

RADIO TEST REPORT

The device described below is tested by Dongguan Nore Testing Center Co., Ltd. to determine the maximum emission levels emanating from the device, the severe levels which the device can endure and E.U.T.'s performance criterion. The test results, data evaluation, test procedures, and equipment of configurations shown in this report were made in accordance with the procedures in ANSI C63.10(2013).

Applicant / Manufacturer : Shenzhen Star-Navi Technology Co., Ltd.

Address : Room 2203, Building B, Block three, Cloud Park Phase 1, Bantian Street, Longgang District, Shenzhen City, China

Factory : Dongguan Winlex Electronics Co., Ltd.

Address : Huatai Technology Park, Xiegang Town, Dongguan City, Guangdong Province, China.

E.U.T. : HeroGoGo Smart Driving Assistant System

Brand Name : HeroGoGo

Model No. : HeroGoGo Pro1, HeroGoGo Pro1C
(For model difference refer to section 1)

FCC ID : 2APORHEROGOGO-1

Measurement Standard : FCC PART 15.247

Date of Receiver : January 05, 2021

Date of Test : January 05, 2021 to April 16, 2021

Date of Report : April 16, 2021

This Test Report is Issued Under the Authority of :

Prepared by

Approved & Authorized Signer


Rose Hu / Engineer


Iori Fan / Authorized Signatory

This test report is for the customer shown above and their specific product only. This report applies to above tested sample only and shall not be reproduced in part without written approval of Dongguan Nore Testing Center Co., Ltd.

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Revision History of This Test Report

Report Number	Description	Issued Date
NTC1901162FV00	Initial Issue	2021-04-16

1. GENERAL INFORMATION

1.1 Product Description for Equipment under Test

Product Name	: HeroGoGo Smart Driving Assistant System
Main model number	: HeroGoGo Pro1
Additional Model number	: HeroGoGo Pro1C
Brand Name	: HeroGoGo
Power Supply	: DC 12V, DC 24V come from Car charger, DC 3.6V li-ion battery
Car charger	: Model: VS2018-5 Input: DC 12-24V Output: USB1: DC 5.0V 2.1A Max USB2: DC 5.0V 1A
Test voltage	: DC 12V, DC 24V, DC 3.6V Only the worst case was recorded in the test report.
Model difference	: Both of models have the same circuitry, electrical mechanical, PCB Layout and physical construction. The differences in model number and color due to marketing purpose
Hardware version	: V1.0
Software version	: V1.0
Serial number	: N/A

Technical parameters
For WIFI Function

Frequency Range	: 2412-2462MHz for 802.11b/g/n(HT20) 2422-2452MHz for 802.11n(HT40)
Modulation	: CCK, DQPSK, DBPSK for 802.11b OFDM for 802.11g/n(HT20)/n(HT40)
Number of Channel	: 11 for 802.11b/g/n(HT20) 7 for 802.11n(HT40)
Channel space	: 5MHz
Date Rate	: 802.11b:1~11Mbps, 802.11g:6~54Mbps n20: 6.5~72.2Mbps n40: 13~135Mbps
Antenna Type	: FPC Antenna
Antenna Gain	: -0.5 dBi
Note	: All data rate for 802.11b/g/n mode has been tested, just the worst case recorded in the report.

WIFI Channel List

802.11 b/g/n(HT20)		802.11 n(HT40)	
Channel	Frequency MHz	Channel	Frequency MHz
1	2412	---	---
2	2417	---	---
3	2422	3	2422
4	2427	4	2427
5	2432	5	2432
6	2437	6	2437
7	2442	7	2442
8	2447	8	2447
9	2452	9	2452
10	2457	---	---
11	2462	---	---

Note: According to section 15.31(m), regards to the operating frequency range over 10MHz, the Lowest, middle, and the Highest frequency of channel were selected to perform the test. The selected frequency see below:

802.11b/g/n(HT20)		802.11 n(HT40)	
Channel	Frequency MHz	Channel	Frequency MHz
1	2412	3	2422
6	2437	6	2437
11	2462	9	2452

Test SW version	ComTool
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1.2 Related Submittal(s) / Grant (s)

This submittal(s) (test report) is intended for FCC ID: 2APORHEROGOGO-1 filing to comply with Section 15.247 of the FCC Part 15, Subpart C Rule.

1.3 Test Methodology

Both AC mains line-conducted and radiated emission measurements were performed according to the procedures in ANSI C63.10 (2013). Radiated emission measurement was performed in semi-anechoic chamber and conducted emission measurement was performed in shield room. For radiated emission measurement, preliminary scans were performed in the semi-anechoic chamber only to determine the worst case modes. All radiated tests were performed at an antenna to EUT distance of 3 meters. All other measurements were made in accordance with the procedures in 47 CFR part 2.

1.4 Equipment Modifications

Not available for this EUT intended for grant.

1.5 Support Device

N/A

1.6 Test Facility and Location

Listed by CNAS, August 14, 2018

The certificate is valid until August 13, 2024

The Laboratory has been assessed and proved to be in compliance with CNAS/CL01

The Certificate Registration Number is L5795.

Listed by A2LA, November 01, 2017

The certificate is valid until December 31, 2021

The Laboratory has been assessed and proved to be in compliance with ISO17025

The Certificate Registration Number is 4429.01

Listed by FCC, November 06, 2017

The Designation Number is CN1214

Test Firm Registration Number: 907417

Listed by Industry Canada, June 08, 2017

The Certificate Registration Number. Is 46405-9743

Dongguan NTC Co., Ltd.

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1.7 Summary of Test Results

FCC Rules	Description Of Test	Uncertainty	Result
§15.207 (a)	AC Power Conducted Emission	±1.06dB	N/A
§15.247(b)(3)	Max. Conducted Output Power	±1.06dB	Compliance
§15.247(a)(2)	6dB Bandwidth	±1.42 x10 ⁻⁴ %	Compliance
§15.247(e)	Power Spectral Density	±1.06dB	Compliance
§15.247(d)	Band Edge and Conducted Spurious Emissions	±1.70dB & ±2.51dB	Compliance
§15.247(d), §15.209, §15.205	Radiated Spurious Emissions and Restricted Bands	±3.70dB	Compliance
§15.203	Antenna Requirement	---	Compliance

Note:

1. The EUT powered by DC 12V, DC 24V come from vehicle power source, therefore the AC Power Conducted Emission is not applicable.

2. The EUT was pretested with 3 orientations placed on the table for the radiated emission measurement –X, Y, and Z-plane. The X- plane results were found as the worst case and were shown in this report.

2. System Test Configuration

2.1 EUT Configuration

The EUT configuration for testing is installed on RF field strength measurement to meet the Commissions requirement and operating in a manner which intends to maximize its emission characteristics in a continuous normal application.

2.2 Special Accessories

Not available for this EUT intended for grant.

2.3 Description of test modes

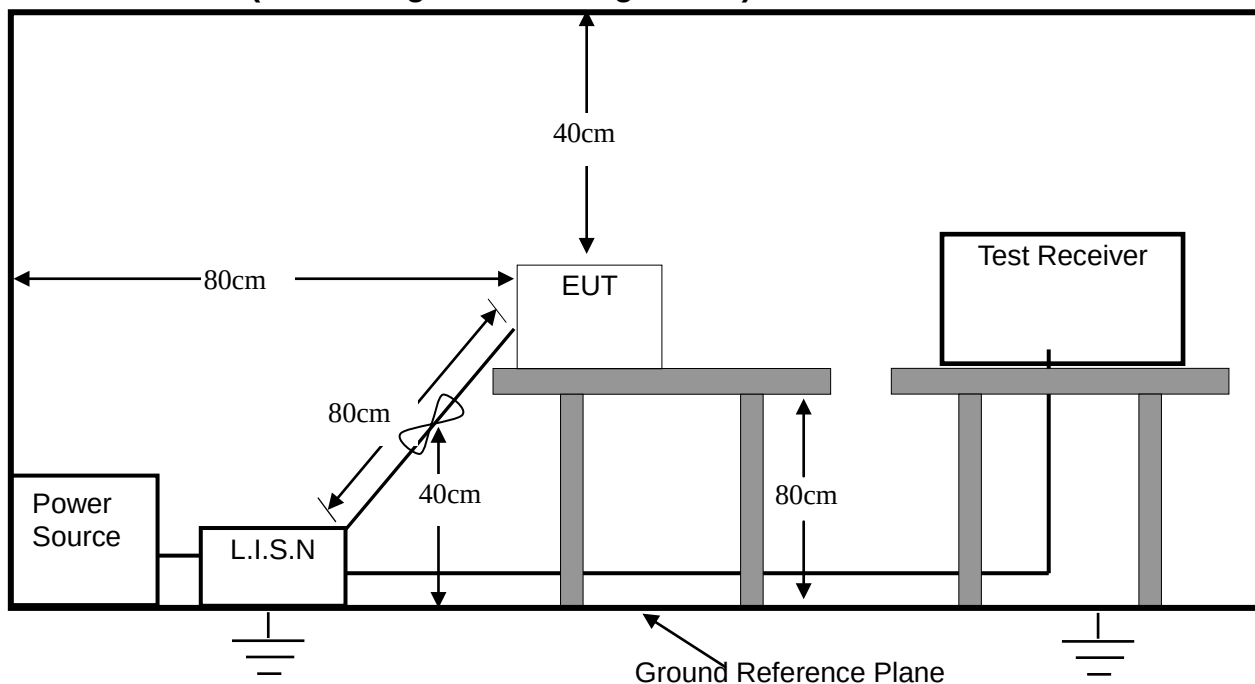
The EUT has been tested under continuous operating condition (The duty cycle $\geq$ 98%, duty cycle factor is not required). Test program used to control the EUT staying in continuous transmitting mode. The Lowest, middle and highest channel were chosen for testing, and modulation type CCK, DQPSK, DBPSK, OFDM and all data rate were tested. But only the worst case data is shown in this report.

2.4 EUT Exercise

The EUT was operated in the engineering mode to fix the Tx frequency that was for the purpose of the measurements.

3. Conducted Emissions Test

3.1 Test SET-UP (Block Diagram of Configuration)



3.2 Test Condition

Test Requirement: FCC Part 15.207

Frequency Range: 150KHz ~ 30MHz

Detector: RBW 9KHz, VBW 30KHz

Operation Mode: WIFI Link

3.3 Measurement Results

Not applicable.

4. Max. Conducted Output Power

4.1 Measurement Procedure

Maximum Conducted Output power at Antenna Terminals, FCC Rules 15.247(b)(3):

One of the following procedures may be used to determine the maximum peak conducted output power of a DTS EUT.

The maximum peak conducted output power may be measured using a broadband peak RF power meter. The power meter shall have a video bandwidth that is greater than or equal to the DTS bandwidth and shall utilize a fast-responding diode detector.

4.2 Test SET-UP (Block Diagram of Configuration)



4.3 Measurement Results

Pass

Please refer to following table and plots.

Temperature :	24 °C	Humidity :	50%
Test By:	Sance	Test Date :	April 12, 2021
Test Result:	PASS		
Frequency MHz	Data Rate Mbps	Peak Output Power dBm	Limit dBm
IEEE 802.11b Mode (CCK, Antenna Gain=-0.5dBi)			
Low Channel: 2412	1	11.09	30
Middle Channel: 2437	1	10.42	30
High Channel: 2462	1	10.30	30
IEEE 802.11g Mode (OFDM, Antenna Gain=-0.5dBi)			
Low Channel: 2412	6	10.80	30
Middle Channel: 2437	6	10.28	30
High Channel: 2462	6	10.28	30
IEEE 802.11n(HT20) Mode (OFDM, Antenna Gain=-0.5dBi)			
Low Channel: 2412	6.5	10.50	30
Middle Channel: 2437	6.5	10.07	30
High Channel: 2462	6.5	10.18	30
IEEE 802.11n(HT40) Mode (OFDM, Antenna Gain=-0.5dBi)			
Low Channel: 2422	13	9.97	30
Middle Channel: 2437	13	9.53	30
High Channel: 2452	13	9.26	30

Note: CCK was the worst case of the 802.11b.

