

**MCH5801****DC / DC Converter Applications****Features**

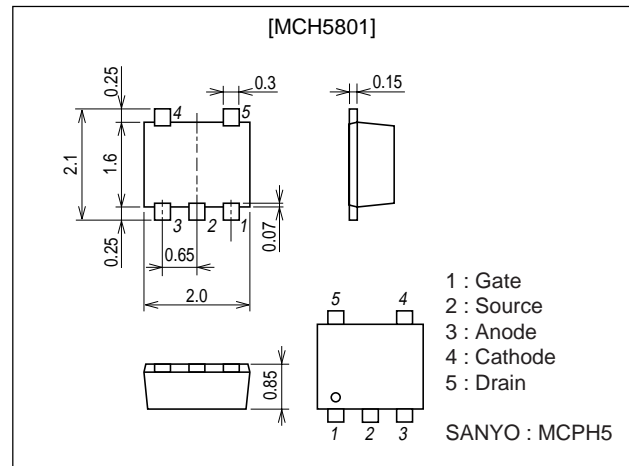
- Composite type with an N-Channel Silicon MOSFET (MCH3405) and a Schottky Barrier Diode (SBS007M) contained in one package facilitating high-density mounting.

**[MOSFET]**

- Low ON-resistance.
- Ultrahigh-speed switching.
- 1.8V drive.

**[SBD]**

- Short reverse recovery time.
- Low forward voltage.

**Package Dimensions**unit : mm  
2195**Specifications****Absolute Maximum Ratings** at Ta=25°C

Parameter	Symbol	Conditions	Ratings	Unit
<b>[MOSFET]</b>				
Drain-to-Source Voltage	V <sub>DSS</sub>		20	V
Gate-to-Source Voltage	V <sub>GS</sub>		±10	V
Drain Current (DC)	I <sub>D</sub>		1.5	A
Drain Current (Pulse)	I <sub>DP</sub>	PW≤10μs, duty cycle≤1%	6	A
Allowable Power Dissipation	P <sub>D</sub>	Mounted on a ceramic board (900mm <sup>2</sup> X0.8mm) 1unit	0.8	W
Channel Temperature	T <sub>ch</sub>		150	°C
Storage Temperature	T <sub>stg</sub>		-55 to +125	°C
<b>[SBD]</b>				
Repetitive Peak Reverse Voltage	V <sub>R</sub> RM		15	V
Nonrepetitive Peak Reverse Surge Voltage	V <sub>R</sub> SM		15	V
Average Output Current	I <sub>O</sub>		0.5	A
Surge Forward Current	I <sub>FSM</sub>	50Hz sine wave, 1 cycle	10	A
Junction Temperature	T <sub>J</sub>		-55 to +125	°C
Storage Temperature	T <sub>stg</sub>		-55 to +125	°C

Marking : QA

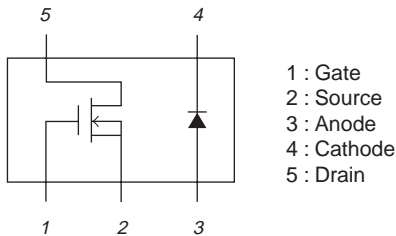
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# MCH5801

