

2.5V Drive Nch MOS FET

2SK3541

●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	T2L
	Basic ordering unit (pieces)	8000

2SK3541

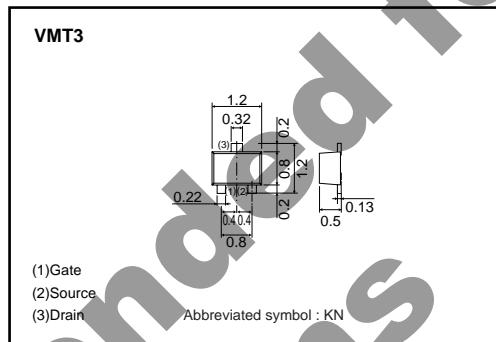
●Absolute maximum ratings (Ta=25°C)

Parameter	Symbol	Limits	Unit
Drain-source voltage	V _{DSS}	30	V
Gate-source voltage	V _{GSS}	±20	V
Drain current	Continuous	I _D	mA
	Pulsed	I _{DP} ^{*1}	mA
Total power dissipation	P _D ^{*2}	150	mW
Channel temperature	T _{ch}	150	°C
Storage temperature	T _{stg}	-55 to +150	°C

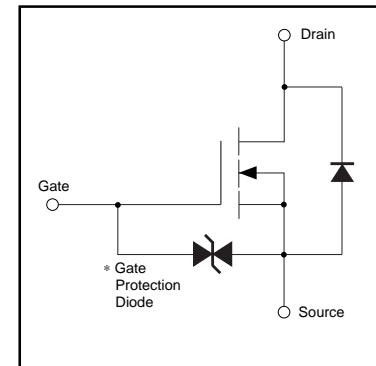
*1 P_w≤10μs, Duty cycle≤1%

*2 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 ($T_a=25^\circ\text{C}$)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Gate-source leakage	I_{GSS}	—	—	± 1	μA	$V_{GS}=\pm 20\text{V}$, $V_{DS}=0\text{V}$
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}	—	—	1.0	μA	$V_{DS}=30\text{V}$, $V_{GS}=0\text{V}$
Gate threshold voltage	$V_{GS(\text{th})}$	0.8	—	1.5	V	$V_{DS}=3\text{V}$, $I_D=100\mu\text{A}$
Static drain-source on-state resistance	$R_{DS(\text{on})}$	—	5	8	Ω	$I_D=10\text{mA}$, $V_{GS}=4\text{V}$
	$R_{DS(\text{on})}$	—	7	13	Ω	$I_D=1\text{mA}$, $V_{GS}=2.5\text{V}$
Forward transfer admittance	$ Y_{fs} $	20	—	—	mS	$I_D=10\text{mA}$, $V_{DS}=3\text{V}$
Input capacitance	C_{iss}	—	13	—	pF	$V_{DS}=5\text{V}$
Output capacitance	C_{oss}	—	9	—	pF	$V_{GS}=0\text{V}$
Reverse transfer capacitance	C_{rss}	—	4	—	pF	$f=1\text{MHz}$
Turn-on delay time	$t_{d(\text{on})}$	—	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	$t_{d(\text{off})}$	—	80	—	ns	$R_L=500\Omega$
Fall time	t_f	—	80	—	ns	$R_G=10\Omega$

●Electrical characteristic curves

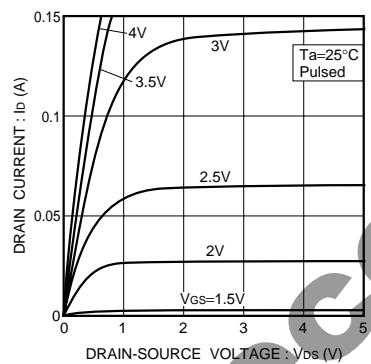


Fig.1 Typical output characteristics

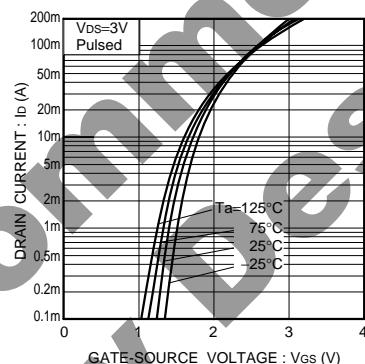


Fig.2 Typical transfer characteristics

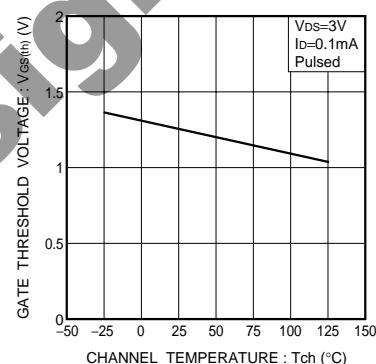


Fig.3 Gate threshold voltage vs. channel temperature

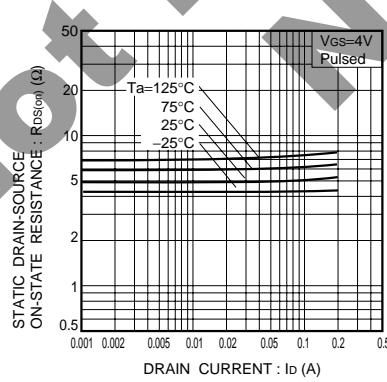


Fig.4 Static drain-source on-state resistance vs. drain current (I)

