

### The 3N166 is a monolithic dual enhancement mode P-Channel Mosfet

The 3N166 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).

#### 3N166 Features:

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

#### FEATURES

DIRECT REPLACEMENT FOR INTERSIL 3N166

**ABSOLUTE MAXIMUM RATINGS<sup>1</sup>** @ 25°C (unless otherwise noted)

#### Maximum Temperatures

Storage Temperature	-65°C to +200°C
Operating Junction Temperature	-55°C to +150°C
Lead Temperature (Soldering, 10 sec.)	+300°C

#### Maximum Power Dissipation

Continuous Power Dissipation (one side)	300mW
Total Derating above 25°C	4.2 mW/°C

#### MAXIMUM CURRENT

Drain Current	50mA
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#### MAXIMUM VOLTAGES

Drain to Gate or Drain to Source <sup>2</sup>	-30V
Peak Gate to Source <sup>3</sup>	±125V
Gate-Gate Voltage	±80V

#### 3N166 ELECTRICAL CHARACTERISTICS @ 25°C (unless otherwise noted)

SYMBOL	CHARACTERISTIC	MIN	TYP.	MAX	UNITS	CONDITIONS
$I_{GSSR}$	Gate Reverse Leakage Current	--	--	10	pA	$V_{GS} = -0V$
$I_{GSSF}$	Gate Forward Current	--	--	-10		$V_{GS} = -40V$
		$T_A = +125°C$	--	--		-25
$I_{DSS}$	Drain to Source Leakage Current	--	--	-200	mA	$V_{DS} = -20V$
$I_{SDS}$	Source to Drain Leakage Current	--	--	-400		$V_{SD} = -20V$ , $V_{DB} = 0$
$I_{D(on)}$	Drain Current "On"	-5.0	--	-30	mA	$V_{DS} = -15V$ , $V_{GS} = -10V$
$V_{GS(th)}$	Gate to Source Threshold Voltage	-2.0	--	-5.0		$V_{DS} = -15V$ , $I_D = -10\mu A$
		-2.0	--	-5.0		$V_{DS} = V_{GS}$ , $I_D = -10\mu A$
$r_{DS(on)}$	Drain to Source "On" Resistance	--	--	300	$\Omega$	$V_{GS} = -20V$ , $I_D = -100\mu A$
$g_{fs}$	Forward Transconductance	1500	--	3000	$\mu S$	$V_{DS} = -15V$ , $I_D = -10mA$ , $f = 1kHz$
$g_{os}$	Output Admittance	--	--	300		
$C_{iss}$	Input Capacitance	--	--	3	pF	$V_{DS} = -15V$ , $I_D = -10mA$ , $f = 1MHz^4$
$C_{rss}$	Reverse Transfer Capacitance	--	--	0.7		
$C_{oss}$	Output Capacitance	--	--	3.0		
$R_E(Y_{fs})$	Common Source Forward Transconductance	1200	--	--	$\mu S$	$V_{DS} = -15V$ , $I_D = -10mA$ , $f = 100MHz^4$

#### MATCHING CHARACTERISTICS 3N166

SYMBOL	CHARACTERISTIC	LIMITS		UNITS	CONDITIONS
		MIN	MAX		
$Y_{fs1}/Y_{fs2}$	Forward Transconductance Ratio	0.90	1.0	ns	$V_{DS} = -15V$ , $I_D = -500\mu A$ , $f = MHz^4$
$V_{GS1-2}$	Gate Source Threshold Voltage Differential	--	100	mV	$V_{DS} = -15V$ , $I_D = -500\mu A$
$\Delta V_{GS1-2}/\Delta T$	Gate Source Threshold Voltage Differential Change with Temperature	--	100	$\mu V/°C$	$V_{DS} = -15V$ , $I_D = -500\mu A$ $T_A = -55°C$ to $+25°C$

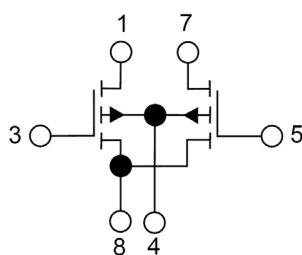
- Note 1 - Absolute maximum ratings are limiting values above which 3N166 serviceability may be impaired. \*  
 Note 2 - Per Transistor  
 Note 3 - Device must not be tested at ±125V more than once or longer than 300ms.  
 Note 4 - For design reference only, not 100% tested

#### Available Packages:

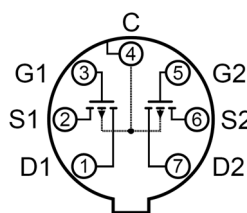
3N166 in TO-72  
 3N166 in bare die.

Please contact Micross for full package and die dimensions

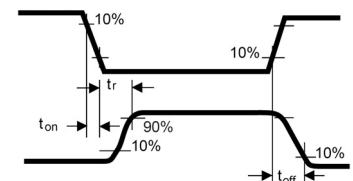
#### Device Schematic



#### TO-78 (Bottom View)

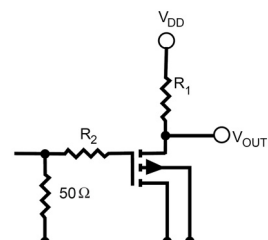


#### SWITCHING WAVEFORM & TEST CIRCUIT



**INPUT PULSE**  
 Rise Time  $\leq 2ns$   
 Pulse Width  $\geq 200ns$

**SAMPLING SCOPE**  
 $T_r \leq 0.2ns$   
 $C_N \leq 2pF$   
 $R_N \leq 10M$



\*To avoid possible damage to the device while wiring, testing, or in actual operation, follow these procedures: To avoid the build-up of static charge, the leads of the devices should remain shorted together with a metal ring except when being tested or used. Avoid unnecessary handling. Pick up devices by the case instead of the leads. Do not insert or remove devices from circuits with the power on, as transient voltages may cause permanent damage to the devices.