MCH3475

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

ON Semiconductor®

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Features

- High Speed Switching
- 4V Drive
- Pb-Free and RoHS Compliance
- Halogen Free Compliance : MCH3475-TL-W

V_{DSS}	R_{DS}(on) Max	I_D Max
30V	180mΩ@ 10V	1.8A
	330mΩ@ 4V	

Specifications

Absolute Maximum Ratings at Ta = 25°C

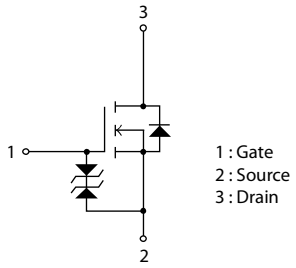
Parameter	Symbol	Value	Unit
Drain to Source Voltage	V_{DSS}	30	V
Gate to Source Voltage	V_{GSS}	±20	V
Drain Current (DC)	I_D	1.8	A
Drain Current (Pulse) PW≤10μs, duty cycle≤1%	I_{DP}	7.2	A
Power Dissipation When mounted on ceramic substrate (900mm^2 × 0.8mm)	P_D	0.8	W
Junction Temperature	Tj	150	°C
Storage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

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

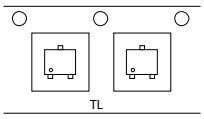
Thermal Resistance Ratings

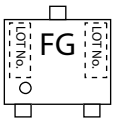
Parameter	Symbol	Value	Unit
Junction to Ambient When mounted on ceramic substrate (900mm^2 × 0.8mm)	$R_{\theta JA}$	156.2	°C/W

Electrical Connection
N-Channel



Packing Type : TL **Marking**





Stresses exceeding those listed in the Maximum Ratings table may damage the device. If any of these limits are exceeded, device functionality should not be assumed, damage may occur and reliability may be affected.

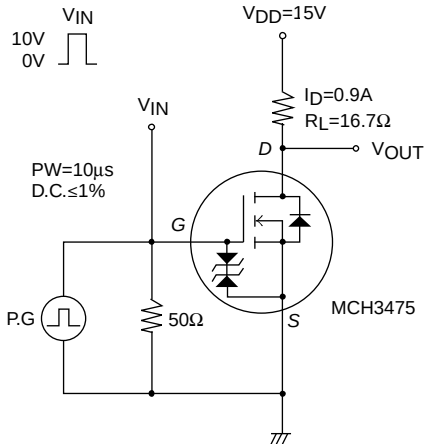
ORDERING INFORMATION
See detailed ordering and shipping information on page 5 of this data sheet.

