

MCH6421

Power MOSFET 20V, 38mΩ, 5.5A, Single N-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
- 1.8V drive
- High Speed Switching
- ESD Diode-Protected Gate
- Pb-Free and RoHS compliance
- Halogen Free compliance : MCH6421-TL-W

Typical Applications

- Load Switch
- Synchronous Boost Converter

SPECIFICATIONS

ABSOLUTE MAXIMUM RATING at $T_a = 25^{\circ}\text{C}$ (Note 1)

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	5.5	A
Drain Current (Pulse) $PW \leq 10\mu\text{s}$, duty cycle $\leq 1\%$	I_{DP}	22	A
Power Dissipation When mounted on ceramic substrate ($1200\text{mm}^2 \times 0.8\text{mm}$)	P_D	1.5	W
Junction Temperature	T_j	150	$^{\circ}\text{C}$
Storage Temperature	T_{stg}	-55 to $+150$	$^{\circ}\text{C}$

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 ($1200\text{mm}^2 \times 0.8\text{mm}$)	$R_{\theta JA}$	83.3	$^{\circ}\text{C/W}$

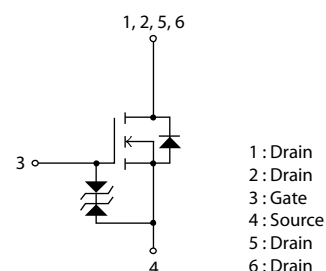


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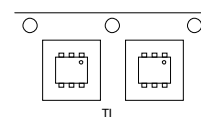
www.onsemi.com

