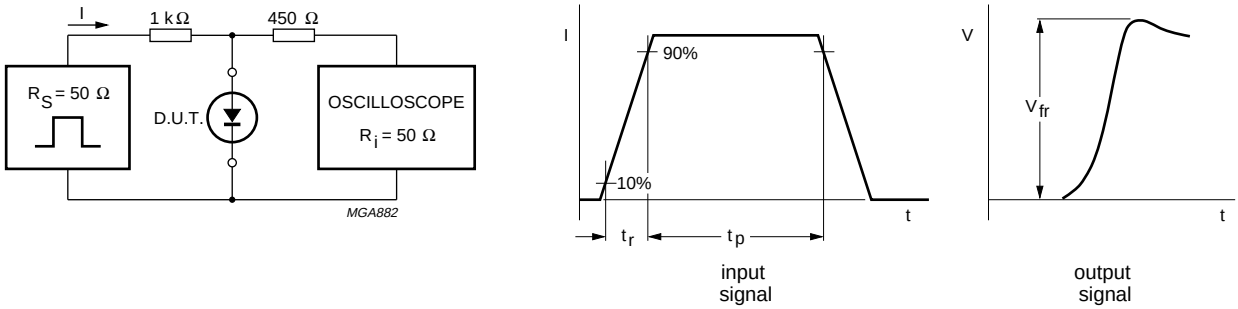
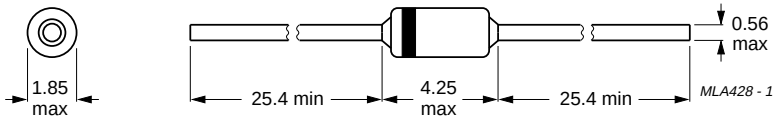


Fig.8 Forward recovery voltage test circuit and waveforms.

PACKAGE OUTLINE



Dimensions in mm.

Fig.9 SOD27 (DO-35).

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 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.