4V Drive Nch MOS FET

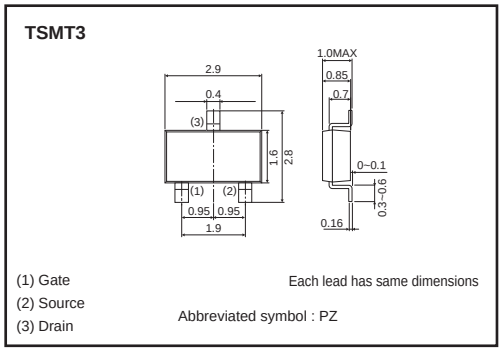
RSR020N06

●Structure
Silicon N-channel
MOSFET

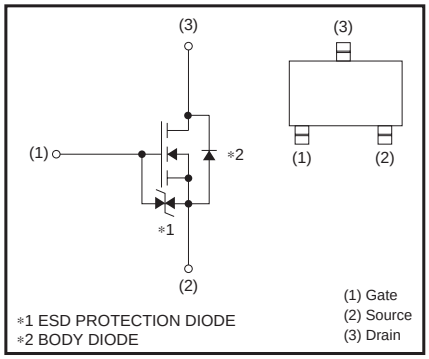
●Features
1) Low on-resistance.
2) Built-in G-S Protection Diode.
3) Small Surface Mount Package (TSMT3) .

●Application
Switching

●Dimensions (Unit : mm)



●Inner circuit



●Packaging specifications

Type	Package	Taping
	Code	TL
	Basic ordering unit (pieces)	3000
RSR020N06		◯

●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	±2	A
	Pulsed	I_{DP} *1	±8	A
Source current (Body diode)	Continuous	I_S	0.8	A
	Pulsed	I_{SP} *1	8	A
Total power dissipation		P_D *2	1.0	W
Range of channel temperature		Tch	150	°C
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

∗2 When mounted on a ceramic board.

© 2009 ROHM Co., Ltd. All rights reserved.

●**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	$R_{DS\ (on)}$*	–	120	170	mΩ	I_D=2A, V_{GS}=10V
		–	140	195		I_D=2A, V_{GS}=4.5V
		–	150	210		I_D=2A, V_{GS}=4V
Forward transfer admittance	$\|Y_{fs}\|$ *	1.3	–	–	S	V_{DS}=10V, I_D=2A
Input capacitance	C_{iss}	–	180	–	pF	V_{DS}=10V
Output capacitance	C_{oss}	–	50	–	pF	V_{GS}=0V
Reverse transfer capacitance	C_{rss}	–	22	–	pF	f=1MHz
Turn-on delay time	$t_{d\ (on)}$ *	–	6	–	ns	V_{DD}≒30V, I_D=1A
Rise time	t_r *	–	10	–	ns	V_{GS}=10V
Turn-off delay time	$t_{d\ (off)}$ *	–	20	–	ns	R_L≒30Ω
Fall time	t_f *	–	6	–	ns	R_G=10Ω
Total gate charge	Q_g *	–	2.7	–	nC	V_{DD}≒30V
Gate-source charge	Q_{gs} *	–	1.0	–	nC	I_D=2A, V_{GS}=5V
Gate-drain charge	Q_{gd} *	–	0.6	–	nC	R_L≒15Ω, 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=2A, V_{GS}=0V

*Pulsed

© 2009 ROHM Co., Ltd. All rights reserved.

●Electrical characteristic curves

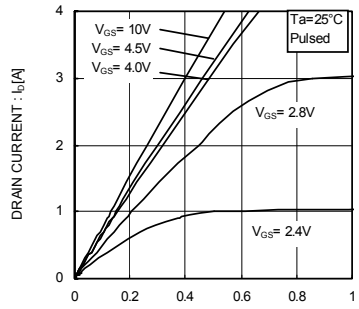


Fig.1 Typical Output Characteristics(Ⅰ)

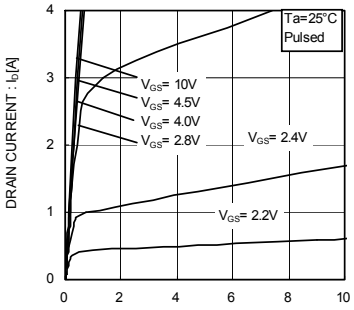


Fig.2 Typical Output Characteristics(Ⅱ)

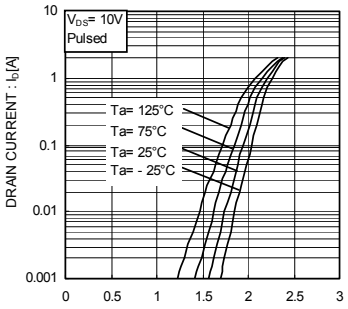


Fig.3 Typical Transfer Characteristics

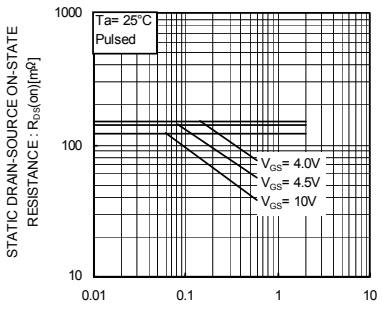


Fig.4 Static Drain-Source On-State Resistance vs. Drain Current(Ⅰ)

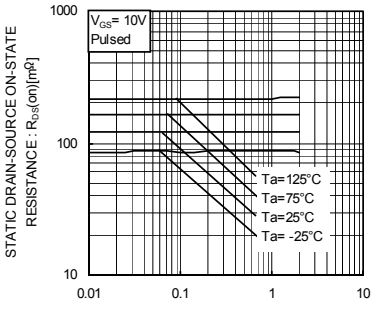


Fig.5 Static Drain-Source On-State Resistance vs. Drain Current(Ⅱ)

