

2.5V Drive Pch MOSFET

RTL020P02

●Structure

Silicon P-channel
MOSFET

●Features

- 1) Low on-resistance. (180mΩ at 2.5V)
- 2) High power package.
- 3) High speed switching.
- 4) Low voltage drive. (2.5V)

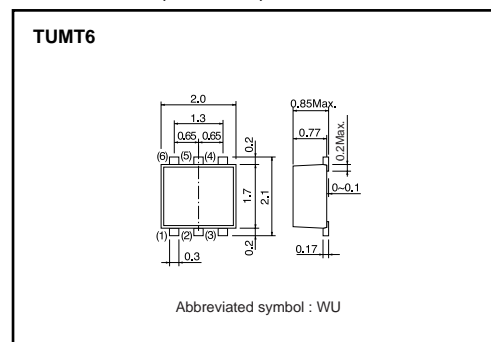
●Applications

DC-DC converter

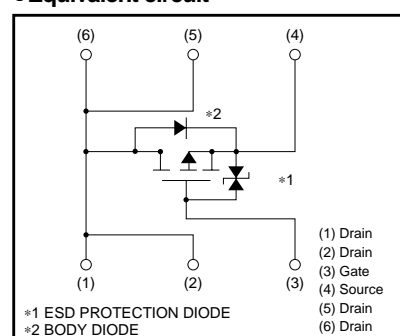
●Packaging specifications

Type	Package	Taping
	Code	TR
	Basic ordering unit (pieces)	3000
RTL020P02		○

●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	A
	Pulsed	I_{DP} *1	±8	A
Source current (Body diode)	Continuous	I_S	-0.8	A
	Pulsed	I_{SP} *1	-8	A
Total power dissipation		P_D *2	1	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 cycle $\leq 1\%$

*2 Mounted on a ceramic board

●Thermal resistance

Parameter	Symbol	Limits	Unit
Channel to ambient	$R_{th(ch-a)}$ *	125	°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	$V_{GS} = \pm 12V$, $V_{DS} = 0V$
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	$R_{DS(on)}$	—	100	135	$m\Omega$	$I_D = -2A$, $V_{GS} = -4.5V$
		—	110	150	$m\Omega$	$I_D = -2A$, $V_{GS} = -4V$
		—	180	250	$m\Omega$	$I_D = -1A$, $V_{GS} = -2.5V$
Forward transfer admittance	$ Y_{fs} $	1.2	—	—	S	$V_{DS} = -10V$, $I_D = -1A$
Input capacitance	C_{iss}	—	430	—	pF	$V_{DS} = -10V$
Output capacitance	C_{oss}	—	80	—	pF	$V_{GS} = 0V$
Reverse transfer capacitance	C_{rss}	—	55	—	pF	$f = 1MHz$
Turn-on delay time	$t_{d(on)}$	—	11	—	ns	$I_D = -1A$
Rise time	t_r	—	13	—	ns	$V_{DD} = -15V$
Turn-off delay time	$t_{d(off)}$	—	38	—	ns	$V_{GS} = -4.5V$
Fall time	t_f	—	12	—	ns	$R_L = 15\Omega$
Total gate charge	Q_g	—	4.9	—	nC	$V_{DD} = -15V$ $R_L = 7.5\Omega$
Gate-source charge	Q_{gs}	—	1.2	—	nC	$V_{GS} = -4.5V$ $R_G = 10\Omega$
Gate-drain charge	Q_{gd}	—	1.3	—	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	$I_S = -0.8A$, $V_{GS} = 0V$

