

# 2.5V Drive Nch MOS FET

## 2SK3019

### ●Structure

Silicon N-channel  
MOSFET

### ●Applications

Interfacing, switching (30V, 100mA)

### ●Features

- 1) Low on-resistance.
- 2) Fast switching speed.
- 3) Low voltage drive (2.5V) makes this device ideal for portable equipment.
- 4) Drive circuits can be simple.
- 5) Parallel use is easy.

### ●Packaging specifications

| Type    | Package                      | Taping |
|---------|------------------------------|--------|
|         | Code                         | TL     |
|         | Basic ordering unit (pieces) | 3000   |
| 2SK3019 |                              | ○      |

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

| Parameter               | Symbol     | Limits        | Unit      |    |
|-------------------------|------------|---------------|-----------|----|
| Drain-source voltage    | $V_{DS}$   | 30            | V         |    |
| Gate-source voltage     | $V_{GS}$   | $\pm 20$      | V         |    |
| Drain current           | Continuous | $I_D$         | $\pm 100$ | mA |
|                         | Pulsed     | $I_{DP}^{*1}$ | $\pm 400$ | mA |
| Total power dissipation | $P_D^{*2}$ | 150           | mW        |    |
| Channel temperature     | $T_{ch}$   | 150           | °C        |    |
| Storage temperature     | $T_{stg}$  | -55 to +150   | °C        |    |

\*1  $P_w \leq 10\mu s$ , Duty cycle  $\leq 50\%$

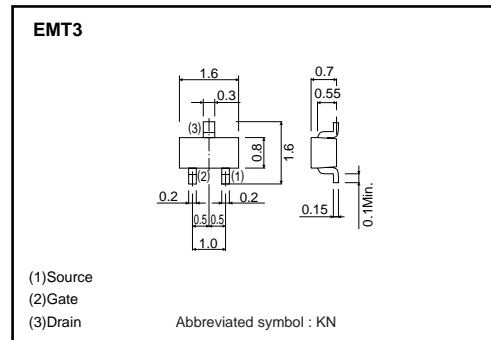
\*2 With each pin mounted on the recommended lands.

### ●Thermal resistance

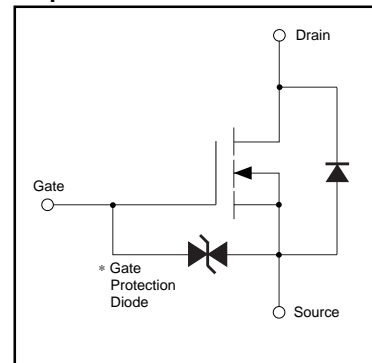
| Parameter          | Symbol           | Limits | Unit   |
|--------------------|------------------|--------|--------|
| Channel to ambient | $R_{th(ch-a)}$ * | 833    | °C / W |

\* With each pin mounted on the recommended lands.

### ●External dimensions (Unit : mm)



### ●Equivalent circuit



\*A protection diode is included between the gate and the source terminals to protect the diode against static electricity when the product is in use. Use a protection circuit when the fixed voltages are exceeded.

Transistor

●Electrical characteristics (Ta=25°C)

