MCH3476

Power MOSFET
20V, 125mΩ, 2A, Single N-Channel

ON Semiconductor®

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Features

- Low On-Resistance
- 1.8V Drive
- ESD Diode-Protected Gate
- Pb-Free, Halogen Free and RoHS Compliance

V_{DSS}	R_{DS}(on) Max	I_D Max
20V	125mΩ@ 4.5V	2A
	190mΩ@ 2.5V	
	310mΩ@ 1.8V	

Specifications

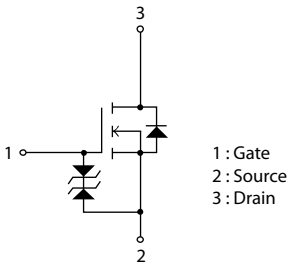
Absolute Maximum Ratings at Ta = 25°C

Parameter	Symbol	Value	Unit
Drain to Source Voltage	V_{DSS}	20	V
Gate to Source Voltage	V_{GSS}	±12	V
Drain Current (DC)	I_D	2	A
Drain Current (Pulse) PW≤10μs, duty cycle≤1%	I_{DP}	8	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

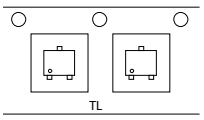
Thermal Resistance Ratings

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

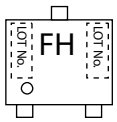
Electrical Connection
N-Channel



Packing Type : TL



Marking



FH : Device Code

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.

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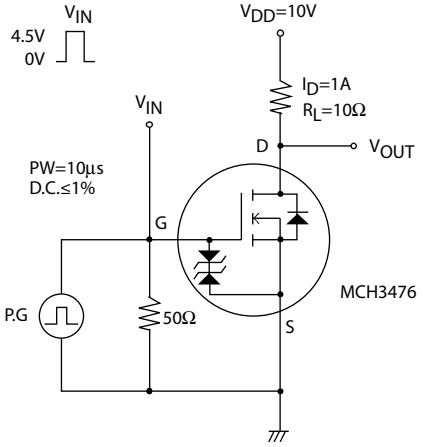
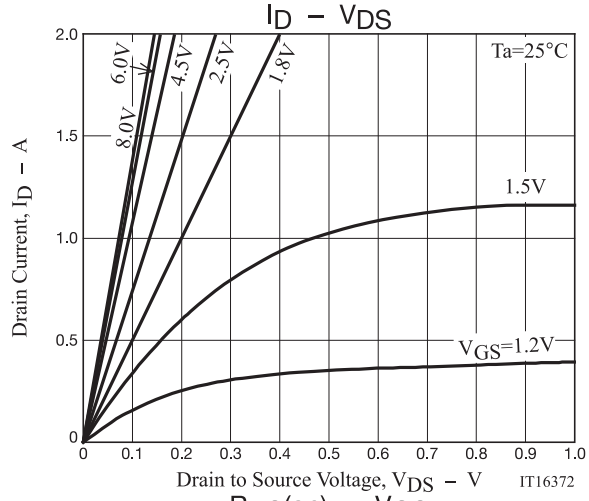
Electrical Characteristics at Ta = 25°C