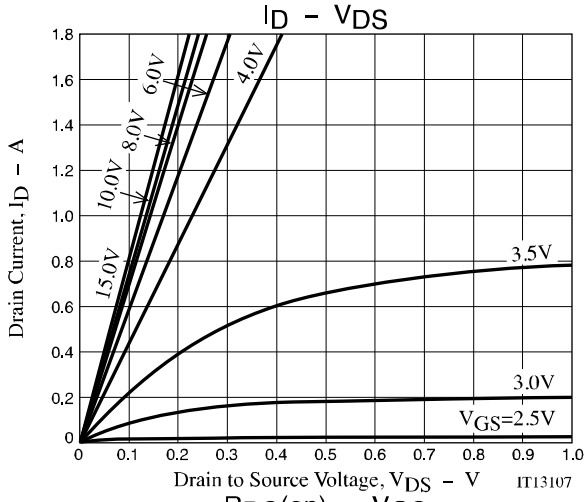
Electrical Characteristics at Ta = 25°C

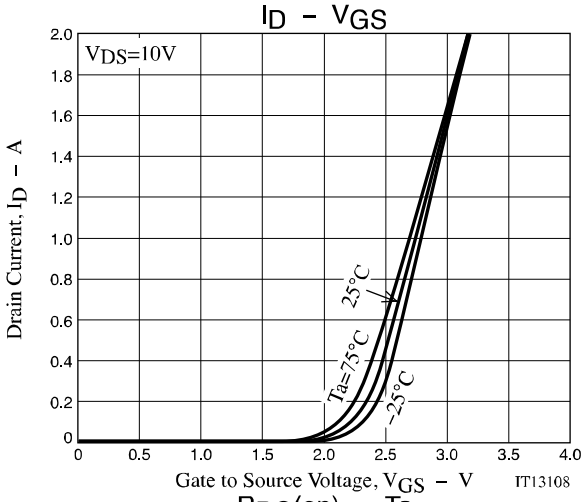
Parameter	Symbol	Conditions	Value			Unit
			min	typ	max	
Drain to Source Breakdown Voltage	$V_{(BR)DSS}$	I_D=1mA, V_{GS}=0V	30			V
Zero-Gate Voltage Drain Current	I_{DSS}	V_{DS}=30V, V_{GS}=0V			1	μA
Gate to Source Leakage Current	I_{GSS}	V_{GS}=±16V, V_{DS}=0V			±10	μA
Gate Threshold Voltage	$V_{GS}(th)$	V_{DS}=10V, I_D=1mA	1.2		2.6	V
Forward Transconductance	g_{FS}	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
Forward Diode Voltage	V_{SD}	I_S=1.8A, V_{GS}=0V		0.86	1.2	V

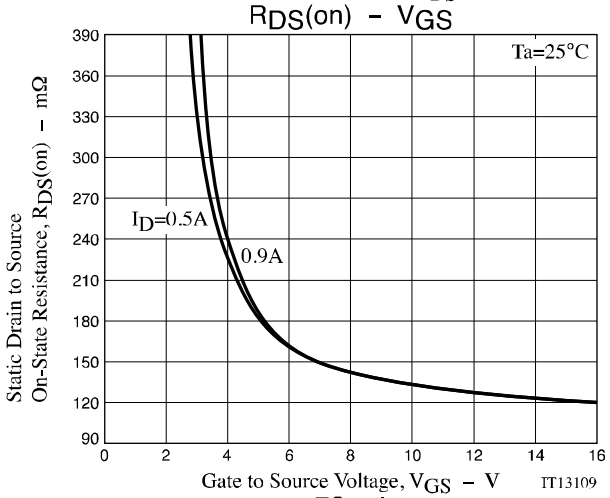
Product parametric performance is indicated in the Electrical Characteristics for the listed test conditions, unless otherwise noted. Product performance may not be indicated by the Electrical Characteristics if operated under different conditions.

