

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

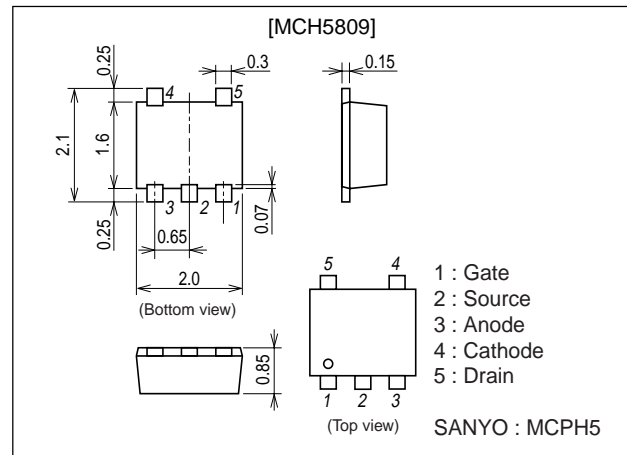
- Composite type with an N-Channel Silicon MOSFET (MCH3443) and a Schottky Barrier Diode (SBS006M) contained in one package facilitating high-density mounting.

[MOSFET]

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

[SBD]

- Short reverse recovery time.
- Low forward voltage.

Package Dimensionsunit : mm
2195**Specifications****Absolute Maximum Ratings** at $T_a=25^\circ\text{C}$

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}	$PW \leq 10\mu\text{s}$, duty cycle $\leq 1\%$	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	$^\circ\text{C}$
Storage Temperature	T_{stg}		-55 to +125	$^\circ\text{C}$
[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	$^\circ\text{C}$
Storage Temperature	T_{stg}		-55 to +125	$^\circ\text{C}$

Marking : QJ

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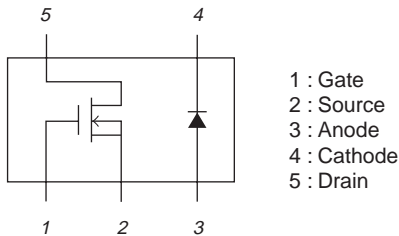
31504 TS IM TA-100394 No.7525-1/5

MCH5809

Electrical Characteristics at Ta=25°C

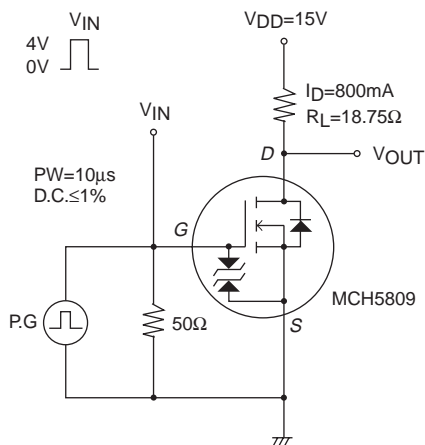
Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
[MOSFET]						
Drain-to-Source Breakdown Voltage	$V_{(BR)DSS}$	$I_D=1mA, V_{GS}=0$	30			V
Zero-Gate Voltage Drain Current	I_{DSS}	$V_{DS}=30V, V_{GS}=0$			1	μA
Gate-to-Source Leakage Current	I_{GSS}	$V_{GS}=\pm 8V, V_{DS}=0$			± 10	μA
Cutoff Voltage	$V_{GS(off)}$	$V_{DS}=10V, I_D=1mA$	0.4		1.3	V
Forward Transfer Admittance	$ y_{fs} $	$V_{DS}=10V, I_D=800mA$	1.3	2.2		S
Static Drain-to-Source On-State Resistance	$R_{DS(on)1}$	$I_D=800mA, V_{GS}=4V$		165	215	$m\Omega$
	$R_{DS(on)2}$	$I_D=400mA, V_{GS}=2.5V$		210	295	$m\Omega$
Input Capacitance	C_{iss}	$V_{DS}=10V, f=1MHz$		130		pF
Output Capacitance	C_{oss}	$V_{DS}=10V, f=1MHz$		22		pF
Reverse Transfer Capacitance	C_{rss}	$V_{DS}=10V, f=1MHz$		16		pF
Turn-ON Delay Time	$t_d(on)$	See specified Test Circuit		9		ns
Rise Time	t_r	See specified Test Circuit		20		ns
Turn-OFF Delay Time	$t_d(off)$	See specified Test Circuit		23		ns
Fall Time	t_f	See specified Test Circuit		29		ns
Total Gate Charge	Q_g	$V_{DS}=10V, V_{GS}=4V, I_D=1.5A$		2.2		nC
Gate-to-Source Charge	Q_{gs}	$V_{DS}=10V, V_{GS}=4V, I_D=1.5A$		0.52		nC
Gate-to-Drain "Miller" Charge	Q_{gd}	$V_{DS}=10V, V_{GS}=4V, I_D=1.5A$		0.52		nC
Diode Forward Voltage	V_{SD}	$I_S=1.5A, V_{GS}=0$		0.9	1.2	V
[SBD]						
Reverse Voltage	V_R	$I_R=0.5mA$	30			V
Forward Voltage	V_{F1}	$I_F=0.3A$		0.35	0.40	V
	V_{F2}	$I_F=0.5A$		0.42	0.47	V
Reverse Current	I_R	$V_R=10V$			200	μA
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)



