

2.5V Drive Pch MOS FET

RTR030P02

●Structure

Silicon P-channel

MOS FET

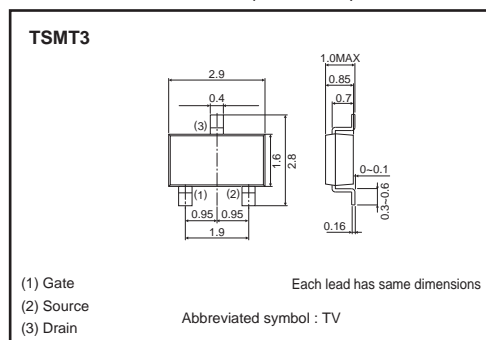
●Features

- 1) Low On-resistance.
- 2) Built-in G-S Protection Diode.
- 3) Small Surface Mount Package (TSMT3).

●Application

Power switching, DC / DC converter.

●External dimensions (Unit : mm)



●Packaging specifications

Type	Package	Taping
	Code	TL
	Basic ordering unit (pieces)	3000
RTR030P02		○

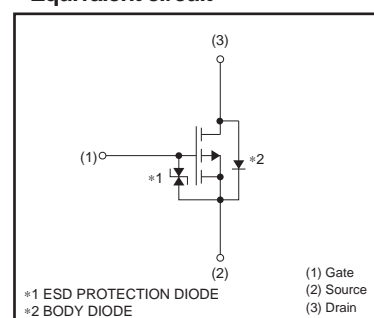
●Absolute maximum ratings (Ta=25°C)

Parameter		Symbol	Limits	Unit
Drain-source voltage		V _{DS}	−20	V
Gate-source voltage		V _{GS}	±12	V
Drain current	Continuous	I _D	±3.0	A
	Pulsed	I _{DP} *1	±12	A
Source current (Body diode)	Continuous	I _S	−0.8	A
	Pulsed	I _{SP} *1	−3.2	A
Total power dissipation		P _D *2	1.0	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

●Equivalent circuit



●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} =±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)} *	—	55	75	mΩ	I _D = −3.0A, V _{GS} = −4.5V
		—	60	85	mΩ	I _D = −3.0A, V _{GS} = −4.0V
		—	90	125	mΩ	I _D = −1.5A, V _{GS} = −2.5V
Forward transfer admittance	Y _{fs} *	2.5	—	—	S	V _{DS} = −10V, I _D = −1.5A
Input capacitance	C _{iss}	—	840	—	pF	V _{DS} = −10V
Output capacitance	C _{oss}	—	140	—	pF	V _{GS} =0V
Reverse transfer capacitance	C _{rss}	—	100	—	pF	f=1MHz
Turn-on delay time	t _{d (on)} *	—	12	—	ns	I _D = −1.5A
Rise time	t _r *	—	20	—	ns	V _{DD} ≒ −15V
Turn-off delay time	t _{d (off)} *	—	50	—	ns	V _{GS} = −4.5V
Fall time	t _f *	—	20	—	ns	R _L =10Ω
Total gate charge	Q _g	—	9.3	—	nC	V _{DD} ≒ −15V
Gate-source charge	Q _{gs}	—	1.6	—	nC	V _{GS} = −4.5V
Gate-drain charge	Q _{gd}	—	2.6	—	nC	I _D = −3.0A

