

MCH3474

Power MOSFET 30V, 50mΩ, 4A, Single N-Channel



ON Semiconductor®

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This Power MOSFET is produced using ON Semiconductor's trench technology, which is specifically designed to minimize gate charge and low on resistance. This device is suitable for applications with low gate charge driving or low on resistance requirements.

Features

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

V _{DSS}	R _{DSS(on)} Max	I _D Max
30V	50mΩ@ 4.5V	
	72mΩ@ 2.5V	
	130mΩ@ 1.8V	4A

Typical Applications

- DC/DC Converter

SPECIFICATIONS

ABSOLUTE MAXIMUM RATING at Ta = 25°C (Note 1)

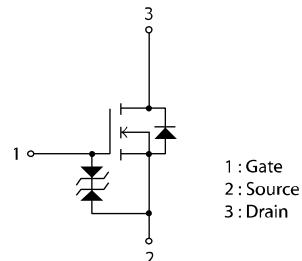
Parameter	Symbol	Value	Unit
Drain to Source Voltage	V _{DSS}	30	V
Gate to Source Voltage	V _{GSS}	±12	V
Drain Current (DC)	I _D	4	A
Drain Current (Pulse) PW ≤ 10μs, duty cycle ≤ 1%	I _{DP}	16	A
Power Dissipation When mounted on ceramic substrate (900mm ² × 0.8mm)	P _D	1	W
Junction Temperature	T _j	150	°C
Storage Temperature	T _{stg}	-55 to +150	°C

Note 1 : 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.

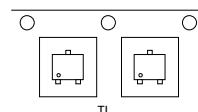
THERMAL RESISTANCE RATINGS

Parameter	Symbol	Value	Unit
Junction to Ambient When mounted on ceramic substrate (900mm ² × 0.8mm)	R _{θJA}	125	°C/W

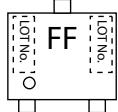
ELECTRICAL CONNECTION N-Channel



PACKING TYPE : TL



MARKING



ORDERING INFORMATION

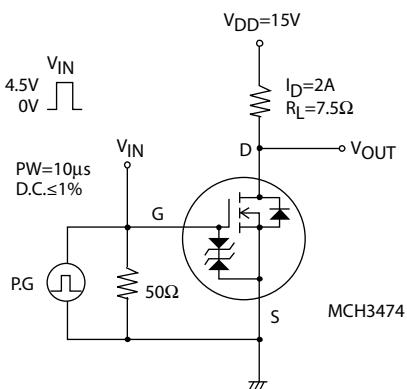
See detailed ordering and shipping information on page 5 of this data sheet.

ELECTRICAL CHARACTERISTICS at $T_a = 25^\circ\text{C}$ (Note 2)

