Ordering number : ENN8235

SANYO Semiconductors
DATA SHEET

CPH5838 — General-Purpose Switching Device Applications

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

Features

- DC / DC converters.
- Composite type with a P-Channel Sillicon MOSFET (MCH3307) and a Schottky Barrier Diode (SBS004) contained in one package facilitating high-density mounting.

[MOSFET]
- Low ON-resistance.
- Ultrahigh-speed switching.
- 2.5V 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		−1	A
Drain Current (Pulse)	I_{DP}	PW≤10μs, duty cycle≤1%	−4	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
[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	10	A
Junction Temperature	Tj		−55 to +125	°C
Storage Temperature	Tstg		−55 to +125	°C

Marking : XQ

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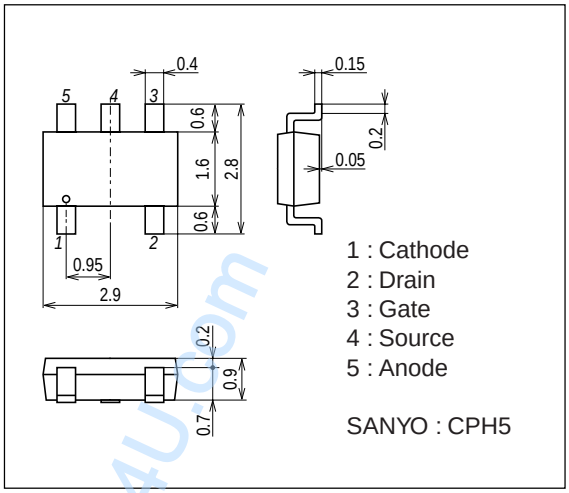
Electrical Characteristics at Ta=25°C

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	μA
Gate-to-Source Leakage Current	I_{GSS}	V_{GS}=±8V, V_{DS}=0			±10	μA
Cutoff Voltage	V_{GS}(off)	V_{DS}=-10V, I_D=-1mA	-0.4		-1.4	V
Forward Transfer Admittance	|yfs|	V_{DS}=-10V, I_D=-500mA	0.72	1.2		S
Static Drain-to-Source On-State Resistance	R_{DS}(on)1	I_D=-500mA, V_{GS}=-4V		380	500	mΩ
	R_{DS}(on)2	I_D=-300mA, V_{GS}=-2.5V		540	760	mΩ
Input Capacitance	Ciss	V_{DS}=-10V, f=1MHz		115		pF
Output Capacitance	Coss	V_{DS}=-10V, f=1MHz		23		pF
Reverse Transfer Capacitance	Crss	V_{DS}=-10V, f=1MHz		15		pF
Turn-ON Delay Time	t_d(on)	See specified Test Circuit.		8		ns
Rise Time	t_r	See specified Test Circuit.		6		ns
Turn-OFF Delay Time	t_d(off)	See specified Test Circuit.		15		ns
Fall Time	t_f	See specified Test Circuit.		7		ns
Total Gate Charge	Qg	V_{DS}=-10V, V_{GS}=-4V, I_D=-1A		1.5		nC
Gate-to-Source Charge	Qgs	V_{DS}=-10V, V_{GS}=-4V, I_D=-1A		0.4		nC
Gate-to-Drain “Miller” Charge	Qgd	V_{DS}=-10V, V_{GS}=-4V, I_D=-1A		0.3		nC
Diode Forward Voltage	V_{SD}	I_S=-1A, V_{GS}=0		-0.89	-1.2	V
[SBD]						
Reverse Voltage	V_R	I_R=1mA	15			V
Forward Voltage	V_F1	I_F=0.5A		0.30	0.35	V
	V_F2	I_F=1A		0.35	0.40	V
Reverse Current	I_R	V_R=6V			500	μA
Interterminal Capacitance	C	V_R=10V, f=1MHz, cycle		42		pF
Reverse Recovery Time	t_{rr}	I_F=I_R=100mA, See specified Test Circuit.			15	ns
Thermal Resistance	Rth(j-a)	Mounted on a ceramic board (900mm²×0.8mm)		110		°C / W

