Ordering number : ENA1161

SANYO Semiconductors
DATA SHEET

CPH5870 — General-Purpose Switching Device Applications

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

Features

- Composite type with a N-channel sillicon MOSFET and a schottky barrier diode contained in one package facilitating high-density mounting.
- [MOSFET]
  - Low ON-resistance
  - Ultrahigh-speed switching
  - 2.5V drive.
- [SBD]
  - Short reverse recovery time (t_{rr} max=10ns).
  - Low forward voltage (V_F max=0.55V).

Specifications

Absolute Maximum Ratings at Ta=25°C

Parameter	Symbol	Conditions	Ratings	Unit
[MOSFET]				
Drain-to-Source Voltage	V_{DSS}		60	V
Gate-to-Source Voltage	V_{GSS}		±10	V
Drain Current (DC)	I_D		1.8	A
Drain Current (Pulse)	I_{DP}	PW≤10μs, duty cycle≤1%	7.2	A
Allowable Power Dissipation	P_D	When mounted on ceramic substrate (600mm²X0.8mm) 1unit	0.9	W
Channel Temperature	Tch		150	°C
Storage Temperature	Tstg		−55 to +125	°C

Marking : YY

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

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Parameter	Symbol	Conditions	Ratings	Unit
[SBD]				
Repetitive Peak Reverse Voltage	V_{RRM}		50	V
Nonrepetitive Peak Reverse Surge Voltage	V_{RSM}		55	V
Average Output Current	I_O		800	mA
Surge Forward Current	I_{FSM}	50Hz sine wave, 1 cycle	5	A
Junction Temperature	Tj		−55 to +125	°C
Storage Temperature	Tstg		−55 to +125	°C

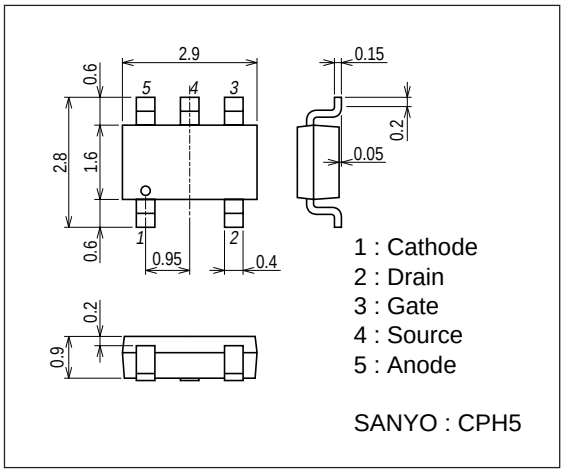
Electrical Characteristics at Ta=25°C

Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
[MOSFET]						
Drain-to-Source Breakdown Voltage	$V_{(BR)DSS}$	I_D=1mA, V_{GS}=0V	60			V
Zero-Gate Voltage Drain Current	I_{DSS}	V_{DS}=60V, V_{GS}=0V			1	μA
Gate-to-Source Leakage Current	I_{GSS}	V_{GS}=±8V, V_{DS}=0V			±10	μA
Cutoff Voltage	V_{GS}(off)	V_{DS}=10V, I_D=1mA	0.4		1.3	V
Forward Transfer Admittance	$\|yfs\|$	V_{DS}=10V, I_D=1A	1.8	3.6		S
Static Drain-to-Source On-State Resistance	R_{DS}(on)1	I_D=1A, V_{GS}=4V		170	220	mΩ
	R_{DS}(on)2	I_D=0.5A, V_{GS}=2.5V		190	270	mΩ
Input Capacitance	Ciss	V_{DS}=20V, f=1MHz		325		pF
Output Capacitance	Coss	V_{DS}=20V, f=1MHz		29		pF
Reverse Transfer Capacitance	Crss	V_{DS}=20V, f=1MHz		21		pF
Turn-ON Delay Time	t_d(on)	See specified Test Circuit.		11		ns
Rise Time	t_r	See specified Test Circuit.		17		ns
Turn-OFF Delay Time	t_d(off)	See specified Test Circuit.		40		ns
Fall Time	t_f	See specified Test Circuit.		27		ns
Total Gate Charge	Qg	V_{DS}=30V, V_{GS}=4V, I_D=1.8A		4.2		nC
Gate-to-Source Charge	Qgs	V_{DS}=30V, V_{GS}=4V, I_D=1.8A		1.1		nC
Gate-to-Drain “Miller” Charge	Qgd	V_{DS}=30V, V_{GS}=4V, I_D=1.8A		1.1		nC
Diode Forward Voltage	V_{SD}	I_S=1.8A, V_{GS}=0V		0.84	1.2	V
[SBD]						
Reverse Voltage	V_R	I_R=200μA	50			V
Forward Voltage	V_F	I_F=500mA		0.5	0.55	V
Reverse Current	I_R	V_R=25V			50	μA
Interterminal Capacitance	C	V_R=10V, f=1MHz, 1 cycle		17		pF
Reverse Recovery Time	t_{rr}	I_F=I_R=100mA, See specified Test Circuit.			10	ns

