Ordering number : ENA0670

SANYO Semiconductors
DATA SHEET

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

CPH5855 — General-Purpose Switching Device Applications

Features

· DC / DC converters.

Features

· Composite type with a N-channel sillicon MOSFET and a schottky barrier diode contained in one package facilitating high-density mounting.
[MOSFET]
· 1.8V 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_{DSS}		20	V
Gate-to-Source Voltage	V_{GSS}		±10	V
Drain Current (DC)	I_D		2.5	A
Drain Current (Pulse)	I_{DP}	PW≤10μs, duty cycle≤1%	10	A
Allowable Power Dissipation	P_D	Mounted on a ceramic board (600mm²×0.8mm) 1unit	0.9	W
Channel Temperature	Tch		150	°C
Storage Temperature	Tstg		−55 to +125	°C

Marking : YH

Continued on next page.

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

Continued from preceding page.

Parameter	Symbol	Conditions	Ratings	Unit
[SBD]				
Repetitive Peak Reverse Voltage	V_{RRM}		15	V
Nonrepetitive Peak Reverse Surge Voltage	V_{RSM}		15	V
Average Output Current	I_O		1	A
Surge Forward Current	I_{FSM}	50Hz sine wave, 1 cycle	3	A
Junction Temperature	Tj		−55 to +125	°C
Storage Temperature	Tstg		−55 to +125	°C

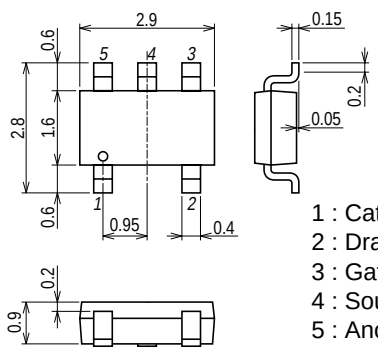
Electrical Characteristics at Ta=25°C

Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
[MOSFET]						
Drain-to-Source Breakdown Voltage	$V_{(BR)DSS}$	I_D=1mA, V_{GS}=0V	20			V
Zero-Gate Voltage Drain Current	I_{DSS}	V_{DS}=20V, 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=1.5A	1.8	3.0		S
Static Drain-to-Source On-State Resistance	R_{DS}(on)1	I_D=1.5A, V_{GS}=4V		71	93	mΩ
	R_{DS}(on)2	I_D=1A, V_{GS}=2.5V		89	125	mΩ
	R_{DS}(on)3	I_D=0.5A, V_{GS}=1.8V		117	180	mΩ
Input Capacitance	Ciss	V_{DS}=10V, f=1MHz		220		pF
Output Capacitance	Coss	V_{DS}=10V, f=1MHz		56		pF
Reverse Transfer Capacitance	Crss	V_{DS}=10V, f=1MHz		43		pF
Turn-ON Delay Time	t_d(on)	See specified Test Circuit.		8.0		ns
Rise Time	t_r	See specified Test Circuit.		44		ns
Turn-OFF Delay Time	t_d(off)	See specified Test Circuit.		28		ns
Fall Time	t_f	See specified Test Circuit.		37		ns
Total Gate Charge	Qg	V_{DS}=10V, V_{GS}=4V, I_D=2.5A		2.9		nC
Gate-to-Source Charge	Qgs	V_{DS}=10V, V_{GS}=4V, I_D=2.5A		0.45		nC
Gate-to-Drain “Miller” Charge	Qgd	V_{DS}=10V, V_{GS}=4V, I_D=2.5A		0.97		nC
Diode Forward Voltage	V_{SD}	I_S=2.5A, V_{GS}=0V		0.83	1.2	V
[SBD]						
Reverse Voltage	V_R	I_R=0.5mA	15			V
Forward Voltage	V_F1	I_F=0.3A		0.31	0.34	V
	V_F2	I_F=0.5A		0.34	0.37	V
Reverse Current	I_R	V_R=6V			90	μA
Interterminal Capacitance	C	V_R=10V, f=1MHz		20		pF
Reverse Recovery Time	t_{rr}	I_F=I_R=100mA, See specified Test Circuit.			10	ns

