

# 1.5V Drive Pch MOSFET

## RZR025P01

### ●Features

- 1) Low On-resistance.
- 2) Built-in G-S Protection Diode.
- 3) Small and Surface Mount Package (TSMT3).
- 4) Low voltage drive (1.5V).

### ●Application

Switching

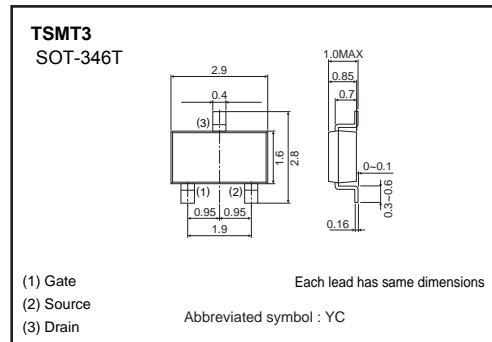
### ●Structure

Silicon P-channel MOSFET

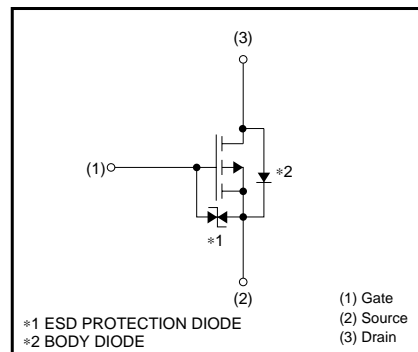
### ●Packaging specifications

Type	Package	Taping
	Code	TL
	Basic ordering unit (pieces)	3000
RZR025P01		○

### ●Dimensions (Unit : mm)



### ●Equivalent circuit



### ●Absolute maximum ratings (Ta=25°C)

Parameter	Symbol	Limits	Unit	
Drain-source voltage	$V_{DS}$	-12	V	
Gate-source voltage	$V_{GS}$	$\pm 10$	V	
Drain current	Continuous	$I_D$	$\pm 2.5$	A
	Pulsed	$I_{DP}$ *1	$\pm 10$	A
Source current (Body diode)	Continuous	$I_S$	-0.8	A
	Pulsed	$I_{SP}$ *1	-10	A
Total power dissipation	$P_D$ *2	1.0	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	$R_{th(ch-a)}$ *	125	°C / W

\* When 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	$R_{DS(on)}$ *	–	44	61	mΩ	$I_D = -2.5A, V_{GS} = -4.5V$
		–	60	84	mΩ	$I_D = -1.2A, V_{GS} = -2.5V$
		–	81	121	mΩ	$I_D = -1.2A, V_{GS} = -1.8V$
		–	110	220	mΩ	$I_D = -0.5A, V_{GS} = -1.5V$
Forward transfer admittance	$ Y_{fs} $ *	3.5	–	–	S	$V_{DS} = -6V, I_D = -2.5A$
Input capacitance	$C_{iss}$	–	1350	–	pF	$V_{DS} = -6V$
Output capacitance	$C_{oss}$	–	130	–	pF	$V_{GS}=0V$
Reverse transfer capacitance	$C_{rss}$	–	125	–	pF	$f=1MHz$
Turn-on delay time	$t_{d(on)}$ *	–	9	–	ns	$I_D = -1.2A$
Rise time	$t_r$ *	–	35	–	ns	$V_{DD} \approx -6V$ $V_{GS} = -4.5V$
Turn-off delay time	$t_{d(off)}$ *	–	130	–	ns	$R_L=5\Omega$
Fall time	$t_f$ *	–	85	–	ns	$R_G=10\Omega$
Total gate charge	$Q_g$ *	–	13	–	nC	$V_{DD} \approx -6V, I_D = -2.5A$
Gate-source charge	$Q_{gs}$ *	–	2.5	–	nC	$V_{GS} = -4.5V$
Gate-drain charge	$Q_{gd}$ *	–	2.0	–	nC	$R_L \approx 2.4\Omega, R_G=10\Omega$

\*Pulsed

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

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Forward voltage	$V_{SD}$ *	–	–	–1.2	V	$I_S = -2.5A, V_{GS}=0V$

\* Pulsed

Transistors

●Electrical characteristic curves

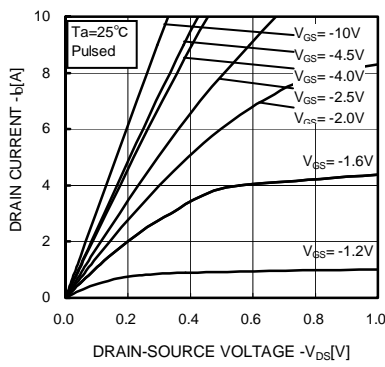


Fig.1 Typical Output Characteristics (I)