5. 6dB Bandwidth

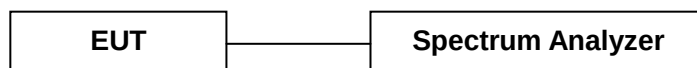
5.1 Measurement Procedure

DTS 6dB Channel Bandwidth, FCC Rule 15.247(a)(2):

The antenna port of the EUT was connected to the input of a spectrum analyzer. Analyzer was set as below according to FCC KDB558074(v05):

1. Set resolution bandwidth (RBW) = 100kHz
2. Set the video bandwidth (VBW) $\geq 3 \times$ RBW, Detector = Peak.
3. Trace mode = max hold.
4. Sweep = auto couple.
5. Measure the maximum width of the emission that is constrained by the frequencies associated with the two amplitude points (upper and lower) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission

5.2 Test SET-UP (Block Diagram of Configuration)



5.3 Measurement Results

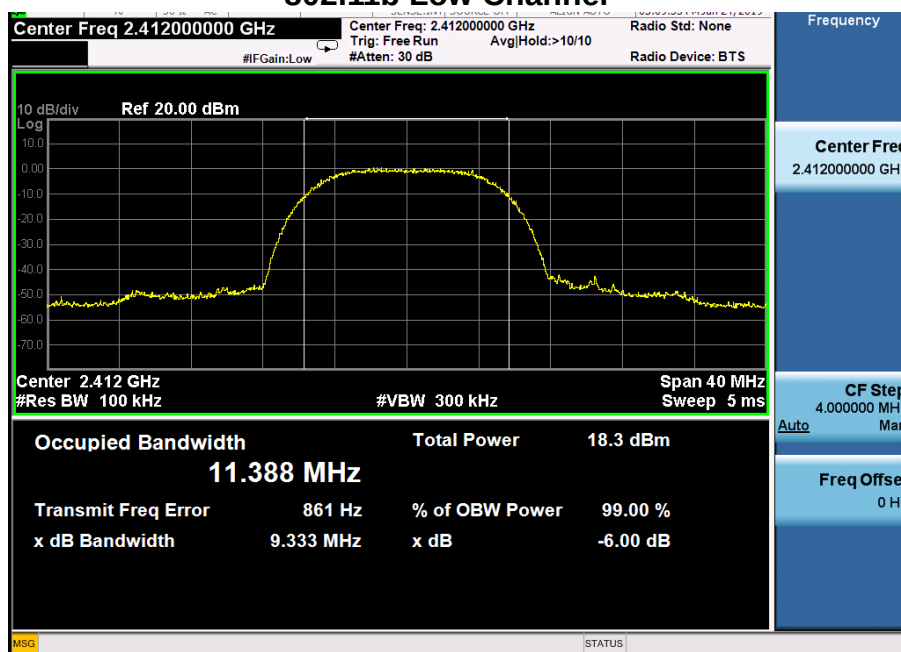
Pass

Please refer to following table and plots.

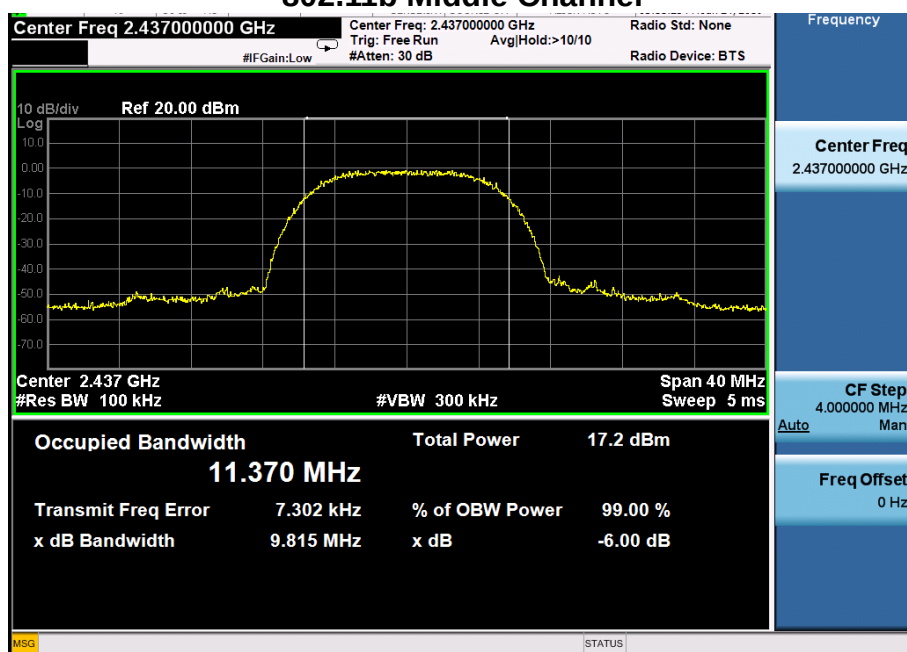
Temperature :	24 °C	Humidity : 50 %	
Test By:	Sance	Test Date : April 12, 2021	
Test Result:	PASS		
Frequency MHz	Data Rate Mbps	6dB Bandwidth MHz	Limit
IEEE 802.11b Mode (CCK)			
Low Channel: 2412	1	9.333	>500KHz
Middle Channel: 2437	1	9.815	>500KHz
High Channel: 2462	1	9.499	>500KHz
IEEE 802.11g Mode (OFDM)			
Low Channel: 2412	6	16.40	>500KHz
Middle Channel: 2437	6	16.40	>500KHz
High Channel: 2462	6	16.38	>500KHz
IEEE 802.11n(HT20) Mode (OFDM)			
Low Channel: 2412	6.5	17.75	>500KHz
Middle Channel: 2437	6.5	17.74	>500KHz
High Channel: 2462	6.5	17.75	>500KHz
IEEE 802.11n(HT40) Mode (OFDM)			
Low Channel: 2422	13	36.43	>500KHz
Middle Channel: 2437	13	36.36	>500KHz
High Channel: 2452	13	36.41	>500KHz

Note: CCK was the worst case of the 802.11b.

