Switching (30V, 10A)

RES100N03

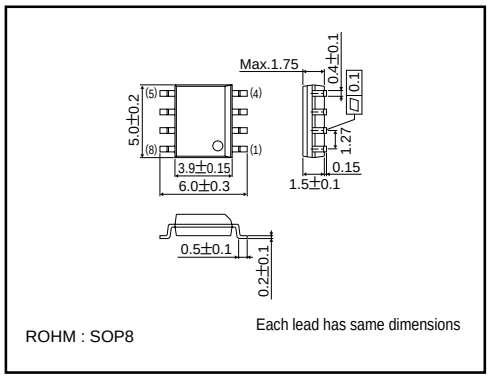
●Features

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

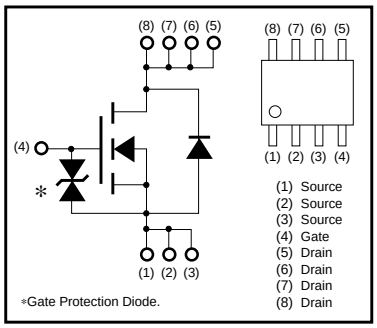
●Structure

Silicon N-channel
MOS FET

●External dimensions (Units : mm)



●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.

●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	10	A
	Pulsed	I_{DP} *	40	A
Reverse Drain Current	Continuous	I_{DR}	10	A
	Pulsed	I_{DRP}*	40	A
Source Current (Body Diode)	Continuous	I_S	1.3	A
	Pulsed	I_{SP} *	5.2	A
Total Power Dissipation (TC=25°C)		P_D	2	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}	–	–	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	$R_{DS\ (on)}$ *	–	10	13	mΩ	I_D=10A, V_{GS}=10V
		–	15	20		I_D=10A, V_{GS}=4.5V
		–	16	21		I_D=10A, V_{GS}=4V
Forward Transfer Admittance	$\|Y_{fs}\|$ *	10	–	–	S	I_D=10A, V_{DS}=10V
Input Capacitance	C_{iss}	–	1600	–	pF	V_{DS}=10V
Output Capacitance	C_{oss}	–	900	–	pF	V_{GS}=0V
Reverse Transfer Capacitance	C_{rss}	–	280	–	pF	f=1MHz
Turn-On Delay Time	$t_{d(on)}$ *	–	17	–	ns	I_D=5A, V_{DD} ≒5V
Rise Time	t_r *	–	50	–	ns	V_{GS}=10V
Turn-Off Delay Time	$t_{d(off)}$ *	–	75	–	ns	R_L=3Ω
Fall Time	t_f *	–	55	–	ns	R_{GS}=10Ω
Total Gate Charge	Q_g *	–	28.5	57.0	nC	V_{DD}=15V
Gate-Source Charge	Q_{gs} *	–	4.9	–	nC	V_{GS}=10V
Gate-Drain Charge	Q_{gd} *	–	5.8	–	nC	I_D=10A

*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=5.2A, V_{GS}=0V
Reverse Recovery Time	t_{rr} *	–	260	–	ns	I_{DR}=5.2A, V_{GS}=0V
Reverse Recovery Charge	Q_{rr} *	–	290	–	nC	di/dt=100A/μs

*Pulsed

●Electrical characteristic curves

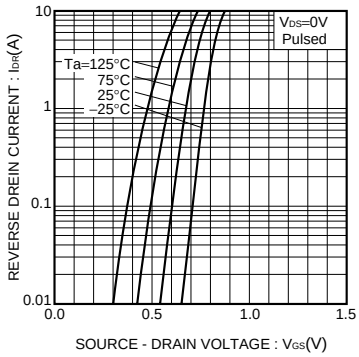


Fig.1 Reverse Drein Current vs. Source - Drain Voltage

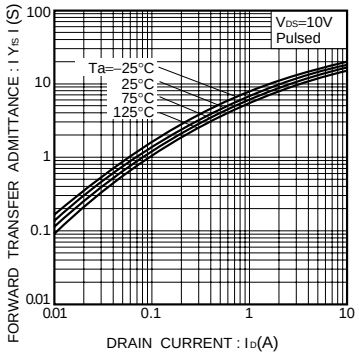


Fig.2 Forward Transfer Admittance vs. Drain Current

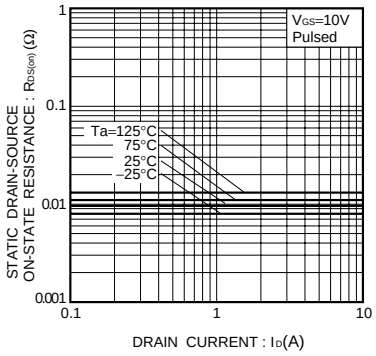


Fig.3 Static Drain-Source On-State Resistance vs. Drain Current (I)

