



ON Semiconductor®

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# MCH6320

## Power MOSFET -12V, 70mΩ, -3.5A, Single P-Channel

### Features

- 1.8V Drive
- High Speed Switching
- Pb-Free and RoHS Compliance

### Specifications

**Absolute Maximum Ratings** at Ta = 25°C

Parameter	Symbol	Value	Unit
Drain to Source Voltage	V <sub>DSS</sub>	-12	V
Gate to Source Voltage	V <sub>GSS</sub>	±10	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 (1200mm <sup>2</sup> × 0.8mm)	P <sub>D</sub>	1.5	W
Junction Temperature	T <sub>J</sub>	150	°C
Storage Temperature	T <sub>stg</sub>	-55 to +150	°C

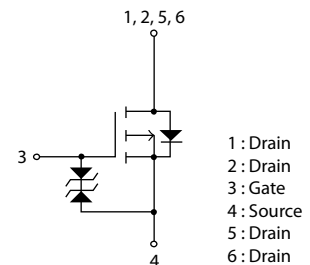
This product is designed to "ESD immunity < 200V\*", so please take care when handling.  
\* Machine Model

### Thermal Resistance Ratings

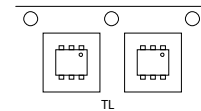
Parameter	Symbol	Value	Unit
Junction to Ambient When mounted on ceramic substrate (1200mm <sup>2</sup> × 0.8mm)	R <sub>θJA</sub>	83.3	°C/W

V <sub>DSS</sub>	R <sub>DS(on)</sub> Max	I <sub>D</sub> Max
-12V	70mΩ@ -4.5V	-3.5A
	115mΩ@ -2.5V	
	215mΩ@ -1.8V	

