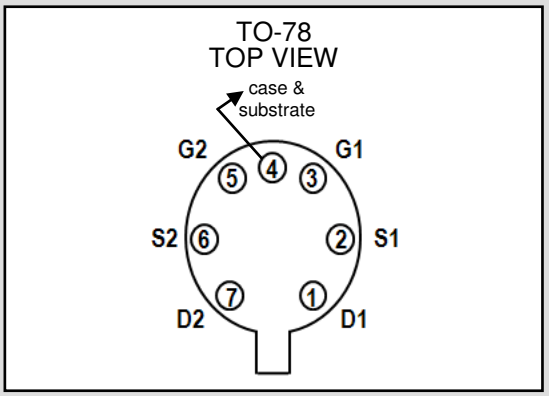
LINEAR SYSTEMS

Linear Integrated Systems

3N190 3N191

P-CHANNEL DUAL MOSFET ENHANCEMENT MODE

FEATURES	
DIRECT REPLACEMENT FOR INTERSIL 3N190 & 3N191	
LOW GATE LEAKAGE CURRENT	I_{GSS} ≤ ±10pA
LOW TRANSFER CAPACITANCE	C_{rss} ≤ 1.0pF
ABSOLUTE MAXIMUM RATINGS[1] @ 25 °C (unless otherwise stated)	
Maximum Temperatures	
Storage Temperature	-65 to +150 °C
Operating Junction Temperature	-55 to +135 °C
Maximum Power Dissipation @ TA=25ºC	
Continuous Power Dissipation One Side	300mW
Continuous Power Dissipation Both Sides	525mW
Maximum Current	
Drain to Source[2]	50mA
Maximum Voltages	
Drain to Gate[2]	30V
Drain to Source[2]	30V
Gate to Gate	±80V



MATCHING CHARACTERISTICS @ 25 °C (unless otherwise stated) (V_{BS} = 0V unless otherwise stated)

SYMBOL	CHARACTERISTIC	MIN	TYP	MAX	UNITS	CONDITIONS
g_{fs1}/g_{fs2}	Forward Transconductance Ratio	0.85		1.0		V_{DS} = -15V, I_D = -500µA, f = 1kHz
V_{GS1-2}	Gate to Source Threshold Voltage Differential			100	mV	V_{DS} = -15V, I_D = -500µA
$\frac{\Delta V_{GS1-2}}{\Delta T}$	Gate to Source Threshold Voltage Differential with Temperature[4]			100	µV/°C	V_{DS} = -15V, I_D = -500µA T_S = -55 to +25 °C
$\frac{\Delta V_{GS1-2}}{\Delta T}$	Gate to Source Threshold Voltage Differential with Temperature[4]			100		V_{DS} = -15V, I_D = -500µA T_S = +25 to +125 °C

ELECTRICAL CHARACTERISTICS @ 25 °C (unless otherwise stated) (V_{SB} = 0V unless otherwise stated)

SYMBOL	CHARACTERISTIC	MIN	TYP	MAX	UNITS	CONDITIONS
BV_{DSS}	Drain to Source Breakdown Voltage	-40			V	I_D = -10µA
BV_{SDS}	Source to Drain Breakdown Voltage	-40				I_S = -10µA, V_{BD} = 0V
V_{GS}	Gate to Source Voltage	-3.0		-6.5		V_{DS} = -15V, I_D = -500µA
$V_{GS(th)}$	Gate to Source Threshold Voltage	-2.0		-5.0		V_{DS} = V_{GS}, I_D = -10µA
		-2.0		-5.0		V_{DS} = -15V, I_D = -500µA
I_{GSSR}	Reverse Gate Leakage Current			10	pA	V_{GS} = 40V
I_{GSSF}	Forward Gate Leakage Current			-10		V_{GS} = -40V
I_{DSS}	Drain Leakage Current "Off"			-200		V_{DS} = -15V
I_{SDS}	Source to Drain Leakage Current "Off"			-400		V_{SD} = -15V, V_{DB} = 0V
$I_{D(on)}$	Drain Current "On"[3]	-5.0		-30.0	mA	V_{DS} = -15V, V_{GS} = -10V
I_{G1G2}	Gate to Gate Isolation Current	-		±1.0	µA	V_{G1G2} = ±80V, I_D = I_S = 0 = mA

