

# 4V Drive Pch MOS FET

## RSS090P03

●Structure

Silicon P-channel MOS FET

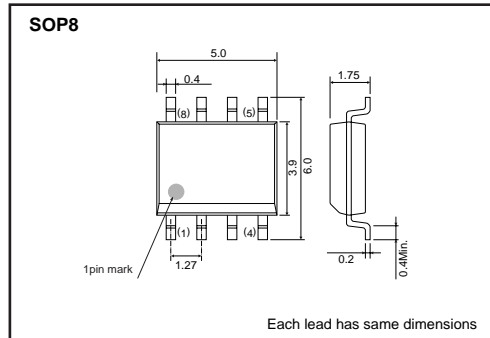
●Features

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

●Application

Power switching, DC / DC converter.

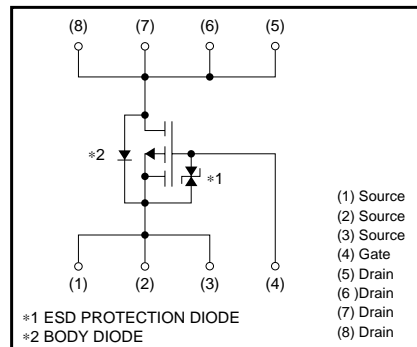
●External dimensions (Unit : mm)



●Packaging specifications

Type	Package	Taping
	Code	TB
	Basic ordering unit (pieces)	2500
RSS090P03		○

●Equivalent circuit



●Absolute maximum ratings (Ta=25°C)

Parameter	Symbol	Limits	Unit	
Drain-source voltage	$V_{DSS}$	-30	V	
Gate-source voltage	$V_{GSS}$	±20	V	
Drain current	Continuous	$I_D$	±9.0	A
	Pulsed	$I_{DP}$ *1	±36	A
Source current (Body diode)	Continuous	$I_S$	-1.6	A
	Pulsed	$I_{SP}$ *1	-36	A
Total power dissipation	$P_D$ *2	2.0	W	
Channel temperature	$T_{ch}$	150	°C	
Range of Storage temperature	$T_{stg}$	-55 to +150	°C	

\*1  $P_w \leq 10 \mu s$ , Duty cycle  $\leq 1\%$   
 \*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.

## Transistors

## ●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	$V_{(BR) DSS}$	–30	–	–	V	$I_D = -1mA, V_{GS} = 0V$
Zero gate voltage drain current	$I_{DSS}$	–	–	–1	μA	$V_{DS} = -30V, V_{GS} = 0V$
Gate threshold voltage	$V_{GS(th)}$	–1.0	–	–2.5	V	$V_{DS} = -10V, I_D = -1mA$
Static drain-source on-state resistance	$R_{DS(on)}$ *	–	10	14	mΩ	$I_D = -9.0A, V_{GS} = -10V$
		–	15	21	mΩ	$I_D = -4.5A, V_{GS} = -4.5V$
		–	17	23	mΩ	$I_D = -4.5A, V_{GS} = -4.0V$
Forward transfer admittance	$ Y_{fs} $ *	6.0	–	–	S	$V_{DS} = -10V, I_D = -4.5A$
Input capacitance	$C_{iss}$	–	4000	–	pF	$V_{DS} = -10V$
Output capacitance	$C_{oss}$	–	750	–	pF	$V_{GS} = 0V$
Reverse transfer capacitance	$C_{rss}$	–	580	–	pF	$f = 1MHz$
Turn-on delay time	$t_{d(on)}$ *	–	25	–	ns	$I_D = -4.5A$
Rise time	$t_r$ *	–	50	–	ns	$V_{DD} = -15V$
Turn-off delay time	$t_{d(off)}$ *	–	150	–	ns	$V_{GS} = -10V$
Fall time	$t_f$ *	–	80	–	ns	$R_L = 3.3\Omega$ $R_G = 10\Omega$
Total gate charge	$Q_g$ *	–	39	–	nC	$V_{DD} = -15V$
Gate-source charge	$Q_{gs}$ *	–	7.0	–	nC	$V_{GS} = -5V$
Gate-drain charge	$Q_{gd}$ *	–	15	–	nC	$I_D = -9.0A$

\*Pulsed

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

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Forward voltage	$V_{SD}$	–	–	–1.2	V	$I_S = -1.6A, V_{GS} = 0V$

