Ordering number : ENN7297

N-Channl Silicon MOSFET

MCH6406

Ultrahigh-Speed Switching Applications

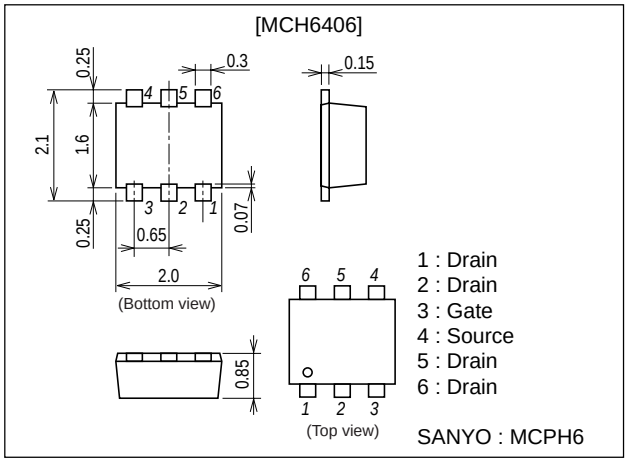
Features

- Low ON-resistance.
- Ultrahigh-speed switcing.
- 4V 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}		30	V
Gate-to-Source Voltage	V_{GSS}		±20	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
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	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}= ±16V, V_{DS}=0			±10	μA
Cutoff Voltage	V_{GS}(off)	V_{DS}=10V, I_D=1mA	1.2		2.6	V
Forward Transfer Admittance	|yfs|	V_{DS}=10V, I_D=2.5A	2.8	4		S
Static Drain-to-Source On-State Resistance	R_{DS}(on)1	I_D=2.5A, V_{GS}=10V		37	48	mΩ
	R_{DS}(on)2	I_D=1.2A, V_{GS}=4V		63	88	mΩ
Input Capacitance	Ciss	V_{DS}=10V, f=1MHz		370		pF
Output Capacitance	Coss	V_{DS}=10V, f=1MHz		85		pF
Reverse Transfer Capacitance	Crss	V_{DS}=10V, f=1MHz		47		pF

Marking : KF

Continued on next page.

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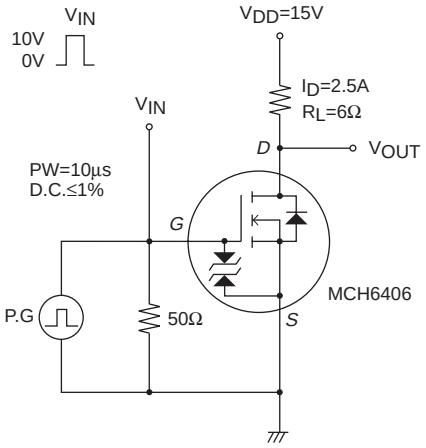
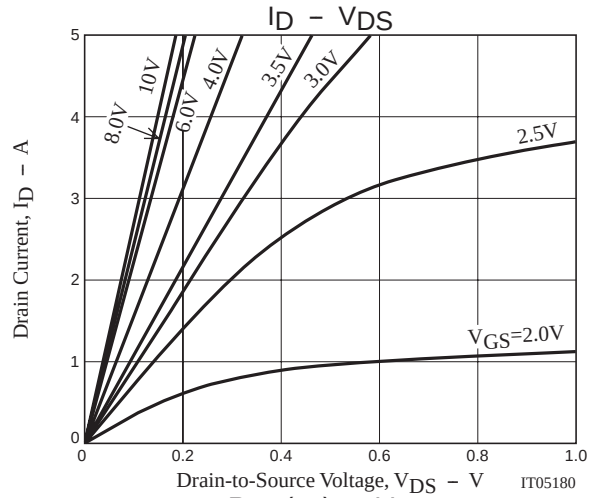
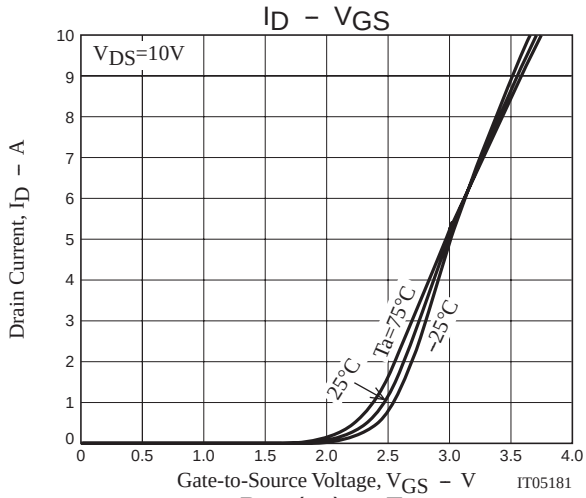
Continued from preceding page.

