Ordering number : ENN7041

P-Channel Silicon MOSFET

MCH6609

Ultrahigh-Speed Switching Applications

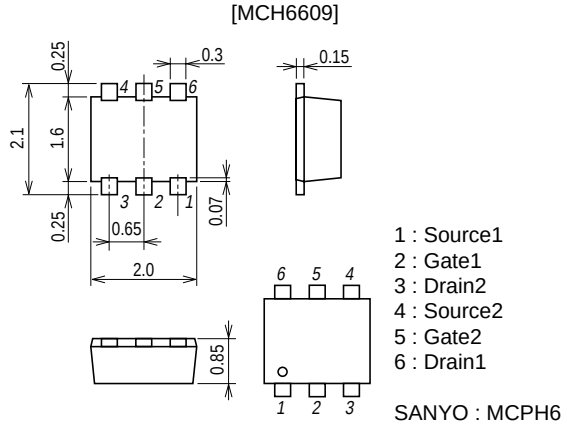
Features

- Low ON-resistance.
- Ultrahigh-speed switching.
- 2.5V drive.
- Composite type with 2 MOSFETs contained in a single package, facilitating high-density mounting.

Package Dimensions

unit : mm

2173A



Specifications

Absolute Maximum Ratings at Ta=25°C

Parameter	Symbol	Conditions	Ratings	Unit
Drain-to-Source Voltage	V_{DSS}		−50	V
Gate-to-Source Voltage	V_{GSS}		±10	V
Drain Current (DC)	I_D		−0.28	A
Drain Current (Pulse)	I_{DP}	PW≤10μs, duty cycle≤1%	−1.1	A
Allowable Power Dissipation	P_D	Mounted on a ceramic board (900mm²×0.8mm)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	
Drain-to-Source Breakdown Voltage	$V_{(BR)DSS}$	I_D=−1mA, V_{GS}=0	−50			V
Zero-Gate Voltage Drain Current	I_{DSS}	V_{DS}=−50V, V_{GS}=0			−10	μA
Gate-to-Source Leakage Current	I_{GSS}	V_{GS}=±8V, V_{DS}=0			±10	μA
Cutoff Voltage	V_{GS}(off)	V_{DS}=−10V, I_D=−100μA	−0.4		−1.4	V
Forward Transfer Admittance	|yfs|	V_{DS}=−10V, I_D=−70mA	170	240		mS
Static Drain-to-Source On-State Resistance	R_{DS}(on)1	I_D=−70mA, V_{GS}=−4V		5.1	6.6	Ω
	R_{DS}(on)2	I_D=−40mA, V_{GS}=−2.5V		6	8.4	Ω
	R_{DS}(on)3	I_D=−10mA, V_{GS}=−1.5V		10	20	Ω

Marking : FI

Continued on next page.

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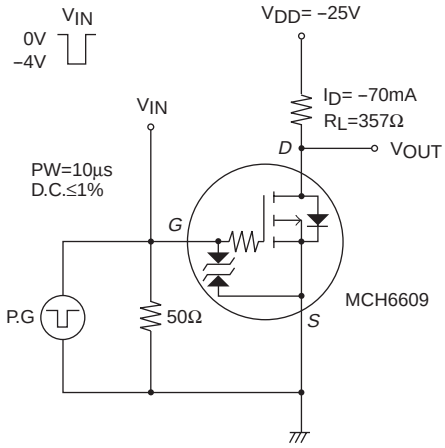
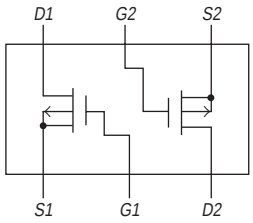
Continued from preceding page.

