

4V Drive Pch MOSFET

RRH050P03

●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

●Packaging specifications

Type	Package	Taping
	Code	TB
	Basic ordering unit (pieces)	2500
RRH050P03		○

●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	±5	A
	Pulsed	I _{DP} *1	±20	A
Source current (Body Diode)	Continuous	I _S	-1.6	A
	Pulsed	I _{SP} *1	-20	A
Power dissipation	P _D *2	2.0	W	
Channel temperature	T _{ch}	150	°C	
Range of storage temperature	T _{stg}	-55 to +150	°C	

*1 Pw ≤ 10μs, Duty cycle ≤ 1%

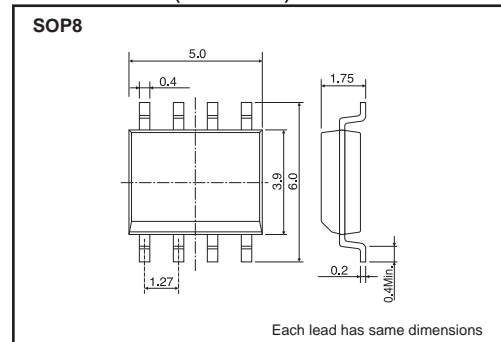
*2 Mounted on a ceramic board.

●Thermal resistance

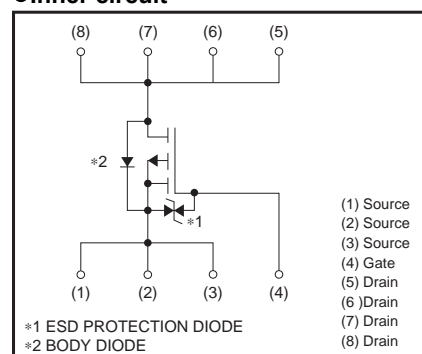
Parameter	Symbol	Limits	Unit
Channel to Ambient	R _{th (ch-a)*}	62.5	°C / W

* Mounted on a ceramic board.

●Dimensions (Unit : mm)



●Inner circuit



●Electrical characteristics (Ta = 25°C)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test Conditions
Gate-source leakage	I_{GSS}	–	–	±10	μA	$V_{GS}=\pm 20V, V_{DS}=0V$
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	$R_{DS(on)}$ *	–	36	50	mΩ	$I_D=-5A, V_{GS}=-10V$
		–	52	72		$I_D=-2.5A, V_{GS}=-4.5V$
		–	58	80		$I_D=-2.5A, V_{GS}=-4.0V$
Forward transfer admittance	$ Y_{fs} $ *	4	–	–	S	$I_D=-5A, V_{DS}=-10V$
Input capacitance	C_{iss}	–	850	–	pF	$V_{DS}=-10V$
Output capacitance	C_{oss}	–	120	–	pF	$V_{GS}=0V$
Reverse transfer capacitance	C_{rss}	–	120	–	pF	$f=1MHz$
Turn-on delay time	$t_{d(on)}$ *	–	9	–	ns	$I_D=-2.5A, V_{DD}=-15V$
Rise time	t_r *	–	25	–	ns	$V_{GS}=-10V$
Turn-off delay time	$t_{d(off)}$ *	–	55	–	ns	$R_L=6.0\Omega$
Fall time	t_f *	–	30	–	ns	$R_G=10\Omega$
Total gate charge	Q_g *	–	9.2	–	nC	$I_D=-5A, V_{DD}=-15V$ $V_{GS}=-5V$
Gate-source charge	Q_{gs} *	–	2.4	–	nC	$R_L=3.0\Omega$
Gate-drain charge	Q_{gd} *	–	3.6	–	nC	$R_G=10\Omega$

*Pulsed

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

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test Conditions
Forward Voltage	V_{SD} *	–	–	–1.2	V	$I_S=-5A, V_{GS}=0V$

*Pulsed

●Electrical characteristic curves

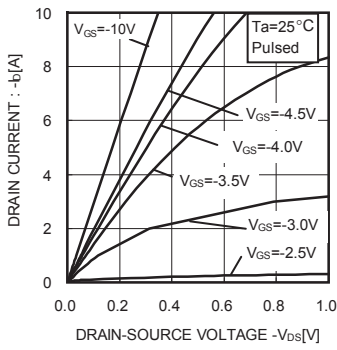


Fig.1 Typical Output Characteristics(I)

