

TA9310E

20 W CW 0.5 – 4.0 GHz GaN Power Transistor

Application Note: TA9310E EVB E

Application Note

2200 MHz~2400 MHz

28 V, 100 mA

Rev-2.1

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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-E is tuned from 2200 MHz to 2400 MHz.

2. TA9310E-EVB-E Board Details

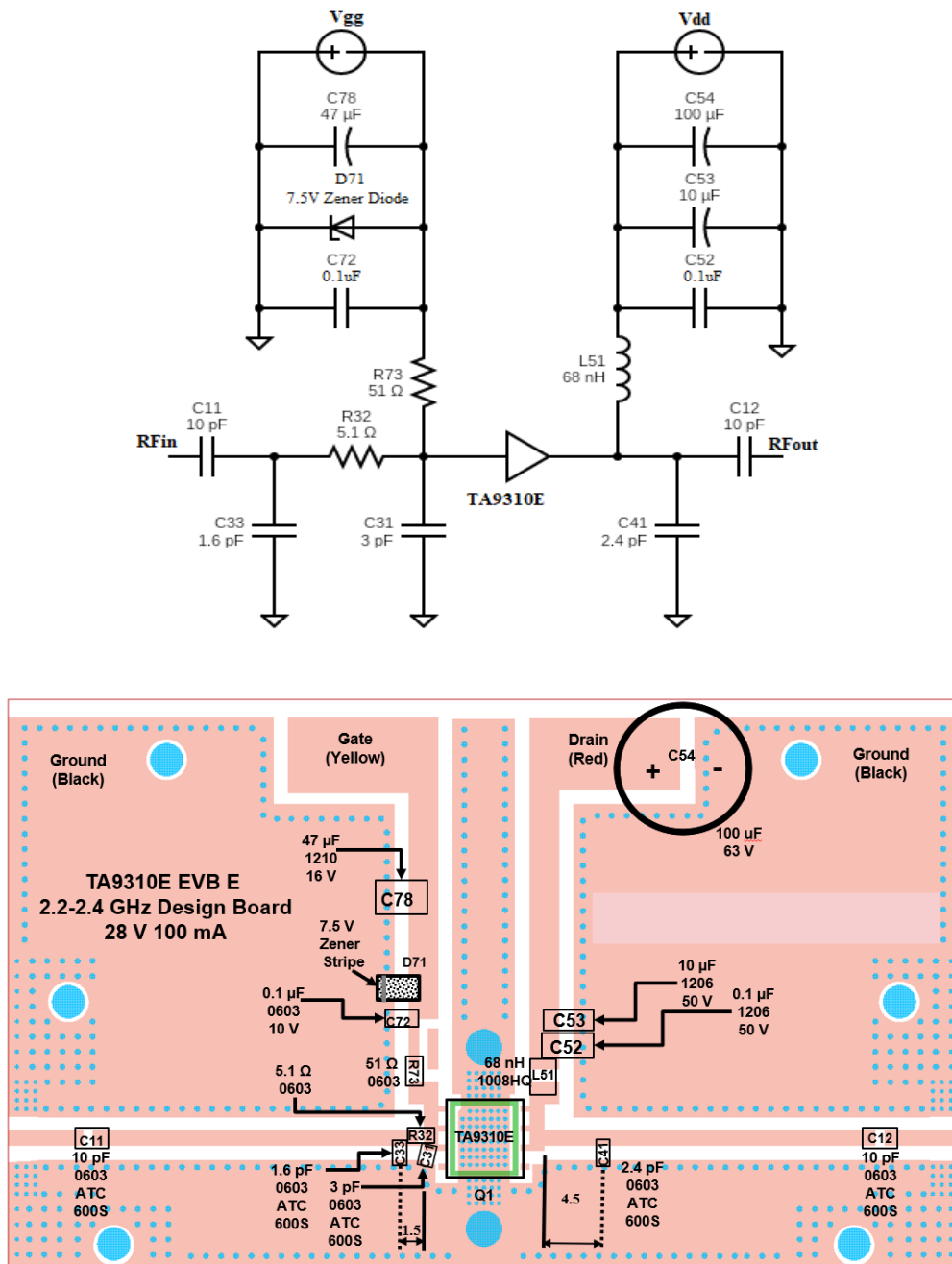


Figure 2.1 TA9310E-EVB-E 2200 MHz ~ 2400 MHz Schematic and EVB Layout

3. TA9310E-EVB-E Bill of Material

Component ID	Value	Manufacturer	Recommended Part Number
C11, C12	10 pF	AVX	600S100AT250XT
C31	3 pF	AVX	600S3R0AT250XT
R32	5.1 Ω	Vishay	CRCW06035R10FKEAHP
C33	1.6 pF	AVX	600S1R6AT250XT
C41	2.4 pF	AVX	600S2R4AT250XT
L51	68 nH	Coil craft	1008HQ-68NXGLB
C52	0.1 μ F, 50 V	Murata	GRM31C5C1H104JA01L
C53	10 μ F, 50 V	Murata	GRM32ER71H106KA12L
C55	100 μ F, 63 V	Nichicon	UPW1J101MPD1TD
D71	7.5 V Zener	On Semiconductor	MMSZ5236BT1G
C72	0.1 μ F, 10 V	AVX	0603ZC104K4T2A
R75	51 Ω	Vishay	CRCW060351R0FKEAHP
C78	47 μ F, 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-E BOM

4. TA9310E-EVB-E 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 TA9310E-EVB-E Bias and Sequencing

5. TA9310E-EVB-E Board Measurement Summary

Frequency (MHz)	S21 Gain(dB)	S11(dB)	S22(dB)	Psat(dBm)	PAE (%) @Psat
2200	16.6	-10.3	-8.0	44.7	58
2300	17.3	-12.8	-10.4	44.4	60
2400	17.6	-9.6	-15.6	44.0	64

Table 5.1 TA9310E-EVB-E 28 V, 100 mA Electrical Characteristics Summary

6. TA9310E-EVB-E Test Results

All the tests are carried out at room temperature.

