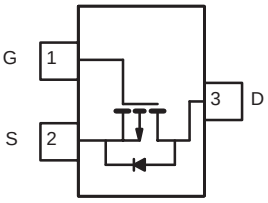
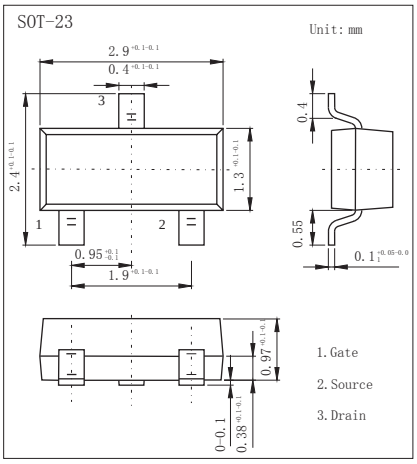
P-Channel Enhancement MOSFET
RC2309A

■ Features

- V_{DS} (V)=-60V
- I_D=-2 A (V_{GS}=-10V)
- $R_{DS(ON)}$ < 200mΩ (V_{GS}=-10V)
- $R_{DS(ON)}$ < 240mΩ (V_{GS}=-4.5V)





■ Marking

Marking	MS09

■ Maximum ratings (T_a=25℃ unless otherwise noted)

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	-60	V
Gate-Source Voltage	V_{GS}	±20	
Continuous Drain Current	I_D	-2	A
Pulsed Drain Current	I_{DM}	-8	
Power Dissipation	P_D④	1.56	W
Thermal Resistance from Junction to Ambient	$R_{\theta JA}$④	80	℃/W
Operation Junction and Storage Temperature Range	T_J,T_{stg}	-55 ~+150	℃

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■MOSFET ELECTRICAL CHARACTERISTICS

Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
Off Characteristics						
Drain-source breakdown voltage	$V_{(BR)\ DSS}$	V_{GS} = 0V, I_D =-250μA	-60			V
Zero gate voltage drain current	I_{DSS}	V_{DS} =-60V,V_{GS} = 0V,T_J=25℃			-1	μA
		V_{DS} =-60V,V_{GS} = 0V,T_J=125℃			-1	mA
Gate-source leakage current	I_{GSS}	V_{GS} =±20V, V_{DS} = 0V			±100	nA
On characteristics						
Drain-source on-resistance②	$R_{DS(on)}$	V_{GS} =-10V, I_D =-2A		160	200	mΩ
		V_{GS} =-4.5V, I_D =-1.5A		195	240	mΩ
Forward transconductance	g_{FS}	V_{DS} =-10V, I_D =-2A		3.5		S
Gate threshold voltage	$V_{GS(th)}$	V_{DS} =V_{GS}, I_D =-250μA	-1.0	-1.5	-2.5	V
Dynamic Characteristics③						
Input capacitance	C_{iss}	V_{DS} =-30V,V_{GS} =0V,f =1MHz		425	615	pF
Output capacitance	C_{oss}			35	50	pF
Reverse transfer capacitance	C_{rss}			20	30	pF
Gate resistance	R_g	V_{DS} =0V,V_{GS} =0V,f =1MHz		17		Ω
Switching Characteristics③						
Turn-on delay time	$t_{d(on)}$	V_{GS}=-10V,V_{DD}=-30V, I_D=-1A,R_G=6Ω		5.2	10	ns
Turn-on rise time	t_r			19	36	ns
Turn-off delay time	$t_{d(off)}$			35	67	ns
Turn-off fall time	t_f			10.6	20	ns
Total Gate Charge	Q_g	V_{DS}=-30V,I_D=-2A, V_{GS}=-10V		8.2	12	nC
Gate-Source Charge	Q_{gs}			1.8	3.6	nC
Gate-Drain Charge	Q_{gd}			1.5	3	nC
Drain-source diode characteristics and maximum ratings						
Diode forward voltage②	V_{SD}	I_S=-1A,V_{GS}=0V		-0.83	-1	V
Continuous drain-source diode forward current	I_S				-2	A
Pulsed drain-source diode forward current①	I_{SM}				-8	A

Notes:

1.Repetitive Rating : Pulse width limited by maximum junction temperature.

2.Pulse Test : Pulse Width≤300μs, Duty Cycle ≤ 2%.

3.Guaranteed by design, not subject to production testing.

4.The value of RθJA is measured with the device mounted on 1 in 2 FR-4 board with 2oz. Copper, in a still air environment with Ta=25 ℃.

