

# TA9410E

25 W CW 0.02 – 3.0 GHz GaN Power Transistor

**Application Note: TA9410E EVB F**

## Application Note

3400 MHz~3800 MHz

36 V, 50 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-F is an evaluation board specially tuned for frequency range of 3400 MHz~3800 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-F Board Details

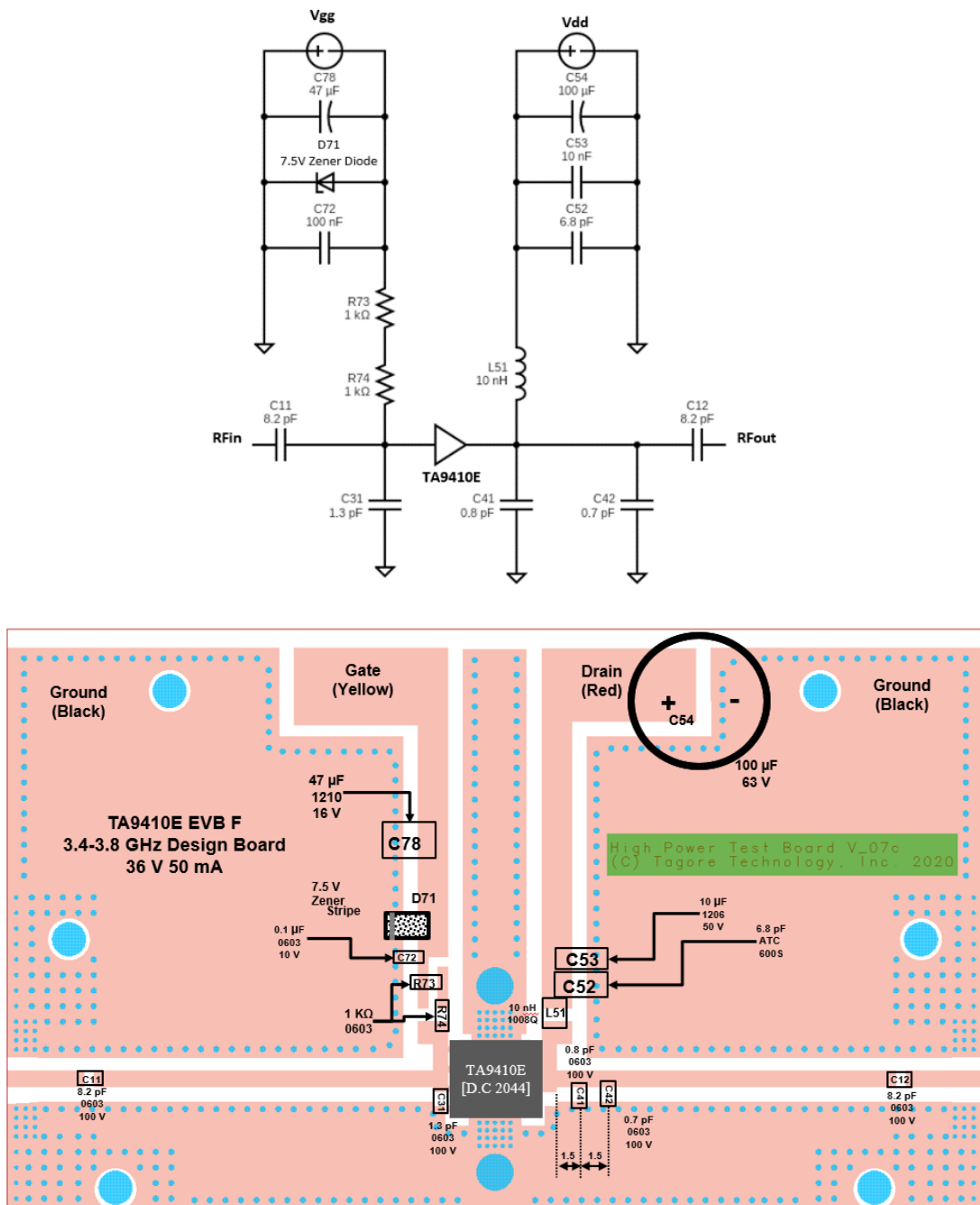


Figure 2.1 TA9410E-EVB-F 3400 MHz ~ 3800 MHz Schematic and EVB Layout

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

Component ID	Value	Manufacturer	Recommended Part Number
C11, C12	8.2 pF, 100 V	Murata	GCM1885C2A8R2BA16D
C31	1.3 pF	AVX	600S1R3AT250XT
C41	0.8 pF	AVX	600S0R8BT250XT
C42	0.7 pF	AVX	600S0R7BT250XT
L51	10 nH	Coil craft	1008HQ-10NXGLB
C52	6.8 pF	AVX	600S6R8AT250XT
C53	10 $\mu$ F	Murata	GRM32ER71H106KA12L
C54	100 $\mu$ F, 63 V	Nichicon	UPW1J101MPD1TD
D71	7.5 V Zener	On Semiconductor	SZMMSZ5236BT 1G
C72	0.1 $\mu$ F, 10 V	AVX	0603ZC104K4T2A
R73	1 K $\Omega$	Vishay/Dale	CRCW06031K00FKEC
R74	1 K $\Omega$	Vishay/Dale	CRCW06031K00FKEC
C78	47 $\mu$ 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-F BOM**

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

Turn ON Device	Turn OFF Device
<ol style="list-style-type: none"> <li>1. Set <math>V_G</math> to -5 V</li> <li>2. Set <math>V_D</math> to +36 V</li> <li>3. Adjust <math>V_G</math> to reach required <math>I_{DQ}</math> current</li> <li>4. Apply RF power</li> </ol>	<ol style="list-style-type: none"> <li>1. Turn RF power off</li> <li>2. Turn off <math>V_D</math></li> <li>3. Turn off <math>V_G</math></li> </ol>

