

# 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)

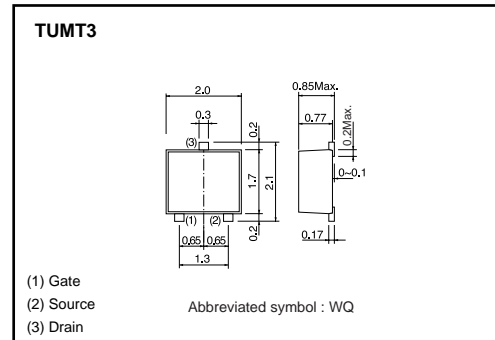
### ●Applications

DC-DC converter

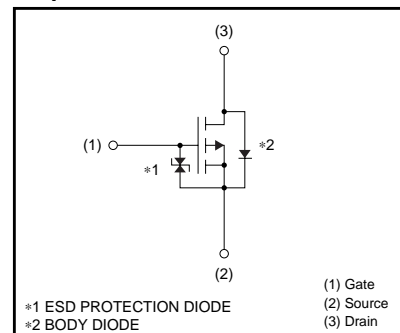
### ●Packaging specifications

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

### ●Dimensions (Unit : mm)



### ●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	$I_D$	±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	$T_{ch}$	150	°C	
Range of Storage temperature	$T_{stg}$	-55 to +150	°C	

\*1  $P_{WS} \leq 10 \mu s$ , Duty cycles 1%

\*2 Mounted on a ceramic board

### ●Thermal resistance

Parameter	Symbol	Limits	Unit
Channel to ambient	$R_{th(ch-a)}$ *	156	°C / W

\* Mounted on a ceramic board.

## Transistors

## ●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	$R_{DS(on)}$ *	–	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	$V_{GS} = -4.5V$
Fall time	$t_f$ *	–	10	–	ns	$R_L=30\Omega$
Total gate charge	$Q_g$ *	–	2.1	–	nC	$V_{DD} = -15V, R_L=15\Omega$
Gate-source charge	$Q_{gs}$ *	–	0.5	–	nC	$V_{GS} = -4.5V, R_G=10\Omega$
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	$I_S = -0.4A, V_{GS}=0V$

