# 4V Drive Pch MOSFET

## RSF010P03

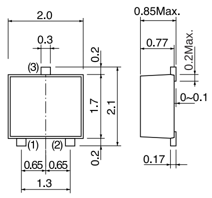
### ●Structure
Silicon P-channel MOSFET

### ●Features
1) Low on-resistance.
2) High speed switching.

### ●Applications
Switching

### ●Dimensions (Unit : mm)

TUMT3



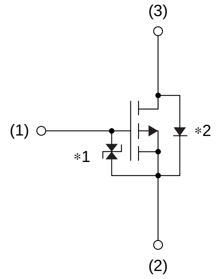

(1) Gate
(2) Source
(3) Drain

Abbreviated symbol : WX

### ●Packaging specifications

| Type | Package | Taping |
|---|---|---|
| | Code | TL |
| | Basic ordering unit (pieces) | 3000 |
| RSF010P03 | | ○ |

### ●Inner circuit




∗1 ESD PROTECTION DIODE
∗2 BODY DIODE

(1) Gate
(2) Source
(3) Drain

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

| Parameter | | Symbol | Limits | Unit |
|---|---|---|---|---|
| Drain-source voltage | | $V_{DSS}$ | –30 | V |
| Gate-source voltage | | $V_{GSS}$ | ±20 | V |
| Drain current | Continuous | $I_D$ | ±1 | A |
| | Pulsed | $I_{DP}$ ∗1 | ±4 | A |
| Source current (Body diode) | Continuous | $I_S$ | –0.3 | A |
| | Pulsed | $I_{SP}$ ∗1 | –4 | A |
| Total power dissipation | | $P_D$ ∗2 | 0.8 | W |
| Channel temperature | | Tch | 150 | °C |
| Range of storage temperature | | Tstg | –55 to +150 | °C |

∗1 Pw≤10µs, Duty cycle≤1%
∗2 Mounted on a ceramic board

### ●Thermal resistance

| Parameter | Symbol | Limits | Unit |
|---|---|---|---|
| Channel to ambient | Rth(ch-a)∗ | 156 | °C/W |

∗ Mounted on a ceramic board

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

| Parameter | Symbol | Min. | Typ. | Max. | Unit | Conditions |
|---|---|---|---|---|---|---|
| Gate-source leakage | $I_{GSS}$ | – | – | ±10 | µA | $V_{GS}$= ±20V, $V_{DS}$=0V |
| Drain-source breakdown voltage | $V_{(BR)\ DSS}$ | –30 | – | – | V | $I_D$= –1mA, $V_{GS}$=0V |
| Zero gate voltage drain current | $I_{DSS}$ | – | – | –1 | µA | $V_{DS}$= –30V, $V_{GS}$=0V |
| Gate threshold voltage | $V_{GS\ (th)}$ | –1.0 | – | –2.5 | V | $V_{DS}$= –10V, $I_D$= –1mA |
| Static drain-source on-state resistance | $R_{DS\ (on)}$* | – | 250 | 350 | mΩ | $I_D$= –1A, $V_{GS}$= –10V |
| | | – | 400 | 560 | mΩ | $I_D$= –0.5A, $V_{GS}$= –4.5V |
| | | – | 450 | 630 | mΩ | $I_D$= –0.5A, $V_{GS}$= –4.0V |
| Forward transfer admittance | $\lvert Y_{fs} \rvert$ * | 0.5 | – | – | S | $V_{DS}$= –10V, $I_D$= –0.5A |
| Input capacitance | $C_{iss}$ | – | 120 | – | pF | $V_{DS}$= –10V |
| Output capacitance | $C_{oss}$ | – | 27 | – | pF | $V_{GS}$=0V |
| Reverse transfer capacitance | $C_{rss}$ | – | 17 | – | pF | f=1MHz |
| Turn-on delay time | $t_{d\ (on)}$ * | – | 8 | – | ns | $V_{DD}$≒ –15V |
| Rise time | $t_r$ * | – | 11 | – | ns | $I_D$= –0.5A |
| Turn-off delay time | $t_{d\ (off)}$ * | – | 20 | – | ns | $V_{GS}$= –10V, $R_L$=30Ω |
| Fall time | $t_f$ * | – | 12 | – | ns | $R_G$ =10Ω |
| Total gate charge | $Q_g$ | – | 1.9 | – | nC | $V_{DD}$≒–15V, $V_{GS}$= –5V |
| Gate-source charge | $Q_{gs}$ | – | 0.7 | – | nC | $I_D$= –1A |
| Gate-drain charge | $Q_{gd}$ | – | 0.4 | – | nC | $R_L$=15Ω, $R_G$ =10Ω |

*Pulsed

## ●Body diode characteristics (Source-drain) (Ta=25°C)

| Parameter | Symbol | Min. | Typ. | Max. | Unit | Conditions |
|---|---|---|---|---|---|---|
| Forward voltage | $V_{SD}$ | – | – | –1.2 | V | $I_S$= –0.3A, $V_{GS}$=0V |