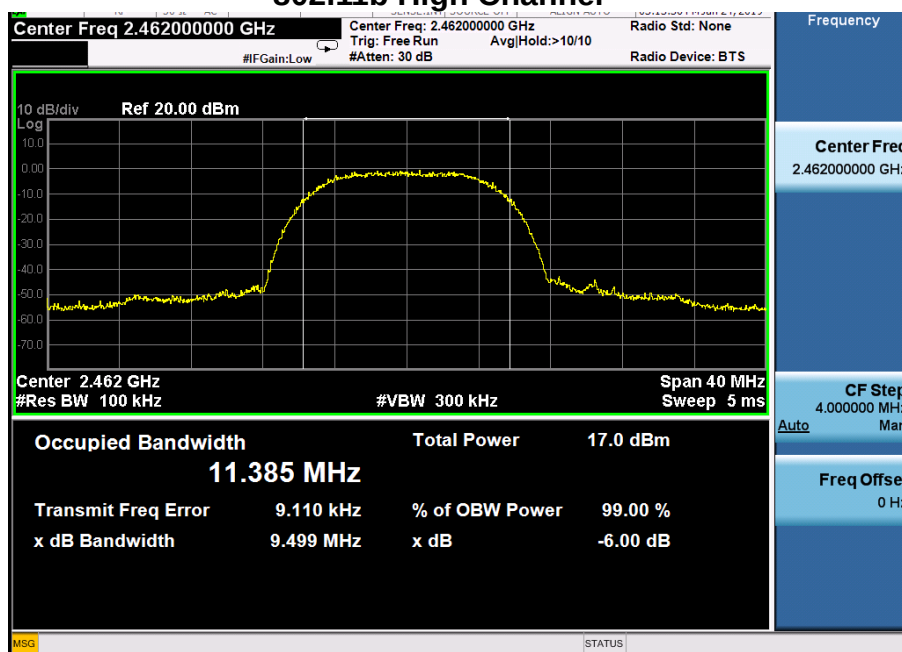
802.11b Low Channel



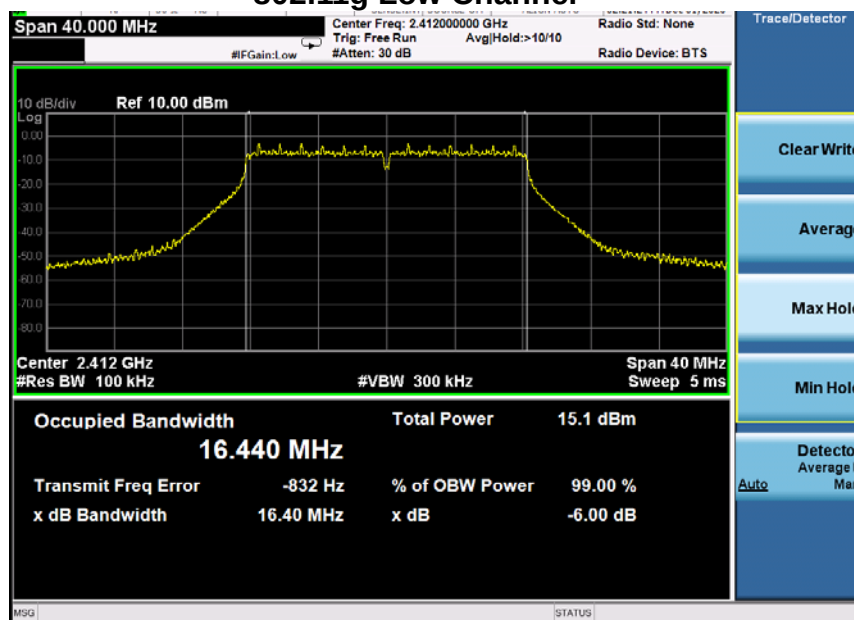
802.11b Middle Channel



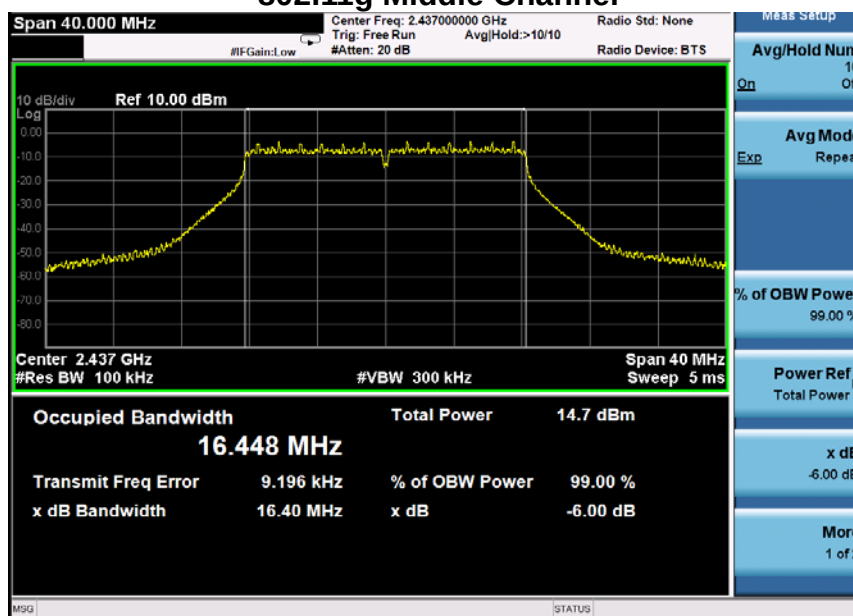
802.11b High Channel



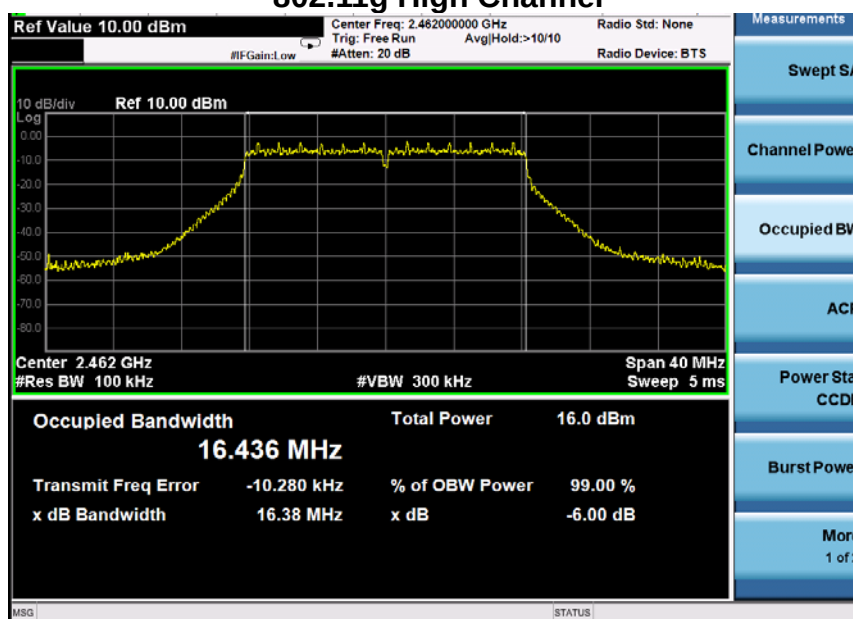
802.11g Low Channel



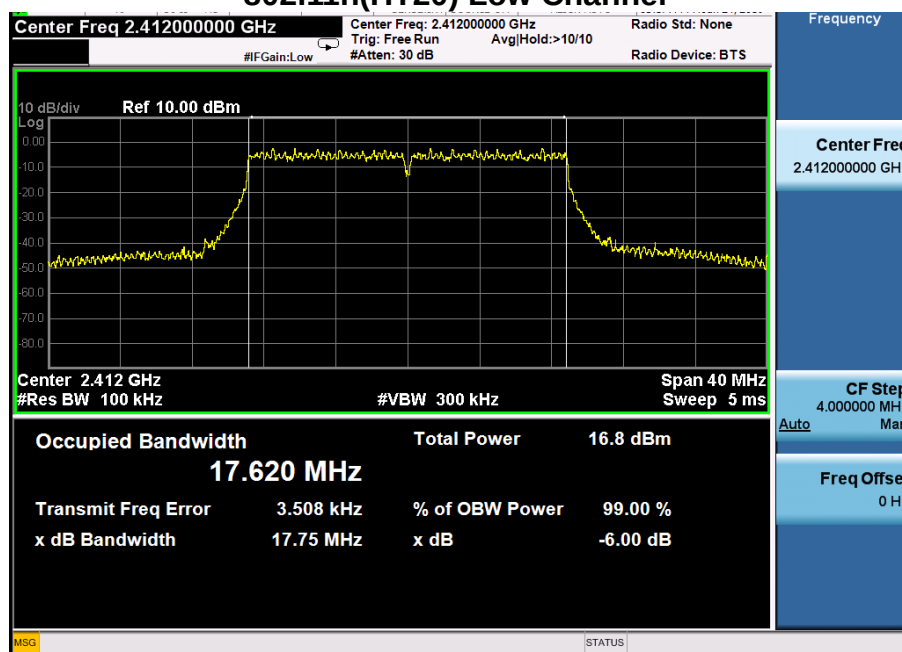
802.11g Middle Channel



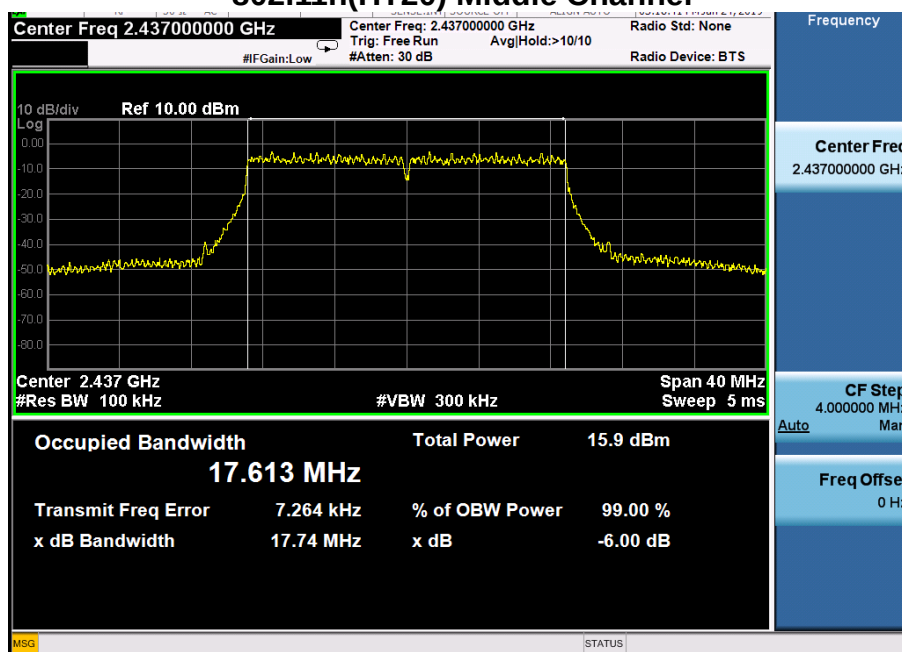
802.11g High Channel



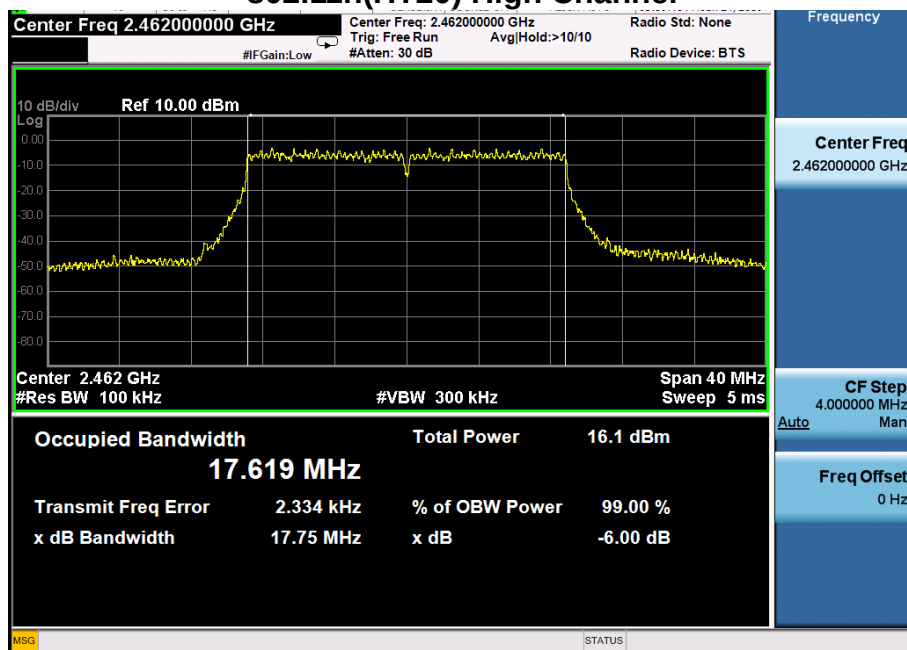
802.11n(HT20) Low Channel



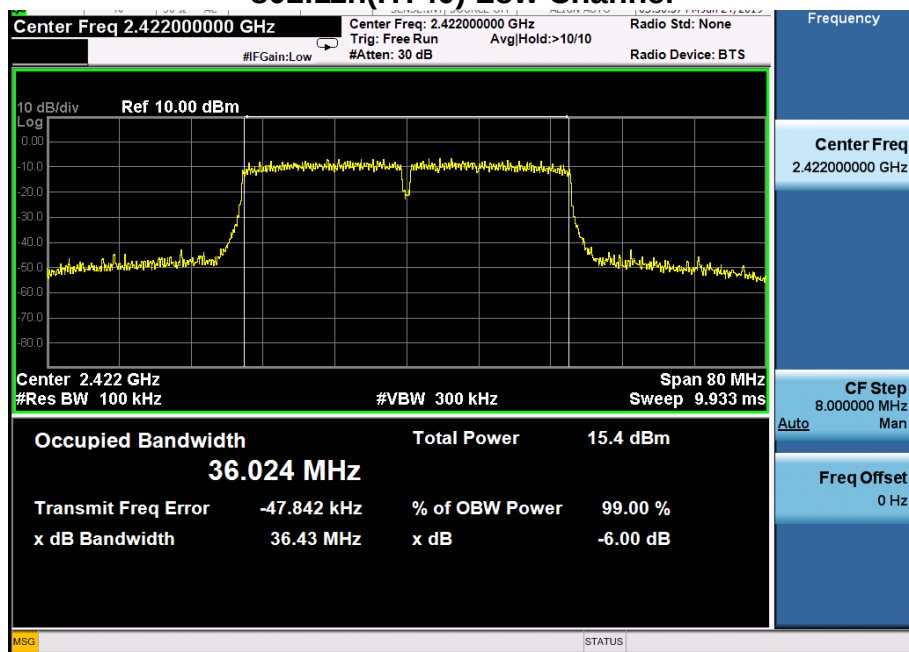
802.11n(HT20) Middle Channel



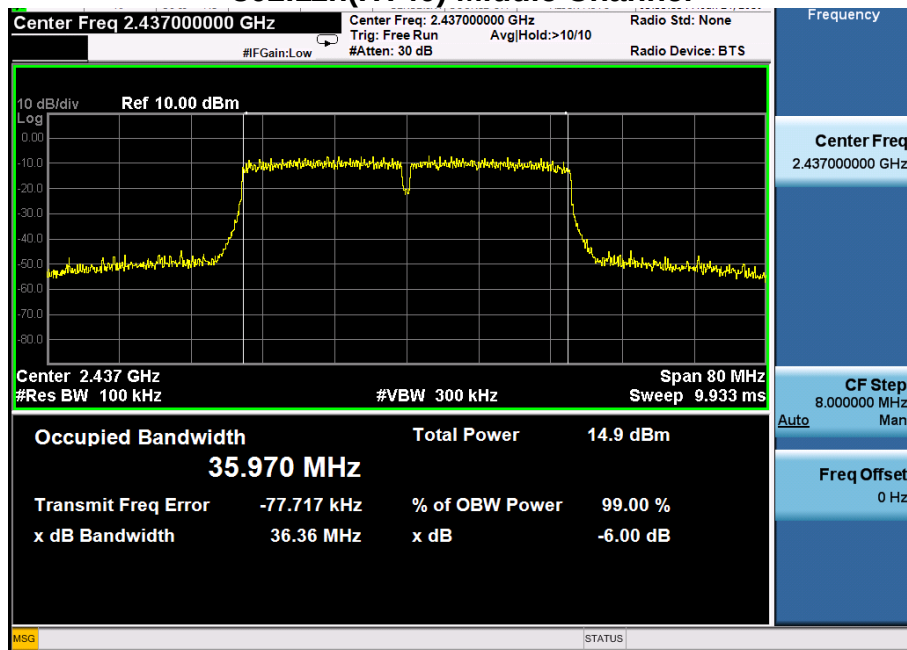
802.11n(HT20) High Channel



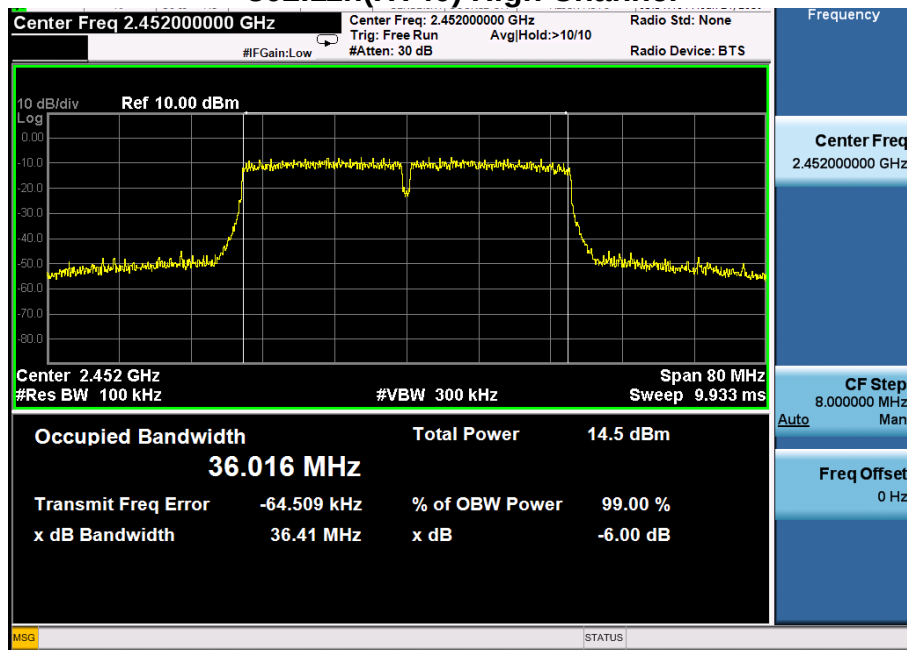
802.11n(HT40) Low Channel



802.11n(HT40) Middle Channel



802.11n(HT40) High Channel



6. Power Spectral Density

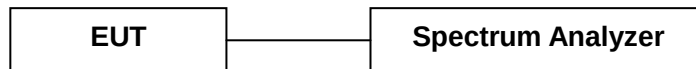
6.1 Measurement Procedure

Power Spectral Density, FCC Rule 15.247(e):

The antenna port of the EUT was connected to the input of a spectrum analyzer. Analyzer was set as below according to FCC KDB558074 (v05):

1. Set analyzer center frequency to DTS channel center frequency.
2. Set the span to 1.5 times the DTS bandwidth.
3. Set the RBW to: $3\text{ kHz} \leq \text{RBW} \leq 100\text{ KHz}$
4. Set the VBW $\geq 3 \times \text{RBW}$.
5. Detector = peak.
6. Sweep time = auto couple.
7. Trace mode = max hold.
8. Allow trace to fully stabilize.
9. Use the peak marker function to determine the maximum amplitude level within the RBW.
10. If measured value exceeds limit, reduce RBW (no less than 3 kHz) and repeat.

6.2 Test SET-UP (Block Diagram of Configuration)



6.3 Measurement Results

Pass

Please refer to following table and plots.

Temperature :	24 °C	Humidity :	50 %
Test By:	Sance	Test Date :	April 12, 2021
Test Result:	PASS		
Frequency MHz	Data Rate Mbps	PSD dBm/3kHz	Limit dBm/3kHz
IEEE 802.11b Mode (CCK)			
Low Channel: 2412	1	-14.16	8
Middle Channel: 2437	1	-12.93	8
High Channel: 2462	1	-14.31	8
IEEE 802.11g Mode (OFDM)			
Low Channel: 2412	6	-16.01	8
Middle Channel: 2437	6	-16.47	8
High Channel: 2462	6	-15.41	8
IEEE 802.11n(HT20) Mode (OFDM)			
Low Channel: 2412	6.5	-14.75	8
Middle Channel: 2437	6.5	-16.19	8
High Channel: 2462	6.5	-15.31	8
IEEE 802.11n(HT40) Mode (OFDM)			
Low Channel: 2422	13	-16.42	8
Middle Channel: 2437	13	-18.37	8
High Channel: 2452	13	-18.65	8

Note: CCK was the worst case of the 802.11b.

