

FCC 15.247 & RSS-247 2.4GHz Test Report

for

LEADER ELECTRONICS INC.

**8F., No. 138, Ln.235, Baoqiao Rd., Xindian Dist., New Taipei
City 23145, Taiwan**

Product Name : Skylight
Model Name : (1)100-FRM (2)100-CAL
Brand : Skylight
FCC ID : 2A85W-100
IC : 29703-100

**Prepared by: : AUDIX Technology Corporation,
EMC Department**



The test report is based on a single evaluation of one sample of the above-mentioned products. It does not imply an assessment of the whole production and does not permit the use of the test lab logo.

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APPENDIX A TEST DATA AND PLOTS
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TEST REPORT

Applicant : LEADER ELECTRONICS INC.
Manufacturer : LEADER ELECTRONICS INC.
EUT Description
(1) Product : Skylight
(2) Model : (1)100-FRM (2)100-CAL
(3) Brand : Skylight
(4) Power Supply: DC 5V, 2.0A

Applicable Standards:

Title 47 CFR FCC Part 15 Subpart C
RSS-Gen (Issue 5), Amendment 2, February 2021
RSS-247 (Issue 2), February 2017

Audix Technology Corp. tested the equipment mentioned in accordance with the requirements set forth in the above standards. Test results indicate that the equipment tested is capable of demonstrating compliance with the requirements as documented within this report.

Audix Technology Corp. does not assume responsibility for any conclusions and generalizations drawn from the test results with regard to other specimens and samples.

Date of Report: 2023. 02. 01

Reviewed by:



(Annie Yu/Administrator)

Approved by:



(Johnny Hsueh/Section Manager)

1. REVISION RECORD OF TEST REPORT

Edition No	Issued Date	Revision Summary	Report Number
0	2023. 02. 01	Original Report	EM-F230094

2. SUMMARY OF TEST RESULTS

Rule		Description	Results
FCC	IC		
15.207	RSS-Gen §8.8	Conducted Emission	PASS
15.247(d)/ 15.205	RSS-Gen §8.9 RSS-247 §5.5	Radiated Band Edge and Radiated Spurious Emission	PASS
15.247(a)(2)	RSS-247 §5.2(1)	DTS/Occupied Bandwidth	PASS
15.247(b)(3)	RSS-247 §5.4(4)	Maximum Peak Output Power	PASS
15.247(d)	RSS-247 §5.5	Conducted Band Edges and Conducted Spurious Emission	PASS
15.247 (e)	RSS-247 §5.2(2)	Peak Power Spectral Density	PASS
15.203	---	Antenna Requirement	Compliance

Note: The uncertainties value is not used in determining the result.

3. GENERAL INFORMATION

3.1. Description of Application

Applicant	LEADER ELECTRONICS INC. 8F., No. 138, Ln.235, Baoqiao Rd., Xindian Dist.,New Taipei City 23145, Taiwan						
Manufacturer	LEADER ELECTRONICS INC. 8F., No. 138, Ln.235, Baoqiao Rd., Xindian Dist.,New Taipei City 23145, Taiwan						
Product	Skylight						
Model	<p>(1)100-FRM (2)100-CAL The difference between models is as following, and the difference has no influence on RF function. The model 100-FRM was tested in this report.</p> <table border="1"> <thead> <tr> <th>Difference Model</th> <th>Color of appearance</th> </tr> </thead> <tbody> <tr> <td>100-FRM</td> <td>Black</td> </tr> <tr> <td>100-CAL</td> <td>White</td> </tr> </tbody> </table>	Difference Model	Color of appearance	100-FRM	Black	100-CAL	White
Difference Model	Color of appearance						
100-FRM	Black						
100-CAL	White						
Brand	Skylight						

3.2. Description of EUT

Test Model	100-FRM		
Serial Number	N/A		
Power Rating	DC 5V, 2.0A		
Software Version	N/A		
RF Features	802.11 a/b/g/n/ac		
Transmit Type	2.4 GHz		
	802.11b		1T1R
	802.11g		1T1R
	802.11n-HT20		1T1R
	U-NII Bands		
	802.11a		1T1R
	802.11n-HT20/802.11ac-VHT20/		1T1R
	802.11n-HT40/802.11ac-VHT40		1T1R
	802.11ac-VHT80		1T1R
	Test Sample	Sample No.	Test Item
01		AC Conduction, RSE	N/A
02		RF Conducted	N/A
Sample Status	Trial sample		
Date of Receipt	2022. 12. 16		
Date of Test	2022. 12. 23 ~ 2023. 01. 06		
Interface Ports of EUT	<ul style="list-style-type: none"> • One DC IN Port • One Micro USB (only used for factory production testing) Port 		
Accessories Supplied	<ul style="list-style-type: none"> • I.T.E. Power Supply 		

3.3. Reference Test Guidance

KDB 662911 D01 Multiple Transmitter Output v02r01
ANSI C63.10:2013

3.4. Antenna Information

No.	Antenna Part Number	Manufacture	Antenna Type	Frequency (MHz)	Gain(dBi)
1.	BQ003PBCMF00	TRONTEK	PCB	2400	4.05
				2450	4.34
				2500	3.87
				5150	5.88
				5470	5.75
				5850	6.21

3.5. EUT Specifications Assessed in Current Report

Mode	Fundamental Range (MHz)	Channel Number	Modulation	Data Rate (Mbps)
802.11b	2412-2462	11	DSSS (DBPSK/DQPSK/CCK)	Up to 11
802.11g		11	OFDM (BPSK/QPSK/16QAM/64QAM)	Up to 54
802.11n-HT20				Up to 72.0

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

3.6. Descriptions of Key Components

Item	Supplier	Model / Type	Character
LCD Panel	TopoVision Technology	YN1010HD052B	Max. Resolution: 1280*800/60Hz
I.T.E Power Supply	LEADER ELECTRONICS	MU10AG050200-A1	Input: 100-240V~, 50/60Hz, 0.3A Output: DC 5.0V, 2.0A (Wall-Mount 2C)
WLAN Module	AzureWave	AW-CM256SM	802.11a/b/g/n/ac

3.7. Test Configuration

Mode	TX _{on} (ms)	TX _{on+off} (ms)	Duty Cycle (x)	Duty Cycle Factor [10log(1/x)] (dB)
802.11b	8.620	8.700	0.991	N/A
802.11g	1.430	1.530	0.935	0.292
802.11n-HT20	1.326	1.437	0.923	0.348

Note: When duty cycle is less than 98% (0.98) that duty cycle factor 10log(1/x) is needed to add in conducted test items measured in average detector.



AC Conduction	
Normal operation	

Item	Mode	Data Rate	Test Channel	
Radiated Test Case	Radiated Spurious Emission (30MHz~1GHz)	802.11n-HT20	MCS0	1

Item	Mode	Data Rate	Test Channel	
Radiated Test Case	Radiated Band Edge ^{Note1}	802.11b	1Mbps	1/11
		802.11g	6Mbps	1/11
		802.11n-HT20	MCS0	1/11
	Radiated Spurious Emission ^{Note1 & 2}	802.11b	1Mbps	1
		802.11g	6Mbps	11
		802.11n-HT20	MCS1	11

Item	Mode	Data Rate	Test Channel	
Conducted Test Case	DTS/Occupied Bandwidth	802.11b	1Mbps	1/6/11
		802.11g	6Mbps	1/6/11
		802.11n-HT20	MCS0	1/6/11
	Peak Output Power	802.11b	1Mbps	1/6/11
		802.11g	6Mbps	1/6/11
		802.11n-HT20	MCS8	1/6/11
	Band Edge	802.11b	1Mbps	1/11
		802.11g	6Mbps	1/11
		802.11n-HT20	MCS8	1/11
	Spurious Emission	802.11b	1Mbps	1/6/11
		802.11g	6Mbps	1/6/11
		802.11n-HT20	MCS8	1/6/11
	Peak Power Spectral Density	802.11b	1Mbps	1/6/11
		802.11g	6Mbps	1/6/11
		802.11n-HT20	MCS8	1/6/11

- Note 1: Mobile Device Portable Device
 and 3 axis were assessed. The worst scenario for Radiated Spurious Emission as follow:
 Lie Side Stand
- Note 2: Low, mid, and high channels were measured, only the worst channel of each modulation was presented in this report.
- Note 3: The data rates were selected based on preliminary testing that identified rate as the worst case for output power.

3.8. Output Power Setting

Mode	Centre Frequency (MHz)	Power Setting	Mode	Centre Frequency (MHz)	Power Setting
802.11b	2412	18.000	802.11g	2412	16.000
	2437	18.000		2437	16.000
	2462	18.000		2462	16.000

Mode	Centre Frequency (MHz)	Power Setting
802.11n-HT20	2412	16.000
	2437	16.000
	2462	16.000

3.9. Tested Supporting System List

3.9.1. Support Peripheral Unit

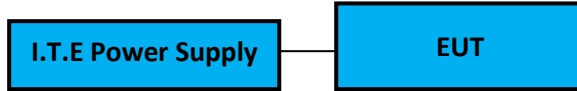
No.	Product	Brand	Model No.	Serial No.	Approval
1.	Notebook Computer	Dynabook	CS40L-HB	51144042H	N/A

3.9.2. Cable Lists

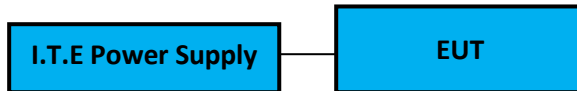
No.	Cable Description Of The Above Support Units
1.	USB Type C Cable: Shielded, Detachable, 1.5m Adapter: BSY, M/N BSY065T1902103 D, DC Cord : Shielded, Undetachable, 1.8m, Bonded a ferrite core AC Power Cord : Unshielded, Detachable, 1.5m

3.10. Setup Configuration

3.10.1. EUT Configuration for Power Line & Radiated Emission



3.10.2. EUT Configuration for RF Conducted Test Items



3.11. Operating Condition of EUT

Test program “cmd” is used for enabling EUT WLAN function under continues transmitting and choosing data rate/ channel.

3.12. Description of Test Facility

Name of Test Firm	Audix Technology Corporation / EMC Department No. 491, Zhongfu Rd., Linkou Dist., New Taipei City 244, Taiwan Tel: +886-2-26092133 Fax: +886-2-26099303 Website : www.audixtech.com Contact e-mail: attemc_report@audixtech.com
Accreditations	The laboratory is accredited by following organizations under ISO/IEC 17025:2017 (1) NVLAP(USA) NVLAP Lab Code 200077-0 (2) TAF(Taiwan) No. 1724
Test Facilities	FCC OET Designation Number under APEC MRA by NCC is : TW1724 ISED CAB Identifier Number under APEC TEL MRA by NCC is TW1724 (1) No.8 Shielded Room (2) No.1 3m Semi Anechoic Chamber

3.13.Measurement Uncertainty

Test Items/Facilities		Frequency Range	Uncertainty
Conduction Test	<input type="checkbox"/>	No. 7 Shielded Room	9kHz-150kHz ±3.7dB
			150kHz-30MHz ±3.4dB
	<input checked="" type="checkbox"/>	No. 8 Shielded Room	9kHz-150kHz ±3.7dB
			150kHz-30MHz ±3.5dB
Radiation Test	<input checked="" type="checkbox"/>	No.1 3m Semi Anechoic Chamber	30MHz-200MHz, 3m, Horizontal ±3.8dB
			200MHz-1000MHz, 3m, Horizontal ±4.4dB
			30MHz-200MHz, 3m, Vertical ±4.5dB
			200MHz-1000MHz, 3m, Vertical ±4.7dB
			1GHz-6GHz, 3m ±4.9dB
			6GHz-18GHz, 3m ±4.5dB
	<input type="checkbox"/>	No.3 3m Semi Anechoic Chamber	30MHz-200MHz, 3m, Horizontal ±4.0dB
			200MHz-1000MHz, 3m, Horizontal ±4.3dB
			30MHz-200MHz, 3m, Vertical ±4.6dB
			200MHz-1000MHz, 3m, Vertical ±4.7dB
			1GHz-6GHz, 3m ±4.8dB
			6GHz-18GHz, 3m ±4.5dB
	<input type="checkbox"/>	No.4 3m Semi Anechoic Chamber	30MHz-200MHz, 3m, Horizontal ±4.3dB
			200MHz-1000MHz, 3m, Horizontal ±4.3dB
			30MHz-200MHz, 3m, Vertical ±4.6dB
			200MHz-1000MHz, 3m, Vertical ±4.7dB
			1GHz-6GHz, 3m ±4.8dB
			6GHz-18GHz, 3m ±4.4dB
	<input type="checkbox"/>	No.5 3m Semi Anechoic Chamber	30MHz-200MHz, 3m, Horizontal ±4.3dB
			200MHz-1000MHz, 3m, Horizontal ±4.3dB
			30MHz-200MHz, 3m, Vertical ±4.5dB
			200MHz-1000MHz, 3m, Vertical ±4.6dB
			1GHz-6GHz, 3m ±4.9dB
			6GHz-18GHz, 3m ±4.1dB
Radiated emissions (18GHz-40GHz)		18GHz-40GHz, 3m	±3.4dB

Remark : Uncertainty = $ku_c(y)$

Test Item	Uncertainty
Bandwidth	$\pm 0.05\text{kHz}$
Maximum peak output power	$\pm 0.33\text{dB}$
Power spectral density	$\pm 0.13\text{dB}$
Conducted Emission Limitations	$\pm 0.13\text{dB}$

4. MEASUREMENT EQUIPMENT LIST

4.1. Conducted Emission Measurement

Item	Type	Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Interval
1.	Test Receiver	R&S	ESCI7	100923	2022. 03 02	1 Year
2.	A.M.N.	R&S	ENV432	101567	2022. 05. 26	1 Year
3.	L.I.S.N.	Kyoritsu	KNW-407	8-855-9	2022 12. 19	1 Year
4.	Pulse Limiter	R&S	ESH3-Z2	100354	2022 12. 24	1 Year
5.	Digital Thermo-Hygro Meter	iMax	HTC-1	No.8 S/R	2022. 04. 14	1 Year
6.	Coaxial Cable	Yeida	RG/58AU	CE-08	2022. 09. 07	1 Year
7.	Test Software	Audix	e3	V9 18621a	N.C.R.	N.C.R.

4.2. Radiated Emission Measurement

Item	Type	Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Interval
1.	Spectrum Analyzer	Agilent	N9030A-526	MY53310269	2022. 02. 21	1 Year
2.	Spectrum Analyzer	Keysight	N9010B-544	MY55460198	2022. 04. 08	1 Year
3.	Test Receiver	R&S	ESCS30	100338	2022. 06. 15	1 Year
4.	Amplifier	Sonoma	310N	187161	2022. 05. 17	1 Year
5.	Microwave Amplifier	Agilent	8449B	3008A02678	2022. 02. 22	1 Year
6.	Microwave Amplifier	Keysight	83051A	MY56480113	2022. 09. 07	1 Year
7.	Loop Antenna	TESEQ	HLA 6121	60478	2022. 02. 17	1 Year
8.	Bilog Antenna	TESEQ	CBL6112D	33821	2022. 07. 01	1 Year
9.	Double-Ridged Waveguide Horn	EMCO	3115	9112-3775	2022. 05. 18	1 Year
10.	Horn Antenna	COM-POWER	AH-840	101092	2022. 12. 30	1 Year
11.	2.4GHz Notch Filter	K&L Microwave	7NSL10-244 1.5/E130.5-O/O	2	2022 .07. 23	1 Year
12.	3GHz Notch Filter	Microwave	H3G018G1	484796	2022 .07. 23	1 Year
13.	Coaxial Cable	MIYAZAKI	5D2W	RE-11	2023. 01. 07	1 Year
14.	Coaxial Cable	HUBER+SUHNER	SUCOFLEX 106	RE-14	2023. 01. 07	1 Year
15.	Coaxial Cable	HUBER+SUHNER	SUCOFLEX 102	RE-30	2022. 08. 22	1 Year
16.	Digital Thermo-Hygro Meter	iMax	HTC-1	No.1 3m A/C	2022. 04. 14	1 Year
17.	Test Software	Audix	e3	V9 18621a	N.C.R.	N.C.R.

4.3. RF Conducted Measurement

Item	Type	Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Interval
1.	Spectrum Analyzer	Keysight	N9010B-544	MY55460198	2022. 04. 08	1 Year
2.	Power Meter	Anritsu	ML2495A	2127005	2022. 12. 01	1 Year
3.	Power Sensor	Anritsu	MA2411B	1911360	2022. 12. 07	1 Year
4.	Digital Thermo-Hygro Meter	iMax	HTC-1	RF-03	2022. 04. 14	1 Year

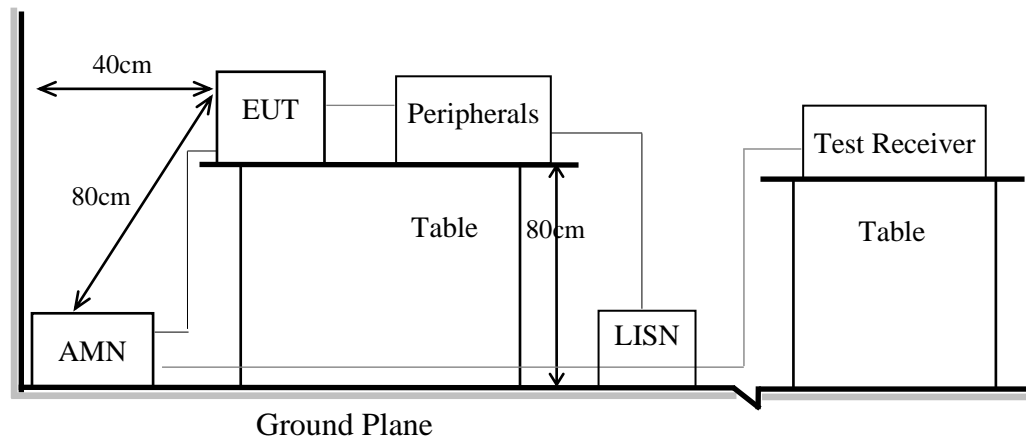
5. CONDUCTED EMISSION

5.1. Block Diagram of Test Setup

5.1.1. Block Diagram of EUT

Indicated as section 3.10

5.1.2. Shielded Room Setup Diagram



5.2. Conducted Emission Limit

Frequency	Conducted Limit	
	Quasi-Peak Level	Average Level
150kHz ~ 500kHz	66 ~ 56 dB μ V	56 ~ 46 dB μ V
500kHz ~ 5MHz	56 dB μ V	46 dB μ V
5MHz ~ 30MHz	60 dB μ V	50 dB μ V

Remark1.: If the average limit is met when using a Quasi-Peak detector, the measurement using the average detector is not required.

2.: The lower limit applies to the band edges.

