

## Transistors

## 4V Drive Pch MOSFET

## RSF010P03

## ●Structure

Silicon P-channel MOSFET

## ●Features

- 1) Low on-resistance.
- 2) High speed switching.

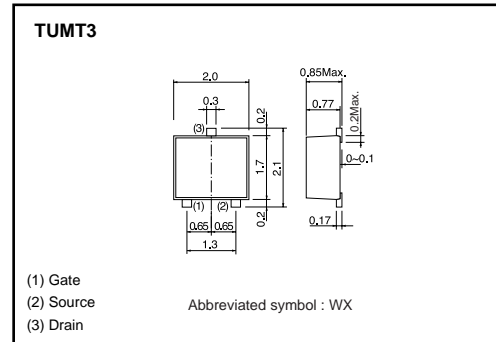
## ●Applications

Switching

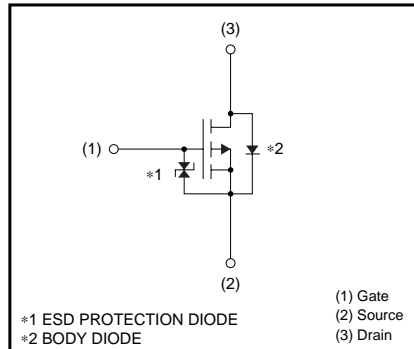
## ●Packaging specifications

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

## ●Dimensions (Unit : mm)



## ●Inner circuit



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

| Parameter                    | Symbol     | Limits      | Unit |   |
|------------------------------|------------|-------------|------|---|
| Drain-source voltage         | $V_{DS}$   | -30         | V    |   |
| Gate-source voltage          | $V_{GS}$   | ±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          | $T_{ch}$   | 150         | °C   |   |
| Range of storage temperature | $T_{stg}$  | -55 to +150 | °C   |   |

\*1  $P_w \leq 10 \mu s$ , Duty cycle  $\leq 1\%$ 

\*2 Mounted on a ceramic board

## ●Thermal resistance

| Parameter          | Symbol           | Limits | Unit |
|--------------------|------------------|--------|------|
| Channel to ambient | $R_{th(ch-a)}$ * | 156    | °C/W |

\* Mounted on a ceramic board

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

| Parameter                               | Symbol         | Min. | Typ. | Max. | Unit | Conditions                           |
|---|----------------|------|------|------|------|--------------------------------------|
| Gate-source leakage                     | $I_{GSS}$      | –    | –    | ±10  | μA   | $V_{GS} = \pm 20V, V_{DS} = 0V$      |
| 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             | $ Y_{fs} $ *   | 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   | $V_{GS} = -10V$                      |
| Fall time                               | $t_f$ *        | –    | 12   | –    | ns   | $R_L = 30\Omega$<br>$R_G = 10\Omega$ |
| 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   | $R_L = 15\Omega, R_G = 10\Omega$     |

\*Pulsed

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

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

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●Electrical characteristics curves

