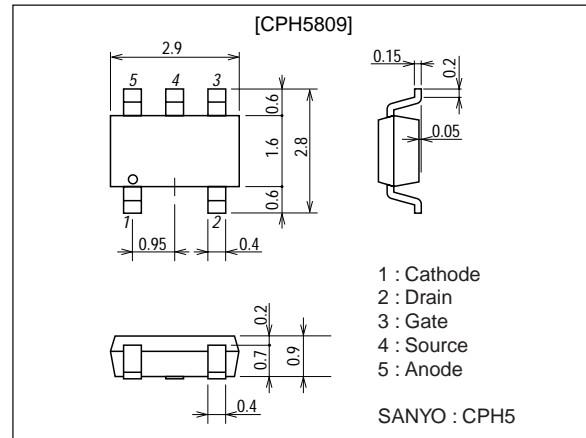


**CPH5809****DC / DC Converter Applications****Features**

- 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 Dimensions**unit : mm  
2171**Specifications****Absolute Maximum Ratings** at Ta=25°C

Parameter	Symbol	Conditions	Ratings	Unit
[MOSFET]				
Drain-to-Source Voltage	V <sub>DSS</sub>		30	V
Gate-to-Source Voltage	V <sub>GSS</sub>		±10	V
Drain Current (DC)	I <sub>D</sub>		3	A
Drain Current (Pulse)	I <sub>DP</sub>	PW≤10μs, duty cycle≤1%	12	A
Allowable Power Dissipation	P <sub>D</sub>	Mounted on a ceramic board (600mm <sup>2</sup> X0.8mm) 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		30	V
Nonrepetitive Peak Reverse Surge Voltage	V <sub>R</sub> S		30	V
Average Output Current	I <sub>O</sub>		1	A
Surge Forward Current	I <sub>F</sub> SM	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 : QK

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**SANYO Electric Co.,Ltd. Semiconductor Company**  
TOKYO OFFICE Tokyo Bldg., 1-10, 1 Chome, Ueno, Taito-ku, TOKYO, 110-8534 JAPAN

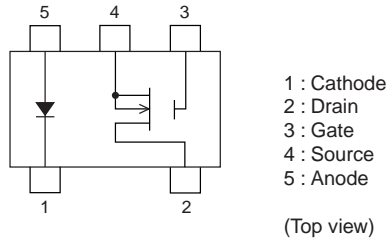
83002 TS IM TA-3482 No.7267-1/5

# CPH5809

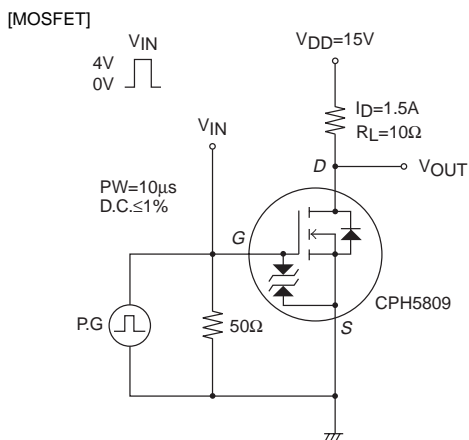
## Electrical Characteristics at Ta=25°C

Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
[MOSFET]						
Drain-to-Source Breakdown Voltage	V(BR)DSS	I <sub>D</sub> =1mA, V <sub>GS</sub> =0	30			V
Zero-Gate Voltage Drain Current	I <sub>DSS</sub>	V <sub>DS</sub> =30V, V <sub>GS</sub> =0			1	μA
Gate-to-Source Leakage Current	I <sub>GSS</sub>	V <sub>GS</sub> =±8V, V <sub>DS</sub> =0			±10	μA
Cutoff Voltage	V <sub>GS(off)</sub>	V <sub>DS</sub> =10V, I <sub>D</sub> =1mA	0.4		1.3	V
Forward Transfer Admittance	y <sub>fs</sub>	V <sub>DS</sub> =10V, I <sub>D</sub> =1.5A	3.5	5.0		S
Static Drain-to-Source On-State Resistance	R <sub>DS(on)1</sub>	I <sub>D</sub> =1.5A, V <sub>GS</sub> =4V		69	90	mΩ
	R <sub>DS(on)2</sub>	I <sub>D</sub> =1A, V <sub>GS</sub> =2.5V		84	118	mΩ
Input Capacitance	C <sub>iss</sub>	V <sub>DS</sub> =10V, f=1MHz		270		pF
Output Capacitance	C <sub>oss</sub>	V <sub>DS</sub> =10V, f=1MHz		38		pF
Reverse Transfer Capacitance	C <sub>rss</sub>	V <sub>DS</sub> =10V, f=1MHz		23		pF
Turn-ON Delay Time	t <sub>d(on)</sub>	See specified Test Circuit.		10		ns
Rise Time	t <sub>r</sub>	See specified Test Circuit.		30		ns
Turn-OFF Delay Time	t <sub>d(off)</sub>	See specified Test Circuit.		42		ns
Fall Time	t <sub>f</sub>	See specified Test Circuit.		52		ns
Total Gate Charge	Q <sub>g</sub>	V <sub>DS</sub> =10V, V <sub>GS</sub> =4V, I <sub>D</sub> =3.0A		3.7		nC
Gate-to-Source Charge	Q <sub>gs</sub>	V <sub>DS</sub> =10V, V <sub>GS</sub> =4V, I <sub>D</sub> =3.0A		0.7		nC
Gate-to-Drain "Miller" Charge	Q <sub>gd</sub>	V <sub>DS</sub> =10V, V <sub>GS</sub> =4V, I <sub>D</sub> =3.0A		0.5		nC
Diode Forward Voltage	V <sub>SD</sub>	I <sub>S</sub> =3.0A, V <sub>GS</sub> =0		0.85	1.2	V
[SBD]						
Reverse Voltage	V <sub>R</sub>	I <sub>R</sub> =1mA	30			V
Forward Voltage	V <sub>F1</sub>	I <sub>F</sub> =0.5A		0.35	0.4	V
	V <sub>F2</sub>	I <sub>F</sub> =1A		0.42	0.47	V
Reverse Current	I <sub>R</sub>	V <sub>R</sub> =15V			500	μA
Interterminal Capacitance	C	V <sub>R</sub> =10V, f=1MHz cycle		35		pF
Reverse Recovery Time	t <sub>rr</sub>	I <sub>F</sub> =I <sub>R</sub> =100mA, see specified Test Circuit.			15	ns
Thermal Resistance	R <sub>thj-a</sub>	Mounted on a ceramic board (600mm²×0.8mm)		110		°C / W

