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Test Report

Report No. : CQASZ20210500028EX-02

Applicant: SHENZHEN PEICHENG TECHNOLOGY CO., LTD

Address of Applicant: 5th floor, B building, Yingxin factory, Baotian 3rd Rd., Xixiang, Bao'an District, Shenzhen, China .Zip code: 518126

Manufacturer: SHENZHEN PEICHENG TECHNOLOGY CO., LTD

Address of Manufacturer: 5th floor, B building, Yingxin factory, Baotian 3rd Rd., Xixiang, Bao'an District, Shenzhen, China .Zip code: 518126

Equipment Under Test (EUT):

Product: tablet pc

Model No.: CP10

Brand Name: COOPERS

FCC ID: 2AV6Y-CP10

Standards: 47 CFR FCC Part 15 Subpart C 15.247

Date of Test: May 11, 2021 – Jun. 01, 2021

Date of Issue: Jun. 15, 2021

Test Result : PASS

Tested By:

Lewis Zhou

(Lewis Zhou)

Reviewed By:

Jun Li

(Jun Li)

Approved By:

Sheek Luo

(Sheek Luo)



* In the configuration tested, the EUT complied with the standards specified above.

The test report is effective only with both signature and specialized stamp. The result(s) shown in this report refer only to the sample(s) tested. Without written approval of CQA, this report can't be reproduced except in full.

1 Version

Revision History Of Report

Report No.	Version	Description	Issue Date
CQASZ20210500028EX-02	Rev.01	Initial report	Jun. 15, 2021

2 Test Summary

Test Item	Test Requirement	Test method	Result
Antenna Requirement	47 CFR Part 15, Subpart C Section 15.203/15.247 (c)	ANSI C63.10 2013	PASS
AC Power Line Conducted Emission	47 CFR Part 15, Subpart C Section 15.207	ANSI C63.10 2013	PASS
Conducted Peak & Average Output Power	47 CFR Part 15, Subpart C Section 15.247 (b)(3)	ANSI C63.10 2013	PASS
6dB Occupied Bandwidth	47 CFR Part 15, Subpart C Section 15.247 (a)(2)	ANSI C63.10 2013	PASS
Power Spectral Density	47 CFR Part 15, Subpart C Section 15.247 (e)	ANSI C63.10 2013	PASS
Band-edge for RF Conducted Emissions	47 CFR Part 15, Subpart C Section 15.247(d)	ANSI C63.10 2013	PASS
RF Conducted Spurious Emissions	47 CFR Part 15, Subpart C Section 15.247(d)	ANSI C63.10 2013	PASS
Radiated Spurious Emissions	47 CFR Part 15, Subpart C Section 15.205/15.209	ANSI C63.10 2013	PASS
Restricted bands around fundamental frequency (Radiated Emission)	47 CFR Part 15, Subpart C Section 15.205/15.209	ANSI C63.10 2013	PASS

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4 General Information

4.1 Client Information

Applicant:	SHENZHEN PEICHENG TECHNOLOGY CO., LTD
Address of Applicant:	5th floor, B building, Yingxin factory, Baotian 3rd Rd., Xixiang, Bao'an Distict, Shenzhen, China .Zip code: 518126
Manufacturer:	SHENZHEN PEICHENG TECHNOLOGY CO., LTD
Address of Manufacturer:	5th floor, B building, Yingxin factory, Baotian 3rd Rd., Xixiang, Bao'an Distict, Shenzhen, China .Zip code: 518126

4.2 General Description of EUT

Product Name:	tablet pc
Test Model No.:	CP10
Trade Mark:	COOPERS
Hardware Version:	V1.0
Software Version:	V1.8
Operation Frequency:	IEEE 802.11b/g/n(HT20): 2412MHz to 2462MHz IEEE 802.11n(H40): 2422MHz~2452MHz
Channel Numbers:	IEEE 802.11b/g, IEEE 802.11n HT20: 11 Channels IEEE 802.11n HT40: 7
Channel Separation:	5MHz
Type of Modulation:	IEEE for 802.11b: DSSS(CCK,DQPSK,DBPSK) IEEE for 802.11g : OFDM IEEE for 802.11n(HT20): OFDM IEEE for 802.11n(HT40): OFDM
Product Type:	☐ Mobile ☒ Portable ☐ Fix Location
Antenna Type	FPC antenna
Antenna Gain	0dBi
Power Supply:	DC 3.7V from battery Charging : DC 5.0V 1A

Note: 1. This report is only for 2.4GHz WIFI

2. For more detailed features description, please refer to the manufacturer's specifications or the User's Manual.

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

Note:

In section 15.31(m), regards to the operating frequency range over 10 MHz, the Lowest frequency, the middle frequency, and the highest frequency of channel were selected to perform the test, and the selected channel see below:

For 802.11b/g/n (HT20):

Channel	Frequency
The Lowest channel	2412MHz
The Middle channel	2437MHz
The Highest channel	2462MHz

For 802.11n

(HT40):

Channel	Frequency
The Lowest channel	2422MHz
The Middle channel	2437MHz
The Highest channel	2452MHz

Note: Software provided by client enabled the EUT to transmit and receive data at lowest, middle and highest channel individually.

4.3 Test Environment

Operating Environment:	
Conduction emission	
Temperature:	23 °C
Humidity:	51 % RH
Atmospheric Pressure:	992mbar
Radiated Emission (Normal Conditions)	
Temperature:	25.1 °C~25.5 °C
Humidity:	51 % RH~55 % RH
Atmospheric Pressure:	992mbar
RF item test (RF test room Normal Conditions)	
Temperature:	26 °C~27.3 °C
Humidity:	58 % RH~59 % RH
Atmospheric Pressure:	992mbar
Transmitting mode:	Use test software to set the lowest frequency, the middle frequency and the

	highest frequency keep transmitting of the EUT. Note: In the process of transmitting of EUT, the duty cycle > 98%.
--	---

4.4 Description of Support Units

The EUT has been tested with associated equipment below.

Description	Manufacturer	Model No.	Remark	certification
ADAPTER	/	MODEL: FJ-SW1260502500UN INPUT:100-240 50/60Hz 0.4A Max OUTPUT:5V 1500mA	Provide by lab	SDOC
/	/	/	/	/

4.5 Test Location

All tests were performed at:

Shenzhen Huaxia Testing Technology Co., Ltd.,

1F., Block A of Tongsheng Technology Building, Huahui Road, Dalang Street, Longhua New District, Shenzhen, Guangdong, China

4.6 Test Facility

The test facility is recognized, certified, or accredited by the following organizations:

• **ISED Registration No.: 22984-1**

The 3m Semi-anechoic chamber of Shenzhen Huaxia Testing Technology Co., Ltd. has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing

• **A2LA (Certificate No. 4742.01)**

Shenzhen Huaxia Testing Technology Co., Ltd., Shenzhen EMC Laboratory is accredited by the American Association for Laboratory Accreditation(A2LA). Certificate No. 4742.01.

• **FCC Registration No.: 522263**

Shenzhen Huaxia Testing Technology Co., Ltd., Shenzhen EMC Laboratory has been registered and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files. Registration No.:522263

4.7 Statement of the measurement uncertainty

The data and results referenced in this document are true and accurate.

The reader is cautioned that there may be errors within the calibration limits of the equipment and facilities.

The measurement uncertainty was calculated for all measurements listed in this test report acc. to CISPR 16 - 4 „Specification for radio disturbance and immunity measuring apparatus and methods – Part 4: Uncertainty in EMC Measurements“ and is documented in the **Shenzhen Huaxia Testing Technology Co., Ltd.** quality system acc. to DIN EN ISO/IEC 17025.

Furthermore, component and process variability of devices similar to that tested may result in additional deviation. The manufacturer has the sole responsibility of continued compliance of the device.

Hereafter the best measurement capability for CQA laboratory is reported:

No.	Item	Uncertainty	Notes
1	Radiated Emission (Below 1GHz)	5.12dB	(1)
2	Radiated Emission (Above 1GHz)	4.60dB	(1)
3	Conducted Disturbance (0.15~30MHz)	3.34dB	(1)
4	Radio Frequency	3×10^{-8}	(1)
5	Duty cycle	0.6 %.	(1)
6	Occupied Bandwidth	1.1%	(1)
7	RF conducted power	0.86dB	(1)
8	RF power density	0.74	(1)
9	Conducted Spurious emissions	0.86dB	(1)
10	Temperature test	0.8℃	(1)
11	Humidity test	2.0%	(1)
12	Supply voltages	0.5 %.	(1)
13	Frequency Error	5.5 Hz	(1)

(1) This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

4.8 Deviation from Standards

None.

4.9 Abnormalities from Standard Conditions

None.

4.10 Other Information Requested by the Customer

None.

4.11 Equipment List

Test Equipment	Manufacturer	Model No.	Instrument No.	Calibration Date	Calibration Due Date
EMI Test Receiver	R&S	ESR7	CQA-005	2020/9/22	2021/9/21
Spectrum analyzer	R&S	FSU26	CQA-038	2020/10/24	2021/10/23
Spectrum analyzer	keysight	N9020A	CQA-105	2020/10/24	2021/10/23
Preamplifier	MITEQ	AFS4-00010300-18-10P-4	CQA-035	2020/9/22	2021/9/21
Preamplifier	MITEQ	AMF-6D-02001800-29-20P	CQA-036	2018/11/2	2019/11/1
Loop antenna	Schwarzbeck	FMZB1516	CQA-087	2018/10/28	2020/10/27
Bilog Antenna	R&S	HL562	CQA-011	2020/9/22	2021/9/21
Horn Antenna	R&S	HF906	CQA-012	2020/9/22	2021/9/21
Horn Antenna	Schwarzbeck	BBHA 9170	CQA-088	2020/9/22	2021/9/21
Coaxial Cable (Above 1GHz)	CQA	N/A	C019	2020/9/22	2021/9/21
Coaxial Cable (Below 1GHz)	CQA	N/A	C020	2020/9/22	2021/9/21
Antenna Connector	CQA	RFC-01	CQA-080	2020/9/22	2021/9/21
RF cable(9KHz~40GHz)	CQA	RF-01	CQA-079	2020/9/22	2021/9/21
Power Sensor	KEYSIGHT	U2021XA	CQA-30	2020/9/22	2021/9/21
N1918A Power Analysis Manager Power Panel	Agilent	N1918A	CQA-074	2020/9/22	2021/9/21
Power divider	MIDWEST	PWD-2533-02-SMA-79	CQA-067	2020/9/22	2021/9/21
EMI Test Receiver	R&S	ESPI3	CQA-013	2020/9/22	2021/9/21
LISN	R&S	ENV216	CQA-003	2021/11/1	2021/10/30
Coaxial cable	CQA	N/A	CQA-C009	2020/9/22	2021/9/21

Note:

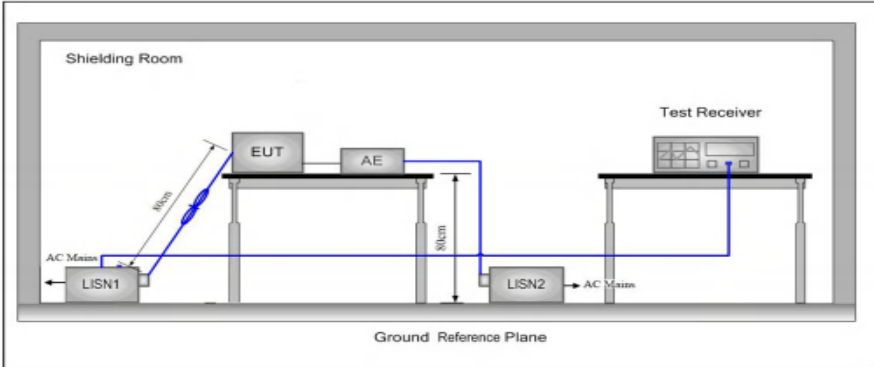
The temporary antenna connector is soldered on the PCB board in order to perform conducted tests and this temporary antenna connector is listed in the equipment list.

5 Test results and Measurement Data

5.1 Antenna Requirement

Standard requirement:	47 CFR Part 15C Section 15.203 /247(c)
15.203 requirement: 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. 15.247(b) (4) requirement: The conducted output power limit specified in paragraph (b) of this section is based on the use of antennas with directional gains that do not exceed 6 dBi. Except as shown in paragraph (c) of this section, if transmitting antennas of directional gain greater than 6 dBi are used, the conducted output power from the intentional radiator shall be reduced below the stated values in paragraphs (b)(1), (b)(2), and (b)(3) of this section, as appropriate, by the amount in dB that the directional gain of the antenna exceeds 6 dBi.	
EUT Antenna:	FPC Antenna 
The antenna is FPC antenna. The best case gain of the antenna is 0dBi.	

5.2 Conducted Emissions

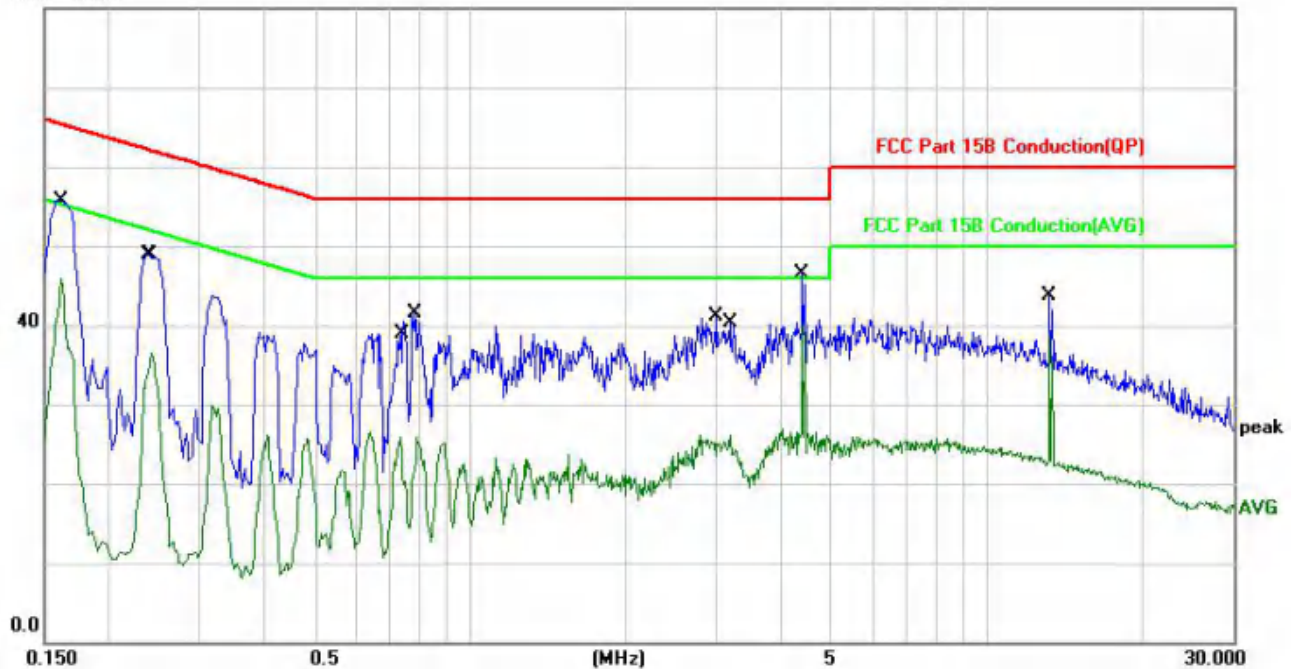
Test Requirement:	47 CFR Part 15C Section 15.207		
Test Method:	ANSI C63.10: 2013		
Test Frequency Range:	150kHz to 30MHz		
Limit:	Frequency range (MHz)	Limit (dBuV)	
		Quasi-peak	Average
	0.15-0.5	66 to 56*	56 to 46*
	0.5-5	56	46
	5-30	60	50
* Decreases with the logarithm of the frequency.			
Test Procedure:	1) The mains terminal disturbance voltage test was conducted in a shielded room. 2) The EUT was connected to AC power source through a LISN 1 (Line Impedance Stabilization Network) which provides a $50\Omega/50\mu\text{H} + 5\Omega$ linear impedance. The power cables of all other units of the EUT were connected to a second LISN 2, which was bonded to the ground reference plane in the same way as the LISN 1 for the unit being measured. A multiple socket outlet strip was used to connect multiple power cables to a single LISN provided the rating of the LISN was not exceeded. 3) The tabletop EUT was placed upon a non-metallic table 0.8m above the ground reference plane. And for floor-standing arrangement, the EUT was placed on the horizontal ground reference plane, 4) The test was performed with a vertical ground reference plane. The rear of the EUT shall be 0.4 m from the vertical ground reference plane. The vertical ground reference plane was bonded to the horizontal ground reference plane. The LISN 1 was placed 0.8 m from the boundary of the unit under test and bonded to a ground reference plane for LISNs mounted on top of the ground reference plane. This distance was between the closest points of the LISN 1 and the EUT. All other units of the EUT and associated equipment was at least 0.8 m from the LISN 2. 5) In order to find the maximum emission, the relative positions of equipment and all of the interface cables must be changed according to ANSI C63.10: 2013 on conducted measurement.		
Test Setup:			
Exploratory Test Mode:	Transmitting with all kind of modulations, data rates at lowest, middle and highest channel.		

