

# 4V Drive Nch MOSFET

## RHP020N06

●Structure

Silicon N-channel MOSFET

●Features

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

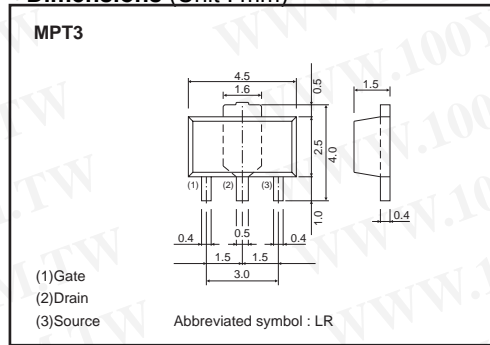
●Applications

Switching

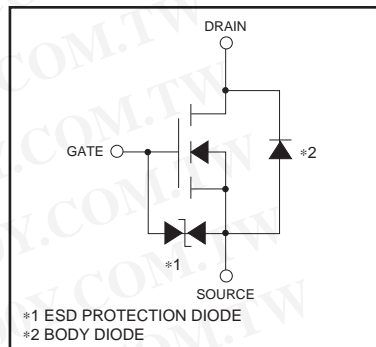
●Packaging specifications and hFE

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

●Dimensions (Unit : mm)



●Inner circuit



●Absolute maximum ratings (Ta=25°C)

Parameter	Symbol	Limits	Unit
Drain-source voltage	$V_{DS}$	60	V
Gate-source voltage	$V_{GS}$	$\pm 20$	V
Drain current	Continuous	$I_D$	$\pm 2$ A
	Pulsed	$I_{DP}$ *1	$\pm 8$ A
Source current	Continuous	$I_S$	2 A
	Pulsed	$I_{SP}$ *1	8 A
Total power dissipation	$P_D$	500	mW
		2	W *2
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 When mounted on a 40x40x0.7mm ceramic board

●Thermal resistance

Parameter	Symbol	Limits	Unit
Channel to ambient	$R_{th(ch-a)}$	250	°C/W
		62.5	°C/W *

\* When mounted on a 40x40x0.7mm ceramic board

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

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Gate-source leakage	I <sub>GSS</sub>	–	–	±10	μA	V <sub>GS</sub> = ±20V, V <sub>DS</sub> =0V
Drain-source breakdown voltage	V <sub>(BR) DSS</sub>	60	–	–	V	I <sub>D</sub> = 1mA, V <sub>GS</sub> =0V
Zero gate voltage drain current	I <sub>DSS</sub>	–	–	1	μA	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
Static drain-source on-state resistance	R <sub>DS(on)</sub> *	–	150	200	mΩ	I <sub>D</sub> = 2A, V <sub>GS</sub> = 10V
		–	200	280	mΩ	I <sub>D</sub> = 2A, V <sub>GS</sub> = 4.5V
		–	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	C <sub>iss</sub>	–	140	–	pF	V <sub>DS</sub> = 10V
Output capacitance	C <sub>oss</sub>	–	50	–	pF	V <sub>GS</sub> =0V
Reverse transfer capacitance	C <sub>rss</sub>	–	40	–	pF	f=1MHz
Turn-on delay time	t <sub>d(on)</sub> *	–	7	–	ns	V <sub>DD</sub> = 30V
Rise time	t <sub>r</sub> *	–	10	–	ns	I <sub>D</sub> = 1A
Turn-off delay time	t <sub>d(off)</sub> *	–	22	–	ns	V <sub>GS</sub> = 10V
Fall time	t <sub>f</sub> *	–	18	–	ns	R <sub>L</sub> =30Ω
Total gate charge	Q <sub>g</sub> *	–	7	14	nC	V <sub>DD</sub> = 30V
Gate-source charge	Q <sub>gs</sub> *	–	1	–	nC	V <sub>GS</sub> = 10V
Gate-drain charge	Q <sub>gd</sub> *	–	2	–	nC	I <sub>D</sub> = 2A

\*Pulsed

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

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Forward voltage	V <sub>SD</sub>	–	–	1.2	V	I <sub>S</sub> = 2A, V <sub>GS</sub> =0V

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●Electrical characteristics curves

