4V Drive Pch MOSFET

RRH090P03

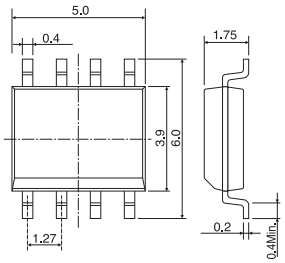
●Structure
Silicon P-channel MOSFET

●Features
1) Low on-resistance.
2) Built-in G-S Protection Diode.
3) Small Surface Mount Package (SOP8).

●Application
Switching

●Dimensions (Unit : mm)

SOP8

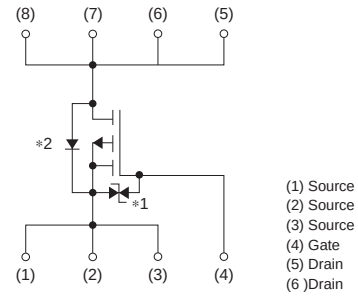


Each lead has same dimensions

●Packaging specifications

Type	Package	Taping
	Code	TB
	Basic ordering unit (pieces)	2500
RRH090P03		○

●Inner circuit



∗1 ESD PROTECTION DIODE
∗2 BODY DIODE

●Absolute maximum ratings (Ta = 25°C)

Parameter		Symbol	Limits	Unit
Drain-source voltage		V_{DSS}	−30	V
Gate-source voltage		V_{GSS}	±20	V
Drain current	Continuous	I_D	±9	A
	Pulsed	I_{DP} ∗1	±36	A
Source current (Body Diode)	Continuous	I_S	−1.6	A
	Pulsed	I_{SP} ∗1	−36	A
Total power dissipation		P_D ∗2	2.0	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)∗	62.5	°C / W

∗ Mounted on a ceramic board.

●**Electrical characteristics** (Ta = 25°C)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test Conditions
Gate-source leakage	I_{GSS}	–	–	±10	μA	V_{GS}=±20V, V_{DS}=0V
Drain-source breakdown voltage	$V_{(BR)DSS}$	–30	–	–	V	I_D=–1mA, V_{GS}=0V
Zero gate voltage drain current	I_{DSS}	–	–	–1	μA	V_{DS}=–30V, 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	$R_{DS\ (on)}$ *	–	11.0	15.4	mΩ	I_D=–9A, V_{GS}=–10V
		–	15.0	21.0		I_D=–4.5A, V_{GS}=–4.5V
		–	17.0	24.0		I_D=–4.5A, V_{GS}=–4.0V
Forward transfer admittance	$\|Y_{fs}\|$ *	10	–	–	S	I_D=–9A, V_{DS}=–10V
Input capacitance	C_{iss}	–	3000	–	pF	V_{DS}=–10V
Output capacitance	C_{oss}	–	360	–	pF	V_{GS}=0V
Reverse transfer capacitance	C_{rss}	–	360	–	pF	f=1MHz
Turn-on delay time	$t_{d(on)}$ *	–	20	–	ns	I_D=–4.5A, V_{DD} ≒ –15V
Rise time	t_r *	–	30	–	ns	V_{GS}=–10V
Turn-off delay time	$t_{d(off)}$ *	–	135	–	ns	R_L=3.3Ω
Fall time	t_f *	–	80	–	ns	R_G=10Ω
Total gate charge	Q_g *	–	30	–	nC	I_D=–9A, V_{DD} ≒ –15V V_{GS}=–5V R_L=1.7Ω R_G=10Ω
Gate-source charge	Q_{gs} *	–	7	–	nC	
Gate-drain charge	Q_{gd} *	–	11	–	nC	

*Pulsed

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

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test Conditions
Forward Voltage	V_{SD} *	–	–	–1.2	V	I_S=–9A, V_{GS}=0V

*Pulsed

●Electrical characteristic curves

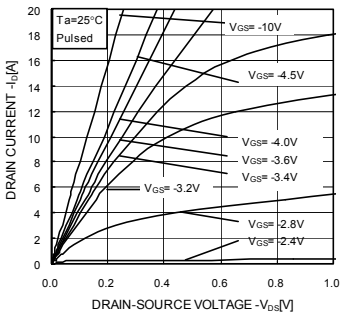


Fig.1 Typical output characteristics(Ⅰ)

