Ordering number : EN8286A

SANYO Semiconductors

DATA SHEET

P-Channel Silicon MOSFET

# FSS172 — General-Purpose Switching Device Applications

## Features

- Low ON-resistance.
- Ultrahigh-speed switching.
- 4V drive.

## 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) | $I_D$ | | −4.5 | A |
| Drain Current (Pulse) | $I_{DP}$ | PW≤10μs, duty cycle≤1% | −18 | A |
| Allowable Power Dissipation | $P_D$ | Mounted on a ceramic board (1200mm²×0.8mm) | 1.4 | 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, $V_{GS}$=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, $I_D$=−4.5A | 3.9 | 6.6 | | S |
| Static Drain-to-Source On-State Resistance | $R_{DS}(on)1$ | $I_D$=−4.5A, $V_{GS}$=−10V | | 48 | 63 | mΩ |
| | $R_{DS}(on)2$ | $I_D$=−4A, $V_{GS}$=−4.5V | | 82 | 115 | mΩ |
| | $R_{DS}(on)3$ | $I_D$=−4A, $V_{GS}$=−4V | | 95 | 135 | mΩ |

Marking : S172

Continued on next page.



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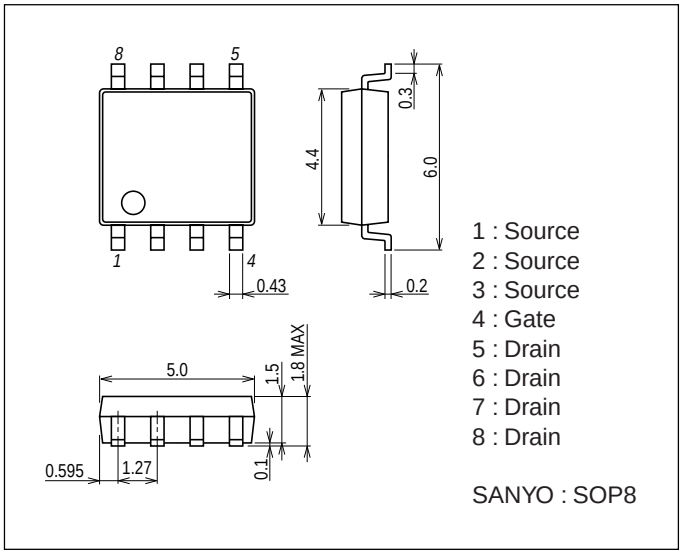
Continued from preceding page.

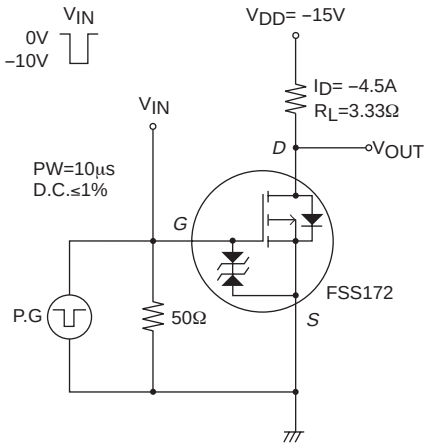
| Parameter | Symbol | Conditions | Ratings | | | Unit |
|---|---|---|---|---|---|---|
| | | | min | typ | max | |
| Input Capacitance | Ciss | $V_{DS}$=–10V, f=1MHz | | 590 | | pF |
| Output Capacitance | Coss | $V_{DS}$=–10V, f=1MHz | | 120 | | pF |
| Reverse Transfer Capacitance | Crss | $V_{DS}$=–10V, f=1MHz | | 115 | | pF |
| Turn-ON Delay Time | $t_{d}$(on) | See specified Test Circuit. | | 8 | | ns |
| Rise Time | $t_{r}$ | See specified Test Circuit. | | 80 | | ns |
| Turn-OFF Delay Time | $t_{d}$(off) | See specified Test Circuit. | | 55 | | ns |
| Fall Time | $t_{f}$ | See specified Test Circuit. | | 62 | | ns |
| Total Gate Charge | Qg | $V_{DS}$=–10V, $V_{GS}$=–10V, $I_{D}$=–4.5A | | 12.8 | | nC |
| Gate-to-Source Charge | Qgs | $V_{DS}$=–10V, $V_{GS}$=–10V, $I_{D}$=–4.5A | | 1.5 | | nC |
| Gate-to-Drain “Miller” Charge | Qgd | $V_{DS}$=–10V, $V_{GS}$=–10V, $I_{D}$=–4.5A | | 4.3 | | nC |
| Diode Forward Voltage | $V_{SD}$ | $I_{S}$=–4.5A, $V_{GS}$=0V | | –0.87 | –1.5 | V |

