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ON Semiconductor®

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MCH6431

Power MOSFET 30V, 55mΩ, 5A, Single N-Channel

Features

- Low On-Resistance
- 4V Drive
- ESD Diode-Protected Gate
- Pb-Free, Halogen Free and RoHS Compliance

Specifications

Absolute Maximum Ratings at Ta = 25°C

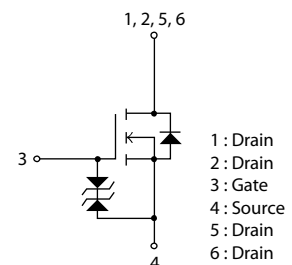
Parameter	Symbol	Value	Unit
Drain to Source Voltage	V _{DSS}	30	V
Gate to Source Voltage	V _{GSS}	±20	V
Drain Current (DC)	I _D	5	A
Drain Current (Pulse) PW≤10μs, duty cycle≤1%	I _{DP}	20	A
Power Dissipation When mounted on ceramic substrate (1200mm ² × 0.8mm)	P _D	1.5	W
Junction Temperature	T _J	150	°C
Storage Temperature	T _{stg}	-55 to +150	°C

Thermal Resistance Ratings

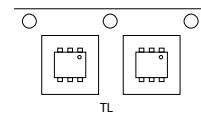
Parameter	Symbol	Value	Unit
Junction to Ambient When mounted on ceramic substrate (1200mm ² × 0.8mm)	R _{θJA}	83.3	°C/W

V _{DSS}	R _{DS(on)} Max	I _D Max
30V	55mΩ@ 10V	5A
	91mΩ@ 4.5V	
	109mΩ@ 4V	

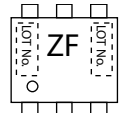
Electrical Connection N-Channel



Packing Type : TL



Marking



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.