*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

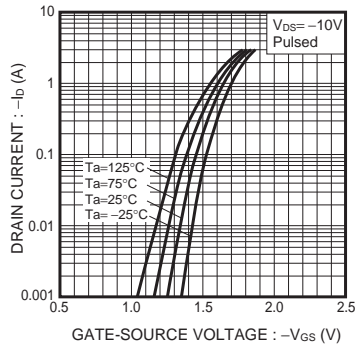


Fig.1 Typical Transfer Characteristics

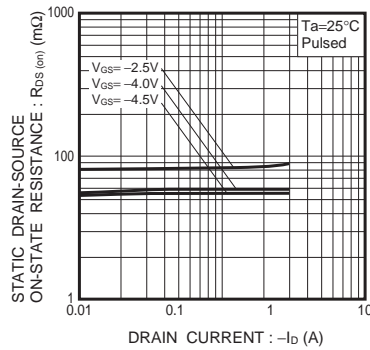


Fig.2 Static Drain-Source On-State Resistance vs. Drain Current

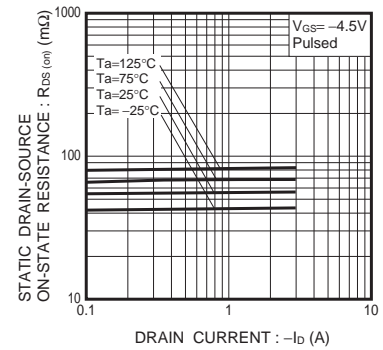


Fig.3 Static Drain-Source On-State Resistance vs. Drain Current

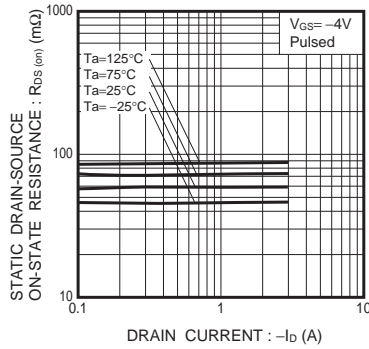


Fig.4 Static Drain-Source On-State Resistance vs. Drain Current

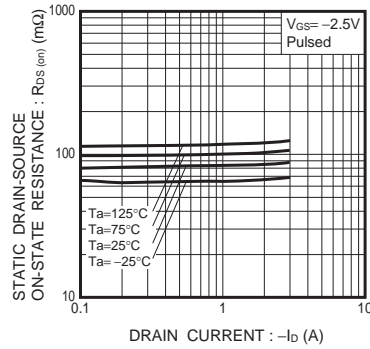


Fig.5 Static Drain-Source On-State Resistance vs. Drain Current

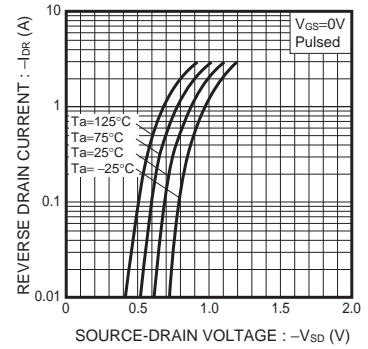


Fig.6 Reverse Drain Current vs. Source-Drain Voltage

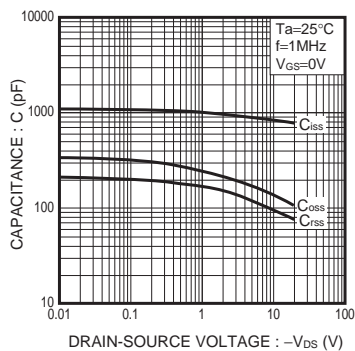


Fig.7 Typical Capacitance vs. Drain-Source Voltage

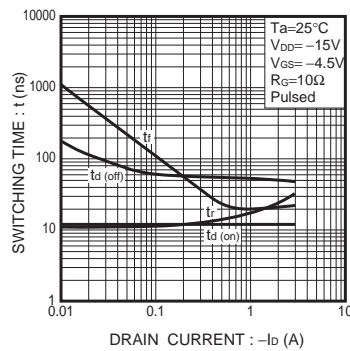


Fig.8 Switching Characteristics

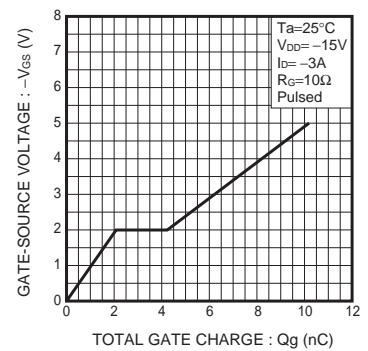


Fig.9 Dynamic Input Characteristics

Transistors

●Measurement circuits

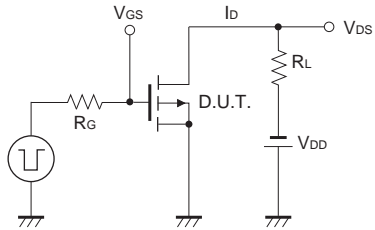


Fig.10 Switching Time Test Circuit

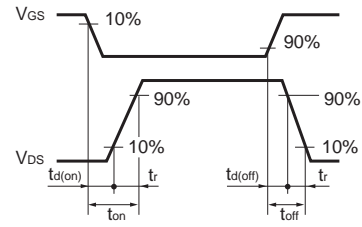


Fig.11 Switching Time Waveforms

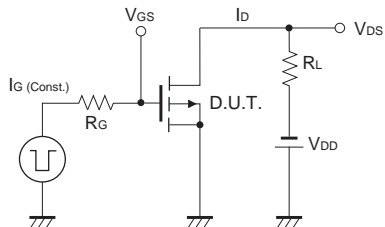


Fig.12 Gate Charge Test Circuit

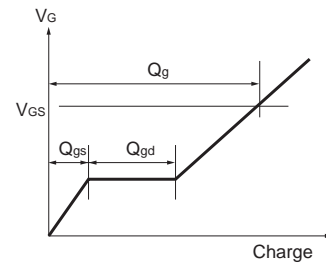


Fig.13 Gate Charge Waveform

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