



SANYO Semiconductors

## DATA SHEET

**MCH5810**

MOSFET : P-Channel Silicon MOSFET

SBD : Schottky Barrier Diode

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

- Composite type with a P-Channel Silicon MOSFET (MCH3335) and a Schottky Barrier Diode (SBS011) contained in one package facilitating high-density mounting.
- [MOSFET]
  - Low ON-resistance.
  - Ultrahigh-speed switching.
  - 4V 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 <sub>DSS</sub>		-30	V
Gate-to-Source Voltage(*1)	V <sub>GS</sub>		-9	V
Drain Current (DC)	I <sub>D</sub>		-0.4	A
Drain Current (Pulse)	I <sub>DP</sub>	PW≤10μs, duty cycle≤1%	-1.6	A
Allowable Power Dissipation	P <sub>D</sub>	Mounted on a ceramic board (900mm <sup>2</sup> ×0.8mm) 1unit	0.6	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>R</sub> RM		15	V
Nonrepetitive Peak Reverse Surge Voltage	V <sub>R</sub> SM		15	V
Average Output Current	I <sub>O</sub>		150	mA
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 : QK

(\*1) : When designing a circuit using this product, that this P-channel MOSFET has a gate (oxide film) protection diode connected only between its gate and source.

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**SANYO Electric Co.,Ltd. Semiconductor Company**

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# MCH5810

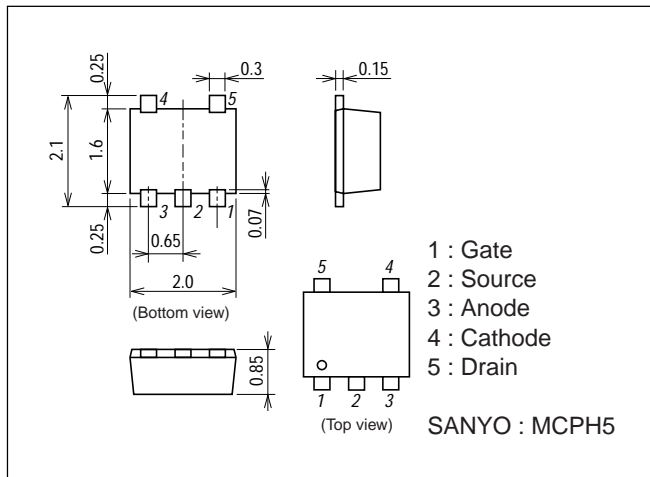
## Electrical Characteristics at Ta=25°C

Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
[MOSFET]						
Drain-to-Source Breakdown Voltage	$V_{(BR)DSS}$	$I_D=-1mA, V_{GS}=0$	-30			V
Zero-Gate Voltage Drain Current	$I_{DSS}$	$V_{DS}=-30V, V_{GS}=0$			-1	$\mu A$
Gate-to-Source Leakage Current	$I_{GSS}$	$V_{GS}=-8V, V_{DS}=0$			-1	$\mu A$
Cutoff Voltage	$V_{GS(off)}$	$V_{DS}=-10V, I_D=-100\mu A$	-0.4		-1.4	V
Forward Transfer Admittance	$ y_{fs} $	$V_{DS}=-10V, I_D=-0.2A$	0.2	0.42		S
Static Drain-to-Source On-State Resistance	$R_{DS(on)1}$	$I_D=-0.2A, V_{GS}=-4.5V$		1.4	1.8	$\Omega$
	$R_{DS(on)2}$	$I_D=-0.1A, V_{GS}=-2.5V$		2.0	2.8	$\Omega$
Input Capacitance	$C_{iss}$	$V_{DS}=-10V, f=1MHz$		40		pF
Output Capacitance	$C_{oss}$	$V_{DS}=-10V, f=1MHz$		8		pF
Reverse Transfer Capacitance	$C_{rss}$	$V_{DS}=-10V, f=1MHz$		4.5		pF
Turn-ON Delay Time	$t_{d(on)}$	See specified Test Circuit.		10		ns
Rise Time	$t_r$	See specified Test Circuit.		5		ns
Turn-OFF Delay Time	$t_{d(off)}$	See specified Test Circuit.		10		ns
Fall Time	$t_f$	See specified Test Circuit.		5		ns
Total Gate Charge	$Q_g$	$V_{DS}=-10V, V_{GS}=-4.5V, I_D=-0.4A$		0.83		nC
Gate-to-Source Charge	$Q_{gs}$	$V_{DS}=-10V, V_{GS}=-4.5V, I_D=-0.4A$		0.25		nC
Gate-to-Drain "Miller" Charge	$Q_{gd}$	$V_{DS}=-10V, V_{GS}=-4.5V, I_D=-0.4A$		0.17		nC
Diode Forward Voltage	$V_{SD}$	$I_S=-0.4A, V_{GS}=0$		-1.0	-1.5	V
[SBD]						
Reverse Voltage	$V_R$	$I_R=0.5mA$	15			V
Forward Voltage	$V_{F1}$	$I_F=100mA$		0.32	0.36	V
	$V_{F2}$	$I_F=150mA$		0.35	0.41	V
Reverse Current	$I_R$	$V_R=6V$			45	$\mu A$
Interterminal Capacitance	$C$	$V_R=10V, f=1MHz$		10		pF
Reverse Recovery Time	$t_{rr}$	$I_F=I_R=100mA$ , See specified Test Circuit.			10	ns

