

# TA9110K

6W CW 0.03 – 4.0 GHz GaN Power Transistor

Application Note: TA9110K EVB C

## Application Note

3300MHz~3800MHz

15V 400mA

Rev-1.3

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## 1. General Description

The TA9110K is a broadband GaN power transistor capable of delivering 6W CW from 30MHz 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 TA9110K is packaged in a compact, low-cost Quad Flat No lead (QFN) 3x3x0.8mm, 16 leads plastic package. TA9110K-EVB-C is tuned from 3300MHz to 3800MHz.

## 2. TA9110K-EVB-C Board Details

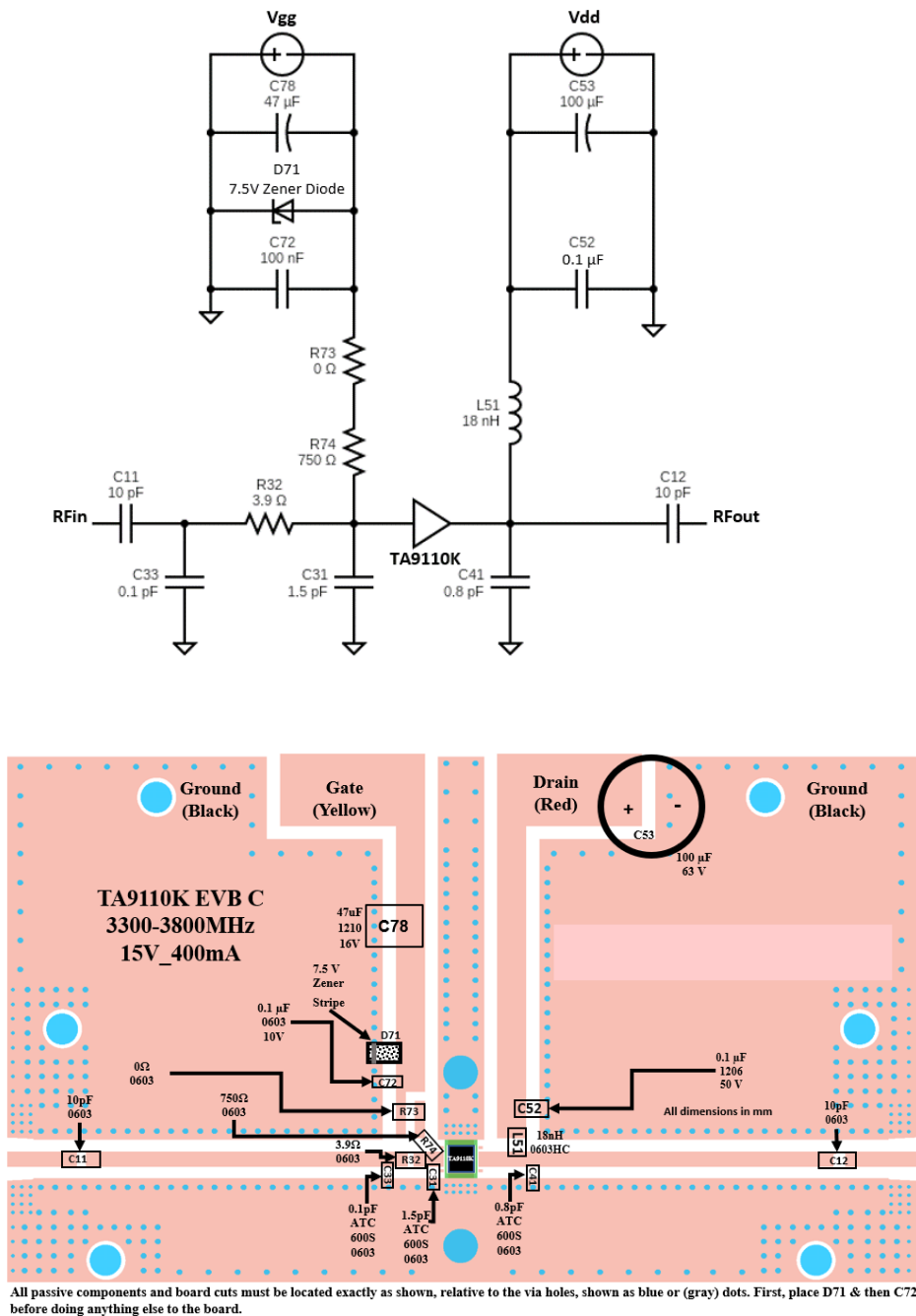


Figure 2.1 TA9110K-EVB-C 3300MHz ~ 3800MHz Schematic and EVB Layout

### 3. [TA9110K-EVB-C Bill of Material](#)

Component ID	Value	Manufacturer	Recommended Part Number
C11,12	10pF	AVX	600S100JT250XT
C31	1.5pF	AVX	600S1R5BT250XT
R32	3.9Ω	Vishay	CRCW06033R90FKEAHP
C33	0.1pF	AVX	600S0R1BT250XT
C41	0.8pF	AVX	600S0R8AT250XT
L51	18nH	Coil craft	0603HC-18NXGLW
C52	0.1μF, 50V	Murata	GRM31C5C1H104JA01L
C53	100μF, 63V	Nichicon	UPW1J101MPD1TD
D71	7.5 V Zener	On Semiconductor	MMSZ5236BT1G
C72	0.1μF, 10V	AVX	0603ZC104K4T2A
R73	0Ω	Vishay	CRCW06030000Z0EAC
R74	750Ω	Vishay	CRCW0603750RFKEB
C78	47μF, 16V	Murata	GRM32ER61C476ME15L
Q1	6W GaN transistor	Tagore Technology	TA9110K
PCB		Rogers RO4350B, 20 mils, 2 oz copper	

**Table 3.1 TA9110K-EVB-C BOM**

### 4. [TA9110K-EVB-C Biasing Sequence](#)

Turn ON Device	Turn OFF Device
1. Set $V_G$ to -5V 2. Set $V_D$ to +15V 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 TA9110K-EVB-C Bias and Sequencing**

### 5. [TA9110K-EVB-C Board Measurement Summary](#)

Frequency (MHz)	S21 Gain(dB)	S11(dB)	S22(dB)	Psat(dBm)	PAE (%) @Psat
3300	12.3	-8.6	-9.3	36.5-37	48
3500	13	-14.4	-8.6		50
3700	12.9	-16.6	-7.6		51
3800	12.2	-9.98	-6.8		53

**Table 5.1 TA9110K-EVB-C 15V 400mA Electrical Characteristics Summary**

## 6. TA9110K-EVB-C Test Results

All the tests are carried out at room temperature.

