

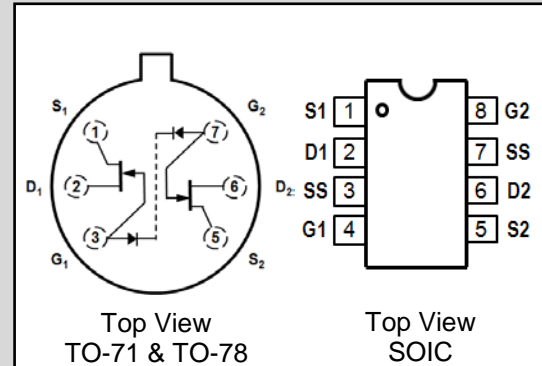
# LINEAR SYSTEMS

Improved Standard Products<sup>®</sup>

| FEATURES   |                                 |      |
|--|---------------------------------|------|
| LOW DRIFT  | $ ΔV_{GS1-2}/ΔT  = 5μV/°C$ max. |      |
| LOW LEAKAGE  | $I_G = 20pA$ TYP.               |      |
| LOW NOISE  | $e_n = 10Nv/√Hz$ TYP.           |      |
| ABSOLUTE MAXIMUM RATINGS <sup>1</sup>                        |                                 |      |
| @ 25 °C (unless otherwise noted)                             |                                 |      |
| Maximum Temperatures   |                                 |      |
| Storage Temperature  | -55 to +150°C                   |      |
| Operating Junction Temperature                               | -55 to +150°C                   |      |
| Maximum Voltage and Current for Each Transistor <sup>1</sup> |                                 |      |
| -V <sub>GSS</sub>  | Gate Voltage to Drain or Source | 60V  |
| -I <sub>G(f)</sub>   | Gate Forward Current            | 50mV |
| Maximum Power Dissipation                                    |                                 |      |
| Device Dissipation @ Free Air - Total                        | 400mW @ 25°C <sup>2</sup>       |      |