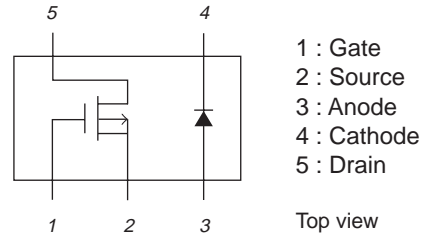
## Package Dimensions

unit : mm

2195



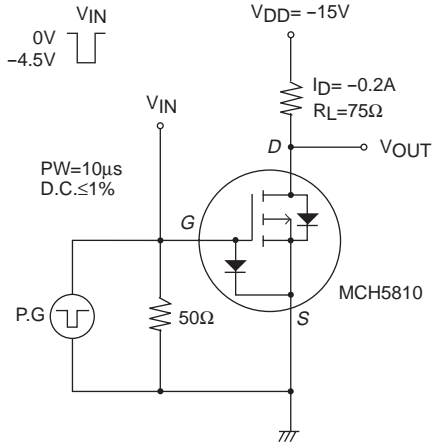
## Electrical Connection



# MCH5810

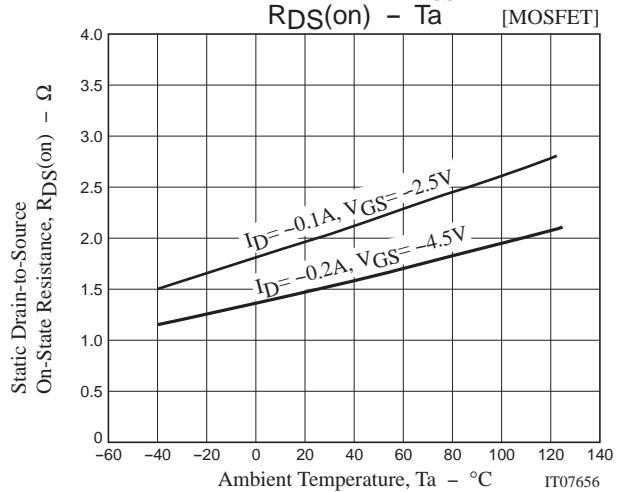
