# 4V Drive Nch MOSFET

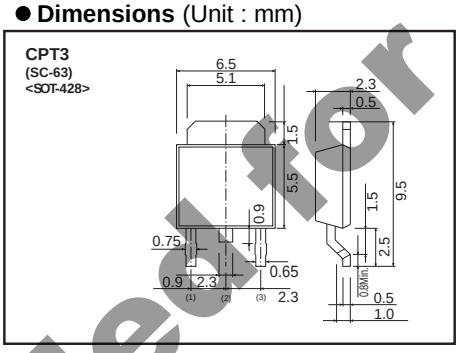
## RSD080N06

### ● Structure
Silicon N-channel MOSFET

### ● Features
1) Low on-resistance.
2) 4V drive.
3) High power package(CPT3).

### ● Application
Switching

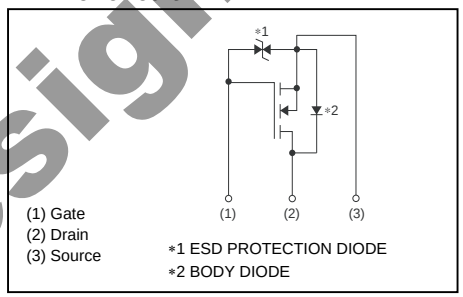
### ● Dimensions (Unit : mm)




### ● Packaging specifications

| | | |
|---|---|---|
| Type | Package | Taping |
| | Code | TL |
| | Basic ordering unit (pieces) | 2500 |
| RSD080N06 | | ○ |

### ● Inner circuit




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

| Parameter | | Symbol | Limits | Unit |
|---|---|---|---|---|
| Drain-source voltage | | $V_{DSS}$ | 60 | V |
| Gate-source voltage | | $V_{GSS}$ | ±20 | V |
| Drain current | Continuous | $I_D$ | ±8 | A |
| | Pulsed | $I_{DP}$ *1 | ±16 | A |
| Source current (Body Diode) | Continuous | $I_S$ | 8 | A |
| | Pulsed | $I_{SP}$ *1 | 16 | A |
| Power dissipation | | $P_D$ *2 | 15 | W |
| Channel temperature | | Tch | 150 | °C |
| Range of storage temperature | | Tstg | −55 to +150 | °C |

*1 Pw≤10μs, Duty cycle≤1%
*2 $T_C$=25°C

### ● Thermal resistance

| Parameter | Symbol | Limits | Unit |
|---|---|---|---|
| Channel to Case | Rth (ch-c)* | 8.33 | °C / W |

* $T_C$=25°C

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

| Parameter | Symbol | Min. | Typ. | Max. | Unit | Conditions |
|---|---|---|---|---|---|---|
| Gate-source leakage | $I_{GSS}$ | - | - | ±10 | μA | $V_{GS}$=±20V, $V_{DS}$=0V |
| Drain-source breakdown voltage | $V_{(BR)DSS}$ | 60 | - | - | V | $I_D$=1mA, $V_{GS}$=0V |
| Zero gate voltage drain current | $I_{DSS}$ | - | - | 1 | μA | $V_{DS}$=60V, $V_{GS}$=0V |
| Gate threshold voltage | $V_{GS\ (th)}$ | 1.0 | - | 2.5 | V | $V_{DS}$=10V, $I_D$=1mA |
| Static drain-source on-state resistance | $R_{DS\ (on)}$ * | - | 57 | 80 | mΩ | $I_D$=8A, $V_{GS}$=10V |
| | | - | 70 | 98 | | $I_D$=8A, $V_{GS}$=4.5V |
| | | - | 78 | 109 | | $I_D$=8A, $V_{GS}$=4.0V |
| Forward transfer admittance | $\|Y_{fs}\|$* | 4.8 | - | - | S | $V_{DS}$=10V, $I_D$=8A |
| Input capacitance | $C_{iss}$ | - | 380 | - | pF | $V_{DS}$=10V |
| Output capacitance | $C_{oss}$ | - | 90 | - | pF | $V_{GS}$=0V |
| Reverse transfer capacitance | $C_{rss}$ | - | 50 | - | pF | f=1MHz |
| Turn-on delay time | $t_{d(on)}$* | - | 9 | - | ns | $V_{DD}$≒30V, $I_D$=4A |
| Rise time | $t_r$ * | - | 13 | - | ns | $V_{GS}$=10V |
| Turn-off delay time | $t_{d(off)}$* | - | 30 | - | ns | $R_L$=7.5Ω |
| Fall time | $t_f$ * | - | 10 | - | ns | $R_G$=10Ω |
| Total gate charge | $Q_g$ * | - | 9.4 | - | nC | $V_{DD}$≒30V, $I_D$=8A |
| Gate-source charge | $Q_{gs}$ * | - | 1.8 | - | nC | $V_{GS}$=10V |
| Gate-drain charge | $Q_{gd}$ * | - | 2.3 | - | nC | |