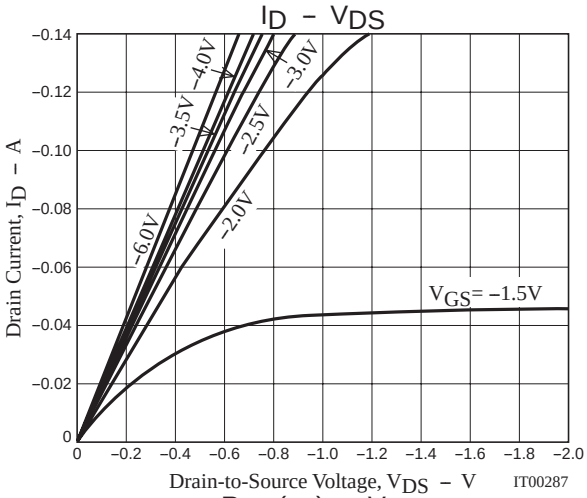
Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Input Capacitance	Ciss	V_{DS}=–10V, f=1MHz		28		pF
Output Capacitance	Coss	V_{DS}=–10V, f=1MHz		11		pF
Reverse Transfer Capacitance	Crss	V_{DS}=–10V, f=1MHz		3.5		pF
Turn-ON Delay Time	t_{d}(on)	See specified Test Circuit.		20		ns
Rise Time	t_{r}	See specified Test Circuit.		45		ns
Turn-OFF Delay Time	t_{d}(off)	See specified Test Circuit.		250		ns
Fall Time	t_{f}	See specified Test Circuit.		120		ns
Total Gate Charge	Qg	V_{DS}=–10V, V_{GS}=–10V, I_{D}=–140mA		1.98		nC
Gate-to-Source Charge	Qgs	V_{DS}=–10V, V_{GS}=–10V, I_{D}=–140mA		0.22		nC
Gate-to-Drain “Miller” Charge	Qgd	V_{DS}=–10V, V_{GS}=–10V, I_{D}=–140mA		0.33		nC
Diode Forward Voltage	V_{SD}	I_{S}=–140mA, V_{GS}=0		0.83	1.2	V