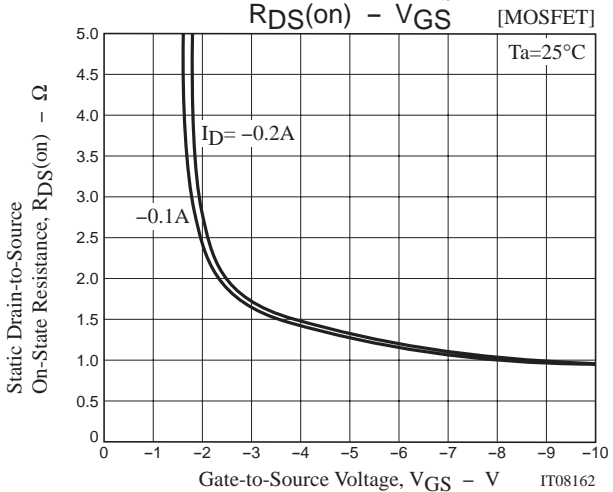
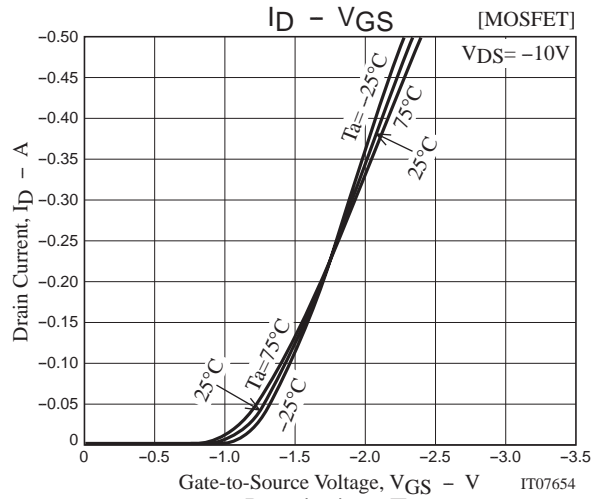
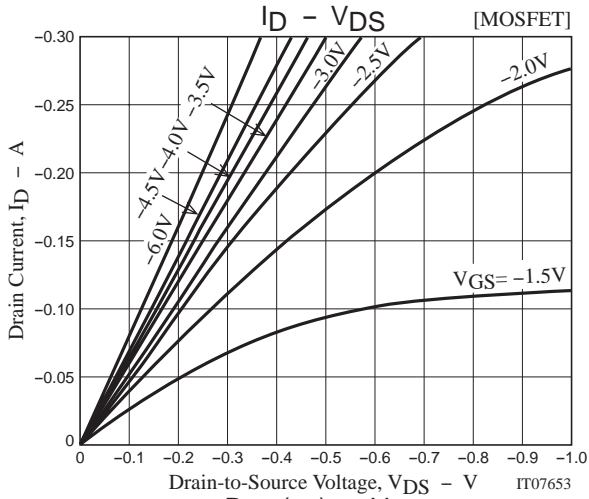
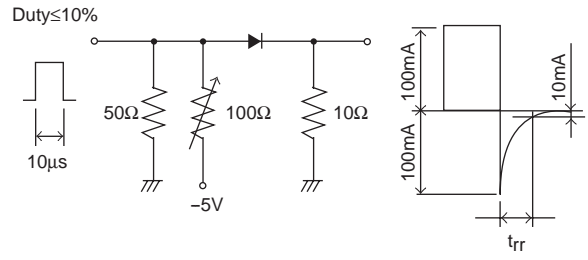
## Switching Time Test Circuit

[MOSFET]

