

# TA9410E

25W CW 0.02 – 3.0 GHz GaN Power Transistor

Application Note: TA9410E EVB F

## Application Note

3400MHz~3800MHz

36V 50mA

Rev-1.1

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## 1. General Description

The TA9410E is a broadband GaN power transistor capable of delivering 25W CW from 20MHz to 3.0GHz 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 Quad Flat No lead (QFN) 5x6x0.8mm, 8 leads plastic package.

TA9410E-EVB-F is an evaluation board specially tuned for frequency range of 3400MHz~3800MHz 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-F Board Details

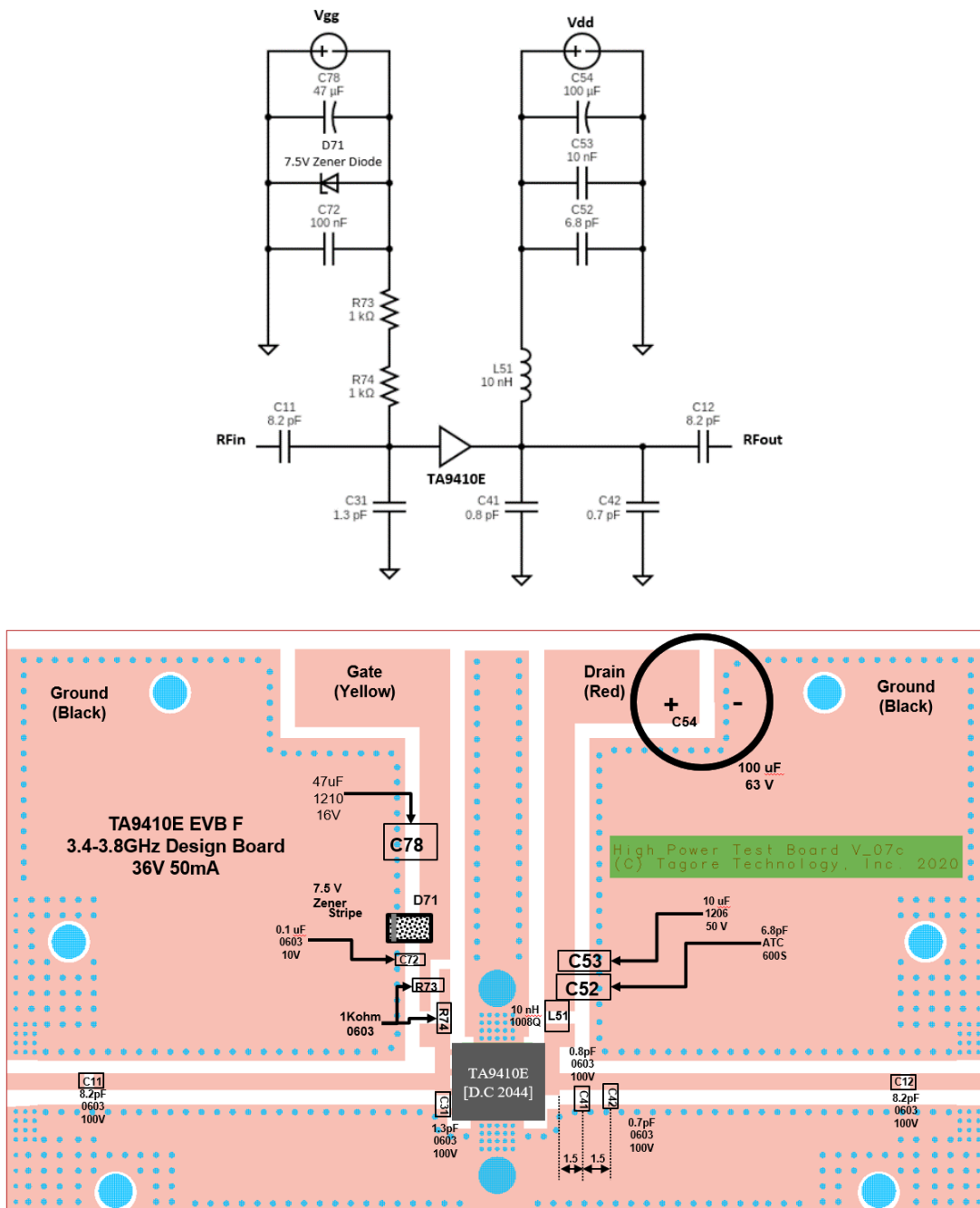


Figure 2.1 TA9410E-EVB-F 3400MHz ~ 3800MHz Schematic and EVB Layout

### 3. TA9410E-EVB-F Bill of Material

Component ID	Value	Manufacturer	Recommended Part Number
C11, C12	8.2pF, 100V	Murata	GCM1885C2A8R2BA16D
C31	1.3pF	AVX	600S1R3AT250XT
C41	0.8pF	AVX	600S0R8BT250XT
C42	0.7pF	AVX	600S0R7BT250XT
L51	10nH	Coil craft	1008HQ-10NXGLB
C52	6.8pF	AVX	600S6R8AT250XT
C53	10 $\mu$ F	Murata	GRM32ER71H106KA12L
C54	100 $\mu$ F, 63V	Nichicon	UPW1J101MPD1TD
D71	7.5 V Zener	On Semiconductor	SZMMSZ5236BT 1G
C72	0.1 $\mu$ F, 10V	AVX	0603ZC104K4T2A
R73	1K $\Omega$	Vishay/Dale	CRCW06031K00FKEC
R74	1K $\Omega$	Vishay/Dale	CRCW06031K00FKEC
C78	47 $\mu$ F, 16V	Murata	GRM32ER61C476ME15L
Q1	25W GaN Transistor	Tagore Technology	TA9410E
PCB	Rogers RO4350B, 20 mils, 1 oz copper		

**Table 3.1 TA9410E-EVB-F BOM**

### 4. TA9410E-EVB-F Biasing Sequence

Turn ON Device	Turn OFF Device
1. Set $V_G$ to -5V 2. Set $V_D$ to +36V 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-F Bias and Sequencing**

## 5. TA9410E-EVB-F Board Measurement Summary

Frequency (MHz)	S21 Gain(dB)	S11(dB)	S22(dB)	Psat(dBm)	PAE (%) @Psat
3400	13.4	-3.5	-4.7	43.6	43
3500	14.5	-4.7	-5.6	44.0	53
3600	15.2	-6.1	-7.1	44.0	54
3700	15.1	-6.4	-8.9	43.5	55
3800	14.2	-5.0	-10.0	42.9	50

Table 5.1 TA9410E-EVB-F Electrical Characteristics Summary

## 6. TA9410E-EVB-F Test Results

All the tests are carried out at room temperature.

