

TEST REPORT

Verified Code: 541318

Report No.:	E202012112553-2	Application No.:	E202012112553
Client:	SHENZHEN EASYLINKIN TECHNOLOGY CO.,LTD		
Address:	705, Floor 7, Zhongdian Difu Building, Zhenhua Road, Fuqiang Community, Huaqiang North Street, Futian District, Shenzhen, Guangdong Province, China		
Sample Description:	LoRaWAN Gateway		
Model:	G200-HU915		
Test Specification:	CFR 47, FCC Part 15 Subpart C RADIO FREQUENCY DEVICES: Subpart C—Intentional Radiators		
Receipt Date:	2021-01-11		
Test Date:	2021-01-12 to 2021-03-08		
Issue Date:	2021-04-15		
Test Result:	Pass		
Prepared By: Test Engineer <i>Xie Jiang</i>	Reviewed By: Technical Manager <i>Wu Haoming</i>	Approved By: Manager <i>Yong Dai</i>	
Other Aspects:			
Note: Note			
Abbreviations: ok / P = passed; fail / F = failed; n.a. / N = not applicable;			
The test result in this test report refers exclusively to the presented test sample. This report shall not be reproduced except in full, without the written approval of GRGT.			



DIRECTIONS OF TEST

- 1. This station carries out test task according to the national regulation of verifications which can be traced to National Primary Standards and BIPM.**
- 2. The test report merely corresponds to the test sample. It is not permitted to copy extracts of these test result without the written permission of the test laboratory.**
- 3. If there is any objection concerning the test, the client should inform the laboratory within 15 days from the date of receiving the test report.**

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1. TEST RESULT SUMMARY

Standard	Item	Limit / Severity	Result
CFR 47, FCC Part 15 Subpart C (§15.247)	Antenna Requirement	§15.203	PASS
	Conducted Emissions	§15.207 (a)	PASS
	Radiated Spurious Emission	§15.247(d)	PASS
	6 dB Bandwidth	§15.247 (a)(2)	PASS
	Maximum Peak Output Power	§15.247(b)(3)	PASS
	Power Spectral Density	§15.247(e)	PASS
	Conducted band edges and Spurious Emission	§15.247(d)	PASS
	Restricted bands of operation	§15.205	PASS

The EUT have one wifi antenna. It is external antenna.

The max gain of antenna is 2.15dBi, which accordance 15.203, is considered sufficient to comply with the provisions of this section.

2. GENERAL DESCRIPTION OF EUT

2.1. APPLICANT

Name: SHENZHEN EASYLINKIN TECHNOLOGY CO.,LTD
Address: 705, Floor 7, Zhongdian Difu Building, Zhenhua Road, Fuqiang Community, Huaqiang North Street, Futian District, Shenzhen, Guangdong Province, China

2.2. MANUFACTURER

Name: SHENZHEN EASYLINKIN TECHNOLOGY CO.,LTD
Address: 705, Floor 7, Zhongdian Difu Building, Zhenhua Road, Fuqiang Community, Huaqiang North Street, Futian District, Shenzhen, Guangdong Province, China

2.3. FACTORY

Name: SHENZHEN EASYLINKIN TECHNOLOGY CO.,LTD
Address: 705, Floor 7, Zhongdian Difu Building, Zhenhua Road, Fuqiang Community, Huaqiang North Street, Futian District, Shenzhen, Guangdong Province, China

2.4. BASIC DESCRIPTION OF EQUIPMENT UNDER TEST

Equipment: LoRaWAN Gateway
Model No.: G200-HU915
Adding /
Model:
Trade Name: Easylinkin
FCC ID: 2AYYO-G200US
Power Supply: DC12V power supplied by adapter
Adapter Model: PS120W1000U
Specification: Input: 100-240V~50/60Hz 0.5A Max
Output: 12.0V --- 1.0A 12.0W
Frequency Range: 2412MHz~2462MHz: 802.11b; 802.11g; 802.11n(HT20)
2422MHz~2452MHz: 802.11n(HT40);
Transmit Power: 18.32dBm for 802.11b mode
22.47dBm for 802.11g mode
22.21dBm for 802.11n HT20 mode
21.02dBm for 802.11n HT40 mode
Modulation type: DSSS for 802.11b mode;
OFDM for 802.11g mode;
OFDM for 802.11n mode.
Channel space: 5MHz

Antenna External antenna with 2.15dBi gain (Max.)

Specification:

Temperature Range: 0 °C ~+60 °C

Hardware PCB-GW200M-01D

Version:

Software g200_v2.0.0.2001201313

Version:

Sample No: E202012112553-0005

Note: The EUT have two different color appearances.

2.5. TEST OPERATION MODE

Mode No.	Description of the modes
1	2.4GHz wifi fixed frequency

2.6. LOCAL SUPPORTIVE INSTRUMENTS

Name of Equipment	Manufacturer	Model	Serial Number	Note
Notebook	LENOVO	TianYi 310-14ISK	MP18DLC6	/
Adapter (Notebook)	LENOVO	ADLX65NCC3A	N/A	/
Cable				
AC cable	/	/	/	Unshielded, 1.00m
DC cable	/	/	/	Shielded, 1.80m

Test software:

Software version	Test level
ART2-GUI	Default

3. LABORATORY AND ACCREDITATIONS

3.1. LABORATORY

The tests & measurements refer to this report were performed by Shenzhen EMC Laboratory of Guangzhou GRG Metrology & Test Co., Ltd.

Add : Address: No.1301 Guanguang Road Xinlan Community, Guanlan Street,
Longhua District Shenzhen, 518110, People's Republic of China

P.C. : 518000

Tel : 0755-61180008

Fax : 0755-61180008

3.2. ACCREDITATIONS

Our laboratories are accredited and approved by the following approval agencies according to GB/T 27025(ISO/IEC 17025:2017)

USA A2LA(Certificate #:2861.01)

The measuring facility of laboratories has been authorized or registered by the following approval agencies.

Canada Industry Canada

USA FCC

Copies of granted accreditation certificates are available for downloading from our web site, <http://www.grgtest.com>

3.3. MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4-2:

Measurement		Frequency	Uncertainty
Radiated Emission	Horizontal	30MHz~1000MHz	4.30dB
		1GHz~18GHz	5.60dB
		18GHz~26GHz	3.65dB
	Vertical	30MHz~1000MHz	4.30dB
		1GHz~18GHz	5.60dB
		18GHz~26GHz	3.65dB
Conduction Emission		9 kHz ~ 150 kHz	2.80dB
		150 kHz ~ 10 MHz	2.80dB
		10 MHz ~ 30 MHz	2.20dB

This uncertainty represents an expanded uncertainty factor of k=2.

4. LIST OF USED TEST EQUIPMENT AT GRGT

Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
Conducted Emissions				
EMI TEST RECEIVER	R&S	ESCI	100783	2021-10-08
LISN(EUT)	R&S	ENV216	101543	2021-03-24
EZ-EMC	EZ	CCS-3A1-CE	/	/
Radiated Spurious Emission& Restricted bands of operation				
TEST RECEIVER	R&S	ESCI	100145	2021-10-07
Spectrum Analyzer	Agilent	N9010A	MY52221469	2021-05-16
Bilog Antenna	TESEQ	CBL6143A	26039	2021-11-25
Horn Antenna	Schwarzbeck	BBHA 9120D(1201)	02143	2021-12-27
Board-Band Horn Antenna	Schwarzbeck	BBHA 9170	BBHA 9170-497	2021-11-05
Amplifier	EMEC	EM330	/	2021-04-01
Amplifier	Tonscend	TAP9E6343	AP20E806065	2021-06-28
Amplifier	Tonscend	TAP01018048	AP20E8060075	2021-06-28
Amplifier	Tonscend	TAP184050	AP20E806071	2021-06-15
Test S/W	EZ	CCS-2ANT	/	/
Test S/W	Tonscend	JS32-RE/2.5.2.4		
6 dB Bandwidth				
Spectrum Analyzer	Agilent	N9010A	MY52221469	2021-05-16
Maximum Peak Output Power				
Spectrum Analyzer	Agilent	N9010A	MY52221469	2021-05-16
Conducted band edges and Spurious Emission				
Spectrum Analyzer	Agilent	N9010A	MY52221469	2021-05-16
Power Spectral Density				
Spectrum Analyzer	Agilent	N9010A	MY52221469	2021-05-16

5. CONDUCTED EMISSION MEASUREMENT

5.1. LIMITS

Frequency range	Limits (dBμV)	
	Quasi-peak	Average
150kHz ~ 0.5MHz	66~56	56~46
0.5 MHz ~ 5 MHz	56	46
5 MHz ~ 30 MHz	60	50

NOTE: (1) The lower limit shall apply at the transition frequencies.

(2) The limit decreases in line with the logarithm of the frequency in the range of 150 kHz to 0.5MHz.

5.2. TEST PROCEDURES

Procedure of Preliminary Test

Test procedures follow ANSI C63.10:2013.

For measurement of the disturbance voltage the equipment under test (EUT) is connected to the power supply mains and any other extended network via one or more artificial network(s). An EUT, whether intended to be grounded or not, and which is to be used on a table is configured as follows:

- Either the bottom or the rear of the EUT shall be at a controlled distance of 40 cm from a reference ground plane. This ground plane is normally the wall or floor of a shielded room. It may also be a grounded metal plane of at least 2 m by 2 m. This is physically accomplished as follows:

- 1) place the EUT on a table of non-conducting material which is at least 80 cm high. Place the EUT so that it is 40 cm from the wall of the shielded room, or place the EUT on a table of non-conducting material which is 40 cm high so that the bottom of the EUT is 40 cm above the ground plane;

- All other conductive surfaces of the EUT shall be at least 80 cm from the reference ground plane;

- The EUT are placed on the floor that one side of the housings is 40 cm from the vertical reference ground plane and other metallic parts;

- Interconnecting cables that hang closer than 40 cm to the ground plane shall be folded back and forth forming a bundle 30 cm to 40 cm long, hanging approximately in the middle between the ground plane and the table.

- I/O cables that are connected to a peripheral shall be bundled in the centre. The end of the cable may be terminated if required using correct terminating impedance. The total length shall not exceed 1 m.

The test mode(s) described in Item 2.4 were scanned during the preliminary test. After the preliminary scan, we found the test mode described in Item 2.4 producing the highest emission level. The EUT configuration and cable configuration of the above highest emission levels were recorded for reference of the final test.

Procedure of Final Test

EUT and support equipment were set up on the test bench as per the configuration with highest emission level in the preliminary test. A scan was taken on both power lines, recording at least the six highest emissions. Emission frequency and amplitude were recorded into a computer in which correction factors were used to calculate the emission level and compare reading to the applicable limit. The test data of the worst-case condition(s) was recorded.

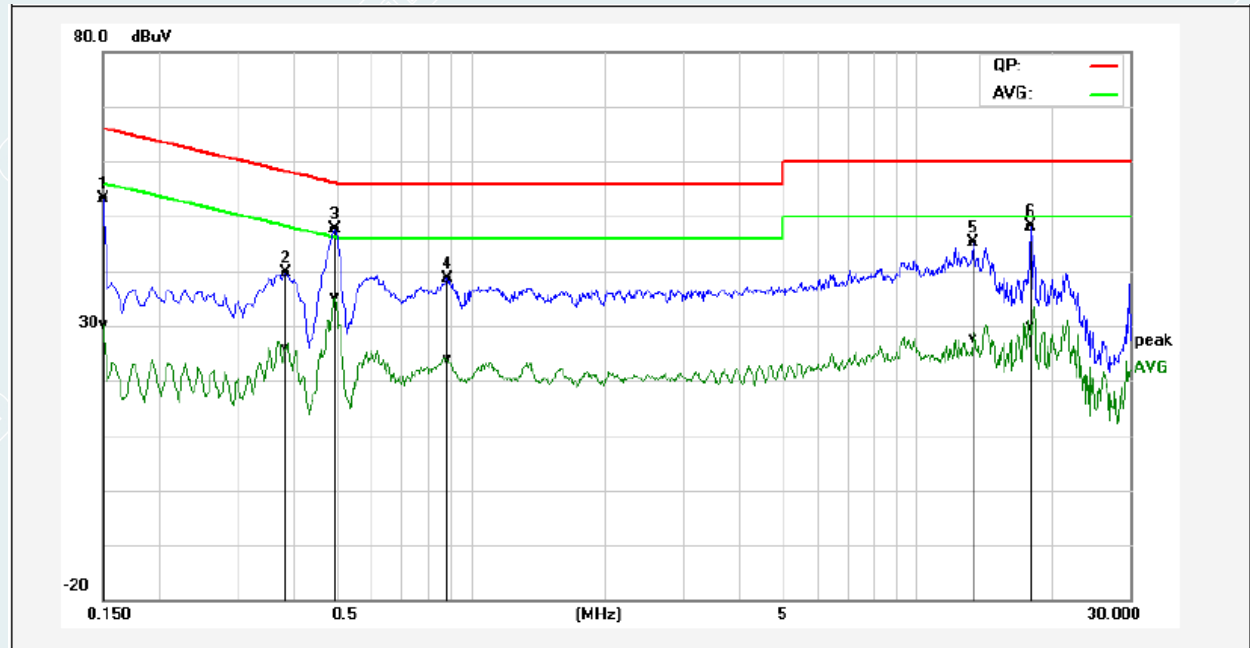
Frequency (MHz)	QuasiPeak Reading (dBuV)	Average Reading (dBuV)	Correction Factor (dB)	QuasiPeak Result (dBuV)	Average Result (dBuV)	QuasiPeak Limit (dBuV)	Average Limit (dBuV)	QuasiPeak Margin (dB)	Average Margin (dB)	Remark (Pass/Fail)
X.XXXX	32.69	25.65	11.52	44.21	37.17	65.78	55.79	-21.57	-18.62	Pass

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5.5. TEST RESULTS

EUT Name	LoRaWAN Gateway	Model	G200-HU915
Environmental Conditions	24.8°C/45%RH/101kPa	Test Mode	Mode 1
Power supply	AC120V/60Hz	Tested By	Jiang Tao
Test Date	2021-01-16	Sample No.	E202012112553-0005

