

# LINEAR SYSTEMS

Twenty-Five Years Of Quality Through Innovation

## U401 - U406

LOW NOISE LOW DRIFT  
MONOLITHIC DUAL N-CHANNEL JFET

### FEATURES

LOW DRIFT	$ V_{GS1-2}/T  = 10\mu V/^{\circ}C$ TYP.
LOW NOISE	$e_n = 6nV/\sqrt{Hz}$ @10Hz TYP.
LOW PINCHOFF	$V_p = 2.5V$ TYP.

### ABSOLUTE MAXIMUM RATINGS NOTE 1

@ 25 °C (unless otherwise noted)

### Maximum Temperatures

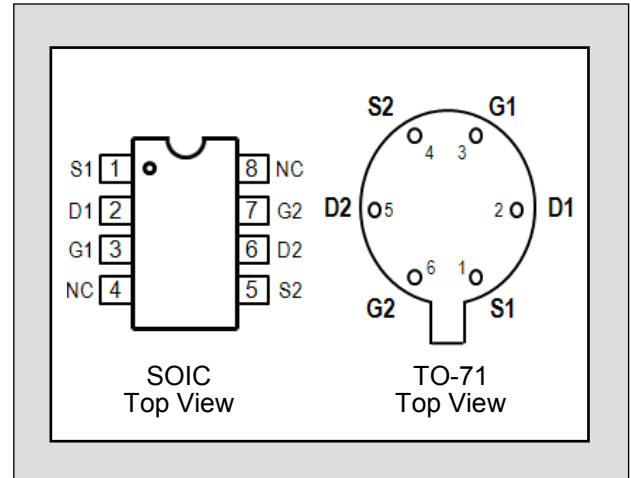
Storage Temperature	-55 to +150°C
Operating Junction Temperature	-55 to +150°C

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

$-V_{GSS}$	Gate Voltage to Drain or Source	50V
$-V_{DSO}$	Drain to Source Voltage	50V
$-I_{G(f)}$	Gate Forward Current	10mA

### Maximum Power Dissipation per side NOTE 2

Device Dissipation $T_A = 25^{\circ}C$	300mW
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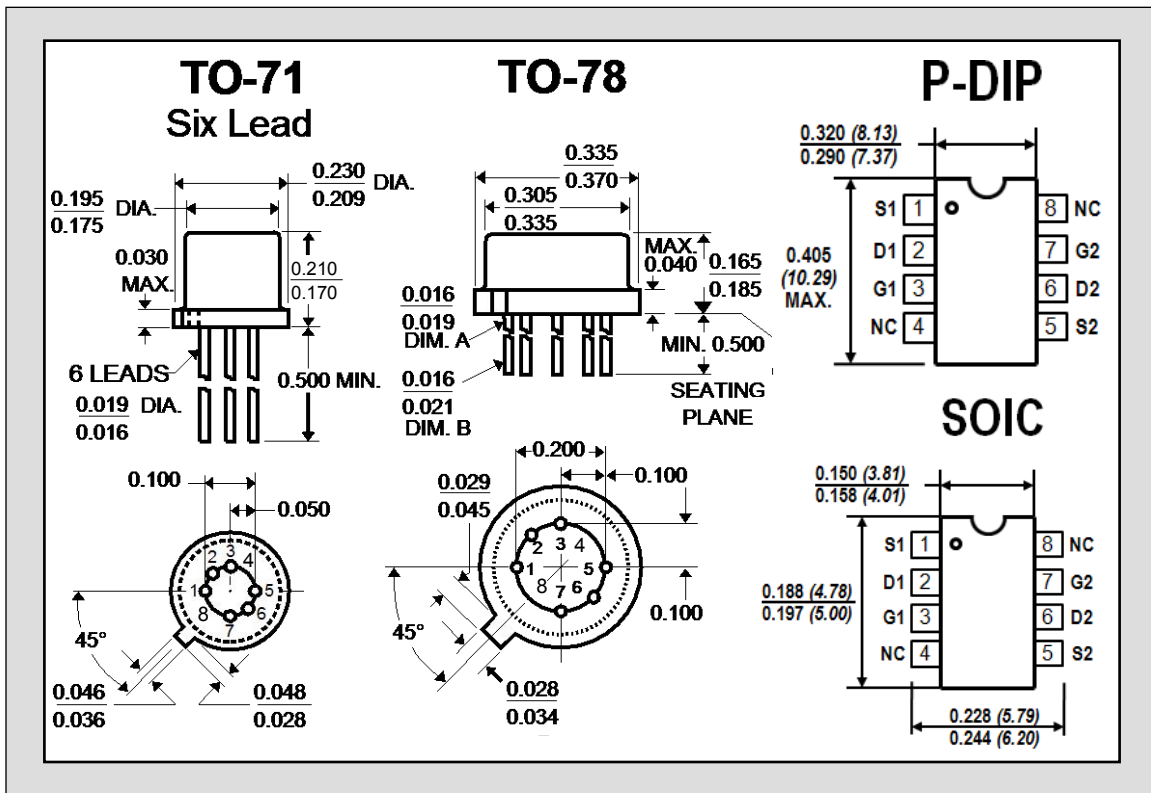
### MATCHING CHARACTERISTICS @ 25°C (unless otherwise noted)

