1.5V Drive Pch MOSFET

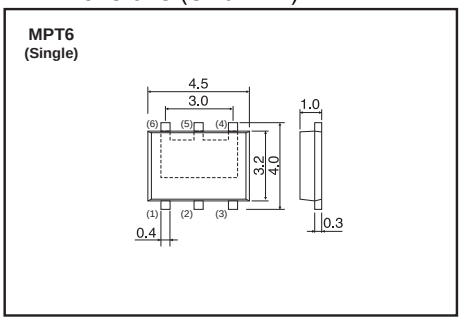
RP1A090ZP

● Structure
Silicon P-channel MOSFET

● Features
1) Low Voltage Drive(1.5V drive).
2) Built-in G-S Protection Diode.
3) Small Surface Mount Package (MPT6).

● Application
Switching

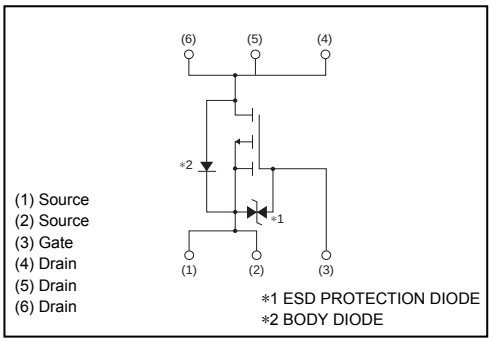
● Dimensions (Unit : mm)



● Packaging specifications

Type	Package	Taping
	Code	TR
	Basic ordering unit (pieces)	1000
RP1A090ZP		○

● Inner circuit



● Absolute maximum ratings (Ta = 25°C)

Parameter		Symbol	Limits	Unit
Drain-source voltage		V_{DSS}	−12	V
Gate-source voltage		V_{GSS}	±10	V
Drain current	Continuous	I_D	±9	A
	Pulsed	I_{DP} *1	±36	A
Source current (Body Diode)	Continuous	I_S	−1.6	A
	Pulsed	I_{SP} *1	−36	A
Power dissipation		P_D *2	2.0	W
Channel temperature		Tch	150	°C
Range of 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.

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● **Electrical characteristics** (Ta = 25°C)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Gate-source leakage	I_{GSS}	-	-	±10	μA	V_{GS}=±10V, V_{DS}=0V
Drain-source breakdown voltage	$V_{(BR)DSS}$	−12	-	-	V	I_D=−1mA, V_{GS}=0V
Zero gate voltage drain current	I_{DSS}	-	-	−1	μA	V_{DS}=−12V, V_{GS}=0V
Gate threshold voltage	$V_{GS\ (th)}$	−0.3	-	−1.0	V	V_{DS}=−6V, I_D=−1mA
Static drain-source on-state resistance	$R_{DS\ (on)}$ *	-	8	12	mΩ	I_D=−9A, V_{GS}=−4.5V
		-	11	16		I_D=−4.5A, V_{GS}=−2.5V
		-	15	23		I_D=−4.5A, V_{GS}=−1.8V
		-	19	38		I_D=−1.8A, V_{GS}=−1.5V
Forward transfer admittance	$\|Y_{fs}\|$*	12	-	-	S	I_D=−9A, V_{DS}=−6V
Input capacitance	C_{iss}	-	7400	-	pF	V_{DS}=−6V
Output capacitance	C_{oss}	-	800	-	pF	V_{GS}=0V
Reverse transfer capacitance	C_{rss}	-	750	-	pF	f=1MHz
Turn-on delay time	$t_{d(on)}$*	-	35	-	ns	I_D=−4.5A, V_{DD}≒−6V
Rise time	t_r *	-	120	-	ns	V_{GS}=−4.5V
Turn-off delay time	$t_{d(off)}$*	-	350	-	ns	R_L=1.3Ω
Fall time	t_f *	-	170	-	ns	R_G=10Ω
Total gate charge	Q_g *	-	59	-	nC	I_D=−9A,
Gate-source charge	Q_{gs} *	-	11	-	nC	V_{GS}=−4.5V
Gate-drain charge	Q_{gd} *	-	9	-	nC	V_{DD}≒−6V

*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=−9A, V_{GS}=0V

*Pulsed

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● Electrical characteristic curves

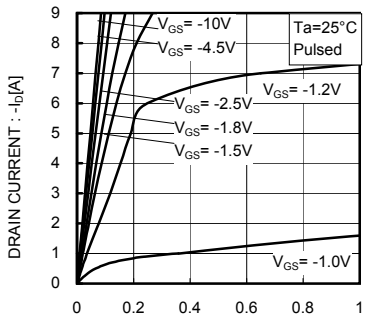


Fig.1 Typical output characteristics(Ⅰ)

