

**MCH5809****DC / DC Converter Applications****Features**

- Composite type with an N-Channel Silicon MOSFET (MCH3443) and a Schottky Barrier Diode (SBS006M) contained in one package facilitating high-density mounting.

[MOSFET]

- Low ON-resistance.
- Ultrahigh-speed switching.
- 2.5V drive.

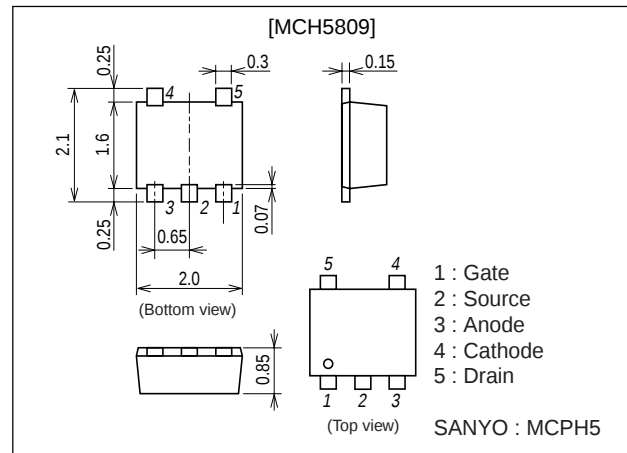
[SBD]

- Short reverse recovery time.
- Low forward voltage.

Package Dimensions

unit : mm

2195

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

Parameter	Symbol	Conditions	Ratings	Unit
[MOSFET]				
Drain-to-Source Voltage	V _{DSS}		30	V
Gate-to-Source Voltage	V _{GSS}		±12	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 (900mm²×0.8mm) 1unit	0.8	W
Channel Temperature	T _{ch}		150	°C
Storage Temperature	T _{stg}		-55 to +125	°C
[SBD]				
Repetitive Peak Reverse Voltage	V _{RRM}		30	V
Nonrepetitive Peak Reverse Surge Voltage	V _{RSM}		30	V
Average Output Current	I _O		0.5	A
Surge Forward Current	I _{FSM}	50Hz sine wave, 1 cycle	3	A
Junction Temperature	T _J		-55 to +125	°C
Storage Temperature	T _{stg}		-55 to +125	°C

Marking : QJ

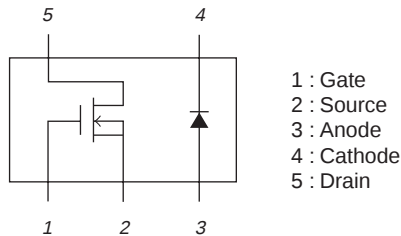
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MCH5809

Electrical Characteristics at Ta=25°C

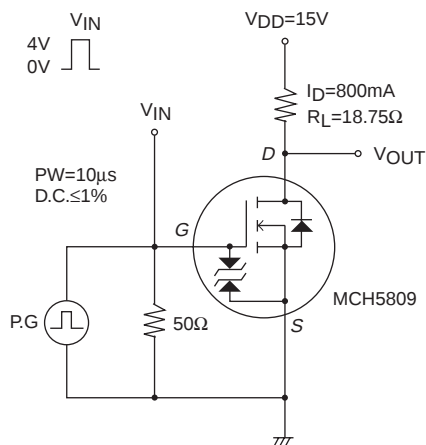
Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
[MOSFET]						
Drain-to-Source Breakdown Voltage	V(BR)DSS	ID=1mA, VGS=0	30			V
Zero-Gate Voltage Drain Current	IDSS	VDS=30V, VGS=0			1	μA
Gate-to-Source Leakage Current	IGSS	VGS=±8V, VDS=0			±10	μA
Cutoff Voltage	VGS(off)	VDS=10V, ID=1mA	0.4		1.3	V
Forward Transfer Admittance	yfs	VDS=10V, ID=800mA	1.3	2.2		S
Static Drain-to-Source On-State Resistance	RDS(on)1	ID=800mA, VGS=4V		165	215	mΩ
	RDS(on)2	ID=400mA, VGS=2.5V		210	295	mΩ
Input Capacitance	Ciss	VDS=10V, f=1MHz		130		pF
Output Capacitance	Coss	VDS=10V, f=1MHz		22		pF
Reverse Transfer Capacitance	Crss	VDS=10V, f=1MHz		16		pF
Turn-ON Delay Time	td(on)	See specified Test Circuit		9		ns
Rise Time	tr	See specified Test Circuit		20		ns
Turn-OFF Delay Time	td(off)	See specified Test Circuit		23		ns
Fall Time	tf	See specified Test Circuit		29		ns
Total Gate Charge	Qg	VDS=10V, VGS=4V, ID=1.5A		2.2		nC
Gate-to-Source Charge	Qgs	VDS=10V, VGS=4V, ID=1.5A		0.52		nC
Gate-to-Drain "Miller" Charge	Qgd	VDS=10V, VGS=4V, ID=1.5A		0.52		nC
Diode Forward Voltage	VSD	IS=1.5A, VGS=0		0.9	1.2	V
[SBD]						
Reverse Voltage	VR	IR=0.5mA	30			V
Forward Voltage	VF1	IF=0.3A		0.35	0.40	V
	VF2	IF=0.5A		0.42	0.47	V
Reverse Current	IR	VR=10V			200	μA
Interterminal Capacitance	C	VR=10V, f=1MHz		20		pF
Reverse Recovery Time	trr	IF=IR=100mA, See specified Test Circuit.			10	ns

