

Ordering number : ENN7381

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



**CPH5815**

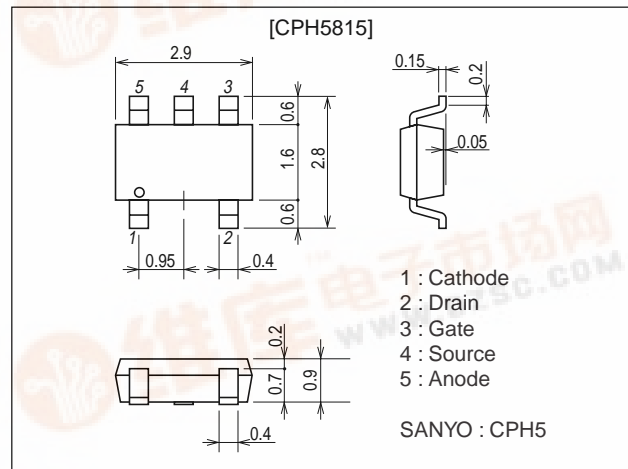
**DC / DC Converter Applications**

**Features**

- Composite type with a P-Channel Silicon MOSFET (MCH3317) and a Schottky Barrier Diode (SBS007M) contained in one package facilitating high-density mounting.
- [MOS]
  - 1) Low ON-resistance.
  - 2) Ultrahigh-speed switching.
  - 3) 1.8V drive.
- [SBD]
  - 1) Short reverse recovery time.
  - 2) Low forward voltage.

**Package Dimensions**

unit : mm  
2171



**Specifications**

**Absolute Maximum Ratings** at Ta=25°C

Parameter	Symbol	Conditions	Ratings	Unit
[MOSFET]				
Drain-to-Source Voltage	V <sub>DSS</sub>		-12	V
Gate-to-Source Voltage	V <sub>GSS</sub>		±10	V
Drain Current (DC)	I <sub>D</sub>		-1.5	A
Drain Current (Pulse)	I <sub>DP</sub>	PW≤10μs, duty cycle≤1%	-6.0	A
Allowable Power Dissipation	P <sub>D</sub>	Mounted on a ceramic board (600mm²X0.8mm) 1unit	0.8	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>		15	V
Nonrepetitive Peak Reverse Surge Voltage	V <sub>RSM</sub>		15	V
Average Output Current	I <sub>O</sub>		0.5	A
Surge Forward Current	I <sub>FSM</sub>	50Hz sine wave, 1 cycle	3	A
Junction Temperature	T <sub>J</sub>		-55 to +125	°C
Storage Temperature	T <sub>stg</sub>		-55 to +125	°C

Marking : QR

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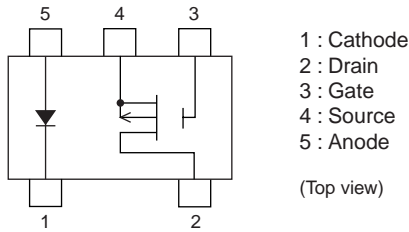


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## Electrical Characteristics at Ta=25°C

