

# 1.2V Drive Nch MOSFET

**RUE002N02**

●**Structure**

Silicon N-channel  
MOSFET

●**Applications**

Switching

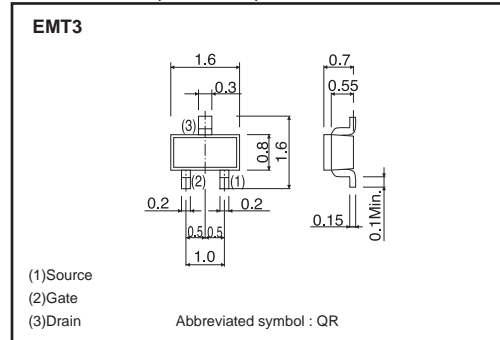
●**Features**

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

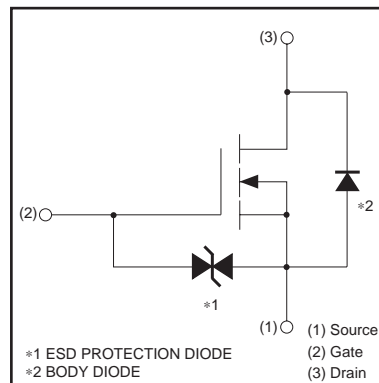
●**Packaging specifications**

Type	Package	Taping
	Code	TL
	Basic ordering unit (pieces)	3000
RUE002N02		○

●**Dimensions (Unit : mm)**



●**Inner circuit**



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

Parameter	Symbol	Limits	Unit
Drain-source voltage	$V_{DSS}$	20	V
Gate-source voltage	$V_{GSS}$	$\pm 8$	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 <sub>GSS</sub>	–	–	±10	μA	V <sub>GS</sub> =±8V, V <sub>DS</sub> =0V
Drain-source breakdown voltage	V <sub>(BR)DSS</sub>	20	–	–	V	I <sub>D</sub> =1mA, V <sub>GS</sub> =0V
Zero gate voltage drain current	I <sub>DSS</sub>	–	–	1	μA	V <sub>DS</sub> =20V, V <sub>GS</sub> =0V
Gate threshold voltage	V <sub>GS(th)</sub>	0.3	–	1	V	V <sub>DS</sub> =10V, I <sub>D</sub> =1mA
Static drain-source on-state resistance	R <sub>DS(on)</sub> *	–	0.8	1.2	Ω	I <sub>D</sub> =200mA, V <sub>GS</sub> =2.5V
		–	1.0	1.4	Ω	I <sub>D</sub> =200mA, V <sub>GS</sub> =1.8V
		–	1.2	2.4	Ω	I <sub>D</sub> =40mA, V <sub>GS</sub> =1.5V
		–	1.6	4.8	Ω	I <sub>D</sub> =20mA, V <sub>GS</sub> =1.2V
Forward transfer admittance	Y <sub>fs</sub>   *	200	–	–	mS	V <sub>DS</sub> =10V, I <sub>D</sub> =200mA
Input capacitance	C <sub>iss</sub>	–	25	–	pF	V <sub>DS</sub> =10V
Output capacitance	C <sub>oss</sub>	–	10	–	pF	V <sub>GS</sub> =0V
Reverse transfer capacitance	C <sub>rss</sub>	–	10	–	pF	f=1MHz
Turn-on delay time	t <sub>d(on)</sub> *	–	5	–	ns	V <sub>DD</sub> ≐ 10V, I <sub>D</sub> =150mA
Rise time	t <sub>r</sub> *	–	10	–	ns	V <sub>GS</sub> =4.0V
Turn-off delay time	t <sub>d(off)</sub> *	–	15	–	ns	R <sub>L</sub> ≐ 67Ω
Fall time	t <sub>f</sub> *	–	10	–	ns	R <sub>G</sub> =10Ω

\* Pulsed

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

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Forward voltage	V <sub>SD</sub> *	–	–	1.2	V	I <sub>S</sub> = 100mA, V <sub>GS</sub> =0V

\* Pulsed

●Electrical characteristics curves

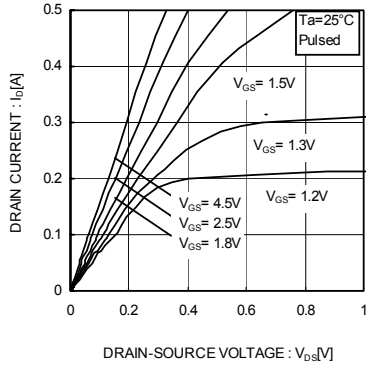


Fig.1 Typical Output Characteristics ( I )

