

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		○

●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%

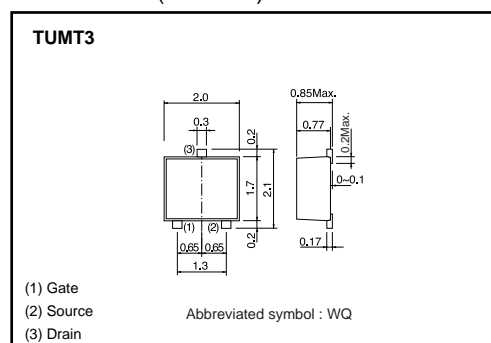
*2 Mounted on a ceramic board

●Thermal resistance

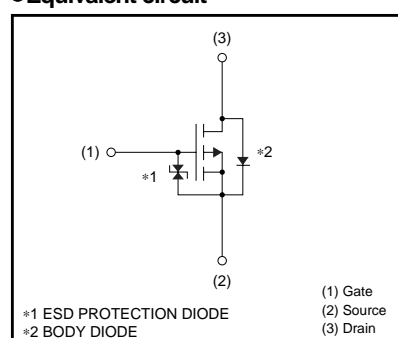
Parameter	Symbol	Limits	Unit
Channel to ambient	$R_{th(ch-a)}$ *	156	°C / W

* Mounted on a ceramic board.

●Dimensions (Unit : mm)



●Equivalent circuit



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	m Ω	$I_D = -1A$, $V_{GS} = -4.5V$
		—	310	430	m Ω	$I_D = -1A$, $V_{GS} = -4V$
		—	570	800	m Ω	$I_D = -0.5A$, $V_{GS} = -2.5V$
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

