Audix Technology Corp.
No. 53-11, Dingfu, Linkou, Dist.,
New Taipei City244, Taiwan

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FCC 15.247 & RSS-247
2.4 GHz Test Report

for

POWERTECH INDUSTRIAL CO. LTD.

10F, No. 407, Sec. 2, Chung-Shan Road
Chung-Ho City, Taipei Hsien 235 Taiwan

Product Name	**:**	**WIFI Smart power strip**
Model Name	**:**	**AS-P-603W**
Brand		**Helios**
FCC ID	**:**	**NHS-ASP603W**
IC	**:**	**3653A-ASP603W**

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

TESTING
NVLAP LAB CODE 200077-0

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.
The report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST or any agency of the U.S. Government.

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TEST REPORT CERTIFICATION

Applicant	:	POWERTECH INDUSTRIAL CO. LTD.
EUT Description		
(1) Product	:	WIFI Smart power strip
(2) Model	:	AS-P-603W
(3) Brand	:	Helios
(4) Power Supply	:	AC 120V, 15A

Applicable Standards:

47 CFR FCC Part 15 Subpart C
RSS-Gen (Issue 5), April 2018
RSS-247 (Issue 2), February 2017
ANSI C63.10:2013

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: 2019. 11. 01

Reviewed by: (Tina Huang/Administrator)

Approved by: (Ben Cheng/Manager)

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1. REVISION RECORD OF TEST REPORT

Edition No	Issued Data	Revision Summary	Report Number
0	2019. 11. 01	Original Report	EM-F190424

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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)	6dB/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	RSS-Gen §8.3	Antenna Requirement	**Compliance**
Note: The uncertainties value is not used in determining the result.			

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3. GENERAL INFORMATION

3.1. Description of Application

Applicant	POWERTECH INDUSTRIAL CO. LTD. 10F, No. 407, Sec. 2, Chung-Shan Road Chung-Ho City, Taipei Hsien 235 Taiwan
Product	WIFI Smart power strip
Model	AS-P-603W
Brand	Helios

3.2. Description of EUT

Test Model	AS-P-603W
Serial Number	N/A
Power Rating	AC 120V, 15A, 60Hz, 1800W
RF Features	WLAN:802.11b/g/n
Transmit Type	2.4 GHz 802.11b: 1T1R 802.11g: 1T1R 802.11n-HT20: 1T1R
Sample Status	Production
Date of Receipt	2019. 10. 14
Date of Test	2019. 10. 18 ~ 24
Interface Ports of EUT	Front : • One AC Outlet • One USB C (5V, 3A) • One USB A (5V, 2.4A) Back : • One Wi-Fi Antenna port • Four Smart AC Outlets • Four Switched AC Outlets • Four DSS/Coax Line Input / Output ports • One DC Inlet (3-30V, 10mA)
Accessories Supplied	• AC Power cord

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3.3. Antenna Information

2.4G Antenna					
No.	Model Name	Manufacture	Antenna Type	Frequency (MHz)	Peak Gain (dBi)
1	Q0211	SHENZHEN QISEN TECHNOLOGY CO., LTD.	Dipole	2400-2483.5	2

3.4. 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 72.2

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

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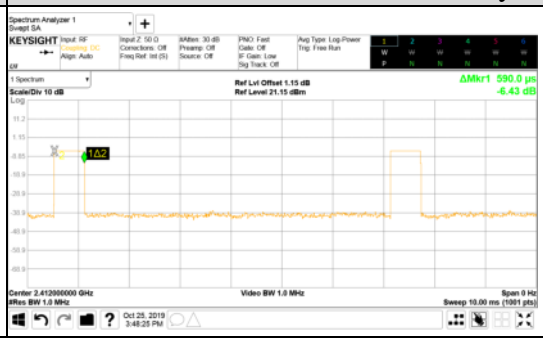
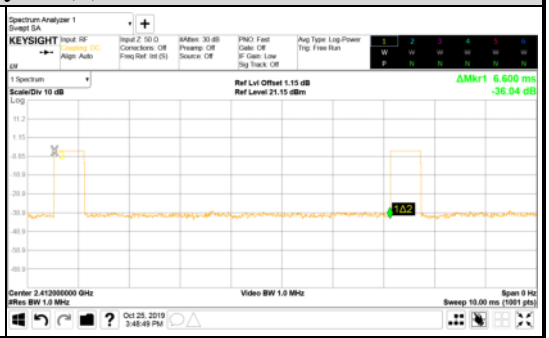
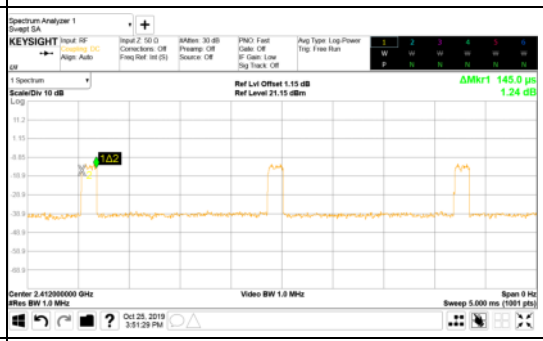
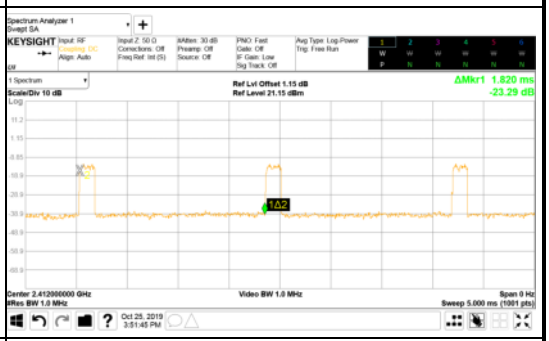
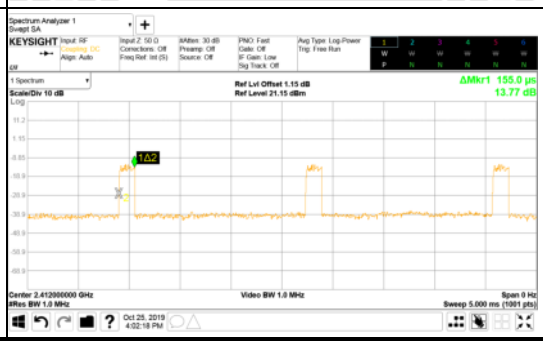
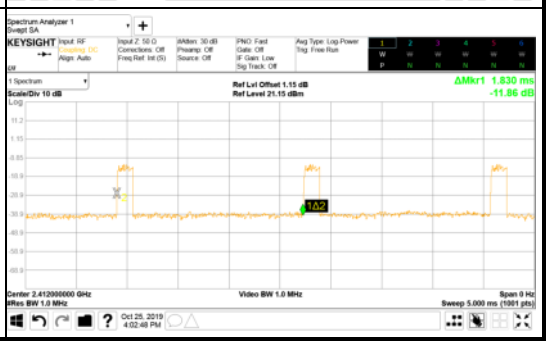
3.5. Descriptions of Key Components

None.

3.6. Test Configuration

Mode	Duty Cycle (x)	T (ms)	Duty Cycle Factor (dB)
802.11b	0.089	0.590	10.50
802.11g	0.080	0.145	10.97
802.11n-HT20	0.085	0.155	8.09

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.

Mode	Duty Cycle (x)	
802.11b		
802.11g		
802.11n-HT20		

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AC Conduction	
Test Case	Normal operation

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	1/6/11
		802.11g	6Mbps	1/6/11
		802.11n-HT20	MCS0	1/6/11
Conducted Test Case	6dB/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	MCS0	1/6/11
	Band Edge	802.11b	1Mbps	1/11
		802.11g	6Mbps	1/11
		802.11n-HT20	MCS0	1/11
	Spurious Emission	802.11b	1Mbps	1/6/11
		802.11g	6Mbps	1/6/11
		802.11n-HT20	MCS0	1/6/11
	Peak Power Spectral Density	802.11b	1Mbps	1/6/11
		802.11g	6Mbps	1/6/11
		802.11n-HT20	MCS0	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.

Note3: The data rates were selected based on preliminary testing that identified those rate as the worst case for output power.

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3.7. Tested Supporting System List

3.7.1. Support Peripheral Unit

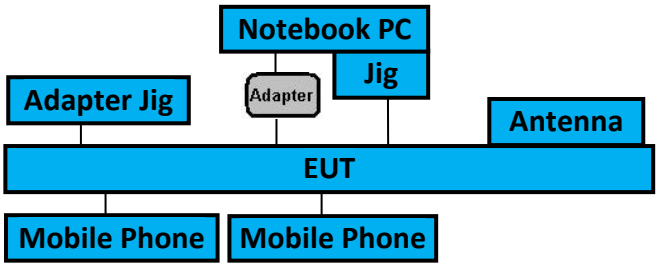
No.	Product	Brand	Model No.	Serial No.	Approval
1.	Notebook PC	hp	TPN-Q189	5CD8175992	FCC ID: PD93168NG
2.	Jig	N/A	N/A	N/A	N/A
3.	Adapter Jig	N/A	S9P21000U0	N/A	N/A
4.	Mobile Phone	ASUS	ZE620KL	N/A	FCC By DoC
5.	Mobile Phone	ASUS	Z01FD	N/A	FCC By DoC
6.	Antenna	N/A	N/A	N/A	N/A

3.7.2. Cable Lists

No.	Cable Description Of The Above Support Units
1.	Adapter: hp, M/N PPP-012C-S DC Cord：Shielded, Undetachable, 1.8m, Bonded a ferrite core AC Power Cord：Unshielded, Detachable, 1.0m
2.	Cable: Unshielded, Undetachable, 0.1m
3.	DC Cord：Shielded, Undetachable, 1.8m
4.	USB Cable: Unshielded, Undetachable, 1.5m (White)
5.	USB Cable: Unshielded, Undetachable, 1.2m (Black)

3.8. Setup Configuration

3.8.1. EUT Configuration for Power Line & Radiated Emission



3.8.2. EUT Configuration for RF Conducted Test Items

3.9. Operating Condition of EUT

Test program "ESP Series Modules FCC & CE Test Tool V.2.2.2.0" is used for enabling EUT WLAN function under continues transmitting and choosing data rate/ channel.

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3.10.Description of Test Facility

Name of Test Firm	Audix Technology Corporation / EMC Department No. 53-11, Dingfu, 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 17025:2005 (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) Fully Anechoic Chamber

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3.11.Measurement Uncertainty

Test Items/Facilities		Frequency Range	Uncertainty
Conduction Test		150kHz~30MHz	±3.50dB
Radiation Test	No.1 3m Semi Anechoic Chamber	30MHz-200MHz, 3m, Horizontal	±3.9dB
		200MHz-1000MHz, 3m, Horizontal	±4.3dB
		30MHz-200MHz, 3m, Vertical	±4.5dB
		200MHz-1000MHz, 3m, Vertical	±4.1dB
		1GHz-6GHz, 3m	±5.1dB
		6GHz-18GHz, 3m	±5.5dB
	No.3 3m Semi Anechoic Chamber	30MHz-200MHz, 3m, Horizontal	±4.7dB
		200MHz-1000MHz, 3m, Horizontal	±4.5dB
		30MHz-200MHz, 3m, Vertical	±4.3dB
		200MHz-1000MHz, 3m, Vertical	±4.1dB
	No.4 3m Semi Anechoic Chamber	30MHz-200MHz, 3m, Horizontal	±4.1dB
		200MHz-1000MHz, 3m, Horizontal	±4.4dB
		30MHz-200MHz, 3m, Vertical	±4.2dB
		200MHz-1000MHz, 3m, Vertical	±5.0dB
		1GHz-6GHz, 3m	±4.4dB
		6GHz-18GHz, 3m	±4.1dB
	No.5 3m Semi Anechoic Chamber	30MHz-200MHz, 3m, Horizontal	±4.0dB
		200MHz-1000MHz, 3m, Horizontal	±4.0dB
		30MHz-200MHz, 3m, Vertical	±4.2dB
		200MHz-1000MHz, 3m, Vertical	±4.4dB
		1GHz-6GHz, 3m	±4.3dB
		6GHz-18GHz, 3m	±4.6dB
	Fully Anechoic Chamber	30MHz~1000MHz	±4.7dB
		1GHz~18GHz	±5.3dB

Remark：Uncertainty = $ku_c(y)$

Test Item	Uncertainty
6dB Bandwidth	± 0.05kHz
Maximum peak output power	± 0.33dB
Power spectral density	± 0.13dB
Conducted Emission Limitations	± 0.13dB

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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	ESR	101774	2019. 01. 23	1 Year
2.	A.M.N.	R&S	ENV4200	100169	2018. 11. 14	1 Year
3.	L.I.S.N.	Kyoritsu	KNW-407	8-855-9	2018. 12. 19	1 Year
4.	Pulse Limiter	R&S	ESH3-Z2	100354	2019. 01. 12	1 Year
5.	Digital Thermo-Hygro Meter	iMax	HTC-1	No.8 S/R	2019. 04. 20	1 Year
6.	Test Software	Audix	e3	V.6.120424	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	N9010A-526	MY53400071	2019. 09. 11	1 Year
2.	Spectrum Analyzer	Keysight	N9010B-544	MY55460198	2019.05.06	1 Year
3.	Test Receiver	R & S	ESCS30	100338	2019. 06. 12	1 Year
4.	Amplifier	HP	8447D	2944A06305	2019. 01. 30	1 Year
5.	Amplifier	HP	8449B	3008A02678	2019. 03. 07	1 Year
6.	Amplifier	Keysight	83051A	MY53010042	2019. 08. 08	1 Year
7.	Bilog Antenna	TESEQ	CBL6112D	33821	2019. 01. 19	1 Year
8.	Loop Antenna	R&S	HFH2-Z2	891847/27	2017.12. 18	2 Years
9	Double-Ridged Waveguide Horn	ETS-Lindgren	3117	00135902	2019. 03. 13	1 Year
10.	Horn Antenna	COM-POWER	AH-840	101092	2019 .05. 14	1 Year
11.	2.4GHz Notch Filter	K&L	7NSL10-2441.5/E130.5-O/O	1	2019. 07. 24	1 Year
12.	3GHz Notch Filter	Microwave	H3G018G1	484796	2019. 08. 21	1 Year
13.	Coaxial Cable	MIYAZAKI	5D2W	RE-11	2019. 02. 01	1 Year
14.	Coaxial Cable	HUBER+SUHNER	SUCOFLEX 104	RF CABLE-01	2019. 09. 20	1 Year
15.	Coaxial Cable	HUBER+ SUHNER	SUCOFLEX 102	No.1 18-40GHz Cable	2019.09.20	1 Year
16.	Digital Thermo-Hygro Meter	iMax	HTC-1	No.1 3m A/C	2019. 04. 20	1 Year
17.	Digital Thermo-Hygro Meter	EVERY DAY	E-512	RF-02	2019. 04. 20	1 Year
18.	Test Software	Audix	e3	V6.120619c	N.C.R.	N.C.R.
19.	Test Software	Audix	e3	V6.110601	N.C.R.	N.C.R.

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4.3. RF Conducted Measurement

Item	Type	Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Interval
1.	Spectrum Analyzer	Keysight	N9010B-544	MY55460198	2019. 05. 06	1 Year
2.	Power Meter	Anritsu	ML2495A	1145008	2018. 11. 07	1 Year
3.	Power Sensor	Anritsu	MA2411B	1126096	2018. 11. 07	1 Year
4.	Digital Thermo-Hygro Meter	Shenzhen Datronn Electronics	KT-905	RF	2019. 04. 20	1 Year

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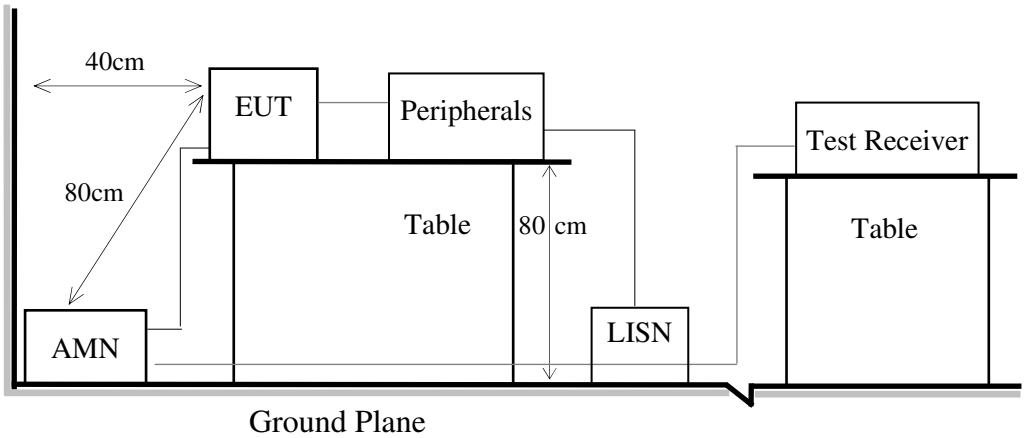
5. CONDUCTED EMISSION

5.1. Block Diagram of Test Setup

5.1.1. Block Diagram of EUT

Indicated as section 3.9

5.1.2. Shielded Room Setup Diagram



5.2. Conducted Emission Limit

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

Remark 1.: 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 C 63.10. 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 150 kHz to 30 MHz and record the emission which does not have 20 dB below limit.

5.4. Test Results

Please refer to Appendix A.

