

4V Drive Pch MOSFET

RRQ030P03

●Structure

Silicon P-channel MOSFET

●Features

- 1) Low On-resistance.
- 2) High Power Package.
- 3) High speed switching.

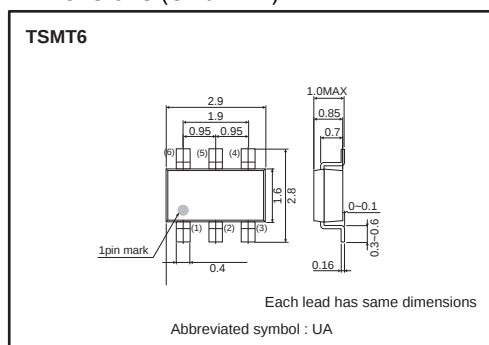
●Applications

Switching

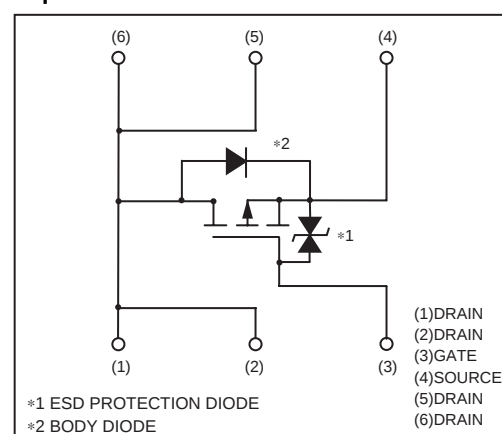
●Packaging specifications

Type	Package	Taping
	Code	TR
	Basic ordering unit (pieces)	3000
RRQ030P03		○

●Dimensions (Unit : mm)



●Equivalent circuit



●Absolute maximum ratings (Ta=25°C)

Parameter		Symbol	Limits	Unit
Drain-source voltage		V_{DS}	-30	V
Gate-source voltage		V_{GS}	±20	V
Drain current	Continuous	I_D	±3	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 ≤ 1%

*2 When mounted on a ceramic board

●Thermal resistance

Parameter	Symbol	Limits	Unit
Channel to ambient	$R_{th(ch-a)}$ *	100	°C / W

* When mounted on a ceramic board.

●Electrical characteristics (Ta=25°C)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Gate-source leakage	I_{GSS}	–	–	± 10	μA	$V_{GS}=\pm 20V$, $V_{DS}=0V$
Drain-source breakdown voltage	$V_{(BR)DSS}$	–30	–	–	V	$I_D=-1mA$, $V_{GS}=0V$
Zero gate voltage drain current	I_{DSS}	–	–	–1	μA	$V_{DS}=-30V$, $V_{GS}=0V$
Gate threshold voltage	$V_{GS(th)}$	–1.0	–	–2.5	V	$V_{DS}=-10V$, $I_D=-1mA$
Static drain-source on-state resistance	$R_{DS(on)}^*$	–	55	75	m Ω	$I_D=-3A$, $V_{GS}=-10V$
		–	85	115	m Ω	$I_D=-1.5A$, $V_{GS}=-4.5V$
		–	95	125	m Ω	$I_D=-1.5A$, $V_{GS}=-4V$
Foward transfer admittance	$ Y_{fs} ^*$	2.4	–	–	S	$V_{DS}=-10V$, $I_D=-3A$
Input capacitance	C_{iss}	–	480	–	pF	$V_{DS}=-10V$
Output capacitance	C_{oss}	–	70	–	pF	$V_{GS}=0V$
Reverse transfer capacitance	C_{rss}	–	70	–	pF	$f=1MHz$
Turn-on delay time	$t_{d(on)}^*$	–	7	–	ns	$V_{DD}=-15V$
Rise time	t_r^*	–	18	–	ns	$I_D=-1.5A$
Turn-off delay time	$t_{d(off)}^*$	–	50	–	ns	$V_{GS}=-10V$
Fall time	t_f^*	–	35	–	ns	$R_L=10\Omega$
Total gate charge	Q_g^*	–	5.2	–	nC	$V_{DD}=-15V$
Gate-source charge	Q_{gs}^*	–	1.6	–	nC	$I_D=-3A$
Gate-drain charge	Q_{gd}^*	–	1.6	–	nC	$V_{GS}=-5V$
						$R_L=5\Omega$
						$R_G=10\Omega$

*Pulsed

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

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Forward voltage	V_{SD}^*	–	–	–1.2	V	$I_S=-3A$, $V_{GS}=0V$