**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

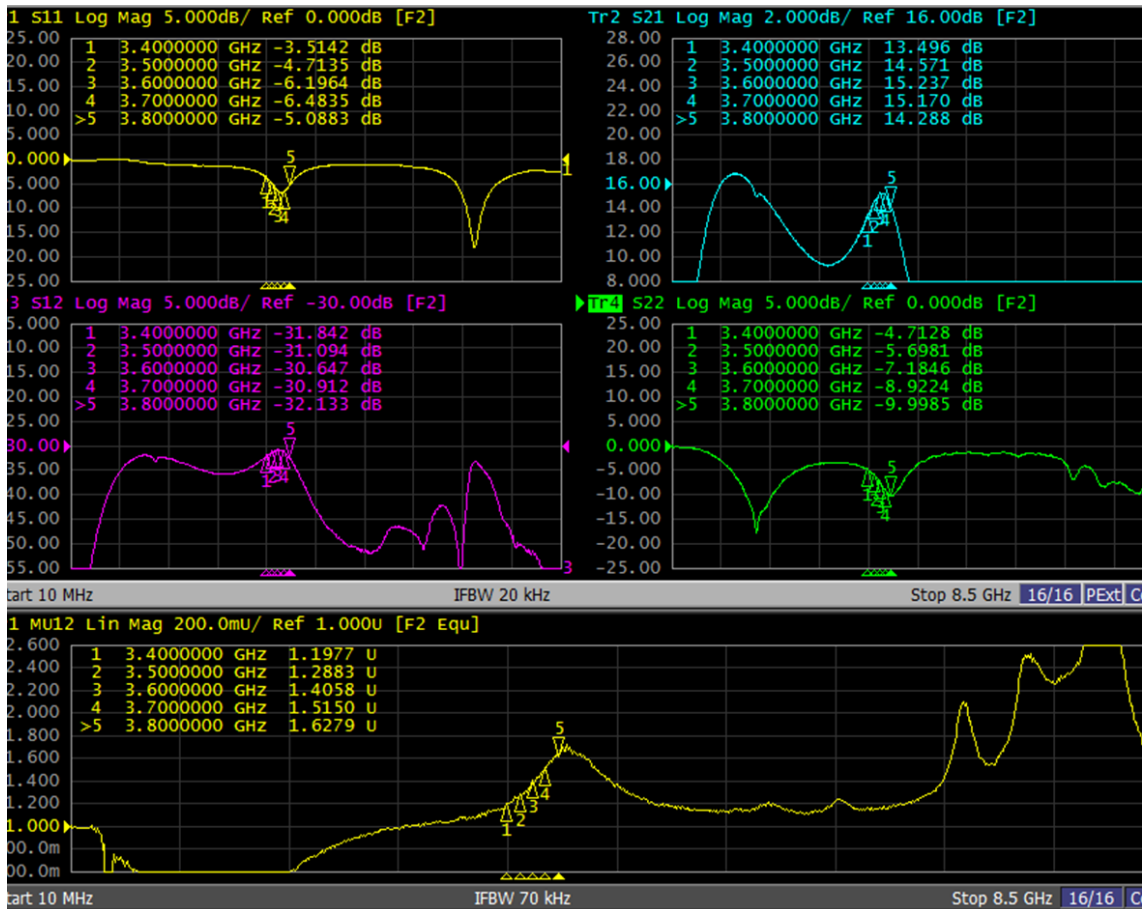


Figure 6.1.1. S parameters of TA9410E-EVB-F

## 6.2. Large Signal Test Results

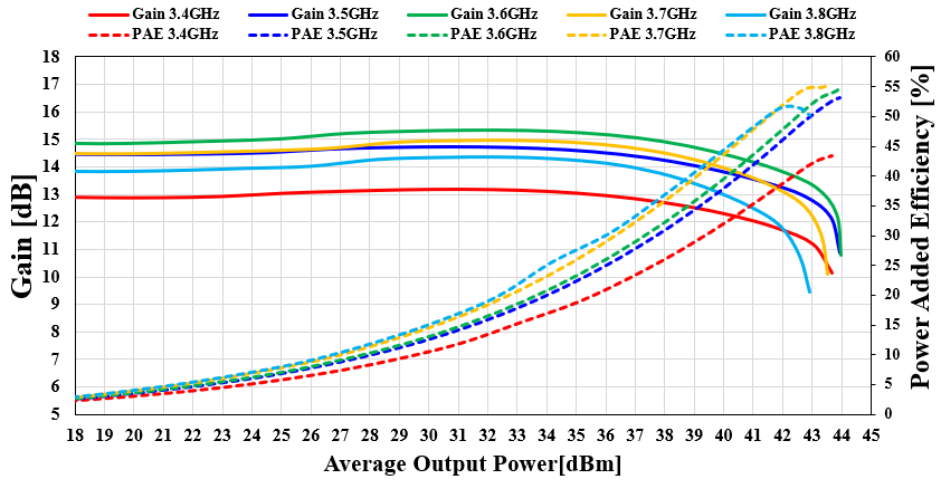