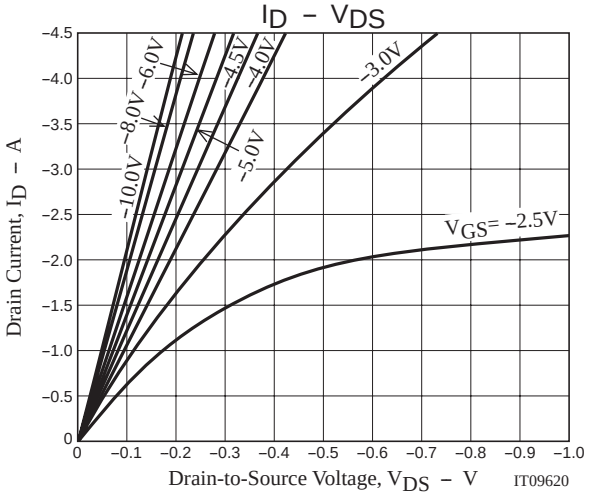
## Package Dimensions

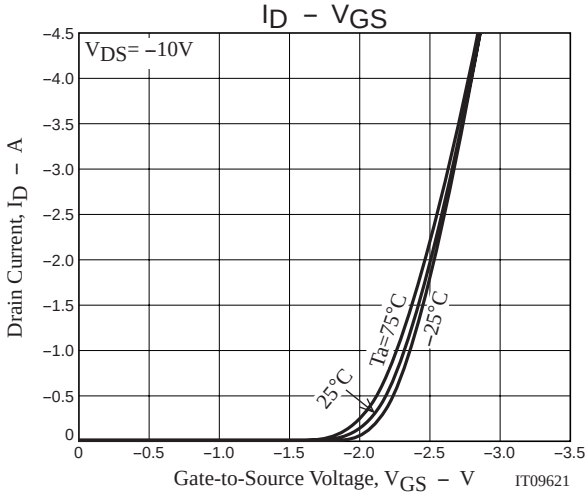
unit : mm (typ)
7005-002

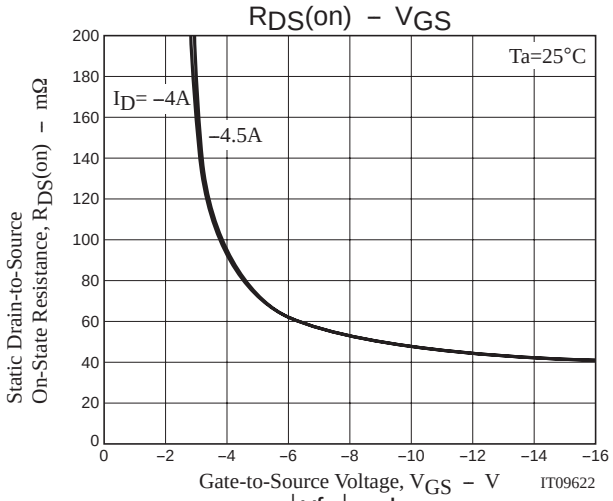


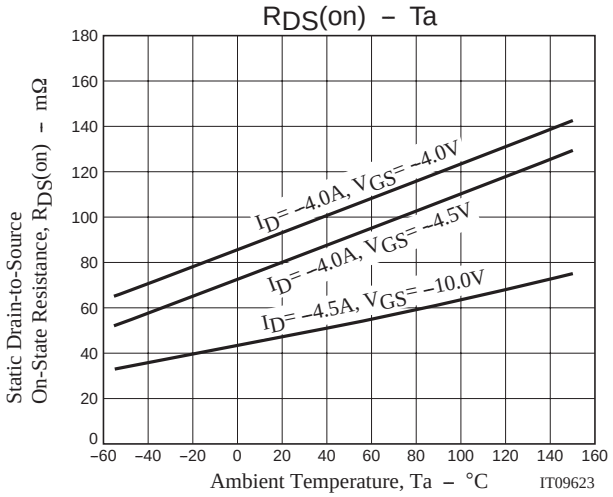

## Switching Time Test Circuit

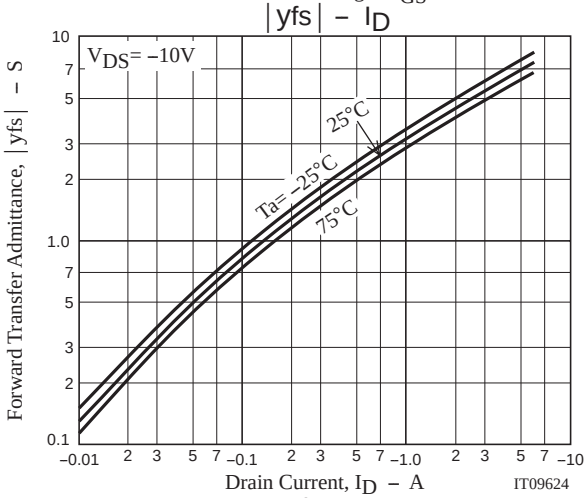


