

Transistor

# 2.5V Drive Pch MOS FET

## RTQ025P02

●Structure

Silicon P-channel MOSFET

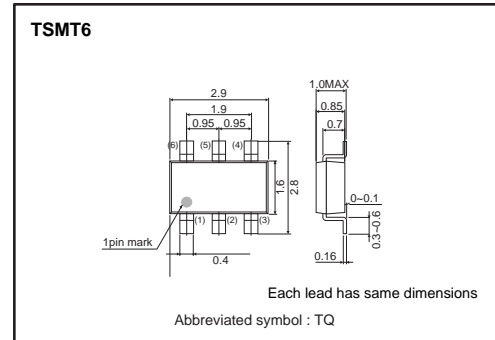
●Features

- 1) Low On-resistance.(140mΩ at 2.5V)
- 2) High Power Package.
- 3) High speed switching.
- 4) Low voltage drive.(2.5V)

●Applications

DC-DC converter

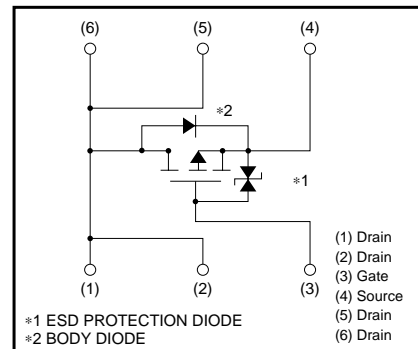
●External dimensions (Unit : mm)



●Packaging specifications

Type	Package	Taping
	Code	TR
	Basic ordering unit (pieces)	3000
RTQ025P02		○

●Equivalent circuit



●Absolute maximum ratings (Ta=25°C)

Parameter	Symbol	Limits	Unit	
Drain-source voltage	V <sub>DSS</sub>	-20	V	
Gate-source voltage	V <sub>GSS</sub>	±12	V	
Drain current	Continuous	I <sub>D</sub>	±2.5	A
	Pulsed	I <sub>DP</sub> *1	±10	A
Source current (Body diode)	Continuous	I <sub>S</sub>	-1	A
	Pulsed	I <sub>SP</sub> *1	-4	A
Total power dissipation	P <sub>D</sub> *2	1.25	W	
Channel temperature	T <sub>ch</sub>	150	°C	
Range of Storage temperature	T <sub>stg</sub>	-55 to +150	°C	

\*1 Pw≤10μs, Duty cycle≤1%  
\*2 Mounted on a ceramic board

●Thermal resistance

Parameter	Symbol	Limits	Unit
Channel to ambient	R <sub>th(ch-a)</sub> *	100	°C / W

\* Mounted on a ceramic board.

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## ●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> =±12V, V <sub>DS</sub> =0V
Drain-source breakdown voltage	V <sub>(BR)DSS</sub>	–20	–	–	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> =–20V, V <sub>GS</sub> =0V
Gate threshold voltage	V <sub>GS(th)</sub>	–0.7	–	–2.0	V	V <sub>DS</sub> =–10V, I <sub>D</sub> =–1mA
Static drain-source on-state resistance	R <sub>DS(on)</sub> <sup>*</sup>	–	72	100	mΩ	I <sub>D</sub> =–2.5A, V <sub>GS</sub> =–4.5V
		–	80	110	mΩ	I <sub>D</sub> =–2.5A, V <sub>GS</sub> =–4V
		–	140	190	mΩ	I <sub>D</sub> =–1.2A, V <sub>GS</sub> =–2.5V
Forward transfer admittance	Y <sub>fs</sub>   <sup>*</sup>	2.0	–	–	S	V <sub>DS</sub> =–10V, I <sub>D</sub> =–1.2A
Input capacitance	C <sub>iss</sub>	–	580	–	pF	V <sub>DS</sub> =–10V, V <sub>GS</sub> =0V f=1MHz
Output capacitance	C <sub>oss</sub>	–	110	–	pF	
Reverse transfer capacitance	C <sub>rss</sub>	–	80	–	pF	
Turn-on delay time	t <sub>d(on)</sub> <sup>*</sup>	–	12	–	ns	I <sub>D</sub> =–1.2A V <sub>DD</sub> =–15V V <sub>GS</sub> =–4.5V R <sub>L</sub> =12.5Ω R <sub>G</sub> =10Ω
Rise time	t <sub>r</sub> <sup>*</sup>	–	20	–	ns	
Turn-off delay time	t <sub>d(off)</sub> <sup>*</sup>	–	40	–	ns	
Fall time	t <sub>f</sub> <sup>*</sup>	–	17	–	ns	
Total gate charge	Q <sub>g</sub>	–	6.4	–	nC	V <sub>DD</sub> =–15V V <sub>GS</sub> =–4.5V I <sub>D</sub> =–2.5A
Gate-source charge	Q <sub>gs</sub>	–	1.4	–	nC	
Gate-drain charge	Q <sub>gd</sub>	–	1.9	–	nC	

