

Transistor

# 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		○

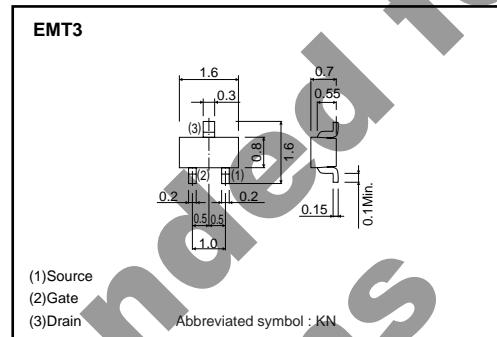
### ●Absolute maximum ratings (Ta=25°C)

Parameter	Symbol	Limits	Unit
Drain-source voltage	V <sub>DSS</sub>	30	V
Gate-source voltage	V <sub>GSS</sub>	±20	V
Drain current	Continuous	I <sub>D</sub>	mA
	Pulsed	I <sub>DP</sub> <sup>*1</sup>	mA
Total power dissipation	P <sub>D</sub> <sup>*2</sup>	150	mW
Channel temperature	T <sub>ch</sub>	150	°C
Storage temperature	T <sub>stg</sub>	-55 to +150	°C

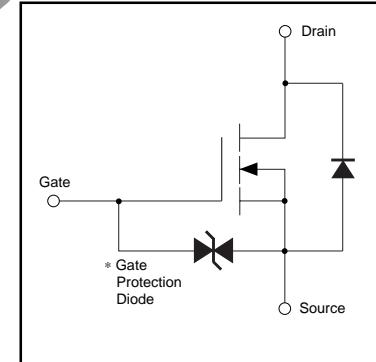
\*1 P<sub>W</sub>≤10μs, Duty cycle≤1%

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

### ●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.

### ●Thermal resistance

Parameter	Symbol	Limits	Unit
Channel to ambient	R <sub>th(ch-a)</sub> <sup>*</sup>	833	°C / W

\* With each pin mounted on the recommended lands.

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●Electrical characteristics ( $T_a=25^\circ C$ )

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Gate-source leakage	$I_{GS}$	—	—	$\pm 1$	$\mu A$	$V_{GS}=\pm 20V, V_{DS}=0V$
Drain-source breakdown voltage	$V_{(BR)DSS}$	30	—	—	V	$I_D=10\mu A, V_{GS}=0V$
Zero gate voltage drain current	$I_{DSS}$	—	—	1.0	$\mu A$	$V_{DS}=30V, V_{GS}=0V$
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	$I_D=10mA, V_{DS}=3V$
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	$R_L=500\Omega$
Fall time	$t_f$	—	80	—	ns	$R_G=10\Omega$

## ●Electrical characteristic curves

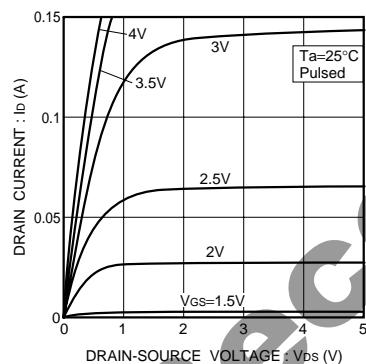


Fig.1 Typical output characteristics

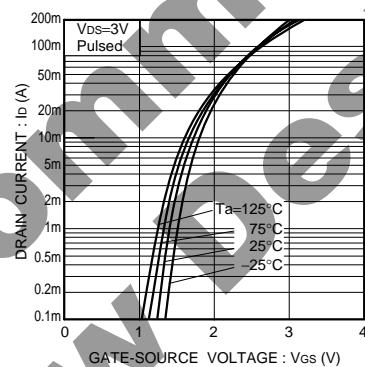


Fig.2 Typical transfer characteristics

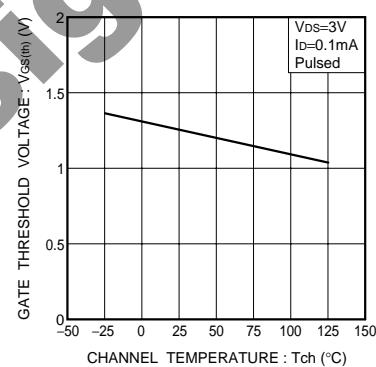


Fig.3 Gate threshold voltage vs. channel temperature

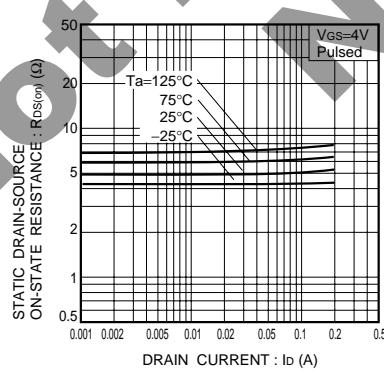


Fig.4 Static drain-source on-state resistance vs. drain current (I)

