



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 _{DSS}		-12	V
Gate-to-Source Voltage	V _{GS}		±10	V
Drain Current (DC)	I _D		-2	A
Drain Current (Pulse)	I _{DP}	PW≤10μs, duty cycle≤1%	-8	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		15	V
Nonrepetitive Peak Reverse Surge Voltage	V _R SM		15	V
Average Output Current	I _O		2	A
Surge Forward 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

Marking : QP

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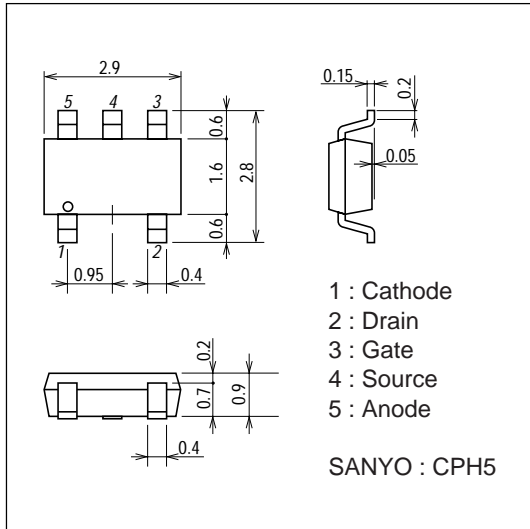
Electrical Characteristics at Ta=25°C

Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
[MOSFET]						
Drain-to-Source Breakdown Voltage	$V_{(BR)DSS}$	$I_D=-1mA, V_{GS}=0$	-12			V
Zero-Gate Voltage Drain Current	I_{DSS}	$V_{DS}=-12V, V_{GS}=0$			-10	μA
Gate-to-Source Leakage Current	I_{GSS}	$V_{GS}=\pm 8.0V, V_{DS}=0$			± 10	μA
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	μA
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 ² X0.8mm)		138		$^{\circ}C/W$