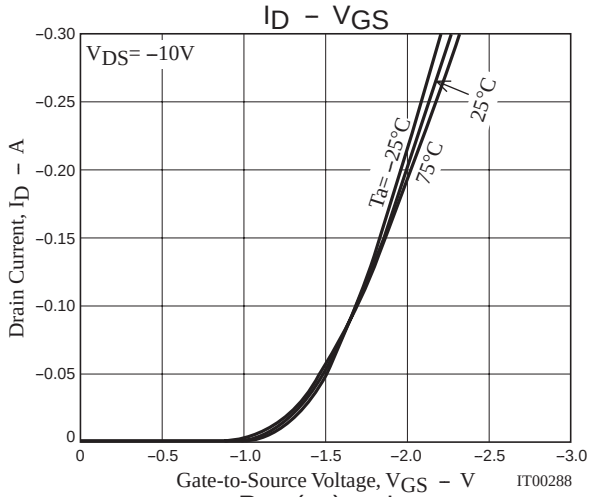
Switching Time Test Circuit

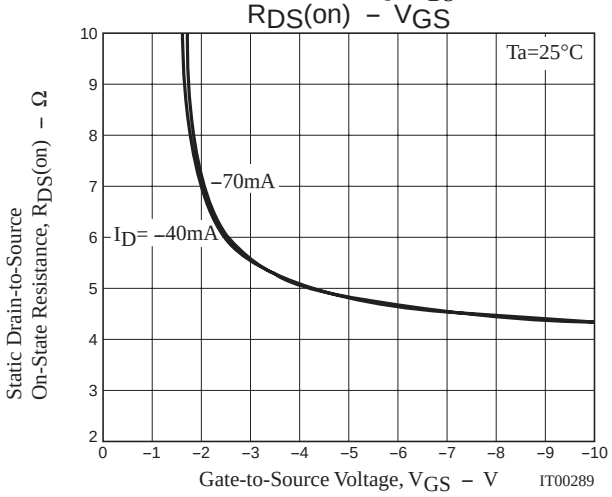


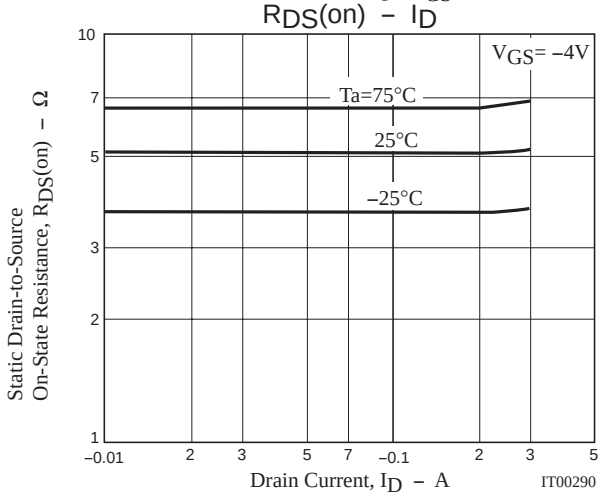
Electrical Connection

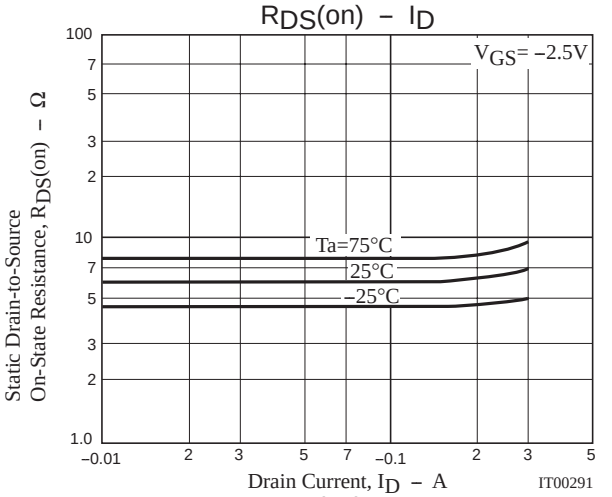


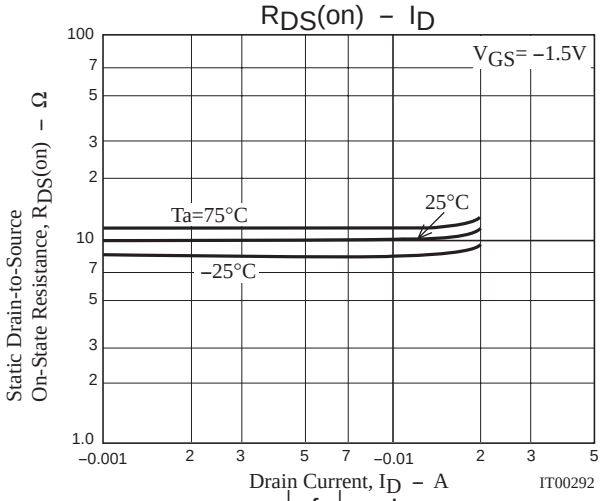


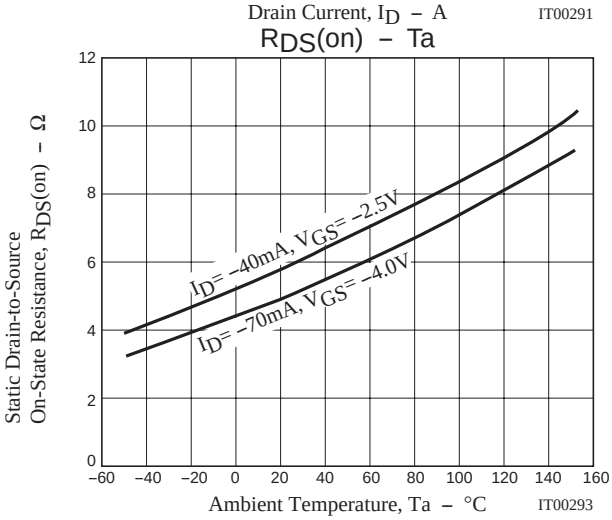


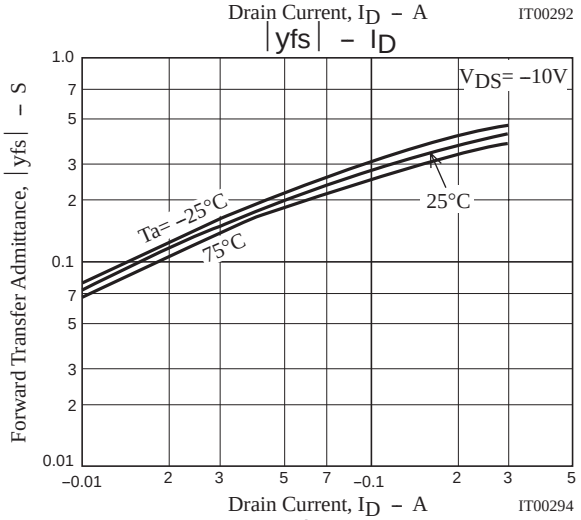


