FCC 47 CFR PART 15 SUBPART C AND ANSI C63.10:2013 TEST REPORT

For

AC1300 IoT Router

Model: X10R

Data Applies To: X10 ; X10S

Trade Name: ASRock

Issued for

ASRock Incorporation

2F., No.37, Sec. 2, Jhongyang S. Rd., Beitou Dist., Taipei City 11270, Taiwan (R.O.C.)

Issued by

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00	02/18/2017	Initial Issue	All Page 146	Michelle Chiu

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1. TEST REPORT CERTIFICATION

Applicant	：	ASRock Incorporation
Address	：	2F., No.37, Sec. 2, Jhongyang S. Rd., Beitou Dist., Taipei City 11270, Taiwan (R.O.C.)
Equipment Under Test	：	AC1300 IoT Router
Model	：	X10R
Data Applies To	：	X10 ; X10S
Trade Name	：	ASRock
Tested Date	：	October 24 ~ December 27, 2016

APPLICABLE STANDARD	
Standard	**Test Result**
FCC Part 15 Subpart C AND ANSI C63.10:2013	PASS

WE HEREBY CERTIFY THAT: The above equipment has been tested by Compliance Certification Services Inc., and found compliance with the requirements set forth in the technical standards mentioned above. The results of testing in this report apply only to the product/system, which was tested. Other similar equipment will not necessarily produce the same results due to production tolerance and measurement uncertainties.

Approved by:

Sb. Lu
Sr. Engineer

Reviewed by:

Gundam Lin
Sr. Engineer

2. EUT DESCRIPTION

Product Name	AC1300 IoT Router
Model Number	X10R
Data Applies To	X10 ; X10S
Identify Number	T161103D21
Received Date	October 24, 2016
Frequency Range	WiFi Mode: IEEE 802.11b/g, 802.11gn HT20, 802.11ac VHT20 Mode: 2412MHz ~ 2462MHz IEEE 802.11gn HT40, 802.11ac VHT40 Mode: 2422MHz ~ 2452MHz ZigBee Mode: 2405MHz ~ 2480MHz
Transmit Power	WiFi Mode: IEEE 802.11b Mode: 26.14 dBm (0.4111 W) IEEE 802.11g Mode: 27.55 dBm (0.5689 W) IEEE 802.11ac VHT20 MCS0 Mode: 27.31 dBm (0.5383 W) IEEE 802.11ac VHT40 MCS0 Mode: 25.20 dBm (0.3311 W) ZigBee Mode: 14.15 dBm (0.0260 W)
Channel Spacing	5MHz
Channel Number	WiFi Mode: IEEE 802.11b/g, 802.11gn HT20, 802.11ac VHT20 Mode: 11 Channels IEEE 802.11gn HT40, 802.11ac VHT40 Mode: 7 Channels ZigBee Mode: 16 Channels
Transmit Data Rate	WiFi Mode: IEEE 802.11b Mode: up to 11 Mbps IEEE 802.11g Mode: up to 54 Mbps IEEE 802.11ac VHT20 Mode(800ns GI): up to 156.00 Mbps IEEE 802.11ac VHT20 Mode(400ns GI): up to 173.40 Mbps IEEE 802.11ac VHT40 Mode(800ns GI): up to 360.00 Mbps IEEE 802.11ac VHT40 Mode(400ns GI): up to 400.00 Mbps ZigBee Mode: 250 kbps
Type of Modulation	WiFi Mode: IEEE 802.11b Mode: DSSS (CCK, DQPSK, DBPSK) IEEE 802.11g Mode: OFDM (64QAM, 16QAM, QPSK, BPSK) IEEE 802.11gn HT20/40, 802.11ac VHT20/ VHT40 Mode: OFDM (256QAM, 64QAM, 16QAM, QPSK, BPSK) ZigBee Mode: OQPSK
Antenna Type	WiFi Mode : Dipole Antenna × 2 Ant. 1 (Left) / Chain 0, Antenna Gain: 5.73dBi Ant. 2 (Right) / Chain 1, Antenna Gain: 5.60 dBi ZigBee Mode : PIFA Antenna × 1, Antenna Gain : 2.55dBi

Power Rating	12Vdc
Test Voltage	120Vac, 60Hz
DC Power Cable Type	Non-shielded cable, 1.5m × 1 (Non-detachable)
I/O Port	USB Port × 2, WAN(RJ-45) Port × 1, LAN(RJ-45) Port × 4, Power Port × 1
Signal Cable	Non-shielded RJ-45 cable, 1.2 m × 1 (Detachable)

Power Adapter:

No.	Manufacturer	Model No.	Power Input	Power Output
1	APD	WB-18D12R	100-240Vac, 50-60Hz, 0.5A Max.	12Vdc, 1.5A

The difference of the series model

Model Number	Difference	
	Function	External Antenna Quantity
X10	Router + Zigbee	2
X10R	Router + Zigbee+LoRa(Sub-G)	3
X10S	Router + Zigbee+LoRa(Sub-G)	3

Remark:

1. *The sample selected for test was engineering sample that approximated to production product and was provided by manufacturer.*
2. *For more details, please refer to the User's manual of the EUT.*
3. *This submittal(s) (test report) is intended for FCC ID: 2AFEB-X10 filing to comply with Section 15.207, 15.209 and 15.247 of the FCC Part 15, Subpart C Rules.*
4. *The model X10R was considered the main model for testing.*

3. DESCRIPTION OF TEST MODES

The EUT (AC1300 IoT Router) had been tested under operating condition.

For WiFi Mode:

IEEE 802.11b/g, 802.11ac VHT20/VHT40 Mode: 2TX / 2RX

For ZigBee Mode: 1TX/1RX

Conducted Emission / Radiated Emission Test (Below 1 GHz)

1. The following test modes were scanned during the preliminary test:

No.	Pre-Test mode
1	TX Mode

2. After the preliminary scan, the following test mode was found to produce the highest emission level.

Final Test mode		
Emission	Radiated Emission	Mode 1
	Conducted Emission	Mode 1

Remark: *Then, the above highest emission mode of the configuration of the EUT and cable was chosen for all final test items.*

Conducted / Radiated Emission Test (Above 1 GHz)

IEEE 802.11b/g, 802.11ac VHT20 Mode:

The EUT had been tested under operating condition.

There are three channels have been tested as following:

Channel	Frequency (MHz)
Low	2412
Middle	2437
High	2462

IEEE 802.11b Mode: 1Mbps data rate (worst case) was chosen for full testing.
IEEE 802.11g Mode: 6Mbps data rate (worst case) was chosen for full testing.
IEEE 802.11ac VHT20 MCS0 Mode: 6.5Mbps data rate (worst case) was chosen for full testing.

IEEE 802.11ac VHT40 Mode:

The EUT had been tested under operating condition.

There are three channels have been tested as following:

Channel	Frequency (MHz)
Low	2422
Middle	2437
High	2452

IEEE 802.11ac VHT40 MCS0 Mode: 13.5Mbps data rate (worst case) was chosen for full testing.

ZigBee Mode:

The EUT had been tested under operating condition.

There are three channels have been tested as following:

Channel	Frequency (MHz)
Low	2405
Middle	2440
High	2480

Remark *: The field strength of spurious emission was measured in the following position: EUT stand-up position(Y axis), lie-down position(X, Z axis). The worst emission was found in stand-up position(Y axis) and the worst case was recorded.*

4. TEST METHODOLOGY

The tests documented in this report were performed in accordance with ANSI C63.10:2013 and FCC CFR 47, 15.207, 15.209 and 15.247.

5. FACILITIES AND ACCREDITATION

5.1 FACILITIES

All measurement facilities used to collect the measurement data are located at

No.989-1, Wenshan Rd., Shangshan Village,
Qionglin Township, Hsinchu County 30741, Taiwan (R.O.C.)

The sites are constructed in conformance with the requirements of ANSI C63.10:2013 and CISPR 22. All receiving equipment conforms to CISPR 16-1-1, CISPR 16-1-2, CISPR 16-1-3, CISPR 16-1-4 and CISPR 16-1-5.

5.2 ACCREDITATIONS

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

Taiwan	TAF

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

Canada	INDUSTRY CANADA
Japan	VCCI
Taiwan	BSMI
USA	FCC MRA

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

Remark: *FCC Designation Number TW1027.*

5.3 MEASUREMENT UNCERTAINTY

The following table is for the measurement uncertainty, which is calculated as per the document CISPR 16-4-2.

PARAMETER	UNCERTAINTY
Semi Anechoic Chamber (966 Chamber_B) / Radiated Emission, 30 to 1000 MHz	+/- 3.97
Semi Anechoic Chamber (966 Chamber_B) / Radiated Emission, 1 to 18GHz	+/- 3.58
Semi Anechoic Chamber (966 Chamber_B) / Radiated Emission, 18 to 26 GHz	+/- 3.59
Semi Anechoic Chamber (966 Chamber_B) / Radiated Emission, 26 to 40 GHz	+/- 3.81
Conducted Emission (Mains Terminals), 9kHz to 30MHz	+/- 2.48

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

Consistent with industry standard (e.g. CISPR 22, clause 11, Measurement Uncertainty) determining compliance with the limits shall be base on the results of the compliance measurement. Consequently the measure emissions being less than the maximum allowed emission result in this be a compliant test or passing test.

The acceptable measurement uncertainty value without requiring revision of the compliance statement is base on conducted and radiated emissions being less than U_{CISPR} which is 3.6dB and 5.2dB respectively. CCS values (called U_{Lab} in CISPR 16-4-2) is less than U_{CISPR} as shown in the table above. Therefore, MU need not be considered for compliance.

6. SETUP OF EQUIPMENT UNDER TEST

SUPPORT EQUIPMENT

No.	Product	Manufacturer	Model No.	Serial No.
1	Notebook PC	TOSHIBA	PORTEGE R30-A	7F097009H

No.	Signal Cable Description
1	Non-shielded RJ-45 cable, 12m × 1

SETUP DIAGRAM FOR TESTS

EUT & peripherals setup diagram is shown in appendix setup photos.

EUT OPERATING CONDITION

WiFi Mode:

1. EUT & peripherals setup diagram is shown in appendix setup photos.
2. TX mode:

⇨ **TX Data Rate:** 1Mbps Bandwidth 20 (IEEE 802.11b Mode)
6Mbps Bandwidth 20 (IEEE 802.11g Mode)
6.5Mbps Bandwidth 20 (IEEE 802.11ac VHT20 MCS0 Mode)
13.5Mbps Bandwidth 40 (IEEE 802.11ac VHT40 MCS0 Mode)

⇨ **Power control**

Mode	Channel	Frequency (MHz)	Chain	Power Set
IEEE 802.11b	Low	2412	0/1	18
	Middle	2437	0/1	20
	High	2462	0/1	17
IEEE 802.11g	Low	2412	0/1	15
	Middle	2437	0/1	19
	High	2462	0/1	14
IEEE 802.11ac VHT20 MCS0	Low	2412	0/1	15
	Middle	2437	0/1	19
	High	2462	0/1	14
IEEE 802.11ac VHT40 MCS0	Low	2422	0/1	12
	Middle	2437	0/1	13
	High	2452	0/1	11

1. All of the functions are under run.
2. Start test.

ZigBee Mode:

1. EUT & peripherals setup diagram is shown in appendix setup photos.
2. Run Test software
   - ⇨ **Power control**
     Channel Low (2405MHz) Power set 15.
     Channel Middle (2440MHz) Power set 15.
     Channel High (2480MHz) Power set 5.
2. All of the functions are under run.
3. Start test.

7. FCC PART 15.247 REQUIREMENTS

7.1 DUTY CYCLE CORRECTION FACTOR

Product Name	AC1300 IoT Router	Test By	Waternil Guan
Test Model	X10R	Test Date	2016/11/04
Test Mode	TX Mode	Temp. & Humidity	25°C, 50%

Mode	TX on (ms)	TX on + off (ms)	Duty Cycle (%)	Duty Factor (dB)	1/T Minimum VBW (kHz)
IEEE 802.11b	12.430	12.510	99.36	0.03	0.010
IEEE 802.11g	2.065	2.154	95.87	0.18	0.484
IEEE 802.11ac VHT20 MCS0	4.991	5.089	98.07	0.08	0.010
IEEE 802.11ac VHT40 MCS0	2.427	2.510	96.69	0.15	0.412
ZigBee	1.000	1.000	100.00	0.00	0.010

7.2 6dB BANDWIDTH

LIMITS

§ 15.247(a) (2) For direct sequence systems, the minimum 6dB bandwidth shall be at least 500kHz.

TEST EQUIPMENT

Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
Spectrum Analyzer	Agilent	E4446A	MY43360132	05/31/2017
Test S/W	N/A			

Remark: *Each piece of equipment is scheduled for calibration once a year.*

TEST SETUP

TEST PROCEDURE

1. The transmitter output was connected to a spectrum analyzer.
2. Set RBW = 100 kHz.
3. Set the video bandwidth (VBW) ≥ 3 x RBW.
4. Detector = Peak.
5. Trace mode = max hold.
6. Sweep = auto couple.
7. Allow the trace to stabilize.
8. Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission.

TEST RESULTS

Product Name	AC1300 IoT Router	Test By	Waternil Guan
Test Model	X10R	Test Date	2016/11/16
Test Mode	WiFi / TX Mode	Temp. & Humidity	25°C, 50%

IEEE 802.11b Mode (2TX)

Channel	Channel Frequency (MHz)	6dB Bandwidth (MHz)		Minimum Limit (kHz)	Result
		Chain 0	Chain 1		
Low	2412	8.07	8.06	500	PASS
Middle	2437	8.08	8.09	500	PASS
High	2462	8.07	8.07	500	PASS

IEEE 802.11g Mode (2TX)

Channel	Channel Frequency (MHz)	6dB Bandwidth (MHz)		Minimum Limit (kHz)	Result
		Chain 0	Chain 1		
Low	2412	15.91	16.37	500	PASS
Middle	2437	15.63	16.34	500	PASS
High	2462	16.32	16.38	500	PASS

IEEE 802.11ac VHT20 MCS0 Mode (2TX)

Channel	Channel Frequency (MHz)	6dB Bandwidth (MHz)		Minimum Limit (kHz)	Result
		Chain 0	Chain 1		
Low	2412	17.59	17.58	500	PASS
Middle	2437	16.94	17.58	500	PASS
High	2462	17.57	17.59	500	PASS

IEEE 802.11ac VHT40 MCS0 Mode (2TX)

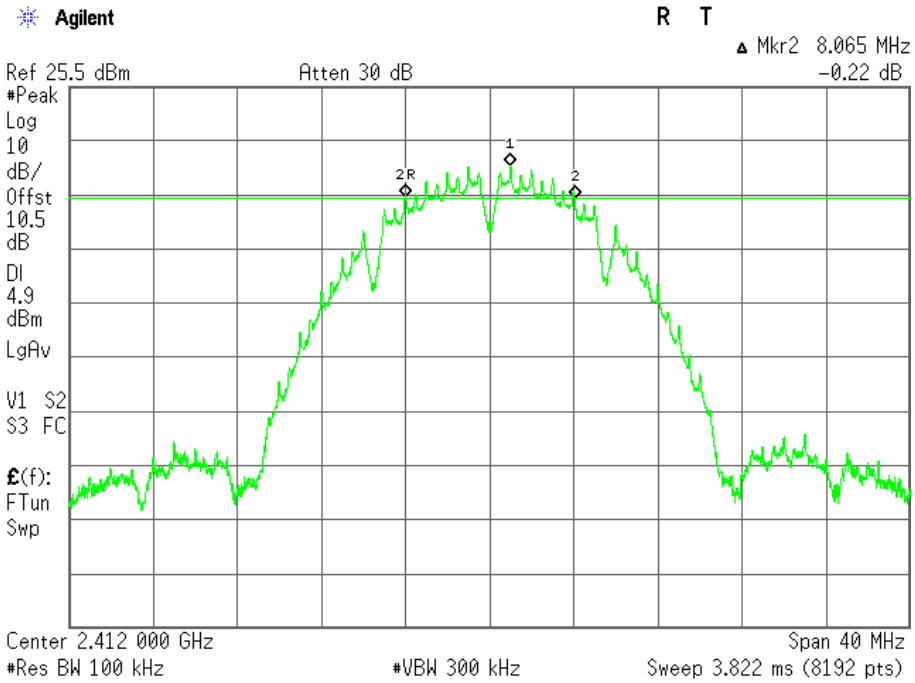
Channel	Channel Frequency (MHz)	6dB Bandwidth (MHz)		Minimum Limit (kHz)	Result
		Chain 0	Chain 1		
Low	2422	35.71	35.71	500	PASS
Middle	2437	35.51	35.89	500	PASS
High	2452	35.68	35.91	500	PASS

