

# 4V Drive Pch MOSFET

## RSD080P05

### ● Structure

Silicon P-channel MOSFET

### ● Features

- 1) Low on-resistance.
- 2) Fast switching speed.
- 3) Drive circuits can be simple.
- 4) Parallel use is easy.

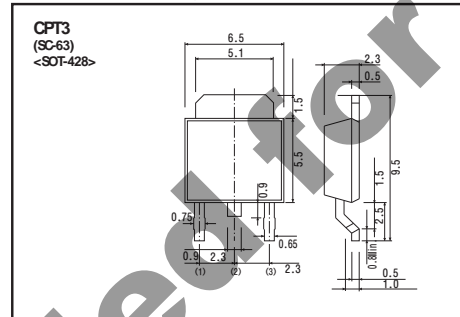
### ● Application

Switching

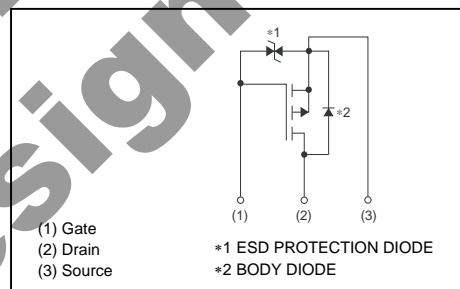
### ● Packaging specifications

| Type      | Package                      | Taping |
|-----------|------------------------------|--------|
|           | Code                         | TL     |
|           | Basic ordering unit (pieces) | 2500   |
| RSD080P05 |                              | ○      |

### ● Dimensions (Unit : mm)



### ● Inner circuit



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

| Parameter                    | Symbol     | Limits      | Unit   |
|------------------------------|------------|-------------|--------|
| Drain-source voltage         | $V_{DSS}$  | -45         | V      |
| Gate-source voltage          | $V_{GSS}$  | ±20         | V      |
| Drain current                | Continuous | $I_D$       | ±8.0 A |
|                              | Pulsed     | $I_{DP}$ *1 | ±16 A  |
| Source current (Body Diode)  | Continuous | $I_S$       | -8.0 A |
|                              | Pulsed     | $I_{SP}$ *1 | -16 A  |
| Power dissipation            | $P_D$ *2   | 15          | 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  $T_c = 25^\circ C$

### ● Thermal resistance

| Parameter       | Symbol           | Limits | Unit   |
|-----------------|------------------|--------|--------|
| Channel to Case | $R_{th(ch-c)}$ * | 8.33   | °C / W |

\*  $T_c = 25^\circ C$

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

| Parameter                               | Symbol         | Min. | Typ. | Max.     | Unit       | Conditions                  |
|---|----------------|------|------|----------|------------|-----------------------------|
| Gate-source leakage                     | $I_{GSS}$      | -    | -    | $\pm 10$ | $\mu A$    | $V_{GS}=\pm 20V, V_{DS}=0V$ |
| Drain-source breakdown voltage          | $V_{(BR)DSS}$  | -45  | -    | -        | V          | $I_D=-1mA, V_{GS}=0V$       |
| Zero gate voltage drain current         | $I_{DSS}$      | -    | -    | -1       | $\mu A$    | $V_{DS}=-45V, V_{GS}=0V$    |
| Gate threshold voltage                  | $V_{GS(th)}$   | -1.0 | -    | -3.0     | V          | $V_{DS}=-10V, I_D=-1mA$     |
| Static drain-source on-state resistance | $R_{DS(on)}^*$ | -    | 65   | 91       | m $\Omega$ | $I_D=-8.0A, V_{GS}=-10V$    |
|   |                | -    | 95   | 133      |            | $I_D=-8.0A, V_{GS}=-4.5V$   |
|   |                | -    | 105  | 147      |            | $I_D=-8.0A, V_{GS}=-4.0V$   |
| Forward transfer admittance             | $ Y_{fs} ^*$   | 6.0  | -    | -        | S          | $I_D=-8.0A, V_{DS}=-10V$    |
| Input capacitance                       | $C_{iss}$      | -    | 1000 | -        | pF         | $V_{DS}=-10V$               |
| Output capacitance                      | $C_{oss}$      | -    | 160  | -        | pF         | $V_{GS}=0V$                 |
| Reverse transfer capacitance            | $C_{rss}$      | -    | 80   | -        | pF         | $f=1MHz$                    |
| Turn-on delay time                      | $t_{d(on)}^*$  | -    | 12   | -        | ns         | $I_D=-4.0A, V_{DD}=-25V$    |
| Rise time                               | $t_r^*$        | -    | 15   | -        | ns         | $V_{GS}=-10V$               |
| Turn-off delay time                     | $t_{d(off)}^*$ | -    | 50   | -        | ns         | $R_L=6.25\Omega$            |
| Fall time                               | $t_f^*$        | -    | 20   | -        | ns         | $R_G=10\Omega$              |
| Total gate charge                       | $Q_g^*$        | -    | 9.0  | -        | nC         | $V_{DD}=-25V$               |
| Gate-source charge                      | $Q_{gs}^*$     | -    | 4.0  | -        | nC         | $I_D=-8.0A,$                |
| Gate-drain charge                       | $Q_{gd}^*$     | -    | 3.0  | -        | nC         | $V_{GS}=-5V$                |