Points 1001

PNO: Fast IF Gain: Low Trig: Free Run Avg Type: Log-Pwr Avg Hold: >10/10

TRACE 1 2 3 4 5 6
TYPE M W W W W W W W
DET P N N N N N N

Sweep/Control
Sweep Time 1.55 s
Mar

Auto

Sweep Setup

Gate [Off, Lo]

Points 1001

MSG STATUS

10 dB/div
Log

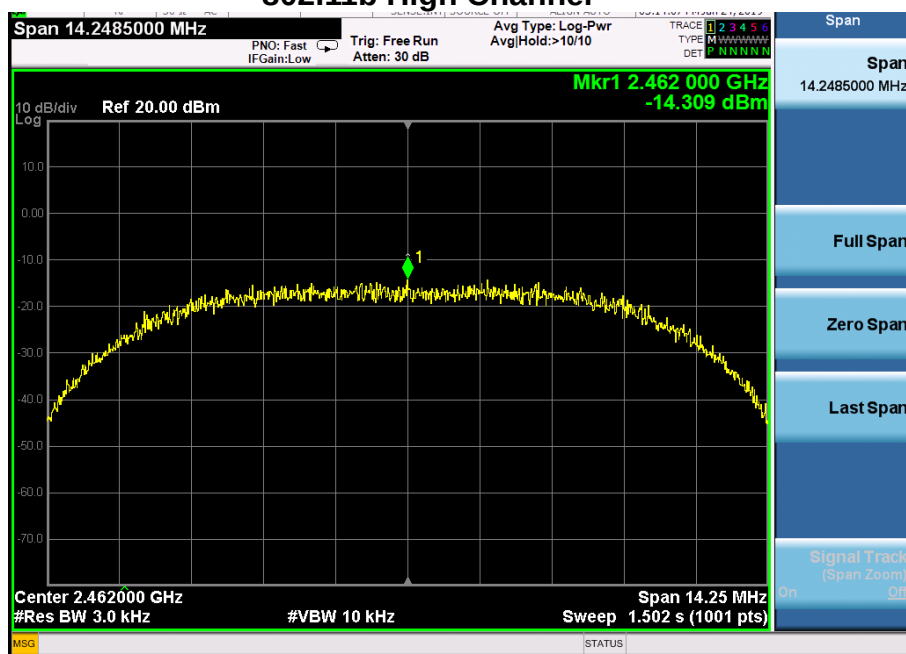
Ref 20.00 dBm

Mkr1 2.438 605 GHz
-14.163 dBm

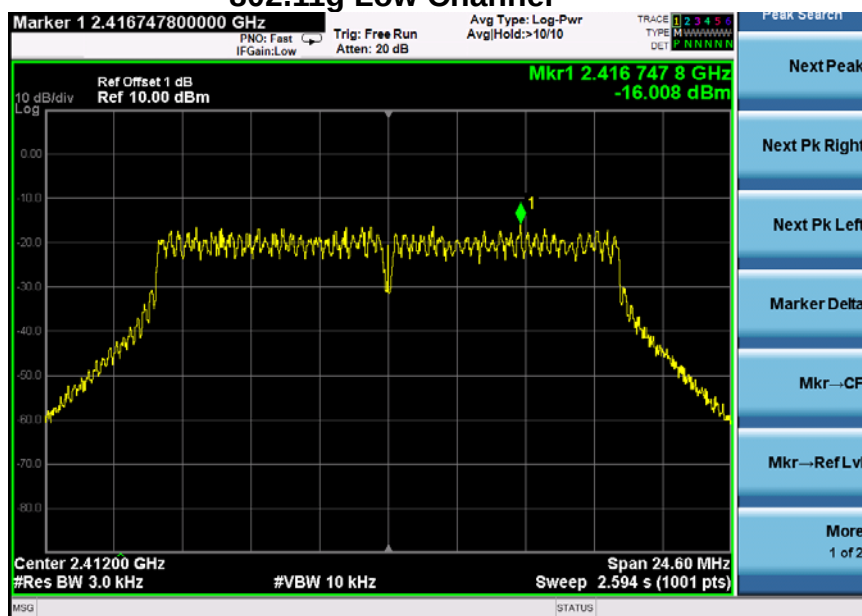
Center 2.437000 GHz
#Res BW 3.0 kHz
#VBW 10 kHz
Span 14.72 MHz
Sweep 1.552 s (1001 pts)

Center Freq 2.41200000 GHz
10 dB/div
Log
Ref 20.00 dBm
Mkr1 2.411 608 GHz
-12.932 dBm
Center Freq 2.41200000 GHz
Start Freq 2.405000000 GHz
Stop Freq 2.419000000 GHz
CF Step 1.400000 MHz
Auto
Freq Offset 0 Hz
Scale Type
Log
Center Freq 2.412000 GHz
#Res BW 3.0 kHz
#VBW 10 kHz
Sweep 1.476 s (1001 pts)
Span 14.00 MHz

