

TA9110K

6 W CW 0.03 – 4.0 GHz GaN Power Transistor

Application Note: TA9110K EVB F

Application Note

950 MHz~1800 MHz

30 V, 30 mA

Rev-2.1

List of Contents

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

1. General Description

The TA9110K is a broadband GaN power transistor capable of delivering 6 W CW from 30 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 TA9110K is packaged in a compact, low-cost Quad Flat No lead (QFN) 3 x 3 x 0.75 mm, 16 leads plastic package. TA9110K-EVB-F is tuned from 950 MHz to 1800 MHz.

2. TA9110K-EVB-F Board Details

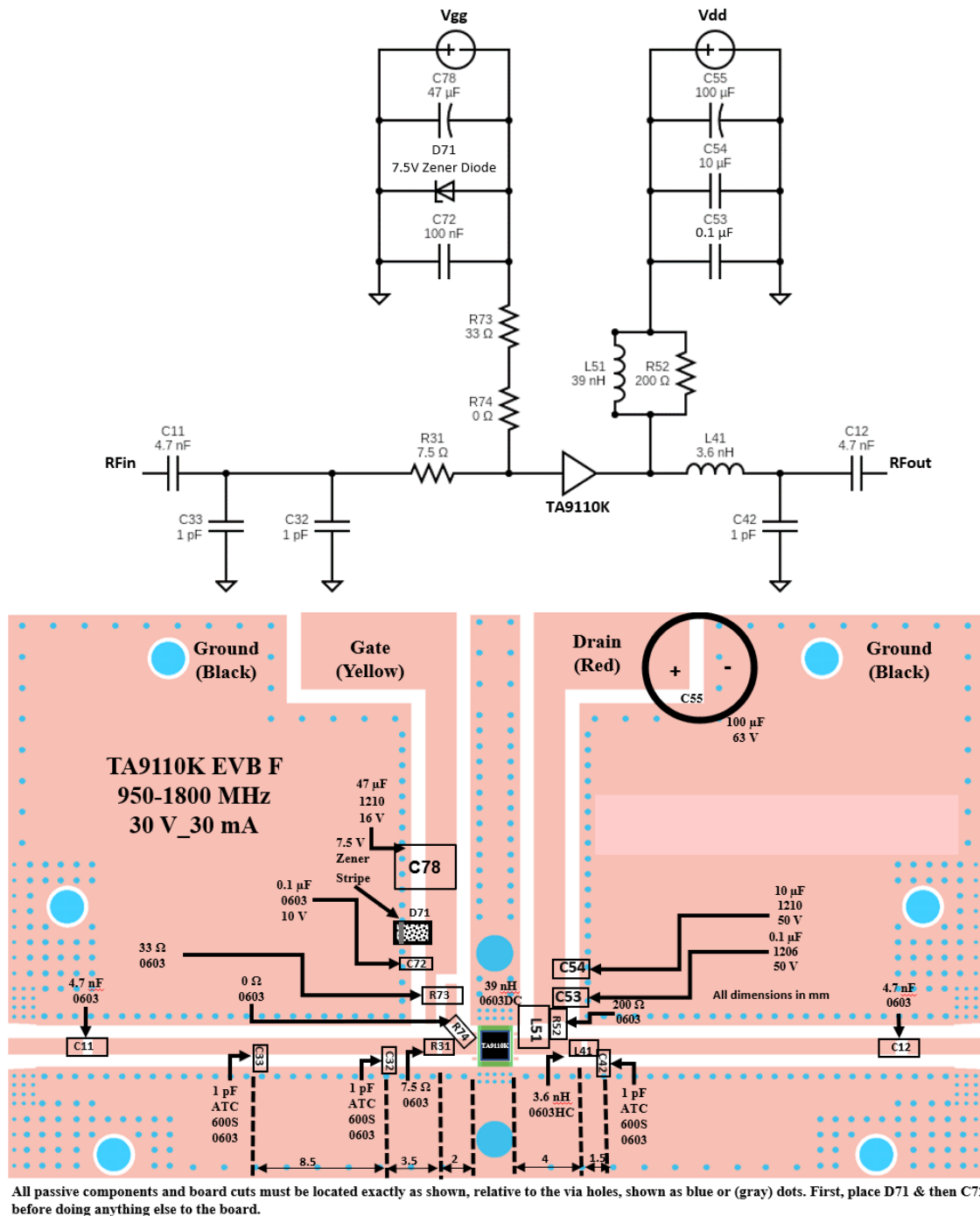


Figure 2.1 TA9110K-EVB-F 950 MHz ~ 1800 MHz Schematic and EVB Layout

3. TA9110K-EVB-F Bill of Material

Component ID	Value	Manufacturer	Recommended Part Number
C11, C12	4.7 nF, 50 V	Murata	GRM1885C1H472JA01D
R31	7.5 Ω	Panasonic	ERJ-3RQF7R5V
C32, C33, C42	1.0 pF	AVX	600S1R0BT250XT
L41	3.6 nH	Coil craft	0603HC-3N6XJLW
L51	39 nH	Coil craft	0603DC-39NXJRW
C52	200 Ω	Bourns	CR0603-FX-2000ELF
