

# TA9310E

20W CW 0.5 – 4.0 GHz GaN Power Transistor

Application Note: TA9310E EVB E

## Application Note

2200MHz~2400MHz

28V 100mA

Rev-1.1

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## 1. General Description

The TA9310E is a broadband GaN power transistor capable of delivering 20W CW from 500MHz to 4.0GHz 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 Quad Flat No lead (QFN) 5x6x0.8mm, 8 leads plastic package.

TA9310E-EVB-E is tuned from 2200MHz to 2400MHz.

## 2. TA9310E-EVB-E Board Details

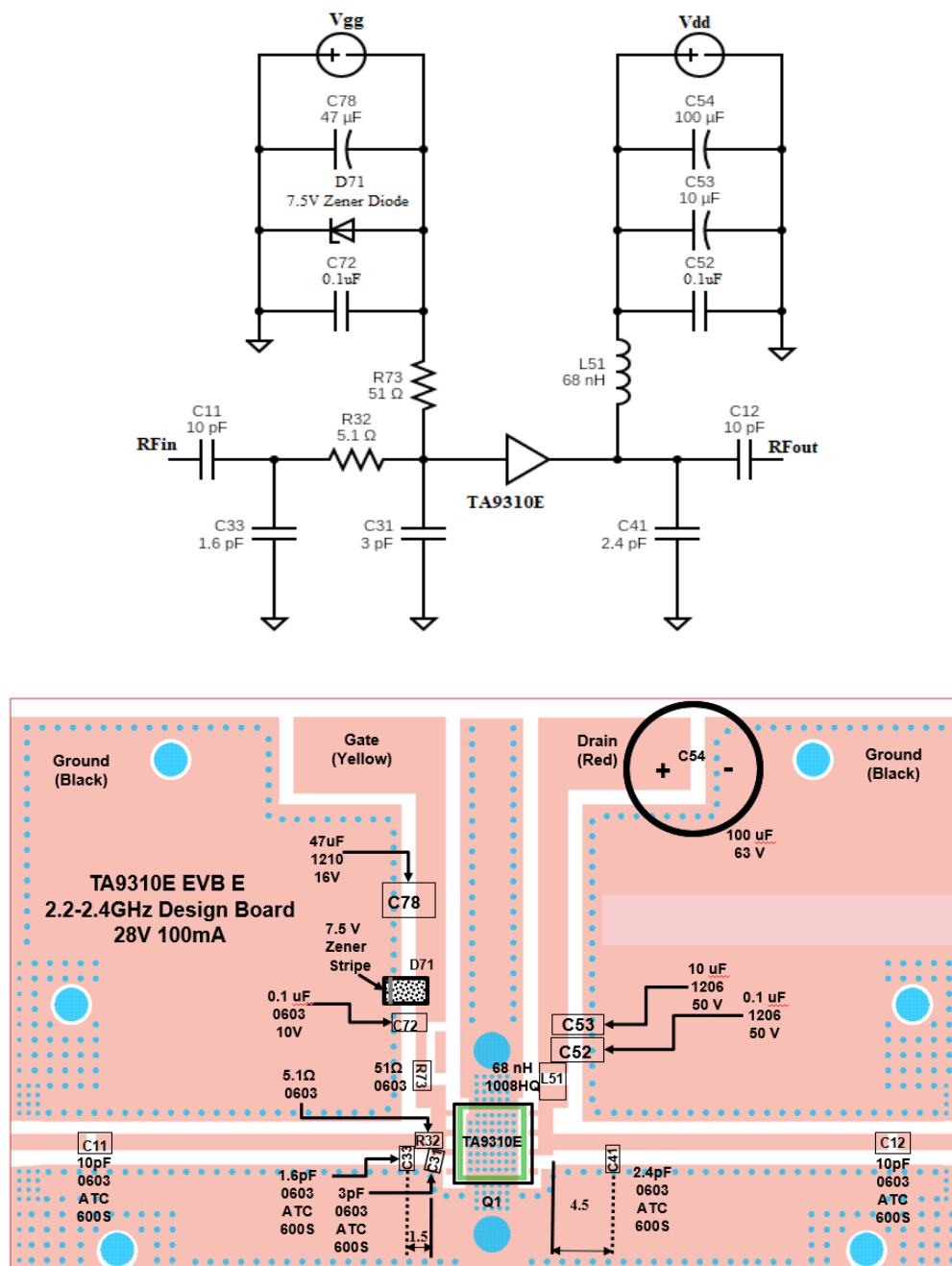


Figure 2.1 TA9310E-EVB-E 2200MHz ~ 2400MHz Schematic and EVB Layout

### 3. TA9310E-EVB-E Bill of Material

Component ID	Value	Manufacturer	Recommended Part Number
C11, C12	10pF	AVX	600S100AT250XT
C31	3pF	AVX	600S3R0AT250XT
R32	5.1Ω	Vishay	CRCW06035R10FKEAHP
C33	1.6pF	AVX	600S1R6AT250XT
C41	2.4pF	AVX	600S2R4AT250XT
L51	68nH	Coil craft	1008HQ-68NXGLB
C52	0.1μF, 50V	Murata	GRM31C5C1H104JA01L
C53	10μF, 50V	Murata	GRM32ER71H106KA12L
C55	100μF, 63V	Nichicon	UPW1J101MPD1TD
D71	7.5 V Zener	On Semiconductor	MMSZ5236BT1G
C72	0.1μF, 10V	AVX	0603ZC104K4T2A
R75	51Ω	Vishay	CRCW060351R0FKEAHP
C78	47μF, 16V	Murata	GRM32ER61C476ME15L
Q1	20Watt GaN Transistor	Tagore Technology	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 -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 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 28V 100mA Electrical Characteristics Summary**

## 6. TA9310E-EVB-E Test Results

All the tests are carried out at room temperature.