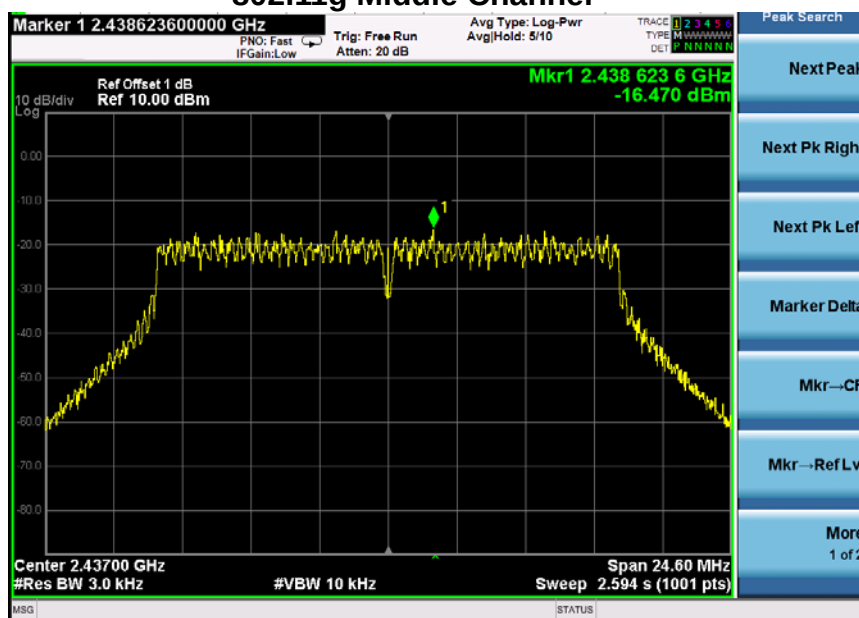
802.11b High Channel



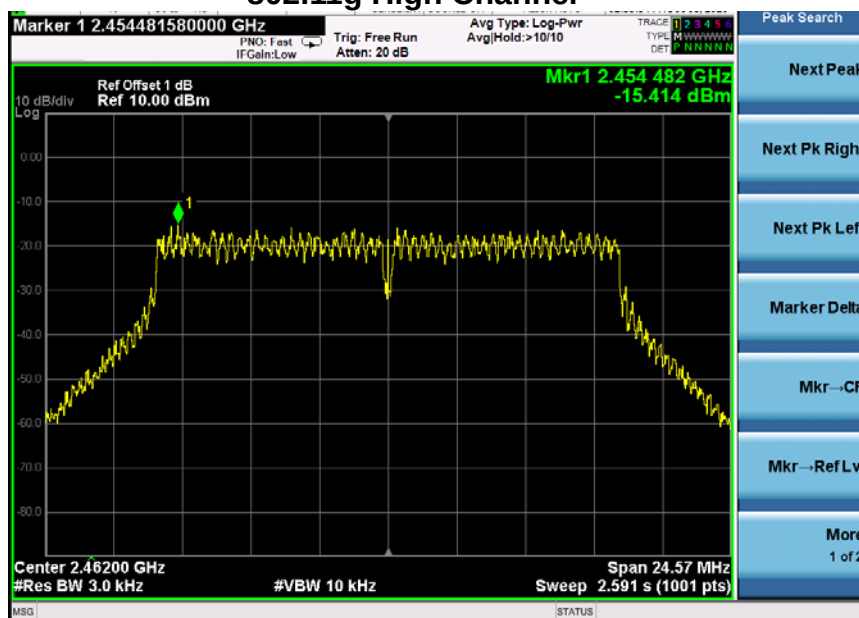
802.11g Low Channel



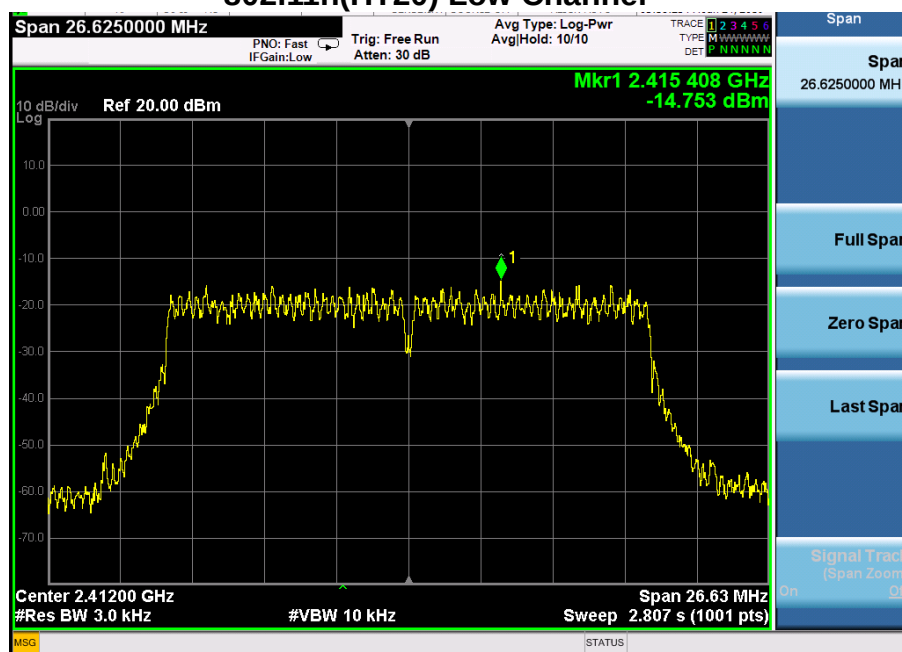
802.11g Middle Channel



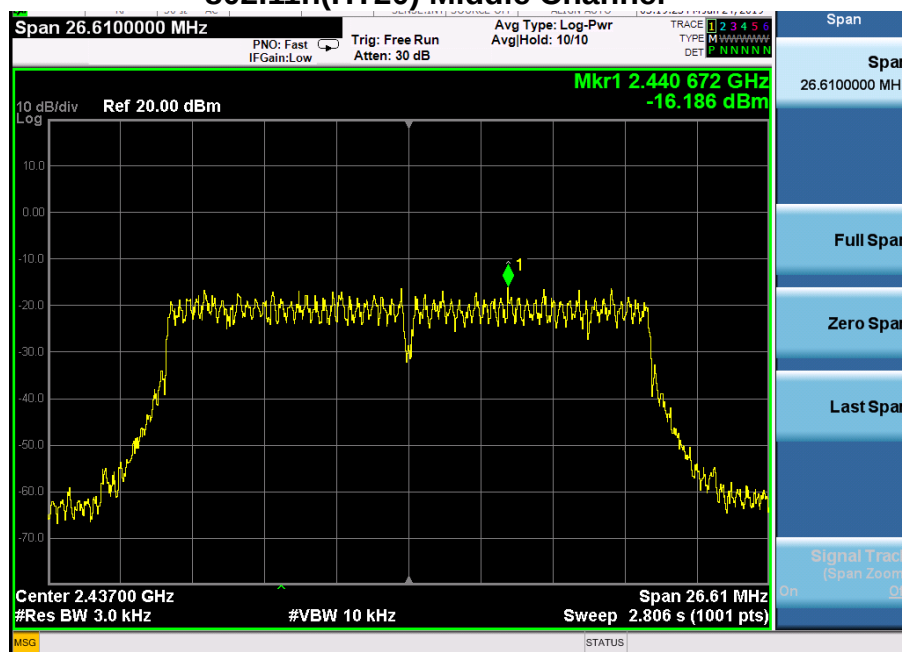
802.11g High Channel

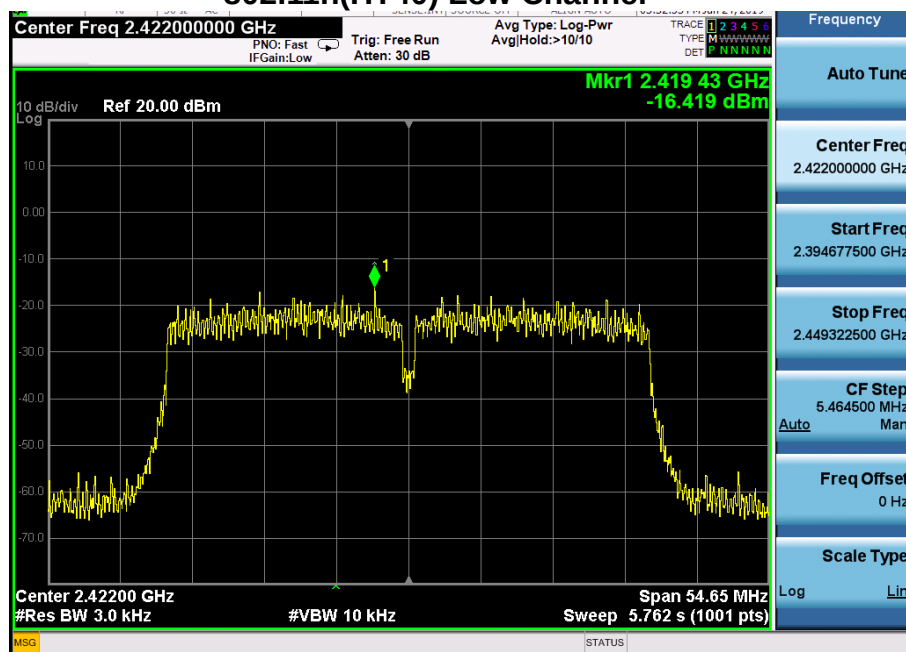
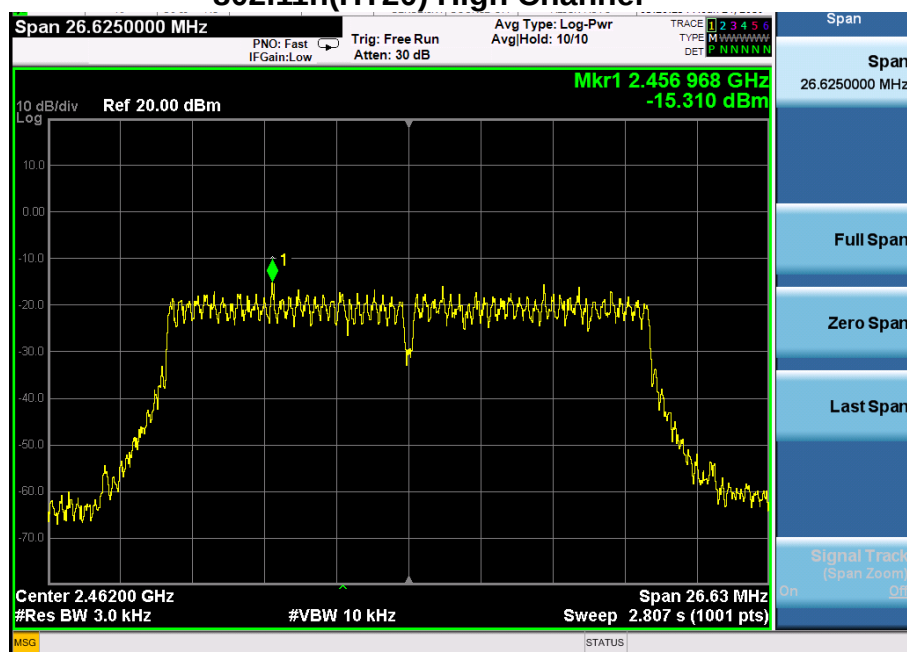


802.11n(HT20) Low Channel

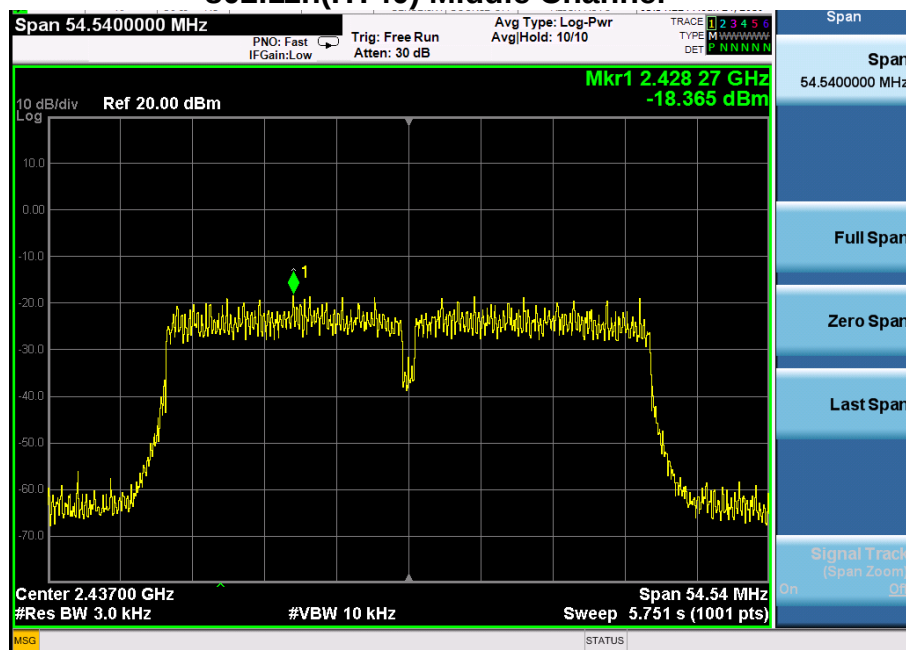


802.11n(HT20) Middle Channel

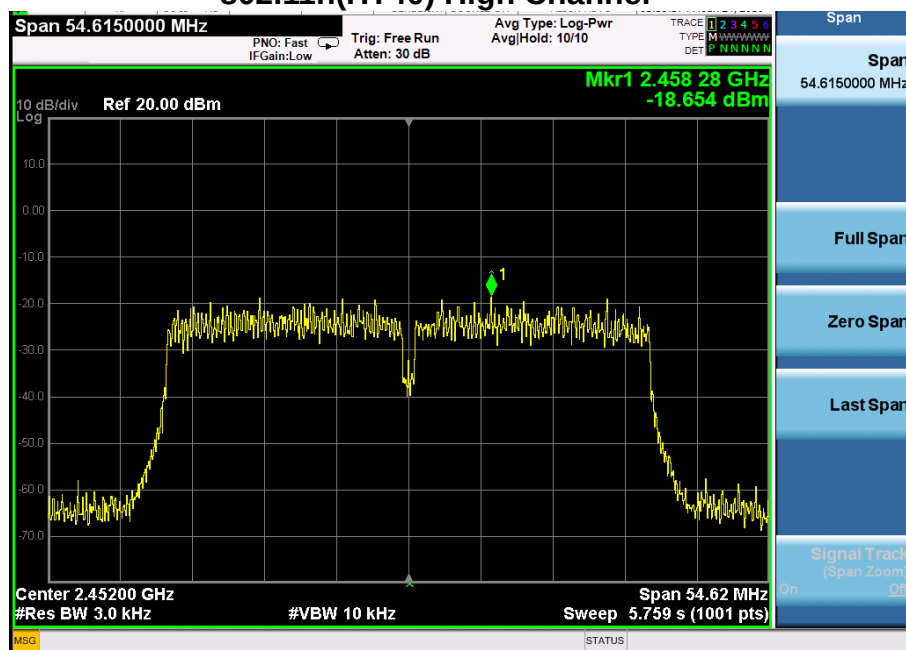




802.11n(HT40) Middle Channel



802.11n(HT40) High Channel



7. Band Edge and Conducted Spurious Emissions

7.1 Requirement and Measurement Procedure

In any 100KHz 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 20dB below that in the 100KHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement.

The antenna port of the EUT was connected to the input of a spectrum analyzer. Analyzer was set as below.

MEASUREMENT PROCEDURE REF

1. Set the RBW = 100 kHz.
2. Set the VBW $\geq$ 300 kHz.
3. Detector = peak.
4. Sweep time = auto couple.
5. Trace mode = max hold.
6. Allow trace to fully stabilize.
7. Use the peak marker function to determine the maximum power level in any 100 kHz band segment within the fundamental EBW.

MEASUREMENT PROCEDURE OOBE

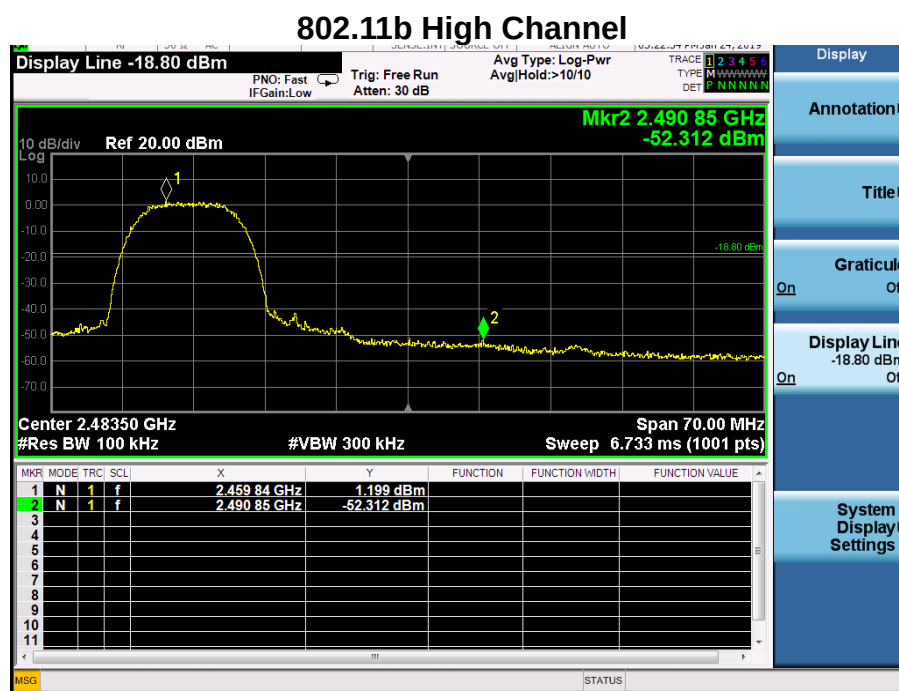
1. Set RBW = 100 kHz.
2. Set VBW $\geq$ 300 kHz.
3. Detector = peak.
4. Sweep = auto couple.
5. Trace Mode = max hold.
6. Allow trace to fully stabilize.
7. Use the peak marker function to determine the maximum amplitude level.

7.2 Test SET-UP (Block Diagram of Configuration)

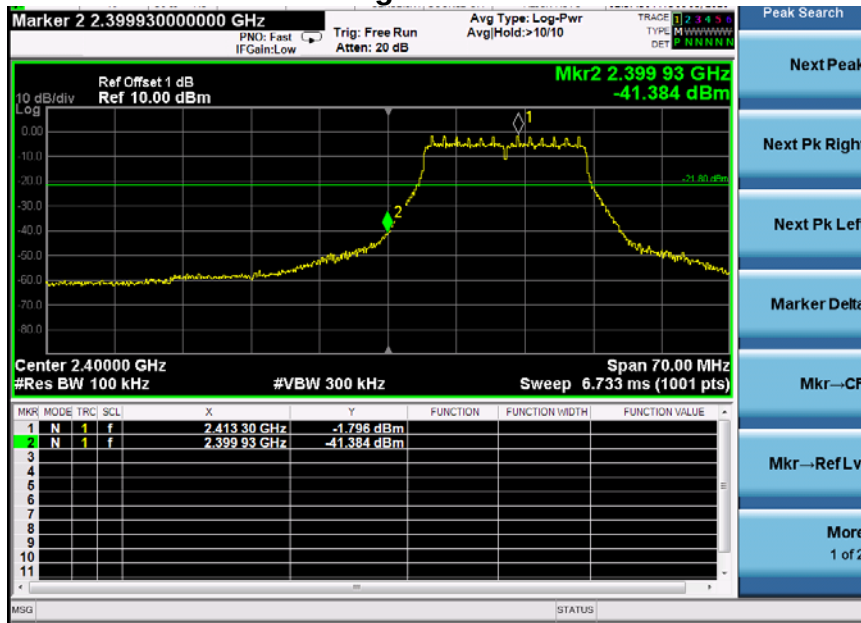


7.3 Measurement Results

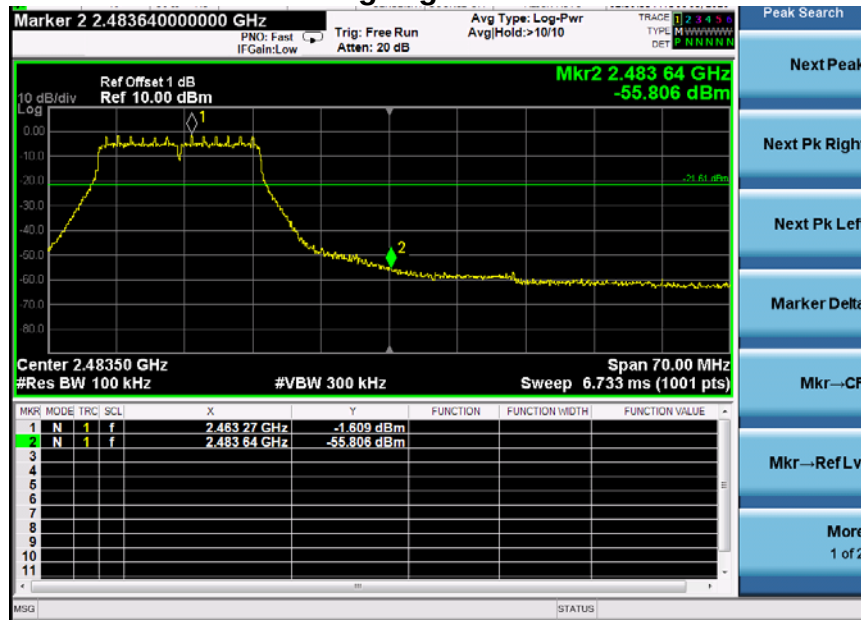
The test plots and table showed all spurious emission and up to the tenth harmonic was measured and they were found to be at least 20dB below the highest level of the desired power in the passband. Please refer to below plots.

