

# TA9410E

25W CW 0.02 – 3.0 GHz GaN Power Transistor

Application Note: TA9410E EVB C

## Application Note

1400MHz~2400MHz

50V 100mA

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-C is an evaluation board specially tuned for frequency range of 1400MHz~2400MHz 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-C Board Details

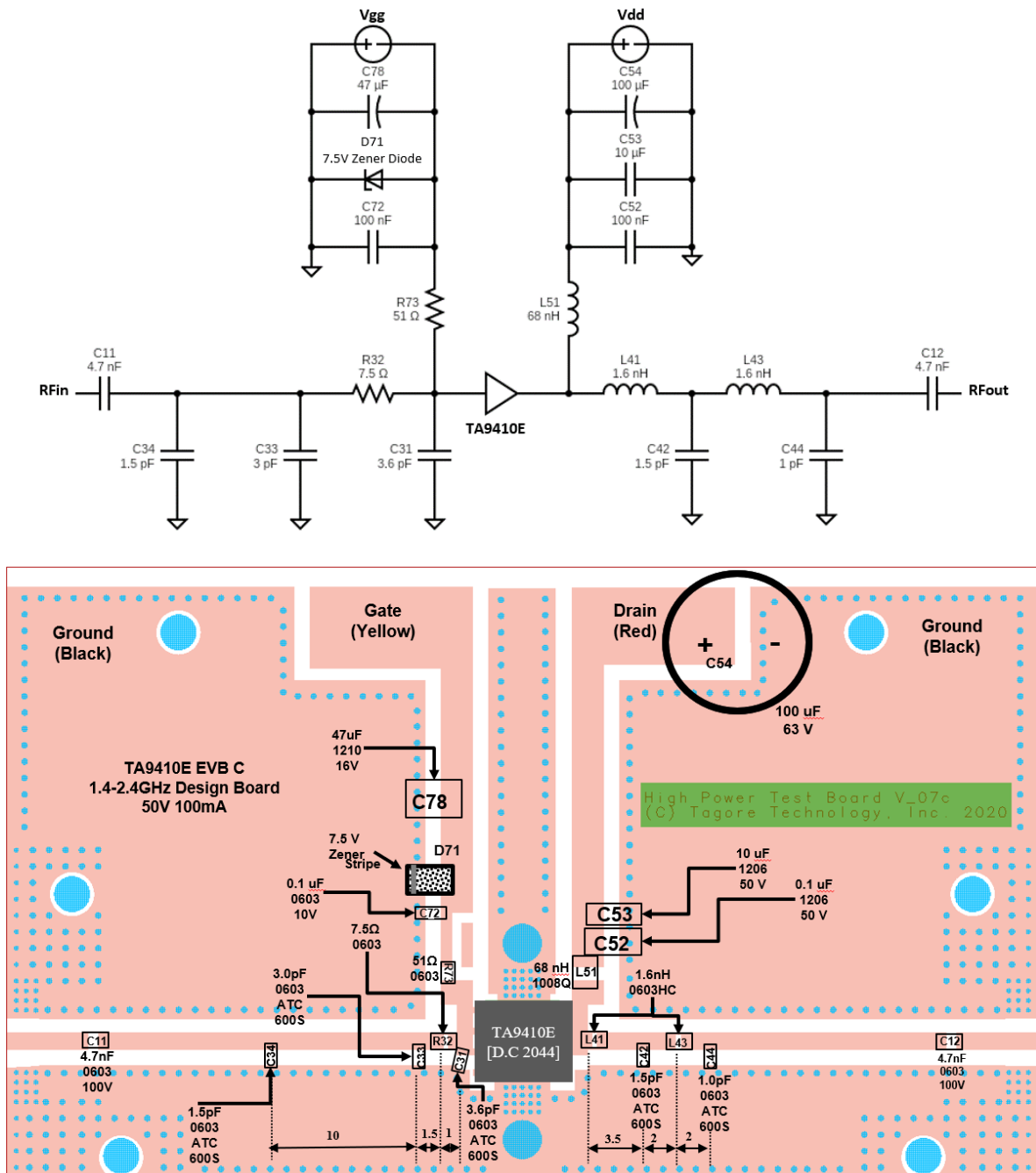


Figure 2.1 TA9410E-EVB-C 1400MHz ~ 2400MHz Schematic and EVB Layout

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

Component ID	Value	Manufacturer	Recommended Part Number
C11, C12	4.7nF, 50V	Murata	GRM1885C1H472JA01
C31	3.6pF	AVX	600S3R6AT250XT
R32	7.5Ω	Vishay/Dale	CRCW06037R50FKEAHP
C33	3.0pF	AVX	600S3R0AT250XT
C34	1.5pF	AVX	600S1R5AT250XT
L41, L43	1.6nH	Coil craft	0603HC-1N6XJLW
C42	1.5pF	AVX	600S1R5BT250XT
C44	1.0pF	AVX	600S1R0BT250XT
L51	68nH	Coil craft	1008HQ-68NXGLB
C52	0.1μF, 50V	Murata	GRM31C5C1H104JA01L
C53	10μF	Murata	GRM32ER71H106KA12L
C54	100μF, 63V	Nichicon	UPW1J101MPD1TD
