



SANYO Semiconductors

## DATA SHEET

CPH5813

MOSFET : P-Channel Silicon MOSFET

SBD : Schottky Barrier Diode

## DC / DC Converter Applications

## Features

- Composite type with a P-Channel Silicon MOSFET (MCH3318) and a Schottky Barrier Diode (SBS010M) 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.

## Specifications

## Absolute Maximum Ratings at Ta=25°C

Parameter	Symbol	Conditions	Ratings	Unit
[MOSFET]				
Drain-to-Source Voltage	V <sub>DSS</sub>		-12	V
Gate-to-Source Voltage	V <sub>GS</sub>		±10	V
Drain Current (DC)	I <sub>D</sub>		-2	A
Drain Current (Pulse)	I <sub>DP</sub>	PW≤10μs, duty cycle≤1%	-8	A
Allowable Power Dissipation	P <sub>D</sub>	Mounted on a ceramic board (600mm <sup>2</sup> ×0.8mm) 1unit	0.9	W
Channel Temperature	T <sub>ch</sub>		150	°C
Storage Temperature	T <sub>stg</sub>		-55 to +125	°C
[SBD]				
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>		2	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 : QP

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# CPH5813

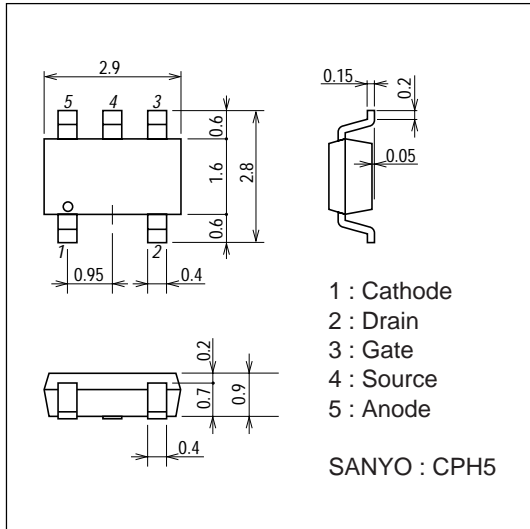
## Electrical Characteristics at Ta=25°C

Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
[MOSFET]						
Drain-to-Source Breakdown Voltage	$V_{(BR)DSS}$	$I_D=-1mA, V_{GS}=0$	-12			V
Zero-Gate Voltage Drain Current	$I_{DSS}$	$V_{DS}=-12V, V_{GS}=0$			-10	$\mu A$
Gate-to-Source Leakage Current	$I_{GSS}$	$V_{GS}=\pm 8.0V, V_{DS}=0$			$\pm 10$	$\mu A$
Cutoff Voltage	$V_{GS(off)}$	$V_{DS}=-6V, I_D=-1mA$	-0.3		-1.0	V
Forward Transfer Admittance	$ y_{fs} $	$V_{DS}=-6V, I_D=-1A$	2.0	2.9		S
Static Drain-to-Source On-State Resistance	$R_{DS(on)1}$	$I_D=-1A, V_{GS}=-4.5V$		110	145	$m\Omega$
	$R_{DS(on)2}$	$I_D=-0.5A, V_{GS}=-2.5V$		160	225	$m\Omega$
	$R_{DS(on)3}$	$I_D=-0.2A, V_{GS}=-1.8V$		220	330	$m\Omega$
Input Capacitance	$C_{iss}$	$V_{DS}=-6V, f=1MHz$		310		pF
Output Capacitance	$C_{oss}$	$V_{DS}=-6V, f=1MHz$		90		pF
Reverse Transfer Capacitance	$C_{rss}$	$V_{DS}=-6V, f=1MHz$		80		pF
Turn-ON Delay Time	$t_{d(on)}$	See specified Test Circuit.		14		ns
Rise Time	$t_r$	See specified Test Circuit.		53		ns
Turn-OFF Delay Time	$t_{d(off)}$	See specified Test Circuit.		53		ns
Fall Time	$t_f$	See specified Test Circuit.		52		ns
Total Gate Charge	$Q_g$	$V_{DS}=-6V, V_{GS}=-4.5V, I_D=-2.0A$		4.6		nC
Gate-to-Source Charge	$Q_{gs}$	$V_{DS}=-6V, V_{GS}=-4.5V, I_D=-2.0A$		0.7		nC
Gate-to-Drain "Miller" Charge	$Q_{gd}$	$V_{DS}=-6V, V_{GS}=-4.5V, I_D=-2.0A$		1.3		nC
Diode Forward Voltage	$V_{SD}$	$I_S=-2.0A, V_{GS}=0$		-0.89	-1.5	V
[SBD]						
Reverse Voltage	$V_R$	$I_R=1.5mA$	15			V
Forward Voltage	$V_{F1}$	$I_F=0.5A$		0.27	0.32	V
	$V_{F2}$	$I_F=1A$		0.30	0.35	V
Reverse Current	$I_R$	$V_R=6V$			600	$\mu A$
Interterminal Capacitance	$C$	$V_R=10V, f=1MHz$ cycle		65		pF
Reverse Recovery Time	$t_{rr}$	$I_F=I_R=100mA$ , See specified Test Circuit.			15	ns
Thermal Resistance	$R_{th(j-a)}$	Mounted on a ceramic board (600mm <sup>2</sup> X0.8mm)		138		$^{\circ}C/W$