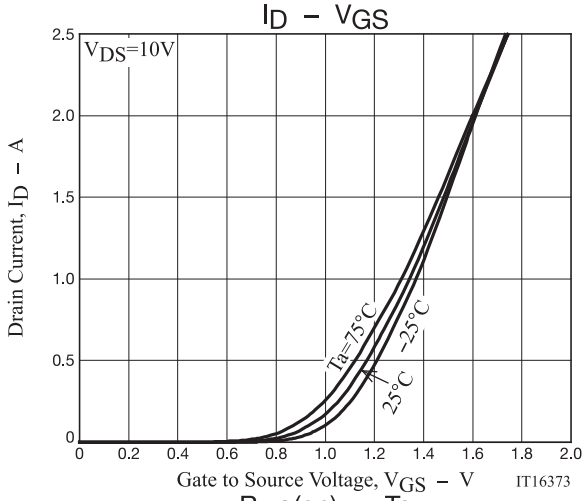
Parameter	Symbol	Conditions	Value			Unit
			min	typ	max	
Drain to Source Breakdown Voltage	$V_{(BR)DSS}$	I_D=1mA, V_{GS}=0V	20			V
Zero-Gate Voltage Drain Current	I_{DSS}	V_{DS}=20V, V_{GS}=0V			1	μA
Gate to Source Leakage Current	I_{GSS}	V_{GS}=±8V, V_{DS}=0V			±10	μA
Gate Threshold Voltage	$V_{GS}(th)$	V_{DS}=10V, I_D=1mA	0.4		1.3	V
Forward Transconductance	g_{FS}	V_{DS}=10V, I_D=1A		1.9		S
Static Drain to Source On-State Resistance	$R_{DS}(on)1$	I_D=1A, V_{GS}=4.5V		93	125	mΩ
	$R_{DS}(on)2$	I_D=0.5A, V_{GS}=2.5V		135	190	mΩ
	$R_{DS}(on)3$	I_D=0.3A, V_{GS}=1.8V		200	310	mΩ
Input Capacitance	Ciss	V_{DS}=10V, f=1MHz		128		pF
Output Capacitance	Coss			28		pF
Reverse Transfer Capacitance	Crss			21		pF
Turn-ON Delay Time	$t_d(on)$	See specified Test Circuit		5.1		ns
Rise Time	t_r			11		ns
Turn-OFF Delay Time	$t_d(off)$			14.5		ns
Fall Time	t_f			12		ns
Total Gate Charge	Qg	V_{DS}=10V, V_{GS}=4.5V, I_D=2A		1.8		nC
Gate to Source Charge	Qgs			0.3		nC
Gate to Drain “Miller” Charge	Qgd			0.55		nC
Forward Diode Voltage	V_{SD}	I_S=2A, V_{GS}=0V		0.85	1.2	V

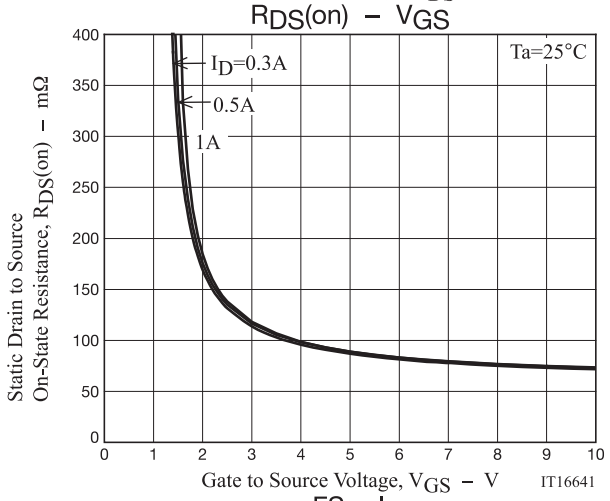
Product parametric performance is indicated in the Electrical Characteristics for the listed test conditions, unless otherwise noted. Product performance may not be indicated by the Electrical Characteristics if operated under different conditions.

