

4V Drive Pch MOSFET

RRH040P03

●Structure

Silicon P-channel MOSFET

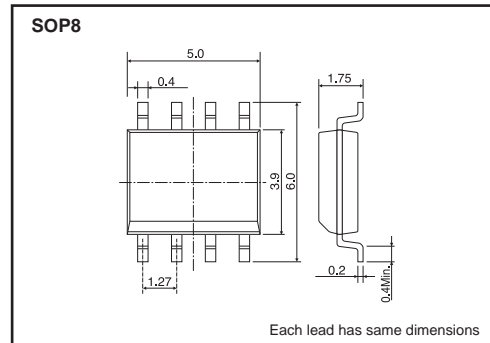
●Features

- 1) Low Gate Charge.
- 2) Built-in G-S Protection Diode.
- 3) Small Surface Mount Package (SOP8).

●Application

Switching

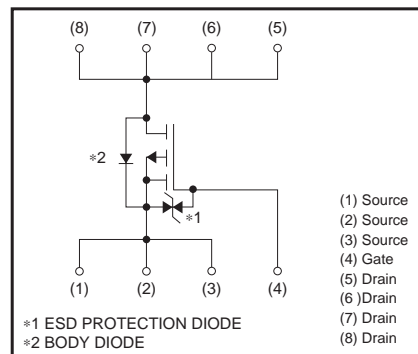
●Dimensions (Unit : mm)



●Packaging specifications

Type	Package	Taping
	Code	TB
	Basic ordering unit (pieces)	2500
RRH040P03		○

●Inner circuit



●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	±4	A
	Pulsed	I_{DP}^{*1}	±16	A
Source current (Body Diode)	Continuous	I_S	-1.6	A
	Pulsed	I_{SP}^{*1}	-16	A
Total 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 $P_w \leq 10 \mu s$, Duty cycle $\leq 1\%$

*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.

●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)} *	–	55	75	mΩ	I _D =–4A, V _{GS} =–10V
		–	85	115		I _D =–2A, V _{GS} =–4.5V
		–	95	125		I _D =–2A, V _{GS} =–4V
Forward transfer admittance	Y _{fs} *	3	–	–	S	I _D =–4A, V _{DS} =–10V
Input capacitance	C _{iss}	–	480	–	pF	V _{DS} =–10V
Output capacitance	C _{oss}	–	70	–	pF	V _{GS} =0V
Reverse transfer capacitance	C _{rss}	–	70	–	pF	f=1MHz
Turn-on delay time	t _{d(on)} *	–	7	–	ns	I _D =–2A, V _{DD} = –15V
Rise time	t _r *	–	18	–	ns	V _{GS} =–10V
Turn-off delay time	t _{d(off)} *	–	50	–	ns	R _L =7.5Ω
Fall time	t _f *	–	37	–	ns	R _G =10Ω
Total gate charge	Q _g *	–	5.2	–	nC	I _D =–4A, V _{DD} = –15V
Gate-source charge	Q _{gs} *	–	1.6	–	nC	V _{GS} =–5V
Gate-drain charge	Q _{gd} *	–	1.6	–	nC	R _L =3.8Ω
						R _G =10Ω

*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 =–4A, V _{GS} =0V

*Pulsed

●Electrical characteristic curves

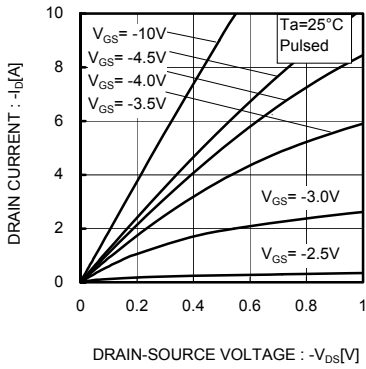


Fig.1 Typical Output Characteristics(I)

