

# 4V Drive Nch MOSFET

**RHU002N06FRA**

## ●Structure

 Silicon N-channel  
 MOSFET transistor

## ●Features

- 1) Low on-resistance.
- 2) High ESD.
- 3) High-speed switching.
- 4) Low-voltage drive (4V).
- 5) Drive circuits can be simple.
- 6) Parallel use is easy.

## ●Applications

Switching

## ●Packaging specifications

Type	Package	Taping
	Code	T106
	Basic ordering unit (pieces)	3000
RHU002N06FRA		○

## ●Absolute maximum ratings (Ta=25°C)

Parameter	Symbol	Limits	Unit
Drain-source voltage	$V_{DS}$	60	V
Gate-source voltage	$V_{GS}$	$\pm 20$	V
Drain current	Continuous	$I_D$	$\pm 200$ mA
	Pulsed	$I_{DP}^{*1}$	$\pm 800$ mA
Source current (Body diode)	Continuous	$I_S$	200 mA
	Pulsed	$I_{SP}^{*1}$	800 mA
Total power dissipation	$P_D^{*2}$	200	mW
Channel temperature	$T_{ch}$	150	°C
Storage temperature	$T_{stg}$	-55 to +150	°C

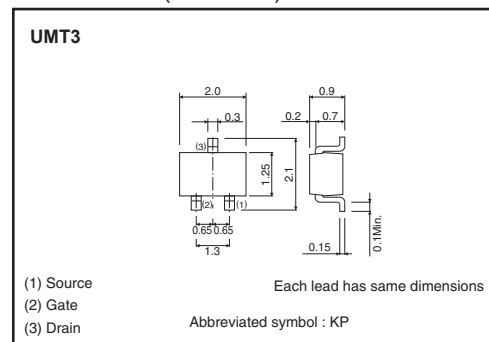
<sup>\*1</sup>  $P_w \leq 10 \mu s$ , Duty cycle  $\leq 1\%$ 
<sup>\*2</sup> Each terminal mounted on a recommended

## ●Thermal resistance

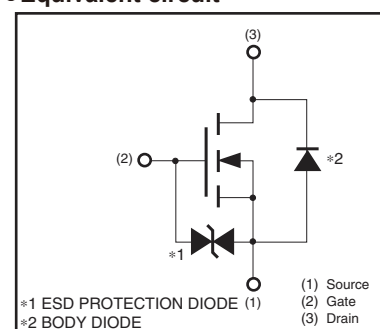
Parameter	Symbol	Limits	Unit
Channel to ambient	$R_{th(ch-a)}^{*}$	625	°C / W

<sup>\*</sup> With each pin mounted on the recommended land.

## ●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.

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

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test Conditions
Gate leakage current	$I_{GSS}$	—	—	$\pm 10$	$\mu A$	$V_{GS}=\pm 20V, V_{DS}=0V$
Drain-source breakdown voltage	$V_{(BR)DSS}$	60	—	—	V	$I_D=1mA, V_{GS}=0V$
Drain cutoff current	$I_{DSS}$	—	—	1	$\mu A$	$V_{DS}=60V, V_{GS}=0V$
Gate threshold voltage	$V_{GS(th)}$	1	—	2.5	V	$V_{DS}=10V, I_D=1mA$
Drain-source on-state resistance	$R_{DS(on)}$ *	—	1.7	2.4	$\Omega$	$I_D=200mA, V_{GS}=10V$
		—	2.8	4.0		$I_D=200mA, V_{GS}=4V$
Forward transfer admittance	$ Y_{fs} $ *	0.1	—	—	S	$V_{DS}=10V, I_D=200mA$
Input capacitance	$C_{iss}$	—	15	—	pF	$V_{DS}=10V$
Output capacitance	$C_{oss}$	—	8	—	pF	$V_{GS}=0V$
Reverse transfer capacitance	$C_{rss}$	—	4	—	pF	$f=1MHz$
Turn-on delay time	$t_{d(on)}$ *	—	6	—	ns	$I_D=100mA, V_{DD}=30V$
Rise time	$t_r$ *	—	5	—	ns	$V_{GS}=10V$
Turn-off delay time	$t_{d(off)}$ *	—	12	—	ns	$R_L=300\Omega$
Fall time	$t_f$ *	—	95	—	ns	$R_G=10\Omega$
Total gate charge	$Q_g$ *	—	2.2	4.4	nC	$V_{DD}=30V$
Gate-source charge	$Q_{gs}$ *	—	0.6	—	nC	$V_{GS}=10V$
Gate-drain charge	$Q_{gd}$ *	—	0.3	—	nC	$I_D=200mA$