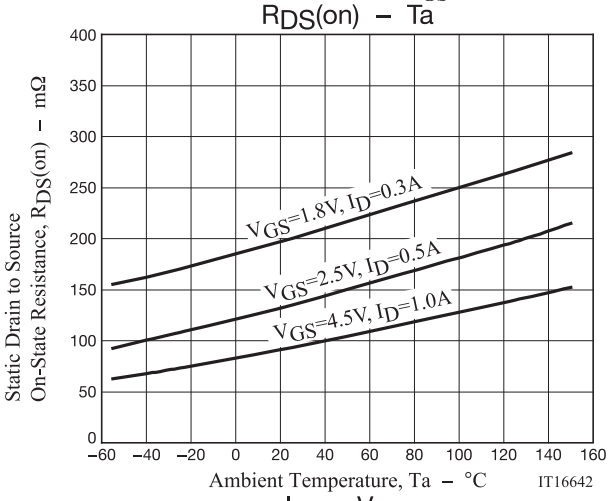
Switching Time Test Circuit

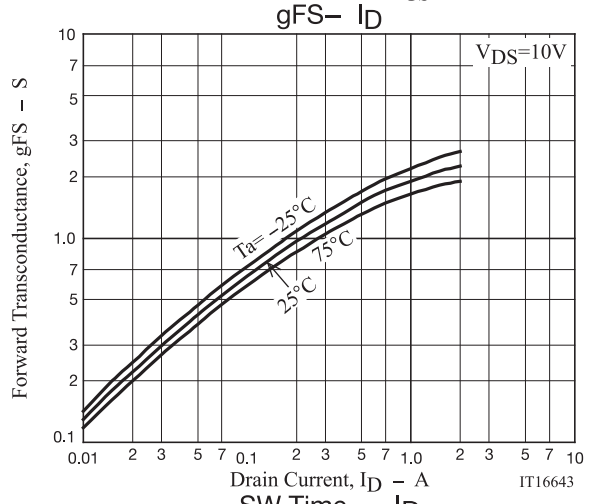


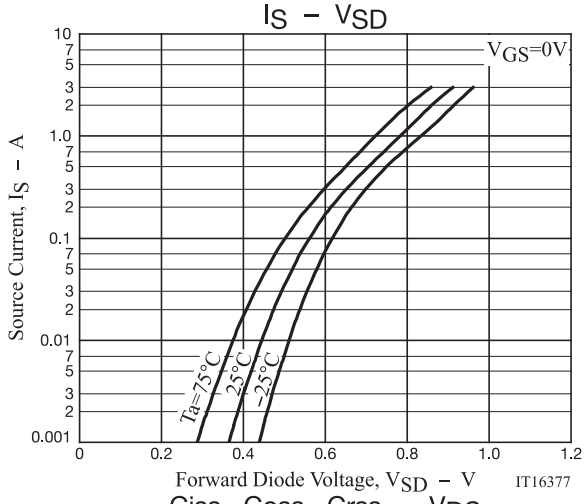

ID – VDS
Ta=25°C
6.0V
8.0V
4.5V
2.5V
1.8V
1.5V
VGS=1.2V
Drain Current, ID – A
Drain to Source Voltage, VDS – V
IT16372

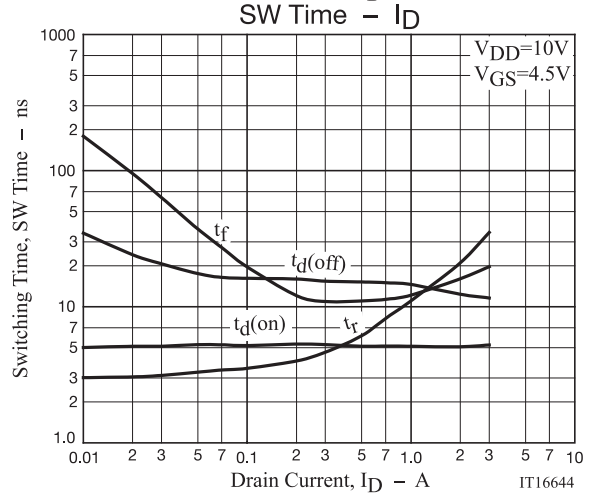

ID – VGS
VDS=10V
Ta=75°C
–25°C
25°C
Drain Current, ID – A
Gate to Source Voltage, VGS – V
IT16373

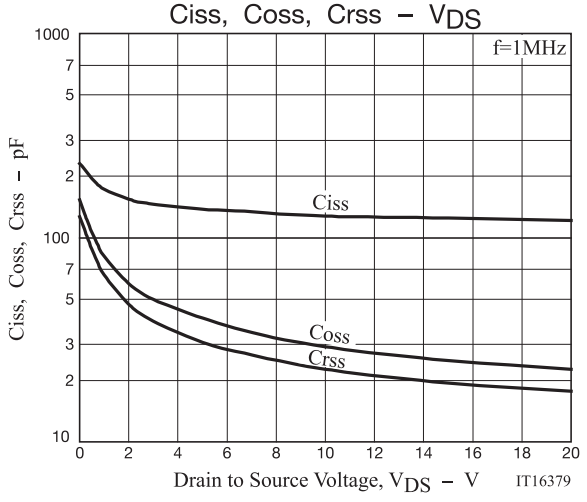

RDS(on) – VGS
Ta=25°C
ID=0.3A
0.5A
1A
Static Drain to Source On-State Resistance, RDS(on) – mΩ
Gate to Source Voltage, VGS – V
IT16641

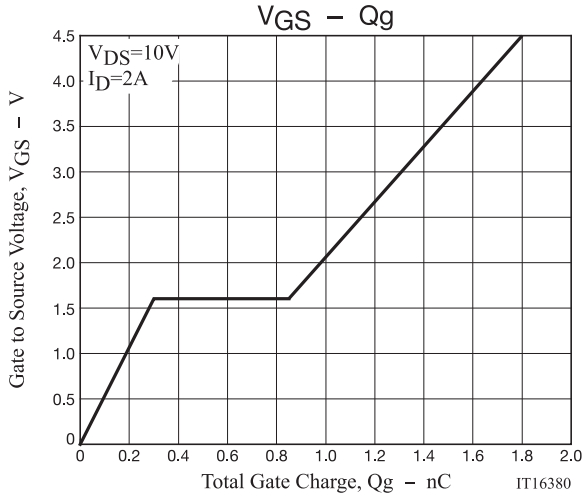

RDS(on) – Ta
VGS=1.8V, ID=0.3A
VGS=2.5V, ID=0.5A
VGS=4.5V, ID=1.0A
Static Drain to Source On-State Resistance, RDS(on) – mΩ
Ambient Temperature, Ta – °C
IT16642

