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Transistor

4V Drive Nch MOS FET

RSS070N05

●Structure

Silicon N-channel
MOS FET

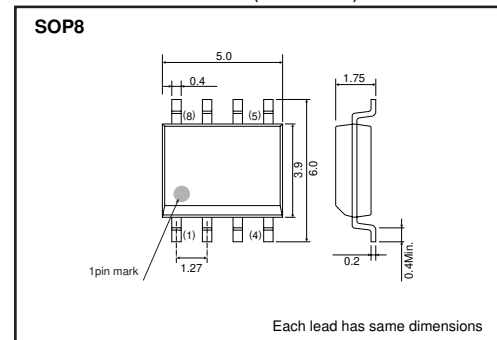
●Features

- 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	
Channel temperature	T_{ch}	150	°C	
Range of Storage temperature	T_{stg}	-55 to +150	°C	

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

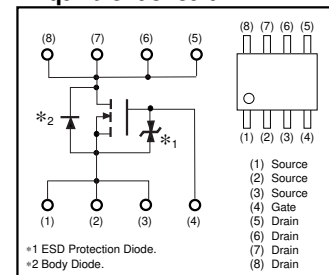
*2 Mounted on a ceramic board

●Thermal resistance

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

* Mounted on a ceramic board

●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.

Transistor

●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 I _D = 3.5A
Rise time	t _r *	—	27	—	ns	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

Transistor

●Electrical characteristic curves

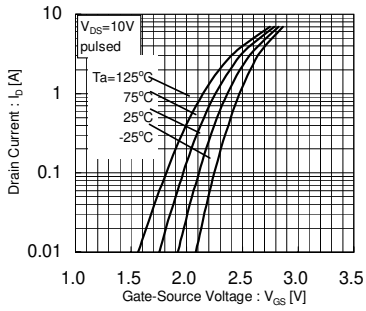


Fig.1 Typical Transfer Characteristics

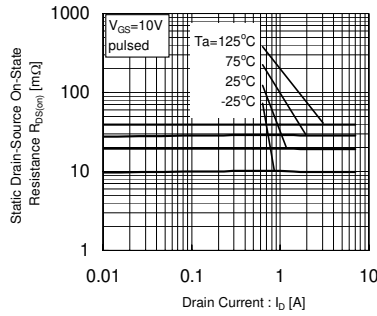


Fig.2 Static Drain-Source On-State Resistance vs. Drain Current (1)

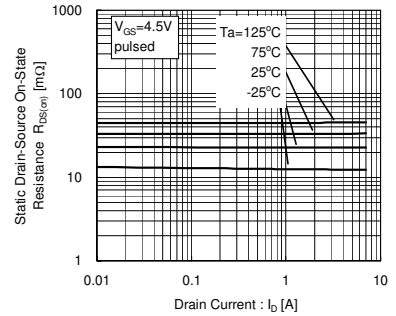


Fig.3 Static Drain-Source On-State Resistance vs. Drain Current (2)

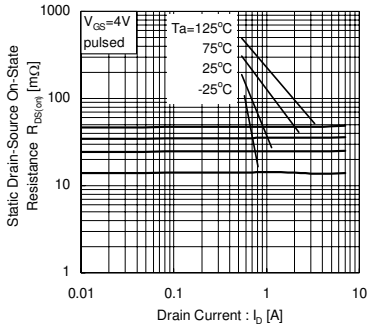


Fig.4 Static Drain-Source On-State Resistance vs. Drain Current (3)

