# THE DATASHEET OF

# 1N4531,113

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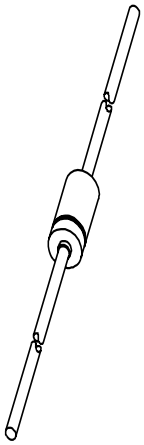
# DATA SHEET



# 1N4531; 1N4532
## High-speed diodes

Product data sheet
Supersedes data of April 1996

1996 Sep 03

# High-speed diodes 1N4531; 1N4532

## FEATURES

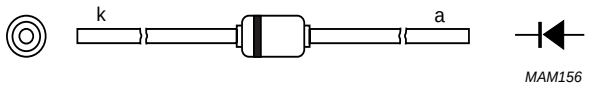
- Hermetically sealed leaded glass SOD68 (DO-34) package
- High switching speed: max. 4 ns
- Continuous reverse voltage: max. 75 V
- Repetitive peak reverse voltage: max. 75 V
- Repetitive peak forward current: max. 450 mA.

## 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 |

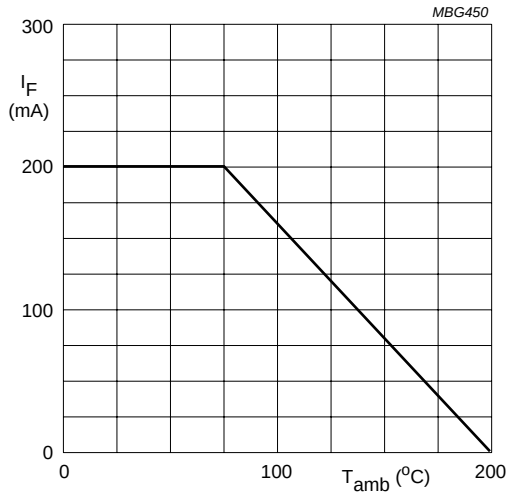
## THERMAL CHARACTERISTICS

| 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**

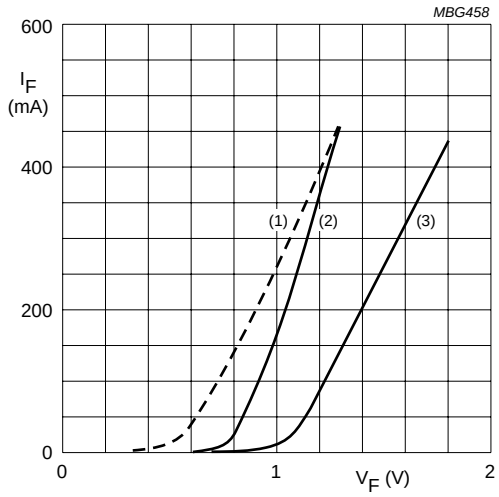
1. Device mounted on a printed circuit-board without metallization pad.

## GRAPHICAL DATA



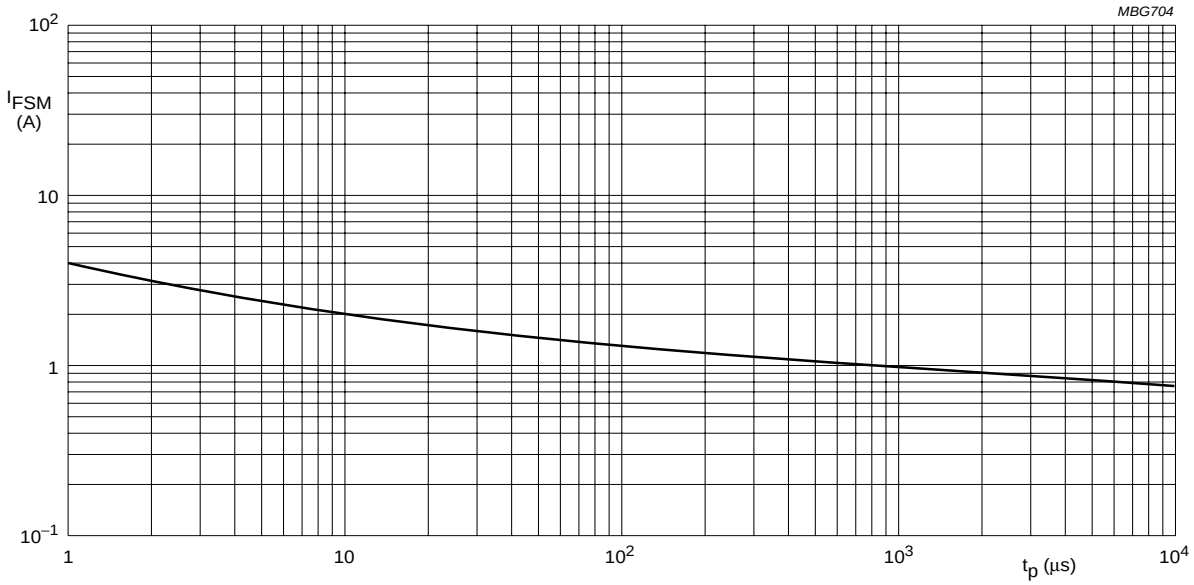

Lead length 5 mm.

