Ordering number : ENN8959

SANYO Semiconductors
DATA SHEET

N-Channel and P-Channel Silicon MOSFETs

MCH6644 — General-Purpose Switching Device Applications

Features

- The MCH6644 incorporates an N-channel MOSFET and a P-channel MOSFET thereby enabling high-density mounting.
- Excellent ON-resistance characteristic.
- Best suited for load switches.
- 4V drive.

Specifications

Absolute Maximum Ratings at Ta=25°C

Parameter	Symbol	Conditions	N-channel	P-channel	Unit
Drain-to-Source Voltage	V_{DSS}		30	−30	V
Gate-to-Source Voltage	V_{GSS}		±20	±20	V
Drain Current (DC)	I_D		1.8	−1.2	A
Drain Current (Pulse)	I_{DP}	PW≤10μs, duty cycle≤1%	7.2	−4.8	A
Allowable Power Dissipation	P_D	Mounted on a ceramic board (900mm²X0.8mm)1unit	0.8		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	
[N-channel]						
Drain-to-Source Breakdown Voltage	$V_{(BR)DSS}$	I_D=1mA, V_{GS}=0V	30			V
Zero-Gate Voltage Drain Current	I_{DSS}	V_{DS}=30V, V_{GS}=0V			1	μA
Gate-to-Source Leakage Current	I_{GSS}	V_{GS}=±16V, V_{DS}=0V			±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=1A	0.78	1.3		S
Static Drain-to-Source On-State Resistance	R_{DS}(on)1	I_D=1A, V_{GS}=10V		160	210	mΩ
	R_{DS}(on)2	I_D=0.5A, V_{GS}=4V		300	420	mΩ
Input Capacitance	Ciss	V_{DS}=10V, f=1MHz		95		pF
Output Capacitance	Coss	V_{DS}=10V, f=1MHz		22		pF
Reverse Transfer Capacitance	Crss	V_{DS}=10V, f=1MHz		16		pF

Marking : WU

Continued on next page.

SANYO Electric Co.,Ltd. Semiconductor Company
TOKYO OFFICE Tokyo Bldg., 1-10, 1 Chome, Ueno, Taito-ku, TOKYO, 110-8534 JAPAN

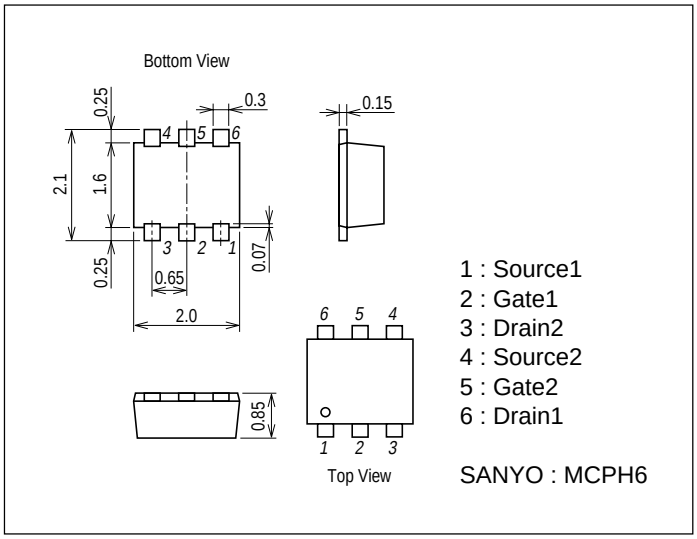
Continued from preceding page.

Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Turn-ON Delay Time	$t_{d(on)}$	See specified Test Circuit.		6.2		ns
Rise Time	t_r	See specified Test Circuit.		4.5		ns
Turn-OFF Delay Time	$t_{d(off)}$	See specified Test Circuit.		13		ns
Fall Time	t_f	See specified Test Circuit.		6.4		ns
Total Gate Charge	Qg	V_{DS}=10V, V_{GS}=10V, I_D=1.8A		3.2		nC
Gate-to-Source Charge	Qgs	V_{DS}=10V, V_{GS}=10V, I_D=1.8A		0.74		nC
Gate-to-Drain “Miller” Charge	Qgd	V_{DS}=10V, V_{GS}=10V, I_D=1.8A		0.42		nC
Diode Forward Voltage	V_{SD}	I_S=1.8A, V_{GS}=0V		0.93	1.2	V
[P-channel]						
Drain-to-Source Breakdown Voltage	$V_{(BR)DSS}$	I_D=–1mA, V_{GS}=0V	–30			V
Zero-Gate Voltage Drain Current	I_{DSS}	V_{DS}=–30V, V_{GS}=0V			–1	μA
Gate-to-Source Leakage Current	I_{GSS}	V_{GS}=±16V, V_{DS}=0V			±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=–0.6A	0.6	1.0		S
Static Drain-to-Source On-State Resistance	$R_{DS(on)1}$	I_D=–0.6A, V_{GS}=–10V		320	420	mΩ
	$R_{DS(on)2}$	I_D=–0.3A, V_{GS}=–4V		590	830	mΩ
Input Capacitance	Ciss	V_{DS}=–10V, f=1MHz		104		pF
Output Capacitance	Coss	V_{DS}=–10V, f=1MHz		22		pF
Reverse Transfer Capacitance	Crss	V_{DS}=–10V, f=1MHz		17		pF
Turn-ON Delay Time	$t_{d(on)}$	See specified Test Circuit.		12.5		ns
Rise Time	t_r	See specified Test Circuit.		24		ns
Turn-OFF Delay Time	$t_{d(off)}$	See specified Test Circuit.		12		ns
Fall Time	t_f	See specified Test Circuit.		12.2		ns
Total Gate Charge	Qg	V_{DS}=–10V, V_{GS}=–10V, I_D=–1.2A		3.3		nC
Gate-to-Source Charge	Qgs	V_{DS}=–10V, V_{GS}=–10V, I_D=–1.2A		0.48		nC
Gate-to-Drain “Miller” Charge	Qgd	V_{DS}=–10V, V_{GS}=–10V, I_D=–1.2A		0.45		nC
Diode Forward Voltage	V_{SD}	I_S=–1.2A, V_{GS}=0V		–0.91	–1.5	V

