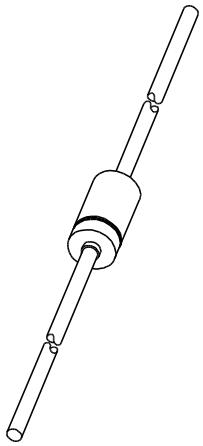
DATA SHEET



1N4531; 1N4532
High-speed diodes

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

1996 Apr 03

Philips
Semiconductors

PHILIPS

High-speed diodes 1N4531; 1N4532

FEATURES

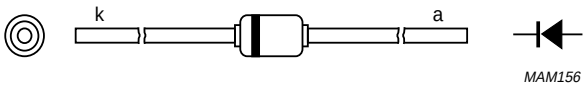
- Hermetically sealed leaded glass SOD68 (DO-34) package
- High switching speed: max. 4 ns
- Continuous reverse voltage: max. 75 V
- Repetitive peak reverse voltage: max. 75 V
- Repetitive peak forward current: max. 450 mA
- Forward voltage: max. 1 V.

APPLICATIONS

- High-speed switching
- Protection diodes in reed relays.

DESCRIPTION

The 1N4531, 1N4532 are high-speed switching diodes fabricated in planar technology, and encapsulated in hermetically sealed leaded glass SOD68 (DO-34) packages.



The diodes are type branded.

Fig.1 Simplified outline (SOD68; DO-34) 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		–	75	V
V_R	continuous reverse voltage		–	75	V
I_F	continuous forward current	see Fig.2	–	200	mA
I_{FRM}	repetitive peak forward current		–	450	mA
I_{FSM}	non-repetitive peak forward current	square wave; T_j = 25 °C prior to surge; see Fig.4			
		t = 1 μs	–	4	A
		t = 1 ms	–	1	A
		t = 1 s	–	0.5	A
P_{tot}	total power dissipation	T_{amb} = 25 °C	–	500	mW
T_{stg}	storage temperature		–65	+200	°C
T_j	junction temperature		–	200	°C

ELECTRICAL CHARACTERISTICS

T_j = 25 °C; unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
V_F	forward voltage	I_F = 10 mA; see Fig.3	–	1000	mV
I_R	reverse current	see Fig.5			
	IN4531	V_R = 20 V	–	25	nA
		V_R = 20 V; T_j = 150 °C	–	50	μA
	IN4532	V_R = 50 V	–	100	nA
		V_R = 50 V; T_j = 150 °C	–	100	μA
C_d	diode capacitance	f = 1 MHz; V_R = 0; see Fig.6			
	IN4531		–	4	pF
	IN4532		–	2	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			
	IN4531		–	4	ns
	IN4532		–	2	ns
	reverse recovery time	when switched from I_F = 10 mA to I_R = 10 mA; R_L = 100 Ω; measured at I_R = 1 mA; see Fig.7			
	IN4532		–	4	ns
V_{fr}	forward recovery voltage	when switched from I_F = 100 mA; $t_r \leq$ 30 ns; see Fig.8	–	3	V

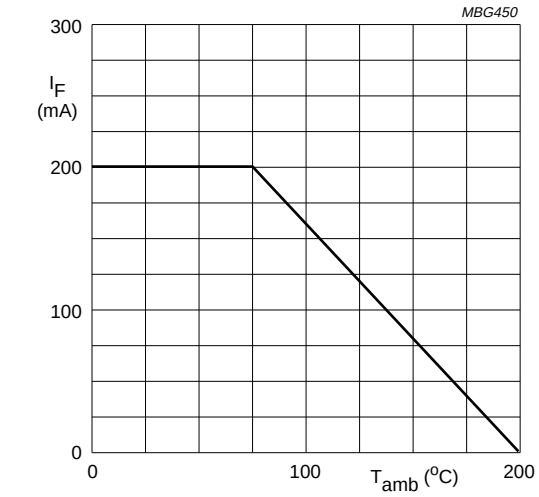
THERMAL CHARACTERISTICS

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
$R_{th\ j\text{-}tp}$	thermal resistance from junction to tie-point	lead length 5 mm	120	K/W
$R_{th\ j\text{-}a}$	thermal resistance from junction to ambient	lead length 5 mm; note 1	350	K/W