●**Electrical characteristics curves**

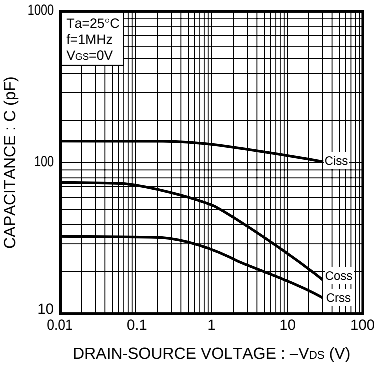



Fig.1 Typical Capacitance vs. Drain-Source Voltage

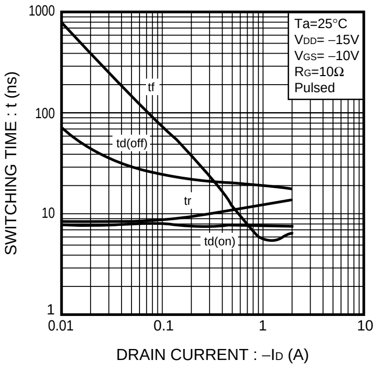



Fig.2 Switching Characteristics

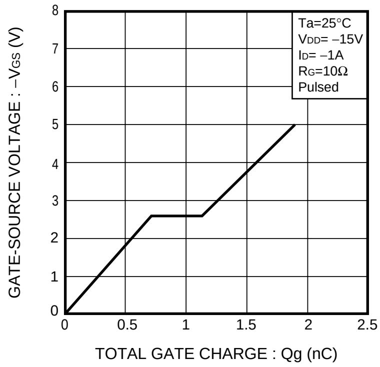



Fig.3 Dynamic Input Characteristics

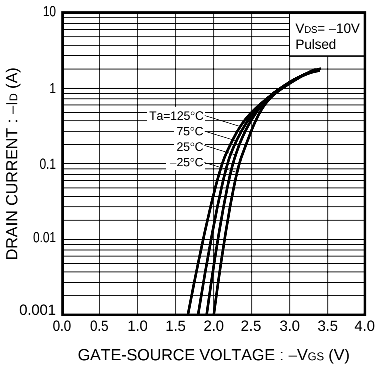



Fig.4 Typical Transfer Characteristics

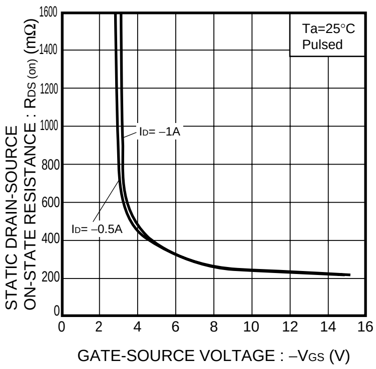



Fig.5 Static Drain-Source On-State Resistance vs. Gate-Source Voltage

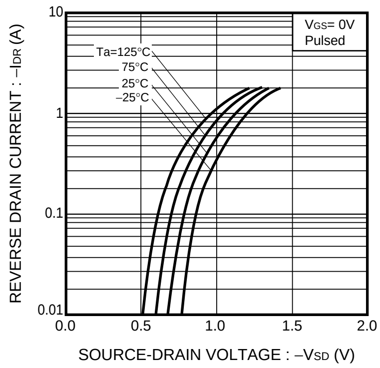



Fig.6 Reverse Drain Current vs. Source-Drain Voltage

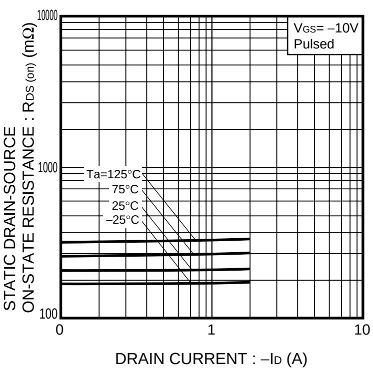



Fig.7 Static Drain-Source On-State Resistance vs. Drain current ( I )

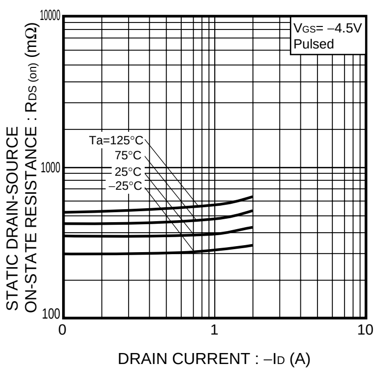



Fig.8 Static Drain-Source On-State Resistance vs. Drain current ( II )

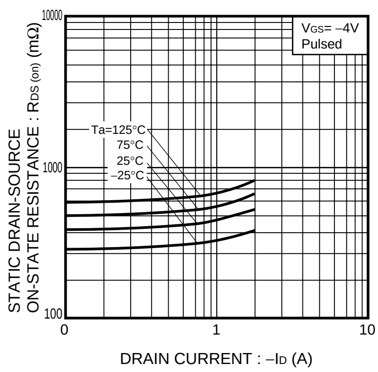



Fig.9 Static Drain-Source On-State Resistance vs. Drain current ( III )

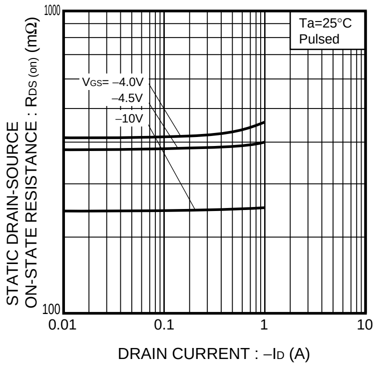



Fig.10 Static Drain-Source On-State Resistance vs. Drain current ( Ⅳ )

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