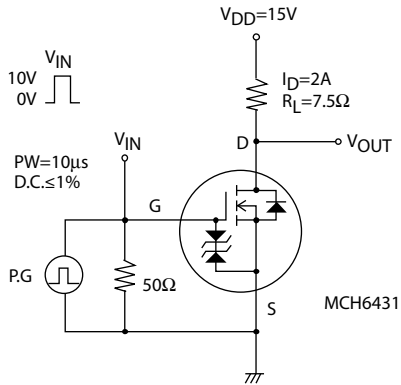
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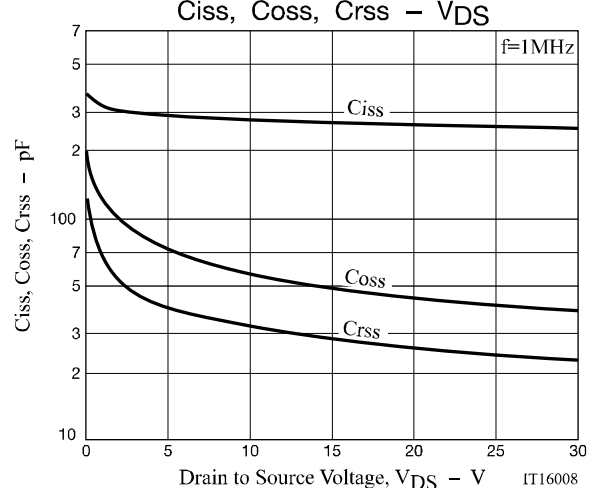
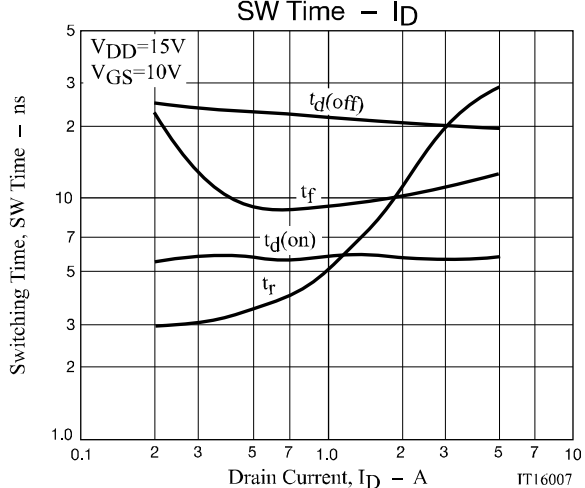
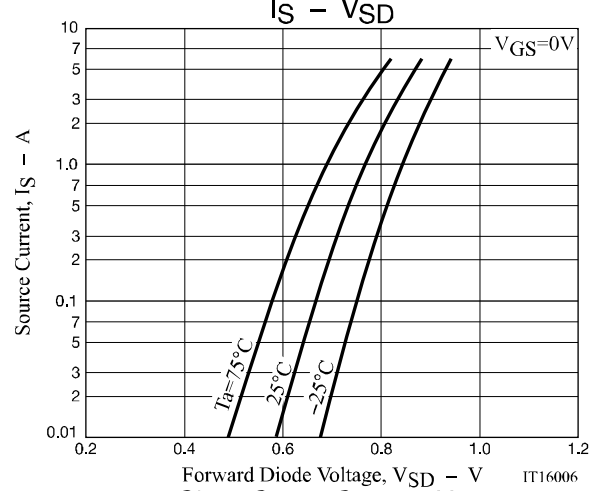
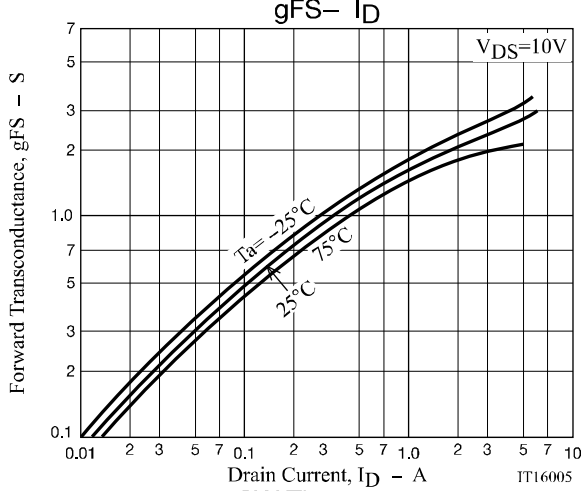