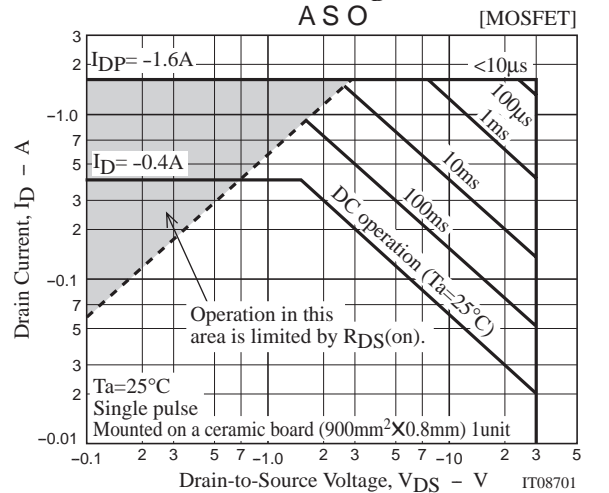
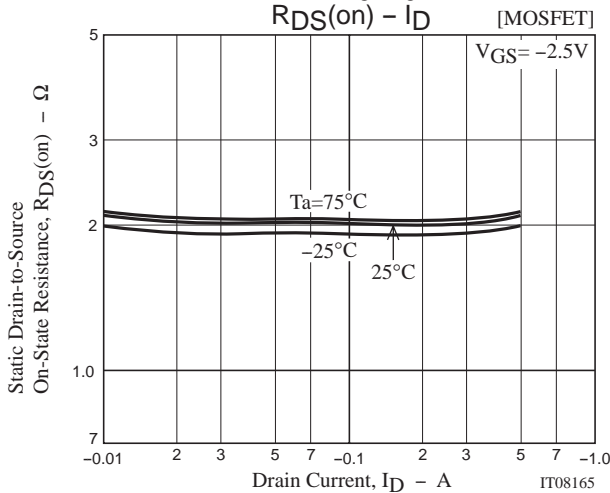
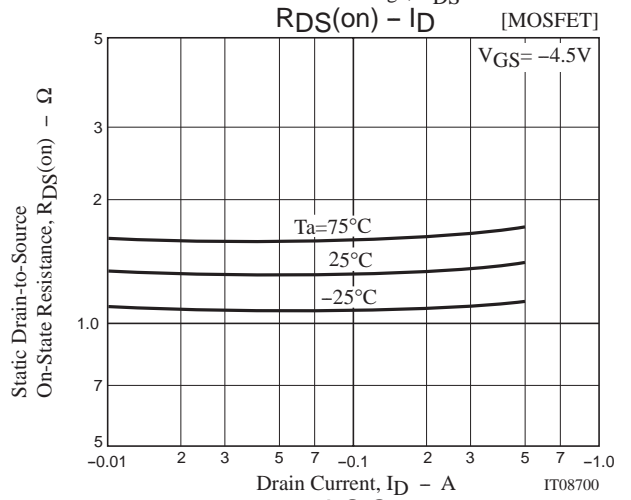
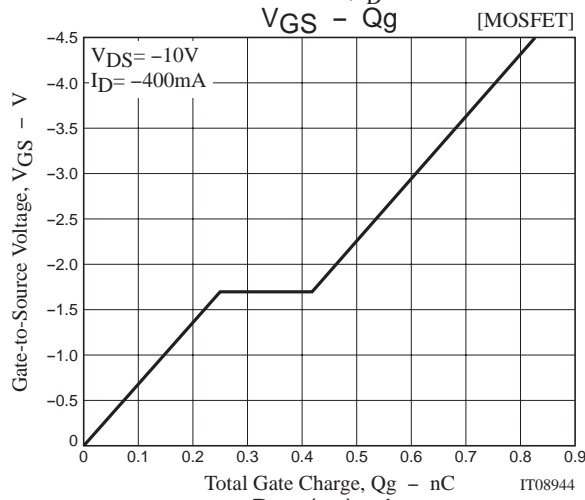
