

4V Drive Nch MOS FET

2SK2094

●Structure

Silicon N-channel MOS FET

●Features

- 1) Low On-resistance.
- 2) Fast switching speed.
- 3) Wide SOA (safe operating area).
- 4) 4V drive.
- 5) Drive circuits can be simple.
- 6) Parallel use is easy.

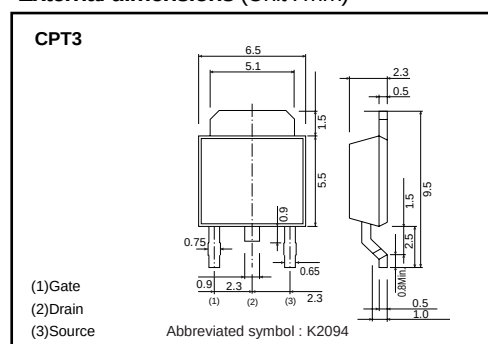
●Applications

Switching

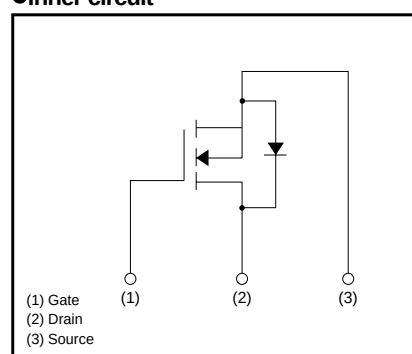
●Packaging specifications

Type	Package	Taping
	Code	TL
	Basic ordering unit (pieces)	2500
2SK2094		○

●External dimensions (Unit : mm)



●Inner circuit



●Absolute maximum ratings (Ta=25°C)

Parameter		Symbol	Limits	Unit
Drain-source voltage		V_{DS}	60	V
Gate-source voltage		V_{GS}	± 20	V
Drain current	Continuous	I_D	2	A
	Pulsed	I_{DP}^*	8	A
Reverse drain current	Continuous	I_{DR}	2	A
	Pulsed	I_{DRP}^*	8	A
Total power dissipation (Tc=25°C)		P_D	10	W
Channel temperature		T_{ch}	150	°C
Storage temperature		T_{stg}	-55 to +150	°C

* $P_w \leq 300\mu s$, Duty cycle $\leq 2\%$

Transistors

●Electrical characteristics (Ta=25°C)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test Conditions
Gate-source leakage	I _{GSS}	–	–	±100	nA	V _{GS} = ±20V, V _{DS} =0V
Drain-source breakdown voltage	V _{(BR)DSS}	60	–	–	V	I _D =1mA, V _{GS} =0V
Zero gate voltage drain current	I _{DSS}	–	–	100	μA	V _{DS} =60V, V _{GS} =0V
Gate threshold voltage	V _{GS(th)}	1.0	–	2.5	V	V _{DS} =10V, I _D =1mA
Static drain-source on-state resistance	R _{DS(on)}	–	0.3	0.35	Ω	I _D =1A, V _{GS} =10V
		–	0.4	0.5		I _D =1A, V _{GS} =4V
Forward transfer admittance	Y _{fs}	1.0	–	–	S	V _{DS} =10V, I _D =1A
Input capacitance	C _{iss}	–	400	–	pF	V _{DS} =10V
Output capacitance	C _{oss}	–	150	–	pF	V _{GS} =0V
Reverse transfer capacitance	C _{rss}	–	50	–	pF	f=1MHz
Turn-on delay time	t _{d(on)}	–	10	–	ns	I _D =1A, V _{DD} ≧30V
Rise time	t _r	–	20	–	ns	V _{GS} =10V
Turn-off delay time	t _{d(off)}	–	100	–	ns	R _L =30Ω
Fall time	t _f	–	40	–	ns	R _G =10Ω
Reverse recovery time (Body Diode)	t _{rr}	–	100	–	ns	I _{DR} =2A, V _{GS} =0V, di/dt=50A/μs

