

# 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  $\leq 1\%$

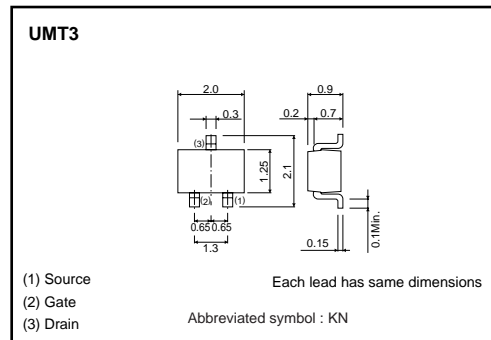
\*2 With each pin mounted on the recommended lands.

### ●Thermal resistance

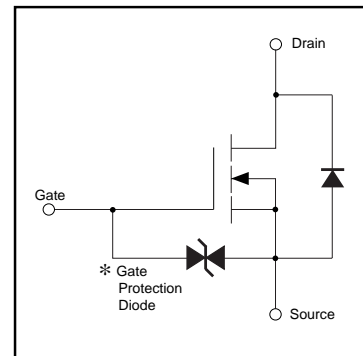
Parameter	Symbol	Limits	Unit
Channel to ambient	$R_{th(ch-a)}^*$	625	°C / W

\* 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 <sub>GSS</sub>	-	-	±1	μA	V <sub>GS</sub> = ±20V, V <sub>DS</sub> = 0V
Drain-source breakdown voltage	V <sub>(BR)DSS</sub>	30	-	-	V	I <sub>D</sub> = 10μA, V <sub>GS</sub> = 0V
Zero gate voltage drain current	I <sub>DSS</sub>	-	-	1	μA	V <sub>DS</sub> = 30V, V <sub>GS</sub> = 0V
Gate threshold voltage	V <sub>GS(th)</sub>	0.8	-	1.5	V	V <sub>DS</sub> = 3V, I <sub>D</sub> = 100μA
Static drain-source on-state resistance	R <sub>DS(on)</sub>	-	5	8	Ω	I <sub>D</sub> = 10mA, V <sub>GS</sub> = 4V
	R <sub>DS(on)</sub>	-	7	13	Ω	I <sub>D</sub> = 1mA, V <sub>GS</sub> = 2.5V
Forward transfer admittance	Y <sub>fs</sub>	20	-	-	mS	V <sub>DS</sub> = 3V, I <sub>D</sub> = 10mA
Input capacitance	C <sub>iss</sub>	-	13	-	pF	V <sub>DS</sub> = 5V
Output capacitance	C <sub>oss</sub>	-	9	-	pF	V <sub>GS</sub> = 0V
Reverse transfer capacitance	C <sub>rss</sub>	-	4	-	pF	f = 1MHz
Turn-on delay time	t <sub>d(on)</sub>	-	15	-	ns	I <sub>D</sub> = 10mA, V <sub>DD</sub> ≐ 5V
Rise time	t <sub>r</sub>	-	35	-	ns	V <sub>GS</sub> = 5V
Turn-off delay time	t <sub>d(off)</sub>	-	80	-	ns	R <sub>L</sub> = 500Ω
Fall time	t <sub>f</sub>	-	80	-	ns	R <sub>G</sub> = 10Ω

●Electrical characteristic curves

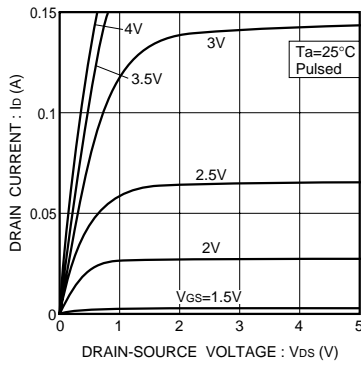


Fig.1 Typical output characteristics

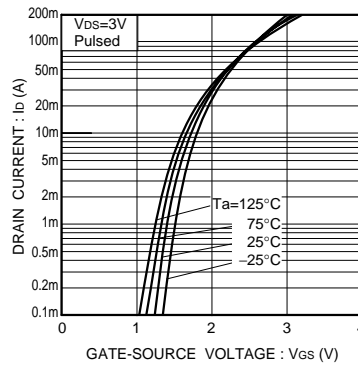


Fig.2 Typical transfer characteristics

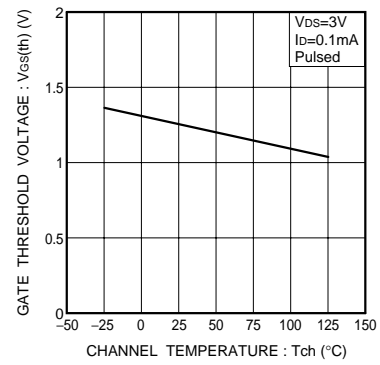


Fig.3 Gate threshold voltage vs. channel temperature

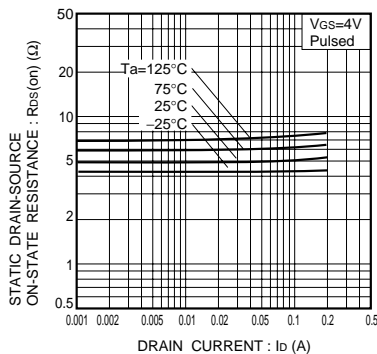


Fig.4 Static drain-source on-state resistance vs. drain current (I)

