Ordering number : ENN7725

SANYO Semiconductors
DATA SHEET

# SCH1416 — N-Channel Silicon MOSFET
# 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 | $V_{DSS}$ | | 20 | V |
| Gate-to-Source Voltage | $V_{GSS}$ | | ±20 | V |
| Drain Current (DC) | $I_D$ | | 2 | A |
| Drain Current (Pulse) | $I_{DP}$ | PW≤10μs, duty cycle≤1% | 8 | A |
| Allowable Power Dissipation | $P_D$ | Mounted on a ceramic board (900mm²×0.8mm) | 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 | 20 | | | V |
| Zero-Gate Voltage Drain Current | $I_{DSS}$ | $V_{DS}$=20V, $V_{GS}$=0 | | | 1 | μA |
| Gate-to-Source Leakage Current | $I_{GSS}$ | $V_{GS}$=±16V, $V_{DS}$=0 | | | ±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, $I_D$=1A | 0.84 | 1.4 | | S |
| Static Drain-to-Source On-State Resistance | $R_{DS}$(on)1 | $I_D$=1A, $V_{GS}$=10V | | 120 | 160 | mΩ |
| | $R_{DS}$(on)2 | $I_D$=0.5A, $V_{GS}$=4V | | 310 | 440 | mΩ |
| Input Capacitance | Ciss | $V_{DS}$=10V, f=1MHz | | 77 | | pF |
| Output Capacitance | Coss | $V_{DS}$=10V, f=1MHz | | 29 | | pF |
| Reverse Transfer Capacitance | Crss | $V_{DS}$=10V, f=1MHz | | 21 | | pF |
| Turn-ON Delay Time | $t_d$(on) | See specified Test Circuit. | | 6.5 | | ns |
| Rise Time | $t_r$ | See specified Test Circuit. | | 3 | | ns |
| Turn-OFF Delay Time | $t_d$(off) | See specified Test Circuit. | | 10.5 | | ns |
| Fall Time | $t_f$ | See specified Test Circuit. | | 4.2 | | ns |

Marking : KR

Continued on next page.



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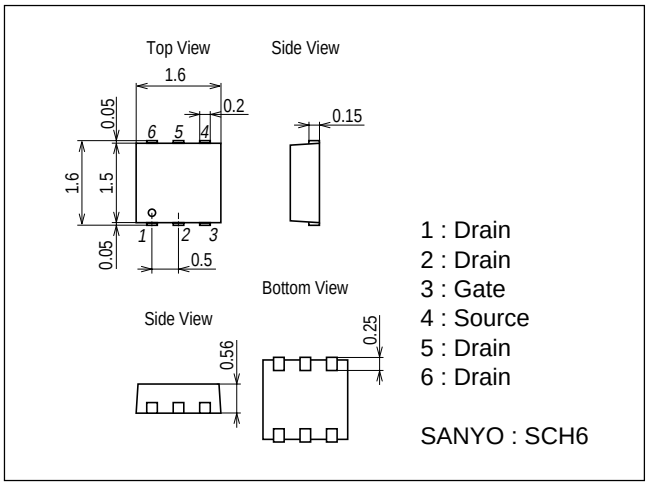
Continued from preceding page.

| Parameter | Symbol | Conditions | Ratings | | | Unit |
|---|---|---|---|---|---|---|
| | | | min | typ | max | |
| Total Gate Charge | Qg | $V_{DS}$=10V, $V_{GS}$=10V, $I_D$=2A | | 2.9 | | nC |
| Gate-to-Source Charge | Qgs | $V_{DS}$=10V, $V_{GS}$=10V, $I_D$=2A | | 0.7 | | nC |
| Gate-to-Drain “Miller” Charge | Qgd | $V_{DS}$=10V, $V_{GS}$=10V, $I_D$=2A | | 0.4 | | nC |
| Diode Forward Voltage | $V_{SD}$ | $I_S$=2A, $V_{GS}$=0 | | 0.88 | 1.2 | V |

