

## Linear Systems Ultra Low Leakage Low Drift Monolithic Dual JFET

The LS841 is a high-performance monolithic dual JFET featuring extremely low noise, tight offset voltage and low drift over temperature specifications, and is targeted for use in a wide range of precision instrumentation applications. The LS841 features a 10-mV offset and 10- $\mu\text{V}/^\circ\text{C}$  drift.

The 8 Pin P-DIP and 8 Pin SOIC provide ease of manufacturing, and the symmetrical pinout prevents improper orientation.

(See Packaging Information).

### LS841 Applications:

- Wideband Differential Amps
- High-Speed, Temp-Compensated Single-Ended Input Amps
- High-Speed Comparators
- Impedance Converters and vibrations detectors.

### FEATURES

|                    |                                                   |
|--------------------|---------------------------------------------------|
| LOW DRIFT          | $ V_{GS1-2}/T  \leq 10\mu\text{V}/^\circ\text{C}$ |
| LOW LEAKAGE        | $I_G = 10\text{pA TYP.}$                          |
| LOW NOISE          | $e_n = 8\text{nV}/\sqrt{\text{Hz}}$ TYP.          |
| LOW OFFSET VOLTAGE | $ V_{GS1-2}  \leq 10\text{mV}$                    |

### ABSOLUTE MAXIMUM RATINGS @ 25°C (unless otherwise noted)

#### Maximum Temperatures

|                                |                 |
|--------------------------------|-----------------|
| Storage Temperature            | -65°C to +150°C |
| Operating Junction Temperature | +150°C          |

#### Maximum Voltage and Current for Each Transistor – Note 1

|                    |                                 |      |
|--------------------|---------------------------------|------|
| -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 |
|---------------------------------------|----------------|

### MATCHING CHARACTERISTICS @ 25°C UNLESS OTHERWISE NOTED

| SYMBOL                       | CHARACTERISTICS       | VALUE | UNITS                        | CONDITIONS                                                                                    |
|------------------------------|-----------------------|-------|------------------------------|-----------------------------------------------------------------------------------------------|
| $ V_{GS1-2}/T  \text{ max.}$ | DRIFT VS. TEMPERATURE | 10    | $\mu\text{V}/^\circ\text{C}$ | $V_{DG}=20\text{V}$ , $I_D=200\mu\text{A}$<br>$T_A=-55^\circ\text{C}$ to $+125^\circ\text{C}$ |
| $ V_{GS1-2}  \text{ max.}$   | OFFSET VOLTAGE        | 10    | mV                           | $V_{DG}=20\text{V}$ , $I_D=200\mu\text{A}$                                                    |