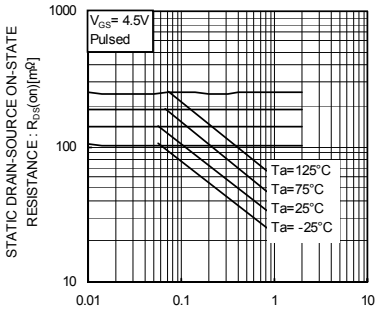


Fig.6 Static Drain-Source On-State Resistance vs. Drain Current(Ⅲ)

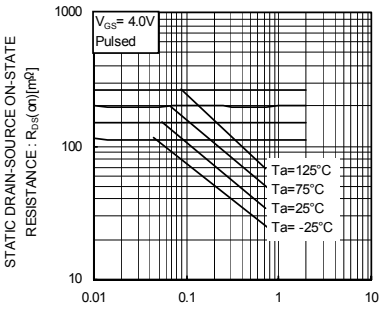


Fig.7 Static Drain-Source On-State Resistance vs. Drain Current(Ⅳ)

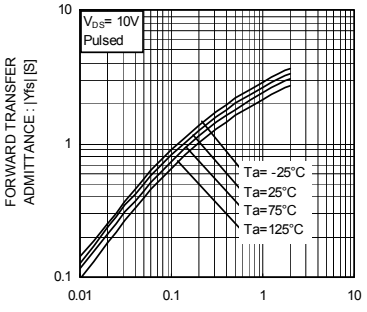


Fig.8 Forward Transfer Admittance vs. Drain Current

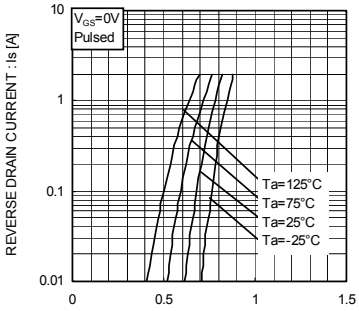


Fig.9 Reverse Drain Current vs. Sourse-Drain Voltage

© 2009 ROHM Co., Ltd. All rights reserved.

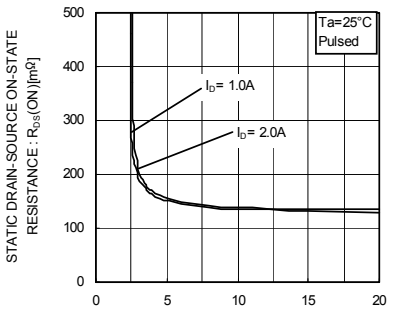


Fig.10 Static Drain-Source On-State Resistance vs. Gate Source Voltage

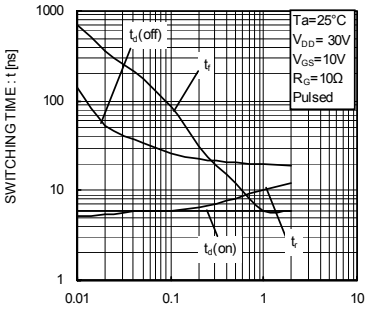


Fig.11 Switching Characteristics

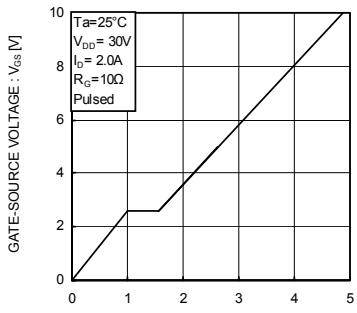


Fig.12 Dynamic Input Characteristics

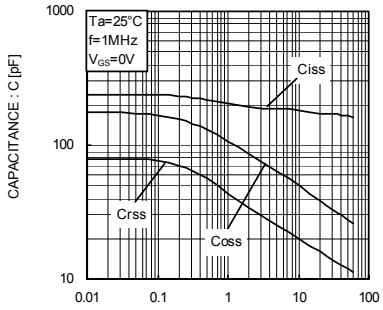


Fig.13 Typical Capacitance vs. Drain-Source Voltage

●Measurement circuit

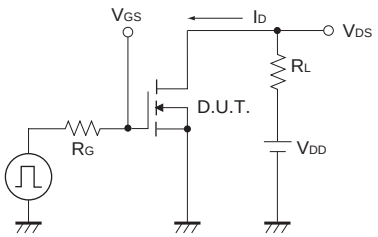


Fig.1-1 Switching time measurement circuit

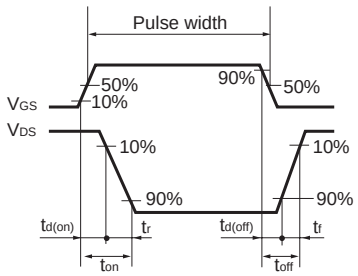


Fig.1-2 Switching waveforms

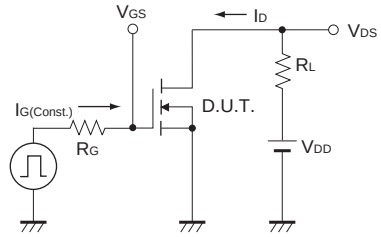


Fig.2-1 Gate charge measurement circuit

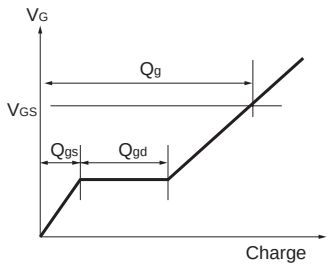


Fig.2-2 Gate charge waveform

© 2009 ROHM Co., Ltd. All rights reserved.