Switching (–30V, –4.0A)

RSS040P03

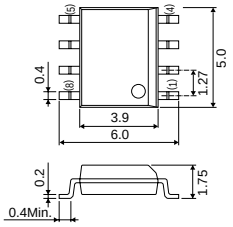
●Features
1) Low On-resistance.
2) Built-in G-S Protection Diode.
3) Small and Surface Mount Package (SOP8).

●Application
Power switching, DC / DC converter.

●Structure
Silicon P-channel
MOS FET

●External dimensions (Unit : mm)

SOP8

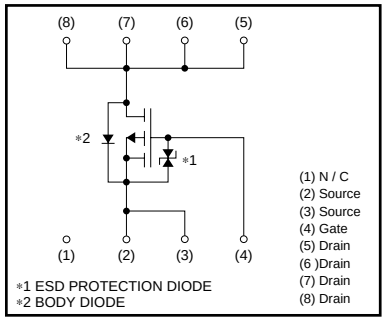


Each lead has same dimensions

●Packaging specifications

Type	Package	Taping
	Code	TB
	Basic ordering unit (pieces)	2500
RSS040P03		○

●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	±4.0	A	
	Pulsed	I_{DP}	±16	A	∗1
Source current (Body diode)	Continuous	I_S	–1.6	A	
	Pulsed	I_{SP}	–16	A	∗1
Total power dissipation		P_D	2.0	W	∗2
Channel temperature		Tch	150	°C	
Range of Storage temperature		Tstg	–55 to +150	°C	

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

●Thermal resistance (Ta=25°C)

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	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	$R_{DS\ (on)}$*	–	42	58	mΩ	I_D= −4.0A, V_{GS}= −10V
		–	68	92	mΩ	I_D= −2.0A, V_{GS}= −4.5V
		–	78	106	mΩ	I_D= −2.0A, V_{GS}= −4.0V
Forward transfer admittance	$\|Y_{fs}\|$ *	2.5	–	–	S	V_{DS}= −10V, I_D= −2.0A
Input capacitance	C_{iss}	–	800	–	pF	V_{DS}= −10V
Output capacitance	C_{oss}	–	180	–	pF	V_{GS}=0V
Reverse transfer capacitance	C_{rss}	–	110	–	pF	f=1MHz
Turn-on delay time	$t_{d\ (on)}$ *	–	12	–	ns	I_D= −2.0A V_{DD}≒ −15V V_{GS}= −10V R_L=7.5Ω R_{GS}=10Ω
Rise time	t_r *	–	25	–	ns	
Turn-off delay time	$t_{d\ (off)}$ *	–	45	–	ns	
Fall time	t_f *	–	15	–	ns	
Total gate charge	Q_g	–	8.0	–	nC	V_{DD}≒ −15V
Gate-source charge	Q_{gs}	–	2.5	–	nC	V_{GS}= −5V
Gate-drain charge	Q_{gd}	–	3.0	–	nC	I_D= −4.0A

*Pulsed

Body diode characteristics (source-drain characteristics)

