

# 2.5V Drive Nch MOS FET

## 2SK3018

### ●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                         | T106   |
|         | Basic ordering unit (pieces) | 3000   |
| 2SK3018 |                              | ○      |

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

| Parameter               | Symbol     | Limits        | Unit    |
|-------------------------|------------|---------------|---------|
| Drain-source voltage    | $V_{DS}$   | 30            | V       |
| Gate-source voltage     | $V_{GS}$   | ±20           | V       |
| Drain current           | Continuous | $I_D$         | ±100 mA |
|                         | Pulsed     | $I_{DP}^{*1}$ | ±400 mA |
| Total power dissipation | $P_D^{*2}$ | 200           | mW      |
| Channel temperature     | $T_{ch}$   | 150           | °C      |
| Storage temperature     | $T_{stg}$  | -55 to +150   | °C      |

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

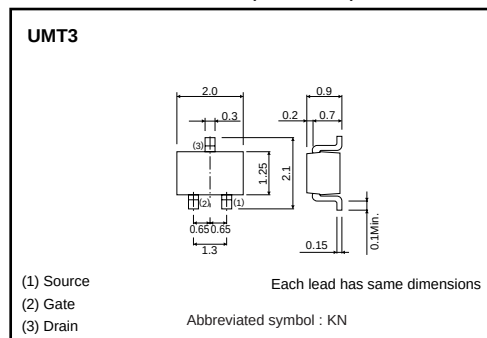
\*2 With each pin mounted on the recommended lands.

### ●Thermal resistance

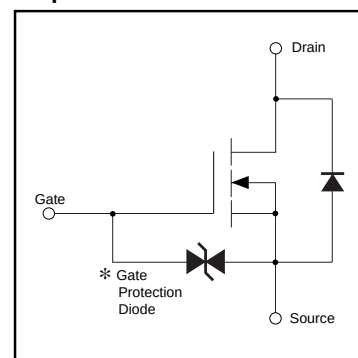
| Parameter          | Symbol           | Limits | Unit   |
|--------------------|------------------|--------|--------|
| Channel to ambient | $R_{th(ch-a)}^*$ | 625    | °C / W |

\* 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                     | $I_{GSS}$     | —    | —    | $\pm 1$ | $\mu A$  | $V_{GS} = \pm 20V, V_{DS} = 0V$ |
| Drain-source breakdown voltage          | $V_{(BR)DSS}$ | 30   | —    | —       | V        | $I_D = 10\mu A, V_{GS} = 0V$    |
| Zero gate voltage drain current         | $I_{DSS}$     | —    | —    | 1       | $\mu A$  | $V_{DS} = 30V, V_{GS} = 0V$     |
| Gate threshold voltage                  | $V_{GS(th)}$  | 0.8  | —    | 1.5     | V        | $V_{DS} = 3V, I_D = 100\mu A$   |
| Static drain-source on-state resistance | $R_{DS(on)}$  | —    | 5    | 8       | $\Omega$ | $I_D = 10mA, V_{GS} = 4V$       |
|                                         | $R_{DS(on)}$  | —    | 7    | 13      | $\Omega$ | $I_D = 1mA, V_{GS} = 2.5V$      |
| Forward transfer admittance             | $ Y_{fs} $    | 20   | —    | —       | mS       | $V_{DS} = 3V, I_D = 10mA$       |
| Input capacitance                       | $C_{iss}$     | —    | 13   | —       | pF       | $V_{DS} = 5V$                   |
| Output capacitance                      | $C_{oss}$     | —    | 9    | —       | pF       | $V_{GS} = 0V$                   |
| Reverse transfer capacitance            | $C_{rss}$     | —    | 4    | —       | pF       | $f = 1MHz$                      |
| Turn-on delay time                      | $t_{d(on)}$   | —    | 15   | —       | ns       | $I_D = 10mA, V_{DD} \div 5V$    |
| Rise time                               | $t_r$         | —    | 35   | —       | ns       | $V_{GS} = 5V$                   |
| Turn-off delay time                     | $t_{d(off)}$  | —    | 80   | —       | ns       | $R_L = 500\Omega$               |
| Fall time                               | $t_f$         | —    | 80   | —       | ns       | $R_G = 10\Omega$                |