Package Dimensions

unit : mm (typ)

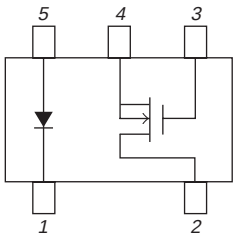
7017A-005



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

SANYO : CPH5

Electrical Connection

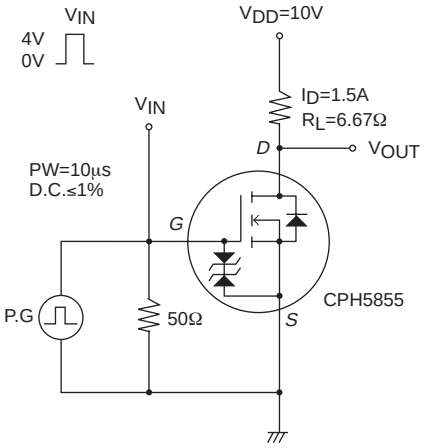


1 : Cathode
2 : Drain
3 : Gate
4 : Source
5 : Anode

Top view

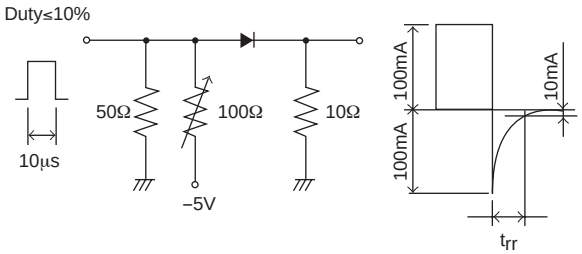
Switching Time Test Circuit

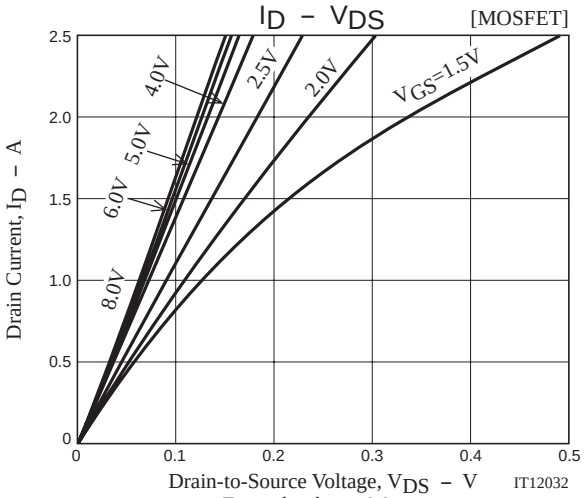
[MOSFET]