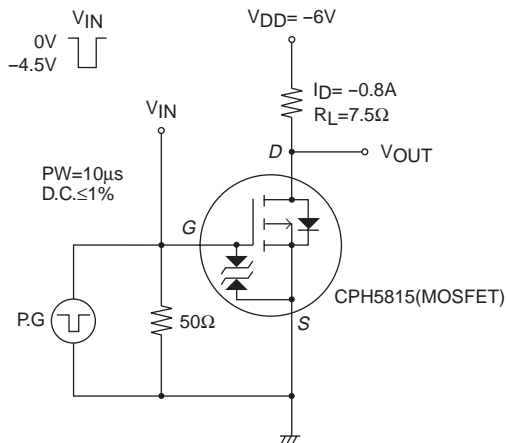
Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
[MOSFET]						
Drain-to-Source Breakdown Voltage	$V_{(BR)DSS}$	$I_D=-1mA, V_{GS}=0$	-12			V
Zero-Gate Voltage Drain Current	$I_{DSS}$	$V_{DS}=-12V, V_{GS}=0$			-10	$\mu A$
Gate-to-Source Leakage Current	$I_{GSS}$	$V_{GS}=\pm 8.0V, V_{DS}=0$			$\pm 10$	$\mu A$
Cutoff Voltage	$V_{GS(off)}$	$V_{DS}=-6V, I_D=-1mA$	-0.3		-1.0	V
Forward Transfer Admittance	$ y_{fs} $	$V_{DS}=-6V, I_D=-0.8A$	1.3	1.8		S
Static Drain-to-Source On-State Resistance	$R_{DS(on)1}$	$I_D=-0.8A, V_{GS}=-4.5V$		220	290	$m\Omega$
	$R_{DS(on)2}$	$I_D=-0.4A, V_{GS}=-2.5V$		320	450	$m\Omega$
	$R_{DS(on)3}$	$I_D=-0.1A, V_{GS}=-1.8V$		430	650	$m\Omega$
Input Capacitance	$C_{iss}$	$V_{DS}=-6V, f=1MHz$		160		pF
Output Capacitance	$C_{oss}$	$V_{DS}=-6V, f=1MHz$		45		pF
Reverse Transfer Capacitance	$C_{rss}$	$V_{DS}=-6V, f=1MHz$		35		pF
Turn-ON Delay Time	$t_{d(on)}$	See specified Test Circuit.		11		ns
Rise Time	$t_r$	See specified Test Circuit.		45		ns
Turn-OFF Delay Time	$t_{d(off)}$	See specified Test Circuit.		29		ns
Fall Time	$t_f$	See specified Test Circuit.		30		ns
Total Gate Charge	$Q_g$	$V_{DS}=-6V, V_{GS}=-4.5V, I_D=-1.5A$		2.6		nC
Gate-to-Source Charge	$Q_{gs}$	$V_{DS}=-6V, V_{GS}=-4.5V, I_D=-1.5A$		0.25		nC
Gate-to-Drain "Miller" Charge	$Q_{gd}$	$V_{DS}=-6V, V_{GS}=-4.5V, I_D=-1.5A$		0.65		nC
Diode Forward Voltage	$V_{SD}$	$I_S=-1.5A, V_{GS}=0$		-0.92	-1.5	V
[SBD]						
Reverse Voltage	$V_R$	$I_R=0.5mA$	15			V
Forward Voltage	$V_{F1}$	$I_F=0.3A$		0.35	0.41	V
	$V_{F2}$	$I_F=0.5A$		0.4	0.46	V
Reverse Current	$I_R$	$V_R=6V$			200	$\mu A$
Interterminal Capacitance	$C$	$V_R=10V, f=1MHz$ cycle		20		pF
Reverse Recovery Time	$t_{rr}$	$I_F=I_R=100mA$ , see specified Test Circuit.			10	ns

## Electrical Connection



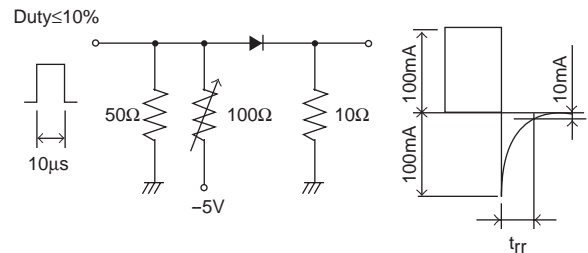
## Switching Time Test Circuit

[MOSFET]

