



CPH5831

MOSFET : N-Channel Silicon MOSFET

SBD : Schottky Barrier Diode

General-Purpose Switching Device Applications

Features

- DC / DC converters.
- Composite type with a N-Channel Silicon MOSFET (MCH3406) and a Schottky Barrier Diode (SBS010M) contained in one package facilitating high-density mounting.
- [MOS]
 - 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}		20	V
Gate-to-Source Voltage	V _{GSS}		±10	V
Drain Current (DC)	I _D		3	A
Drain Current (Pulse)	I _{DP}	PW≤10μs, duty cycle≤1%	12	A
Allowable Power Dissipation	P _D	Mounted on a ceramic board (600mm ² X0.8mm) 1unit	0.9	W
Channel Temperature	T _{ch}		150	°C
Storage Temperature	T _{stg}		-55 to +125	°C
[SBD]				
Repetitive Peak Reverse Voltage	V _{RRM}		15	V
Nonrepetitive Peak Reverse Surge Voltage	V _{RSM}		15	V
Average Output Current	I _O		2	A
Surge Forward Current	I _{FSM}	50Hz sine wave, 1cycle	10	A
Junction Temperature	T _J		-55 to +125	°C
Storage Temperature	T _{stg}		-55 to +125	°C

Marking : XH

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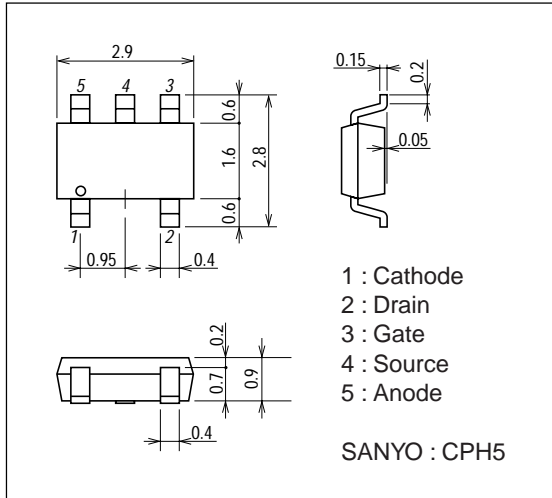
Electrical Characteristics at Ta=25°C

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}	$V_{DS}=20V, V_{GS}=0$			1	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} $	$V_{DS}=10V, I_D=1.5A$	3.36	5.6		S
Static Drain-to-Source On-State Resistance	$R_{DS(on)1}$	$I_D=1.5A, V_{GS}=4V$		48	63	$m\Omega$
	$R_{DS(on)2}$	$I_D=1A, V_{GS}=2.5V$		58	82	$m\Omega$
	$R_{DS(on)3}$	$I_D=0.5A, V_{GS}=1.8V$		72	110	$m\Omega$
Input Capacitance	C_{iss}	$V_{DS}=10V, f=1MHz$		280		pF
Output Capacitance	C_{oss}	$V_{DS}=10V, f=1MHz$		60		pF
Reverse Transfer Capacitance	C_{rss}	$V_{DS}=10V, f=1MHz$		38		pF
Turn-ON Delay Time	$t_{d(on)}$	See specified Test Circuit.		13		ns
Rise Time	t_r	See specified Test Circuit.		35		ns
Turn-OFF Delay Time	$t_{d(off)}$	See specified Test Circuit.		35		ns
Fall Time	t_f	See specified Test Circuit.		25		ns
Total Gate Charge	Q_g	$V_{DS}=10V, V_{GS}=4V, I_D=3A$		8.8		nC
Gate-to-Source Charge	Q_{gs}	$V_{DS}=10V, V_{GS}=4V, I_D=3A$		0.85		nC
Gate-to-Drain "Miller" Charge	Q_{gd}	$V_{DS}=10V, V_{GS}=4V, I_D=3A$		0.85		nC
Diode Forward Voltage	V_{SD}	$I_S=3A, V_{GS}=0$		0.82	1.2	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		$^{\circ}C / W$