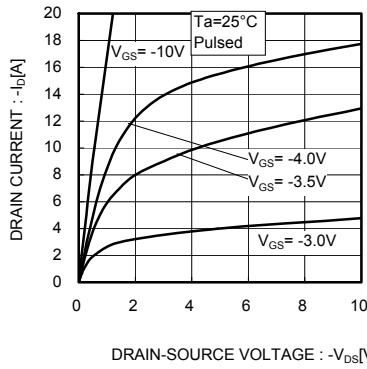


Fig.2 Typical Output Characteristics(II)

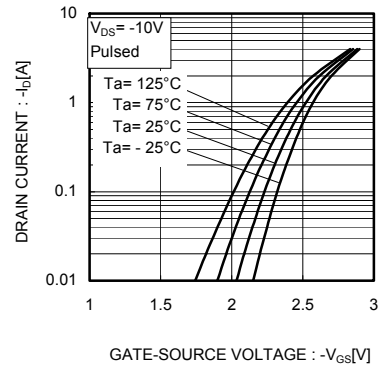


Fig.3 Typical Transfer Characteristics

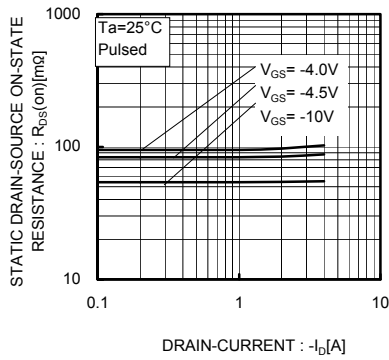


Fig.4 Static Drain-Source On-State Resistance vs. Drain Current(I)

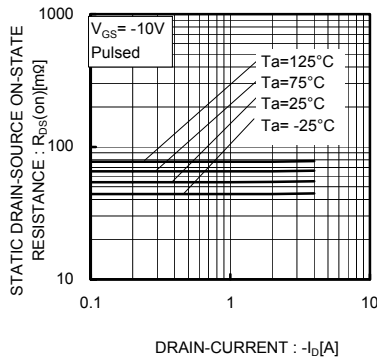


Fig.5 Static Drain-Source On-State Resistance vs. Drain Current(II)

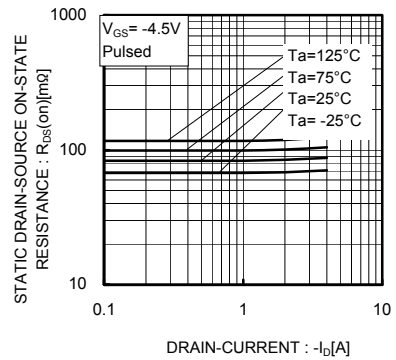


Fig.6 Static Drain-Source On-State Resistance vs. Drain Current(III)

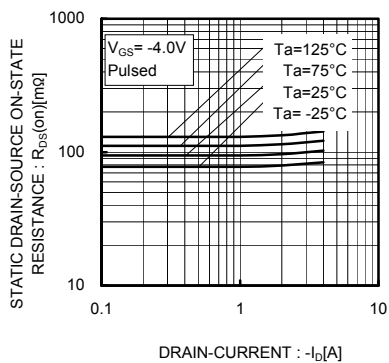


Fig.7 Static Drain-Source On-State Resistance vs. Drain Current(IV)

