

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_{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}	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 $\leq 1\%$

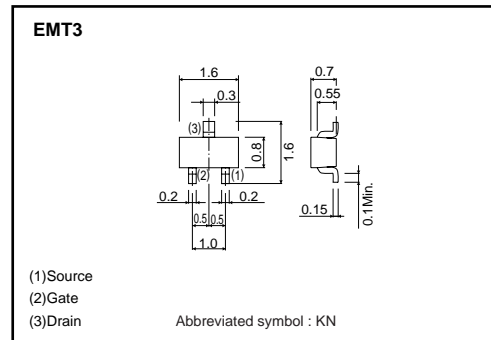
*2 With each pin mounted on the recommended lands.

●Thermal resistance

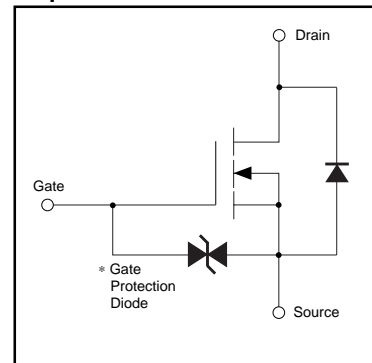
Parameter	Symbol	Limits	Unit
Channel to ambient	$R_{th(ch-a)}$ *	833	°C / W

* 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} =±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}	–	–	1.0	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	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 =500Ω
Fall time	t _f	–	80	–	ns	R _G =10Ω

●Electrical characteristic curves

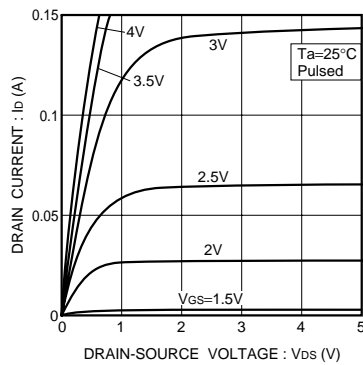


Fig.1 Typical output characteristics

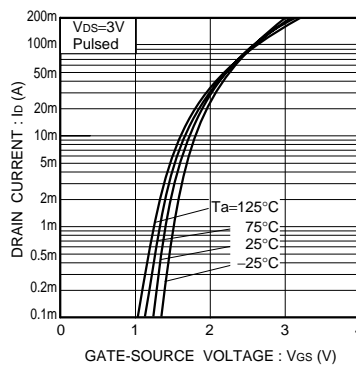


Fig.2 Typical transfer characteristics

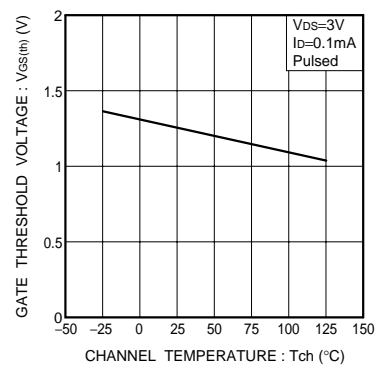


Fig.3 Gate threshold voltage vs. channel temperature

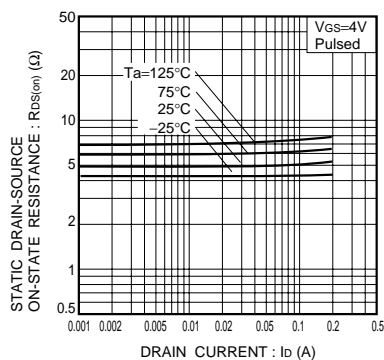


Fig.4 Static drain-source on-state resistance vs. drain current (I)

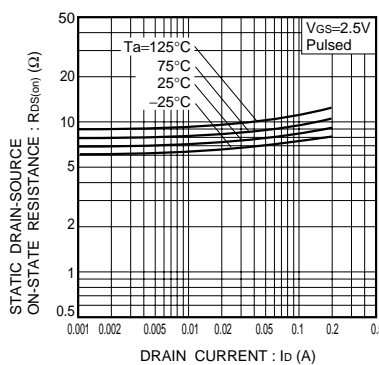


Fig.5 Static drain-source on-state resistance vs. drain current (II)

