

## 2.5V Drive Nch MOS FET

**2SK3018**

## ● Structure

## Silicon N-channel MOSFET

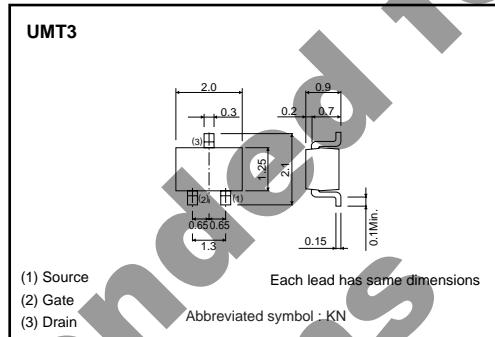
## ● Applications

## 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.

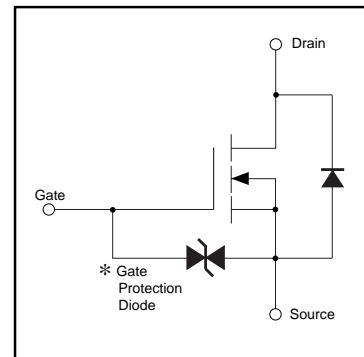
● **External dimensions** (Unit : mm)



## ●Packaging specifications

Type	Package	Taping
	Code	T106
	Basic ordering unit (pieces)	3000

## ● 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.

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

Parameter	Symbol	Limits	Unit	
Drain-source voltage	V <sub>DS</sub>	30	V	
Gate-source voltage	V <sub>G</sub>	±20	V	
Drain current	Continuous	I <sub>D</sub>	±100	mA
	Pulsed	I <sub>D</sub> <sup>*1</sup>	±400	mA
Total power dissipation	P <sub>D</sub> <sup>*2</sup>	200	mW	
Channel temperature	T <sub>ch</sub>	150	°C	
Storage temperature	T <sub>stg</sub>	−55 to +150	°C	

\*1 Pw≤10μs, Duty cycle≤1%

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

### ● Thermal resistance

Parameter	Symbol	Limits	Unit
Channel to ambient	Rth(ch-a) *	625	°C / W

\* With each pin mounted on the recommended lands.

## Transistor

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

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Gate-source leakage	$I_{GSS}$	—	—	$\pm 1$	$\mu\text{A}$	$V_{GS} = \pm 20\text{V}$ , $V_{DS} = 0\text{V}$
Drain-source breakdown voltage	$V_{(BR)DSS}$	30	—	—	V	$I_D = 10\mu\text{A}$ , $V_{GS} = 0\text{V}$
Zero gate voltage drain current	$I_{DSS}$	—	—	1	$\mu\text{A}$	$V_{DS} = 30\text{V}$ , $V_{GS} = 0\text{V}$
Gate threshold voltage	$V_{GS(th)}$	0.8	—	1.5	V	$V_{DS} = 3\text{V}$ , $I_D = 100\mu\text{A}$
Static drain-source on-state resistance	$R_{DS(on)}$	—	5	8	$\Omega$	$I_D = 10\text{mA}$ , $V_{GS} = 4\text{V}$
	$R_{DS(on)}$	—	7	13	$\Omega$	$I_D = 1\text{mA}$ , $V_{GS} = 2.5\text{V}$
Forward transfer admittance	$ Y_{fs} $	20	—	—	$\text{mS}$	$V_{DS} = 3\text{V}$ , $I_D = 10\text{mA}$
Input capacitance	$C_{iss}$	—	13	—	$\text{pF}$	$V_{DS} = 5\text{V}$
Output capacitance	$C_{oss}$	—	9	—	$\text{pF}$	$V_{GS} = 0\text{V}$
Reverse transfer capacitance	$C_{rss}$	—	4	—	$\text{pF}$	$f = 1\text{MHz}$
Turn-on delay time	$t_{d(on)}$	—	15	—	ns	$I_D = 10\text{mA}$ , $V_{DD} = 5\text{V}$
Rise time	$t_r$	—	35	—	ns	$V_{GS} = 5\text{V}$
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

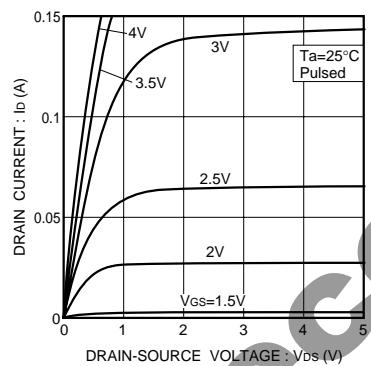


Fig.1 Typical output characteristics

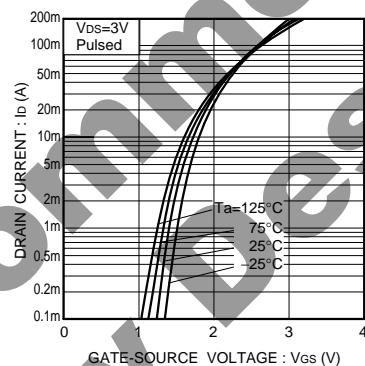


Fig.2 Typical transfer characteristics

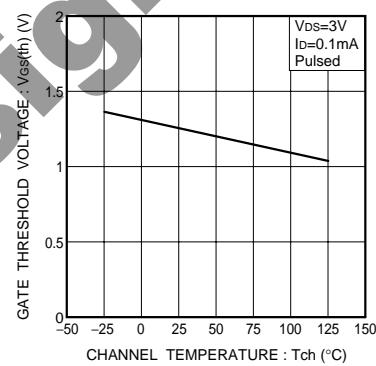


Fig.3 Gate threshold voltage vs. channel temperature

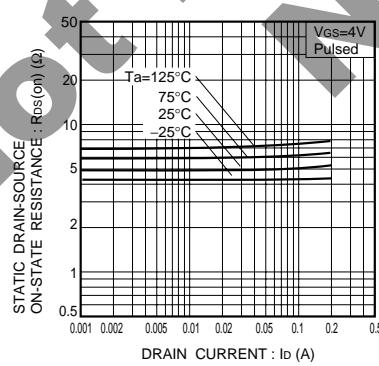


Fig.4 Static drain-source on-state resistance vs. drain current (I)