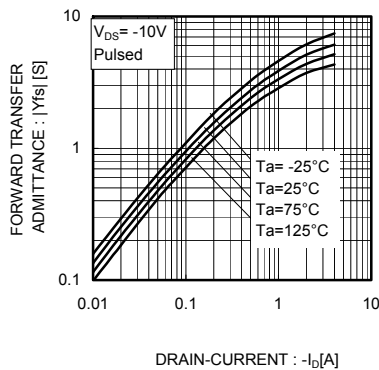


Fig.8 Forward Transfer Admittance vs. Drain Current

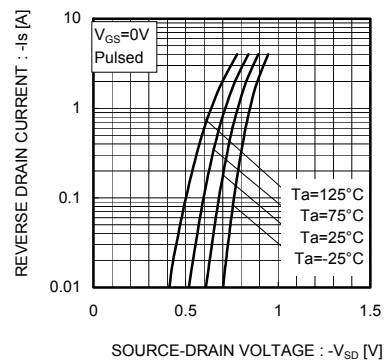


Fig.9 Reverse Drain Current vs. Source-Drain Voltage

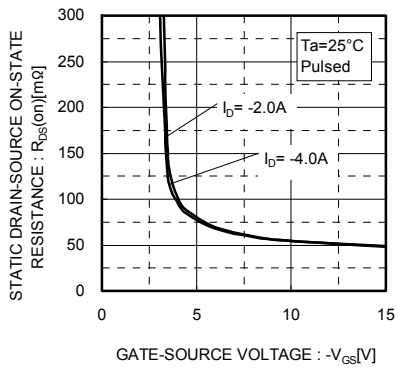


Fig.10 Static Drain-Source On-State Resistance vs. Gate Source Voltage

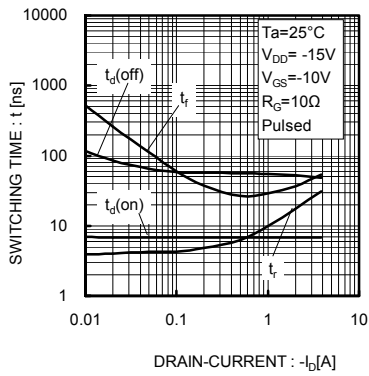


Fig.11 Switching Characteristics

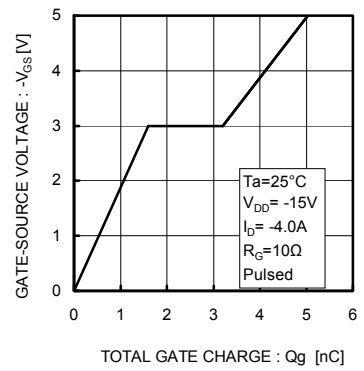


Fig.12 Dynamic Input Characteristics

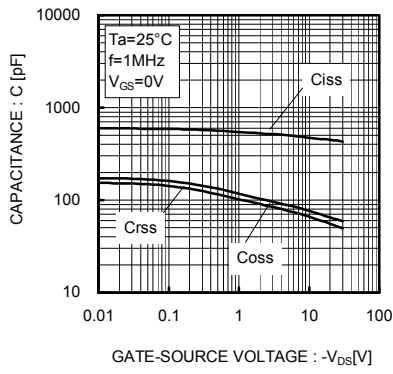


Fig.13 Typical Capacitance vs. Drain-Source Voltage

●Measurement circuit

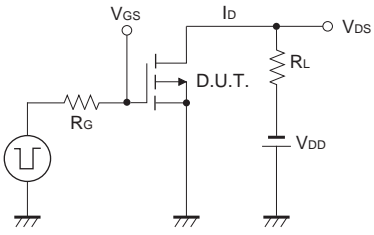


Fig.1-1 Switching Time Measurement Circuit

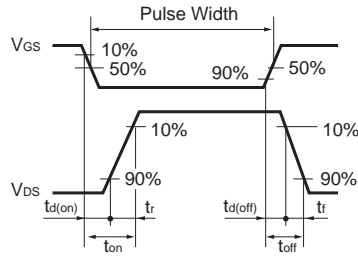


Fig.1-2 Switching Waveforms

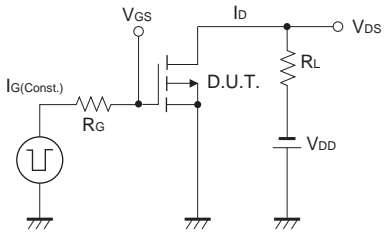


Fig.2-1 Gate Charge Measurement Circuit

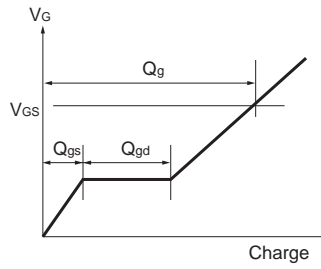


Fig.2-2 Gate Charge Waveform

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