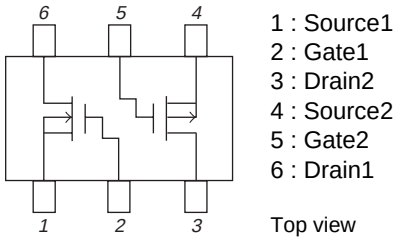
Package Dimensions

unit : mm

7022-006

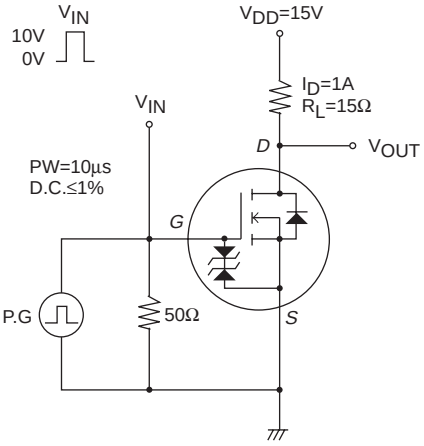


Electrical Connection

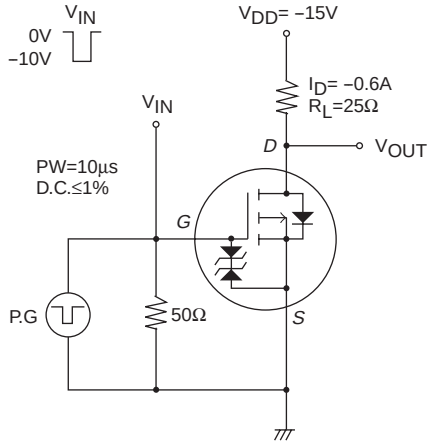


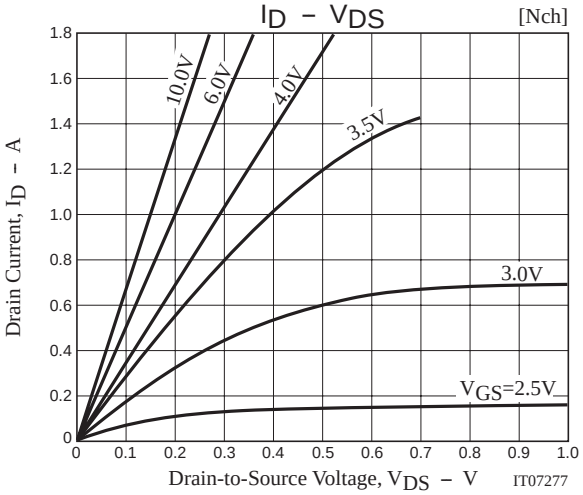
Switching Time Test Circuit

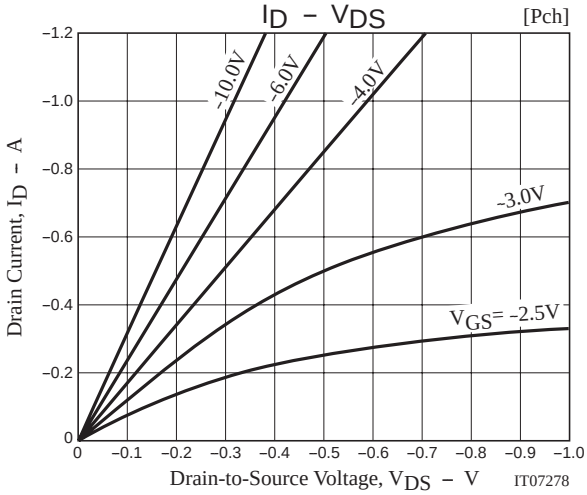
[N-channel]

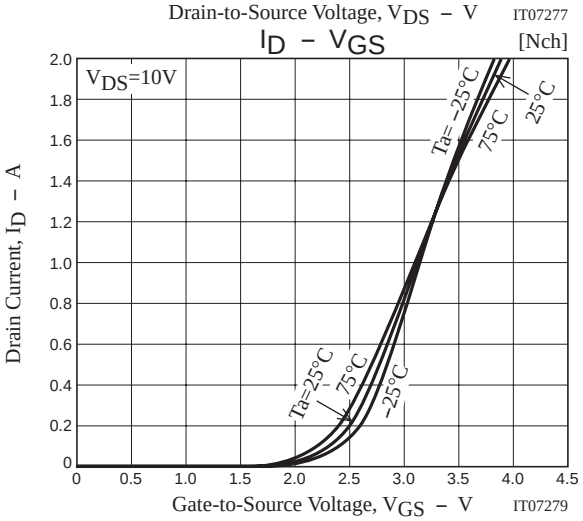


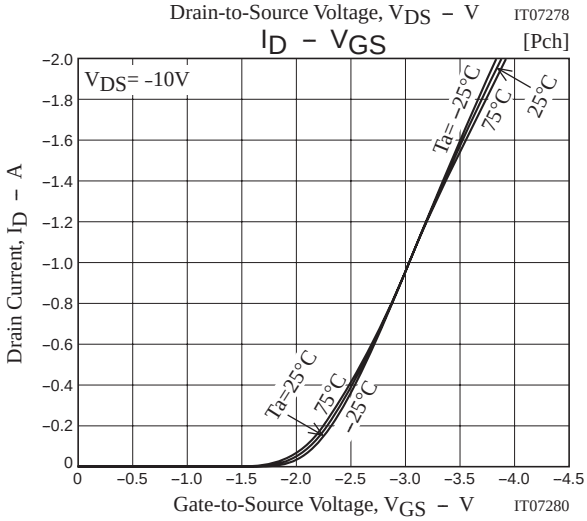
[P-channel]