Product Name	AC1300 IoT Router	Test By	Waternil Guan
Test Model	X10R	Test Date	2016/11/21
Test Mode	ZigBee / TX Mode	Temp. & Humidity	23°C, 66%

Channel	Channel Frequency (MHz)	6dB Bandwidth (MHz)	Minimum Limit (kHz)	Result
Low	2405	1.64	500	PASS
Middle	2440	1.61	500	PASS
High	2480	1.62	500	PASS

6dB BANDWIDTH

CH Low (IEEE 802.11b Mode / Chain 0)



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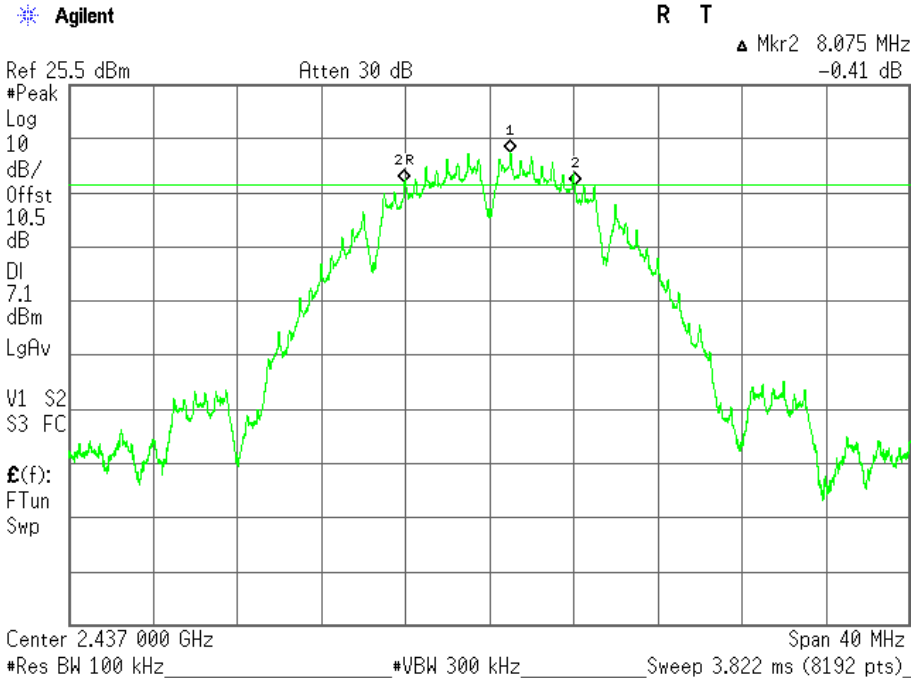

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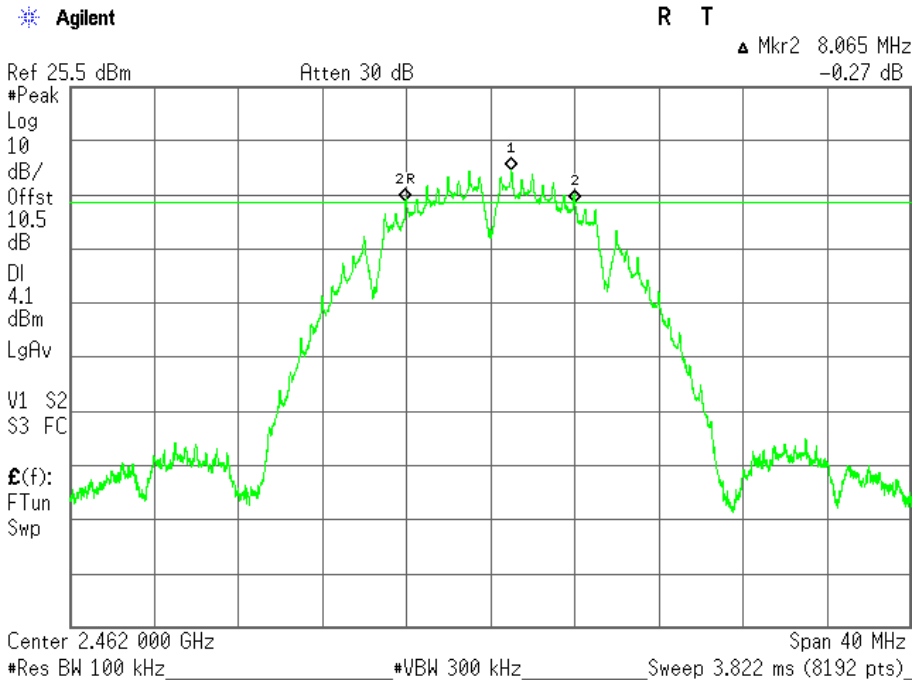

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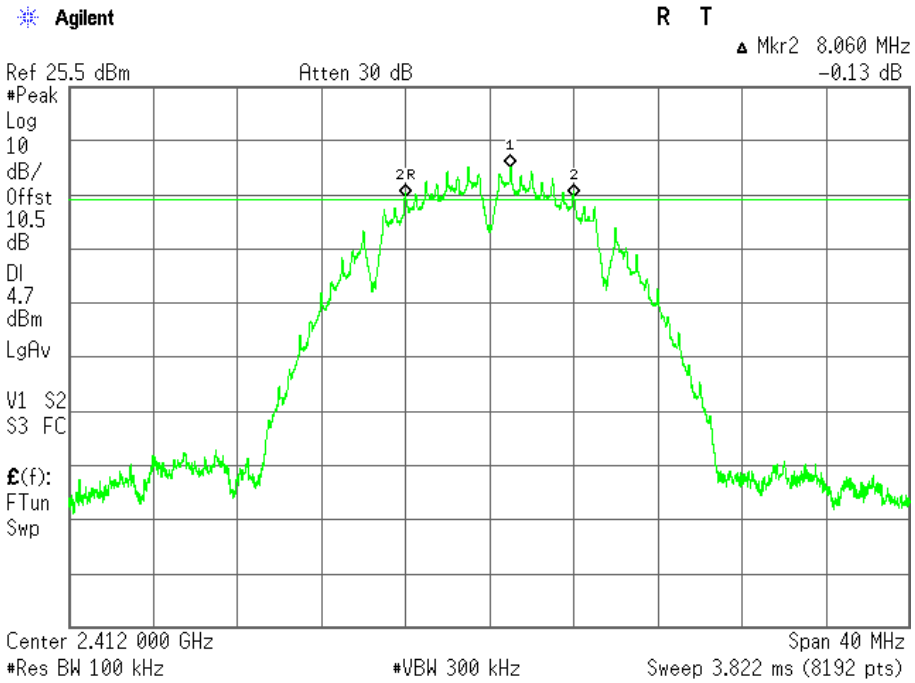

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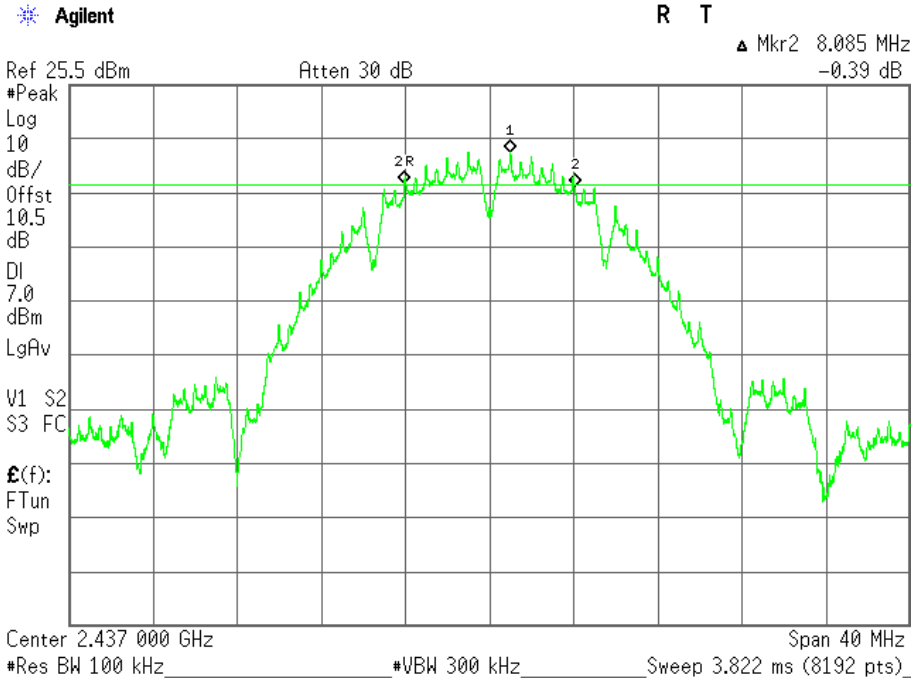

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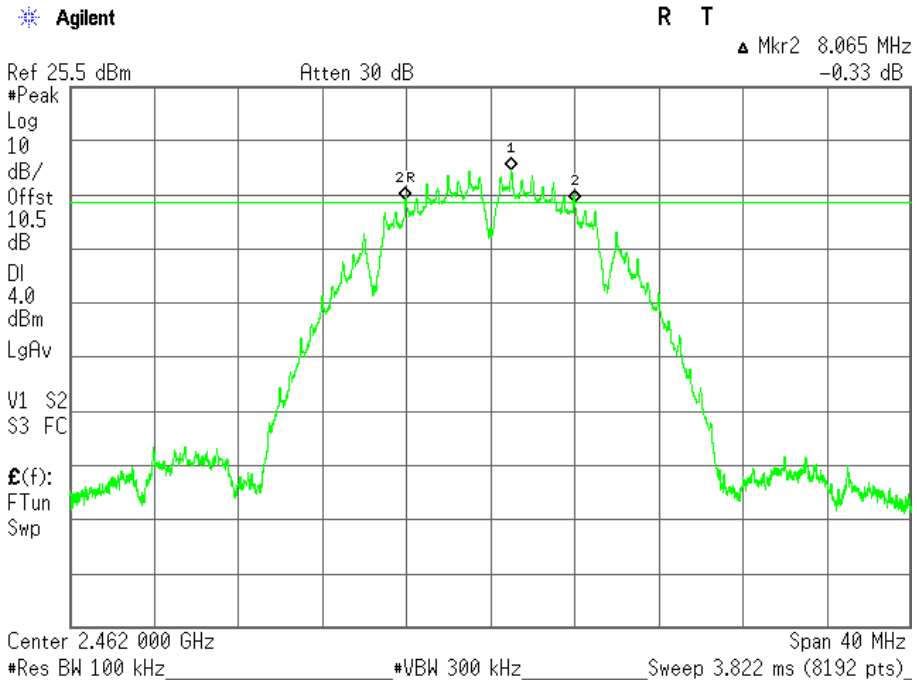

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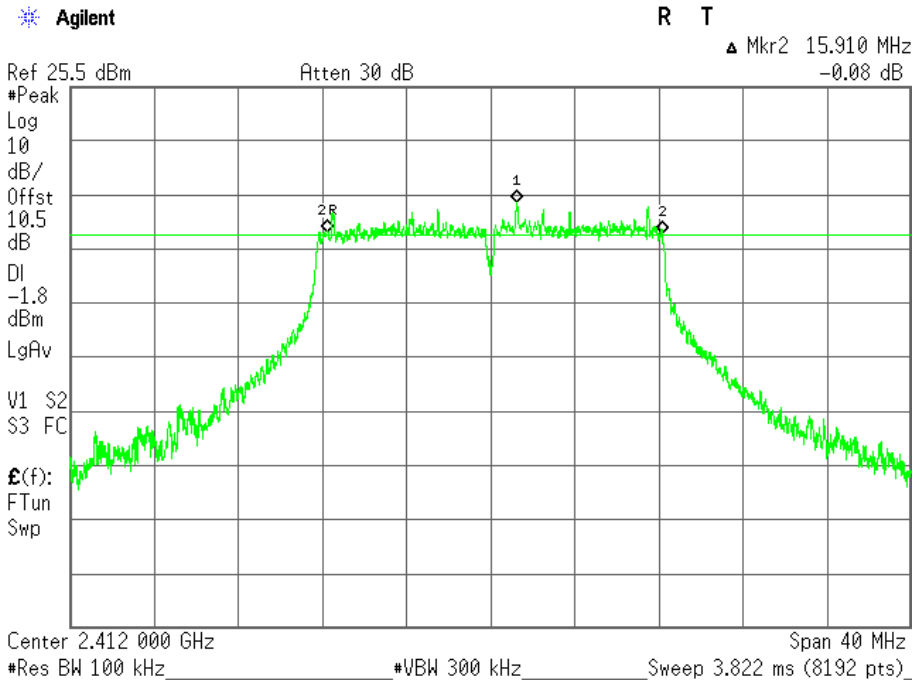

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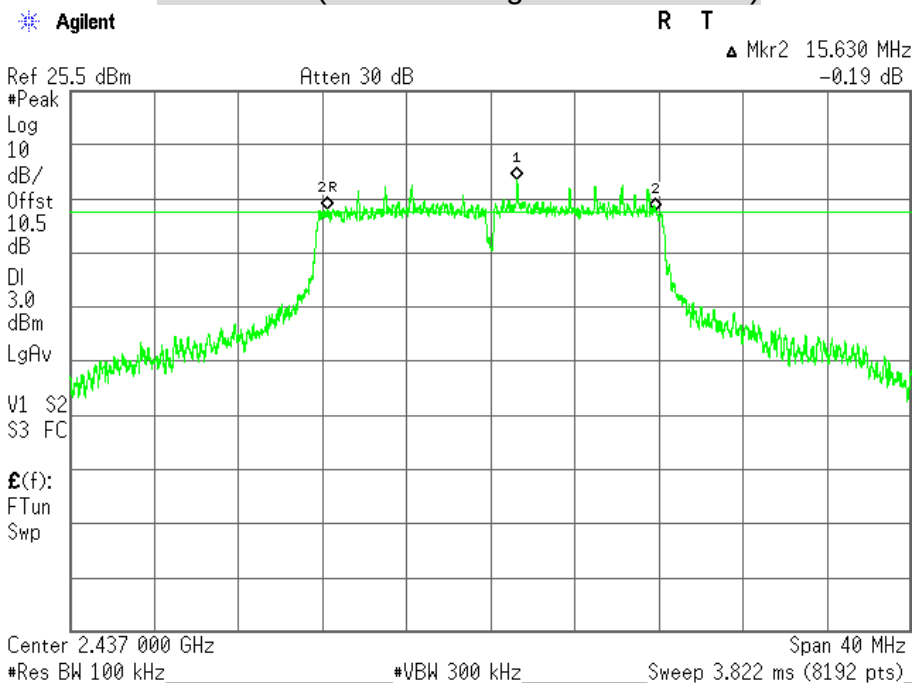

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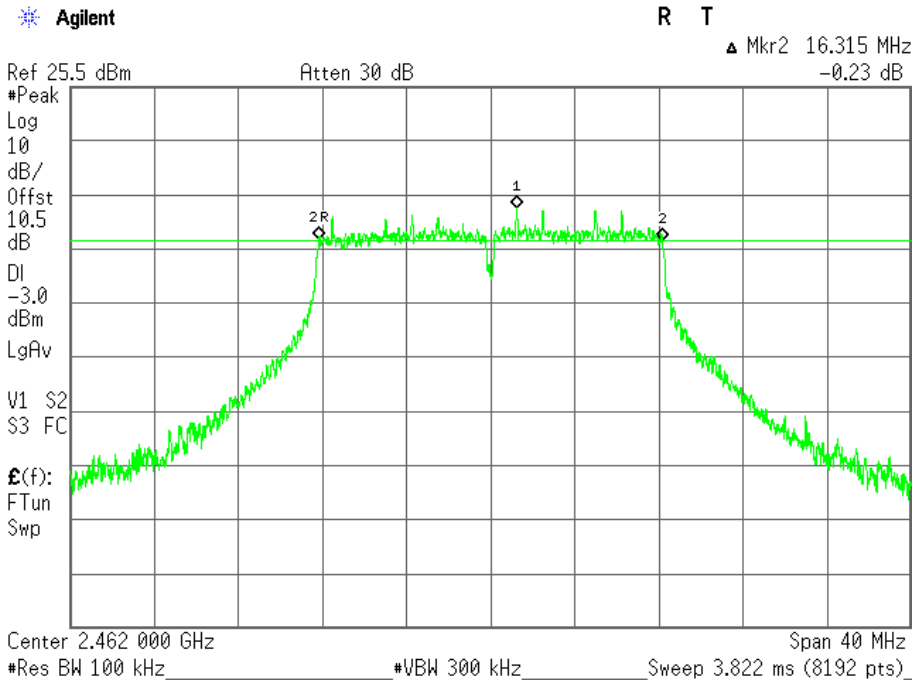