5.3. Test Procedure

- 5.3.1. To set up the EUT as indicated in ANSI C63.10. The EUT was placed on the table which has 80 cm height to the ground and 40 cm distance to the conducting wall.
- 5.3.2. Power supplier of the EUT was connected to the AC mains through an Artificial Mains Network (A.M.N.).
- 5.3.3. The AC power supplies to all peripheral devices must be provided through line impedance stabilization network (L.I.S.N.)
- 5.3.4. Checking frequency range from 150kHz to 30 MHz and record the emission which does not have 20 dB below limit.

5.4. Test Results

Please refer to Appendix A.

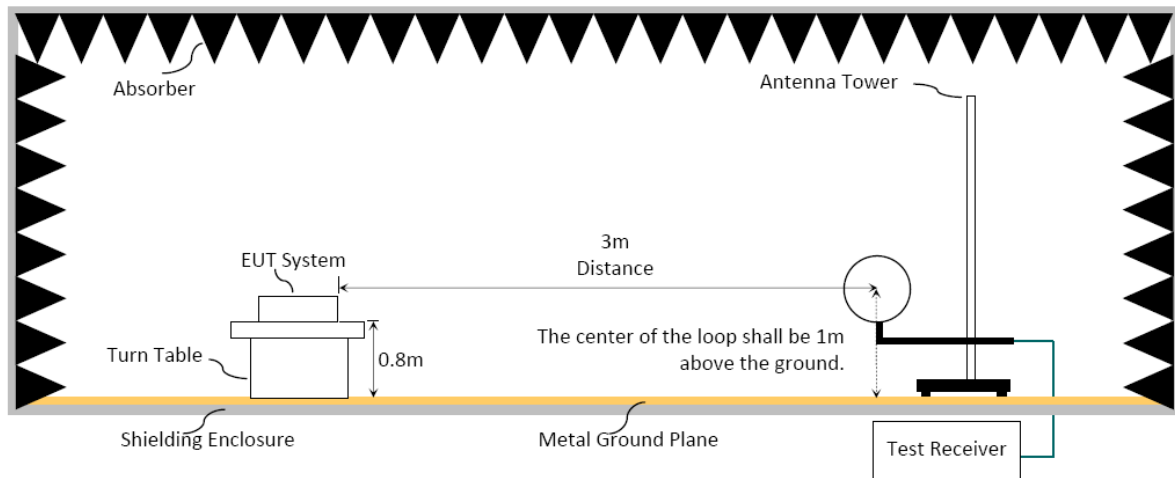
6. RADIATED EMISSION

6.1. Block Diagram of Test Setup

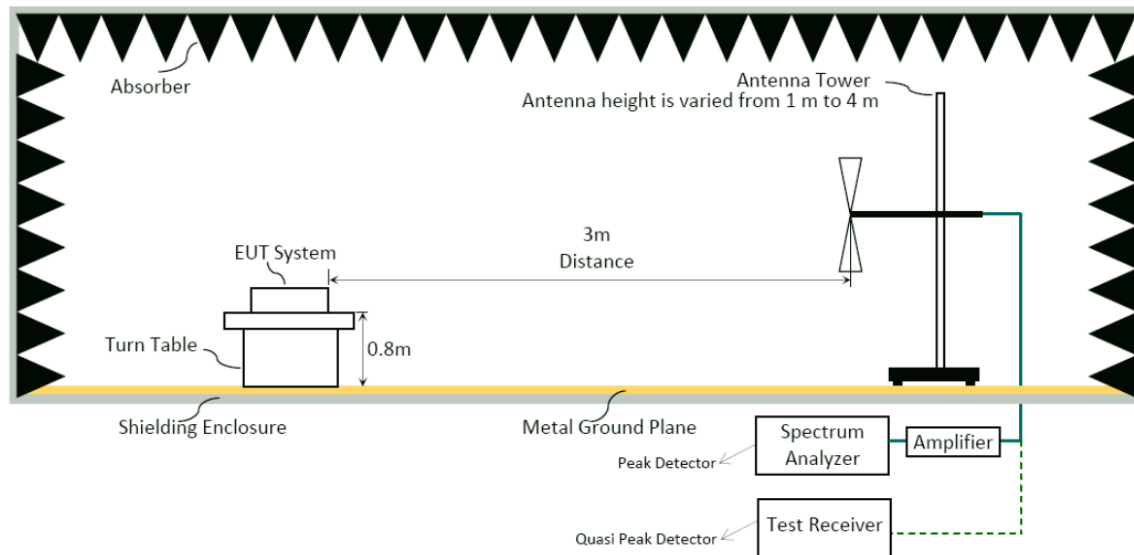
6.1.1. Block Diagram of EUT

Indicated as section 3.10

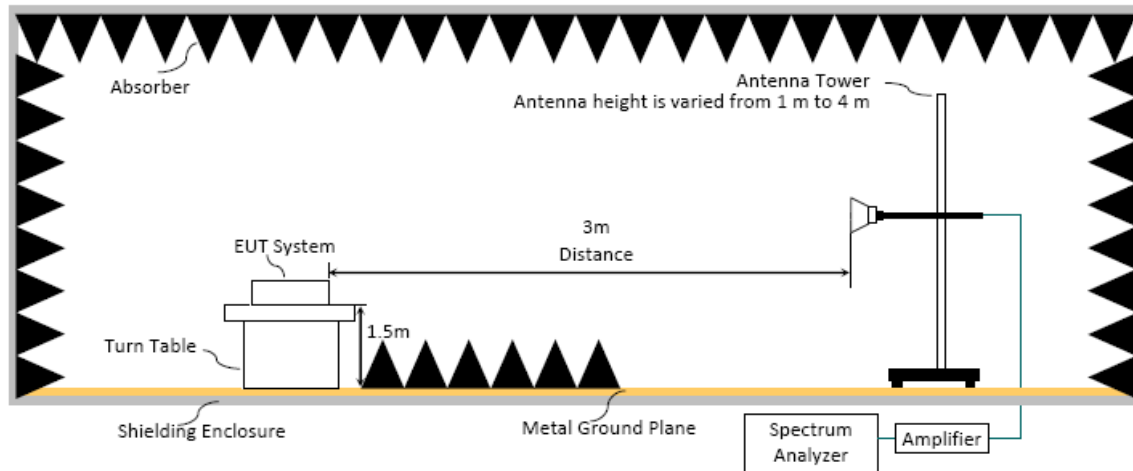
6.1.2. Setup Diagram for 9kHz-30MHz



6.1.3. Setup Diagram for 30-1000MHz



6.1.4. Setup Diagram for above 1GHz



6.2. Radiated Emission Limits

In any 100kHz bandwidth outside the frequency band, the radio frequency power produced by the intentional radiator shall be at least 20dB below that in the 100kHz bandwidth within the band that contains the highest level. In addition, radiated emissions which fall in restricted bands, as defined in Section 15.205/RSS-Gen Section 8.10 table 6, must also comply with the radiated emission limits specified as below.

Frequency (MHz)	Distance(m)	Limits	
		dB μ V/m	μ V/m
0.009 - 0.490	300	67.6-20 log f(kHz)	2400/f kHz
0.490 - 1.705	30	87.6-20 log f(kHz)	24000/f kHz
1.705 - 30	30	29.5	30
30 - 88	3	40.0	100
88- 216	3	43.5	150
216- 960	3	46.0	200
Above 960	3	54.0	500
Above 1000	3	74.0 dB μ V/m (Peak) 54.0 dB μ V/m (Average)	

Remark : (1) dB μ V/m = 20 log (μ V/m)

- (2) The tighter limit applies to the edge between two frequency bands.
- (3) Distance refers to the distance in meters between the measuring instrument antenna and the closed point of any part of the device or system.
- (4) Fundamental and emission fall within operation band are exempted from this section.
- (5) Pursuant to ANSI C63.10: 6.6.4.3, if the maximized peak measured value complies with the average limit, then it is unnecessary to perform an average measurement.

6.3. Test Procedure

Frequency Range 9kHz~30MHz:

The EUT setup on the turntable which has 0.8 m height to the ground. The turn table rotated 360 degrees and antenna fixed to 1 m to find the maximum emission level. In order to find the maximum emission, all of the interface cables were manipulated according to ANSI C63.10-2013 regulation.

- (1) RBW = 9kHz with peak and average detector.
- (2) Detector: average and peak (9kHz-490kHz)
Q.P. (490kHz-30MHz)

Frequency Range 30MHz ~ 25GHz:

The EUT setup on the turn table which has 80cm (for 30-1000MHz) and 1.5m (for above 1GHz) height to the ground. The turn table rotated 360 degrees and antenna varied from 1 m to 4 m to find the maximum emission level. Both horizontal and vertical polarization are required. In order to find the maximum emission, all of the interface cables were manipulated according to ANSI C63.10-2013 regulation.

Frequency below 1GHz:

Spectrum Analyzer is used for pre-testing with following setting:

- (1) RBW = 120KHz
- (2) VBW $\geq 3 \times$ RBW.
- (3) Detector = Peak.
- (4) Sweep time = auto.
- (5) Trace mode = max hold.
- (6) Allow sweeps to continue until the trace stabilizes.

Note 1: When peak-detected value is lower than limit that the measurement using the Q.P. detector is not required, otherwise using Q.P. for final measurement.

Note 2: When the radiated emissions limits are expressed in terms of the average value of the emissions, and pulsed operation is employed, the measurement field strength shall be determined by averaging over one complete pulse train, including blanking intervals, as long as the pulse train does not exceed 0.1 seconds.

Frequency above 1GHz to 10th harmonic (up to 25 GHz):

Peak Detector:

- (1) RBW = 1MHz
- (2) VBW $\geq 3 \times$ RBW.
- (3) Detector = Peak.
- (4) Sweep time = auto.
- (5) Trace mode = max hold.
- (6) Allow sweeps to continue until the trace stabilizes.

Note: When peak-detected value is lower than limit that the measurement using the average detector is not required, otherwise using average detector for final measurement.

Average Detector:

■ Option 1:

(1) RBW = 1MHz

(2) VBW $\geq 1/T$. (Duty Cycle < 98%, when duty cycle presented in section 3.7)

Modulation Type	VBW Setting (VBW $\geq 1/T$)
802.11g	750Hz
802.11n-HT20	820Hz

(3) VBW = 10Hz (Duty Cycle $\geq 98\%$, when duty cycle presented in section 3.7)

Modulation Type	VBW Setting
802.11b	10Hz

(4) Detector = Peak.

(5) Sweep time = auto.

(6) Trace mode = max hold.

(7) Allow sweeps to continue until the trace stabilizes.

□ Option 2:

Average Emission Level = Peak Emission Level + D.C.C.F.

6.4. Measurement Result Explanation

■ Peak Emission Level (dB μ V/m) = Antenna Factor (dB/m) + Cable Loss (dB) – Preamp Gain (dB) + Reading (dB μ V).

■ Average Emission Level (dB μ V/m) = Antenna Factor (dB/m) + Cable Loss (dB) – Preamp Gain (dB) + Reading (dB μ V).

□ Average Emission Level (dB μ V/m) = Peak Emission Level (dB μ V/m) + DCCF (dB)
Duty Cycle Correction Factor (DCCF) (dB) = $20\log(TX_{on}/TX_{on+off})$ presented in section 3.7.

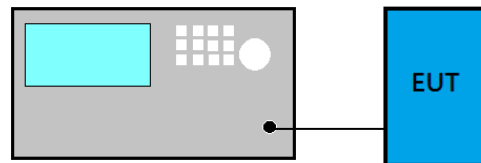
□ ERP (dBm) = Peak Emission Level (dB μ V/m) - 95.2dB - 2.14dB

6.5. Test Results

Please refer to Appendix A.

7. DTS/OCCUPIED BANDWIDTH

7.1. Block Diagram of Test Setup



7.2. Specification Limits

The minimum bandwidth shall be at least 500kHz.

7.3. Test Procedure

Following measurement procedure is reference to ANSI C63.10:2013:

For DTS Bandwidth

- (1) Set RBW = 100 kHz.
- (2) Set the video bandwidth (VBW) $\geq 3 \times$ RBW.
- (3) Detector = Peak.
- (4) Trace mode = max hold.
- (5) Sweep = auto couple.
- (6) Allow the trace to stabilize.
- (7) Setting channel bandwidth function x to -6dB power to record the final bandwidth..

For 99% Occupied Bandwidth

- (1) Set Span range 1.5~5 times the OBW
- (2) Set RBW close to 1% to 5% of OBW.
- (3) Set $VBW \geq 3 \times RBW$.
- (4) Detector = Peak.
- (5) Trace mode = Max hold
- (6) Sweep = Auto couple.
- (7) Allow the trace to stabilize.

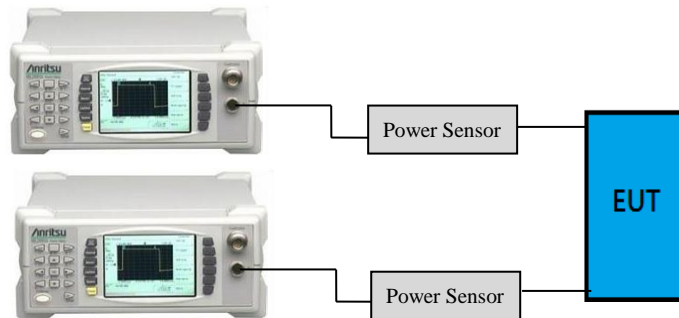
7.4. Test Results

Please refer to Appendix A

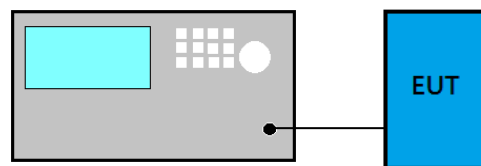
8. MAXIMUM PEAK OUTPUT POWER

8.1. Block Diagram of Test Setup

- For WLAN Function



- For BLE Function



8.2. Specification Limits

The Limits of maximum Peak Output Power for digital modulation in 2400-2483.5MHz is : 1Watt. (30dBm), and E.I.R.P.: 4Watt (36dBm)

8.3. Test Procedure

Following measurement procedure is reference to ANSI C63.10:2013:

■ PKPM1 Peak power meter method:

EUT is connected to power sensor and record the maximum output power.

■ Maximum peak conducted output power method:

- (1) Set the RBW \geq DTS bandwidth
- (2) Set VBW $\geq 3 \times$ RBW
- (3) Set span $\geq 3 \times$ RBW.
- (4) Sweep time = auto couple
- (5) Detector = peak.
- (6) Trace mode = max hold.
- (7) Allow trace to fully stabilize.
- (8) Use peak marker function to determine the peak amplitude level.

■ Method AVGPM (Measurement using an RF average power meter):

EUT is connected to power sensor and record the maximum average output power and duty cycle factor is added when duty cycle presented in section 3.7 is $< 98\%$.

Method AVGSA-2 (Spectrum channel power)

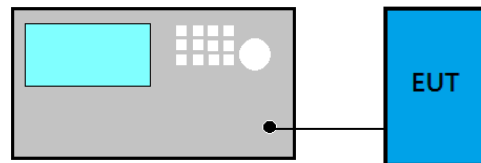
- (1) Set span to at least 1.5 times the OBW
- (2) Set RBW = 1 -5% of OBW
- (3) Set the video bandwidth (VBW) $\geq 3 \times$ RBW.
- (4) Detector = RMS.
- (5) Trace mode = trace average at least 100 traces
- (6) Sweep = auto couple.
- (7) Compute power by integrating the spectrum across the OBW of the signal using the instrument's band power measurement function with band limits set equal to the OBW band edges.
- (8) Duty cycle factor is added when duty cycle presented in section 3.7 is $< 98\%$.

8.4. Test Results

Please refer to Appendix A

9. EMISSION LIMITATIONS

9.1. Block Diagram of Test Setup



9.2. Specification 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. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, that the required attenuation shall be 30 dB instead of 20 dB.

Attenuation below the general limits specified in Section 15.209(a)/RSS-Gen Section 8.9 table 4 is not required. In addition, radiated emissions which fall in restricted bands, as defined in Section 15.205(a)/RSS-Gen Section 8.10 table 6, must also comply with the radiated emission limits specified in Section 15.209(a)/RSS-Gen Section 8.9 table 4 (See Section 15.205(c)).

9.3. Test Procedure

Following measurement procedure is reference to ANSI C63.10:2013:

■ Reference Level

- (1) Set analyzer center frequency to DTS channel center frequency.
- (2) Set the span to 1.5 times the DTS bandwidth.
- (3) Set the RBW to: 100 kHz.
- (4) Set the VBW $\geq 3 \times$ RBW.
- (5) Detector = peak.
- (6) Sweep time = auto couple.
- (7) Trace mode = max hold.
- (8) Allow trace to fully stabilize to find the max PSD as reference level.

■ Emission Level Measurement

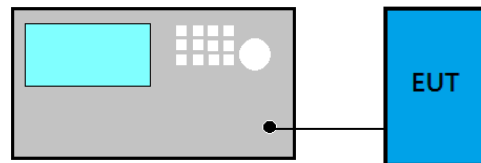
- (1) Set analyzer center frequency to DTS channel center frequency.
- (2) Set the span to 1.5 times the DTS bandwidth.
- (3) Set the RBW to: 100 kHz.
- (4) Set the VBW $\geq 3 \times$ RBW.
- (5) Detector = peak.
- (6) Sweep time = auto couple.
- (7) Trace mode = max hold.
- (8) Allow trace to fully stabilize to find the max level.

9.4. Test Results

Please refer to Appendix A

10. POWER SPECTRAL DENSITY

10.1. Block Diagram of Test Setup



10.2. Specification Limits

The peak power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8dBm in any 3kHz band.

10.3. Test Procedure

Following measurement procedure is reference to ANSI C63.10:2013:

■ Method PKPSD (peak PSD)

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

□ Method AVGPSD-2

- (1) Using peak PSD procedure step 1 to step 4.
- (2) Detector = RMS detector
- (3) Sweep time = auto couple
- (4) Trace mode = trace averaging over a minimum of 100 traces
- (5) Use the peak marker function to determine the maximum amplitude level.
- (6) Duty cycle factor is added when duty cycle presented in section 3.7 < 98%.
- (7) If measured value exceeds limit, reduce RBW (no less than 3 kHz) and repeat.

