Test Report

Verified code: 385259

Report No.: E20221124437601-4-G1

Customer:	Lumi United Technology Co., Ltd
Address:	B1, Chongwen Park, Nanshan iPark, Liuxian Avenue, Taoyuan Residential District, Nanshan District, Shenzhen, China
Sample Name:	Presence Sensor FP2
Sample Model:	PS-S02E
Receive Sample Date:	Nov.28,2022
Test Date:	Nov.29,2022 ~ Dec.20,2022
Reference Document:	CFR 47, FCC Part 15 Subpart C RADIO FREQUENCY DEVICES:Subpart C—Intentional Radiators
Test Result:	Pass

Prepared by: Chen XiaoCong Reviewed by: Jiang Tao Approved by: Zhao Zetian

GUANGZHOU GRG METROLOGY & TEST CO., LTD

Issued Date: 2023-02-27

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Statement

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2. The sample information is provided by the client and responsible for its authenticity; The content of the report is only valid for the samples sent this time.

3. When there are reports in both Chinese and English, the Chinese version will prevail when the language problems are inconsistent.

4. If there is any objection concerning the report, please inform us within 15 days from the date of receiving the report.

5. Without the agreement of the laboratory, the client is not authorized to use the test results for unapproved propaganda.

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REPORT ISSUED HISTORY

Report Version	Report No.	Description	Compile Date
1.0	E20221124437601-4	Original Issue	2022-12-14
2.0	E20221124437601-4-G1	Update	2023-02-27

Note:

This report E20221124437601-4-G1 is the modification of report E20221124437601-4. On the basis of the original report, update the home page customer and address, and the original report E20221124437601-4 is invalid.

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1. TEST RESULT SUMMARY

Standard	Item	Limit / Severity	Result
CFR 47, FCC Part 15 Subpart C (§15.247) ANSI C63.10-2013 KDB 558074 D01 15.247 measurement guidance v05r02	Antenna Requirement	§15.203	PASS
	Conducted Emissions	§15.207 (a)	PASS
	Radiated Spurious Emission	§15.247(d) §15.205 §15.209	PASS
	6dB 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 §15.209 §15.247(d)	PASS

The EUT have one antenna. The antenna is FPC antenna. The max gain of Antenna is 1dBi, which accordance 15.203is considered sufficient to comply with the provisions of this section.

---------- The following blanks ----------

2. GENERAL DESCRIPTION OF EUT

2.1 APPLICANT

Name:	Lumi United Technology Co., Ltd
Address:	B1, Chongwen Park, Nanshan iPark, Liuxian Avenue, Taoyuan Residential District, Nanshan District, Shenzhen, China

2.2 MANUFACTURER

Name:	Lumi United Technology Co., Ltd
Address:	B1, Chongwen Park, Nanshan iPark, Liuxian Avenue, Taoyuan Residential District, Nanshan District, Shenzhen, China

2.3 BASIC DESCRIPTION OF EQUIPMENT UNDER TEST

Product Name:	Presence Sensor FP2
Product Model:	PS-S02E
Adding Model:	PS-S02D
Models Difference:	That EUT (Presence Sensor FP2) Model Numbers PS-S02E and PS-S02D have the same technical construction including circuit diagram PCB layout,hardware version and software version identical,except sales area,packaging and accessories are different.
Trade Name:	Aqara
FCC ID:	2AKIT-PS-S02
Rating:	DC 5V /1A
Frequency Band:	2412MHz-2462MHz for 802.11b/g/n HT20 2422MHz-2452MHz for 802.11n HT40
Modulation Type:	DSSS for IEEE 802.11b mode OFDM for IEEE 802.11g/n mode
Antenna Specification:	FPC antenna with 1dBi gain (Max)
Temperature Range:	-10℃~ +40℃
Hardware Version:	X2
Software Version:	1.0.0_0004.0004
Sample submitting way:	■Provided by customer □Sampling
Sample No:	E20221124437601-0007, E20221124437601-0008

2.4 CHANNEL LIST

CH01 – CH11 for IEEE 802.11b, IEEE 802.11g, IEEE 802.11n HT20 CH03 – CH09 for IEEE 802.11n HT40							
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
01	2412	04	2427	07	2442	10	2457
02	2417	05	2432	08	2447	11	2462
03	2422	06	2437	09	2452		

2.5 TEST OPERATION MODE

Mode No.	Description of the modes
1	2.4G Wi-Fi fixed transmitting mode

2.6 LOCAL SUPPORTIVE

Name of Equipment	Manufacturer	Model	Serial Number	Note
Notebook	LENOVO	TianYi 310-14ISK	MP18DLC6	/
Test board	/	/	/	/
Adapter	Jingsai	/	/	/
Notebook adapter	LENOVO	/	/	/

No.	Cable Type	Qty.	Shielded Type	Ferrite Core(Qty.)	Length
1	DC cable	1	No	0	0.3m
2	USB cable	1	No	0	1.0m
3	USB cable	1	No	0	2.0m
4	DC cable	1	No	0	1.2m

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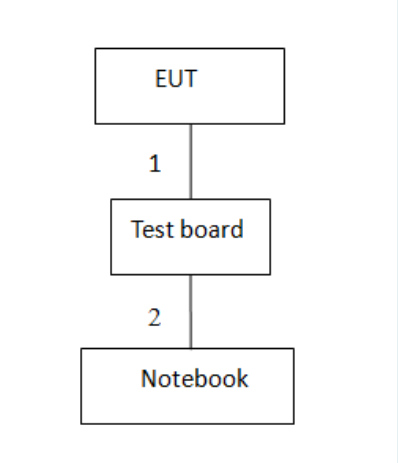
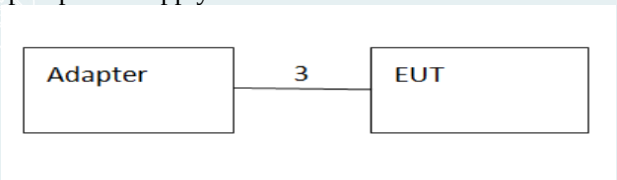
2.7 CONFIGURATION OF SYSTEM UNDER TEST

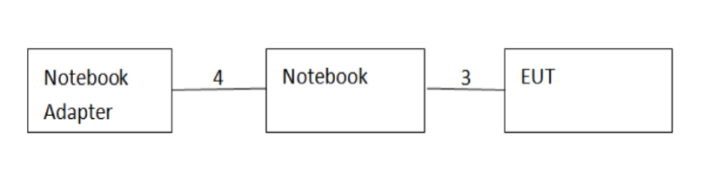
For Radiated Spurious Emission, 6dB Bandwidth, Maximum Peak Output Power, Power Spectral Density, Conducted band edges and Spurious Emission, Restricted bands of operation



For Conducted Emissions adapter power supply



For Conducted Emissions notebook power supply



Test software:

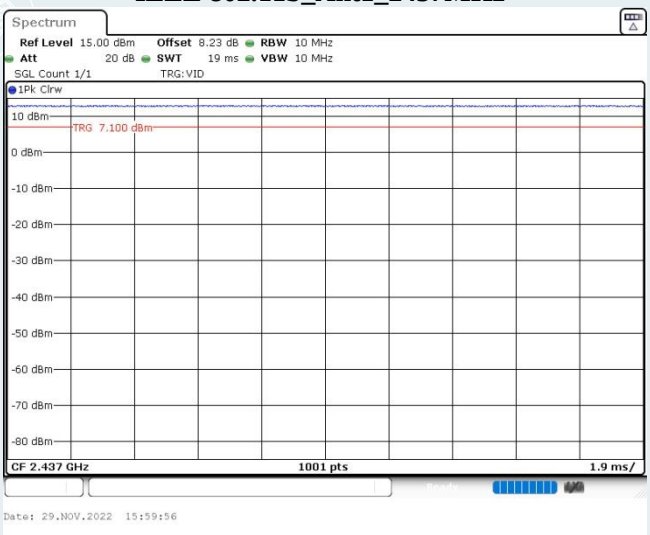
Software version	Test level
EspRFTestTool_v2.8_Manual	IEEE 802.11b mode:8 IEEE 802.11g mode:8 IEEE 802.11nHT20 mode:8 IEEE 802.11nHT40 mode:8

2.8 DUTY CYCLE

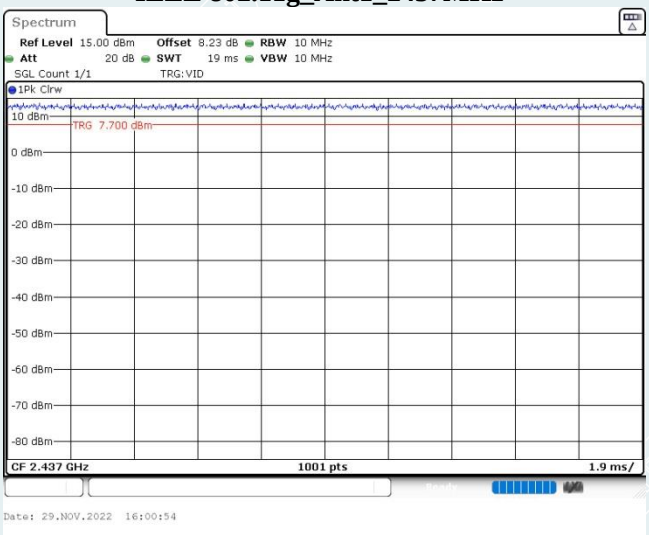
EUT Name	Presence Sensor FP2	**Model**	PS-S02E
Environmental Conditions	23.7℃/57%RH/101.0kPa	**Test Voltage**	DC 5V
Tested By	Qin Tingting	**Tested Date**	2022-11-29

Test Mode	Antenna	Frequency (MHz)	Transmission Duration [ms]	Transmission Period [ms]	Duty Cycle [%]	T [s]
IEEE 802.11b	Ant1	2437	19.00	19.00	100.00	0.01900
IEEE 802.11g	Ant1	2437	19.00	19.00	100.00	0.01900
IEEE 802.11n HT20	Ant1	2437	19.00	19.00	100.00	0.01900
IEEE 802.11n HT40	Ant1	2437	19.00	19.00	100.00	0.01900

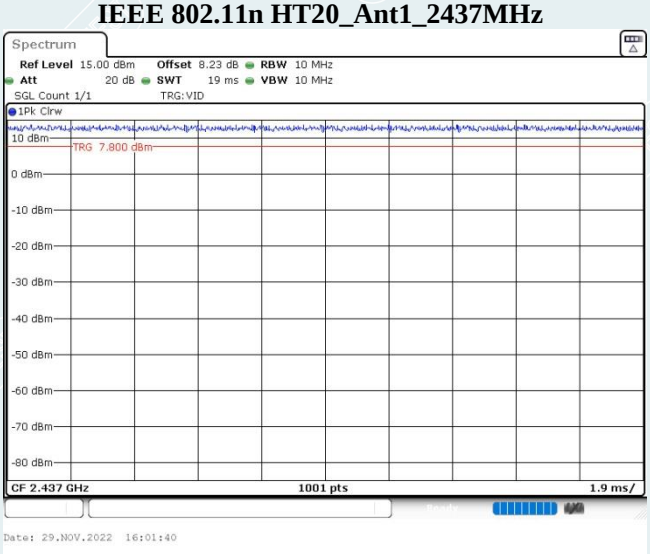
IEEE 802.11b_Ant1_2437MHz



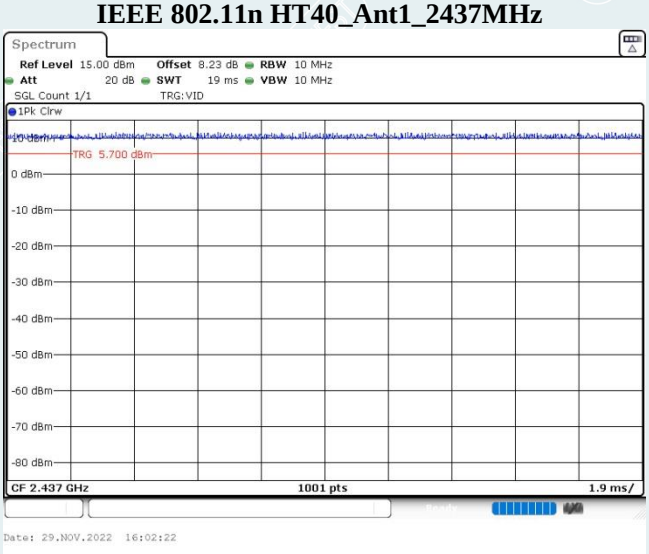
IEEE 802.11g_Ant1_2437MHz



IEEE 802.11n HT20_Ant1_2437MHz



IEEE 802.11n HT40_Ant1_2437MHz



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	:	No.1301 Guanguang Road Xinlan Community, Guanlan Street, Longhua District Shenzhen, 518110, People's Republic of China
P.C.	:	518110
Tel	:	0755-61180008
Fax	:	0755-61180008

3.2 ACCREDITATIONS

Our laboratories are accredited and approved by the following approval agencies according to ISO/IEC 17025.

USA	A2LA(Certificate #2861.01)

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

Canada	ISED (Company Number: 24897，CAB identifier:CN0069)
USA	FCC (Registration Number: 759402，Designation Number:CN1198)

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

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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	9kHz～30MHz	5.1dB[1)]
		30MHz～200MHz	4.5dB[1)]
		200MHz～1000MHz	4.4dB[1)]
		1GHz～18GHz	5.6dB[1)]
		18GHz～26.5GHz	3.7dB[1)]
	Vertical	9kHz～30MHz	5.1dB[1)]
		30MHz～200MHz	4.4dB[1)]
		200MHz～1000MHz	4.5dB[1)]
		1GHz～18GHz	5.6dB[1)]
		18GHz～26.5GHz	3.7dB[1)]
Conduction Emission		150kHz～30MHz	3.4dB[1)]

Measurement	Uncertainty
RF frequency	6.0×10^{-6}
RF power conducted	0.78dB
Power spectral density conducted	0.8dB
Occupied channel bandwidth	0.4 dB
Unwanted emission, conducted	0.68 dB
Humidity	6 %
Temperature	2℃

Note:

[1)] This uncertainty represents an expanded uncertainty expressed at approximately the 95%.
This uncertainty represents an expanded uncertainty factor of *k*=2.

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4. LIST OF USED TEST EQUIPMENT AT GRGT

Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
Conducted Emissions				
EZ-EMC	EZ	CCS-3A1-CE	/	/
EMI Receiver	R&S	ESCI	100783	2023-08-28
LISN(EUT)	R&S	ENV216	101543	2023-09-13
Radiated Spurious Emission & Restricted bands of operation				
Test S/W	EZ	CCS-03A1		
Loop Antenna	TESEQ	HLA6121	52599	2023-04-02
Test Receiver	R&S	ESR7	102444	2023-09-02
Preamplifier	EMEC	EM330	I00426	2023-03-05
Bi-log Antenna	Schwarzbeck	CBL6143A	26039	2024-10-23
Spectrum Analyzer	Agilent	N9010A	MY52221469	2023-06-29
Horn Antenna	Schwarzbeck	BBHA 9120D	02143	2023-10-15
Board-Band Horn Antenna	Schwarzbeck	BBHA 9170	BBHA 9170-497	2023-10-14
Amplifier	Tonscend	TAP01018048	AP20E8060075	2023-05-05
Amplifier	Tonscend	TAP184050	AP20E806071	2023-05-05
Amplifier	SHIRONG ELECTRONIC	DLNA-1G18G-G40	20200928005	2023-05-08
Test S/W	Tonscend	JS32-RE/2.5.1.5		
6dB Bandwidth&Conducted band edges and Spurious Emission&Power Spectral Density				
Spectrum Analyzer	R&S	FSV30	1321.3008K30-104381-rH	2023-11-17
BT/WIFI System	Tonscend	JS0806		
Output Power				
Pulse power sensor	Anristu	MA2411B	1126150	2023-03-01
Power meter	Anristu	ML2495A	1204003	2023-02-28

Note: The calibration cycle of the above instruments is 12 months except for the Bi-log Antenna which is 24 months

5. CONDUCTED EMISSION MEASUREMENT

5.1 LIMITS

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

5.2 TEST PROCEDURES

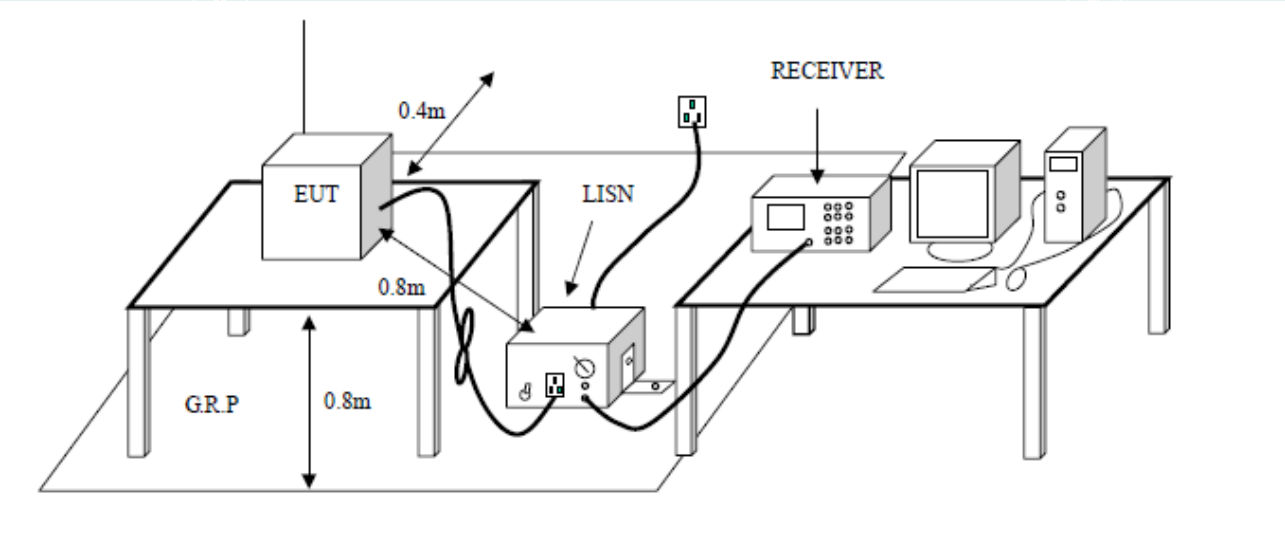
Procedure of Preliminary Test

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
2) 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.
– Use serial board or connecting line to make EUT and notebook to communicate, according to the actual need to make EUT send constant frequency signal continuously.
The test mode(s) described in Item 2.5 were scanned during the preliminary test. After the preliminary scan, we found the test mode described in Item 2.5 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.

