

4V Drive Pch MOSFET

RRQ045P03

●Structure

Silicon P-channel MOSFET

●Features

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

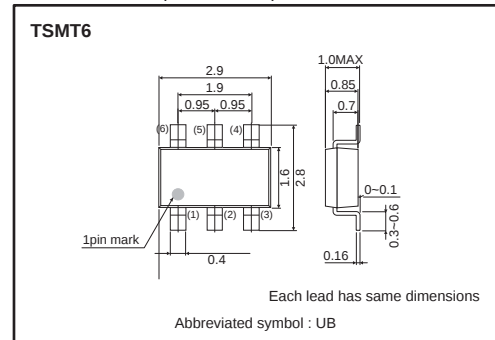
●Application

Switching

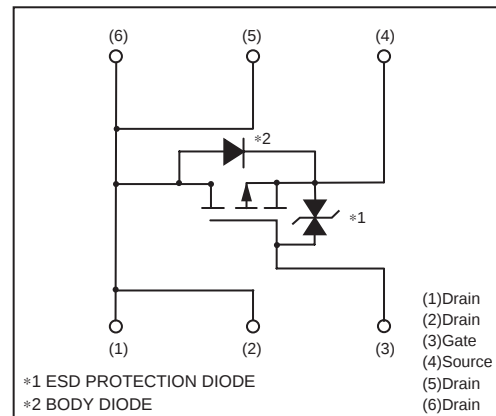
●Packaging specifications

Type	Package	Taping
	Code	TR
	Basic ordering unit (pieces)	3000
RRQ045P03		○

●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}	± 20	V
Drain current	Continuous	I_D	A
	Pulsed	I_{DP} *1	A
Source current (Body diode)	Continuous	I_S	A
	Pulsed	I_{SP} *1	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 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} =±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)} *	–	25	35	mΩ	I _D =–4.5A, V _{GS} =–10V
		–	34	48	mΩ	I _D =–2.2A, V _{GS} =–4.5V
		–	38	53	mΩ	I _D =–2.2A, V _{GS} =–4.0V
Forward transfer admittance	Y _{fs} *	3.5	–	–	S	V _{DS} =–10V, I _D =–4.5A
Input capacitance	C _{iss}	–	1350	–	pF	V _{DS} =–10V
Output capacitance	C _{oss}	–	180	–	pF	V _{GS} =0V
Reverse transfer capacitance	C _{rss}	–	180	–	pF	f=1MHz
Turn-on delay time	t _{d(on)} *	–	10	–	ns	V _{DD} ≐–15V
Rise time	t _r	–	35	–	ns	I _D =–2.2A
Turn-off delay time	t _{d(off)}	–	110	–	ns	V _{GS} =–10V
Fall time	t _f	–	65	–	ns	R _L ≐6.8Ω R _G ≐10Ω
Total gate charge	Q _g *	–	14	–	nC	V _{DD} ≐–15V I _D =–4.5A
Gate-source charge	Q _{gs} *	–	3.5	–	nC	V _{GS} =–5V
Gate-drain charge	Q _{gd} *	–	4.2	–	nC	R _L ≐3.3Ω R _G ≐10Ω

*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

●Electrical characteristics curves

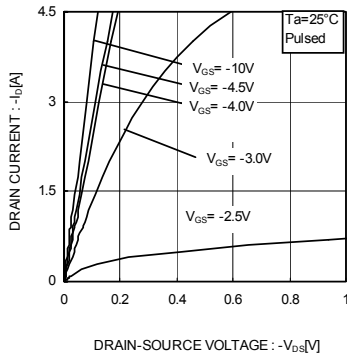


Fig.1 Typical Output Characteristics(I)

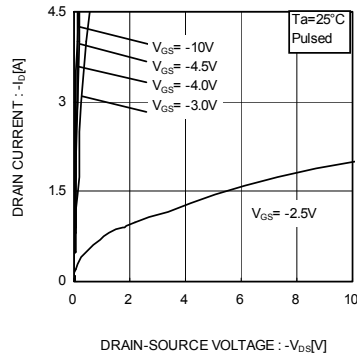


Fig.2 Typical Output Characteristics(II)

