

Interface and switching (30V, 200mA)

2SK2731

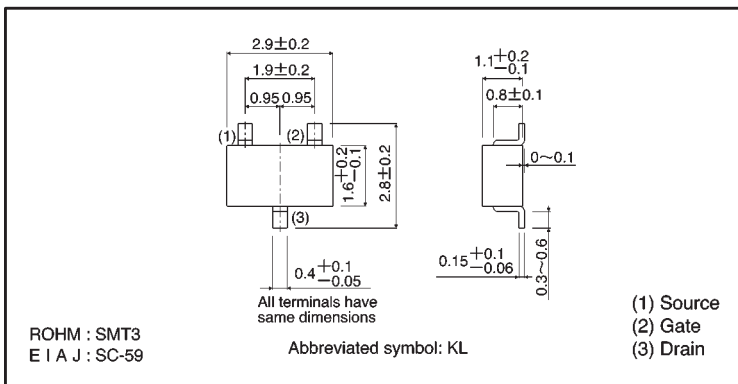
●Features

- 1) Low on-resistance.
- 2) Fast switching speed.
- 3) Low-voltage drive (4V).
- 4) Easily designed drive circuits.
- 5) Easy to parallel.

●Structure

Silicon N-channel
MOSFET

●External dimensions (Units: mm)

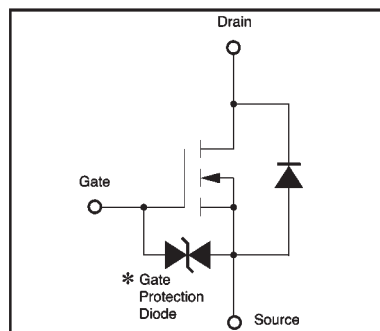


●Absolute maximum ratings (Ta = 25°C)

Parameter	Symbol	Limits	Unit
Drain-source voltage	V _{DSS}	30	V
Gate-source voltage	V _{GSS}	±20	V
Drain current	Continuous	I _D	200 mA
	Pulsed	I _{DP} *	800 mA
Reverse drain current	Continuous	I _{DR}	200 mA
	Pulsed	I _{DRP} *	800 mA
Total power dissipation	P _D	200	mW
Channel temperature	T _{ch}	150	°C
Storage temperature	T _{stg}	-55~+150	°C

* P_w ≤ 10 μs, Duty cycle ≤ 1%

●Equivalent 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.

●Electrical characteristics (Ta = 25°C)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test 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	$I_D = 0.1A, V_{DD} \approx 15V$
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	$R_G = 10\Omega$

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

●Packaging specifications

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

●Electrical characteristic curves

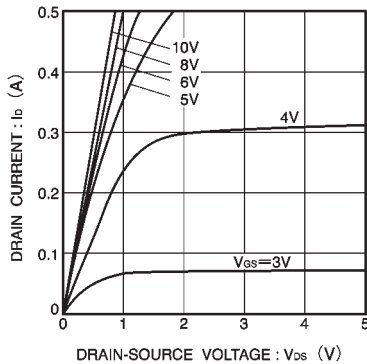


Fig.1 Typical output characteristics

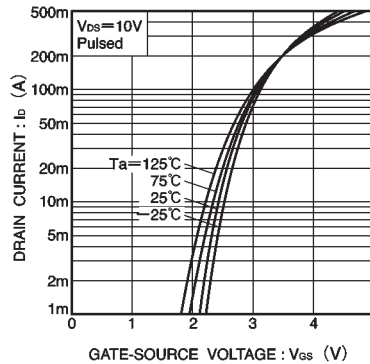


Fig.2 Typical transfer characteristics

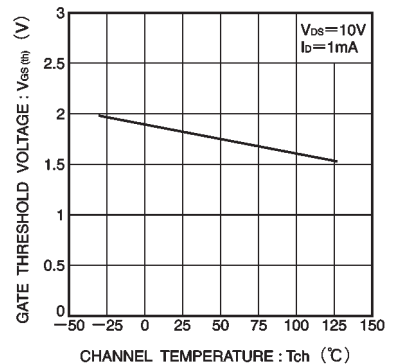


Fig.3 Gate threshold voltage vs. channel temperature

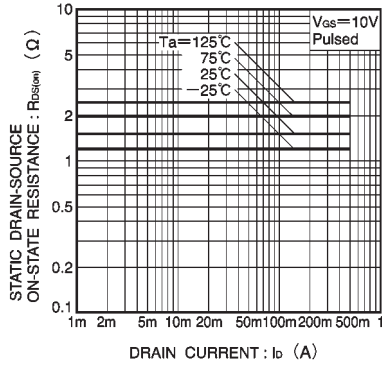


Fig. 4 Static drain-source on-state resistance vs. drain current (I)

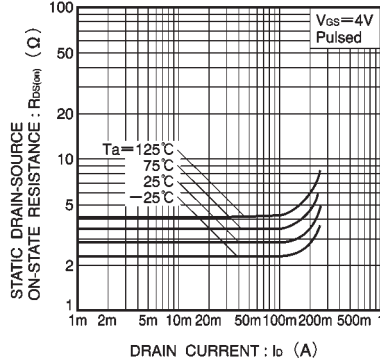


Fig. 5 Static drain-source on-state resistance vs. drain current (II)

