

# MCH3383

## Power MOSFET –12V, 69mΩ, –3.5A, Single P-Channel

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
- 0.9V drive
- ESD Diode-Protected Gate
- Pb-Free, Halogen Free and RoHS compliance

### Typical Applications

- LED Current Balance SW
- Load Switch

### SPECIFICATIONS

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

Parameter	Symbol	Value	Unit
Drain to Source Voltage	V <sub>DSS</sub>	–12	V
Gate to Source Voltage	V <sub>GSS</sub>	±5	V
Drain Current (DC)	I <sub>D</sub>	–3.5	A
Drain Current (Pulse) PW ≤ 10μs, duty cycle ≤ 1%	I <sub>DP</sub>	–14	A
Power Dissipation When mounted on ceramic substrate (900mm <sup>2</sup> × 0.8mm)	P <sub>D</sub>	1.0	W
Junction Temperature	T <sub>j</sub>	150	°C
Operating Temperature	T <sub>opr</sub>	–5 to +150	°C
Storage Temperature	T <sub>stg</sub>	–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 <sup>2</sup> × 0.8mm)	R <sub>θJA</sub>	125	°C/W

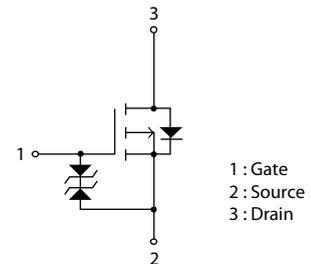


**ON Semiconductor**<sup>®</sup>

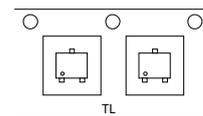
www.onsemi.com

V <sub>DSS</sub>	R <sub>DS(on)</sub> Max	I <sub>D</sub> Max
–12V	69mΩ@ –2.5V	–3.5A
	98mΩ@ –1.8V	
	173mΩ@ –1.2V	
	500mΩ@ –0.9V	

