

# LINEAR SYSTEMS

Twenty-Five Years Of Quality Through Innovation

## LS840 LS841 LS842

LOW NOISE LOW DRIFT  
LOW CAPACITANCE  
MONOLITHIC DUAL N-CANNEL JFET

### FEATURES

LOW NOISE	$e_n=8nV/Hz$ TYP.
LOW LEAKAGE	$I_G=10pA$ TYP.
LOW DRIFT	$I V_{GS1-2}/Tl=5\mu V/^{\circ}C$ max.
LOW OFFSET VOLTAGE	$ V_{GS1-2} =2mV$ TYP.

### ABSOLUTE MAXIMUM RATINGS<sup>1</sup>

@ 25°C (unless otherwise noted)

### Maximum Temperatures

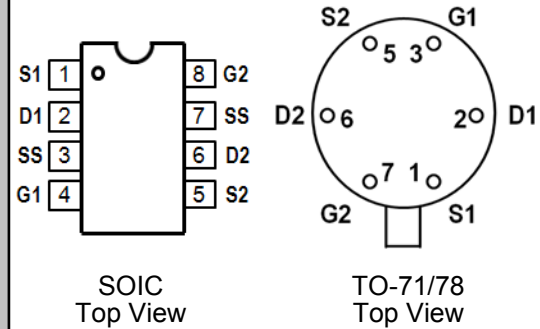
Storage Temperature	-55°C to +150°C
Operating Junction Temperature	-55°C to +150°C

### Maximum Voltage and Current for Each Transistor<sup>1</sup>

$-V_{GSS}$	Gate Voltage to Drain or Source	60V
$I_{G(f)}$	Gate Forward Current	10mA

### Maximum Power Dissipation

Device Dissipation <sup>2</sup> @ Free Air - Total	400mW $T_A=+25^{\circ}C$
--	--------------------------

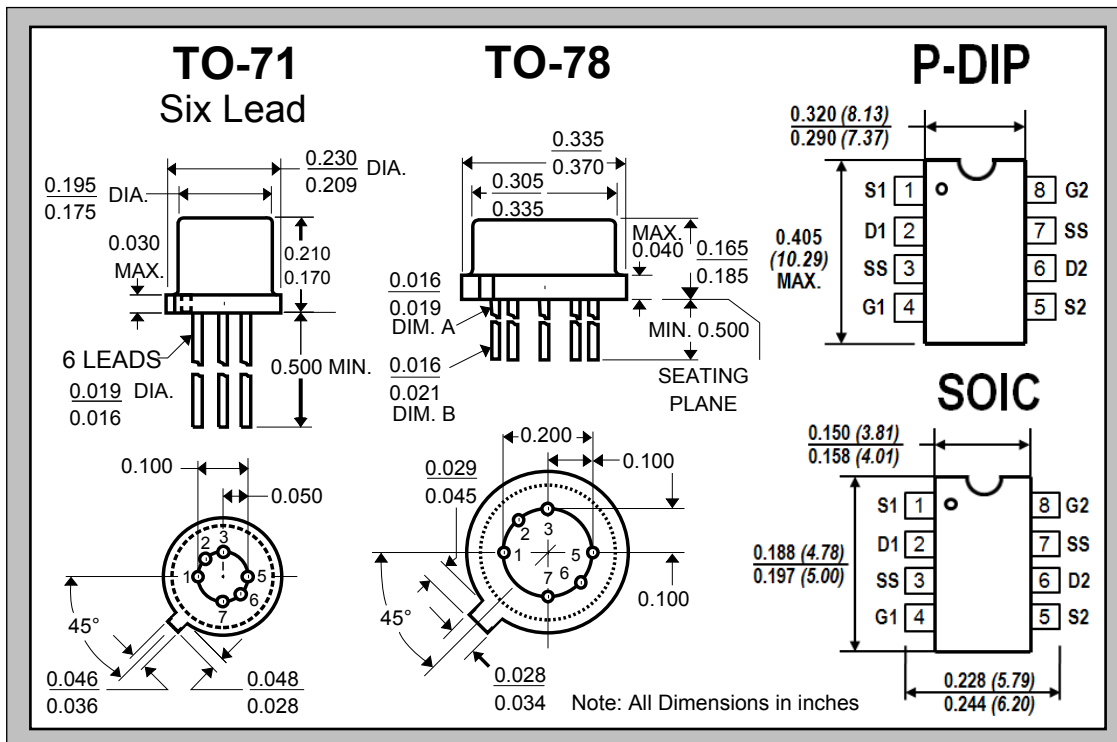


### ELECTRICAL CHARACTERISTICS @ 25°C (unless otherwise noted)

SYMBOL	CHARACTERISTIC	LS840	LS841	LS842	UNITS	CONDITIONS
$I V_{GS1-2} / Tl$ max.	Drift vs. Temperature	5	10	40	$\mu V/^{\circ}C$	$V_{DG} = 20V$ $I_D = 200\mu A$ $T_A = -55^{\circ}C$ to $+125^{\circ}C$
$ V_{GS1-2} $ max.	Offset Voltage	5	10	25	mA	$V_{DG} = 20V$ $I_D = 200\mu A$

