Switching (30V, 7A)

RDS070N03

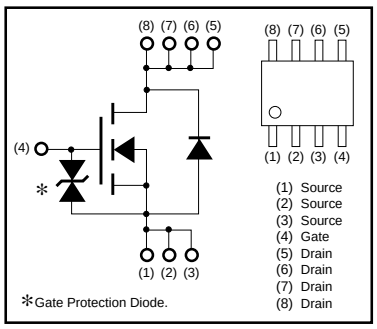
●Features

1) Low Qg.
2) Low on-resistance.
3) Excellent resistance to damage from static electricity.

●Structure

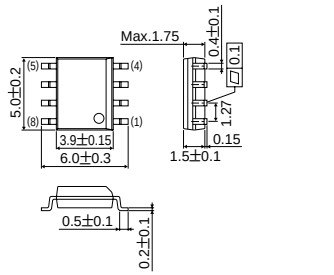
Silicon N-channel
MOS FET

●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.

●External dimensions (Units : mm)



ROHM : SOP8

●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	7	A
	Pulsed	I_{DP}*	28	A
Reverse Drain Current	Continuous	I_{DR}	7	A
	Pulsed	I_{DRP}*	28	A
Source Current (Body Diode)	Continuous	I_S	1.6	A
	Pulsed	I_{SP}*	6.4	A
Total Power Dissipation(Tc=25°C)		P_D	2.5	W
Channel Temperature		Tch	150	°C
Storage Temperature		Tstg	–55~+150	°C

*Pw≤10μs, Duty cycle≤1%

●**Thermal resistance** (Ta = 25°C)

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

●**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}	–	–	10	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	$R_{DS(on)}$*	–	23	–	mΩ	I_D=7A, V_{GS}=10V
		–	38	–		I_D=7A, V_{GS}=4.5V
		–	47	–		I_D=7A, V_{GS}=4.0V
Forward Transfer Admittance	$\|Y_{fs}\|$*	5	–	–	S	I_D=7A, V_{DS}=10V
Input Capacitance	C_{iss}	–	470	–	pF	V_{DS}=10V
Output Capacitance	C_{oss}	–	260	–	pF	V_{GS}=0V
Reverse Transfer Capacitance	C_{rss}	–	105	–	pF	f=1MHz
Turn-On Delay Time	$t_{d(on)}$*	–	10	–	ns	I_D=3.5A, V_{DD}≒15V
Rise Time	t_r*	–	14	–	ns	V_{GS}=10V
Turn-Off Delay Time	$t_{d(off)}$*	–	35	–	ns	R_L=4.3Ω
Fall Time	t_f*	–	12	–	ns	R_{GS}=10Ω
Total Gate Charge	Q_g*	–	14	28	nC	V_{DD}=15V
Gate-Source Charge	Q_{gs}*	–	2	–	nC	V_{GS}=10V
Gate-Drain Charge	Q_{gd}*	–	4	–	nC	I_D=7A

*Pulsed

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

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test Conditions
Forward Voltage	V_{SD}*	–	–	1.5	V	I_S=6.4A, V_{GS}=0V
Reverse Recovery Time	t_{rr}*	–	46	–	ns	I_{DR}=5.2A, V_{GS}=0V
Reverse Recovery Charge	Q_{rr}*	–	46	–	nC	di/dt=100A/μs

*Pulsed

●Electrical characteristic curves

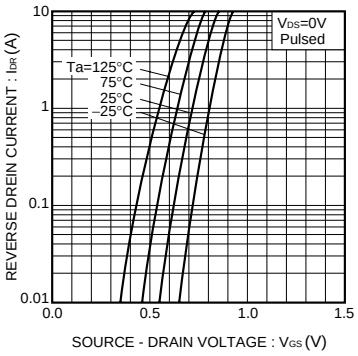


Fig.1 Reverse Drein Current vs. Source-Drain Voltage

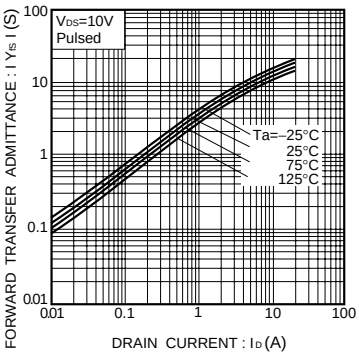


Fig.2 Forward Transfer Admittance vs. Drain Current

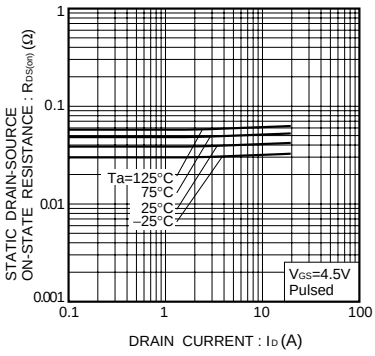


Fig.3 Static Drain-Source On-State Resistance vs. Drain Current (I)

