Tagore Technology

TA9210D

12.5W CW 0.03 – 4.0 GHz GaN Power Transistor

Application Note: TA9210D EVB C

Application Note

30MHz~512MHz

32V/28V 50mA

Rev-1.3

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-C is tuned from 30MHz to 512MHz.

2. TA9210D-EVB-C Board Details

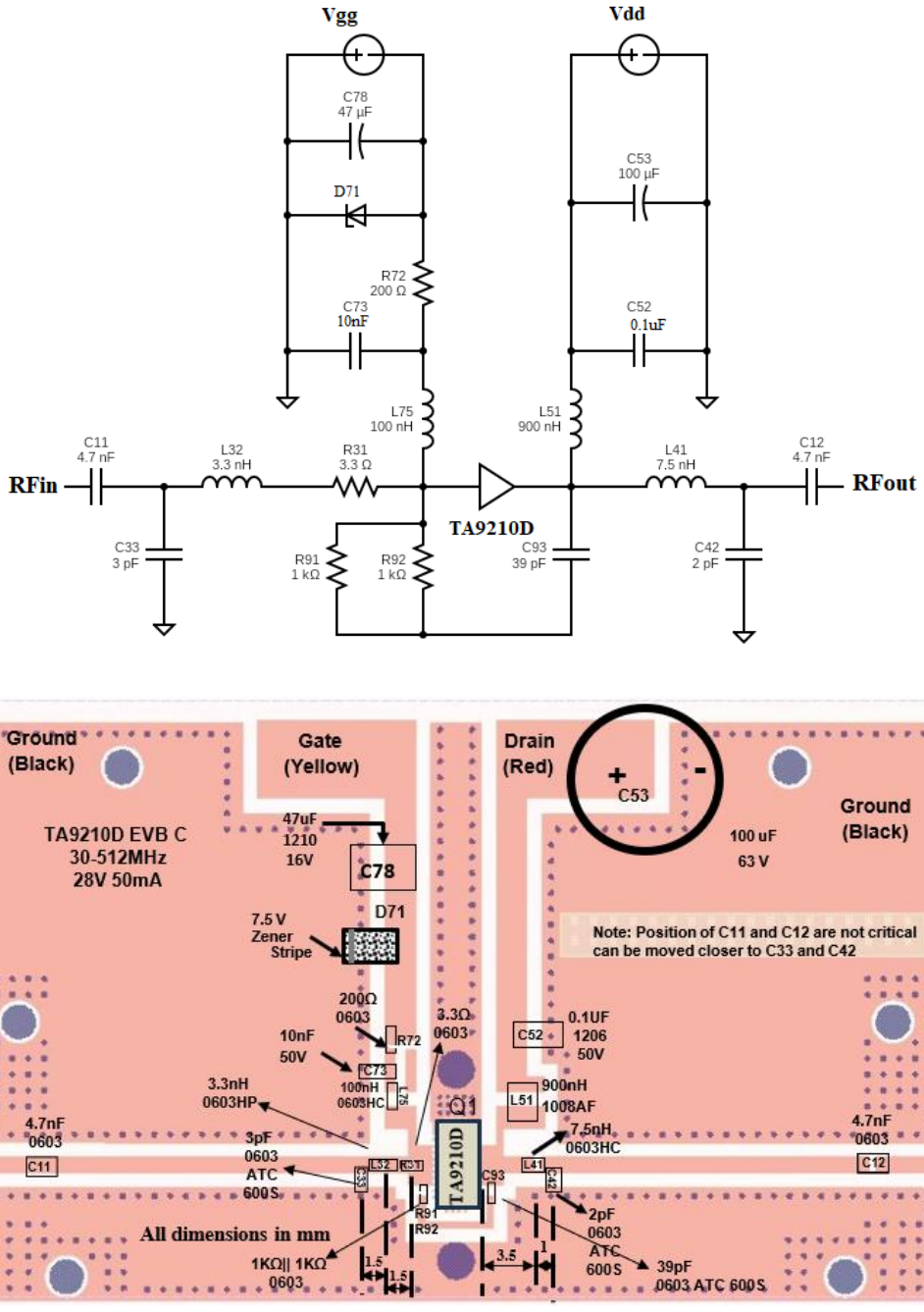

Figure 2.1 TA9210D-EVB-C 30MHz ~ 512MHz Schematic and EVB Layout

3. TA9210D-EVB-C Bill of Material

Component ID	Value	Manufacturer	Recommended Part Number
C11, C12	4.7nF, 50V	Murata	GRM1885C1H472JA01D
C33	3pF	AVX	ATC600S3R0BT
L32	3.3nH	Coil craft	0603HP-3N3XGEU
R31	3.3Ω	Vishay	RCS08053R30FKEA
L41	7.5nH	Coil craft	0603HC-7N5XJLU
C42	2pF	AVX	ATC600S2R0BT
C53	100µF	Nichicon	UPW1J101MPD1TD
C52	0.1µF, 50V	Murata	GRM31C5C1H104JA01L
L51	900nH	Coil craft	1008AF-901XJLC
D71	7.5 V Zener	On Semiconductor	MMSZ5236BT 1G
R72	20Ω	Vishay/Dale	CRCW060320R0FKEAHP
C73	10nF, 50V	Murata	GRM155R71H103KA88D
L75	100nH	Coil craft	0603HP-R10XJE
R91, R92	1KΩ//1KΩ	Vishay	RCP0603W1K00GEB
C93	39pF	AVX	600S390FT250XT
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-C BOM

4. TA9210D-EVB-C Biasing Sequence

Turn ON Device	Turn OFF Device
1. Set V_G to -5V 2. Set V_D to +32V/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-C Bias and Sequencing