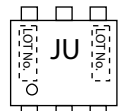
### Electrical Connection P-Channel



### 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.

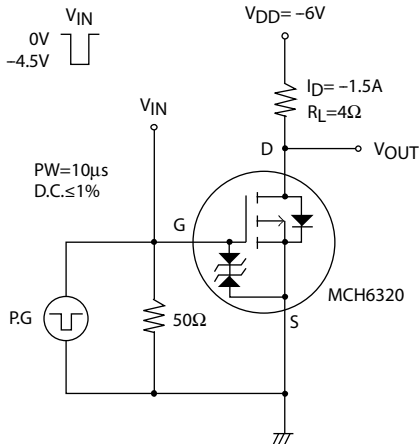
# MCH6320

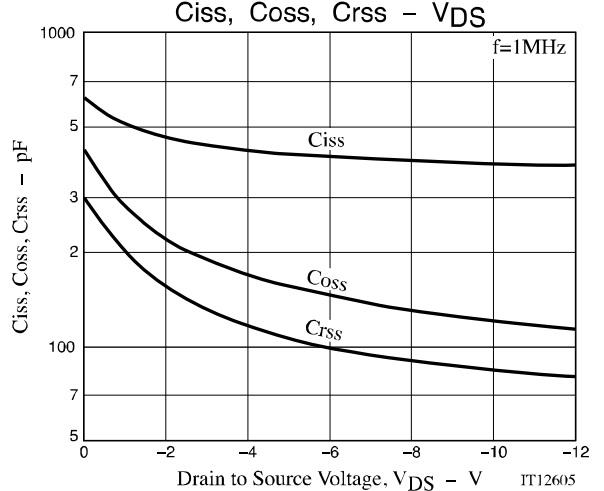
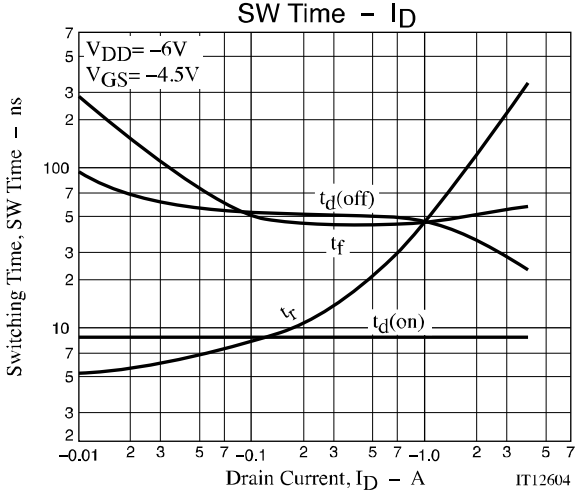
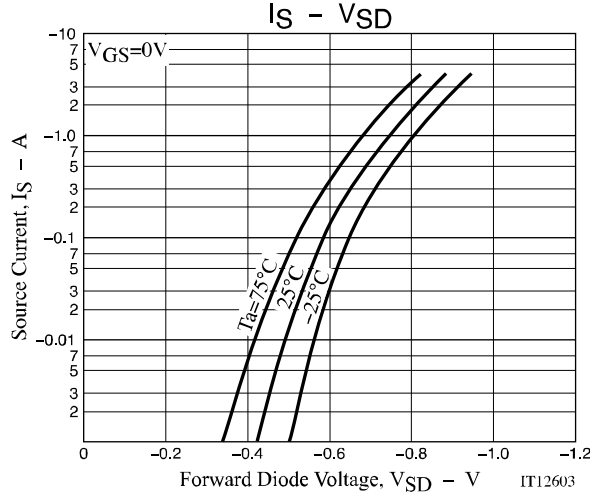
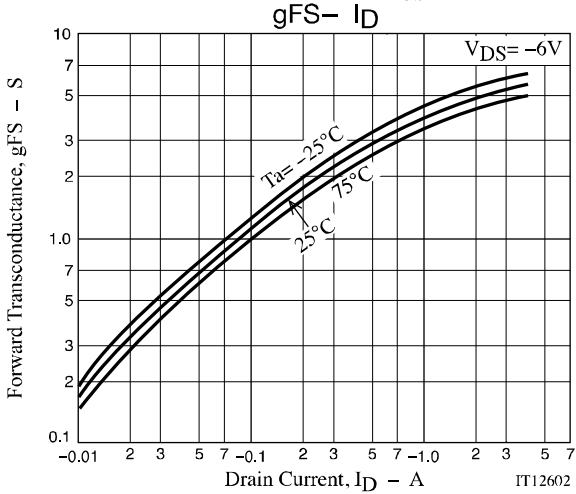
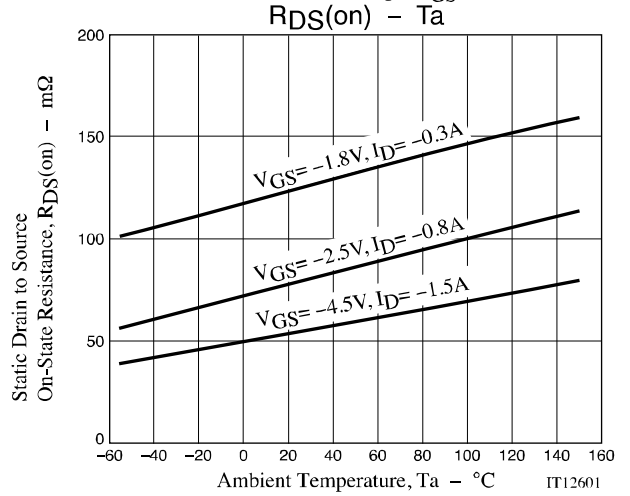
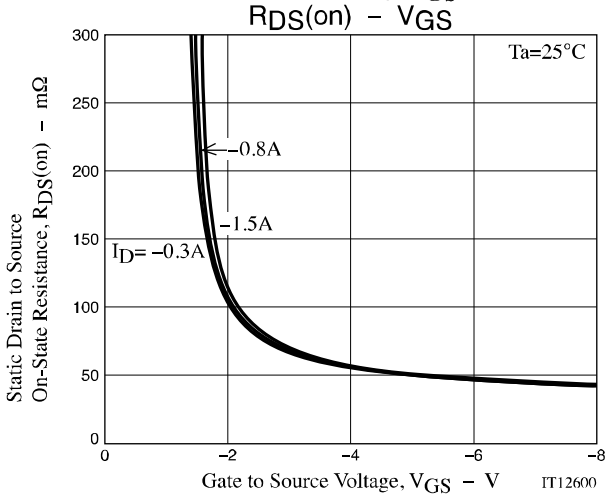
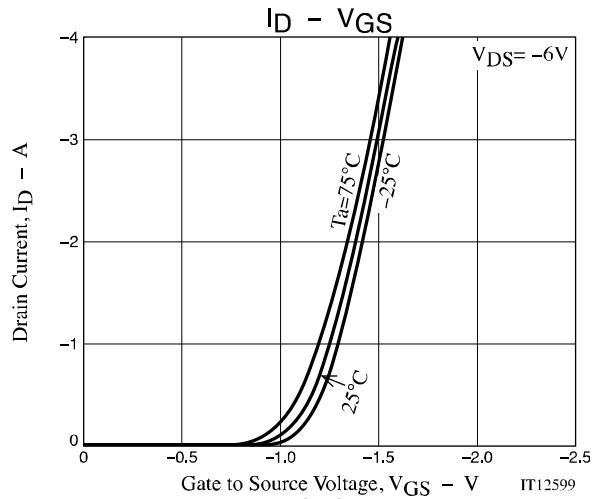
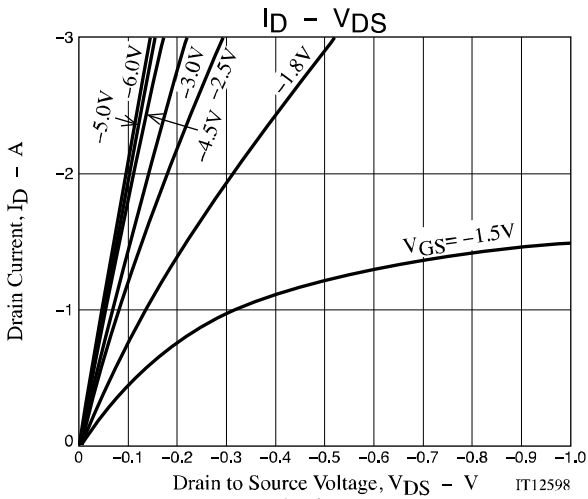
## Electrical Characteristics at $T_a = 25^\circ\text{C}$