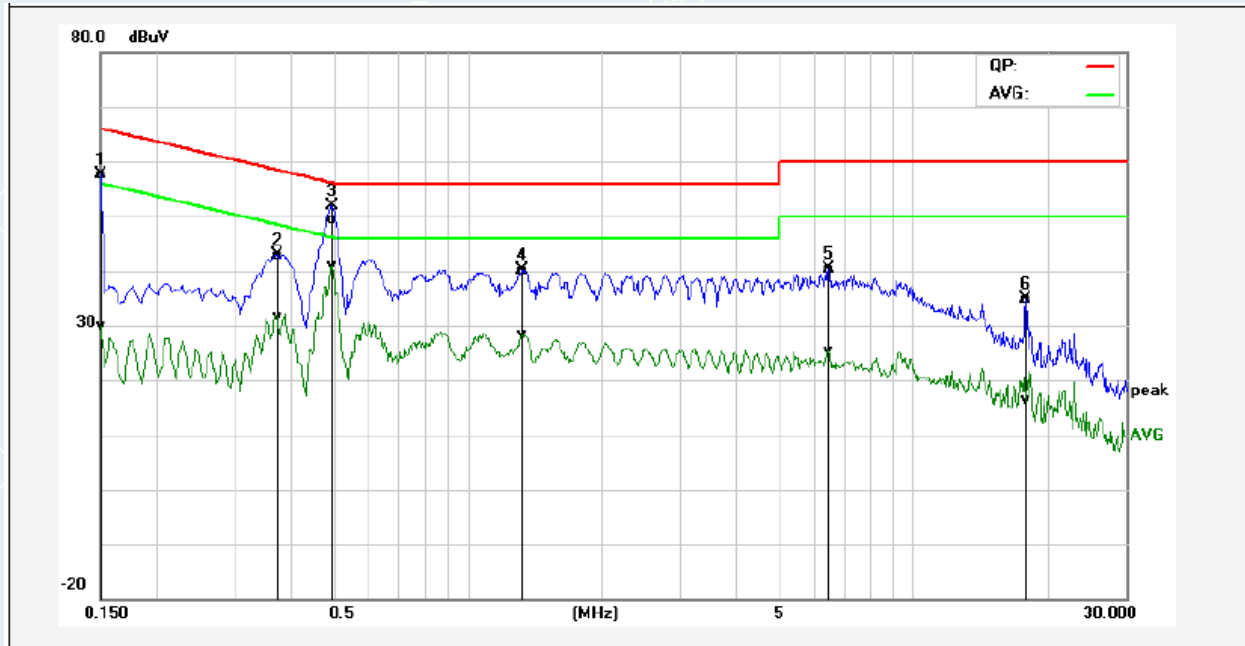
Line: L1



No.	Frequency (MHz)	QuasiPeak reading (dBuV)	Average reading (dBuV)	Correction factor (dB)	QuasiPeak result (dBuV)	Average result (dBuV)	QuasiPeak limit (dBuV)	Average limit (dBuV)	QuasiPeak margin (dB)	Average margin (dB)	Remark
1	0.1500	43.42	20.44	9.61	53.03	30.05	65.99	56.00	-12.96	-25.95	Pass
2	0.3860	29.98	16.19	9.62	39.60	25.81	58.15	48.15	-18.55	-22.34	Pass
3*	0.4980	38.02	25.43	9.62	47.64	35.05	56.03	46.03	-8.39	-10.98	Pass
4	0.8860	29.08	14.33	9.62	38.70	23.95	56.00	46.00	-17.30	-22.05	Pass
5	13.3580	35.35	17.98	9.76	45.11	27.74	60.00	50.00	-14.89	-22.26	Pass
6	18.0380	38.24	20.13	9.83	48.07	29.96	60.00	50.00	-11.93	-20.04	Pass

EUT Name	LoRaWAN Gateway	Model	G200-HU915
Environmental Conditions	24.8°C/45%RH/101kPa	Test Mode	Mode 1
Power supply	AC120V/60Hz	Tested By	Jiang Tao
Test Date	2021-01-16	Sample No.	E202012112553-0005

Line: N



No.	Frequency (MHz)	QuasiPeak reading (dBuV)	Average reading (dBuV)	Correction factor (dB)	QuasiPeak result (dBuV)	Average result (dBuV)	QuasiPeak limit (dBuV)	Average limit (dBuV)	QuasiPeak margin (dB)	Average margin (dB)	Remark
1	0.1500	48.06	20.39	9.61	57.67	30.00	65.99	56.00	-8.32	-26.00	Pass
2	0.3740	33.35	21.95	9.62	42.97	31.57	58.41	48.41	-15.44	-16.84	Pass
3*	0.4980	39.70	31.21	9.62	49.32	40.83	56.03	46.03	-6.71	-5.20	Pass
4	1.3300	30.61	18.65	9.62	40.23	28.27	56.00	46.00	-15.77	-17.73	Pass
5	6.4820	30.80	15.58	9.68	40.48	25.26	60.00	50.00	-19.52	-24.74	Pass
6	17.9220	25.12	6.64	9.83	34.95	16.47	60.00	50.00	-25.05	-33.53	Pass

6. RADIATED SPURIOUS EMISSIONS

6.1. LIMITS

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated 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, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in §15.209(a) is not required.

Frequency (MHz)	Quasi-peak($\mu\text{V/m}$)	Measurement distance(m)	Quasi-peak($\text{dB}\mu\text{V/m}$)@distance 3m
0.009-0.490	2400/F(kHz)	300	53.8~88.5
0.490-1.705	24000/F(kHz)	30	43~53.8
1.705-30.0	30	30	49.5
30 ~ 88	100	3	40
88~216	150	3	43.5
216 ~ 960	200	3	46
Above 960	500	3	54

NOTE: (1) The lower limit shall apply at the transition frequencies.

NOTE: (2) Above 18G Limit= $74+20\log(3/1)=83.54$ ($\text{dB}\mu\text{V/m}$).

6.2. TEST PROCEDURES (please refer to measurement standard)

1) Sequence of testing 9 kHz to 30 MHz

Setup:

- The equipment was set up to simulate a typical usage like described in the user manual or described by manufacturer.
- If the EUT is a tabletop system, a rotatable table with 0.8 m height is used.
- If the EUT is a floor standing device, it is placed on the ground.
- Auxiliary equipment and cables were positioned to simulate normal operation conditions.
- The AC power port of the EUT (if available) is connected to a power outlet below the turntable.
- The measurement distance is 3 meter.
- The EUT was set into operation.

Pre measurement:

- The turntable rotates from 0° to 315° using 45° steps.
- The antenna height is 0.8 meter.
- At each turntable position the analyzer sweeps with peak detection to find the maximum of all emissions

Final measurement:

- Identified emissions during the pre measurement the software maximizes by rotating the turntable position (0 °to 360 °) and by rotating the elevation axes (0 °to 360 °).
- The final measurement will be done in the position (turntable and elevation) causing the highest emissions with QPK detector.
- The final levels, frequency, measuring time, bandwidth, turntable position, correction factor, margin to the limit and limit will be recorded. Also a plot with the graph of the pre measurement and the limit will be stored.

2) Sequence of testing 30 MHz to 1 GHz**Setup:**

- The equipment was set up to simulate a typical usage like described in the user manual or described by manufacturer.
- If the EUT is a tabletop system, a table with 0.8 m height is used, which is placed on the ground plane.
- If the EUT is a floor standing device, it is placed on the ground plane with insulation between both.
- Auxiliary equipment and cables were positioned to simulate normal operation conditions
- The AC power port of the EUT (if available) is connected to a power outlet below the turntable.
- The measurement distance is 3 meter.
- The EUT was set into operation.

Pre measurement:

- The turntable rotates from 0 °to 315 °using 45 °steps.
- The antenna is polarized vertical and horizontal.
- The antenna height changes from 1 to 3 meter.
- At each turntable position, antenna polarization and height the analyzer sweeps three times in peak to find the maximum of all emissions.

Final measurement:

- The final measurement will be performed with minimum the six highest peaks.
- According to the maximum antenna and turntable positions of premeasurement the software maximize the peaks by changing turntable position ($\pm 45^\circ$) and antenna movement between 1 and 4 meter.
- The final measurement will be done with QP detector with an EMI receiver.
- The final levels, frequency, measuring time, bandwidth, antenna height, antenna polarization, turntable angle, correction factor, margin to the limit and limit will be recorded. Also a plot with the graph of the premeasurement with marked maximum final measurements and the limit will be stored.

3) Sequence of testing 1 GHz to 18 GHz

Setup:

- The equipment was set up to simulate a typical usage like described in the user manual or described by manufacturer.
- If the EUT is a tabletop system, a rotatable table with 1.5 m height is used.
- If the EUT is a floor standing device, it is placed on the ground plane with insulation between both.
- Auxiliary equipment and cables were positioned to simulate normal operation conditions
- The AC power port of the EUT (if available) is connected to a power outlet below the turntable.
- The measurement distance is 3 meter.
- The EUT was set into operation.

Pre measurement:

- The turntable rotates from 0 ° to 315 ° using 45 ° steps.
- The antenna is polarized vertical and horizontal.
- The antenna height scan range is 1 meter to 2.5 meter.
- At each turntable position and antenna polarization the analyzer sweeps with peak detection to find the maximum of all emissions.

Final measurement:

- The final measurement will be performed with minimum the six highest peaks.
- According to the maximum antenna and turntable positions of premeasurement the software maximize the peaks by changing turntable position ($\pm 45^\circ$) and antenna movement between 1 and 4 meter. This procedure is repeated for both antenna polarizations.
- The final measurement will be done in the position (turntable, EUT-table and antenna polarization) causing the highest emissions with Peak and Average detector.
- The final levels, frequency, measuring time, bandwidth, turntable position, EUT-table position, antenna polarization, correction factor, margin to the limit and limit will be recorded. Also a plot with the graph of the pre measurement with marked maximum final measurements and the limit will be stored.

4) Sequence of testing above 18 GHz**Setup:**

- The equipment was set up to simulate a typical usage like described in the user manual or described by manufacturer.
- If the EUT is a tabletop system, a rotatable table with 1.5 m height is used.
- If the EUT is a floor standing device, it is placed on the ground plane with insulation between both.
- Auxiliary equipment and cables were positioned to simulate normal operation conditions
- The AC power port of the EUT (if available) is connected to a power outlet below the turntable.
- The measurement distance is 1 meter.
- The EUT was set into operation.

Pre measurement:

- The antenna is moved spherical over the EUT in different polarisations of the antenna.

Final measurement:

- The final measurement will be performed at the position and antenna orientation for all detected emissions that were found during the premeasurements with Peak and Average detector.
- The final levels, frequency, measuring time, bandwidth, correction factor, margin to the limit and limit will be recorded. Also a plot with the graph of the premeasurement and the limit will be stored.

NOTE: The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and the video bandwidth is 3MHz for RMS Average (Duty cycle < 98%) for Average detection (AV) at frequency above 1GHz, then the measurement results was added to a correction factor ($10 \log(1/\text{duty cycle})$).