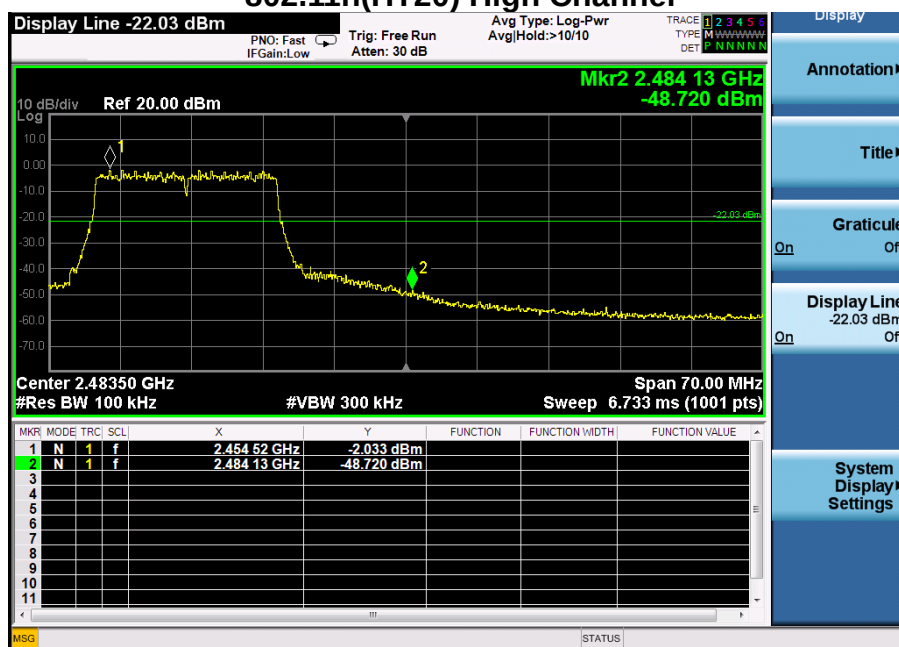
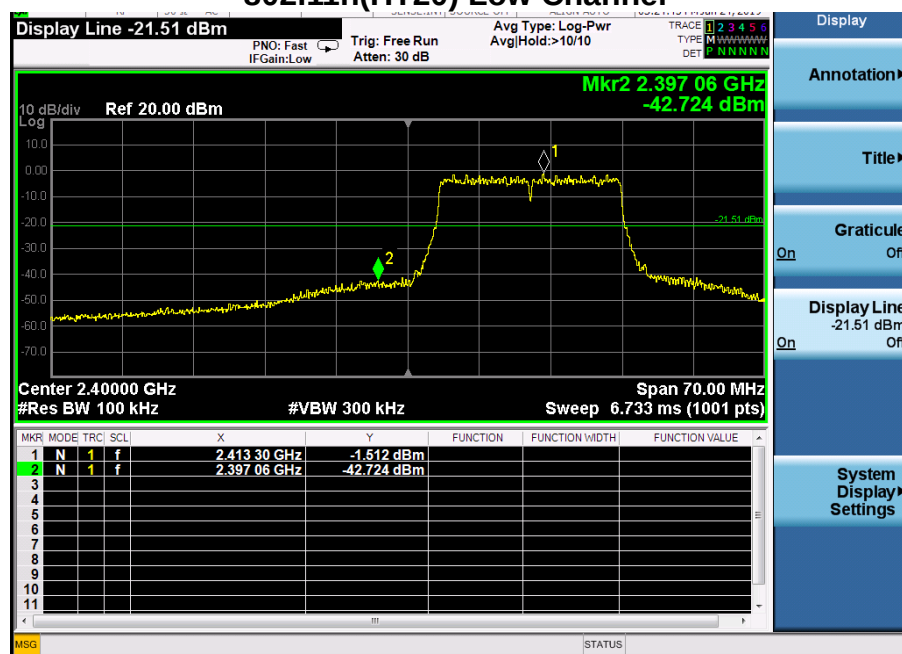


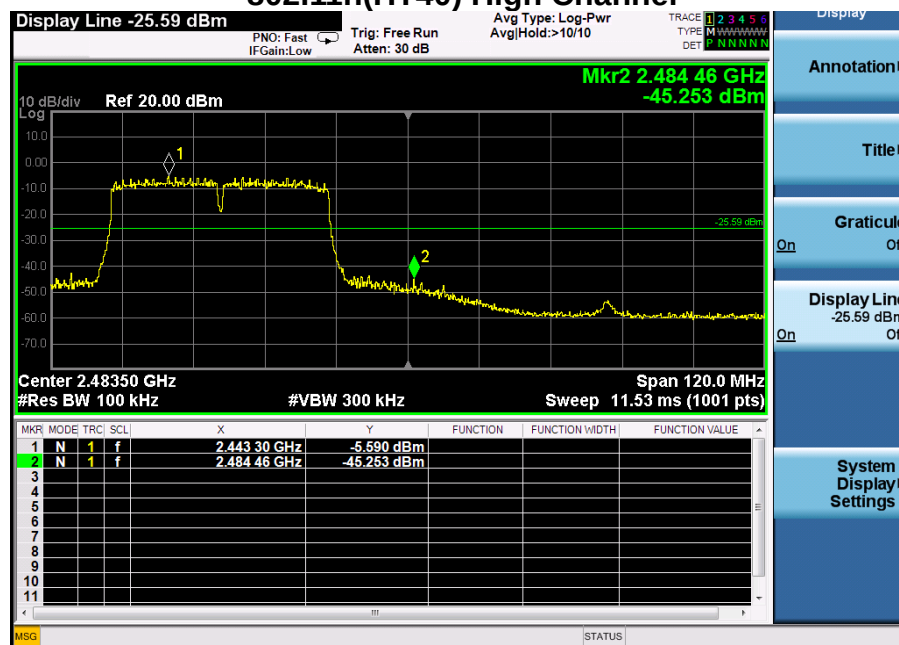
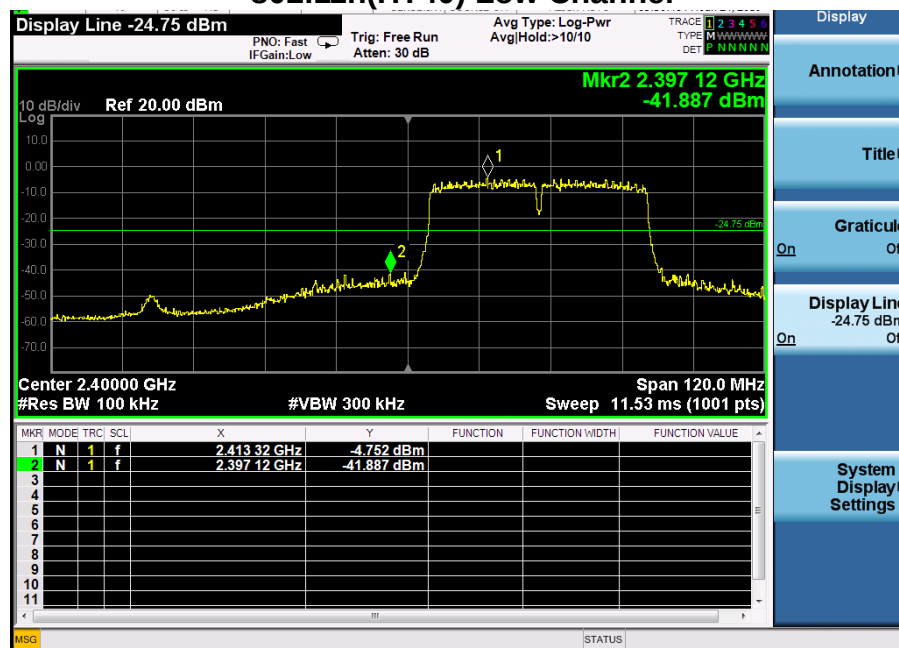
802.11g Low Channel



