Transistors

2.5V Drive Pch MOSFET

RTF010P02

●**Structure**

Silicon P-channel
MOSFET

●**Features**

1) Low on-resistance. (570mΩ at 2.5V)
2) High power package.
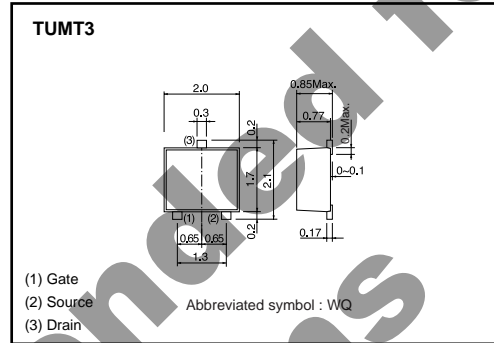3) High speed switching.
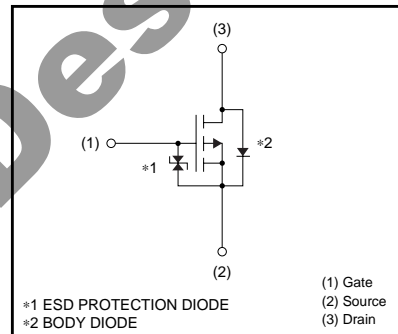4) Low voltage drive. (2.5V)

●**Applications**

DC-DC converter

●**Dimensions** (Unit : mm)

TUMT3

(1) Gate
(2) Source
(3) Drain

Abbreviated symbol : WQ

●**Packaging specifications**

Type	Package	Taping
	Code	TL
	Basic ordering unit (pieces)	3000
RTF010P02	○	

●**Equivalent circuit**

∗1 ESD PROTECTION DIODE
∗2 BODY DIODE

(1) Gate
(2) Source
(3) Drain

●**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	±1	A
	Pulsed	I_{DP} ∗1	±4	A
Source current (Body diode)	Continuous	I_S ∗1	−0.4	A
	Pulsed	I_{SP}	−4	A
Total power dissipation		P_D ∗2	0.8	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) ∗	156	°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$_{DS (on)}$ *	–	280	390	mΩ	I$_D$= –1A, V$_{GS}$= –4.5V
		–	310	430	mΩ	I$_D$= –1A, V$_{GS}$= –4V
		–	570	800	mΩ	I$_D$= –0.5A, V$_{GS}$= –2.5V
Forward transfer admittance	|Y$_{fs}$| *	0.7	–	–	S	V$_{DS}$= –10V, I$_D$= –0.5A
Input capacitance	C$_{iss}$	–	150	–	pF	V$_{DS}$= –10V
Output capacitance	C$_{oss}$	–	20	–	pF	V$_{GS}$=0V
Reverse transfer capacitance	C$_{rss}$	–	20	–	pF	f=1MHz
Turn-on delay time	t$_{d (on)}$ *	–	9	–	ns	I$_D$= –0.5A
Rise time	t$_r$ *	–	8	–	ns	V$_{DD}$= –15V
Turn-off delay time	t$_{d (off)}$ *	–	25	–	ns	V$_{GS}$= –4.5V R$_L$=30Ω
Fall time	t$_f$ *	–	10	–	ns	R$_G$=10Ω
Total gate charge	Q$_g$ *	–	2.1	–	nC	V$_{DD}$= –15V R$_L$=15Ω
Gate-source charge	Q$_{gs}$ *	–	0.5	–	nC	V$_{GS}$= –4.5V R$_G$=10Ω
Gate-drain charge	Q$_{gd}$ *	–	0.5	–	nC	I$_D$= –1A

∗Pulsed

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

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Forward voltage	V$_{SD}$	–	–	–1.2	V	I$_S$= –0.4A, V$_{GS}$=0V

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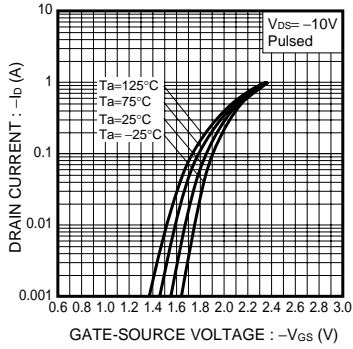●**Electrical characteristic curves**

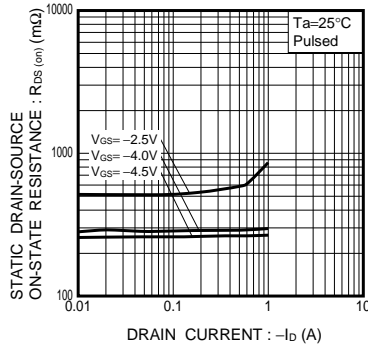Fig.1 Typical Transfer Characteristics

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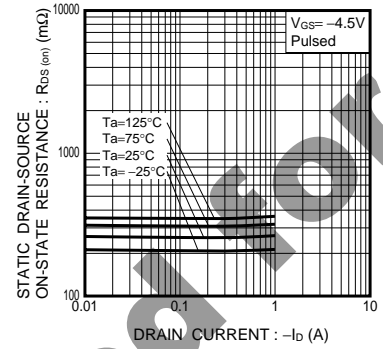Resistance vs. Drain Current