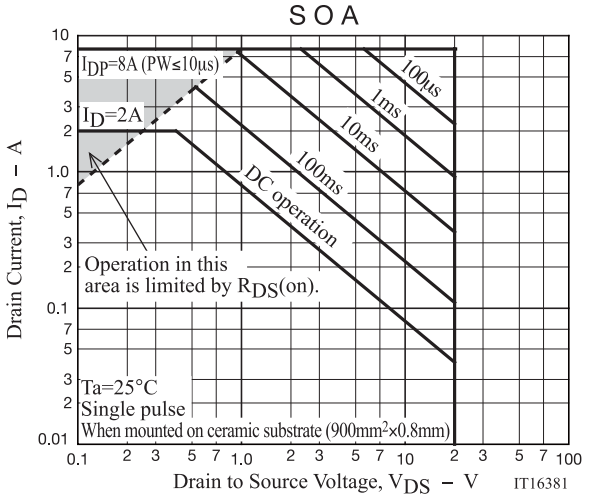

gFS– ID
VDS=10V
Ta= –25°C
75°C
25°C
Forward Transconductance, gFS – S
Drain Current, ID – A
IT16643

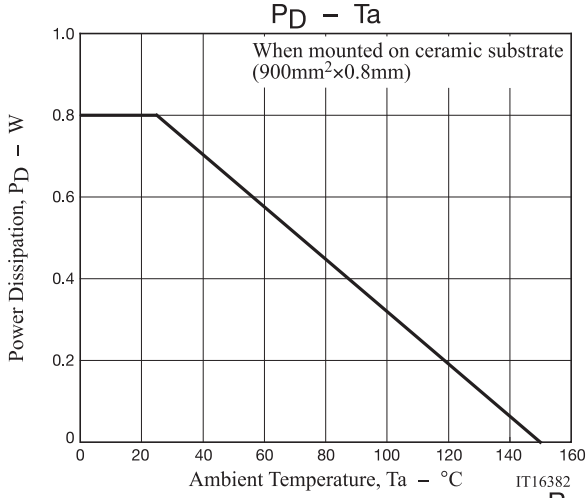

IS – VSD
VGS=0V
Ta=75°C
25°C
–25°C
Source Current, IS – A
Forward Diode Voltage, VSD – V
IT16377