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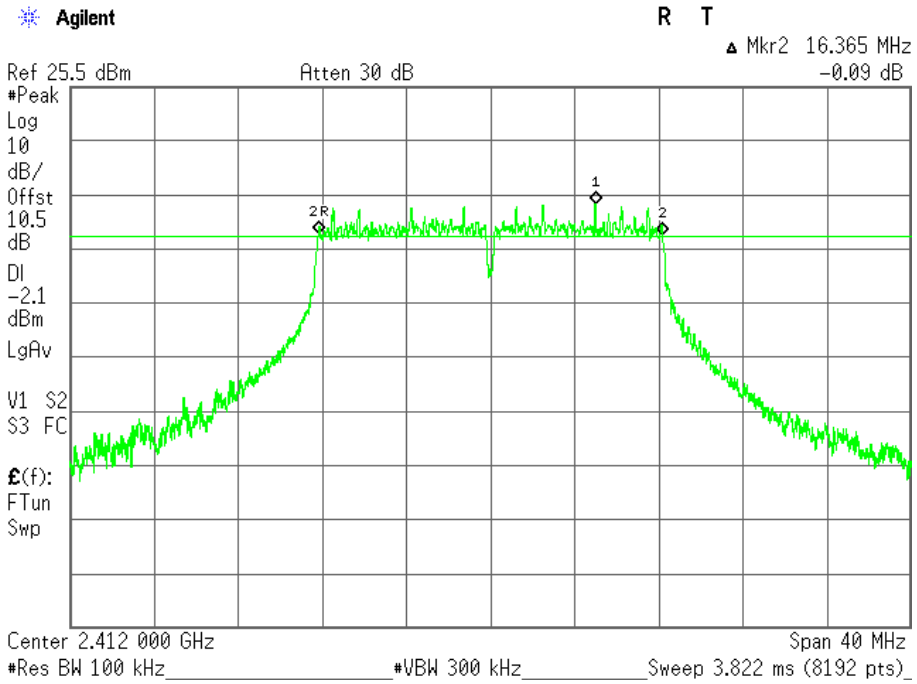

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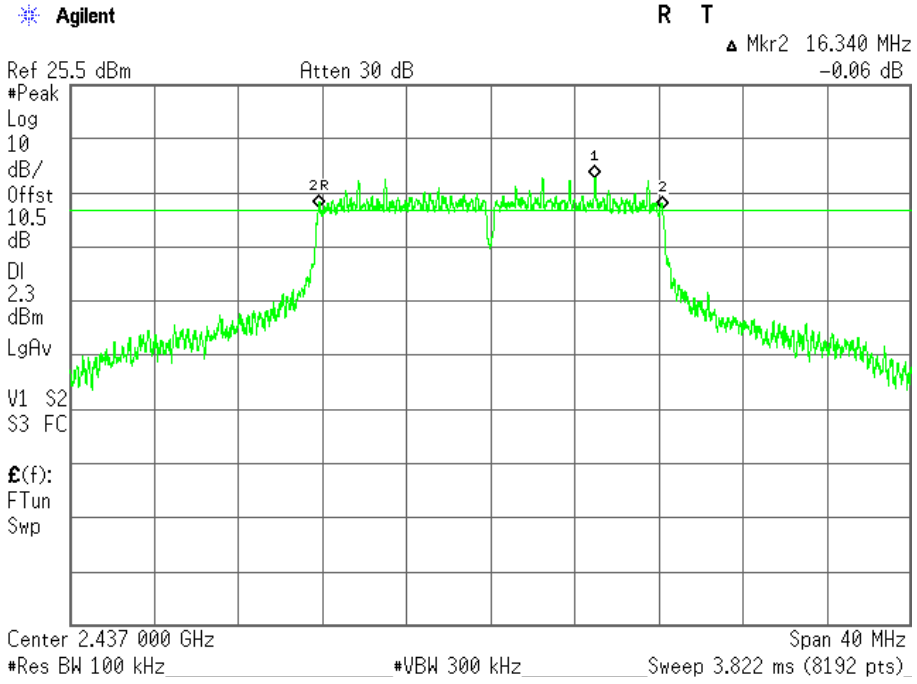

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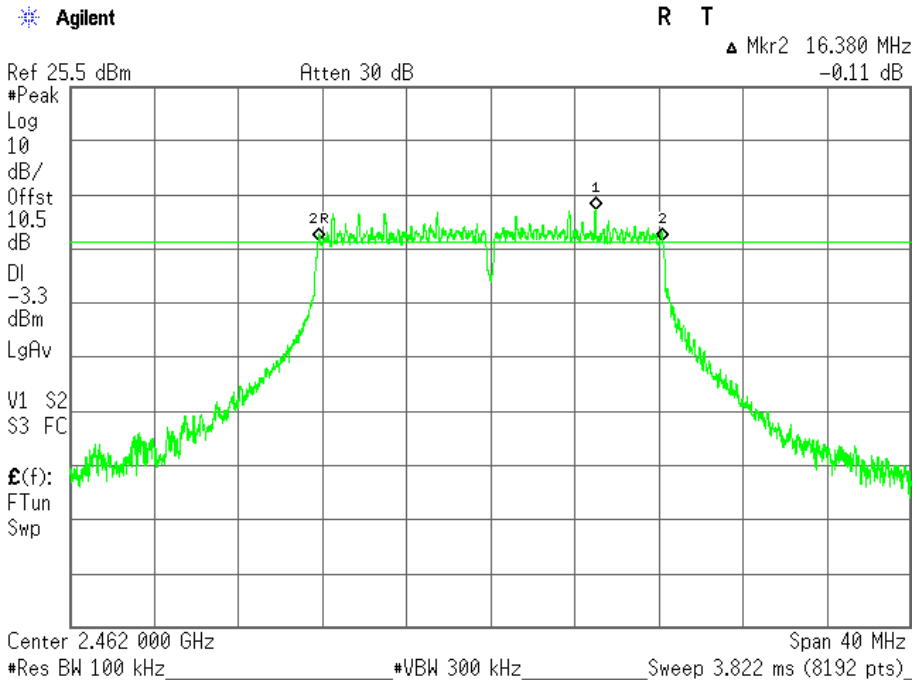

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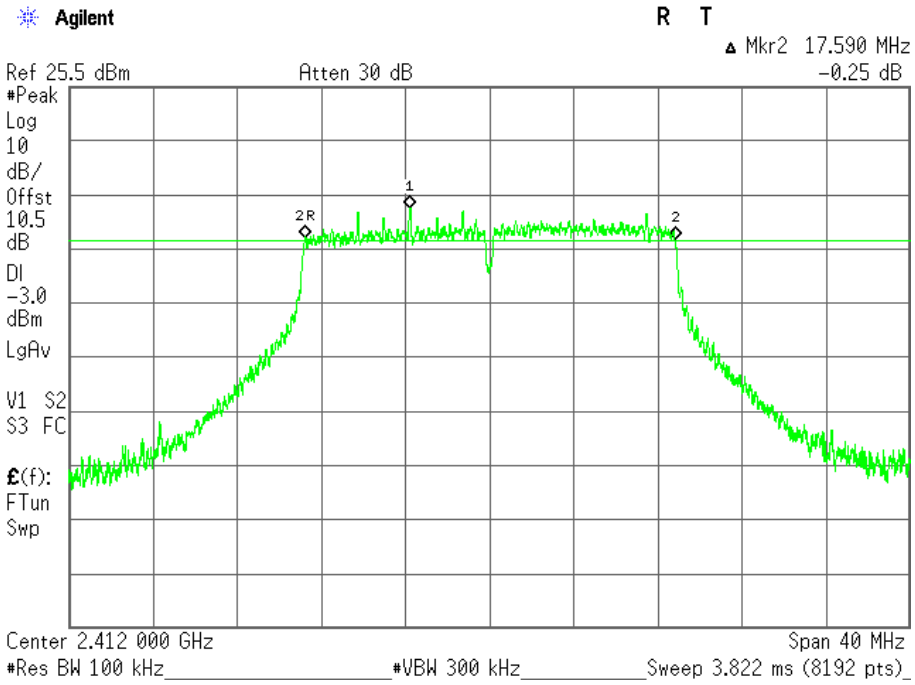

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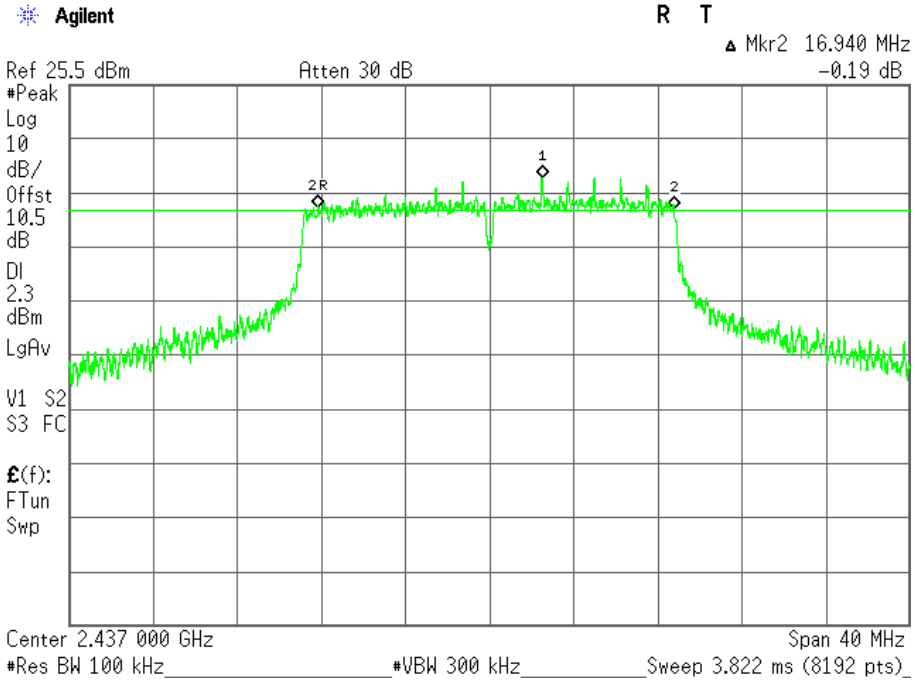

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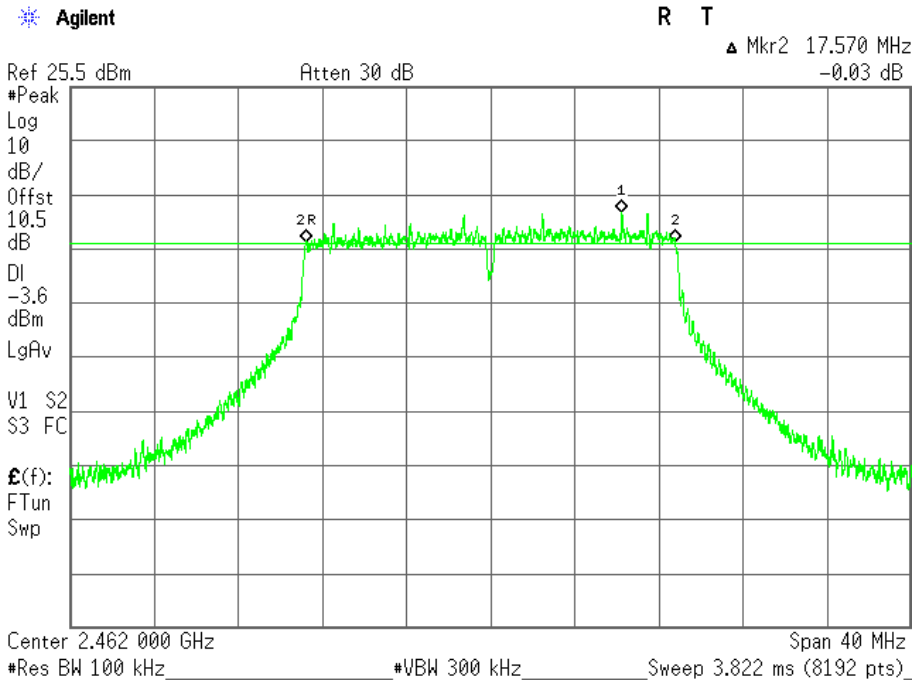

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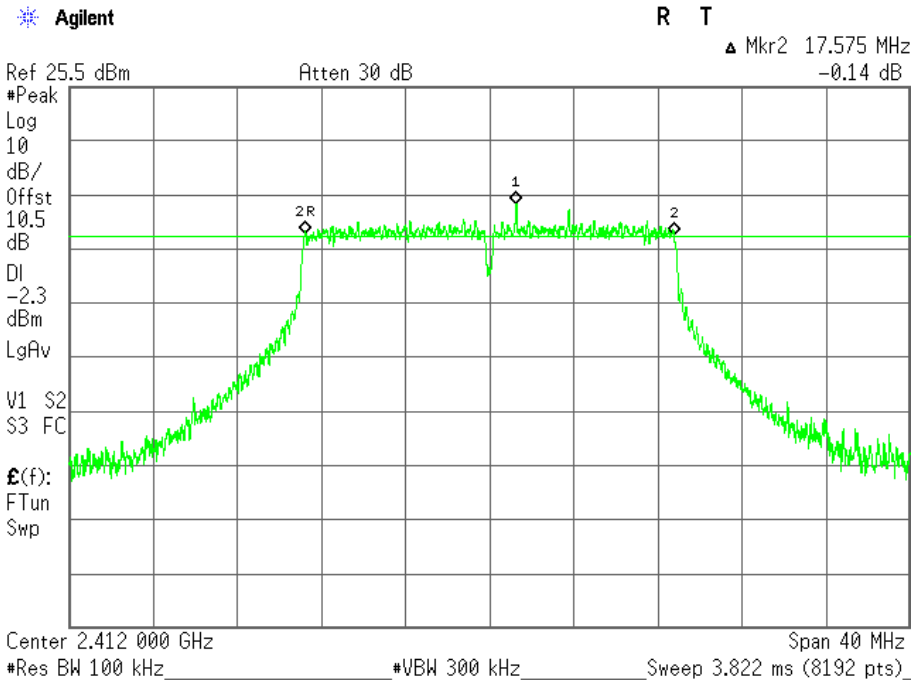

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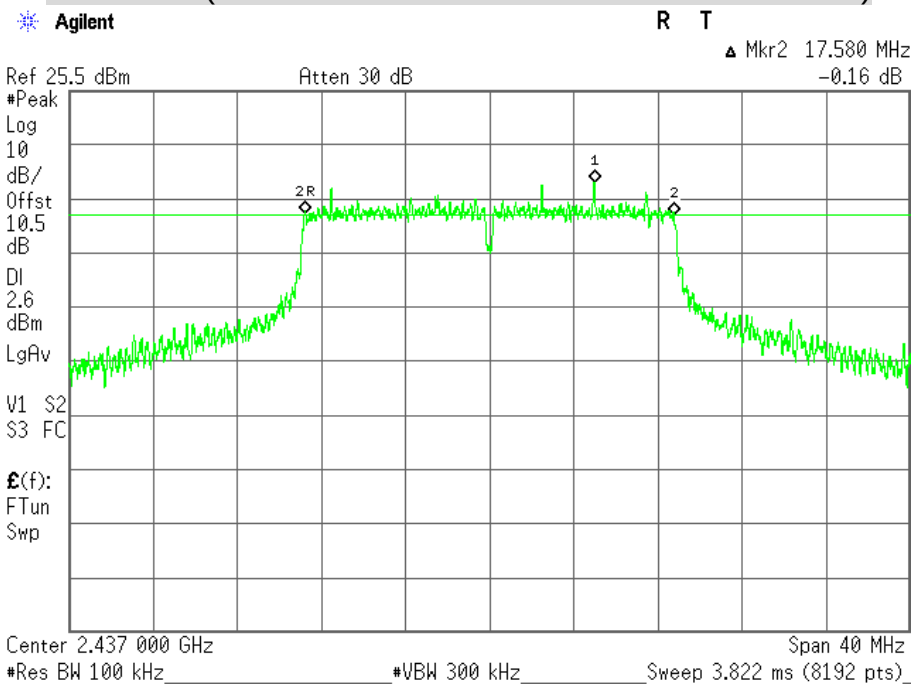

