

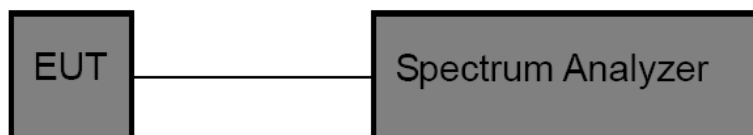


### 3.4. Band edge and Spurious Emissions (Conducted)

#### Limit

FCC CFR Title 47 Part 15 Subpart C Section 15.247 (d): In any 100 kHz bandwidth outside the frequency band in which the spread spectrum intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 30 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement.

#### Test Configuration



#### Test Procedure

1. The transmitter output was connected to the spectrum analyzer through an attenuator, the path loss was compensated to the results for each measurement.
2. Set to the maximum power setting and enable the EUT transmit continuously
3. Use the following spectrum analyzer settings:  
RBW = 100 kHz, VBW  $\geq$  RBW, scan up through 10<sup>th</sup> harmonic.  
Sweep = auto, Detector function = peak, Trace = max hold
4. Measure and record the results in the test report.

#### Test Mode

Please refer to the clause 2.4.

#### Test Results

**(1) Band edge Conducted Test**

Test Mode	Frequency[MHz]	Ref Level[dBm]	Result[dBm]	Limit[dBm]	Verdict
802.11b	2412	7.75	-34.63	$\leq -22.25$	PASS
	2462	8.32	-48.04	$\leq -21.68$	PASS
802.11g	2412	4.50	-28.31	$\leq -25.50$	PASS
	2462	4.89	-38.35	$\leq -25.11$	PASS
802.11n(HT20)	2412	4.28	-28.25	$\leq -25.72$	PASS
	2462	5.65	-31.75	$\leq -24.35$	PASS



## Test Graphs



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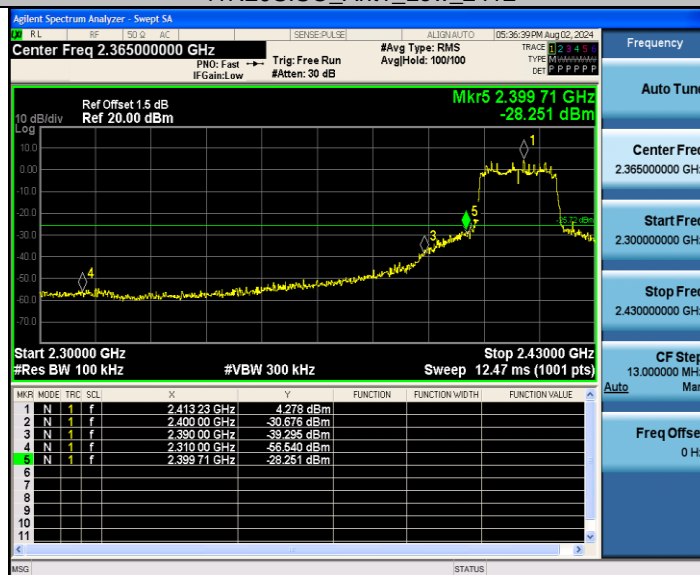
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11N20SISO\_Ant1\_Low\_2412



11N20SISO\_Ant1\_High\_2462



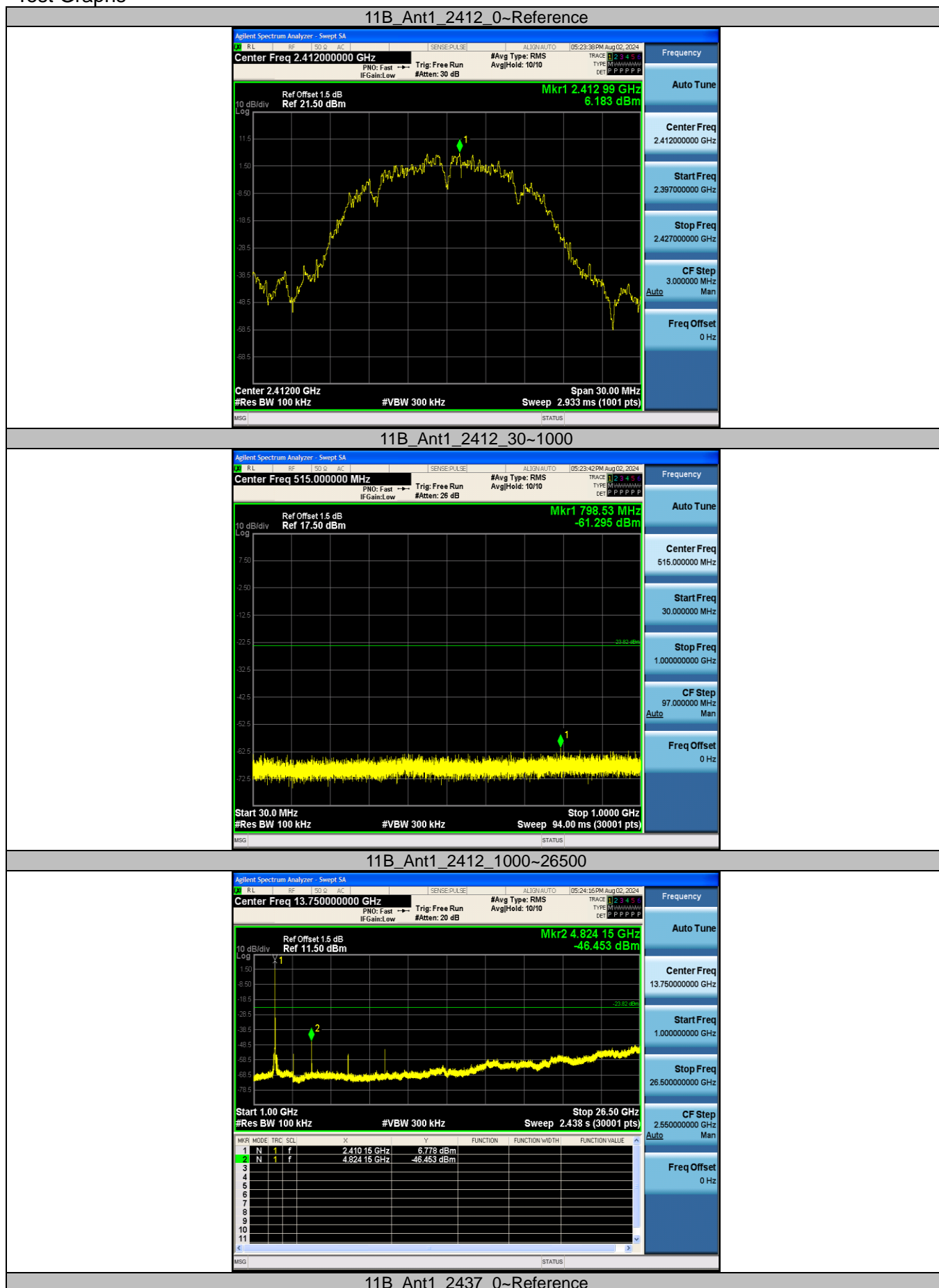


## (2) Conducted Spurious Emissions Test

Test Mode	Frequency [MHz]	Freq. Range [MHz]	Ref Level [dBm]	Result [dBm]	Limit [dBm]	Verdict
802.11b	2412	Reference	6.18	6.18	---	PASS
		30~1000	6.18	-61.30	$\leq -23.82$	PASS
		1000~26500	6.18	-46.45	$\leq -23.82$	PASS
	2437	Reference	7.04	7.04	---	PASS
		30~1000	7.04	-61.62	$\leq -22.96$	PASS
		1000~26500	7.04	-45.58	$\leq -22.96$	PASS
	2462	Reference	7.27	7.27	---	PASS
		30~1000	7.27	-62.29	$\leq -22.73$	PASS
		1000~26500	7.27	-44.30	$\leq -22.73$	PASS
802.11g	2412	Reference	1.36	1.36	---	PASS
		30~1000	1.36	-61.97	$\leq -28.64$	PASS
		1000~26500	1.36	-48.82	$\leq -28.64$	PASS
	2437	Reference	4.80	4.80	---	PASS
		30~1000	4.80	-61.47	$\leq -25.20$	PASS
		1000~26500	4.80	-48.39	$\leq -25.20$	PASS
	2462	Reference	2.65	2.65	---	PASS
		30~1000	2.65	-62.29	$\leq -27.35$	PASS
		1000~26500	2.65	-48.28	$\leq -27.35$	PASS
802.11n(HT20)	2412	Reference	1.93	1.93	---	PASS
		30~1000	1.93	-62.30	$\leq -28.07$	PASS
		1000~26500	1.93	-47.48	$\leq -28.07$	PASS
	2437	Reference	3.35	3.35	---	PASS
		30~1000	3.35	-62.37	$\leq -26.65$	PASS
		1000~26500	3.35	-48.65	$\leq -26.65$	PASS
	2462	Reference	4.74	4.74	---	PASS
		30~1000	4.74	-61.77	$\leq -25.26$	PASS
		1000~26500	4.74	-47.68	$\leq -25.26$	PASS



