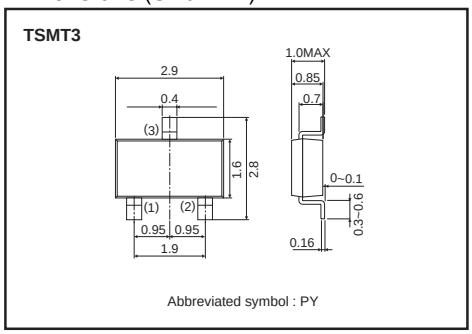
4V Drive Nch MOSFET

RSR030N06

●Structure
Silicon N-channel MOSFET

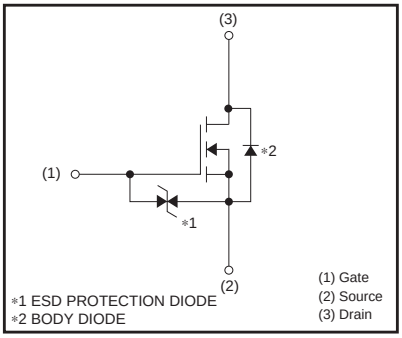
●Dimensions (Unit : mm)



●Features
1) Low On-resistance.
2) Small Surface Mount Package (TSMT3).

●Application
Switching

●Inner circuit



●Packaging specifications

Type	Package	Taping
	Code	TL
	Basic ordering unit (pieces)	3000
RSR030N06		○

●Absolute maximum ratings (Ta=25°C)

Parameter		Symbol	Limits	Unit
Drain-source voltage		V_{DSS}	60	V
Gate-source voltage		V_{GSS}	±20	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

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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}= ±20V, V_{DS}=0V
Drain-source breakdown voltage	$V_{(BR)\ DSS}$	60	–	–	V	I_D= 1mA, V_{GS}=0V
Zero gate voltage drain current	I_{DSS}	–	–	1	µA	V_{DS}= 60V, V_{GS}=0V
Gate threshold voltage	$V_{GS\ (th)}$	1.0	–	2.5	V	V_{DS}= 10V, I_D= 1mA
Static drain-source on-state resistance	$R_{DS\ (on)}$ *	–	60	85	mΩ	I_D= 3A, V_{GS}= 10V
		–	70	100	mΩ	I_D= 3A, V_{GS}= 4.5V
		–	75	105	mΩ	I_D= 3A, V_{GS}= 4V
Forward transfer admittance	$\lvert Y_{fs} \rvert$ *	2.1	–	–	S	V_{DS}= 10V, I_D= 3A
Input capacitance	C_{iss}	–	380	–	pF	V_{DS}= 10V
Output capacitance	C_{oss}	–	95	–	pF	V_{GS}=0V
Reverse transfer capacitance	C_{rss}	–	45	–	pF	f=1MHz
Turn-on delay time	$t_{d\ (on)}$ *	–	8	–	ns	V_{DD}≒30V I_D= 1.5A V_{GS}= 10V R_L≒20Ω R_G=10Ω
Rise time	t_r *	–	12	–	ns	
Turn-off delay time	$t_{d\ (off)}$ *	–	30	–	ns	
Fall time	t_f *	–	10	–	ns	
Total gate charge	Q_g *	–	5.0	–	nC	V_{DD}≒30V R_L≒10Ω I_D= 3A R_G=10Ω V_{GS}= 5V
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

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●Electrical characteristics curves

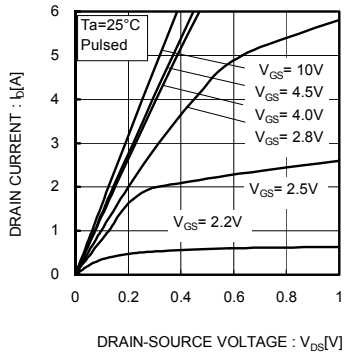

Fig.1 Typical Output Characteristics(Ⅰ)

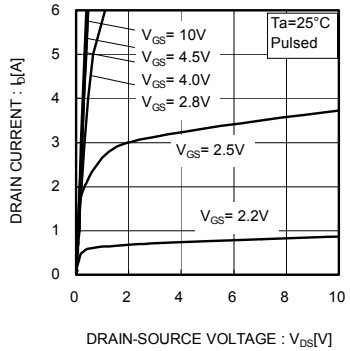

Fig.2 Typical Output Characteristics(Ⅱ)

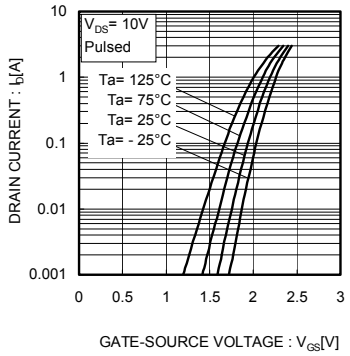

Fig.3 Typical Transfer Characteristics

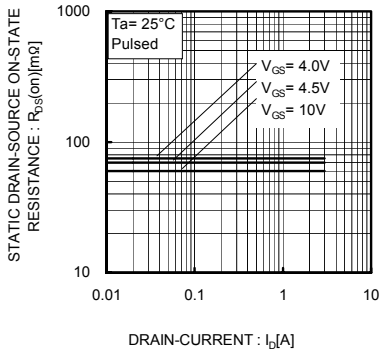

Fig.4 Static Drain-Source On-State Resistance vs. Drain Current(Ⅰ)

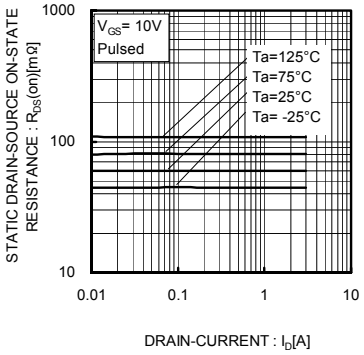

Fig.5 Static Drain-Source On-State Resistance vs. Drain Current(Ⅱ)

