

# LINEAR SYSTEMS

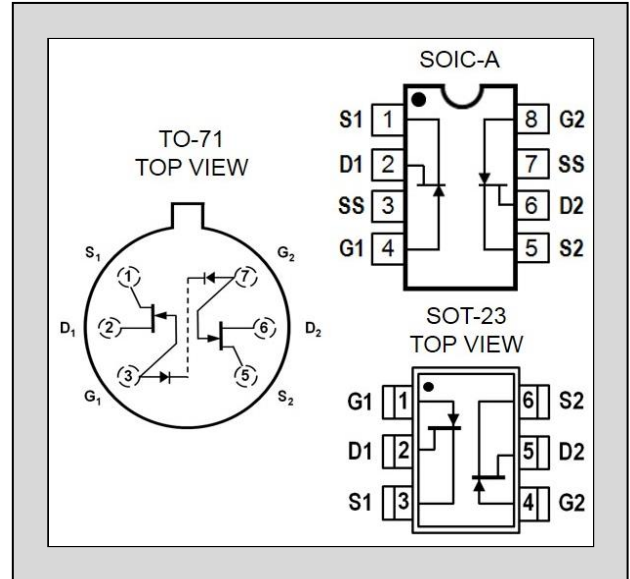
Twenty-Five Years Of Quality Through Innovation

## LS843 LS844 LS845

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

### FEATURES

ULTRA LOW NOISE	$e_n=3nV/Hz$ TYP.
LOW LEAKAGE	$I_G=15pA$ TYPs.
LOW DRIFT	$I_{V_{GS1-2}/T_I}=5\mu V/^{\circ}C$ max.
ULTRA LOW OFFSET VOLTAGE	$I_{V_{GS1-2}}=1mV$ max.
<b>ABSOLUTE MAXIMUM RATINGS<sup>1</sup></b> @ 25°C (unless otherwise noted)	
<b>Maximum Temperatures</b>	
Storage Temperature	-55° to +150°C
Operating Junction Temperature	-55° to +150°C
<b>Maximum Voltage and Current for Each Transistor<sup>1</sup></b>	
-V <sub>GSS</sub>	Gate Voltage to Drain or Source 60V
I <sub>G(f)</sub>	Gate Forward Current 50mA
<b>Maximum Power Dissipation<sup>2</sup></b>	
Device Dissipation <sup>2</sup> @ Free Air - Total	400mW T <sub>A</sub> =+25°C

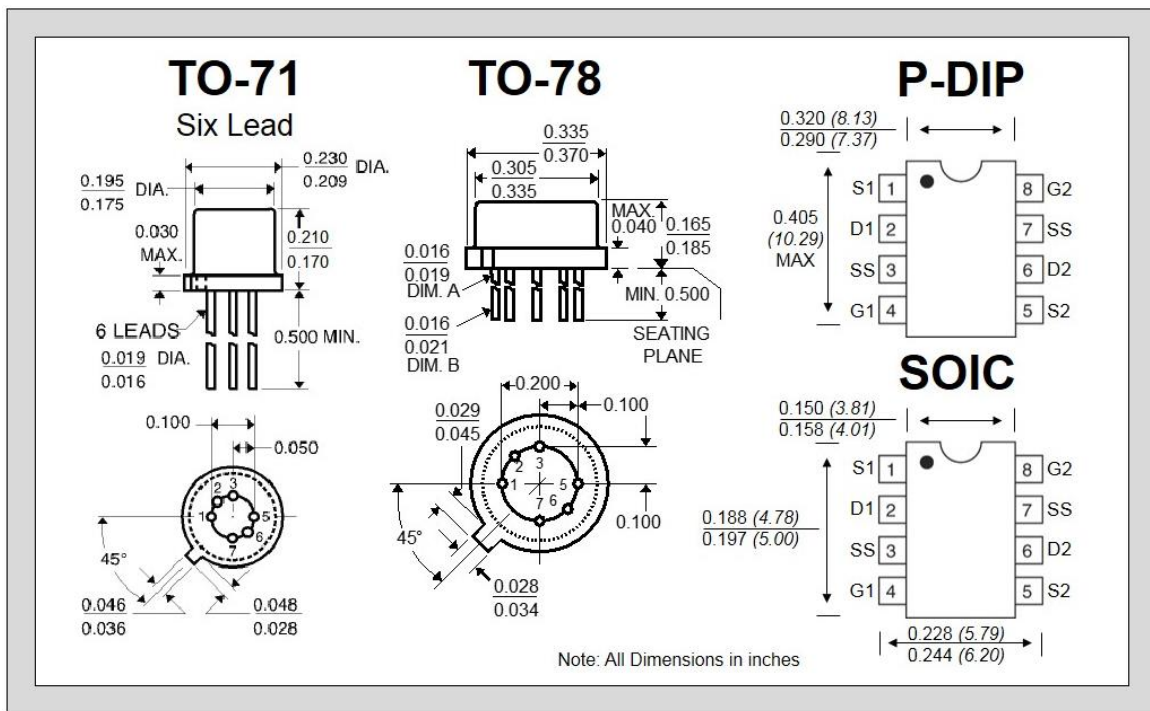


### ELECTRICAL CHARACTERISTICS @ 25°C (unless otherwise noted)

SYMBOL	CHARACTERISTIC	LS843	LS844	LS845	UNITS	CONDITIONS
$I_{V_{GS1-2}/T_I}$ max.	Drift vs. Temperature	5	10	25	$\mu V/^{\circ}C$	$V_{DG}=10V$ $I_D=500\mu A$ $T_A=-55^{\circ}C$ to $+125^{\circ}C$
$I_{V_{GS1-2}}$ max.	Offset Voltage	1	5	15	mV	$V_{GS}=10V$ $I_D=500\mu A$