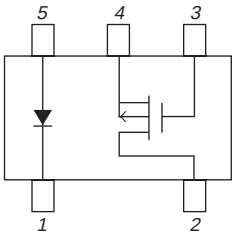
Package Dimensions

unit : mm

2171A

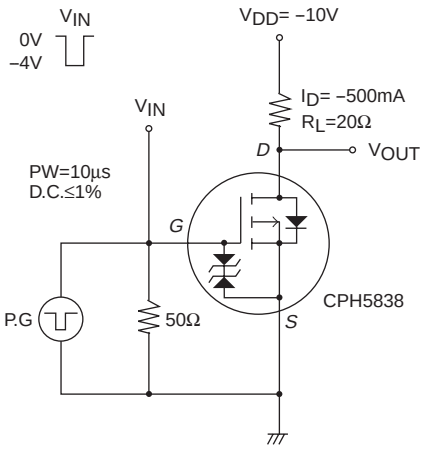


Electrical Connection



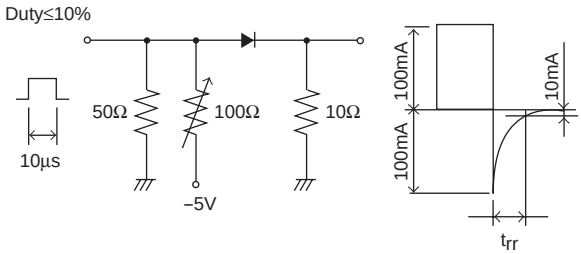
Switching Time Test Circuit

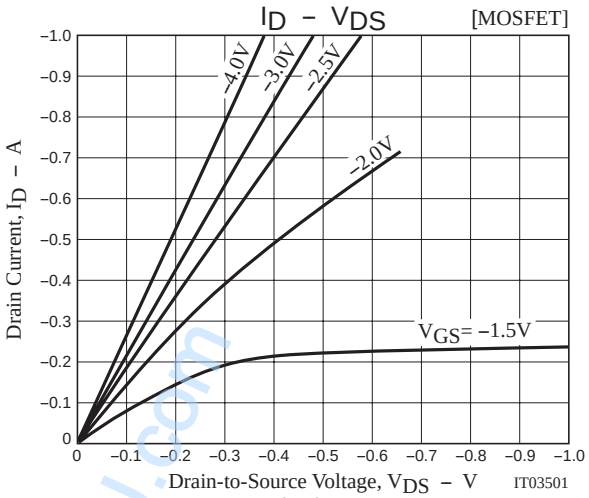
[MOSFET]