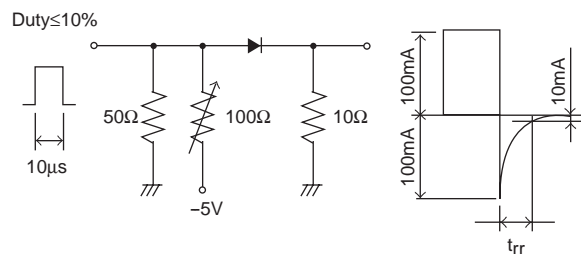
Switching Time Test Circuit

[MOSFET]

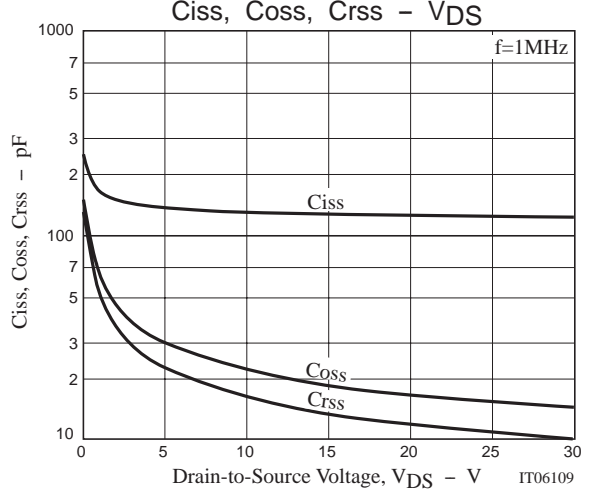
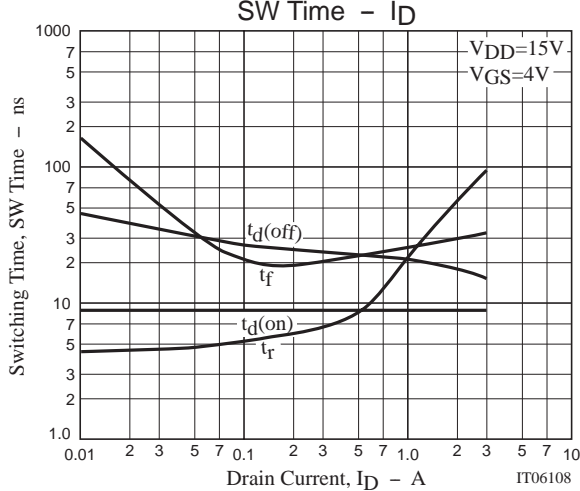
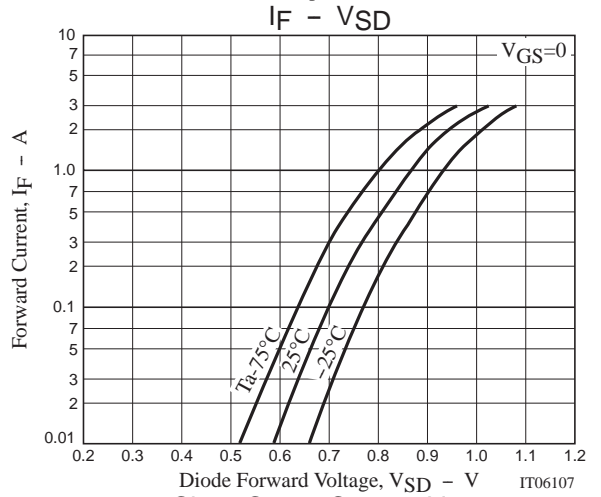
