



# MCH5835

MOSFET : N-Channel Silicon MOSFET

SBD : Schottky Barrier Diode

## General-Purpose Switching Device Applications

### Features

- Composite type with an N-channel silicon MOSFET (MCH3443) and a schottky barrier diode (SS0503SH) 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.

### 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>		±12	V
Drain Current (DC)	I <sub>D</sub>		1.5	A
Drain Current (Pulse)	I <sub>DP</sub>	PW≤10μs, duty cycle≤1%	6	A
Allowable Power Dissipation	P <sub>D</sub>	Mounted on a ceramic board (900mm <sup>2</sup> ×0.8mm) 1unit	0.8	W
Channel Temperature	T <sub>ch</sub>		150	°C
Storage Temperature	T <sub>stg</sub>		-55 to +125	°C

Marking : XZ

Continued on next page.

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Parameter	Symbol	Conditions	Ratings	Unit
[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	5	A
Junction Temperature	$T_J$		-55 to +125	°C
Storage Temperature	$T_{stg}$		-55 to +125	°C

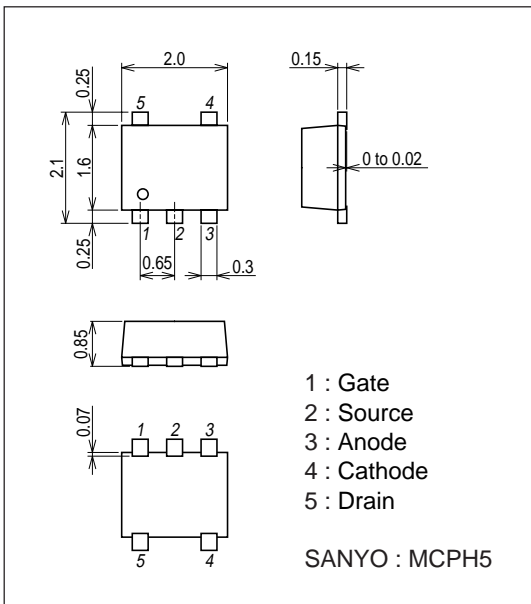
## Electrical Characteristics at $T_a=25^\circ\text{C}$

Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
[MOSFET]						
Drain-to-Source Breakdown Voltage	$V_{(BR)DSS}$	$I_D=1\text{mA}, V_{GS}=0\text{V}$	30			V
Zero-Gate Voltage Drain Current	$I_{DSS}$	$V_{DS}=30\text{V}, V_{GS}=0\text{V}$			1	$\mu\text{A}$
Gate-to-Source Leakage Current	$I_{GSS}$	$V_{GS}=\pm 8\text{V}, V_{DS}=0\text{V}$			$\pm 10$	$\mu\text{A}$
Cutoff Voltage	$V_{GS(off)}$	$V_{DS}=10\text{V}, I_D=1\text{mA}$	0.4		1.3	V
Forward Transfer Admittance	$ y_{fs} $	$V_{DS}=10\text{V}, I_D=800\text{mA}$	1.3	2.2		S
Static Drain-to-Source On-State Resistance	$R_{DS(on)1}$	$I_D=800\text{mA}, V_{GS}=4\text{V}$		165	215	$\text{m}\Omega$
	$R_{DS(on)2}$	$I_D=400\text{mA}, V_{GS}=2.5\text{V}$		210	295	$\text{m}\Omega$
Input Capacitance	$C_{iss}$	$V_{DS}=10\text{V}, f=1\text{MHz}$		130		pF
Output Capacitance	$C_{oss}$	$V_{DS}=10\text{V}, f=1\text{MHz}$		22		pF
Reverse Transfer Capacitance	$C_{rss}$	$V_{DS}=10\text{V}, f=1\text{MHz}$		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	$Q_g$	$V_{DS}=10\text{V}, V_{GS}=4\text{V}, I_D=1.5\text{A}$		2.2		nC
Gate-to-Source Charge	$Q_{gs}$	$V_{DS}=10\text{V}, V_{GS}=4\text{V}, I_D=1.5\text{A}$		0.52		nC
Gate-to-Drain "Miller" Charge	$Q_{gd}$	$V_{DS}=10\text{V}, V_{GS}=4\text{V}, I_D=1.5\text{A}$		0.52		nC
Diode Forward Voltage	$V_{SD}$	$I_S=1.5\text{A}, V_{GS}=0\text{V}$		0.9	1.2	V
[SBD]						
Reverse Voltage	$V_R$	$I_R=0.5\text{mA}$	30			V
Forward Voltage	$V_{F1}$	$I_F=0.3\text{A}$		0.37	0.42	V
	$V_{F2}$	$I_F=0.5\text{A}$		0.42	0.47	V
Reverse Current	$I_R$	$V_R=15\text{V}$			120	$\mu\text{A}$
Interterminal Capacitance	$C$	$V_R=10\text{V}, f=1\text{MHz}$		13		pF
Reverse Recovery Time	$t_{rr}$	$I_F=I_R=100\text{mA}$ , See specified Test Circuit.			10	ns