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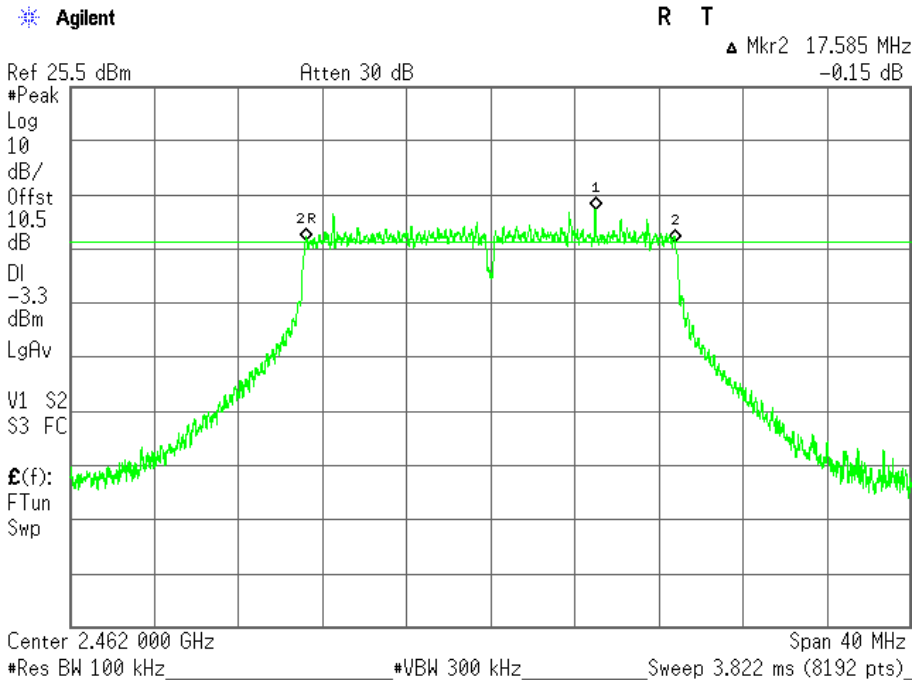

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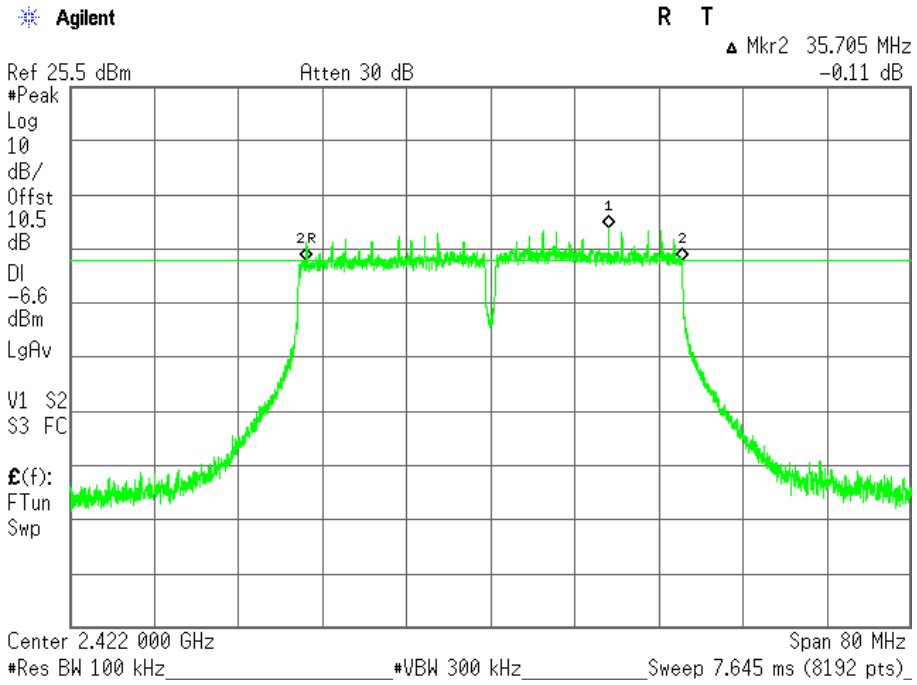

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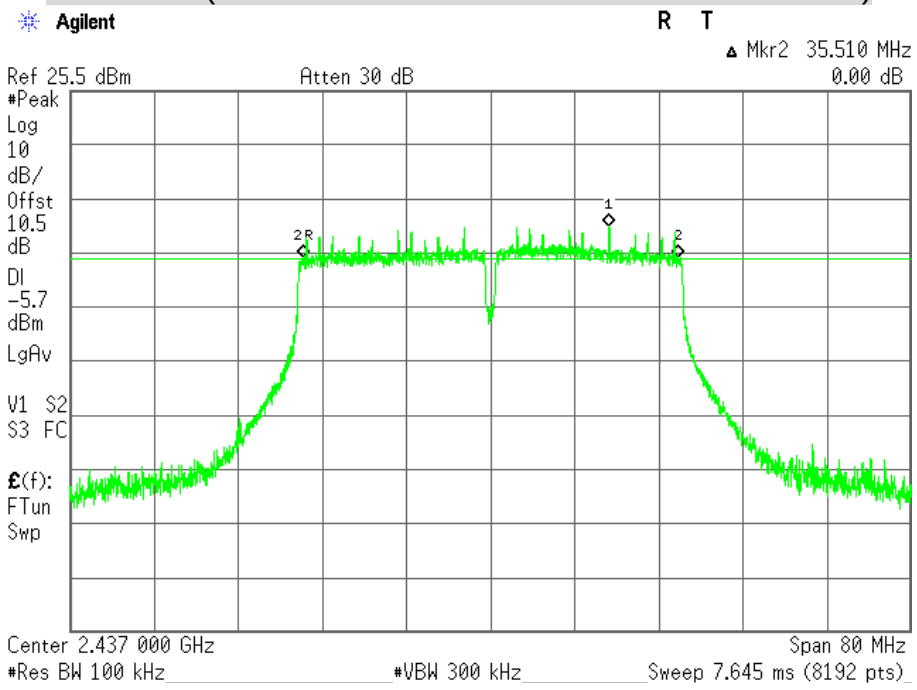

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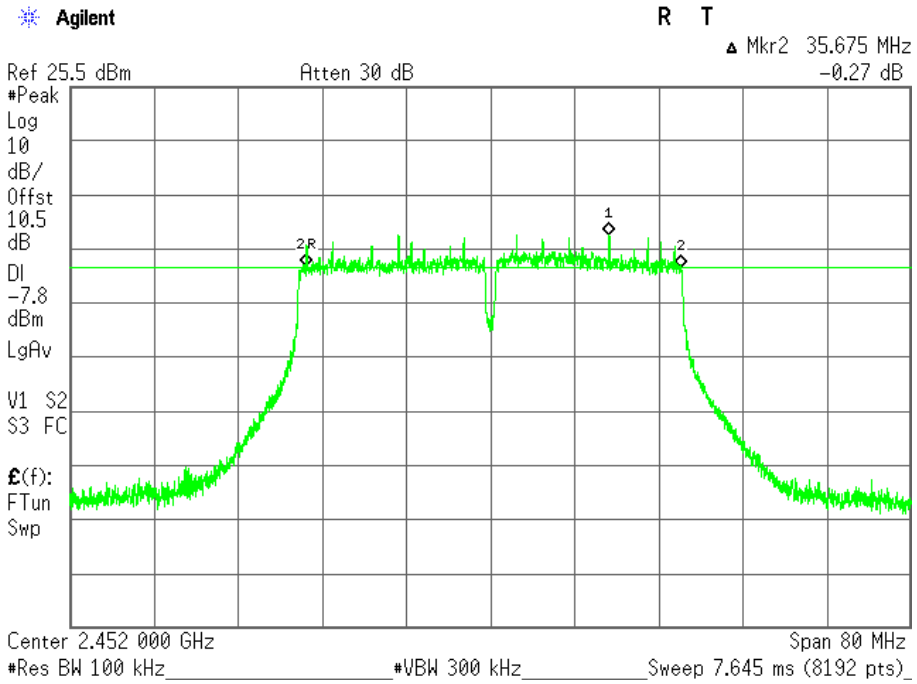

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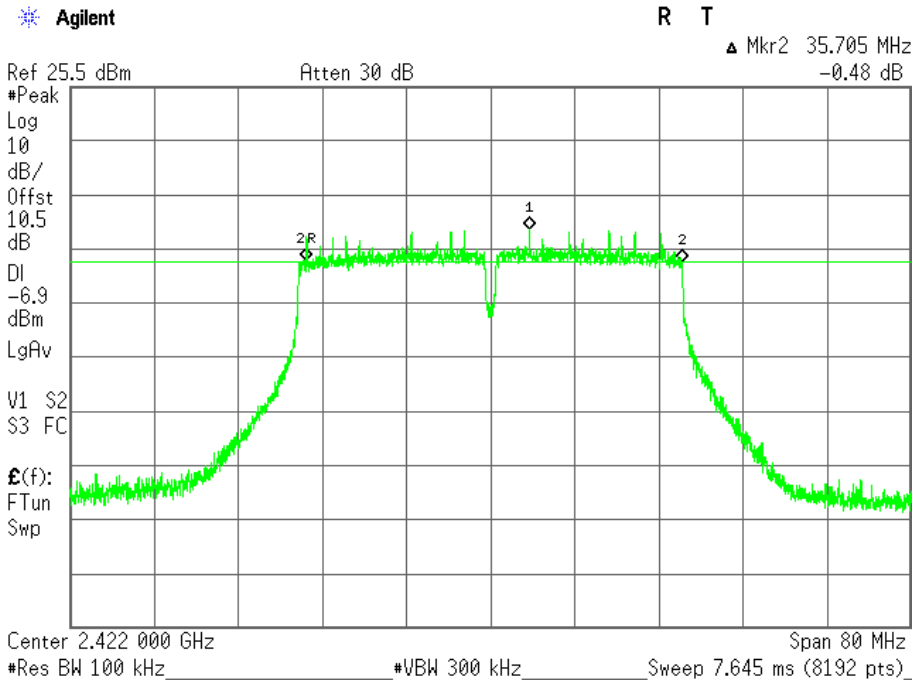
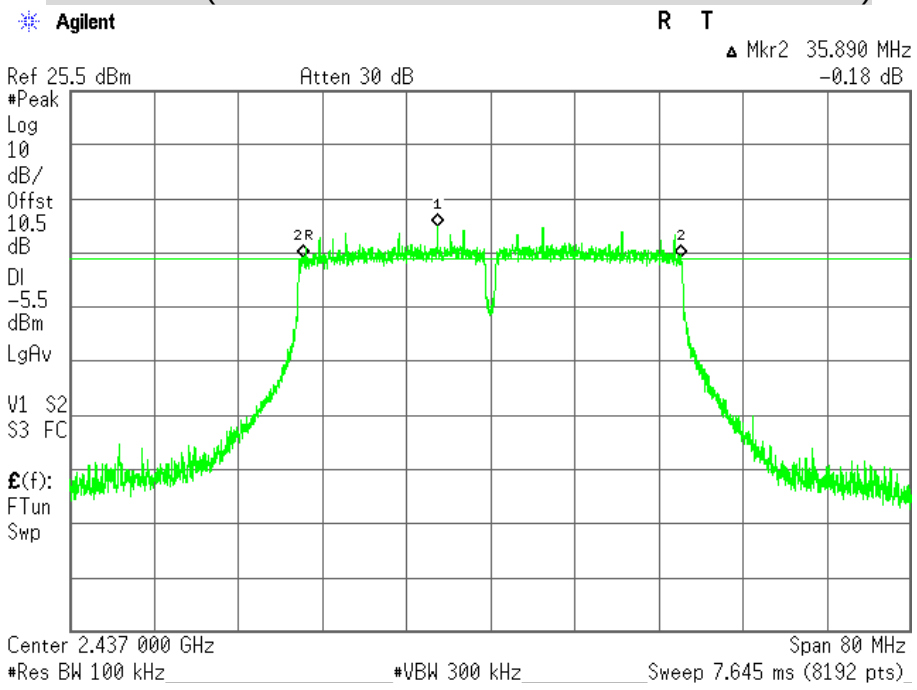
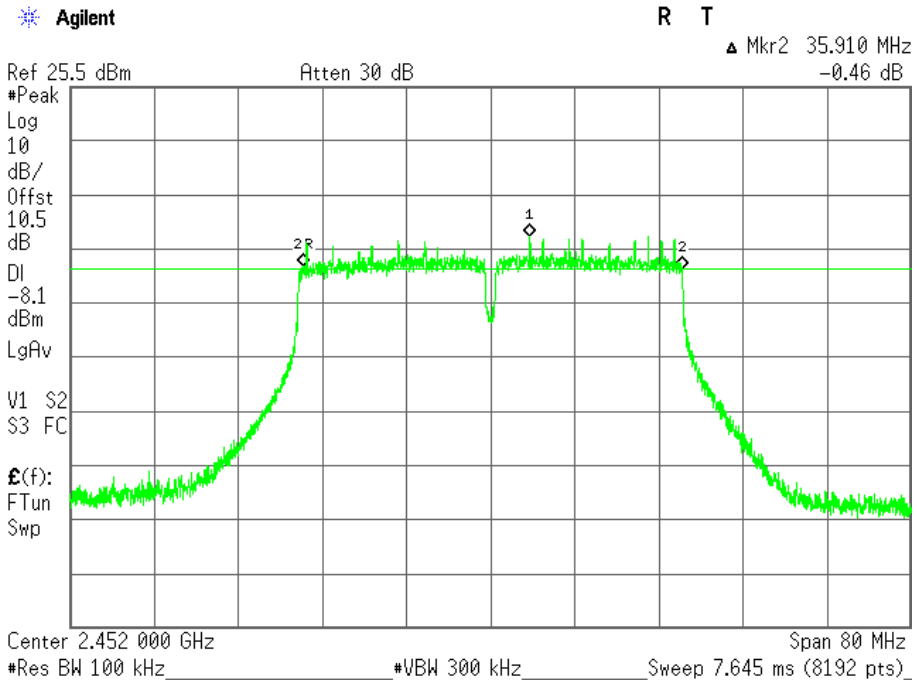


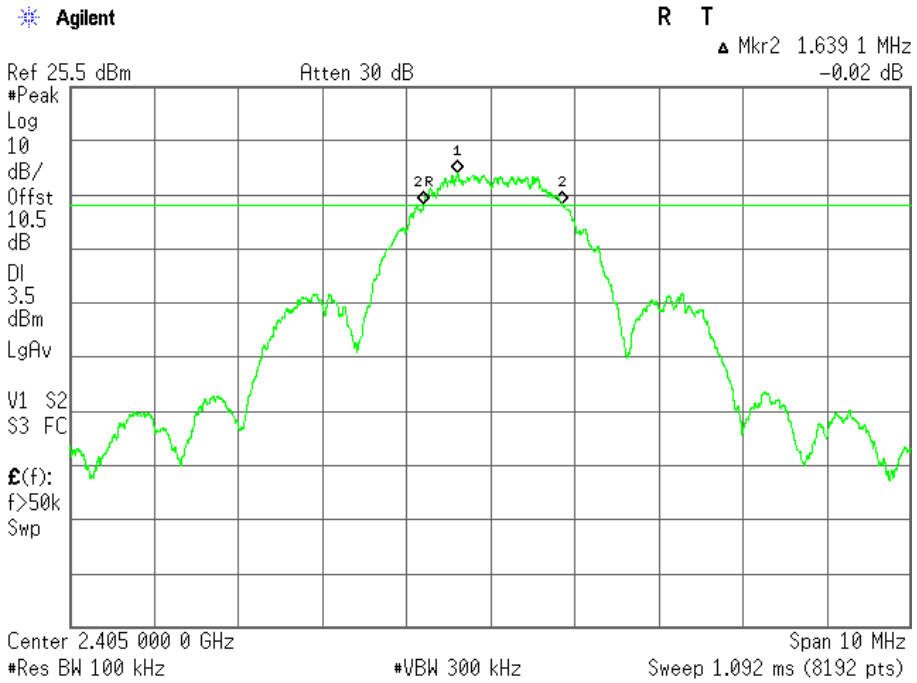
CH Middle (IEEE 802.11ac VHT40 MCS0 Mode / Chain 1)



