

Ordering number : ENN8181



SANYO Semiconductors

# DATA SHEET

## CPH5839

MOSFET : N-Channel Silicon MOSFET  
SBD : Schottky Barrier Diode

## General-Purpose Switching Device Applications

### Features

- DC / DC converter applications.
  - Composite type with a N-Channel Silicon MOSFET (MCH3409) and a schottky barrier diode (SBS005) contained in one package facilitating high-density mounting.
- [MOSFET]
- Low ON-resistance.
  - Ultrahigh-speed switching.
  - Low voltage 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>		20	V
Gate-to-Source Voltage	V <sub>GSS</sub>		±10	V
Drain Current (DC)	I <sub>D</sub>		2.0	A
Drain Current (Pulse)	I <sub>DP</sub>	PW≤10μs, duty cycle≤1%	8.0	A
Allowable Power Dissipation	P <sub>D</sub>	Mounted on a ceramic board (600mm²X0.8mm) 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>RRM</sub>		30	V
Nonrepetitive Peak Reverse Surge Voltage	V <sub>RSM</sub>		30	V
Average Output Current	I <sub>O</sub>		1	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 : XR

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# CPH5839

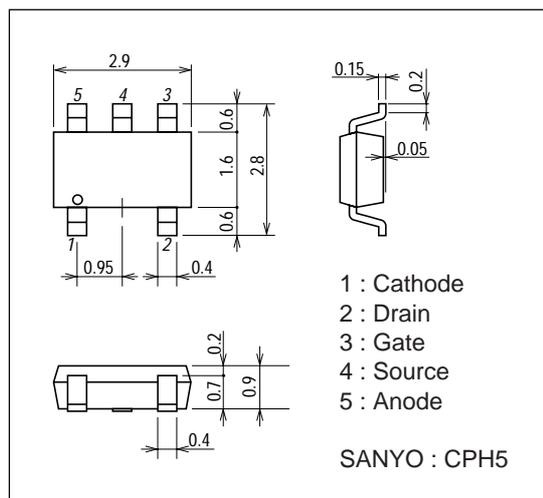
## Electrical Characteristics at Ta=25°C

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	$\mu A$
Gate-to-Source Leakage Current	$I_{GSS}$	$V_{GS}=\pm 8V, V_{DS}=0$			$\pm 10$	$\mu A$
Cutoff Voltage	$V_{GS(off)}$	$V_{DS}=10V, I_D=1mA$	0.4		1.3	V
Forward Transfer Admittance	$ y_{fs} $	$V_{DS}=10V, I_D=1A$	2.1	3.5		S
Static Drain-to-Source On-State Resistance	$R_{DS(on)1}$	$I_D=1A, V_{GS}=4V$		100	130	m $\Omega$
	$R_{DS(on)2}$	$I_D=0.5A, V_{GS}=2.5V$		130	180	m $\Omega$
Input Capacitance	$C_{iss}$	$V_{DS}=10V, f=1MHz$		190		pF
Output Capacitance	$C_{oss}$	$V_{DS}=10V, f=1MHz$		40		pF
Reverse Transfer Capacitance	$C_{rss}$	$V_{DS}=10V, f=1MHz$		25		pF
Turn-ON Delay Time	$t_d(on)$	See specified Test Circuit		9		ns
Rise Time	$t_r$	See specified Test Circuit		25		ns
Turn-OFF Delay Time	$t_d(off)$	See specified Test Circuit		25		ns
Fall Time	$t_f$	See specified Test Circuit		18		ns
Total Gate Charge	$Q_g$	$V_{DS}=10V, V_{GS}=4V, I_D=2A$		2.7		nC
Gate-to-Source Charge	$Q_{gs}$	$V_{DS}=10V, V_{GS}=4V, I_D=2A$		0.6		nC
Gate-to-Drain "Miller" Charge	$Q_{gd}$	$V_{DS}=10V, V_{GS}=4V, I_D=2A$		0.6		nC
Diode Forward Voltage	$V_{SD}$	$I_S=2A, V_{GS}=0$		0.87	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	$\mu A$
Interterminal Capacitance	$C$	$V_R=10V, f=1MHz, 1 \text{ cycle}$		35		pF
Reverse Recovery Time	$t_{rr}$	$I_F=I_R=100mA, \text{ See specified Test Circuit.}$			15	ns
Thermal Resistance	$R_{th(j-a)}$	Mounted on a ceramic board (90mm <sup>2</sup> ×0.8mm)		110		°C / W