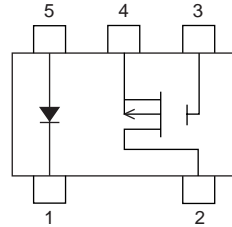
## Package Dimensions

unit : mm

2171



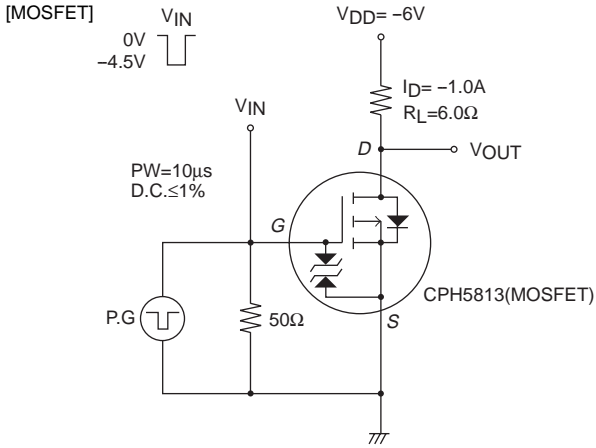
## Electrical Connection



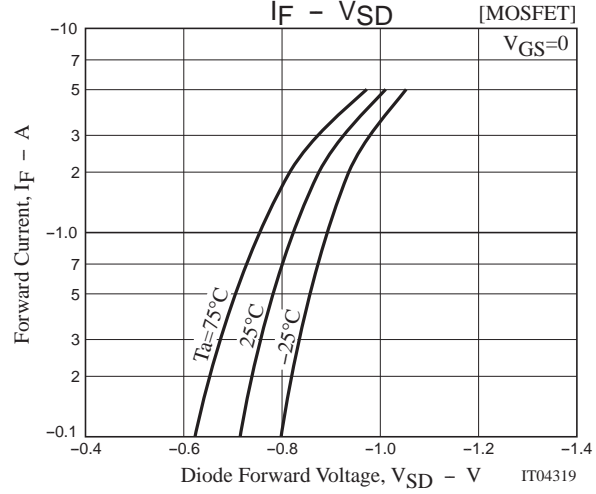
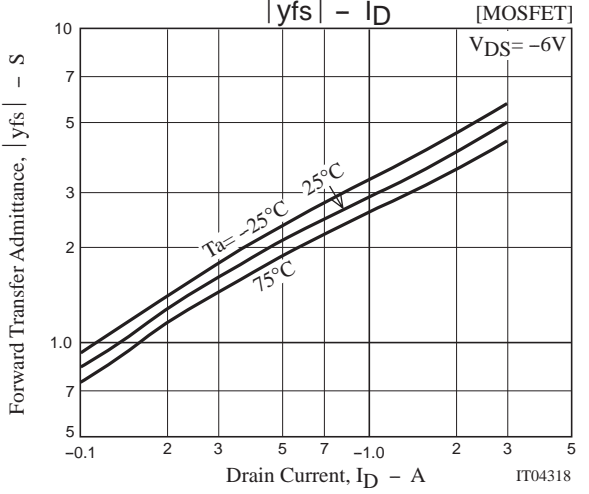
