

**DC / DC Converter Applications****Features**

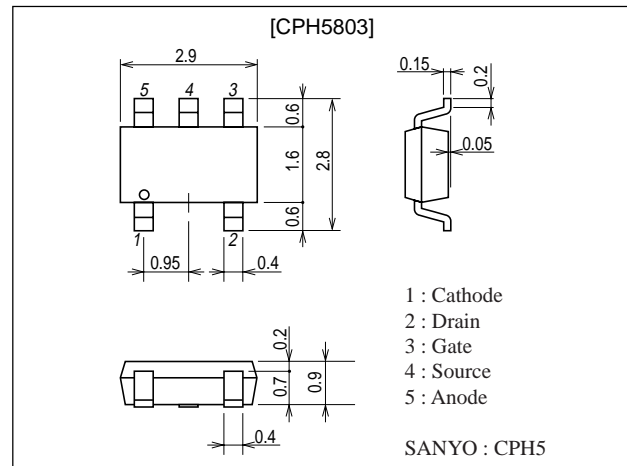
- Composite type with an N-Channel Silicon MOSFET (MCH3405) and a Schottky Barrier Diode (SBS004M) contained in one package facilitating high-density mounting.

[MOSFET]

- Low ON-resistance.
- Ultrahigh-speed switching.
- 1.8V drive.

[SBD]

- Short reverse recovery time.
- Low forward voltage.

Package Dimensionsunit : mm
2171**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 _{GS}		±10	V
Drain Current (DC)	I _D		1.5	A
Drain Current (Pulse)	I _{DP}	PW≤10μs, duty cycle≤1%	6	A
Allowable Power Dissipation	P _D	Mounted on a ceramic board (900mm ² X0.8mm) 1unit	0.8	W
Channel Temperature	T _{ch}		150	°C
Storage Temperature	T _{stg}		-55 to +125	°C
[SBD]				
Repetitive Peak Reverse Voltage	V _R RM		15	V
Non-repetitive Peak Reverse Surge Voltage	V _R S		15	V
Average Output Current	I _O		1	A
Surge Forward Current	I _{FSM}	50Hz sine wave, 1 cycle	10	A
Junction Temperature	T _J		-55 to +125	°C
Storage Temperature	T _{stg}		-55 to +125	°C

Marking : QD

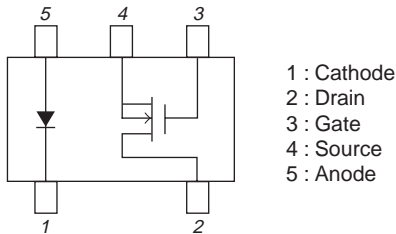
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Electrical Characteristics at Ta=25°C

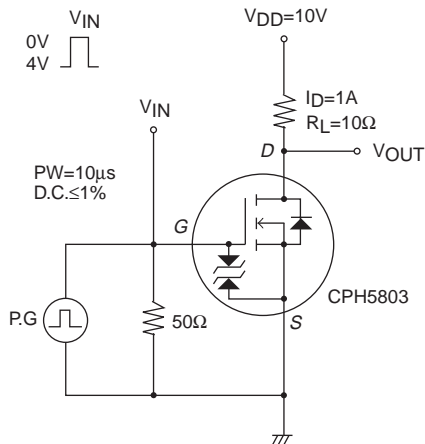
Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
[MOSFET]						
Drain-to-Source Breakdown Voltage	$V_{(BR)DSS}$	$I_D=1mA, V_{GS}=0$	20			V
Zero-Gate Voltage Drain Current	I_{DSS}	$V_{DS}=20V, V_{GS}=0$			1	μA
Gate-to-Source Leakage Current	I_{GSS}	$V_{GS}=\pm 8V, V_{DS}=0$			± 10	μA
Cutoff Voltage	$V_{GS(off)}$	$V_{DS}=10V, I_D=1mA$	0.4		1.3	V
Forward Transfer Admittance	$ y_{fs} $	$V_{DS}=10V, I_D=1A$	1.9	2.8		S
Static Drain-to-Source On-State Resistance	$R_{DS(on)1}$	$I_D=1A, V_{GS}=4V$		160	210	m Ω
	$R_{DS(on)2}$	$I_D=0.5A, V_{GS}=2.5V$		200	280	m Ω
	$R_{DS(on)3}$	$I_D=0.1A, V_{GS}=1.8V$		280	390	m Ω
Input Capacitance	C_{iss}	$V_{DS}=10V, f=1MHz$		100		pF
Output Capacitance	C_{oss}	$V_{DS}=10V, f=1MHz$		22		pF
Reverse Transfer Capacitance	C_{rss}	$V_{DS}=10V, f=1MHz$		15		pF
Turn-ON Delay Time	$t_d(on)$	See specified Test Circuit		6.5		ns
Rise Time	t_r	See specified Test Circuit		28		ns
Turn-OFF Delay Time	$t_d(off)$	See specified Test Circuit		19		ns
Fall Time	t_f	See specified Test Circuit		13		ns
Total Gate Charge	Q_g	$V_{DS}=10V, V_{GS}=10V, I_D=1.5A$		4.5		nC
Gate-to-Source Charge	Q_{gs}	$V_{DS}=10V, V_{GS}=10V, I_D=1.5A$		0.4		nC
Gate-to-Drain "Miller" Charge	Q_{gd}	$V_{DS}=10V, V_{GS}=10V, I_D=1.5A$		0.4		nC
Diode Forward Voltage	V_{SD}	$I_S=1.5A, V_{GS}=0$		0.83	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	$V_R=10V, f=1MHz, 1 \text{ cycle}$		42		pF
Reverse Recovery Time	t_{rr}	$I_F=I_R=100mA$, See specified Test Circuit.			15	ns
Thermal Resistance	$R_{th(j-a)}$	Mounted on a ceramic board (900mm ² X0.8mm)		110		$^{\circ}C / W$