## Electrical Characteristics at Ta=25°C

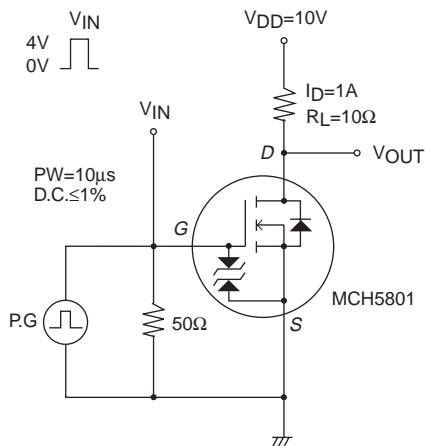
Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
[MOSFET]						
Drain-to-Source Breakdown Voltage	$V_{(BR)DSS}$	$I_D=1mA, V_{GS}=0$	20			V
Zero-Gate Voltage Drain Current	$I_{DSS}$	$V_{DS}=20V, V_{GS}=0$			1	$\mu A$
Gate-to-Source Leakage Current	$I_{GSS}$	$V_{GS}=\pm 8V, V_{DS}=0$			$\pm 10$	$\mu A$
Cutoff Voltage	$V_{GS(off)}$	$V_{DS}=10V, I_D=1mA$	0.4		1.3	V
Forward Transfer Admittance	$ y_{fs} $	$V_{DS}=10V, I_D=1A$	1.9	2.8		S
Static Drain-to-Source On-State Resistance	$R_{DS(on)1}$	$I_D=1A, V_{GS}=4V$		160	210	m $\Omega$
	$R_{DS(on)2}$	$I_D=0.5A, V_{GS}=2.5V$		200	280	m $\Omega$
	$R_{DS(on)3}$	$I_D=0.1A, V_{GS}=1.8V$		280	390	m $\Omega$
Input Capacitance	$C_{iss}$	$V_{DS}=10V, f=1MHz$		100		pF
Output Capacitance	$C_{oss}$	$V_{DS}=10V, f=1MHz$		22		pF
Reverse Transfer Capacitance	$C_{rss}$	$V_{DS}=10V, f=1MHz$		15		pF
Turn-ON Delay Time	$t_{d(on)}$	See specified Test Circuit		6.5		ns
Rise Time	$t_r$	See specified Test Circuit		28		ns
Turn-OFF Delay Time	$t_{d(off)}$	See specified Test Circuit		19		ns
Fall Time	$t_f$	See specified Test Circuit		13		ns
Total Gate Charge	$Q_g$	$V_{DS}=10V, V_{GS}=10V, I_D=1.5A$		4.5		nC
Gate-to-Source Charge	$Q_{gs}$	$V_{DS}=10V, V_{GS}=10V, I_D=1.5A$		0.4		nC
Gate-to-Drain "Miller" Charge	$Q_{gd}$	$V_{DS}=10V, V_{GS}=10V, I_D=1.5A$		0.4		nC
Diode Forward Voltage	$V_{SD}$	$I_S=1.5A, V_{GS}=0$		0.9	1.2	V
[SBD]						
Reverse Voltage	$V_R$	$I_R=0.5mA$	15			V
Forward Voltage	$V_{F1}$	$I_F=0.3A$		0.35	0.40	V
	$V_{F2}$	$I_F=0.5A$		0.40	0.45	V
Reverse Current	$I_R$	$V_R=6V$			200	$\mu A$
Interterminal Capacitance	$C$	$V_R=10V, f=1MHz, 1 \text{ cycle}$		20		pF
Reverse Recovery Time	$t_{rr}$	$I_F=I_R=100mA, \text{ See specified Test Circuit.}$			10	ns

## Electrical Connection (Top view)



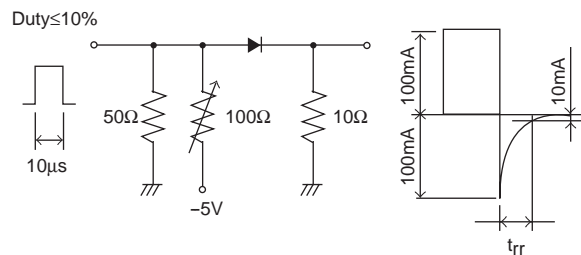
## Switching Time Test Circuit

[MOSFET]

