



MCH5837

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

General-Purpose Switching Device Applications

Features

- Composite type with an N-channel silicon MOSFET and a schottky barrier diode (SS10015M) contained in one package facilitating high-density mounting.
- [MOSFET]
 - Low ON-resistance.
 - 1.8V 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 _{DSS}		20	V
Gate-to-Source Voltage	V _{GSS}		±10	V
Drain Current (DC)	I _D		2	A
Drain Current (Pulse)	I _{DP}	PW≤10μs, duty cycle≤1%	8	A
Allowable Power Dissipation	P _D	Mounted on a ceramic board (900mm ² ×0.8mm) 1unit	0.8	W
Channel Temperature	T _{ch}		150	°C
Storage Temperature	T _{stg}		-55 to +125	°C

Marking : YB

Continued on next page.

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Parameter	Symbol	Conditions	Ratings	Unit
[SBD]				
Repetitive Peak Reverse Voltage	V_{RRM}		15	V
Nonrepetitive Peak Reverse Surge Voltage	V_{RSM}		15	V
Average Output Current	I_O		1	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

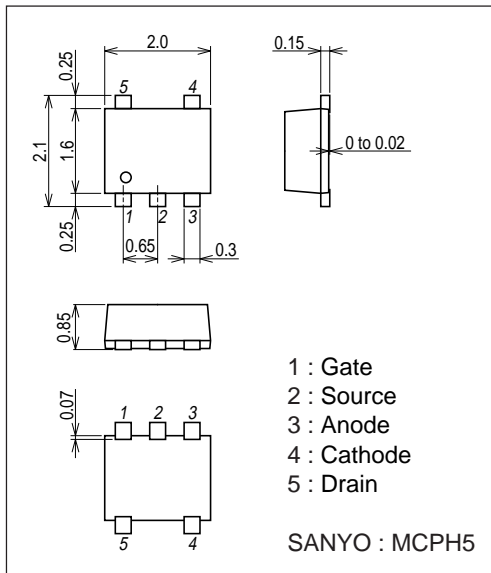
Electrical Characteristics at $T_a=25^\circ\text{C}$

Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
[MOSFET]						
Drain-to-Source Breakdown Voltage	$V_{(BR)DSS}$	$I_D=1\text{mA}, V_{GS}=0\text{V}$	20			V
Zero-Gate Voltage Drain Current	I_{DSS}	$V_{DS}=20\text{V}, V_{GS}=0\text{V}$			1	μA
Gate-to-Source Leakage Current	I_{GSS}	$V_{GS}=\pm 8\text{V}, V_{DS}=0\text{V}$			± 10	μA
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} $	$V_{DS}=10\text{V}, I_D=1\text{A}$	1.4	2.4		S
Static Drain-to-Source On-State Resistance	$R_{DS(on)1}$	$I_D=1\text{A}, V_{GS}=4\text{V}$		110	145	$\text{m}\Omega$
	$R_{DS(on)2}$	$I_D=0.5\text{A}, V_{GS}=2.5\text{V}$		150	215	$\text{m}\Omega$
	$R_{DS(on)3}$	$I_D=0.1\text{A}, V_{GS}=1.8\text{V}$		210	320	$\text{m}\Omega$
Input Capacitance	C_{iss}	$V_{DS}=10\text{V}, f=1\text{MHz}$		115		pF
Output Capacitance	C_{oss}	$V_{DS}=10\text{V}, f=1\text{MHz}$		35		pF
Reverse Transfer Capacitance	C_{rss}	$V_{DS}=10\text{V}, f=1\text{MHz}$		25		pF
Turn-ON Delay Time	$t_d(on)$	See specified Test Circuit.		7.5		ns
Rise Time	t_r	See specified Test Circuit.		27		ns
Turn-OFF Delay Time	$t_d(off)$	See specified Test Circuit.		20		ns
Fall Time	t_f	See specified Test Circuit.		30		ns
Total Gate Charge	Q_g	$V_{DS}=10\text{V}, V_{GS}=4\text{V}, I_D=2\text{A}$		1.8		nC
Gate-to-Source Charge	Q_{gs}	$V_{DS}=10\text{V}, V_{GS}=4\text{V}, I_D=2\text{A}$		0.35		nC
Gate-to-Drain "Miller" Charge	Q_{gd}	$V_{DS}=10\text{V}, V_{GS}=4\text{V}, I_D=2\text{A}$		0.5		nC
Diode Forward Voltage	V_{SD}	$I_S=2\text{A}, V_{GS}=0\text{V}$		0.86	1.2	V
[SBD]						
Reverse Voltage	V_R	$I_R=0.5\text{mA}$	15			V
Forward Voltage	V_{F1}	$I_F=0.3\text{A}$		0.3	0.33	V
	V_{F2}	$I_F=0.5\text{A}$		0.33	0.36	V
Reverse Current	I_R	$V_R=6\text{V}$			90	μA
Interterminal Capacitance	C	$V_R=10\text{V}, f=1\text{MHz}$		20		pF
Reverse Recovery Time	t_{rr}	$I_F=I_R=100\text{mA}$, See specified Test Circuit.			10	ns