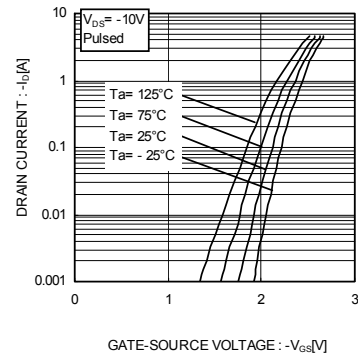


Fig.3 Typical Transfer Characteristics

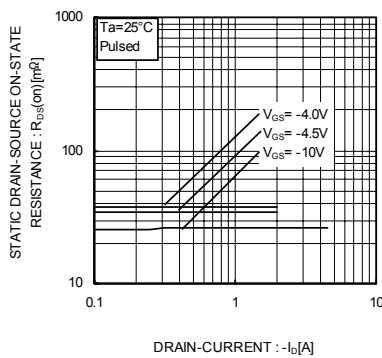


Fig.4 Static Drain-Source On-State Resistance vs. Drain Current(I)

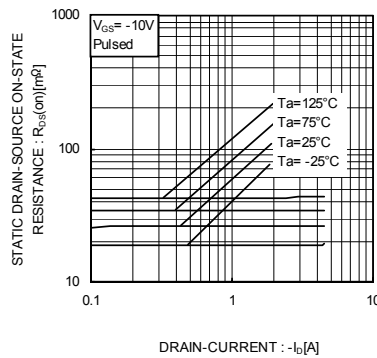


Fig.5 Static Drain-Source On-State Resistance vs. Drain Current(II)

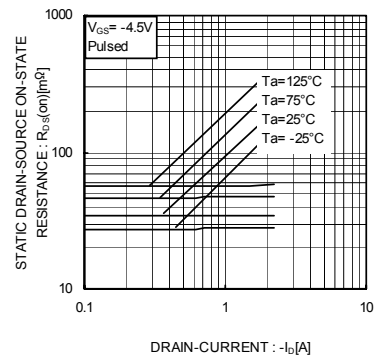


Fig.6 Static Drain-Source On-State Resistance vs. Drain Current(III)

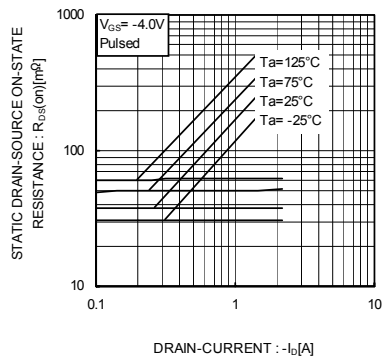


Fig.7 Static Drain-Source On-State Resistance vs. Drain Current(IV)