10.4. Test Results

Please refer to Appendix A

11.DEVIATION TO TEST SPECIFICATIONS

【NONE】



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APPDNDIX A

TEST DATA AND PLOTS

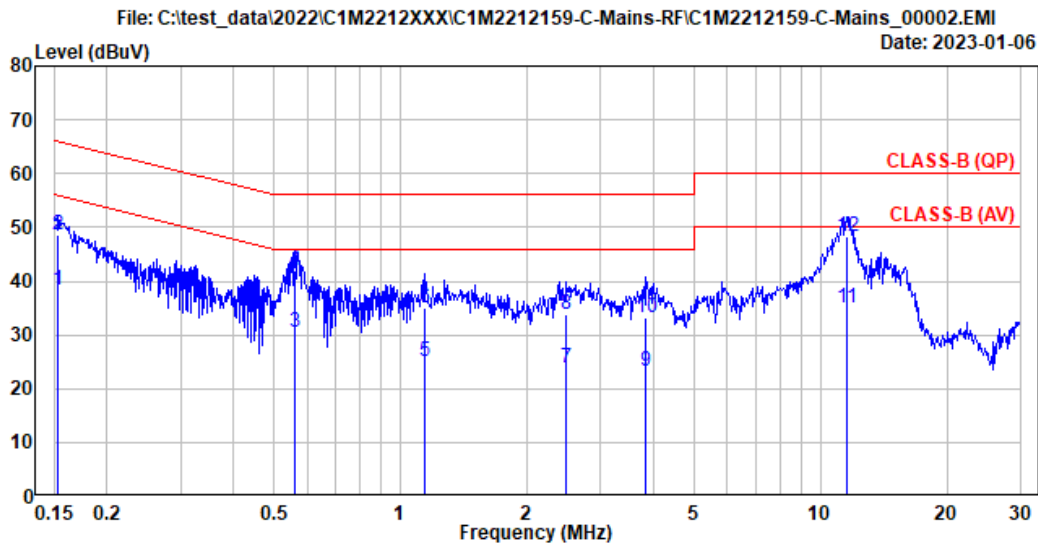
(Model: (1)100-FRM (2)100-CAL)

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A.1 CONDUCTED EMISSION

Test Date	2023/01/06	Temp./Hum.	19°C/55%
Test Voltage	AC 120V 60Hz (Via AC Adapter)	Tested By	Chucky Chiu

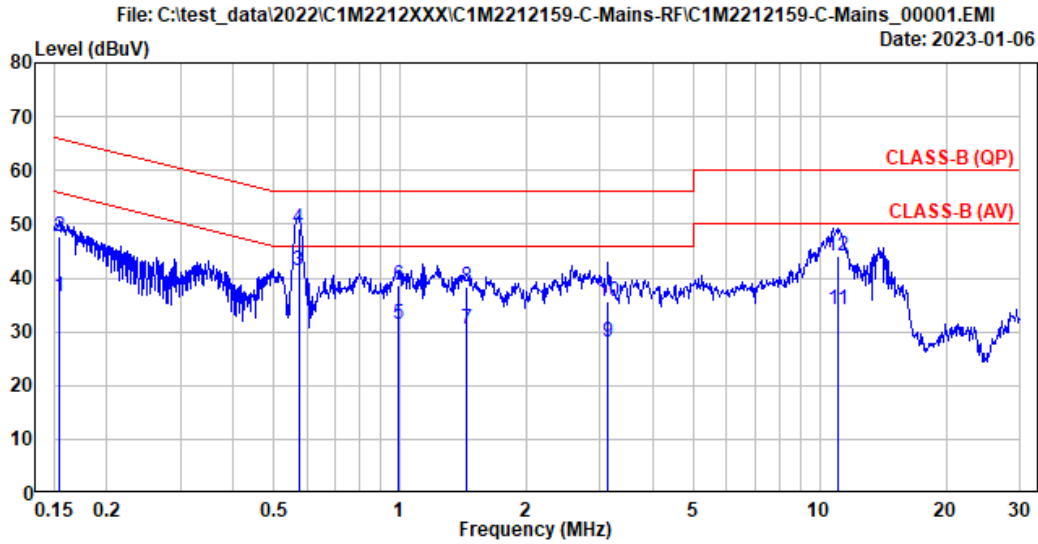


Site No.	: No.8 Shielded Room	Data No.	: 2
Instrument 1	: Receiver ESCI(923)		
Instrument 2	: ENV432 (567)(A) CE-08 ESH3-Z2 (354)		
Limit	: CLASS-B (QP)	Phase	: Neutral
Environment	: 19°C/55%	Engineer	: Chucky Chiu
EUT Model	: 100-FRM	Test Rating	: 120Vac/60Hz
Test Mode	: Operating		

	Freq. (MHz)	AMN Factor (dB)	Cable Loss (dB)	Pulse Att. (dB)	Reading (dBμV)	Emission Level (dBμV)	Limits (dBμV)	Margin (dB)	Remark
1	0.152	10.34	0.03	9.85	18.00	38.22	55.88	17.66	Average
2	0.152	10.34	0.03	9.85	28.41	48.63	65.88	17.25	QP
3	0.562	10.33	0.03	9.85	10.42	30.63	46.00	15.37	Average
4	0.562	10.33	0.03	9.85	21.90	42.11	56.00	13.89	QP
5	1.141	10.34	0.04	9.85	4.86	25.09	46.00	20.91	Average
6	1.141	10.34	0.04	9.85	14.76	34.99	56.00	21.01	QP
7	2.482	10.37	0.07	9.86	3.68	23.98	46.00	22.02	Average
8	2.482	10.37	0.07	9.86	13.51	33.81	56.00	22.19	QP
9	3.848	10.40	0.08	9.86	2.80	23.14	46.00	22.86	Average
10	3.848	10.40	0.08	9.86	12.77	33.11	56.00	22.89	QP
11	11.521	10.72	0.15	9.90	14.37	35.14	50.00	14.86	Average
12	11.521	10.72	0.15	9.90	27.47	48.24	60.00	11.76	QP

Remarks: 1. Emission Level= AMN Factor + Cable Loss + Pulse Att. + Reading.
 2. If the average limit is met when using a quasi-peak detector, the EUT shall be deemed to meet both limits and measurement with average detector is unnecessary.

Test Date	2023/01/06	Temp./Hum.	19°C/55%
Test Voltage	AC 120V 60Hz (Via AC Adapter)	Tested By	Chucky Chiu



Site No.	: No.8 Shielded Room	Data No.	: 1
Instrument 1	: Receiver ESCI(923)		
Instrument 2	: ENV432 (567)(A) CE-08 ESH3-Z2 (354)		
Limit	: CLASS-B (QP)	Phase	: Line
Environment	: 19°C/55%	Engineer	: Chucky Chiu
EUT Model	: 100-FRM	Test Rating	: 120Vac/60Hz
Test Mode	: Operating		

	Freq. (MHz)	AMN Factor (dB)	Cable Loss (dB)	Pulse Att. (dB)	Reading (dBµV)	Emission Level (dBµV)	Limits (dBµV)	Margin (dB)	Remark
1	0.155	10.22	0.03	9.85	16.30	36.40	55.75	19.35	Average
2	0.155	10.22	0.03	9.85	27.52	47.62	65.75	18.13	QP
3	0.573	10.22	0.03	9.85	21.18	41.28	46.00	4.72	Average
4	0.573	10.22	0.03	9.85	29.10	49.20	56.00	6.80	QP
5	0.987	10.23	0.04	9.85	11.20	31.32	46.00	14.68	Average
6	0.987	10.23	0.04	9.85	18.42	38.54	56.00	17.46	QP
7	1.442	10.24	0.05	9.86	10.39	30.54	46.00	15.46	Average
8	1.442	10.24	0.05	9.86	18.21	38.36	56.00	17.64	QP
9	3.137	10.27	0.07	9.86	7.82	28.02	46.00	17.98	Average
10	3.137	10.27	0.07	9.86	15.35	35.55	56.00	20.45	QP
11	11.016	10.45	0.15	9.89	13.52	34.01	50.00	15.99	Average
12	11.016	10.45	0.15	9.89	23.73	44.22	60.00	15.78	QP

Remarks: 1. Emission Level= AMN Factor + Cable Loss + Pulse Att. + Reading.
 2. If the average limit is met when using a quasi-peak detector, the EUT shall be deemed to meet both limits and measurement with average detector is unnecessary.

A.2 RADIATED EMISSION

Test Date	2022/12/23	Temp./Hum.	20°C/62%
Test Voltage	AC 120V 60Hz (Via AC Adapter)	Tested By	Hua Wu

A.2.1 Emissions within Restricted Frequency Bands

A.2.1.1 Frequency 9kHz~30MHz

The emissions (9kHz~30MHz) not reported for there is no emission be found.

A.2.1.2 Frequency Below 1GHz

Mode	802.11n-HT20	Frequency	TX 2412MHz
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Antenna at Horizontal Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Gain (dB)	Read Level (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
37.76	20.57	1.59	32.46	48.84	38.54	40.00	1.46	Peak
117.30	17.88	2.82	32.34	42.60	30.96	43.50	12.54	Peak
146.40	17.11	3.16	32.31	42.26	30.22	43.50	13.28	Peak
197.81	15.37	3.68	32.27	44.92	31.70	43.50	11.80	Peak
244.37	18.15	4.20	32.28	43.38	33.45	46.00	12.55	Peak
378.23	21.18	5.69	32.29	43.79	38.37	46.00	7.63	Peak

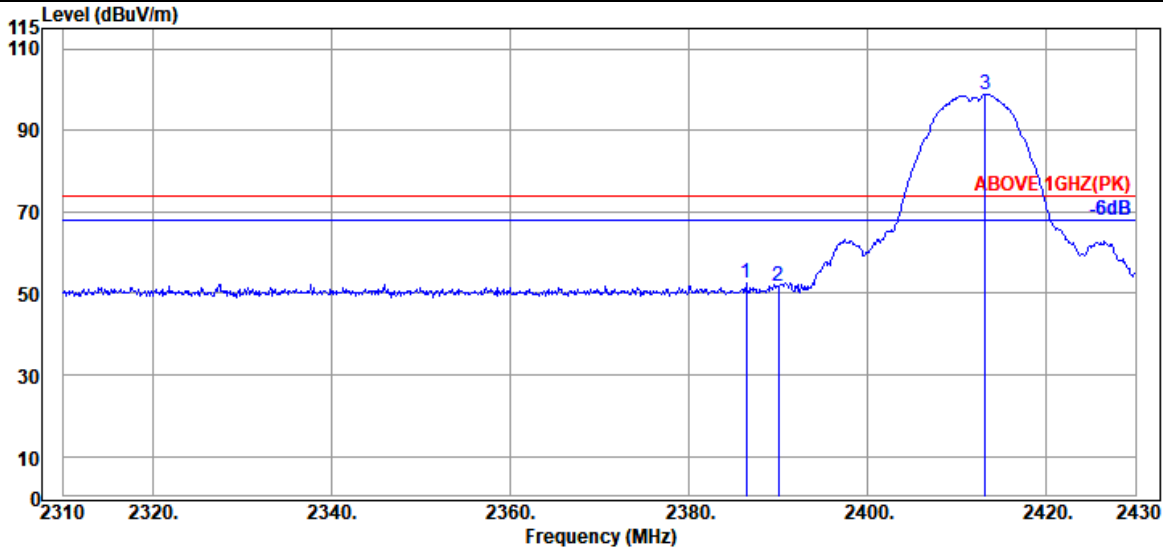
Antenna at Vertical Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Gain (dB)	Read Level (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
37.76	20.57	1.59	0.00	16.33	38.49	40.00	1.51	QP
53.28	13.55	1.89	32.44	47.28	30.28	40.00	9.72	Peak
113.42	17.66	2.78	32.34	40.40	28.50	43.50	15.00	Peak
193.93	15.40	3.64	32.27	40.66	27.43	43.50	16.07	Peak
378.23	21.18	5.69	32.29	42.86	37.44	46.00	8.56	Peak
431.58	22.24	6.21	32.28	40.66	36.83	46.00	9.17	Peak

A.2.1.3 Frequency Above 1 GHz to 10th harmonics

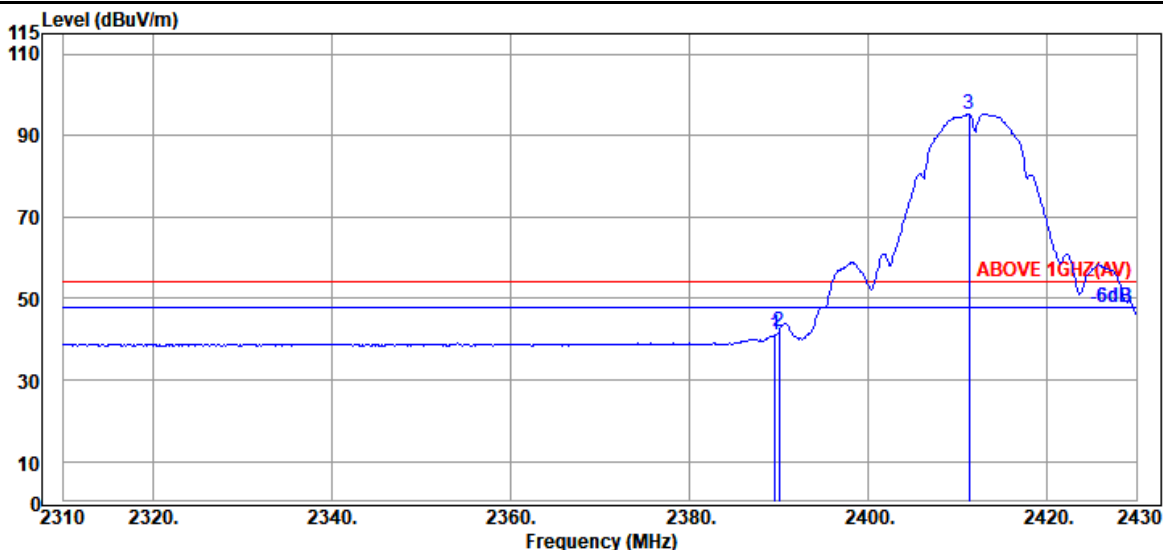
Band Edge:

Mode	802.11b	Frequency	TX 2412MHz
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Antenna at Horizontal Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamplifier Gain (dB)	Read Level (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
2386.44	28.21	5.72	34.51	53.02	52.44	74.00	21.56	Peak
2390.04	28.21	5.72	34.51	52.40	51.82	74.00	22.18	Peak
@ 2413.20	28.19	5.76	34.51	99.32	98.76	---	---	Peak

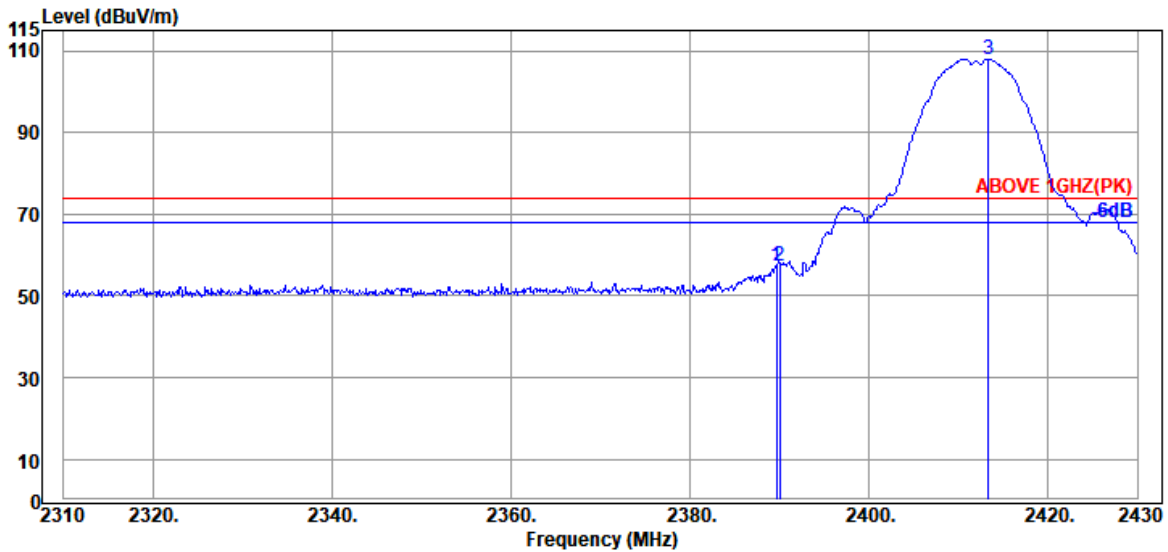


Antenna at Horizontal Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamplifier Gain (dB)	Read Level (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
2389.56	28.21	5.72	34.51	41.58	41.00	54.00	13.00	Average
2390.04	28.21	5.72	34.51	42.47	41.89	54.00	12.11	Average
@ 2411.28	28.19	5.76	34.51	95.81	95.25	---	---	Average

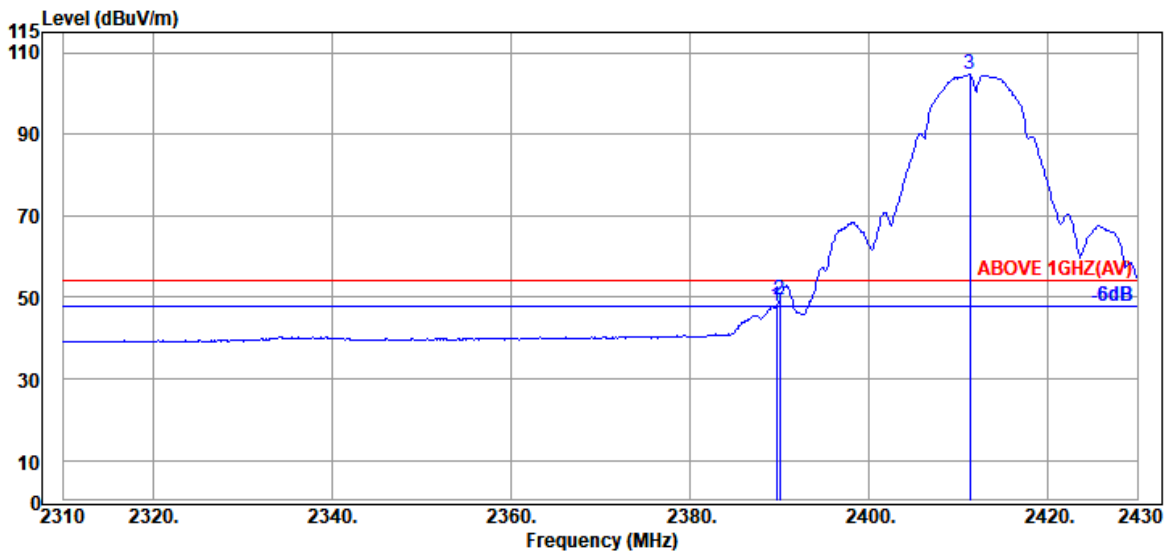
Remark: The “@” means fundamental frequency, it is ignored in this section.