## Test Graphs



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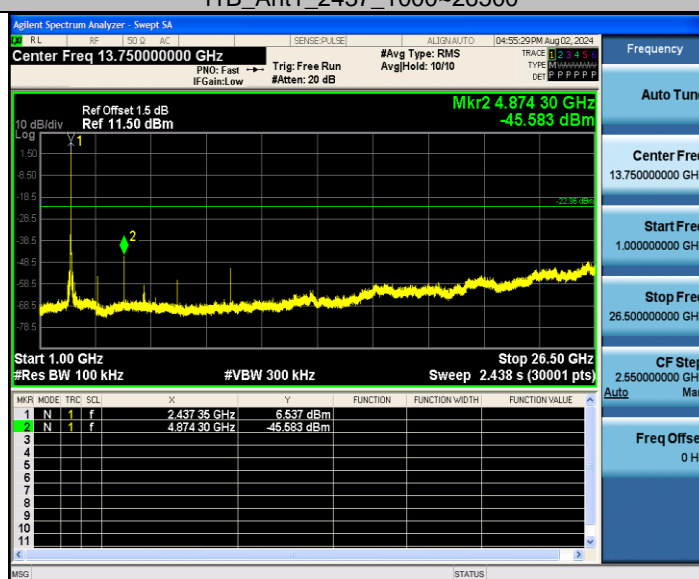
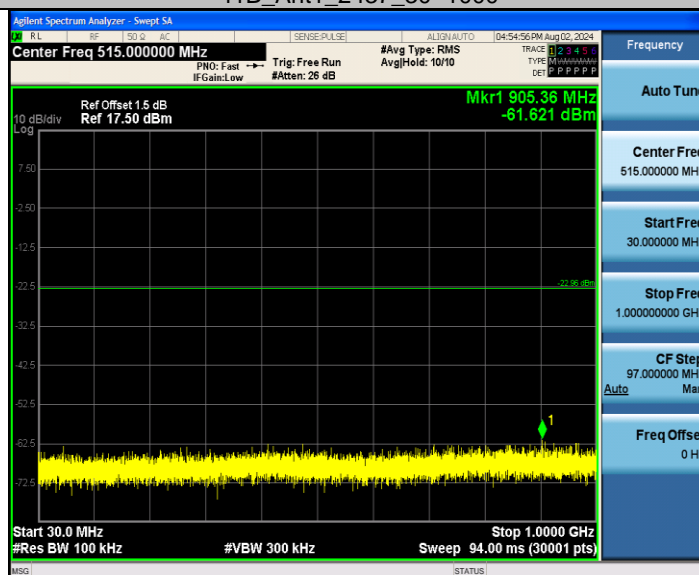
Room 101 Building B, No. 7, Lanqing 1st Road, Luhua Community, Guanhu Subdistrict, Longhua District, Shenzhen, Guangdong, China

Tel.: (86)755-27521059

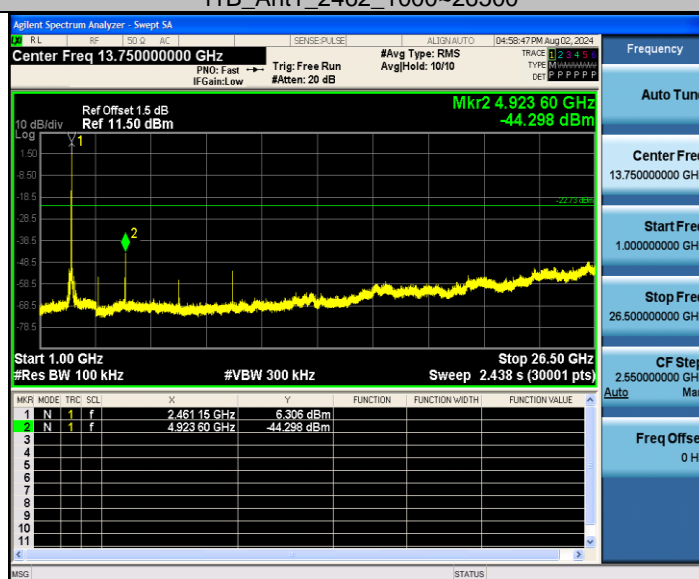
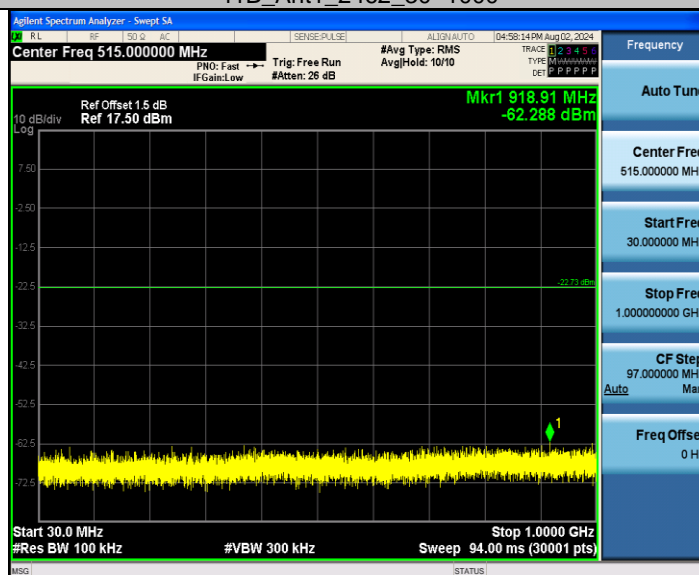
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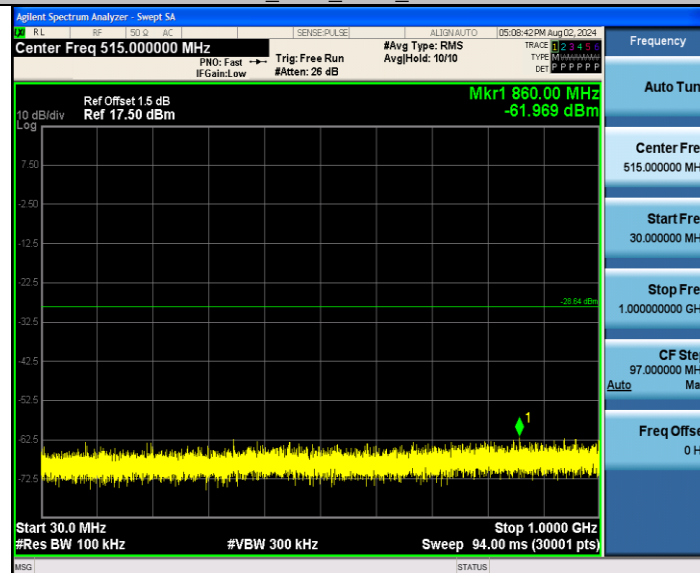




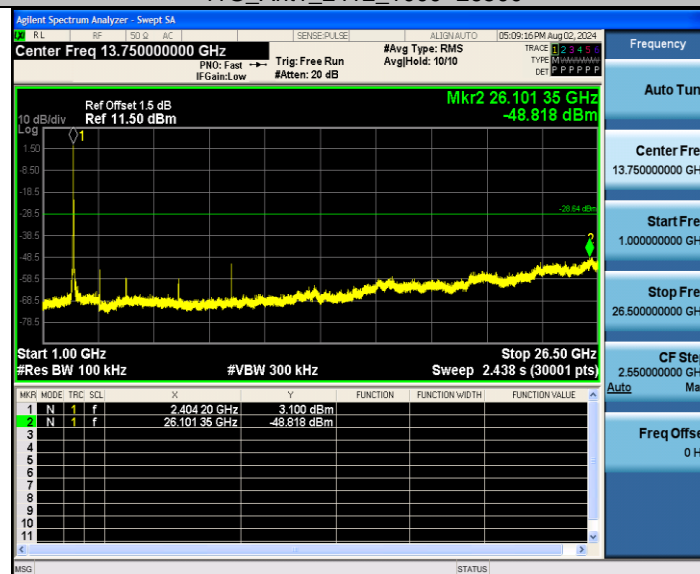




11G\_Ant1\_2412\_30~1000



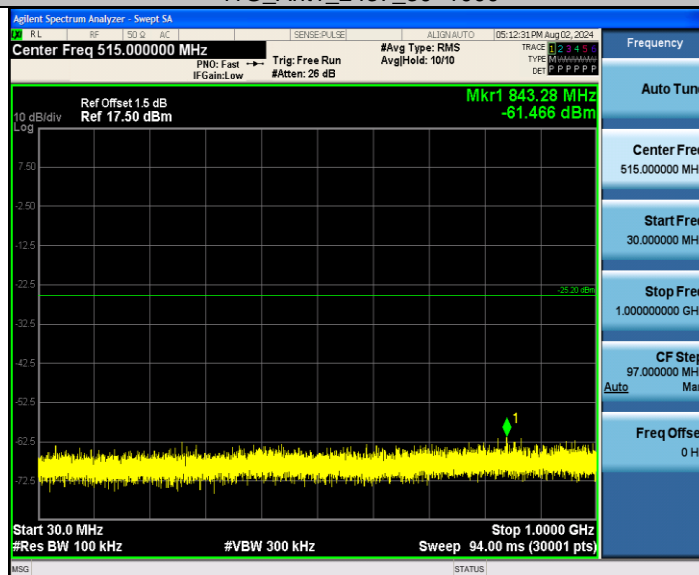
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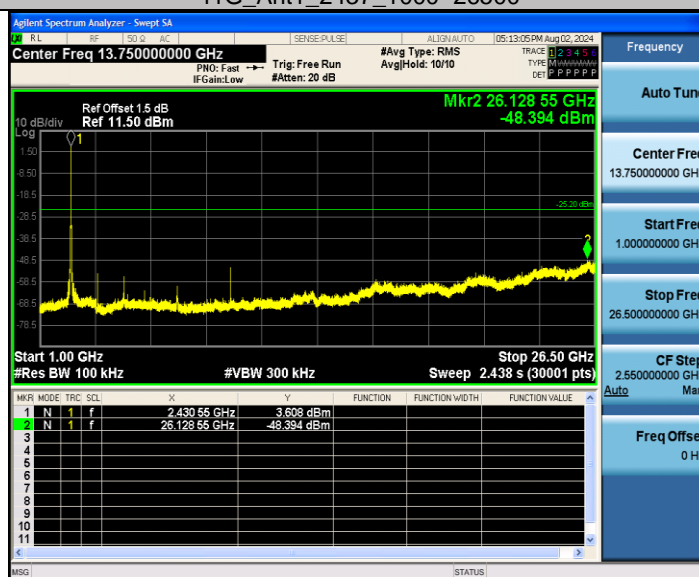
11G\_Ant1\_2437\_0~Reference