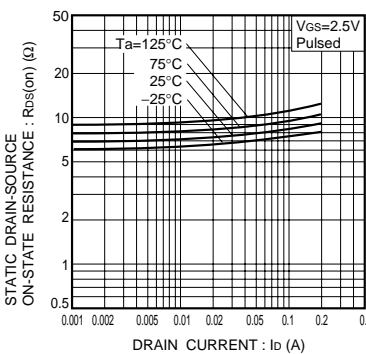


Fig.5 Static drain-source on-state resistance vs. drain current (II)

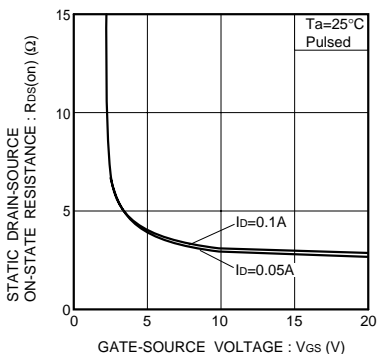


Fig.6 Static drain-source on-state resistance vs. gate-source voltage

Transistor

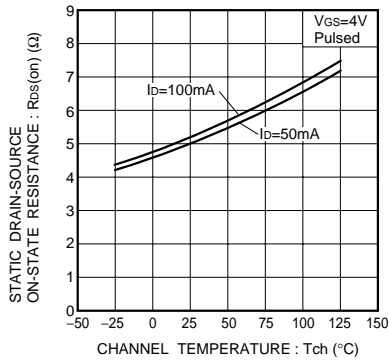


Fig.7 Static drain-source on-state resistance vs. channel temperature

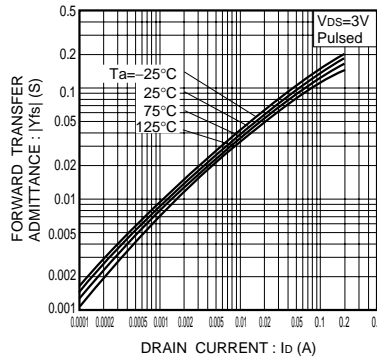


Fig.8 Forward transfer admittance vs. drain current

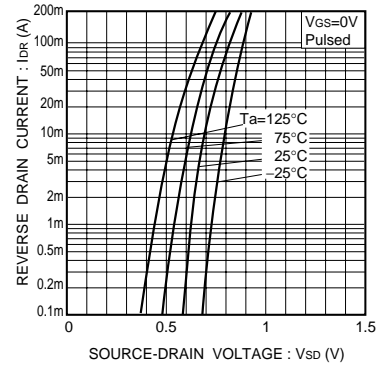


Fig.9 Reverse drain current vs. source-drain voltage (I)

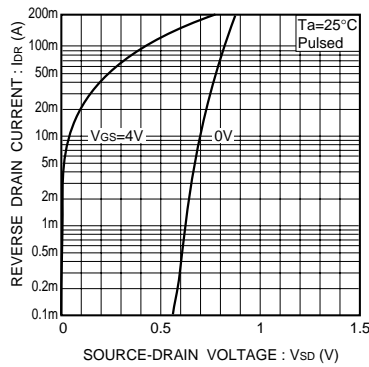


Fig.10 Reverse drain current vs. source-drain voltage (II)

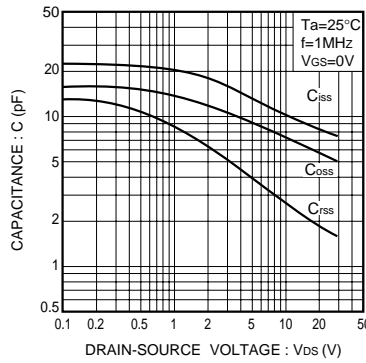


Fig.11 Typical capacitance vs. drain-source voltage

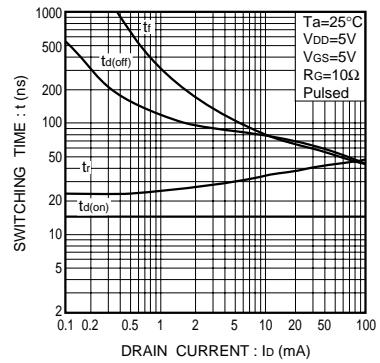


Fig.12 Switching characteristics (See Figures 13 and 14 for the measurement circuit and resultant waveforms)

●Switching characteristics measurement circuit

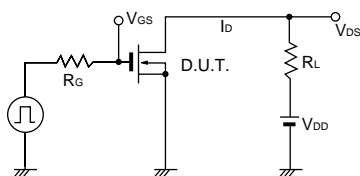


Fig.13 Switching time measurement circuit

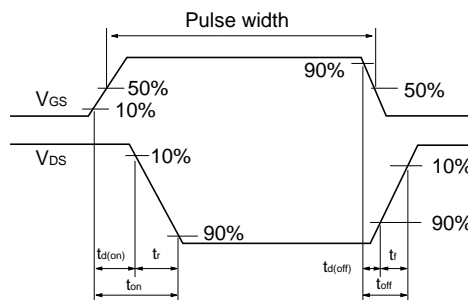


Fig.14 Switching time waveforms

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