

Switching (300V, 16A)

2SK2739

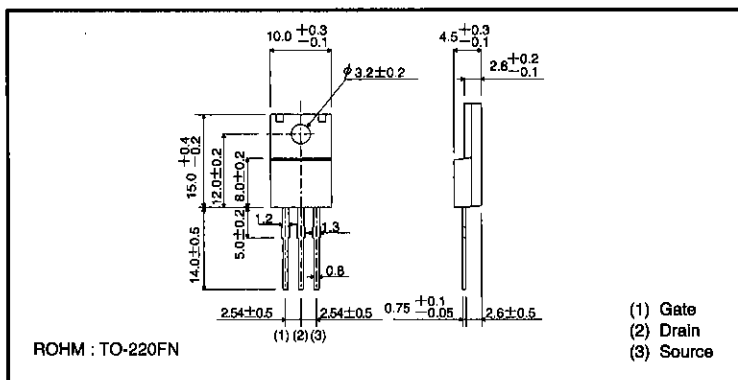
●Features

- 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}	300	V
Gate-source voltage	V_{GS}	± 30	V
Drain current	Continuous	I_D	16 A
	Pulsed	I_{DP}^*	48 A
Drain reverse current	Continuous	I_{DR}	16 A
	Pulsed	I_{DRP}^*	48 A
Total power dissipation ($T_c=25^\circ C$)	P_D	30	W
Channel temperature	T_{ch}	150	$^\circ C$
Storage temperature	T_{stg}	-55~150	$^\circ C$

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

●Packaging specifications

Type	Package	Bulk
	Code	—
	Basic ordering unit (pieces)	500
2SK2739		○

●Electrical characteristics (Ta = 25°C)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Gate leakage current	I_{GSS}	—	—	± 100	nA	$V_{GS} = \pm 30V, V_{DS} = 0V$
Drain-source breakdown voltage	$V_{(BR)DSS}$	300	—	—	V	$I_D = 1mA, V_{GS} = 0V$
Drain cutoff current	I_{DSS}	—	—	100	μA	$V_{DS} = 300V, V_{GS} = 0V$
Gate threshold voltage	$V_{GS(th)}$	2	—	4	V	$V_{DS} = 10V, I_D = 1mA$
Drain-source on-state resistance	$R_{DS(on)}$	—	0.27	0.33	Ω	$I_D = 8A, V_{GS} = 10V$
Forward transfer admittance	$ Y_{fs} ^*$	5	10	—	S	$V_{DS} = 10V, I_D = 8A$
Input capacitance	C_{iss}	—	1240	—	pF	$V_{DS} = 10V$
Output capacitance	C_{oss}	—	350	—	pF	$V_{GS} = 0V$
Reverse transfer capacitance	C_{rss}	—	73	—	pF	$f = 1MHz$
Turn-on delay time	$t_{d(on)}$	—	19	—	ns	$I_D = 8A, V_{DD} = 100V$
Rise time	t_r	—	24	—	ns	$V_{GS} = 10V$
Turn-off delay time	$t_{d(off)}$	—	66	—	ns	$R_L = 12.5\Omega$
Fall time	t_f	—	22	—	ns	$R_G = 10\Omega$
Reverse recovery time	t_{rr}	—	230	—	ns	$I_{DR} = 16A, V_{GS} = 0V$
Reverse recovery load	Q_{rr}	—	1.8	—	μC	$di/dt = 100A/\mu s$