11G\_Ant1\_2437\_30~1000



11G\_Ant1\_2437\_1000~26500



11G\_Ant1\_2462\_0~Reference

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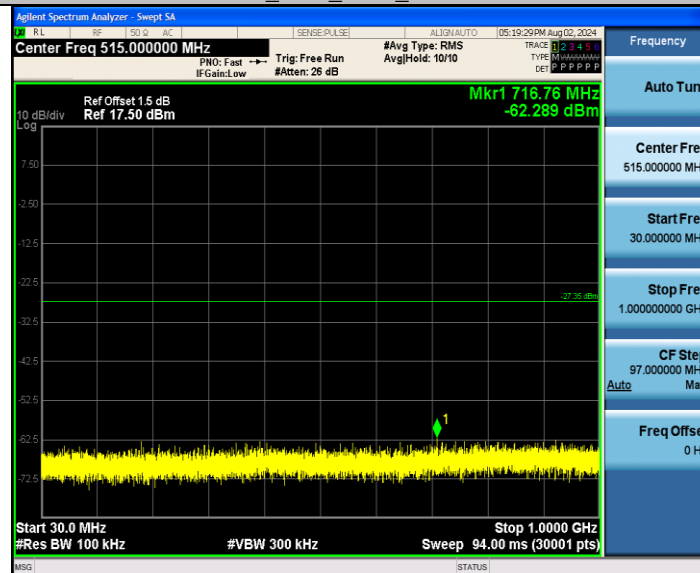
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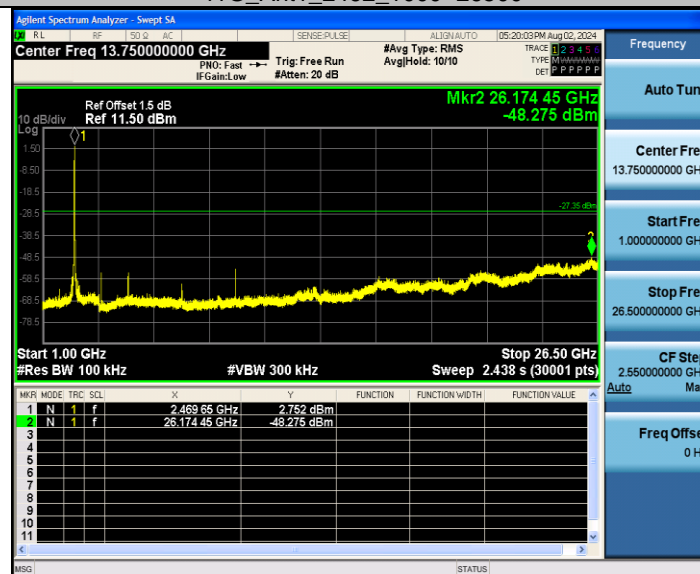
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11G\_Ant1\_2462\_30~1000



11G\_Ant1\_2462\_1000~26500



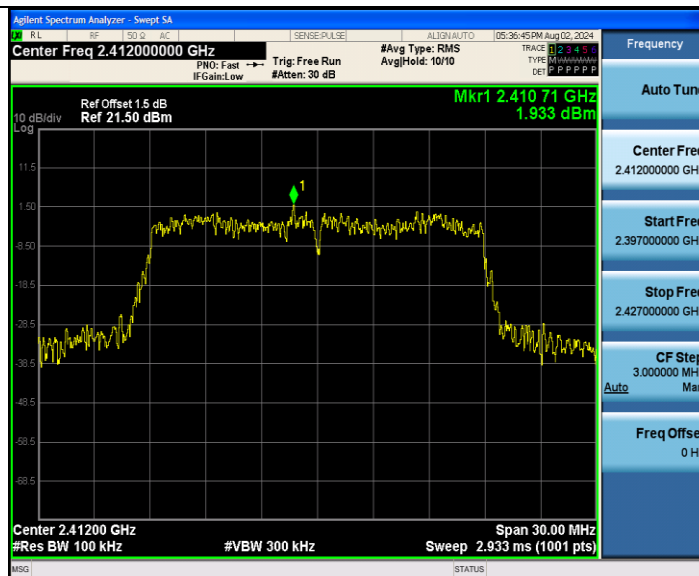
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CTC Laboratories, Inc.

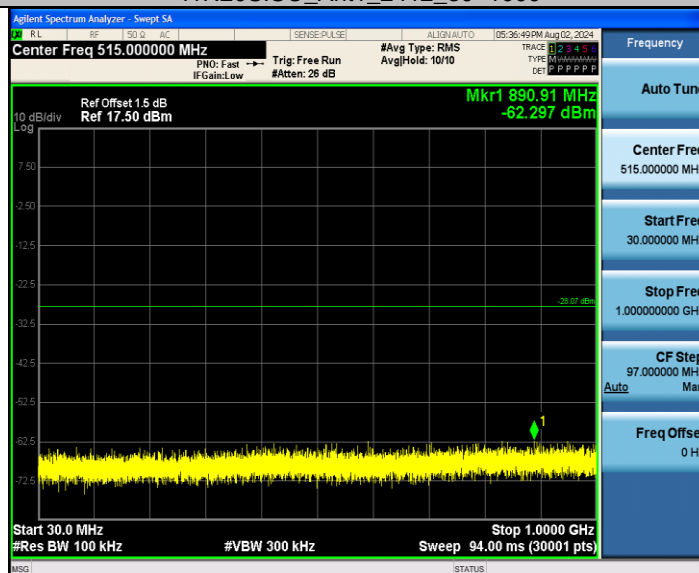
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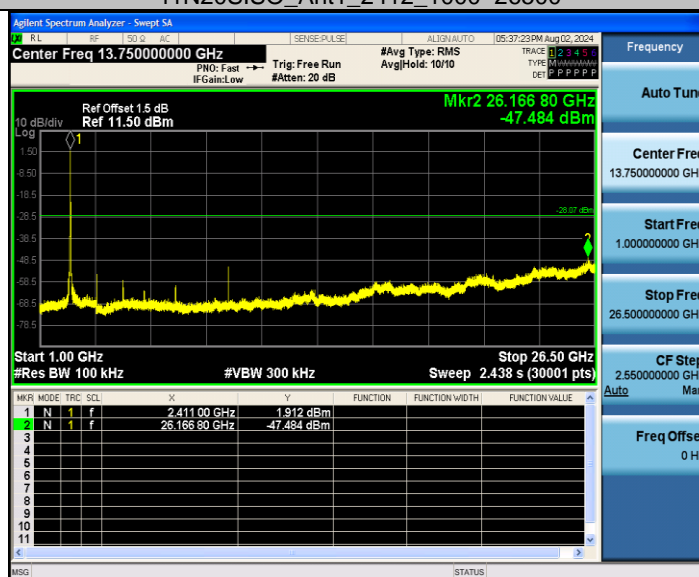
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11N20SISO\_Ant1\_2412\_30~1000



11N20SISO\_Ant1\_2412\_1000~26500



11N20SISO\_Ant1\_2437\_0~Reference

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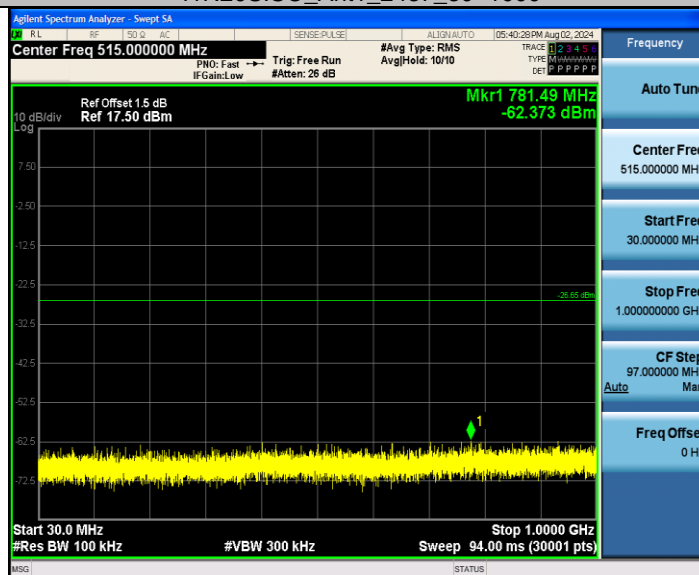
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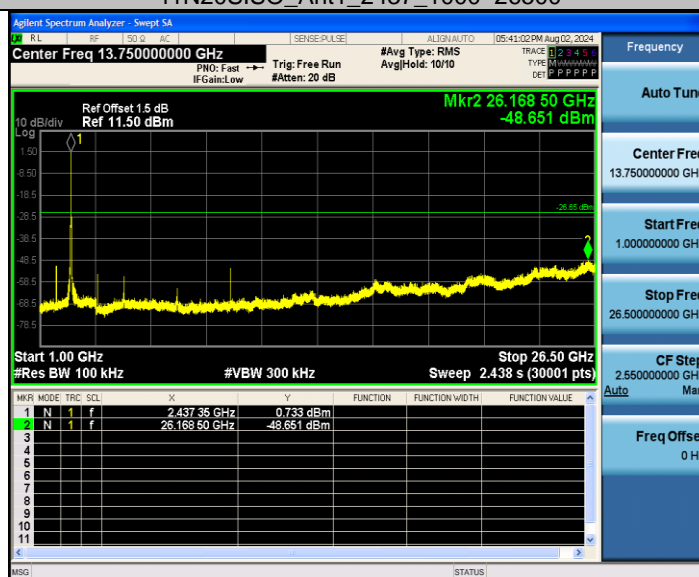
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11N20SISO\_Ant1\_2437\_30~1000



11N20SISO\_Ant1\_2437\_1000~26500



11N20SISO\_Ant1\_2462\_0~Reference

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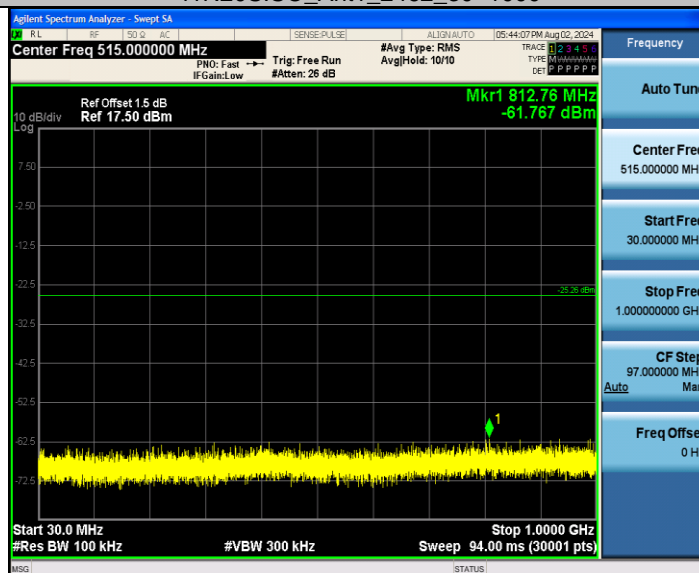
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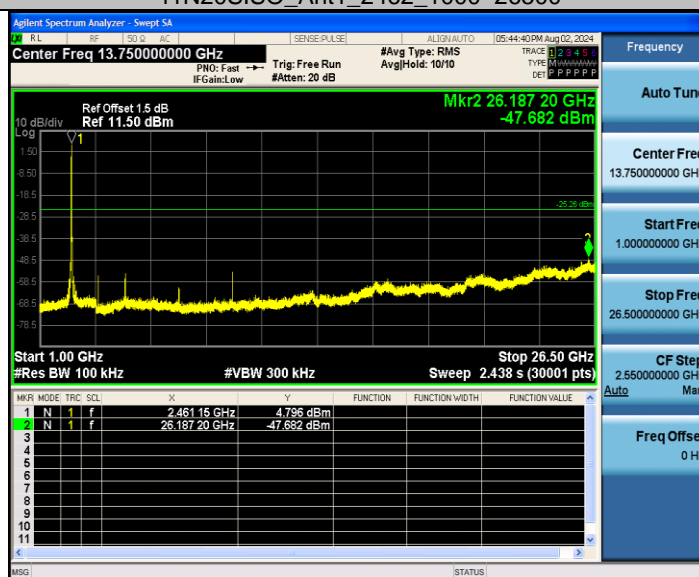
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11N20SISO\_Ant1\_2462\_30~1000



