Ordering number : ENN7918

ON Semiconductor®

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DATA SHEET

# MCH6626

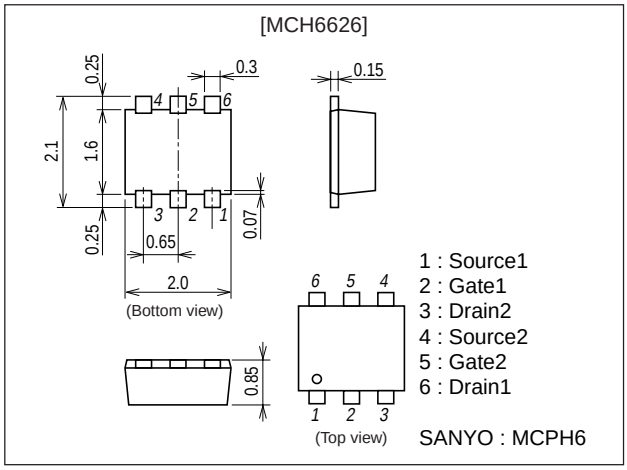
N-Channel and P-Channel Silicon MOSFETs
General-Purpose Switching Device Applications

## Features

- The MCH6626 incorporates an N-channel MOSFET and a P-channel MOSFET that feature low ON-resistance and high-speed switching, thereby enabling high-density mounting.
- Excellent ON-resistance characteristic.
- 2.5V drive.

## Package Dimensions

unit : mm
2173A




## Specifications

### Absolute Maximum Ratings at Ta=25°C

| Parameter | Symbol | Conditions | N-channel | P-channel | Unit |
|---|---|---|---|---|---|
| Drain-to-Source Voltage | $V_{DSS}$ | | 20 | −20 | V |
| Gate-to-Source Voltage | $V_{GSS}$ | | ±10 | ±10 | V |
| Drain Current (DC) | $I_D$ | | 1.6 | −1.0 | A |
| Drain Current (Pulse) | $I_{DP}$ | PW≤10μs, duty cycle≤1% | 6.4 | −4.0 | 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, $V_{GS}$=0 | 20 | | | V |
| Zero-Gate Voltage Drain Current | $I_{DSS}$ | $V_{DS}$=20V, $V_{GS}$=0 | | | 1 | μA |
| Gate-to-Source Leakage Current | $I_{GSS}$ | $V_{GS}$=±8V, $V_{DS}$=0 | | | ±10 | μA |
| Cutoff Voltage | $V_{GS}(off)$ | $V_{DS}$=10V, $I_D$=1mA | 0.4 | | 1.3 | V |
| Forward Transfer Admittance | $\|yfs\|$ | $V_{DS}$=10V, $I_D$=0.8A | 1.4 | 2.4 | | S |
| Static Drain-to-Source On-State Resistance | $R_{DS}(on)1$ | $I_D$=0.8A, $V_{GS}$=4V | | 180 | 230 | mΩ |
| | $R_{DS}(on)2$ | $I_D$=0.4A, $V_{GS}$=2.5V | | 220 | 310 | mΩ |
| | $R_{DS}(on)3$ | $I_D$=0.1A, $V_{GS}$=1.8V | | 300 | 450 | mΩ |

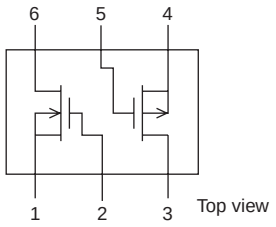
Marking : WA

Continued on next page.

Continued from preceding page.

