Ordering number : ENN7647



P-Channel Silicon MOSFET

# VEC2301

## General-Purpose Switching Device Applications

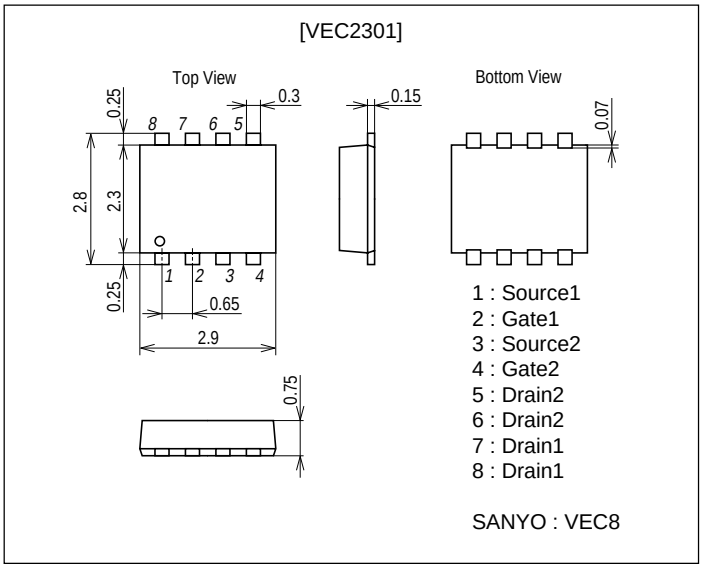
### Features

- Best suited for load switches.
- Low ON-resistance.
- 2.5V drive.
- Composite type, facilitating high-density mounting.
- Mount height 0.75mm

### Package Dimensions

unit : mm

2227




### 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) | $I_D$ | | −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)1unit | 0.9 | W |
| Total Dissipation | $P_T$ | Mounted on a ceramic board (900mm²×0.8mm) | 1.0 | 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 |

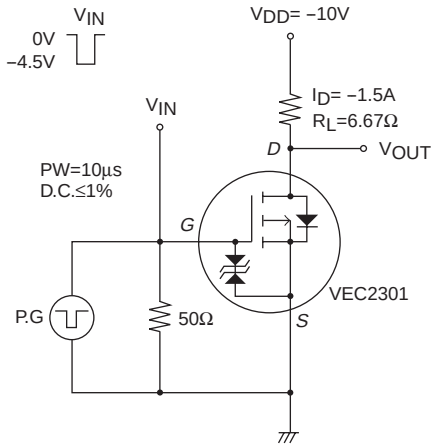
Marking : BA

Continued on next page.

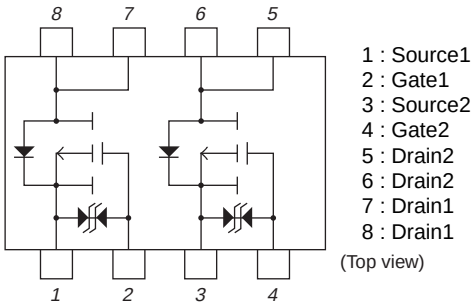
Continued from preceding page.

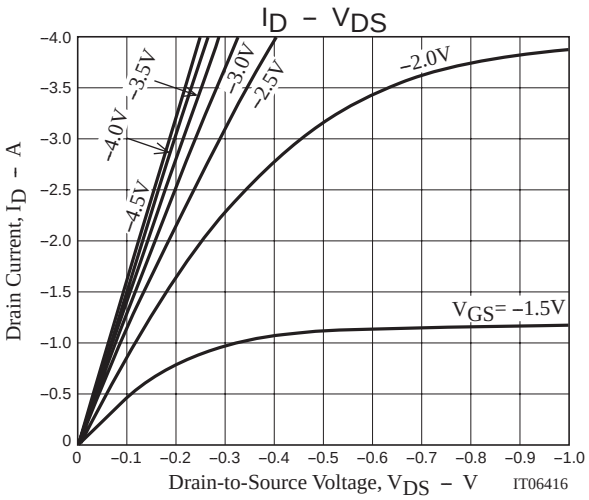
| Parameter | Symbol | Conditions | Ratings | | | Unit |
|---|---|---|---|---|---|---|
| | | | min | typ | max | |
| Cutoff Voltage | $V_{GS}$(off) | $V_{DS}$=−10V, $I_D$=−1mA | −0.4 | | −1.3 | V |
| Forward Transfer Admittance | \|yfs\| | $V_{DS}$=−10V, $I_D$=−1.5A | 2.9 | 4.9 | | S |
| Static Drain-to-Source On-State Resistance | $R_{DS}$(on)1 | $I_D$=−2A, $V_{GS}$=−4.5V | | 62 | 81 | mΩ |
| | $R_{DS}$(on)2 | $I_D$=−1A, $V_{GS}$=−2.5V | | 87 | 120 | mΩ |
| Input Capacitance | Ciss | $V_{DS}$=−10V, f=1MHz | | 680 | | pF |
| Output Capacitance | Coss | $V_{DS}$=−10V, f=1MHz | | 115 | | pF |
| Reverse Transfer Capacitance | Crss | $V_{DS}$=−10V, f=1MHz | | 80 | | pF |
| Turn-ON Delay Time | $t_d$(on) | See specified Test Circuit. | | 13 | | ns |
| Rise Time | $t_r$ | See specified Test Circuit. | | 53 | | ns |
| Turn-OFF Delay Time | $t_d$(off) | See specified Test Circuit. | | 77 | | ns |
| Fall Time | $t_f$ | See specified Test Circuit. | | 62 | | ns |
| Total Gate Charge | Qg | $V_{DS}$=−10V, $V_{GS}$=−4.5V, $I_D$=−3A | | 8.2 | | nC |
| Gate-to-Source Charge | Qgs | $V_{DS}$=−10V, $V_{GS}$=−4.5V, $I_D$=−3A | | 1.7 | | nC |
| Gate-to-Drain “Miller” Charge | Qgd | $V_{DS}$=−10V, $V_{GS}$=−4.5V, $I_D$=−3A | | 2.1 | | nC |
| Diode Forward Voltage | $V_{SD}$ | $I_S$=−3A, $V_{GS}$=0 | | −0.88 | −1.2 | V |

