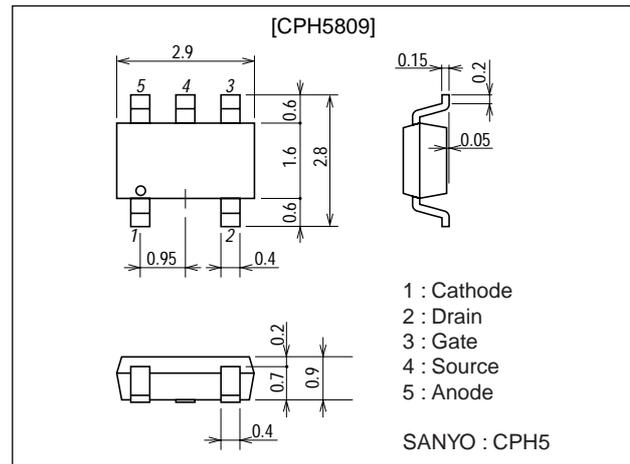


**DC / DC Converter Applications****Features**

- The CPH5809 composite device consists of following two devices to facilitate high-density mounting. One is an N-channel MOSFET that features low ON-resistance, ultrahigh-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 CPH5809 is equivalent to the MCH3411 and to the SBS005, respectively.

Package Dimensionsunit : mm
2171**Specifications****Absolute Maximum Ratings** at Ta=25°C

Parameter	Symbol	Conditions	Ratings	Unit
[MOSFET]				
Drain-to-Source Voltage	V _{DSS}		30	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 _R RM		30	V
Nonrepetitive Peak Reverse Surge Voltage	V _R S		30	V
Average Output Current	I _O		1	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 : QK

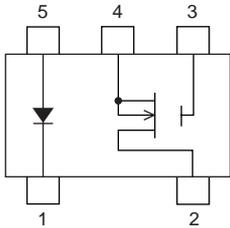
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CPH5809

Electrical Characteristics at Ta=25°C

Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
[MOSFET]						
Drain-to-Source Breakdown Voltage	$V_{(BR)DSS}$	$I_D=1mA, V_{GS}=0$	30			V
Zero-Gate Voltage Drain Current	I_{DSS}	$V_{DS}=30V, V_{GS}=0$			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} $	$V_{DS}=10V, I_D=1.5A$	3.5	5.0		S
Static Drain-to-Source On-State Resistance	$R_{DS(on)1}$	$I_D=1.5A, V_{GS}=4V$		69	90	m Ω
	$R_{DS(on)2}$	$I_D=1A, V_{GS}=2.5V$		84	118	m Ω
Input Capacitance	C_{iss}	$V_{DS}=10V, f=1MHz$		270		pF
Output Capacitance	C_{oss}	$V_{DS}=10V, f=1MHz$		38		pF
Reverse Transfer Capacitance	C_{rss}	$V_{DS}=10V, f=1MHz$		23		pF
Turn-ON Delay Time	$t_d(on)$	See specified Test Circuit.		10		ns
Rise Time	t_r	See specified Test Circuit.		30		ns
Turn-OFF Delay Time	$t_d(off)$	See specified Test Circuit.		42		ns
Fall Time	t_f	See specified Test Circuit.		52		ns
Total Gate Charge	Q_g	$V_{DS}=10V, V_{GS}=4V, I_D=3.0A$		3.7		nC
Gate-to-Source Charge	Q_{gs}	$V_{DS}=10V, V_{GS}=4V, I_D=3.0A$		0.7		nC
Gate-to-Drain "Miller" Charge	Q_{gd}	$V_{DS}=10V, V_{GS}=4V, I_D=3.0A$		0.5		nC
Diode Forward Voltage	V_{SD}	$I_S=3.0A, V_{GS}=0$		0.85	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}	$I_F=1A$		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	Rthj-a	Mounted on a ceramic board (600mm ² X0.8mm)		110		$^{\circ}C/W$

