

Transistors

2.5V Drive Pch MOSFET

RTF020P02

●Structure

Silicon P-channel
MOSFET

●Features

- 1) Low on-resistance. (120mΩ at 2.5V)
- 2) High power package.
- 3) High speed switching.
- 4) Low voltage drive. (2.5V)

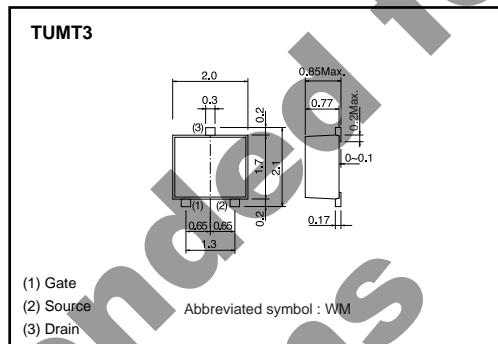
●Applications

DC-DC converter

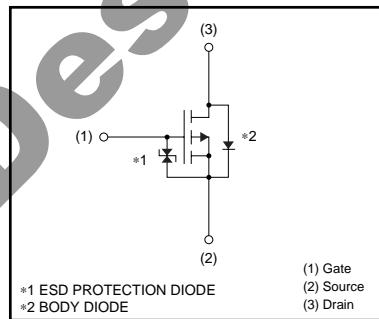
●Packaging specifications

Type	Package	Taping
	Code	TL
	Basic ordering unit (pieces)	3000
RTF020P02	○	

●Dimensions (Unit : mm)



●Equivalent circuit



●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	I _D	±2.0	A
Pulsed	I _{DP} *1	±8	A
Source current (Body diode)	I _S *1	-0.6	A
Pulsed	I _{SP}	-8	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 Pw:10μs, Duty cycle≤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} =±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)} *	—	60	85	mΩ	I _D =-2A, V _{GS} =-4.5V
		—	65	90	mΩ	I _D =-2A, V _{GS} =-4V
		—	120	165	mΩ	I _D =-1A, V _{GS} =-2.5V
Forward transfer admittance	Y _{fs} *	2.0	—	—	S	V _{DS} =-10V, I _D =-1A
Input capacitance	C _{iss}	—	640	—	pF	V _{DS} =-10V
Output capacitance	C _{oss}	—	110	—	pF	V _{GS} =0V
Reverse transfer capacitance	C _{rss}	—	85	—	pF	f=1MHz
Turn-on delay time	t _{d (on)} *	—	12	—	ns	I _D =-1A V _{DD} =-15V V _{GS} =-4.5V
Rise time	t _r *	—	15	—	ns	R _L =15Ω R _G =10Ω
Turn-off delay time	t _{d (off)} *	—	40	—	ns	
Fall time	t _f *	—	12	—	ns	
Total gate charge	Q _g *	—	7.0	—	nC	V _{DD} =-15V R _L =7.5Ω
Gate-source charge	Q _{gs} *	—	1.6	—	nC	V _{GS} =-4.5V R _G =10Ω
Gate-drain charge	Q _{gd} *	—	2.0	—	nC	I _D =-2A