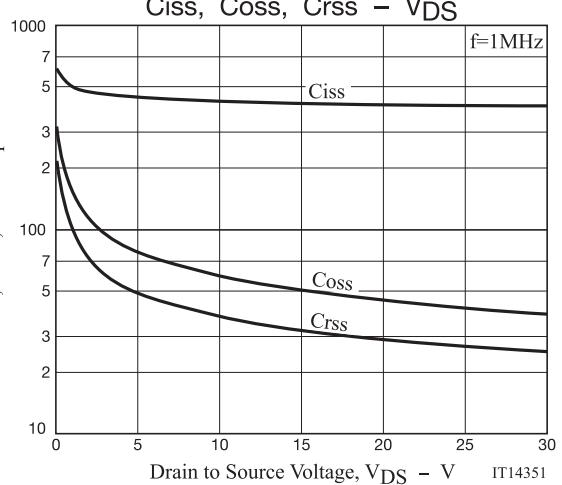
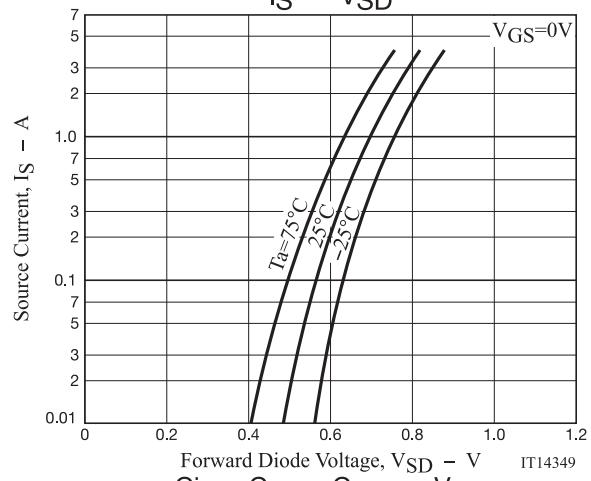
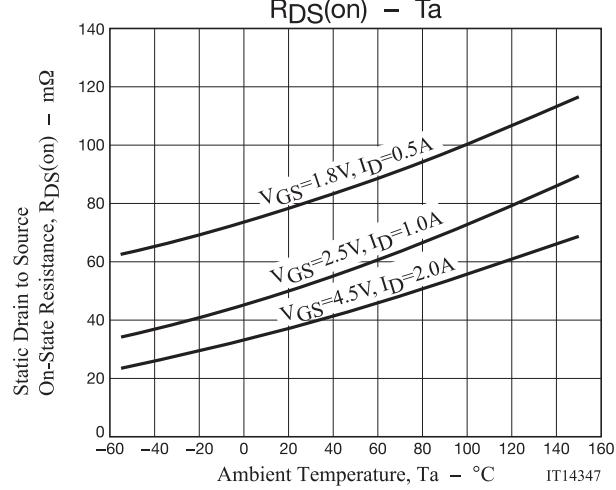
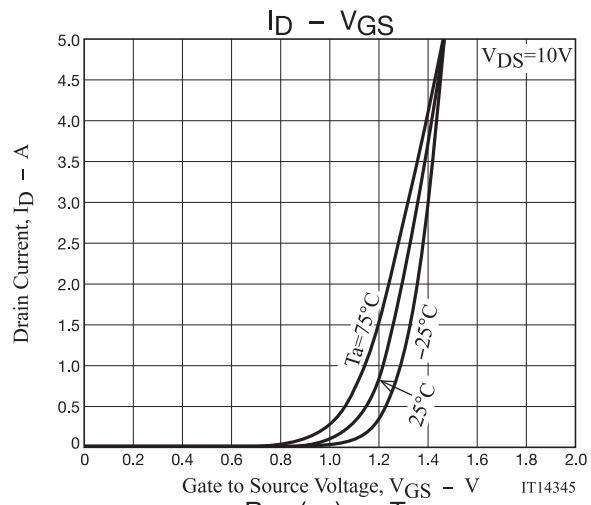
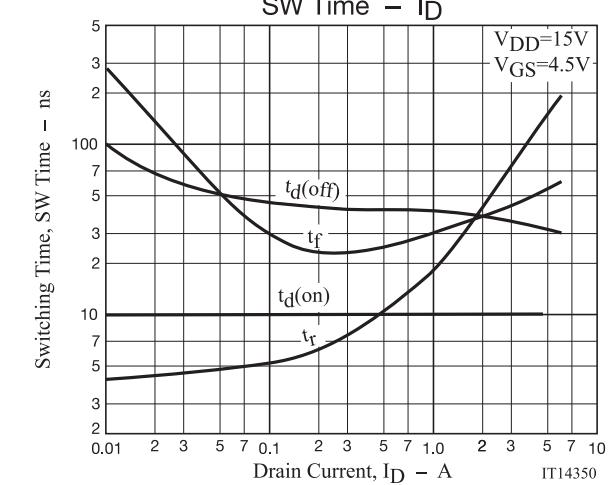
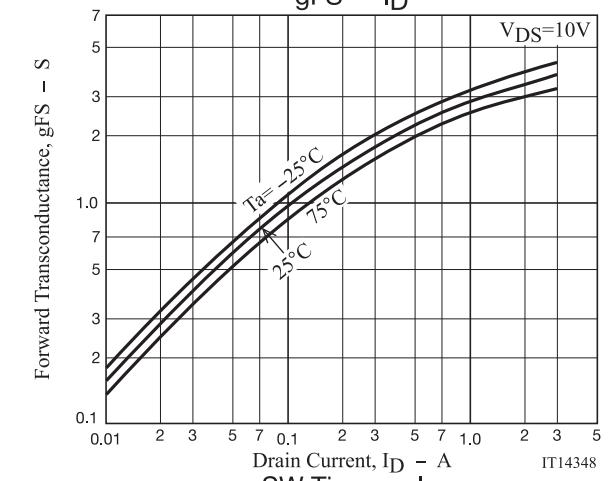
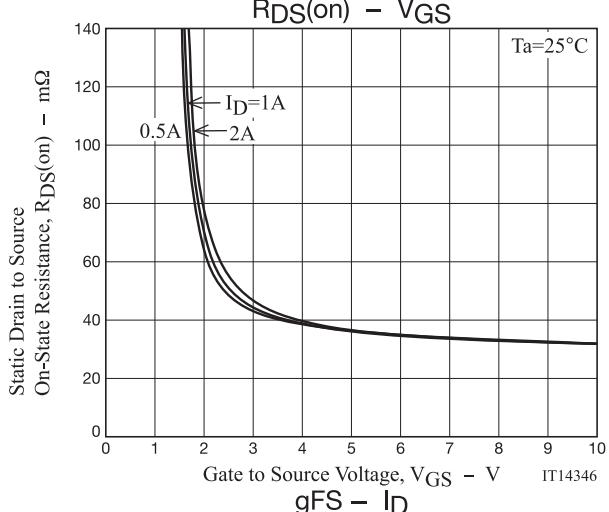
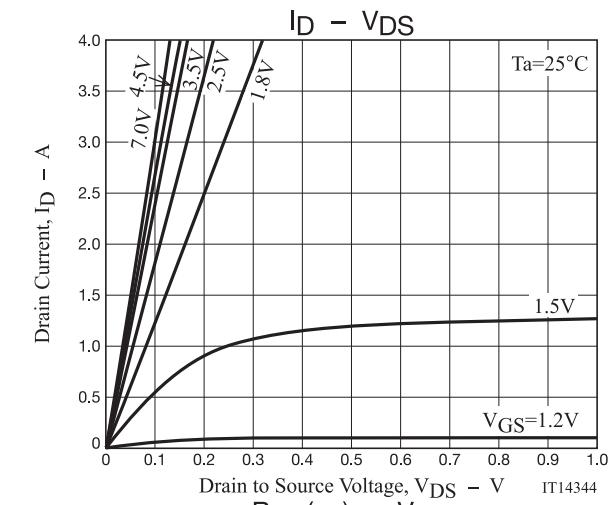
Parameter	Symbol	Conditions	Value			Unit
			min	typ	max	
Drain to Source Breakdown Voltage	$V(\text{BR})_{\text{DSS}}$	$I_D=1\text{mA}, V_{GS}=0\text{V}$	30			V
Zero-Gate Voltage Drain Current	I_{DSS}	$V_{DS}=30\text{V}, V_{GS}=0\text{V}$			1	μA
Gate to Source Leakage Current	I_{GSS}	$V_{GS}=\pm 8\text{V}, V_{DS}=0\text{V}$			± 10	μA
Gate Threshold Voltage	$V_{GS(\text{th})}$	$V_{DS}=10\text{V}, I_D=1\text{mA}$	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	$R_{DS(\text{on})1}$	$I_D=2\text{A}, V_{GS}=4.5\text{V}$		38	50	$\text{m}\Omega$
	$R_{DS(\text{on})2}$	$I_D=1\text{A}, V_{GS}=2.5\text{V}$		51	72	$\text{m}\Omega$
	$R_{DS(\text{on})3}$	$I_D=0.5\text{A}, V_{GS}=1.8\text{V}$		80	130	$\text{m}\Omega$
Input Capacitance	C_{iss}	$V_{DS}=10\text{V}, f=1\text{MHz}$		430		pF
Output Capacitance	C_{oss}			59		pF
Reverse Transfer Capacitance	C_{rss}			38		pF
Turn-ON Delay Time	$t_{q(\text{on})}$	See specified Test Circuit		10		ns
Rise Time	t_r			41		ns
Turn-OFF Delay Time	$t_{q(\text{off})}$			36		ns
Fall Time	t_f			37		ns
Total Gate Charge	Q_g	$V_{DS}=15\text{V}, V_{GS}=4.5\text{V}, I_D=4\text{A}$		4.7		nC
Gate to Source Charge	Q_{gs}			0.8		nC
Gate to Drain "Miller" Charge	Q_{gd}			1.1		nC
Forward Diode Voltage	V_{SD}	$I_S=4\text{A}, V_{GS}=0\text{V}$		0.82	1.2	V

