

# Small switching (60V, 10A)

## 2SK2095N

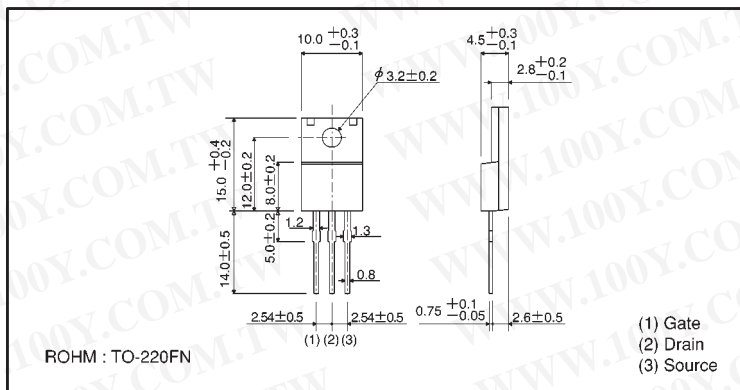
### ●Features

- 1) Low on-resistance.
- 2) Fast switching speed.
- 3) Wide SOA (safe operating area).
- 4) Easily designed drive circuits.
- 5) Low  $V_{GS(th)}$ .
- 6) Easy to parallel.

### ●Structure

Silicon N-channel  
MOSFET

### ●External dimensions (Units: mm)



### ●Absolute maximum ratings ( $T_a = 25^\circ\text{C}$ )

Parameter	Symbol	Limits	Unit
Drain-source voltage	$V_{DS}$	60	V
Gate-source voltage	$V_{GS}$	$\pm 20$	V
Drain current	Continuous	$I_D$	10 A
	Pulsed	$I_{DP}^*$	40 A
Reverse drain current	Continuous	$I_{DR}$	10 A
	Pulsed	$I_{DRP}^*$	40 A
Total power dissipation ( $T_c=25^\circ\text{C}$ )	$P_D$	30	W
Channel temperature	$T_{ch}$	150	$^\circ\text{C}$
Storage temperature	$T_{stg}$	$-55 \sim +150$	$^\circ\text{C}$

\*  $P_w \leq 10 \mu\text{s}$ , Duty cycle  $\leq 1\%$

### ●Packaging specifications

Type	Package	Bulk
	Code	—
	Basic ordering unit (pieces)	500
2SK2095N		○

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●Electrical characteristics (Ta = 25°C)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test Conditions
Gate-source leakage	I <sub>gss</sub>	—	—	±100	nA	V <sub>GS</sub> =±20V, V <sub>DS</sub> =0V
Drain-source breakdown voltage	V <sub>(BR)DSS</sub>	60	—	—	V	I <sub>D</sub> =1mA, V <sub>GS</sub> =0V
Zero gate voltage drain current	I <sub>DSS</sub>	—	—	100	μA	V <sub>DS</sub> =60V, V <sub>GS</sub> =0V
Gate threshold voltage	V <sub>GS(th)</sub>	1.0	—	2.5	V	V <sub>DS</sub> =10V, I <sub>D</sub> =1mA
Static drain-source on-state resistance	R <sub>DS(on)</sub>	—	0.080	0.095	Ω	I <sub>D</sub> =5A, V <sub>GS</sub> =10V
		—	0.11	0.14		I <sub>D</sub> =5A, V <sub>GS</sub> =4V
Forward transfer admittance	Y <sub>fs</sub>  *	5.0	—	—	S	I <sub>D</sub> =5A, V <sub>DS</sub> =10V
Input capacitance	C <sub>iss</sub>	—	1600	—	pF	V <sub>DS</sub> =10V
Output capacitance	C <sub>oss</sub>	—	600	—	pF	V <sub>GS</sub> =0V
Reverse transfer capacitance	C <sub>rss</sub>	—	150	—	pF	f=1MHz
Turn-on delay time	t <sub>d(on)</sub>	—	30	—	ns	I <sub>D</sub> =5A, V <sub>DD</sub> ≠30V
Rise time	t <sub>r</sub>	—	80	—	ns	V <sub>GS</sub> =10V
Turn-off delay time	t <sub>d(off)</sub>	—	300	—	ns	R <sub>L</sub> =6Ω
Fall time	t <sub>f</sub>	—	100	—	ns	R <sub>G</sub> =10Ω

\* Pw≤300 μs, Duty cycle≤1%

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●Electrical characteristic curves