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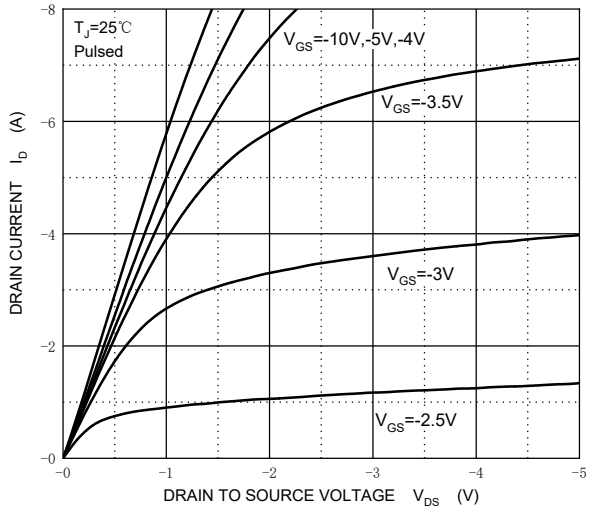
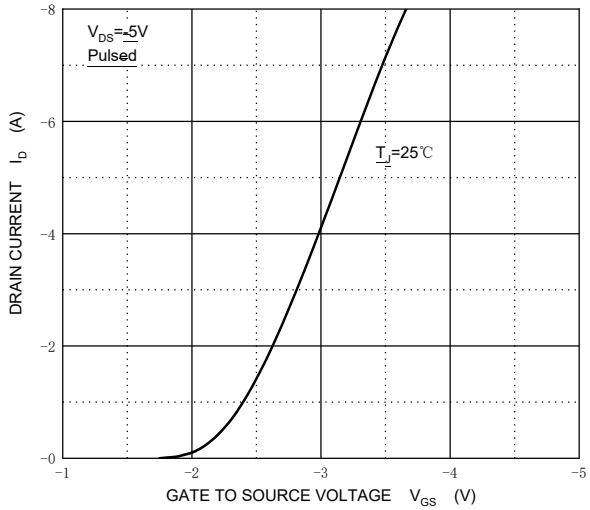
■Typical Characteristics

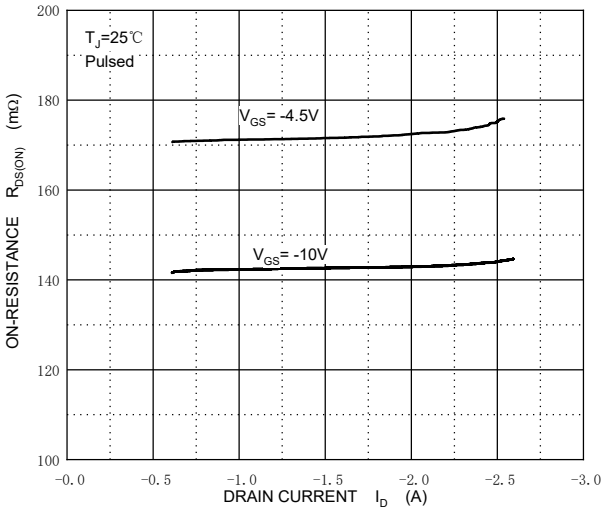
Output Characteristics



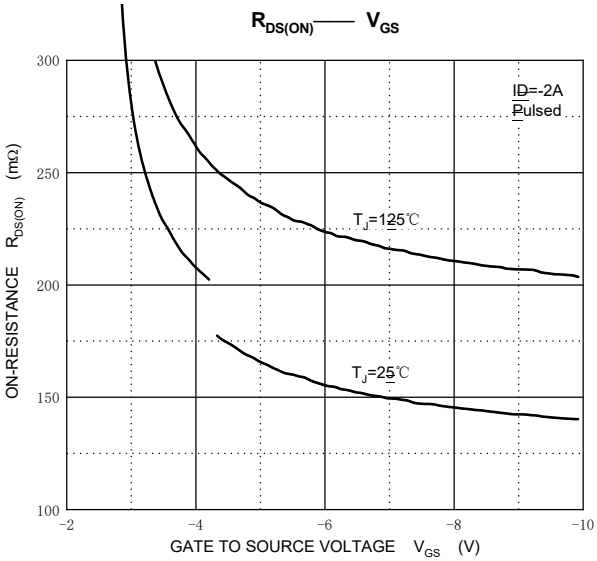
Transfer Characteristics



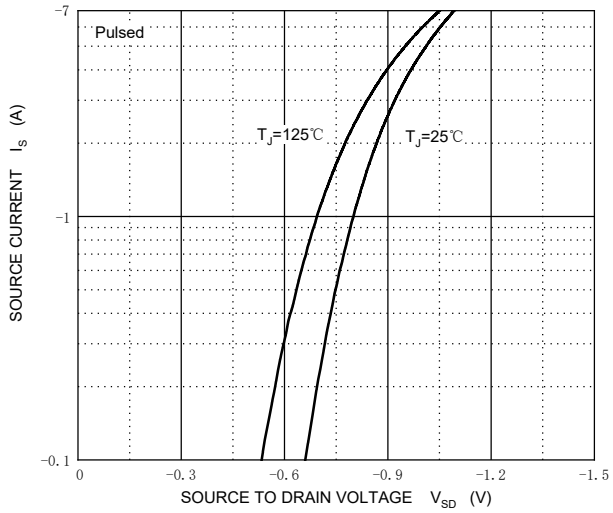
$R_{DS(ON)}$ — I_D



$R_{DS(ON)}$ — V_{GS}



I_S — V_{SD}



Threshold Voltage