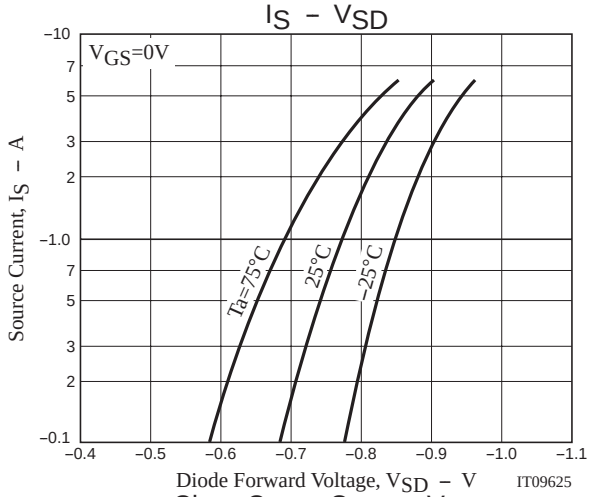



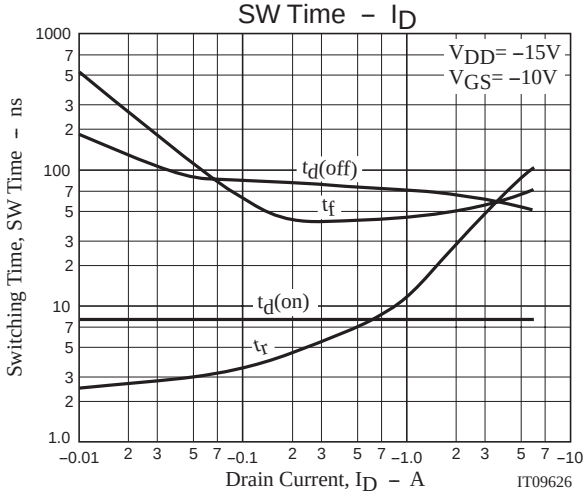



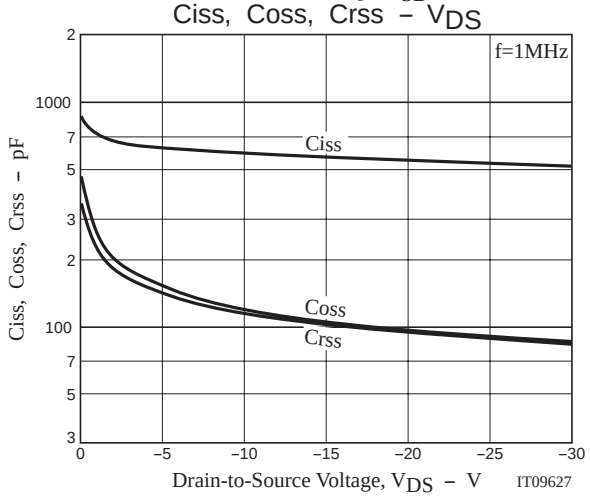

RDS(on) – VGS
Ta=25°C
ID= –4A
–4.5A
Static Drain-to-Source On-State Resistance, RDS(on) – mΩ
Gate-to-Source Voltage, VGS – V
IT09622

