# 1.2V Drive Pch + Pch MOSFET

## VT6J1

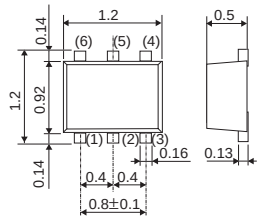
### ●Structure
Silicon P-channel MOSFET

### ●Features
1) Low on-resistance.
2) Small package(VMT6).
3) Low voltage drive(1.2V drive).

### ●Application
Switching

### ●Dimensions (Unit : mm)

VMT6

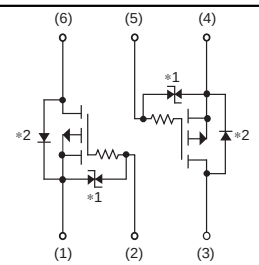



Abbreviated symbol : J01

### ●Packaging specifications

| | | |
|---|---|---|
| Type | Package | Taping |
| | Code | T2CR |
| | Basic ordering unit (pieces) | 8000 |
| VT6J1 | | O |

### ●Inner circuit




(1) Tr1 Source
(2) Tr1 Gate
(3) Tr2 Drain
(4) Tr2 Source
(5) Tr2 Gate
(6) Tr1 Drain

*1 ESD PROTECTION DIODE
*2 BODY DIODE

### ●Absolute maximum ratings (Ta = 25°C)

| Parameter | | Symbol | Limits | Unit |
|---|---|---|---|---|
| Drain-source voltage | | $V_{DSS}$ | −20 | V |
| Gate-source voltage | | $V_{GSS}$ | ±10 | V |
| Drain current | Continuous | $I_D$ | ±100 | mA |
| | Pulsed | $I_{DP}$ *1 | ±400 | mA |
| Power dissipation | | $P_D$ *2 | 0.15 | W/TOTAL |
| | | | 0.12 | W/ELEMENT |
| Channel temperature | | Tch | 150 | °C |
| Range of storage temperature | | Tstg | −55 to +150 | °C |

*1 Pw≤10μs, Duty cycle≤1%

*2 Each terminal mounted on a reference land.

●**Electrical characteristics** (Ta = 25°C)

<It is the same ratings for Tr1 and Tr2.>

| Parameter | Symbol | Min. | Typ. | Max. | Unit | Conditions |
|---|---|---|---|---|---|---|
| Gate-source leakage | $I_{GSS}$ | - | - | ±10 | μA | $V_{GS}$=±10V, $V_{DS}$=0V |
| Drain-source breakdown voltage | $V_{(BR)DSS}$ | −20 | - | - | V | $I_D$=−1mA, $V_{GS}$=0V |
| Zero gate voltage drain current | $I_{DSS}$ | - | - | −1 | μA | $V_{DS}$=−20V, $V_{GS}$=0V |
| Gate threshold voltage | $V_{GS\ (th)}$ | −0.3 | - | −1.0 | V | $V_{DS}$=−10V, $I_D$=−100μA |
| Static drain-source on-state resistance | $R_{DS\ (on)}$* | - | 2.5 | 3.8 | Ω | $I_D$=−100mA, $V_{GS}$=−4.5V |
| | | - | 3.4 | 5.1 | | $I_D$=−50mA, $V_{GS}$=−2.5V |
| | | - | 4.8 | 8.2 | | $I_D$=−20mA, $V_{GS}$=−1.8V |
| | | - | 6.0 | 13.2 | | $I_D$=−10mA, $V_{GS}$=−1.5V |
| | | - | 10.0 | 40.0 | | $I_D$=−1mA, $V_{GS}$=−1.2V |
| Forward transfer admittance | $\|Y_{fs}\|$* | 120 | - | - | mS | $V_{DS}$=−10V, $I_D$=−100mA |
| Input capacitance | $C_{iss}$ | - | 15.0 | - | pF | $V_{DS}$=−10V |
| Output capacitance | $C_{oss}$ | - | 4.0 | - | pF | $V_{GS}$=0V |
| Reverse transfer capacitance | $C_{rss}$ | - | 1.5 | - | pF | f=1MHz |
| Turn-on delay time | $t_{d(on)}$* | - | 46 | - | ns | $V_{DD}$≒−10V, $I_D$=−50mA |
| Rise time | $t_r$ * | - | 62 | - | ns | $V_{GS}$=−4.5V |
| Turn-off delay time | $t_{d(off)}$* | - | 325 | - | ns | $R_L$=200Ω |
| Fall time | $t_f$ * | - | 137 | - | ns | $R_G$=10Ω |

*Pulsed

●**Body diode characteristics** (Source-Drain)

<It is the same ratings for Tr1 and Tr2.>

| Parameter | Symbol | Min. | Typ. | Max. | Unit | Conditions |
|---|---|---|---|---|---|---|
| Forward Voltage | $V_{SD}$* | - | - | −1.2 | V | $I_s$=−100mA, $V_{GS}$=0V |