6.1. S parameters

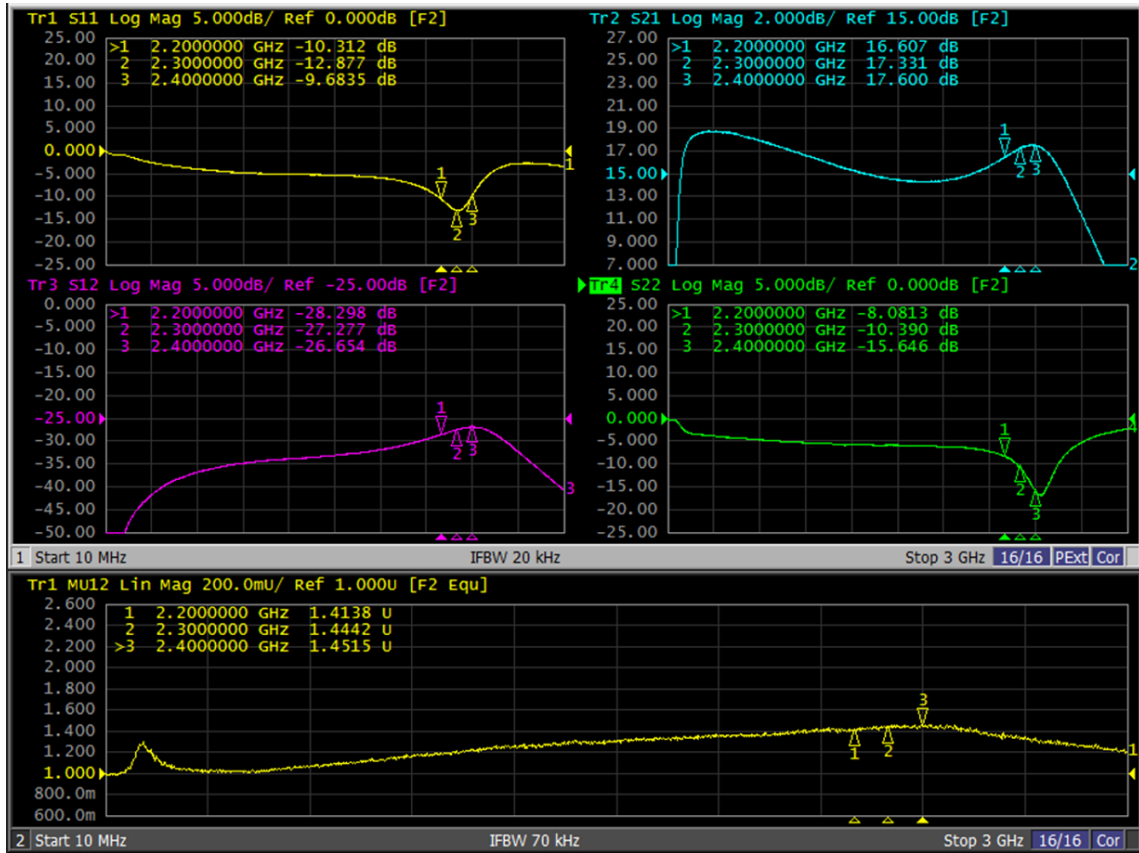


Figure 6.1.1. S parameters of TA9310E-EVB-E 28 V, 100 mA

6.2. Large Signal Test Results

Gain and PAE Vs P_{OUT} data and IRL and P_{diss} Vs P_{OUT} [V_d=28 V, I_{DQ}=100 mA, CW]

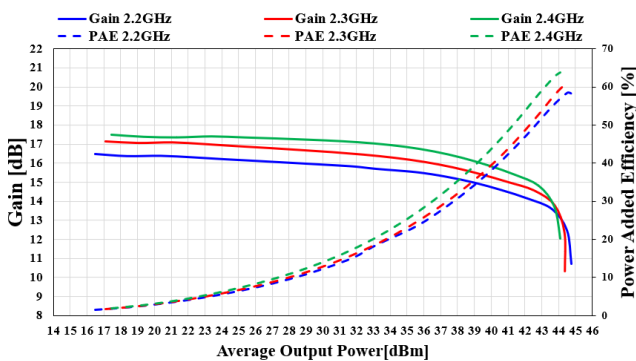


Figure 6.2.1. Gain and PAE vs P_{OUT} of TA9310E-EVB-E for 28 V, 100 mA for freq:2200-2400 MHz

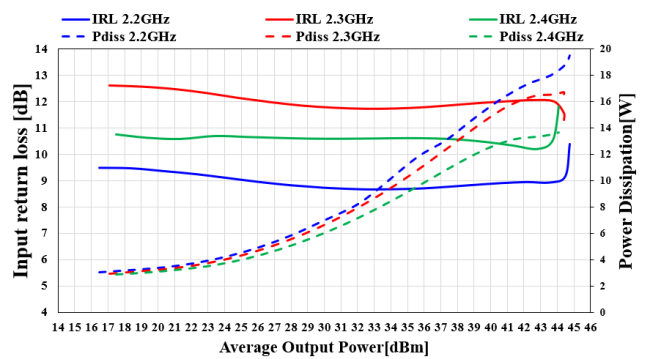


Figure 6.2.2. IRL and P_{diss} vs P_{OUT} of TA9310E-EVB-E for 28 V, 100 mA for freq:2200-2400 MHz

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