

# TA9210D

12.5W CW 0.03 – 4.0 GHz GaN Power Transistor

Application Note: TA9210D EVB G

## Application Note

700MHz~3700MHz

28V/30V 50mA

Rev-1.3

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## 1. General Description

The TA9210D is a broadband capable 12.5W GaN power transistor covering 30MHz to 2.7GHz frequency band with a single match. TA9210D is usable up to 4GHz. 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) 3x6x0.75mm, 32 leads plastic package. TA9210D-EVB-G is tuned from 700MHz to 3700MHz.

## 2. TA9210D-EVB-G Board Details

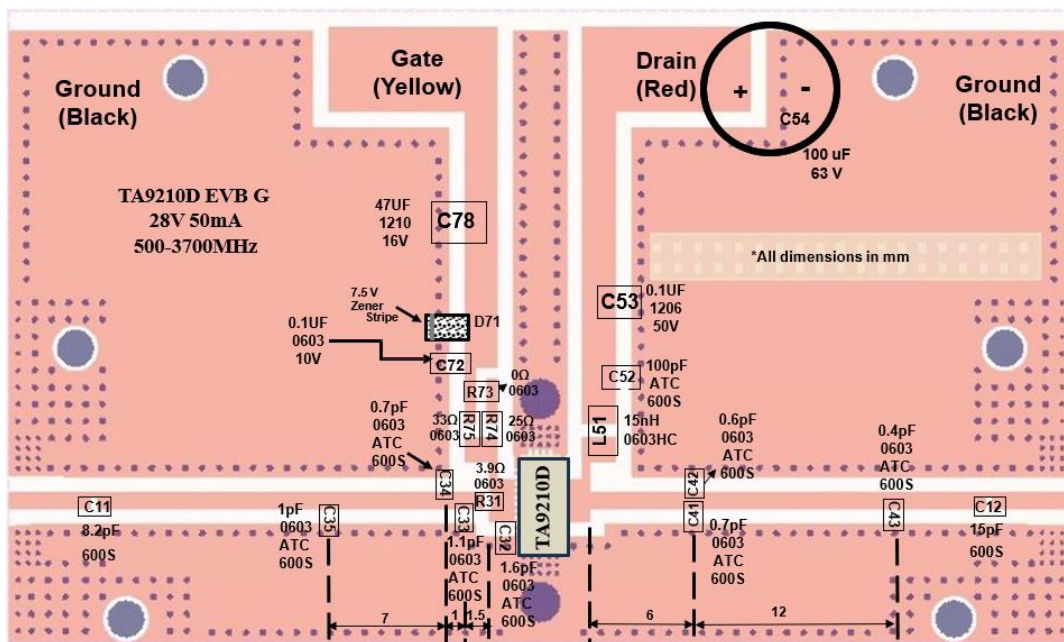
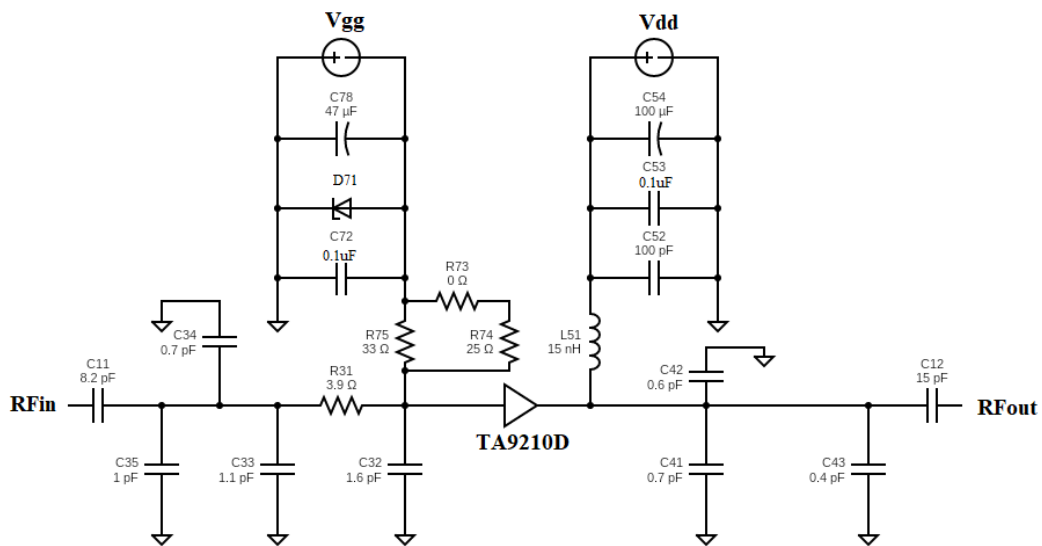