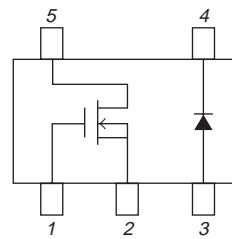
## Package Dimensions

unit : mm (typ)

7021A-008



## Electrical Connection



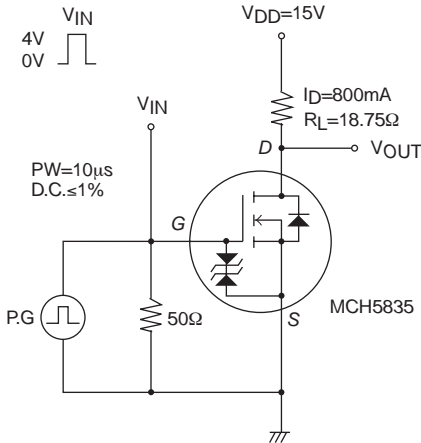
- 1 : Gate
- 2 : Source
- 3 : Anode
- 4 : Cathode
- 5 : Drain

Top view

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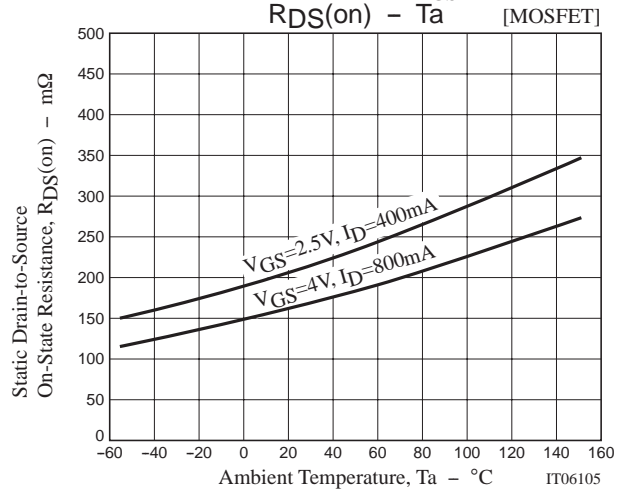
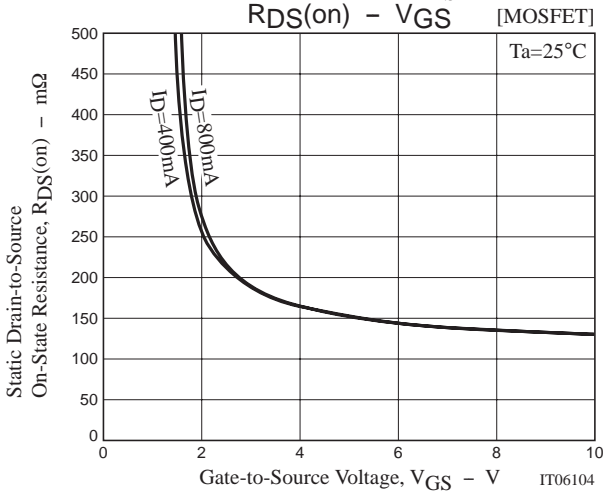
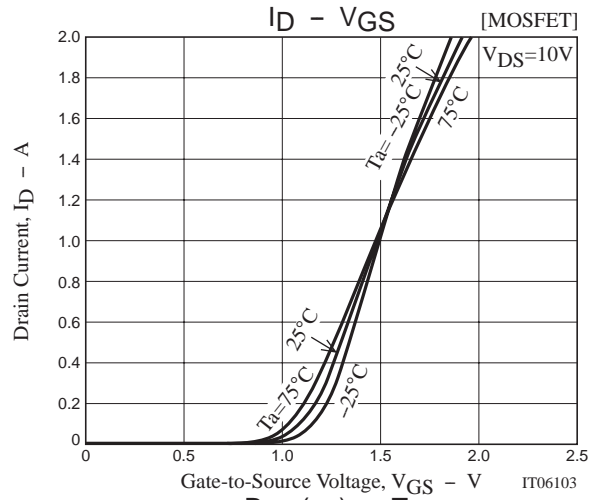
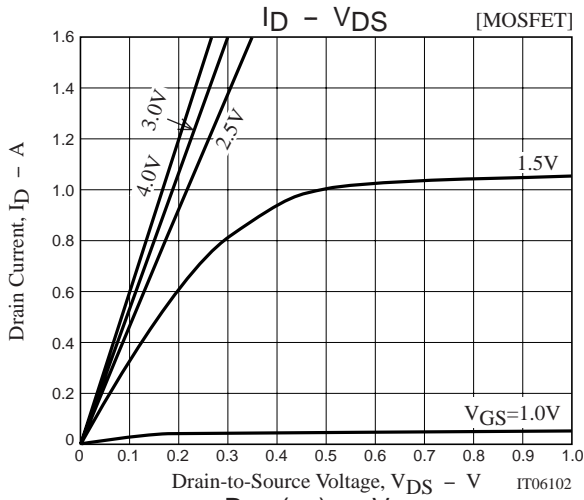
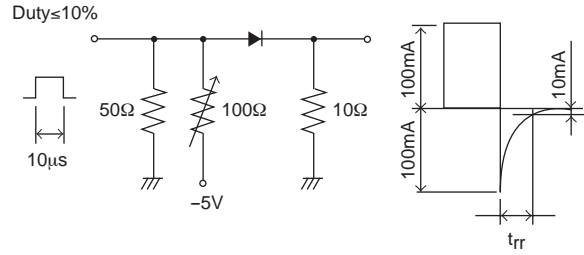
## Switching Time Test Circuit

