

# LINEAR SYSTEMS

Twenty-Five Years Of Quality Through Innovation

## LS830 LS831 LS832 LS833

ULTRA LOW LEAKAGE LOW DRIFT  
MONOLITHIC DUAL N-CHANNEL  
JFET AMPLIFIER

### FEATURES

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

### ABSOLUTE MAXIMUM RATINGS NOTE 1

@ 25°C (unless otherwise noted)

### Maximum Temperatures

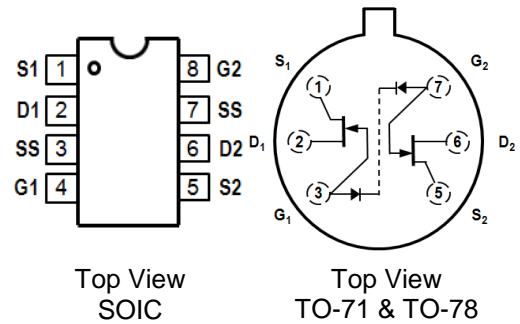
Storage Temperature	-55 to +150°C
Operating Junction Temperature	-55 to +150°C

### Maximum Voltage and Current for Each Transistor NOTE 1

-V <sub>GSS</sub>	Gate Voltage to Drain or Source	40V
-V <sub>DSO</sub>	Drain to Source Voltage	40V
-I <sub>G(f)</sub>	Gate Forward Current	10mA
-I <sub>G</sub>	Gate Reverse Current	10μA

### Maximum Power Dissipation @ TA = 25°C

Continuous Power Dissipation (Total)	500mW
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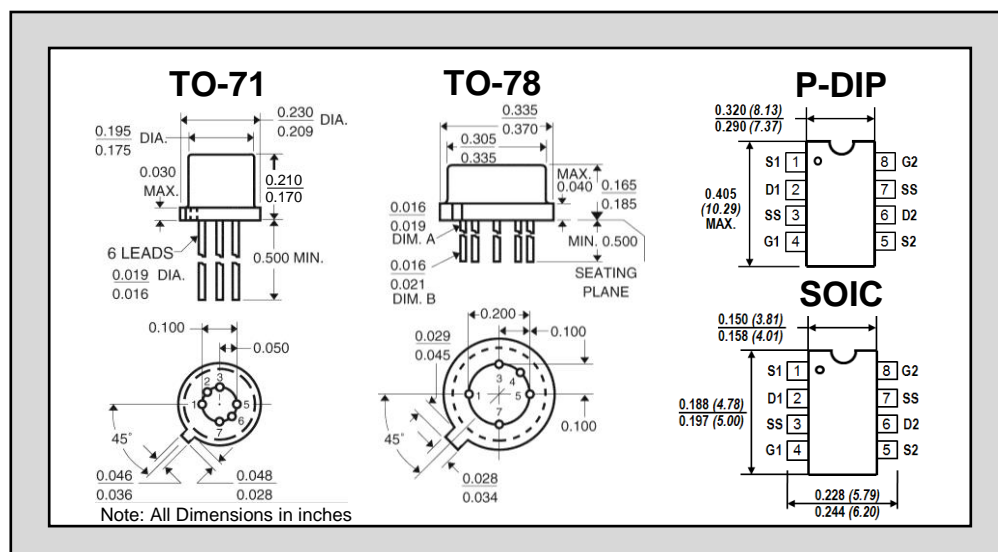
SYMBOL	CHARACTERISTIC	MIN.	TYP.	MAX.	UNITS	CONDITIONS
BV <sub>GSS</sub>	Breakdown Voltage	-40	-60	--	V	V <sub>DS</sub> = 0 I <sub>G</sub> = -1nA
BV <sub>GGO</sub>	Gate-to-Gate Breakdown	±40	--	--	V	I <sub>G</sub> = ±1μA I <sub>D</sub> = 0 I <sub>S</sub> = 0
<b>TRANSCONDUCTANCE</b>						
g <sub>fss</sub>	Full Conduction	70	300	500	μS	V <sub>DG</sub> = 10V V <sub>GS</sub> = 0 f = 1kHz
g <sub>fs</sub>	Typical Operation	50	100	200	μS	V <sub>DG</sub> = 10V I <sub>D</sub> = 30μA f = 1kHz
g <sub>fs1-2</sub> /g <sub>fs</sub>	Differential	--	1	5	%	
<b>DRAIN CURRENT</b>						
I <sub>DSS</sub>	Full Conduction	60	400	1000	μA	V <sub>DG</sub> = 10V V <sub>GS</sub> = 0
I <sub>DSS1-2</sub> /I <sub>DSS</sub>	Differential at Full Conduction	--	2	5	%	