*Pulsed

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

| Parameter | Symbol | Min. | Typ. | Max. | Unit | Conditions |
|---|---|---|---|---|---|---|
| Forward Voltage | $V_{SD}$ * | - | - | 1.5 | V | $I_s$=8A, $V_{GS}$=0V |

*Pulsed

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## ●Electrical characteristic curves (Ta=25°C)

Fig.1 Typical Output Characteristics ( Ⅰ )

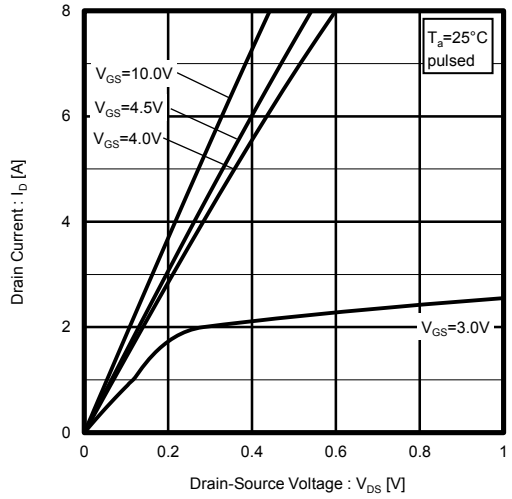



Fig.2 Typical Output Characteristics ( Ⅱ )