Note 2 : 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.

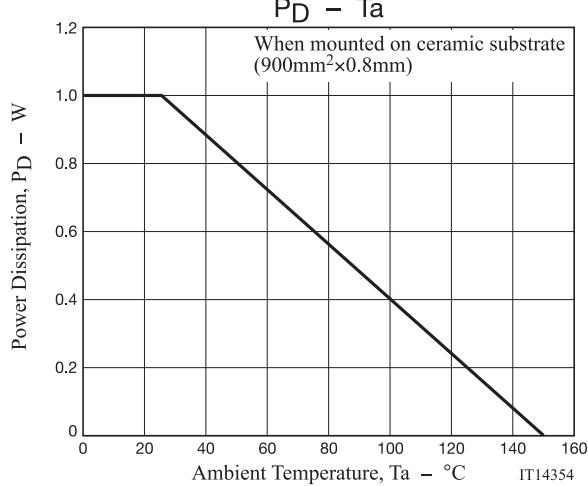
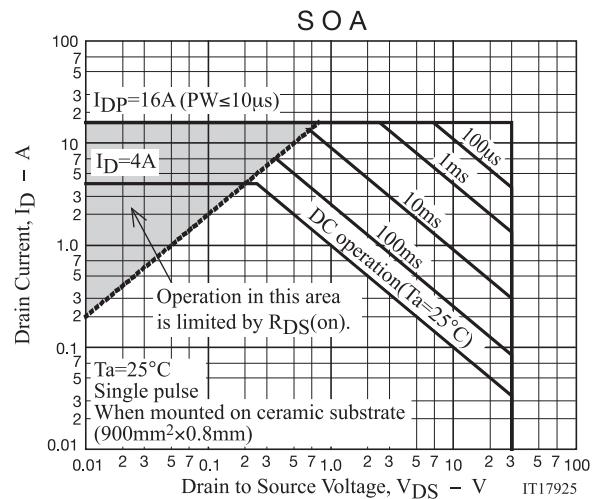
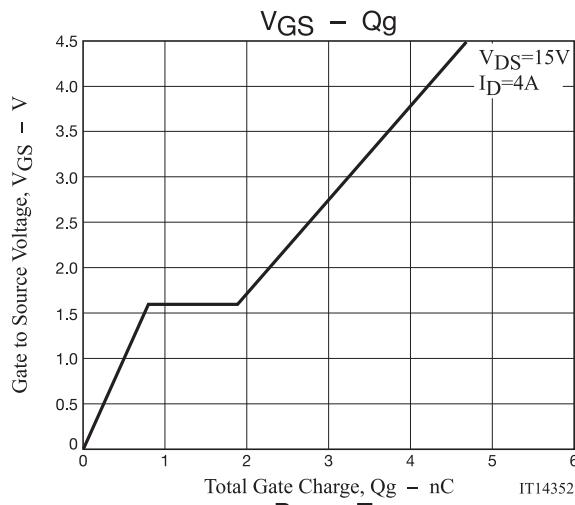
Switching Time Test Circuit