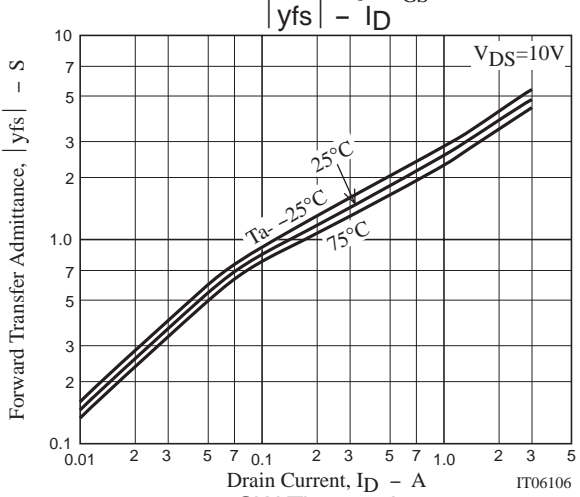
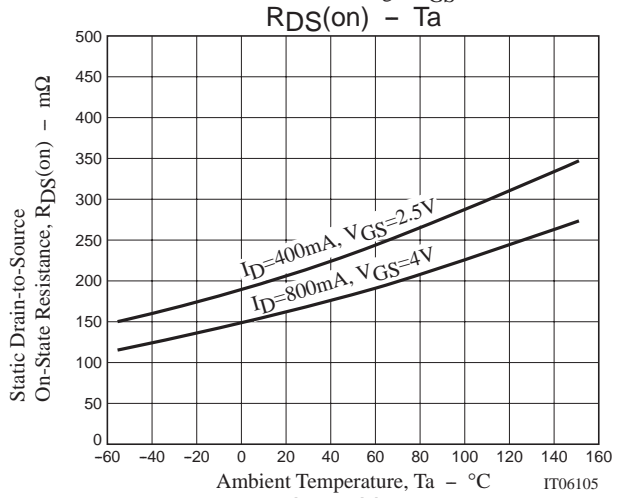
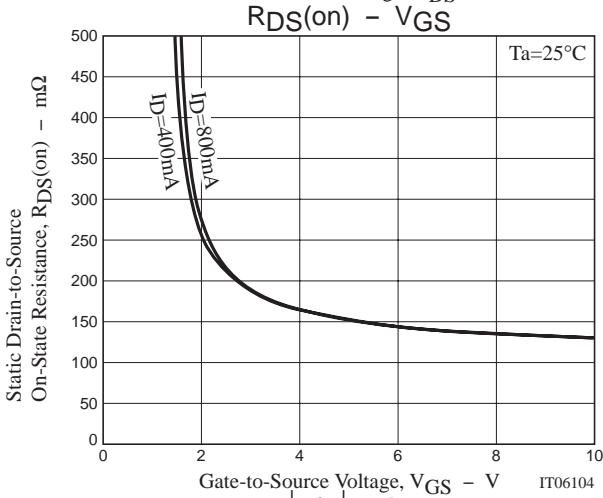
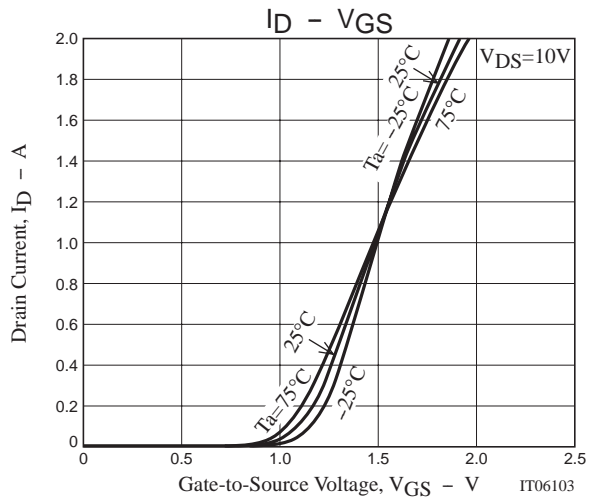
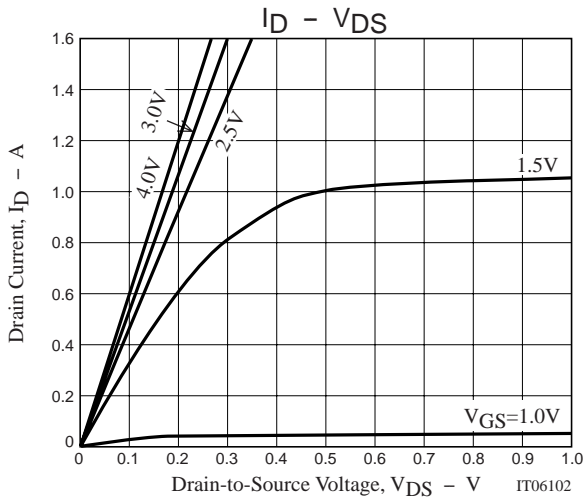