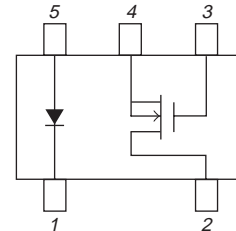
Package Dimensions

unit : mm

2171



Electrical Connection

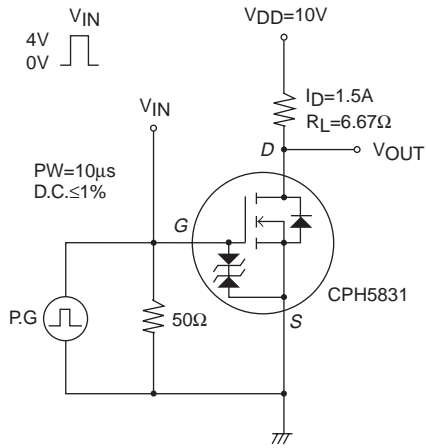


1 : Cathode
2 : Drain
3 : Gate
4 : Source
5 : Anode

Top view

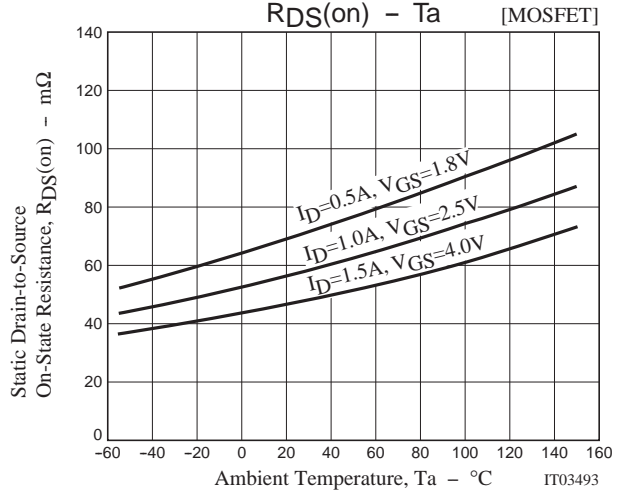
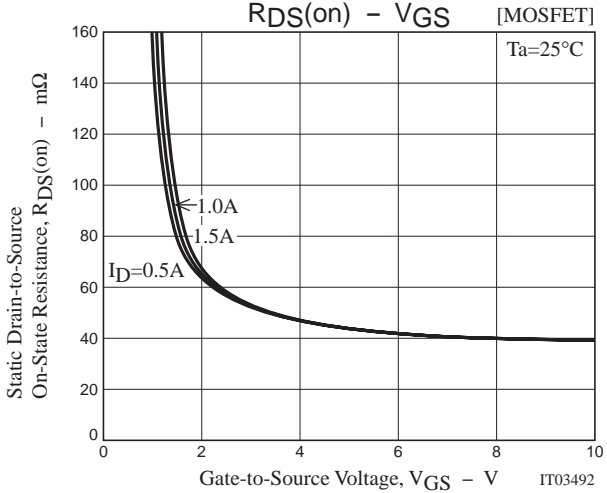
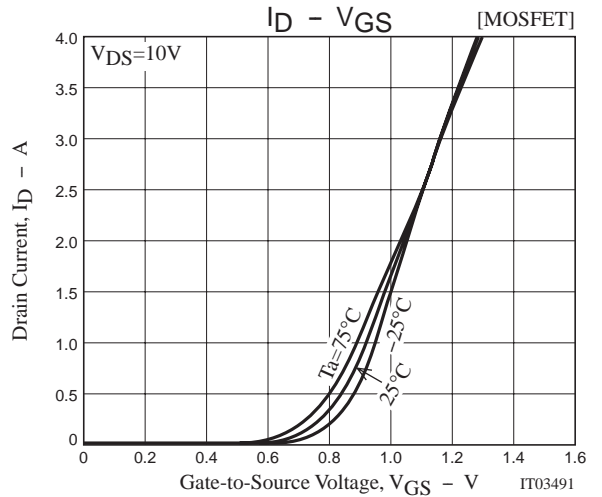
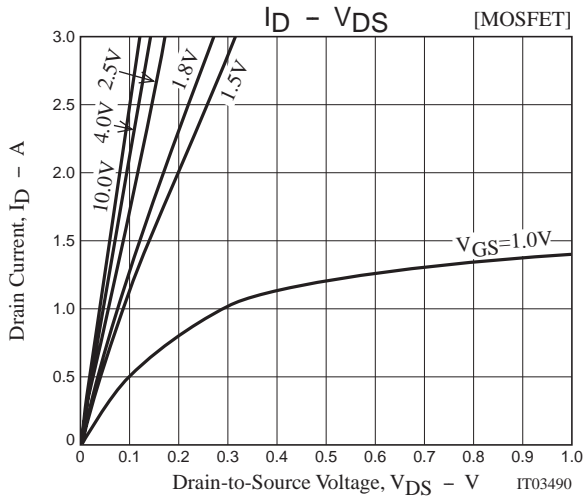
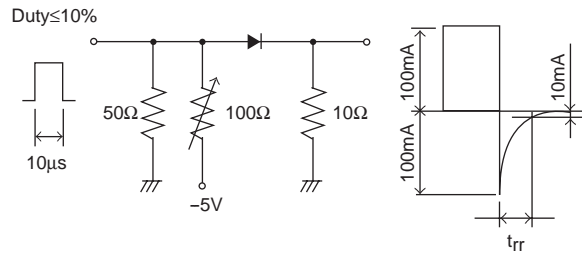
Switching Time Test Circuit

