

Switching (30V, 13A)

RSS130N03

● Features

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

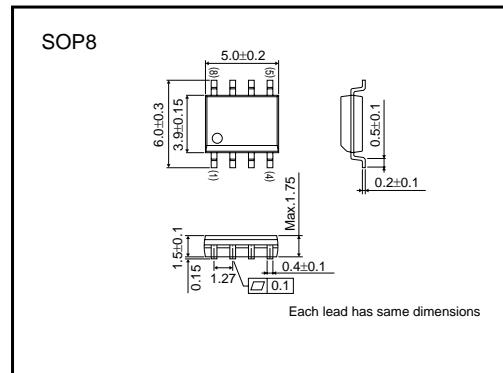
●Application

Power switching, DC/DC converter.

● Structure

Silicon N-channel
MOS FET

● **External dimensions (Unit : mm)**



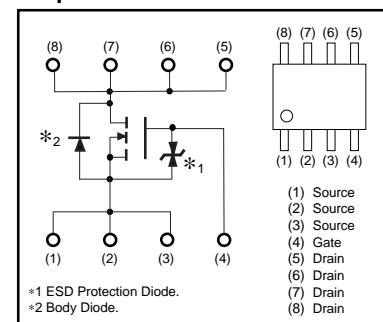
- **Absolute maximum ratings (Ta = 25°C)**

Parameter	Symbol	Limits	Unit
Drain-Source Voltage	V _{DSS}	30	V
Gate-Source Voltage	V _{GSS}	20	V
Drain Current	Continuous	I _D	±13
	Pulsed	I _{DP}	±52
Source Current (Body Diode)	Continuous	I _S	1.6
	Pulsed	I _{SP}	6.4
Total Power Dissipation	P _D	2	W
Channel Temperature	T _{CH}	150	°C
Storage Temperature	T _{STG}	-55 to +150	°C

*1 Pw<10μs, Duty cycle<1%

*1 Fw \leq 10μs, Duty cycle \leq 1%

● 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.

- **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	Test Conditions
Gate-Source Leakage	I _{GS}	—	—	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 _{DS}	—	—	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)} *	—	5.9	8.1	mΩ	I _D =13A, V _{GS} =10V
		—	7.4	10.3		I _D =13A, V _{GS} =4.5V
		—	7.9	11.0		I _D =13A, V _{GS} =4V
Forward Transfer Admittance	Y _{fs} *	11	—	—	S	I _D =13A, V _{DS} =10V
Input Capacitance	C _{iss}	—	2000	—	pF	V _{DS} =10V
Output Capacitance	C _{oss}	—	605	—	pF	V _{GS} =0V
Reverse Transfer Capacitance	C _{rss}	—	320	—	pF	f=1MHz
Turn-On Delay Time	t _{d(on)} *	—	13	—	ns	I _D =6.5A, V _{DD} =15V
Rise Time	t _r *	—	30	—	ns	V _{GS} =10V
Turn-Off Delay Time	t _{d(off)} *	—	88	—	ns	R _L =2.31Ω
Fall Time	t _f *	—	55	—	ns	R _{GS} =10Ω
Total Gate Charge	Q _g *	—	25	35	nC	V _{DD} =15V
Gate-Source Charge	Q _{gs} *	—	4.7	—	nC	V _{GS} =5V
Gate-Drain Charge	Q _{gd} *	—	9.4	—	nC	I _D =13A

*Pulsed

●Body diode characteristics (Source-Drain Characteristics) (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

