

3N165, 3N166

Monolithic Dual P-Channel Enhancement Mode MOSFET General Purpose Amplifier

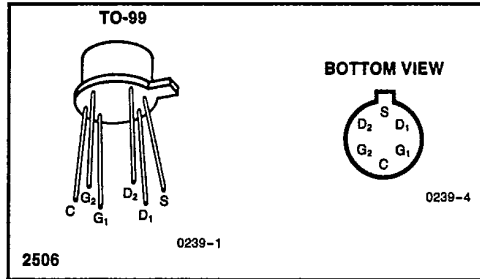


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FEATURES

- Very High Impedance
- High Gate Breakdown
- Low Capacitance

PIN CONFIGURATION



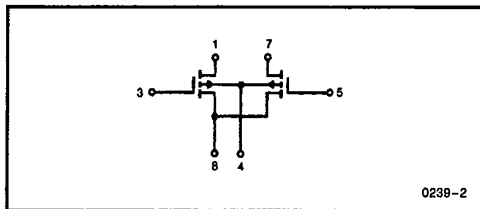
ABSOLUTE MAXIMUM RATINGS (Note 1)

($T_A = 25^\circ\text{C}$ unless otherwise specified)

Drain-Source or Drain-Gate Voltage (Note 2)	
3N165	40V
3N166	30V
Transient Gate-Source Voltage (Note 3)	± 125
Gate-Gate Voltage	$\pm 80\text{V}$
Drain Current (Note 2)	50mA
Storage Temperature	-65°C to $+200^\circ\text{C}$
Operating Temperature	-55°C to $+150^\circ\text{C}$
Lead Temperature (Soldering, 10sec)	$+300^\circ\text{C}$
Power Dissipation	
One Side	300mW
Both Sides	525mW
Total Derating above 25°C	4.2mW/ $^\circ\text{C}$

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.

DEVICE SCHEMATIC



ORDERING INFORMATION

TO-99
3N165
3N166

ELECTRICAL CHARACTERISTICS ($T_A = 25^\circ\text{C}$ and $V_{BS} = 0$ unless otherwise specified)

Symbol	Parameter	Test Conditions	Limits		Units
			Min	Max	
I_{GSSR}	Gate Reverse Leakage Current	$V_{GS} = 40\text{V}$		10	pA
I_{GSSF}	Gate Forward Leakage Current	$V_{GS} = -40\text{V}$		-10	
		$T_A = +125^\circ\text{C}$		-25	
I_{DSS}	Drain to Source Leakage Current	$V_{DS} = -20\text{V}$		-200	mA
I_{SDS}	Source to Drain Leakage Current	$V_{SD} = -20, V_{DB} = 0$		-400	
$I_{D(on)}$	On Drain Current	$V_{DS} = -15\text{V}, V_{GS} = -10\text{V}$	-5	-30	V
$V_{GS(th)}$	Gate Source Threshold Voltage	$V_{DS} = -15\text{V}, I_D = -10\mu\text{A}$	-2	-5	
$V_{GS(th)}$	Gate Source Threshold Voltage	$V_{DS} = V_{GS}, I_D = -10\mu\text{A}$	-2	-5	ohms
$r_{DS(on)}$	Drain Source ON Resistance	$V_{GS} = -20\text{V}, I_D = -100\mu\text{A}$		300	

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

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T-29-27

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ELECTRICAL CHARACTERISTICS (Continued) ($T_A = 25^\circ\text{C}$ and $V_{BS} = 0$ unless otherwise specified)

Symbol	Parameter	Test Conditions	Limits		Units
			Min	Max	
g_{fs}	Forward Transconductance	$V_{DS} = -15\text{V}$, $I_D = -10\text{mA}$, $f = 1\text{kHz}$	1500	3000	μs
g_{os}	Output Admittance			300	
C_{iss}	Input Capacitance			3.0	pF
C_{rss}	Reverse Transfer Capacitance	$V_{DS} = -15\text{V}$, $I_D = -10\text{mA}$, $f = 1\text{MHz}$ (Note 4)		0.7	
C_{oss}	Output Capacitance			3.0	
$R_E(Y_{fs})$	Common Source Forward Transconductance	$V_{DS} = -15\text{V}$, $I_D = -10\text{mA}$, $f = 100\text{MHz}$ (Note 4)	1200		μs

MATCHING CHARACTERISTICS 3N165

Symbol	Parameter	Test Conditions	Limits		Units
			Min	Max	
Y_{fs1}/Y_{fs2}	Forward Transconductance Ratio	$V_{DS} = -15\text{V}$, $I_D = -500\mu\text{A}$, $f = 1\text{kHz}$	0.90	1.0	
V_{GS1-2}	Gate Source Threshold Voltage Differential	$V_{DS} = -15\text{V}$, $I_D = -500\mu\text{A}$		100	mV
$\frac{\Delta V_{GS1-2}}{\Delta T}$	Gate Source Threshold Voltage Differential Change with Temperature	$V_{DS} = -15\text{V}$, $I_A = -500\mu\text{A}$ $T_A = -55^\circ\text{C}$ to $+25^\circ\text{C}$		100	$\mu\text{V}/^\circ\text{C}$

- NOTES 1. See handling precautions on 3N170 data sheet.
 2. Per transistor.
 3. Devices must not be tested at $\pm 125\text{V}$ more than once, nor for longer than 300ms.
 4. For design reference only, not 100% tested.

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