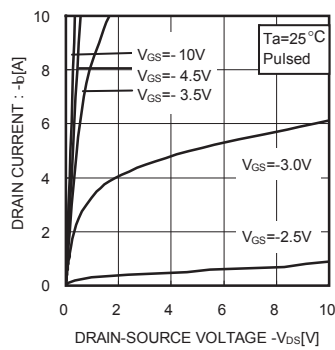


Fig.2 Typical Output Characteristics(II)

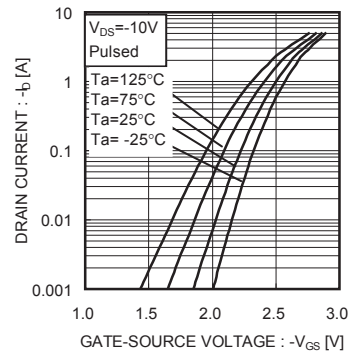


Fig.3 Typical Transfer Characteristics

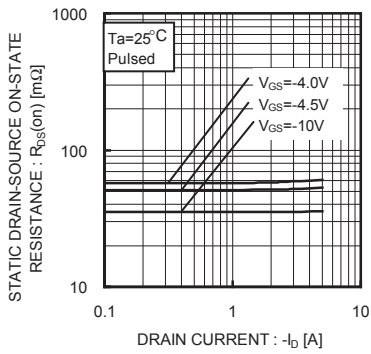


Fig.4 Static Drain-Source On-State Resistance vs. Drain Current(I)

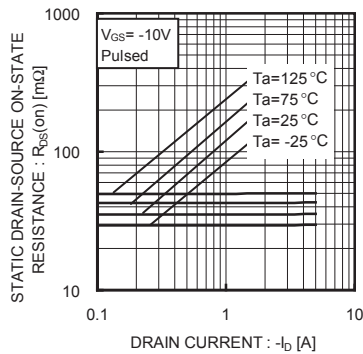


Fig.5 Static Drain-Source On-State Resistance vs. Drain Current(II)

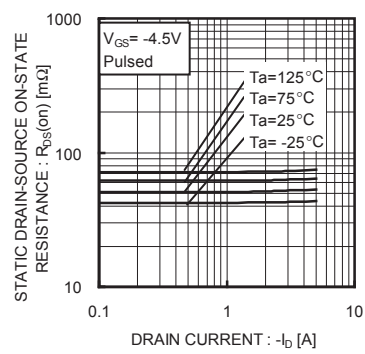


Fig.6 Static Drain-Source On-State Resistance vs. Drain Current(III)

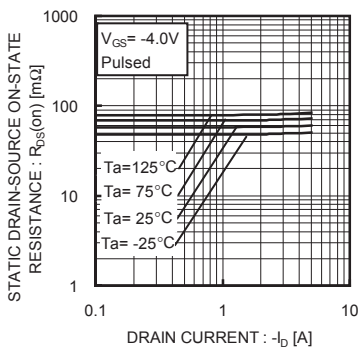


Fig.7 Static Drain-Source On-State Resistance vs. Drain Current(IV)

