Tagore Technology

TA9210D

12.5W CW .03 – 4.0 GHz GaN Power Transistor

Application Note: TA9210D EVB K

Application Note

2100MHz~2500MHz

28V 300mA

Rev-1.1

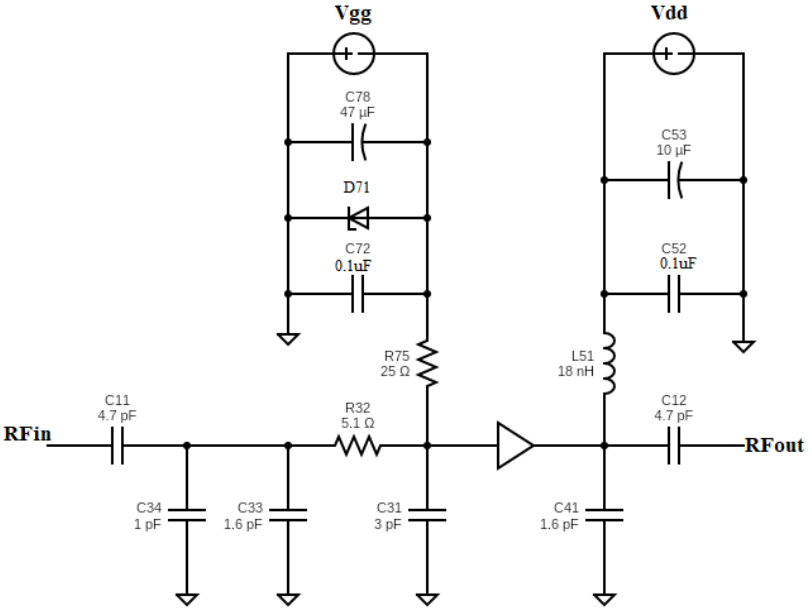
List of Contents

1. General Description

The TA9210D is a broadband capable 12.5W GaN power transistor covering 30MHz to 2.7GHz frequency band with a single match. TA9210D is usable up to 4GHz. The input and output can be matched for best power and efficiency for the desired band.

The TA9210D is packaged in a compact, low-cost Quad Flat No lead (QFN) 3x6x0.75mm, 32 leads plastic package. TA9210D-EVB-K is tuned from 2100MHz to 2500MHz.