\*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> =–1A, V <sub>GS</sub> =0V

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●Electrical characteristic curves

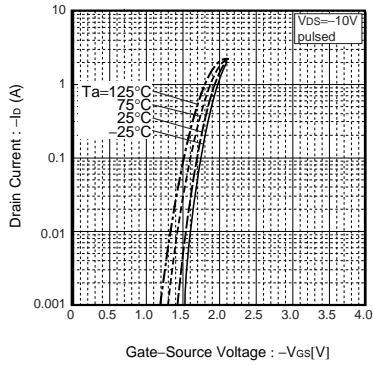


Fig.1 Typical Transfer Characteristics

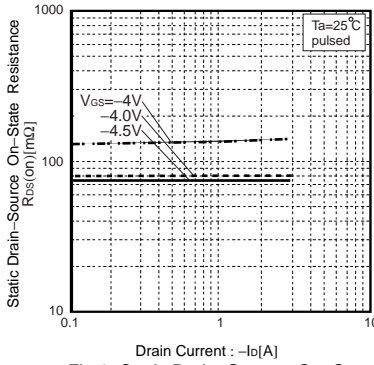


Fig.2 Static Drain-Source On-State Resistance vs. Drain Current

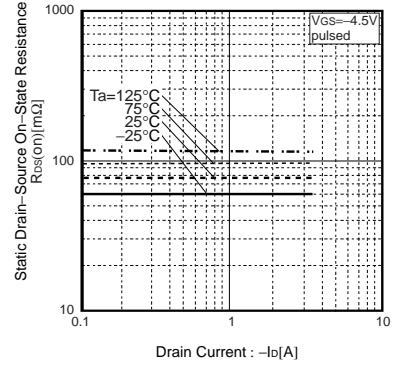


Fig.3 Static Drain-Source On-State Resistance vs. Drain Current

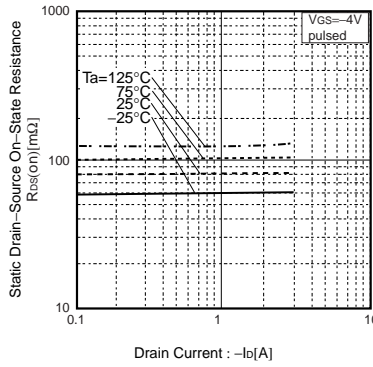


Fig.4 Static Drain-Source On-State Resistance vs. Drain-Current

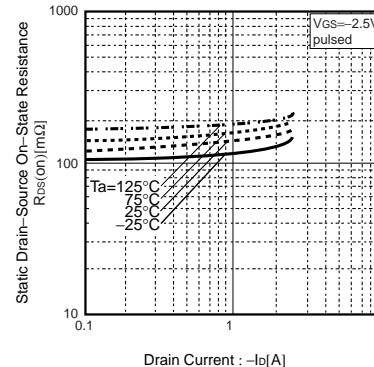


Fig.5 Static Drain-Source On-State Resistance vs. Drain-Current

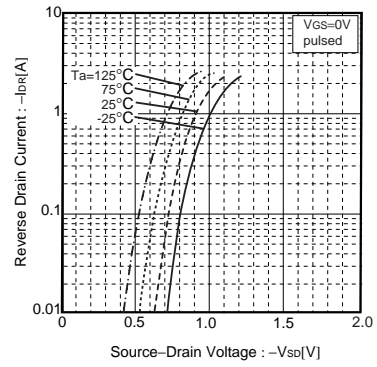


