

Small switching (60V, 2A)

2SK2094

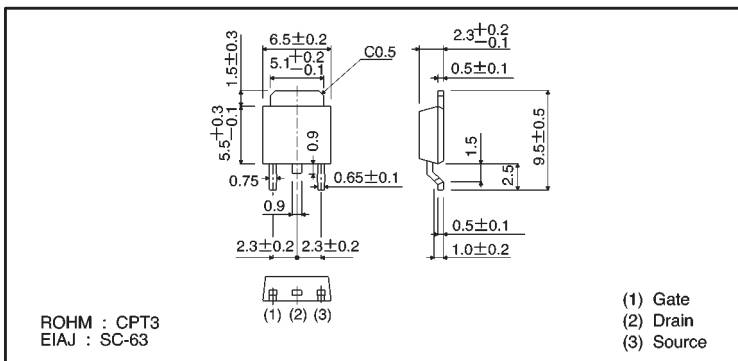
●Features

- 1) Low on-resistance.
- 2) Fast switchig speed.
- 3) Wide SOA (safe operating area).
- 4) Low-voltage drive (4V).
- 5) Easily designed drive circuits.
- 6) Easy to parallel.

●Structure

Silicon N-channel
MOSFET

●External dimensions (Units: mm)



●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	20	W	
Channel temperature	T_{ch}	150	°C	
Storage temperature	T_{stg}	-55~+150	°C	

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

●Packaging specifications

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

●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	t _{rr}	—	100	—	ns	I _{DR} =2A, V _{GS} =0V, di/dt=50A/μs

●Electrical characteristic curves

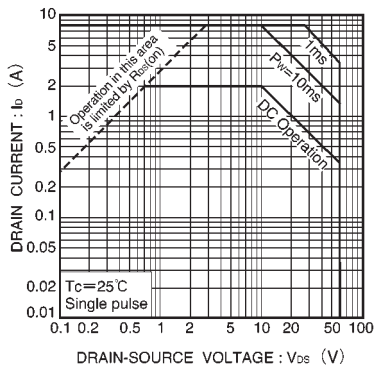


Fig.1 Maximum safe operating area

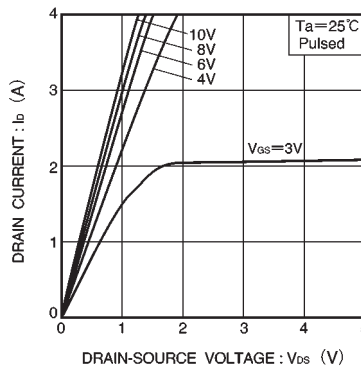


Fig.2 Typical output characteristics

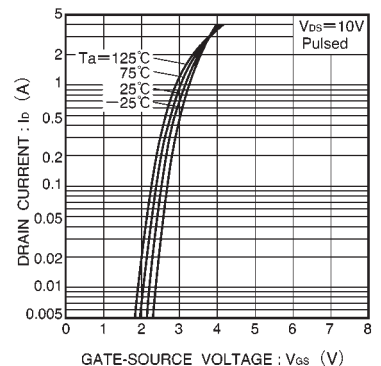


Fig.3 Typical transfer characteristics

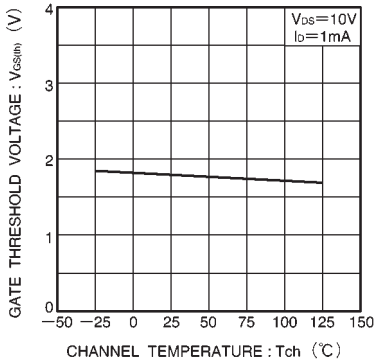


Fig.4 Gate threshold voltage vs. channel temperature

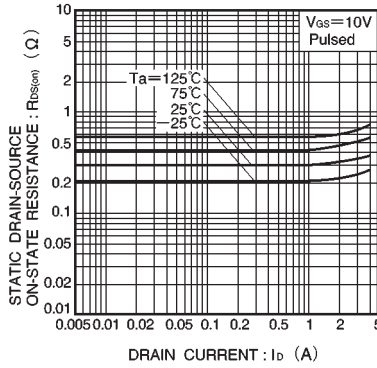


Fig.5 Static drain-source on-state resistance vs. drain current (I)

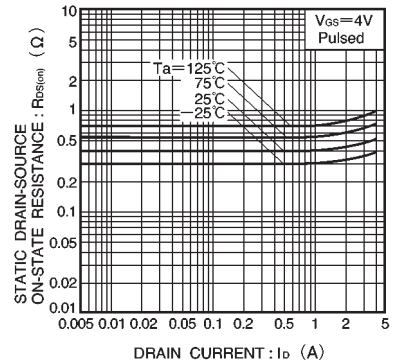


Fig.6 Static drain-source on-state resistance vs. drain current (II)