## LS3954A LS3954 LS3955 LS3956 LS3958

LOW NOISE LOW DRIFT  
MONOLITHIC DUAL N-CHANNEL  
JFET AMPLIFIER

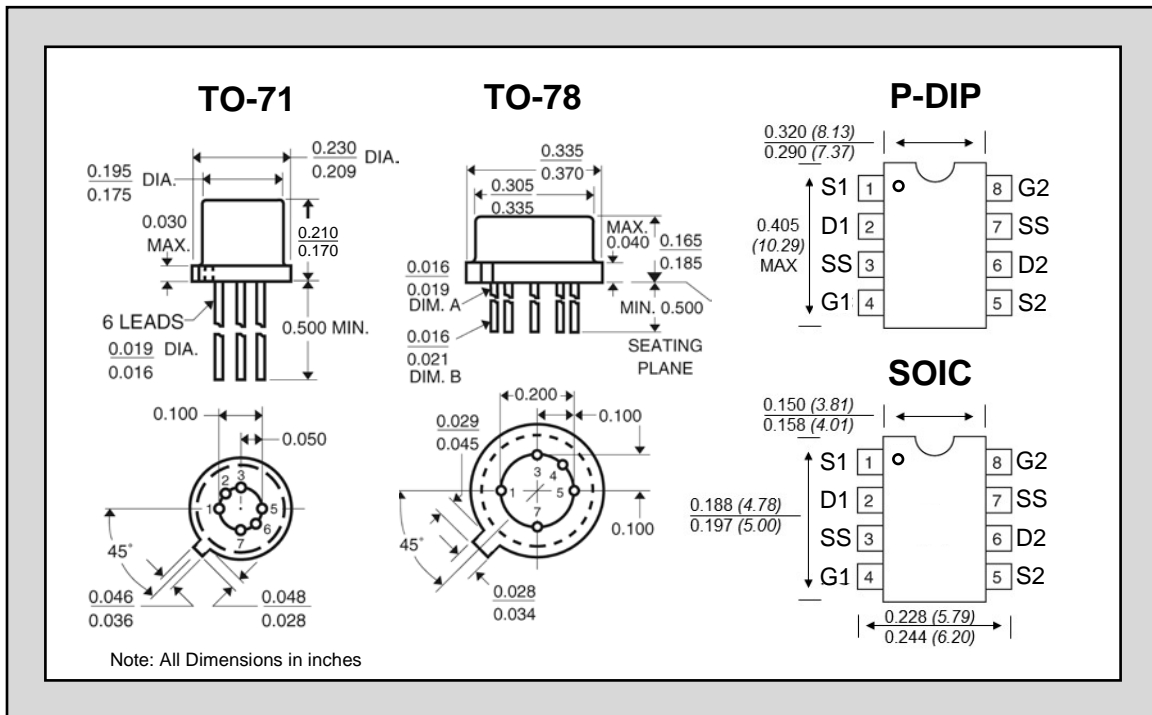


### ELECTRICAL CHARACTERISTICS @ 25°C (unless otherwise noted)

| SYMBOL                 | CHARACTERISTIC        | LS3954A | LS3954 | LS3955 | LS3956 | LS3958 | UNITS | CONDITIONS  |
|------------------------|-----------------------|---------|--------|--------|--------|--------|-------|---|
| $ ΔV_{GS1-2}/ΔT $ max. | Drift vs. Temperature | 5       | 10     | 25     | 50     | 100    | μV/°C | V <sub>DG</sub> = 20V, I <sub>D</sub> = 200μA<br>T <sub>A</sub> = -55°C to +125°C |
| $ V_{GS1-2} $ max.     | Offset Voltage        | 5       | 5      | 10     | 15     | 25     | mV    | V <sub>DG</sub> = 20V, I <sub>D</sub> = 200μA                                     |

| SYMBOL                  | CHARACTERISTIC          | MIN. | TYP. | MAX. | UNITS | CONDITIONS  |
|-------------------------|-------------------------|------|------|------|-------|---|
| BV <sub>GSS</sub>       | Breakdown Voltage       | 60   | --   | --   | V     | V <sub>DS</sub> = 0 I <sub>G</sub> = 1μA                              |
| BV <sub>GGO</sub>       | Gate-to-Gate Breakdown  | 60   | --   | --   | V     | I <sub>GG</sub> = ±1μA I <sub>D</sub> = 0 I <sub>S</sub> = 0          |
| <b>TRANSCONDUCTANCE</b> |                         |      |      |      |       |   |
| g <sub>fss</sub>        | Full Conduction         | 1000 | 2000 | 4000 | μS    | V <sub>DG</sub> = 20V V <sub>GS</sub> = 0 f = 1kHz                    |
| g <sub>fs</sub>         | Typical Operation       | 500  | 700  | 1250 | μS    | V <sub>DG</sub> = 20V I <sub>D</sub> = 200μA                          |
| $ g_{fs1-2}/g_{fs} $    | Differential            | --   | ±0.6 | ±3   | %     |   |
| <b>DRAIN CURRENT</b>    |                         |      |      |      |       |   |
| I <sub>DSS</sub>        | Full Conduction         | 0.5  | 2    | 5    | mA    | V <sub>DS</sub> = 20V V <sub>GS</sub> = 0                             |
| $ I_{DSS1-2}/I_{DSS} $  | Differential            | --   | ±1   | ±5   | %     |   |
| <b>GATE VOLTAGE</b>     |                         |      |      |      |       |   |
| V <sub>GS(off)</sub>    | Pinchoff Voltage        | -1   | -2   | -4.5 | V     | V <sub>DS</sub> = 20V I <sub>D</sub> = 1nA                            |
| V <sub>GS</sub>         | Operating Range         | -0.5 | --   | -4   | V     | V <sub>DS</sub> = 20V I <sub>D</sub> = 200μA                          |
| <b>GATE CURRENT</b>     |                         |      |      |      |       |   |
| -I <sub>G</sub>         | Operating               | --   | 20   | 50   | pA    | V <sub>DG</sub> = 20V I <sub>D</sub> = 200μA                          |
| -I <sub>G</sub>         | High Temperature        | --   | --   | 50   | nA    | V <sub>DG</sub> = 20V I <sub>D</sub> = 200μA T <sub>A</sub> = +125 °C |
| -I <sub>G</sub>         | Reduced V <sub>DG</sub> | --   | 5    | --   | pA    | V <sub>DG</sub> = 10V I <sub>D</sub> = 200μA                          |
| -I <sub>GSS</sub>       | At Full Conduction      | --   | --   | 100  | pA    | V <sub>DG</sub> = 20V V <sub>DS</sub> = 0                             |