*Pulsed

## ●Electrical characteristic curves

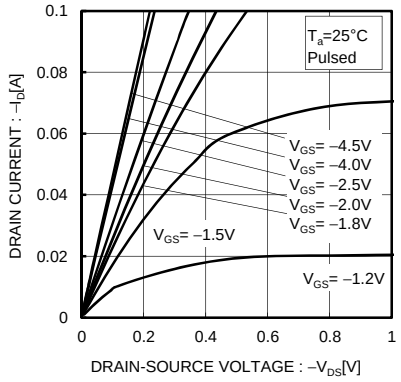



Fig.1 Typical output characteristics(Ⅰ)

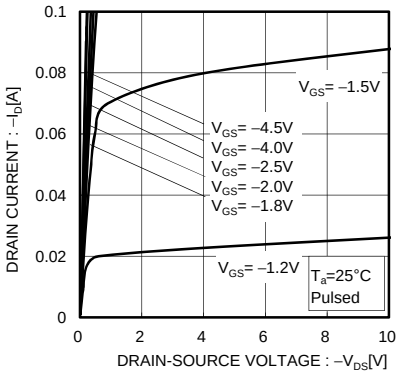



Fig.2 Typical output characteristics(Ⅱ)

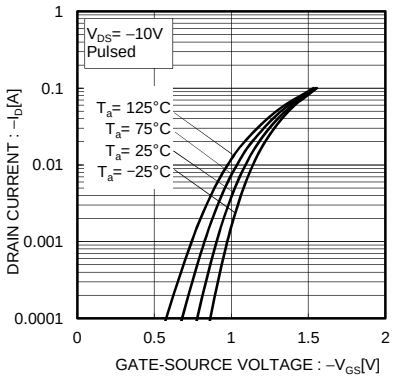



Fig.3 Typical Transfer Characteristics

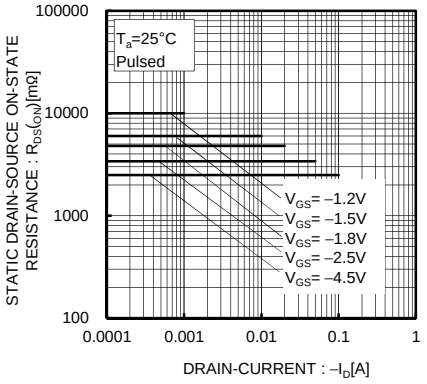



Fig.4 Static Drain-Source On-State Resistance vs. Drain Current(Ⅰ)

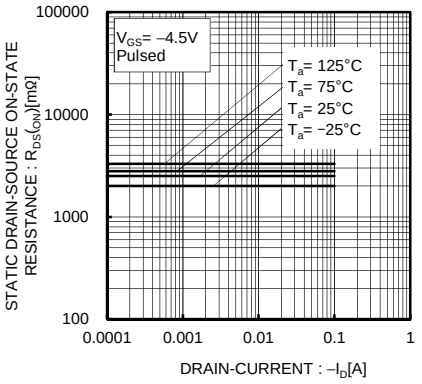



Fig.5 Static Drain-Source On-State Resistance vs. Drain Current(Ⅱ)

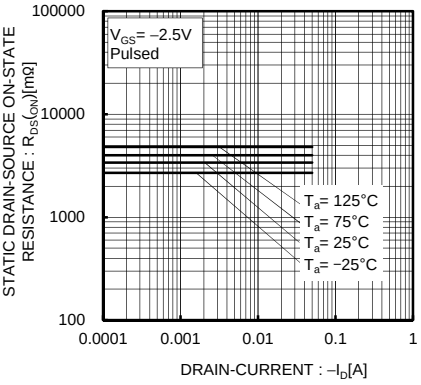



Fig.6 Static Drain-Source On-State Resistance vs. Drain Current(Ⅲ)

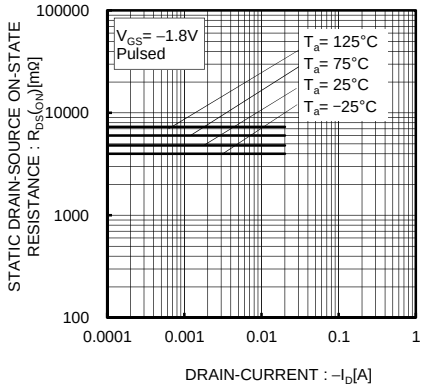



Fig.7 Static Drain-Source On-State Resistance vs. Drain Current(Ⅳ)