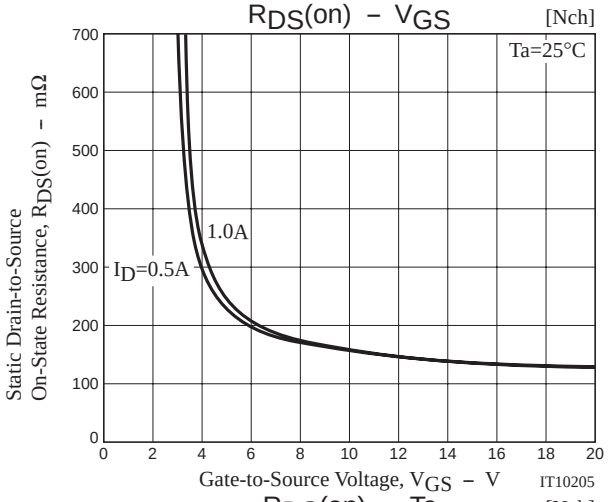


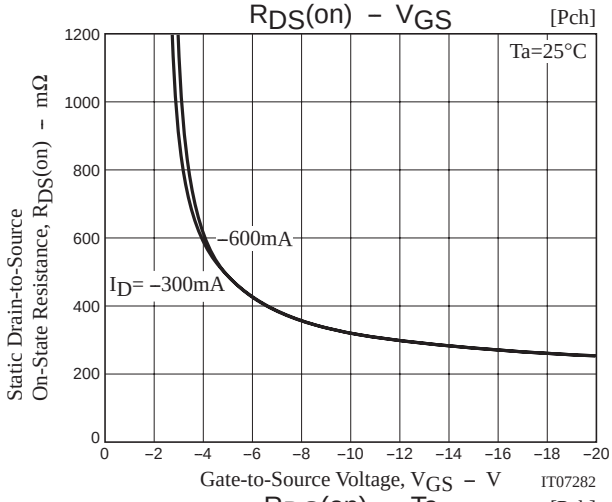


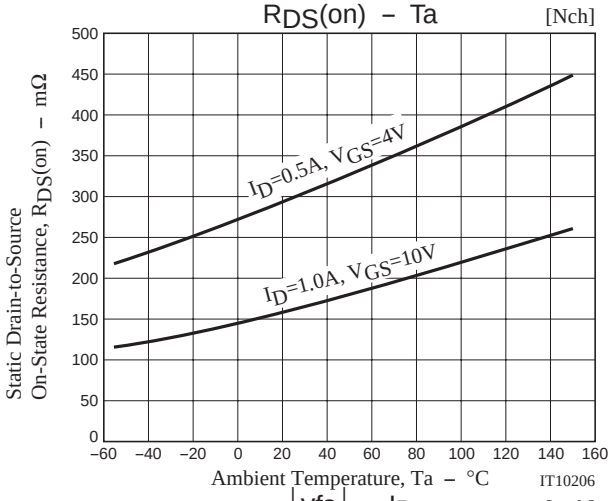


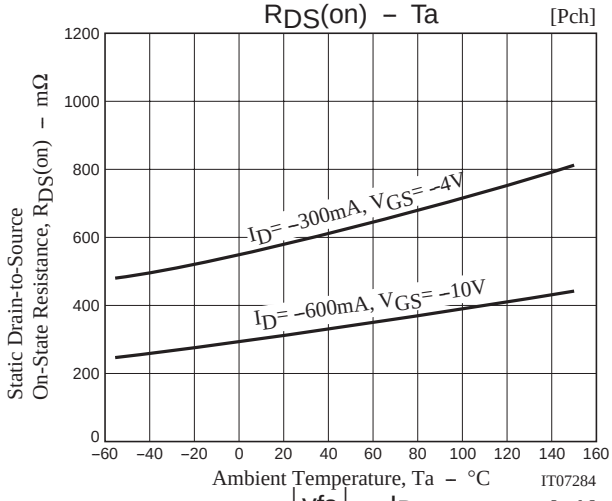


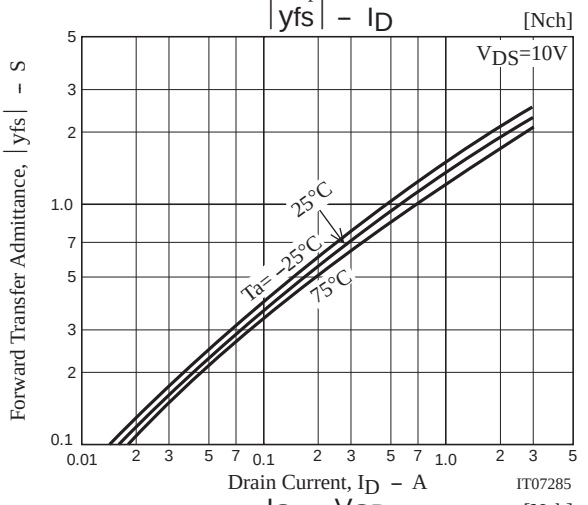


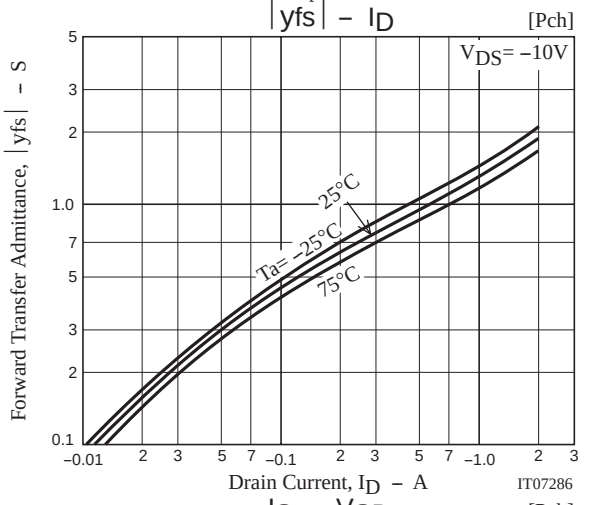

RDS(on) – VGS
[Nch]
Ta=25°C
1.0A
ID=0.5A
Static Drain-to-Source On-State Resistance, RDS(on) – mΩ
Gate-to-Source Voltage, VGS – V
IT10205

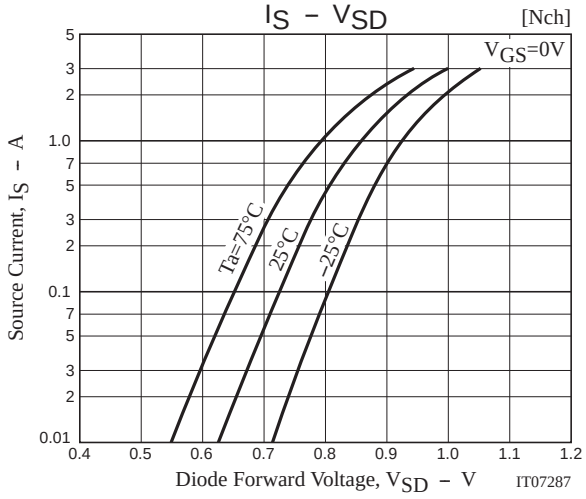

RDS(on) – VGS
[Pch]
Ta=25°C
–600mA
ID= –300mA
Static Drain-to-Source On-State Resistance, RDS(on) – mΩ
Gate-to-Source Voltage, VGS – V
IT07282

