

TA9410E

25 W CW 0.02 – 3.0 GHz GaN Power Transistor

Application Note: TA9410E EVB E

Application Note

5100 MHz~5300 MHz

50 V, 100 mA

Rev-2.1

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1. General Description

The TA9410E is a broadband GaN power transistor capable of delivering 25 W CW from 20 MHz to 3.0 GHz frequency band. The input and output can be matched for best power and efficiency for the desired band. The TA9410E is packaged in a compact, low-cost Dual Flat No lead (DFN) 5 x 6 x 0.75 mm, 8 leads plastic package.

TA9410E-EVB-E is an evaluation board specially tuned for frequency range of 5100 MHz~5300 MHz applications. Its high output power, power added efficiency performance makes it suitable for application of Private mobile radio handsets, public safety radios, Cellular infrastructure, Military radios etc.

2. TA9410E-EVB-E Board Details

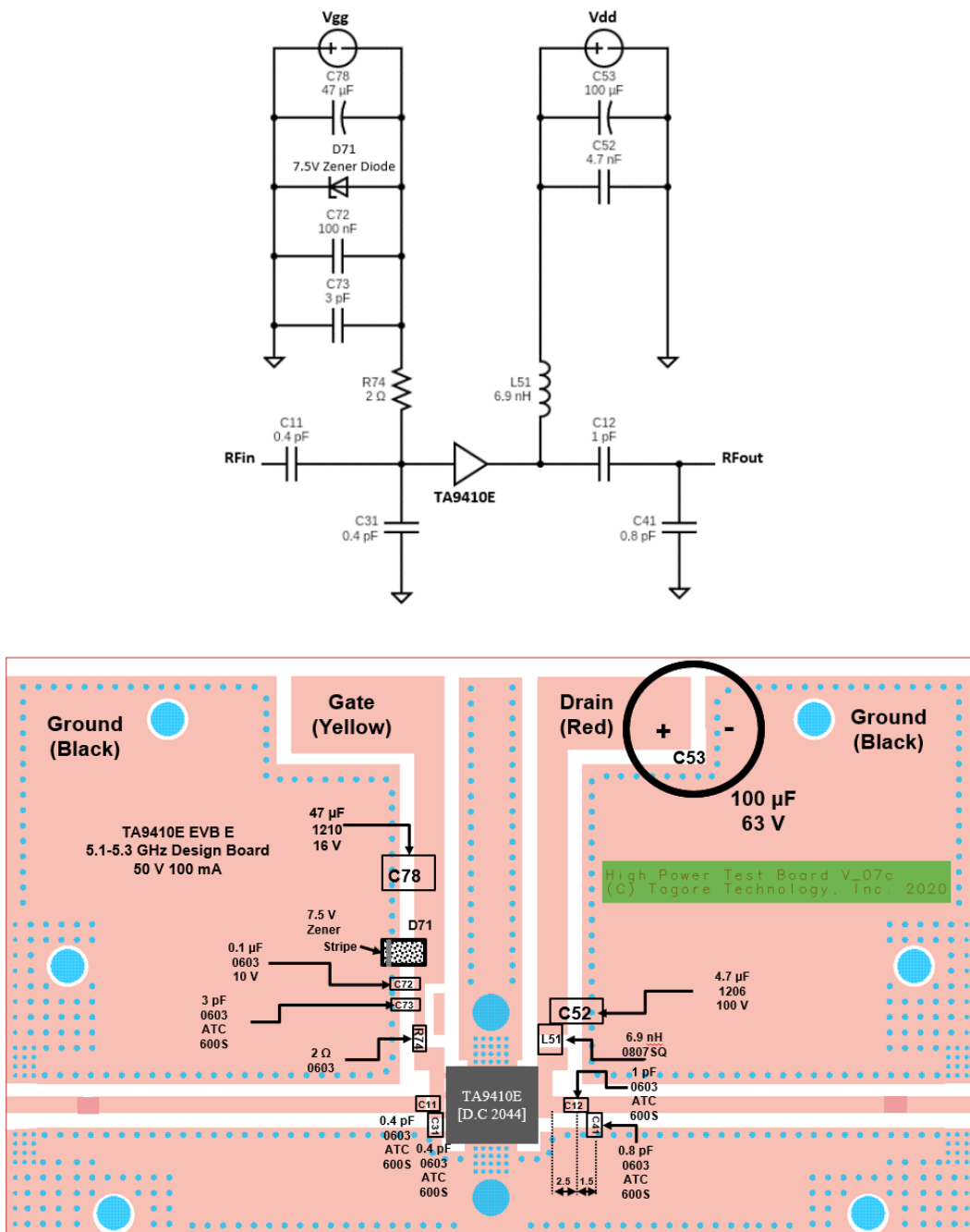


Figure 2.1 TA9410E-EVB-E 5100 MHz ~ 5300 MHz Schematic and EVB Layout

3. TA9410E-EVB-E Bill of Material

Component ID	Value	Manufacturer	Recommended Part Number