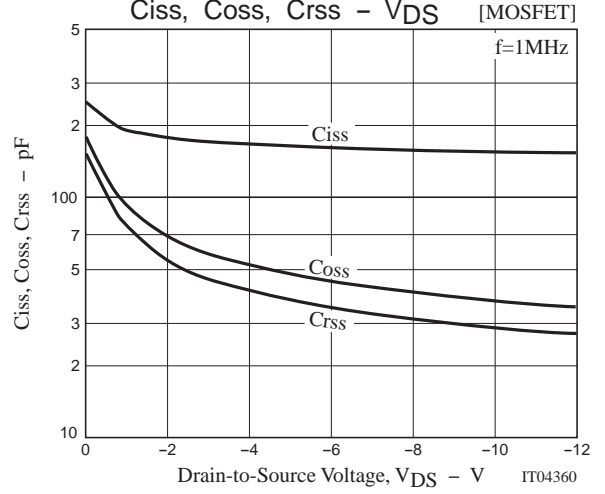
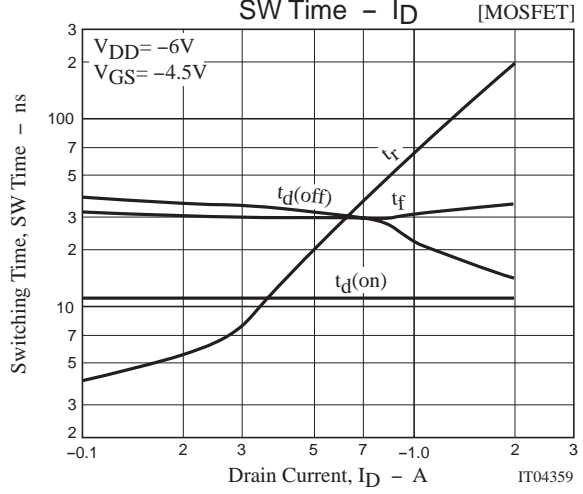
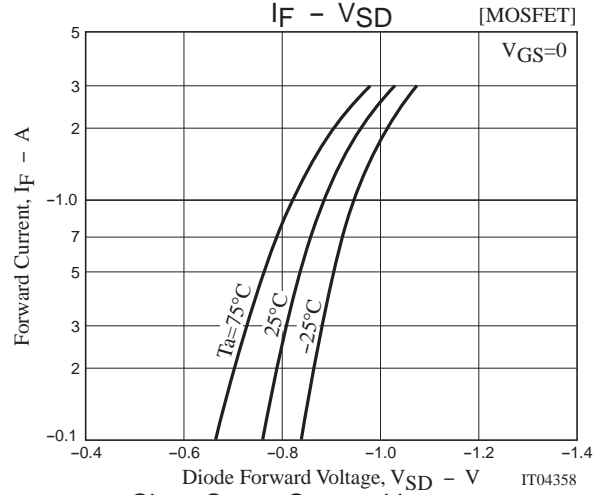
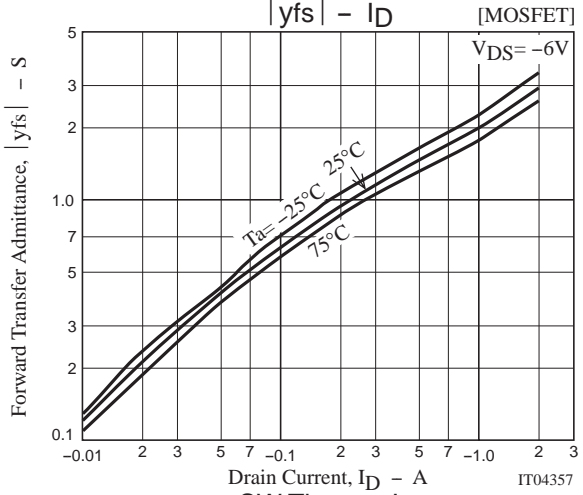