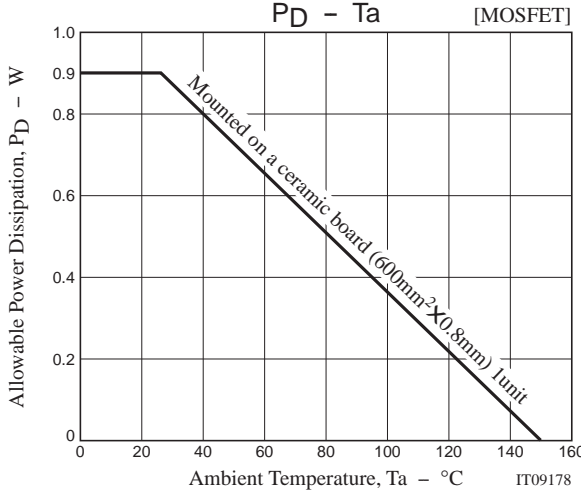
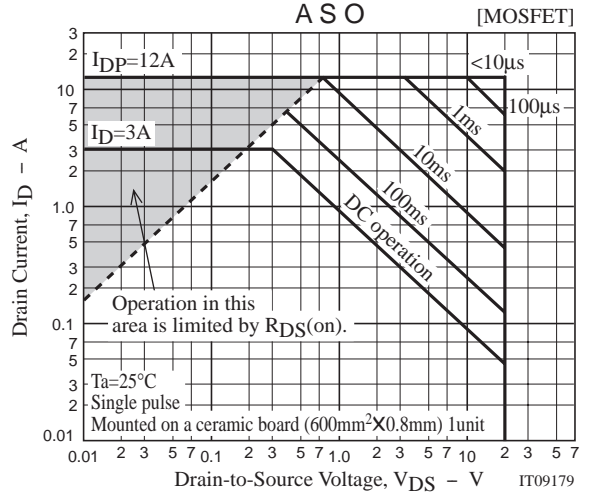
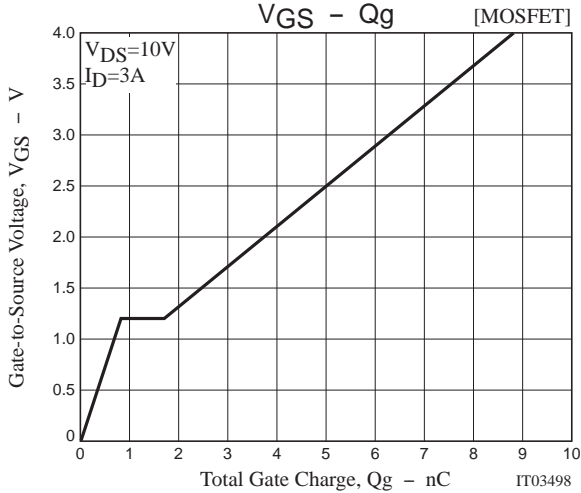
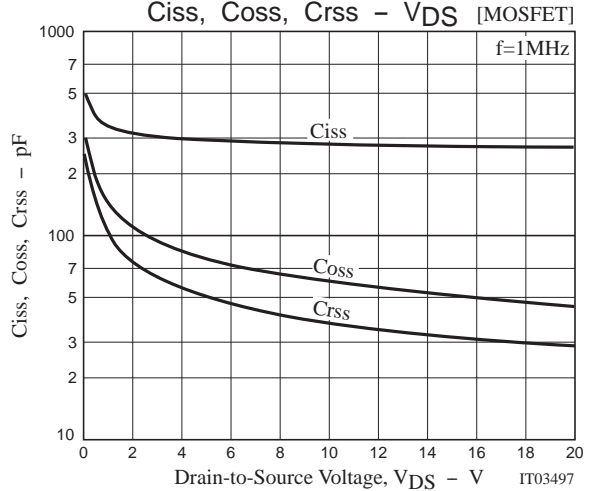
