4V Drive Nch MOS FET

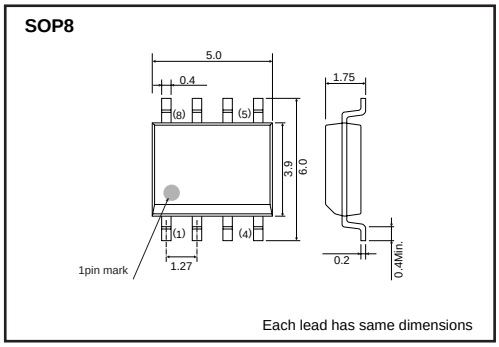
RSS090N03

●Structure
Silicon N-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.

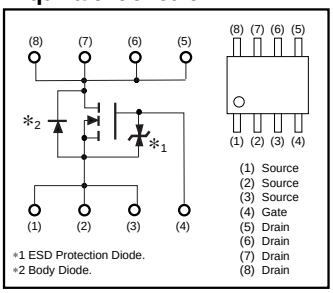
●External dimensions (Unit : mm)



●Packaging specifications

Type	Package	Taping
	Code	TB
	Basic ordering unit (pieces)	2500
RSS090N03		◯

●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.

●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	18	A
Total Power Dissipation		P_D *2	2	W
Channel Temperature		Tch	150	°C
Storage Temperature		Tstg	−55 to +150	°C

∗1 Pw≤10µs, Duty cycle≤1%
∗2 Mounted on a ceramic board.

●Thermal resistance

Parameter	Symbol	Limits	Unit
Channel to Ambient	Rth (ch-a)*	62.5	°C / W

∗ Mounted on a ceramic board.

●**Electrical characteristics** (Ta = 25°C)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test 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	$R_{DS\ (on)}$ *	–	11	16	mΩ	I_D=9A, V_{GS}=10V
		–	15	22		I_D=9A, V_{GS}=4.5V
		–	17	24		I_D=9A, V_{GS}=4V
Forward Transfer Admittance	$\|Y_{fs}\|$ *	6.0	–	–	S	I_D=9A, V_{DS}=10V
Input Capacitance	C_{iss}	–	810	–	pF	V_{DS}=10V
Output Capacitance	C_{oss}	–	225	–	pF	V_{GS}=0V
Reverse Transfer Capacitance	C_{rss}	–	160	–	pF	f=1MHz
Turn-On Delay Time	$t_{d(on)}$ *	–	10	–	ns	I_D=4.5A, V_{DD}≒ 15V
Rise Time	t_r *	–	13	–	ns	V_{GS}=10V
Turn-Off Delay Time	$t_{d(off)}$ *	–	46	–	ns	R_L=3.33Ω
Fall Time	t_f *	–	15	–	ns	R_G =10Ω
Total Gate Charge	Q_g *	–	11	15	nC	V_{DD}≒15V
Gate-Source Charge	Q_{gs} *	–	2.5	–	nC	V_{GS}=5V
Gate-Drain Charge	Q_{gd} *	–	4.5	–	nC	I_D=9A

*Pulsed

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

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test Conditions
Forward Voltage	V_{SD} *	–	–	1.2	V	I_S=6.4A, V_{GS}=0V