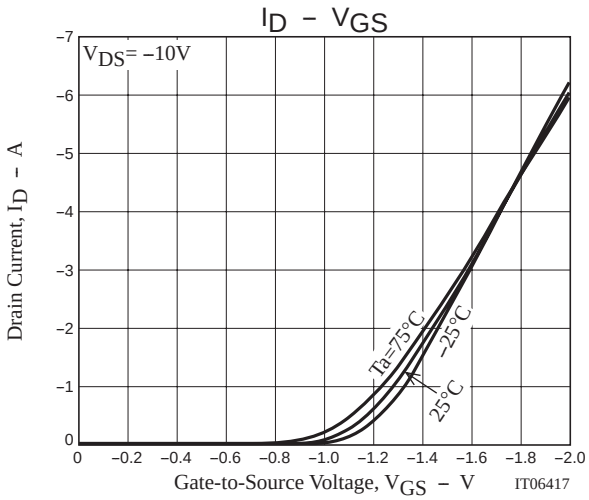
## Switching Time Test Circuit



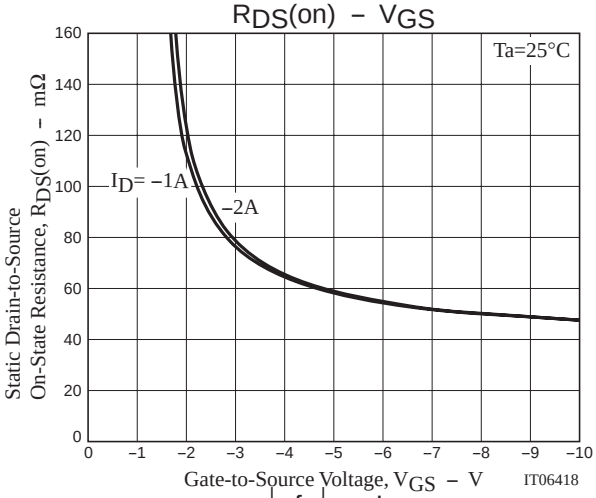

## Electrical Connection



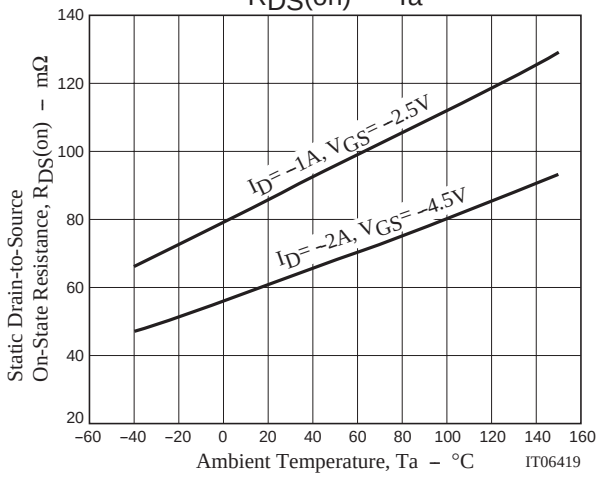



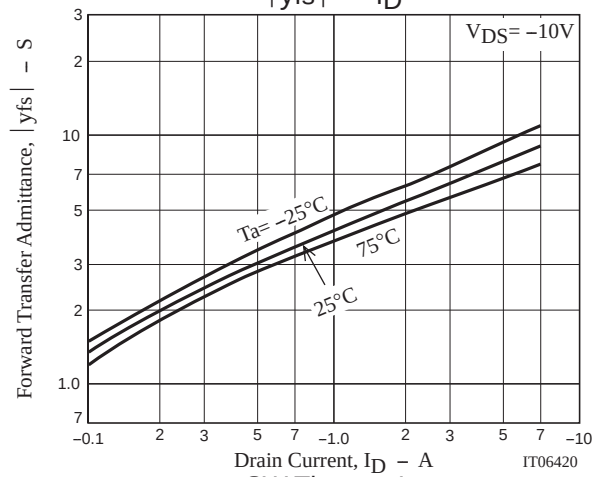
$R_{DS(on)}$ – $V_{GS}$



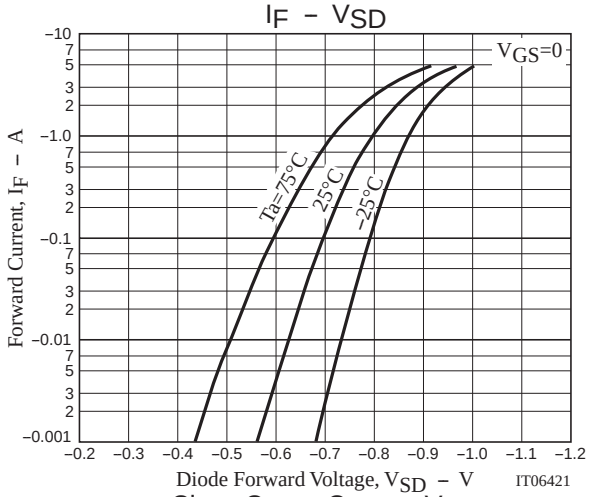

