

VERY HIGH INPUT IMPEDANCE, HIGH GATE BREAKDOWN, FAST SWITCHING, LOW CAPACITANCE

FEATURES

VERY HIGH INPUT IMPEDANCE

HIGH GATE BREAKDOWN

ULTRA LOW LEAKAGE

FAST SWITCHING

LOW CAPACITANCE

ABSOLUTE MAXIMUM RATINGS

@ 25°C (unless otherwise stated)

Drain-Source or Drain-Gate Voltage

3N163 -40V

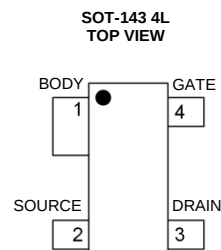
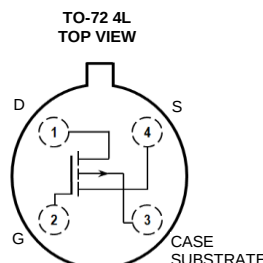
3N164 -30V

Drain Current 50mA

Storage Temperature -55°C to +150°C

Power Dissipation TO-72 case 375mW²

Power Dissipation SOT-143 case 350mW³



TO-72 4L
PACKAGE
PHOTO



SOT-143 4L
TOP VIEW



ELECTRICAL CHARACTERISTICS @ 25°C (unless otherwise noted)

SYMBOL	CHARACTERISTIC	3N163		3N164		UNITS	CONDITIONS
		MIN	MAX	MIN	MAX		
I _{GSS}	Gate Leakage Current		-10		-10	pA	V _{GS} =-40V, V _{DS} =0 (3N163), V _{SB} =0V
			-25		-25		V _{GS} =-30V, V _{DS} =0 (3N164), V _{SB} =0V
	T _A =+125°C						
BV _{DSS}	Drain-Source Breakdown Voltage	-40		-30			I _D =-10μA V _{GS} =0, V _{BS} =0
BV _{SDS}	Source-Drain Breakdown Voltage	-40		-30			I _S =-10μA V _{GD} =0, V _{BD} =0
V _{GS(th)}	Threshold Voltage	-2.0	-5.0	-2.0	-5.0	V	V _{DS} =V _{GS} I _D =-10μA, V _{SB} =0V
V _{GS}	Gate Source Voltage (on)	-3.0	-6.5	-3.0	-6.5		V _{DS} =-15V I _D =-0.5mA, V _{SB} =0V
I _{DSS}	Zero Gate Voltage, Drain Current (off)		-200		-400	pA	V _{DS} =-15V V _{GS} =0, V _{SB} =0V
I _{SDS}	Zero Gate Voltage, Source Current		-400		-800		V _{SD} =-15V V _{GS} =0, V _{DB} =0V
R _{DS(on)}	Drain-Source on Resistance		250		300	ohms	V _{GS} =-20V I _D =-100μA, V _{SB} =0V
I _{D(on)}	On Drain Current	-5.0	-30	-3.0	-30	mA	V _{DS} =-15V V _{GS} =-10V, V _{SB} =0V
g _{fs}	Forward Transconductance	2.0	4.0	1.0	4.0	mS	V _{DS} =-15V I _D =-10mA f=1kHz
g _{og}	Output Admittance		250		250	μS	
C _{iss}	Input Capacitance-Output Shorted		3.5		3.5	pF	V _{DS} =-15V I _D =-10mA ¹ f=1MHz
C _{rss}	Reverse Transfer Capacitance		0.7		0.7		
C _{oss}	Output Capacitance Input Shorted		3.0		3.0		

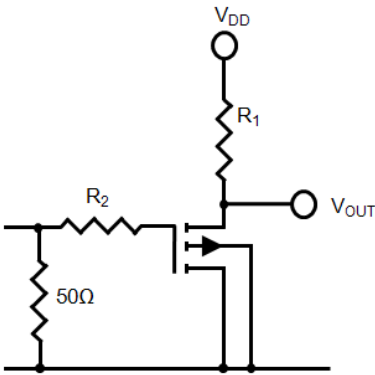
3N163 and 3N164

P-Channel Enhancement Mode MOSFET

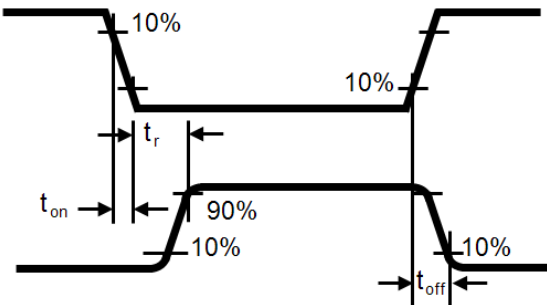
SWITCHING CHARACTERISTICS $T_A=25^{\circ}\text{C}$ and $V_{BS}=0$ (unless otherwise noted)

SYMBOL	CHARACTERISTIC	3N163		3N164		UNITS	CONDITIONS
		MIN	MAX	MIN	MAX		
t_{on}	Turn-On Delay Time		12		12	ns	$V_{DD}=-15\text{V}$, $V_{SB}=0\text{V}$ $I_{D(on)}=-10\text{mA}^1$ $R_G=R_L=1.4\text{K}$
t_r	Rise Time		24		24		
t_{off}	Turn-Off Time		50		50		