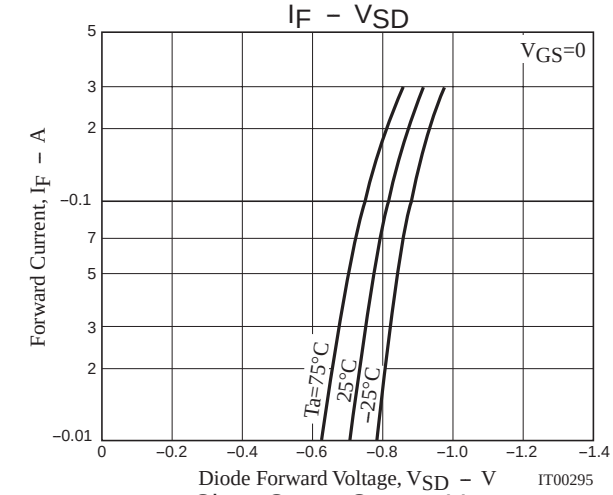


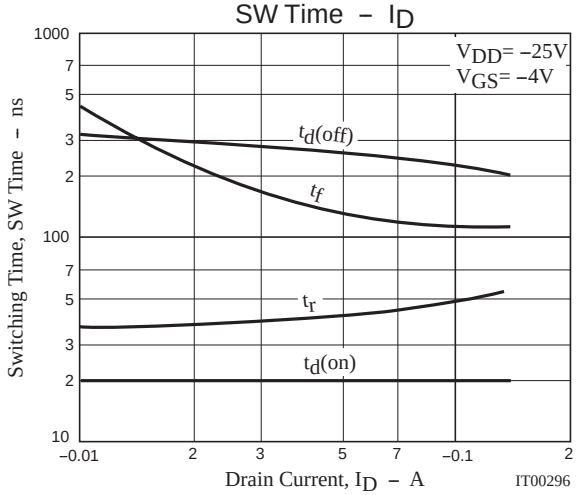

RDS(on) – ID
VGS= –2.5V
Ta=75°C
25°C
–25°C
Static Drain-to-Source On-State Resistance, RDS(on) – Ω
Drain Current, ID – A
IT00291

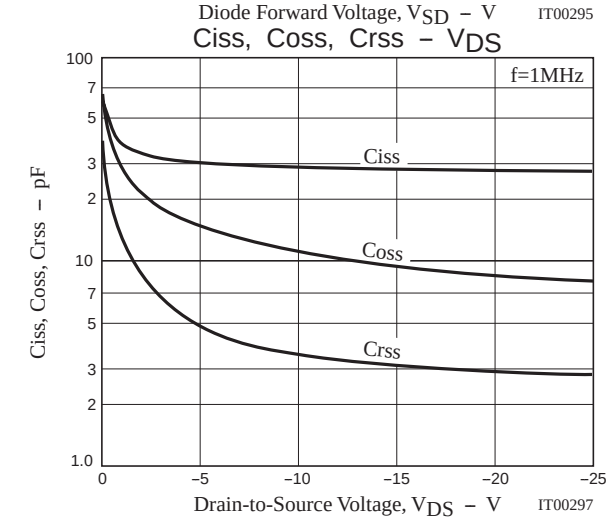

RDS(on) – ID
VGS= –1.5V
Ta=75°C
25°C
–25°C
Static Drain-to-Source On-State Resistance, RDS(on) – Ω
Drain Current, ID – A
IT00292