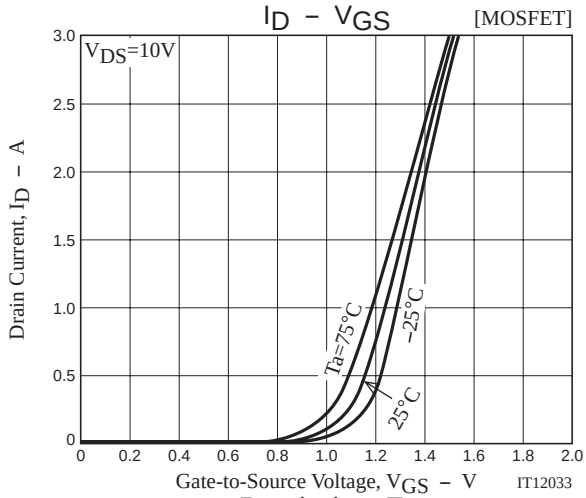


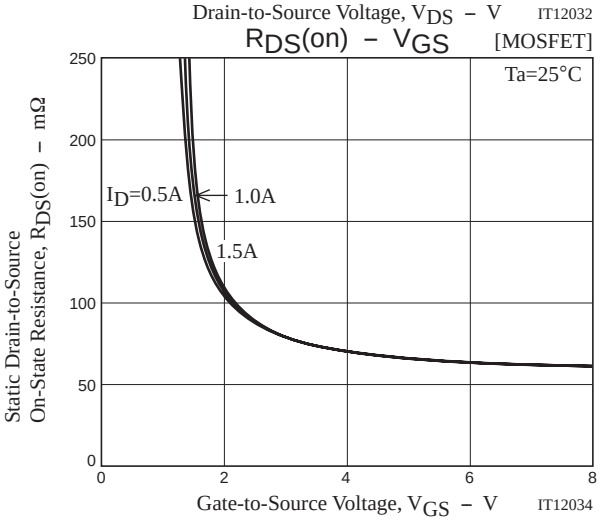
t_{rr} Test Circuit

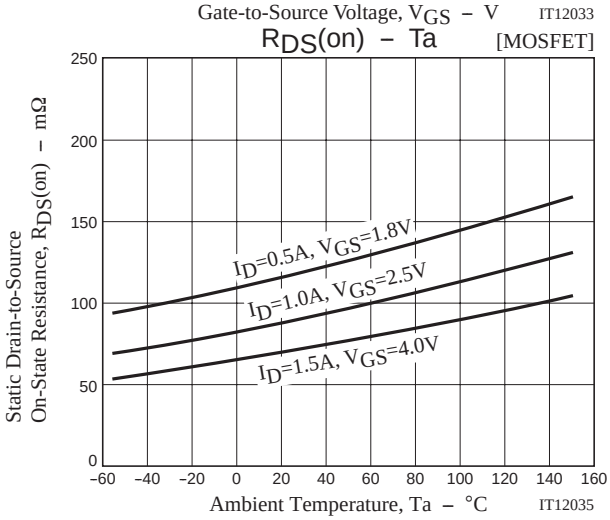
[SBD]

