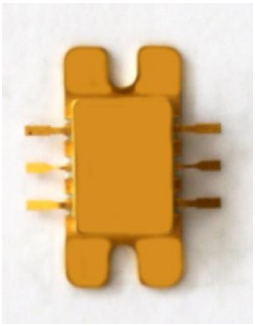
HPA060180P41-P

6-18 GHz GaN Power Amplifier Module

► *Features*

- Frequency: 6~18 GHz
- P_{sat}: 41dBm at P_{in}=25dBm
- Saturated Power Gain: 16dB @P_{in}=25dBm
- PAE: 25% Typ.
- Bias Voltage: V_D=28V, V_G=-1.8V (Typ.), I_{dq}=1.5A (Typ.)
- T_{JC}: 1.8°C/W
- T_{JT}: 3.5°C/W
- Dimension: 18.03mm x 8.7mm x 2.5mm



► *General Description*

HPA060180P41-P is a 6-18GHz high performance power amplifier module designed using 0.2um GaN HEMT process. The amplifier provides 16dB of gain and 41dBm of saturated power by 28V drain supply. The HPA060180P41-P is an ideal chip for T/R module, wireless communication and so on.

► *Absolute Maximum Ratings[1] (T_A=25°C)*

Symbol	Parameter	Value	Remark
Vd	Drain Voltage	30V	
Id	Drain Current	3.0A	
Vg	Gate Voltage	-10V	
Ig	Gate Current	150mA	
Pd	DC Power	60W	25°C
Pin	Input Power	30dBm	
Tch	Channel Temperature	200°C	
Tm	Mounting Temperature	300°C	1min, N_2 Protection
Tstg	Storage Temperature	-55～175°C	

1. Exceeding any one or combination of these limits may cause permanent damage

► *Electrical Characteristics*

Symbol	Parameter	Test Condition	Value			Unit
			Min.	Typ.	Max.	
P_{out}	Saturated Power	V_d=28V，V_g=-1.8V, F：6～18GHz P_{in}=25dBm		41	-	dB
Gp	Power Gain			16	-	dB
PAE	Power Added Efficiency			25	-	%

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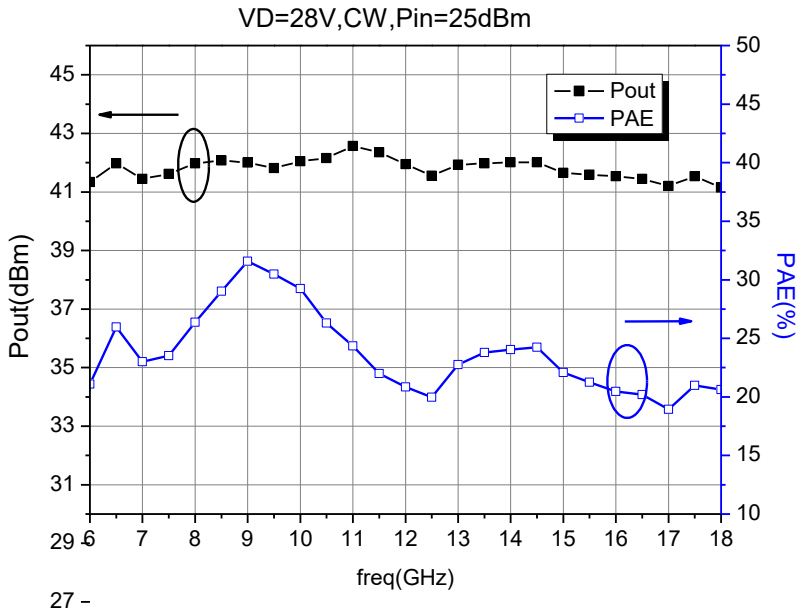
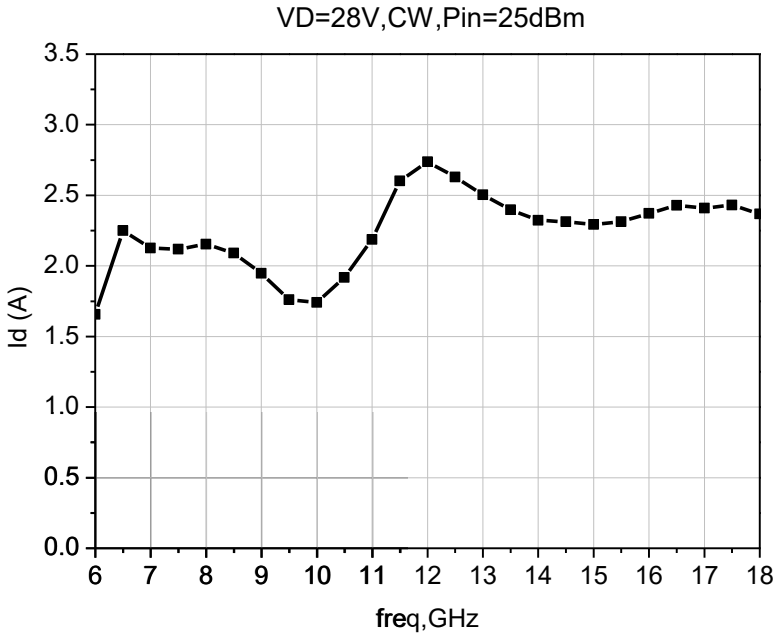
► *Typical Performance*

