

Ordering number : ENN6942

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



# MCH5804

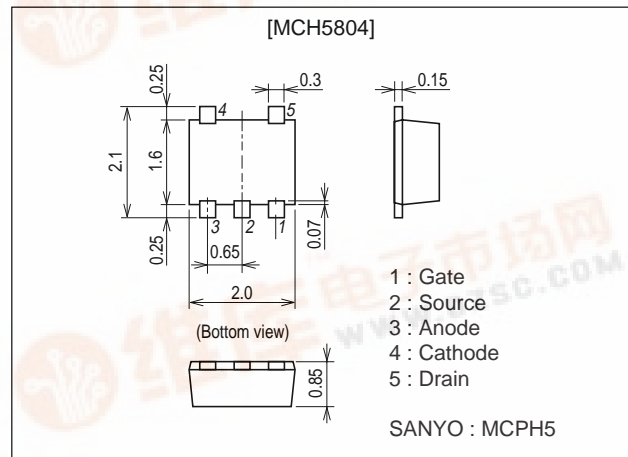
## DC / DC Converter Applications

### Features

- Composite type with an N-Channel Silicon MOSFET (MCH3408) and a Schottky Barrier Diode (SBS007M) 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.

### Package Dimensions

unit : mm  
2195



### 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	V <sub>GSS</sub>		±20	V
Drain Current (DC)	I <sub>D</sub>		1.4	A
Drain Current (Pulse)	I <sub>DP</sub>	PW≤10μs, duty cycle≤1%	5.6	A
Allowable Power Dissipation	P <sub>D</sub>	Mounted on a ceramic board (600mm <sup>2</sup> X0.8mm) 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	10	A
Junction Temperature	T <sub>J</sub>		-55 to +125	°C
Storage Temperature	T <sub>stg</sub>		-55 to +125	°C

Marking : QD

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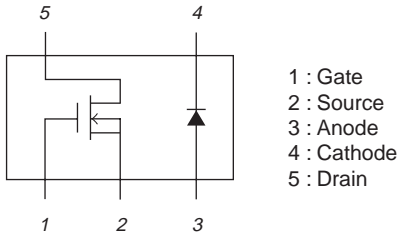


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## Electrical Characteristics at Ta=25°C

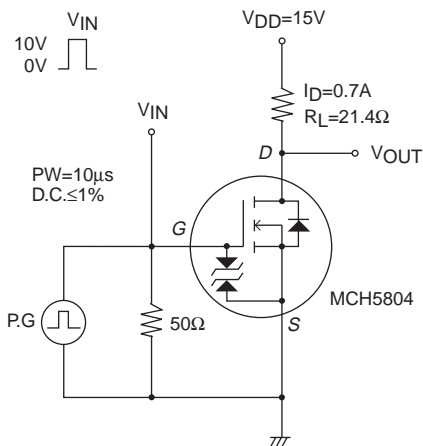
Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
[MOSFET]						
Drain-to-Source Breakdown Voltage	$V_{(BR)DSS}$	$I_D=1mA, V_{GS}=0$	30			V
Zero-Gate Voltage Drain Current	$I_{DSS}$	$V_{DS}=30V, V_{GS}=0$			1	$\mu A$
Gate-to-Source Leakage Current	$I_{GSS}$	$V_{GS}=\pm 16V, V_{DS}=0$			$\pm 10$	$\mu A$
Cutoff Voltage	$V_{GS(off)}$	$V_{DS}=10V, I_D=1mA$	1.2		2.6	V
Forward Transfer Admittance	$ y_{fs} $	$V_{DS}=10V, I_D=700mA$	0.85	1.2		S
Static Drain-to-Source On-State Resistance	$R_{DS(on)1}$	$I_D=700mA, V_{GS}=10V$		230	300	$m\Omega$
	$R_{DS(on)2}$	$I_D=400mA, V_{GS}=4V$		370	520	$m\Omega$
Input Capacitance	$C_{iss}$	$V_{DS}=10V, f=1MHz$		70		pF
Output Capacitance	$C_{oss}$	$V_{DS}=10V, f=1MHz$		15		pF
Reverse Transfer Capacitance	$C_{rss}$	$V_{DS}=10V, f=1MHz$		10		pF
Turn-ON Delay Time	$t_d(on)$	See specified Test Circuit		6		ns
Rise Time	$t_r$	See specified Test Circuit		3		ns
Turn-OFF Delay Time	$t_d(off)$	See specified Test Circuit		10		ns
Fall Time	$t_f$	See specified Test Circuit		4		ns
Total Gate Charge	$Q_g$	$V_{DS}=10V, V_{GS}=10V, I_D=1.4A$		2.6		nC
Gate-to-Source Charge	$Q_{gs}$	$V_{DS}=10V, V_{GS}=10V, I_D=1.4A$		0.6		nC
Gate-to-Drain "Miller" Charge	$Q_{gd}$	$V_{DS}=10V, V_{GS}=10V, I_D=1.4A$		0.5		nC
Diode Forward Voltage	$V_{SD}$	$I_S=1.4A, V_{GS}=0$		0.9	1.2	V
[SBD]						
Reverse Voltage	$V_R$	$I_R=0.5mA$	15			V
Forward Voltage	$V_{F1}$	$I_F=0.3A$		0.35	0.40	V
	$V_{F2}$	$I_F=0.5A$		0.40	0.45	V
Reverse Current	$I_R$	$V_R=6V$			200	$\mu A$
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