### 6.1. S parameters

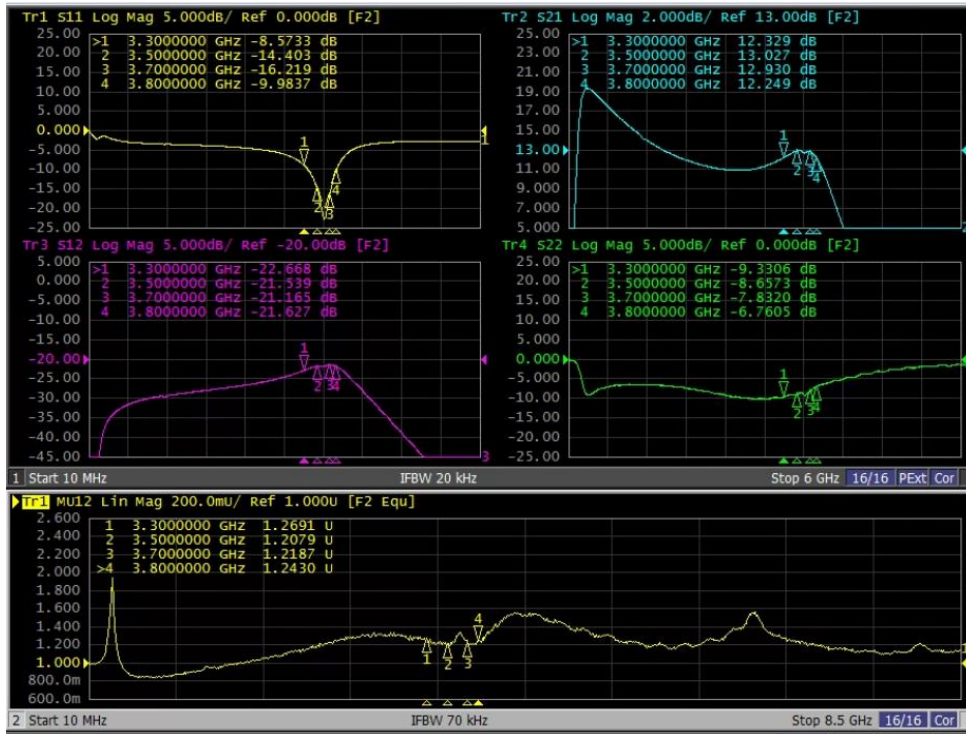


Figure 6.1.1. S parameters of TA9110K-EVB-C 15V 400mA

### 6.2. Large Signal Test Results

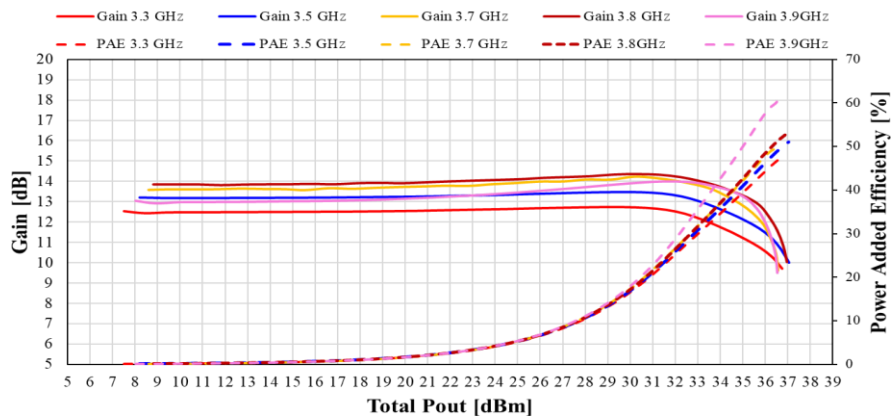


Figure 6.2.1. Gain and PAE vs P<sub>OUT</sub> of TA9110K-EVB-C

### 6.3. Spectrum Mask Plots

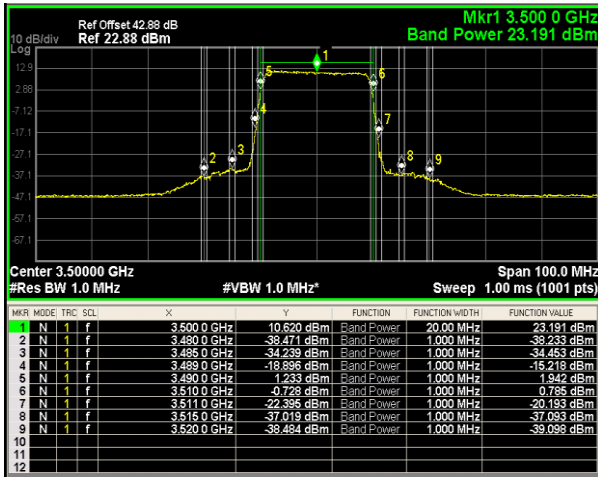


