Ordering number : ENA1000B

MCH3475

N-Channel Power MOSFET
30V, 1.8A, 180mΩ, Single MCPH3

ON Semiconductor®
http://onsemi.com

Features

- Ultrahigh speed switching
- 4V drive

Specifications

Absolute Maximum Ratings at Ta=25°C

Parameter	Symbol	Conditions	Ratings	Unit
Drain to Source Voltage	V_{DSS}		30	V
Gate to Source Voltage	V_{GSS}		±20	V
Drain Current (DC)	I_D		1.8	A
Drain Current (Pulse)	I_{DP}	PW≤10μs, duty cycle≤1%	7.2	A
Allowable Power Dissipation	P_D	When mounted on ceramic substrate (900mm^2×0.8mm)	0.8	W
Channel Temperature	Tch		150	°C
Storage Temperature	Tstg		−55 to +150	°C

This product is designed to "ESD immunity < 200V*", so please take care when handling.

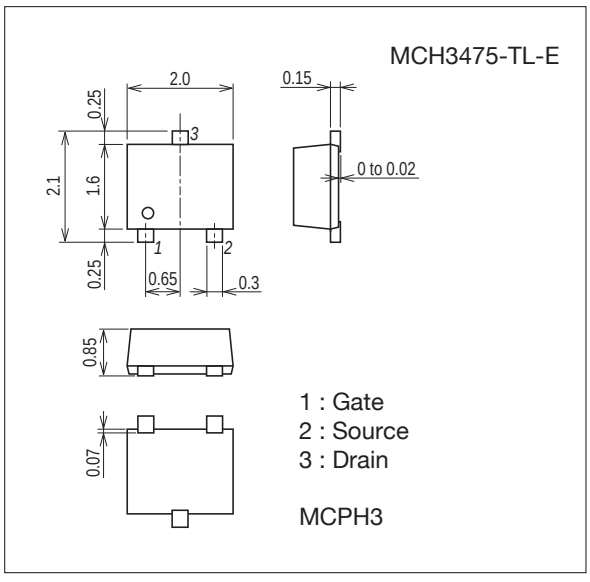
* Machine Model

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.

Package Dimensions

unit : mm (typ)

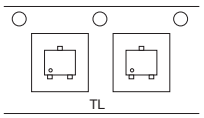
7019A-003



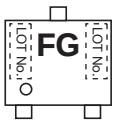
Product & Package Information

- Package : MCPH3
- JEITA, JEDEC : SC-70, SOT-323
- Minimum Packing Quantity : 3,000 pcs./reel

