

# 1.2V Drive Nch MOSFET

## RUM002N02

### ●Structure

Silicon N-channel  
MOSFET

### ●Applications

Switching

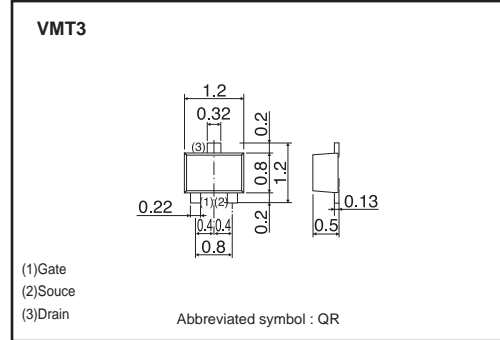
### ●Features

- 1) Fast switching speed.
- 2) Low voltage drive (1.2V) makes this device ideal for portable equipment.
- 3) Drive circuits can be simple.

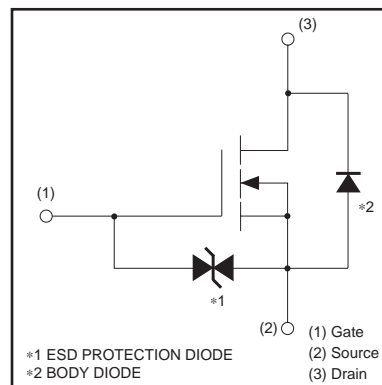
### ●Packaging specifications

Type	Package	Taping
	Code	T2L
	Basic ordering unit (pieces)	8000
RUM002N02		○

### ●Dimensions (Unit : mm)



### ●Inner circuit



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

Parameter	Symbol	Limits	Unit
Drain-source voltage	$V_{DS}$	20	V
Gate-source voltage	$V_{GS}$	$\pm 8$	V
Drain current	Continuous	$I_D$	$\pm 200$ mA
	Pulsed	$I_{DP}^{*1}$	$\pm 400$ mA
Total power dissipation	$P_D^{*2}$	150	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	$R_{th(ch-a)}^*$	833	°C / W

\* Each terminal mounted on a recommended land

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

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Gate-source leakage	$I_{GSS}$	–	–	$\pm 10$	$\mu A$	$V_{GS}=\pm 8V, V_{DS}=0V$
Drain-source breakdown voltage	$V_{(BR)DSS}$	20	–	–	V	$I_D=1mA, V_{GS}=0V$
Zero gate voltage drain current	$I_{DSS}$	–	–	1.0	$\mu A$	$V_{DS}=20V, V_{GS}=0V$
Gate threshold voltage	$V_{GS(th)}$	0.3	–	1.0	V	$V_{DS}=10V, I_D=1mA$
Static drain-source on-state resistance	$R_{DS(on)}$ *	–	0.8	1.2	$\Omega$	$I_D=200mA, V_{GS}=2.5V$
		–	1.0	1.4	$\Omega$	$I_D=200mA, V_{GS}=1.8V$
		–	1.2	2.4	$\Omega$	$I_D=40mA, V_{GS}=1.5V$
		–	1.6	4.8	$\Omega$	$I_D=20mA, V_{GS}=1.2V$
Forward transfer admittance	$ Y_{fs} $ *	200	–	–	mS	$V_{DS}=10V, I_D=200mA$
Input capacitance	$C_{iss}$	–	25	–	pF	$V_{DS}=10V$
Output capacitance	$C_{oss}$	–	10	–	pF	$V_{GS}=0V$
Reverse transfer capacitance	$C_{rss}$	–	10	–	pF	$f=1MHz$
Turn-on delay time	$t_{d(on)}$ *	–	5	–	ns	$V_{DD} \doteq 10V, I_D=150mA$
Rise time	$t_r$ *	–	10	–	ns	$V_{GS}=4.0V$
Turn-off delay time	$t_{d(off)}$ *	–	15	–	ns	$R_L \doteq 67\Omega$
Fall time	$t_f$ *	–	10	–	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	$I_S=100mA, V_{GS}=0V$

