

4V Drive Nch MOSFET

RSH070N05

●Structure

Silicon N-channel MOSFET

●Features

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

●Application

Power switching, DC / DC converter, Inverter

●Packaging specifications

Type	Package	Taping
	Code	TB
	Basic ordering unit (pieces)	2500
RSH070N05		○

●Absolute maximum ratings (Ta=25°C)

Parameter	Symbol	Limits	Unit	
Drain-source voltage	V_{DSS}	45	V	
Gate-source voltage	V_{GSS}	20	V	
Drain current	Continuous	I_D	± 7.0	A
	Pulsed	I_{DP} *1	± 28	A
Source current (Body diode)	Continuous	I_S	1.6	A
	Pulsed	I_{SP} *1	28	A
Total power dissipation	P_D *2	2	W	
Chanel temperature	T_{ch}	150	°C	
Range of Storage temperature	T_{stg}	-55 to +150	°C	

*1 $PW \leq 10\mu s$, Duty cycle $\leq 1\%$

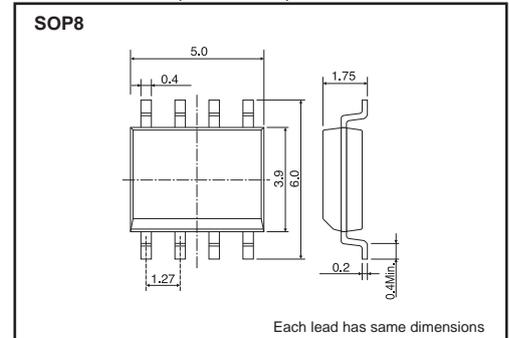
*2 Mounted on a ceramic board

●Thermal resistance

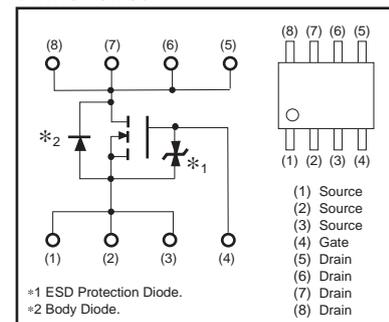
Parameter	Symbol	Limits	Unit
Chanel to ambient	$R_{th(ch-a)}$ *	62.5	°C/W

* Mounted on a ceramic board

●Dimensions (Unit : mm)



●Inner circuit



*1 ESD Protection Diode.
*2 Body Diode.

* A protection diode is included between the gate and the source terminals to protect the diode against static electricity when the product is in use. Use a protection circuit when the fixed voltage are exceeded.

●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	$V_{(BR)DSS}$	45	–	–	V	$I_D=1mA, V_{GS}=0V$
Zero gate voltage drain current	I_{DSS}	–	–	1	μA	$V_{DS}=45V, V_{GS}=0V$
Gate threshold voltage	$V_{GS(th)}$	1.0	–	2.5	V	$V_{DS}=10V, I_D=1mA$
Static drain-source on-state resistance	$R_{DS(on)}^*$	–	18	25	$m\Omega$	$I_D=7A, V_{GS}=10V$
		–	23	32	$m\Omega$	$I_D=7A, V_{GS}=4.5V$
		–	25	35	$m\Omega$	$I_D=7A, V_{GS}=4.0V$
Forward transfer admittance	$ Y_{fs} ^*$	6.0	–	–	S	$V_{DS}=10V, I_D=7A$
Input capacitance	C_{iss}	–	1000	–	pF	$V_{DS}=10V$
Output capacitance	C_{oss}	–	230	–	pF	$V_{GS}=0V$
Reverse transfer capacitance	C_{rss}	–	125	–	pF	$f=1MHz$
Turn-on delay time	$t_{d(on)}^*$	–	16	–	ns	$V_{DD}=25V$ $I_D=3.5A$
Rise time	t_r^*	–	27	–	ns	$V_{GS}=10V$ $R_L=7.1\Omega$
Turn-off delay time	$t_{d(off)}^*$	–	57	–	ns	$R_L=7.1\Omega$
Fall time	t_f^*	–	21	–	ns	$R_G=10\Omega$
Total gate charge	Q_g^*	–	12.0	16.8	nC	$V_{DD}=25V, V_{GS}=5V$
Gate-source charge	Q_{gs}^*	–	3.0	–	nC	$I_D=7A$
Gate-drain charge	Q_{gd}^*	–	4.6	–	nC	$R_L=3.6\Omega, R_G=10\Omega$

*Pulsed

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

Parameter	Symbol	Min.	Typ.	Max.	Unit	Condition
Forward voltage	V_{SD}^*	–	–	1.2	V	$I_S=1.6A, V_{GS}=0V$

* pulsed

●Electrical characteristic curves

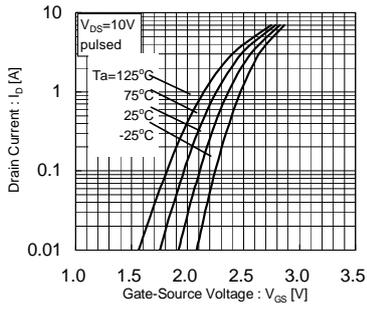


Fig.1 Typical Transfer Characteristics

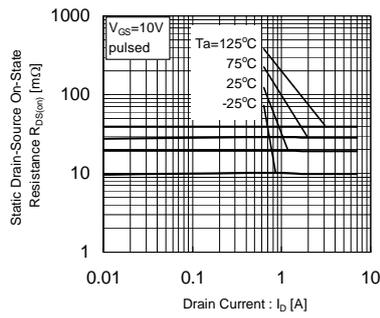


Fig.2 Static Drain-Source On-State Resistance vs. Drain Current (1)