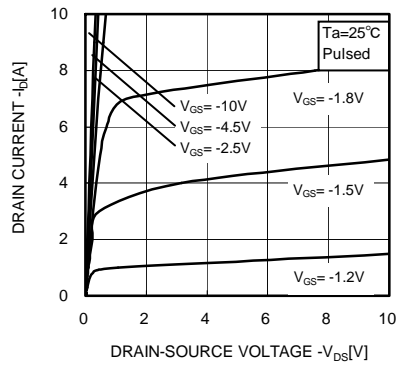


Fig.2 Typical Output Characteristics (II)

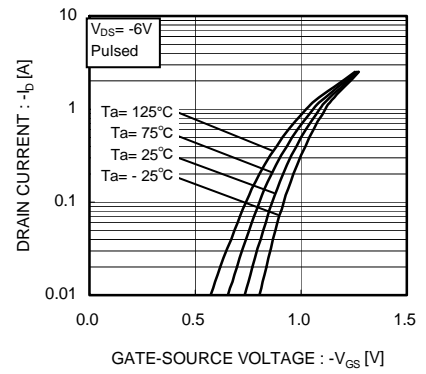


Fig.3 Typical Transfer Characteristics

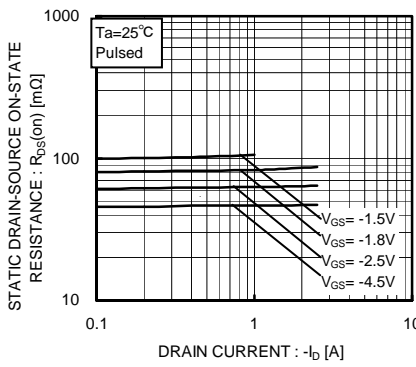


Fig.4 Static Drain-Source On-State Resistance vs. Drain Current (I)

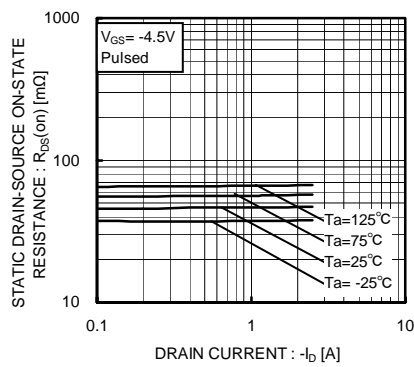


Fig.5 Static Drain-Source On-State Resistance vs. Drain Current (II)

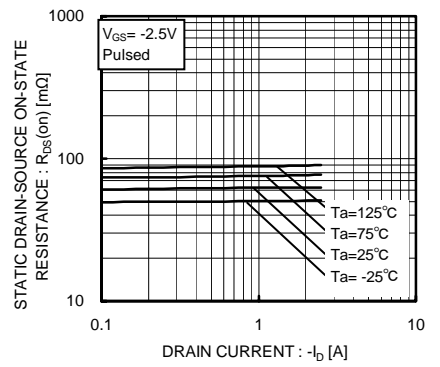


Fig.6 Static Drain-Source On-State Resistance vs. Drain Current (III)

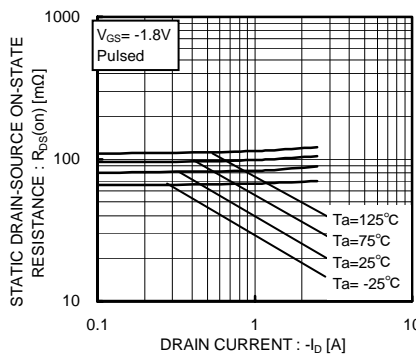


Fig.7 Static Drain-Source On-State Resistance vs. Drain Current (IV)

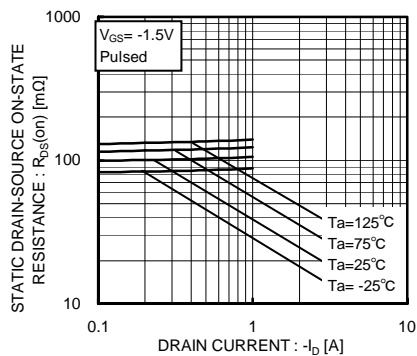


Fig.8 Static Drain-Source On-State Resistance vs. Drain Current (IV)