Figure 2.1 TA9210D-EVB-G 700MHz ~ 3700MHz Schematic and EVB Layout

### 3. [TA9210D-EVB-G Bill of Material](#)

Component ID	Value	Manufacturer	Recommended Part Number
C11	8.2pF	AVX	600S8R2AT250XT
C12	15pF	AVX	600S150GT250XT
R31	3.9Ω	Vishay	CRCW06033R90FKEAHP
C32	1.6pF	AVX	600S1R6BW250XT
C33	1.1pF	AVX	600S1R1BW250XT
C34, C41	0.7pF	AVX	600S0R7BW250XT
C35	1pF	AVX	600S1R0BW250XT
C42	0.6pF	AVX	600S0R6BW250XT
C43	0.4pF	AVX	600S0R4BW250XT
L51	15nH	Coil craft	0603HC-15NXGLW
C52	100pF	AVX	600S101GT250XT
C53	0.1μF, 50V	Murata	GRM31C5C1H104JA01L
C54	100μF, 63V	Nichicon	UPW1J101MPD1TD
D71	7.5 V Zener Diode	On Semiconductor	MMSZ5236BT1G
C72	0.1uF, 10V	AVX	0603ZC104K4T2A
R73	0Ω	Vishay/Dale	CRCW06030000Z0EAC
R74	24.9Ω	Vishay/Dale	CRCW060324R9FKEAHP
R75	33Ω	Vishay/Dale	CRCW060333R0FKEAHP
C78	47μF, 16V	Murata	GRM32ER61C476ME15L
Q1	12.5W GaN Transistor	Tagore Technology	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
<ol style="list-style-type: none"> <li>1. Set <math>V_G</math> to -5V</li> <li>2. Set <math>V_D</math> to +28V/30V</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 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 28V 50mA Electrical Characteristics Summary**

## 6. TA9210D-EVB-G Test Results

All the tests are carried out at room temperature.

