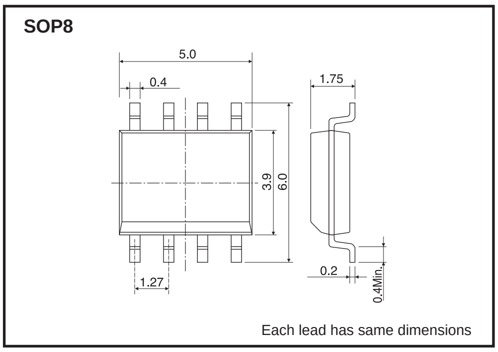
Data Sheet

4V Drive Nch MOSFET

RSH125N03

●Structure
Silicon N-channel MOSFET

●Dimensions (Unit : mm)



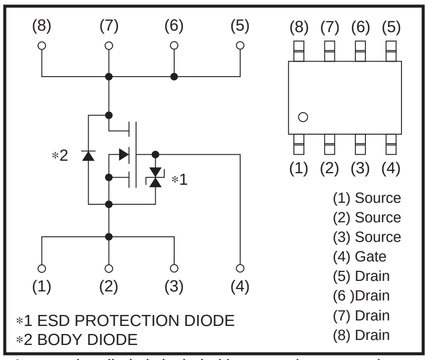
●Features
1) Low on-resistance.
2) Built-in G-S Protection Diode.
3) Small Surface Mount Package (SOP8) .

●Application
Power switching, DC / DC converter.

●Packaging specifications

Type	Package	Taping
	Code	TB
	Basic ordering unit (pieces)	2500
RSH125N03		○

●Inner 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 the protection circuit when the fixed voltages 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	±12.5	A
	Pulsed	I_{DP} *1	±50	A
Source current (Body diode)	Continuous	I_S	1.6	A
	Pulsed	I_{SP} *1	6.4	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	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	$R_{DS(on)}$ *	–	6.5	9.1	mΩ	I_D=12.5A, V_{GS}=10V
		–	8.6	12.1		I_D=12.5A, V_{GS}=4.5V
		–	9.3	13.1		I_D=12.5A, V_{GS}=4V
Forward transfer admittance	$\lvert Y_{fs} \rvert$ *	10	–	–	S	I_D=12.5A, V_{DS}=10V
Input capacitance	C_{iss}	–	1670	–	pF	V_{DS}=10V
Output capacitance	C_{oss}	–	470	–	pF	V_{GS}=0V
Reverse transfer capacitance	C_{rss}	–	270	–	pF	f=1MHz
Turn-on delay time	$t_{d(on)}$ *	–	10	–	ns	I_D=6.25A, V_{DD}≒15V
Rise time	t_r *	–	17	–	ns	V_{GS}=10V
Turn-off delay time	$t_{d(off)}$ *	–	69	–	ns	R_L=2.40Ω
Fall time	t_f *	–	30	–	ns	R_G=10Ω
Total gate charge	Q_g *	–	20	28	nC	V_{DD}≒15V
Gate-source charge	Q_{gs} *	–	4.2	–	nC	V_{GS}=5V
Gate-drain charge	Q_{gd} *	–	8.0	–	nC	I_D=12.5A