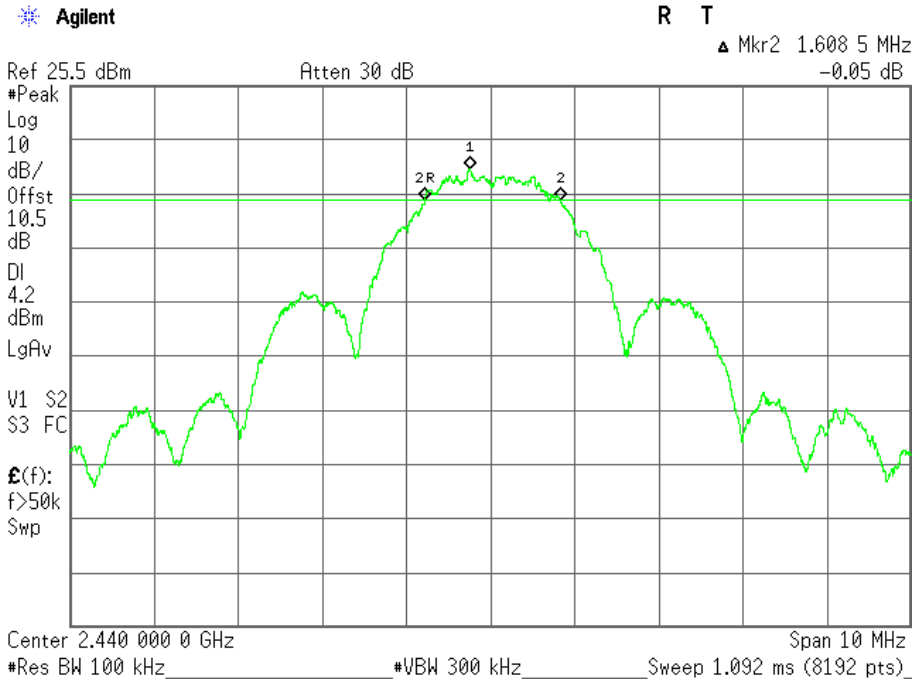
CH High (IEEE 802.11ac VHT40 MCS0 Mode / Chain 1)



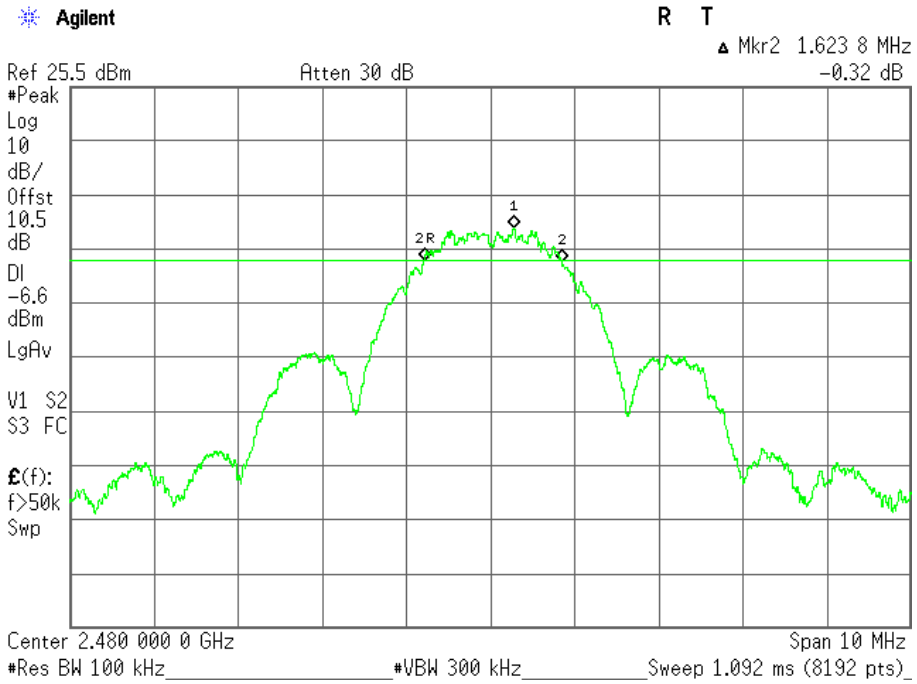
CH Low (ZigBee Mode)



CH Middle (ZigBee Mode)



CH High (ZigBee Mode)



7.3 MAXIMUM PEAK OUTPUT POWER

LIMITS

§ 15.247(b) The maximum peak output power of the intentional radiator shall not exceed the following:
§ 15.247(b) (3) For systems using digital modulation in the 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz bands: 1 watt.
§ 15.247(b) (4) Except as shown in paragraphs (c) of this section, if transmitting antennas of directional gain greater than 6 dBi are used the peak output power from the intentional radiator shall be reduced below the stated values in paragraphs (b)(1) or (b)(2), and (b)(3) of this section, as appropriate, by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

§ KDB 662911:
If all antennas have the same gain, G_{ANT}, Directional gain = G_{ANT} + Array Gain, where Array Gain is as follows.
Array Gain = 0 dB (i.e., no array gain) for $N_{ANT} \leq 4$;
Array Gain = 0 dB (i.e., no array gain) for channel widths ≥ 40 MHz for any N_{ANT} ;
Array Gain = 5 log(N_{ANT}/N_{SS}) dB or 3 dB, whichever is less for 20-MHz channel widths with $N_{ANT} \geq 5$.
If antenna gains are not equal, the user may use either of the following methods to calculate directional gain, provided that each transmit antenna is driven by only one spatial stream:
Directional gain may be calculated by using the formulas applicable to equal gain antennas with G_{ANT} set equal to the gain of the antenna having the highest gain; or,

$$DirectionalGain = 10 \cdot \log\left[\frac{\sum_{j=1}^{N_{SS}}\left\{\sum_{k=1}^{N_{ANT}} g_{j,k}\right\}^2}{N_{ANT}}\right]$$

TEST EQUIPMENT

Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
Power Meter	Anritsu	ML2495A	1149001	12/05/2017
Power Sensor	Anritsu	MA2411B	1126148	12/05/2017
Test S/W	N/A			

Remark: *Each piece of equipment is scheduled for calibration once a year.*

TEST SETUP

TEST PROCEDURE

The transmitter output is connected to the power meter. The power meter is set to the peak power detection.

TEST RESULTS

Product Name	AC1300 IoT Router	Test By	Waternil Guan
Test Model	X10R	Test Date	2016/11/16
Test Mode	WiFi / TX Mode	Temp. & Humidity	25°C, 62%

IEEE 802.11b Mode (2TX)

Channel	Channel Frequency (MHz)	Maximum Peak Output Power						Result
		Chain 0	Chain 1	Total		Limit		
		(dBm)	(dBm)	(dBm)	(W)	(dBm)	(W)	
Low	2412	21.08	21.12	24.11	0.2576	30.00	1.0000	PASS
Middle	2437	23.19	23.06	26.14	0.4111	30.00	1.0000	PASS
High	2462	20.02	20.01	23.03	0.2009	30.00	1.0000	PASS

Remark:

1. *At finial test to get the worst-case emission at 1Mbps.*
2. *The cable assembly insertion loss of 10.5 dB (including 10 dB pad and 0.5 dB cable) was entered as an offset in the power meter to allow for direct reading of power.*
3. *Total peak power = Chain 0 + Chain 1*
4. *The maximum antenna gain is 5.73 dBi which is less than 6dBi, the limit should be 1 W.*

IEEE 802.11g Mode (2TX)

Channel	Channel Frequency (MHz)	Maximum Peak Output Power						Result
		Chain 0	Chain 1	Total		Limit		
		(dBm)	(dBm)	(dBm)	(W)	(dBm)	(W)	
Low	2412	22.90	22.97	25.95	0.3936	30.00	1.0000	PASS
Middle	2437	24.57	24.50	27.55	0.5689	30.00	1.0000	PASS
High	2462	22.27	22.36	25.33	0.3412	30.00	1.0000	PASS

Remark:

1. *At finial test to get the worst-case emission at 6Mbps.*
2. *The cable assembly insertion loss of 10.5 dB (including 10 dB pad and 0.5 dB cable) was entered as an offset in the power meter to allow for direct reading of power.*
3. *Total peak power = Chain 0 + Chain 1*
4. *The maximum antenna gain is 5.73 dBi which is less than 6dBi, the limit should be 1 W.*

IEEE 802.11ac VHT20 MCS0 Mode (2TX)

Channel	Channel Frequency (MHz)	Maximum Peak Output Power						Result
		Chain 0	Chain 1	Total		Limit		
		(dBm)	(dBm)	(dBm)	(W)	(dBm)	(W)	
Low	2412	22.54	22.61	25.59	0.3622	30.00	1.0000	PASS
Middle	2437	24.28	24.32	27.31	0.5383	30.00	1.0000	PASS
High	2462	21.45	21.57	24.52	0.2831	30.00	1.0000	PASS

Remark:

1. *At finial test to get the worst-case emission at 6.5Mbps.*
2. *The cable assembly insertion loss of 10.5 dB (including 10 dB pad and 0.5 dB cable) was entered as an offset in the power meter to allow for direct reading of power.*
3. *Total peak power = Chain 0 + Chain 1.*
4. *The maximum antenna gain is 5.73 dBi which is less than 6dBi, the limit should be 1 W.*

IEEE 802.11ac VHT40 MCS0 Mode (2TX)

Channel	Channel Frequency (MHz)	Maximum Peak Output Power						Result
		Chain 0	Chain 1	Total		Limit		
		(dBm)	(dBm)	(dBm)	(W)	(dBm)	(W)	
Low	2422	21.05	21.13	24.10	0.2570	30.00	1.0000	PASS
Middle	2437	22.12	22.25	25.20	0.3311	30.00	1.0000	PASS
High	2452	20.30	20.27	23.30	0.2138	30.00	1.0000	PASS

Remark:

1. *At finial test to get the worst-case emission at 13.5Mbps.*
2. *The cable assembly insertion loss of 10.5 dB (including 10 dB pad and 0.5 dB cable) was entered as an offset in the power meter to allow for direct reading of power.*
3. *Total peak power = Chain 0 + Chain 1.*
4. *The maximum antenna gain is 5.73 dBi which is less than 6dBi, the limit should be 1 W.*

Product Name	AC1300 IoT Router	Test By	Waternil Guan
Test Model	X10R	Test Date	2016/11/21
Test Mode	ZigBee / TX Mode	Temp. & Humidity	23°C, 66%

Channel	Channel Frequency (MHz)	Maximum Peak Output Power				Result
		Measured Value		Limit		
		(dBm)	(W)	(dBm)	(W)	
Low	2405	14.15	0.0260	30.00	1.0000	PASS
Middle	2440	13.27	0.0212	30.00	1.0000	PASS
High	2480	2.76	0.0019	30.00	1.0000	PASS

Remark: *The cable assembly insertion loss of 10.5 dB (including 10 dB pad and 0.5 dB cable) was entered as an offset in the power meter to allow for direct reading of power.*

7.4 AVERAGE POWER

LIMITS

None: For reporting purposes only.

TEST EQUIPMENT

Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
Power Meter	Anritsu	ML2495A	1149001	12/05/2017
Power Sensor	Anritsu	MA2411B	1126148	12/05/2017
Test S/W	N/A			

Remark: *Each piece of equipment is scheduled for calibration once a year.*

TEST SETUP

TEST PROCEDURE

The transmitter output is connected to the power meter. The power meter is set to the average power detection.

TEST RESULTS

Product Name	AC1300 IoT Router	Test By	Waternil Guan
Test Model	X10R	Test Date	2016/11/16
Test Mode	WiFi / TX Mode	Temp. & Humidity	25°C, 62%

IEEE 802.11b Mode

Channel	Channel Frequency (MHz)	Average Power (dBm)	
		Chain 0	Chain 1
Low	2412	18.75	18.78
Middle	2437	21.13	20.94
High	2462	17.64	17.58

Remark:

1. *At finial test to get the worst-case emission at 1Mbps.*
2. *The cable assembly insertion loss of 10.5 dB (including 10 dB pad and 0.5 dB cable) was entered as an offset in the spectrum analyzer to allow for direct reading of power.*

IEEE 802.11g Mode

Channel	Channel Frequency (MHz)	Average Power (dBm)	
		Chain 0	Chain 1
Low	2412	14.47	14.65
Middle	2437	18.91	18.95
High	2462	13.52	13.55

Remark:

1. *At finial test to get the worst-case emission at 6Mbps.*
2. *The cable assembly insertion loss of 10.5 dB (including 10 dB pad and 0.5 dB cable) was entered as an offset in the spectrum analyzer to allow for direct reading of power.*

IEEE 802.11ac VHT20 MCS0 Mode

Channel	Channel Frequency (MHz)	Average Power (dBm)	
		Chain 0	Chain 1
Low	2412	14.67	14.86
Middle	2437	19.02	19.11
High	2462	13.64	13.78

Remark:

1. *At finial test to get the worst-case emission at 6.5Mbps.*
2. *The cable assembly insertion loss of 10.5 dB (including 10 dB pad and 0.5 dB cable) was entered as an offset in the spectrum analyzer to allow for direct reading of power.*

IEEE 802.11ac VHT40 MCS0 Mode

Channel	Channel Frequency (MHz)	Average Power (dBm)	
		Chain 0	Chain 1
Low	2422	12.71	12.94
Middle	2437	14.09	14.21
High	2452	11.91	11.86

Remark:

1. *At finial test to get the worst-case emission at 13.5Mbps.*
2. *The cable assembly insertion loss of 10.5 dB (including 10 dB pad and 0.5 dB cable) was entered as an offset in the spectrum analyzer to allow for direct reading of power.*

Product Name	AC1300 IoT Router	Test By	Waternil Guan
Test Model	X10R	Test Date	2016/11/21
Test Mode	ZigBee / TX Mode	Temp. & Humidity	23°C, 66%

Channel	Channel Frequency (MHz)	Average Power (dBm)
Low	2405	14.05
Middle	2440	13.18
High	2480	2.56

Remark:

1. *At finial test to get the worst-case emission at 13.5Mbps.*
2. *The cable assembly insertion loss of 10.5 dB (including 10 dB pad and 0.5 dB cable) was entered as an offset in the spectrum analyzer to allow for direct reading of power.*

7.5 POWER SPECTRAL DENSITY

LIMITS

§ 15.247(e) For digitally modulated systems, the power spectral density conducted from the intentional radiator to the antenna shall not greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission.

§ KDB 662911:

If all antennas have the same gain, G_{ANT}, Directional gain = G_{ANT} + Array Gain, where Array Gain is as follows.

Array Gain = 10 log(N_{ANT}/N_{SS}) dB.