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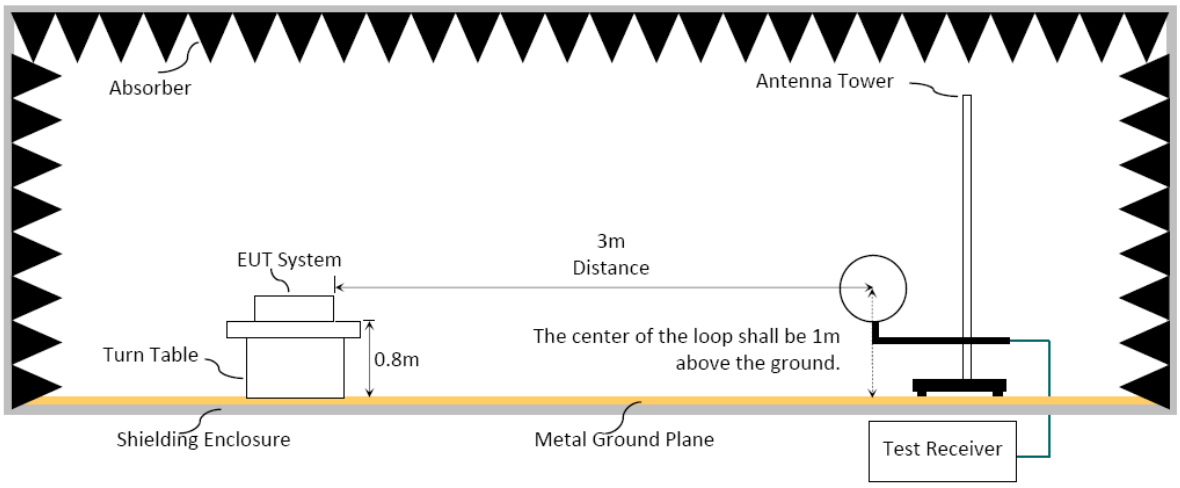
6. RADIATED EMISSION

6.1. Block Diagram of Test Setup

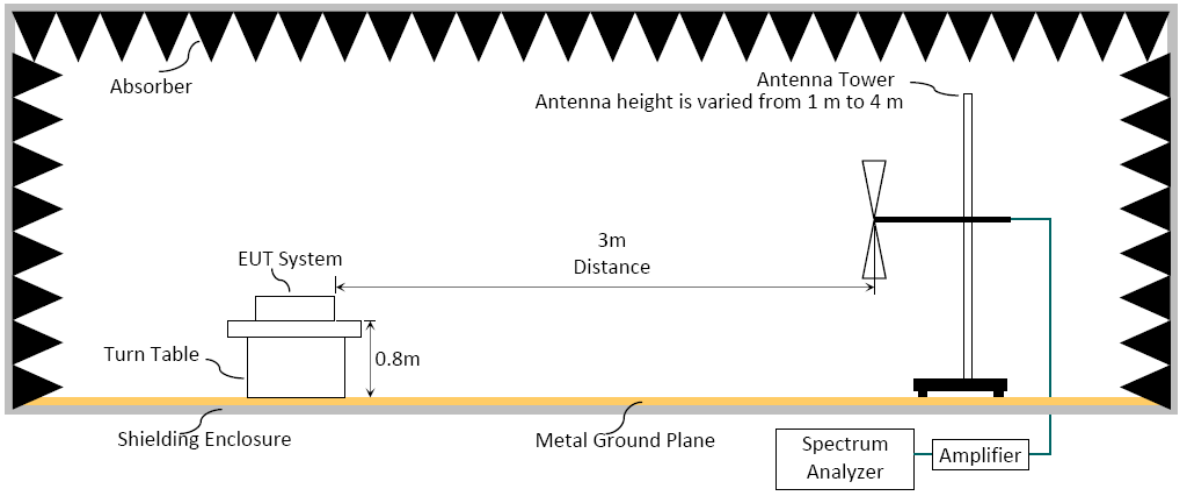
6.1.1. Block Diagram of EUT

Indicated as section 3.8

6.1.2. Setup Diagram for 9kHz-30MHz



6.1.3. Setup Diagram for 30-1000 MHz



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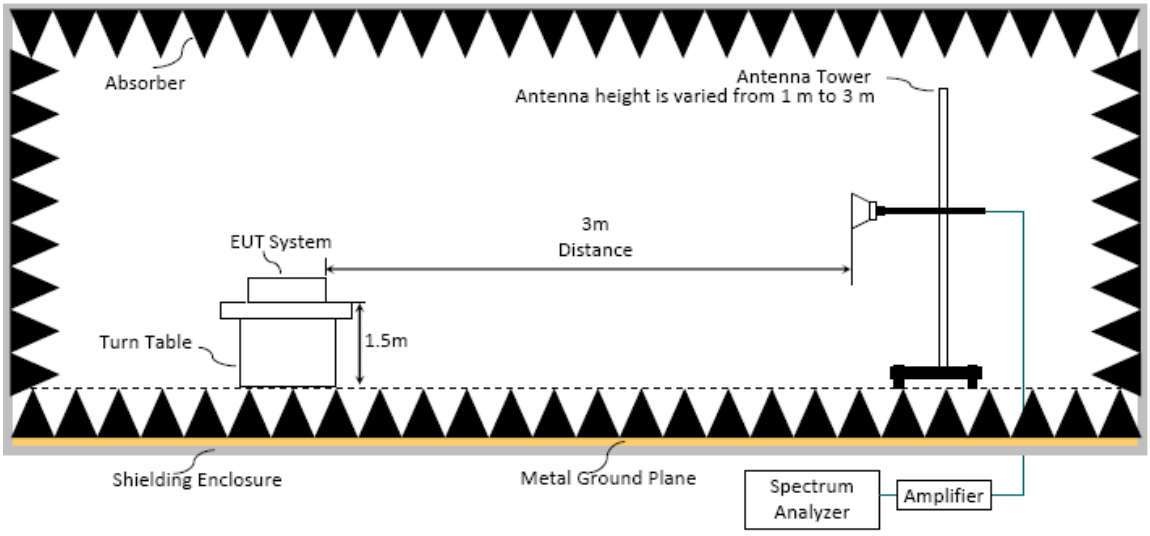
6.1.4. Setup Diagram for above 1GHz



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	
		dBμV/m	μV/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 dBμV/m (Peak) 54.0 dBμV/m (Average)	

Remark：(1) dBμV/m = 20 log (μV/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.

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6.3. Test Procedure

Frequency Range 9kHz~30MHz:
The EUT setup on the turn table 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 80 cm (for 30-1000 MHz) 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 (for 30-1000MHz) or antenna varied from 1 m to 3 m (for above 1GHz) 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 C63.10-2013regulation.

Frequency below 1 GHz:
Spectrum Analyzer is used for pre-testing with following setting:
(1)RBW = 120KHz
(2)VBW ≥ 3 x 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 ≥ 3 x 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.

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Average Detector:

■Option 1:

(1)RBW = 1MHz

(2)VBW ≥ 1/ T.

Modulation Type	T (ms)	1/ T (kHz)	VBW Setting (kHz)
802.11b	0.590	1.694915	1.6kHz
802.11g	0.145	6.896552	6.8kHz
802.11n-HT20	0.155	6.451613	6.2kHz

N/A: 1/ T is not implemented when duty cycle presented in section 3.6 is ≥98 %.

(1)Detector = Peak.

(2)Sweep time = auto.

(3)Trace mode = max hold.

(4)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=Antenna Factor + Cable Loss + Meter Reading (Including Pre-Amp factor)

■Average Emission Level l=Antenna Factor + Cable Loss + Meter Reading (Including Pre-Amp factor)

□Average Emission Level= Peak Emission Level+ DCCF

Duty Cycle Correction Factor (DCCF)= 20log (TX_{on}/TX_{on+off}) presented in section 3.7

□ERP= Peak Emission Level-95.2dB-2.14dB

6.5. Test Results

Please refer to Appendix A.

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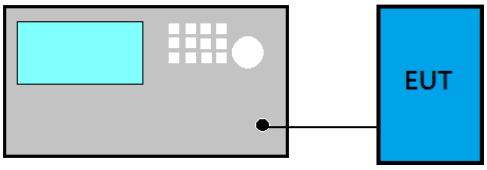
7. 6dB/OCCUPIED BANDWIDTH

7.1. Block Diagram of Test Setup



7.2. Specification Limits

The minimum 6dB bandwidth shall be at least 500kHz.

7.3. Test Procedure

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

(1) Set RBW = 100 kHz.
(2) Set the video bandwidth (VBW) ≥ 3 × 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 dB to -6 dB to record the final bandwidth.
(7) Setting channel bandwidth function x to -6dB or 99% power to record the final bandwidth.

7.4. Test Results

Please refer to Appendix A

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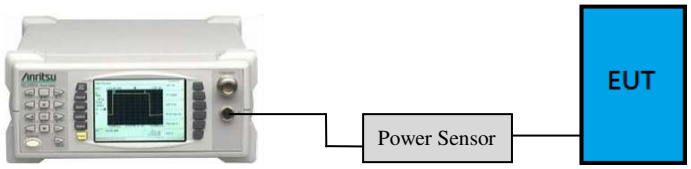
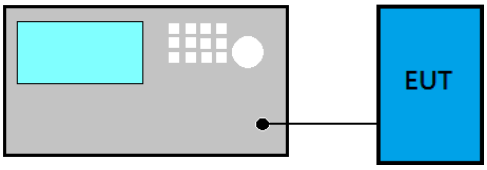
8. MAXIMUM PEAK OUTPUT POWER

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)

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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 ≥ DTS bandwidth
(2) Set VBW ≥ 3 × RBW
(3) Set span ≥ 3 × 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) ≥ 3 × 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

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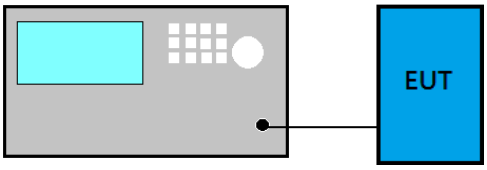
9. EMISSION LIMITATIONS

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 ≥ 3 × 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.

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■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 ≥ 3 × 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

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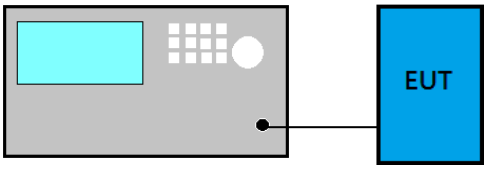
10. POWER SPECTRAL DENSITY

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 kHz ≤ RBW ≤ 100 kHz.
(4) Set the VBW ≥ 3 × 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

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11. DEVIATION TO TEST SPECIFICATIONS

【NONE】

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APPDNDIX A

TEST DATA AND PLOTS

(Model: AS-P-603W)

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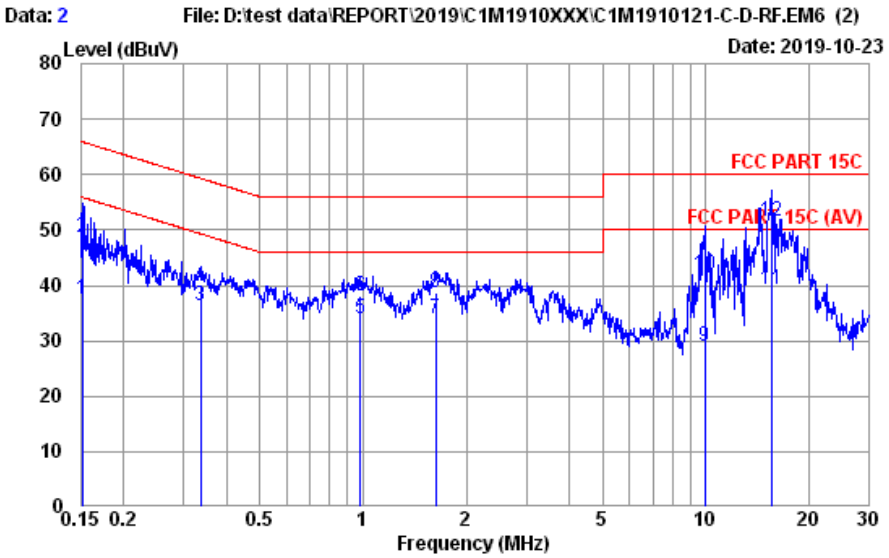
A.1 CONDUCTED EMISSION

Test Phase	Neutral	Test Result	Pass
Test Voltage	AC 120V 60Hz		



Site no. : No.8 Shielded Room
Condition : ENV4200 100169
Limit : FCC PART 15C
Env. / Ins. : 24*C / 61% ESR3 (1774)
EUT : AS-P-603W
Power Rating : 120Vac/60Hz
Test Mode : Operating

Data no. : 2
LISN Phase : NEUTRAL
Engineer : Chucky Chiu

	Freq. (MHz)	AMN Factor (dB)	Cable Loss (dB)	Pulse Att. (dB)	Reading (dBμV)	Emission Level (dBμV)	Limits (dBμV)	Margin (dB)	Remark
1	0.152	10.70	0.04	9.86	16.98	37.58	55.91	18.33	Average
2	0.152	10.70	0.04	9.86	28.03	48.63	65.91	17.28	QP
3	0.336	10.52	0.04	9.86	15.83	36.25	49.31	13.06	Average
4	0.336	10.52	0.04	9.86	19.41	39.83	59.31	19.48	QP
5	0.984	10.47	0.05	9.86	13.54	33.92	46.00	12.08	Average
6	0.984	10.47	0.05	9.86	17.76	38.14	56.00	17.86	QP
7	1.628	10.50	0.06	9.86	13.59	34.01	46.00	11.99	Average
8	1.628	10.50	0.06	9.86	18.23	38.65	56.00	17.35	QP
9	9.913	11.35	0.14	9.89	7.70	29.08	50.00	20.92	Average
10	9.913	11.35	0.14	9.89	20.38	41.76	60.00	18.24	QP
11	15.552	12.77	0.16	9.92	16.44	39.29	50.00	10.71	Average
12	15.552	12.77	0.16	9.92	28.58	51.43	60.00	8.57	QP