11N20SISO\_Ant1\_2462\_1000~26500



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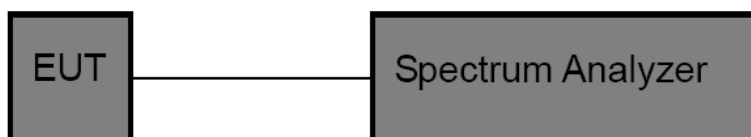
### 3.5. DTS Bandwidth

#### Limit

FCC CFR Title 47 Part 15 Subpart C Section 15.247 (a)(2)/ RSS-247 5.2 a:

Test Item	Limit	Frequency Range(MHz)
DTS Bandwidth	$\geq 500$ KHz (6dB bandwidth)	2400~2483.5

#### Test Configuration



#### Test Procedure

1. The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram above.

2. DTS Spectrum Setting:

- (1) Set RBW = 100 kHz.
- (2) Set the video bandwidth (VBW)  $\geq 3$  RBW.
- (3) Detector = Peak.
- (4) Trace mode = Max hold.
- (5) Sweep = Auto couple.

OCB Spectrum Setting:

- (1) Set RBW = 1% ~ 5% occupied bandwidth.
- (2) Set the video bandwidth (VBW)  $\geq 3$  RBW.
- (3) Detector = Peak.
- (4) Trace mode = Max hold.
- (5) Sweep = Auto couple.

NOTE: The EUT was set to continuously transmitting in each mode and low, Middle and high channel for the test.

#### Test Mode

Please refer to the clause 2.4.

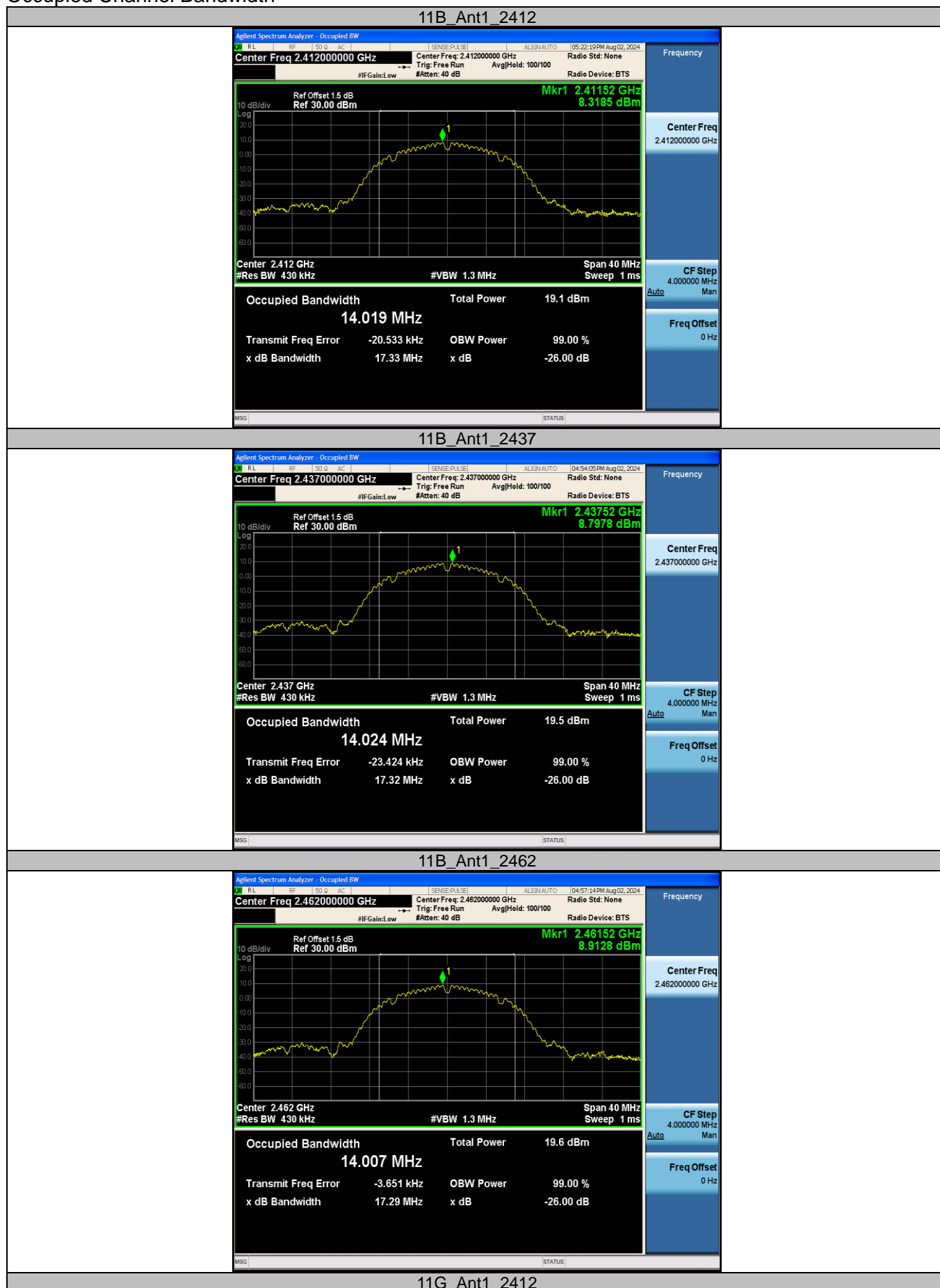


**Test Results**

Test Mode	Frequency[MHz]	OCB[MHz]	DTS BW[MHz]	Limit[MHz]	Verdict
802.11b	2412	14.019	8.520	≥0.5	PASS
	2437	14.024	8.080	≥0.5	PASS
	2462	14.007	8.040	≥0.5	PASS
802.11g	2412	17.213	15.840	≥0.5	PASS
	2437	17.302	15.080	≥0.5	PASS
	2462	17.134	16.320	≥0.5	PASS
802.11n(HT20)	2412	18.176	16.880	≥0.5	PASS
	2437	18.233	15.960	≥0.5	PASS
	2462	18.239	16.360	≥0.5	PASS



## Occupied Channel Bandwidth



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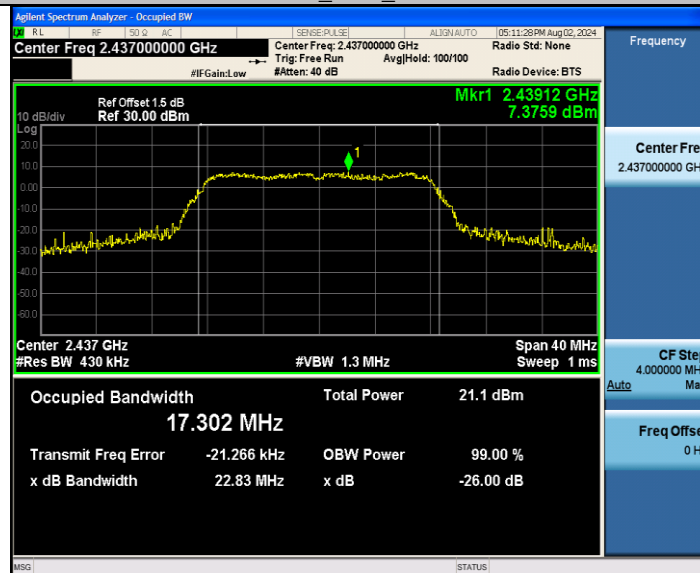
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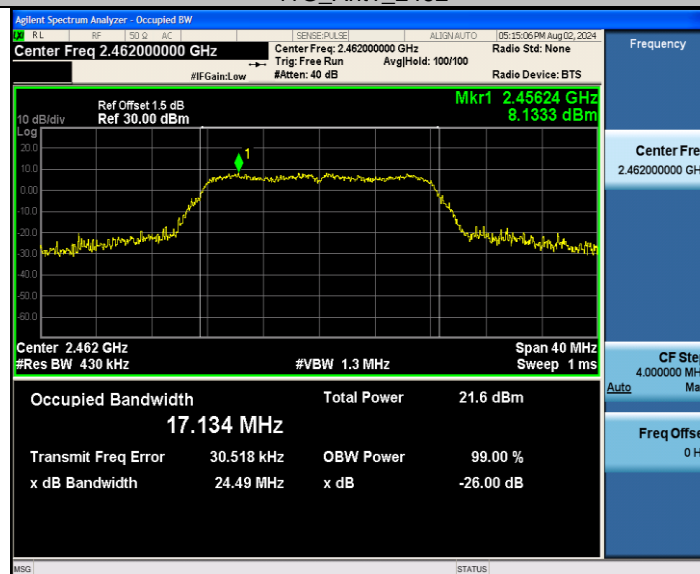
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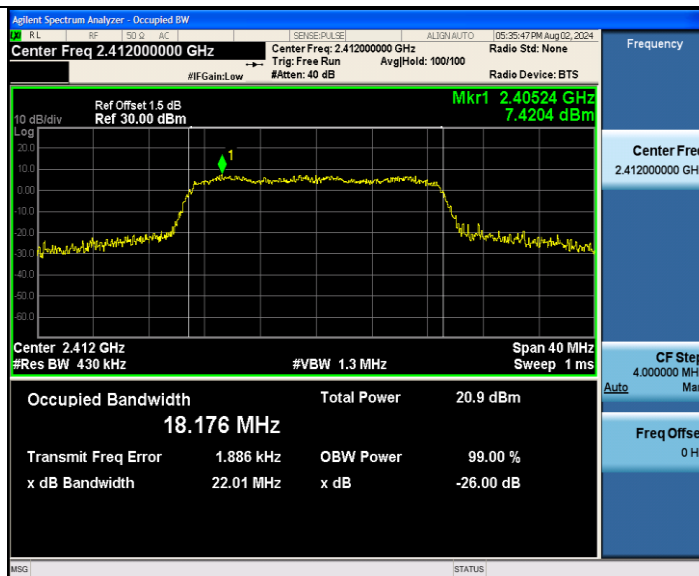
11G\_Ant1\_2437