SYMBOL	CHARACTERISTIC <sup>3</sup>	MIN.	TYP.	MAX.	UNITS	CONDITIONS
BV <sub>GSS</sub>	Breakdown Voltage	-60	--	--	V	$V_{DS}=0$ $I_D=-1nA$
BV <sub>GGO</sub>	Gate-to-Gate Breakdown	$\pm 60$	--	--	V	$I_{GGO}=\pm 1\mu A$ $I_D=0$ $I_S=0$
<b>TRANSCONDUCTANCE</b>						
G <sub>fss</sub>	Full Conduction	1500	--	--	$\mu S$	$V_{DS}=15V$ $V_{GS}=0$ $f=1kHz$
G <sub>fs</sub>	Typical Conduction	1000	1500	--	$\mu S$	$V_{DS}=15V$ $I_D=500\mu A$
$ G_{fs1-2}/G_{fs1} $	Mismatch	--	0.6	3	%	
<b>DRAIN CURRENT</b>						
I <sub>DSS</sub>	Full Conduction	1.5	5	15	mA	$V_{DS}=15V$ $V_{GS}=0$
$ I_{DSS1-2}/I_{DSS} $	Mismatch at Full Conduction	--	1	5	%	
<b>GATE VOLTAGE</b>						
V <sub>GS(off)</sub>	Pinchoff Voltage	-1	--	-3.5	V	$V_{DS}=15V$ $I_D=1nA$
V <sub>GS</sub>	Operating Range	-0.5	--	-3.5	V	$V_{DS}=15V$ $I_D=500\mu A$
<b>GATE CURRENT</b>						
-I <sub>G</sub>	Operating	--	15	50	pA	$V_{DG}=15V$ $I_D=500\mu A$
-I <sub>G</sub>	High Temperature	--	--	50	nA	$V_{DG}=15V$ $I_D=500\mu A$ $T_A=+125^{\circ}C$
-I <sub>G</sub>	Reduced VDG	--	5	30	pA	$V_{DG}=3V$ $I_D=500\mu A$
-I <sub>GSS</sub>	At Full Conduction	--	--	100	pA	$V_{GS}=15V$ $V_{GS}=0$

SYMBOL	CHARACTERISTIC	MIN.	TYP.	MAX.	UNITS	CONDITIONS
	<b>OUTPUT CONDUCTANCE</b>					
$G_{OSS}$	Full Conduction	--	--	40	$\mu S$	$V_{DS}= 15V$ $V_{GS}= 0$
$G_{OS}$	Operating	--	2.0	2.7	$\mu S$	$V_{DS}= 15V$ $I_D= 200\mu A$
$ G_{OS1-2} $	Differential	--	0.02	0.2	$\mu S$	
	<b>COMMON MODE REJECTION</b>					
CMRR	$-20 \log  \Delta V_{GS1-2} / \Delta V_{DS} $	90	100	--	dB	$V_{DS}= 10$ to $20V$ $I_D= 500\mu A$
CMRR		--	85	--	dB	$V_{DS}= 5$ to $10V$ $I_D= 500\mu A$
	<b>NOISE</b>					
NF	Figure	--	--	0.5	dB	$V_{DS}= 15V$ $V_{GS}= 0$ $R_G= 10M\Omega$ $f= 100Hz$ $NBW= 6Hz$
$e_n$	Voltage	--	--	7	nV/Hz	$V_{DS}= 15V$ $I_D= 500\mu A$ $f= 1kHz$ $NBW= 1Hz$
$e_n$	Voltage	--	--	11	nV/Hz	$V_{DS}= 15V$ $I_D= 500\mu A$ $f= 10Hz$ $NBW= 1Hz$
	<b>CAPACITANCE</b>					
$C_{ISS}$	Input	--	--	8	pF	$V_{DS}= 15V$ $I_D= 500\mu A$ $f= 1mHz$
$C_{RSS}$	Reverse Transfer	--	--	3	pF	
$C_{DD}$	Drain-to-Drain	--	0.5	--	pF	$V_{DD}= 15V$ $I_D= 500\mu A$ $f= 1mHz$



### NOTES:

1. These ratings are limiting values above which the serviceability of any semiconductor may be impaired.
2. Derate 4mW/°C above 25°C
3. All MIN/TYP/MAX limits are absolute numbers. Negative signs indicate electrical polarity only.

Linear Integrated Systems (LIS) is a 25-year-old, third-generation precision semiconductor company providing high-quality discrete components. Expertise brought to LIS is based on processes and products developed at Amelco, Union Carbide, Intersil and Micro Power Systems by company President John H. Hall. Hall, a protégé of Silicon Valley legend Dr. Jean Hoerni, was the director of IC Development at Union Carbide, co-founder and vice president of R&D at Intersil, and founder/president of Micro Power Systems.