Switching Times Test Circuit



TYPICAL SWITCHING WAVEFORM

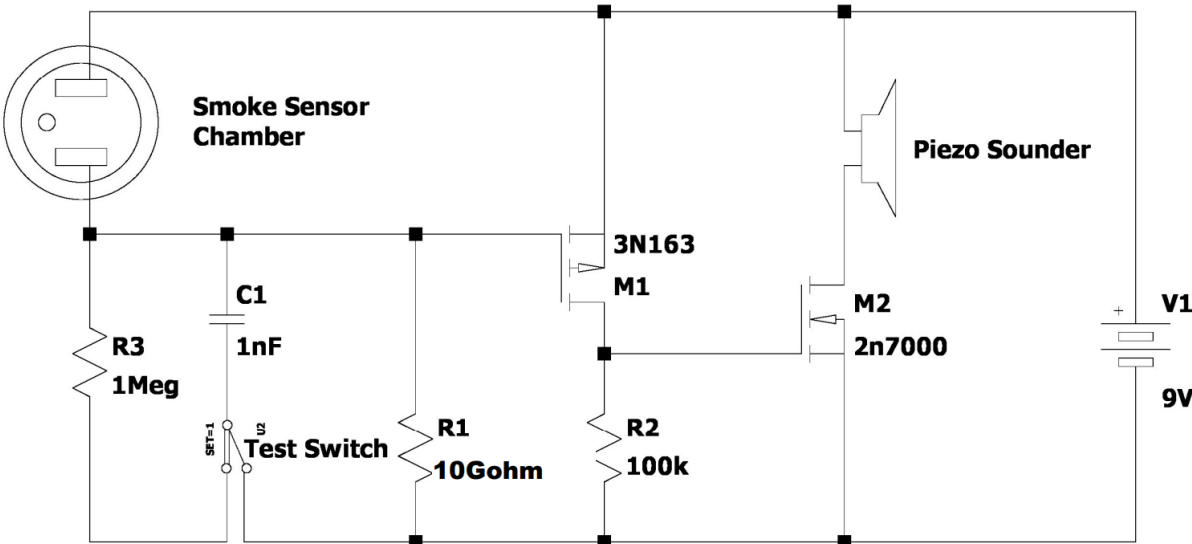


INPUT PULSE
Rise Times $\leq 2\text{ns}$
Pulse Width $\geq 200\text{ns}$

SAMPLING SCOPE
 $T_r \leq 0.2\text{ns}$
 $C_{IN} \leq 2\text{pF}$
 $R_{IN} \geq 10\text{M}$

Simplest Possible Smoke Detector

KRL 09/26/2021

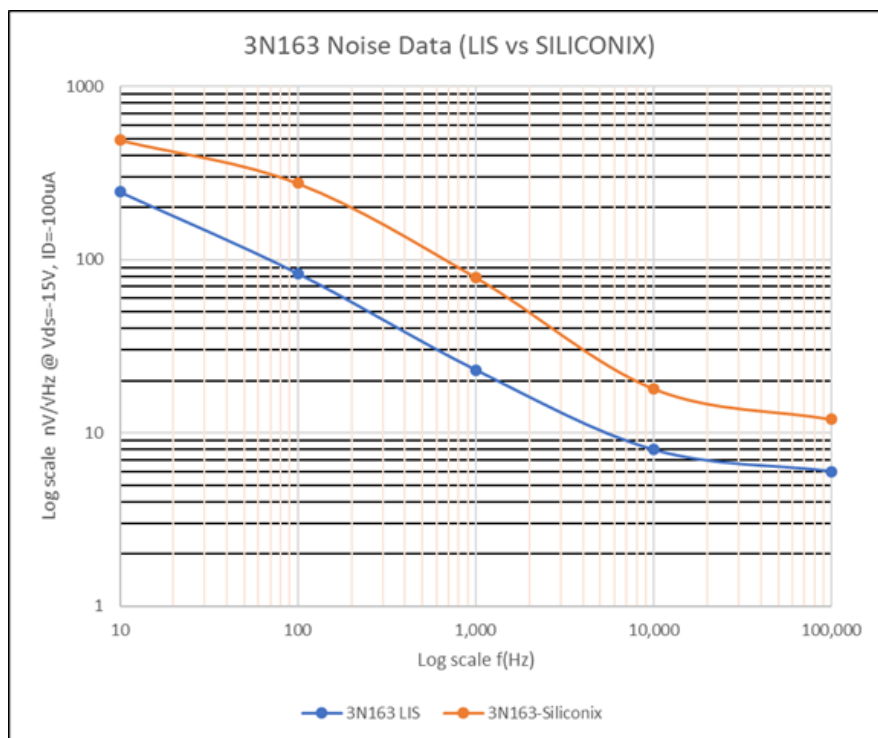


NOTES:

1. For design reference only, not 100% tested.
2. Derate 3mW/°C above 25°C
3. Derate 3.5mW/°C above 25°C
4. All min/max limits are absolute numbers. Negative signs indicate electrical polarity only.

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.

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