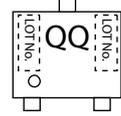
### ELECTRICAL CONNECTION P-Channel



### PACKING TYPE : TL



### MARKING



### ORDERING INFORMATION

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

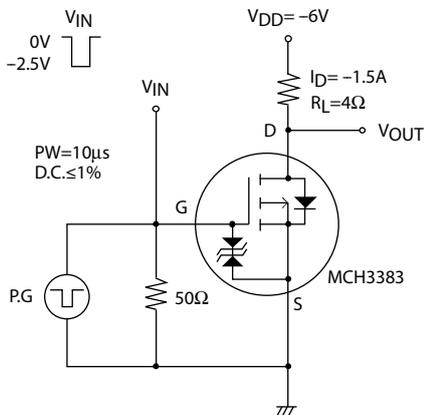
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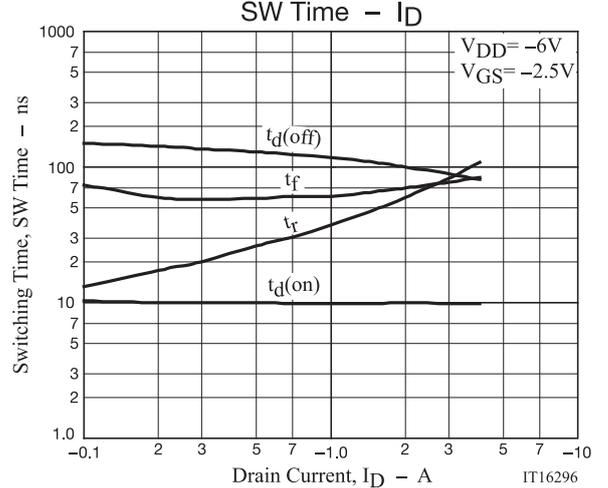
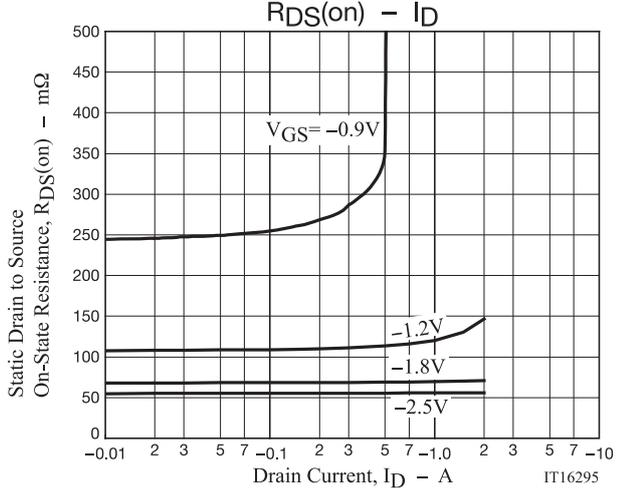
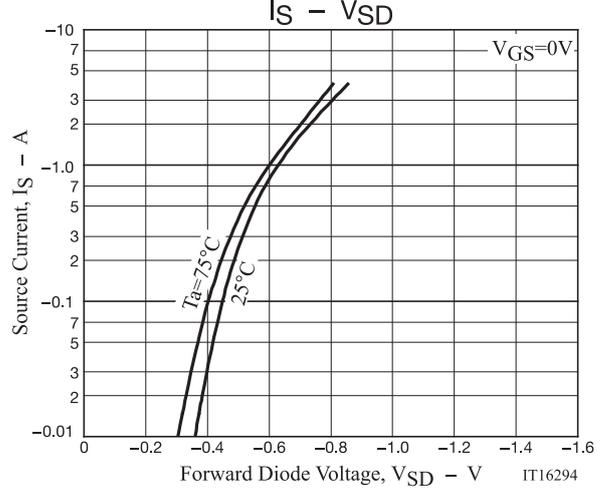
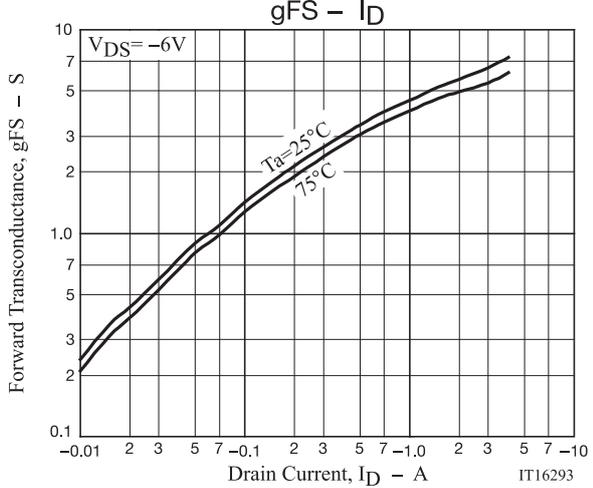
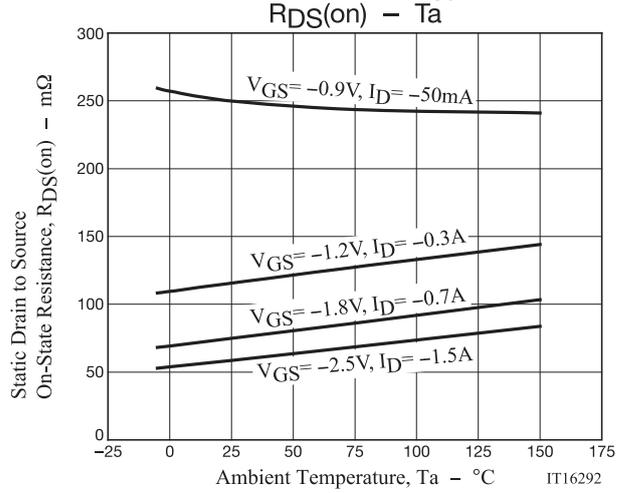
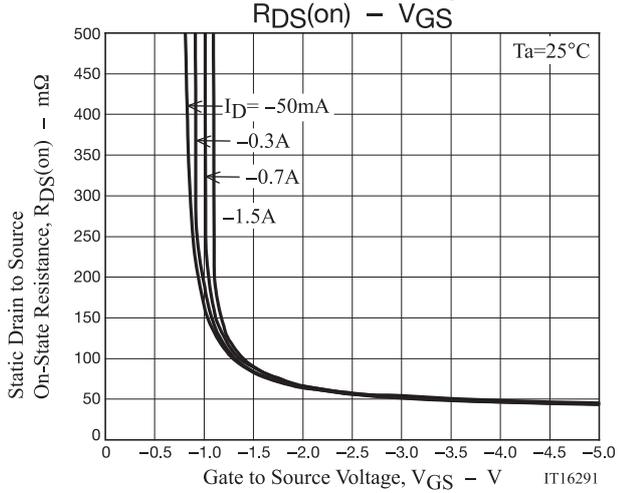
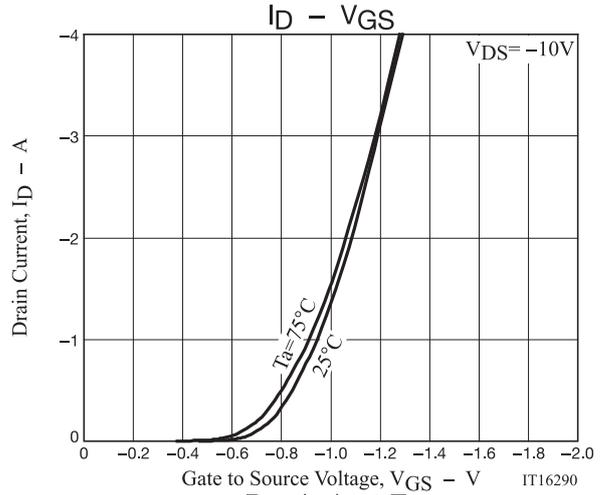
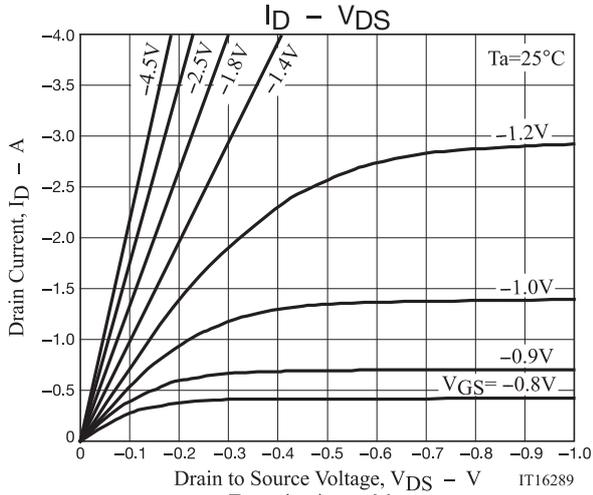
## ELECTRICAL CHARACTERISTICS at Ta = 25°C (Note 2)