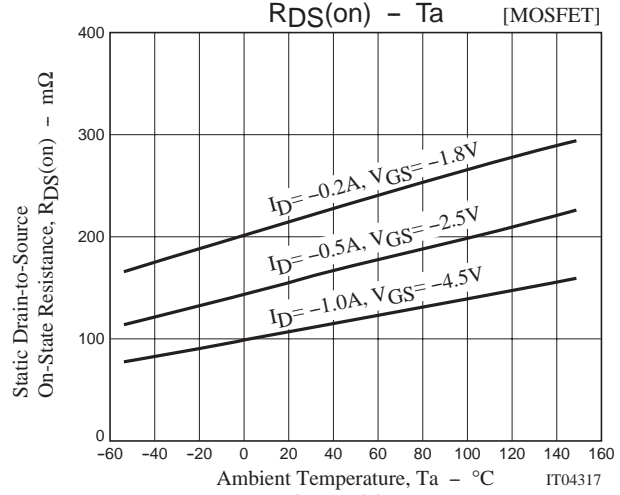
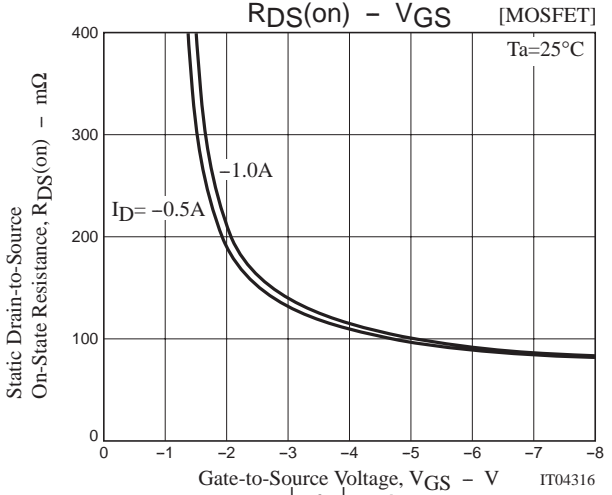
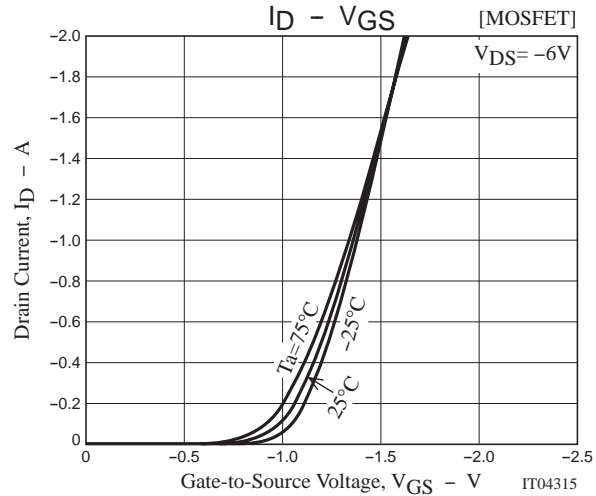
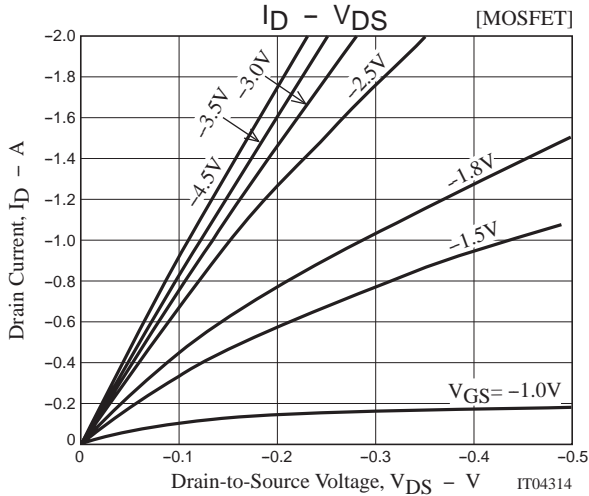
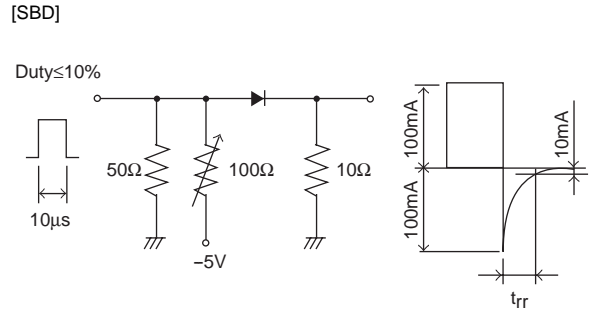
- 1 : Cathode
- 2 : Drain
- 3 : Gate
- 4 : Source
- 5 : Anode