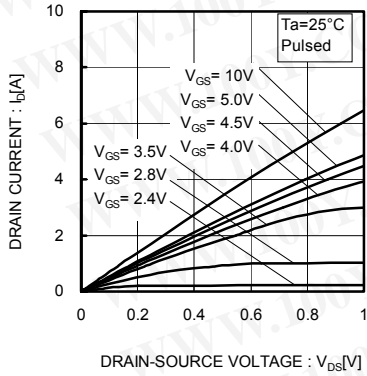


Fig.1 Typical Output Characteristics (I)

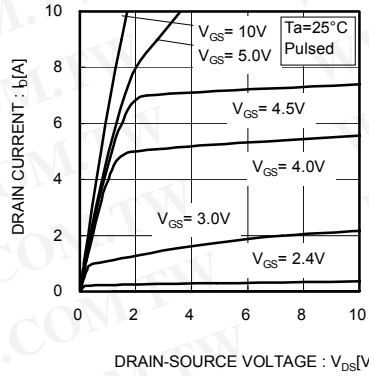


Fig.2 Typical Output Characteristics (II)

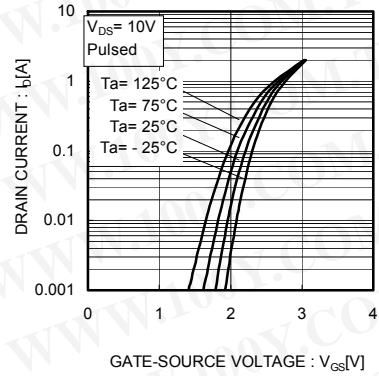


Fig.3 Typical Transfer Characteristics

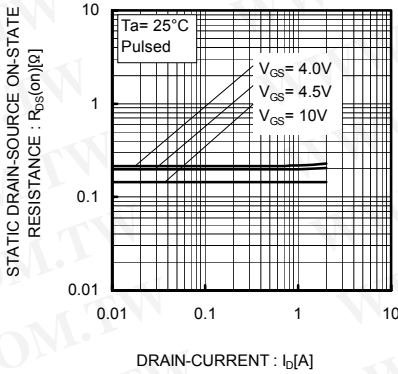


Fig.4 Static Drain-Source On-State Resistance vs. Drain Current (I)

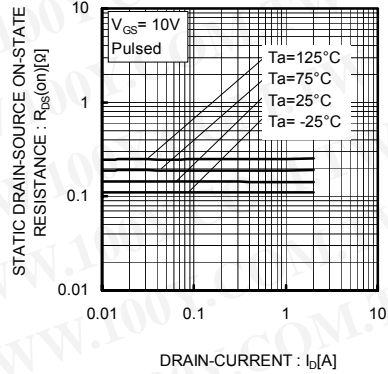


Fig.5 Static Drain-Source On-State Resistance vs. Drain Current (II)

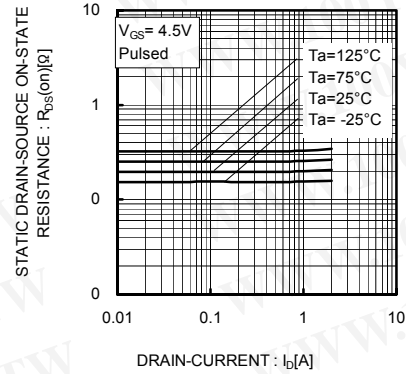


Fig.6 Static Drain-Source On-State Resistance vs. Drain Current (III)

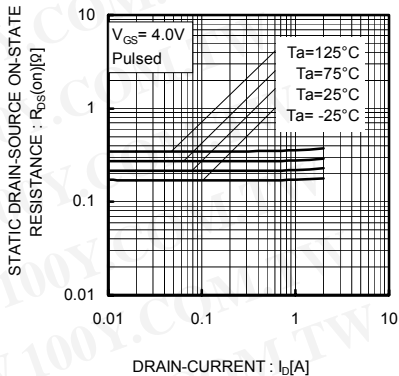


Fig.7 Static Drain-Source On-State Resistance vs. Drain Current (IV)