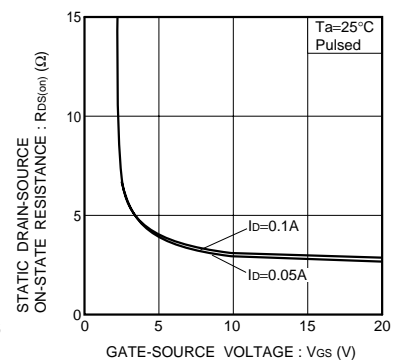


Fig.6 Static drain-source on-state resistance vs. gate-source voltage

Transistor

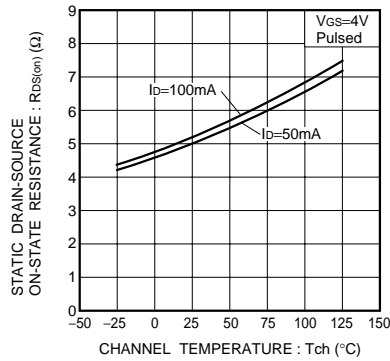


Fig.7 Static drain-source on-state resistance vs. channel temperature

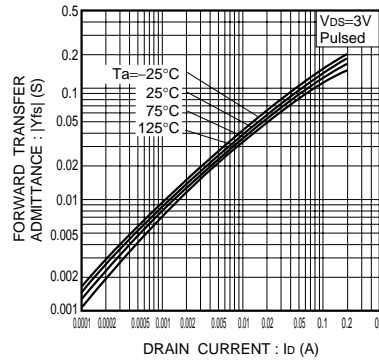


Fig.8 Forward transfer admittance vs. drain current

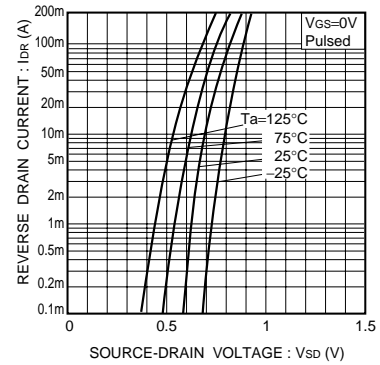


Fig.9 Reverse drain current vs. source-drain voltage (I)

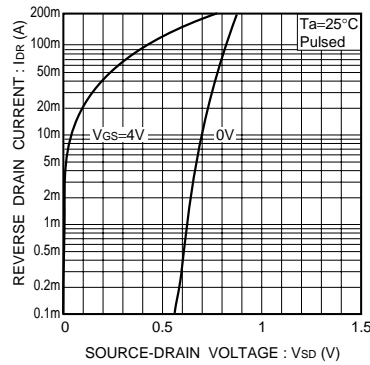


Fig.10 Reverse drain current vs. source-drain voltage (II)

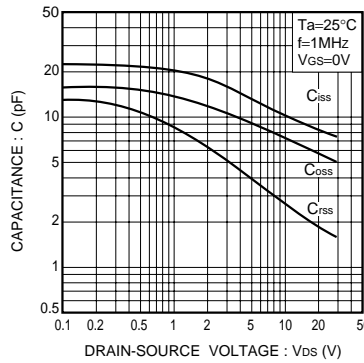


Fig.11 Typical capacitance vs. drain-source voltage

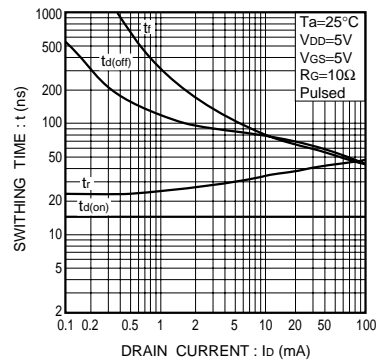


Fig.12 Switching characteristics (See Figures 13 and 14 for the measurement circuit and resultant waveforms)

●Switching characteristics measurement circuit

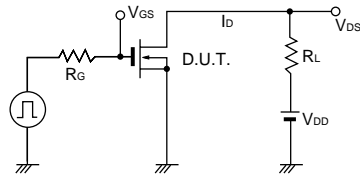


Fig.13 Switching time measurement circuit

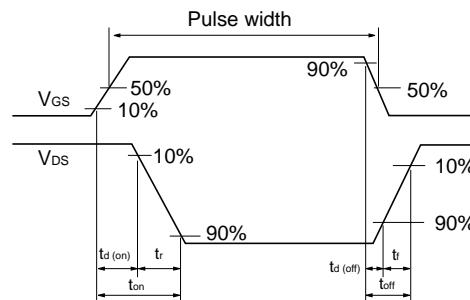


Fig.14 Switching time waveforms

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