* Pulsed

●Electrical characteristic curves

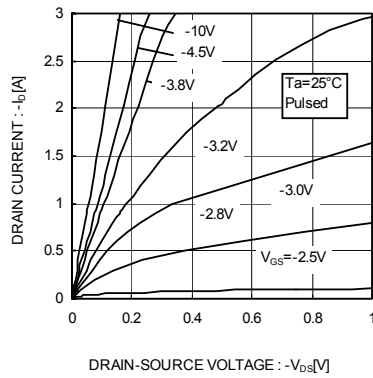


Fig.1 Typical output characteristics(I)

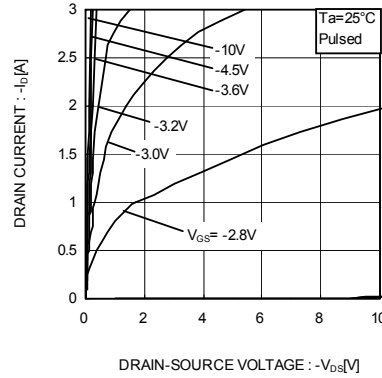


Fig.2 Typical output characteristics(II)

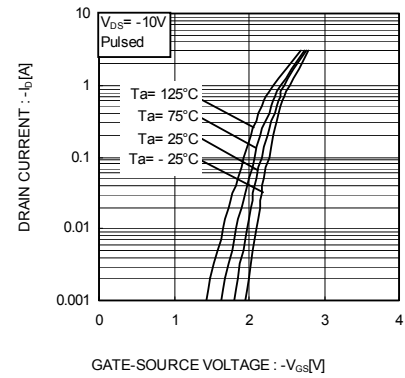


Fig.3 Typical Transfer Characteristics

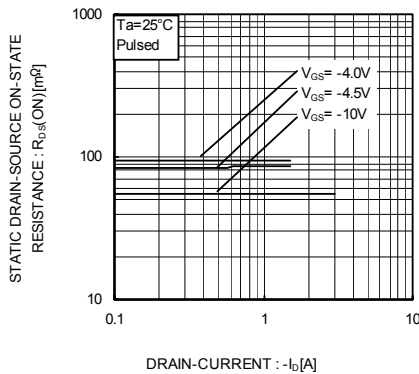


Fig.4 Static Drain-Source On-State Resistance vs. Drain Current(I)

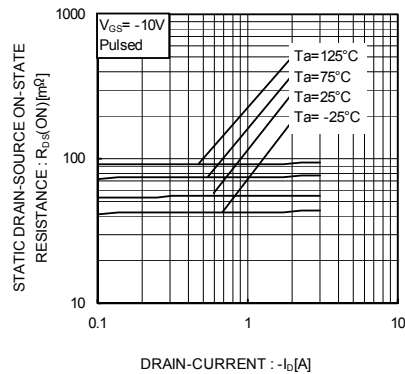


Fig.5 Static Drain-Source On-State Resistance vs. Drain Current(II)

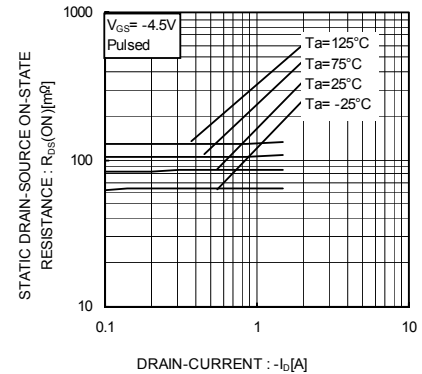


Fig.6 Static Drain-Source On-State Resistance vs. Drain Current(III)

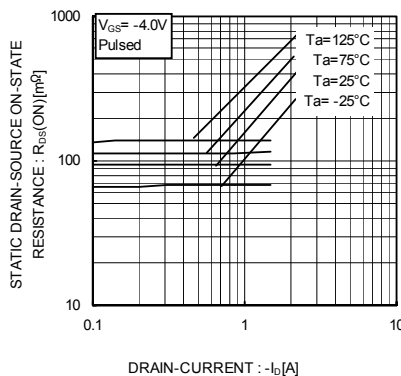


Fig.7 Static Drain-Source On-State Resistance vs. Drain Current(IV)