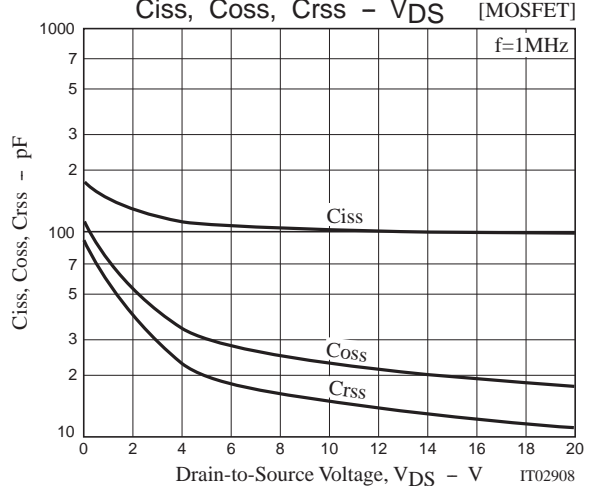
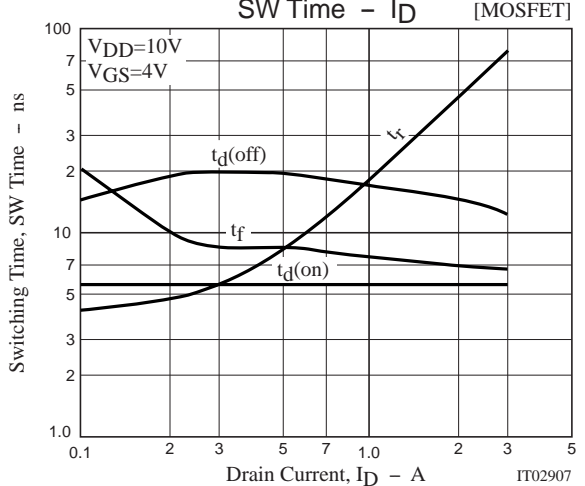
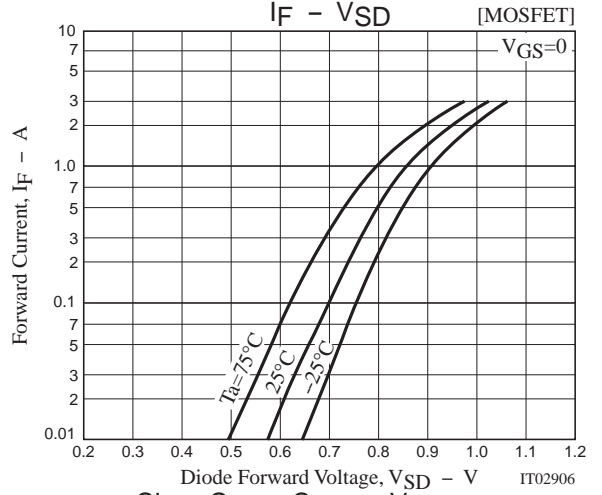
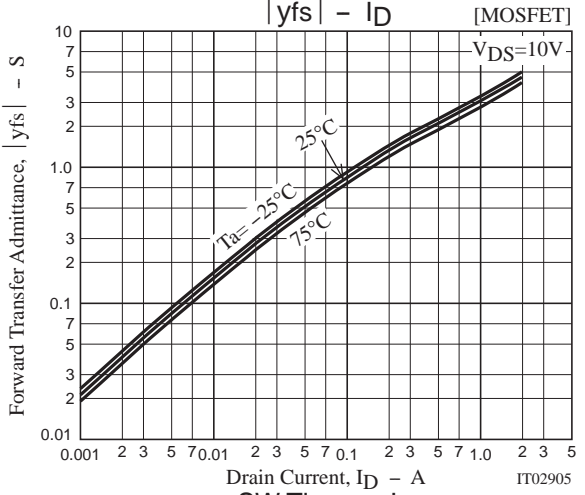