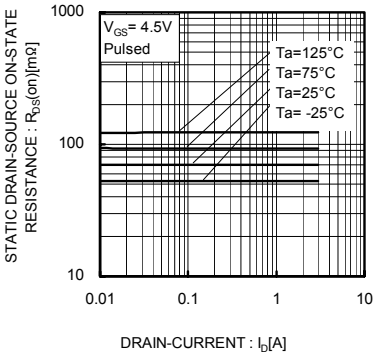

Fig.6 Static Drain-Source On-State Resistance vs. Drain Current(Ⅲ)

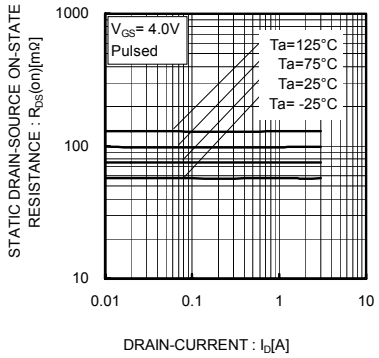

Fig.7 Static Drain-Source On-State Resistance vs. Drain Current(Ⅳ)

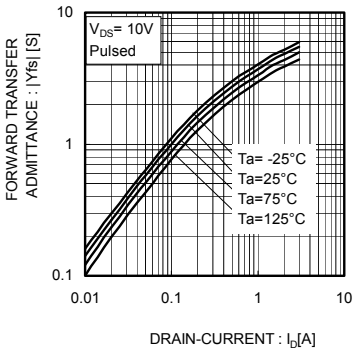

Fig.8 Forward Transfer Admittance vs. Drain Current

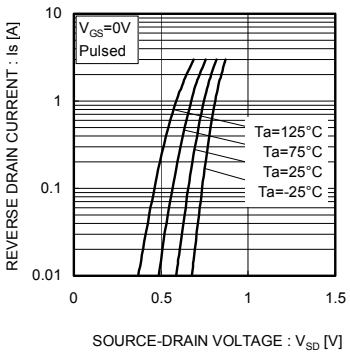

Fig.9 Reverse Drain Current vs. Sourse-Drain Voltage

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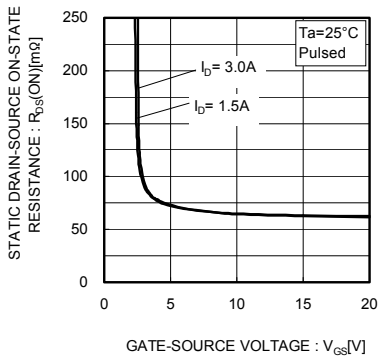

Fig.10 Static Drain-Source On-State Resistance vs. Gate Source Voltage

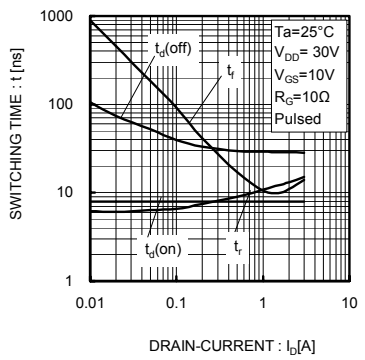

Fig.11 Switching Characteristics

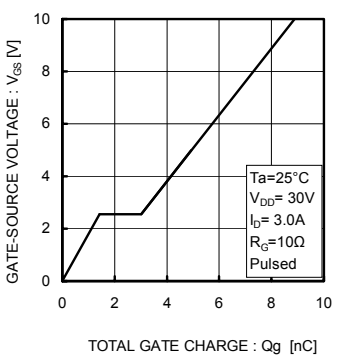

Fig.12 Dynamic Input Characteristics

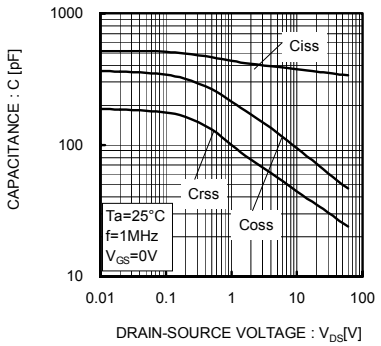

Fig.13 Typical Capacitance vs. Drain-Source Voltage

●Measurement circuits

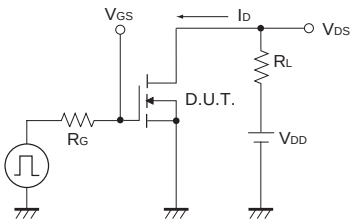

Fig.1-1 Switching time measurement circuit

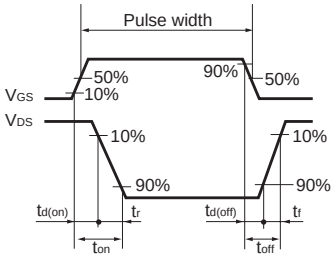

Fig.1-2 Switching waveforms

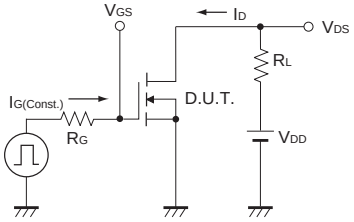

Fig.2-1 Gate charge measurement circuit

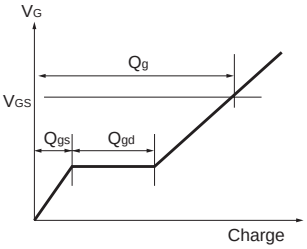

Fig.2-2 Gate charge waveform

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