

2.5V Drive Pch MOS FET

RTQ025P02

●Structure

Silicon P-channel MOSFET

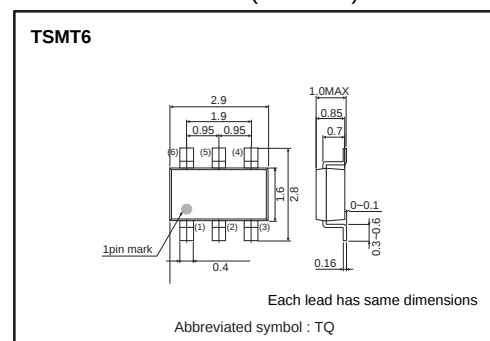
●Features

- 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

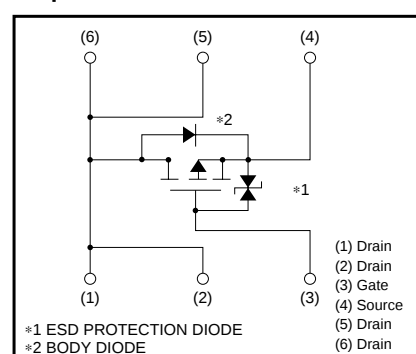
●External dimensions (Unit : mm)



●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_{DS}	-20	V
Gate-source voltage		V_{GS}	±12	V
Drain current	Continuous	I_D	±2.5	A
	Pulsed	I_{DP} *1	±10	A
Source current (Body diode)	Continuous	I_S	-1	A
	Pulsed	I_{SP} *1	-4	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 cycles ≤ 1%

*2 Mounted on a ceramic board

●Thermal resistance

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

* Mounted on a ceramic board.

Transistor

●Electrical characteristics (Ta=25°C)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Gate-source leakage	I_{GSS}	—	—	± 10	μA	$V_{GS}=\pm 12V$, $V_{DS}=0V$
Drain-source breakdown voltage	$V_{(BR)DSS}$	-20	—	—	V	$I_D=-1mA$, $V_{GS}=0V$
Zero gate voltage drain current	I_{DSS}	—	—	-1	μA	$V_{DS}=-20V$, $V_{GS}=0V$
Gate threshold voltage	$V_{GS(th)}$	-0.7	—	-2.0	V	$V_{DS}=-10V$, $I_D=-1mA$
Static drain-source on-state resistance	$R_{DS(on)}^*$	—	72	100	m Ω	$I_D=-2.5A$, $V_{GS}=-4.5V$
		—	80	110	m Ω	$I_D=-2.5A$, $V_{GS}=-4V$
		—	140	190	m Ω	$I_D=-1.2A$, $V_{GS}=-2.5V$
Foward transfer admittance	$ Y_{fs} ^*$	2.0	—	—	S	$V_{DS}=-10V$, $I_D=-1.2A$
Input capacitance	C_{iss}	—	580	—	pF	$V_{DS}=-10V$, $V_{GS}=0V$ $f=1MHz$
Output capacitance	C_{oss}	—	110	—	pF	
Reverse transfer capacitance	C_{rss}	—	80	—	pF	
Turn-on delay time	$t_{d(on)}^*$	—	12	—	ns	$I_D=-1.2A$ $V_{DD}=-15V$ $V_{GS}=-4.5V$ $R_L=12.5\Omega$ $R_G=10\Omega$
Rise time	t_r^*	—	20	—	ns	
Turn-off delay time	$t_{d(off)}^*$	—	40	—	ns	
Fall time	t_f^*	—	17	—	ns	
Total gate charge	Q_g	—	6.4	—	nC	$V_{DD}=-15V$ $V_{GS}=-4.5V$ $I_D=-2.5A$
Gate-source charge	Q_{gs}	—	1.4	—	nC	
Gate-drain charge	Q_{gd}	—	1.9	—	nC	

*PULSED

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

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Forward voltage	V_{SD}	—	—	-1.2	V	$I_S=-1A$, $V_{GS}=0V$