5.3 TEST SETUP



5.4 DATA SAMPLE

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

Factor = Insertion loss of LISN + Cable Loss
Result = Quasi-peak Reading/ Average Reading + Factor
Limit = Limit stated in standard
Margin = Result (dBuV) – Limit (dBuV)

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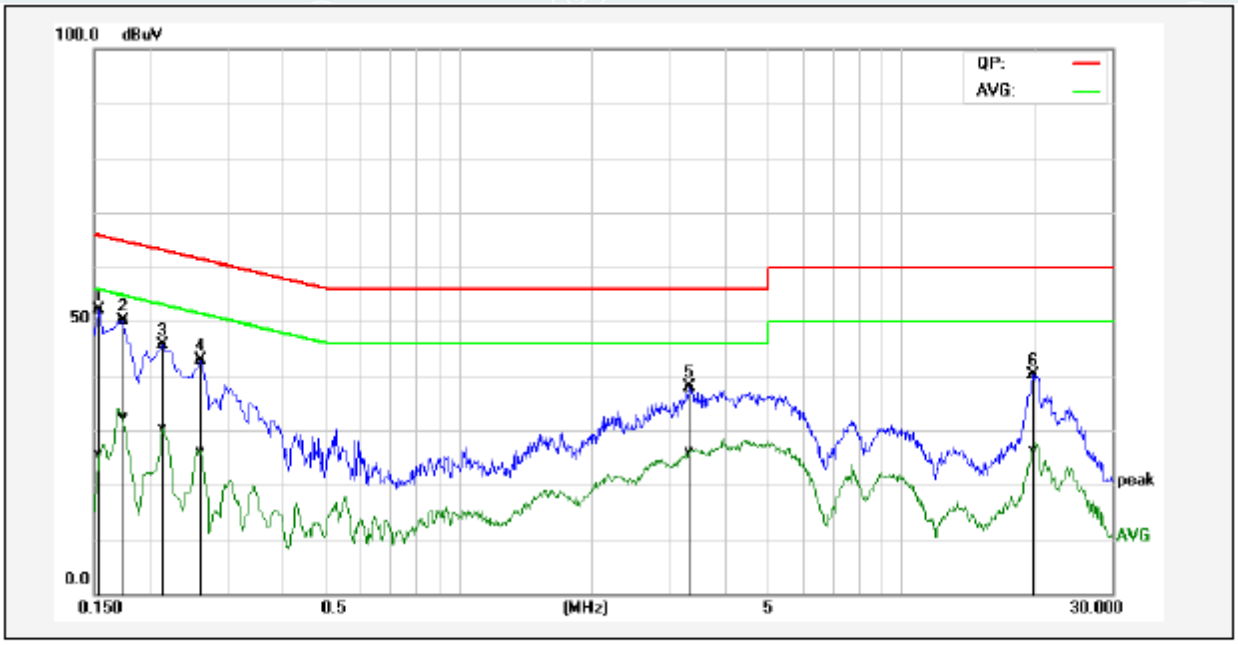
5.5 TEST RESULTS

For notebook power supply:

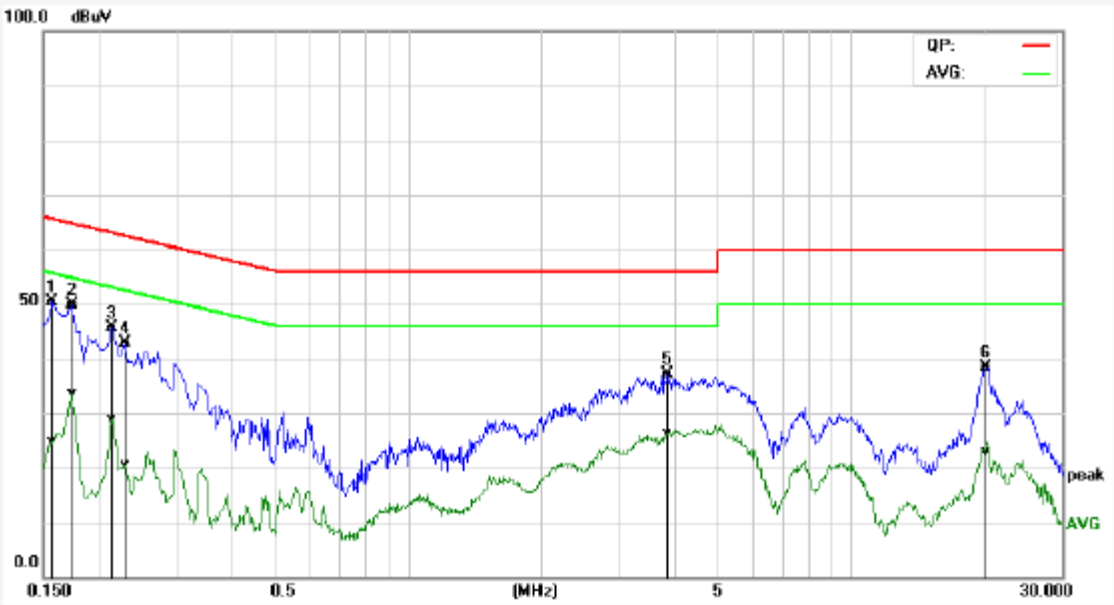
All models were pretested and the worst modes and channels were recorded in this report. (IEEE 802.11b 2437MHz)

EUT Name	Presence Sensor FP2	**Model**	PS-S02E
Environmental Conditions	23.1℃/46%RH/101.0kPa	**Test Mode**	Mode 1
Tested By	Huang Xinlong	**Line**	L
Tested Date	2022-12-06	**Test Voltage**	AC 120V/60Hz



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*	0.1539	42.47	16.01	9.61	52.08	25.62	65.78	55.79	-13.70	-30.17	Pass
2	0.1740	40.57	22.86	9.61	50.18	32.47	64.76	54.77	-14.58	-22.30	Pass
3	0.2140	35.92	20.77	9.61	45.53	30.38	63.04	53.05	-17.51	-22.67	Pass
4	0.2620	33.15	16.46	9.61	42.76	26.07	61.36	51.37	-18.60	-25.30	Pass
5	3.3340	28.12	16.44	9.67	37.79	26.11	56.00	46.00	-18.21	-19.89	Pass
6	19.9380	30.17	16.57	9.93	40.10	26.50	60.00	50.00	-19.90	-23.50	Pass

EUT Name	Presence Sensor FP2	**Model**	PS-S02E
Environmental Conditions	23.1℃/46%RH/101.0kPa	**Test Mode**	Mode 1
Tested By	Huang Xinlong	**Line**	N
Tested Date	2022-12-06	**Test Voltage**	AC 120V/60Hz

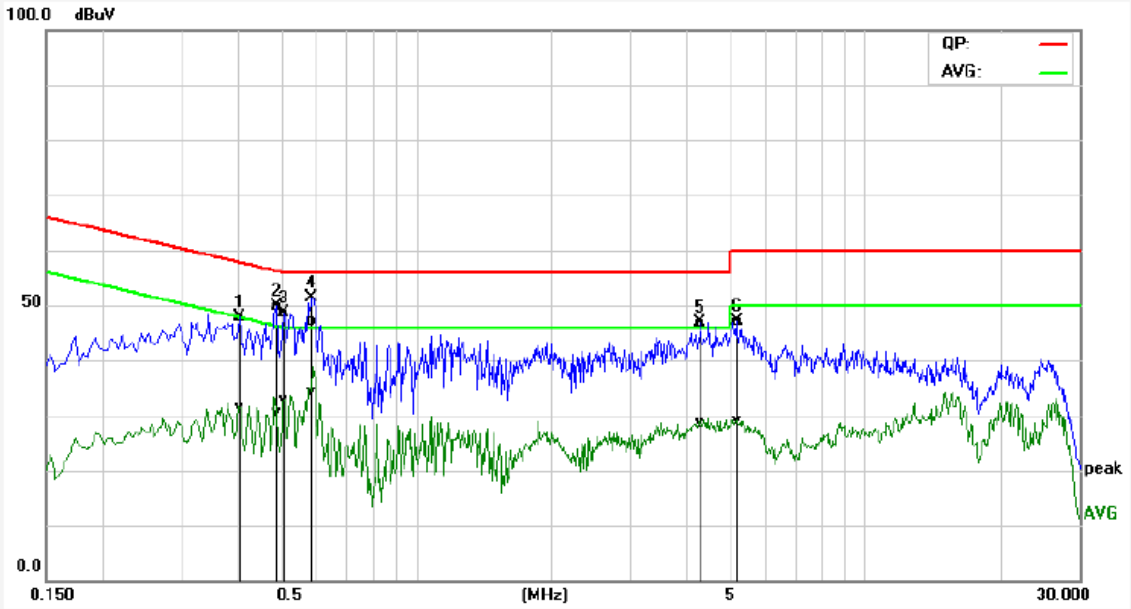


No.	Frequency (MHz)	QuasiPeak reading (dBuV)	Average reading (dBuV)	Correction factor (dB)	QuasiPeak result (dBuV)	Average result (dBuV)	QuasiPeak limit (dBuV)	Average limit (dBuV)	QuasiPeak margin (dB)	Average margin (dB)	Remark
1	0.1580	40.79	15.20	9.60	50.39	24.80	65.56	55.57	-15.17	-30.77	Pass
2*	0.1740	40.19	24.05	9.60	49.79	33.65	64.76	54.77	-14.97	-21.12	Pass
3	0.2140	36.06	19.34	9.60	45.66	28.94	63.04	53.05	-17.38	-24.11	Pass
4	0.2300	33.39	11.14	9.60	42.99	20.74	62.45	52.45	-19.46	-31.71	Pass
5	3.8780	27.48	16.74	9.68	37.16	26.42	56.00	46.00	-18.84	-19.58	Pass
6	20.0580	28.51	13.01	9.96	38.47	22.97	60.00	50.00	-21.53	-27.03	Pass

For adapter power supply:

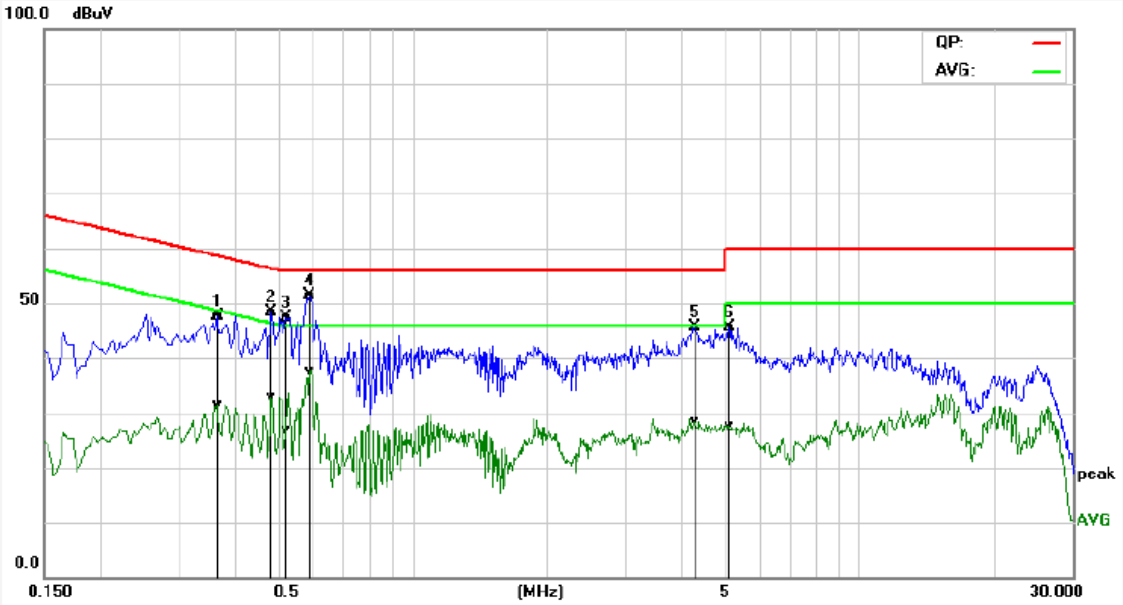
All models were pretested and the worst modes and channels were recorded in this report. (IEEE 802.11b 2462MHz)

EUT Name	Presence Sensor FP2	**Model**	PS-S02E
Environmental Conditions	23.1℃/46%RH/101.0kPa	**Test Mode**	Mode 1
Tested By	Huang Xinlong	**Line**	L
Tested Date	2022-12-06	**Test Voltage**	AC 120V/60Hz



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	0.4060	38.30	21.79	9.61	47.91	31.40	57.73	47.73	-9.82	-16.33	Pass
2*	0.4900	40.26	21.12	9.61	49.87	30.73	56.17	46.17	-6.30	-15.44	Pass
3	0.5100	39.12	23.27	9.61	48.73	32.88	56.00	46.00	-7.27	-13.12	Pass
4	0.5860	37.49	24.87	9.61	47.10	34.48	56.00	46.00	-8.90	-11.52	Pass
5	4.3140	37.21	18.97	9.69	46.90	28.66	56.00	46.00	-9.10	-17.34	Pass
6	5.1700	37.39	19.41	9.70	47.09	29.11	60.00	50.00	-12.91	-20.89	Pass

EUT Name	Presence Sensor FP2	**Model**	PS-S02E
Environmental Conditions	23.1℃/46%RH/101.0kPa	**Test Mode**	Mode 1
Tested By	Huang Xinlong	**Line**	N
Tested Date	2022-12-06	**Test Voltage**	AC 120V/60Hz



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	0.3660	38.04	21.83	9.60	47.64	31.43	58.59	48.59	-10.95	-17.16	Pass
2	0.4860	38.81	23.20	9.60	48.41	32.80	56.24	46.24	-7.83	-13.44	Pass
3	0.5220	37.81	17.16	9.60	47.41	26.76	56.00	46.00	-8.59	-19.24	Pass
4*	0.5899	41.71	28.13	9.60	51.31	37.73	56.00	46.00	-4.69	-8.27	Pass
5	4.2819	35.86	18.67	9.68	45.54	28.35	56.00	46.00	-10.46	-17.65	Pass
6	5.1300	35.88	17.93	9.70	45.58	27.63	60.00	50.00	-14.42	-22.37	Pass

6. RADIATED SPURIOUS EMISSIONS

6.1 LIMITS

In any 100kHz 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 20dB below that in the 100kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, 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 30dB instead of 20dB. Attenuation below the general limits specified in §15.209(a) is not required.

