GTAH30220D4^{V1} Class AB 2000~3000MHz

Sep. 19, 2023

Introduction

This amplifier is designed with Innogration 28V GaN transistor.

Demo and Transistor

Frequencyband	:	2000~3000MHz
Application	:	Multi Market
Configuration	:	Class AB
Test Signal	:	CW/Pulse
Transistor	:	GTAH30220D4 ^{V1}
Date code	:	233610S-03
PCB	:	Rogers tc350-plus, r = 3.5, thickness 30 mils, 1oz copper; //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 CW.

Note：The PA is tested with a supply voltage of V_{DS} = 28V , V_{GS}= -2.55V , I_{dq} = 100mA，all measurements unless otherwise noted.

Test Results

1. Summary @ Bench (Chengdu)

（1）Test Condition:

V_{ds} = 28V， V_{gs} = -2.55V， I_{dq} = 100 mA

Frequency：2000-3000MHz

Signal mode：Pulse Width=100us， Duty Cycle= 10%

Freq(MHz)	Pin(dBm)	Psat(dBm)	Psat(W)	IDS(A)	Gain(dB)	Eff(%)
2000	41.71	53.61	229.61	1.61	11.9	50.93
2100	43.07	55.13	325.84	2.27	12.06	51.26
2200	41.73	54.73	297.17	1.91	13	55.57
2300	41.01	54.72	296.48	1.9	13.71	55.73
2400	40.73	54.39	274.79	1.86	13.66	52.76
2500	42.18	54.35	272.27	1.91	12.17	50.91
2600	42.37	54.68	293.76	2.09	12.31	50.20
2700	41.98	54.71	295.80	2.06	12.73	51.28
2800	42.36	54.79	301.30	2	12.43	53.80
2900	41.39	54.6	288.40	1.91	13.21	53.93
3000	40.04	54.16	260.62	1.71	14.12	54.43

（2）Test Condition:

V_{ds} = 28V， V_{gs} = -2.55V， I_{dq} = 100 mA

Frequency：2000-3000MHz

Signal mode：CW，Frequency：2000-3000MHz

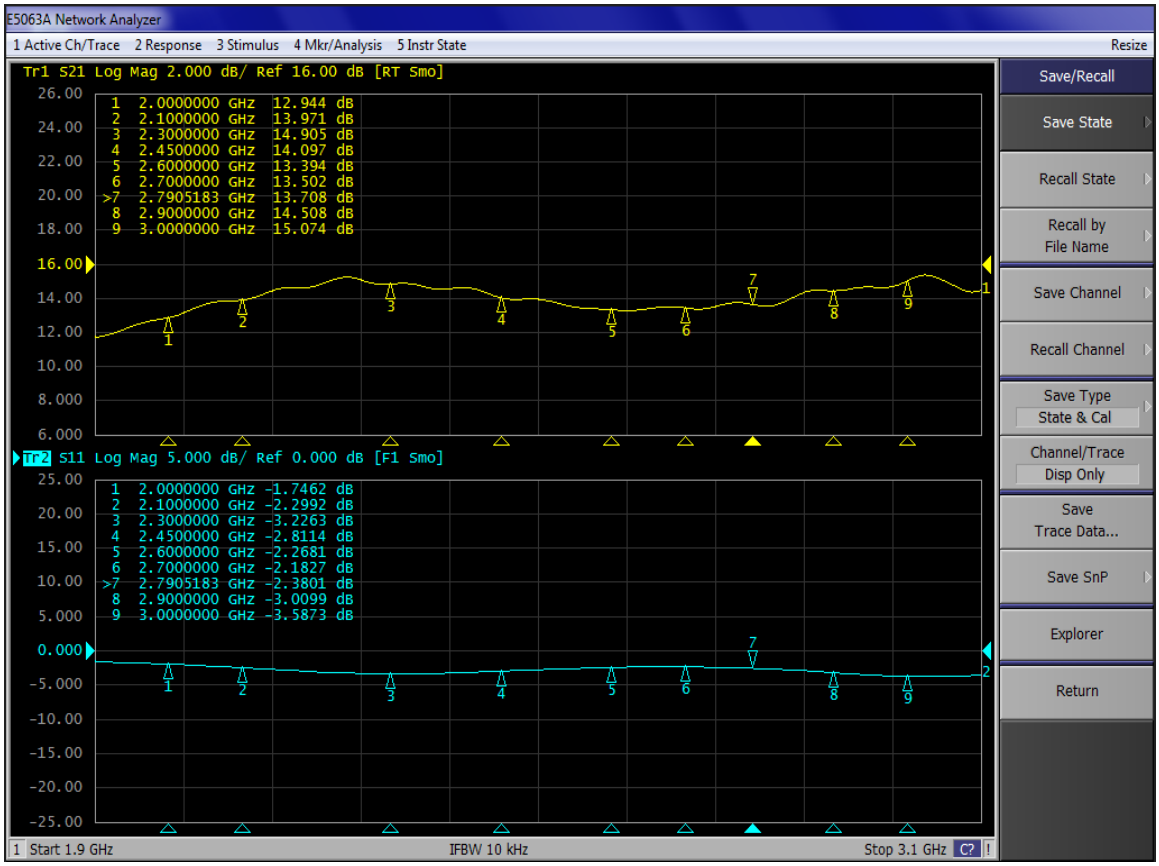
Freq(MHz)	Pin(dBm)	Psat(dBm)	Psat(W)	IDS(A)	Gain(dB)	Eff(%)
2000	41.2	53.38	217.77	15.68	12.18	49.60
2100	42.66	54.84	304.79	21.67	12.18	50.23
2200	41.4	54.28	267.92	18.05	12.88	53.01
2300	40.66	54.14	259.42	17.71	13.48	52.31
2400	40.41	53.76	237.68	17.24	13.35	49.24
2500	41.8	54.18	261.82	18.8	12.38	49.74
2600	41.91	54.19	262.42	19.45	12.28	48.19
2700	41.49	54.21	263.63	19.02	12.72	49.50
2800	41.95	54.55	285.10	19.24	12.6	52.92
2900	40.93	54.19	262.42	17.89	13.26	52.39
3000	39.72	53.78	238.78	16.1	14.06	52.97

