

# **4V Drive Nch MOSFET**

# RHP020N06

#### Structure

Silicon N-channel MOSFET

## ● Features

- 1) Low On-resistance.
- 2) High speed switching.
- 3) Wide SOA.

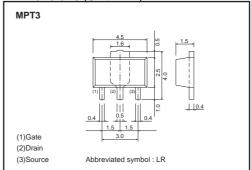
# Applications

Switching

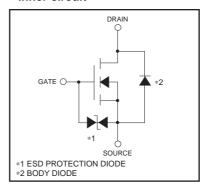
## ●Packaging specifications and hfE

	Package	Taping	
Type	Code	T100	
	Basic ordering unit (pieces)	1000	
RHP020N06		0	

## ● Dimensions (Unit: mm)



#### ●Inner circuit



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

Parameter		Symbol	Limits	Unit	
Drain-source voltage		VDSS	60	V	
Gate-source voltage		V <sub>GSS</sub>	±20	V	
Drain current	Continuous	$I_D$	±2	Α	
Drain current	Pulsed	I <sub>DP</sub> *1	±8	А	
Source current	Continuous	Is	2	A	
Source current	Pulsed	I <sub>SP</sub> *1	8	А	
Total names discination	Pp	500	mW		
Total power dissipation		FD	2	W *2	
Channel temperature	Tch	150	°C		
Range of storage temperature		Tstg	-55 to +150	°C	

#### ●Thermal resistance

Parameter	Symbol	Limits	Unit
Channel to ambient	Dth/ah a)	250	°C/W
Channel to ambient	Rth(ch-a)	62.5	°C/W *

<sup>\*</sup> When mounted on a 40×40×0.7mm ceramic board

<sup>\*1</sup> Pw≤10μs, Duty cycle≤1% \*2 When mounted on a 40×40×0.7mm ceramic board

# ●Electrical characteristics (Ta=25°C)

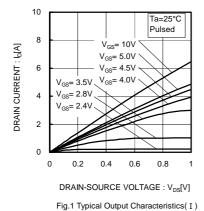
Parameter	Symbol	Min.	Тур.	Max.	Unit	Conditions
Gate-source leakage	I <sub>GSS</sub>	-	_	±10	μΑ	V <sub>GS</sub> = ±20V, V <sub>DS</sub> =0V
Drain-source breakdown voltage	V <sub>(BR)</sub> DSS	60	_	_	V	I <sub>D</sub> = 1mA, V <sub>GS</sub> =0V
Zero gate voltage drain current	IDSS	-	-	1	μΑ	V <sub>DS</sub> = 60V, 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
Ctatia duain annua an atata	R <sub>DS</sub> (on)*	-	150	200	mΩ	I <sub>D</sub> = 2A, V <sub>GS</sub> = 10V
Static drain-source on-state resistance		-	200	280	mΩ	I <sub>D</sub> = 2A, V <sub>GS</sub> = 4.5V
resistance		-	240	340	mΩ	I <sub>D</sub> = 2A, V <sub>GS</sub> = 4V
Forward transfer admittance	Y <sub>fs</sub> *	2.0	_	_	S	V <sub>DS</sub> = 10V, I <sub>D</sub> = 2A
Input capacitance	Ciss	_	140	_	pF	V <sub>DS</sub> = 10V
Output capacitance	Coss	-	50	_	pF	V <sub>GS</sub> =0V
Reverse transfer capacitance	Crss	-	40	-	pF	f=1MHz
Turn-on delay time	t <sub>d (on)</sub> *	_	7	_	ns	V <sub>DD</sub> ≒ 30V
Rise time	tr *	-	10	_	ns	ID= 1A
Turn-off delay time	td (off) *	_	22	_	ns	Vgs= 10V RL=30Ω
Fall time	t <sub>f</sub> *	-	18	_	ns	R <sub>G</sub> =10Ω
Total gate charge	Qg *	-	7	14	nC	V <sub>DD</sub> ≒30V
Gate-source charge	Qgs *	_	1	-	nC	Vgs= 10V
Gate-drain charge	Q <sub>gd</sub> *	_	2	_	nC	I <sub>D</sub> = 2A