## Electrical Connection (Top view)



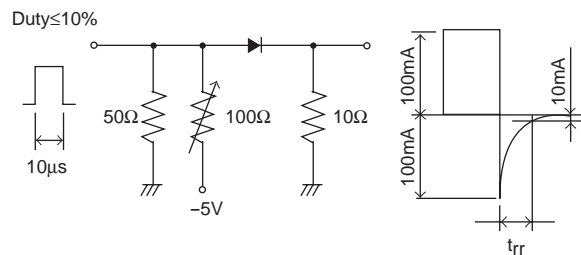
## Switching Time Test Circuit

[MOSFET]

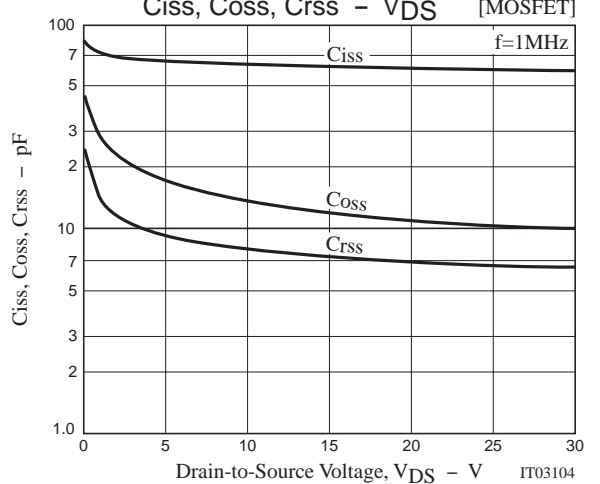
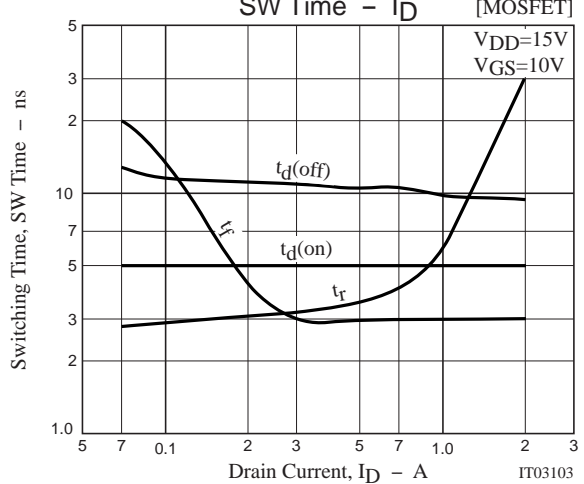
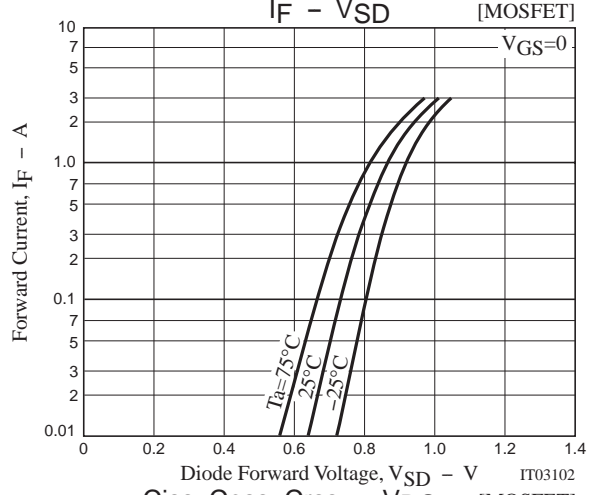