* $P_w \leq 300 \mu s$, Duty cycle $\leq 1\%$

●Electrical characteristic curves

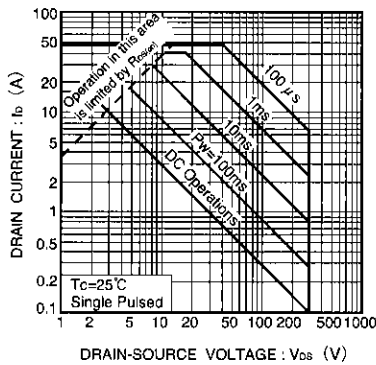


Fig.1 Maximum Safe Operating Area

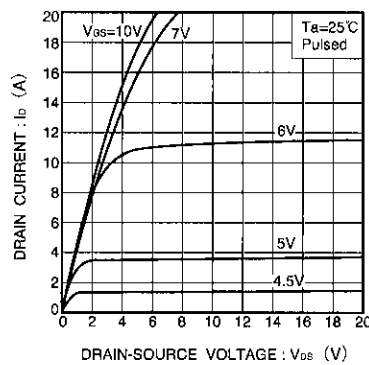


Fig.2 Typical Output Characteristics

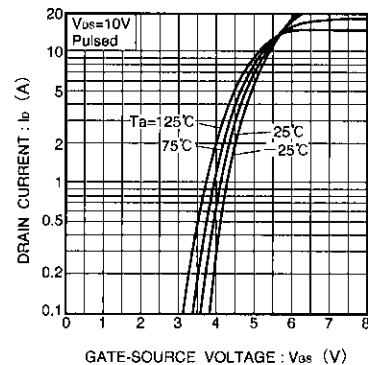


Fig.3 Typical Transfer Characteristics

● Electrical characteristic curves

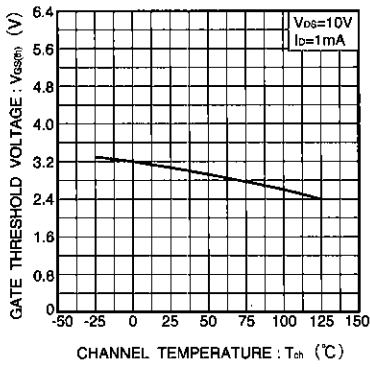


Fig.4 Gate Threshold Voltage vs. Channel Temperature

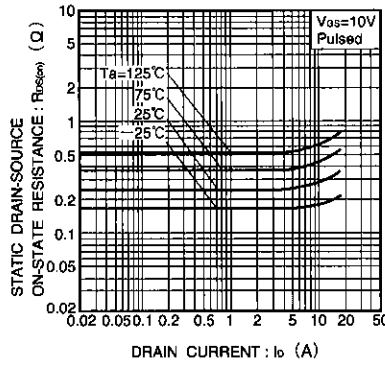


Fig.5 Static Drain-Source On-State Resistance vs. Drain Current

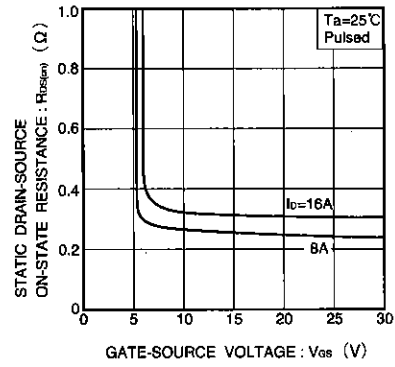


Fig.6 Static Drain-Source On-State Resistance vs. Gate-Source Voltage

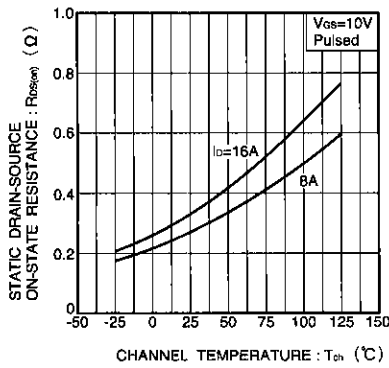


Fig.7 Static Drain-Source On-State Resistance vs. Channel Temperature

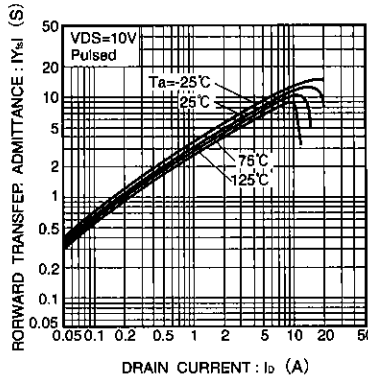


Fig.8 Forward Transfer Admittance vs. Drain Current

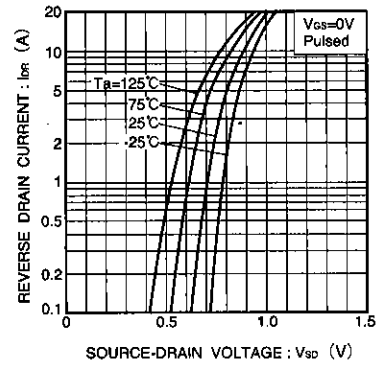


Fig.9 Reverse Drain Current vs. Source-Drain Voltage (I)

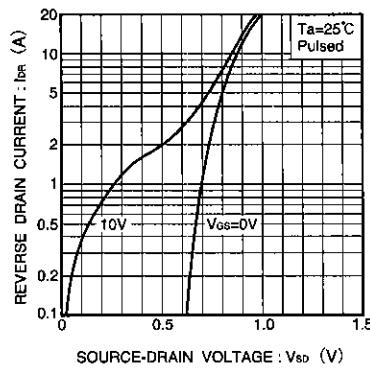


Fig.10 Reverse Drain Current vs. Source-Drain Voltage (II)

