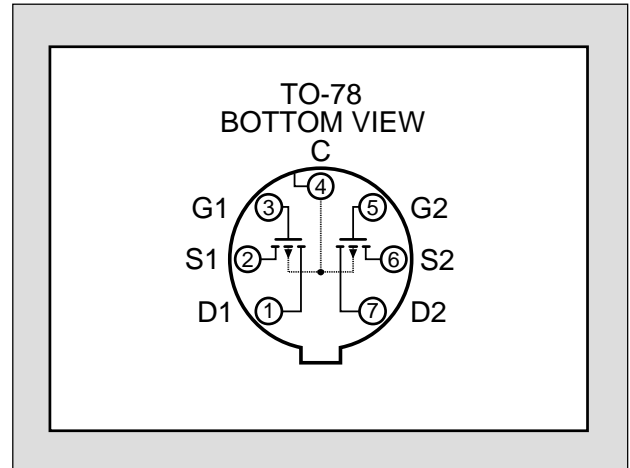


3N190 3N191

P-CHANNEL DUAL MOSFET ENHANCEMENT MODE

| FEATURES | |
|---|--------------------------------|
| DIRECT REPLACEMENT FOR INTERSIL 3N190 & 3N191 | |
| LOW GATE LEAKAGE CURRENT | $I_{GSS} \leq \pm 10\text{pA}$ |
| LOW TRANSFER CAPACITANCE | $C_{rss} \leq 1.0\text{pF}$ |
| 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 | |
| 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 |
| Transient Gate to Source ^{2,3} | $\pm 125\text{V}$ |
| Gate to Gate | $\pm 80\text{V}$ |



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

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

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

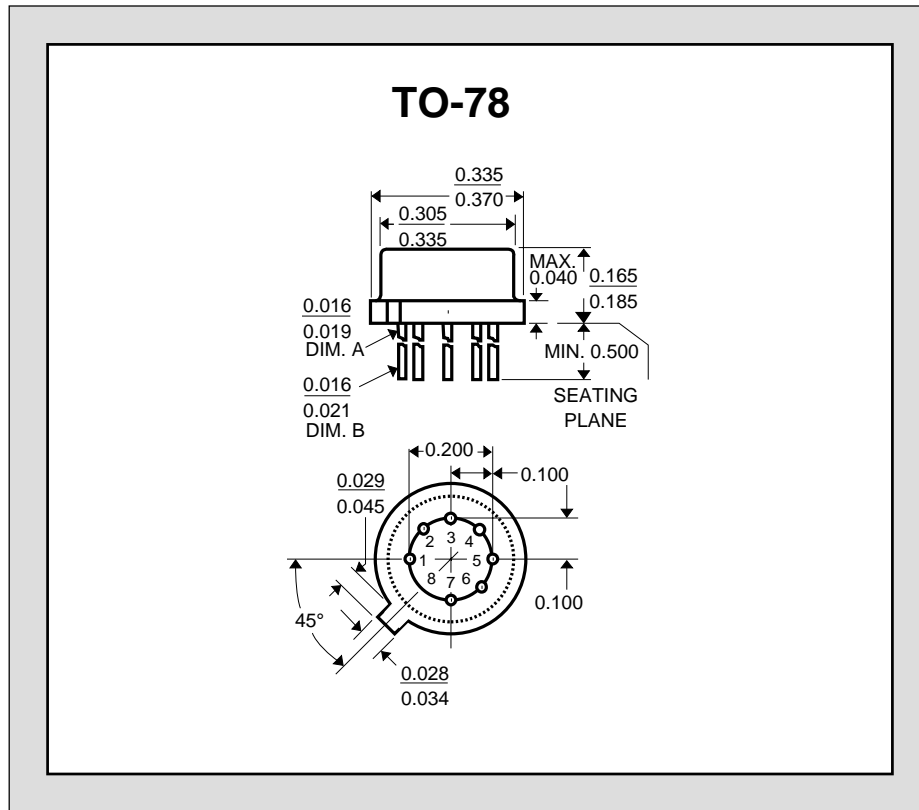
| SYMBOL | CHARACTERISTIC | MIN | TYP | MAX | UNITS | CONDITIONS |
|--------------|---------------------------------------|------|-----|-------|-------|--|
| BV_{DSS} | Drain to Source Breakdown Voltage | -40 | | | V | $I_D = -10\mu\text{A}$ |
| BV_{SDS} | Source to Drain Breakdown Voltage | -40 | | | | $I_S = -10\mu\text{A}$, $V_{BD} = 0\text{V}$ |
| 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 | | $V_{DS} = V_{GS}$, $I_D = -10\mu\text{A}$ |
| | | -2.0 | | -5.0 | | $V_{DS} = -15\text{V}$, $I_D = -500\mu\text{A}$ |
| I_{GSSR} | Reverse Gate Leakage Current | | | 10 | pA | $V_{GS} = 40\text{V}$ |
| I_{GSSF} | Forward Gate Leakage Current | | | -10 | | $V_{GS} = -40\text{V}$ |
| I_{DSS} | Drain Leakage Current "Off" | | | -200 | | $V_{DS} = -15\text{V}$ |
| I_{SDS} | Source to Drain Leakage Current "Off" | | | -400 | | $V_{SD} = -15\text{V}$, $V_{DB} = 0\text{V}$ |
| $I_{D(on)}$ | Drain Current "On" | -5.0 | | -30.0 | mA | $V_{DS} = -15\text{V}$, $V_{GS} = -10\text{V}$ |

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

| SYMBOL | | | | | |
|--------------|---------------------------------------|------|--|------|---|
| g_{fs} | Forward Transconductance ⁵ | 1500 | | 4000 | μS $V_{DS} = -15V, I_D = -5mA, f = 1kHz$ |
| Y_{os} | Output Admittance | | | 300 | |
| $r_{ds(on)}$ | Drain to Source "On" Resistance | | | 300 | Ω $V_{DS} = -20V, I_D = -100\mu A$ |
| 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 | $V_{DD} = -15V, I_{D(on)} = -5mA,$ $R_G = R_L = 1.4k\Omega$ |
| 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. Approximately doubles for every 10 °C increase in T_A .
4. Pulse: $t = 300\mu s$, Duty Cycle $\leq 3\%$
5. Measured at end points, T_A and T_B .

Information furnished by Linear Integrated Systems is believed to be accurate and reliable. However, no responsibility is assumed for its use; nor for any infringement of patents or other rights of third parties which may result from its use. No license is granted by implication or otherwise under any patent or patent rights of Linear Integrated Systems.