Electrical Connection

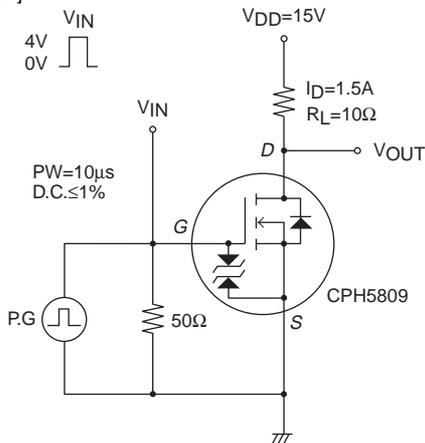


- 1 : Cathode
- 2 : Drain
- 3 : Gate
- 4 : Source
- 5 : Anode

(Top view)

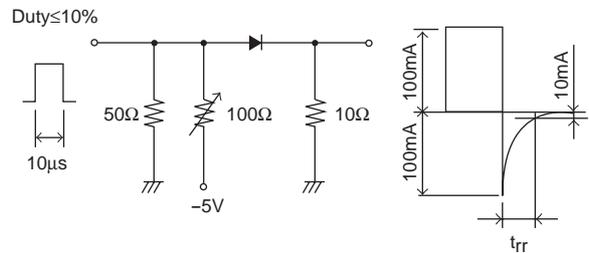
Switching Time Test Circuit

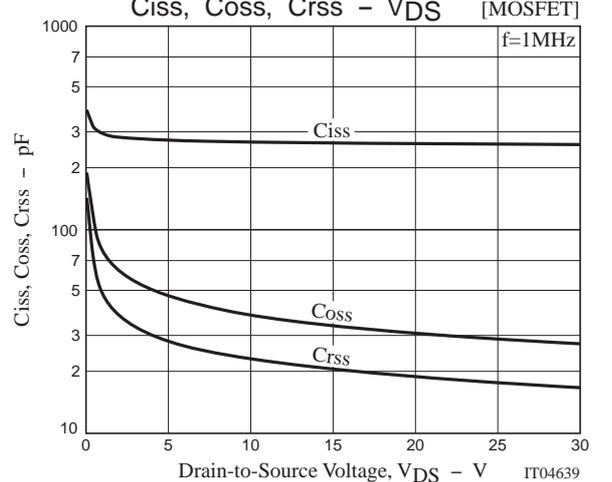
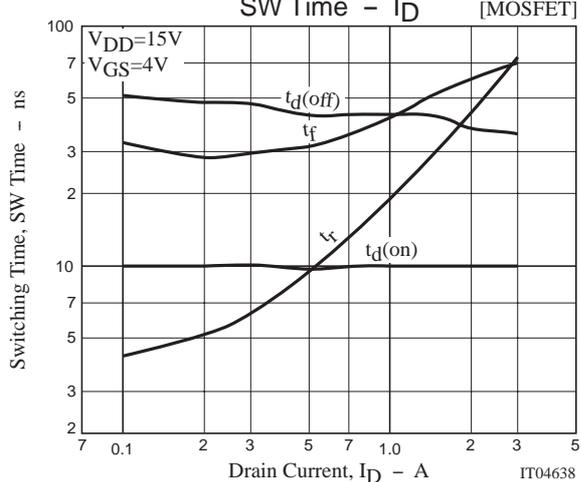
