Ordering number : ENA0368A

6HP04MH

P-Channel Small Single MOSFET
−60V, −370mA, 4.2Ω Single MCPH3

ON Semiconductor®
http://onsemi.com

Features

- 4V drive
- Halogen free compliance
- Protection diode in

Specifications

Absolute Maximum Ratings at Ta=25°C

Parameter	Symbol	Conditions	Ratings	Unit
Drain to Source Voltage	V_{DSS}		−60	V
Gate to Source Voltage	V_{GSS}		±20	V
Drain Current (DC)	I_D		−370	mA
Drain Current (Pulse)	I_{DP}	PW≤10μs, duty cycle≤1%	−1480	mA
Allowable Power Dissipation	P_D	When mounted on ceramic substrate (900mm^2×0.8mm)	0.6	W
Channel Temperature	Tch		150	°C
Storage Temperature	Tstg		−55 to +150	°C

Stresses exceeding Maximum Ratings may damage the device. Maximum Ratings are stress ratings only. Functional operation above the Recommended Operating Conditions is not implied. Extended exposure to stresses above the Recommended Operating Conditions may affect device reliability.

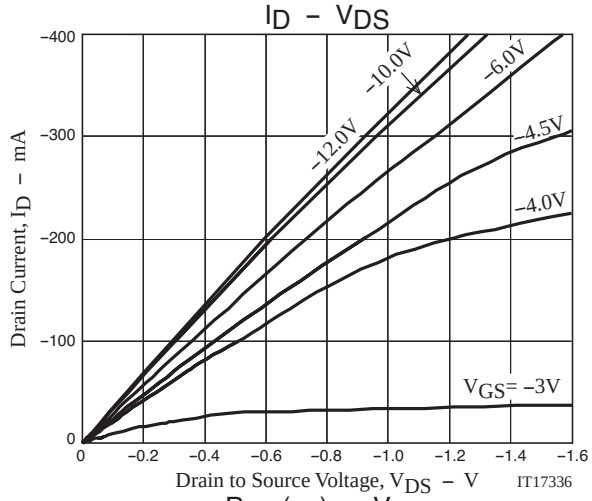
Electrical Characteristics at Ta=25°C

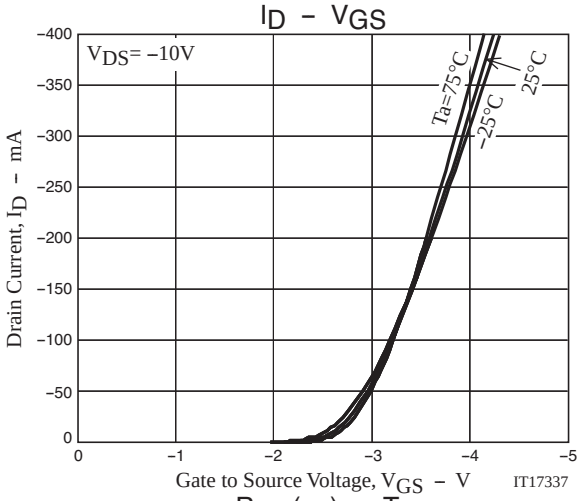
Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Drain to Source Breakdown Voltage	$V_{(BR)DSS}$	I_D=−1mA, V_{GS}=0V	−60			V
Zero-Gate Voltage Drain Current	I_{DSS}	V_{DS}=−60V, V_{GS}=0V			−1	μA
Gate to Source Leakage Current	I_{GSS}	V_{GS}=±16V, V_{DS}=0V			±10	μA
Cutoff Voltage	V_{GS}(off)	V_{DS}=−10V, I_D=−100μA	−1.2		−2.6	V
Forward Transfer Admittance	| yfs |	V_{DS}=−10V, I_D=−190mA		310		mS
Static Drain to Source On-State Resistance	R_{DS}(on)1	I_D=−190mA, V_{GS}=−10V		3.1	4.2	Ω
	R_{DS}(on)2	I_D=−100mA, V_{GS}=−4V		5.1	7.3	Ω
Input Capacitance	Ciss	V_{DS}=−20V, f=1MHz		24.1		pF
Output Capacitance	Coss			8.5		pF
Reverse Transfer Capacitance	Crss			4.1		pF
Turn-ON Delay Time	t_d(on)	See specified Test Circuit.		18.4		ns
Rise Time	t_r			15.2		ns
Turn-OFF Delay Time	t_d(off)			113		ns
Fall Time	t_f			41		ns
Total Gate Charge	Qg	V_{DS}=−30V, V_{GS}=−10V, I_D=−370mA		0.84		nC
Gate to Source Charge	Qgs			0.19		nC
Gate to Drain “Miller” Charge	Qgd			0.21		nC
Diode Forward Voltage	V_{SD}	I_S=−370mA, V_{GS}=0V		−0.92	−1.2	V