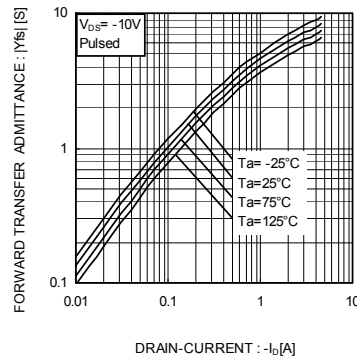


Fig.8 Forward Transfer Admittance vs. Drain Current

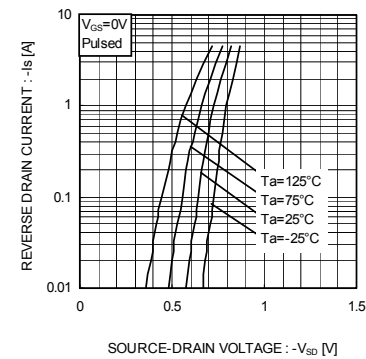


Fig.9 Reverse Drain Current vs. Source-Drain Voltage

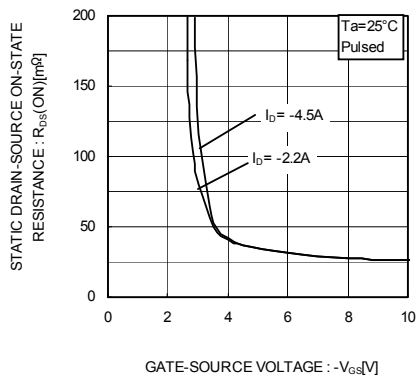


Fig.10 Static Drain-Source On-State Resistance vs. Gate Source Voltage

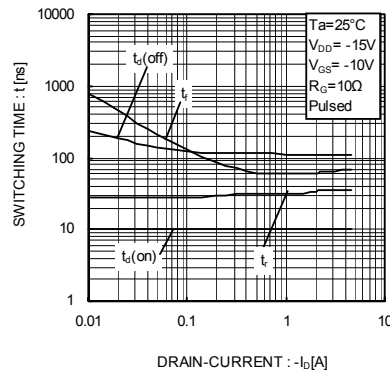


Fig.11 Switching Characteristics

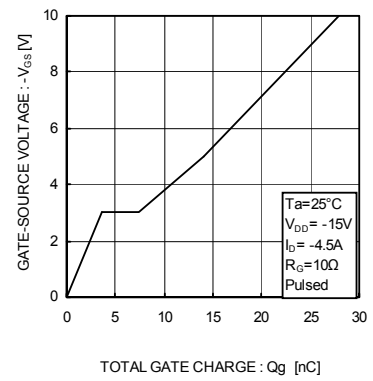


Fig.12 Dynamic Input Characteristics

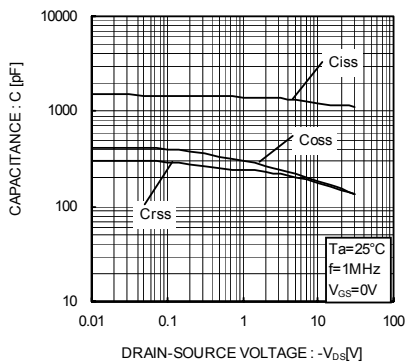


Fig.13 Typical Capacitance vs. Drain-Source Voltage

●Measurement circuits

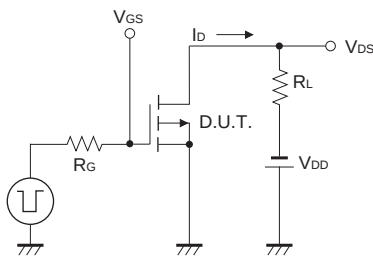


Fig.1-1 Switching Time Measurement Circuit

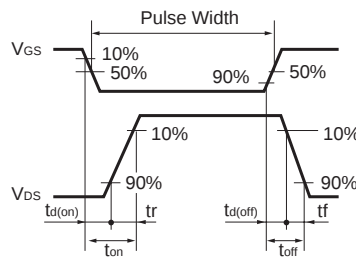


Fig.1-2 Switching Waveforms

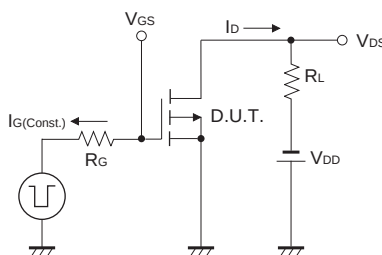


Fig.2-1 Gate Charge Measurement Circuit

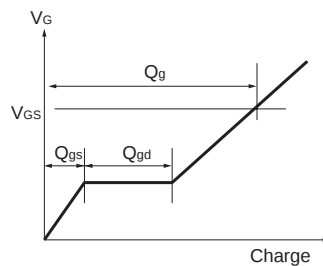


Fig.2-2 Gate Charge Waveform

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