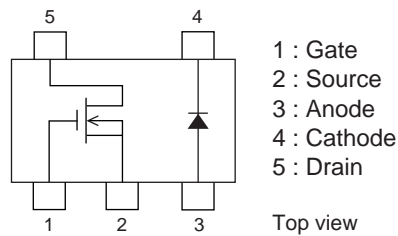
Package Dimensions

unit : mm (typ)

7021A-008



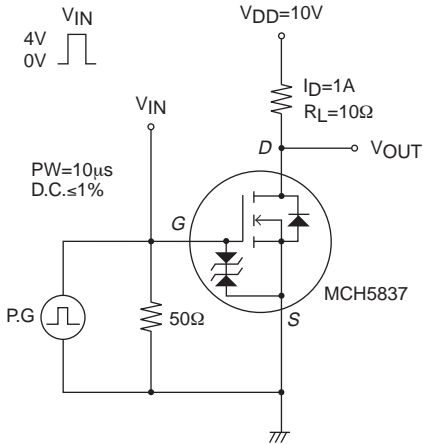
Electrical Connection



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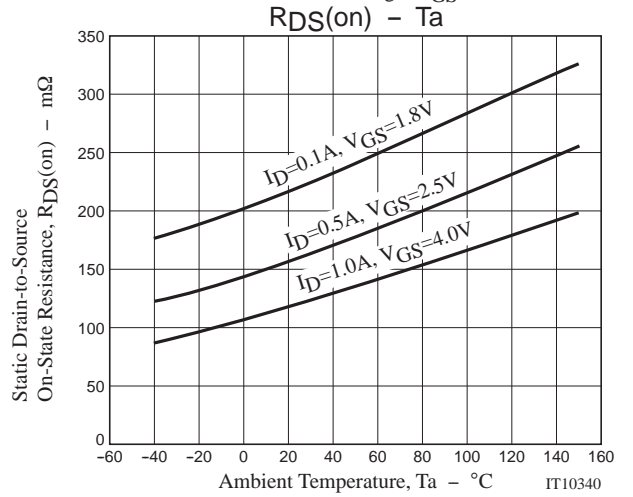
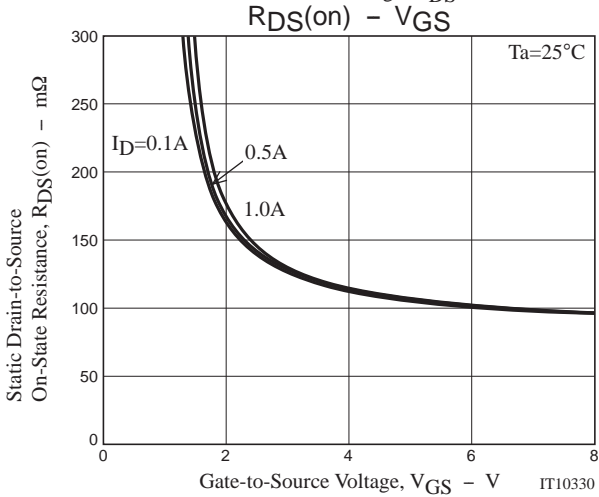
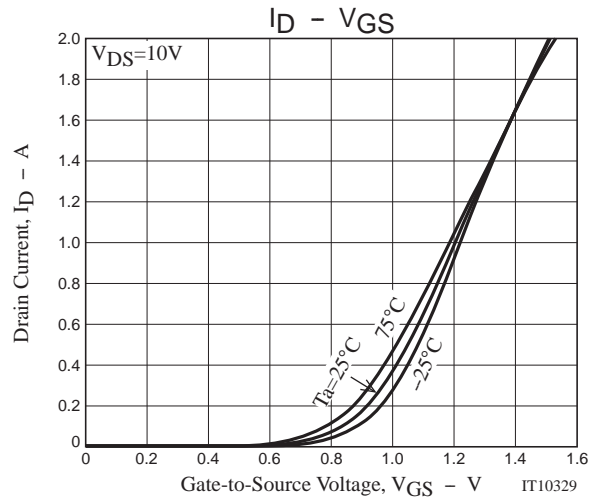
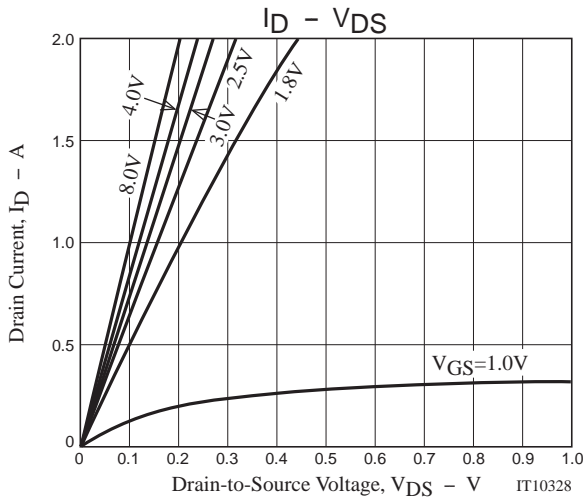
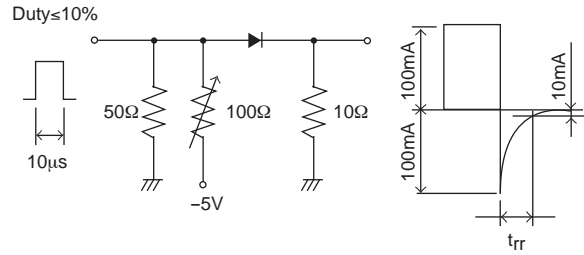
Switching Time Test Circuit

