

Transistors

# 1.8V Drive Nch MOSFET

## RUF015N02

●Structure

Silicon N-channel MOSFET

●Features

- 1) Low On-resistance.
- 2) Space saving, small surface mount package (TUMT3).
- 3) Low voltage drive (1.8V drive).

●Applications

Switching

●Packaging specifications

Type	Package	Taping
	Code	TL
	Basic ordering unit (pieces)	3000
RUF015N02		○

●Absolute maximum ratings (Ta=25°C)

Parameter	Symbol	Limits	Unit	
Drain-source voltage	V <sub>DSS</sub>	20	V	
Gate-source voltage	V <sub>GSS</sub>	10	V	
Drain current	Continuous	I <sub>D</sub>	±1.5	A
	Pulsed	I <sub>DP</sub> *1	±3.0	A
Source current (Body diode)	Continuous	I <sub>S</sub>	0.6	A
	Pulsed	I <sub>SP</sub> *1	2.4	A
Total power dissipation	P <sub>D</sub> *2	0.8	W	
Channel temperature	T <sub>ch</sub>	150	°C	
Range of storage temperature	T <sub>stg</sub>	-55 to +150	°C	

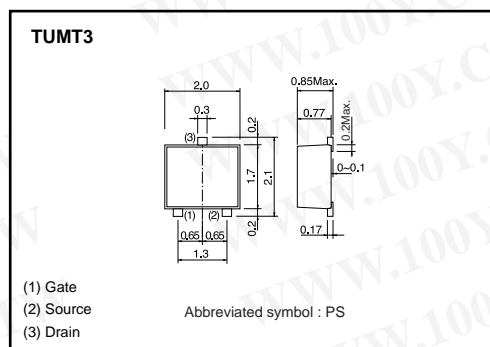
\*1 Pw≤10μs, Duty cycle≤1%  
 \*2 Mounted on a ceramic board

●Thermal resistance

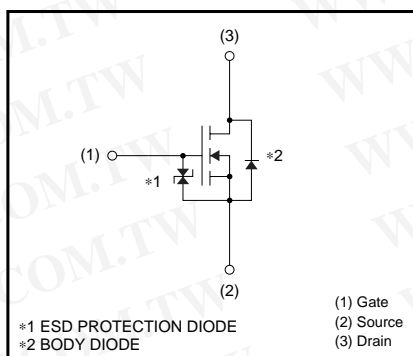
Parameter	Symbol	Limits	Unit
Channel to ambient	R <sub>th(ch-a)</sub> *	156	°C/W

\* Mounted on a ceramic board

●Dimensions (Unit : mm)



●Inner circuit



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●Electrical characteristics (Ta=25°C)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Gate-source leakage	$I_{GSS}$	–	–	10	$\mu A$	$V_{GS}=10V, V_{DS}=0V$
Drain-source breakdown voltage	$V_{(BR)DSS}$	20	–	–	V	$I_D=1mA, V_{GS}=0V$
Zero gate voltage drain current	$I_{DSS}$	–	–	1	$\mu A$	$V_{DS}=20V, V_{GS}=0V$
Gate threshold voltage	$V_{GS(th)}$	0.3	–	1.0	V	$V_{DS}=10V, I_D=1mA$
Static drain-source on-state resistance	$R_{DS(on)}$ *	–	130	180	$m\Omega$	$I_D=1.5A, V_{GS}=4.5V$
		–	170	240	$m\Omega$	$I_D=1.5A, V_{GS}=2.5V$
		–	220	310	$m\Omega$	$I_D=0.8A, V_{GS}=1.8V$
Forward transfer admittance	$ Y_{fs} $ *	1.6	–	–	S	$V_{DS}=10V, I_D=1.5A$
Input capacitance	$C_{iss}$	–	110	–	pF	$V_{DS}=10V$
Output capacitance	$C_{oss}$	–	18	–	pF	$V_{GS}=0V$
Reverse transfer capacitance	$C_{rss}$	–	15	–	pF	$f=1MHz$
Turn-on delay time	$t_{d(on)}$ *	–	5	–	ns	$I_D=1.0A$
Rise time	$t_r$ *	–	5	–	ns	$V_{DD}=10V$
Turn-off delay time	$t_{d(off)}$ *	–	20	–	ns	$V_{GS}=4.5V$
Fall time	$t_f$ *	–	3	–	ns	$R_L=10\Omega$
Total gate charge	$Q_g$ *	–	1.8	2.5	nC	$V_{DD}=10V$
Gate-source charge	$Q_{gs}$ *	–	0.3	–	nC	$V_{GS}=4.5V$
Gate-drain charge	$Q_{gd}$ *	–	0.3	–	nC	$I_D=1.5A$

\*Pulsed

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

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Forward voltage	$V_{SD}$	–	–	1.2	V	$I_S=0.6A, V_{GS}=0V$

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●Electrical characteristics curves

