



SANYO Semiconductors

DATA SHEET

CPH5870

MOSFET : N-Channel Silicon MOSFET

SBD : Schottky Barrier Diode

General-Purpose Switching Device Applications

Features

- Composite type with a N-channel silicon 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 $T_a=25^\circ\text{C}$

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}	$PW \leq 10\mu\text{s}$, duty cycle $\leq 1\%$	7.2	A
Allowable Power Dissipation	P_D	When mounted on ceramic substrate (600mm ² X0.8mm) 1unit	0.9	W
Channel Temperature	T_{ch}		150	$^\circ\text{C}$
Storage Temperature	T_{stg}		-55 to +125	$^\circ\text{C}$

Marking : YY

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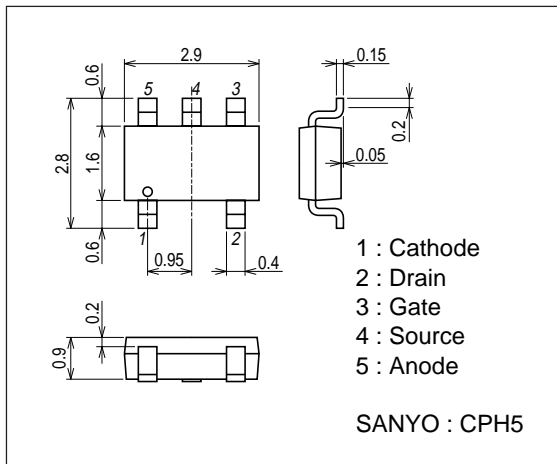
Parameter	Symbol	Conditions	Ratings	Unit
[SBD]				
Repetitive Peak Reverse Voltage	VRRM		50	V
Nonrepetitive Peak Reverse Surge Voltage	VRRSM		55	V
Average Output Current	I _O		800	mA
Surge Forward Current	I _{FSM}	50Hz sine wave, 1 cycle	5	A
Junction Temperature	T _J		-55 to +125	°C
Storage Temperature	T _{stg}		-55 to +125	°C

Electrical Characteristics at Ta=25°C

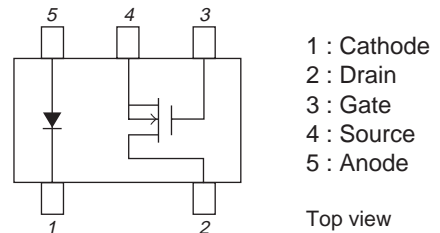
Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
[MOSFET]						
Drain-to-Source Breakdown Voltage	V _{(BR)DSS}	I _D =1mA, V _{GS} =0V	60			V
Zero-Gate Voltage Drain Current	I _{DSS}	V _{DS} =60V, V _{GS} =0V			1	μA
Gate-to-Source Leakage Current	I _{GSS}	V _{GS} =±8V, V _{DS} =0V			±10	μA
Cutoff Voltage	V _{GS(off)}	V _{DS} =10V, I _D =1mA	0.4		1.3	V
Forward Transfer Admittance	y _{fs}	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	C _{iss}	V _{DS} =20V, f=1MHz		325		pF
Output Capacitance	C _{oss}	V _{DS} =20V, f=1MHz		29		pF
Reverse Transfer Capacitance	C _{rss}	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	Q _g	V _{DS} =30V, V _{GS} =4V, I _D =1.8A		4.2		nC
Gate-to-Source Charge	Q _{gs}	V _{DS} =30V, V _{GS} =4V, I _D =1.8A		1.1		nC
Gate-to-Drain "Miller" Charge	Q _{gd}	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