### 6.1. S parameters

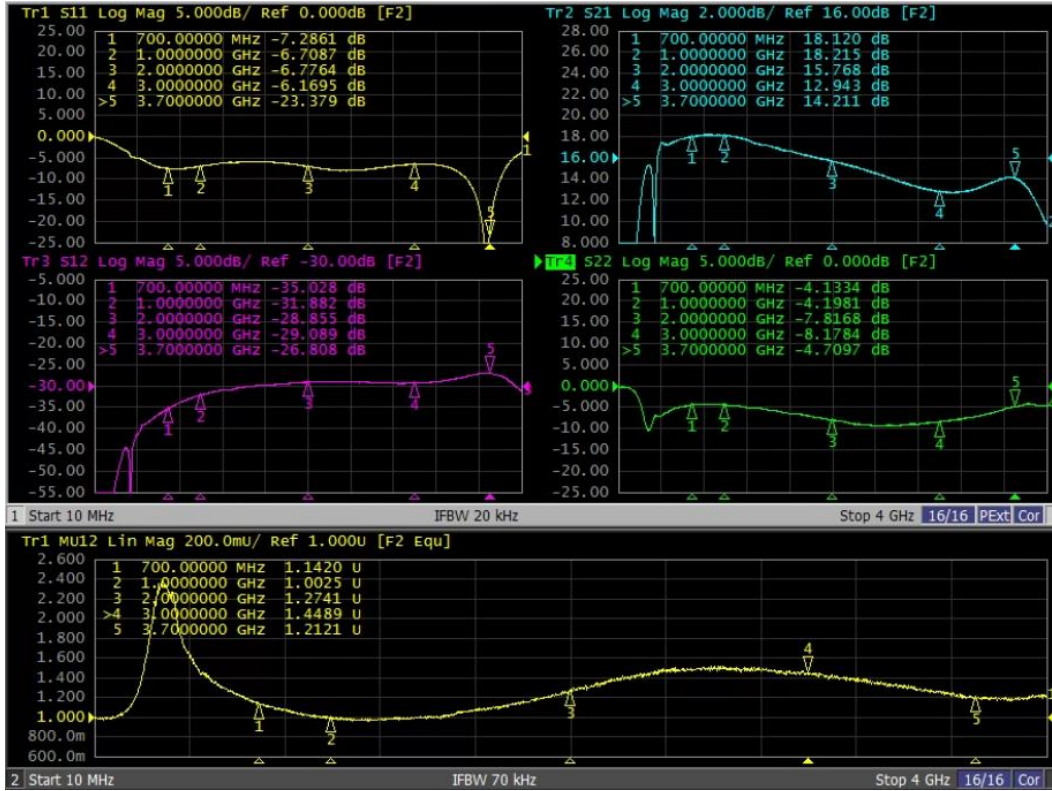


Figure 6.1.1. S parameters of TA9210D-EVB-G 28V 50mA

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

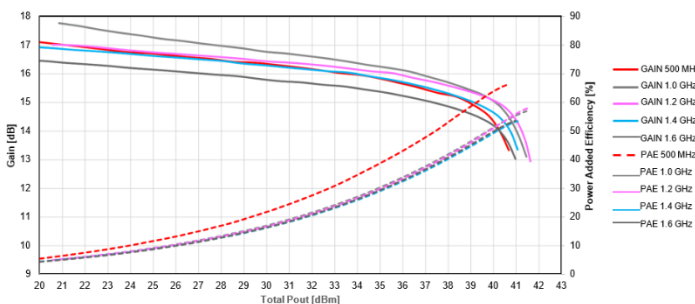


Figure 6.2.1 Gain, PAE v/s Pout Of TA9210D-EVB-G, VD=28V, IDQ=50mA Freq:500MHz to 1.6GHz

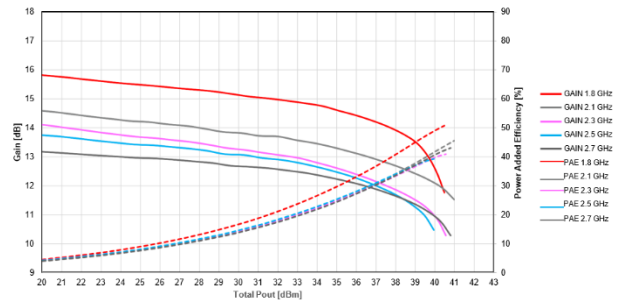
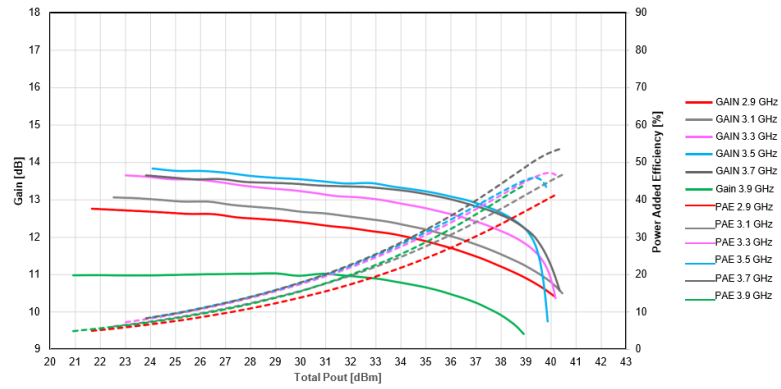


Figure 6.2.2 Gain, PAE v/s Pout Of TA9210D-EVB-G, VD=28V, IDQ=50mA Freq:1.8G-2.7GHz



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

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