

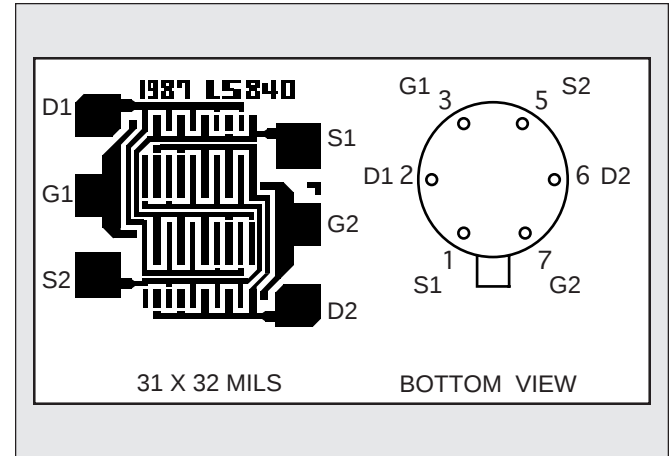
# LINEAR SYSTEMS

## Linear Integrated Systems

## LS840 LS841 LS842

LOW NOISE LOW DRIFT  
LOW CAPACITANCE  
MONOLITHIC DUAL N-CANNEL JFET

| FEATURES                                                      |                                 |                                                                    |
|---------------------------------------------------------------|---------------------------------|--------------------------------------------------------------------|
| LOW NOISE                                                     |                                 | $e_n = 8\text{nV}/\sqrt{\text{Hz}}$ TYP.                           |
| LOW LEAKAGE                                                   |                                 | $I_G = 10\text{pA}$ TYP.                                           |
| LOW DRIFT                                                     |                                 | $ \Delta V_{GS1-2} / \Delta T  = 5\mu\text{V}/^\circ\text{C}$ max. |
| LOW OFFSET VOLTAGE                                            |                                 | $ V_{GS1-2}  = 2\text{mV}$ TYP.                                    |
| ABSOLUTE MAXIMUM RATINGS <u>NOTE 1</u>                        |                                 |                                                                    |
| @ 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 <u>NOTE 1</u> |                                 |                                                                    |
| -V <sub>GSS</sub>                                             | Gate Voltage to Drain or Source | 60V                                                                |
| -V <sub>DSO</sub>                                             | Drain to Source Voltage         | 60V                                                                |
| -I <sub>G(f)</sub>                                            | Gate Forward Current            | 50mA                                                               |
| Maximum Power Dissipation                                     |                                 |                                                                    |
| Device Dissipation @ Free Air - Total                         |                                 | 400mW @ +125°C                                                     |



