VP0300M

352-810

Siliconix

P-Channel Enhancement Mode Switch
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
VP0300M	–30	2.5	TO–237

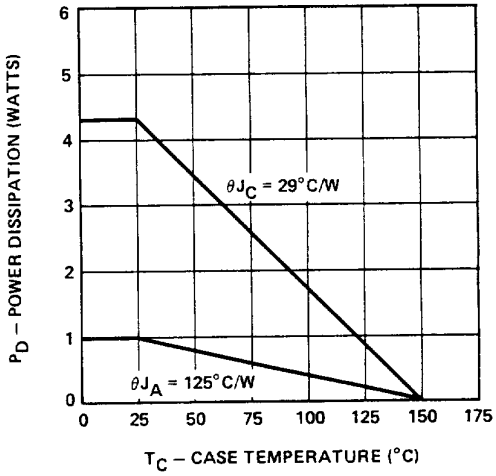
For Additional Curves
See Section 5: VPMH03

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

	Parameter	VP0300M	Units
V_{DS}	Drain-Source Voltage	–30	V
V_{DGR}	Drain-Gate Voltage (R_{GS} = 1 MΩ)	–30	V
I_D @ T_C = 25° C	Continuous Drain Current	±0.5	A
I_D @ T_C = 100° C	Continuous Drain Current	±0.32	A
I_{DM}	Pulsed Drain Current[1]	±3	A
V_{GS}	Gate-Source Voltage	±40	V
P_D	Max Continuous Power Dissipation	1	W
P_D	Max Pulse[2] Power Dissipation	4.3	W
Junction to Case	Linear Derating Factor	0.034	W/° C
Junction to Ambient	Linear Derating Factor	0.008	W/° C
T_J Tstg	Operating and Storage Temperature Range	–55 To +150	° C
Lead Temperature	(1/16" from case for 10 secs.)	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	VP0300M	−30	−45		V	V_{GS} = 0 I_D = −10 μA
$V_{GS(th)}$	Gate-Threshold Voltage	VP0300M	−2	−3.4	−4.5	V	V_{DS} = V_{GS}, I_D = −1 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° 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°C

DYNAMIC

g_{fs}	Forward Transductance[1]	VP0300M	200	300		mS(℧)	$V_{DS} \geq 2V_{DS(ON)}$, I_D = −0.5A
C_{iss}	Input Capacitance	VP0300M		125	150	pF	V_{GS} = 0 , V_{DS} = −15V f = 1 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} = −25V, $I_D \cong$ −1A R_g = 25Ω , R_L = 23Ω (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	°C/W	
R_{thJA}	Junction-to-Ambient	VP0300M			125	°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°C , I_S = 0.5A, V_{GS} = 0

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

Data Sheet Curves VPMH03