

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)

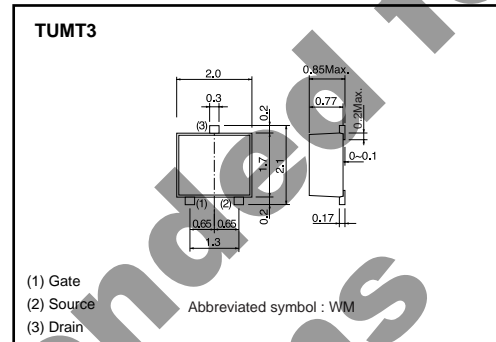
●Applications

DC-DC converter

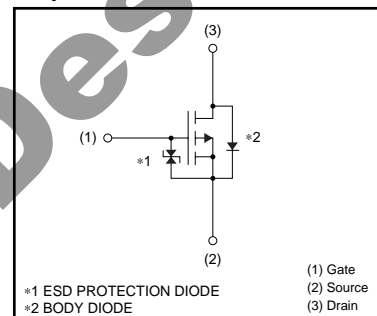
●Packaging specifications

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_{DS}	-20	V	
Gate-source voltage	V_{GS}	±12	V	
Drain current	Continuous	I_D	±2.0	A
	Pulsed	I_{DP} *1	±8	A
Source current (Body diode)	Continuous	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 $P_w \leq 10\mu s$, Duty cycles $\leq 1\%$

*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
Rise time	t _r *	–	15	–	ns	V _{DD} = –15V
Turn-off delay time	t _{d(off)} *	–	40	–	ns	V _{GS} = –4.5V
Fall time	t _f *	–	12	–	ns	R _L =15Ω R _G =10Ω
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