Frequency (MHz)	Quasi-peak(μV/m)	Measurement distance(m)	Quasi-peak(dBμV/m)@distance 3m
0.009-0.490	2400/F(kHz)	300	128.5~93.8
0.490-1.705	24000/F(kHz)	30	73.8~63
1.705-30.0	30	30	69.5
30~88	100	3	40
88~216	150	3	43.5
216~960	200	3	46
Above 960	500	3	54

NOTE:

(1) The emission limits for the ranges 9-90kHz and 110-490kHz are based on measurements employing a linear average detector.

(2) The lower limit shall apply at the transition frequencies.

(3) Above 18GHz test distance is 1m, so the Peak Limit=74+20*log(3/1)=83.54 (dBμV/m).
The Avg Limit=54+20*log(3/1)=63.54 (dBμV/m).

6.2 TEST PROCEDURES

1) Sequence of testing 9kHz to 30MHz

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.

--- Use serial board or connecting line to make EUT and notebook to communicate, according to the actual need to make EUT send constant frequency signal continuously.

--- The EUT is placed on a desktop position in the center of the turntable.

--- The measurement distance is 3 meter.

--- The EUT was set into operation.

Pre measurement:

--- The turntable rotates from 0 °to 360 °.

--- The antenna height is 1.0 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 QP 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 30MHz to 1GHz

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.

--- Use serial board or connecting line to make EUT and notebook to communicate, according to the actual need to make EUT send constant frequency signal continuously.

--- The EUT is placed on a desktop position in the center of the turntable.

--- The measurement distance is 3 meter.

--- The EUT was set into operation.

Pre measurement:

--- The turntable rotates from 0 °to 360 °.

--- The antenna is polarized vertical and horizontal.

--- The antenna height changes from 1 to 4 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 pre measurement the software maximize the peaks by changing turntable rotates from 0 °to 360 °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 pre measurement with marked maximum final measurements and the limit will be stored.

3) Sequence of testing 1GHz to 18GHz

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.

--- Use serial board or connecting line to make EUT and notebook to communicate, according to the actual need to make EUT send constant frequency signal continuously.

--- The EUT is placed on a desktop position in the center of the turntable.

--- The measurement distance is 3 meter.

--- The EUT was set into operation.

Pre measurement:

--- The turntable rotates from 0 °to 360 °.

--- The antenna is polarized vertical and horizontal.

--- The antenna height scan range is 1 meter to 4 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 pre measurement the software maximize the peaks by changing turntable rotates from 0 °to 360 °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 18GHz
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.

--- Use serial board or connecting line to make EUT and notebook to communicate, according to the actual need to make EUT send constant frequency signal continuously.

--- The EUT is placed on a desktop position in the center of the turntable.

--- The measurement distance is 1 meter.

--- The EUT was set into operation.

Pre measurement:

--- The turntable rotates from 0 °to 360 °.

--- The antenna is polarized vertical and horizontal.

--- The antenna height scan range is 1 meter to 4 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 pre measurement the software maximize the peaks by changing turntable rotates from 0 °to 360 °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.

NOTE:

(a).The frequency from 9kHz to 150kHz, Set RBW=300Hz(for Peak & AVG), RBW=300Hz(for Peak & AVG).

the frequency from 150kHz to 30MHz, Set RBW=9kHz, RBW=9kHz,(for QP Detector).

(b).The frequency from 30MHz to 1GHz, Set RBW=120kHz, RBW=300kHz,(for QP Detector).

(c).The frequency above 1GHz, for Peak detector: Set RBW=1MHz, RBW=3MHz.

(d). The frequency above 1GHz, for Avg detector: Set RBW=1MHz, if the EUT is configured to transmit with duty cycle ≥98%, set VBW≤RBW/100 (i.e.,10kHz) but not less than 10Hz. Where duty cycle is defined in section 2.8. If the EUT duty cycle is ＜98%, set VBW≥1/T, Where T is defined in section 2.8.

---------- The following blanks ----------

6.3 TEST SETUP

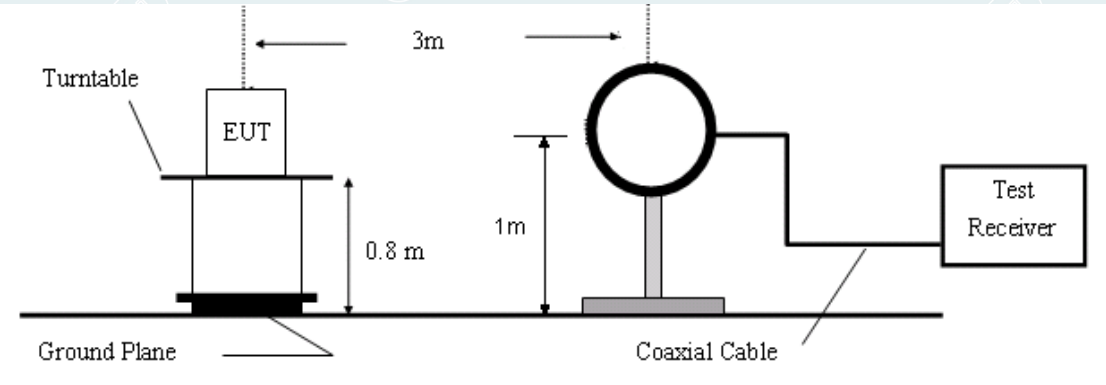


Figure 1. 9kHz to 30MHz radiated emissions test configuration

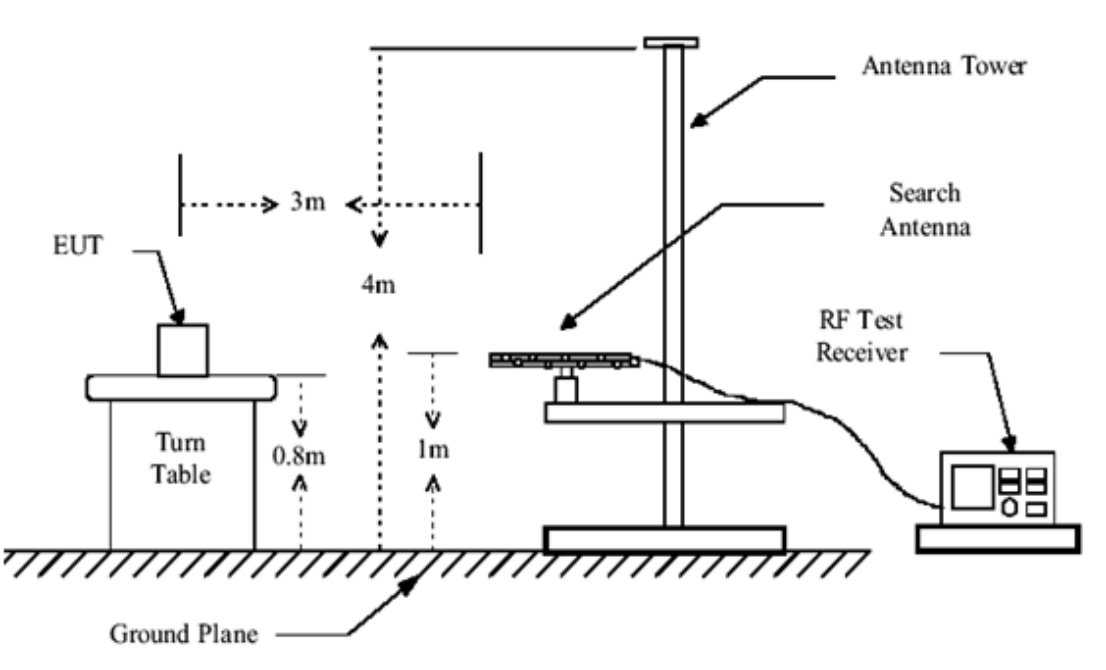


Figure 2. 30MHz to 1GHz radiated emissions test configuration

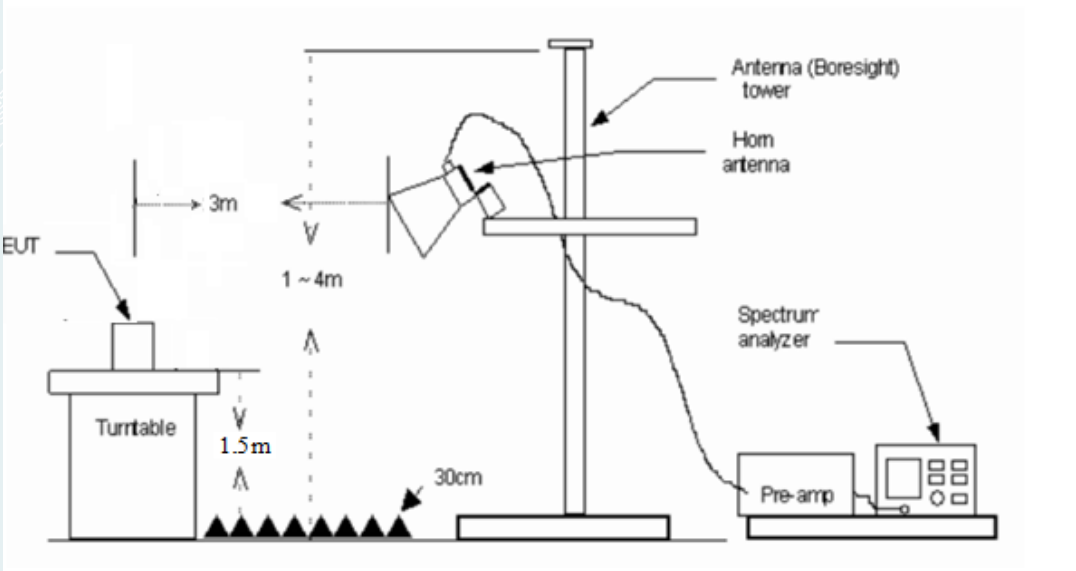


Figure 3. 1GHz to 18GHz radiated emissions test configuration

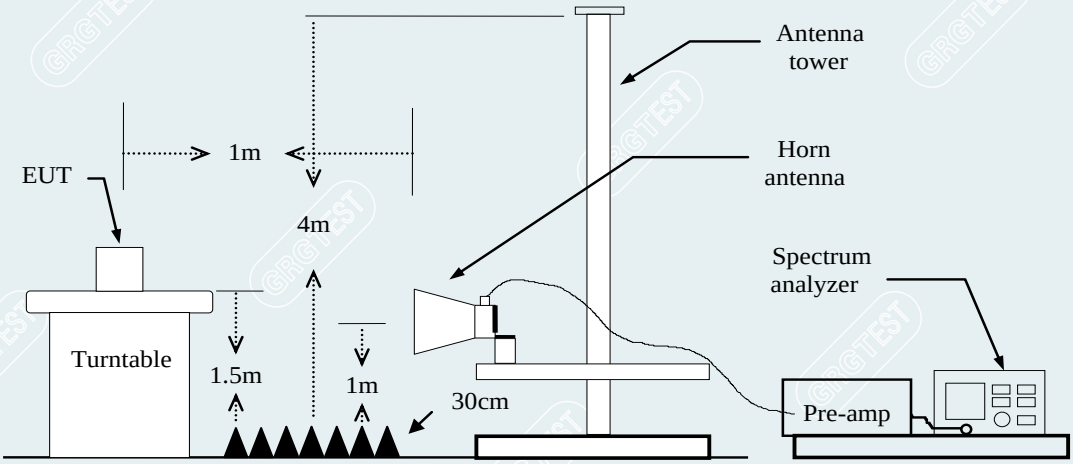


Figure 4.18GHz to 26.5GHz radiated emissions test configuration

6.4 DATA SAMPLE

30MHz to 1GHz

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

1GHz to 18GHz

No.	Frequency (MHz)	Reading (dBuV/m)	Factor (dB)	Level (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 18GHz

No.	Frequency (MHz)	Reading (dBuV/m)	Factor (dB)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Pole
xxx	xxx	68.86	57.66	-11.20	83.54	25.88	peak	Vertical
xxx	xxx	68.89	-11.20	57.69	63.54	5.85	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

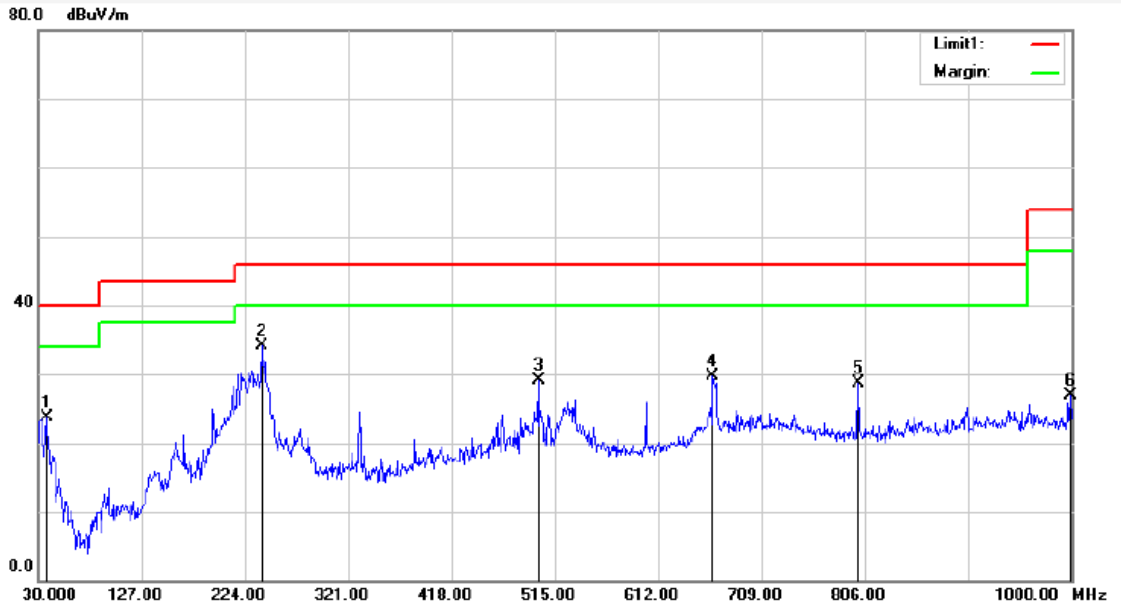
6.5 TEST RESULTS

According to the user manual, the EUT has two typical installation modes,namely side installation and suction top installation.The two modes have been tested and verified,the worst configuration is the suction top installation mode,which is recorded in this report.

Below 1GHz

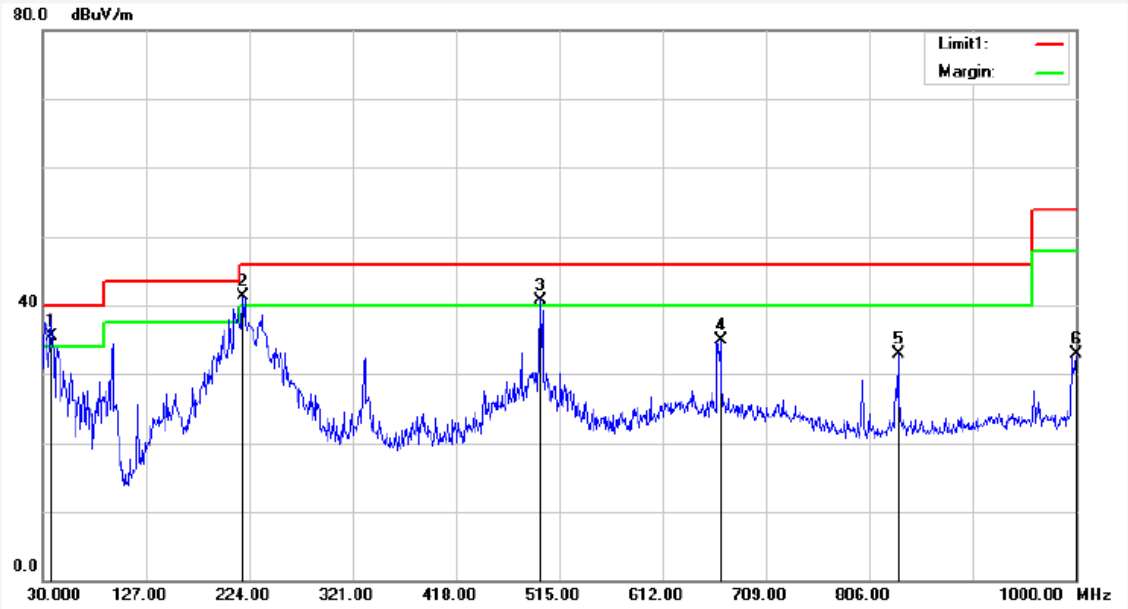
All models were pretested and the worst modes and channels were recorded in this report. (IEEE 802.11g 2412MHz)

EUT Name	Presence Sensor FP2	**Model**	PS-S02E
Environmental Conditions	23.7℃/41%RH/101.0kPa	**Test Voltage**	DC 5V
Test Mode	Mode 1	**Polarity**	Horizontal
Tested By	Huang Xinlong	**Tested Date**	2022-12-02



No.	Frequency (MHz)	Reading (dBuV)	Correction factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Over (dB)	Degree (deg.)	Height (cm)	Remark
1	37.7600	44.32	-20.61	23.71	40.00	-16.29	204	100	QP
2*	239.5200	59.20	-25.05	34.15	46.00	-11.85	161	100	QP
3	499.4800	47.36	-18.32	29.04	46.00	-16.96	110	200	QP
4	663.4100	45.45	-15.67	29.78	46.00	-16.22	79	200	QP
5	800.1800	42.74	-14.12	28.62	46.00	-17.38	289	100	QP
6	999.0300	39.00	-12.02	26.98	54.00	-27.02	56	100	QP

EUT Name	Presence Sensor FP2	**Model**	PS-S02E
Environmental Conditions	23.7℃/41%RH/101.0kPa	**Test Voltage**	DC 5V
Test Mode	Mode 1	**Polarity**	Vertical
Tested By	Huang Xinlong	**Tested Date**	2022-12-02



No.	Frequency (MHz)	Reading (dBuV)	Correction factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Over (dB)	Degree (deg.)	Height (cm)	Remark
1*	37.7600	56.21	-20.61	35.60	40.00	-4.40	228	100	QP
2!	218.1800	67.14	-25.86	41.28	46.00	-4.72	360	100	QP
3!	497.5400	59.15	-18.35	40.80	46.00	-5.20	1	100	QP
4	666.3200	50.49	-15.61	34.88	46.00	-11.12	42	100	QP
5	833.1600	46.67	-13.86	32.81	46.00	-13.19	333	100	QP
6	1000.0000	44.89	-12.01	32.88	54.00	-21.12	358	100	QP

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.