Parameter	Symbol	Conditions	Value			Unit
			min	typ	max	
Drain to Source Breakdown Voltage	$V_{(BR)DSS}$	$I_D = -1\text{mA}$ , $V_{GS} = 0\text{V}$	-12			V
Zero-Gate Voltage Drain Current	$I_{DSS}$	$V_{DS} = -12\text{V}$ , $V_{GS} = 0\text{V}$			-10	$\mu\text{A}$
Gate to Source Leakage Current	$I_{GSS}$	$V_{GS} = \pm 8\text{V}$ , $V_{DS} = 0\text{V}$			$\pm 10$	$\mu\text{A}$
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS} = -6\text{V}$ , $I_D = -1\text{mA}$	-0.4		-1.4	V
Forward Transconductance	$g_{FS}$	$V_{DS} = -6\text{V}$ , $I_D = -1.5\text{A}$	2.7	4.5		S
Static Drain to Source On-State Resistance	$R_{DS(on)1}$	$I_D = -1.5\text{A}$ , $V_{GS} = -4.5\text{V}$		54	70	$\text{m}\Omega$
	$R_{DS(on)2}$	$I_D = -0.8\text{A}$ , $V_{GS} = -2.5\text{V}$		80	115	$\text{m}\Omega$
	$R_{DS(on)3}$	$I_D = -0.3\text{A}$ , $V_{GS} = -1.8\text{V}$		125	215	$\text{m}\Omega$
Input Capacitance	$C_{iss}$	$V_{DS} = -6\text{V}$ , $f = 1\text{MHz}$		405		pF
Output Capacitance	$C_{oss}$			145		pF
Reverse Transfer Capacitance	$C_{rss}$			100		pF
Turn-ON Delay Time	$t_{d(on)}$			8.8		ns
Rise Time	$t_r$	See specified Test Circuit		80		ns
Turn-OFF Delay Time	$t_{d(off)}$			41		ns
Fall Time	$t_f$			50		ns
Total Gate Charge	$Q_g$	$V_{DS} = -6\text{V}$ , $V_{GS} = -4.5\text{V}$ , $I_D = -3.5\text{A}$		5.6		nC
Gate to Source Charge	$Q_{gs}$			0.7		nC
Gate to Drain "Miller" Charge	$Q_{gd}$			1.6		nC
Forward Diode Voltage	$V_{SD}$		$I_S = -3.5\text{A}$ , $V_{GS} = 0\text{V}$		-0.86	-1.2

