Tagore Technology

TA9110K

6W CW 0.03 – 4.0 GHz GaN Power Transistor

Application Note: TA9110K EVB B

Application Note

30MHz~512MHz

32V/28V 40mA

Rev-1.1

List of Contents

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-B is tuned from 30 to 512MHz.

2. TA9110K-EVB-B Board Details

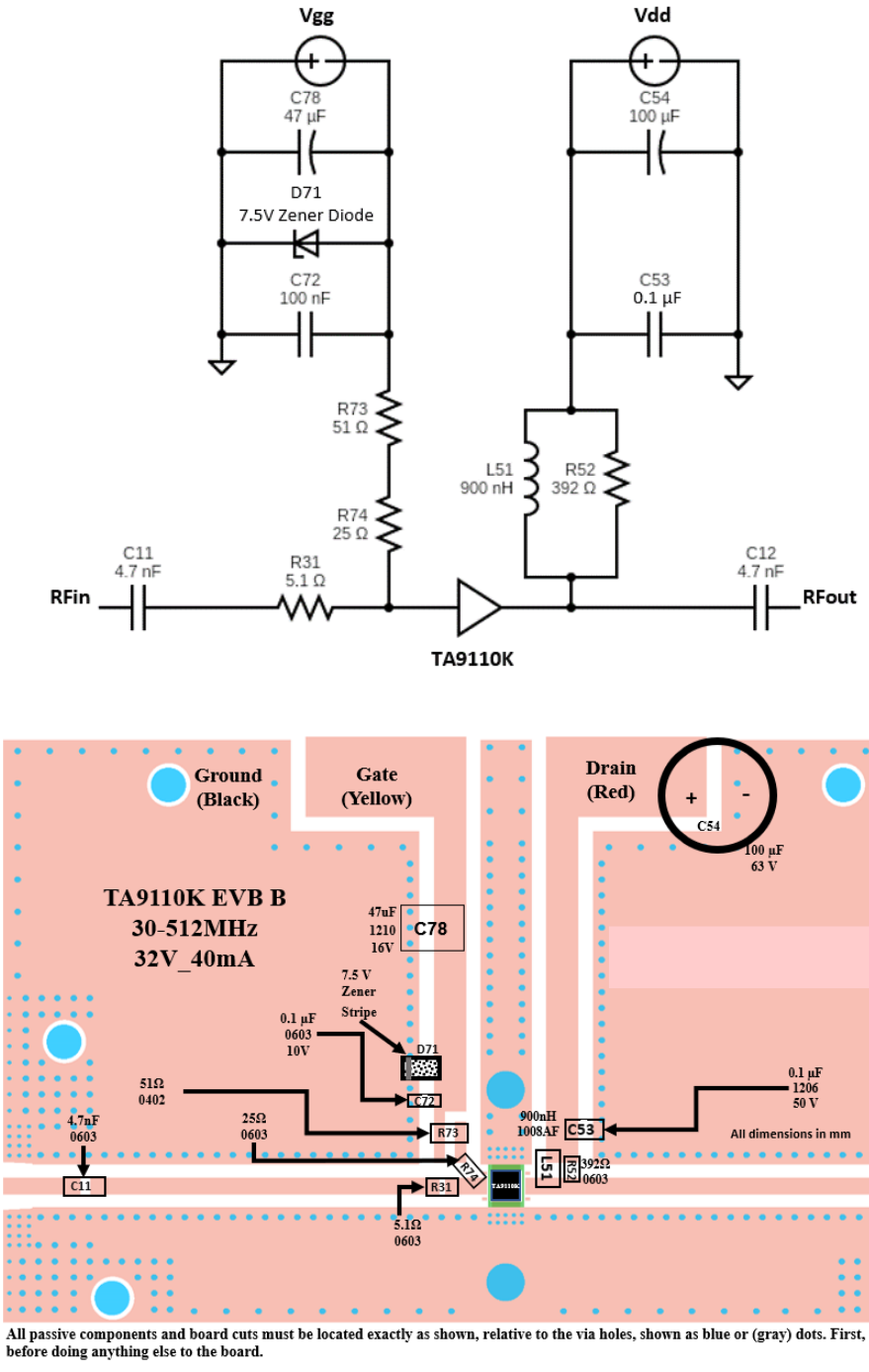

Figure 2.1 TA9110K-EVB-B 30MHz ~ 512MHz Schematic and EVB Layout

3. TA9110K-EVB-B Bill of Material

Component ID	Value	Manufacturer	Recommended Part Number
C11,12	4.7nF, 50V	Murata	GRM1885C1H472JA01D
R31	5.1Ω	Vishay	RCS06035R10FKEA
L51	900nH	Coil craft	1008AF-901XJLC
R52	392Ω	Panasonic	ERJ-UP3F3920V
C53	0.1µF, 50V	Murata	GRM31C5C1H104JA01L
C54	100µF, 63V	Nichicon	UPW1J101MPD1TD
D71	7.5 V Zener	On Semiconductor	MMSZ5236BT1G
C72	0.1µF, 10V	AVX	0603ZC104K4T2A
R73	51Ω	Vishay	CRCW060351R0FKEAHP
R74	25Ω	Panasonic	ERJ-PA3F24R9V
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-B BOM