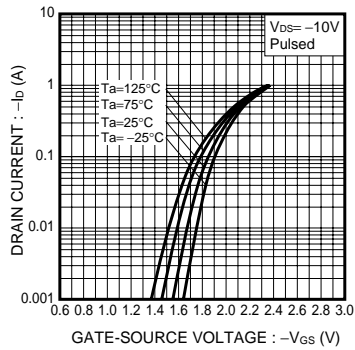


Fig.1 Typical Transfer Characteristics

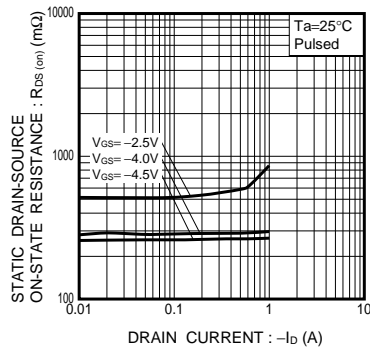


Fig.2 Static Drain-Source On-State Resistance vs. Drain Current

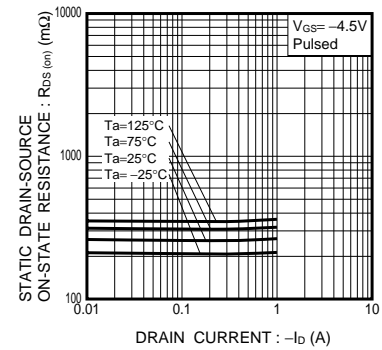


Fig.3 Static Drain-Source On-State Resistance vs. Drain Current

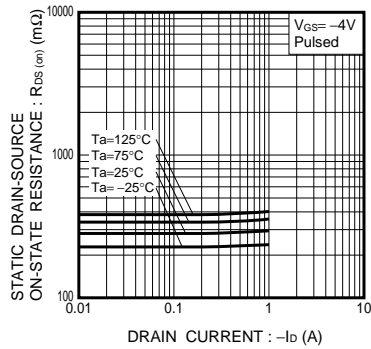


Fig.4 Static Drain-Source On-State Resistance vs. Drain Current

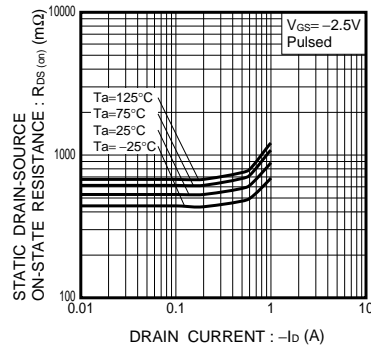


Fig.5 Static Drain-Source On-State Resistance vs. Drain Current

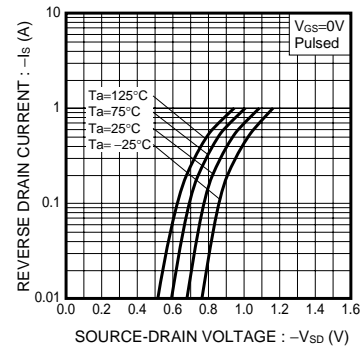


Fig.6 Reverse Drain Current vs. Source-Drain Voltage

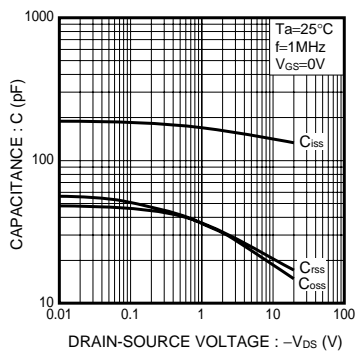


Fig.7 Typical Capacitance vs. Drain-Source Voltage

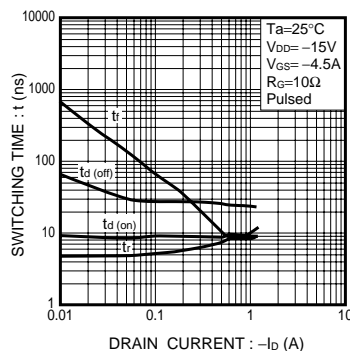


Fig.8 Switching Characteristics

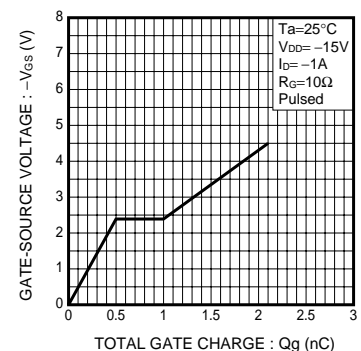


Fig.9 Dynamic Input Characteristics

Transistors

●Measurement circuits

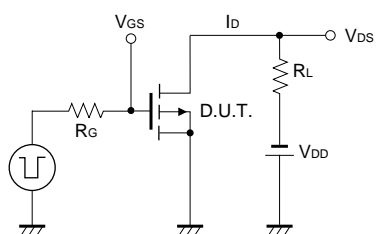


Fig.10 Switching Time Measurement Circuit

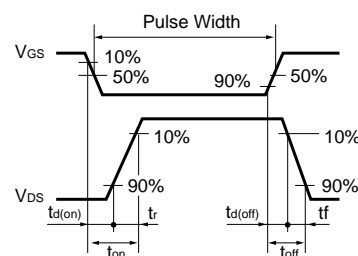


Fig.11 Switching Waveforms

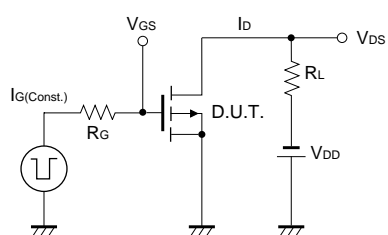


Fig.12 Gate Charge Measurement Circuit

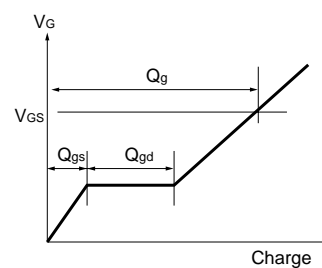


Fig.13 Gate Charge Waveforms

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