Final Test Mode:	All wifi modes were tested at Low, Middle, and High channel; only the worst result of 802.11b- CH11 was reported as below
Test Voltage:	AC110V/60Hz
Test Results:	Pass

Measurement Data

Live Line:

80.0 dBuV

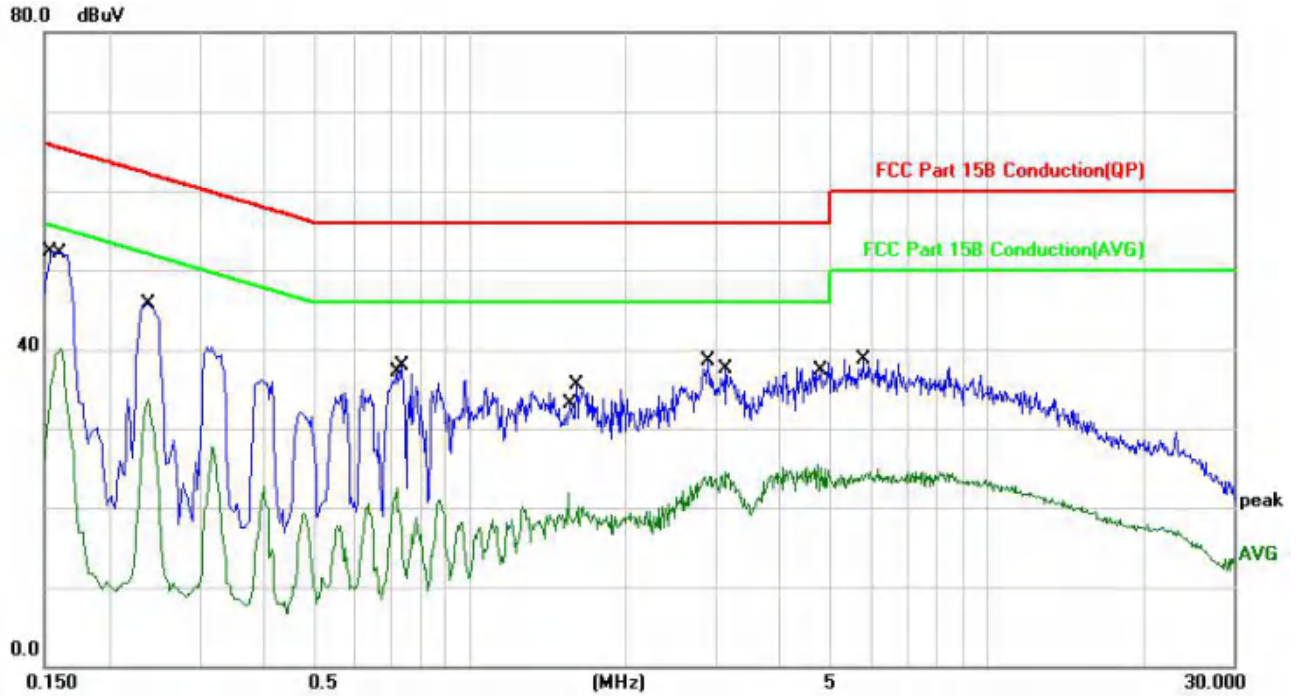


No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV	Limit dBuV	Over dB	Detector	Comment
1		0.1620	55.89	-0.13	55.76	65.36	-9.60	QP	
2		0.1620	46.09	-0.13	45.96	55.36	-9.40	AVG	
3		0.2380	49.07	-0.11	48.96	62.16	-13.20	QP	
4		0.2420	36.67	-0.11	36.56	52.02	-15.46	AVG	
5		0.7340	25.99	-0.06	25.93	46.00	-20.07	AVG	
6		0.7820	41.50	-0.07	41.43	56.00	-14.57	QP	
7		3.0059	41.31	-0.18	41.13	56.00	-14.87	QP	
8		3.1740	26.26	-0.18	26.08	46.00	-19.92	AVG	
9		4.3940	46.62	-0.21	46.41	56.00	-9.59	QP	
10	*	4.3940	40.29	-0.21	40.08	46.00	-5.92	AVG	
11		13.2140	43.94	-0.15	43.79	60.00	-16.21	QP	
12		13.2140	39.05	-0.15	38.90	50.00	-11.10	AVG	

Remark:

1. The following Quasi-Peak and Average measurements were performed on the EUT:
2. Final Test Level = Receiver Reading + LISN Factor + Cable Loss.
3. If the Peak value under Average limit, the Average value is not recorded in the report.

Neutral Line:



No.	Mk.	Freq.	Reading	Correct	Measure-	Limit	Over		
		MHz	Level	Factor	ment			Detector	Comment
			dBuV	dB	dBuV	dBuV	dB		
1	*	0.1539	52.50	-0.13	52.37	65.78	-13.41	QP	
2		0.1620	40.32	-0.13	40.19	55.36	-15.17	AVG	
3		0.2380	45.74	-0.11	45.63	62.16	-16.53	QP	
4		0.2380	33.77	-0.11	33.66	52.16	-18.50	AVG	
5		0.7220	22.52	-0.06	22.46	46.00	-23.54	AVG	
6		0.7380	37.87	-0.06	37.81	56.00	-18.19	QP	
7		1.5500	22.09	-0.19	21.90	46.00	-24.10	AVG	
8		1.6060	35.76	-0.20	35.56	56.00	-20.44	QP	
9		2.8900	38.70	-0.18	38.52	56.00	-17.48	QP	
10		3.1380	24.77	-0.18	24.59	46.00	-21.41	AVG	
11		4.7020	25.62	-0.21	25.41	46.00	-20.59	AVG	
12		5.7700	38.99	-0.24	38.75	60.00	-21.25	QP	

Remark:

1. The following Quasi-Peak and Average measurements were performed on the EUT:
2. Final Test Level = Receiver Reading + LISN Factor + Cable Loss.
3. If the Peak value under Average limit, the Average value is not recorded in the report.

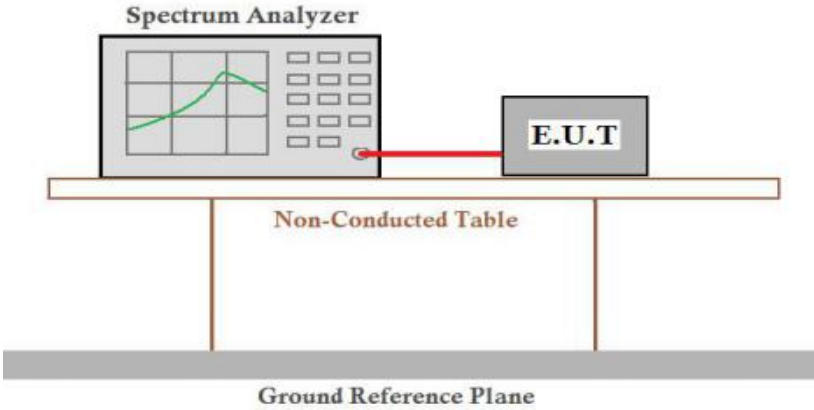
5.3 Conducted Peak & Average Output Power

Test Requirement:	47 CFR Part 15C Section 15.247 (b)(3)
Test Method:	ANSI C63.10: 2013
Test Setup:	
Exploratory Test Mode:	Transmitting with all kind of modulations, data rates
Final Test Mode:	Through Pre-scan, find the 1Mbps of rate is the worst case of 802.11b; 6Mbps of rate is the worst case of 802.11g; 6.5Mbps of rate is the worst case of 802.11n(HT20); 13.5Mbps of rate is the worst case of 802.11n(HT40); Only the worst case is recorded in the report.
Limit:	30dBm
Test Results:	Pass

WIFI

Type	Test channel	Peak Output Power (dBm)	AVG Output Power (dBm)	Limit (dBm)	Result
802.11b	Lowest	6.59	3.55	30.00	Pass
	Middle	7.25	4.34		
	Highest	8.53	5.49		
802.11g	Lowest	7.55	4.74	30.00	Pass
	Middle	8.27	5.45		
	Highest	6.74	3.78		
802.11n(HT20)	Lowest	6.70	4.07	30.00	Pass
	Middle	7.46	4.83		
	Highest	5.84	3.24		
802.11n(HT40)	Lowest	5.79	2.90	30.00	Pass
	Middle	6.49	3.51		
	Highest	6.32	3.50		

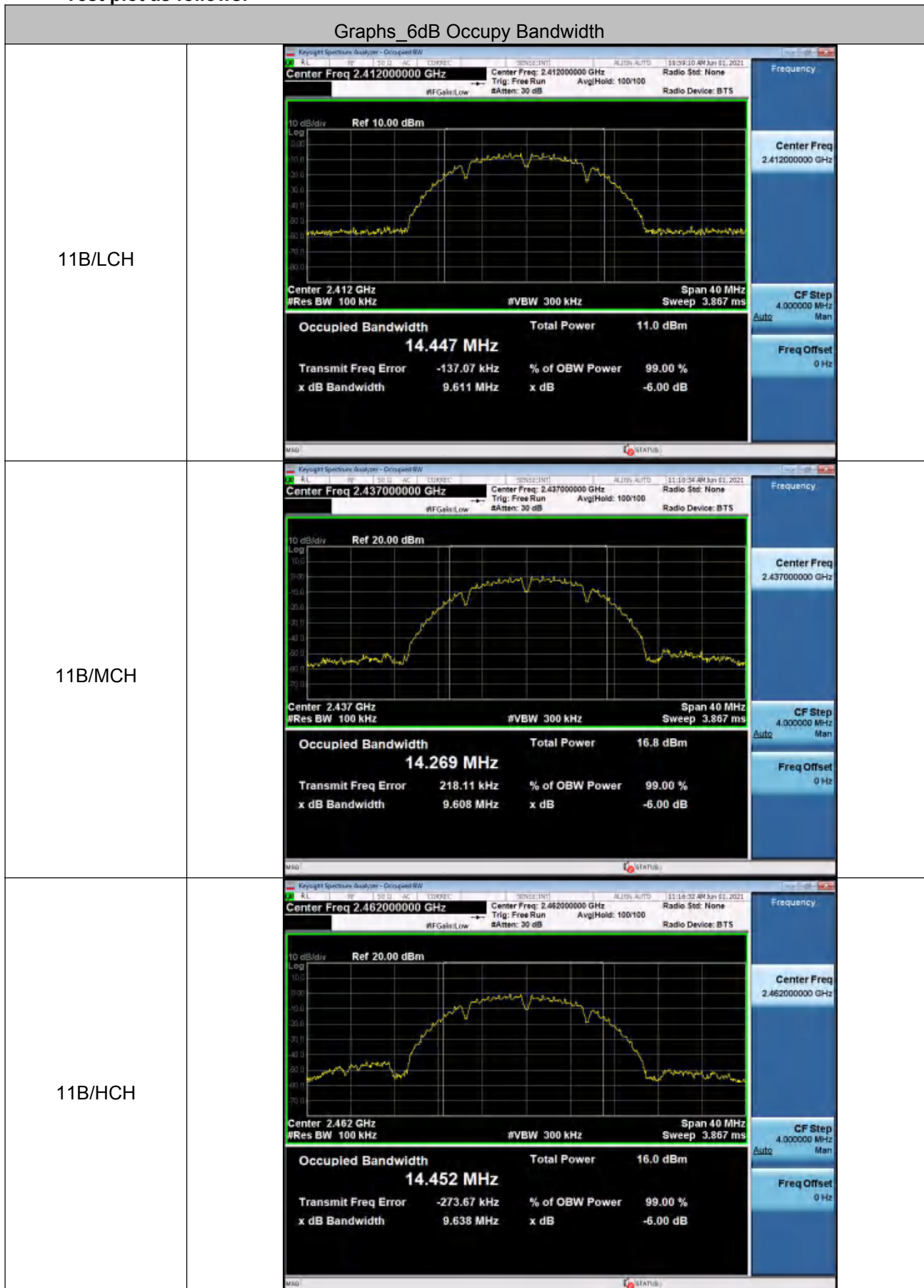
5.4 6dB Occupy Bandwidth

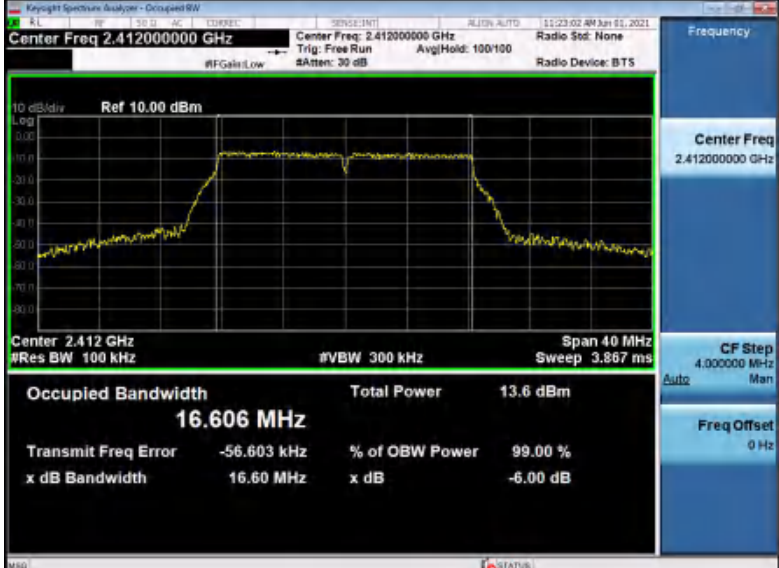
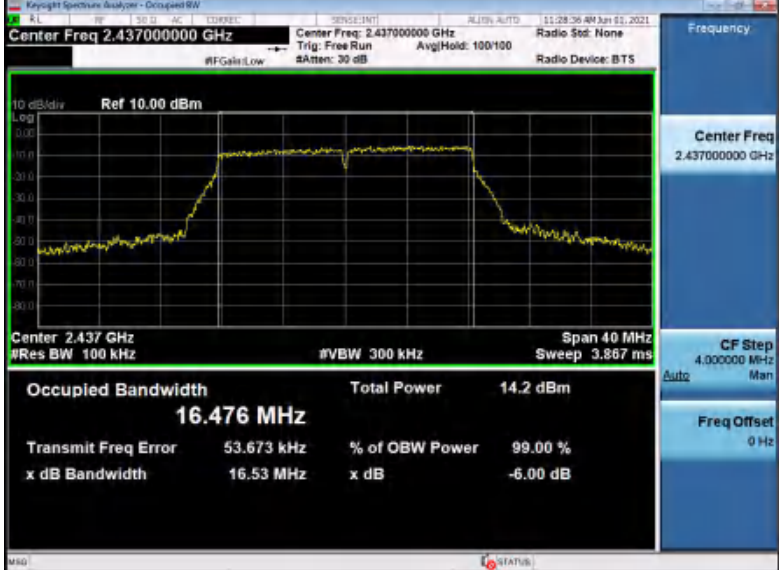
Test Requirement:	47 CFR Part 15C Section 15.247 (a)(2)
Test Method:	ANSI C63.10: 2013
Test Setup:	 Offset=cable loss+ attenuation factor
Exploratory Test Mode:	Transmitting with all kind of modulations, data rates
Final Test Mode:	Through Pre-scan, find the 11Mbps of rate is the worst case of 802.11b; 6Mbps of rate is the worst case of 802.11g; 6.5Mbps of rate is the worst case of 802.11n(HT20); 13.5Mbps of rate is the worst case of 802.11n(HT40); Only the worst case is recorded in the report.
Limit:	≥ 500 kHz
Test Results:	Pass

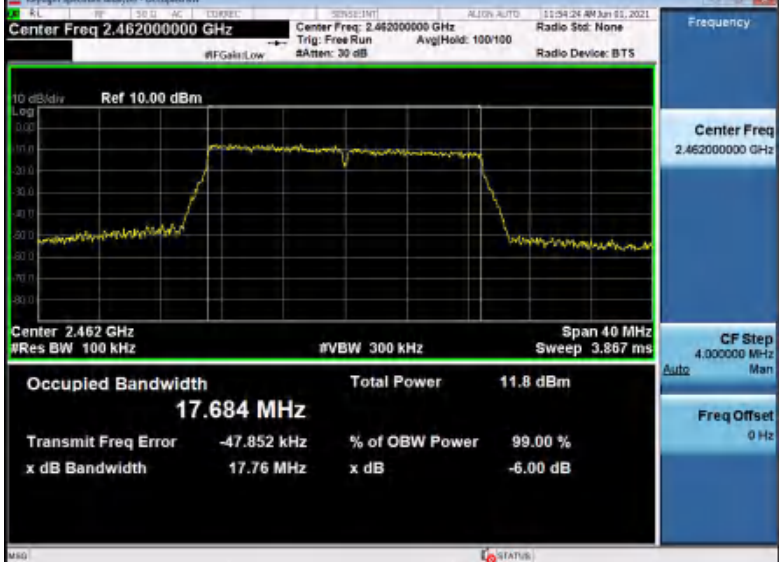
Measurement Data

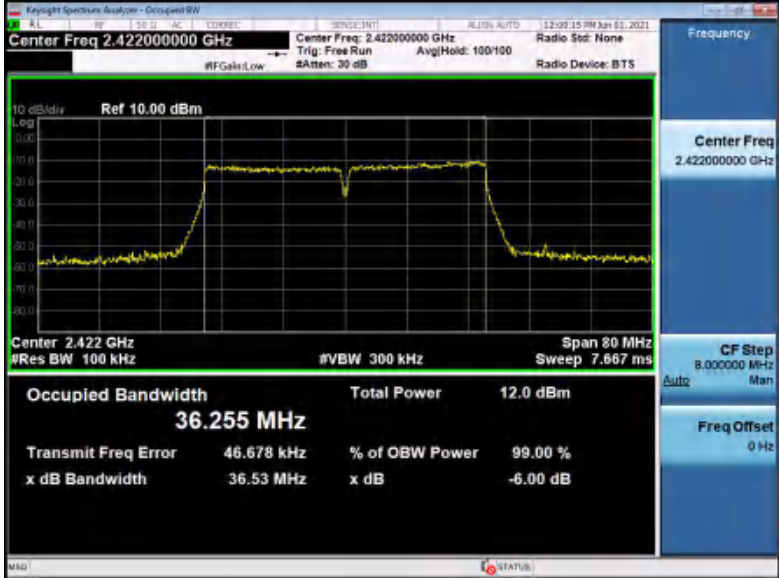
Type	Channel	6dB Bandwidth (MHz)	Limit (KHz)	Result
802.11b	Lowest	9.611	≥500	Pass
	Middle	9.608		
	Highest	9.638		
802.11g	Lowest	16.60	≥500	Pass
	Middle	16.53		
	Highest	16.50		
802.11n(HT20)	Lowes	17.84	≥500	Pass
	Middle	17.73		
	Highest	17.76		
802.11n(HT40)	Lowest	36.53	≥500	Pass
	Middle	36.03		
	Highest	35.76		

Test plot as follows:

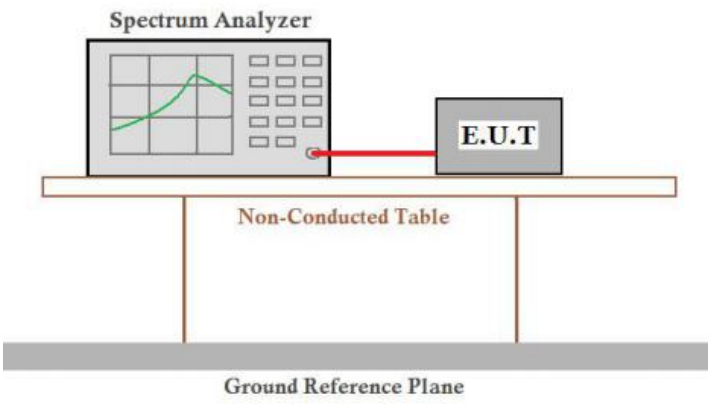


11G/LCH	 KeySight Spectrum Analyzer - Occupied BW Center Freq 2.412000000 GHz Center Freq: 2.412000000 GHz Trig: Free Run Avg/Hold: 100/100 Radio Std: None Radio Device: BTS 10 dB/div Ref 10.00 dBm Center 2.412 GHz #Res BW 100 kHz #VBW 300 kHz Span 40 MHz Sweep 3.867 ms Occupied Bandwidth 16.606 MHz Total Power 13.6 dBm Transmit Freq Error -56.603 kHz % of OBW Power 99.00 % x dB Bandwidth 16.60 MHz x dB -6.00 dB Frequency Center Freq 2.412000000 GHz CF Step 4.000000 MHz Auto Man Freq Offset 0 Hz
11G/MCH	 KeySight Spectrum Analyzer - Occupied BW Center Freq 2.437000000 GHz Center Freq: 2.437000000 GHz Trig: Free Run Avg/Hold: 100/100 Radio Std: None Radio Device: BTS 10 dB/div Ref 10.00 dBm Center 2.437 GHz #Res BW 100 kHz #VBW 300 kHz Span 40 MHz Sweep 3.867 ms Occupied Bandwidth 16.476 MHz Total Power 14.2 dBm Transmit Freq Error 53.673 kHz % of OBW Power 99.00 % x dB Bandwidth 16.53 MHz x dB -6.00 dB Frequency Center Freq 2.437000000 GHz CF Step 4.000000 MHz Auto Man Freq Offset 0 Hz
11G/HCH	 KeySight Spectrum Analyzer - Occupied BW Center Freq 2.462000000 GHz Center Freq: 2.462000000 GHz Trig: Free Run Avg/Hold: 100/100 Radio Std: None Radio Device: BTS 10 dB/div Ref 10.00 dBm Center 2.462 GHz #Res BW 100 kHz #VBW 300 kHz Span 40 MHz Sweep 3.867 ms Occupied Bandwidth 16.624 MHz Total Power 12.7 dBm Transmit Freq Error -121.07 kHz % of OBW Power 99.00 % x dB Bandwidth 16.50 MHz x dB -6.00 dB Frequency Center Freq 2.462000000 GHz CF Step 4.000000 MHz Auto Man Freq Offset 0 Hz

11N20/LCH	 KeySight Spectrum Analyzer - Occupied BW Center Freq 2.412000000 GHz Center Freq: 2.412000000 GHz Trig: Free Run Avg/Hold: 100/100 Radio Std: None Radio Device: BTS 10 dB/div Ref 10.00 dBm Center 2.412 GHz #Res BW 100 kHz #VBW 300 kHz Span 40 MHz Sweep 3.867 ms Occupied Bandwidth 17.710 MHz Total Power 12.7 dBm Transmit Freq Error -12.434 kHz % of OBW Power 99.00 % x dB Bandwidth 17.84 MHz x dB -6.00 dB Frequency Center Freq 2.412000000 GHz CF Step 4.000000 MHz Auto Man Freq Offset 0 Hz
11N20/MCH	 KeySight Spectrum Analyzer - Occupied BW Center Freq 2.437000000 GHz Center Freq: 2.437000000 GHz Trig: Free Run Avg/Hold: 100/100 Radio Std: None Radio Device: BTS 10 dB/div Ref 10.00 dBm Center 2.437 GHz #Res BW 100 kHz #VBW 300 kHz Span 40 MHz Sweep 3.867 ms Occupied Bandwidth 17.658 MHz Total Power 13.3 dBm Transmit Freq Error 60.022 kHz % of OBW Power 99.00 % x dB Bandwidth 17.73 MHz x dB -6.00 dB Frequency Center Freq 2.437000000 GHz CF Step 4.000000 MHz Auto Man Freq Offset 0 Hz
11N20/HCH	 KeySight Spectrum Analyzer - Occupied BW Center Freq 2.462000000 GHz Center Freq: 2.462000000 GHz Trig: Free Run Avg/Hold: 100/100 Radio Std: None Radio Device: BTS 10 dB/div Ref 10.00 dBm Center 2.462 GHz #Res BW 100 kHz #VBW 300 kHz Span 40 MHz Sweep 3.867 ms Occupied Bandwidth 17.684 MHz Total Power 11.8 dBm Transmit Freq Error -47.852 kHz % of OBW Power 99.00 % x dB Bandwidth 17.76 MHz x dB -6.00 dB Frequency Center Freq 2.462000000 GHz CF Step 4.000000 MHz Auto Man Freq Offset 0 Hz

11N40/LCH	 KeySight Spectrum Analyzer - Occupied BW Center Freq 2.42200000 GHz Center Freq: 2.42200000 GHz Trig: Free Run Avg/Hold: 100/100 Radio Std: None Radio Device: BTS Ref 10.00 dBm Center 2.422 GHz #Res BW 100 kHz #VBW 300 kHz Span 80 MHz Sweep 7.667 ms Occupied Bandwidth 36.255 MHz Total Power 12.0 dBm Transmit Freq Error 46.678 kHz % of OBW Power 99.00 % x dB Bandwidth 36.53 MHz x dB -6.00 dB Frequency Center Freq 2.42200000 GHz CF Step 8.000000 MHz Auto Freq Offset 0 Hz
11N40/MCH	 KeySight Spectrum Analyzer - Occupied BW Center Freq 2.43700000 GHz Center Freq: 2.43700000 GHz Trig: Free Run Avg/Hold: 100/100 Radio Std: None Radio Device: BTS Ref 10.00 dBm Center 2.437 GHz #Res BW 100 kHz #VBW 300 kHz Span 80 MHz Sweep 7.667 ms Occupied Bandwidth 35.942 MHz Total Power 12.7 dBm Transmit Freq Error 121.77 kHz % of OBW Power 99.00 % x dB Bandwidth 36.03 MHz x dB -6.00 dB Frequency Center Freq 2.43700000 GHz CF Step 8.000000 MHz Auto Freq Offset 0 Hz
11N40/HCH	 KeySight Spectrum Analyzer - Occupied BW Center Freq 2.45200000 GHz Center Freq: 2.45200000 GHz Trig: Free Run Avg/Hold: 100/100 Radio Std: None Radio Device: BTS Ref 10.00 dBm Center 2.452 GHz #Res BW 100 kHz #VBW 300 kHz Span 80 MHz Sweep 7.667 ms Occupied Bandwidth 35.859 MHz Total Power 12.6 dBm Transmit Freq Error -93.177 kHz % of OBW Power 99.00 % x dB Bandwidth 35.76 MHz x dB -6.00 dB Frequency Center Freq 2.45200000 GHz CF Step 8.000000 MHz Auto Freq Offset 0 Hz

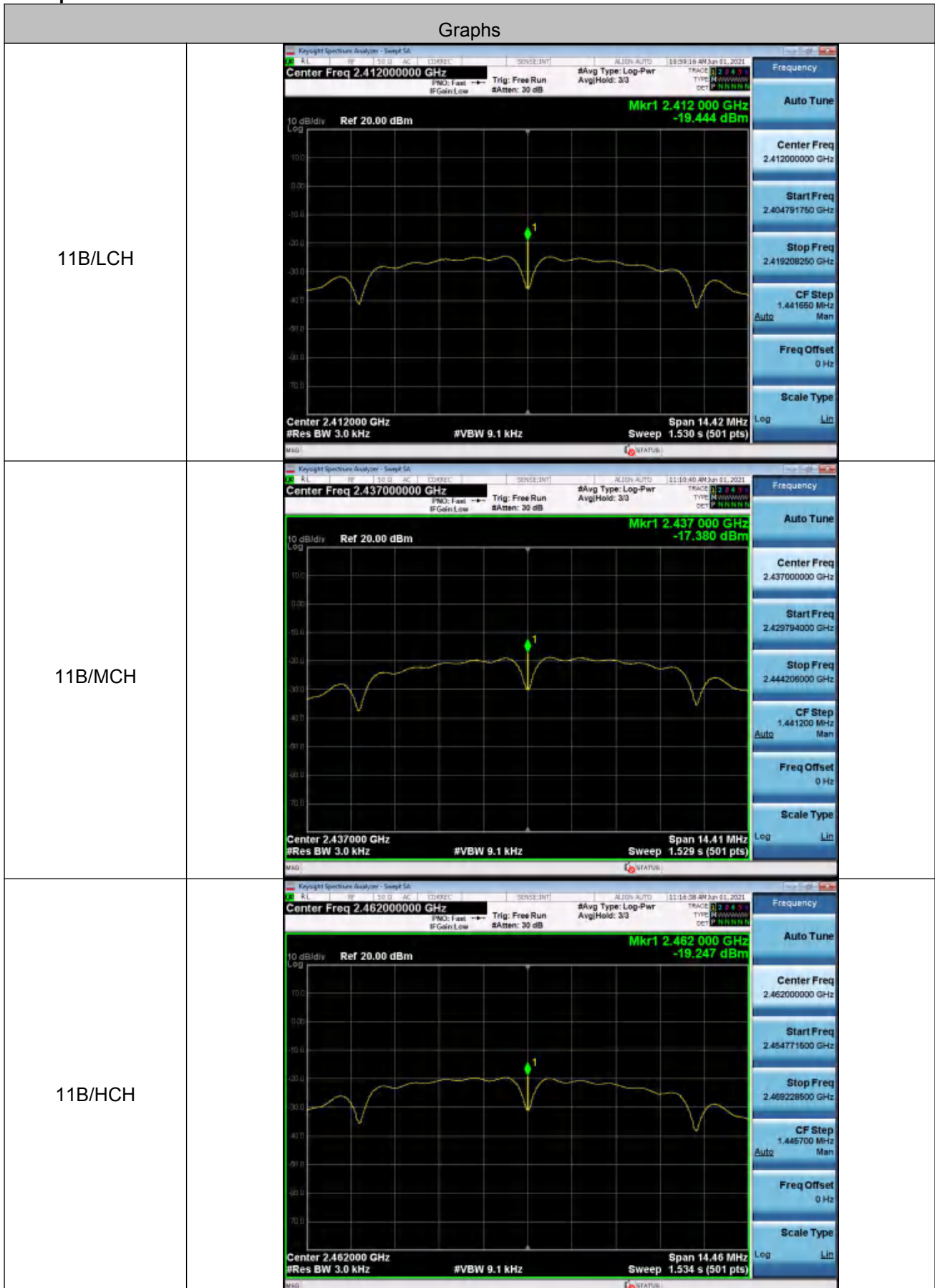
5.5 Power Spectral Density

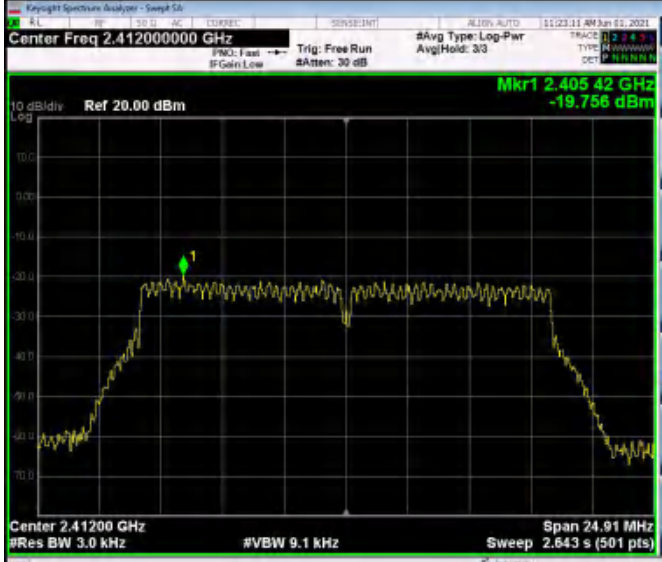
Test Requirement:	47 CFR Part 15C Section 15.247 (e)
Test Method:	ANSI C63.10: 2013
Test Setup:	 Offset=cable loss+ attenuation factor
Exploratory Test Mode:	Transmitting with all kind of modulations, data rates
Final Test Mode:	Through Pre-scan, find the 1Mbps of rate is the worst case of 802.11b; 6Mbps of rate is the worst case of 802.11g; 6.5Mbps of rate is the worst case of 802.11n(HT20); 13.5Mbps of rate is the worst case of 802.11n(HT40); Only the worst case is recorded in the report.
Limit:	≤8.00dBm/3kHz
Test Results:	Pass

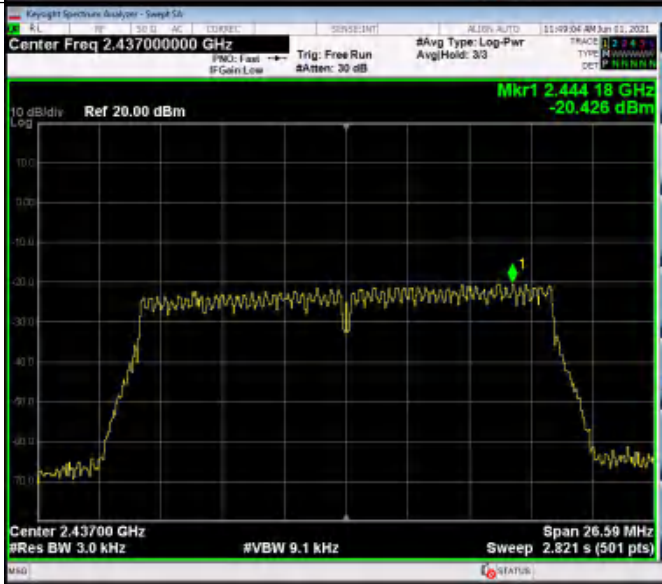
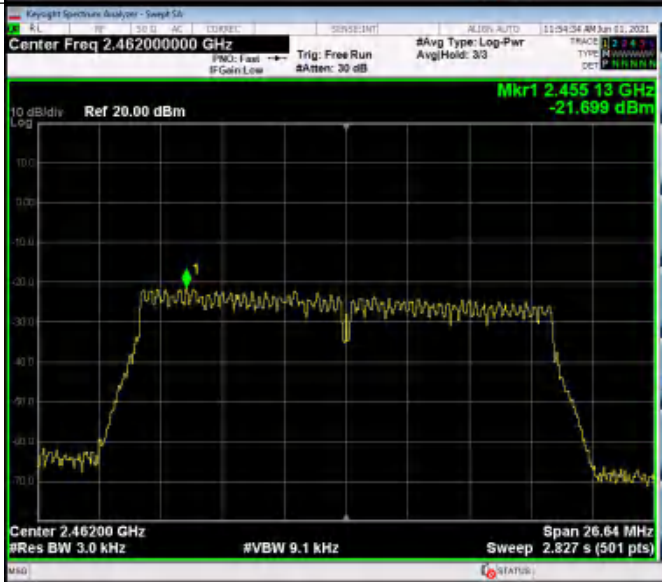
Measurement Data

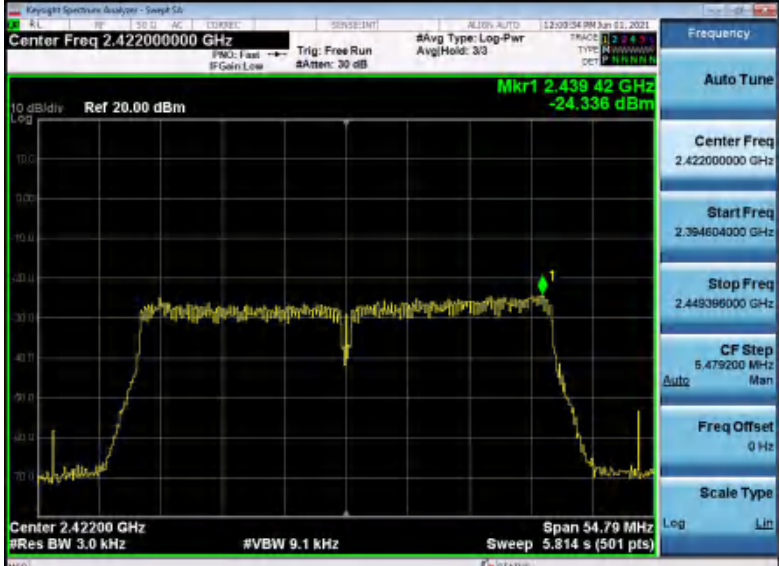
Type	Channel	Power Spectral Density (dBm/3KHz)	Limit (dBm/3KHz)	Result
802.11b	Lowes	-19.444	8	Pass
	Middle	-17.380		
	Highest	-19.247		
802.11g	Lowest	-19.756	8	Pass
	Middle	-19.82		
	Highest	-21.342		
802.11n(HT20)	Lowest	-20.847	8	Pass
	Middle	-20.426		
	Highest	-21.699		
802.11n(HT40)	Lowest	-24.336	8	Pass
	Middle	-23.427		
	Highest	-23.136		

Test plot as follows:

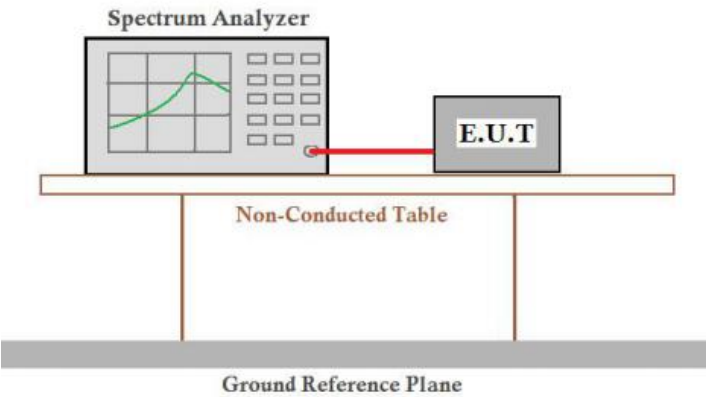


11G/LCH	
11G/MCH	
11G/HCH	

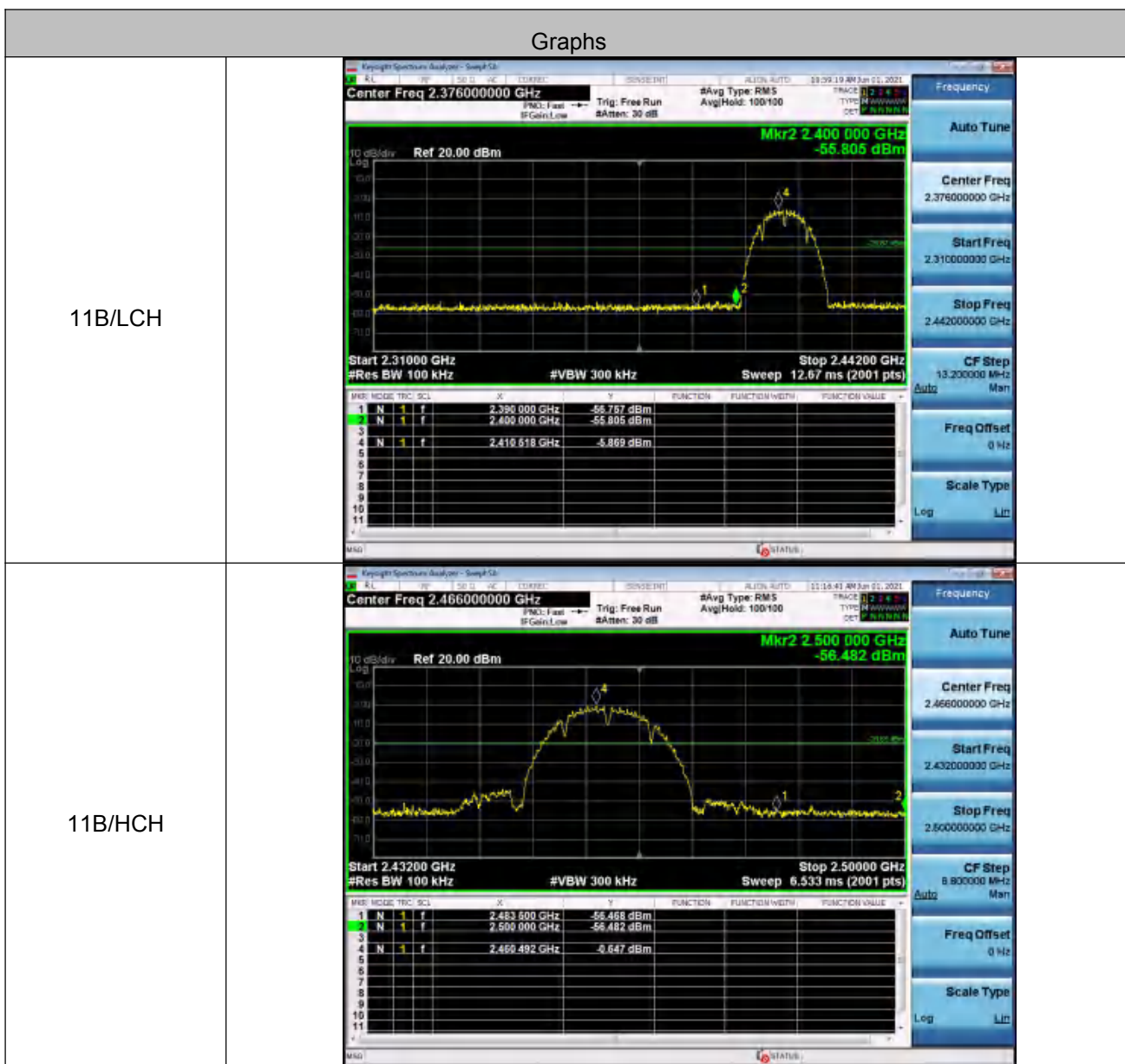
11N20/LCH	 KeySight Spectrum Analyzer - Sweep 5b Center Freq 2.41200000 GHz 10 dB/div Ref 20.00 dBm Mkr1 2.40552 GHz -20.847 dBm Center 2.41200 GHz #Res BW 3.0 kHz #VBW 9.1 kHz Span 26.76 MHz Sweep 2.839 s (501 pts) Frequency Auto Tune Center Freq 2.41200000 GHz Start Freq 2.398619250 GHz Stop Freq 2.426380750 GHz CF Step 2.676150 MHz Auto Freq Offset 0 Hz Scale Type Log Lin
11N20/MCH	 KeySight Spectrum Analyzer - Sweep 5b Center Freq 2.43700000 GHz 10 dB/div Ref 20.00 dBm Mkr1 2.44418 GHz -20.426 dBm Center 2.43700 GHz #Res BW 3.0 kHz #VBW 9.1 kHz Span 26.59 MHz Sweep 2.821 s (501 pts) Frequency Auto Tune Center Freq 2.43700000 GHz Start Freq 2.423704750 GHz Stop Freq 2.450295250 GHz CF Step 2.659050 MHz Auto Freq Offset 0 Hz Scale Type Log Lin
11N20/HCH	 KeySight Spectrum Analyzer - Sweep 5b Center Freq 2.46200000 GHz 10 dB/div Ref 20.00 dBm Mkr1 2.45513 GHz -21.699 dBm Center 2.46200 GHz #Res BW 3.0 kHz #VBW 9.1 kHz Span 26.64 MHz Sweep 2.827 s (501 pts) Frequency Auto Tune Center Freq 2.46200000 GHz Start Freq 2.448677750 GHz Stop Freq 2.475322250 GHz CF Step 2.654450 MHz Auto Freq Offset 0 Hz Scale Type Log Lin

11N40/LCH	 KeySight Spectrum Analyzer - Sweep 5b Center Freq 2.42200000 GHz Mkr1 2.43942 GHz -24.336 dBm Center 2.42200 GHz #Res BW 3.0 kHz #VBW 9.1 kHz Span 54.79 MHz Sweep 5.814 s (501 pts)
11N40/MCH	 KeySight Spectrum Analyzer - Sweep 5b Center Freq 2.43700000 GHz Mkr1 2.44327 GHz -23.427 dBm Center 2.43700 GHz #Res BW 3.0 kHz #VBW 9.1 kHz Span 54.05 MHz Sweep 5.735 s (501 pts)
11N40/HCH	 KeySight Spectrum Analyzer - Sweep 5b Center Freq 2.45200000 GHz Mkr1 2.44857 GHz -23.136 dBm Center 2.45200 GHz #Res BW 3.0 kHz #VBW 9.1 kHz Span 53.65 MHz Sweep 5.692 s (501 pts)

5.6 Band-edge for RF Conducted Emissions

Test Requirement:	47 CFR Part 15C Section 15.247 (d)
Test Method:	ANSI C63.10: 2013
Test Setup:	 Offset=cable loss+ attenuation factor
Exploratory Test Mode:	Transmitting with all kind of modulations, data rates
Final Test Mode:	Through Pre-scan, find the 1Mbps of rate is the worst case of 802.11b; 6Mbps of rate is the worst case of 802.11g ; 6.5Mbps of rate is the worst case of 802.11n(HT20) ; 13.5Mbps of rate is the worst case of 802.11n(HT40); Only the worst case is recorded in the report.
Limit:	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 20 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 Results:	Pass

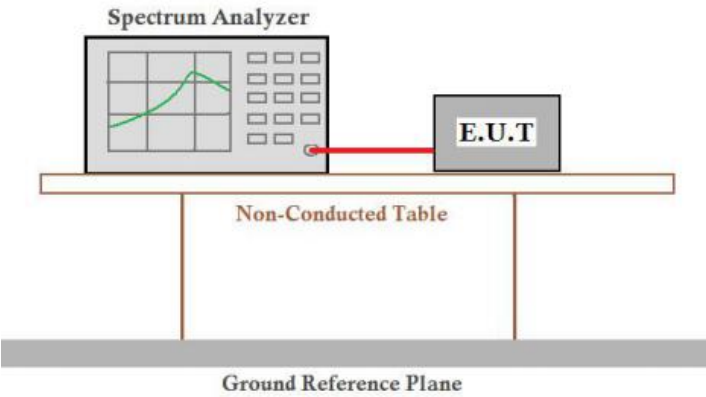
Test plot as follows:



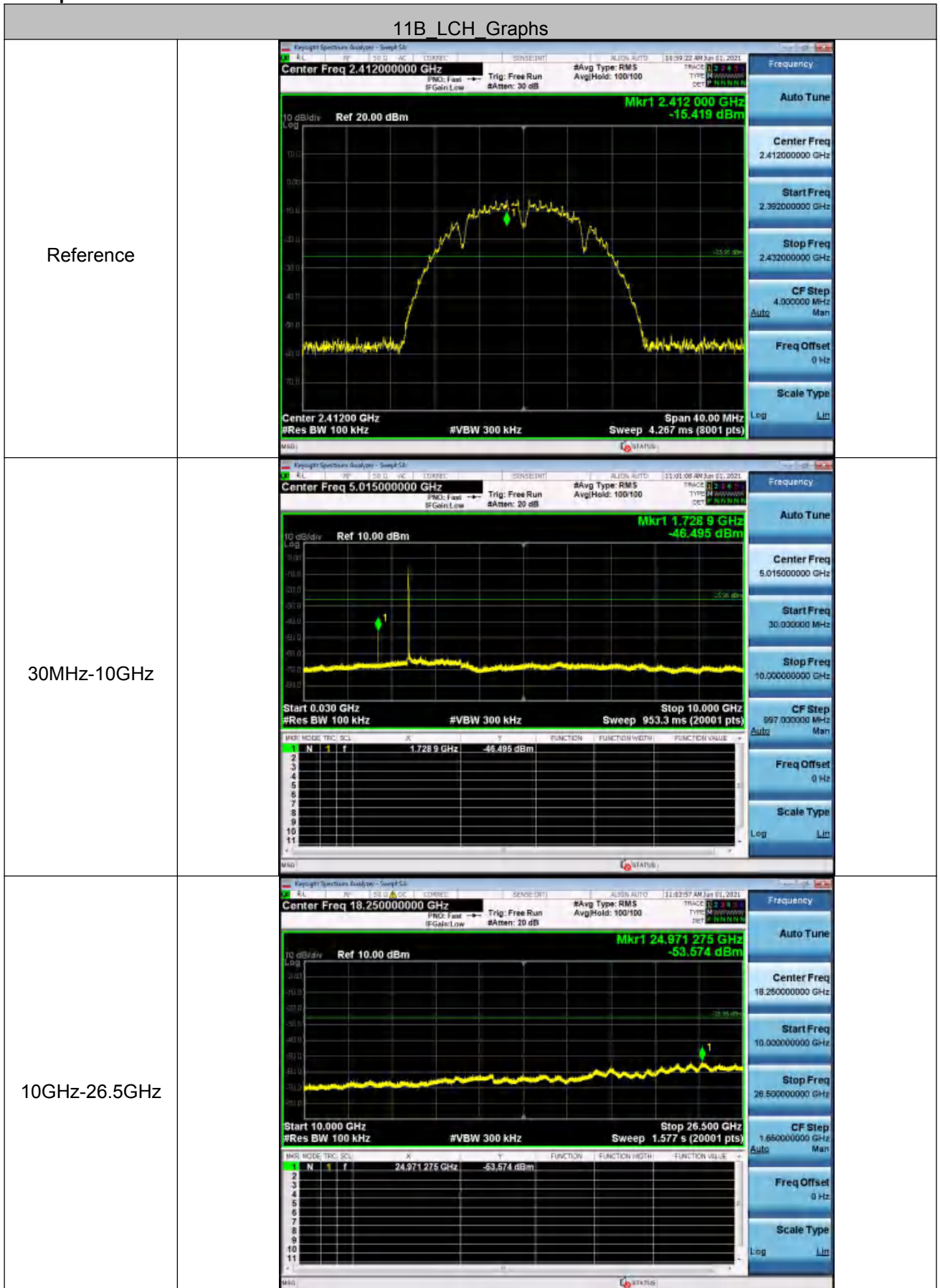
11G/LCH	KeySight Spectrum Analyzer - Sample 53 Center Freq 2.376000000 GHz 10 dB/div Ref 20.00 dBm Mkr2 2.400 000 GHz -43.026 dBm Start 2.31000 GHz #Res BW 100 kHz #VBW 300 kHz Stop 2.44200 GHz Sweep 12.67 ms (2001 pts) <table><thead><tr><th>PKR</th><th>MODE</th><th>TRC</th><th>SCL</th><th>X</th><th>Y</th><th>FUNCTION</th><th>FUNCTION WIDTH</th><th>FUNCTION VALUE</th></tr></thead><tbody><tr><td>1</td><td>N</td><td>1</td><td>f</td><td>2.390 000 GHz</td><td>-54.844 dBm</td><td></td><td></td><td></td></tr><tr><td>2</td><td>N</td><td>1</td><td>f</td><td>2.400 000 GHz</td><td>-43.026 dBm</td><td></td><td></td><td></td></tr><tr><td>3</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>4</td><td>N</td><td>1</td><td>f</td><td>2.405 106 GHz</td><td>-5.671 dBm</td><td></td><td></td><td></td></tr></tbody></table> Frequency Auto Tune Center Freq 2.376000000 GHz Start Freq 2.310000000 GHz Stop Freq 2.442000000 GHz CF Step 13.200000 MHz Man Freq Offset 0 Hz Scale Type Log Lin	PKR	MODE	TRC	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE	1	N	1	f	2.390 000 GHz	-54.844 dBm				2	N	1	f	2.400 000 GHz	-43.026 dBm				3									4	N	1	f	2.405 106 GHz	-5.671 dBm			
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11G/HCH	KeySight Spectrum Analyzer - Sample 53 Center Freq 2.466000000 GHz 10 dB/div Ref 20.00 dBm Mkr2 2.500 000 GHz -56.705 dBm Start 2.43200 GHz #Res BW 100 kHz #VBW 300 kHz Stop 2.50000 GHz Sweep 6.533 ms (2001 pts) <table><thead><tr><th>PKR</th><th>MODE</th><th>TRC</th><th>SCL</th><th>X</th><th>Y</th><th>FUNCTION</th><th>FUNCTION WIDTH</th><th>FUNCTION VALUE</th></tr></thead><tbody><tr><td>1</td><td>N</td><td>1</td><td>f</td><td>2.483 600 GHz</td><td>-54.426 dBm</td><td></td><td></td><td></td></tr><tr><td>2</td><td>N</td><td>1</td><td>f</td><td>2.500 000 GHz</td><td>-56.705 dBm</td><td></td><td></td><td></td></tr><tr><td>3</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>4</td><td>N</td><td>1</td><td>f</td><td>2.457 262 GHz</td><td>-6.977 dBm</td><td></td><td></td><td></td></tr></tbody></table> Frequency Auto Tune Center Freq 2.466000000 GHz Start Freq 2.432000000 GHz Stop Freq 2.500000000 GHz CF Step 8.800000 MHz Man Freq Offset 0 Hz Scale Type Log Lin	PKR	MODE	TRC	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE	1	N	1	f	2.483 600 GHz	-54.426 dBm				2	N	1	f	2.500 000 GHz	-56.705 dBm				3									4	N	1	f	2.457 262 GHz	-6.977 dBm			
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11N20/LCH	KeySight Spectrum Analyzer - Sample 53 Center Freq 2.376000000 GHz 10 dB/div Ref 20.00 dBm Mkr2 2.400 000 GHz -48.119 dBm Start 2.31000 GHz #Res BW 100 kHz #VBW 300 kHz Stop 2.44200 GHz Sweep 12.67 ms (2001 pts) <table><thead><tr><th>PKR</th><th>MODE</th><th>TRC</th><th>SCL</th><th>X</th><th>Y</th><th>FUNCTION</th><th>FUNCTION WIDTH</th><th>FUNCTION VALUE</th></tr></thead><tbody><tr><td>1</td><td>N</td><td>1</td><td>f</td><td>2.390 000 GHz</td><td>-55.291 dBm</td><td></td><td></td><td></td></tr><tr><td>2</td><td>N</td><td>1</td><td>f</td><td>2.400 000 GHz</td><td>-48.119 dBm</td><td></td><td></td><td></td></tr><tr><td>3</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>4</td><td>N</td><td>1</td><td>f</td><td>2.405 132 GHz</td><td>-7.276 dBm</td><td></td><td></td><td></td></tr></tbody></table> Frequency Auto Tune Center Freq 2.376000000 GHz Start Freq 2.310000000 GHz Stop Freq 2.442000000 GHz CF Step 13.200000 MHz Man Freq Offset 0 Hz Scale Type Log Lin	PKR	MODE	TRC	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE	1	N	1	f	2.390 000 GHz	-55.291 dBm				2	N	1	f	2.400 000 GHz	-48.119 dBm				3									4	N	1	f	2.405 132 GHz	-7.276 dBm			
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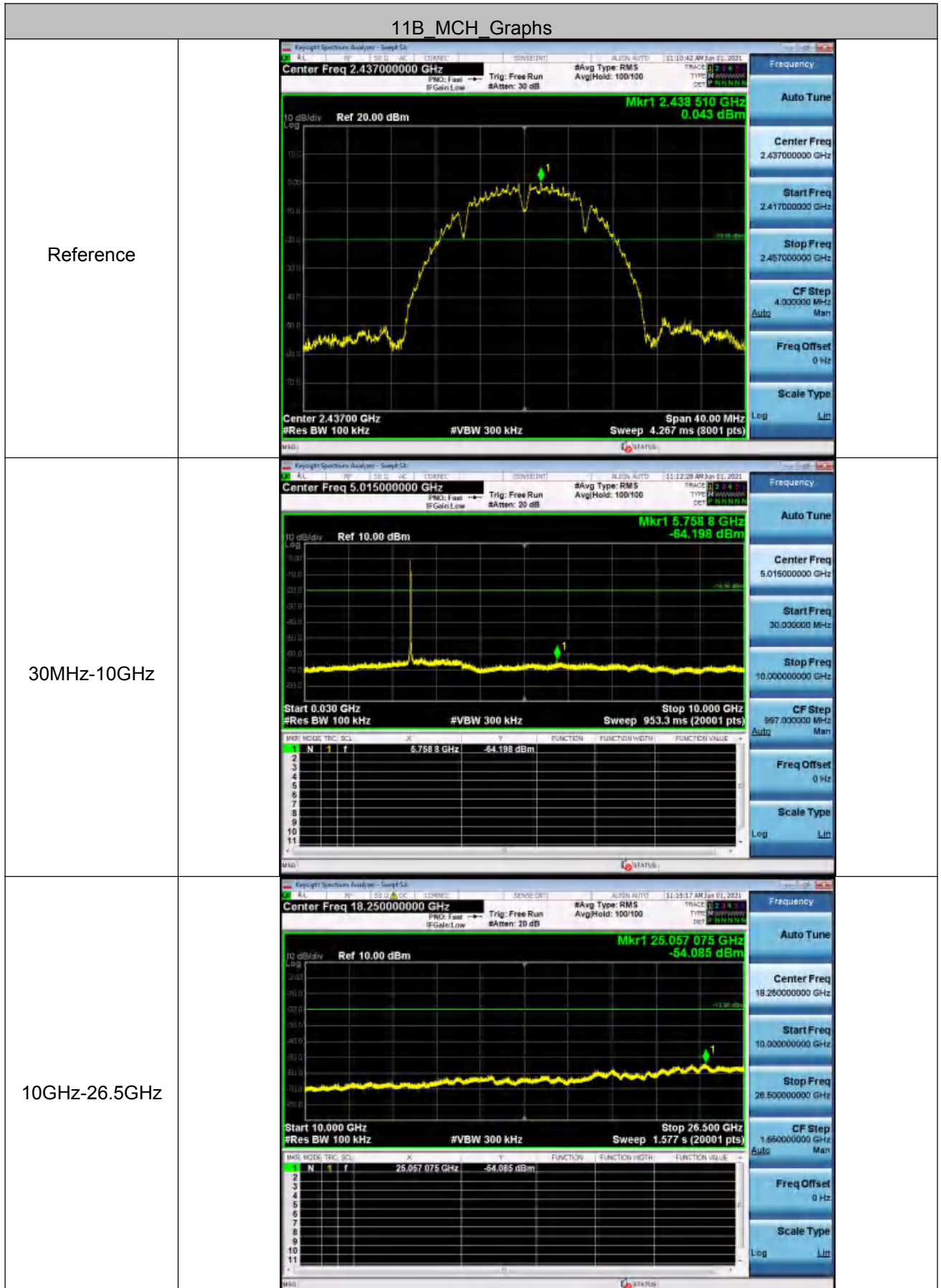
11N20/HCH	Keyight Spectrum Analyzer - Sweep 54 Center Freq 2.466000000 GHz 10 dB/div Ref 20.00 dBm Mkr2 2.500 000 GHz -54.518 dBm Start 2.43200 GHz #Res BW 100 kHz #VBW 300 kHz Sweep 6.533 ms (2001 pts) <table><thead><tr><th>MR</th><th>MODE</th><th>TRC</th><th>SCL</th><th>X</th><th>Y</th><th>FUNCTION</th><th>FUNCTION WIDTH</th><th>FUNCTION VALUE</th></tr></thead><tbody><tr><td>1</td><td>N</td><td>1</td><td>f</td><td>2.483 500 GHz</td><td>-56.098 dBm</td><td></td><td></td><td></td></tr><tr><td>2</td><td>N</td><td>1</td><td>f</td><td>2.500 000 GHz</td><td>-54.518 dBm</td><td></td><td></td><td></td></tr><tr><td>3</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>4</td><td>N</td><td>1</td><td>f</td><td>2.464 168 GHz</td><td>-7.815 dBm</td><td></td><td></td><td></td></tr><tr><td>5</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>6</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>7</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>8</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>9</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>10</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>11</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></tbody></table> Frequency Auto Tune Center Freq 2.466000000 GHz Start Freq 2.432000000 GHz Stop Freq 2.500000000 GHz CF Step 8.8000000 MHz Freq Offset 0 Hz Scale Type Log Lin	MR	MODE	TRC	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE	1	N	1	f	2.483 500 GHz	-56.098 dBm				2	N	1	f	2.500 000 GHz	-54.518 dBm				3									4	N	1	f	2.464 168 GHz	-7.815 dBm				5									6									7									8									9									10									11								
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11N40/HCH	Keyight Spectrum Analyzer - Sweep 54 Center Freq 2.446000000 GHz 10 dB/div Ref 20.00 dBm Mkr2 2.500 000 GHz -56.359 dBm Start 2.39200 GHz #Res BW 100 kHz #VBW 300 kHz Sweep 10.40 ms (2001 pts) <table><thead><tr><th>MR</th><th>MODE</th><th>TRC</th><th>SCL</th><th>X</th><th>Y</th><th>FUNCTION</th><th>FUNCTION WIDTH</th><th>FUNCTION VALUE</th></tr></thead><tbody><tr><td>1</td><td>N</td><td>1</td><td>f</td><td>2.483 500 GHz</td><td>-55.304 dBm</td><td></td><td></td><td></td></tr><tr><td>2</td><td>N</td><td>1</td><td>f</td><td>2.500 000 GHz</td><td>-56.359 dBm</td><td></td><td></td><td></td></tr><tr><td>3</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>4</td><td>N</td><td>1</td><td>f</td><td>2.447 242 GHz</td><td>-9.881 dBm</td><td></td><td></td><td></td></tr><tr><td>5</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>6</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>7</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>8</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>9</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>10</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>11</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></tbody></table> Frequency Auto Tune Center Freq 2.446000000 GHz Start Freq 2.392000000 GHz Stop Freq 2.500000000 GHz CF Step 10.8000000 MHz Freq Offset 0 Hz Scale Type Log Lin	MR	MODE	TRC	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE	1	N	1	f	2.483 500 GHz	-55.304 dBm				2	N	1	f	2.500 000 GHz	-56.359 dBm				3									4	N	1	f	2.447 242 GHz	-9.881 dBm				5									6									7									8									9									10									11								
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5.7 RF Conducted Spurious Emissions

