# STBV25401BY2V0x2 Class AB 2400-2500MHz

## Introduction

This amplifier is designed with Innogration GaN transistor, 2 pcs of STBV25401BY2. Typically, within 2.4-2.5GHz, at single frequency, it can deliver 750W at 50V and 800W at 55V, and within full band it can deliver >600W at 50V and 700W at 55V. This solution is also the thermal enhancement of STCV25750D4

Innogration guarantee the product quality at 55V

## Demo and Transistor

| | |
|---|---|
| **Frequencyband** | : 2400-2500MHz |
| **Application** | : Multi Market |
| **Configuration** | : Class AB |
| **Test Signal** | : Pulse/CW |
| **Transistor** | : STBV25401BY2V0 （2 pcs combined） |
| **Date code** | : 235005S-08, 235005S-09 |
| **PCB** | : Rogers TC350, thickness 20 mils, 1oz copper<br>//Taconic RF-35TC-0600-A, thickness 60 mils, 1oz copper。 |

The amplifier has been characterized under the following conditions:

- Network Analyzer plots for gain and IRL.
- The output power measurement using Pulse/CW.

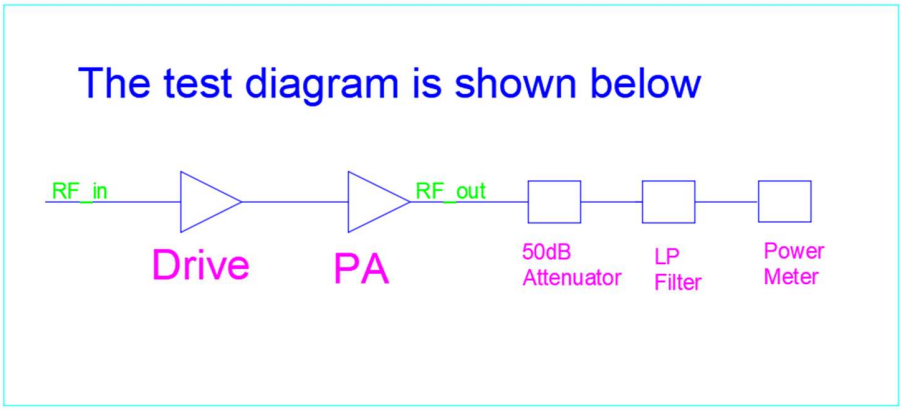
# STBV25401BY2V0 X2：2400-2500MHz

**Note： The PA is tested with a supply voltage of $V_{DS}$ = 50/55V , $I_{dq}$ = 0mA， all measurements unless otherwise noted.**

**Cooling method use: Air forced (Better performance expected when water cooling)**

## Test Results

### 1. Summary @ Bench 2(Chengdu)




#### (1) Test Condition

$V_{gs}$= -4.5V， $V_{ds}$= 50V， $I_{dq}$ = 0mA Signal mode ： Pulse 100us 10%

| Freq (MHz) | P1dB (dBm) | P1dB (W) | P1dB Eff(%) | P1dB Gain(dB) | P4dB (dBm) | P4dB (W) | P4dB Eff(%) |
|---|---|---|---|---|---|---|---|
| 2400 | 58.79 | 757.4 | 72.7 | 15.87 | 59.11 | 815.2 | 74.2 |
| 2420 | 58.45 | 699.1 | 71.8 | 16.18 | 59 | 794.3 | 74.4 |
| 2440 | 58.06 | 639.1 | 70.7 | 16.33 | 58.84 | 765.2 | 74.2 |
| 2450 | 57.88 | 613.8 | 70.7 | 16.45 | 58.77 | 753.5 | 74.4 |
| 2475 | 57.41 | 551.4 | 70.0 | 16.53 | 58.57 | 720.1 | 74.6 |
| 2500 | 56.88 | 487.7 | 68.6 | 16.45 | 58.27 | 671.4 | 74.2 |

**(2) Test Condition**

$V_{gs}$= -4.5V， $V_{ds}$= 50V， $I_{dq}$ = 0mA Signal mode： CW

| Freq(MHz) | Pin(dBm) | Psat(dBm) | Psat(W) | IDS(A) | Gain(dB) | Eff(%) | 2nd(dBc) | 3rd(dBc) |
|---|---|---|---|---|---|---|---|---|
| 2400 | 44.2 | 58.92 | 779.83 | 21.84 | 14.72 | 71.41 | -55 | -49.75 |
| 2420 | 44.19 | 58.81 | 760.33 | 21.18 | 14.62 | 71.80 | -55 | -50.11 |
| 2440 | 43.4 | 58.65 | 732.82 | 20.35 | 15.25 | 72.02 | -55 | -49.32 |
| 2450 | 43.14 | 58.55 | 716.14 | 19.92 | 15.41 | 71.90 | -55 | -49.85 |
| 2475 | 42.84 | 58.31 | 677.64 | 18.72 | 15.47 | 72.40 | -55 | -48.57 |
| 2500 | 43.4 | 58.03 | 635.33 | 17.52 | 14.63 | 72.53 | -55 | -51.64 |