| Parameter                               | Symbol               | Min. | Typ. | Max. | Unit | Conditions                                 |
|---|----------------------|------|------|------|------|--|
| Gate-source leakage                     | I <sub>GSS</sub>     | -    | -    | ±1   | μA   | V <sub>GS</sub> =±20V, V <sub>DS</sub> =0V |
| Drain-source breakdown voltage          | V <sub>(BR)DSS</sub> | 30   | -    | -    | V    | I <sub>D</sub> =10μA, V <sub>GS</sub> =0V  |
| Zero gate voltage drain current         | I <sub>DSS</sub>     | -    | -    | 1.0  | μA   | V <sub>DS</sub> =30V, V <sub>GS</sub> =0V  |
| Gate threshold voltage                  | V <sub>GS(th)</sub>  | 0.8  | -    | 1.5  | V    | V <sub>DS</sub> =3V, I <sub>D</sub> =100μA |
| Static drain-source on-state resistance | R <sub>DS(on)</sub>  | -    | 5    | 8    | Ω    | I <sub>D</sub> =10mA, V <sub>GS</sub> =4V  |
|   | R <sub>DS(on)</sub>  | -    | 7    | 13   | Ω    | I <sub>D</sub> =1mA, V <sub>GS</sub> =2.5V |
| Forward transfer admittance             | Y <sub>fs</sub>      | 20   | -    | -    | ms   | I <sub>D</sub> =10mA, V <sub>DS</sub> =3V  |
| Input capacitance                       | C <sub>iss</sub>     | -    | 13   | -    | pF   | V <sub>DS</sub> =5V                        |
| Output capacitance                      | C <sub>oss</sub>     | -    | 9    | -    | pF   | V <sub>GS</sub> =0V                        |
| Reverse transfer capacitance            | C <sub>rss</sub>     | -    | 4    | -    | pF   | f=1MHz                                     |
| Turn-on delay time                      | t <sub>d(on)</sub>   | -    | 15   | -    | ns   | I <sub>D</sub> =10mA, V <sub>DD</sub> ≐ 5V |
| Rise time                               | t <sub>r</sub>       | -    | 35   | -    | ns   | V <sub>GS</sub> =5V                        |
| Turn-off delay time                     | t <sub>d(off)</sub>  | -    | 80   | -    | ns   | R <sub>L</sub> =500Ω                       |
| Fall time                               | t <sub>f</sub>       | -    | 80   | -    | ns   | R <sub>G</sub> =10Ω                        |

●Electrical characteristic curves

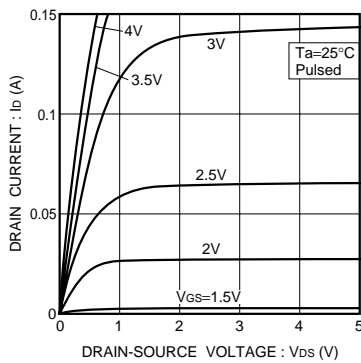


Fig.1 Typical output characteristics

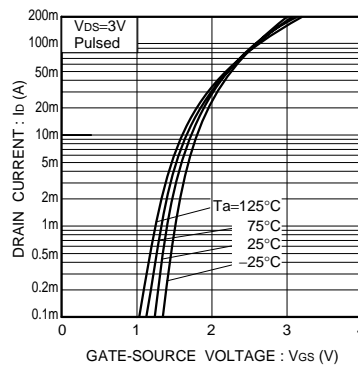


Fig.2 Typical transfer characteristics

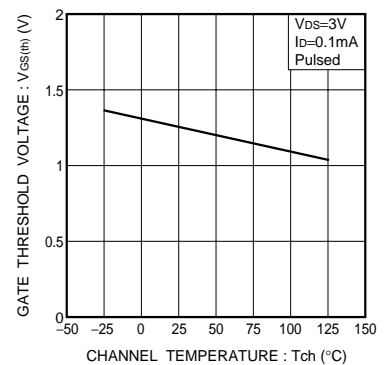


Fig.3 Gate threshold voltage vs. channel temperature

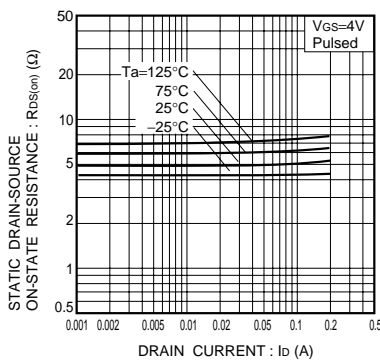


Fig.4 Static drain-source on-state resistance vs. drain current (I)

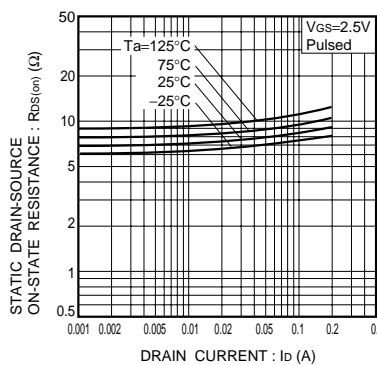


Fig.5 Static drain-source on-state resistance vs. drain current (II)