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

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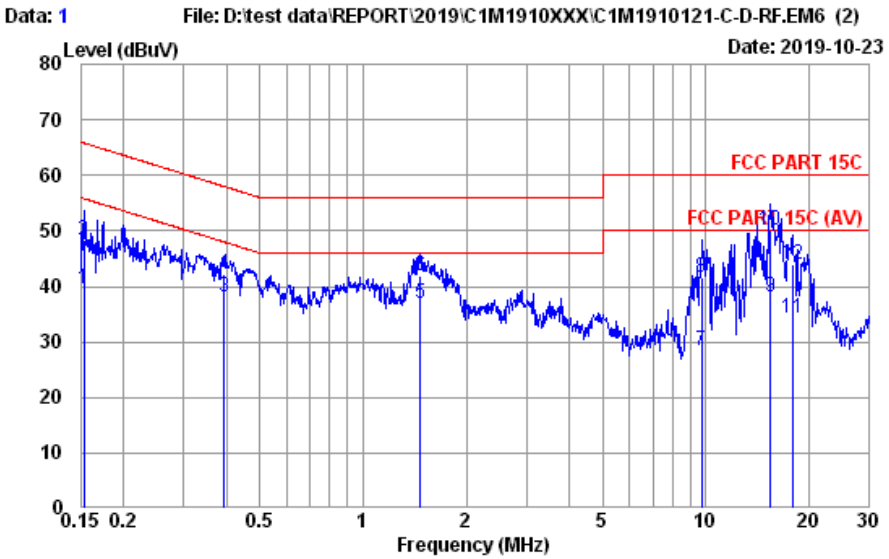
Test Phase	Neutral	Test Result	Pass
Test Voltage	AC 120V 60Hz		




```
Site no.      : No.8 Shielded Room          Data no.    : 1
Condition     : ENV4200 100169              LISN Phase  : LINE
Limit         : FCC PART 15C
Env. / Ins.   : 24*C / 61% ESR3 (1774)      Engineer    : Chucky Chiu
EUT           : AS-P-603W
Power 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	0.153	10.61	0.04	9.86	19.17	39.68	55.82	16.14	Average
2	0.153	10.61	0.04	9.86	27.70	48.21	65.82	17.61	QP
3	0.393	10.45	0.04	9.86	17.86	38.21	47.99	9.78	Average
4	0.393	10.45	0.04	9.86	21.89	42.24	57.99	15.75	QP
5	1.472	10.44	0.06	9.86	16.62	36.98	46.00	9.02	Average
6	1.472	10.44	0.06	9.86	21.68	42.04	56.00	13.96	QP
7	9.705	11.13	0.14	9.89	7.22	28.38	50.00	21.62	Average
8	9.705	11.13	0.14	9.89	20.53	41.69	60.00	18.31	QP
9	15.470	12.39	0.16	9.92	15.73	38.20	50.00	11.80	Average
10	15.470	12.39	0.16	9.92	27.62	50.09	60.00	9.91	QP
11	17.849	12.80	0.18	9.94	11.36	34.28	50.00	15.72	Average
12	17.849	12.80	0.18	9.94	21.14	44.06	60.00	15.94	QP

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

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A.2 RADIATED EMISSION

Test Date	2019/10/18 ~ 22	Temp./Hum.	24-25℃/43-51%
Test Voltage	AC 120V, 60Hz	Tested By	Brian Hsieh

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.

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A.2.1.2 Frequency Below 1GHz

Mode	802.11n-HT20	Frequency	TX 2412MHz

Antenna at Horizontal Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
80.44	13.55	2.05	19.86	35.46	40.00	4.54	Peak
120.21	18.63	2.53	17.88	39.04	43.50	4.46	Peak
159.98	16.50	3.01	18.30	37.81	43.50	5.69	Peak
199.75	16.27	3.42	18.74	38.43	43.50	5.07	Peak
240.49	18.38	3.85	21.91	44.14	46.00	1.86	Peak
335.55	20.76	4.99	12.48	38.23	46.00	7.77	Peak

Antenna at Vertical Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
62.01	12.47	1.76	24.49	38.72	40.00	1.28	Peak
120.21	18.63	2.53	16.46	37.62	43.50	5.88	Peak
143.49	17.38	2.81	15.24	35.43	43.50	8.07	Peak
159.98	16.50	3.01	15.04	34.55	43.50	8.95	Peak
240.49	18.38	3.85	7.79	30.02	46.00	15.98	Peak
870.02	27.07	8.29	2.03	37.39	46.00	8.61	Peak

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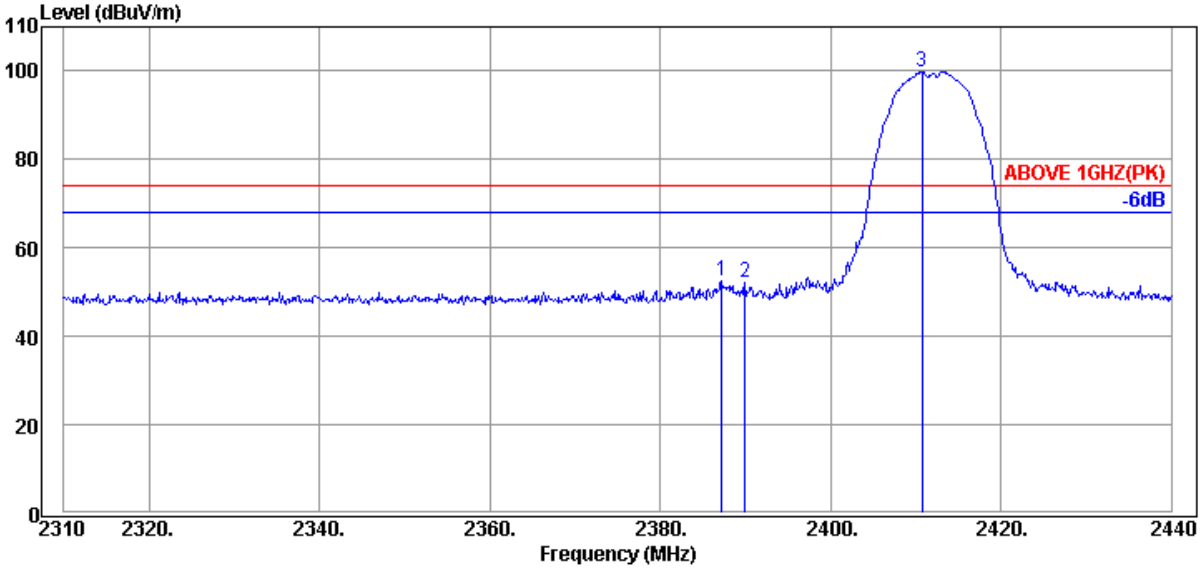
A.2.1.3 Frequency Above 1 GHz to 10th harmonics

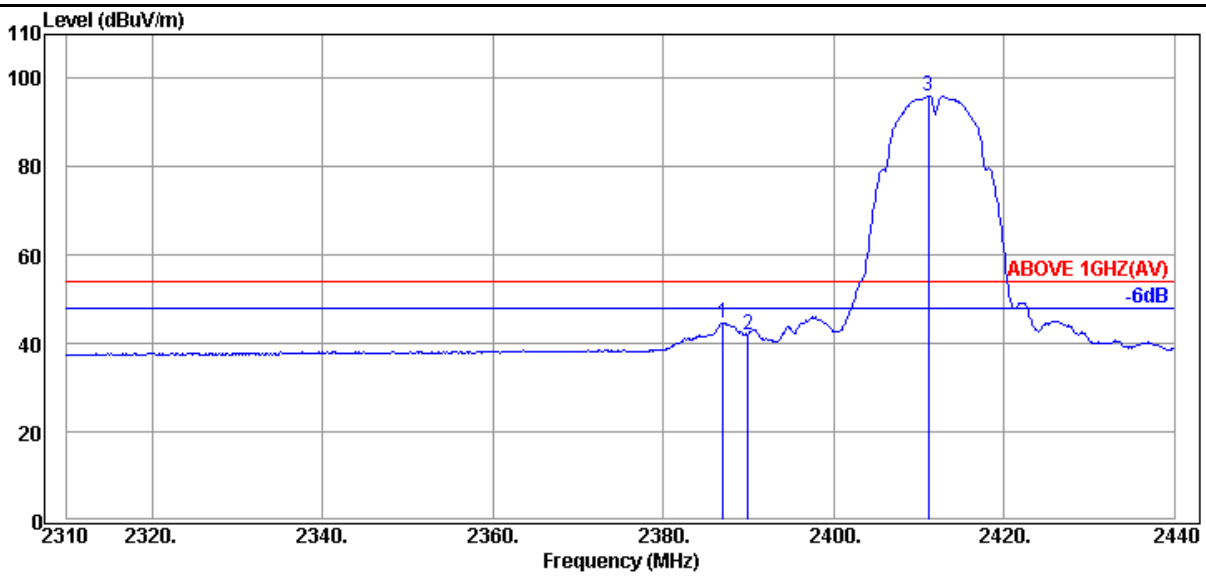
Band Edge:

Mode	802.11b	Frequency	TX 2412MHz



Antenna at Horizontal Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
2387.22	32.00	8.52	11.93	52.45	74.00	21.55	Peak
2389.95	32.00	8.52	11.60	52.12	74.00	21.88	Peak
2410.75	32.15	8.53	59.15	99.83	---	---	Peak



Antenna at Horizontal Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
2387.09	32.00	8.52	4.16	44.68	54.00	9.32	Average
2389.95	32.00	8.52	1.59	42.11	54.00	11.89	Average
2411.14	32.16	8.53	55.50	96.19	---	---	Average

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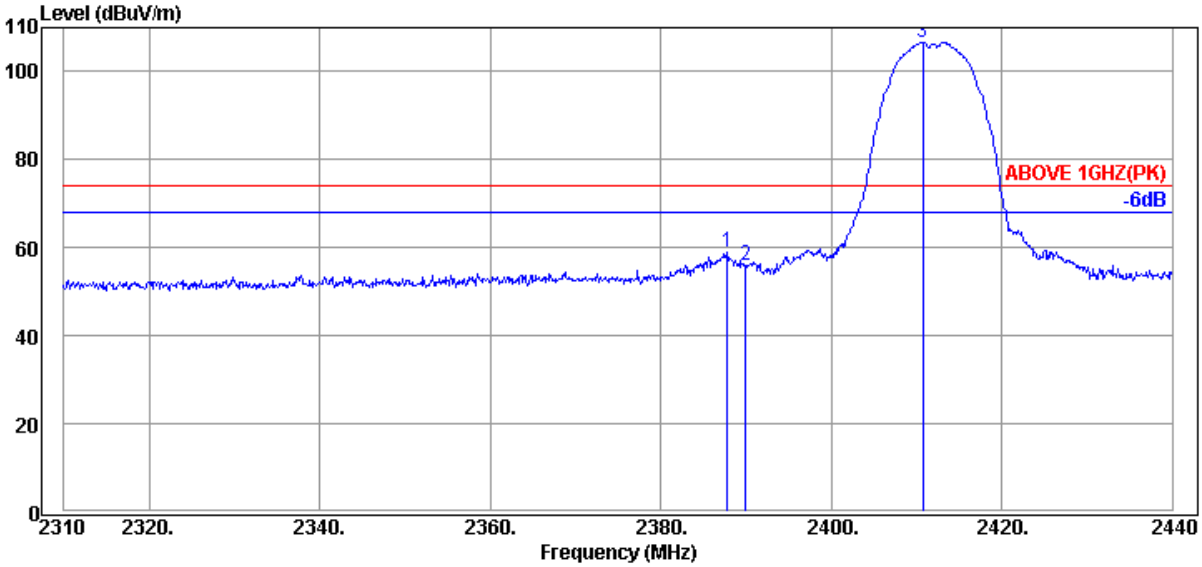
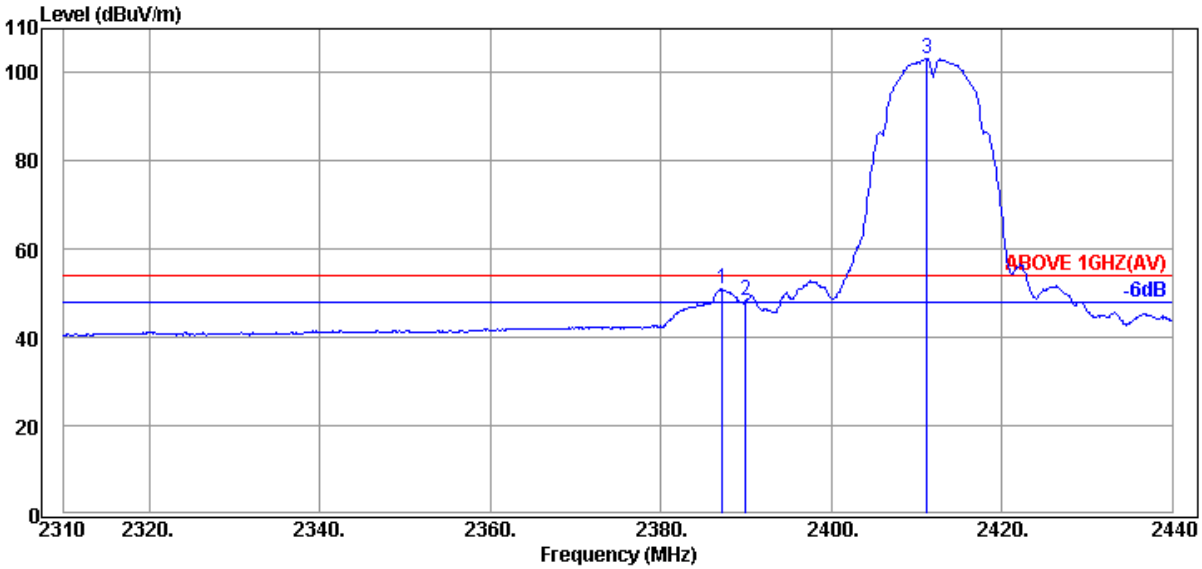
Mode	802.11b	Frequency	TX 2412MHz



Antenna at Vertical Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
2387.87	32.00	8.52	18.53	59.05	74.00	14.95	Peak
2389.95	32.00	8.52	15.43	55.95	74.00	18.05	Peak
2410.75	32.15	8.53	66.00	106.68	---	---	Peak



Antenna at Vertical Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
2387.22	32.00	8.52	10.51	51.03	54.00	2.97	Average
2389.95	32.00	8.52	7.70	48.22	54.00	5.78	Average