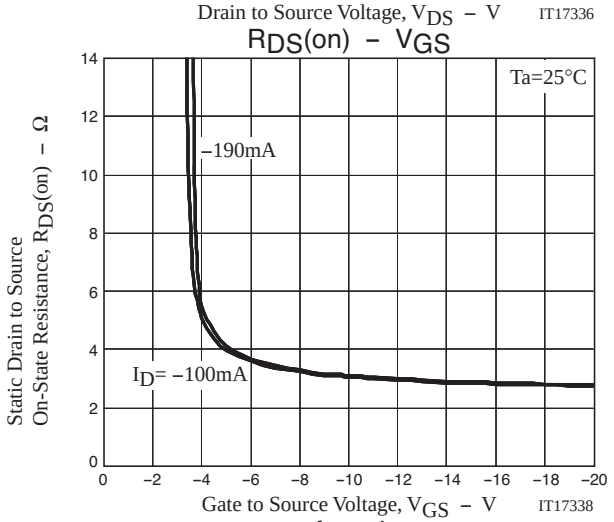
ORDERING INFORMATION

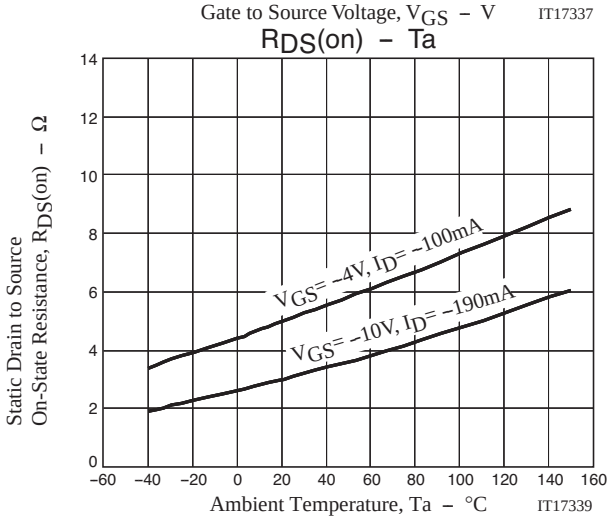
See detailed ordering and shipping information on page 4 of this data sheet.

