

# 4V Drive Pch MOSFET

## RRR030P03

### ●Structure

Silicon P-channel MOSFET

### ●Features

- 1) Low On-resistance
- 2) Space saving-small surface mount package (TSMT3)
- 3) 4V drive

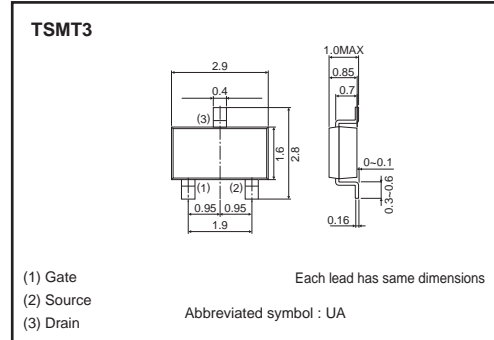
### ●Applications

Switching

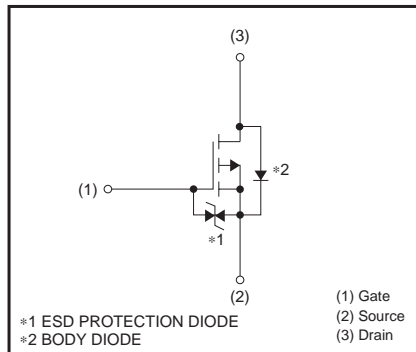
### ●Packaging specifications

Type	Package	Taping
	Code	TL
	Basic ordering unit (pieces)	3000
RRR030P03		○

### ●Dimensions (Unit : mm)



### ●Inner circuit



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

Parameter	Symbol	Limits	Unit	
Drain-source voltage	$V_{DS}$	-30	V	
Gate-source voltage	$V_{GS}$	$\pm 20$	V	
Drain current	Continuous	$I_D$	$\pm 3$	A
	Pulsed	$I_{DP}$ *1	$\pm 12$	A
Source current (Body diode)	Continuous	$I_S$	-0.8	A
	Pulsed	$I_{SP}$ *1	-12	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 When 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

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

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Gate-source leakage	I <sub>GSS</sub>	–	–	±10	μA	V <sub>GS</sub> = ±20V, V <sub>DS</sub> =0V
Drain-source breakdown voltage	V <sub>(BR) DSS</sub>	–30	–	–	V	I <sub>D</sub> = –1mA, V <sub>GS</sub> =0V
Zero gate voltage drain current	I <sub>DSS</sub>	–	–	–1	μA	V <sub>DS</sub> = –30V, V <sub>GS</sub> =0V
Gate threshold voltage	V <sub>GS(th)</sub>	–1.0	–	–2.5	V	V <sub>DS</sub> = –10V, I <sub>D</sub> = –1mA
Static drain-source on-state resistance	R <sub>DS(on)*</sub>	–	55	75	mΩ	I <sub>D</sub> = –3A, V <sub>GS</sub> = –10V
		–	85	115	mΩ	I <sub>D</sub> = –1.5A, V <sub>GS</sub> = –4.5V
		–	95	125	mΩ	I <sub>D</sub> = –1.5A, V <sub>GS</sub> = –4V
Forward transfer admittance	Y <sub>fs</sub>   *	2.4	–	–	S	V <sub>DS</sub> = –10V, I <sub>D</sub> = –3A
Input capacitance	C <sub>iss</sub>	–	480	–	pF	V <sub>DS</sub> = –10V
Output capacitance	C <sub>oss</sub>	–	70	–	pF	V <sub>GS</sub> =0V
Reverse transfer capacitance	C <sub>rss</sub>	–	70	–	pF	f=1MHz
Turn-on delay time	t <sub>d(on)</sub> *	–	7	–	ns	V <sub>DD</sub> ≐ –15V
Rise time	t <sub>r</sub> *	–	18	–	ns	I <sub>D</sub> = –1.5A V <sub>GS</sub> = –10V
Turn-off delay time	t <sub>d(off)</sub> *	–	50	–	ns	R <sub>L</sub> ≐ 10Ω
Fall time	t <sub>f</sub> *	–	35	–	ns	R <sub>GS</sub> =10Ω
Total gate charge	Q <sub>g</sub> *	–	5.2	–	nC	V <sub>DD</sub> ≐ –15V, I <sub>D</sub> = –3A
Gate-source charge	Q <sub>gs</sub> *	–	1.6	–	nC	V <sub>GS</sub> = –5V
Gate-drain charge	Q <sub>gd</sub> *	–	1.6	–	nC	R <sub>L</sub> ≐ 5Ω, R <sub>G</sub> =10Ω

