MCH6331

Power MOSFET
–30V, 98mΩ, –3.5A, Single P-Channel

ON Semiconductor®

www.onsemi.com

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

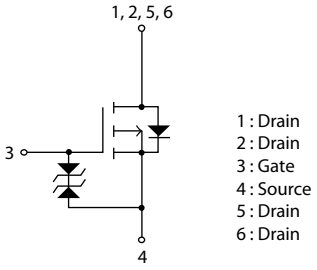
- Low On-Resistance
- 4V drive
- Pb-Free, Halogen Free and RoHS compliance
- Ultra small package MCPH6 (2.0mm×2.1mm×0.85mmt)

Typical Applications

- Load Switch

V_{DSS}	R_{DS}(on) Max	I_D Max
–30V	98mΩ@ –10V	–3.5A
	171mΩ@ –4.5V	
	199mΩ@ –4V	

ELECTRICAL CONNECTION
P-Channel



SPECIFICATIONS

ABSOLUTE MAXIMUM RATING at Ta = 25°C (Note 1, 2)

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	–3.5	A
Drain Current (Pulse) PW ≤ 10μs, duty cycle ≤ 1%	I_{DP}	–14	A
Power Dissipation When mounted on ceramic substrate (1200mm^2 × 0.8mm)	P_D	1.5	W
Junction Temperature	Tj	150	°C
Storage Temperature	Tstg	–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.

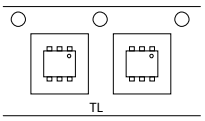
2 : This product is designed to "ESD immunity<200V*", so please take care when handling.

*Machine Model

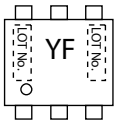
THERMAL RESISTANCE RATINGS

Parameter	Symbol	Value	Unit
Junction to Ambient When mounted on ceramic substrate (1200mm^2 × 0.8mm)	$R_{\theta JA}$	83.3	°C/W

PACKING TYPE : TL



MARKING



ORDERING INFORMATION

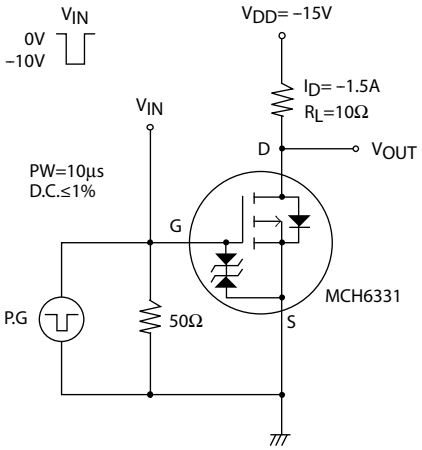
See detailed ordering and shipping information on page 5 of this data sheet.

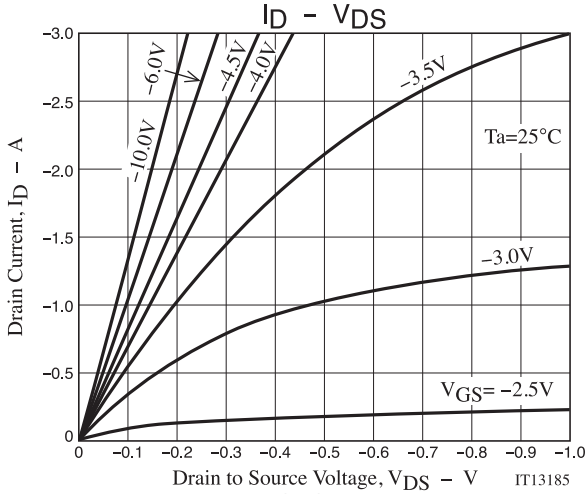
ELECTRICAL CHARACTERISTICS at Ta = 25°C (Note 3)

