

1.5V Drive Pch MOSFET

RQ1A060ZP

●Structure

Silicon P-channel MOSFET

●Features

- 1) Low on-resistance.
- 2) High power package.
- 3) Low voltage drive. (1.5V)

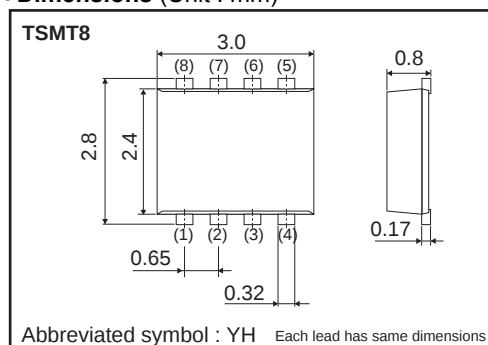
●Applications

Switching

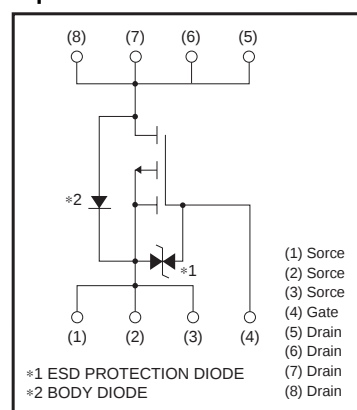
●Packaging specifications

Type	Package	Taping
	Code	TR
	Basic ordering unit (pieces)	3000
RQ1A060ZP		○

●Dimensions (Unit : mm)



- Equivalent 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	± 6	A
	Pulsed	I_{DP} ^{*1}	± 24	A
Source current (Body diode)	Continuous	I_S	-1	A
	Pulsed	I_{SP} ^{*1}	-24	A
Total power dissipation		P_D ^{*2}	1.5	W
Channel temperature		T_{ch}	150	°C
Range of Storage temperature		T_{stg}	-55 to +150	°C

*1 $P_{W} \leq 10 \mu s$. Duty cycle $\leq 1\%$

*2 Mounted on a ceramic board

- Thermal resistance

Parameter	Symbol	Limits	Unit
Channel to ambient	Rth(ch-a) *	83.3	°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	$V_{GS}=±10V$, $V_{DS}=0V$
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	$R_{DS(on)}$ *	–	16	23	mΩ	$I_D = -6A$, $V_{GS} = -4.5V$
		–	22	31	mΩ	$I_D = -3A$, $V_{GS} = -2.5V$
		–	28	42	mΩ	$I_D = -3A$, $V_{GS} = -1.8V$
		–	39	78	mΩ	$I_D = -1.2A$, $V_{GS} = -1.5V$
Forward transfer admittance	$ Y_{fs} $ *	7.5	–	–	S	$V_{DS} = -6V$, $I_D = -6A$
Input capacitance	C_{iss}	–	2800	–	pF	$V_{DS} = -6V$
Output capacitance	C_{oss}	–	340	–	pF	$V_{GS}=0V$
Reverse transfer capacitance	C_{rss}	–	310	–	pF	$f=1MHz$
Turn-on delay time	$t_{d(on)}$ *	–	12	–	ns	$V_{DD} = -6V$
Rise time	t_r *	–	105	–	ns	$I_D = -3A$
Turn-off delay time	$t_{d(off)}$ *	–	400	–	ns	$V_{GS} = -4.5V$
Fall time	t_f *	–	230	–	ns	$R_L = 2Ω$
Total gate charge	Q_g *	–	34	–	nC	$V_{DD} = -6V$ $R_L = 1Ω$
Gate-source charge	Q_{gs} *	–	6.0	–	nC	$I_D = -6A$ $R_G = 10Ω$
Gate-drain charge	Q_{gd} *	–	5.0	–	nC	$V_{GS} = -4.5V$

*Pulsed

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

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Forward voltage	V_{SD} *	–	–	–1.2	V	$I_S = -6A$, $V_{GS}=0V$

*Pulsed

●Electrical characteristic curves

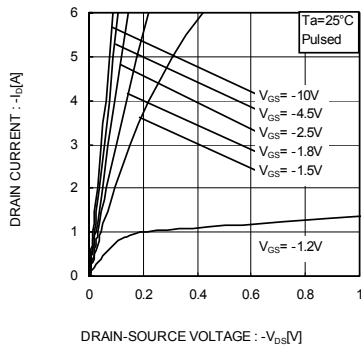


Fig.1 Typical Output Characteristics(I)

