

LINEAR SYSTEMS

Twenty-Five Years Of Quality Through Innovation

3N163, 3N164

P-CHANNEL
ENHANCEMENT MODE
MOSFET

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

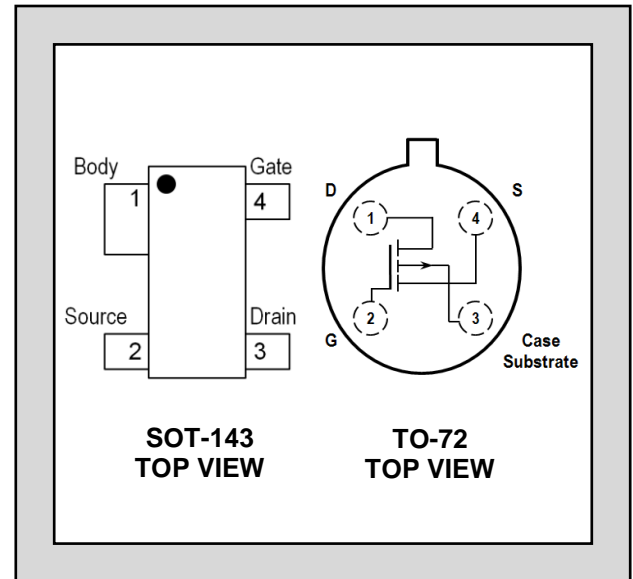
3N164 -30V

Drain Current 50mA

Storage Temperature -55°C to +150°C

Power Dissipation TO-72 case 375mW²

Power Dissipation SOT-143 case 350mW³

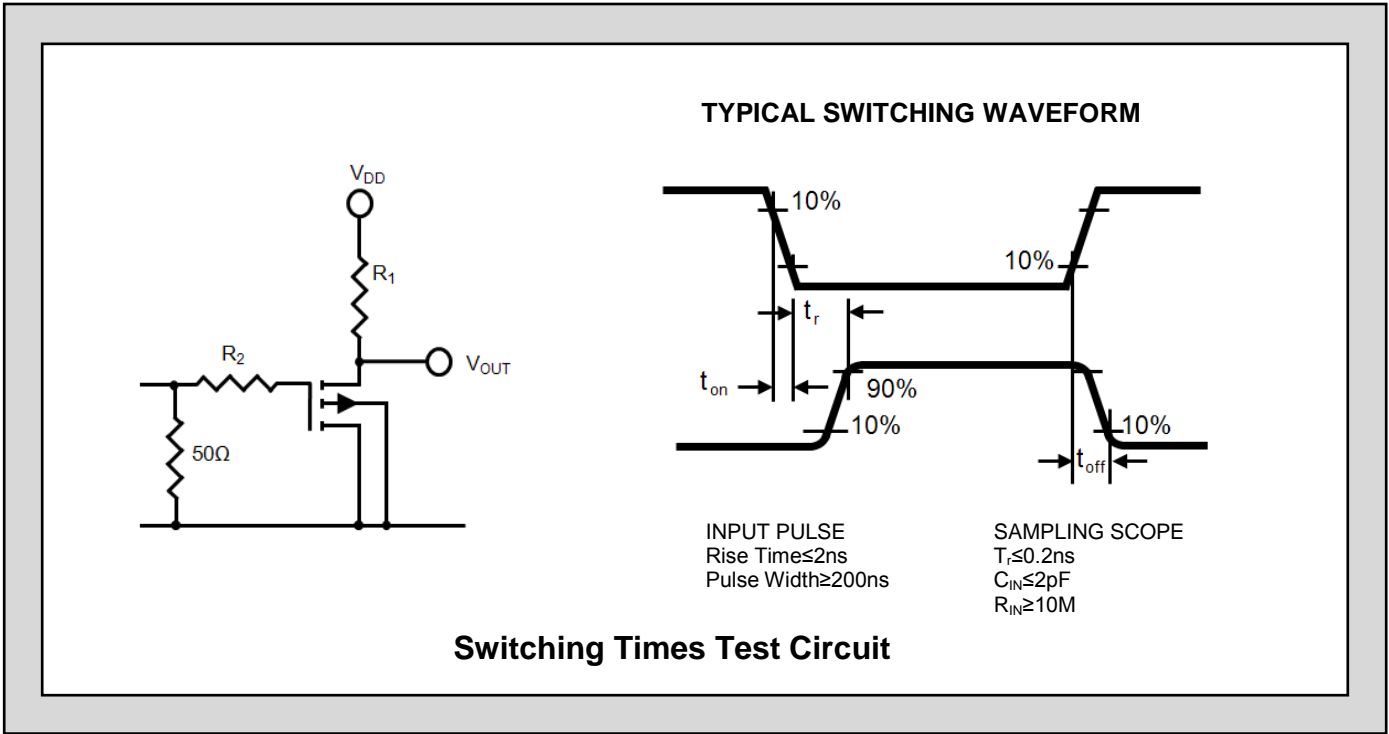


ELECTRICAL CHARACTERISTICS @ 25°C (unless otherwise noted)

| SYMBOL | CHARACTERISTIC | 3N163 | | 3N164 | | UNITS | CONDITIONS |
|---------------------|--|-------|------|-------|------|-------|--|
| | | MIN | MAX | MIN | MAX | | |
| I _{GSS} | Gate Leakage Current T _A =+125°C | | -10 | | -10 | pA | V _{GS} =-40V, V _{DS} =0 (3N163), V _{SB} =0V V _{GS} =-30V, V _{DS} =0 (3N164), V _{SB} =0V |
| | | | -25 | | -25 | | |
| BV _{DSS} | Drain-Source Breakdown Voltage | -40 | | -30 | | V | 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 | pA | 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 | | |

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 | | |



NOTES:

1. For design reference only, not 100% tested.
2. Derate $3\text{mW}/^\circ\text{C}$ above 25°C
3. Derate $3.5\text{mW}/^\circ\text{C}$ 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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