Ordering number : ENN7080

P-Channel Silicon MOSFET

MCH6307

Ultrahigh-Speed Switching Applications

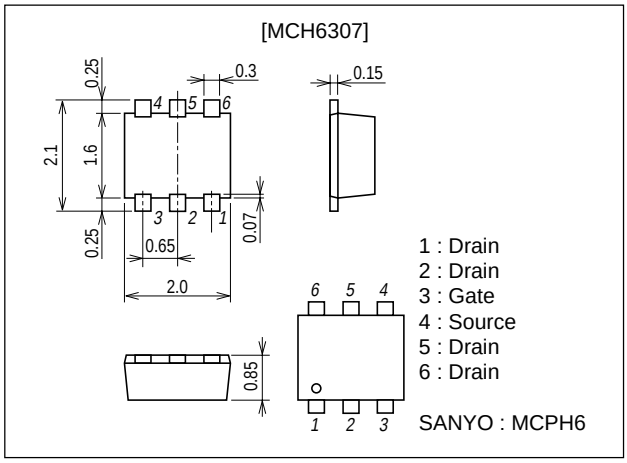
Features

- Low ON-resistance.
- Ultrahigh-speed switching.
- 1.8V drive.

Package Dimensions

unit : mm

2193A



Specifications

Absolute Maximum Ratings at Ta=25°C

Parameter	Symbol	Conditions	Ratings	Unit
Drain-to-Source Voltage	V_{DSS}		−12	V
Gate-to-Source Voltage	V_{GSS}		±8	V
Drain Current (DC)	I_D		−5	A
Drain Current (Pulse)	I_{DP}	PW≤10μs, duty cycle≤1%	−20	A
Allowable Power Dissipation	P_D	Mounted on a ceramic board (900mm²×0.8mm)	1.5	W
		Mounted on an FR4 board, PW≤3s	2.0	W
Channel Temperature	Tch		150	°C
Storage Temperature	Tstg		−55 to +150	°C

Electrical Characteristics at Ta=25°C

Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Drain-to-Source Breakdown Voltage	$V_{(BR)DSS}$	I_D=-1mA, V_{GS}=0	−12			V
Zero-Gate Voltage Drain Current	I_{DSS}	V_{DS}=−12V, V_{GS}=0			−10	μA
Gate-to-Source Leakage Current	I_{GSS}	V_{GS}=±6.4V, V_{DS}=0			±10	μA
Cutoff Voltage	V_{GS}(off)	V_{DS}=-6V, I_D=-1mA	-0.3		-1.0	V
Forward Transfer Admittance	|yfs|	V_{DS}=-6V, I_D=-3A	5.8	8.5		S
Static Drain-to-Source On-State Resistance	R_{DS}(on)1	I_D=-3A, V_{GS}=-4.5V		35	46	mΩ
	R_{DS}(on)2	I_D=-1.5A, V_{GS}=-2.5V		47	66	mΩ
	R_{DS}(on)3	I_D=-0.3A, V_{GS}=-1.8V		68	98	mΩ

Marking : JG

Continued on next page.

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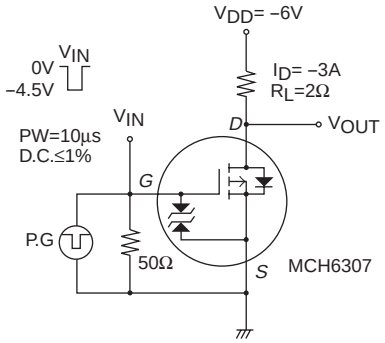
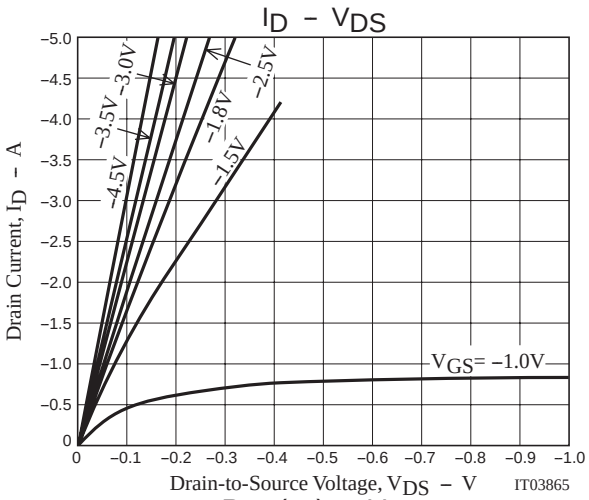
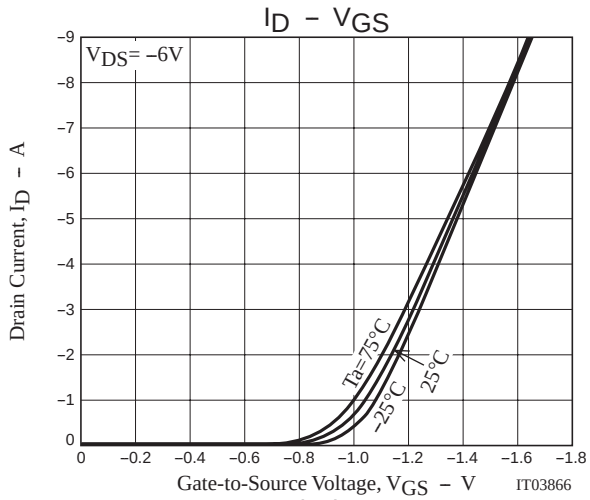
Continued from preceding page.

