

2.5V Drive Nch MOSFET

RU1L002SN

● Structure

Silicon N-channel MOSFET

● Features

- 1) Low on-resistance.
- 2) Low voltage drive (2.5V drive).
- 3) Small package (UMT3F).

● Application

Switching

● Packaging specifications

Type	Package	Taping
	Code	TCL
	Basic ordering unit (pieces)	3000
RU1L002SN		○

● Absolute maximum ratings (Ta = 25°C)

Parameter		Symbol	Limits	Unit
Drain-source voltage		V_{DSS}	60	V
Gate-source voltage		V_{GSS}	±20	V
Drain current	Continuous	I_D	±250	mA
	Pulsed	I_{DP} *1	±1	A
Source current (Body Diode)	Continuous	I_S	125	mA
	Pulsed	I_{SP} *1	1	A
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 $\leq 1\%$

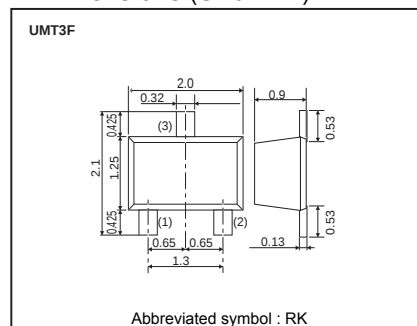
*2 Each terminal mounted on a recommended land

● Thermal resistance

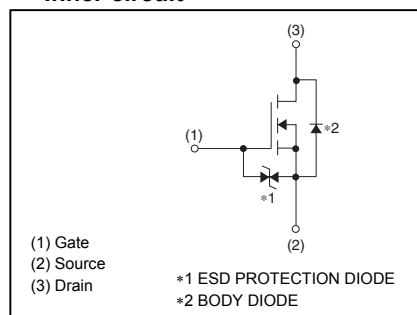
Parameter	Symbol	Limits	Unit
Channel to Ambient	$R_{th}(ch-a)$	625	°C / W

* 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	$V_{GS} = \pm 20V, V_{DS} = 0V$
Drain-source breakdown voltage	$V_{(BR)DSS}$	60	-	-	V	$I_D = 1mA, V_{GS} = 0V$
Zero gate voltage drain current	I_{DSS}	-	-	1	μA	$V_{DS} = 60V, V_{GS} = 0V$
Gate threshold voltage	$V_{GS(th)}$	1.0	-	2.3	V	$V_{DS} = 10V, I_D = 1mA$
Static drain-source on-state resistance	$R_{DS(on)}^*$	-	1.7	2.4	Ω	$I_D = 250mA, V_{GS} = 10V$
		-	2.1	3.0		$I_D = 250mA, V_{GS} = 4.5V$
		-	2.3	3.2		$I_D = 250mA, V_{GS} = 4.0V$
		-	3.0	12.0		$I_D = 10mA, V_{GS} = 2.5V$
Forward transfer admittance	$ Y_{fs} ^*$	0.25	-	-	S	$V_{DS} = 10V, I_D = 250mA$
Input capacitance	C_{iss}	-	15	-	pF	$V_{DS} = 25V$
Output capacitance	C_{oss}	-	4.5	-	pF	$V_{GS} = 0V$
Reverse transfer capacitance	C_{rss}	-	2.0	-	pF	$f = 1MHz$
Turn-on delay time	$t_{d(on)}^*$	-	3.5	-	ns	$V_{DD} \approx 30V, I_D = 100mA$ $V_{GS} = 10V$
Rise time	t_r^*	-	5	-	ns	
Turn-off delay time	$t_{d(off)}^*$	-	18	-	ns	
Fall time	t_f^*	-	28	-	ns	

*Pulsed

● **Body diode characteristics** (Source-Drain)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Forward Voltage	V_{SD}^*	-	-	1.2	V	$I_S = 250mA, V_{GS} = 0V$

*Pulsed

●Electrical characteristic curves (Ta=25°C)