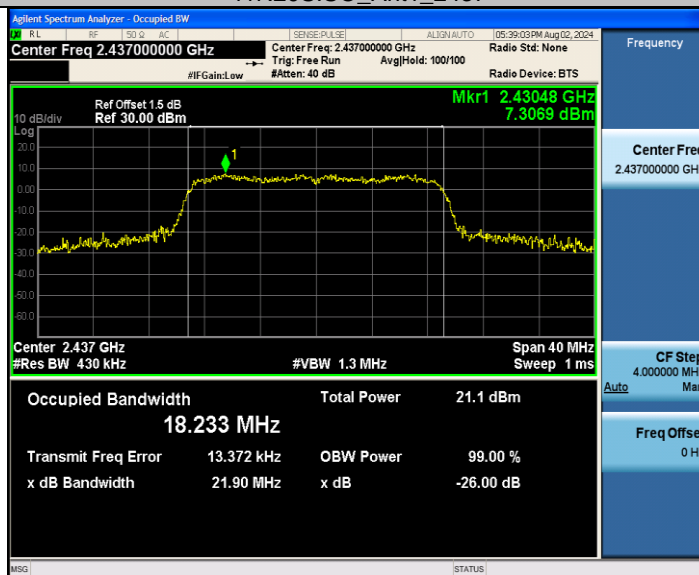
11G\_Ant1\_2462



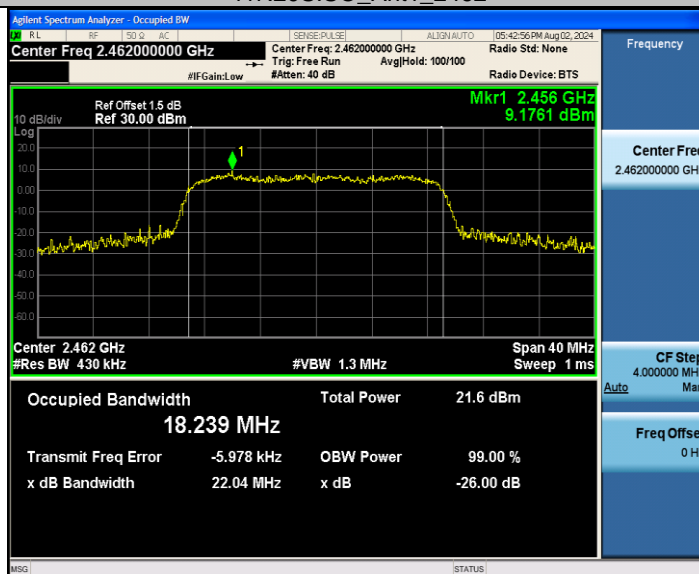
11N20SISO\_Ant1\_2412



11N20SISO\_Ant1\_2437



11N20SISO\_Ant1\_2462



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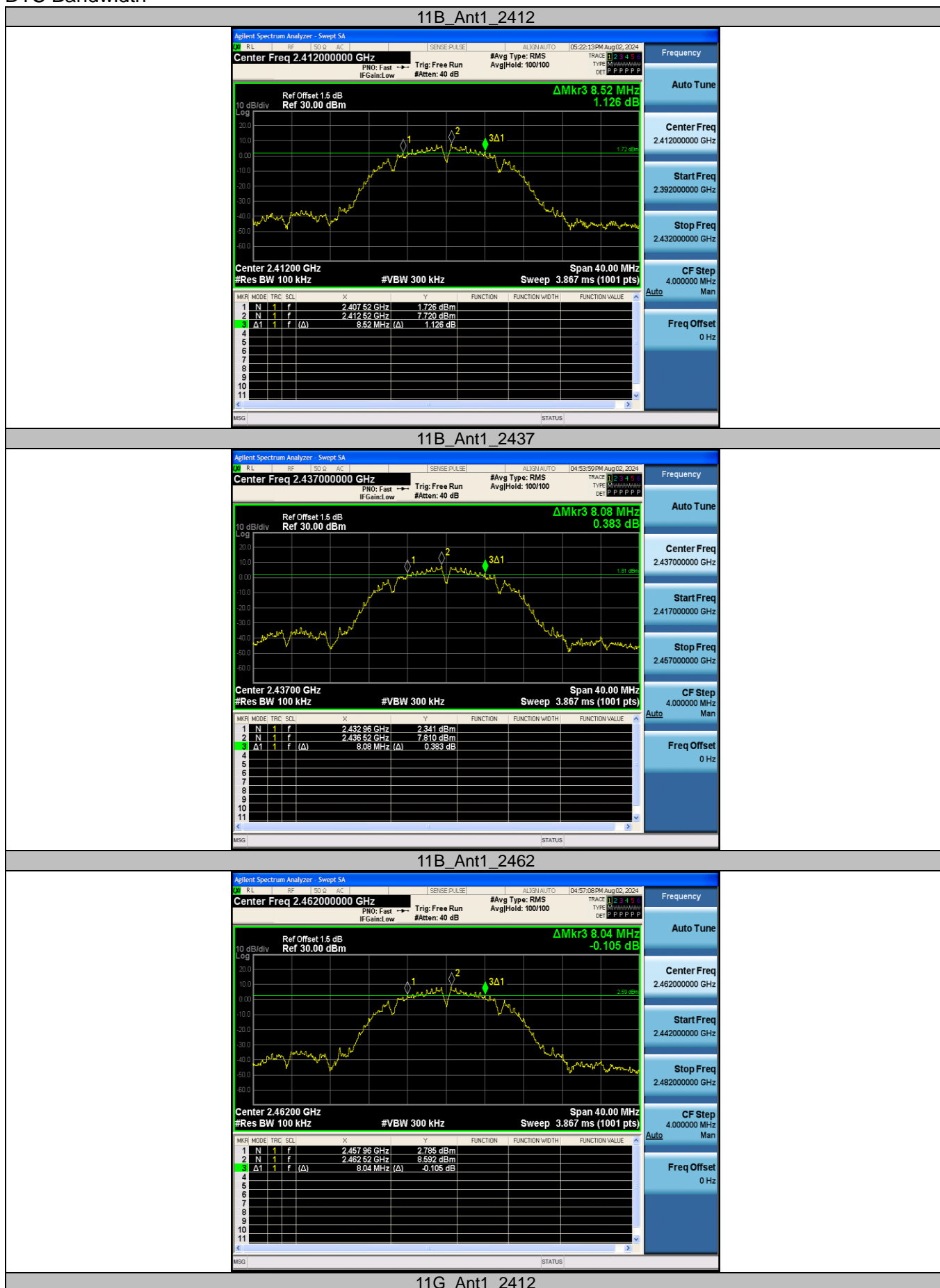
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## DTS Bandwidth