*Pulsed

●Electrical characteristic curves

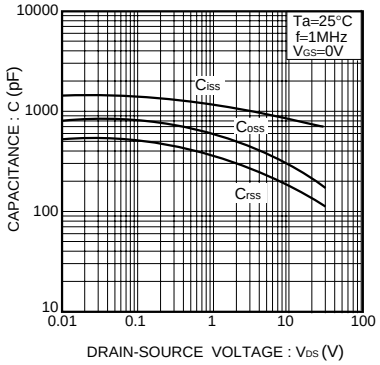


Fig.1 Typical Capacitance vs. Drain-Source Voltage

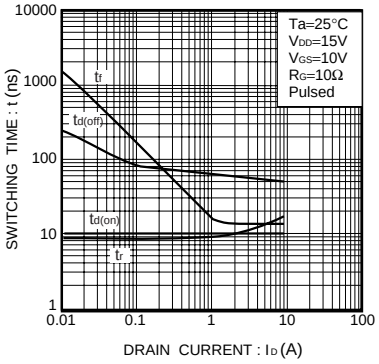


Fig.2 Switching Characteristics

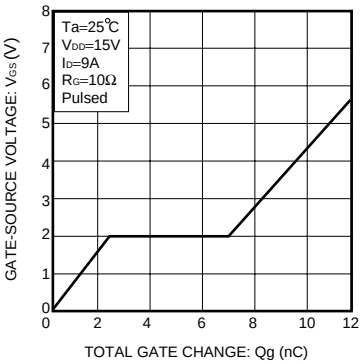


Fig.3 Dynamic Input Characteristics

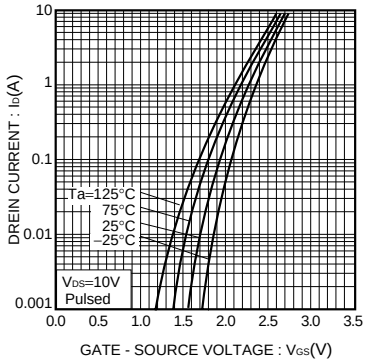


Fig.4 Typical Transfer Characteristics

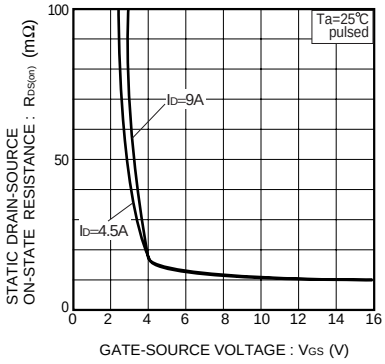


Fig.5 Static Drain-Source On-State Resistance vs. Gate-Source Voltage

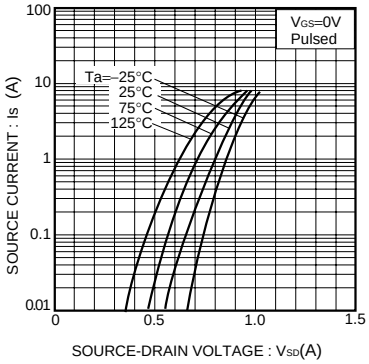


Fig.6 Source-Current vs. Source-Drain Voltage

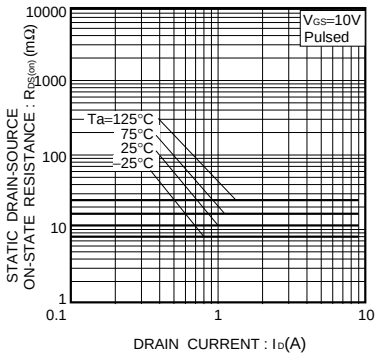


Fig.7 Static Drain-Source On-State Resistance vs. Drain Current (1)

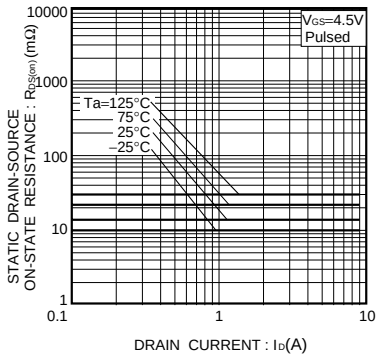


Fig.8 Static Drain-Source On-State Resistance vs. Drain Current (2)

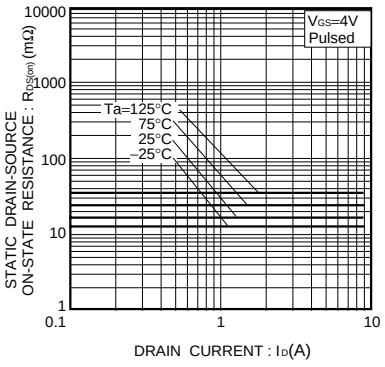


Fig.9 Static Drain-Source On-State Resistance vs. Drain Current (3)

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