6.3. TEST SETUP

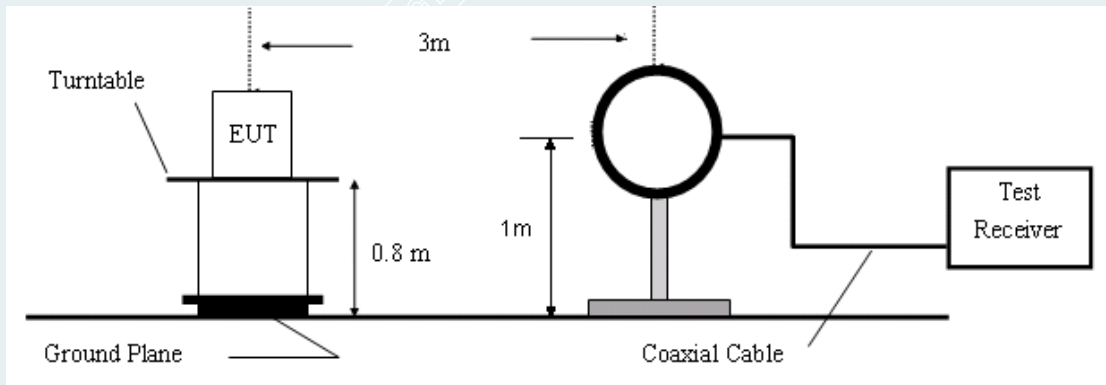


Figure 1. 9 KHz to 30MHz radiated emissions test configuration

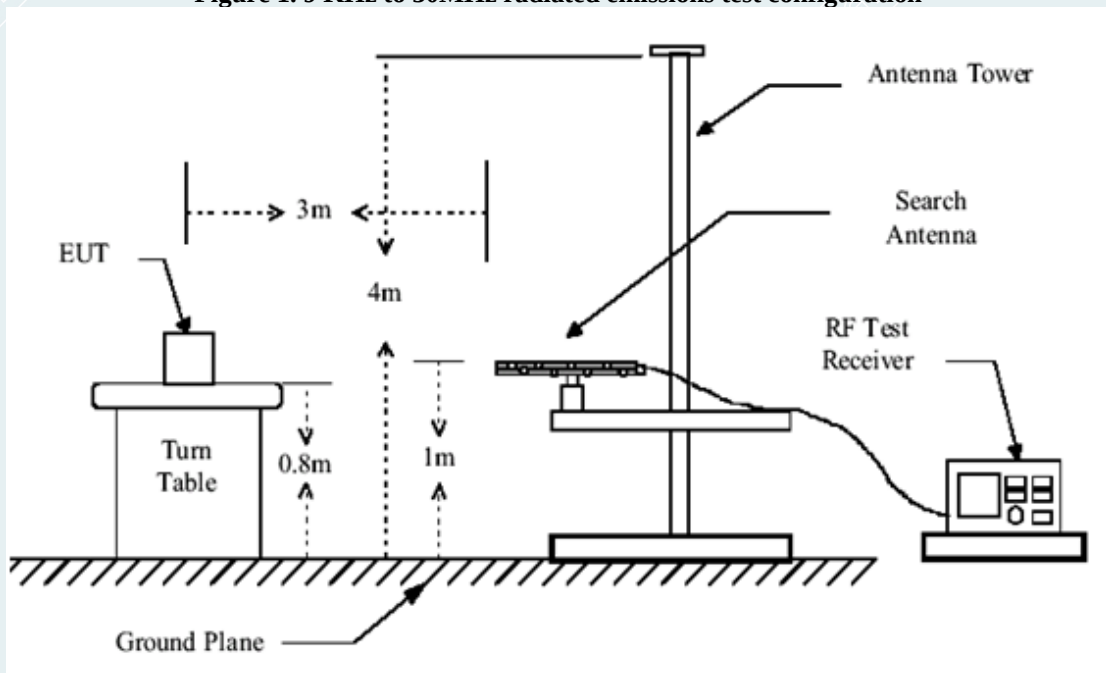


Figure 2. 30MHz to 1GHz radiated emissions test configuration

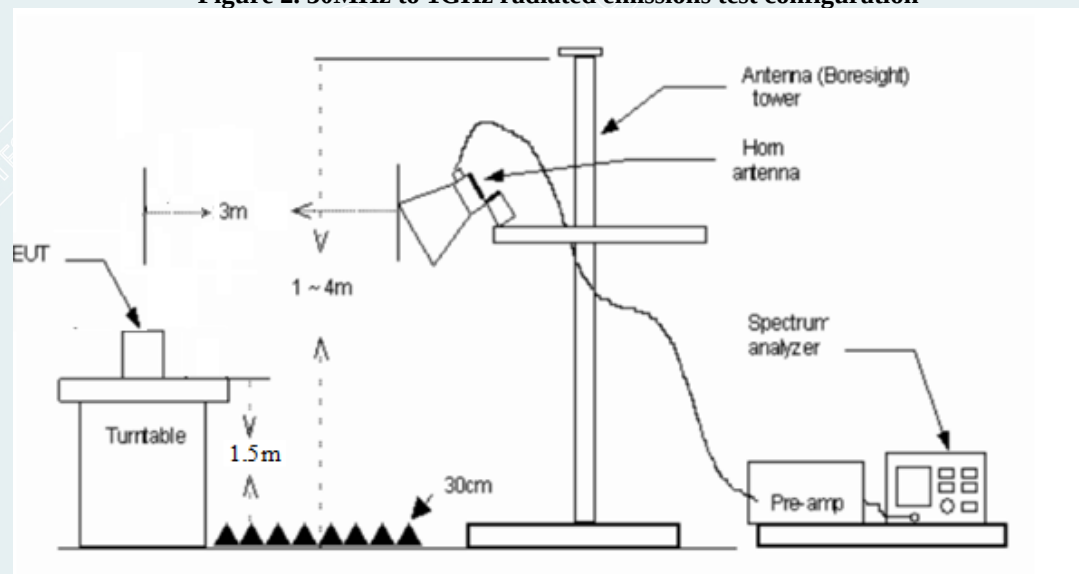


Figure 3. Above 1GHz radiated emissions test configuration

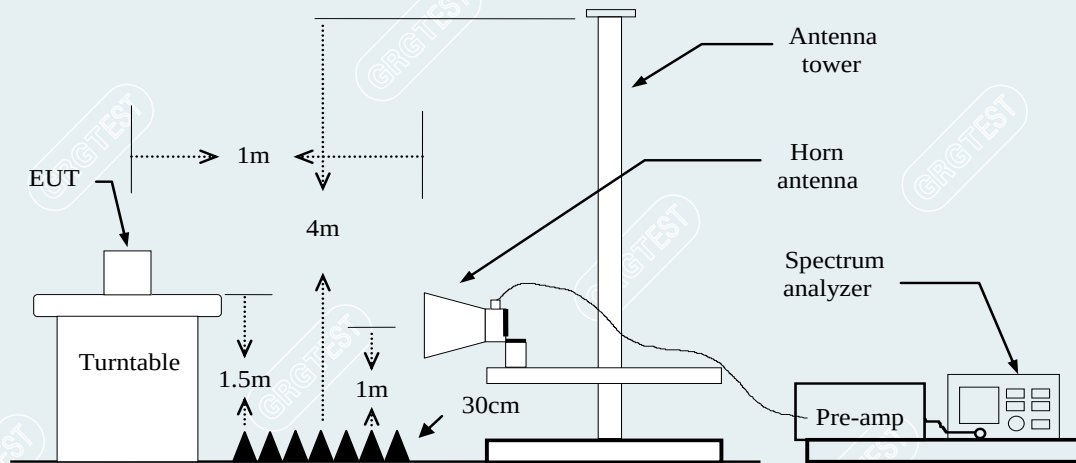


Figure 4. Above 18GHz radiated emissions test configuration

6.4. DATA SAMPLE

30MHz to 1GHz

No.	Frequency (MHz)	Reading (dBuV/m)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Pole
xxx	xxx	37.06	-15.48	21.58	40.00	-18.42	QP	Vertical

Above 1 GHz

No.	Frequency (MHz)	Reading (dBuV/m)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Pole
xxx	xxx	65.45	-11.12	54.33	74.00	-19.67	peak	Vertical
xxx	xxx	63.00	-11.12	51.88	54.00	-2.12	AVG	Vertical

Above 18 GHz

No.	Frequency (MHz)	Reading (dBuV/m)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Pole
xxx	xxx	65.45	-11.12	54.33	74.00	-19.67	peak	Vertical
xxx	xxx	63.00	-11.12	51.88	54.00	-2.12	AVG	Vertical

Frequency (MHz)

= Emission frequency in MHz

Ant.Pol. (H/V)

= Antenna polarization

Reading (dBuV)

= Uncorrected Analyzer / Receiver reading

Correction Factor (dB/m)

= Antenna factor + Cable loss – Amplifier gain

Result (dBuV/m)

= Reading (dBuV) + Correction Factor (dB/m)

Limit (dBuV/m)

= Limit stated in standard

Margin (dB)

= Remark Result (dBuV/m) – Limit (dBuV/m)

Peak

= Peak Reading

QP

= Quasi-peak Reading

AVG

= Average Reading

6.5. TEST RESULTS

30MHz to 1GHz

Recorded the worst case results in this report (IEEE 802.11b)

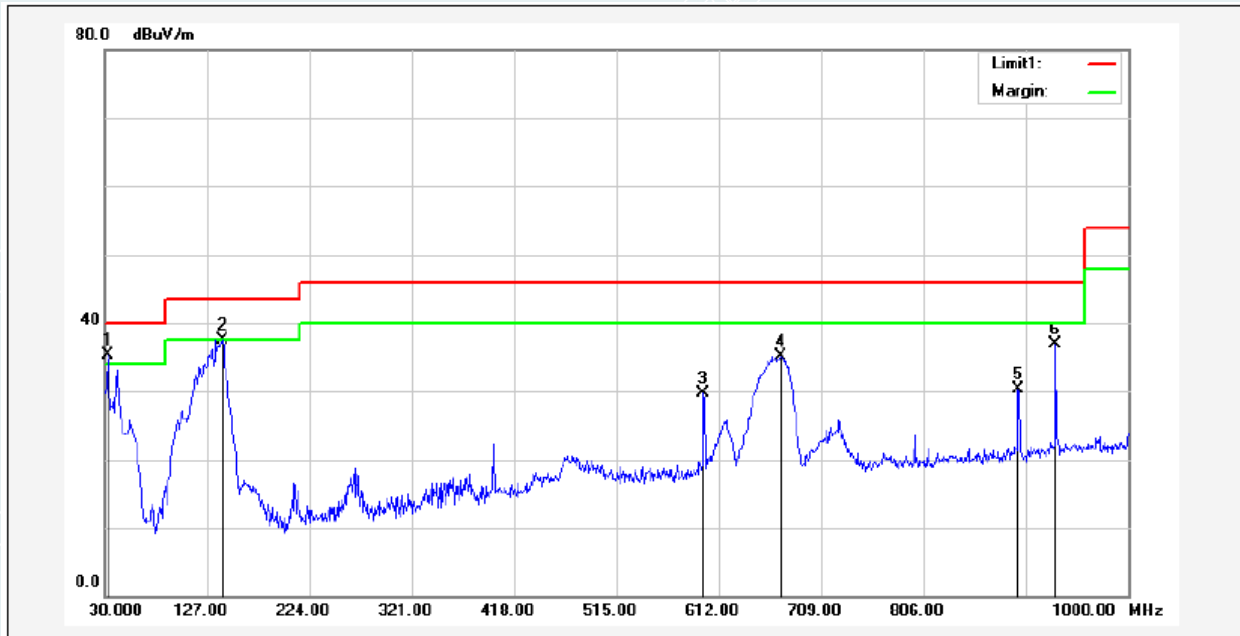
Mode: TX/ IEEE 802.11b

Lowest channel (2412MHz)

Polarity

Date: 2021-02-01

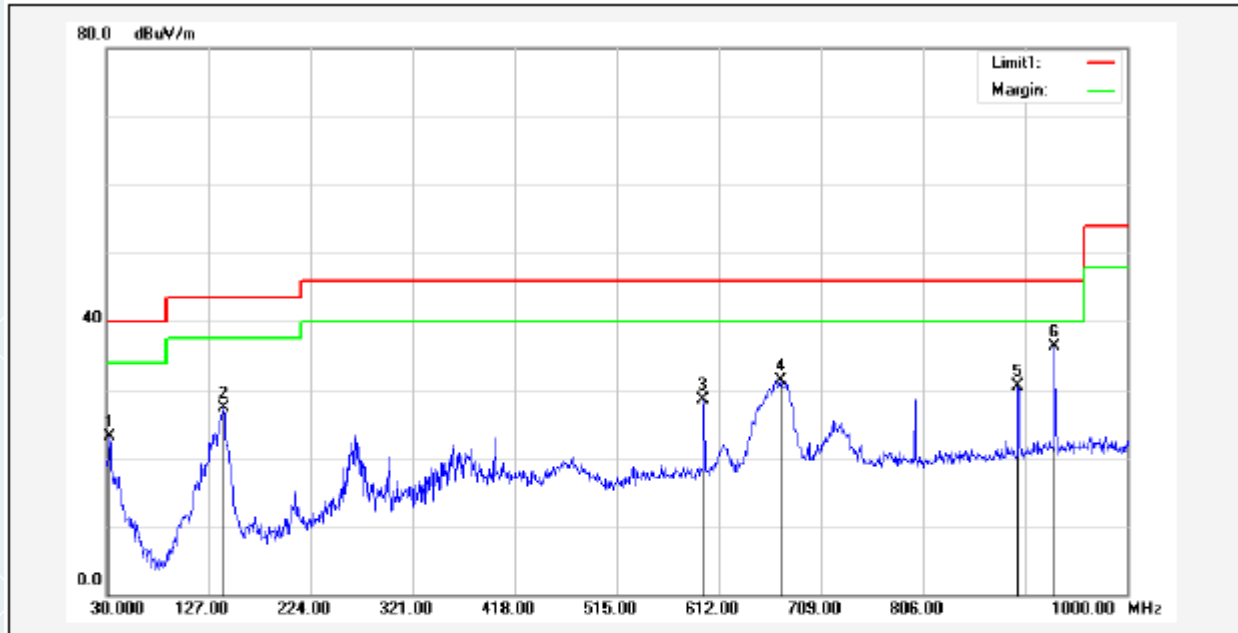
Vertical



No.	Frequency (MHz)	Reading (dBuV)	Correction factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Over (dB)	Degree (deg.)	Height (cm)	Remark
1*	32.9100	53.73	-18.38	35.35	40.00	-4.65	344	100	QP
2!	141.5500	63.98	-26.42	37.56	43.50	-5.94	127	100	QP
3	597.4500	47.33	-17.60	29.73	46.00	-16.27	287	149	QP
4	671.1700	52.30	-17.11	35.19	46.00	-10.81	235	100	QP
5	896.2100	45.29	-14.97	30.32	46.00	-15.68	105	199	QP
6	931.1300	51.56	-14.56	37.00	46.00	-9.00	224	100	QP

Mode: TX/ IEEE 802.11b
 Lowest channel (2412MHz)
 Polarity

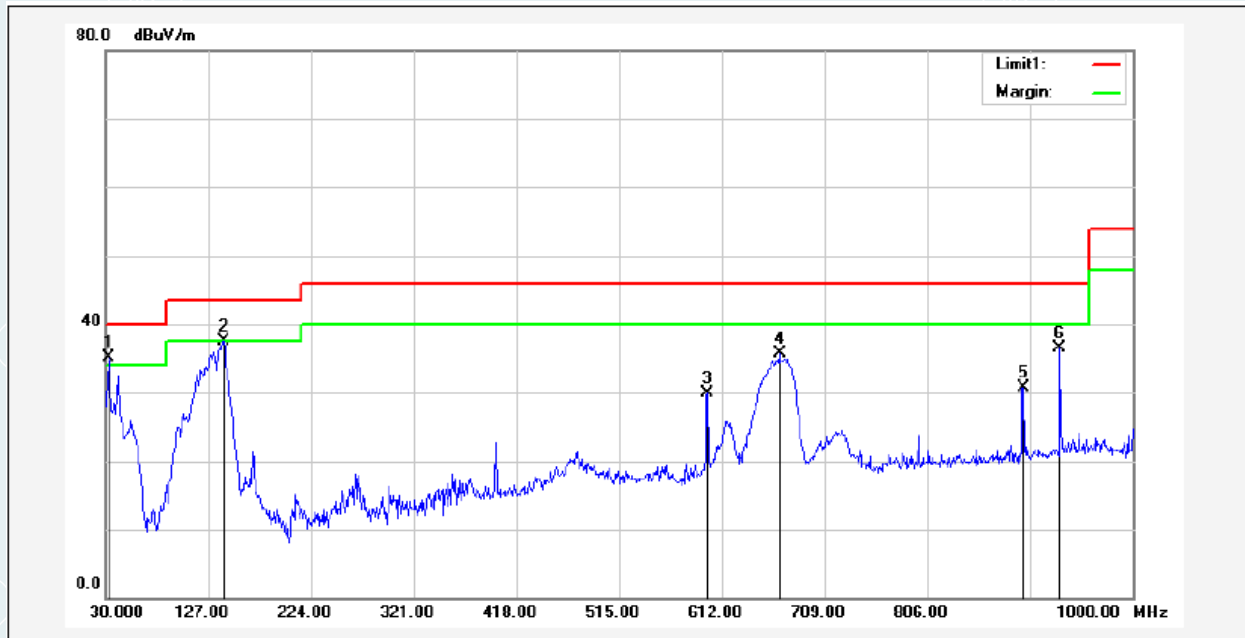
Date: 2021-02-01
 Horizontal



No.	Frequency (MHz)	Reading (dBuV)	Correction factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Over (dB)	Degree (deg.)	Height (cm)	Remark
1	32.9100	41.50	-18.38	23.12	40.00	-16.88	155	100	QP
2	141.5500	53.67	-26.42	27.25	43.50	-16.25	264	100	QP
3	597.4500	46.15	-17.60	28.55	46.00	-17.45	187	155	QP
4	671.1700	48.42	-17.11	31.31	46.00	-14.69	303	198	QP
5	896.2100	45.45	-14.97	30.48	46.00	-15.52	354	100	QP
6*	931.1300	50.85	-14.56	36.29	46.00	-9.71	149	100	QP

Mode: TX/ IEEE 802.11b
 Middle channel (2437MHz)
 Polarity

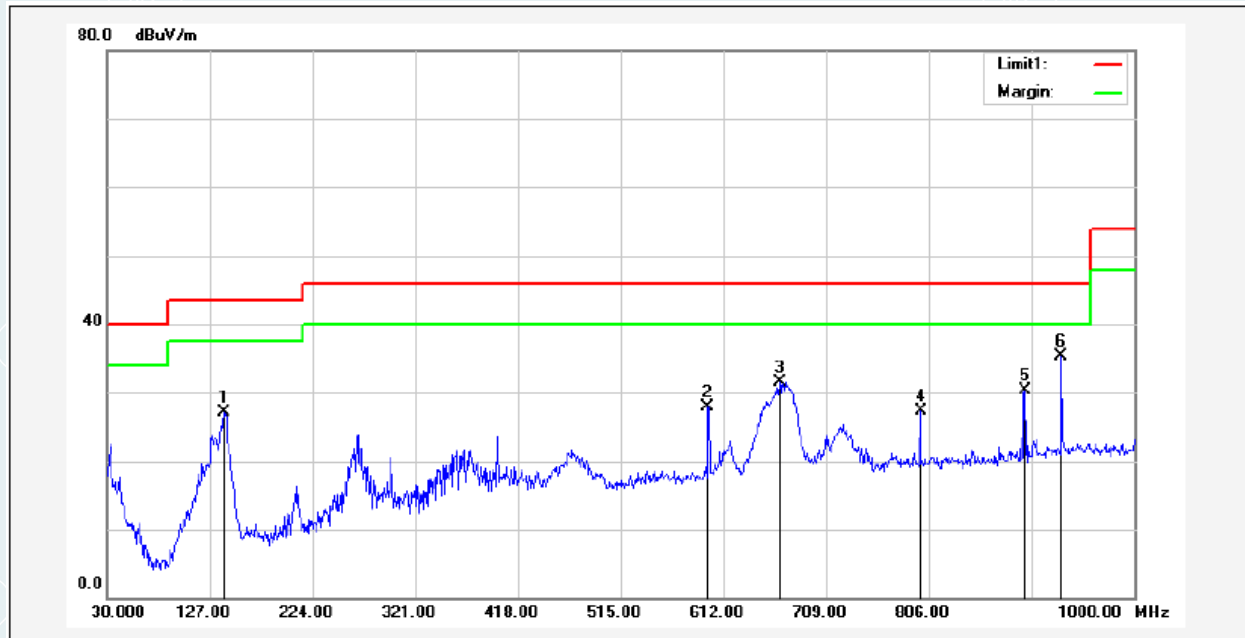
Date: 2021-02-01
 Vertical



No.	Frequency (MHz)	Reading (dBuV)	Correction factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Over (dB)	Degree (deg.)	Height (cm)	Remark
1*	32.9100	53.43	-18.38	35.05	40.00	-4.95	263	100	QP
2!	141.5500	63.98	-26.42	37.56	43.50	-5.94	119	155	QP
3	598.4200	47.41	-17.60	29.81	46.00	-16.19	216	199	QP
4	666.3200	52.89	-17.14	35.75	46.00	-10.25	325	100	QP
5	897.1800	45.66	-14.98	30.68	46.00	-15.32	95	100	QP
6	931.1300	50.97	-14.56	36.41	46.00	-9.59	164	100	QP