\* Pulsed

## ●Body diode characteristics (Source-drain) (Ta=25°C)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Forward voltage	$V_{SD}$ *	—	—	1.2	V	$I_S=200mA, V_{GS}=0V$

\*Pulsed

## ●Electrical characteristic curves

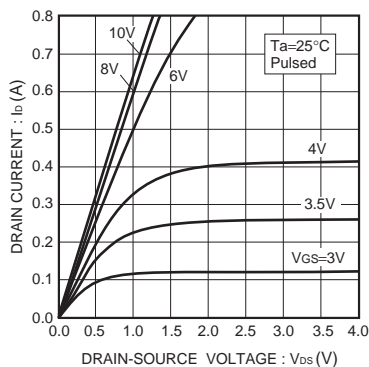


Fig.1 Typical Output Characteristics

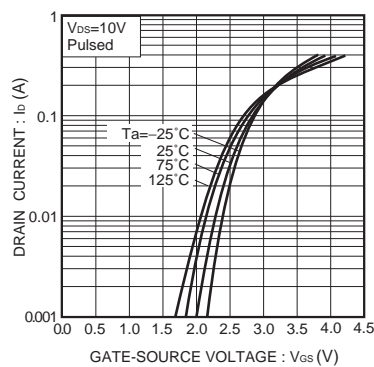


Fig.2 Typical Transfer Characteristics

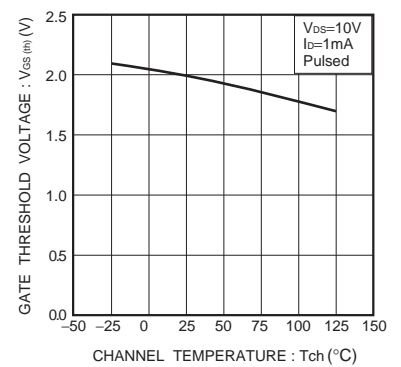


Fig.3 Gate Threshold Voltage vs. Channel Temperature

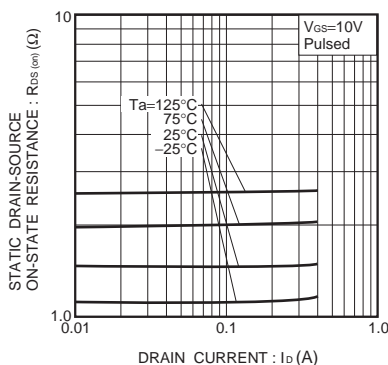


Fig.4 Static Drain-Source On-State Resistance vs. Drain Current ( I )

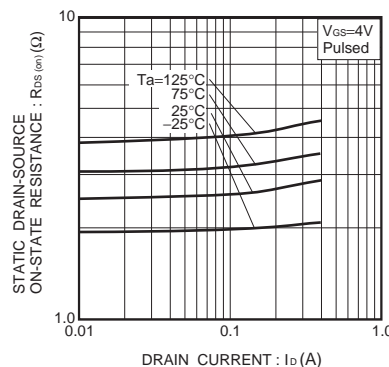


Fig.5 Static Drain-Source On-State Resistance vs. Drain Current ( II )

