3N163, 3N164
P-Channel Enhancement Mode MOSFET General Purpose Amplifier Switch

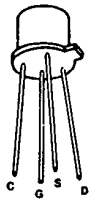
INTERSIL

T-37-25

FEATURES
- Very High Input Impedance
- High Gate Breakdown
- Fast Switching
- Low Capacitance

PIN CONFIGURATION

TO-72



0238-1

1503

ABSOLUTE MAXIMUM RATINGS (Note 1)

(T_A = 25°C unless otherwise noted)

Drain-Source or Drain-Gate Voltage
- 3N163 ..... −40V
- 3N164 ..... −30V

Static Gate-Source Voltage
- 3N163 ..... ±40V
- 3N164 ..... ±30V

Transient Gate-Source Voltage (Note 2) ..... ±125V
Drain Current 50mA
Storage Temperature ..... −65°C to +200°C
Operating Temperature ..... −55°C to +150°C
Lead Temperature (Soldering, 10sec) ..... +300°C
Power Dissipation 375mW
Derate above +25°C ..... 3.0mW/°C

NOTES: 1. See handling precautions on 3N170 data sheet.
2. Devices must not be tested at ±125V more than once, nor for longer than 300ms.

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-72
3N163
3N164

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

Symbol	Parameter	Test Conditions	3N163 Min	3N163 Max	3N164 Min	3N164 Max	Units
I_{GSS}	Gate-Body Leakage Current	V_{GS} = −40V, V_{DS} = 0 (3N163) V_{GS} = −30V, V_{DS} = 0 (3N164)		−10		−10	pA
		T_A = +125°C		−25		−25	
BV_{DSS}	Drain-Source Breakdown Voltage	I_D = −10μA, V_{GS} = 0	−40		−30		V
BV_{SDS}	Source-Drain Breakdown Voltage	I_S = −10μA, V_{GD} = 0, V_{BD} = 0	−40		−30		
$V_{GS(th)}$	Threshold Voltage	V_{DS} = V_{GS}, I_D = −10μA	−2.0	−5.0	−2.0	−5.0	
$V_{GS(th)}$	Threshold Voltage	V_{DS} = −15V, I_D = −10μA	−2.0	−5.0	−2.0	−5.0	
V_{GS}	Gate Source Voltage	V_{DS} = −15V, I_D = −0.5mA	−2.5	−6.5	−2.5	−6.5	
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS} = −15V, V_{GS} = 0		200		400	pA
I_{SDS}	Source Drain Current	V_{SD} = 15V, V_{GS} = V_{DB} = 0		400		800	
$r_{DS(on)}$	Drain-Source on Resistance	V_{GS} = −20V, I_D = −100μA		250		300	ohms
$I_{D(on)}$	On Drain Current	V_{DS} = −15V, V_{GS} = −10V	−5.0	−30.0	−3.0	−30.0	mA

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

3N163, 3N164

3N163, 3N164

INTERSIL

T-37-25

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

Symbol	Parameter	Test Conditions	3N163		3N164		Units
			Min	Max	Min	Max	
g_{fs}	Forward Transconductance	V_{DS} = −15V, I_D = −10mA, f = 1kHz	2000	4000	1000	4000	µs
g_{os}	Output Admittance			250		250	
C_{iss}	Input Capacitance—Output Shorted	V_{DS} = −15V, I_D = −10mA, f = 1MHz (Note 1)		2.5		2.5	pF
C_{rss}	Reverse Transfer Capacitance			0.7		0.7	
C_{oss}	Output Capacitance Input Shorted			3.0		3.0	

NOTE 1: For design reference only, not 100% tested.

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

Symbol	Parameter	Test Conditions	3N163		3N164		Units
			Min	Max	Min	Max	
t_{on}	Turn-On Delay Time	V_{DD} = −15V, $I_{D(on)}$ = −10mA (Note 1), R_G = R_L = 1.4kΩ		12		12	ns
t_r	Rise Time			24		24	
t_{off}	Turn-Off Time			50		50	

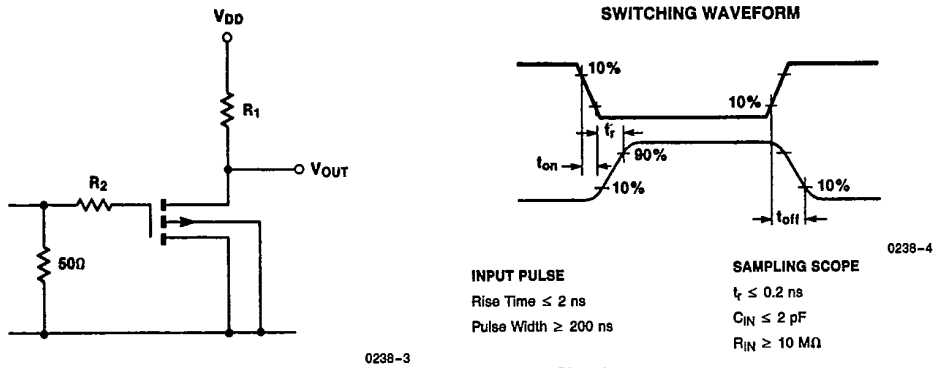


Figure 1. Switching Times Test Circuit

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