2. Network Results

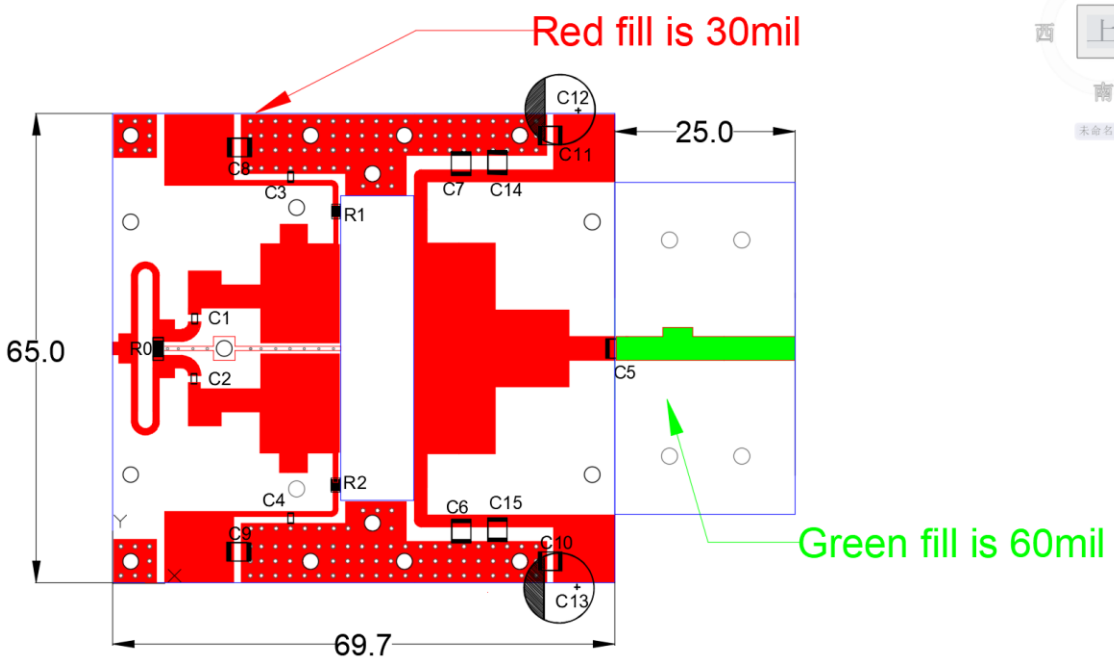
Test Condition

V_{gs} = -2.45 V， V_{ds} = 28 V， I_{dq}= 400 mA

Input power = -0 dBm



BOM of Test Circuit



Component	Description	Suggested Manufacturer
C12,C13	1000uF/63V	
C8,C9,C10,C11, C14, C15	10uF	1210
C5	MCM-1-300V-D-150J	陕西华茂电子
C6,C7	18pF	北京元六鸿远电子 MQ101111
C1,C2,C3,C4	15pF	北京元六鸿远电子 MQ300805
R0	Chip Resistor,100Ω	1206
R1,R2	Chip Resistor,10Ω	0805
PCB	Rogers tc350-plus, r= 3.5, thickness 30 mils, 1oz copper（red fill）; //Taconic RF-35TC-0600-A, thickness 60 mils, 1oz copper(green fill)	

Demo Picture