Electrical Connection (Top view)



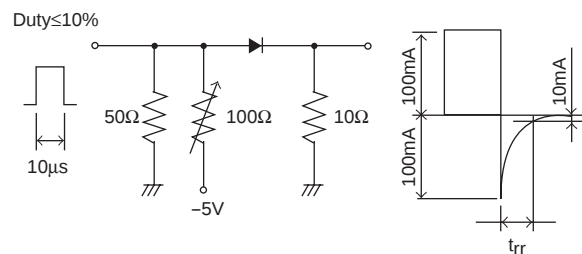
Switching Time Test Circuit

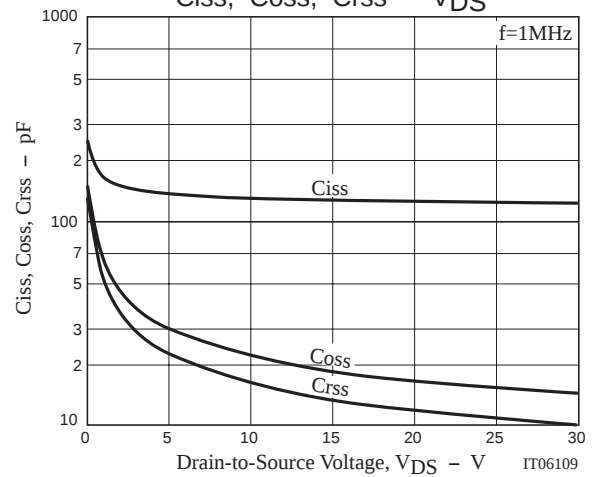
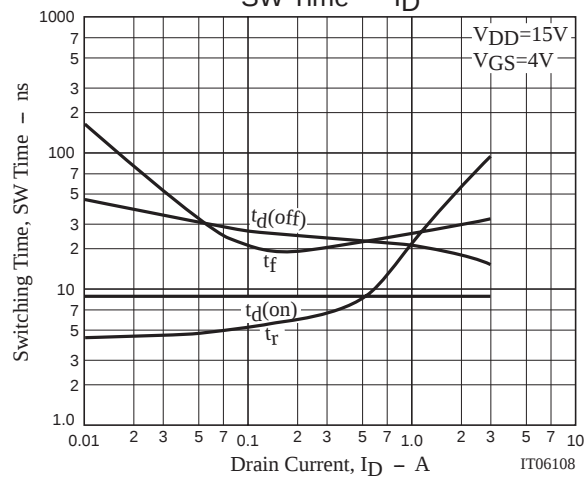
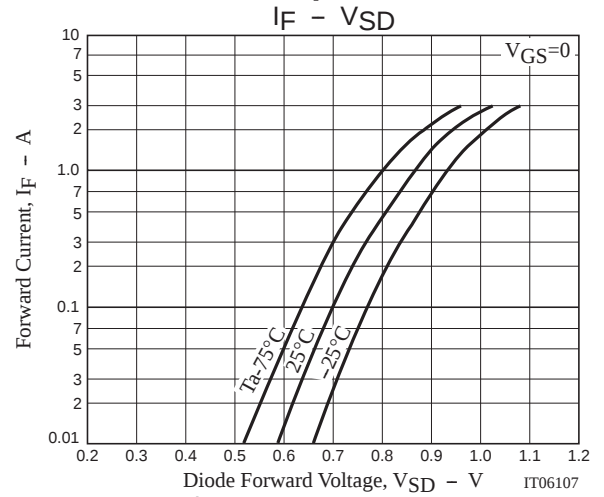