P_{sat} & PAE Vs. Frequency



Drain Current Vs. Frequency



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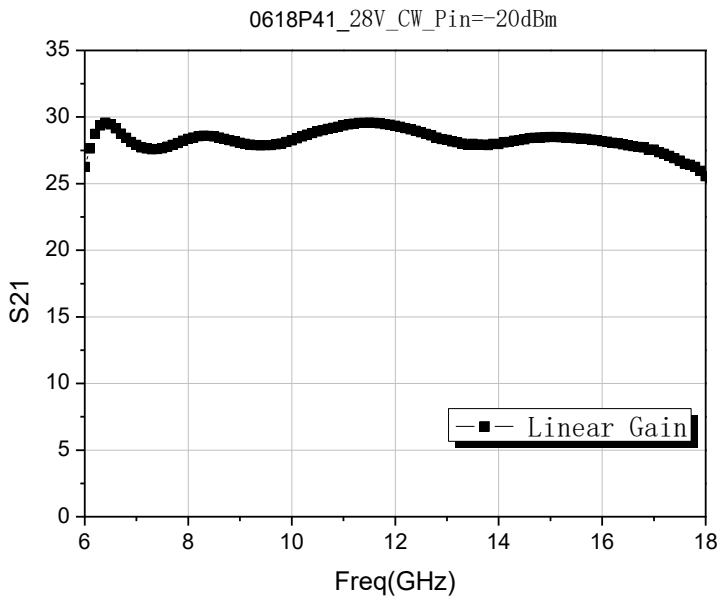
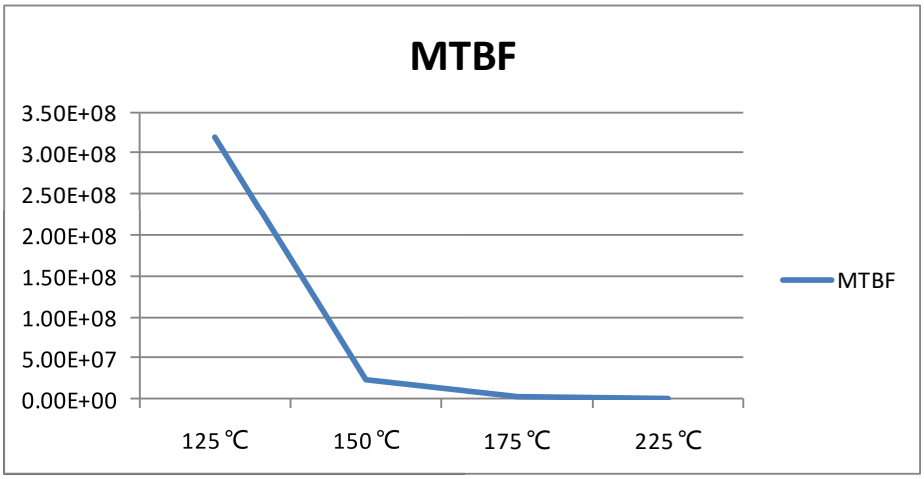
Linear Gain Vs. Frequency