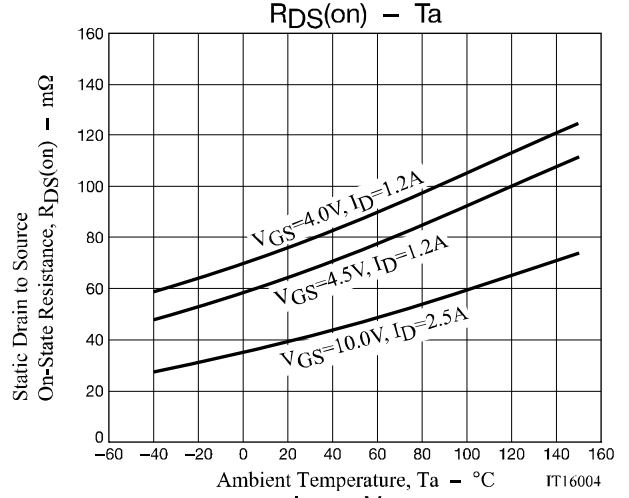
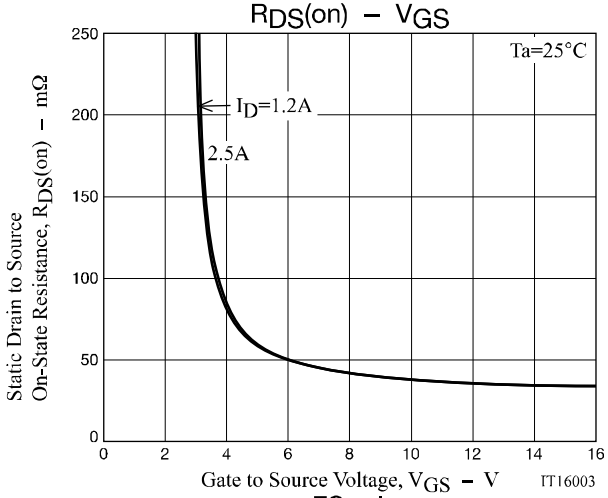
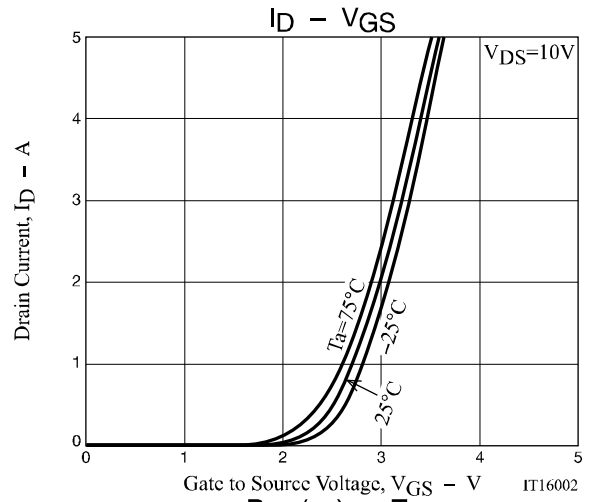
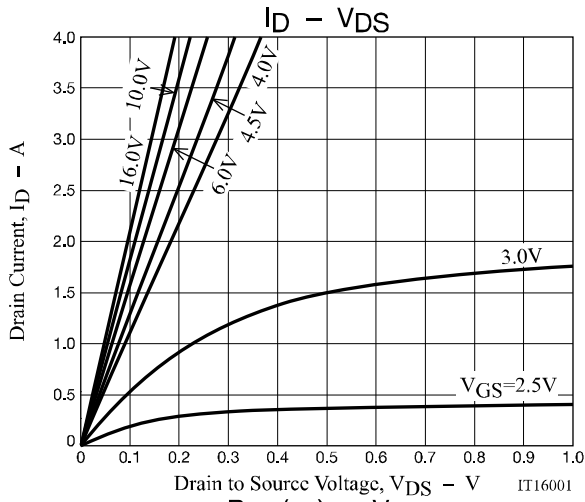
Electrical Characteristics at $T_a = 25^\circ\text{C}$

