

4V Drive Nch MOSFET

RHP020N06

●Structure

Silicon N-channel MOSFET

●Features

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

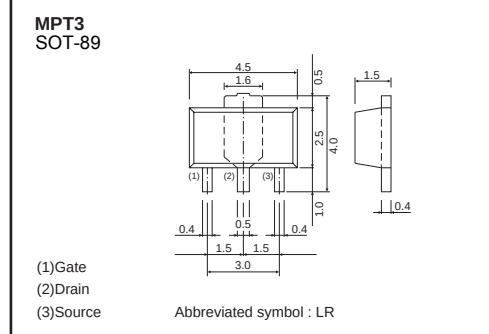
●Applications

Switching

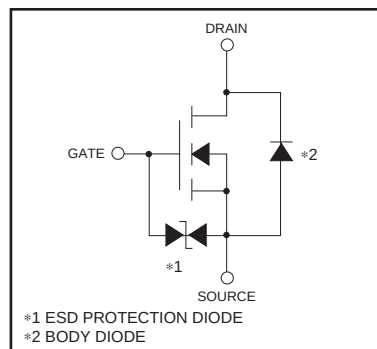
●Packaging specifications and hFE

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}	± 20	V
Drain current	Continuous	I_D	± 2	A
	Pulsed	I_{DP} *1	± 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 40×40×0.7mm 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 40×40×0.7mm ceramic board

●Electrical characteristics (Ta=25°C)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Gate-source leakage	I_{GSS}	–	–	±10	μA	$V_{GS} = \pm 20V$, $V_{DS} = 0V$
Drain-source breakdown voltage	$V_{(BR) DSS}$	60	–	–	V	$I_D = 1mA$, $V_{GS} = 0V$
Zero gate voltage drain current	I_{DSS}	–	–	1	μA	$V_{DS} = 60V$, $V_{GS} = 0V$
Gate threshold voltage	$V_{GS(th)}$	1.0	–	2.5	V	$V_{DS} = 10V$, $I_D = 1mA$
Static drain-source on-state resistance	$R_{DS(on)}^*$	–	150	200	mΩ	$I_D = 2A$, $V_{GS} = 10V$
		–	200	280	mΩ	$I_D = 2A$, $V_{GS} = 4.5V$
		–	240	340	mΩ	$I_D = 2A$, $V_{GS} = 4V$
Forward transfer admittance	$ Y_{fs} ^*$	2.0	–	–	S	$V_{DS} = 10V$, $I_D = 2A$
Input capacitance	C_{iss}	–	140	–	pF	$V_{DS} = 10V$
Output capacitance	C_{oss}	–	50	–	pF	$V_{GS} = 0V$
Reverse transfer capacitance	C_{rss}	–	40	–	pF	$f = 1MHz$
Turn-on delay time	$t_{d(on)}^*$	–	7	–	ns	$V_{DD} = 30V$
Rise time	t_r^*	–	10	–	ns	$I_D = 1A$
Turn-off delay time	$t_{d(off)}^*$	–	22	–	ns	$V_{GS} = 10V$
Fall time	t_f^*	–	18	–	ns	$R_L = 30\Omega$
Total gate charge	Q_g^*	–	7	14	nC	$V_{DD} = 30V$
Gate-source charge	Q_{gs}^*	–	1	–	nC	$V_{GS} = 10V$
Gate-drain charge	Q_{gd}^*	–	2	–	nC	$I_D = 2A$

*Pulsed

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

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Forward voltage	V_{SD}	–	–	1.2	V	$I_S = 2A$, $V_{GS} = 0V$

●Electrical characteristics curves

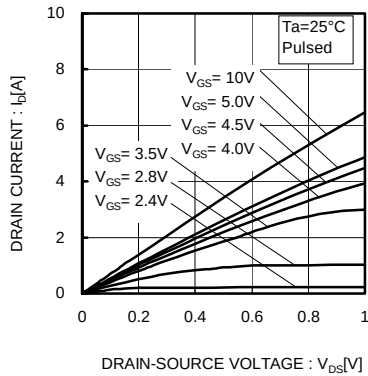


Fig.1 Typical Output Characteristics (I)