Figure 6.2.1. Gain Vs Pout of TA9410E-EVB-F

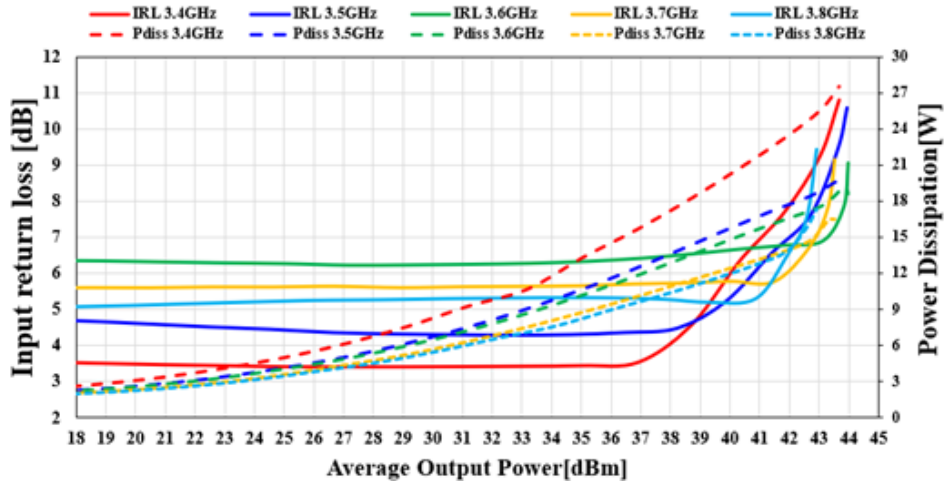


Figure 6.2.2. IRL and Pdiss Vs Pout of TA9410E-EVB-F

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