

# 2.5V Drive Nch MOSFET

**RSE002N06**

## ● Structure

Silicon N-channel MOSFET

## ● Features

- 1) High speed switing.
- 2) Small package(EMT3).
- 3) Low voltage drive(2.5V drive).

## ● Application

Switching

## ● Packaging specifications

| Type      | Package                      | Taping |
|-----------|------------------------------|--------|
|           | Code                         | TL     |
|           | Basic ordering unit (pieces) | 3000   |
| RSE002N06 |                              | ○      |

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

| Parameter                    | Symbol     | Limits        | Unit    |
|------------------------------|------------|---------------|---------|
| Drain-source voltage         | $V_{DS}$   | 60            | V       |
| Gate-source voltage          | $V_{GS}$   | ±20           | V       |
| Drain current                | Continuous | $I_D$         | ±250 mA |
|                              | Pulsed     | $I_{DP}^{*1}$ | ±1 A    |
| Source current (Body Diode)  | Continuous | $I_S$         | 125 mA  |
|                              | Pulsed     | $I_{SP}^{*1}$ | 1 A     |
| Power dissipation            | $P_D^{*2}$ | 150           | mW      |
| Channel temperature          | $T_{ch}$   | 150           | °C      |
| Range of storage temperature | $T_{stg}$  | -55 to +150   | °C      |

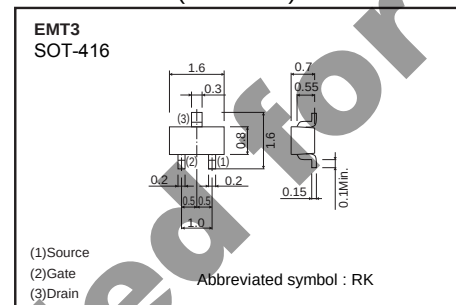
<sup>\*1</sup>  $P_w \leq 10 \mu s$ , Duty cycle  $\leq 1\%$ 
<sup>\*2</sup> Each terminal mounted on a recommended land.

## ● Thermal resistance

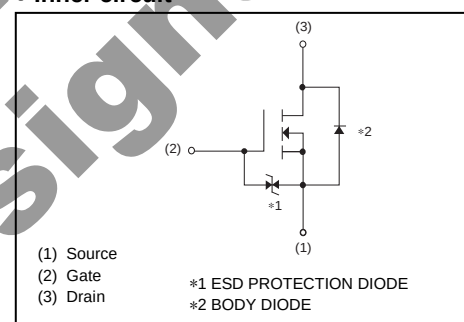
| Parameter          | Symbol           | Limits | Unit   |
|--------------------|------------------|--------|--------|
| Channel to ambient | $R_{th}(ch-a)^*$ | 833    | °C / W |

<sup>\*</sup> Each terminal mounted on a recommended land.

## ● Dimensions (Unit : mm)



## ● Inner circuit



## ●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          | $V_{(BR)DSS}$  | 60   | -    | -        | V        | $I_D = 1mA, V_{GS} = 0V$        |
| Zero gate voltage drain current         | $I_{DSS}$      | -    | -    | 1        | $\mu A$  | $V_{DS} = 60V, V_{GS} = 0V$     |
| Gate threshold voltage                  | $V_{GS(th)}$   | 1.0  | -    | 2.3      | V        | $V_{DS} = 10V, I_D = 1mA$       |
| Static drain-source on-state resistance | $R_{DS(on)}^*$ | -    | 1.7  | 2.4      | $\Omega$ | $I_D = 250mA, V_{GS} = 10V$     |
|                                         |                | -    | 2.1  | 3.0      |          | $I_D = 250mA, V_{GS} = 4.5V$    |
|                                         |                | -    | 2.3  | 3.2      |          | $I_D = 250mA, V_{GS} = 4.0V$    |
|                                         |                | -    | 3.0  | 12.0     |          | $I_D = 10mA, V_{GS} = 2.5V$     |
| Forward transfer admittance             | $ Y_{fs} ^*$   | 0.25 | -    | -        | S        | $I_D = 250mA, V_{DS} = 10V$     |
| Input capacitance                       | $C_{iss}$      | -    | 15   | -        | pF       | $V_{DS} = 25V$                  |
| Output capacitance                      | $C_{oss}$      | -    | 4.5  | -        | pF       | $V_{GS} = 0V$                   |
| Reverse transfer capacitance            | $C_{rss}$      | -    | 2.0  | -        | pF       | $f = 1MHz$                      |
| Turn-on delay time                      | $t_{d(on)}^*$  | -    | 3.5  | -        | ns       | $I_D = 100mA, V_{DS} = 30V$     |
| Rise time                               | $t_r^*$        | -    | 5    | -        | ns       | $V_{GS} = 10V$                  |
| Turn-off delay time                     | $t_{d(off)}^*$ | -    | 18   | -        | ns       | $R_L = 300\Omega$               |
| Fall time                               | $t_f^*$        | -    | 28   | -        | ns       | $R_G = 10\Omega$                |