\* Pulsed

●Electrical characteristics curves

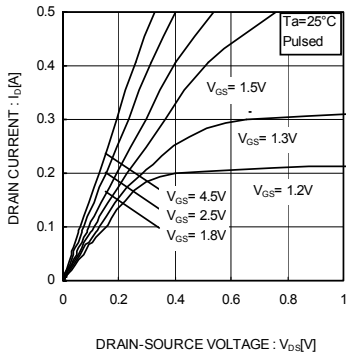


Fig.1 Typical Output Characteristics ( I )

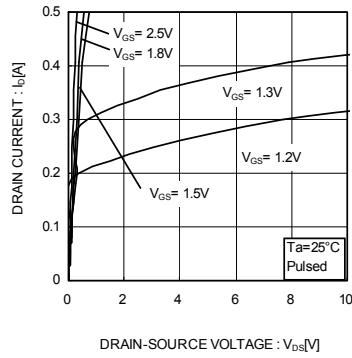


Fig.2 Typical Output Characteristics ( II )

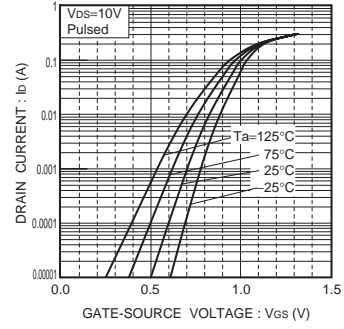


Fig.3 Typical transfer characteristics

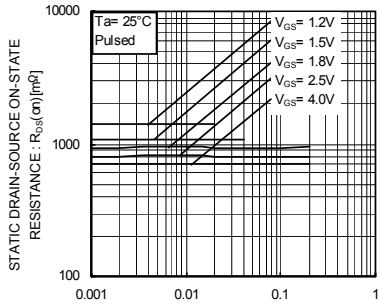


Fig.4 Static Drain-Source On-State Resistance vs. Drain Current( I )

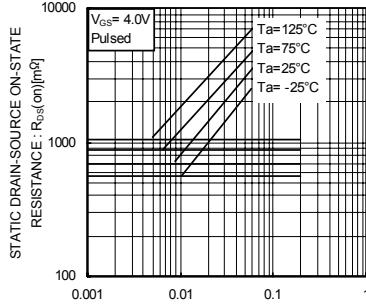


Fig.5 Static Drain-Source On-State Resistance vs. Drain Current( II )

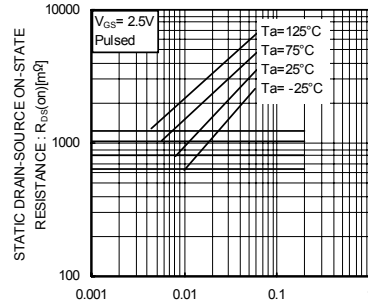


Fig.6 Static Drain-Source On-State Resistance vs. Drain Current( II )

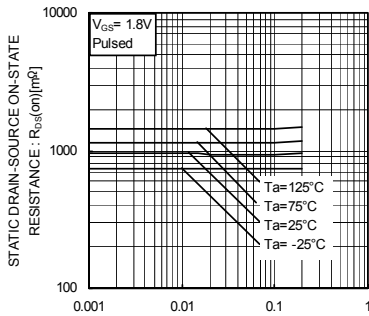


Fig.7 Static Drain-Source On-State Resistance vs. Drain Current( III )

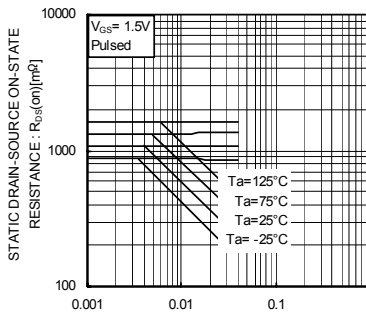


Fig.8 Static Drain-Source On-State Resistance vs. Drain Current( IV )