| Parameter | Symbol | Conditions | Ratings | | | Unit |
|---|---|---|---|---|---|---|
| | | | min | typ | max | |
| Input Capacitance | Ciss | $V_{DS}$=10V, f=1MHz | | 105 | | pF |
| Output Capacitance | Coss | $V_{DS}$=10V, f=1MHz | | 23 | | pF |
| Reverse Transfer Capacitance | Crss | $V_{DS}$=10V, f=1MHz | | 15 | | pF |
| Turn-ON Delay Time | $t_{d}$(on) | See specified Test Circuit. | | 6 | | ns |
| Rise Time | $t_{r}$ | See specified Test Circuit. | | 16 | | ns |
| Turn-OFF Delay Time | $t_{d}$(off) | See specified Test Circuit. | | 19 | | ns |
| Fall Time | $t_{f}$ | See specified Test Circuit. | | 8 | | ns |
| Total Gate Charge | Qg | $V_{DS}$=10V, $V_{GS}$=4V, $I_{D}$=1.6A | | 1.4 | | nC |
| Gate-to-Source Charge | Qgs | $V_{DS}$=10V, $V_{GS}$=4V, $I_{D}$=1.6A | | 0.3 | | nC |
| Gate-to-Drain “Miller” Charge | Qgd | $V_{DS}$=10V, $V_{GS}$=4V, $I_{D}$=1.6A | | 0.3 | | nC |
| Diode Forward Voltage | $V_{SD}$ | $I_{S}$=1.6A, $V_{GS}$=0 | | 0.92 | 1.2 | V |
| [P-channel] | | | | | | |
| Drain-to-Source Breakdown Voltage | $V_{(BR)DSS}$ | $I_{D}$=−1mA, $V_{GS}$=0 | −20 | | | V |
| Zero-Gate Voltage Drain Current | $I_{DSS}$ | $V_{DS}$=−20V, $V_{GS}$=0 | | | −1 | μA |
| Gate-to-Source Leakage Current | $I_{GSS}$ | $V_{GS}$=±8V, $V_{DS}$=0 | | | ±10 | μA |
| Cutoff Voltage | $V_{GS}$(off) | $V_{DS}$=−10V, $I_{D}$=−1mA | −0.4 | | −1.3 | V |
| Forward Transfer Admittance | \|yfs\| | $V_{DS}$=−10V, $I_{D}$=−500mA | 0.7 | 1.2 | | S |
| Static Drain-to-Source On-State Resistance | $R_{DS}$(on)1 | $I_{D}$=−500mA, $V_{GS}$=−4V | | 380 | 500 | mΩ |
| | $R_{DS}$(on)2 | $I_{D}$=−300mA, $V_{GS}$=−2.5V | | 540 | 760 | mΩ |
| Input Capacitance | Ciss | $V_{DS}$=−10V, f=1MHz | | 115 | | pF |
| Output Capacitance | Coss | $V_{DS}$=−10V, f=1MHz | | 23 | | pF |
| Reverse Transfer Capacitance | Crss | $V_{DS}$=−10V, f=1MHz | | 15 | | pF |
| Turn-ON Delay Time | $t_{d}$(on) | See specified Test Circuit. | | 8 | | ns |
| Rise Time | $t_{r}$ | See specified Test Circuit. | | 6 | | ns |
| Turn-OFF Delay Time | $t_{d}$(off) | See specified Test Circuit. | | 15 | | ns |
| Fall Time | $t_{f}$ | See specified Test Circuit. | | 7 | | ns |
| Total Gate Charge | Qg | $V_{DS}$=−10V, $V_{GS}$=−4V, $I_{D}$=−1A | | 1.5 | | nC |
| Gate-to-Source Charge | Qgs | $V_{DS}$=−10V, $V_{GS}$=−4V, $I_{D}$=−1A | | 0.4 | | nC |
| Gate-to-Drain “Miller” Charge | Qgd | $V_{DS}$=−10V, $V_{GS}$=−4V, $I_{D}$=−1A | | 0.3 | | nC |
| Diode Forward Voltage | $V_{SD}$ | $I_{S}$=−1A, $V_{GS}$=0 | | −0.9 | −1.5 | V |

