

**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



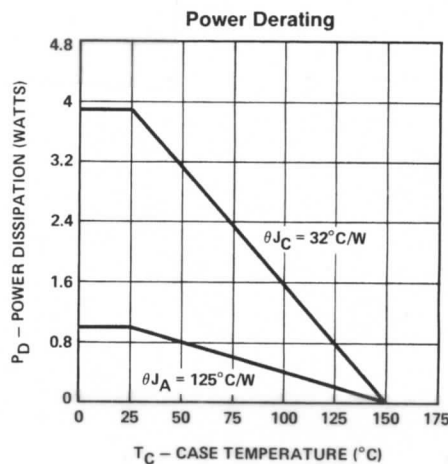
T0-237

**ABSOLUTE MAXIMUM RATINGS ( $T_C = 25^\circ C$  unless otherwise noted)**

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

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

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



## ELECTRICAL CHARACTERISTICS ( $T_C = 25^\circ\text{C}$ unless otherwise noted)

### STATIC

Parameter	Type	Min.	Typ.	Max.	Units	Test Conditions
$BV_{DSS}$ Drain-Source Breakdown Voltage	All	60	120		V	$V_{GS} = 0$ $I_D = 100 \mu\text{A}$
$V_{GS(th)}$ Gate-Threshold Voltage	VN10KM VN2222KM	0.8 0.6	1.5 1.5	2.5 2.5	V	$V_{DS} = V_{GS}$ , $I_D = 1 \text{ mA}$
$I_{GSSF}$ Gate-Body Leakage Forward	All		1	100	nA	$V_{GS} = 15\text{V}$ , $V_{DS} = 0$
$I_{DSS}$ Zero Gate Voltage Drain Current	All		0.1	10	$\mu\text{A}$	$V_{DS} = 45\text{V}$ , $V_{GS} = 0$
$I_{D(on)}$ On-State Drain Current <sup>1</sup>	All	0.75	1.5		A	$V_{DS} \geq 2V_{DS(ON)}$ , $V_{GS} = 10\text{V}$
$V_{DS(on)}$ Static Drain-Source On-State Voltage <sup>1</sup>	All		1.2	1.5	V	$V_{GS} = 5\text{V}$ , $I_D = 0.2\text{A}$
	VN10KM VN2222KM		2 3	2.5 3.75	V	$V_{GS} = 10\text{V}$ , $I_D = 0.5\text{A}$
$R_{DS(on)}$ Static Drain-Source On-State Resistance <sup>1</sup>	All		6	7.5	$\Omega$	$V_{GS} = 5\text{V}$ , $I_D = 0.2\text{A}$
	VN10KM VN2222KM		4 6	5 7.5	$\Omega$	$V_{GS} = 10\text{V}$ , $I_D = 0.5\text{A}$
$R_{DS(on)}$ Static Drain-Source On-State Resistance <sup>1</sup>	VN10KM		7.2	9	$\Omega$	$V_{GS} = 10\text{V}$ , $I_D = 0.5\text{A}$ , $T_C = 125^\circ\text{C}$
	VN2222KM		10.8	13.5	$\Omega$	$V_{GS} = 10\text{V}$ , $I_D = 0.5\text{A}$ , $T_C = 125^\circ\text{C}$

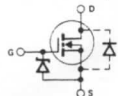
### DYNAMIC

$g_{fs}$ Forward Transconductance <sup>1</sup>	All	100	200		mS	$V_{DS} \geq 2V_{DS(ON)}$ , $I_D = 0.5\text{A}$
$C_{iss}$ Input Capacitance	All		40	60	pF	$V_{GS} = 0$ , $V_{DS} = 25\text{V}$ $f = 1 \text{ MHz}$
$C_{oss}$ Output Capacitance	All		17	25	pF	
$C_{rss}$ Reverse Transfer Capacitance	All		3	5	pF	
$t_{ON}$ Turn-On Time $t_{ime}$	All		7	10	ns	$V_{DD} = 15\text{V}$ , $I_D \cong 0.6\text{A}$ $R_g = 25\Omega$ , $R_L = 23\Omega$ (MOSFET switching times are essentially independent of operating temperature.)
					ns	
$t_{OFF}$ Turn-Off Time $t_{ime}$	All		7	10	ns	
					ns	

### THERMAL RESISTANCE

$R_{thJC}$ Junction-to-Case	All		26	32	$^\circ\text{C/W}$	
$R_{thJA}$ Junction-to-Ambient	All			125	$^\circ\text{C/W}$	Free Air Operation

### BODY-DRAIN DIODE RATINGS AND CHARACTERISTICS

$I_S$ Continuous Source Current (Body Diode)	VN10KM			-0.3	A	Modified MOSPOWER symbol showing the integral P-N Junction rectifier 
	VN2222KM			-0.25	A	
$I_{SM}$ Source Current <sup>1</sup> (Body Diode)	All			-1	A	
$V_{SD}$ Diode Forward Voltage <sup>1</sup>	VN10KM		-0.85		V	$T_C = 25^\circ\text{C}$ , $I_S = -0.3\text{A}$ , $V_{GS} = 0$
	VN2222KM		-0.85		V	$T_C = 25^\circ\text{C}$ , $I_S = -0.25\text{A}$ , $V_{GS} = 0$

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