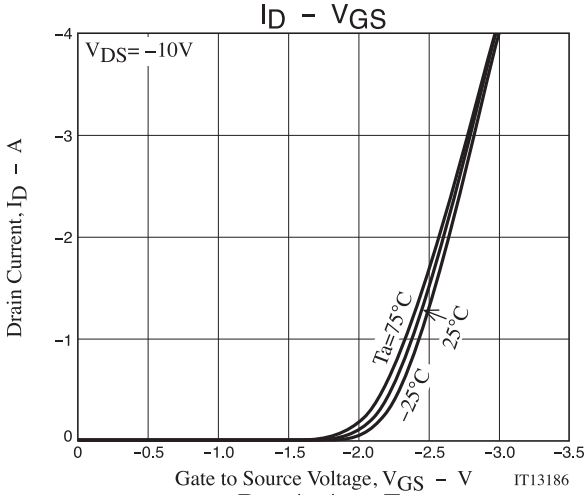
Parameter	Symbol	Conditions	Value			Unit
			min	typ	max	
Drain to Source Breakdown Voltage	$V_{(BR)DSS}$	I_D=−1mA, V_{GS}=0V	−30			V
Zero-Gate Voltage Drain Current	I_{DSS}	V_{DS}=−30V, V_{GS}=0V			−1	μA
Gate to Source Leakage Current	I_{GSS}	V_{GS}=±16V, V_{DS}=0V			±10	μA
Gate Threshold Voltage	$V_{GS}(th)$	V_{DS}=−10V, I_D=−1mA	−1.2		−2.6	V
Forward Transconductance	g_{FS}	V_{DS}=−10V, I_D=−1.5A	1.68	2.8		S
Static Drain to Source On-State Resistance	$R_{DS}(on)1$	I_D=−1.5A, V_{GS}=−10V		75	98	mΩ
	$R_{DS}(on)2$	I_D=−0.75A, V_{GS}=−4.5V		122	171	mΩ
	$R_{DS}(on)3$	I_D=−0.75A, V_{GS}=−4V		142	199	mΩ
Input Capacitance	Ciss	V_{DS}=−10V, f=1MHz		250		pF
Output Capacitance	Coss			65		pF
Reverse Transfer Capacitance	Crss			46		pF
Turn-ON Delay Time	$t_d(on)$	See specified Test Circuit		5.4		ns
Rise Time	t_r			12		ns
Turn-OFF Delay Time	$t_d(off)$			26		ns
Fall Time	t_f			19		ns
Total Gate Charge	Qg	V_{DS}=−10V, V_{GS}=−10V, I_D=−3.5A		5.0		nC
Gate to Source Charge	Qgs			1.0		nC
Gate to Drain “Miller” Charge	Qgd			1.2		nC
Forward Diode Voltage	V_{SD}	I_S=−3.5A, V_{GS}=0V		−0.86	−1.5	V

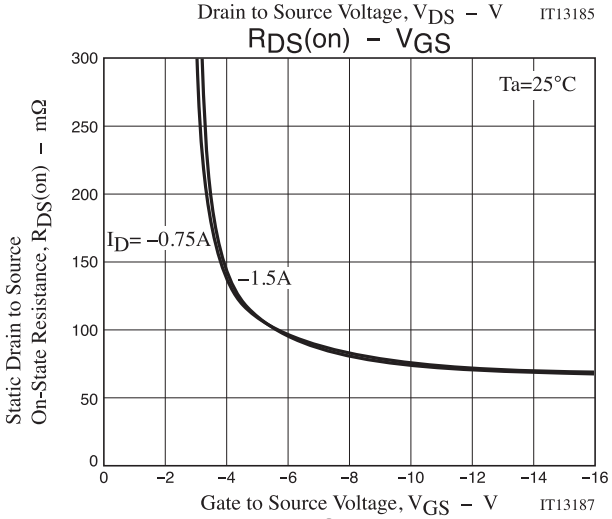
Note 3 : Product parametric performance is indicated in the Electrical Characteristics for the listed test conditions, unless otherwise noted. Product performance may not be indicated by the Electrical Characteristics if operated under different conditions.