Note

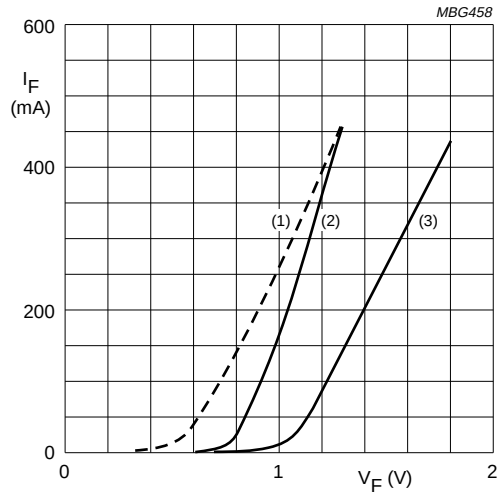
1. Device mounted on a printed circuit-board without metallization pad.

GRAPHICAL DATA



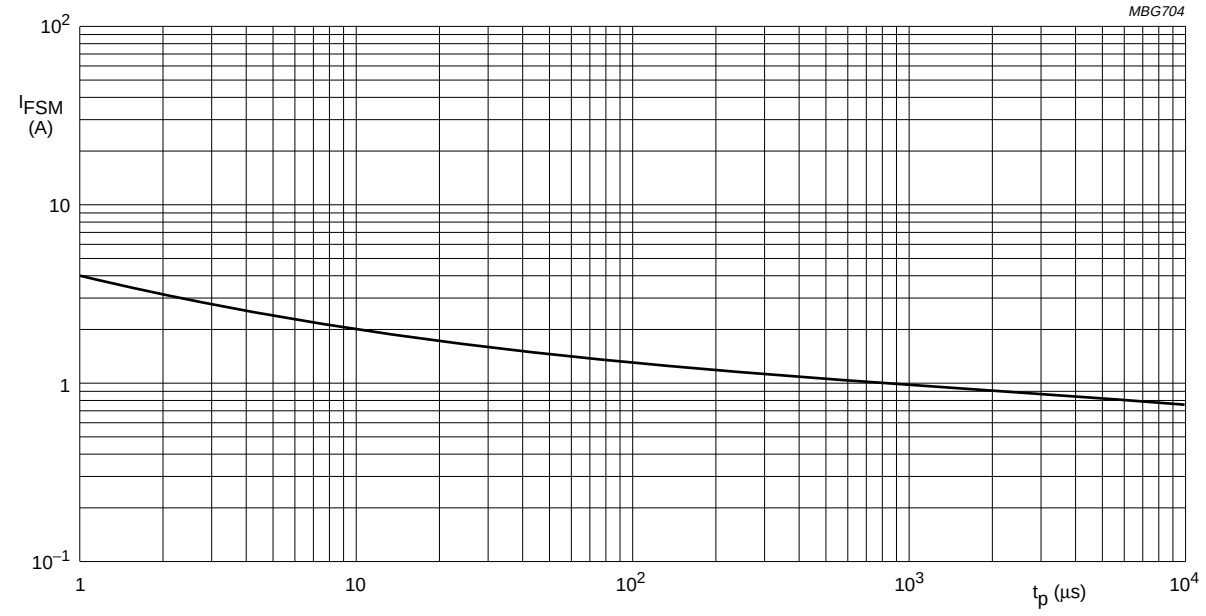
Lead length 5 mm.

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



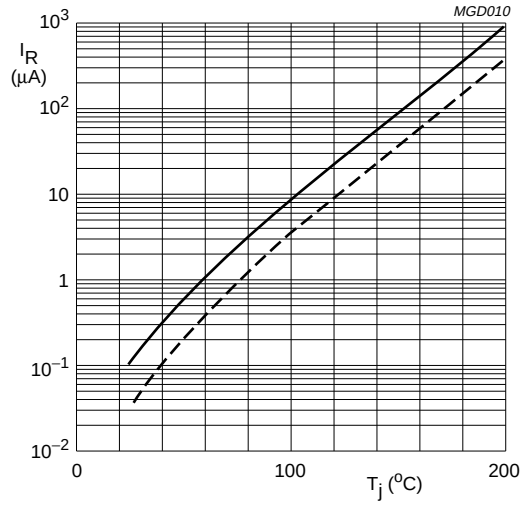
(1) T_j = 175 °C; typical values.
(2) T_j = 25 °C; typical values.
(3) T_j = 25 °C; maximum values.

