

Transistor

## 4V Drive Nch MOS FET

## RSS085N05

## ●Structure

Silicon N-channel  
MOS FET

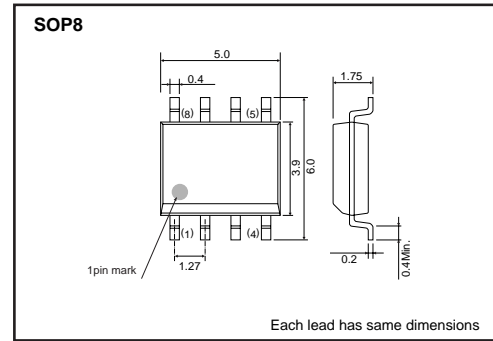
## ●Features

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

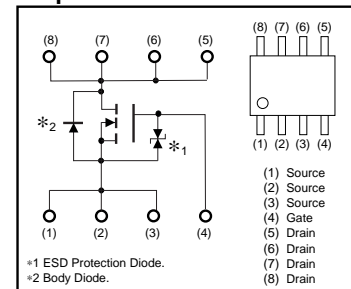
\*2 Mounted on a ceramic board

## ●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	$\mu A$	$V_{GS}=20V, V_{DS}=0V$
Drain-source breakdown voltage	$V_{(BR)DSS}$	45	–	–	V	$I_D=1mA, V_{GS}=0V$
Zero gate voltage drain current	$I_{DSS}$	–	–	1	$\mu A$	$V_{DS}=45V, V_{GS}=0V$
Gate threshold voltage	$V_{GS(th)}$	1.0	–	2.5	V	$V_{DS}=10V, I_D=1mA$
Static drain-source on-state resistance	$R_{DS(on)}$ *	–	13	18	$m\Omega$	$I_D=8.5A, V_{GS}=10V$
		–	16	23	$m\Omega$	$I_D=8.5A, V_{GS}=4.5V$
		–	18	25	$m\Omega$	$I_D=8.5A, V_{GS}=4V$
Forward transfer admittance	$ Y_{fs} $ *	7.0	–	–	S	$V_{DS}=10V, I_D=8.5A$
Input capacitance	$C_{iss}$	–	1500	–	pF	$V_{DS}=10V$
Output capacitance	$C_{oss}$	–	350	–	pF	$V_{GS}=0V$
Reverse transfer capacitance	$C_{rss}$	–	170	–	pF	$f=1MHz$
Turn-on delay time	$t_{d(on)}$ *	–	19	–	ns	$V_{DD}\doteq 25V$
Rise time	$t_r$ *	–	25	–	ns	$I_D=4.0A$
Turn-off delay time	$t_{d(off)}$ *	–	71	–	ns	$V_{GS}=10V$
Fall time	$t_f$ *	–	24	–	ns	$R_L=6.3\Omega$
Total gate charge	$Q_g$ *	–	15.3	21.4	nC	$V_{DD}\doteq 25V, V_{GS}=5V$
Gate-source charge	$Q_{gs}$ *	–	4.4	–	nC	$I_D=8.5A$
Gate-drain charge	$Q_{gd}$ *	–	6.0	–	nC	$R_L=2.9\Omega, R_G=10\Omega$

\*Pulsed

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

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Forward voltage	$V_{SD}$ *	–	–	1.2	V	$I_S=8.5A, V_{GS}=0V$

\*Pulsed

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●Electrical characteristic curves

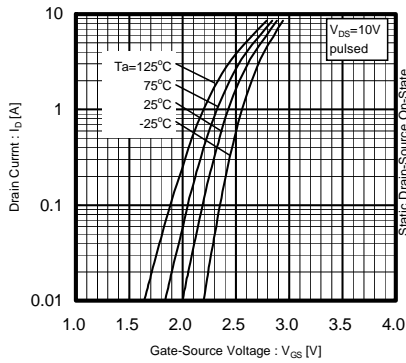


Fig.1 Typical Transfer Characteristics

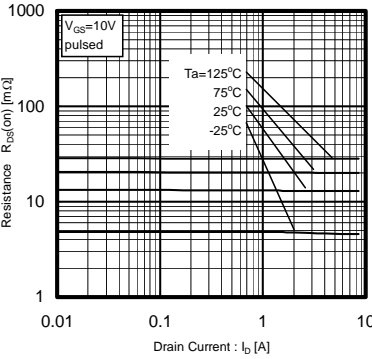


Fig.2 Static Drain-Source On-State Resistance vs. Drain Current (1)

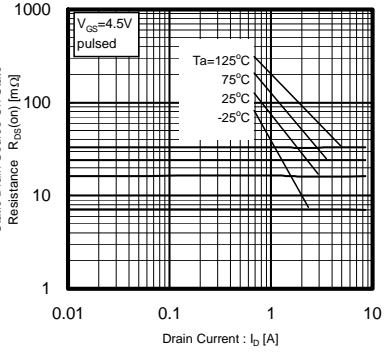


Fig.3 Static Drain-Source On-State Resistance vs. Drain Current (2)

