Ordering number:ENN6458

P-Channel Silicon MOSFET

# MCH6601

## Ultrahigh-Speed Switching Applications

## Features

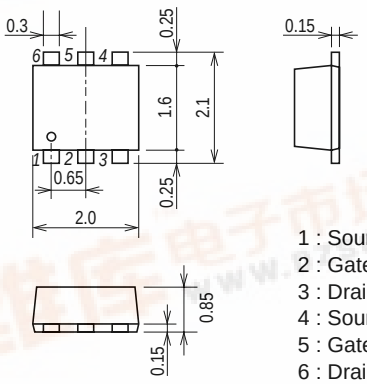
- Low ON resistance.
- Ultrahigh-speed swithcing.
- 2.5V drive.
- Composite type with 2 MOSFETs contained in one package, facilitating high-density mounting.

## Package Dimensions

unit:mm

2173

[MCH6601]




1 : Source1
2 : Gate1
3 : Drain2
4 : Source2
5 : Gate2
6 : Drain1
SANYO : MCPH6

## 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 | $V_{GSS}$ | | ±10 | V |
| Drain Current (DC) | $I_D$ | | –0.2 | A |
| Drain Current (pulse) | $I_{DP}$ | PW≤10μs, duty cycle≤1% | –0.8 | 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 | –30 | | | V |
| Zero-Gate Voltage Drain Current | $I_{DSS}$ | $V_{DS}$=–30V, $V_{GS}$=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, $I_D$=–50mA | 80 | 110 | | mS |
| Static Drain-to-Source On-State Resistance | $R_{DS}$(on)1 | $I_D$=–50mA, $V_{GS}$=–4V | | 8 | 10.4 | Ω |
| | $R_{DS}$(on)2 | $I_D$=–30mA, $V_{GS}$=–2.5V | | 11 | 15.4 | Ω |
| | $R_{DS}$(on)3 | $I_D$=–1mA, $V_{GS}$=–1.5V | | 27 | 54 | Ω |

Marking : FA

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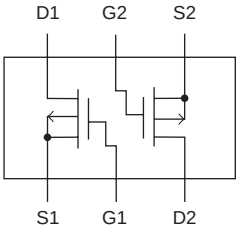
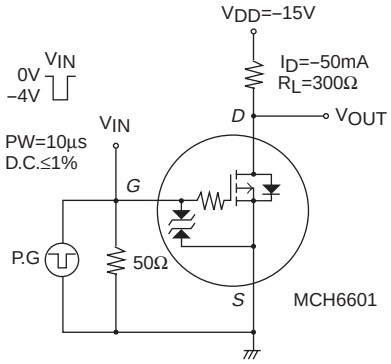
| Parameter | Symbol | Conditions | Ratings | | | Unit |
|---|---|---|---|---|---|---|
| | | | min | typ | max | |
| Input Capacitance | Ciss | $V_{DS}$=–10V, f=1MHz | | 7.5 | | pF |
| Output Capacitance | Coss | $V_{DS}$=–10V, f=1MHz | | 5.7 | | pF |
| Reverse Transfer Capacitance | Crss | $V_{DS}$=–10V, f=1MHz | | 1.8 | | pF |
| Turn-ON Delay Time | $t_{d}$(on) | See specified Test Circuit | | 24 | | ns |
| Rise Time | $t_{r}$ | See specified Test Circuit | | 55 | | ns |
| Turn-OFF Delay Time | $t_{d}$(off) | See specified Test Circuit | | 120 | | ns |
| Fall Time | $t_{f}$ | See specified Test Circuit | | 130 | | ns |
| Total Gate Charge | Qg | $V_{DS}$=–10V, $V_{GS}$=–10V, $I_{D}$=–100mA | | 1.43 | | nC |
| Gate-to-Source Charge | Qgs | $V_{DS}$=–10V, $V_{GS}$=–10V, $I_{D}$=–100mA | | 0.18 | | nC |
| Gate-to-Drain "Miller" Charge | Qgd | $V_{DS}$=–10V, $V_{GS}$=–10V, $I_{D}$=–100mA | | 0.25 | | nC |
| Diode Forward Voltage | $V_{SD}$ | $I_{S}$=–100mA, $V_{GS}$=0 | | 0.83 | 1.2 | V |