Mode	802.11b	Frequency	TX 2412MHz
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Antenna at Vertical Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamplifier Gain (dB)	Read Level (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
2389.68	28.21	5.72	34.51	57.83	57.25	74.00	16.75	Peak
2390.04	28.21	5.72	34.51	57.93	57.35	74.00	16.65	Peak
@ 2413.32	28.19	5.76	34.51	108.49	107.93	---	---	Peak

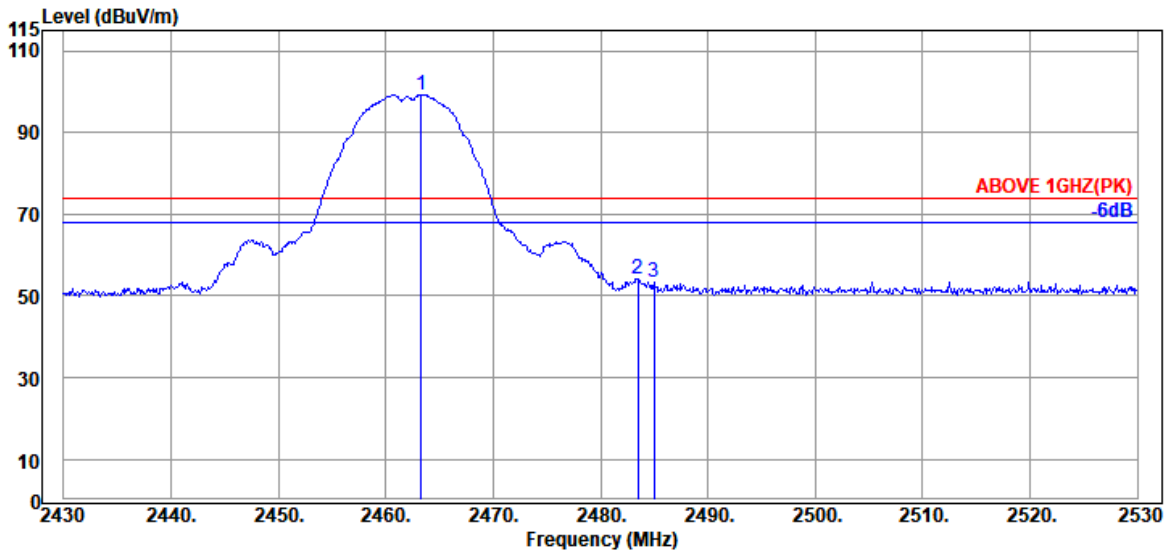


Antenna at Vertical Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamplifier Gain (dB)	Read Level (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
2389.68	28.21	5.72	34.51	48.33	47.75	54.00	6.25	Average
2390.04	28.21	5.72	34.51	49.83	49.25	54.00	4.75	Average
@ 2411.28	28.19	5.76	34.51	105.15	104.59	---	---	Average

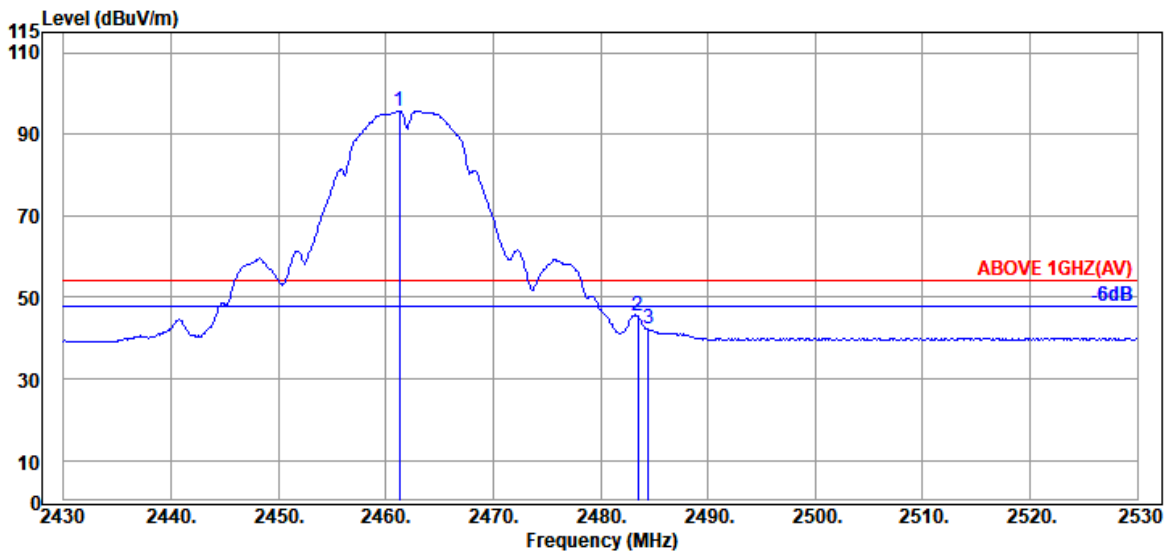
Remark: The “@” means fundamental frequency, it is ignored in this section.

Mode	802.11b	Frequency	TX 2462MHz
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Antenna at Horizontal Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamplifier Gain (dB)	Read Level (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
@ 2463.30	28.43	5.84	34.52	99.56	99.31	---	---	Peak
2483.50	28.47	5.87	34.53	54.14	53.95	74.00	20.05	Peak
2485.00	28.47	5.87	34.53	53.56	53.37	74.00	20.63	Peak

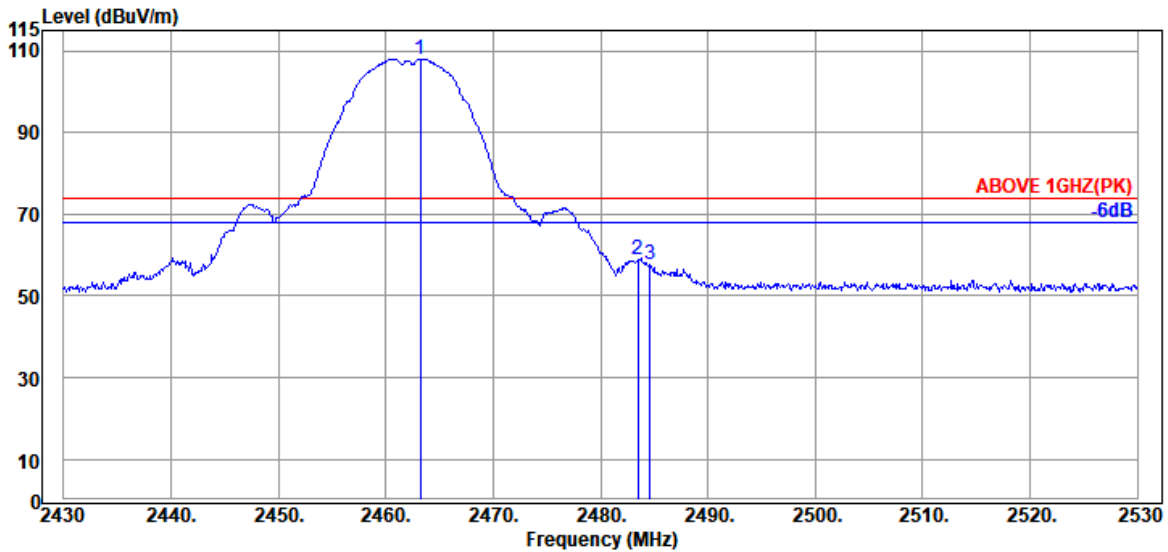


Antenna at Horizontal Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamplifier Gain (dB)	Read Level (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
@ 2461.30	28.43	5.84	34.52	96.00	95.75	---	---	Average
2483.50	28.47	5.87	34.53	45.48	45.29	54.00	8.71	Average
2484.50	28.47	5.87	34.53	42.52	42.33	54.00	11.67	Average

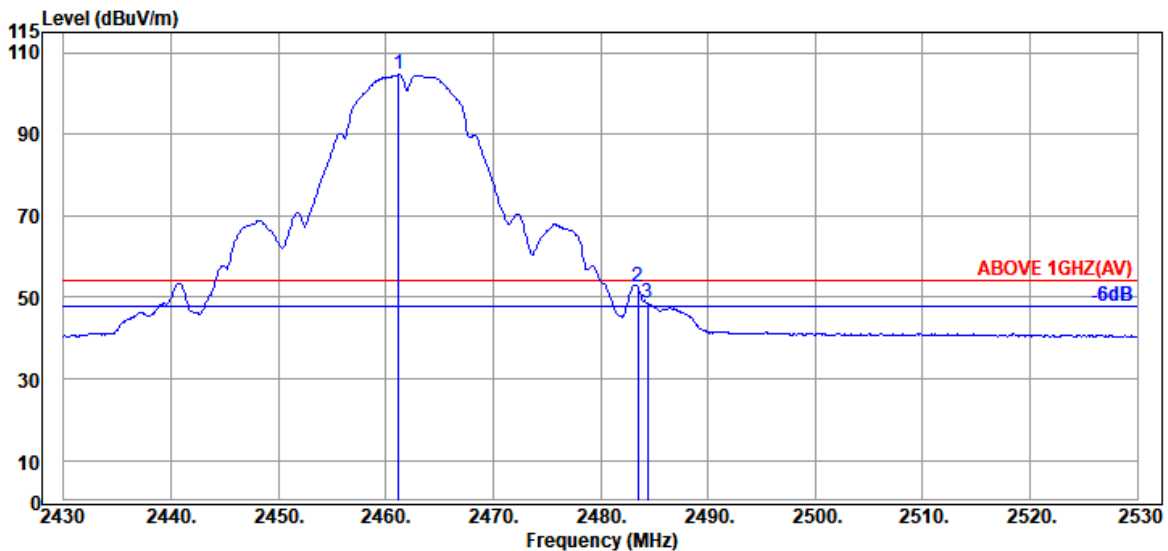
Remark: The “@” means fundamental frequency, it is ignored in this section.

Mode	802.11b	Frequency	TX 2462MHz
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Antenna at Vertical Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamplifier Gain (dB)	Read Level (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
@ 2463.20	28.43	5.84	34.52	108.29	108.04	---	---	Peak
2483.50	28.47	5.87	34.53	59.26	59.07	74.00	14.93	Peak
2484.60	28.47	5.87	34.53	57.93	57.74	74.00	16.26	Peak

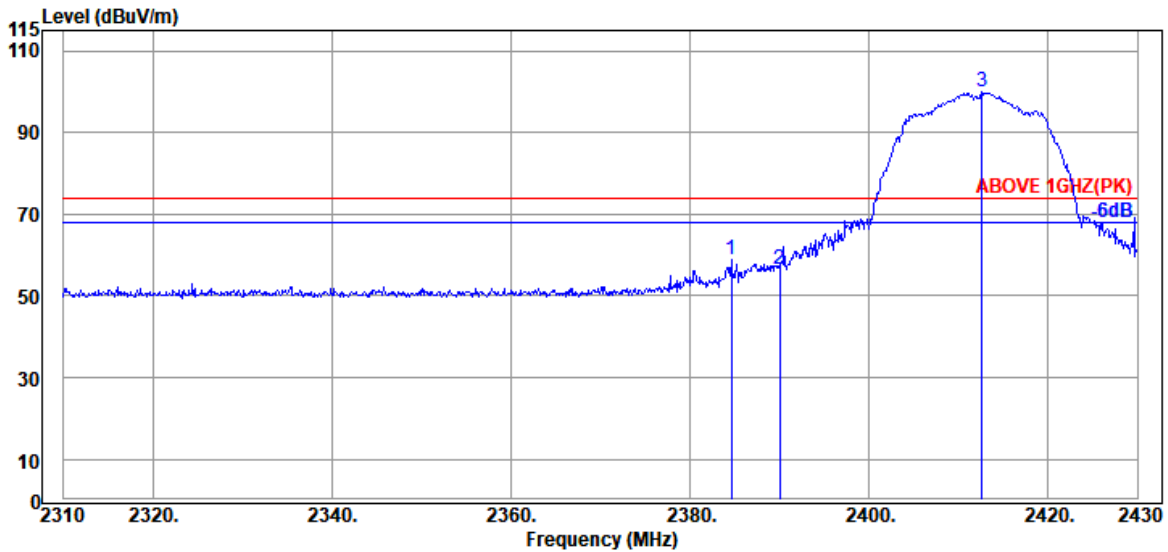


Antenna at Vertical Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamplifier Gain (dB)	Read Level (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
@ 2461.20	28.43	5.84	34.52	104.86	104.61	---	---	Average
2483.50	28.47	5.87	34.53	52.66	52.47	54.00	1.53	Average
2484.40	28.47	5.87	34.53	48.61	48.42	54.00	5.58	Average

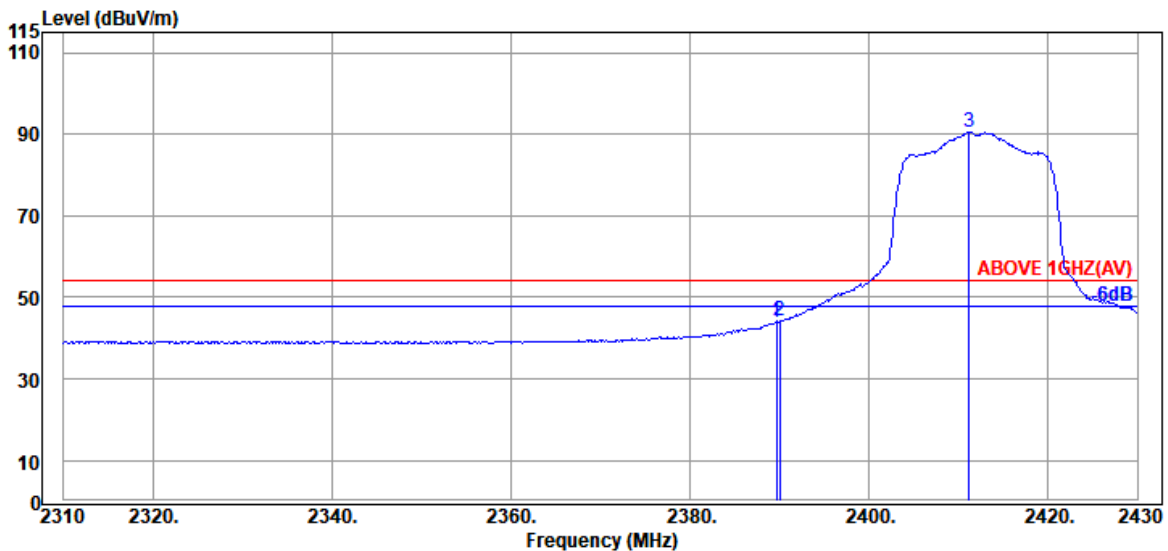
Remark: The “@” means fundamental frequency, it is ignored in this section.

Mode	802.11g	Frequency	TX 2412MHz
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Antenna at Horizontal Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamplifier Gain (dB)	Read Level (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
2384.64	28.21	5.72	34.51	59.31	58.73	74.00	15.27	Peak
2390.04	28.21	5.72	34.51	57.26	56.68	74.00	17.32	Peak
@ 2412.60	28.19	5.76	34.51	100.44	99.88	---	---	Peak

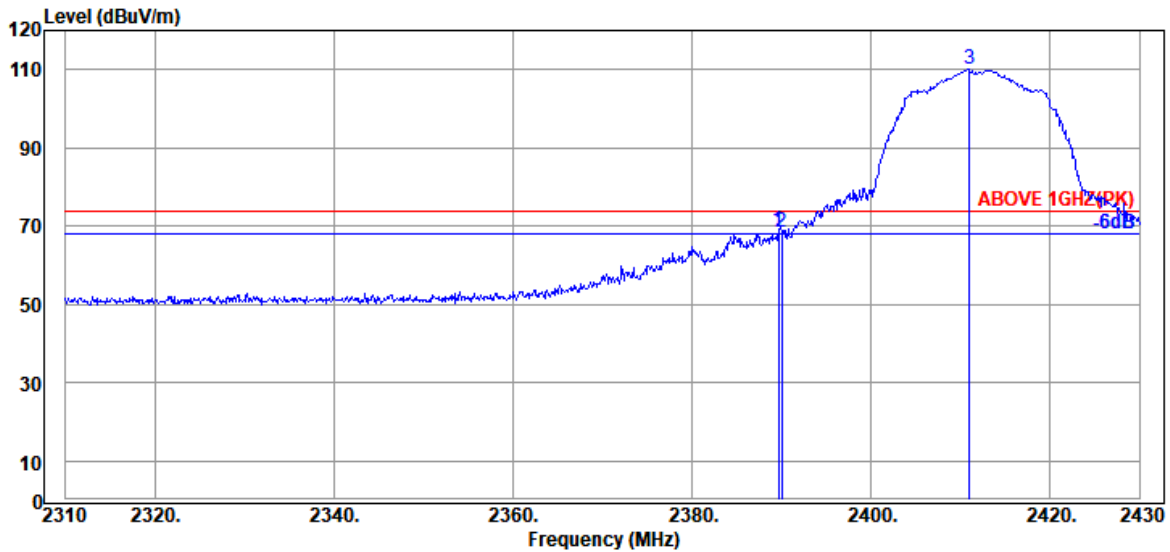


Antenna at Horizontal Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamplifier Gain (dB)	Read Level (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
2389.68	28.21	5.72	34.51	44.40	43.82	54.00	10.18	Average
2390.04	28.21	5.72	34.51	44.67	44.09	54.00	9.91	Average
@ 2411.16	28.14	5.75	34.51	91.24	90.62	---	---	Average

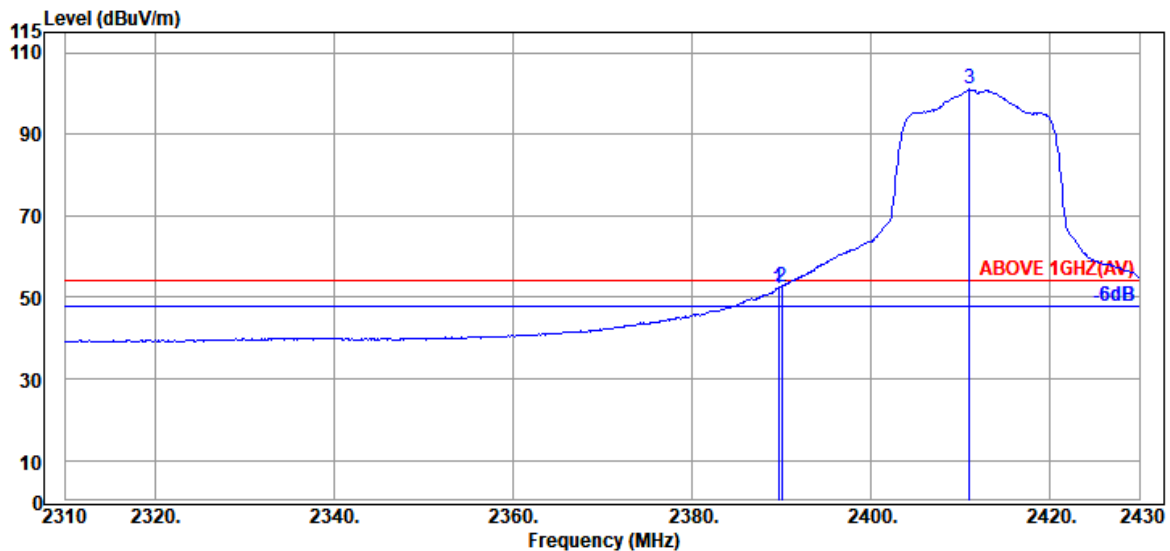
Remark: The “@” means fundamental frequency, it is ignored in this section.