1GHz-18GHz:
According to C63.10, if the peak (or quasi-peak) measured value complies with the average limit, it is unnecessary to perform an average measurement, so AV emission value did not show in below table if the peak value complies with average limit.

Mode: IEEE 802.11b
Lowest Frequency (2412MHz) Date:2022-11-29
Environment: 23.7℃/41%RH/101.0kPa Voltage: DC 5V
Tested By: Zhang Zishan

Suspected Data List

NO.	Freq. [MHz]	Reading [dBμV/m]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	1198.7748	65.78	41.83	-23.95	74.00	32.17	100	110	Horizontal
2	1991.1239	63.69	42.51	-21.18	74.00	31.49	100	266	Horizontal
3	2194.1493	62.56	44.37	-18.19	74.00	29.63	200	218	Horizontal
4	3215.652	61.37	45.58	-15.79	74.00	28.42	200	240	Horizontal
5	4824.6031	60.61	48.04	-12.57	74.00	25.96	100	43	Horizontal
6	10461.5577	47.89	53.71	5.82	74.00	20.29	100	121	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	4824.1141	-12.57	54.65	42.08	54.00	11.92	134	239.3	Horizontal
2	10461.5577	5.82	41.45	47.27	54.00	6.73	100	121	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	1161.2702	69.43	45.25	-24.18	74.00	28.75	100	226	Vertical
2	1824.6031	67.31	44.48	-22.83	74.00	29.52	100	167	Vertical
3	2330.9164	62.37	43.83	-18.54	74.00	30.17	200	198	Vertical
4	3331.9165	62.69	46.34	-16.35	74.00	27.66	100	182	Vertical
5	4824.6031	62.64	49.82	-12.82	74.00	24.18	100	46	Vertical
6	17983.1229	44.98	57.81	12.83	74.00	16.19	200	251	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	4824.0441	-12.82	56.49	43.67	54.00	10.33	120	34.8	Vertical
2	17857.2588	12.83	34.21	47.04	54.00	6.96	198	212.6	Vertical

Mode: IEEE 802.11b
Middle Frequency (2437MHz)
Environment: 23.7℃/41%RH/101.0kPa
Tested By: Zhang Zishan

Date:2022-11-29
Voltage: DC 5V

Suspected Data List									
NO.	Freq. [MHz]	Reading [dBμV/m]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	1038.0048	65.14	40.34	-24.80	74.00	33.66	200	343	Horizontal
2	2190.8989	58.68	40.33	-18.35	74.00	33.67	200	238	Horizontal
3	2659.9575	64.22	45.79	-18.43	74.00	28.21	100	325	Horizontal
4	3247.5309	60.80	44.80	-16.00	74.00	29.20	100	229	Horizontal
5	4873.3592	61.78	49.97	-11.81	74.00	24.03	100	258	Horizontal
6	17831.2289	45.00	55.00	10.00	74.00	19.00	100	73	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	4873.9944	-11.81	57.12	45.31	54.00	8.69	168	234.6	Horizontal
2	17831.2289	10.00	38.41	48.41	54.00	5.59	100	73	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	1665.8332	66.16	43.78	-22.38	74.00	30.22	200	326	Vertical
2	1827.8535	67.65	44.77	-22.88	74.00	29.23	100	170	Vertical
3	2328.166	62.20	43.66	-18.54	74.00	30.34	100	189	Vertical
4	3320.6651	62.66	46.30	-16.36	74.00	27.70	100	181	Vertical
5	4873.3592	64.18	52.36	-11.82	74.00	21.64	200	327	Vertical
6	17981.2477	44.84	57.61	12.77	74.00	16.39	100	15	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	4874.1354	-11.82	58.46	46.64	54.00	7.36	145	328.1	Vertical

Mode: IEEE 802.11b
Highest Frequency (2462MHz)
Environment: 23.7℃/41%RH/101.0kPa
Tested By: Zhang Zishan

Date:2022-11-29
Voltage: DC 5V

Suspected Data List									
NO.	Freq. [MHz]	Reading [dBμV/m]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	1039.0049	66.88	42.09	-24.79	74.00	31.91	100	324	Horizontal
2	2195.8995	59.00	40.90	-18.10	74.00	33.10	100	237	Horizontal
3	2655.4569	62.71	44.27	-18.44	74.00	29.73	100	237	Horizontal
4	3281.2852	61.72	44.91	-16.81	74.00	29.09	100	239	Horizontal
5	4923.9905	65.15	53.90	-11.25	74.00	20.10	100	239	Horizontal
6	17803.1004	44.70	54.80	10.10	74.00	19.20	100	15	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	4923.9905	-11.25	59.22	47.97	54.00	6.03	162	180.6	Horizontal
2	17803.1004	10.10	37.41	47.51	54.00	6.49	100	15	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	1037.2547	62.91	39.07	-23.84	74.00	34.93	100	239	Vertical
2	1830.6038	68.11	45.19	-22.92	74.00	28.81	100	191	Vertical
3	3281.2852	62.23	45.99	-16.24	74.00	28.01	100	318	Vertical
4	4653.9567	59.65	46.34	-13.31	74.00	27.66	100	25	Vertical
5	4923.9905	66.80	55.79	-11.01	74.00	18.21	100	336	Vertical
6	17986.8734	44.52	57.48	12.96	74.00	16.52	100	220	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	4924.0615	-11.01	60.68	49.67	54.00	4.33	134	334.6	Vertical
2	17986.8734	12.96	33.21	46.17	54.00	7.83	100	220	Vertical

Mode: IEEE 802.11g
Lowest Frequency (2412MHz)
Environment: 23.7℃/41%RH/101.0kPa
Tested By: Zhang Zishan

Date:2022-11-29
Voltage: DC 5V

Suspected Data List									
NO.	Freq. [MHz]	Reading [dBμV/m]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	1197.2747	69.70	45.72	-23.98	74.00	28.28	100	229	Horizontal
2	1827.1034	66.51	44.36	-22.15	74.00	29.64	100	181	Horizontal
3	2332.4166	62.05	42.30	-19.75	74.00	31.70	100	199	Horizontal
4	3215.652	62.05	46.26	-15.79	74.00	27.74	200	228	Horizontal
5	4824.6031	58.69	46.12	-12.57	74.00	27.88	100	33	Horizontal
6	18000	44.70	55.29	10.59	74.00	18.71	100	286	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	18000	10.59	36.51	47.10	54.00	6.90	100	286	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	1661.3327	66.86	44.35	-22.51	74.00	29.65	100	180	Vertical
2	1832.104	69.20	46.25	-22.95	74.00	27.75	100	180	Vertical
3	2192.399	65.30	46.03	-19.27	74.00	27.97	100	239	Vertical
4	3215.652	62.35	46.08	-16.27	74.00	27.92	200	188	Vertical
5	4824.6031	60.51	47.69	-12.82	74.00	26.31	100	33	Vertical
6	17971.8715	45.31	57.77	12.46	74.00	16.23	200	111	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	17971.8715	12.46	34.22	46.68	54.00	7.32	200	111	Vertical

Mode: IEEE 802.11g
Middle Frequency (2437MHz)
Environment: 23.7℃/41%RH/101.0kPa
Tested By: Zhang Zishan

Date:2022-11-29
Voltage: DC 5V

Suspected Data List									
NO.	Freq. [MHz]	Reading [dBμV/m]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	1038.7548	63.68	38.88	-24.80	74.00	35.12	200	250	Horizontal
2	1160.02	64.23	39.50	-24.73	74.00	34.50	100	134	Horizontal
3	2662.7078	61.88	43.45	-18.43	74.00	30.55	100	220	Horizontal
4	3247.5309	61.44	45.44	-16.00	74.00	28.56	100	226	Horizontal
5	4875.2344	59.47	47.72	-11.75	74.00	26.28	100	236	Horizontal
6	17889.3612	45.31	54.89	9.58	74.00	19.11	100	43	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	17889.3612	9.58	36.44	46.02	54.00	7.98	100	43	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	1038.2548	64.17	40.39	-23.78	74.00	33.61	200	140	Vertical
2	1664.8331	67.63	45.23	-22.40	74.00	28.77	200	324	Vertical
3	2325.9157	61.34	42.81	-18.53	74.00	31.19	100	190	Vertical
4	3247.5309	61.12	45.09	-16.03	74.00	28.91	100	238	Vertical
5	4873.3592	61.76	49.94	-11.82	74.00	24.06	100	131	Vertical
6	17996.2495	44.59	57.85	13.26	74.00	16.15	200	160	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	4874.9104	-11.82	52.35	40.53	54.00	13.47	100	132	Vertical
2	17996.2495	13.26	34.51	47.77	54.00	6.23	200	160	Vertical

Mode: IEEE 802.11g
Highest Frequency (2462MHz)
Environment: 23.7℃/41%RH/101.0kPa
Tested By: Zhang Zishan

Date:2022-11-29
Voltage: DC 5V

Suspected Data List

NO.	Freq. [MHz]	Reading [dBμV/m]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	2197.6497	55.59	37.57	-18.02	74.00	36.43	100	344	Horizontal
2	2660.9576	60.57	42.14	-18.43	74.00	31.86	100	344	Horizontal
3	3281.2852	61.96	45.15	-16.81	74.00	28.85	100	226	Horizontal
4	3991.999	60.36	44.98	-15.38	74.00	29.02	100	294	Horizontal
5	4925.8657	62.18	50.90	-11.28	74.00	23.10	100	187	Horizontal
6	17855.607	45.34	55.23	9.89	74.00	18.77	200	210	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	4924.9394	-11.28	54.38	43.10	54.00	10.90	120	179.7	Horizontal
2	17855.607	9.89	37.44	47.33	54.00	6.67	200	210	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	1662.8329	66.85	44.38	-22.47	74.00	29.62	100	170	Vertical
2	2994.7493	59.77	43.35	-16.42	74.00	30.65	200	209	Vertical
3	3281.2852	62.91	46.67	-16.24	74.00	27.33	200	296	Vertical
4	3984.4981	60.74	45.69	-15.05	74.00	28.31	100	316	Vertical
5	4922.1153	63.01	52.02	-10.99	74.00	21.98	100	337	Vertical
6	18000	44.18	57.57	13.39	74.00	16.43	200	16	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	4925.0357	-10.99	54.70	43.71	54.00	10.29	155	0	Vertical
2	18000	13.39	34.45	47.84	54.00	6.16	200	16	Vertical

Mode: IEEE 802.11n HT20
Lowest Frequency (2412MHz)
Environment: 23.7℃/41%RH/101.0kPa
Tested By: Zhang Zishan

Date:2022-11-29
Voltage: DC 5V

Suspected Data List

NO.	Freq. [MHz]	Reading [dBμV/m]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	1162.2703	62.38	37.70	-24.68	74.00	36.30	100	162	Horizontal
2	1996.6246	60.31	39.13	-21.18	74.00	34.87	100	259	Horizontal
3	2657.4572	61.95	43.51	-18.44	74.00	30.49	100	220	Horizontal
4	3215.652	60.80	45.01	-15.79	74.00	28.99	200	238	Horizontal
5	3980.7476	57.55	42.21	-15.34	74.00	31.79	100	286	Horizontal
6	17816.227	44.64	54.70	10.06	74.00	19.30	100	345	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	17816.227	10.06	36.33	46.39	54.00	7.61	100	345	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	1198.5248	65.64	40.64	-25.00	74.00	33.36	200	143	Vertical
2	1660.3325	68.53	45.99	-22.54	74.00	28.01	100	360	Vertical
3	1745.8432	69.21	47.49	-21.72	74.00	26.51	100	16	Vertical
4	2333.1666	63.17	44.62	-18.55	74.00	29.38	100	212	Vertical
5	3215.652	61.71	45.44	-16.27	74.00	28.56	200	229	Vertical
6	18000	44.64	58.03	13.39	74.00	15.97	100	227	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	18000	13.39	34.52	47.91	54.00	6.09	100	227	Vertical

Mode: IEEE 802.11n HT20
Middle Frequency (2437 MHz)
Environment: 23.7℃/41%RH/101.0kPa
Tested By: Zhang Zishan

Date:2022-11-29
Voltage: DC 5V

Suspected Data List									
NO.	Freq. [MHz]	Reading [dBμV/m]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	1194.5243	64.25	40.21	-24.04	74.00	33.79	200	152	Horizontal
2	1999.875	59.88	38.71	-21.17	74.00	35.29	100	259	Horizontal
3	2659.9575	62.18	43.75	-18.43	74.00	30.25	100	308	Horizontal
4	3247.5309	60.79	44.79	-16.00	74.00	29.21	100	228	Horizontal
5	3993.8742	58.67	43.29	-15.38	74.00	30.71	100	305	Horizontal
6	17988.7486	44.98	55.29	10.31	74.00	18.71	100	53	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	17988.7486	10.31	36.12	46.43	54.00	7.57	100	53	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	1659.0824	65.53	42.95	-22.58	74.00	31.05	100	201	Vertical
2	1827.6034	66.99	44.11	-22.88	74.00	29.89	200	182	Vertical
3	2325.4157	60.58	42.04	-18.54	74.00	31.96	100	201	Vertical
4	3247.5309	61.71	45.68	-16.03	74.00	28.32	200	215	Vertical
5	3984.4981	62.91	47.86	-15.05	74.00	26.14	100	245	Vertical
6	18000	44.12	57.51	13.39	74.00	16.49	200	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	18000	13.39	32.88	46.27	54.00	7.73	200	255	Vertical

Mode: IEEE 802.11n HT20
Highest Frequency (2462MHz)
Environment: 23.7℃/41%RH/101.0kPa
Tested By: Zhang Zishan

Date:2022-11-29
Voltage: DC 5V

Suspected Data List									
NO.	Freq. [MHz]	Reading [dBμV/m]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	1165.0206	61.68	37.05	-24.63	74.00	36.95	100	84	Horizontal
2	1998.8749	60.87	39.70	-21.17	74.00	34.30	100	261	Horizontal
3	2654.4568	63.01	44.57	-18.44	74.00	29.43	100	240	Horizontal
4	3281.2852	60.97	44.16	-16.81	74.00	29.84	100	238	Horizontal
5	3995.7495	58.95	43.56	-15.39	74.00	30.44	100	297	Horizontal
6	17883.7355	45.81	55.45	9.64	74.00	18.55	100	306	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	17883.7355	9.64	37.15	46.79	54.00	7.21	100	306	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	1161.2702	64.58	40.40	-24.18	74.00	33.60	100	228	Vertical
2	1826.3533	67.98	45.13	-22.85	74.00	28.87	100	180	Vertical
3	2325.6657	62.30	43.76	-18.54	74.00	30.24	100	210	Vertical
4	3281.2852	62.56	46.32	-16.24	74.00	27.68	200	187	Vertical
5	4931.4914	58.04	46.97	-11.07	74.00	27.03	100	346	Vertical
6	17996.2495	45.33	58.59	13.26	74.00	15.41	100	142	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	17996.2495	13.26	34.55	47.81	54.00	6.19	100	142	Vertical

