

# 1.2V Drive Nch MOSFET

**RUU002N05**

● **Structure**

Silicon N-channel MOSFET

● **Features**

- 1) High speed switing.
- 2) Small package(UMT3).
- 3)Ultra low voltage drive(1.2V drive).

● **Application**

Switching

● **Packaging specifications**

Type	Package	Taping
	Code	T106
	Basic ordering unit (pieces)	3000
RUU002N05		○

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

Parameter	Symbol	Limits	Unit
Drain-source voltage	$V_{DSS}$	50	V
Gate-source voltage	$V_{GSS}$	$\pm 8$	V
Drain current	Continuous	$I_D$	$\pm 200$ mA
	Pulsed	$I_{DP}^{*1}$	$\pm 800$ mA
Source current (Body Diode)	Continuous	$I_S$	150 mA
	Pulsed	$I_{SP}^{*1}$	800 mA
Power dissipation	$P_D^{*2}$	200	mW
Channel temperature	$T_{ch}$	150	°C
Range of storage temperature	$T_{stg}$	-55 to +150	°C

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

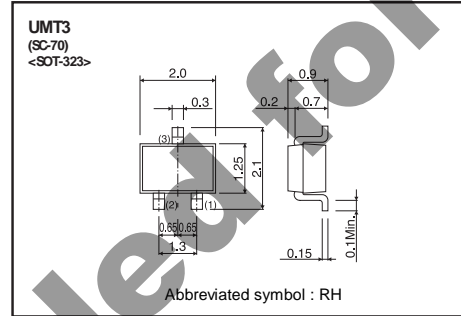
\*2 Each terminal mounted on a recommended land.

● **Thermal resistance**

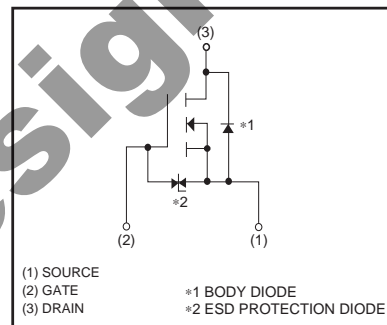
Parameter	Symbol	Limits	Unit
Channel to ambient	$R_{th}(ch-a)^*$	625	°C / W

\* Each terminal mounted on a recommended land.

● **Dimensions (Unit : mm)**



● **Inner circuit**



●Electrical characteristics (Ta = 25°C)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Gate-source leakage	$I_{GSS}$	-	-	±10	μA	$V_{GS}=\pm 8V, V_{DS}=0V$
Drain-source breakdown voltage	$V_{(BR)DSS}$	50	-	-	V	$I_D=1mA, V_{GS}=0V$
Zero gate voltage drain current	$I_{DSS}$	-	-	1	μA	$V_{DS}=50V, V_{GS}=0V$
Gate threshold voltage	$V_{GS(th)}$	0.3	-	1.0	V	$V_{DS}=10V, I_D=1mA$
Static drain-source on-state resistance	$R_{DS(on)}$ *	-	1.6	2.2	Ω	$I_D=200mA, V_{GS}=4.5V$
		-	1.7	2.4		$I_D=200mA, V_{GS}=2.5V$
		-	1.9	2.7		$I_D=100mA, V_{GS}=1.8V$
		-	2.0	4.0		$I_D=40mA, V_{GS}=1.5V$
		-	2.4	7.2		$I_D=20mA, V_{GS}=1.2V$
Forward transfer admittance	$ Y_{fs} $ *	0.4	-	-	S	$I_D=200mA, V_{DS}=10V$
Input capacitance	$C_{iss}$	-	25	-	pF	$V_{DS}=10V$
Output capacitance	$C_{oss}$	-	6	-	pF	$V_{GS}=0V$
Reverse transfer capacitance	$C_{rss}$	-	3	-	pF	$f=1MHz$
Turn-on delay time	$t_{d(on)}$ *	-	4	-	ns	$I_D=100mA, V_{DD}=30V$
Rise time	$t_r$ *	-	6	-	ns	$V_{GS}=4.5V$
Turn-off delay time	$t_{d(off)}$ *	-	15	-	ns	$R_L=300\Omega$
Fall time	$t_f$ *	-	55	-	ns	$R_G=10\Omega$