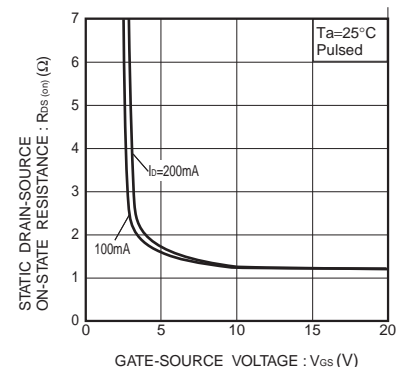


Fig.6 Static Drain-Source On-State Resistance vs. Gate-Source Voltage

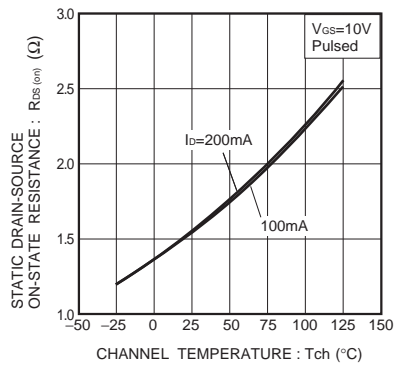


Fig.7 Static Drain-Source On-State Resistance vs. Channel Temperature

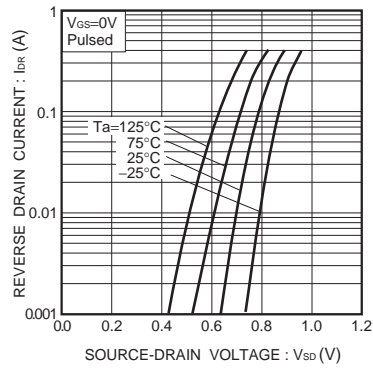


Fig.8 Reverse Drain Current vs. Source-Drain Voltage ( I )

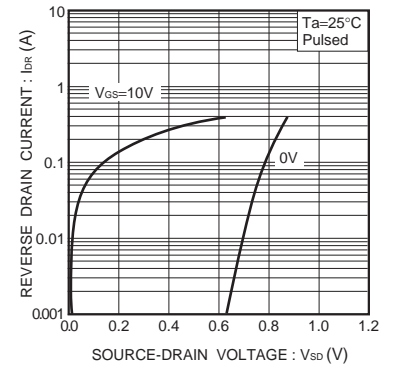


Fig.9 Reverse Drain Current vs. Source-Drain Voltage ( II )

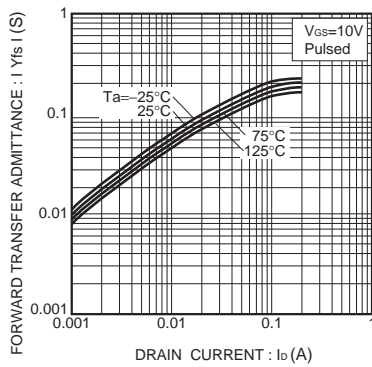


Fig.10 Forward Transfer Admittance vs. Drain Current

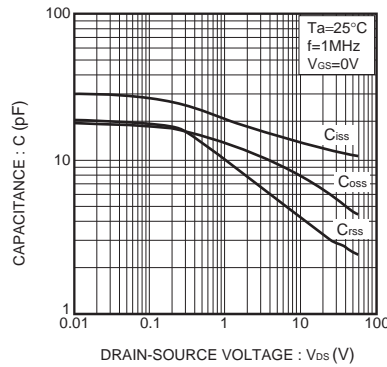


Fig.11 Typical Capacitance vs. Drain-Source Voltage

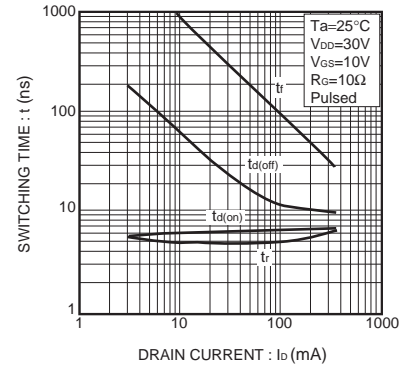


Fig.12 Switching Characteristics

### ●Switching characteristics measurement circuit

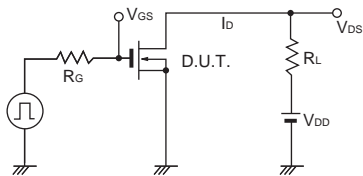


Fig.13 Switching time test circuit

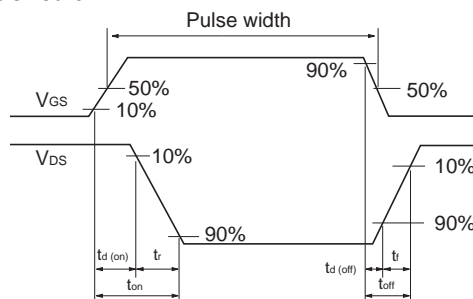


Fig.14 Switching time waveforms

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