

Linear Systems Ultra Low Leakage Low Drift Monolithic Dual JFET

The LS844 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 LS844 features a 5-mV offset and 10- $\mu\text{V}/^\circ\text{C}$ drift.

The hermetically sealed TO-71 & TO-78 packages are well suited for military and harsh environment applications.

(See Packaging Information).

LS844 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 | $I_G = 15\text{pA TYP.}$ |
| LOW NOISE | $e_n = 3\text{nV}/\sqrt{\text{Hz}} \text{ TYP.}$ |
| LOW OFFSET VOLTAGE | $ V_{GS1-2} \leq 5\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

| | | |
|-------------|---------------------------------|------|
| $-V_{GSS}$ | Gate Voltage to Drain or Source | 60V |
| $-V_{DSO}$ | Drain to Source Voltage | 60V |
| $-I_{G(f)}$ | 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 | $\mu\text{V}/^\circ\text{C}$ | $V_{DG}=10\text{V}, I_D=500\mu\text{A}$ $T_A=-55^\circ\text{C to }+125^\circ\text{C}$ |
| $ V_{GS1-2} \text{ max.}$ | OFFSET VOLTAGE | 5 | mV | $V_{DG}=10\text{V}, I_D=500\mu\text{A}$ |

ELECTRICAL CHARACTERISTICS @ 25°C (unless otherwise noted)

| 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 | $I_G = 1\text{nA}$ $I_D = 0$ $I_S = 0$ |
| TRANSCONDUCTANCE | | | | | | |
| Y_{fSS} | Full Conduction | 1500 | -- | -- | μmho | $V_{DG}=15\text{V}$ $V_{GS}=0\text{V}$ $f=1\text{kHz}$ |
| Y_{fS} | Typical Operation | 1000 | 1500 | -- | μmho | $V_{DG}=15\text{V}$ $I_D=500\mu\text{A}$ |
| $ Y_{FS1-2}/Y_{FS} $ | Mismatch | -- | 0.6 | 3 | % | |
| DRAIN CURRENT | | | | | | |
| I_{DSS} | Full Conduction | 1.5 | 5 | 15 | mA | $V_{DG}=15\text{V}$ $V_{GS}=0\text{V}$ |
| $ I_{DSS1-2}/I_{DSS} $ | Mismatch at Full Conduction | -- | 1 | 5 | % | |
| GATE VOLTAGE | | | | | | |
| $V_{GS}(\text{off})$ or V_p | Pinchoff voltage | 1 | -- | 3.5 | V | $V_{DS}=15\text{V}$ $I_D=1\text{nA}$ |
| $V_{GS}(\text{on})$ | Operating Range | 0.5 | -- | 3.5 | V | $V_{DS}=15\text{V}$ $I_D=500\mu\text{A}$ |
| GATE CURRENT | | | | | | |
| $-I_G \text{ max.}$ | Operating | -- | 15 | 50 | pA | $V_{DG}=15\text{V}$ $I_D=500\mu\text{A}$ |
| $-I_G \text{ max.}$ | High Temperature | -- | -- | 50 | nA | $T_A = +125^\circ\text{C}$ |
| $-I_G \text{ max.}$ | Reduced V_{DG} | -- | 5 | 30 | pA | $V_{DG}=3\text{V}$ $I_D=500\mu\text{A}$ |
| $-I_{GSS} \text{ max.}$ | At Full Conduction | -- | -- | 100 | pA | $V_{DG}=15\text{V}, V_{DS}=0$ |
| OUTPUT CONDUCTANCE | | | | | | |
| Y_{OSS} | Full Conduction | -- | -- | 20 | μmho | $V_{DG}=15\text{V}$ $V_{GS}=0\text{V}$ |
| Y_{OS} | Operating | -- | 0.2 | 2 | μmho | $V_{DG}=15\text{V}$ $I_D=500\mu\text{A}$ |
| $ Y_{OS1-2} $ | Differential | -- | 0.02 | 0.2 | μmho | |
| COMMON MODE REJECTION | | | | | | |
| CMR | $-20 \log V_{GS1-2}/V_{DS} $ | 90 | 110 | -- | dB | $\Delta V_{DS} = 10 \text{ to } 20\text{V}$ $I_D=500\mu\text{A}$ |
| | $-20 \log V_{GS1-2}/V_{DS} $ | -- | 85 | -- | dB | $\Delta V_{DS} = 5 \text{ to } 10\text{V}$ $I_D=500\mu\text{A}$ |
| NOISE | | | | | | |
| NF | Figure | -- | -- | 0.5 | dB | $V_{DS}=15\text{V}$ $V_{GS}=0\text{V}$ $R_G=10\text{M}\Omega$ $f=100\text{Hz}$ $\text{NBW}=6\text{Hz}$ |
| e_n | Voltage | -- | -- | 7 | nV/ $\sqrt{\text{Hz}}$ | $V_{DS}=15\text{V}$ $I_D=500\mu\text{A}$ $f=1\text{kHz}$ $\text{NBW}=1\text{Hz}$ |
| | | -- | -- | 11 | | $V_{DS}=15\text{V}$ $I_D=500\mu\text{A}$ $f=10\text{Hz}$ $\text{NBW}=1\text{Hz}$ |
| CAPACITANCE | | | | | | |
| C_{ISS} | Input | -- | -- | 8 | pF | $V_{DS}=15\text{V}, I_D=500\mu\text{A}$ |
| C_{RSS} | Reverse Transfer | -- | -- | 3 | | |
| C_{DD} | Drain-to-Drain | -- | 0.5 | -- | | $V_{DG}=15\text{V}, I_D=500\mu\text{A}$ |

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

Available Packages:

LS844 / LS844 in TO-71 & TO-78
LS844 / LS844 available as bare die
Please contact [Micross](http://www.micross.com) for full package and die dimensions

TO-71 & TO-78 (Top View)