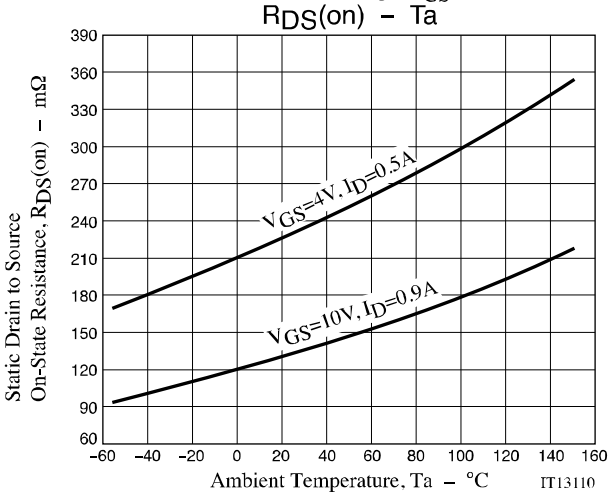
Switching Time Test Circuit

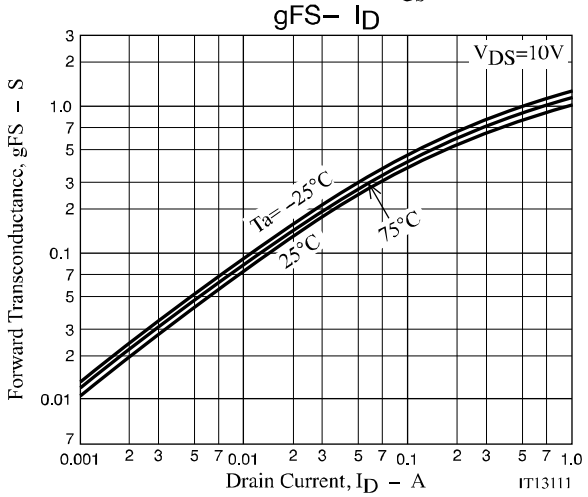


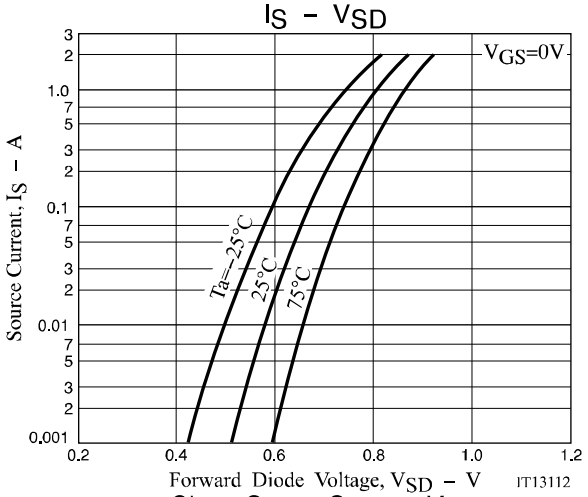

ID – VDS
Drain Current, ID – A
Drain to Source Voltage, VDS – V
IT13107
6.0V
4.0V
8.0V
10.0V
15.0V
3.5V
3.0V
VGS=2.5V

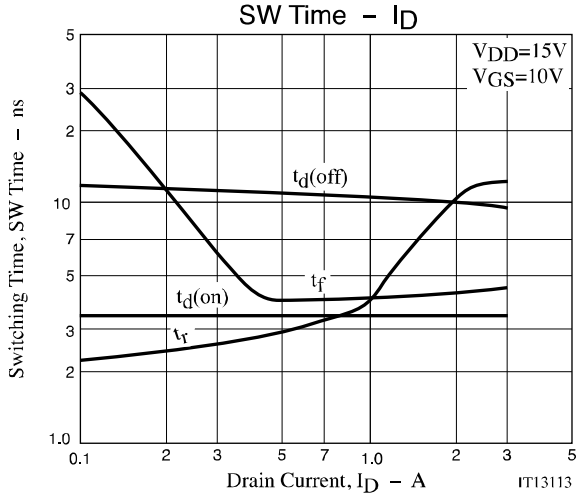

ID – VGS
Drain Current, ID – A
Gate to Source Voltage, VGS – V
IT13108
VDS=10V
25°C
Ta=75°C
–25°C

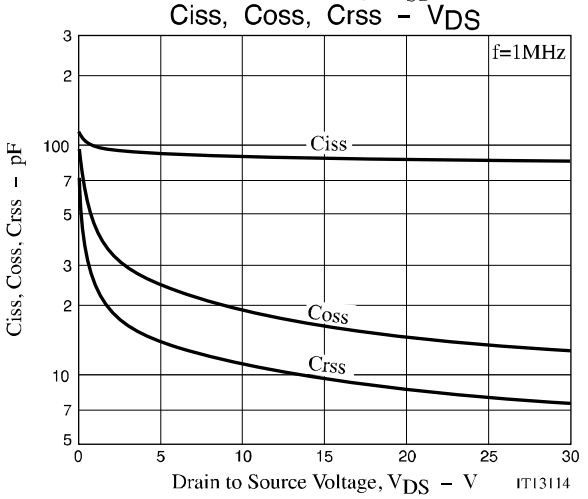

RDS(on) – VGS
Static Drain to Source
On-State Resistance, RDS(on) – mΩ
Gate to Source Voltage, VGS – V
IT13109
Ta=25°C
ID=0.5A
0.9A

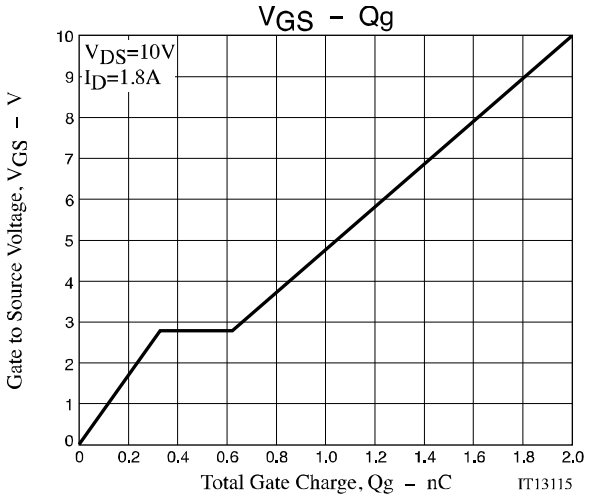

RDS(on) – Ta
Static Drain to Source
On-State Resistance, RDS(on) – mΩ
Ambient Temperature, Ta – °C
IT13110
VGS=4V, ID=0.5A
VGS=10V, ID=0.9A