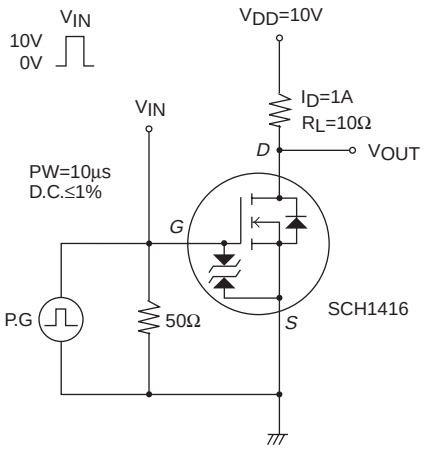
## Package Dimensions

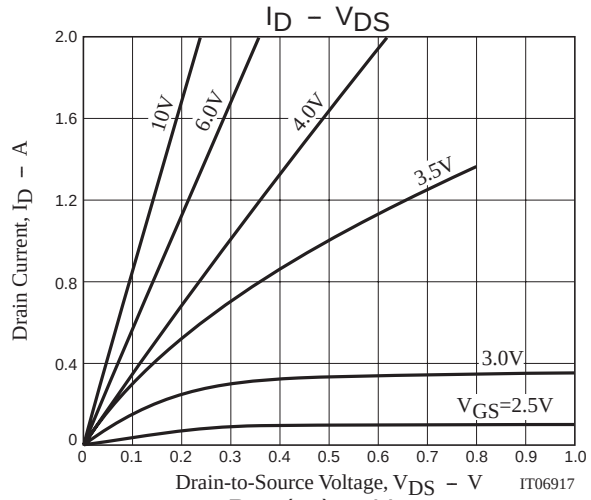
unit : mm

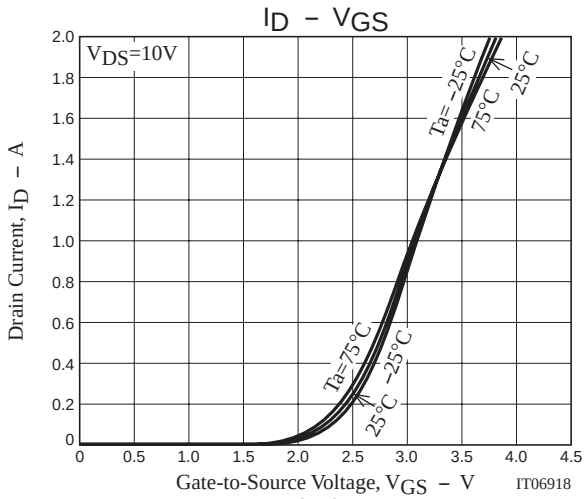
2221

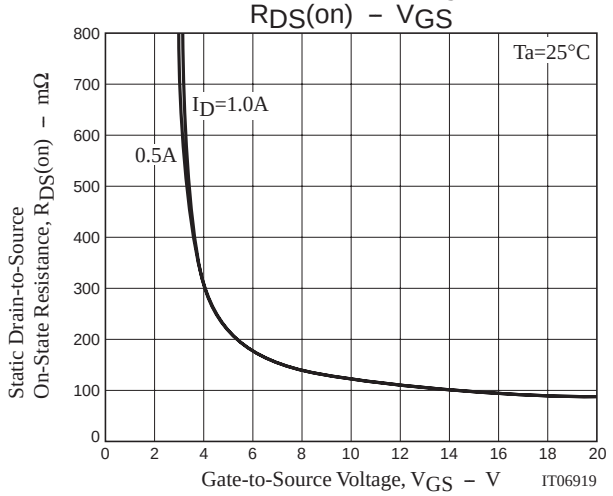


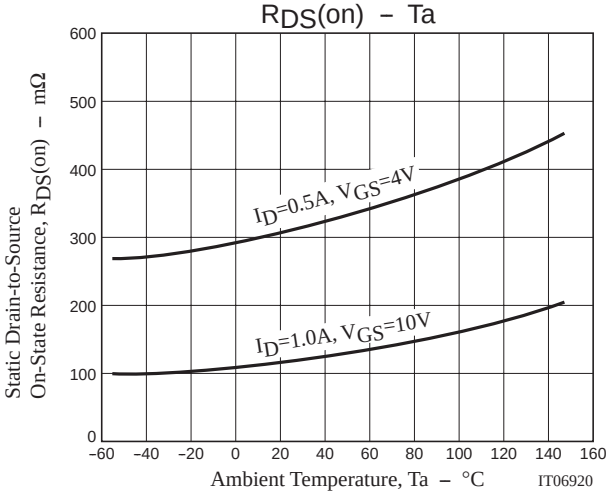

## Switching Time Test Circuit

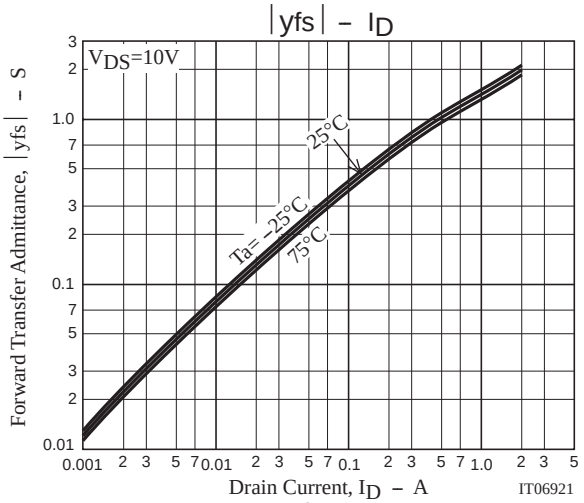


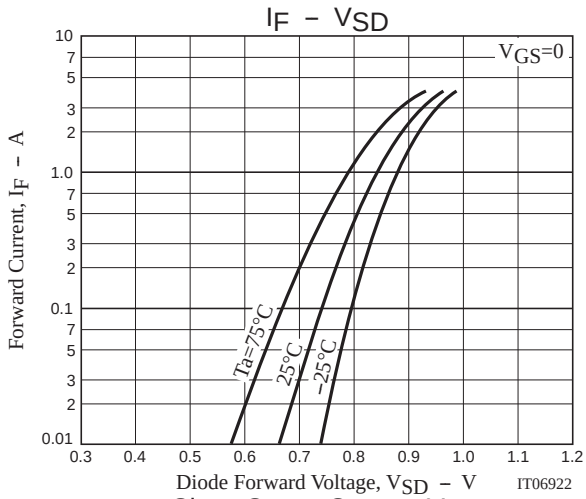



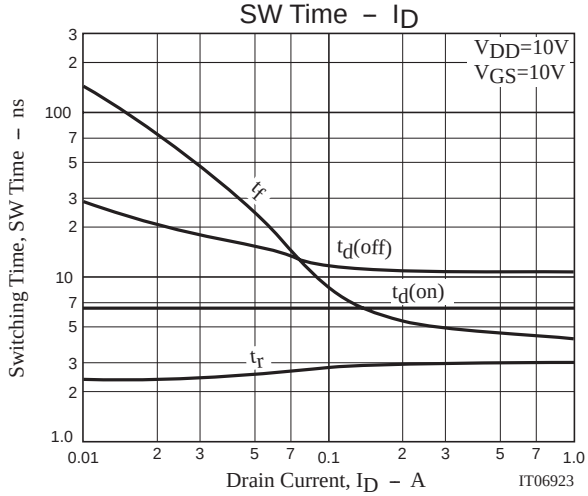



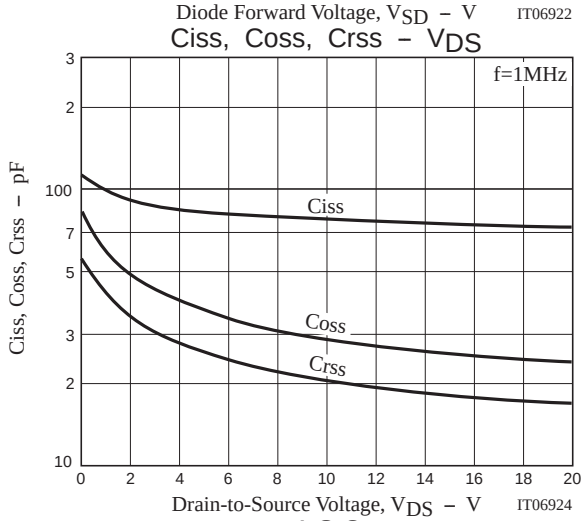



