

Switching (-30V, -5.0A)

RSS050P03

● Features

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

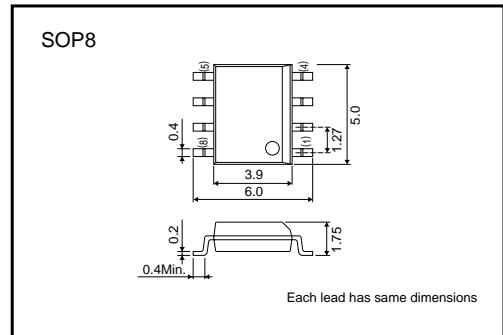
● Application

Power switching, DC / DC converter.

● Structure

Silicon P-channel MOS FET

● **External dimensions** (Unit : mm)



●Packaging specifications

Type	Package	Taping
	Code	TB
	Basic ordering unit (pieces)	2500
RSS050P03		<input type="radio"/>

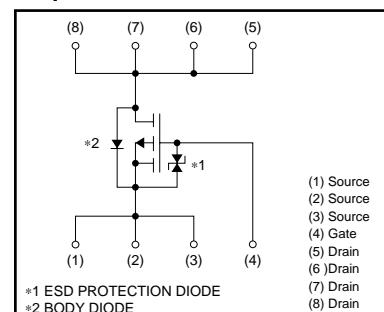
● Absolute maximum ratings (Ta=25°C)

Parameter	Symbol	Limits	Unit
Drain-source voltage	V_{DSS}	-30	V
Gate-source voltage	V_{GSS}	± 20	V
Drain current	Continuous	I_D	± 5.0
	Pulsed	I_{DP}	± 20
Source current (Body diode)	Continuous	I_S	-1.6
	Pulsed	I_{SP}	-20
Total power dissipation	P_D	2.0	W
Channel temperature	T_{ch}	150	°C
Range of Storage temperature	T_{stg}	-55 to +150	°C

*1 $P_w \leq 10\mu\text{s}$, Duty cycle $\leq 1\%$

*2 Mounted on a ceramic board

● Equivalent circuit



● Thermal resistance ($T_a=25^\circ\text{C}$)

Parameter	Symbol	Limits	Unit
Channel to ambient	Rth (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)*}	—	30	42	mΩ	I _D =—5.0A, V _{GS} =—10V
		—	47	65	mΩ	I _D =—2.5A, V _{GS} =—4.5V
		—	55	77	mΩ	I _D =—2.5A, V _{GS} =—4.0V
Forward transfer admittance	Y _{fs} *	5.0	—	—	S	V _{DS} =—10V, I _D =—2.5A
Input capacitance	C _{iss}	—	1200	—	pF	V _{DS} =—10V
Output capacitance	C _{oss}	—	250	—	pF	V _{GS} =0V
Reverse transfer capacitance	C _{rss}	—	180	—	pF	f=1MHz
Turn-on delay time	t _{d (on)} *	—	12	—	ns	I _D =—2.5A
Rise time	t _r *	—	25	—	ns	V _{DD} =—15V
Turn-off delay time	t _{d (off)} *	—	70	—	ns	V _{GS} =—10V
Fall time	t _f *	—	35	—	ns	R _L =6Ω
Total gate charge	Q _g	—	13	—	nC	V _{DD} =—15V
Gate-source charge	Q _{gs}	—	2.8	—	nC	V _{GS} =—5V
Gate-drain charge	Q _{gd}	—	5.0	—	nC	I _D =—5.0A

*Pulsed

Body diode characteristics (source-drain characteristics)

Forward voltage	V _{SD}	—	—	—1.2	V	I _S =—1.6A, V _{GS} =0V
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Transistors

