

MOSFET : N-Channel Silicon MOSFET
SBD : Schottky Barrier Diode



CPH5801

DC/DC Converter Applications

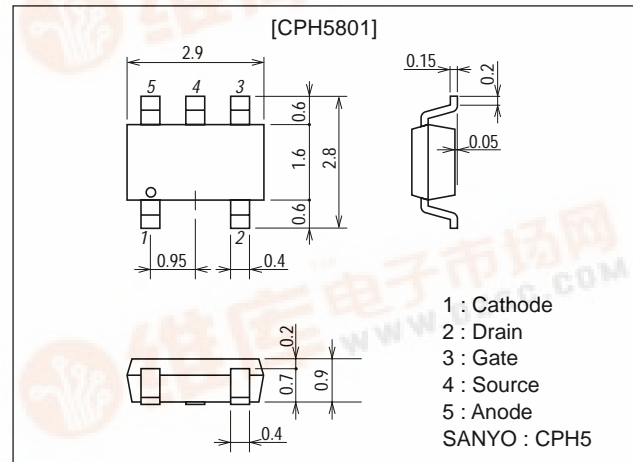
Features

- The CPH5801 composite device consists of following two devices to facilitate high-density mounting. One is an N-channel MOSFET that features low ON resistance, high-speed switching, and low driving voltage. The other is a schottky barrier diode that features short reverse recovery time and low forward voltage.
- Each device incorporated in the CPH5801 is equivalent to the 2SK3119 and to the SBS005, respectively.

Package Dimensions

unit:mm

2171



Specifications

Absolute Maximum Ratings at Ta = 25°C

Parameter	Symbol	Conditions	Ratings	Unit
[MOSFET]				
Drain-to-Source Voltage	V _{DSS}		20	V
Gate-to-Source Voltage	V _{GSS}		±10	V
Drain Current (DC)	I _D		1.4	A
Drain Current (pulse)	I _{DP}	PW≤10μs, duty cycle≤1%	5.6	A
Allowable Power Dissipation	P _D	Mounted on a ceramic board (600mm ² ×0.8mm) 1unit	0.9	W
Channel Temperature	T _{ch}		150	°C
Storage Temperature	T _{stg}		-55 to +125	°C
[SBD]				
Repetitive Peak Reverse Voltage	V _R RM		30	V
Non-repetitive Peak Reverse Surge Voltage	V _R S		30	V
Average Output Current	I _O		1	A
Surge Current	I _{FSM}	50Hz sine wave, 1 cycle	10	A
Junction Temperature	T _J		-55 to +125	°C
Storage Temperature	T _{stg}		-55 to +125	°C

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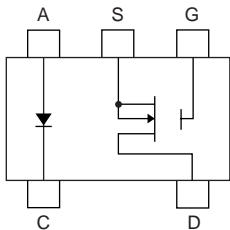
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Electrical Characteristics at Ta = 25°C

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}	$V_{DS}=20V, V_{GS}=0$			10	μA
Gate-to-Source Leakage Current	I_{GSS}	$V_{GS}=\pm 8V, V_{DS}=0$			± 10	μA
Cutoff Voltage	$V_{GS(off)}$	$V_{DS}=10V, I_D=1mA$	0.4		1.3	V
Forward Transfer Admittance	$ y_{fs} $	$V_{DS}=10V, I_D=700mA$	1.8	2.5		S
Static Drain-to-Source On-State Resistance	$R_{DS(on)1}$	$I_D=700mA, V_{GS}=4V$		200	260	$m\Omega$
	$R_{DS(on)2}$	$I_D=400mA, V_{GS}=2.5V$		260	360	$m\Omega$
Input Capacitance	C_{iss}	$V_{DS}=10V, f=1MHz$		90		pF
Output Capacitance	C_{oss}	$V_{DS}=10V, f=1MHz$		60		pF
Reverse Transfer Capacitance	C_{rss}	$V_{DS}=10V, f=1MHz$		28		pF
Turn-ON Delay Time	$t_{d(on)}$	See specified Test Circuit		10		ns
Rise Time	t_r	See specified Test Circuit		20		ns
Turn-OFF Delay Time	$t_{d(off)}$	See specified Test Circuit		20		ns
Fall Time	t_f	See specified Test Circuit		20		ns
Total Gate Charge	Q_g	$V_{DS}=10V, V_{GS}=10V, I_D=1.4A$		6		nC
Gate-to-Source Charge	Q_{gs}	$V_{DS}=10V, V_{GS}=10V, I_D=1.4A$		1		nC
Gate-to-Drain "Miller" Charge	Q_{gd}	$V_{DS}=10V, V_{GS}=10V, I_D=1.4A$		2		nC
Diode Forward Voltage	V_{SD}	$I_S=1.4A, V_{GS}=0$		0.9	1.2	V
[SBD]						
Reverse Voltage	V_R	$I_R=1mA$	30			V
Forward Voltage	V_{F1}	$I_F=0.5A$		0.35	0.4	V
	V_{F2}	$I_F=2A$		0.42	0.47	V
Reverse Current	I_R	$V_R=15V$			500	μA
Interterminal Capacitance	C	$V_R=10V, f=1MHz$ cycle		35		pF
Reverse Recovery Time	t_{rr}	$I_F=I_R=100mA$, See specified Test Circuit.			15	ns
Thermal Resistance	R_{thj-a}	Mounted on a ceramic board (600mm ² ×0.8mm)		110		°C/W

