

## The LS3N190 is a monolithic dual enhancement mode P-Channel Mosfet

The LS3N190 is a dual enhancement mode P-Channel Mosfet and is ideal for space constrained applications and those requiring tight electrical matching.

The hermetically sealed TO-78 package is well suited for high reliability and harsh environment applications.

(See Packaging Information).

### LS3N190 Features:

- Very high Input Impedance
- High Gate Breakdown Voltage
- Low Capacitance

FEATURES	
DIRECT REPLACEMENT FOR INTERSIL LS3N190	
LOW GATE LEAKAGE CURRENT	$I_{GSS} \leq \pm 10\text{pA}$
LOW TRANSFER CAPACITANCE	$C_{RSS} \leq 1.0\text{pF}$
<b>ABSOLUTE MAXIMUM RATINGS<sup>1</sup> @ 25°C (unless otherwise noted)</b>	
<b>Maximum Temperatures</b>	
Storage Temperature	-65°C to +150°C
Operating Junction Temperature	-55°C to +135°C
<b>Maximum Power Dissipation</b>	
Continuous Power Dissipation (one side)	300mW
Continuous Power Dissipation (one side)	525mW
<b>MAXIMUM CURRENT</b>	
Drain to Source <sup>2</sup>	50mA
<b>MAXIMUM VOLTAGES</b>	
Drain to Gate or Drain to Source <sup>2</sup>	-30V
Transient Gate to Source <sup>2,3</sup>	$\pm 125\text{V}$
Gate-Gate Voltage	$\pm 80\text{V}$

### LS3N190 ELECTRICAL CHARACTERISTICS @ 25°C (unless otherwise noted)

SYMBOL	CHARACTERISTIC	MIN	TYP.	MAX	UNITS	CONDITIONS
$BV_{DSS}$	Drain to Source Breakdown Voltage	-40	--	--	V	$I_D = -10\mu\text{A}$
$BV_{SDS}$	Source to Drain Breakdown Voltage	-40	--	--		$I_S = -10\mu\text{A}, V_{BD} = 0\text{V}$
$V_{GS}$	Gate to Source Voltage	-3.0	--	-6.5		$V_{DS} = -15\text{V}, I_D = -500\mu\text{A}$
$V_{GS(th)}$	Gate to Source Threshold Voltage	-2.0	--	-5.0		$V_{DS} = -15\text{V}, I_D = -500\mu\text{A}$
		-2.0	--	-5.0		$V_{DS} = V_{GS}, I_D = -10\mu\text{A}$
$I_{GSSR}$	Gate Reverse Leakage Current	--	--	10	pA	$V_{GS} = 40\text{V}$
$I_{GSSF}$	Forward Gate Leakage Current	--	--	-10		$V_{GS} = -40\text{V}$
$I_{DSS}$	Drain to Source Leakage Current	--	--	-200		$V_{DS} = -15\text{V}$
$I_{SDS}$	Source to Drain Leakage Current	--	--	-400		$V_{SD} = -15\text{V}, V_{DB} = 0$
$I_{D(on)}$	Drain Current "On"	-5.0	--	-30	mA	$V_{DS} = -15\text{V}, V_{GS} = -10\text{V}$
$r_{DS(on)}$	Drain to Source "On" Resistance	--	--	300	$\Omega$	$V_{DS} = -20\text{V}, I_D = -100\mu\text{A}$
$g_{fs}$	Forward Transconductance <sup>4</sup>	1500	--	4000	$\mu\text{S}$	$V_{DS} = -15\text{V}, I_D = -5\text{mA}, f = 1\text{kHz}$
$Y_{os}$	Output Admittance	--	--	300		
$C_{iss}$	Input Capacitance	--	--	4.5	pF	$V_{DS} = -15\text{V}, I_D = -5\text{mA}, f = 1\text{MHz}$
$C_{rss}$	Reverse Transfer Capacitance	--	--	1.0		
$C_{oss}$	Output Capacitance	--	--	3.0		

### MATCHING CHARACTERISTICS LS3N190

SYMBOL	CHARACTERISTIC	LIMITS		UNITS	CONDITIONS
		MIN	MAX		
$g_{fs1}/g_{fs2}$	Forward Transconductance Ratio	0.85	1.0	ns	$V_{DS} = -15\text{V}, I_D = -500\mu\text{A}, f = \text{kHz}$
$V_{GS1-2}$	Gate Source Threshold Voltage Differential <sup>5</sup>	--	100	mV	$V_{DS} = -15\text{V}, I_D = -500\mu\text{A}$
$\Delta V_{GS1-2}/\Delta T$	Gate Source Threshold Voltage Differential Change with Temperature <sup>5</sup>	--	100	$\mu\text{V}/^\circ\text{C}$	$V_{DS} = -15\text{V}, I_D = -500\mu\text{A}, T_S = -55^\circ\text{C to } +25^\circ\text{C}$ $V_{DS} = -15\text{V}, I_D = -500\mu\text{A}, T_S = +25^\circ\text{C to } +125^\circ\text{C}$

### SWITCHING CHARACTERISTICS

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

Note 1 - Absolute maximum ratings are limiting values above which LS3N190 serviceability may be impaired.

Note 2 - Per Transistor

Note 3 - Approximately doubles for every 10°C in  $T_A$

Note 4 - Measured at end points,  $T_A$  and  $T_B$

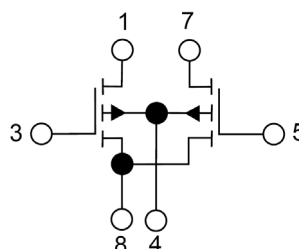
Note 5 - Pulse:  $t = 300\mu\text{S}$ , Duty Cycle  $\leq 3\%$

Available Packages:

LS3N190 in TO-72  
LS3N190 in bare die.

Please contact Micross for full package and die dimensions

Device Schematic



TO-78 (Bottom View)