Fig.1 Typical Output Characteristics(I)

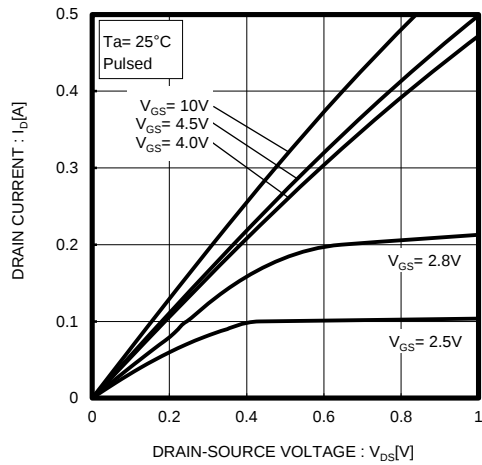


Fig.2 Typical Output Characteristics(II)

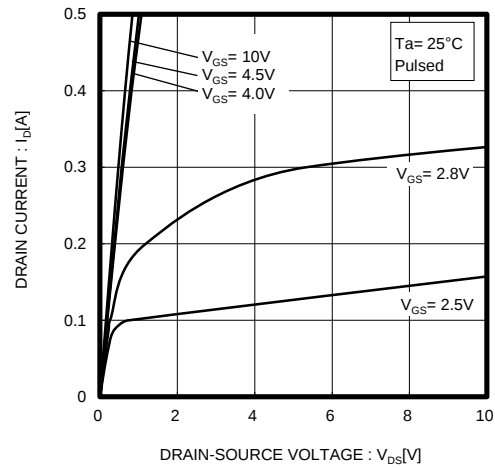


Fig.3 Typical Transfer Characteristics

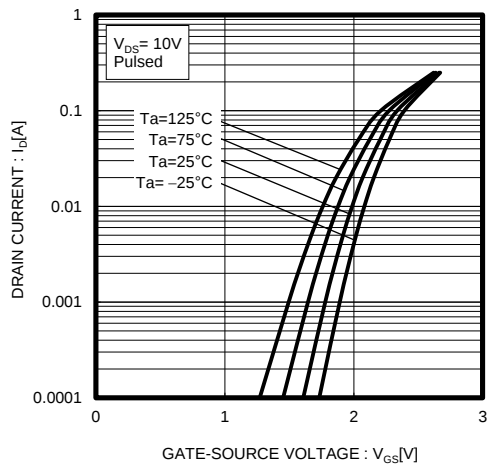


Fig.4 Static Drain-Source On-State Resistance vs. Drain Current(I)

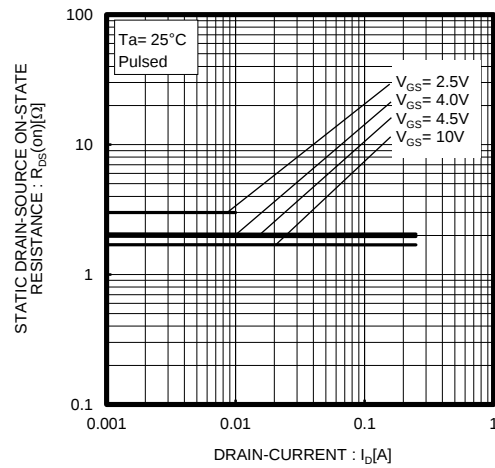


Fig.5 Static Drain-Source On-State Resistance vs. Drain Current(II)

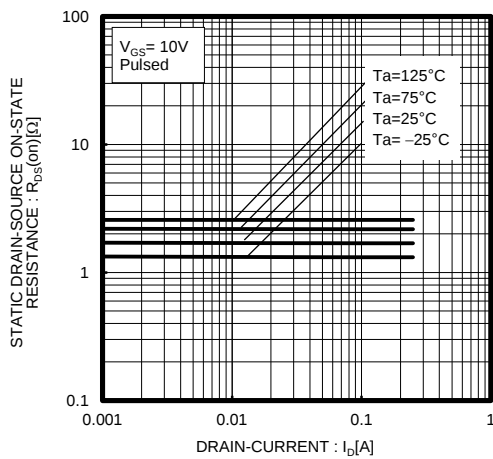


Fig.6 Static Drain-Source On-State Resistance vs. Drain Current(III)