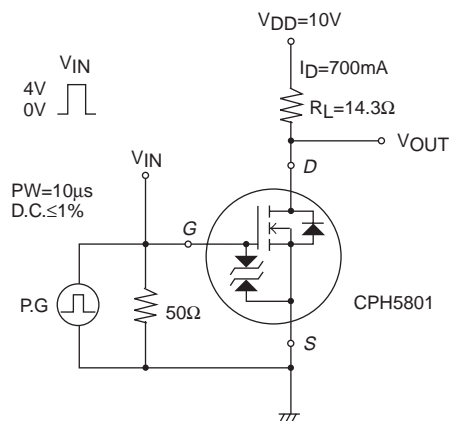
Marking : QA

Electrical Connection (Top view)



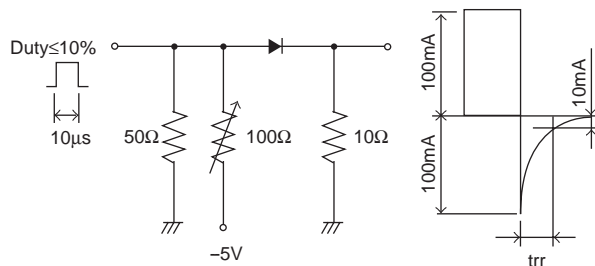
Switching Time Test Circuit

[MOSFET block]

