FAIRCHILD SEMICONDUCTOR®

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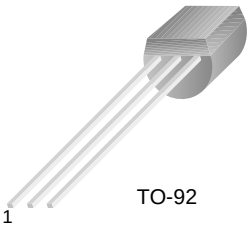
# 2N5953
# N-Channel RF Amplifier

- This device is designed primarily for electronic switching applications such as low on resistance analog switching.
- Sourced from process 50.



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1. Gate 2. Source 3. Drain

## Absolute Maximum Ratings* $T_a$=25°C unless otherwise noted

| Symbol | Parameter | Value | Units |
|---|---|---|---|
| $V_{DG}$ | Drain-Gate Voltage | 30 | V |
| $V_{GS}$ | Gate-Source Voltage | -30 | V |
| $I_{GF}$ | Forward Gate Current | 10 | mA |
| $T_J$, $T_{STG}$ | Operating and Storage Junction Temperature Range | -55 ~ 150 | °C |

* This ratings are limiting values above which the serviceability of any semiconductor device may be impaired.

**NOTES:**
1) These rating are based on a maximum junction temperature of 150 degrees C.

2) These are steady limits. The factory should be consulted on applications involving pulsed or low duty cycle operations.

## Thermal Characteristics $T_a$=25°C unless otherwise noted

| Symbol | Parameter | Max. | Units |
|---|---|---|---|
| $P_D$ | Total Device Dissipation<br>Derate above 25°C | 350<br>2.8 | mW<br>mW/°C |
| $R_{\theta JC}$ | Thermal Resistance, Junction to Case | 125 | °C/W |
| $R_{\theta JA}$ | Thermal Resistance, Junction to Ambient | 357 | °C/W |

## Electrical Characteristics* $T_a$=25°C unless otherwise noted

| Symbol | Parameter | Test Condition | Min. | Max. | Units |
|---|---|---|---|---|---|
| **Off Characteristics** | | | | | |
| $V_{(BR)GSS}$ | Gate-Source Breakdown Voltage | $I_G$ = 1.0μA, $V_{DS}$ = 0 | -30 | | V |
| $I_{GSS}$ | Gate Reverse Current | $V_{GS}$ = 15V, $V_{DS}$ = 0, T = 25°C<br>T = 100°C | | -1.0<br>-200 | nA |
| $V_{GS(off)}$ | Gate-Source Cut-off Voltage | $V_{DS}$ = 15V, $I_D$ = 100nA | -0.8 | -3.0 | V |
| $V_{GS}$ | Gate-Source Forward Voltage | $V_{DS}$ = 15V, $I_D$ = 250μA | -0.5 | -2.5 | V |
| **On Characteristics** | | | | | |
| $I_{DSS}$ | Zero-Gate Voltage Drain Current * | $V_{DS}$ = 15V, $V_{GS}$ = 0 | 2.5 | 5 | mA |
| $V_{DS}$(on) | Drain-Source On Voltage | $I_D$ = 267μA | | 0.1 | V |
| **Small Signal Characteristics** | | | | | |
| $g_{fs}$ | Forward Transferconductance | $V_{DS}$ = 15V, $V_{GS}$ = 0V, f = 100MHz | 1000 | 6500 | μ/Ω |
| $g_{oss}$ | Common- Source Output Conductance | $V_{DS}$ = 15V, $V_{GS}$ = 0V, f = 1.0kHz | | 50 | μ/Ω |
| $g_{os}$ | Output Conductance | $V_{DS}$ = 15V, $V_{GS}$ = 0V, f = 100MHz | | 50 | μ/Ω |
| $g_{is}$ | Input Conductance | $V_{DS}$ = 15V, $V_{GS}$ = 0V, f = 100MHz | | 250 | μ/Ω |
| $C_{iss}$ | Input Capacitance | $V_{DS}$ = 15V, $V_{GS}$ = 0V, f = 1.0MHz | | 6 | pF |
| $C_{rss}$ | Reverse Transfer Capacitance | $V_{DS}$ = 15V, $V_{GS}$ = 0V, f = 1.0MHz | | 2 | pF |
| $e_n$ | Equivalent Short-Circuit Input Noise Voltage | $V_{DS}$ = 15V, $V_{GS}$ = 0V, f = 1.0kHz | | 100 | nV |
| NF | Noise Figure | $V_{DS}$ = 15V, $V_{GS}$ = 0V,<br>$R_G$ = 1.0mΩ, f = 1.0kHz<br>$R_G$ = 1.0kΩ, f = 100MHz | | 2<br>5 | dB |

* Pulse Test: Pulse Width ≤ 300μs, Duty Cycle = 2%

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|---|---|---|
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