[MOSFET]

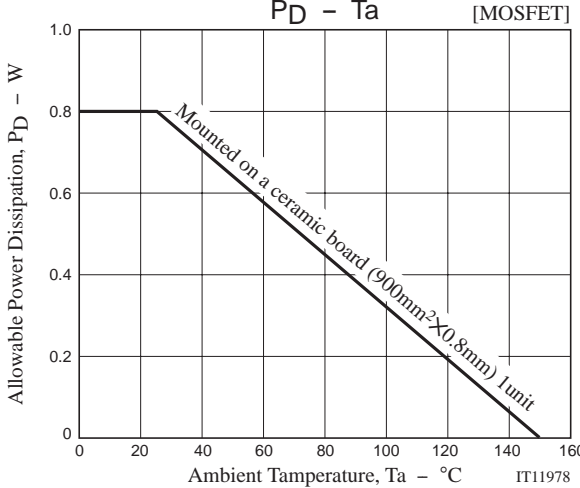
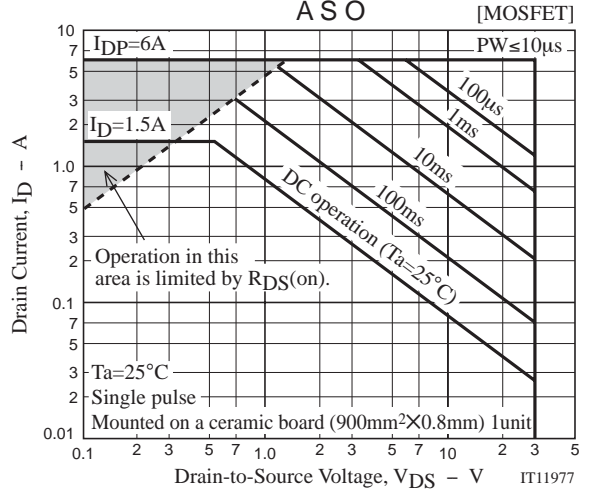
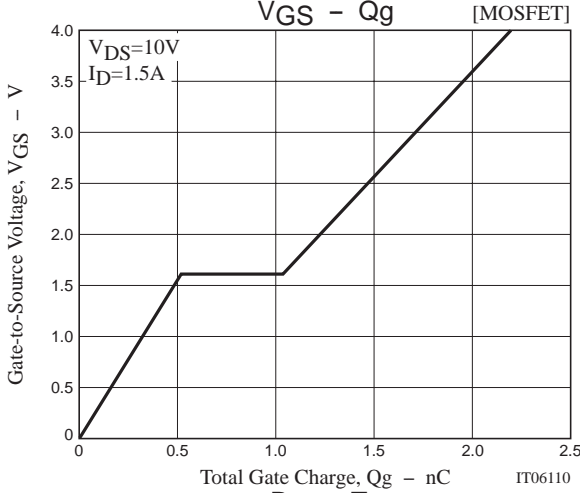