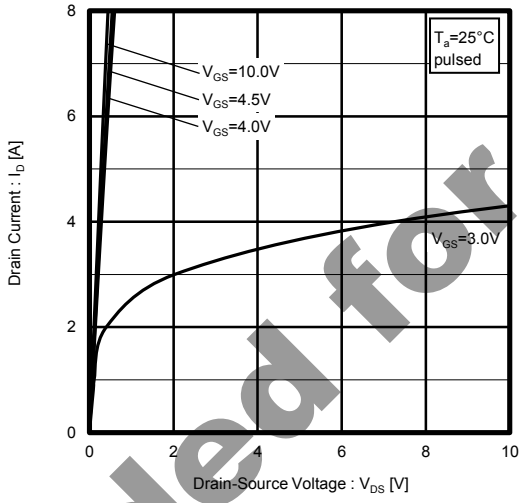



Fig.3 Static Drain-Source On-State Resistance vs. Drain Current

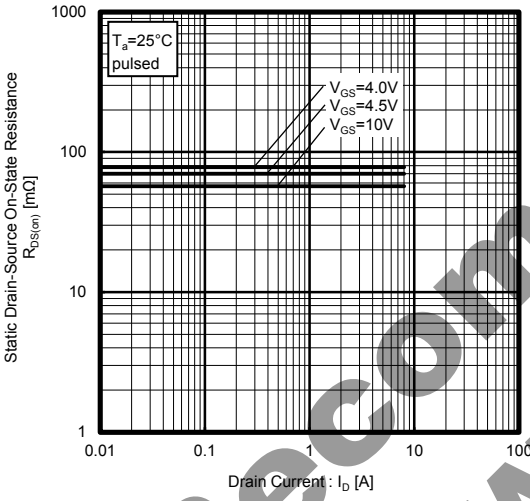



Fig.4 Static Drain-Source On-State Resistance vs. Drain Current

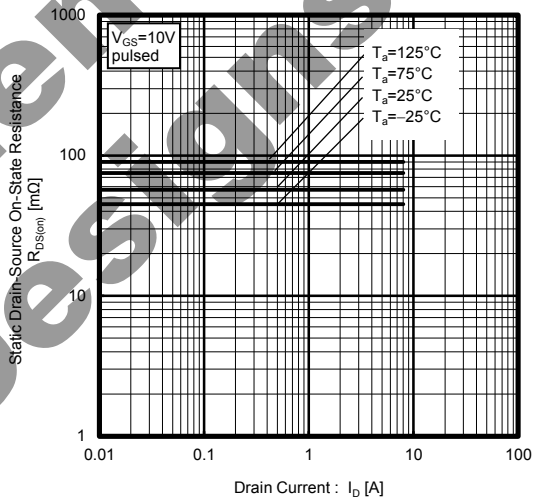



Fig.5 Static Drain-Source On-State Resistance vs. Drain Current

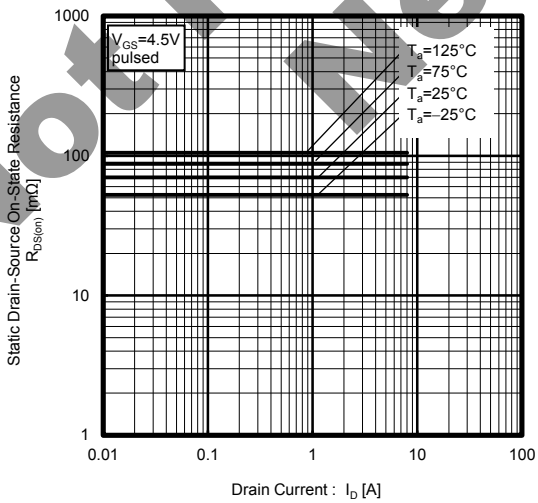
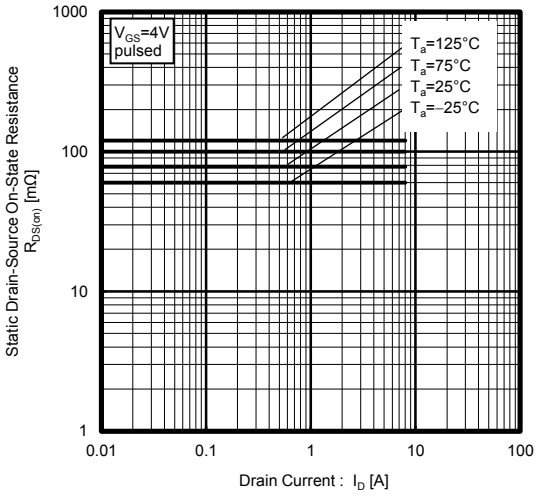



Fig.6 Static Drain-Source On-State Resistance vs. Drain Current




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Fig.7 Forward Transfer Admittance vs. Drain Current