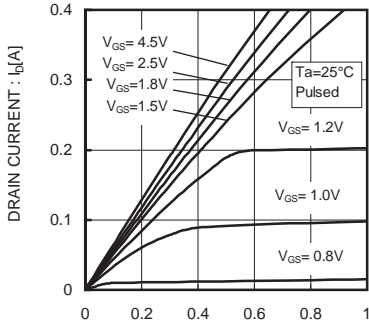
\*Pulsed

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

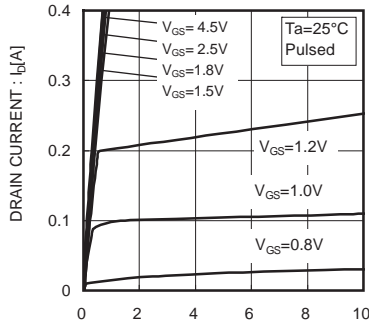
Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Forward voltage	$V_{SD}$ *	-	-	1.2	V	$I_S=200mA, V_{GS}=0V$

\*Pulsed

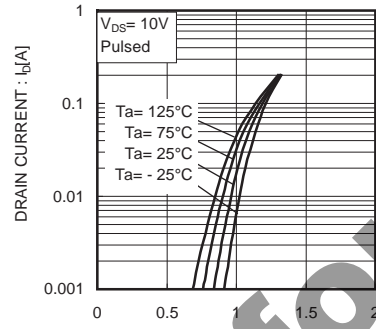
●Electrical characteristic curves



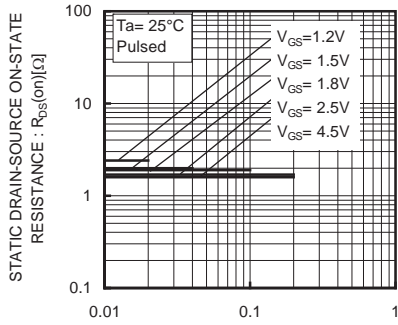
DRAIN-SOURCE VOLTAGE :  $V_{DS}$ [V]  
Fig.1 Typical Output Characteristics( I )



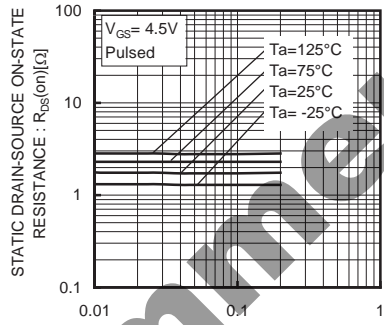
DRAIN-SOURCE VOLTAGE :  $V_{DS}$ [V]  
Fig.2 Typical Output Characteristics( II )



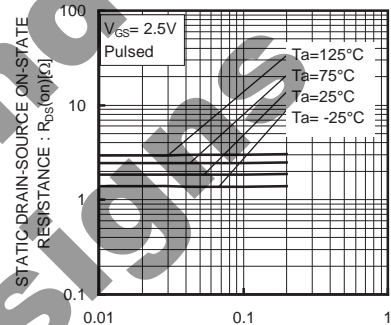
GATE-SOURCE VOLTAGE :  $V_{GS}$ [V]  
Fig.3 Typical Transfer Characteristics



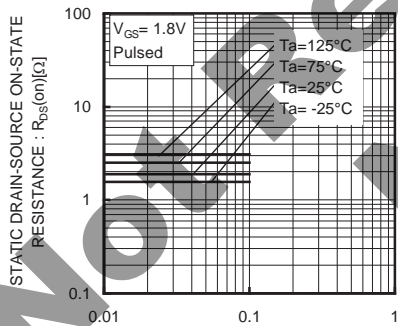
DRAIN-CURRENT :  $I_D$ [A]  
Fig.4 Static Drain-Source On-State Resistance vs. Drain Current( I )



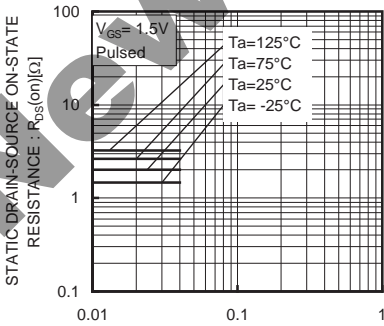
DRAIN-CURRENT :  $I_D$ [A]  
Fig.5 Static Drain-Source On-State Resistance vs. Drain Current( II )



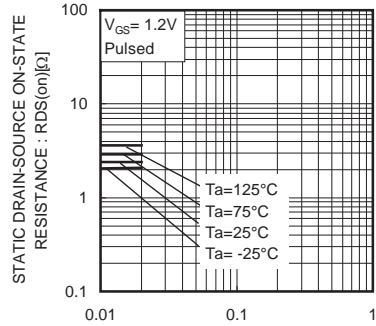
DRAIN-CURRENT :  $I_D$ [A]  
Fig.6 Static Drain-Source On-State Resistance vs. Drain Current( III )