Mode	802.11g	Frequency	TX 2412MHz
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Antenna at Vertical Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Gain (dB)	Read Level (dBμV)	Emission Level (dBUV/m)	Limits (dBUV/m)	Margin (dB)	Detector
2389.68	28.21	5.72	34.51	69.32	68.74	74.00	5.26	Peak
2390.04	28.21	5.72	34.51	69.11	68.53	74.00	5.47	Peak
@ 2411.04	28.14	5.75	34.51	110.76	110.14	---	---	Peak

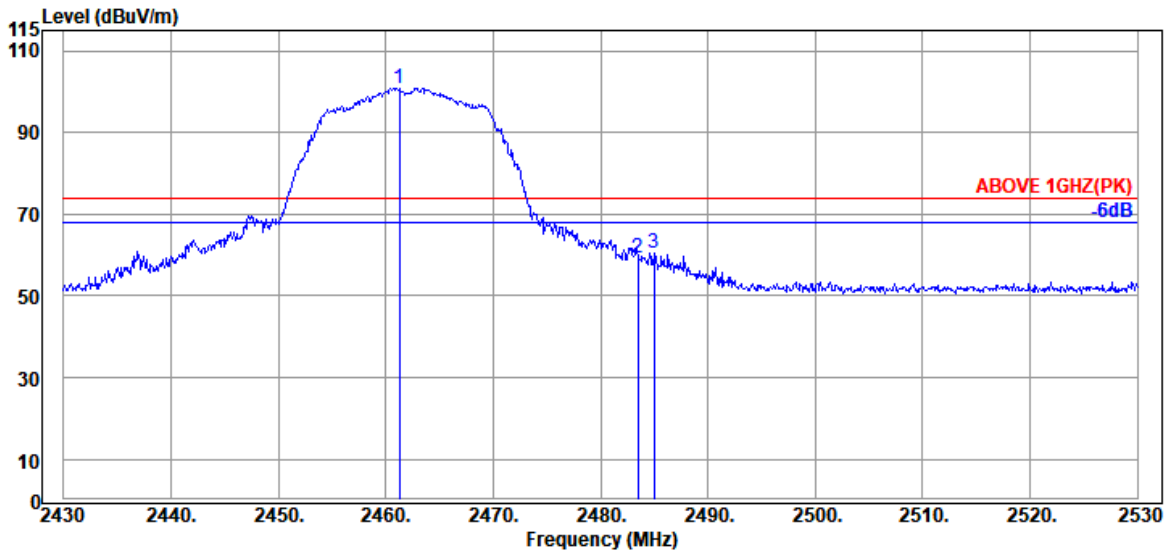


Antenna at Vertical Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Gain (dB)	Read Level (dBμV)	Emission Level (dBUV/m)	Limits (dBUV/m)	Margin (dB)	Detector
2389.68	28.21	5.72	34.51	52.84	52.26	54.00	1.74	Average
2390.04	28.21	5.72	34.51	53.06	52.48	54.00	1.52	Average
@ 2411.04	28.14	5.75	34.51	101.59	100.97	---	---	Average

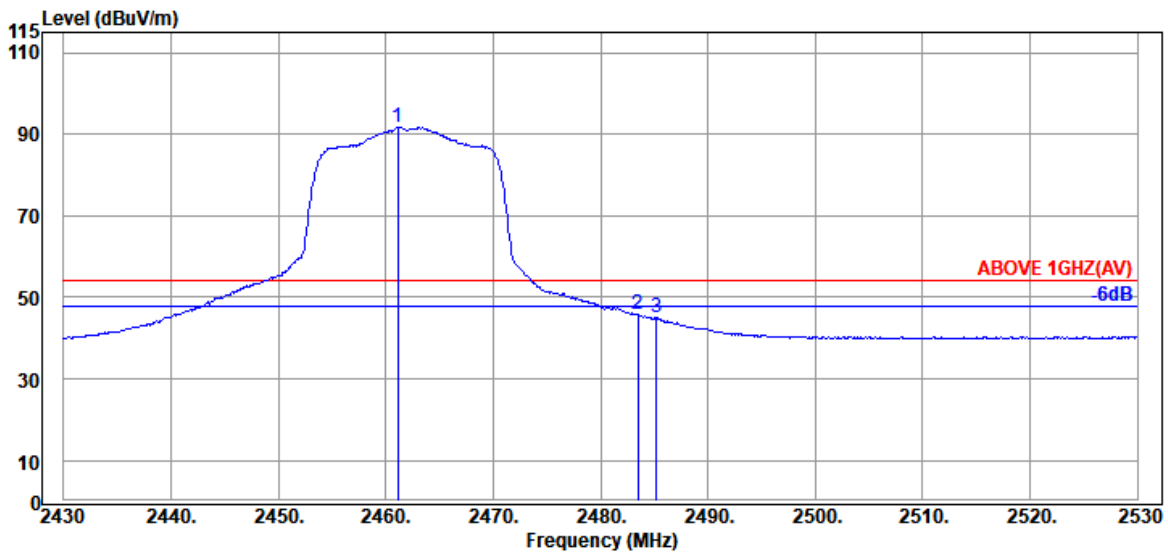
Remark: The “@” means fundamental frequency, it is ignored in this section.

Mode	802.11g	Frequency	TX 2462MHz
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Antenna at Horizontal Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamplifier Gain (dB)	Read Level (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
@ 2461.30	28.43	5.84	34.52	101.13	100.88	---	---	Peak
2483.50	28.47	5.87	34.53	59.38	59.19	74.00	14.81	Peak
2485.00	28.47	5.87	34.53	60.65	60.46	74.00	13.54	Peak

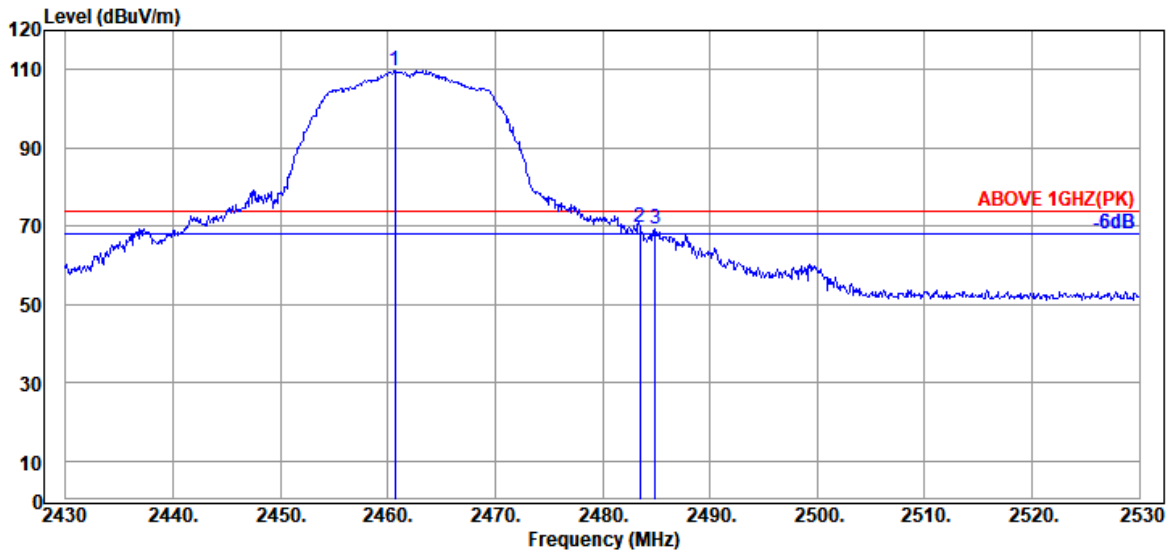


Antenna at Horizontal Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamplifier Gain (dB)	Read Level (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
@ 2461.10	28.43	5.84	34.52	91.93	91.68	---	---	Average
2483.50	28.47	5.87	34.53	45.87	45.68	54.00	8.32	Average
2485.20	28.47	5.87	34.53	45.26	45.07	54.00	8.93	Average

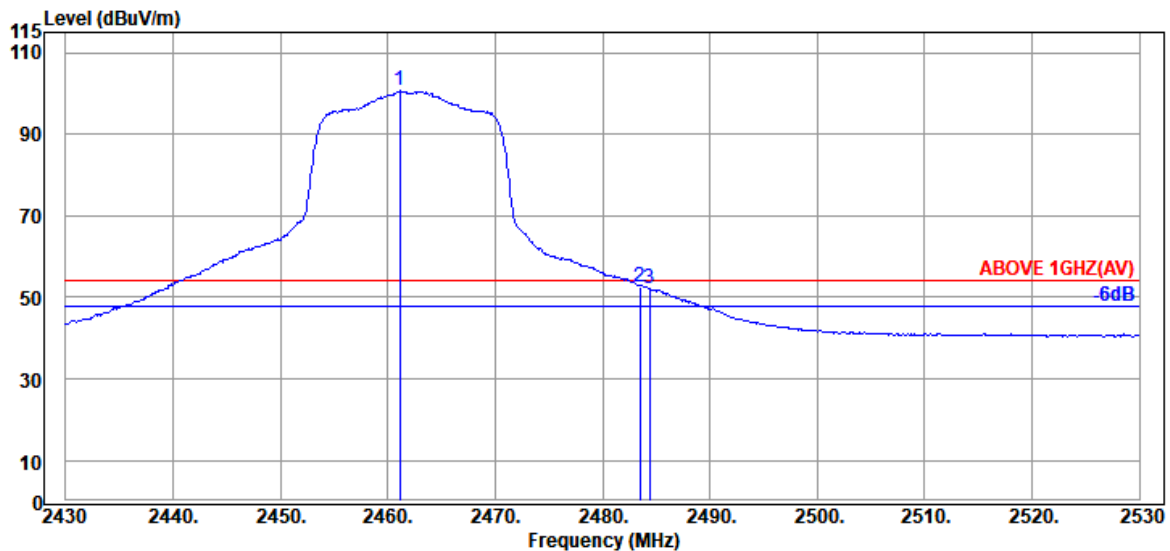
Remark: The "@" means fundamental frequency, it is ignored in this section.

Mode	802.11g	Frequency	TX 2462MHz
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Antenna at Vertical Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamplifier Gain (dB)	Read Level (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
@ 2460.70	28.43	5.84	34.52	110.03	109.78	---	---	Peak
2483.50	28.47	5.87	34.53	69.70	69.51	74.00	4.49	Peak
2484.90	28.47	5.87	34.53	69.67	69.48	74.00	4.52	Peak

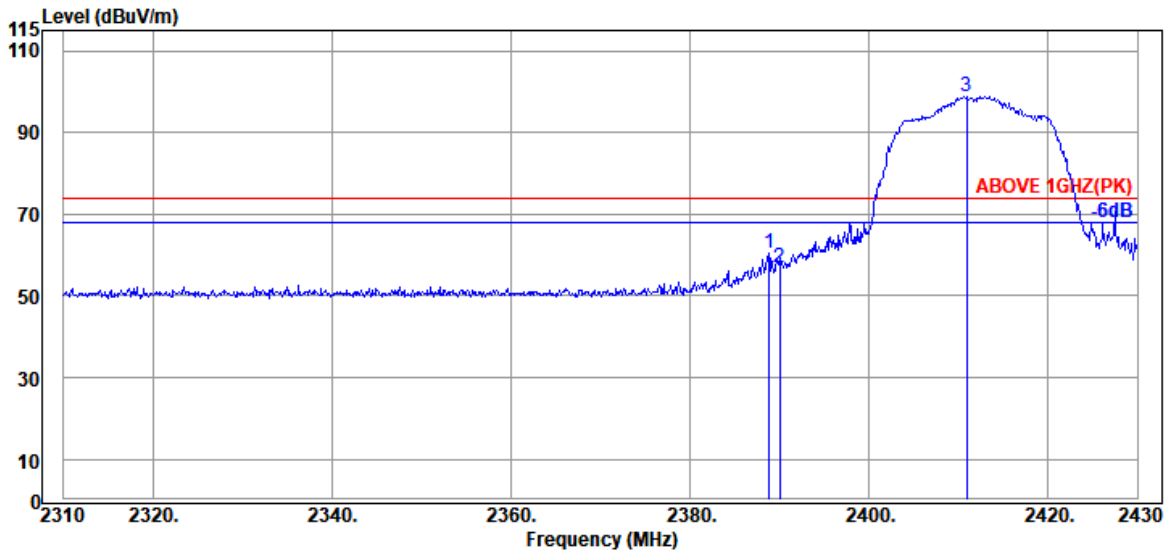


Antenna at Vertical Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamplifier Gain (dB)	Read Level (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
@ 2461.10	28.43	5.84	34.52	100.93	100.68	---	---	Average
2483.50	28.47	5.87	34.53	52.69	52.50	54.00	1.50	Average
2484.40	28.47	5.87	34.53	52.33	52.14	54.00	1.86	Average

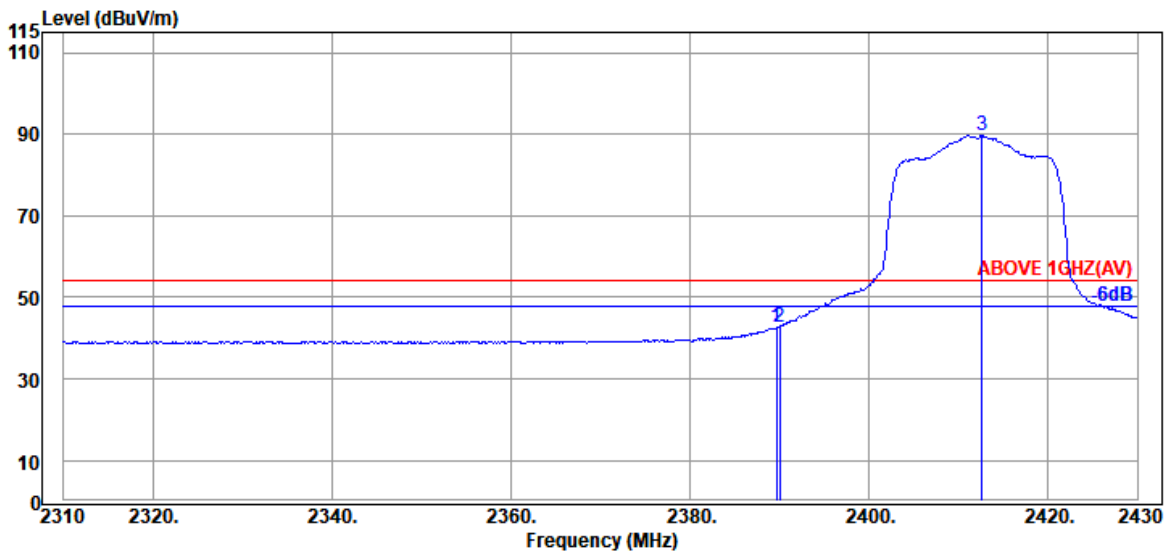
Remark: The “@” means fundamental frequency, it is ignored in this section.

Mode	802.11n-HT20	Frequency	TX 2412MHz
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Antenna at Horizontal Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Gain (dB)	Read Level (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
2388.84	28.21	5.72	34.51	60.90	60.32	74.00	13.68	Peak
2390.04	28.21	5.72	34.51	57.58	57.00	74.00	17.00	Peak
@ 2410.92	28.14	5.75	34.51	99.54	98.92	---	---	Peak

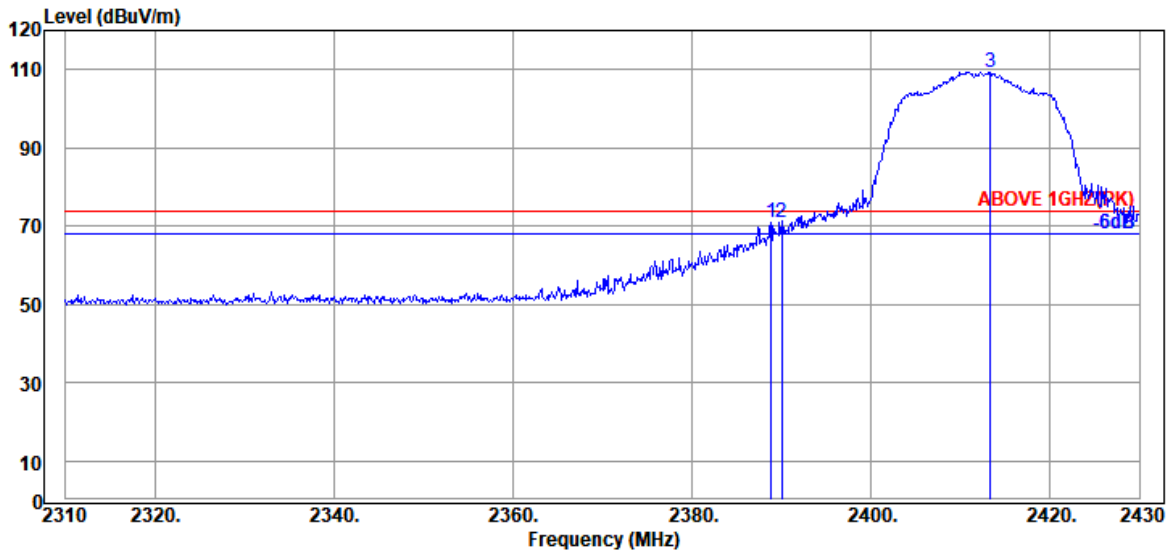


Antenna at Horizontal Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Gain (dB)	Read Level (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
2389.68	28.21	5.72	34.51	43.12	42.54	54.00	11.46	Average
2390.04	28.21	5.72	34.51	43.34	42.76	54.00	11.24	Average
@ 2412.60	28.19	5.76	34.51	90.25	89.69	---	---	Average

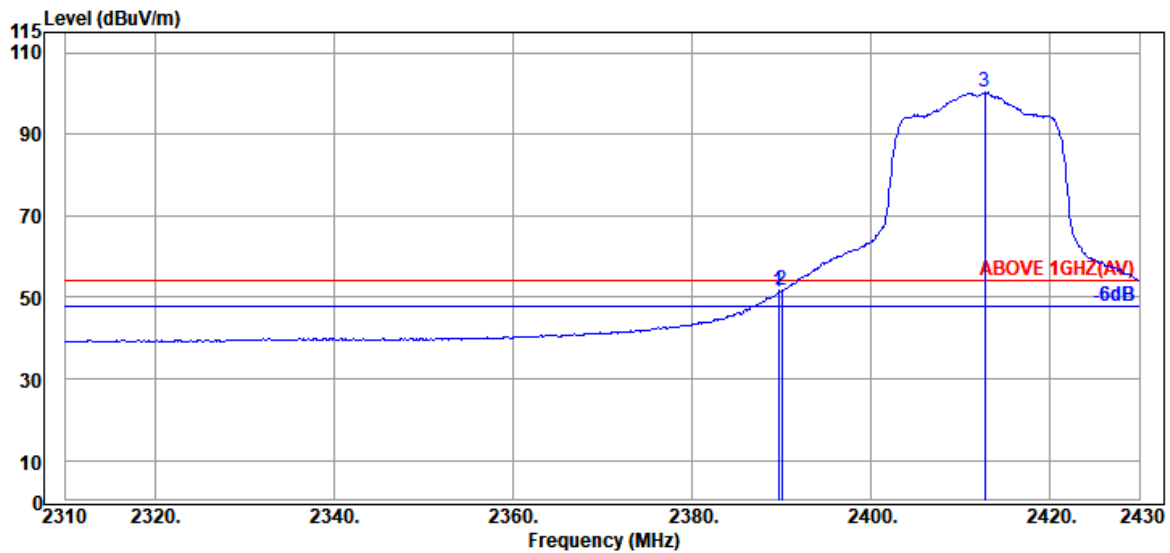
Remark: The “@” means fundamental frequency, it is ignored in this section.