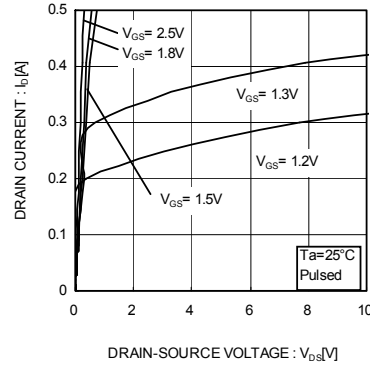


Fig.2 Typical Output Characteristics ( II )

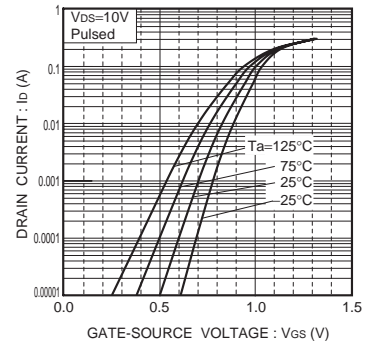


Fig.3 Typical transfer characteristics

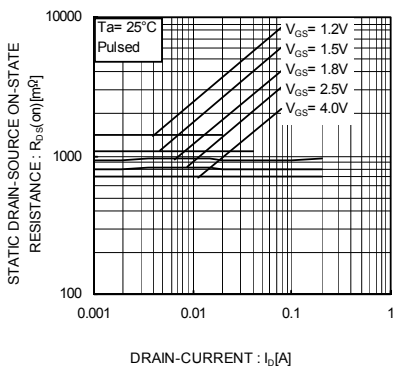


Fig.4 Static Drain-Source On-State Resistance vs. Drain Current( I )

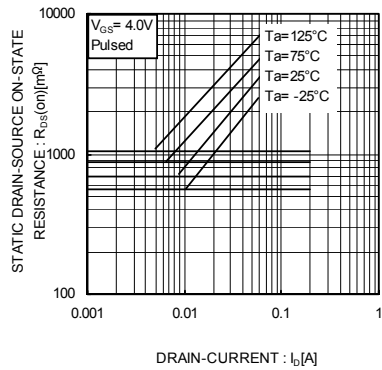


Fig.5 Static Drain-Source On-State Resistance vs. Drain Current( II )

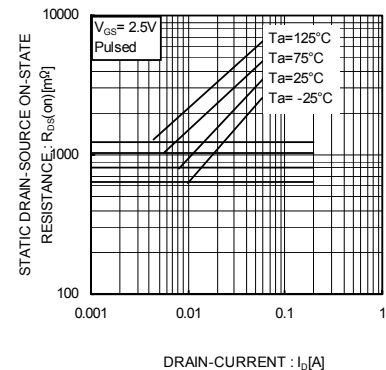


Fig.6 Static Drain-Source On-State Resistance vs. Drain Current( II )

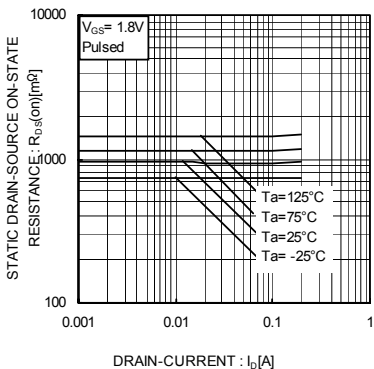


Fig.7 Static Drain-Source On-State Resistance vs. Drain Current( III )

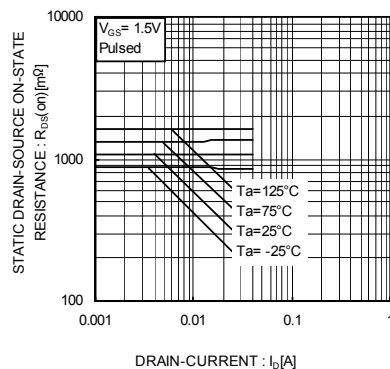


Fig.8 Static Drain-Source On-State Resistance vs. Drain Current( IV )