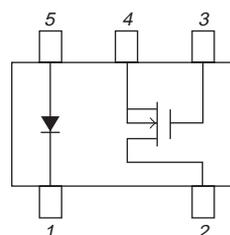
### Package Dimensions

unit : mm

2171



### Electrical Connection



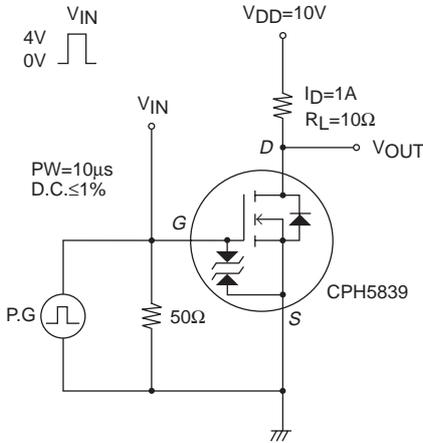
- 1 : Cathode
- 2 : Drain
- 3 : Gate
- 4 : Source
- 5 : Anode

Top view

# CPH5839

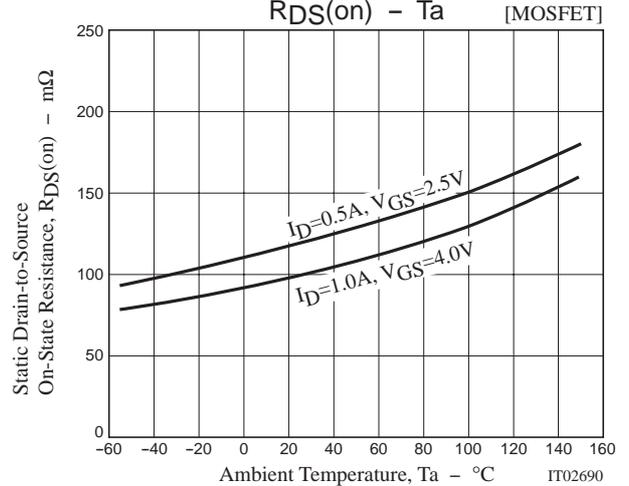
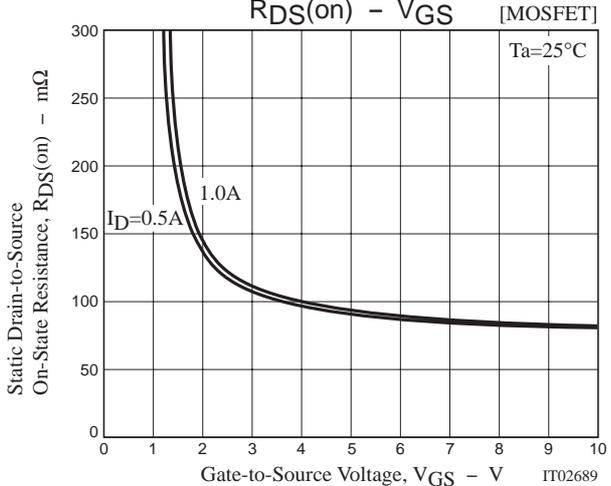
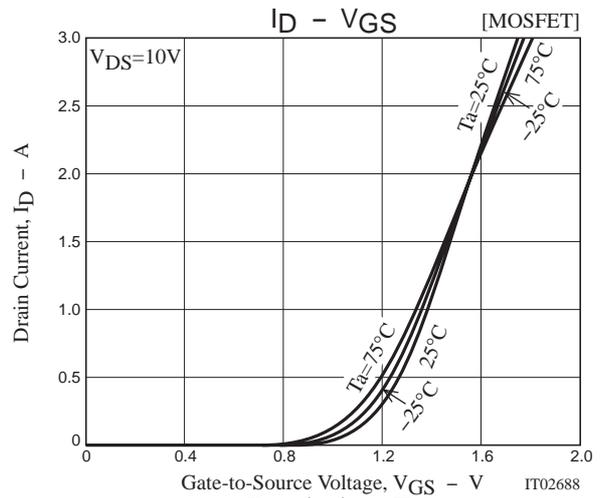
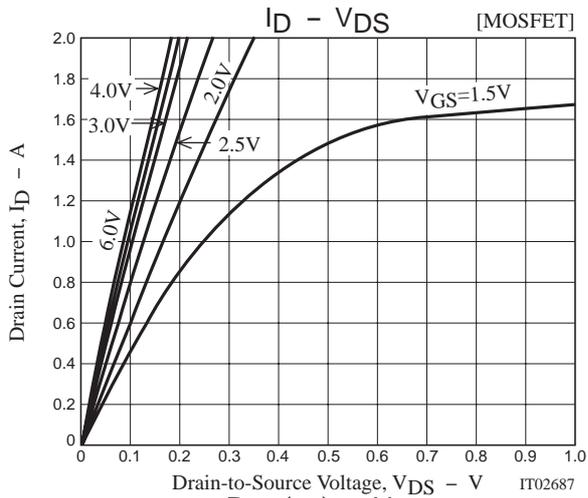
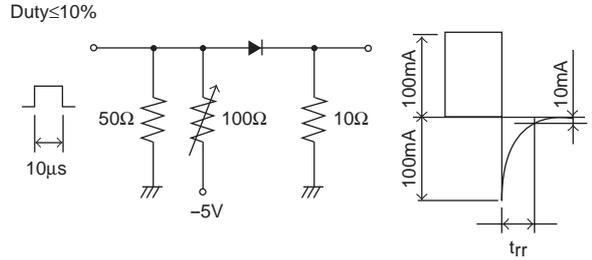
## Switching Time Test Circuit