D71	7.5 V Zener	On Semiconductor	SZMMSZ5236BT 1G
C72	0.1μF, 10V	AVX	0603ZC104K4T2A
R73	51Ω	Vishay	CRCW060351R0FKEAHP
C78	47μF, 16V	Murata	GRM32ER61C476ME15L
TA9410E	25W GaN transistor	Tagore Technology	TA9410E
PCB	Rogers RO4350B, 20 mils, 1 oz copper		

**Table 3.1 TA9410E-EVB-C BOM**

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

Turn ON Device	Turn OFF Device
<ol style="list-style-type: none"> <li>1. Set <math>V_G</math> to -5V</li> <li>2. Set <math>V_D</math> to +50V</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-C Bias and Sequencing**

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

Frequency (MHz)	S21 Gain(dB)	S11(dB)	S22(dB)	Psat(dBm)	PAE (%) @Psat
1400	16.5	-13.4	-3.9	46.5	53
1600	16.5	-19.3	-4.7	46.5	57
1800	16.2	-10.2	-5.5	46.1	56
2000	16.1	-7.3	-4.8	45.4	52
2200	16.5	-7.2	-4.1	45.4	51
2400	16.0	-7.0	-3.6	45.4	45

Table 5.1 TA9410E-EVB-C Electrical Characteristics Summary

## 6. TA9410E-EVB-C Test Results

All the tests are carried out at room temperature.