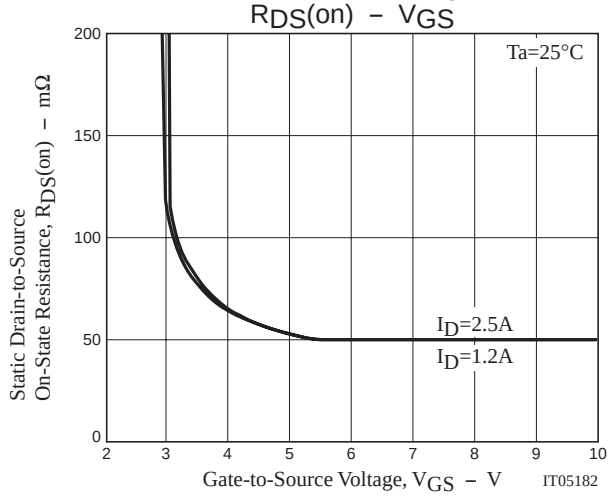
Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Turn-ON Delay Time	t_{d}(on)	See specified Test Circuit.		11		ns
Rise Time	t_{r}	See specified Test Circuit.		12		ns
Turn-OFF Delay Time	t_{d}(off)	See specified Test Circuit.		32		ns
Fall Time	t_{f}	See specified Test Circuit.		18		ns
Total Gate Charge	Qg	V_{DS}=10V, V_{GS}=10V, I_{D}=5A		8.5		nC
Gate-to-Source Charge	Qgs	V_{DS}=10V, V_{GS}=10V, I_{D}=5A		1.8		nC
Gate-to-Drain “Miller” Charge	Qgd	V_{DS}=10V, V_{GS}=10V, I_{D}=5A		1.3		nC
Diode Forward Voltage	V_{SD}	I_{S}=5A, V_{GS}=0		0.86	1.2	V

