

Interface and switching (30V, 200mA)

2SK2731

●Structure

Silicon N-channel
MOSFET

●Features

- 1) Low on-resistance.
- 2) High-speed switching.
- 3) Low-voltage drive(4V).

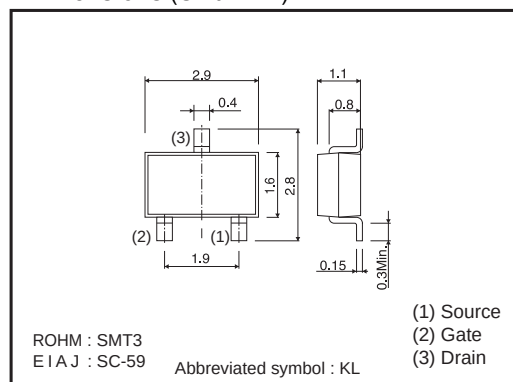
●Application

Switching

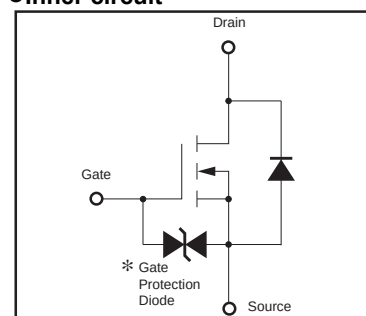
●Packaging specifications

Type	Package	Taping
	Code	T146
	Basic ordering unit (pieces)	3000
2SK2731		○

●Dimensions (Unit : mm)



●Inner circuit



* A protection diode is included between the gate and the source terminals to protect the diode against static electricity when the product is in use. Use a protection circuit when the fixed voltage are exceeded.

●Absolute maximum ratings (Ta=25°C)

Parameter	Symbol	Limits	Unit
Drain-source voltage	V_{DS}	30	V
Gate-source voltage	V_{GS}	± 20	V
Drain current	Continuous	I_D	200 mA
	Pulsed	I_{DP}^*	800 mA
Total power dissipation	P_D	200	mW
Channel temperature	T_{ch}	150	°C
Storage temperature	T_{stg}	-55 to +150	°C

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

●Electrical characteristics (Ta=25°C)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Gate-source leakage	I_{GSS}	—	—	± 10	μA	$V_{GS} = \pm 20V, V_{DS} = 0V$
Drain-source breakdown voltage	$V_{(BR) DSS}$	30	—	—	V	$I_D = 1mA, V_{GS} = 0V$
Zero gate voltage drain current	I_{DSS}	—	—	10	μA	$V_{DS} = 30V, V_{GS} = 0V$
Gate threshold voltage	$V_{GS(th)}$	1.0	—	2.5	V	$V_{DS} = 10V, I_D = 1mA$
Static drain-source on-state resistance	$R_{DS(on)}$	—	1.5	2.8	Ω	$I_D = 0.1A, V_{GS} = 10V$
		—	2.8	4.5		$I_D = 0.1A, V_{GS} = 4V$
Forward transfer admittance	$ Y_{fs} ^*$	100	—	—	mS	$I_D = 0.1A, V_{DS} = 10V$
Input capacitance	C_{iss}	—	25	—	pF	$V_{DS} = 10V$
Output capacitance	C_{oss}	—	15	—	pF	$V_{GS} = 0V$
Reverse transfer capacitance	C_{rss}	—	10	—	pF	$f = 1MHz$
Turn-on delay time	$t_{d(on)}$	—	15	—	ns	$I_D = 0.1A, V_{DD} \doteq 15V$
Rise time	t_r	—	20	—	ns	$V_{GS} = 10V$
Turn-off delay time	$t_{d(off)}$	—	90	—	ns	$R_L = 150\Omega$
Fall time	t_f	—	100	—	ns	$R_G = 10\Omega$

* $P_w \leq 300ms$, Duty cycle $\leq 1\%$

●Electrical characteristic curves

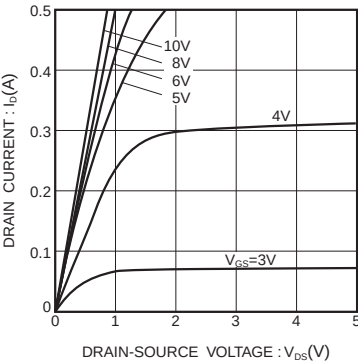


Fig.1 Typical Output Characteristics

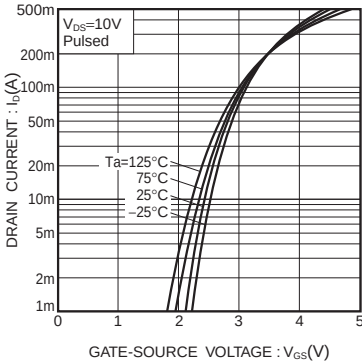


Fig.2 Typical Transfer Characteristics

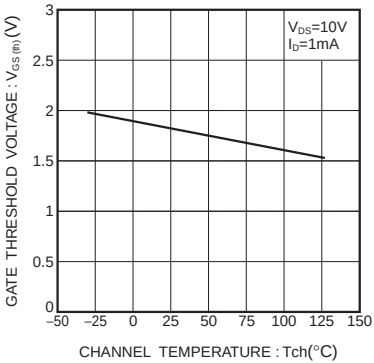


Fig.3 Gate Threshold Voltage vs. Channel Temperature

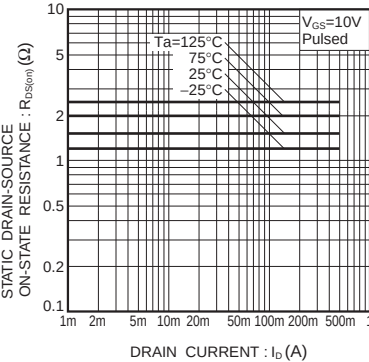


Fig.4 Static Drain-Source On-State Resistance vs. Drain Current (I)