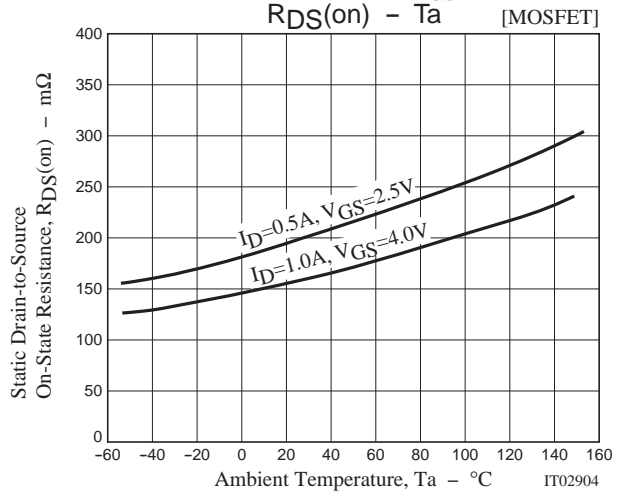
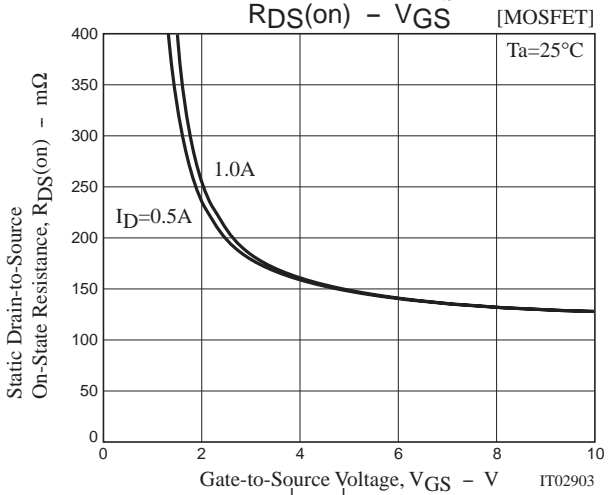
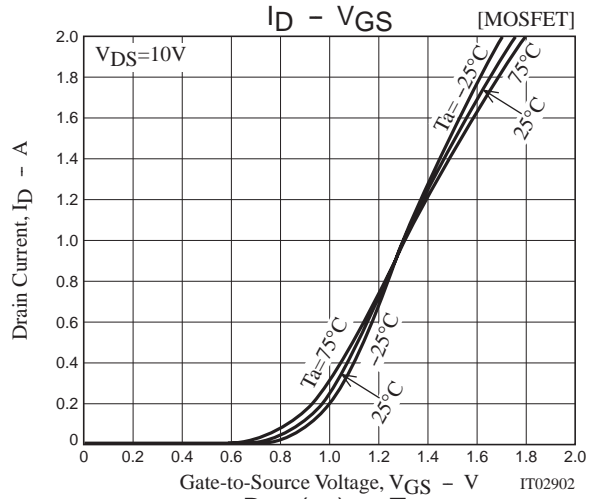
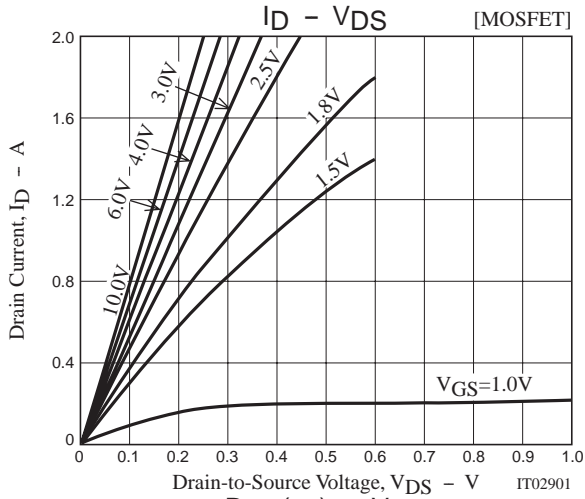


