

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 $\leq 1\%$

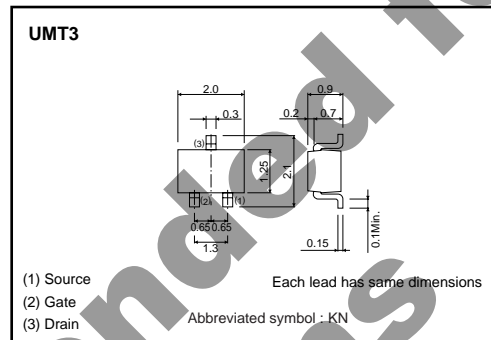
*2 With each pin mounted on the recommended lands.

●Thermal resistance

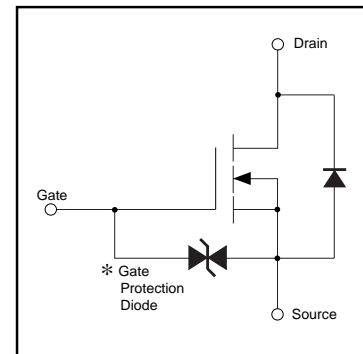
Parameter	Symbol	Limits	Unit
Channel to ambient	$R_{th(ch-a)}^*$	625	°C / W

* 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}	-	-	±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

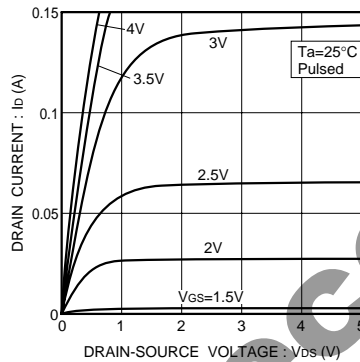


Fig.1 Typical output characteristics

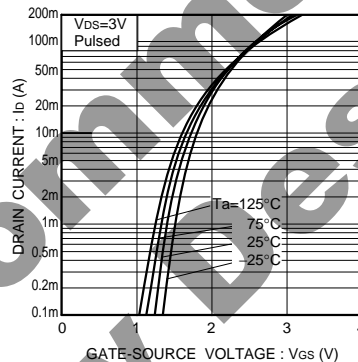


Fig.2 Typical transfer characteristics

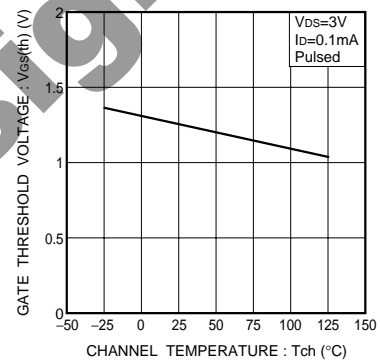


Fig.3 Gate threshold voltage vs. channel temperature

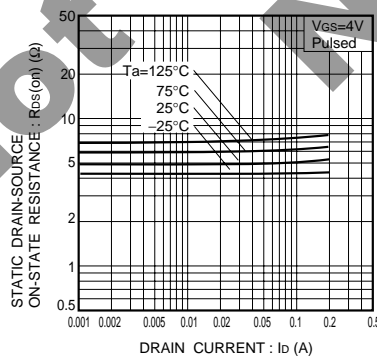


Fig.4 Static drain-source on-state resistance vs. drain current (I)

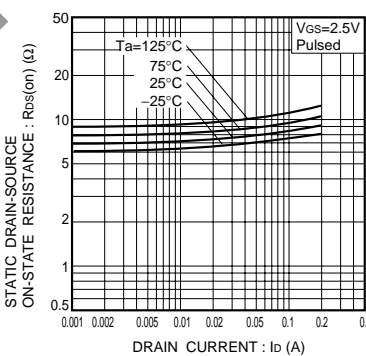


Fig.5 Static drain-source on-state resistance vs. drain current (II)