*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=6.4A, V_{GS}=0V

*Pulsed

●Electrical characteristic curves

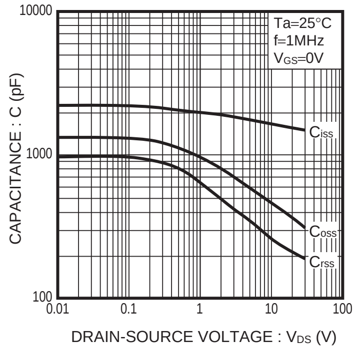


Fig.1 Typical Capacitance vs. Drain-Source Voltage

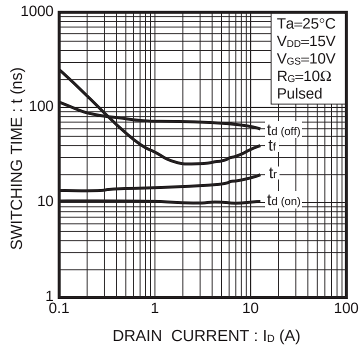


Fig.2 Switching Characteristics

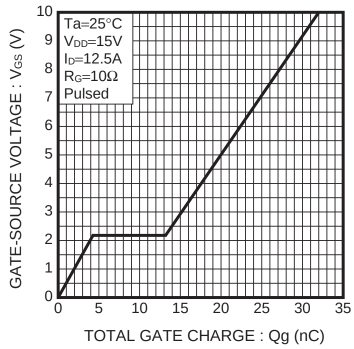


Fig.3 Dynamic Input Characteristics

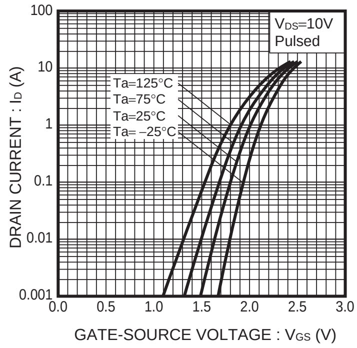


Fig.4 Typical Transfer Characteristics

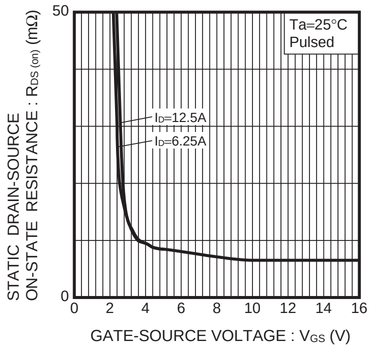


Fig.5 Static Drain-Source On-State Resistance vs. Gate-Source Voltage

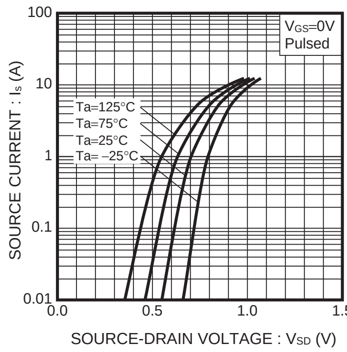


Fig.6 Source Current vs. Source-Drain Voltage

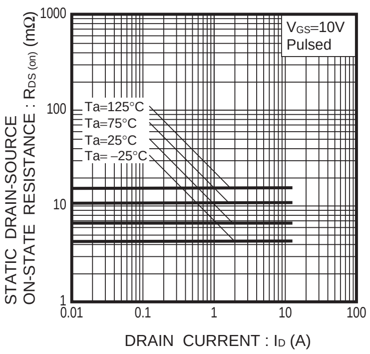


Fig.7 Static Drain-Source On-State Resistance vs. Drain Current (I)

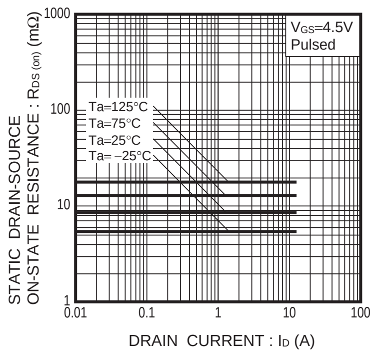


Fig.8 Static Drain-Source On-State Resistance vs. Drain Current (II)

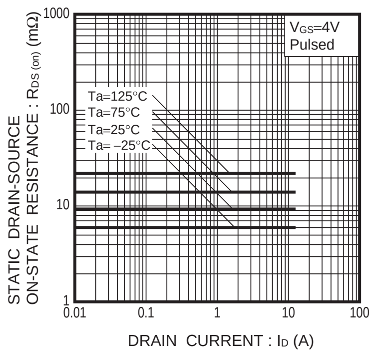


Fig.9 Static Drain-Source On-State Resistance vs. Drain Current (III)

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