Tagore Technology

TA9110K

6W CW 0.03 – 4.0 GHz GaN Power Transistor

Application Note: TA9110K EVB F

Application Note

950MHz~1800MHz

30V 30mA

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-F is tuned from 950MHz to 1800MHz.

2. TA9110K-EVB-F Board Details

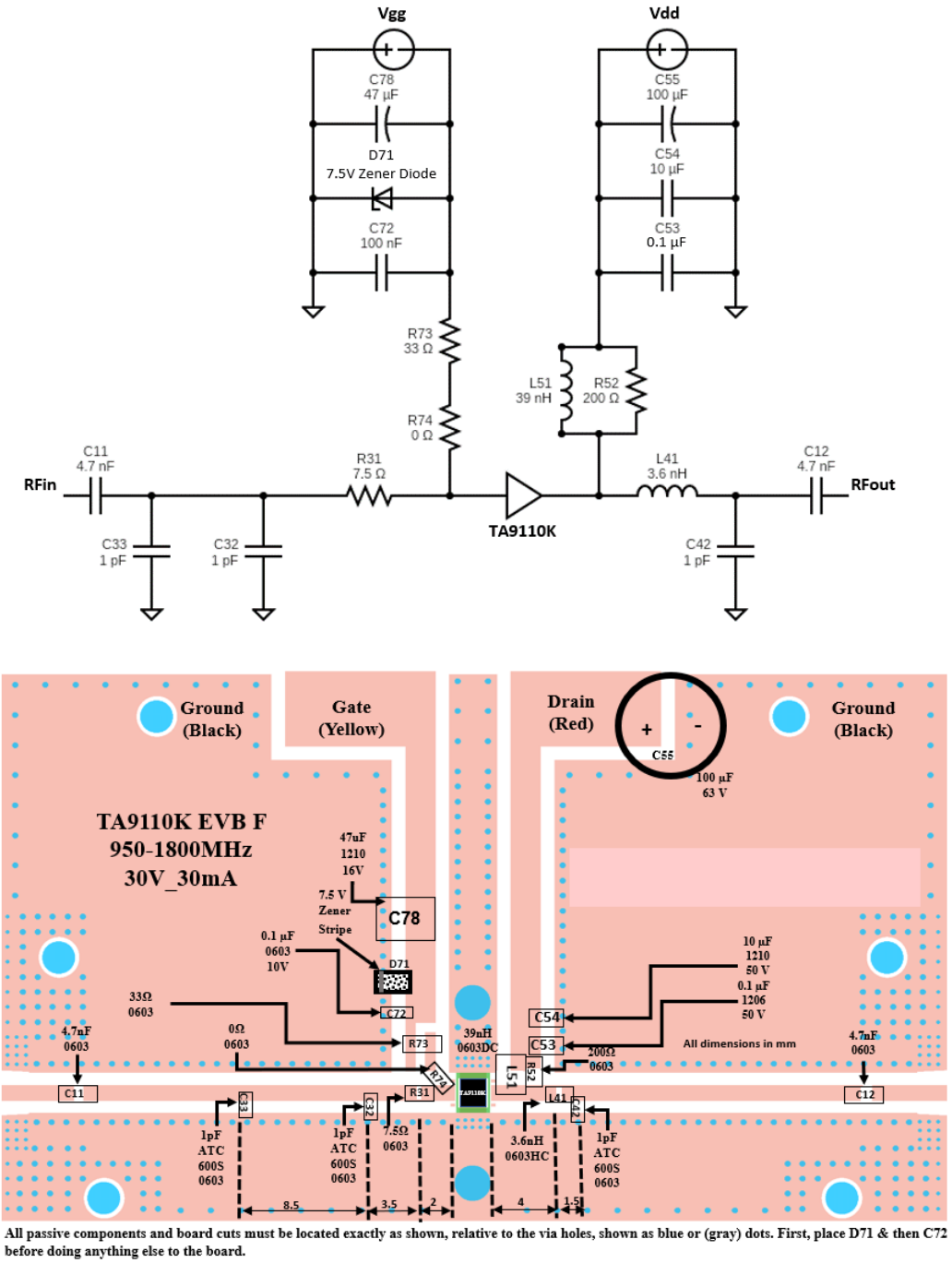

Figure 2.1 TA9110K-EVB-F 950MHz ~ 1800MHz Schematic and EVB Layout

3. TA9110K-EVB-F Bill of Material

Component ID	Value	Manufacturer	Recommended Part Number
C11, C12	4.7nF, 50V	Murata	GRM1885C1H472JA01D
R31	7.5Ω	Panasonic	ERJ-3RQF7R5V
C32, C33, C42	1.0pF	AVX	600S1R0BT250XT
L41	3.6nH	Coil craft	0603HC-3N6XJLW
L51	39nH	Coil craft	0603DC-39NXJRW
C52	200Ω	Bourns	CR0603-FX-2000ELF
C53	0.1µF, 50V	Murata	GRM31C5C1H104JA01L
C54	10µF, 50V	Murata	GRM32ER71H106KA12L
C55	100µF, 63V	Nichicon	UPW1J101MPD1TD
D71	7.5 V Zener	On Semiconductor	SZMMSZ5236BT1G
C72	0.1µF, 10V	AVX	0603ZC104K4T2A
R73	33Ω	ROHM Semiconductor	ESR03EZPJ330
R74	0Ω	Panasonic	ERJ-2GE0R00X
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-F BOM

4. TA9110K-EVB-F Biasing Sequence

Turn ON Device	Turn OFF Device
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	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 30V 30mA Electrical Characteristics Summary

6. TA9110K-EVB-F Test Results

All the tests are carried out at room temperature.