## $t_{rr}$ Test Circuit

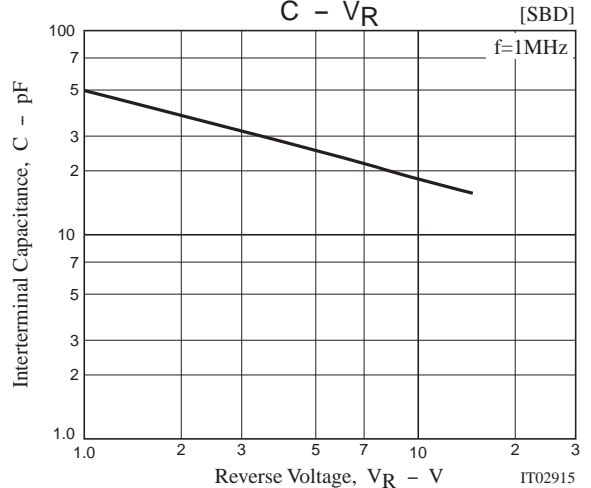
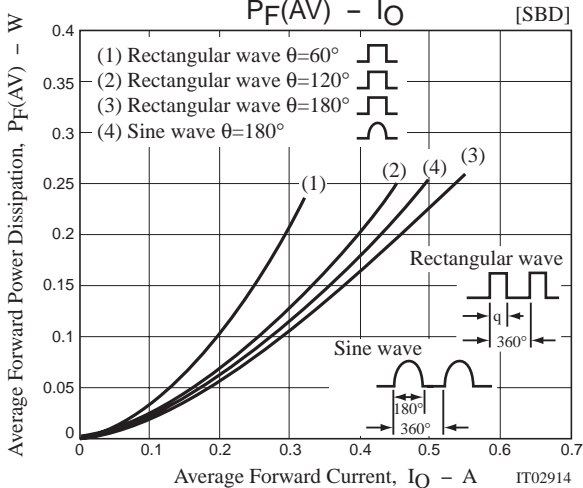
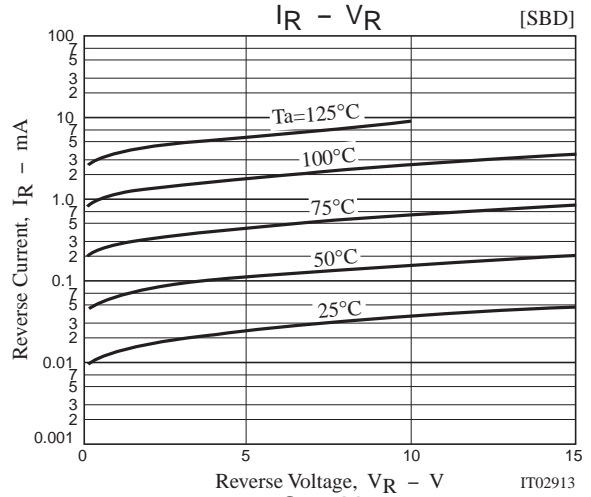
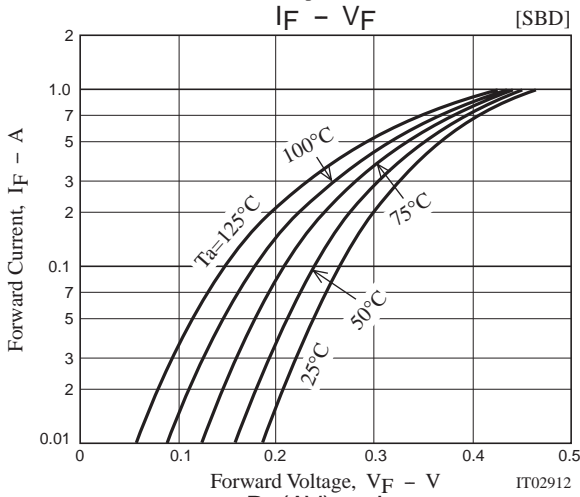