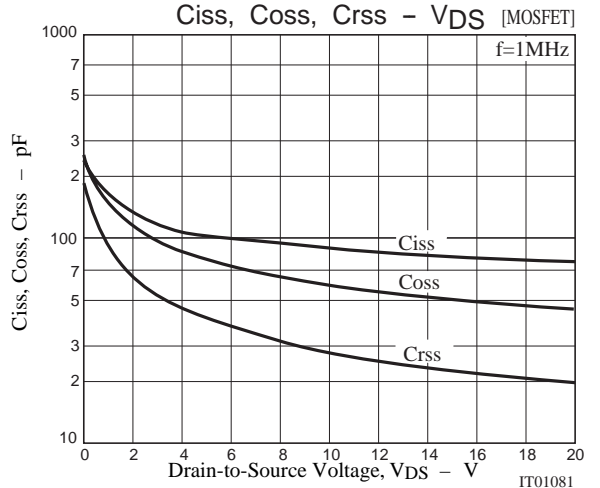
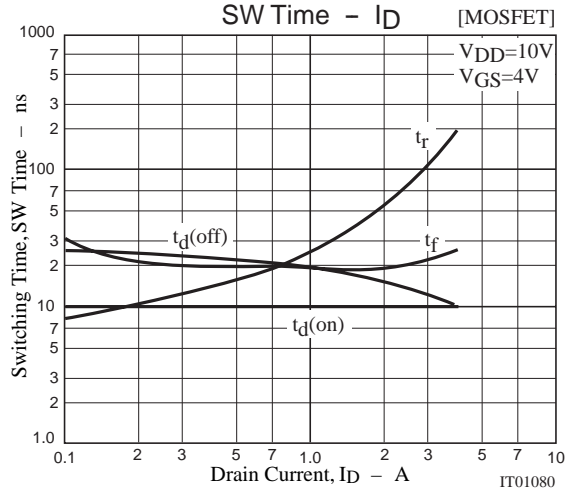
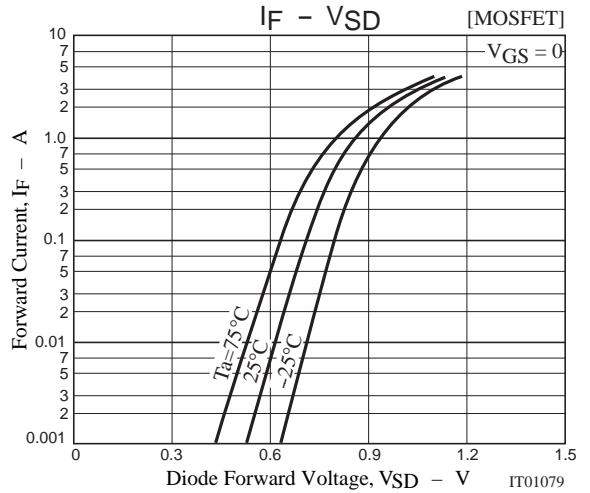
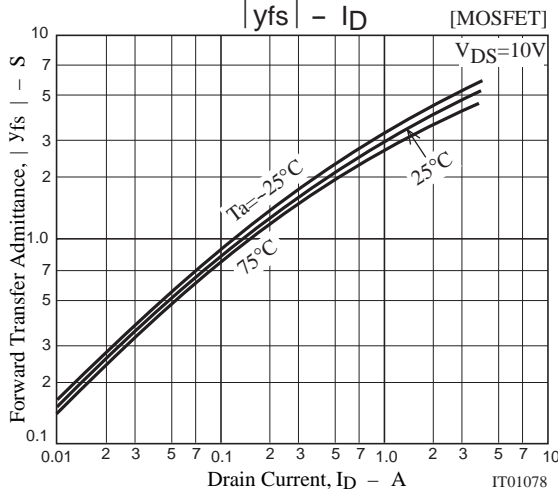