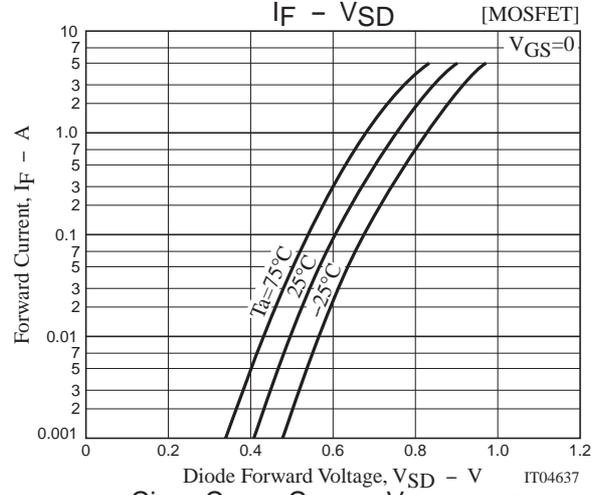
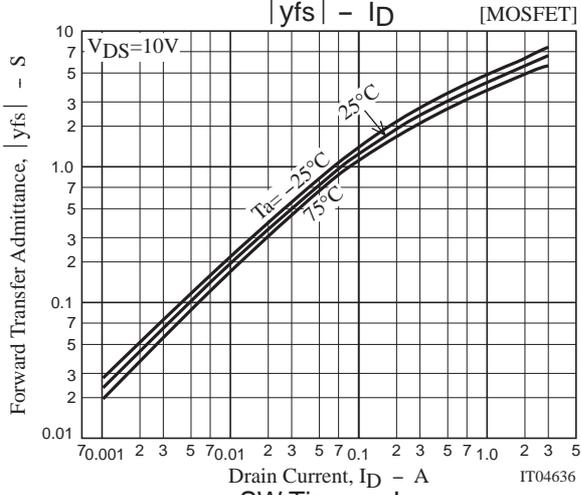
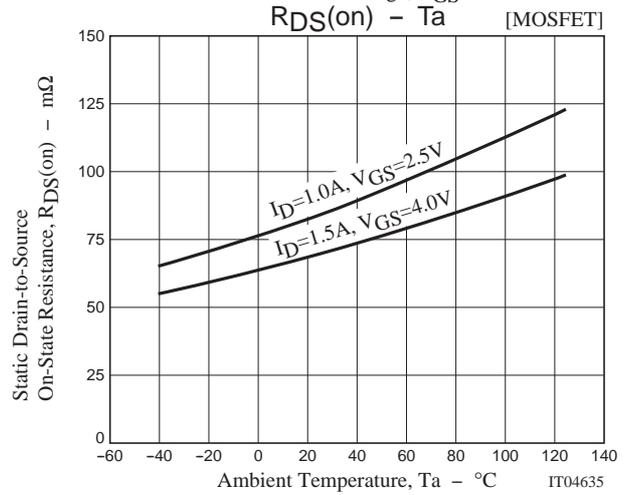
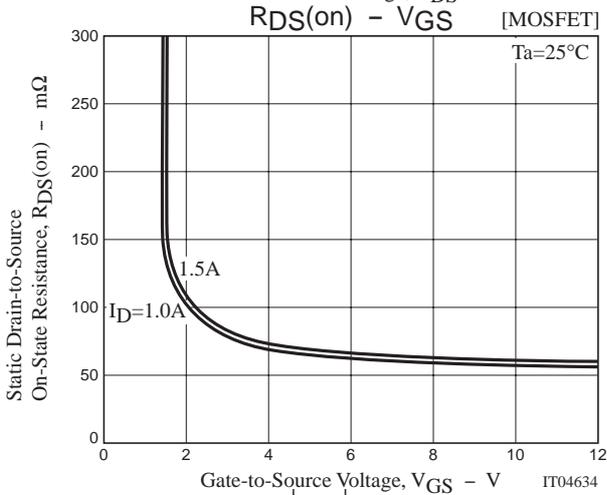
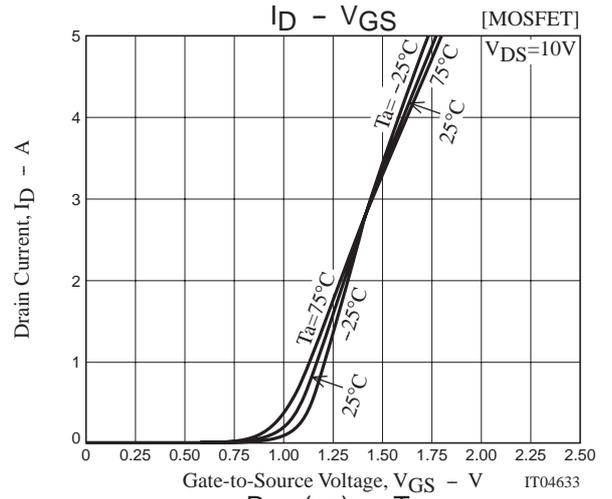
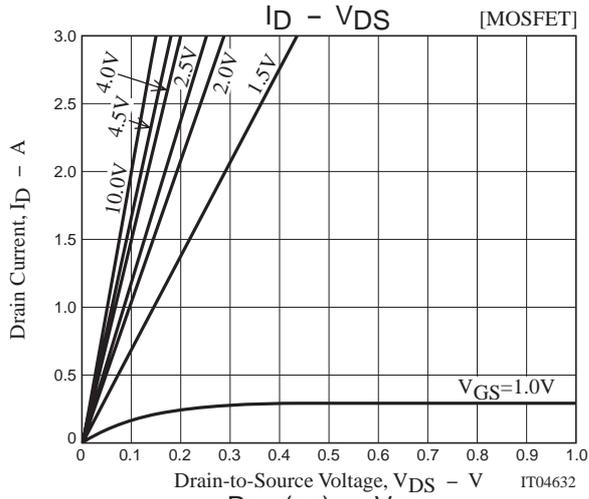
[MOSFET]