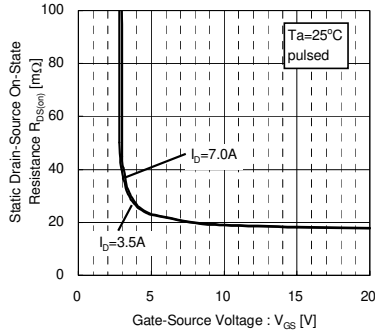


Fig.5 Static Drain-Source On-State Resistance vs. Gate-Source Voltage

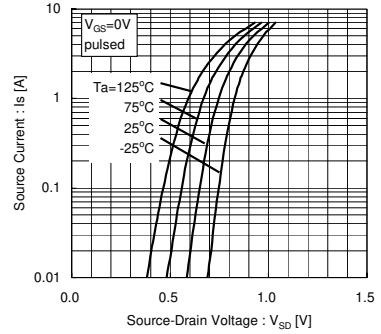


Fig.6 Source-Current vs. Source-Drain Voltage

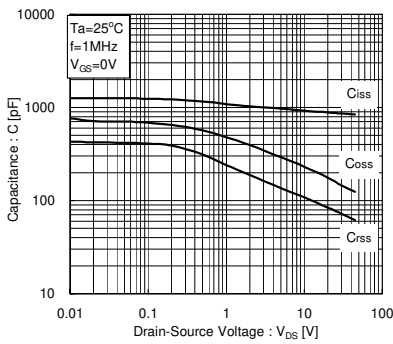


Fig.7 Typical capacitance vs. Source-Drain Voltage

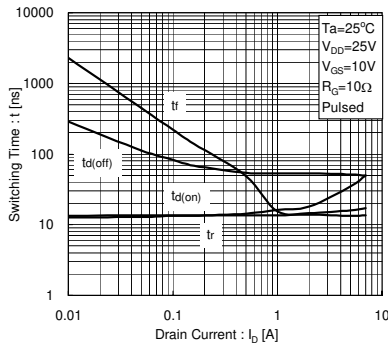


Fig.8 Switching Characteristics

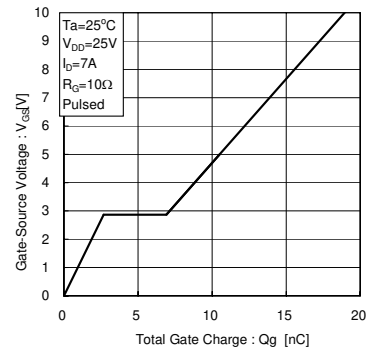


Fig.9 Dynamic Input Characteristics

Transistor

●Measurement circuits

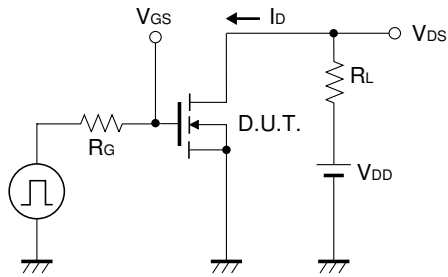


Fig.10 Switching Time Test Circuit

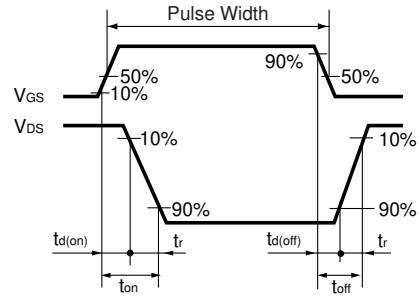


Fig.11 Switching Time Waveforms

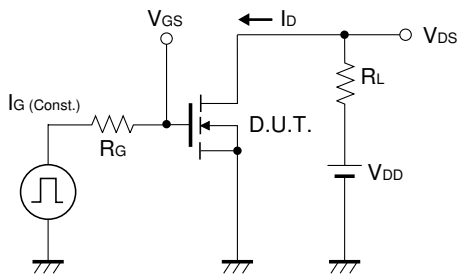


Fig.12 Gate Charge Test Circuit

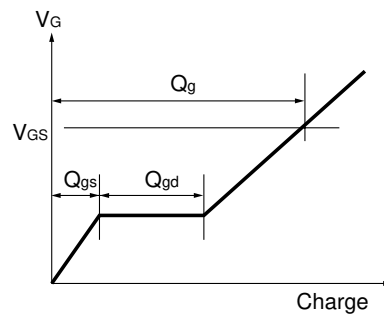


Fig.13 Gate Charge Waveform

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