2. TA9210D-EVB-K Board Details



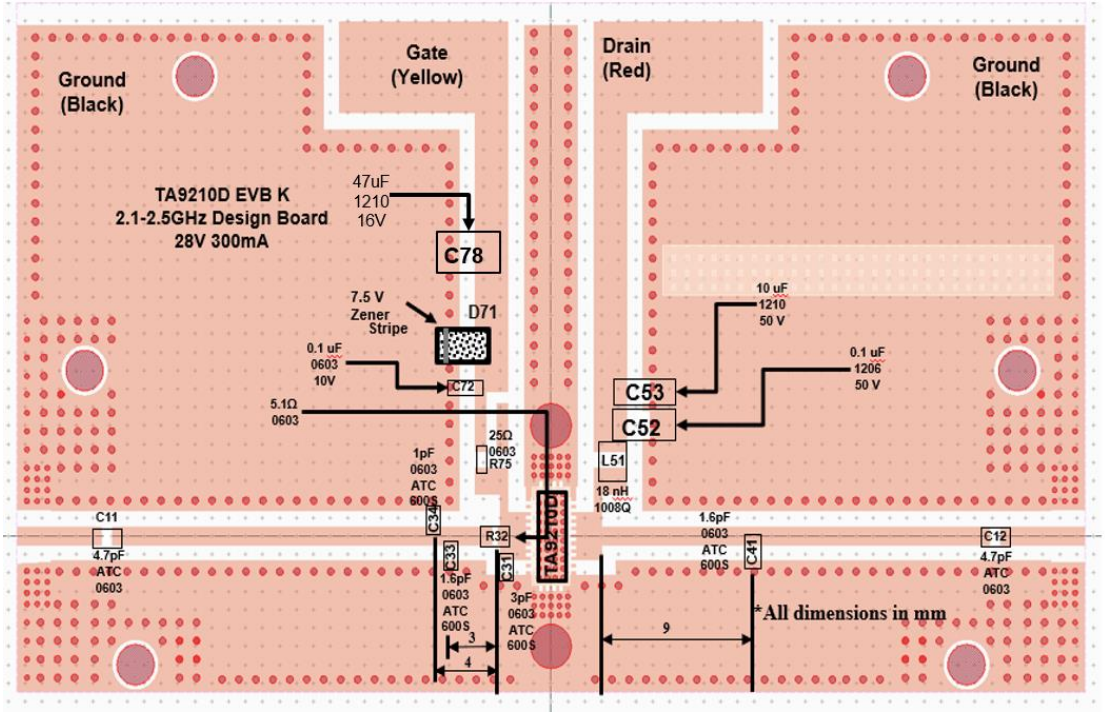


Figure 2.1 TA9210D-EVB-K 2100MHz ~ 2500MHz Schematic and EVB Layout

3. TA9210D-EVB-K Bill of Material

Component ID	Value	Manufacturer	Recommended Part Number
C11, C12	4.7pF	AVX	600S4R7BT250XT
C31	3pF	AVX	600S3R0AT250XT
R32	5.1Ω	Vishay	CRCW06035R10FKEAHP
C33, C41	1.6pF	AVX	600S1R6AT250XT
C34	1pF	AVX	600S1R0BW250XT
L51	18nH	Coil craft	1008HQ-18NXGLB
C52	0.1µF, 50V	Murata	GRM31C5C1H104JA01L
C53	10µF, 50V	Murata	GRM32ER71H106KA12L
D71	7.5 V Zener	On Semiconductor	MMSZ5236BT 1G
C72	0.1µF, 10V	AVX	0603ZC104K4T2A
R75	25Ω	Vishay	CRCW060324R9FKEAHP
C78	47µF, 16V	Murata	GRM32ER61C476ME15L
Q1	12.5W GaN Transistor	Tagore Technology	TA9210D
PCB	Rogers RO4350B, 20 mils, 2 oz copper		

Table 3.1 TA9210D-EVB-K BOM

4. TA9210D-EVB-K Biasing Sequence

Turn ON Device	Turn OFF Device
1. Set V_G to -5V 2. Set V_D to +28V 3. Adjust V_G to reach required I_{DQ} current 4. Apply RF power	1. Turn RF power off 2. Turn off V_D 3. Turn off V_G

Table 4.1 TA9210D-EVB-K Bias and Sequencing

5. TA9210D-EVB-K Board Measurement Summary

Frequency (GHz)	S21 Gain(dB)	S11 (dB)	S22 (dB)	S12 (dB)	Psat (dBm)	PAE% @Psat	ACPR and AACPR
2.1	16.8	-10.9	-12.6	-30.5	40.1-40.8	47-55%	ACPR less than -28dBc and AACPR less than -46dBc for Average power up to 38.9dBm With LTE 8dB PAPR, 9.1MHz BW
2.2	16.8	-14.6	-12.8	-30.1			
2.3	16.9	-21.3	-13.2	-29.7			
2.4	16.8	-18.2	-12.8	-29.4			
2.5	16.6	-11.5	-11.6	-29.4			

Table 5.1 TA9210D-EVB-K 28V 300mA Electrical Characteristics Summary

6. TA9210D-EVB-K Test Results

All the tests are carried out at room temperature.

