

## Abstract

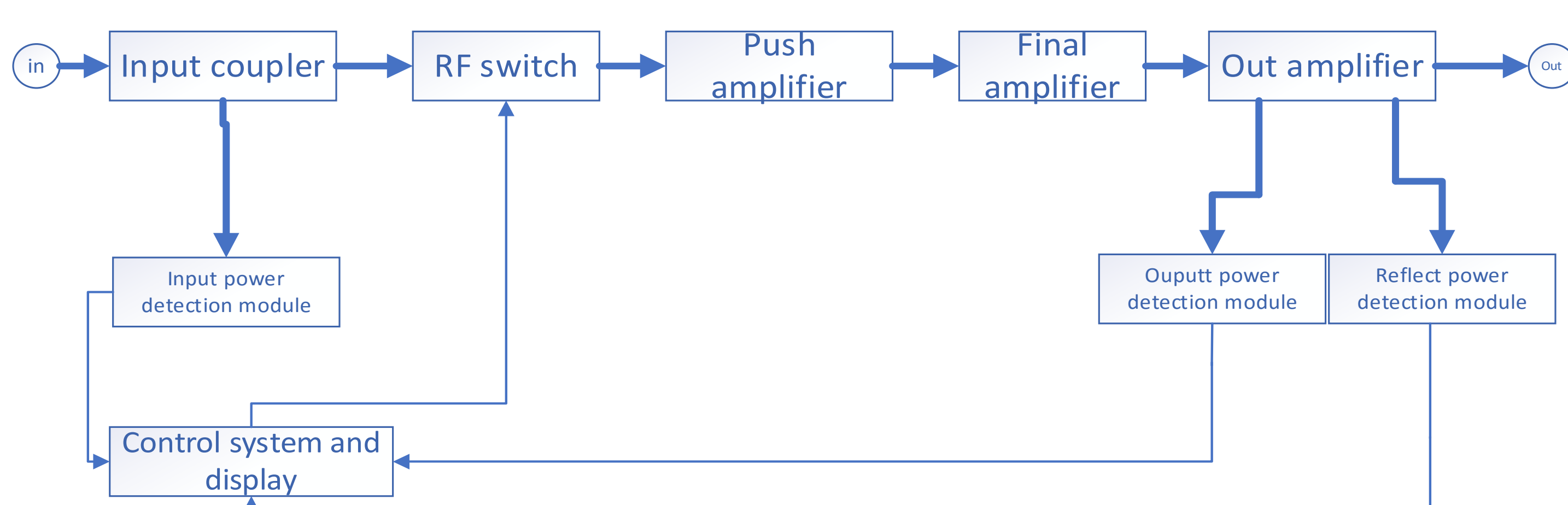
A 150.4MHz to 155.4MHz, 300W continuous wave solid-state amplifier being used for an accelerator has been developed by Nanjing University and 3Andesun Technology Group Co., Ltd., . In order to increase the lifetime of MOSFET and meet the requirements of all the parameters, drain voltage and quiescent current is optimized, also the heat dissipation structure. Taking the microwave leakage into account, the chassis structure is optimized and designed, and the microwave absorption device is adopted to make the structure compact, protect other parts not affected by the microwave leakage. After the assembly is completed, the working parameters meet the design requirements very well. The MOSFET flange temperature and output parameters meet the design requirements.

## 1. Introduction

- Solid-state amplifier is oftenly used for the low frequency and power amplifier, especially at the CW working condition.
- Solid-state amplifier is a better choice than electric vacuum tubes as the CW and low-frequency RF source for the accelerator system.
- A broad-band CW solid-state amplifier of 150.4 MHz and 300W has been developed by Nanjing University and 3Andesun Technology Group Co., Ltd.