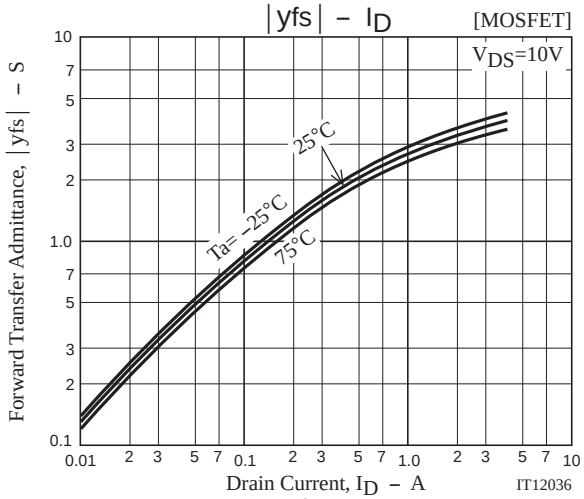


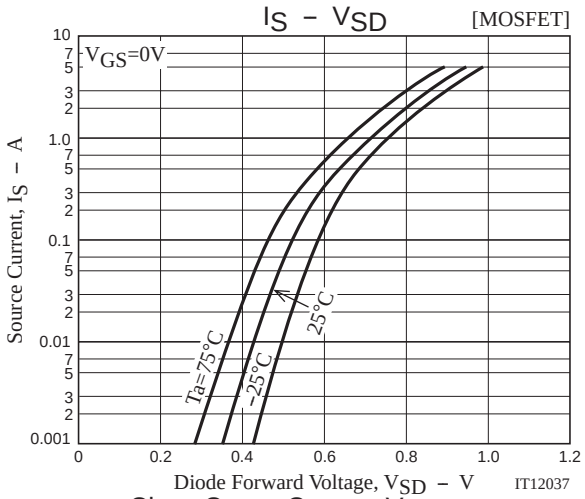


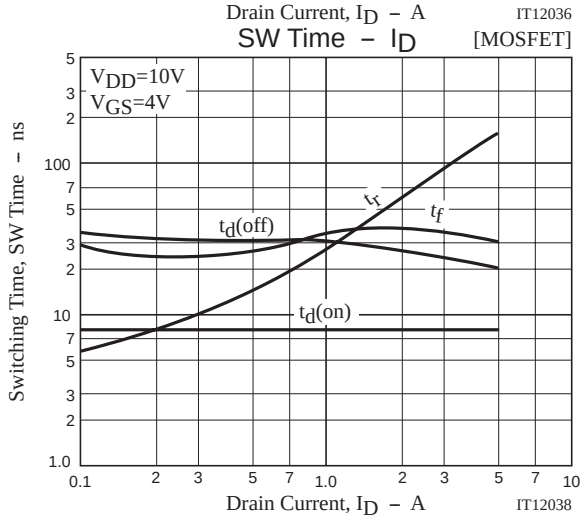


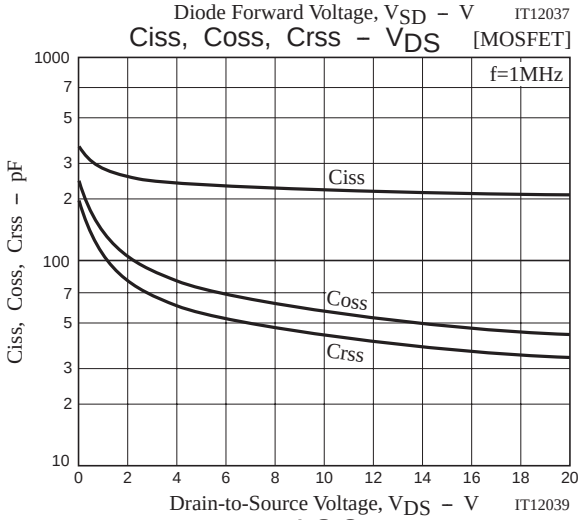


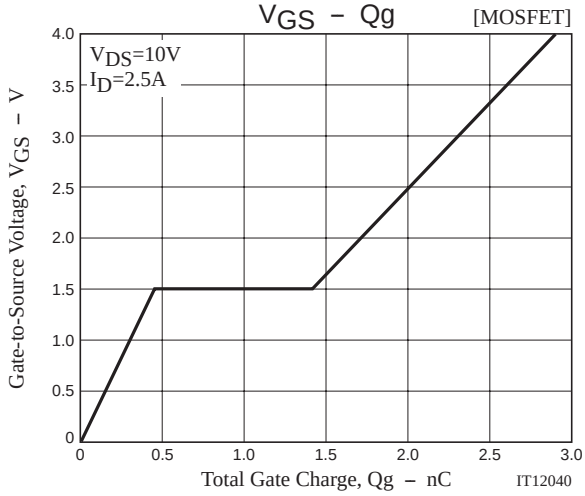


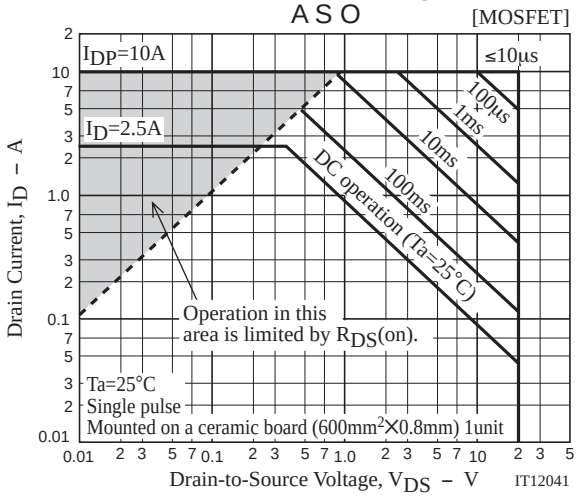

|yfs| – ID [MOSFET]
VDS=10V
25°C
Ta=–25°C
75°C
Forward Transfer Admittance, |yfs| – S
Drain Current, ID – A
IT12036