\*Pulsed

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

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Forward voltage	V <sub>SD</sub> *	–	–	–1.2	V	I <sub>S</sub> = –3A, V <sub>GS</sub> =0V

\*Pulsed

●Electrical characteristic curves

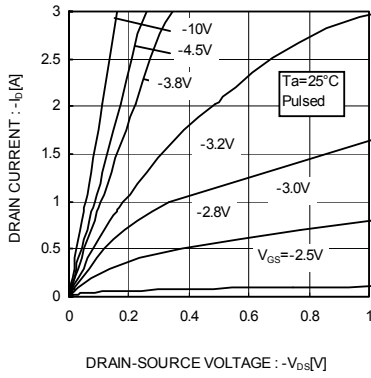


Fig.1 Typical output characteristics(I)

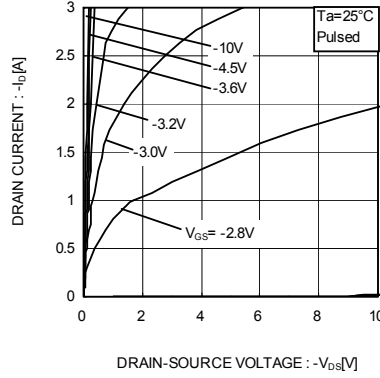


Fig.2 Typical output characteristics(II)

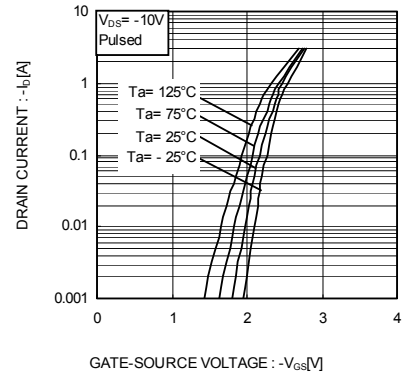


Fig.3 Typical Transfer Characteristics

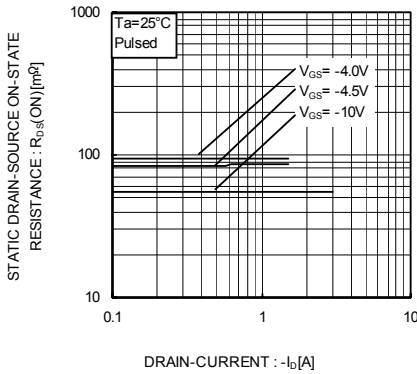


Fig.4 Static Drain-Source On-State Resistance vs. Drain Current(I)

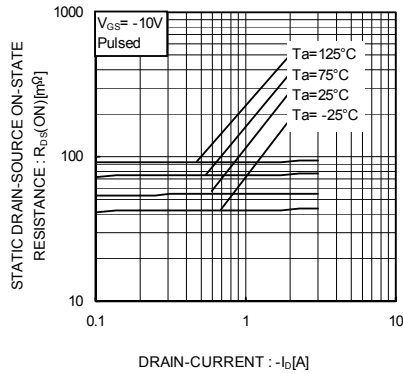


Fig.5 Static Drain-Source On-State Resistance vs. Drain Current(II)

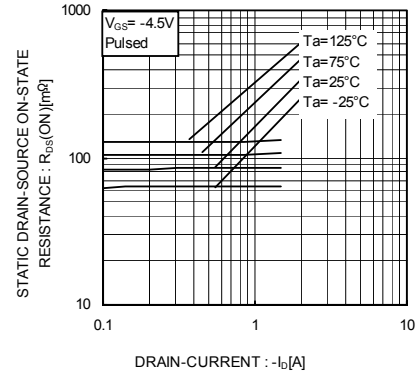


Fig.6 Static Drain-Source On-State Resistance vs. Drain Current(III)

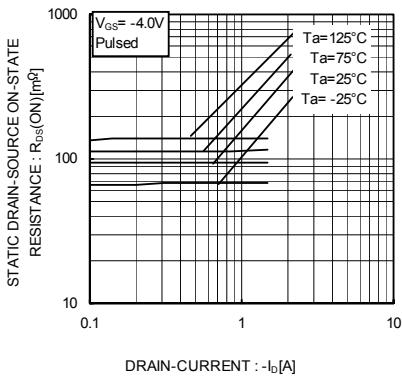


Fig.7 Static Drain-Source On-State Resistance vs. Drain Current(IV)

