

# LINEAR SYSTEMS

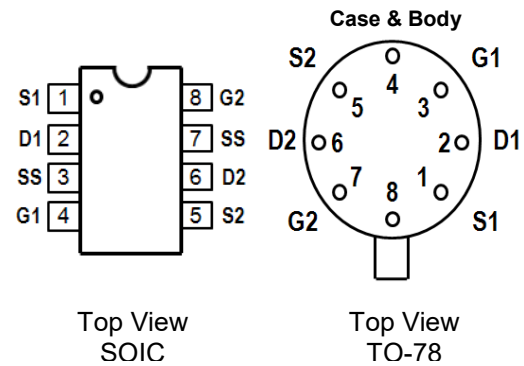
Twenty-Five Years Of Quality Through Innovation

## FEATURES

LOW DRIFT	$ \Delta V_{GS1-2}/\Delta T  = 5\mu V/^{\circ}C$ max.
ULTRA LOW LEAKAGE	$I_G = 150fA$ TYP.
LOW PINCHOFF	$V_P = 2V$ TYP.
<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 40V
-I <sub>G(f)</sub>	Gate Forward Current 10mA
-I <sub>G</sub>	Gate Reverse Current 10µA
<b>Maximum Power Dissipation</b>	
Device Dissipation @ TA=25°C - Total	500mW <sup>2</sup>