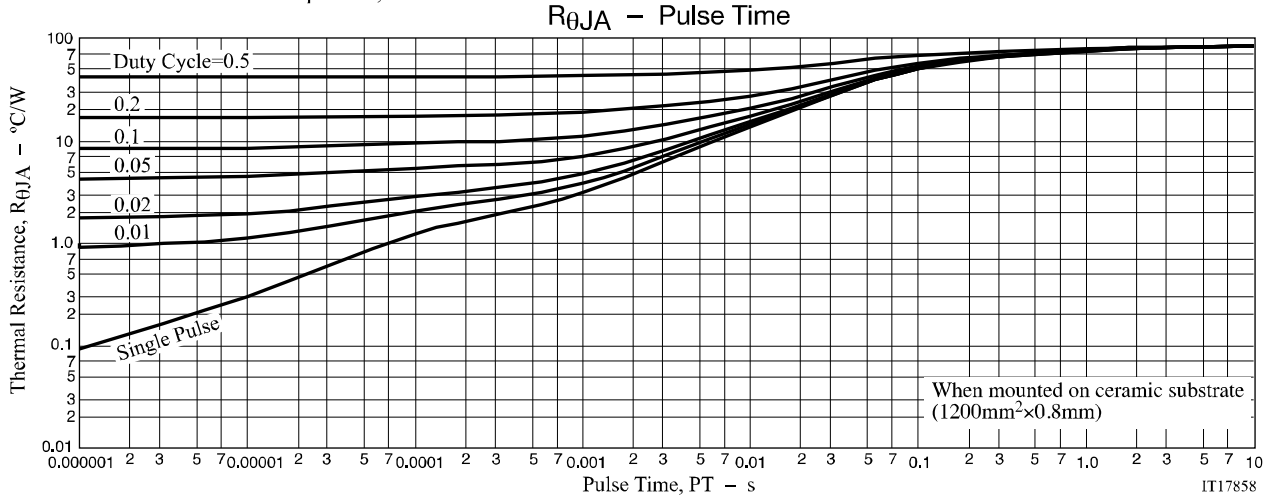
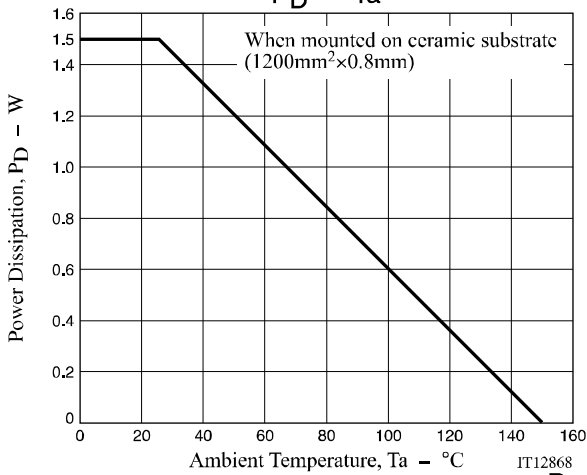
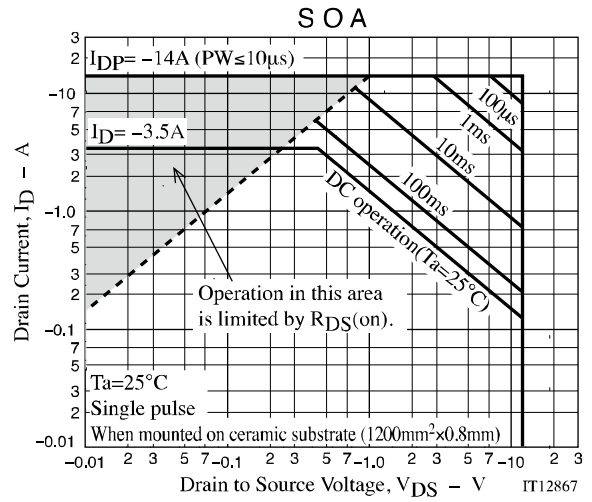
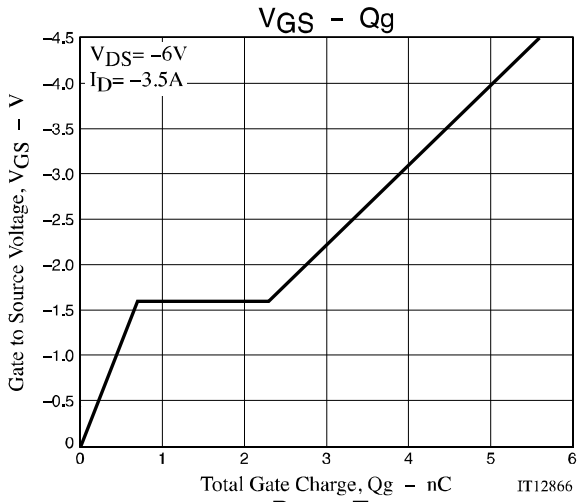
Product parametric performance is indicated in the Electrical Characteristics for the listed test conditions, unless otherwise noted. Product performance may not be indicated by the Electrical Characteristics if operated under different conditions.