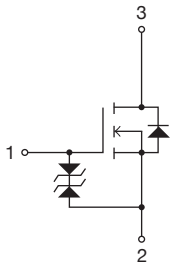
Packing Type : TL



Marking



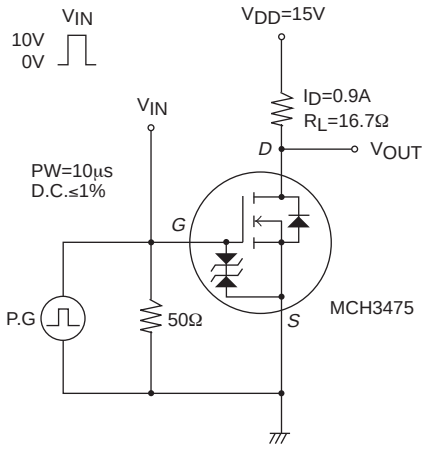
Electrical Connection



Electrical Characteristics at Ta=25°C

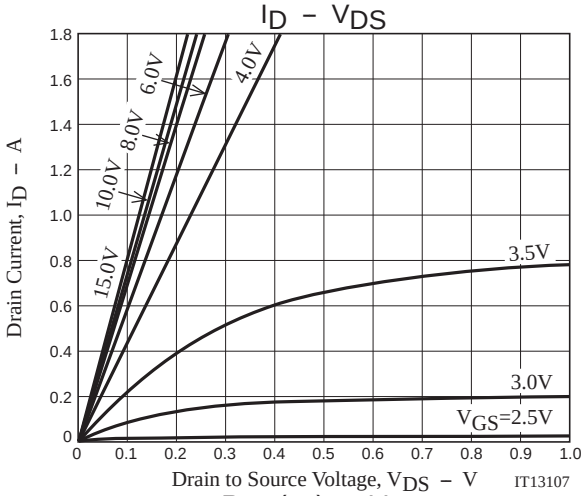
Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Drain to Source Breakdown Voltage	$V_{(BR)DSS}$	I_D=1mA, V_{GS}=0V	30			V
Zero-Gate Voltage Drain Current	I_{DSS}	V_{DS}=30V, V_{GS}=0V			1	μA
Gate to Source Leakage Current	I_{GSS}	V_{GS}=±16V, V_{DS}=0V			±10	μA
Cutoff Voltage	V_{GS}(off)	V_{DS}=10V, I_D=1mA	1.2		2.6	V
Forward Transfer Admittance	| yfs |	V_{DS}=10V, I_D=0.9A	0.66	1.1		S
Static Drain to Source On-State Resistance	R_{DS}(on)1	I_D=0.9A, V_{GS}=10V		135	180	mΩ
	R_{DS}(on)2	I_D=0.5A, V_{GS}=4V		230	330	mΩ
Input Capacitance	Ciss	V_{DS}=10V, f=1MHz		88		pF
Output Capacitance	Coss			19		pF
Reverse Transfer Capacitance	Crss			11		pF
Turn-ON Delay Time	t_d(on)	See specified Test Circuit.		3.4		ns
Rise Time	t_r			3.6		ns
Turn-OFF Delay Time	t_d(off)			10.5		ns
Fall Time	t_f			4.0		ns
Total Gate Charge	Qg	V_{DS}=10V, V_{GS}=10V, I_D=1.8A		2.0		nC
Gate to Source Charge	Qgs			0.33		nC
Gate to Drain “Miller” Charge	Qgd			0.29		nC
Diode Forward Voltage	V_{SD}	I_S=1.8A, V_{GS}=0V		0.86	1.2	V