802.11g High Channel

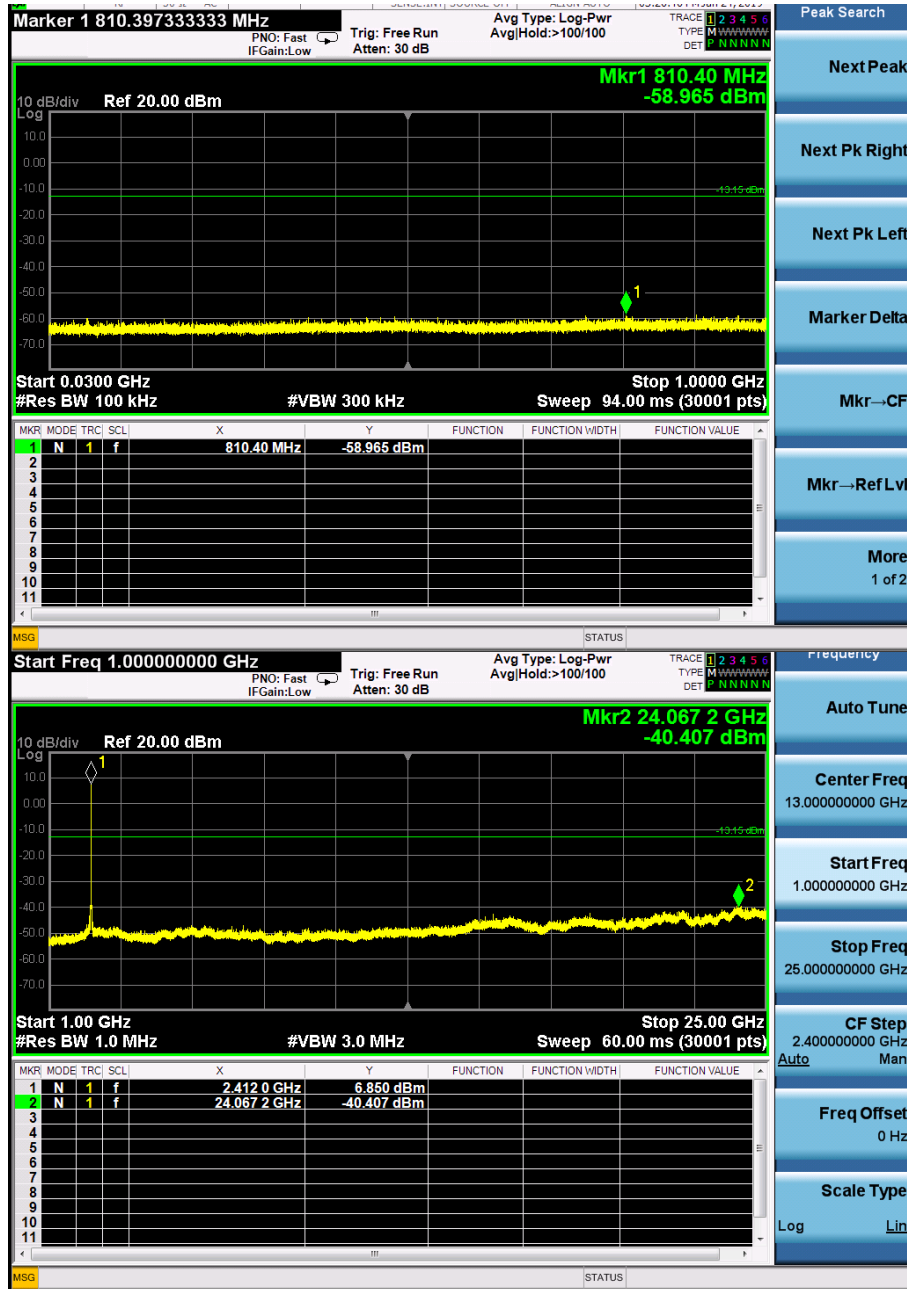




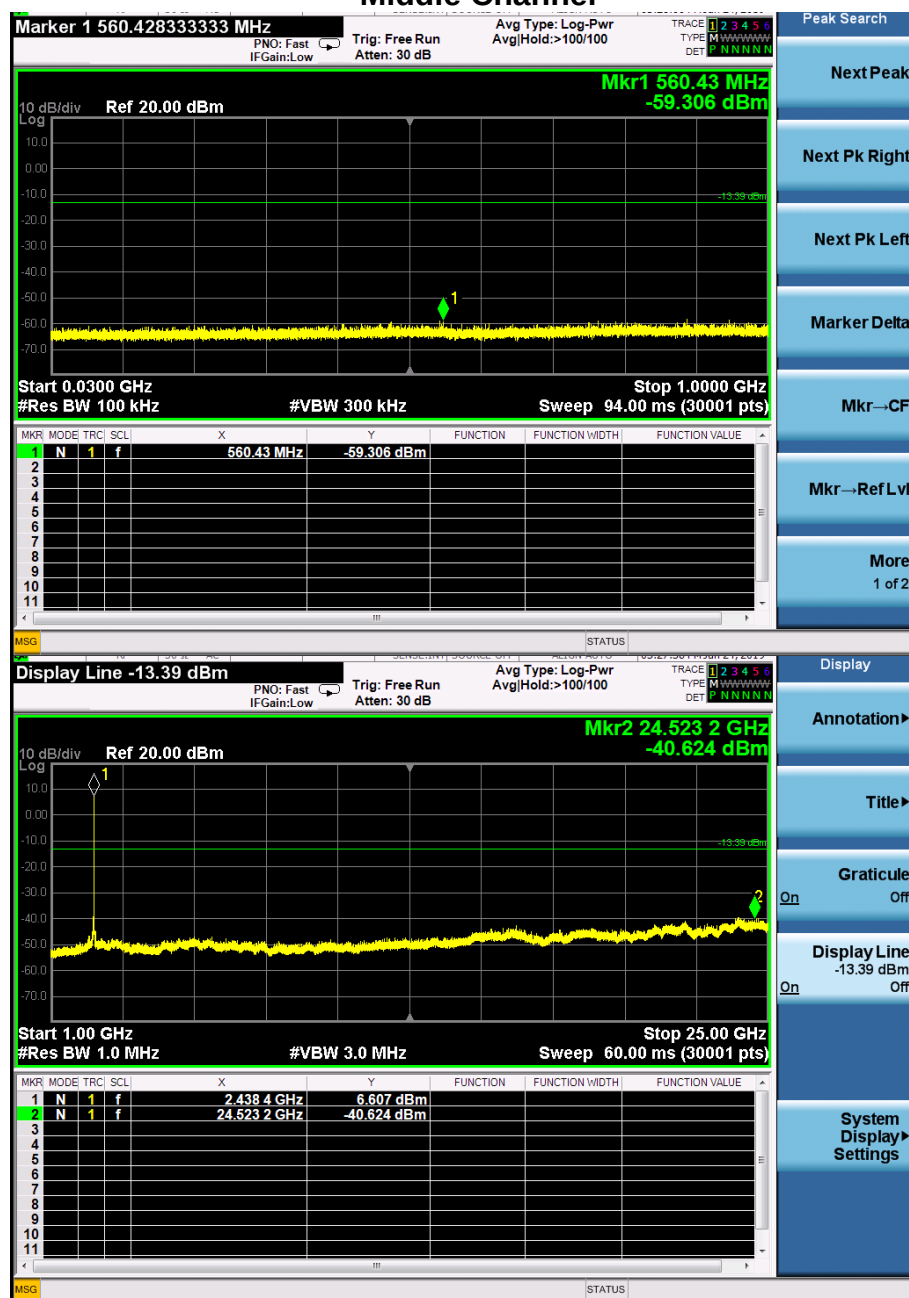


Conducted Spurious Emissions

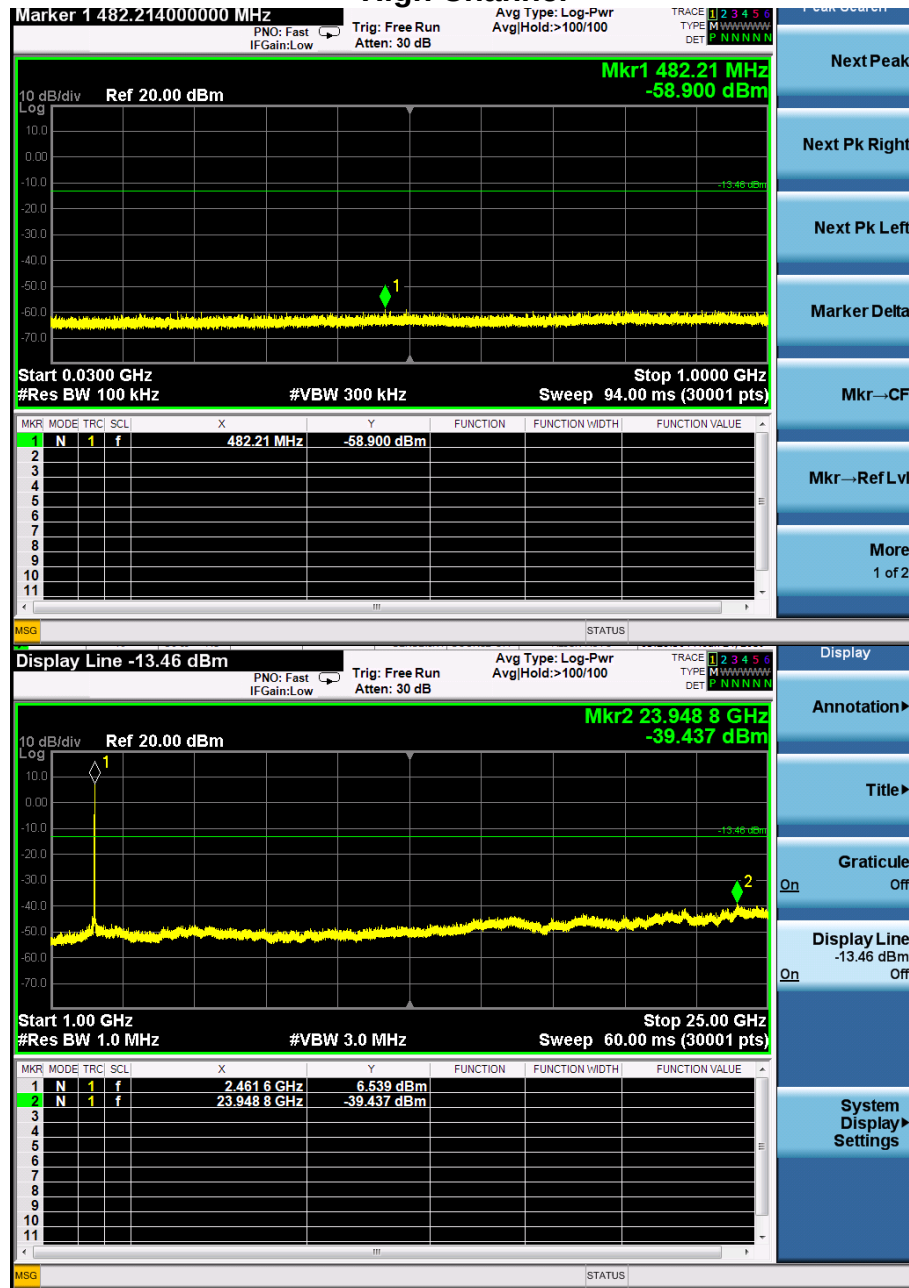
The worst case: 802.11n(HT20)
Low Channel



Middle Channel



High Channel

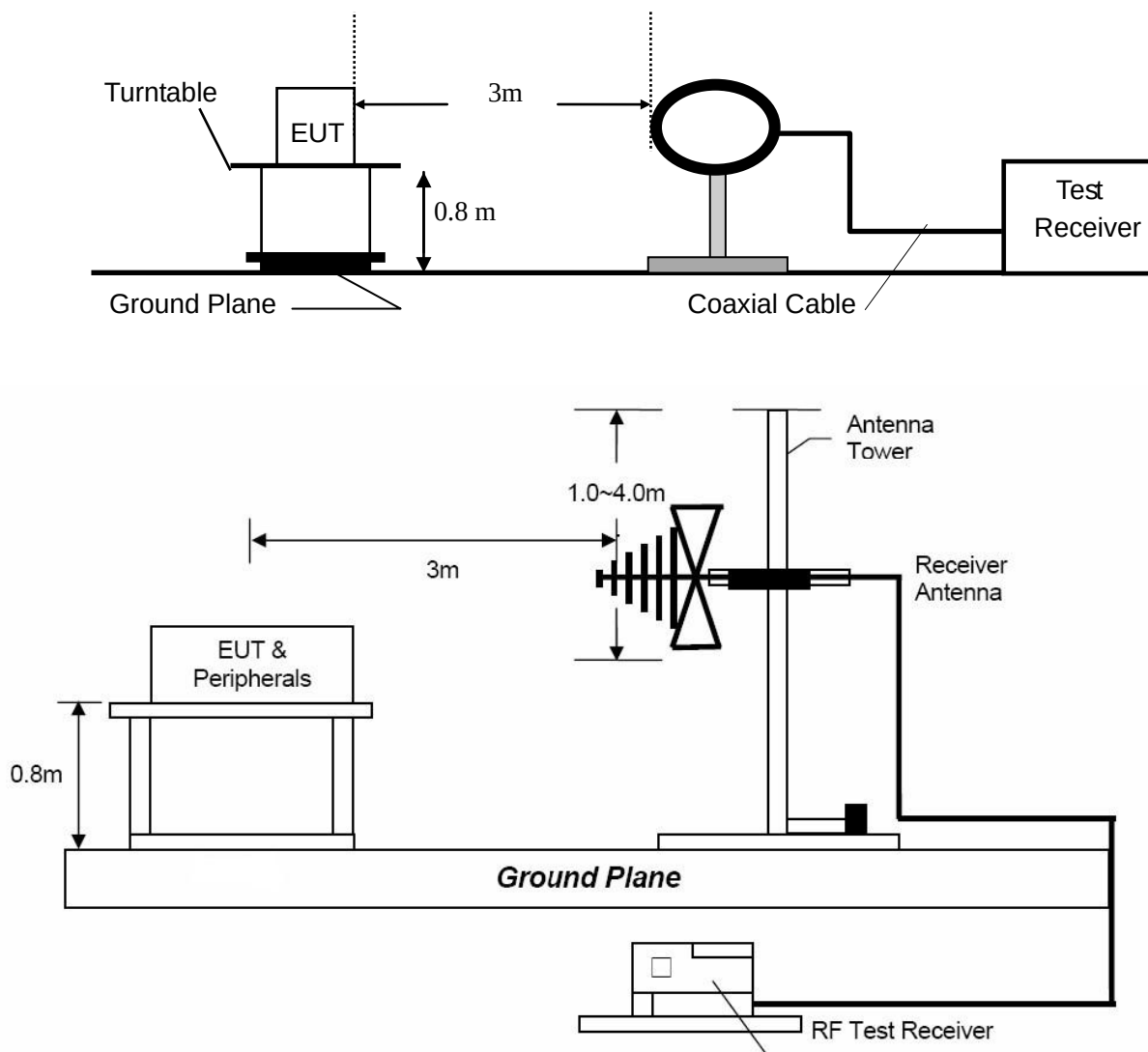


Note: Sweep points=30001pts

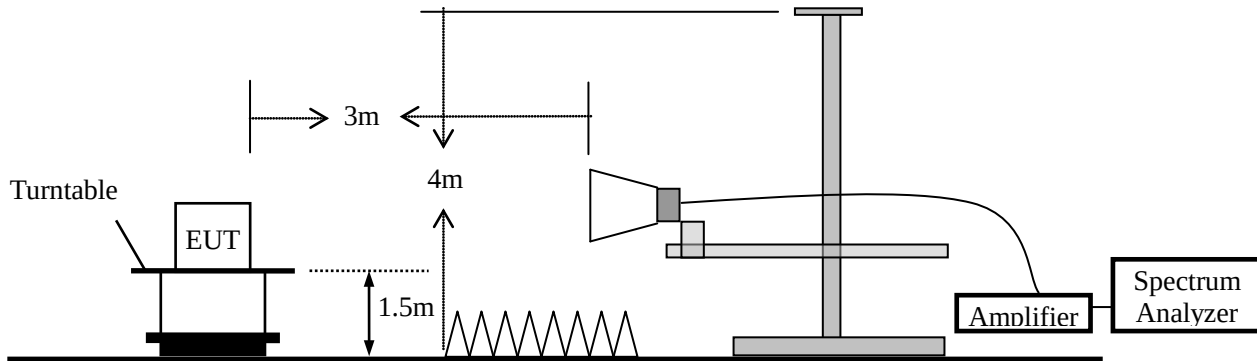
8. Radiated Spurious Emissions and Restricted Bands

8.1 Test SET-UP (Block Diagram of Configuration)

8.1.1 Radiated Emission Test Set-Up, Frequency Below 30MHz



8.1.2 Radiated Emission Test Set-Up, Frequency above 1GHz



8.2 Measurement Procedure

- Blow 1GHz, the EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter semi- anechoic chamber room.
- For the radiated emission test above 1GHz:
The EUT was placed on the top of a rotating table 1.5 meters above the ground at a 3 meter full anechoic chamber room. The table was rotated 360 degrees to determine the position of the highest radiation. Place the measurement antenna away from each area of the EUT determined to be a source of emissions at the specified measurement distance, while keeping the measurement antenna aimed at the source of emissions at each frequency of significant emissions, with polarization oriented for maximum response. The measurement antenna may have to be higher or lower than the EUT, depending on the radiation pattern of the emission and staying aimed at the emission source for receiving the maximum signal. The final measurement antenna elevation shall be that which maximizes the emissions. The measurement antenna elevation for maximum emissions shall be restricted to a range of heights of from 1 m to 4 m above the ground or reference ground plane.
- The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- The height of antenna is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading. The test-receiver system was set to peak detect function and specified bandwidth with maximum hold mode.
- A Quasi-peak measurement was then made for that frequency point for below 1GHz test. PK and AV for above 1GHz emission test.

During the radiated emission test, the spectrum analyzer was set with the following configurations:

Frequency Band (MHz)	Level	Resolution Bandwidth	Video Bandwidth
30 to 1000	QP	120 kHz	300 kHz
Above 1000	Peak	1 MHz	3 MHz
	Average	1 MHz	10 Hz

8.3 Limit

Frequency range MHz	Distance Meters	Field Strengths Limit (15.209)
		$\mu\text{V/m}$
0.009 ~ 0.490	300	$2400/F(\text{kHz})$
0.490 ~ 1.705	30	$24000/F(\text{kHz})$
1.705 ~ 30	30	30
30 ~ 88	3	100
88 ~ 216	3	150
216 ~ 960	3	200
Above 960	3	500

- Remark: (1) Emission level $(\text{dB})\mu\text{V} = 20 \log \text{Emission level } \mu\text{V/m}$
 (2) The smaller limit shall apply at the cross point between two frequency bands.
 (3) As shown in 15.35(b), for frequencies above 1000MHz, the field strength limits are based on average detector, however, the peak field strength of any emission shall not exceed the maximum permitted average limits, specified above by more than 20dB under any condition of modulation.
 (4) The frequency range scanned is from the lowest radio frequency signal generated in the device which is greater than 9 kHz to the tenth harmonic of the highest fundamental frequency or 40 GHz, whichever is lower.
 (5) §15.247(d) specifies that emissions which fall in the restricted bands, as defined in §15.205 comply with radiated emission limits specified in §15.209.

