4V Drive Nch MOSFET

RHP020N06

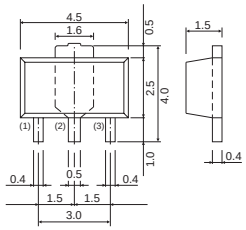
●Structure
Silicon N-channel MOSFET

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

●Applications
Switching

●Dimensions (Unit : mm)

MPT3



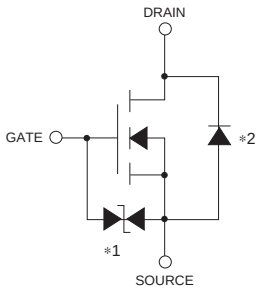
(1)Gate
(2)Drain
(3)Source

Abbreviated symbol : LR

●Packaging specifications and hFE

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

●Inner circuit



∗1 ESD PROTECTION DIODE
∗2 BODY DIODE

●Absolute maximum ratings (Ta=25°C)

Parameter		Symbol	Limits	Unit
Drain-source voltage		V_{DSS}	60	V
Gate-source voltage		V_{GSS}	±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		Tch	150	°C
Range of storage temperature		Tstg	−55 to +150	°C

∗1 Pw≤10μs, Duty cycle≤1%
∗2 When mounted on a 40×40×0.7mm ceramic board

●Thermal resistance

Parameter	Symbol	Limits	Unit
Channel to ambient	Rth(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}= ±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 I_D= 1A V_{GS}= 10V R_L=30Ω R_G=10Ω
Rise time	t_r *	–	10	–	ns	
Turn-off delay time	$t_{d\ (off)}$ *	–	22	–	ns	
Fall time	t_f *	–	18	–	ns	
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

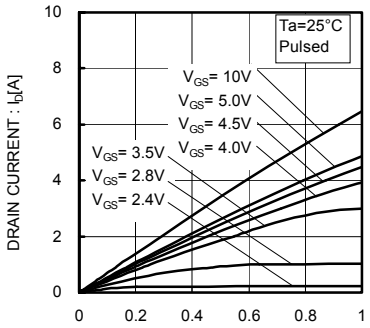


Fig.1 Typical Output Characteristics(Ⅰ)

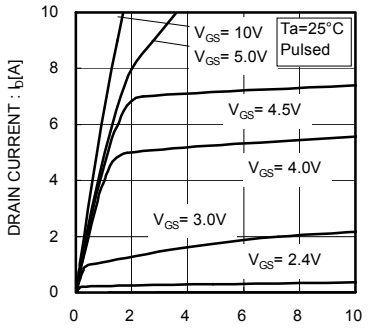


Fig.2 Typical Output Characteristics(Ⅱ)

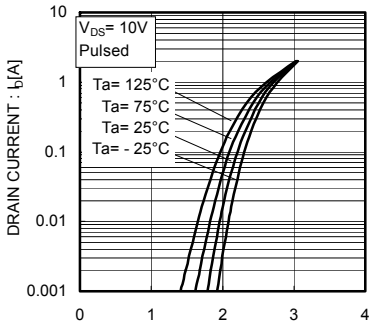


Fig.3 Typical Transfer Characteristics

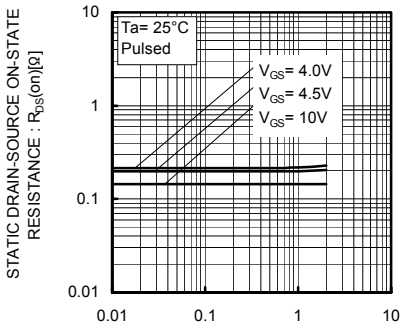


Fig.4 Static Drain-Source On-State Resistance vs. Drain Current(Ⅰ)

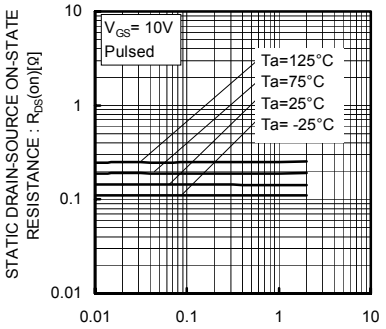


Fig.5 Static Drain-Source On-State Resistance vs. Drain Current(Ⅱ)

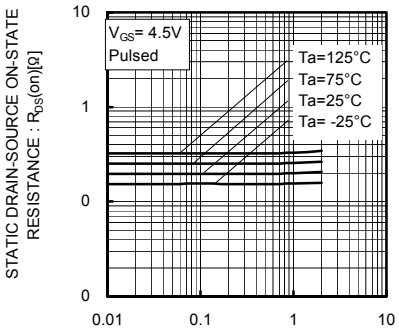


Fig.6 Static Drain-Source On-State Resistance vs. Drain Current(Ⅲ)