**(3) Test Condition**

$V_{gs}$= -4.5V， $V_{ds}$= 55V， $I_{dq}$ = 0mA Signal mode： Pulse 100us 10%

| Freq (MHz) | P1dB (dBm) | P1dB (W) | P1dB Eff(%) | P1dB Gain(dB) | P4dB (dBm) | P4dB (W) | P4dB Eff(%) |
|---|---|---|---|---|---|---|---|
| 2400 | 59.45 | 880.1 | 70.6 | 16.56 | 59.61 | 915.1 | 71.7 |
| 2420 | 59.18 | 828.6 | 70.7 | 16.98 | 59.54 | 899.9 | 72.6 |
| 2440 | 58.83 | 764.6 | 70.0 | 17.26 | 59.44 | 879.0 | 73.0 |
| 2450 | 58.57 | 719.6 | 69.1 | 17.42 | 59.39 | 868.8 | 73.2 |
| 2475 | 57.94 | 621.7 | 67.5 | 17.71 | 59.24 | 839.9 | 73.8 |
| 2500 | 57.41 | 550.4 | 66.2 | 17.78 | 59 | 793.6 | 74.1 |

**(4) Test Condition**

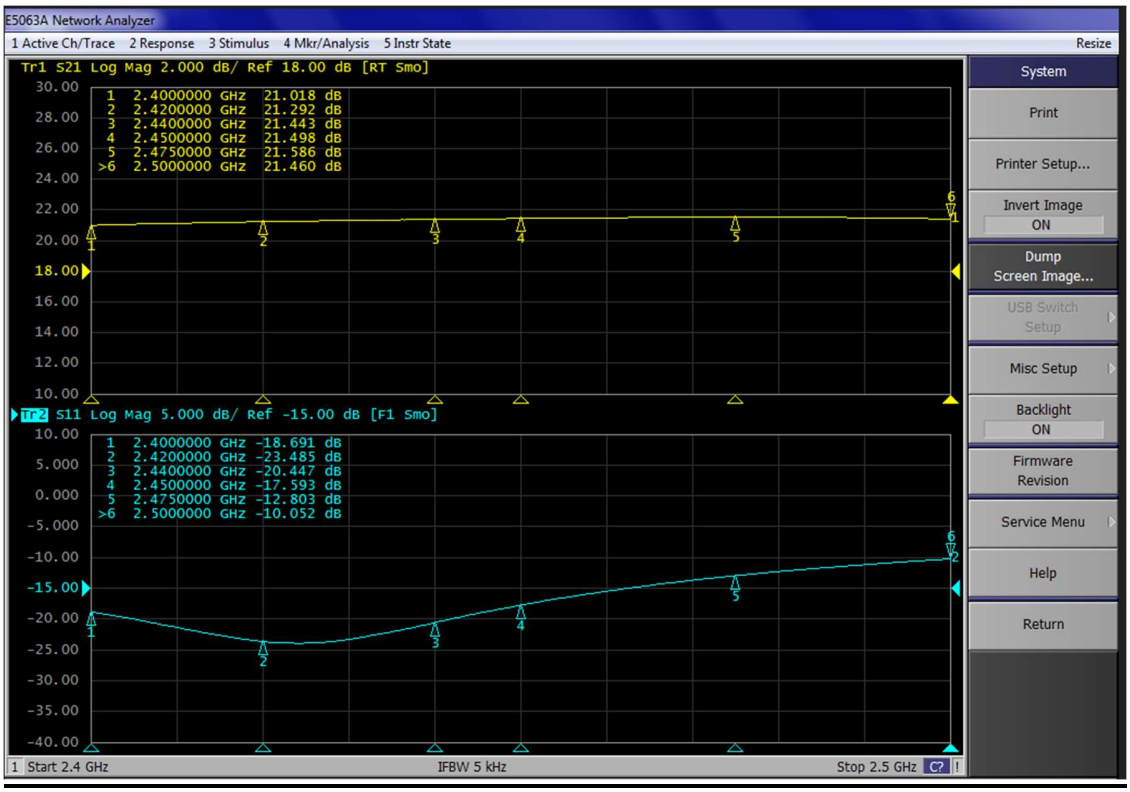
$V_{gs}$= -4.5V， $V_{ds}$= 55V， $I_{dq}$ = 0mA Signal mode： CW