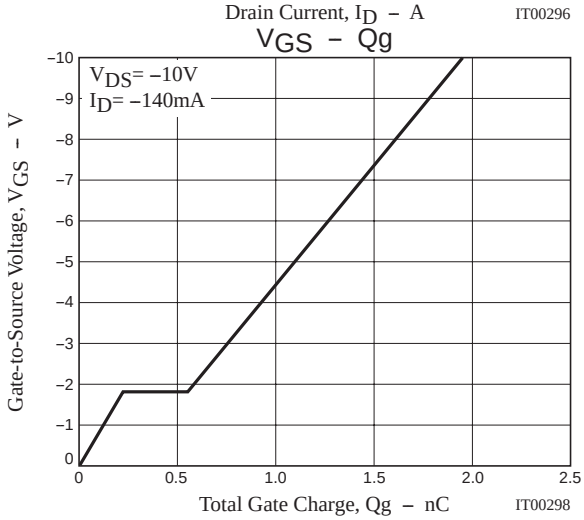

RDS(on) – Ta
ID= –40mA, VGS= –2.5V
ID= –70mA, VGS= –4.0V
Static Drain-to-Source On-State Resistance, RDS(on) – Ω
Ambient Temperature, Ta – °C
IT00293

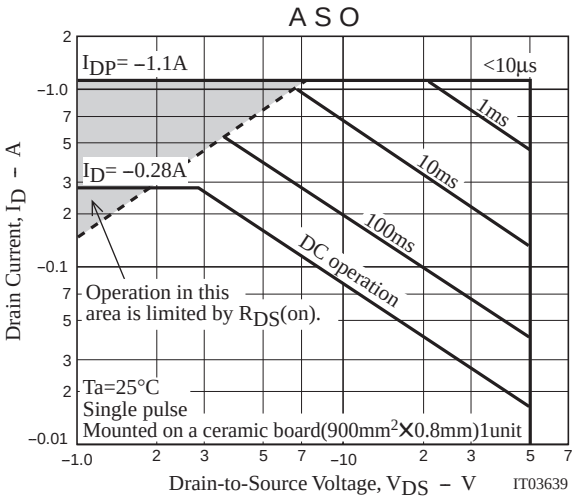

|yfs| – ID
VDS= –10V
Ta= –25°C
75°C
25°C
Forward Transfer Admittance, |yfs| – S
Drain Current, ID – A
IT00294

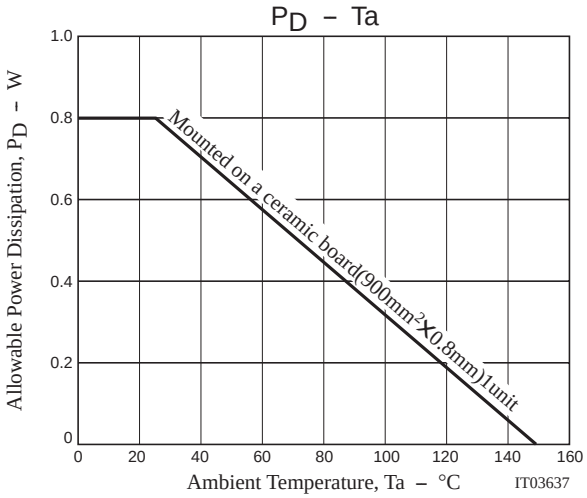

IF – VSD
VGS=0
Ta=75°C
25°C
–25°C
Forward Current, IF – A
Diode Forward Voltage, VSD – V
IT00295


SW Time – ID
VDD= –25V
VGS= –4V
td(off)
tf
tr
td(on)
Switching Time, SW Time – ns
Drain Current, ID – A
IT00296


Ciss, Coss, Crss – VDS
f=1MHz
Ciss
Coss
Crss
Ciss, Coss, Crss – pF
Drain-to-Source Voltage, VDS – V
IT00297


VGS – Qg
VDS= –10V
ID= –140mA
Gate-to-Source Voltage, VGS – V
Total Gate Charge, Qg – nC
IT00298





Note on usage : Since the MCH6609 is designed for high-speed switching applications, please avoid using this device in the vicinity of highly charged objects.