

VP0300M

352-810



P-Channel Enhancement Mode Switch MOSPOWER

APPLICATIONS

- Switching Regulators
- Converters
- Motor Drivers

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

T0-237



PRODUCT SUMMARY

Part Number	BVDSS Volts	rDS(ON) (ohms)	Package
VP0300M	-30	2.5	T0-237

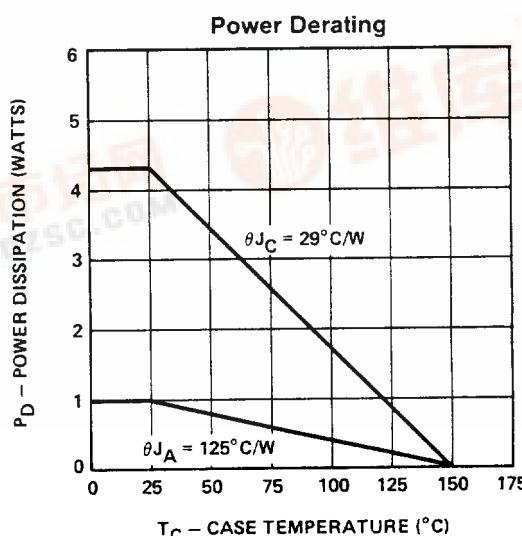
For Additional Curves
See Section 5: VPMH03

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

Parameter	VP0300M	Units
V_{DS}	-30	V
V_{DGR}	-30	V
$I_D @ T_C = 25^\circ C$	± 0.5	A
$I_D @ T_C = 100^\circ C$	± 0.32	A
I_{DM}	± 3	A
V_{GS}	± 40	V
P_D	1	W
P_D	4.3	W
Junction to Case	0.034	W/ $^\circ C$
Junction to Ambient	0.008	W/ $^\circ C$
T_J	$-55 \text{ To } +150$	
T_{stg}		
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 ($T_C = 25^\circ C$ unless otherwise noted)

STATIC

Parameter		Type	Min.	Typ.	Max.	Units	Test Conditions
BV_{DSS}	Drain-Source Breakdown Voltage	VP0300M	-30	-45		V	$V_{GS} = 0$, $I_D = -10 \mu A$
$V_{GS(th)}$	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	$V_{GS} = -30V$, $V_{DS} = 0$
I_{GSSR}	Gate-Body Leakage Reverse	VP0300M		1	100	nA	$V_{GS} = +30V$, $V_{DS} = 0$
I_{DSS}	Zero Gate Voltage Drain Current	VP0300M		-1	-10	μA	$V_{DS} = -25V$, $V_{GS} = 0$
		VP0300M		-50	-500	μA	$V_{DS} = -25V$, $V_{GS} = 0$, $T_C = 125^\circ C$
$I_{D(on)}$	On-State Drain Current ¹	VP0300M	-1.5	-1.7		A	$V_{DS} \geq 2V_{DS(ON)}$, $V_{GS} = -12V$
$V_{DS(on)}$	Static Drain-Source On-State Voltage ¹	VP0300M		-2.2	-2.5	V	$V_{GS} = -12V$, $I_D = -1A$
$R_{DS(on)}$	Static Drain-Source On-State Resistance ¹	VP0300M		2.2	2.5	Ω	$V_{GS} = -12V$, $I_D = -1A$
$R_{DS(on)}$	Static Drain-Source On-State Resistance ¹	VP0300M		3.2	3.63	Ω	$V_{GS} = -12V$, $I_D = -1A$, $T_C = 125^\circ C$

DYNAMIC

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

THERMAL RESISTANCE

R_{thJC}	Junction-to-Case	VP0300M		24	29	$^\circ C/W$	
R_{thJA}	Junction-to-Ambient	VP0300M			125	$^\circ C/W$	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 ¹ (Body Diode)	VP0300M		3	A	
V_{SD}	Diode Forward Voltage ¹	VP0300M	1.2		V	$T_C = 25^\circ C$, $I_S = 0.5A$, $V_{GS} = 0$

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