Transistors

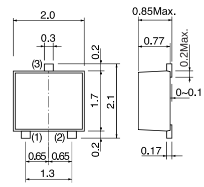
1.8V Drive Nch MOSFET

RUF015N02

●Structure
Silicon N-channel MOSFET

●Dimensions (Unit : mm)

TUMT3



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

Abbreviated symbol : PS

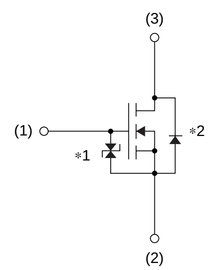
●Features
1) Low On-resistance.
2) Space saving, small surface mount package (TUMT3).
3) Low voltage drive (1.8V drive).

●Applications
Switching

●Packaging specifications

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

●Inner circuit



∗1 ESD PROTECTION DIODE
∗2 BODY DIODE

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

●Absolute maximum ratings (Ta=25°C)

Parameter		Symbol	Limits	Unit
Drain-source voltage		V_{DSS}	20	V
Gate-source voltage		V_{GSS}	10	V
Drain current	Continuous	I_D	±1.5	A
	Pulsed	I_{DP} ∗1	±3.0	A
Source current (Body diode)	Continuous	I_S	0.6	A
	Pulsed	I_{SP} ∗1	2.4	A
Total power dissipation		P_D ∗2	0.8	W
Channel temperature		Tch	150	°C
Range of storage temperature		Tstg	−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	Rth(ch-a)∗	156	°C/W

∗ Mounted on a ceramic board

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●**Electrical characteristics** (Ta=25°C)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Gate-source leakage	I_{GSS}	–	–	10	μA	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	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	$R_{DS\ (on)}$*	–	130	180	mΩ	I_D= 1.5A, V_{GS}= 4.5V
		–	170	240	mΩ	I_D= 1.5A, V_{GS}= 2.5V
		–	220	310	mΩ	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 V_{DD}≒ 10V V_{GS}= 4.5V R_L=10Ω R_G=10Ω
Rise time	t_r *	–	5	–	ns	
Turn-off delay time	$t_{d\ (off)}$ *	–	20	–	ns	
Fall time	t_f *	–	3	–	ns	
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

●Electrical characteristics curves

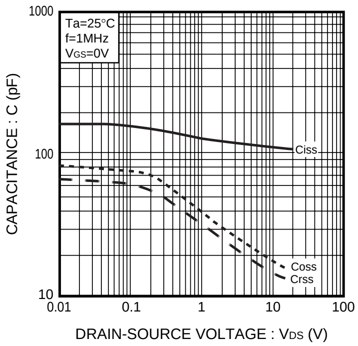

Fig.1 Typical Capacitance vs. Drain-Source Voltage

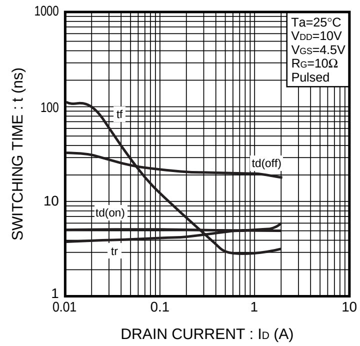

Fig.2 Switching Characteristics

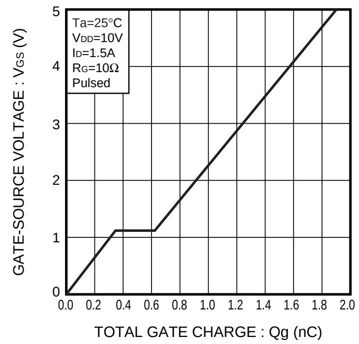

Fig.3 Dynamic Input Characteristics

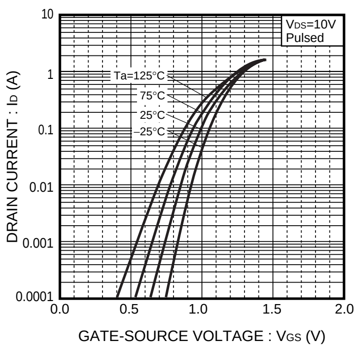

Fig.4 Typical Transfer Characteristics

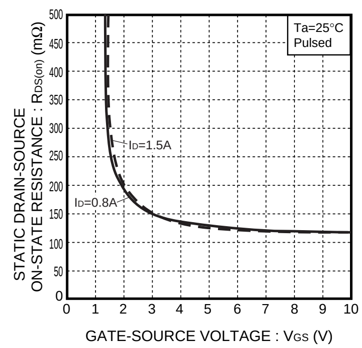

Fig.5 Static Drain-Source On-State Resistance vs. Gate-source Voltage

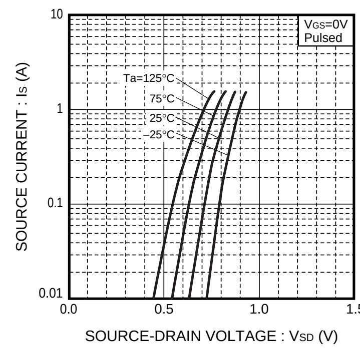

Fig.6 Source Current vs. Source-Drain Voltage

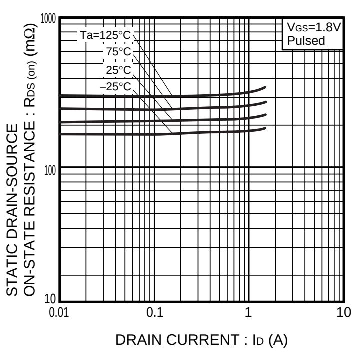

Fig.7 Static Drain-Source On-State Resistance vs. Drain Current (I)

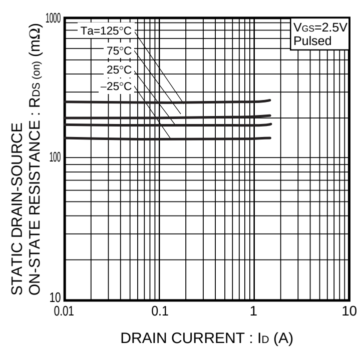

Fig.8 Static Drain-Source On-State Resistance vs. Drain Current (II)

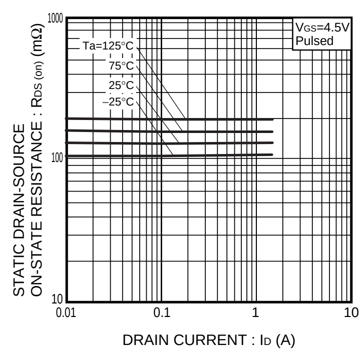

Fig.9 Static Drain-Source On-State Resistance vs. Drain Current (III)

●Notice

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

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