Transistor

2.5V Drive Pch MOS FET

RTQ025P02

● **Structure**

Silicon P-channel MOSFET
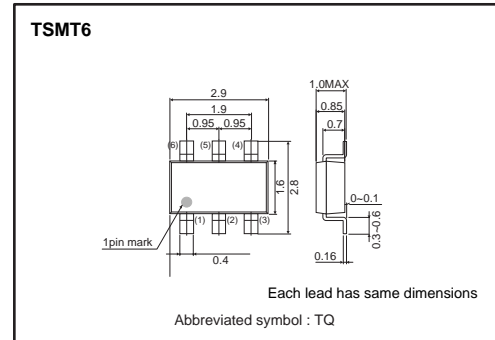
● **Features**

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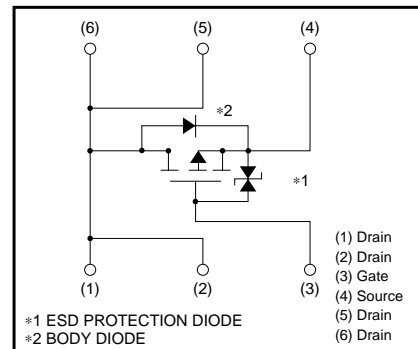4) Low voltage drive.(2.5V)

● **Applications**

DC-DC converter

● **External dimensions** (Unit : mm)

TSMT6

2.9
1.9
0.95 0.95
(6) (5) (4)
1.6
2.8
1pin mark
(1) (2) (3)
0.4

1.0MAX
0.85
0.7
0~0.1
0.3~0.6
0.16

Each lead has same dimensions

Abbreviated symbol : TQ

● **Packaging specifications**

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

● **Equivalent circuit**

(6)   (5)   (4)

*2

*1

(1)   (2)   (3)

(1) Drain
(2) Drain
(3) Gate
(4) Source
(5) Drain
(6) Drain

*1 ESD PROTECTION DIODE
*2 BODY DIODE

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

Parameter		Symbol	Limits	Unit
Drain−source voltage		V_{DSS}	−20	V
Gate−source voltage		V_{GSS}	±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		Tch	150	°C
Range of Storage temperature		Tstg	−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	Rth(ch-a) *	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_{GSS}	–	–	±10	μA	$V_{GS}=±12V$, $V_{DS}=0V$
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	mΩ	$I_D=–2.5A$, $V_{GS}=–4.5V$
		–	80	110	mΩ	$I_D=–2.5A$, $V_{GS}=–4V$
		–	140	190	mΩ	$I_D=–1.2A$, $V_{GS}=–2.5V$
Foward transfer admittance	$\mid Y_{fs}\mid$*	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	$I_D=–1.2A$ $V_{DD}≒–15V$ $V_{GS}=–4.5V$ $R_L=12.5Ω$ $R_G=10Ω$
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	$I_S=–1A$, $V_{GS}=0V$

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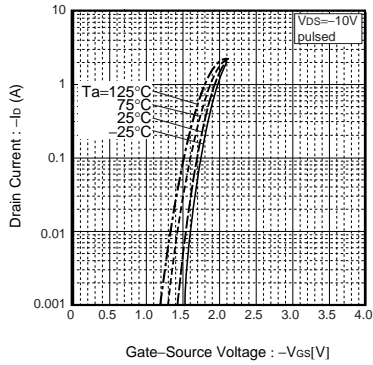Transistor

● **Electrical characteristic curves**

Fig.1 Typical Transfer Characteristics

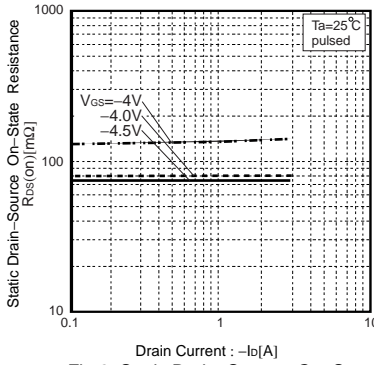

Fig.2 Static Drain–Source On–State
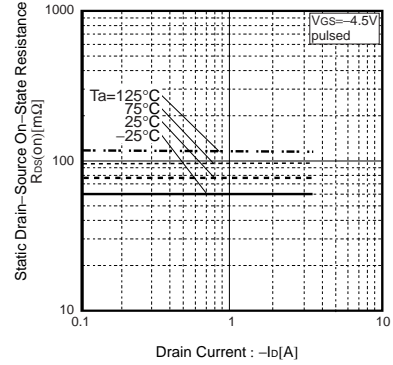Resistance vs.Drain Current

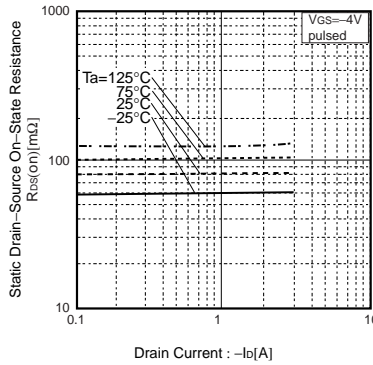Fig.3 Static Drain–Source On–State
Resistance vs.Drain Current

