

# 1.5V Drive Pch MOSFET

## RZQ045P01

### ●Structure

Silicon P-channel MOSFET

### ●Features

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

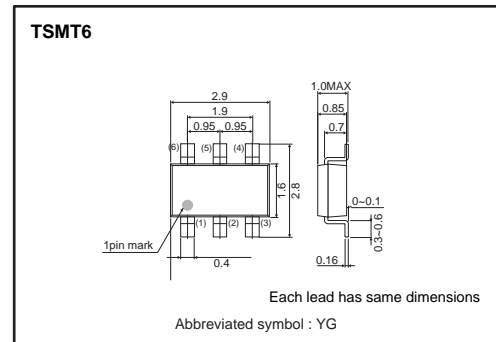
### ●Applications

Switching

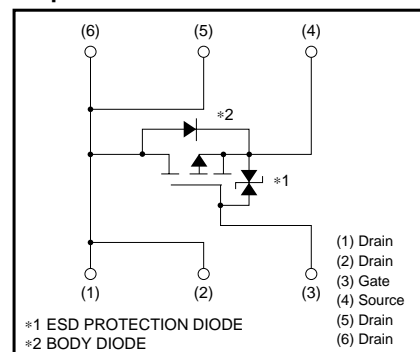
### ●Packaging specifications

Type	Package	Taping
	Code	TR
	Basic ordering unit (pieces)	3000
RZQ045P01		○

### ●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	$I_D$	±4.5	A
	Pulsed	$I_{DP}$ *1	±12	A
Source current (Body diode)	Continuous	$I_S$	-1	A
	Pulsed	$I_{SP}$ *1	-12	A
Total power dissipation	$P_D$ *2	1.25	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	$R_{th(ch-a)}$ *	100	°C / W

\* Mounted on a ceramic board.

## Transistors

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

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Gate-source leakage	$I_{GSS}$	–	–	±10	μA	$V_{GS}=\pm 10V, V_{DS}=0V$
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	$R_{DS(on)}$ *	–	25	35	mΩ	$I_D = -4.5A, V_{GS} = -4.5V$
		–	31	43	mΩ	$I_D = -2.2A, V_{GS} = -2.5V$
		–	39	58	mΩ	$I_D = -2.2A, V_{GS} = -1.8V$
		–	50	100	mΩ	$I_D = -0.9A, V_{GS} = -1.5V$
Forward transfer admittance	$ Y_{fs} $ *	6.5	–	–	S	$V_{DS} = -6V, I_D = -4.5A$
Input capacitance	$C_{iss}$	–	2450	–	pF	$V_{DS} = -6V$
Output capacitance	$C_{oss}$	–	320	–	pF	$V_{GS} = 0V$
Reverse transfer capacitance	$C_{rss}$	–	290	–	pF	$f = 1MHz$
Turn-on delay time	$t_{d(on)}$ *	–	12	–	ns	$I_D = -2.2A$
Rise time	$t_r$ *	–	75	–	ns	$V_{DD} = -6V$ $V_{GS} = -4.5V$
Turn-off delay time	$t_{d(off)}$ *	–	390	–	ns	$R_L = 2.7\Omega$
Fall time	$t_f$ *	–	215	–	ns	$R_G = 10\Omega$
Total gate charge	$Q_g$ *	–	31	–	nC	$V_{DD} = -6V \quad R_L = 1.3\Omega$
Gate-source charge	$Q_{gs}$ *	–	4.5	–	nC	$V_{GS} = -4.5V \quad R_G = 10\Omega$
Gate-drain charge	$Q_{gd}$ *	–	4.0	–	nC	$I_D = -4.5A$

\*Pulsed

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

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Forward voltage	$V_{SD}$ *	–	–	–1.2	V	$I_S = -4.5A, V_{GS} = 0V$

\*Pulsed

Transistors

●Electrical characteristic curves

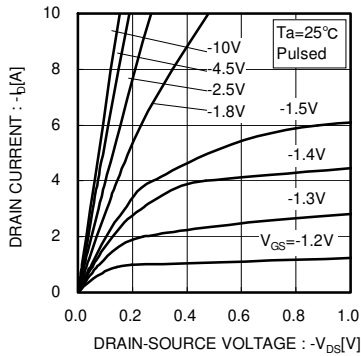


Fig.1 Typical Output Characteristics( I )