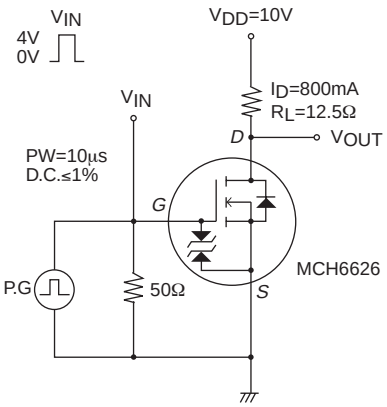
## Electrical Connection



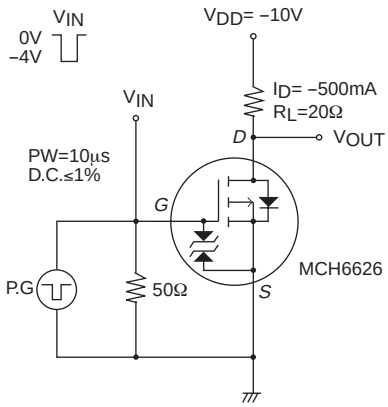

1 : Source1
2 : Gate1
3 : Drain2
4 : Source2
5 : Gate2
6 : Drain1

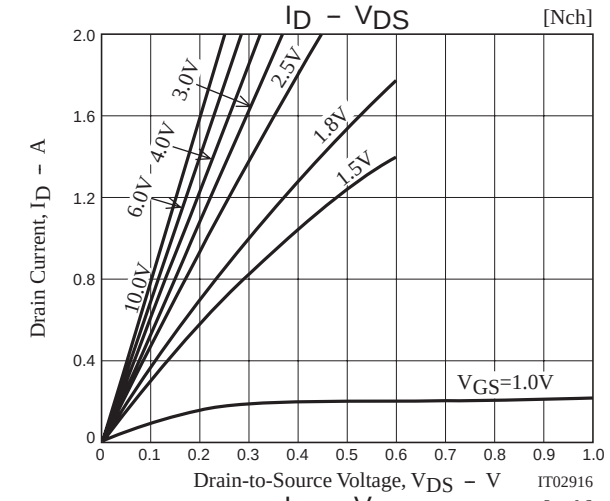
## Switching Time Test Circuit

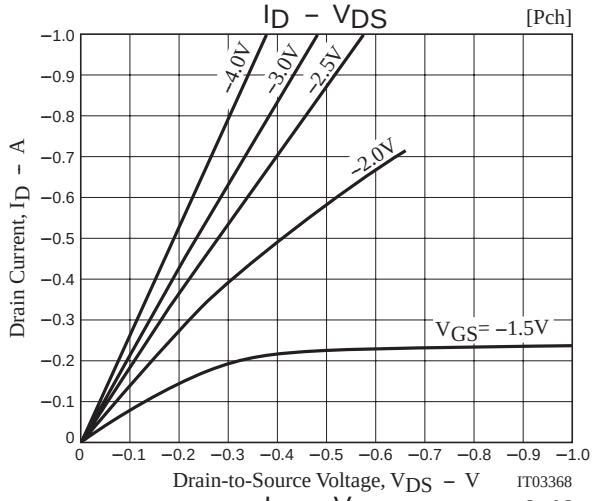
[N-channel]

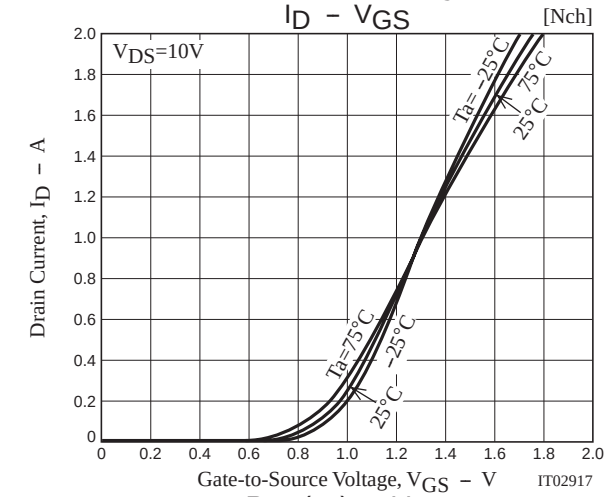


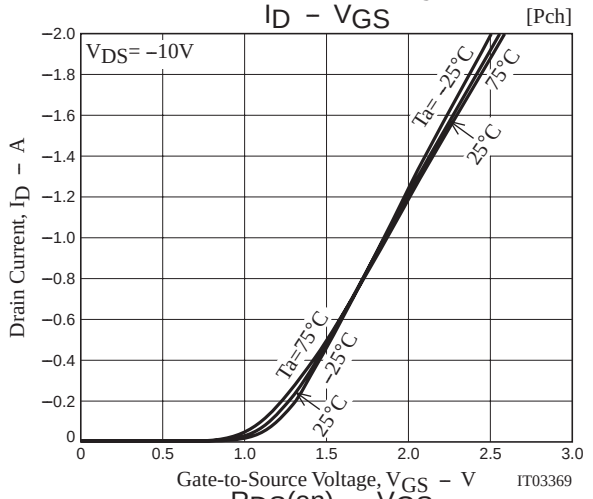

[P-channel]

