

Switching (60V, 300mA)

RK7002A

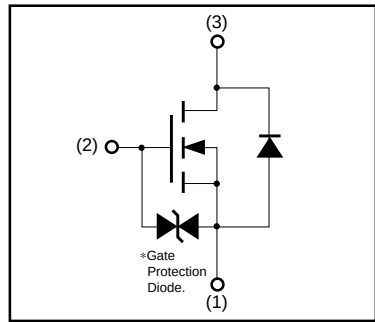
●Features

- 1) Low on-resistance.
- 2) High ESD
- 3) High-speed switching.
- 4) Low-voltage drive (4V).
- 5) Easily designed drive circuits.
- 6) Easy to use in parallel.

●Structure

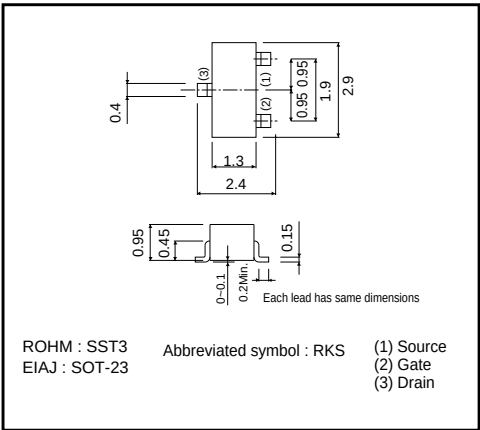
Silicon N-channel
MOSFET transistor

●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.

●External dimensions (Units : mm)



●Absolute maximum ratings (Ta=25°C)

Parameter		Symbol	Limits	Unit
Drain-source voltage		V_{DS}	60	V
Gate-source voltage		V_{GS}	±20	V
Drain current	Continuous	I_D	300	mA
	Pulsed	I_{DP}^{*1}	1.2	A
Drain reverse current	Continuous	I_{DR}	300	mA
	Pulsed	I_{DRP}^{*1}	1.2	A
Total power dissipation		P_D^{*2}	200	mW
Channel temperature		T_{ch}	150	°C
Storage temperature		T_{stg}	-55~+150	°C

*1 $P_w \leq 10\mu s$, Duty cycle $\leq 1\%$
*2 When using 1×0.75×0.062 inch glass epoxy board.

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●Electrical characteristics (Ta=25°C)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test Conditions
Gate leakage current	I_{GSS}	—	—	± 10	μA	$V_{GS}=\pm 20V$, $V_{DS}=0V$
Drain-source breakdown voltage	$V_{(BR)DSS}$	60	—	—	V	$I_D=10\mu A$, $V_{GS}=0V$
Drain cutoff current	I_{DSS}	—	—	1	μA	$V_{DS}=60V$, $V_{GS}=0V$
Gate threshold voltage	$V_{GS(th)}$	1	—	2.5	V	$V_{DS}=10V$, $I_D=1mA$
Drain-source on-state resistance	$R_{DS(on)}^{*1}$	—	0.7	1.0	Ω	$I_D=300mA$, $V_{GS}=10V$
		—	1.1	1.5		$I_D=300mA$, $V_{GS}=4V$
Forward transfer admittance	$ Y_{fs} ^{*1}$	200	—	—	mS	$V_{DS}=10V$, $I_D=300mA$
Input capacitance	C_{iss}	—	33	—	pF	$V_{DS}=10V$ $V_{GS}=0V$ $f=1MHz$
Output capacitance	C_{oss}	—	14	—	pF	
Reverse transfer capacitance	C_{rss}	—	9	—	pF	
Turn-on delay time	$t_{d(on)}^{*2}$	—	6	—	ns	$I_D=150mA$, $V_{DD}=30V$ $V_{GS}=10V$
Rise time	t_r^{*2}	—	5	—	ns	
Turn-off delay time	$t_{d(off)}^{*2}$	—	13	—	ns	$R_L=200\Omega$ $R_{GS}=10\Omega$
Fall time	t_f^{*2}	—	80	—	ns	
Total gate charge	Q_g^{*2}	—	3	6	nC	$V_{DD}=30V$ $V_{GS}=10V$ $I_D=200mA$
Gate-source charge	Q_{gs}^{*2}	—	0.6	—	nC	
Gate-drain charge	Q_{gd}^{*2}	—	0.5	—	nC	

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

*2 Pulsed

●Packaging specifications

Type	Package	Taping
	Code	T116
	Basic ordering unit (pieces)	3000
RK7002A		○

●Electrical characteristic curves

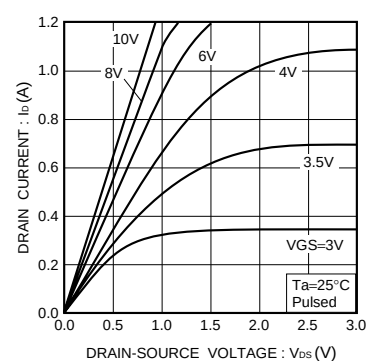


Fig.1 Typical output characteristics

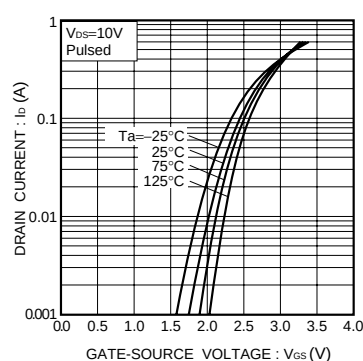
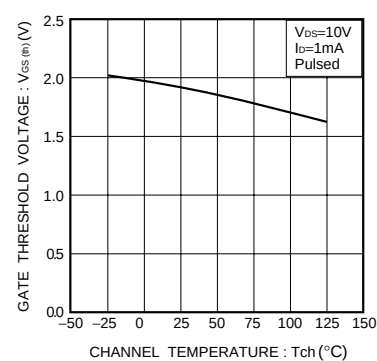