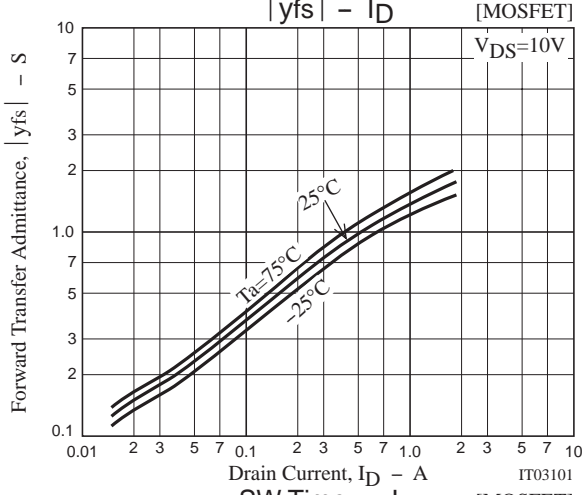
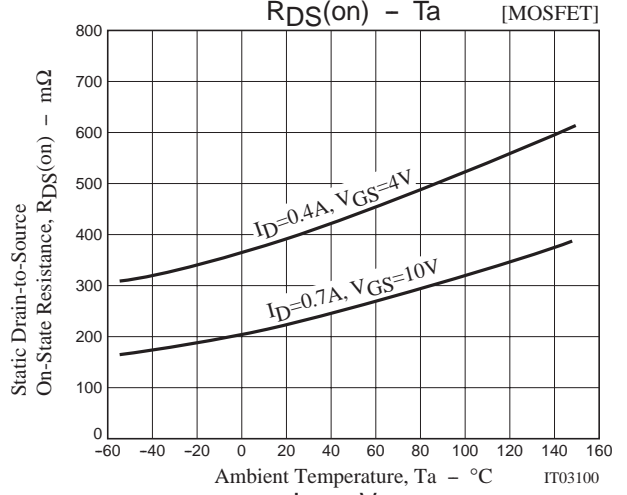
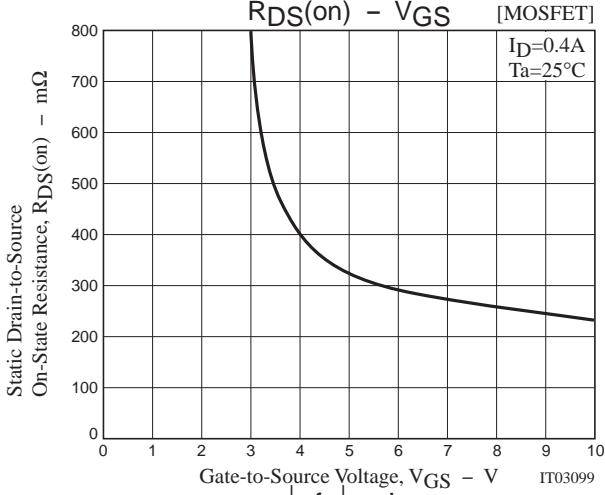
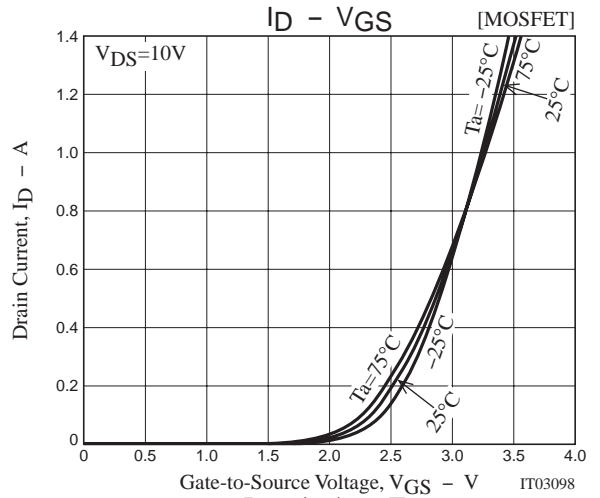
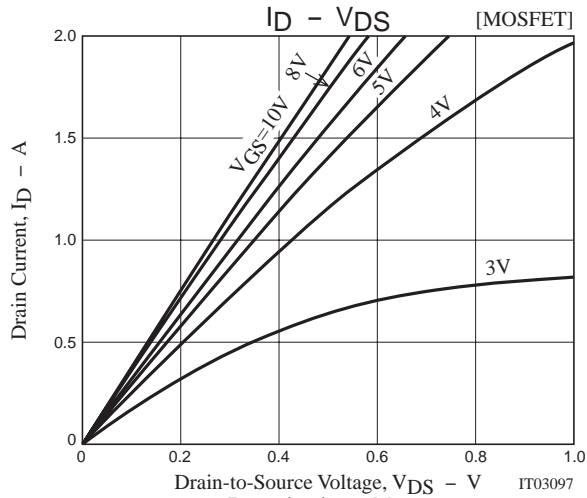