Transistors

●Electrical characteristics curve

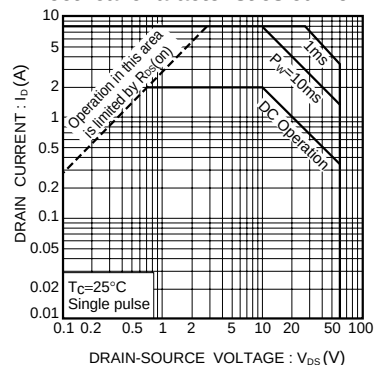


Fig.1 Maximum Safe Operating Area

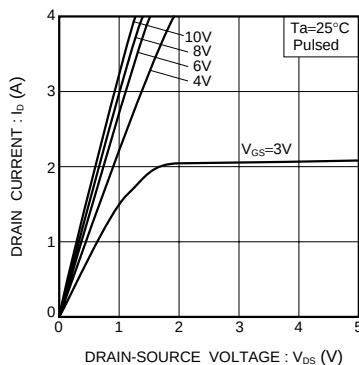


Fig.2 Typical Output Characteristics

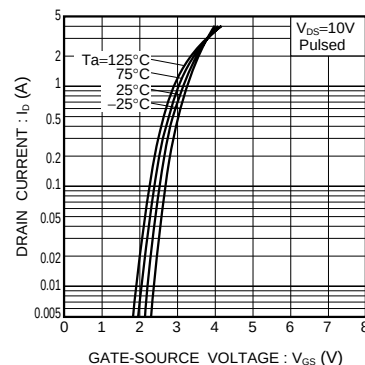


Fig.3 Typical Transfer Characteristics

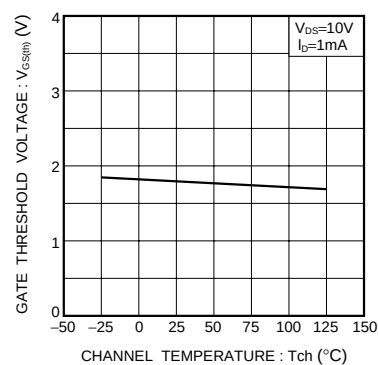


Fig.4 Gate Threshold Voltage vs. Channel Temperature

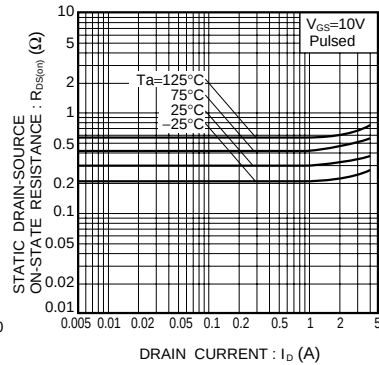


Fig.5 Static Drain-Source On-State Resistance vs. Drain Current (I)

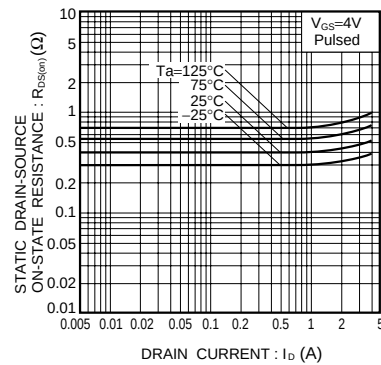


Fig.6 Static Drain-Source On-State Resistance vs. Drain Current (II)