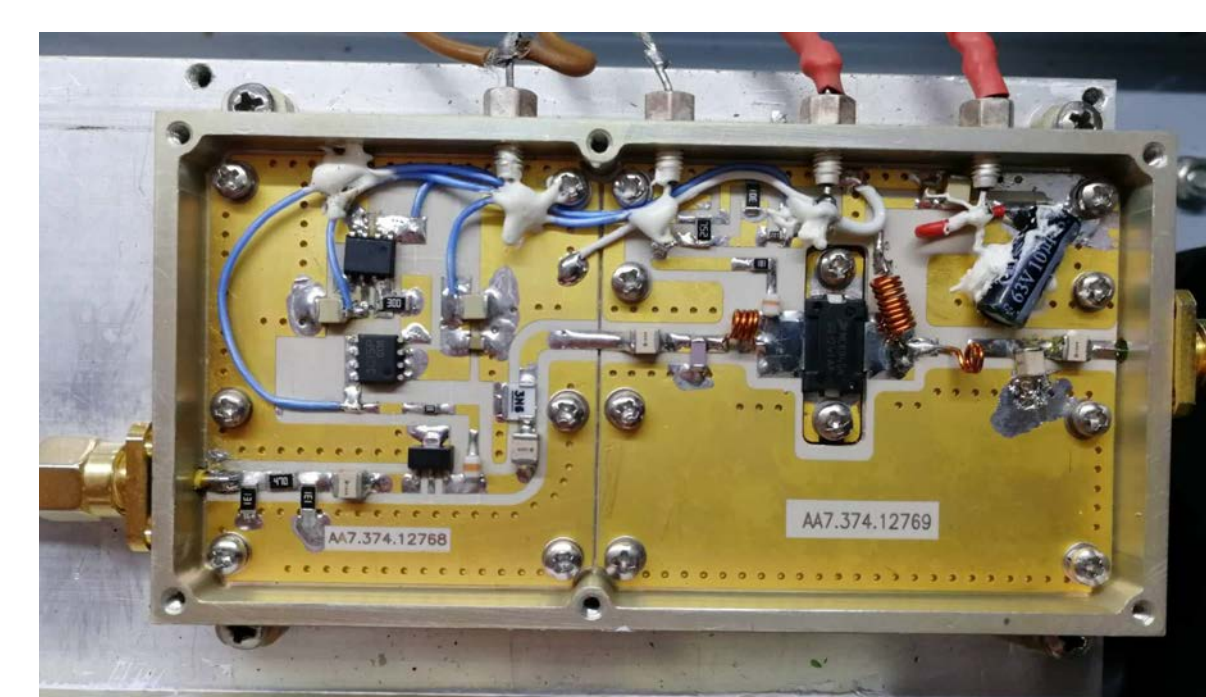
## 2. Design of the SSA

### 2.1 Circuit design

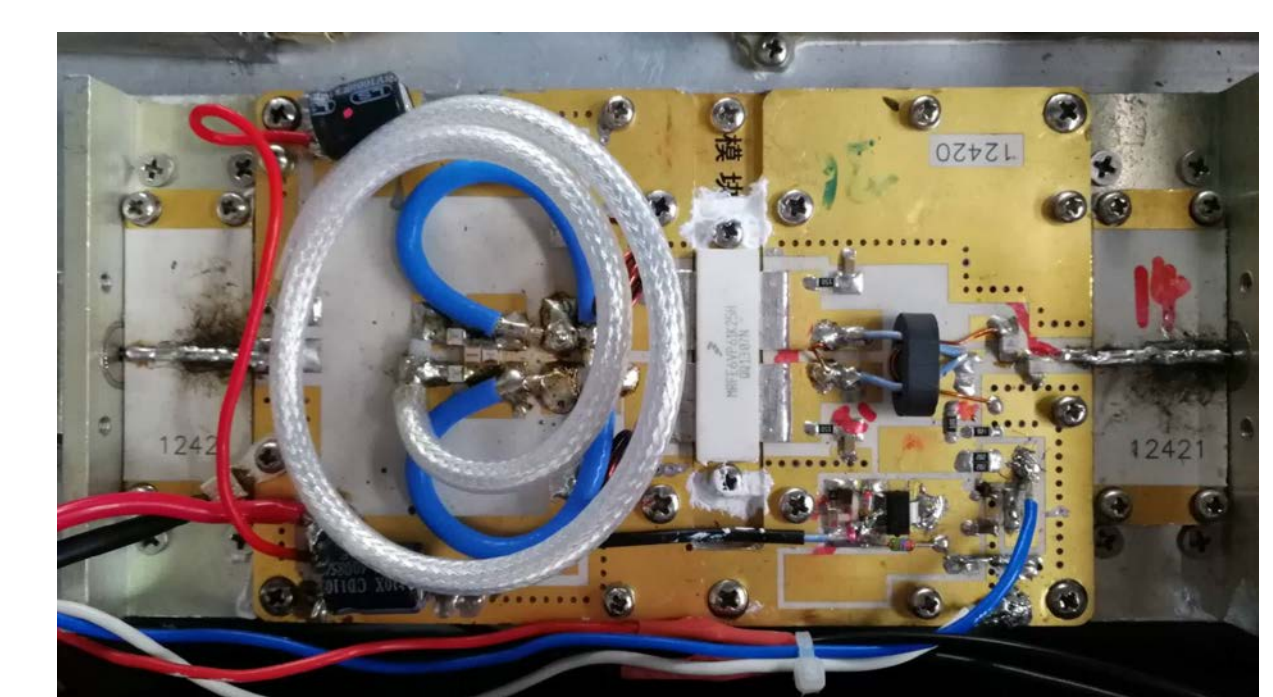


### 2.2 RF module design

Based on the available RF amplifier's chips and parts, the amplifier's power amplifier system includes a 10W pusher amplifier module and a 350W final amplifier module. Their parameters meet all the specifications of the whole system, even better more.