Fig.2 Typical transfer characteristics

Fig.3 Gate threshold voltage
vs. channel temperature

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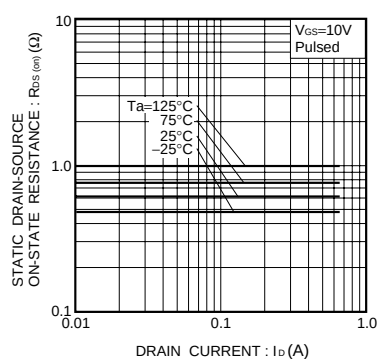


Fig.4 Static drain-source on-state resistance vs. drain current (I)

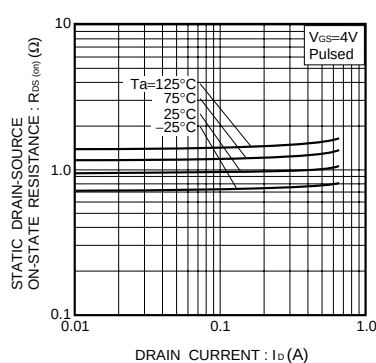


Fig.5 Static drain-source on-state resistance vs. drain current (II)

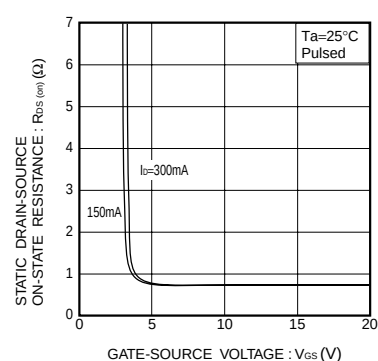


Fig.6 Static drain-source on-state resistance vs. gate-source voltage

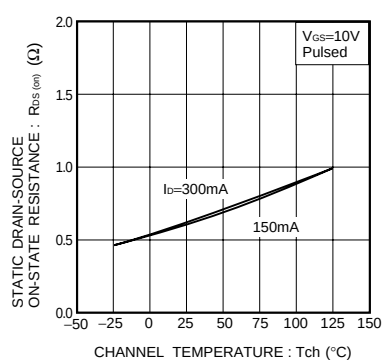


Fig.7 Static drain-source on-state resistance vs. channel temperature

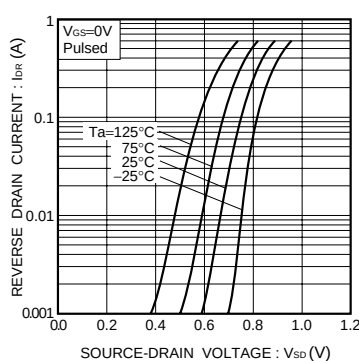


Fig.8 Reverse drain current vs. source-drain voltage (I)

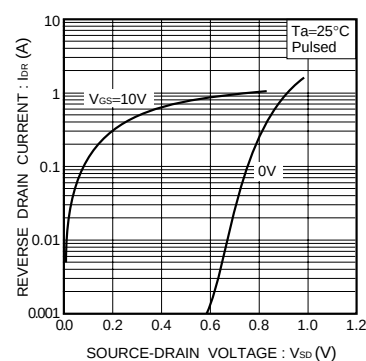


Fig.9 Reverse drain current vs. source-drain voltage (II)

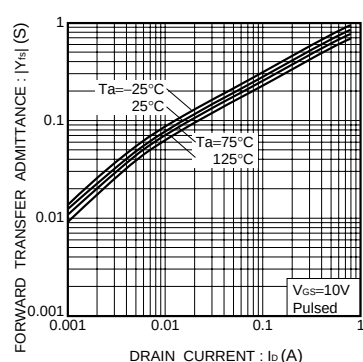


Fig.10 Forward transfer admittance vs. drain current

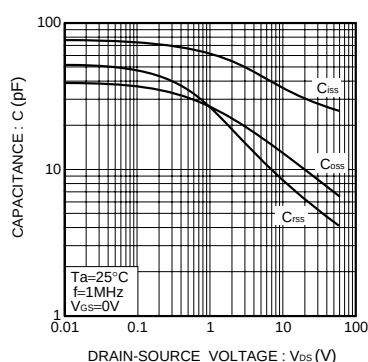
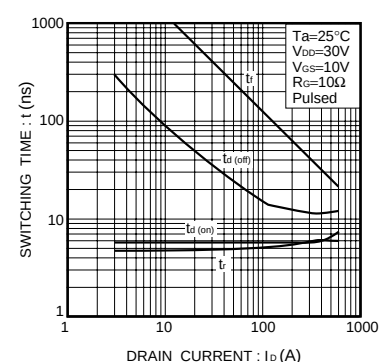


Fig.11 Typical capacitance vs. drain-source voltage

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

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● Switching characteristics measurement circuit

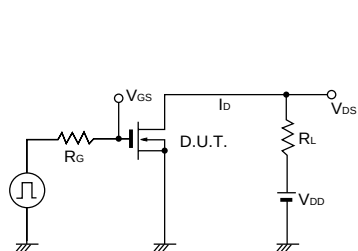


Fig.13 Switching time measurement circuit

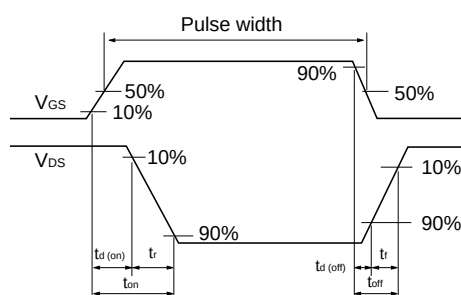


Fig.14 Switching time waveforms