VN10KM ■ VN2222KM

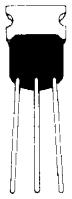
Siliconix

N-Channel Enhancement Mode
MOSPOWER

APPLICATIONS
- Switching Regulators
- Converters
- Motor Drivers

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

TO–237



PRODUCT SUMMARY

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

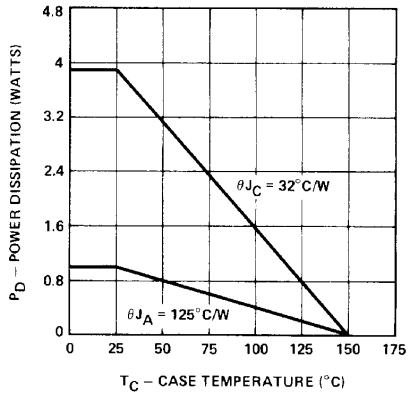
For Additional Curves
See Section 5: VNMK06

ABSOLUTE MAXIMUM RATINGS (T_C = 25° C unless otherwise noted)

	Parameter	VN10KM	VN2222KM	Units
V_{DS}	Drain-Source Voltage	60	60	V
V_{DGR}	Drain-Gate Voltage (R_{GS} = 1 MΩ)	60	60	V
I_D @ T_C = 25° C	Continuous Drain Current	±0.3	±0.25	A
I_D @ T_C = 100° C	Continuous Drain Current	±0.2	±0.16	A
I_{DM}	Pulsed Drain Current[1]	±1	±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[2] Power Dissipation	3.9	3.9	W
Junction to Case	Linear Derating Factor	0.031	0.031	W/° C
Junction to Ambient	Linear Derating Factor	0.008	0.008	W/° C
T_J Tstg	Operating and Storage Temperature Range	−55 To +150	−55 To +150	° C
Lead Temperature	(1/16" from case for 10 secs.)	300	300	° C

1 **Pulse Test:** Pulsewidth ≤ 300μsec, Duty Cycle ≤ 2%
2 1 Sec Continuous Power Single Pulse

Power Derating



ELECTRICAL CHARACTERISTICS (T_C = 25°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 µA
$V_{GS(th)}$	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 mA
I_{GSSF}	Gate-Body Leakage Forward	All		1	100	nA	V_{GS} = 15V, V_{DS} = 0
I_{DSS}	Zero Gate Voltage Drain Current	All		0.1	10	µA	V_{DS} = 45V , V_{GS} = 0
$I_{D(on)}$	On-State Drain Current[1]	All	0.75	1.5		A	$V_{DS} \geq 2V_{DS(ON)}$, V_{GS} = 10V
$V_{DS(on)}$	Static Drain-Source On-State Voltage[1]	All		1.2	1.5	V	V_{GS} = 5V , I_D = 0.2A
		VN10KM VN2222KM		2 3	2.5 3.75	V	V_{GS} = 10V , I_D = 0.5A
$R_{DS(on)}$	Static Drain-Source On-State Resistance[1]	All		6	7.5	Ω	V_{GS} = 5V , I_D = 0.2A
		VN10KM VN2222KM		4 6	5 7.5	Ω	V_{GS} = 10V , I_D = 0.5A
$R_{DS(on)}$	Static Drain-Source On-State Resistance[1]	VN10KM		7.2	9	Ω	V_{GS} = 10V, I_D = 0.5A, T_C = 125°C
		VN2222KM		10.8	13.5	Ω	V_{GS}=10V, I_D=0.5A, T_C=125°C

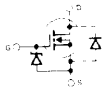
DYNAMIC

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

THERMAL RESISTANCE

R_{thJC}	Junction-to-Case	All		26	32	°C/W	
R_{thJA}	Junction-to-Ambient	All			125	°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[1] (Body Diode)	All			−1	A	
V_{SD}	Diode Forward Voltage[1]	VN10KM		−0.85		V	T_C=25°C, I_S=−0.3A, V_{GS} = 0
		VN2222KM		−0.85		V	T_C=25°C, I_S=−0.25A, V_{GS} = 0

1 **Pulse Test:** Pulse Width ≤ 300 µsec, Duty Cycle ≤ 2%

Data Sheet Curves: VNMK06