# Switching (60V, 300mA)

## RK7002A

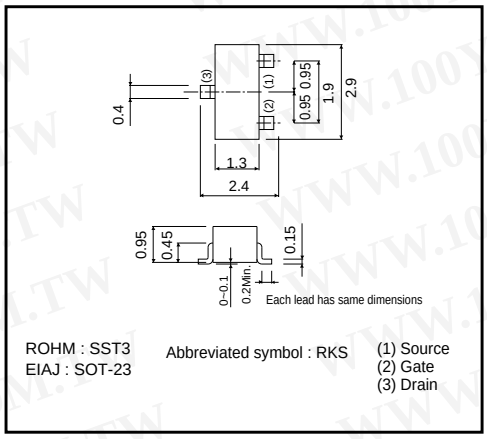
### ●Features

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

### ●External dimensions (Units : mm)

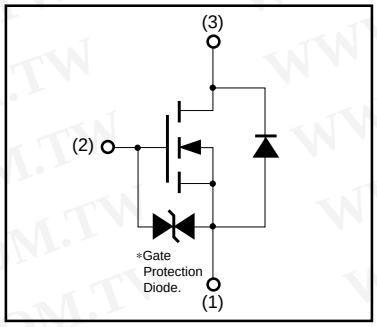



ROHM : SST3
EIAJ : SOT-23

Abbreviated symbol : RKS

(1) Source
(2) Gate
(3) Drain

### ●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 | $I_D$ | 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 | | Tch | 150 | °C |
| Storage temperature | | Tstg | −55~+150 | °C |

*1 Pw≤10μs, Duty cycle≤1%
*2 When using 1×0.75×0.062 inch glass epoxy board.

## ●Electrical characteristics (Ta=25°C)

| Parameter | Symbol | Min. | Typ. | Max. | Unit | Test Conditions |
|---|---|---|---|---|---|---|
| Gate leakage current | $I_{GSS}$ | – | – | ±10 | μA | $V_{GS}$=±20V, $V_{DS}$=0V |
| Drain-source breakdown voltage | $V_{(BR)DSS}$ | 60 | – | – | V | $I_D$=10μA, $V_{GS}$=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<br>$V_{GS}$=0V<br>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<br>$V_{GS}$=10V<br>$R_L$=200Ω<br>$R_{GS}$=10Ω |
| Rise time | $t_r$*2 | – | 5 | – | ns | |
| Turn-off delay time | $t_{d(off)}$*2 | – | 13 | – | ns | |
| Fall time | $t_f$*2 | – | 80 | – | ns | |
| Total gate charge | $Q_g$*2 | – | 3 | 6 | nC | $V_{DD}$≒30V<br>$V_{GS}$=10V<br>$I_D$=200mA |
| Gate-source charge | $Q_{gs}$*2 | – | 0.6 | – | nC | |
| Gate-drain charge | $Q_{gd}$*2 | – | 0.5 | – | nC | |

*1 Pw≤300μs, Duty cycle≤1%
*2 Pulsed

## ●Packaging specifications

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



## ●Electrical characteristic curves

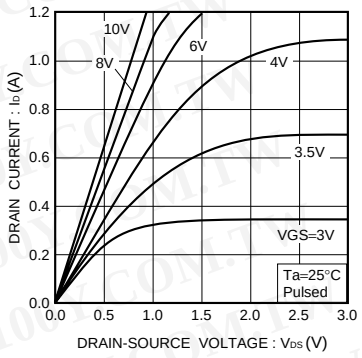



Fig.1 Typical output characteristics

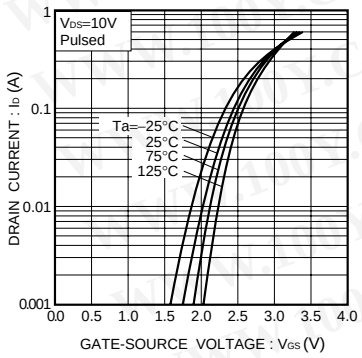



Fig.2 Typical transfer characteristics

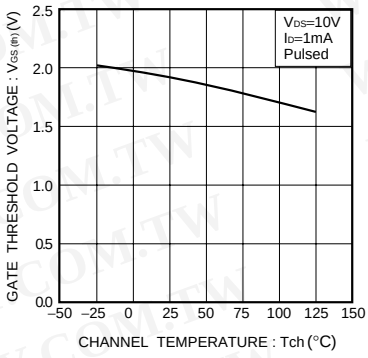



Fig.3 Gate threshold voltage vs. channel temperature

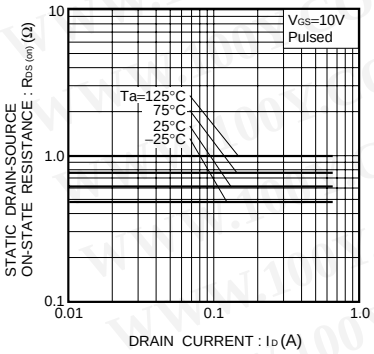



Fig.4 Static drain-source on-state resistance vs. drain current ( I )

