

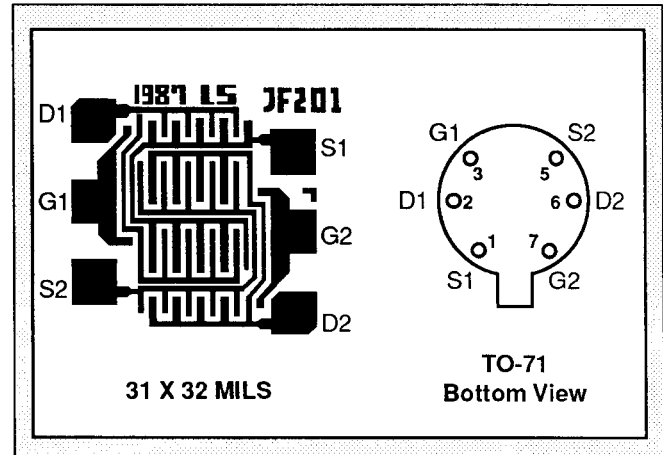
# LINEAR SYSTEMS

## Linear Integrated Systems

# LS-U401 - U406

LOW NOISE LOW DRIFT  
MONOLITHIC DUAL N-CHANNEL JFET

| FEATURES   |  |       |
|--|--|-------|
| LOW DRIFT  | $ V_{GS1-2}/T  = 10\mu V/^{\circ}C$ TYP. |       |
| LOW NOISE  | $e_n = 6nV/\text{Hz}$ @10Hz TYP.         |       |
| LOW PINCHOFF   | $V_p = 2.5V$ TYP.                        |       |
| ABSOLUTE MAXIMUM RATINGS NOTE 1                        |  |       |
| @ 25°C (unless otherwise noted)                        |  |       |
| Maximum Temperatures                                   |  |       |
| Storage Temperature                                    | -65° to +150°C                           |       |
| Operating Junction Temperature                         | +150°C                                   |       |
| Maximum Voltage and Current for Each Transistor NOTE 1 |  |       |
| $-V_{GSS}$   | Gate Voltage to Drain or Source          | 50V   |
| $-V_{DSO}$   | Drain to Source Voltage                  | 50V   |
| $-I_{G(t)}$  | Gate Forward Current                     | 10mA  |
| Maximum Power Dissipation                              |  |       |
| Device Dissipation @ Free Air - Total                  |  | 300mW |



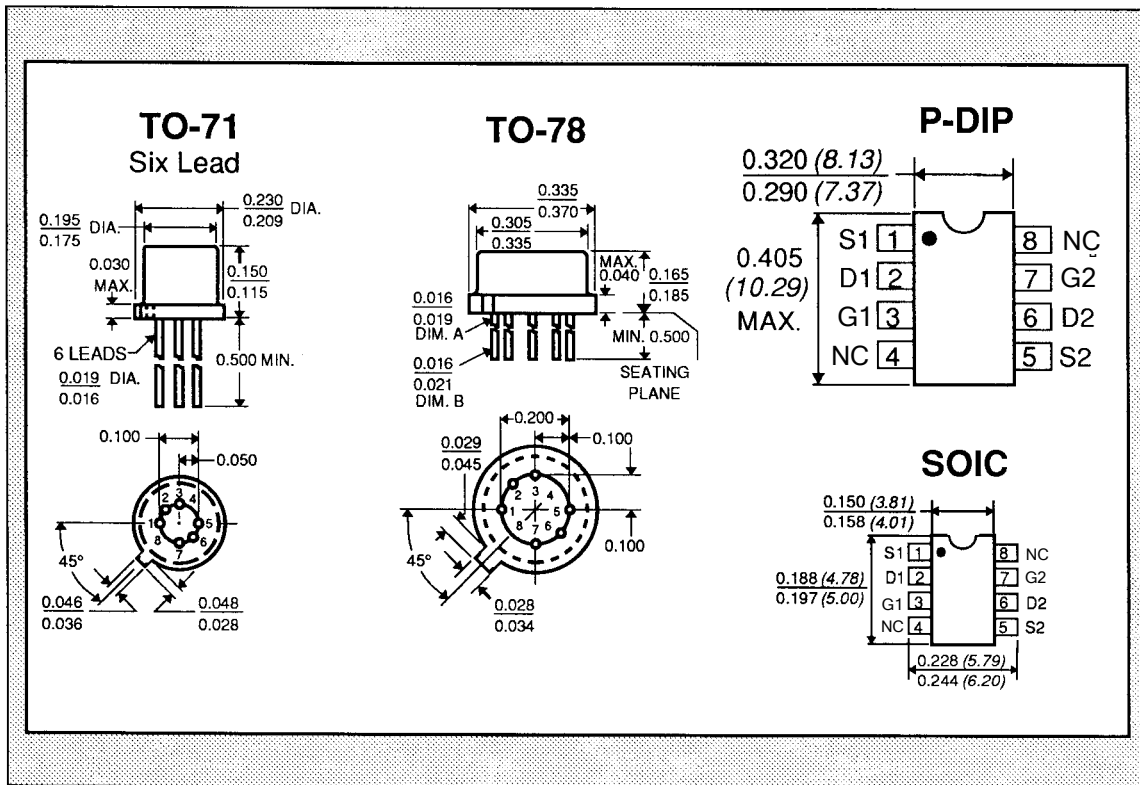
### MATCHING CHARACTERISTICS @ 25°C (unless otherwise noted)

| SYMBOL               | CHARACTERISTICS       | LS-401 | LS-402 | LS-403 | LS-404 | LS-405 | LS-406 | UNITS             | CONDITIONS  |
|----------------------|-----------------------|--------|--------|--------|--------|--------|--------|-------------------|---|
| $ V_{GS1-2}/T $ max. | Drift vs. Temperature | 10     | 10     | 25     | 25     | 40     | 80     | $\mu V/^{\circ}C$ | $V_{DG} = 10V, I_D = 200\mu A$<br>$T_A = -55^{\circ}C$ to $+125^{\circ}C$ |
| $ V_{GS1-2} $ max.   | Offset Voltage        | 5      | 10     | 10     | 15     | 20     | 40     | mV                | $V_{DG} = 10V, I_D = 200\mu A$  |

