

# VN0610LL, VN10LM

## N-Channel Enhancement-Mode MOS Transistors



### VN0610LL / VN10LM

#### FEATURES

- Low  $r_{DS(on)} < 5\Omega$

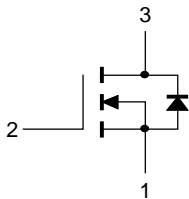
#### APPLICATIONS

- Switching
- Amplification

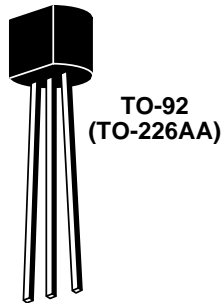
#### ORDERING INFORMATION

Part	Package	Temperature Range
VN0610LL	Plastic TO-92	-55°C to +150°C
VN10LM	Plastic TO-237	-55°C to +150°C
For sorted chips in carriers see 2N7000		

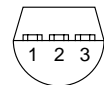
#### PIN CONNECTIONS



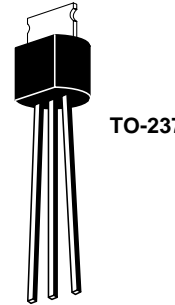
CD5



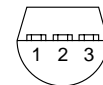
#### BOTTOM VIEW



1. SOURCE
2. GATE
3. DRAIN



#### BOTTOM VIEW



1. SOURCE
2. GATE
3. TAB-DRAIN

#### ABSOLUTE MAXIMUM RATINGS ( $T_A = 25^\circ\text{C}$ unless otherwise noted)

SYMBOL	PARAMETERS/TEST CONDITIONS	LIMITS		UNITS
		VN0610LL	VN10LM	
$V_{DS}$	Drain-Source Voltage	60	60	V
$V_{GS}$	Gate-Source Voltage	$\pm 30$	$\pm 30$	
$I_D$	Continuous Drain Current	$T_A = 25^\circ\text{C}$	0.28	0.32
		$T_A = 100^\circ\text{C}$	0.17	0.2
$I_{DM}$	Pulsed Drain Current <sup>1</sup>	1.3	1.4	A
$P_D$	Power Dissipation	$T_A = 25^\circ\text{C}$	0.8	1.0
		$T_A = 100^\circ\text{C}$	0.32	0.4
$T_J, T_{stg}$	Operating Junction & Storage Temperature Range	-55 to 150		$^\circ\text{C}$
$T_L$	Lead Temperature (1/16" from case for 10 sec.)	300		

#### THERMAL RESISTANCE RATINGS

SYMBOL	THERMAL RESISTANCE	LIMITS		UNITS
		VN0610LL	VN10LM	
$R_{thJA}$	Junction-to-Ambient	156	125	K/W

<sup>1</sup>Pulse width limited by maximum junction temperature.

SPECIFICATIONS <sup>a</sup>		LIMITS				
SYMBOL	PARAMETER	TYP <sup>b</sup>	MIN	MAX	UNIT	TEST CONDITIONS
<b>STATIC</b>						
V <sub>(BR)DSS</sub>	Drain-Source Breakdown Voltage	70	60		V	I <sub>D</sub> = 100μA, V <sub>GS</sub> = 0V
V <sub>GS(th)</sub>	Gate-Threshold Voltage	2.3	0.8	2.5		V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = 1mA
I <sub>GSS</sub>	Gate-Body Leakage			±100	nA	V <sub>GS</sub> = ±30V, V <sub>DS</sub> = 0V
I <sub>DSS</sub>	Zero Gate Voltage Drain Current			10	μA	V <sub>DS</sub> = 50V, V <sub>GS</sub> = 0V
				500		
I <sub>D(ON)</sub>	On-State Drain Current <sup>d</sup>	1000	750		mA	V <sub>DS</sub> = 10V, V <sub>GS</sub> = 10V
r <sub>DS(ON)</sub>	Drain-Source On-Resistance <sup>c</sup>	5		7.5	Ω	V <sub>GS</sub> = 5V, I <sub>D</sub> = 0.2A
		2.5		5		V <sub>GS</sub> = 10V, I <sub>D</sub> = 0.5A
		4.4		9		T <sub>J</sub> = 125°C
g <sub>FS</sub>	Forward Transconductance <sup>c</sup>	230	100		mS	V <sub>DS</sub> = 10V, I <sub>D</sub> = 0.5A
g <sub>OS</sub>	Common Source Output Conductance <sup>c</sup>	500			μS	V <sub>DS</sub> = 5V, I <sub>D</sub> = 50mA
<b>DYNAMIC</b>						
C <sub>iss</sub>	Input Capacitance	16		60	pF	V <sub>DS</sub> = 25V, V <sub>GS</sub> = 0V, f = 1MHz
C <sub>oss</sub>	Output Capacitance	11		25		
C <sub>rss</sub>	Reverse Transfer Capacitance	2		5		
<b>SWITCHING</b>						
t <sub>ON</sub>	Turn-On Time	7		10	ns	V <sub>DD</sub> = 15V, R <sub>L</sub> = 23Ω, I <sub>D</sub> = 0.6A V <sub>GEN</sub> = 10V, R <sub>G</sub> = 25Ω
t <sub>OFF</sub>	Turn-Off Time	7		10		(Switching time is essentially independent of operating temperature)

**Notes:**

- T<sub>A</sub> = 25°C unless otherwise noted.
- For design aid only, not subject to production testing.
- Pulse test; PW = ≤300μS, duty cycle ≤2%.
- Pulse width limited by maximum junction temperature.