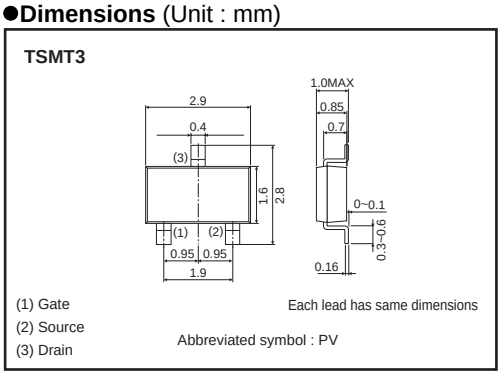
2.5V Drive Nch MOSFET

RTR030N05

●Structure
Silicon N-channel MOSFET

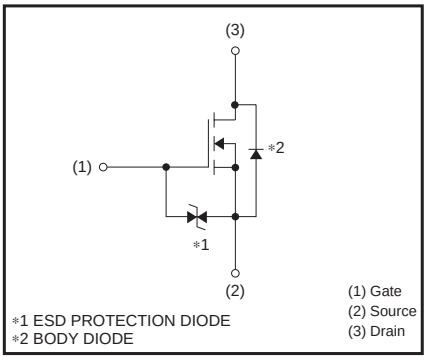
●Features
1) Low On-resistance.
2) Built-in G-S Protection Diode.
3) Small Surface Mount Package (TSMT3).

●Dimensions (Unit : mm)



●Application
Switching

●Inner circuit



●Packaging specifications

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

●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		Tch	150	°C
Range of Storage temperature		Tstg	−55 to +150	°C

*1 Pw≤10μs, Duty cycle≤1%
*2 When mounted on a ceramic board

●Thermal resistance

Parameter	Symbol	Limits	Unit
Channel to ambient	Rth (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 I_D= 1.5A V_{GS}= 4.5V R_L≒ 16.6Ω R_G=10Ω
Rise time	t_r *	–	19	–	ns	
Turn-off delay time	$t_{d\ (off)}$ *	–	34	–	ns	
Fall time	t_f *	–	26	–	ns	
Total gate charge	Q_g *	–	6.2	–	nC	V_{DD}≒ 25V I_D= 3A V_{GS}= 4.5V R_L≒ 8.3Ω R_G=10Ω
Gate-source charge	Q_{gs} *	–	1.6	–	nC	
Gate-drain charge	Q_{gd} *	–	1.4	–	nC	

*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

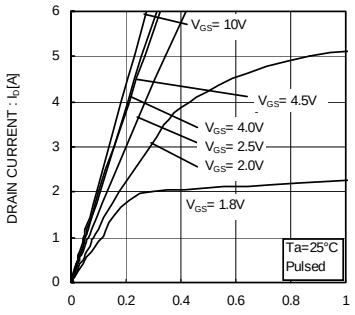


Fig.1 Typical Output Characteristics(Ⅰ)

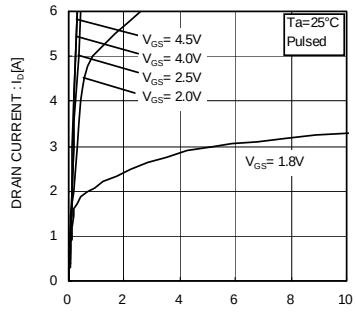


Fig.2 Typical Output Characteristics(Ⅱ)

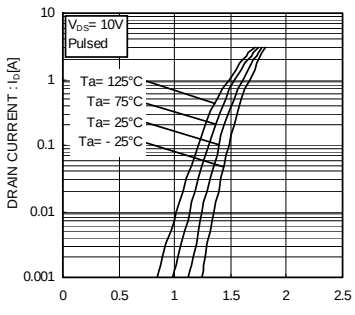


Fig.3 Typical Transfer Characteristics

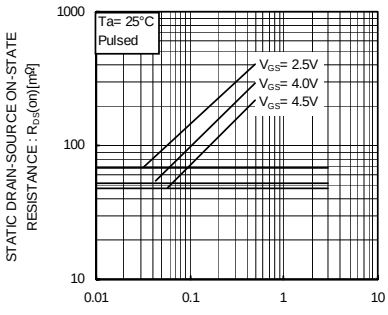


Fig.4 Static Drain-Source On-State Resistance vs. Drain Current(Ⅰ)

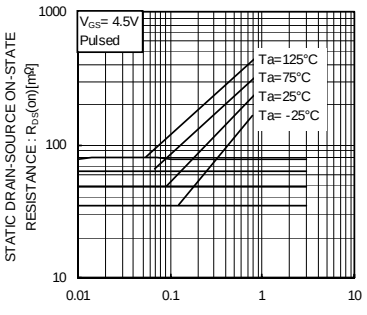


Fig.5 Static Drain-Source On-State Resistance vs. Drain Current(Ⅱ)

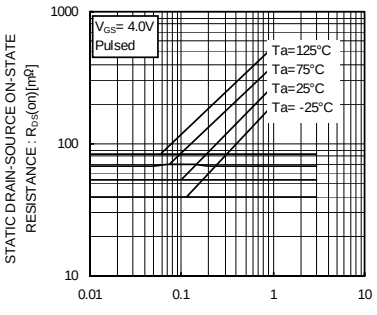


Fig.6 Static Drain-Source On-State Resistance vs. Drain Current(Ⅲ)