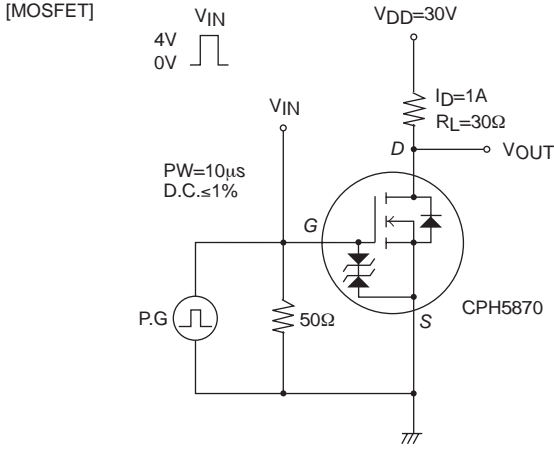
unit : mm (typ)
7017A-005



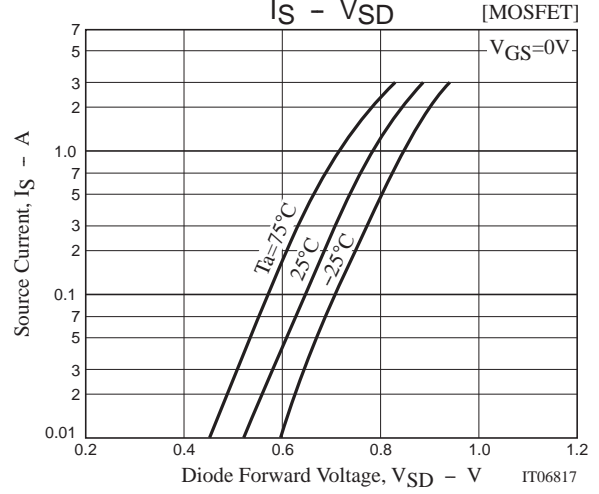
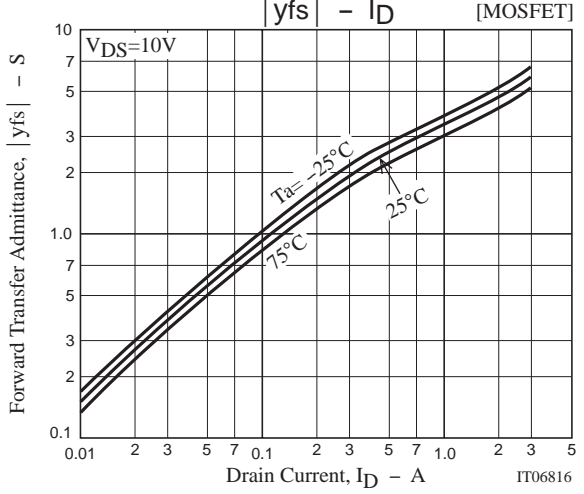
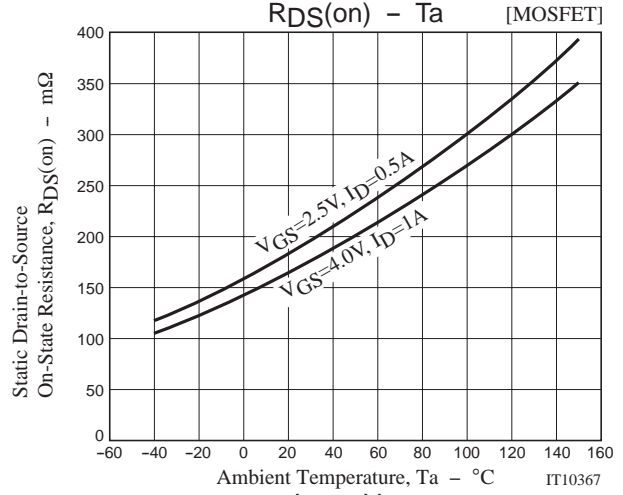