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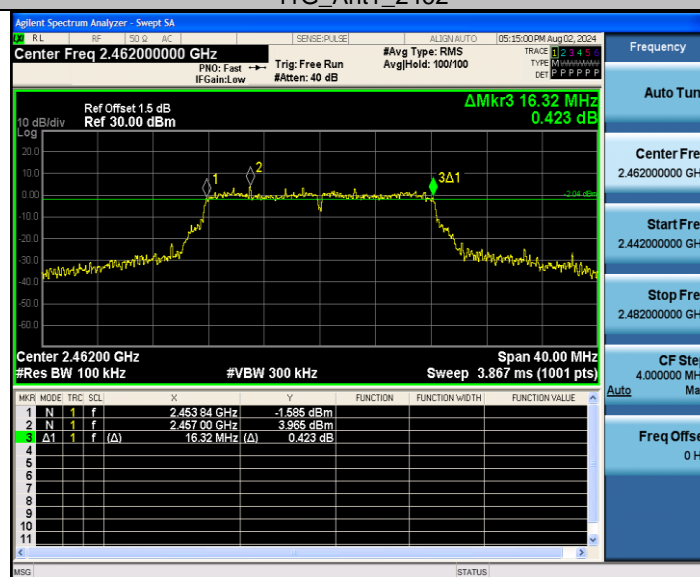
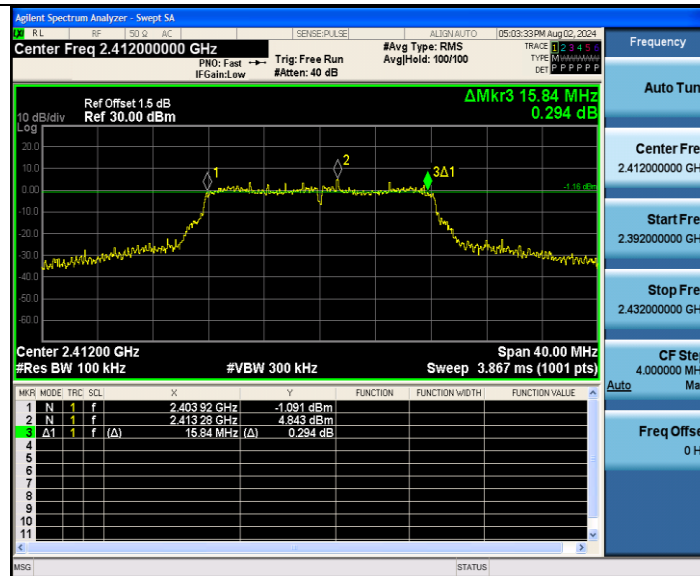
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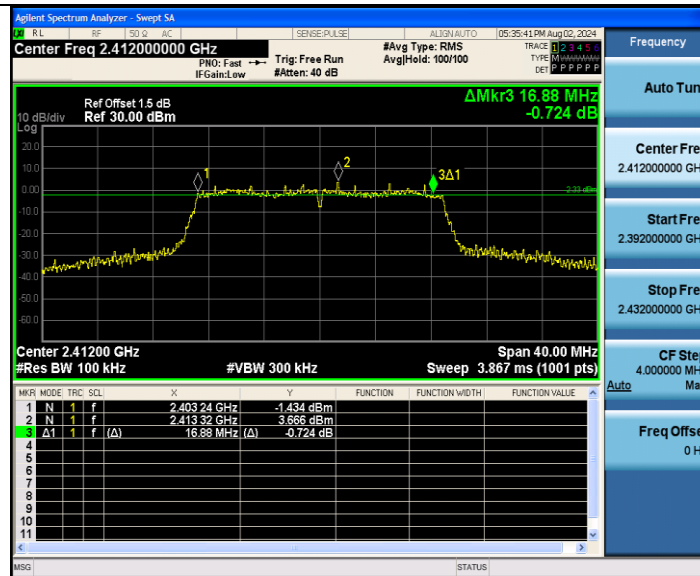
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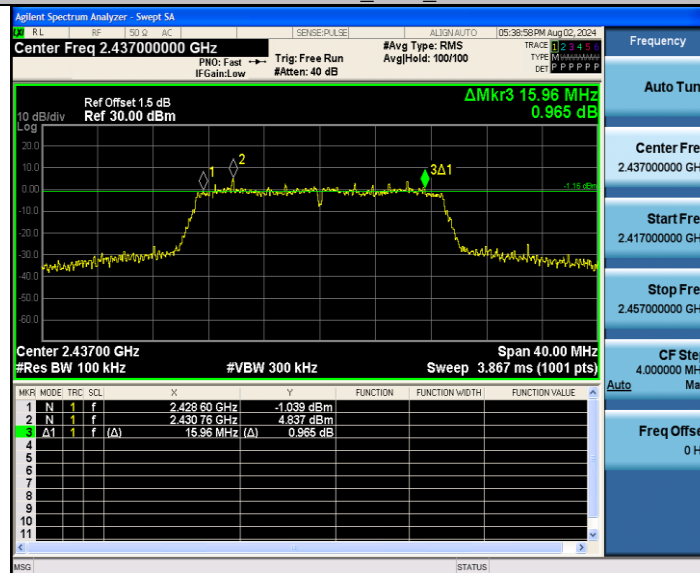
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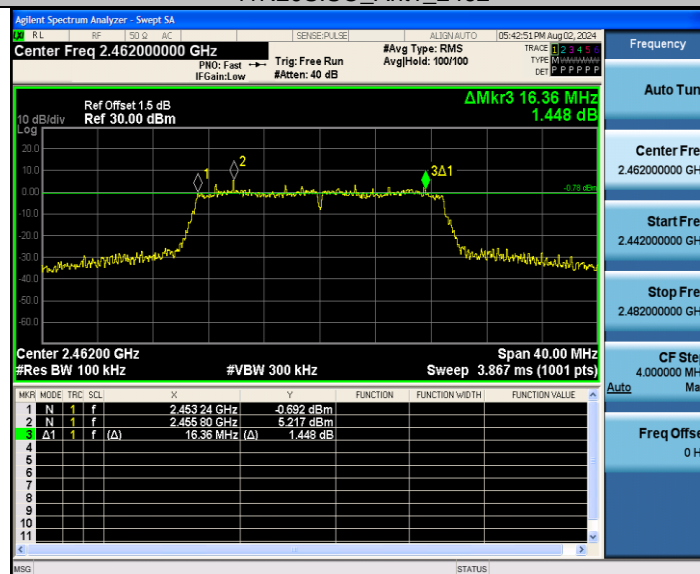




11N20SISO\_Ant1\_2437



11N20SISO\_Ant1\_2462







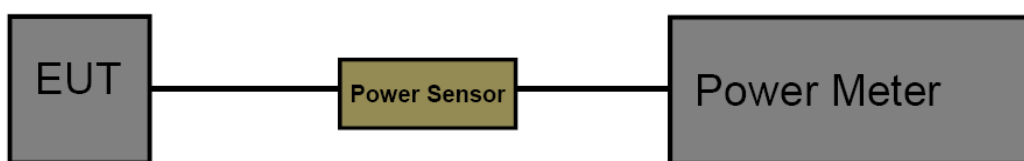
### 3.6. Maximum Conducted Output Power

#### Limit

FCC CFR Title 47 Part 15 Subpart C Section 15.247 (b)(3)/ RSS-247 5.4:

Section	Test Item	Limit	Frequency Range(MHz)
CFR 47 FCC 15.247(b)(3)	Maximum conducted output power	1 Watt or 30dBm	2400~2483.5
ISED RSS-247 5.4 d	EIRP	4 Watt or 36dBm	2400~2483.5

#### Test Configuration



#### Test Procedure

1. The maximum conducted output power may be measured using a broadband RF power meter.
2. Power measurements were performed only when the EUT was transmitting at its AVG power control level using a broadband power meter with a pulse sensor.
3. The power meter implemented triggering and gating capabilities which were set up such that power measurements were recorded only during the ON time of the transmitter.
4. Record the measurement data.

#### Test Mode

Please refer to the clause 2.4.

#### Test Result



Test Mode	Frequency [MHz]	Result AVG [dBm]	Limit [dBm]	Verdict
802.11b	2412	16.15	≤30	PASS
	2437	16.46	≤30	PASS
	2462	16.67	≤30	PASS
802.11g	2412	14.82	≤30	PASS
	2437	15.10	≤30	PASS
	2462	15.49	≤30	PASS
802.11n(HT20)	2412	14.80	≤30	PASS
	2437	15.05	≤30	PASS
	2462	15.41	≤30	PASS

Note: Test results increased RF cable loss by 1.5dB and Duty Cycle Factor.



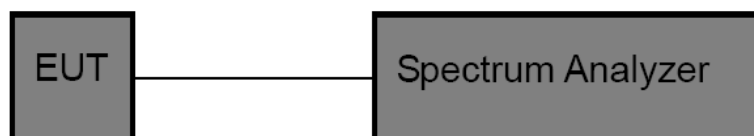
### 3.7. Power Spectral Density

#### Limit

FCC CFR Title 47 Part 15 Subpart C Section 15.247 (e)/ RSS-247 5.2 b:

Test Item	Limit	Frequency Range(MHz)
Power Spectral Density	8dBm(in any 3 kHz)	2400~2483.5

#### Test Configuration



#### Test Procedure

1. The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram above.
2. The EUT was directly connected to the Spectrum Analyzer and antenna output port as show in the block diagram above. The measurement according to section 10.2 of KDB 558074 D01 DTS Meas Guidance v05r02.
3. Spectrum Setting:  
Set analyzer center frequency to DTS channel center frequency.  
Set the span to 1.5 times the DTS bandwidth.  
Set the RBW to: 3 kHz  
Set the VBW to: 10 kHz  
Detector: PK  
Sweep time: Auto  
Allow trace to fully stabilize. Then use the peak marker function to determine the maximum amplitude level.

#### Test Mode

Please refer to the clause 2.4.

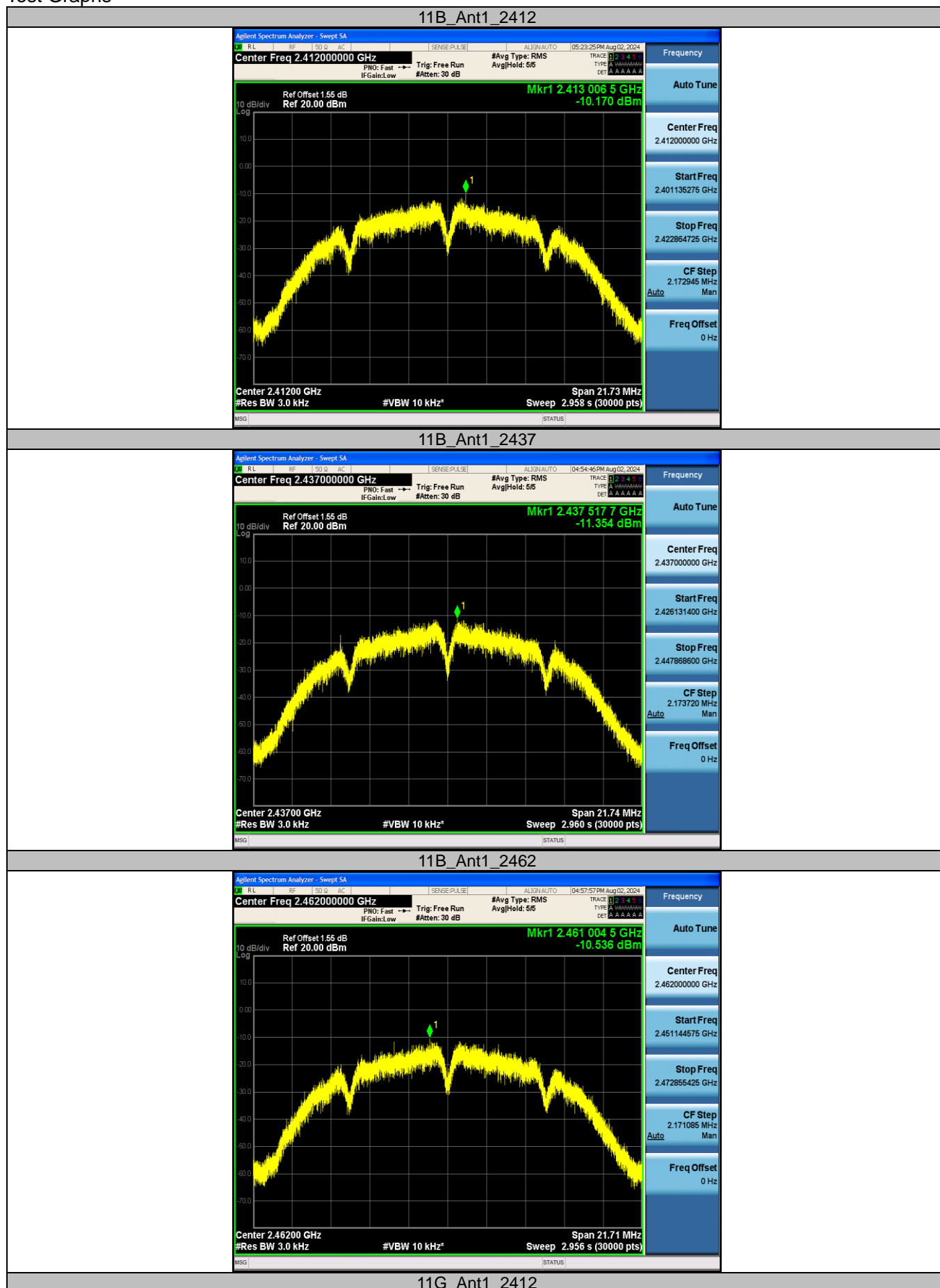
**Test Result**

Test Mode	Frequency [MHz]	Result [dBm/3kHz]	Limit [dBm/3kHz]	Verdict
802.11b	2412	-10.17	≤8	PASS
	2437	-11.35	≤8	PASS
	2462	-10.54	≤8	PASS
802.11g	2412	-15.68	≤8	PASS
	2437	-15.29	≤8	PASS
	2462	-14.78	≤8	PASS
802.11n(HT20)	2412	-16.01	≤8	PASS
	2437	-15.35	≤8	PASS
	2462	-13.81	≤8	PASS

*Note: Test results increased Duty Cycle Factor.*



## Test Graphs



CTC Laboratories, Inc.