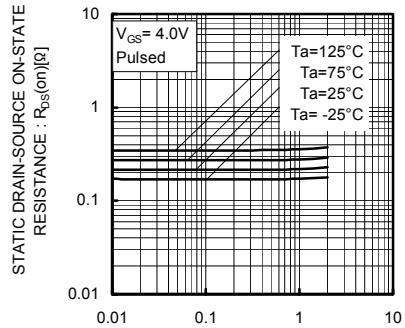


Fig.7 Static Drain-Source On-State Resistance vs. Drain Current(Ⅳ)

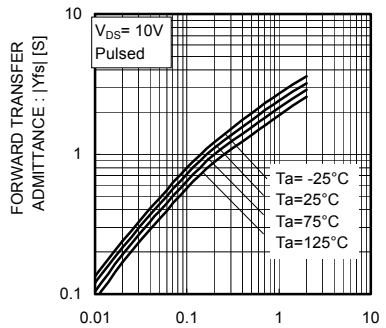


Fig.8 Forward Transfer Admittance vs. Drain Current

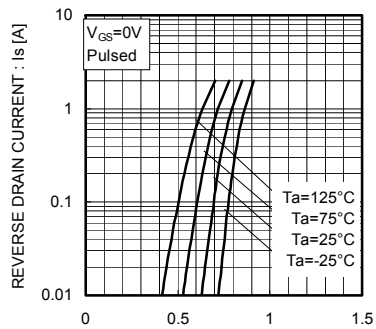


Fig.9 Reverse Drain Current vs. Sourse-Drain Voltage

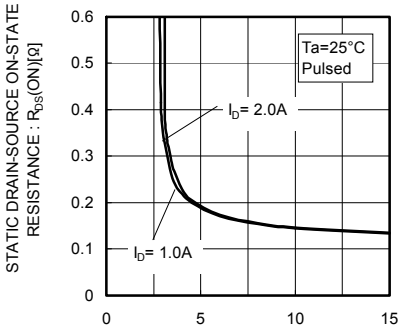


Fig.10 Static Drain-Source On-State Resistance vs. Gate Source Voltage

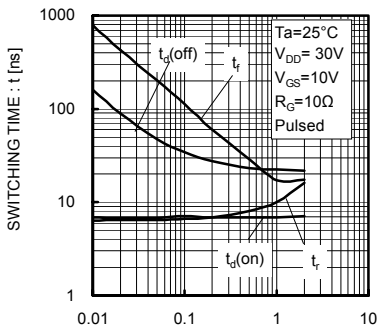


Fig.11 Switching Characteristics

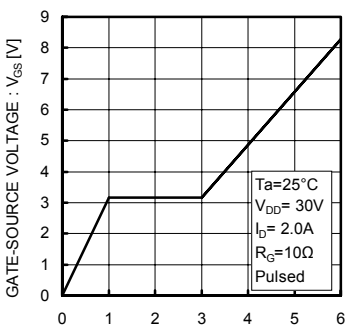


Fig.12 Dynamic Input Characteristics

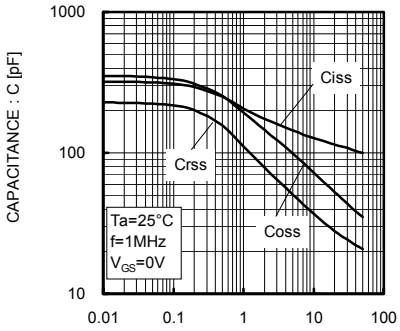


Fig.13 Typical Capacitance vs. Drain-Source Voltage

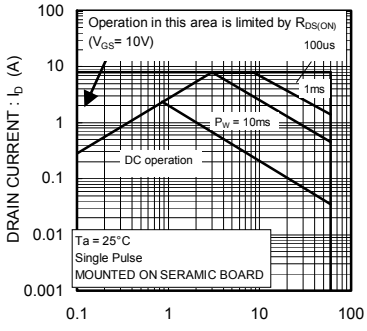


Fig.14 Maximum Safe Operating Aera

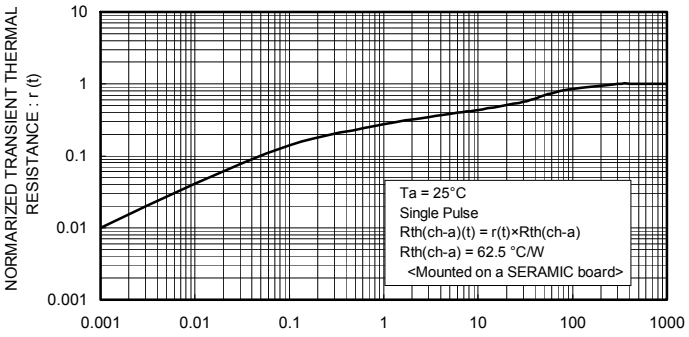


Fig.15 Normalized Transient Thermal Resistance vs. Pulse Width

Notes

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