TA9310E

20 W CW 0.5 – 4.0 GHz GaN Power Transistor

Application Note: TA9310E EVB G

Application Note

2700 MHz~3500 MHz

32 V, 50 mA

Rev-2.1

List of Contents

1. General Description

The TA9310E is a broadband GaN power transistor capable of delivering 20 W CW from 500 MHz to 4.0 GHz frequency band. The transistor can be used at lower frequencies with reduced output power. The input and output can be matched for best power and efficiency for the desired band. The TA9310E is packaged in a compact, low-cost Dual Flat No lead (DFN) 5 x 6 x 0.75 mm, 8 leads plastic package.

TA9310E-EVB-G is tuned from 2700 MHz to 3500 MHz.

2. TA9310E-EVB-G Board Details

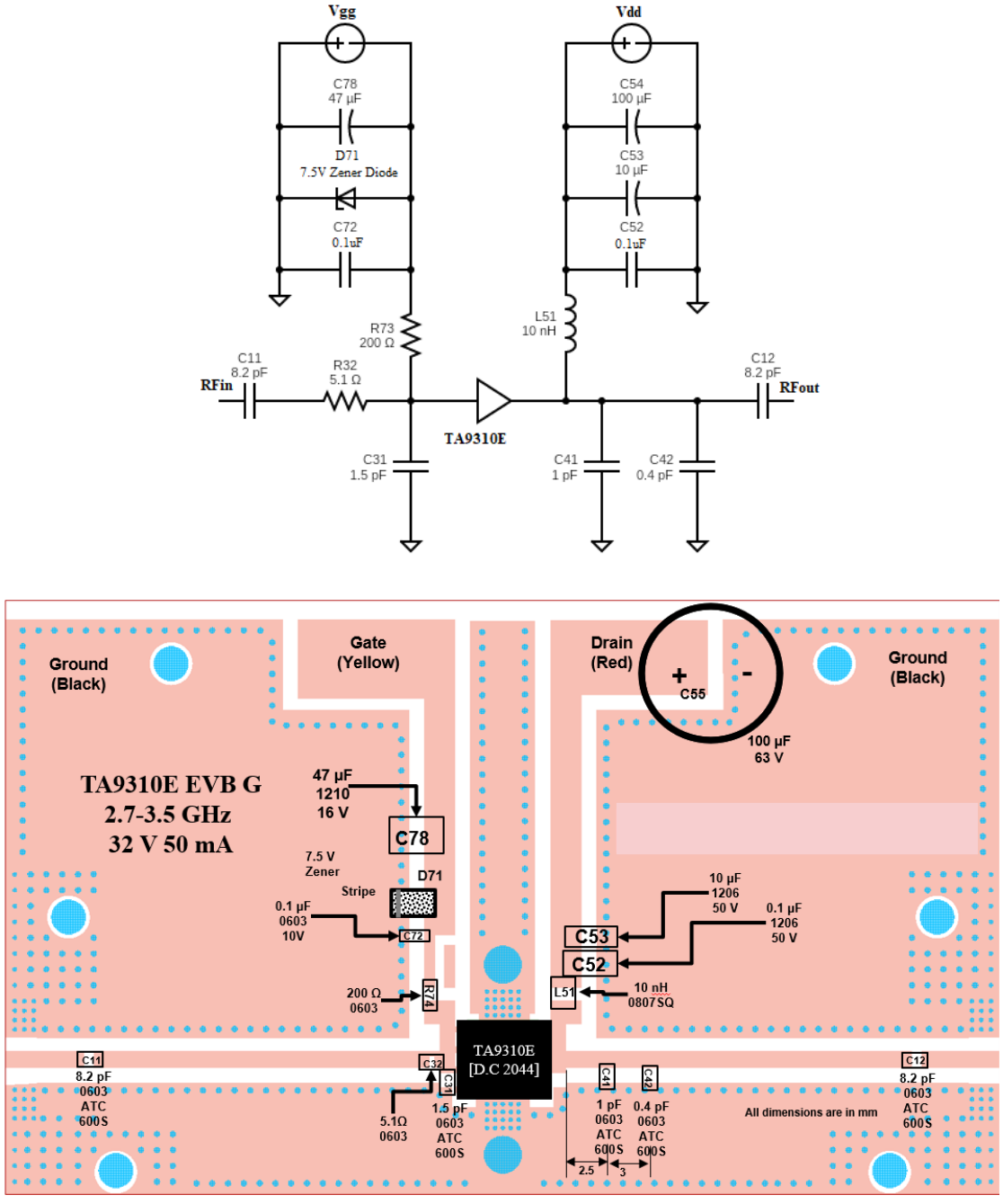

Figure 2.1 TA9310E-EVB-G 2700 MHz ~ 3500 MHz Schematic and EVB Layout

3. TA9310E-EVB-G Bill of Material

Component ID	Value	Manufacturer	Recommended Part Number
C11, C12	8.2 pF	AVX	600S8R2CT250XT
C31	1.5 pF	AVX	600S1R5BT250XT
C32	5.1 Ω	Vishay	600S0R4BT250XT
C41	1 pF	AVX	600S1R0BT250T
