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MCH3477

Power MOSFET 20V, 38mΩ, 4.5A, Single N-Channel



ON Semiconductor®

www.onsemi.com

Features

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

Specifications

Absolute Maximum Ratings at $T_a = 25^\circ\text{C}$

Parameter	Symbol	Value	Unit
Drain to Source Voltage	V_{DS}	20	V
Gate to Source Voltage	V_{GS}	± 12	V
Drain Current (DC)	I_D	4.5	A
Drain Current (Pulse) $PW \leq 10\mu\text{s}$, duty cycle $\leq 1\%$	I_{DP}	18	A
Power Dissipation When mounted on ceramic substrate (900mm ² × 0.8mm)	P_D	1.0	W
Junction Temperature	T_J	150	°C
Storage Temperature	T_{stg}	-55 to +150	°C

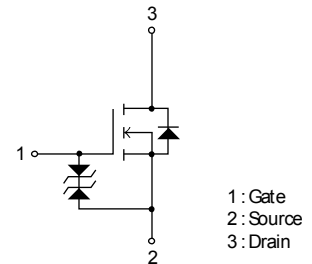
Thermal Resistance Ratings

Parameter	Symbol	Value	Unit
Junction to Ambient When mounted on ceramic substrate (900mm ² × 0.8mm)	$R_{\theta JA}$	125	°C/W

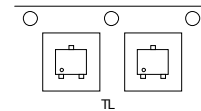
Stresses exceeding those listed in the Maximum Ratings table may damage the device. If any of these limits are exceeded, device functionality should not be assumed, damage may occur and reliability may be affected.