\*Pulsed

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

| Parameter       | Symbol     | Min. | Typ. | Max. | Unit | Conditions                 |
|-----------------|------------|------|------|------|------|----------------------------|
| Forward voltage | $V_{SD}^*$ | -    | -    | 1.2  | V    | $I_S = 250mA, V_{GS} = 0V$ |

\*Pulsed

## ●Electrical characteristic curves

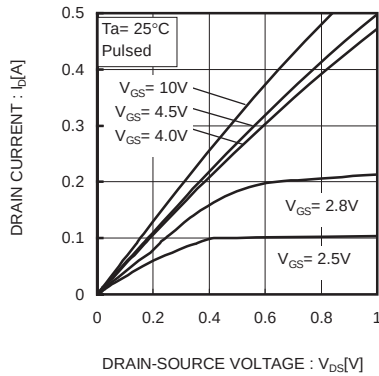


Fig.1 Typical Output Characteristics ( I )

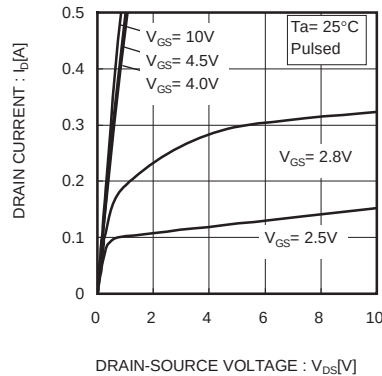


Fig.2 Typical Output Characteristics( II )

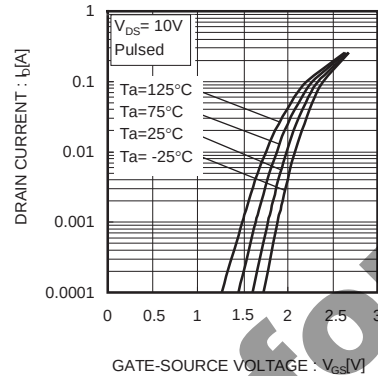


Fig.3 Typical Transfer Characteristics

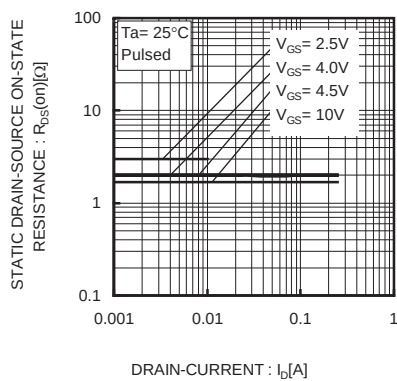


Fig.4 Static Drain-Source On-State Resistance vs. Drain Current( I )

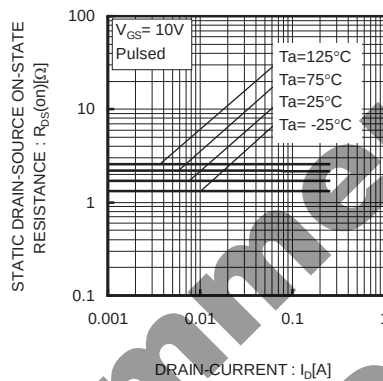


Fig.5 Static Drain-Source On-State Resistance vs. Drain Current( II )

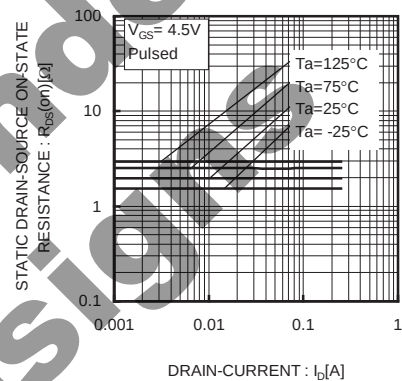


Fig.6 Static Drain-Source On-State Resistance vs. Drain Current( III )

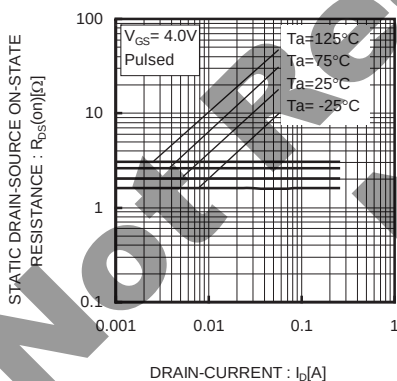


Fig.7 Static Drain-Source On-State Resistance vs. Drain Current( IV )