Electrical Connection (Top view)



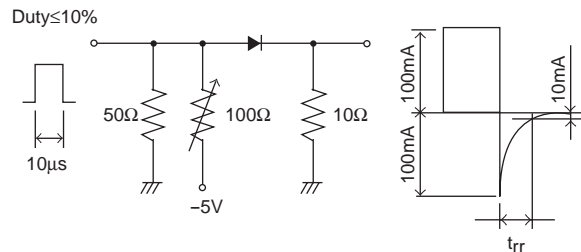
Switching Time Test Circuit

[MOSFET]

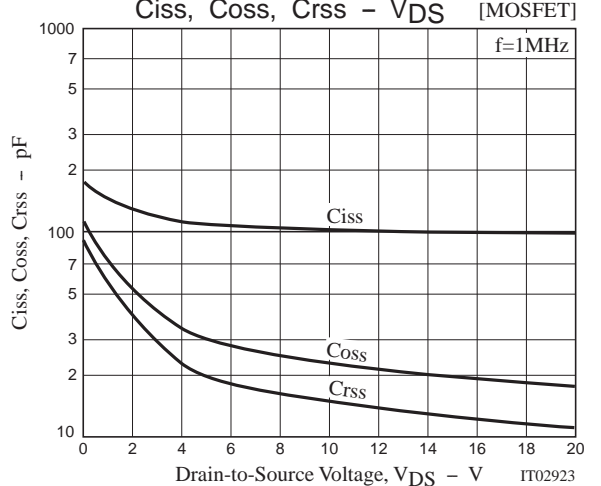
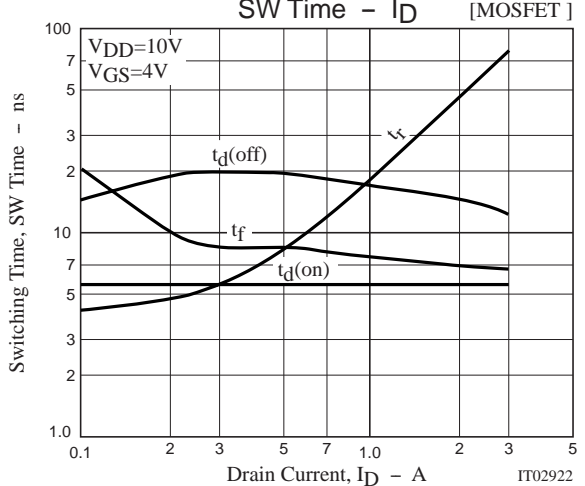
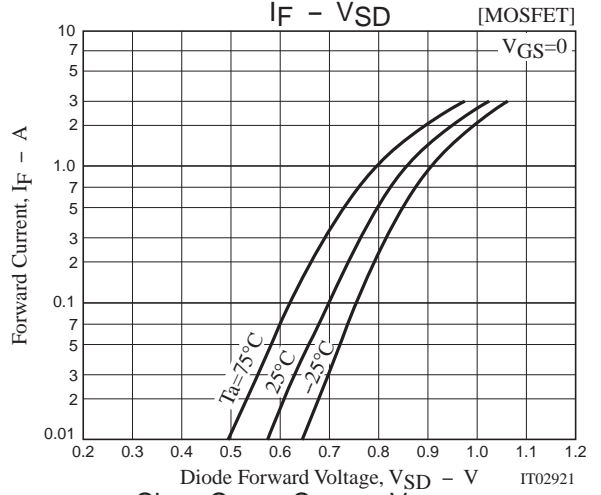