Forward voltage	V_{SD}	–	–	−1.2	V	I_S= −1.6A, V_{GS}=0V

●Electrical characteristic curves

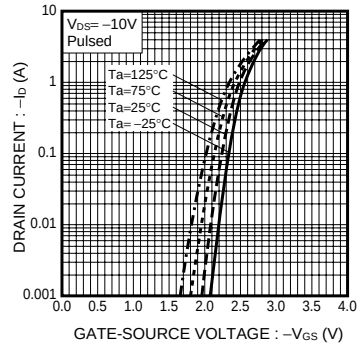


Fig.1 Typical Transfer Characteristics

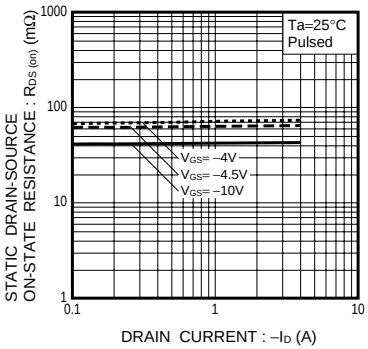


Fig.2 Static Drain-Source On-State Resistance vs. Drain Current

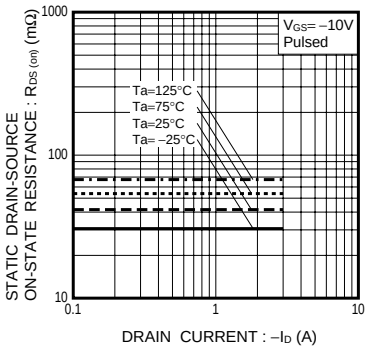


Fig.3 Static Drain-Source On-State Resistance vs. Drain Current

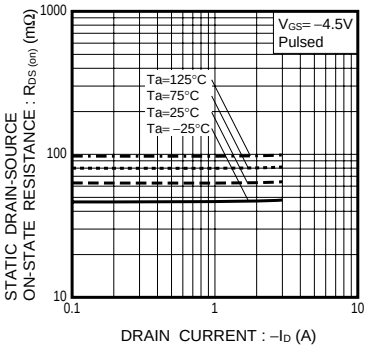


Fig.4 Static Drain-Source On-State vs. Drain Current

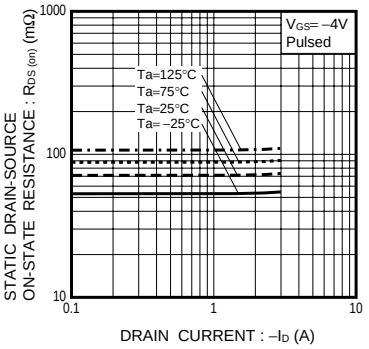


Fig.5 Static Drain-Source On-State vs. Drain Current

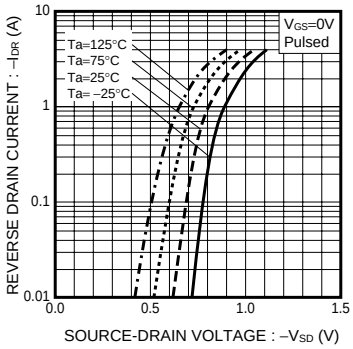


Fig.6 Reverse Drain Current Source-Drain Current

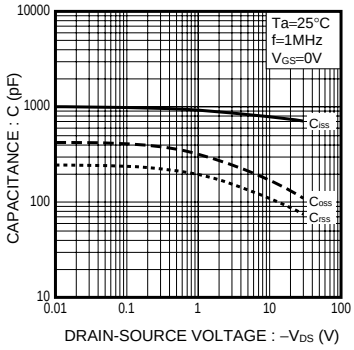


Fig.7 Typical Capacitance vs. Drain-Source Voltage

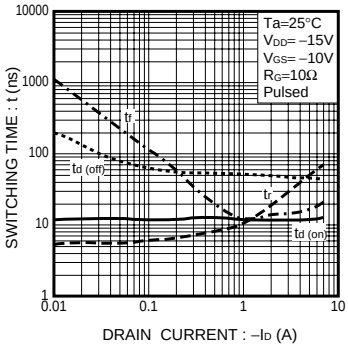


Fig.8 Switching Characteristics

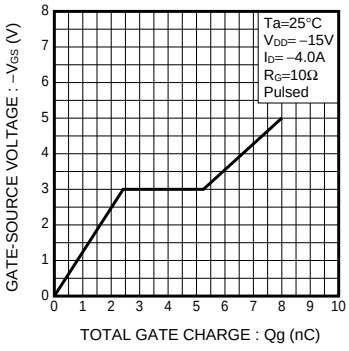


Fig.9 Dynamic Input Characteristics

●**Measurement circuits**

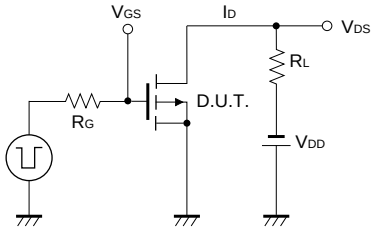


Fig.10 Switching Time Test Circuit

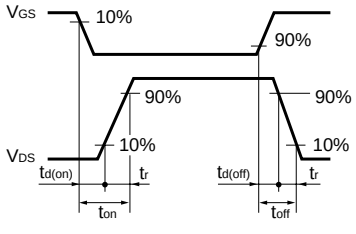


Fig.11 Switching Time Waveforms

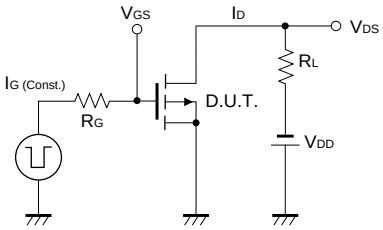


Fig.12 Gate Charge Test Circuit

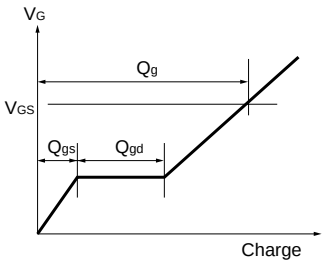


Fig.13 Gate Charge Waveform

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