

TA9110K

6W CW 0.03 – 4.0 GHz GaN Power Transistor

Application Note: TA9110K EVB D

Application Note

1500MHz~1800MHz

30V 30mA

Rev-1.1

List of Contents

- 1 General Description
- 2 TA9110K-EVB-D Board Details
- 3 TA9110K-EVB-D Bill of Material
- 4 TA9110K-EVB-D Biasing sequence
- 5 TA9110K-EVB-D Board Measurement Summary
- 6 TA9110K-EVB-D Board Measurement Results

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-D is tuned from 1.5GHz to 1.8GHz.

2. TA9110K-EVB-D Board Details

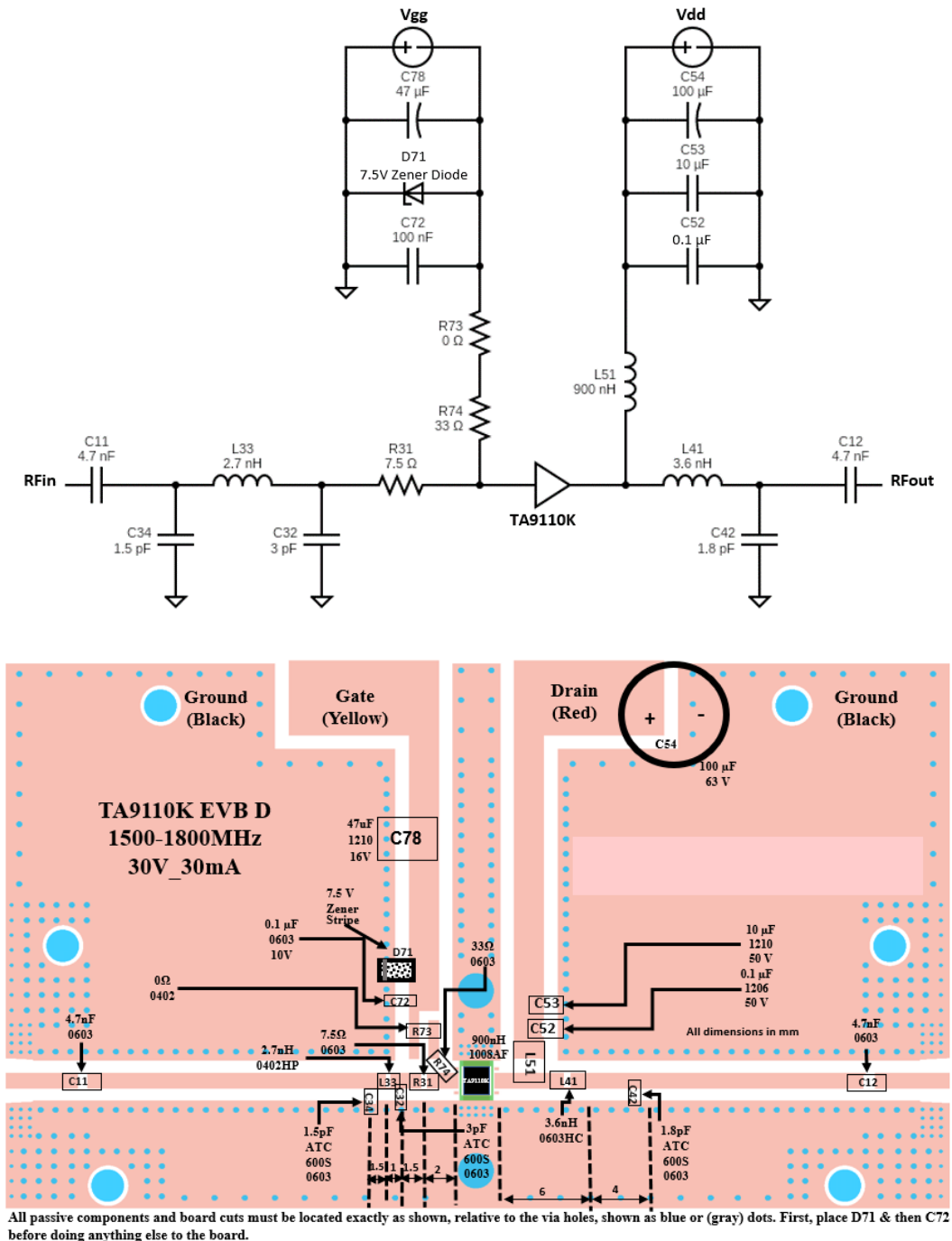


Figure 2.1 TA9110K-EVB-D 1500MHz ~ 1800MHz Schematic and EVB Layout

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

Component ID	Value	Manufacturer	Recommended Part Number
C11, C12	4.7nF, 50V	Murata	GRM1885C1H472JA01
R31	7.5Ω	Panasonic	ERJ-3RQF7R5V
C32	3pF	AVX	600S3R0BT250XT
L33	2.7nH	Coil craft	0402HP-2N7XGE
C34	1.5pF	AVX	600S1R5BT250XT
L41	3.6nH	Coil craft	0603HC-3N6XJLW
C42	1.8pF	AVX	600S1R8BT250XT
L51	900nH	Coil craft	1008AF-901XJLC
C52	0.1μF, 50V	Murata	GRM31C5C1H104JA01L