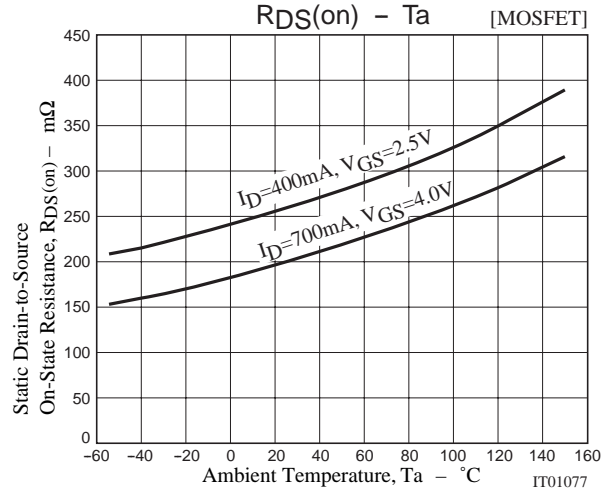
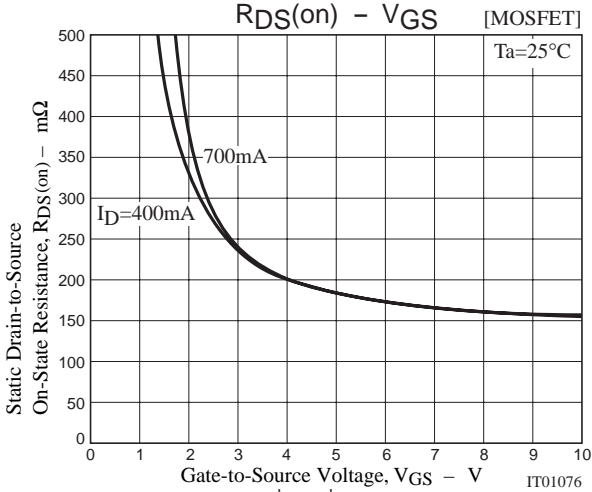
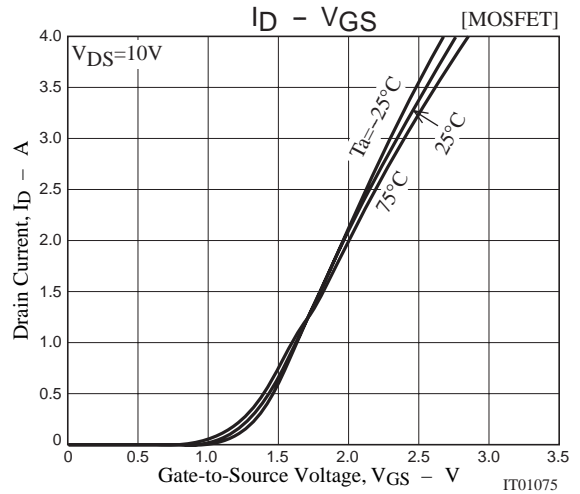
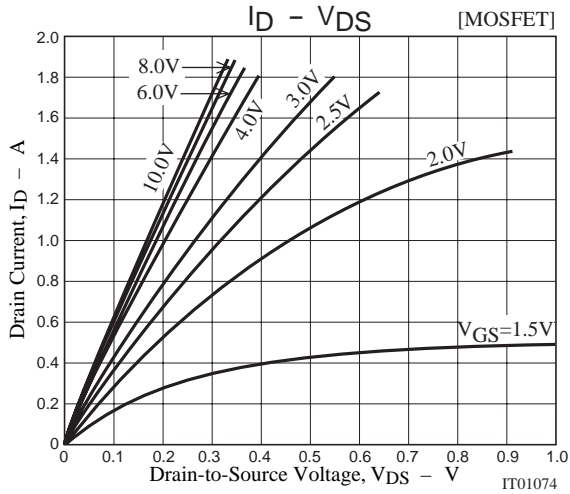


