

2.5V Drive Nch MOSFET

RTR030N05

●Structure

Silicon N-channel MOSFET

●Features

- 1) Low On-resistance.
- 2) Built-in G-S Protection Diode.
- 3) Small Surface Mount Package (TSMT3).

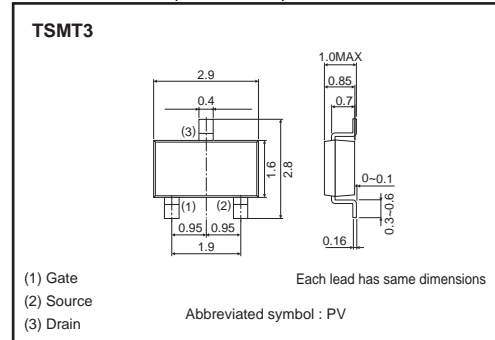
●Application

Switching

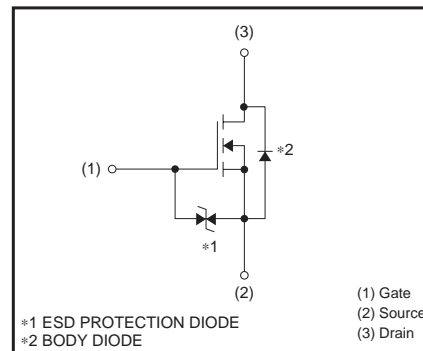
●Packaging specifications

Type	Package	Taping
	Code	TL
	Basic ordering unit (pieces)	3000
RTR030N05		○

●Dimensions (Unit : mm)



●Inner circuit



●Absolute maximum ratings (Ta=25°C)

Parameter	Symbol	Limits	Unit	
Drain-source voltage	V_{DSS}	45	V	
Gate-source voltage	V_{GSS}	± 12	V	
Drain current	Continuous	I_D	± 3	A
	Pulsed	I_{DP} *1	± 12	A
Source current (Body diode)	Continuous	I_S	0.8	A
	Pulsed	I_{SP} *1	12	A
Total power dissipation	P_D *2	1.0	W	
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 When mounted on a ceramic board

●Thermal resistance

Parameter	Symbol	Limits	Unit
Channel to ambient	$R_{th}(ch-a)$ *	125	°C / W

* When mounted on a ceramic board

●Electrical characteristics (Ta=25°C)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Gate-source leakage	I _{GSS}	–	–	±10	μA	V _{GS} = ±12V, V _{DS} =0V
Drain-source breakdown voltage	V _{(BR)DSS}	45	–	–	V	I _D = 1mA, V _{GS} =0V
Zero gate voltage drain current	I _{DSS}	–	–	1	μA	V _{DS} = 45V, V _{GS} =0V
Gate threshold voltage	V _{GS(th)}	0.5	–	1.5	V	V _{DS} = 10V, I _D = 1mA
Static drain-source on-state resistance	R _{DS(on)} *	–	48	67	mΩ	I _D = 3A, V _{GS} = 4.5V
		–	53	74	mΩ	I _D = 3A, V _{GS} = 4V
		–	68	95	mΩ	I _D = 3A, V _{GS} = 2.5V
Forward transfer admittance	Y _{fs} *	2.8	–	–	S	V _{DS} = 10V, I _D = 3A
Input capacitance	C _{iss}	–	510	–	pF	V _{DS} = 10V
Output capacitance	C _{oss}	–	110	–	pF	V _{GS} = 0V
Reverse transfer capacitance	C _{rss}	–	55	–	pF	f=1MHz
Turn-on delay time	t _{d(on)} *	–	12	–	ns	V _{DD} ≐ 25V
Rise time	t _r *	–	19	–	ns	I _D = 1.5A
Turn-off delay time	t _{d(off)} *	–	34	–	ns	V _{GS} = 4.5V
Fall time	t _f *	–	26	–	ns	R _L ≐ 16.6Ω
Total gate charge	Q _g *	–	6.2	–	nC	V _{DD} ≐ 25V
Gate-source charge	Q _{gs} *	–	1.6	–	nC	I _D = 3A
Gate-drain charge	Q _{gd} *	–	1.4	–	nC	V _{GS} = 4.5V
						R _L ≐ 8.3Ω
						R _G =10Ω