V_{DS}	$R_{DS(on)}$ Max	I_D Max
20V	38 mΩ@4.5V	4.5A
	61 mΩ@2.5V	
	99 mΩ@1.8V	

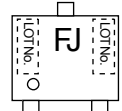
Electrical Connection N-Channel



Packing Type: TL



Marking



ORDERING INFORMATION

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

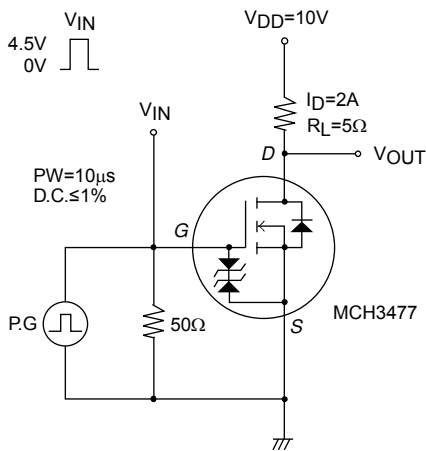
MCH3477

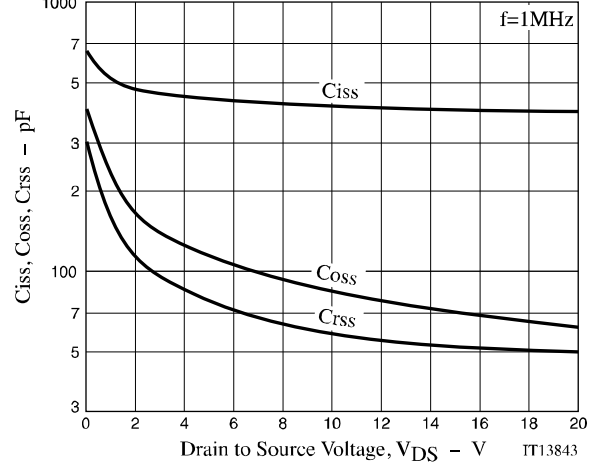