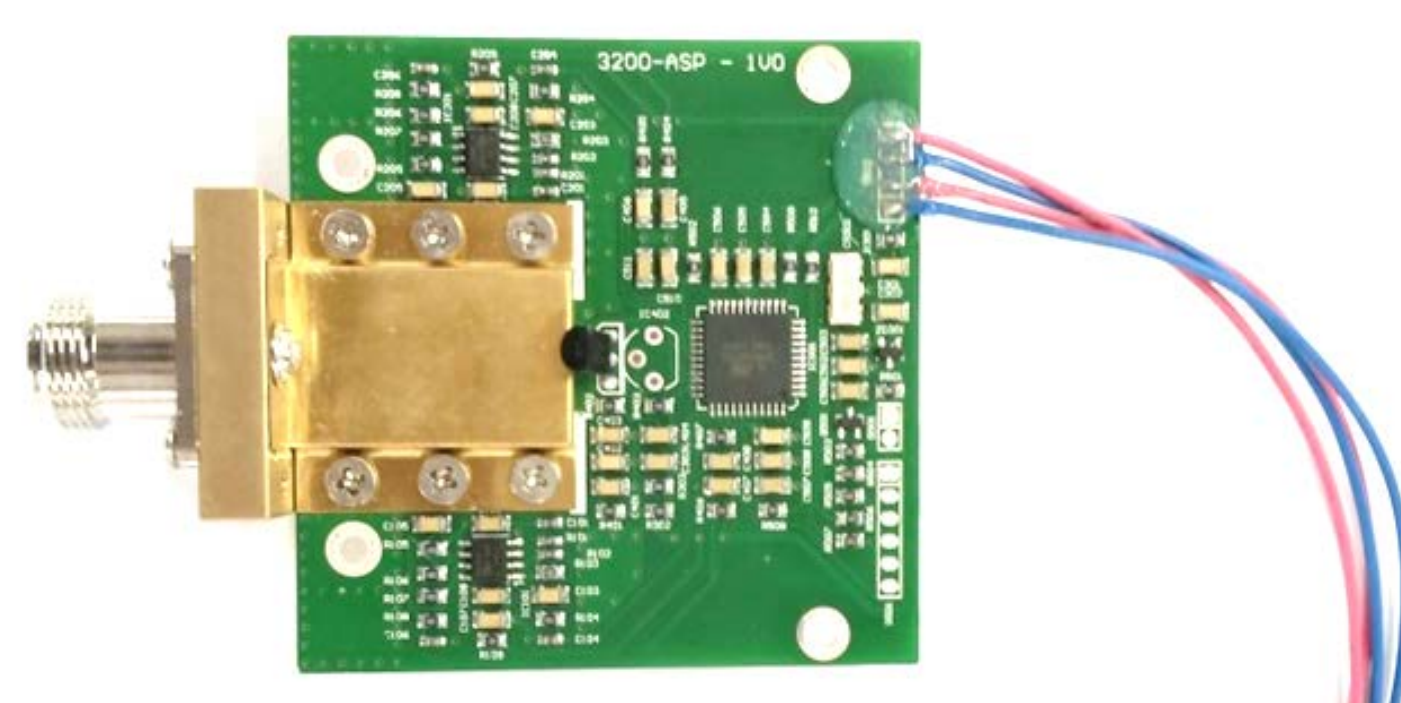


Front amplifier



End amplifier

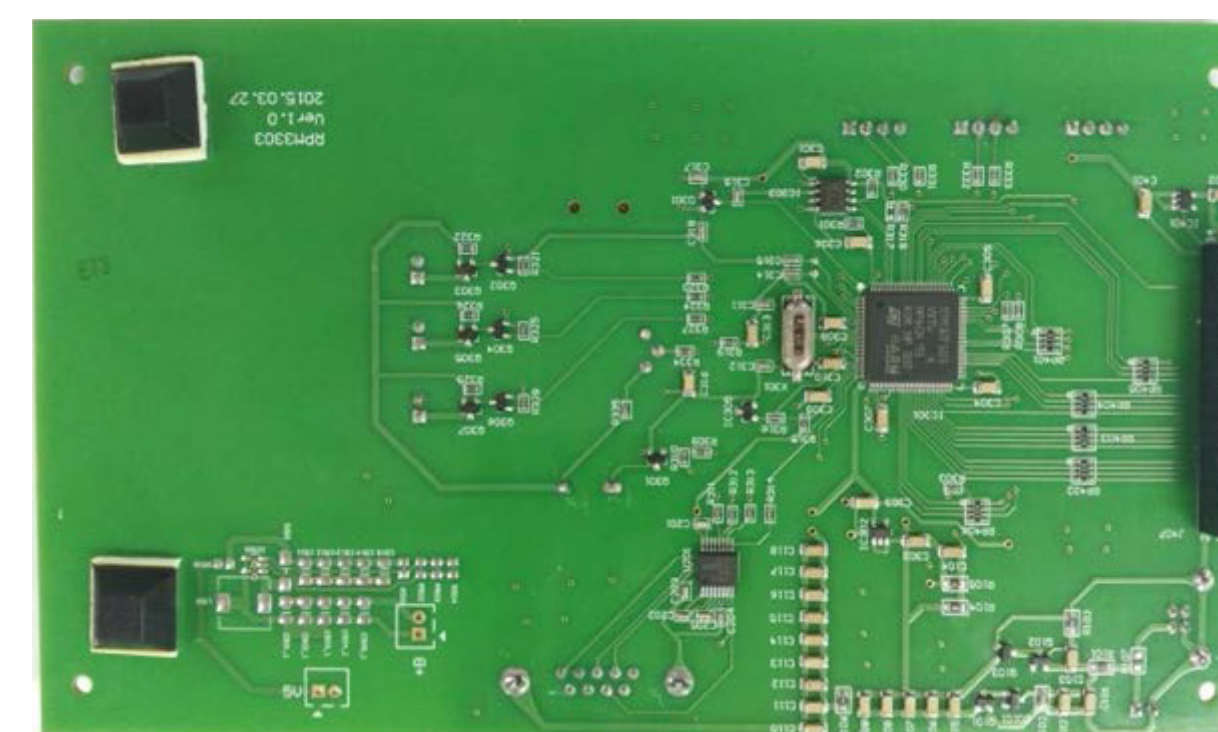
## 3. System integration



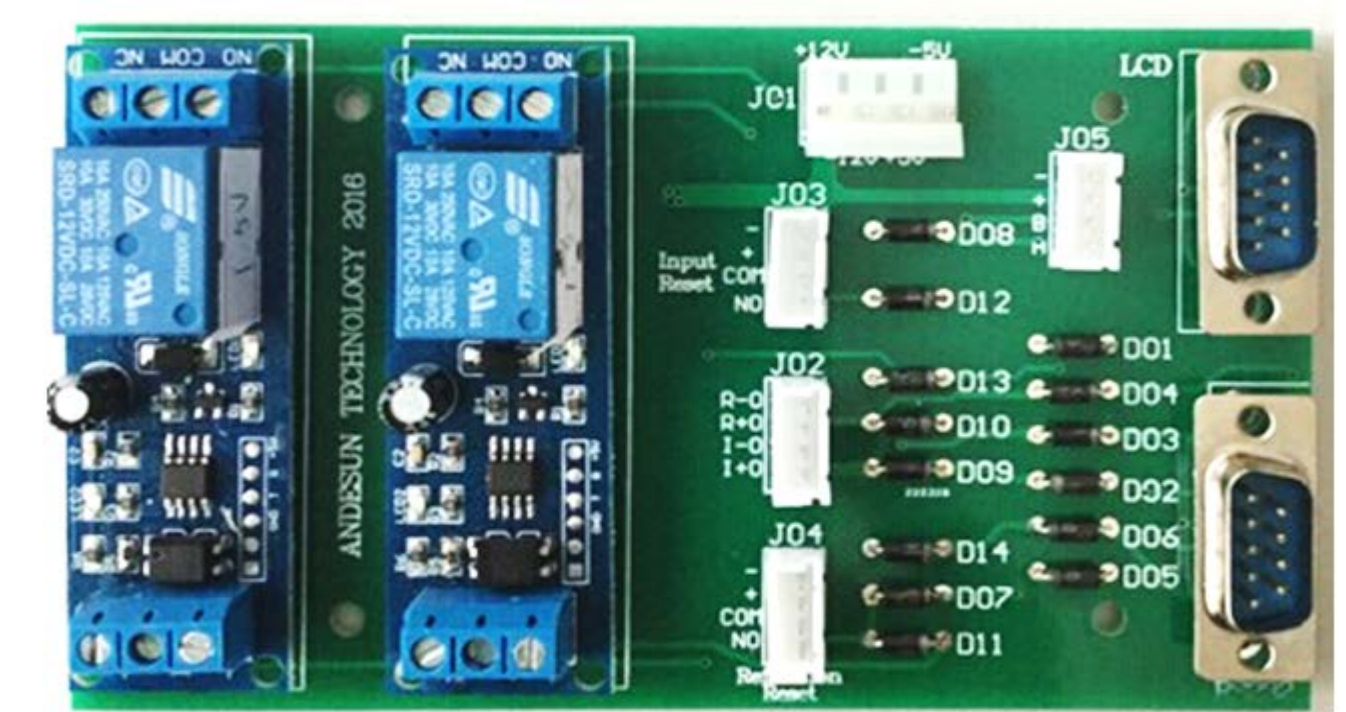
A power detector