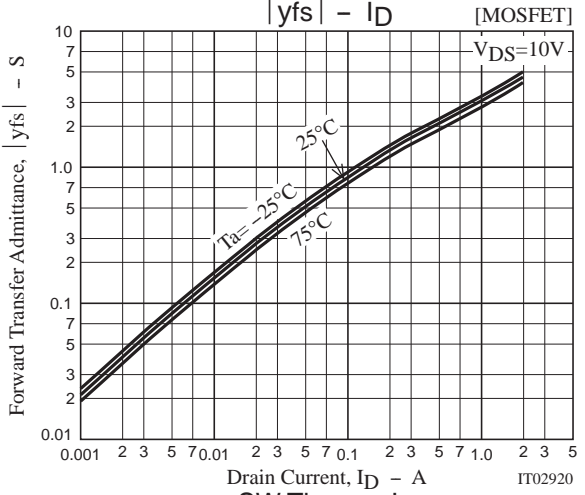
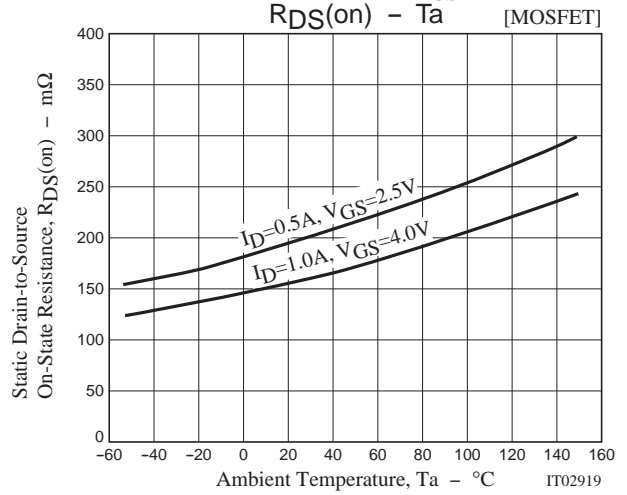
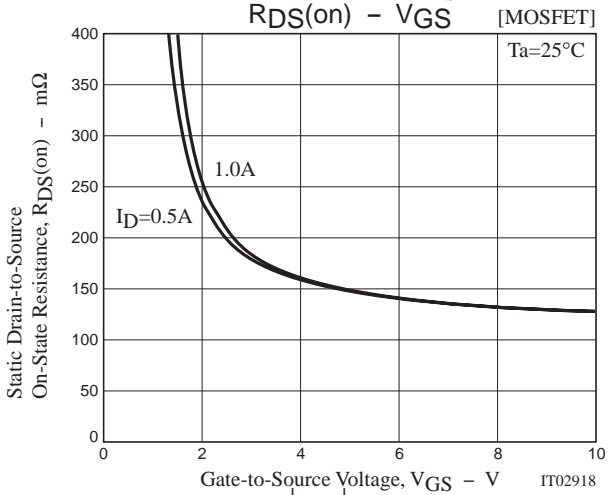
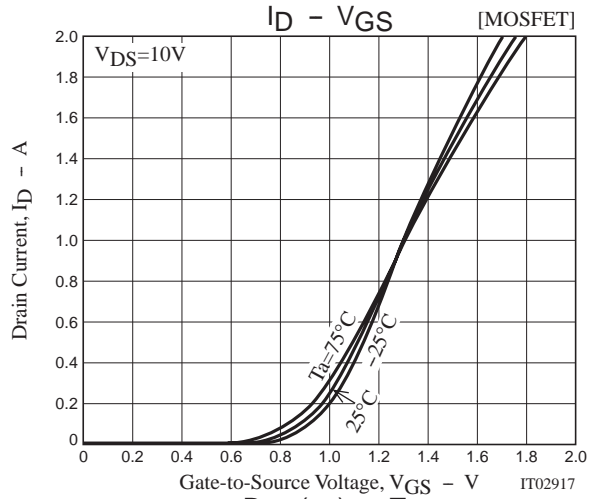
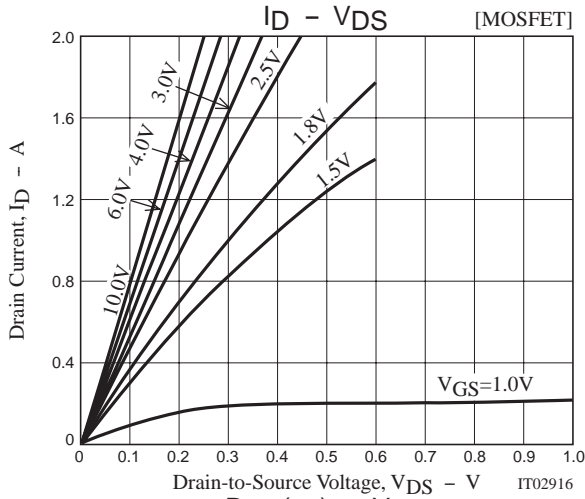