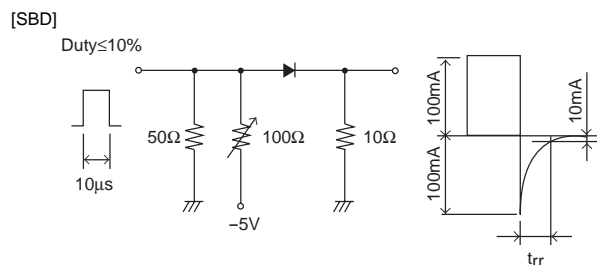
## Electrical Connection



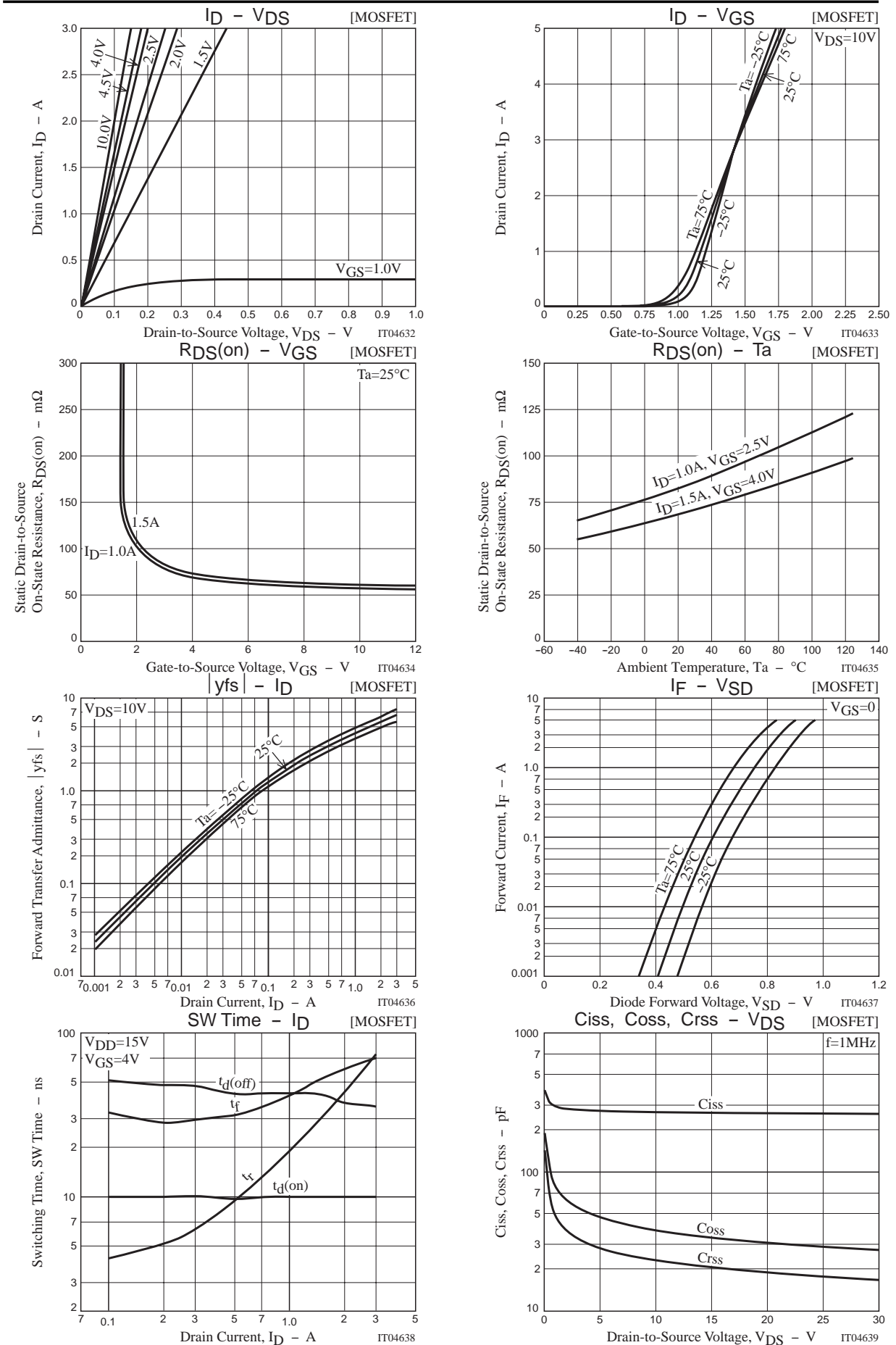
## Switching Time Test Circuit



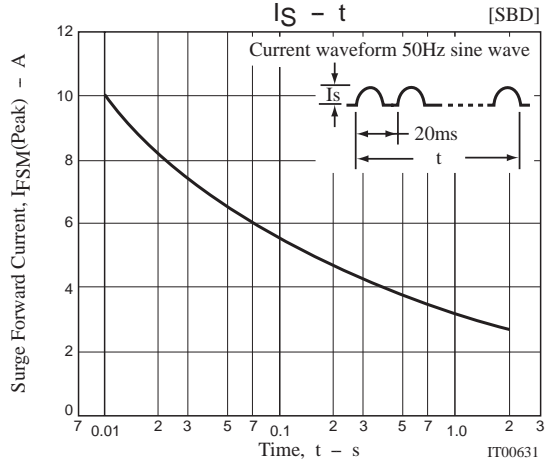
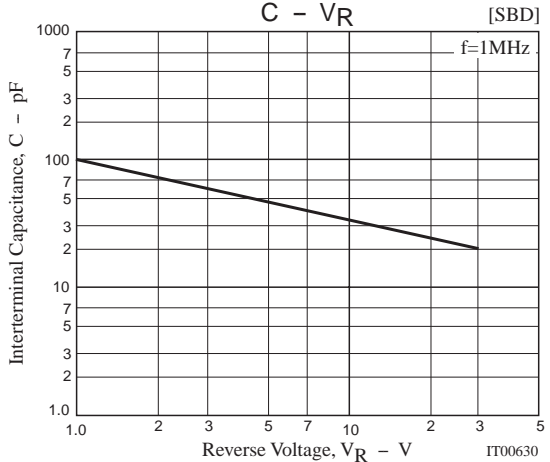
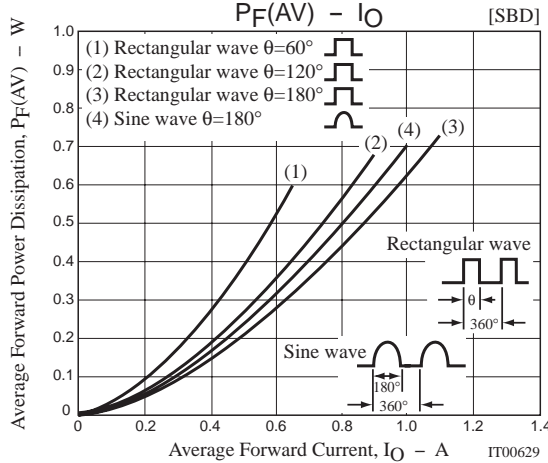
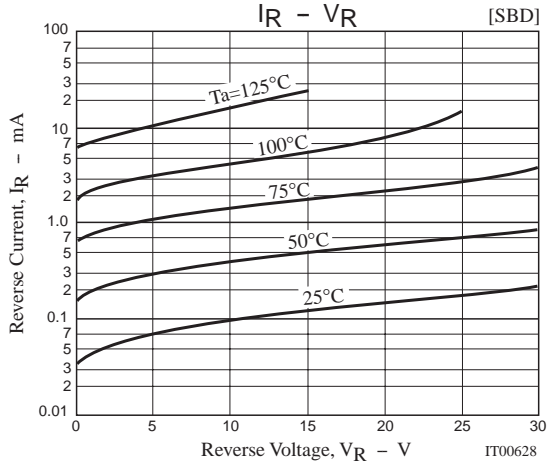