### 6.1. S parameters

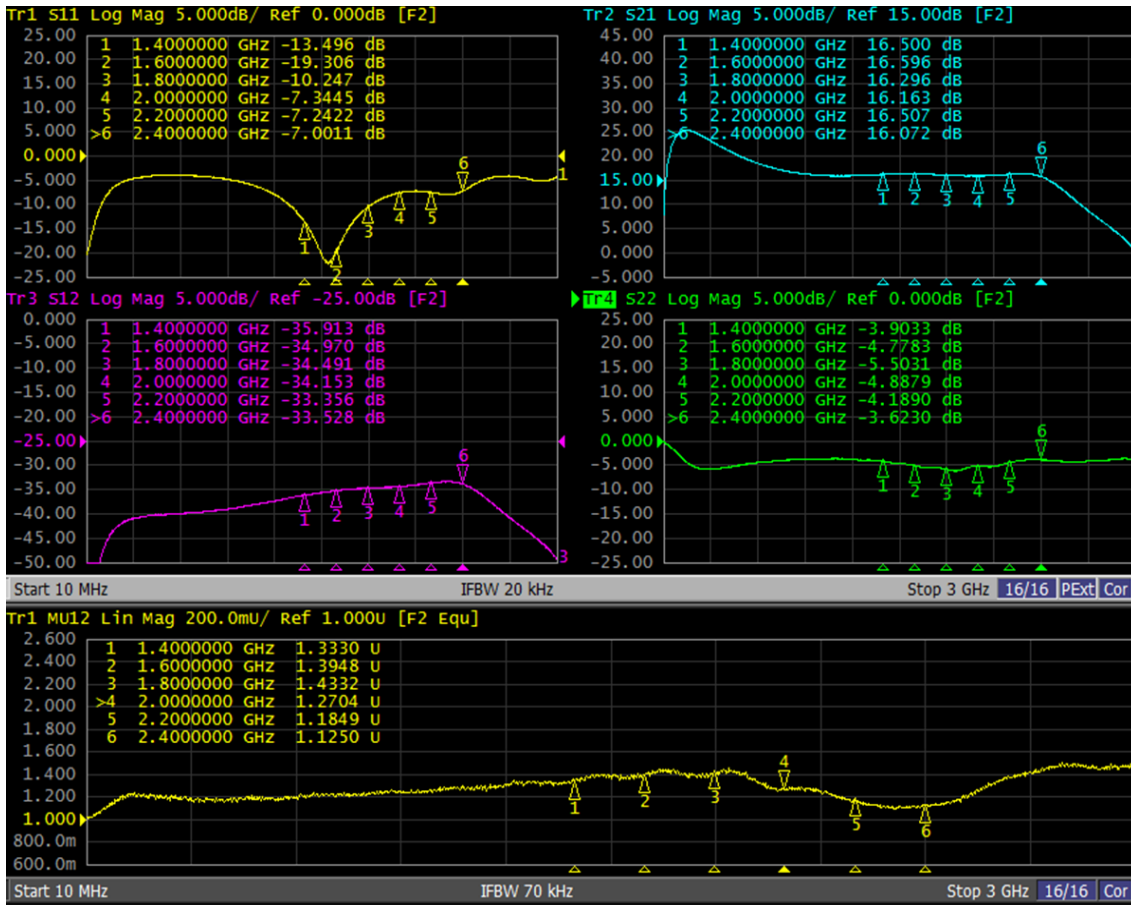
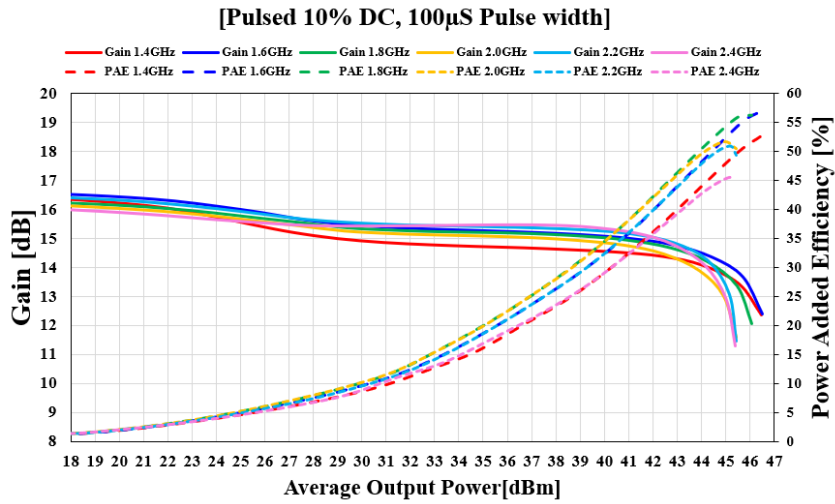
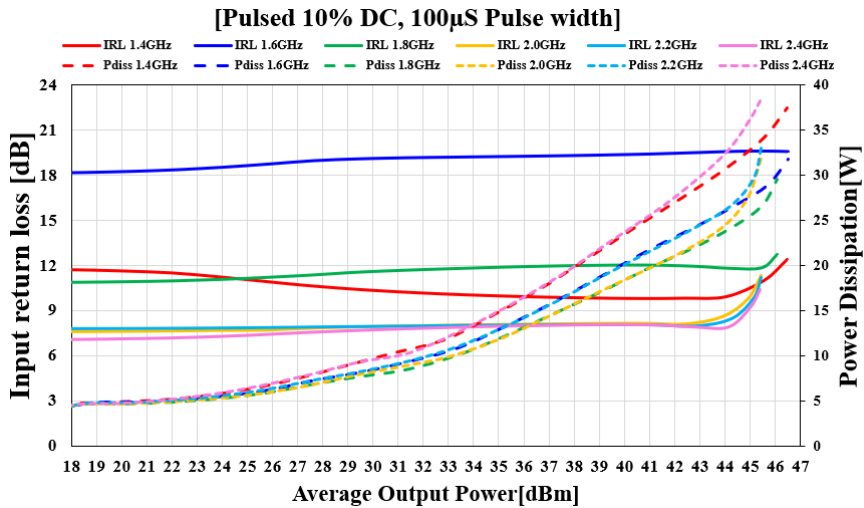


Figure 6.1.1. S parameters of TA9410E-EVB-C

## 6.2. Large Signal Test Results



**Figure 6.2.1. Gain Vs Pout of TA9410E-EVB-C**



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

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