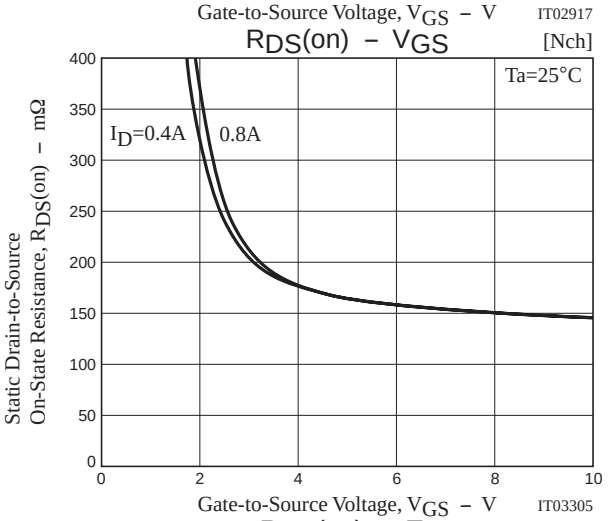


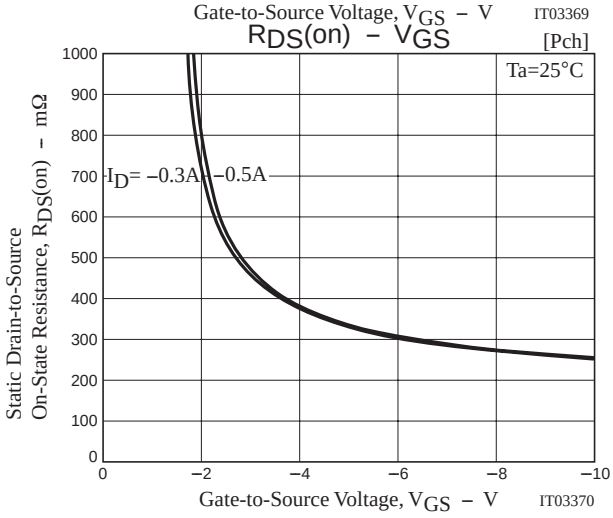

ID – VDS
[Nch]
Drain Current, ID – A
Drain-to-Source Voltage, VDS – V
IT02916
VGS=1.0V
1.5V
1.8V
2.5V
3.0V
4.0V
6.0V
10.0V

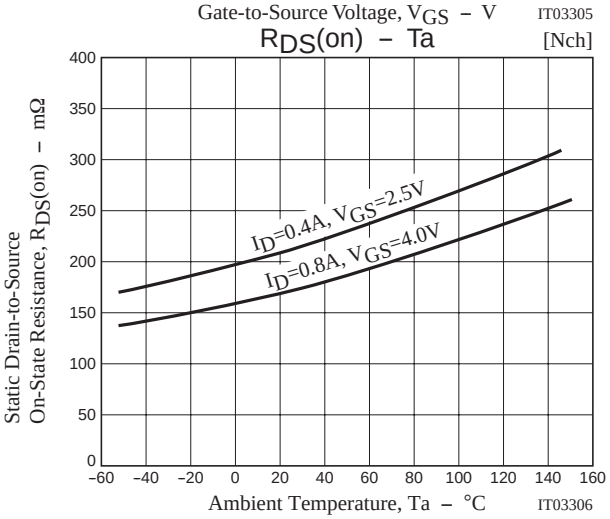

ID – VDS
[Pch]
Drain Current, ID – A
Drain-to-Source Voltage, VDS – V
IT03368
VGS= –1.5V
–2.0V
–2.5V
–3.0V
–4.0V