### ELECTRICAL CHARACTERISTICS

| SYMBOL                  | CHARACTERISTICS             | MIN.     | TYP. | MAX. | UNITS     | CONDITIONS                               |
|-------------------------|-----------------------------|----------|------|------|-----------|--|
| $BV_{GSS}$              | Breakdown Voltage           | 50       | 60   | --   | V         | $V_{DS} = 0, I_D = 1nA$                  |
| $BV_{GGO}$              | Gate-to-Gate Breakdown      | $\pm 50$ | --   | --   | V         | $I_G = 1nA, I_D = 0, I_S = 0$            |
| <b>TRANSCONDUCTANCE</b> |                             |          |      |      |           |  |
| $Y_{fss}$               | Full Conduction             | 2000     | --   | 7000 | $\mu mho$ | $V_{DG} = 10V, V_{GS} = 0, f = 1kHz$     |
| $Y_{fs}$                | Typical Operation           | 1000     | --   | 2000 | $\mu mho$ | $V_{DG} = 15V, I_D = 200\mu A, f = 1kHz$ |
| $ Y_{fs1-2}/Y_{fs} $    | Mismatch                    | --       | 0.6  | 3    | %         |  |
| <b>DRAIN CURRENT</b>    |                             |          |      |      |           |  |
| $I_{DSS}$               | Full Conduction             | 0.5      | --   | 10   | mA        | $V_{DG} = 10V, V_{GS} = 0$               |
| $ I_{DSS1-2}/I_{DSS} $  | Mismatch at Full Conduction | --       | 1    | 5    | %         |  |
| <b>GATE VOLTAGE</b>     |                             |          |      |      |           |  |
| $V_{GS(off)}$ or $V_p$  | Pinchoff Voltage            | -0.5     | --   | -2.5 | V         | $V_{DS} = 15V, I_D = 1nA$                |
| $V_{GS(on)}$            | Operating Range             | --       | --   | -2.3 | V         | $V_{DS} = 15V, I_D = 200\mu A$           |
| <b>GATE CURRENT</b>     |                             |          |      |      |           |  |
| $-I_{Gmax}$             | Operating                   | --       | -4   | -15  | pA        | $V_{DG} = 15V, I_D = 200\mu A$           |
| $-I_{Gmax}$             | High Temperature            | --       | --   | -10  | nA        | $T_A = +125^{\circ}C$                    |
| $-I_{GSSmax}$           | At Full Conduction          | --       | --   | 100  | pA        | $V_{DS} = 0V$                            |
| $-I_{GSSmax}$           | High Temperature            | 5        | 5    | 5    | pA        | $V_{DG} = 15V, T_A = +125^{\circ}C$      |

| SYMBOL    | CHARACTERISTICS                 | MIN. | TYP. | MAX. | UNITS           | CONDITIONS  |
|-----------|---------------------------------|------|------|------|-----------------|---|
|           | <b>OUTPUT CONDUCTANCE</b>       |      |      |      |                 |   |
| $Y_{OSS}$ | Full Conduction                 | --   | --   | 20   | $\mu\text{mho}$ | $V_{DG} = 10\text{V}$ $V_{GS} = 0$  |
| $Y_{OS}$  | Operating                       | --   | 0.2  | 2    | $\mu\text{mho}$ | $V_{DG} = 15\text{V}$ $I_D = 500\mu\text{A}$  |
|           | <b>COMMON MODE REJECTION</b>    |      |      |      |                 |   |
| CMR       | $-20 \log  V_{GS1-2} / V_{DS} $ | 95   | --   | --   | dB              | $V_{DS} = 10$ to $20\text{V}$ $I_D = 30\mu\text{A}$   |
|           | <b>NOISE</b>                    |      |      |      |                 |   |
| NF        | Figure                          | --   | --   | 0.5  | dB              | $V_{DS} = 15\text{V}$ $V_{GS} = 0$ $R_G = 10\text{M}$<br>$f = 100\text{Hz}$ $\text{NBW} = 6\text{Hz}$ |
| $e_n$     | Voltage                         | --   | 20   | --   | nV/Hz           | $V_{DS} = 15\text{V}$ $I_D = 200\mu\text{A}$ $f = 10\text{Hz}$<br>$\text{NBW} = 1\text{Hz}$           |
|           | <b>CAPACITANCE</b>              |      |      |      |                 |   |
| $C_{ISS}$ | Input                           | --   | --   | 8    | pF              | $V_{DS} = 15\text{V}$ $I_D = 200\mu\text{A}$ $f = 1\text{MHz}$  |
| $C_{RSS}$ | Reverse Transfer                | --   | --   | 1.5  | pF              |   |



**NOTES:**

1. These ratings are limiting values above which the serviceability of any semiconductor may be impaired.