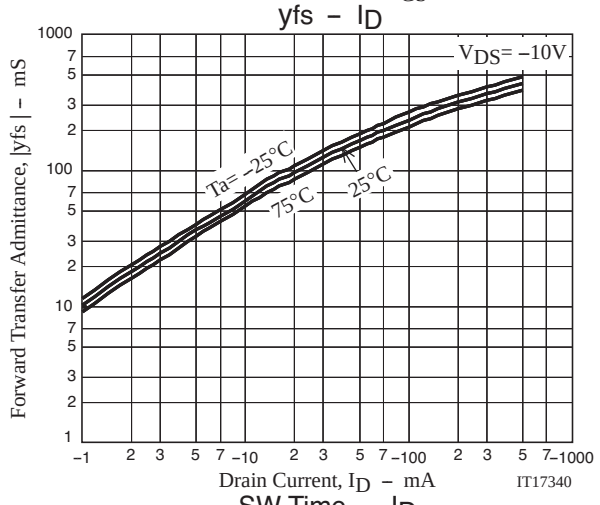
December, 2013

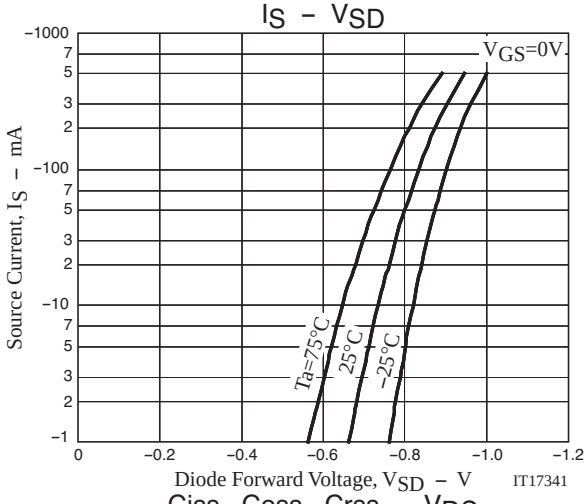

ID – VDS
Drain Current, ID – mA
Drain to Source Voltage, VDS – V
IT17336
–10.0V
–6.0V
–12.0V
–4.5V
–4.0V
VGS= –3V

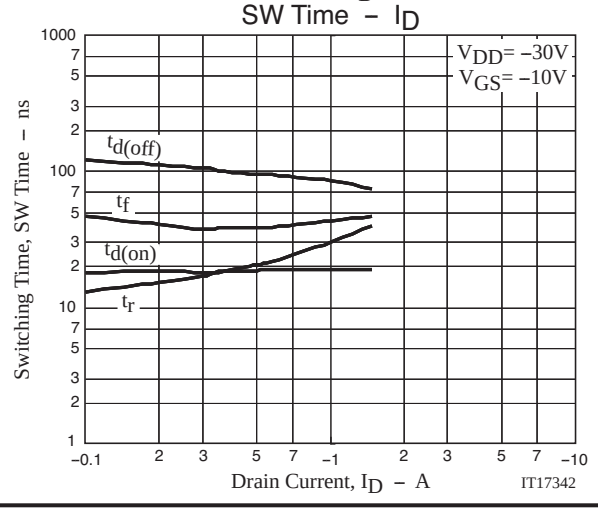

ID – VGS
Drain Current, ID – mA
Gate to Source Voltage, VGS – V
IT17337
VDS= –10V
Ta=75°C
25°C
–25°C

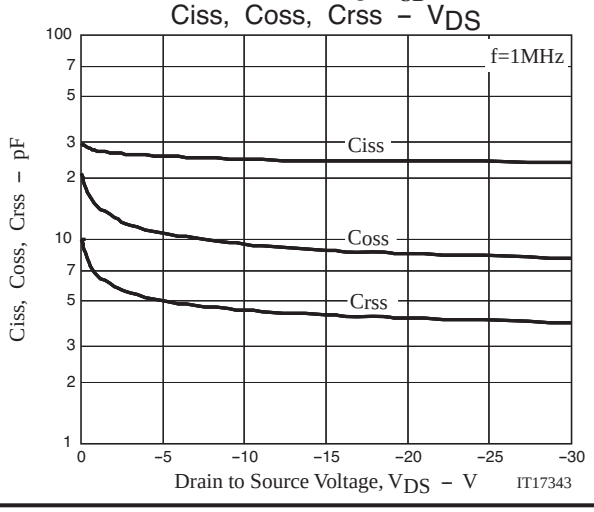

RDS(on) – VGS
Static Drain to Source On-State Resistance, RDS(on) – Ω
Gate to Source Voltage, VGS – V
IT17338
Ta=25°C
–190mA
ID= –100mA