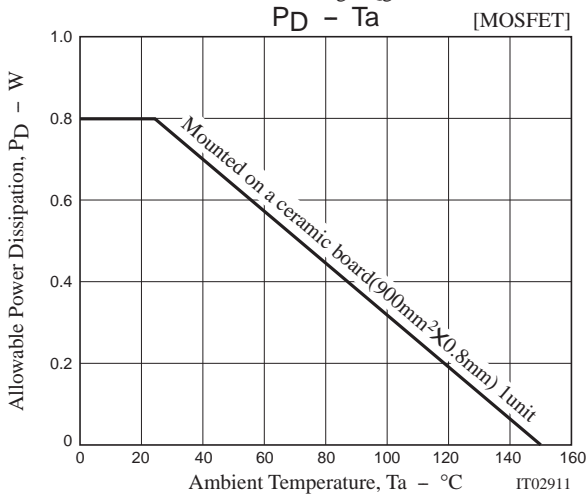
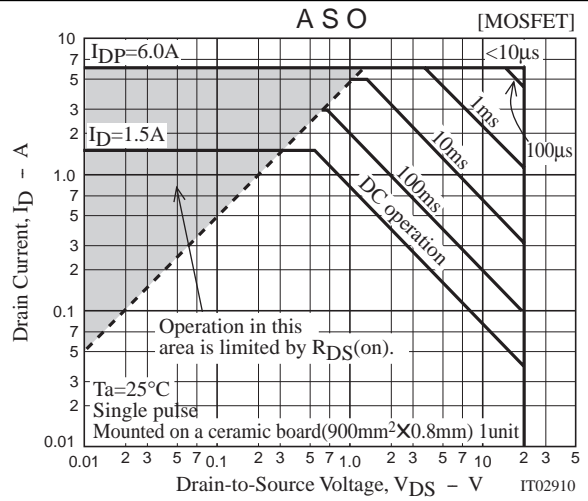
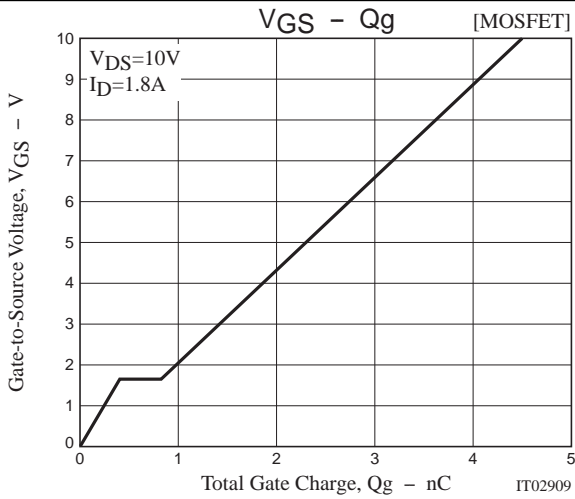
[SBD]

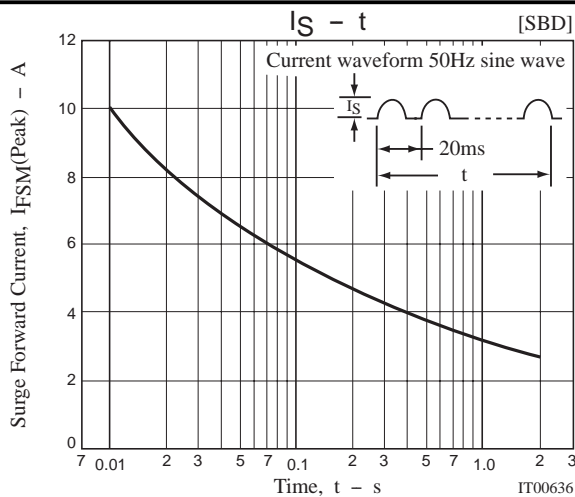


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