6.1. S parameters

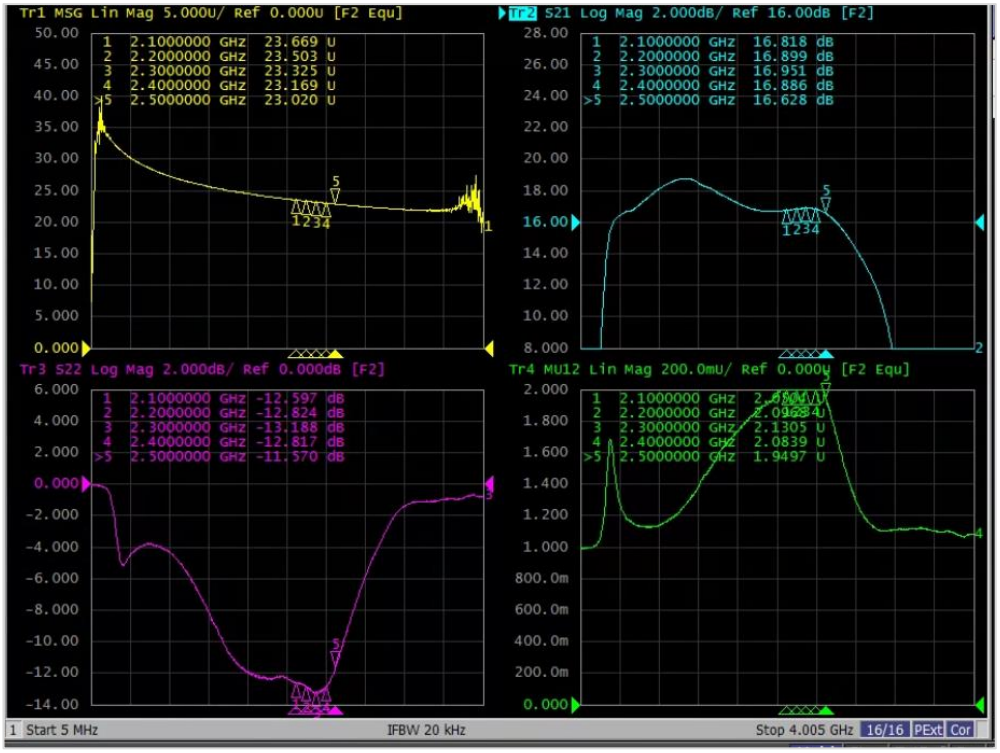


Figure 6.1.1. S parameters of TA9210D-EVB-K 28V 300mA

6.2. Gain, PAE vs Pout @ 28V Vdd, 300mA Idq

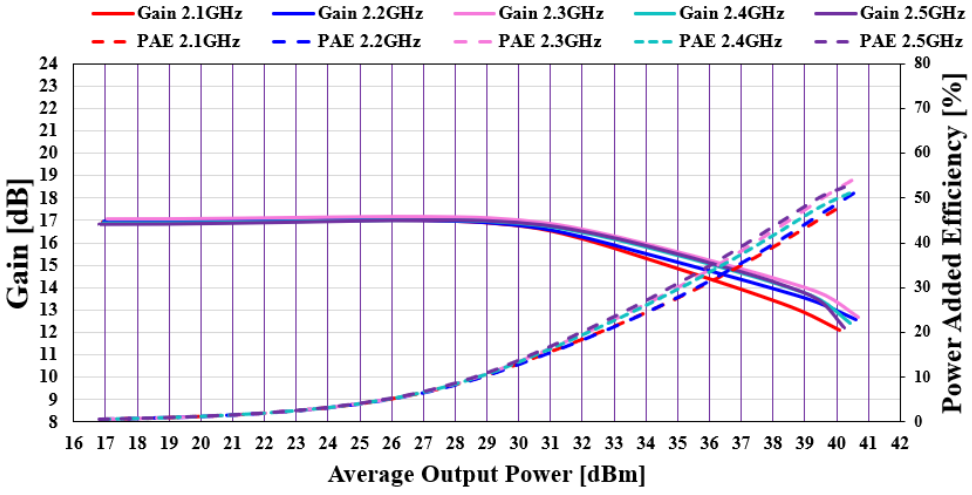


Figure 6.2.1 Gain, PAE v/s Pout of TA9210D-EVB-K, VD=28V, IDQ=300mA

6.3. TA9210D-EVB-K 2.1-2.5GHz: ACPR Measurements