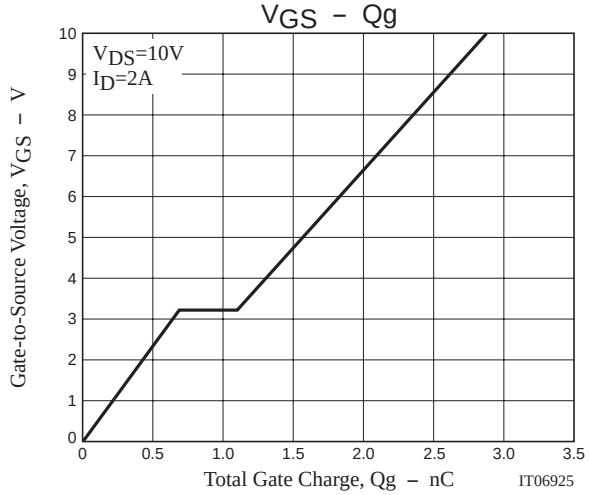



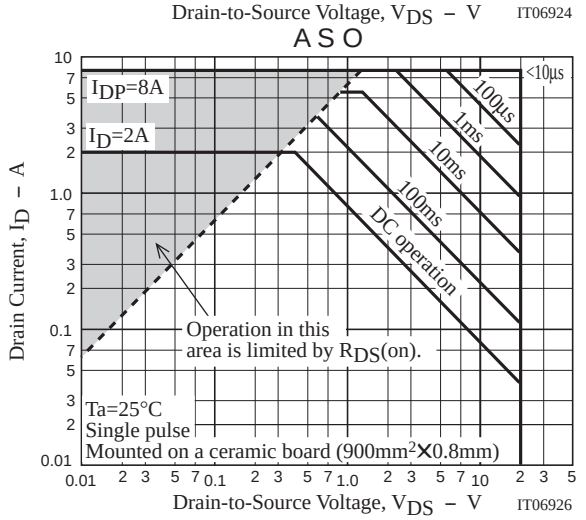

|yfs| – ID
VDS=10V
25°C
Ta=–25°C
75°C
Forward Transfer Admittance, |yfs| – S
Drain Current, ID – A
IT06921

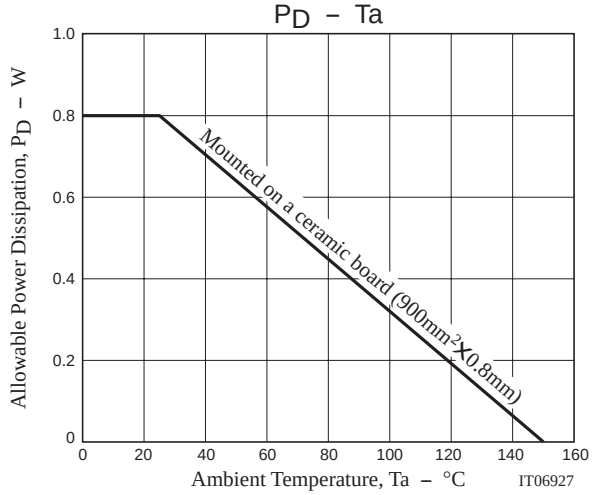

IF – VSD
VGS=0
Ta=75°C
25°C
–25°C
Forward Current, IF – A
Diode Forward Voltage, VSD – V
IT06922


SW Time – ID
VDD=10V
VGS=10V
tf
td(off)
td(on)
tr
Switching Time, SW Time – ns
Drain Current, ID – A
IT06923


Ciss, Coss, Crss – VDS
f=1MHz
Ciss
Coss
Crss
Ciss, Coss, Crss – pF
Drain-to-Source Voltage, VDS – V
IT06924


VGS – Qg
VDS=10V
ID=2A
Gate-to-Source Voltage, VGS – V
Total Gate Charge, Qg – nC
IT06925


ASO
IDP=8A
ID=2A
<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)
Drain Current, ID – A
Drain-to-Source Voltage, VDS – V
IT06926


PD – Ta
Mounted on a ceramic board (900mm²×0.8mm)
Allowable Power Dissipation, PD – W
Ambient Temperature, Ta – °C
IT06927