

Interface and switching (60V, 115mA)

RK7002

●Structure

Silicon N-channel
MOSFET

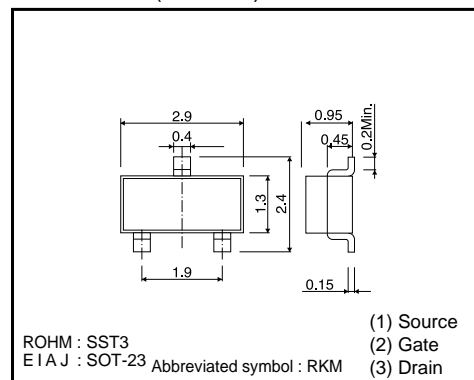
●Features

- 1) Low on-resistance.
- 2) High-speed switching.
- 3) Low-voltage drive(5V).

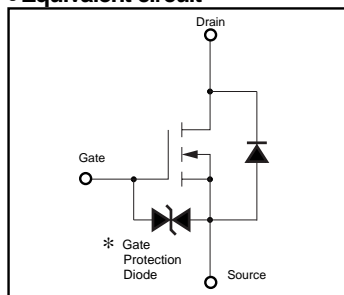
●Application

Switching

●Dimensions (Unit : mm)



●Equivalent circuit



* A protection diode has been built in between the gate and the source to protect against static electricity when the product is in use. Use the protection circuit when fixed voltages are exceeded.

●Absolute maximum ratings (Ta=25°C)

Parameter	Symbol	Limits	Unit
Drain-source voltage	V_{DSS}	60	V
Gate-source voltage	V_{GSS}	± 20	V
Drain current	Continuous	I_D	115 mA
	Pulsed	I_{DP}^{*1}	800 mA
Reverse drain current	Continuous	I_{DR}	115 mA
	Pulsed	I_{DRP}^{*1}	800 mA
Total power dissipation	P_D^{*2}	225	mW
Channel temperature	T_{ch}	150	°C
Storage temperature	T_{stg}	-55 to +150	°C

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

*2 When mounted on a 1x0.75x0.062 inch glass epoxy board.

Transistors

●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	$V_{(BR)DSS}$	60	-	-	V	$I_D = 10\mu A, V_{GS} = 0V$
Zero gate voltage drain current	I_{DSS}	-	-	1.0	μA	$V_{DS} = 60V, V_{GS} = 0V$
Gate threshold voltage	$V_{GS(th)}$	1.0	1.85	2.5	V	$V_{DS} = 10V, I_D = 1mA$
Static drain-source on-state resistance	$R_{DS(on)}$ *	-	-	7.5	Ω	$I_D = 0.5A, V_{GS} = 10V$
		-	-	7.5		$I_D = 0.05A, V_{GS} = 5V$
Forward transfer admittance	$ Y_{fs} $ *	80	-	-	mS	$I_D = 0.2A, V_{DS} = 10V$
Input capacitance	C_{iss}	-	25	50	pF	$V_{DS} = 25V$
Output capacitance	C_{oss}	-	10	25	pF	$V_{GS} = 0V$
Reverse transfer capacitance	C_{rss}	-	3.0	5.0	pF	$f = 1MHz$
Turn-on delay time	$t_{d(on)}$ *	-	12	20	ns	$I_D = 0.2A, V_{DD} \approx 30V, V_{GS} = 10V,$
Turn-off delay time	$t_{d(off)}$ *	-	20	30	ns	$R_L = 150\Omega, R_G = 10\Omega$

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

●Electrical characteristic curves

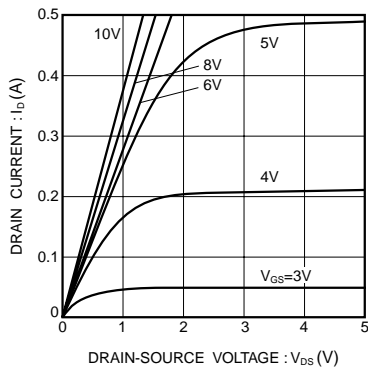


Fig.1 Typical Output Characteristics

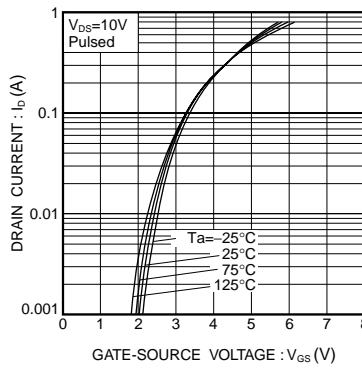


Fig.2 Typical Transfer Characteristics

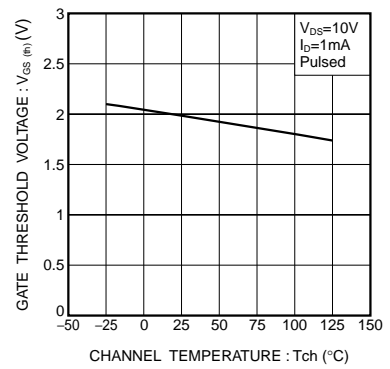


Fig.3 Gate Threshold Voltage vs. Channel Temperature

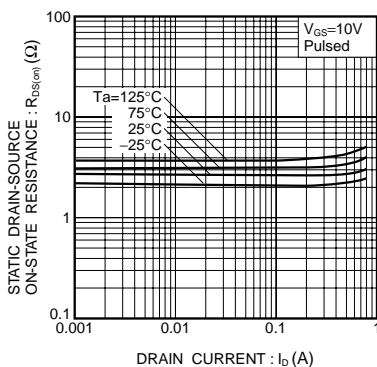


Fig.4 Static Drain-Source On-State Resistance vs. Drain Current (I)