C53	0.1 μ F, 50 V	Murata	GRM31C5C1H104JA01L
C54	10 μ F, 50 V	Murata	GRM32ER71H106KA12L
C55	100 μ F, 63 V	Nichicon	UPW1J101MPD1TD
D71	7.5 V Zener	On Semiconductor	SZMMSZ5236BT1G
C72	0.1 μ F, 10 V	AVX	0603ZC104K4T2A
R73	33 Ω	ROHM Semiconductor	ESR03EZPJ330
R74	0 Ω	Panasonic	ERJ-2GE0R00X
C78	47 μ F, 16 V	Murata	GRM32ER61C476ME15L
Q1	6 W GaN transistor	Tagore Tech	TA9110K
PCB		Rogers RO4350B, 20 mils, 2 oz copper	

Table 3.1 TA9110K-EVB-F BOM

4. TA9110K-EVB-F Biasing Sequence

Turn ON Device	Turn OFF Device
1. Set V_G to -5 V 2. Set V_D to +30 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 TA9110K-EVB-F Bias and Sequencing

5. TA9110K-EVB-F Board Measurement Summary

Frequency (MHz)	S21 Gain(dB)	S11(dB)	S22(dB)	Psat(dBm)	PAE (%) @Psat
950	16.3	-6.6	-7.6	39.2	44
1200	16.3	-6.4	-8.2	39.9	48
1400	16.7	-7.2	-8.8	39.8	50
1600	16.7	-9.2	-10.2	39.3	52
1800	16.0	-10.3	-10.4	38.7	51

Table 5.1 TA9110K-EVB-F 30 V, 30 mA Electrical Characteristics Summary

6. TA9110K-EVB-F Test Results

All the tests are carried out at room temperature.