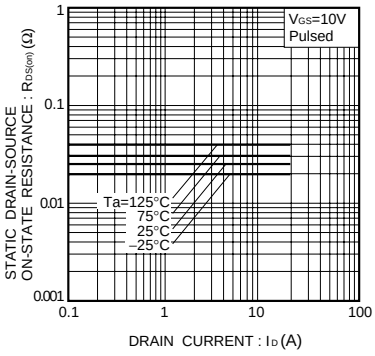


Fig.4 Static Drain-Source On-State Resistance vs. Drain Current (II)

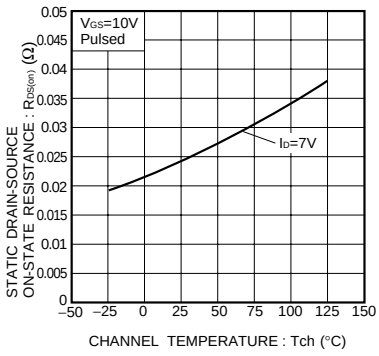


Fig.5 Static Drain-Source On-State Resistance vs. Channel Temperature

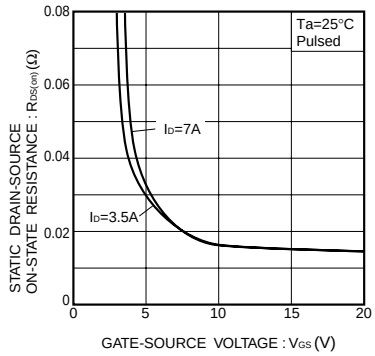


Fig.6 Static Drain-Source On-State Resistance vs. Gate-Source Voltage

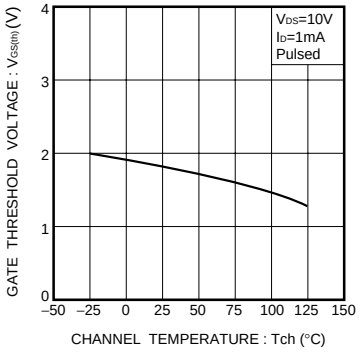


Fig.7 Gate Threshold Voltage vs. Channel Temperature

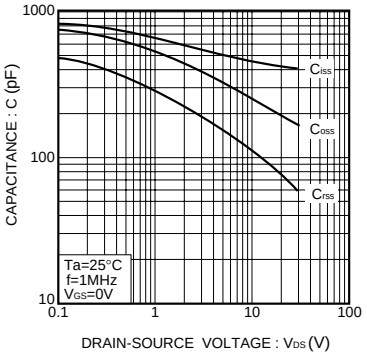


Fig.8 Typical Capacitance vs. Drain-Source Voltage

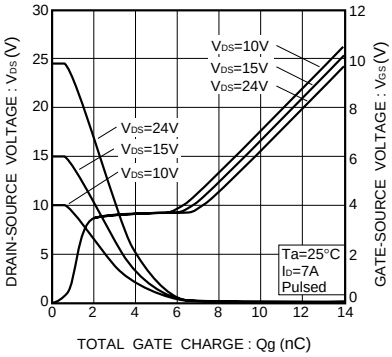


Fig.9 Dynamic Input Characteristics

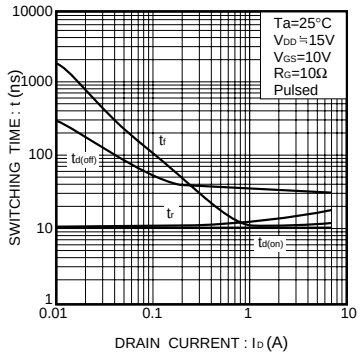


Fig.10 Switching Characteristics

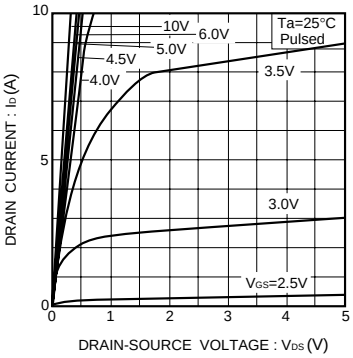


Fig.11 Typical Output Characteristics

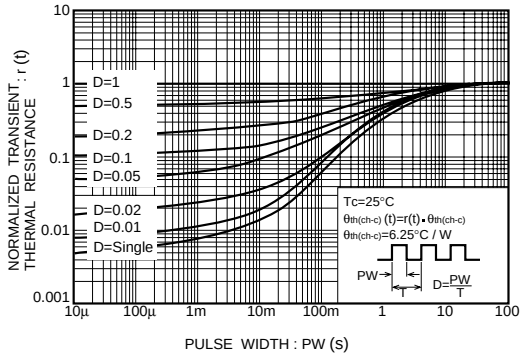


Fig.12 Normalized Transient Thermal Resistance vs. Pulse Width