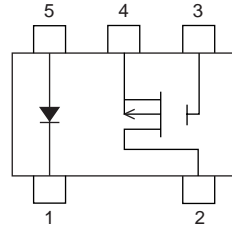
Package Dimensions

unit : mm

2171



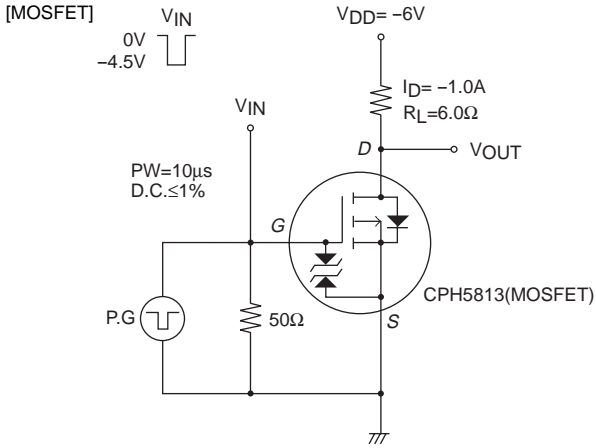
Electrical Connection



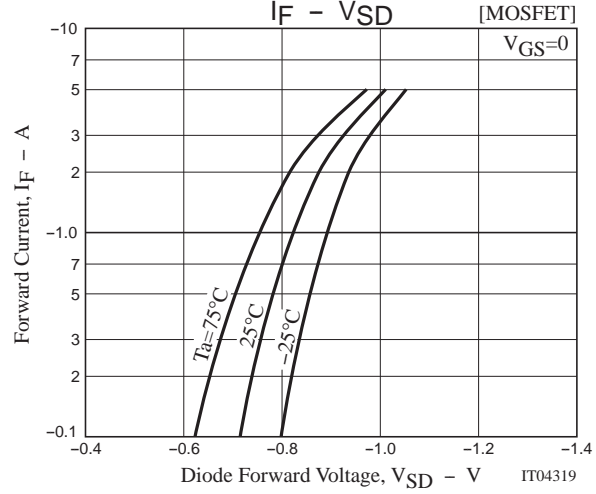
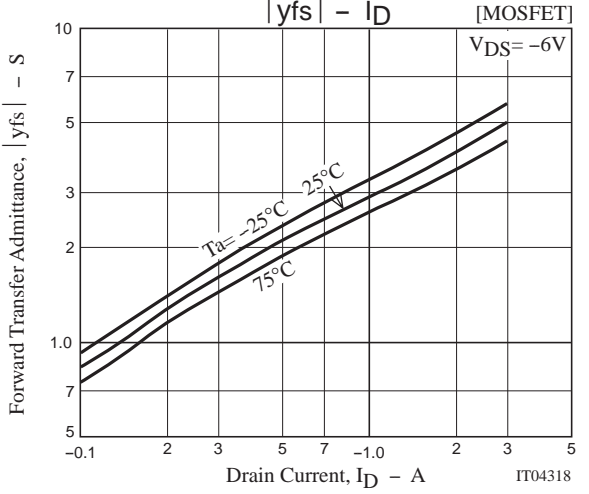