\*Pulsed

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

| Parameter       | Symbol     | Min. | Typ. | Max. | Unit | Conditions             |
|-----------------|------------|------|------|------|------|------------------------|
| Forward Voltage | $V_{SD}^*$ | -    | -    | -1.2 | V    | $I_s=-8.0A, V_{GS}=0V$ |

\*Pulsed

●Electrical characteristic curves (Ta=25°C)

Fig.1 Typical Output Characteristics ( I )

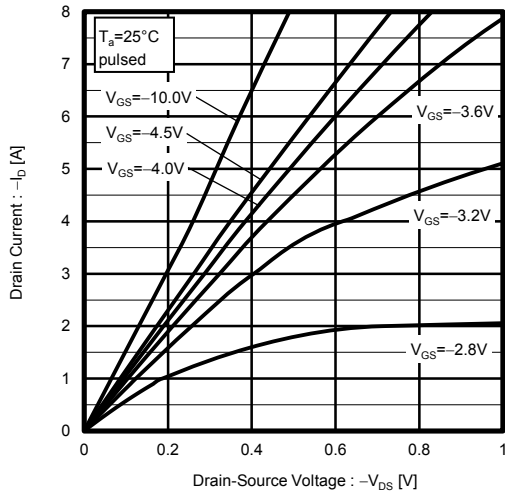


Fig.2 Typical Output Characteristics ( II )

