1.5V Drive Nch MOSFET

RUF025N02

●Structure

Silicon N-channel MOSFET

●Features

- 1) Low On-resistance.
- 2) Space saving, small surface mount package (TUMT3).
- 3) Low voltage drive (1.5V drive).

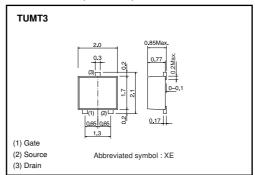
Applications

Switching

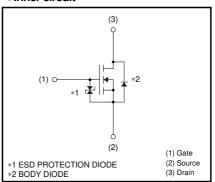
Packaging specifications

	Package	Taping	
Type	Code	TL	
	Basic ordering unit (pieces)	3000	
RUF025N02		0	

●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}	±10	V	
Drain aurrent	Continuous	I _D	±2.5	Α	
Drain current	Pulsed	I _{DP} *1	±5	Α	
Source current	Continuous	Is	0.6	Α	
(Body diode)	Pulsed	Isp *1	5	Α	
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

●Electrical characteristics (Ta=25°C)

Parameter	Symbol	Min.	Тур.	Max.	Unit	Conditions
Gate-source leakage	Igss	-	_	±10	μΑ	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	IDSS	_	_	1	μΑ	V _{DS} = 20V, V _{GS} =0V
Gate threshold voltage	VGS (th)	0.3	_	1.3	٧	V _{DS} = 10V, I _D = 1mA
Static drain-source on-state resistance	R _{DS (on)} *	-	39	54	mΩ	I _D = 2.5A, V _{GS} = 4.5V
		_	49	68	mΩ	I _D = 2.5A, V _{GS} = 2.5V
		_	65	91	mΩ	I _D = 1.3A, V _{GS} = 1.8V
		_	80	160	mΩ	ID= 0.5A, VGS= 1.5V
Forward transfer admittance	Y _{fs} *	3.6	_	_	S	V _{DS} = 10V, I _D = 2.5A
Input capacitance	Ciss	-	370	_	рF	V _{DS} = 10V
Output capacitance	Coss	_	90	_	pF	V _{GS} =0V
Reverse transfer capacitance	Crss	_	50	_	pF	f=1MHz
Turn-on delay time	t _{d (on)} *	_	7	_	ns	ID= 1.3A
Rise time	tr *	_	15	_	ns	VDD≒ 10V VGS= 4.5V
Turn-off delay time	td (off) *	-	35	_	ns	vgs= 4.5v RL≒7.7Ω
Fall time	t _f *	-	15	_	ns	R _G =10Ω
Total gate charge	Qg *	_	5	-	nC	I _D = 2.5A, V _{DD} ≒ 10V
Gate-source charge	Q _{gs} *	_	0.9	_	nC	V _{GS} = 4.5V
Gate-drain charge	Q _{gd} *	-	0.8	_	nC	R∟≒4Ω, R _G =10Ω

^{*}Pulsed

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

Parameter	Symbol	Min.	Тур.	Max.	Unit	Conditions
Forward voltage	VsD *	_	_	1.2	V	I _S = 0.6A, V _{GS} =0V

^{*}Pulsed

Electrical characteristics curves

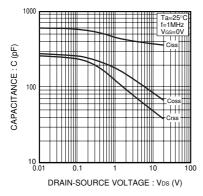


Fig.1 Typical Capacitance vs. Drain-Source Voltage

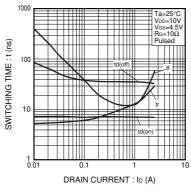


Fig.2 Switching Characteristics

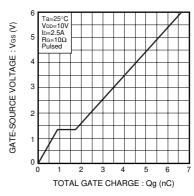


Fig.3 Dynamic Input Characteristics

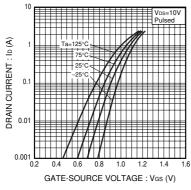


Fig.4 Typical Transfer Characteristics

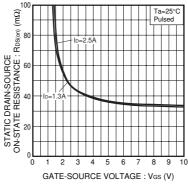


Fig.5 Static Drain-Source On-State Resistance vs. Gate-Source Voltage

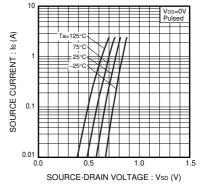


Fig.6 Source Current vs. Source-Drain Voltage

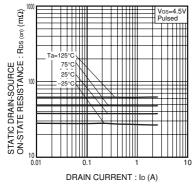


Fig.7 Static Drain-Source On-State Resistance vs. Drain Current (I)

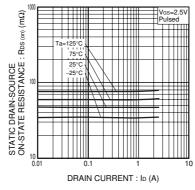


Fig.8 Static Drain-Source On-State Resistance vs. Drain Current (II)

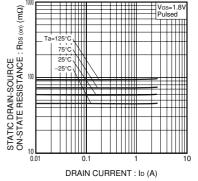
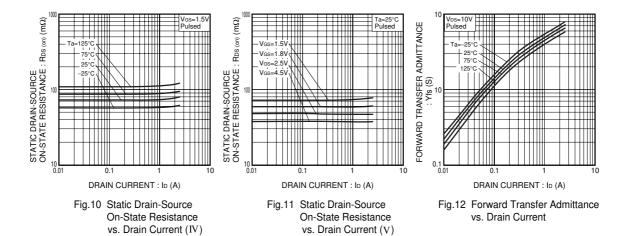


Fig.9 Static Drain-Source On-State Resistance vs. Drain Current(III)



●Measurement circuit

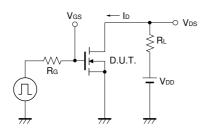


Fig.13 Switching Time Measurement Circuit

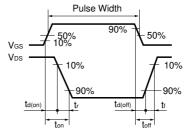


Fig.14 Switching Waveforms

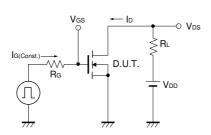


Fig.15 Gate Charge Measurement Circuit

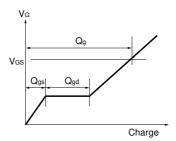


Fig.16 Gate Charge Waveform

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