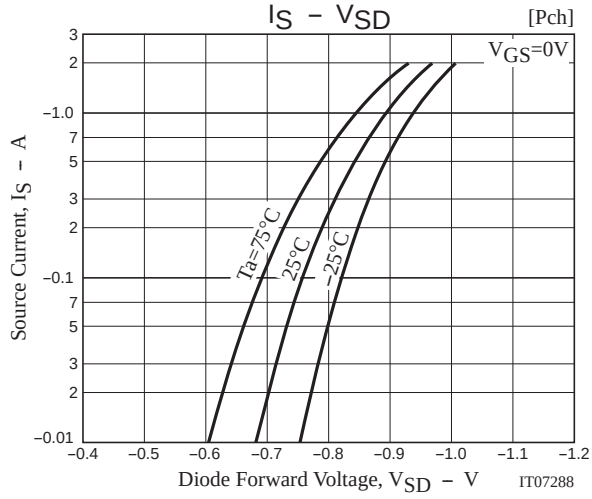

RDS(on) – Ta
[Nch]
ID=0.5A, VGS=4V
ID=1.0A, VGS=10V
Static Drain-to-Source On-State Resistance, RDS(on) – mΩ
Ambient Temperature, Ta – °C
IT10206


RDS(on) – Ta
[Pch]
ID= –300mA, VGS= –4V
ID= –600mA, VGS= –10V
Static Drain-to-Source On-State Resistance, RDS(on) – mΩ
Ambient Temperature, Ta – °C
IT07284

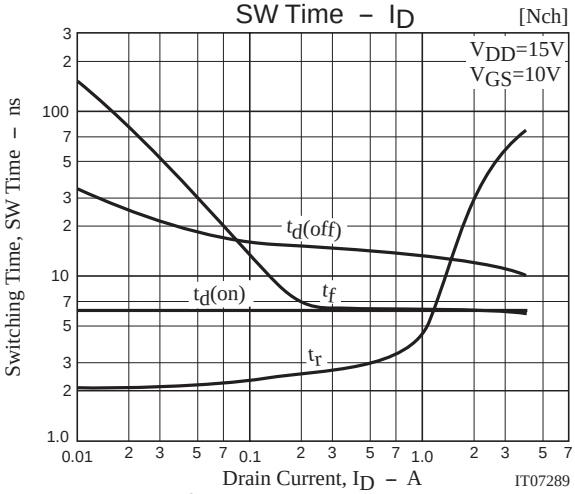

|yfs| – ID
[Nch]
VDS=10V
25°C
Ta= –25°C
75°C
Forward Transfer Admittance, |yfs| – S
Drain Current, ID – A
IT07285


|yfs| – ID
[Pch]
VDS= –10V
25°C
Ta= –25°C
75°C
Forward Transfer Admittance, |yfs| – S
Drain Current, ID – A
IT07286