● Electrical characteristic curves

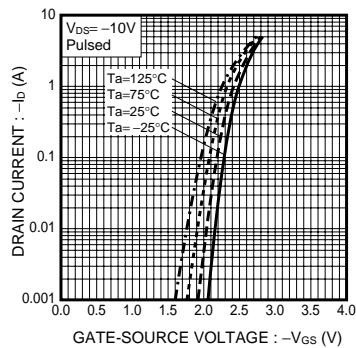


Fig.1 Typical Transfer Characteristics

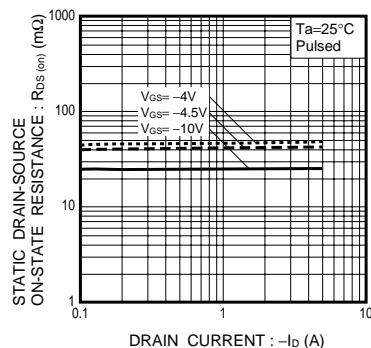


Fig.2 Static Drain-Source On-State Resistance vs. Drain Current

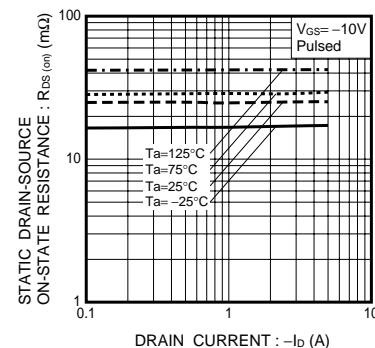


Fig.3 Static Drain-Source On-State Resistance vs. Drain Current

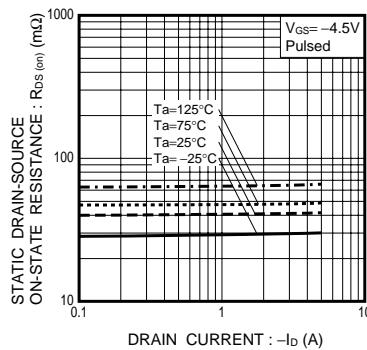


Fig.4 Static Drain-Source On-State vs. Drain Current

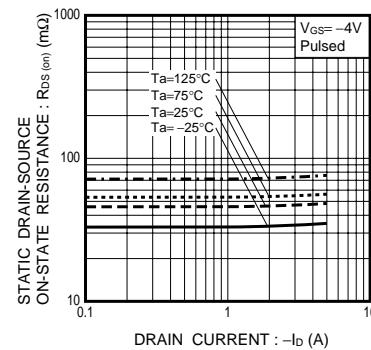


Fig.5 Static Drain-Source On-State vs. Drain Current

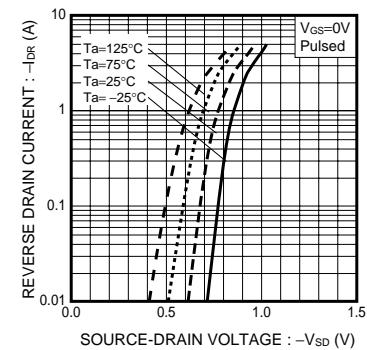


Fig.6 Reverse Drain Current Source-Drain Current

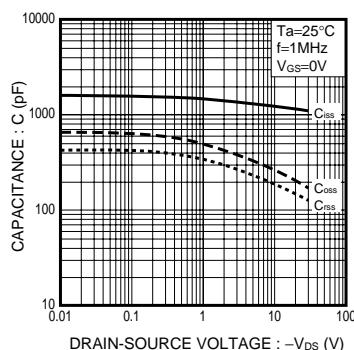


Fig.7 Typical Capacitance vs. Drain-Source Voltage

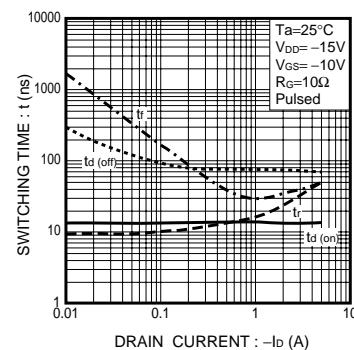


Fig.8 Switching Characteristics

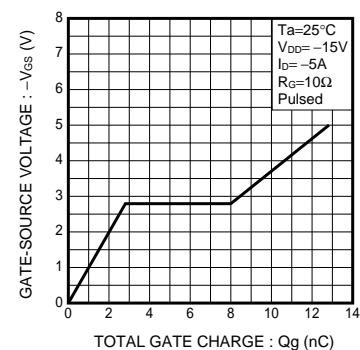


Fig.9 Dynamic Input Characteristics

Transistors

● Measurement circuits

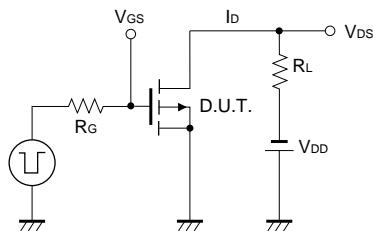


Fig.10 Switching Time Test Circuit

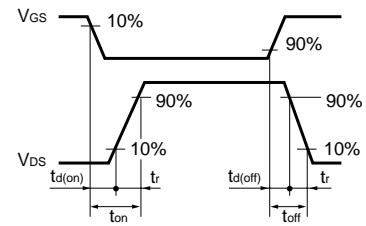


Fig.11 Switching Time Waveforms

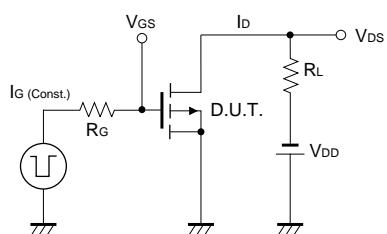


Fig.12 Gate Charge Test Circuit

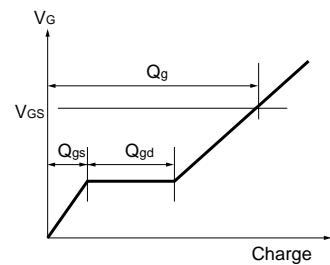


Fig.13 Gate Charge Waveform

Appendix

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