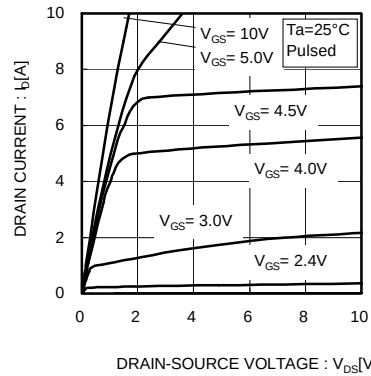


Fig.2 Typical Output Characteristics (II)

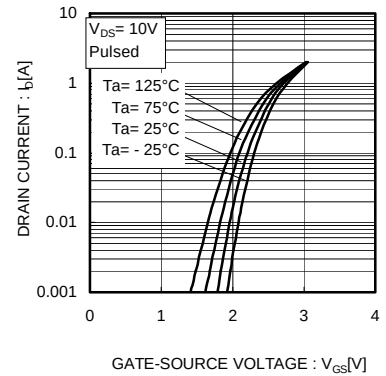


Fig.3 Typical Transfer Characteristics

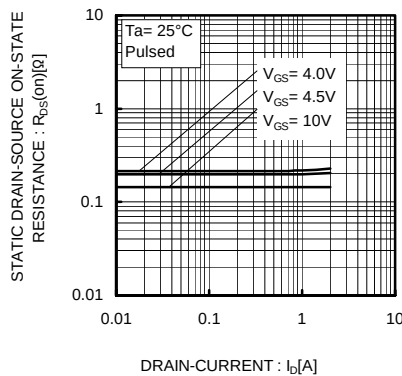


Fig.4 Static Drain-Source On-State Resistance vs. Drain Current (I)

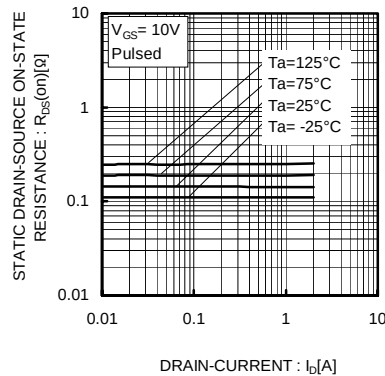


Fig.5 Static Drain-Source On-State Resistance vs. Drain Current (II)

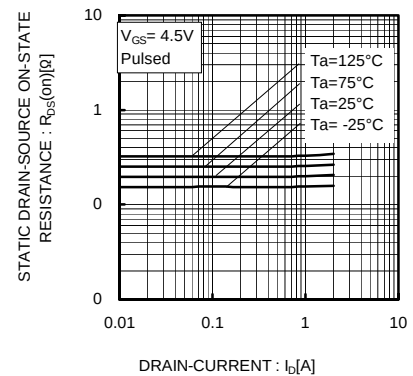


Fig.6 Static Drain-Source On-State Resistance vs. Drain Current (III)

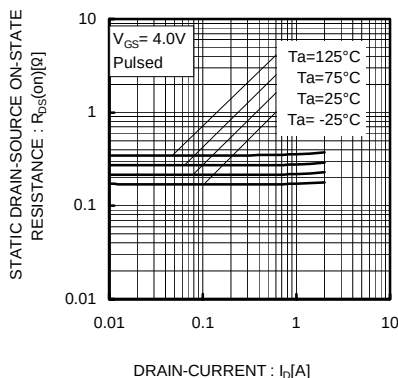


Fig.7 Static Drain-Source On-State Resistance vs. Drain Current (IV)