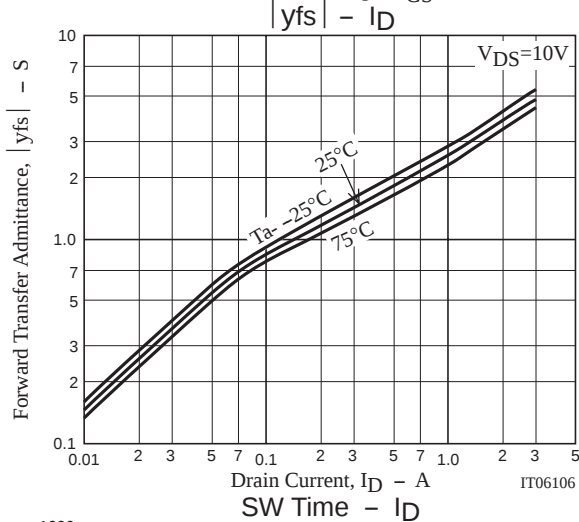
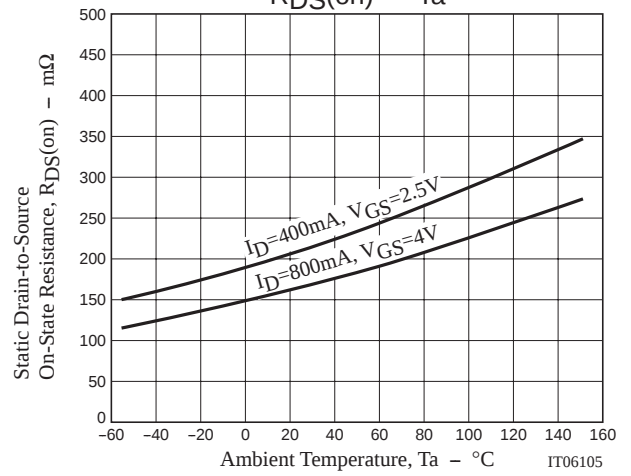
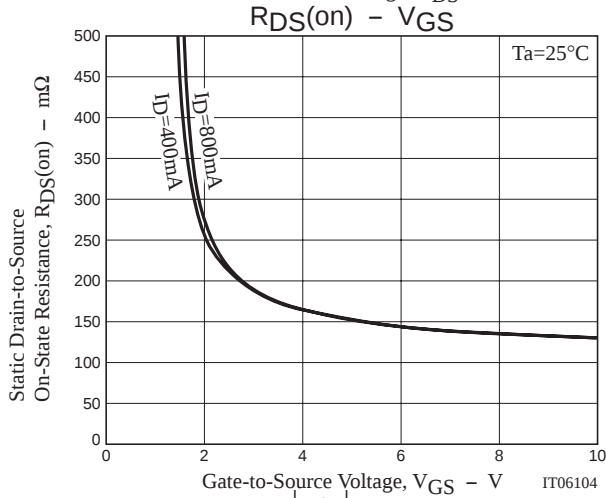
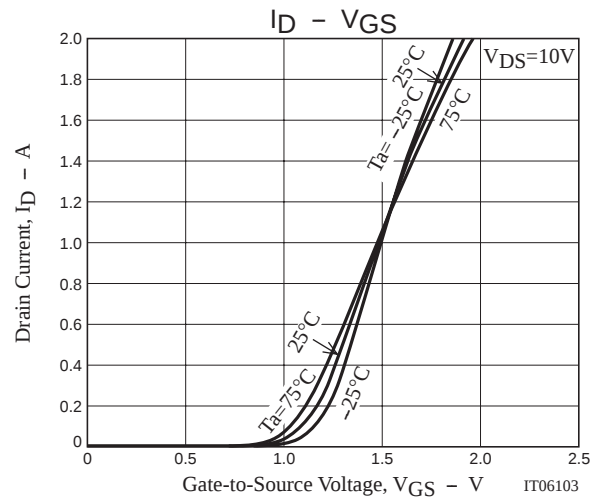
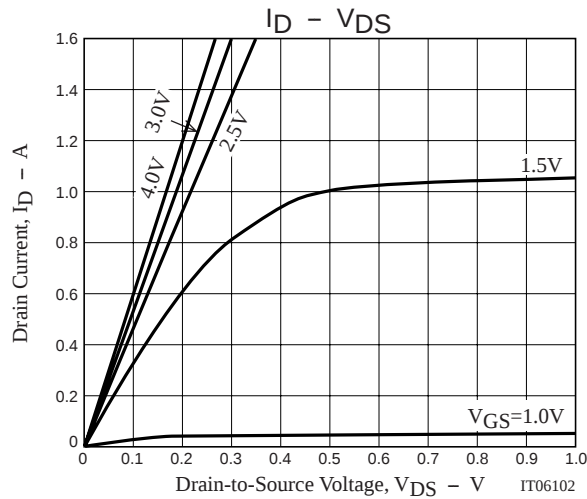
[MOSFET]