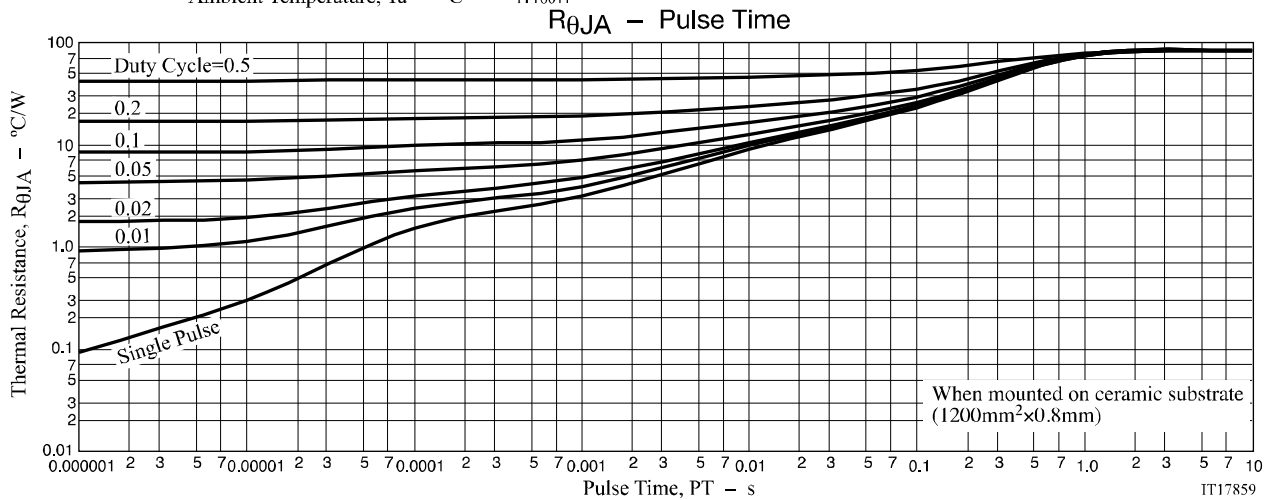
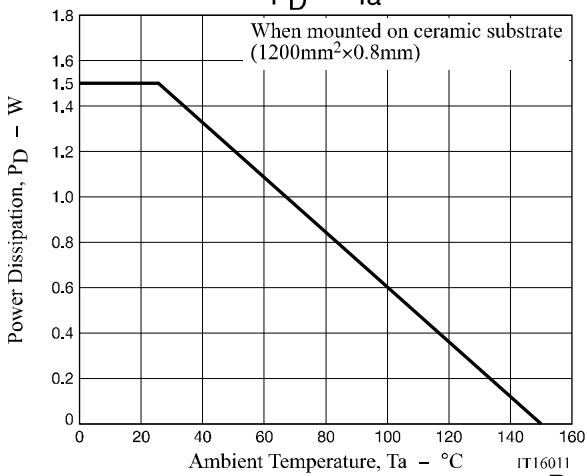
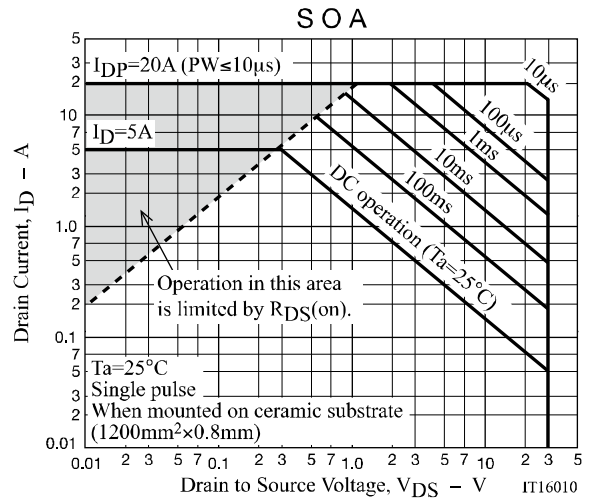
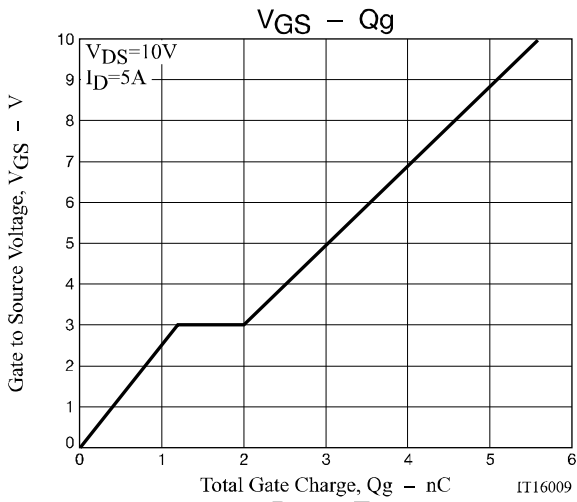
Parameter	Symbol	Conditions	Value			Unit
			min	typ	max	
Drain to Source Breakdown Voltage	$V_{(BR)DSS}$	$I_D=1\text{mA}, V_{GS}=0\text{V}$	30			V
Zero-Gate Voltage Drain Current	I_{DSS}	$V_{DS}=30\text{V}, V_{GS}=0\text{V}$			1	μA
Gate to Source Leakage Current	I_{GSS}	$V_{GS}=\pm 16\text{V}, V_{DS}=0\text{V}$			± 10	μA
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=10\text{V}, I_D=1\text{mA}$	1.2		2.6	V
Forward Transconductance	g_{FS}	$V_{DS}=10\text{V}, I_D=2.5\text{A}$		2.2		S
Static Drain to Source On-State Resistance	$R_{DS(on)1}$	$I_D=2.5\text{A}, V_{GS}=10\text{V}$		42	55	$\text{m}\Omega$
	$R_{DS(on)2}$	$I_D=1.2\text{A}, V_{GS}=4.5\text{V}$		65	91	$\text{m}\Omega$
	$R_{DS(on)3}$	$I_D=1.2\text{A}, V_{GS}=4\text{V}$		78	109	$\text{m}\Omega$
Input Capacitance	C_{iss}	$V_{DS}=10\text{V}, f=1\text{MHz}$		280		pF
Output Capacitance	C_{oss}			60		pF
Reverse Transfer Capacitance	C_{rss}			30		pF
Turn-ON Delay Time	$t_{d(on)}$			5.7		ns
Rise Time	t_r	See specified Test Circuit		11		ns
Turn-OFF Delay Time	$t_{d(off)}$			21		ns
Fall Time	t_f			10		ns
Total Gate Charge	Q_g	$V_{DS}=15\text{V}, V_{GS}=10\text{V}, I_D=5\text{A}$		5.6		nC
Gate to Source Charge	Q_{gs}			1.2		nC
Gate to Drain "Miller" Charge	Q_{gd}			0.8		nC
Forward Diode Voltage	V_{SD}		$I_S=5\text{A}, V_{GS}=0\text{V}$		0.85	1.2

