

2N3954, 2N3955, 2N3956

N-Channel Dual Silicon Junction Field-Effect Transistor

- Low and Medium Frequency Differential Amplifiers
- High Input Impedance Amplifiers

Absolute maximum ratings at $T_A = 25^\circ\text{C}$

| | |
|--|------------------|
| Reverse Gate Source & Reverse Gate Drain Voltage | - 50 V |
| Gate Current | 50 mA |
| Total Device Power Dissipation (each side) @ 85°C Case Temperature (both sides) | 250 mW 500 mW |
| Power Derating (both sides) | 4.3 mW/°C |

| At 25°C free air temperature: Static Electrical Characteristics | | 2N3954 | | 2N3955 | | 2N3956 | | Process NJ16 | | |
|--|---------------|--------|-------|--------|-------|--------|-------|--------------|---|--|
| | | Min | Max | Min | Max | Min | Max | Unit | Test Conditions | |
| Gate Source Breakdown Voltage | $V_{(BR)GSS}$ | - 50 | | - 50 | | - 50 | | V | $I_G = -1\mu\text{A}, V_{DS} = \emptyset\text{V}$ | |
| Gate Reverse Current | I_{GSS} | | - 100 | | - 100 | | - 100 | pA | $V_{GS} = -30\text{V}, V_{DS} = \emptyset\text{V}$ | |
| | | | - 500 | | - 500 | | - 500 | nA | $V_{GS} = -30\text{V}, V_{DS} = \emptyset\text{V}$ $T_A = 125^\circ\text{C}$ | |
| Gate Operating Current | I_G | | - 50 | | - 50 | | - 50 | pA | $V_{DS} = 20\text{V}, I_D = 200\mu\text{A}$ | |
| | | | - 250 | | - 250 | | - 250 | nA | $V_{DS} = 20\text{V}, I_D = 200\mu\text{A}$ $T_A = 125^\circ\text{C}$ | |
| Gate Source Voltage | V_{GS} | | - 4.2 | | - 4.2 | | - 4.2 | V | $V_{DS} = 20\text{V}, I_D = 50\mu\text{A}$ | |
| | | - 0.5 | - 4 | - 0.5 | - 4 | - 0.5 | - 4 | V | $V_{DS} = 20\text{V}, I_D = 200\mu\text{A}$ | |
| Gate Source Cutoff Voltage | $V_{GS(OFF)}$ | - 1 | - 4.5 | - 1 | - 4.5 | - 1 | - 4.5 | V | $V_{DS} = -20\text{V}, I_G = 1\text{nA}$ | |
| Gate Source Forward Voltage | $V_{GS(F)}$ | | 2 | | 2 | | 2 | V | $V_{DS} = \emptyset\text{V}, I_G = 1\text{mA}$ | |
| Drain Saturation Current (Pulsed) | I_{DSS} | 0.5 | 5 | 0.5 | 5 | 0.5 | 5 | mA | $V_{DS} = 20\text{V}, V_{GS} = \emptyset\text{V}$ | |

Dynamic Electrical Characteristics

| | | | | | | | | | | |
|---|---|------|------|------|------|------|------|---------------|---|---|
| Common Source Forward Transconductance | g_{fs} | 1000 | 3000 | 1000 | 3000 | 1000 | 3000 | μS | $V_{DS} = 20\text{V}, V_{GS} = \emptyset\text{V}$ | $f = 1\text{kHz}$ |
| | | 1000 | | 1000 | | 1000 | | | μS | $V_{DS} = 20\text{V}, V_{GS} = \emptyset\text{V}$ |
| Common Source Output Capacitance | g_{os} | | 35 | | 35 | | 35 | μS | $V_{DS} = 20\text{V}, V_{GS} = \emptyset\text{V}$ | $f = 1\text{kHz}$ |
| Common Source Input Capacitance | C_{iss} | | 4 | | 4 | | 4 | pF | $V_{DS} = 20\text{V}, V_{GS} = \emptyset\text{V}$ | $f = 1\text{MHz}$ |
| Drain Gate Capacitance | C_{dgo} | | 1.5 | | 1.5 | | 1.5 | pF | $V_{dg} = 10\text{V}, I_S = \emptyset\text{A}$ | $f = 1\text{MHz}$ |
| Common Source Reverse Transfer Capacitance | C_{rss} | | 1.2 | | 1.2 | | 1.2 | pF | $V_{DS} = 20\text{V}, V_{GS} = \emptyset\text{V}$ | $f = 1\text{MHz}$ |
| Noise Figure | NF | | 0.5 | | 0.5 | | 0.5 | dB | $V_{DS} = 20\text{V}, V_{GS} = \emptyset\text{V}, R_g = 10\text{M}\Omega$ | $f = 100\text{Hz}$ |
| Differential Gate Current | $ I_{G1} - I_{G2} $ | | 10 | | 10 | | 10 | nA | $V_{DS} = 20\text{V}, I_D = 200\mu\text{A}$ | $T_A = 125^\circ\text{C}$ |
| Saturation Drain Current Ratio | I_{DSS1}/I_{DSS2} | 0.95 | 1 | 0.95 | 1 | 0.95 | 1 | | $V_{DS} = 20\text{V}, V_{GS} = \emptyset\text{V}$ | |
| Differential Gate Source Voltage | $ V_{GS1} - V_{GS2} $ | | 5 | | 10 | | 15 | mV | $V_{DS} = 20\text{V}, I_D = 200\mu\text{A}$ | |
| Differential Gate Source Voltage with Temperature | $\frac{\Delta V_{GS1} - V_{GS2}}{\Delta T}$ | | 0.8 | | 2 | | 4 | mV/°C | $V_{DS} = 20\text{V}, I_D = 200\mu\text{A}$ | $T_A = 25^\circ\text{C}$ to -55°C |
| | | | 1 | | 2.5 | | 5 | mV/°C | $V_{DS} = 20\text{V}, I_D = 200\mu\text{A}$ | $T_A = 25^\circ\text{C}$ to $+125^\circ\text{C}$ |
| Transconductance Ratio | g_{fs1}/g_{fs2} | 0.97 | 1 | 0.97 | 1 | 0.97 | 1 | | $V_{DS} = 20\text{V}, I_D = 200\mu\text{A}$ | $f = 1\text{kHz}$ |

TO-71 Package

See Section G for Outline Dimensions

Pin Configuration

1 Source, 2 Drain, 3 Gate,
5 Source, 6 Drain, 7 Gate