

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}	± 20	V
Drain current	Continuous	I_D	± 100 mA
	Pulsed	I_{DP}^{*1}	± 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 $\leq 1\%$

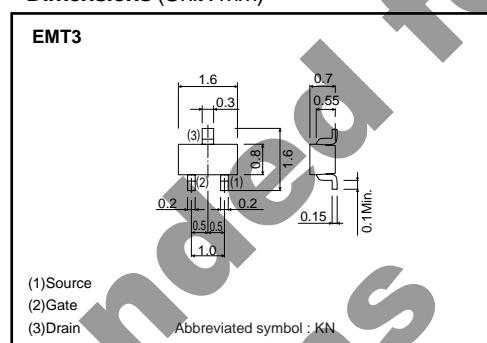
*2 With each pin mounted on the recommended lands.

●Thermal resistance

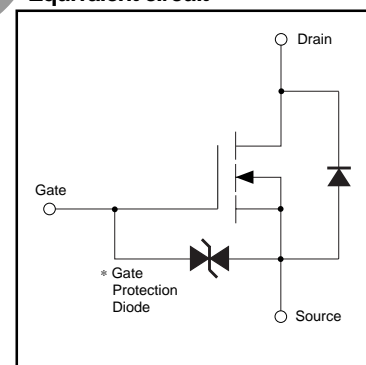
Parameter	Symbol	Limits	Unit
Channel to ambient	$R_{th(ch-a)}^{*}$	833	°C / W

* With each pin mounted on the recommended lands.

●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	$V_{GS}=\pm 20V$, $V_{DS}=0V$
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	μA	$V_{DS}=30V$, $V_{GS}=0V$
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	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	$I_D=10mA$, $V_{DS}=3V$
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

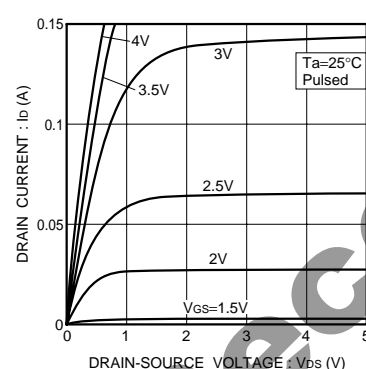


Fig.1 Typical output characteristics

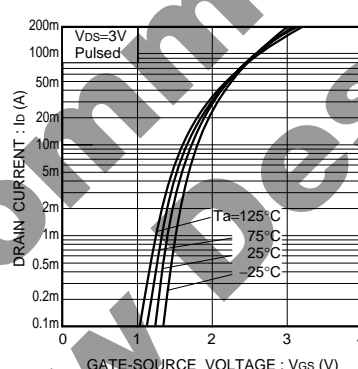


Fig.2 Typical transfer characteristics

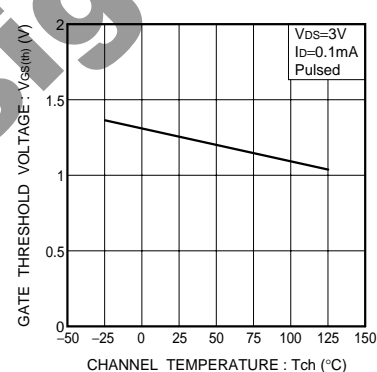


Fig.3 Gate threshold voltage vs. channel temperature

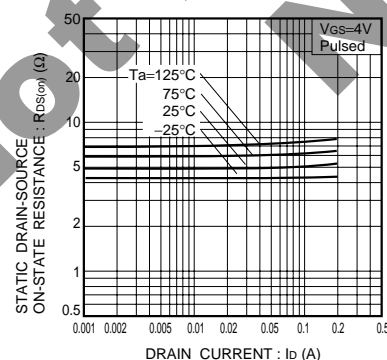


Fig.4 Static drain-source on-state resistance vs. drain current (I)

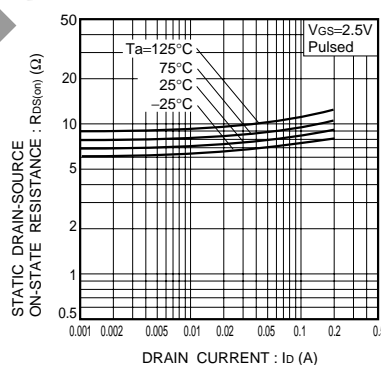


Fig.5 Static drain-source on-state resistance vs. drain current (II)