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



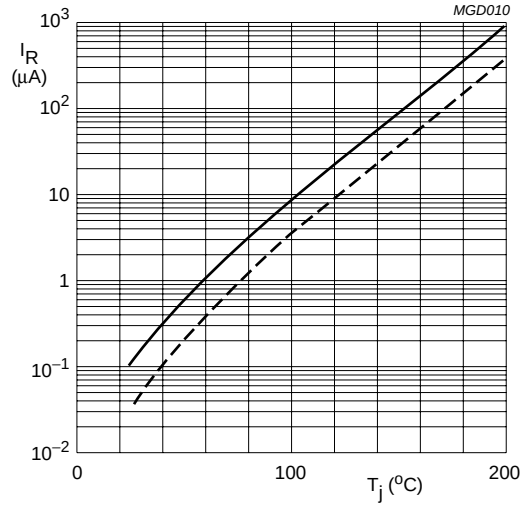

(1) $T_j$ = 175 °C; typical values.
(2) $T_j$ = 25 °C; typical values.
(3) $T_j$ = 25 °C; maximum values.

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



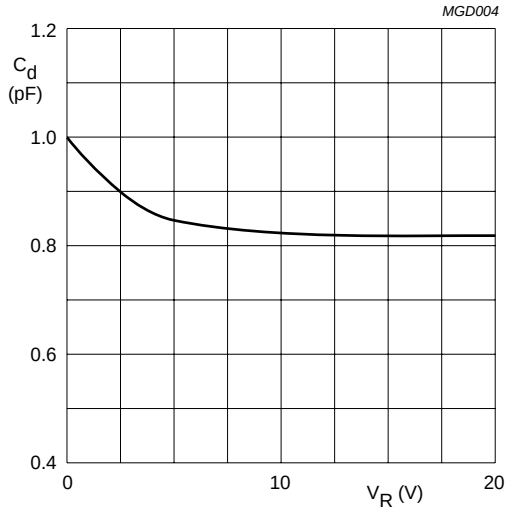

Based on square wave currents.
$T_j$ = 25 °C prior to surge.

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



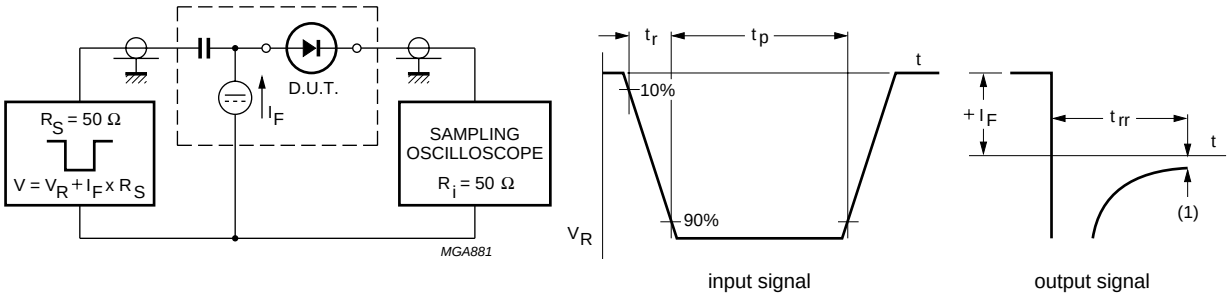

$V_R$ = 50 V
Solid line; maximum values.
Dotted line; typical values.

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.

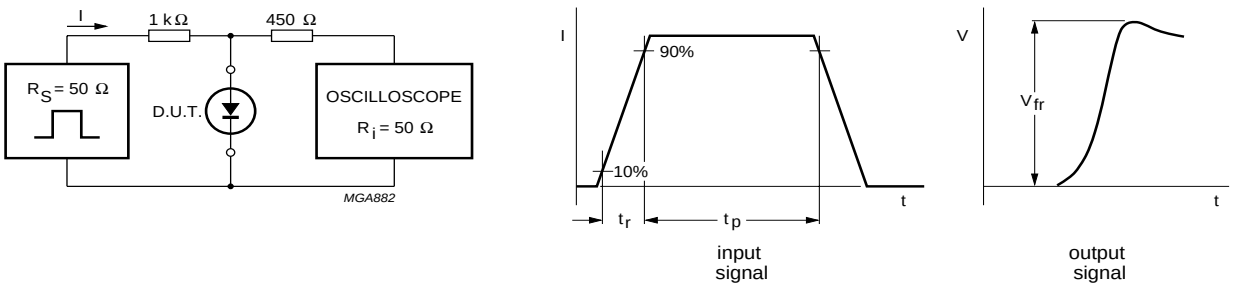
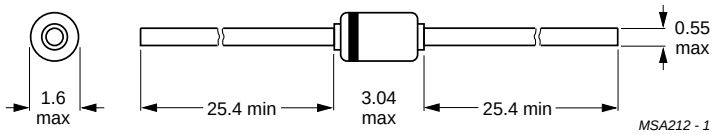



Fig.8 Forward recovery voltage test circuit and waveforms.

**PACKAGE OUTLINE**




Dimensions in mm.

Fig.9 SOD68 (DO-34).

## DATA SHEET STATUS

| DOCUMENT STATUS[1] | PRODUCT STATUS[2] | DEFINITION |
|---|---|---|
| Objective data sheet | Development | This document contains data from the objective specification for product development. |
| Preliminary data sheet | Qualification | This document contains data from the preliminary specification. |
| Product data sheet | Production | This document contains the product specification. |

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