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# Switching (−30V, −7.5A)

## RSS075P03

### ●Features

- 1) Low On-resistance.
- 2) Built-in G-S Protection Diode.
- 3) Small and Surface Mount Package (SOP8).

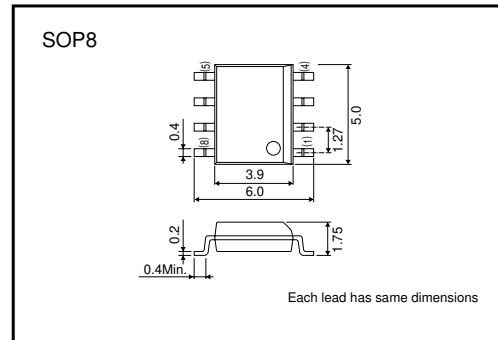
### ●Application

Power switching, DC / DC converter.

### ●Structure

Silicon P-channel  
MOS FET

### ●External dimensions (Unit : mm)



### ●Packaging specifications

| Type      | Package                      | Taping |
|-----------|------------------------------|--------|
|           | Code                         | TB     |
|           | Basic ordering unit (pieces) | 2500   |
| RSS075P03 |                              | ○      |

### ●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 | $I_D$       | ±7.5 A   |
|                              | Pulsed     | $I_{DP}$    | ±30 A *1 |
| Source current (Body diode)  | Continuous | $I_S$       | −1.6 A   |
|                              | Pulsed     | $I_{SP}$    | −30 A *1 |
| Total power dissipation      | $P_D$      | 2.0         | W *2     |
| Channel temperature          | $T_{ch}$   | 150         | °C       |
| Range of Storage temperature | $T_{stg}$  | −55 to +150 | °C       |

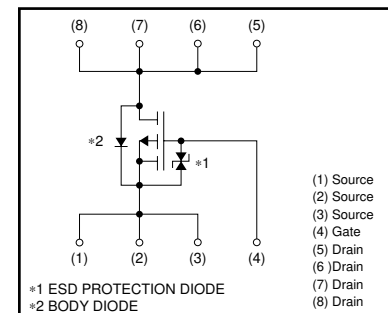
\*1  $P_W \leq 10 \mu s$ , Duty cycle  $\leq 1\%$   
\*2 Mounted on a ceramic board

### ●Thermal resistance (Ta=25°C)

| Parameter          | Symbol         | Limits | Unit     |
|--------------------|----------------|--------|----------|
| Channel to ambient | $R_{th(ch-a)}$ | 62.5   | °C / W * |

\* Mounted on a ceramic board.

### ●Equivalent circuit



## Transistors

## ●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          | $V_{(BR) DSS}$ | –30  | –    | –        | V         | $I_D=-1mA, V_{GS}=0V$       |
| Zero gate voltage drain current         | $I_{DSS}$      | –    | –    | –1       | $\mu A$   | $V_{DS}=-30V, V_{GS}=0V$    |
| Gate threshold voltage                  | $V_{GS(th)}$   | –1.0 | –    | –2.5     | V         | $V_{DS}=-10V, I_D=-1mA$     |
| Static drain-source on-state resistance | $R_{DS(on)}$ * | –    | 15   | 21       | $m\Omega$ | $I_D=-7.5A, V_{GS}=-10V$    |
|   |                | –    | 22   | 31       | $m\Omega$ | $I_D=-4.0A, V_{GS}=-4.5V$   |
|   |                | –    | 25   | 35       | $m\Omega$ | $I_D=-4.0A, V_{GS}=-4.0V$   |
| Forward transfer admittance             | $ Y_{fs} $ *   | 6.0  | –    | –        | S         | $V_{DS}=-10V, I_D=-4.0A$    |
| Input capacitance                       | $C_{iss}$      | –    | 2900 | –        | pF        | $V_{DS}=-10V$               |
| Output capacitance                      | $C_{oss}$      | –    | 540  | –        | pF        | $V_{GS}=0V$                 |
| Reverse transfer capacitance            | $C_{rss}$      | –    | 430  | –        | pF        | $f=1MHz$                    |
| Turn-on delay time                      | $t_{d(on)}$ *  | –    | 20   | –        | ns        | $I_D=-4.0A$                 |
| Rise time                               | $t_r$ *        | –    | 35   | –        | ns        | $V_{DD}=-15V$               |
| Turn-off delay time                     | $t_{d(off)}$ * | –    | 85   | –        | ns        | $V_{GS}=-10V$               |
| Fall time                               | $t_f$ *        | –    | 90   | –        | ns        | $R_L=3.75\Omega$            |
| Total gate charge                       | $Q_g$          | –    | 30   | –        | nC        | $V_{DD}=-15V$               |
| Gate-source charge                      | $Q_{gs}$       | –    | 5.5  | –        | nC        | $V_{GS}=-5V$                |
| Gate-drain charge                       | $Q_{gd}$       | –    | 12   | –        | nC        | $I_D=-7.5A$                 |

\*Pulsed

## Body diode characteristics (source-drain characteristics)

|                 |          |   |   |      |   |                        |
|-----------------|----------|---|---|------|---|------------------------|
| Forward voltage | $V_{SD}$ | – | – | –1.2 | V | $I_S=-1.6A, V_{GS}=0V$ |
|-----------------|----------|---|---|------|---|------------------------|

