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Kind regards,

Team Nexperia
1N4531; 1N4532
High-speed diodes

Product data sheet
Supersedes data of April 1996
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.

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

<table>
<thead>
<tr>
<th>SYMBOL</th>
<th>PARAMETER</th>
<th>CONDITIONS</th>
<th>MIN.</th>
<th>MAX.</th>
<th>UNIT</th>
</tr>
</thead>
<tbody>
<tr>
<td>V_{RRM}</td>
<td>repetitive peak reverse voltage</td>
<td>–</td>
<td>75</td>
<td>V</td>
<td></td>
</tr>
<tr>
<td>V_R</td>
<td>continuous reverse voltage</td>
<td>–</td>
<td>75</td>
<td>V</td>
<td></td>
</tr>
<tr>
<td>I_F</td>
<td>continuous forward current</td>
<td>see Fig.2</td>
<td>–</td>
<td>200</td>
<td>mA</td>
</tr>
<tr>
<td>I_{FRM}</td>
<td>repetitive peak forward current</td>
<td>–</td>
<td>450</td>
<td>mA</td>
<td></td>
</tr>
<tr>
<td>I_{FSM}</td>
<td>non-repetitive peak forward current</td>
<td>square wave; T_J = 25 °C prior to surge; see Fig.4</td>
<td>–</td>
<td>4</td>
<td>A</td>
</tr>
<tr>
<td></td>
<td></td>
<td>t = 1 μs</td>
<td>–</td>
<td>1</td>
<td>A</td>
</tr>
<tr>
<td></td>
<td></td>
<td>t = 1 ms</td>
<td>–</td>
<td>0.5</td>
<td>A</td>
</tr>
<tr>
<td>P_{tot}</td>
<td>total power dissipation</td>
<td>T_{amb} = 25 °C</td>
<td>–</td>
<td>500</td>
<td>mW</td>
</tr>
<tr>
<td>T_{slq}</td>
<td>storage temperature</td>
<td>–65</td>
<td>+200</td>
<td>°C</td>
<td></td>
</tr>
<tr>
<td>T_J</td>
<td>junction temperature</td>
<td>–</td>
<td>200</td>
<td>°C</td>
<td></td>
</tr>
</tbody>
</table>
ELECTRICAL CHARACTERISTICS

$T_J = 25 \, ^\circ C$; unless otherwise specified.

<table>
<thead>
<tr>
<th>SYMBOL</th>
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<th>CONDITIONS</th>
<th>MIN.</th>
<th>MAX.</th>
<th>UNIT</th>
</tr>
</thead>
<tbody>
<tr>
<td>$V_F$</td>
<td>forward voltage</td>
<td>$I_F = 10 , mA$; see Fig.3</td>
<td>—</td>
<td>1000</td>
<td>mV</td>
</tr>
<tr>
<td>$I_R$</td>
<td>reverse current</td>
<td>see Fig.5</td>
<td>—</td>
<td>25</td>
<td>nA</td>
</tr>
<tr>
<td></td>
<td>IN4531</td>
<td>$V_R = 20 , V$</td>
<td>—</td>
<td>50</td>
<td>μA</td>
</tr>
<tr>
<td></td>
<td>IN4532</td>
<td>$V_R = 50 , V$</td>
<td>—</td>
<td>100</td>
<td>nA</td>
</tr>
<tr>
<td></td>
<td></td>
<td>$V_R = 50 , V$; $T_J = 150 , ^\circ C$</td>
<td>—</td>
<td>100</td>
<td>μA</td>
</tr>
<tr>
<td>$C_d$</td>
<td>diode capacitance</td>
<td>$f = 1 , MHz$; $V_R = 0$; see Fig.6</td>
<td>—</td>
<td>4</td>
<td>pF</td>
</tr>
<tr>
<td></td>
<td>IN4531</td>
<td>—</td>
<td>2</td>
<td>pF</td>
<td></td>
</tr>
<tr>
<td></td>
<td>IN4532</td>
<td>—</td>
<td>2</td>
<td>pF</td>
<td></td>
</tr>
<tr>
<td>$t_{rr}$</td>
<td>reverse recovery time</td>
<td>when switched from $I_F = 10 , mA$ to $I_R = 60 , mA$; $R_L = 100 , \Omega$; measured at $I_R = 1 , mA$; see Fig.7</td>
<td>—</td>
<td>4</td>
<td>ns</td>
</tr>
<tr>
<td></td>
<td>IN4531</td>
<td>—</td>
<td>2</td>
<td>ns</td>
<td></td>
</tr>
<tr>
<td></td>
<td>IN4532</td>
<td>—</td>
<td>2</td>
<td>ns</td>
<td></td>
</tr>
<tr>
<td>$V_{fr}$</td>
<td>forward recovery voltage</td>
<td>when switched from $I_F = 100 , mA$; $t_r \leq 30 , ns$; see Fig.8</td>
<td>—</td>
<td>3</td>
<td>V</td>
</tr>
</tbody>
</table>

THERMAL CHARACTERISTICS

<table>
<thead>
<tr>
<th>SYMBOL</th>
<th>PARAMETER</th>
<th>CONDITIONS</th>
<th>VALUE</th>
<th>UNIT</th>
</tr>
</thead>
<tbody>
<tr>
<td>$R_{th,j\rightarrow tp}$</td>
<td>thermal resistance from junction to tie-point</td>
<td>lead length 5 mm</td>
<td>120</td>
<td>K/W</td>
</tr>
<tr>
<td>$R_{th,j\rightarrow a}$</td>
<td>thermal resistance from junction to ambient</td>
<td>lead length 5 mm; note 1</td>
<td>350</td>
<td>K/W</td>
</tr>
</tbody>
</table>

Note
1. Device mounted on a printed circuit-board without metallization pad.
**High-speed diodes**

**1N4531; 1N4532**

**GRAPHICAL DATA**

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

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

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

Lead length 5 mm.

Based on square wave currents.

$T_j = 25 \, ^\circ\text{C}$ prior to surge.

(1) $T_j = 175 \, ^\circ\text{C}$; typical values.
(2) $T_j = 25 \, ^\circ\text{C}$; typical values.
(3) $T_j = 25 \, ^\circ\text{C}$; maximum values.
High-speed diodes

1N4531; 1N4532

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

\[ V_R = 50 \text{ V} \]

Solid line; maximum values.

Dotted line; typical values.

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

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

\[ f = 1 \text{ MHz}; T_j = 25 \degree \text{C}. \]
High-speed diodes

1N4531; 1N4532

Fig. 7 Reverse recovery voltage test circuit and waveforms.

Fig. 8 Forward recovery voltage test circuit and waveforms.

(1) \( I_R = 1 \text{ mA} \).
High-speed diodes

1N4531; 1N4532

PACKAGE OUTLINE

Fig.9  SOD68 (DO-34).

Dimensions in mm.
Data Sheet Status

<table>
<thead>
<tr>
<th>Document Status(1)</th>
<th>Product Status(2)</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Objective data sheet</td>
<td>Development</td>
<td>This document contains data from the objective specification for product development.</td>
</tr>
<tr>
<td>Preliminary data sheet</td>
<td>Qualification</td>
<td>This document contains data from the preliminary specification.</td>
</tr>
<tr>
<td>Product data sheet</td>
<td>Production</td>
<td>This document contains the product specification.</td>
</tr>
</tbody>
</table>

Notes

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