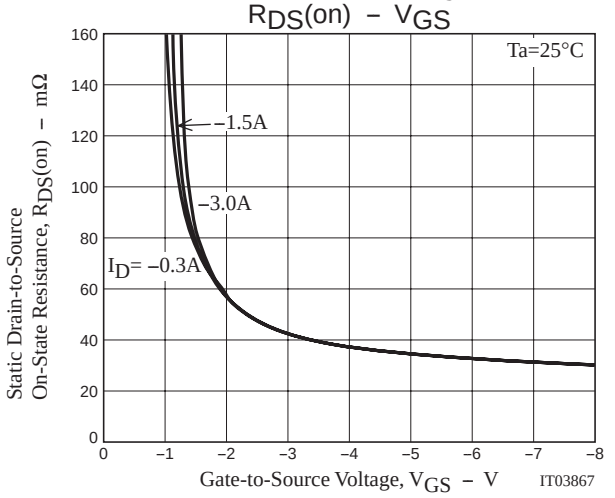
Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Input Capacitance	Ciss	V_{DS}=−6V, f=1MHz		940		pF
Output Capacitance	Coss	V_{DS}=−6V, f=1MHz		230		pF
Reverse Transfer Capacitance	Crss	V_{DS}=−6V, f=1MHz		180		pF
Turn-ON Delay Time	t_{d}(on)	See specified Test Circuit.		12		ns
Rise Time	t_{r}	See specified Test Circuit.		143		ns
Turn-OFF Delay Time	t_{d}(off)	See specified Test Circuit.		71		ns
Fall Time	t_{f}	See specified Test Circuit.		89		ns
Total Gate Charge	Qg	V_{DS}=−6V, V_{GS}=−4.5V, I_{D}=−5A		11		nC
Gate-to-Source Charge	Qgs	V_{DS}=−6V, V_{GS}=−4.5V, I_{D}=−5A		1.6		nC
Gate-to-Drain “Miller” Charge	Qgd	V_{DS}=−6V, V_{GS}=−4.5V, I_{D}=−5A		2.8		nC
Diode Forward Voltage	V_{SD}	I_{S}=−5A, V_{GS}=0		−0.85	−1.5	V