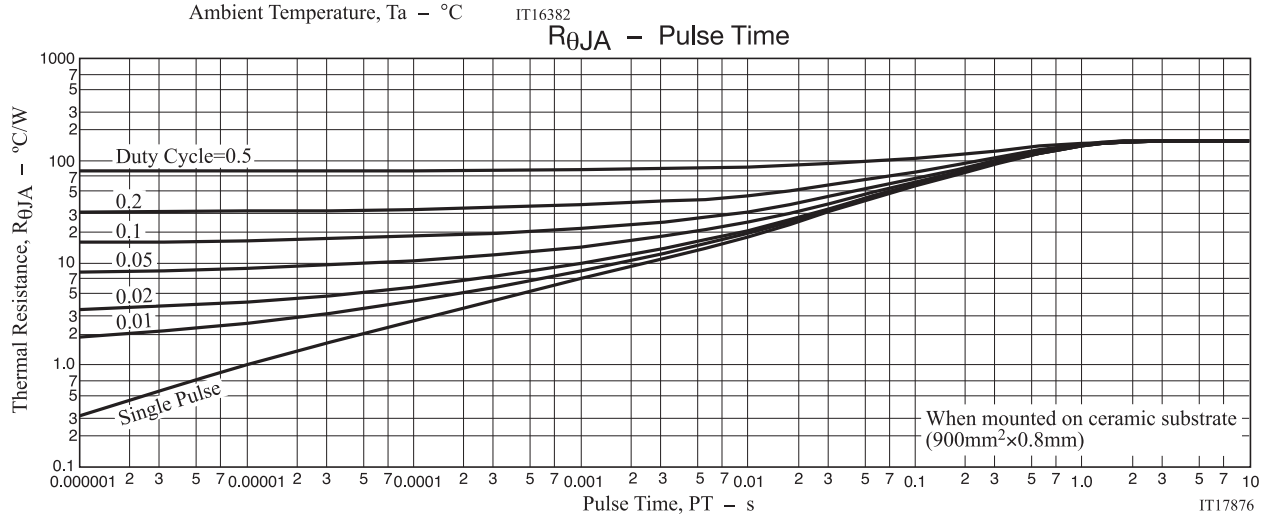

SW Time – ID
VDD=10V
VGS=4.5V
tf
td(off)
td(on)
tr
Switching Time, SW Time – ns
Drain Current, ID – A
IT16644


Ciss, Coss, Crss – VDS
f=1MHz
Ciss
Coss
Crss
Ciss, Coss, Crss – pF
Drain to Source Voltage, VDS – V
IT16379


VGS – Qg
VDS=10V
ID=2A
Gate to Source Voltage, VGS – V
Total Gate Charge, Qg – nC
IT16380


S O A
IDP=8A (PW≤10μs)
ID=2A
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
IT16381


PD – Ta
When mounted on ceramic substrate
(900mm2×0.8mm)
Power Dissipation, PD – W
Ambient Temperature, Ta – °C
IT16382


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
IT17876

Package Dimensions

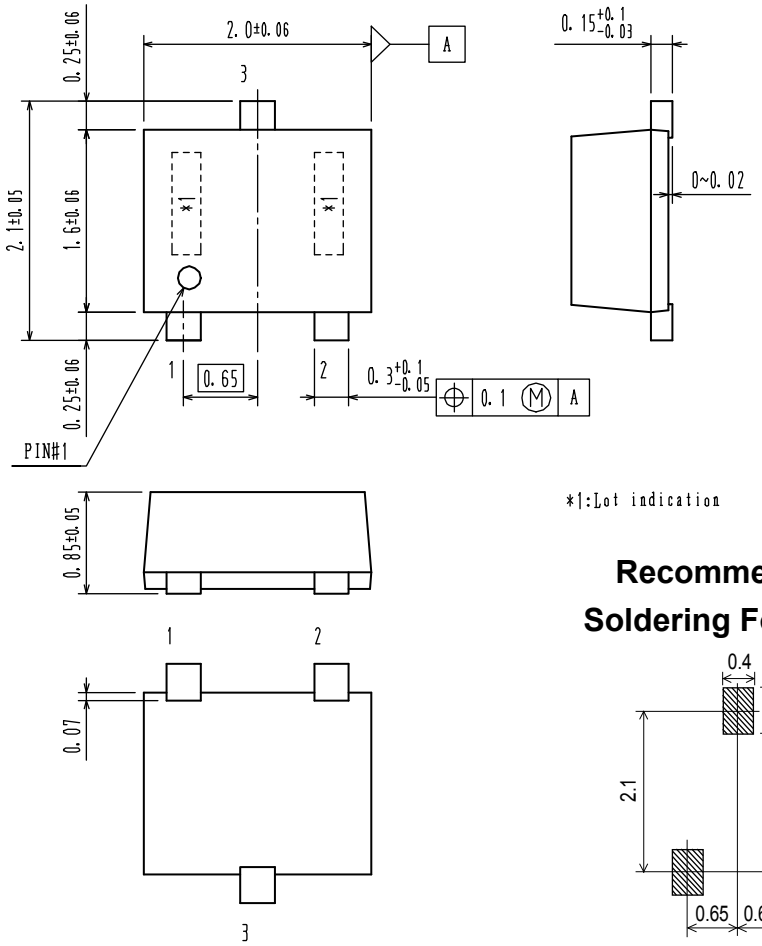
MCH3476-TL-H / MCH3476-TL-W

MCPH3

CASE 419AQ
ISSUE O

unit : mm

1 : Gate
2 : Source
3 : Drain



Recommended Soldering Footprint

ORDERING INFORMATION

Device	Package	Shipping	Note
MCH3476-TL-H	MCPH3 SC-70FL, SOT-323	3,000 pcs. / Tape & Reel	Pb-Free and Halogen Free
MCH3476-TL-W			

† 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 MCH3476 is a MOSFET product, please avoid using this device in the vicinity of highly charged objects.

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