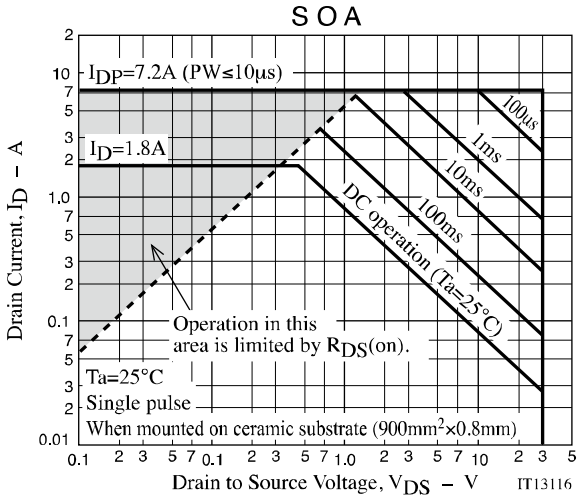

gFS– ID
Forward Transconductance, gFS – S
Drain Current, ID – A
IT13111
VDS=10V
Ta= –25°C
25°C
75°C

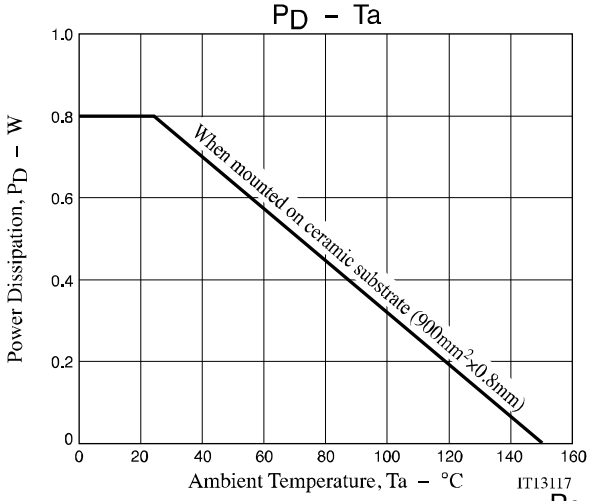

IS – VSD
Source Current, IS – A
Forward Diode Voltage, VSD – V
IT13112
VGS=0V
Ta=–25°C
25°C
75°C