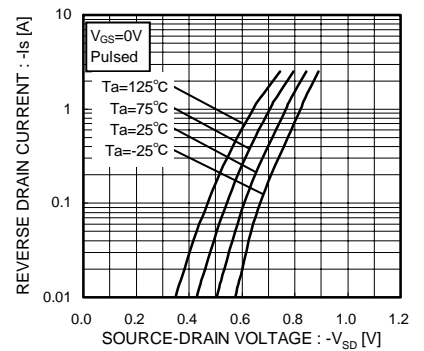


Fig.9 Reverse Drain Current vs. Source-Drain Voltage

Transistors

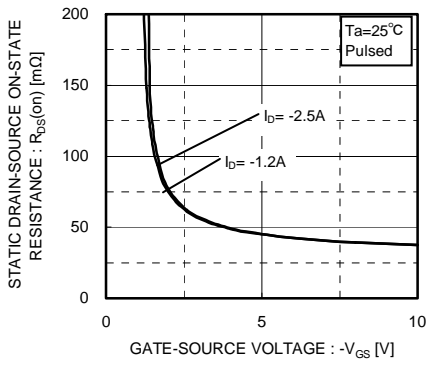


Fig.10 Static Drain-Source On-State Resistance vs. Gate Source Voltage

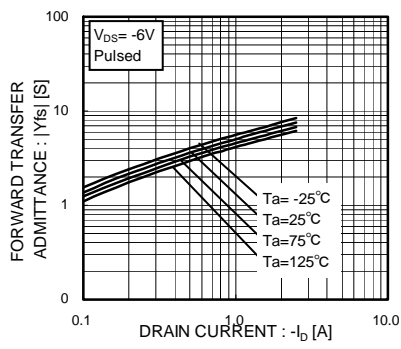


Fig.11 Forward Transfer Admittance vs. Drain Current

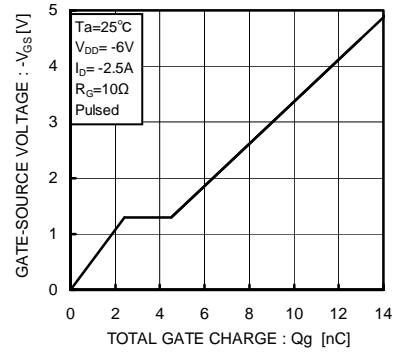


Fig.12 Dynamic Input Characteristics

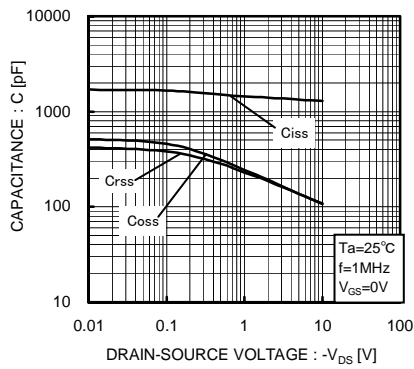


Fig.13 Typical Capacitance vs. Drain-Source Voltage

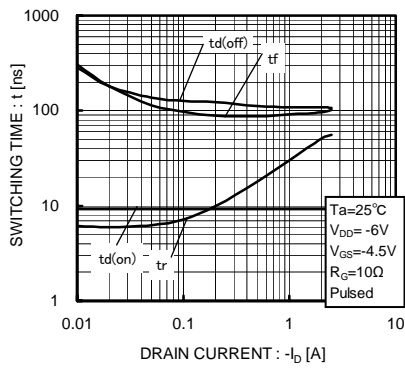


Fig.14 Switching Characteristics

Transistors

●Measurement circuits

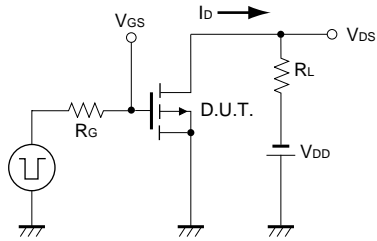


Fig.15 Switching Time Test Circuit

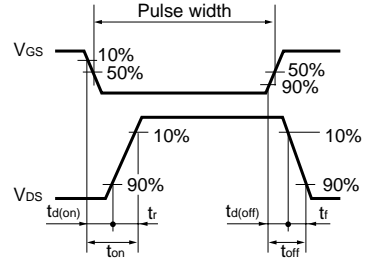


Fig.16 Switching Time Waveforms

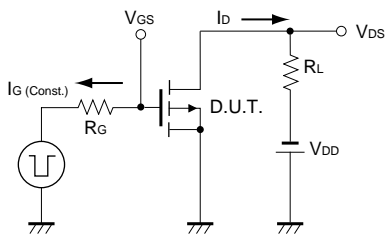


Fig.17 Gate Charge Test Circuit

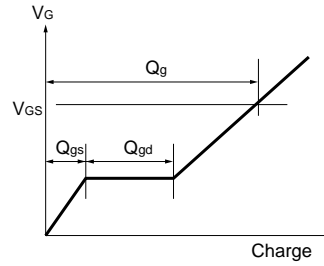


Fig.18 Gate Charge Waveform

●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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