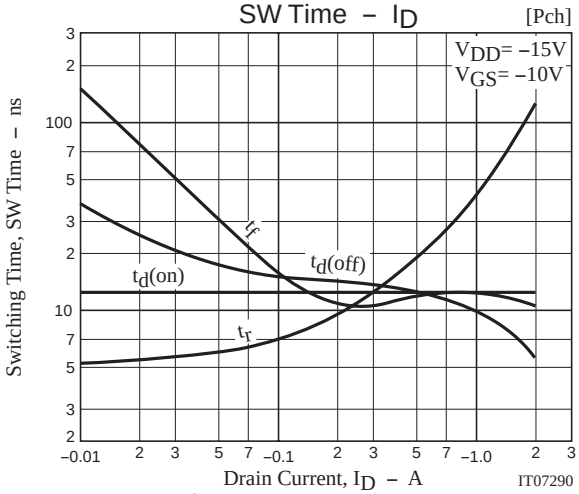

IS – VSD
[Nch]
VGS=0V
Ta=75°C
25°C
–25°C
Source Current, IS – A
Diode Forward Voltage, VSD – V
IT07287


IS – VSD
[Pch]
VGS=0V
Ta=75°C
25°C
–25°C
Source Current, IS – A
Diode Forward Voltage, VSD – V
IT07288

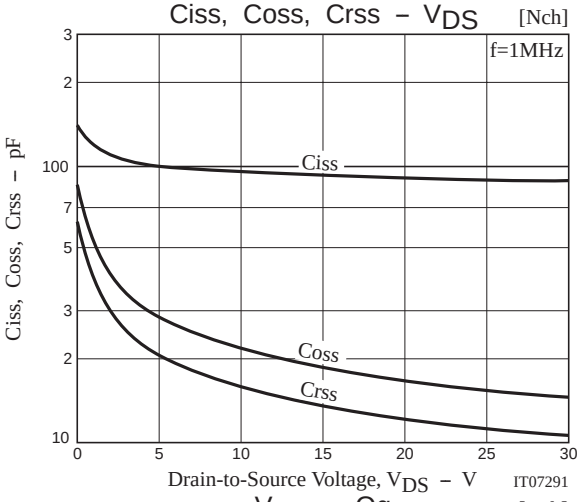
SW Time – I_D [Nch]



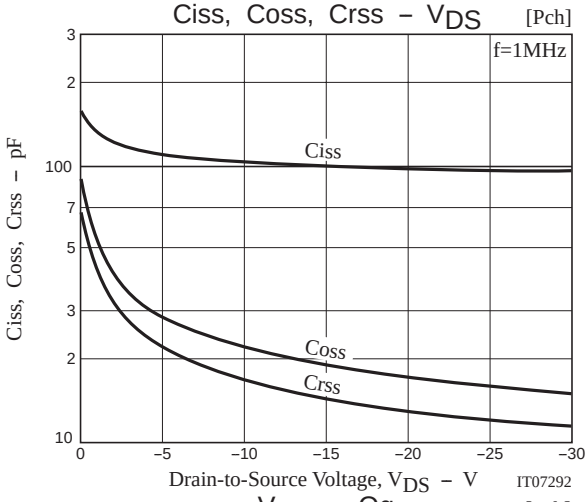
SW Time – I_D [Pch]



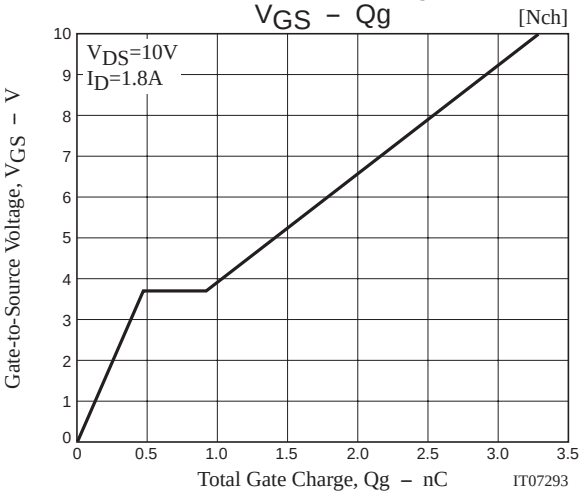
Ciss, Coss, Crss – V_{DS} [Nch]