V_{DS}	$R_{DS(on)}$ Max	I_D Max
20V	38mΩ@ 4.5V	5.5A
	61mΩ@ 2.5V	
	99mΩ@ 1.8V	

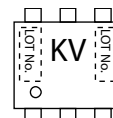
ELECTRICAL CONNECTION N-Channel



PACKING TYPE : TL



MARKING



ORDERING INFORMATION

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

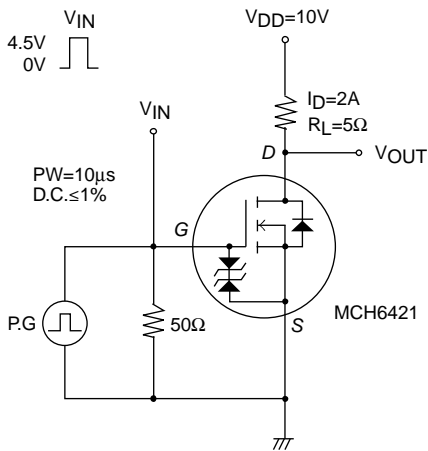
MCH6421

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

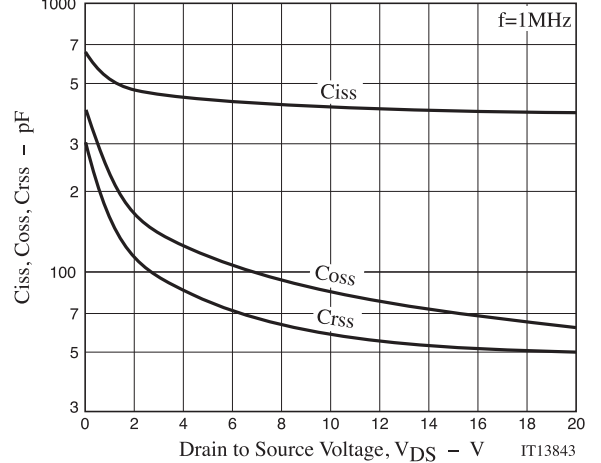
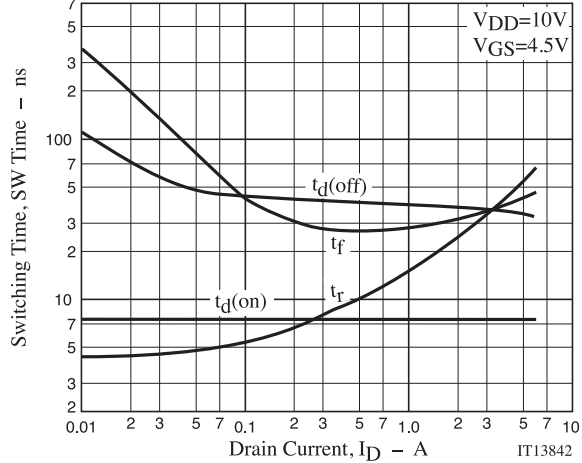
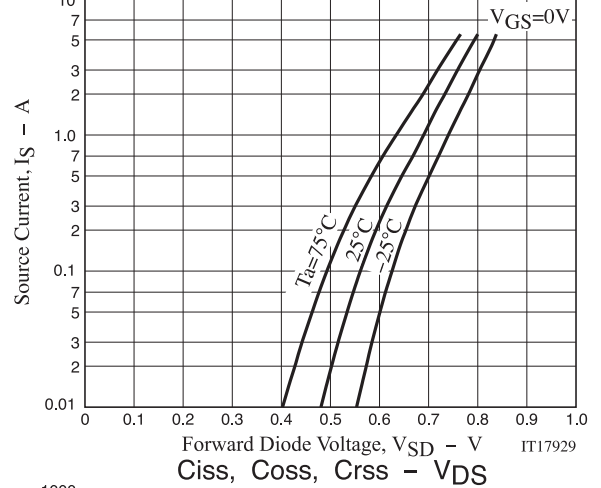
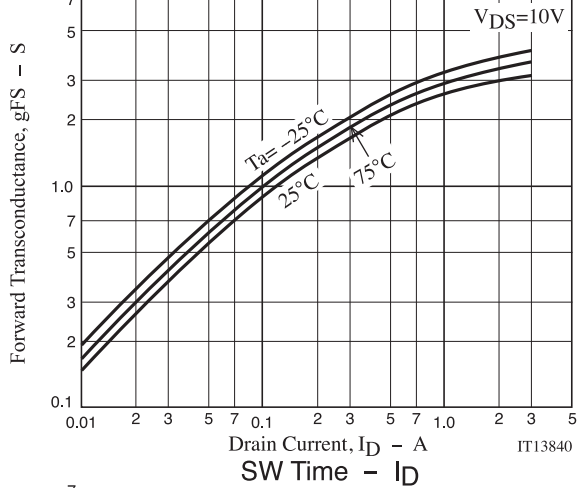
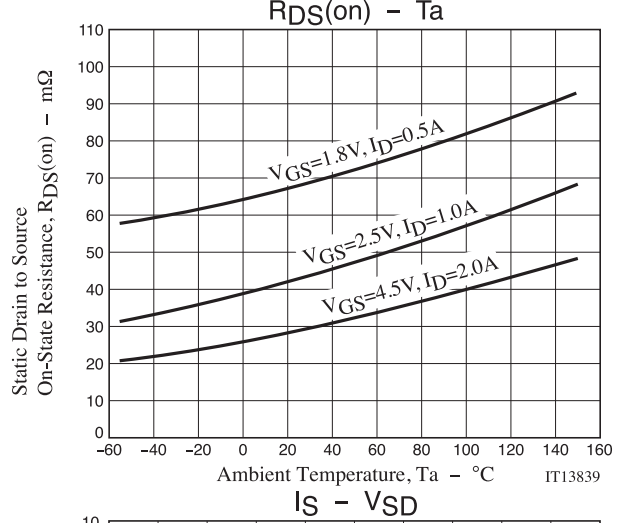
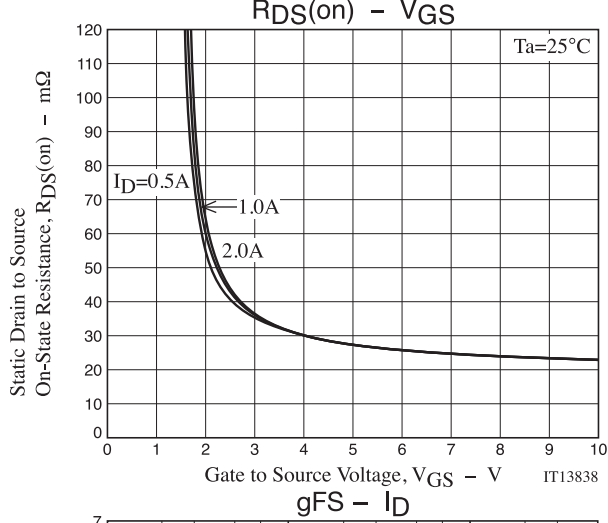
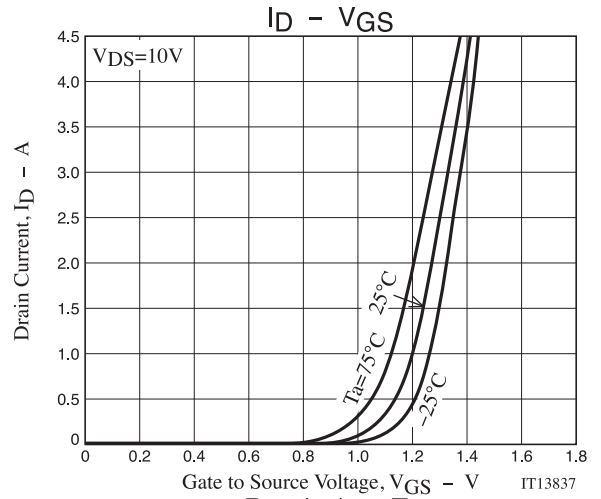
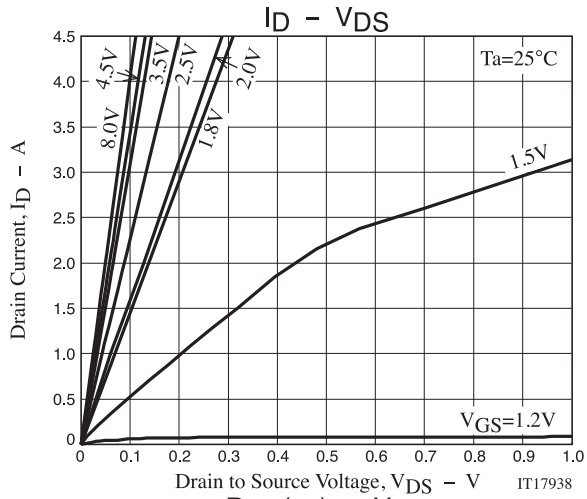
Parameter	Symbol	Conditions	Value			Unit
			min	typ	max	
Drain to Source Breakdown Voltage	$V_{(BR)DSS}$	$I_D=1mA, V_{GS}=0V$	20			V
Zero-Gate Voltage Drain Current	I_{DSS}	$V_{DS}=20V, V_{GS}=0V$			1	μA
Gate to Source Leakage Current	I_{GSS}	$V_{GS}=\pm 8V, V_{DS}=0V$			± 10	μA
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=10V, I_D=1mA$	0.4		1.3	V
Forward Transconductance	g_{FS}	$V_{DS}=10V, I_D=2A$	2.0	3.8		S
Static Drain to Source On-State Resistance	$R_{DS(on)1}$	$I_D=2A, V_{GS}=4.5V$		29	38	$m\Omega$
	$R_{DS(on)2}$	$I_D=1A, V_{GS}=2.5V$		43	61	$m\Omega$
	$R_{DS(on)3}$	$I_D=0.5A, V_{GS}=1.8V$		69	99	$m\Omega$
Input Capacitance	C_{iss}	$V_{DS}=10V, f=1MHz$		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	$V_{DS}=10V, V_{GS}=4.5V, I_D=5.5A$		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}	$I_S=5.5A, V_{GS}=0V$		0.8	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.

