

Test Report: 800W 3-Ways Doherty 1800-2200MHz

Introduction

The amplifier are designed with Innogration 50V GaN transistor, **T1:STBV22W300AY2**, and **T2: STCV22W600BY4V**, **with output isolator included**, by innovative 3 ways Doherty configuration.

With normal 9dB back off at 100W average output power , it can reach >50% efficiency across the full band of 1.8-2.2G to cover 4G/5G B1/B3 and N1/N3 simultaneously

Demo and Transistor

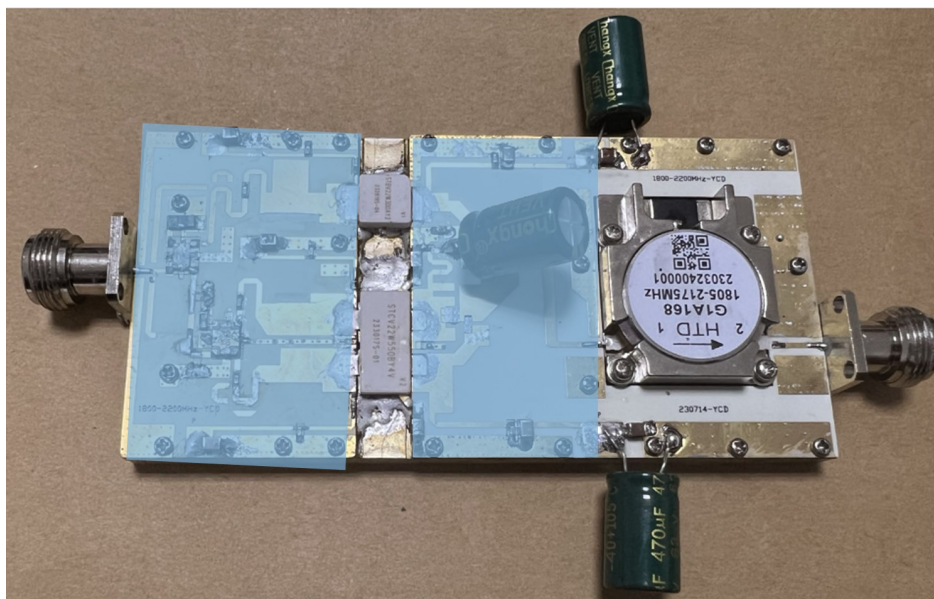
Frequency band : 1800-2175 MHz
Application : Telecom
Configuration : Doherty
Test Signal : Pulsed CW/ WCDMA
Transistor : T1: STBV22W300AY2
 T2:STCV22W600BY4V
PCB : 20 Mil Rogers 4350

The amplifier has been characterized under the following conditions:

- Network Analyzer plots for gain and IRL.
- P1dB and P3dB Peak power measurement using the Pulse, 20 us width, 10% duty cycle.
- RF Test Bench 1

Note: The PA is tested with a supply voltage of $V_{DS}= 50V$, $I_{DQ-Mian}=260\text{ mA}$ $V_{gs-main}=-3.32V$. $V_{gs-peak1}=-5.0V$, $V_{gs-peak2}=-6.8V$.all measurements unless otherwise noted.

Demonstration application board (BOM and Layout upon request)



Test Results:

1. Pulsed CW Peak power and Efficiency /WCDMA_1C Pavg and Efficiency

Freq (GHz)	Pulse CW Signal ⁽¹⁾				P _{avg} =51dBm WCDMA Signal ⁽²⁾		
	P1 (dBm)	P1 (W)	P3 (dBm)	P3 (W)	Gp (dB)	η _D (%)	ACPR _{5M} (dBc)
1.80	57.61	576	59.11	815	12.46	52.20	-28.15
1.85	57.50	562	59.14	820	12.63	52.92	-29.65
1.90	57.44	555	59.09	810	12.85	53.65	-30.47
2.00	58.07	641	59.55	900	12.93	54.50	-32.88
2.10	59.05	804	59.73	940	12.90	55.21	-31.38
2.15	57.71	589	59.34	860	12.38	53.93	-32.62
2.175	47.39	52.0	59.08	810	11.92	51.80	-33.18