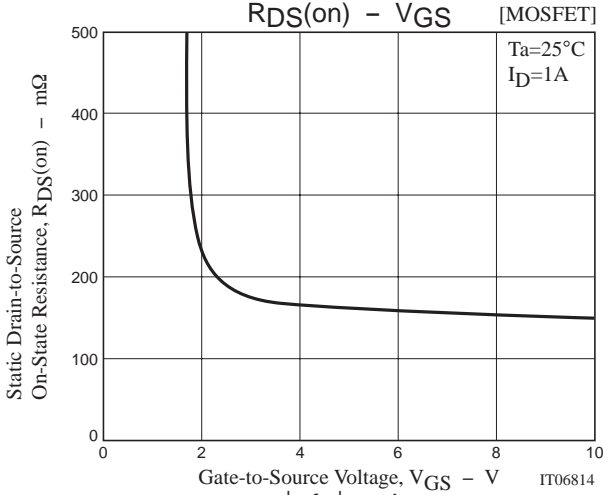
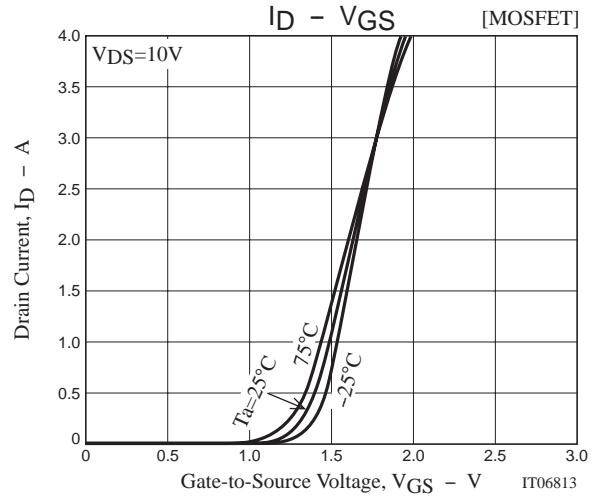
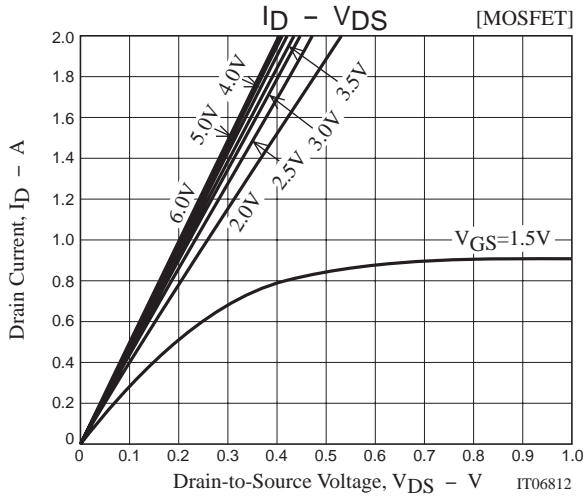
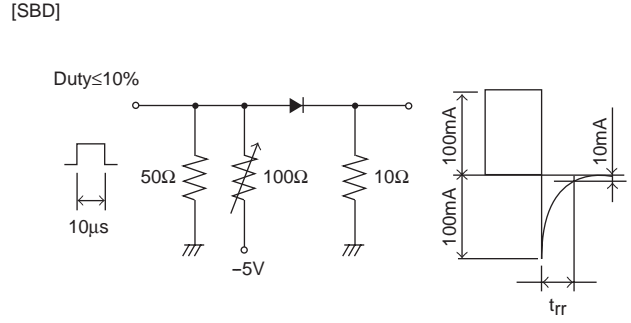
Electrical Connection