Test Requirement:	47 CFR Part 15C Section 15.247 (d)
Test Method:	ANSI C63.10: 2013
Test Setup:	 Offset=cable loss+ attenuation factor
Exploratory Test Mode:	Transmitting with all kind of modulations, data rates
Final Test Mode:	Through Pre-scan, find the 1Mbps of rate is the worst case of 802.11b; 6Mbps of rate is the worst case of 802.11g; 6.5Mbps of rate is the worst case of 802.11n(HT20); 13.5Mbps of rate is the worst case of 802.11n(HT40); Only the worst case is recorded in the report.
Limit:	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 20 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 Results:	Pass

Test plot as follows:



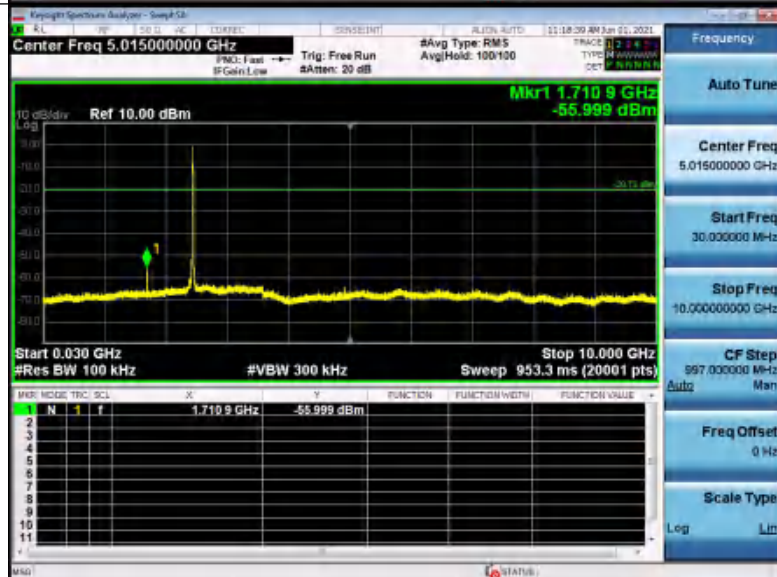


11B_HCH_Graphs

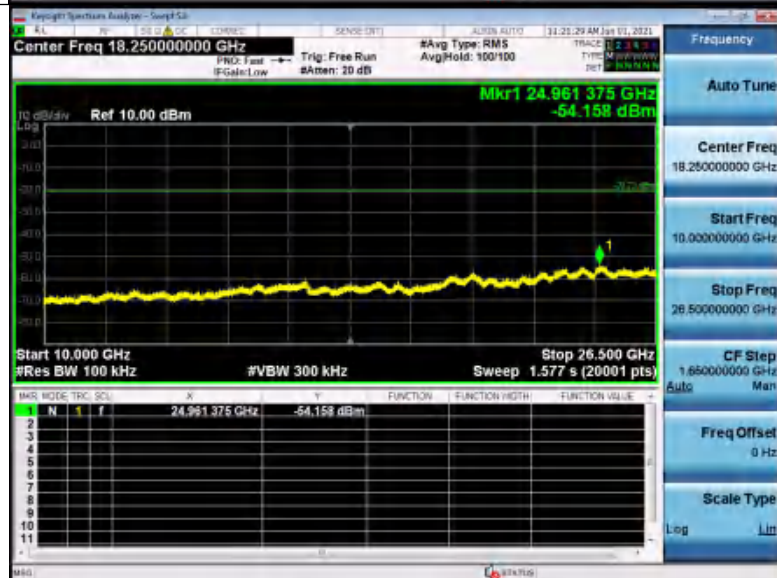
Reference



30MHz-10GHz

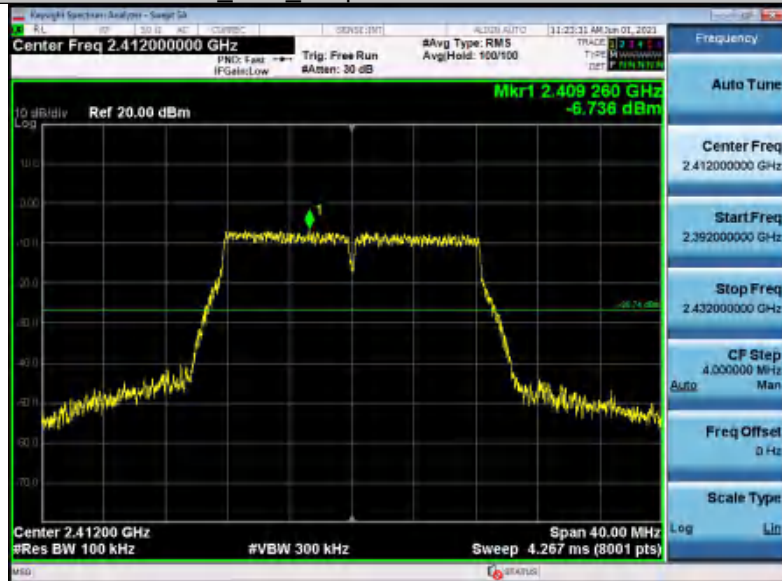


10GHz-26.5GHz

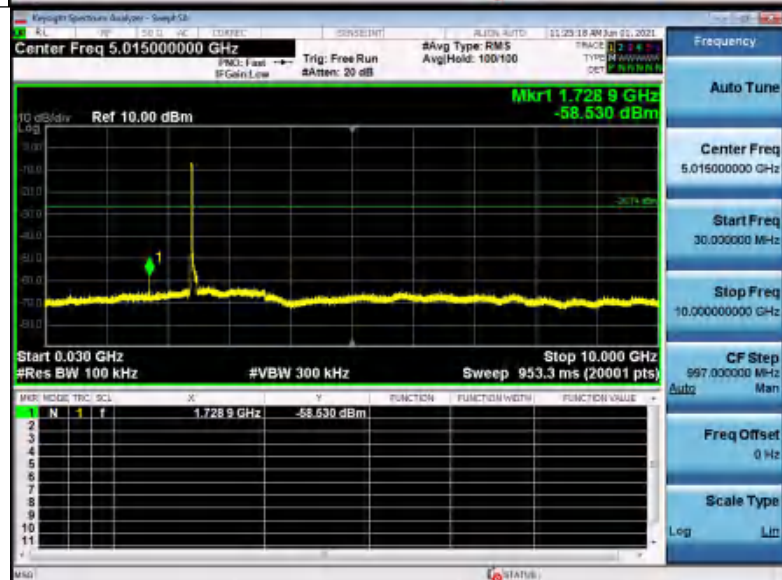


11G_LCH_Graphs

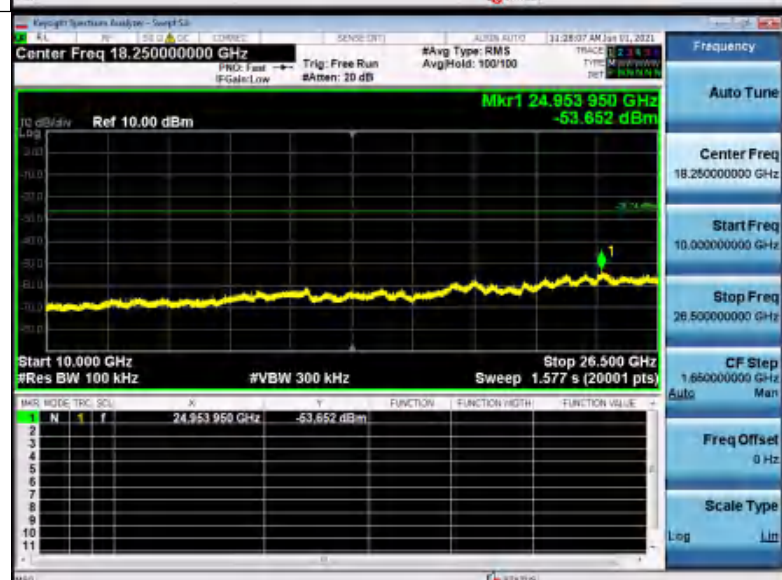
Reference

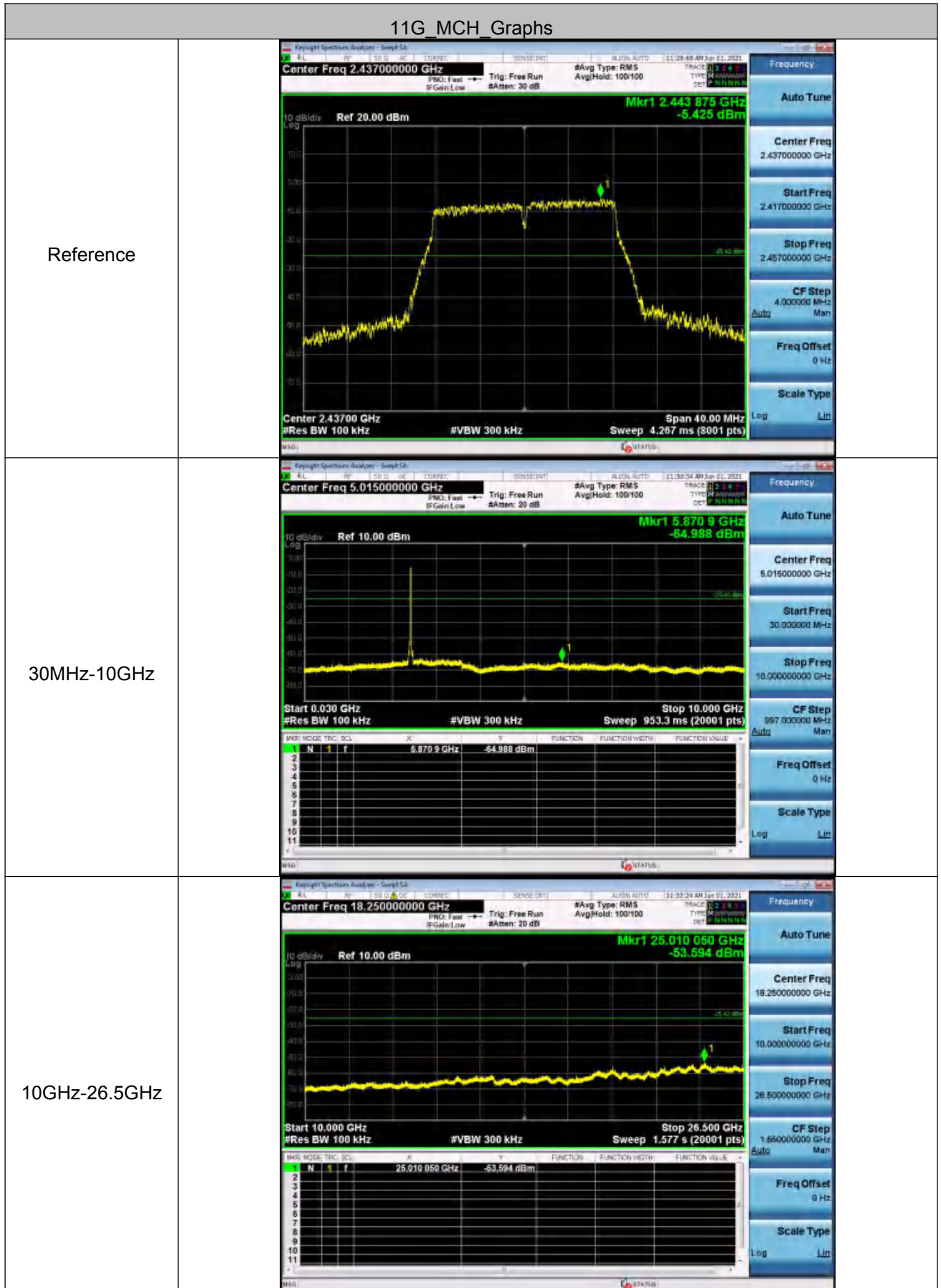


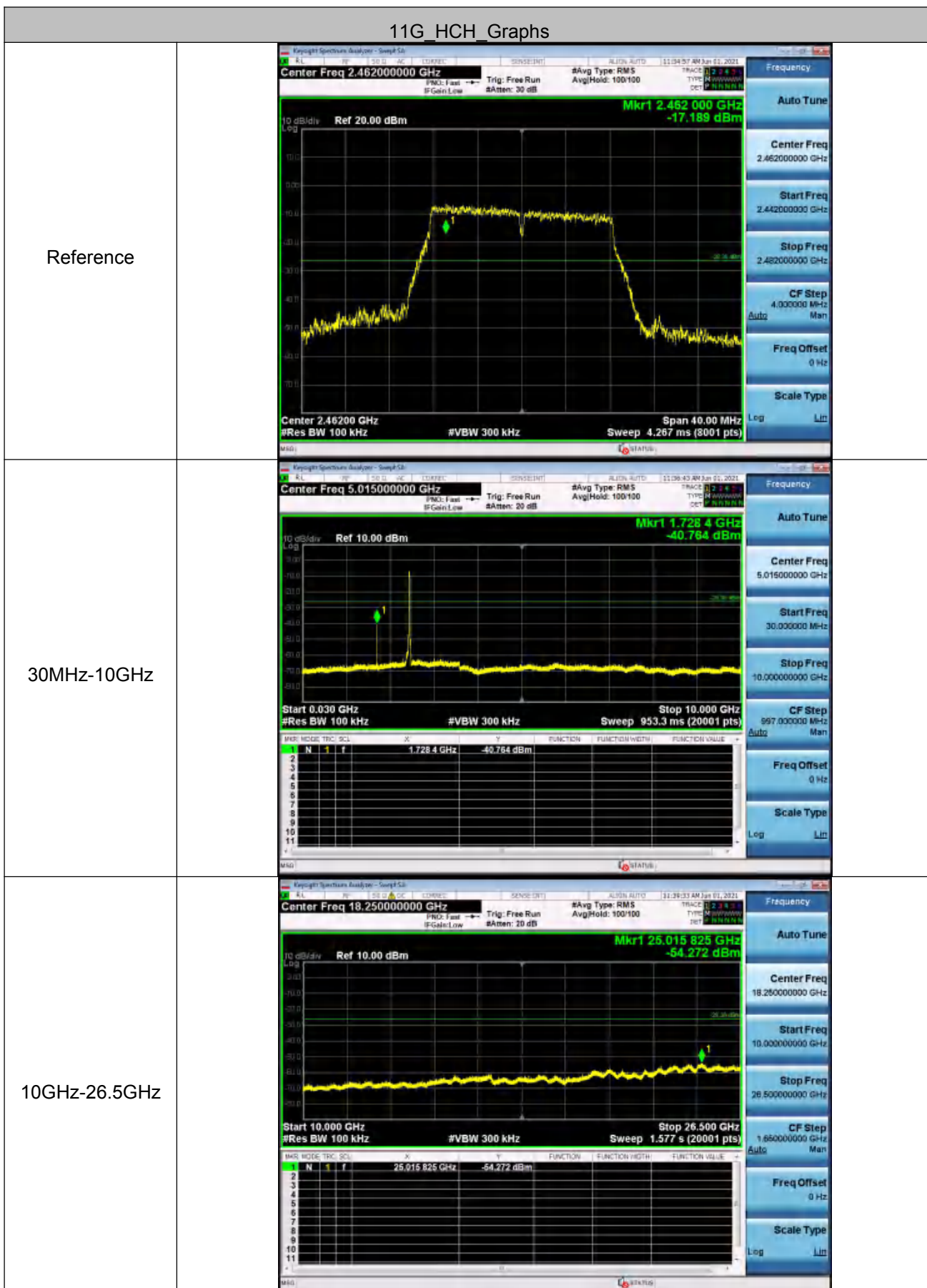
30MHz-10GHz



10GHz-26.5GHz





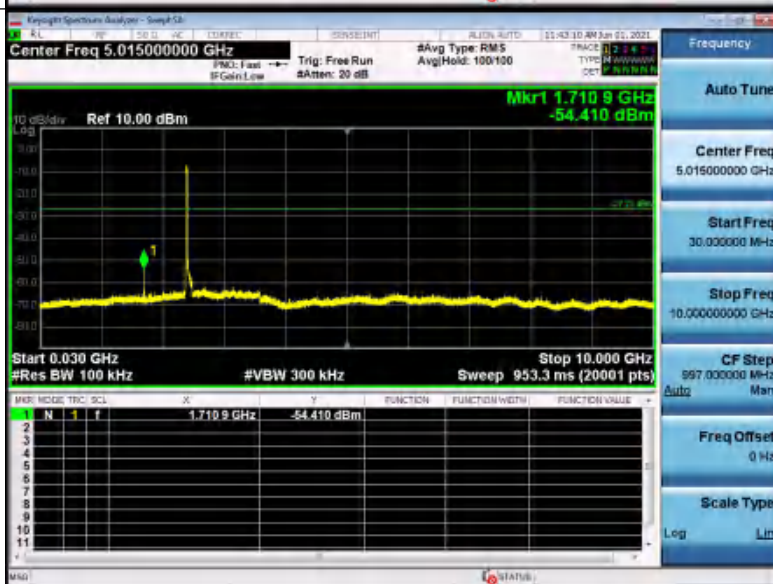