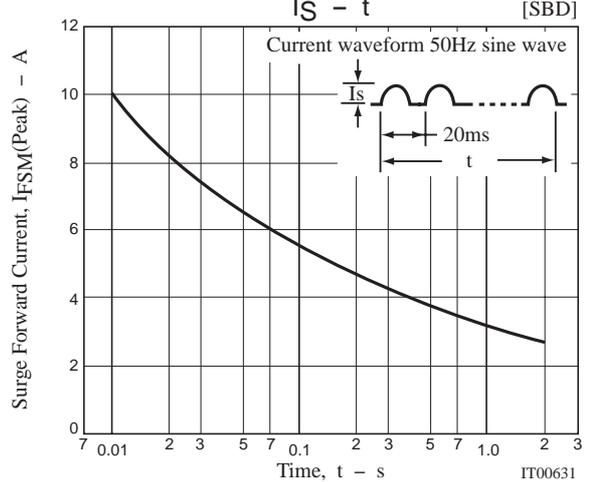
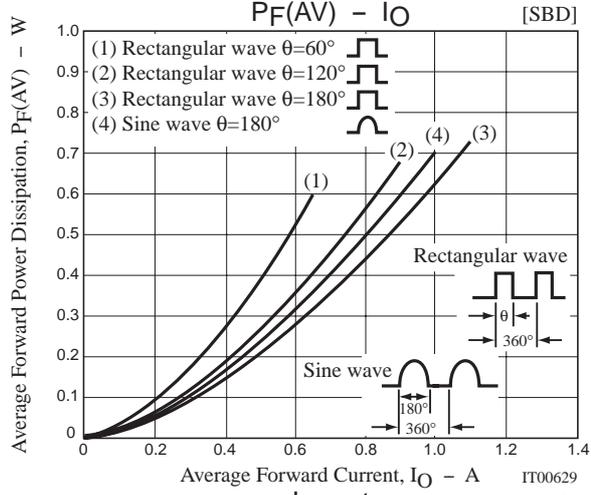
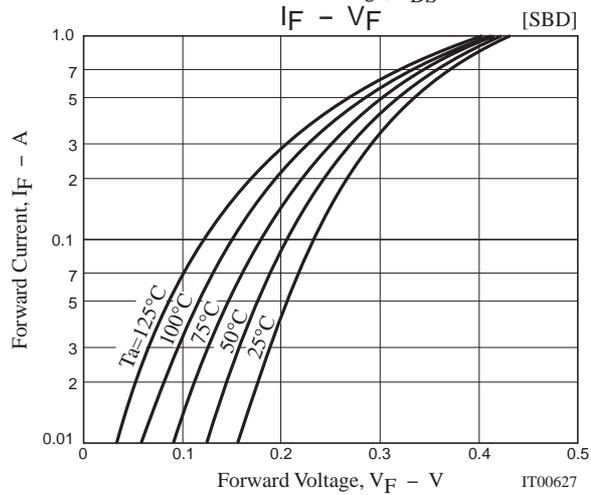
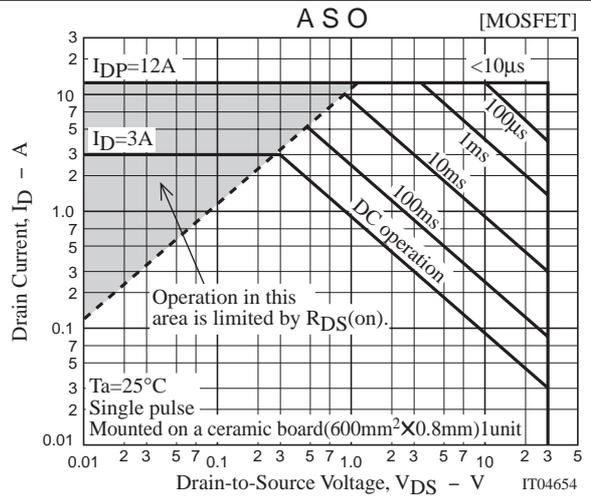
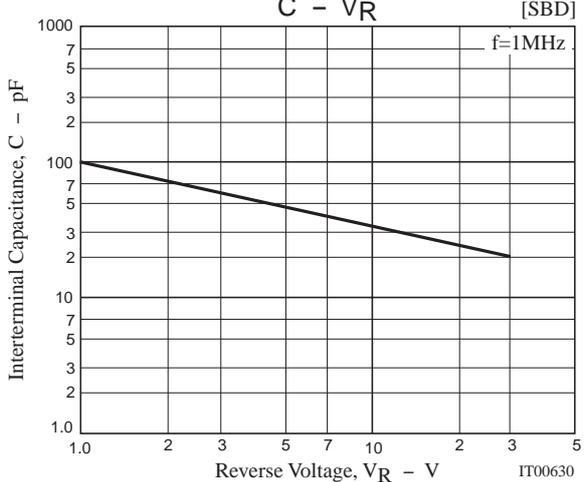