Mode: TX/ IEEE 802.11b
 Middle channel (2437MHz)
 Polarity

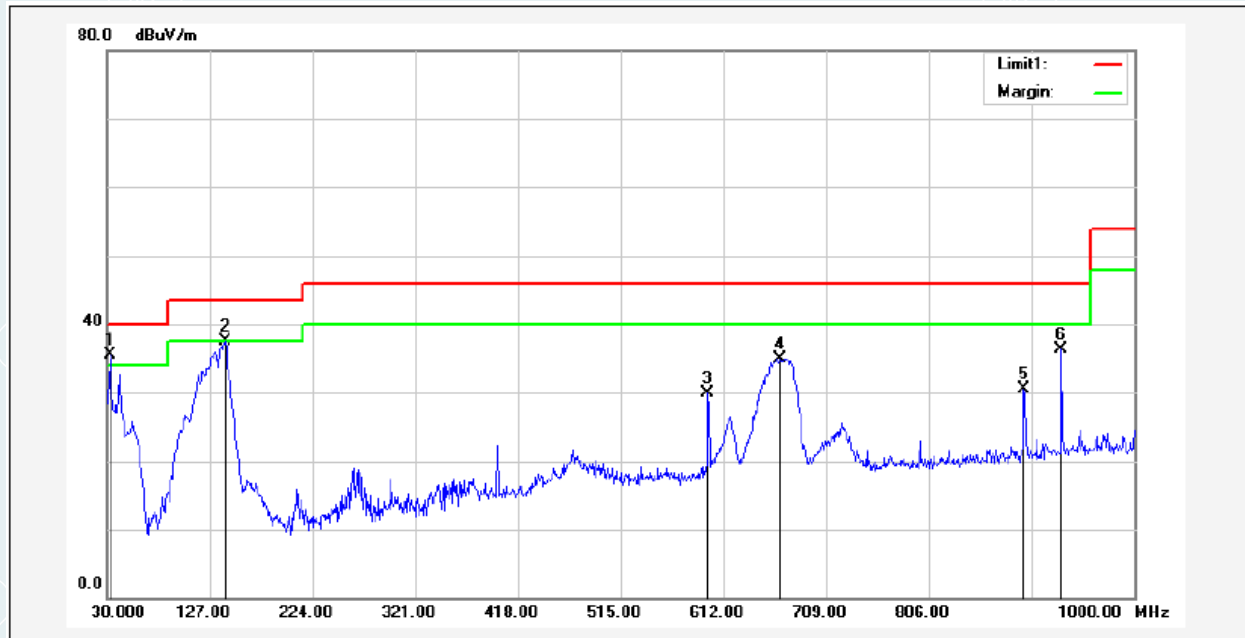
Date: 2021-02-01
 Horizontal



No.	Frequency (MHz)	Reading (dBuV)	Correction factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Over (dB)	Degree (deg.)	Height (cm)	Remark
1	140.5800	53.53	-26.35	27.18	43.50	-16.32	231	199	QP
2	597.4500	45.50	-17.60	27.90	46.00	-18.10	360	183	QP
3	665.3500	48.59	-17.15	31.44	46.00	-14.56	238	199	QP
4	798.2400	42.88	-15.59	27.29	46.00	-18.71	247	100	QP
5	897.1800	45.21	-14.98	30.23	46.00	-15.77	138	100	QP
6*	931.1300	49.83	-14.56	35.27	46.00	-10.73	225	100	QP

Mode: TX/ IEEE 802.11b
 Highest channel (2462MHz)
 Polarity

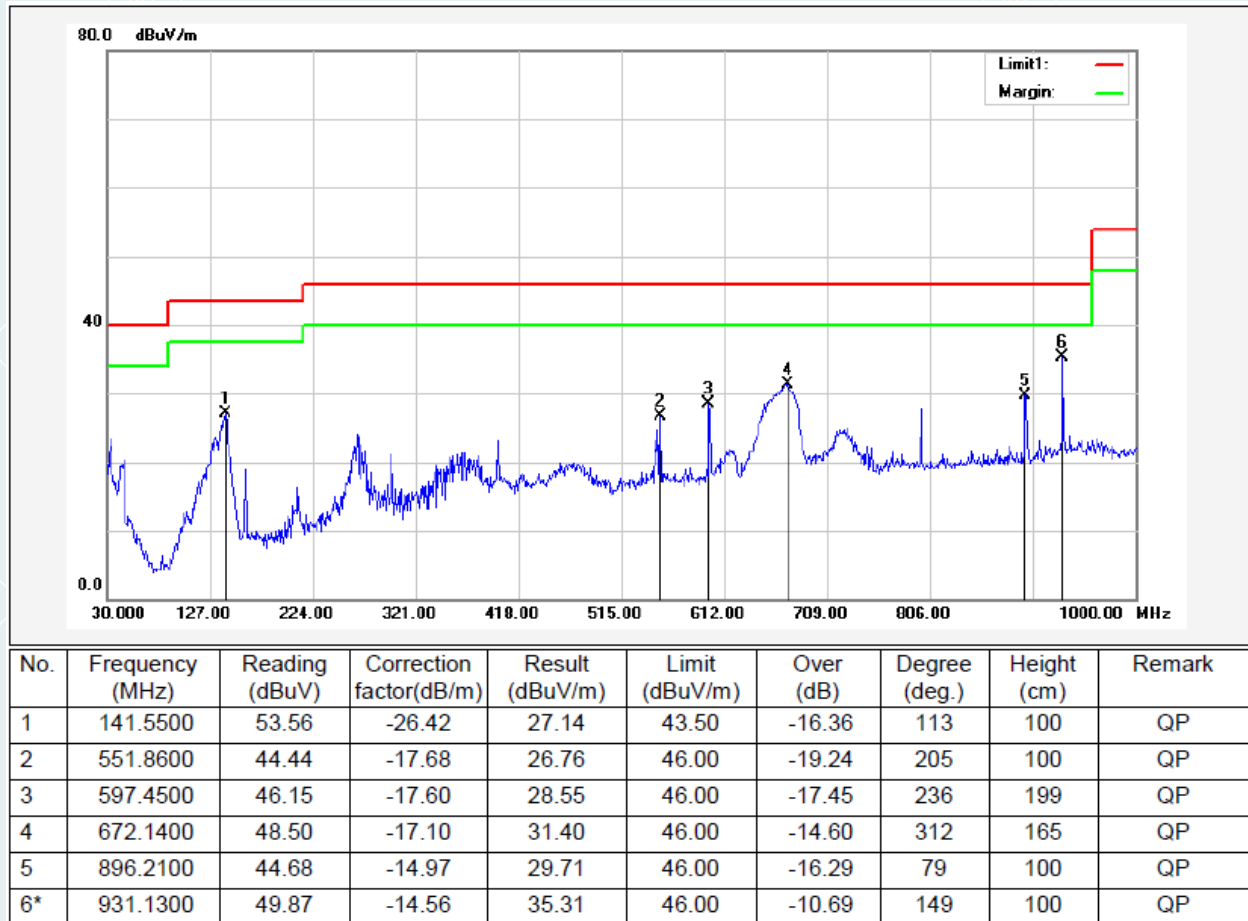
Date: 2021-02-01
 Vertical



No.	Frequency (MHz)	Reading (dBuV)	Correction factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Over (dB)	Degree (deg.)	Height (cm)	Remark
1*	32.9100	53.89	-18.38	35.51	40.00	-4.49	0	100	QP
2!	141.5500	63.94	-26.42	37.52	43.50	-5.98	355	100	QP
3	597.4500	47.42	-17.60	29.82	46.00	-16.18	121	100	QP
4	665.3500	52.09	-17.15	34.94	46.00	-11.06	334	100	QP
5	896.2100	45.39	-14.97	30.42	46.00	-15.58	144	199	QP
6	931.1300	50.86	-14.56	36.30	46.00	-9.70	176	100	QP

Mode: TX/ IEEE 802.11b
 Highest channel (2462MHz)
 Polarity

Date: 2021-02-01
 Horizontal



Remark:

- 1 No emission found between lowest internal used/generated frequency to 30MHz.
- 2 Radiated emissions measured in frequency range from 9 kHz to 1GHz were made with an instrument using Quasi-peak detector mode.
- 3 Data of measurement within this frequency range shown "----" in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
- 4 The IF bandwidth of Receiver between 30MHz to 1GHz was 120 kHz.

Above 1GHz-18GHz:

Mode: TX / IEEE 802.11b

Lowest channel (2412MHz)

Date: 2021-03-08

Suspected Data List									
NO.	Freq. [MHz]	Reading [dBμV/m]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	1409.0511	65.41	41.82	-23.59	74.00	32.18	150	289	Horizontal
2	2599.1999	67.63	47.51	-20.12	74.00	26.49	150	112	Horizontal
3	2798.9749	64.01	44.69	-19.32	74.00	29.31	150	119	Horizontal
4	4824.2680	61.18	50.54	-10.64	74.00	23.46	150	255	Horizontal
5	10800.4334	46.27	49.06	2.79	74.00	24.94	150	23	Horizontal
6	17691.6495	41.81	51.87	10.06	74.00	22.13	150	174	Horizontal

Suspected Data List									
NO.	Freq. [MHz]	Reading [dBμV/m]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	1398.0498	68.40	44.74	-23.66	74.00	29.26	150	357	Vertical
2	2511.9390	69.55	49.37	-20.18	74.00	24.63	150	112	Vertical
3	2995.7495	63.33	44.75	-18.58	74.00	29.25	150	324	Vertical
4	4824.2680	64.84	54.20	-10.64	74.00	19.80	150	31	Vertical
5	10410.4117	47.01	48.89	1.88	74.00	25.11	150	256	Vertical
6	17969.1650	42.25	51.59	9.34	74.00	22.41	150	2	Vertical

PK Final Data List					
NO.	Freq. [MHz]	Factor [dB]	Height [cm]	Angle [°]	Polarity
1	4824.2680	-10.64	150	31	Vertical

AV Final Data List									
NO.	Freq. [MHz]	Factor [dB]	AV Reading [dBμV/m]	AV Value [dBμV/m]	AV Limit [dBμV/m]	AV Margin [dB]	Height [cm]	Angle [°]	Polarity
1	4824.2680	-10.64	58.76	48.12	54.00	5.88	150	31	Vertical

Mode: TX/ IEEE 802.11b
Middle channel (2437 MHz)

Date: 2021-03-08

Suspected Data List									
NO.	Freq. [MHz]	Reading [dBμV/m]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	1434.5543	66.03	42.59	-23.44	74.00	31.41	150	289	Horizontal
2	2588.4486	68.46	48.46	-20.00	74.00	25.54	150	119	Horizontal
3	2622.7028	63.02	43.24	-19.78	74.00	30.76	150	127	Horizontal
4	4874.2708	58.39	47.63	-10.76	74.00	26.37	150	255	Horizontal
5	10724.5958	46.39	48.88	2.49	74.00	25.12	150	255	Horizontal
6	17818.3232	42.06	52.12	10.06	74.00	21.88	150	0	Horizontal

Suspected Data List									
NO.	Freq. [MHz]	Reading [dBμV/m]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	1194.7743	66.30	41.69	-24.61	74.00	32.31	150	141	Vertical
2	2536.6921	70.23	50.45	-19.78	74.00	23.55	150	112	Vertical
3	2792.9741	63.76	44.43	-19.33	74.00	29.57	150	105	Vertical
4	4874.2708	62.38	51.62	-10.76	74.00	22.38	150	24	Vertical
5	10832.1018	45.40	48.29	2.89	74.00	25.71	150	24	Vertical
6	17870.8262	41.75	51.79	10.04	74.00	22.21	150	24	Vertical

PK Final Data List					
NO.	Freq. [MHz]	Factor [dB]	Height [cm]	Angle [°]	Polarity
1	4874.2708	-10.76	150	24	Vertical

AV Final Data List									
NO.	Freq. [MHz]	Factor [dB]	AV Reading [dBμV/m]	AV Value [dBμV/m]	AV Limit [dBμV/m]	AV Margin [dB]	Height [cm]	Angle [°]	Polarity
1	4874.2708	-10.76	59.76	49.00	54.00	5.00	150	24	Vertical

Mode: TX / IEEE 802.11b
Highest channel (2462MHz)

Date: 2021-03-08

Suspected Data List									
NO.	Freq. [MHz]	Reading [dBμV/m]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	1357.0446	65.48	41.63	-23.85	74.00	32.37	150	280	Horizontal
2	2508.6886	66.47	46.23	-20.24	74.00	27.77	150	317	Horizontal
3	2799.2249	62.43	43.11	-19.32	74.00	30.89	150	295	Horizontal
4	4923.4402	59.90	48.91	-10.99	74.00	25.09	150	0	Horizontal
5	10821.2678	45.93	48.78	2.85	74.00	25.22	150	255	Horizontal
6	17681.6490	42.05	52.13	10.08	74.00	21.87	150	86	Horizontal

Suspected Data List									
NO.	Freq. [MHz]	Reading [dBμV/m]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	1399.8000	67.91	44.26	-23.65	74.00	29.74	150	104	Vertical
2	2510.1888	70.24	50.03	-20.21	74.00	23.97	150	112	Vertical
3	2792.9741	63.98	44.65	-19.33	74.00	29.35	150	104	Vertical
4	4924.2736	63.77	52.78	-10.99	74.00	21.22	150	255	Vertical
5	10823.7680	45.37	48.23	2.86	74.00	25.77	150	15	Vertical
6	17864.9925	42.06	52.12	10.06	74.00	21.88	150	255	Vertical