## $t_{rr}$ Test Circuit

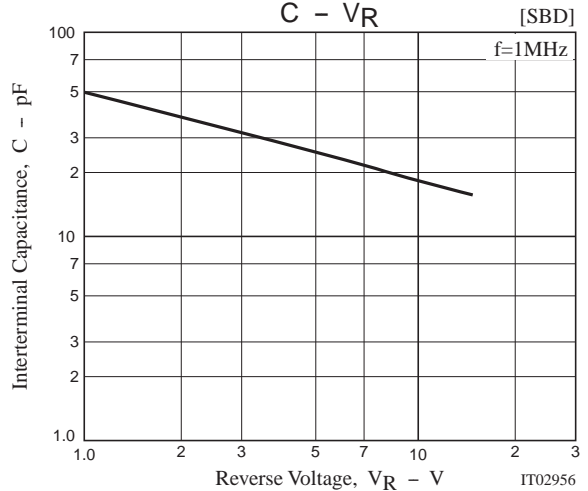
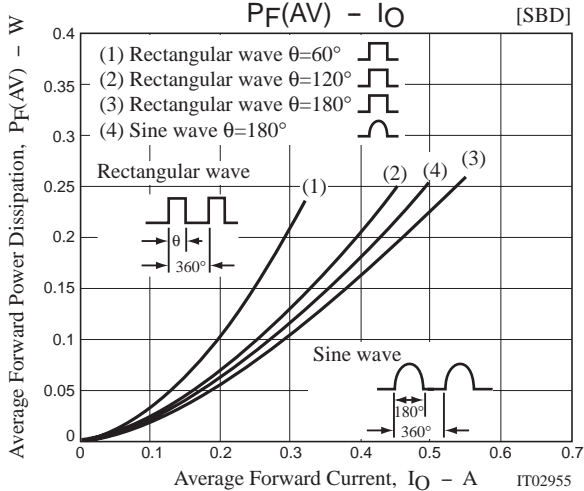
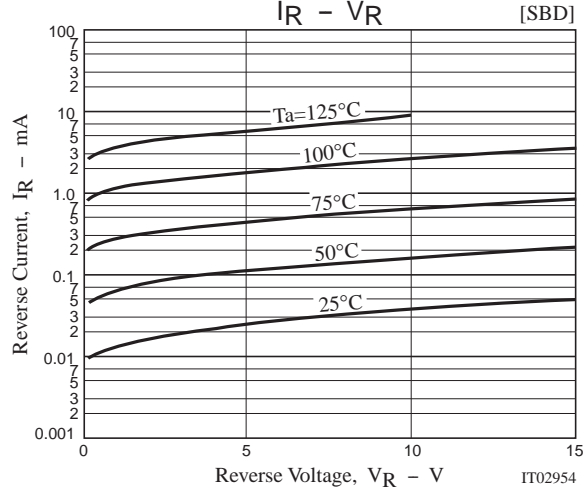
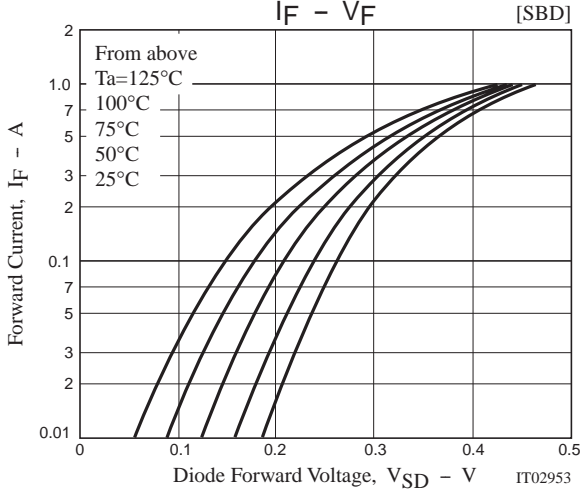