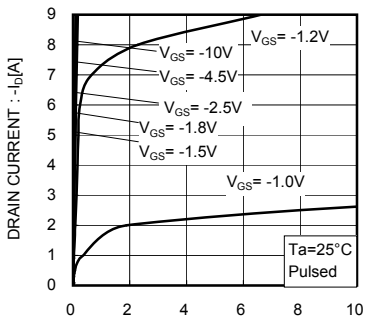


Fig.2 Typical output characteristics(Ⅱ)

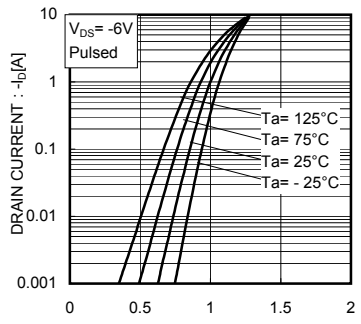


Fig.3 Typical Transfer Characteristics

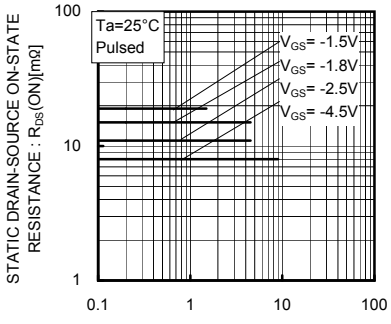


Fig.4 Static Drain-Source On-State Resistance vs. Drain Current(Ⅰ)

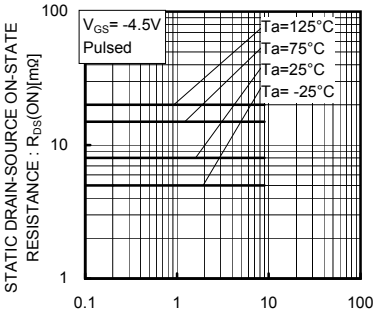


Fig.5 Static Drain-Source On-State Resistance vs. Drain Current(Ⅱ)

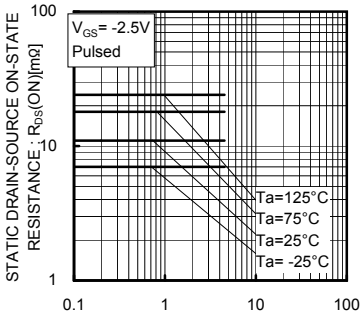


Fig.6 Static Drain-Source On-State Resistance vs. Drain Current(Ⅲ)

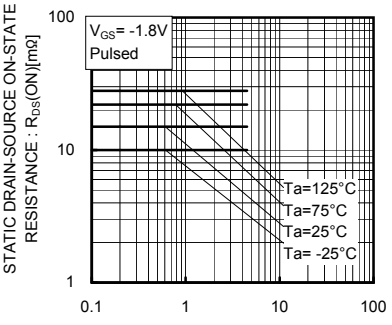


Fig.7 Static Drain-Source On-State Resistance vs. Drain Current(Ⅳ)

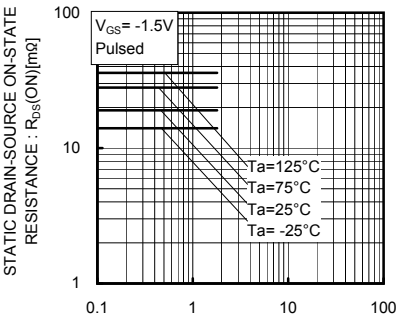


Fig.8 Static Drain-Source On-State Resistance vs. Drain Current(Ⅴ)

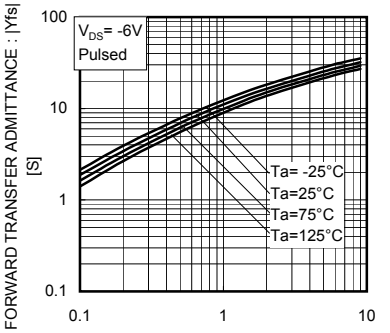


Fig.9 Forward Transfer Admittance vs. Drain Current

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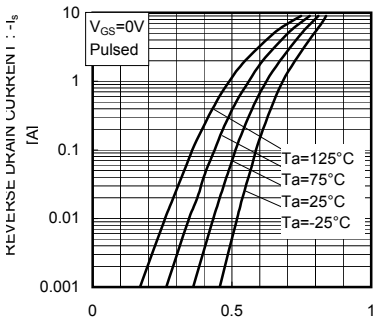