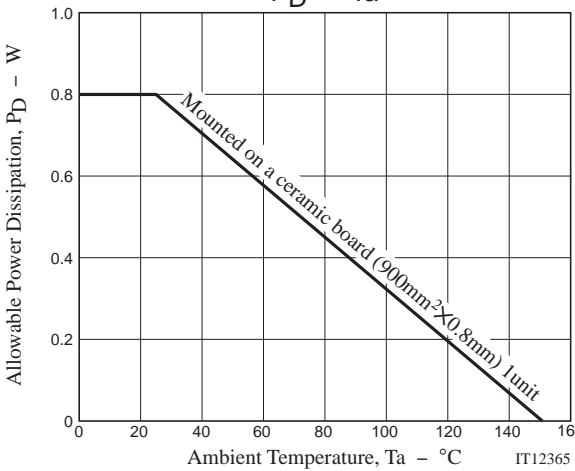
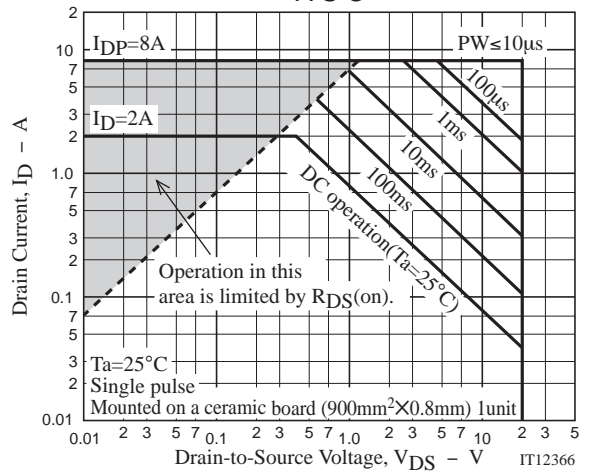
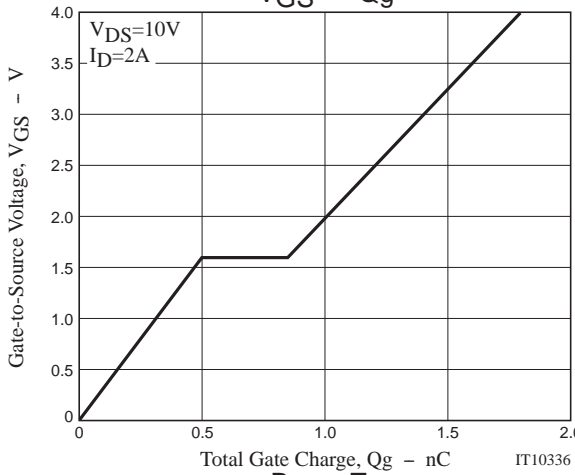
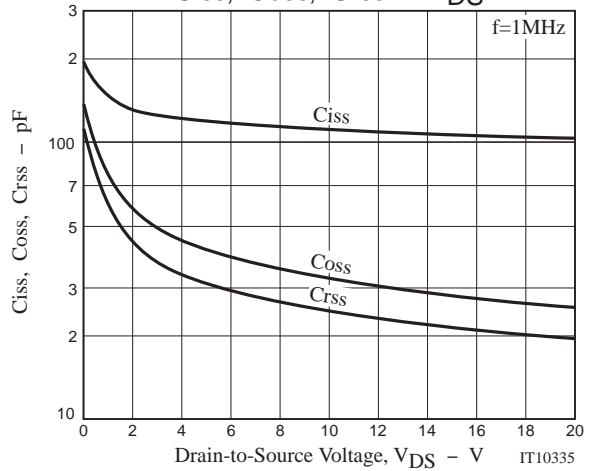
