

VN0610LL

FET Transistor N-Channel — Enhancement



ON Semiconductor®

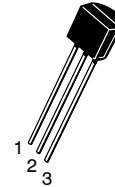
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MAXIMUM RATINGS

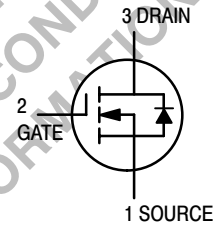
Rating	Symbol	Value	Unit
Drain-Source Voltage	V_{DSS}	60	Vdc
Drain-Gate Voltage ($R_{GS} = 1\text{ M}\Omega$)	V_{DGR}	60	Vdc
Gate-Source Voltage - Continuous - Non-repetitive ($t_p \leq 50\ \mu\text{s}$)	V_{GS} V_{GSM}	± 20 ± 40	Vdc Vpk
Drain Current Continuous Pulsed	I_D I_{DM}	190 1000	mAdc
Total Power Dissipation @ $T_A = 25^\circ\text{C}$ Derate above 25°C	P_D	400 3.2	mW mW/ $^\circ\text{C}$
Operating and Storage Temperature Range	T_J, T_{stg}	-55 to +150	$^\circ\text{C}$

THERMAL CHARACTERISTICS

Characteristics	Symbol	Max	Unit
Thermal Resistance, Junction to Ambient	$R_{\theta JA}$	312.5	$^\circ\text{C}/\text{W}$
Maximum Lead Temperature for Soldering Purposes, 1/16" from case for 10 seconds	T_L	300	$^\circ\text{C}$



CASE 29-11, STYLE 22
TO-92 (TO-226AA)



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ELECTRICAL CHARACTERISTICS (T_C = 25°C unless otherwise noted)

Characteristic	Symbol	Min	Max	Unit
OFF CHARACTERISTICS				
Drain-Source Breakdown Voltage (V _{GS} = 0, I _D = 100 μA)	V _{(BR)DSS}	60	—	Vdc
Zero Gate Voltage Drain Current (V _{DS} = 48 Vdc, V _{GS} = 0) (V _{DS} = 48 Vdc, V _{GS} = 0, T _J = 125°C)	I _{DSS}	—	10 500	μAdc
Gate-Body Leakage Current, Forward (V _{GSF} = 30 V, V _{DS} = 0)	I _{GSSF}	—	-100	nAdc

ON CHARACTERISTICS⁽¹⁾

Gate Threshold Voltage (V _{DS} = V _{GS} , I _D = 1.0 mA)	V _{GS(th)}	0.8	2.5	Vdc
Static Drain-Source On-Resistance (V _{GS} = 10 V, I _D = 500 mA) (V _{GS} = 10 V, I _D = 500 mA, T _C = 125°C)	r _{DS(on)}	—	5.0 9.0	Ω
Drain-Source On-Voltage (V _{GS} = 5.0 V, I _D = 200 mA) (V _{GS} = 10 V, I _D = 500 mA)	V _{DS(on)}	—	1.5 2.5	Vdc
On-State Drain Current (V _{GS} = 10 V, V _{DS} ≥ 2.0 V _{DS(on)})	I _{D(on)}	750	—	mAdc
Forward Transconductance (V _{DS} ≥ 2.0 V _{DS(on)} , I _D = 500 mA)	g _{fs}	100	—	μmhos

1. Pulse Test: Pulse Width ≤ 300 μs, Duty Cycle ≤ 2.0%.

DYNAMIC CHARACTERISTICS

Input Capacitance	(V _{DS} = 25 Vdc, V _{GS} = 0, f = 1.0 MHz)	C _{iss}	—	60	pF
Output Capacitance		C _{oss}	—	25	
Reverse Transfer Capacitance		C _{rss}	—	5.0	

