

Transistors

Switching (-20V, -2.0A)

RTR020P02

●Features

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

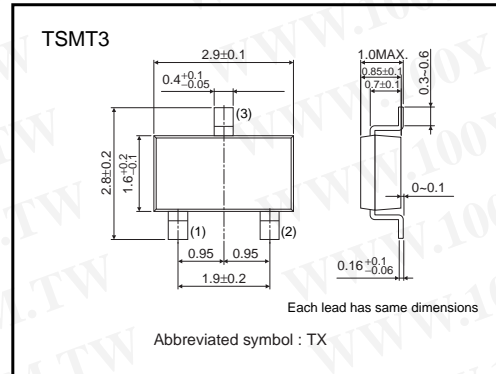
●Application

Power switching, DC / DC converter.

●Structure

Silicon P-channel
 MOS FET

●External dimensions (Unit : mm)



●Packaging specifications

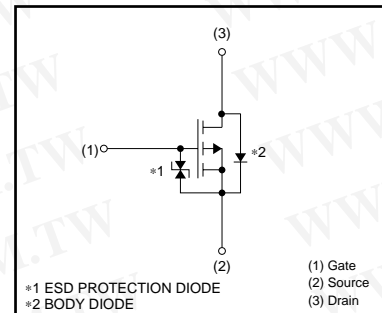
Type	Package	Taping
	Code	TL
	Basic ordering unit (pieces)	3000
RTR020P02		○

●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	±2.0
	Pulsed	I _{DP} *1	±8.0
Source current (Body diode)	Continuous	I _S	-0.8
	Pulsed	I _{SP} *1	-3.2
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 Pw≤10μs, Duty cycle≤1%
 *2 Mounted on a ceramic board

●Equivalent circuit



●Thermal resistance (Ta=25°C)

Parameter	Symbol	Limits	Unit
Channel to ambient	R _{th} (ch-A)	125	°C / W

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●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)} *	-	100	135	mΩ	I _D = -2.0A, V _{GS} = -4.5V
		-	110	150	mΩ	I _D = -2.0A, V _{GS} = -4.0V
		-	180	250	mΩ	I _D = -1.0A, V _{GS} = -2.5V
Forward transfer admittance	Y _{fs} *	1.2	-	-	S	V _{DS} = -10V, I _D = -1.0A
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 = -1.0A
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 =15Ω
Total gate charge	Q _g	-	4.9	-	nC	V _{DD} = -15V
Gate-source charge	Q _{gs}	-	1.2	-	nC	V _{GS} = -4.5V
Gate-drain charge	Q _{gd}	-	1.3	-	nC	I _D = -2.0A

*Pulsed

Body diode characteristics (source-drain characteristics)

Forward voltage	V _{SD}	-	-	-1.2	V	I _S = -0.8A, V _{GS} =0V
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●Electrical characteristic curves