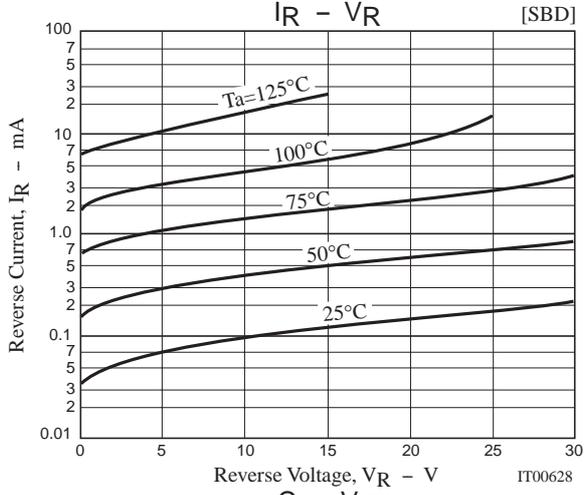
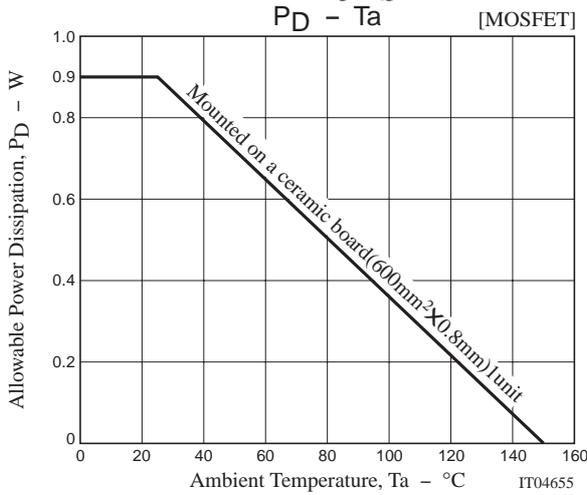
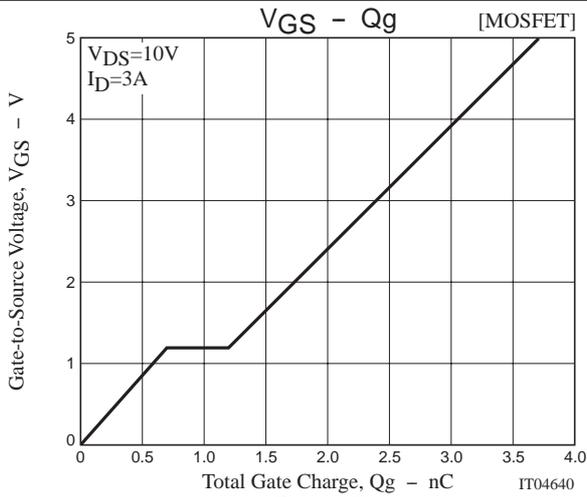


t_{rr} Test Circuit

[SBD]







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