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

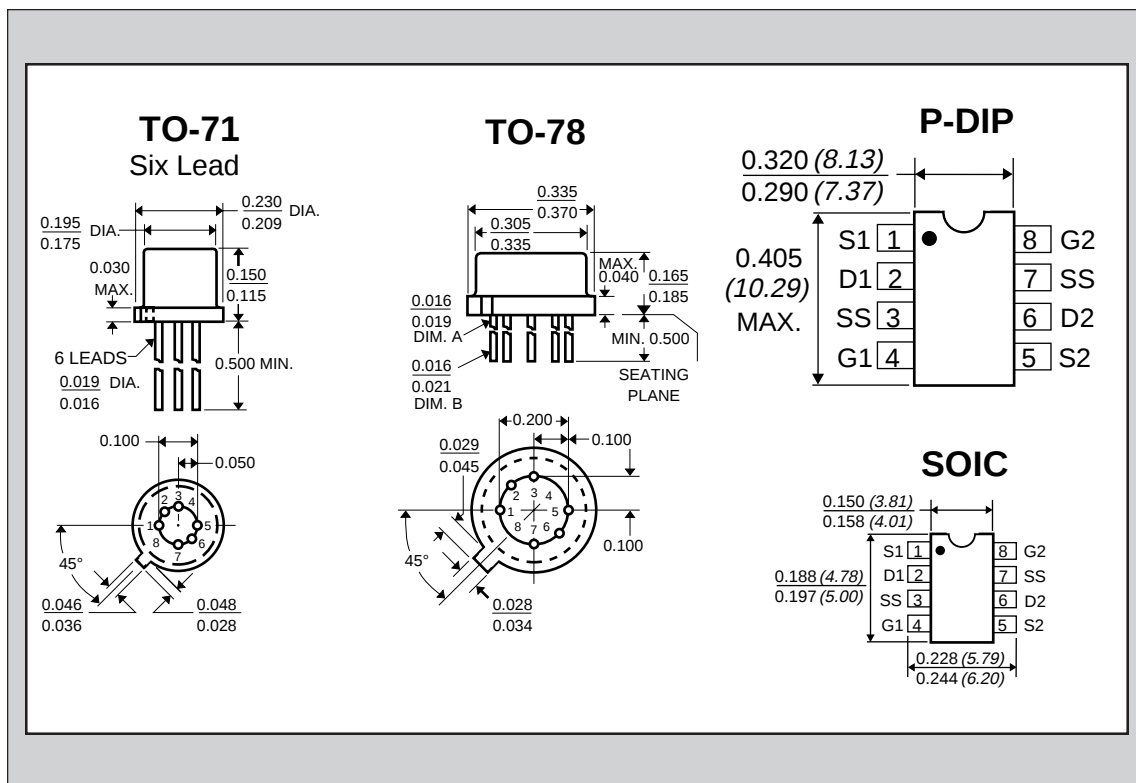
| SYMBOL                             | CHARACTERISTICS       | LS840 | LS841 | LS842 | UNITS                        | CONDITIONS                                                                                           |
|------------------------------------|-----------------------|-------|-------|-------|------------------------------|------------------------------------------------------------------------------------------------------|
| $ \Delta V_{GS1-2}/\Delta T $ max. | Drift vs. Temperature | 5     | 10    | 40    | $\mu\text{V}/^\circ\text{C}$ | $V_{DG} = 20\text{V}$<br>$T_A = -55^\circ\text{C}$ to $+125^\circ\text{C}$<br>$I_D = 200\mu\text{A}$ |
| $ V_{GS1-2} $ max.                 | Offset Voltage        | 5     | 10    | 25    | mV                           | $V_{DG} = 20\text{V}$<br>$I_D = 200\mu\text{A}$                                                      |

| SYMBOL                 | CHARACTERISTICS                            | MIN. | TYP. | MAX. | UNITS           | CONDITIONS                                                              |
|------------------------|--------------------------------------------|------|------|------|-----------------|-------------------------------------------------------------------------|
| $BV_{GSS}$             | Breakdown Voltage                          | 60   | --   | --   | V               | $V_{DS} = 0$ $I_D = 1\text{nA}$                                         |
| $BV_{GGO}$             | Gate-to-Gate Breakdown                     | 60   | --   | --   | V               | $I_G = 1\text{nA}$ $I_D = 0$ $I_S = 0$                                  |
| $Y_{fss}$              | <b>TRANSCONDUCTANCE</b><br>Full Conduction | 1000 |      | 4000 | $\mu\text{mho}$ | $V_{DG} = 20\text{V}$ $V_{GS} = 0$ $f = 1\text{kHz}$                    |
| $Y_{fs}$               | Typical Conduction                         | 500  |      | 1000 | $\mu\text{mho}$ | $V_{DG} = 20\text{V}$ $I_D = 200\mu\text{A}$                            |
| $ Y_{fs1-2}/Y_{fs} $   | Mismatch                                   | --   | 0.6  | 3    | %               |                                                                         |
| $I_{DSS}$              | <b>DRAIN CURRENT</b><br>Full Conduction    | 0.5  | 2    | 5    | mA              | $V_{DG} = 20\text{V}$ $V_{GS} = 0$                                      |
| $ I_{DSS1-2}/I_{DSS} $ | Mismatch at Full Conduction                | --   | 1    | 5    | %               |                                                                         |
| $V_{GS(off)}$ or $V_P$ | <b>GATE VOLTAGE</b><br>Pinchoff Voltage    | 1    | 2    | 4.5  | V               | $V_{DS} = 20\text{V}$ $I_D = 1\text{nA}$                                |
| $V_{GS}$               | Operating Range                            | 0.5  | --   | 4    | V               | $V_{DS} = 20\text{V}$ $I_D = 200\mu\text{A}$                            |
| $-I_G$                 | <b>GATE CURRENT</b><br>Operating           | --   | 10   | 50   | pA              | $V_{DG} = 20\text{V}$ $I_D = 200\mu\text{A}$                            |
| $-I_G$                 | High Temperature                           | --   | --   | 50   | nA              | $V_{DG} = 20\text{V}$ $I_D = 200\mu\text{A}$ $T_A = +125^\circ\text{C}$ |
| $-I_G$                 | Reduced VDG                                | --   | 5    | --   | pA              | $V_{DG} = 10\text{V}$ $I_D = 200\mu\text{A}$                            |
| $-I_{GSS}$             | At Full Conduction                         | --   | --   | 100  | pA              | $V_{DG} = 20\text{V}$ $V_{DS} = 0$                                      |