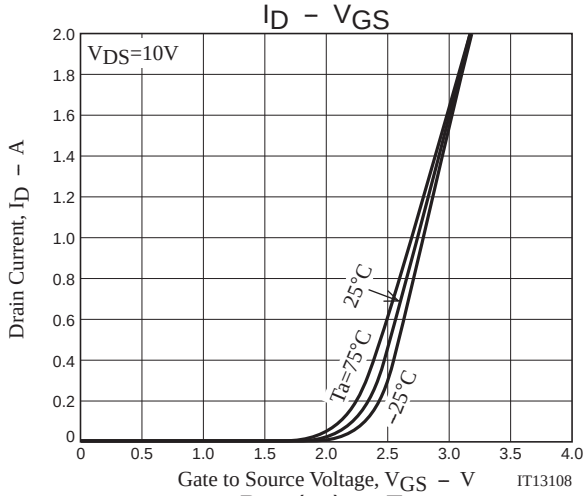
Switching Time Test Circuit

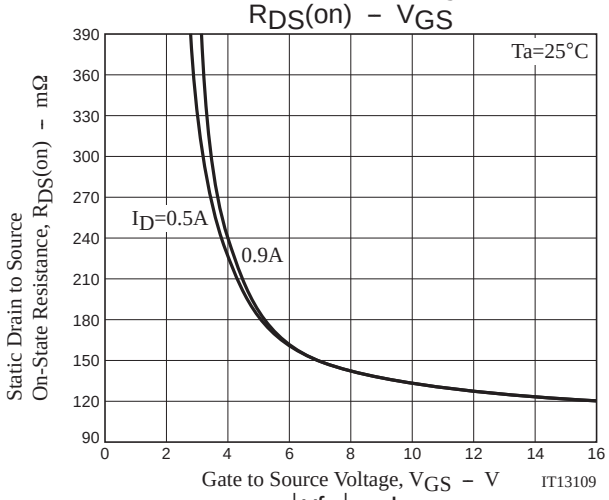


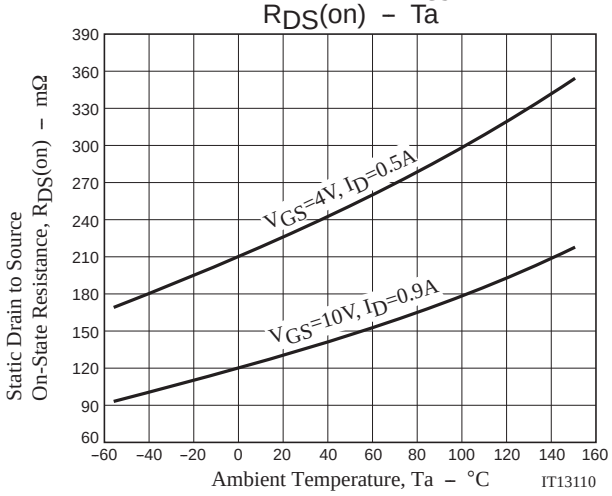
Ordering Information

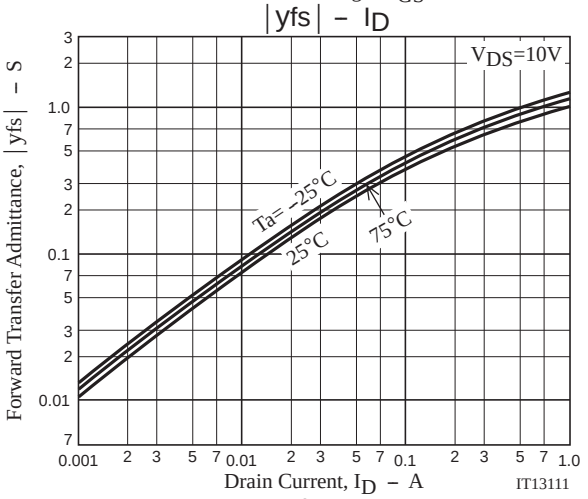
Device	Package	Shipping	memo
MCH3475-TL-E	MCPH3	3,000pcs./reel	Pb Free

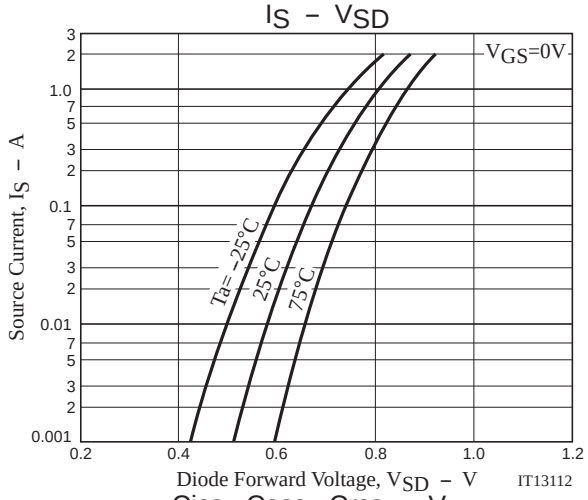

ID – VDS
Drain Current, ID – A
Drain to Source Voltage, VDS – V
IT13107
4.0V
6.0V
8.0V
10.0V
15.0V
3.5V
3.0V
VGS=2.5V

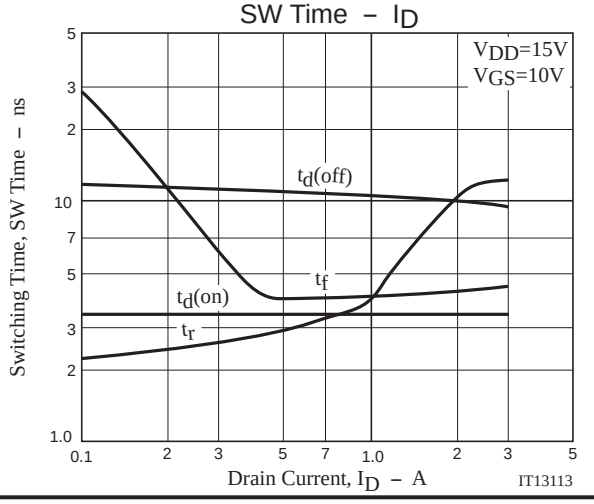

ID – VGS
Drain Current, ID – A
Gate to Source Voltage, VGS – V
IT13108
VDS=10V
25°C
Ta=75°C
–25°C