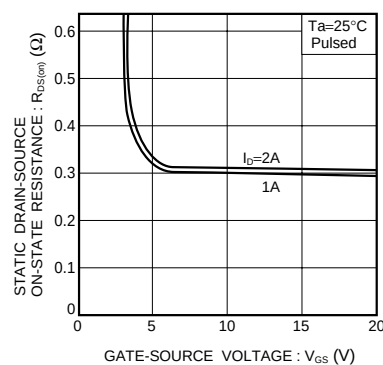


Fig.7 Static Drain-Source On-State Resistance vs. Gate-Source Voltage

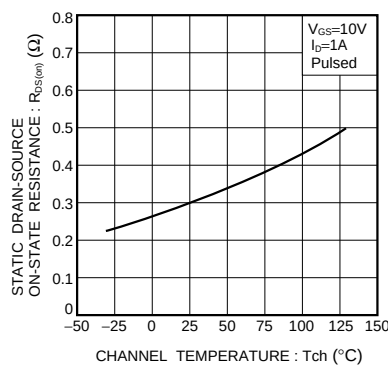


Fig.8 Static Drain-Source On-State Resistance vs. Channel Temperature

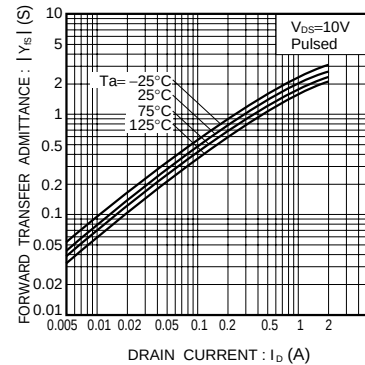


Fig.9 Forward Transfer Admittance vs. Drain Current

Transistors

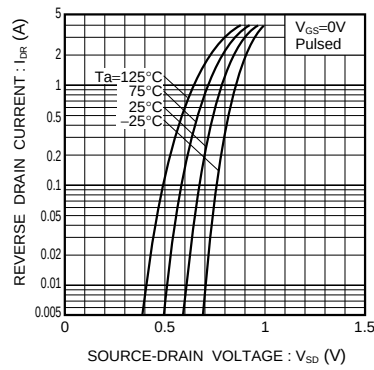


Fig.10 Reverse Drain Current vs. Source-Drain Voltage (I)

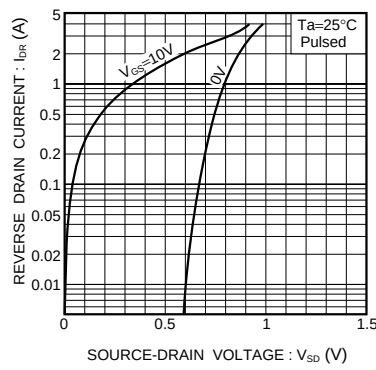


Fig.11 Reverse Drain Current vs. Source-Drain Voltage (II)

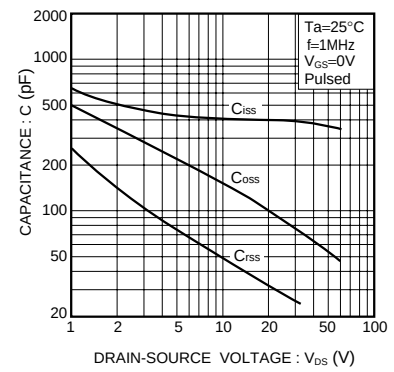


Fig.12 Typical Capacitance vs. Drain-Source Voltage

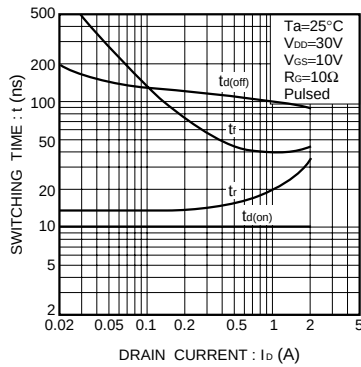


Fig.13 Switching characteristics (See Figure. 15 and 16 for the measurement circuit and resultant waveforms)

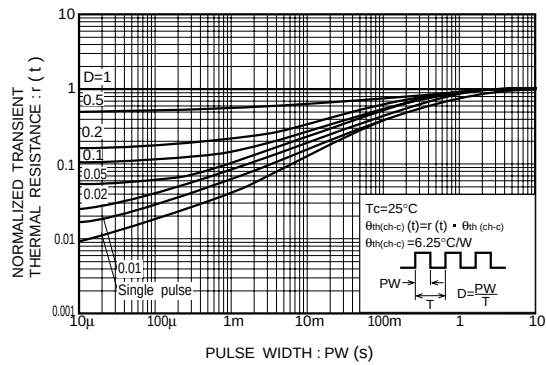


Fig.14 Normalized Transient Thermal Resistance vs. Pulse Width

● Switching characteristics measurement circuit

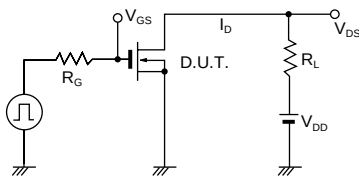


Fig.15 Switching Time Test Circuit

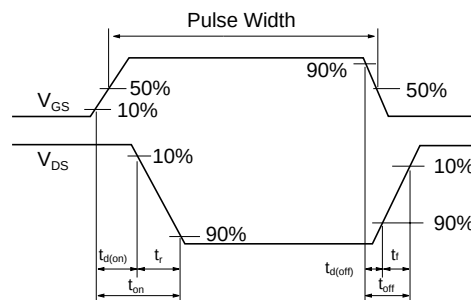


Fig.16 Switching Time Waveforms

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