

Transistor

## 4V Drive Nch MOS FET

## RSS085N05

## ●Structure

Silicon N-channel  
MOS FET

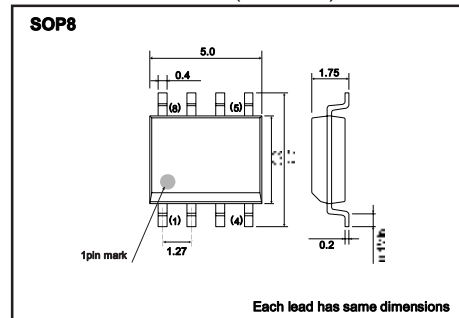
## ●Features

- 1) Built-in G-S Protection Diode.
- 2) Small and 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
RSS085N05		○

## ●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	$I_D$	$\pm 8.5$	A
	Pulsed	$I_{DP}$ *1	$\pm 34$	A
Source current (Body diode)	Continuous	$I_S$	1.6	A
	Pulsed	$I_{SP}$ *1	34	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  $PW \sim 10 \mu s$ , Duty cycle  $\sim 1\%$

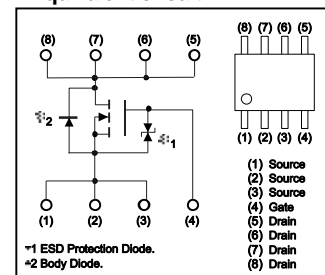
\*2 Mounted on a ceramic board

## ●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 <sub>GSS</sub>	–	–	10	μA	V <sub>GS</sub> =20V, V <sub>DS</sub> =0V
Drain-source breakdown voltage	V <sub>(BR)DSS</sub>	45	–	–	V	I <sub>D</sub> = 1mA, V <sub>GS</sub> =0V
Zero gate voltage drain current	I <sub>DSS</sub>	–	–	1	μA	V <sub>DS</sub> = 45V, V <sub>GS</sub> =0V
Gate threshold voltage	V <sub>GS(th)</sub>	1.0	–	2.5	V	V <sub>DS</sub> = 10V, I <sub>D</sub> = 1mA
Static drain-source on-state resistance	R <sub>DS(on)</sub>	–	13	18	mΩ	I <sub>D</sub> = 8.5A, V <sub>GS</sub> = 10V
		–	16	23	mΩ	I <sub>D</sub> = 8.5A, V <sub>GS</sub> = 4.5V
		–	18	25	mΩ	I <sub>D</sub> = 8.5A, V <sub>GS</sub> = 4V
Forward transfer admittance	Y <sub>fs</sub>	7.0	–	–	S	V <sub>DS</sub> = 10V, I <sub>D</sub> = 8.5A
Input capacitance	C <sub>iss</sub>	–	1500	–	pF	V <sub>DS</sub> = 10V
Output capacitance	C <sub>oss</sub>	–	350	–	pF	V <sub>GS</sub> =0V
Reverse transfer capacitance	C <sub>rss</sub>	–	170	–	pF	f=1MHz
Turn-on delay time	t <sub>d(on)</sub>	–	19	–	ns	V <sub>DD</sub> = 25V
Rise time	t <sub>r</sub>	–	25	–	ns	I <sub>D</sub> = 4.0A V <sub>GS</sub> = 10V
Turn-off delay time	t <sub>d(off)</sub>	–	71	–	ns	R <sub>L</sub> =6.3Ω
Fall time	t <sub>f</sub>	–	24	–	ns	R <sub>G</sub> =10Ω
Total gate charge	Q <sub>g</sub>	–	15.3	21.4	nC	V <sub>DD</sub> = 25V V <sub>GS</sub> = 5V
Gate-source charge	Q <sub>gs</sub>	–	4.4	–	nC	I <sub>D</sub> = 8.5A
Gate-drain charge	Q <sub>gd</sub>	–	6.0	–	nC	R <sub>L</sub> =2.9Ω R <sub>G</sub> =10Ω

\*Pulsed

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

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Forward voltage	V <sub>SD</sub> *	–	–	1.2	V	I <sub>S</sub> = 8.5A, V <sub>GS</sub> =0V

\*Pulsed

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●Electrical characteristic curves

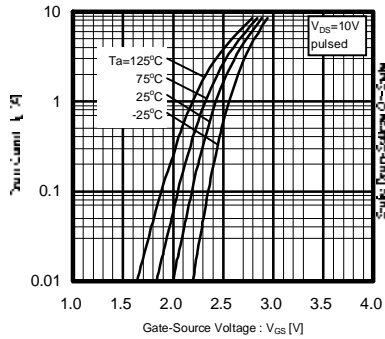


Fig.1 Typical Transfer Characteristics

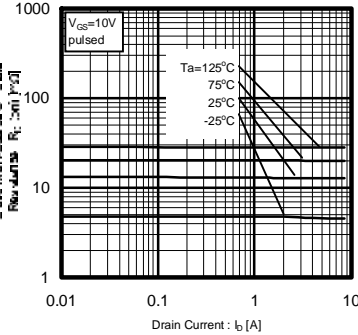


Fig.2 Static Drain-Source On-State Resistance vs. Drain Current (1)

