Ordering number : ENN7132

P-Channel Silicon MOSFET

# MCH6302

## Ultrahigh-Speed Switching Applications

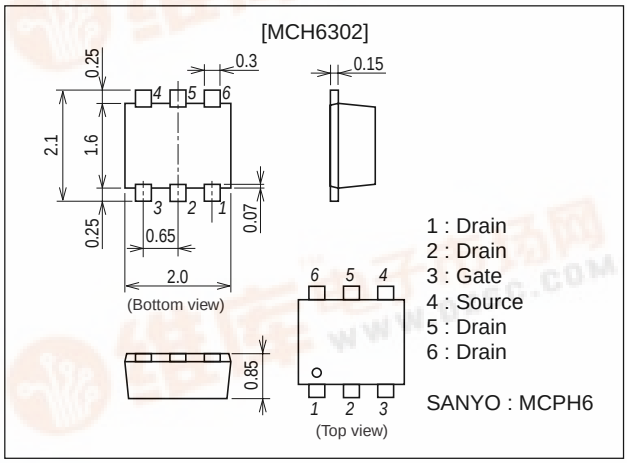
## Features

- Low ON-resistance.
- Ultrahigh-speed switching.
- 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) | $I_D$ | | -3 | A |
| Drain Current (Pulse) | $I_{DP}$ | PW≤10μs, duty cycle≤1% | -12 | 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 | -1.0 | | -2.4 | V |
| Forward Transfer Admittance | \|yfs\| | $V_{DS}$=-10V, $I_D$=-1.5A | 1.9 | 2.8 | | S |
| Static Drain-to-Source On-State Resistance | $R_{DS}$(on)1 | $I_D$=-1.5A, $V_{GS}$=-10V | | 85 | 110 | mΩ |
| | $R_{DS}$(on)2 | $I_D$=-0.7A, $V_{GS}$=-4V | | 150 | 210 | mΩ |

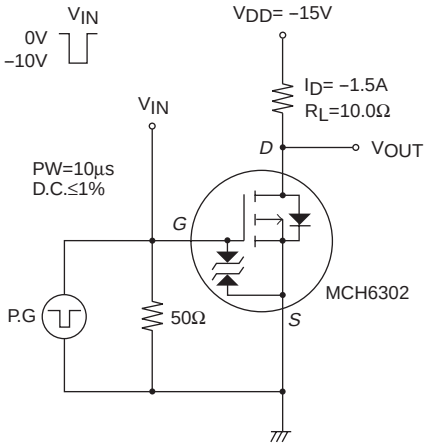
Marking : JB

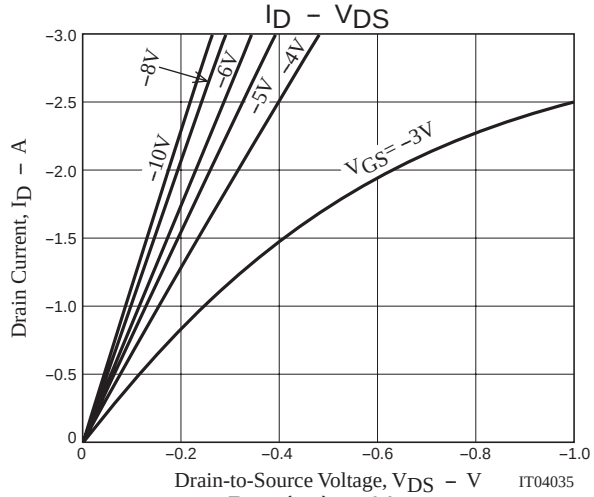
Continued on next page.

