

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

The LS830 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 LS830 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 applications.

(See Packaging Information).

### LS830 Applications:

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

### FEATURES

ULTRA LOW DRIFT	$ V_{GS1-2}/T  \leq 5\mu\text{V}/^\circ\text{C}$ TYP.
ULTRA LOW LEAKAGE	$I_G = 80\text{fA}$ TYP.
LOW NOISE	$e_n = 70\text{nV}/\sqrt{\text{Hz}}$ TYP.
LOW CAPACITANCE	$C_{ISS} = 3\text{pF}$ MAX.

### 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	40V
$-V_{DSO}$	Drain to Source Voltage	40V
$-I_{G(f)}$	Gate Forward Current	10mA
$-I_G$	Gate Reverse Current	10 $\mu\text{A}$

#### 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 $ max.	DRIFT VS. TEMPERATURE	5	$\mu\text{V}/^\circ\text{C}$	$V_{DG}=10\text{V}$ , $I_D=30\mu\text{A}$ $T_A=-55^\circ\text{C}$ to $+125^\circ\text{C}$
$ V_{GS1-2} $ max.	OFFSET VOLTAGE	25	mV	$V_{DG}=10\text{V}$ , $I_D=30\mu\text{A}$

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

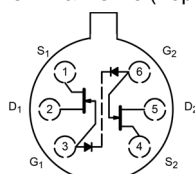
SYMBOL	CHARACTERISTICS	MIN.	TYP.	MAX.	UNITS	CONDITIONS
$BV_{GSS}$	Breakdown Voltage	40	60	--	V	$V_{DS} = 0$ $I_D=1\text{nA}$
$BV_{GGO}$	Gate-To-Gate Breakdown	40	--	--	V	$I_G = 1\text{nA}$ $I_D = 0$ $I_S = 0$
<b>TRANSCONDUCTANCE</b>						
$Y_{FSS}$	Full Conduction	70	300	500	$\mu\text{mho}$	$V_{DG} = 10\text{V}$ $V_{GS} = 0\text{V}$ $f = 1\text{kHz}$
$Y_{FS}$	Typical Operation	50	100	200	$\mu\text{mho}$	$V_{DG} = 10\text{V}$ $I_D = 30\mu\text{A}$ $f = 1\text{kHz}$
$ Y_{FS1-2}/Y_{FS} $	Mismatch	--	0.6	3	%	
<b>DRAIN CURRENT</b>						
$I_{DSS}$	Full Conduction	0.5	--	10	mA	$V_{DG} = 10\text{V}$ $V_{GS} = 0\text{V}$
$ I_{DSS1-2}/I_{DSS} $	Mismatch at Full Conduction	--	1	5	%	
<b>GATE VOLTAGE</b>						
$V_{GS}(\text{off})$ or $V_p$	Pinchoff voltage	0.6	2	4.5	V	$V_{DS} = 10\text{V}$ $I_D = 1\text{nA}$
$V_{GS}(\text{on})$	Operating Range	--	--	4	V	$V_{DS} = 10\text{V}$ $I_D = 30\mu\text{A}$
<b>GATE CURRENT</b>						
$-I_{G\text{max}}$	Operating	--	--	0.1	pA	$V_{DG} = 10\text{V}$ $I_D = 30\mu\text{A}$
$-I_{G\text{max}}$	High Temperature	--	--	0.1	nA	$T_A = +125^\circ\text{C}$
$-I_{GSS\text{max}}$	At Full Conduction	--	--	0.2	pA	$V_{DS} = 0$
$-I_{GSS\text{max}}$	High Temperature	5	5	0.5	nA	$V_{GS} = 0\text{V}$ , $V_{GS} = -20\text{V}$ , $T_A = +125^\circ\text{C}$
$I_{GGO}$	Gate-to-Gate Leakage	--	1	--	pA	$V_{GG} = 20\text{V}$
<b>OUTPUT CONDUCTANCE</b>						
$Y_{OSS}$	Full Conduction	--	--	5	$\mu\text{mho}$	$V_{DG} = 10\text{V}$ $V_{GS} = 0\text{V}$
$Y_{OS}$	Operating	--	--	0.5	$\mu\text{mho}$	$V_{DG} = 10\text{V}$ $I_D = 30\mu\text{A}$
<b>COMMON MODE REJECTION</b>						
CMR	$-20 \log  V_{GS1-2}/V_{DS} $	--	90	--	dB	$\Delta V_{DS} = 10$ to $20\text{V}$ $I_D = 30\mu\text{A}$
	$-20 \log  V_{GS1-2}/V_{DS} $	--	90	--	dB	$\Delta V_{DS} = 5$ to $10\text{V}$ $I_D = 30\mu\text{A}$
<b>NOISE</b>						
NF	Figure	--	--	1	dB	$V_{DS} = 10\text{V}$ $V_{GS} = 0\text{V}$ $R_G = 10\text{M}\Omega$ $f = 100\text{Hz}$ $\text{NBW} = 6\text{Hz}$
$e_n$	Voltage	--	20	70	nV/ $\sqrt{\text{Hz}}$	$V_{DS} = 10\text{V}$ $I_D = 30\mu\text{A}$ $f = 10\text{Hz}$ $\text{NBW} = 1\text{Hz}$
<b>CAPACITANCE</b>						
$C_{ISS}$	Input	--	--	3	pF	$V_{DS} = 10\text{V}$ , $V_{GS} = 0\text{V}$ , $f = 1\text{MHz}$
$C_{RSS}$	Reverse Transfer	--	--	1.5	pF	$V_{DS} = 10\text{V}$ , $V_{GS} = 0\text{V}$ , $f = 1\text{MHz}$
$C_{DD}$	Drain-to-Drain	--	--	0.1	pF	$V_{DS} = 10\text{V}$ , $I_D = 30\mu\text{A}$

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

### Available Packages:

LS830 / LS830 in TO-71 & TO-78  
LS830 / LS830 available as bare die  
Please contact [Micross](http://www.micross.com) for full package and die dimensions

### TO-71 & TO-78 (Top View)



Tel: +44 1603 788967  
Email: [chipcomponents@micross.com](mailto:chipcomponents@micross.com)  
Web: <http://www.micross.com/distribution>