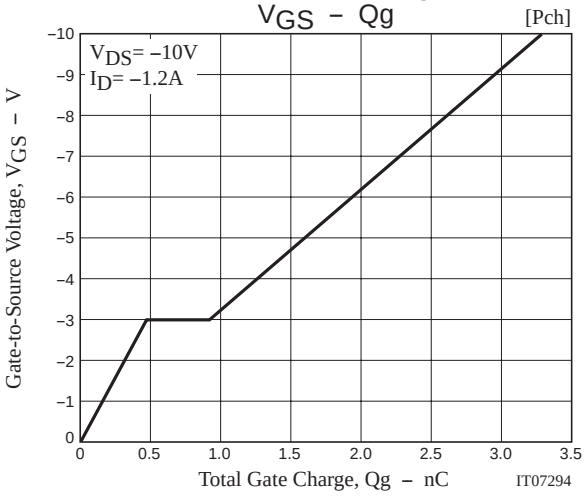
Ciss, Coss, Crss – V_{DS} [Pch]



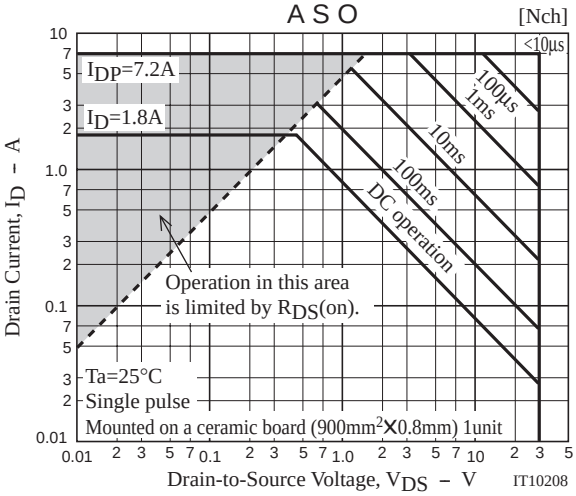
V_{GS} – Qg [Nch]



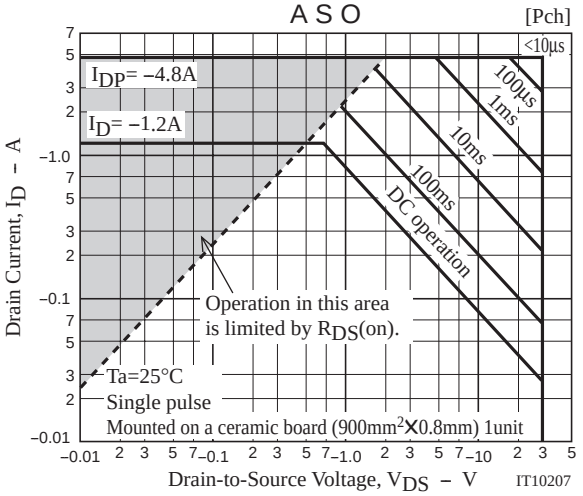
V_{GS} – Qg [Pch]

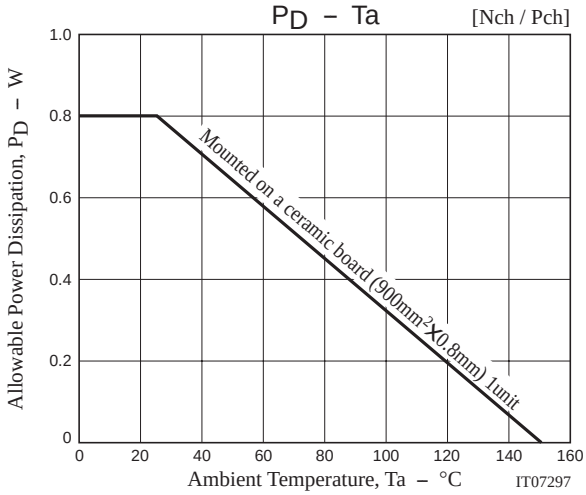


A S O [Nch]



A S O [Pch]





Note on usage : Since the MCH6644 is a MOSFET product, please avoid using this device in the vicinity of highly charged objects.