If antenna gains are not equal, the user may use either of the following methods to calculate directional gain, provided that each transmit antenna is driven by only one spatial stream:

Directional gain may be calculated by using the formulas applicable to equal gain antennas with G_{ANT} set equal to the gain of the antenna having the highest gain; or,

$$DirectionalGain = 10 \cdot \log \left[\frac{\sum_{j=1}^{N_{SS}} \left\{ \sum_{k=1}^{N_{ANT}} g_{j,k} \right\}^2}{N_{ANT}} \right]$$

TEST EQUIPMENT

Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
Spectrum Analyzer	Agilent	E4446A	MY43360132	05/31/2017
Test S/W	N/A			

Remark: *Each piece of equipment is scheduled for calibration once a year.*

TEST SETUP

TEST PROCEDURE

1. The transmitter output was connected to the spectrum analyzer.
2. Set analyzer center frequency to DTS channel center frequency.
3. Set the span to 1.5 times the DTS channel bandwidth.
4. Set the RBW to: 3 kHz ≤ RBW ≤ 100 kHz.
5. Set the VBW ≥ 3 x RBW.
6. Detector = peak.
7. Sweep time = auto couple.
8. Trace mode = max hold.
9. Allow trace to fully stabilize.
10. Use the peak marker function to determine the maximum amplitude level within the RBW.
11. If measured value exceeds limit, reduce RBW (no less than 3 kHz) and repeat.

TEST RESULTS

Product Name	AC1300 IoT Router	Test By	Waternil Guan
Test Model	X10R	Test Date	2016/11/16
Test Mode	WiFi / TX Mode	Temp. & Humidity	25°C, 62%

IEEE 802.11b Mode

Channel	Channel Frequency (MHz)	Final RF Power Level in 3KHz BW (dBm)				Result
		Chain 0	Chain 1	Total	Limit	
Low	2412	-6.33	-6.49	-3.40	5.32	PASS
Middle	2437	-5.09	-4.95	-2.01	5.32	PASS
High	2462	-6.67	-6.39	-3.52	5.32	PASS

Remark:

1. *At finial test to get the worst-case emission at 1Mbps.*
2. *The cable assembly insertion loss of 10.5 dB (including 10 dB pad and 0.5 dB cable) was entered as an offset in the spectrum analyzer to allow for direct reading of power.*
3. *Total power spectral density = Chain 0 + Chain 1.*
4. *The maximum antenna gain is 8.68 dBi which is more than 6dBi, the limit should be 5.32 dBm.*

IEEE 802.11g Mode

Channel	Channel Frequency (MHz)	Final RF Power Level in 3KHz BW (dBm)				Result
		Chain 0	Chain 1	Total	Limit	
Low	2412	-12.88	-12.69	-9.77	5.32	PASS
Middle	2437	-6.94	-7.92	-4.39	5.32	PASS
High	2462	-13.33	-14.36	-10.80	5.32	PASS

Remark:

1. *At finial test to get the worst-case emission at 6Mbps.*
2. *The cable assembly insertion loss of 10.5 dB (including 10 dB pad and 0.5 dB cable) was entered as an offset in the spectrum analyzer to allow for direct reading of power.*
3. *Total power spectral density = Chain 0 + Chain 1.*
4. *The directional gain is 8.68 dBi which is more than 6dBi, the limit should be 5.32 dBm.*

IEEE 802.11ac VHT20 MCS0 Mode

Channel	Channel Frequency (MHz)	Final RF Power Level in 3KHz BW (dBm)				Result
		Chain 0	Chain 1	Total	Limit	
Low	2412	-12.90	-11.06	-8.87	5.32	PASS
Middle	2437	-8.65	-9.03	-5.83	5.32	PASS
High	2462	-14.31	-13.66	-10.96	5.32	PASS

Remark:

1. *At finial test to get the worst-case emission at 6.5Mbps.*
2. *The cable assembly insertion loss of 10.5 dB (including 10 dB pad and 0.5 dB cable) was entered as an offset in the spectrum analyzer to allow for direct reading of power.*
3. *Total power spectral density = Chain 0 + Chain 1.*
4. *The directional gain is 8.68 dBi which is more than 6dBi, the limit should be 5.32 dBm.*

IEEE 802.11ac VHT40 MCS0 Mode

Channel	Channel Frequency (MHz)	Final RF Power Level in 3KHz BW (dBm)				Result
		Chain 0	Chain 1	Total	Limit	
Low	2422	-16.16	-15.98	-13.05	5.32	PASS
Middle	2437	-15.66	-14.60	-12.09	5.32	PASS
High	2452	-17.33	-18.51	-14.87	5.32	PASS

Remark:

1. *At finial test to get the worst-case emission at 13.5Mbps.*
2. *The cable assembly insertion loss of 10.5 dB (including 10 dB pad and 0.5 dB cable) was entered as an offset in the spectrum analyzer to allow for direct reading of power.*
3. *Total power spectral density = Chain 0 + Chain 1.*
4. *The directional gain is 8.68 dBi which is more than 6dBi, the limit should be 5.32 dBm.*

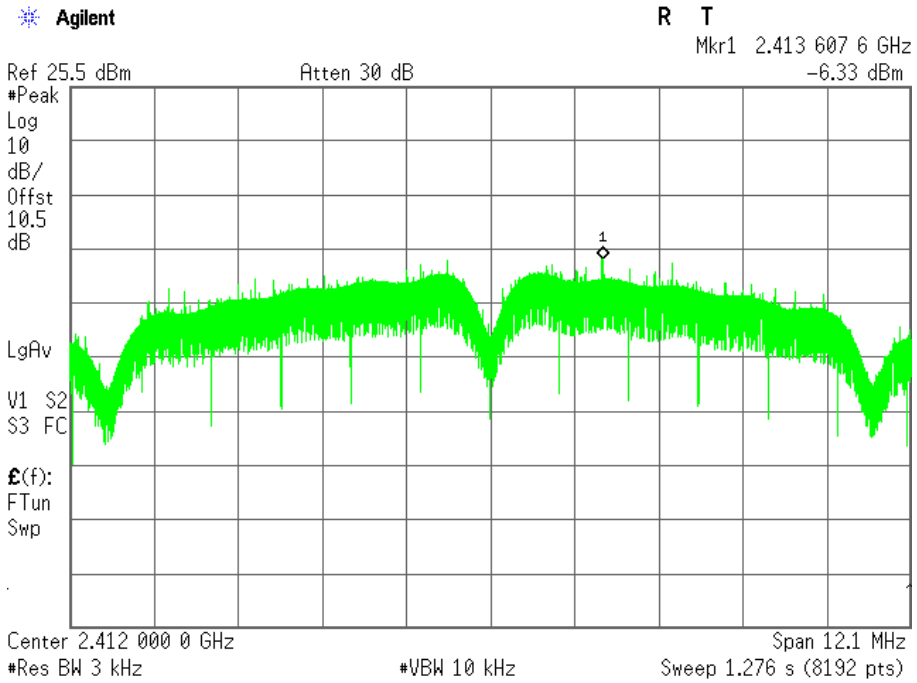
Product Name	AC1300 IoT Router	Test By	Waternil Guan
Test Model	X10R	Test Date	2016/11/21
Test Mode	ZigBee / TX Mode	Temp. & Humidity	23°C, 66%

Channel	Channel Frequency (MHz)	Final RF Power Level in 3KHz BW (dBm)		Result
		Measured Value	Limit	
Low	2405	-1.22	8	PASS
Middle	2440	-1.43	8	PASS
High	2480	-11.39	8	PASS

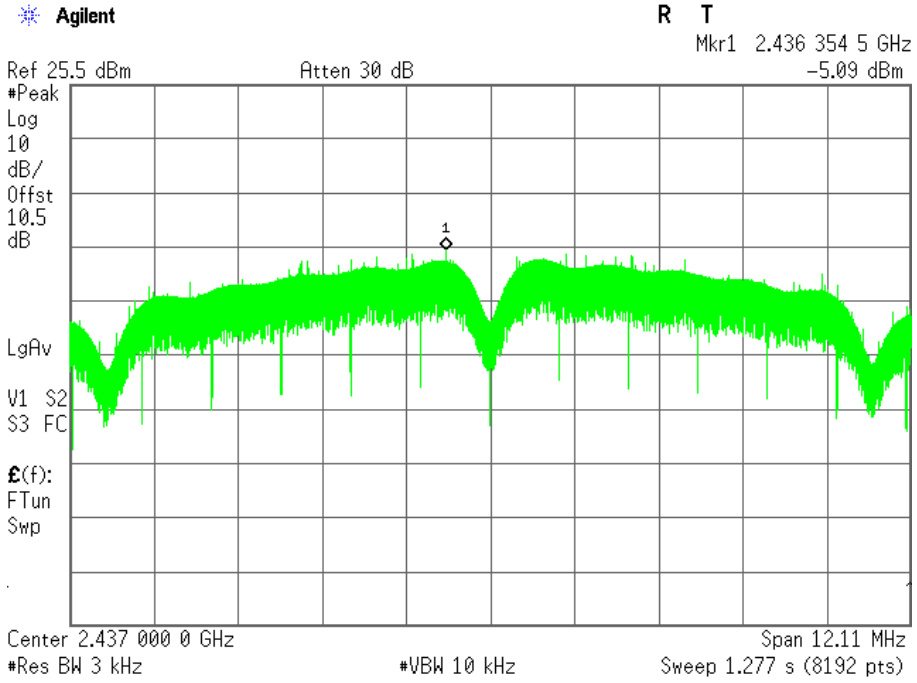
Remark: *The cable assembly insertion loss of 10.5 dB (including 10 dB pad and 0.5 dB cable) was entered as an offset in the spectrum analyzer to allow for direct reading of power.*

POWER SPECTRAL DENSITY

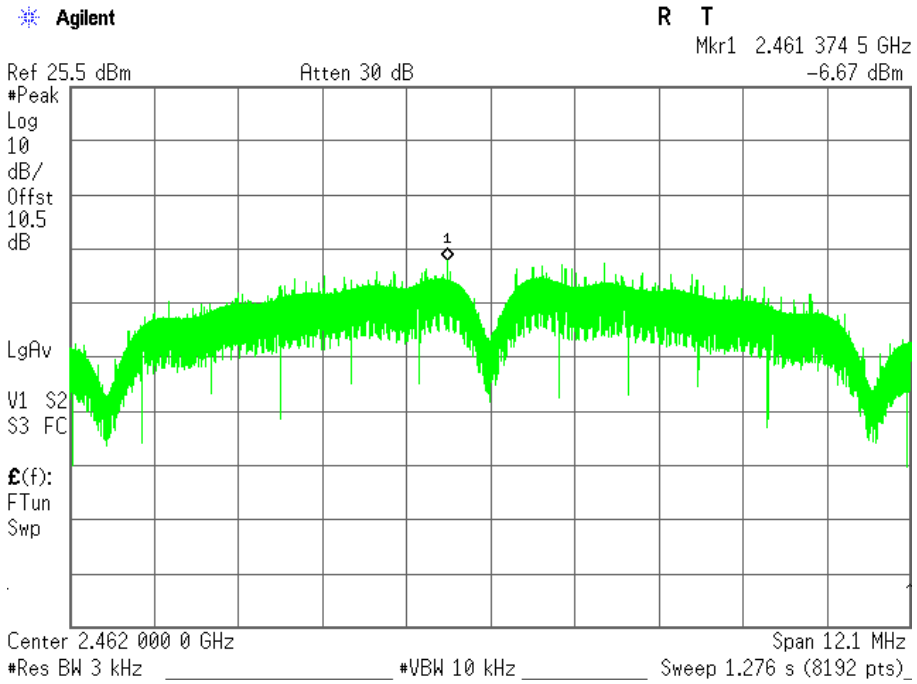
CH Low (IEEE 802.11b Mode / Chain 0)



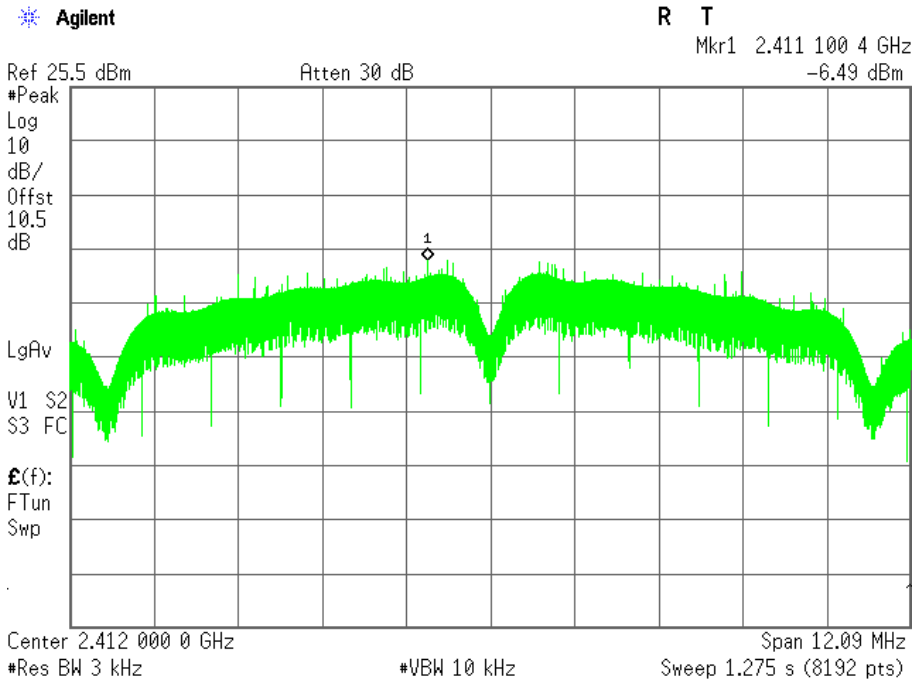
CH Middle (IEEE 802.11b Mode / Chain 0)



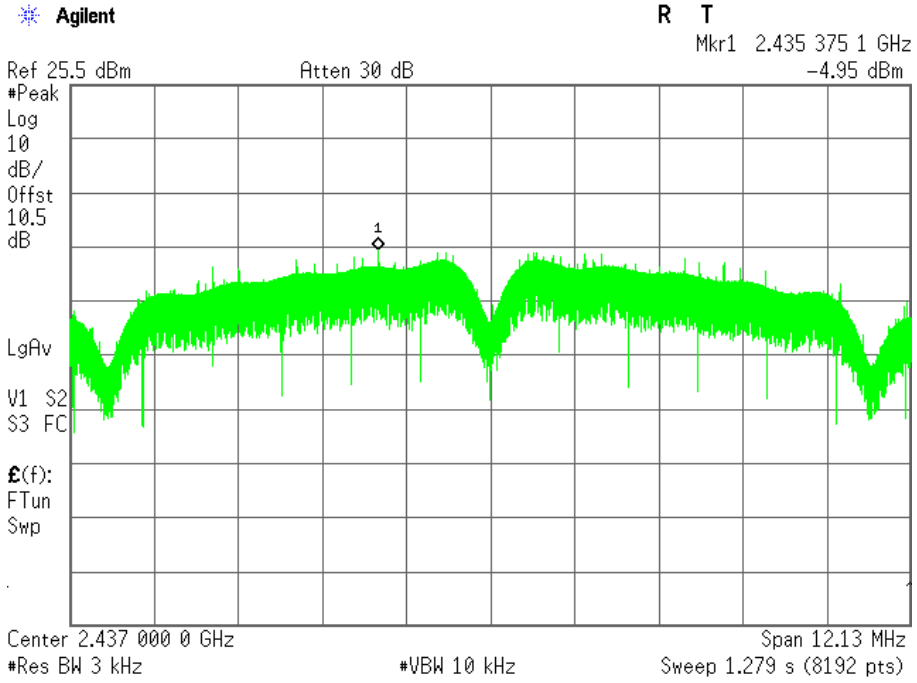
CH High (IEEE 802.11b Mode / Chain 0)