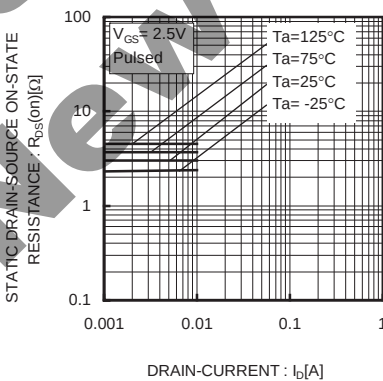


Fig.8 Static Drain-Source On-State Resistance vs. Drain Current( IV )

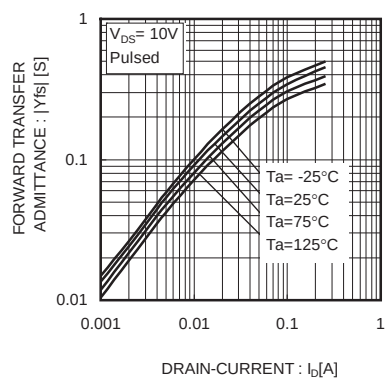


Fig.9 Forward Transfer Admittance vs. Drain Current

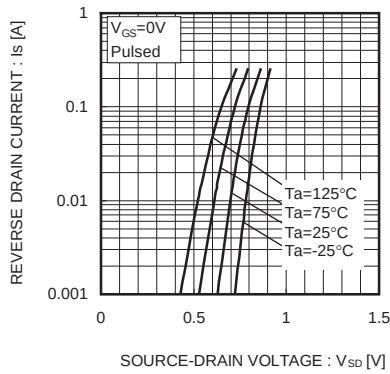


Fig.10 Reverse Drain Current  
vs. Source-Drain Voltage

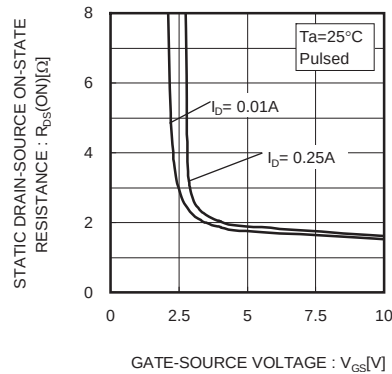


Fig.11 Static Drain-Source On-State  
Resistance vs. Gate Source Voltage

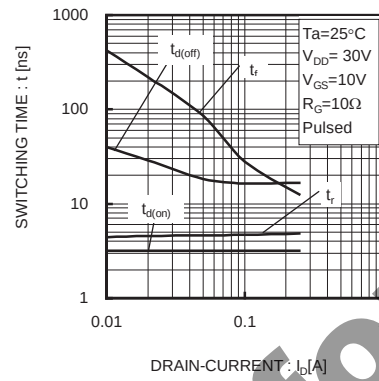


Fig.12 Switching Characteristics

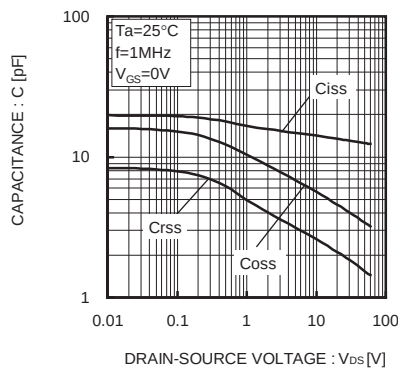


Fig.13 Typical Capacitance  
vs. Drain-Source Voltage

# ●Measurement circuits

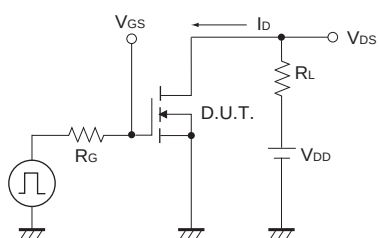


Fig.1-1 Switching time measurement circuit

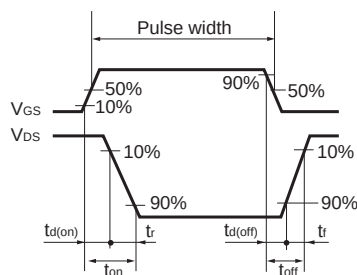


Fig.1-2 Switching waveforms

# ●Notice

This product might cause chip aging and breakdown under the large electrified environment.  
Please consider to design ESD protection circuit.

Not Recommended for New Designs

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