### ELECTRICAL CHARACTERISTICS TA = 25°C (unless otherwise noted)

SYMBOL	CHARACTERISTIC	LS830	LS831	LS832	LS833	UNITS	CONDITIONS
ΔV <sub>GS1-2</sub> /ΔT  max.	Drift vs. Temperature	5	10	20	75	μV/°C	V <sub>DG</sub> = 10V I <sub>D</sub> = 30μA TA = -55°C to +125°C
V <sub>GS1-2</sub>   max.	Offset Voltage	25	25	25	25	mV	V <sub>DG</sub> = 10V I <sub>D</sub> = 30μA
-I <sub>G</sub> typical	Operating	0.1	0.1	0.1	0.5	pA	
-I <sub>G</sub> typical	High Temperature	0.1	0.1	0.1	0.5	nA	TA = +125°C
I <sub>GSS</sub> typical	At Full Conduction	0.2	0.2	0.2	1.0	pA	V <sub>GS</sub> = 20V, V <sub>GS</sub> = 0V
I <sub>GSS</sub> typical	High Temperature	0.5	0.5	0.5	1.0	nA	V <sub>GS</sub> = 0 V <sub>GS</sub> = 20V TA = +125°C

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SYMBOL	CHARACTERISTIC	MIN.	TYP.	MAX.	UNITS	CONDITIONS
$V_{GS(off)}$	<b>GATE-SOURCE</b> Cutoff Voltage	-0.6	-2	-4.5	V	$V_{DS}= 10V$ $I_D= 1nA$
$V_{GS}$	Operating Range	--	--	-4	V	$V_{DG}= 10V$ $I_D= 30\mu A$
$I_{GGO}$	<b>GATE CURRENT</b> Gate-to-Gate Leakage	--	1	--	pA	$V_{GG}= \pm 20V$ $I_D = I_S = 0A$
$g_{OSS}$	<b>OUTPUT CONDUCTANCE</b> Full Conduction	--	--	5	$\mu S$	$V_{DG}= 10V$ $V_{GS}= 0$
$g_{OS}$	Operating	--	--	0.5	$\mu S$	$V_{DG}= 10V$ $I_D= 30\mu A$
$ g_{OS1-2} $	Differential	--	--	0.1	$\mu S$	
CMRR	<b>COMMON MODE REJECTION</b> $-20 \log  \Delta V_{GS1-2}/ \Delta V_{DS} $	--	90	--	dB	$\Delta V_{DS}= 10$ to $20V$ $I_D=30\mu A$
CMRR	$-20 \log  \Delta V_{GS1-2}/ \Delta V_{DS} $	--	90	--	dB	$\Delta V_{DS}= 5$ to $10V$ $I_D=30\mu A$
NF	<b>NOISE</b> Figure	--	--	1	dB	$V_{DS}= 10V$ $V_{GS}= 0$ $R_G=10M\Omega$ $f= 100Hz$ $NBW= 6Hz$
$e_n$	Voltage	--	20	70	nV/ $\sqrt{Hz}$	$V_{DG}= 10V$ $I_D= 30\mu A$ $f= 10Hz$ $NBW= 1Hz$
$C_{ISS}$	<b>CAPACITANCE</b> Input	--	--	3	pF	$V_{DS}= 10V$ $V_{GS}= 0$ $f= 1MHz$
$C_{RSS}$	Reverse Transfer	--	--	1.5	pF	$V_{DS}= 10V$ $V_{GS}= 0$ $f= 1MHz$
$C_{DD}$	Drain-to-Drain	--	--	0.1	pF	$V_{DG}= 10V$ $I_D= 30\mu A$



## NOTES:

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

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