[MOSFET]

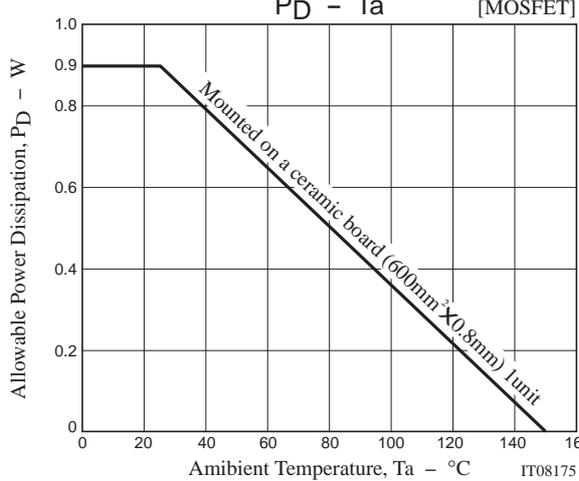
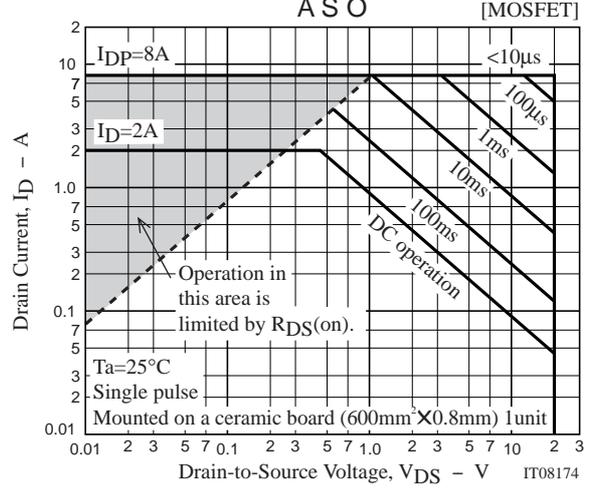
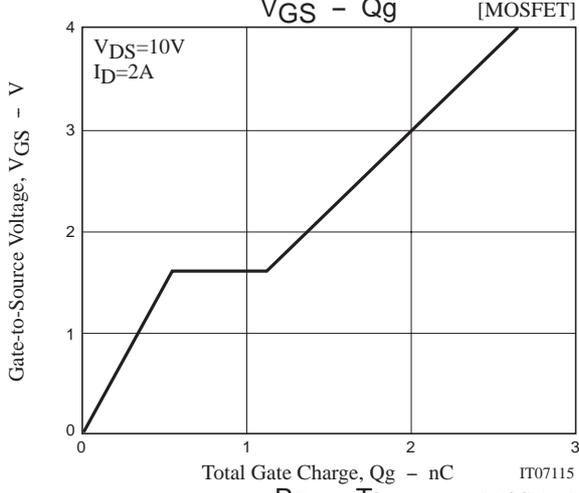