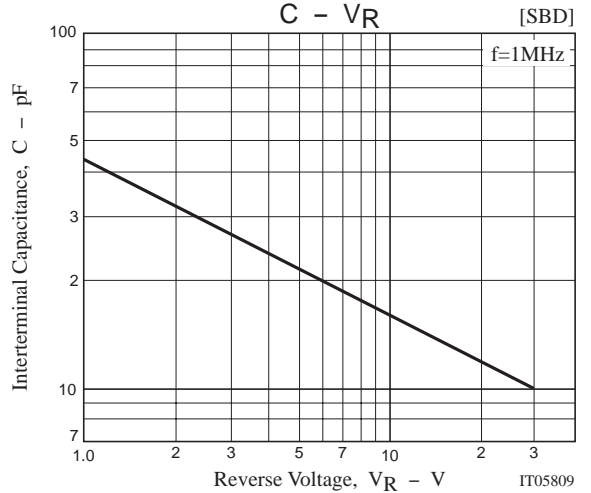
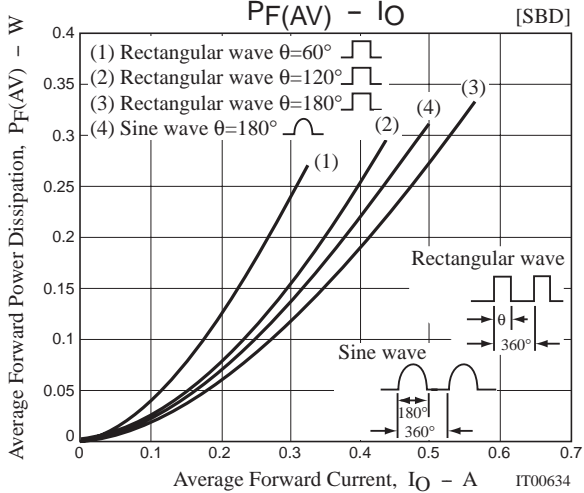
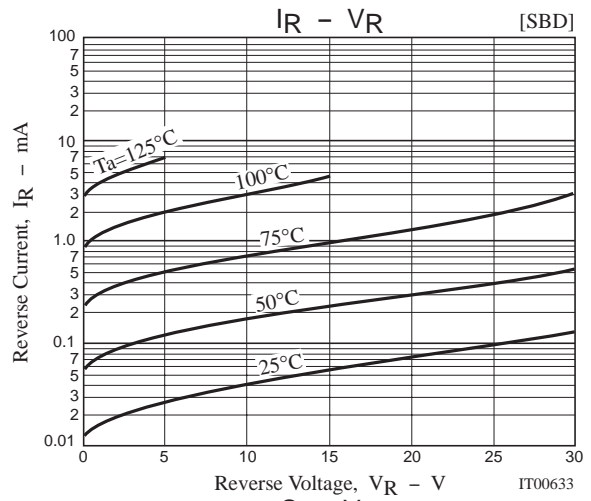
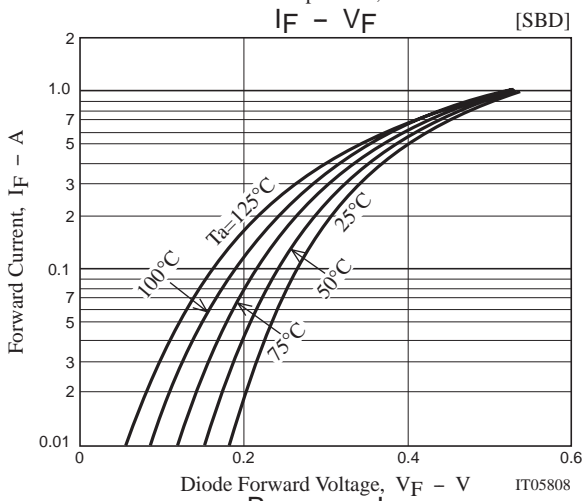
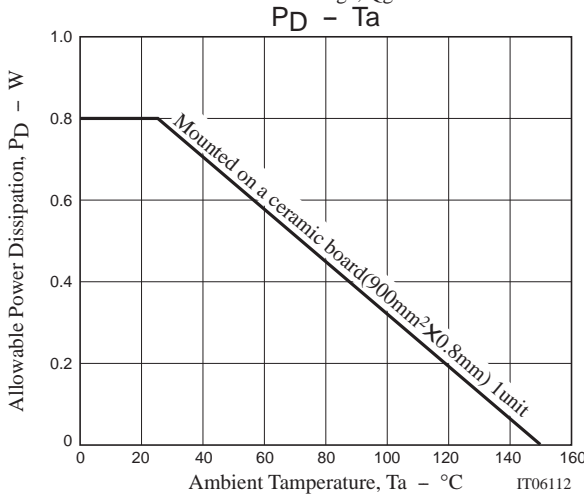
