# HIGH-SPEED SILICON DIODES

Planar epitaxial diodes intended for general purpose applications.

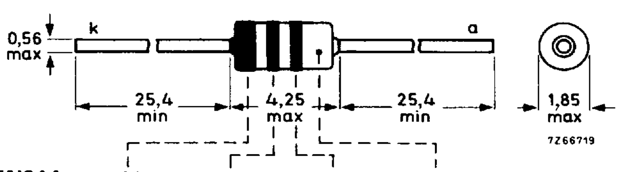
## QUICK REFERENCE DATA

| | | | | |
|---|---|---|---|---|
| Continuous reverse voltage | $V_R$ | max. | 75 | V |
| Repetitive peak reverse voltage | $V_{RRM}$ | max. | 100 | V |
| Repetitive peak forward current | $I_{FRM}$ | max. | 225 | mA |
| Forward voltage<br>$I_F = 10$ mA | $V_F$ | < | 1 | V |
| Reverse recovery time when switched<br>from $I_F = 10$ mA to $I_R = 60$ mA;<br>$R_L = 100\ \Omega$; measured at $I_R = 1$ mA | $t_{rr}$ | < | 4 | ns |

## MECHANICAL DATA

Dimensions in mm

Fig. 1 SOD-27 (DO-35).




| | | | | |
|---|---|---|---|---|
| **1N914:** | **white** | **brown** | **yellow** | **natural** |
| **1N916:** | **white**<br>**(cathode)** | **brown** | **blue** | **natural** |

Diodes may be either type-branded or colour-coded.

Products approved to CECC 50 001-21.

## RATINGS

Limiting values in accordance with the Absolute Maximum System (IEC 134)

| | | | |
|---|---|---|---|
| Continuous reverse voltage | $V_R$ | max. | 75 V |
| Repetitive peak reverse voltage | $V_{RRM}$ | max. | 100 V |
| Average rectified forward current (averaged over any 20 ms period) | | | |
| $T_{amb}$ = 25 °C | $I_{F(AV)}$ | max. | 75 mA |
| $T_{amb}$ = 150 °C | $I_{F(AV)}$ | max. | 10 mA |
| Forward current (d.c.) | $I_F$ | max. | 75 mA |
| Repetitive peak forward current | $I_{FRM}$ | max. | 225 mA |
| Non-repetitive peak forward current (t = 1 s) | $I_{FSM}$ | max. | 500 mA |
| Total power dissipation | $P_{tot}$ | max. | 250 mW |
| Storage temperature | $T_{stg}$ | −65 to + 200 °C | |
| Operating ambient temperature | $T_{amb}$ | −65 to + 175 °C | |

## CHARACTERISTICS

$T_j$ = 25 °C unless otherwise specified

| | | | |
|---|---|---|---|
| Forward voltages | | | |
| $I_F$ = 10 mA | $V_F$ | < | 1 V |
| Reverse avalanche breakdown voltage | | | |
| $I_R$ = 100 μA | $V_{(BR)R}$ | > | 100 V |
| Reverse currents | | | |
| $V_R$ = 20 V | $I_R$ | < | 25 nA |
| $V_R$ = 75 V | $I_R$ | < | 5 μA |
| $V_R$ = 20 V; $T_j$ = 150 °C | $I_R$ | < | 50 μA |
| Diode capacitance | | | |
| $V_R$ = 0; f = 1 MHz | | | |
| 1N914 | $C_d$ | < | 4 pF |
| 1N916 | $C_d$ | < | 2 pF |
| Forward recovery voltage | | | |
| when switched to $I_F$ = 50 mA; $t_r$ = 20 ns | $V_{fr}$ | < | 2,5 V |

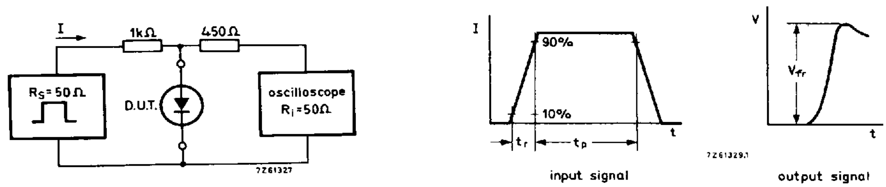
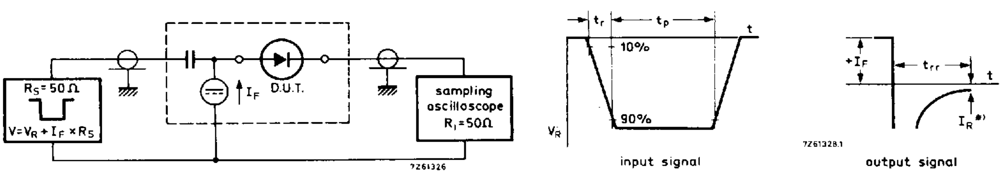



Fig. 2 Test circuit and waveforms forward recovery voltage. Input signal: Rise time of the forward pulse, $t_r$ = 20 ns; forward current pulse duration, $t_p$ = 120 ns; duty factor, d = 0,01. Oscilloscope rise time, $t_r$ = 0,35 ns. Circuit capacitance < 1 pF (oscilloscope input capacitance and parasitic capacitance).

| Reverse recovery time when switched from | | 1N914 | 1N916 | |
|---|---|---|---|---|
| $I_F$ = 10 mA to $I_R$ = 10 mA, $R_L$ = 100 Ω, measured at $I_R$ = 1 mA | $t_{rr}$ | 8 | – | ns |
| $I_F$ = 10 mA to $I_R$ = 60 mA, $R_L$ = 100 Ω, measured at $I_R$ = 1 mA | $t_{rr}$ | 4 | 4 | ns |




* $I_R$ = 1 mA

Fig. 3 Test circuit and waveform reverse recovery time. Input signal: Rise time of the reverse pulse, $t_r$ = 0,6 ns; reverse pulse duration, $t_p$ = 100 ns; duty factor, d = 0,05. Oscilloscope rise time, $t_r$ = 0,35 ns. Circuit capacitance < 1 pF (oscilloscope input capacitance + parasitic capacitance).

| | | |
|---|---|---|
| Rectifying efficiency f = 100 MHz; $V_{i(rms)}$ = 2 V | $\eta$ | > 45 % |

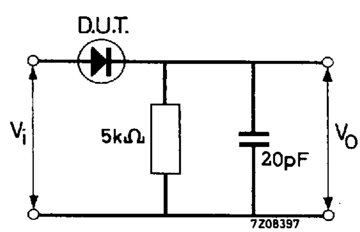



Fig. 4 Test circuit. $\eta = \dfrac{V_o}{V_{i(rms)}\sqrt{2}}$