

Switching (450V, 7A)

2SK2299N

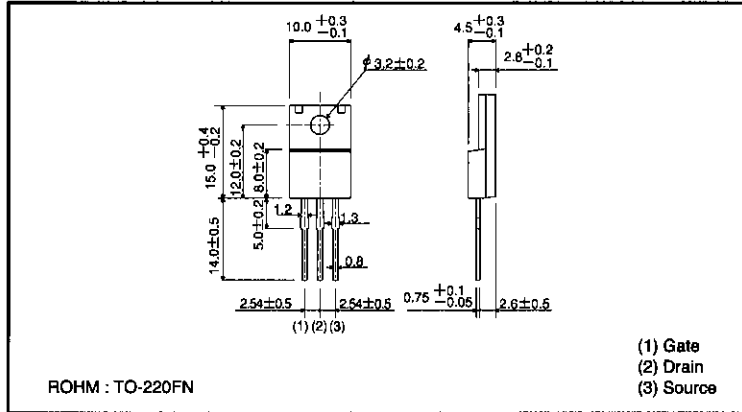
●Features

- 1) Low on-resistance.
- 2) High-speed switching.
- 3) Wide SOA (safe operating area).
- 4) Gate-source voltage guaranteed at $V_{GS} = \pm 30V$.
- 5) Easily designed drive circuits.
- 6) Easy to use in parallel.

●Structure

Silicon N-channel
MOSFET transistor

●External dimensions (Units: mm)



MOS FET

●Absolute maximum ratings ($T_a = 25^\circ C$)

Parameter	Symbol	Limits	Unit	
Drain-source voltage	V_{DS}	450	V	
Gate-source voltage	V_{GS}	± 30	V	
Drain current	Continuous	I_D	7	A
	Pulsed	I_{DP}^*	28	A
Drain reverse current	Continuous	I_{DR}	7	A
	Pulsed	I_{DRP}^*	28	A
Total power dissipation ($T_c=25^\circ C$)	P_D	30	W	
Channel temperature	T_{ch}	150	$^\circ C$	
Storage temperature	T_{stg}	$-55 \sim 150$	$^\circ C$	

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

●Packaging specifications

Type	Package	Bulk
	Code	—
	Basic ordering unit (pieces)	500
2SK2299N		○

●Electrical characteristics (Ta = 25°C)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Gate leakage current	I _{GSS}	—	—	±100	nA	V _{GS} =±30V, V _{DS} =0V
Drain-source breakdown voltage	V _{(BR)DSS}	450	—	—	V	I _D =1mA, V _{GS} =0V
Drain cutoff current	I _{DSS}	—	—	100	μA	V _{DS} =450V, V _{GS} =0V
Gate threshold voltage	V _{GS(th)}	2	—	4	V	V _{DS} =10V, I _D =1mA
Drain-source on-resistance	R _{DS(on)}	—	0.85	1.1	Ω	I _D =4.0A, V _{GS} =10V
Forward propagation admittance	Y _{fs} *	3	5.5	—	S	V _{DS} =10V, I _D =4.0A
Input capacitance	C _{ISS}	—	870	—	pF	V _{DS} =10V
Output capacitance	C _{OSS}	—	180	—	pF	V _{GS} =0
Return capacitance	C _{RSS}	—	40	—	pF	f=1MHz
Turn-on delay time	t _{d(on)}	—	15	—	ns	I _D =4A, V _{DD} =150V
Rise time	t _r	—	18	—	ns	V _{GS} =10V
Turn-off delay time	t _{d(off)}	—	60	—	ns	R _L =37.5Ω
Fall time	t _f	—	35	—	ns	R _G =10Ω
Reverse recovery time	t _{rr}	—	400	—	ns	I _{DR} =7A, V _{GS} =0V
Reverse recovery load	Q _{rr}	—	2.5	—	μC	di/dt=100A/μs