Transistors

●Electrical characteristic curves

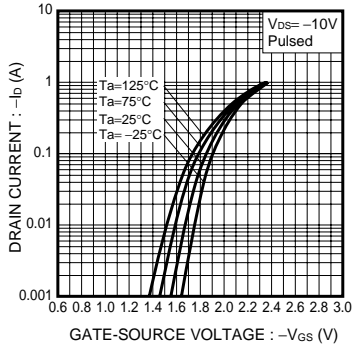


Fig.1 Typical Transfer Characteristics

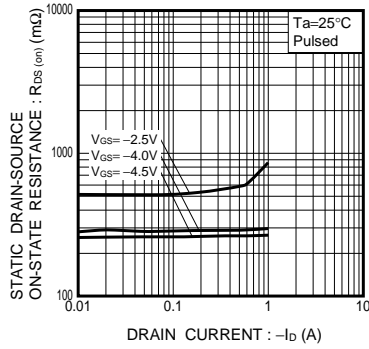


Fig.2 Static Drain-Source On-State Resistance vs. Drain Current

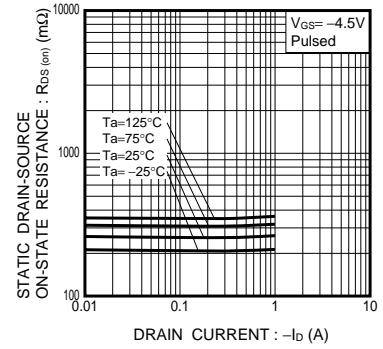


Fig.3 Static Drain-Source On-State Resistance vs. Drain Current

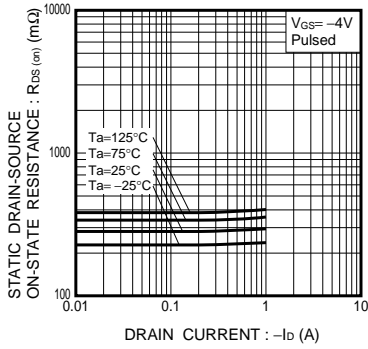


Fig.4 Static Drain-Source On-State Resistance vs. Drain Current

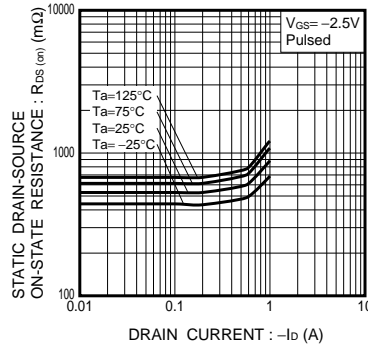


Fig.5 Static Drain-Source On-State Resistance vs. Drain Current

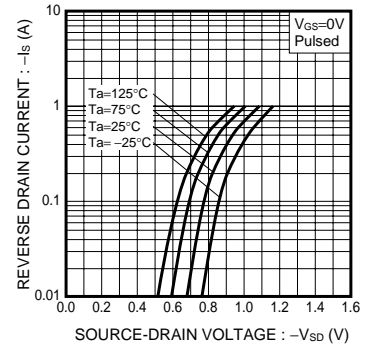


Fig.6 Reverse Drain Current vs. Source-Drain Voltage

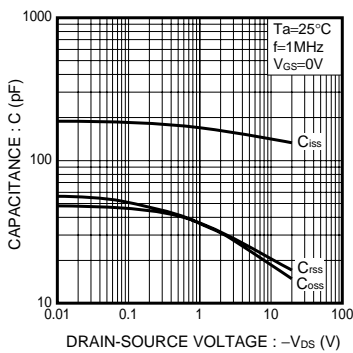


Fig.7 Typical Capacitance vs. Drain-Source Voltage

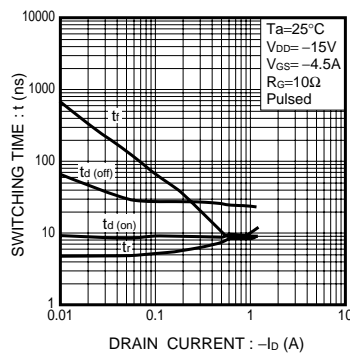


Fig.8 Switching Characteristics

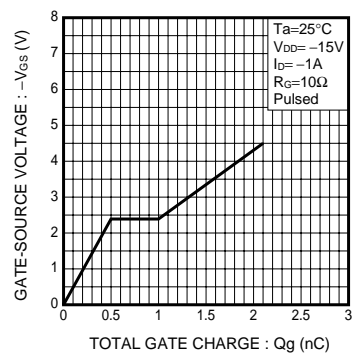


Fig.9 Dynamic Input Characteristics

Transistors

●Measurement circuits

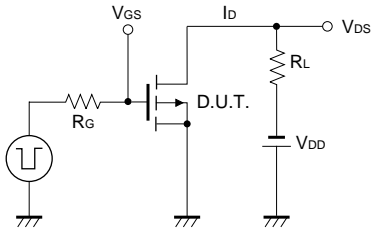


Fig.10 Switching Time Measurement Circuit

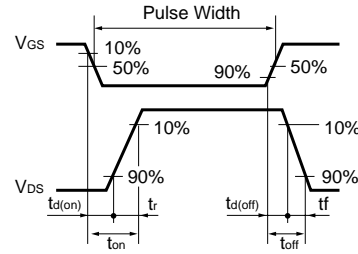


Fig.11 Switching Waveforms

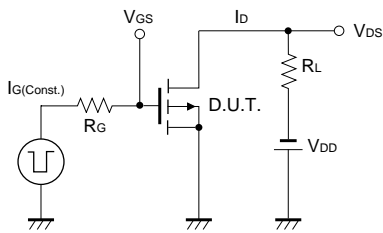


Fig.12 Gate Charge Measurement Circuit

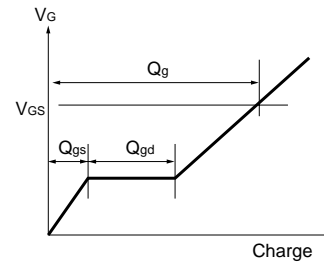


Fig.13 Gate Charge Waveforms

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