C11, C31	0.4 pF, 50 V	AVX	600S0R4AT250XT
C12	1.0 pF	AVX	600S1R0BT250XT
C41	0.8 pF	AVX	600S0R8BT250XT
L51	6.9 nH	Coil craft	0807SQ-6N9_L_
C52	4.7 μ F, 50 V	Murata	GRM31CC72A475KE11K
C53	100 μ F, 63 V	Nichicon	UPW1J101MPD1TD
D71	7.5 V Zener	On Semiconductor	SZMMSZ5236BT 1G
C72	0.1 μ F, 10 V	AVX	0603ZC104K4T2A
C73	3.0 pF	AVX	600S3R0AT250XT
R74	2 Ω	Vishay	CRCW06032R00FKEAHP
C78	47 μ F, 16 V	Murata	GRM32ER61C476ME15L
Q1	25 W GaN Transistor	Tagore Tech	TA9410E
PCB	Rogers RO4350B, 20 mils, 2 oz copper		

Table 3.1 TA9410E-EVB-E BOM

4. TA9410E-EVB-E Biasing Sequence

Turn ON Device	Turn OFF Device
1. Set V_G to -5 V 2. Set V_D to +50 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 TA9410E-EVB-E Bias and Sequencing

5. TA9410E-EVB-E Board Measurement Summary

Frequency (MHz)	S21 Gain(dB)	S11 (dB)	S22 (dB)	Psat (dBm)	PAE (%) @Psat
5100	11.6	-8.3	-4.5	43.4	34
5200	11.8	-7.9	-6.2	43.6	38
5300	11.4	-7.4	-9.1	43.5	39

Table 5.1 TA9410E-EVB-E Electrical Characteristics Summary

6. TA9410E-EVB-E Test Results

All the tests are carried out at room temperature.