► ***MTBF***

AVERAGE LIFETIME (hour)	
Temperature (℃)	**MTBF**
125 ℃	3.20E+08
150 ℃	2.40E+07
175 ℃	2.40E+06
225 ℃	6.40E+05



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► *Reliability*

Parameter	Test Conditions	Value	Untis
Thermal Resistance (θjc)	TBASE = 85°C, VD = +28 V (CW) At Idq = 1500 mA, Pdiss = 28x1.5=42 W	1.8	°C/W
Channel Temperature (Tch) (Quiescent)		161	°C
Median Lifetime (TM)		1x10^8	Hrs
Thermal Resistance (θjc)	TBASE = 85 °C, VD = +28 V (CW) At Freq = 18 GHz, PIN = 25 dBm: Idq = 1500 mA, ID_Drive(max) = 2.5 A Pout = 40 dBm, Pdiss = 46.4 W	1.4	°C/W
Channel Temperature (Tch) (Under RF drive)		150	°C
Median Lifetime		7.2x10^8	Hrs
Thermal Resistance (θjc)		1.8	°C/W

Formule:

$R_{th} = (T_{ch}(K)/T_{ch0}(K))*R_{tho}$

，R_{th}—Thermal resistance from junction to bottom；

T_{ch}—Channel temperature at high temp.（Absolute Temperature）；

R_{tho}—Thermal resistance from junction to borrom at testing temp.；

T_{cho}—Channel temperature at testing temp.；

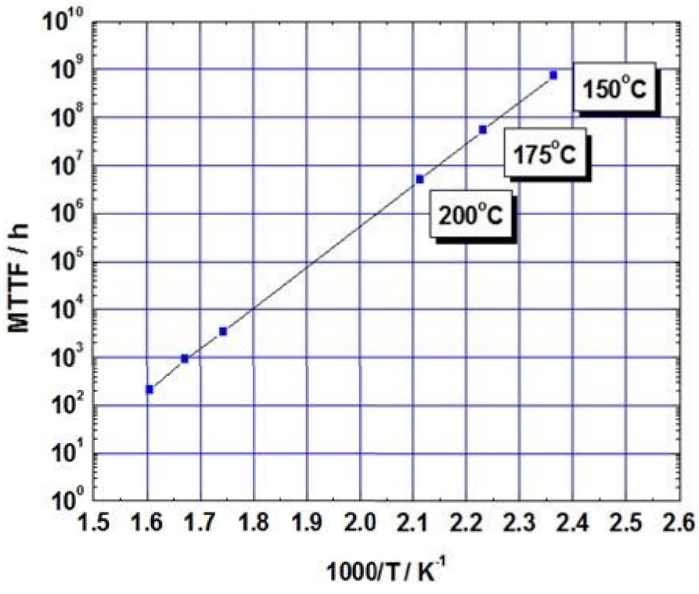

图1.12 0.2um GaN HEMT工艺三温法热加速寿命试验结果

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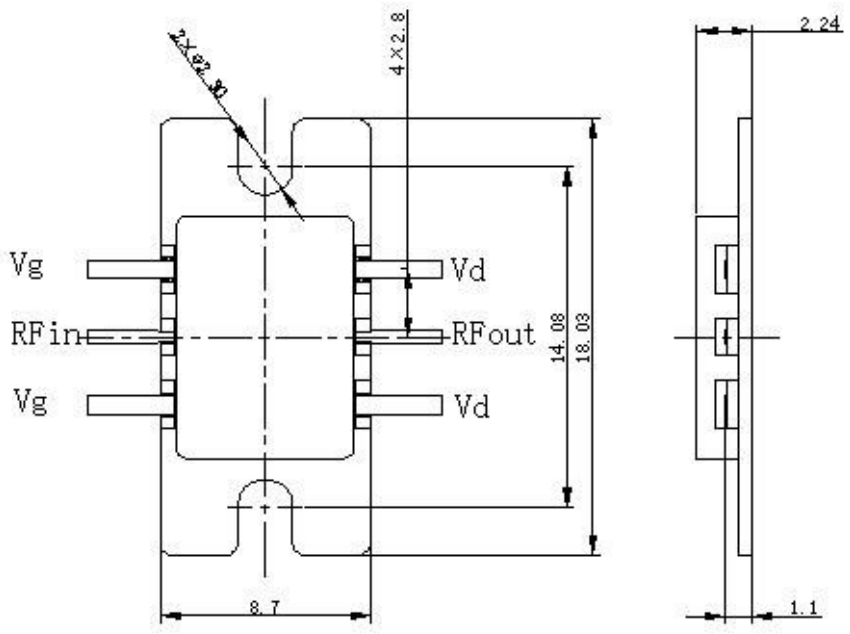
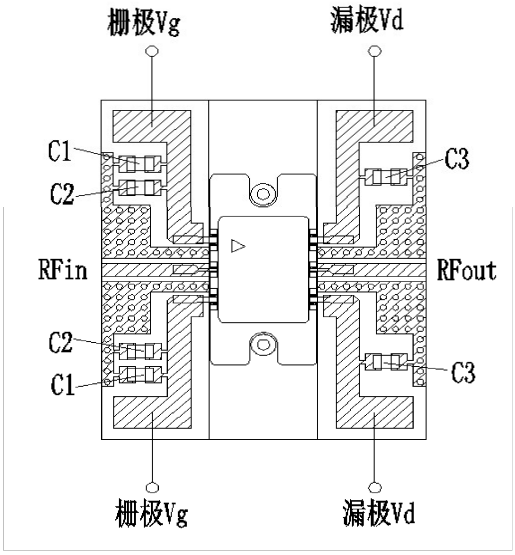
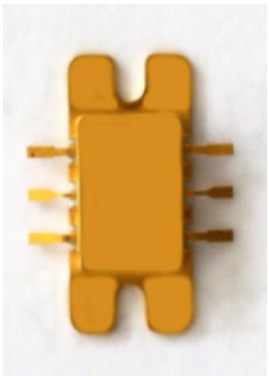
► *Outline Drawing (mm)*



Pin No.	Symbol	Description
1, 3	V_g	Gate Voltage
2	RF_{in}	Input, matched to 50Ω
4, 6	V_d	Drain Voltage
5	RF_{out}	Output, matched to Ω

► *Application Circuit*





Caution! ESD-Sensitive Device

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► *Bill of Material*

Symbol	Recommend Value	Manuf.	Part Number
C1	10uF		
C2	1uF		
C3	1000pF		

► *User Manual*

1. When use in CW mode, please add μ level filter capacitor at Vd port according to the feeder circuit above.
2. If the feeder circuit uses voltage regulator for voltage conversion, please make sure the current capacity of the regulator is higher than the working current of NDNC01053-JF
3. Please use current-limiting protection
4. Working temperature should not exceed the Max. rating of the datasheet
5. Bias on procedure in pulse mode: 1. Apply Vg; 2. Apply Vd; 3 Apply signal generator. Make sure Idq=1.5A, then apply input signal Pin=25dBm
6. Bias off procedure in pulse mode: 1. Turn off signal source; 2. Turn off pulse signal generator; 3. Turn off Vd; 4. Turn off Vg.
7. Operating temperature should be controlled within the recommended value in the datasheet.
8. Do not open the device, return the device when it appears problem.

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