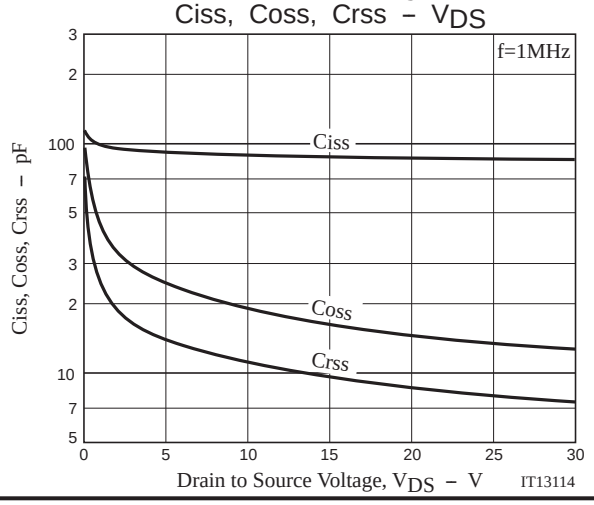

RDS(on) – VGS
Static Drain to Source On-State Resistance, RDS(on) – mΩ
Gate to Source Voltage, VGS – V
IT13109
Ta=25°C
ID=0.5A
0.9A

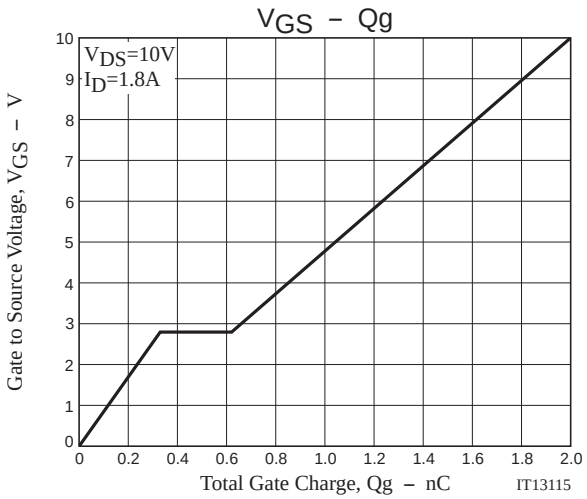

RDS(on) – Ta
Static Drain to Source On-State Resistance, RDS(on) – mΩ
Ambient Temperature, Ta – °C
IT13110
VGS=4V, ID=0.5A
VGS=10V, ID=0.9A

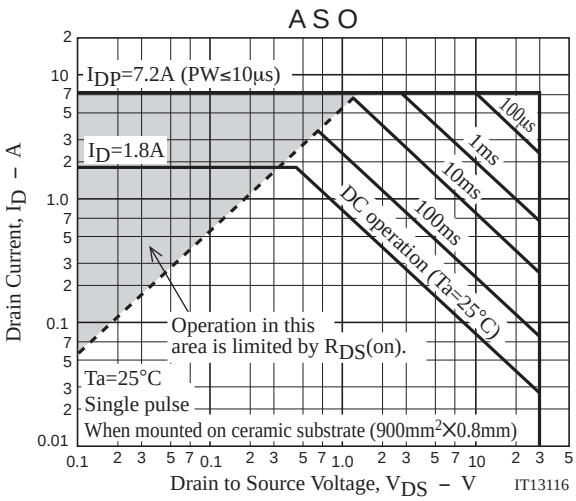

|yfs| – ID
Forward Transfer Admittance, |yfs| – S
Drain Current, ID – A
IT13111
VDS=10V
Ta= –25°C
25°C
75°C

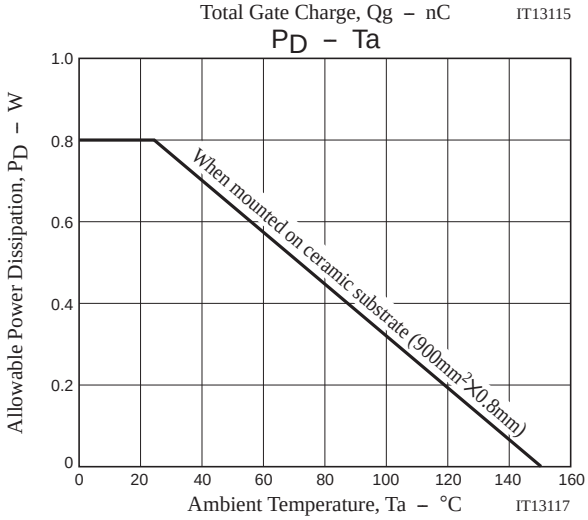

IS – VSD
Source Current, IS – A
Diode Forward Voltage, VSD – V
IT13112
VGS=0V
Ta= –25°C
25°C
75°C