Package Dimensions

unit : mm (typ)

7017A-005



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

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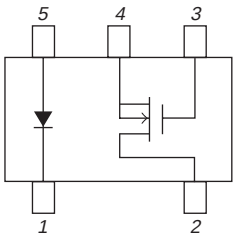
Electrical Connection



1 : Cathode
2 : Drain
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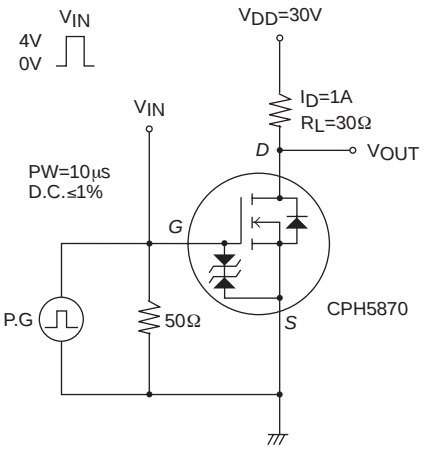
Top view

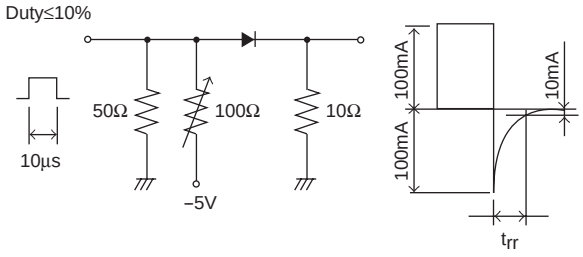
Switching Time Test Circuit

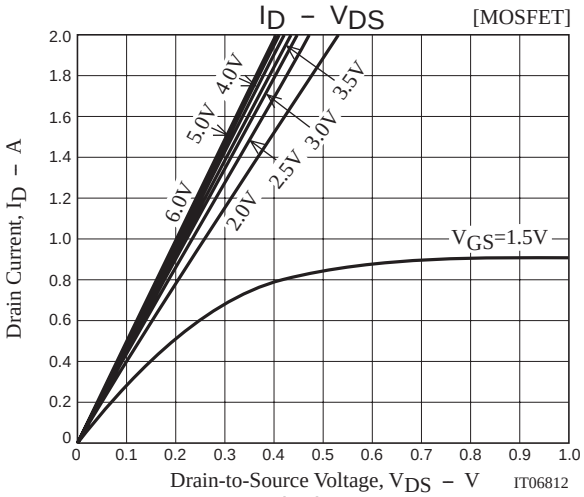
[MOSFET]