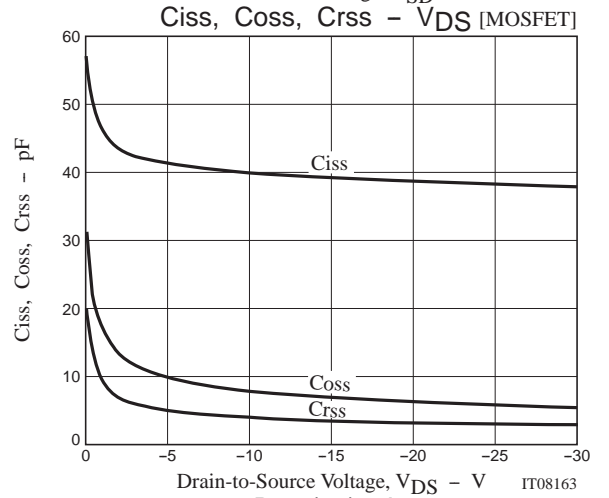
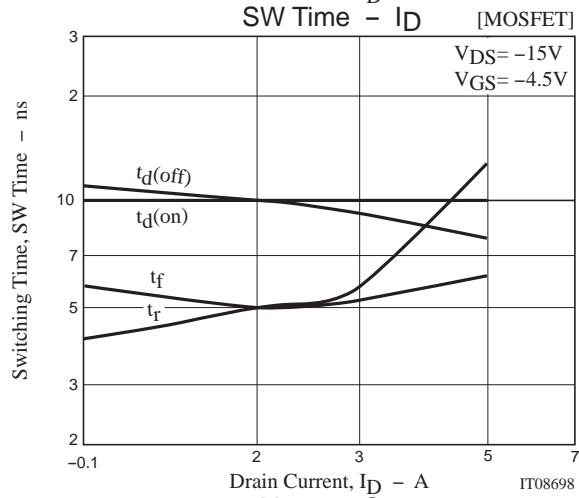
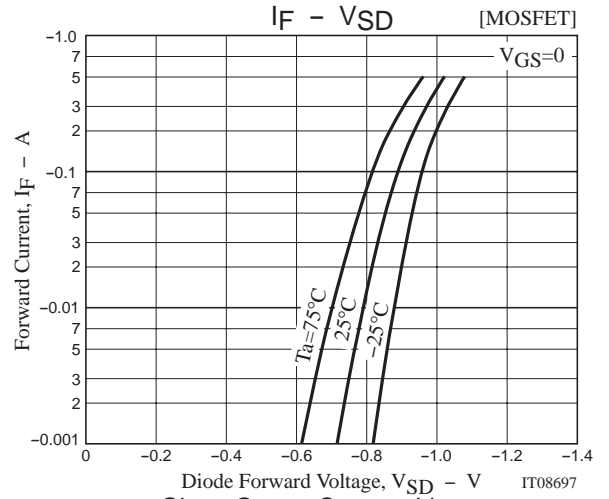
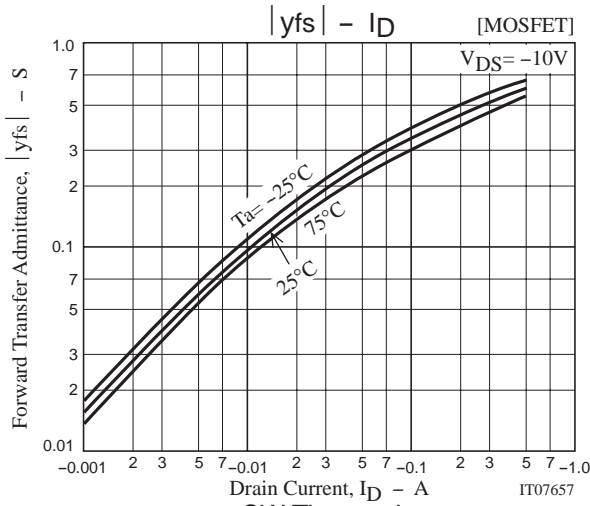