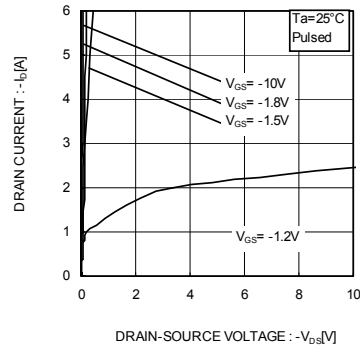


Fig.2 Typical Output Characteristics(II)

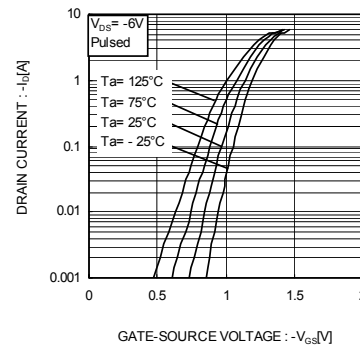


Fig.3 Typical Transfer Characteristics

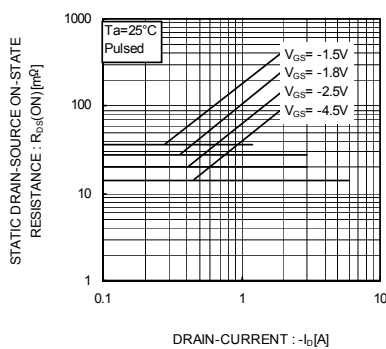


Fig.4 Static Drain-Source On-State Resistance vs. Drain Current(I)

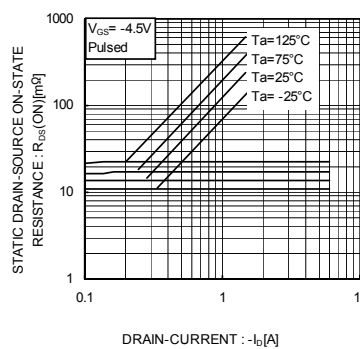


Fig.5 Static Drain-Source On-State Resistance vs. Drain Current(II)

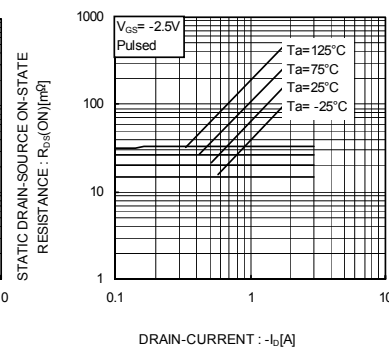


Fig.6 Static Drain-Source On-State Resistance vs. Drain Current(III)

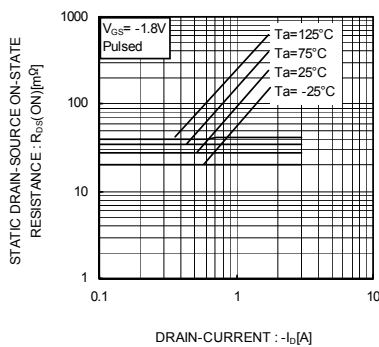


Fig.7 Static Drain-Source On-State Resistance vs. Drain Current(IV)

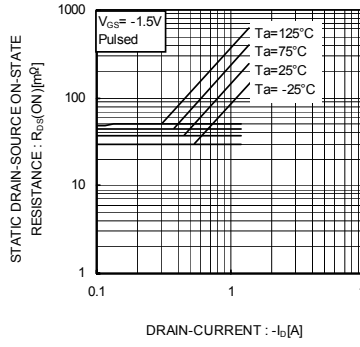


Fig.8 Static Drain-Source On-State Resistance vs. Drain Current(V)