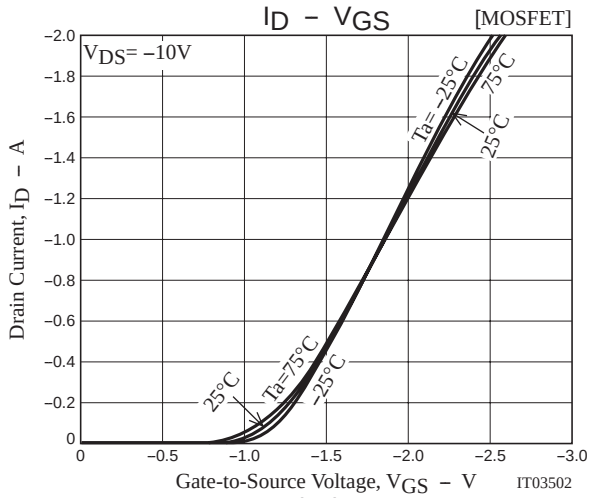


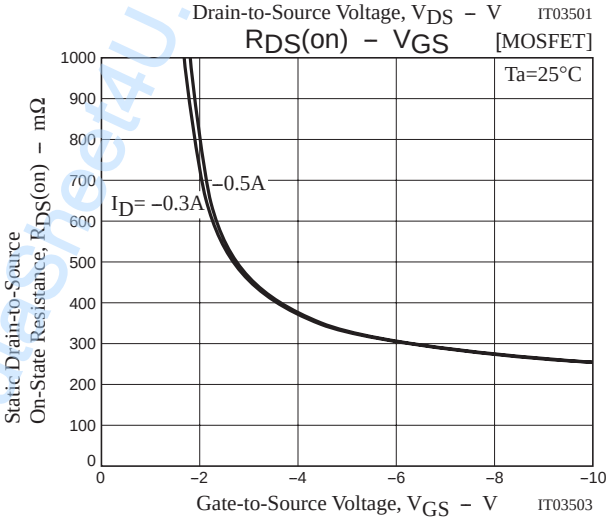
t_{rr} Test Circuit

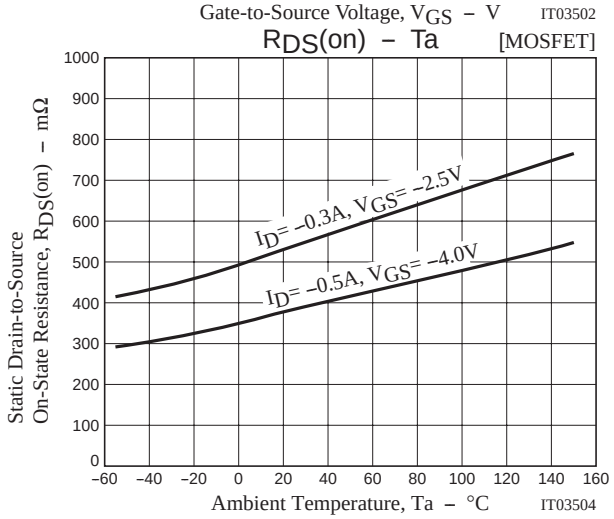
[SBD]