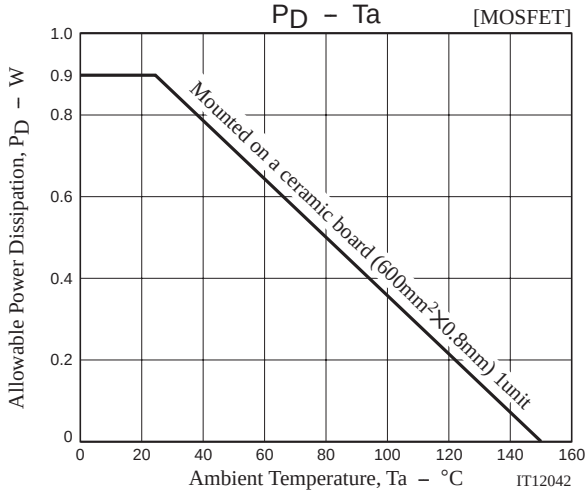

IS – VSD [MOSFET]
VGS=0V
Ta=75°C
–25°C
25°C
Source Current, IS – A
Diode Forward Voltage, VSD – V
IT12037

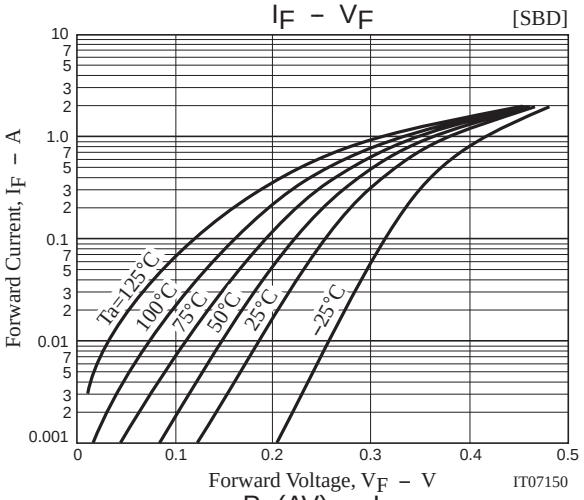

SW Time – ID [MOSFET]
VDD=10V
VGS=4V
tf
td(off)
td(on)
Switching Time, SW Time – ns
Drain Current, ID – A
IT12038

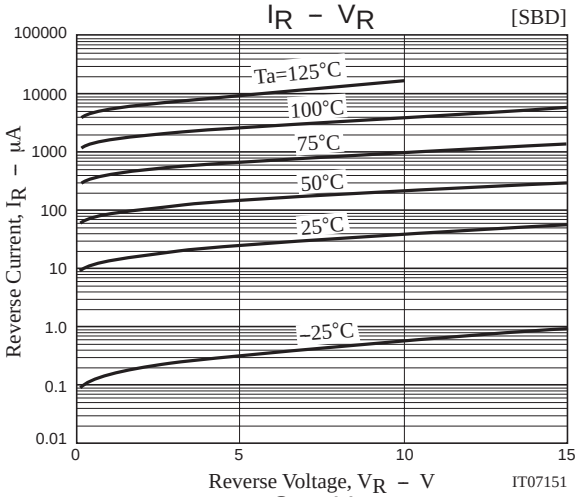

Ciss, Coss, Crss – VDS [MOSFET]
f=1MHz
Ciss
Coss
Crss
Ciss, Coss, Crss – pF
Drain-to-Source Voltage, VDS – V
IT12039

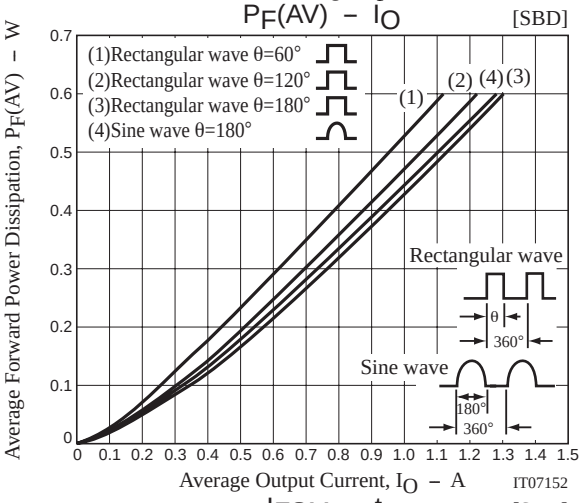

VGS – Qg [MOSFET]
VDS=10V
ID=2.5A
Gate-to-Source Voltage, VGS – V
Total Gate Charge, Qg – nC
IT12040