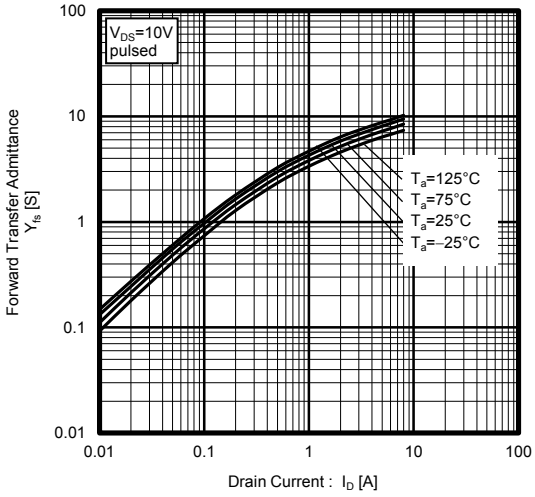



Fig.8 Typical Transfer Characteristics

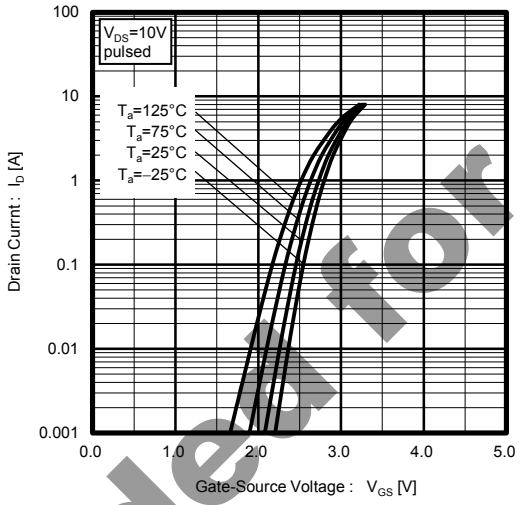



Fig.9 Source Current vs. Source-Drain Voltage

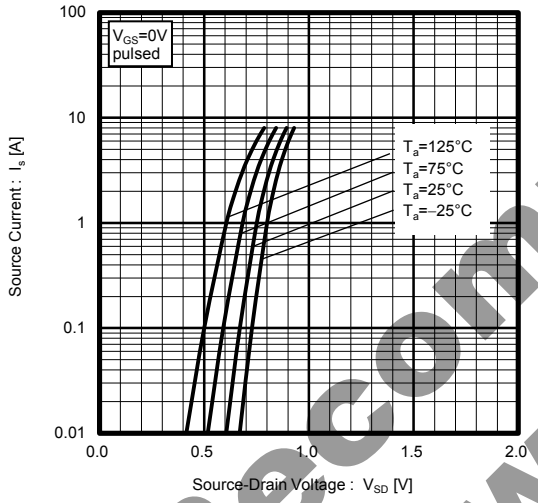



Fig.10 Static Drain-Source On-State Resistance vs. Gate-Source Voltage

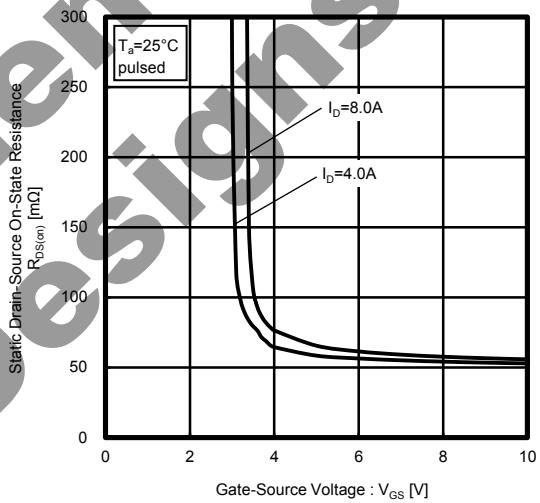



Fig.11 Switching Characteristics

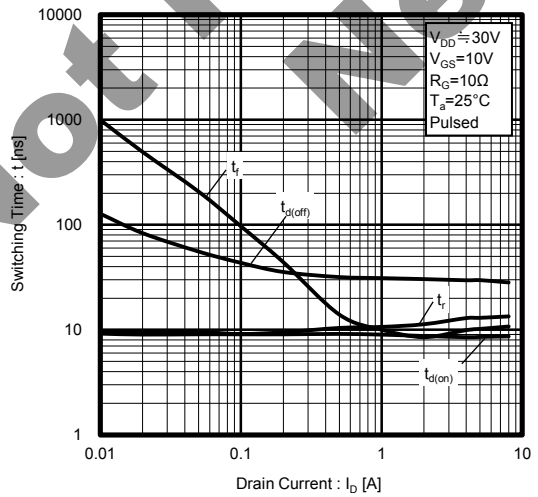
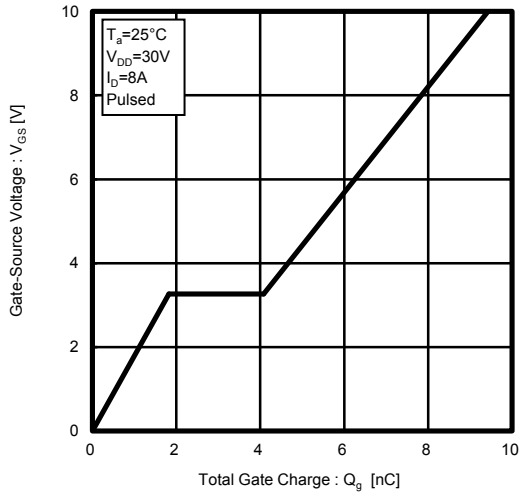