Transistors

●Electrical characteristic curves

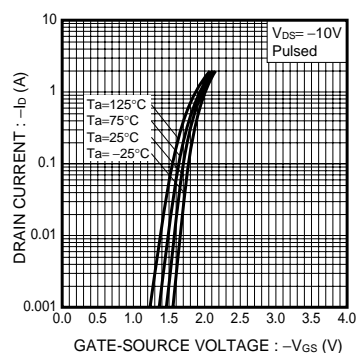


Fig.1 Typical Transfer Characteristics

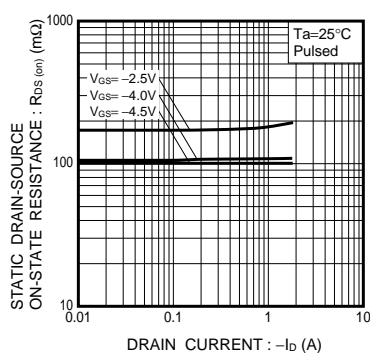


Fig.2 Static Drain-Source On-State Resistance vs. Drain Current

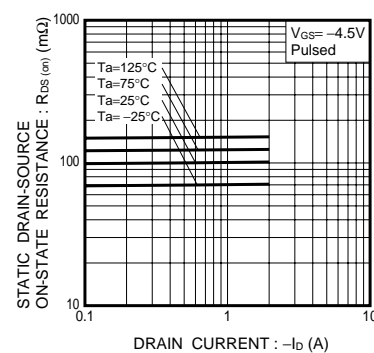


Fig.3 Static Drain-Source On-State Resistance vs. Drain Current

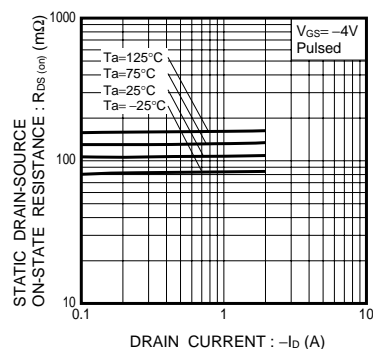


Fig.4 Static Drain-Source On-State Resistance vs. Drain Current

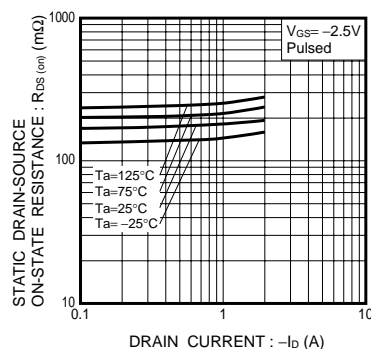


Fig.5 Static Drain-Source On-State Resistance vs. Drain Current

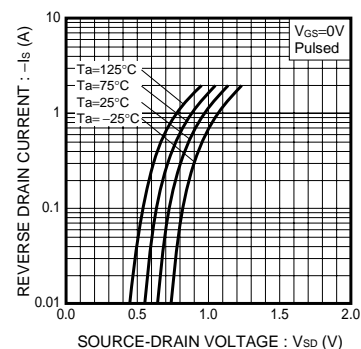


Fig.6 Reverse Drain Current vs. Source-Drain Voltage

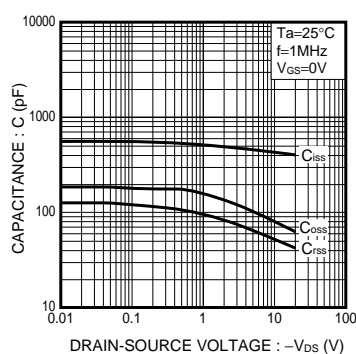


Fig.7 Typical Capacitance vs. Drain-Source Voltage

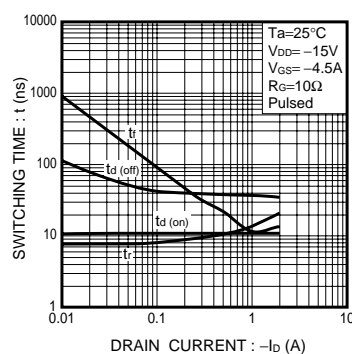


Fig.8 Switching Characteristics

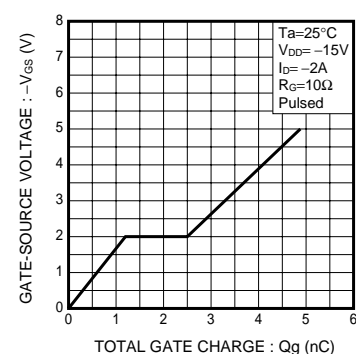


Fig.9 Dynamic Input Characteristics

Transistors

●Measurement circuits

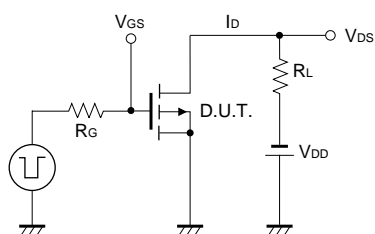


Fig.10 Switching Time Measurement Circuit

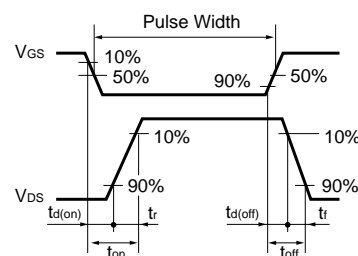


Fig.11 Switching Waveforms

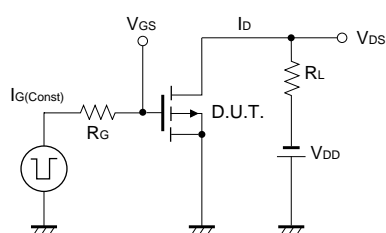


Fig.12 Gate Charge Measurement Circuit

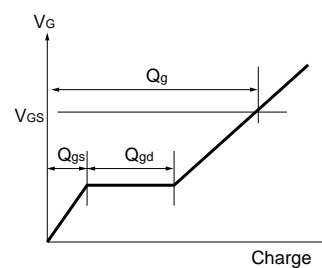


Fig.13 Gate Charge Waveforms

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