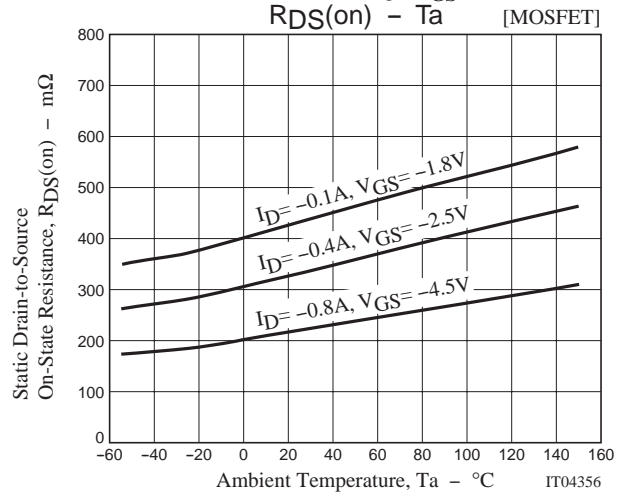
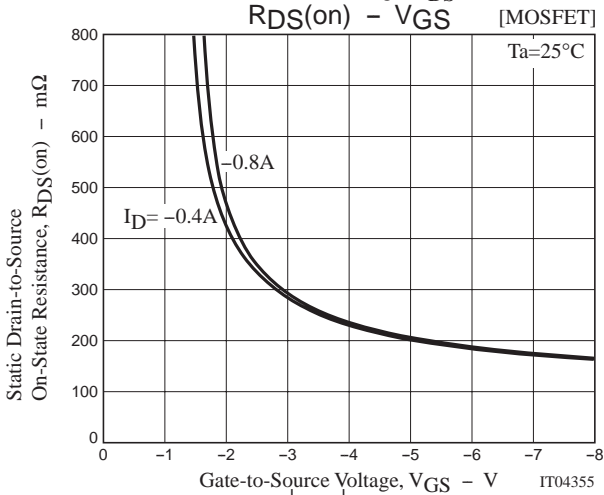
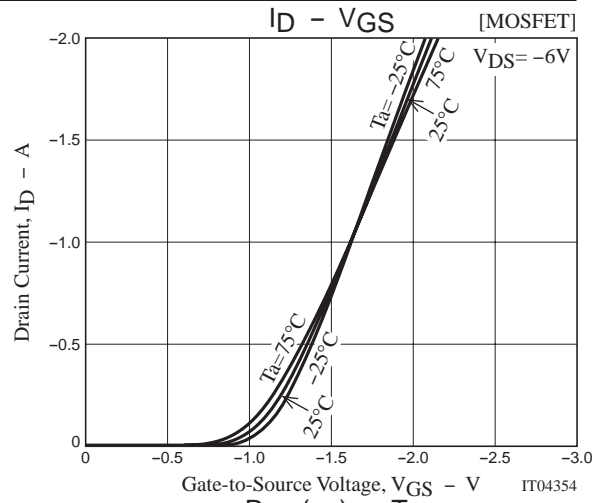
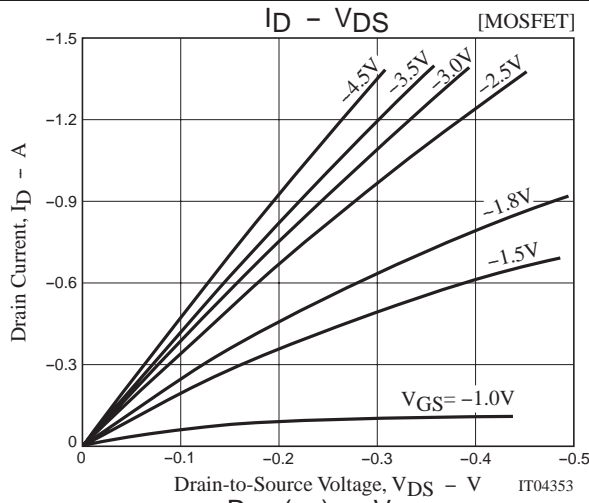