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







MCH6431

Package Dimensions

MCH6431-TL-H / MCH6431-TL-W

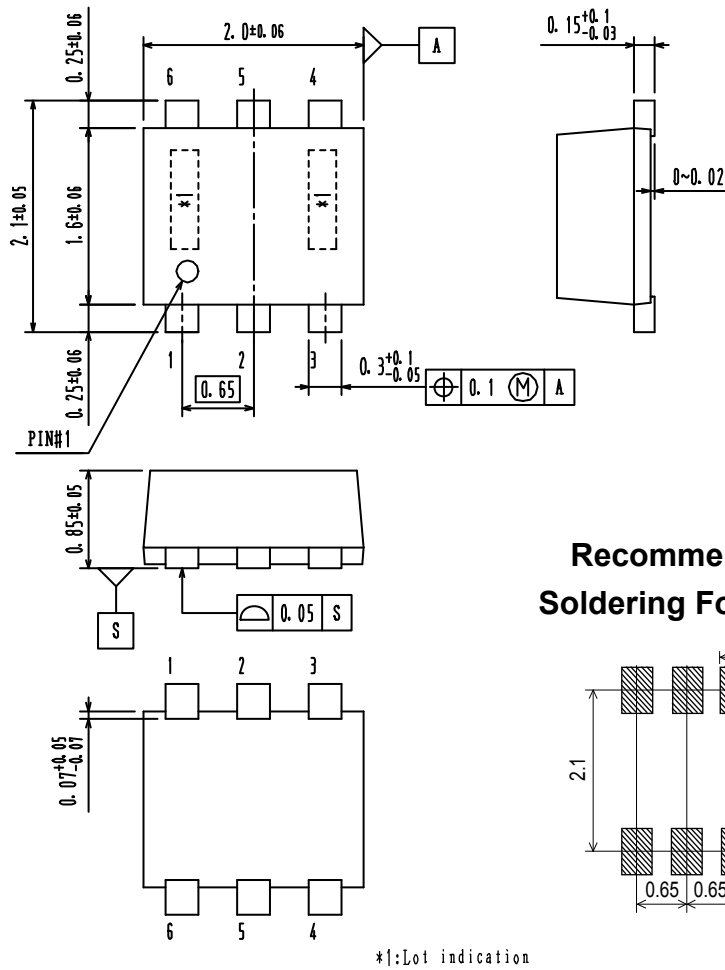
MCPH6

CASE 419AS

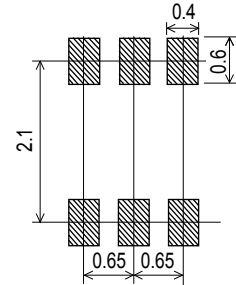
ISSUE O

unit : mm

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



Recommended Soldering Footprint



ORDERING INFORMATION

Device	Package	Shipping	Note
MCH6431-TL-H	MCPH6	3,000 pcs. / Tape & Reel	Pb-Free and Halogen Free
MCH6431-TL-W	SC-88FL, SC-70-6, SOT-363		

† 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 MCH6431 is a MOSFET product, please avoid using this device in the vicinity of highly charged objects.

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