

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)

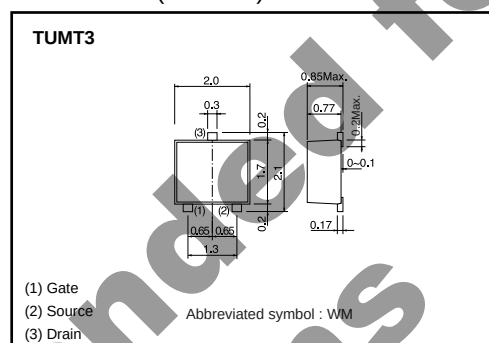
●Applications

DC-DC converter

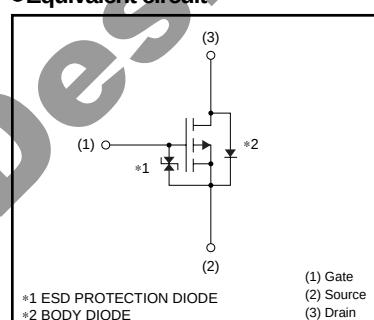
●Packaging specifications

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	Continuous	I _D	A
	Pulsed	I _{DP} *1	A
Source current (Body diode)	Continuous	I _S *1	A
	Pulsed	I _{SP}	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≤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	$I_D = -1A$
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