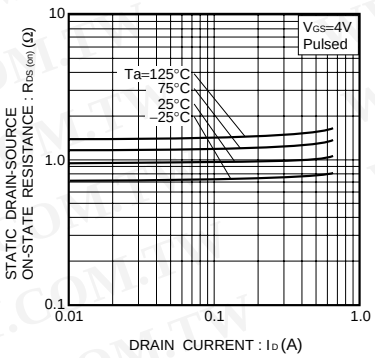



Fig.5 Static drain-source on-state resistance vs. drain current ( II )

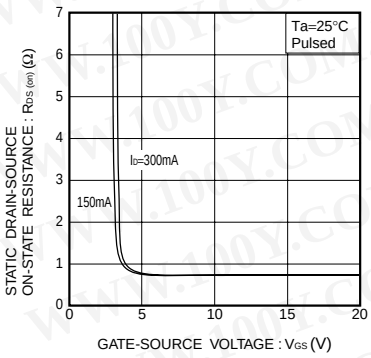



Fig.6 Static drain-source on-state resistance vs. gate-source voltage

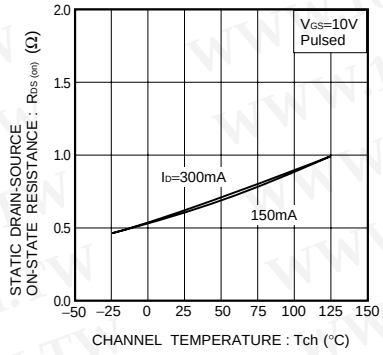



Fig.7 Static drain-source on-state resistance vs. channel temperature

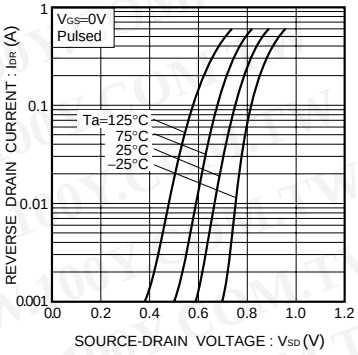



Fig.8 Reverse drain current vs. source-drain voltage ( I )

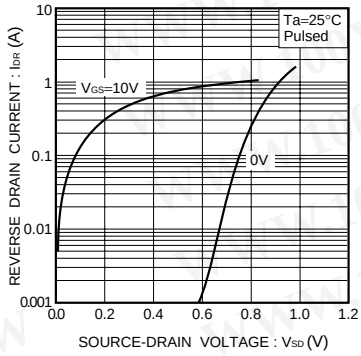



Fig.9 Reverse drain current vs. source-drain voltage ( II )

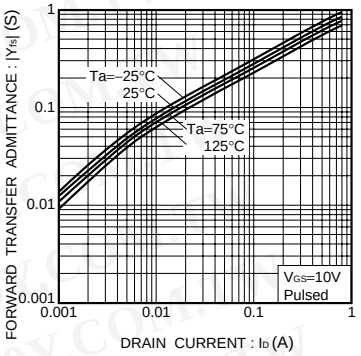



Fig.10 Forward transfer admittance vs. drain current

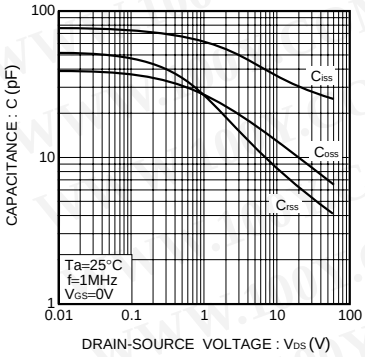



Fig.11 Typical capacitance vs. drain-source voltage

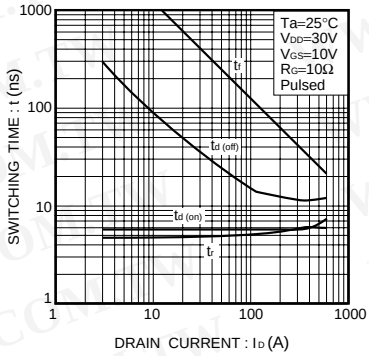



Fig.12 Switching characteristics (See Figures 13 and 14 for the measurement circuit and resultant waveforms)

●**Switching characteristics measurement circuit**

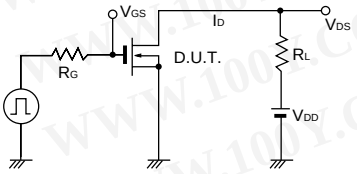



Fig.13 Switching time measurement circuit

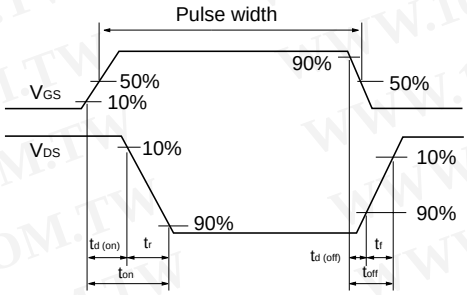



Fig.14 Switching time waveforms

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