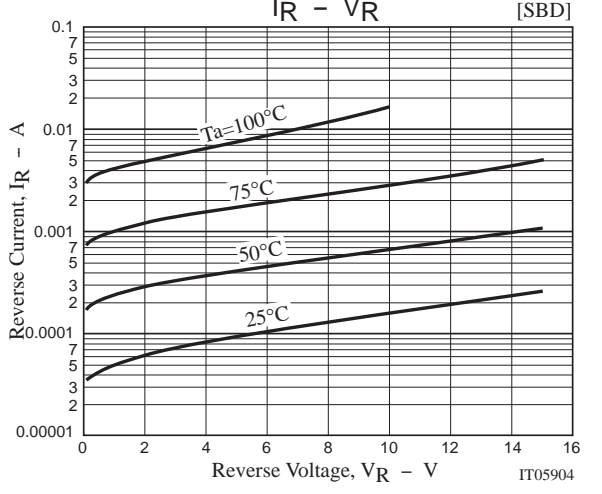
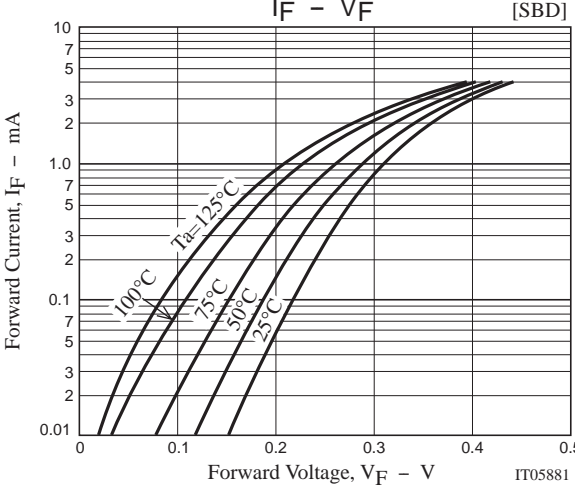
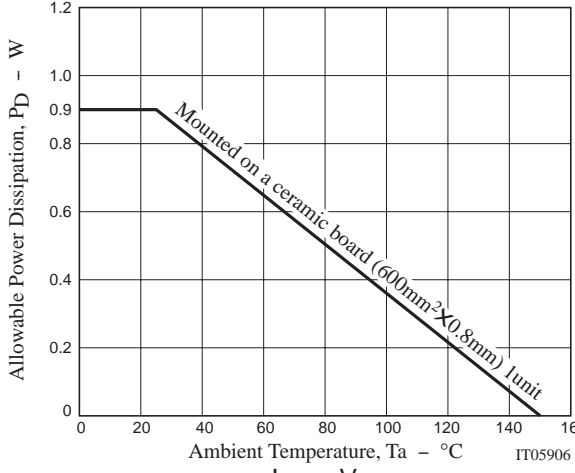
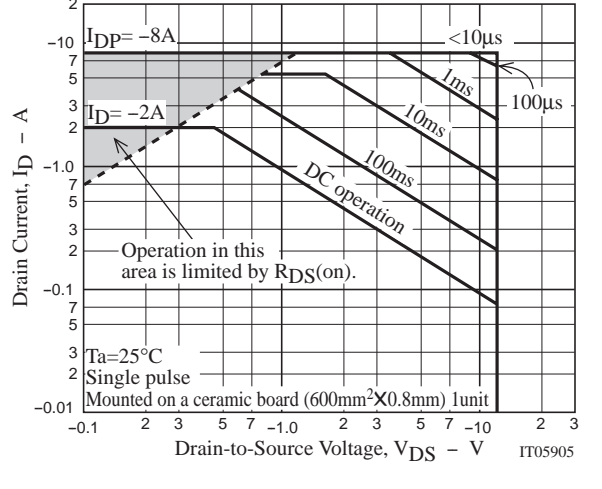
