

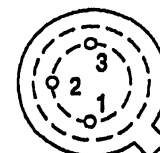
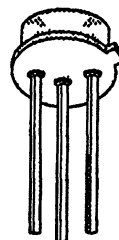
## VN0610L, VN10KE, VN10KM

N-Channel Enhancement-Mode MOSFET Transistors  
 Zener Gate Protected

PART NUMBER	$V_{(BR)DSS}$ (V)	$r_{DS(ON)}$ ( $\Omega$ )	$I_D$ (A)	PACKAGE
VN0610L	60	5	0.27	TO-92
VN10KE	60	5	0.17	TO-206AC
VN10KM	60	5	0.31	TO-237

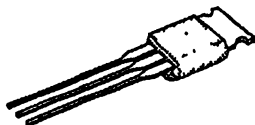
Performance Curves: VNDP06 (See Section 7)

TO-206AC (TO-52) BOTTOM VIEW



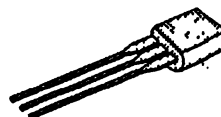
- 1 SOURCE
- 2 GATE
- 3 DRAIN

TO-237 BOTTOM VIEW



- 1 SOURCE
- 2 GATE
- 3 DRAIN & TAB

TO-92 BOTTOM VIEW



- 1 SOURCE
- 2 GATE
- 3 DRAIN

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

PARAMETERS/TEST CONDITIONS		SYMBOL	VN0610L	VN10KE	VN10KM	UNITS
Drain-Source Voltage		$V_{DS}$	60	60	60	V
Gate-Source Voltage <sup>2</sup>		$V_{GS}$	15/-0.3	15/-0.3	15/-0.3	
Continuous Drain Current	$T_A = 25^\circ\text{C}$	$I_D$	0.27	0.17	0.31	A
	$T_A = 100^\circ\text{C}$		0.17	0.11	0.20	
Pulsed Drain Current <sup>1</sup>		$I_{DM}$	1	1	1	
Power Dissipation	$T_A = 25^\circ\text{C}$	$P_D$	0.8	0.3	1	W
	$T_A = 100^\circ\text{C}$		0.32	0.12	0.4	
Operating Junction and Storage Temperature		$T_J, T_{stg}$	-55 to 150			$^\circ\text{C}$
Lead Temperature (1/16" from case for 10 seconds)		$T_L$	300			

### THERMAL RESISTANCE

THERMAL RESISTANCE	SYMBOL	VN0610L	VN10KE	VN10KM	UNITS
Junction-to-Ambient	$R_{thJA}$	156	400	125	$^\circ\text{C/W}$

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

<sup>2</sup> Features internal gate-source Zener diode

ELECTRICAL CHARACTERISTICS <sup>1</sup>				LIMITS		
PARAMETER	SYMBOL	TEST CONDITIONS	TYP <sup>2</sup>	All		UNIT
				MIN	MAX	
<b>STATIC</b>						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS} = 0 \text{ V}, I_D = 100 \mu\text{A}$	120	60		V
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 1 \text{ mA}$	1.4	0.8	2.5	
Gate-Body Leakage	$I_{GSS}$	$V_{DS} = 0 \text{ V}, V_{GS} = 15 \text{ V}$	1		100	nA
Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{DS} = 48 \text{ V}$ $V_{GS} = 0 \text{ V}$ $T_J = 125^\circ\text{C}$	0.7		10	$\mu\text{A}$
			3		500	
On-State Drain Current <sup>3</sup>	$I_{D(ON)}$	$V_{DS} = 10 \text{ V}, V_{GS} = 10 \text{ V}$	1000	750		mA
Drain-Source On-Resistance <sup>3</sup>	$r_{DS(ON)}$	$V_{GS} = 5 \text{ V}, I_D = 0.2 \text{ A}$ $V_{GS} = 10 \text{ V}$ $I_D = 0.5 \text{ A}$ $T_J = 125^\circ\text{C}$	4		7.5	$\Omega$
			3		5	
			5.6		9	
Forward Transconductance <sup>3</sup>	$g_{FS}$	$V_{DS} = 10 \text{ V}, I_D = 0.5 \text{ A}$	300	100		mS
Common Source Output Conductance <sup>3</sup>	$g_{OS}$	$V_{DS} = 7.5 \text{ V}, I_D = 50 \text{ mA}$	200			$\mu\text{S}$
<b>DYNAMIC</b>						
Input Capacitance	$C_{iss}$	$V_{DS} = 25 \text{ V}$ $V_{GS} = 0 \text{ V}$ $f = 1 \text{ MHz}$	38		60	pF
Output Capacitance	$C_{oss}$		16		25	
Reverse Transfer Capacitance	$C_{rss}$		2		5	
<b>SWITCHING</b>						
Turn-On Time	$t_{ON}$	$V_{DD} = 15 \text{ V}, R_L = 23 \Omega$ $I_D = 0.6 \text{ A}, V_{GEN} = 10 \text{ V}$ $R_G = 25 \Omega$ (Switching time is essentially independent of operating temperature)	7		10	ns
Turn-Off Time	$t_{OFF}$		9		10	

- NOTES: 1.  $T_A = 25^\circ\text{C}$  unless otherwise noted.  
2. For design aid only, not subject to production testing.  
3. Pulse test;  $PW = 300 \mu\text{s}$ , duty cycle  $\leq 2\%$ .