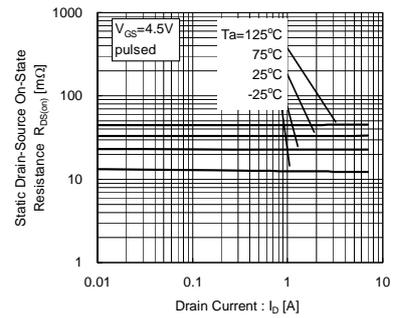


Fig.3 Static Drain-Source On-State Resistance vs. Drain Current (2)

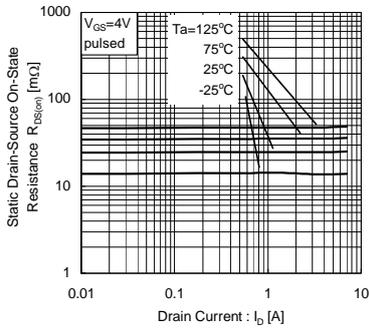


Fig.4 Static Drain-Source On-State Resistance vs. Drain Current (3)

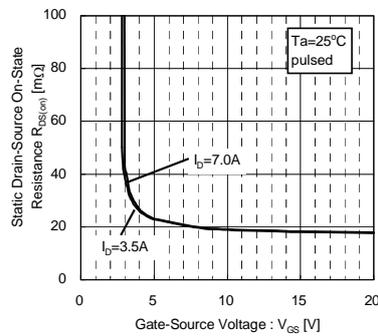


Fig.5 Static Drain-Source On-State Resistance vs. Gate-Source Voltage

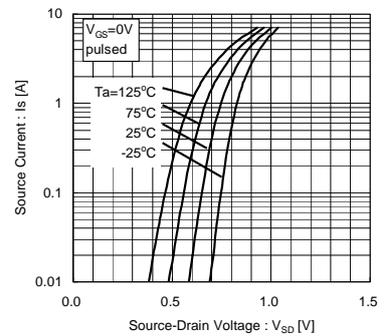


Fig.6 Source-Current vs. Source-Drain Voltage

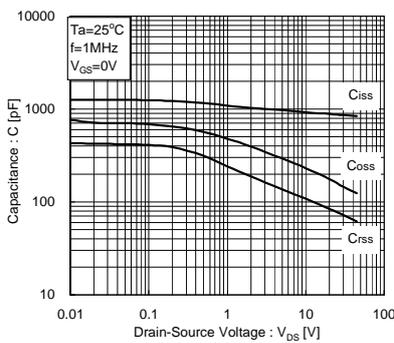


Fig.7 Typical capacitance vs. Source-Drain Voltage

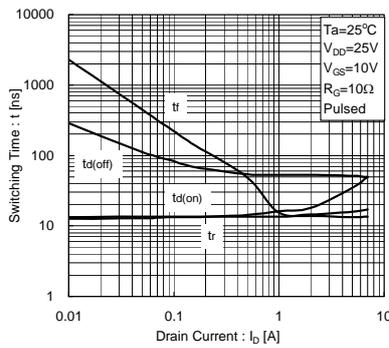


Fig.8 Switching Characteristics

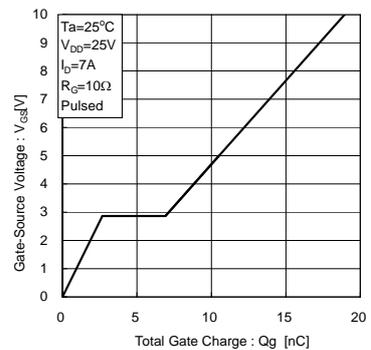


Fig.9 Dynamic Input Characteristics

● Measurement circuits

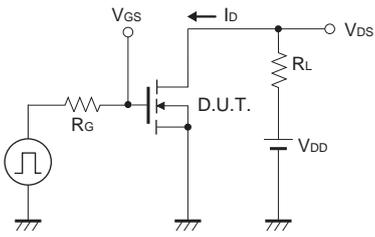


Fig.10 Switching Time Test Circuit

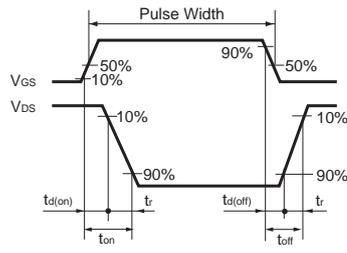


Fig.11 Switching Time Waveforms

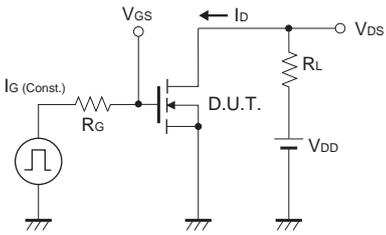


Fig.12 Gate Charge Test Circuit

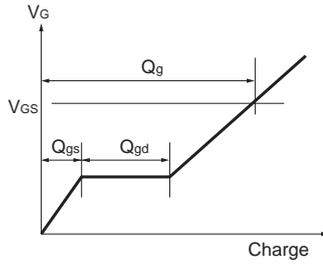


Fig.13 Gate Charge Waveform

Notes

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