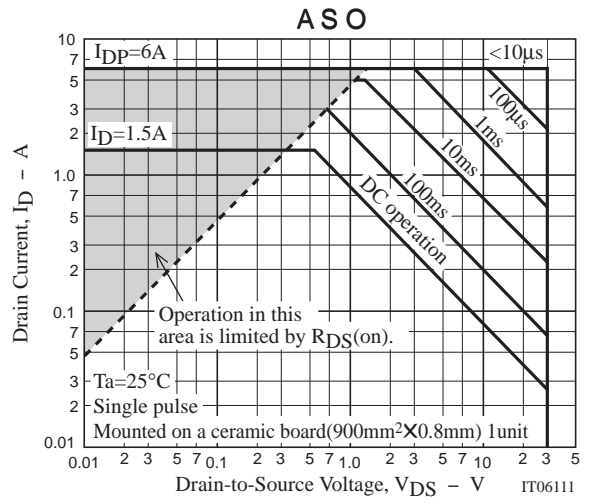
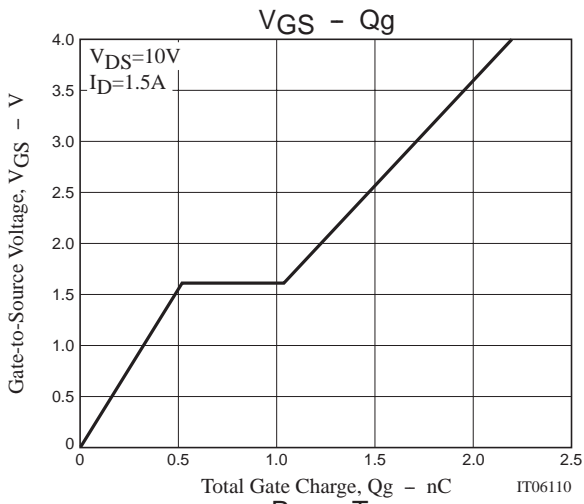
trr Test Circuit

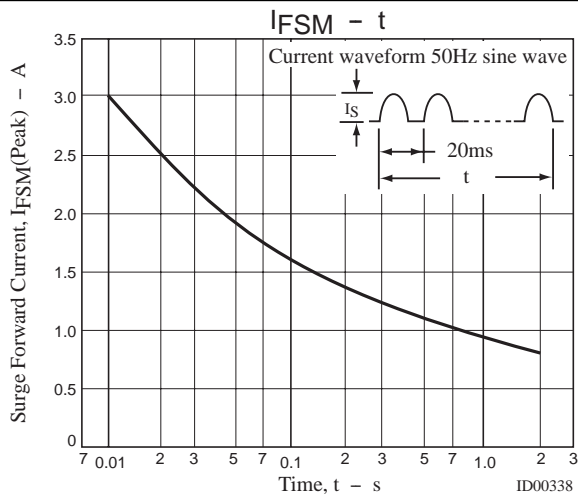
[SBD]



MCH5809







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