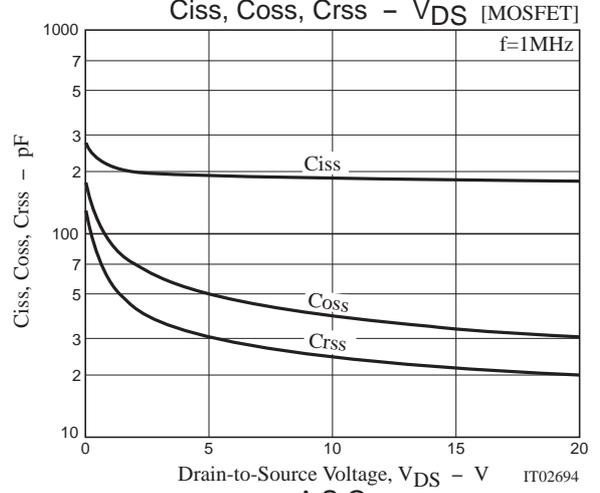
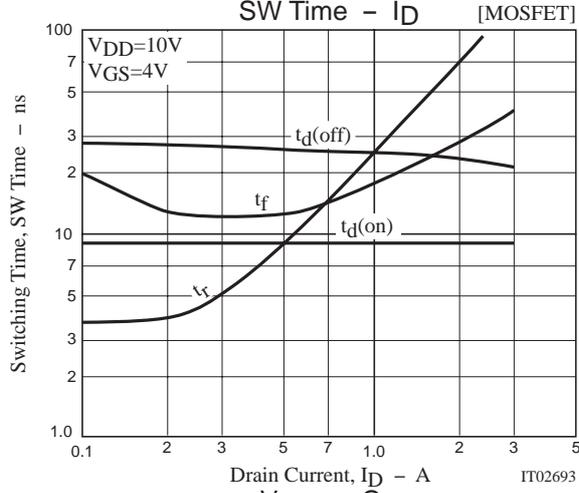
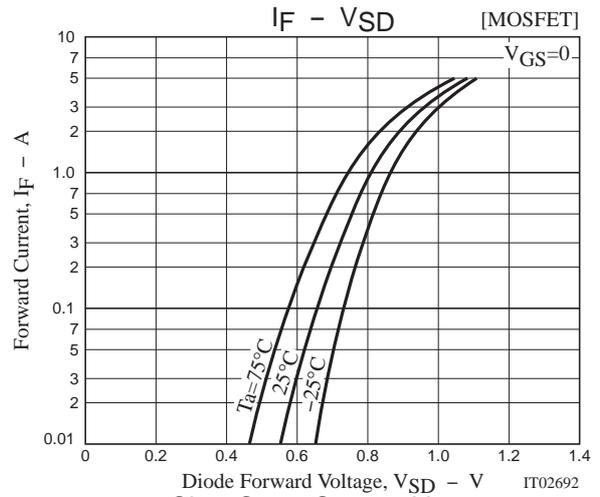
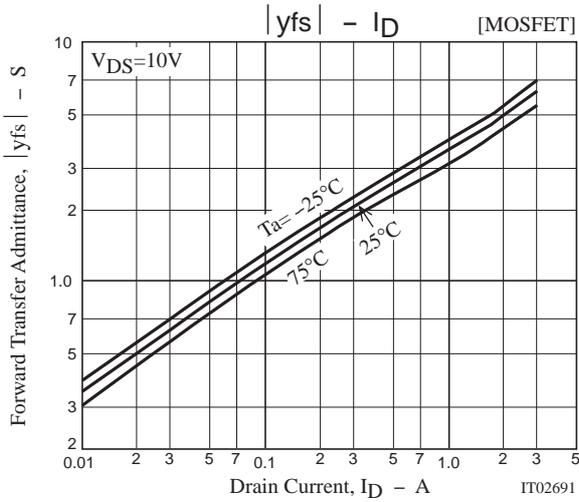