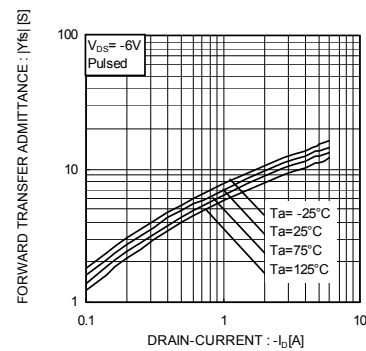


Fig.9 Forward Transfer Admittance vs. Drain Current

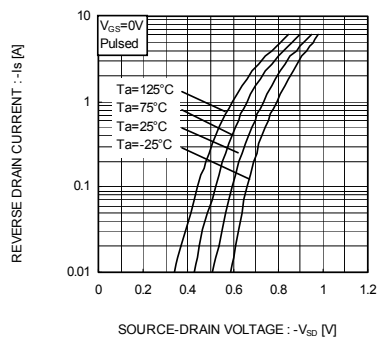


Fig.10 Reverse Drain Current
vs. Source-Drain Voltage

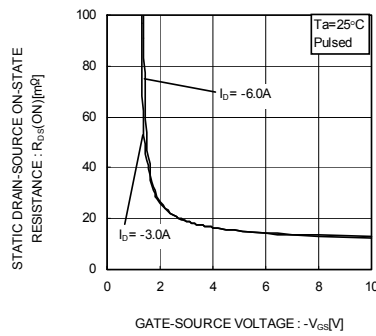


Fig.11 Static Drain-Source On-State
Resistance vs. Gate Source Voltage

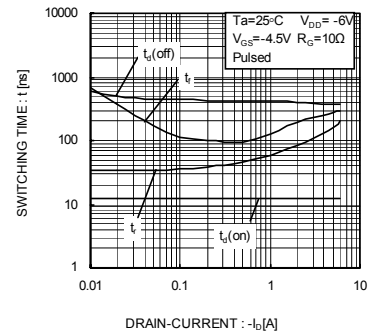


Fig.12 Switching Characteristics

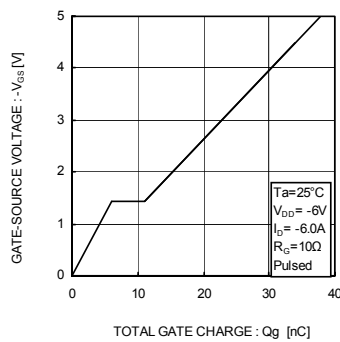


Fig.13 Dynamic Input Characteristics

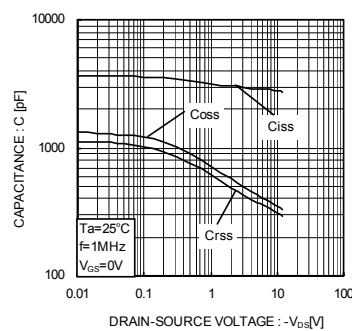


Fig.14 Typical Capacitance
vs. Drain-Source Voltage

●Measurement circuits

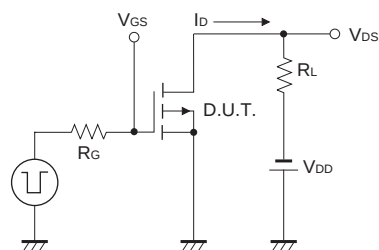


Fig.1-1 Switching Time Measurement Circuit

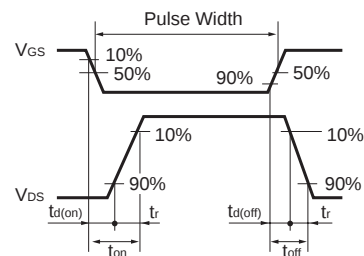


Fig.1-2 Switching Waveforms

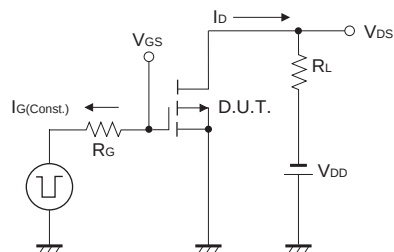


Fig.2-1 Gate Charge Measurement Circuit

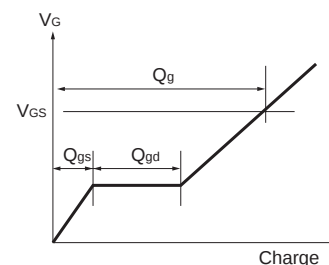


Fig.2-2 Gate Charge Waveforms

●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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