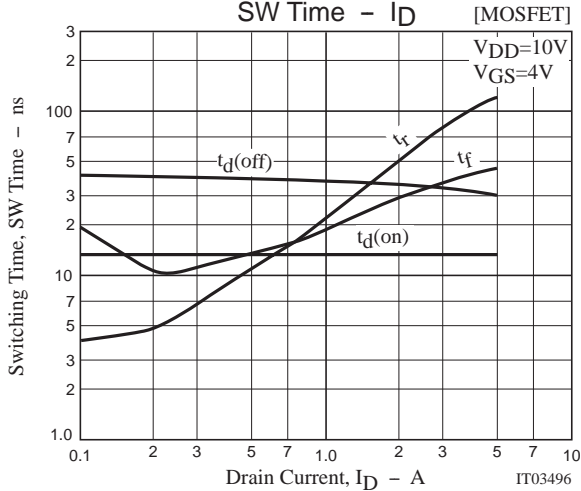
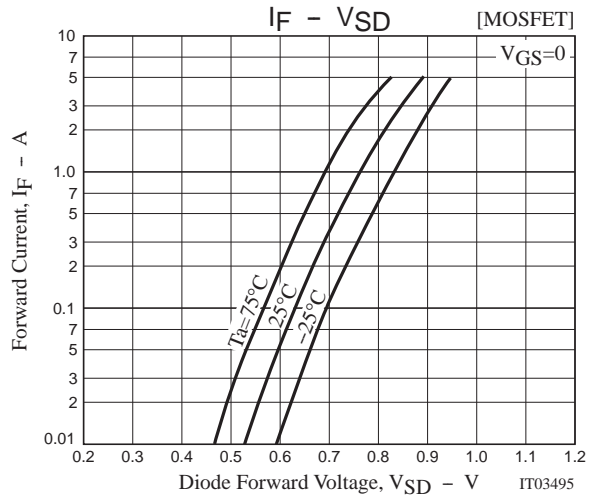
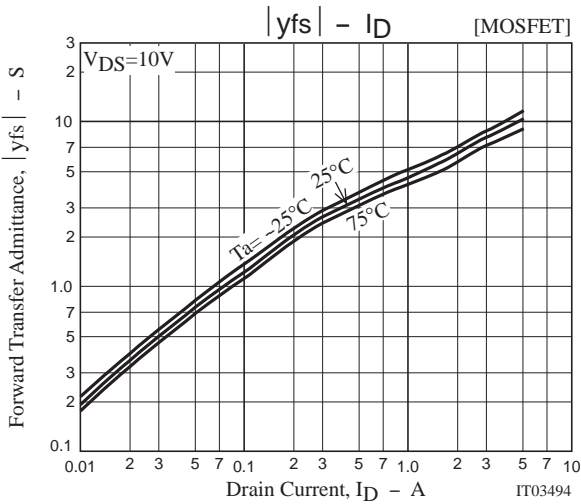
[MOSFET]

