

VP0300M

352-810



P-Channel Enhancement Mode Switch  
**MOSPOWER**

**APPLICATIONS**

- Switching Regulators
- Converters
- Motor Drivers

**PRODUCT SUMMARY**

Part Number	$BV_{DSS}$ Volts	$r_{DS(ON)}$ (ohms)	Package
VP0300M	-30	2.5	T0-237

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



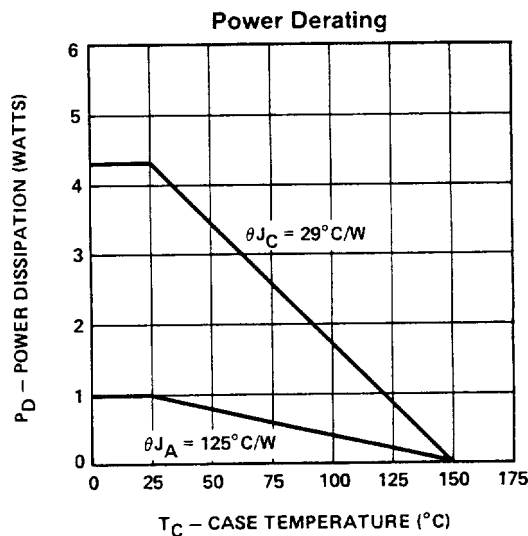
T0-237

For Additional Curves  
See Section 5: VPMH03

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

Parameter	VP0300M	Units
$V_{DS}$ Drain-Source Voltage	-30	V
$V_{DGR}$ Drain-Gate Voltage ( $R_{GS} = 1 M\Omega$ )	-30	V
$I_D @ T_C = 25^\circ C$ Continuous Drain Current	$\pm 0.5$	A
$I_D @ T_C = 100^\circ C$ Continuous Drain Current	$\pm 0.32$	A
$I_{DM}$ Pulsed Drain Current <sup>1</sup>	$\pm 3$	A
$V_{GS}$ Gate-Source Voltage	$\pm 40$	V
$P_D$ Max Continuous Power Dissipation	1	W
$P_D$ Max Pulse <sup>2</sup> Power Dissipation	4.3	W
Junction to Case Linear Derating Factor	0.034	W/ $^\circ C$
Junction to Ambient Linear Derating Factor	0.008	W/ $^\circ C$
$T_J$ Operating and Storage Temperature Range	-55 To +150	$^\circ C$
Lead Temperature (1/16" from case for 10 secs.)	300	$^\circ C$

1 Pulse Test: Pulsewidth  $\leq 300\mu sec$ , Duty Cycle  $\leq 2\%$   
2 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	VP0300M	-30	-45		V	$V_{GS} = 0$ $I_D = -10\ \mu\text{A}$
$V_{GS(th)}$ Gate-Threshold Voltage	VP0300M	-2	-3.4	-4.5	V	$V_{DS} = V_{GS}$ , $I_D = -1\ \text{mA}$
$I_{GSSF}$ Gate-Body Leakage Forward	VP0300M		-1	-100	nA	$V_{GS} = -30\text{V}$ , $V_{DS} = 0$
$I_{GSSR}$ Gate-Body Leakage Reverse	VP0300M		1	100	nA	$V_{GS} = +30\text{V}$ , $V_{DS} = 0$
$I_{DSS}$ Zero Gate Voltage Drain Current	VP0300M		-1	-10	$\mu\text{A}$	$V_{DS} = -25\text{V}$ , $V_{GS} = 0$
	VP0300M		-50	-500	$\mu\text{A}$	$V_{DS} = -25\text{V}$ , $V_{GS} = 0$ $T_C = 125^\circ\text{C}$
$I_{D(on)}$ On-State Drain Current <sup>1</sup>	VP0300M	-1.5	-1.7		A	$V_{DS} \geq 2V_{DS(ON)}$ , $V_{GS} = -12\text{V}$
$V_{DS(on)}$ Static Drain-Source On-State Voltage <sup>1</sup>	VP0300M		-2.2	-2.5	V	$V_{GS} = -12\text{V}$ , $I_D = -1\text{A}$
$R_{DS(on)}$ Static Drain-Source On-State Resistance <sup>1</sup>	VP0300M		2.2	2.5	$\Omega$	$V_{GS} = -12\text{V}$ , $I_D = -1\text{A}$
$R_{DS(on)}$ Static Drain-Source On-State Resistance <sup>1</sup>	VP0300M		3.2	3.63	$\Omega$	$V_{GS} = -12\text{V}$ , $I_D = -1\text{A}$ , $T_C = 125^\circ\text{C}$

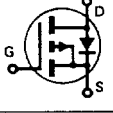
## DYNAMIC

$g_{fs}$ Forward Transconductance <sup>1</sup>	VP0300M	200	300		mS(V)	$V_{DS} \geq 2V_{DS(ON)}$ , $I_D = -0.5\text{A}$
$C_{iss}$ Input Capacitance	VP0300M		125	150	pF	$V_{GS} = 0$ , $V_{DS} = -15\text{V}$ $f = 1\ \text{MHz}$
$C_{oss}$ Output Capacitance	VP0300M		92	100	pF	
$C_{rss}$ Reverse Transfer Capacitance	VP0300M		25	60	pF	
$t_{d(on)}$ Turn-On Delay Time	VP0300M		20	30	ns	$V_{DD} = -25\text{V}$ , $I_D \cong -1\text{A}$ $R_g = 25\ \Omega$ , $R_L = 23\ \Omega$ (MOSFET switching times are essentially independent of operating temperature)
$t_{d(off)}$ Turn-Off Delay Time	VP0300M		20	30	ns	

## THERMAL RESISTANCE

$R_{thJC}$ Junction-to-Case	VP0300M		24	29	$^\circ\text{C}/\text{W}$	
$R_{thJA}$ Junction-to-Ambient	VP0300M			125	$^\circ\text{C}/\text{W}$	Free Air Operation

## BODY-DRAIN DIODE RATINGS AND CHARACTERISTICS

$I_S$ Continuous Source Current (Body Diode)	VP0300M			0.5	A	Modified MOSPOWER symbol showing the integral P-N Junction rectifier 
$I_{SM}$ Source Current <sup>1</sup> (Body Diode)	VP0300M			3	A	
$V_{SD}$ Diode Forward Voltage <sup>1</sup>	VP0300M		1.2		V	$T_C = 25^\circ\text{C}$ , $I_S = 0.5\text{A}$ , $V_{GS} = 0$

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

Data Sheet Curves VPMH03