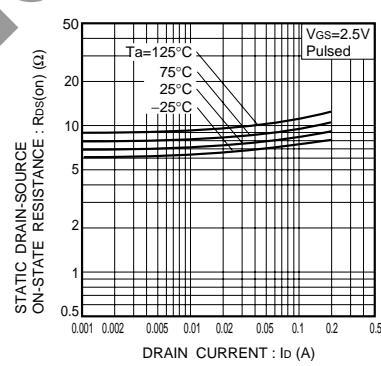


Fig.5 Static drain-source on-state resistance vs. drain current (II)

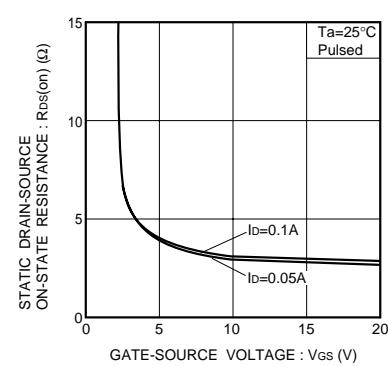


Fig.6 Static drain-source on-state resistance vs. gate-source voltage

## Transistor

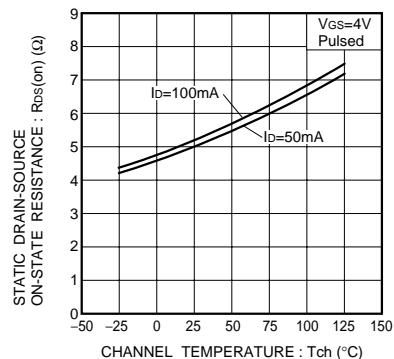


Fig.7 Static drain-source on-state resistance vs. channel temperature

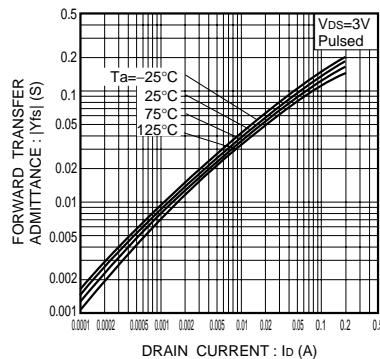


Fig.8 Forward transfer admittance vs. drain current

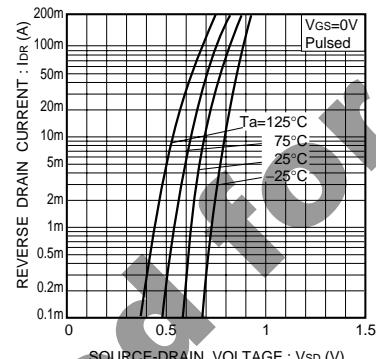


Fig.9 Reverse drain current vs. source-drain voltage (I)

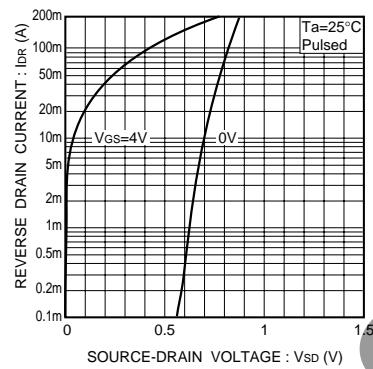


Fig.10 Reverse drain current vs. source-drain voltage (II)

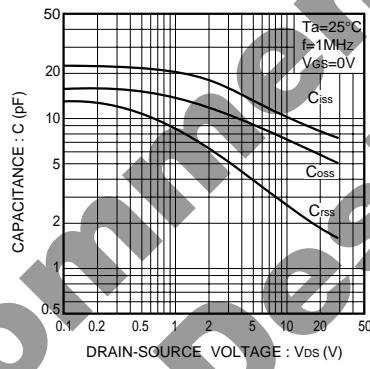
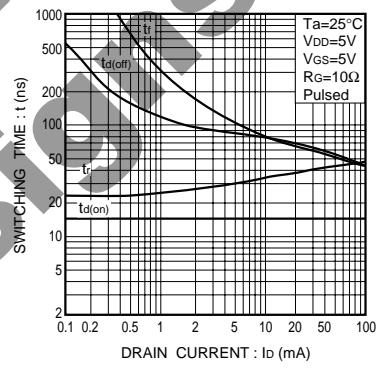


Fig.11 Typical capacitance vs. drain-source voltage

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

## ●Switching characteristics measurement circuit

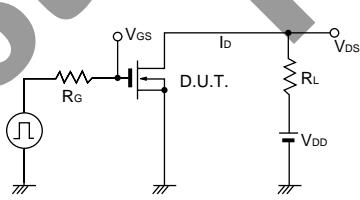


Fig.13 Switching time measurement circuit

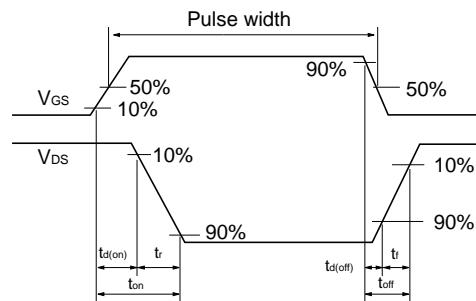


Fig.14 Switching time waveforms

## Appendix

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