

Transistor

4V Drive Nch MOS FET

RSS070N05

●Structure

Silicon N-channel
MOS FET

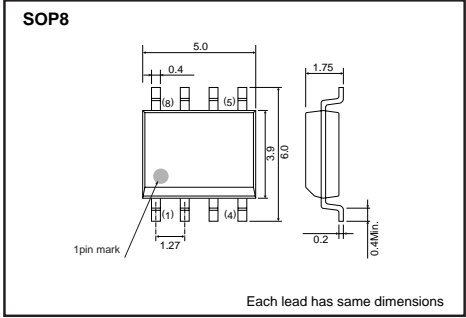
●Features

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

●Applications

Power switching , DC / DC converter , Inverter

●External dimensions (Unit : mm)



●Packaging dimensions

Type	Package	Taping
	Code	TB
	Basic ordering unit (pieces)	2500
RSS070N05		○

●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

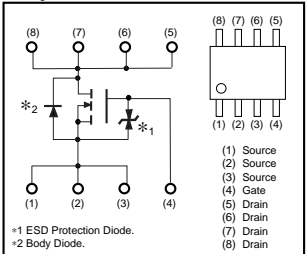
*1 $PW \leq 10\mu s$, Duty cycle $\leq 1\%$
*2 Mounted on a ceramic board

●Thermal resistance

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

* Mounted on a ceramic board

●Equivalent 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.

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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 V _{GS} = 10V
Turn-off delay time	t _{d(off)} *	–	57	–	ns	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

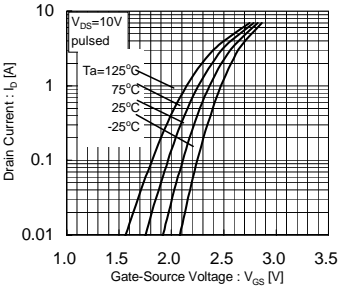


Fig.1 Typical Transfer Characteristics

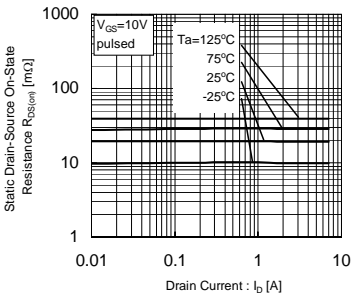


Fig.2 Static Drain-Source On-State Resistance vs. Drain Current (1)

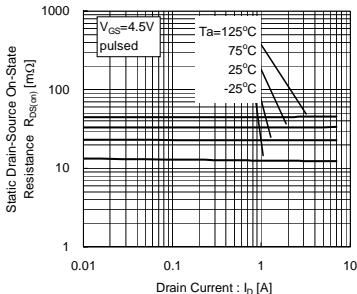


Fig.3 Static Drain-Source On-State Resistance vs. Drain Current (2)

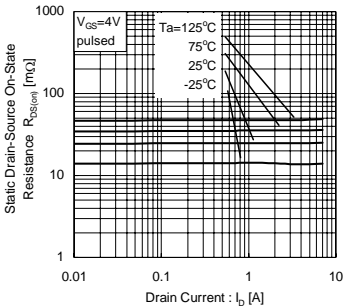


Fig.4 Static Drain-Source On-State Resistance vs. Drain Current (3)

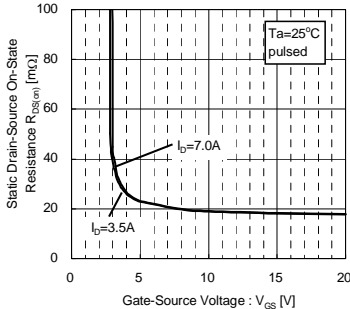


Fig.5 Static Drain-Source On-State Resistance vs. Gate-Source Voltage

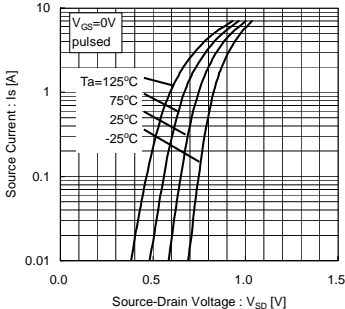


Fig.6 Source-Current vs. Source-Drain Voltage

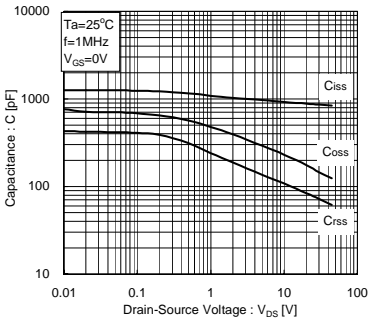


Fig.7 Typical capacitance vs. Source-Drain Voltage

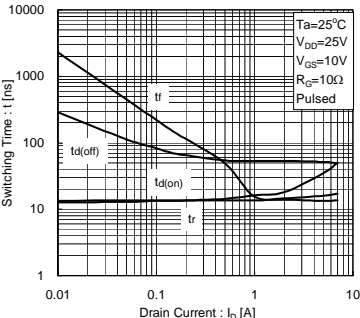


Fig.8 Switching Characteristics

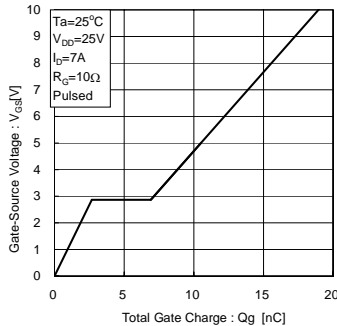


Fig.9 Dynamic Input Characteristics

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●Measurement circuits

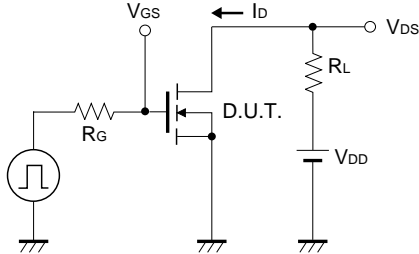


Fig.10 Switching Time Test Circuit

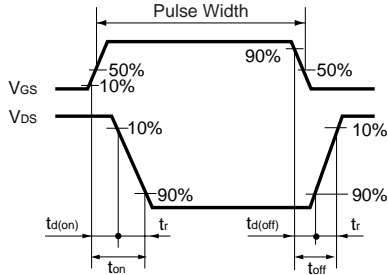


Fig.11 Switching Time Waveforms

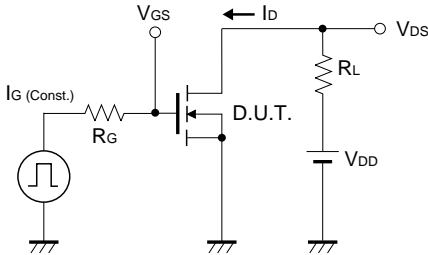


Fig.12 Gate Charge Test Circuit

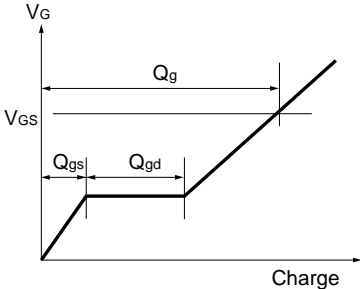


Fig.13 Gate Charge Waveform

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