

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_{DSS} | 30 | V | |
| Gate-source voltage | V_{GSS} | ±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 $\leq 1\%$

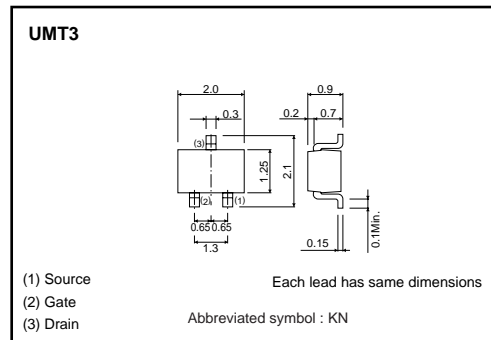
*2 With each pin mounted on the recommended lands.

●Thermal resistance

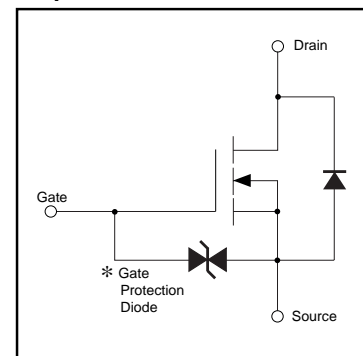
| Parameter | Symbol | Limits | Unit |
|--------------------|------------------|--------|--------|
| Channel to ambient | $R_{th(ch-a)}^*$ | 625 | °C / W |

* 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} | - | - | ±1 | μA | V _{GS} = ±20V, V _{DS} = 0V |
| Drain-source breakdown voltage | V _{(BR)DSS} | 30 | - | - | V | I _D = 10μA, V _{GS} = 0V |
| Zero gate voltage drain current | I _{DSS} | - | - | 1 | μA | V _{DS} = 30V, V _{GS} = 0V |
| Gate threshold voltage | V _{GS(th)} | 0.8 | - | 1.5 | V | V _{DS} = 3V, I _D = 100μA |
| Static drain-source on-state resistance | R _{DS(on)} | - | 5 | 8 | Ω | I _D = 10mA, V _{GS} = 4V |
| | R _{DS(on)} | - | 7 | 13 | Ω | 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} ≐ 5V |
| Rise time | t _r | - | 35 | - | ns | V _{GS} = 5V |
| Turn-off delay time | t _{d(off)} | - | 80 | - | ns | R _L = 500Ω |
| Fall time | t _f | - | 80 | - | ns | R _G = 10Ω |

●Electrical characteristic curves

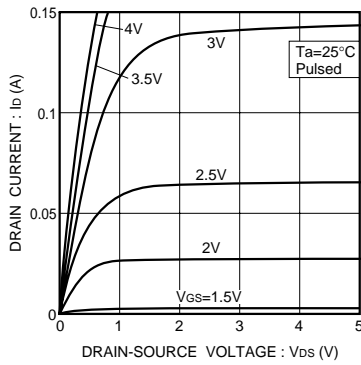


Fig.1 Typical output characteristics

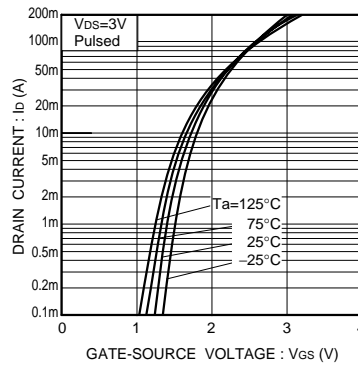


Fig.2 Typical transfer characteristics

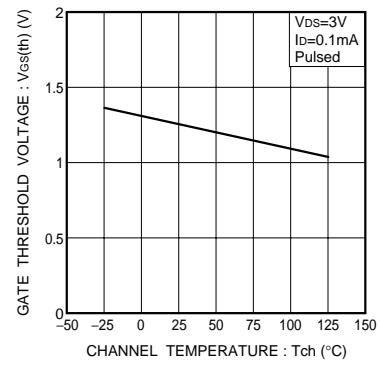


Fig.3 Gate threshold voltage vs. channel temperature

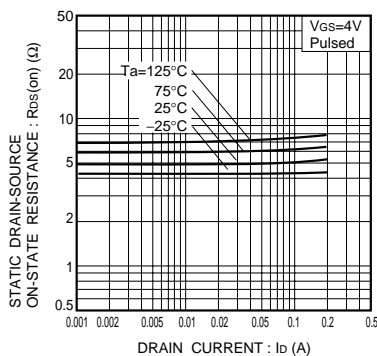


Fig.4 Static drain-source on-state resistance vs. drain current (I)

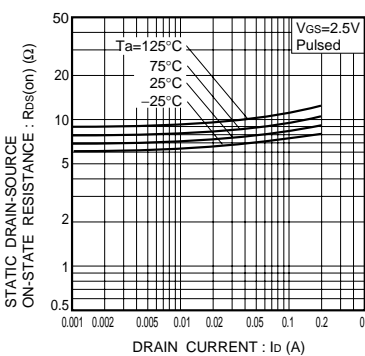


Fig.5 Static drain-source on-state resistance vs. drain current (II)