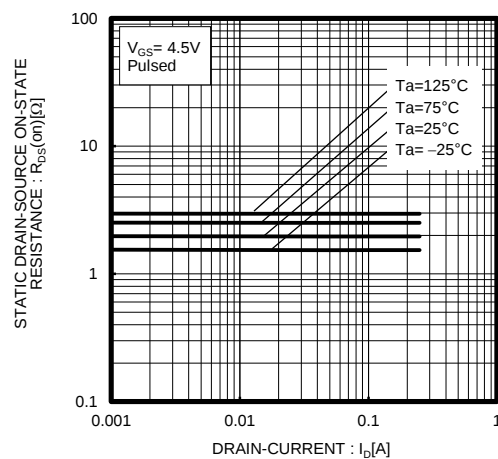


Fig.7 Static Drain-Source On-State Resistance vs. Drain Current(IV)

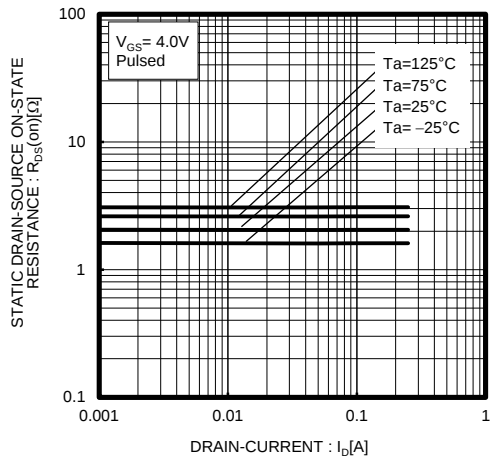


Fig.8 Static Drain-Source On-State Resistance vs. Drain Current(IV)