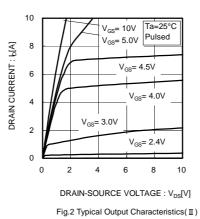
<sup>\*</sup>Pulsed

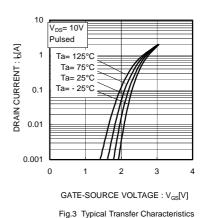
# ●Body diode characteristics (Source-drain) (Ta=25°C)

	•		, ,			
Parameter	Symbol	Min.	Тур.	Max.	Unit	Conditions
Forward voltage	Vsn	_	_	12	V	Is= 2A Vcs=0V

#### •Electrical characteristics curves







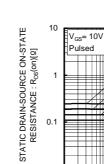
STATIC DRAIN-SOURCE ON-STATE RESISTANCE: RDS(on)[\varDelta]

Ta= 25°C

0.1

0.01

0.01



0.01

0.01

10

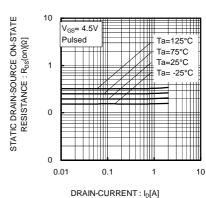


Fig.4 Static Drain-Source On-State Resistance vs. Drain Current( I )

DRAIN-CURRENT : I<sub>D</sub>[A]

0.1

V<sub>GS</sub>= 4.5V

V<sub>GS</sub>= 10V

DRAIN-CURRENT : I<sub>D</sub>[A] Fig.5 Static Drain-Source On-State Resistance vs. Drain Current( II )

0.1

Ta=125°C

Ta=75°C

Ta=25°C

Ta= -25°C

10

Fig.6 Static Drain-Source On-State Resistance vs. Drain Current(Ⅲ)

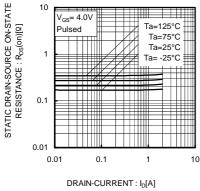


Fig.7 Static Drain-Source On-State Resistance vs. Drain Current(IV)

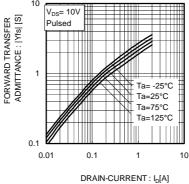


Fig.8 Forward Transfer Admittance vs. Drain Current

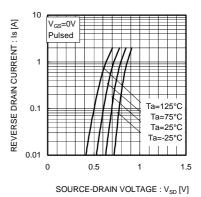


Fig.9 Reverse Drain Current vs. Sourse-Drain Voltage

RHP020N06 **Data Sheet** 

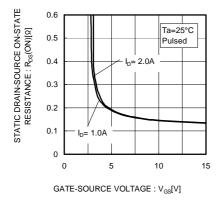


Fig.10 Static Drain-Source On-State Resistance vs. Gate Source Voltage

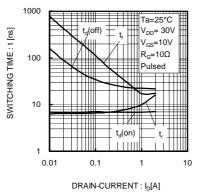


Fig.11 Switching Characteristics

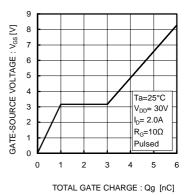


Fig.12 Dynamic Input Characteristics

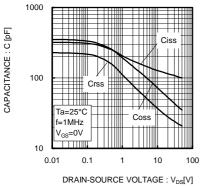


Fig.13 Typical Capacitance vs. Drain-Source Voltage

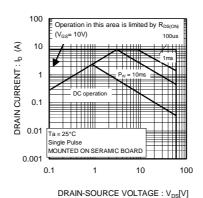
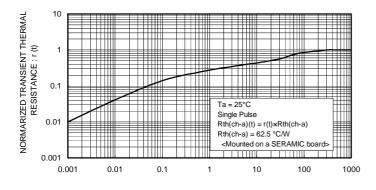


Fig.14 Maximum Safe Operating Aera



PULSE WIDTH: Pw(s) Fig.15 Normalized Transient Thermal Resistance vs. Pulse Width

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