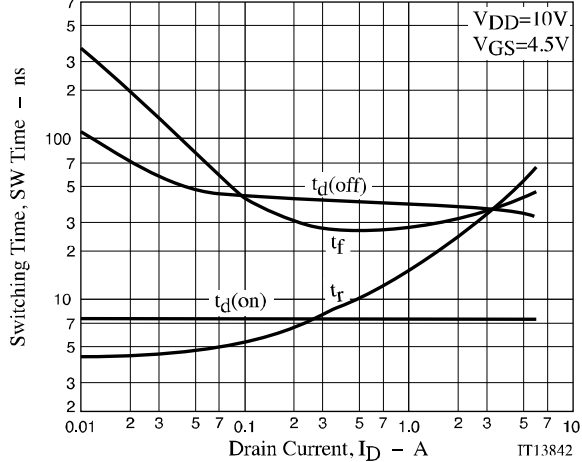
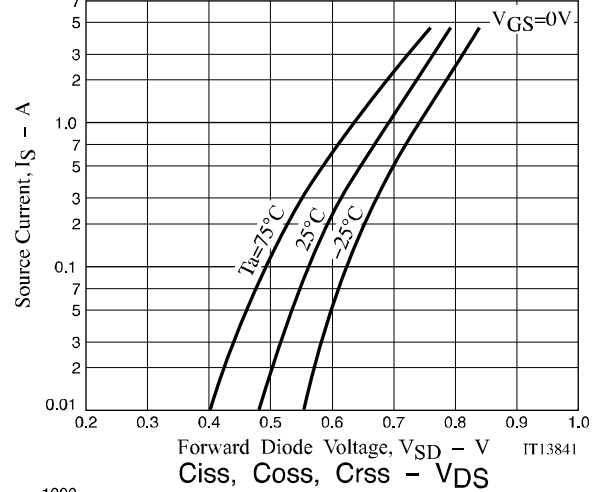
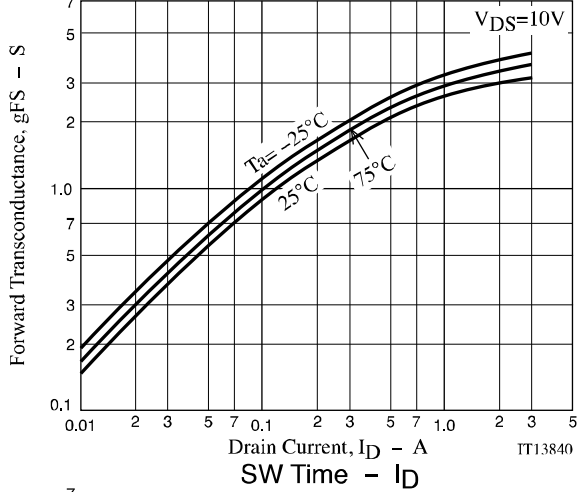
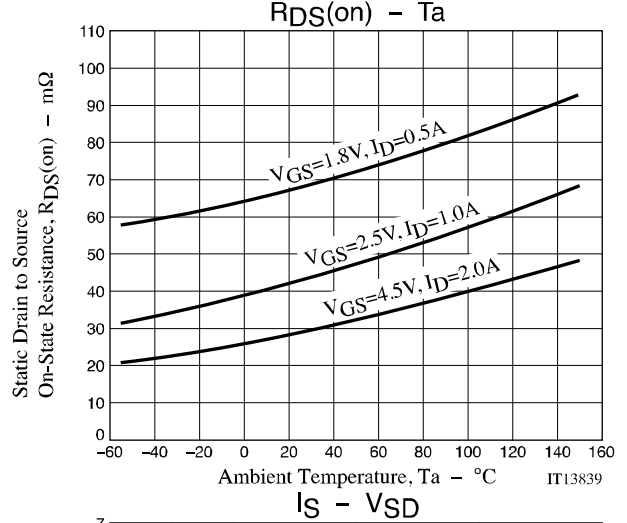
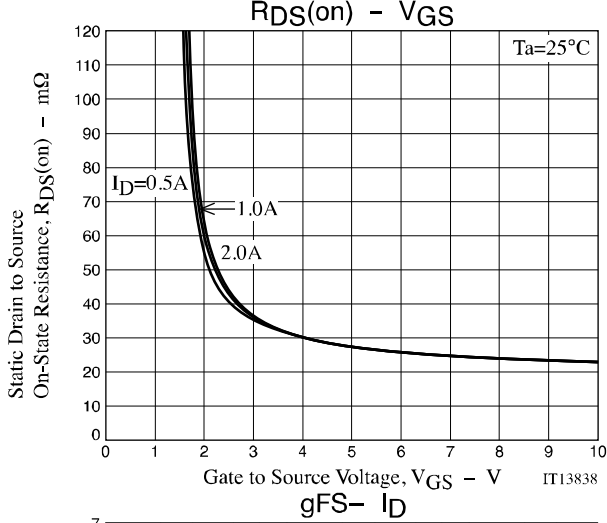
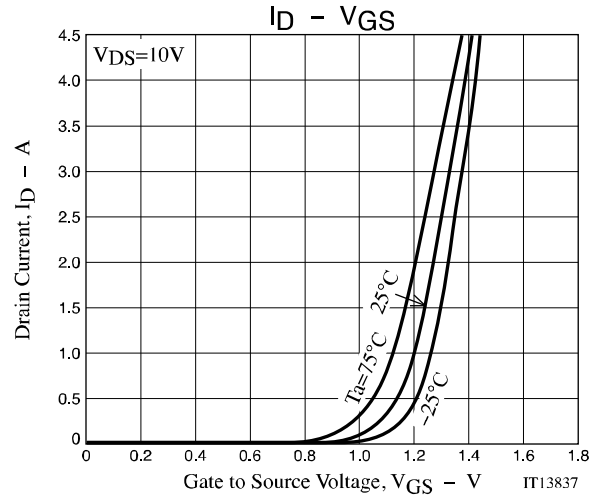
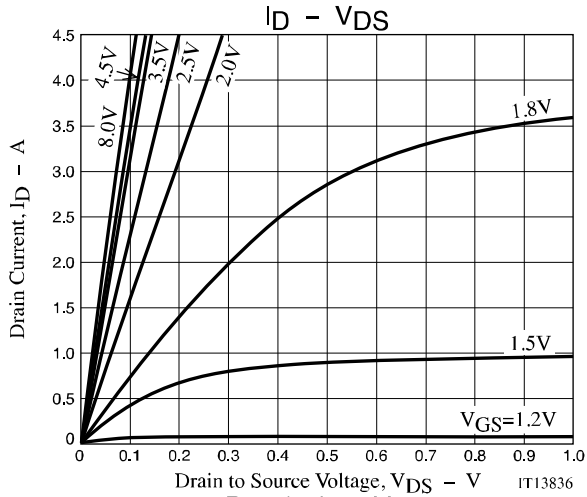
Electrical Characteristics at $T_a = 25^\circ\text{C}$