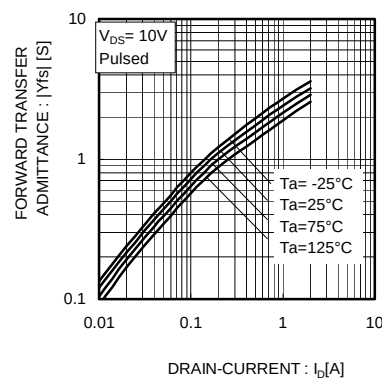


Fig.8 Forward Transfer Admittance vs. Drain Current

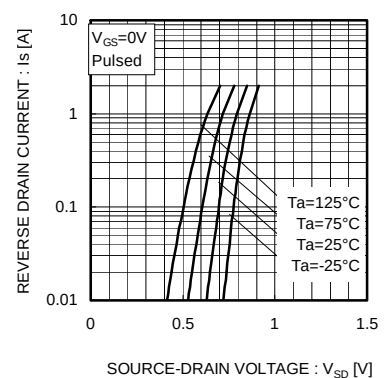


Fig.9 Reverse Drain Current vs. Source-Drain Voltage

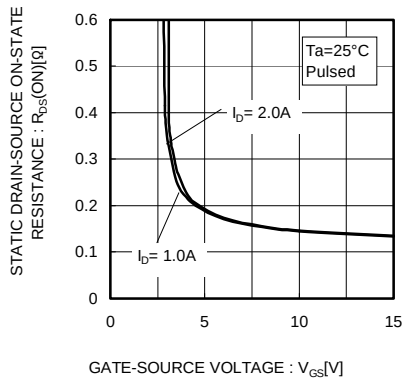


Fig.10 Static Drain-Source On-State Resistance vs. Gate Source Voltage

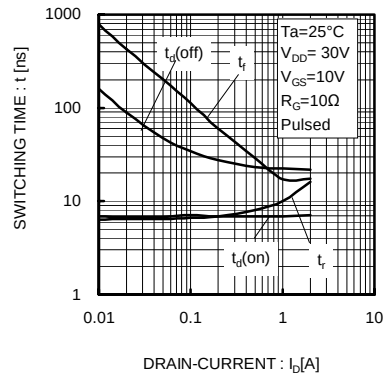


Fig.11 Switching Characteristics

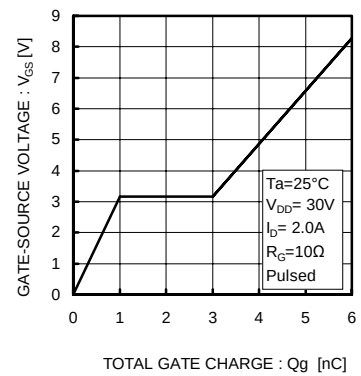


Fig.12 Dynamic Input Characteristics

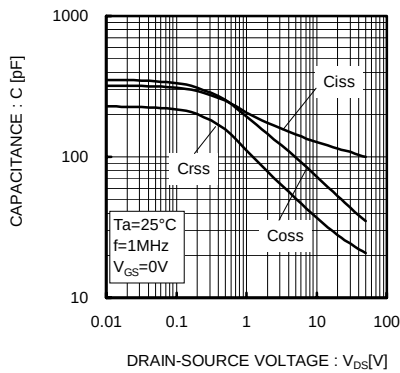


Fig.13 Typical Capacitance vs. Drain-Source Voltage

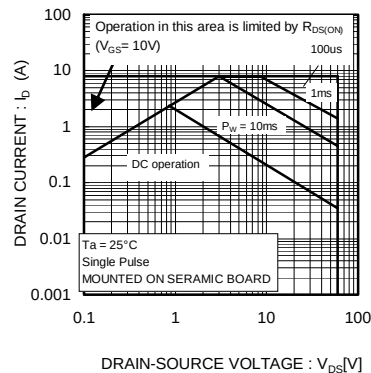


Fig.14 Maximum Safe Operating Area

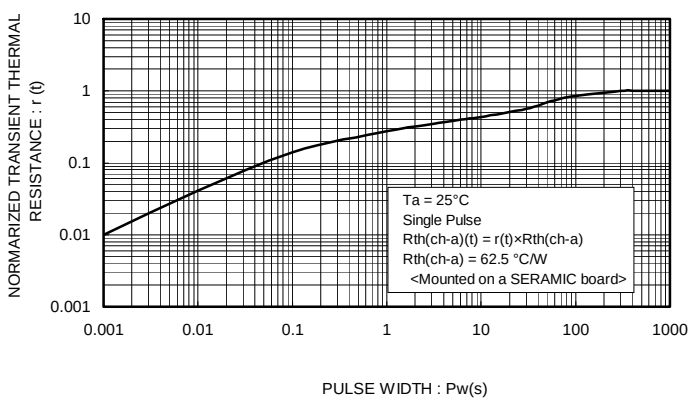


Fig.15 Normalized Transient Thermal Resistance vs. Pulse Width

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