### 6.1. S parameters

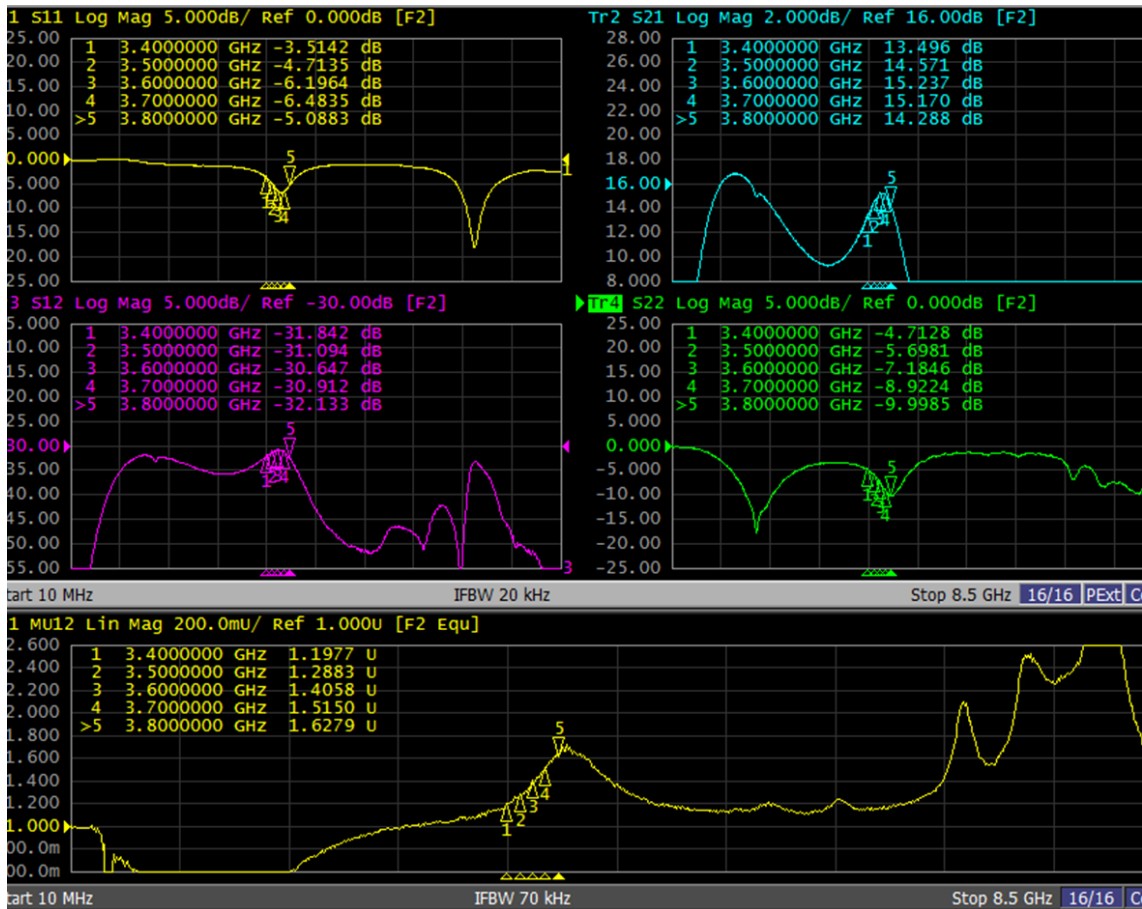


Figure 6.1.1. S parameters of TA9410E-EVB-F

## 6.2. Large Signal Test Results

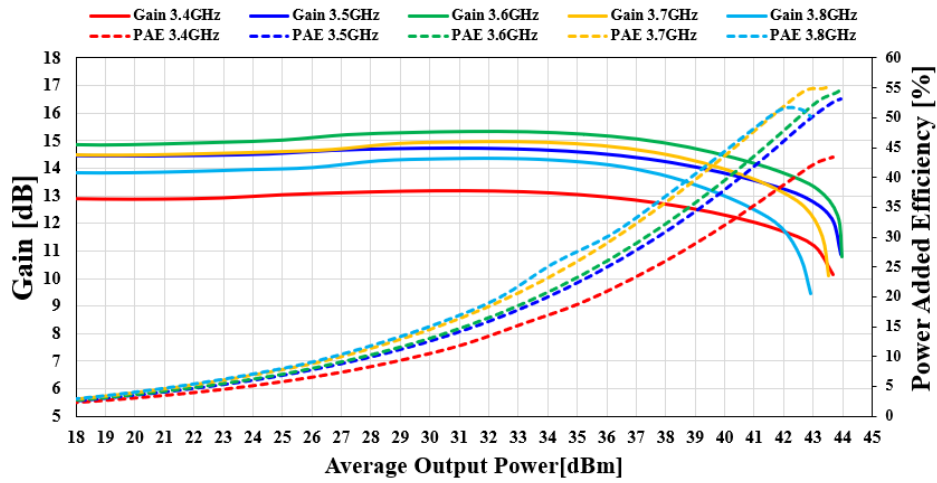