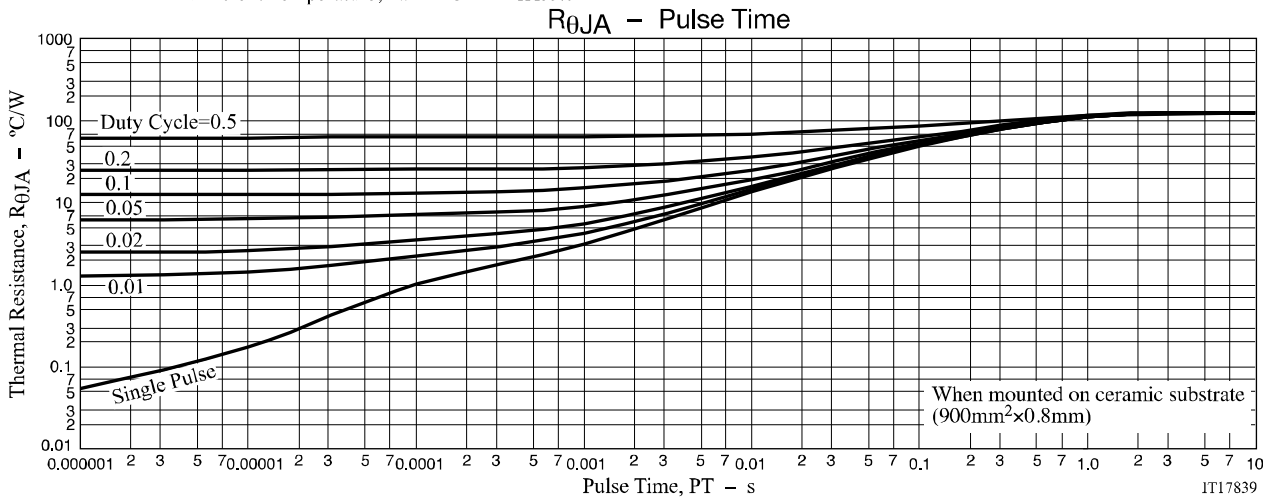
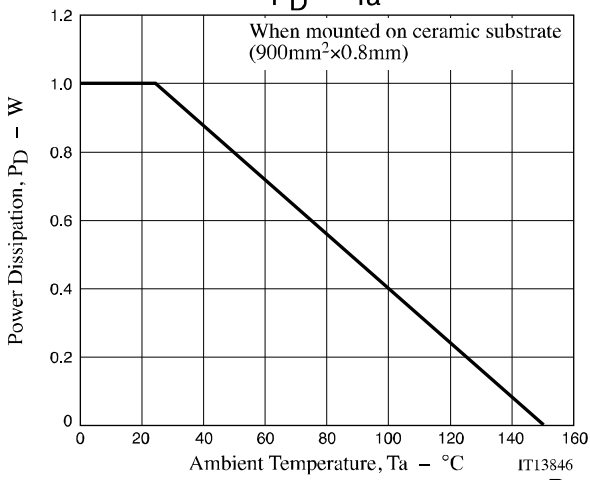
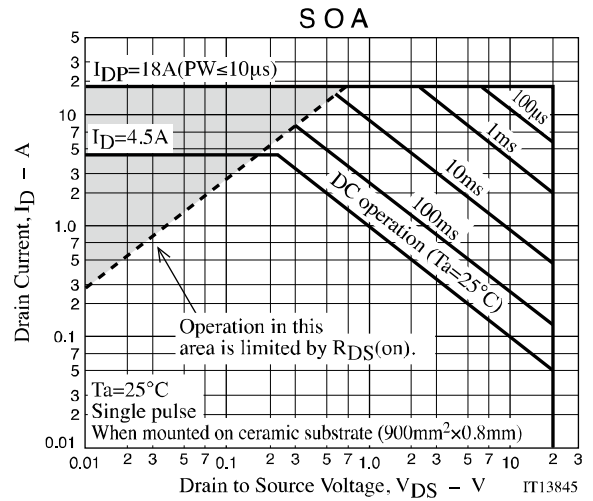
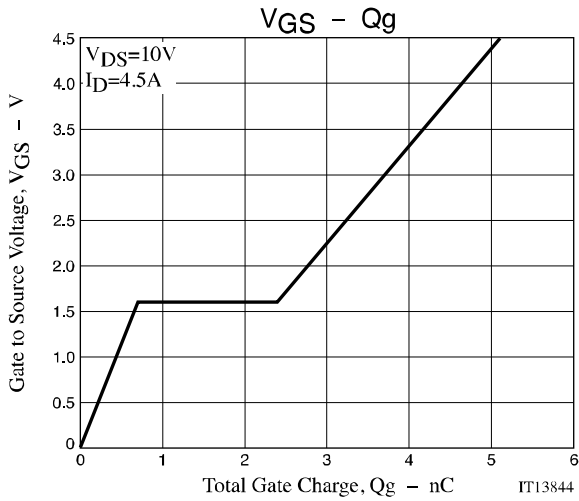
Parameter	Symbol	Conditions	Value			Unit
			min	typ	max	
Drain to Source Breakdown Voltage	$V_{(BR)DSS}$	$I_D=1\text{mA}$, $V_{GS}=0\text{V}$	20			V
Zero-Gate Voltage Drain Current	I_{DSS}	$V_{DS}=20\text{V}$, $V_{GS}=0\text{V}$			1	μA
Gate to Source Leakage Current	I_{GSS}	$V_{GS}=\pm 8\text{V}$, $V_{DS}=0\text{V}$			± 10	μA
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=10\text{V}$, $I_D=1\text{mA}$	0.4		1.3	V
Forward Transconductance	g_{FS}	$V_{DS}=10\text{V}$, $I_D=2\text{A}$	2.0	3.4		S
Static Drain to Source On-State Resistance	$R_{DS(on)1}$	$I_D=2\text{A}$, $V_{GS}=4.5\text{V}$		29	38	$\text{m}\Omega$
	$R_{DS(on)2}$	$I_D=1\text{A}$, $V_{GS}=2.5\text{V}$		43	61	$\text{m}\Omega$
	$R_{DS(on)3}$	$I_D=0.5\text{A}$, $V_{GS}=1.8\text{V}$		69	99	$\text{m}\Omega$
Input Capacitance	C_{iss}	$V_{DS}=10\text{V}$, $f=1\text{MHz}$		410		pF
Output Capacitance	C_{oss}			84		pF
Reverse Transfer Capacitance	C_{rss}			59		pF
Turn-ON Delay Time	$t_{d(on)}$	See specified Test Circuit		7.5		ns
Rise Time	t_r			26		ns
Turn-OFF Delay Time	$t_{d(off)}$			38		ns
Fall Time	t_f			32		ns
Total Gate Charge	Q_g	$V_{DS}=10\text{V}$, $V_{GS}=4.5\text{V}$, $I_D=4.5\text{A}$		5.1		nC
Gate to Source Charge	Q_{gs}			0.7		nC
Gate to Drain "Miller" Charge	Q_{gd}			1.7		nC
Forward Diode Voltage	V_{SD}	$I_S=4.5\text{A}$, $V_{GS}=0\text{V}$		0.78	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