Display screen

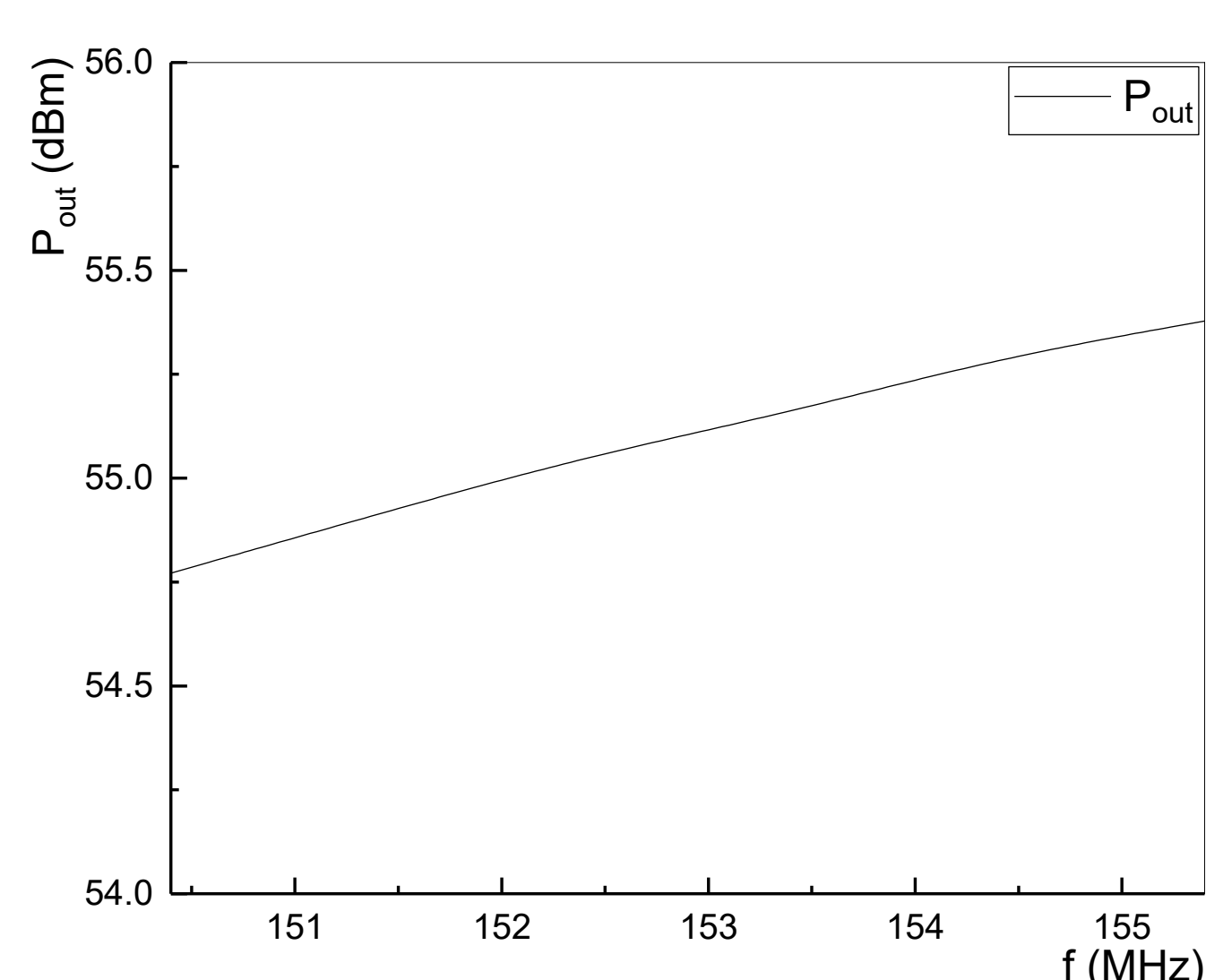


Process board

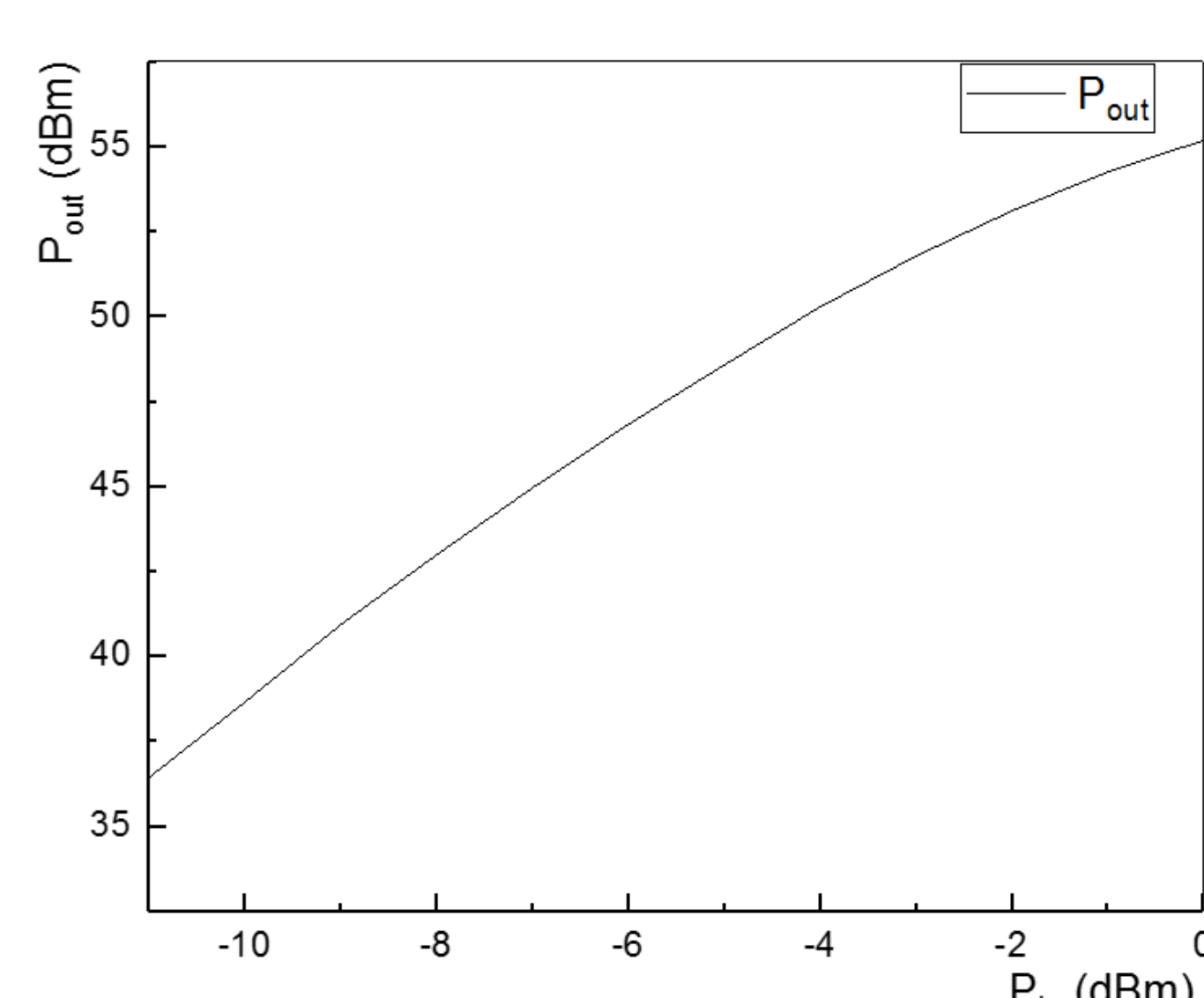


Wiring board

## 4. Testing results



Frequency versus Output power



Power of input versus output



product

Parameter	Value	Parameter	Value
Frequency	150.4~155.4MHz	Noise suppression	>70dBc
Output power	>300W	Harmonic suppression	>20dBc
Gain	>54.77dB	AC Input power	<1000W
Maximum input power	0dBm	Self protection	yes

## 5. Conclusions

By adjusting the MOSFET drain voltage and quiescent current of the final amplifier properly, it is set to a good operating mode. Heat dissipation, overload protection, microwave radiation shielding and absorption, remote control, etc. are taken into account, the solid-state amplifier systems are designed rationally to make the solid-state amplifier work normally.