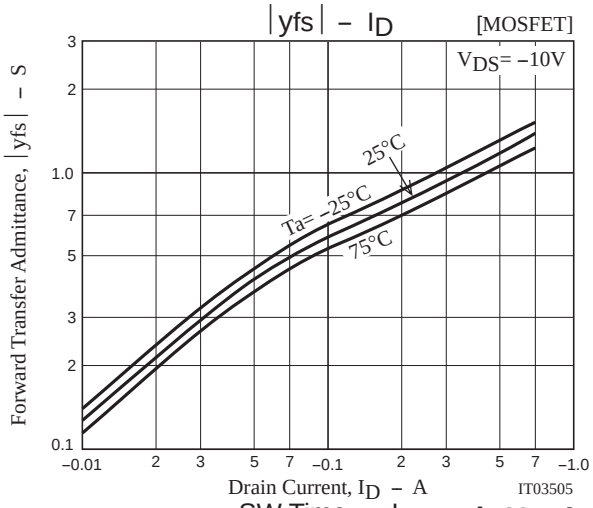


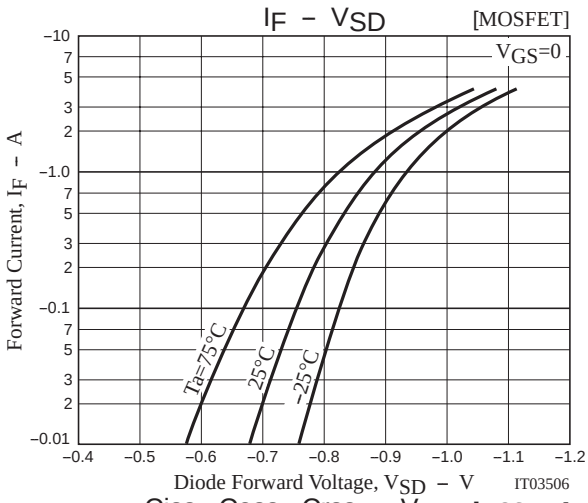


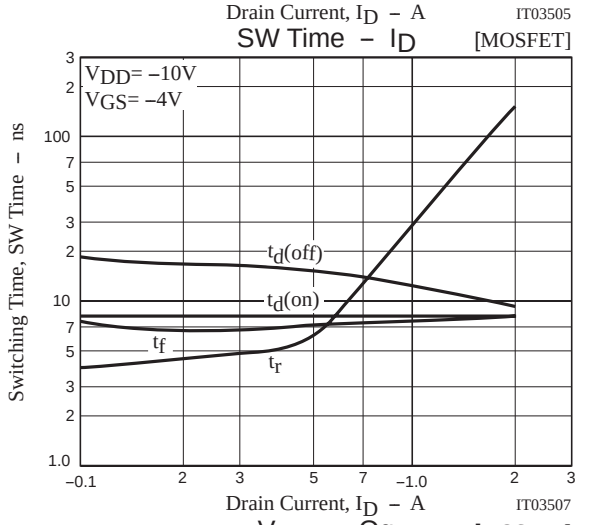


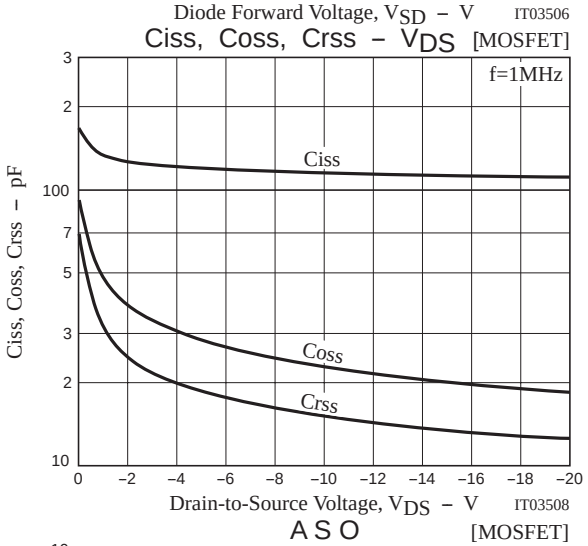


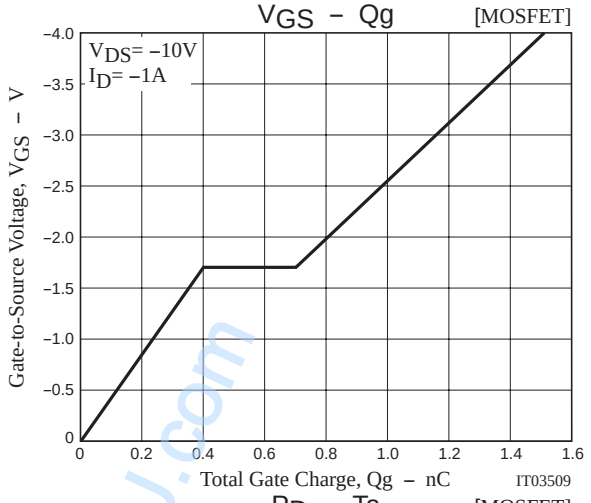


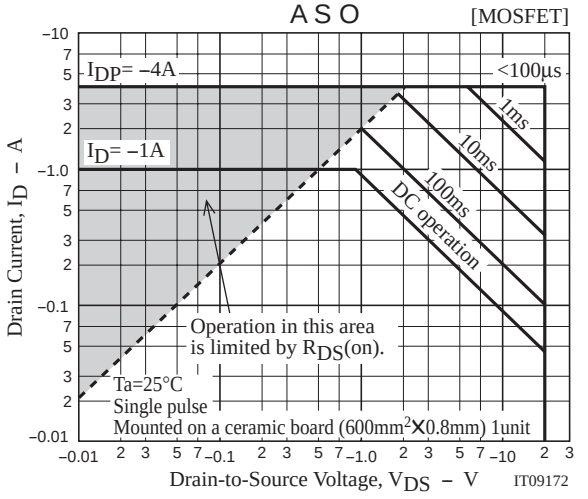


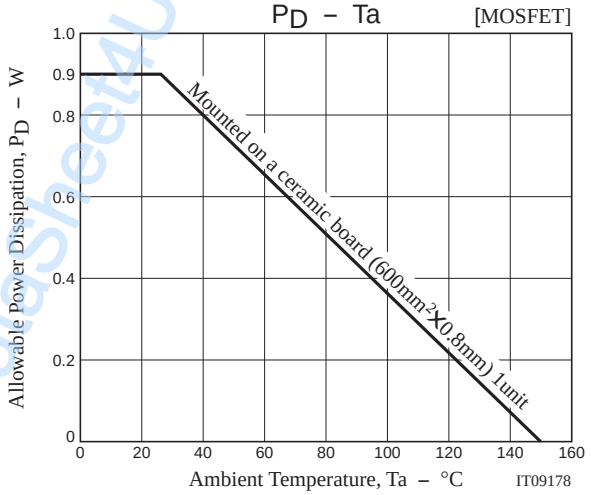




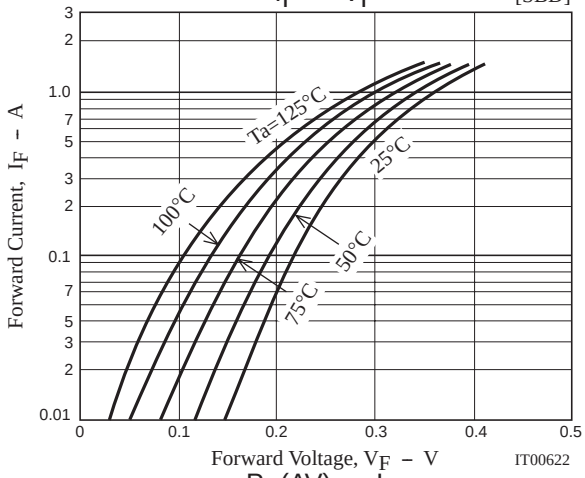




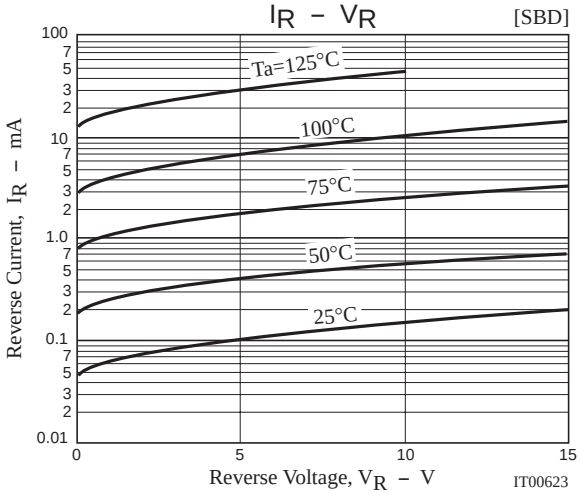