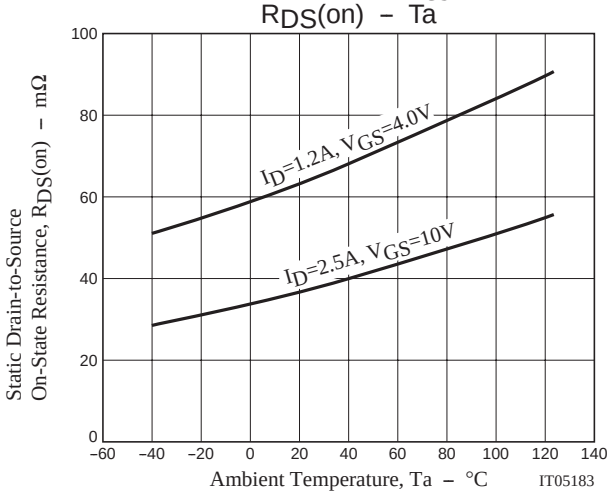
Switching Time Test Circuit

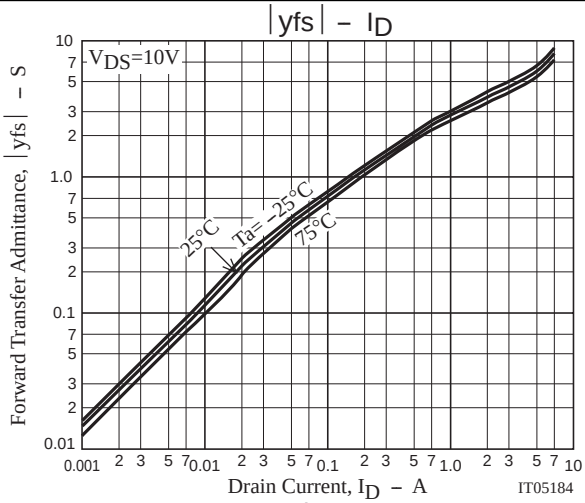


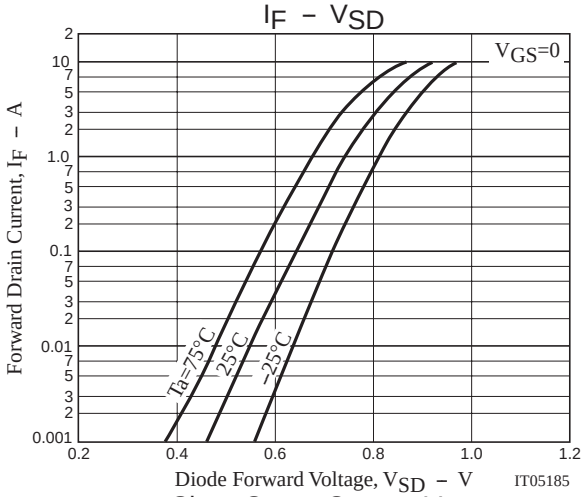


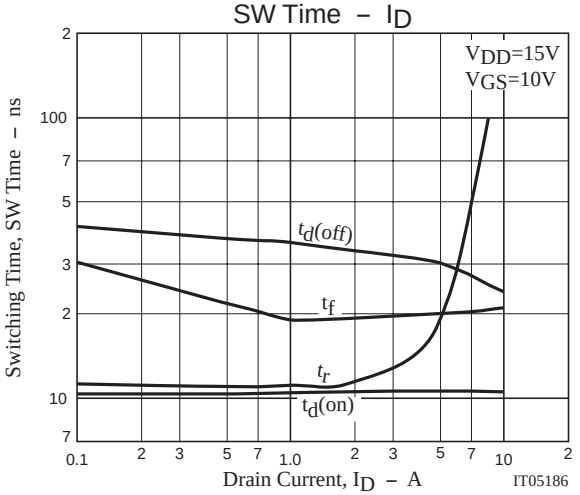


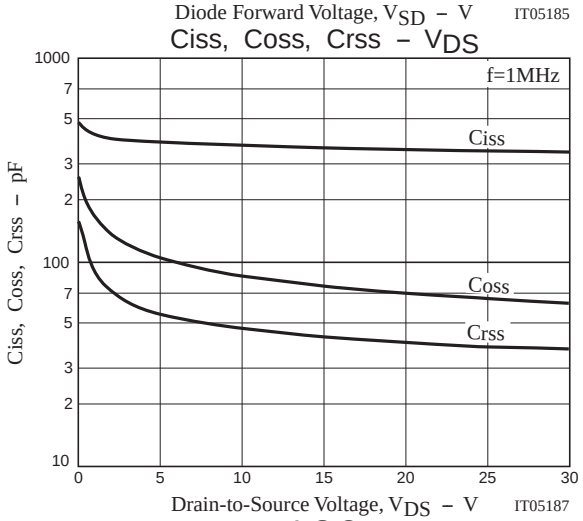


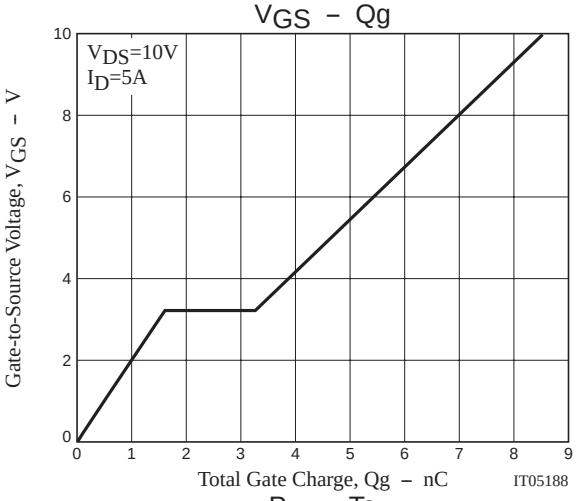


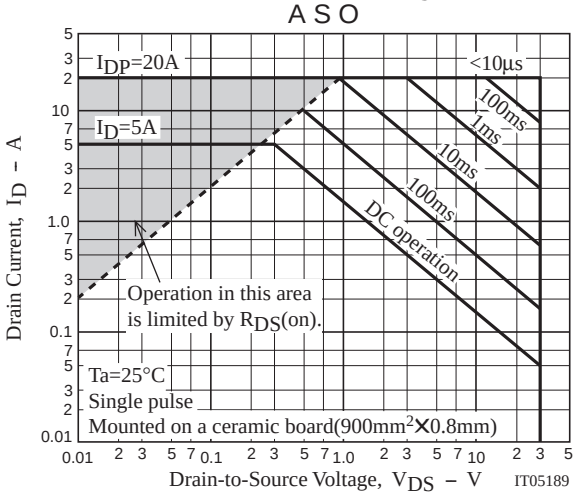

|yfs| – ID
VDS=10V
25°C
Ta=–25°C
75°C
Forward Transfer Admittance, |yfs| – S
Drain Current, ID – A
IT05184

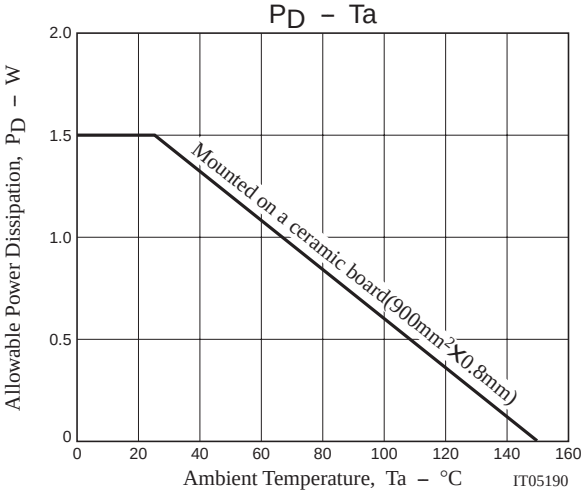

IF – VSD
VGS=0
Ta=75°C
25°C
–25°C
Forward Drain Current, IF – A
Diode Forward Voltage, VSD – V
IT05185


SW Time – ID
VDD=15V
VGS=10V
td(off)
tf
tr
td(on)
Switching Time, SW Time – ns
Drain Current, ID – A
IT05186


Ciss, Coss, Crss – VDS
f=1MHz
Ciss
Coss
Crss
Ciss, Coss, Crss – pF
Drain-to-Source Voltage, VDS – V
IT05187


VGS – Qg
VDS=10V
ID=5A
Gate-to-Source Voltage, VGS – V
Total Gate Charge, Qg – nC
IT05188


A S O
IDP=20A
ID=5A
<10µs
100ms
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
IT05189


PD – Ta
Mounted on a ceramic board(900mm2×0.8mm)
Allowable Power Dissipation, PD – W
Ambient Temperature, Ta – °C
IT05190