

Transistors

2.5V Drive Nch MOS FET

RTR020N05

●Structure

Silicon N-channel MOS FET

●Features

- 1) Low On-resistance.
- 2) Space saving, small surface mount package (TSMT3).
- 3) Low voltage drive (2.5V drive).

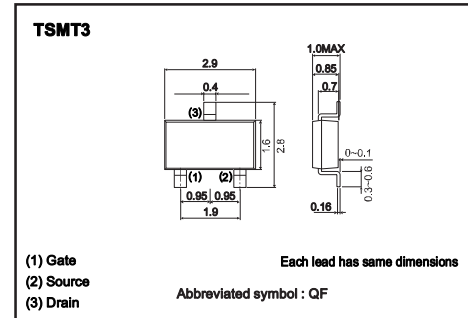
●Applications

Switching

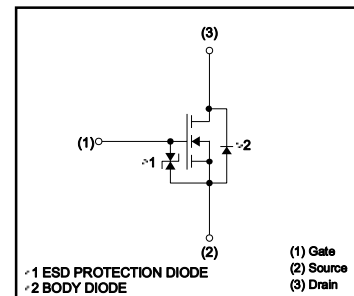
●Packaging specifications and hFE

Type	Package	Taping
	Code	TL
	Basic ordering unit (pieces)	3000
RTR020N05		○

●External dimensions (Unit : mm)



●Inner circuit

●Absolute maximum ratings ($T_a=25^\circ\text{C}$)

Parameter	Symbol	Limits	Unit	
Drain-source voltage	V_{DS}	45	V	
Gate-source voltage	V_{GS}	12	V	
Drain current	Continuous	I_D	± 2.0	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	1.0	W	
Channel temperature	T_{ch}	150	$^\circ\text{C}$	
Range of storage temperature	T_{stg}	-55 to +150	$^\circ\text{C}$	

*1 $P_w \leq 10\mu\text{s}$, Duty cycle $\leq 1\%$

*2 Mounted on a ceramic board

●Thermal resistance

Parameter	Symbol	Limits	Unit
Channel to ambient	$R_{th(ch-a)}$ *1	125	$^\circ\text{C/W}$

*1 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	$V_{(BR)DSS}$	45	–	–	V	$I_D=1mA, V_{GS}=0V$
Zero gate voltage drain current	I_{DSS}	–	–	1	μA	$V_{DS}=45V, V_{GS}=0V$
Gate threshold voltage	$V_{GS(th)}$	0.5	–	1.5	V	$V_{DS}=10V, I_D=1mA$
Static drain-source on-state resistance	$R_{DS(on)}$	–	130	180	$m\Omega$	$I_D=2.0A, V_{GS}=4.5V$
		–	135	190	$m\Omega$	$I_D=2.0A, V_{GS}=4V$
		–	180	250	$m\Omega$	$I_D=2.0A, V_{GS}=2.5V$
Forward transfer admittance	$ Y_{fs} $	1.5	–	–	S	$V_{DS}=10V, I_D=2.0A$
Input capacitance	C_{iss}	–	200	–	pF	$V_{DS}=10V$
Output capacitance	C_{oss}	–	45	–	pF	$V_{GS}=0V$
Reverse transfer capacitance	C_{rss}	–	25	–	pF	$f=1MHz$
Turn-on delay time	$t_d(on)$	–	11	–	ns	$V_{DD}=25V$ $I_D=1.0A$
Rise time	t_r	–	16	–	ns	$V_{GS}=4.5V$
Turn-off delay time	$t_d(off)$	–	21	–	ns	$R_L=25\Omega$
Fall time	t_f	–	11	–	ns	$R_G=10\Omega$
Total gate charge	Q_g	–	2.9	4.1	nC	$V_{DD}=25V, V_{GS}=4.5V$
Gate-source charge	Q_{gs}	–	0.7	–	nC	$I_D=2.0A$
Gate-drain charge	Q_{gd}	–	0.9	–	nC	$R_L=12.5\Omega, R_G=10\Omega$

Pulsed

●Body diode characteristics (Source-drain) (Ta=25°C)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Forward voltage	V_{SD}	–	–	1.2	V	$I_S=0.8A, V_{GS}=0V$

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