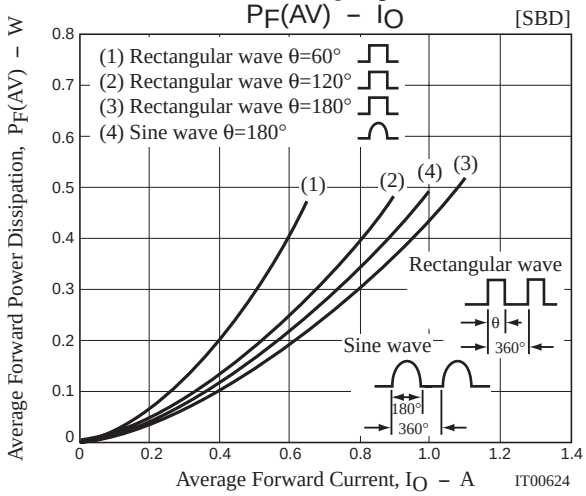
$I_F - V_F$ [SBD]



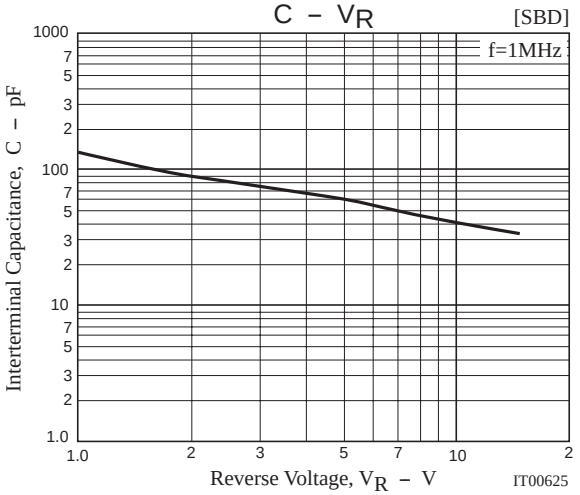
$I_R - V_R$ [SBD]



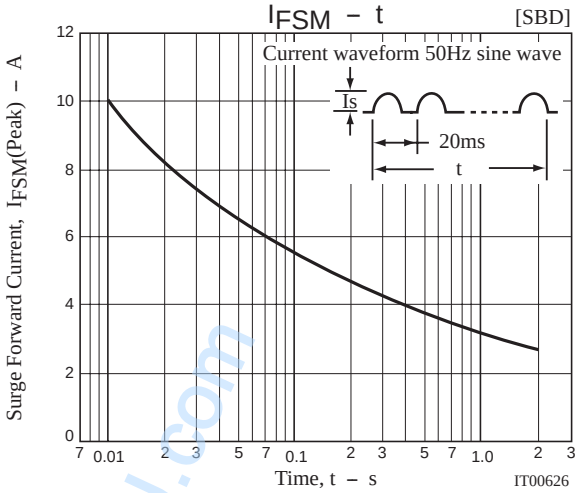
$P_{F(AV)} - I_O$ [SBD]



$C - V_R$ [SBD]



$I_{FSM} - t$ [SBD]



Note on usage : Since the CPH5838 is a MOSFET product, please avoid using this device in the vicinity of highly charged objects.