

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%

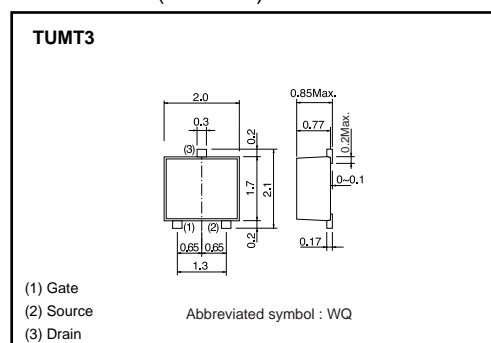
*2 Mounted on a ceramic board

●Thermal resistance

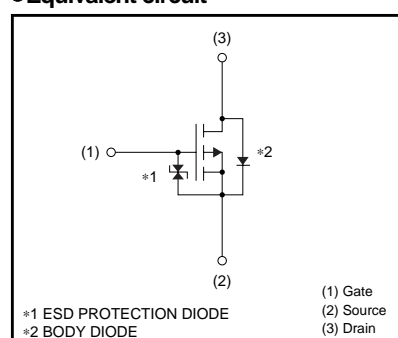
Parameter	Symbol	Limits	Unit
Channel to ambient	$R_{th(ch-a)}$ *	156	°C / W

* 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} =±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 V _{GS} = −4.5V
Turn-off delay time	t _{d (off)} *	—	25	—	ns	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

Transistors

●Electrical characteristic curves

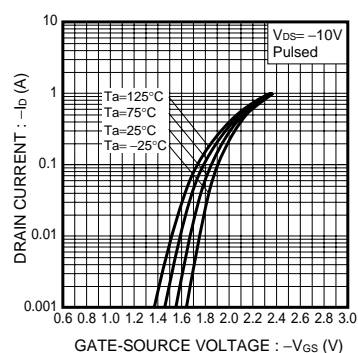


Fig.1 Typical Transfer Characteristics

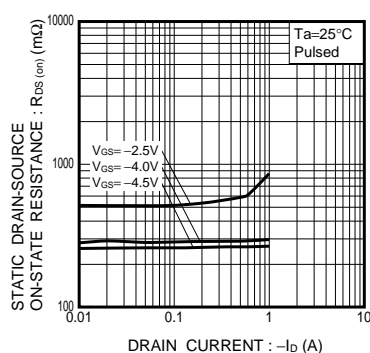


Fig.2 Static Drain-Source On-State Resistance vs. Drain Current

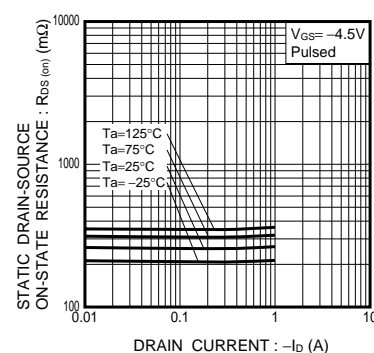


Fig.3 Static Drain-Source On-State Resistance vs. Drain Current

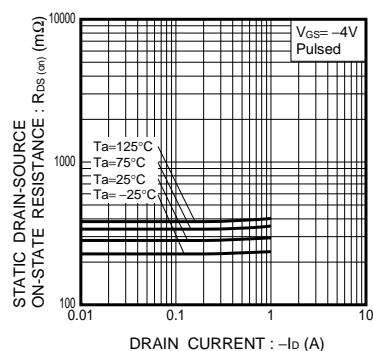


Fig.4 Static Drain-Source On-State Resistance vs. Drain Current

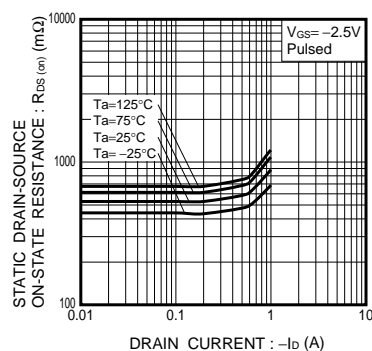


Fig.5 Static Drain-Source On-State Resistance vs. Drain Current

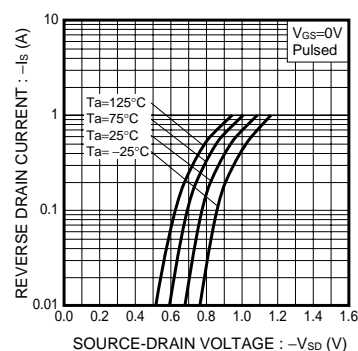


Fig.6 Reverse Drain Current vs. Source-Drain Voltage

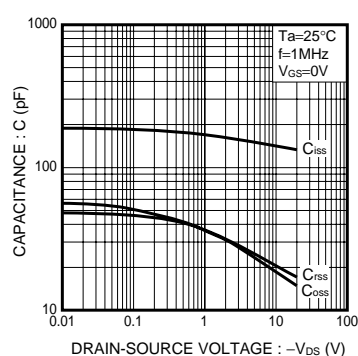


Fig.7 Typical Capacitance vs. Drain-Source Voltage

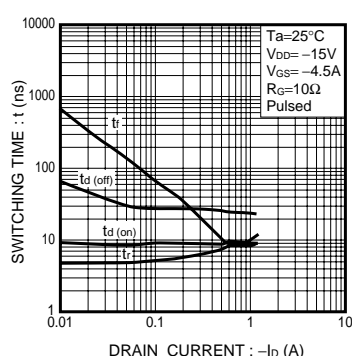


Fig.8 Switching Characteristics

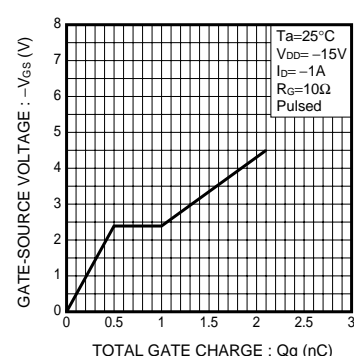


Fig.9 Dynamic Input Characteristics

Transistors

● Measurement circuits

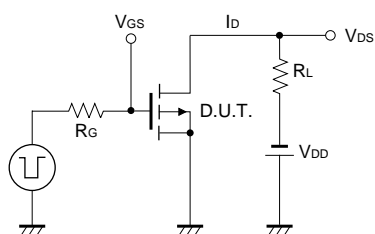


Fig.10 Switching Time Measurement Circuit

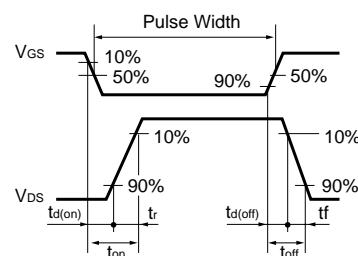


Fig.11 Switching Waveforms

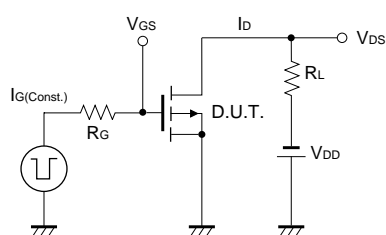


Fig.12 Gate Charge Measurement Circuit

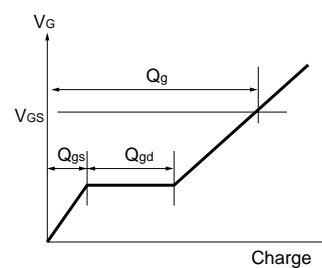


Fig.13 Gate Charge Waveforms

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