5. TA9210D-EVB-C Board Measurement Summary

Frequency (MHz)	S21 Gain(dB)	S11 (dB)	S22 (dB)	Noise Figure(dB)	ACPR and AACPR
30	19.7	-5.7	-7.3	3.6	ACPR less than -28dBc and AACPR less than -40dBc for Average power up to 36dBm With LTE 8dB PAPR 4.515MHz BW
80	21.1	-11.8	-6.8	1.6	
100	21.1	-12.8	-6.7	1.4	
200	21.1	-13.1	-7.2	1.2	
300	20.7	-11.6	-7.9	1.4	
400	20.6	-10.2	-9.3	1.5	
512	20.2	-9.0	-10.5	1.5	

Table 5.1 TA9210D-EVB-C 32V 50mA Electrical Characteristics Summary

6. TA9210D-EVB-C Test Results

All the tests are carried out at room temperature.

6.1. S parameters

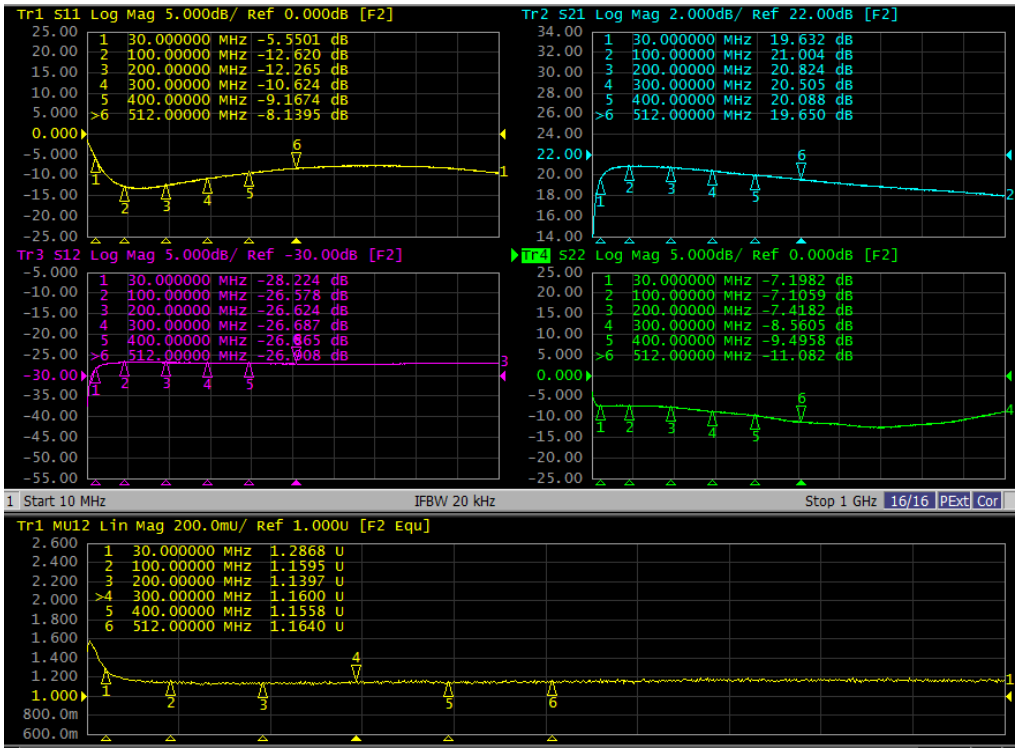

Figure 6.1.1. S parameters of TA9210D-EVB-C 32V 50mA

6.2. ACPR & AACPR Test Results

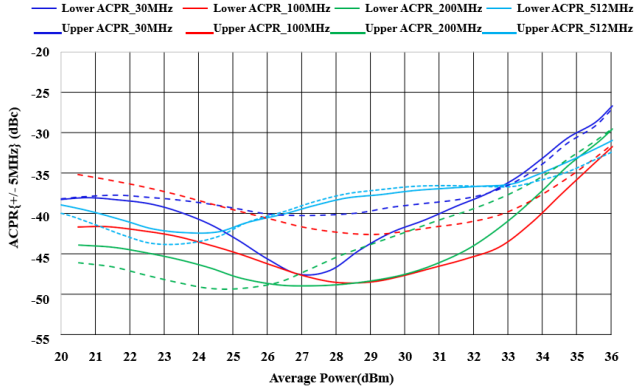

Figure 6.2.1 ACPR Vs P_{OUT} Of TA9210D-EVB-C, VD=32V, IDQ=50mA, LTE, PAPR = 8dB, 4.515MHz BW, TA=+25°C

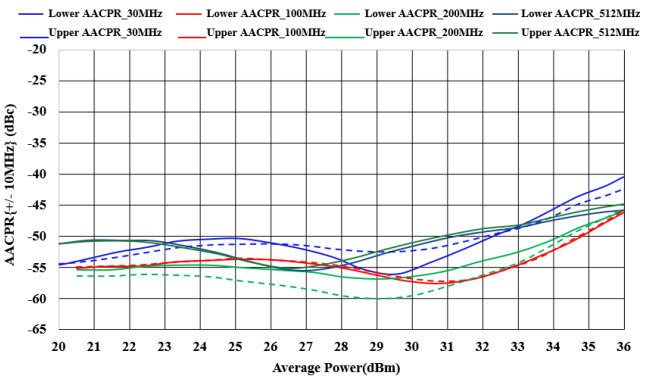

Figure 6.2.2 AACPR Vs P_{OUT} Of TA9210D-EVB-C, VD=32V, IDQ=50mA, LTE, PAPR = 8dB, 4.515MHz BW, TA=+25°C

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