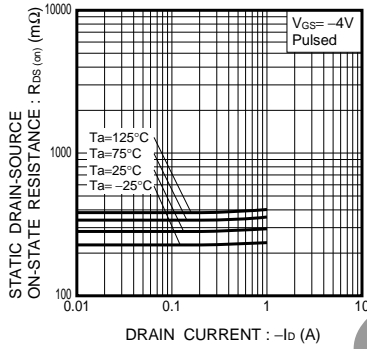Fig.3 Static Drain-Source On-State
Resistance vs. Drain Current

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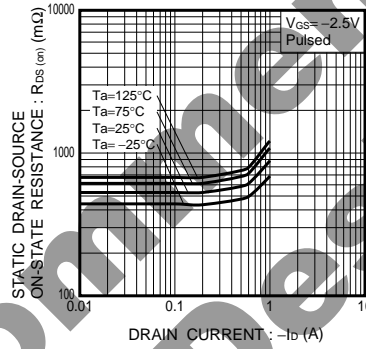Resistance vs. Drain Current

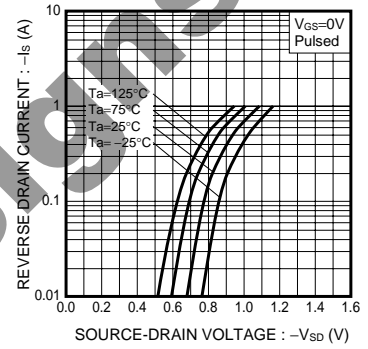Fig.5 Static Drain-Source On-State
Resistance vs. Drain Current

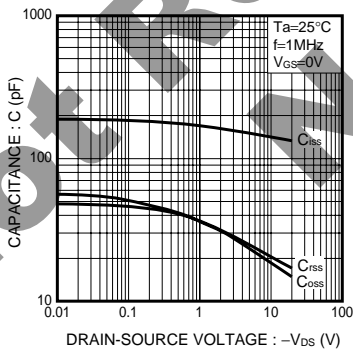Fig.6 Reverse Drain Current vs.
Source-Drain Voltage

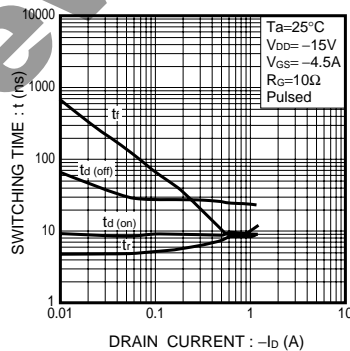Fig.7 Typical Capacitance
vs. Drain-Source Voltage

Fig.8 Switching Characteristics

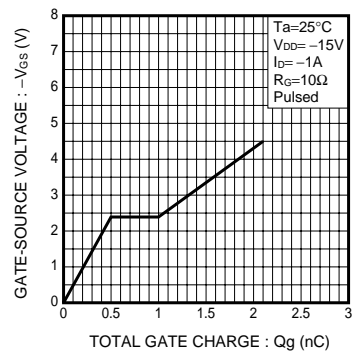Fig.9 Dynamic Input Characteristics
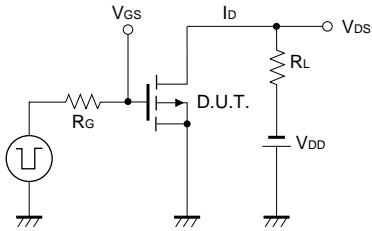
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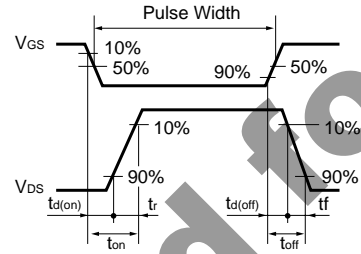●**Measurement circuits**

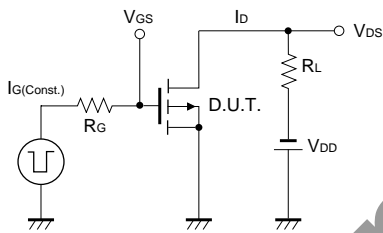Fig.10 Switching Time Measurement Circuit

Fig.11 Switching Waveforms

Fig.12 Gate Charge Measurement Circuit
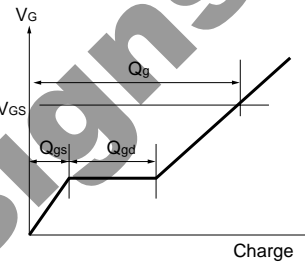

Fig.13 Gate Charge Waveforms

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