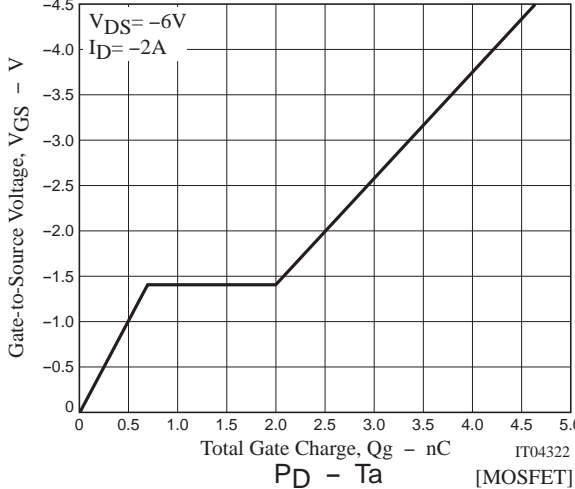
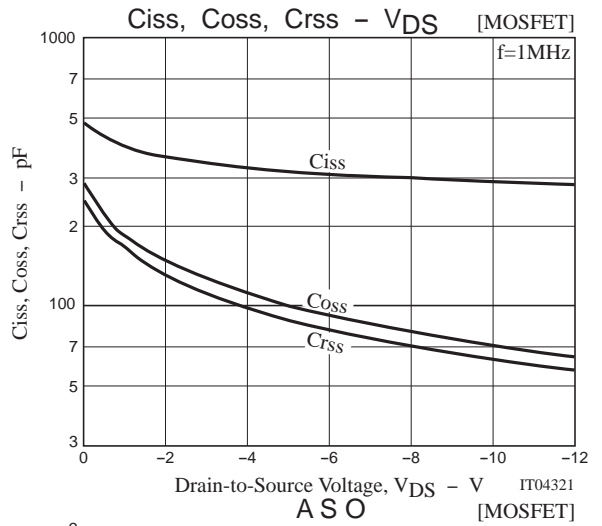
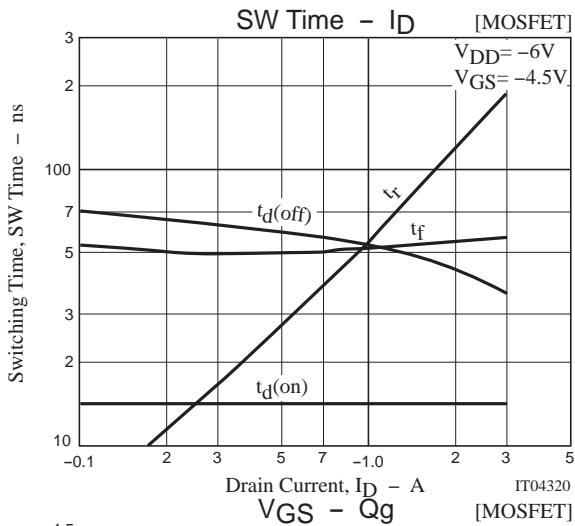
Top view