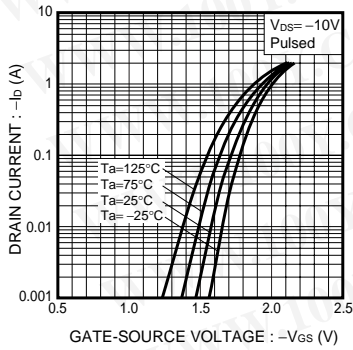


Fig.1 Typical Transfer Characteristics

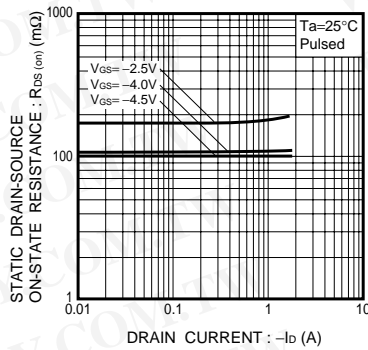


Fig.2 Static Drain-Source On-State Resistance vs. Drain Current

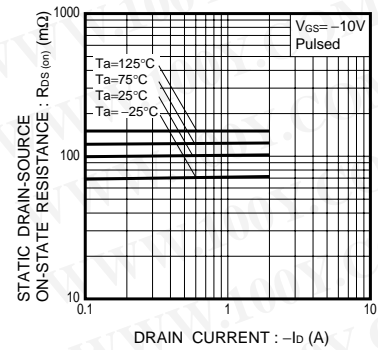


Fig.3 Static Drain-Source On-State Resistance vs. Drain Current

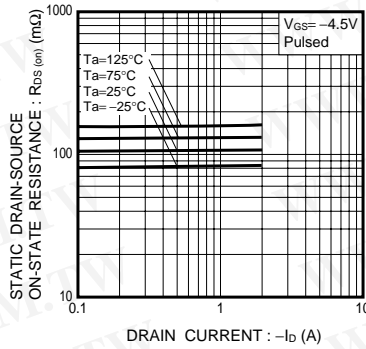


Fig.4 Static Drain-Source On-State Resistance vs. Drain Current

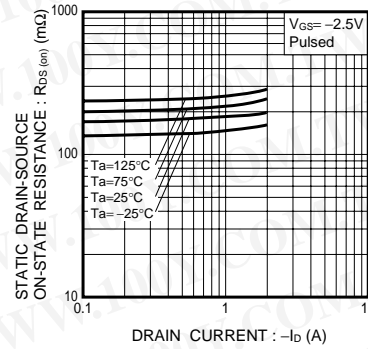


Fig.5 Static Drain-Source On-State Resistance vs. Drain Current

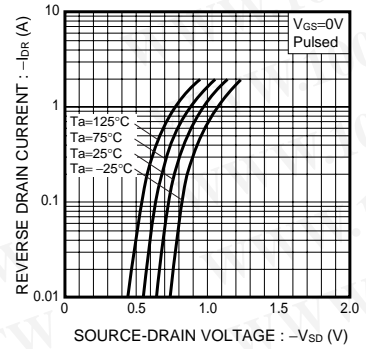


Fig.6 Reverse Drain Current vs. Source-Drain Voltage

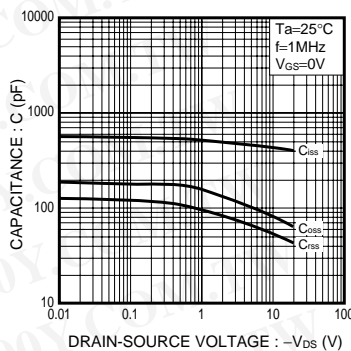


Fig.7 Typical Capacitance vs. Drain-Source Voltage

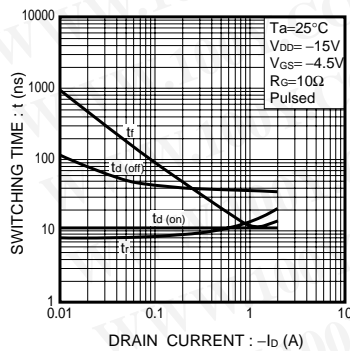


Fig.8 Switching Characteristics

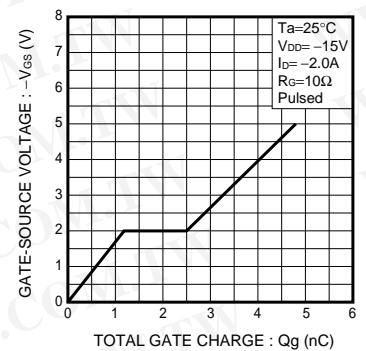


Fig.9 Dynamic Input Characteristics

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●Measurement circuits

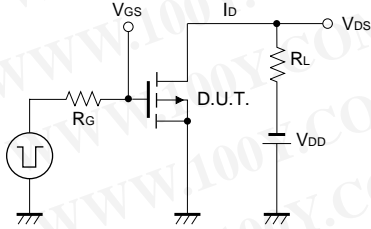


Fig.10 Switching Time Test Circuit

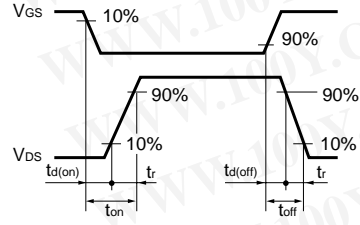


Fig.11 Switching Time Waveforms

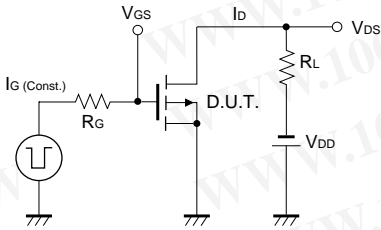


Fig.12 Gate Charge Test Circuit

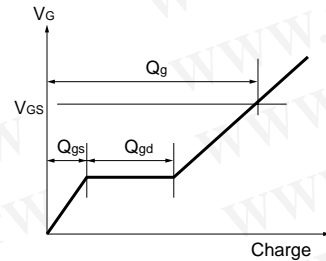


Fig.13 Gate Charge Waveform

Appendix

Notes

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