C53	10μF, 50V	Murata	GRM32ER71H106KA12L
C54	100μF, 63V	Nichicon	UPW1J101MPD1TD
D71	7.5 V Zener	On Semiconductor	SZMMSZ5236BT 1G
C72	0.1μF, 10V	AVX	0603ZC104K4T2A
R73	0Ω	Panasonic	ERJ-2GE0R00X
R74	33Ω	ROHM Semiconductor	ESR03EZPJ330
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-D BOM

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

Turn ON Device	Turn OFF Device
<ol style="list-style-type: none"> 1. Set V_G to -5V 2. Set V_D to +30V 3. Adjust V_G to reach required I_{DQ} current 4. Apply RF power 	<ol style="list-style-type: none"> 1. Turn RF power off 2. Turn off V_D 3. Turn off V_G

Table 4.1 TA9110K-EVB-D Bias and Sequencing

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

Frequency (MHz)	S21 Gain(dB)	S11(dB)	S22(dB)	Psat(dBm)	PAE (%) @Psat
1500	18.2	-7.0	-6.7	40.2	70.2
1600	18.2	-9.0	-8.0	39.6	75.0
1700	18.0	-11.6	-9.0	39.2	70.0
1800	17.3	-14.2	-9.0	38.1	60.3

Table 5.1 TA9110K-EVB-D 30V 30mA Electrical Characteristics Summary

6. TA9110K-EVB-D Test Results

All the tests are carried out at room temperature.

