

# 2.5V Drive Nch MOSFET

## RTL035N03

### ●Structure

Silicon N-channel MOSFET

### ●Features

- 1) Low On-resistance.
- 2) Space saving, small surface mount package (TUMT6).
- 3) Low voltage drive (2.5V drive).

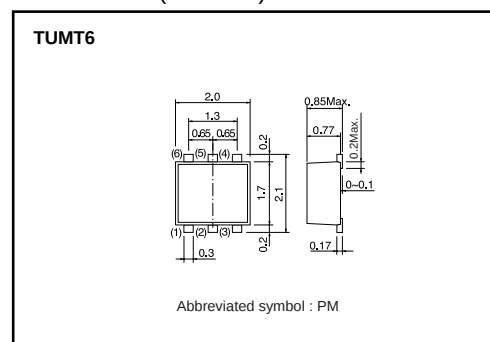
### ●Applications

Switching

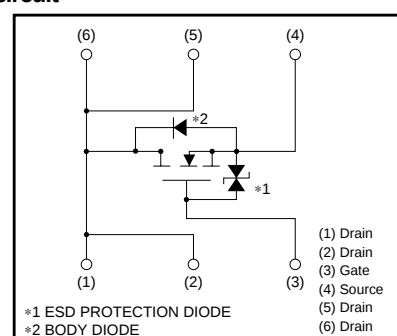
### ●Packaging specifications

| Type      | Package                      | Taping |
|-----------|------------------------------|--------|
|           | Code                         | TR     |
|           | Basic ordering unit (pieces) | 3000   |
| RTL035N03 |                              | ○      |

### ●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            |            | $V_{GS}$    | 12          | V    |
| Drain current                  | Continuous | $I_D$       | $\pm 3.5$   | A    |
|                                | Pulsed     | $I_{DP}$ *1 | $\pm 14$    | A    |
| Source current<br>(Body diode) | Continuous | $I_S$       | 0.8         | A    |
|                                | Pulsed     | $I_{SP}$ *1 | 14          | A    |
| Total power dissipation        |            | $P_D$ *2    | 1.0         | 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 | $R_{th(ch-a)}$ * | 125    | °C/W |

\* Mounted on a ceramic board

## Transistors

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

| Parameter                               | Symbol         | Min. | Typ. | Max. | Unit      | Conditions                       |
|-----------------------------------------|----------------|------|------|------|-----------|----------------------------------|
| Gate-source leakage                     | $I_{GSS}$      | —    | —    | 10   | $\mu A$   | $V_{GS}=12V, V_{DS}=0V$          |
| 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                  | $V_{GS(th)}$   | 0.5  | —    | 1.5  | V         | $V_{DS}=10V, I_D=1mA$            |
| Static drain-source on-state resistance | $R_{DS(on)}^*$ | —    | 40   | 56   | $m\Omega$ | $I_D=3.5A, V_{GS}=4.5V$          |
|                                         |                | —    | 42   | 59   | $m\Omega$ | $I_D=3.5A, V_{GS}=4V$            |
|                                         |                | —    | 56   | 79   | $m\Omega$ | $I_D=3.5A, V_{GS}=2.5V$          |
| Forward transfer admittance             | $ Y_{fs} ^*$   | 3    | —    | —    | S         | $V_{DS}=10V, I_D=3.5A$           |
| Input capacitance                       | $C_{iss}$      | —    | 350  | —    | pF        | $V_{DS}=10V$                     |
| Output capacitance                      | $C_{oss}$      | —    | 90   | —    | pF        | $V_{GS}=0V$                      |
| Reverse transfer capacitance            | $C_{rss}$      | —    | 55   | —    | pF        | $f=1MHz$                         |
| Turn-on delay time                      | $t_{d(on)}^*$  | —    | 9    | —    | ns        | $V_{DD} \doteq 15V$              |
| Rise time                               | $t_r^*$        | —    | 25   | —    | ns        | $I_D=1.75A$                      |
| Turn-off delay time                     | $t_{d(off)}^*$ | —    | 32   | —    | ns        | $V_{GS}=4.5V$                    |
| Fall time                               | $t_f^*$        | —    | 20   | —    | ns        | $R_L=8.6\Omega$                  |
| Total gate charge                       | $Q_g^*$        | —    | 4.6  | 6.4  | nC        | $V_{DD} \doteq 15V, V_{GS}=4.5V$ |
| Gate-source charge                      | $Q_{gs}^*$     | —    | 0.8  | —    | nC        | $I_D=3.5A$                       |
| Gate-drain charge                       | $Q_{gd}^*$     | —    | 1.5  | —    | nC        | $R_L=4.3\Omega, R_G=10\Omega$    |

\*Pulsed

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

| Parameter       | Symbol   | Min. | Typ. | Max. | Unit | Conditions            |
|-----------------|----------|------|------|------|------|-----------------------|
| Forward voltage | $V_{SD}$ | —    | —    | 1.2  | V    | $I_S=0.8A, V_{GS}=0V$ |

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