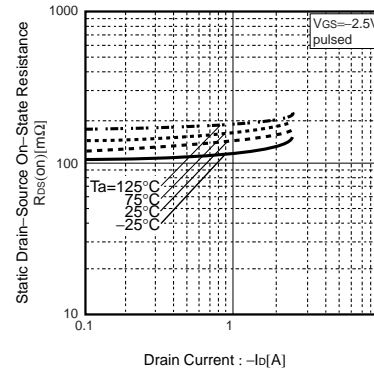Fig.4 Static Drain–Source On–State
Resistance vs.Drain–Current

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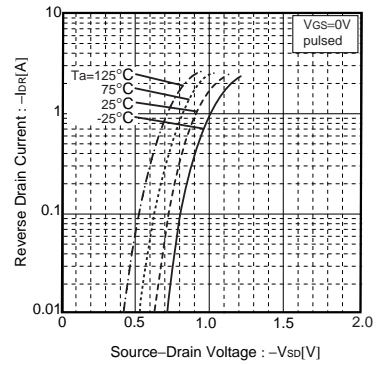Resistance vs.Drain–Current
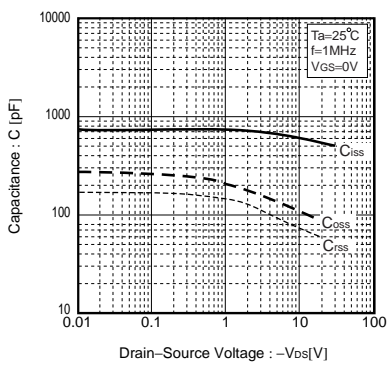

Fig.6 Reverse Drain Current vs.
Source-Drain Voltage
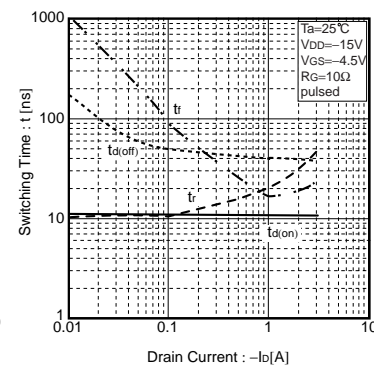

Fig.7 Typical Capactitance
vs.Drain–Source Voltage

Fig.8 Switching Characteristics

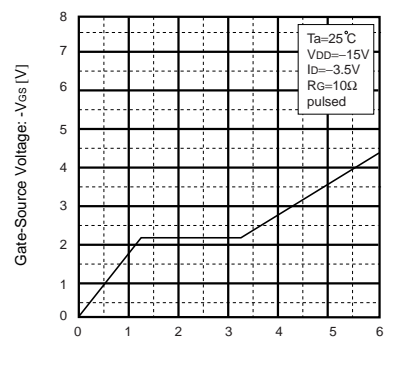
Fig.9 Dynamic Input Characteristics

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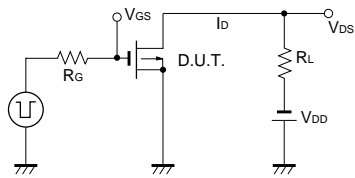●**Measurement circuits**

Fig.10 Switching Time Measurement Circuit
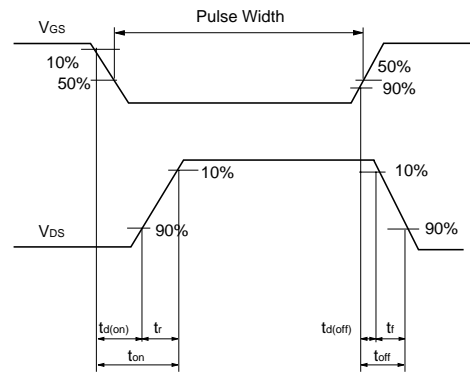

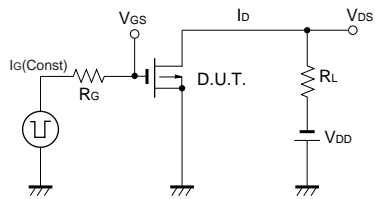Fig.11 Switching Waveforms

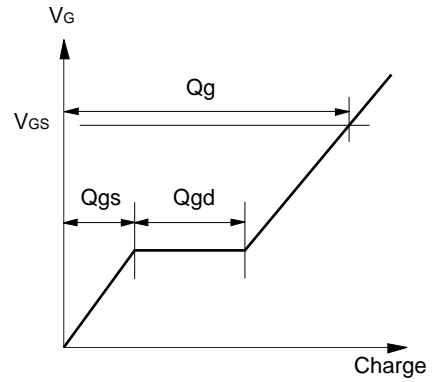Fig.12 Gate Charge Measurement Circuit

Fig.13 Gate Charge Waveforms

Appendix

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