Package Dimensions

MCH3477-TL-H / MCH3477-TL-W

MCPH3

CASE 419AQ

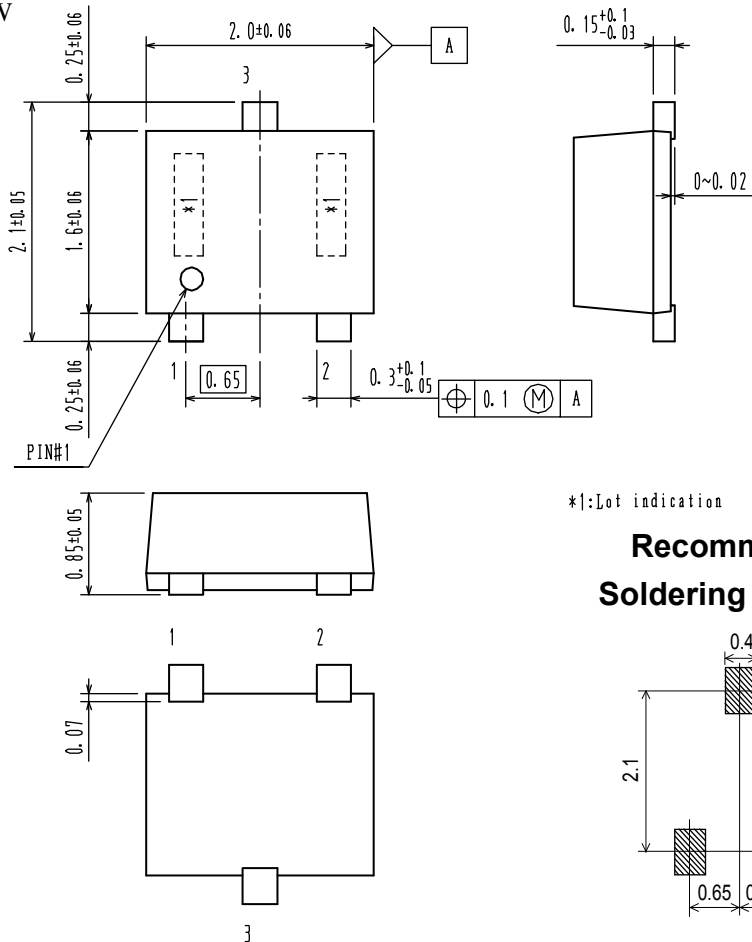
ISSUE O

Unit : mm

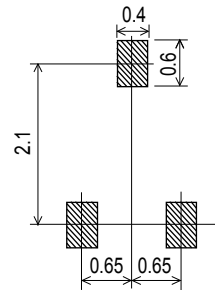
1 : Gate

2 : Source

3 : Drain



Recommended Soldering Footprint



ORDERING INFORMATION

Device	Package	Shipping	Note
MCH3477-TL-H	MCPH3 SC-70, SOT-323	3,000 pcs. / reel	Pb-Free and Halogen Free
MCH3477-TL-W			

Note on usage : Since the MCH3477 is a MOSFET product, please avoid using this device in the vicinity of highly charged objects.

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