4. TA9110K-EVB-B Biasing Sequence

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

5. TA9110K-EVB-B Board Measurement Summary

Frequency (MHz)	S21 Gain(dB)	S11(dB)	S22(dB)	Psat(dBm)	PAE (%) @Psat
30	21.3	-12	-4.9	39.5-40	58-62
100	21.6	-12	-5.0		
200	21.5	-11	-5.1		
300	21.2	-9.9	-5.2		
400	20.9	-8.8	-5.4		
512	20.6	-7.5	-5.6		

Table 5.1 TA9110K-EVB-B 32V 40mA Electrical Characteristics Summary

6. TA9110K-EVB-B Test Results

All the tests are carried out at room temperature.

6.1. S parameters

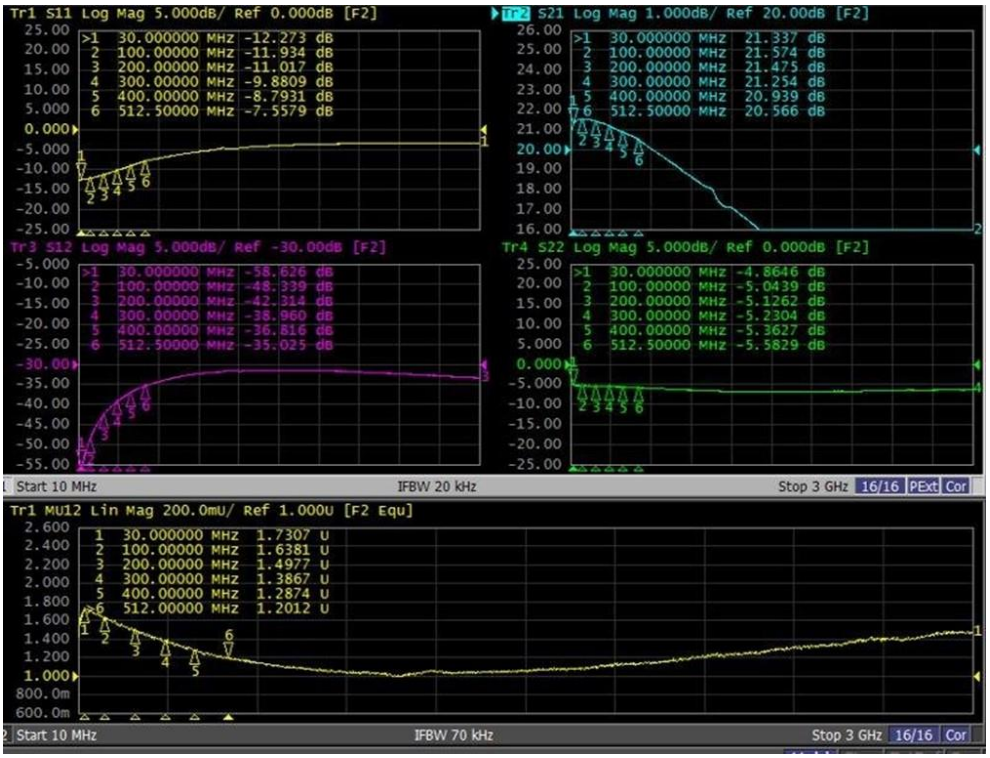

Figure 6.1.1. S parameters of TA9110K-EVB-B 32V 40mA

