

# TA9210D

12.5 W CW 0.03 – 4.0 GHz GaN Power Transistor

**Application Note: TA9210D EVB G**

## Application Note

700 MHz~3700 MHz

28 V/ 30 V, 50 mA

Rev-2.3

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## 1. General Description

The TA9210D is a broadband capable 12.5 W GaN power transistor covering 30 MHz to 2.7 GHz frequency band with a single match. TA9210D is usable up to 4 GHz. The input and output can be matched for best power and efficiency for the desired band.

The TA9210D is packaged in a compact, low-cost Quad Flat No lead (QFN) 3 x 6 x 0.75 mm, 32 leads plastic package. TA9210D-EVB-G is tuned from 700 MHz to 3700 MHz.

## 2. TA9210D-EVB-G Board Details

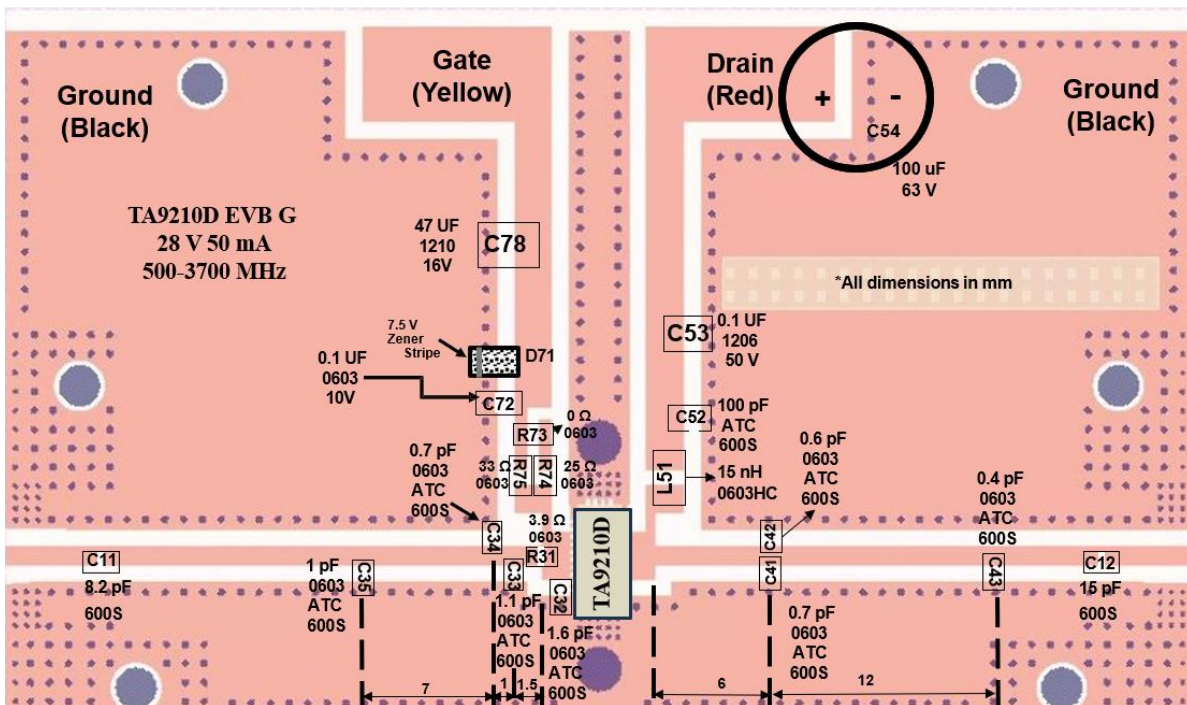
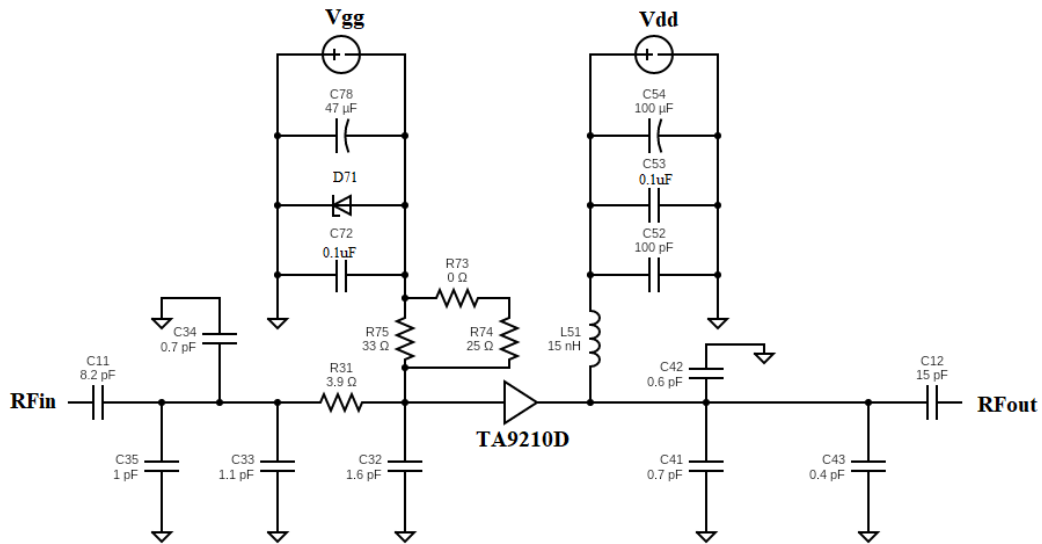