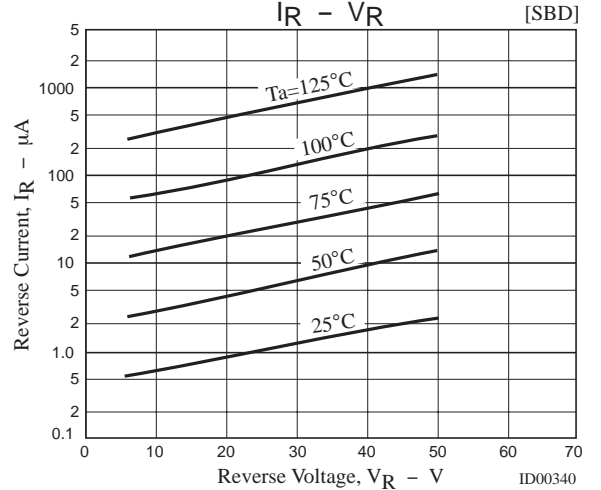
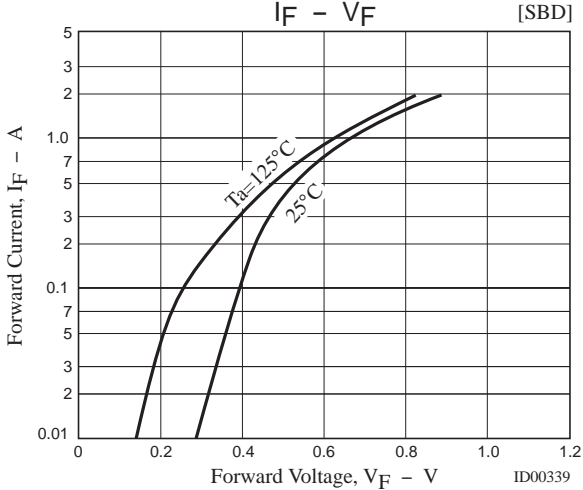
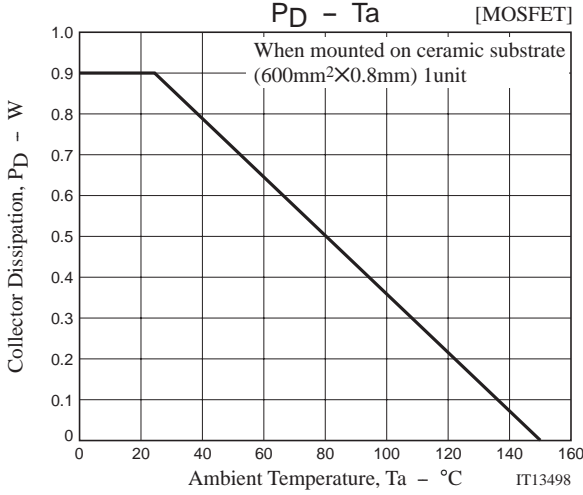
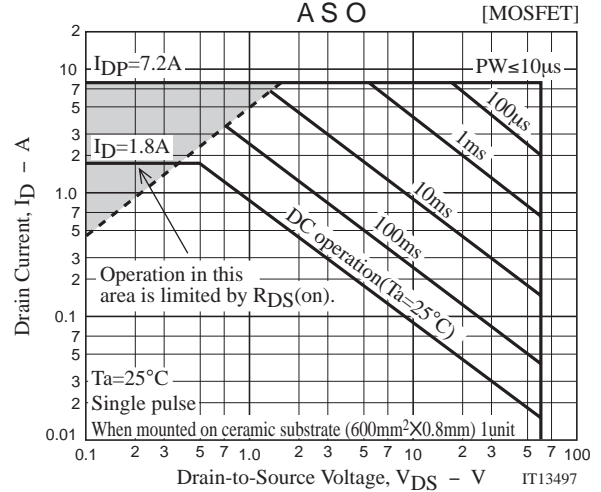
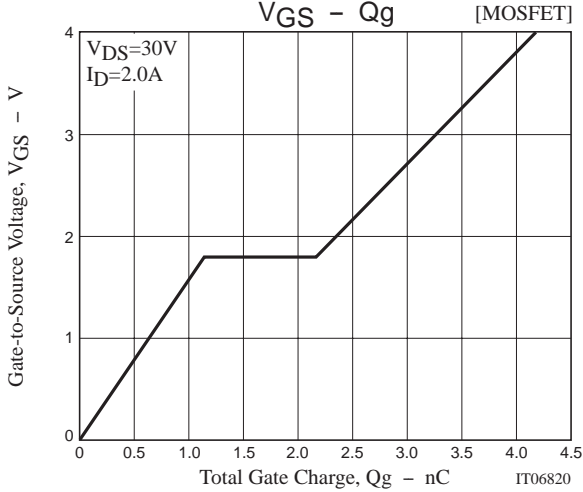
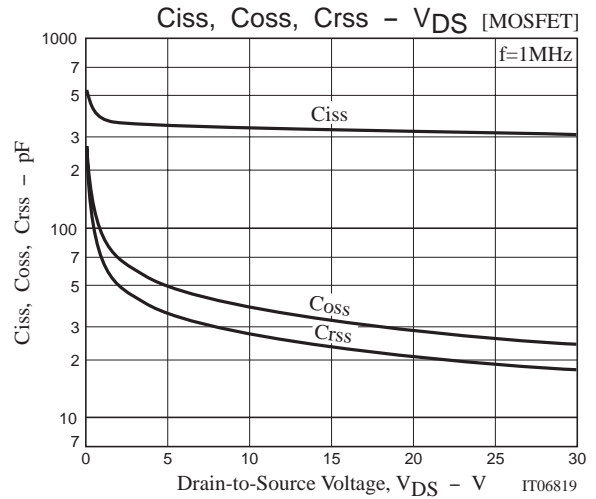
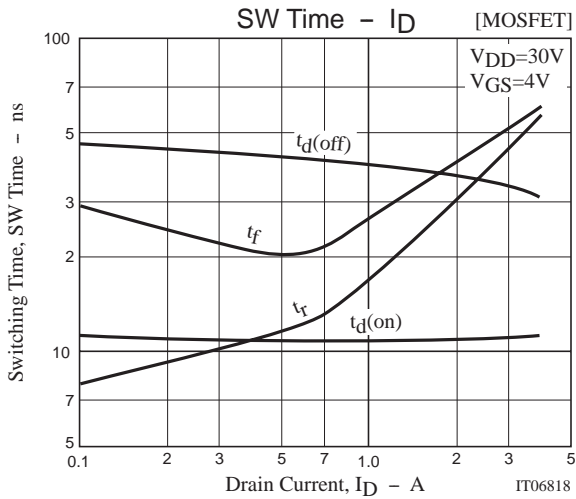