11N20_LCH_Graphs

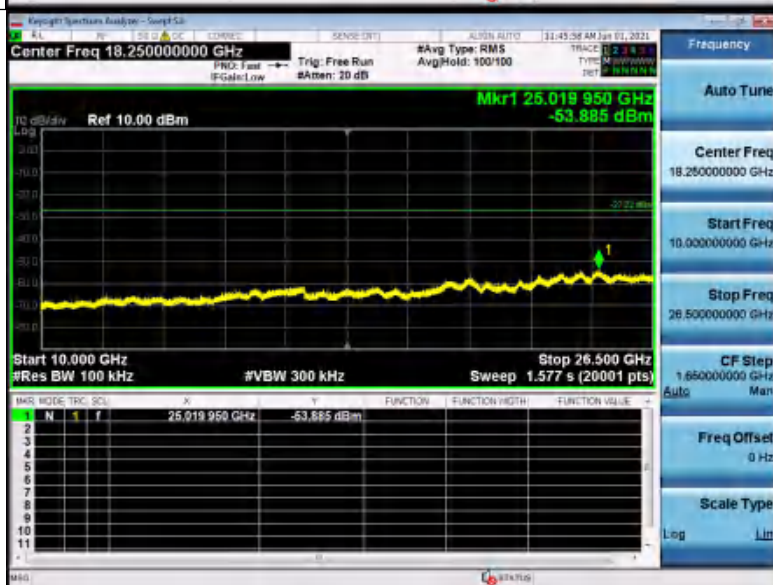
Reference

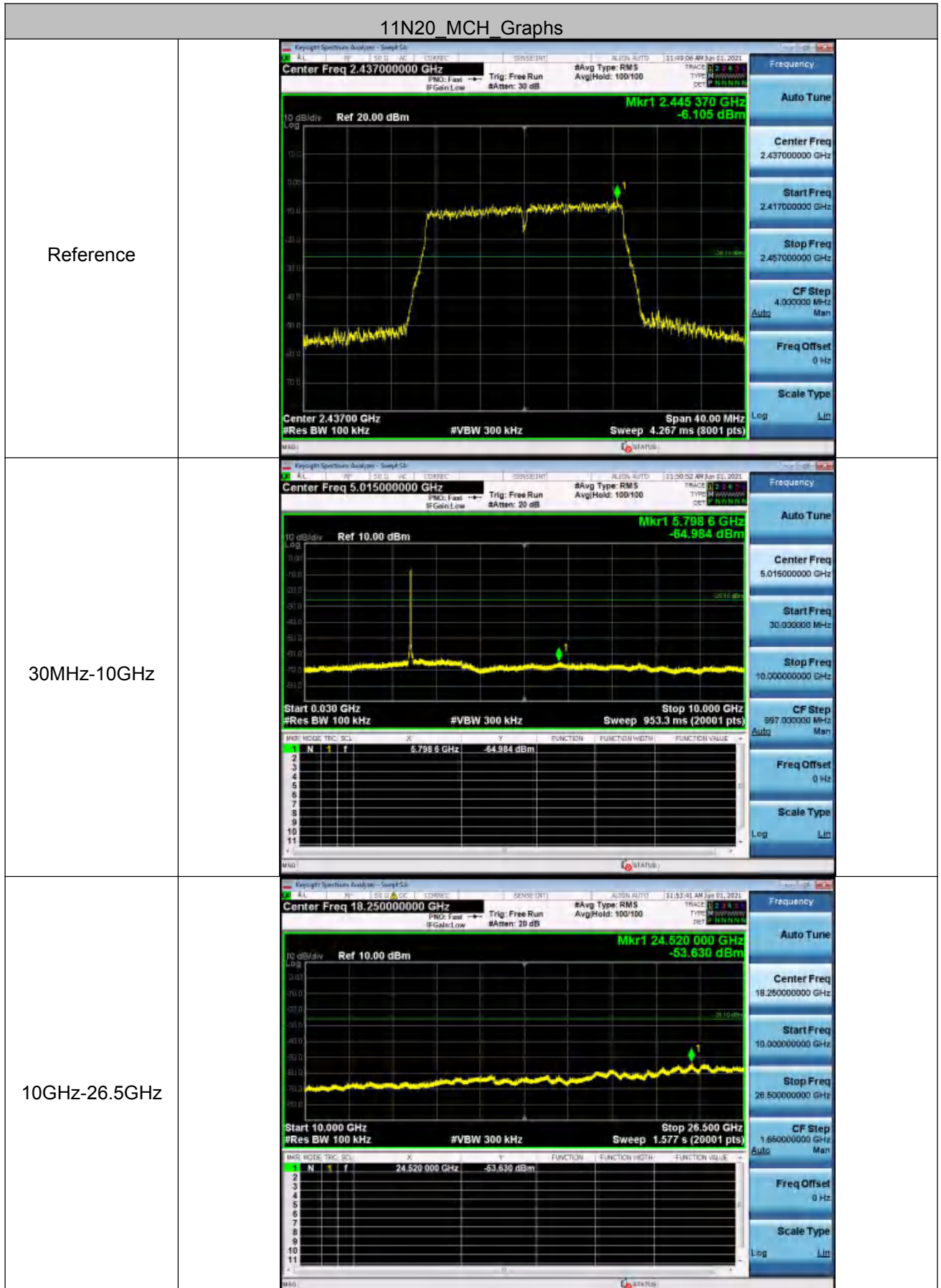


30MHz-10GHz



10GHz-26.5GHz



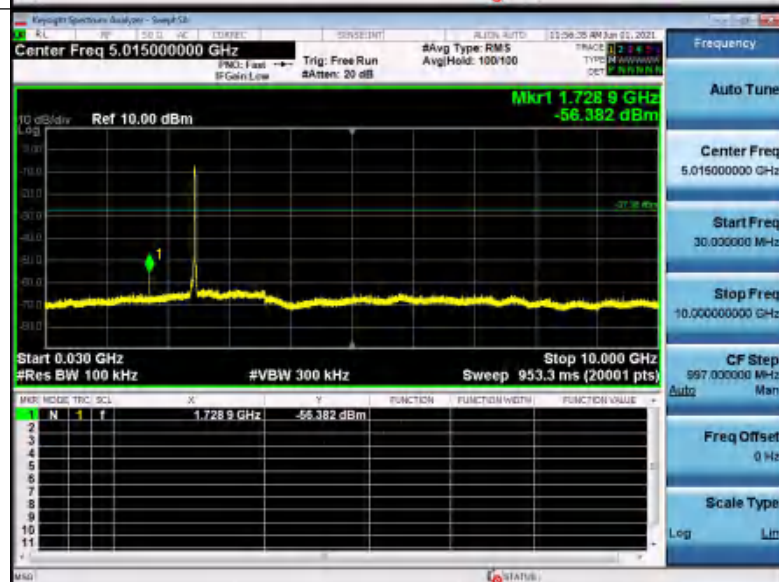


11N20_HCH_Graphs

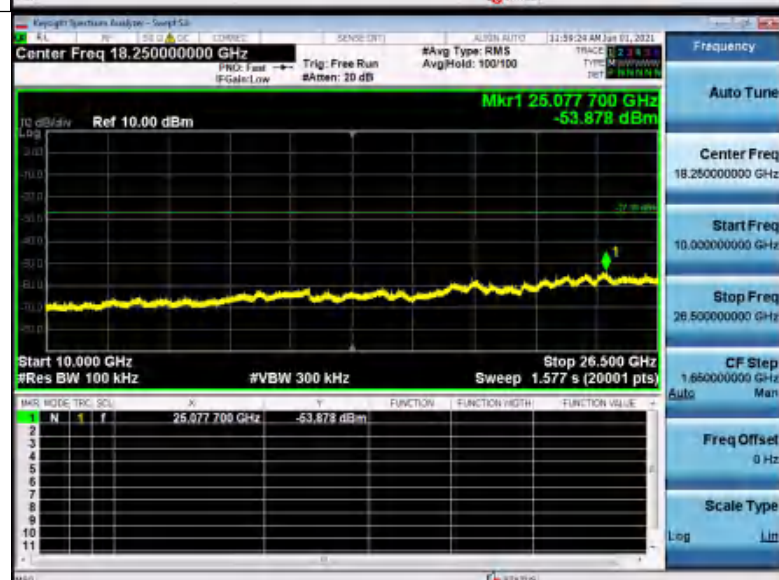
Reference



30MHz-10GHz



10GHz-26.5GHz

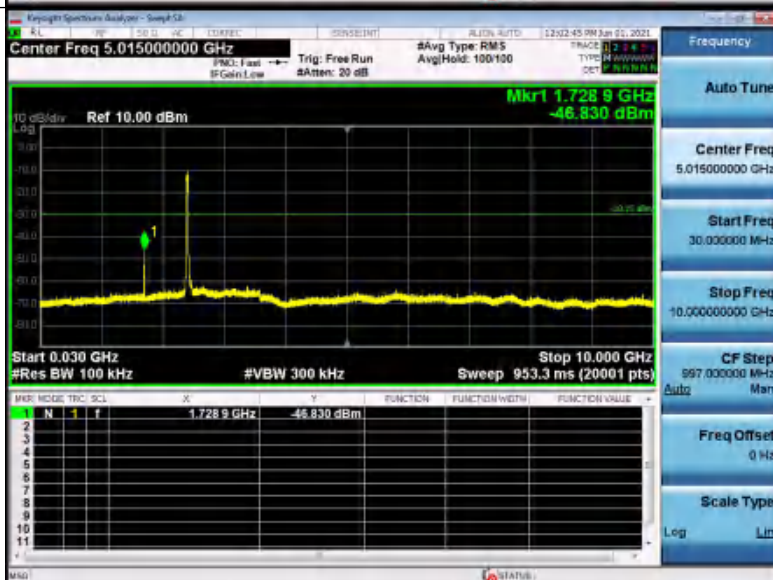


11N40_LCH_Graphs

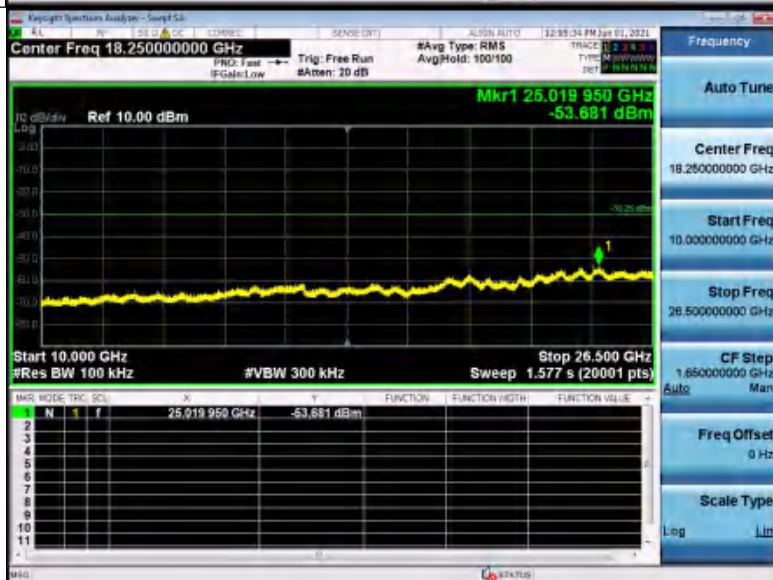
Reference



30MHz-10GHz



10GHz-26.5GHz

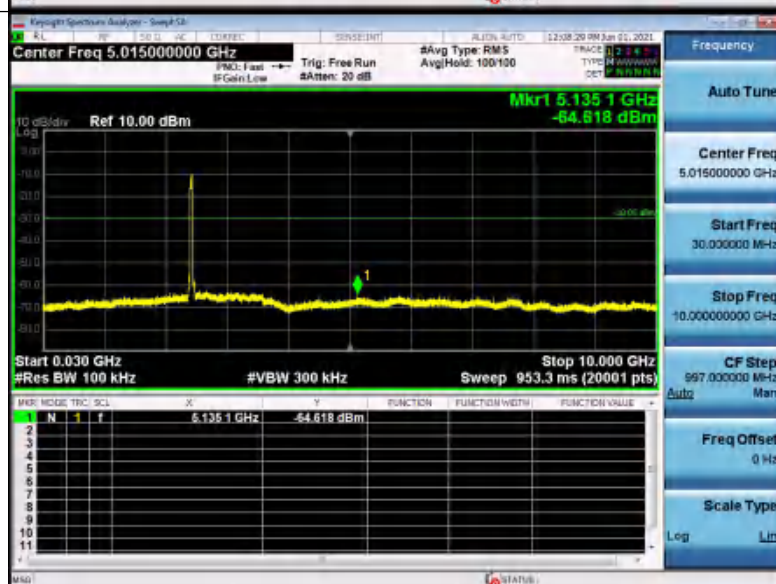


11N40 MCH Graphs

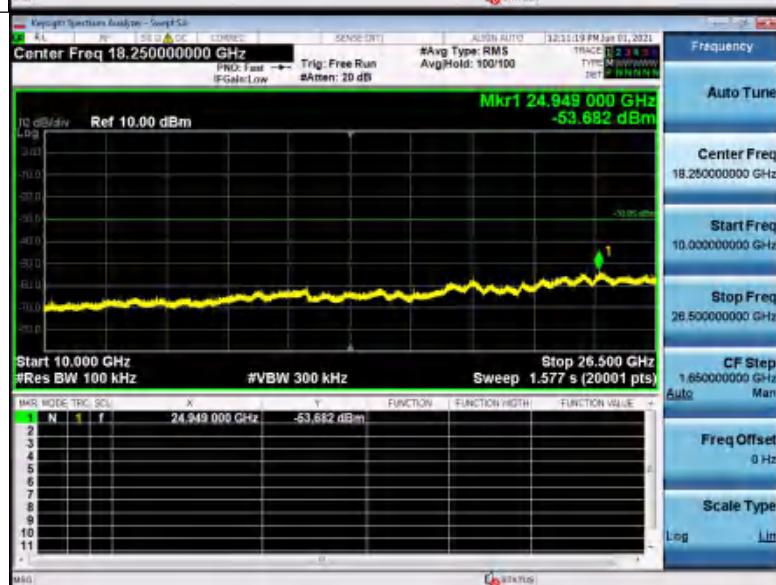
Reference



30MHz-10GHz



10GHz-26.5GHz

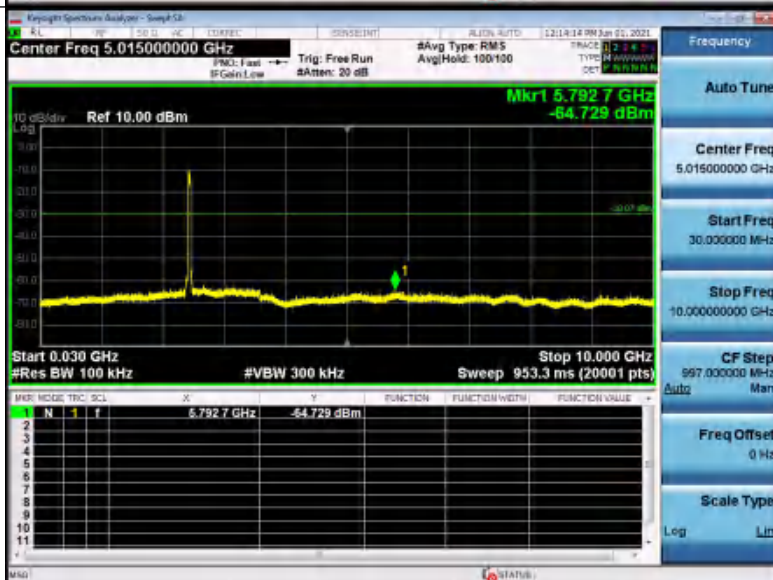


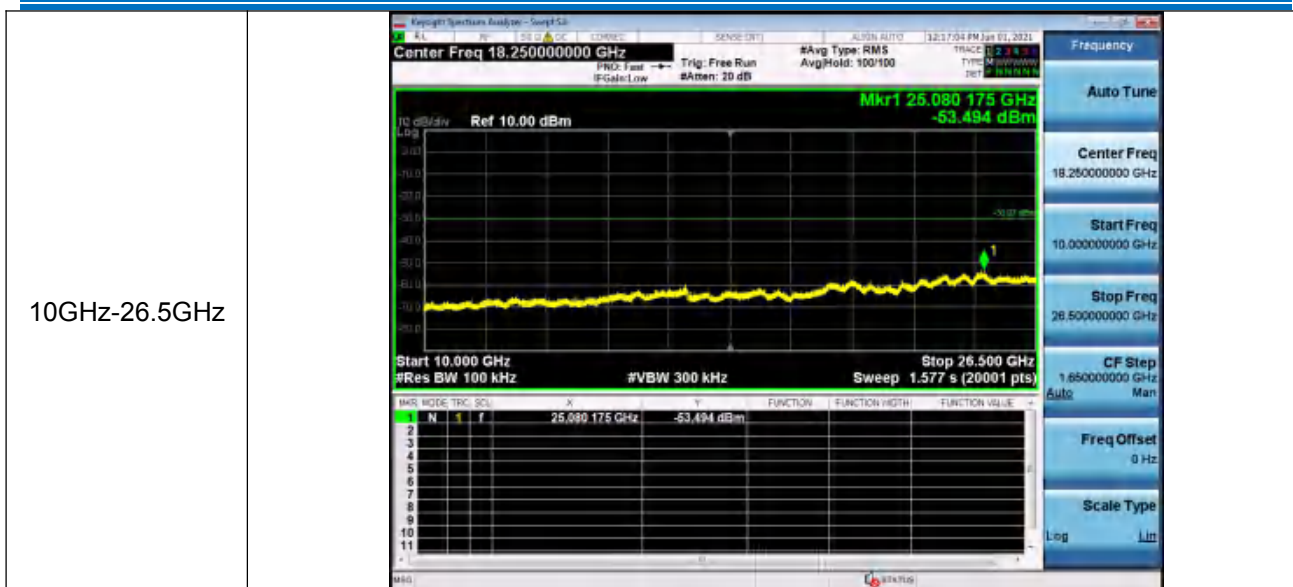
11N40_HCH_Graphs

Reference



30MHz-10GHz





Remark:

Pretest 9kHz to 25GHz, find the highest point when testing, so only the worst data were shown in the test report. Per FCC Part 15.33 (a) and 15.31 (o) ,The amplitude of spurious emissions from intentional radiators which are attenuated more than 20 dB below the permissible value need not be reported unless specifically required elsewhere in this part.