PK Final Data List					
NO.	Freq. [MHz]	Factor [dB]	Height [cm]	Angle [°]	Polarity
1	4924.2736	-10.99	150	255	Vertical

AV Final Data List									
NO.	Freq. [MHz]	Factor [dB]	AV Reading [dBμV/m]	AV Value [dBμV/m]	AV Limit [dBμV/m]	AV Margin [dB]	Height [cm]	Angle [°]	Polarity
1	4924.2736	-10.99	59.26	48.27	54.00	5.73	150	255	Vertical

Mode: TX / IEEE 802.11g
Lowest channel (2412MHz)

Date: 2021-03-08

Suspected Data List									
NO.	Freq. [MHz]	Reading [dBμV/m]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	1084.2084	67.86	42.89	-24.97	74.00	31.11	200	26	Horizontal
2	1194.2194	65.07	40.46	-24.61	74.00	33.54	200	196	Horizontal
3	1493.0493	62.17	39.05	-23.12	74.00	34.95	200	189	Horizontal
4	4872.1872	60.07	49.33	-10.74	74.00	24.67	100	321	Horizontal
5	14099.6100	43.10	51.12	8.02	74.00	22.88	200	349	Horizontal
6	17870.9871	41.97	52.01	10.04	74.00	21.99	100	247	Horizontal

PK Final Data List					
NO.	Freq. [MHz]	Factor [dB]	Height [cm]	Angle [°]	Polarity
1	4871.7731	-10.74	100	314	Horizontal
2	14099.6100	8.02	200	349	Horizontal
3	17870.9871	10.04	100	266	Horizontal

AV Final Data List									
NO.	Freq. [MHz]	Factor [dB]	AV Reading [dBμV/m]	AV Value [dBμV/m]	AV Limit [dBμV/m]	AV Margin [dB]	Height [cm]	Angle [°]	Polarity
1	4871.7731	-10.74	45.83	35.09	54.00	18.91	100	314	Horizontal
2	14099.6100	8.02	28.16	36.18	54.00	17.82	200	349	Horizontal
3	17870.9871	10.04	28.75	38.79	54.00	15.21	100	266	Horizontal

Suspected Data List									
NO.	Freq. [MHz]	Reading [dBμV/m]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	1083.0083	67.08	42.10	-24.98	74.00	31.90	200	255	Vertical
2	1194.0194	65.72	41.11	-24.61	74.00	32.89	200	255	Vertical
3	1492.8493	62.94	39.81	-23.13	74.00	34.19	200	255	Vertical
4	3058.5059	61.24	43.19	-18.05	74.00	30.81	200	105	Vertical
5	4819.6820	67.22	56.56	-10.66	74.00	17.44	200	172	Vertical
6	14201.6202	42.55	50.62	8.07	74.00	23.38	100	209	Vertical

PK Final Data List					
NO.	Freq. [MHz]	Factor [dB]	Height [cm]	Angle [°]	Polarity
1	4823.9715	-10.66	200	356	Vertical
2	14201.6202	8.07	100	209	Vertical

AV Final Data List									
NO.	Freq. [MHz]	Factor [dB]	AV Reading [dBμV/m]	AV Value [dBμV/m]	AV Limit [dBμV/m]	AV Margin [dB]	Height [cm]	Angle [°]	Polarity
1	4823.9715	-10.66	53.52	42.86	54.00	11.14	200	356	Vertical
2	14201.6202	8.07	27.99	36.06	54.00	17.94	100	209	Vertical

Mode: TX/ IEEE 802.11g
Middle channel (2437 MHz)

Date: 2021-03-08

Suspected Data List									
NO.	Freq. [MHz]	Reading [dBμV/m]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	1084.2084	67.86	42.89	-24.97	74.00	31.11	200	26	Horizontal
2	1194.2194	65.07	40.46	-24.61	74.00	33.54	200	196	Horizontal
3	1493.0493	62.17	39.05	-23.12	74.00	34.95	200	189	Horizontal
4	4872.1872	60.07	49.33	-10.74	74.00	24.67	100	321	Horizontal
5	14099.6100	43.10	51.12	8.02	74.00	22.88	200	349	Horizontal
6	17870.9871	41.97	52.01	10.04	74.00	21.99	100	247	Horizontal

PK Final Data List						
NO.	Freq. [MHz]	Factor [dB]	Height [cm]	Angle [°]	Polarity	
1	4871.7731	-10.74	100	314	Horizontal	
2	14099.6100	8.02	200	349	Horizontal	
3	17870.9871	10.04	100	266	Horizontal	

AV Final Data List									
NO.	Freq. [MHz]	Factor [dB]	AV Reading [dBμV/m]	AV Value [dBμV/m]	AV Limit [dBμV/m]	AV Margin [dB]	Height [cm]	Angle [°]	Polarity
1	4871.7731	-10.74	45.83	35.09	54.00	18.91	100	314	Horizontal
2	14099.6100	8.02	28.16	36.18	54.00	17.82	200	349	Horizontal
3	17870.9871	10.04	28.75	38.79	54.00	15.21	100	266	Horizontal

Suspected Data List									
NO.	Freq. [MHz]	Reading [dBμV/m]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	1083.6084	66.93	41.95	-24.98	74.00	32.05	200	255	Vertical
2	1195.2195	66.04	41.43	-24.61	74.00	32.57	200	255	Vertical
3	2090.1090	62.38	40.80	-21.58	74.00	33.20	200	247	Vertical
4	3058.5059	60.80	42.75	-18.05	74.00	31.25	200	105	Vertical
5	4872.1872	63.57	52.83	-10.74	74.00	21.17	200	105	Vertical
6	14201.6202	42.49	50.56	8.07	74.00	23.44	200	105	Vertical

PK Final Data List						
NO.	Freq. [MHz]	Factor [dB]	Height [cm]	Angle [°]	Polarity	
1	4872.1385	-10.74	194	349	Vertical	
2	14201.6202	8.07	200	132	Vertical	

AV Final Data List									
NO.	Freq. [MHz]	Factor [dB]	AV Reading [dBμV/m]	AV Value [dBμV/m]	AV Limit [dBμV/m]	AV Margin [dB]	Height [cm]	Angle [°]	Polarity
1	4872.1385	-10.74	49.85	39.11	54.00	14.89	194	349	Vertical
2	14201.6202	8.07	28.96	37.03	54.00	16.97	200	132	Vertical

Mode: TX/ IEEE 802.11g
Highest channel (2462MHz)

Date: 2021-03-08

Suspected Data List									
NO.	Freq. [MHz]	Reading [dBμV/m]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	1083.8084	68.20	43.22	-24.98	74.00	30.78	200	20	Horizontal
2	1194.4194	65.28	40.67	-24.61	74.00	33.33	200	203	Horizontal
3	1494.0494	62.81	39.69	-23.12	74.00	34.31	200	211	Horizontal
4	1794.0794	60.43	38.24	-22.19	74.00	35.76	100	215	Horizontal
5	4915.6916	57.89	46.90	-10.99	74.00	27.10	200	327	Horizontal
6	14198.6199	42.80	50.87	8.07	74.00	23.13	100	252	Horizontal

PK Final Data List					
NO.	Freq. [MHz]	Factor [dB]	Height [cm]	Angle [°]	Polarity
1	14198.6199	8.07	100	275	Horizontal

AV Final Data List									
NO.	Freq. [MHz]	Factor [dB]	AV Reading [dBμV/m]	AV Value [dBμV/m]	AV Limit [dBμV/m]	AV Margin [dB]	Height [cm]	Angle [°]	Polarity
1	14198.6199	8.07	28.39	36.46	54.00	17.54	100	275	Horizontal

Suspected Data List									
NO.	Freq. [MHz]	Reading [dBμV/m]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	1083.4083	67.52	42.54	-24.98	74.00	31.46	200	255	Vertical
2	1195.0195	66.60	41.99	-24.61	74.00	32.01	200	255	Vertical
3	3058.5059	60.65	42.60	-18.05	74.00	31.40	200	105	Vertical
4	4926.1926	60.64	49.66	-10.98	74.00	24.34	200	105	Vertical
5	14098.1098	43.31	51.29	7.98	74.00	22.71	200	328	Vertical
6	17230.4230	42.42	52.02	9.60	74.00	21.98	200	150	Vertical

PK Final Data List					
NO.	Freq. [MHz]	Factor [dB]	Height [cm]	Angle [°]	Polarity
1	4925.3551	-10.99	200	349	Vertical
2	14098.1098	7.98	200	330	Vertical
3	17187.6916	9.60	200	358	Vertical

AV Final Data List									
NO.	Freq. [MHz]	Factor [dB]	AV Reading [dBμV/m]	AV Value [dBμV/m]	AV Limit [dBμV/m]	AV Margin [dB]	Height [cm]	Angle [°]	Polarity
1	4925.3551	-10.99	46.27	35.28	54.00	18.72	200	349	Vertical
2	14098.1098	7.98	28.35	36.33	54.00	17.67	200	330	Vertical
3	17187.6916	9.60	28.12	37.72	54.00	16.28	200	358	Vertical

Mode: TX / IEEE 802.11n HT20
Lowest channel (2412MHz)

Date: 2021-03-08

Suspected Data List									
NO.	Freq. [MHz]	Reading [dBμV/m]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	1083.2083	68.50	43.52	-24.98	74.00	30.48	200	248	Horizontal
2	1194.6195	65.24	40.63	-24.61	74.00	33.37	200	211	Horizontal
3	4827.1827	63.50	52.87	-10.63	74.00	21.13	200	338	Horizontal
4	7762.9763	50.29	47.06	-3.23	74.00	26.94	200	105	Horizontal
5	14099.6100	43.10	51.12	8.02	74.00	22.88	100	209	Horizontal
6	17074.4074	43.70	51.96	8.26	74.00	22.04	100	282	Horizontal

PK Final Data List					
NO.	Freq. [MHz]	Factor [dB]	Height [cm]	Angle [°]	Polarity
1	4823.8278	-10.63	200	252	Horizontal

AV Final Data List									
NO.	Freq. [MHz]	Factor [dB]	AV Reading [dBμV/m]	AV Value [dBμV/m]	AV Limit [dBμV/m]	AV Margin [dB]	Height [cm]	Angle [°]	Polarity
1	4823.8278	-10.63	47.94	37.31	54.00	16.69	200	252	Horizontal

Suspected Data List									
NO.	Freq. [MHz]	Reading [dBμV/m]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	1081.4081	64.01	39.03	-24.98	74.00	34.97	200	255	Vertical
2	1196.0196	66.18	41.57	-24.61	74.00	32.43	200	255	Vertical
3	2388.9389	76.24	55.58	-20.66	74.00	18.42	200	129	Vertical
4	3216.0216	59.77	42.79	-16.98	74.00	31.21	100	217	Vertical
5	4822.6823	68.62	57.97	-10.65	74.00	16.03	200	165	Vertical
6	13927.0927	43.07	50.36	7.29	74.00	23.64	100	105	Vertical
7	17884.4884	42.42	52.40	9.98	74.00	21.60	200	113	Vertical

PK Final Data List					
NO.	Freq. [MHz]	Factor [dB]	Height [cm]	Angle [°]	Polarity
1	4823.6468	-10.65	186	349	Vertical

AV Final Data List									
NO.	Freq. [MHz]	Factor [dB]	AV Reading [dBμV/m]	AV Value [dBμV/m]	AV Limit [dBμV/m]	AV Margin [dB]	Height [cm]	Angle [°]	Polarity
1	4823.6468	-10.65	53.31	42.66	54.00	11.34	186	349	Vertical

Mode: TX/ IEEE 802.11n HT20
Middle channel (2437 MHz)

Date: 2021-03-08

Suspected Data List									
NO.	Freq. [MHz]	Reading [dBμV/m]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	1084.6085	67.40	42.43	-24.97	74.00	31.57	200	30	Horizontal
2	1194.8195	65.58	40.97	-24.61	74.00	33.03	200	204	Horizontal
3	1462.8463	61.41	38.13	-23.28	74.00	35.87	200	135	Horizontal
4	4870.6871	59.95	49.22	-10.73	74.00	24.78	200	346	Horizontal
5	14198.6199	42.44	50.51	8.07	74.00	23.49	100	105	Horizontal
6	17815.4815	42.31	52.36	10.05	74.00	21.64	200	142	Horizontal

PK Final Data List					
NO.	Freq. [MHz]	Factor [dB]	Height [cm]	Angle [°]	Polarity
1	4871.7343	-10.73	200	322	Horizontal
2	14198.6199	8.07	100	110	Horizontal
3	17815.4815	10.05	222	142	Horizontal

AV Final Data List									
NO.	Freq. [MHz]	Factor [dB]	AV Reading [dBμV/m]	AV Value [dBμV/m]	AV Limit [dBμV/m]	AV Margin [dB]	Height [cm]	Angle [°]	Polarity
1	4871.7343	-10.73	46.96	36.23	54.00	17.77	200	322	Horizontal
2	14198.6199	8.07	28.13	36.20	54.00	17.80	100	110	Horizontal
3	17815.4815	10.05	28.95	39.00	54.00	15.00	222	142	Horizontal

Suspected Data List									
NO.	Freq. [MHz]	Reading [dBμV/m]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	1082.6083	68.75	43.77	-24.98	74.00	30.23	100	61	Vertical
2	1195.4195	65.81	41.20	-24.61	74.00	32.80	200	255	Vertical
3	1493.0493	61.16	38.04	-23.12	74.00	35.96	200	255	Vertical
4	3058.5059	60.28	42.23	-18.05	74.00	31.77	200	105	Vertical
5	4869.1869	64.19	53.48	-10.71	74.00	20.52	200	105	Vertical
6	14084.6085	43.15	50.80	7.65	74.00	23.20	200	268	Vertical

PK Final Data List					
NO.	Freq. [MHz]	Factor [dB]	Height [cm]	Angle [°]	Polarity
1	14084.6085	7.65	200	275	Vertical
2	4873.0092	-10.71	177	345	Vertical

AV Final Data List									
NO.	Freq. [MHz]	Factor [dB]	AV Reading [dBμV/m]	AV Value [dBμV/m]	AV Limit [dBμV/m]	AV Margin [dB]	Height [cm]	Angle [°]	Polarity
1	14084.6085	7.65	28.54	36.19	54.00	17.81	200	275	Vertical
2	4873.0092	-10.71	48.71	38.00	54.00	16.00	177	345	Vertical

Mode: TX/ IEEE 802.11n HT20
Highest channel (2462MHz)

Date: 2021-03-08

Suspected Data List									
NO.	Freq. [MHz]	Reading [dBμV/m]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	1082.4082	72.38	47.40	-24.98	74.00	26.60	200	0	Horizontal
2	1194.4194	65.04	40.43	-24.61	74.00	33.57	200	90	Horizontal
3	1463.2463	60.98	37.71	-23.27	74.00	36.29	100	255	Horizontal
4	4914.1914	55.22	44.23	-10.99	74.00	29.77	200	335	Horizontal
5	11100.8101	45.50	49.20	3.70	74.00	24.80	200	149	Horizontal
6	14215.1215	42.69	50.44	7.75	74.00	23.56	100	203	Horizontal