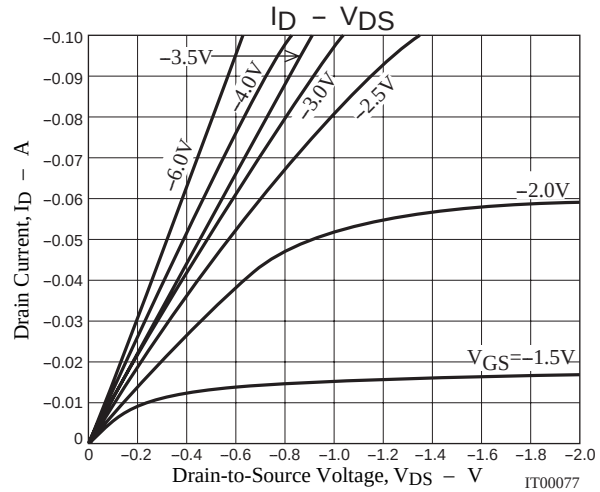
## Electrical Connection

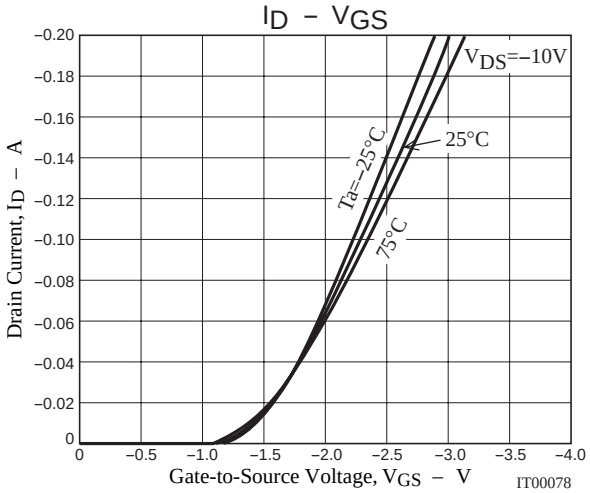


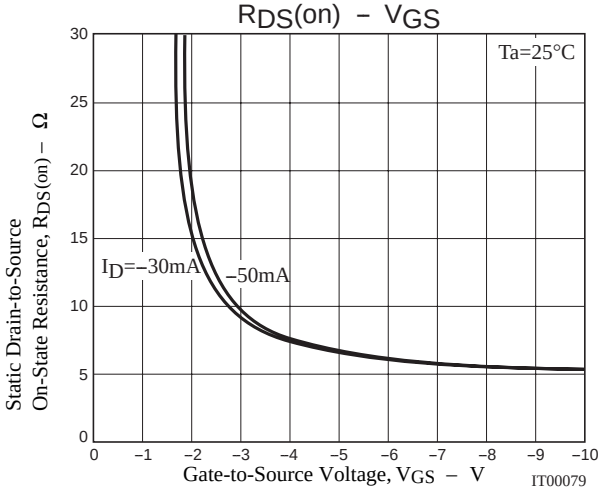

(Top view)