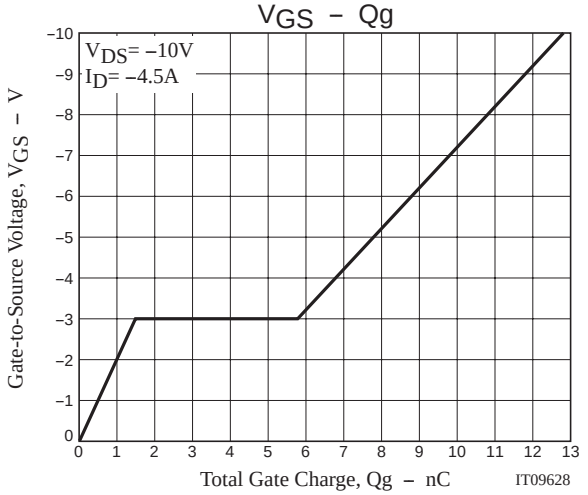

RDS(on) – Ta
ID= –4.0A, VGS= –4.0V
ID= –4.0A, VGS= –4.5V
ID= –4.5A, VGS= –10.0V
Static Drain-to-Source On-State Resistance, RDS(on) – mΩ
Ambient Temperature, Ta – °C
IT09623

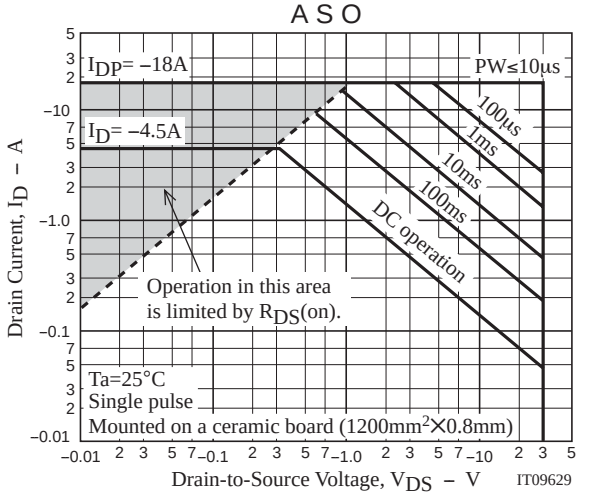

|yfs| – ID
VDS= –10V
25°C
Ta= –25°C
75°C
Forward Transfer Admittance, |yfs| – S
Drain Current, ID – A
IT09624

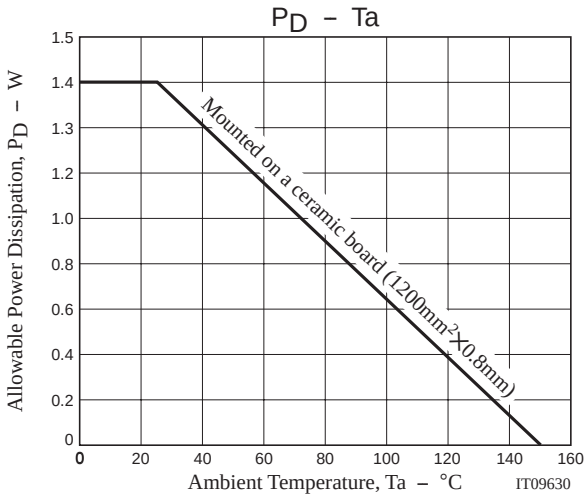

IS – VSD
VGS=0V
Ta=75°C
25°C
–25°C
Source Current, IS – A
Diode Forward Voltage, VSD – V
IT09625


SW Time – ID
VDD= –15V
VGS= –10V
td(off)
tf
td(on)
tr
Switching Time, SW Time – ns
Drain Current, ID – A
IT09626


Ciss, Coss, Crss – VDS
f=1MHz
Ciss
Coss
Crss
Ciss, Coss, Crss – pF
Drain-to-Source Voltage, VDS – V
IT09627


VGS – Qg
VDS= –10V
ID= –4.5A
Gate-to-Source Voltage, VGS – V
Total Gate Charge, Qg – nC
IT09628


A S O
IDP= –18A
PW≤10μs
ID= –4.5A
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 (1200mm²×0.8mm)
Drain Current, ID – A
Drain-to-Source Voltage, VDS – V
IT09629




Note on usage : Since the FSS172 is a MOSFET product, please avoid using this device in the vicinity of highly charged objects.