## Switching Time Test Circuit





# MCH6320



# MCH6320

## Package Dimensions

MCH6320-TL-E / MCH6320-TL-W

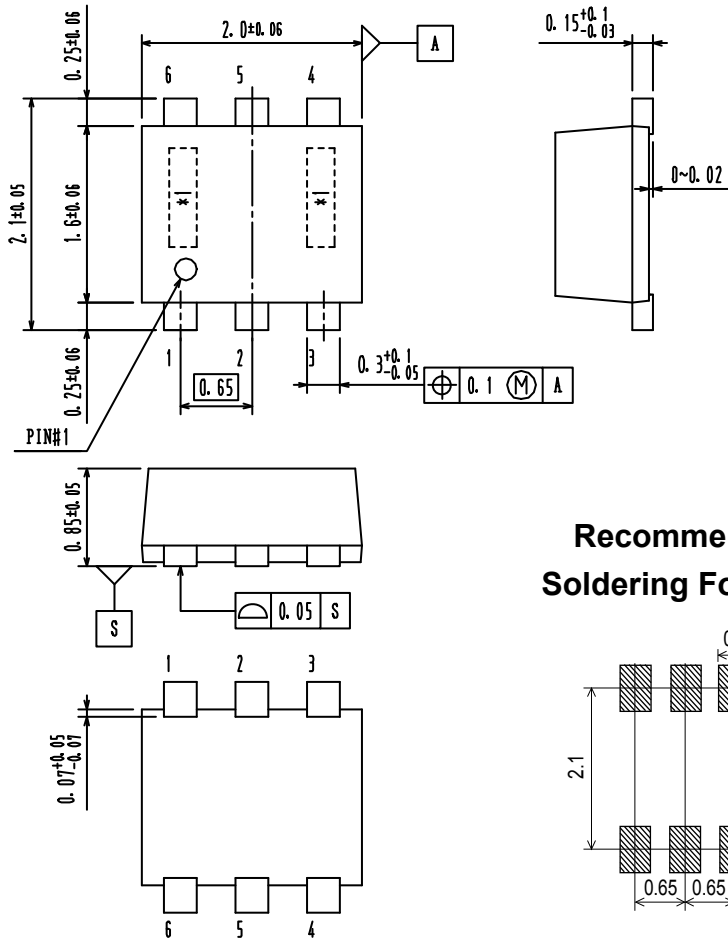
### MCPH6

CASE 419AS

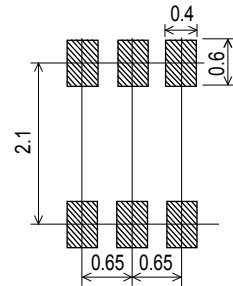
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unit : mm

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



### Recommended Soldering Footprint



\*:Lot indication

## ORDERING INFORMATION

Device	Package	Shipping	Note
MCH6320-TL-E	MCPH6 SC-88FL,SC-70-6,SOT-363	3,000 pcs. / Tape & Reel	Pb-Free
MCH6320-TL-W			Pb-Free and 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](http://www.onsemi.com/pub_link/Collateral/BRD8011-D.PDF)

Note on usage : Since the MCH6320 is a MOSFET product, please avoid using this device in the vicinity of highly charged objects.

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