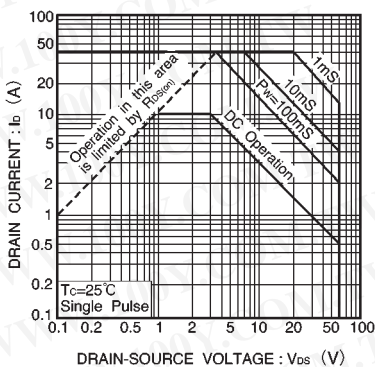


Fig.1 Maximum safe operating area

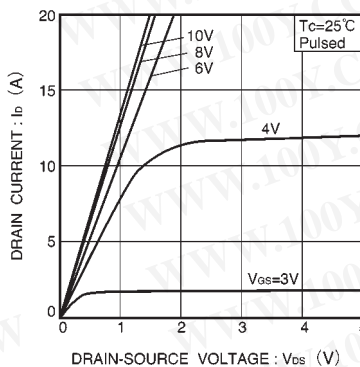


Fig.2 Typical output characteristics

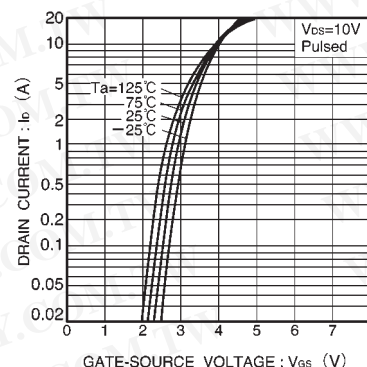


Fig.3 Typical transfer characteristics

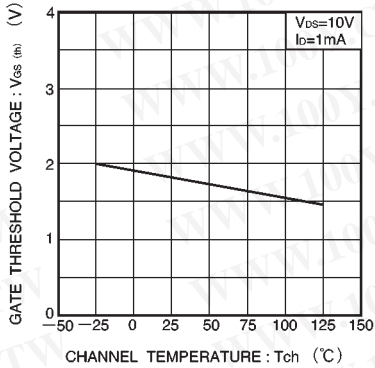


Fig.4 Gate threshold voltage vs. channel temperature

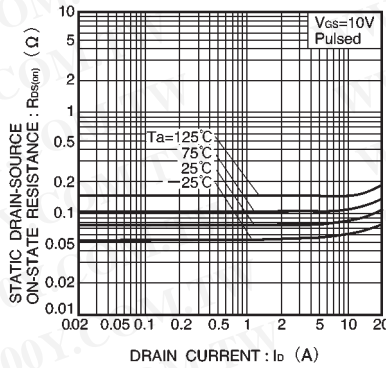


Fig.5 Static drain-source on-state resistance vs. drain current (I)

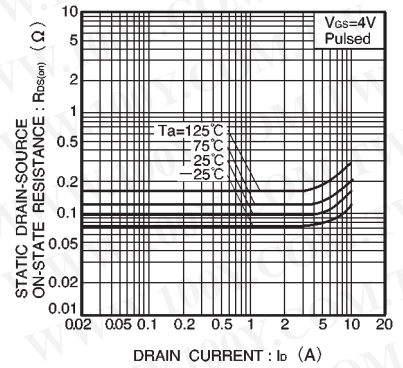


Fig.6 Static drain-source on-state resistance vs. drain current (II)