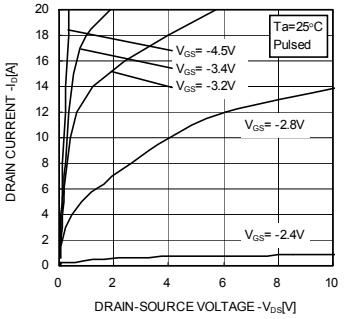


Fig.2 Typical output characteristics(Ⅱ)

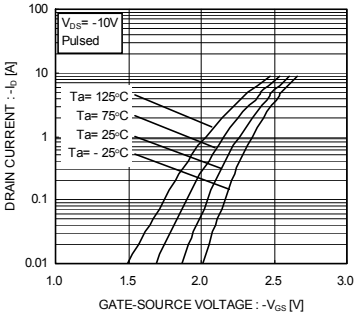


Fig.3 Typical Transfer Characteristics

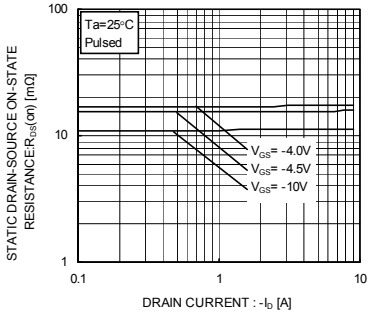


Fig.4 Static Drain-Source On-State Resistance vs. Drain Current(Ⅰ)

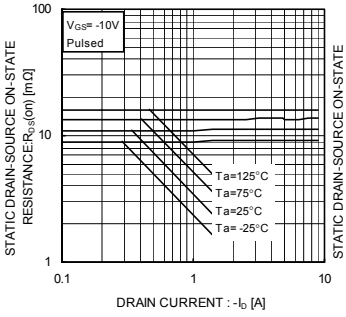


Fig.5 Static Drain-Source On-State Resistance vs. Drain Current(Ⅱ)

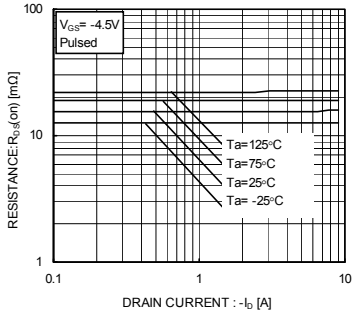


Fig.6 Static Drain-Source On-State Resistance vs. Drain Current(Ⅲ)

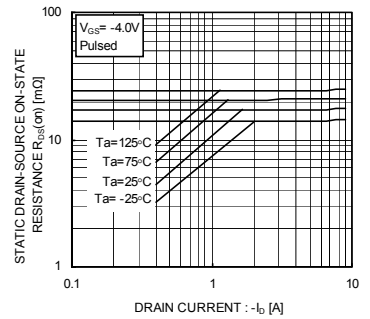


Fig.7 Static Drain-Source On-State Resistance vs. Drain Current(Ⅳ)