Mode: IEEE 802.11n HT40
Lowest Frequency (2422MHz)
Environment: 23.7℃/41%RH/101.0kPa
Tested By: Zhang Zishan

Date:2022-11-29
Voltage: DC 5V

Suspected Data List									
NO.	Freq. [MHz]	Reading [dBμV/m]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	1166.0208	62.12	37.51	-24.61	74.00	36.49	200	298	Horizontal
2	1993.1241	65.77	44.59	-21.18	74.00	29.41	200	55	Horizontal
3	2666.2083	62.47	44.05	-18.42	74.00	29.95	100	64	Horizontal
4	3228.7786	61.37	45.50	-15.87	74.00	28.50	100	228	Horizontal
5	4991.4989	55.02	43.54	-11.48	74.00	30.46	200	149	Horizontal
6	17881.8602	46.53	56.18	9.65	74.00	17.82	200	72	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	17881.8602	9.65	34.58	44.23	54.00	9.77	200	72	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	1166.2708	63.23	38.94	-24.29	74.00	35.06	100	219	Vertical
2	1738.8424	63.18	41.51	-21.67	74.00	32.49	200	15	Vertical
3	3228.7786	61.93	45.77	-16.16	74.00	28.23	100	198	Vertical
4	3328.166	60.29	43.93	-16.36	74.00	30.07	100	178	Vertical
5	4663.3329	57.22	44.01	-13.21	74.00	29.99	100	33	Vertical
6	17801.2252	46.16	58.08	11.92	74.00	15.92	200	229	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	17801.2252	11.92	34.55	46.47	54.00	7.53	200	229	Vertical

Mode: IEEE 802.11n HT40
Middle Frequency (2437 MHz)
Environment: 23.7℃/41%RH/101.0kPa
Tested By: Zhang Zishan

Date:2022-11-29
Voltage: DC 5V

Suspected Data List									
NO.	Freq. [MHz]	Reading [dBμV/m]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	1499.3124	60.32	37.63	-22.69	74.00	36.37	100	298	Horizontal
2	1999.625	65.01	43.84	-21.17	74.00	30.16	100	190	Horizontal
3	2658.9574	61.76	43.32	-18.44	74.00	30.68	100	241	Horizontal
4	3247.5309	61.37	45.37	-16.00	74.00	28.63	100	225	Horizontal
5	4884.6106	54.67	43.21	-11.46	74.00	30.79	100	236	Horizontal
6	17868.7336	45.85	55.63	9.78	74.00	18.37	100	314	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	17868.7336	9.78	35.41	45.19	54.00	8.81	100	314	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	1199.5249	65.97	40.95	-25.02	74.00	33.05	100	276	Vertical
2	1660.0825	65.05	42.50	-22.55	74.00	31.50	100	161	Vertical
3	1826.8534	66.90	44.04	-22.86	74.00	29.96	200	163	Vertical
4	3249.4062	61.76	45.75	-16.01	74.00	28.25	200	190	Vertical
5	4888.361	54.87	43.63	-11.24	74.00	30.37	100	334	Vertical
6	17801.2252	45.67	57.59	11.92	74.00	16.41	100	22	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	17801.2252	11.92	34.42	46.34	54.00	7.66	100	22	Vertical

Mode: IEEE 802.11n HT40
Highest Frequency (2452MHz)
Environment: 23.7℃/41%RH/101.0kPa
Tested By: Zhang Zishan

Date:2022-11-29
Voltage: DC 5V

Suspected Data List									
NO.	Freq. [MHz]	Reading [dBμV/m]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	1197.0246	69.31	45.32	-23.99	74.00	28.68	100	74	Horizontal
2	1665.0831	66.14	43.04	-23.10	74.00	30.96	100	359	Horizontal
3	2001.6252	66.02	44.86	-21.16	74.00	29.14	100	94	Horizontal
4	2662.2078	64.30	45.87	-18.43	74.00	28.13	100	261	Horizontal
5	3268.1585	61.89	45.42	-16.47	74.00	28.58	100	237	Horizontal
6	17546.1933	46.76	55.53	8.77	74.00	18.47	100	196	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	17546.1933	8.77	37.12	45.89	54.00	8.11	100	196	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	1328.7911	66.37	43.72	-22.65	74.00	30.28	100	171	Vertical
2	2659.7075	64.98	47.25	-17.73	74.00	26.75	100	201	Vertical
3	3268.1585	62.62	46.47	-16.15	74.00	27.53	200	179	Vertical
4	3592.5741	62.30	46.48	-15.82	74.00	27.52	100	344	Vertical
5	3991.999	61.11	46.03	-15.08	74.00	27.97	100	246	Vertical
6	17803.1004	45.49	57.40	11.91	74.00	16.60	100	23	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	17803.1004	11.91	35.78	47.69	54.00	6.31	100	23	Vertical

18GHz-26.5GHz:

According to C63.10, if the peak (or quasi-peak) measured value complies with the average limit, it is unnecessary to perform an average measurement, so AV emission value did not show in below table if the peak value complies with average limit.

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

Mode: IEEE 802.11g
Lowest Frequency (2412MHz) Date: 2022-12-05
Environment: 24.2℃/53%RH/101.0kPa Voltage: DC 5V
Tested By: Zhang Zishan

Suspected Data List									
NO.	Freq. [MHz]	Reading [dBμV/m]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	18193.8	52.19	39.79	-12.40	83.54	43.75	150	190	Horizontal
2	18813.875	52.71	40.79	-11.92	83.54	42.75	150	126	Horizontal
3	19672.8	52.58	41.32	-11.26	83.54	42.22	150	302	Horizontal
4	20194.7	53.43	42.56	-10.87	83.54	40.98	150	348	Horizontal
5	22904.5	49.66	40.98	-8.68	83.54	42.56	150	348	Horizontal
6	24997.2	47.79	40.49	-7.30	83.54	43.05	150	64	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	19560.175	53.02	41.69	-11.33	83.54	41.85	150	204	Vertical
2	19999.2	52.66	41.70	-10.96	83.54	41.84	150	158	Vertical
3	21419.975	50.89	41.08	-9.81	83.54	42.46	150	109	Vertical
4	22208.35	50.75	41.29	-9.46	83.54	42.25	150	124	Vertical
5	24094.075	49.16	40.91	-8.25	83.54	42.63	150	60	Vertical
6	25434.525	47.17	39.89	-7.28	83.54	43.65	150	140	Vertical

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Mode: IEEE 802.11g
Middle Frequency (2437MHz)
Environment: 24.2℃/53%RH/101.0kPa
Tested By: Zhang Zishan

Date: 2022-12-05
Voltage: DC 5V

Suspected Data List									
NO.	Freq. [MHz]	Reading [dBμV/m]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	18626.875	52.50	40.42	-12.08	83.54	43.12	150	144	Horizontal
2	19999.625	54.54	43.48	-11.06	83.54	40.06	150	32	Horizontal
3	20700.45	50.75	40.42	-10.33	83.54	43.12	150	349	Horizontal
4	22590.425	50.05	41.02	-9.03	83.54	42.52	150	32	Horizontal
5	23034.125	49.61	40.97	-8.64	83.54	42.57	150	97	Horizontal
6	25134.05	47.88	40.72	-7.16	83.54	42.82	150	269	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	19630.725	52.70	41.46	-11.24	83.54	42.08	150	266	Vertical
2	19999.625	53.84	42.88	-10.96	83.54	40.66	150	172	Vertical
3	20844.1	52.14	42.10	-10.04	83.54	41.44	150	91	Vertical
4	22073.625	50.71	41.12	-9.59	83.54	42.42	150	187	Vertical
5	23209.225	49.83	41.21	-8.62	83.54	42.33	150	202	Vertical
6	25478.725	47.93	40.59	-7.34	83.54	42.95	150	187	Vertical

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Mode: IEEE 802.11g
Highest Frequency (2462MHz)
Environment: 24.2℃/53%RH/101.0kPa
Tested By: Zhang Zishan

Date: 2022-12-05
Voltage: DC 5V

Suspected Data List									
NO.	Freq. [MHz]	Reading [dBμV/m]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	18464.95	52.78	40.54	-12.24	83.54	43.00	150	76	Horizontal
2	20124.15	51.85	40.91	-10.94	83.54	42.63	150	284	Horizontal
3	20655.4	52.37	42.00	-10.37	83.54	41.54	150	30	Horizontal
4	21671.15	50.47	40.71	-9.76	83.54	42.83	150	298	Horizontal
5	23440.425	49.87	41.16	-8.71	83.54	42.38	150	233	Horizontal
6	24604.075	49.04	41.36	-7.68	83.54	42.18	150	314	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	18352.75	52.86	40.59	-12.27	83.54	42.95	150	234	Vertical
2	19920.575	52.62	41.61	-11.01	83.54	41.93	150	219	Vertical
3	21427.625	50.49	40.69	-9.80	83.54	42.85	150	297	Vertical
4	22865.4	49.34	40.64	-8.70	83.54	42.90	150	172	Vertical
5	23387.725	49.28	40.66	-8.62	83.54	42.88	150	329	Vertical
6	25201.625	47.56	40.57	-6.99	83.54	42.97	150	15	Vertical

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7. 6dB BANDWIDTH

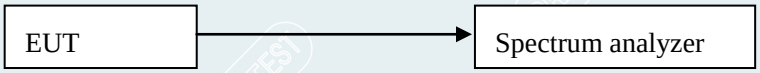
7.1 LIMITS

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) ≥ 3 x 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



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7.4 TEST RESULTS

Environment: 23.7℃/57%RH/101.0kPa Voltage: DC 5V
Tested By:Qin Tingting Date: 2022-11-30 to 2022-12-20

Test Mode	Antenna	Frequency[MHz]	DTS BW [MHz]	Limit[MHz]	Verdict
IEEE 802.11b	Ant1	2412	9.08	≥0.5	PASS
		2437	9.52	≥0.5	PASS
		2462	9.08	≥0.5	PASS
IEEE 802.11g	Ant1	2412	16.56	≥0.5	PASS
		2437	16.52	≥0.5	PASS
		2462	16.56	≥0.5	PASS
IEEE 802.11n HT20	Ant1	2412	17.80	≥0.5	PASS
		2437	17.72	≥0.5	PASS
		2462	17.72	≥0.5	PASS
IEEE 802.11n HT40	Ant1	2422	36.56	≥0.5	PASS
		2437	36.48	≥0.5	PASS
		2452	36.56	≥0.5	PASS

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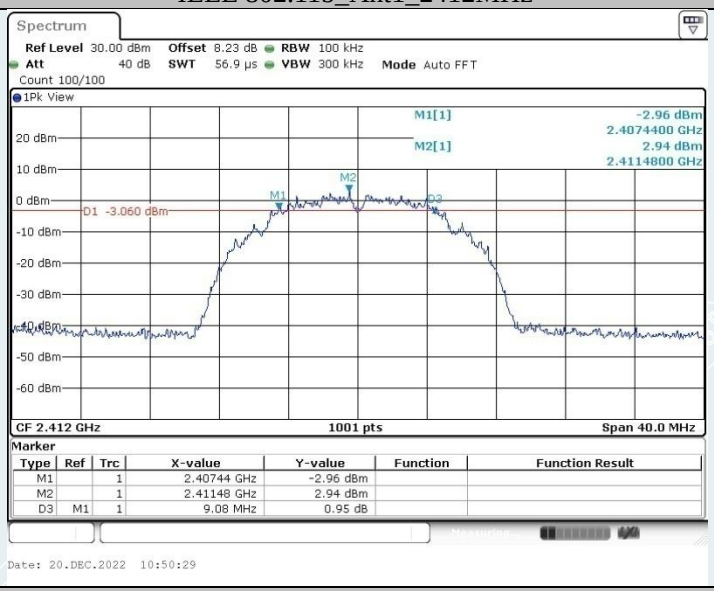
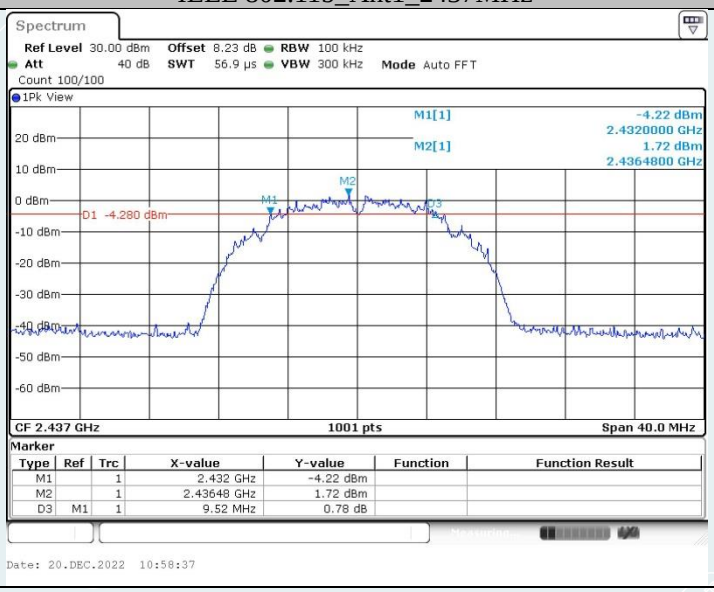
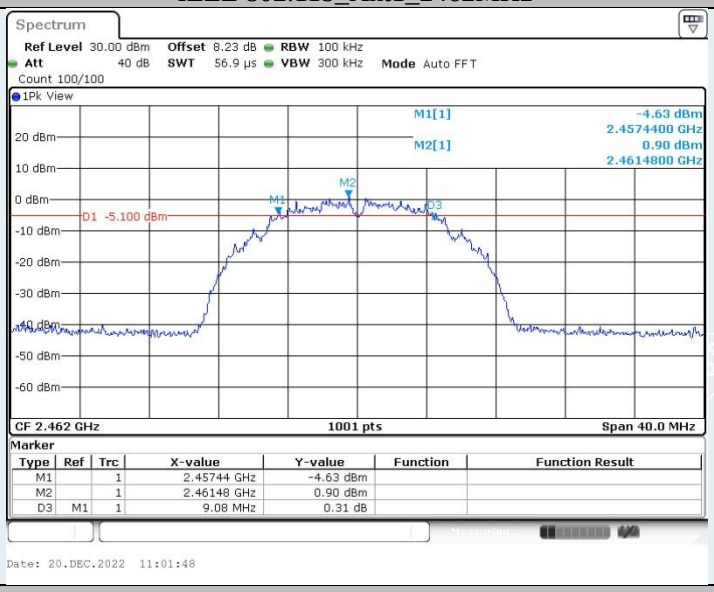
IEEE 802.11b_Ant1_2412MHz