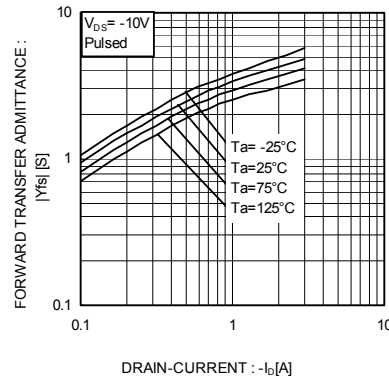


Fig.8 Forward Transfer Admittance vs. Drain Current

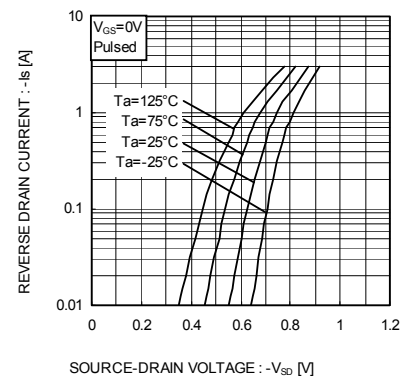


Fig.9 Reverse Drain Current vs. Source-Drain Voltage

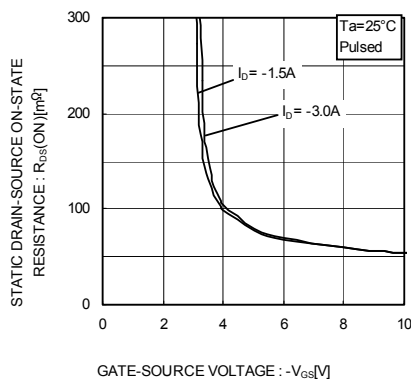


Fig.10 Static Drain-Source On-State Resistance vs. Gate Source Voltage

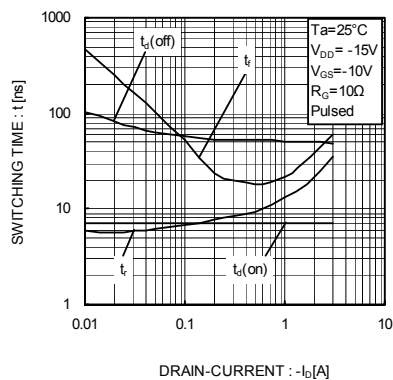


Fig.11 Switching Characteristics

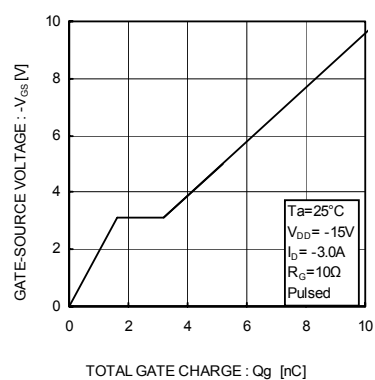


Fig.12 Dynamic Input Characteristics

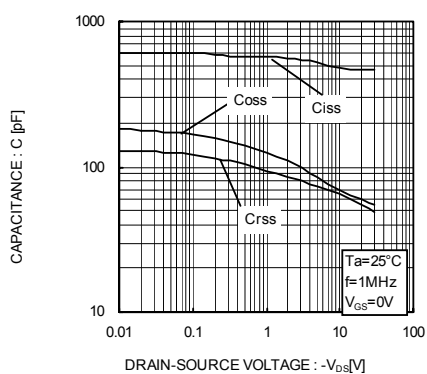


Fig.13 Typical Capacitance vs. Drain-Source Voltage

●Measurement circuits

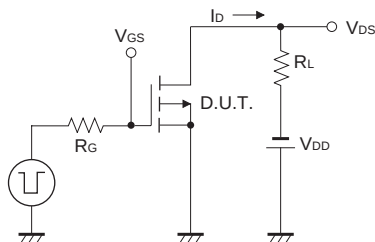


Fig.1-1 Switching Time Measurement Circuit

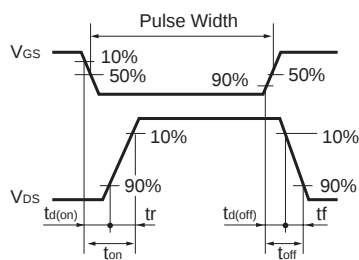


Fig.1-2 Switching Waveforms

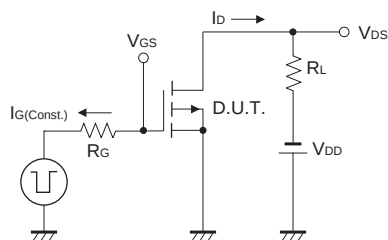


Fig.2-1 Gate Charge Measurement Circuit

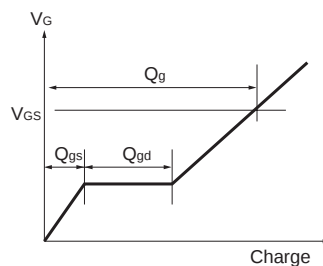


Fig.2-2 Gate Charge Waveform

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