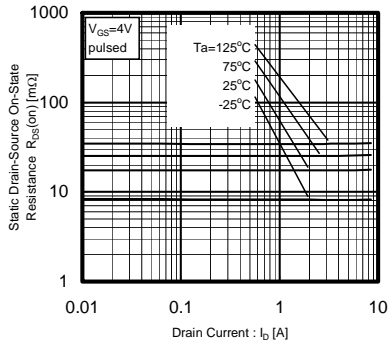


Fig.4 Static Drain-Source On-State Resistance vs. Drain Current (3)

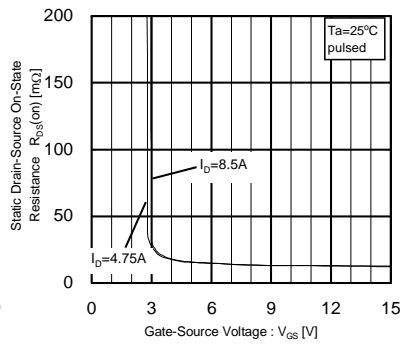


Fig.5 Static Drain-Source On-State Resistance vs. Gate-Source Voltage

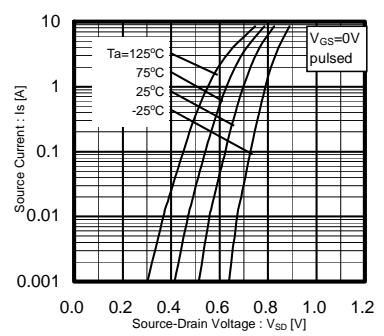


Fig.6 Source-Current vs. Source-Drain Voltage

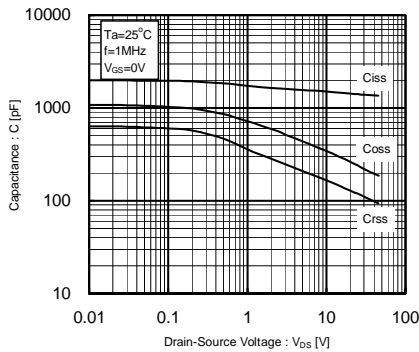


Fig.7 Typical capacitance vs. Source-Drain Voltage

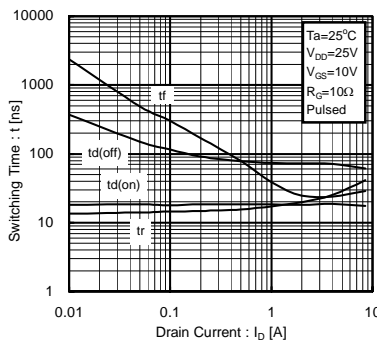


Fig.8 Switching Characteristics

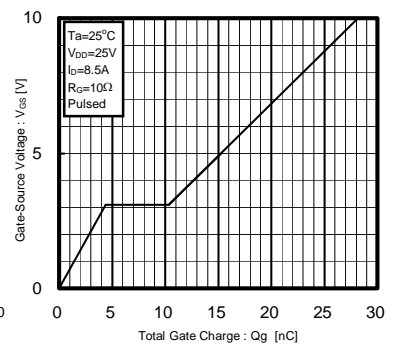


Fig.9 Dynamic Input Characteristics

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● Measurement circuits

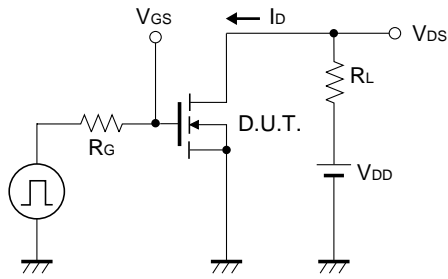


Fig.10 Switching Time Test Circuit

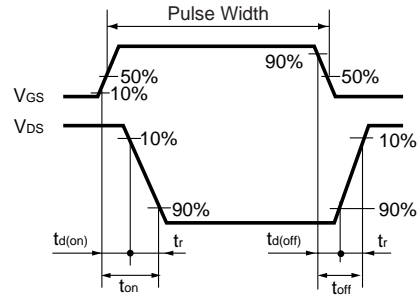


Fig.11 Switching Time Waveforms

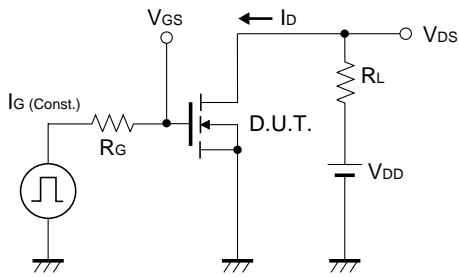


Fig.12 Gate Charge Test Circuit

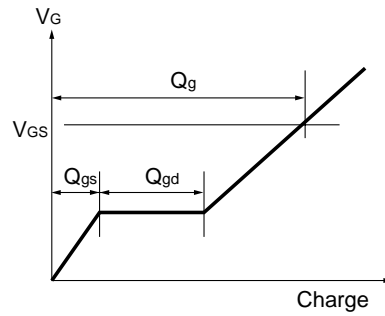


Fig.13 Gate Charge Waveform

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