6.1. S parameters

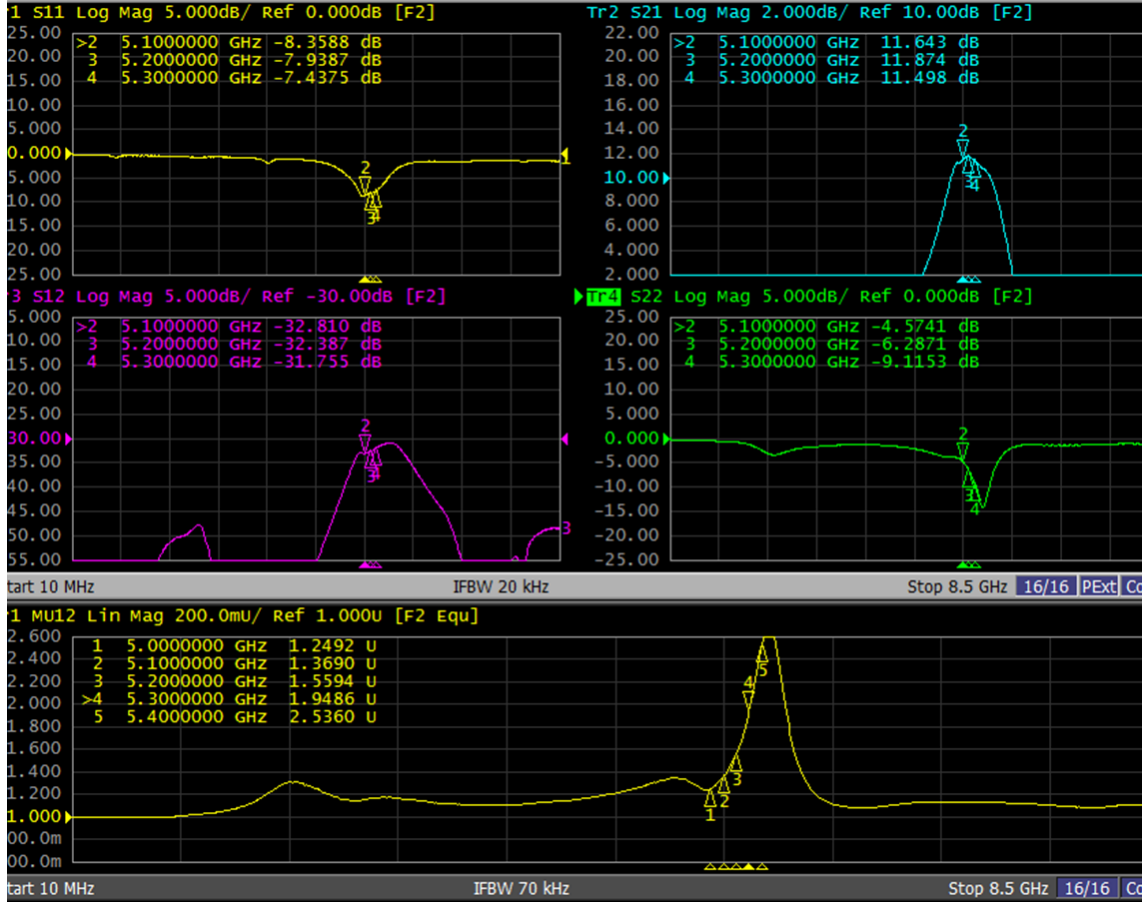


Figure 6.1.1. S parameters of TA9410E-EVB-E

6.2. Large Signal Test Results

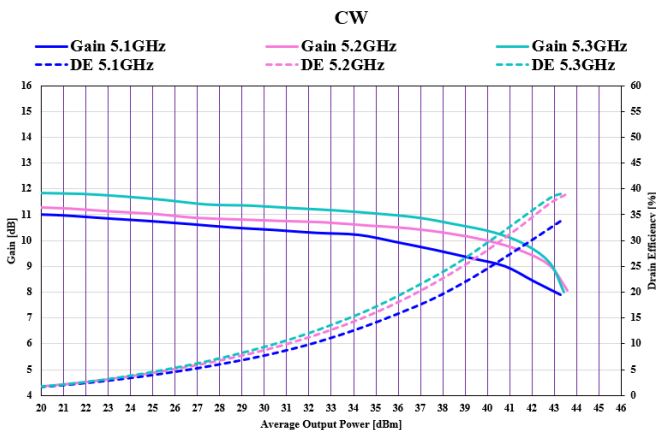


Figure 6.2.1. Gain Vs Pout of TA9410E-EVB-E CW set up

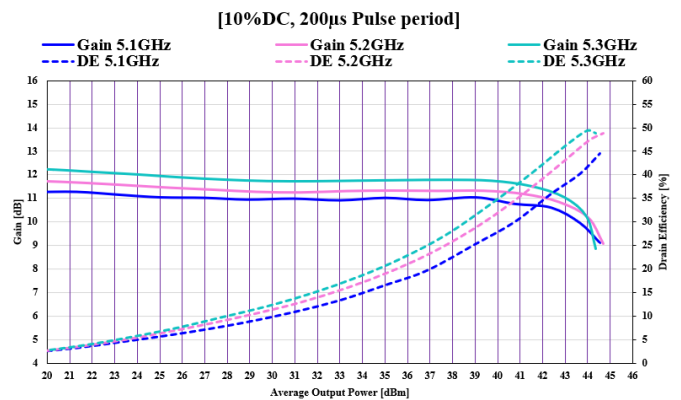


Figure 6.2.2. Gain Vs Pout of TA9410E-EVB-E with 10% DC & 200 µs pulse period

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