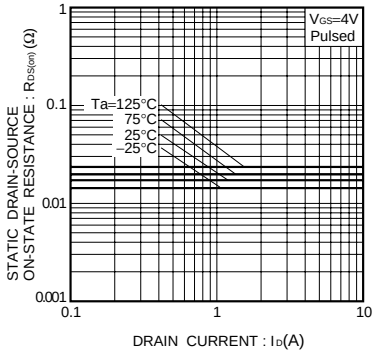


Fig.4 Static Drain-Source On-State Resistance vs. Drain Current (II)

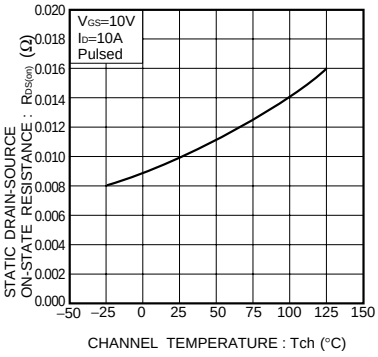


Fig.5 Static Drain-Source On-State Resistance vs. Channel Temperature

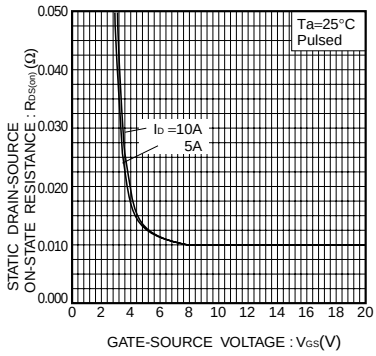


Fig.6 Static Drain-Source On-State Resistance vs. Gate-Source Voltage

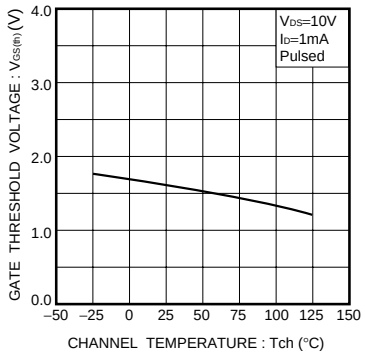


Fig.7 Gate Threshold Voltage vs. Channel Temperature

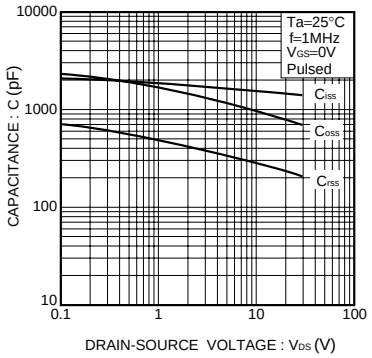


Fig.8 Typical Capacitance vs. Drain-Source Voltage

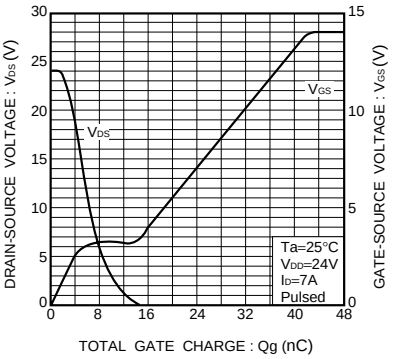


Fig.9 Dynamic Input Characteristics

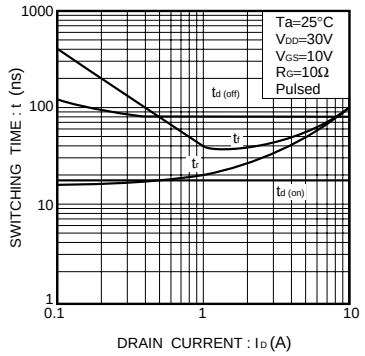


Fig.10 Switching Characteristics

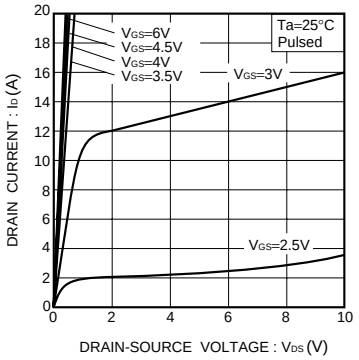


Fig.11 Typical Output Characteristics

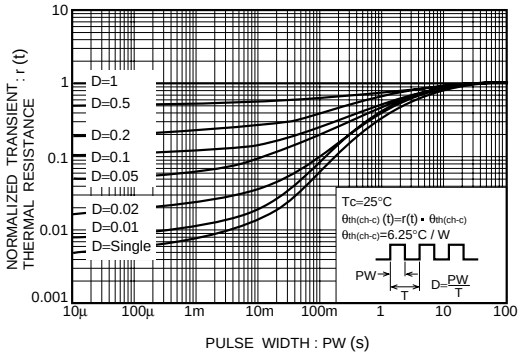


Fig.12 Normalized Transient Thermal Resistance vs. Pulse Width