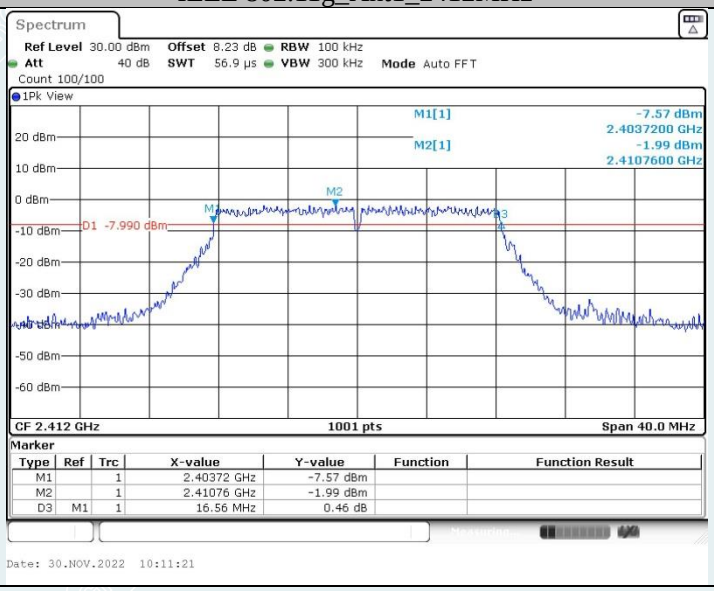
IEEE 802.11b_Ant1_2437MHz



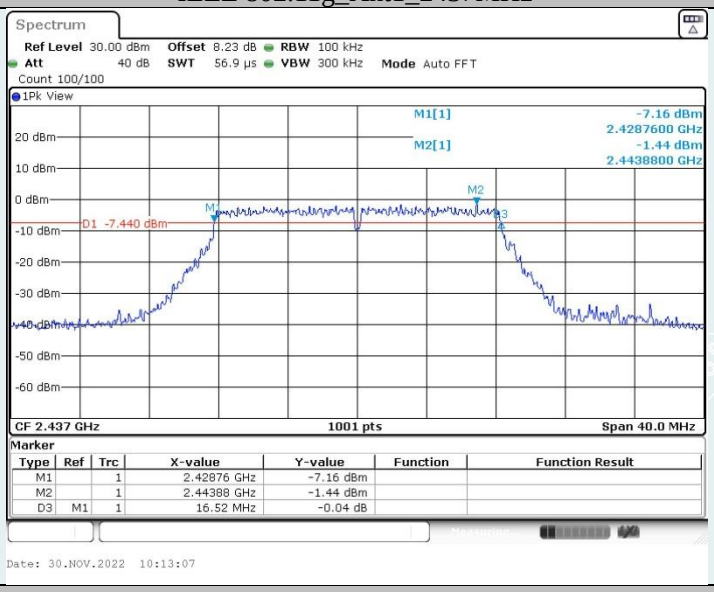
IEEE 802.11b_Ant1_2462MHz



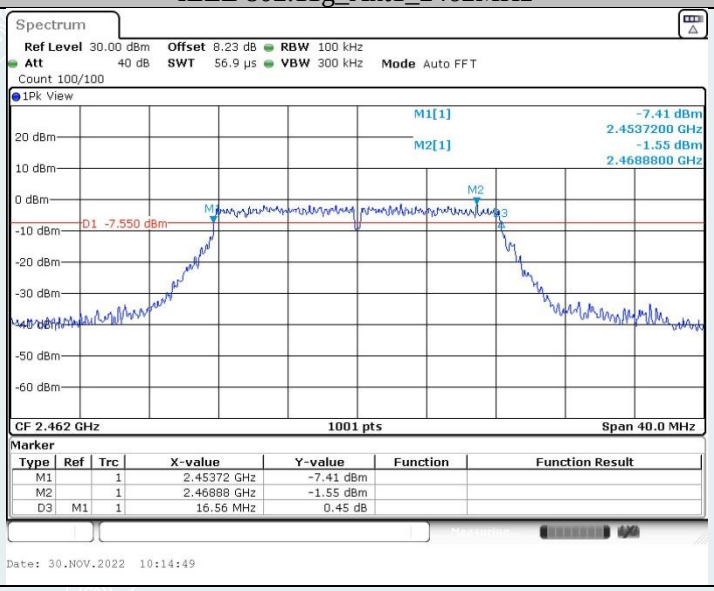
IEEE 802.11g_Ant1_2412MHz



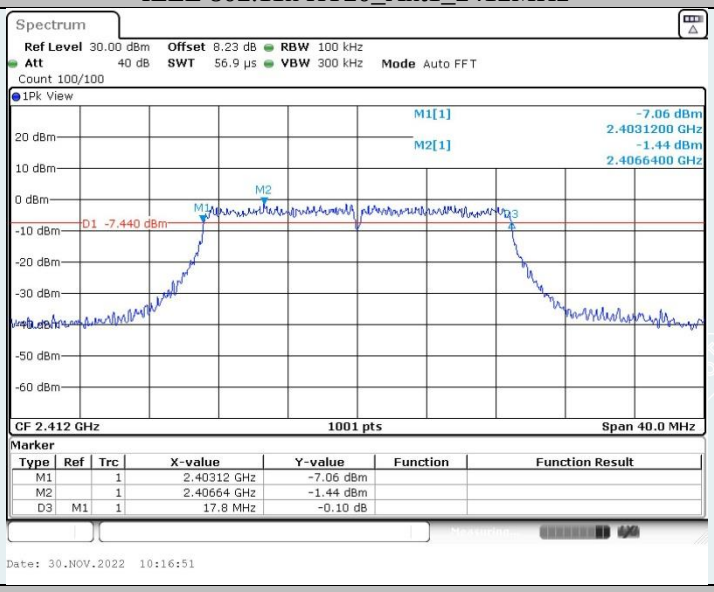
IEEE 802.11g_Ant1_2437MHz



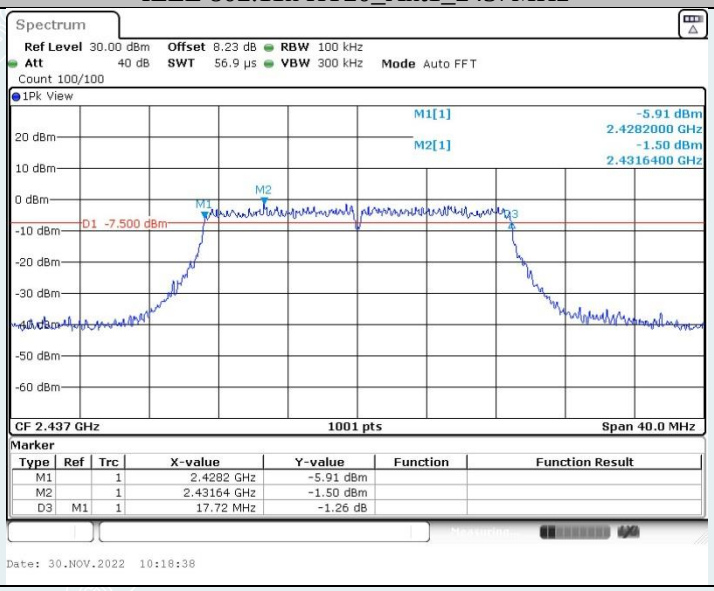
IEEE 802.11g_Ant1_2462MHz



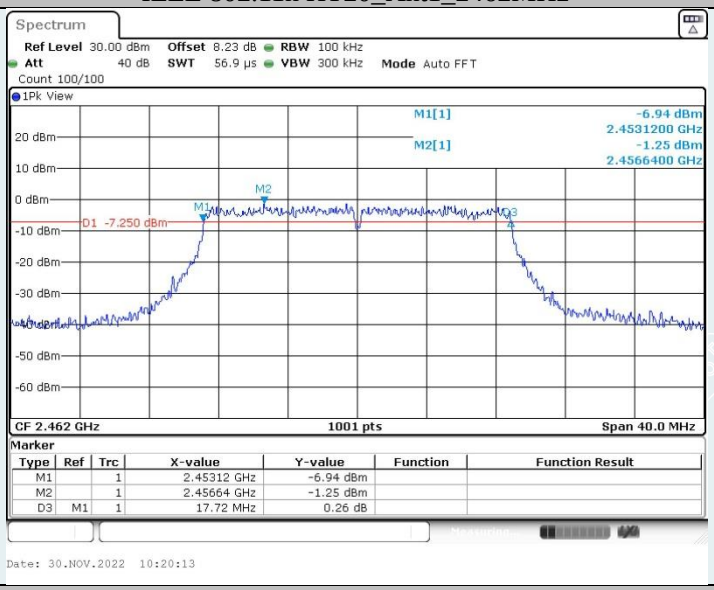
IEEE 802.11n HT20_Ant1_2412MHz



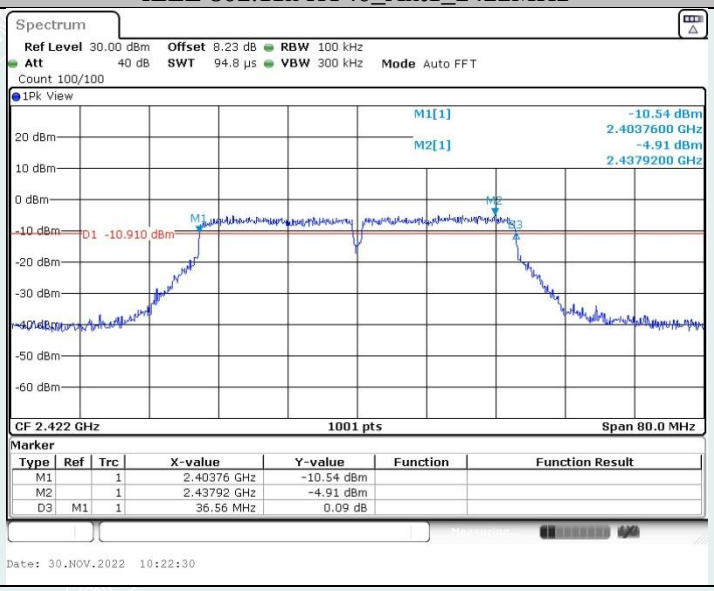
IEEE 802.11n HT20_Ant1_2437MHz



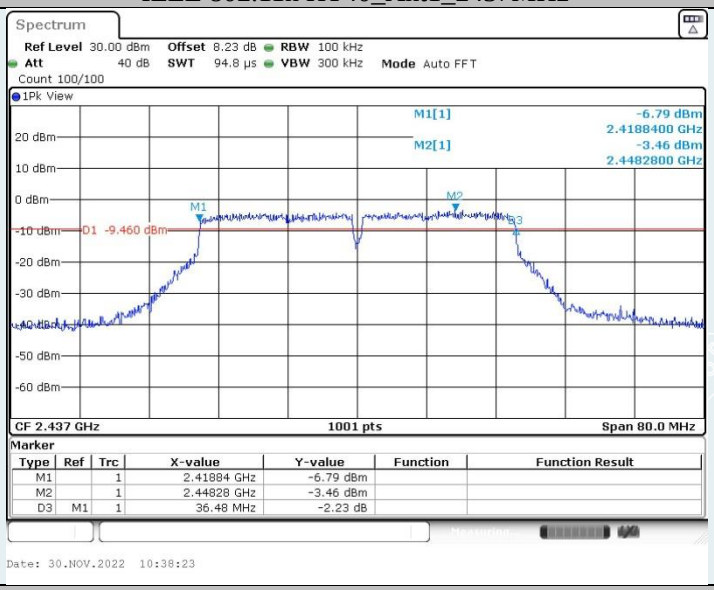
IEEE 802.11n HT20_Ant1_2462MHz



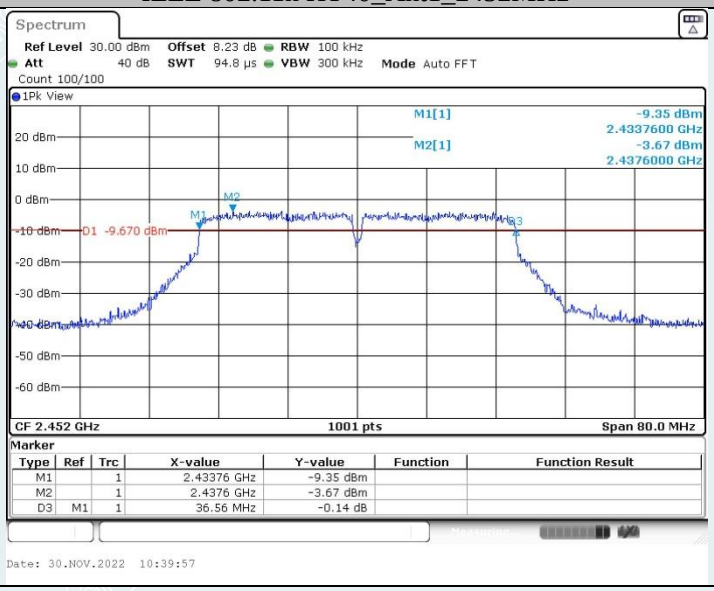
IEEE 802.11n HT40_Ant1_2422MHz



IEEE 802.11n HT40_Ant1_2437MHz



IEEE 802.11n HT40_Ant1_2452MHz



8. MAXIMUM PEAK OUTPUT POWER

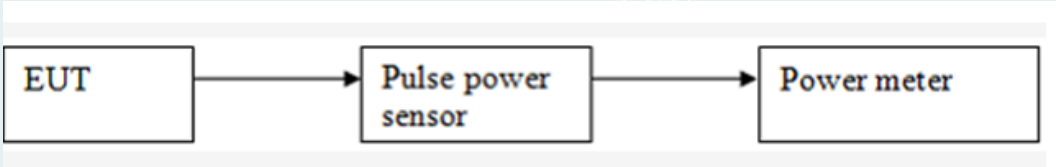
8.1 LIMITS

The maximum Peak output power measurement is 1W

8.2 TEST PROCEDURES

1) RF output of EUT was connected to the broadband peak RF power meter by RF cable. The path loss was compensated to the results for each measurement.
2) Set to the maximum power setting and enable the EUT transmit continuously.
3) Measure the conducted output power and record the results in the test report.

8.3 TEST SETUP



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8.4 TEST RESULT

Environment: 23.7℃/57%RH/101.0kPa
Tested By:Qin Tingting

Voltage: DC 5V
Date: 2022-11-30

IEEE 802.11b Mode:

Channel No.	Frequency (MHz)	Measured Channel Power (dBm)	Peak / AVG	Limit	Result
1	2412	21.57	Peak	30dBm	Pass
6	2437	21.13			Pass
11	2462	21.27			Pass

IEEE 802.11g Mode:

Channel No.	Frequency (MHz)	Measured Channel Power (dBm)	Peak / AVG	Limit	Result
1	2412	21.13	Peak	30dBm	Pass
6	2437	20.61			Pass
11	2462	20.73			Pass

IEEE 802.11n HT20 Mode:

Channel No.	Frequency (MHz)	Measured Channel Power (dBm)	Peak/ AVG	Limit	Result
1	2412	21.51	Peak	30dBm	Pass
6	2437	20.94			Pass
11	2462	21.04			Pass

IEEE 802.11n HT40 Mode:

Channel No.	Frequency (MHz)	Measured Channel Power (dBm)	Peak/ AVG	Limit	Result
3	2422	20.84	Peak	30dBm	Pass
6	2437	20.38			Pass
9	2452	20.46			Pass

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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) The following procedure shall be used if maximum peak conducted output power was used to determine compliance, and it is optional if the maximum conducted (average) output power was used to determine compliance:
   a) Set analyzer center frequency to DTS channel center frequency.
   b) Set the span to 1.5 times the DTS bandwidth.
   c) Set the RBW to 3 kHz ≤ RBW ≤ 100 kHz.
   d) Set the VBW ≥ [3 × RBW].
   e) Detector = peak
   f) Sweep time = auto couple.
   g) Trace mode = max hold.
   h) Allow trace to fully stabilize.
   i) Use the peak marker function to determine the maximum amplitude level within the RBW.
   j) If measured value exceeds requirement, then reduce RBW (but no less than 3 kHz) and repeat.
4) Repeat above procedures until all frequencies measured were complete.