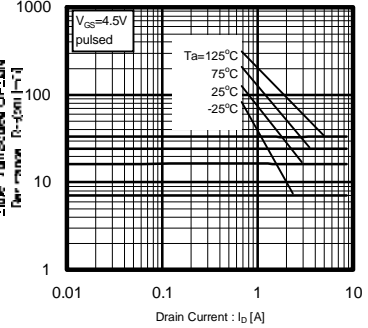


Fig.3 Static Drain-Source On-State Resistance vs. Drain Current (2)

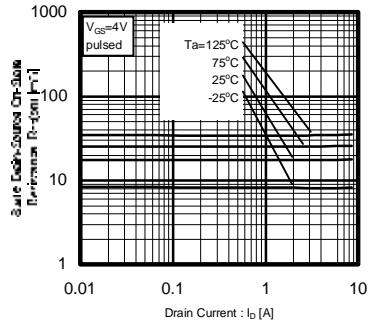


Fig.4 Static Drain-Source On-State Resistance vs. Drain Current (3)

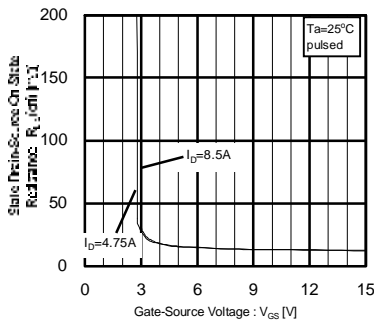


Fig.5 Static Drain-Source On-State Resistance vs. Gate-Source Voltage

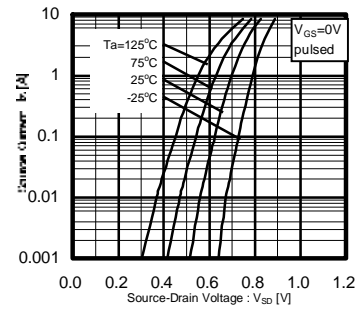


Fig.6 Source-Current vs. Source-Drain Voltage

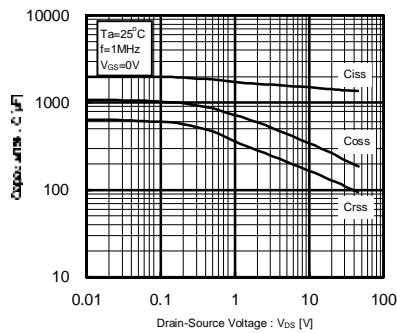


Fig.7 Typical capacitance vs. Source-Drain Voltage

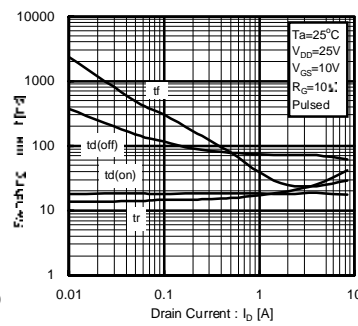


Fig.8 Switching Characteristics

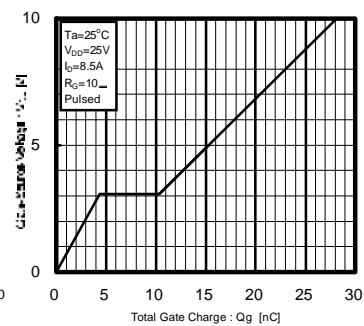


Fig.9 Dynamic Input Characteristics

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●Measurement circuits

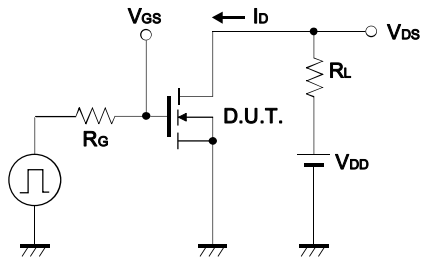


Fig.10 Switching Time Test Circuit

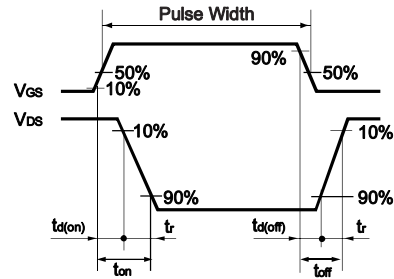


Fig.11 Switching Time Waveforms

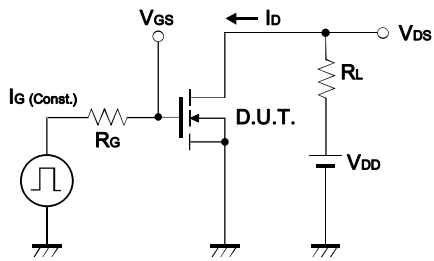


Fig.12 Gate Charge Test Circuit

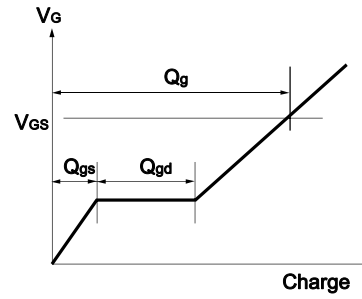


Fig.13 Gate Charge Waveform

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