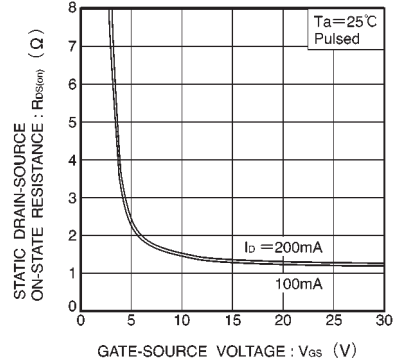


Fig. 6 Static drain-source on-state resistance vs. gate-source voltage

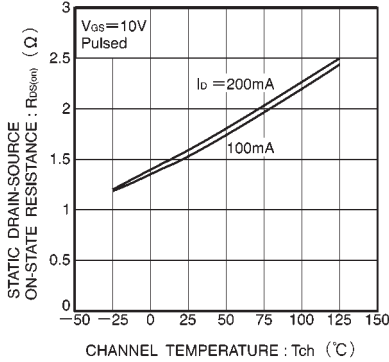


Fig. 7 Static drain-source on-state resistance vs. channel temperature

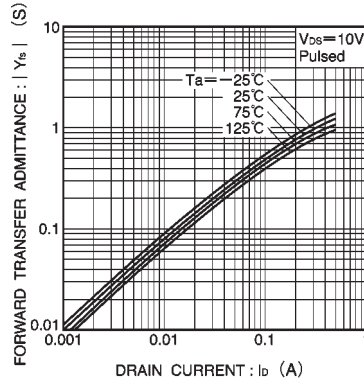


Fig. 8 Forward transfer admittance vs. drain current

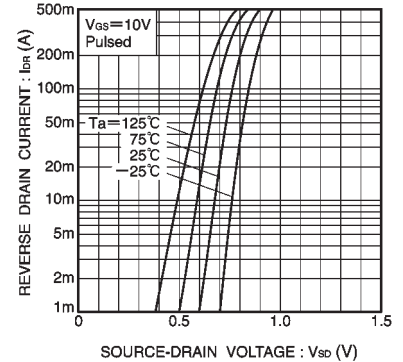


Fig. 9 Reverse drain current vs. source-drain voltage (I)

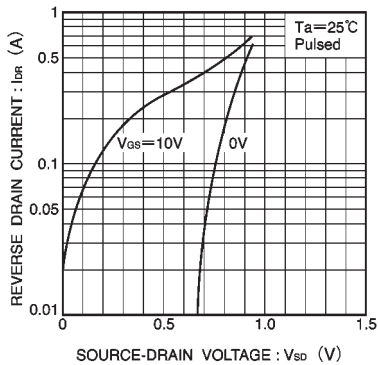


Fig. 10 Reverse drain current vs. source-drain voltage (II)

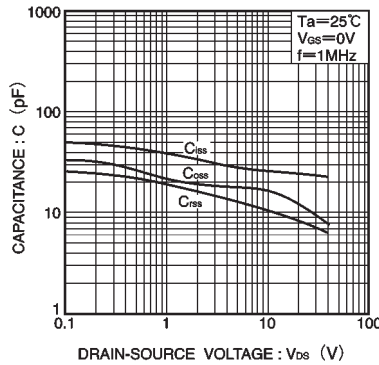


Fig. 11 Typical capacitance vs. drain-source voltage

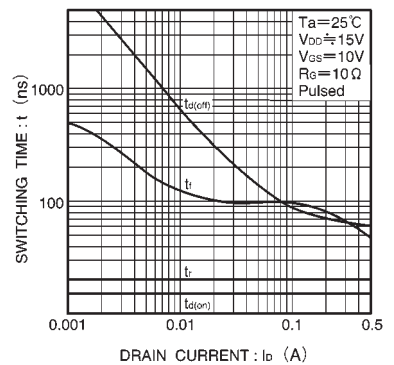


Fig. 12 Switching characteristics (See Figures 13 and 14 for the measurement circuit and resultant waveforms)

● Switching characteristics measurement circuit

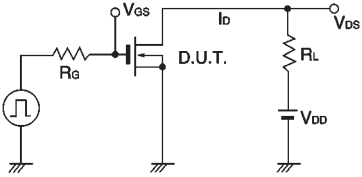


Fig.13 Switching time measurement circuit

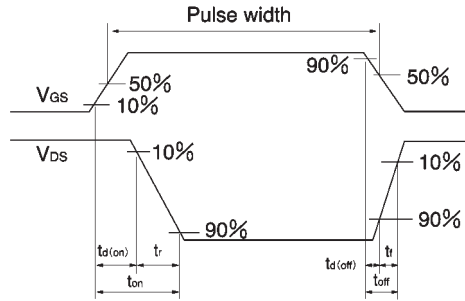


Fig.14 Switching time waveforms