6.1. S parameters

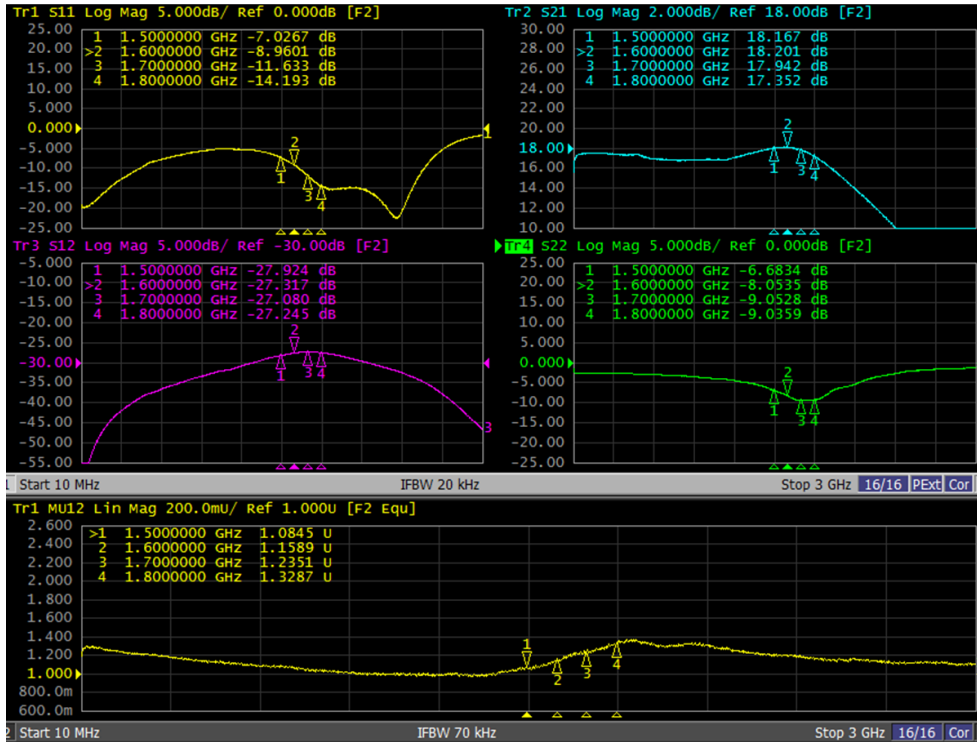


Figure 6.1.1. S parameters of TA9110K-EVB-D 30V 30mA

6.2. Large Signal Test Results

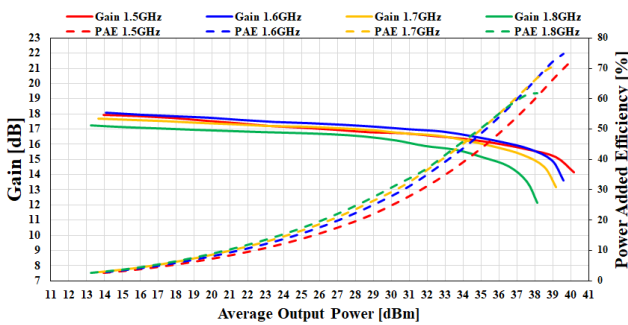


Figure 6.2.1. Gain and PAE vs P_{OUT} of TA9110K-EVB-D For 30V 30mA

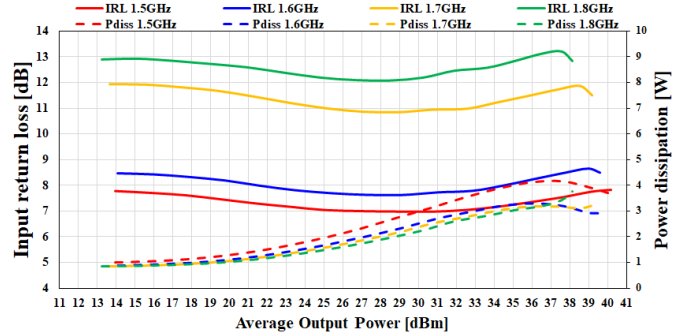


Figure 6.2.2. IRL and Pdiss vs P_{OUT} of TA9110K-EVB-D For 30V 30mA

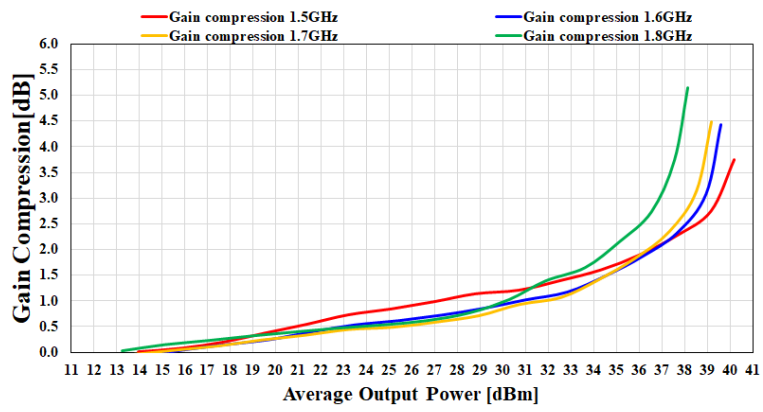


Figure 6.2.3. Gain Compression vs P_{OUT} of TA9110K-EVB-D For 30V 30mA

Edition Revision 1.1 - 2023-09-15

Published by

Tagore Technology Inc.

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Arlington Heights, IL 60004, USA

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