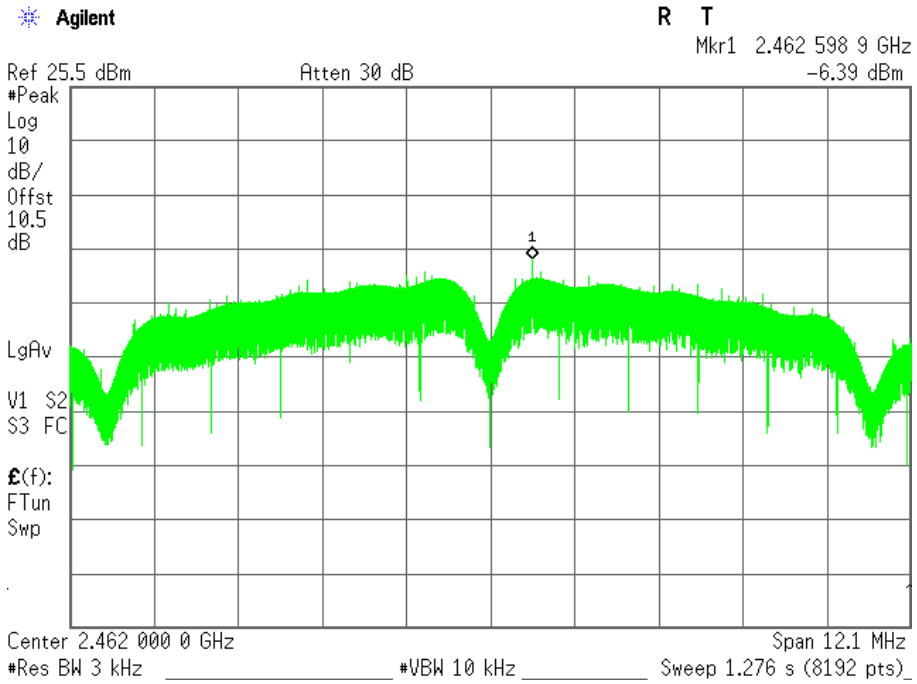
CH Low (IEEE 802.11b Mode / Chain 1)



CH Middle (IEEE 802.11b Mode / Chain 1)



CH High (IEEE 802.11b Mode / Chain 1)



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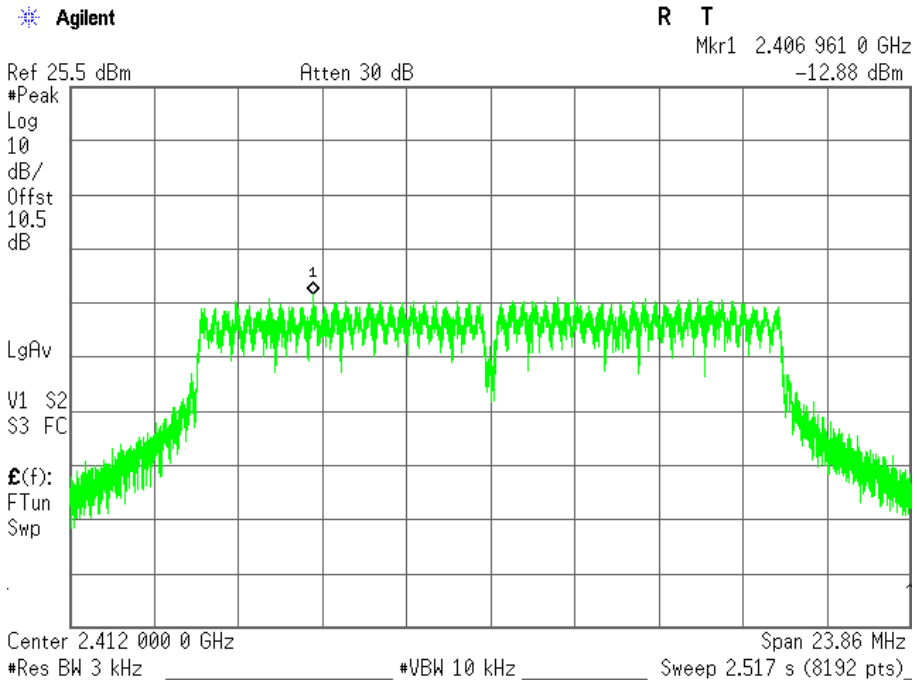
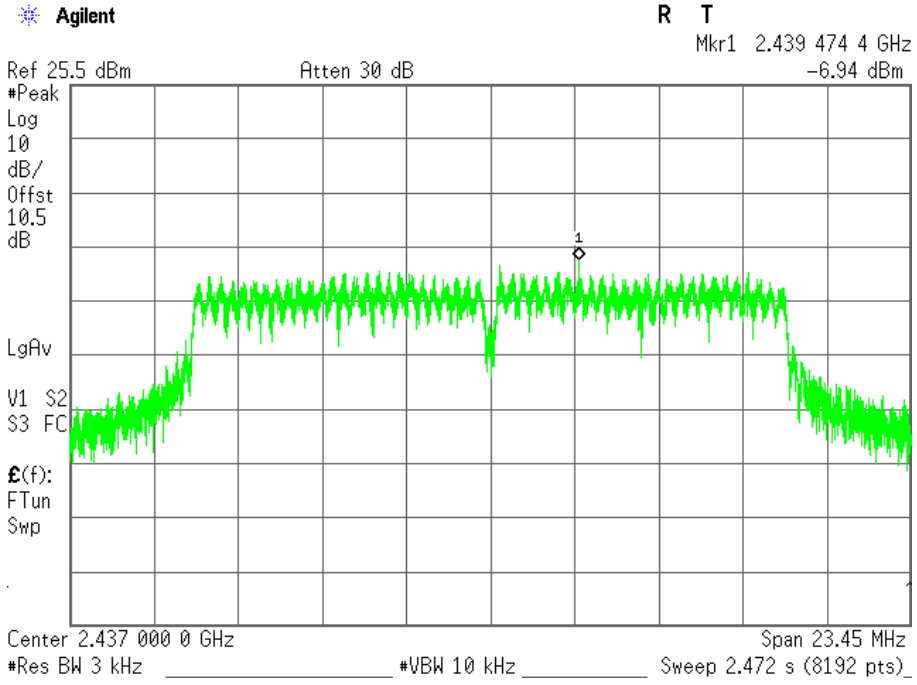
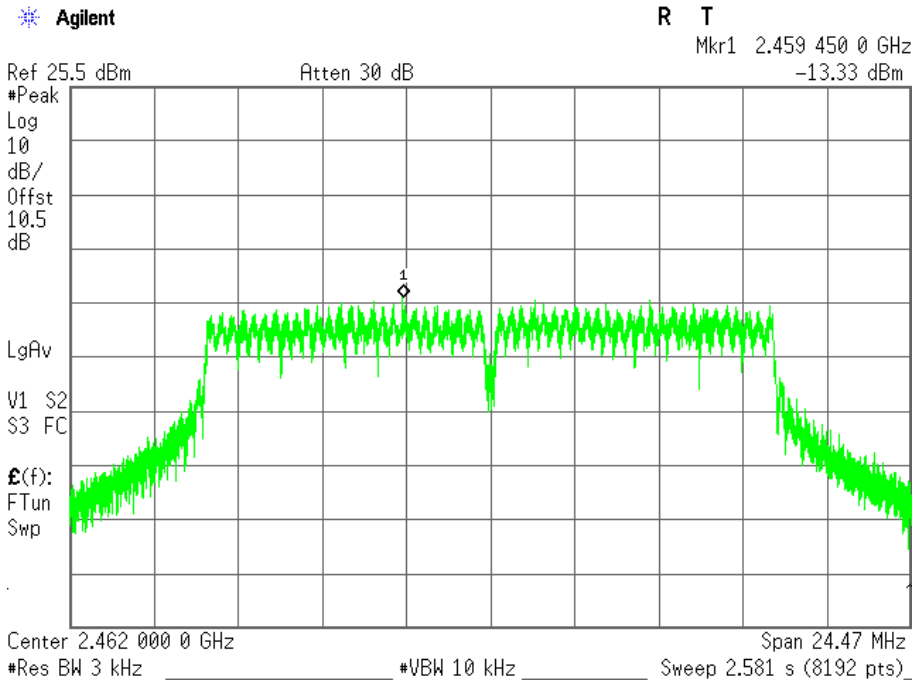


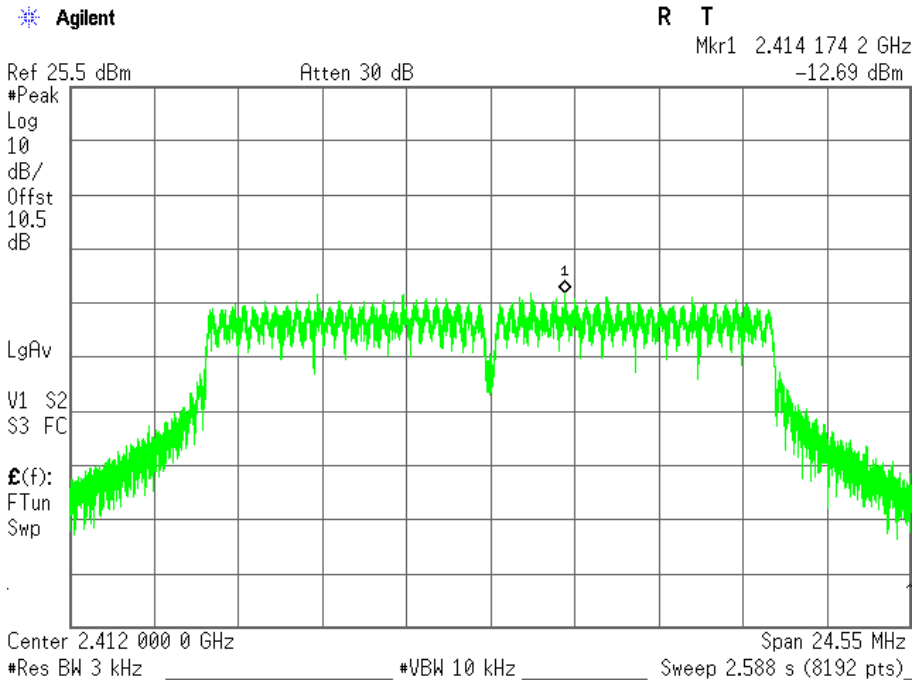
CH Middle (IEEE 802.11g Mode / Chain 0)



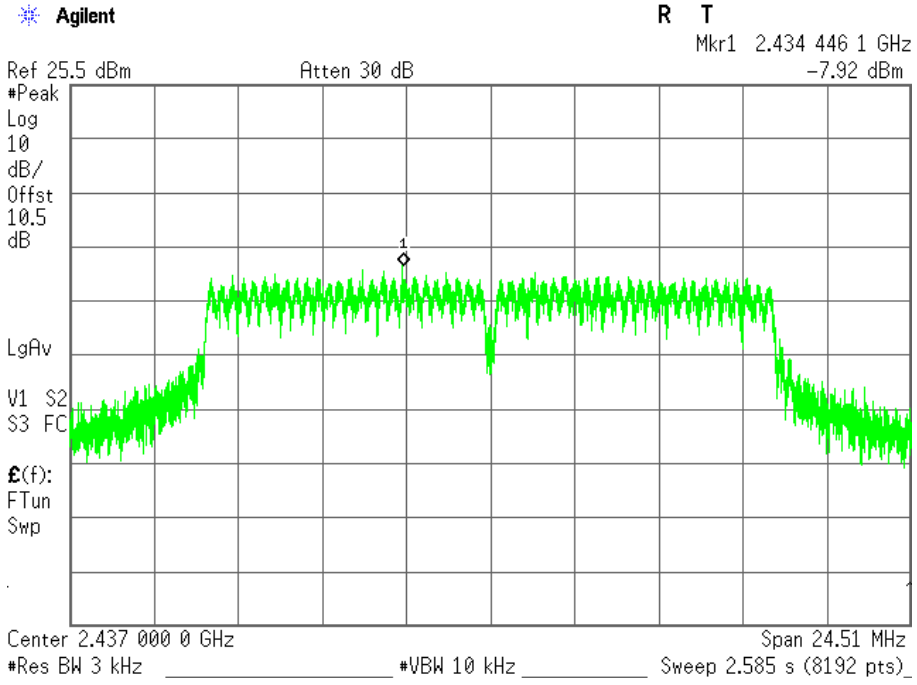
CH High (IEEE 802.11g Mode / Chain 0)



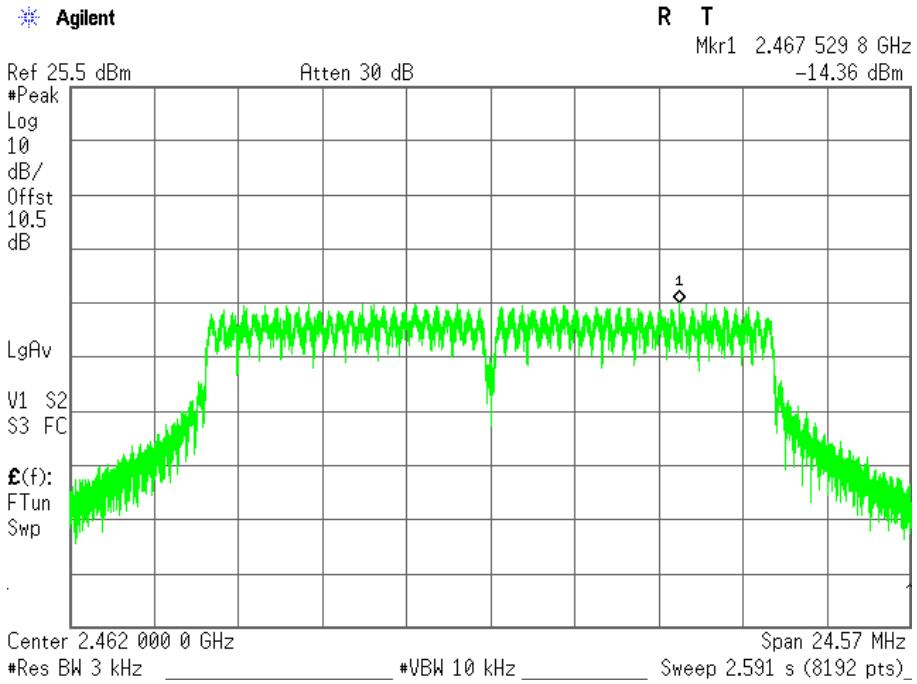
CH Low (IEEE 802.11g Mode / Chain 1)



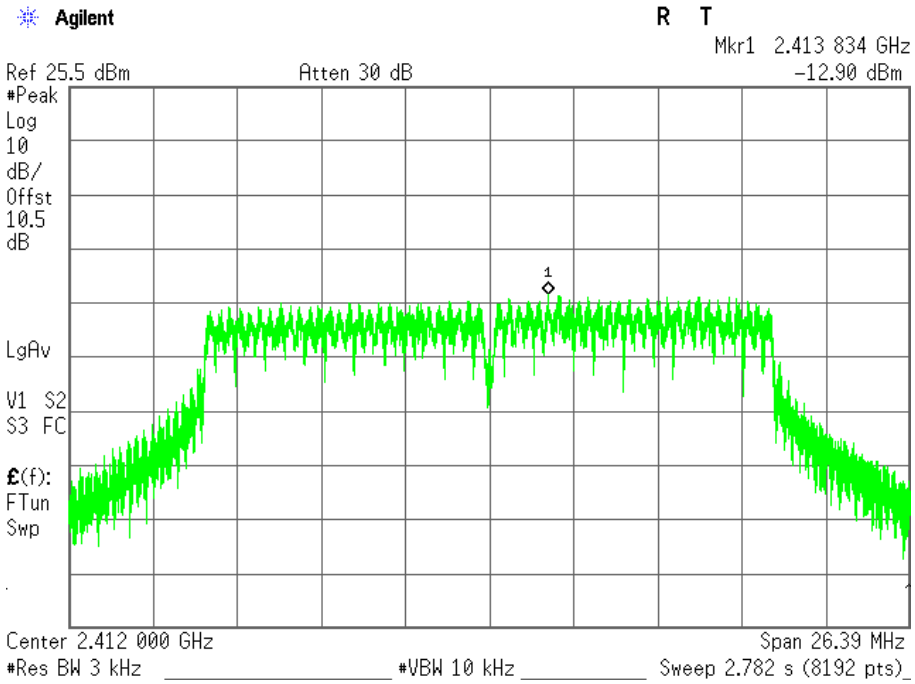
CH Middle (IEEE 802.11g Mode / Chain 1)