C42	0.4 pF	AVX	600S0R4BT250XT
L51	10 nH	Coil craft	0807SQ-10NJLC
C52	0.1 µF, 50 V	Murata	GRM31C5C1H104JA01L
C53	10 µF	Murata	GRM32ER71H106KA12L
D71	7.5 V Zener	On Semiconductor	SZMMSZ5236BT1G
C72	0.1 µF, 10 V	AVX	0603ZC104K4T2A
R74	200 Ω	Vishay	RCP0603W200RGEB
C78	47 µF, 16 V	Murata	GRM32ER61C476ME15L
Q1	20 W GaN Transistor	Tagore Tech	TA9310E
PCB	Rogers RO4350B, 20 mils, 2 oz copper		

Table 3.1 TA9310E-EVB-G BOM

4. TA9310E-EVB-G Biasing Sequence

Turn ON Device	Turn OFF Device
1. Set V_G to -5 V 2. Set V_D to +32 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 TA9310E-EVB-G Bias and Sequencing

5. TA9310E-EVB-G Board Measurement Summary

Frequency (MHz)	S21 Gain(dB)	S11(dB)	S22(dB)	Psat(dBm)	PAE (%) @Psat
2700	10.3	-2.8	-5.6	43.5	43
2900	11.6	-3.2	-6.3	44.7	53
3100	13.3	-4.4	-7.8	49.0	62
3300	14.6	-7.3	-8.6	44.7	67
3500	13.2	-7.4	-6.8	43.5	54

Table 5.1 TA9310E-EVB-G 32 V, 50 mA Electrical Characteristics Summary

6. TA9310E-EVB-G Test Results

All the tests are carried out at room temperature.