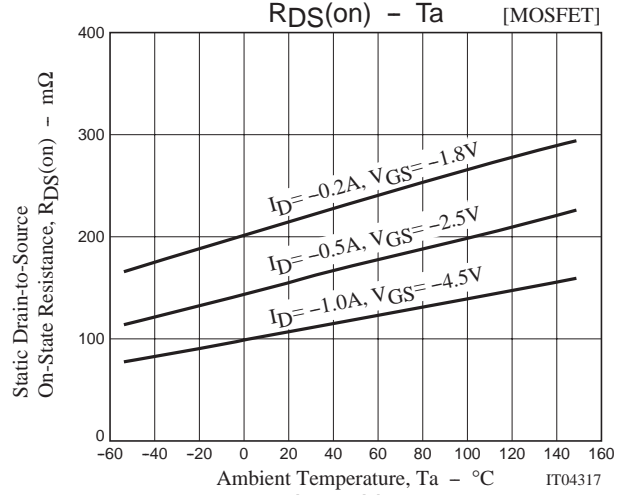
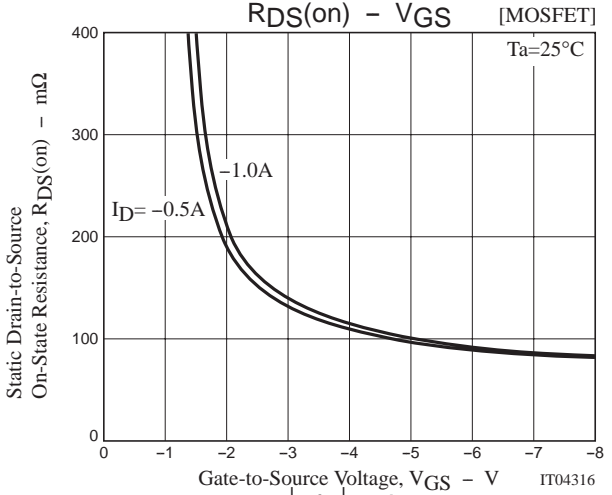
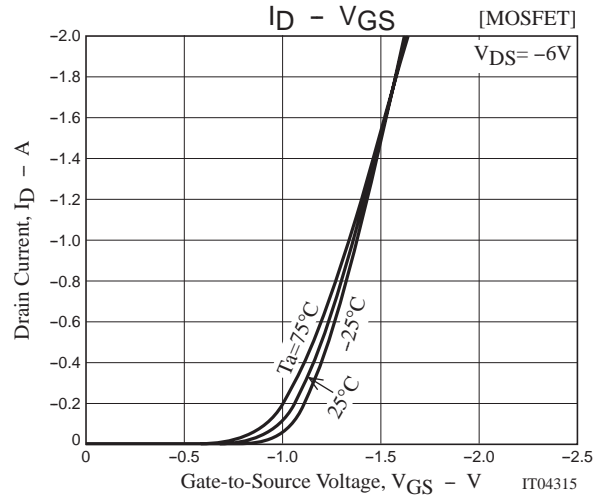
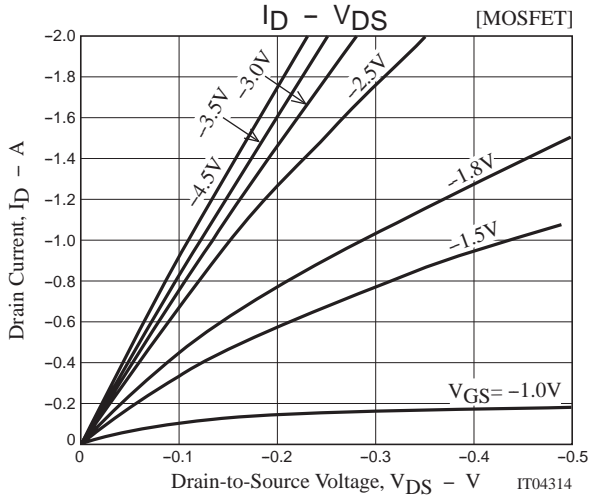
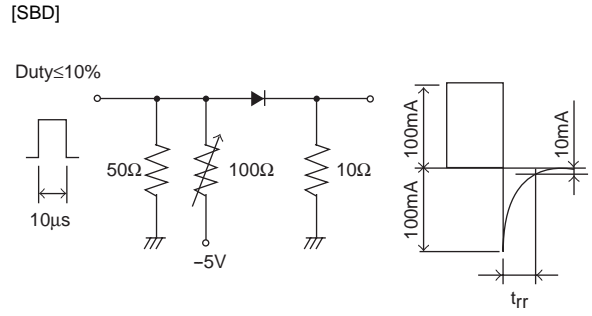
- 1 : Cathode
- 2 : Drain
- 3 : Gate
- 4 : Source
- 5 : Anode