Figure 6.2.1. Gain Vs Pout of TA9410E-EVB-F

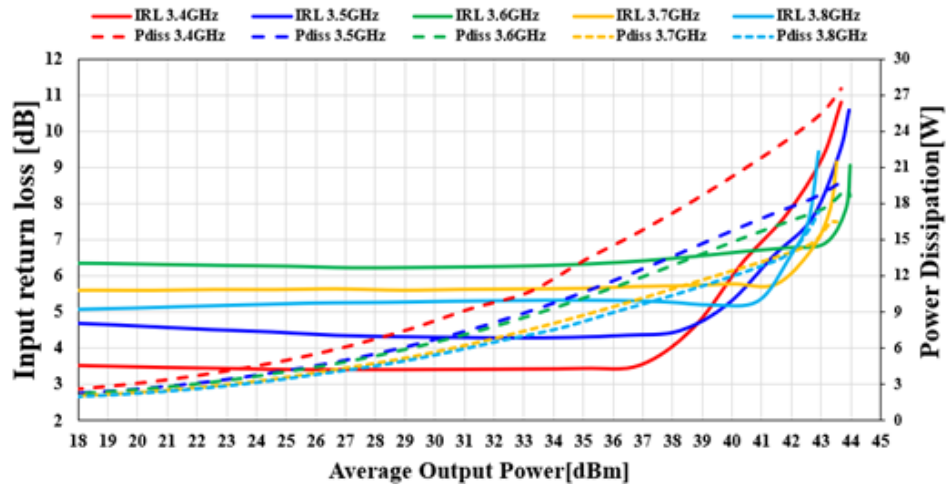


Figure 6.2.2. IRL and Pdiss Vs Pout of TA9410E-EVB-F

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