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| SYMBOL                | CHARACTERISTICS                                | MIN. | TYP. | MAX. | UNITS  | CONDITIONS                                                                                        |
|-----------------------|------------------------------------------------|------|------|------|--------|---------------------------------------------------------------------------------------------------|
| OUTPUT CONDUCTANCE    |                                                |      |      |      |        |                                                                                                   |
| Y <sub>oss</sub>      | Full Conduction                                | --   | --   | 10   | μmho   | V <sub>DG</sub> = 20V      V <sub>GS</sub> = 0                                                    |
| Y <sub>os</sub>       | Operating                                      | --   | 0.1  | 1    | μmho   | V <sub>DG</sub> = 20V      I <sub>D</sub> = 200μA                                                 |
| Y <sub>os1-2</sub>    | Differential                                   | --   | 0.01 | 0.1  | μmho   |                                                                                                   |
| COMMON MODE REJECTION |                                                |      |      |      |        |                                                                                                   |
| CMR                   | -20 log  ΔV <sub>GS1-2</sub> /ΔV <sub>DS</sub> | --   | 100  | --   | dB     | ΔV <sub>DS</sub> = 10 to 20V      I <sub>D</sub> = 200μA                                          |
| CMR                   |                                                | --   | 75   | --   | dB     | ΔV <sub>DS</sub> = 5 to 10V      I <sub>D</sub> = 200μA                                           |
| NOISE                 |                                                |      |      |      |        |                                                                                                   |
| NF                    | Figure                                         | --   | --   | 0.5  | dB     | V <sub>DS</sub> = 20V      V <sub>GS</sub> = 0    R <sub>G</sub> = 10MΩ<br>f= 100Hz      NBW= 6Hz |
| e <sub>n</sub>        | Voltage                                        | --   | --   | 10   | nV/√Hz | V <sub>DS</sub> = 20V      I <sub>D</sub> = 200μA    f= 1KHz<br>NBW= 1Hz                          |
| e <sub>n</sub>        | Voltage                                        | --   | --   | 15   | nV/√Hz | V <sub>DS</sub> = 20V      I <sub>D</sub> = 200μA    f= 10Hz<br>NBW= 1Hz                          |
| CAPACITANCE           |                                                |      |      |      |        |                                                                                                   |
| C <sub>ISS</sub>      | Input                                          | --   | 4    | 10   | pF     | V <sub>DS</sub> = 20V      I <sub>D</sub> = 200μA                                                 |
| C <sub>RSS</sub>      | Reverse Transfer                               | --   | 1.2  | 5    | pF     |                                                                                                   |
| C <sub>DD</sub>       | Drain-to-Drain                                 | --   | 0.1  | --   | pF     | V <sub>DG</sub> = 20V      I <sub>D</sub> = 200μA                                                 |



#### NOTES:

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