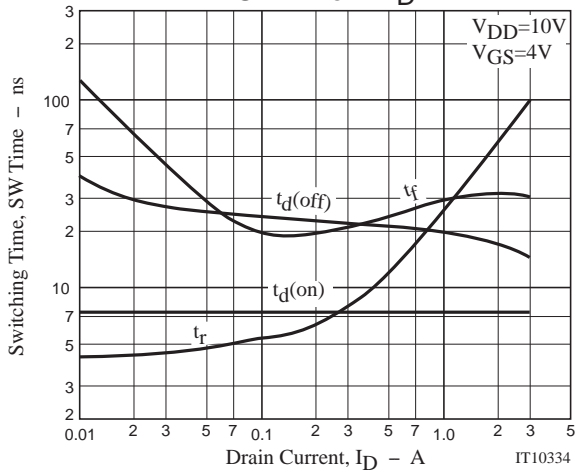
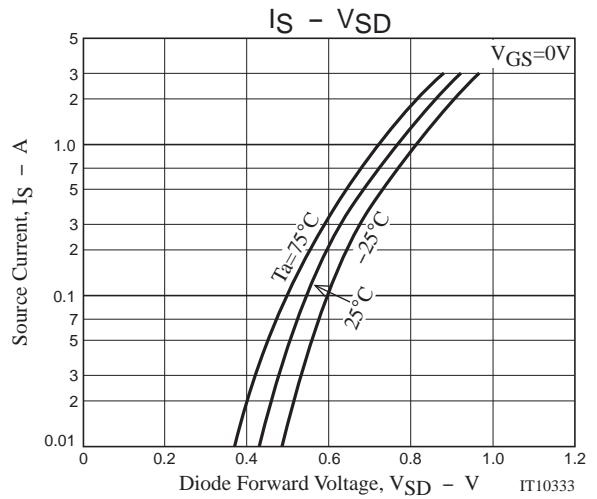
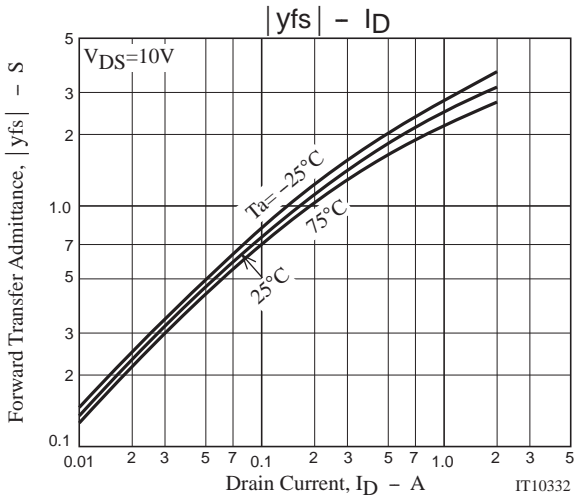
[MOSFET]