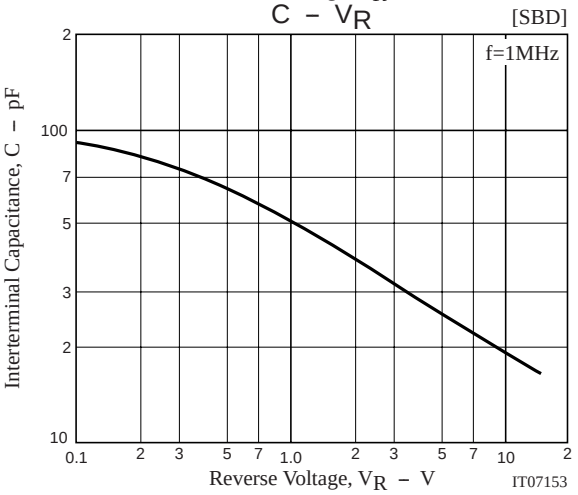

A S O [MOSFET]
IDP=10A
ID=2.5A
≤10μs
100μs
1ms
10ms
100ms
DC operation (Ta=25°C)
Operation in this
area is limited by RDS(on).
Ta=25°C
Single pulse
Mounted on a ceramic board (600mm2×0.8mm) 1unit
Drain Current, ID – A
Drain-to-Source Voltage, VDS – V
IT12041

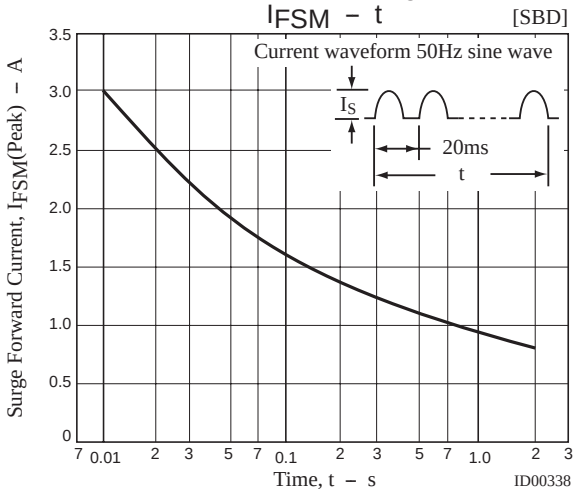

PD – Ta [MOSFET]
Mounted on a ceramic board (600mm2×0.8mm) 1unit
Allowable Power Dissipation, PD – W
Ambient Temperature, Ta – °C
IT12042


IF – VF
[SBD]
Forward Current, IF – A
Forward Voltage, VF – V
Ta=125°C
100°C
75°C
50°C
25°C
–25°C
IT07150


IR – VR
[SBD]
Reverse Current, IR – μA
Reverse Voltage, VR – V
Ta=125°C
100°C
75°C
50°C
25°C
–25°C
IT07151


PF(AV) – IO
[SBD]
Average Forward Power Dissipation, PF(AV) – W
Average Output Current, IO – A
(1)Rectangular wave θ=60°
(2)Rectangular wave θ=120°
(3)Rectangular wave θ=180°
(4)Sine wave θ=180°
Rectangular wave
Sine wave
θ
360°
180°
IT07152


C – VR
[SBD]
f=1MHz
Interterminal Capacitance, C – pF
Reverse Voltage, VR – V
IT07153


IFSM – t
[SBD]
Current waveform 50Hz sine wave
IS
20ms
t
Surge Forward Current, IFSM(Peak) – A
Time, t – s
ID00338

Note on usage : Since the CPH5855 is a MOSFET product, please avoid using this device in the vicinity of highly charged objects.

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