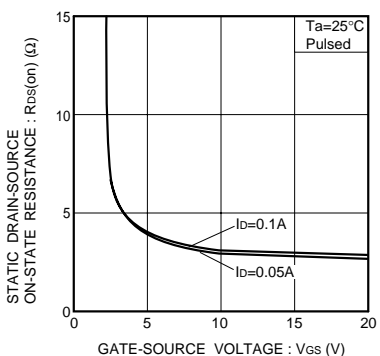


Fig.6 Static drain-source on-state resistance vs. gate-source voltage

Transistor

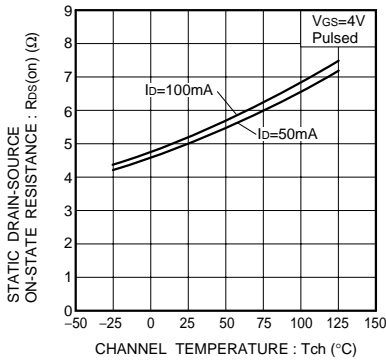


Fig.7 Static drain-source on-state resistance vs. channel temperature

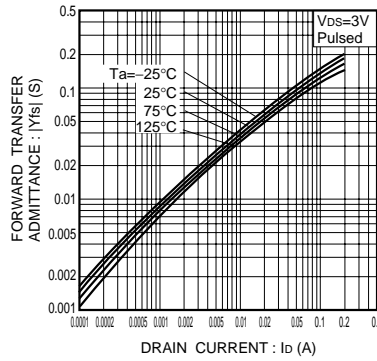


Fig.8 Forward transfer admittance vs. drain current

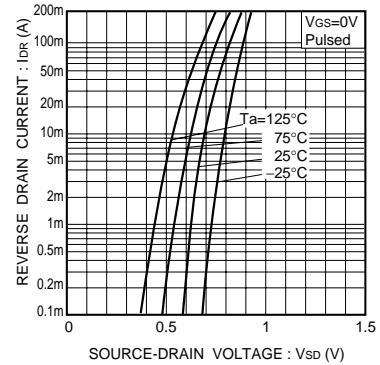


Fig.9 Reverse drain current vs. source-drain voltage (I)

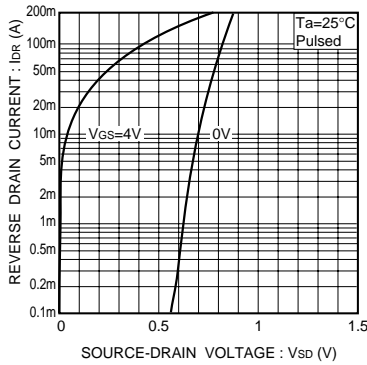


Fig.10 Reverse drain current vs. source-drain voltage (II)

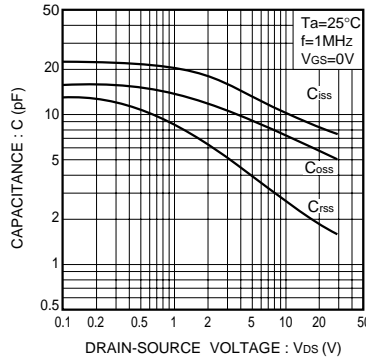


Fig.11 Typical capacitance vs. drain-source voltage

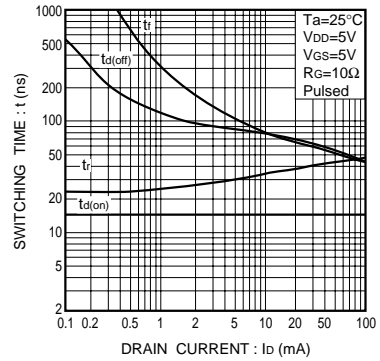


Fig.12 Switching characteristics (See Figures 13 and 14 for the measurement circuit and resultant waveforms)

●Switching characteristics measurement circuit

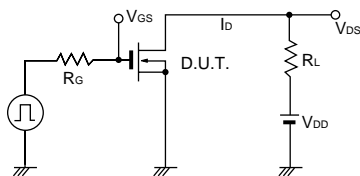


Fig.13 Switching time measurement circuit

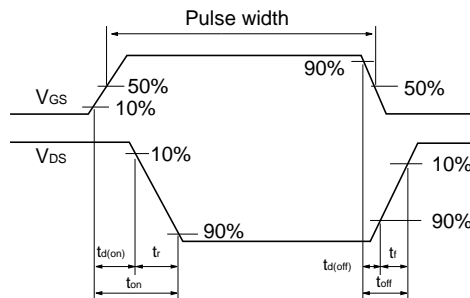


Fig.14 Switching time waveforms

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