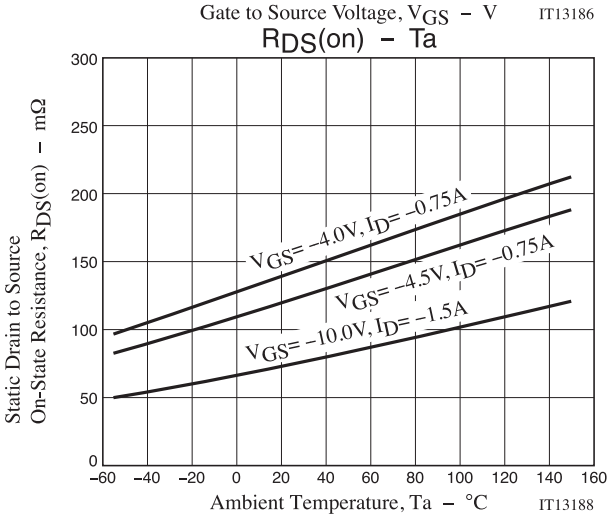
Switching Time Test Circuit

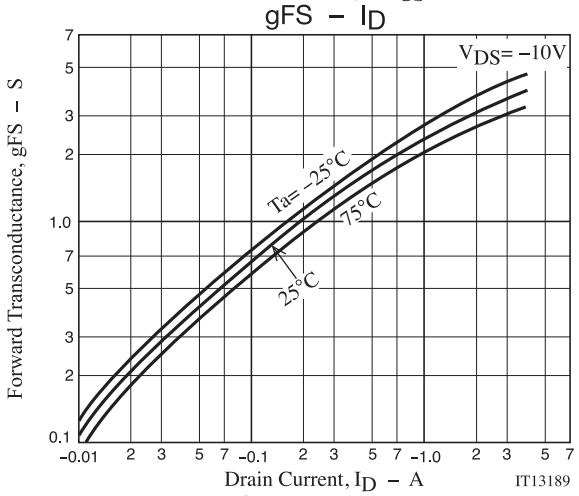


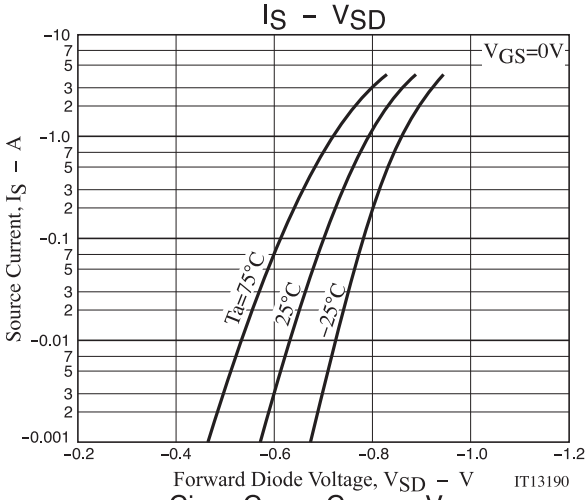


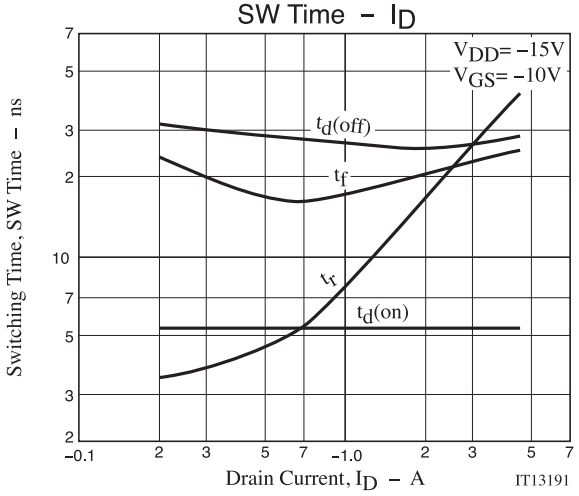


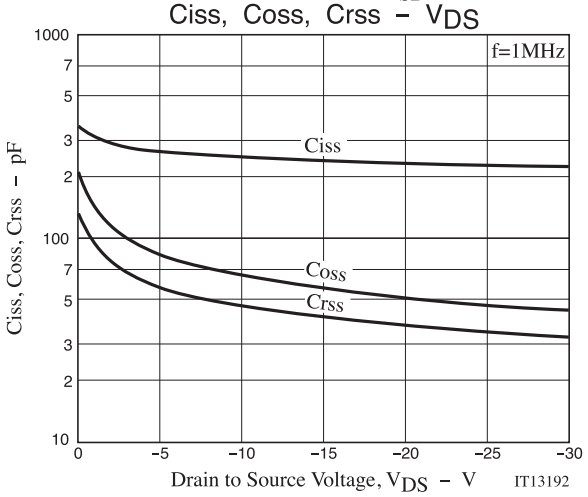


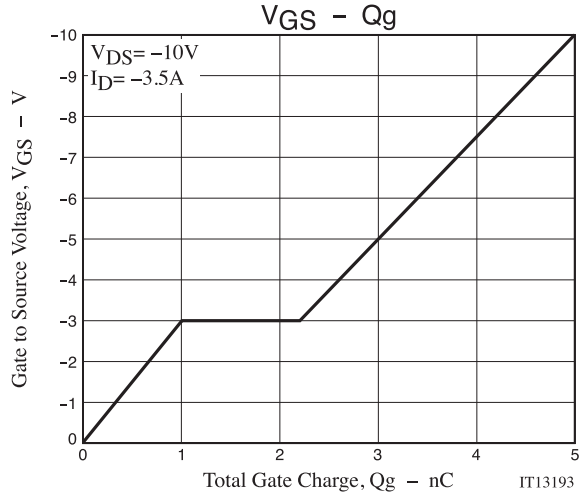


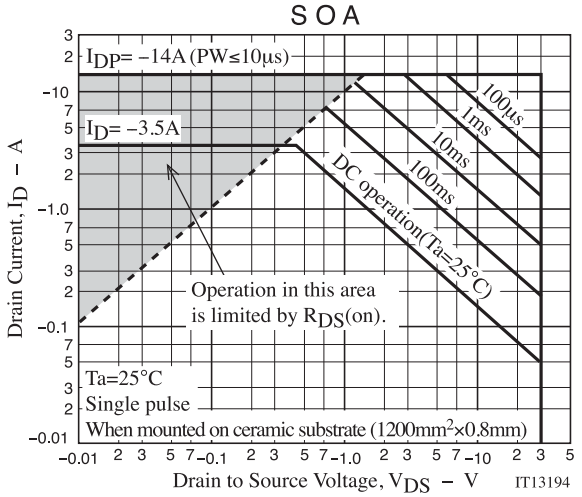


