TA9210D

12.5 W CW 0.03 – 4.0 GHz GaN Power Transistor

Application Note: TA9210D EVB L

Application Note

2400 MHz~2500 MHz

28 V, 100 mA

Rev-2.1

List of Contents

1. General Description

The TA9210D is a broadband capable 12.5W GaN power transistor covering 30 MHz to 2.7 GHz frequency band with a single match. TA9210D is usable up to 4 GHz. 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) 3 x 6 x 0.75 mm, 32 leads plastic package. TA9210D-EVB-L is tuned from 2400 MHz to 2500 MHz.

2. TA9210D-EVB-L Board Details

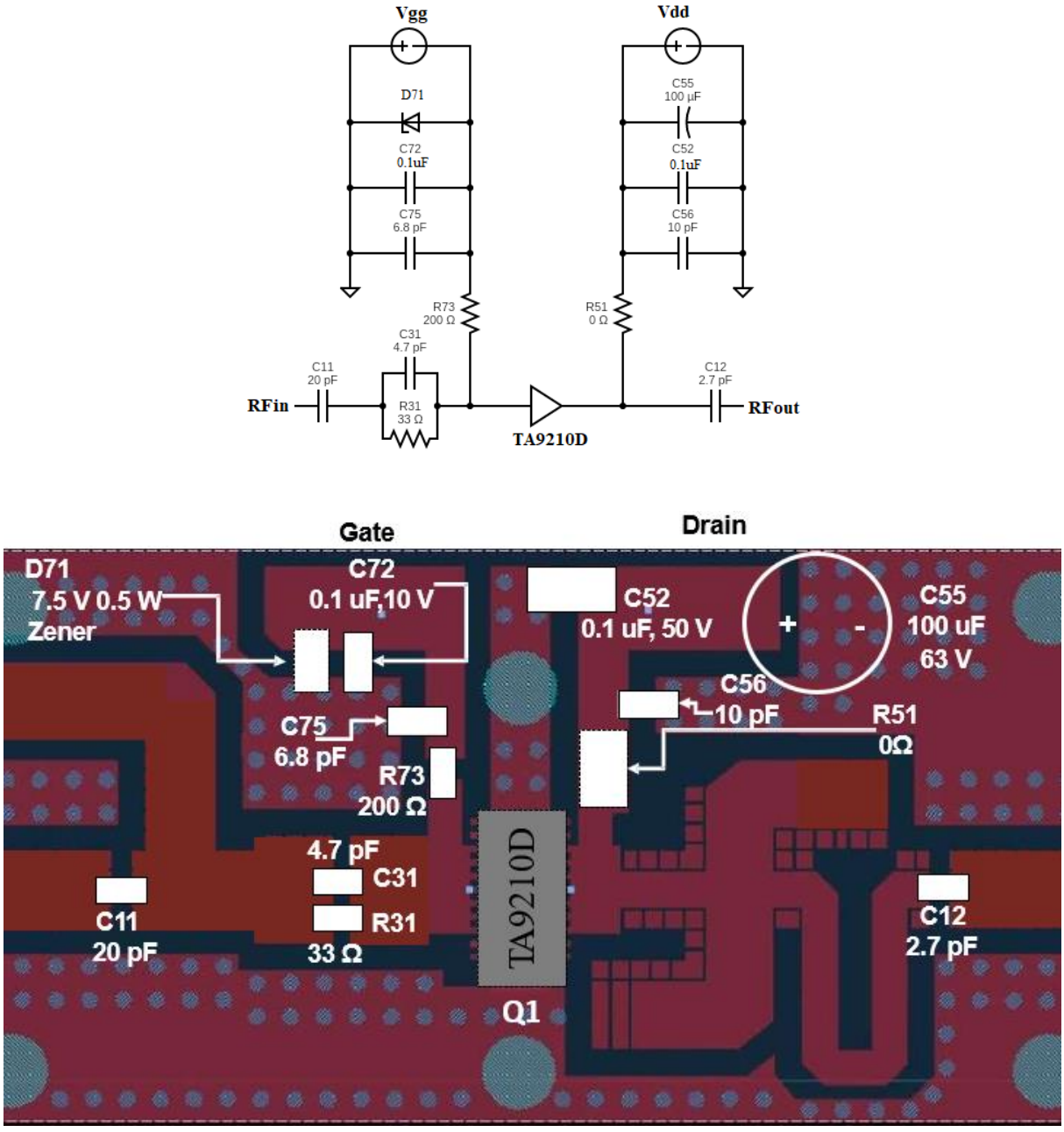

Figure 2.1 TA9210D-EVB-L 2400 MHz ~ 2500 MHz Schematic and EVB Layout

3. TA9210D-EVB-L Bill of Material

Component ID	Value	Manufacturer	Recommended Part Number
C11	20 pF	AVX	600S200GT250XT
C12	3.3 pF	AVX	600S3R3AT250XT
C31, C75	4.7 pF	AVX	600S4R7AT250XT
R31	33 Ω	Vishay	CRCW060333R0FKEAHP
R51	0 Ω	Vishay	CRCW08050000Z0EAC
C52	0.1 µF, 50 V	Murata	GRM31C5C1H104JA01L
C55	100 µF, 63 V	Nichicon	UPW1J101MPD1TD
C56	15 pF	AVX	600S150GT250XT
D71	7.5 V Zener	On Semiconductor	MMSZ5236BT 1G
C72	0.1 µF, 10 V	AVX	0603ZC104K4T2A
R73	51 Ω	Vishay	CRCW060351R0FKEAHP
Q1	12.5 W GaN Transistor	Tagore Tech	TA9210D
PCB		Rogers RO4350B, 20 mils, 2 oz copper	