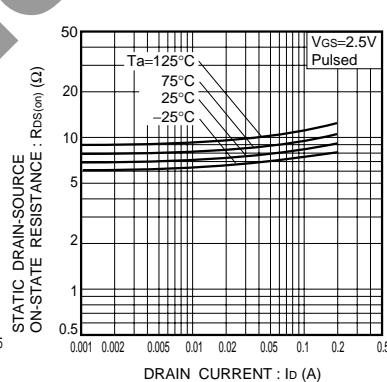


Fig.5 Static drain-source on-state resistance vs. drain current (II)

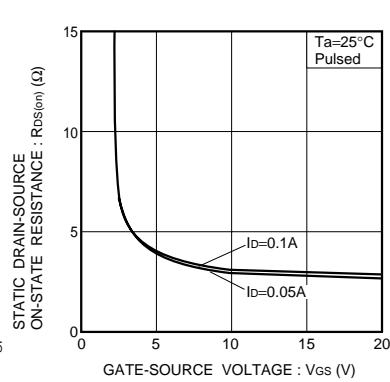


Fig.6 Static drain-source on-state resistance vs. gate-source voltage

Transistor

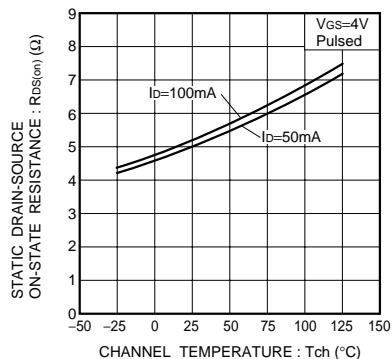


Fig.7 Static drain-source on-state resistance vs. channel temperature

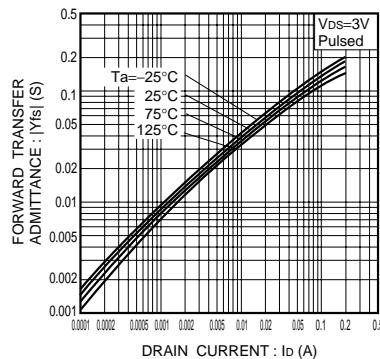


Fig.8 Forward transfer admittance vs. drain current

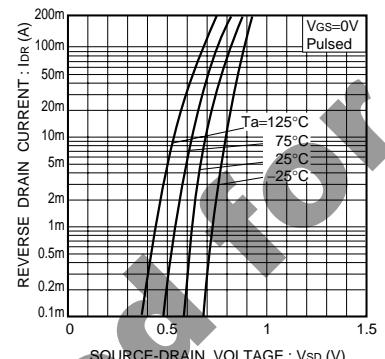


Fig.9 Reverse drain current vs. source-drain voltage (I)

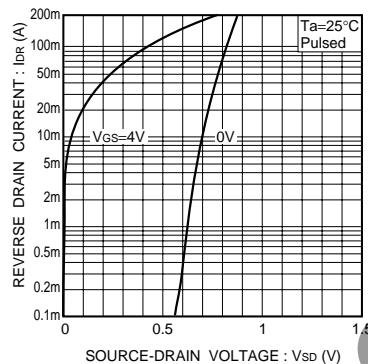


Fig.10 Reverse drain current vs. source-drain voltage (II)

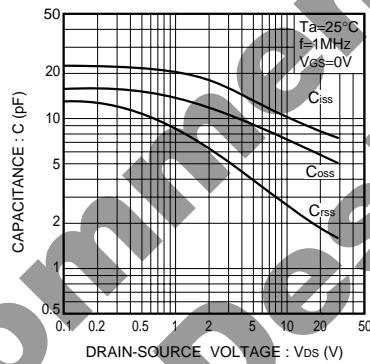
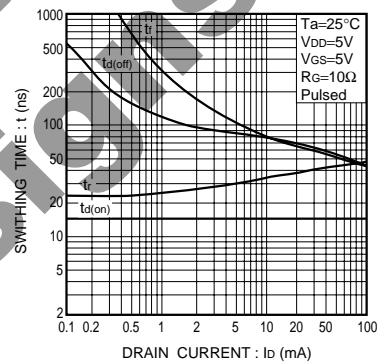


Fig.11 Typical capacitance vs. drain-source voltage

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

●Switching characteristics measurement circuit

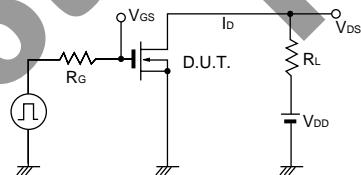


Fig.13 Switching time measurement circuit

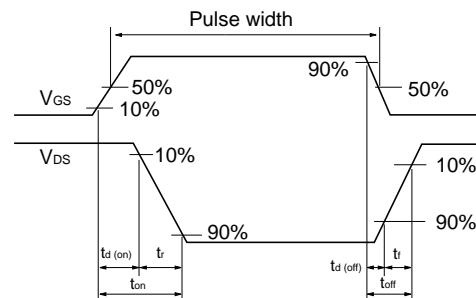


Fig.14 Switching time waveforms

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