5.8 Radiated Spurious Emissions

Test Requirement:	47 CFR Part 15C Section 15.209 and 15.205				
Test Method:	ANSI C63.10 2013				
Test Site:	Measurement Distance: 3m (Semi-Anechoic Chamber)				
Receiver Setup:	Frequency	Detector	RBW	VBW	Remark
	0.009MHz-0.090MHz	Peak	10kHz	30kHz	Peak
	0.009MHz-0.090MHz	Average	10kHz	30kHz	Average
	0.090MHz-0.110MHz	Quasi-peak	10kHz	30kHz	Quasi-peak
	0.110MHz-0.490MHz	Peak	10kHz	30kHz	Peak
	0.110MHz-0.490MHz	Average	10kHz	30kHz	Average
	0.490MHz -30MHz	Quasi-peak	10kHz	30kHz	Quasi-peak
	30MHz-1GHz	Quasi-peak	100 kHz	300kHz	Quasi-peak
	Above 1GHz	Peak	1MHz	3MHz	Peak
		Peak	1MHz	10Hz	Average
Limit:	Frequency	Field strength (microvolt/meter)	Limit (dBuV/m)	Remark	Measurement distance (m)
	0.009MHz-0.490MHz	2400/F(kHz)	-	-	300
	0.490MHz-1.705MHz	24000/F(kHz)	-	-	30
	1.705MHz-30MHz	30	-	-	30
	30MHz-88MHz	100	40.0	Quasi-peak	3
	88MHz-216MHz	150	43.5	Quasi-peak	3
	216MHz-960MHz	200	46.0	Quasi-peak	3
	960MHz-1GHz	500	54.0	Quasi-peak	3
	Above 1GHz	500	54.0	Average	3
	Note: 15.35(b), Unless otherwise specified, the limit on peak radio frequency emissions is 20dB above the maximum permitted average emission limit applicable to the equipment under test. This peak limit applies to the total peak emission level radiated by the device.				

Test Setup:

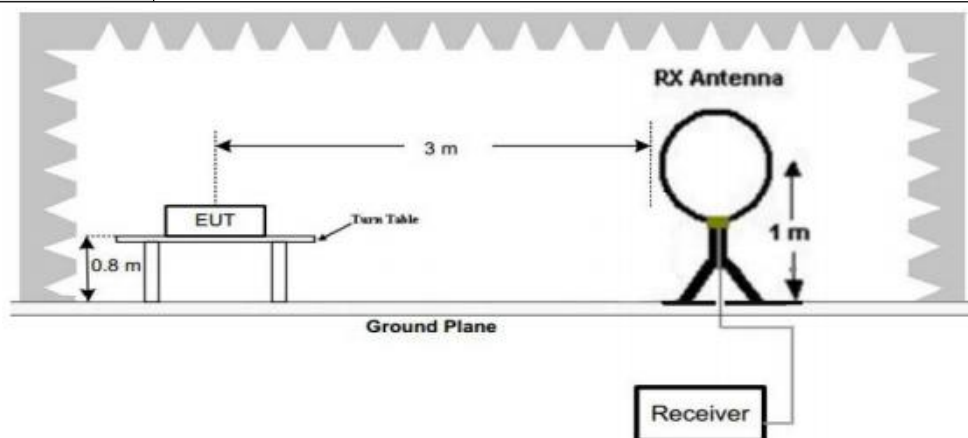


Figure 1. Below 30MHz

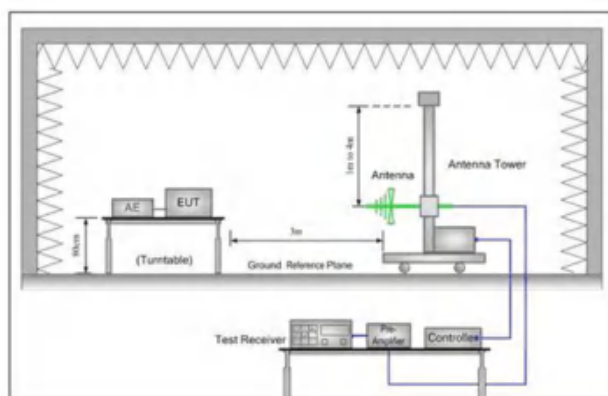


Figure 2. 30MHz to 1GHz

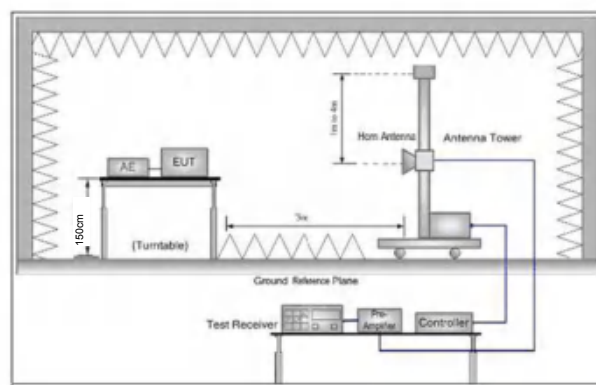


Figure 3. Above 1 GHz

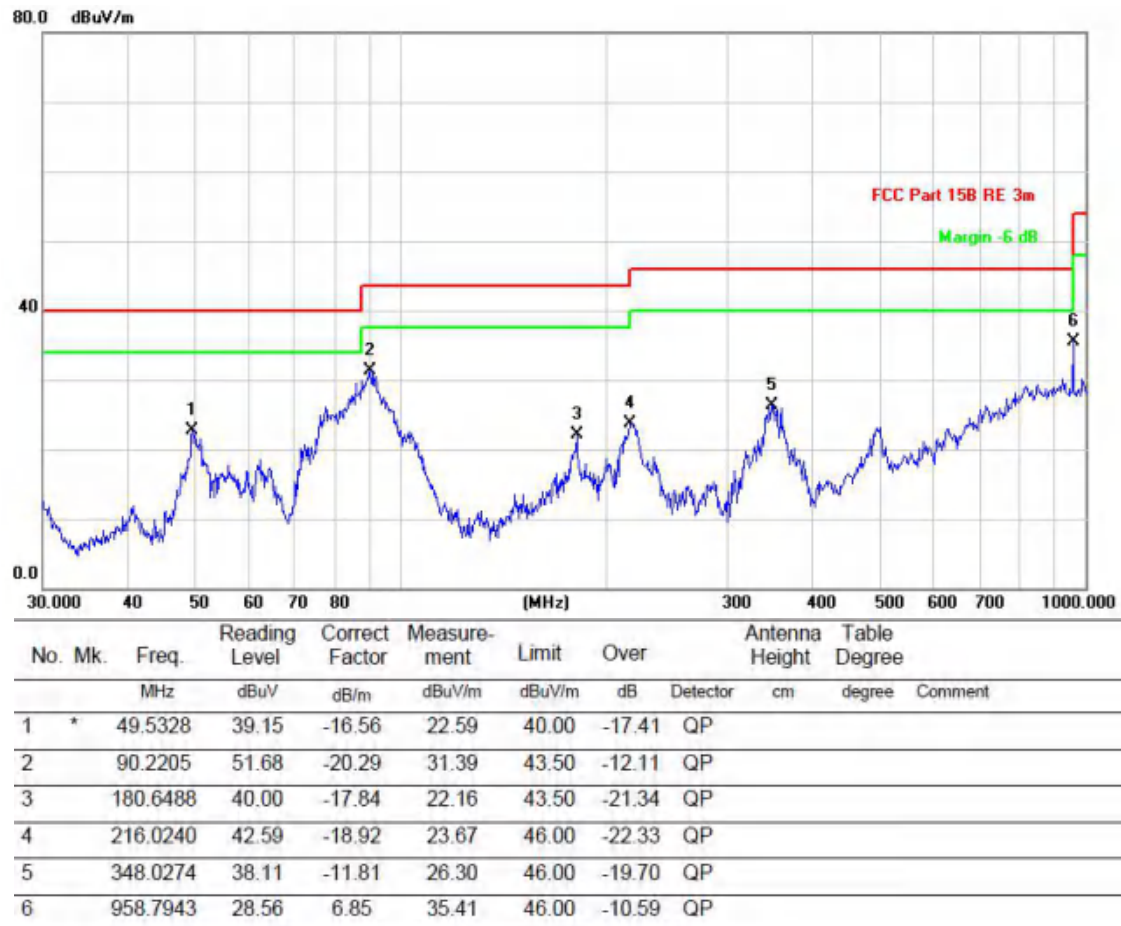
Test Procedure:

- a. 1) Below 1G: The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
2) Above 1G: The EUT was placed on the top of a rotating table 1.5 meters above the ground at a 3 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
Note: For the radiated emission test above 1GHz:
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.
- b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- c. The antenna height 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.

	d. 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 (for the test frequency of below 30MHz, the antenna was tuned to heights 1 meter) and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading. e. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode. f. If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet. g. Test the EUT in the lowest channel, the middle channel, the Highest channel h. Repeat above procedures until all frequencies measured was complete.
Exploratory Test Mode:	Transmitting with all kind of modulations, data rates. Transmitting mode,
Final Test Mode:	Through Pre-scan, find the 1Mbps of rate is the worst case of 802.11b; 6Mbps of rate is the worst case of 802.11g ; 6.5Mbps of rate is the worst case of 802.11n(HT20) ; 13.5Mbps of rate is the worst case of 802.11n(HT40) For below 1GHz, through Pre-scan, find the 1Mbps of rate of 802.11b at lowest channel is the worst case.
Test Results:	Pass

5.8.1 Radiated emission below 1GHz

30MHz~1GHz		
Test mode:	Transmitting	Vertical



Remark:

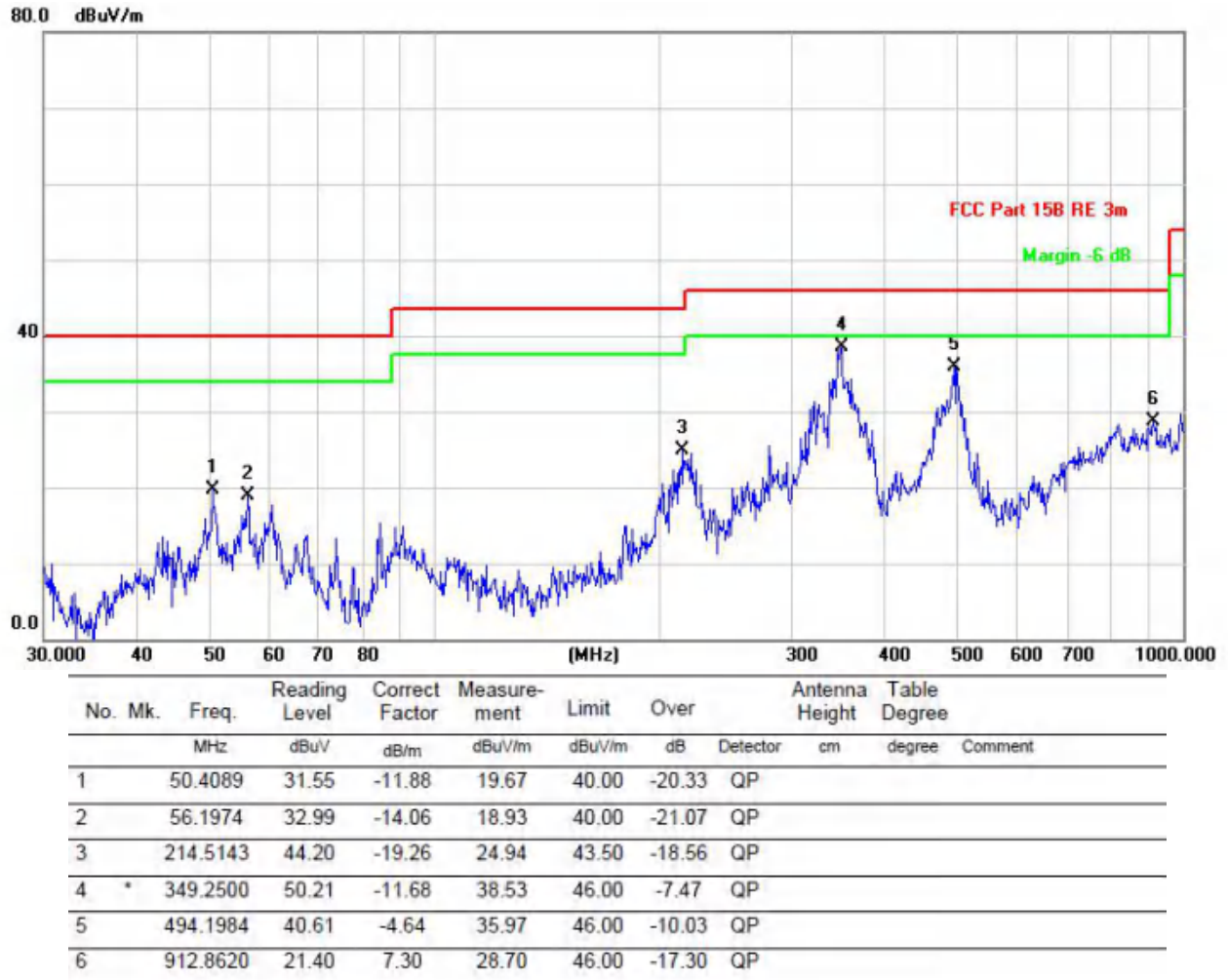
The field strength is calculated by adding the Antenna Factor, Cable Factor & Preamplifier. The basic equation with a sample calculation is as follows:

Factor= Antenna Factor + Cable Factor – Preamplifier Factor,

Level = Read Level + Factor,

Over Limit=Level-Limit Line.

Test mode:	Transmitting	Horizontal
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Remark:

The field strength is calculated by adding the Antenna Factor, Cable Factor & Preamplifier. The basic equation with a sample calculation is as follows:

Factor= Antenna Factor + Cable Factor – Preamplifier Factor,

Level = Read Level + Factor,

Over Limit=Level-Limit Line.