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

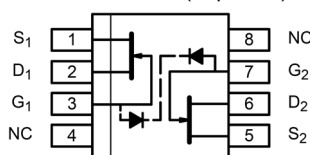
| SYMBOL                                 | CHARACTERISTICS                                | MIN. | TYP. | MAX. | UNITS  | CONDITIONS                                                                              |
|----------------------------------------|------------------------------------------------|------|------|------|--------|-----------------------------------------------------------------------------------------|
| BV <sub>GSS</sub>                      | Breakdown Voltage                              | 60   | 60   | --   | V      | V <sub>DS</sub> = 0 I <sub>D</sub> = 1nA                                                |
| BV <sub>GGO</sub>                      | Gate-To-Gate Breakdown                         | 60   | --   | --   | V      | I <sub>G</sub> = 1nA I <sub>D</sub> = 0 I <sub>S</sub> = 0                              |
| <b><u>TRANSCONDUCTANCE</u></b>         |                                                |      |      |      |        |                                                                                         |
| Y <sub>FSS</sub>                       | Full Conduction                                | 1000 | --   | 4000 | μmho   | V <sub>DG</sub> = 20V V <sub>GS</sub> = 0V f = 1kHz                                     |
| Y <sub>FS</sub>                        | Typical Operation                              | 500  | --   | 1000 | μmho   | V <sub>DG</sub> = 20V I <sub>D</sub> = 200μA                                            |
| Y <sub>FS1-2</sub> / Y <sub>FS</sub>   | Mismatch                                       | --   | 0.6  | 3    | %      |                                                                                         |
| <b><u>DRAIN CURRENT</u></b>            |                                                |      |      |      |        |                                                                                         |
| I <sub>DSS</sub>                       | Full Conduction                                | 0.5  | 2    | 5    | mA     | V <sub>DG</sub> = 20V V <sub>GS</sub> = 0V                                              |
| I <sub>DSS1-2</sub> / I <sub>DSS</sub> | Mismatch at Full Conduction                    | --   | 1    | 5    | %      |                                                                                         |
| <b><u>GATE VOLTAGE</u></b>             |                                                |      |      |      |        |                                                                                         |
| V <sub>GS(off)</sub> or V <sub>p</sub> | Pinchoff voltage                               | 1    | 2    | 4.5  | V      | V <sub>DS</sub> = 20V I <sub>D</sub> = 1nA                                              |
| V <sub>GS(on)</sub>                    | Operating Range                                | 0.5  | --   | 4    | V      | V <sub>DS</sub> = 20V I <sub>D</sub> = 200μA                                            |
| <b><u>GATE CURRENT</u></b>             |                                                |      |      |      |        |                                                                                         |
| -I <sub>G</sub> max.                   | Operating                                      | --   | 10   | 50   | pA     | V <sub>DG</sub> = 20V I <sub>D</sub> = 200μA                                            |
| -I <sub>G</sub> max.                   | High Temperature                               | --   | --   | 50   | nA     | T <sub>A</sub> = +125°C                                                                 |
| -I <sub>G</sub> max.                   | Reduced V <sub>DG</sub>                        | --   | 5    | --   | pA     | V <sub>DG</sub> = 10V I <sub>D</sub> = 200μA                                            |
| -I <sub>GSS</sub> max.                 | At Full Conduction                             | --   | --   | 100  | pA     | V <sub>DG</sub> = 20V , V <sub>DS</sub> = 0                                             |
| <b><u>OUTPUT CONDUCTANCE</u></b>       |                                                |      |      |      |        |                                                                                         |
| Y <sub>OSS</sub>                       | Full Conduction                                | --   | --   | 10   | μmho   | V <sub>DG</sub> = 20V V <sub>GS</sub> = 0V                                              |
| 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   |                                                                                         |
| CMR                                    | <b><u>COMMON MODE REJECTION</u></b>            |      |      |      |        |                                                                                         |
|                                        | -20 log   V <sub>GS1-2</sub> / V <sub>DS</sub> | --   | 100  | --   | dB     | ΔV <sub>DS</sub> = 10 to 20V I <sub>D</sub> = 200μA                                     |
|                                        | -20 log   V <sub>GS1-2</sub> / V <sub>DS</sub> | --   | 75   | --   |        | ΔV <sub>DS</sub> = 5 to 10V I <sub>D</sub> = 200μA                                      |
| <b><u>NOISE</u></b>                    |                                                |      |      |      |        |                                                                                         |
| NF                                     | Figure                                         | --   | --   | 0.5  | dB     | V <sub>DS</sub> = 20V V <sub>GS</sub> = 0V 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 NBW = 1Hz                         |
|                                        |                                                | --   | --   | 15   |        | V <sub>DS</sub> = 20V I <sub>D</sub> = 200μA f = 10Hz NBW = 1Hz                         |
| <b><u>CAPACITANCE</u></b>              |                                                |      |      |      |        |                                                                                         |
| 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    |        |                                                                                         |
| C <sub>DD</sub>                        | Drain-to-Drain                                 | --   | 0.1  | --   |        |                                                                                         |

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

### Available Packages:

LS841 / LS841 in PDIP & SOIC  
LS841 / LS841 available as bare die  
Please contact [Micross](http://www.micross.com) for full package and die dimensions

### PDIP & SOIC (Top View)



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