6.1. S parameters

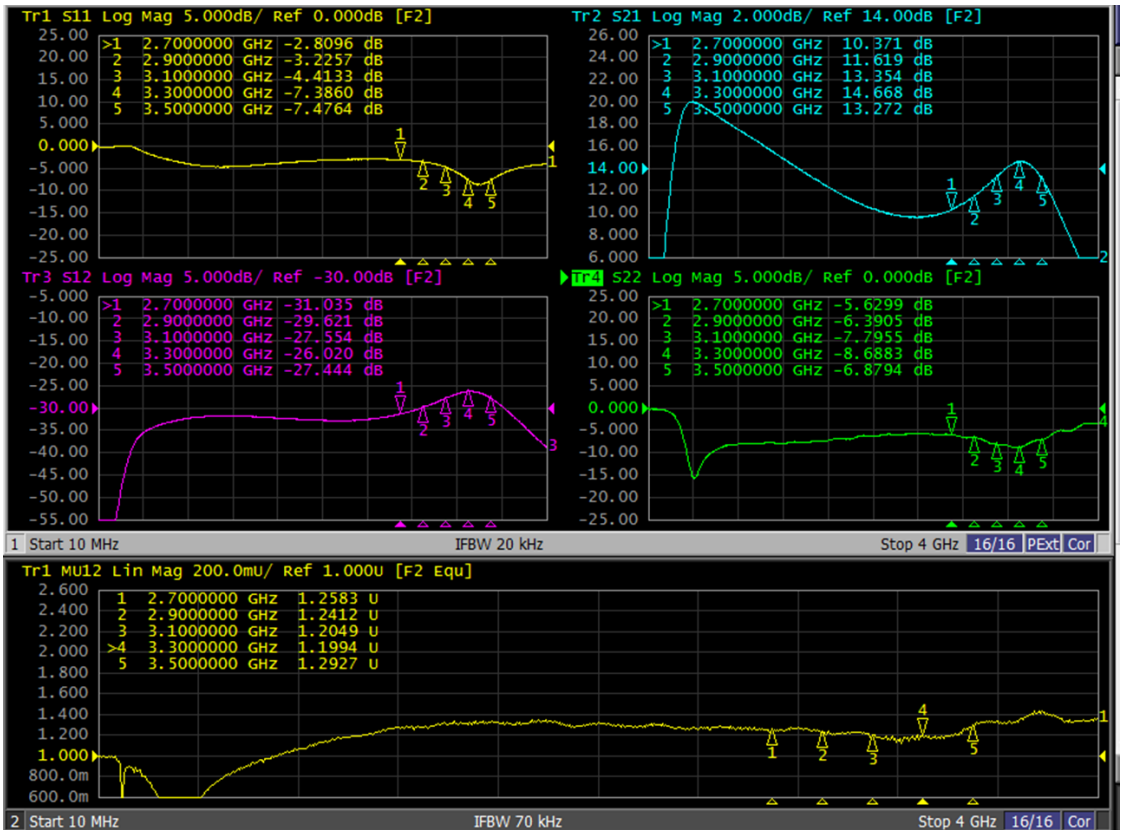

Figure 6.1.1. S parameters of TA9310E-EVB-G 32 V, 50 mA

6.2. Large Signal Test Results

Gain and PAE Vs P_{OUT} data and IRL and Pdiss Vs P_{OUT} [Pulsed 20% DC, 500 µS Pulse width]

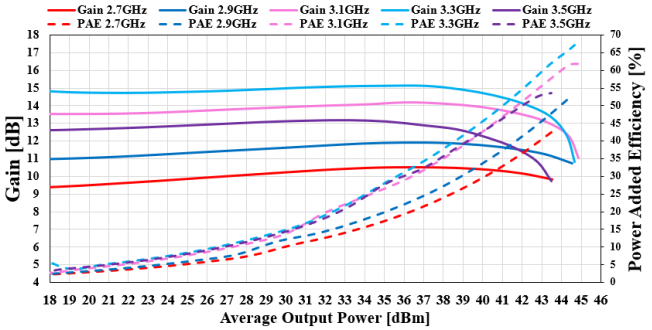

Figure 6.2.1. Gain and PAE vs P_{OUT} of TA9310E-EVB-G for 32 V, 50 mA for freq: 2700-3500 MHz

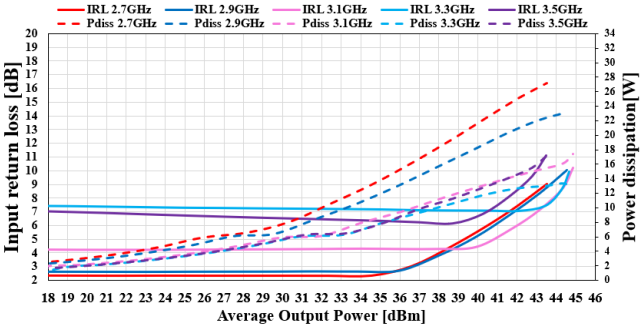

Figure 6.2.2. IRL and Pdiss vs P_{OUT} of TA9310E-EVB-G for 32 V, 50 mA for freq: 2700-3500 MHz

Edition Revision 2.1 - 2024-07-30

Published by

Tagore Tech Inc.

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Arlington Heights, IL 60004, USA

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