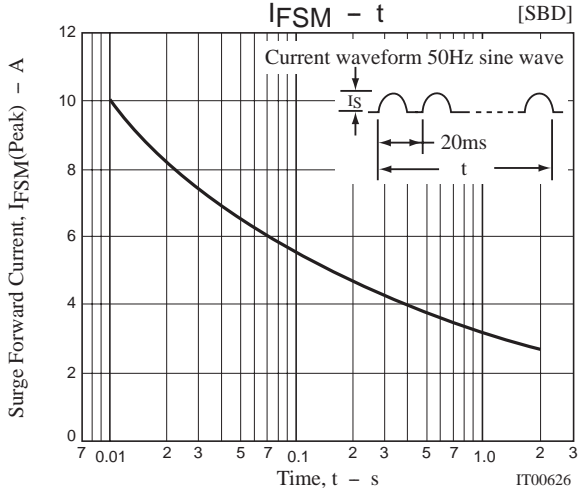
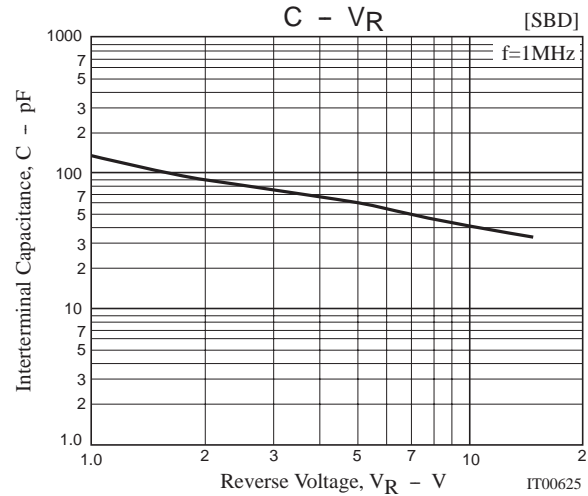
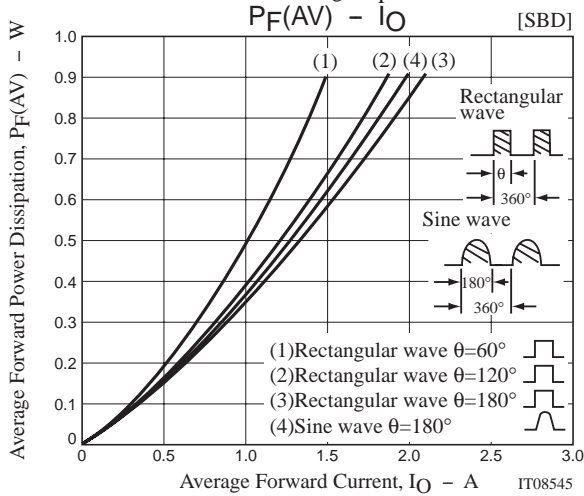
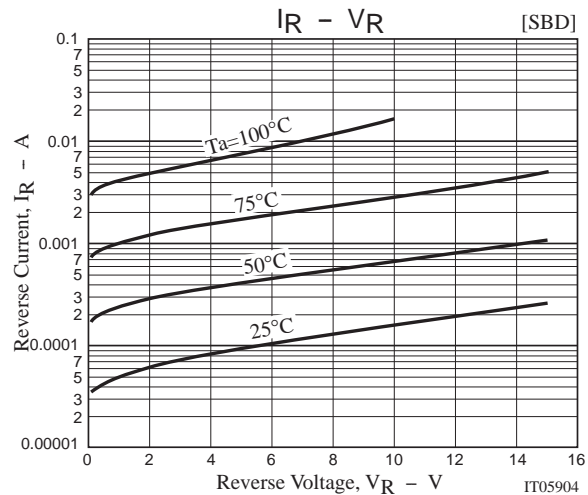
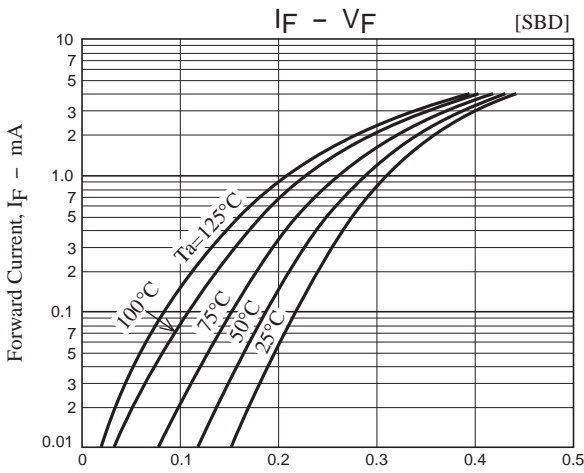


t_{rr} Test Circuit

[SBD]







Note on usage : Since the CPH5831 is a MOSFET product, please avoid using this device in the vicinity of highly charged objects.

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