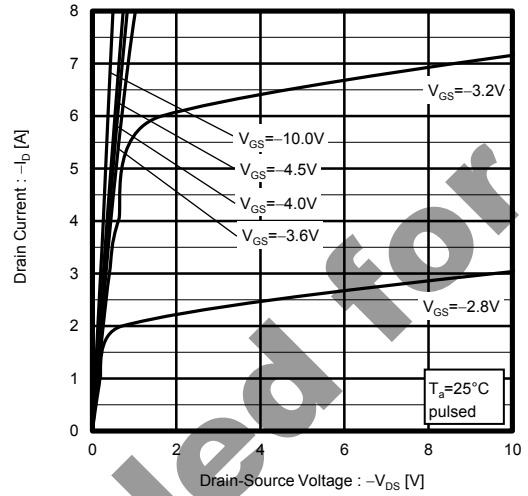


Fig.3 Static Drain-Source On-State Resistance vs. Drain Current

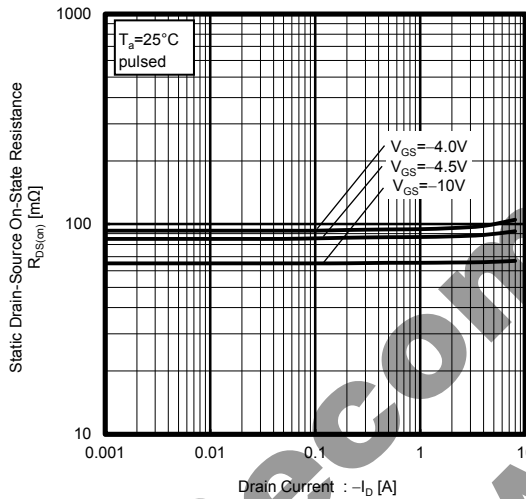


Fig.4 Static Drain-Source On-State Resistance vs. Drain Current

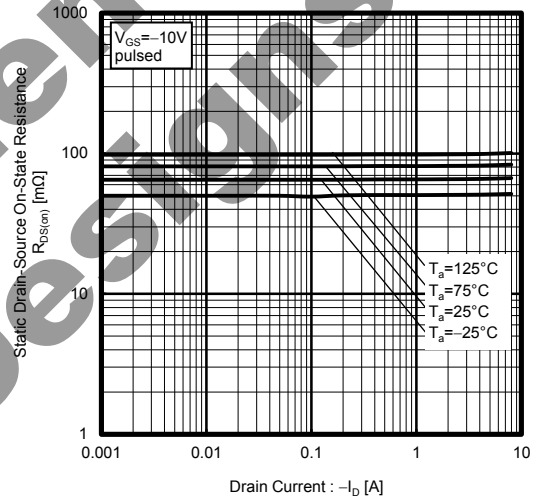


Fig.5 Static Drain-Source On-State Resistance vs. Drain Current

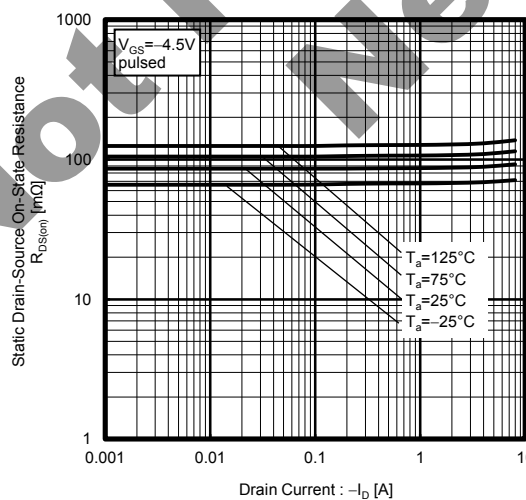


Fig.6 Static Drain-Source On-State Resistance vs. Drain Current

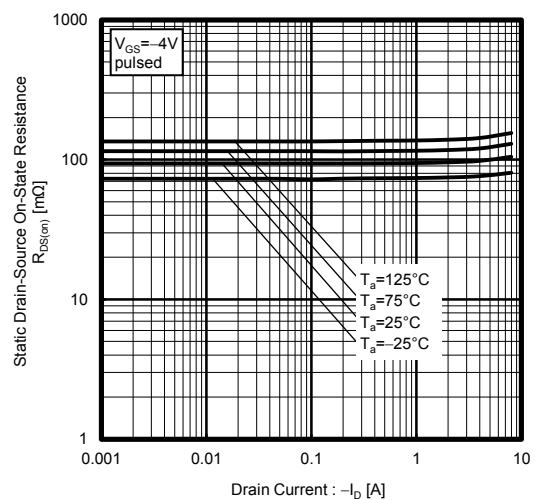


Fig.7 Forward Transfer Admittance vs. Drain Current

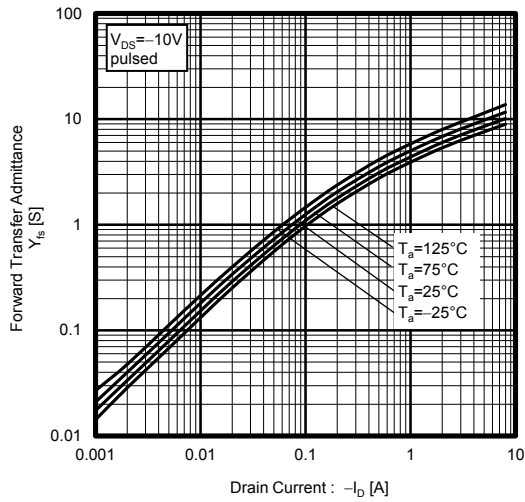