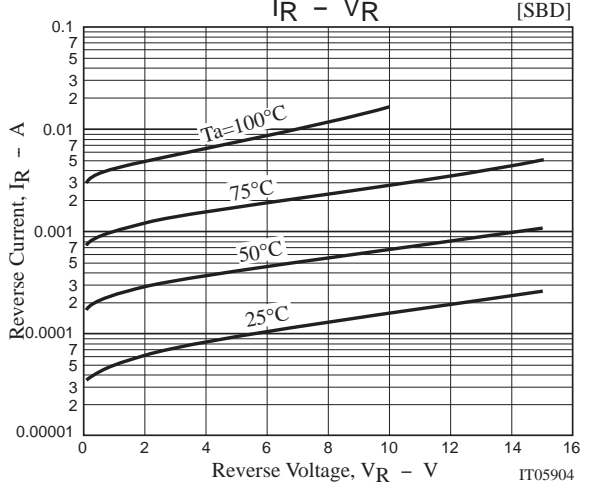
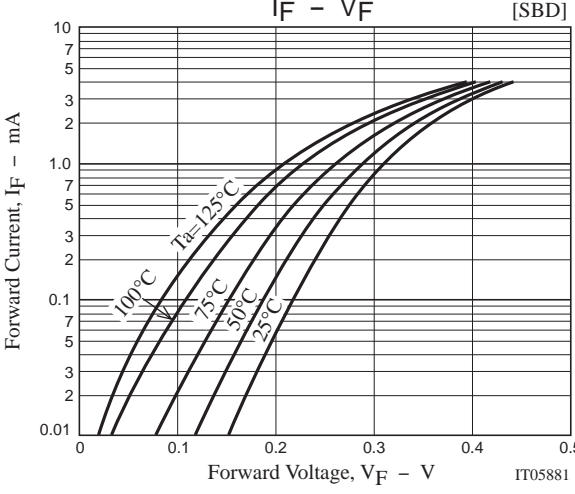
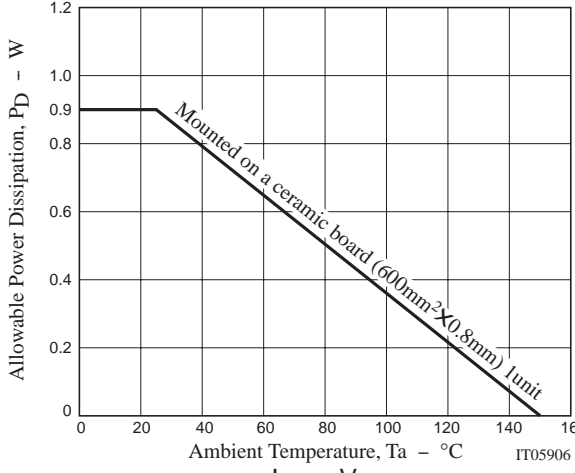
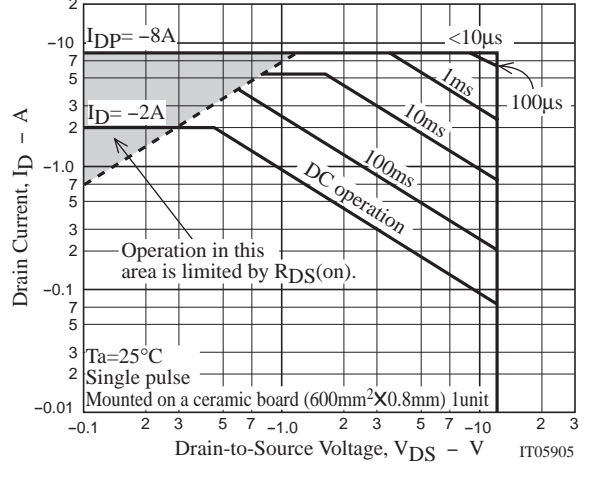
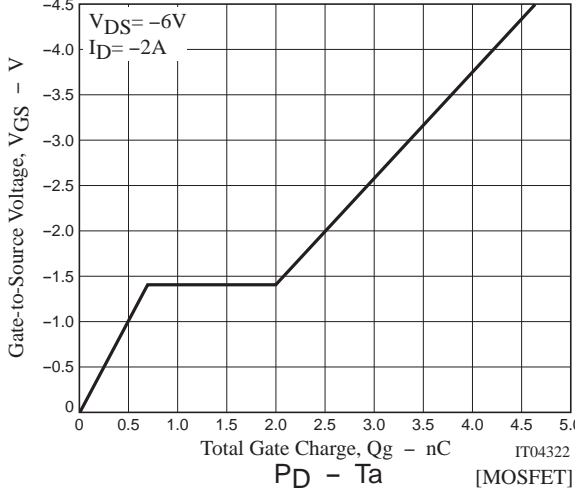
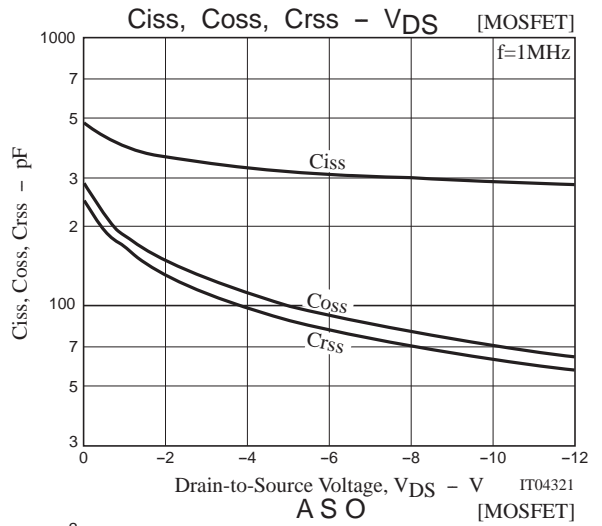
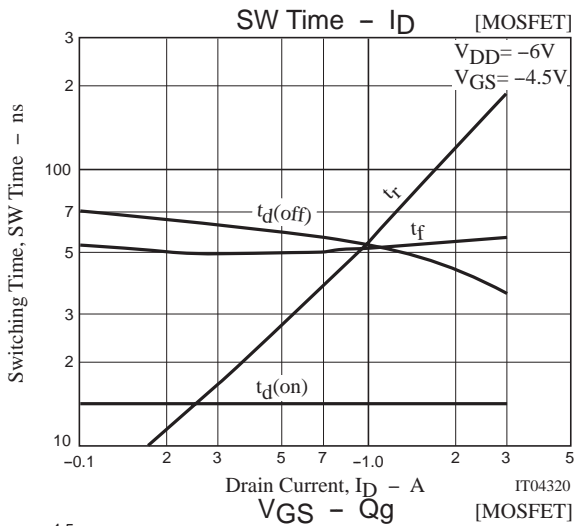
Top view