Parameter	Symbol	Conditions	Value			Unit
			min	typ	max	
Drain to Source Breakdown Voltage	V(BR)DSS	I <sub>D</sub> =-1mA, V <sub>GS</sub> =0V	-12			V
Zero-Gate Voltage Drain Current	I <sub>DSS</sub>	V <sub>DS</sub> =-12V, V <sub>GS</sub> =0V			-10	μA
Gate to Source Leakage Current	I <sub>GSS</sub>	V <sub>GS</sub> =±4V, V <sub>DS</sub> =0V			±10	μA
Gate Threshold Voltage	V <sub>GS(th)</sub>	V <sub>DS</sub> =-6V, I <sub>D</sub> =-1mA	-0.3		-0.8	V
Forward Transconductance	g <sub>FS</sub>	V <sub>DS</sub> =-6V, I <sub>D</sub> =-1.5A		5.3		S
Static Drain to Source On-State Resistance	R <sub>DS(on)1</sub>	I <sub>D</sub> =-1.5A, V <sub>GS</sub> =-2.5V		57	69	mΩ
	R <sub>DS(on)2</sub>	I <sub>D</sub> =-0.7A, V <sub>GS</sub> =-1.8V		75	98	mΩ
	R <sub>DS(on)3</sub>	I <sub>D</sub> =-0.3A, V <sub>GS</sub> =-1.2V		115	173	mΩ
	R <sub>DS(on)4</sub>	I <sub>D</sub> =-50mA, V <sub>GS</sub> =-0.9V		250	500	mΩ
Input Capacitance	C <sub>iss</sub>	V <sub>DS</sub> =-6V, f=1MHz		1010		pF
Output Capacitance	C <sub>oss</sub>			130		pF
Reverse Transfer Capacitance	C <sub>rss</sub>			85		pF
Turn-ON Delay Time	t <sub>d(on)</sub>			9.9		ns
Rise Time	t <sub>r</sub>	See specified Test Circuit		49		ns
Turn-OFF Delay Time	t <sub>d(off)</sub>			109		ns
Fall Time	t <sub>f</sub>			65		ns
Total Gate Charge	Q <sub>g</sub>	V <sub>DS</sub> =-6V, V <sub>GS</sub> =-2.5V, I <sub>D</sub> =-3.5A		6.2		nC
Gate to Source Charge	Q <sub>gs</sub>			1.6		nC
Gate to Drain "Miller" Charge	Q <sub>gd</sub>			1.1		nC
Forward Diode Voltage	V <sub>SD</sub>		I <sub>S</sub> =-3.5A, V <sub>GS</sub> =0V		-0.83	-1.2

