

0.9V Drive Nch MOSFET

RYU002N05

● Structure

Silicon N-channel MOSFET

● Features

- 1) High speed switing.
- 2) Small package(UMT3).
- 3) Ultra low voltage drive(0.9V drive).

● Application

Switching

● Packaging specifications

Type	Package	Taping
	Code	T306
	Basic ordering unit (pieces)	3000
RYU002N05		○

● Absolute maximum ratings ($T_a = 25^\circ\text{C}$)

Parameter		Symbol	Limits	Unit
Drain-source voltage		V_{DSS}	50	V
Gate-source voltage		V_{GSS}	± 8	V
Drain current	Continuous	I_D	± 200	mA
	Pulsed	I_{DP} *1	± 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	$^\circ\text{C}$
Range of storage temperature		T_{stg}	-55 to +150	$^\circ\text{C}$

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

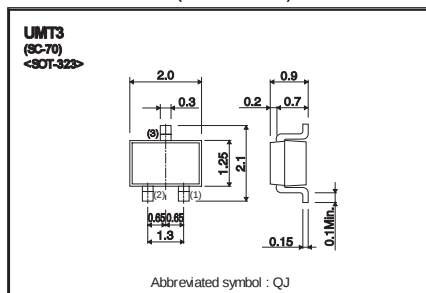
*2 Each terminal mounted on a recommended land.

● Thermal resistance

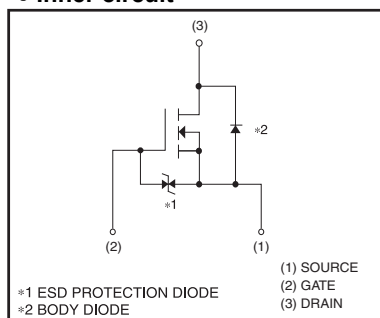
Parameter	Symbol	Limits	Unit
Channel to Ambient	$R_{th}(ch-a)^*$	625	$^\circ\text{C} / \text{W}$

* Each terminal mounted on a recommended land.

● Dimensions (Unit : mm)



● Inner circuit



● Electrical characteristics (T_a = 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}	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	-	0.8	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
		-	2.0	2.8		I _D =200mA, V _{GS} =1.5V
		-	2.2	3.3		I _D =100mA, V _{GS} =1.2V
		-	3.0	9.0		I _D =10mA, V _{GS} =0.9V
Forward transfer admittance	Y _{fs} *	0.2	-	-	S	I _D =200mA, V _{DS} =10V
Input capacitance	C _{iss}	-	26	-	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)} *	-	5	-	ns	I _D =100mA, V _{DD} =25V
Rise time	t _r *	-	8	-	ns	V _{GS} =4.5V
Turn-off delay time	t _{d(off)} *	-	17	-	ns	R _L =250Ω
Fall time	t _f *	-	43	-	ns	R _G =10Ω

*Pulsed

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

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Forward Voltage	V _{SD} *	-	-	1.2	V	I _S =200mA, V _{GS} =0V

*Pulsed

● Electrical characteristics curves

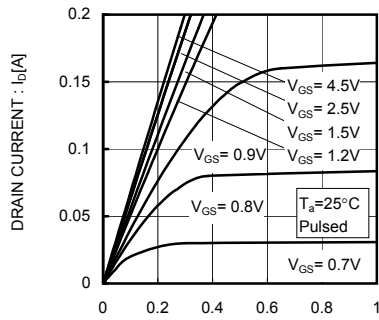


Fig.1 Typical Output Characteristics(I)

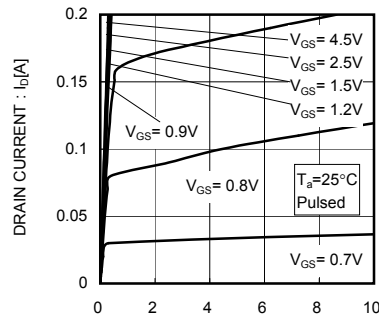


Fig.2 Typical Output Characteristics(II)

