4V Drive Nch MOSFET

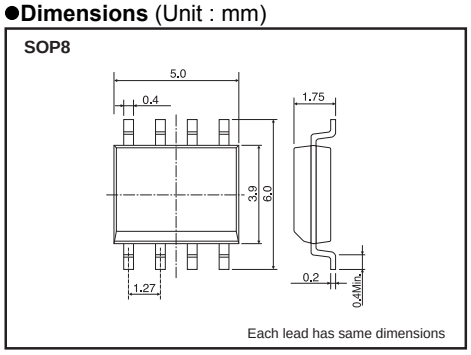
RSH070N05

●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

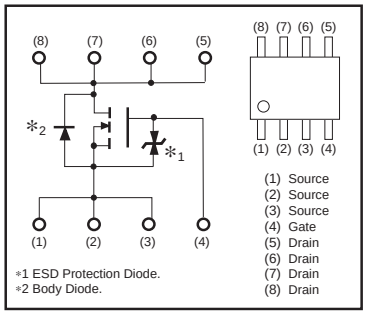
●Dimensions (Unit : mm)



●Packaging specifications

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

●Inner circuit



∗ 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.

●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≤10μs, Duty cycle≤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

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●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	mΩ	I_D=7A, V_{GS}= 10V
		–	23	32	mΩ	I_D= 7A, V_{GS}= 4.5V
		–	25	35	mΩ	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
Rise time	t_r *	–	27	–	ns	I_D= 3.5A
Turn-off delay time	$t_{d\ (off)}$ *	–	57	–	ns	V_{GS}= 10V R_L=7.1Ω
Fall time	t_f *	–	21	–	ns	R_G=10Ω
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=3.6Ω R_G=10Ω

*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

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●Electrical characteristic curves

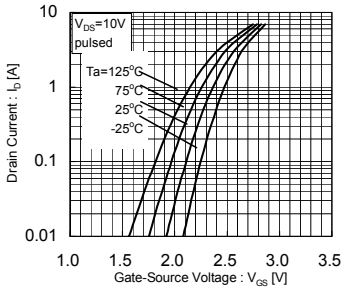

Fig.1 Typical Transfer Characteristics

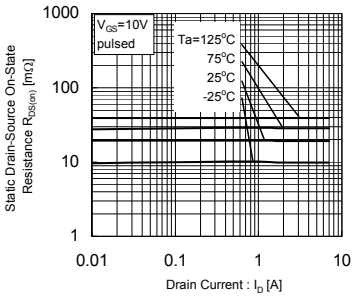

Fig.2 Static Drain-Source On-State Resistance vs. Drain Current (1)

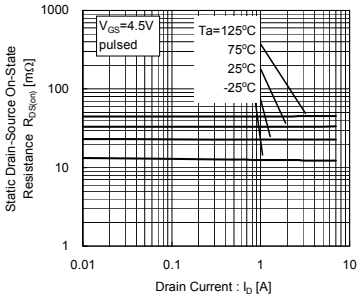

Fig.3 Static Drain-Source On-State Resistance vs. Drain Current (2)

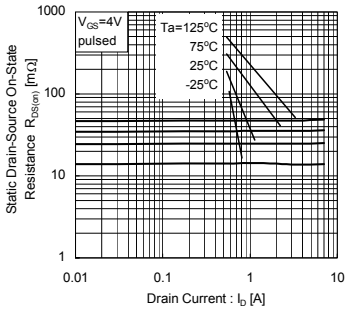

Fig.4 Static Drain-Source On-State Resistance vs. Drain Current (3)

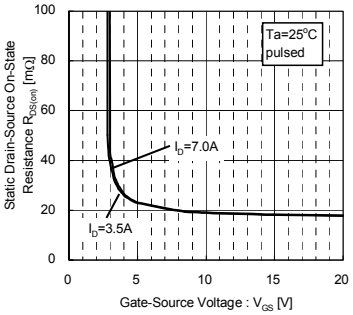

Fig.5 Static Drain-Source On-State Resistance vs. Gate-Source Voltage

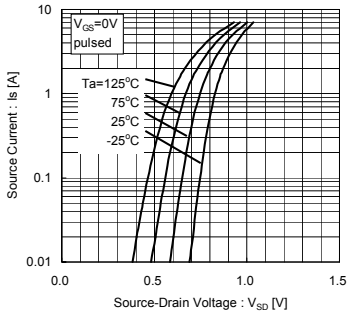

Fig.6 Source-Current vs. Source-Drain Voltage

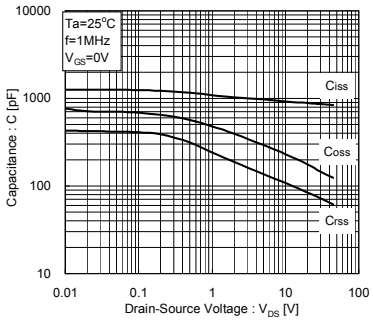

Fig.7 Typical capacitance vs. Source-Drain Voltage

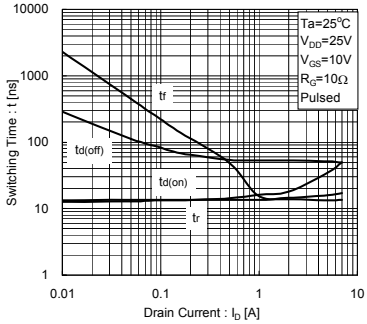

Fig.8 Switching Characteristics

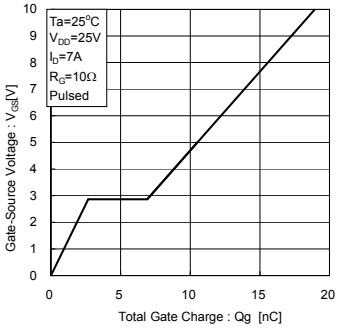

Fig.9 Dynamic Input Characteristics

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●**Measurement circuits**

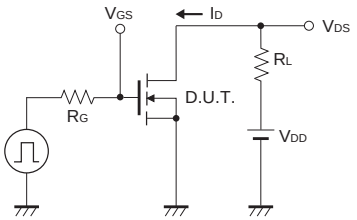

Fig.10 Switching Time Test Circuit

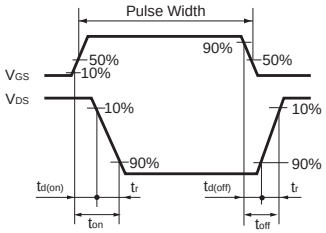

Fig.11 Switching Time Waveforms

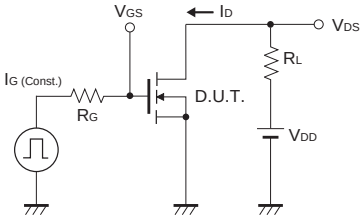

Fig.12 Gate Charge Test Circuit

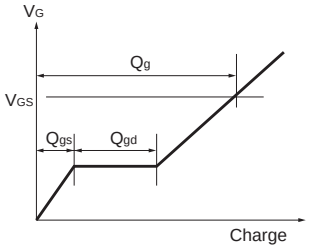

Fig.13 Gate Charge Waveform

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