SW Time – ID
Switching Time, SW Time – ns
Drain Current, ID – A
IT13113
VDD=15V
VGS=10V
td(off)
tf
td(on)
tr


Ciss, Coss, Crss – VDS
Ciss, Coss, Crss – pF
Drain to Source Voltage, VDS – V
IT13114
f=1MHz
Ciss
Coss
Crss

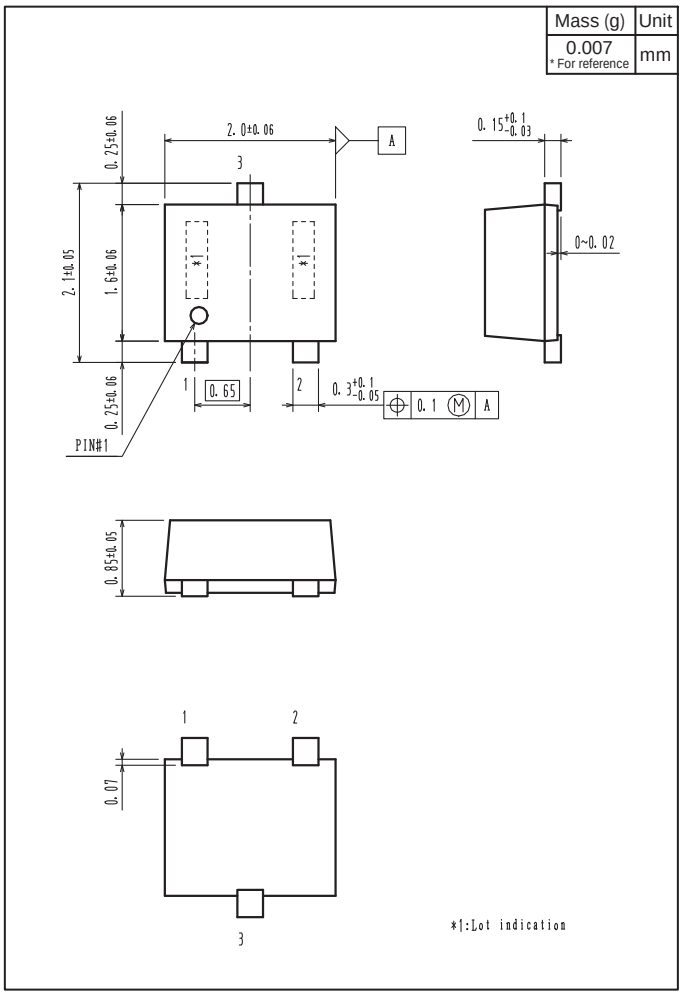

VGS – Qg
VDS=10V
ID=1.8A
Gate to Source Voltage, VGS – V
Total Gate Charge, Qg – nC
IT13115


A S O
IDP=7.2A (PW≤10μs)
ID=1.8A
100μs
1ms
10ms
100ms
DC operation (Ta=25°C)
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
IT13116

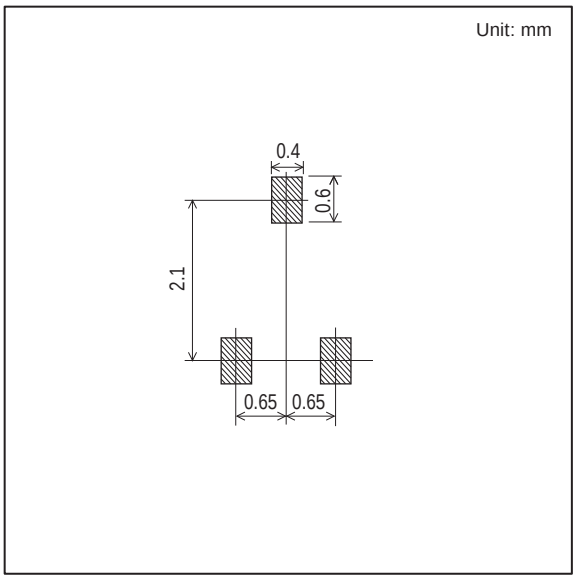

PD – Ta
When mounted on ceramic substrate (900mm2×0.8mm)
Allowable Power Dissipation, PD – W
Ambient Temperature, Ta – °C
IT13117

Outline Drawing

MCH3475-TL-E



Land Pattern Example



Note on usage : Since the MCH3475 is a MOSFET product, please avoid using this device in the vicinity of highly charged objects.