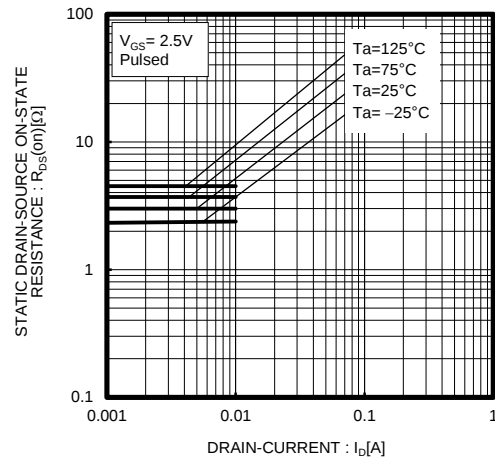


Fig.9 Forward Transfer Admittance vs. Drain Current

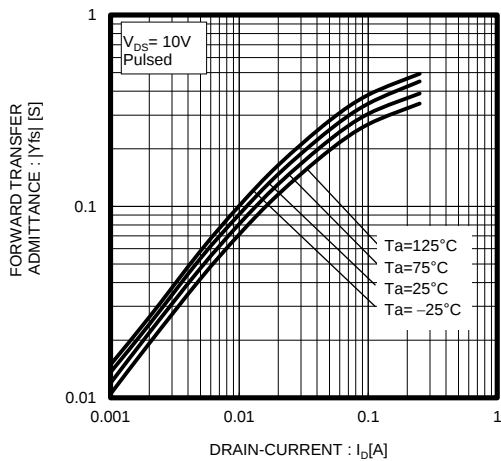


Fig.10 Reverse Drain Current vs. Source-Drain Voltage

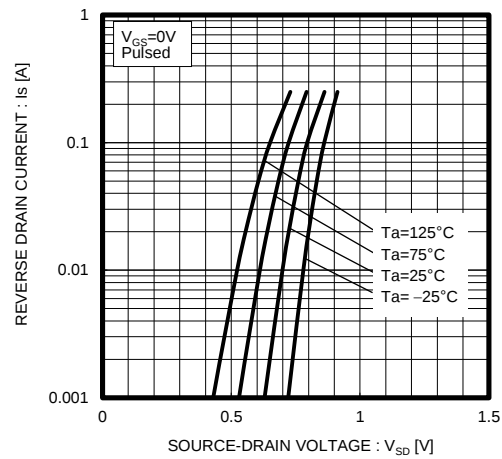


Fig.11 Static Drain-Source On-State Resistance vs. Gate Source Voltage

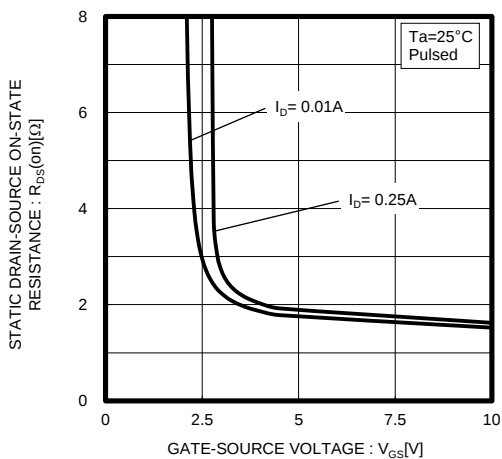


Fig.12 Switching Characteristics

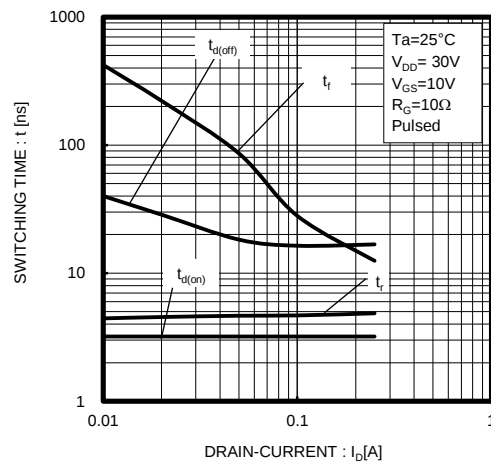
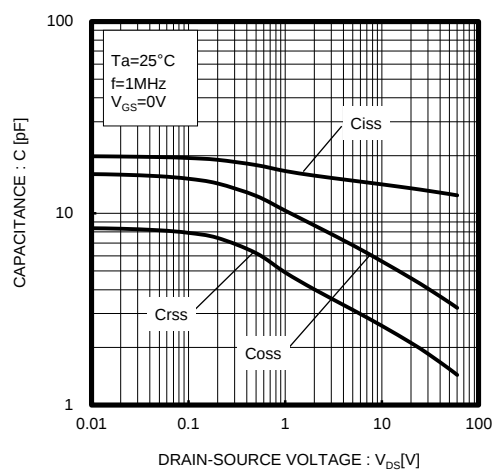


Fig.13 Typical Capacitance vs. Drain-Source Voltage



● Measurement circuits

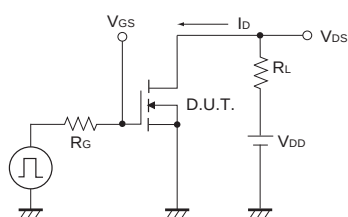


Fig.1-1 Switching Time Measurement Circuit

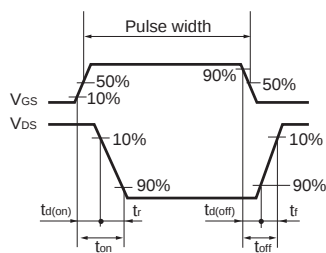


Fig.1-2 Switching Waveforms

● Notice

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

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