## t<sub>rr</sub> Test Circuit

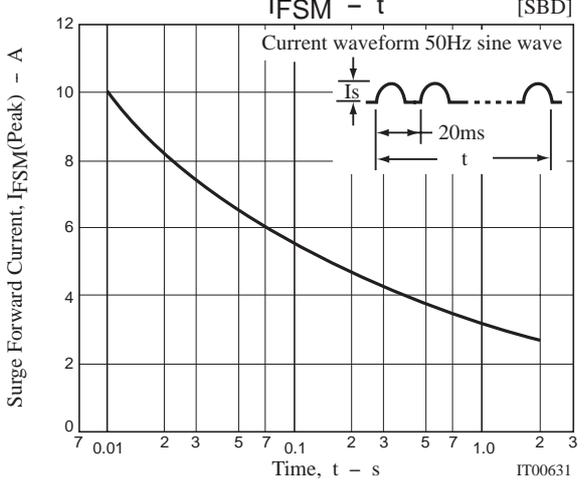
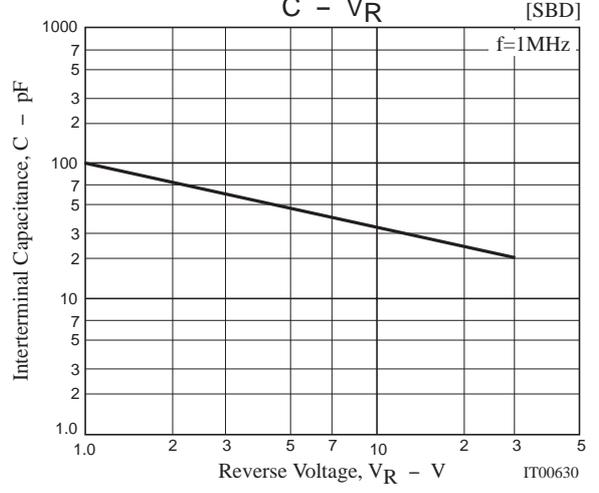
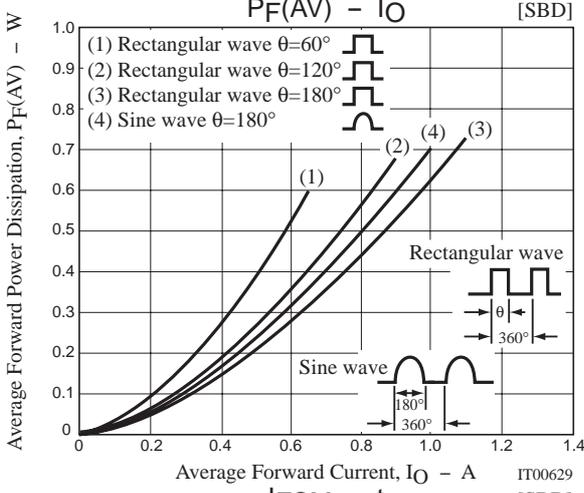
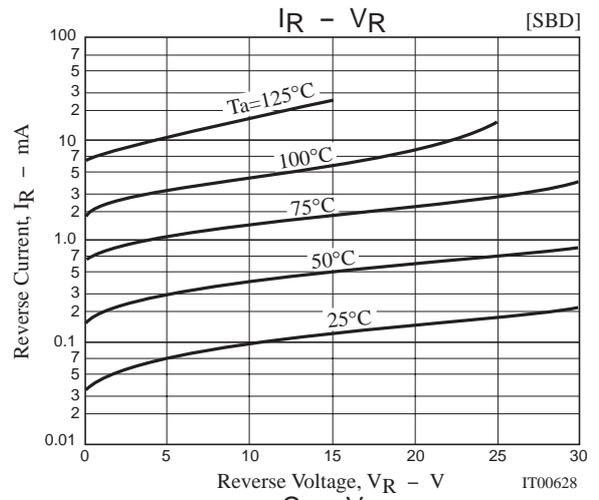
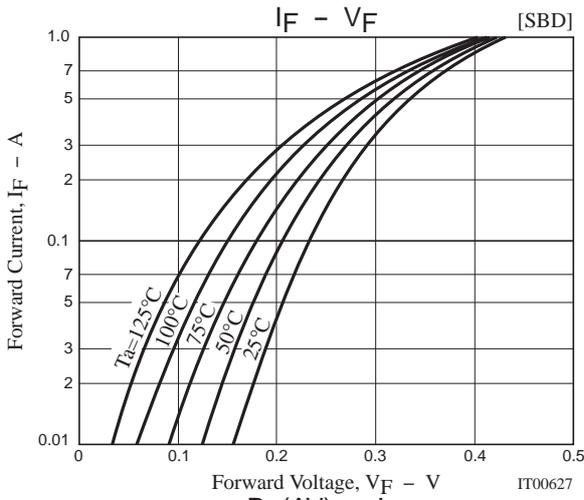
[SBD]



# CPH5839



# CPH5839



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Note on usage : Since the CPH5839 is a MOSFET product, please avoid using this device in the vicinity of highly charged objects.

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