Figure 6.3.1. Spectrum Mask Plot of TA9110K-EVB-C for Pout=23dBm

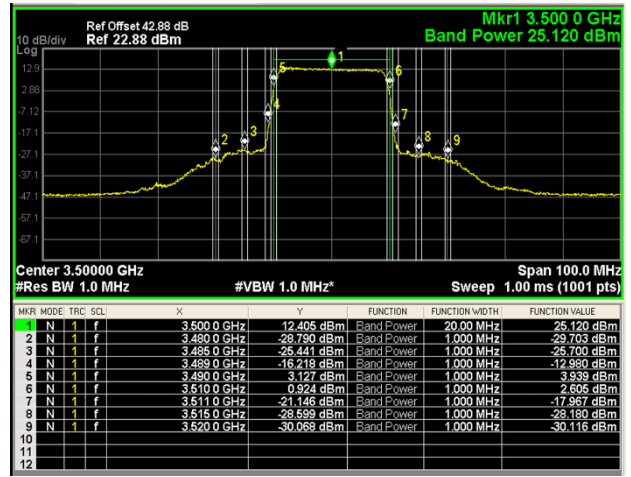


Figure 6.3.2. Spectrum Mask Plot of TA9110K-EVB-C for Pout=25dBm

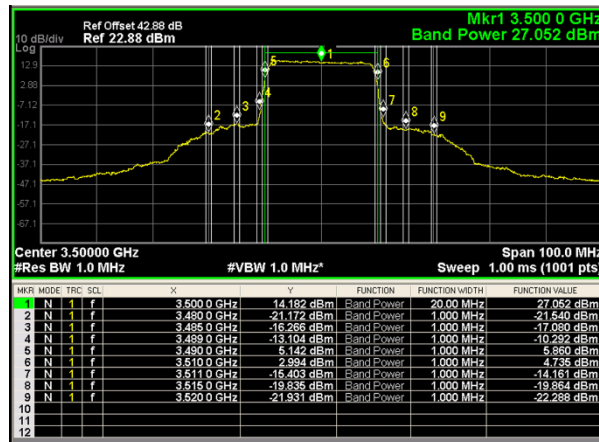


Figure 6.3.3. Spectrum Mask Plot of TA9110K-EVB-C for Pout=27dBm

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