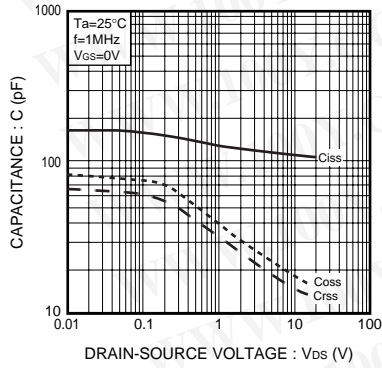


Fig.1 Typical Capacitance vs. Drain-Source Voltage

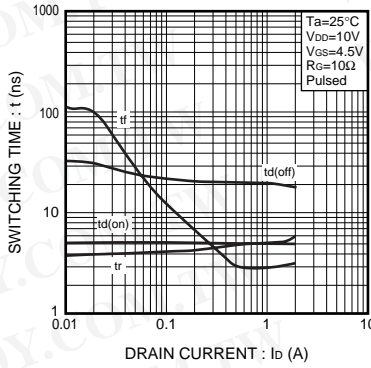


Fig.2 Switching Characteristics

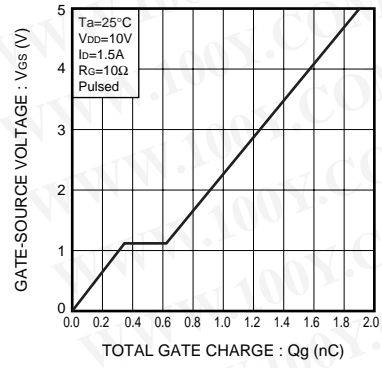


Fig.3 Dynamic Input Characteristics

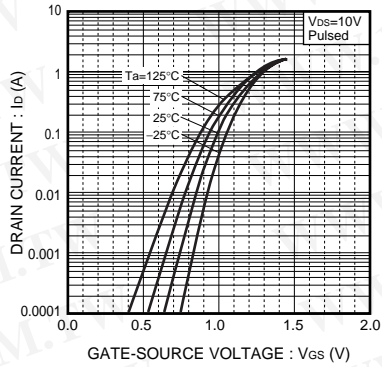


Fig.4 Typical Transfer Characteristics

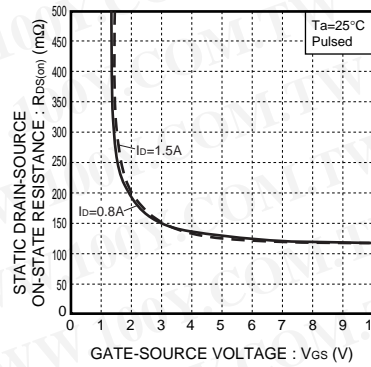


Fig.5 Static Drain-Source On-State Resistance vs. Gate-source Voltage

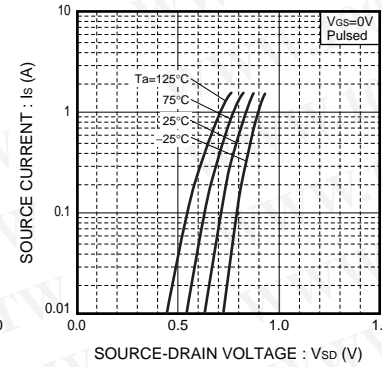


Fig.6 Source Current vs. Source-Drain Voltage

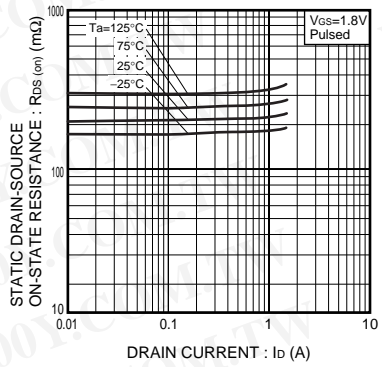


Fig.7 Static Drain-Source On-State Resistance vs. Drain Current ( I )

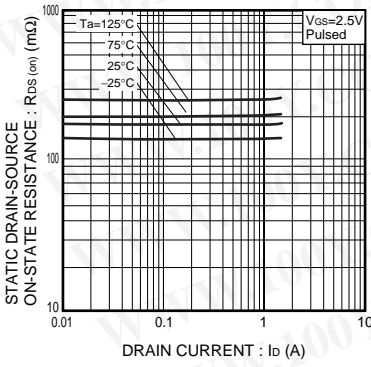


Fig.8 Static Drain-Source On-State Resistance vs. Drain Current ( II )

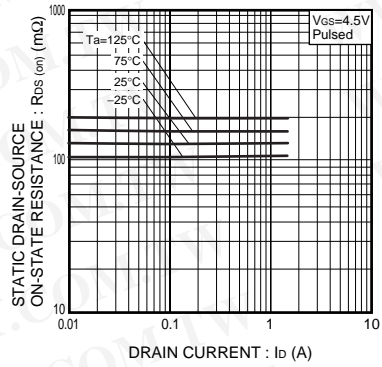


Fig.9 Static Drain-Source On-State Resistance vs. Drain Current ( III )

●Notice

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

## Appendix

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