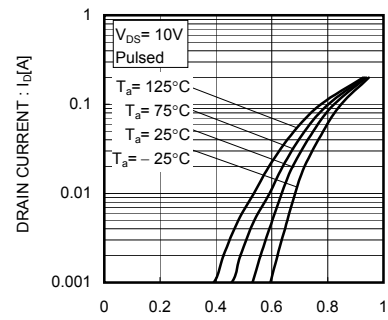


Fig.3 Typical Transfer Characteristics

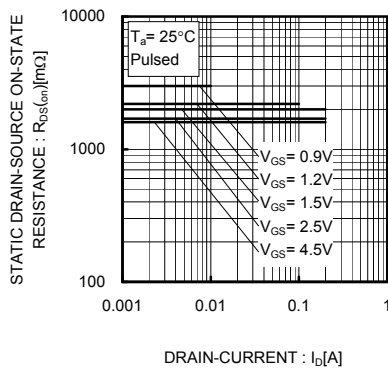


Fig.4 Static Drain-Source On-State Resistance vs. Drain Current(I)

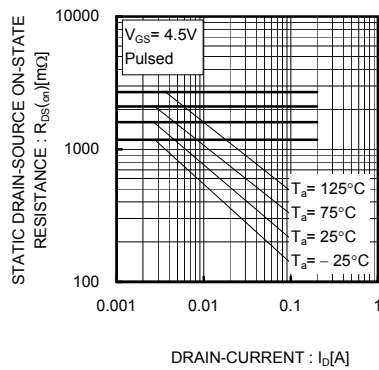


Fig.5 Static Drain-Source On-State Resistance vs. Drain Current(II)

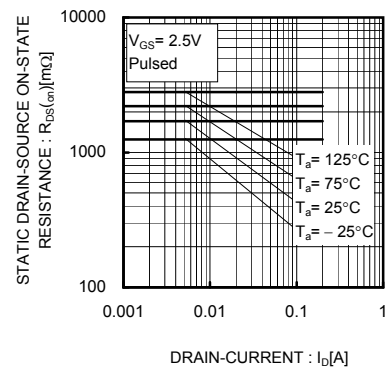


Fig.6 Static Drain-Source On-State Resistance vs. Drain Current(III)

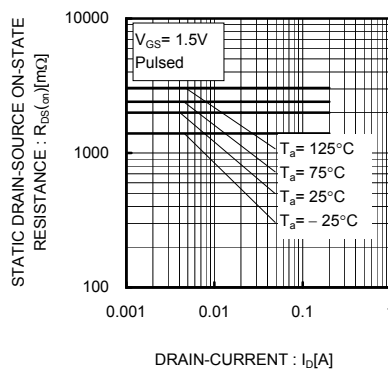


Fig.7 Static Drain-Source On-State Resistance vs. Drain Current(IV)

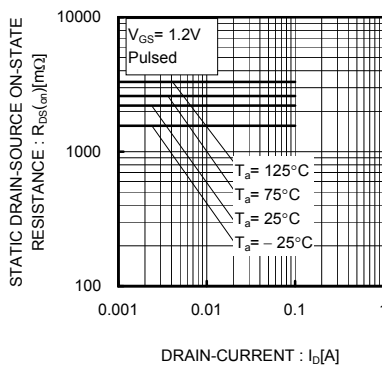


Fig.8 Static Drain-Source On-State Resistance vs. Drain Current(V)

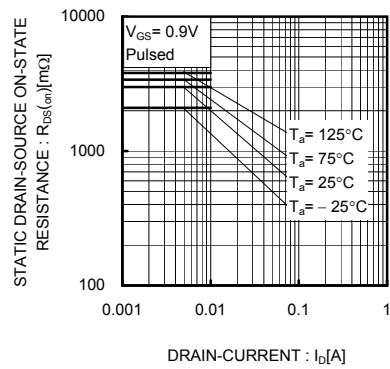


Fig.9 Static Drain-Source On-State Resistance vs. Drain Current(VI)