*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 = 3A, V _{GS} =0V

*Pulsed

●Electrical characteristics curves

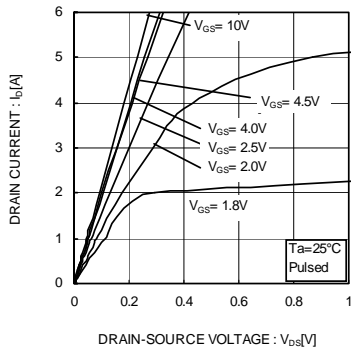


Fig.1 Typical Output Characteristics (I)

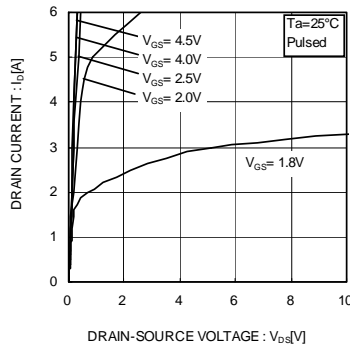


Fig.2 Typical Output Characteristics (II)

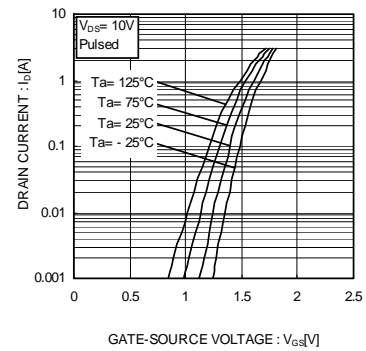


Fig.3 Typical Transfer Characteristics

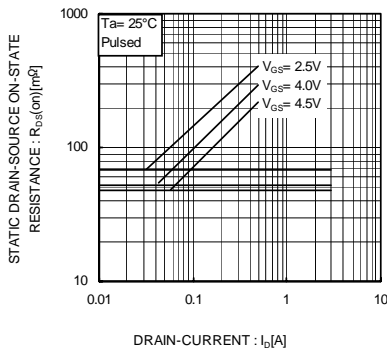


Fig.4 Static Drain-Source On-State Resistance vs. Drain Current(I)

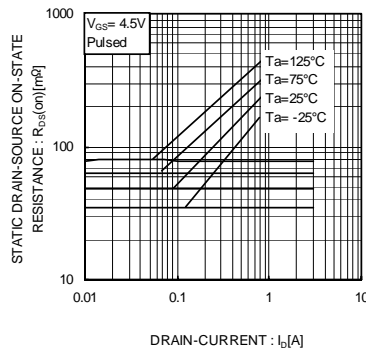


Fig.5 Static Drain-Source On-State Resistance vs. Drain Current(II)

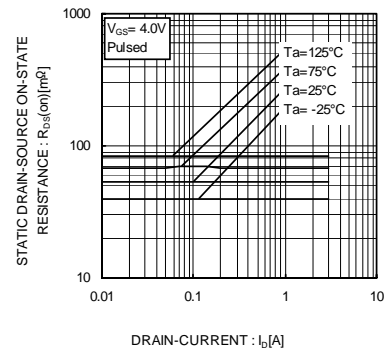


Fig.6 Static Drain-Source On-State Resistance vs. Drain Current(III)

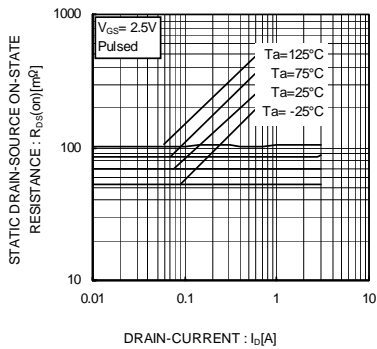


Fig.7 Static Drain-Source On-State Resistance vs. Drain Current(IV)