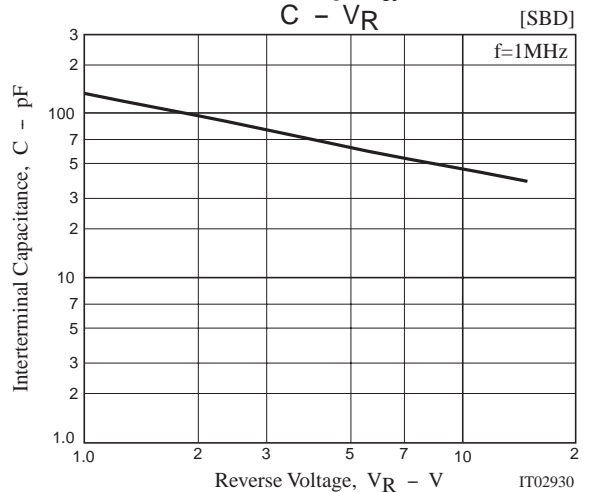
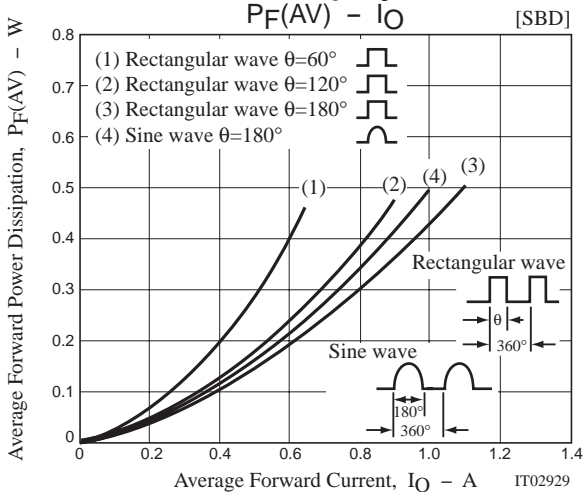
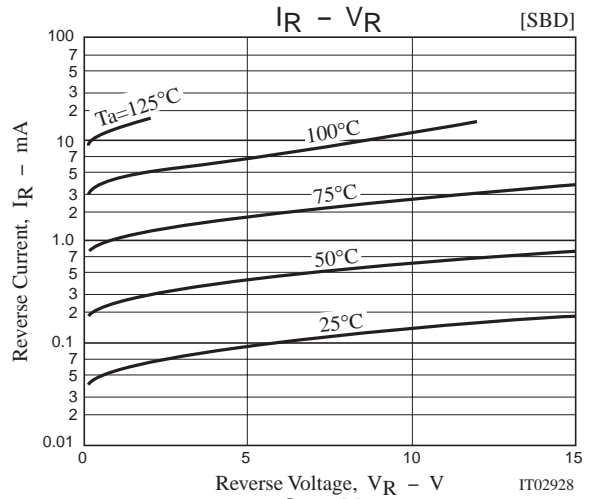
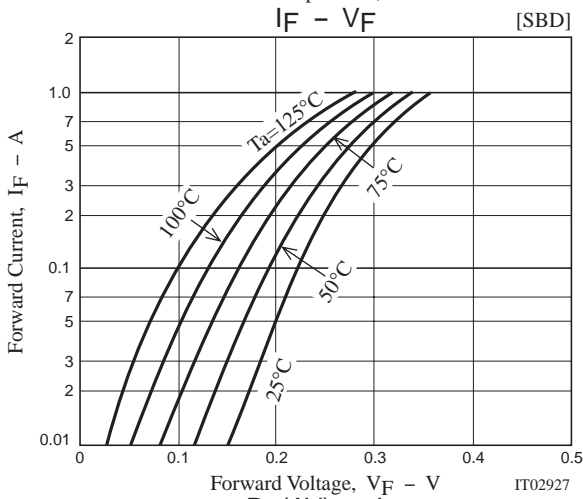
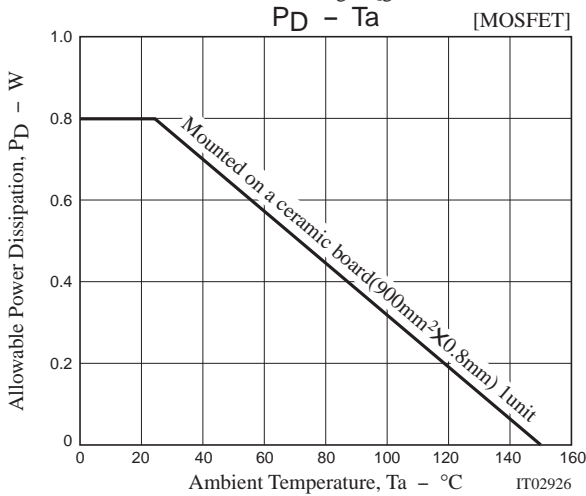