| SYMBOL        | CHARACTERISTIC                              | MIN. | TYP. | MAX. | UNITS          | CONDITIONS   |
|---------------|---|------|------|------|----------------|--|
|               | <b>OUTPUT CONDUCTANCE</b>                   |      |      |      |                |  |
| $g_{oss}$     | Full Conduction                             | --   | --   | 35   | $\mu S$        | $V_{DG}=20V$ $V_{GS}=0$  |
| $g_{os}$      | Operating                                   | --   | 0.5  | 1    | $\mu S$        | $V_{DG}=20V$ $I_D=200\mu A$                                    |
| $ g_{os1-2} $ | Differential                                | --   | 0.05 |      | $\mu S$        |  |
|               | <b>COMMON MODE REJECTION</b>                |      |      |      |                |  |
| CMRR          | $-20 \log  \Delta V_{GS1-2}/\Delta V_{DS} $ | --   | 100  | --   | dB             | $\Delta V_{DS}=10$ to $20V$ $I_D=200\mu A$                     |
| CMRR          | $-20 \log  \Delta V_{GS1-2}/\Delta V_{DS} $ | --   | 75   | --   | dB             | $\Delta V_{DS}=5$ to $10V$ $I_D=200\mu A$                      |
|               | <b>NOISE</b>                                |      |      |      |                |  |
| NF            | Figure                                      | --   | --   | 0.5  | dB             | $V_{DS}=20V$ $V_{GS}=0$ $R_G=10M\Omega$<br>$f=100Hz$ $NBW=6Hz$ |
| $e_n$         | Voltage                                     | --   | --   | 15   | $nV/\sqrt{Hz}$ | $V_{DS}=20V$ $I_D=200\mu A$ $f=10Hz$<br>$NBW=1Hz$              |
|               | <b>CAPACITANCE</b>                          |      |      |      |                |  |
| $C_{ISS}$     | Input                                       | --   | --   | 6    | pF             | $V_{DS}=20V$ $V_{GS}=0$ $f=1MHz$                               |
| $C_{RSS}$     | Reverse Transfer                            | --   | --   | 2    | pF             |  |
| $C_{DD}$      | Drain-to-Drain                              | --   | 0.1  | --   | pF             | $V_{DG}=20V$ $I_D=200\mu A$                                    |



### NOTES:

1. These ratings are limiting values above which the serviceability of any semiconductor may be impaired.
2. Derate  $4mW/^\circ C$  above  $25^\circ C$

Information furnished by Linear Integrated Systems is believed to be accurate and reliable. However, no responsibility is assumed for its use; nor for any infringement of patents or other rights of third parties which may result from its use. No license is granted by implication or otherwise under any patent or patent rights of Linear Integrated Systems.

Linear Integrated Systems develops and produces the highest performance semiconductors of their kind in the industry. Linear Systems, founded in 1987, uses patented and proprietary processes and designs to create its high performance discrete semiconductors. Expertise brought to the company is based on processes and products developed at Amelco, Union Carbide, Intersil and Micro Power Systems by company founder John H. Hall.