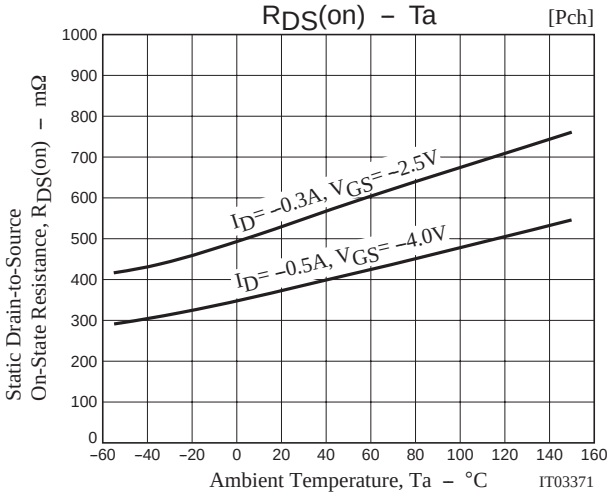

ID – VGS
[Nch]
VDS=10V
Drain Current, ID – A
Gate-to-Source Voltage, VGS – V
IT02917
Ta= –25°C
75°C
25°C
Ta=75°C
–25°C
25°C

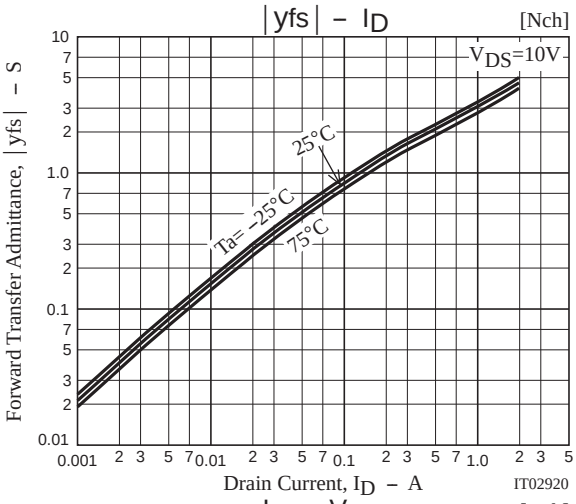

ID – VGS
[Pch]
VDS= –10V
Drain Current, ID – A
Gate-to-Source Voltage, VGS – V
IT03369
Ta= –25°C
75°C
25°C
Ta=75°C
–25°C
25°C

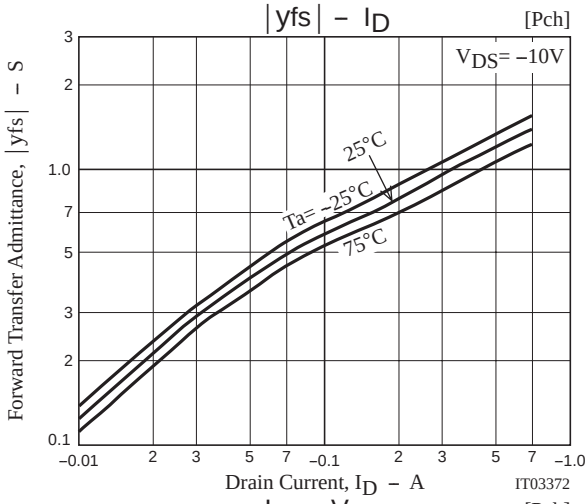

RDS(on) – VGS
[Nch]
Ta=25°C
ID=0.4A
0.8A
Static Drain-to-Source On-State Resistance, RDS(on) – mΩ
Gate-to-Source Voltage, VGS – V
IT03305

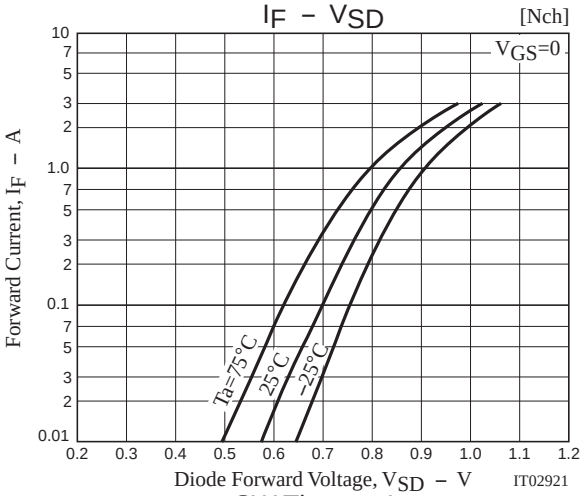

RDS(on) – VGS
[Pch]
Ta=25°C
ID= –0.3A
–0.5A
Static Drain-to-Source On-State Resistance, RDS(on) – mΩ
Gate-to-Source Voltage, VGS – V
IT03370