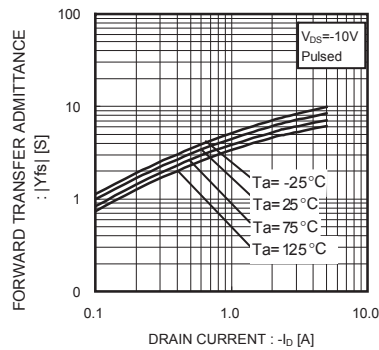


Fig.8 Forward Transfer Admittance vs. Drain Current

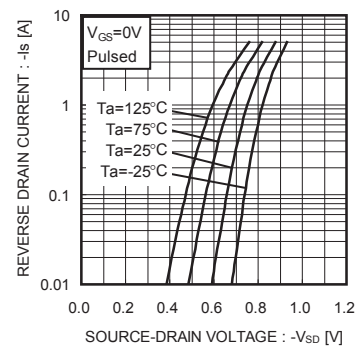


Fig.9 Reverse Drain Current vs. Source-Drain Voltage

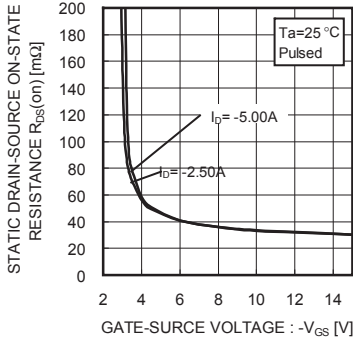


Fig.10 Static Drain-Source On-State Resistance vs. Gate Source Voltage

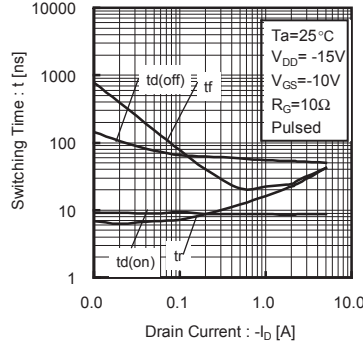


Fig.11 Switching Characteristics

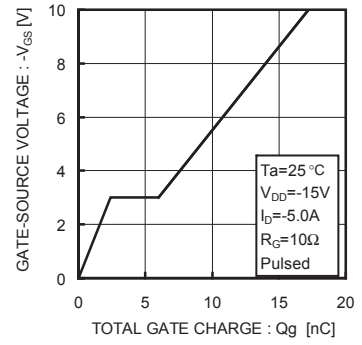


Fig.12 Dynamic Input Characteristics

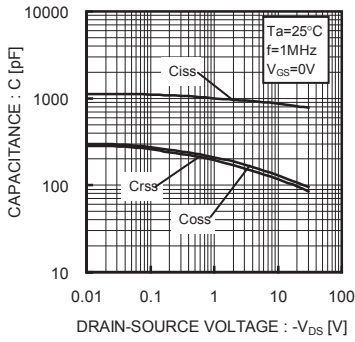


Fig.13 Typical Capacitance vs. Drain-Source Voltage

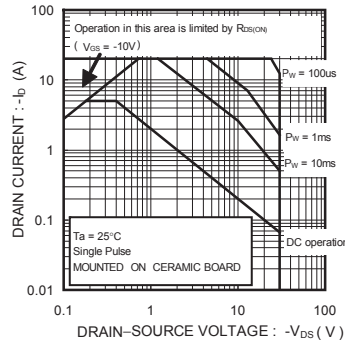
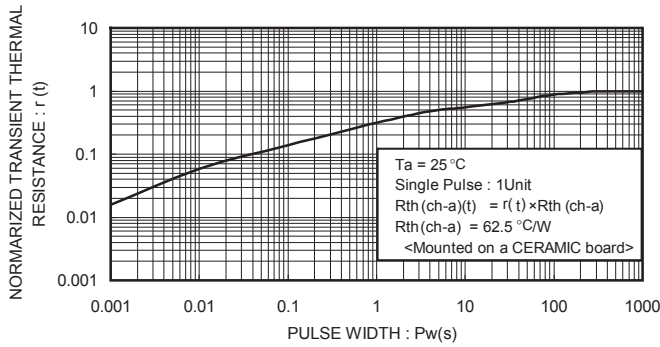


Fig.14 Maximum Safe Operating Area



● Measurement circuit

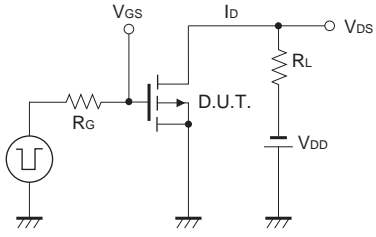


Fig.1-1 Switching Time Measurement Circuit

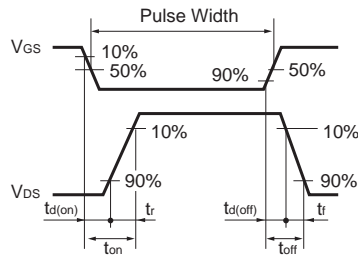


Fig.1-2 Switching Waveforms

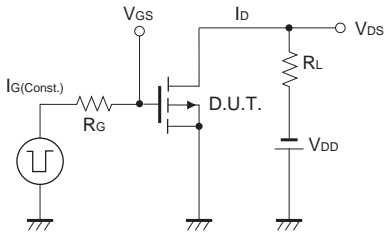


Fig.2-1 Gate Charge Measurement Circuit

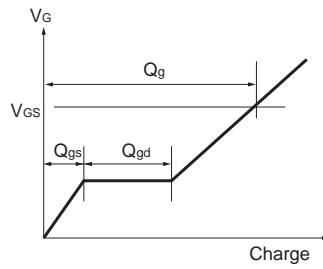


Fig.2-2 Gate Charge Waveform

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