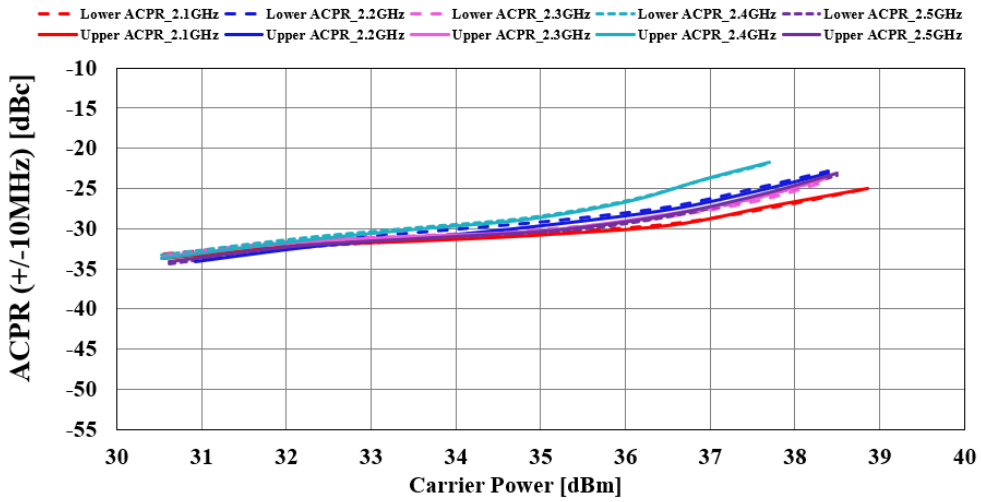


Figure 6.3.1 TA9210D-EVB-K 2.1-2.5GHz_Design_Vdd:28V, Id:300mA 8dB PAPR, 9.1MHz BW

6.4. TA9210D 2.1-2.5GHz: AACPR Measurements

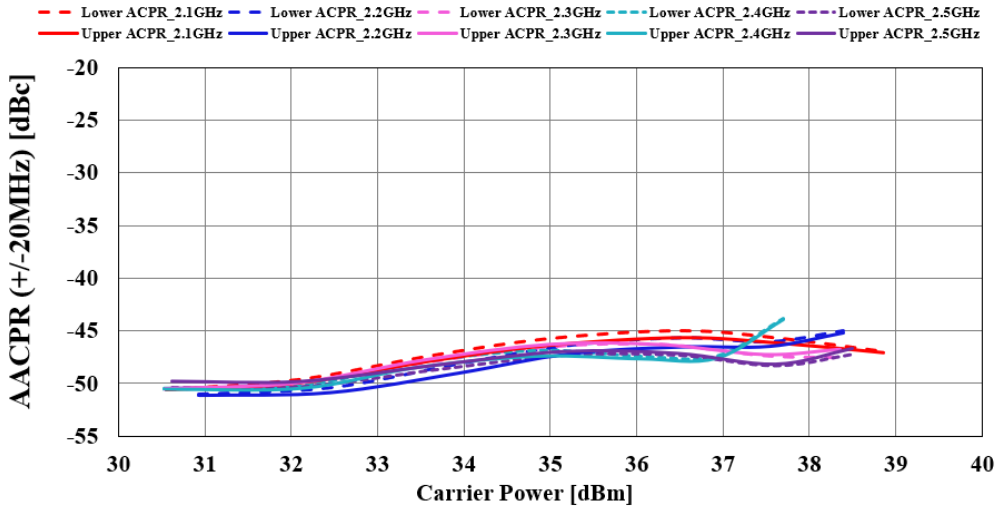


Figure 6.4.1 TA9210D-EVB-K 2.1-2.5GHz_Design_Vdd:28V, Id:300mA 8dB PAPR, 9.1MHz BW

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