2411.27	32.16	8.53	62.54	103.23	---	---	Average

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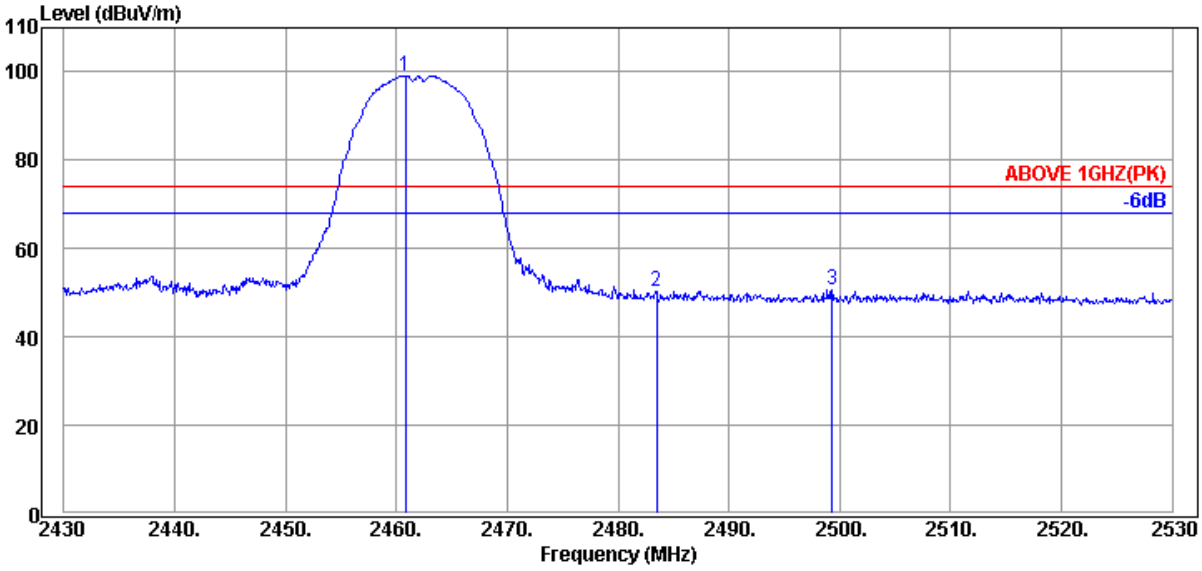
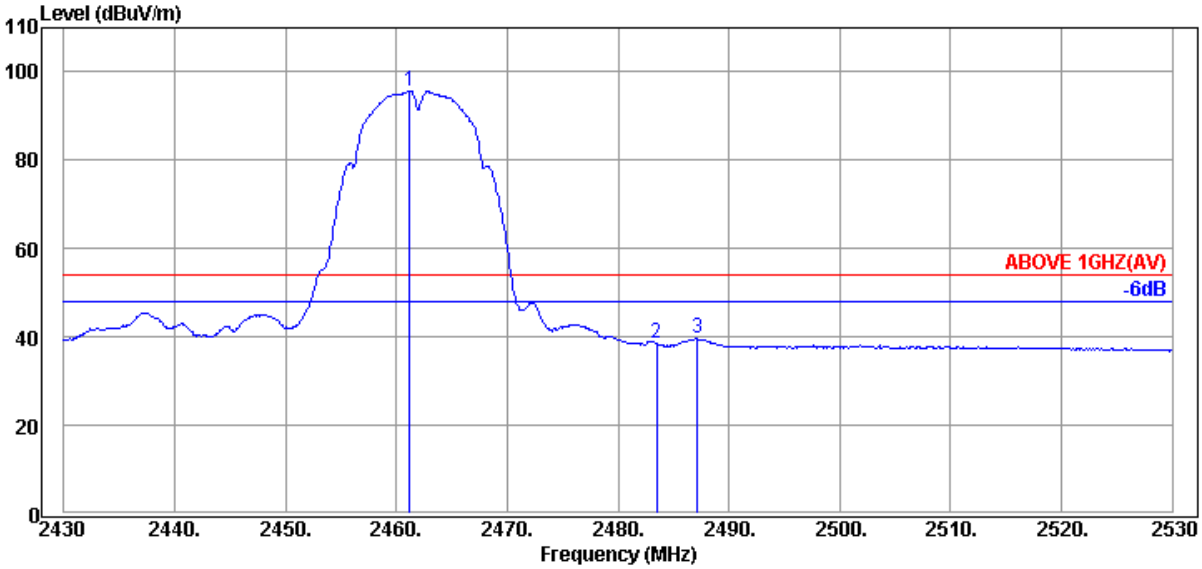
Mode	802.11b	Frequency	TX 2462MHz



Antenna at Horizontal Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dBµV)	Emission Level (dBµV/m)	Limits (dBµV/m)	Margin (dB)	Detector
2460.80	32.66	8.57	57.95	99.18	---	---	Peak
2483.50	32.57	8.58	9.13	50.28	74.00	23.72	Peak
2499.30	32.50	8.59	9.45	50.54	74.00	23.46	Peak



Antenna at Horizontal Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dBµV)	Emission Level (dBµV/m)	Limits (dBµV/m)	Margin (dB)	Detector
2461.20	32.66	8.57	54.55	95.78	---	---	Average
2483.50	32.57	8.58	-2.60	38.55	54.00	15.45	Average
2487.20	32.55	8.58	-1.46	39.67	54.00	14.33	Average

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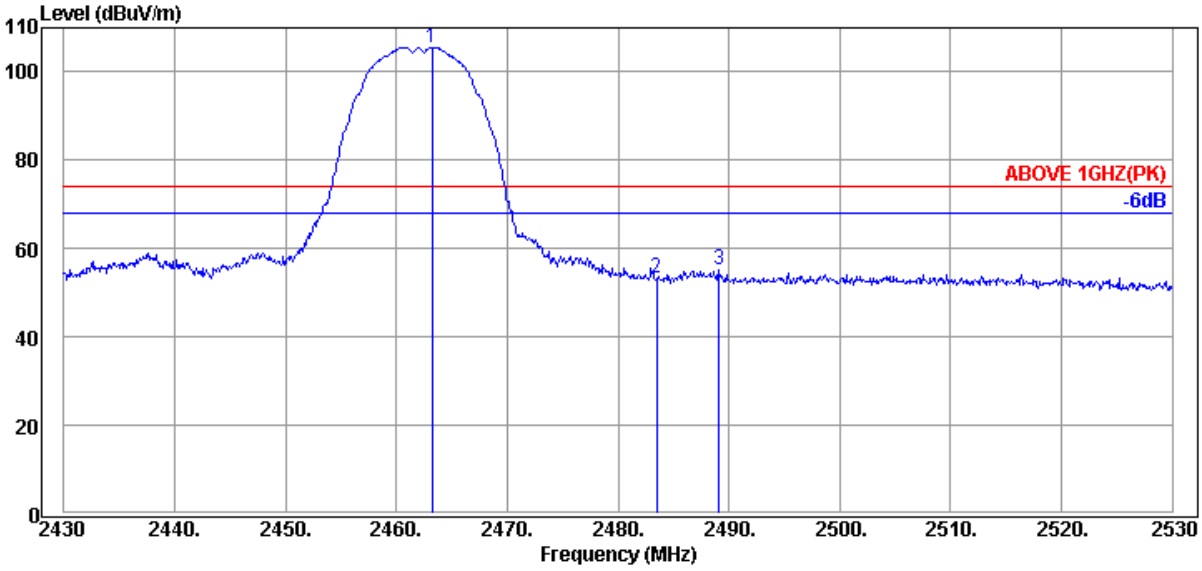
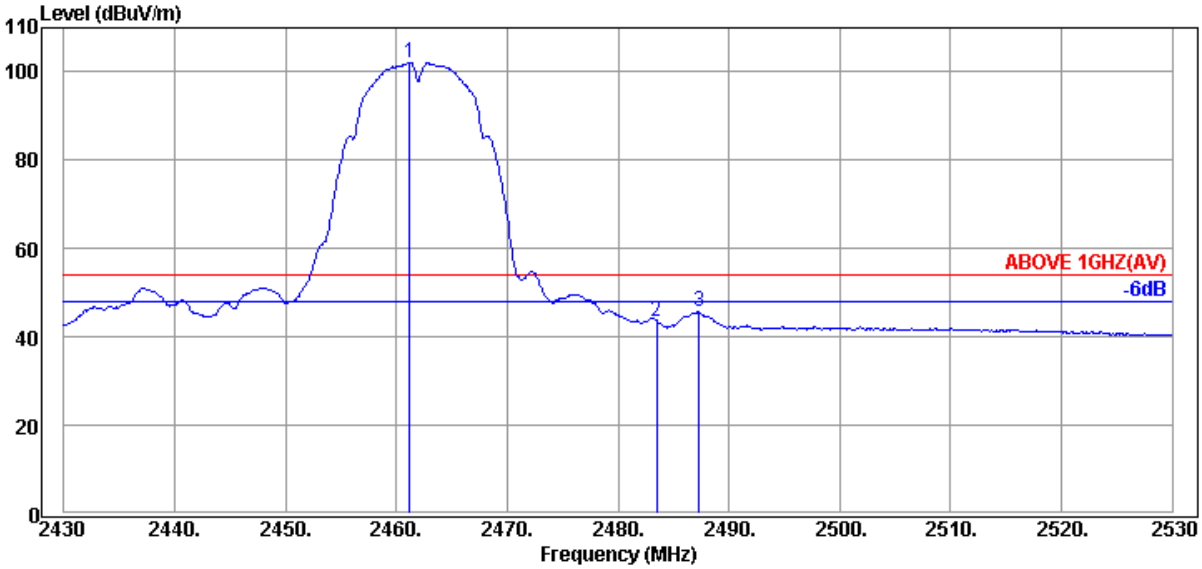
Mode	802.11b	Frequency	TX 2462MHz



Antenna at Vertical Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dBµV)	Emission Level (dBµV/m)	Limits (dBµV/m)	Margin (dB)	Detector
2463.20	32.65	8.57	64.39	105.61	---	---	Peak
2483.50	32.57	8.58	12.03	53.18	74.00	20.82	Peak
2489.10	32.54	8.59	13.92	55.05	74.00	18.95	Peak



Antenna at Vertical Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dBµV)	Emission Level (dBµV/m)	Limits (dBµV/m)	Margin (dB)	Detector
2461.20	32.66	8.57	60.93	102.16	---	---	Average
2483.50	32.57	8.58	2.50	43.65	54.00	10.35	Average
2487.30	32.55	8.58	4.62	45.75	54.00	8.25	Average

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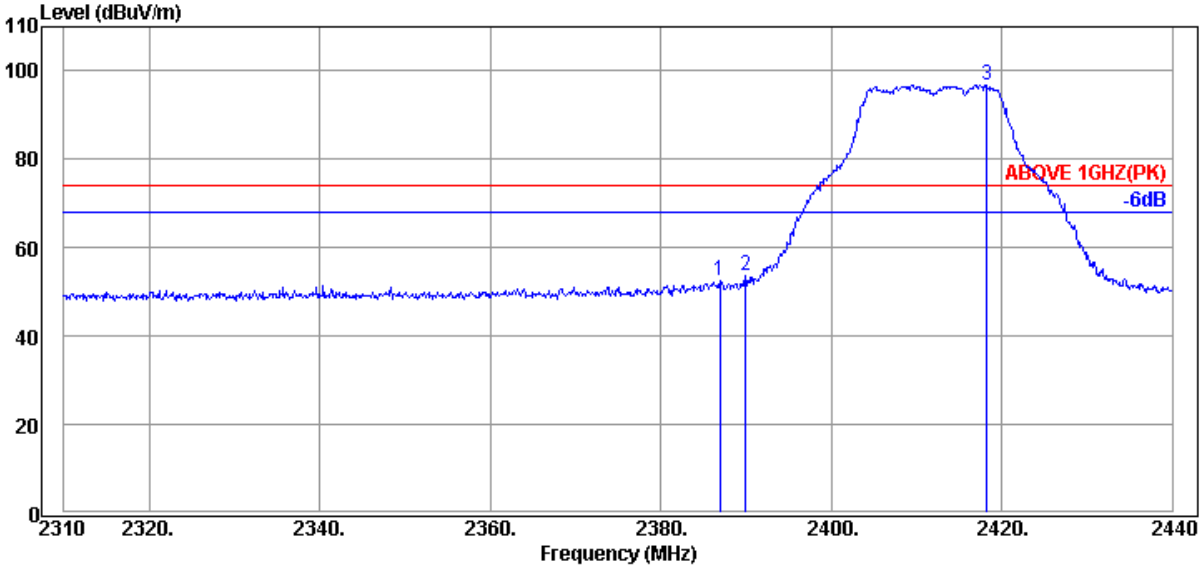
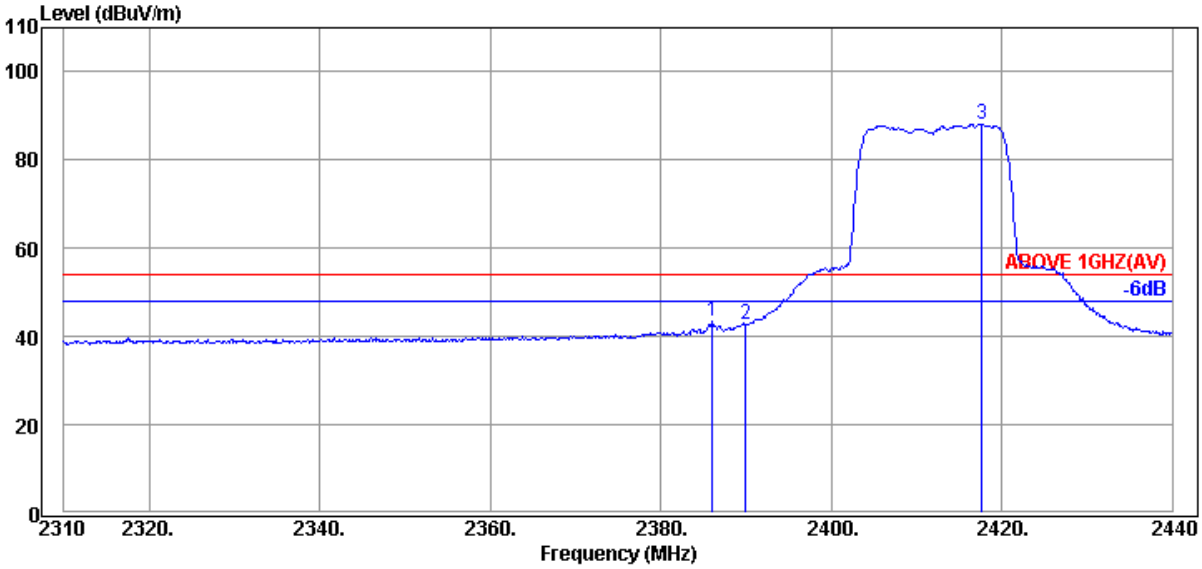
Mode	802.11g	Frequency	TX 2412MHz



Antenna at Horizontal Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
2386.96	32.00	8.52	11.87	52.39	74.00	21.61	Peak
2389.95	32.00	8.52	13.03	53.55	74.00	20.45	Peak
2418.29	32.26	8.53	55.91	96.70	---	---	Peak



Antenna at Horizontal Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
2386.05	32.00	8.52	2.82	43.34	54.00	10.66	Average
2389.95	32.00	8.52	2.36	42.88	54.00	11.12	Average
2417.64	32.25	8.53	47.44	88.22	---	---	Average

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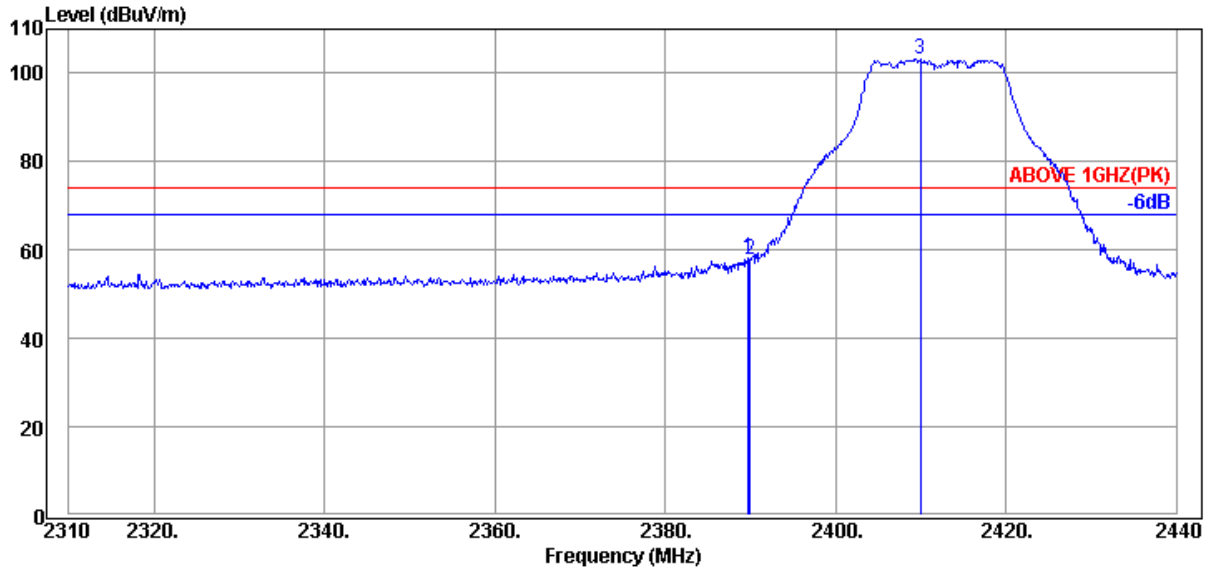
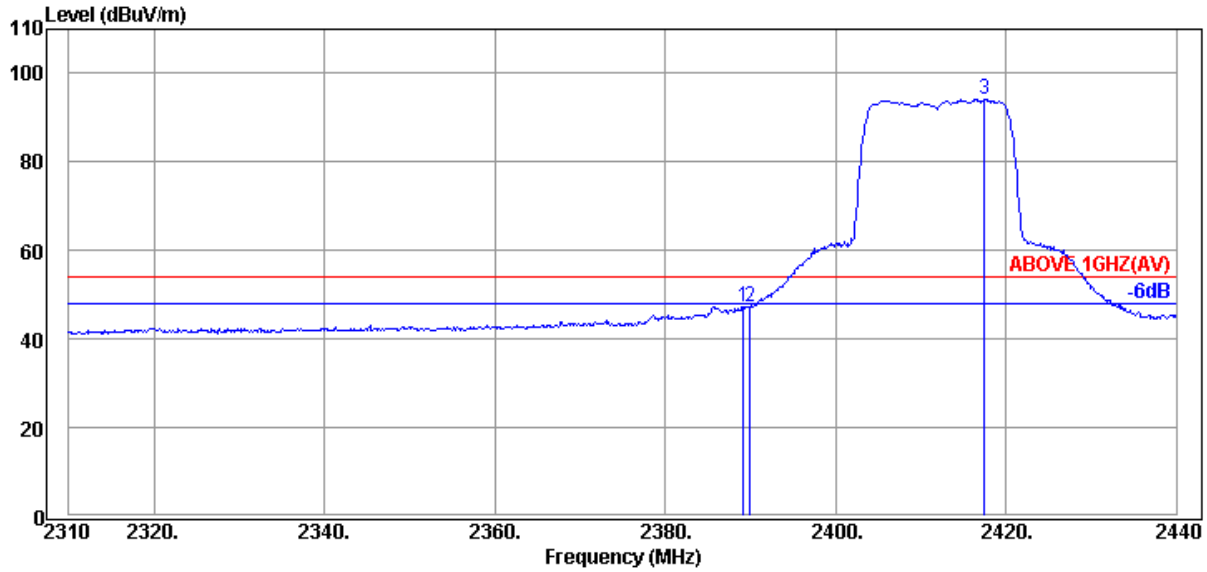
Mode	802.11g	Frequency	TX 2412MHz



Antenna at Vertical Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
2389.82	32.00	8.52	17.63	58.15	74.00	15.85	Peak
2389.95	32.00	8.52	17.46	57.98	74.00	16.02	Peak
2409.97	32.14	8.53	62.55	103.22	---	---	Peak



Antenna at Vertical Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
2389.17	32.00	8.52	6.91	47.43	54.00	6.57	Average
2389.95	32.00	8.52	6.74	47.26	54.00	6.74	Average
2417.51	32.25	8.53	53.42	94.20	---	---	Average

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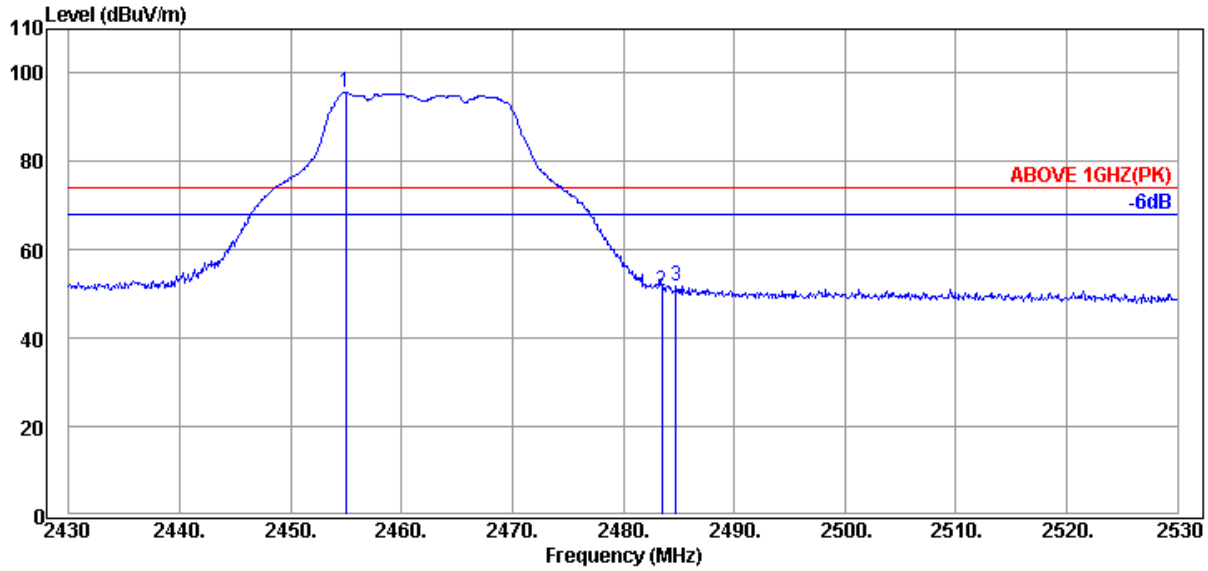
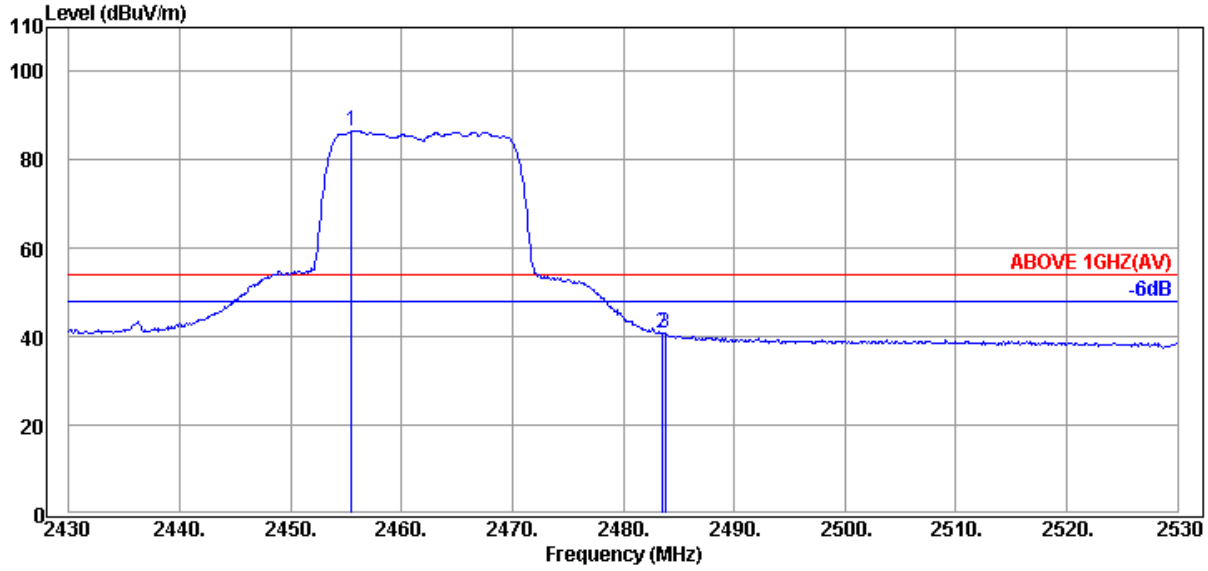
Mode	802.11g	Frequency	TX 2462MHz



Antenna at Horizontal Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
2455.00	32.68	8.57	54.35	95.60	---	---	Peak
2483.50	32.57	8.58	9.55	50.70	74.00	23.30	Peak
2484.80	32.56	8.58	10.74	51.88	74.00	22.12	Peak



Antenna at Horizontal Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
2455.50	32.68	8.57	45.46	86.71	---	---	Average
2483.50	32.57	8.58	-0.39	40.76	54.00	13.24	Average
2483.80	32.56	8.58	-0.44	40.70	54.00	13.30	Average

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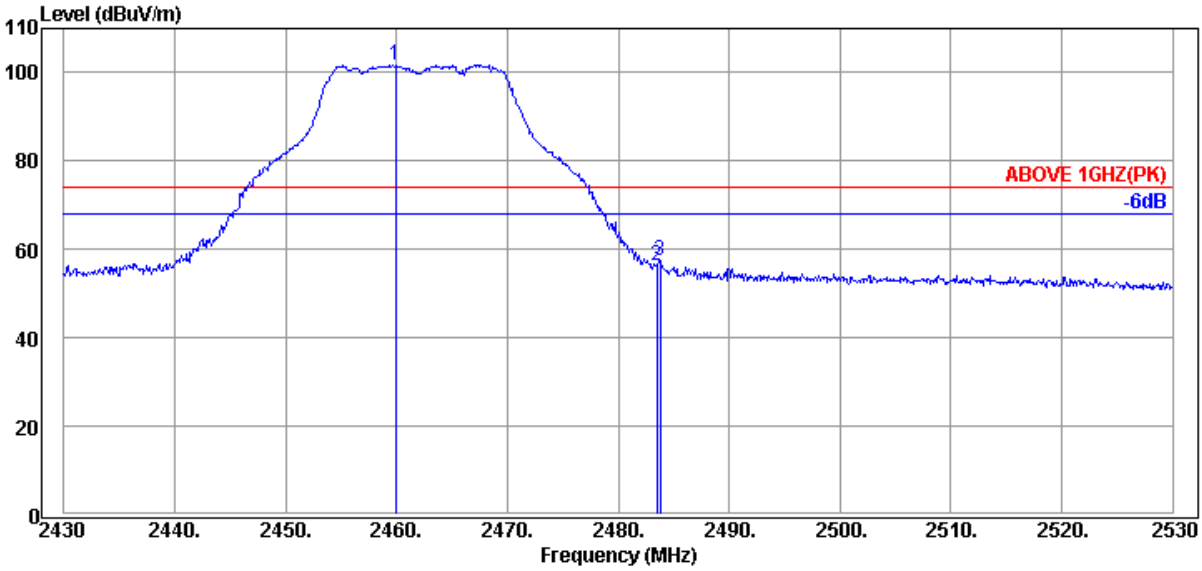
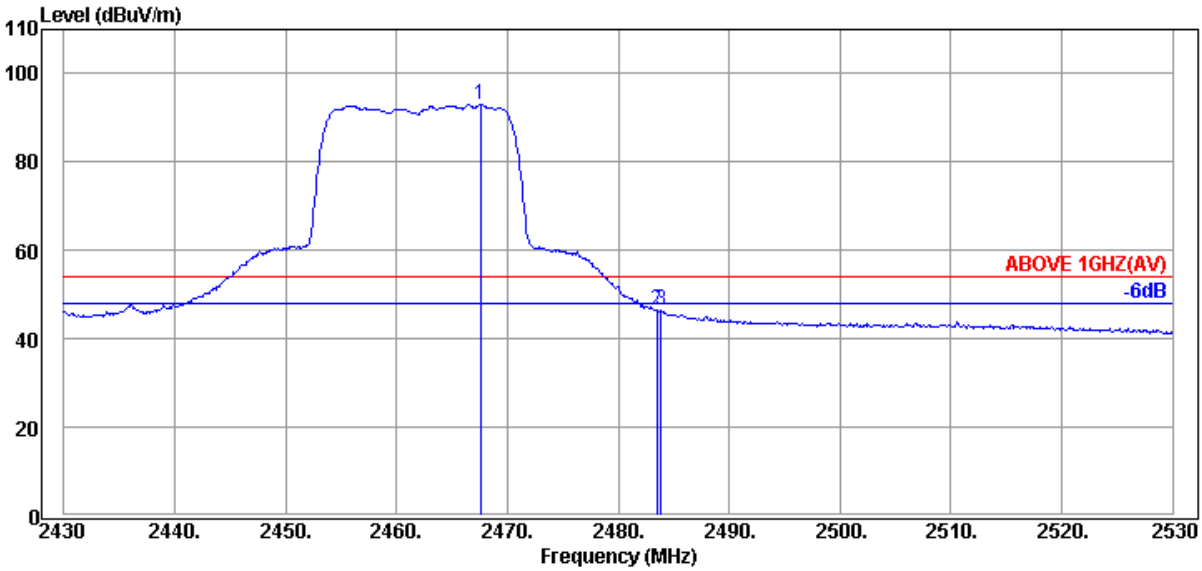
Mode	802.11g	Frequency	TX 2462MHz