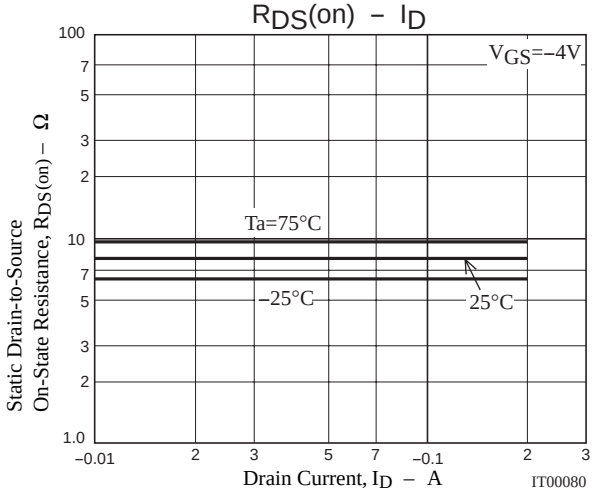
## Switching Time Test Circuit

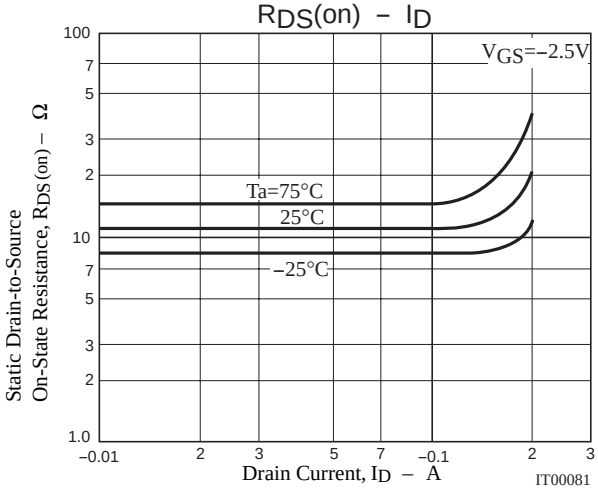


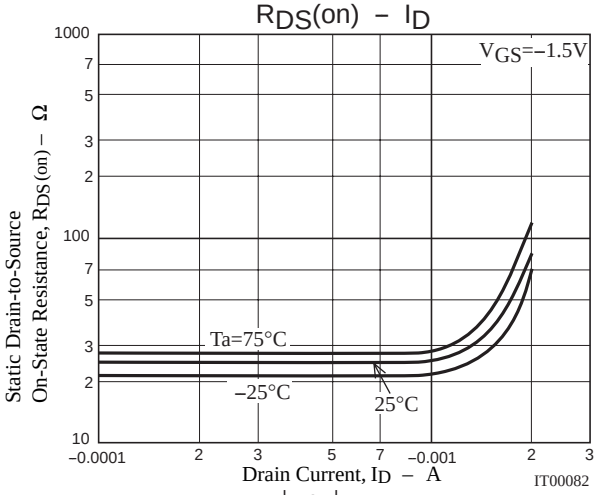



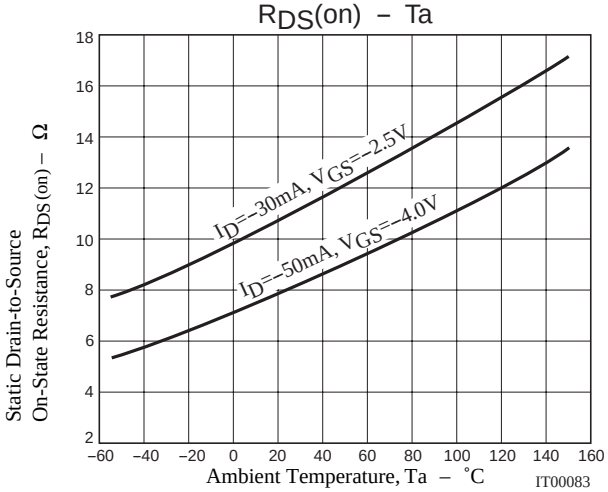



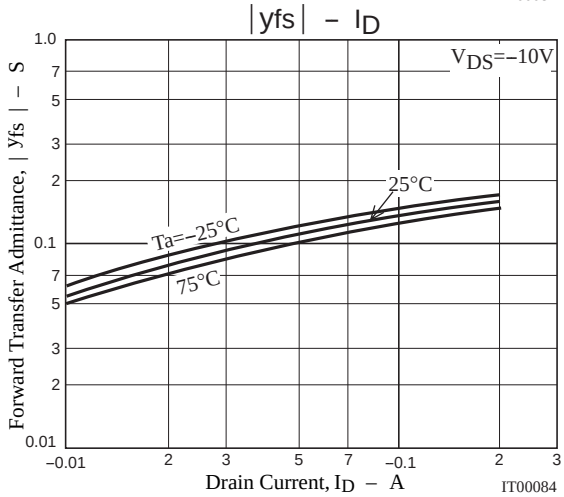



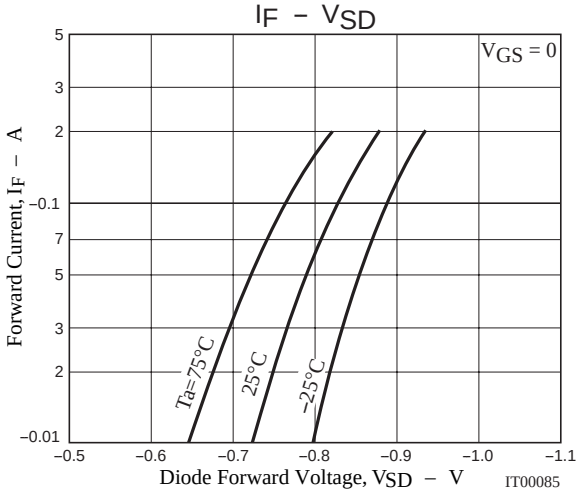



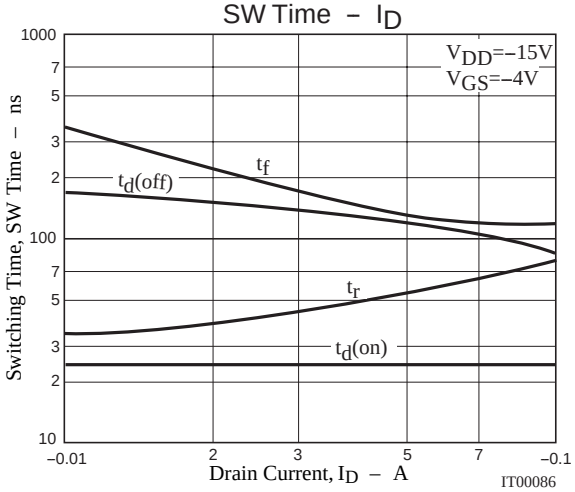

RDS(on) – ID
VGS=–2.5V
Ta=75°C
25°C
–25°C
Static Drain-to-Source On-State Resistance, RDS(on) – Ω
Drain Current, ID – A
IT00081

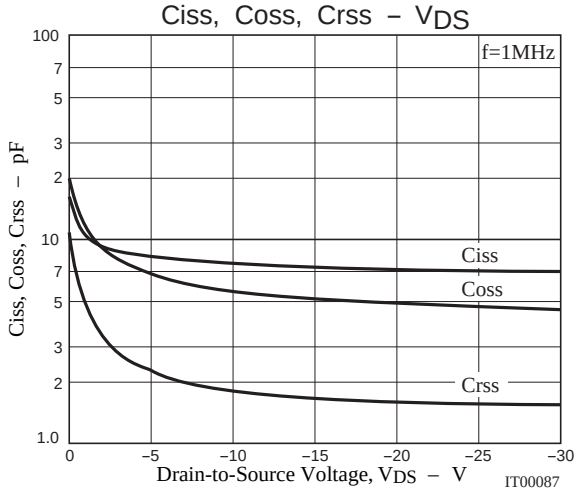

RDS(on) – ID
VGS=–1.5V
Ta=75°C
–25°C
25°C
Static Drain-to-Source On-State Resistance, RDS(on) – Ω
Drain Current, ID – A
IT00082

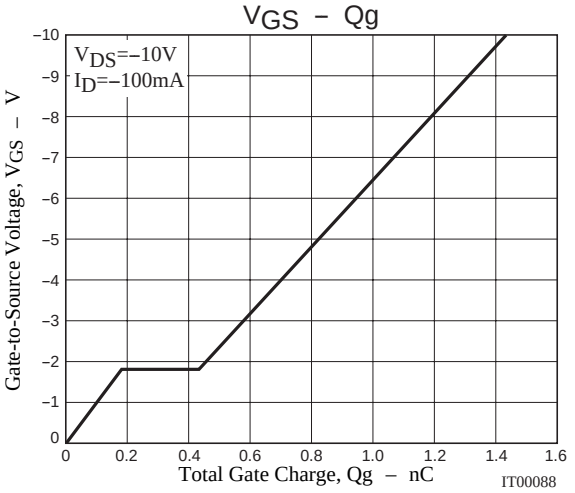

RDS(on) – Ta
ID=–30mA, VGS=–2.5V
ID=–50mA, VGS=–4.0V
Static Drain-to-Source On-State Resistance, RDS(on) – Ω
Ambient Temperature, Ta – °C
IT00083


|yfs| – ID
VDS=–10V
25°C
Ta=–25°C
75°C
Forward Transfer Admittance, |yfs| – S
Drain Current, ID – A
IT00084


IF – VSD
VGS = 0
Ta=75°C
25°C
–25°C
Forward Current, IF – A
Diode Forward Voltage, VSD – V
IT00085


SW Time – ID
VDD=–15V
VGS=–4V
tf
td(off)
tr
td(on)
Switching Time, SW Time – ns
Drain Current, ID – A
IT00086


Ciss, Coss, Crss – VDS
f=1MHz
Ciss
Coss
Crss
Ciss, Coss, Crss – pF
Drain-to-Source Voltage, VDS – V
IT00087


VGS – Qg
VDS=–10V
ID=–100mA
Gate-to-Source Voltage, VGS – V
Total Gate Charge, Qg – nC
IT00088