### 6.1. S parameters

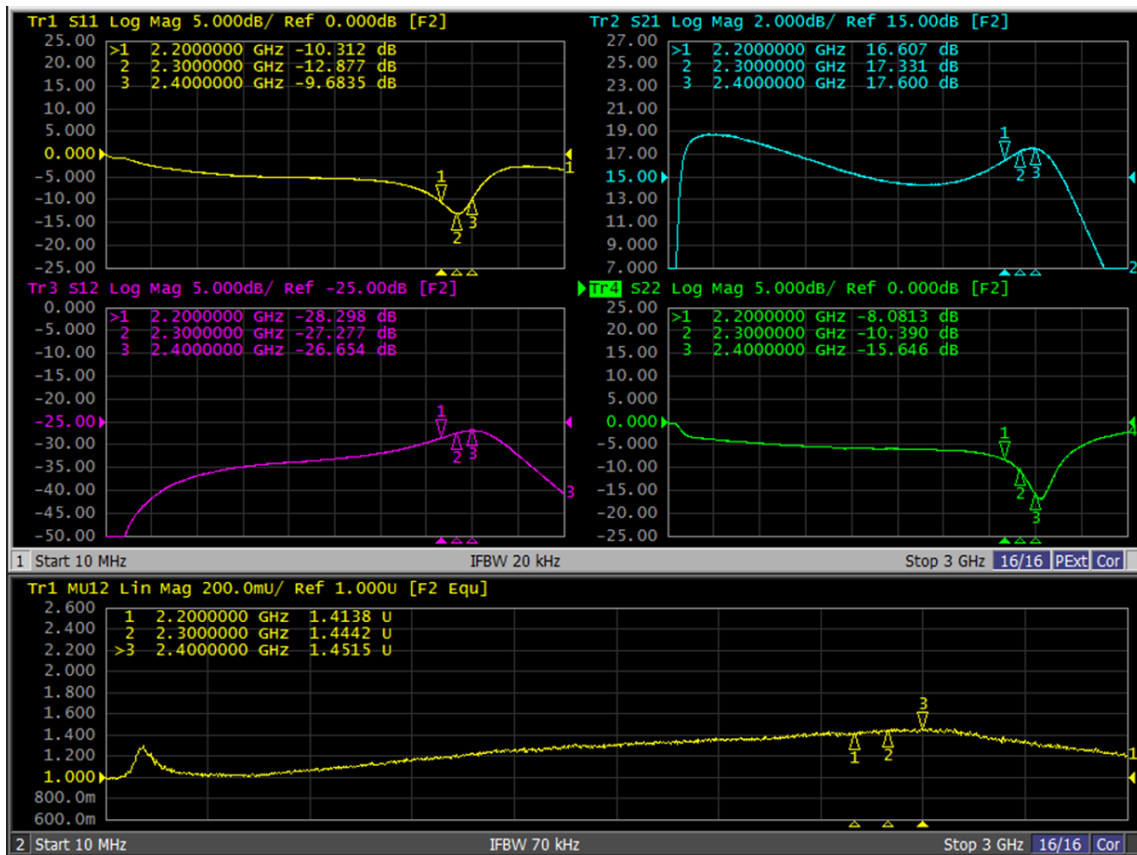


Figure 6.1.1. S parameters of TA9310E-EVB-E 28V 100mA

### 6.2. Large Signal Test Results

**Gain and PAE Vs  $P_{OUT}$  data and IRL and Pdiss Vs  $P_{OUT}$  |  $V_d=28V$ ,  $I_{DQ}=100mA$ , CW]**

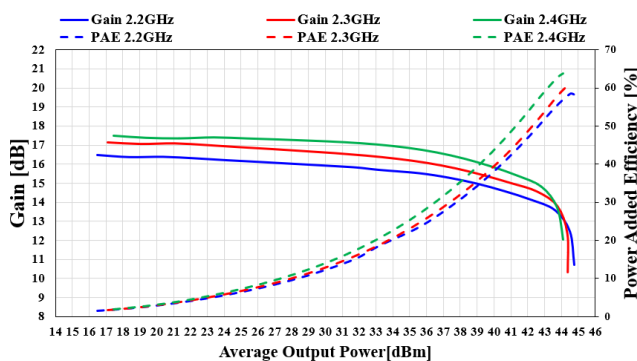


Figure 6.2.1. Gain and PAE vs  $P_{OUT}$  of TA9310E-EVB-E for 28V 100mA for freq:2200-2400MHz

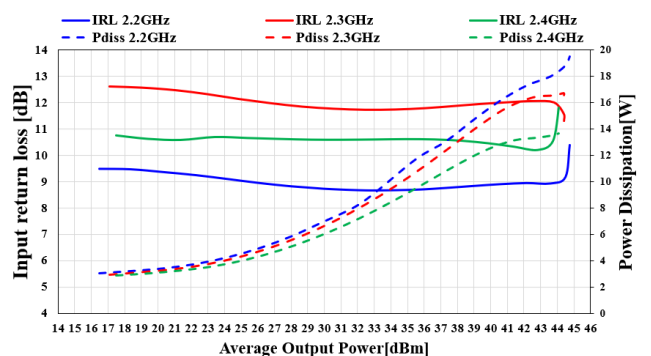


Figure 6.2.2. IRL and Pdiss vs  $P_{OUT}$  of TA9310E-EVB-E for 28V 100mA for freq:2200-2400MHz

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