SYMBOL	CHARACTERISTIC <sup>3</sup>	MIN.	TYP.	MAX.	UNITS	CONDITIONS
$BV_{GSS}$	Breakdown Voltage	-60	--	--	V	$V_{DS}=0$ $I_D = -1nA$
$BV_{GGO}$	Gate-to-Gate Breakdown	$\pm 60$	--	--	V	$I_{GGO} = \pm 1\mu A$ $I_D = 0$ $I_S = 0$
<b>TRANSCONDUCTANCE</b>						
$G_{fss}$	Full Conduction	1000		4000	$\mu S$	$V_{DG}=20V$ $V_{GS}=0$ $f = 1kHz$
$G_{fs}$	Typical Conduction	500		1000	$\mu S$	$V_{DG}=20V$ $I_D = 200\mu A$
$\frac{G_{fs1}}{G_{fs2}}$ <sup>4</sup>	Mismatch Transconductance Ratio	0.97		1.0		
<b>DRAIN CURRENT</b>						
$I_{DSS}$	Full Conduction	0.5	2	5	mA	$V_{DG}=20V$ $V_{GS}=0$
$\frac{I_{DSS1}}{I_{DSS2}}$ <sup>4</sup>	Drain Current Ratio	0.95		1.0		
<b>GATE-SOURCE</b>						
$V_{GS(off)}$	Pinchoff Voltage	-1	-2	-4.5	V	$V_{DS}=20V$ $I_D = 1nA$
$V_{GS}$	Operating Range	-0.5	--	-4	V	$V_{DS}=20V$ $I_D = 200\mu A$
<b>GATE CURRENT</b>						
$-I_G$	Operating	--	10	50	pA	$V_{DG}=20V$ $I_D = 200\mu A$
$-I_G$	High Temperature	--	--	50	nA	$V_{DG}=20V$ $I_D = 200\mu A$ $T_A = +125^{\circ}C$
$-I_G$	Reduced VDG	--	5	--	pA	$V_{DG}=10V$ $I_D = 200\mu A$
$-I_{GSS}$	At Full Conduction	--	--	100	pA	$V_{DG}=20V$ $V_{DS}=0$

SYMBOL	CHARACTERISTIC	MIN.	TYP.	MAX.	UNITS	CONDITIONS
$G_{OSS}$	<b>OUTPUT CONDUCTANCE</b>					
	Full Conduction	--	--	10	$\mu S$	$V_{DS}=20V$ $V_{GS}=0$
	Operating	--	0.1	1	$\mu S$	$V_{DS}=20V$ $I_D=200\mu A$
$ G_{OS1-2} $	Differential	--	0.01	0.1	$\mu S$	
CMRR	<b>COMMON MODE REJECTION</b>					
	$-20 \log  V_{GS1-2}/V_{DS} $	--	100	--	dB	$V_{DS}=10$ to $20V$ $I_D=200\mu A$
CMRR		--	75	--	dB	$V_{DS}=5$ to $10V$ $I_D=200\mu A$
NF	<b>NOISE</b>					
	Figure	--	--	0.5	dB	$V_{DS}=20V$ $V_{GS}=0$ $R_G=10M$ $f=100Hz$ $NBW=6Hz$
$e_n$	Voltage	--	--	10	nV/Hz	$V_{DS}=20V$ $I_D=200\mu A$ $f=1KHz$ $NBW=1Hz$
$e_n$	Voltage	--	--	15	nV/Hz	$V_{DS}=20V$ $I_D=200\mu A$ $f=10Hz$ $NBW=1Hz$
$C_{ISS}$	<b>CAPACITANCE</b>					
	Input	--	4	10	pF	$V_{DS}=20V$ $I_D=200\mu A$
	Reverse Transfer	--	1.2	5	pF	
$C_{DD}$	Drain-to-Drain	--	0.1	--	pF	$V_{DG}=20V$ $I_D=200\mu A$



### 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.
4. Assumes smaller number in the numerator.

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.