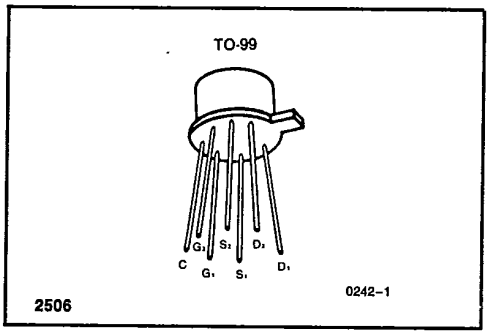
3N188-3N191
Dual P-Channel Enhancement Mode MOSFET General Purpose Amplifier

INTERSIL

FEATURES
- Very High Input Impedance
- High Gate Breakdown 3N190-3N191
- Zener Protected Gate 3N188-3N189
- Low Capacitance

PIN CONFIGURATION



ABSOLUTE MAXIMUM RATINGS
(T_A = 25°C unless otherwise noted)

Drain-Source or Drain-Gate Voltage (Note 1)
- 3N188, 3N189 ..... 40V
- 3N190, 3N191 ..... 30V

Transient Gate-Source Voltage (Notes 1 and 2) ... ±125V
Gate-Gate Voltage ..... ±80V
Drain Current (Note 1) 50mA
Storage Temperature ..... −65°C to +200°C
Operating Temperature ..... −55°C to +150°C
Lead Temperature (Soldering, 10sec) ..... +300°C

Power Dissipation
- One Side 300mW
- Both Sides 525mW
- Total Derating above 25°C ..... 4.2mW/°C

NOTE: *Stresses above those listed under "Absolute Maximum Ratings" may cause permanent damage to the device. These are stress ratings only and functional operation of the device at these or any other conditions above those indicated in the operational sections of the specifications is not implied. Exposure to absolute maximum rating conditions for extended periods may affect device reliability.*

ORDERING INFORMATION

TO-99
3N188
3N189
3N190
3N191

ELECTRICAL CHARACTERISTICS (T_A = 25°C and V_{BS} = 0 unless otherwise specified)

Symbol	Parameter	Test Conditions	3N188 3N189		3N190 3N191		Units
			Min	Max	Min	Max	
I_{GSSR}	Gate Reverse Current	V_{GS} = 40V				10	pA
I_{GSSF}	Gate Forward Current	V_{GS} = −40V		−200		−10	pA
		T_A = 125°C		−200		−25	pA
BV_{DSS}	Drain-Source Breakdown Voltage	I_D = −10μA	−40		−40		V
BV_{SDS}	Source-Drain Breakdown Voltage	I_S = −10μA, V_{BD} = 0	−40		−40		V
$V_{GS(th)}$	Threshold Voltage	V_{DS} = −15V, I_D = −10μA	−2.0	−5.0	−2.0	−5.0	V
		V_{DS} = V_{GS}, I_D = −10μA	−2.0	−5.0	−2.0	−5.0	V
V_{GS}	Gate Source Voltage	V_{DS} = −15V, I_D = −500μA	−3.0	−6.5	−3.0	−6.5	V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS} = −15V		−200		−200	pA
I_{SDS}	Source Drain Current	V_{SD} = −15V, V_{DB} = 0		−400		−400	pA
$r_{DS(on)}$	Drain-Source on Resistance	V_{DS} = −20V, I_D = −100μA		300		300	ohms
$I_{D(on)}$	On Drain Current	V_{DS} = −15V, V_{GS} = −10V	−5.0	−30.0	−5.0	−30.0	mA

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NOTE: All typical values have been characterized but are not tested.

3N188-3N191

INTERSIL

T-29-27

ELECTRICAL CHARACTERISTICS (Continued) (T_A = 25°C and V_{BS} = 0 unless otherwise specified)

Symbol	Parameter	Test Conditions		3N188 3N189		3N190 3N191		Units
				Min	Max	Min	Max	
g_{fs}	Forward Transconductance (Note 3)	V_{DS} = −15V, I_D = −10mA	f = 1kHz	1500	4000	1500	4000	μs
Y_{os}	Output Admittance				300		300	
C_{iss}	Input Capacitance Output Shorted (Note 5)		f = 1MHz		4.5		4.5	pF
C_{rss}	Reverse Transfer Capacitance (Note 5)				1.5		1.0	
C_{oss}	Output Capacitance Input Shorted (Note 5)				3.0		3.0	

SWITCHING CHARACTERISTICS (T_A = 25°C and V_{BS} = 0 unless otherwise specified)

Symbol	Parameter	Test Conditions	Limits		Units
			Min	Max	
$t_{d(on)}$	Turn On Delay Time	V_{DD} = −15V, I_D = −10mA		15	ns
t_r	Rise Time	R_G = R_L = 1.4kΩ (Note 5)		30	
t_{off}	Turn Off Time			50	

MATCHING CHARACTERISTICS (T_A = 25°C and V_{BS} = 0 unless otherwise specified) 3N188 and 3N190

Symbol	Parameter	Test Conditions	Limits		Units
			Min	Max	
Y_{fs1}/Y_{fs2}	Forward Transconductance Ratio	V_{DS} = −15V, I_D = −500μA, f = 1kHz	0.85	1.0	
V_{GS1-2}	Gate Source Threshold Voltage Differential	V_{DS} = −15V, I_D = −500μA		100	mV
$\frac{\Delta V_{GS1-2}}{\Delta T}$	Gate Source Threshold Voltage Differential Change with Temperature (Note 4)	V_{DS} = −15V, I_D = −500μA, T = −55°C to +25°C		100	μV/°C
$\frac{\Delta V_{GS1-2}}{\Delta T}$	Gate Source Threshold Voltage Differential Change with Temperature (Note 4)	V_{DS} = −15V, I_D = −500μA T = +25°C to +125°C		100	μV/°C

NOTES: 1. Per transistor.
2. Approximately doubles for every 10°C increase in T_A.
3. Pulse test duration = 300μs; duty cycle ≤ 3%.
4. Measured at end points, T_A and T_B.
5. For design reference only, not 100% tested.

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NOTE: All typical values have been characterized but are not tested.