Mode	802.11n-HT20	Frequency	TX 2412MHz
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Antenna at Vertical Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamplifier Gain (dB)	Read Level (dBμV)	Emission Level (dBUV/m)	Limits (dBUV/m)	Margin (dB)	Detector
2388.84	28.21	5.72	34.51	71.71	71.13	74.00	2.87	Peak
2390.04	28.21	5.72	34.51	71.45	70.87	74.00	3.13	Peak
@ 2413.32	28.19	5.76	34.51	110.01	109.45	---	---	Peak

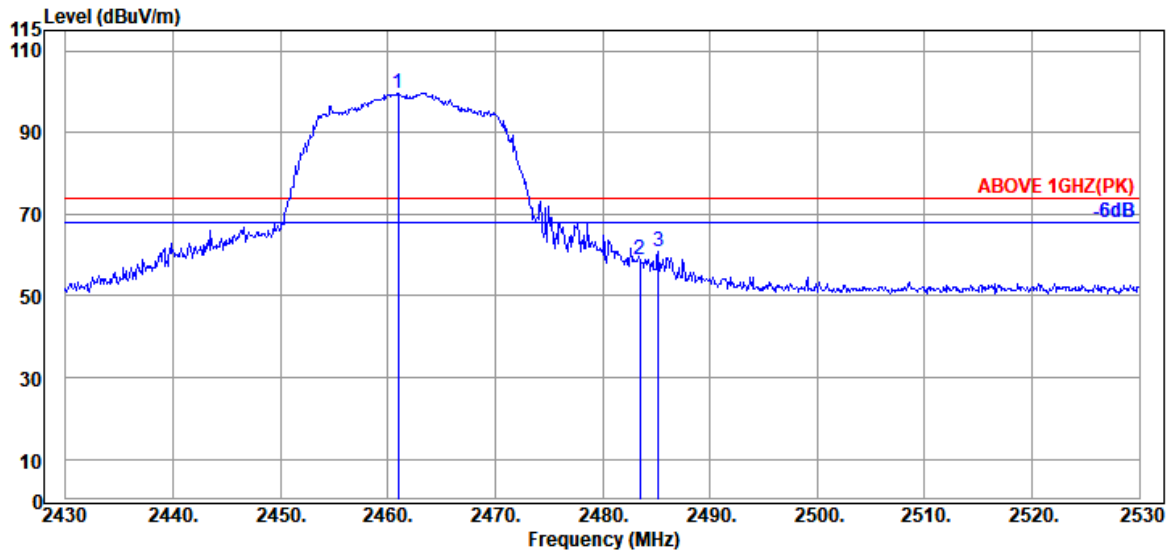


Antenna at Vertical Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamplifier Gain (dB)	Read Level (dBμV)	Emission Level (dBUV/m)	Limits (dBUV/m)	Margin (dB)	Detector
2389.68	28.21	5.72	34.51	52.14	51.56	54.00	2.44	Average
2390.04	28.21	5.72	34.51	52.20	51.62	54.00	2.38	Average
@ 2412.72	28.19	5.76	34.51	100.82	100.26	---	---	Average

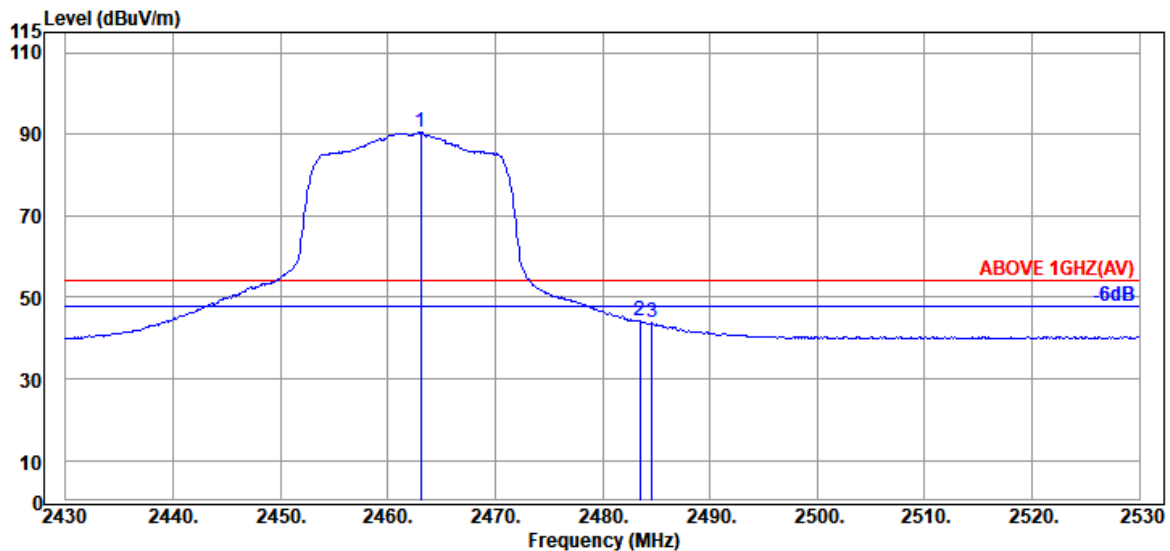
Remark: The "@" means fundamental frequency, it is ignored in this section.

Mode	802.11n-HT20	Frequency	TX 2462MHz
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Antenna at Horizontal Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamplifier Gain (dB)	Read Level (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
@ 2461.00	28.43	5.84	34.52	99.82	99.57	---	---	Peak
2483.50	28.47	5.87	34.53	58.98	58.79	74.00	15.21	Peak
2485.20	28.47	5.87	34.53	60.95	60.76	74.00	13.24	Peak

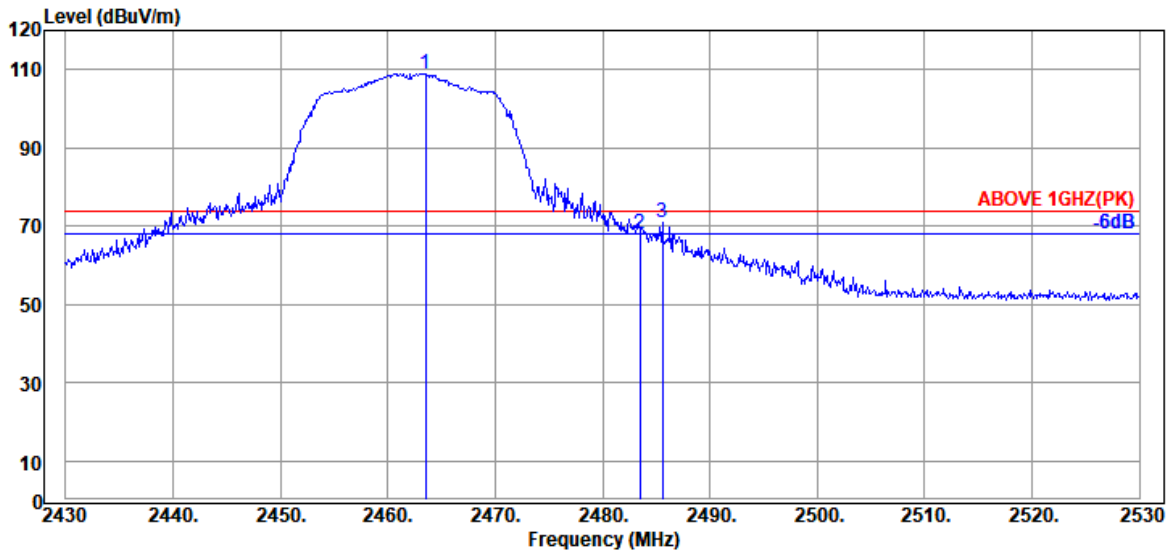


Antenna at Horizontal Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamplifier Gain (dB)	Read Level (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
@ 2463.10	28.43	5.84	34.52	90.67	90.42	---	---	Average
2483.50	28.47	5.87	34.53	44.38	44.19	54.00	9.81	Average
2484.60	28.47	5.87	34.53	43.90	43.71	54.00	10.29	Average

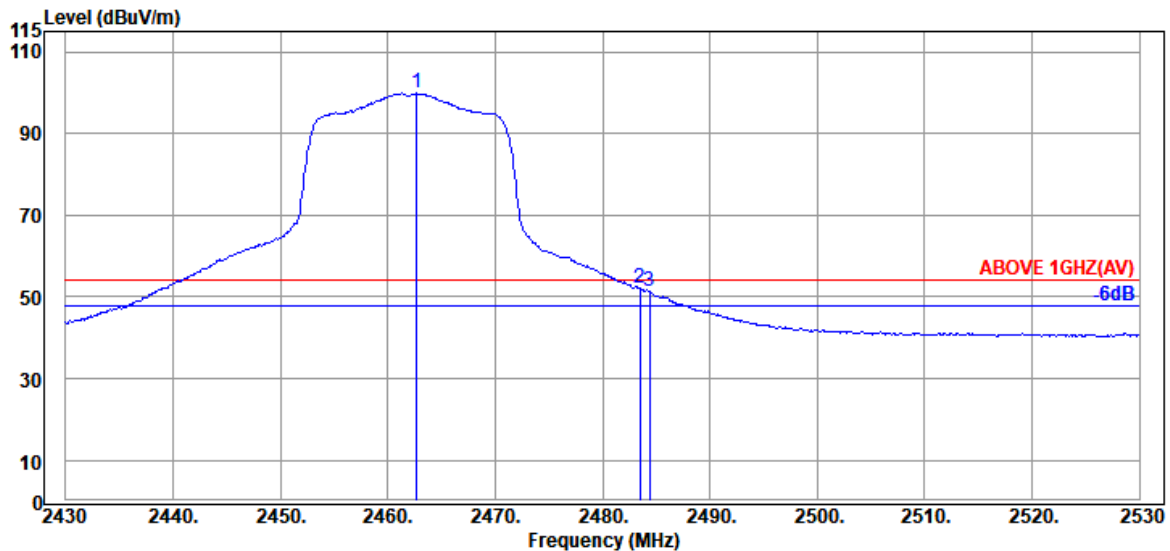
Remark: The “@” means fundamental frequency, it is ignored in this section.

Mode	802.11n-HT20	Frequency	TX 2462MHz
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Antenna at Vertical Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamplifier Gain (dB)	Read Level (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
@ 2463.50	28.43	5.84	34.52	109.29	109.04	---	---	Peak
2483.50	28.47	5.87	34.53	68.42	68.23	74.00	5.77	Peak
2485.60	28.47	5.87	34.53	71.02	70.83	74.00	3.17	Peak



Antenna at Vertical Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamplifier Gain (dB)	Read Level (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
@ 2462.70	28.43	5.84	34.52	100.11	99.86	---	---	Average
2483.50	28.47	5.87	34.53	52.29	52.10	54.00	1.90	Average
2484.40	28.47	5.87	34.53	51.47	51.28	54.00	2.72	Average

Remark: The “@” means fundamental frequency, it is ignored in this section.

A.2.2 Emissions outside the frequency band:

The emissions (up to 25GHz) not reported for there is no emission be found.

Mode	802.11b	Frequency	TX 2412MHz
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Antenna at Horizontal Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Gain (dB)	Read Level (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
4824.00	33.03	8.55	34.43	34.46	41.61	54.00	12.39	Peak

Antenna at Vertical Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Gain (dB)	Read Level (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
4824.00	33.03	8.55	34.43	37.63	44.78	54.00	9.22	Peak

Mode	802.11g	Frequency	TX 2462MHz
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Antenna at Horizontal Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Gain (dB)	Read Level (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
4924.00	33.37	8.70	34.41	33.50	41.16	54.00	12.84	Peak

Antenna at Vertical Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Gain (dB)	Read Level (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
4924.00	33.37	8.70	34.41	34.07	41.73	54.00	12.27	Peak

Mode	802.11n-HT20	Frequency	TX 2462MHz
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Antenna at Horizontal Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Gain (dB)	Read Level (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
4924.00	33.37	8.70	34.41	33.86	41.52	54.00	12.48	Peak

Antenna at Vertical Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Gain (dB)	Read Level (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
4924.00	33.37	8.70	34.41	34.04	41.70	54.00	12.30	Peak

A.2.3 Emissions in Non-restricted Frequency Bands:

Pursuant to ANSI C63.10:2013 that emission levels below the FCC 15.209(a)/RSS-Gen Section 8.9 table 4 general radiated emissions limits is not required.

A.3 DTS/OCCUPIED BANDWIDTH

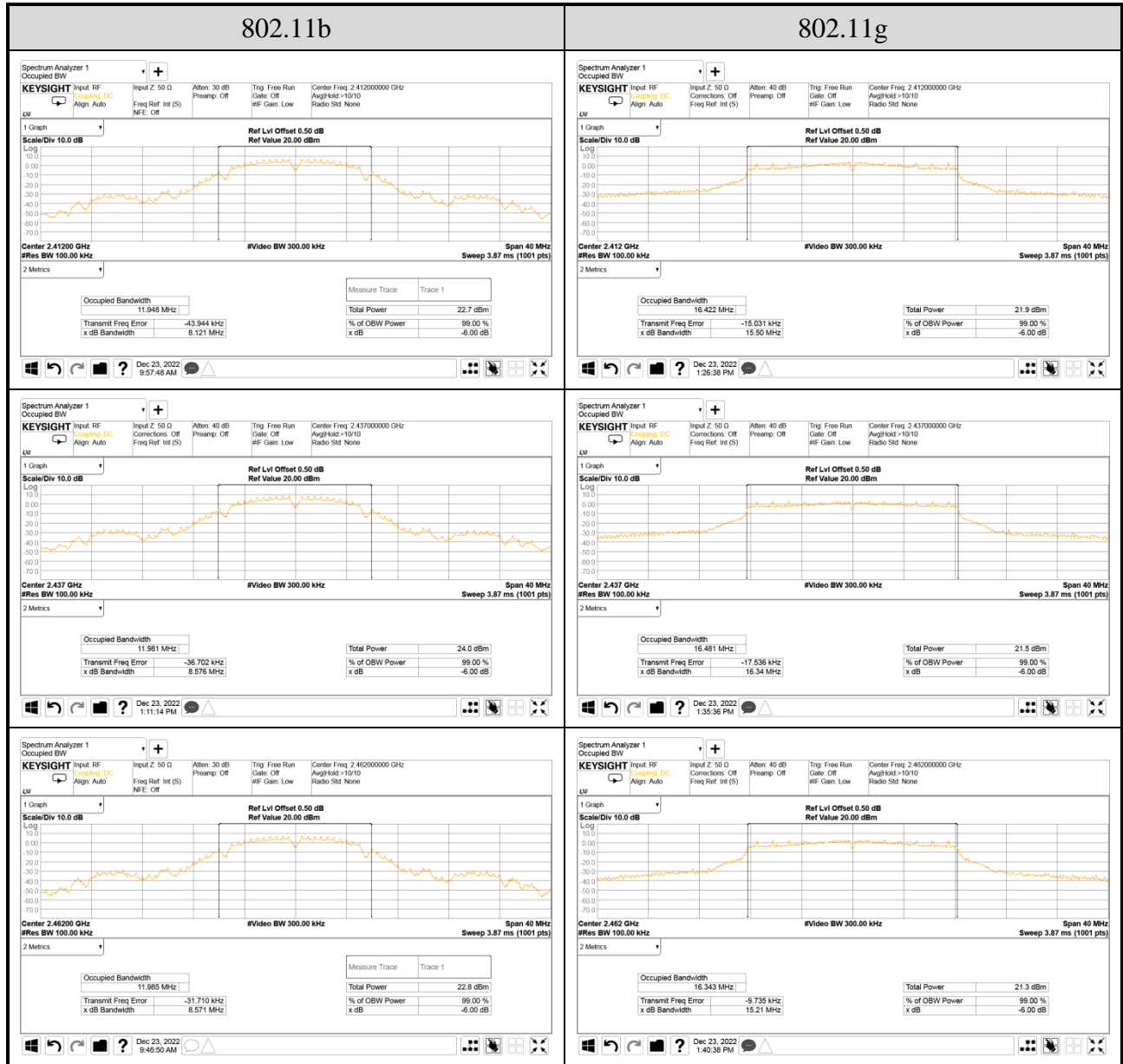
Test Date	2022/12/23	Temp./Hum.	16°C/65%
Cable Loss	0.5dB	Tested By	Hua Wu
Test Voltage	AC 120V, 60Hz (via AC Adapter)		

A.3.1 DTS/Occupied Bandwidth Result

Mode	Centre Frequency (MHz)	DTS (6dB) Bandwidth (MHz)	Occupied (99%) Bandwidth (MHz)	Limit
802.11b	2412	8.121	11.954	>500kHz
	2437	8.576	11.999	
	2462	8.571	11.984	
802.11g	2412	15.50	16.685	
	2437	16.34	16.691	
	2462	15.21	16.490	
802.11n-HT20	2412	15.22	17.592	
	2437	17.32	17.723	
	2462	15.21	17.590	

