

Small switching (60V, 2A)

2SK2094

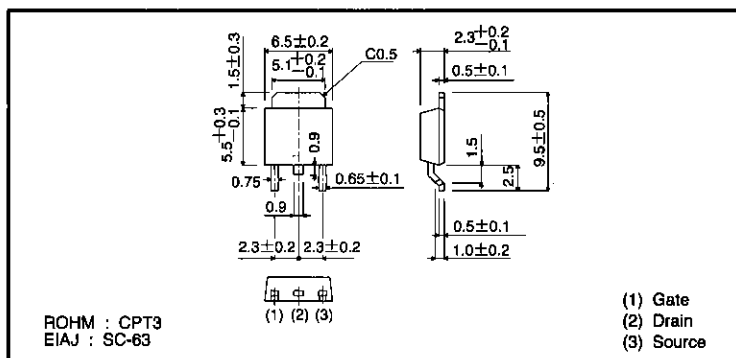
●Features

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

●Structure

Silicon N-channel
MOSFET transistor

●External dimensions (Unit: mm)



●Absolute maximum ratings (Ta=25°C)

Parameter	Symbol	Limits	Unit	
Drain-source voltage	V _{DSS}	60	V	
Gate-source voltage	V _{GSS}	±20	V	
Drain current	Continuous	I _D	2	A
	Pulsed	I _{DP} *	8	A
Drain reverse 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	

* Pw≤300 μs, Duty cycle≤2%

●Packaging specifications

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

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●Electrical characteristics (Ta=25°C)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Gate leakage current	I_{GSS}	—	—	± 100	nA	$V_{DS} = \pm 20V, V_{GS} = 0V$
Drain-source breakdown voltage	$V_{(BR)DSS}$	60	—	—	V	$I_D = 1mA, V_{GS} = 0V$
Drain cutoff current	I_{DSS}	—	—	100	μA	$V_{DS} = 60V, V_{GS} = 0V$
Gate threshold voltage	$V_{GS(th)}$	1	—	2.5	V	$V_{DS} = 10V, I_D = 1mA$
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	—	—	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	$I_D = 1A, V_{DD} \approx 30V$
Rise time	t_r	—	20	—	ns	$V_{GS} = 10V$
Turn-off delay time	$t_{d(off)}$	—	100	—	ns	$R_L = 30\Omega$
Fall time	t_f	—	40	—	ns	$R_G = 10\Omega$
Reverse recovery time	t_{rr}	—	100	—	ns	$I_{DR} = 2A, V_{GS} = 0V, di/dt = 50A/\mu s$

●Electrical characteristic curves

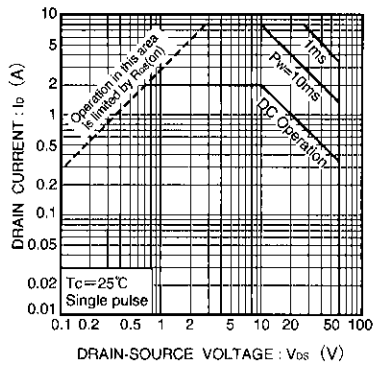


Fig.1 Maximum Safe Operating Area

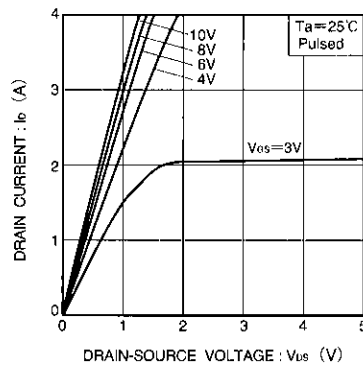


Fig.2 Typical Output Characteristics

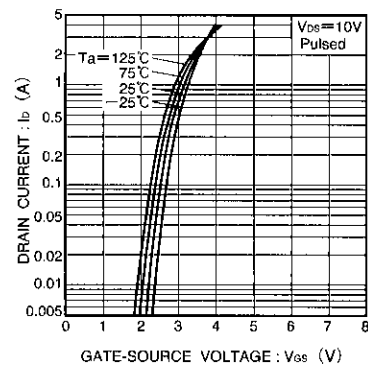


Fig.3 Typical Transfer Characteristics

● Electrical characteristic curves

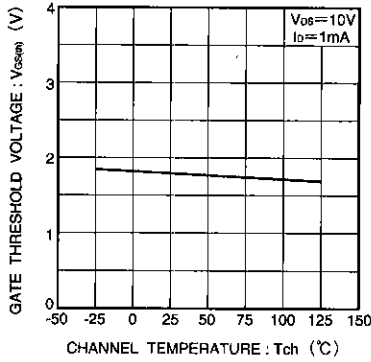


Fig.4 Gate Threshold Voltage vs. Channel Temperature

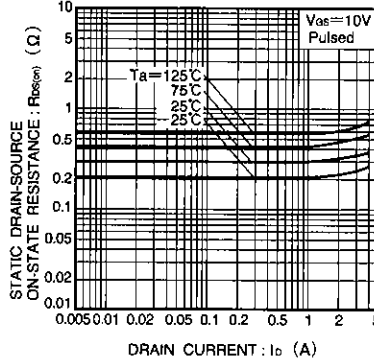


Fig.5 Static Drain-Source On-State Resistance vs. Drain Current (I)

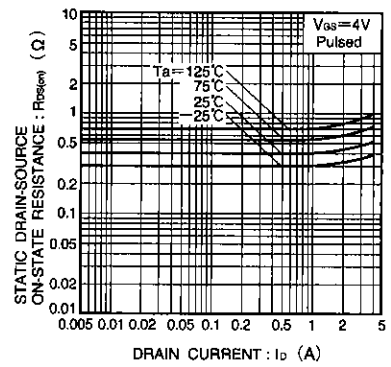


Fig.6 Static Drain-Source On-State Resistance vs. Drain Current (II)