## $t_{rr}$ Test Circuit

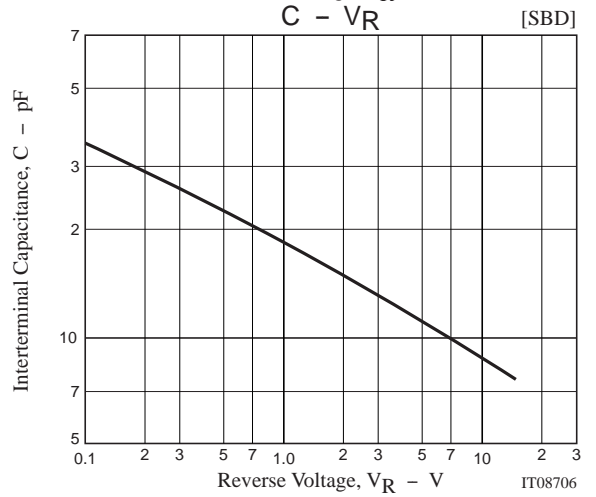
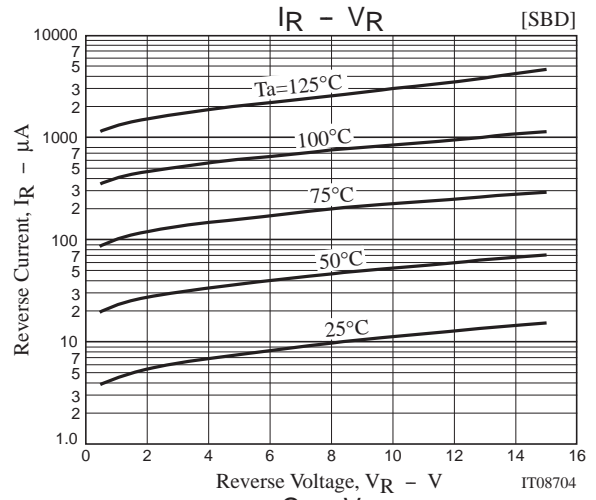
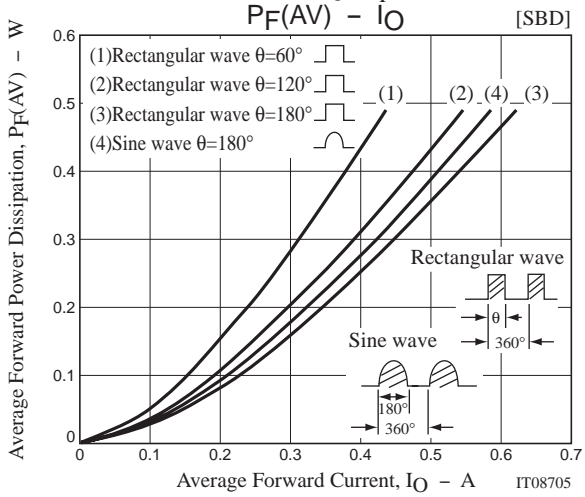
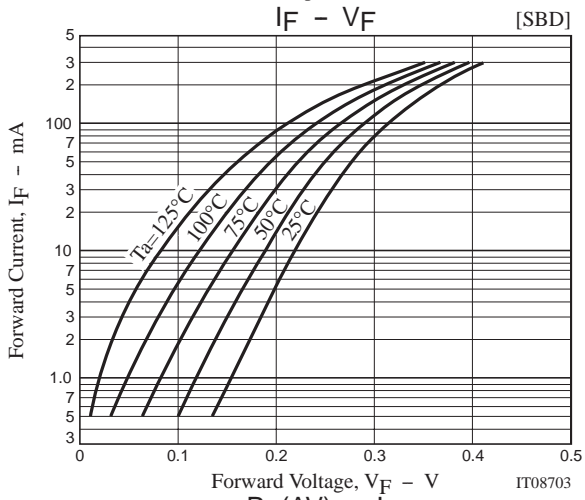
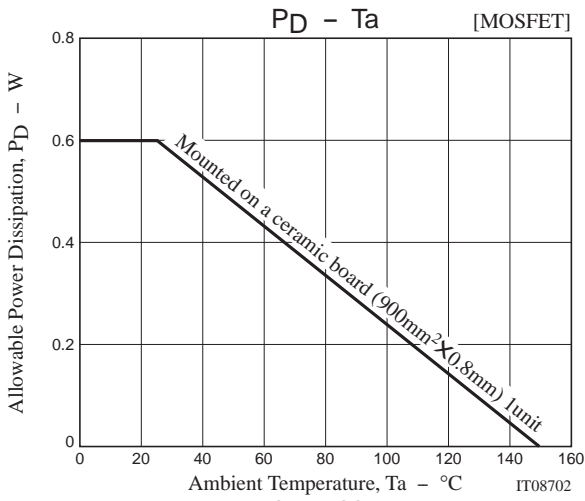
[SBD]



# MCH5810



# MCH5810



Note on usage : Since the MCH5810 is a MOSFET product, please avoid using this device in the vicinity of highly charged objects.

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