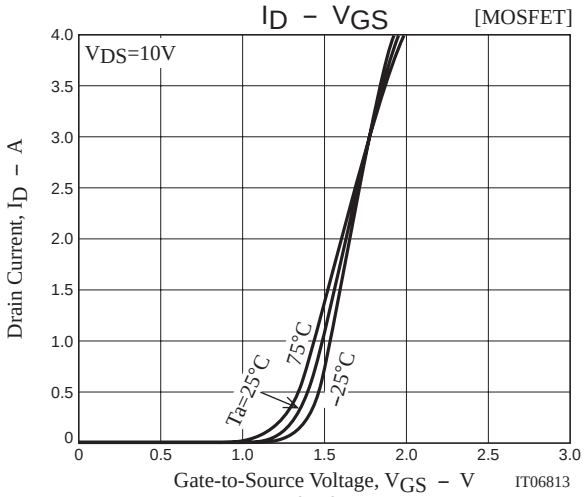


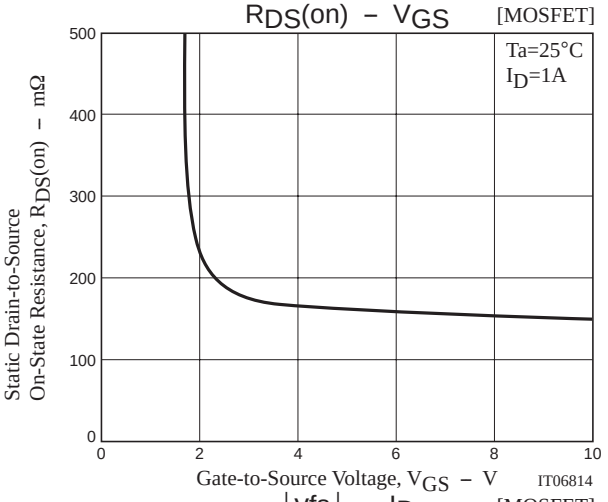
t_{rr} Test Circuit

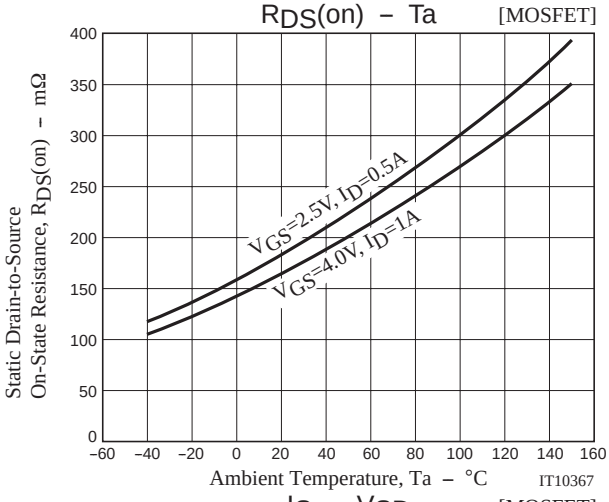
[SBD]