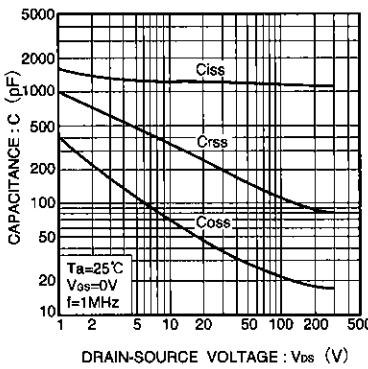


Fig.11 Typical Capacitance vs. Drain-Source Voltage

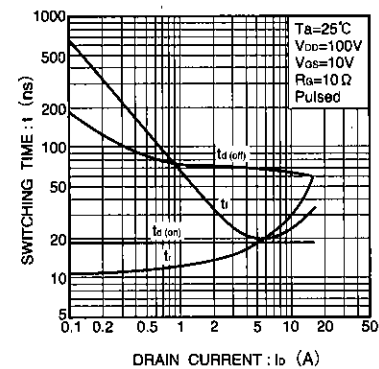


Fig.12 Switching Characteristics (See Figure. 16 and 17 for measurement circuits)

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● Electrical characteristic curves

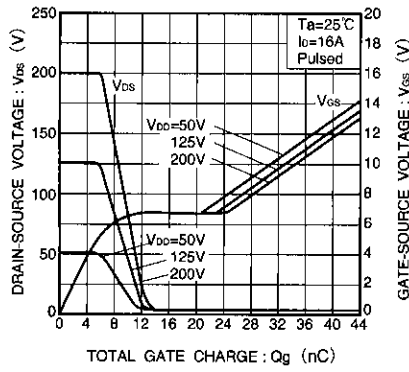


Fig.13 Dynamic Input Characteristics (See Fig. 18 for measurement circuit)

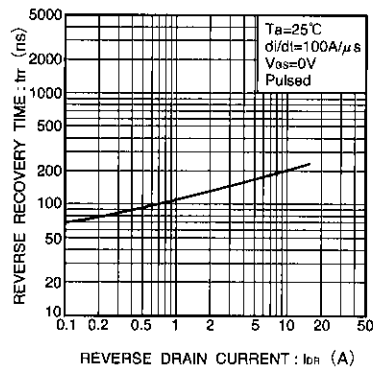


Fig.14 Reverse Recovery Time vs. Reverse Drain Current

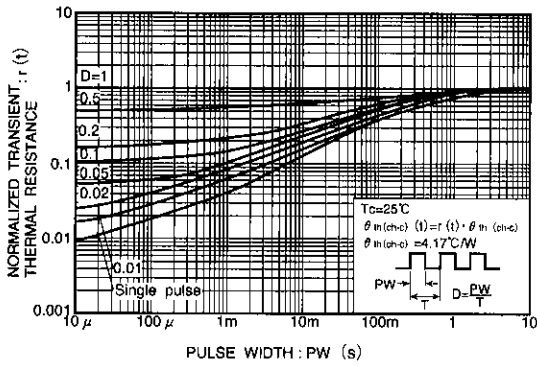


Fig.15 Normalized Transient Thermal Resistance vs. Pulse Width

● Switching characteristics measurement circuit

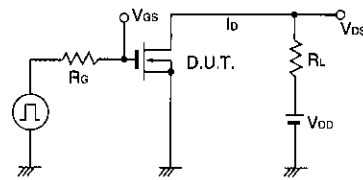


Fig.16 Switching Time Measurement Circuit

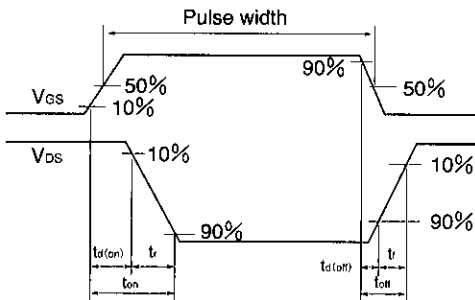


Fig.17 Switching Time Waveforms

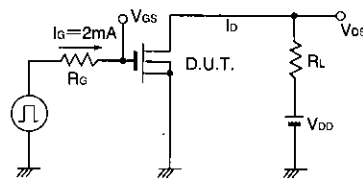


Fig.18 Gate Charge Measurement Circuit

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