* Pw≤300 μs, Duty cycle≤1%

●Electrical characteristic curves

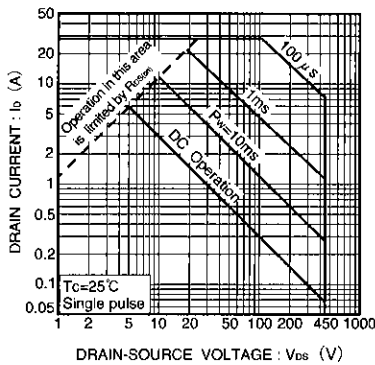


Fig.1 Maximum Safe Operating Area

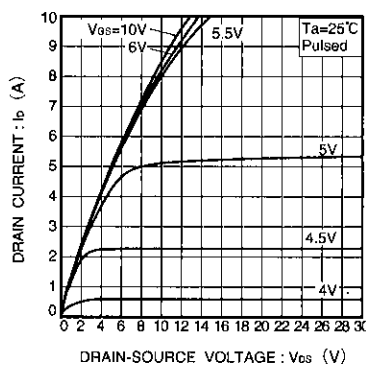


Fig.2 Typical Output Characteristics

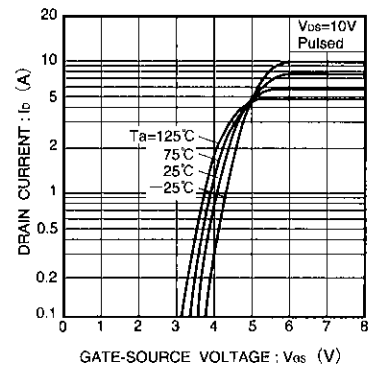


Fig.3 Typical Transfer Characteristics

●Electrical characteristic curves

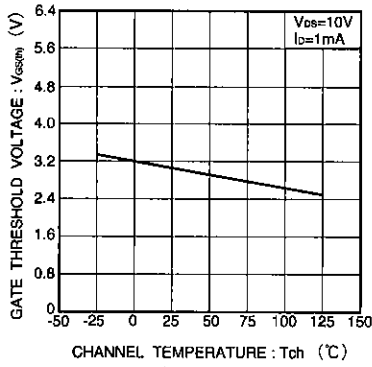


Fig.4 Gate Threshold Voltage vs. Channel Temperature

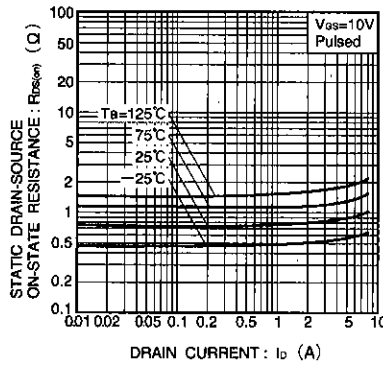


Fig.5 Static Drain-Source On-State Resistance vs. Drain Current

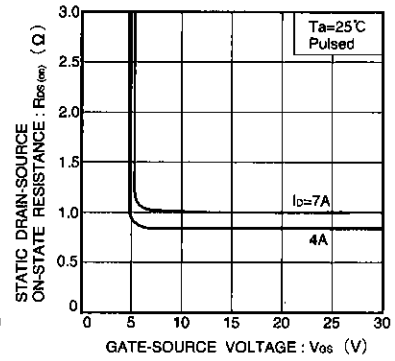


Fig.6 Static Drain-Source On-State Resistance vs. Gate-Source Voltage

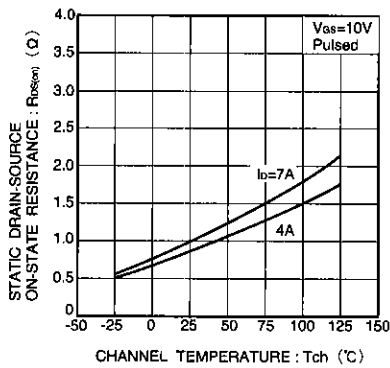


Fig.7 Static Drain-Source On-State Resistance vs. Channel Temperature

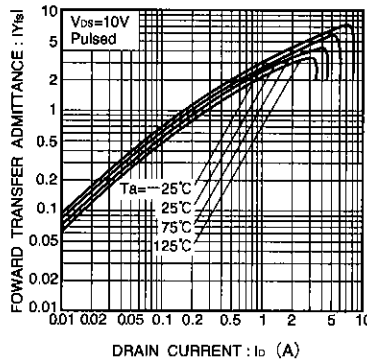


Fig.8 Forward Transfer Admittance vs. Drain Current

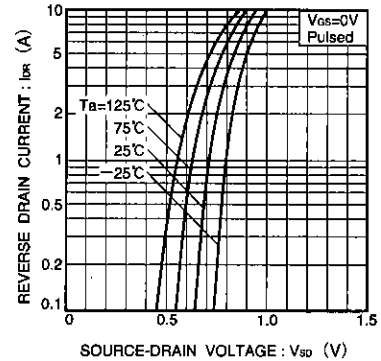


Fig.9 Reverse Drain Current vs. Source-Drain Voltage (I)