Antenna at Vertical Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
2459.90	32.66	8.57	60.33	101.56	---	---	Peak
2483.50	32.57	8.58	15.01	56.16	74.00	17.84	Peak
2483.80	32.56	8.58	16.41	57.55	74.00	16.45	Peak



Antenna at Vertical Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
2467.60	32.63	8.57	51.76	92.96	---	---	Average
2483.50	32.57	8.58	5.22	46.37	54.00	7.63	Average
2483.90	32.56	8.58	5.46	46.60	54.00	7.40	Average

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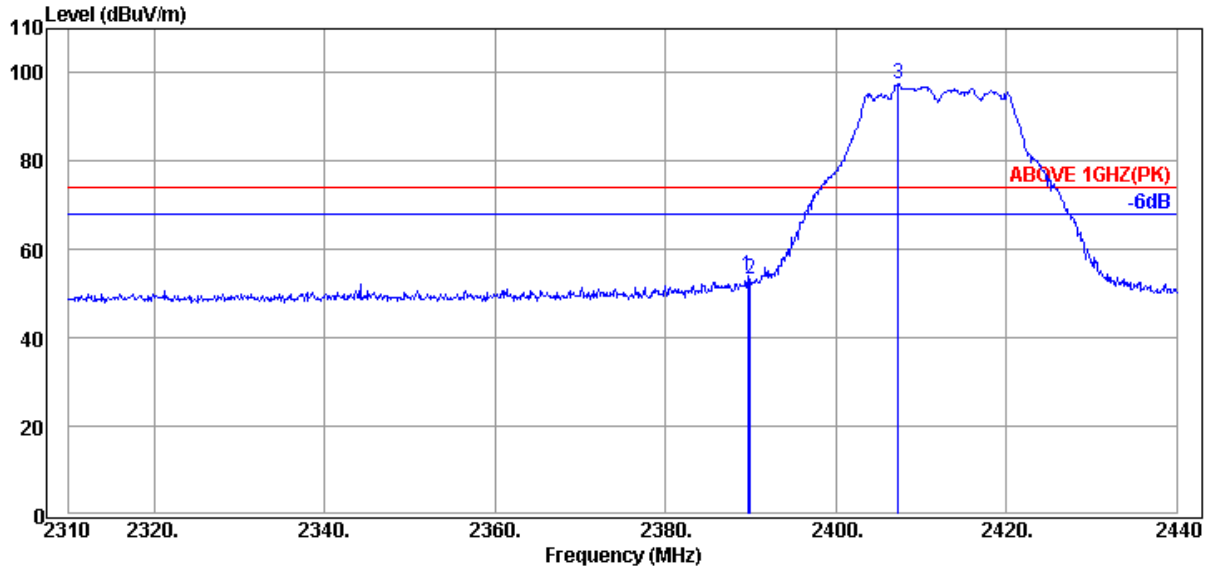
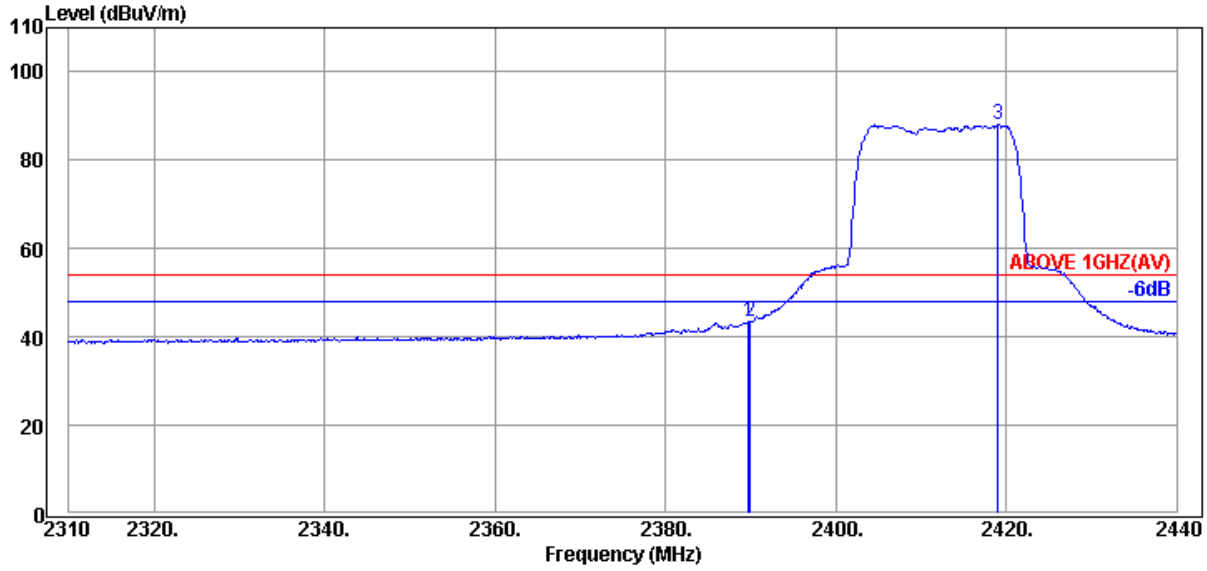
Mode	802.11n-HT20	Frequency	TX 2412MHz



Antenna at Horizontal Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dBµV)	Emission Level (dBµV/m)	Limits (dBµV/m)	Margin (dB)	Detector
2389.69	32.00	8.52	13.35	53.87	74.00	20.13	Peak
2389.95	32.00	8.52	12.66	53.18	74.00	20.82	Peak
2407.37	32.10	8.53	56.90	97.53	---	---	Peak



Antenna at Horizontal Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dBµV)	Emission Level (dBµV/m)	Limits (dBµV/m)	Margin (dB)	Detector
2389.82	32.00	8.52	3.04	43.56	54.00	10.44	Average
2389.95	32.00	8.52	2.98	43.50	54.00	10.50	Average
2419.07	32.27	8.53	47.26	88.06	---	---	Average

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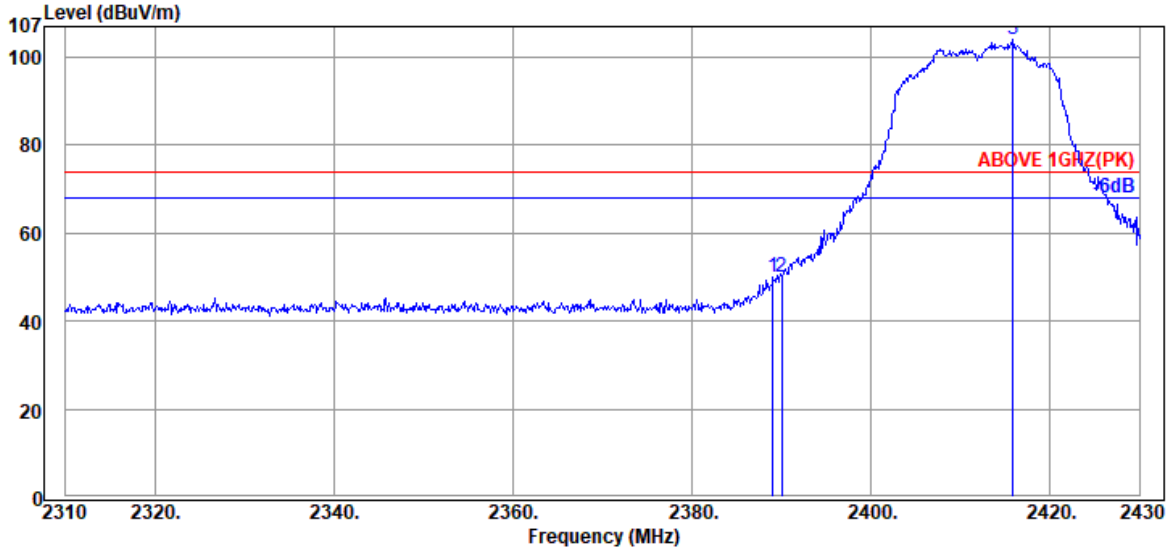
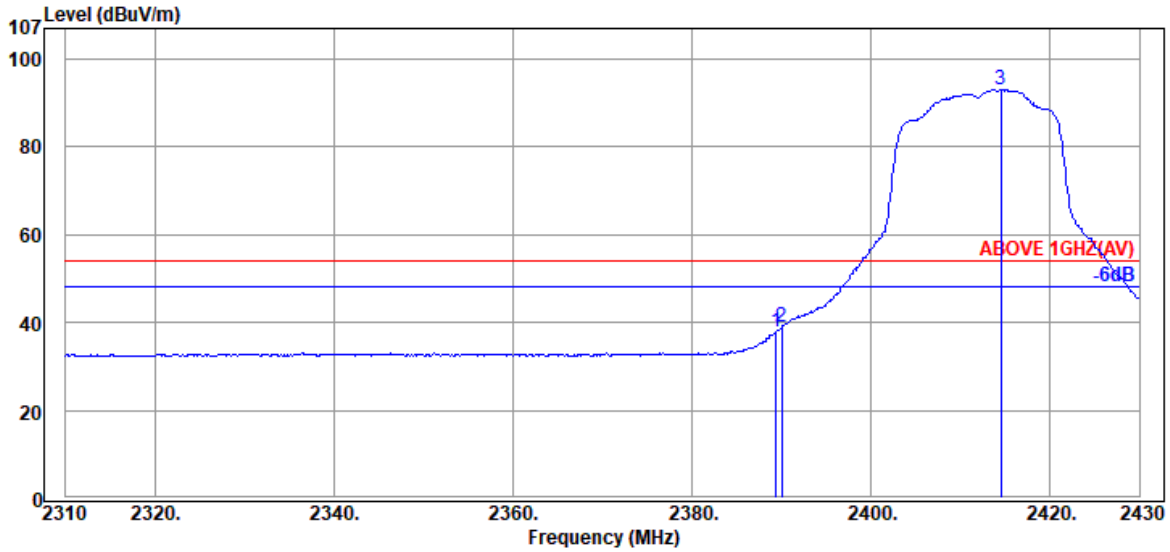
Mode	802.11n-HT20	Frequency	TX 2412MHz



Antenna at Vertical Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dBµV)	Emission Level (dBµV/m)	Limits (dBµV/m)	Margin (dB)	Detector
2389.82	32.00	8.52	17.63	58.15	74.00	15.85	Peak
2389.95	32.00	8.52	18.01	58.53	74.00	15.47	Peak
2407.50	32.10	8.53	63.13	103.76	---	---	Peak



Antenna at Vertical Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dBµV)	Emission Level (dBµV/m)	Limits (dBµV/m)	Margin (dB)	Detector
2389.56	32.00	8.52	7.82	48.34	54.00	5.66	Average
2389.95	32.00	8.52	7.85	48.37	54.00	5.63	Average
2404.64	32.06	8.53	53.28	93.87	---	---	Average

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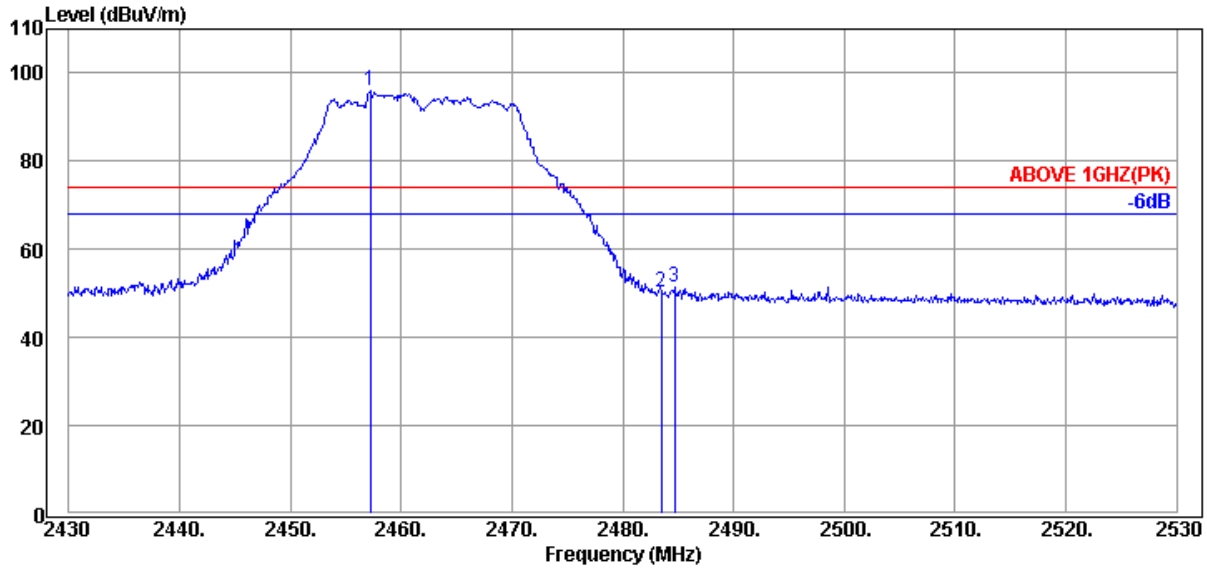
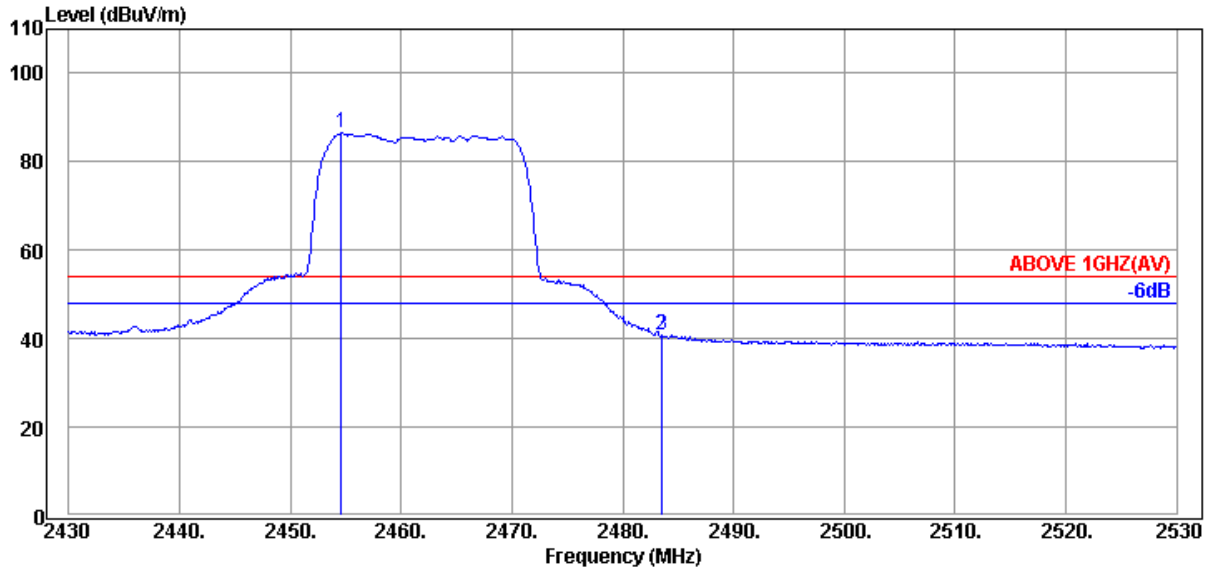
Mode	802.11n-HT20	Frequency	TX 2462MHz



Antenna at Horizontal Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
2457.20	32.67	8.57	54.62	95.86	---	---	Peak
2483.50	32.57	8.58	9.25	50.40	74.00	23.60	Peak
2484.70	32.56	8.58	10.23	51.37	74.00	22.63	Peak



Antenna at Horizontal Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
2454.60	32.68	8.57	45.15	86.40	---	---	Average
2483.50	32.57	8.58	-0.43	40.72	54.00	13.28	Average
2483.60	32.57	8.58	-0.37	40.78	54.00	13.22	Average

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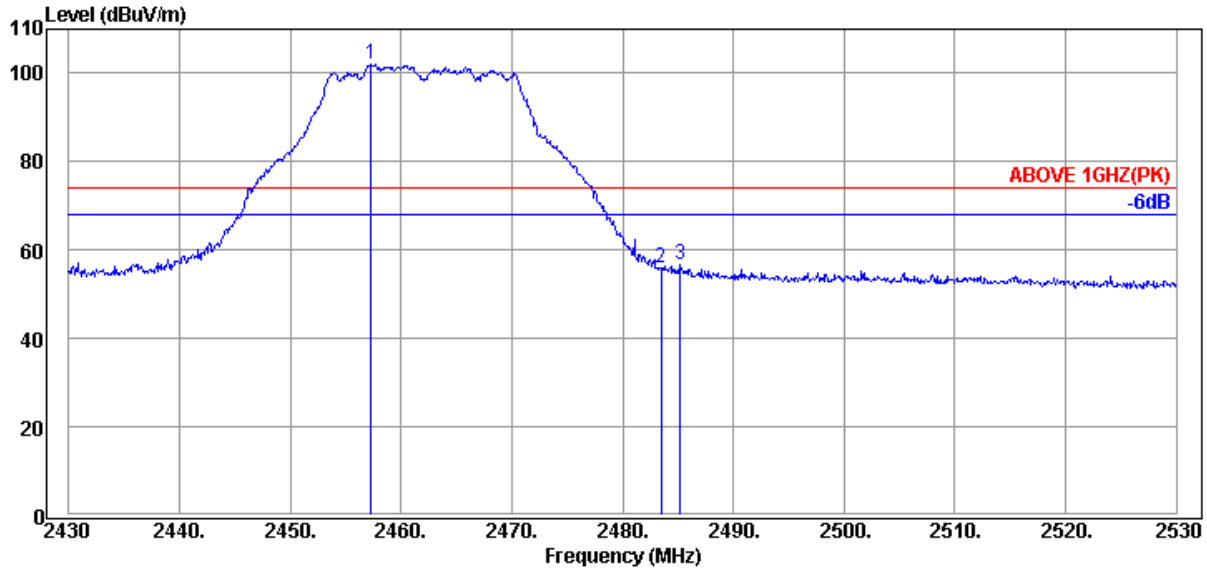
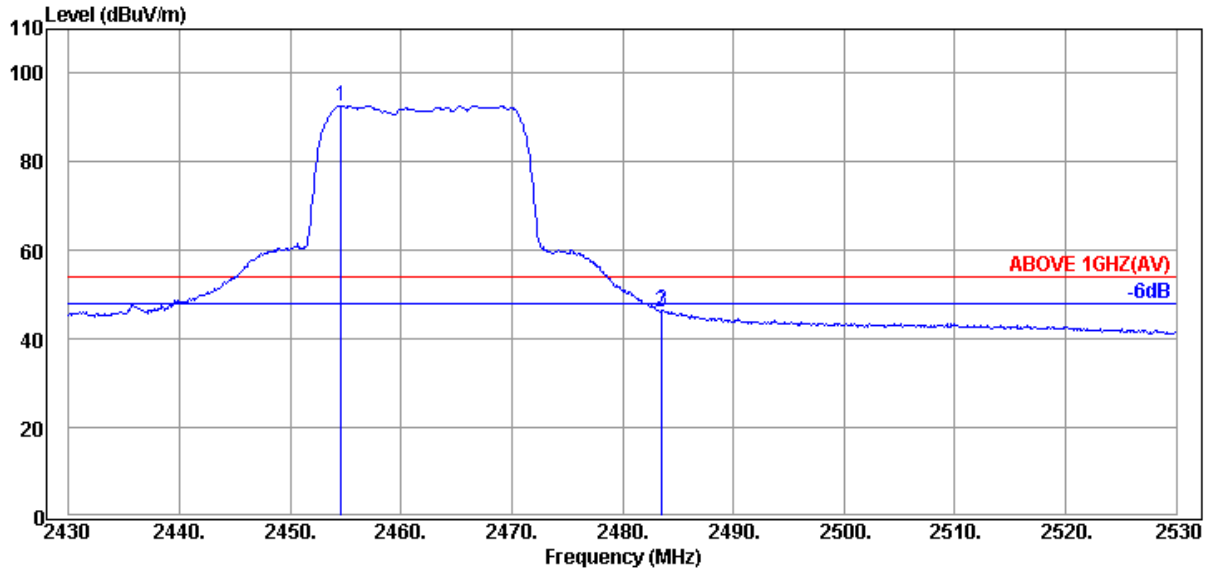
Mode	802.11n-HT20	Frequency	TX 2462MHz



Antenna at Vertical Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
2457.30	32.67	8.57	60.85	102.09	---	---	Peak
2483.50	32.57	8.58	14.65	55.80	74.00	18.20	Peak
2485.20	32.56	8.58	15.39	56.53	74.00	17.47	Peak



Antenna at Vertical Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
2454.60	32.68	8.57	51.52	92.77	---	---	Average
2483.50	32.57	8.58	5.07	46.22	54.00	7.78	Average
2483.60	32.57	8.58	5.26	46.41	54.00	7.59	Average

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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		
Antenna at Horizontal Polarization							
Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
4824.00	34.00	10.22	5.58	49.80	54.00	4.20	Peak
Antenna at Vertical Polarization							
Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
4824.00	34.00	10.22	8.22	52.44	54.00	1.56	Peak