5.8.2 Transmitter emission above 1GHz

Test mode:		802.11b(1Mbps)		Test channel:		Lowest	
Frequency	Meter Reading	Factor	Emission Level	Limits	Over	Detector Type	Ant. Pol.
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)		H/V
4824.000	54.28	-4.26	50.02	74	-23.98	PK	H
4824.000	36.57	-4.26	32.31	54	-21.69	AV	H
7236.000	48.20	1.18	49.38	74	-24.62	PK	H
7236.000	34.78	1.18	35.96	54	-18.04	AV	H
4824.000	51.39	-4.26	47.13	74	-26.87	PK	V
4824.000	37.87	-4.26	33.61	54	-20.39	AV	V
7236.000	49.48	1.18	50.66	74	-23.34	PK	V
7236.000	33.19	1.18	34.37	54	-19.63	AV	V

Test mode:		802.11b(1Mbps)		Test channel:		Middle	
Frequency	Meter Reading	Factor	Emission Level	Limits	Over	Detector Type	Ant. Pol.
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)		H/V
4874.000	53.66	-4.12	49.54	74	-24.46	PK	H
4874.000	35.16	-4.12	31.04	54	-22.96	AV	H
7311.000	48.16	1.46	49.62	74	-24.38	PK	H
7311.000	32.09	1.46	33.55	54	-20.45	AV	H
4874.000	50.52	-4.12	46.40	74	-27.60	PK	V
4874.000	38.06	-4.12	33.94	54	-20.06	AV	V
7311.000	49.77	1.46	51.23	74	-22.77	PK	V
7311.000	31.42	1.46	32.88	54	-21.12	AV	V

Test mode:		802.11b(1Mbps)		Test channel:		Highest	
Frequency	Meter Reading	Factor	Emission Level	Limits	Over	Detector Type	Ant. Pol.
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)		H/V
4924.000	53.83	-4.03	49.80	74	-24.20	PK	H
4924.000	37.69	-4.03	33.66	54	-20.34	AV	H
7386.000	48.78	1.66	50.44	74	-23.56	PK	H
7386.000	32.92	1.66	34.58	54	-19.42	AV	H
4924.000	51.86	-4.03	47.83	74	-26.17	PK	V
4924.000	35.21	-4.03	31.18	54	-22.82	AV	V
7386.000	50.01	1.66	51.67	74	-22.33	PK	V
7386.000	32.72	1.66	34.38	54	-19.62	AV	V

Test mode:		802.11g(6Mbps)		Test channel:		Lowest	
Frequency	Meter Reading	Factor	Emission Level	Limits	Over	Detector Type	Ant. Pol.
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)		H/V
4824.000	55.02	-4.26	50.76	74	-23.24	PK	H
4824.000	36.63	-4.26	32.37	54	-21.63	AV	H
7236.000	50.50	1.18	51.68	74	-22.32	PK	H
7236.000	33.91	1.18	35.09	54	-18.91	AV	H
4824.000	52.09	-4.26	47.83	74	-26.17	PK	V
4824.000	35.67	-4.26	31.41	54	-22.59	AV	V
7236.000	47.84	1.18	49.02	74	-24.98	PK	V
7236.000	33.76	1.18	34.94	54	-19.06	AV	V

Test mode:		802.11g(6Mbps)		Test channel:		Middle	
Frequency	Meter Reading	Factor	Emission Level	Limits	Over	Detector Type	Ant. Pol.
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)		H/V
4874.000	54.72	-4.12	50.60	74	-23.40	PK	H
4874.000	35.16	-4.12	31.04	54	-22.96	AV	H
7311.000	50.41	1.46	51.87	74	-22.13	PK	H
7311.000	34.76	1.46	36.22	54	-17.78	AV	H
4874.000	52.12	-4.12	48.00	74	-26.00	PK	V
4874.000	35.26	-4.12	31.14	54	-22.86	AV	V
7311.000	48.17	1.46	49.63	74	-24.37	PK	V
7311.000	32.91	1.46	34.37	54	-19.63	AV	V

Test mode:		802.11g(6Mbps)		Test channel:		Highest	
Frequency	Meter Reading	Factor	Emission Level	Limits	Over	Detector Type	Ant. Pol.
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)		H/V
4924.000	55.26	-4.03	51.23	74	-22.77	PK	H
4924.000	37.35	-4.03	33.32	54	-20.68	AV	H
7386.000	50.62	1.66	52.28	74	-21.72	PK	H
7386.000	35.03	1.66	36.69	54	-17.31	AV	H
4924.000	53.12	-4.03	49.09	74	-24.91	PK	V
4924.000	35.46	-4.03	31.43	54	-22.57	AV	V
7386.000	49.23	1.66	50.89	74	-23.11	PK	V
7386.000	33.66	1.66	35.32	54	-18.68	AV	V

Test mode:		802.11n(6.5Mbps)		Test channel:		Lowest	
Frequency	Meter Reading	Factor	Emission Level	Limits	Over	Detector Type	Ant. Pol.
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)		H/V
4824.000	53.55	-4.26	49.29	74	-24.71	PK	H
4824.000	36.24	-4.26	31.98	54	-22.02	AV	H
7236.000	48.76	1.18	49.94	74	-24.06	PK	H
7236.000	35.02	1.18	36.20	54	-17.80	AV	H
4824.000	51.24	-4.26	46.98	74	-27.02	PK	V
4824.000	36.13	-4.26	31.87	54	-22.13	AV	V
7236.000	47.90	1.18	49.08	74	-24.92	PK	V
7236.000	31.69	1.18	32.87	54	-21.13	AV	V

Test mode:		802.11n(6.5Mbps)		Test channel:		Middle	
Frequency	Meter Reading	Factor	Emission Level	Limits	Over	Detector Type	Ant. Pol.
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)		H/V
4874.000	56.34	-4.12	52.22	74	-21.78	PK	H
4874.000	37.90	-4.12	33.78	54	-20.22	AV	H
7311.000	48.23	1.46	49.69	74	-24.31	PK	H
7311.000	34.41	1.46	35.87	54	-18.13	AV	H
4874.000	53.14	-4.12	49.02	74	-24.98	PK	V
4874.000	35.75	-4.12	31.63	54	-22.37	AV	V
7311.000	49.25	1.46	50.71	74	-23.29	PK	V
7311.000	32.20	1.46	33.66	54	-20.34	AV	V

Test mode:		802.11n(6.5Mbps)		Test channel:		Highest	
Frequency	Meter Reading	Factor	Emission Level	Limits	Over	Detector Type	Ant. Pol.
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)		H/V
4924.000	55.14	-4.03	51.11	74	-22.89	PK	H
4924.000	35.28	-4.03	31.25	54	-22.75	AV	H
7386.000	49.36	1.66	51.02	74	-22.98	PK	H
7386.000	33.02	1.66	34.68	54	-19.32	AV	H
4924.000	50.67	-4.03	46.64	74	-27.36	PK	V
4924.000	36.22	-4.03	32.19	54	-21.81	AV	V
7386.000	49.79	1.66	51.45	74	-22.55	PK	V
7386.000	33.57	1.66	35.23	54	-18.77	AV	V

Test mode:		802.11n40(13.5Mbps)		Test channel:		Lowest	
Frequency	Meter Reading	Factor	Emission Level	Limits	Over	Detector Type	Ant. Pol.
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)		H/V
4844.000	53.78	-4.2	49.58	74	-24.42	PK	H
4844.000	35.51	-4.2	31.31	54	-22.69	AV	H
7266.000	48.77	1.18	49.95	74	-24.05	PK	H
7266.000	32.23	1.18	33.41	54	-20.59	AV	H
4844.000	53.05	-4.2	48.85	74	-25.15	PK	V
4844.000	37.40	-4.2	33.20	54	-20.80	AV	V
7266.000	49.80	1.18	50.98	74	-23.02	PK	V
7266.000	32.87	1.18	34.05	54	-19.95	AV	V

Test mode:		802.11n40(13.5Mbps)		Test channel:		Middle	
Frequency	Meter Reading	Factor	Emission Level	Limits	Over	Detector Type	Ant. Pol.
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)		H/V
4874.000	55.57	-4.12	51.45	74	-22.55	PK	H
4874.000	37.74	-4.12	33.62	54	-20.38	AV	H
7311.000	49.13	1.46	50.59	74	-23.41	PK	H
7311.000	34.44	1.46	35.90	54	-18.10	AV	H
4874.000	52.77	-4.12	48.65	74	-25.35	PK	V
4874.000	35.42	-4.12	31.30	54	-22.70	AV	V
7311.000	48.03	1.46	49.49	74	-24.51	PK	V
7311.000	33.49	1.46	34.95	54	-19.05	AV	V

Test mode:		802.11n40(13.5Mbps)		Test channel:		Highest	
Frequency	Meter Reading	Factor	Emission Level	Limits	Over	Detector Type	Ant. Pol.
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)		H/V
4904.000	54.15	-4.03	50.12	74	-23.88	PK	H
4904.000	36.96	-4.03	32.93	54	-21.07	AV	H
7356.000	50.39	1.66	52.05	74	-21.95	PK	H
7356.000	33.63	1.66	35.29	54	-18.71	AV	H
4904.000	52.86	-4.03	48.83	74	-25.17	PK	V
4904.000	35.61	-4.03	31.58	54	-22.42	AV	V
7356.000	48.69	1.66	50.35	74	-23.65	PK	V
7356.000	33.31	1.66	34.97	54	-19.03	AV	V

Remark:

- 1) The 1Mbps of rate of 802.11b is the worst case.
- 2) The field strength is calculated by adding the Antenna Factor, Cable Factor & Preamplifier. The basic equation with a sample calculation is as follows:
Final Test Level = Receiver Reading + Antenna Factor + Cable Factor – Preamplifier Factor
- 3) Scan from 9kHz to 25GHz, The disturbance above 13GHz and below 30MHz was very low, and the above harmonics were the highest point could be found when testing, so only the above harmonics had been displayed. The amplitude of spurious emissions from the radiator which are attenuated more than 20dB below the limit need not be reported.

5.9 Restricted bands around fundamental frequency

Test Requirement:	47 CFR Part 15C Section 15.209 and 15.205		
Test Method:	ANSI C63.10 2013		
Test Site:	Measurement Distance: 3m (Semi-Anechoic Chamber)		
Limit:	Frequency	Limit (dBuV/m @3m)	Remark
	30MHz-88MHz	40.0	Quasi-peak Value
	88MHz-216MHz	43.5	Quasi-peak Value
	216MHz-960MHz	46.0	Quasi-peak Value
	960MHz-1GHz	54.0	Quasi-peak Value
	Above 1GHz	54.0	Average Value
		74.0	Peak Value
Test Setup:			

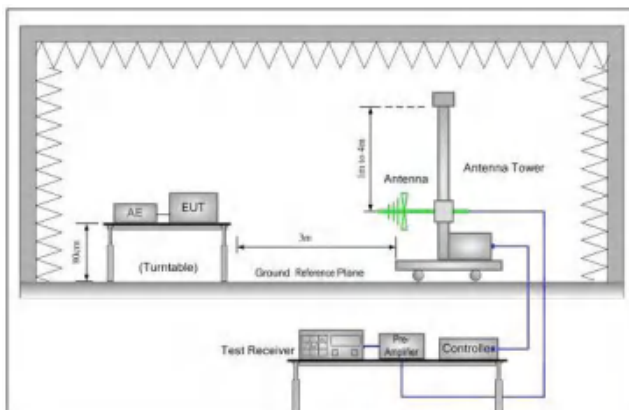


Figure 1. 30MHz to 1GHz

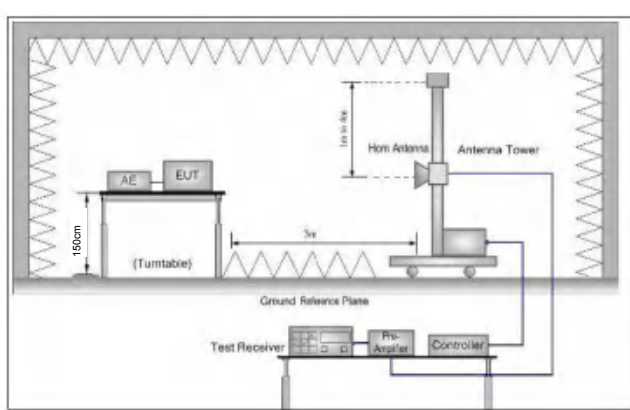


Figure 2. Above 1 GHz

Test Procedure:	a. 1) Below 1G: The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation. 2) Above 1G: The EUT was placed on the top of a rotating table 1.5 meters above the ground at a 3 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation. Note: For the radiated emission test above 1GHz: 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. b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower. c. The antenna height 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.
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	d. 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. e. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode. f. Place a marker at the end of the restricted band closest to the transmit frequency to show compliance. Also measure any emissions in the restricted bands. Save the spectrum analyzer plot. Repeat for each power and modulation for lowest and highest channel g. Test the EUT in the lowest channel , the Highest channel h. Repeat above procedures until all frequencies measured was complete.
Exploratory Test Mode:	Transmitting with all kind of modulations, data rates. Transmitting mode.
Final Test Mode:	1Mbps of rate is the worst case of 802.11b; 6Mbps of rate is the worst case of 802.11g ; 6.5Mbps of rate is the worst case of 802.11n(HT20) ; 13.5Mbps of rate is the worst case of 802.11n(HT40) Only the worst case is recorded in the report.
Test Results:	Pass

Test data:

Worse case mode:		802.11b(1Mbps)		Test channel:		Lowest	
Frequency	Meter Reading	Factor	Emission Level	Limits	Over	Detector Type	Ant. Pol.
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)		H/V
2390.000	59.83	-9.2	50.63	74	-23.37	PK	H
2390.000	45.00	-9.2	35.80	54	-18.20	AV	H
2400.000	59.28	-9.39	49.89	74	-24.11	PK	H
2400.000	40.11	-9.39	30.72	54	-23.28	AV	H
2390.000	59.23	-9.2	50.03	74	-23.97	PK	V
2390.000	44.58	-9.2	35.38	54	-18.62	AV	V
2400.000	60.61	-9.39	51.22	74	-22.78	PK	V
2400.000	42.32	-9.39	32.93	54	-21.07	AV	V

Worse case mode:		802.11b(1Mbps)		Test channel:		Highest	
Frequency	Meter Reading	Factor	Emission Level	Limits	Over	Detector Type	Ant. Pol.
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)		H/V
2483.500	60.03	-9.29	50.74	74	-23.26	PK	H
2483.500	43.94	-9.29	34.65	54	-19.35	AV	H
2483.500	58.51	-9.29	49.22	74	-24.78	PK	V
2483.500	40.28	-9.29	30.99	54	-23.01	AV	V

Worse case mode:		802.11g(6Mbps)		Test channel:		Lowest	
Frequency	Meter Reading	Factor	Emission Level	Limits	Over	Detector Type	Ant. Pol.
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)		H/V
2390.000	59.93	-9.2	50.73	74	-23.27	PK	H
2390.000	43.42	-9.2	34.22	54	-19.78	AV	H
2400.000	58.61	-9.39	49.22	74	-24.78	PK	H
2400.000	40.43	-9.39	31.04	54	-22.96	AV	H
2390.000	59.18	-9.2	49.98	74	-24.02	PK	V
2390.000	42.30	-9.2	33.10	54	-20.90	AV	V
2400.000	59.09	-9.39	49.70	74	-24.30	PK	V
2400.000	40.74	-9.39	31.35	54	-22.65	AV	V

Worse case mode:		802.11g(6Mbps)		Test channel:		Highest	
Frequency	Meter Reading	Factor	Emission Level	Limits	Over	Detector Type	Ant. Pol.
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)		H/V
2483.500	58.58	-9.29	49.29	74	-24.71	PK	H
2483.500	42.49	-9.29	33.20	54	-20.80	AV	H
2483.500	60.20	-9.29	50.91	74	-23.09	PK	V
2483.500	41.21	-9.29	31.92	54	-22.08	AV	V

Worse case mode:		802.11n(HT20)(6.5Mbps)		Test channel:		Lowest	
Frequency	Meter Reading	Factor	Emission Level	Limits	Over	Detector Type	Ant. Pol.
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)		H/V
2390.000	58.62	-9.2	49.42	74	-24.58	PK	H
2390.000	44.02	-9.2	34.82	54	-19.18	AV	H
2400.000	58.94	-9.39	49.55	74	-24.45	PK	H
2400.000	41.12	-9.39	31.73	54	-22.27	AV	H
2390.000	59.53	-9.2	50.33	74	-23.67	PK	V
2390.000	44.38	-9.2	35.18	54	-18.82	AV	V
2400.000	60.08	-9.39	50.69	74	-23.31	PK	V
2400.000	40.64	-9.39	31.25	54	-22.75	AV	V

Worse case mode:		802.11n(HT20)(6.5Mbps)		Test channel:		Highest	
Frequency	Meter Reading	Factor	Emission Level	Limits	Over	Detector Type	Ant. Pol.
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)		H/V
2483.500	59.61	-9.29	50.32	74	-23.68	PK	H
2483.500	43.54	-9.29	34.25	54	-19.75	AV	H
2483.500	60.29	-9.29	51.00	74	-23.00	PK	V
2483.500	42.64	-9.29	33.35	54	-20.65	AV	V

Worse case mode:		802.11n(HT40)(13.5Mbps)		Test channel:		Lowest	
Frequency	Meter Reading	Factor	Emission Level	Limits	Over	Detector Type	Ant. Pol.
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)		H/V
2390.000	60.61	-9.2	51.41	74	-22.59	PK	H
2390.000	44.47	-9.2	35.27	54	-18.73	AV	H
2400.000	58.80	-9.39	49.41	74	-24.59	PK	H
2400.000	42.40	-9.39	33.01	54	-20.99	AV	H
2390.000	59.97	-9.2	50.77	74	-23.23	PK	V
2390.000	44.02	-9.2	34.82	54	-19.18	AV	V
2400.000	60.18	-9.39	50.79	74	-23.21	PK	V
2400.000	42.46	-9.39	33.07	54	-20.93	AV	V

Worse case mode:		802.11n(HT40)(13.5Mbps)		Test channel:		Highest	
Frequency	Meter Reading	Factor	Emission Level	Limits	Over	Detector Type	Ant. Pol.
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)		H/V
2483.500	61.32	-9.29	52.03	74	-21.97	PK	H
2483.500	43.24	-9.29	33.95	54	-20.05	AV	H
2483.500	60.66	-9.29	51.37	74	-22.63	PK	V
2483.500	41.94	-9.29	32.65	54	-21.35	AV	V

Note:

The field strength is calculated by adding the Antenna Factor, Cable Factor & Preamplifier. The basic equation with a sample calculation is as follows:

Final Test Level = Receiver Reading + Antenna Factor + Cable Factor – Preamplifier Factor

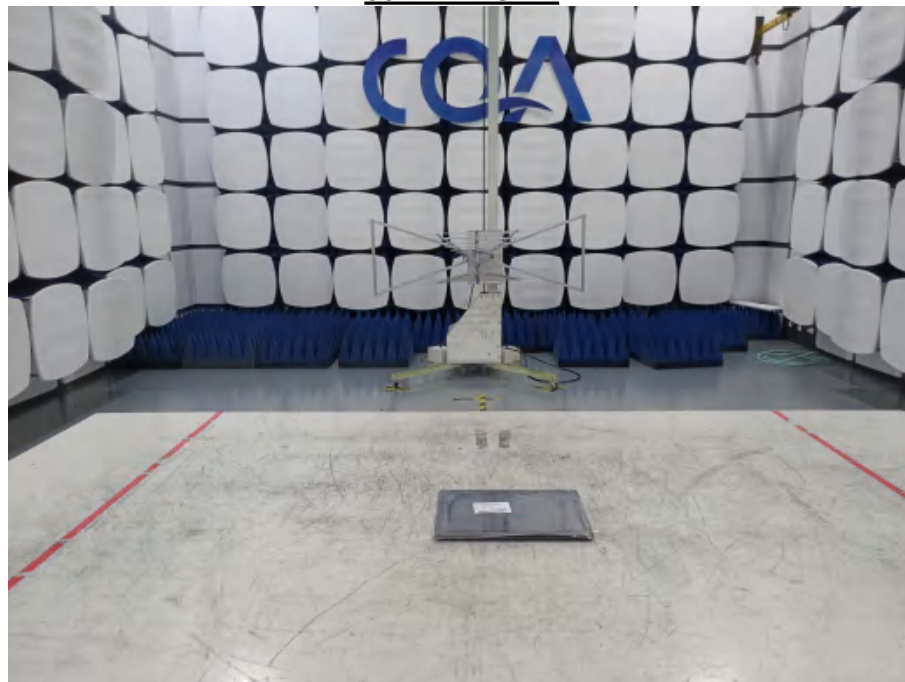
6 Photographs - EUT Test Setup

Please refer to test setup file

9kHz~30MHz:



30MHz~1GHz:



Above 1GHz:



Conducted emission Test Setup



7 Photographs - EUT Constructional Details

Please refer to the report No.: CQASZ20210500028EX-01

THE END