PK Final Data List					
NO.	Freq. [MHz]	Factor [dB]	Height [cm]	Angle [°]	Polarity
1	11096.4253	3.70	200	358	Horizontal
2	14215.1215	7.75	100	233	Horizontal

AV Final Data List									
NO.	Freq. [MHz]	Factor [dB]	AV Reading [dBμV/m]	AV Value [dBμV/m]	AV Limit [dBμV/m]	AV Margin [dB]	Height [cm]	Angle [°]	Polarity
1	11096.4253	3.70	31.48	35.18	54.00	18.82	200	358	Horizontal
2	14215.1215	7.75	28.96	36.71	54.00	17.29	100	233	Horizontal

Suspected Data List									
NO.	Freq. [MHz]	Reading [dBμV/m]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	1085.0085	65.52	40.55	-24.97	74.00	33.45	200	241	Vertical
2	1194.2194	65.35	40.74	-24.61	74.00	33.26	200	255	Vertical
3	2089.3089	62.59	41.01	-21.58	74.00	32.99	200	248	Vertical
4	4923.1923	60.77	49.78	-10.99	74.00	24.22	100	105	Vertical
5	9378.6379	47.30	47.33	0.03	74.00	26.67	100	312	Vertical
6	13864.0864	43.75	50.42	6.67	74.00	23.58	100	341	Vertical

PK Final Data List					
NO.	Freq. [MHz]	Factor [dB]	Height [cm]	Angle [°]	Polarity
1	13864.0864	6.67	100	360	Vertical
2	4923.6846	-10.98	200	348	Vertical

AV Final Data List									
NO.	Freq. [MHz]	Factor [dB]	AV Reading [dBμV/m]	AV Value [dBμV/m]	AV Limit [dBμV/m]	AV Margin [dB]	Height [cm]	Angle [°]	Polarity
1	13864.0864	6.67	28.64	35.31	54.00	18.69	100	360	Vertical
2	4923.6846	-10.98	46.34	35.36	54.00	18.64	200	348	Vertical

Mode: TX / IEEE 802.11n HT40
Lowest channel (2422MHz)

Date: 2021-03-08

Suspected Data List									
NO.	Freq. [MHz]	Reading [dBμV/m]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	1084.4084	68.68	43.71	-24.97	74.00	30.29	200	26	Horizontal
2	1196.4196	65.77	41.16	-24.61	74.00	32.84	200	204	Horizontal
3	1493.8494	62.32	39.20	-23.12	74.00	34.80	200	211	Horizontal
4	2091.1091	61.67	40.09	-21.58	74.00	33.91	100	226	Horizontal
5	2388.1388	82.56	61.89	-20.67	74.00	12.11	100	100	Horizontal
6	4845.1845	59.31	48.75	-10.56	74.00	25.25	200	349	Horizontal

PK Final Data List					
NO.	Freq. [MHz]	Factor [dB]	Height [cm]	Angle [°]	Polarity
1	2388.1985	-20.67	100	153	Horizontal
2	4841.0176	-10.56	200	351	Horizontal

AV Final Data List									
NO.	Freq. [MHz]	Factor [dB]	AV Reading [dBμV/m]	AV Value [dBμV/m]	AV Limit [dBμV/m]	AV Margin [dB]	Height [cm]	Angle [°]	Polarity
1	2388.1985	-20.67	64.86	44.19	54.00	9.81	100	153	Horizontal
2	4841.0176	-10.56	43.92	33.36	54.00	20.64	200	351	Horizontal

Suspected Data List									
NO.	Freq. [MHz]	Reading [dBμV/m]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	1083.4083	66.42	41.44	-24.98	74.00	32.56	200	255	Vertical
2	1194.0194	65.41	40.80	-24.61	74.00	33.20	200	255	Vertical
3	1493.8494	62.88	39.76	-23.12	74.00	34.24	200	255	Vertical
4	2091.5092	62.91	41.33	-21.58	74.00	32.67	200	239	Vertical
5	2387.1387	84.46	63.78	-20.68	74.00	10.22	200	99	Vertical
6	4845.1845	61.28	50.72	-10.56	74.00	23.28	200	105	Vertical

PK Final Data List					
NO.	Freq. [MHz]	Factor [dB]	Height [cm]	Angle [°]	Polarity
1	2387.9981	-20.68	149	50	Vertical
2	4841.0176	-10.56	200	2	Vertical

AV Final Data List									
NO.	Freq. [MHz]	Factor [dB]	AV Reading [dBμV/m]	AV Value [dBμV/m]	AV Limit [dBμV/m]	AV Margin [dB]	Height [cm]	Angle [°]	Polarity
1	2387.9981	-20.68	71.21	50.53	54.00	3.47	149	50	Vertical
2	4841.0176	-10.56	46.39	35.83	54.00	18.17	200	2	Vertical

Mode: TX/ IEEE 802.11n HT40
Middle channel (2437 MHz)

Date: 2021-03-08

Suspected Data List									
NO.	Freq. [MHz]	Reading [dBμV/m]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	1084.2084	69.83	44.86	-24.97	74.00	29.14	200	255	Horizontal
2	1194.2194	65.71	41.10	-24.61	74.00	32.90	200	211	Horizontal
3	1494.6495	61.85	38.73	-23.12	74.00	35.27	200	196	Horizontal
4	2387.3387	73.82	53.14	-20.68	74.00	20.86	200	101	Horizontal
5	4872.1872	56.36	45.62	-10.74	74.00	28.38	200	157	Horizontal
6	14099.6100	42.27	50.29	8.02	74.00	23.71	200	254	Horizontal

PK Final Data List					
NO.	Freq. [MHz]	Factor [dB]	Height [cm]	Angle [°]	Polarity
1	14099.6100	8.02	200	265	Horizontal
2	2388.2459	-20.68	200	154	Horizontal

AV Final Data List									
NO.	Freq. [MHz]	Factor [dB]	AV Reading [dBμV/m]	AV Value [dBμV/m]	AV Limit [dBμV/m]	AV Margin [dB]	Height [cm]	Angle [°]	Polarity
1	14099.6100	8.02	28.69	36.71	54.00	17.29	200	265	Horizontal
2	2388.2459	-20.68	53.77	33.09	54.00	20.91	200	154	Horizontal

Suspected Data List									
NO.	Freq. [MHz]	Reading [dBμV/m]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	1082.4082	65.78	40.80	-24.98	74.00	33.20	200	255	Vertical
2	1195.2195	65.59	40.98	-24.61	74.00	33.02	200	255	Vertical
3	1494.6495	61.20	38.08	-23.12	74.00	35.92	200	255	Vertical
4	2388.5389	75.78	55.12	-20.66	74.00	18.88	200	112	Vertical
5	3058.5059	60.44	42.39	-18.05	74.00	31.61	200	105	Vertical
6	4860.1860	61.57	50.94	-10.63	74.00	23.06	200	105	Vertical

PK Final Data List					
NO.	Freq. [MHz]	Factor [dB]	Height [cm]	Angle [°]	Polarity
1	2388.3598	-20.67	151	40	Vertical
2	4867.6950	-10.63	200	42	Vertical

AV Final Data List									
NO.	Freq. [MHz]	Factor [dB]	AV Reading [dBμV/m]	AV Value [dBμV/m]	AV Limit [dBμV/m]	AV Margin [dB]	Height [cm]	Angle [°]	Polarity
1	2388.3598	-20.67	60.80	40.13	54.00	13.87	151	40	Vertical
2	4867.6950	-10.63	46.55	35.92	54.00	18.08	200	42	Vertical

Mode: TX/ IEEE 802.11n HT40
Highest channel (2452MHz)

Date: 2021-03-08

Suspected Data List									
NO.	Freq. [MHz]	Reading [dBμV/m]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	1083.2083	73.07	48.09	-24.98	74.00	25.91	200	105	Horizontal
2	1194.6195	65.40	40.79	-24.61	74.00	33.21	200	210	Horizontal
3	1462.8463	61.14	37.86	-23.28	74.00	36.14	200	105	Horizontal
4	1903.8904	60.02	38.10	-21.92	74.00	35.90	200	225	Horizontal
5	2499.9500	70.04	49.66	-20.38	74.00	24.34	100	142	Horizontal
6	4900.6901	56.32	45.33	-10.99	74.00	28.67	200	255	Horizontal

PK Final Data List					
NO.	Freq. [MHz]	Factor [dB]	Height [cm]	Angle [°]	Polarity
1	2500.4750	-20.38	100	150	Horizontal

AV Final Data List									
NO.	Freq. [MHz]	Factor [dB]	AV Reading [dBμV/m]	AV Value [dBμV/m]	AV Limit [dBμV/m]	AV Margin [dB]	Height [cm]	Angle [°]	Polarity
1	2500.4750	-20.38	51.12	30.74	54.00	23.26	100	150	Horizontal

Suspected Data List									
NO.	Freq. [MHz]	Reading [dBμV/m]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	1082.6083	68.43	43.45	-24.98	74.00	30.55	200	263	Vertical
2	1194.6195	65.94	41.33	-24.61	74.00	32.67	200	286	Vertical
3	1494.0494	63.53	40.41	-23.12	74.00	33.59	200	293	Vertical
4	2090.5091	61.04	39.46	-21.58	74.00	34.54	200	278	Vertical
5	2499.3499	74.59	54.21	-20.38	74.00	19.79	100	105	Vertical
6	4905.1905	61.03	50.04	-10.99	74.00	23.96	200	16	Vertical

PK Final Data List					
NO.	Freq. [MHz]	Factor [dB]	Height [cm]	Angle [°]	Polarity
1	2500.9370	-20.38	172	135	Vertical
2	4899.8684	-10.99	200	38	Vertical

AV Final Data List									
NO.	Freq. [MHz]	Factor [dB]	AV Reading [dBμV/m]	AV Value [dBμV/m]	AV Limit [dBμV/m]	AV Margin [dB]	Height [cm]	Angle [°]	Polarity
1	2500.9370	-20.38	58.80	38.42	54.00	15.58	172	135	Vertical
2	4899.8684	-10.99	47.38	36.39	54.00	17.61	200	38	Vertical

Above 18GHz-26.5GHz:

Pre-scan all modes and recorded the worst case results in this report (IEEE 802.11b)

Mode: TX / IEEE 802.11b

Lowest channel (2412MHz)

Date: 2021-01-21

Suspected Data List									
NO.	Freq. [MHz]	Reading [dBμV/m]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	18932.4500	58.33	47.17	-11.16	83.50	36.33	100	77	Horizontal
2	19541.9000	57.24	46.34	-10.90	83.50	37.16	100	102	Horizontal
3	20495.6000	56.42	45.93	-10.49	83.50	37.57	100	89	Horizontal
4	23011.6000	55.63	46.70	-8.93	83.50	36.80	100	201	Horizontal
5	23719.6500	56.00	47.45	-8.55	83.50	36.05	100	164	Horizontal
6	26477.0500	55.13	47.62	-7.51	83.50	35.88	100	359	Horizontal

Suspected Data List									
NO.	Freq. [MHz]	Reading [dBμV/m]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	18896.3250	57.74	46.54	-11.20	83.50	36.96	100	18	Vertical
2	19699.5750	57.04	46.17	-10.87	83.50	37.33	100	295	Vertical
3	20547.0250	56.11	45.65	-10.46	83.50	37.85	100	345	Vertical
4	23250.8750	55.43	46.61	-8.82	83.50	36.89	100	270	Vertical
5	24621.5000	55.32	47.20	-8.12	83.50	36.30	100	360	Vertical
6	25237.7500	55.36	47.71	-7.65	83.50	35.79	100	221	Vertical

Mode: TX / IEEE 802.11b

Lowest channel (2437MHz)

Date: 2021-01-21

Suspected Data List									
NO.	Freq. [MHz]	Reading [dBμV/m]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	18352.7500	58.45	46.90	-11.55	83.50	36.60	100	272	Horizontal
2	19605.6500	57.33	46.46	-10.87	83.50	37.04	100	9	Horizontal
3	21370.2500	55.64	45.51	-10.13	83.50	37.99	100	109	Horizontal
4	22662.2500	55.42	46.21	-9.21	83.50	37.29	100	309	Horizontal
5	24700.9750	55.34	47.24	-8.10	83.50	36.26	100	360	Horizontal
6	26463.0250	55.25	47.74	-7.51	83.50	35.76	100	235	Horizontal

Suspected Data List									
NO.	Freq. [MHz]	Reading [dBμV/m]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	18657.4750	58.08	46.70	-11.38	83.50	36.80	100	40	Vertical
2	19877.2250	57.72	46.86	-10.86	83.50	36.64	100	342	Vertical
3	21558.9500	56.01	46.05	-9.96	83.50	37.45	100	228	Vertical
4	22816.1000	55.45	46.39	-9.06	83.50	37.11	100	78	Vertical
5	24269.1750	55.49	47.30	-8.19	83.50	36.20	100	0	Vertical
6	26463.4500	55.21	47.70	-7.51	83.50	35.80	100	15	Vertical

Mode: TX / IEEE 802.11b
Highest channel (2462MHz)

Date: 2021-01-21

Suspected Data List									
NO.	Freq. [MHz]	Reading [dBμV/m]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	18311.5250	59.06	47.50	-11.56	83.50	36.00	100	164	Horizontal
2	19336.2000	57.28	46.27	-11.01	83.50	37.23	100	216	Horizontal
3	21630.7750	55.80	45.88	-9.92	83.50	37.62	100	292	Horizontal
4	22711.9750	56.10	46.94	-9.16	83.50	36.56	100	78	Horizontal
5	23869.6750	55.33	46.94	-8.39	83.50	36.56	100	14	Horizontal
6	25193.5500	55.39	47.75	-7.64	83.50	35.75	100	65	Horizontal

Suspected Data List									
NO.	Freq. [MHz]	Reading [dBμV/m]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	19027.2250	58.14	47.05	-11.09	83.50	36.45	100	282	Vertical
2	19559.7500	56.92	46.03	-10.89	83.50	37.47	100	55	Vertical
3	21049.8000	56.59	46.29	-10.30	83.50	37.21	100	81	Vertical
4	22966.9750	55.77	46.81	-8.96	83.50	36.69	100	68	Vertical
5	23720.5000	55.41	46.86	-8.55	83.50	36.64	100	243	Vertical
6	26498.3000	55.34	47.81	-7.53	83.50	35.69	100	7	Vertical

7. 6DB BANDWIDTH

7.1. LIMITS

Systems using digital modulation techniques may operate in the 902–928 MHz, 2400–2483.5 MHz, and 5725–5850 MHz bands. The minimum 6 dB bandwidth shall be at least 500 kHz.

7.2. TEST PROCEDURES

- 1) Remove the antenna from the EUT, and then connect a low loss RF cable from antenna port to the spectrum analyzer.
- 2) Set resolution bandwidth (RBW) = 100kHz. Set the video bandwidth (VBW) $\geq 3 \times$ RBW. Detector = Peak. Trace mode = max hold. Sweep = auto couple. Allow the trace to stabilize, record 6dB bandwidth value.
- 3) Repeat above procedures until all frequencies measured were complete.