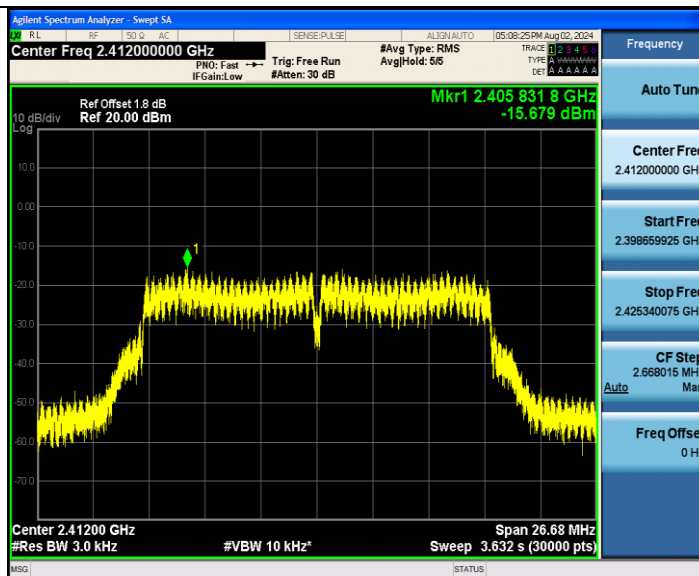
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Tel.: (86)755-27521059

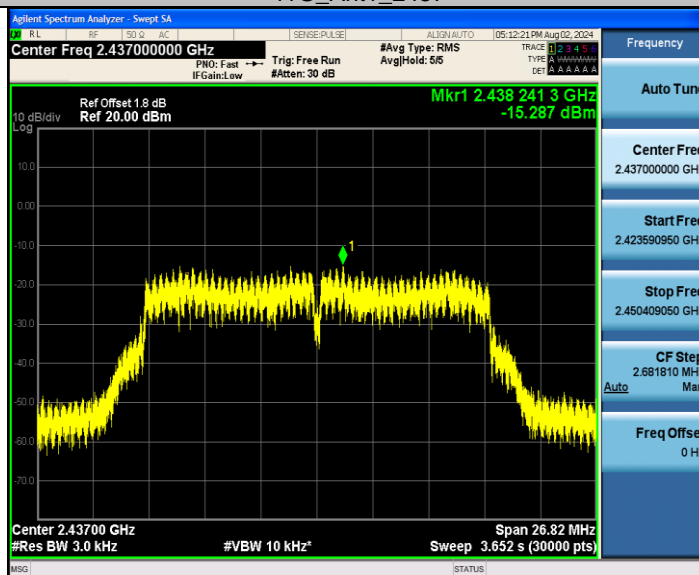
Fax: (86)755-27521011

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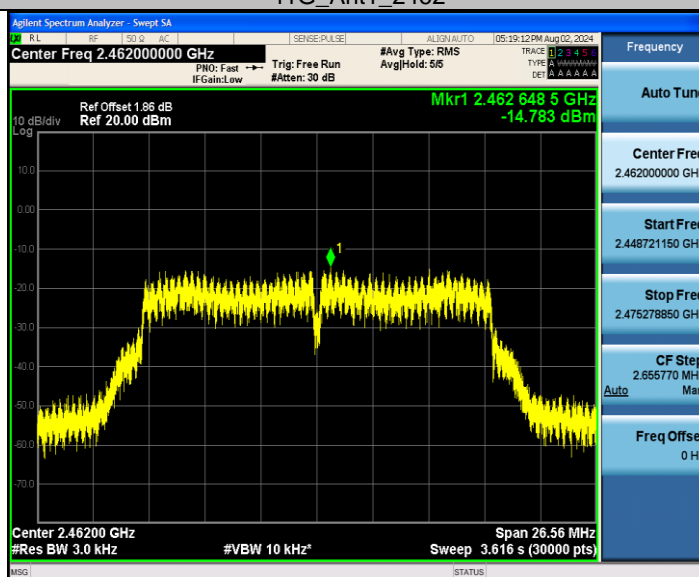
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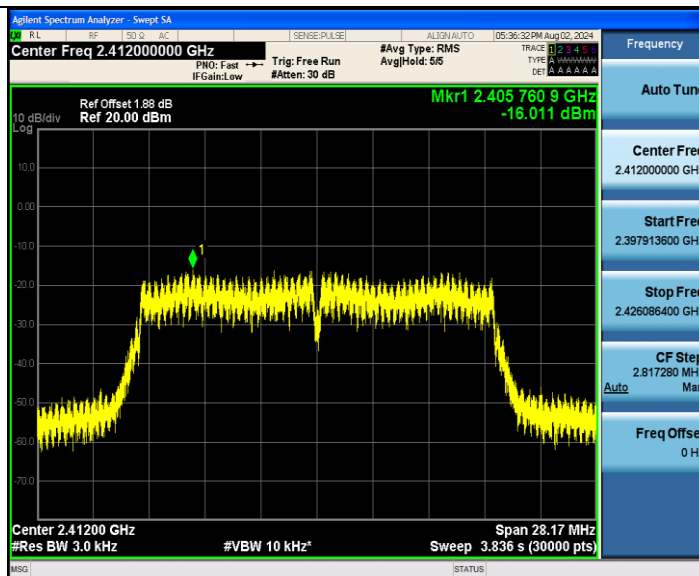
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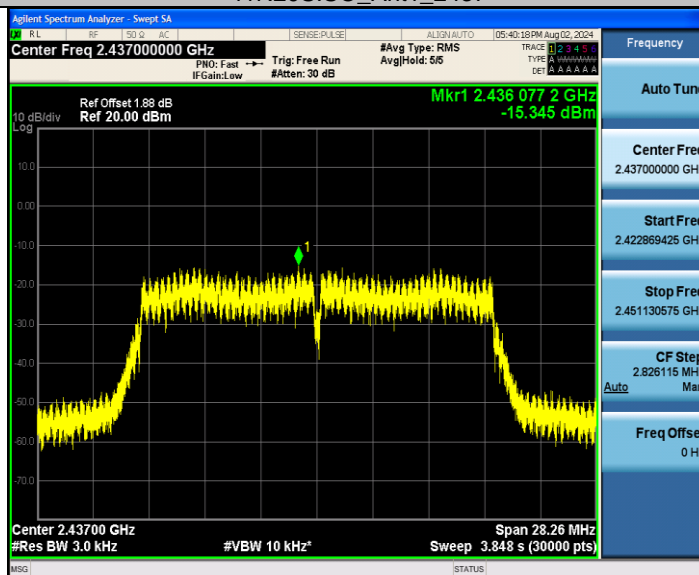
11G\_Ant1\_2462



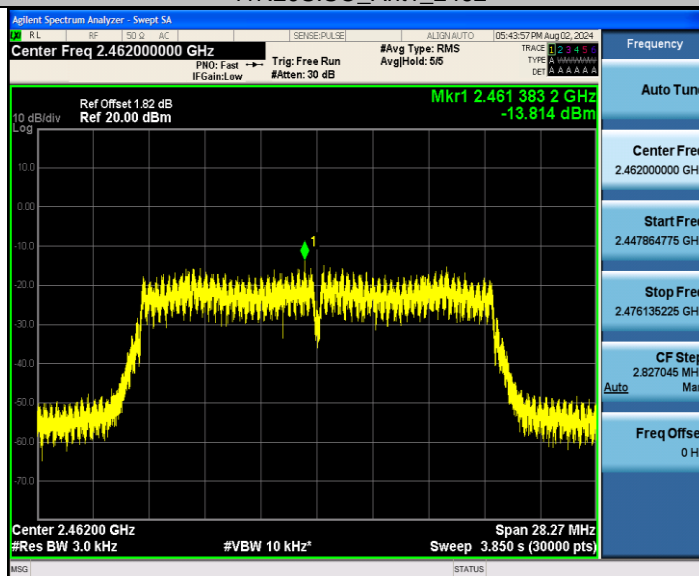
11N20SISO\_Ant1\_2412



11N20SISO\_Ant1\_2437



11N20SISO\_Ant1\_2462





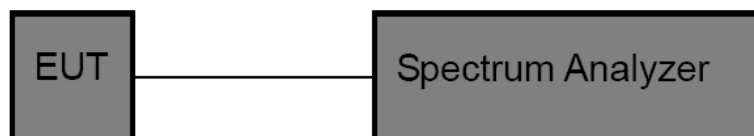


### 3.8. Duty Cycle

#### Limit

None, for report purposes only.

#### Test Configuration



#### Test Procedure

1. The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram above.
2. The EUT was directly connected to the Spectrum Analyzer and antenna output port as show in the block diagram above. The measurement according to section 10.2 of KDB 558074 D01 DTS Meas Guidance v05r02.
3. Spectrum Setting:  
Set analyzer center frequency to DTS channel center frequency.  
Set the span to 0Hz  
Set the RBW to 8MHz  
Set the VBW to 8MHz  
Detector: peak  
Sweep time: auto  
Allow trace to fully stabilize. Then use the peak marker function to determine the maximum amplitude level.