Fig.8 Typical Transfer Characteristics

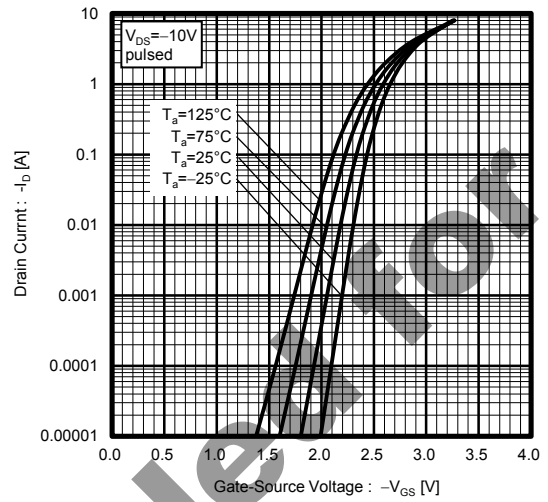


Fig.9 Source Current vs. Source-Drain Voltage

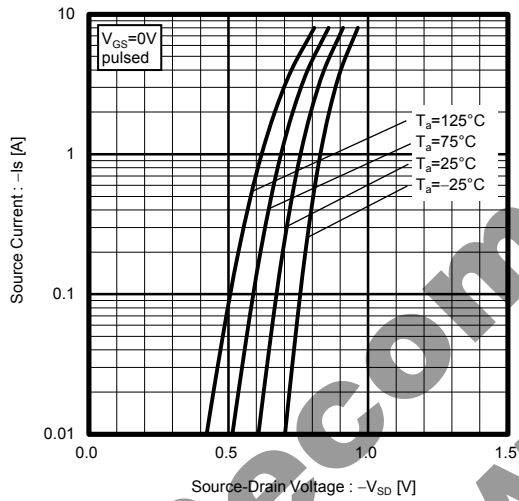


Fig.10 Static Drain-Source On-State Resistance vs. Gate-Source Voltage

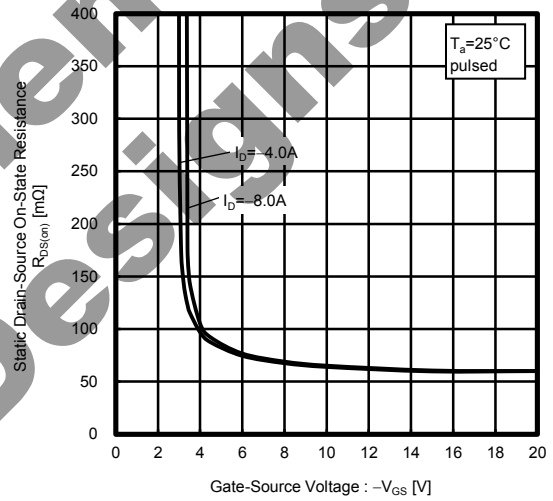


Fig.11 Switching Characteristics

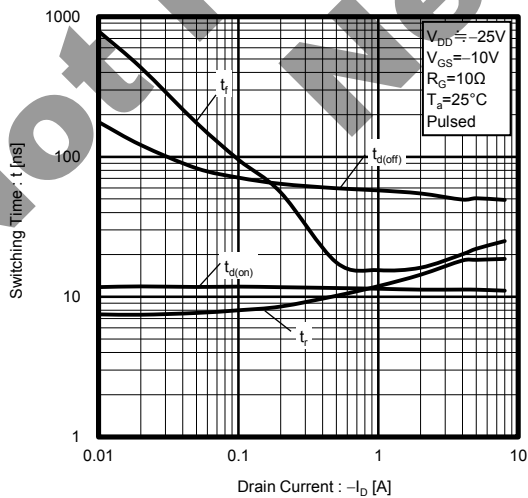


Fig.12 Dynamic Input Characteristics

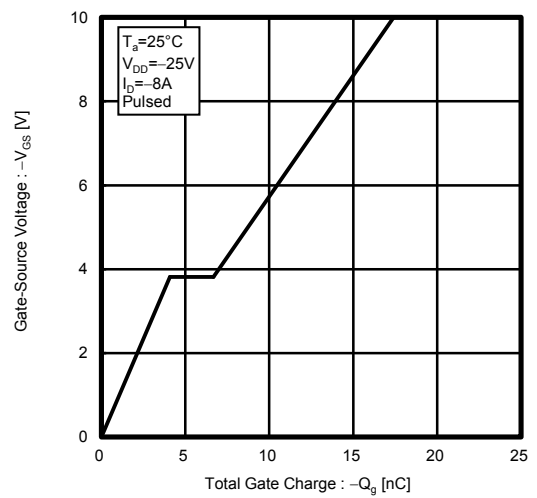


Fig.13 Typical Capacitance vs. Drain-Source Voltage

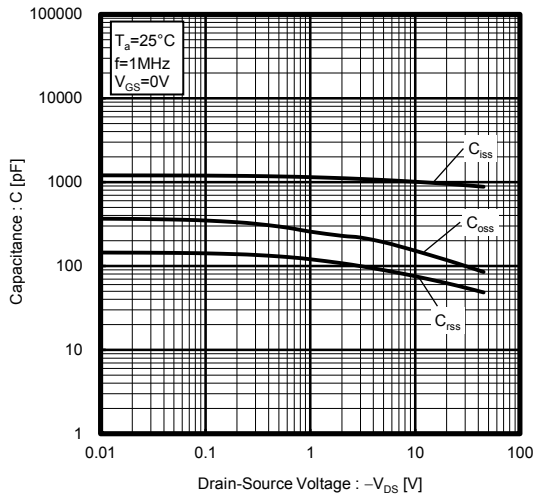


Fig.14 Maximum Safe Operating Area

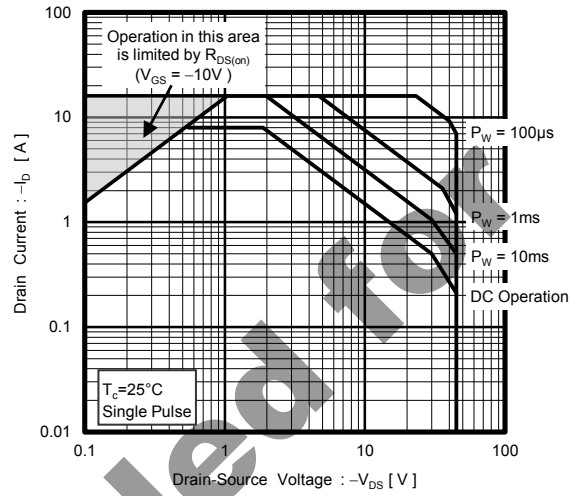