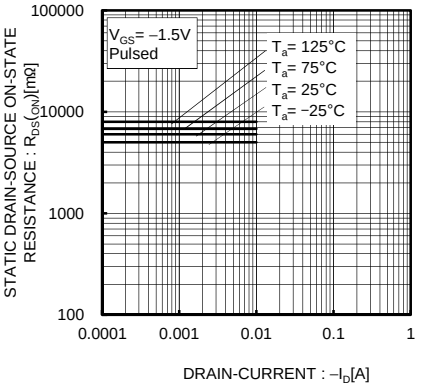



Fig.8 Static Drain-Source On-State Resistance vs. Drain Current(Ⅴ)

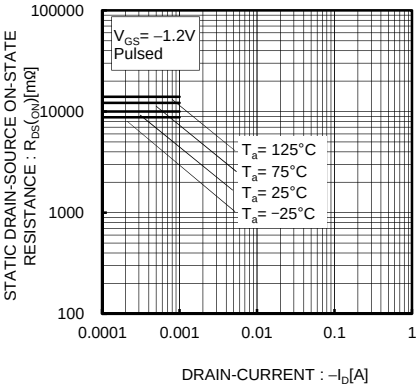



Fig.9 Static Drain-Source On-State Resistance vs. Drain Current(Ⅵ)

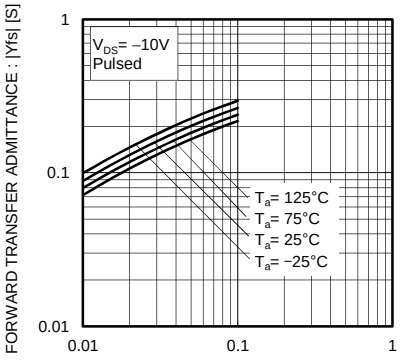



Fig.10 Forward Transfer Admittance vs. Drain Current

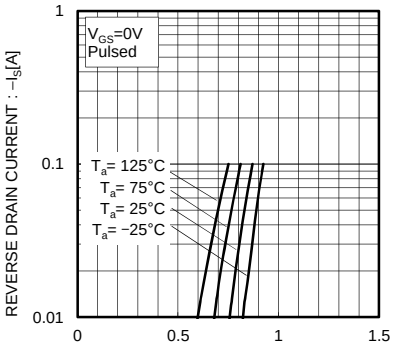



Fig.11 Reverse Drain Current vs. Sourse-Drain Voltage

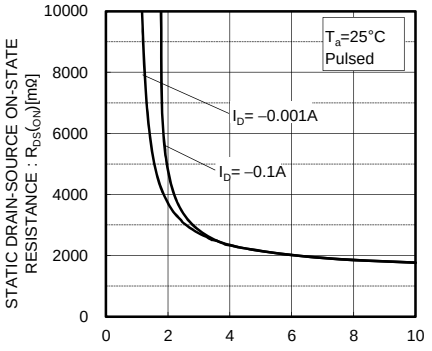



Fig.12 Static Drain-Source On-State Resistance vs. Gate Source Voltage

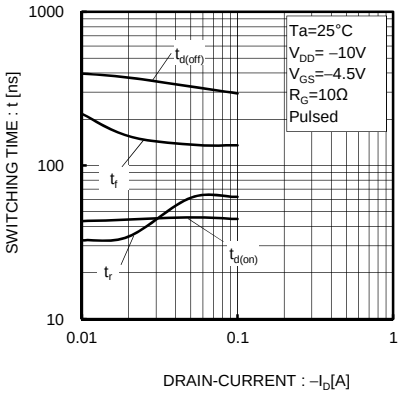



Fig.13 Switching Characteristics

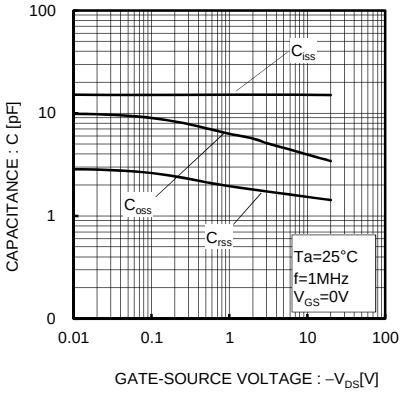



Fig.14 Typical Capacitance vs. Drain-Source Voltage

## ●Measurement circuits

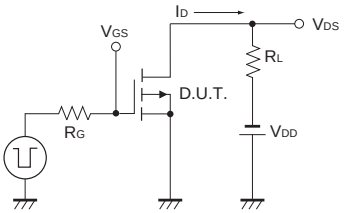



Fig.1-1 Switching Time Measurement Circuit

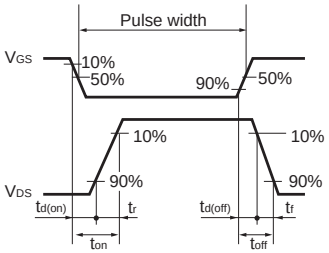



Fig.1-2 Switching Waveforms

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