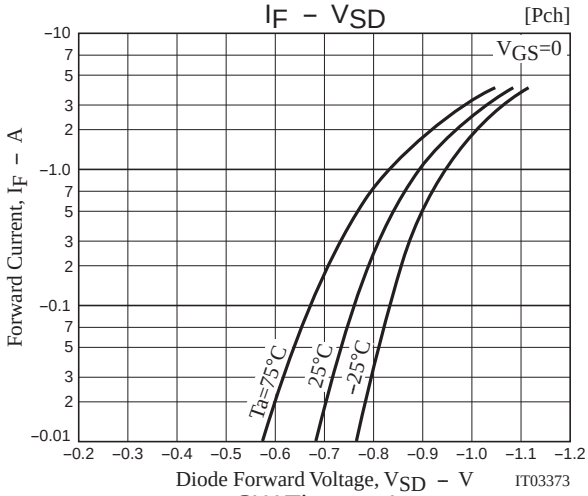

RDS(on) – Ta
[Nch]
ID=0.4A, VGS=2.5V
ID=0.8A, VGS=4.0V
Static Drain-to-Source On-State Resistance, RDS(on) – mΩ
Ambient Temperature, Ta – °C
IT03306

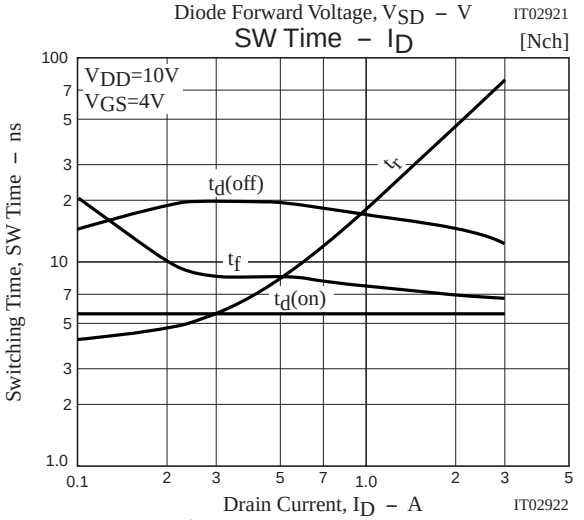

RDS(on) – Ta
[Pch]
ID= –0.3A, VGS= –2.5V
ID= –0.5A, VGS= –4.0V
Static Drain-to-Source On-State Resistance, RDS(on) – mΩ
Ambient Temperature, Ta – °C
IT03371

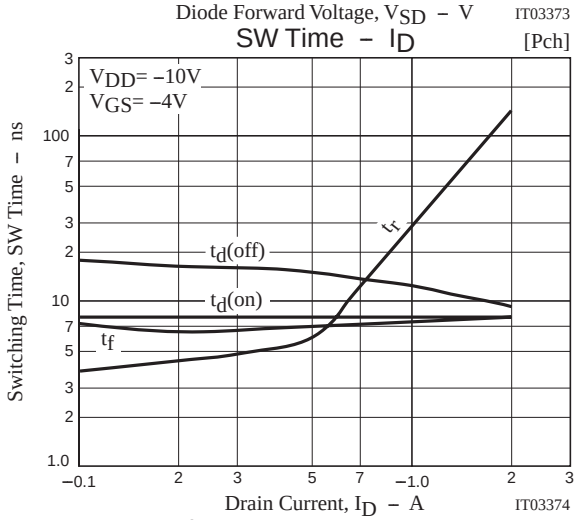

|yfs| – ID
[Nch]
VDS=10V
25°C
Ta= –25°C
75°C
Forward Transfer Admittance, |yfs| – S
Drain Current, ID – A
IT02920