Switching Time Test Circuit

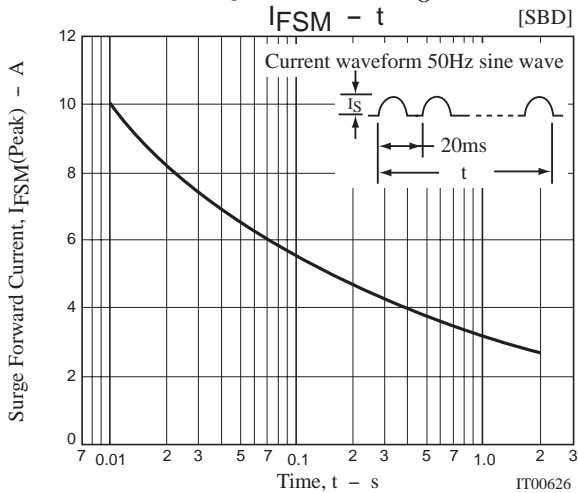
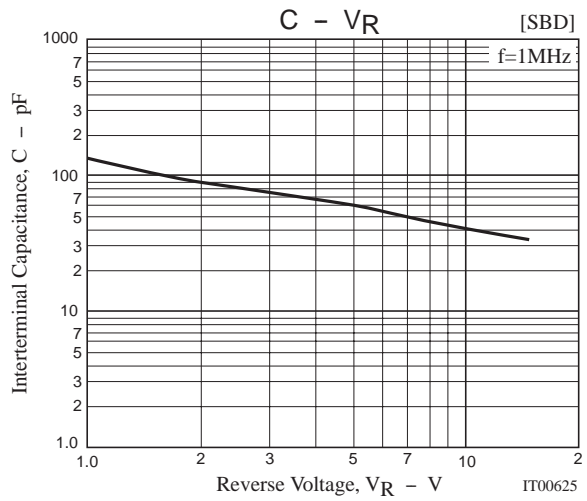
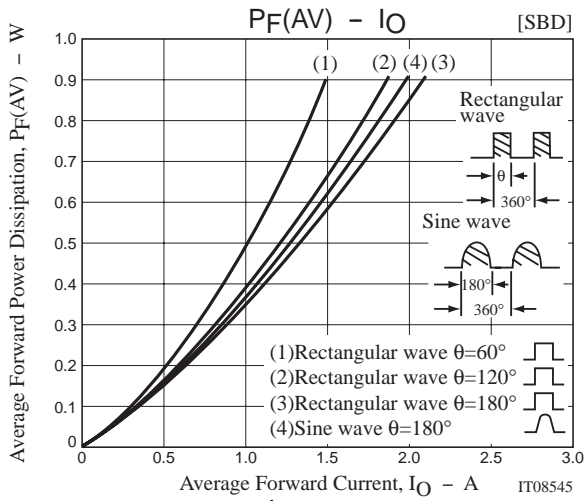


t_{rr} Test Circuit





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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