## $t_{rr}$ Test Circuit

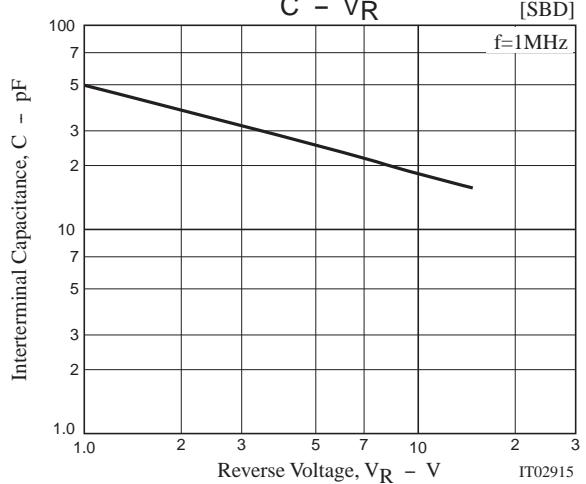
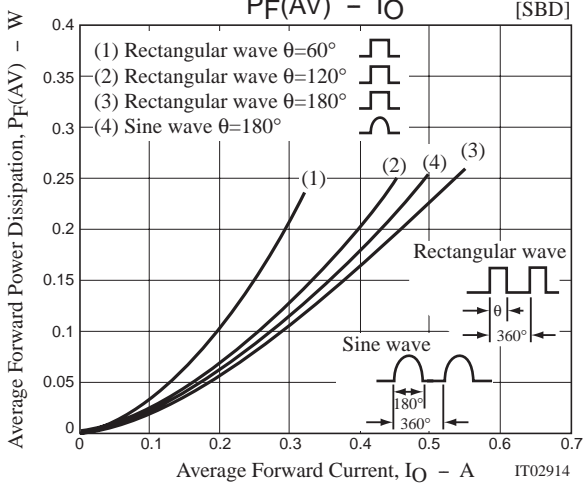
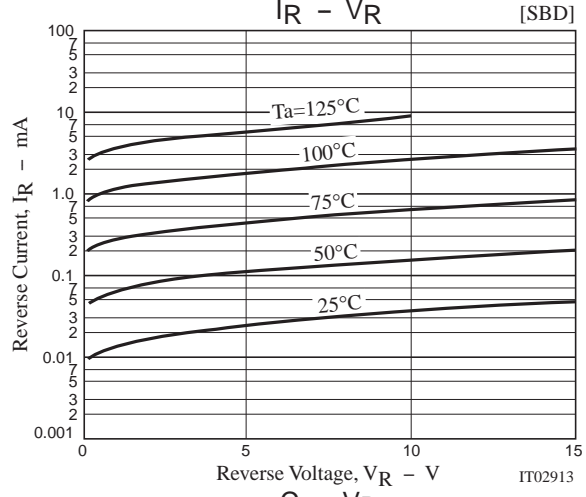
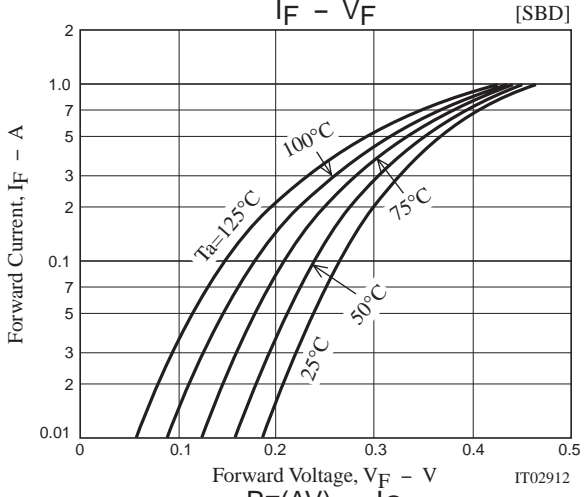