Reverse Recovery Time Test Circuit

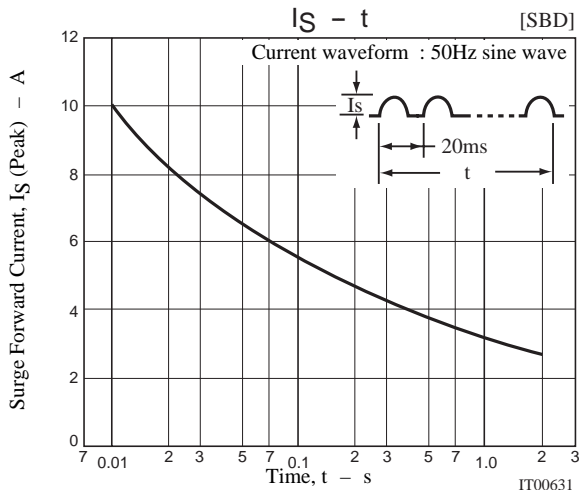
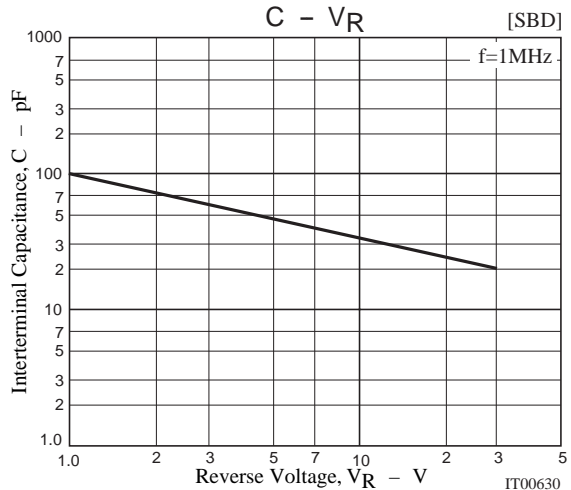
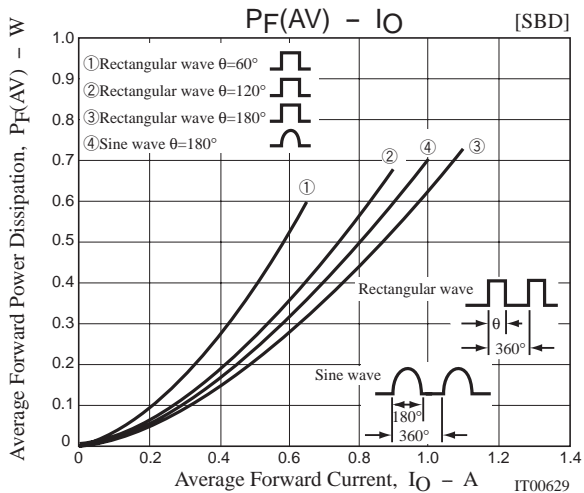
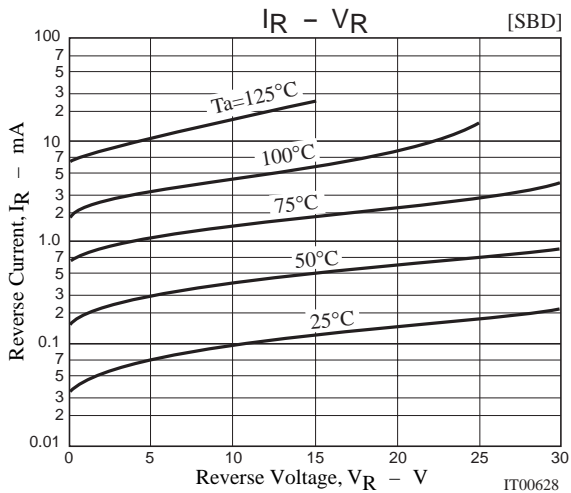
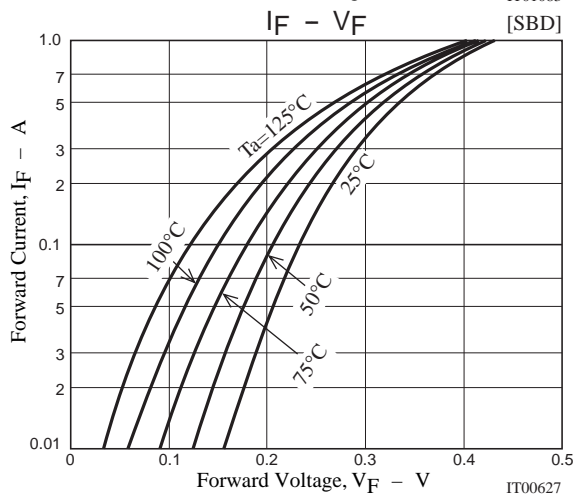
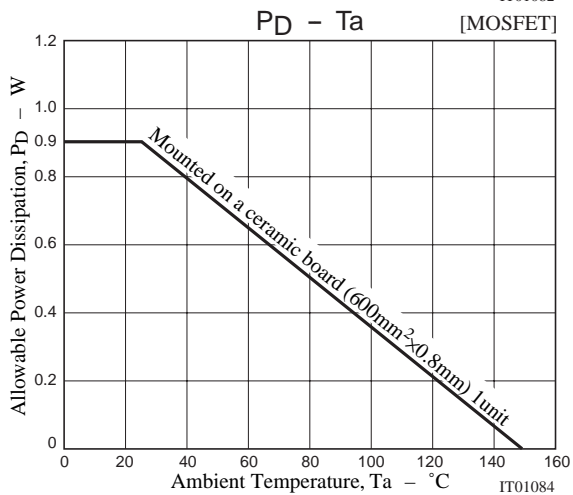
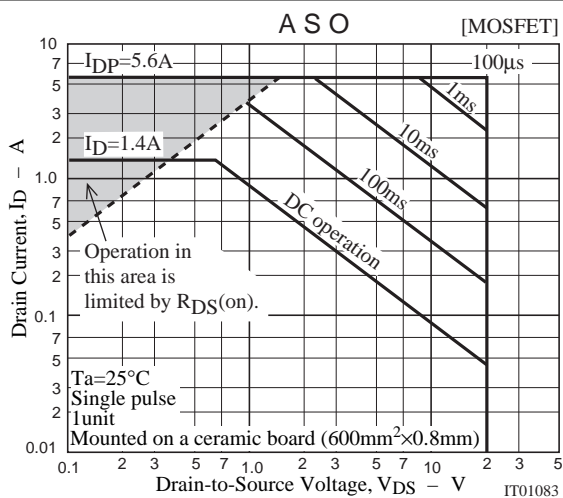
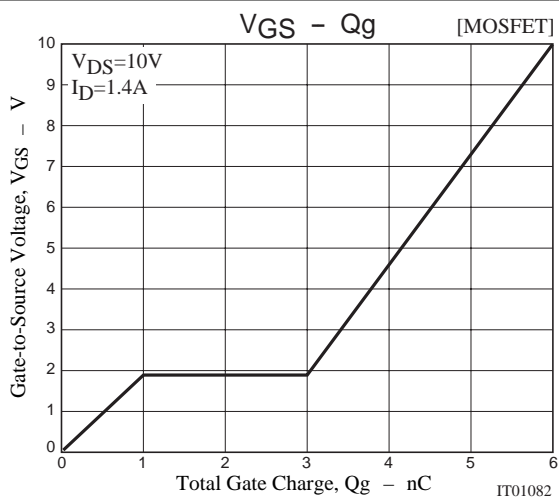
[SBD block]



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