| Freq(MHz) | Pin(dBm) | Psat(dBm) | Psat(W) | IDS(A) | Gain(dB) | Eff(%) | 2nd(dBc) | 3rd(dBc) |
|---|---|---|---|---|---|---|---|---|
| 2400 | 46.3 | 59.39 | 868.96 | 23.1 | 13.09 | 68.40 | -55 | -50.1 |
| 2420 | 45.59 | 59.31 | 853.10 | 22.41 | 13.72 | 69.21 | -55 | -50.14 |
| 2440 | 44.84 | 59.21 | 833.68 | 21.61 | 14.37 | 70.14 | -55 | -48.7 |
| 2450 | 44.58 | 59.1 | 812.83 | 21.03 | 14.52 | 70.27 | -55 | -49.62 |
| 2475 | 44.93 | 58.97 | 788.86 | 20.15 | 14.04 | 71.18 | -55 | -48 |
| 2500 | 44.64 | 58.63 | 729.46 | 18.58 | 13.99 | 71.38 | -55 | -50.46 |

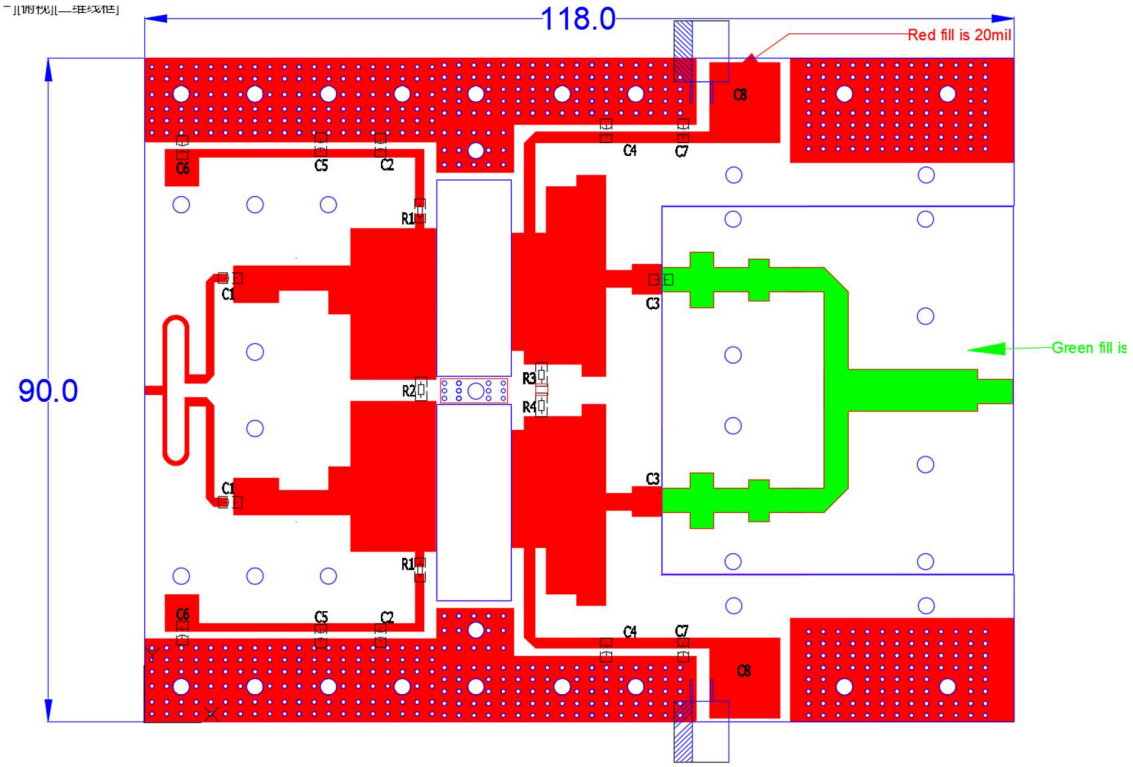
## 2. Network Results

### Test Condition

$V_{ds}$=50V， $V_{gs}$=-3.42V， $I_{dq}$=1A， Input Power = 0dBm



# BOM of Test Circuit




| Component | Description | Suggestion |
|---|---|---|
| C5,C6,C7 | 10uF | 10uF/100V |
| C4, | 15pF | MQ101111 |
| C1, C2, | 15pF | MQ300805 |
| C8 | 4700uF/63V | Electrolyic Capacitor |
| R1 | 10Ω | 0805 |
| R2，R3，R4 | 10Ω*2 | 1812 |
| C3 | 12pF | MIN02-002CC120J-F, Dubilier - CDE |
| PCB | Rogers TC350, thickness 20 mils, 1oz copper.<br>//Taconic RF-35TC-0600-A, thickness 60 mils, 1oz copper | |