9.3 TEST SETUP

---------- The following blanks ----------

9.4 TEST RESULTS

Environment: 23.7℃/57%RH/101.0kPa Voltage: DC 5V
Tested By:Qin Tingting Date: 2022-11-30 to 2022-12-20

IEEE 802.11b Mode:

Channel No.	Frequency (MHz)	PSD (dBm/3kHz)	Limit (dBm/3kHz)	Result
1	2412	-13.07	8.00	Pass
6	2437	-13.52	8.00	Pass
11	2462	-15.09	8.00	Pass

IEEE 802.11g Mode:

Channel No.	Frequency (MHz)	PSD (dBm/3kHz)	Limit (dBm/3kHz)	Result
1	2412	-20.58	8.00	Pass
6	2437	-21.26	8.00	Pass
11	2462	-22.38	8.00	Pass

IEEE 802.11n HT20 Mode:

Channel No.	Frequency (MHz)	PSD (dBm/3kHz)	Limit (dBm/3kHz)	Result
1	2412	-20.11	8.00	Pass
6	2437	-20.77	8.00	Pass
11	2462	-21.85	8.00	Pass

IEEE 802.11n HT40 Mode:

Channel No.	Frequency (MHz)	PSD (dBm/3kHz)	Limit (dBm/3kHz)	Result
3	2422	-21.68	8.00	Pass
6	2437	-22.35	8.00	Pass
9	2452	-22.91	8.00	Pass

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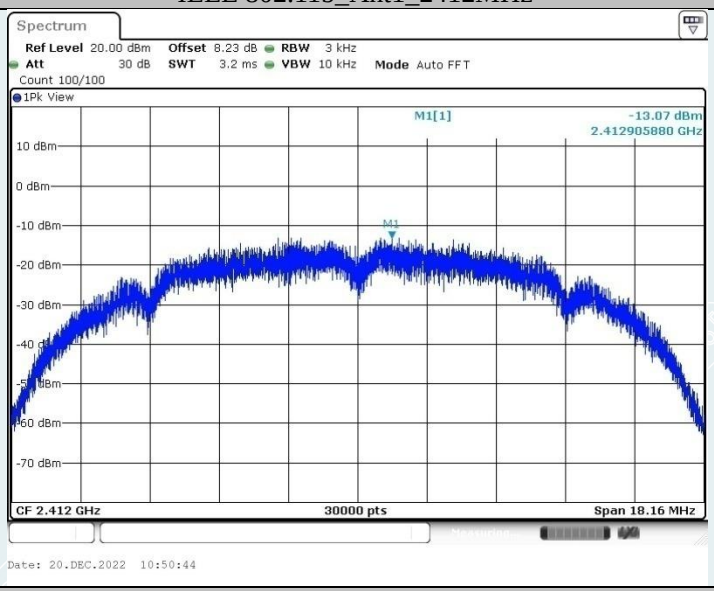
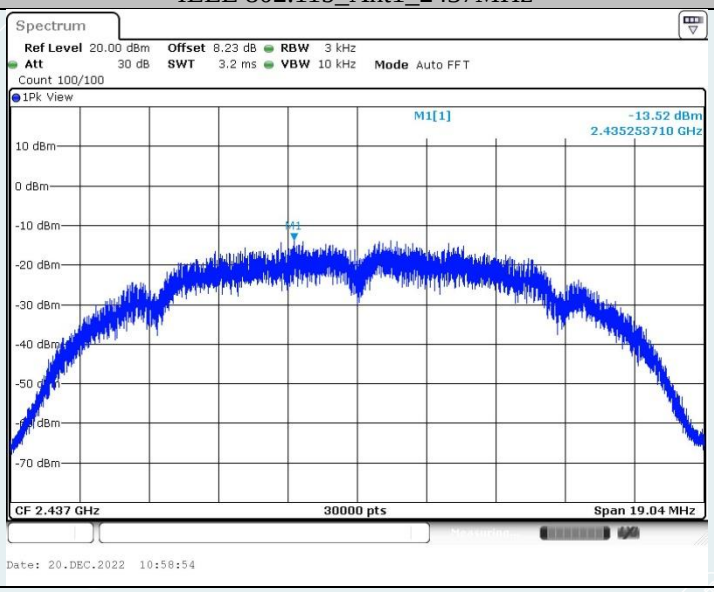
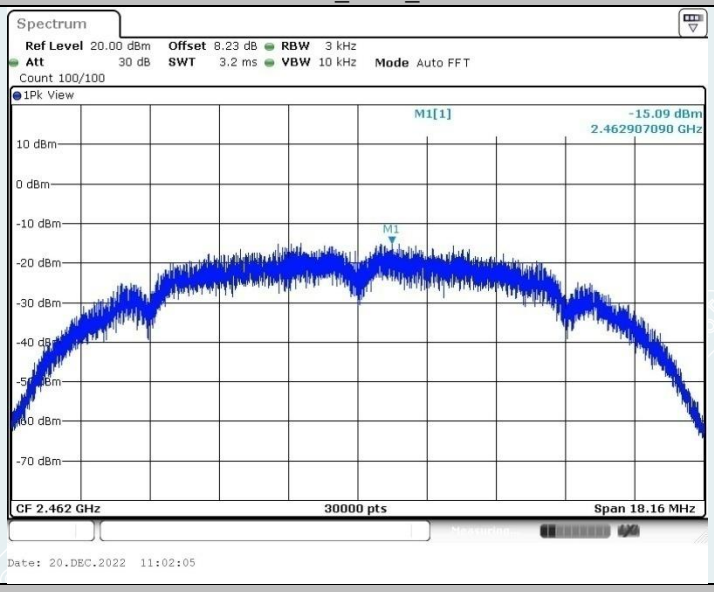
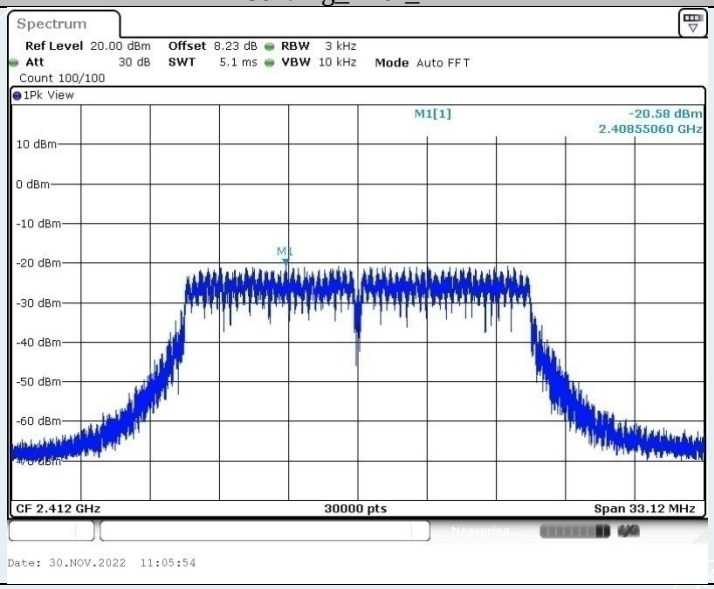
IEEE 802.11b_Ant1_2412MHz



IEEE 802.11b_Ant1_2437MHz



IEEE 802.11b_Ant1_2462MHz


IEEE 802.11g_Ant1_2412MHz


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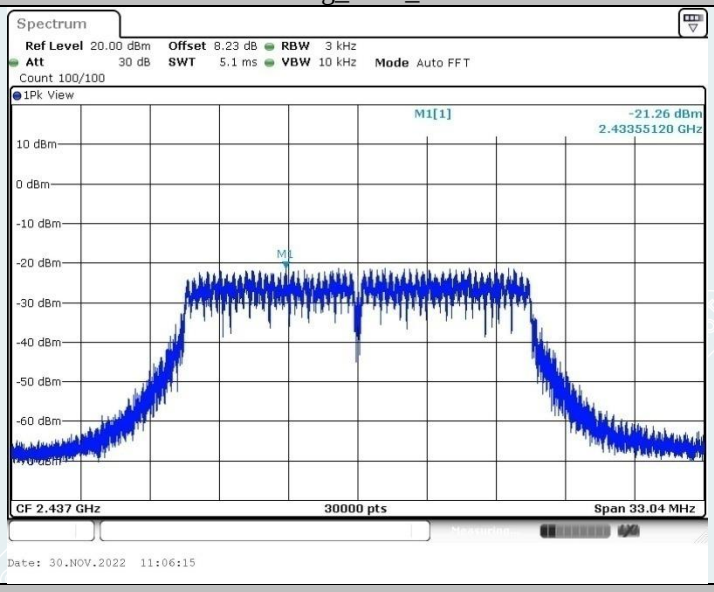
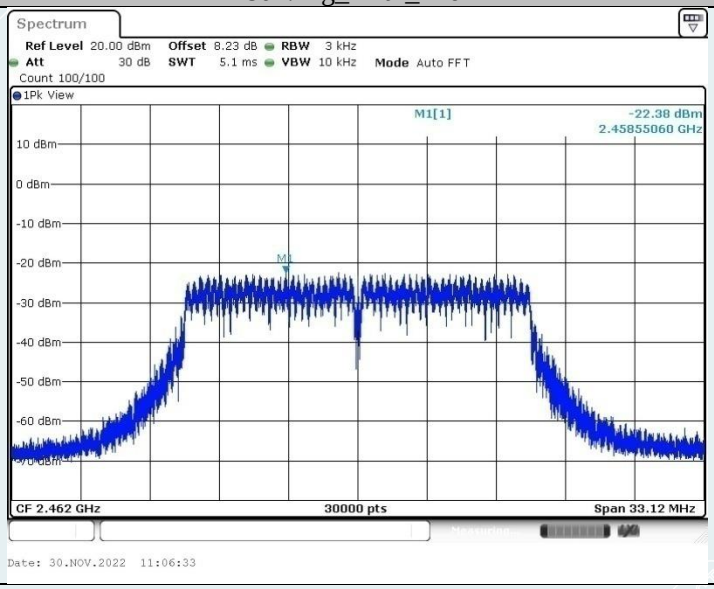
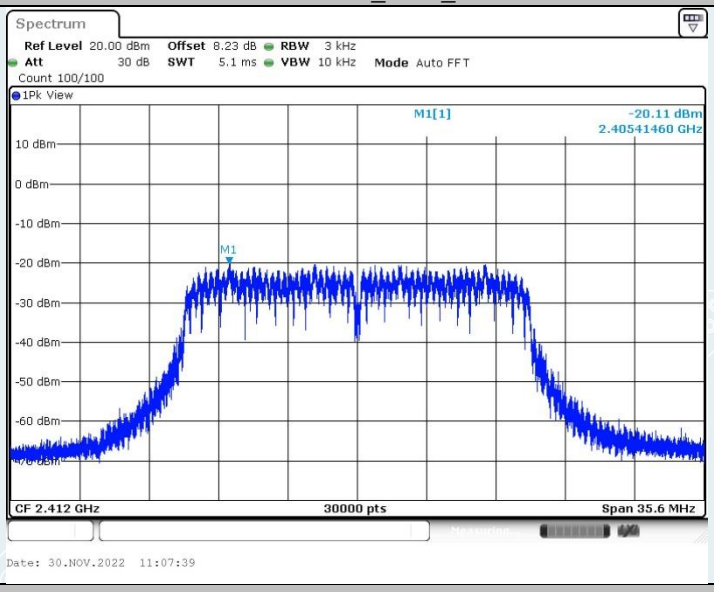
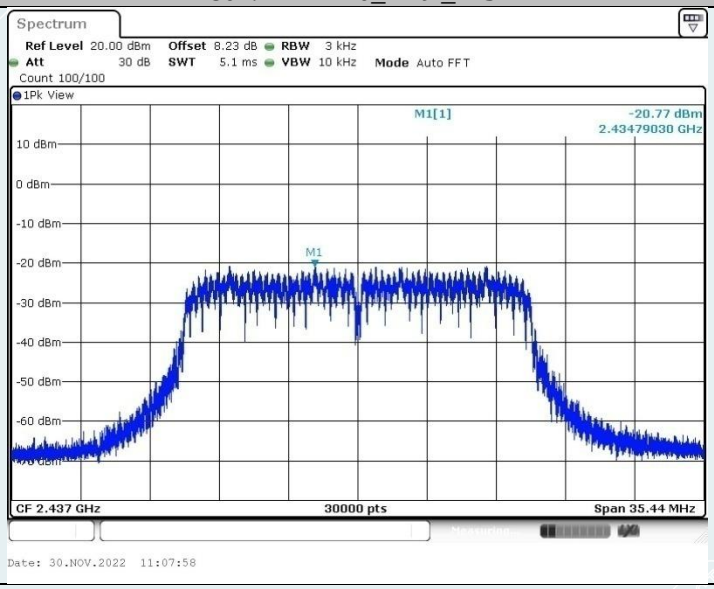
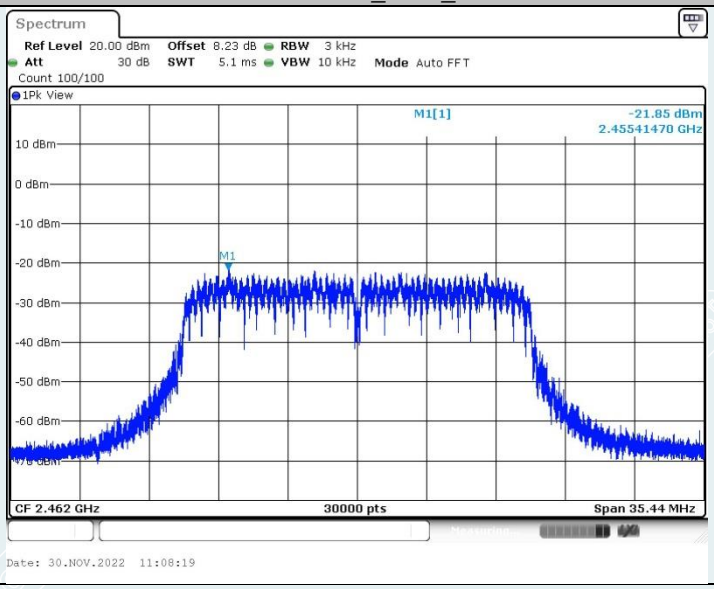
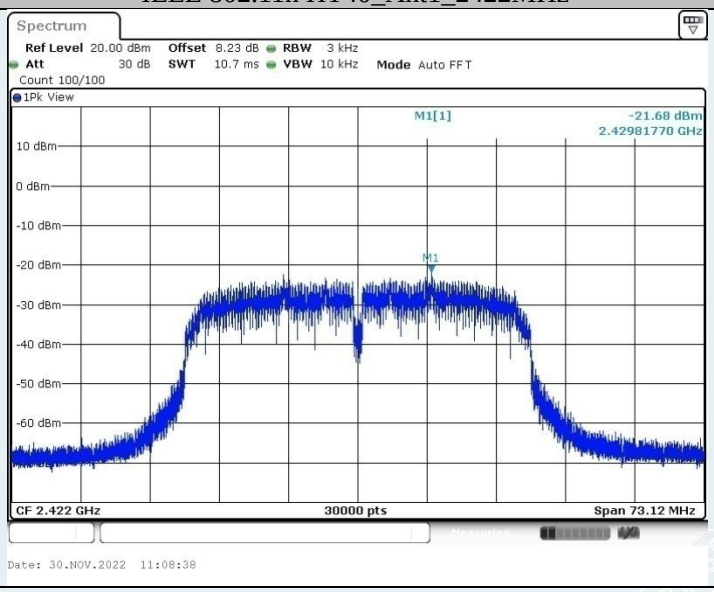


IEEE 802.11g_Ant1_2462MHz


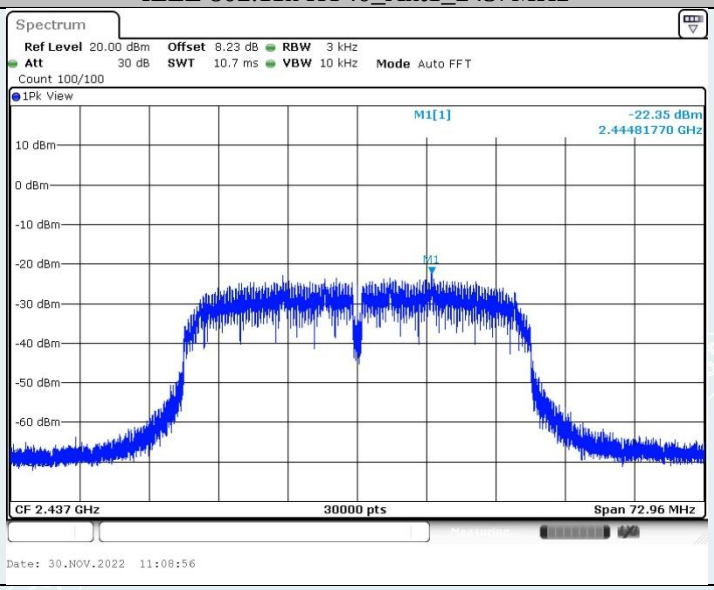
IEEE 802.11n HT20_Ant1_2412MHz


IEEE 802.11n HT20_Ant1_2437MHz


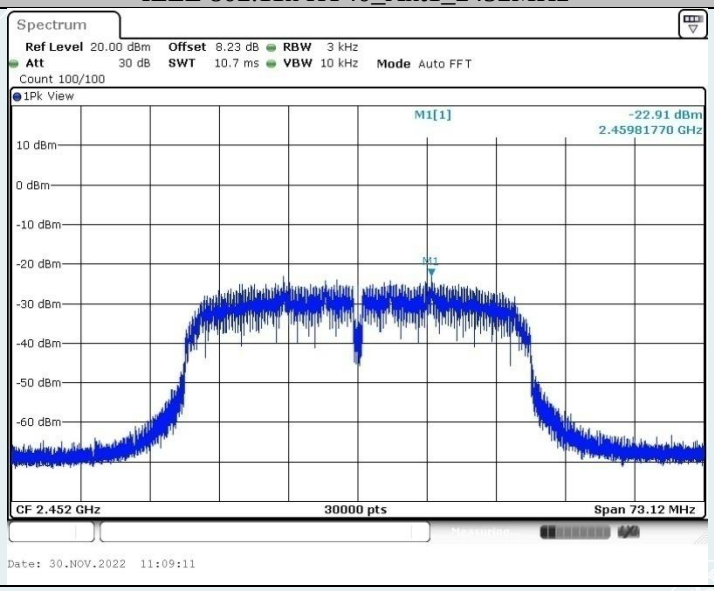
IEEE 802.11n HT20_Ant1_2462MHz


IEEE 802.11n HT40_Ant1_2422MHz


IEEE 802.11n HT40_Ant1_2437MHz



IEEE 802.11n HT40_Ant1_2452MHz



10. CONDUCTED BAND EDGES AND SPURIOUS EMISSIONS

10.1 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.