SYMBOL	CHARACTERISTIC	U401	U402	U403	U404	U405	U406	UNITS	CONDITIONS
$ V_{GS1-2}/T $ max.	Drift vs. Temperature	10	10	25	25	40	80	$\mu V/^{\circ}C$	$V_{DG} = 10V, I_D = 200\mu A$ $T_A = -55^{\circ}C$ to $+125^{\circ}C$
$ V_{GS1-2} $ max.	Offset Voltage	5	10	10	15	20	40	mV	$V_{DG} = 10V, I_D = 200\mu A$

### ELECTRICAL CHARACTERISTICS $T_A = 25^{\circ}C$ (unless otherwise noted) NOTE 3

SYMBOL	CHARACTERISTIC	MIN.	TYP.	MAX.	UNITS	CONDITIONS		
$BV_{GSS}$	Breakdown Voltage	-50	-60	--	V	$V_{DS} = 0$	$I_D = 1nA$	
$BV_{G1G2}$	Gate-to-Gate Breakdown	$\pm 50$	--	--	V	$I_G = \pm 1\mu A$	$I_D = 0, I_S = 0$	
<b>TRANSCONDUCTANCE</b>								
$G_{fs}$	Full Conduction	2000	--	7000	$\mu S$	$V_{DG} = 10V$	$V_{GS} = 0, f = 1kHz$	
$G_{fs}$	Typical Operation	1000	--	2000	$\mu S$	$V_{DG} = 15V$	$I_D = 200\mu A, f = 1kHz$	
$ G_{fs1}/G_{fs2} $	Mismatch	0.97	--	1.0				
$I_{DSS}$	Saturation Drain Current	0.5	--	10	mA			
$I_{DSS1}/I_{DSS2}$	Saturation Current Ratio	0.9	0.98	1.0		$V_{DG} = 10V$	$V_{GS} = 0$	
<b>GATE VOLTAGE</b>								
$V_{GS(off)}$ or $V_p$	Pinchoff Voltage	-0.5	--	-2.5	V	$V_{DS} = 15V$	$I_D = 1nA$	
$V_{GS}$	Operating Range	--	--	-2.3	V	$V_{DS} = 15V$	$I_D = 200\mu A$	
<b>GATE CURRENT</b>								
$I_G$	Operating	--	-4	-15	pA	$V_{DG} = 15V$	$I_D = 200\mu A$	
$I_G$	High Temperature	--	--	-10	nA	$T_A = +125^{\circ}C$		
$I_{GSS}$	Gate Reverse Current	--	--	-100	pA	$V_{GS} = -30V, V_{DS} = 0V$		
$I_{G1G2}$	Gate to Gate Isolation Current	--	--	$\pm 1.0$	$\mu A$	$V_{G1} - V_{G2} = \pm 50V, I_D = I_S = 0$		

SYMBOL	CHARACTERISTIC	MIN.	TYP.	MAX.	UNITS	CONDITIONS
	<b><u>OUTPUT CONDUCTANCE</u></b>					
G <sub>oss</sub>	Full Conduction	--	--	20	μS	V <sub>DS</sub> = 10V, V <sub>GS</sub> = 0, f = 1kHz
G <sub>os</sub>	Operating	--	0.2	2	μS	V <sub>DS</sub> = 15V, I <sub>D</sub> = 500μA, f = 1kHz
	<b><u>COMMON MODE REJECTION</u></b>					
CMRR	$-20 \log \left  \frac{\Delta V_{GS1-2}}{V_{DG}} \right $	95	--	--	dB	V <sub>DS</sub> = 10 to 20V I <sub>D</sub> =30μA
	<b><u>NOISE</u></b>					
NF	Figure	--	--	0.5	dB	V <sub>DS</sub> = 15V V <sub>GS</sub> = 0 R <sub>G</sub> =10M f= 100Hz NBW= 6Hz
e <sub>n</sub>	Voltage	--	20	--	nV/Hz	V <sub>DS</sub> = 15V I <sub>D</sub> = 200μA f= 10Hz NBW= 1Hz
	<b><u>CAPACITANCE</u></b>					
C <sub>ISS</sub>	Input	--	--	8	pF	V <sub>DS</sub> = 15V I <sub>D</sub> = 200μA f= 1MHz
C <sub>RSS</sub>	Reverse Transfer	--	--	1.5	pF	



**NOTES:**

1. These ratings are limiting values above which the serviceability of any semiconductor may be impaired
2. Derate 2.4mW/°C when TA is greater than 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.