1.2V Drive Nch MOSFET

RUM002N02

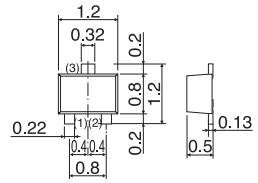
●Structure
Silicon N-channel
MOSFET

●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.

●Dimensions (Unit : mm)

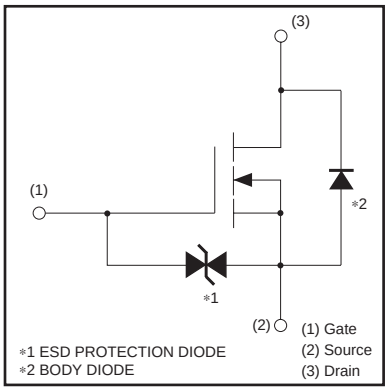
VMT3



(1)Gate
(2)Souce
(3)Drain

Abbreviated symbol : QR

●Inner circuit



∗1 ESD PROTECTION DIODE
∗2 BODY DIODE

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

●Packaging specifications

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

●Absolute maximum ratings (Ta=25°C)

Parameter		Symbol	Limits	Unit
Drain-source voltage		V_{DSS}	20	V
Gate-source voltage		V_{GSS}	±8	V
Drain current	Continuous	I_D	±200	mA
	Pulsed	I_{DP}*1	±400	mA
Total power dissipation		P_D*2	150	mW
Channel temperature		Tch	150	°C
Range of storage temperature		Tstg	−55 to +150	°C

∗1 Pw≤10µs, Duty cycle≤1%
∗2 Each terminal mounted on a recommended land

●Thermal resistance

Parameter	Symbol	Limits	Unit
Channel to ambient	Rth(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}	–	–	±10	μA	V_{GS}=±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	μA	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	Ω	I_D=200mA, V_{GS}=2.5V
		–	1.0	1.4	Ω	I_D=200mA, V_{GS}=1.8V
		–	1.2	2.4	Ω	I_D=40mA, V_{GS}=1.5V
		–	1.6	4.8	Ω	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} ≒ 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 ≒ 67Ω
Fall time	t_f *	–	10	–	ns	R_G=10Ω

* 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

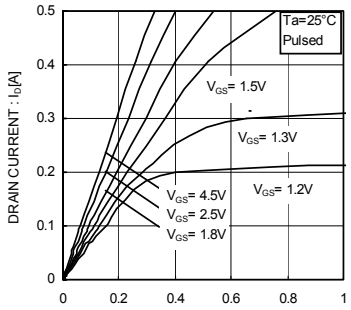


Fig.1 Typical Output Characteristics(Ⅰ)

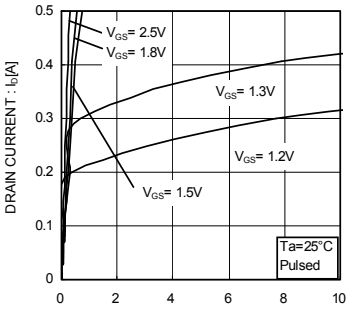


Fig.2 Typical Output Characteristics(Ⅱ)

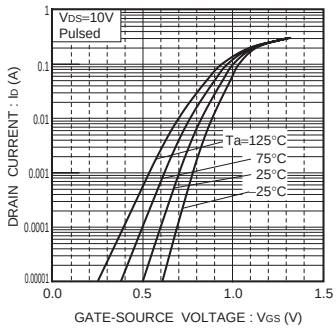


Fig.3 Typical transfer characteristics

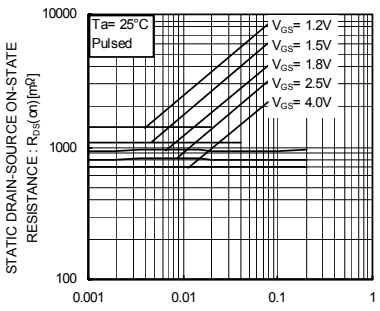


Fig.4 Static Drain-Source On-State Resistance vs. Drain Current(Ⅰ)

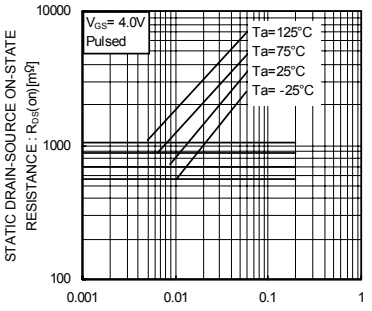


Fig.5 Static Drain-Source On-State Resistance vs. Drain Current(Ⅱ)

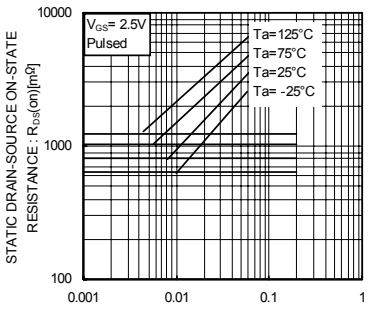


Fig.6 Static Drain-Source On-State Resistance vs. Drain Current(Ⅱ)

