

Switching (60V, 200mA)

SM6K2

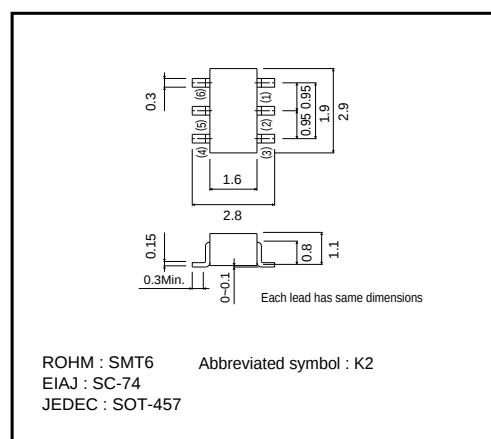
●Features

- 1) Two RHU002N06 chips in a SMT package.
- 2) Mounting possible with SMT3 automatic mounting machines.
- 3) Transistor elements are independent, eliminating interference.
- 4) Mounting cost and area can be cut in half.

●Structure

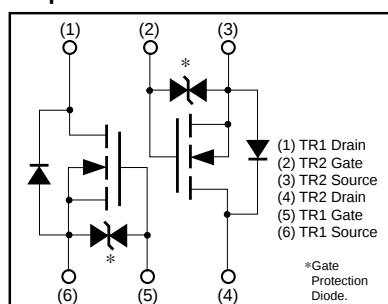
Silicon N-channel
MOSFET transistor

●External dimensions (Units : mm)



The following characteristics apply to both Tr1 and Tr2.

●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 _{DS}	60	V
Gate-source voltage		V _{GS}	±20	V
Drain current	Continuous	I _D	200	mA
	Pulsed	I _{DP} *1	800	mA
Drain reverse current	Continuous	I _{DR}	200	mA
	Pulsed	I _{DRP} *1	800	mA
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.

Transistors

●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	$R_{DS(on)}^{*1}$	—	1.7	2.4	Ω	$I_D=200mA$, $V_{GS}=10V$
		—	2.8	4.0		$I_D=200mA$, $V_{GS}=4V$
Forward transfer admittance	$ Y_{fs} ^{*1}$	100	—	—	mS	$V_{DS}=10V$, $I_D=200mA$
Input capacitance	C_{iss}	—	15	—	pF	$V_{DS}=25V$
Output capacitance	C_{oss}	—	8	—	pF	$V_{GS}=0V$
Reverse transfer capacitance	C_{rss}	—	4	—	pF	$f=1MHz$
Turn-on delay time	$t_{d(on)}^{*2}$	—	6	—	ns	$I_D=100mA$, $V_{DD}=30V$ $V_{GS}=10V$ $R_L=300\Omega$ $R_{GS}=10\Omega$
Rise time	t_r^{*2}	—	5	—	ns	
Turn-off delay time	$t_{d(off)}^{*2}$	—	12	—	ns	
Fall time	t_f^{*2}	—	95	—	ns	
Total gate charge	Q_g^{*2}	—	2.2	4.4	nC	$V_{DD}=30V$
Gate-source charge	Q_{gs}^{*2}	—	0.6	—	nC	$V_{GS}=10V$
Gate-drain charge	Q_{gd}^{*2}	—	0.3	—	nC	$I_D=200mA$

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

*2 Pulsed

●Packaging specifications

Type	Package	Taping
	Code	T110
	Basic ordering unit (pieces)	3000
SM6K2		○

●Electrical characteristic curves

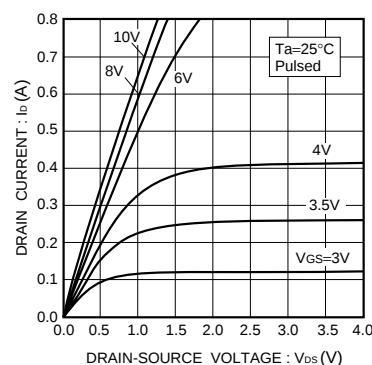


Fig.1 Typical output characteristics

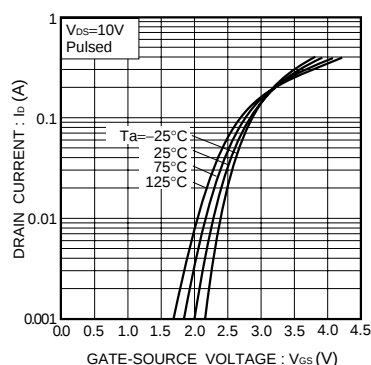
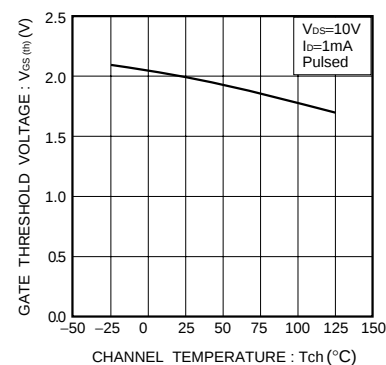


Fig.2 Typical transfer characteristics

Fig.3 Gate threshold voltage
vs. channel temperature

Transistors

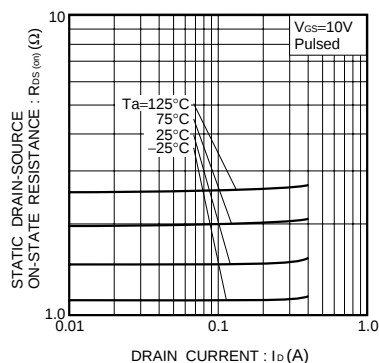


Fig.4 Static drain-source on-state resistance vs. drain current (I)