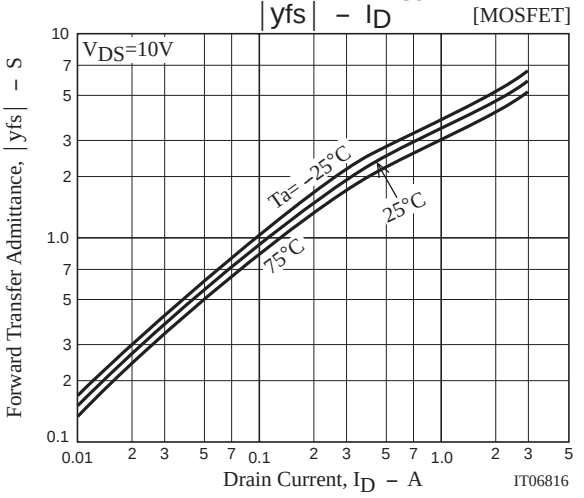


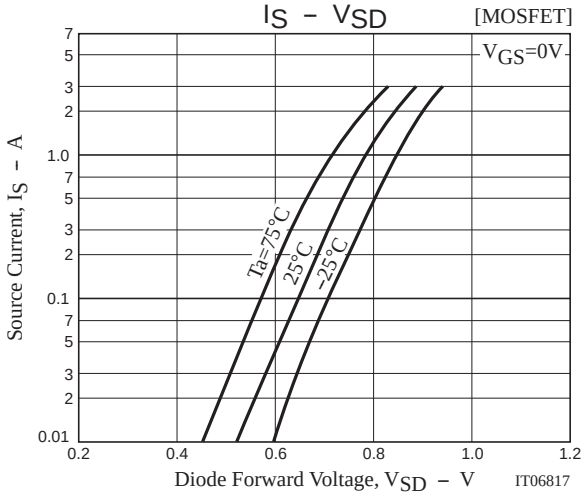




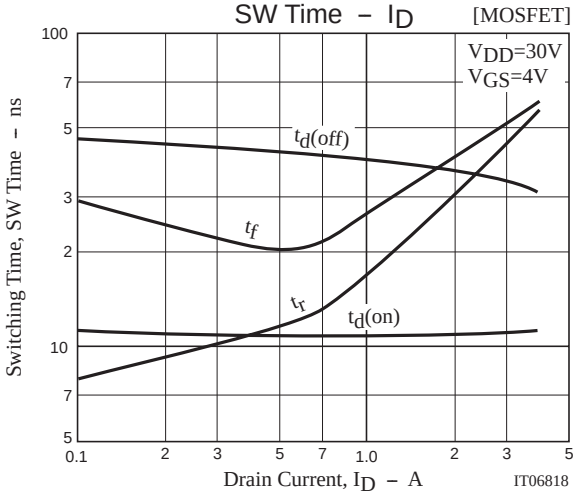




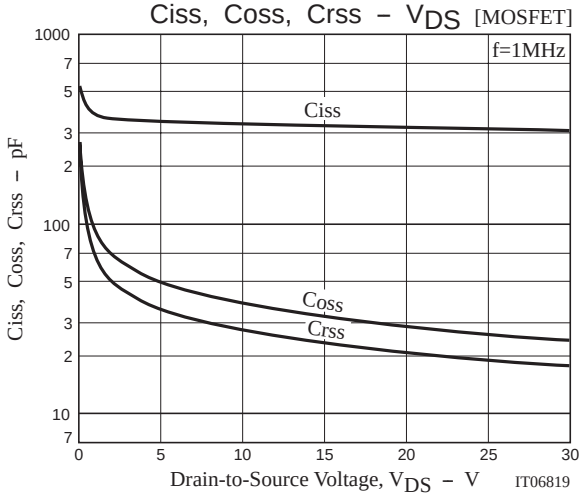




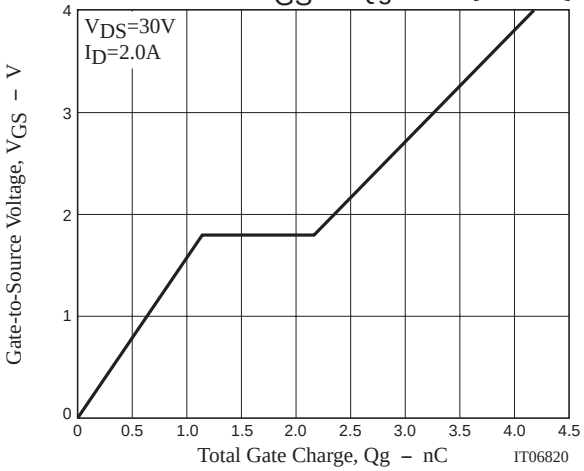
SW Time – I_D [MOSFET]



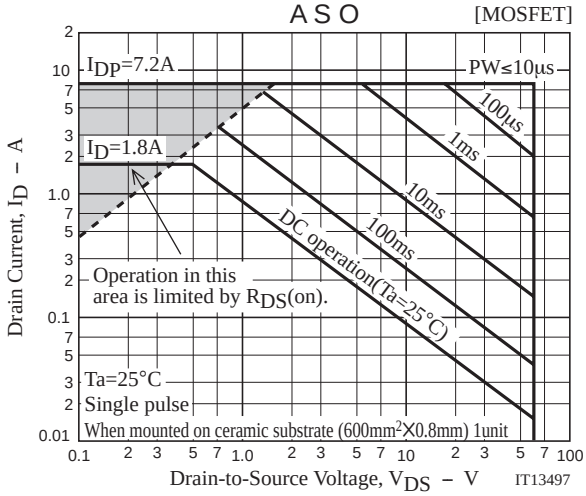
Ciss, Coss, Crss – V_{DS} [MOSFET]



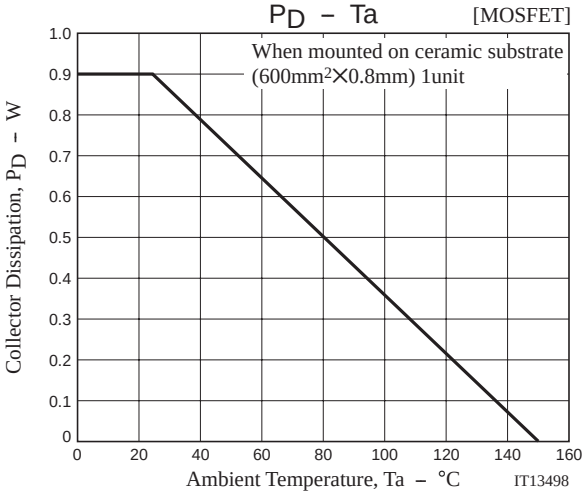
V_{GS} – Qg [MOSFET]



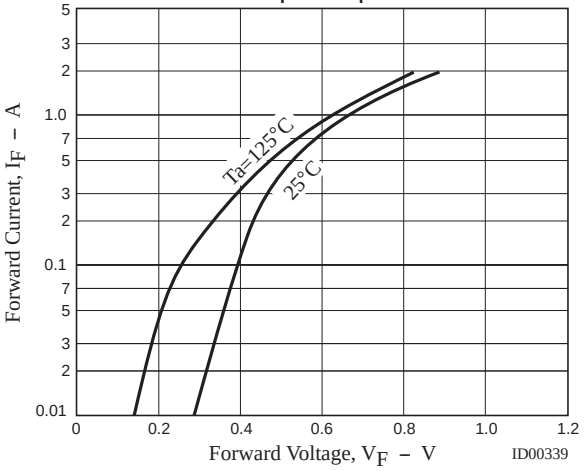
A S O [MOSFET]