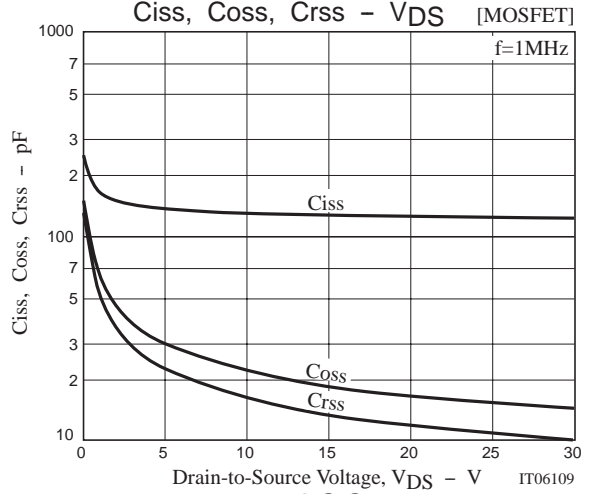
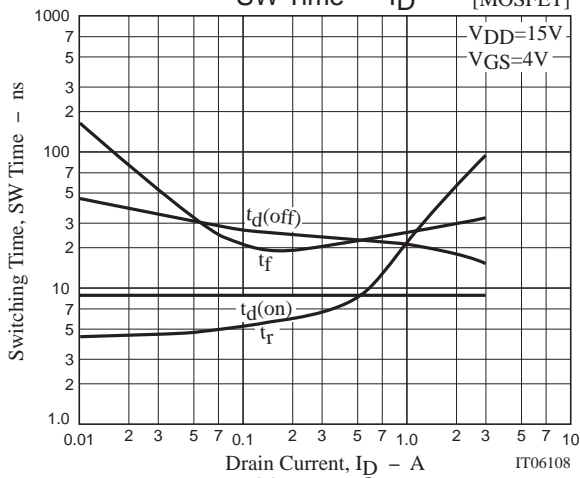
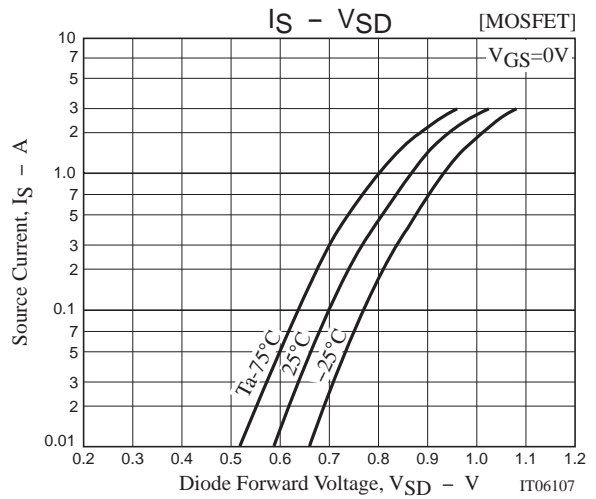
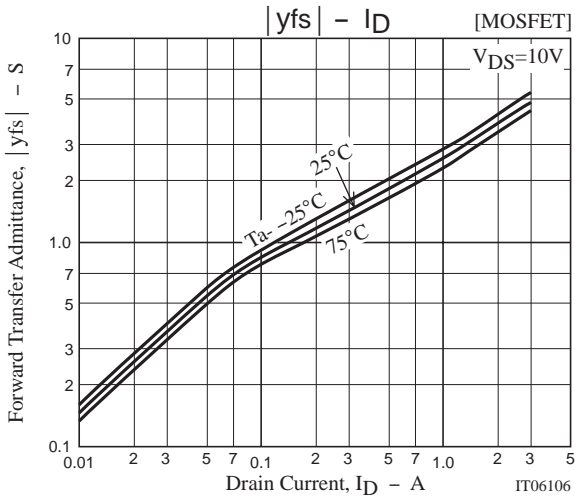