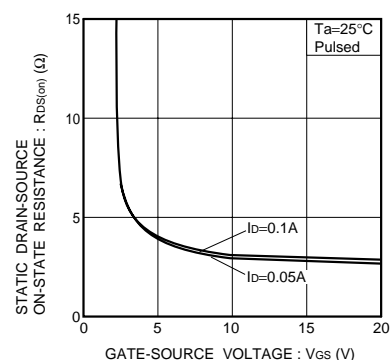


Fig.6 Static drain-source on-state resistance vs. gate-source voltage

Transistor

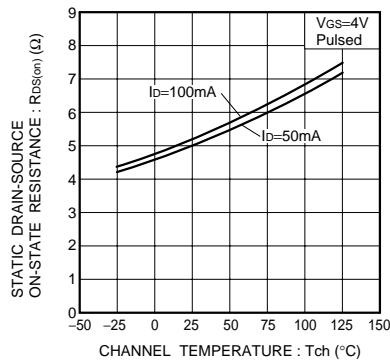


Fig.7 Static drain-source on-state resistance vs. channel temperature

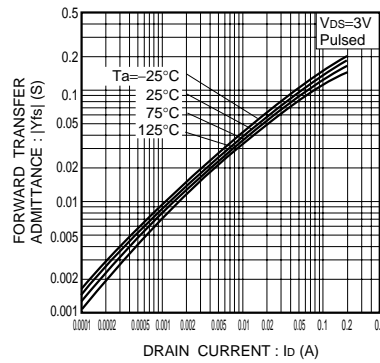


Fig.8 Forward transfer admittance vs. drain current

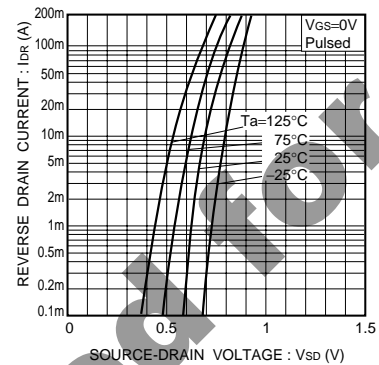


Fig.9 Reverse drain current vs. source-drain voltage (I)

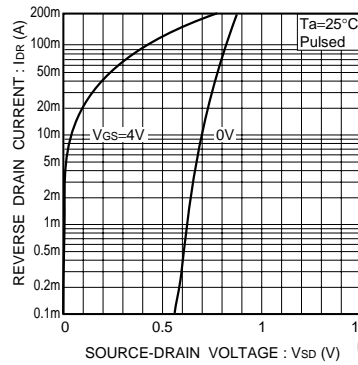


Fig.10 Reverse drain current vs. source-drain voltage (II)

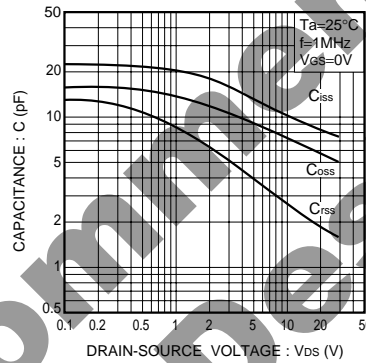


Fig.11 Typical capacitance vs. drain-source voltage

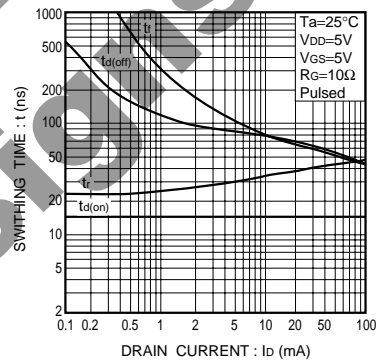


Fig.12 Switching characteristics (See Figures 13 and 14 for the measurement circuit and resultant waveforms)

●Switching characteristics measurement circuit

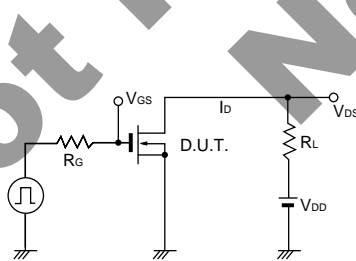


Fig.13 Switching time measurement circuit

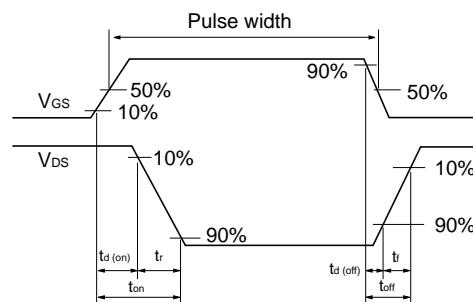


Fig.14 Switching time waveforms

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