## ●Electrical characteristic curves

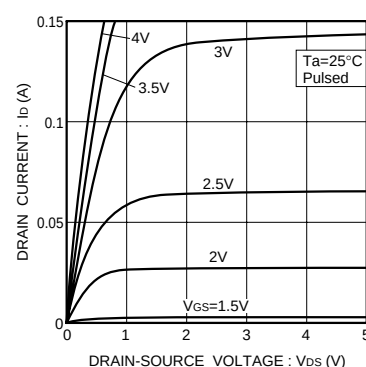


Fig.1 Typical output characteristics

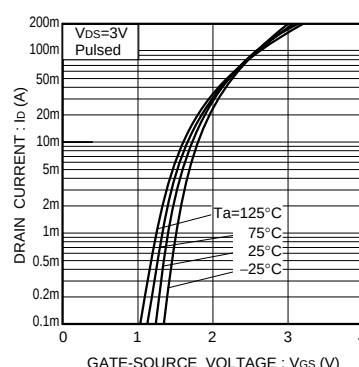


Fig.2 Typical transfer characteristics

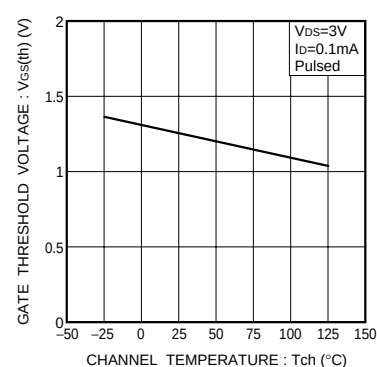


Fig.3 Gate threshold voltage vs. channel temperature

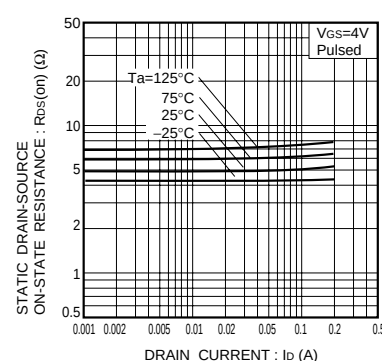


Fig.4 Static drain-source on-state resistance vs. drain current (I)

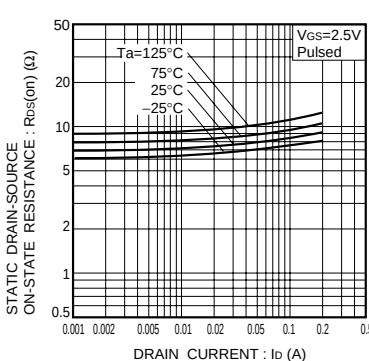


Fig.5 Static drain-source on-state resistance vs. drain current (II)

