Ordering number:ENN6268

N-Channel Silicon MOSFET

# FW236

## Load Switching Applications

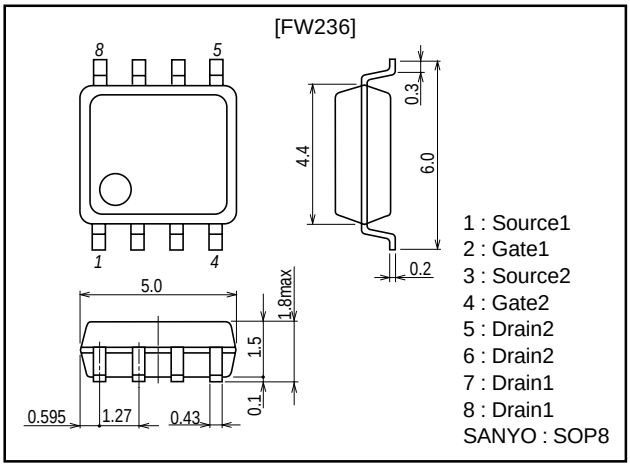
## Features

- Low ON resistance.
- 2.5V drive.

## Package Dimensions

unit:mm

2129




## 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 | $V_{GSS}$ | | ±10 | V |
| Drain Current (DC) | $I_D$ | | 6 | A |
| Drain Current (pulse) | $I_{DP}$ | PW≤10μs, duty cycle≤1% | 52 | A |
| Allowable Power Dissipation | $P_D$ | Mounted on a ceramic board (1000mm²×0.8mm) 1unit | 1.7 | W |
| Total Dissipation | $P_T$ | Mounted on a ceramic board (1000mm²×0.8mm) | 2.0 | 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 | $I_{GSS}$ | $V_{GS}$=±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, $I_D$=6A | 9 | 13 | | S |
| Static Drain-to-Source On-State Resistance | $R_{DS(on)}1$ | $I_D$=6A, $V_{GS}$=4V | | 32 | 42 | mΩ |
| | $R_{DS(on)}2$ | $I_D$=2A, $V_{GS}$=2.5V | | 42 | 59 | mΩ |

Marking : W236

Continued on next page.



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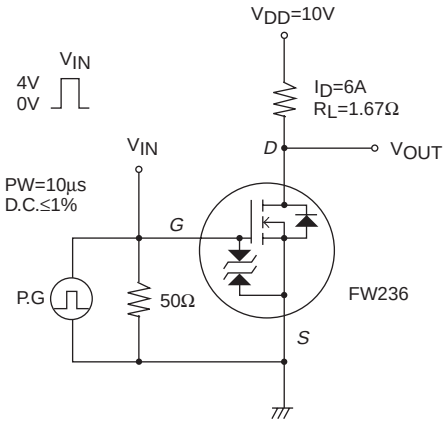
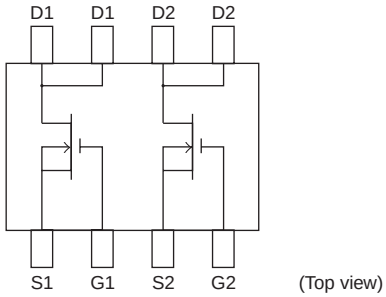
Continued from preceding page.