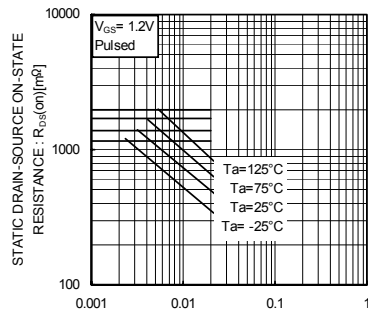


Fig.9 Static Drain-Source On-State Resistance vs. Drain Current( V )

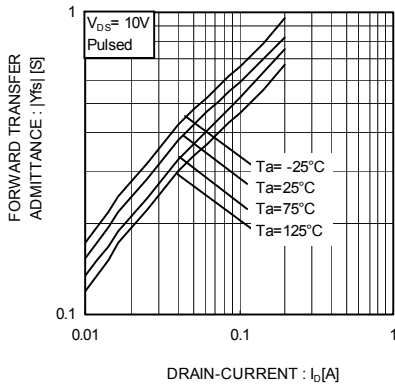


Fig.10 Forward Transfer Admittance vs. Drain Current

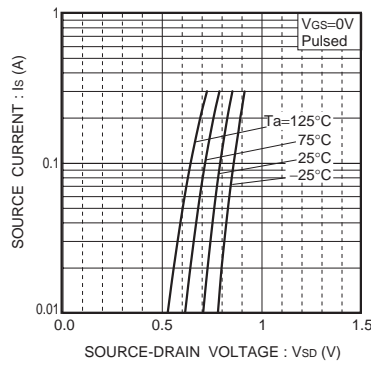


Fig.11 Source current vs. source-drain voltage

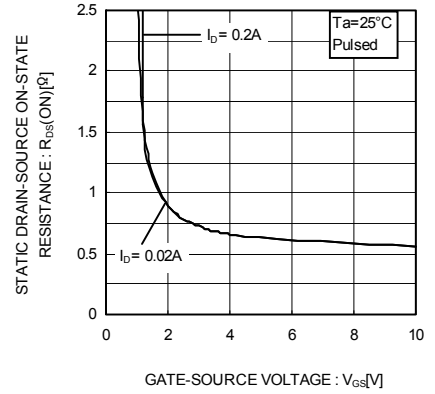


Fig.12 Static Drain-Source On-State Resistance vs. Gate Source Voltage

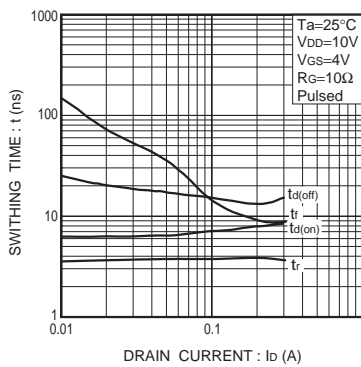


Fig.13 Switching characteristics

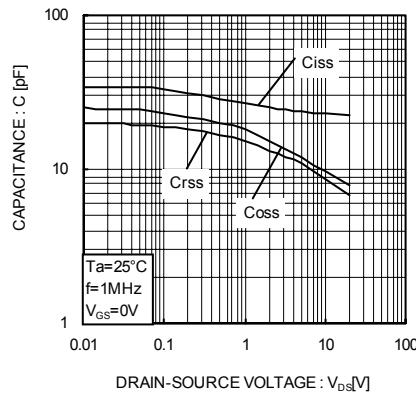


Fig.14 Typical Capacitance vs. Drain-Source Voltage

●Measurement circuit

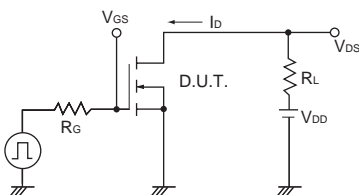


Fig.1-1 Switching time measurement circuit

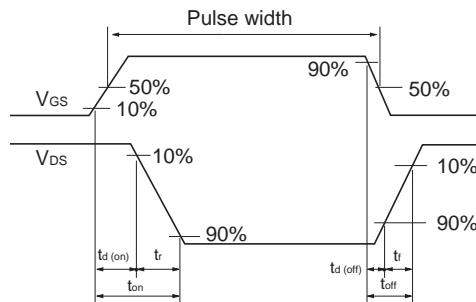


Fig.1-2 Switching waveforms

●Notice

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

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