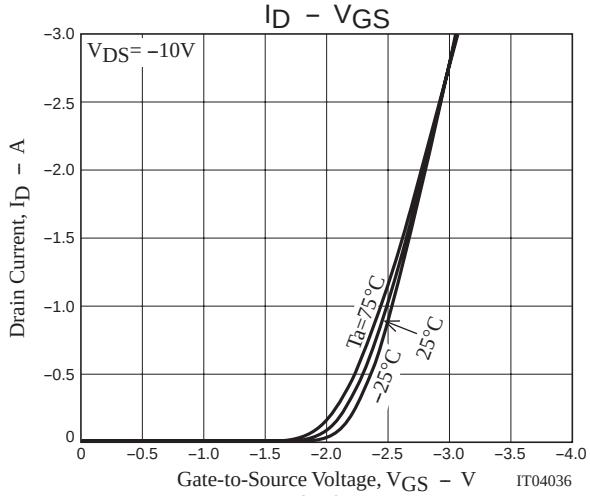
Continued from preceding page.

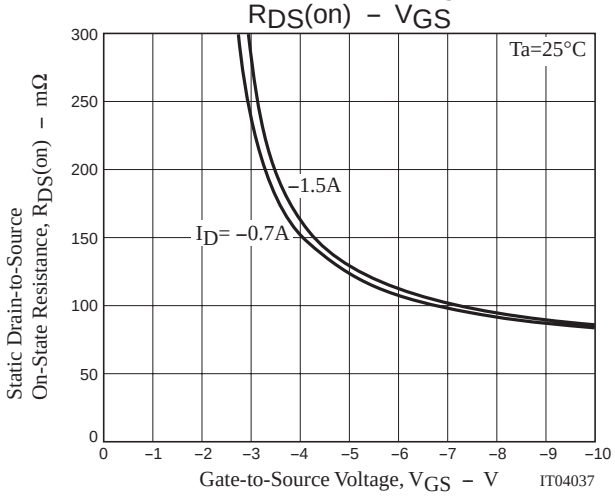
| Parameter | Symbol | Conditions | Ratings | | | Unit |
|---|---|---|---|---|---|---|
| | | | min | typ | max | |
| Input Capacitance | Ciss | $V_{DS}$=−10V, f=1MHz | | 370 | | pF |
| Output Capacitance | Coss | $V_{DS}$=−10V, f=1MHz | | 100 | | pF |
| Reverse Transfer Capacitance | Crss | $V_{DS}$=−10V, f=1MHz | | 65 | | pF |
| Turn-ON Delay Time | $t_{d}$(on) | See specified Test Circuit. | | 8 | | ns |
| Rise Time | $t_{r}$ | See specified Test Circuit. | | 20 | | ns |
| Turn-OFF Delay Time | $t_{d}$(off) | See specified Test Circuit. | | 32 | | ns |
| Fall Time | $t_{f}$ | See specified Test Circuit. | | 31 | | ns |
| Total Gate Charge | Qg | $V_{DS}$=−10V, $V_{GS}$=−10V, $I_{D}$=−3.0A | | 8.6 | | nC |
| Gate-to-Source Charge | Qgs | $V_{DS}$=−10V, $V_{GS}$=−10V, $I_{D}$=−3.0A | | 1.2 | | nC |
| Gate-to-Drain “Miller” Charge | Qgd | $V_{DS}$=−10V, $V_{GS}$=−10V, $I_{D}$=−3.0A | | 1.8 | | nC |
| Diode Forward Voltage | $V_{SD}$ | $I_{S}$=−3.0A, $V_{GS}$=0 | | −0.85 | −1.5 | V |