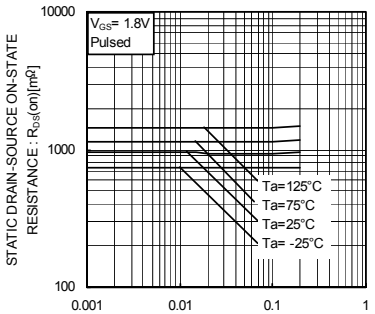


Fig.7 Static Drain-Source On-State Resistance vs. Drain Current(Ⅲ)

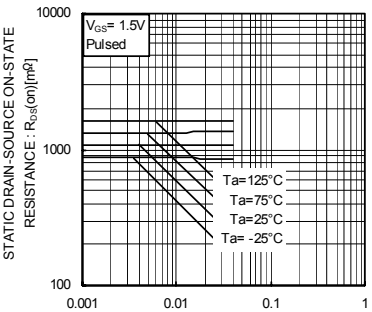


Fig.8 Static Drain-Source On-State Resistance vs. Drain Current(Ⅳ)

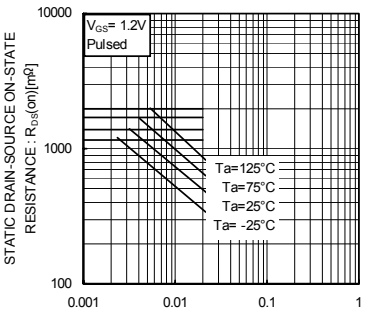


Fig.9 Static Drain-Source On-State Resistance vs. Drain Current(Ⅴ)

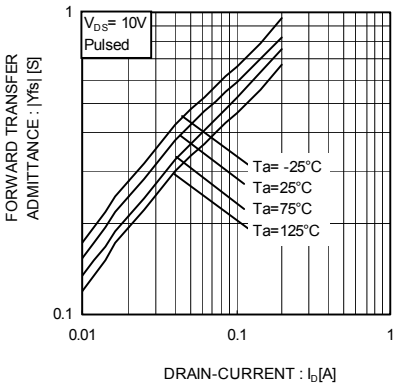


Fig.10 Forward Transfer Admittance vs. Drain Current

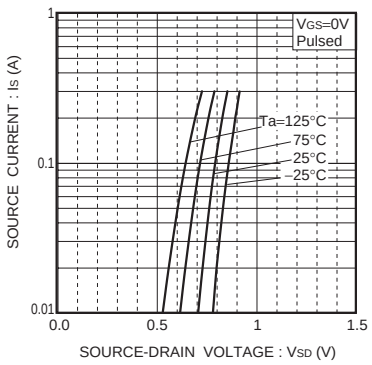


Fig.11 Source current vs. source-drain voltage

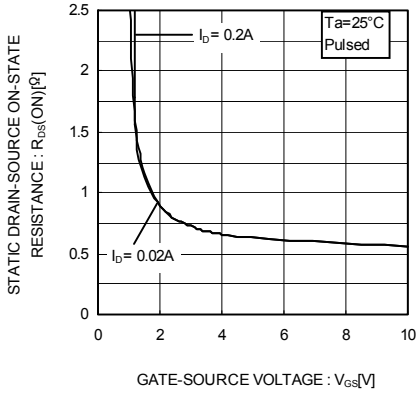


Fig.12 Static Drain-Source On-State Resistance vs. Gate Source Voltage

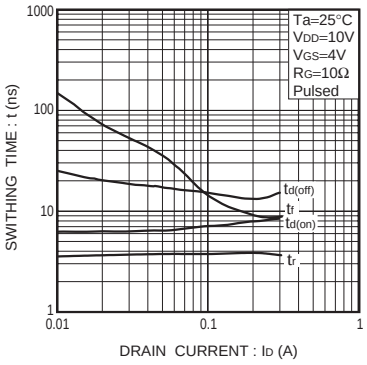


Fig.13 Switching characteristics

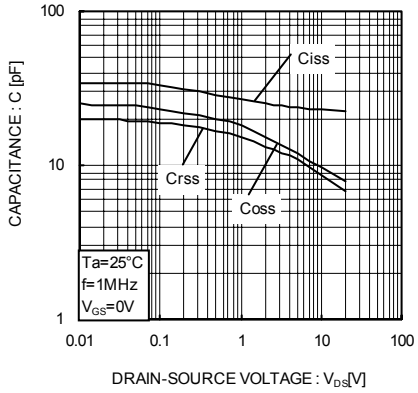


Fig.14 Typical Capacitance vs. Drain-Source Voltage

●Measurement circuit

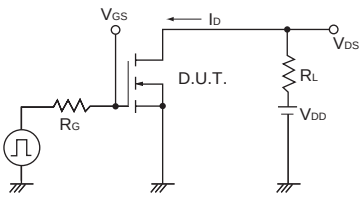


Fig.1-1 Switching time measurement circuit

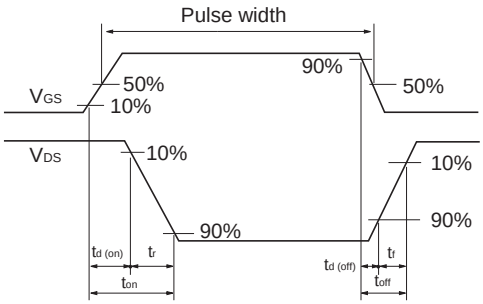


Fig.1-2 Switching waveforms

●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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