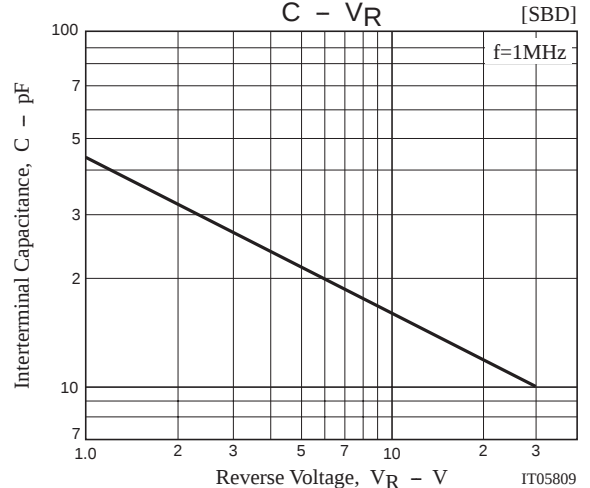
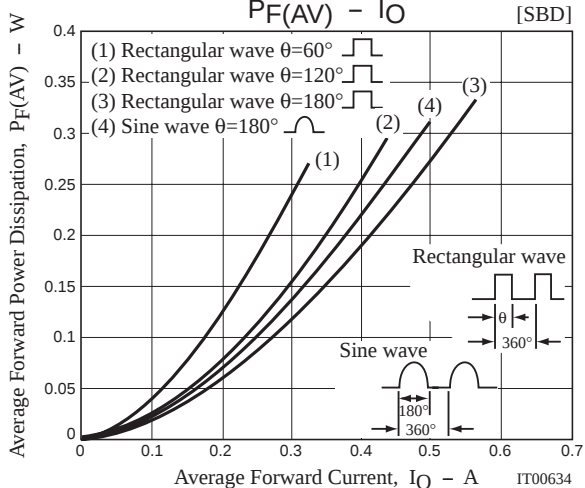
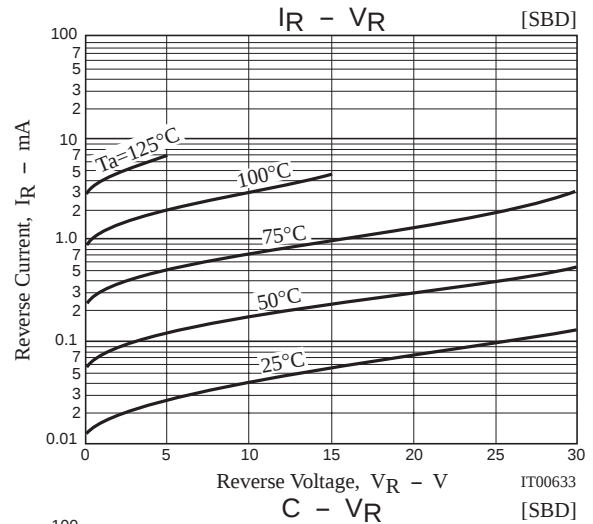
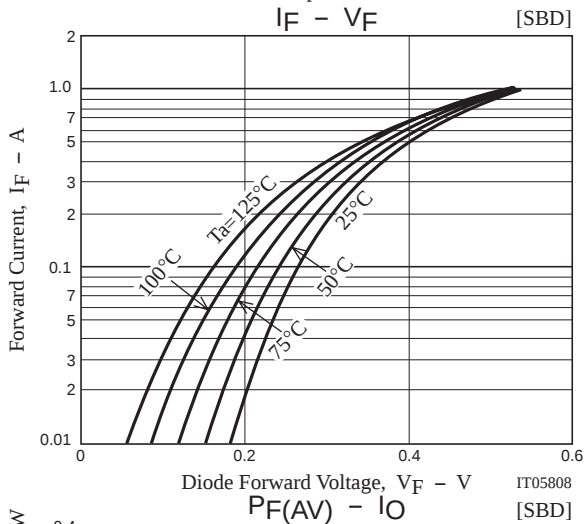
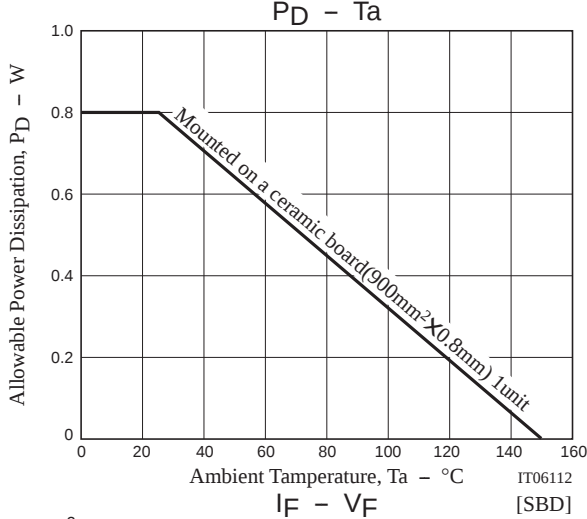