#### Test Mode

Please refer to the clause 2.4.

#### Test Result

Test Mode	Frequency [MHz]	Transmission Duration [ms]	Transmission Period [ms]	Duty Cycle [%]	Duty Cycle Factor	1/T Minimum VBW [kHz]	Final setting For VBW [kHz]
802.11b	2412	8.40	8.50	98.82	0.05	0.12	1
	2437	8.40	8.50	98.82	0.05	0.12	1
	2462	8.40	8.50	98.82	0.05	0.12	1
802.11g	2412	1.38	1.48	93.24	0.30	0.72	1
	2437	1.38	1.48	93.24	0.30	0.72	1
	2462	1.38	1.50	92.00	0.36	0.72	1
802.11n(HT20)	2412	1.30	1.42	91.55	0.38	0.77	1
	2437	1.30	1.42	91.55	0.38	0.77	1
	2462	1.30	1.40	92.86	0.32	0.77	1

Note: Duty Cycle Factor =  $10 \cdot \log_{10}(1/\text{Duty Cycle})$



## Test Graphs



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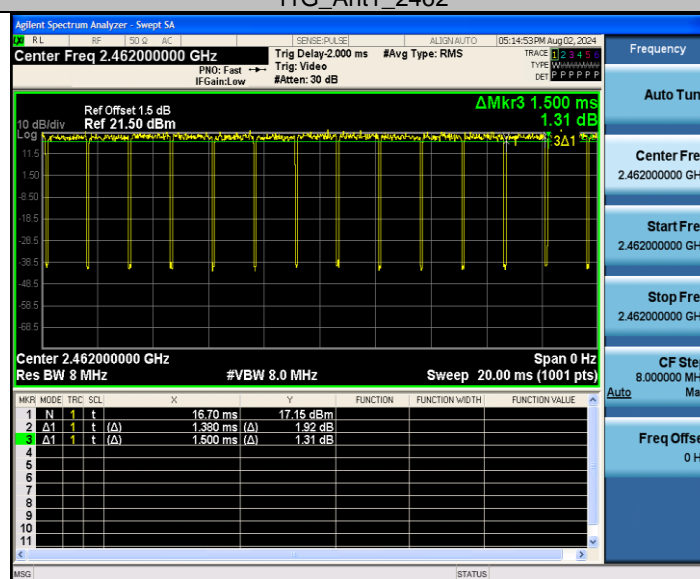
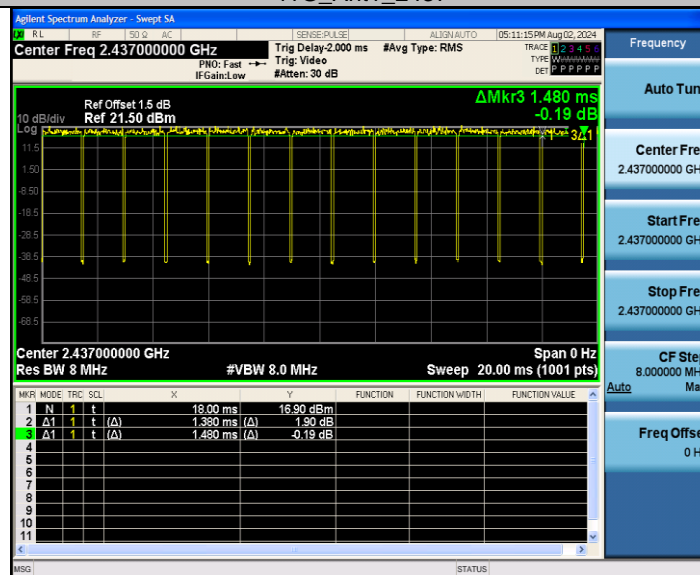
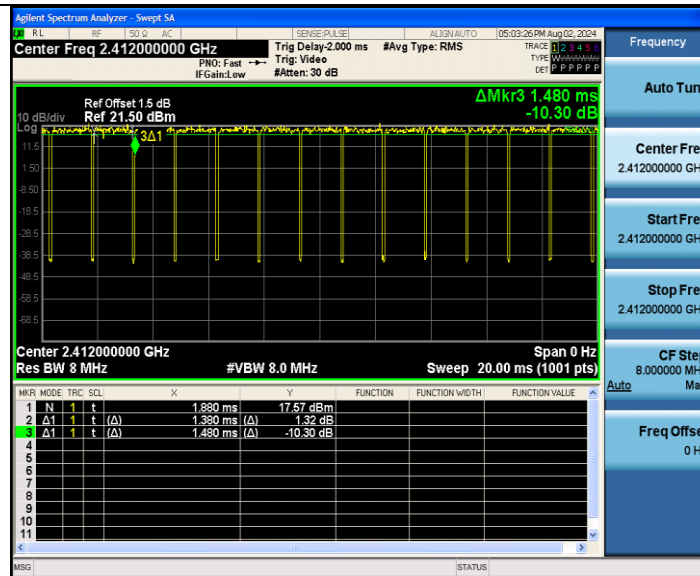
Room 101 Building B, No. 7, Lanqing 1st Road, Luhu Community, Guanhu Subdistrict, Longhua District, Shenzhen, Guangdong, China

Tel.: (86)755-27521059

Fax: (86)755-27521011

Http://www.sz-ctc.org.cn

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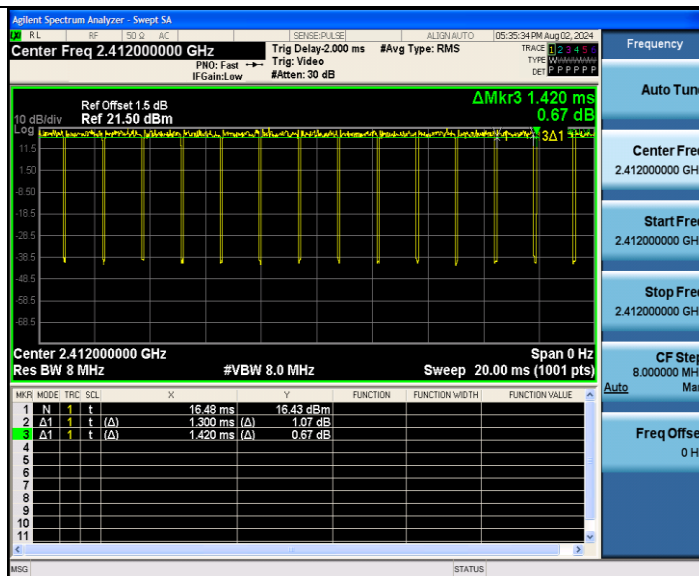


CTC Laboratories, Inc.

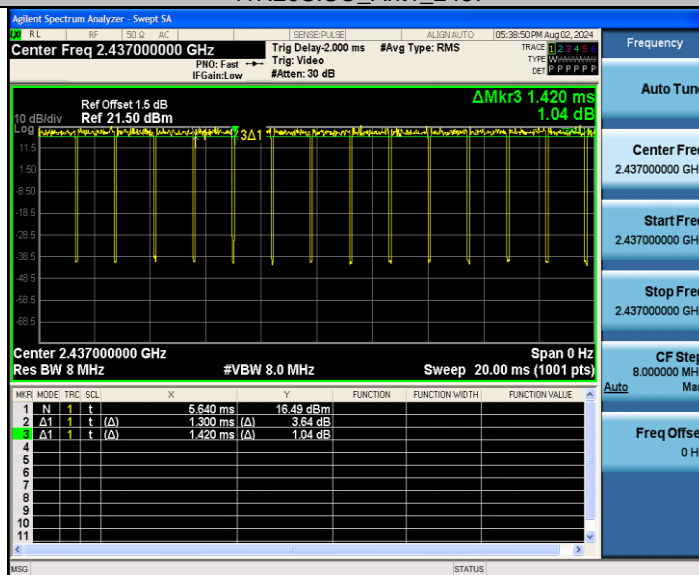
Room 101 Building B, No. 7, Lanqing 1st Road, Luhua Community, Guanhu Subdistrict, Longhua District, Shenzhen, Guangdong, China  
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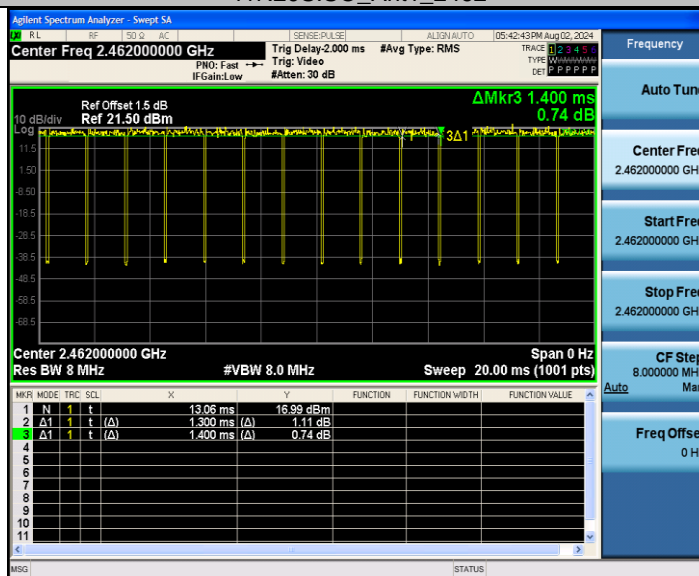
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### 3.9. Antenna Requirement

#### Requirement

**FCC CFR Title 47 Part 15 Subpart C Section 15.203:**

An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of antenna that uses a unique coupling to the intentional radiator, the manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.

**FCC CFR Title 47 Part 15 Subpart C Section 15.247(c) (1)(i):**

(i) Systems operating in the 2400~2483.5 MHz band that is used exclusively for fixed. Point-to-point operations may employ transmitting antennas with directional gain greater than 6dBi provided the maximum conducted output power of the intentional radiator is reduced by 1 dB for every 3 dB that the directional gain of the antenna exceeds 6dBi.

#### Test Result

The directional gain of the antenna less than 6dBi, please refer to the EUT internal photographs antenna photo.

\*\*\*\*\*THE END\*\*\*\*\*