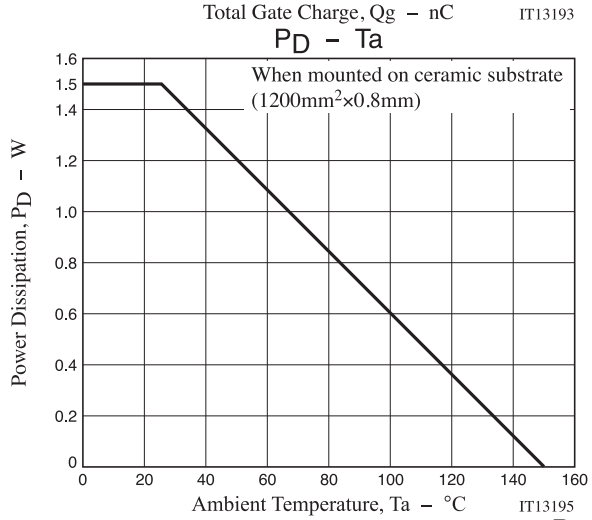


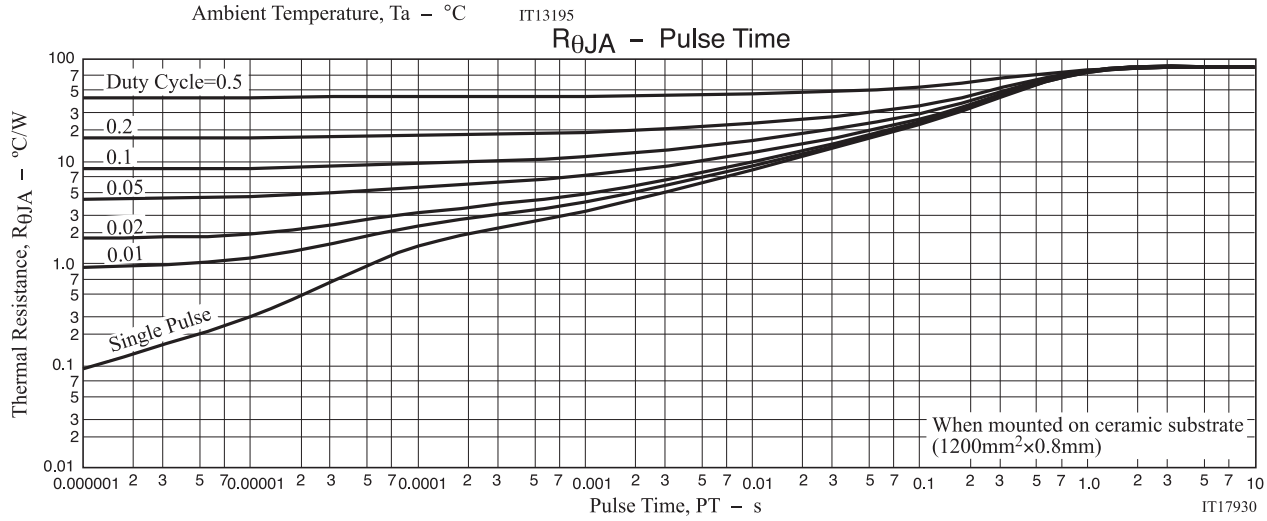








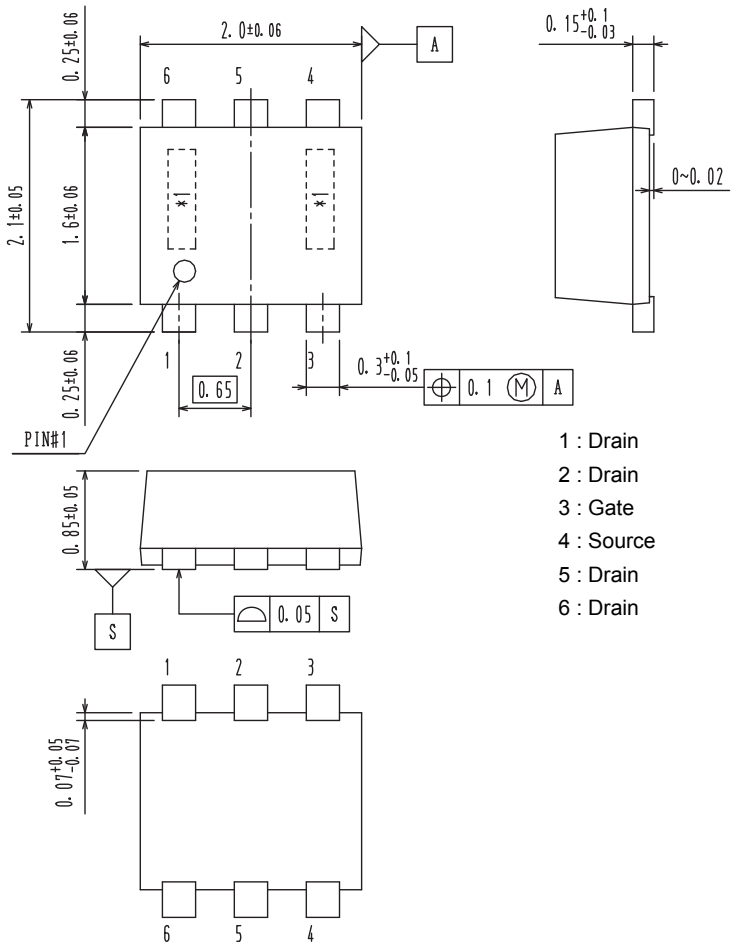




PACKAGE DIMENSIONS

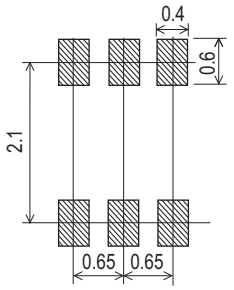
unit : mm

SC-88FL / MCPH6
CASE 419AS
ISSUE O



1 : Drain
2 : Drain
3 : Gate
4 : Source
5 : Drain
6 : Drain

Recommended Soldering Footprint



ORDERING INFORMATION

Device	Marking	Package	Shipping (Qty / Packing)
MCH6331-TL-H	YF	SC-88FL / MCPH6 (Pb-Free / Halogen Free)	3,000 / Tape & Reel
MCH6331-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 MCH6331 is a MOSFET product, please avoid using this device in the vicinity of highly charged objects.