Figure 2.1 TA9210D-EVB-G 700 MHz ~ 3700 MHz Schematic and EVB Layout

### 3. TA9210D-EVB-G Bill of Material

Component ID	Value	Manufacturer	Recommended Part Number
C11	8.2 pF	AVX	600S8R2AT250XT
C12	15 pF	AVX	600S150GT250XT
R31	3.9Ω	Vishay	CRCW06033R90FKEAHP
C32	1.6 pF	AVX	600S1R6BW250XT
C33	1.1 pF	AVX	600S1R1BW250XT
C34, C41	0.7 pF	AVX	600S0R7BW250XT
C35	1 pF	AVX	600S1R0BW250XT
C42	0.6 pF	AVX	600S0R6BW250XT
C43	0.4 pF	AVX	600S0R4BW250XT
L51	15 nH	Coil craft	0603HC-15NXGLW
C52	100 pF	AVX	600S101GT250XT
C53	0.1 μF, 50 V	Murata	GRM31C5C1H104JA01L
C54	100 μF, 63 V	Nichicon	UPW1J101MPD1TD
D71	7.5 V Zener Diode	On Semiconductor	MMSZ5236BT1G
C72	0.1 μF, 10 V	AVX	0603ZC104K4T2A
R73	0Ω	Vishay/Dale	CRCW06030000Z0EAC
R74	24.9Ω	Vishay/Dale	CRCW060324R9FKEAHP
R75	33Ω	Vishay/Dale	CRCW060333R0FKEAHP
C78	47 μF, 16 V	Murata	GRM32ER61C476ME15L
Q1	12.5 W GaN Transistor	Tagore Tech	TA9210D
PCB	Rogers RO4350B, 20 mils, 2 oz copper		

Table 3.1 TA9210D-EVB-G BOM

### 4. TA9210D-EVB-G Biasing Sequence

Turn ON Device	Turn OFF Device
1. Set $V_G$ to -5 V 2. Set $V_D$ to +28 V/ 30 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 TA9210D-EVB-G Bias and Sequencing

### 5. TA9210D-EVB-G Board Measurement Summary

Frequency (GHz)	S21 Gain(dB)	S11(dB)	S22(dB)	Psat(dBm)	PAE [%] @Psat
0.7	18.2	-7.3	-4.1	41	62
1	18.2	-6.7	-4.2	41	55
2	15.7	-6.8	-7.8	41	45
3	12.9	-6.2	-8.2	40	55
3.7	14.2	-23.4	-4.7	40	45

Table 5.1 TA9210D-EVB-G 28 V, 50 mA Electrical Characteristics Summary

## 6. TA9210D-EVB-G Test Results

All the tests are carried out at room temperature.

### 6.1. S parameters



Figure 6.1.1. S parameters of TA9210D-EVB-G 28 V, 50 mA

### 6.2. Gain, PAE v/s Pout (CW) @ 28V Vdd

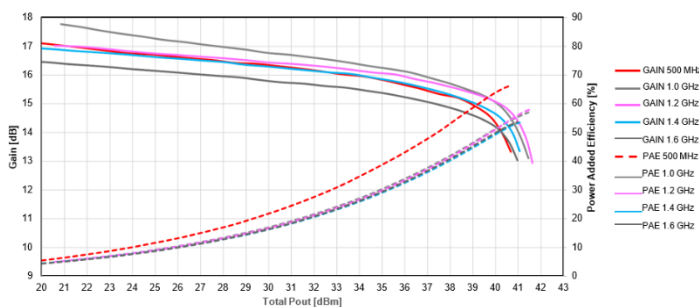


Figure 6.2.1 Gain, PAE v/s Pout Of TA9210D-EVB-G, VD=28 V, IDQ=50 mA Freq:500 MHz to 1.6 GHz

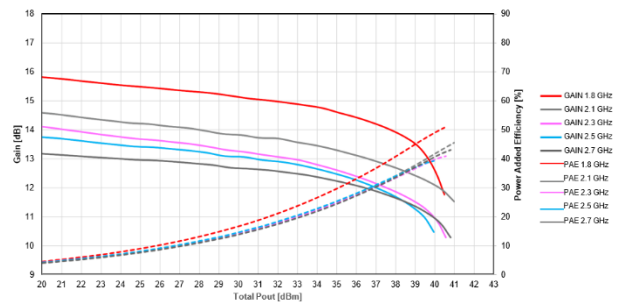
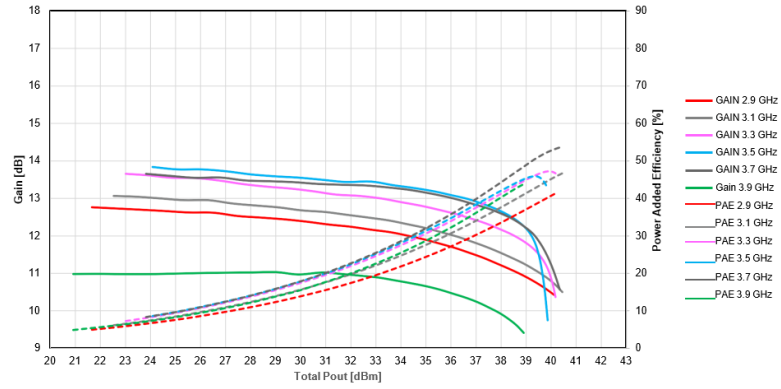


Figure 6.2.2 Gain, PAE v/s Pout Of TA9210D-EVB-G, VD=28 V, IDQ=50 mA Freq:1.8-2.7 GHz



**Figure 6.2.3 Gain, PAE v/s Pout  
Of TA9210D-EVB-G, VD=28 V, IDQ=50 mA  
Freq:2.9-3.9 GHz**

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