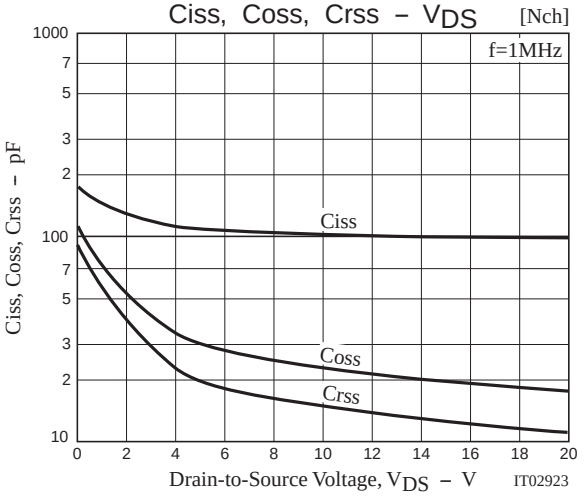

|yfs| – ID
[Pch]
VDS= –10V
25°C
Ta= –25°C
75°C
Forward Transfer Admittance, |yfs| – S
Drain Current, ID – A
IT03372

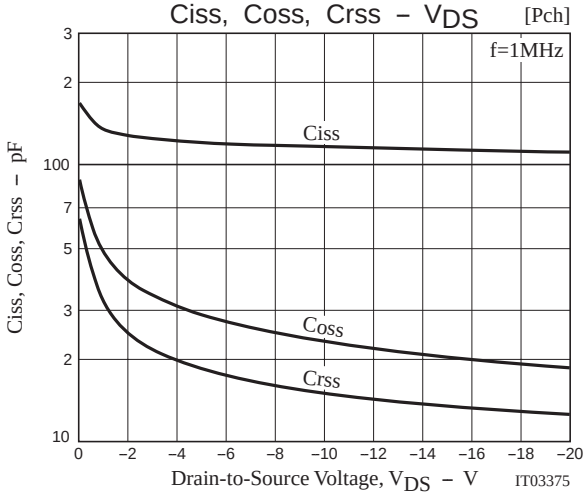

IF – VSD
[Nch]
VGS=0
Ta=75°C
25°C
–25°C
Forward Current, IF – A
Diode Forward Voltage, VSD – V
IT02921

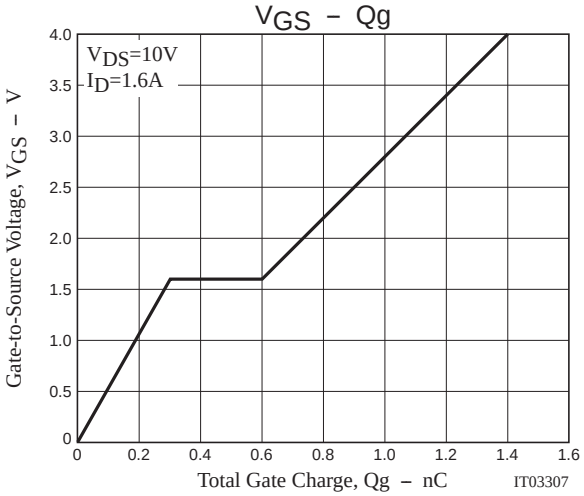

IF – VSD
[Pch]
VGS=0
Ta=75°C
25°C
–25°C
Forward Current, IF – A
Diode Forward Voltage, VSD – V
IT03373

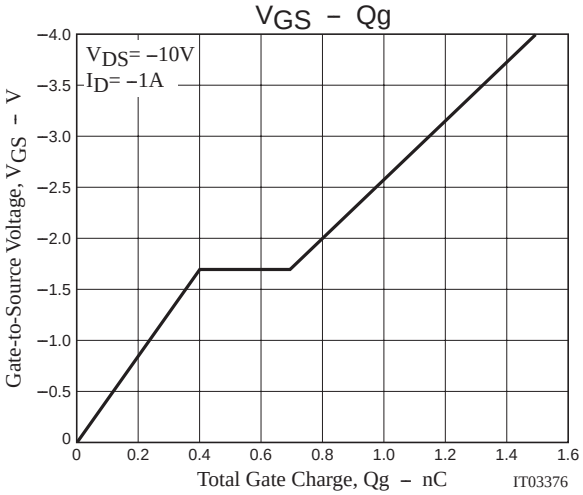

SW Time – ID
[Nch]
VDD=10V
VGS=4V
td(off)
tf
tr
td(on)
Switching Time, SW Time – ns
Drain Current, ID – A
IT02922