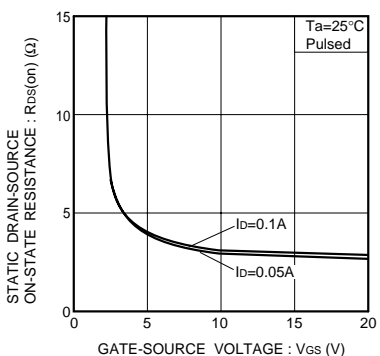


Fig.6 Static drain-source on-state resistance vs. gate-source voltage

Transistor

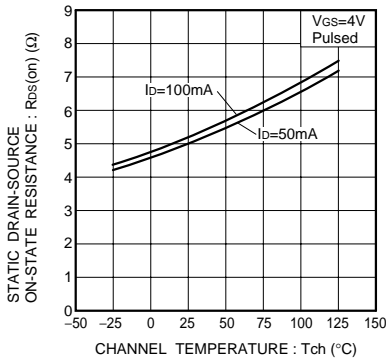


Fig.7 Static drain-source on-state resistance vs. channel temperature

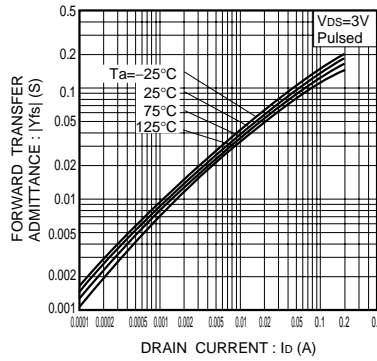


Fig.8 Forward transfer admittance vs. drain current

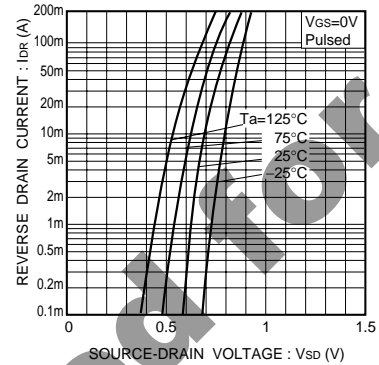


Fig.9 Reverse drain current vs. source-drain voltage (I)

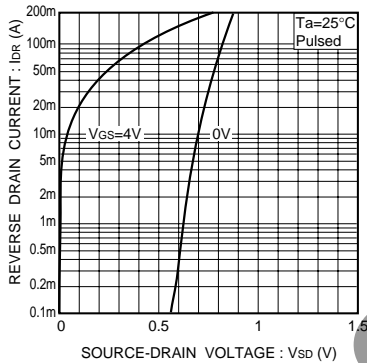


Fig.10 Reverse drain current vs. source-drain voltage (II)

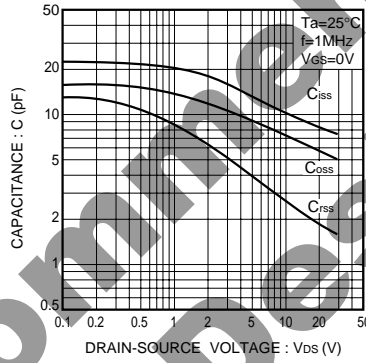


Fig.11 Typical capacitance vs. drain-source voltage

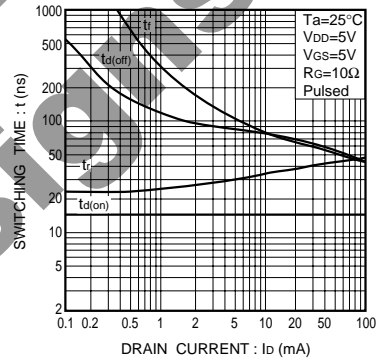


Fig.12 Switching characteristics (See Figures 13 and 14 for the measurement circuit and resultant waveforms)

●Switching characteristics measurement circuit

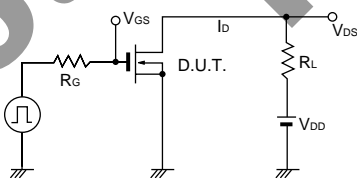


Fig.13 Switching time measurement circuit

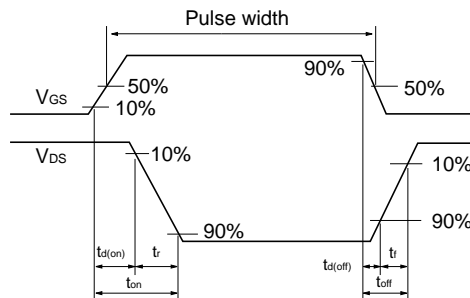


Fig.14 Switching time waveforms

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