Transistors

●Electrical characteristic curves

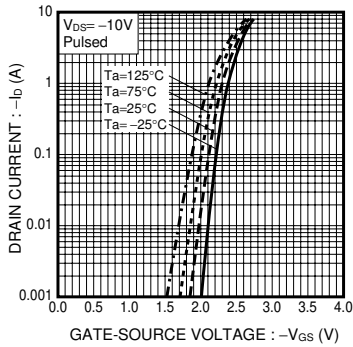


Fig.1 Typical Transfer Characteristics

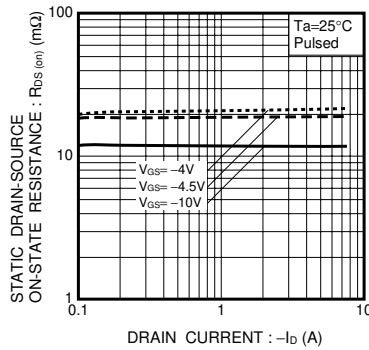


Fig.2 Static Drain-Source On-State Resistance vs. Drain Current

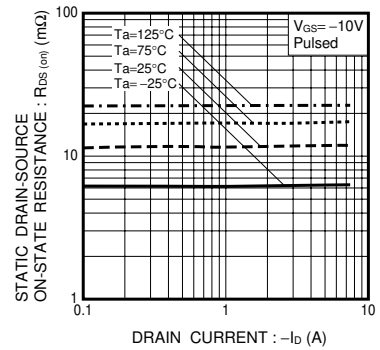


Fig.3 Static Drain-Source On-State Resistance vs. Drain Current

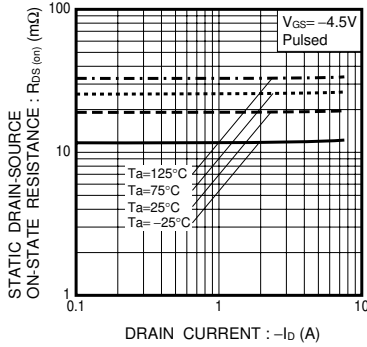


Fig.4 Static Drain-Source On-State vs. Drain Current

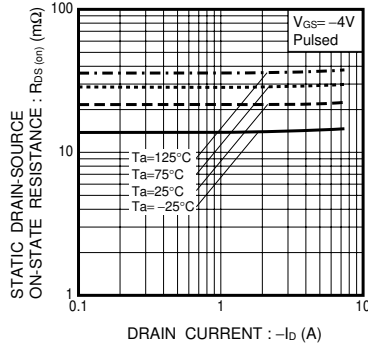


Fig.5 Static Drain-Source On-State vs. Drain Current

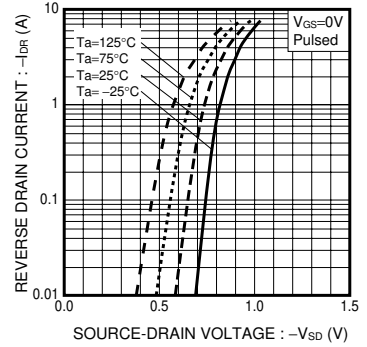


Fig.6 Reverse Drain Current Source-Drain Current

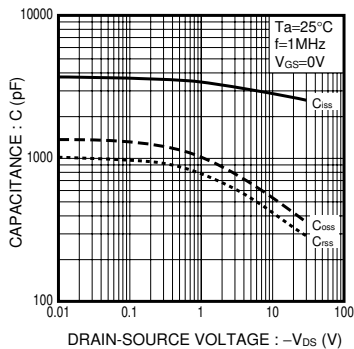


Fig.7 Typical Capacitance vs. Drain-Source Voltage

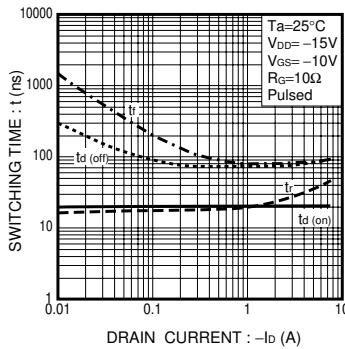


Fig.8 Switching Characteristics

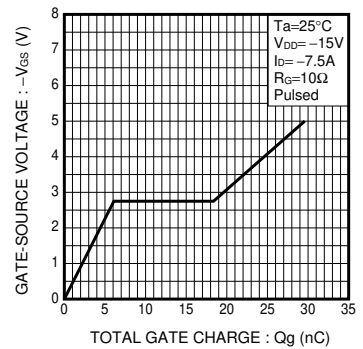


Fig.9 Dynamic Input Characteristics

Transistors

●Measurement circuits

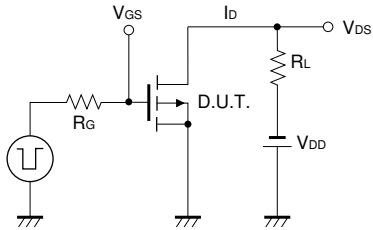


Fig.10 Switching Time Test Circuit

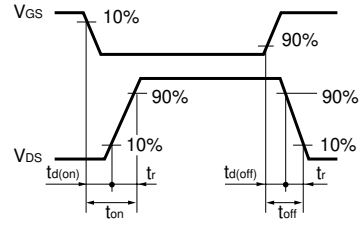


Fig.11 Switching Time Waveforms

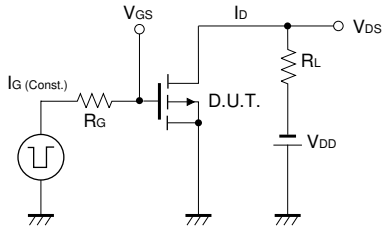


Fig.12 Gate Charge Test Circuit

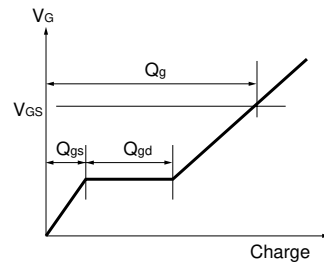


Fig.13 Gate Charge Waveform

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