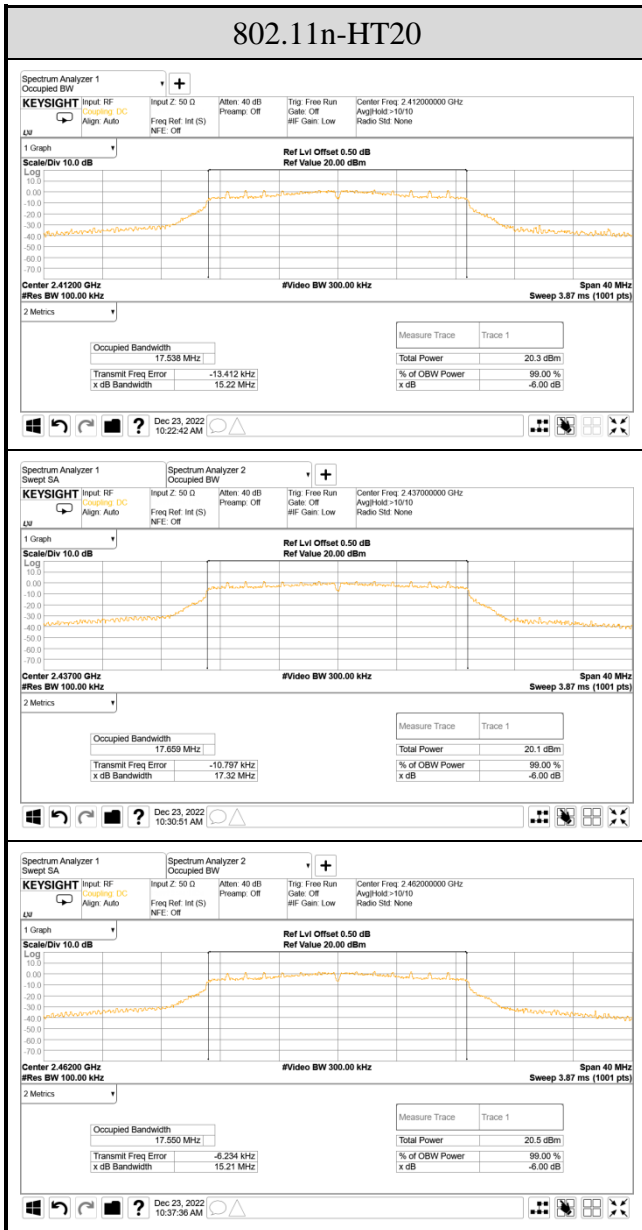
A.3.2 Measurement Plots

- DTS (6dB) Bandwidth

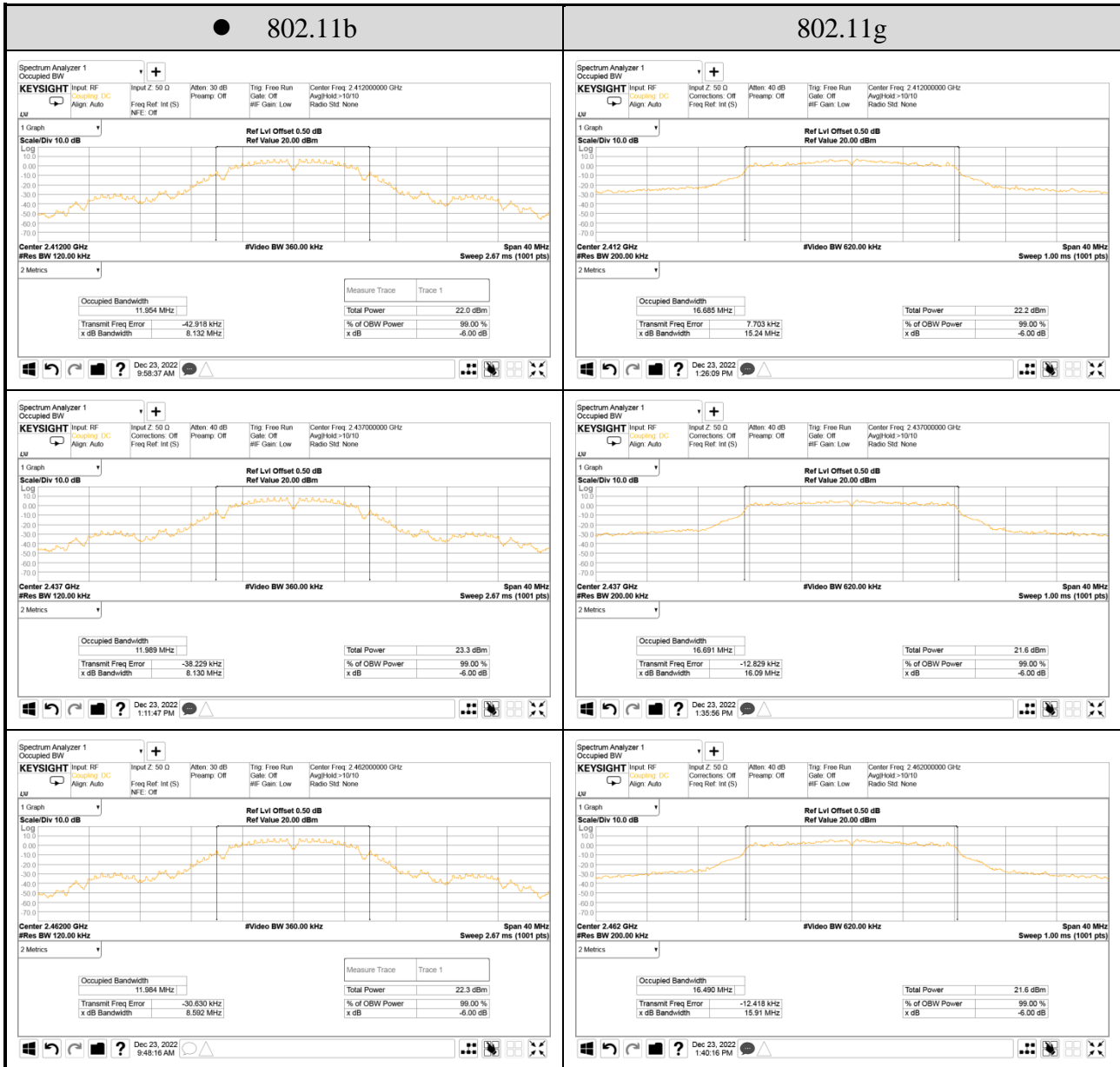


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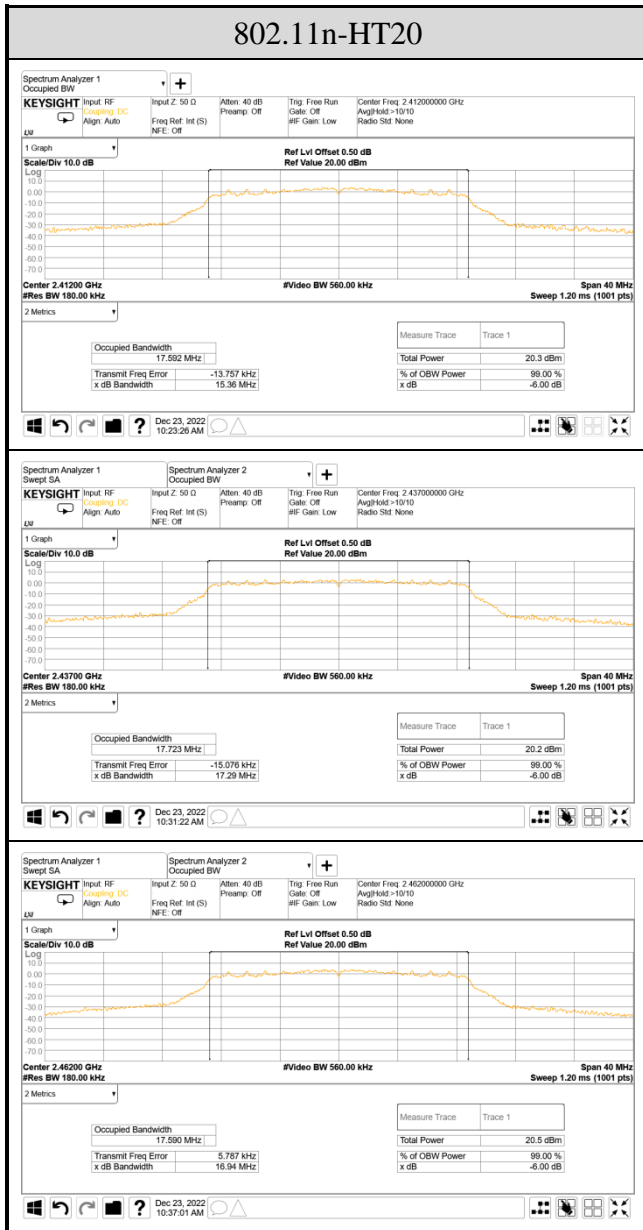


● Occupied (99%) Bandwidth



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A.4 MAXIMUM PEAK OUTPUT POWER

Test Date	2022/12/23 ~ 26	Temp./Hum.	16°C/65%
Cable Loss	0.5dB	Tested By	Hua Wu
Test Voltage	AC 120V, 60Hz (via AC Adapter)		

A.4.1 Peak Output Power

Mode	Centre Frequency (MHz)	Peak Output Power (dBm)	Antenna Gain (dBi)	E.I.R.P (dBm) ^{Note2}	Limit
802.11b	2412	18.75	4.05	22.80	<30dBm (Maximum Peak Output Power) <36dBm (E.I.R.P)
	2437	18.57	4.34	22.91	
	2462	18.72	4.34	23.06	
802.11g	2412	23.28	4.05	27.33	
	2437	23.25	4.34	27.59	
	2462	23.32	4.34	27.66	
802.11n-HT20	2412	23.81	4.05	27.86	
	2437	23.64	4.34	27.98	
	2462	23.67	4.34	28.01	

Note: 1. The results have been included cable loss.

2. E.I.R.P.= Peak Output Power (dBm)+ Antenna Gain (dBi).

A.4.2 Average Output Power (Reporting only)

Mode	Centre Frequency (MHz)	Average Output Power (dBm)	Duty cycle factor (dB) 10log (1/x)	Total Average Output Power (dBm)	Antenna Gain (dBi)	E.I.R.P (dBm) ^{Note2}	Limit
802.11b	2412	15.64	N/A	15.64	4.05	19.69	<30dBm (Maximum Peak Output Power) <36dBm (E.I.R.P)
	2437	15.45		15.45	4.34	19.79	
	2462	15.61		15.61	4.34	19.95	
802.11g	2412	13.71	0.29	14.00	4.05	18.05	
	2437	13.62		13.91	4.34	18.25	
	2462	13.74		14.03	4.34	18.37	
802.11n-HT20	2412	13.63	0.35	13.98	4.05	18.03	
	2437	13.43		13.78	4.34	18.12	
	2462	13.57		13.92	4.34	18.26	

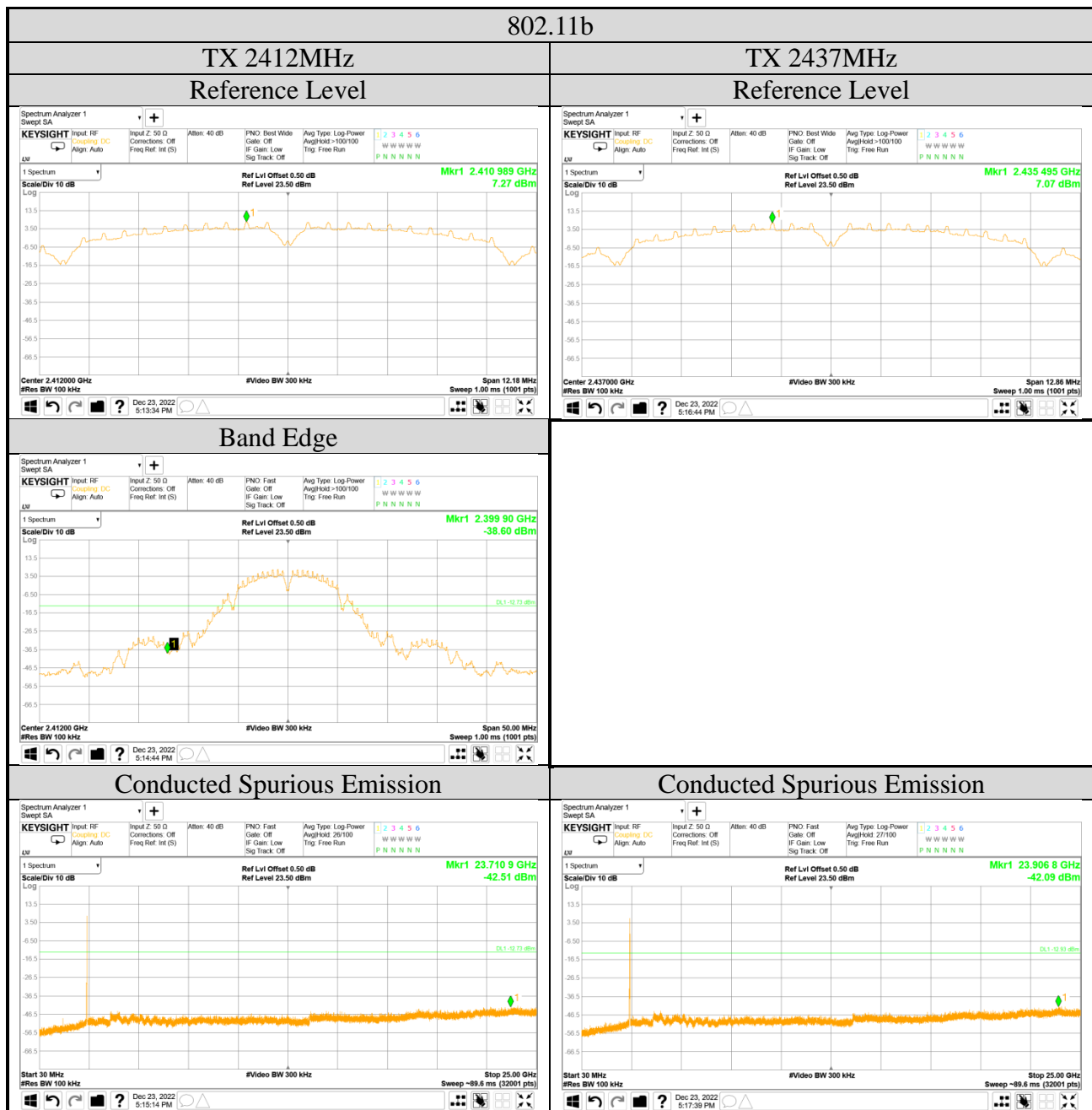
Note: 1. The results have been included cable loss.

2. E.I.R.P.= The total Average Output Power (dBm)+ Antenna Gain (dBi).

3. Max Average Output Power (dBm) = The Average output power (dBm)+ Duty Cycle Factor (dB) when duty cycle is less than 98%.

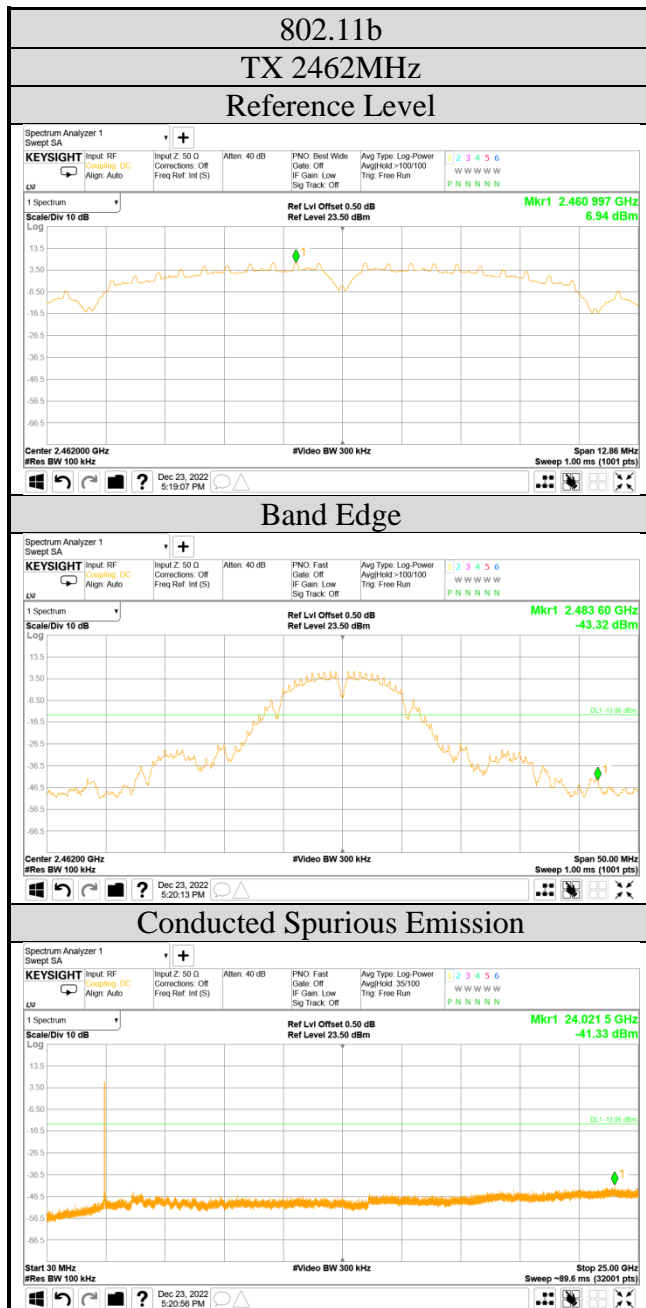
A.5 EMISSION LIMITATIONS

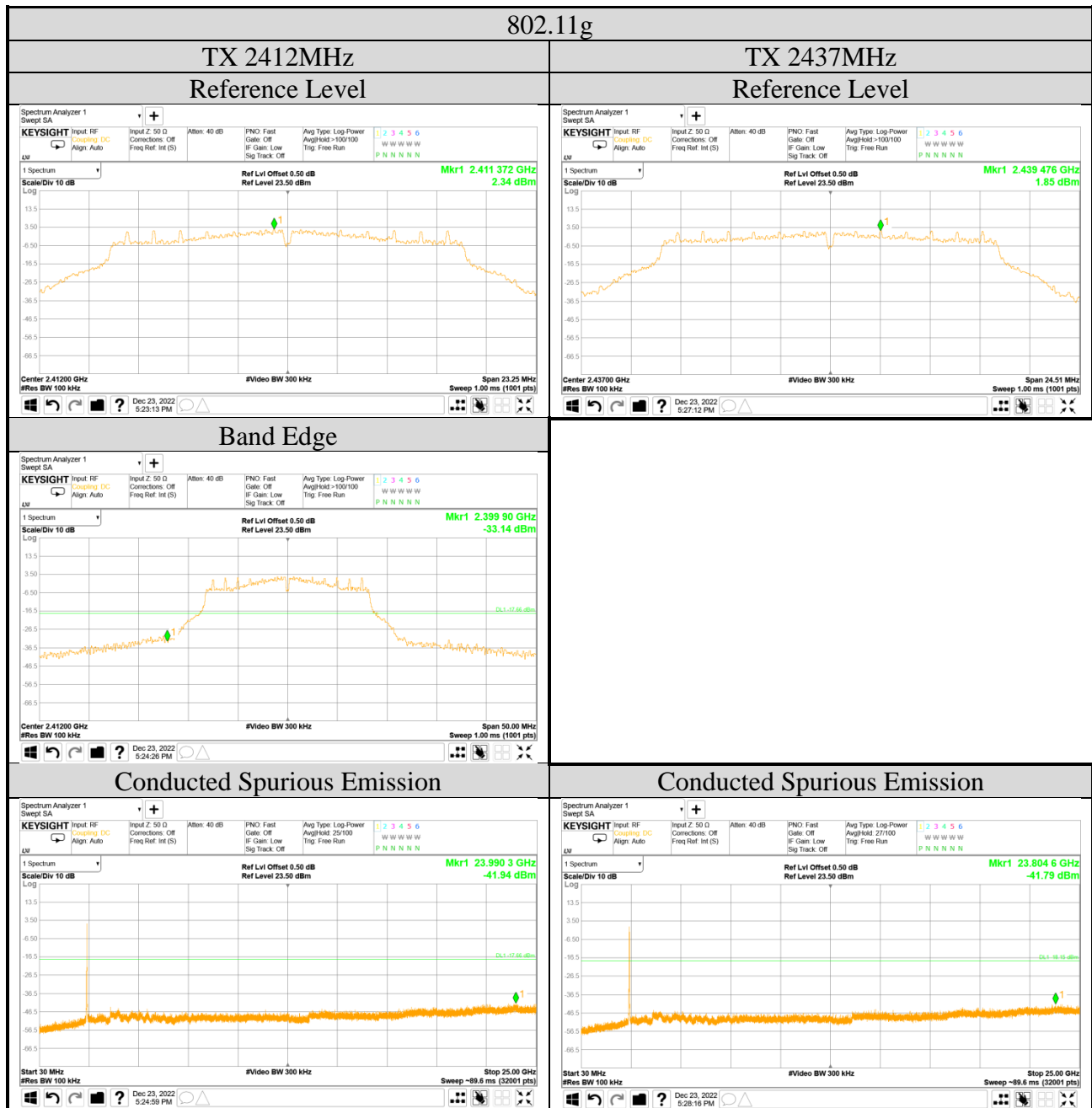
Test Date	2022/12/23	Temp./Hum.	16°C/65%
Cable Loss	0.50dB	Tested By	Hua Wu
Test Voltage	AC 120V, 60Hz (via AC Adapter)		
Simultaneous Factor 10 log(N _{ANT})(Note: where N _{ANT} is the number of outputs)	0dB		