## t<sub>rr</sub> Test Circuit

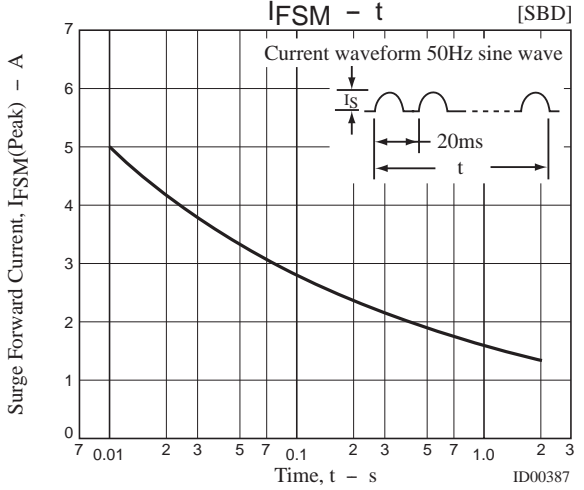
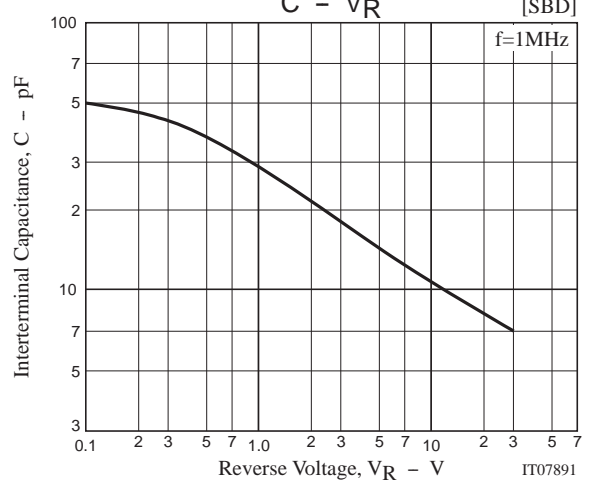
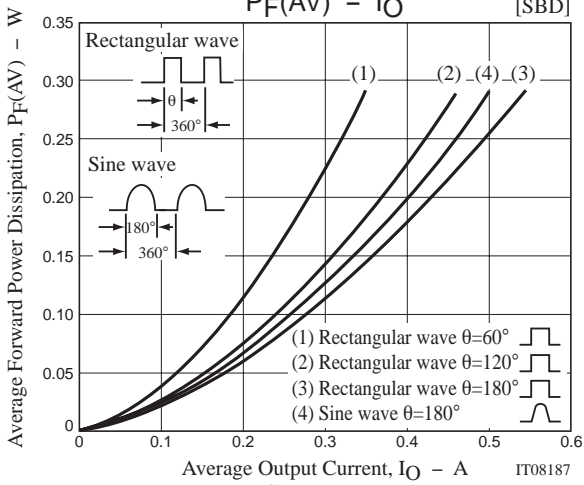
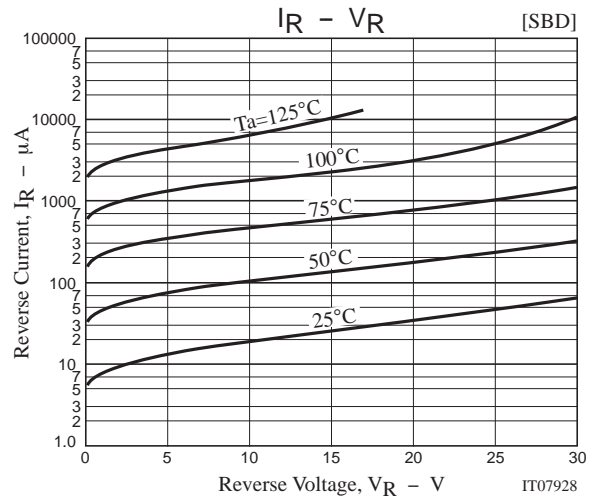
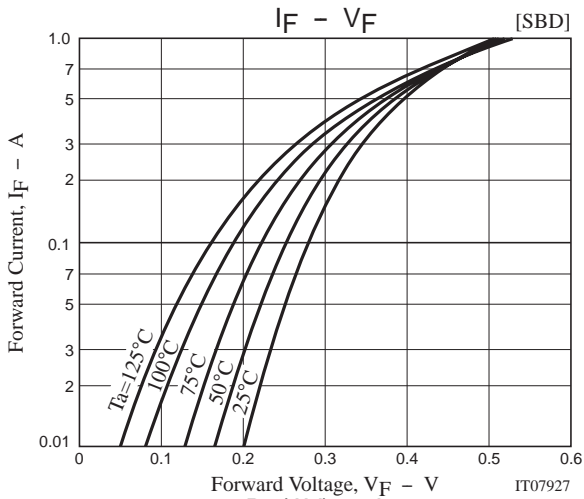
[SBD]



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Note on usage : Since the MCH5835 is a MOSFET product, please avoid using this device in the vicinity of highly charged objects.

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