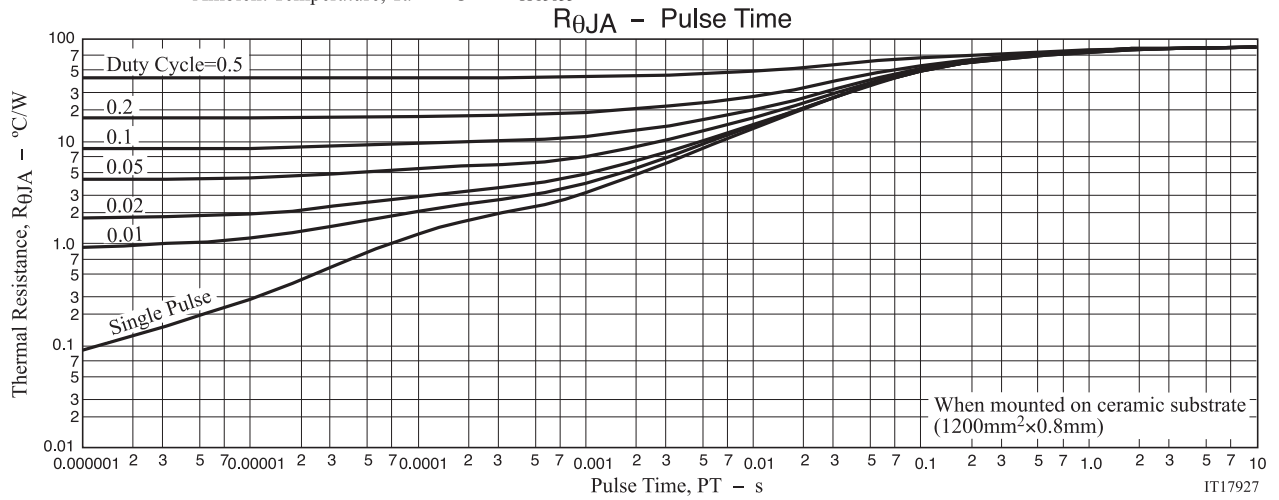
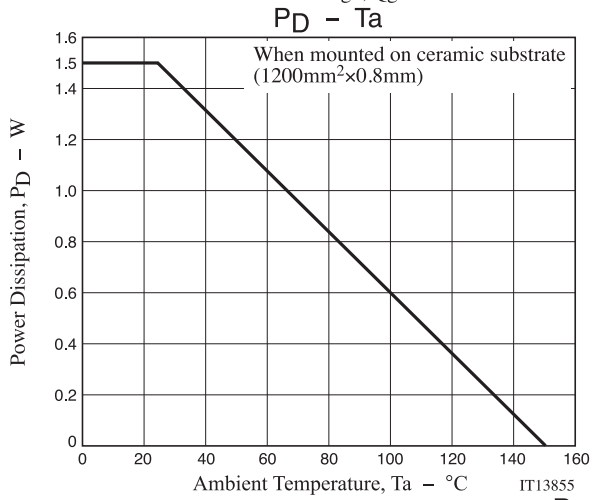
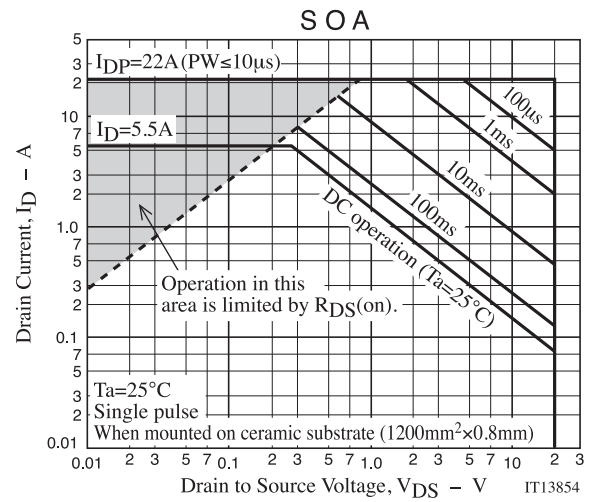
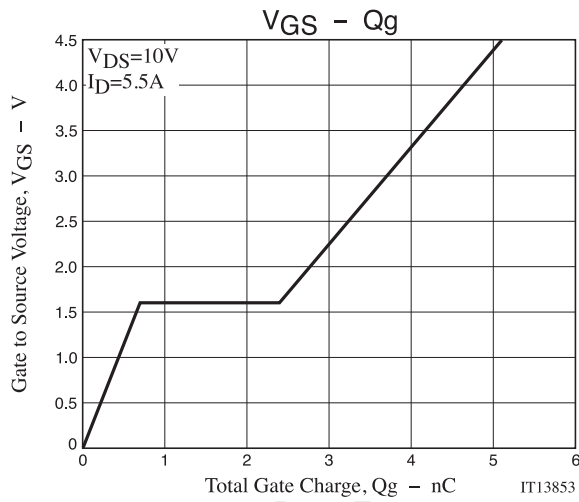
Switching Time Test Circuit



