

TA9210D

12.5W CW 0.03 – 4.0 GHz GaN Power Transistor

Application Note: TA9210D EVB H

Application Note

1200MHz~2600MHz

28V/20V 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-H is tuned from 1200MHz to 2600MHz.

2. TA9210D-EVB-H Board Details

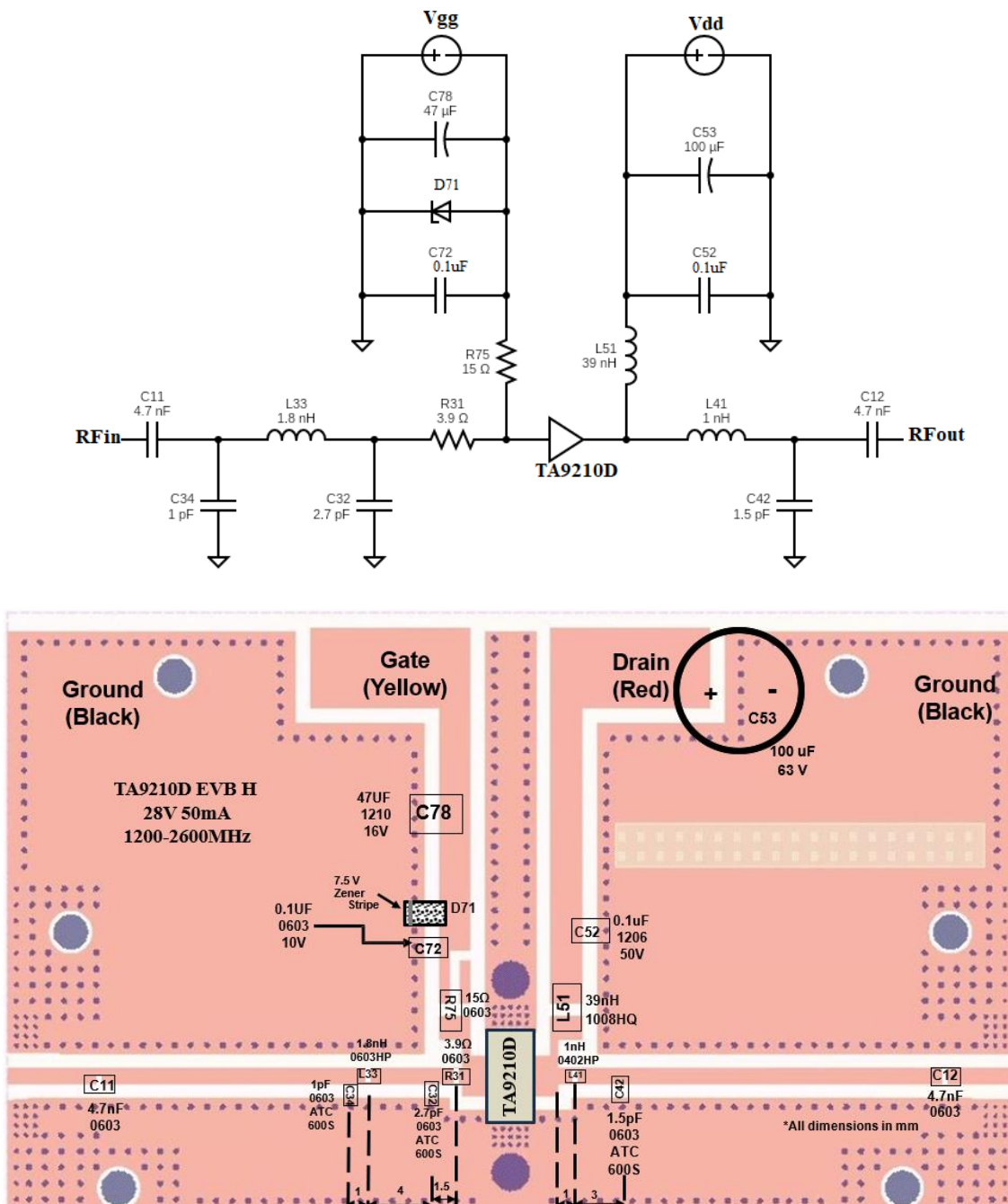


Figure 2.1 TA9210D-EVB-H 1200MHz ~ 2600MHz Schematic and EVB Layout

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

Component ID	Value	Manufacturer	Recommended Part Number
C11, C12	4.7nF, 50V	Murata	GRM1885C1H472JA01D
R31	3.9Ω	Vishay	CRCW06033R90FKEAHP
C32	2.7pF	AVX	600S2R7CT250XT
L33	1.8nH	Coil craft	0603HP-1N8XJLW
C34	1pF	AVX	600S1R0BW250XT
L41	1nH	Coil craft	0402HP-1N0XJRW
C42	1.5pF	AVX	600S1R5CT250XT
L51	39nH	Coil craft	1008HQ-39NXGLC
C52	0.1μF, 50V	Murata	GRM31C5C1H104JA01L
C53	100μF, 63V	Nichicon	UPW1J101MPD1TD
D71	7.5 V Zener Diode	On Semiconductor	MMSZ5236BT1G
C72	0.1uF, 10V	AVX	0603ZC104K4T2A
R75	15Ω	Vishay/Dale	CRCW060315R0FKEAHP
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-H BOM

4. [TA9210D-EVB-H Biasing Sequence](#)

Turn ON Device	Turn OFF Device