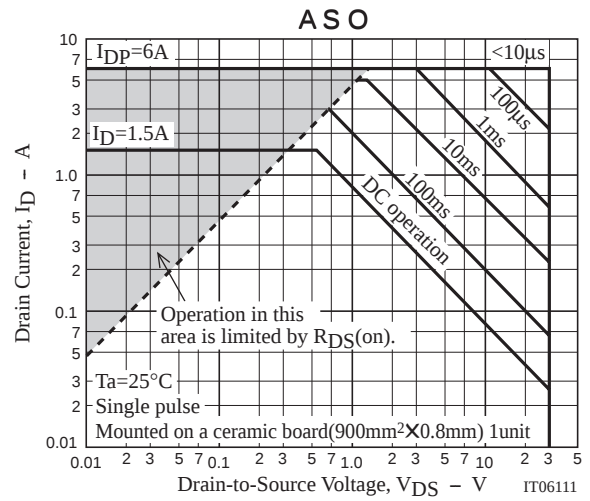
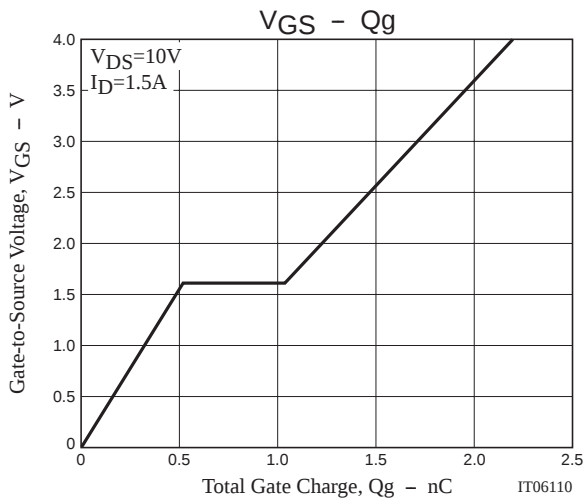


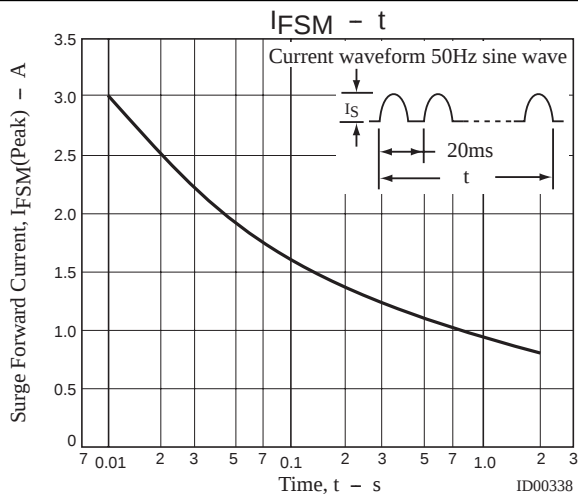
trr Test Circuit

[SBD]









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