Transistor

●Electrical characteristic curves

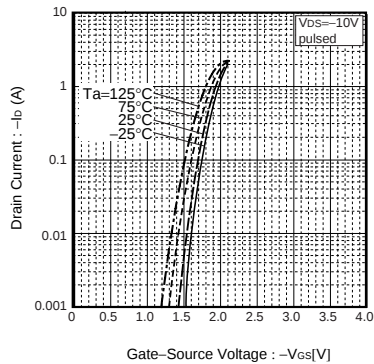


Fig.1 Typical Transfer Characteristics

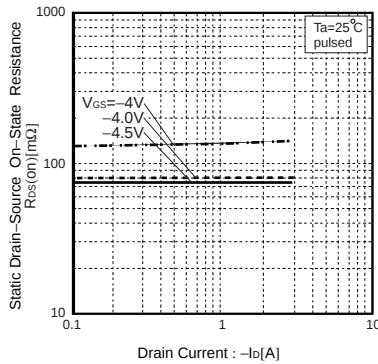


Fig.2 Static Drain-Source On-State Resistance vs. Drain Current

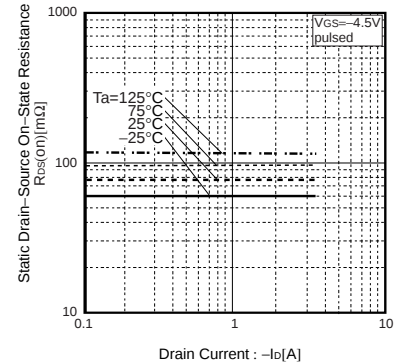


Fig.3 Static Drain-Source On-State Resistance vs. Drain Current

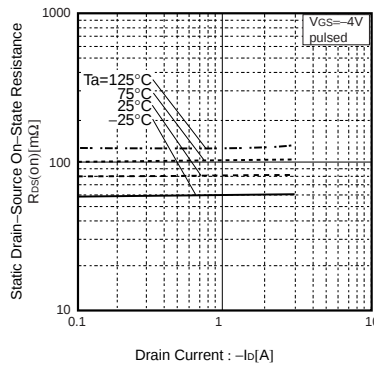


Fig.4 Static Drain-Source On-State Resistance vs. Drain Current

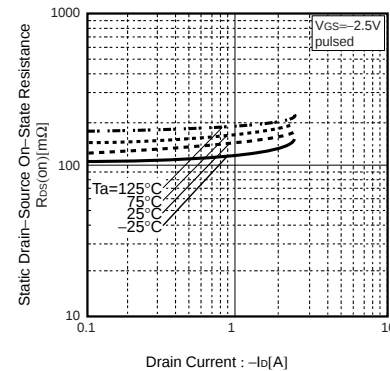


Fig.5 Static Drain-Source On-State Resistance vs. Drain Current

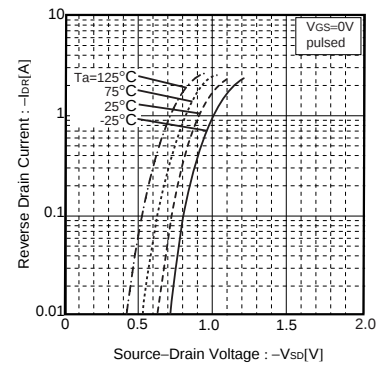


Fig.6 Reverse Drain Current vs. Source-Drain Voltage

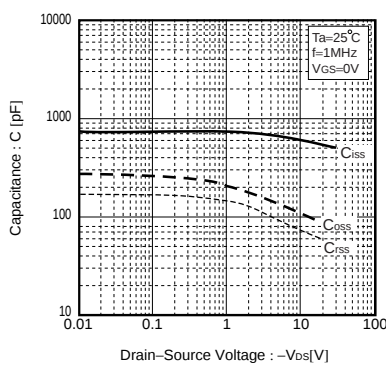


Fig.7 Typical Capacitance vs. Drain-Source Voltage

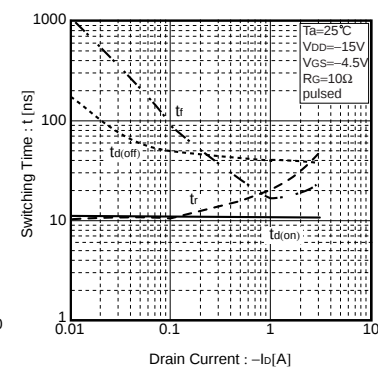


Fig.8 Switching Characteristics

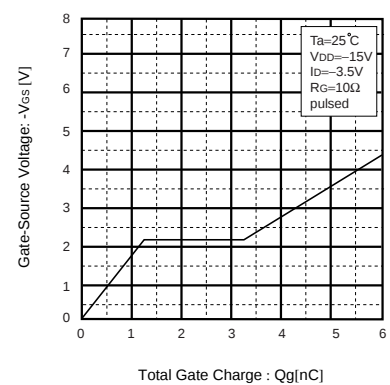


Fig.9 Dynamic Input Characteristics

Transistor

●Measurement circuits

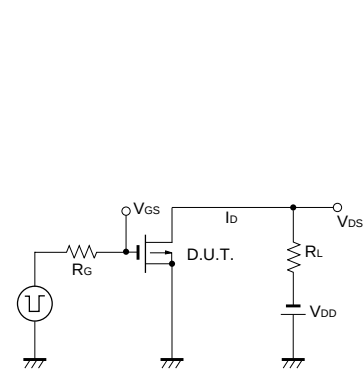


Fig.10 Switching Time Measurement Circuit

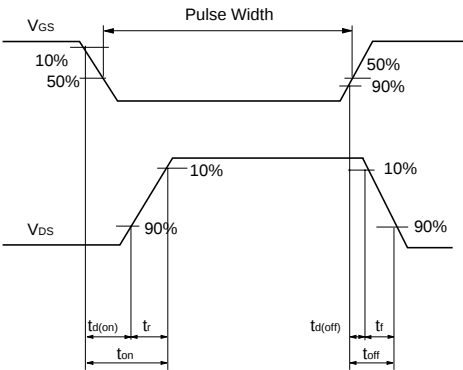


Fig.11 Switching Waveforms

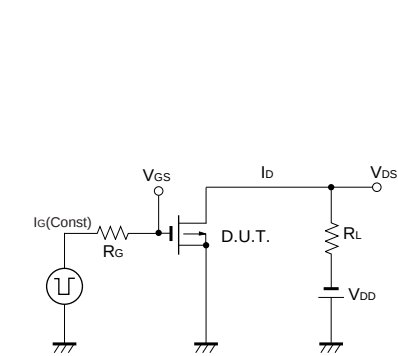


Fig.12 Gate Charge Measurement Circuit

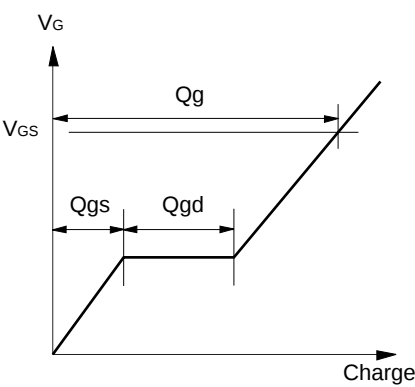


Fig.13 Gate Charge Waveforms

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