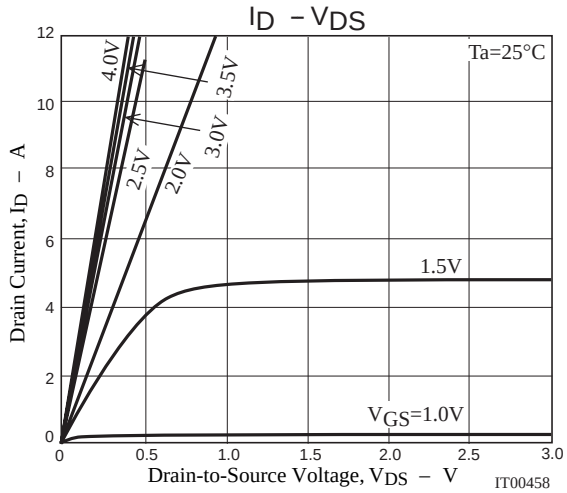
| Parameter | Symbol | Conditions | Ratings | | | Unit |
|---|---|---|---|---|---|---|
| | | | min | typ | max | |
| Input Capacitance | Ciss | $V_{DS}$=10V, f=1MHz | | 700 | | pF |
| Output Capacitance | Coss | $V_{DS}$=10V, f=1MHz | | 200 | | pF |
| Reverse Transfer Capacitance | Crss | $V_{DS}$=10V, f=1MHz | | 150 | | pF |
| Turn-ON Delay Time | $t_{d(on)}$ | See specified Test Circuit | | 14 | | ns |
| Rise Time | $t_r$ | See specified Test Circuit | | 200 | | ns |
| Turn-OFF Delay Time | $t_{d(off)}$ | See specified Test Circuit | | 75 | | ns |
| Fall Time | $t_f$ | See specified Test Circuit | | 120 | | ns |
| Total Gate Charge | Qg | $V_{DS}$=10V, $V_{GS}$=10V, $I_D$=6A | | 24 | | nC |
| Gate-to-Source Charge | Qgs | $V_{DS}$=10V, $V_{GS}$=10V, $I_D$=6A | | 1.5 | | nC |
| Gate-to-Drain "Miller" Charge | Qgd | $V_{DS}$=10V, $V_{GS}$=10V, $I_D$=6A | | 3.2 | | nC |
| Diode Forward Voltage | $V_{SD}$ | $I_S$=6A, $V_{GS}$=0 | | 0.86 | 1.2 | V |