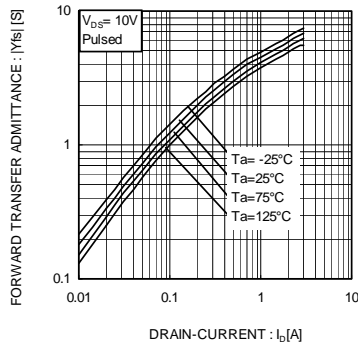


Fig.8 Forward Transfer Admittance vs. Drain Current

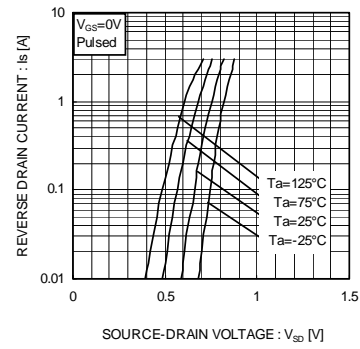


Fig.9 Reverse Drain Current vs. Source-Drain Voltage

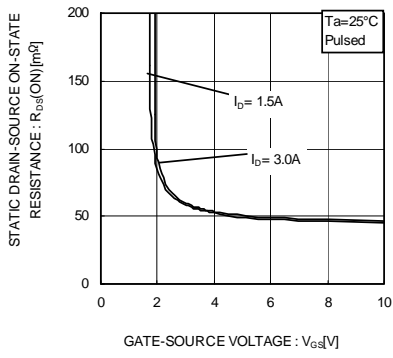


Fig.10 Static Drain-Source On-State Resistance vs. Gate Source Voltage

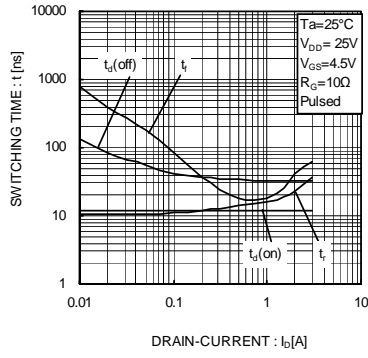


Fig.11 Switching Characteristics

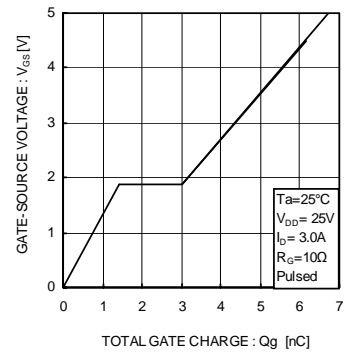


Fig.12 Dynamic Input Characteristics

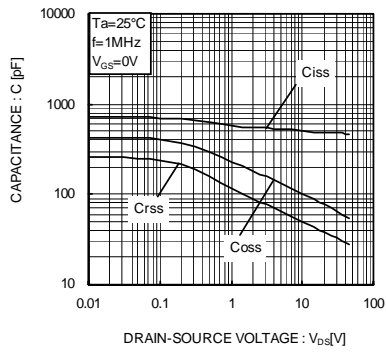


Fig.13 Typical Capacitance vs. Drain-Source Voltage

●Measurement circuits

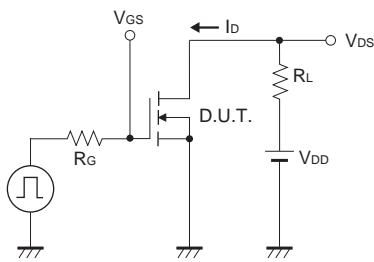


Fig.1-1 Switching Time Measurement Circuit

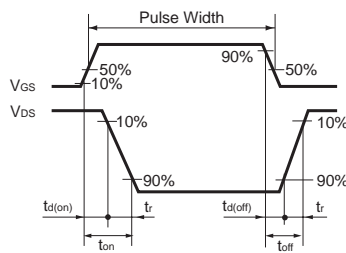


Fig.1-2 Switching Time Waveforms

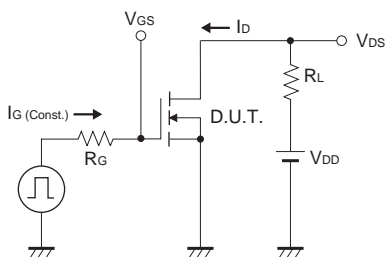


Fig.2-1 Gate Charge Measurement Circuit

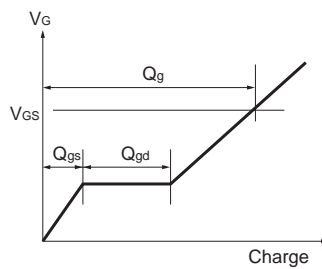


Fig.2-2 Gate Charge Waveform

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