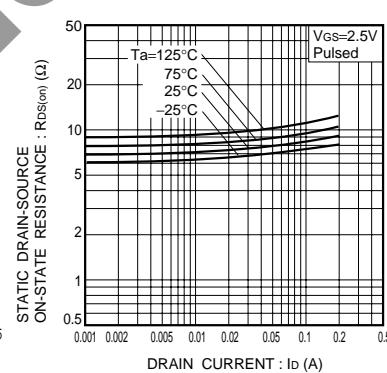


Fig.5 Static drain-source on-state resistance vs. drain current (II)

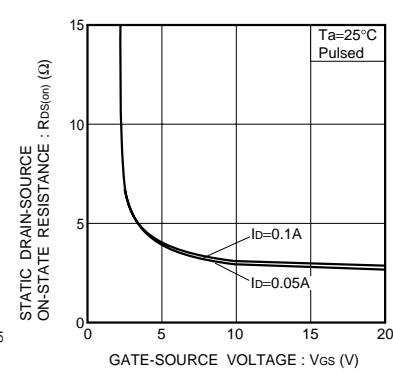


Fig.6 Static drain-source on-state resistance vs. gate-source voltage

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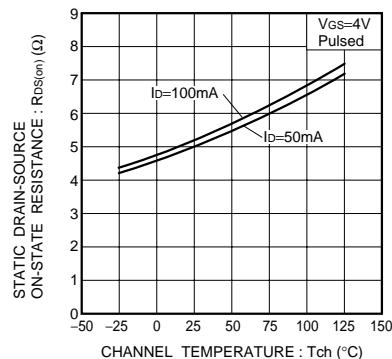


Fig.7 Static drain-source on-state resistance vs. channel temperature

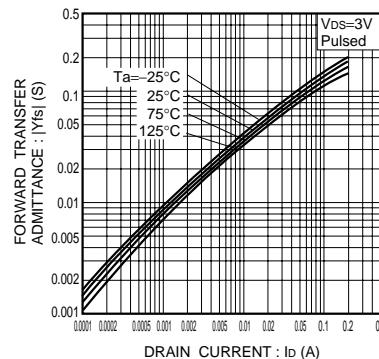


Fig.8 Forward transfer admittance vs. drain current

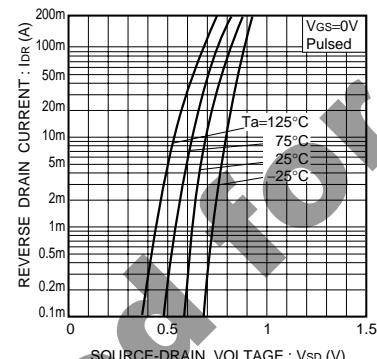


Fig.9 Reverse drain current vs. source-drain voltage (I)

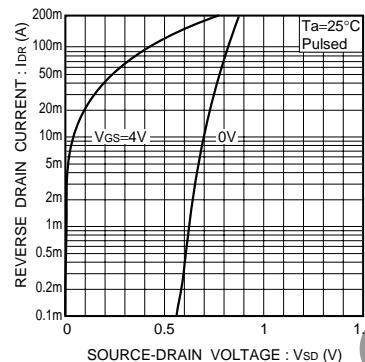


Fig.10 Reverse drain current vs. source-drain voltage (II)

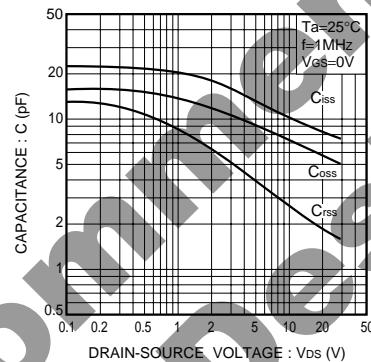
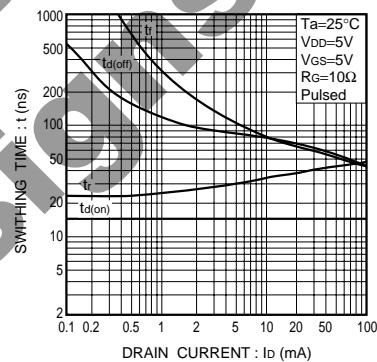


Fig.11 Typical capacitance vs. drain-source voltage

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

## ●Switching characteristics measurement circuit

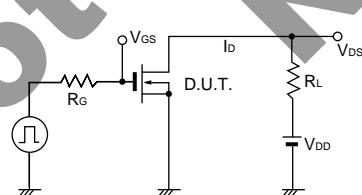


Fig.13 Switching time measurement circuit

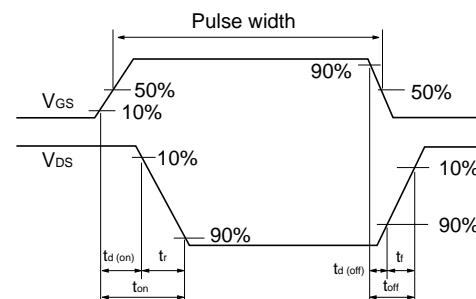


Fig.14 Switching time waveforms

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