Mode	802.11g			Frequency	TX 2412MHz		
Antenna at Horizontal Polarization							
Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
4824.00	34.00	10.22	-2.53	41.69	54.00	12.31	Peak
Antenna at Vertical Polarization							
Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
4824.00	34.00	10.22	-0.71	43.51	54.00	10.49	Peak

Mode	802.11n-HT20			Frequency	TX 2412MHz		
Antenna at Horizontal Polarization							
Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
4824.00	34.00	10.22	-1.66	42.56	54.00	11.44	Peak
Antenna at Vertical Polarization							
Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
4824.00	34.00	10.22	-2.71	41.51	54.00	12.49	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 8.9table 4 general radiated emissions limits is not required.

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A.3 6dB/OCCUPIED BANDWIDTH

Test Date	2019/10/24	Temp./Hum.	25℃/43%
Cable Loss	1.15dB	Test Voltage	AC 120V, 60Hz
		Tested By	Brian Hsieh

A.3.1 Emission Bandwidth Result

Mode	Centre Frequency (MHz)	6 dB Bandwidth (MHz)	Occupied (99%) Bandwidth (MHz)	Limit
802.11b	2412	8.121	10.477	>500kHz
	2437	8.579	10.486	
	2462	8.108	10.473	
802.11g	2412	16.37	16.471	
	2437	16.37	16.478	
	2462	16.38	16.491	
802.11n-HT20	2412	17.60	17.705	
	2437	17.60	17.701	
	2462	17.61	17.720	

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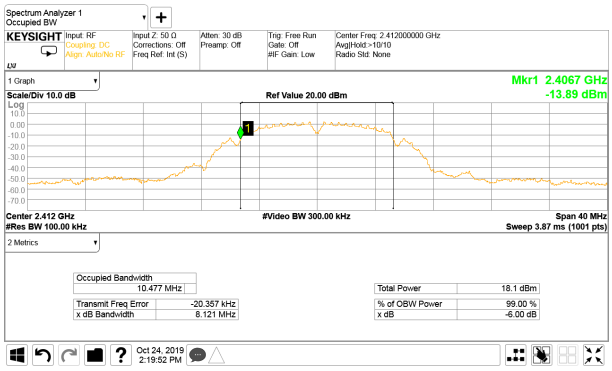
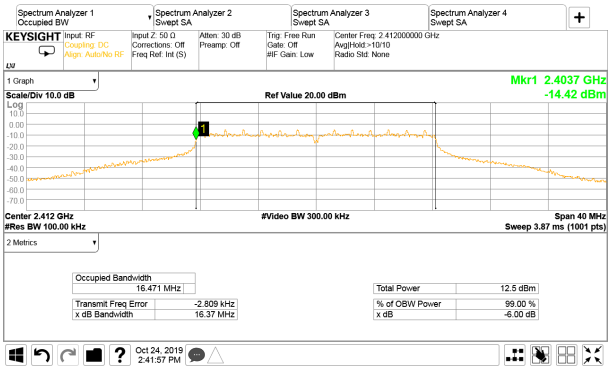
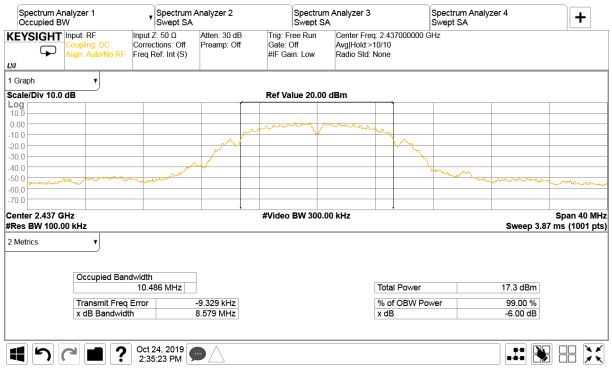
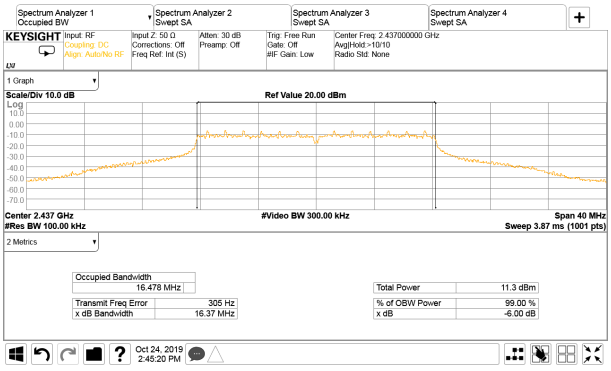
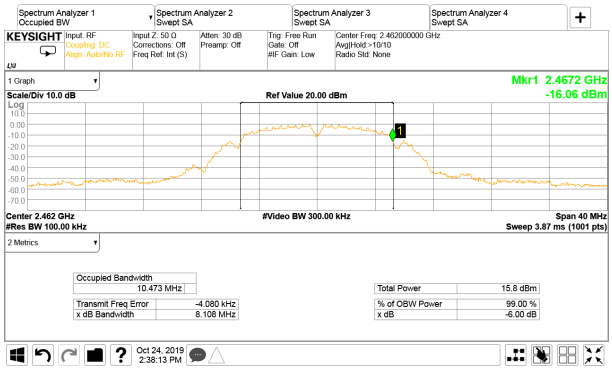
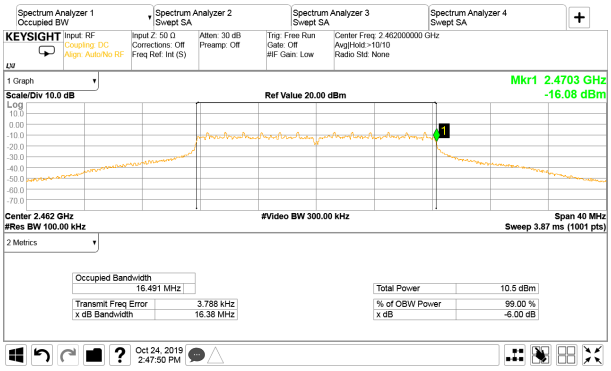
A.3.2 Measurement Plots

802.11b	802.11g
	
	
	

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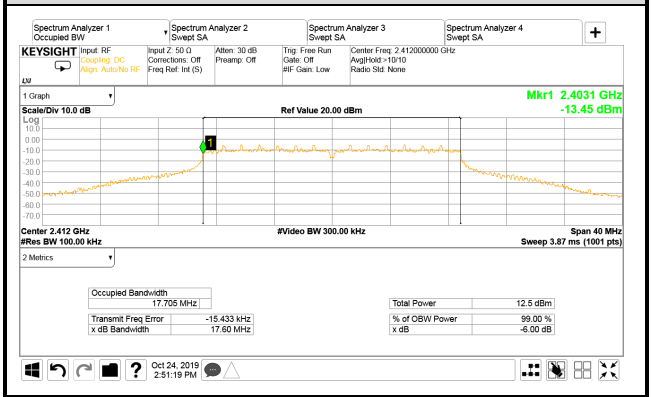
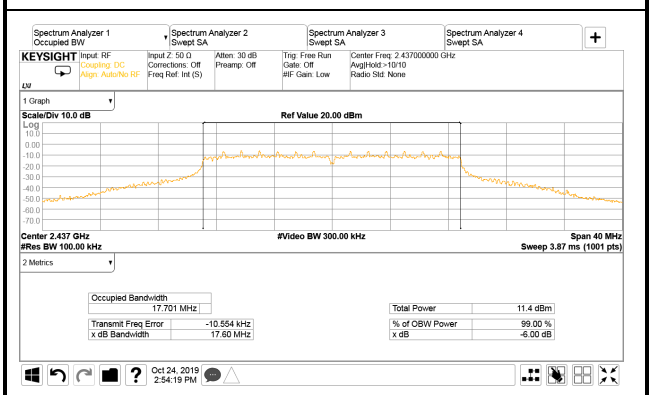
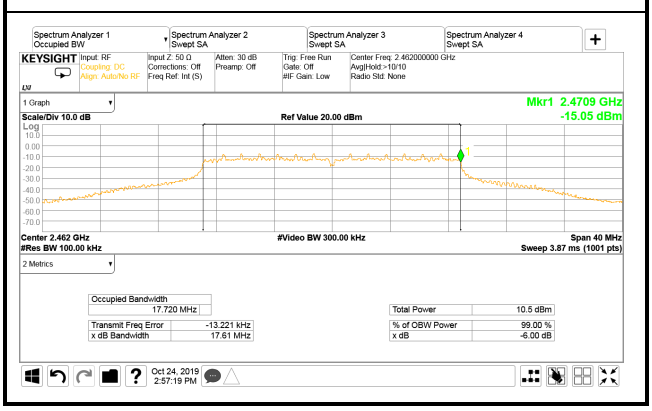
802.11n-HT20







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A.4 MAXIMUM PEAK OUTPUT POWER

Test Date	2019/10/18	Temp./Hum.	23℃/50%
Cable Loss	1.15dB	Test Voltage	AC 120V, 60Hz
		Tested By	Brian Hsieh

A.4.1 Peak Output Power

Mode	Centre Frequency (MHz)	Peak Output Power (dBm)		Antenna Gain (dBi)	Output Power (E.I.R.P.)		Limit
		(dBm)	(W)		(dBm)	(W)	
802.11b	2412	15.03	0.032	3.15	18.18	0.066	<30dBm (1W) (Peak Output Power) <36dBm (4W) (E.I.R.P)
	2437	14.63	0.029		17.78	0.060	
	2462	13.91	0.025		17.06	0.051	

Mode	Centre Frequency (MHz)	Peak Output Power (dBm)		Antenna Gain (dBi)	Output Power (E.I.R.P.)		Limit
		(dBm)	(W)		(dBm)	(W)	
802.11g	2412	15.11	0.032	3.15	18.26	0.067	<30dBm (1W) (Peak Output Power) <36dBm (4W) (E.I.R.P)
	2437	14.15	0.026		17.30	0.054	
	2462	14.04	0.025		17.19	0.052	

Mode	Centre Frequency (MHz)	Peak Output Power (dBm)		Antenna Gain (dBi)	Output Power (E.I.R.P.)		Limit
		(dBm)	(W)		(dBm)	(W)	
802.11n-HT20	2412	15.45	0.035	3.15	18.60	0.072	<30dBm (1W) (Peak Output Power) <36dBm (4W) (E.I.R.P)
	2437	14.52	0.028		17.67	0.058	
	2462	14.28	0.027		17.43	0.055	

Note: The results have been included cable loss.

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A.4.2 Average Output Power (Reporting only)

Mode	Centre Frequency (MHz)	Average Output Power (dBm)	10log (1/X)	Max. Average Output Power		Antenna Gain (dBi)	Total Average Output Power (E.I.R.P.)		Limit
				(dBm)	(W)		(dBm)	(W)	
802.11b	2412	1.64	10.49	12.13	0.016	3.15	15.28	0.034	<30dBm (1W) (Maximum Peak Output Power) <36dBm (4W) (E.I.R.P)
	2437	1.15		11.64	0.015		14.79	0.030	
	2462	0.43		10.92	0.012		14.07	0.026	