Freq (GHz)	Pulse CW Signal ⁽¹⁾				P _{avg} =50.5dBm WCDMA Signal ⁽²⁾		
	P1 (dBm)	P1 (W)	P3 (dBm)	P3 (W)	Gp (dB)	η _D (%)	ACPR _{5M} (dBc)
1.80	57.61	576	59.11	815	12.55	51.65	-27.95
1.85	57.50	562	59.14	820	12.72	52.26	-29.52
1.90	57.44	555	59.09	810	12.96	52.93	-30.24
2.00	58.07	641	59.55	900	12.95	53.52	-33.16
2.10	59.05	804	59.73	940	12.97	54.46	-31.19
2.15	57.71	589	59.34	860	12.48	53.58	-32.02
2.175	47.39	52.0	59.08	810	12.00	51.76	-32.71

Freq (GHz)	Pulse CW Signal ⁽¹⁾				P _{avg} =50.0dBm WCDMA Signal ⁽²⁾		
	P1 (dBm)	P1 (W)	P3 (dBm)	P3 (W)	Gp (dB)	η _D (%)	ACPR _{5M} (dBc)
1.80	57.61	576	59.11	815	12.54	50.80	-28.25
1.85	57.50	562	59.14	820	12.72	51.12	-29.84
1.90	57.44	555	59.09	810	12.98	51.86	-30.52
2.00	58.07	641	59.55	900	12.99	52.81	-33.27
2.10	59.05	804	59.73	940	12.98	53.49	-31.15
2.15	57.71	589	59.34	860	12.49	53.06	-31.78
2.175	47.39	52.0	59.08	810	12.01	51.31	-32.35

Freq (GHz)	Pulse CW Signal ⁽¹⁾				P _{avg} =49.5dBm WCDMA Signal ⁽²⁾		
	P1 (dBm)	P1 (W)	P3 (dBm)	P3 (W)	Gp (dB)	η _D (%)	ACPR _{5M} (dBc)
1.80	57.61	576	59.11	815	12.55	49.80	-28.73
1.85	57.50	562	59.14	820	12.74	49.93	-30.22
1.90	57.44	555	59.09	810	13.00	50.78	-30.97
2.00	58.07	641	59.55	900	13.00	51.66	-33.41
2.10	59.05	804	59.73	940	12.97	52.27	-31.58
2.15	57.71	589	59.34	860	12.47	52.09	-31.07
2.175	47.39	52.0	59.08	810	11.98	50.39	-32.42

Freq (GHz)	Pulse CW Signal ⁽¹⁾				P _{avg} =49.0dBm WCDMA Signal ⁽²⁾		
	P1 (dBm)	P1 (W)	P3 (dBm)	P3 (W)	Gp (dB)	η _D (%)	ACPR _{5M} (dBc)
1.80	57.61	576	59.11	815	12.59	48.75	-28.93
1.85	57.50	562	59.14	820	12.76	48.80	-30.42
1.90	57.44	555	59.09	810	13.03	49.65	-31.15
2.00	58.07	641	59.55	900	13.00	50.61	-33.54
2.10	59.05	804	59.73	940	12.97	51.20	-31.77
2.15	57.71	589	59.34	860	12.49	51.35	-31.74
2.175	47.39	52.0	59.08	810	11.98	49.86	-32.02

Freq (GHz)	Pulse CW Signal ⁽¹⁾				P _{avg} =48.5dBm WCDMA Signal ⁽²⁾		
	P1 (dBm)	P1 (W)	P3 (dBm)	P3 (W)	Gp (dB)	η _D (%)	ACPR _{5M} (dBc)
1.80	57.61	576	59.11	815	12.60	47.70	-29.49
1.85	57.50	562	59.14	820	12.77	47.60	-30.75
1.90	57.44	555	59.09	810	13.04	48.45	-31.25
2.00	58.07	641	59.55	900	13.01	49.52	-33.62
2.10	59.05	804	59.73	940	12.94	50.02	-31.95
2.15	57.71	589	59.34	860	12.46	50.50	-31.83
2.175	47.39	52.0	59.08	810	11.95	49.31	-31.63

Freq (GHz)	Pulse CW Signal ⁽¹⁾				P _{avg} =48.0dBm WCDMA Signal ⁽²⁾		
	P1 (dBm)	P1 (W)	P3 (dBm)	P3 (W)	Gp (dB)	η _D (%)	ACPR _{5M} (dBc)
1.80	57.61	576	59.11	815	12.60	46.50	-29.70
1.85	57.50	562	59.14	820	12.77	46.10	-31.17
1.90	57.44	555	59.09	810	13.04	47.10	-31.72
2.00	58.07	641	59.55	900	13.00	48.31	-33.77
2.10	59.05	804	59.73	940	12.93	48.69	-32.14
2.15	57.71	589	59.34	860	12.47	49.62	-31.57
2.175	47.39	52.0	59.08	810	11.95	48.69	-31.58

2. S11 S21 Curve Picture