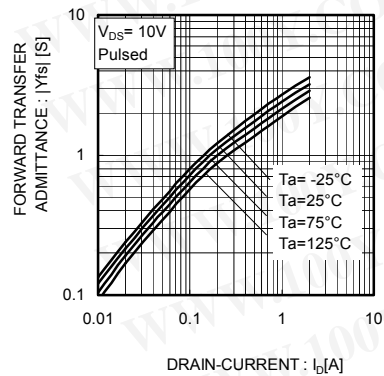


Fig.8 Forward Transfer Admittance vs. Drain Current

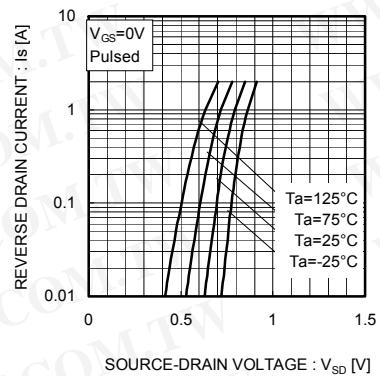


Fig.9 Reverse Drain Current vs. Source-Drain Voltage

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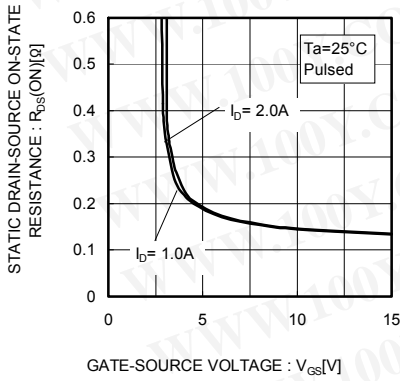


Fig.10 Static Drain-Source On-State Resistance vs. Gate Source Voltage

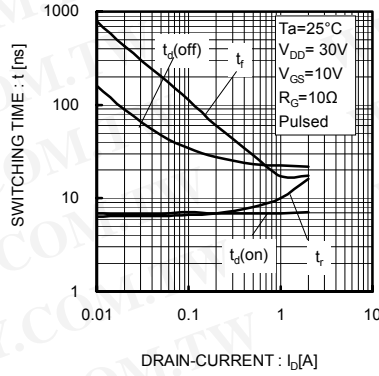


Fig.11 Switching Characteristics

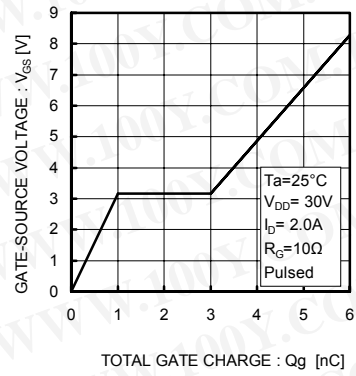


Fig.12 Dynamic Input Characteristics

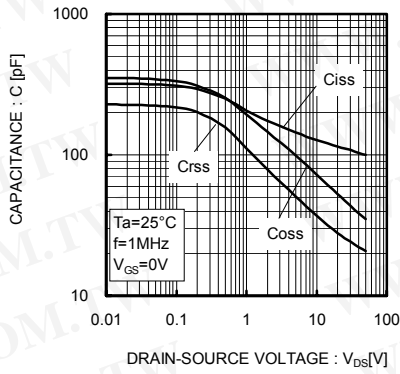


Fig.13 Typical Capacitance vs. Drain-Source Voltage

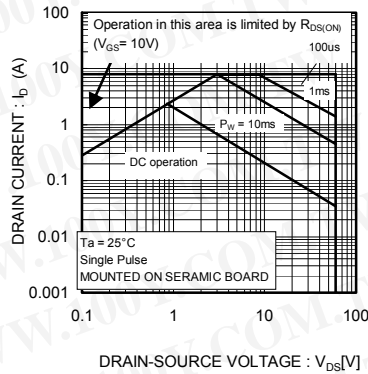


Fig.14 Maximum Safe Operating Area

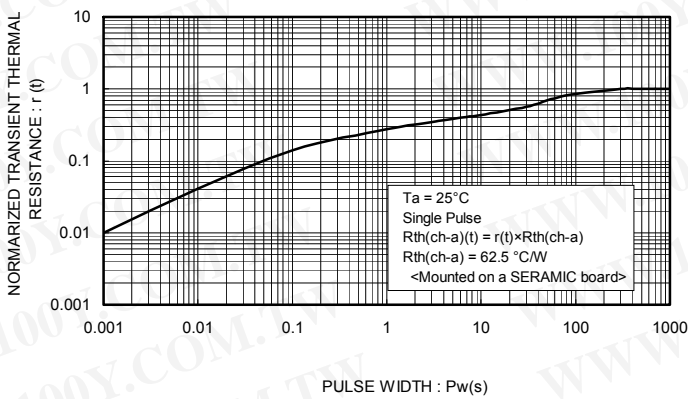


Fig.15 Normalized Transient Thermal Resistance vs. Pulse Width

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