Transistors

● Electrical characteristic curves

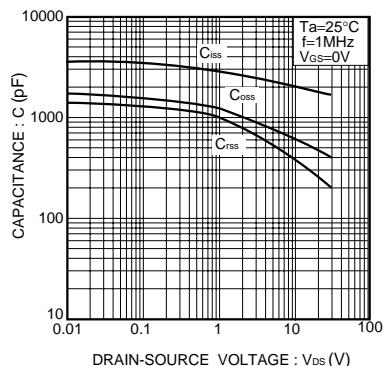


Fig.1 Typical Capacitance vs. Drain-Source Voltage

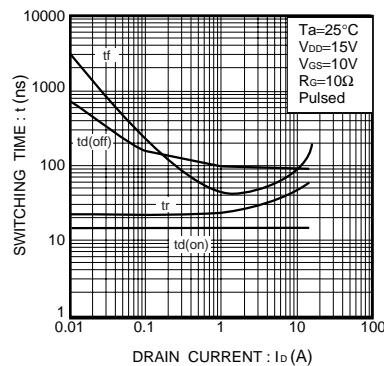


Fig.2 Switching Characteristics

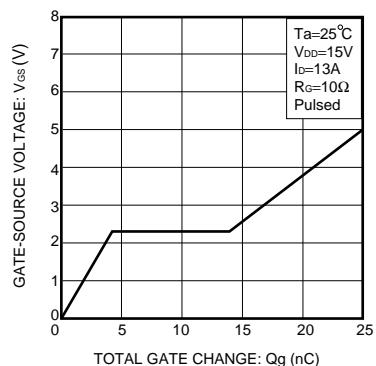


Fig.3 Dynamic Input Characteristics

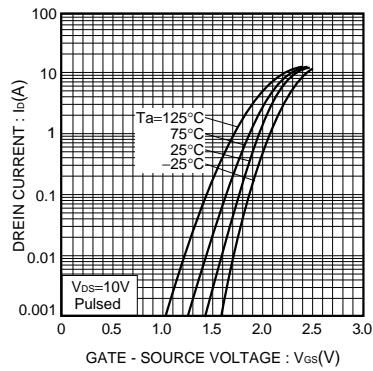


Fig.4 Typical Transfer Characteristics

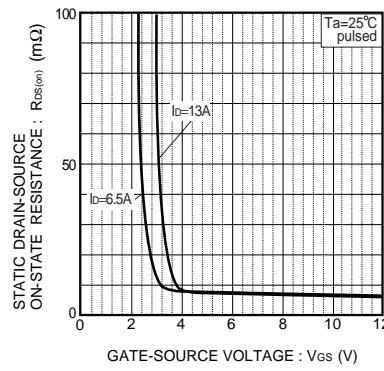


Fig.5 Static Drain-Source On-State Resistance vs. Gate-Source Voltage

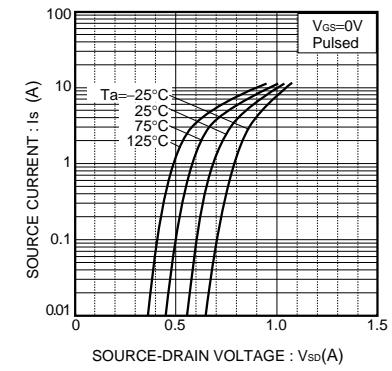


Fig.6 Source-Current vs. Source-Drain Voltage

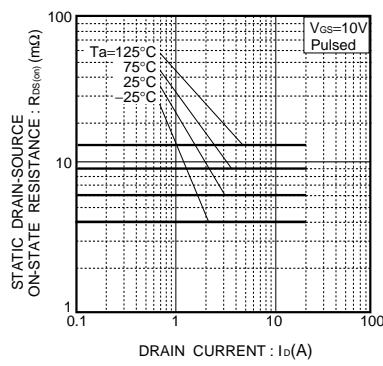


Fig.7 Static Drain-Source On-State Resistance vs. Drain Current (1)

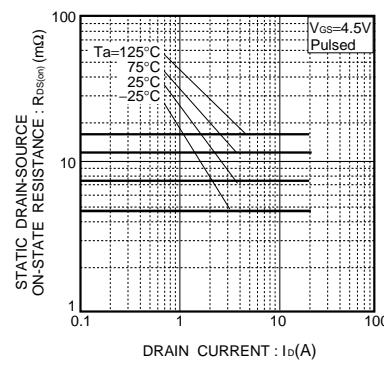


Fig.7 Static Drain-Source On-State Resistance vs. Drain Current (2)

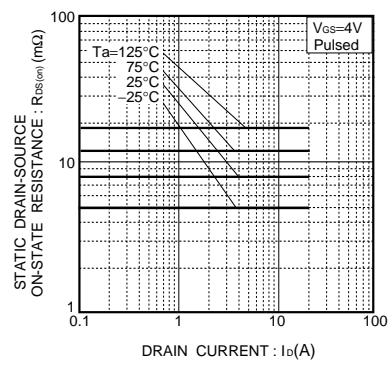


Fig.7 Static Drain-Source On-State Resistance vs. Drain Current (3)

Appendix

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