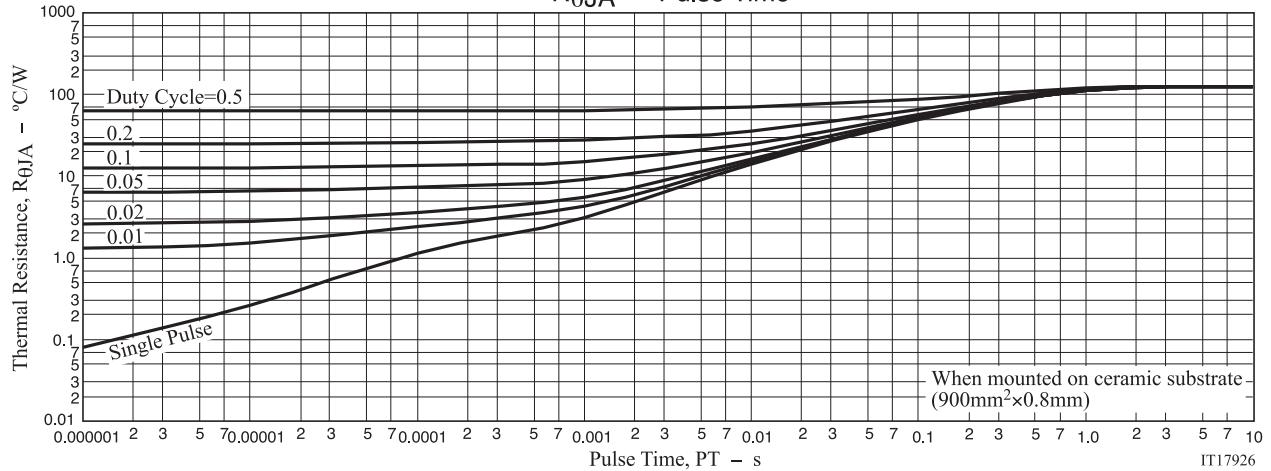
MCH3474



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R_{θJA} - Pulse Time

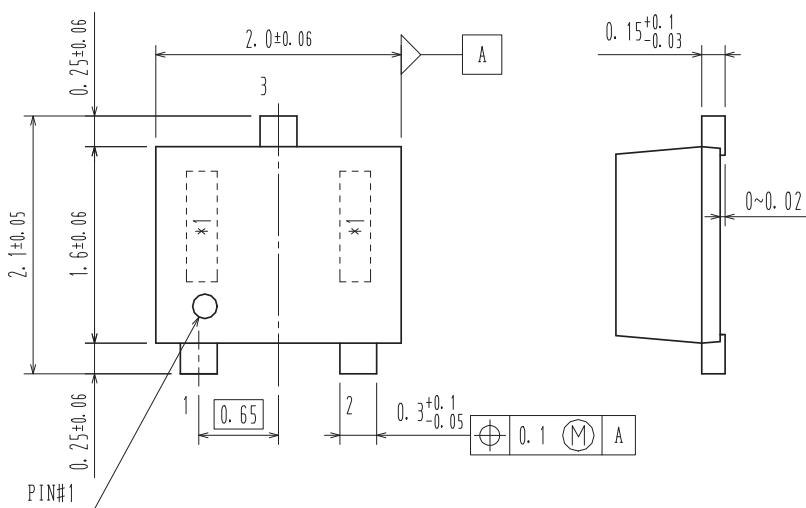


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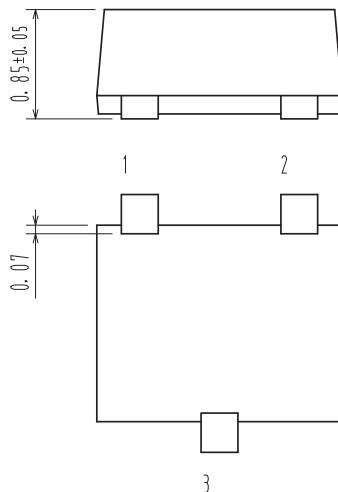
PACKAGE DIMENSIONS

unit : mm

SC-70FL / MCPH3
CASE 419AQ
ISSUE O

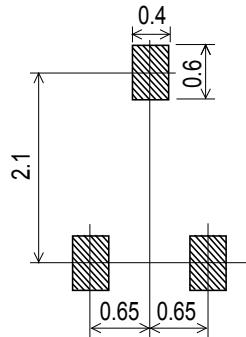


Recommended Soldering Footprint



*1: Lot indication

1 : Gate
2 : Source
3 : Drain



ORDERING INFORMATION

Device	Marking	Package	Shipping (Qty / Packing)
MCH3474-TL-H	FF	SC-70FL / MCPH3 (Pb-Free / Halogen Free)	3,000 / Tape & Reel
MCH3474-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 MCH3474 is a MOSFET product, please avoid using this device in the vicinity of highly charged objects.

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