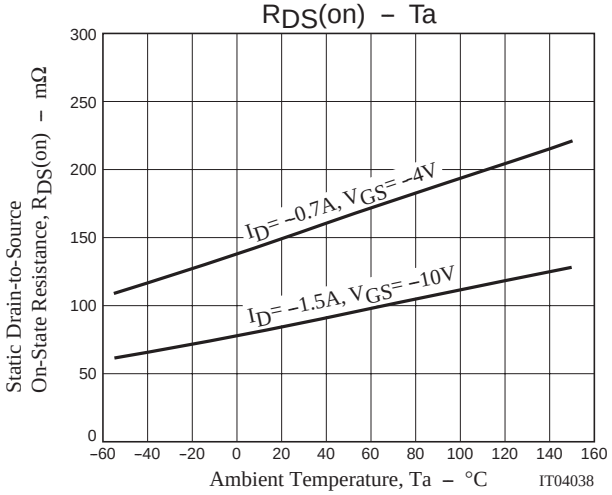
## Switching Time Test Circuit

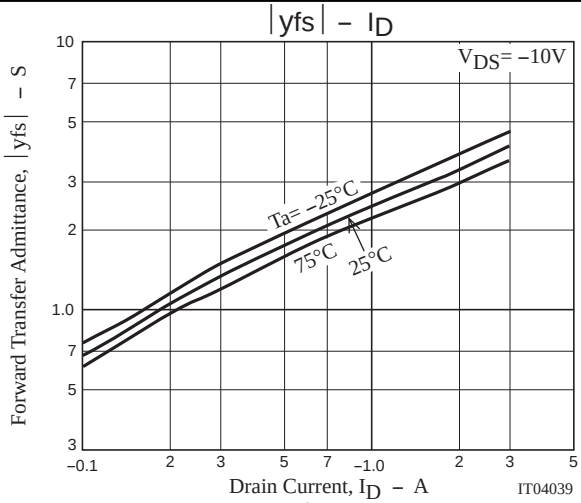


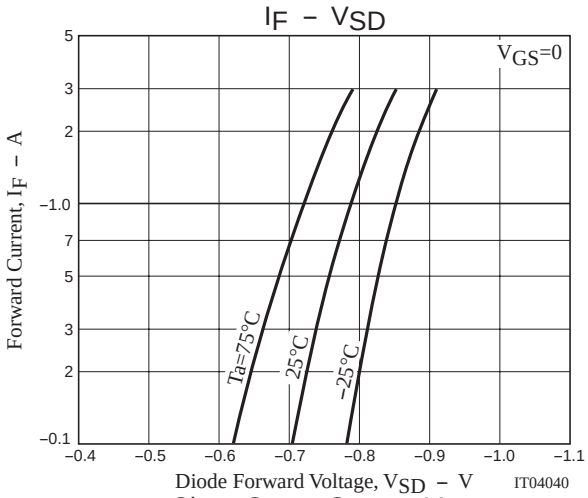



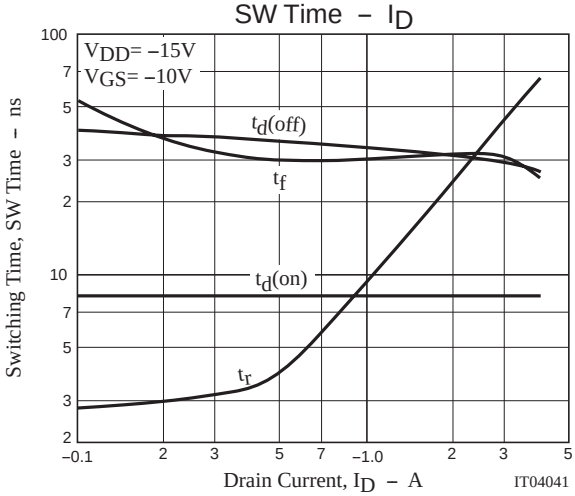



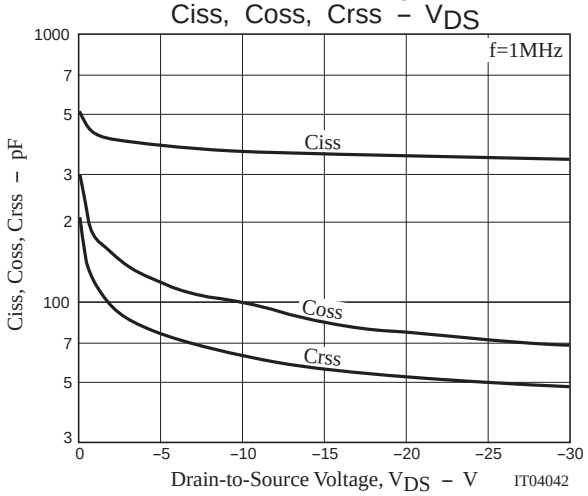



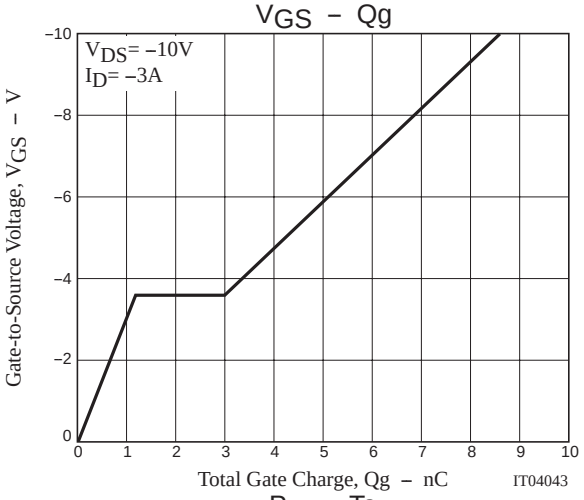



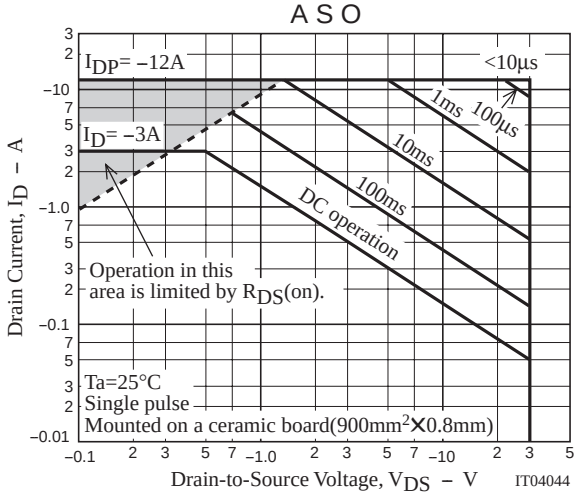

|yfs| – ID
VDS= –10V
Ta= –25°C
75°C
25°C
Forward Transfer Admittance, |yfs| – S
Drain Current, ID – A
IT04039

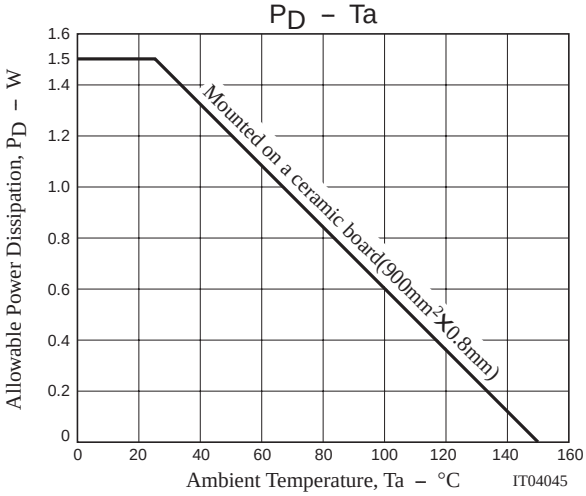

IF – VSD
VGS=0
Ta=75°C
25°C
–25°C
Forward Current, IF – A
Diode Forward Voltage, VSD – V
IT04040


SW Time – ID
VDD= –15V
VGS= –10V
td(off)
tf
td(on)
tr
Switching Time, SW Time – ns
Drain Current, ID – A
IT04041


Ciss, Coss, Crss – VDS
f=1MHz
Ciss
Coss
Crss
Ciss, Coss, Crss – pF
Drain-to-Source Voltage, VDS – V
IT04042


VGS – Qg
VDS= –10V
ID= –3A
Gate-to-Source Voltage, VGS – V
Total Gate Charge, Qg – nC
IT04043


A S O
IDP= –12A
<10µs
1ms
100µs
ID= –3A
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
IT04044


PD – Ta
Mounted on a ceramic board(900mm2×0.8mm)
Allowable Power Dissipation, PD – W
Ambient Temperature, Ta – °C
IT04045