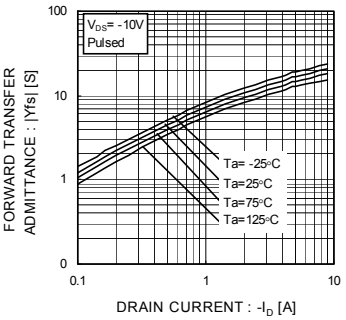


Fig.8 Forward Transfer Admittance vs. Drain Current

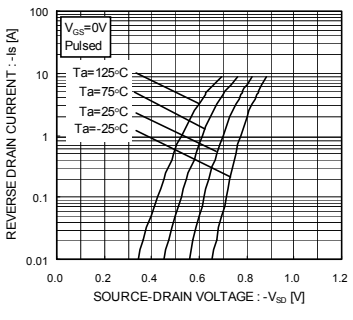


Fig.9 Reverse Drain Current vs. Sourse-Drain Voltage

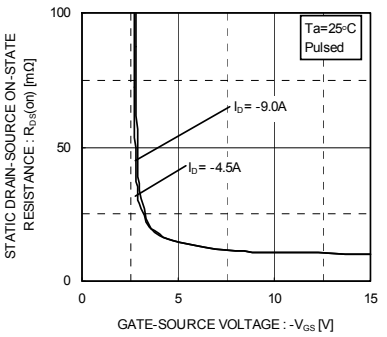


Fig.10 Static Drain-Source On-State Resistance vs. Gate Source Voltage

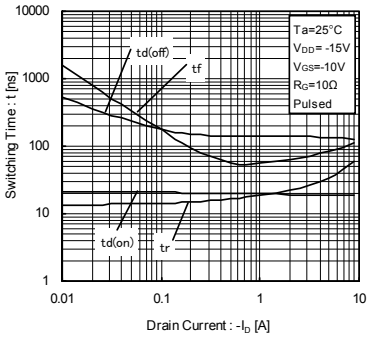


Fig.11 Switching Characteristics

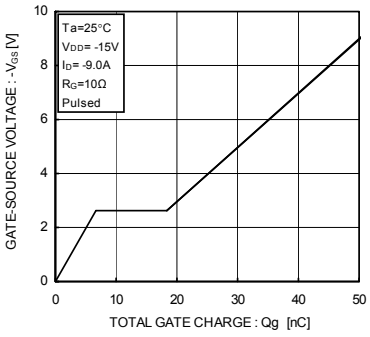


Fig.12 Dynamic Input Characteristics

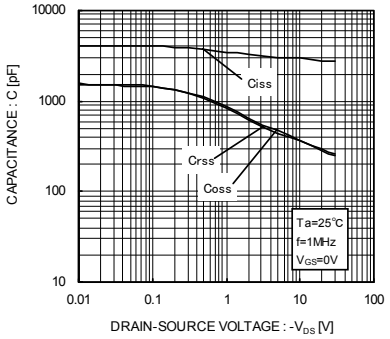


Fig.13 Typical Capacitance vs. Drain-Source Voltage

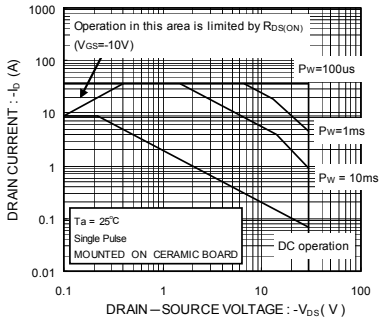


Fig.14 Maximum Safe Operating Aera

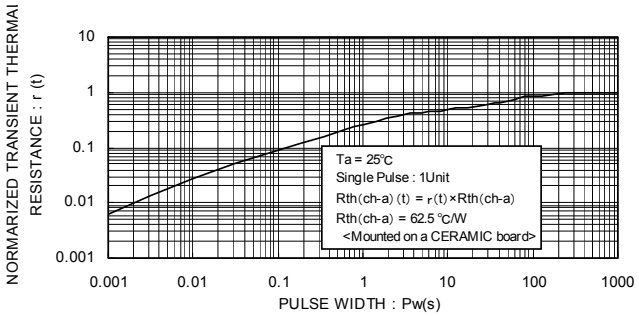


Fig.15 Normalized Transient Thermal Resistance vs. Pulse Width

●**Measurement circuit**

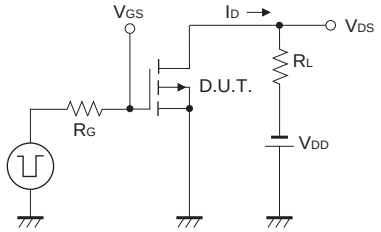


Fig.1-1 Switching Time Measurement Circuit

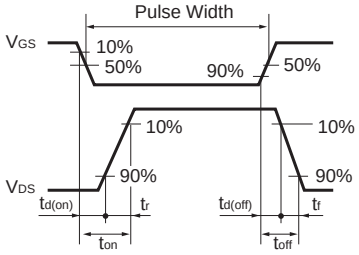


Fig.1-2 Switching Waveforms

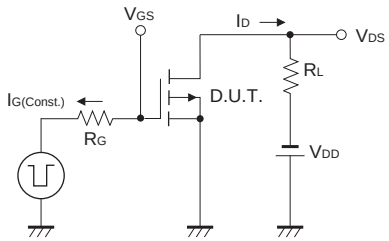


Fig.2-1 Gate Charge Measurement Circuit

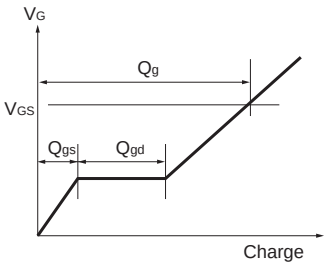


Fig.2-2 Gate Charge Waveform

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