<ol style="list-style-type: none"> 1. Set V_G to -5V 2. Set V_D to +28V/20V 3. Adjust V_G to reach required I_{DQ} current 4. Apply RF power 	<ol style="list-style-type: none"> 1. Turn RF power off 2. Turn off V_D 3. Turn off V_G

Table 4.1 TA9210D-EVB-H Bias and Sequencing

5. [TA9210D-EVB-H Board Measurement Summary](#)

Frequency (GHz)	S21 Gain(dB)	S11 (dB)	S22 (dB)	Psat (dBm)	PAE [%] @Psat
1.2	16.8	-5.1	-3.7	40.9	50
1.6	16.0	-4.9	-4.4	40.9	38
2	15.7	-6.3	-5.8	41.2	42
2.4	15.6	-11.0	-10.2	41.4	55
2.6	15.3	-28.8	-14.4	41.0	60

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

6. TA9210D-EVB-H Test Results

All the tests are carried out at room temperature.

6.1. S parameters



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

6.2. Gain, PAE v/s Pout (CW) @ 20V and 28V Vdd

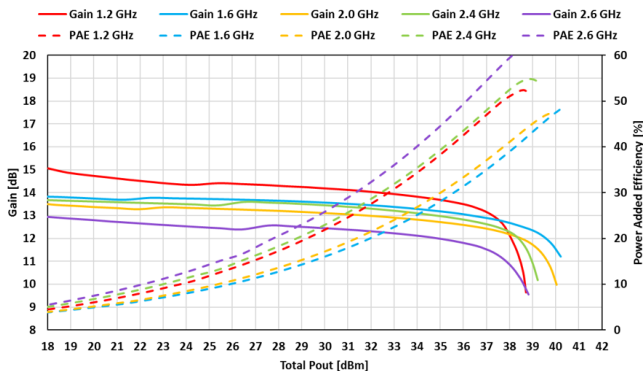


Figure 6.2.1 Gain, PAE v/s Pout Of TA9210D-EVB-H, VD=20V, IDQ=50mA

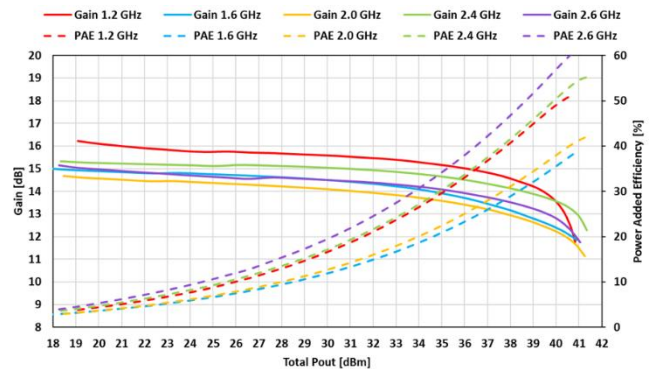


Figure 6.2.2 Gain, PAE v/s Pout Of TA9210D-EVB-H, VD=28V, IDQ=50mA

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