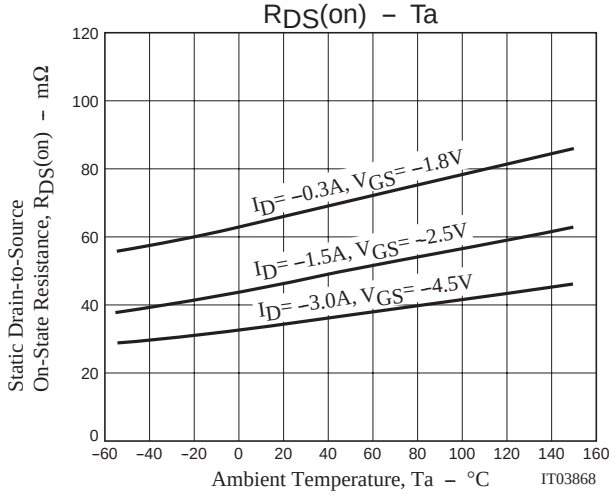
Switching Time Test Circuit

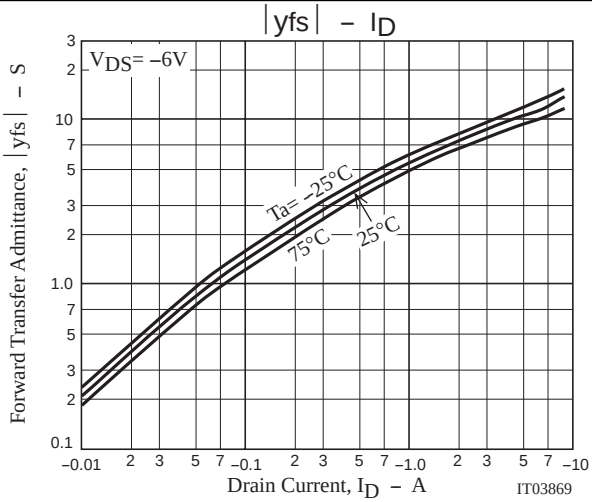


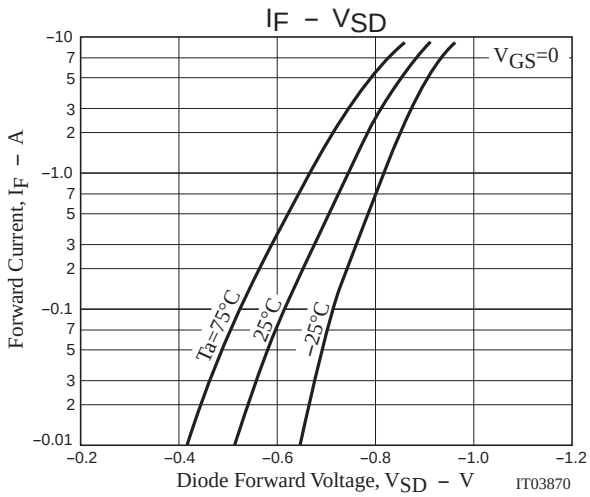


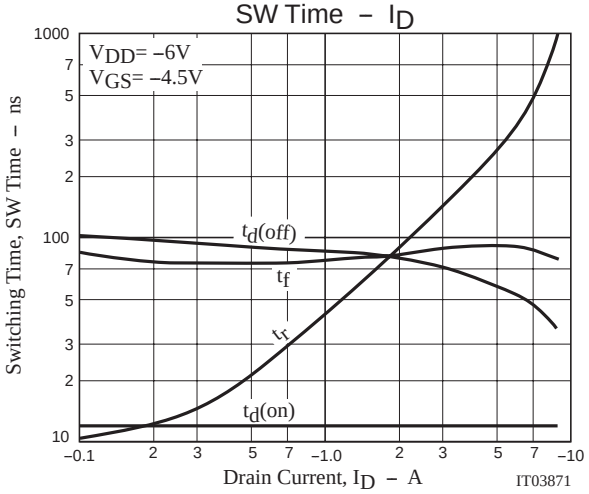


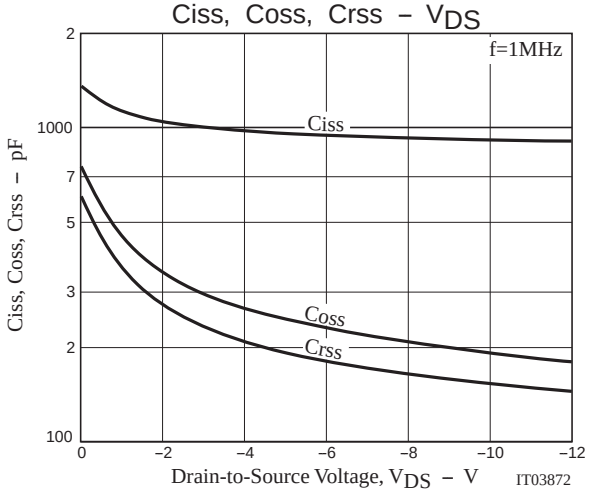


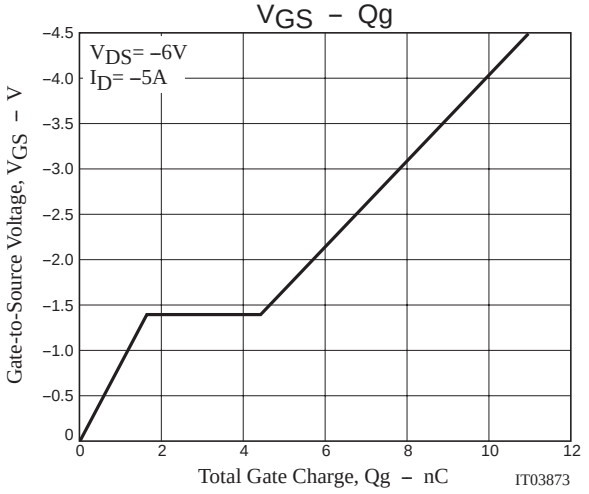


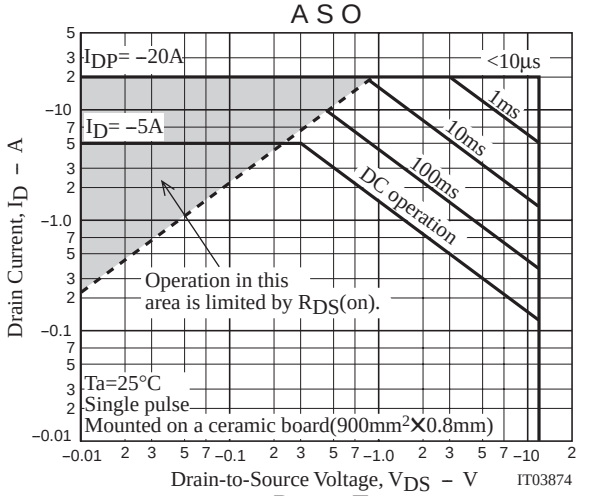

|yfs| – ID
VDS= –6V
Ta= –25°C
75°C
25°C
Forward Transfer Admittance, |yfs| – S
Drain Current, ID – A
IT03869

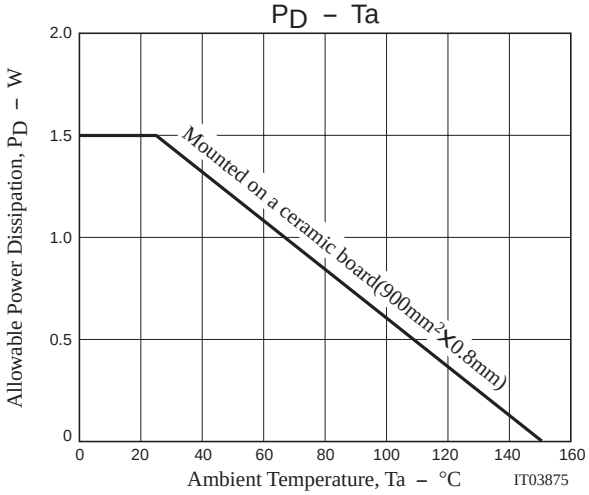

IF – VSD
VGS=0
Ta=75°C
25°C
–25°C
Forward Current, IF – A
Diode Forward Voltage, VSD – V
IT03870

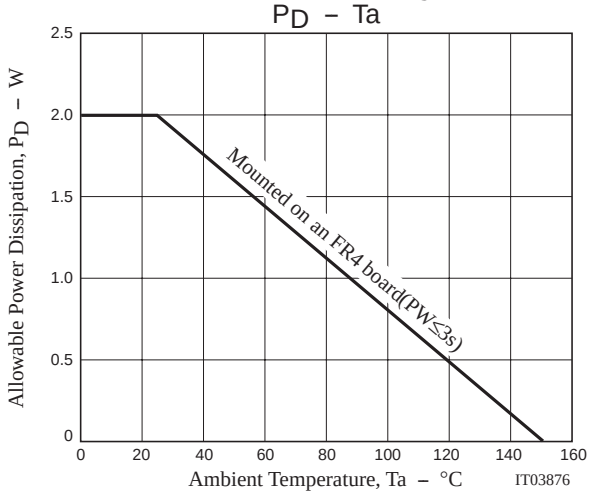

SW Time – ID
VDD= –6V
VGS= –4.5V
td(off)
tf
tr
td(on)
Switching Time, SW Time – ns
Drain Current, ID – A
IT03871


Ciss, Coss, Crss – VDS
f=1MHz
Ciss
Coss
Crss
Ciss, Coss, Crss – pF
Drain-to-Source Voltage, VDS – V
IT03872


VGS – Qg
VDS= –6V
ID= –5A
Gate-to-Source Voltage, VGS – V
Total Gate Charge, Qg – nC
IT03873


A S O
IDP= –20A
ID= –5A
<10μs
1ms
10ms
100ms
DC operation
Operation in this
area is limited by RDS(on).
Ta=25°C
Single pulse
Mounted on a ceramic board(900mm²×0.8mm)
Drain Current, ID – A
Drain-to-Source Voltage, VDS – V
IT03874


PD – Ta
Mounted on a ceramic board(900mm²×0.8mm)
Allowable Power Dissipation, PD – W
Ambient Temperature, Ta – °C
IT03875


PD – Ta
Mounted on an FR4 board(PW≤3s)
Allowable Power Dissipation, PD – W
Ambient Temperature, Ta – °C
IT03876

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