SWITCHING CHARACTERISTICS⁽¹⁾

Turn-On Delay Time	(V _{DD} = 15 Vdc, I _D = 600 mA, R _{gen} = 25 Ω, R _L = 23 Ω)	t _{on}	—	10	ns
Turn-Off Delay Time		t _{off}	—	10	

1. Pulse Test: Pulse Width ≤ 300 ms, Duty Cycle ≤ 10%.

RESISTIVE SWITCHING

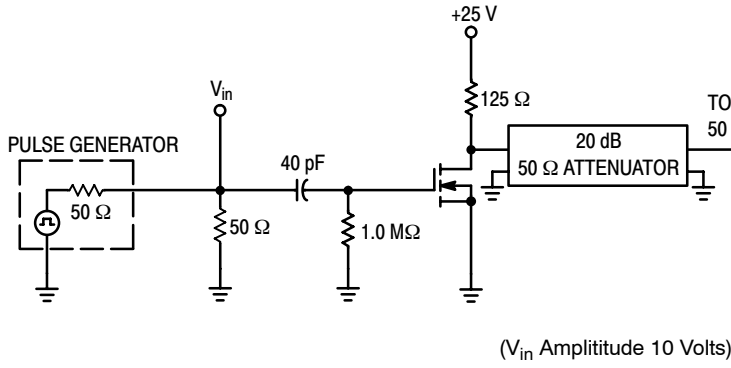


Figure 1. Switching Test Circuit

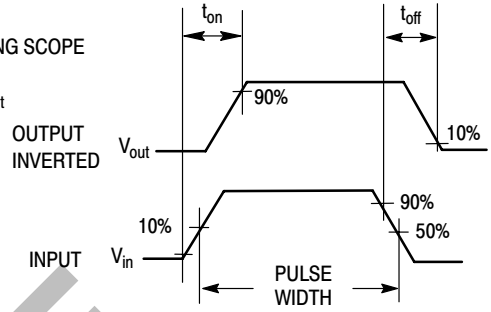


Figure 2. Switching Waveforms

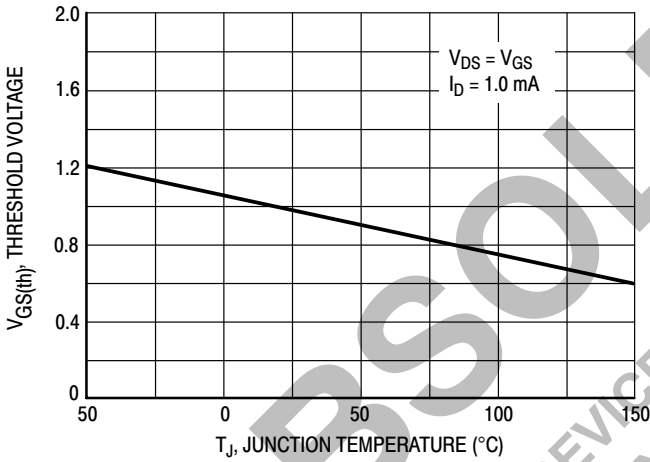


Figure 3. $V_{GS(th)}$ Normalized versus Temperature

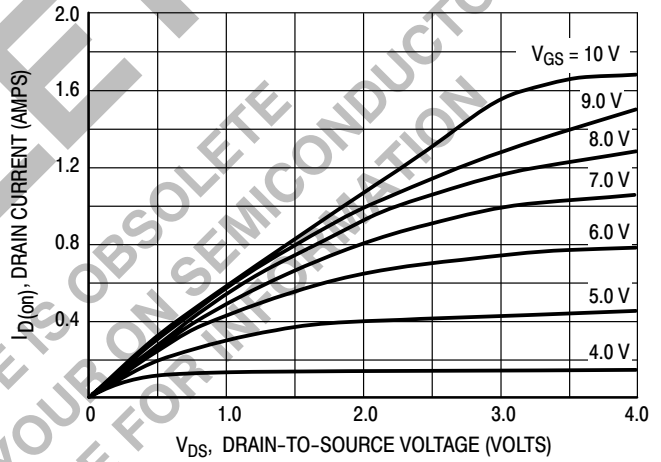


Figure 4. On-Region Characteristics

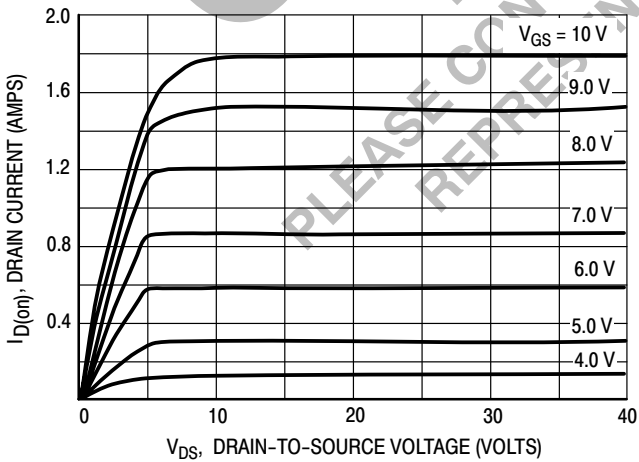


Figure 5. Output Characteristics

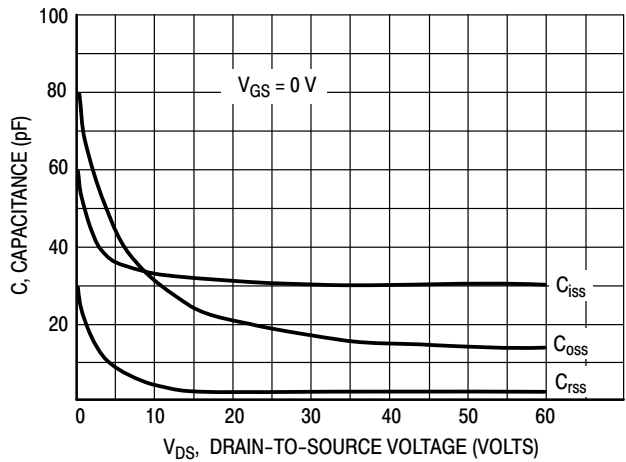
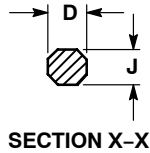
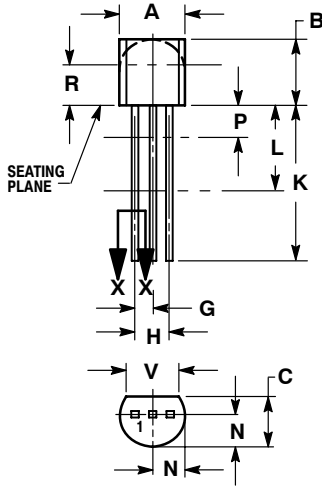


Figure 6. Capacitance versus Drain-To-Source Voltage

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PACKAGE DIMENSIONS

TO-92 (TO-226AA) CASE 29-11 ISSUE AL



NOTES:

1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: INCH.
3. CONTOUR OF PACKAGE BEYOND DIMENSION R IS UNCONTROLLED.
4. LEAD DIMENSION IS UNCONTROLLED IN P AND BEYOND DIMENSION K MINIMUM.

DIM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	0.175	0.205	4.45	5.20
B	0.170	0.210	4.32	5.33
C	0.125	0.165	3.18	4.19
D	0.016	0.021	0.407	0.533
G	0.045	0.055	1.15	1.39
H	0.095	0.105	2.42	2.66
J	0.015	0.020	0.39	0.50
K	0.500	---	12.70	---
L	0.250	---	6.35	---
N	0.080	0.105	2.04	2.66
P	---	0.100	---	2.54
R	0.115	---	2.93	---
V	0.135	---	3.43	---

- STYLE 22:
PIN 1: SOURCE
2: GATE
3: DRAIN

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