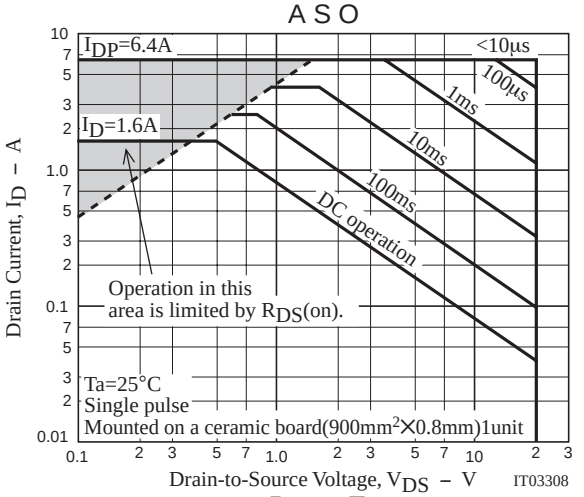

SW Time – ID
[Pch]
VDD= –10V
VGS= –4V
tr
td(off)
td(on)
tf
Switching Time, SW Time – ns
Drain Current, ID – A
IT03374

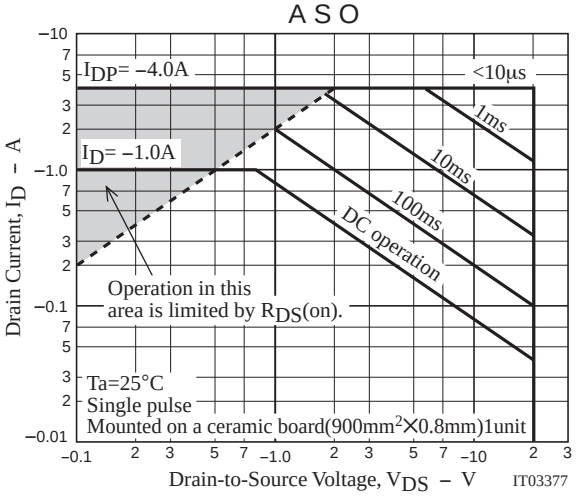

Ciss, Coss, Crss – VDS
[Nch]
f=1MHz
Ciss
Coss
Crss
Ciss, Coss, Crss – pF
Drain-to-Source Voltage, VDS – V
IT02923

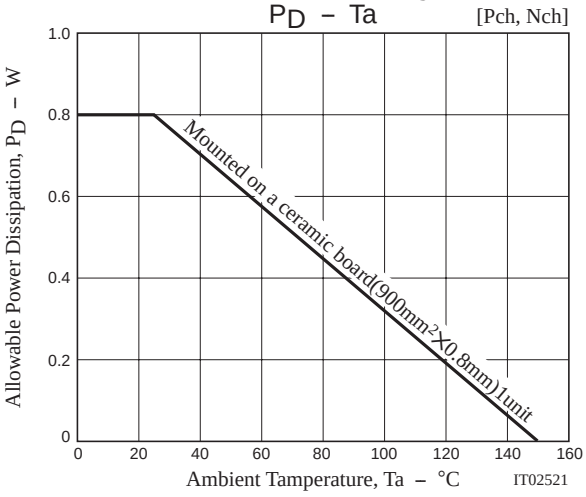

Ciss, Coss, Crss – VDS
[Pch]
f=1MHz
Ciss
Coss
Crss
Ciss, Coss, Crss – pF
Drain-to-Source Voltage, VDS – V
IT03375


VGS – Qg
VDS=10V
ID=1.6A
Gate-to-Source Voltage, VGS – V
Total Gate Charge, Qg – nC
IT03307


VGS – Qg
VDS= –10V
ID= –1A
Gate-to-Source Voltage, VGS – V
Total Gate Charge, Qg – nC
IT03376


ASO
IDP=6.4A
ID=1.6A
<10µs
100µs
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)1unit
Drain Current, ID – A
Drain-to-Source Voltage, VDS – V
IT03308


ASO
IDP= –4.0A
ID= –1.0A
<10µs
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)1unit
Drain Current, ID – A
Drain-to-Source Voltage, VDS – V
IT03377


PD – Ta
[Pch, Nch]
Mounted on a ceramic board(900mm2×0.8mm)1unit
Allowable Power Dissipation, PD – W
Ambient Tamperature, Ta – °C
IT02521

## PUBLICATION ORDERING INFORMATION

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