• 4042 Clipper Court • Fremont, CA 94538 • Tel: 510 490-9160 • Fax: 510 353-0261

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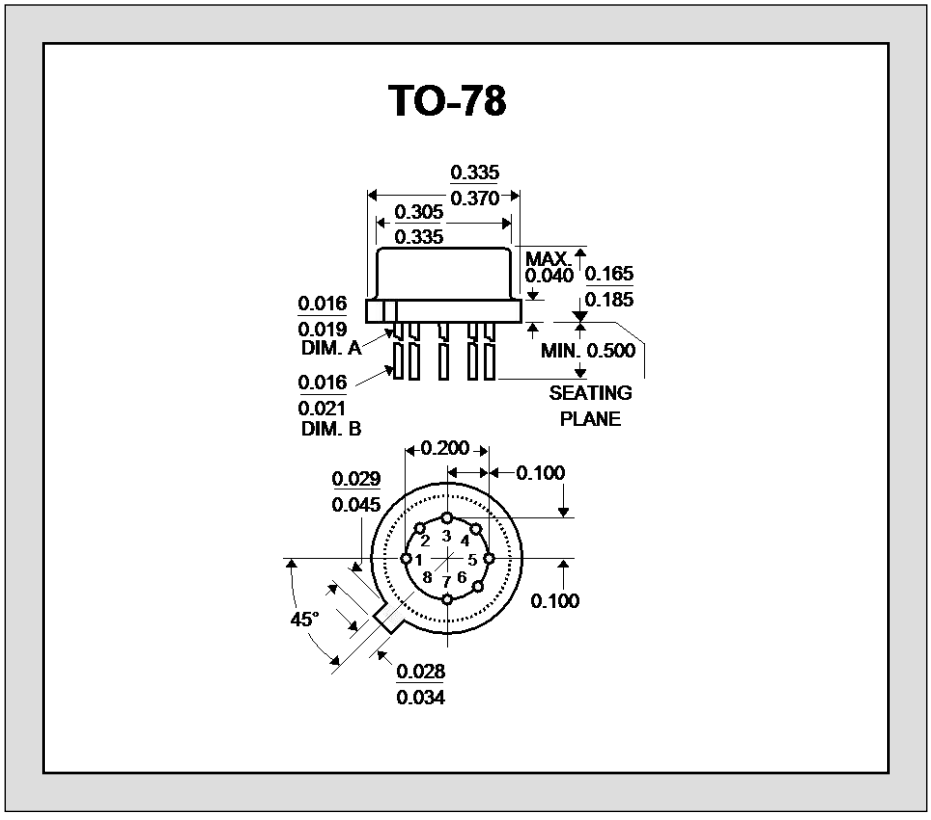
ELECTRICAL CHARACTERISTICS CONT. @ 25 °C (unless otherwise stated) (V_{SB} = 0V unless otherwise stated)

SYMBOL	CHARACTERISTIC	MIN	TYP	MAX	UNITS	CONDITIONS
g_{fs}	Forward Transconductance[4]	1500		4000	µS	V_{DS} = -15V, I_D = -5mA, f = 1kHz
g_{os}	Output Admittance			300		
$r_{ds(on)}$	Drain to Source "On" Resistance			300	Ω	V_{DS} = -20V, I_D = -100µA
C_{rss}	Reverse Transfer Capacitance			1.0	pF	V_{DS} = -15V, I_D = -5mA, f = 1MHz
C_{iss}	Input Capacitance Output Shorted			4.5		
C_{oss}	Output Capacitance Input Shorted			3.0		

SWITCHING CHARACTERISTICS

SYMBOL	CHARACTERISTIC	MIN	TYP	MAX	UNITS	CONDITIONS
$t_{d(on)}$	Turn On Delay Time			15	ns	V_{DD} = -15V, $I_{D(on)}$ = -5mA, $R_G = R_L$ = 1.4kΩ
t_r	Turn On Rise Time			30		
t_{off}	Turn Off Time			50		



1. Absolute maximum ratings are limiting values above which serviceability may be impaired.
2. Per transistor.
3. Pulse: t = 300µs, Duty Cycle ≤ 3%
4. Measured at end points, T_A and T_B.

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.