Transistors

●Electrical characteristic curves

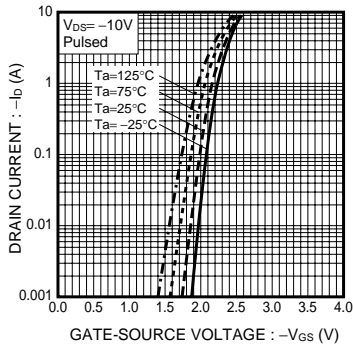


Fig.1 Typical Transfer Characteristics

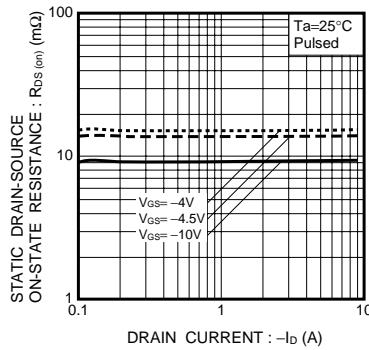


Fig.2 Static Drain-Source On-State Resistance vs. Drain Current

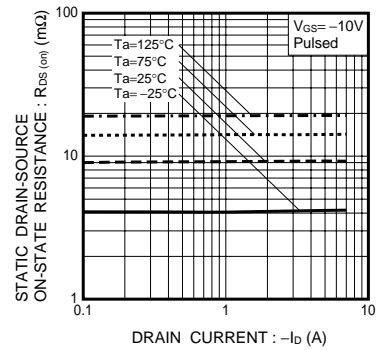


Fig.3 Static Drain-Source On-State Resistance vs. Drain Current

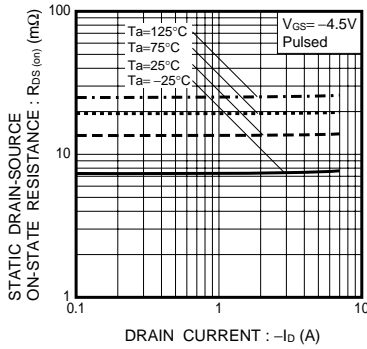


Fig.4 Static Drain-Source On-State vs. Drain Current

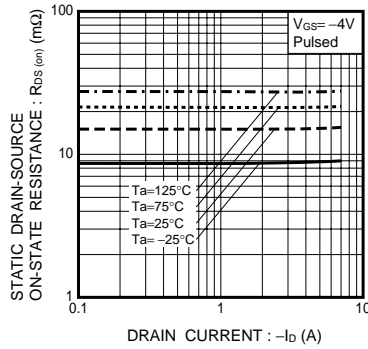


Fig.5 Static Drain-Source On-State vs. Drain Current

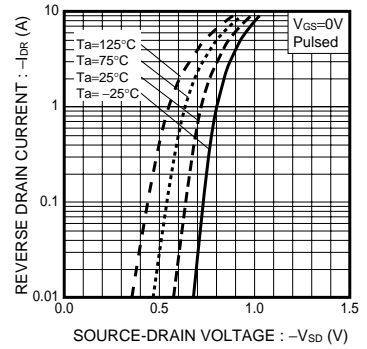


Fig.6 Reverse Drain Current Source-Drain Current

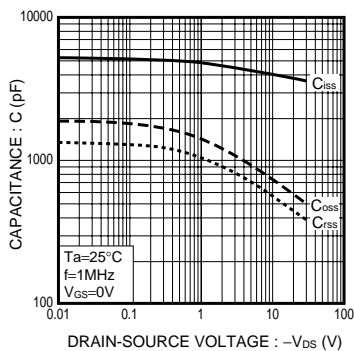


Fig.7 Typical Capacitance vs. Drain-Source Voltage

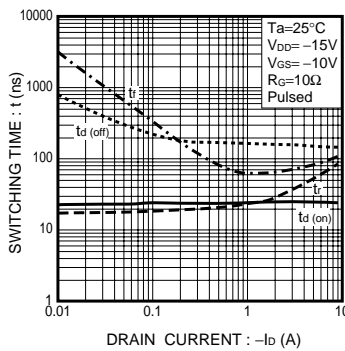


Fig.8 Switching Characteristics

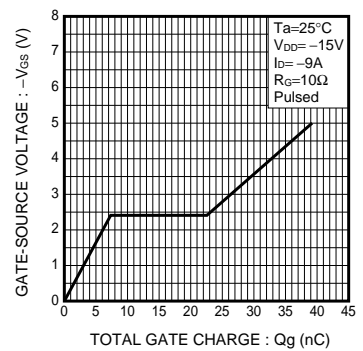


Fig.9 Dynamic Input Characteristics

Transistors

●Measurement circuits

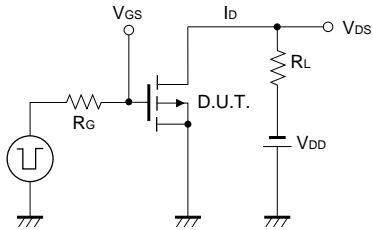


Fig.10 Switching Time Test Circuit

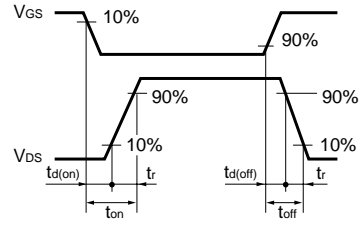


Fig.11 Switching Time Waveforms

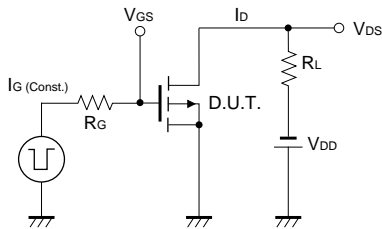


Fig.12 Gate Charge Test Circuit

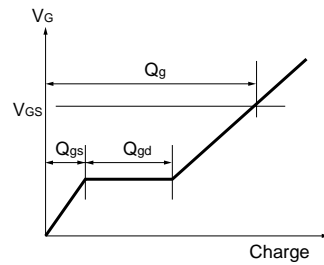


Fig.13 Gate Charge Waveform

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