DRAIN-CURRENT :  $I_D$ [A]  
Fig.7 Static Drain-Source On-State Resistance vs. Drain Current( IV )



DRAIN-CURRENT :  $I_D$ [A]  
Fig.8 Static Drain-Source On-State Resistance vs. Drain Current( V )



DRAIN-CURRENT :  $I_D$ [A]  
Fig.9 Static Drain-Source On-State Resistance vs. Drain Current( VI )

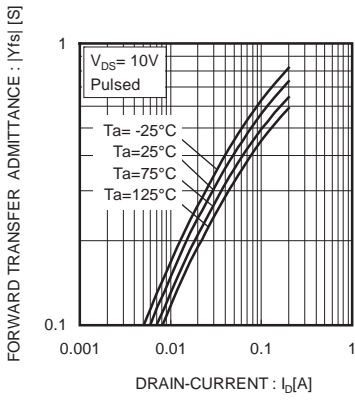


Fig.10 Forward Transfer Admittance vs. Drain Current

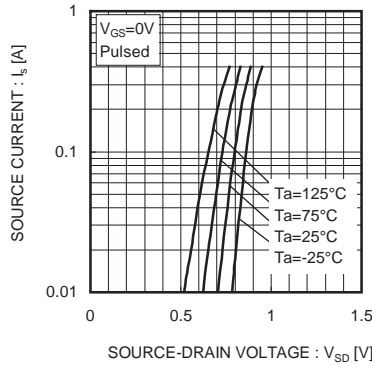


Fig.11 Reverse Drain Current vs. Source-Drain Voltage

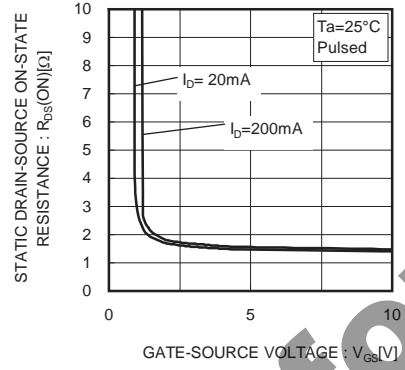


Fig.12 Static Drain-Source On-State Resistance vs. Gate Source Voltage

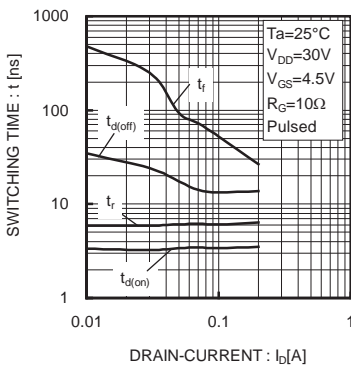


Fig.13 Switching Characteristics

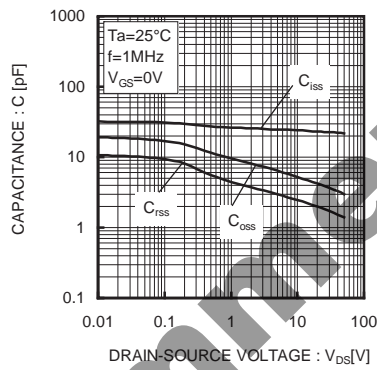


Fig.14 Typical Capacitance vs. Drain-Source Voltage

Not Recommended for New Designs

●Measurement circuits

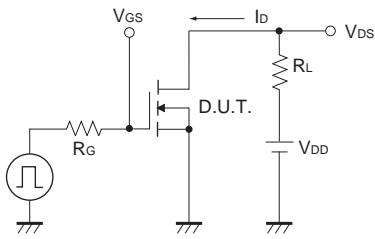


Fig.1-1 Switching time measurement circuit

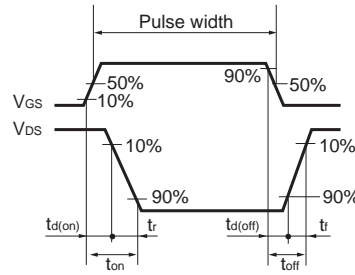


Fig.1-2 Switching waveforms

●Notice

This product might cause chip aging and breakdown under the large electrified environment. Please consider to design ESD protection circuit.

Not Recommended for New Designs

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