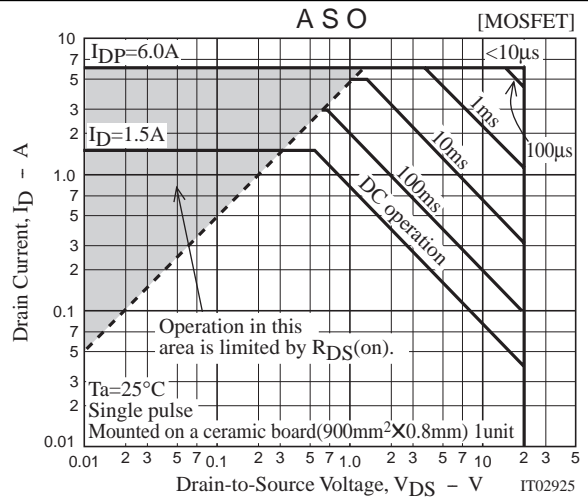
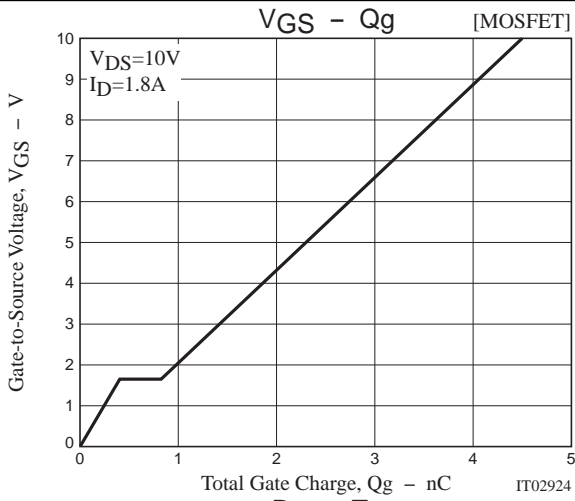
trr Test Circuit

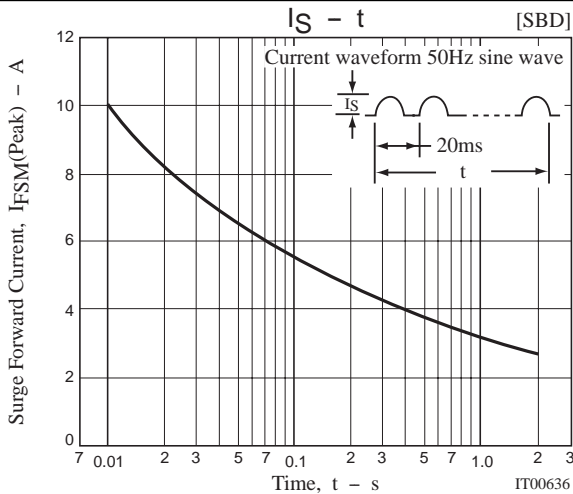
[SBD]



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