Table 3.1 TA9210D-EVB-L BOM

4. TA9210D-EVB-L Biasing Sequence

Turn ON Device	Turn OFF Device
1. Set V_G to -5 V 2. Set V_D to +28 V 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-L Bias and Sequencing

5. TA9210D-EVB-L Board Measurement Summary

Frequency (GHz)	S21 Gain(dB)	S11 (dB)	S22 (dB)	Psat (dBm)	PAE% @Psat
2.4	18.4	-14.0	-17.2	41.3	75
2.45	18.5	-28.8	-12.8	41.0	77
2.5	18.3	-17.6	-10.2	41.2	76

Table 5.1 TA9210D-EVB-L 28 V, 100 mA Electrical Characteristics Summary

6. TA9210D-EVB-L Test Results

All the tests are carried out at room temperature.

6.1. S parameters

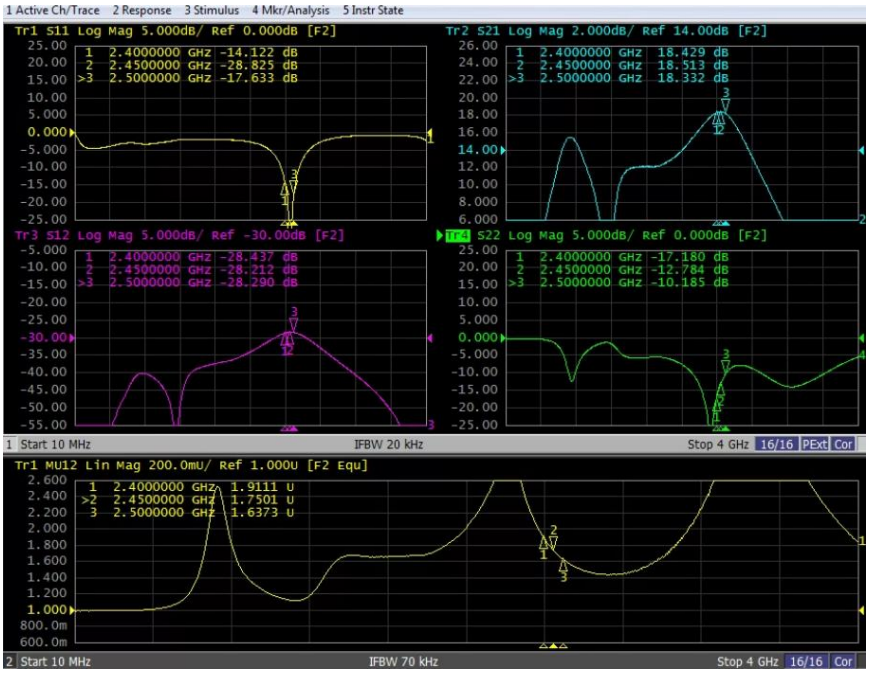

Figure 6.1.1. S parameters of TA9210D-EVB-L 28 V, 100 mA

6.2. Gain, PAE vs Pout @ 28 V Vdd, 100 mA Idq

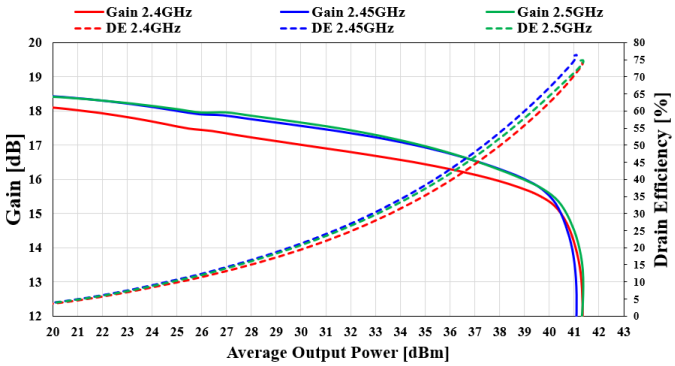

Figure 6.2.1 Gain, PAE v/s Pout of TA9210D-EVB-L, VD=28 V, IDQ=100 mA

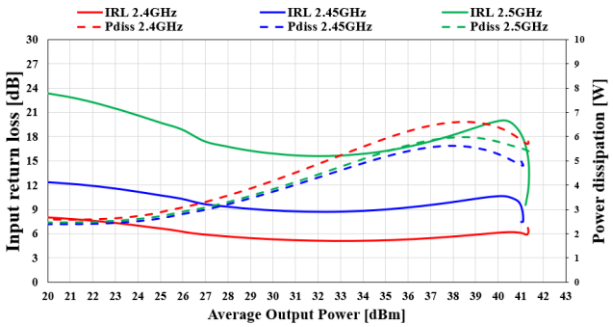

Figure 6.2.2 IRL, Pdiss v/s Pout of TA9210D-EVB-L, VD=28 V, IDQ=100 mA

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