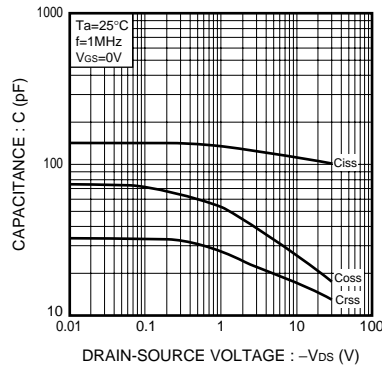


Fig.1 Typical Capacitance vs. Drain-Source Voltage

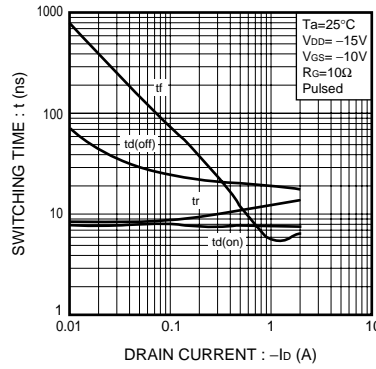


Fig.2 Switching Characteristics

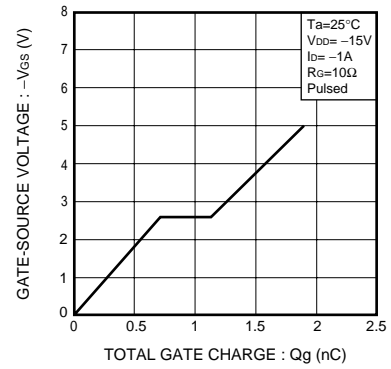


Fig.3 Dynamic Input Characteristics

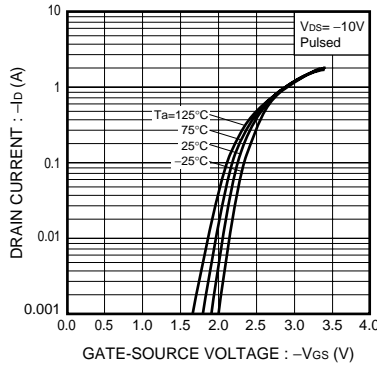


Fig.4 Typical Transfer Characteristics

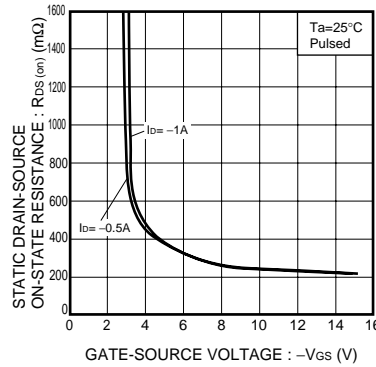


Fig.5 Static Drain-Source On-State Resistance vs. Gate-Source Voltage

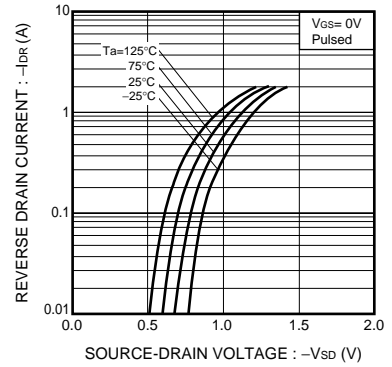


Fig.6 Reverse Drain Current vs. Source-Drain Voltage

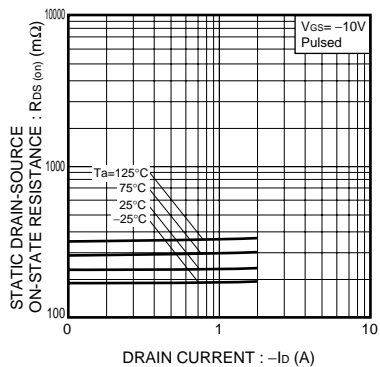


Fig.7 Static Drain-Source On-State Resistance vs. Drain current ( I )

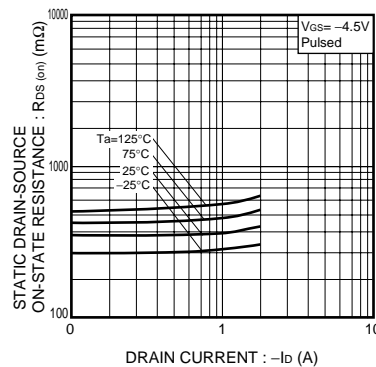


Fig.8 Static Drain-Source On-State Resistance vs. Drain current ( II )

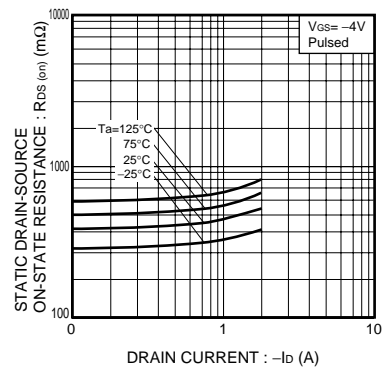


Fig.9 Static Drain-Source On-State Resistance vs. Drain current ( III )

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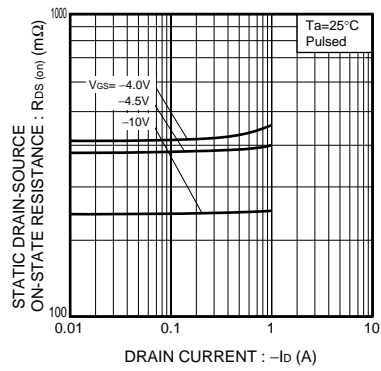


Fig.10 Static Drain-Source On-State Resistance vs. Drain current ( I<sub>V</sub> )

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