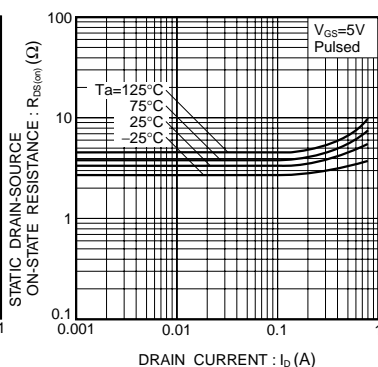


Fig.5 Static Drain-Source On-State Resistance vs. Drain Current (II)

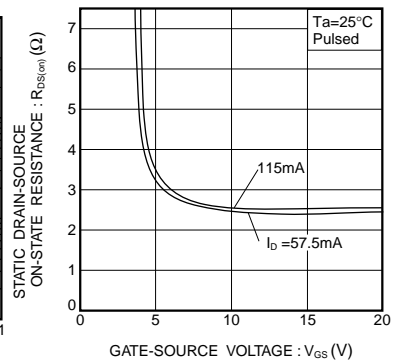


Fig.6 Static Drain-Source On-State Resistance vs. Gate-Source Voltage

Transistors

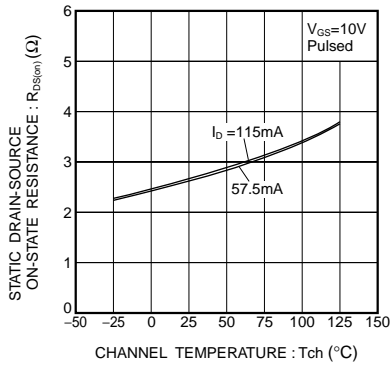


Fig.7 Static Drain-Source On-State Resistance vs. Channel Temperature

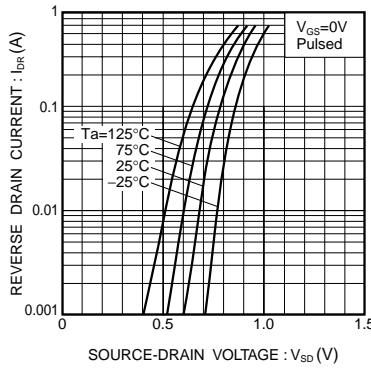


Fig.8 Reverse Drain Current vs. Source-Drain Voltage (I)

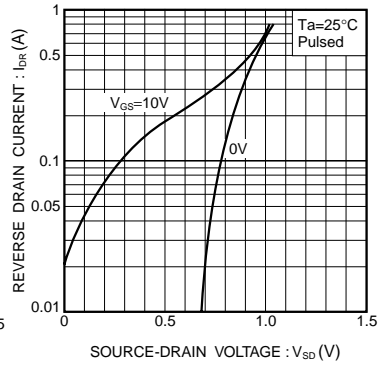


Fig.9 Reverse Drain Current vs. Source-Drain Voltage (II)

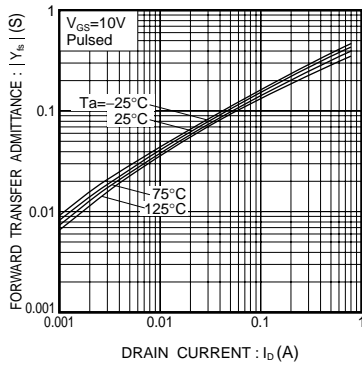


Fig.10 Reverse Drain Current vs. Source-Drain Voltage (II)

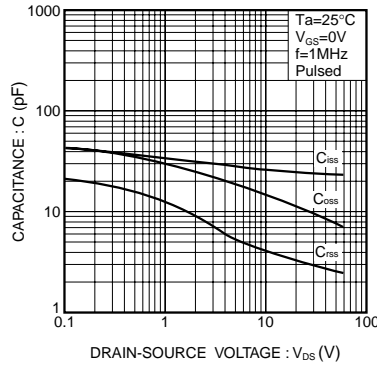


Fig.11 Typical Capacitance vs. Drain-Source Voltage

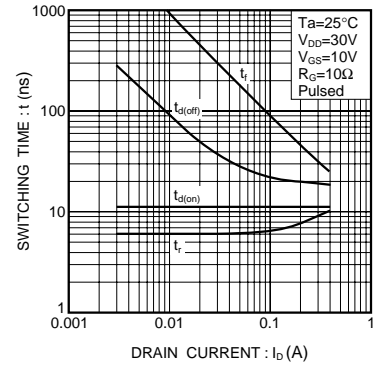


Fig.12 Switching Characteristics (See Figure. 13 and 14 for measurement circuits)

●Measurement circuit

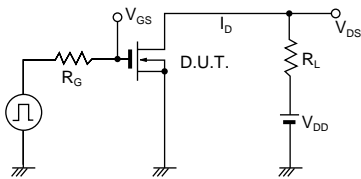


Fig.13 Switching Time Test Circuit

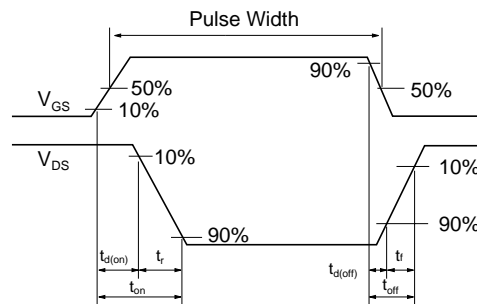


Fig.14 Switching Time Waveforms

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