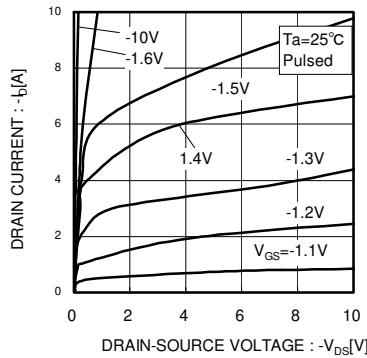


Fig.2 Typical Output Characteristics( II )

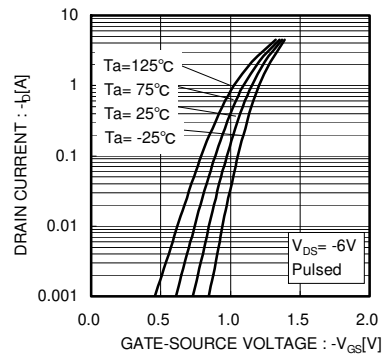


Fig.3 Typical Transfer Characteristics

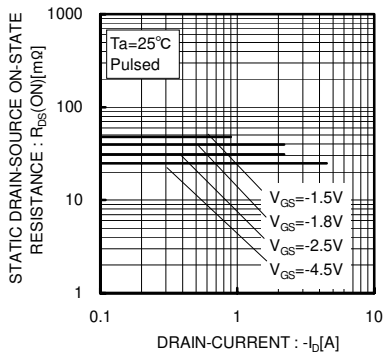


Fig.4 Static Drain-Source On-State Resistance vs. Drain Current( I )

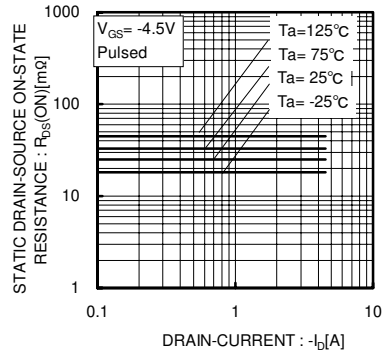


Fig.5 Static Drain-Source On-State Resistance vs. Drain Current( II )

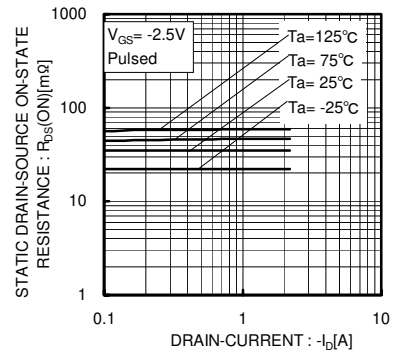


Fig.6 Static Drain-Source On-State Resistance vs. Drain Current( III )

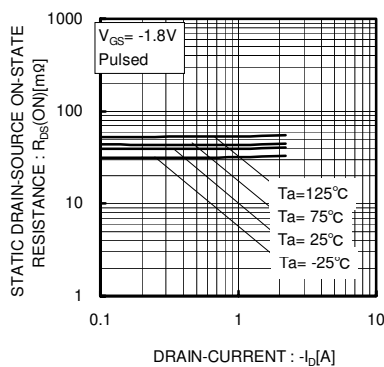


Fig.7 Static Drain-Source On-State Resistance vs. Drain Current(IV)

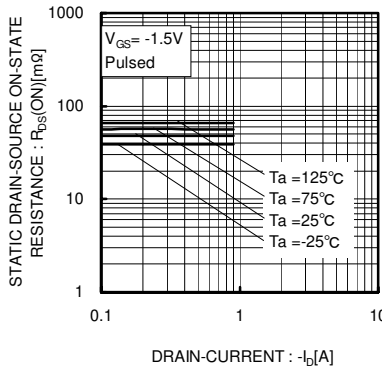


Fig.8 Static Drain-Source On-State Resistance vs. Drain Current(V)

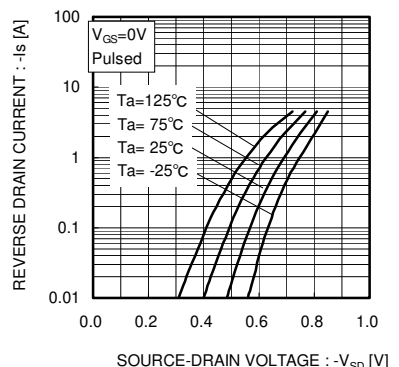


Fig.9 Reverse Drain Current vs. Source-Drain Voltage

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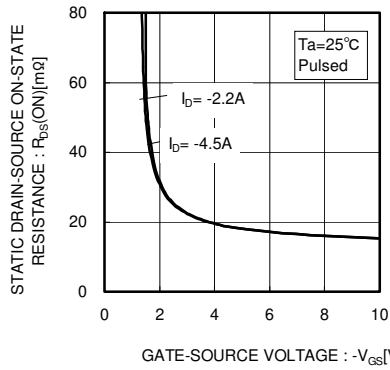