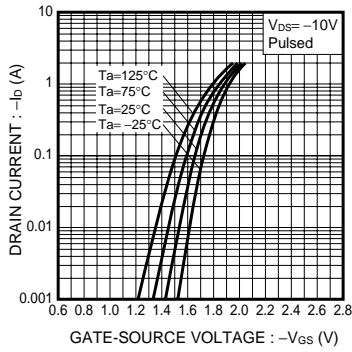


Fig.1 Typical Transfer Characteristics

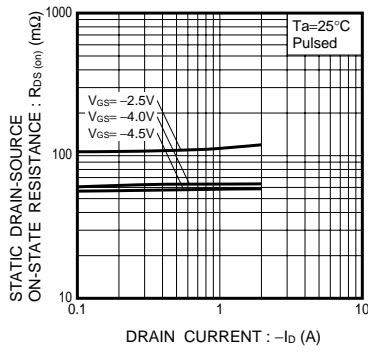


Fig.2 Static Drain-Source On-State Resistance vs. Drain Current

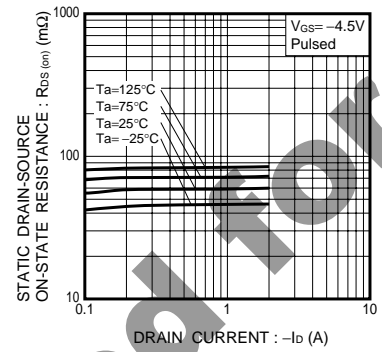


Fig.3 Static Drain-Source On-State Resistance vs. Drain Current

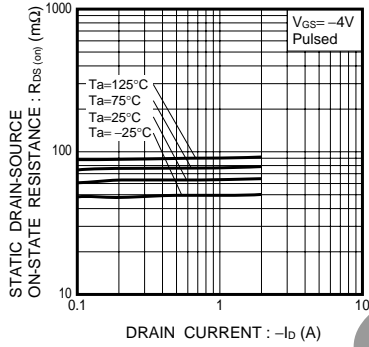


Fig.4 Static Drain-Source On-State Resistance vs. Drain Current

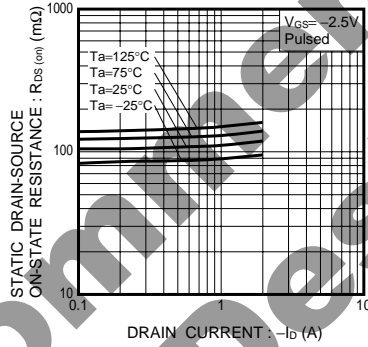


Fig.5 Static Drain-Source On-State Resistance vs. Drain Current

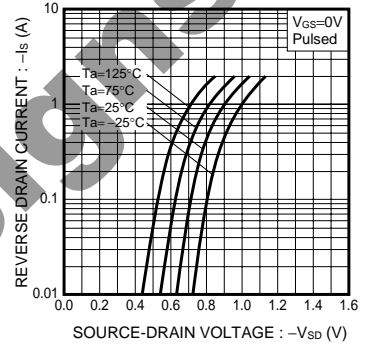


Fig.6 Reverse Drain Current vs. Source-Drain Voltage

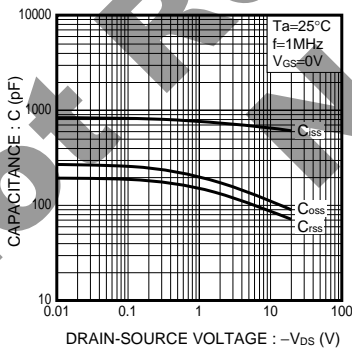


Fig.7 Typical Capacitance vs. Drain-Source Voltage

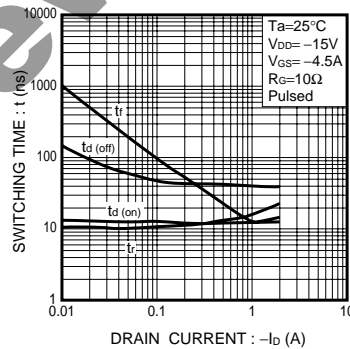


Fig.8 Switching Characteristics

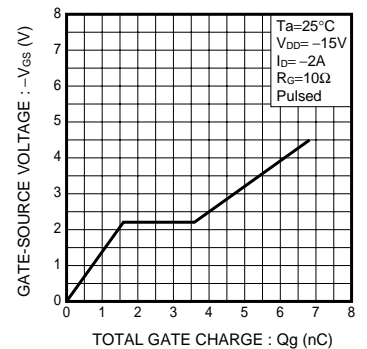


Fig.9 Dynamic Input Characteristics

Transistors

● Measurement circuits

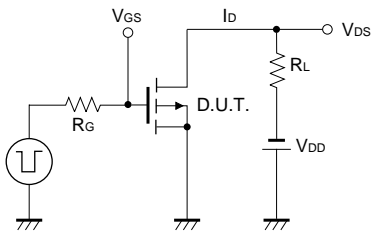


Fig.10 Switching Time Measurement Circuit

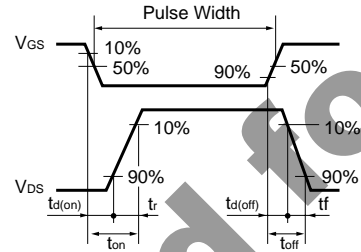


Fig.11 Switching Waveforms

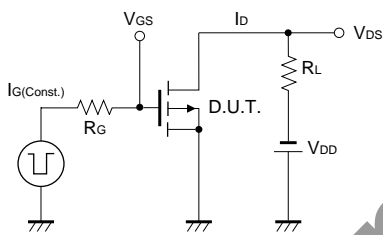


Fig.12 Gate Charge Measurement Circuit

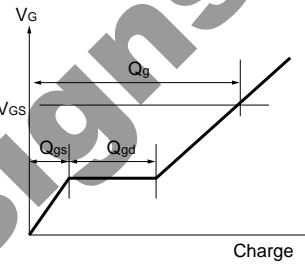


Fig.13 Gate Charge Waveforms

Not Recommended for New Designs

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