Mode	Centre Frequency (MHz)	Average Output Power (dBm)	10log (1/X)	Max. Average Output Power		Antenna Gain (dBi)	Total Average Output Power (E.I.R.P.)		Limit
				(dBm)	(W)		(dBm)	(W)	
802.11g	2412	-2.7	10.99	8.29	0.007	3.15	11.44	0.014	<30dBm (1W) (Maximum Peak Output Power) <36dBm (4W) (E.I.R.P)
	2437	-3.73		7.26	0.005		10.41	0.011	
	2462	-3.95		7.04	0.005		10.19	0.010	

Mode	Centre Frequency (MHz)	Average Output Power (dBm)	10log (1/X)	Max. Average Output Power		Antenna Gain (dBi)	Total Average Output Power (E.I.R.P.)		Limit
				(dBm)	(W)		(dBm)	(W)	
802.11n-HT20	2412	-2.24	10.72	8.48	0.007	3.15	11.63	0.015	<30dBm (1W) (Maximum Peak Output Power) <36dBm (4W) (E.I.R.P)
	2437	-3.38		7.34	0.005		10.49	0.011	
	2462	-3.91		6.81	0.005		9.96	0.010	

Note: The results have been included cable loss.

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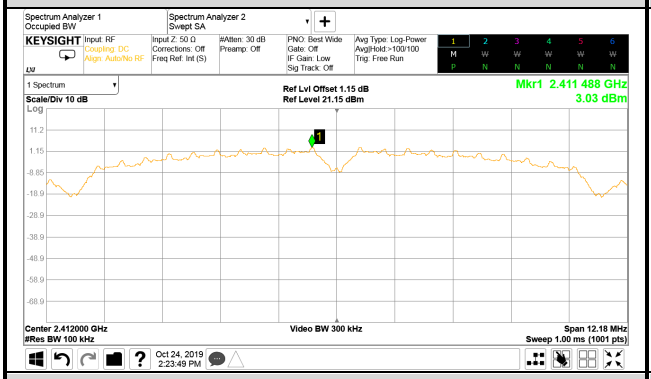
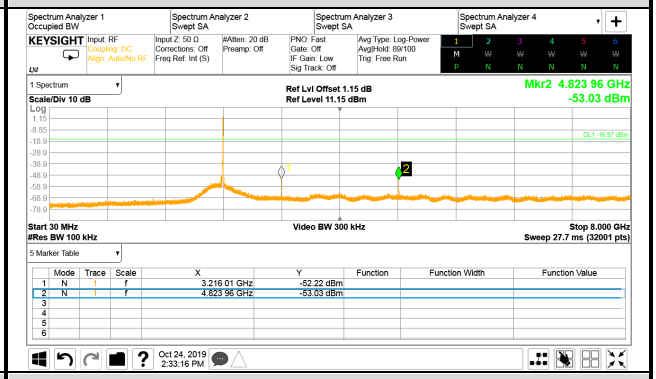
A.5 EMISSION LIMITATIONS

Test Date	2019/10/24	Temp./Hum.	25°C/43%
Cable Loss	1.15dB	Test Voltage	AC 120V, 60Hz
		Tested By	Brian Hsieh
Mode	802.11b	Frequency	TX 2412MHz
Simultaneous Factor10 log(n) (Note: “n” is antenna number)			0

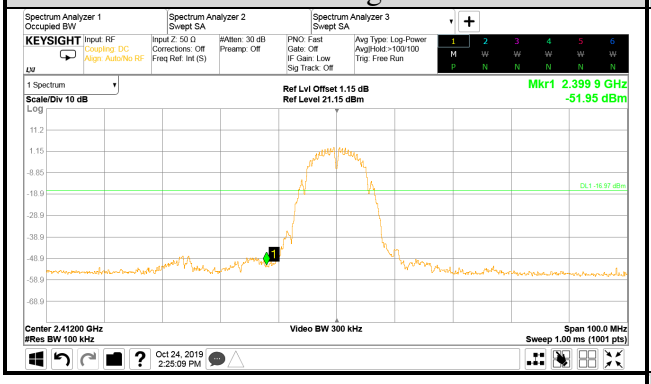
Reference Level



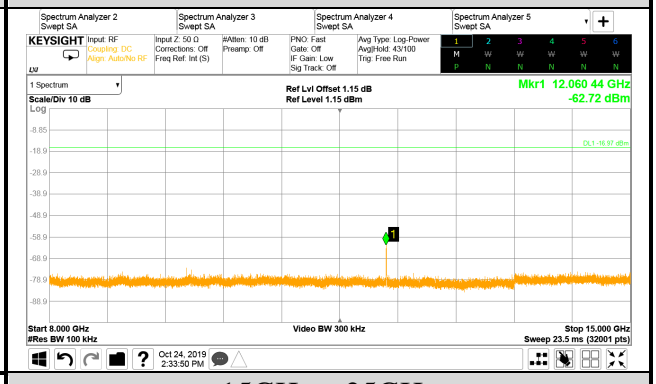
30MHz – 8GHz



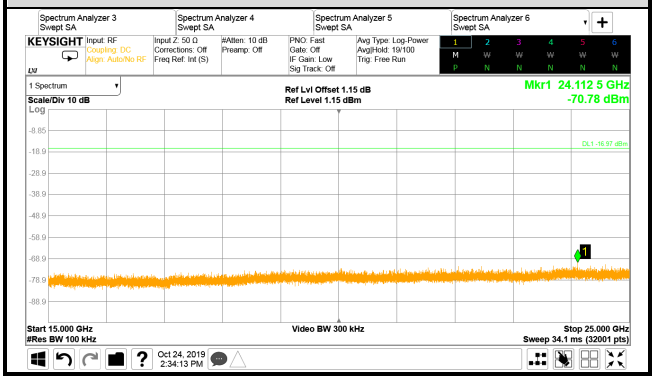
Band Edge



8GHz – 15GHz



15GHz – 25GHz



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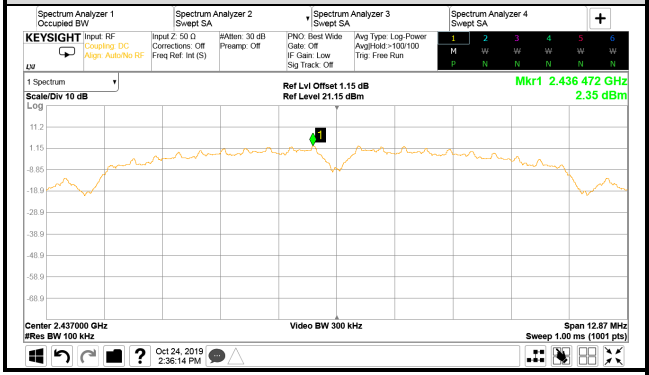
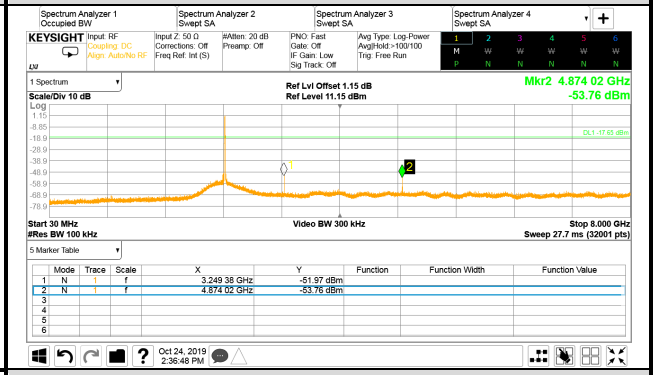
Test Date	2019/10/24	Temp./Hum.	25°C/43%
Cable Loss	1.15dB	Test Voltage	AC 120V, 60Hz
		Tested By	Brian Hsieh
Mode	802.11b	Frequency	TX 2437MHz
Simultaneous Factor10 log(n) (Note: “n” is antenna number)			0

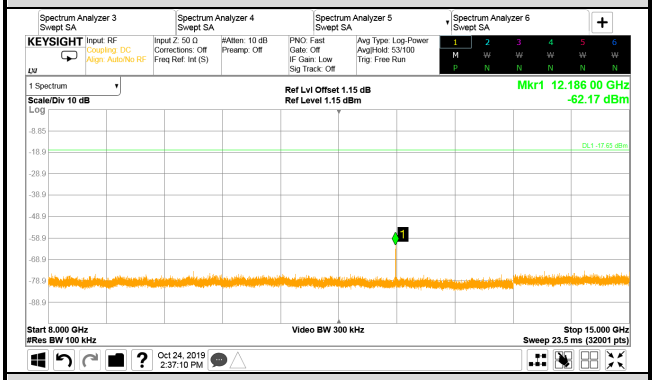
Reference Level



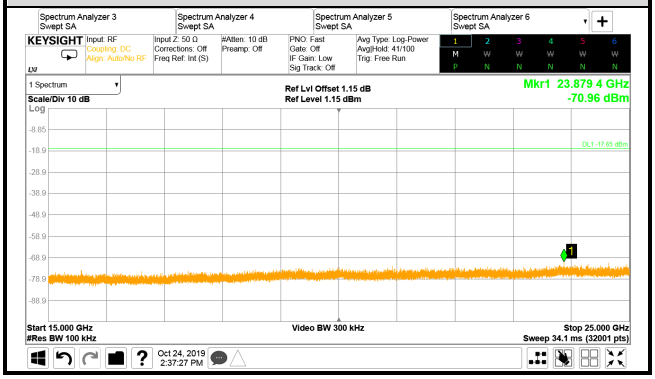
30MHz – 8GHz



8GHz – 15GHz



15GHz – 25GHz



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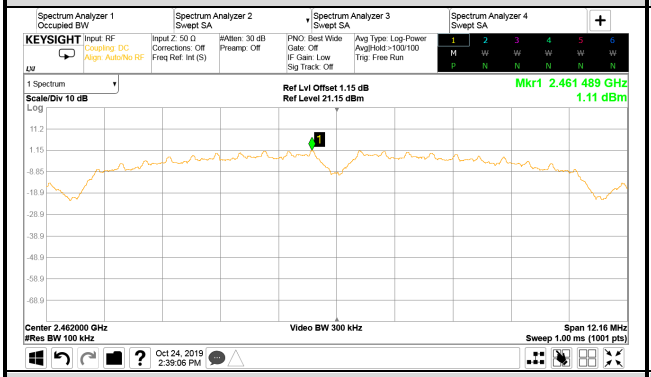
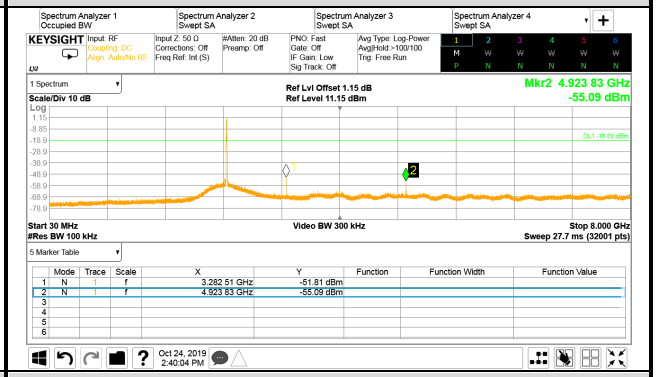
Test Date	2019/10/24	Temp./Hum.	25°C/43%
Cable Loss	1.15dB	Test Voltage	AC 120V, 60Hz
		Tested By	Brian Hsieh
Mode	802.11b	Frequency	TX 2462MHz
Simultaneous Factor10 log(n) (Note: “n” is antenna number)			0

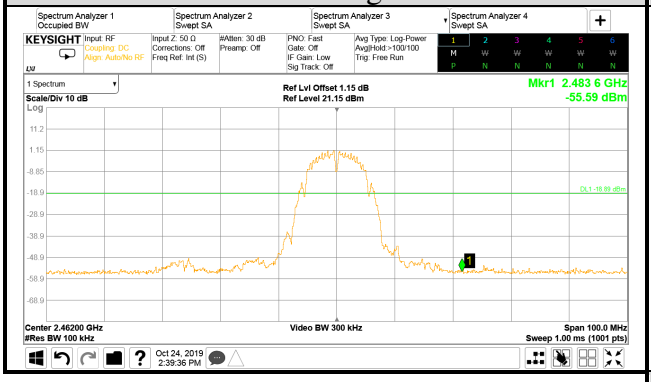
Reference Level



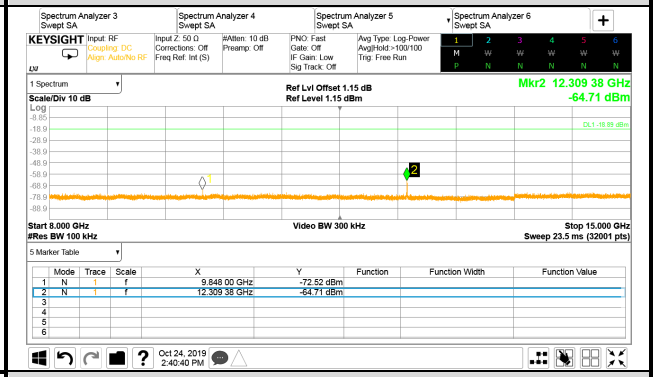
30MHz – 8GHz



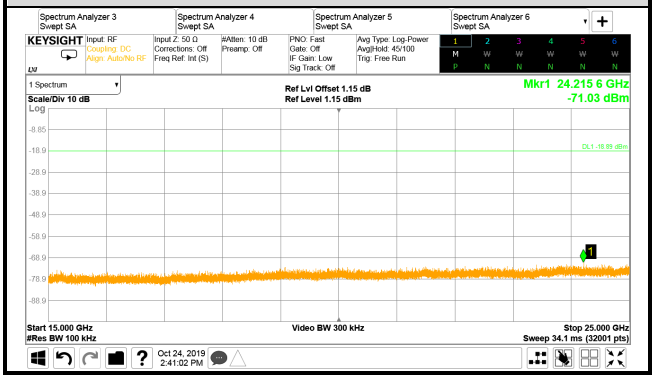
Band Edge



8GHz – 15GHz



15GHz – 25GHz



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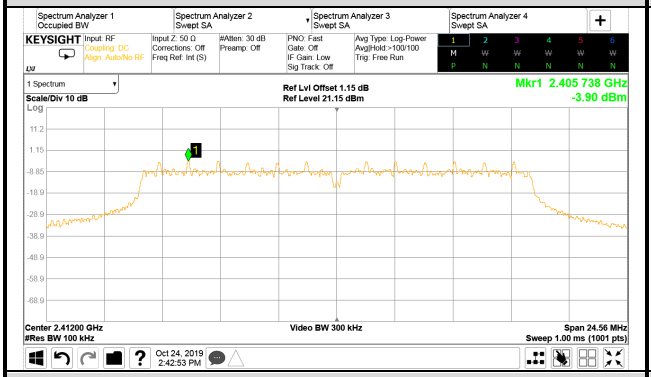
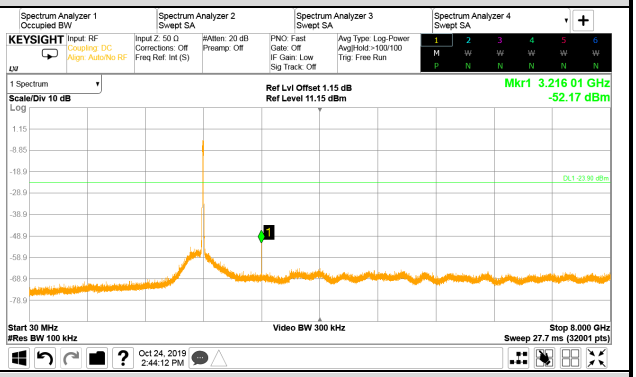
Test Date	2019/10/24	Temp./Hum.	25°C/43%
Cable Loss	1.15dB	Test Voltage	AC 120V, 60Hz
		Tested By	Brian Hsieh
Mode	802.11g	Frequency	TX 2412MHz
Simultaneous Factor10 log(n) (Note: "n" is antenna number)			0

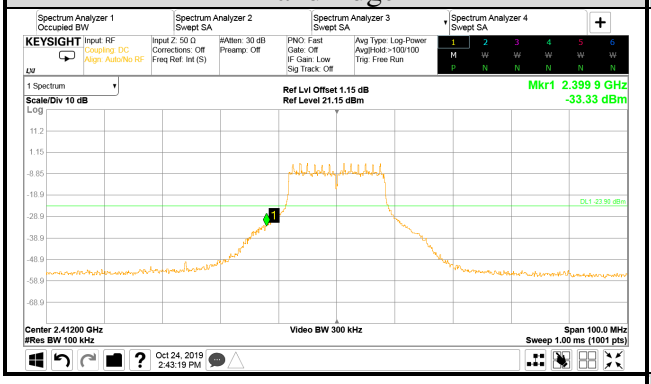
Reference Level



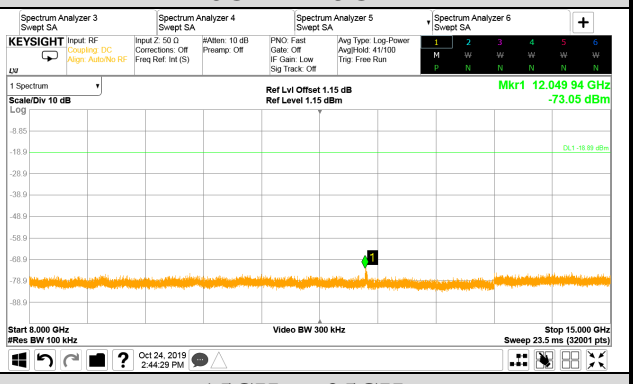
30MHz – 8GHz



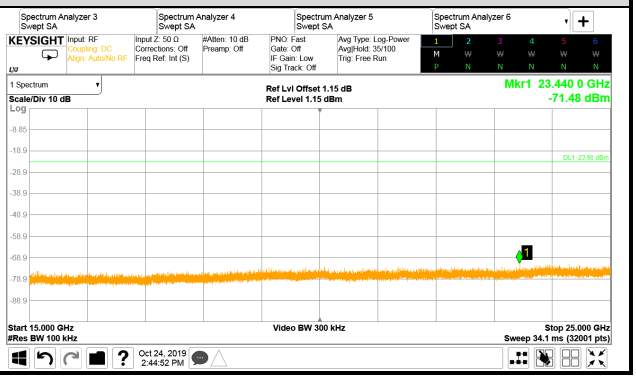
Band Edge



8GHz – 15GHz



15GHz – 25GHz



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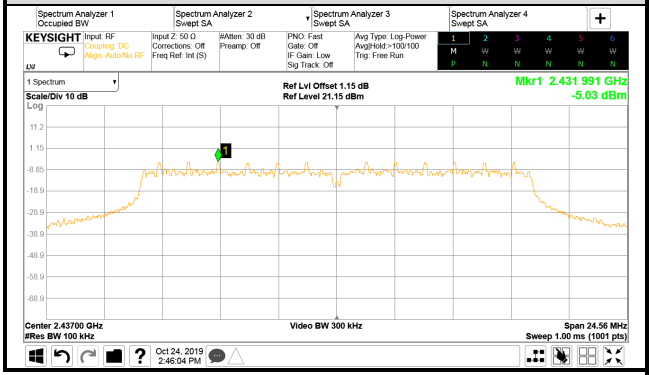
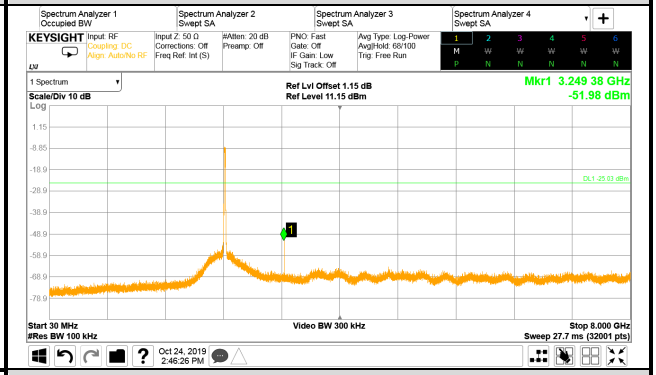
Test Date	2019/10/24	Temp./Hum.	25°C/43%
Cable Loss	1.15dB	Test Voltage	AC 120V, 60Hz
		Tested By	Brian Hsieh
Mode	802.11g	Frequency	TX 2437MHz
Simultaneous Factor10 log(n) (Note: “n” is antenna number)			0

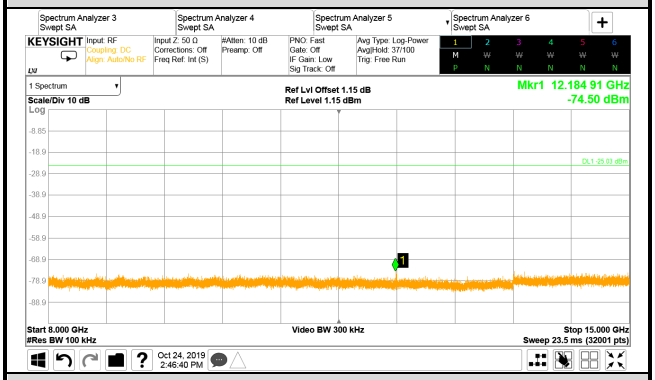
Reference Level



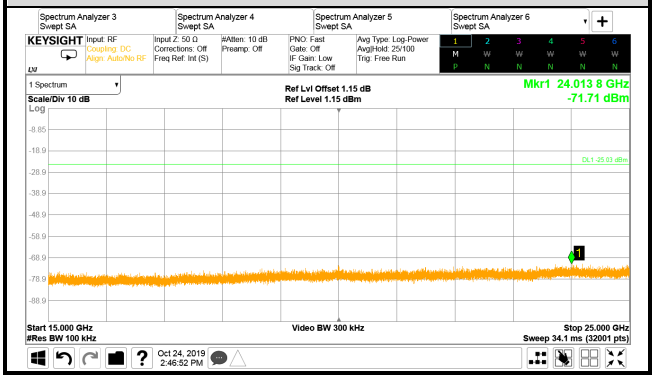
30MHz – 8GHz



8GHz – 15GHz



15GHz – 25GHz



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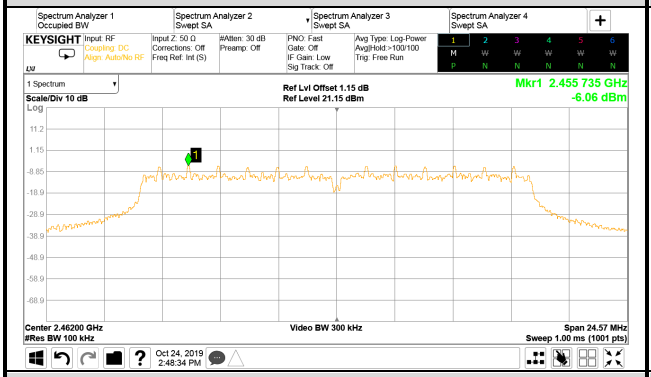
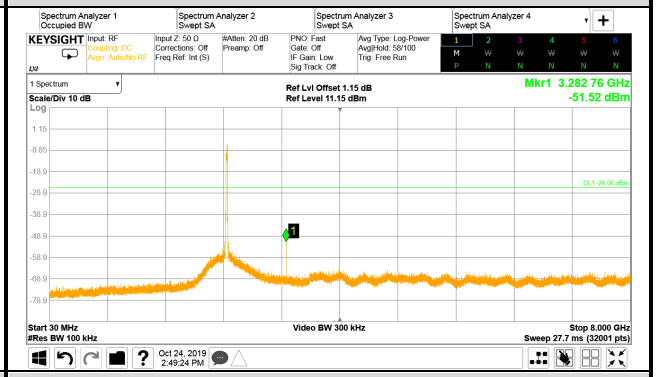