Fig.10 Static Drain-Source On-State Resistance vs. Gate-Source Voltage

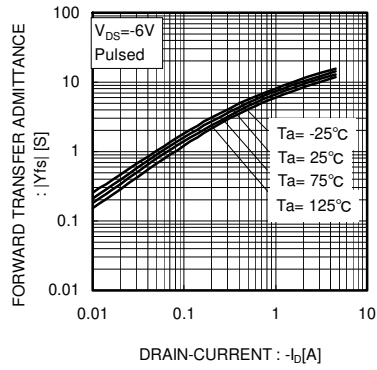


Fig.11 Forward Transfer Admittance vs. Drain Current

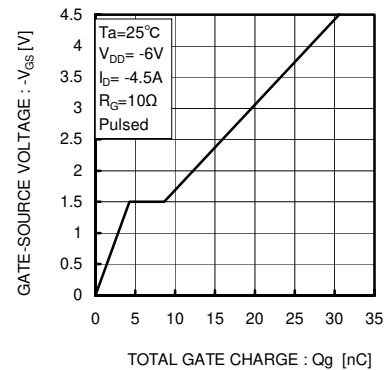


Fig.12 Dynamic Input Characteristics

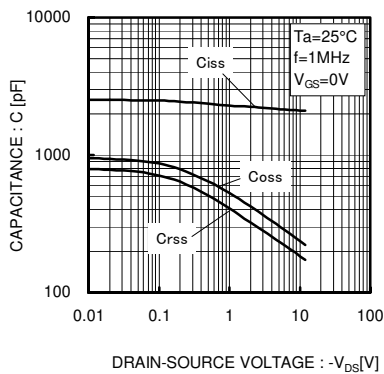


Fig.13 Typical Capacitance vs. Drain-Source Voltage

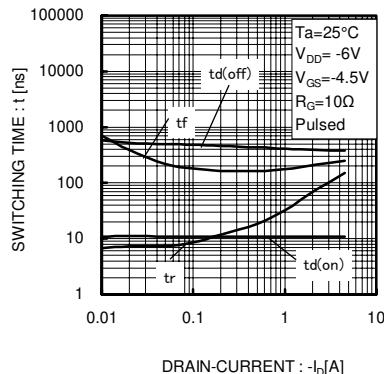


Fig.14 Switching Characteristics

Transistors

●Measurement circuits

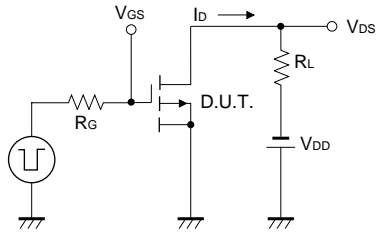


Fig.15 Switching Time Measurement Circuit

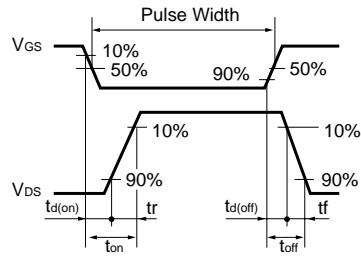


Fig.16 Switching Waveforms

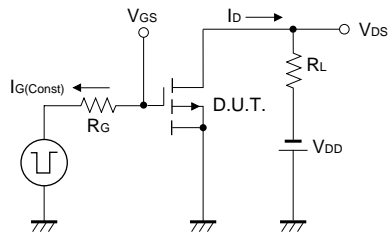


Fig.17 Gate Charge Measurement Circuit

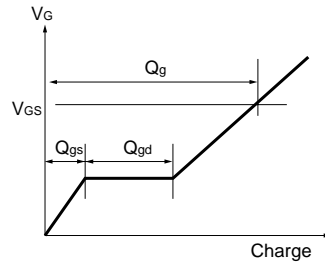


Fig.18 Gate Charge Waveform

●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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