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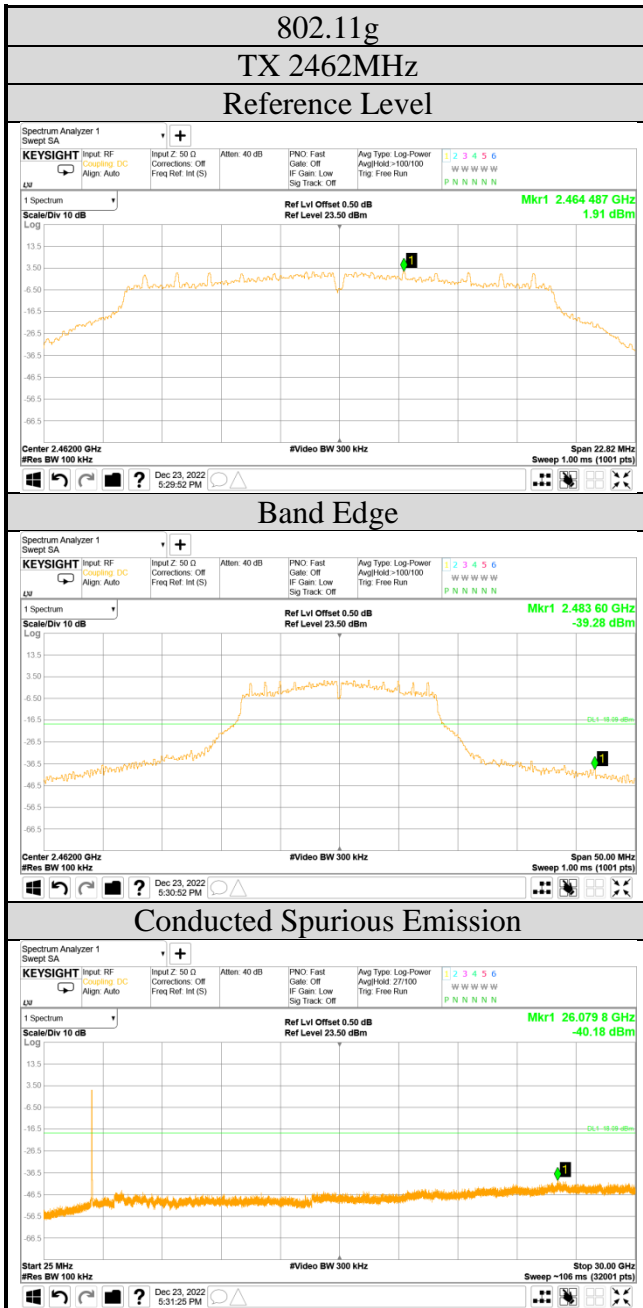
Tel: +886 2 26099301
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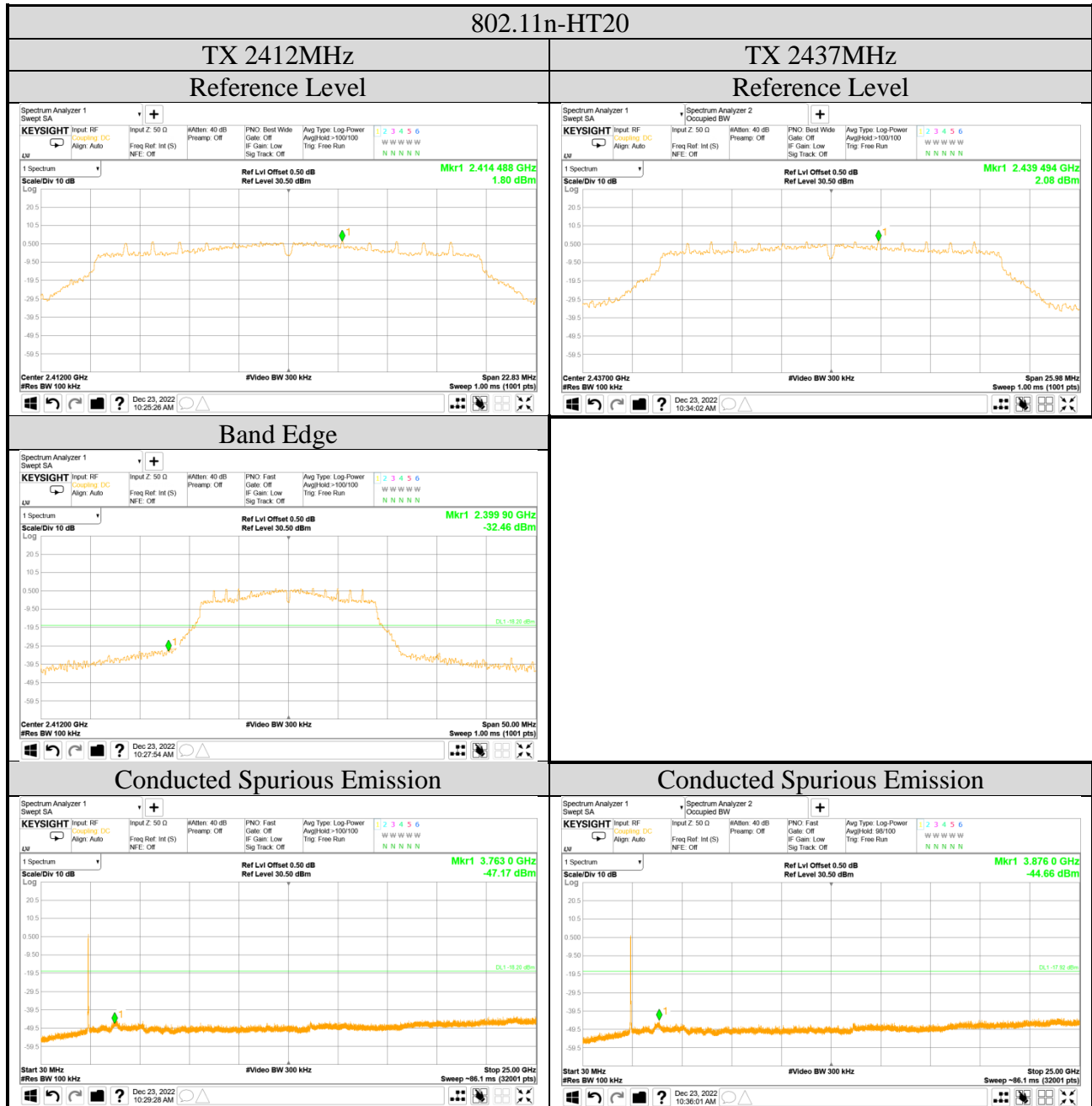




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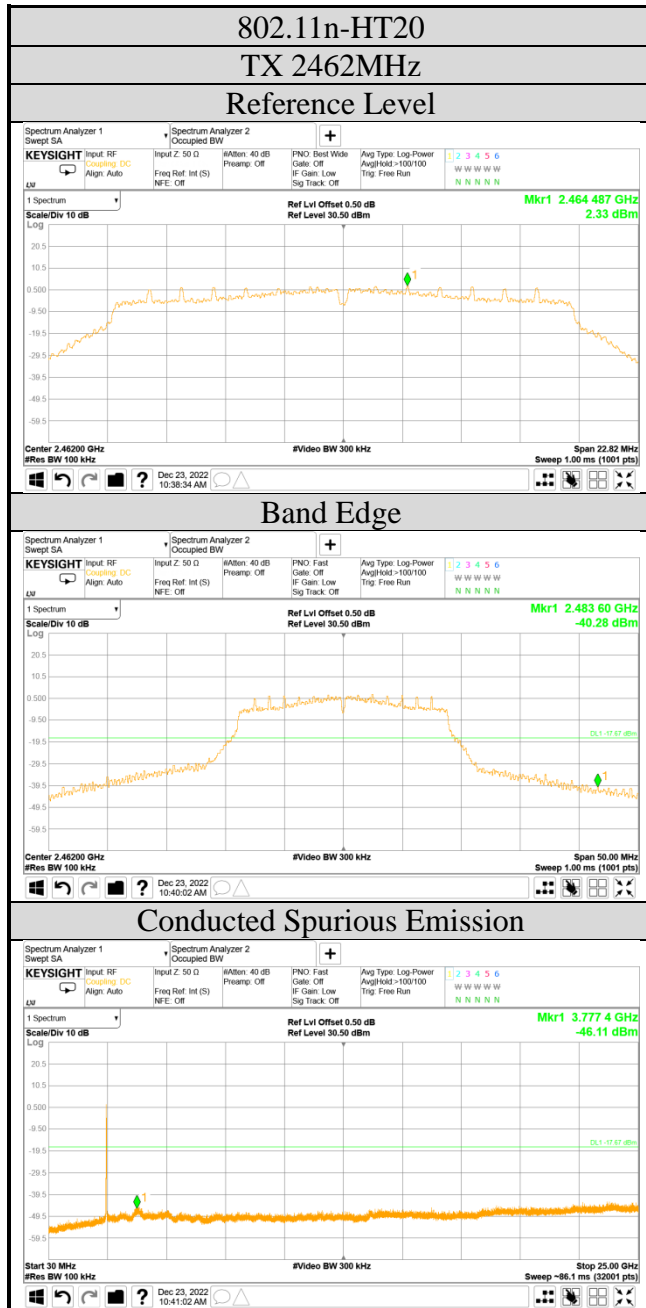
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A.6 POWER SPECTRAL DENSITY

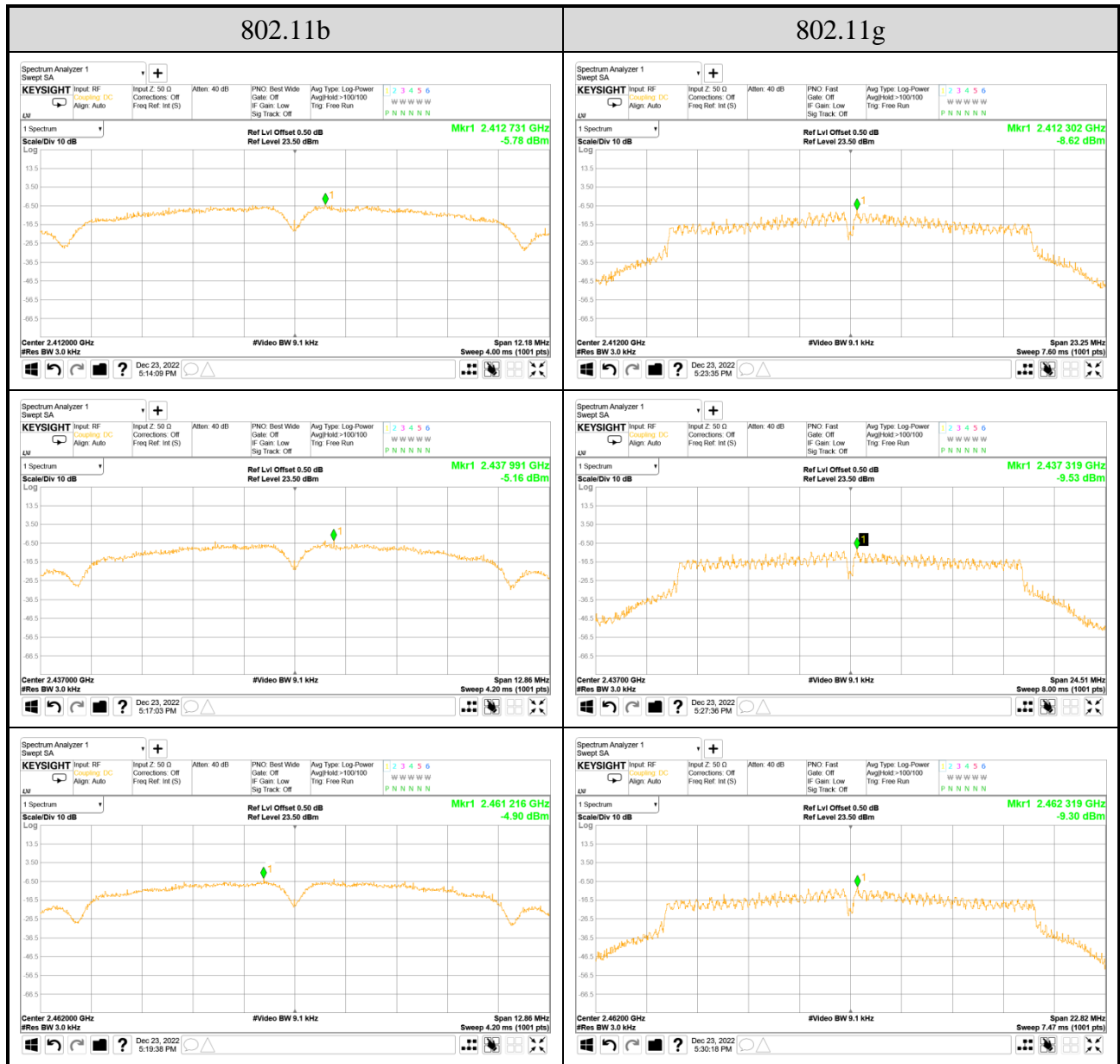
Test Date	2022/12/23	Temp./Hum.	16°C/65%
Cable Loss	0.50dB	Tested By	Hua Wu
Test Voltage	AC 120V, 60Hz (via AC Adapter)		

A.6.1 Power Spectral Density Result

Mode	Centre Frequency (MHz)	Power Spectral Density (dBm)	Limit
802.11b	2412	-5.78	<8 dBm/3kHz
	2437	-5.16	
	2462	-4.90	
802.11g	2412	-8.62	
	2442	-9.53	
	2462	-9.30	
802.11n-HT20	2412	-9.16	
	2442	-10.17	
	2462	-10.04	

Note: All results have been included cable loss.

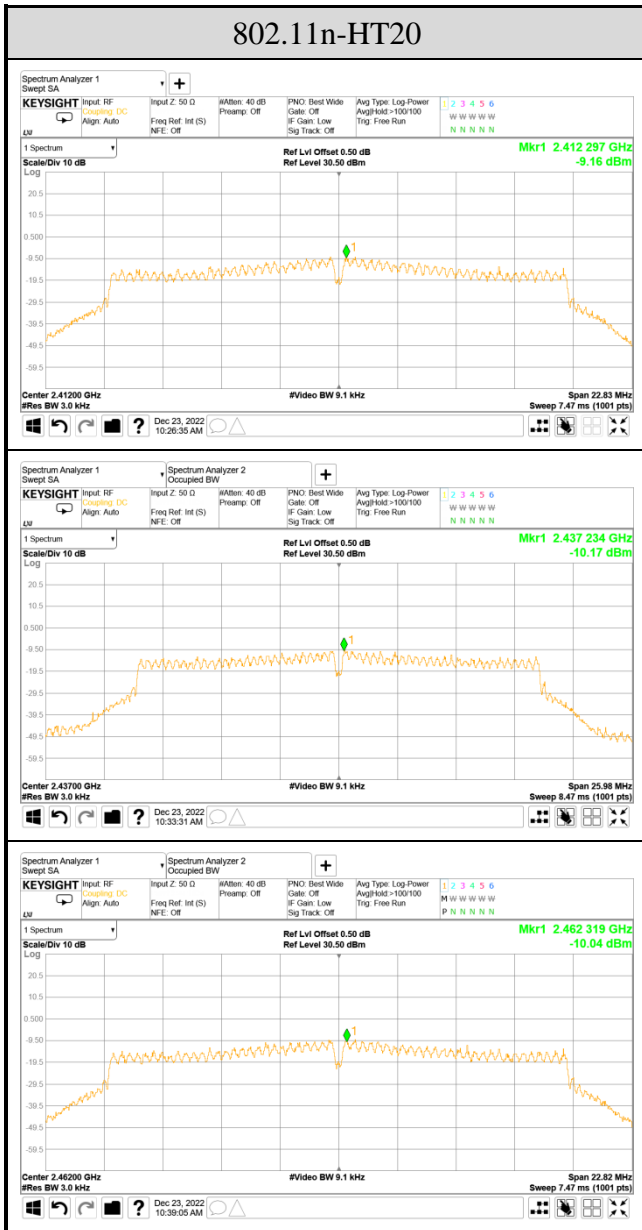
A.6.2 Measurement Plots



Note: All results have been included cable loss.

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Note: All results have been included cable loss.



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APPDNDIX B

TEST PHOTOGRAPHS

(Model: (1)100-FRM (2)100-CAL)