*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 =-0.6A, V _{GS} =0V

Transistors

● Electrical characteristic curves

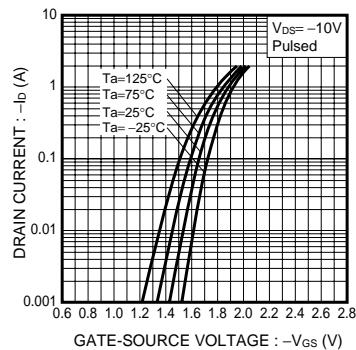


Fig.1 Typical Transfer Characteristics

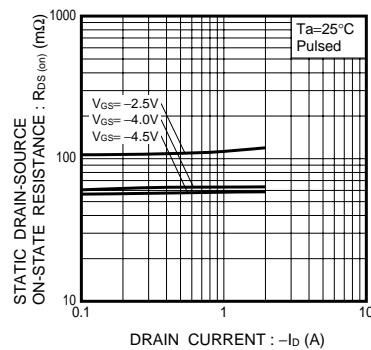


Fig.2 Static Drain-Source On-State Resistance vs. Drain Current

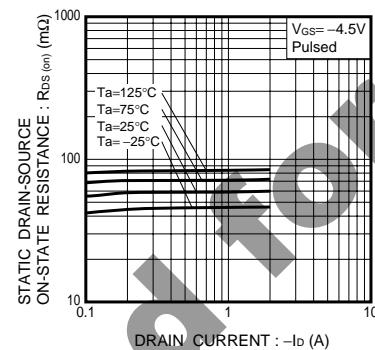


Fig.3 Static Drain-Source On-State Resistance vs. Drain Current

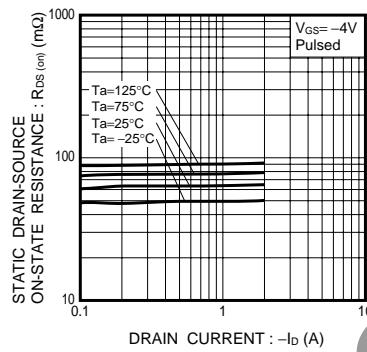


Fig.4 Static Drain-Source On-State Resistance vs. Drain Current

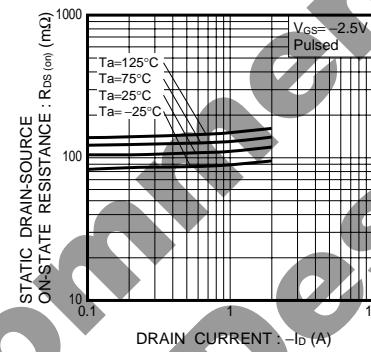


Fig.5 Static Drain-Source On-State Resistance vs. Drain Current

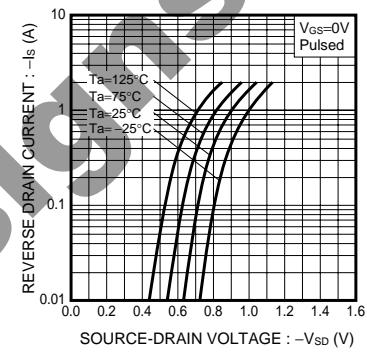


Fig.6 Reverse Drain Current vs. Source-Drain Voltage

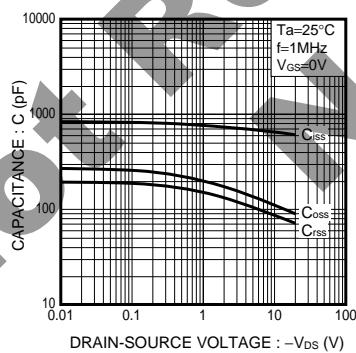


Fig.7 Typical Capacitance vs. Drain-Source Voltage

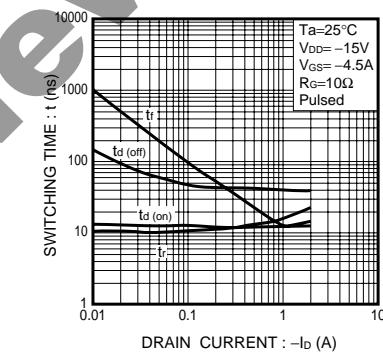


Fig.8 Switching Characteristics

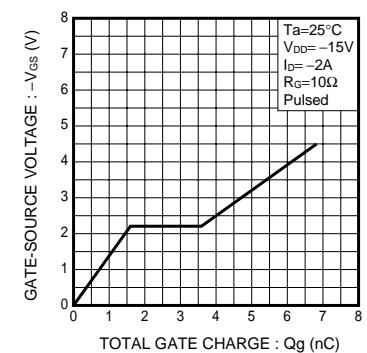


Fig.9 Dynamic Input Characteristics

Transistors

● Measurement circuits

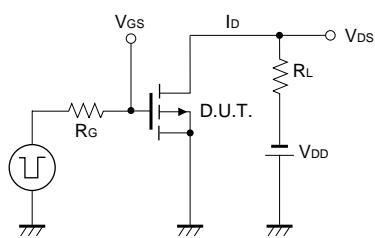


Fig.10 Switching Time Measurement Circuit

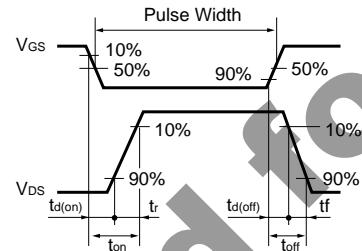


Fig.11 Switching Waveforms

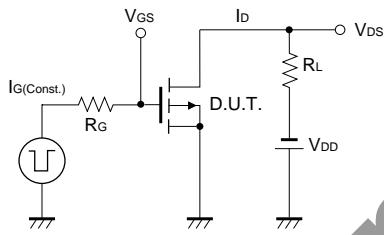


Fig.12 Gate Charge Measurement Circuit

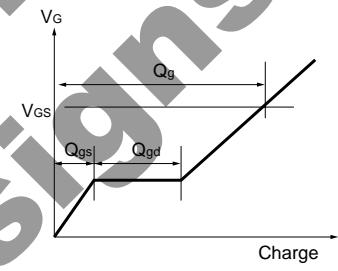


Fig.13 Gate Charge Waveforms

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