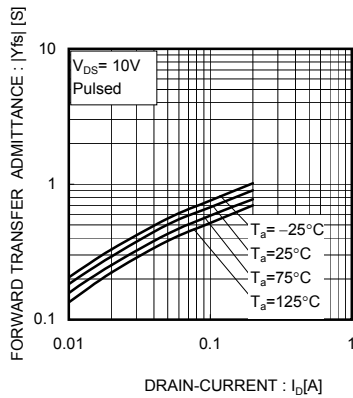


Fig.10 Forward Transfer Admittance vs. Drain Current

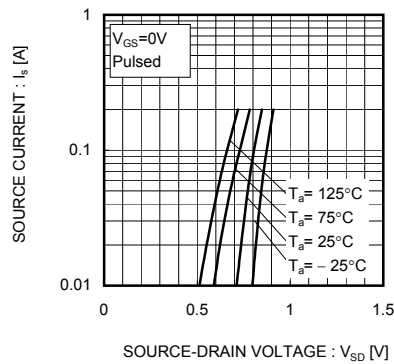


Fig.11 Reverse Drain Current vs. Source-Drain Voltage

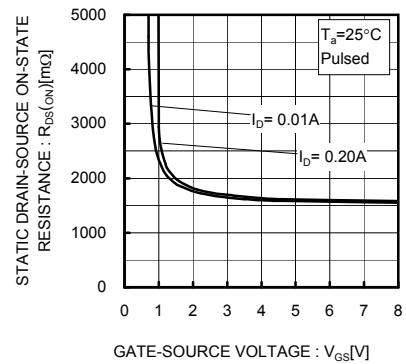


Fig.12 Static Drain-Source On-State Resistance vs. Gate Source Voltage

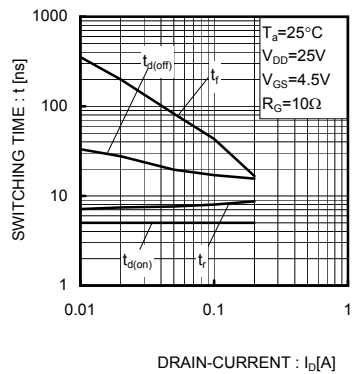


Fig.13 Switching Characteristics

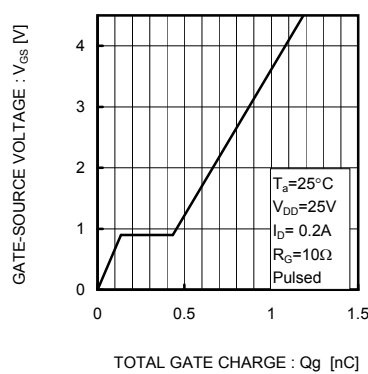


Fig.14 Typical Capacitance vs. Drain-Source Voltage

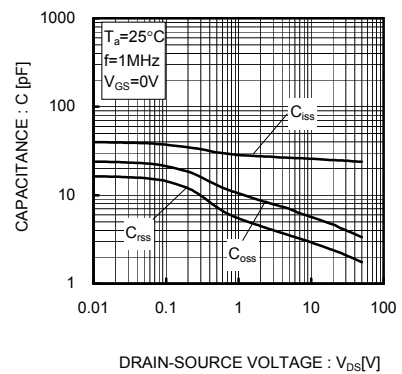


Fig.15 Typical Capacitance vs. Drain-Source Voltage

● Measurement circuits

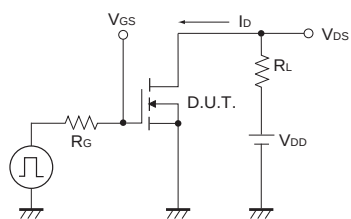


Fig.1-1 Switching Time Measurement Circuit

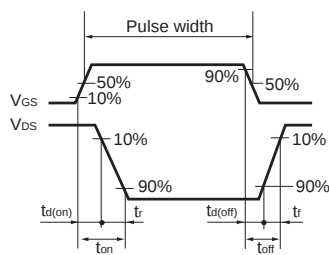


Fig.1-2 Switching Waveforms

● 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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