Switching Time Test Circuit

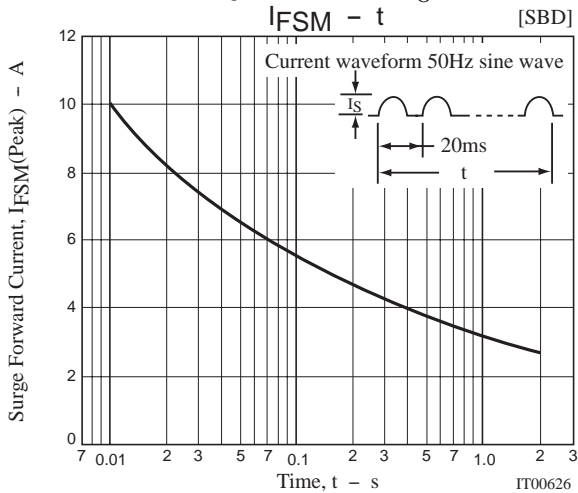
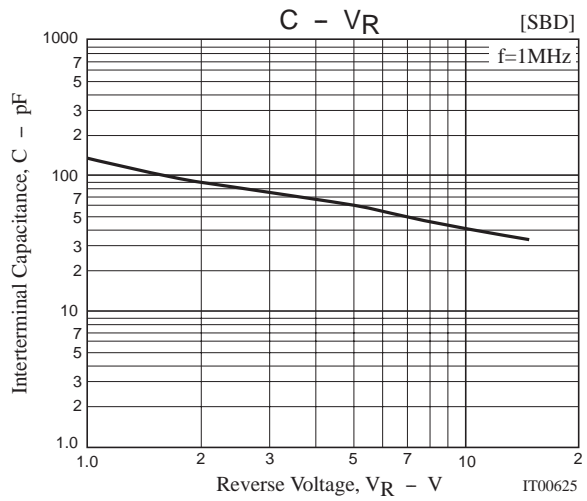
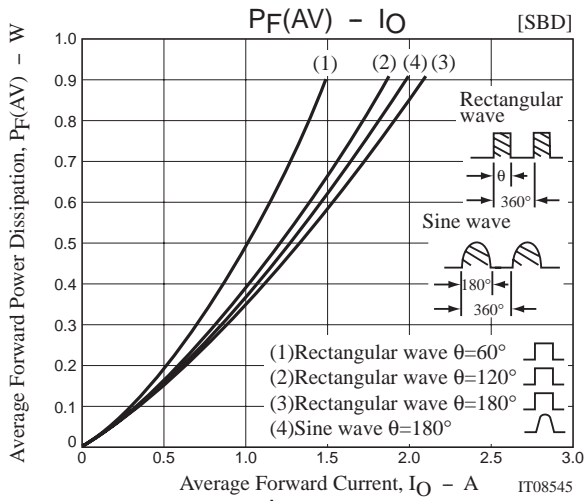


t<sub>rr</sub> Test Circuit





# CPH5813



Note on usage : Since the CPH5813 is a MOSFET product, please avoid using this device in the vicinity of highly charged objects.

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