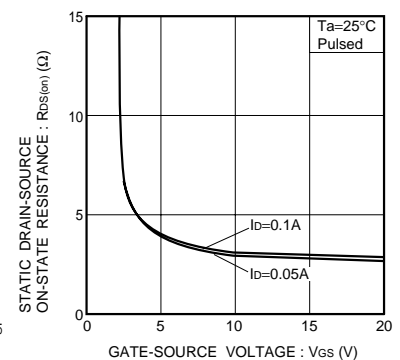


Fig.6 Static drain-source on-state resistance vs. gate-source voltage

Transistor

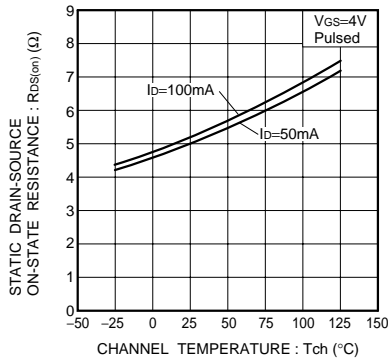


Fig.7 Static drain-source on-state resistance vs. channel temperature

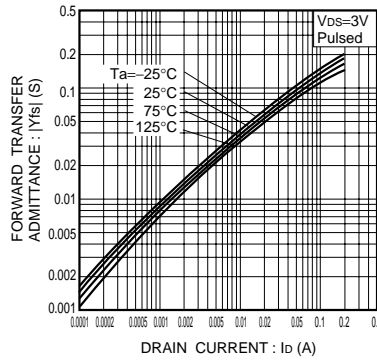


Fig.8 Forward transfer admittance vs. drain current

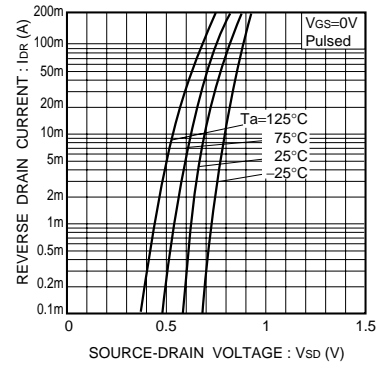


Fig.9 Reverse drain current vs. source-drain voltage (I)

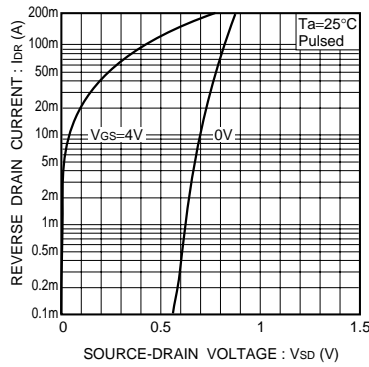


Fig.10 Reverse drain current vs. source-drain voltage (II)

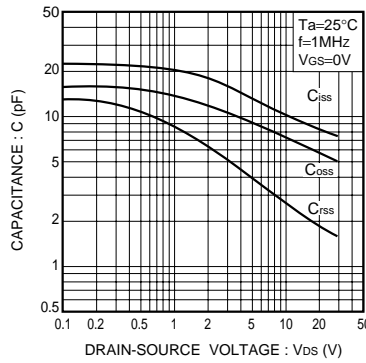


Fig.11 Typical capacitance vs. drain-source voltage

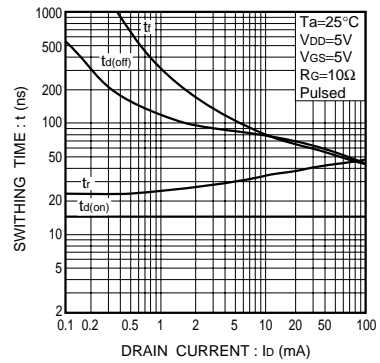


Fig.12 Switching characteristics (See Figures 13 and 14 for the measurement circuit and resultant waveforms)

●Switching characteristics measurement circuit

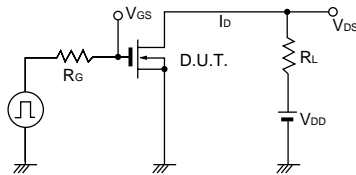


Fig.13 Switching time measurement circuit

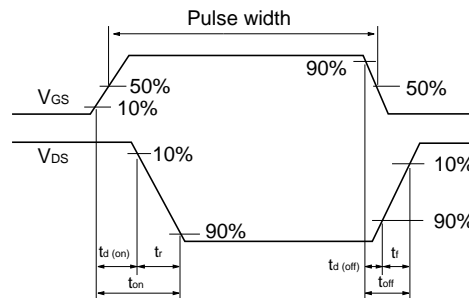


Fig.14 Switching time waveforms

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