Test Date	2019/10/24	Temp./Hum.	25°C/43%
Cable Loss	1.15dB	Test Voltage	AC 120V, 60Hz
		Tested By	Brian Hsieh
Mode	802.11g	Frequency	TX 2462MHz
Simultaneous Factor10 log(n) (Note: "n" is antenna number)			0

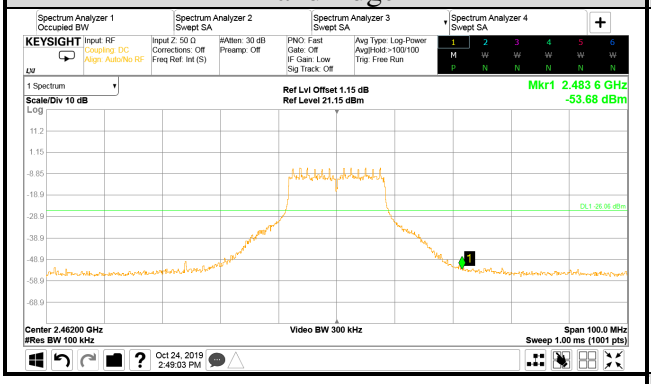
Reference Level



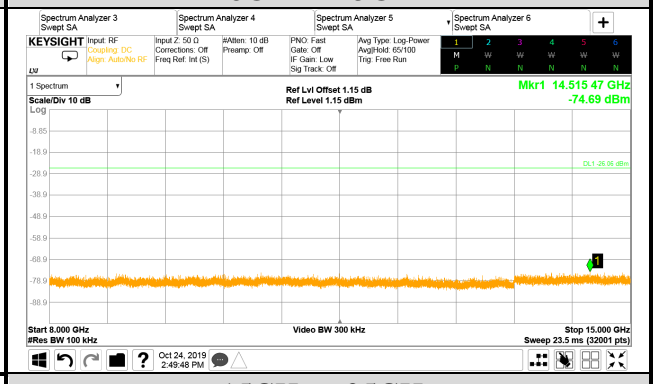
30MHz – 8GHz



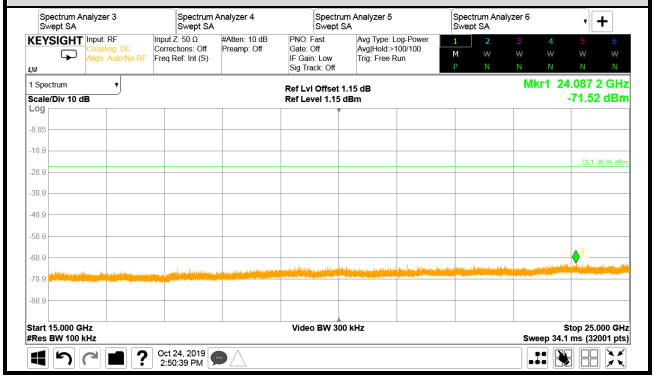
Band Edge



8GHz – 15GHz



15GHz – 25GHz



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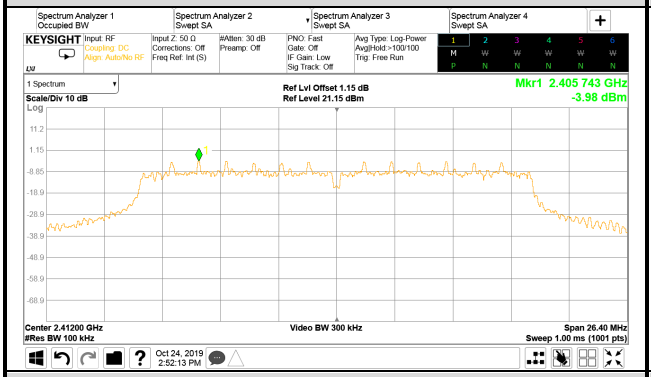
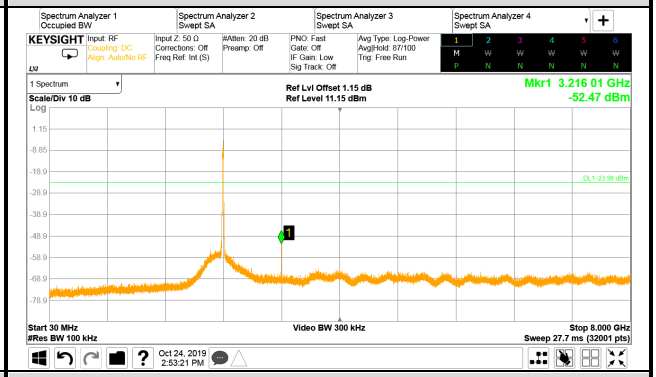
Test Date	2019/10/24	Temp./Hum.	25°C/43%
Cable Loss	1.15dB	Test Voltage	AC 120V, 60Hz
		Tested By	Brian Hsieh
Mode	802.11n-HT20	Frequency	TX 2412MHz
Simultaneous Factor10 log(n) (Note: “n” is antenna number)			0

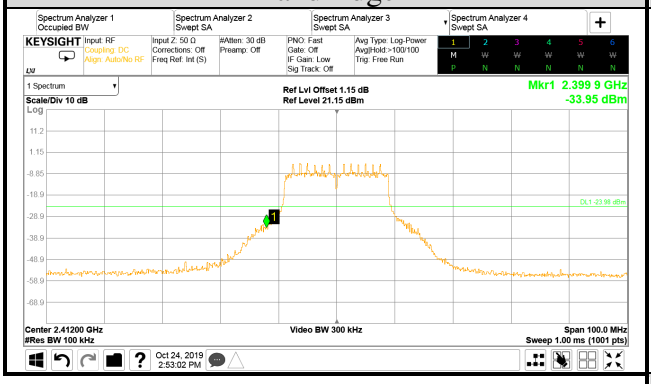
Reference Level



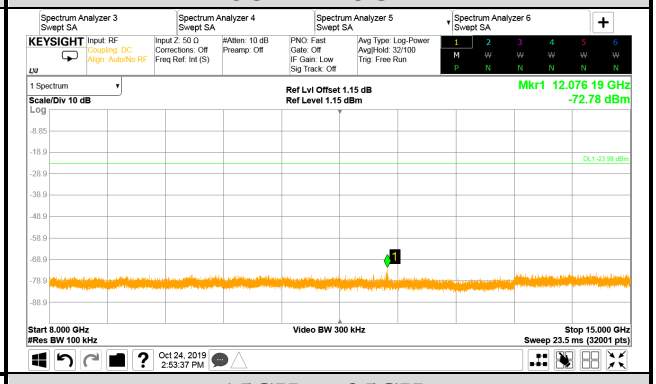
30MHz – 8GHz



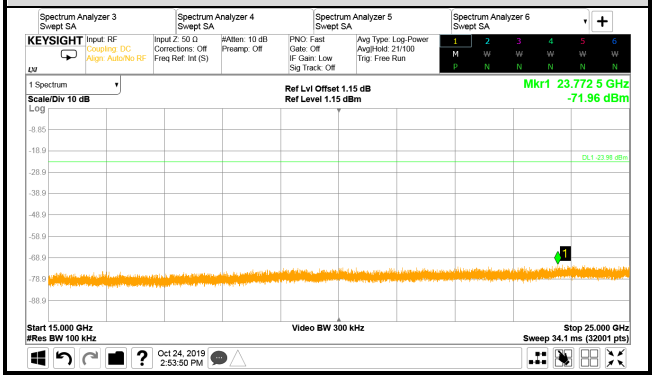
Band Edge



8GHz – 15GHz



15GHz – 25GHz



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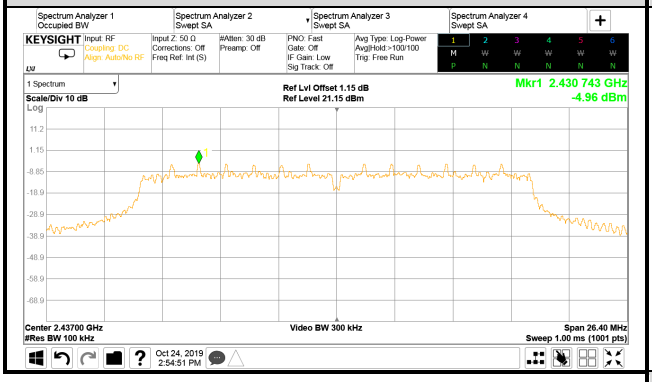
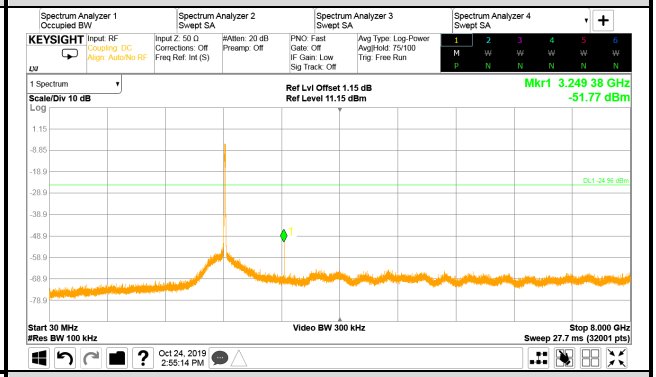
Test Date	2019/10/24	Temp./Hum.	25°C/43%
Cable Loss	1.15dB	Test Voltage	AC 120V, 60Hz
		Tested By	Brian Hsieh
Mode	802.11n-HT20	Frequency	TX 2437MHz
Simultaneous Factor10 log(n) (Note: "n" is antenna number)			0

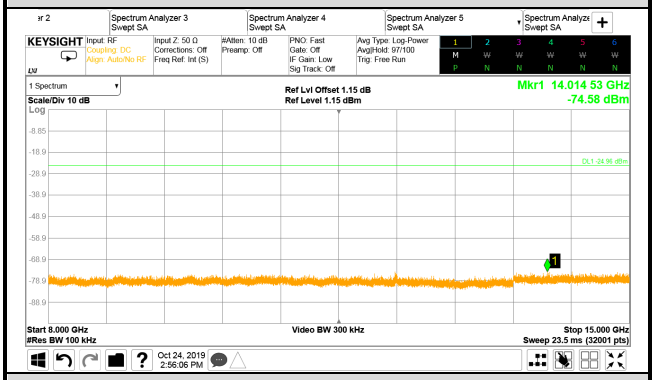
Reference Level



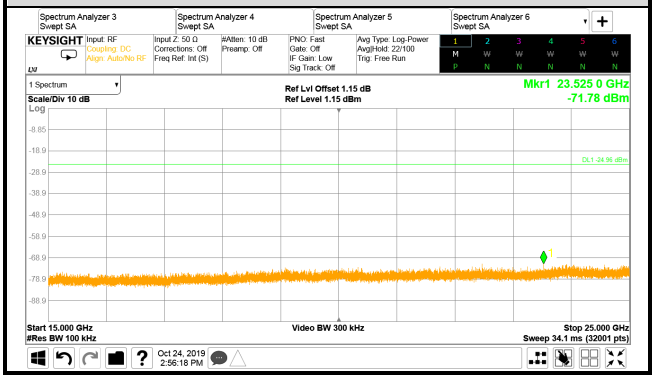
30MHz – 8GHz



8GHz – 15GHz



15GHz – 25GHz



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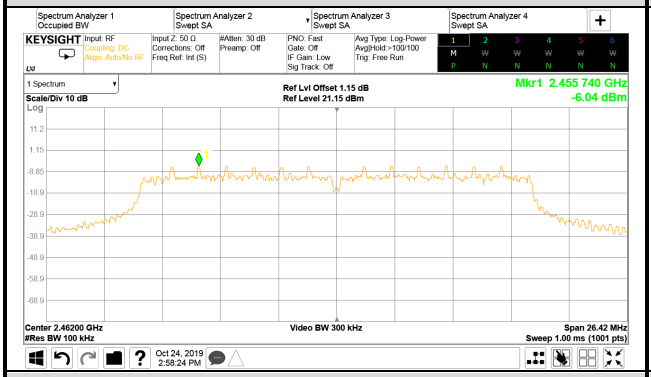
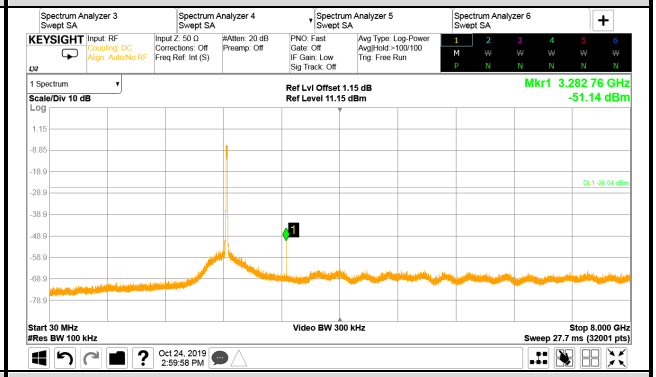
Test Date	2019/10/24	Temp./Hum.	25°C/43%
Cable Loss	1.15dB	Test Voltage	AC 120V, 60Hz
		Tested By	Brian Hsieh
Mode	802.11n-HT20	Frequency	TX 2462MHz
Simultaneous Factor10 log(n) (Note: “n” is antenna number)			0

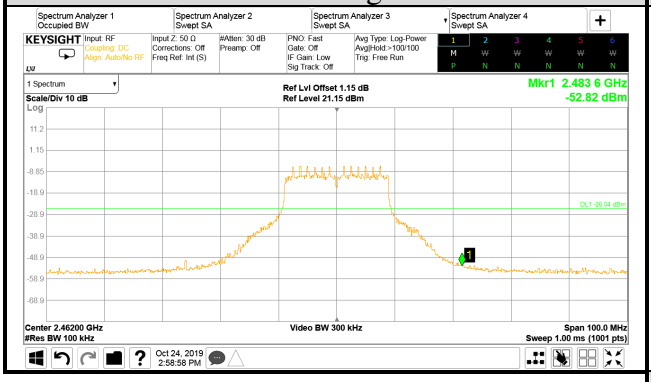
Reference Level



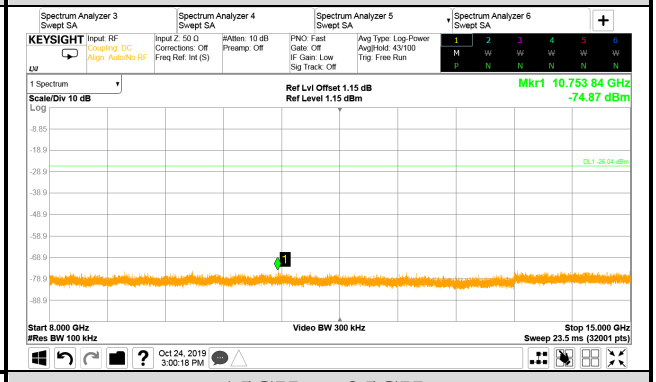
30MHz – 8GHz



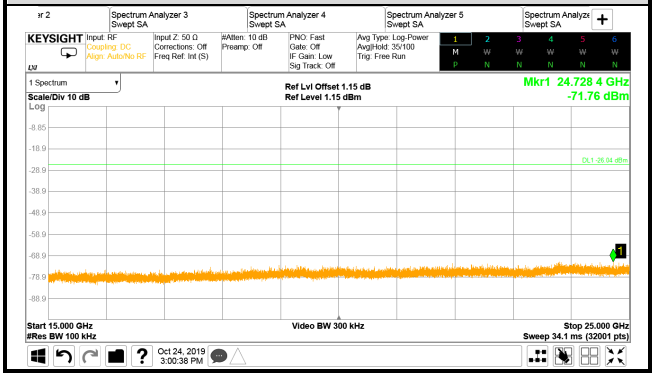
Band Edge



8GHz – 15GHz



15GHz – 25GHz



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A.6 POWER SPECTRAL DENSITY

Test Date	2019/10/24	Temp./Hum.	25°C/43%
Cable Loss	1.15dB	Test Voltage	AC 120V, 60Hz
		Tested By	Brian Hsieh
Simultaneous Factor10 log(n) (Note: "n" is antenna number)			0

A.6.1 Power Spectral Density Result

Mode	Centre Frequency (MHz)	Power Spectral Density (dBm)	Limit
802.11b	2412	-3.03	<8 dBm/3kHz
	2437	-2.35	
	2462	-1.11	
802.11g	2412	-3.90	
	2437	-5.03	
	2462	-6.06	
802.11n-HT20	2412	-3.98	
	2437	-4.96	
	2462	-6.04	

Note: 1. All results have been included cable loss and Simultaneous Factor.
2. For KDB558074 D01V04, in the test result, when RBW set at 100kHz is stricter than 3kHz.

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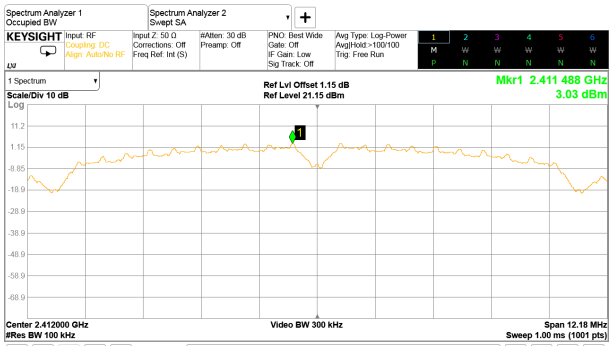
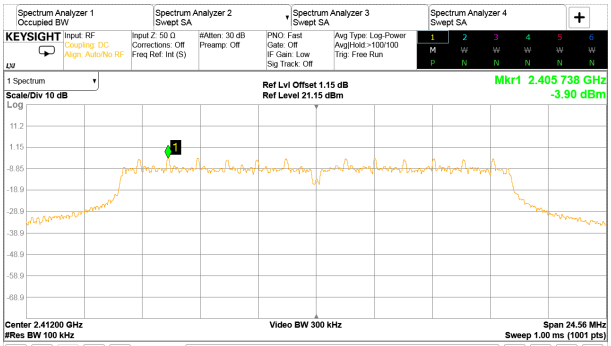
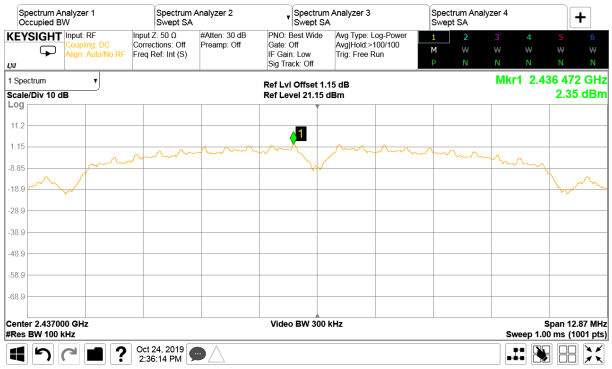
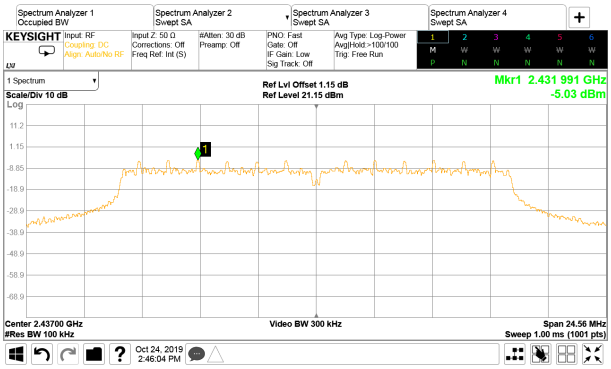
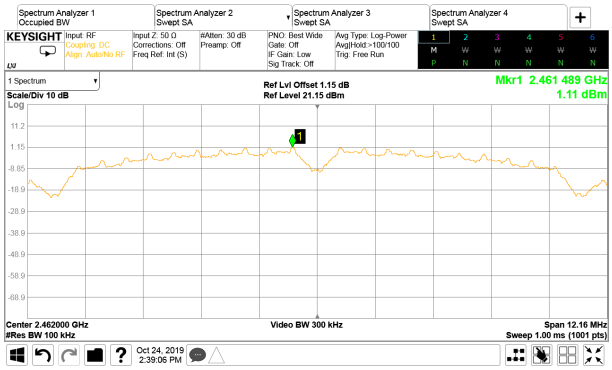
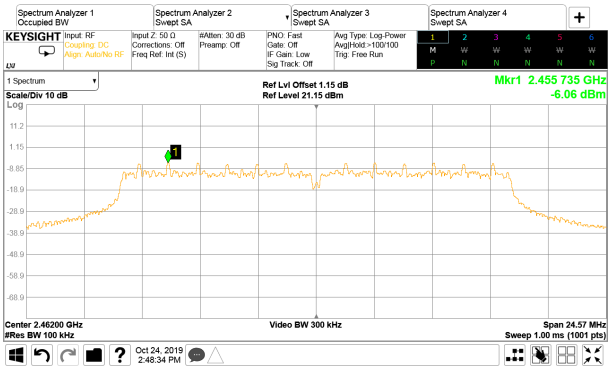
A.6.2 Measurement Plots

802.11b	802.11g
	
	
	

Note: All results have been included cable loss and Simultaneous Factor.

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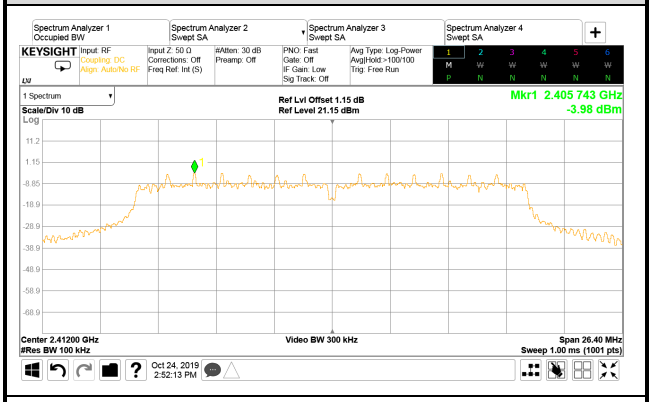
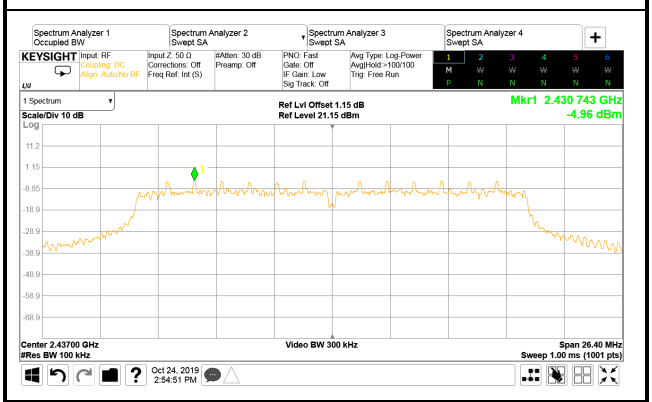
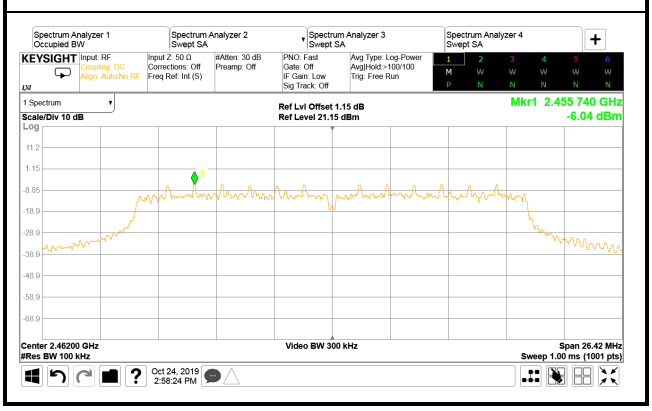
802.11n-HT20







Note: All results have been included cable loss and Simultaneous Factor.

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APPDNDIX B

TEST PHOTOGRAPHS

(Model: AS-P-603W)

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