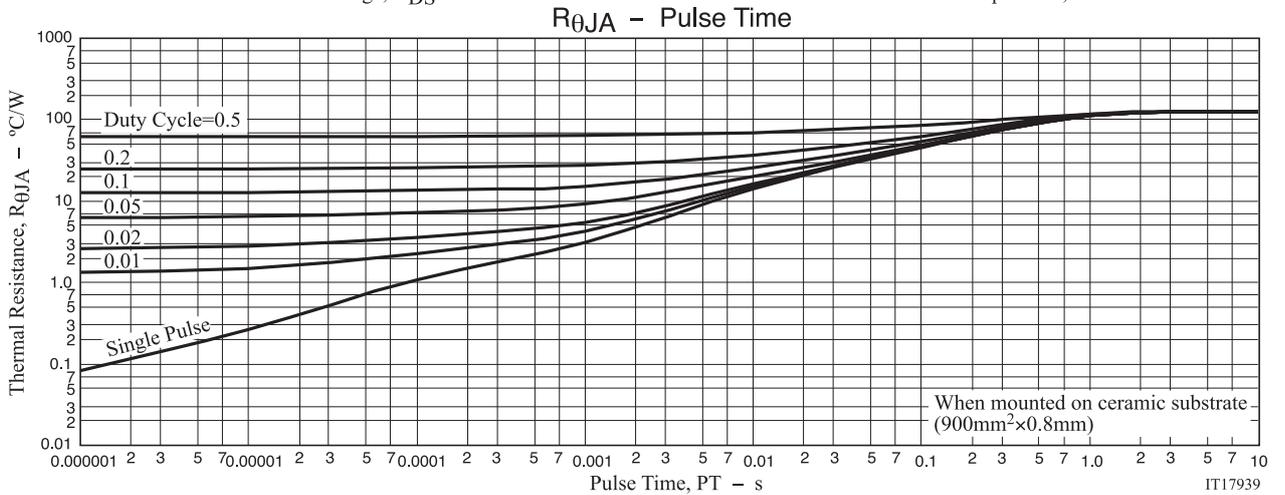
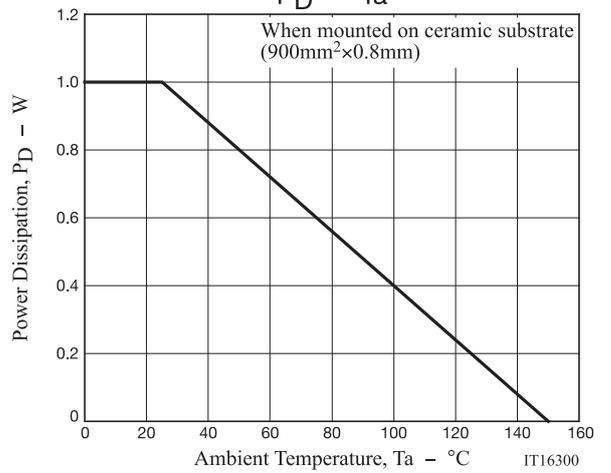
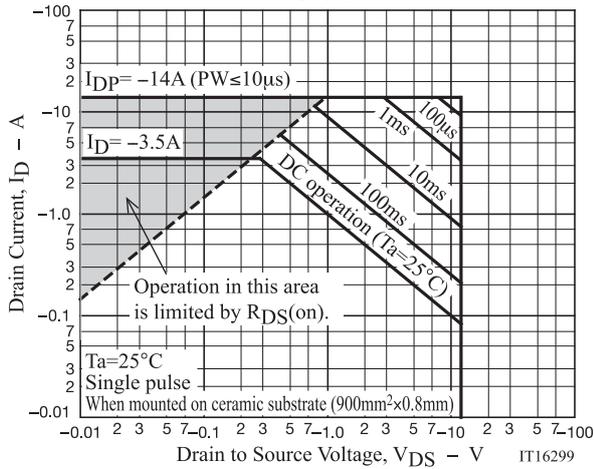
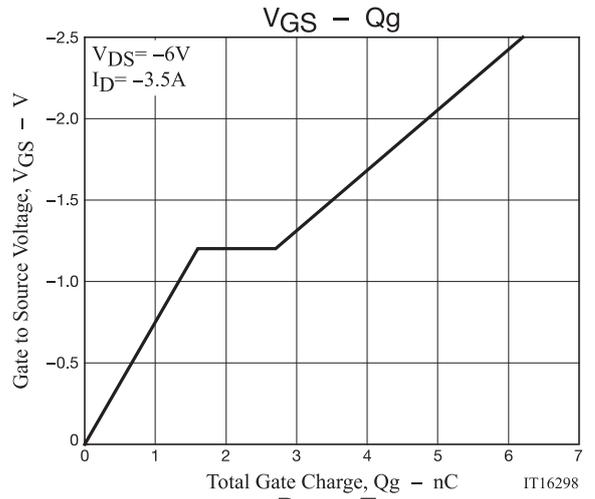
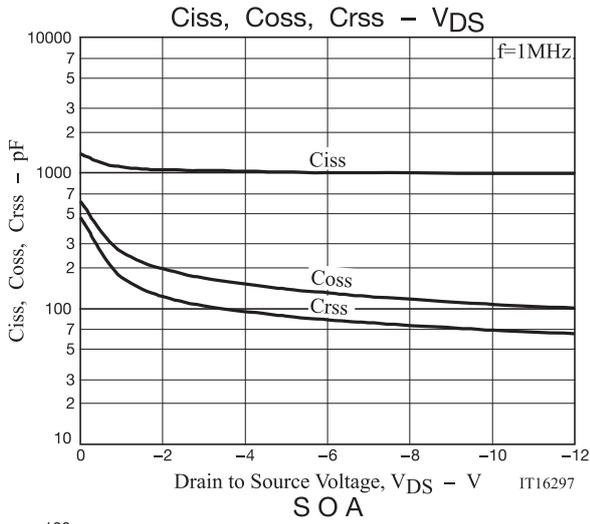
Note 2 : Product parametric performance is indicated in the Electrical Characteristics for the listed test conditions, unless otherwise noted. Product performance may not be indicated by the Electrical Characteristics if operated under different conditions.