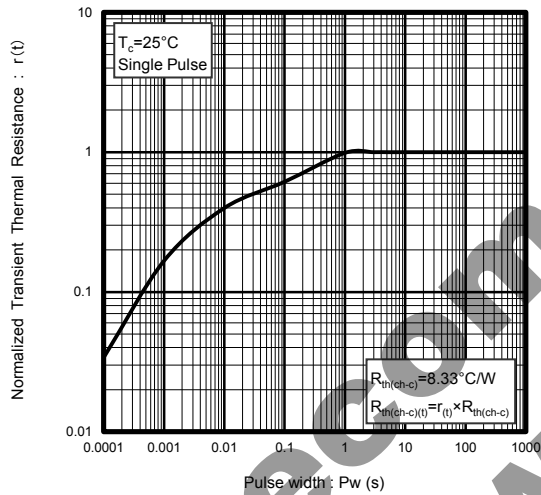


Fig.15 Normalized Transient Thermal Resistance v.s. Pulse Width



Not Recommended for New Designs

● Measurement circuits

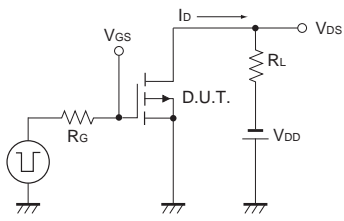


Fig.1-1 Switching Time Measurement Circuit

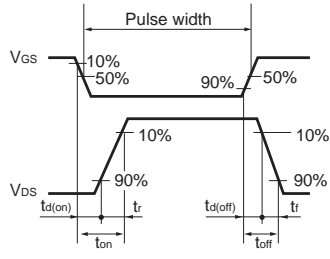


Fig.1-2 Switching Waveforms

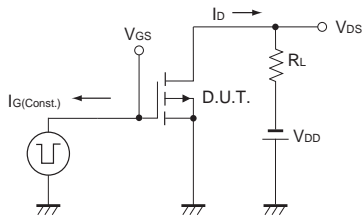


Fig.2-1 Gate Charge Measurement Circuit

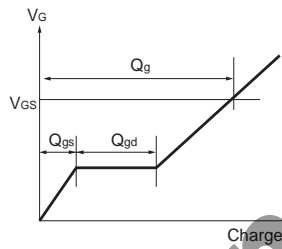


Fig.2-2 Gate Charge Waveform

Not Recommended for New Designs

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