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



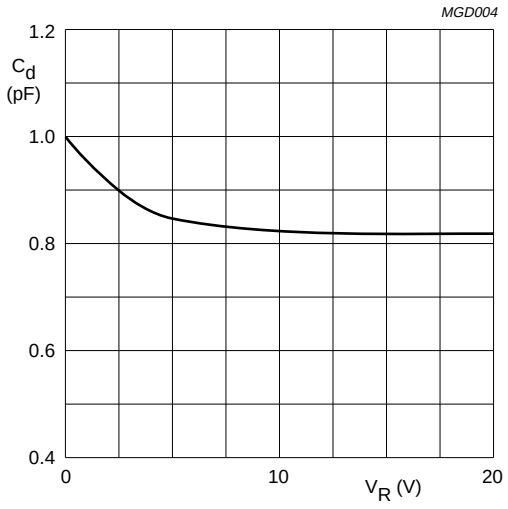
Based on square wave currents.
T_j = 25 °C prior to surge.

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



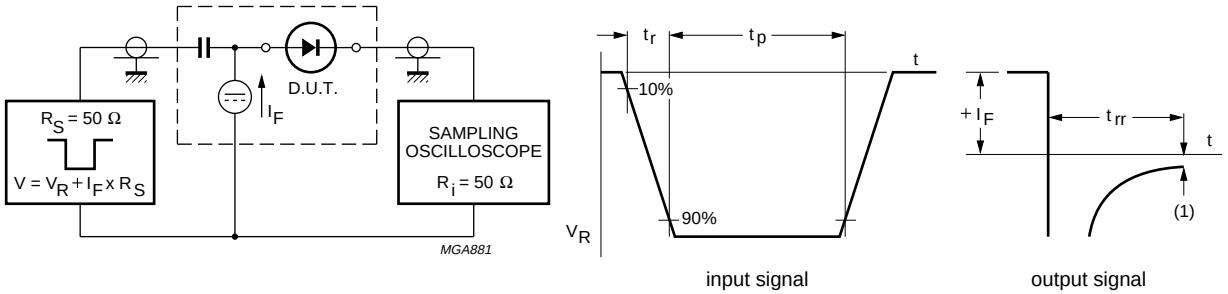
V_R = 50 V
Solid line; maximum values.
Dotted line; typical values.

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.

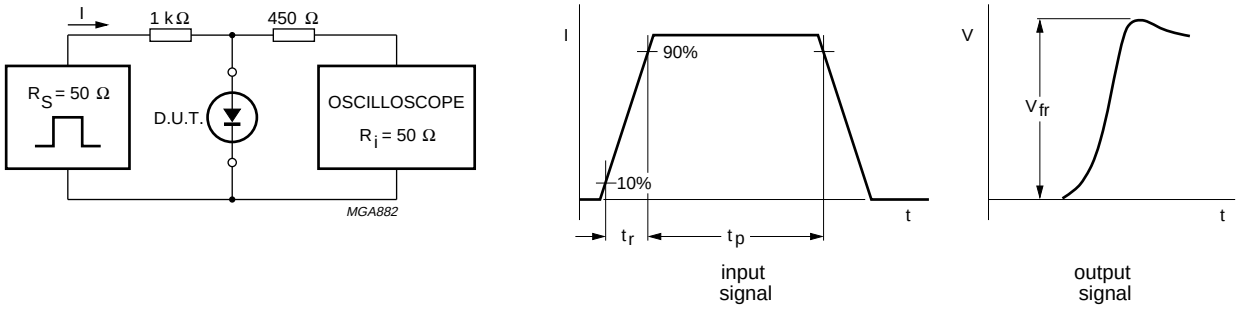
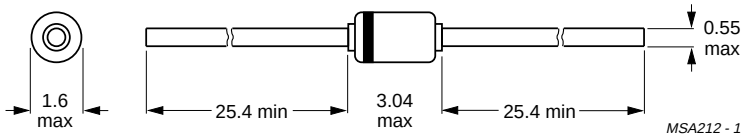


Fig.8 Forward recovery voltage test circuit and waveforms.

PACKAGE OUTLINE



Dimensions in mm.

Fig.9 SOD68 (DO-34).

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.