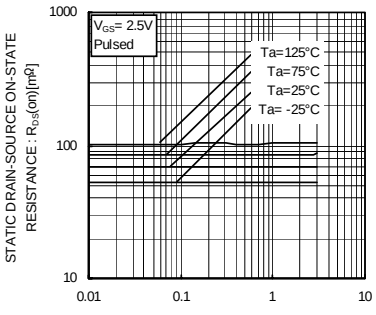


Fig.7 Static Drain-Source On-State Resistance vs. Drain Current(Ⅳ)

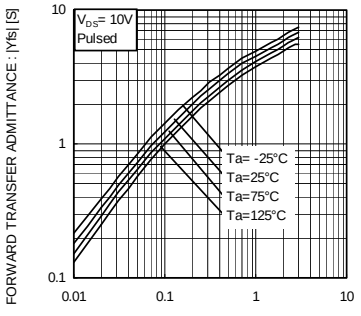


Fig.8 Forward Transfer Admittance vs. Drain Current

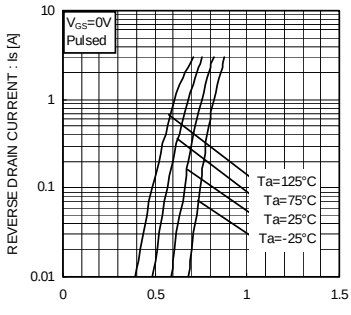


Fig.9 Reverse Drain Current vs. Sourse-Drain Voltage

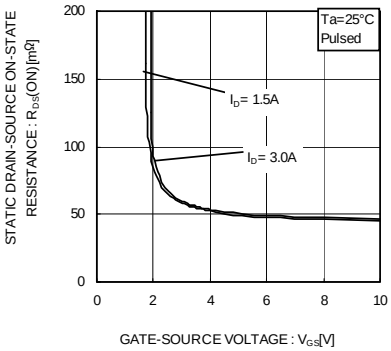


Fig.10 Static Drain-Source On-State Resistance vs. Gate Source Voltage

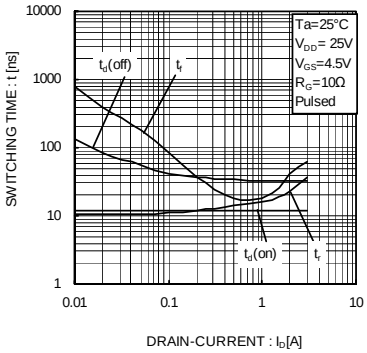


Fig.11 Switching Characteristics

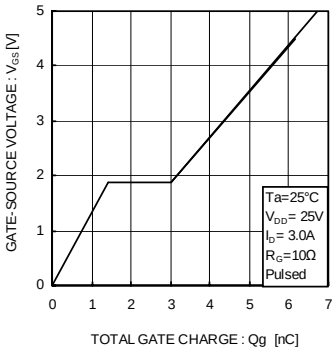


Fig.12 Dynamic Input Characteristics

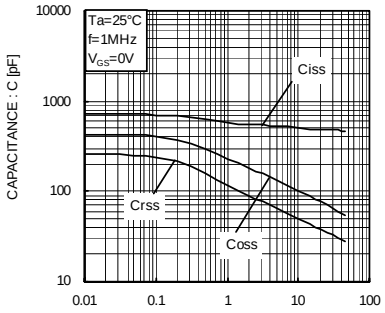


Fig.13 Typical Capacitance vs. Drain-Source Voltage

●Measurement circuits

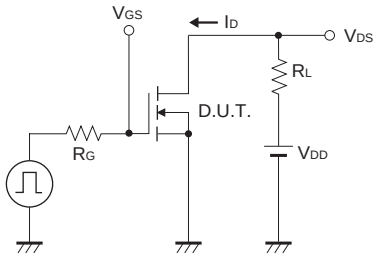


Fig.1-1 Switching Time Measurement Circuit

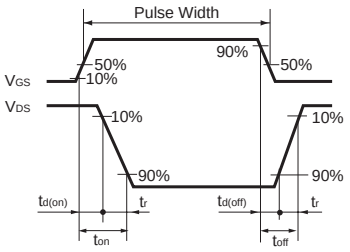


Fig.1-2 Switching Time Waveforms

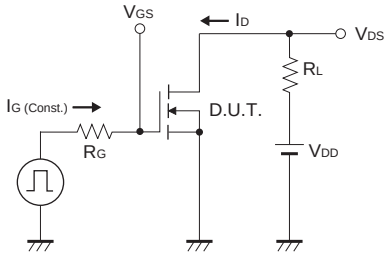


Fig.2-1 Gate Charge Measurement Circuit

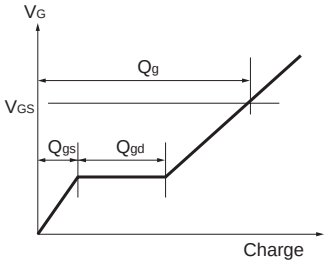


Fig.2-2 Gate Charge Waveform

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