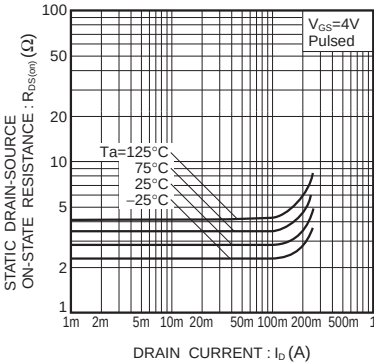


Fig.5 Static Drain-Source On-State Resistance vs. Drain Current (II)

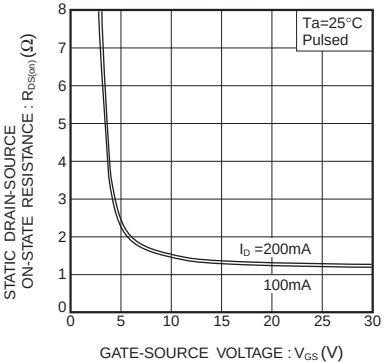


Fig.6 Static Drain-Source On-State Resistance vs. Gate-Source Voltage

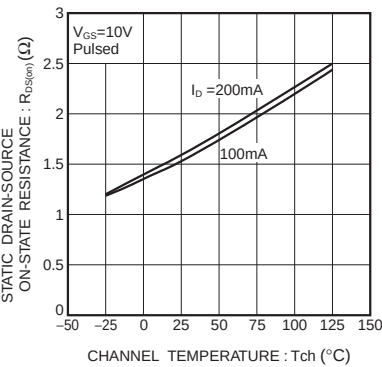


Fig.7 Static Drain-Source On-State Resistance vs. Channel Temperature

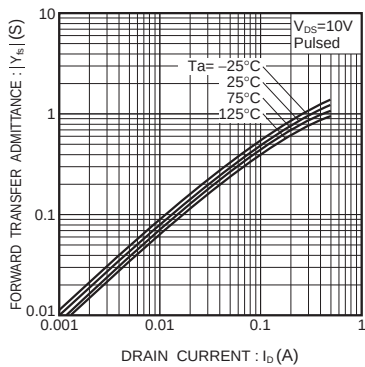


Fig.8 Forward Transfer Admittance vs. Drain Current

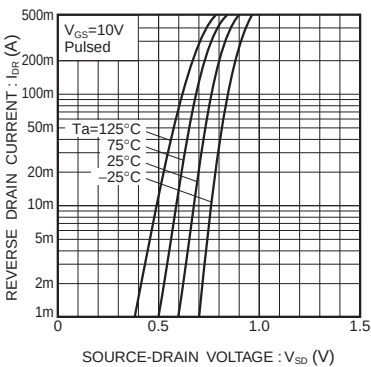


Fig.9 Reverse Drain Current vs. Source-Drain Voltage (I)

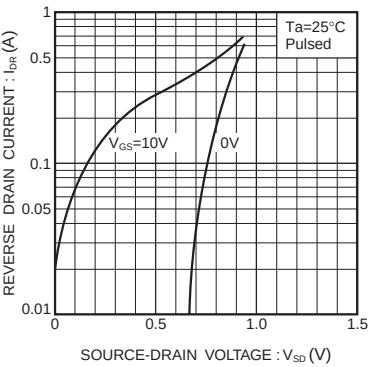


Fig.10 Reverse Drain Current vs. Source-Drain Voltage (II)

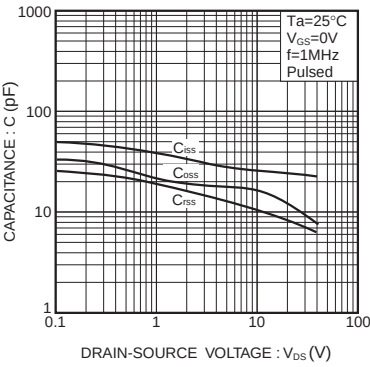


Fig.11 Typical Capacitance vs. Drain-Source Voltage

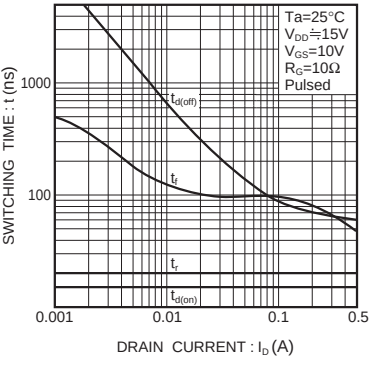


Fig.12 Switching Characteristics (See Figure. 13 and 14 for measurement circuit)

●Measurement circuit

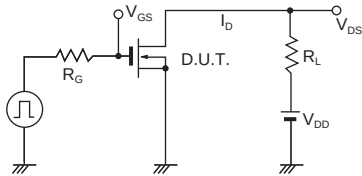


Fig.13 Switching Time Test Circuit

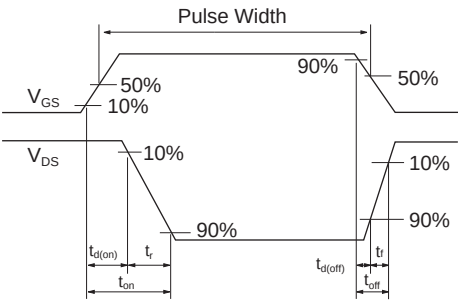


Fig.14 Switching Time Waveforms

Notes

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