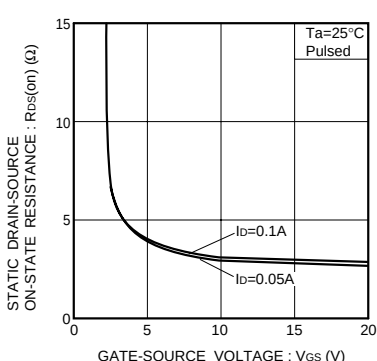


Fig.6 Static drain-source on-state resistance vs. gate-source voltage

## Transistor

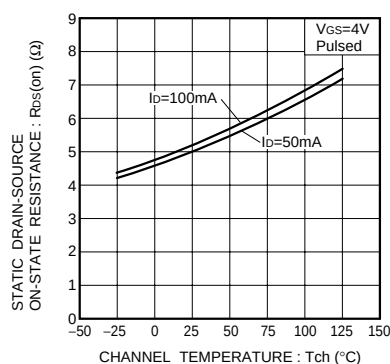


Fig.7 Static drain-source on-state resistance vs. channel temperature

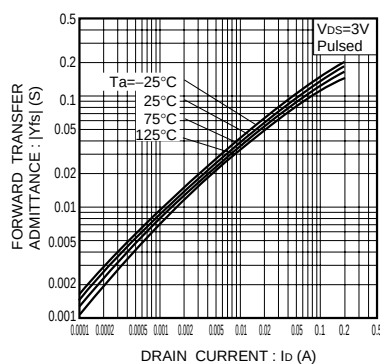


Fig.8 Forward transfer admittance vs. drain current

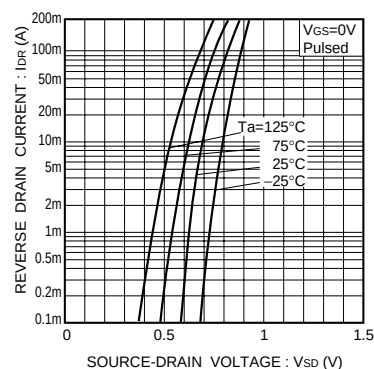


Fig.9 Reverse drain current vs. source-drain voltage (I)

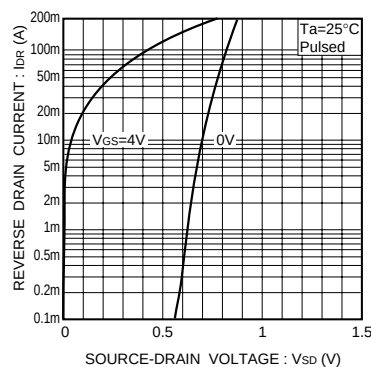


Fig.10 Reverse drain current vs. source-drain voltage (II)

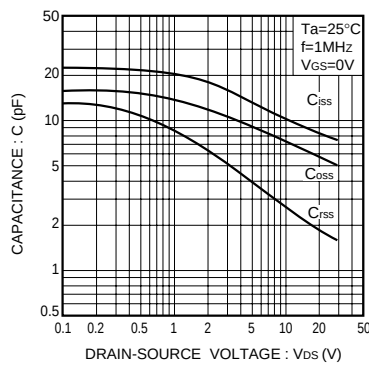


Fig.11 Typical capacitance vs. drain-source voltage

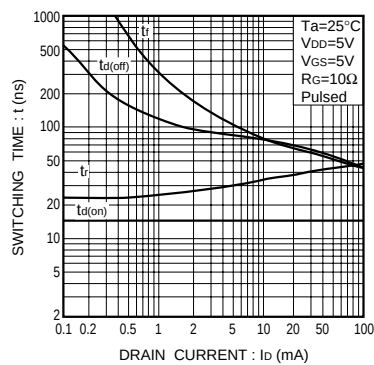


Fig.12 Switching characteristics  
(See Figures 13 and 14 for the measurement circuit and resultant waveforms)

### ●Switching characteristics measurement circuit

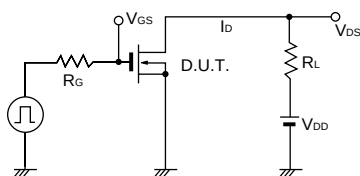


Fig.13 Switching time measurement circuit

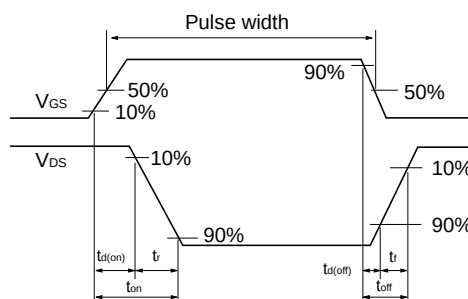


Fig.14 Switching time waveforms

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