6.1. S parameters

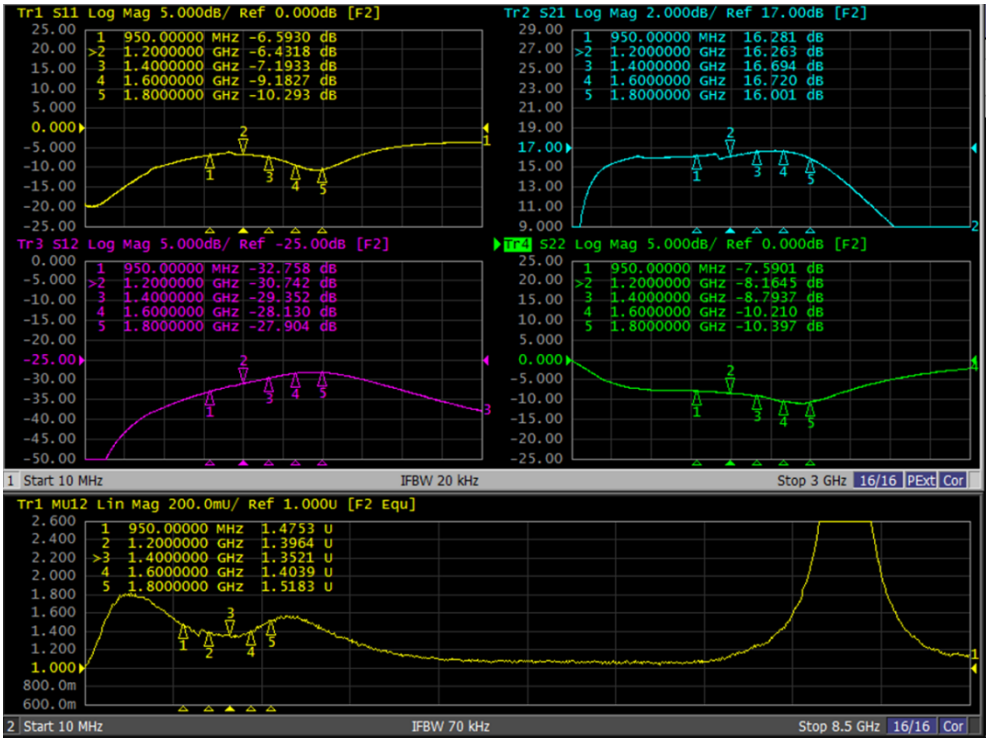

Figure 6.1.1. S parameters of TA9110K-EVB-F 30V 30mA

6.2. Large Signal Test Results

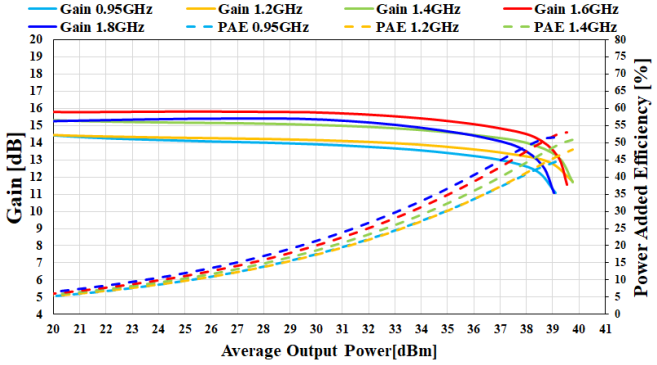

Figure 6.2.1. Gain and PAE vs P_{OUT} of TA9110K-EVB-F

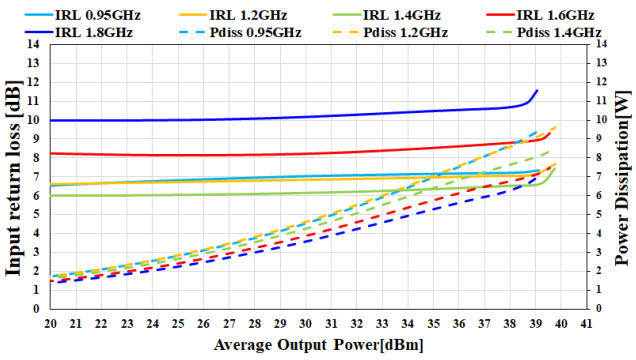

Figure 6.2.2. IRL and Pdiss vs P_{OUT} of TA9110K-EVB-F

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