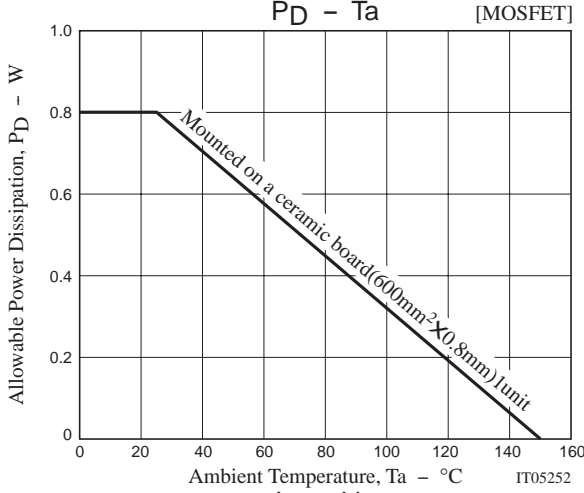
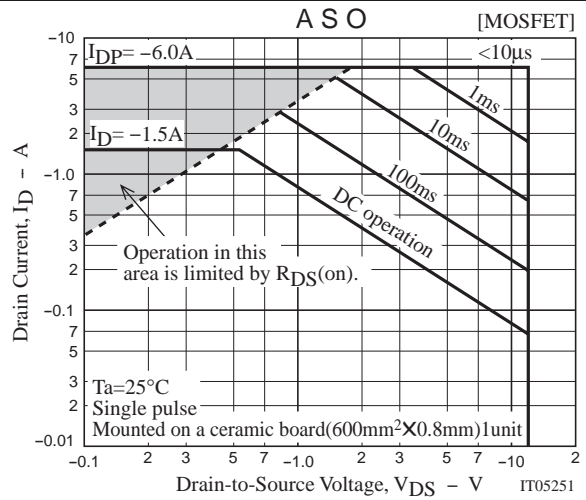
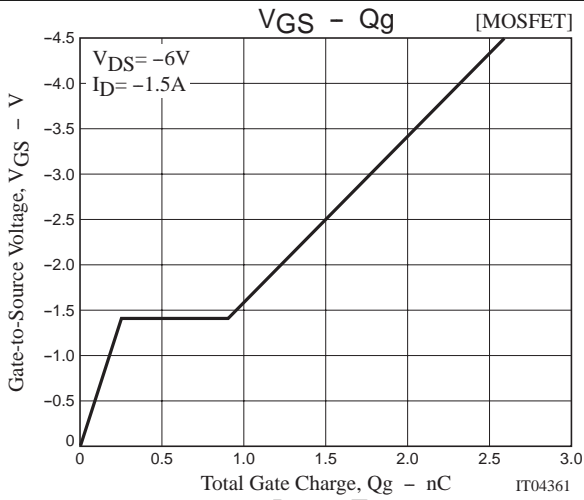
[SBD]



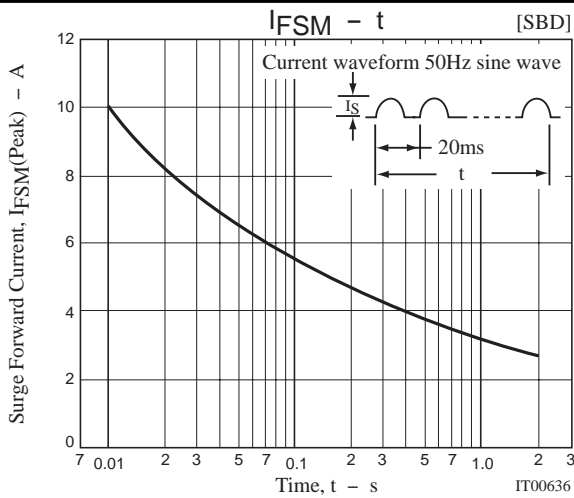
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