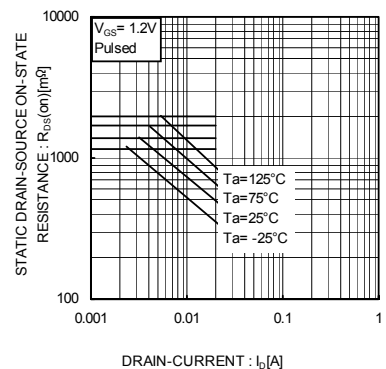


Fig.9 Static Drain-Source On-State Resistance vs. Drain Current( V )

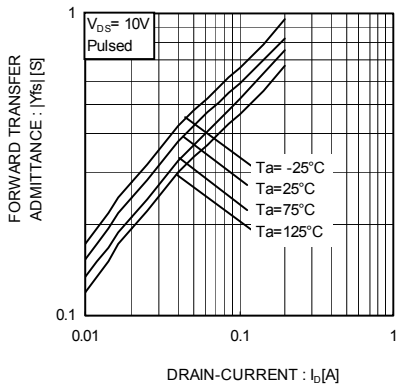


Fig.10 Forward Transfer Admittance vs. Drain Current

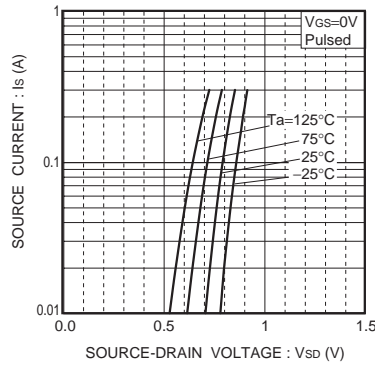


Fig.11 Source current vs. source-drain voltage

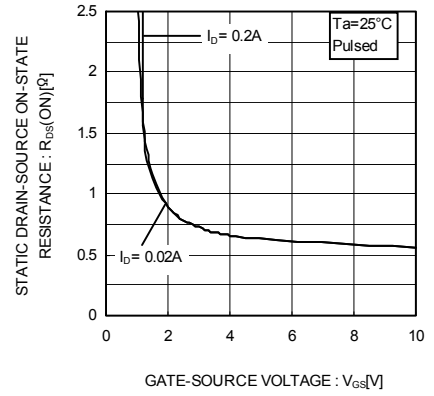


Fig.12 Static Drain-Source On-State Resistance vs. Gate Source Voltage

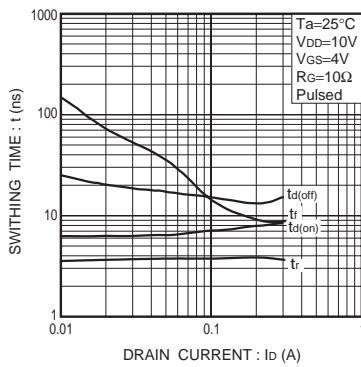


Fig.13 Switching characteristics

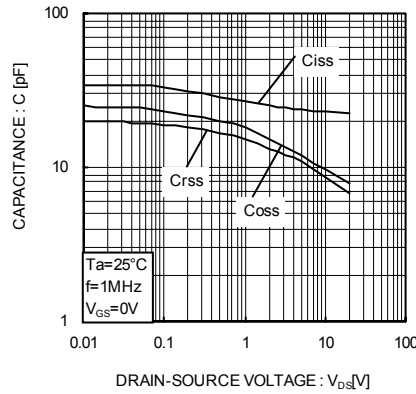


Fig.14 Typical Capacitance vs. Drain-Source Voltage

●Measurement circuit

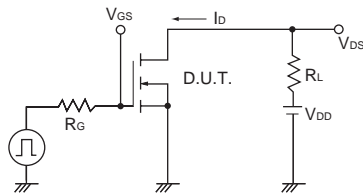


Fig.1-1 Switching time measurement circuit

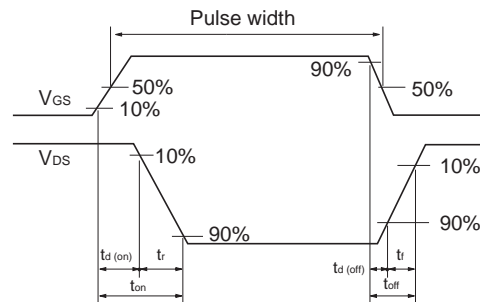


Fig.1-2 Switching waveforms

●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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