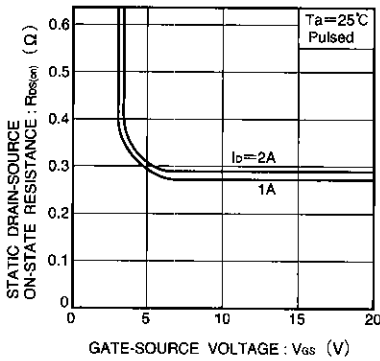


Fig.7 Static Drain-Source On-State Resistance vs. Gate-Source Voltage

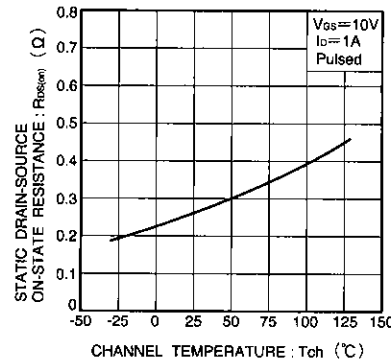


Fig.8 Static Drain-Source On-State Resistance vs. Channel Temperature

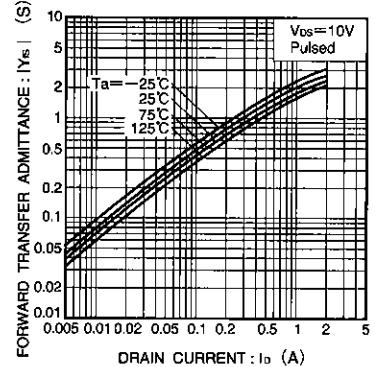


Fig.9 Forward Transfer Admittance vs. Drain Current

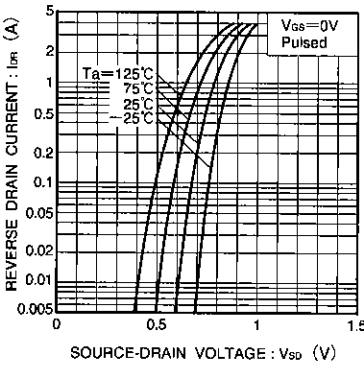


Fig.10 Reverse Drain Current vs. Source-Drain Voltage (I)

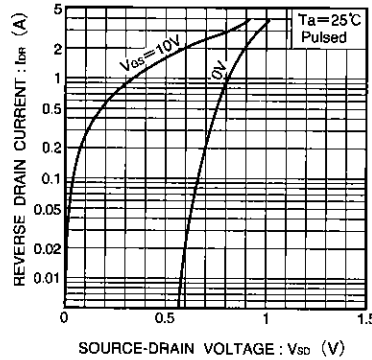


Fig.11 Reverse Drain Current vs. Source-Drain Voltage (II)

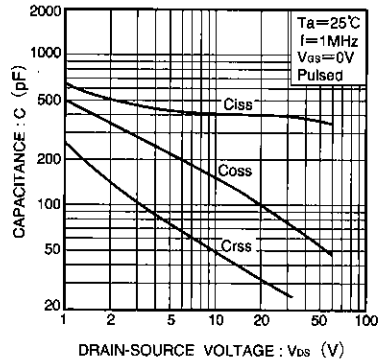


Fig.12 Typical Capacitance vs. Drain-Source Voltage

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●Electrical characteristic curves

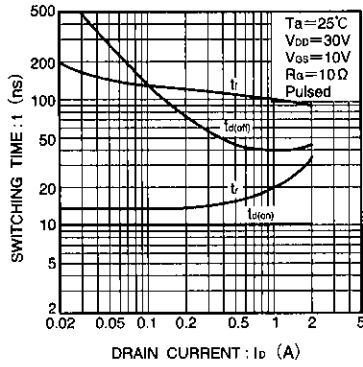


Fig.13 Switching Characteristics
(See Figure. 15 and 16 for measurement circuits)

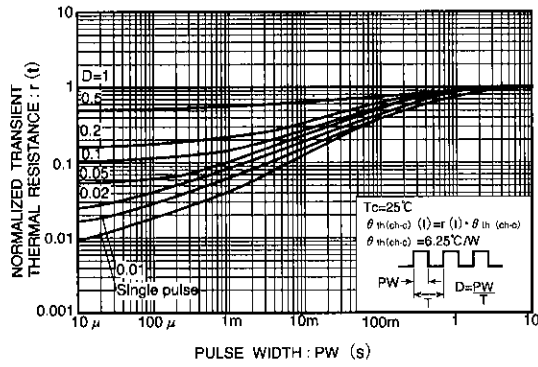


Fig.14 Normalized Transient Thermal Resistance vs. Pulse Width

●Switching characteristics measurement circuit

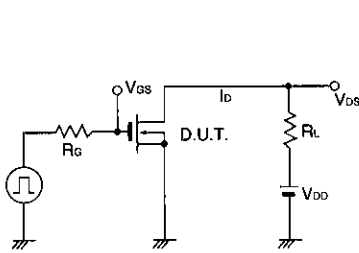


Fig.15 Switching Time Measurement Circuit

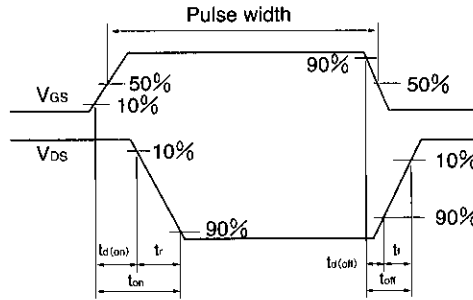


Fig.16 Switching Time Waveforms

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