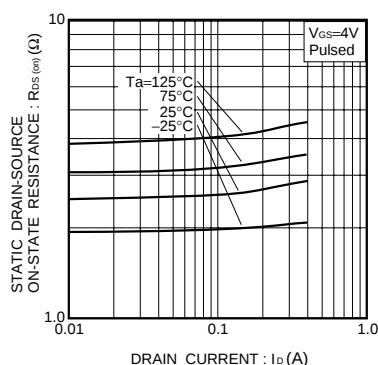


Fig.5 Static drain-source on-state resistance vs. drain current (II)

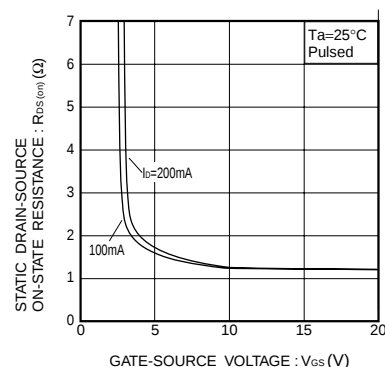


Fig.6 Static drain-source on-state resistance vs. gate-source voltage

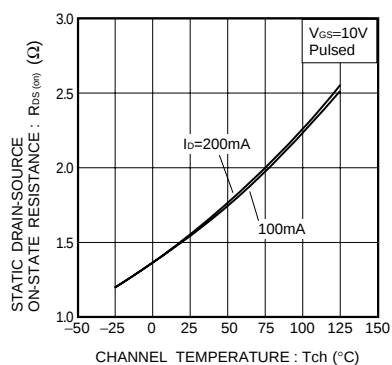


Fig.7 Static drain-source on-state resistance vs. channel temperature

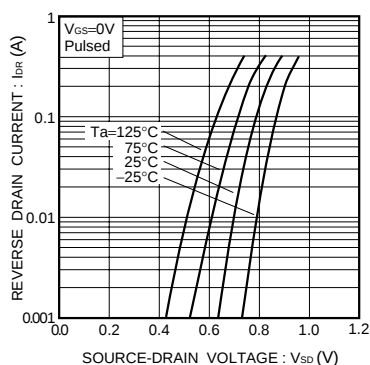


Fig.8 Reverse drain current vs. source-drain voltage (I)

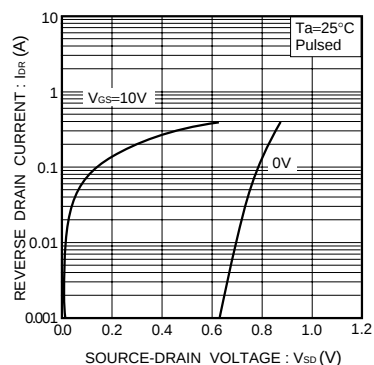


Fig.9 Reverse drain current vs. source-drain voltage (II)

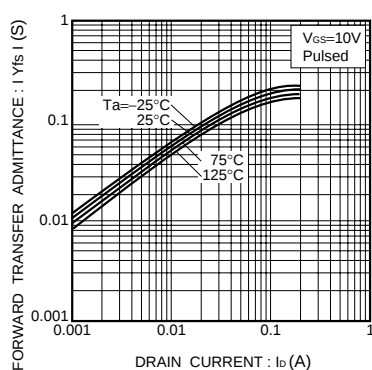


Fig.10 Forward transfer admittance vs. drain current

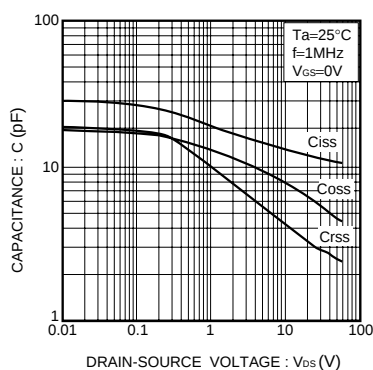


Fig.11 Typical capacitance vs. drain-source voltage

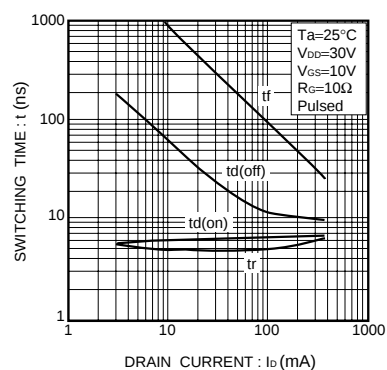


Fig.12 Switching characteristics

Transistors

● Switching characteristics measurement circuit

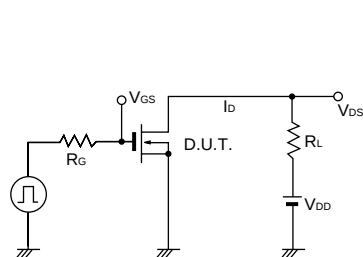


Fig.13 Switching time test circuit

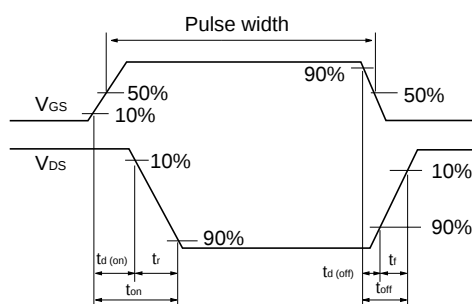


Fig.14 Switching time waveforms

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