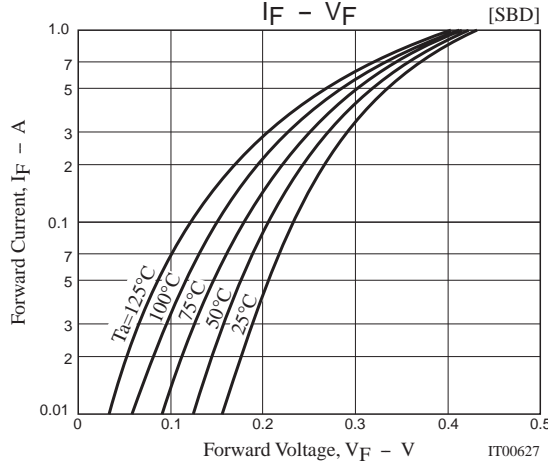
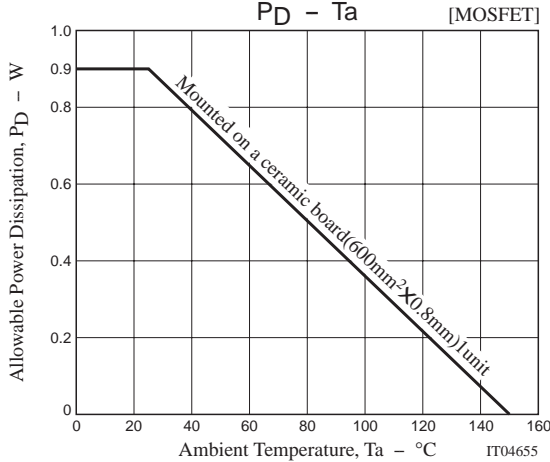
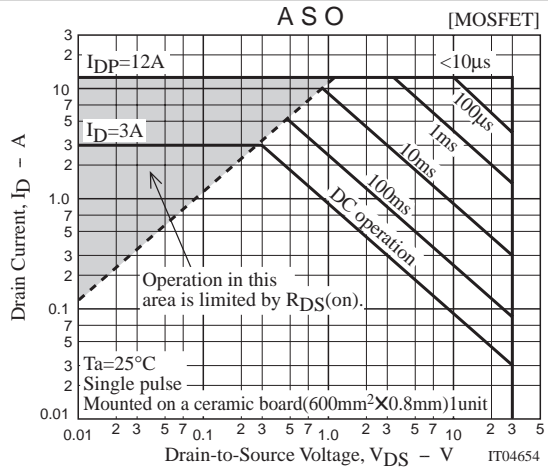
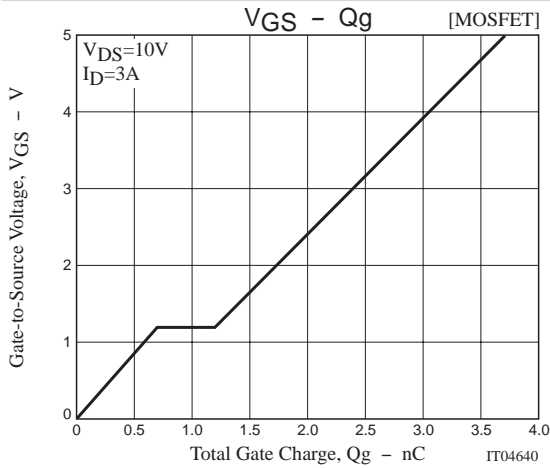
## t<sub>rr</sub> Test Circuit



# CPH5809



# CPH5809



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