

Transistors

# 2.5V Drive Nch MOS FET

## RTF025N03

●Structure

Silicon N-channel MOS FET

●Features

- 1) Low On-resistance.
- 2) Space saving—small surface mount package (TUMT3).
- 3) Low voltage drive (2.5V drive).

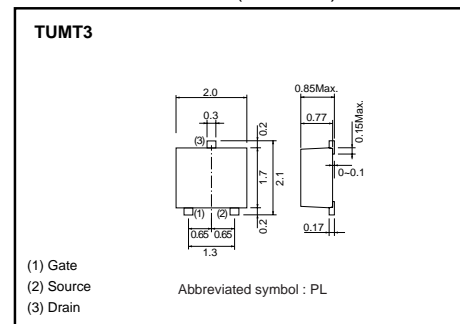
●Applications

Switching

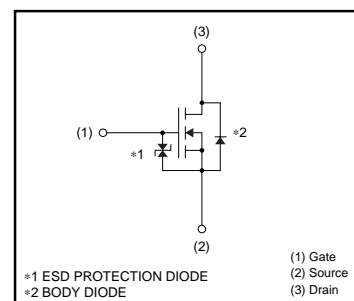
●Packaging specifications

| Type      | Package                      | Taping |
|-----------|------------------------------|--------|
|           | Code                         | TL     |
|           | Basic ordering unit (pieces) | 3000   |
| RTF025N03 |                              | ○      |

●External dimensions (Unit : mm)



●Inner circuit



●Absolute maximum ratings (Ta=25°C)

| Parameter                    | Symbol            | Limits             | Unit |   |
|------------------------------|-------------------|--------------------|------|---|
| Drain-source voltage         | V <sub>DSS</sub>  | 30                 | V    |   |
| Gate-source voltage          | V <sub>GSS</sub>  | 12                 | V    |   |
| Drain current                | Continuous        | I <sub>D</sub>     | ±2.5 | A |
|                              | Pulsed            | I <sub>DP</sub> *1 | ±10  | A |
| Source current (Body diode)  | Continuous        | I <sub>S</sub>     | 0.6  | A |
|                              | Pulsed            | I <sub>SP</sub> *1 | 10   | A |
| Total power dissipation      | P <sub>D</sub> *2 | 0.8                | W    |   |
| Channel temperature          | T <sub>ch</sub>   | 150                | °C   |   |
| Range of storage temperature | T <sub>stg</sub>  | -55 to +150        | °C   |   |

\*1 Pw≤10μs, Duty cycle≤1%

\*2 Mounted on a ceramic board

●Thermal resistance

| Parameter          | Symbol                  | Limits | Unit |
|--------------------|-------------------------|--------|------|
| Channel to ambient | R <sub>th(ch-a)</sub> * | 156    | °C/W |

\* Mounted on a ceramic board

## Transistors

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

| Parameter                               | Symbol                | Min. | Typ. | Max. | Unit | Conditions                                    |
|---|-----------------------|------|------|------|------|---|
| Gate-source leakage                     | I <sub>GSS</sub>      | –    | –    | 10   | μA   | V <sub>GS</sub> =12V, V <sub>DS</sub> =0V     |
| Drain-source breakdown voltage          | V <sub>(BR) DSS</sub> | 30   | –    | –    | V    | I <sub>D</sub> = 1mA, V <sub>GS</sub> =0V     |
| Zero gate voltage drain current         | I <sub>DSS</sub>      | –    | –    | 1    | μA   | V <sub>DS</sub> = 30V, V <sub>GS</sub> =0V    |
| Gate threshold voltage                  | V <sub>GS(th)</sub>   | 0.5  | –    | 1.5  | V    | V <sub>DS</sub> = 10V, I <sub>D</sub> = 1mA   |
| Static drain-source on-state resistance | R <sub>DS(on)</sub> * | –    | 48   | 67   | mΩ   | I <sub>D</sub> = 2.5A, V <sub>GS</sub> = 4.5V |
|   |                       | –    | 50   | 70   | mΩ   | I <sub>D</sub> = 2.5A, V <sub>GS</sub> = 4V   |
|   |                       | –    | 70   | 98   | mΩ   | I <sub>D</sub> = 2.5A, V <sub>GS</sub> = 2.5V |
| Forward transfer admittance             | Y <sub>fs</sub>  *    | 2    | –    | –    | S    | V <sub>DS</sub> = 10V, I <sub>D</sub> = 2.5A  |
| Input capacitance                       | C <sub>iss</sub>      | –    | 270  | –    | pF   | V <sub>DS</sub> = 10V                         |
| Output capacitance                      | C <sub>oss</sub>      | –    | 70   | –    | pF   | V <sub>GS</sub> =0V                           |
| Reverse transfer capacitance            | C <sub>rss</sub>      | –    | 40   | –    | pF   | f=1MHz  |
| Turn-on delay time                      | t <sub>d(on)</sub> *  | –    | 8    | –    | ns   | V <sub>DD</sub> ≐ 15V                         |
| Rise time                               | t <sub>r</sub> *      | –    | 15   | –    | ns   | I <sub>D</sub> = 1.25A                        |
| Turn-off delay time                     | t <sub>d(off)</sub> * | –    | 27   | –    | ns   | V <sub>GS</sub> = 4.5V                        |
| Fall time                               | t <sub>f</sub> *      | –    | 11   | –    | ns   | R <sub>L</sub> =12Ω                           |
| Total gate charge                       | Q <sub>g</sub> *      | –    | 3.7  | 5.2  | nC   | R <sub>G</sub> =10Ω                           |
| Gate-source charge                      | Q <sub>gs</sub> *     | –    | 0.7  | –    | nC   | V <sub>DD</sub> ≐ 15V                         |
| Gate-drain charge                       | Q <sub>gd</sub> *     | –    | 1.2  | –    | nC   | V <sub>GS</sub> = 4.5V                        |
|   |                       |      |      |      |      | I <sub>D</sub> = 2.5A                         |

\*Pulsed

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

| Parameter       | Symbol          | Min. | Typ. | Max. | Unit | Conditions                                 |
|-----------------|-----------------|------|------|------|------|--|
| Forward voltage | V <sub>SD</sub> | –    | –    | 1.2  | V    | I <sub>S</sub> = 0.6A, V <sub>GS</sub> =0V |

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