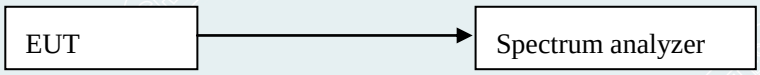
10.2 TEST PROCEDURES

Test procedures follow KDB 558074 D01 15.247 measurement guidance v05r02.

Remove the antenna from the EUT and then connect a low attenuation cable from the antenna port to the spectrum.

1) Remove the antenna from the EUT and then connect a low attenuation cable from the antenna port to the spectrum.
2) Set the spectrum analyzer: RBW =100kHz; VBW =300kHz, Frequency range = 30MHz to 26.5GHz; Sweep = auto; Detector Function = Peak; Trace = Max hold.
3) Measure and record the results in the test report.
4) The RF fundamental frequency should be excluded against the limit line in the operating frequency band.

10.3 TEST SETUP



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10.4 TEST RESULTS

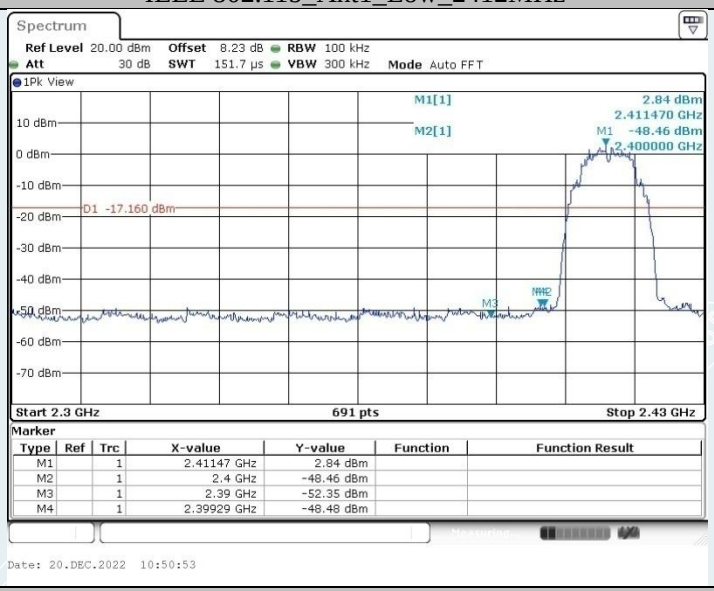
Environment: 23.7℃/57%RH/101.0kPa Voltage: DC 5V
Tested By:Qin Tingting Date: 2022-11-30 to 2022-12-20

Band edge

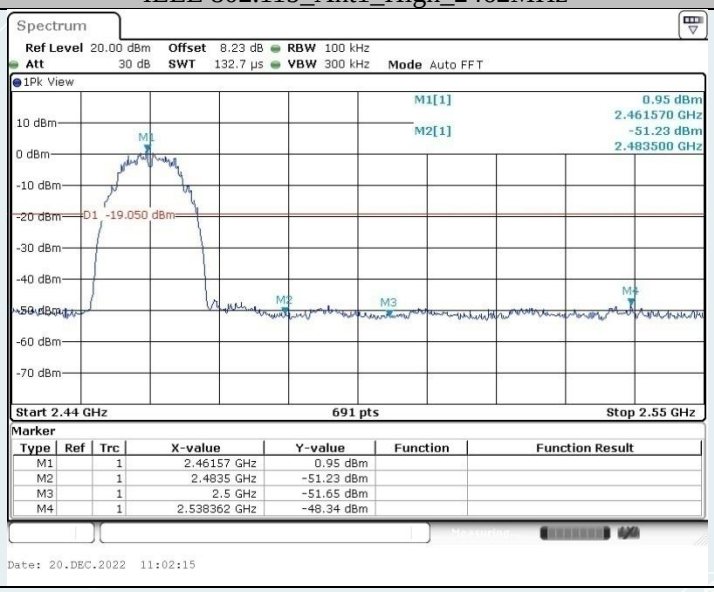
Test Mode	Antenna	ChName	Frequency[MHz]	RefLevel[dBm]	Result[dBm]	Limit[dBm]	Verdict
IEEE 802.11b	Ant1	Low	2412	2.84	-48.48	≤-17.16	PASS
		High	2462	0.95	-48.34	≤-19.05	PASS
IEEE 802.11g	Ant1	Low	2412	0.27	-31.36	≤-19.73	PASS
		High	2462	-0.24	-43.58	≤-20.24	PASS
IEEE 802.11n HT20	Ant1	Low	2412	-0.18	-32.41	≤-20.18	PASS
		High	2462	-0.06	-41.28	≤-20.06	PASS
IEEE 802.11n HT40	Ant1	Low	2422	-2.65	-26.49	≤-22.65	PASS
		High	2452	-3.82	-38.3	≤-23.82	PASS

---------- The following blanks ----------

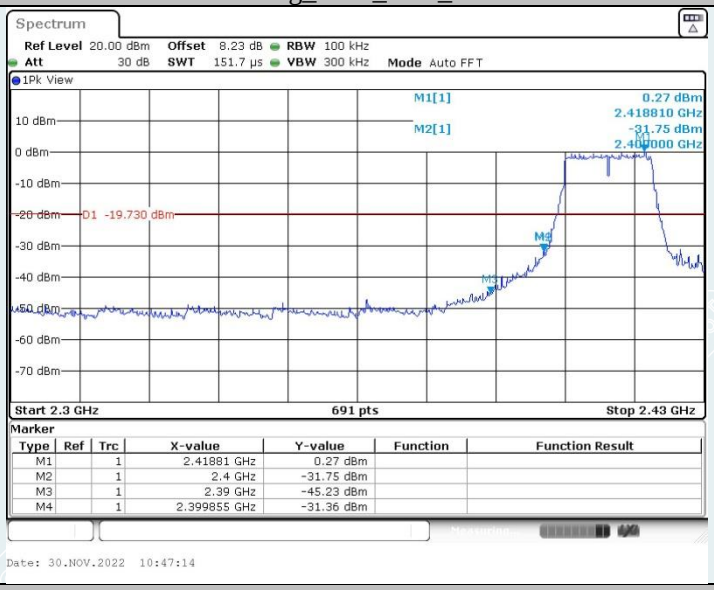
IEEE 802.11b_Ant1_Low_2412MHz



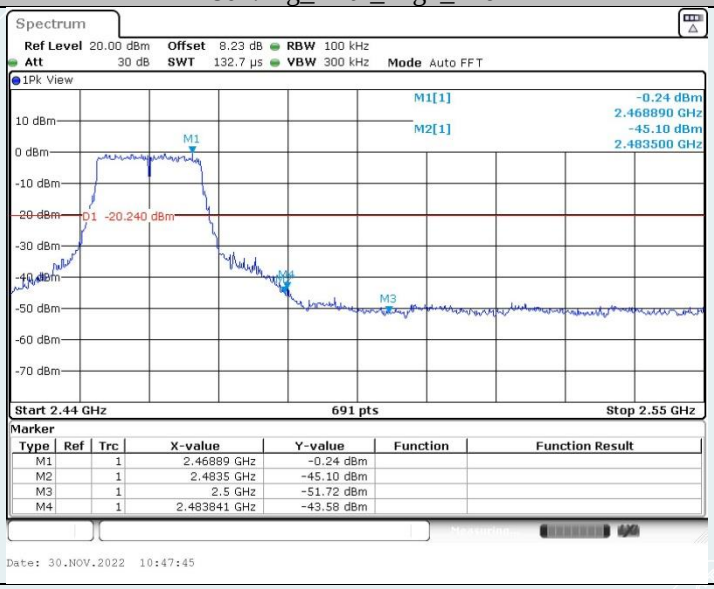
IEEE 802.11b_Ant1_High_2462MHz



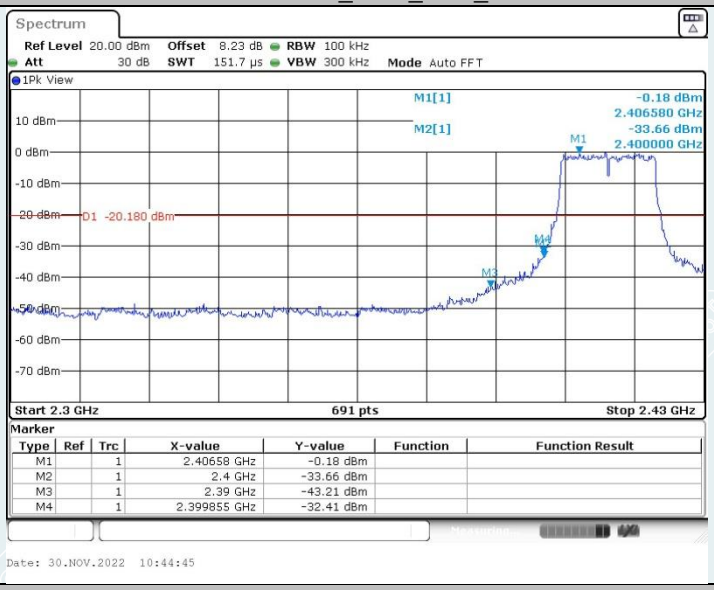
IEEE 802.11g_Ant1_Low_2412MHz



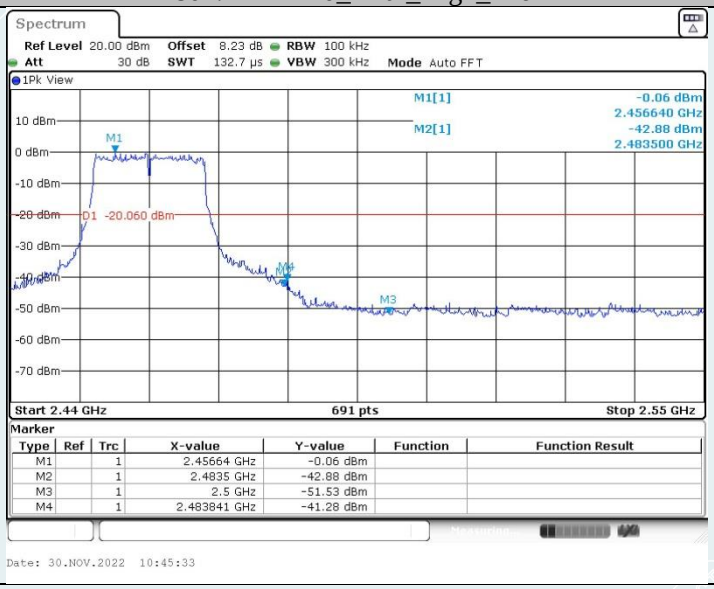
IEEE 802.11g_Ant1_High_2462MHz



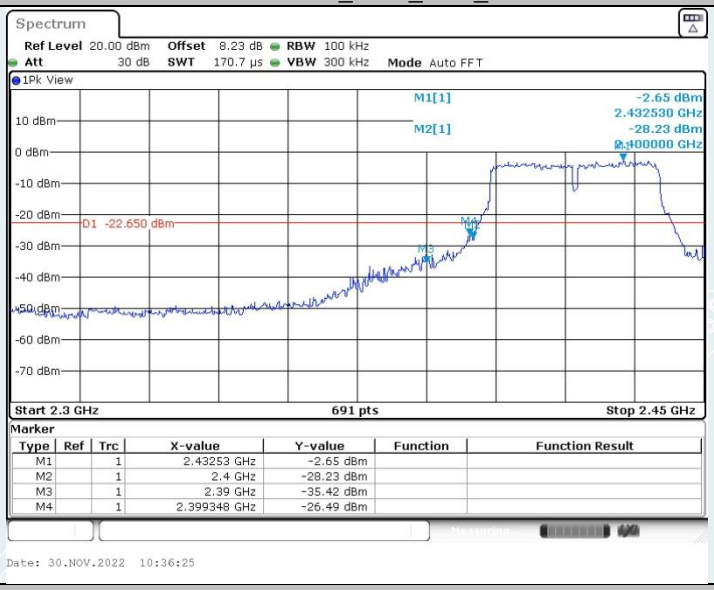
IEEE 802.11n HT20_Ant1_Low_2412MHz



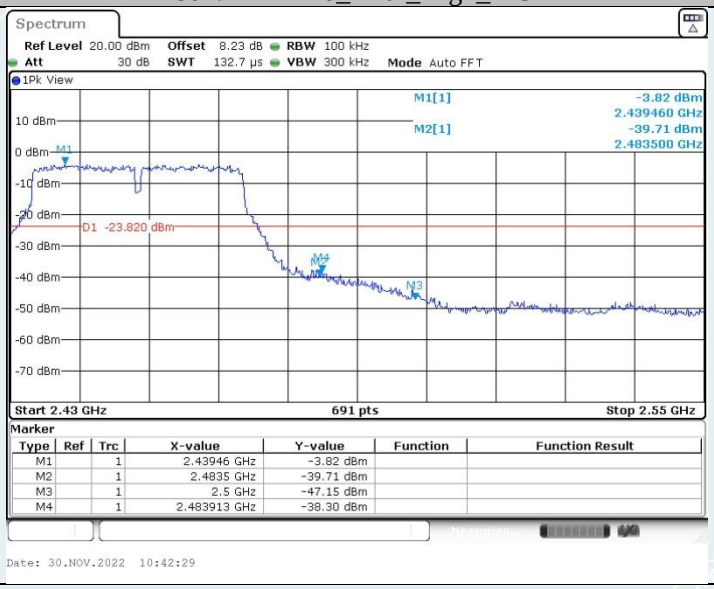
IEEE 802.11n HT20_Ant1_High_2462MHz



IEEE 802.11n HT40_Ant1_Low_2422MHz



IEEE 802.11n HT40_Ant1_High_2452MHz



Conducted Spurious Emission:
Test Result
Environment: 23.7℃/57%RH/101.0kPa Voltage: DC 5V
Tested By:Qin Tingting Date: 2022-11-30 to 2022-12-20

Test Mode	Antenna	Frequency[MHz]	FreqRange [MHz]	RefLevel [dBm]	Result [dBm]	Limit [dBm]	Verdict
IEEE 802.11b	Ant1	2412	Reference	2.84	2.84	---	PASS
			30~1000	2.84	-53.45	≤-17.16	PASS
			1000~26500	2.84	-45.96	≤-17.16	PASS
		2437	Reference	1.91	1.91	---	PASS
			30~1000	1.91	-54.07	≤-18.09	PASS
			1000~26500	1.91	-46.05	≤-18.09	PASS
		2462	Reference	0.78	0.78	---	PASS
			30~1000	0.78	-54.29	≤-19.22	PASS
			1000~26500	0.78	-44.57	≤-19.22	PASS
IEEE 802.11g	Ant1	2412	Reference	-1.09	-1.09	---	PASS
			30~1000	-1.09	-55.59	≤-21.09	PASS
			1000~26500	-1.09	-49.6	≤-21.09	PASS
		2437	Reference	-1.09	-1.09	---	PASS
			30~1000	-1.09	-55.45	≤-21.09	PASS
			1000~26500	-1.09	-49.76	≤-21.09	PASS
		2462	Reference	-1.29	-1.29	---	PASS
			30~1000	-1.29	-55.36	≤-21.29	PASS
			1000~26500	-1.29	-49.03	≤-21.29	PASS
IEEE 802.11n HT20	Ant1	2412	Reference	-1.33	-1.33	---	PASS
			30~1000	-1.33	-56.15	≤-21.33	PASS
			1000~26500	-1.33	-49.85	≤-21.33	PASS
		2437	Reference	-1.55	-1.55	---	PASS
			30~1000	-1.55	-55.44	≤-21.55	PASS
			1000~26500	-1.55	-49.4	≤-21.55	PASS
		2462	Reference	-1.21	-1.21	---	PASS
			30~1000	-1.21	-55.54	≤-21.21	PASS
			1000~26500	-1.21	-48.63	≤-21.21	PASS
IEEE 802.11n HT40	Ant1	2422	Reference	-4.61	-4.61	---	PASS
			30~1000	-4.61	-56.61	≤-24.61	PASS
			1000~26500	-4.61	-49.93	≤-24.61	PASS
		2437	Reference	-3.64	-3.64	---	PASS
			30~1000	-3.64	-57.01	≤-23.64	PASS
			1000~26500	-3.64	-49.46	≤-23.64	PASS
		2452	Reference	-3.68	-3.68	---	PASS
			30~1000	-3.68	-57.36	≤-23.68	PASS
			1000~26500	-3.68	-49	≤-23.68	PASS