8.4 Measurement Results

Please refer to following plots of the worst case 802.11b Low channel.



Dongguan NTC Co., Ltd.
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Web: [Http://www.ntc-c.com](http://www.ntc-c.com)

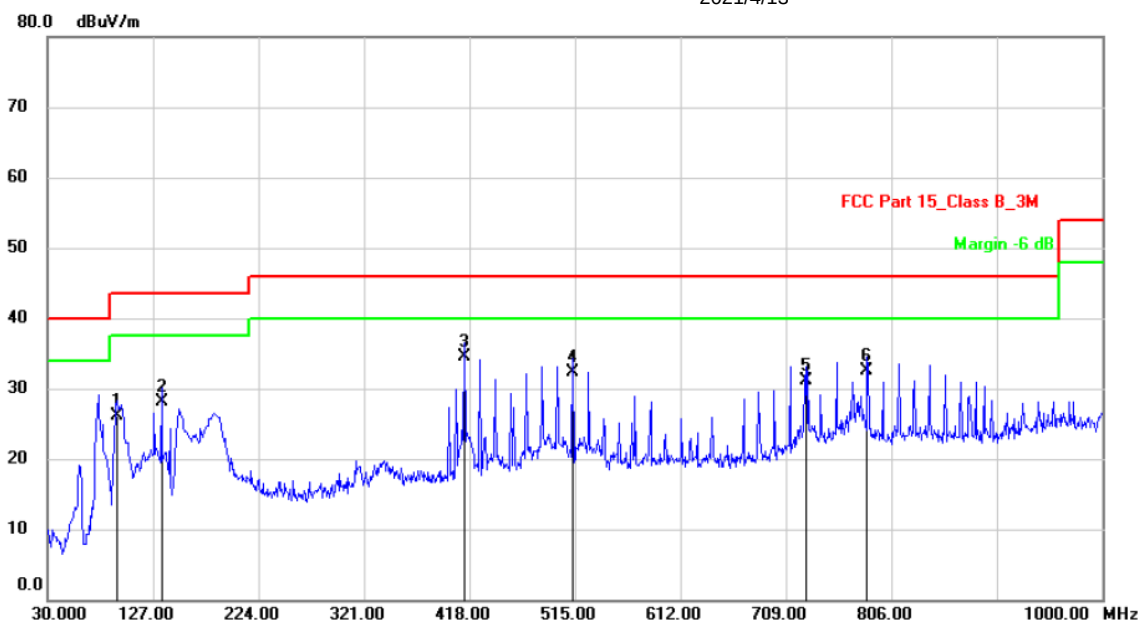
Radiated Emission Measurement

File :HeroGoGo Pro1

Data :#7

Date: 2021/4/13

Time: 16:22:10



Site: 3m Chamber

Polarization: **Horizontal**

Temperature: 26

Limit: FCC Part 15_Class B_3M

Power: DC12V

Humidity: 47 %

EUT:

Distance: 3m

M/N: HeroGoGo Pro1

Mode: TX

Note: Eut:HeroGoGo Smart Driving Assistant System

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	Antenna Height	Table Degree	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	cm	degree	Comment
1		94.0199	39.21	-13.01	26.20	43.50	-17.30	QP		
2		134.7600	43.56	-15.36	28.20	43.50	-15.30	QP		
3	*	413.1500	43.40	-8.80	34.60	46.00	-11.40	QP		
4		513.0600	39.14	-6.74	32.40	46.00	-13.60	QP		
5		727.4300	34.32	-3.12	31.20	46.00	-14.80	QP		
6		783.6900	34.75	-2.15	32.60	46.00	-13.40	QP		

Note: Below 30MHz, the emissions are lower than 20dB below the allowable limit.



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Radiated Emission Measurement

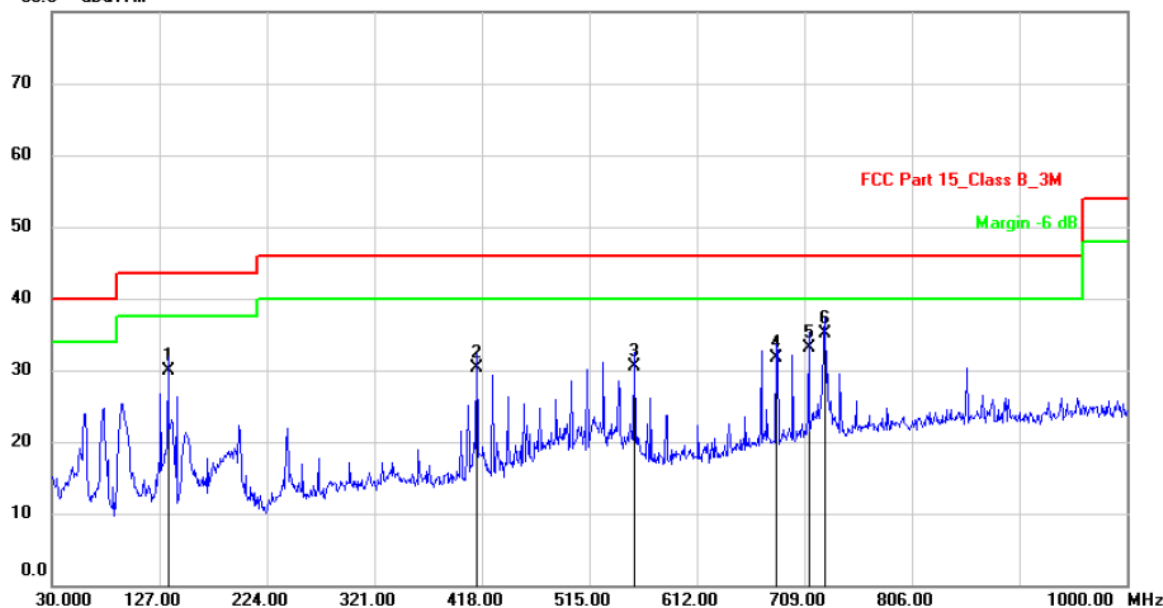
File :HeroGoGo Pro1

Data :#8

Date: 2021/4/13

Time: 16:29:09

80.0 dBuV/m



Site: 3m Chamber

Polarization: **Vertical**

Temperature: 26

Limit: FCC Part 15_Class B_3M

Power: DC12V

Humidity: 47 %

EUT:

Distance: 3m

M/N: HeroGoGo Pro1

Mode: TX

Note: Eut:HeroGoGo Smart Driving Assistant System

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	Antenna Height	Table Degree	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	cm	degree	Comment
1		134.7600	48.26	-18.36	29.90	43.50	-13.60	QP		
2		413.1500	41.86	-11.46	30.40	46.00	-15.60	QP		
3		555.7400	38.97	-8.37	30.60	46.00	-15.40	QP		
4		683.7800	35.96	-4.26	31.70	46.00	-14.30	QP		
5		712.8800	36.70	-3.50	33.20	46.00	-12.80	QP		
6	*	727.4300	38.32	-3.12	35.20	46.00	-10.80	QP		

Note: Below 30MHz, the emissions are lower than 20dB below the allowable limit.

Test Mode: The worst case: Test Date : April 13, 2021
802.11b
Frequency Range: Above 1GHz Temperature : 24°C
Test Result: PASS Humidity : 50 %
Measured Distance: 3m Test By: Sance

Freq. (MHz)	Ant.Pol. (H/V)	Reading Level(dBuV)		Factor (dB/m)	Emission Level (dBuV)		Limit 3m (dBuV/m)		Margin (dB)	
		PK	AV		PK	AV	PK	AV	PK	AV
Operation Mode: TX Mode (Low)										
4824	V	45.77	35.49	6.38	52.15	41.87	74.00	54.00	-21.85	-12.13
7236	V	45.60	31.24	10.48	56.08	41.72	74.00	54.00	-17.92	-12.28

4824	H	46.93	31.98	6.38	53.31	38.36	74.00	54.00	-20.69	-15.64
7236	H	46.11	31.35	10.48	56.59	41.83	74.00	54.00	-17.41	-12.17

Operation Mode: TX Mode (Mid)										
4874	V	47.58	34.01	6.56	54.14	40.57	74.00	54.00	-19.86	-13.43
7311	V	46.19	31.06	10.53	56.72	41.59	74.00	54.00	-17.28	-12.41

4874	H	47.65	31.86	6.56	54.21	38.42	74.00	54.00	-19.79	-15.58
7311	H	46.14	31.52	10.53	56.67	42.05	74.00	54.00	-17.33	-11.95

Operation Mode: TX Mode (High)										
4924	V	47.89	34.88	6.76	54.65	41.64	74.00	54.00	-19.35	-12.36
7386	V	46.21	31.02	10.57	56.78	41.59	74.00	54.00	-17.22	-12.41

4924	H	47.00	32.01	6.76	53.76	38.77	74.00	54.00	-20.24	-15.23
7386	H	46.50	31.66	10.57	57.07	42.23	74.00	54.00	-16.93	-11.77

For others emissions are attenuated 20dB below the limits, so it does not record in report.

- Note:**
- (1) All Readings are Peak Value and AV.
 - (2) Emission Level= Reading Level + Factor
 - (3) Factor= Antenna Gain + Cable Loss – Amplifier Gain
 - (4) Data of measurement within this frequency range shown “ --- ” in the table above means the reading of emissions are attenuated more than 10dB below the permissible limits.
 - (5) Measurement uncertainty : ± 3.7 dB.
 - (6) Horn antenna used for the emission over 1000MHz.

Spurious Emission in restricted band:

Operation Mode:	TX	Test Date :	April 13, 2021
Frequency Range:	Above 1GHz	Temperature :	24 °C
Test Result:	PASS	Humidity :	50 %
Measured Distance:	3m	Test By:	Sance

Freq. (MHz)	Ant.Pol. (H/V)	Reading Level(dBuV)		Factor (dB/m)	Emission Level (dBuV)		Limit 3m (dBuV/m)		Margin (dB)	
		PK	AV		PK	AV	PK	AV	PK	AV
The worst case: Test Mode: 802.11b										
2390.000	H	58.30	41.79	0.09	58.39	41.88	74.00	54.00	-15.61	-12.12
2390.000	V	52.97	35.00	0.09	53.06	35.09	74.00	54.00	-20.94	-18.91
2483.500	H	58.10	41.72	0.35	58.45	42.07	74.00	54.00	-15.55	-11.93
2483.500	V	54.92	37.77	0.35	55.27	38.12	74.00	54.00	-18.73	-15.88

Note:

- (1) All Readings are Peak Value and AV
- (2) Emission Level= Reading Level+Probe Factor +Cable Loss
- (3) Measurement uncertainty : ± 3.7 dB
- (4) For others emissions are attenuated 20dB below the limits, so it does not record in report.

9. Antenna Application

9.1 Antenna requirement

According to of FCC part 15C section 15.203 and 15.240:

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 an 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.

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

9.2 Measurement Results

The antenna is FPC antenna and no consideration of replacement, and the best case gain of the antenna is -0.5dBi. So, the antenna is consider meet the requirement.

10. Test Equipment List

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	Test Receiver	Rohde & Schwarz	ESCI7	100837	Mar. 13, 2021	1 Year
2.	Antenna	Schwarzbeck	VULB9162	9162-010	Mar. 23, 2021	1 Year
3.	Spectrum Analyzer	Rohde & Schwarz	FSU26	200409/026	Mar. 13, 2021	1 Year
4.	Spectrum Analyzer	Keysight	N9020A	MY54200831	Mar. 13, 2021	1 Year
5.	Spectrum Analyzer	Rohde & Schwarz	FSV40	101094	Mar. 13, 2021	1 Year
6.	Horn Antenna	Schwarzbeck	BBHA9170	9170-172	Mar. 22, 2021	2 Year
7.	Power Sensor	DARE	RPR3006W	15I00041SNO 64	Mar. 13, 2021	1 Year
8.	Horn Antenna	COM-Power	AH-118	071078	Mar. 23, 2021	1 Year
9.	Pre-Amplifier	HP	HP 8449B	3008A00964	Mar. 13, 2021	1 Year
10.	Pre-Amplifier	HP	HP 8447D	1145A00203	Mar. 13, 2021	1 Year
11.	Loop Antenna	Schwarzbeck	FMZB 1513	1513-272	Mar. 23, 2021	1 Year
12.	Test Receiver	Rohde & Schwarz	ESCI	101152	Mar. 14, 2021	1 Year
13.	L.I.S.N	Rohde & Schwarz	ENV 216	101317	Mar. 13, 2021	1 Year
14.	RF Switching Unit	Compliance Direction Systems Inc.	RSU-M2	38311	Mar.13, 2021	1 Year
15.	Temporary antenna connector	TESCOM	SS402	N/A	N/A	N/A
16.	Chamber	SAEMC	9*7*7m	N/A	Jun. 20, 2019	2 Year
17.	Test Software	EZ	EZ_EMCC	N/A	N/A	N/A

Note: The temporary antenna connector is soldered on the PCB board in order to perform conducted tests and this temporary antenna connector is listed in the equipment list.

---End---