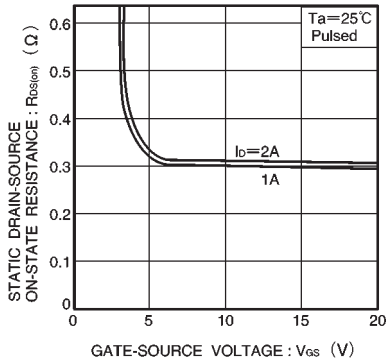


Fig.7 Static drain-source on-state resistance vs. gate-source voltage

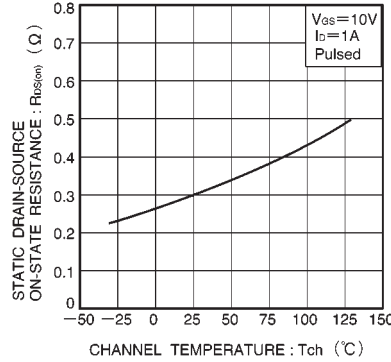


Fig.8 Static drain-source on-state resistance vs. channel temperature

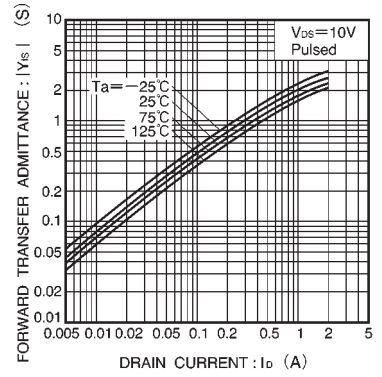


Fig.9 Forward transfer admittance vs. drain current

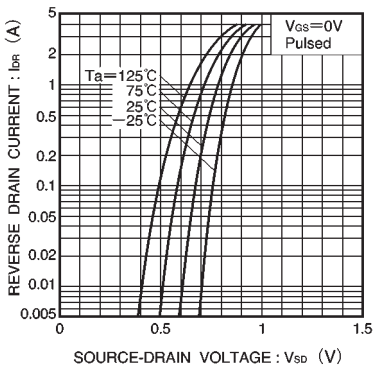


Fig.10 Reverse drain current vs. source-drain voltage (I)

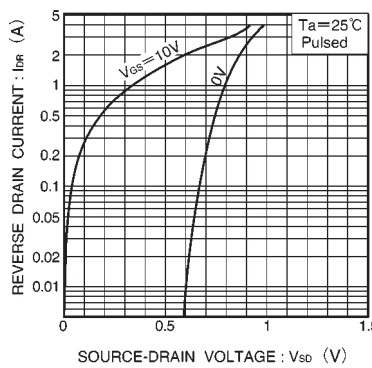


Fig.11 Reverse drain current vs. source-drain voltage (II)

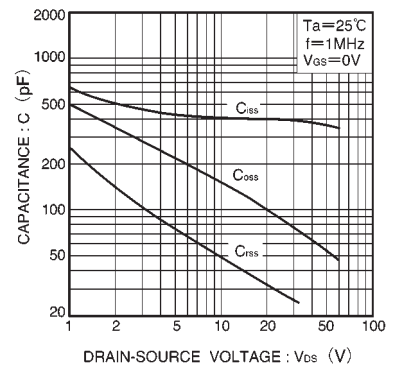


Fig.12 Typical capacitance vs. drain-source voltage

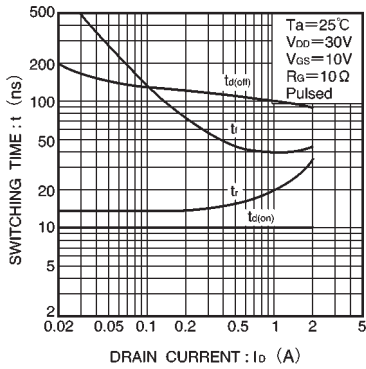


Fig.13 Switching characteristics (See Figure. 15 and 16 for the measurement circuit and resultant waveforms)

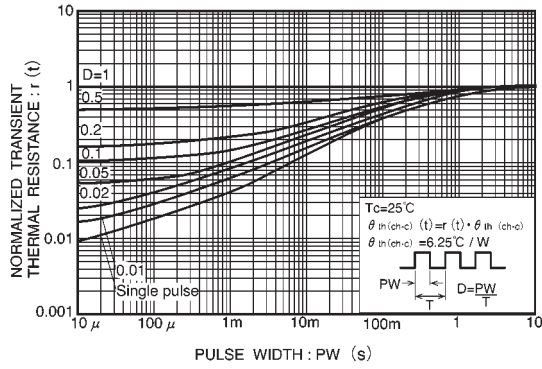


Fig.14 Normalized transient thermal resistance vs. pulse width

● Switching characteristics measurement circuit

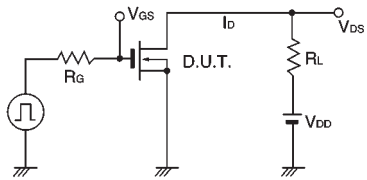


Fig.15 Switching time measurement circuit

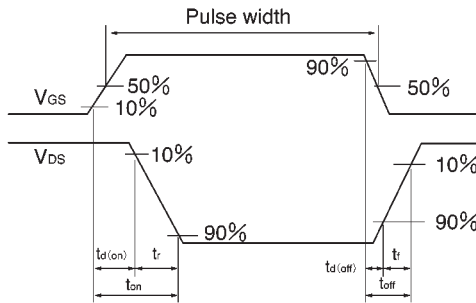


Fig.16 Switching time waveforms