Fig.12 Dynamic Input Characteristics




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Fig.13 Typical Capacitance vs. Drain-Source Voltage

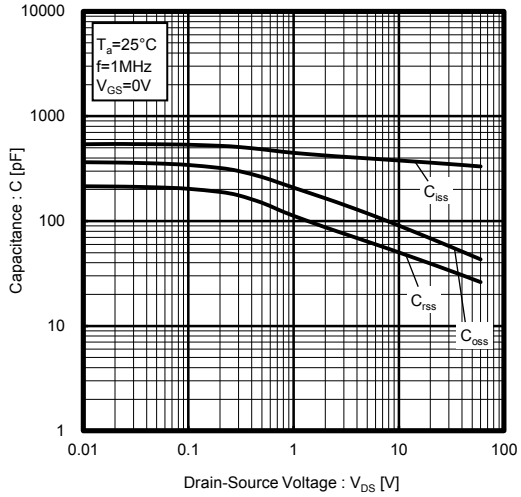



Fig.14 Maximum Safe Operating Area

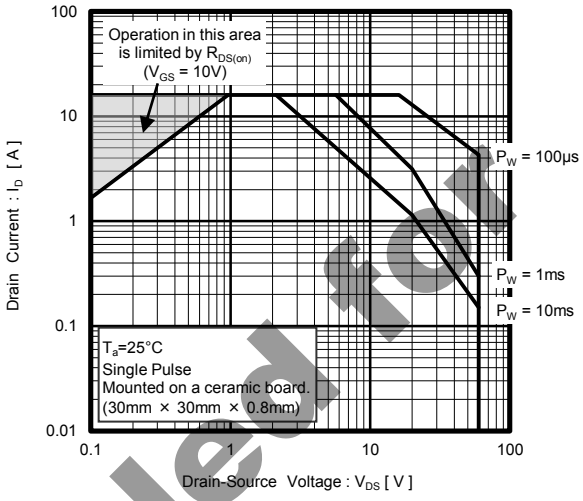
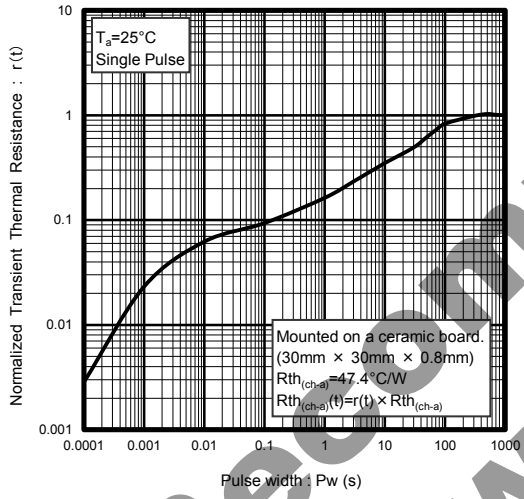



Fig.15 Normalized Transient Thermal Resistance v.s. Pulse Width




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● **Measurement circuits**

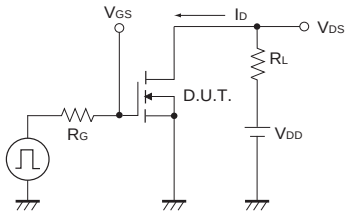



Fig.1-1 Switching Time Measurement Circuit

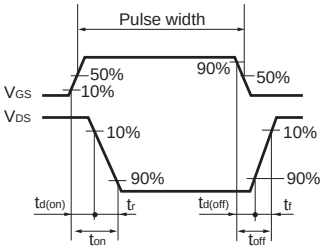



Fig.1-2 Switching Waveforms

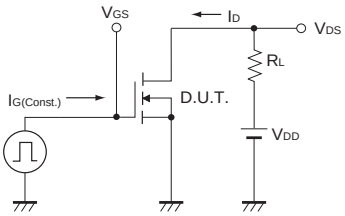



Fig.2-1 Gate Charge Measurement Circuit

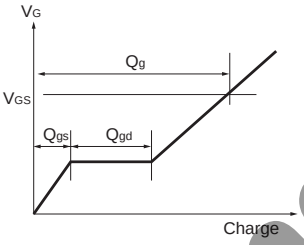



Fig.2-2 Gate Charge Waveform

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