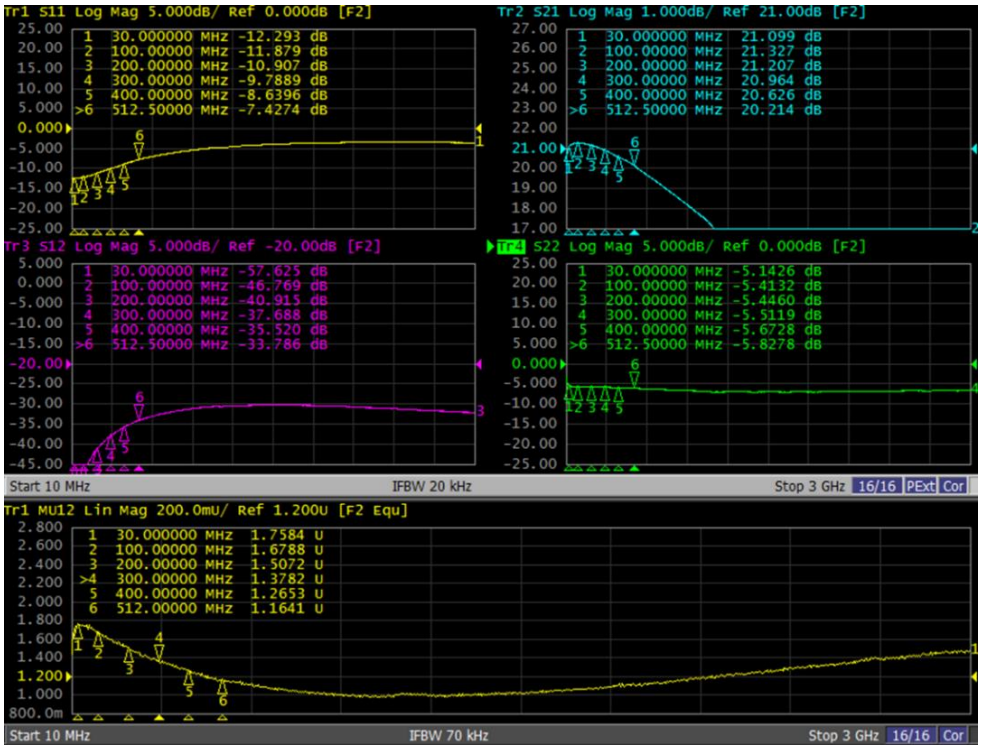

Figure 6.1.2. S parameters of TA9110K-EVB-B 28V 40mA

6.2. Large Signal Test Results

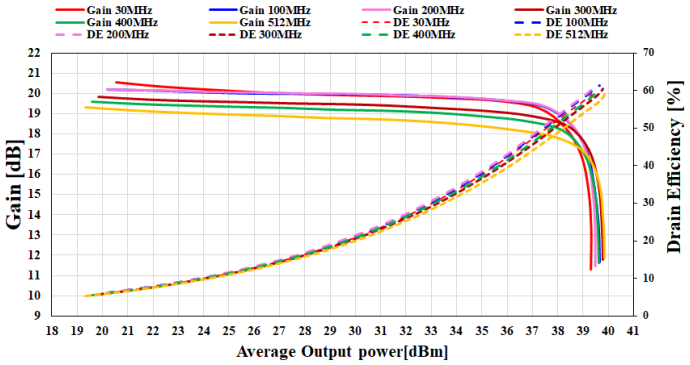

Figure 6.2.1. Gain and DE vs P_{OUT} of TA9110K-EVB-B For 32V 40mA

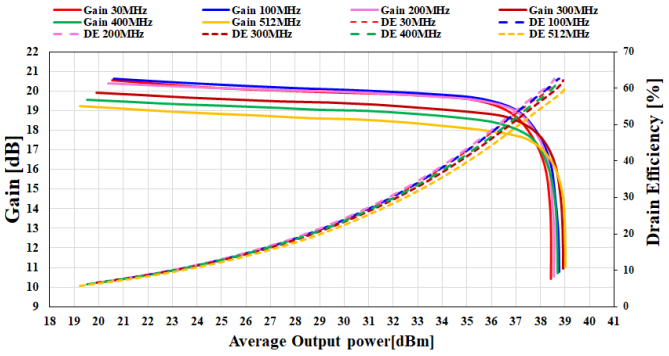

Figure 6.2.2. Gain and DE vs P_{OUT} of TA9110K-EVB-B For 28V 40mA

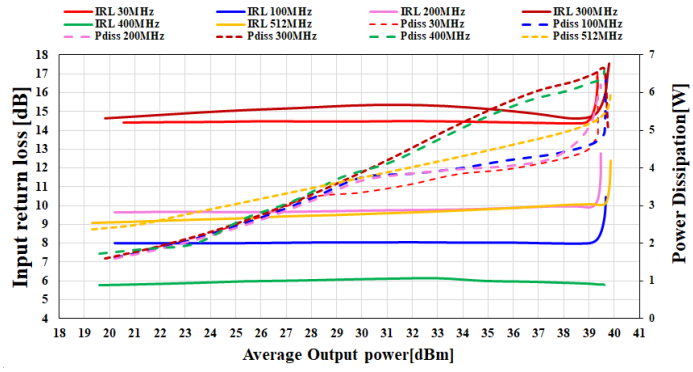

Figure 6.2.3. IRL and Pdiss vs P_{OUT} of TA9110K-EVB-B For 32V 40mA

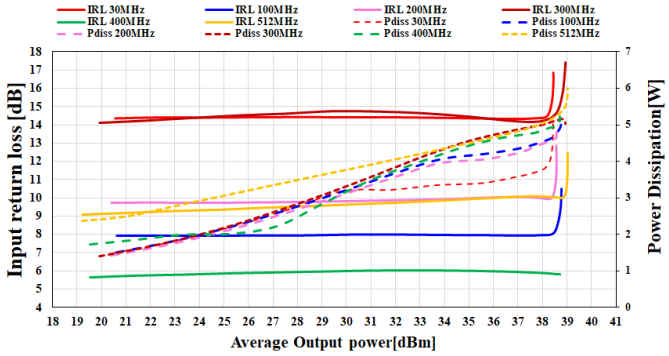

Figure 6.2.4. IRL and Pdiss vs P_{OUT} of TA9110K-EVB-B For 28V 40mA

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