$R_{DS(on)}$ – Ta



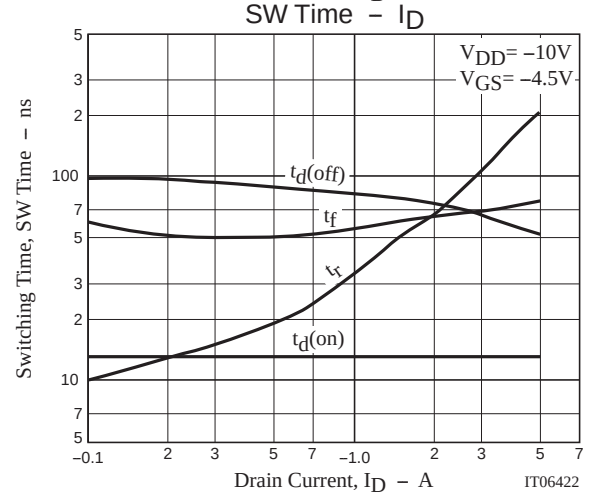

|yfs| – $I_D$



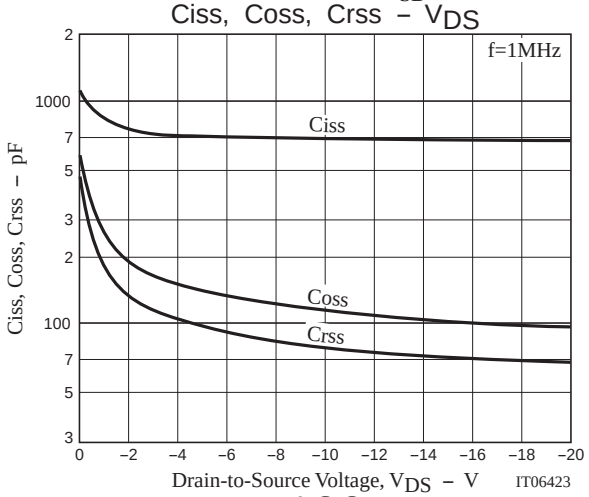

$I_F$ – $V_{SD}$



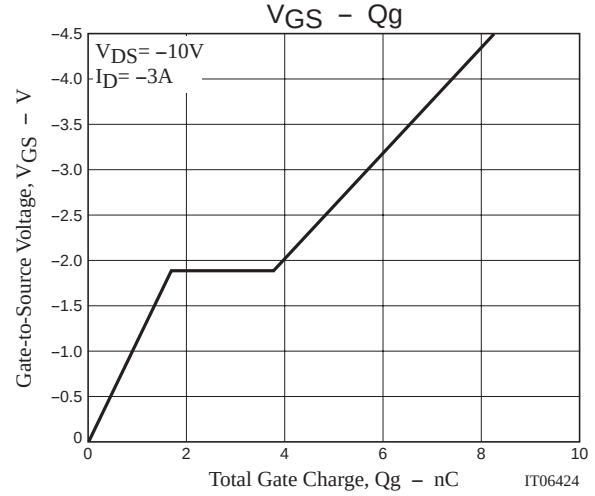

SW Time – $I_D$




Ciss, Coss, Crss – $V_{DS}$




$V_{GS}$ – Qg




A S O