Fig.6 Reverse Drain Current vs. Source-Drain Voltage

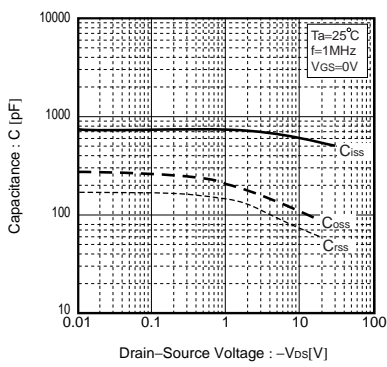


Fig.7 Typical Capacitance vs. Drain-Source Voltage

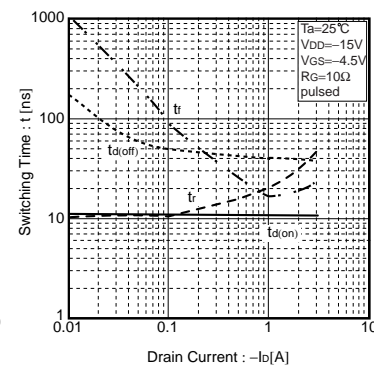


Fig.8 Switching Characteristics

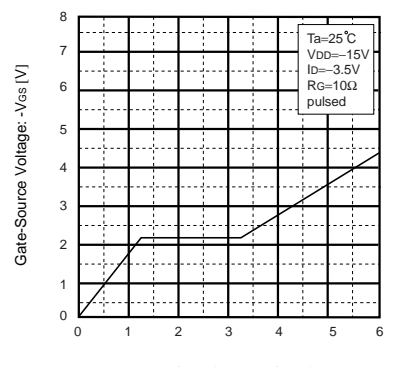


Fig.9 Dynamic Input Characteristics

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●Measurement circuits

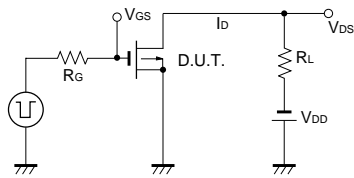


Fig.10 Switching Time Measurement Circuit

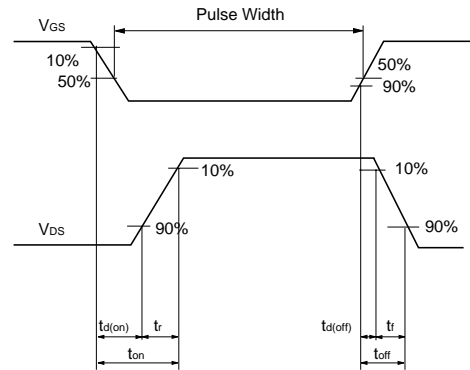


Fig.11 Switching Waveforms

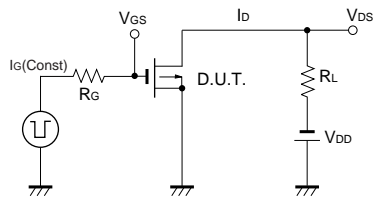


Fig.12 Gate Charge Measurement Circuit

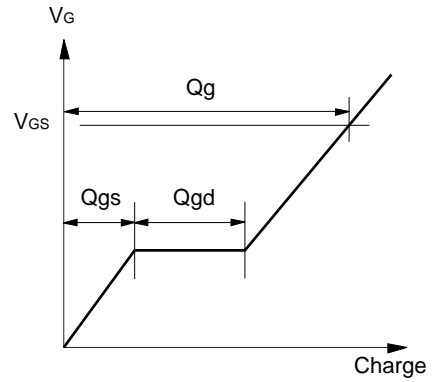


Fig.13 Gate Charge Waveforms

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