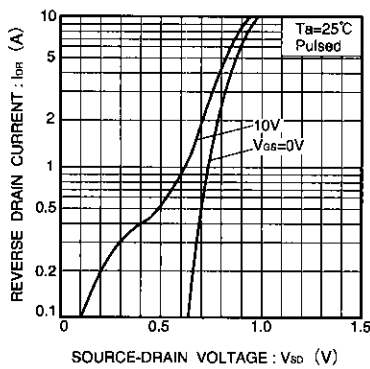


Fig.10 Reverse Drain Current vs. Source-Drain Voltage (II)

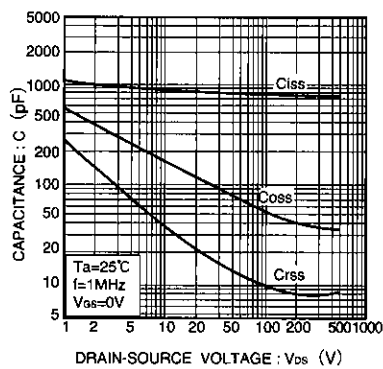


Fig.11 Typical Capacitance vs. Drain-Source Voltage

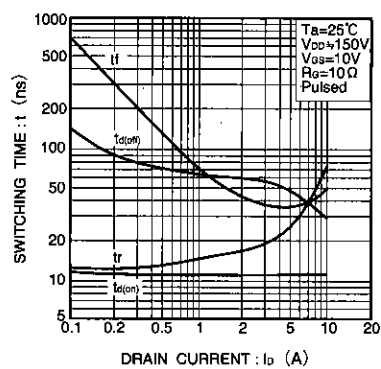


Fig.12 Switching Characteristics (See Figure. 16 and 17 for measurement circuits)

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● Electrical characteristic curves

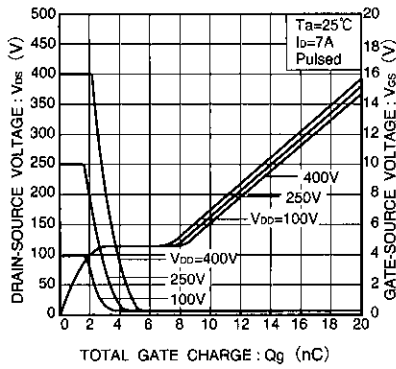


Fig.13 Dynamic Input Characteristics (See Fig. 18 for measurement circuit)

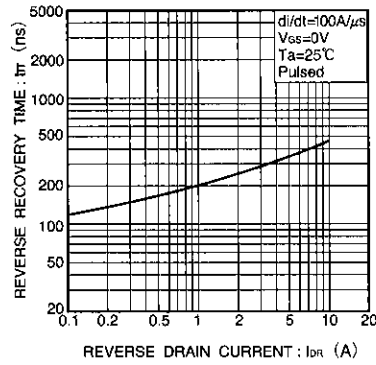


Fig.14 Reverse Recovery Time vs. Reverse Drain Current

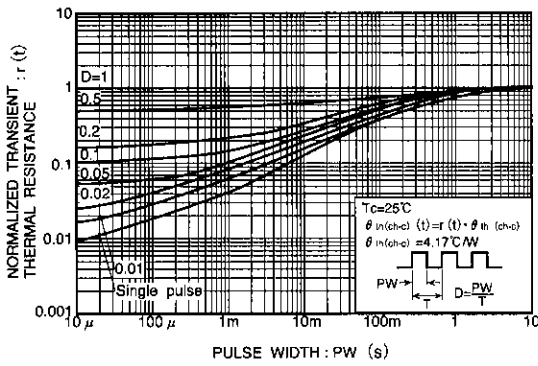


Fig.15 Normalized Transient Thermal Resistance Vs. Pulse Width

● Switching characteristics measurement circuit

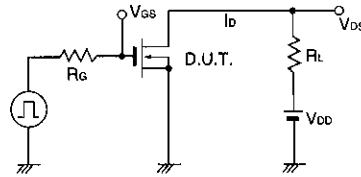


Fig.16 Switching Time Measurement Circuit

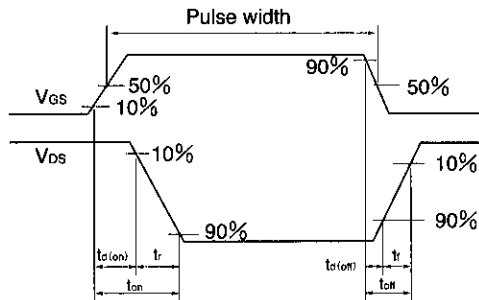


Fig.17 Switching Time Waveforms

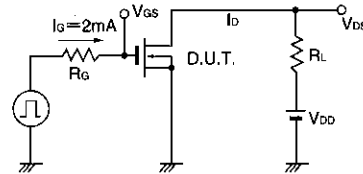


Fig.18 Gate Charge Measurement Circuit

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