Fig.10 Reverse Drain Current vs. Sourse-Drain Voltage

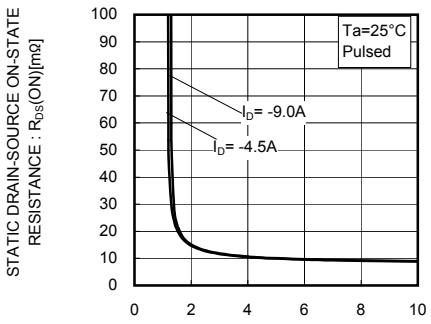


Fig.11 Static Drain-Source On-State Resistance vs. Gate Source Voltage

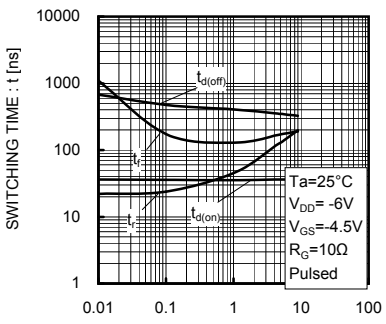


Fig.12 Switching Characteristics

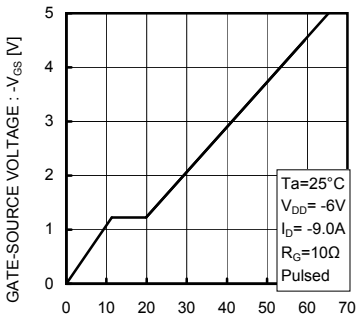


Fig.13 Dynamic Input Characteristics

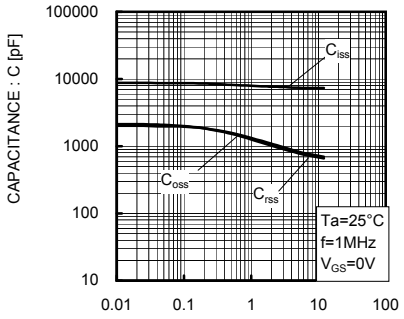


Fig.14 Typical Capacitance vs. Drain-Source Voltage

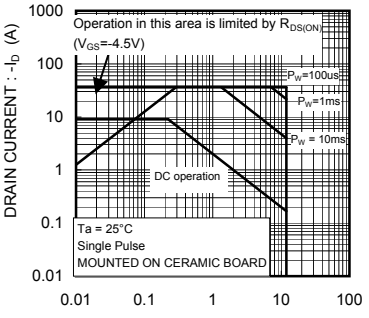


Fig.15 Maximum Safe Operating Aera

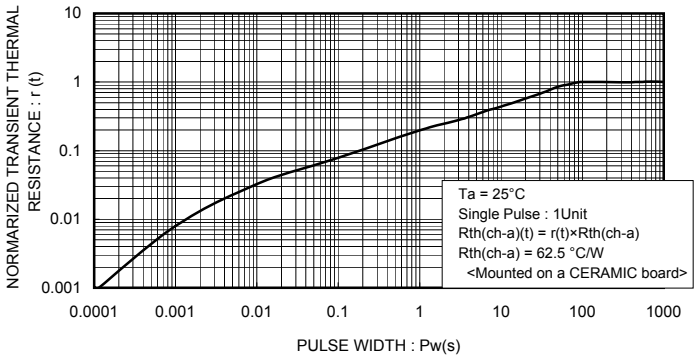


Fig.16 Normalized Transient Thermal Resistance vs. Pulse Width

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● Measurement circuits

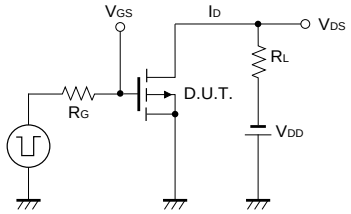


Fig.1-1 Switching Time Measurement Circuit

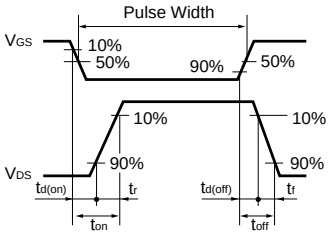


Fig.1-2 Switching Waveforms

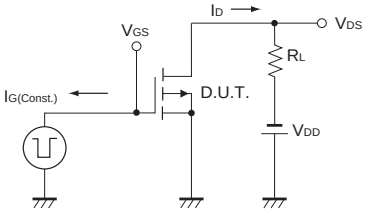


Fig.2-1 Gate charge measurement circuit

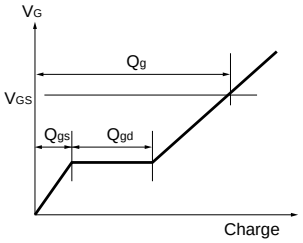


Fig.2-2 Gate Charge Waveform

● Notice

This product might cause chip aging and breakdown under the large electrified environment. Please consider to design ESD protection circuit.

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