### Switching Time Test Circuit





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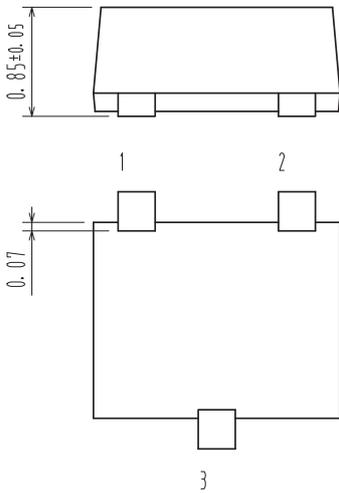
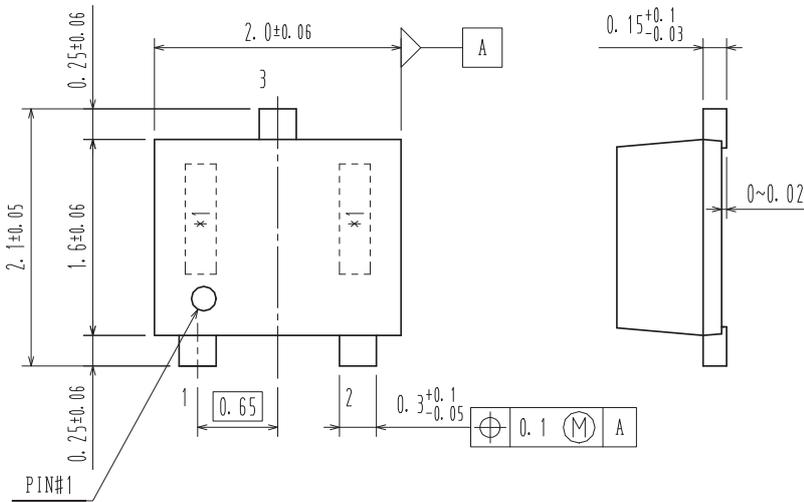


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## PACKAGE DIMENSIONS

unit : mm

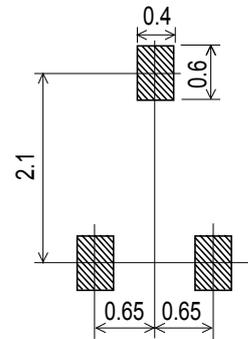
SC-70FL / MCPH3  
CASE 419AQ  
ISSUE O



\*1: Lot indication

- 1 : Gate
- 2 : Source
- 3 : Drain

### Recommended Soldering Footprint



## ORDERING INFORMATION

Device	Marking	Package	Shipping (Qty / Packing)
MCH3383-TL-H	QQ	SC-70FL / MCPH3 (Pb-Free / Halogen Free)	3,000 / Tape & Reel
MCH3383-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](http://www.onsemi.com/pub_link/Collateral/BRD8011-D.PDF)

Note on usage : Since the MCH3383 is a MOSFET product, please avoid using this device in the vicinity of highly charged objects.

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