# Switching (30V, 2.5A)

## RSR025N03

#### Features

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

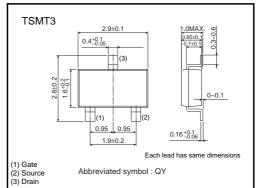
#### Application

Power switching, DC / DC converter.

#### ●Structure

Silicon N-channel MOS FET

#### ●External dimensions (Unit : mm)



#### Packaging specifications

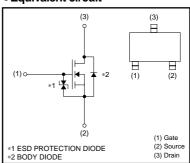
	Package	Taping
Туре	Code	TL
	Basic ordering unit (pieces)	3000
RSR025N03	0	

#### ● Absolute maximum ratings (Ta=25°C)

Parameter		Symbol	Limits	Unit	
Drain-source voltage		VDSS	30	V	
Gate-source voltage		Vgss	20	V	
Drain current	Continuous	ID	±2.5	Α	
	Pulsed	I <sub>DP</sub>	±10	A *	
Source current	Continuous	Is	0.8	Α	
(Body diode)	Pulsed	I <sub>SP</sub>	3.2	Α *	
Total power dissipation (T <sub>C</sub> =25°C)		PD	1	W	
Channel temperature		Tch	150	°C	
Storage temperature		Tstg	-55 to 150	°C	

<sup>\*1</sup> Pw≤10μs, Duty cycle≤1%

#### ●Equivalent circuit



A protection diode is included between the gate and the source terminals to protect the diode against static electricity when the product is in use. Use the protection circuit when the fixed voltages are exceeded.

#### ●Thermal resistance (Ta=25°C)

Parameter	Symbol	Limits	Unit	
Channel to ambient	Rth (ch-A)	125	°C / W	

#### ●Electrical characteristics (Ta=25°C)

Parameter	Symbol	Min.	Тур.	Max.	Unit	Conditions
Gate-source leakage	Igss	-	_	±10	μΑ	Vgs=±20V, Vps=0V
Drain-source breakdown voltage	V <sub>(BR) DSS</sub>	30	_	_	V	I <sub>D</sub> =1mA, V <sub>GS</sub> =0V
Zero gate voltage drain current	IDSS	-	_	1	μΑ	V <sub>DS</sub> =30V, V <sub>GS</sub> =0V
Gate threshold voltage	V <sub>GS (th)</sub>	1.0	-	2.5	V	V <sub>DS</sub> =10V, I <sub>D</sub> =1mA
Static drain-source on-state resistance		_	50	68		I <sub>D</sub> =2.5A, V <sub>GS</sub> =10V
	R <sub>DS (on)</sub> *	_	74	102	mΩ	I <sub>D</sub> =2.5A, V <sub>GS</sub> =4.5V
		_	83	115		I <sub>D</sub> =2.5A, V <sub>GS</sub> =4V
Forward transfer admittance	Y <sub>fs</sub> *	1.5	_	_	S	I <sub>D</sub> =2.5A, V <sub>DS</sub> =10V
Input capacitance	Ciss	_	165	_	pF	Vps=10V
Output capacitance	Coss	_	55	_	pF	Vgs=0V
Reverse transfer capacitance	Crss	_	35	_	pF	f=1MHz
Turn-on delay time	t <sub>d (on)</sub> *	-	6	_	ns	I <sub>D</sub> =1.25A, V <sub>DD</sub> ≒15V
Rise time	<b>t</b> r *	_	10	_	ns	V <sub>GS</sub> =10V
Turn-off delay time	t <sub>d (off)</sub> *	_	20	_	ns	R <sub>L</sub> =12.0Ω
Fall time	t <sub>f</sub> *	-	5	_	ns	R <sub>GS</sub> =10Ω
Total gate charge	Qg *	-	2.9	4.1	nC	V <sub>DD</sub> =15V
Gate-source charge	Qgs *	_	0.8	_	nC	V <sub>GS</sub> =10V
Gate-drain charge	Q <sub>gd</sub> *	_	0.9	_	nC	ID=2.5A

<sup>\*</sup>Pulsed

### $\bullet \textbf{Body diode characteristics (Source-Drain Characteristics)} \ (\textbf{Ta=25}^{\circ}\textbf{C}) \\$

Parameter	Symbol	Min.	Тур.	Max.	Unit	Conditions
Forward voltage	V <sub>SD</sub> *	-	_	1.2	V	Is=3.2A, Vgs=0V

<sup>\*</sup>Pulsed

#### Electrical characteristic curves

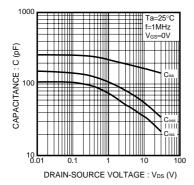


Fig.1 Typical Capacitance vs. Drain-Source Voltage

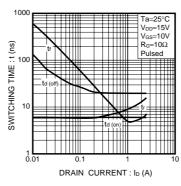


Fig.2 Switching Characteristics

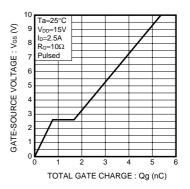


Fig.3 Dynamic Input Characteristics

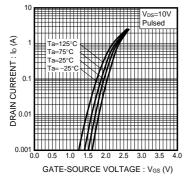


Fig.4 Typical Transfer Characteristics

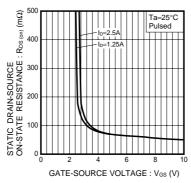


Fig.5 Static Drain-Source On-State Resistance vs. Gate-Source Voltage

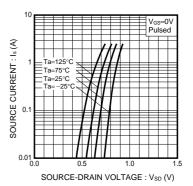


Fig.6 Source Current vs. Source-Drain Voltage

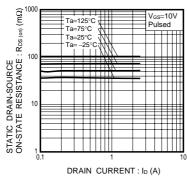


Fig.7 Static Drain-Source On-State Resistance vs. Drain Current (I)

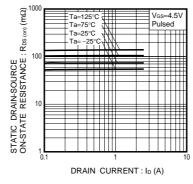


Fig.8 Static Drain-Source On-State Resistance vs. Drain Current (II)

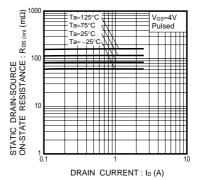


Fig.9 Static Drain-Source On-State Resistance vs. Drain Current (III)

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