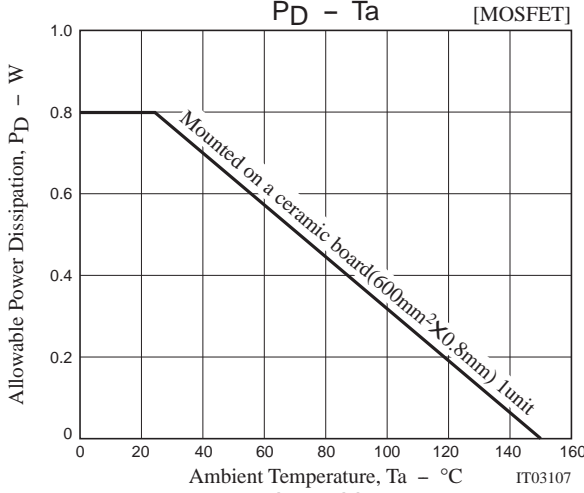
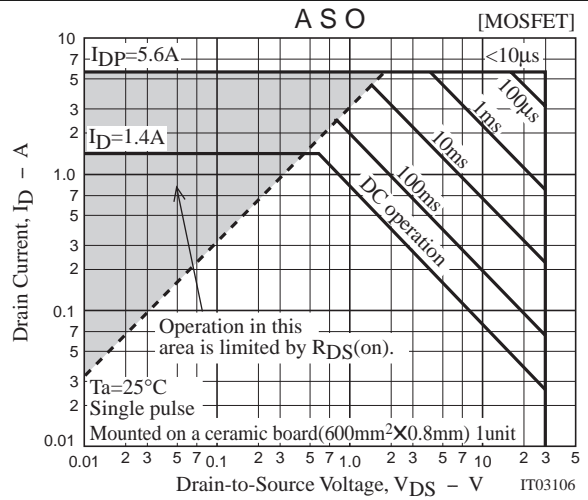
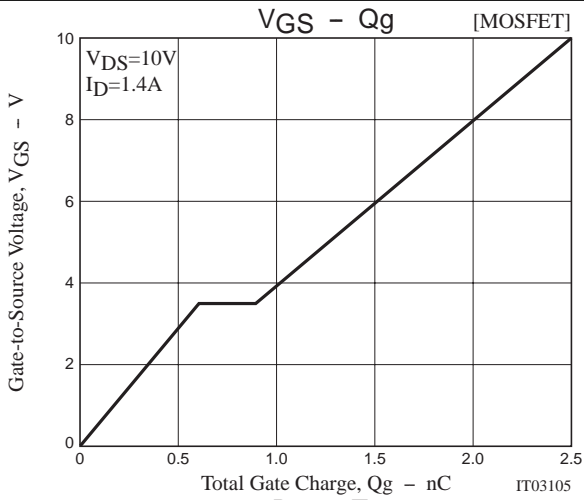
[SBD]



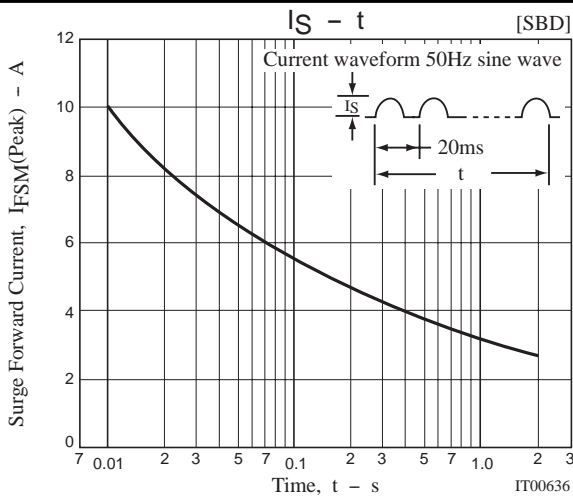
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