6.1. S parameters

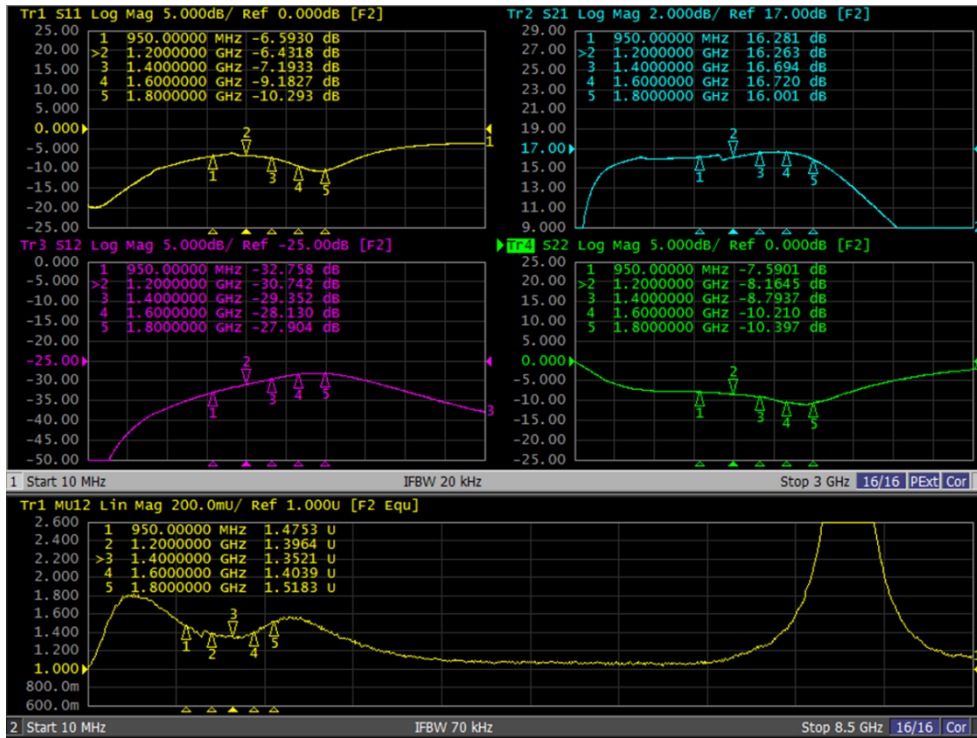


Figure 6.1.1. S parameters of TA9110K-EVB-F 30 V, 30 mA

6.2. Large Signal Test Results

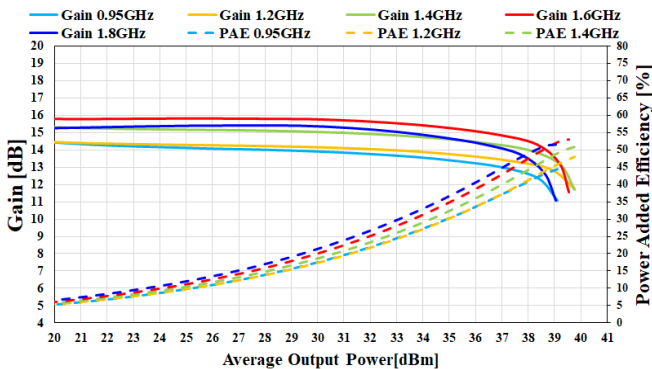


Figure 6.2.1. Gain and PAE vs P_{OUT} of TA9110K-EVB-F

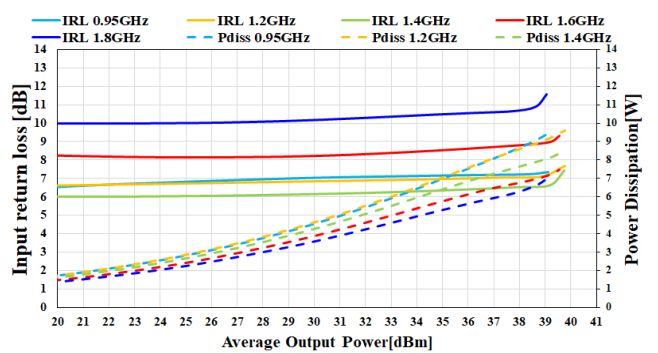


Figure 6.2.2. IRL and Pdiss vs P_{OUT} of TA9110K-EVB-F

Edition Revision 2.1 - 2024-07-30

Published by

Tagore Tech Inc.

601 W Campus Dr. Ste C1

Arlington Heights, IL 60004, USA

©2024 All Rights Reserved

Legal Disclaimer

The information provided in this document shall in no event be regarded as a guarantee of conditions or characteristics. Tagore Tech assumes no responsibility for the consequences of the use of this information, nor for any infringement of patents or of other rights of third parties which may result from the use of this information. No license is granted by implication or otherwise under any patent or patent rights of Tagore Tech. The specifications mentioned in this document are subject to change without notice.

Information

For further information on technology, delivery terms and conditions and prices, please contact Tagore Tech: support@tagoretech.com.