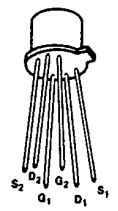
2N5515-2N5524

# 2N5515-2N5524
## Dual N-Channel JFET Low Noise Amplifier

### FEATURES
- Tight Temperature Tracking
- Tight Matching
- High Common Mode Rejection
- Low Noise

### PIN CONFIGURATION




6037-2N5515-19
6019-2N5520-24

### ABSOLUTE MAXIMUM RATINGS
($T_A$ = 25°C unless otherwise specified)

Gate-Source or Gate-Drain Voltage ..... −40V
Gate Current (Note 1) ..... 50mA
Storage Temperature Range ..... −65°C to +200°C
Operating Temperature Range ..... −55°C to +150°C
Lead Temperature (Soldering, 10sec) ..... +300°C

| | One Side | Both Sides |
|---|---|---|
| Power Dissipation ($T_A$ = 85°C) | 250mW | 375mW |
| Derate above 25°C ..... | 2.0mW/°C | 3.0mW/°C |

**NOTE:** Per transistor.

**NOTE:** *Stresses above those listed under "Absolute Maximum Ratings" may cause permanent damage to the device. These are stress ratings only and functional operation of the device at these or any other conditions above those indicated in the operational sections of the specifications is not implied. Exposure to absolute maximum rating conditions for extended periods may affect device reliability.*

### ORDERING INFORMATION

| TO-72 |
|---|
| 2N5515 |
| 2N5516 |
| 2N5517 |
| 2N5518 |
| 2N5519 |
| 2N5520 |
| 2N5521 |
| 2N5522 |
| 2N5523 |
| 2N5524 |

### ELECTRICAL CHARACTERISTICS ($T_A$ = 25°C unless otherwise specified)

| Symbol | Parameter | Test Conditions | | Min | Max | Units |
|---|---|---|---|---|---|---|
| $I_{GSS}$ | Gate Reverse Current | $V_{GS}$ = −30V, $V_{DS}$ = 0 | | | −250 | pA |
| | | | $T_A$ = 150°C | | −250 | nA |
| $BV_{GSS}$ | Gate-Source Breakdown Voltage | $I_G$ = −1μA, $V_{DS}$ = 0 | | −40 | | V |
| $V_P$ | Gate-Source Pinch-Off Voltage | $V_{DS}$ = 20V, $I_D$ = 1nA | | −0.7 | −4 | |
| $I_{DSS}$ | Drain Current at Zero Gate Voltage (Note 1) | $V_{DS}$ = 20V, $V_{GS}$ = 0 | | 0.5 | 7.5 | mA |
| $g_{fs}$ | Common-Source Forward Transconductance (Note 1) | | f = 1kHz | 1000 | 4000 | μs |
| $g_{oss}$ | Common-Source Output Conductance | | | | 10 | |
| $C_{rss}$ | Common-Source Reverse Transfer Capacitance (Note 3) | | f = 1MHz | | 5 | pF |
| $C_{iss}$ | Common-Source Input Capacitance (Note 3) | | | | 25 | |



*NOTE: All typical values have been characterized but are not tested*

# 2N5515-2N5524

INTERSIL

T-29-27



## ELECTRICAL CHARACTERISTICS (Continued) ($T_A$ = 25°C unless otherwise specified)

| Symbol | Parameter | | Test Conditions | | Min | Max | Units |
|---|---|---|---|---|---|---|---|
| $\bar{e}_n$ | Equivalent Input Noise Voltage (Note 3) | 2N5515-19 | $V_{DG}$=20V, $I_D$=200μA | f=10Hz | | 30 | nV/√Hz |
| | | 2N5520-24 | | | | 15 | |
| | | 2N5515-24 | | f=1kHz | | 10 | |
| $I_G$ | Gate Current | | | | | −100 | pA |
| | | | | $T_A$=125°C | | −100 | nA |
| $V_{GS}$ | Gate Source Voltage | | | | −0.2 | −3.8 | V |
| $g_{fs}$ | Common-Source Forward Transconductance (Note 1) | | | f=1kHz | 500 | 1000 | μs |
| $g_{oss}$ | Common-Source Output Conductance | | | | | 1 | μs |

## MATCHING CHARACTERISTICS ($T_A$ = 25°C unless otherwise specified)

| Symbol | Parameter | Test Conditions | 2N5515,20 | | 2N5516,21 | | 2N5517,22 | | 2N5518,23 | | 2N5519,24 | | Units |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Min | Max | Min | Max | Min | Max | Min | Max | Min | Max | |
| $I_{DSS1}/I_{DSS2}$ | Drain Current Ratio at Zero Gate Voltage (Note 1) | $V_{DS}$=20V, $V_{GS}$=0 | 0.95 | 1 | 0.95 | 1 | 0.95 | 1 | 0.95 | 1 | 0.90 | 1 | |
| $\lvert I_{G1} - I_{G2} \rvert$ | Differential Gate Current (+125°C) | $V_{DG}$=20V, $I_D$=200μA | | 10 | | 10 | | 10 | | 10 | | 10 | nA |
| $g_{fs1}/g_{fs2}$ | Transconductance Ratio (Note 1) | $V_{DG}$=20V, $I_D$=200μA f=1kHz | 0.97 | 1 | 0.97 | 1 | 0.95 | 1 | 0.95 | 1 | 0.90 | 1 | |
| $\lvert g_{oss1} - g_{oss2} \rvert$ | Differential Output Conductance | $V_{DG}$=20V, $I_D$=200μA f=1kHz | | 0.1 | | 0.1 | | 0.1 | | 0.1 | | 0.1 | μs |
| $\lvert V_{GS1} - V_{GS2} \rvert$ | Differential Gate-Source Voltage | $V_{DG}$=20V, $I_D$=200μA | | 5 | | 5 | | 10 | | 15 | | 15 | mV |
| $\frac{\Delta\lvert V_{GS1} - V_{GS2} \rvert}{\Delta T}$ | Gate-Source Voltage Differential Drift ($T_A$=−55°C to +125°C) | $V_{DG}$=20V, $I_D$=200μA | | 5 | | 10 | | 20 | | 40 | | 80 | $\frac{\mu V}{°C}$ |
| CMRR | Common Mode Rejection Ratio (Note 2, 3) | $V_{DD}$=10 to 20V, $I_D$=200μA | 100 | | 100 | | 90 | | | | | | dB |

**NOTES:** 1. Pulse duration of 28ms used during test.
2. CMRR = 20 $\log_{10}\Delta V_{DD}/\Delta\lvert V_{GS1} - V_{GS2}\rvert$, ($\Delta V_{DD}$ = 10V)
3. For design reference only, not 100% tested.

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*NOTE: All typical values have been characterized but are not tested.*