MCH6421



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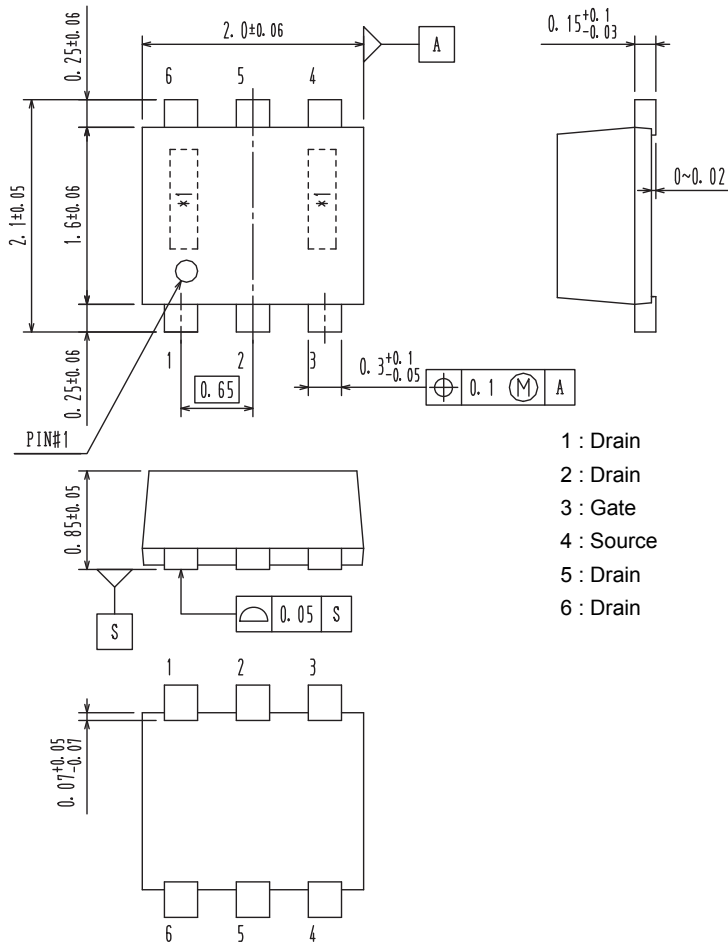


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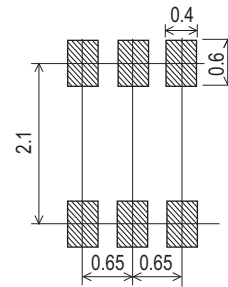
PACKAGE DIMENSIONS

unit : mm

SC-88FL / MCPH6
CASE 419AS
ISSUE O



Recommended Soldering Footprint



ORDERING INFORMATION

Device	Marking	Package	Shipping (Qty / Packing)
MCH6421-TL-E	KV	SC-88FL / MCPH6 (Pb-Free)	3,000 / Tape & Reel
MCH6421-TL-W		SC-88FL / MCPH6 (Pb-Free / Halogen Free)	

† 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 MCH6421 is a MOSFET product, please avoid using this device in the vicinity of highly charged objects.

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