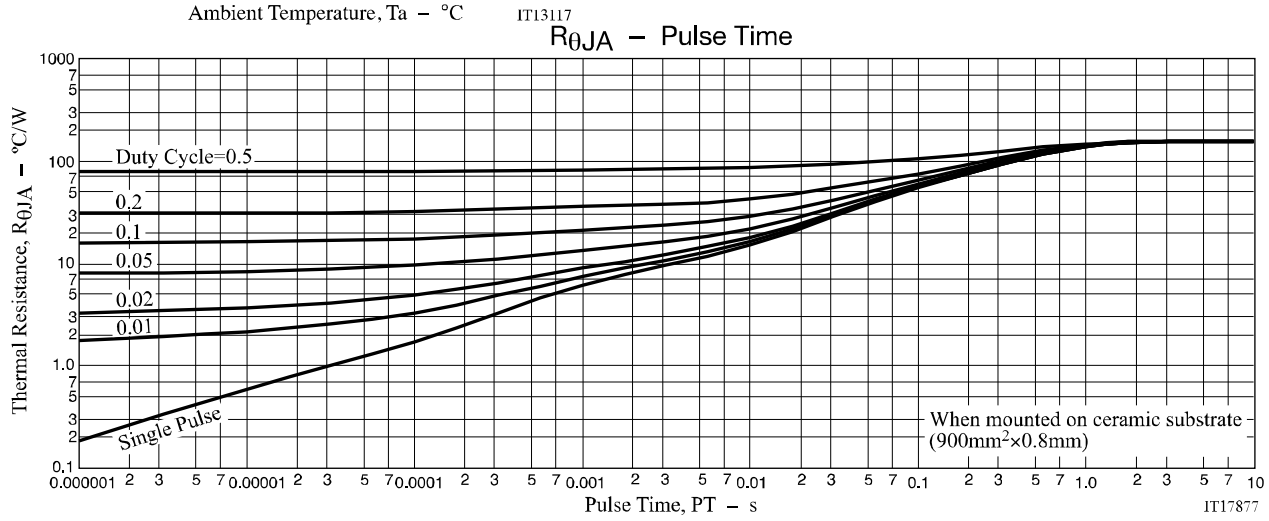

SW Time – ID
Switching Time, SW Time – ns
Drain Current, ID – A
IT13113
VDD=15V
VGS=10V
td(off)
tf
td(on)
tr


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


S O A
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)
Power Dissipation, PD – W
Ambient Temperature, Ta – °C
IT13117


RθJA – Pulse Time
Duty Cycle=0.5
0.2
0.1
0.05
0.02
0.01
Single Pulse
When mounted on ceramic substrate
(900mm2×0.8mm)
Thermal Resistance, RθJA – °C/W
Pulse Time, PT – s
IT17877

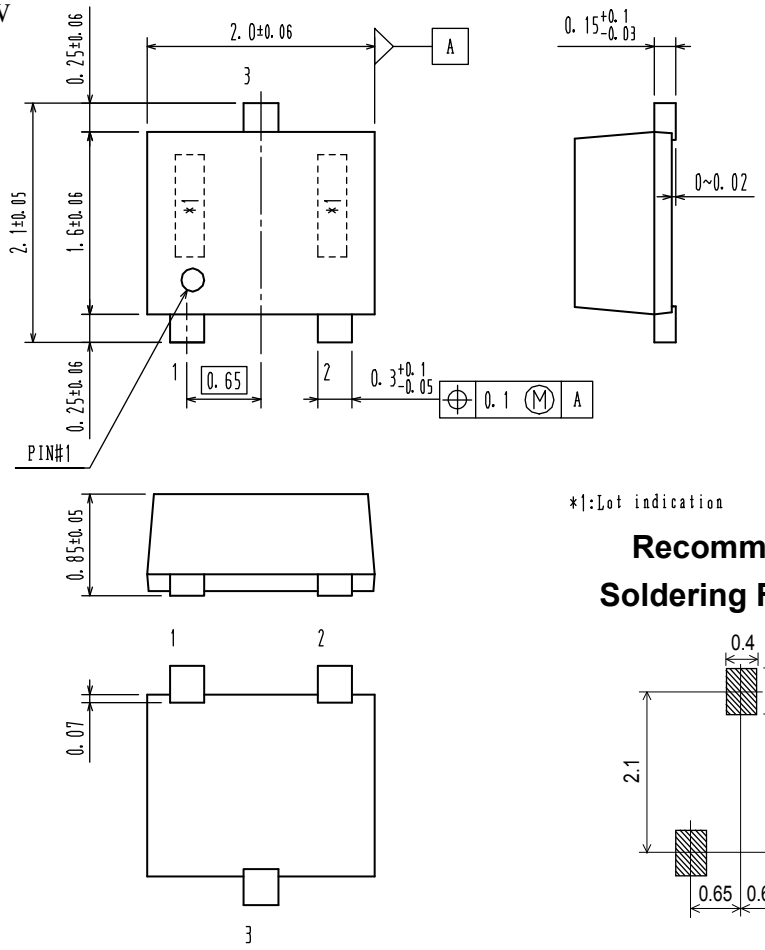
Package Dimensions

MCH3475-TL-E / MCH3475-TL-W

MCPH3
CASE 419AQ
ISSUE O

Unit : mm

1 : Gate
2 : Source
3 : Drain



Recommended Soldering Footprint

ORDERING INFORMATION

Device	Package	Shipping	Note
MCH3475-TL-E	MCPH3 SC-70FL, SOT-323	3,000 pcs. / Tape & Reel	Pb-Free
MCH3475-TL-W			Pb-Free and Halogen Free

† For information on tape and reel specifications, including part orientation and tape sizes, please refer to our Tape and Reel Packaging Specifications Brochure, BRD8011/D. http://www.onsemi.com/pub_link/Collateral/BRD8011-D.PDF

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