## LS5905 LS5906 LS5907 LS5908 LS5909

LOW LEAKAGE LOW DRIFT  
MONOLITHIC DUAL N-CHANNEL JFET

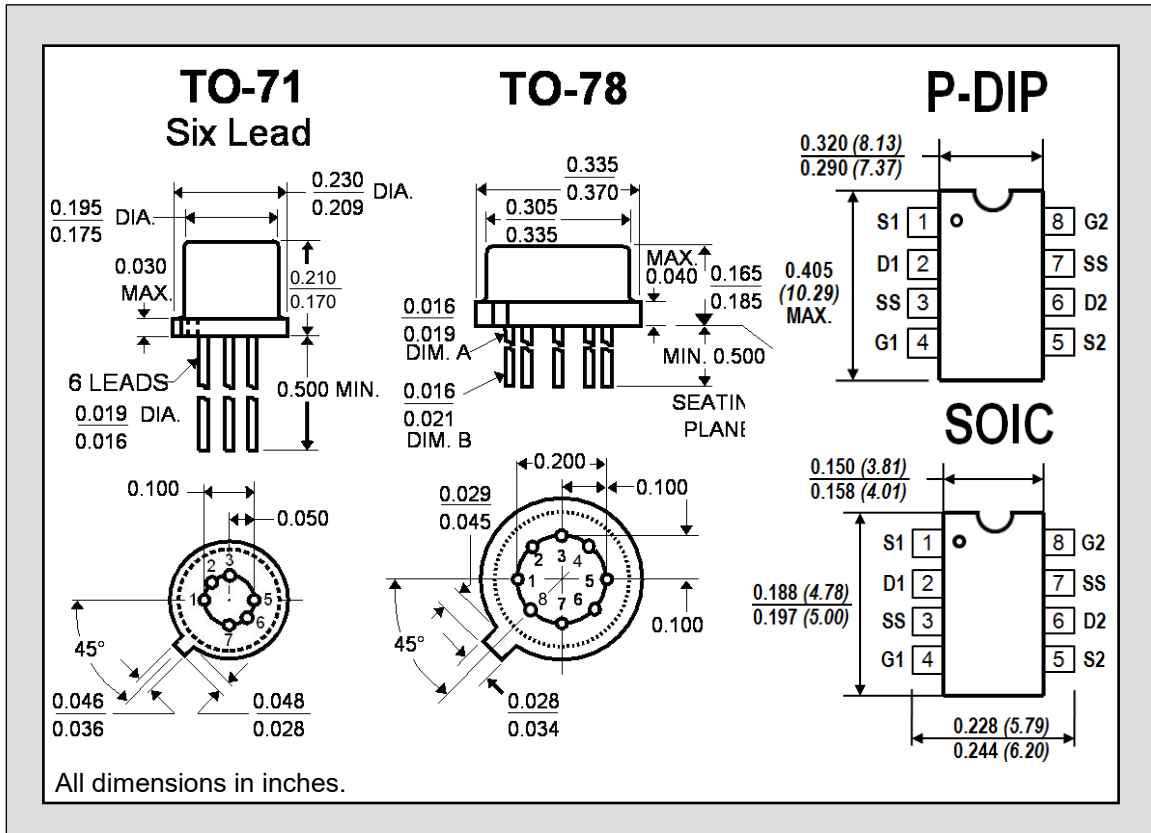


## ELECTRICAL CHARACTERISTICS @ 25°C (unless otherwise noted)

SYMBOL	CHARACTERISTIC	LS5906	LS5907	LS5908	LS5909	LS5905	UNITS	CONDITIONS
$ \Delta V_{GS1-2}/\Delta T $ max.	Drift vs. Temperature	5	10	20	40	40	µV/°C	V <sub>DS</sub> = 10V, I <sub>D</sub> = 30µA T <sub>A</sub> = -55°C to +125°C
$ V_{GS1-2} $ max.	Offset Voltage	5	5	10	15	15	mV	V <sub>DS</sub> = 10V I <sub>D</sub> = 30µA
-I <sub>G</sub> Max	Operating	1	1	1	1	3	pA	
-I <sub>G</sub> Max	High Temperature	1	1	1	1	3	nA	T <sub>A</sub> = +125 °C
-I <sub>GSS</sub> Max	Gate Reverse Current	2	2	2	2	5	pA	V <sub>DS</sub> = 0V V <sub>GS</sub> = -20V
-I <sub>GSS</sub> Max	Gate Reverse Current	5	5	5	5	10	nA	T <sub>A</sub> = +125 °C

SYMBOL	CHARACTERISTIC	MIN.	TYP.	MAX.	UNITS	CONDITIONS
BV <sub>GSS</sub>	Breakdown Voltage	-40	-60	--	V	V <sub>DS</sub> = 0 I <sub>D</sub> = -1µA
BV <sub>GGO</sub>	Gate-to-Gate Breakdown	±40	--	--	V	I <sub>GG</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>DS</sub> = 10V V <sub>GS</sub> = 0 f = 1kHz
G <sub>fs</sub>	Typical Operation	50	100	200	µS	V <sub>DS</sub> = 10V I <sub>D</sub> = 30µA f = 1kHz
$ G_{fs1}/G_{fs2}^3 $	Transconductance Ratio	--	1	5	%	
<b>DRAIN CURRENT</b>						
I <sub>DSS</sub>	Full Conduction	60	400	1000	µA	V <sub>DS</sub> = 10V V <sub>GS</sub> = 0
$ I_{DSS1}/I_{DSS2}^3 $	Drain Current Ratio	--	2	5	%	
<b>GATE VOLTAGE</b>						
V <sub>GS(off)</sub>	Gate-Source Cutoff Voltage	-0.6	-2	-4.5	V	V <sub>DS</sub> = 10V I <sub>D</sub> = 1nA
V <sub>GS</sub>	Operating Range	--	--	-4	V	V <sub>DS</sub> = 10V I <sub>D</sub> = 30µA
<b>GATE CURRENT</b>						
I <sub>GGO</sub>	Gate-to-Gate Leakage	--	±1	--	pA	V <sub>GG</sub> = 20V

SYMBOL	CHARACTERISTIC	MIN.	TYP.	MAX.	UNITS	CONDITIONS
<b>OUTPUT CONDUCTANCE</b>						
$g_{oss}$	Full Conduction	--	--	5	$\mu S$	$V_{DG}=10V$ $V_{GS}=0$
$g_{os}$	Operating	--	0.1	--	$\mu S$	$V_{DG}=10V$ $I_D=30\mu A$
$ g_{os1-2} $	Differential	--	0.01	0.2	$\mu S$	
<b>COMMON MODE REJECTION</b>						
CMRR	$-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 $10V$ $I_D=30\mu A$
<b>NOISE</b>						
NF	Figure	--	--	1	dB	$V_{DS}=10V$ $V_{GS}=0$ $R_G=10M\Omega$ $f=100Hz$ $NBW=6Hz$
$e_n$	Voltage	--	20	70	$nV/\sqrt{Hz}$	$V_{DS}=10V$ $I_D=30\mu A$ $f=10Hz$ $NBW=1Hz$
<b>CAPACITANCE</b>						
$C_{ISS}$	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	$V_{DG}=20V$ $I_D=30\mu A$ $f=1MHz$



**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. Assume smaller value 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.