

# VN10KM ■ VN2222KM



## N-Channel Enhancement Mode MOSPOWER

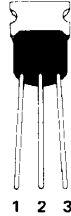
### APPLICATIONS

- Switching Regulators
- Converters
- Motor Drivers

### PRODUCT SUMMARY

Part Number	$BV_{DSS}$ Volts	$r_{DS(ON)}$ (ohms)	Package
VN10KM	60	5	T0-237
VN2222KM	60	7.5	T0-237

PIN 1 – Source  
PIN 2 – Gate  
PIN 3 & TAB – Drain



T0-237

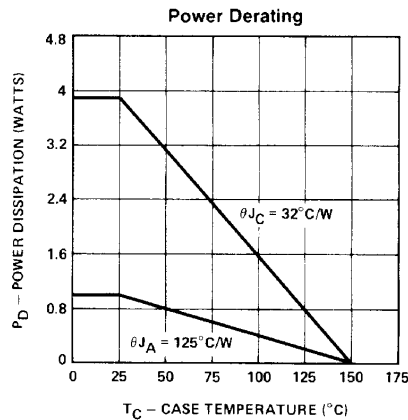
For Additional Curves  
See Section 5: VNMK06

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

Parameter	VN10KM	VN2222KM	Units
$V_{DS}$ Drain-Source Voltage	60	60	V
$V_{DGR}$ Drain-Gate Voltage ( $R_{GS} = 1\text{ M}\Omega$ )	60	60	V
$I_D @ T_C = 25^\circ\text{C}$ Continuous Drain Current	$\pm 0.3$	$\pm 0.25$	A
$I_D @ T_C = 100^\circ\text{C}$ Continuous Drain Current	$\pm 0.2$	$\pm 0.16$	A
$I_{DM}$ Pulsed Drain Current <sup>1</sup>	$\pm 1$	$\pm 1$	A
$V_{GS}$ Gate-Source Voltage	+15, -0.3	+15, -0.3	V
$P_D$ Max Continuous Power Dissipation	1	1	W
$P_D$ Max Pulse <sup>2</sup> Power Dissipation	3.9	3.9	W
Junction to Case Linear Derating Factor	0.031	0.031	$\text{W}/^\circ\text{C}$
Junction to Ambient Linear Derating Factor	0.008	0.008	$\text{W}/^\circ\text{C}$
$T_J$ Operating and Storage Temperature Range	-55 To +150	-55 To +150	$^\circ\text{C}$
Lead Temperature (1/16" from case for 10 secs.)	300	300	$^\circ\text{C}$

<sup>1</sup> Pulse Test: Pulsewidth  $\leq 300\mu\text{sec}$ , Duty Cycle  $\leq 2\%$

<sup>2</sup> 1 Sec Continuous Power Single Pulse



**ELECTRICAL CHARACTERISTICS (T<sub>C</sub> = 25°C unless otherwise noted)**  
**STATIC**

Parameter	Type	Min.	Typ.	Max.	Units	Test Conditions
BV <sub>DSS</sub>	Drain-Source Breakdown Voltage	All	60	120		V V <sub>GS</sub> = 0 I <sub>D</sub> = 100 μA
V <sub>GS(th)</sub>	Gate-Threshold Voltage	VN10KM VN2222KM	0.8 0.6	1.5 1.5	2.5 2.5	V V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = 1 mA
I <sub>GSSF</sub>	Gate-Body Leakage Forward	All		1	100	nA V <sub>GS</sub> = 15V, V <sub>DS</sub> = 0
I <sub>DSS</sub>	Zero Gate Voltage Drain Current	All		0.1	10	μA V <sub>DS</sub> = 45V, V <sub>GS</sub> = 0
I <sub>D(on)</sub>	On-State Drain Current <sup>1</sup>	All	0.75	1.5		A V <sub>DS</sub> = 2V <sub>DS(ON)</sub> , V <sub>GS</sub> = 10V
V <sub>DS(on)</sub>	Static Drain-Source On-State Voltage <sup>1</sup>	All		1.2	1.5	V V <sub>GS</sub> = 5V, I <sub>D</sub> = 0.2A
		VN10KM VN2222KM		2 3	2.5 3.75	V V <sub>GS</sub> = 10V, I <sub>D</sub> = 0.5A
R <sub>DS(on)</sub>	Static Drain-Source On-State Resistance <sup>1</sup>	All		6	7.5	Ω V <sub>GS</sub> = 5V, I <sub>D</sub> = 0.2A
		VN10KM VN2222KM		4 6	5 7.5	Ω V <sub>GS</sub> = 10V, I <sub>D</sub> = 0.5A
R <sub>DS(on)</sub>	Static Drain-Source On-State Resistance <sup>1</sup>	VN10KM		7.2	9	Ω V <sub>GS</sub> = 10V, I <sub>D</sub> = 0.5A, T <sub>C</sub> = 125°C
		VN2222KM		10.8	13.5	Ω V <sub>GS</sub> = 10V, I <sub>D</sub> = 0.5A, T <sub>C</sub> = 125°C

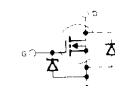
**DYNAMIC**

g <sub>fs</sub>	Forward Transconductance <sup>1</sup>	All	100	200		mS V <sub>DS</sub> ≥ 2V <sub>DS(ON)</sub> , I <sub>D</sub> = 0.5A
C <sub>iss</sub>	Input Capacitance	All		40	60	pF V <sub>GS</sub> = 0, V <sub>DS</sub> = 25V
C <sub>oss</sub>	Output Capacitance	All		17	25	pF f = 1 MHz
C <sub>rss</sub>	Reverse Transfer Capacitance	All		3	5	pF
t <sub>ON</sub>	Turn-On Time	All		7	10	ns V <sub>DD</sub> = 15V, I <sub>D</sub> = 0.6A R <sub>g</sub> = 25Ω, R <sub>L</sub> = 23Ω
t <sub>OFF</sub>	Turn-Off Time	All		7	10	ns (MOSFET switching times are essentially independent of operating temperature.)

**THERMAL RESISTANCE**

R <sub>thJC</sub>	Junction-to-Case	All		26	32	°C/W
R <sub>thJA</sub>	Junction-to-Ambient	All			125	°C/W Free Air Operation

**BODY-DRAIN DIODE RATINGS AND CHARACTERISTICS**

I <sub>S</sub>	Continuous Source Current (Body Diode)	VN10KM			-0.3	A	Modified MOSPOWER symbol showing the integral P-N Junction rectifier 
		VN2222KM			-0.25	A	
I <sub>SM</sub>	Source Current <sup>1</sup> (Body Diode)	All			-1	A	
V <sub>SD</sub>	Diode Forward Voltage <sup>1</sup>	VN10KM			-0.85	V	T <sub>C</sub> = 25°C, I <sub>S</sub> = -0.3A, V <sub>GS</sub> = 0
		VN2222KM			-0.85	V	T <sub>C</sub> = 25°C, I <sub>S</sub> = -0.25A, V <sub>GS</sub> = 0

<sup>1</sup> Pulse Test: Pulse Width ≤ 300 μsec, Duty Cycle ≤ 2%

Data Sheet Curves: VNМК06