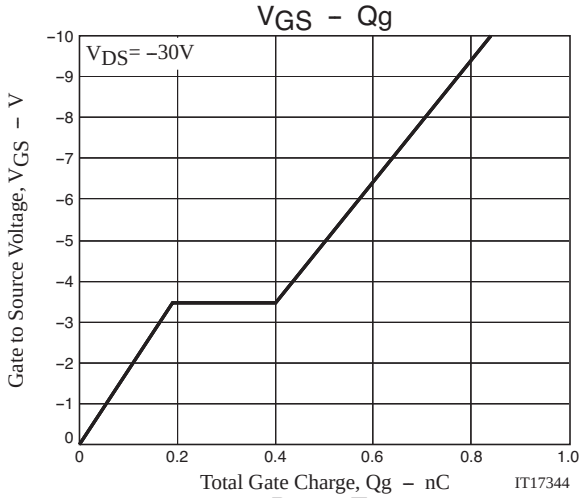

RDS(on) – Ta
Static Drain to Source On-State Resistance, RDS(on) – Ω
Ambient Temperature, Ta – °C
IT17339
VGS= –4V, ID= –100mA
VGS= –10V, ID= –190mA

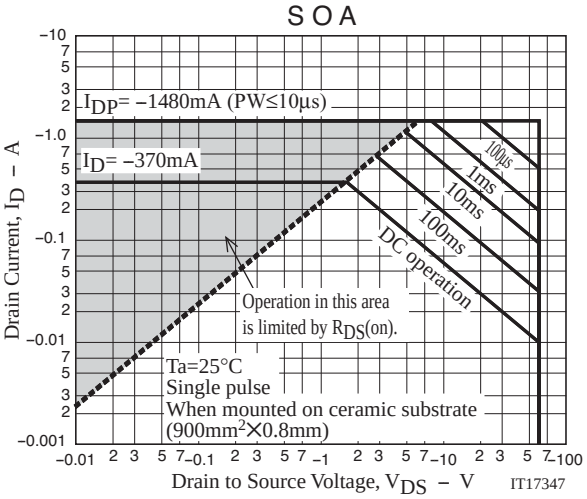

yfs – ID
Forward Transfer Admittance, |yfs| – mS
Drain Current, ID – mA
IT17340
VDS= –10V
Ta= –25°C
75°C
25°C

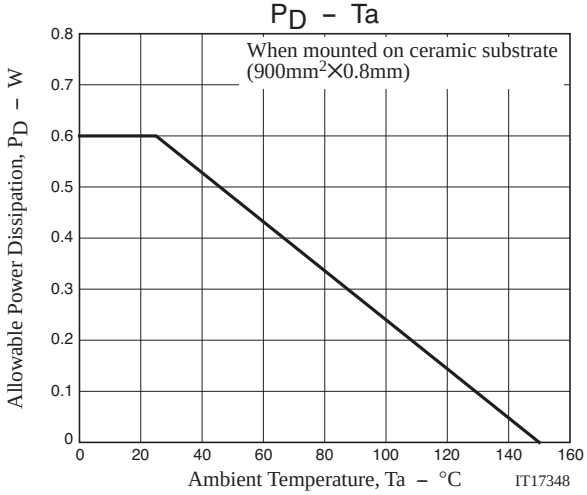

IS – VSD
Source Current, IS – mA
Diode Forward Voltage, VSD – V
IT17341
VGS=0V
Ta=75°C
25°C
–25°C


SW Time – ID
Switching Time, SW Time – ns
Drain Current, ID – A
IT17342
VDD= –30V
VGS= –10V
td(off)
tf
td(on)
tr


Ciss, Coss, Crss – VDS
Ciss, Coss, Crss – pF
Drain to Source Voltage, VDS – V
IT17343
f=1MHz
Ciss
Coss
Crss


VGS – Qg
VDS= –30V
Gate to Source Voltage, VGS – V
Total Gate Charge, Qg – nC
IT17344


S O A
IDP= –1480mA (PW≤10μs)
ID= –370mA
100μs
1ms
10ms
100ms
DC operation
Operation in this area
is limited by RDS(on).
Ta=25°C
Single pulse
When mounted on ceramic substrate
(900mm2×0.8mm)
Drain Current, ID – A
Drain to Source Voltage, VDS – V
IT17347