Switching Time Test Circuit

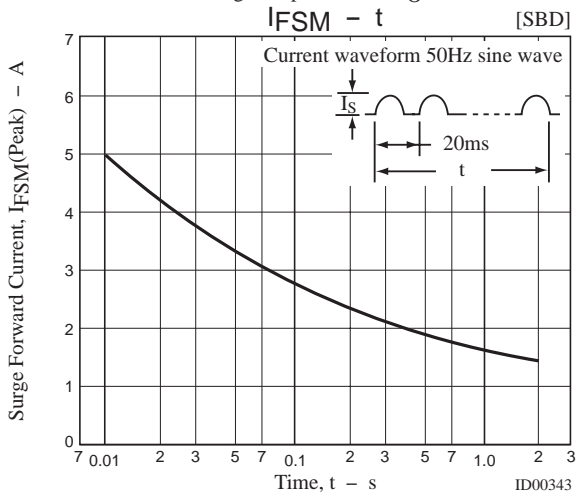
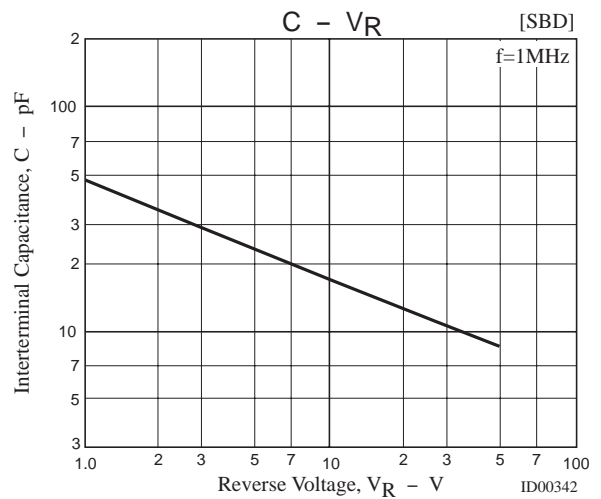
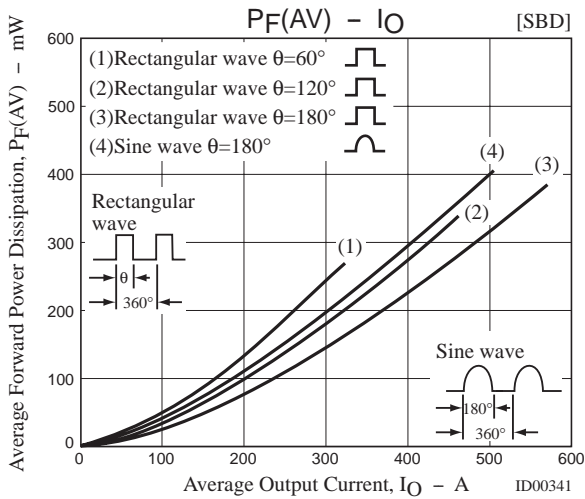


t_{rr} Test Circuit





CPH5870



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

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