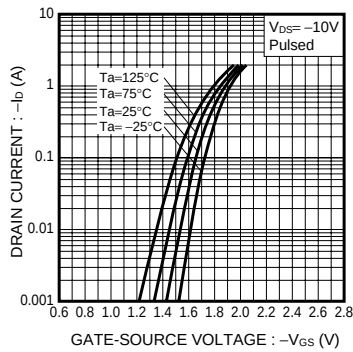


Fig.1 Typical Transfer Characteristics

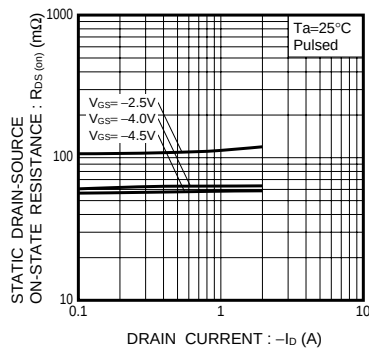


Fig.2 Static Drain-Source On-State Resistance vs. Drain Current

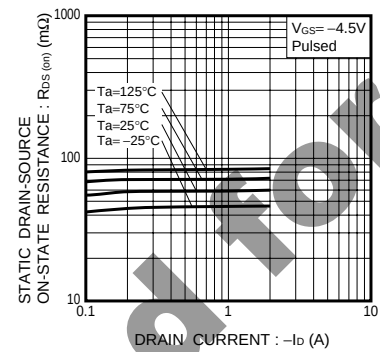


Fig.3 Static Drain-Source On-State Resistance vs. Drain Current

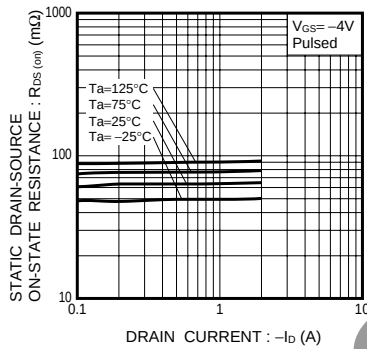


Fig.4 Static Drain-Source On-State Resistance vs. Drain Current

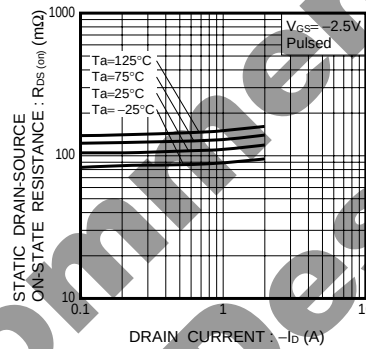


Fig.5 Static Drain-Source On-State Resistance vs. Drain Current

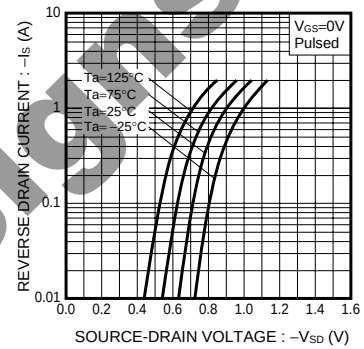


Fig.6 Reverse Drain Current vs. Source-Drain Voltage

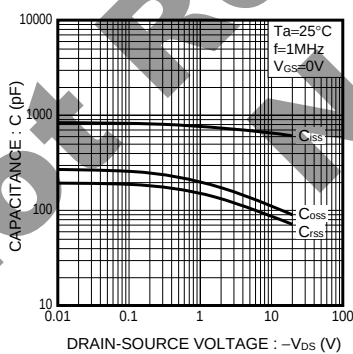


Fig.7 Typical Capacitance vs. Drain-Source Voltage

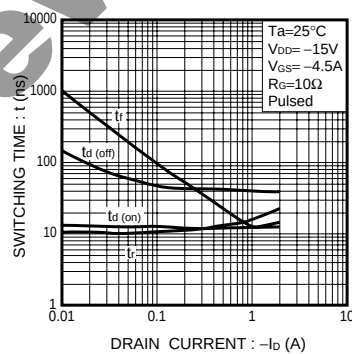


Fig.8 Switching Characteristics

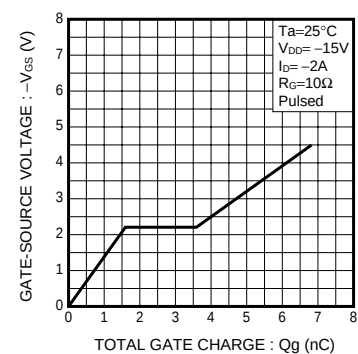


Fig.9 Dynamic Input Characteristics

Transistors

●Measurement circuits

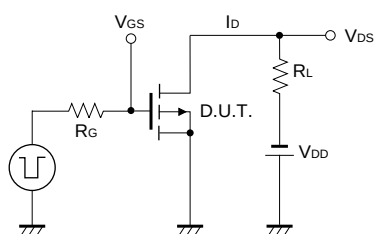


Fig.10 Switching Time Measurement Circuit

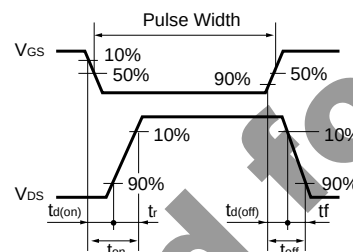


Fig.11 Switching Waveforms

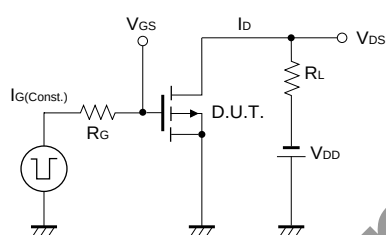


Fig.12 Gate Charge Measurement Circuit

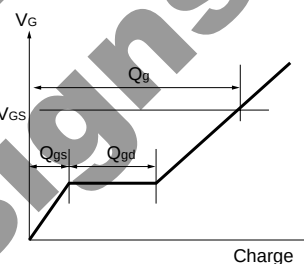


Fig.13 Gate Charge Waveforms

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Офис по работе с юридическими лицами:

105318, г.Москва, ул.Щербаковская д.3, офис 1107, 1118, ДЦ «Щербаковский»

Телефон: +7 495 668-12-70 (многоканальный)

Факс: +7 495 668-12-70 (доб.304)

E-mail: info@moschip.ru

Skype отдела продаж:

moschip.ru

moschip.ru_4

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moschip.ru_9