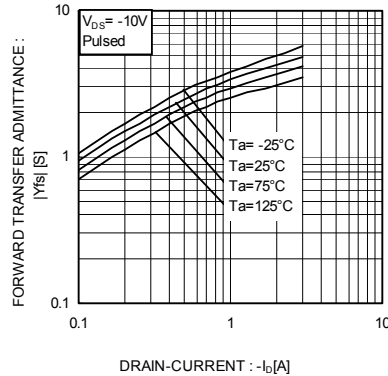


Fig.8 Forward Transfer Admittance vs. Drain Current

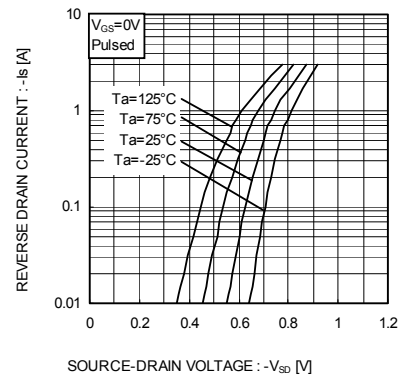


Fig.9 Reverse Drain Current vs. Source-Drain Voltage

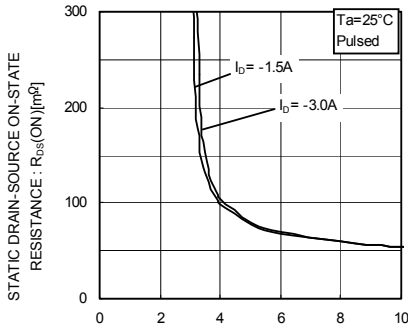


Fig.10 Static Drain-Source On-State Resistance vs. Gate Source Voltage

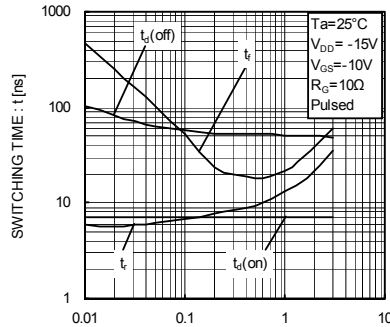


Fig.11 Switching Characteristics

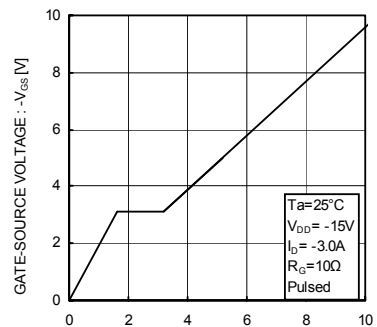


Fig.12 Dynamic Input Characteristics

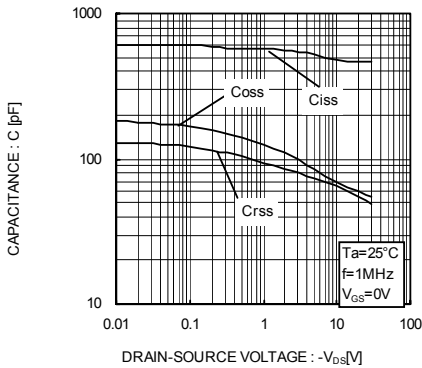


Fig.13 Typical Capacitance vs. Drain-Source Voltage

●Measurement circuit

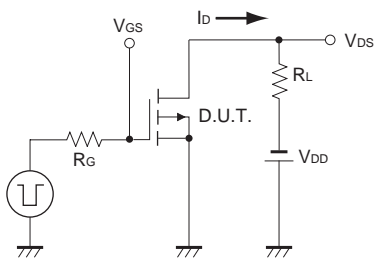


Fig.1-1 Switching Time Measurement Circuit

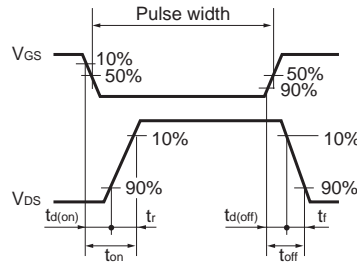


Fig.1-2 Switching Waveforms

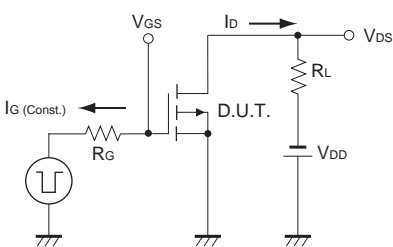


Fig.2-1 Gate Charge Measurement Circuit

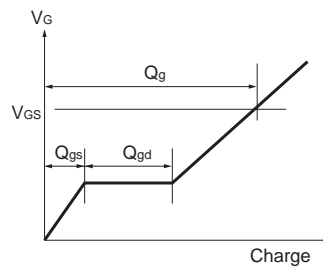


Fig.2-2 Gate Charge Waveform

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