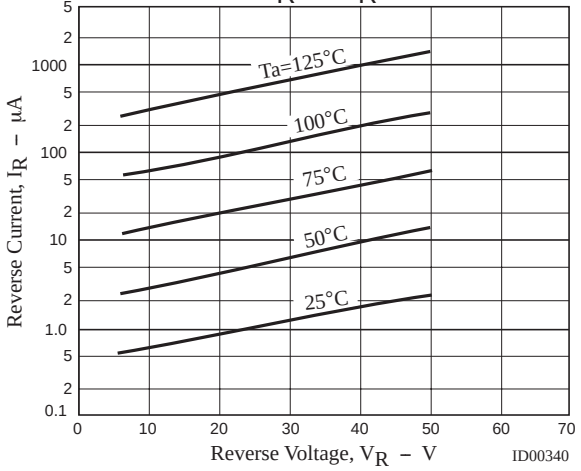
P_D – Ta [MOSFET]

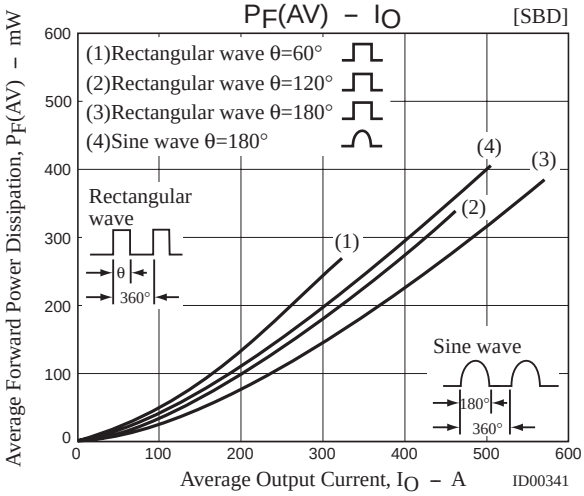


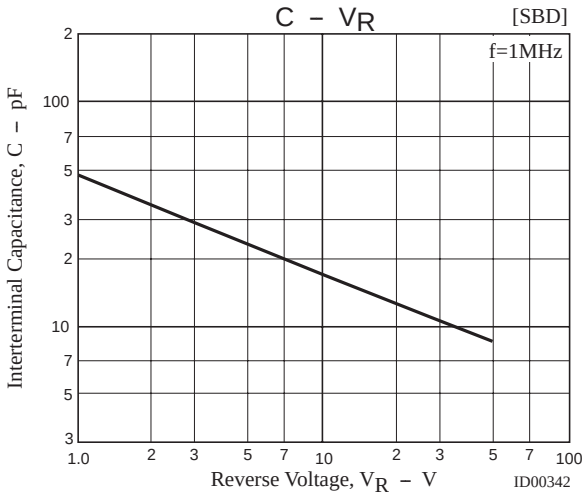
I_F – V_F [SBD]

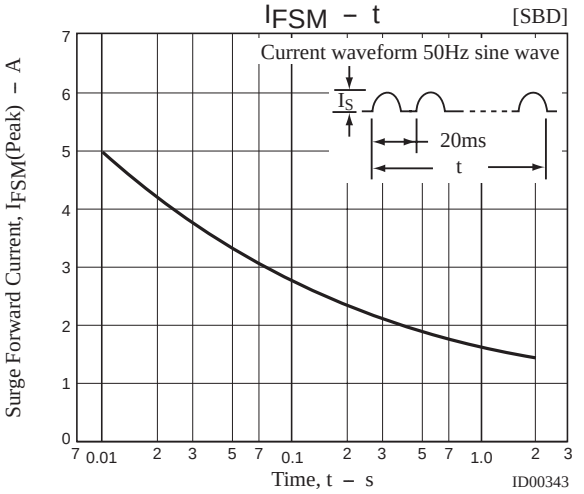


I_R – V_R [SBD]









Note on usage : Since the CPH5870 is a MOSFET product, please avoid using this device in the vicinity of highly charged objects.

This catalog provides information as of May, 2008. Specifications and information herein are subject to change without notice.