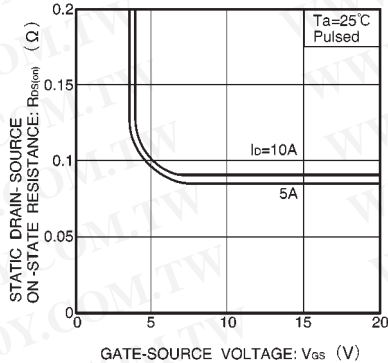


Fig.7 Static drain-source on-state resistance vs. gate-source voltage

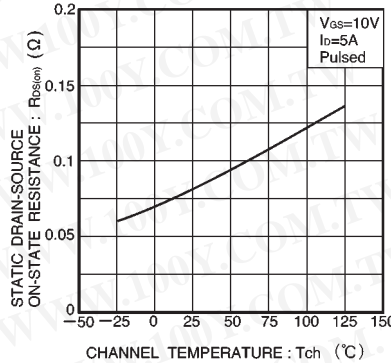


Fig.8 Static drain-source on-state resistance vs. channel temperature

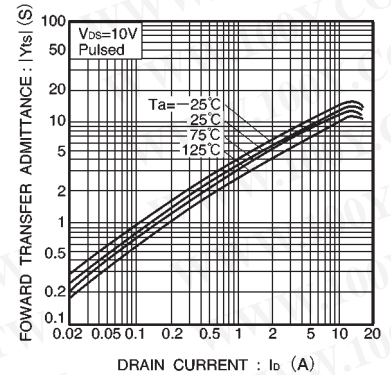


Fig.9 Forward transfer admittance vs. drain current

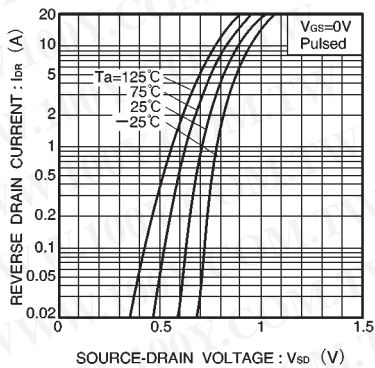


Fig.10 Reverse drain current vs. source-drain voltage (I)

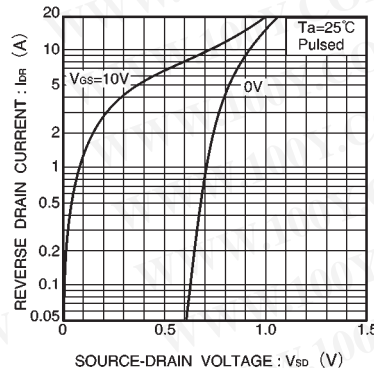


Fig.11 Reverse drain current vs. source-drain voltage (II)

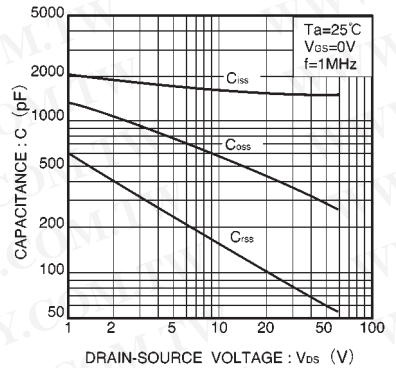


Fig.12 Typical capacitance vs. drain-source voltage

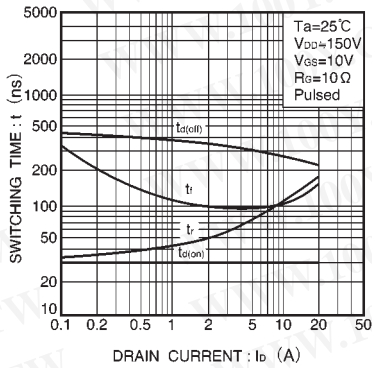


Fig.13 Switching characteristics (See Figures 15 and 16 for the measurement circuit and resultant waveforms.)

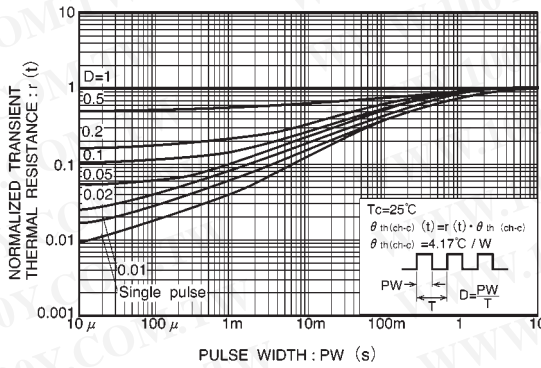


Fig.14 Normalized transient thermal resistance vs. pulse width

● Switching characteristics measurement circuit

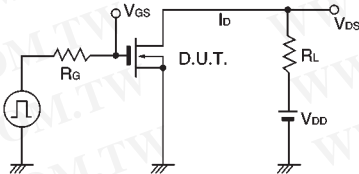


Fig.15 Switching time measurement circuit

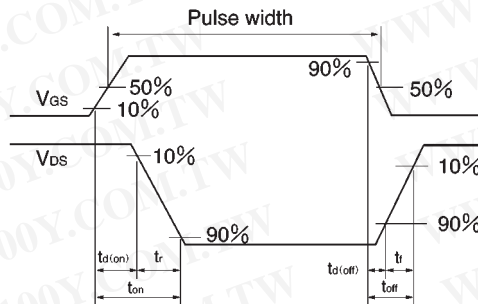


Fig.16 Switching time waveforms

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