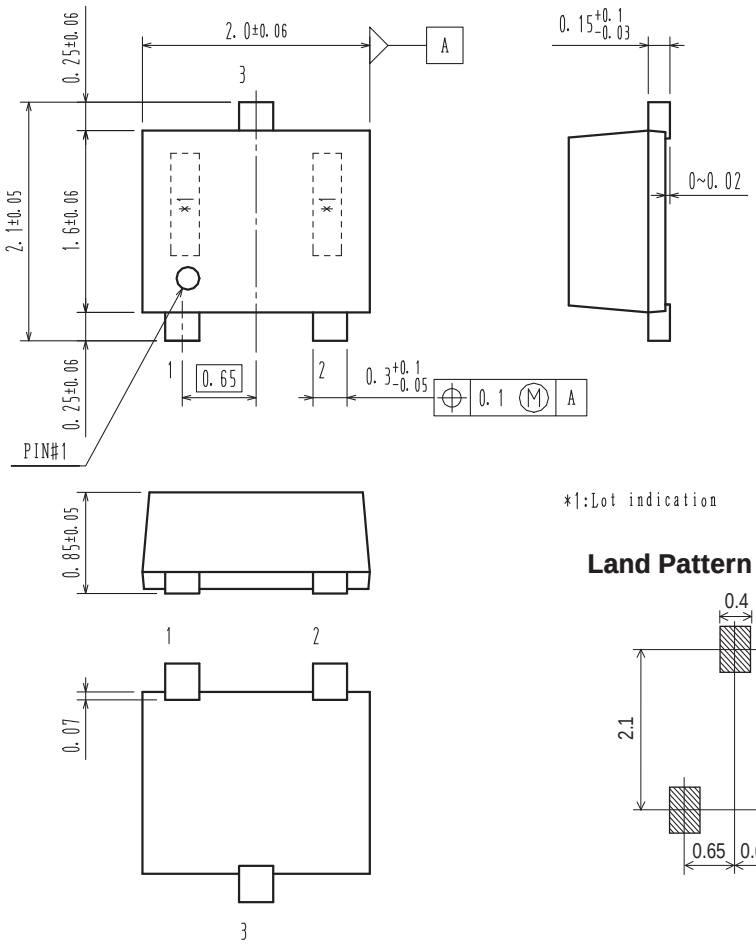

PD – Ta
When mounted on ceramic substrate
(900mm2×0.8mm)
Allowable Power Dissipation, PD – W
Ambient Temperature, Ta – °C
IT17348

Package Dimensions

6HP04MH-TL-W

SC-70FL/MCPH3
CASE 419AQ
ISSUE O
Unit : mm

1: Gate
2: Source
3: Drain

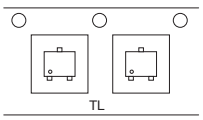


Land Pattern Example

Ordering & Package Information

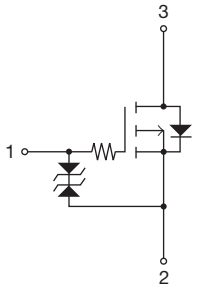
Device	Package	Shipping	memo
6HP04MH-TL-W	MCPH3 SC-70, SOT-323	3,000 pcs. / reel	Pb-Free and Halogen Free

Packing Type:TL

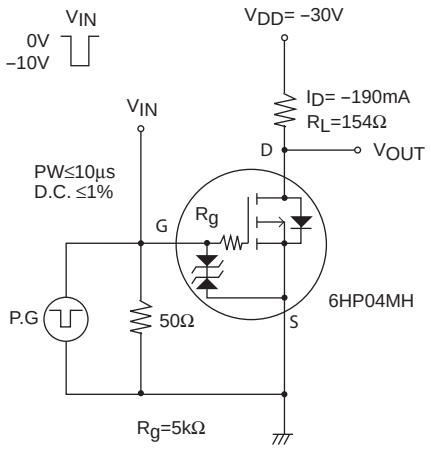


Marking

Electrical Connection



Switching Time Test Circuit



Note on usage : Since the 6HP04MH is a MOSFET product, please avoid using this device in the vicinity of highly charged objects.

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