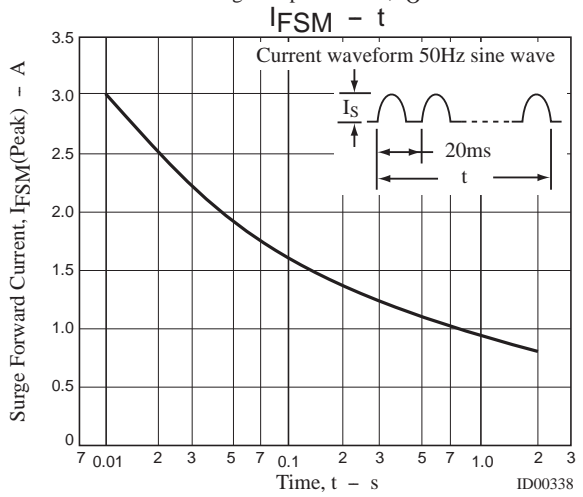
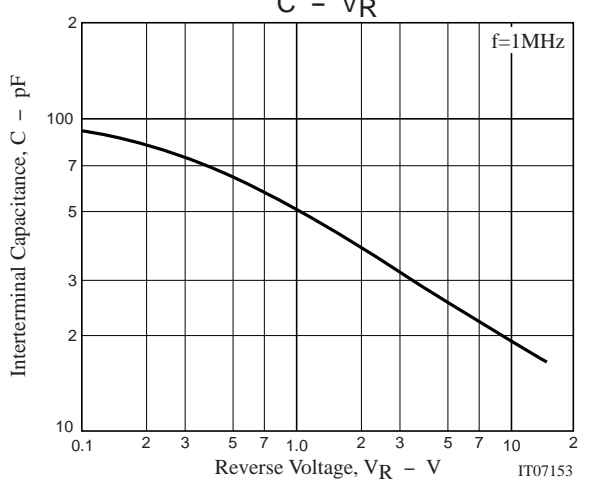
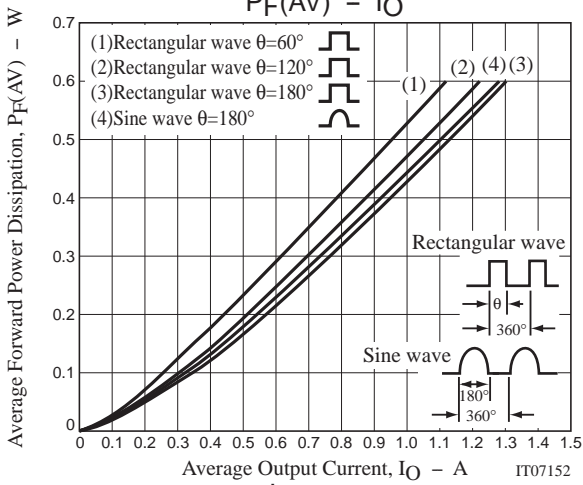
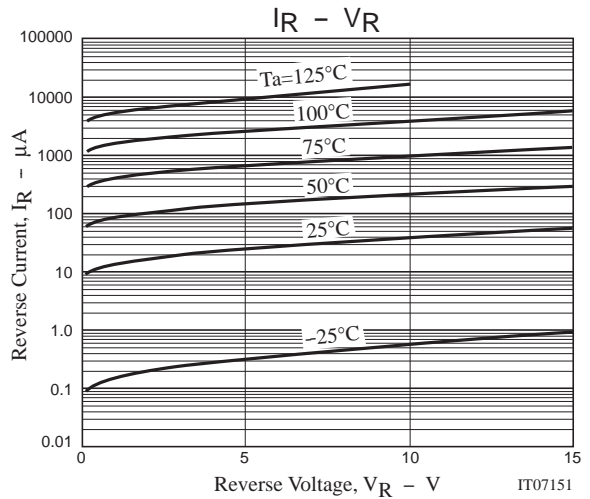
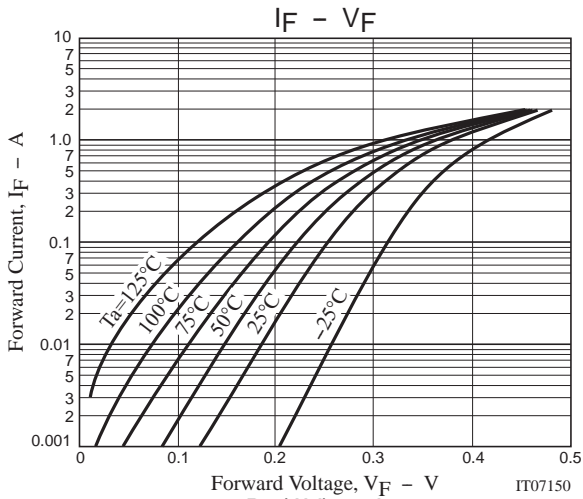
t_{rr} Test Circuit

[SBD]





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Note on usage : Since the MCH5837 is a MOSFET product, please avoid using this device in the vicinity of highly charged objects.

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