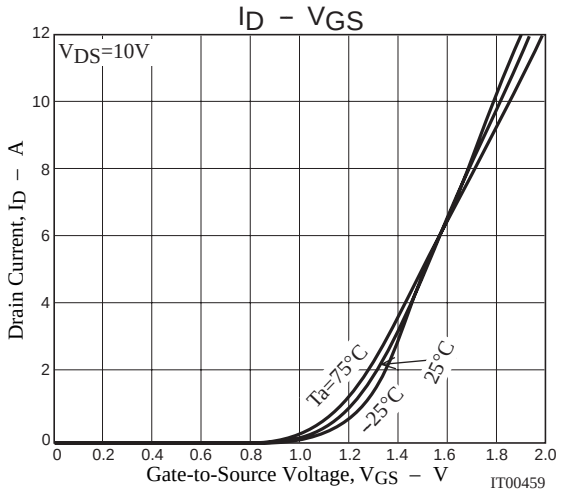
## Switching Time Test Circuit

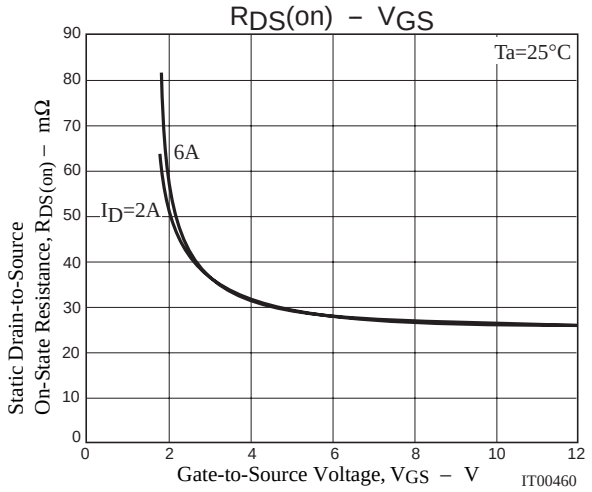


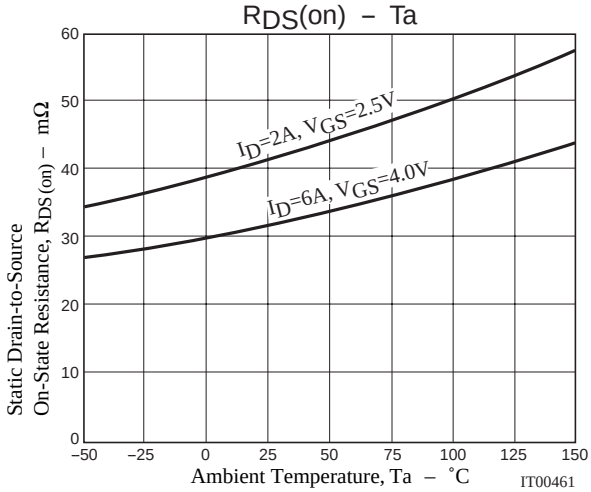

## Electrical Connection

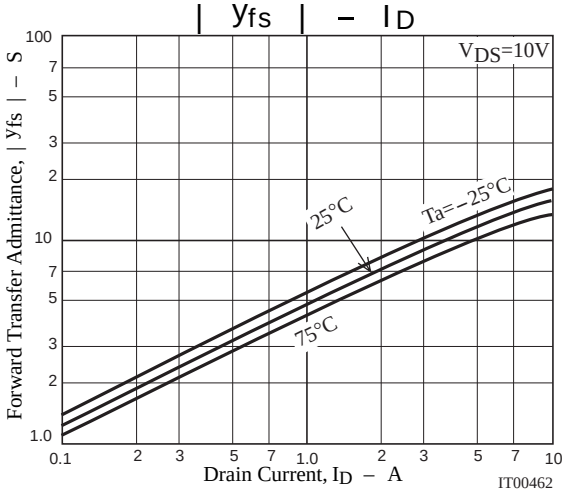


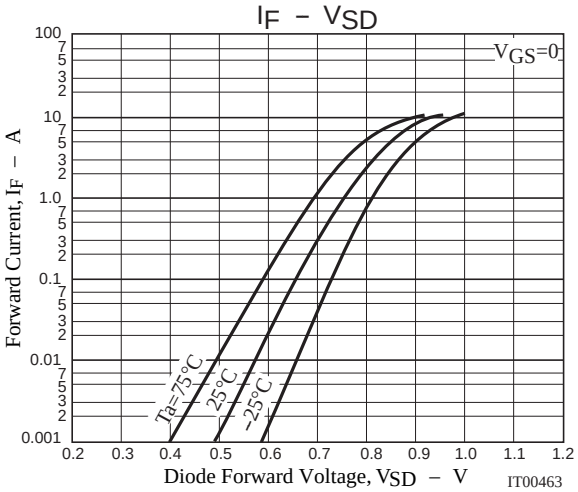



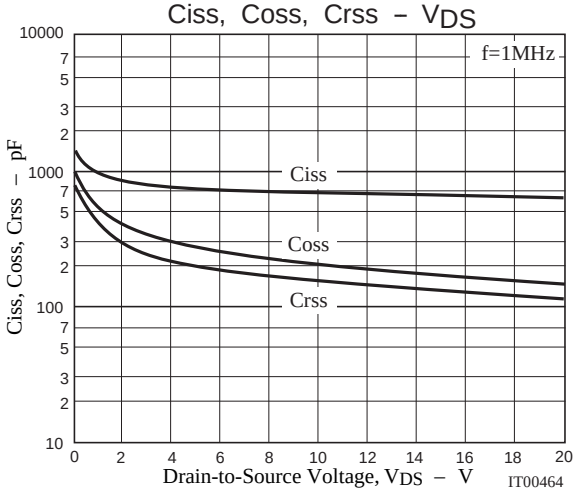



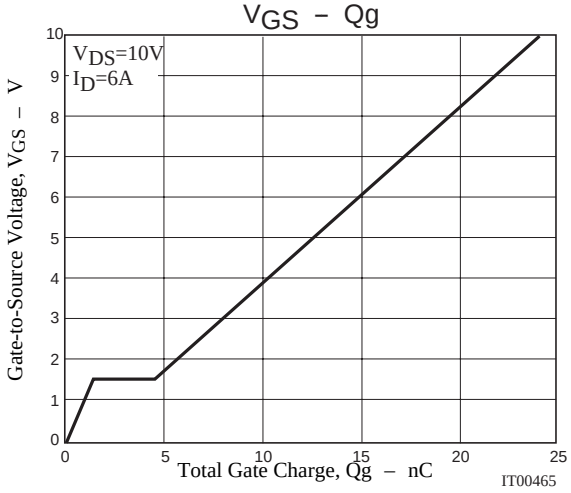



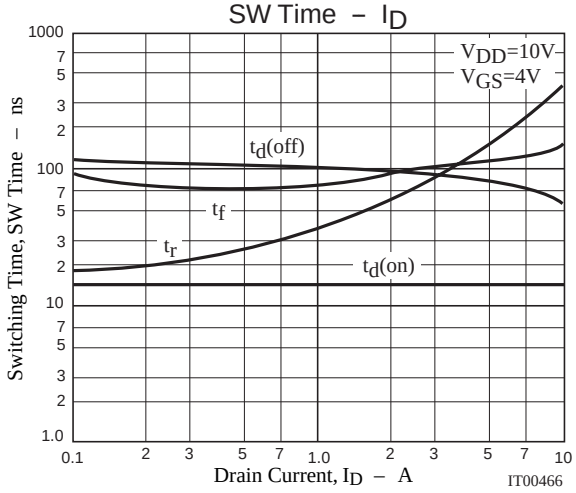



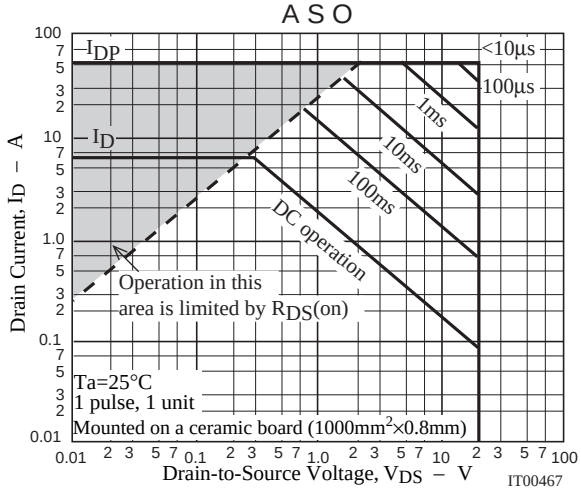

| Yfs | – ID
VDS=10V
Ta=–25°C
25°C
75°C
Forward Transfer Admittance, | Yfs | – S
Drain Current, ID – A
IT00462

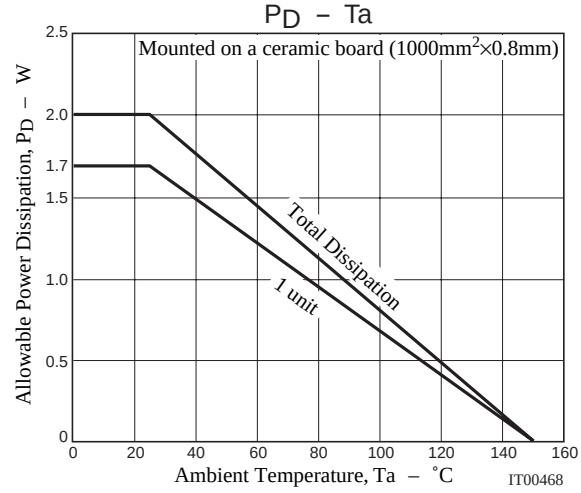

IF – VSD
VGS=0
Ta=75°C
25°C
–25°C
Forward Current, IF – A
Diode Forward Voltage, VSD – V
IT00463


Ciss, Coss, Crss – VDS
f=1MHz
Ciss
Coss
Crss
Ciss, Coss, Crss – pF
Drain-to-Source Voltage, VDS – V
IT00464


VGS – Qg
VDS=10V
ID=6A
Gate-to-Source Voltage, VGS – V
Total Gate Charge, Qg – nC
IT00465


SW Time – ID
VDD=10V
VGS=4V
td(off)
tf
tr
td(on)
Switching Time, SW Time – ns
Drain Current, ID – A
IT00466


A S O
IDP
ID
<10μs
100μs
1ms
10ms
100ms
DC operation
Operation in this
area is limited by RDS(on)
Ta=25°C
1 pulse, 1 unit
Mounted on a ceramic board (1000mm2×0.8mm)
Drain Current, ID – A
Drain-to-Source Voltage, VDS – V
IT00467


PD – Ta
Mounted on a ceramic board (1000mm2×0.8mm)
Total Dissipation
1 unit
Allowable Power Dissipation, PD – W
Ambient Temperature, Ta – ˚C
IT00468