7.3. TEST SETUP



7.4. TEST RESULTS

Test mode: IEEE 802.11b

Channel No.	Frequency (MHz)	Bandwidth (kHz)	Limit (kHz)	Test Result
1	2412	10.07	>500	PASS
6	2437	10.07		PASS
11	2462	9.593		PASS

Test mode: IEEE 802.11g

Channel No.	Frequency (MHz)	Bandwidth (kHz)	Limit (kHz)	Test Result
1	2412	15.11	>500	PASS
6	2437	15.14		PASS
11	2462	15.14		PASS

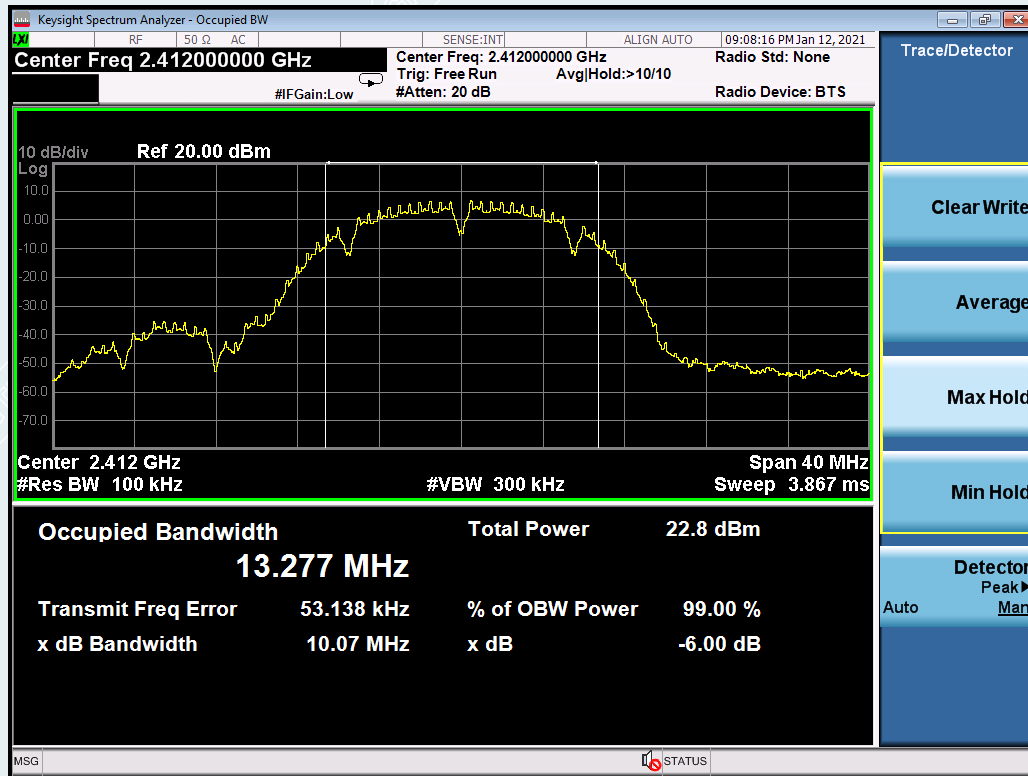
Test mode: IEEE 802.11n HT20

Channel No.	Frequency (MHz)	Bandwidth (kHz)	Limit (kHz)	Test Result
1	2412	15.14	>500	PASS
6	2437	15.14		PASS
11	2462	15.13		PASS

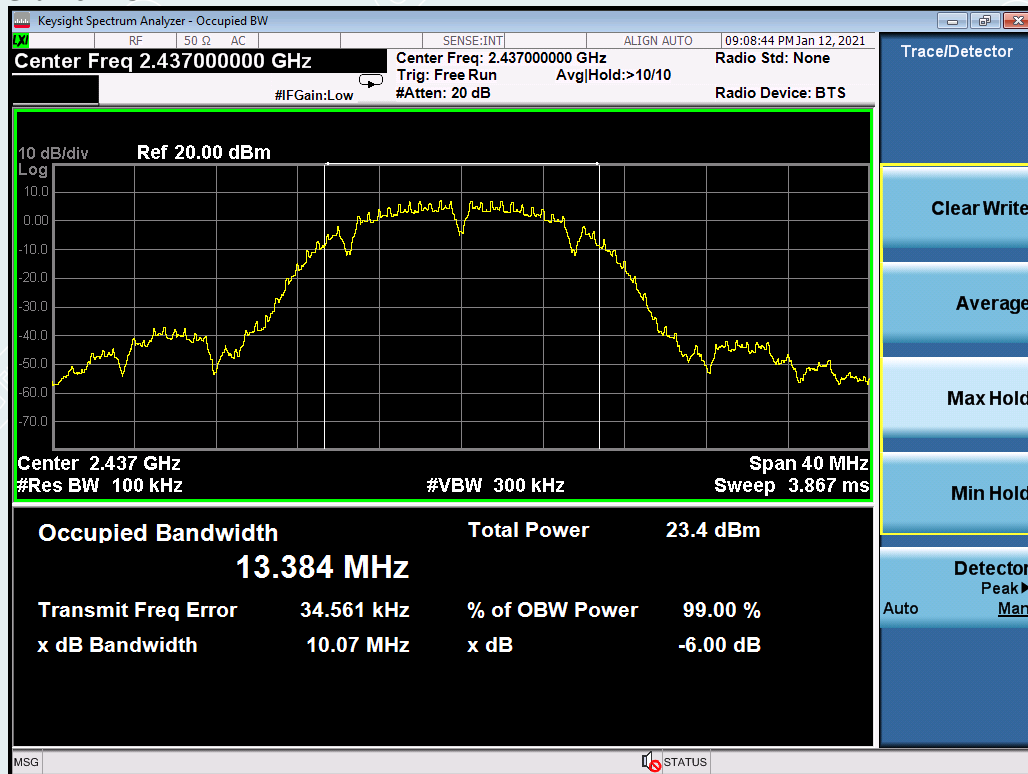
Test mode: IEEE 802.11n HT40

Channel No.	Frequency (MHz)	Bandwidth (kHz)	Limit (kHz)	Test Result
3	2422	33.88	>500	PASS
6	2437	33.83		PASS
9	2452	33.89		PASS

802.11b mode:
Channel 2412MHz



802.11b mode:
Channel 2437MHz



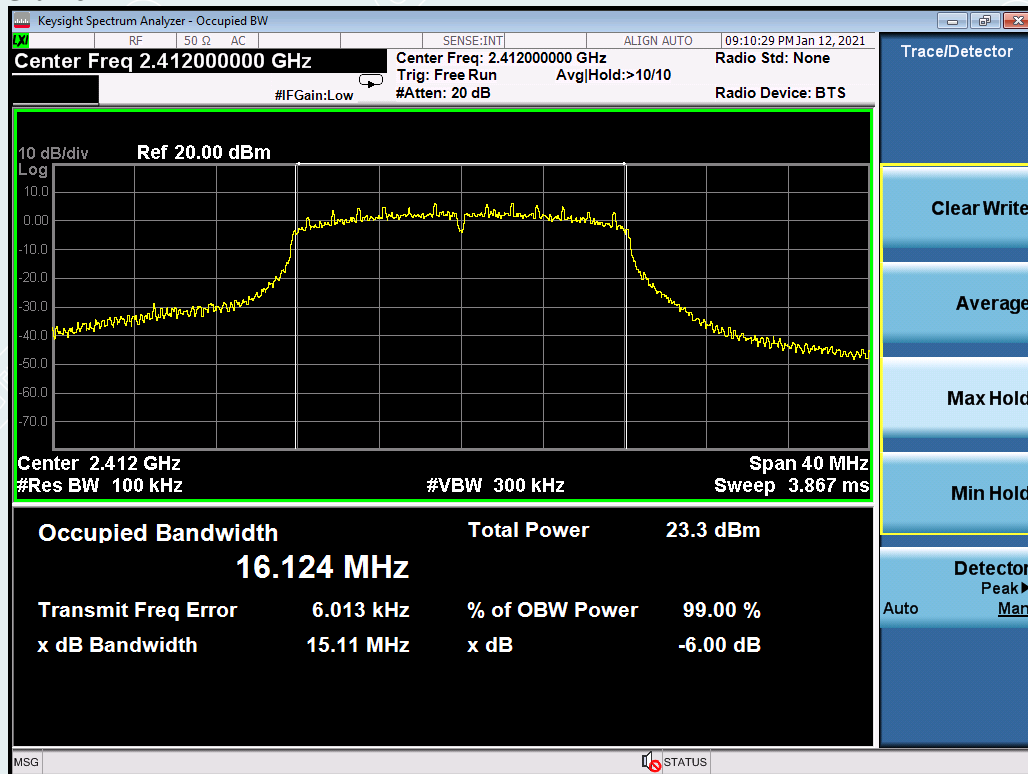
802.11b mode:

Channel 2462MHz

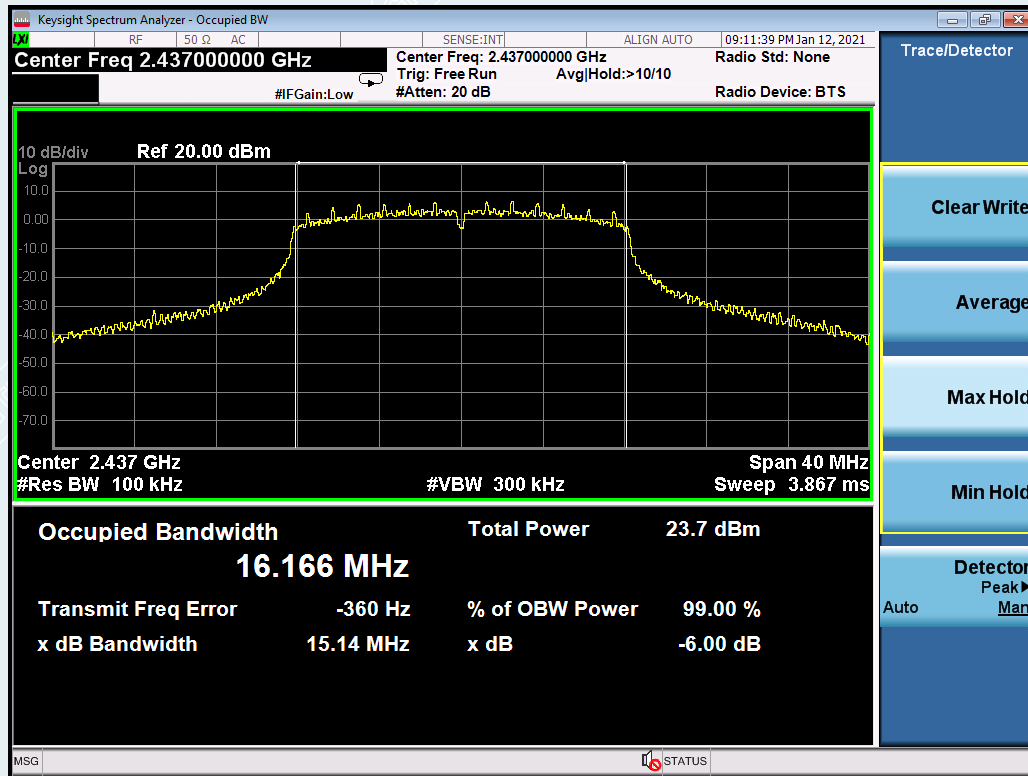


802.11g mode:

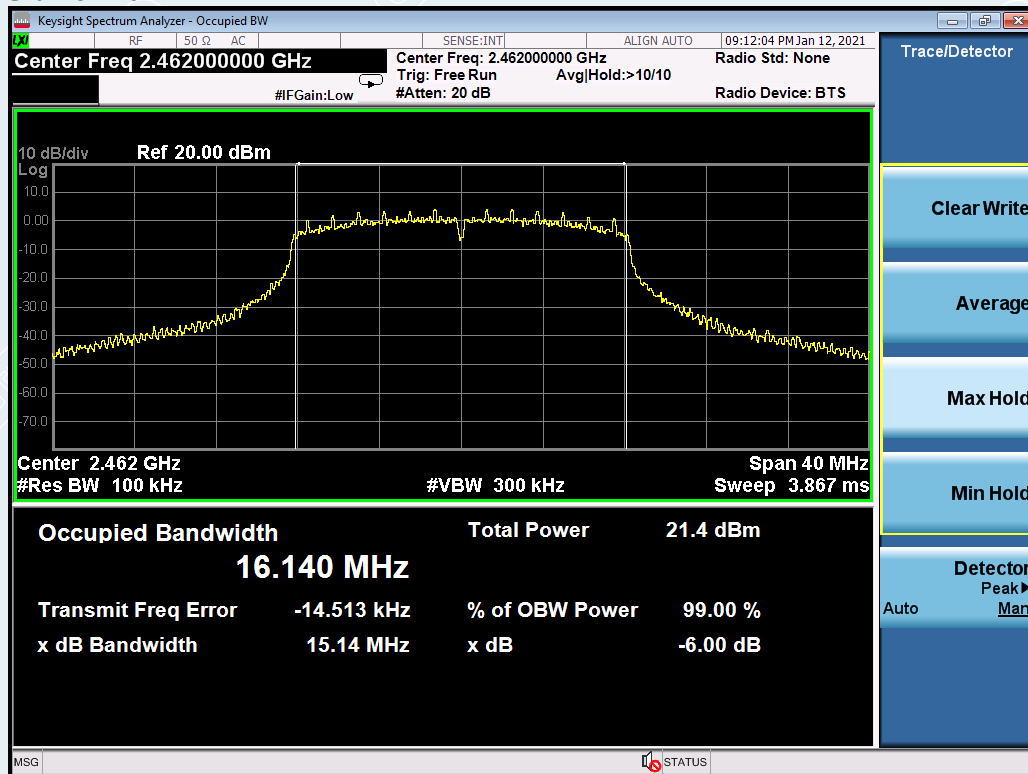
Channel 2412MHz



802.11g mode:
Channel 2437MHz



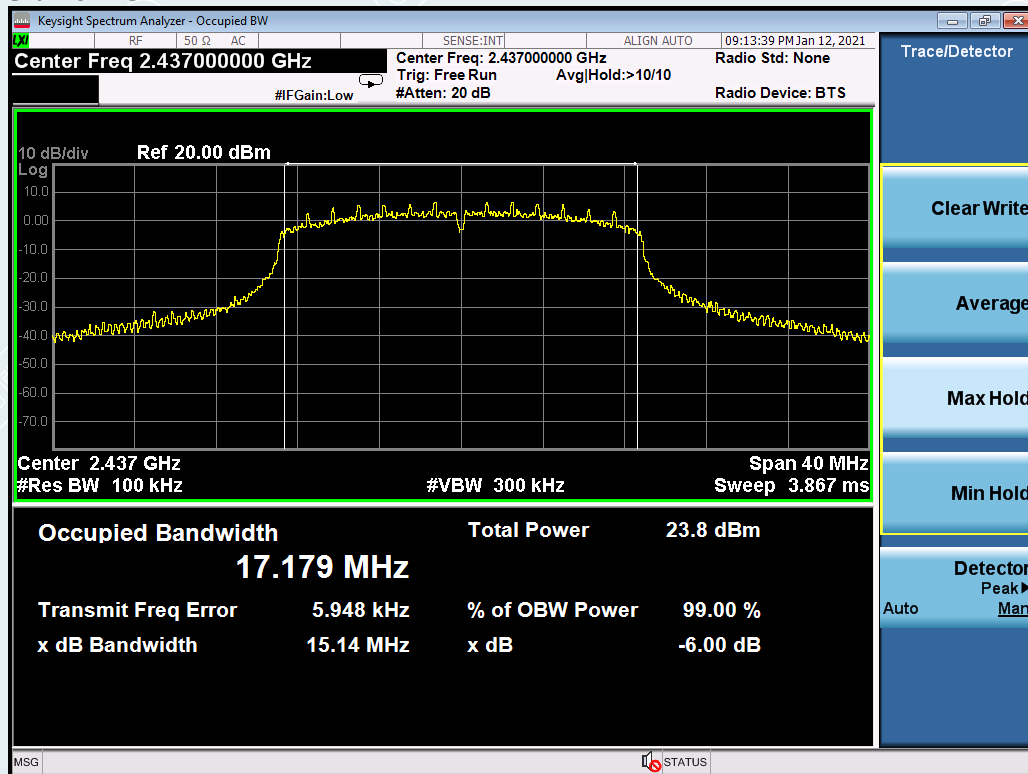
802.11g mode:
Channel 2462MHz



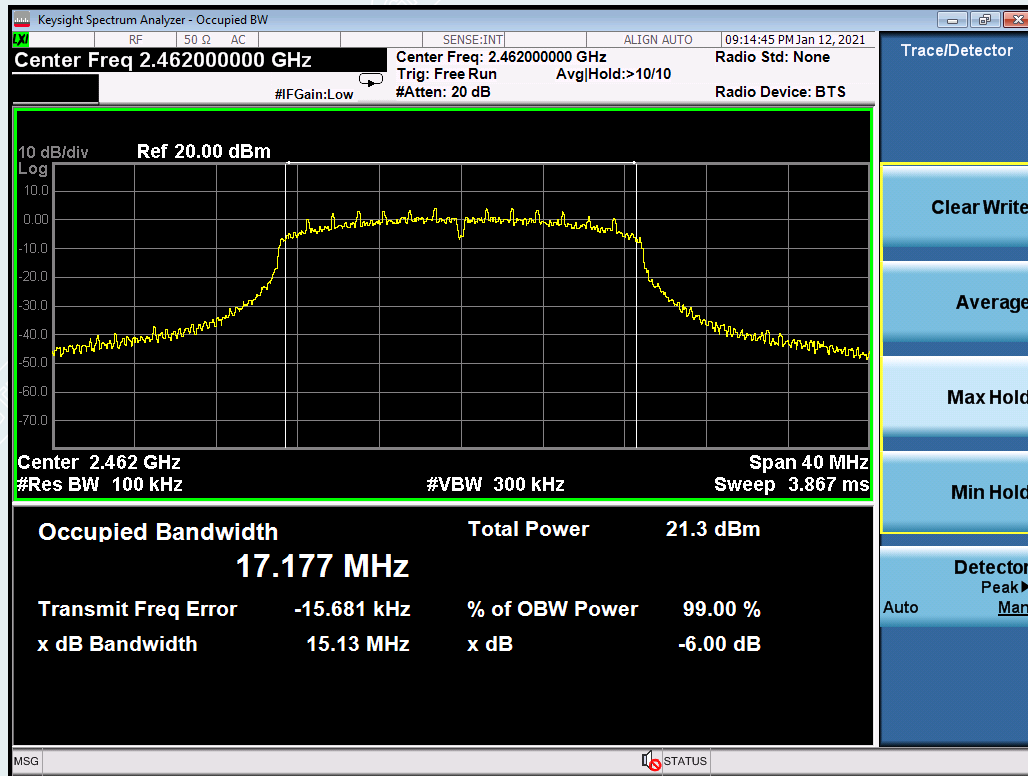
802.11n HT20 mode:
Channel 2412MHz



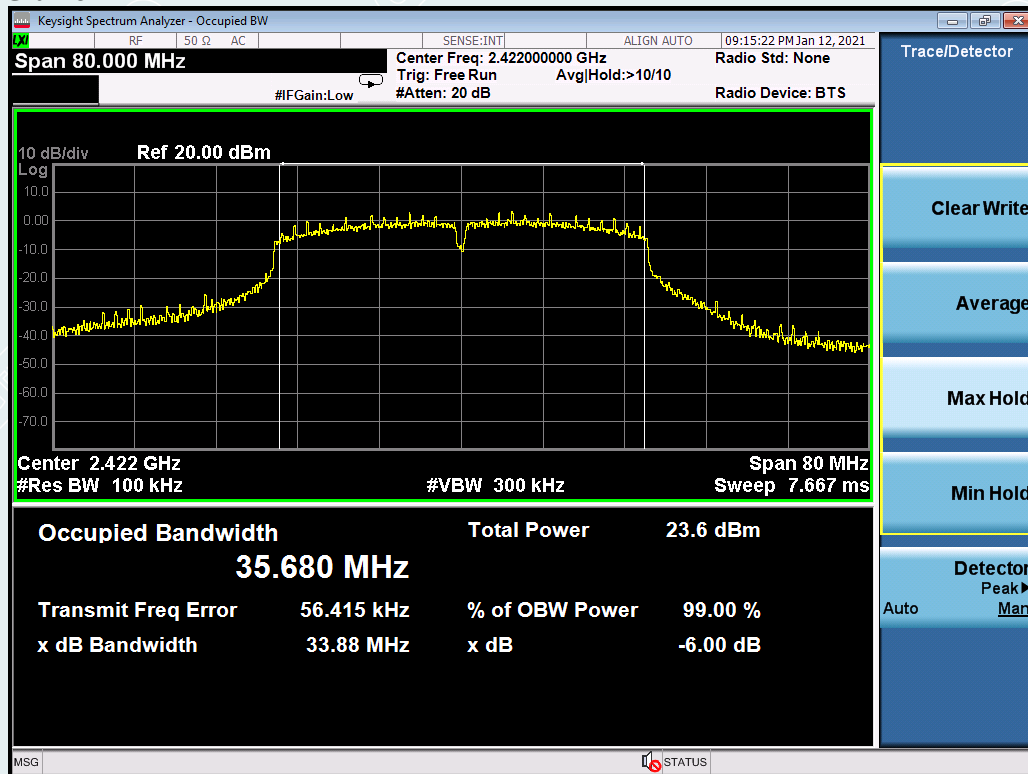
802.11n HT20 mode:
Channel 2437MHz



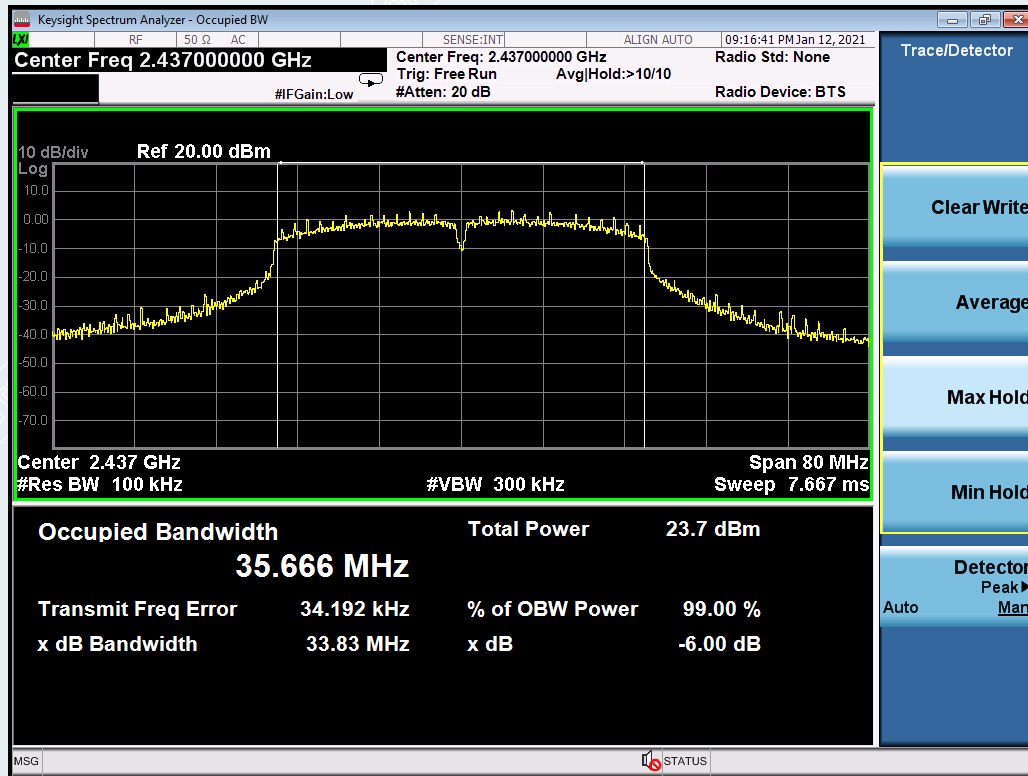
802.11n HT20 mode:
Channel 2462MHz



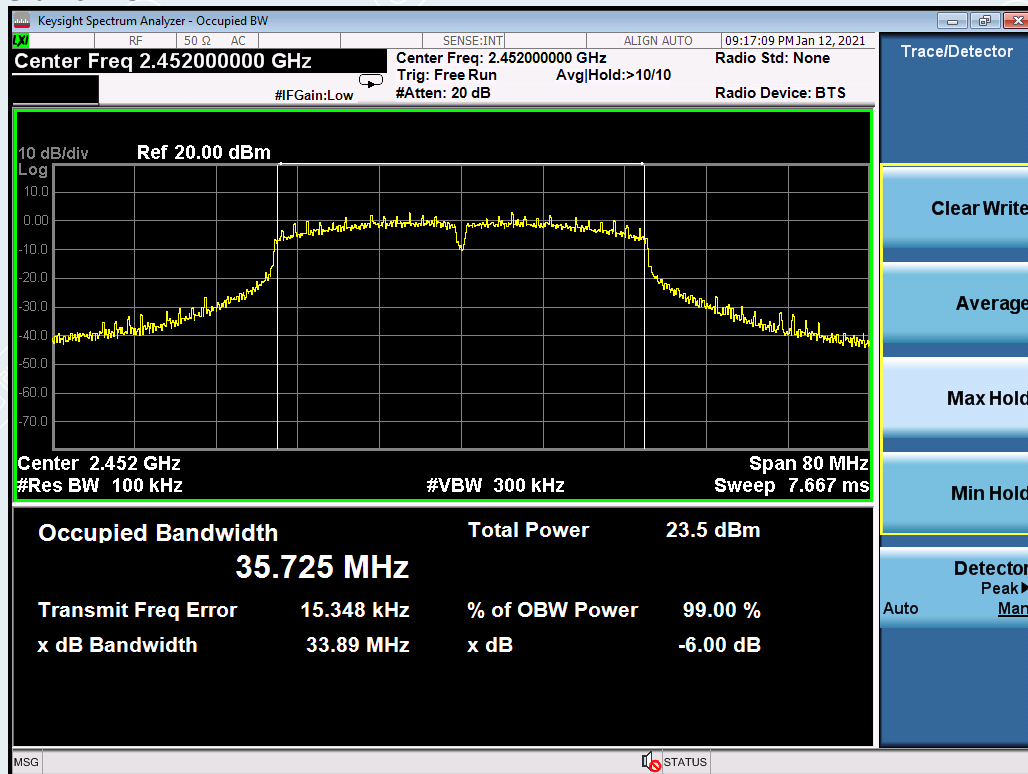
802.11n HT40 mode:
Channel 2422MHz



802.11n HT40 mode:
Channel 2437MHz



802.11n HT40 mode:
Channel 2452MHz



8. MAXIMUM PEAK OUTPUT POWER

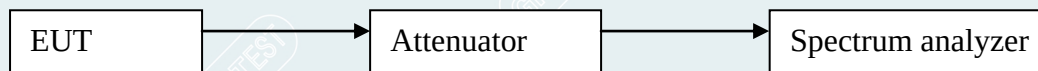
8.1. LIMITS

The maximum Peak output power measurement is 1W

8.2. TEST PROCEDURES

- 1) Place the EUT on a bench and set it in transmitting mode.
- 2) Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to an EMI Test Receiver.
- 3) The spectrum analyzer resolution bandwidth that is $\leq$ EBW. So we test the Maximum Conducted Output Power —Integrated band power method.
- 4) Set the analyzer span $\geq 1.5 \times$ DTS bandwidth. Set the RBW = 1 MHz. Set the VBW ≥ 3 MHz. Sweep time = auto couple. Detector = peak. Allow trace to fully stabilize.

8.3. TEST SETUP



8.4. TEST RESULTS

802.11b Mode:

Channel No.	Frequency (MHz)	Measured Channel Power (dBm)	Peak / AVG	Limit	Result
1	2412	17.72	Peak	1W (30dBm)	Pass
6	2437	18.32			Pass
11	2462	16.16			Pass

802.11g Mode:

Channel No.	Frequency (MHz)	Measured Channel Power (dBm)	Peak / AVG	Limit	Result
1	2412	21.38	Peak	1W (30dBm)	Pass
6	2437	22.47			Pass
11	2462	20.32			Pass

802.11n HT20 Mode:

Channel No.	Frequency (MHz)	Measured Channel Power (dBm)	Peak / AVG	Limit	Result
1	2412	22.21	Peak	1W (30dBm)	Pass
6	2437	22.19			Pass
11	2462	20.38			Pass

802.11n HT40 Mode:

Channel No.	Frequency (MHz)	Measured Channel Power (dBm)	Peak / AVG	Limit	Result
3	2422	20.84	Peak	1W (30dBm)	Pass
6	2437	20.70			Pass
9	2452	21.02			Pass

9. POWER SPECTRAL DENSITY

9.1. LIMITS

For digitally modulated systems, the power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission. This power spectral density shall be determined in accordance with the provisions of paragraph (b) of this section. The same method of determining the conducted output power shall be used to determine the power spectral density.

9.2. TEST PROCEDURES

- 1) Remove the antenna from the EUT, and then connect a low loss RF cable from antenna port to the spectrum analyzer.
- 2) Position the EUT was set without connection to measurement instrument. Turn on the EUT and connect its antenna terminal to measurement instrument via a low loss cable. Then set it to any one measured frequency within its operating range, and make sure the instrument is operated in its linear range.
- 3) Set the analyzer span to 1.5 times the DTS bandwidth. Set the RBW = 3 kHz. Set the VBW ≥ 3 RBW. Detector = peak. Ensure that the number of measurement points in the sweep $\geq 2 \times$ span/RBW (use of a greater number of measurement points than this minimum requirement is recommended).
- 4) Repeat above procedures until all frequencies measured were complete.

9.3. TEST SETUP