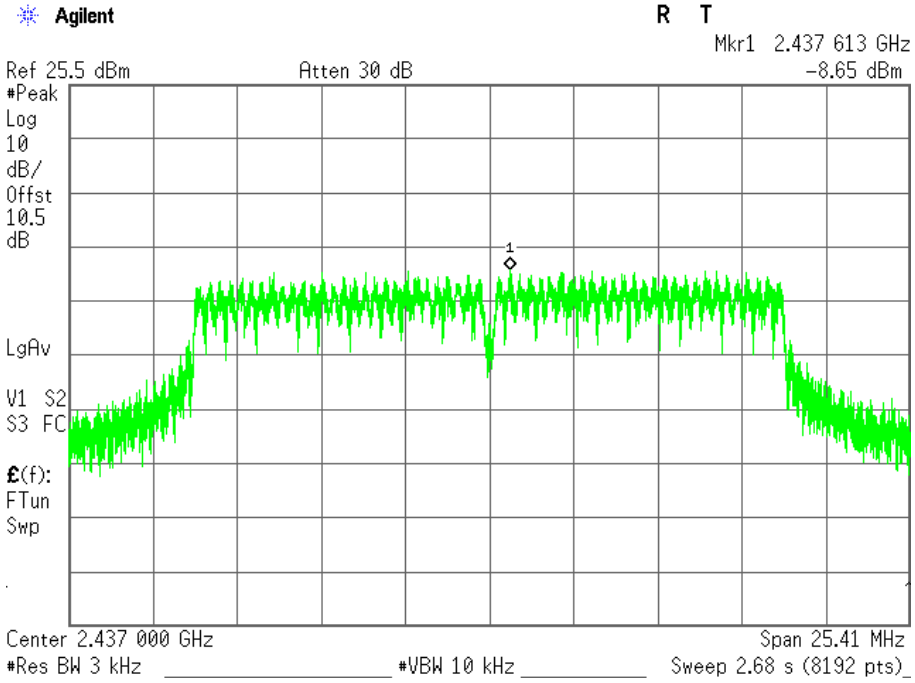
CH High (IEEE 802.11g Mode / Chain 1)



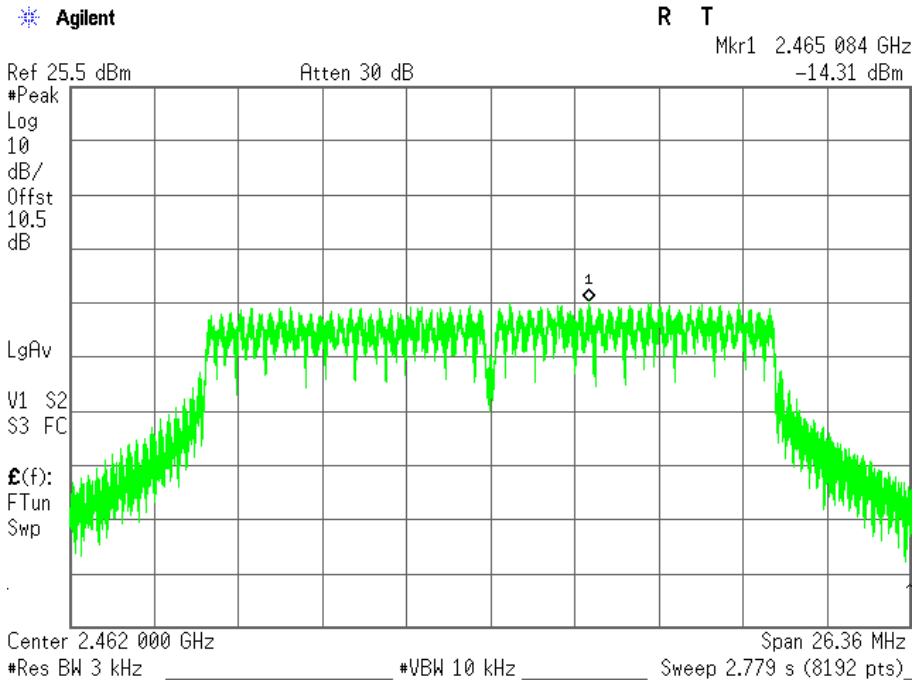
CH Low (IEEE 802.11ac VHT20 MCS0 Mode / Chain 0)



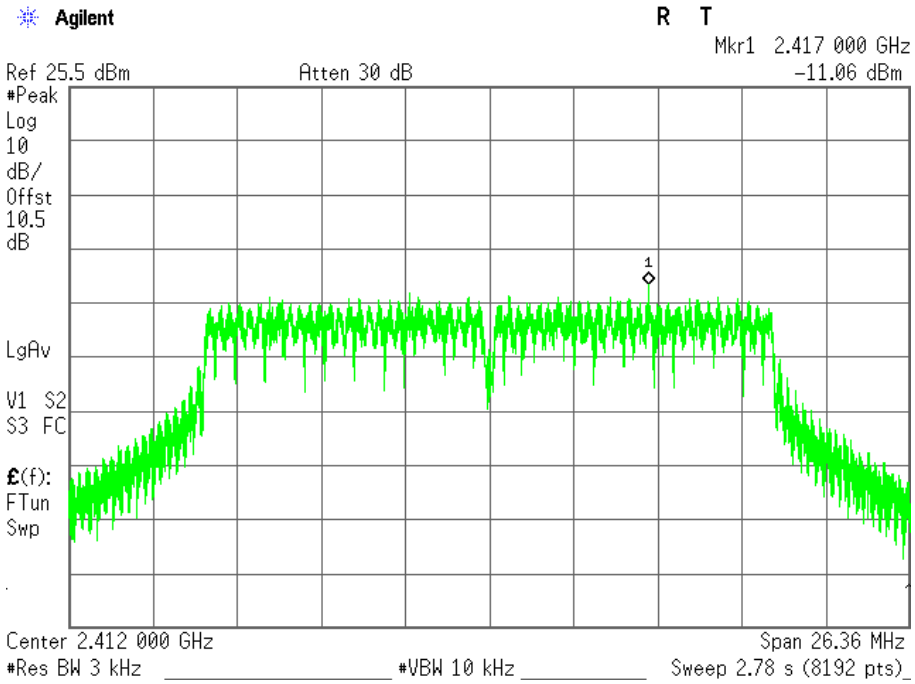
CH Middle (IEEE 802.11ac VHT20 MCS0 Mode / Chain 0)



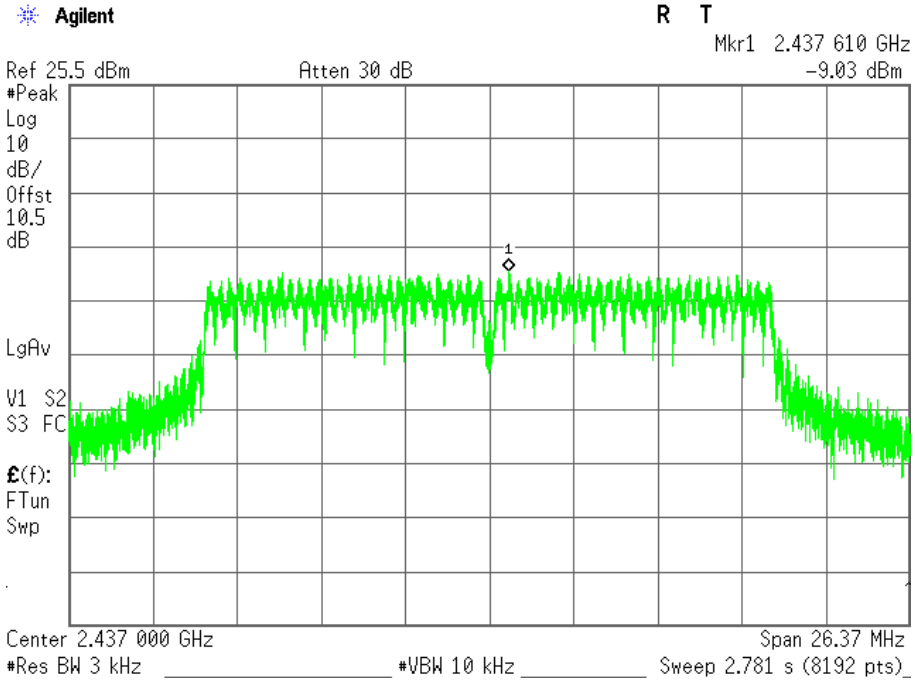
CH High (IEEE 802.11ac VHT20 MCS0 Mode / Chain 0)



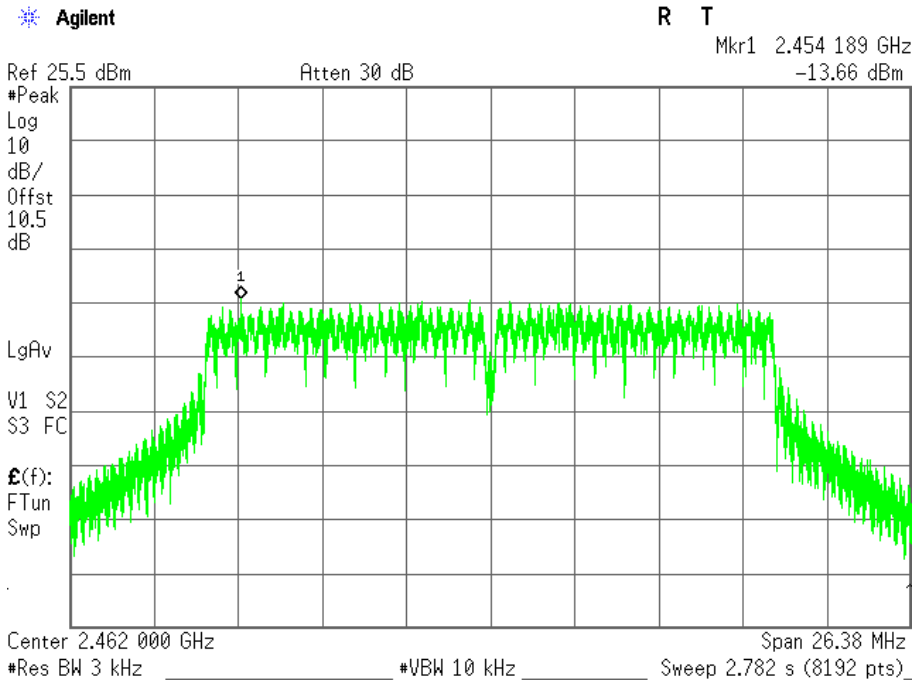
CH Low (IEEE 802.11ac VHT20 MCS0 Mode / Chain 1)



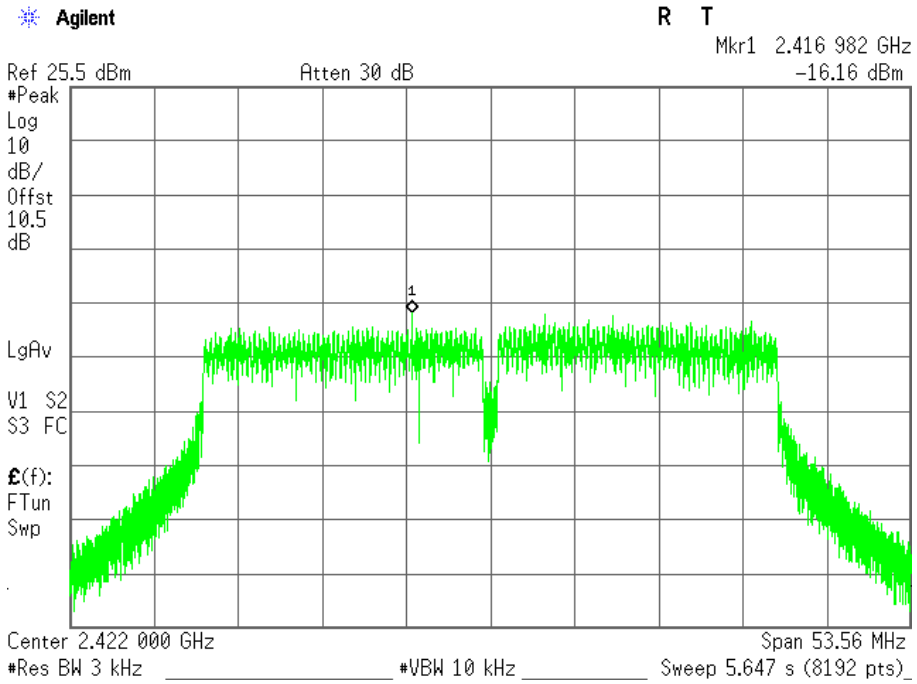
CH Middle (IEEE 802.11ac VHT20 MCS0 Mode / Chain 1)



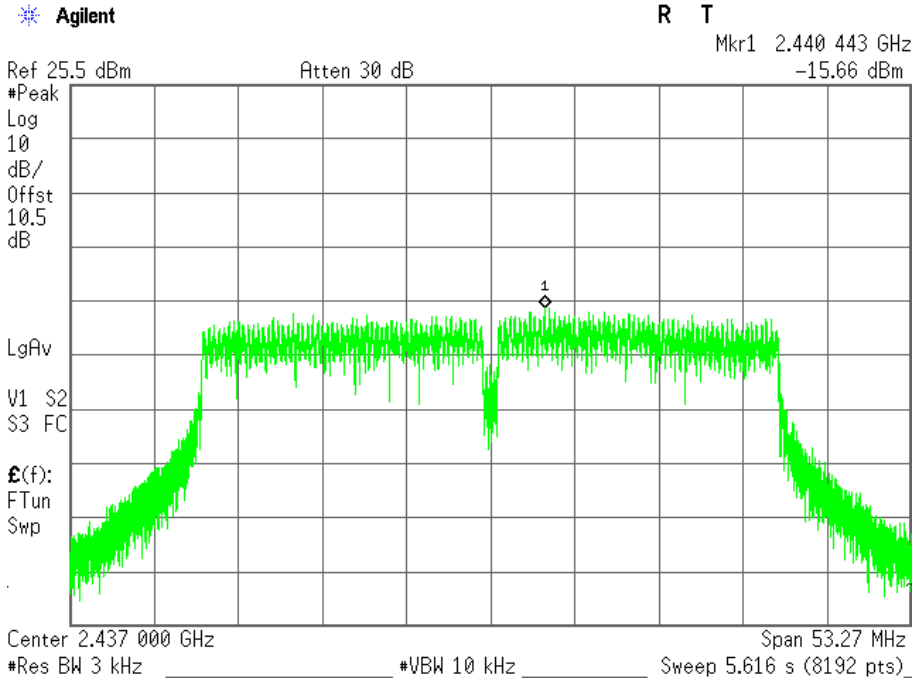
CH High (IEEE 802.11ac VHT20 MCS0 Mode / Chain 1)



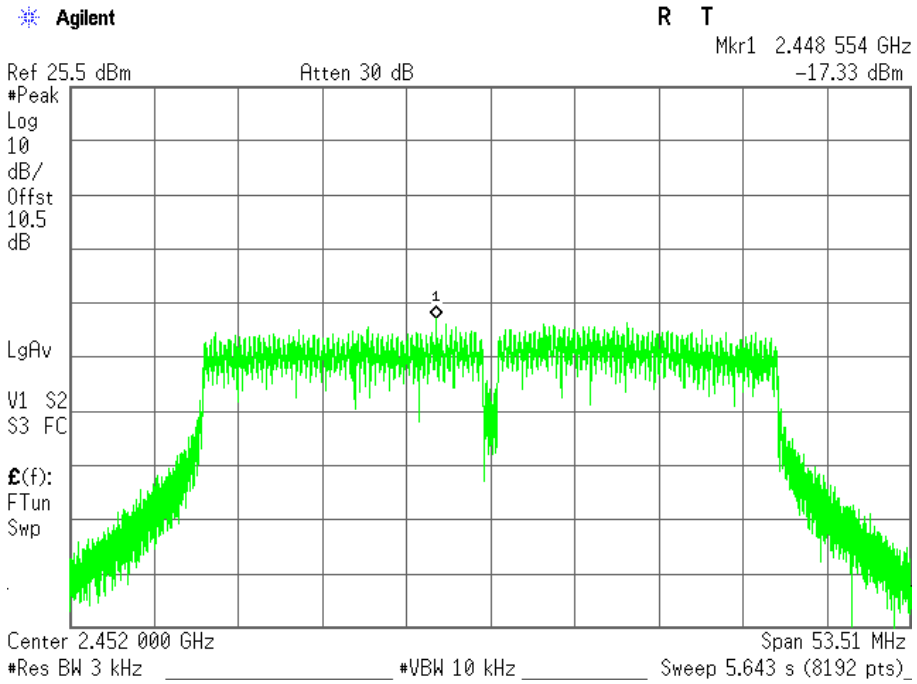
CH Low (IEEE 802.11ac VHT40 MCS0 Mode / Chain 0)



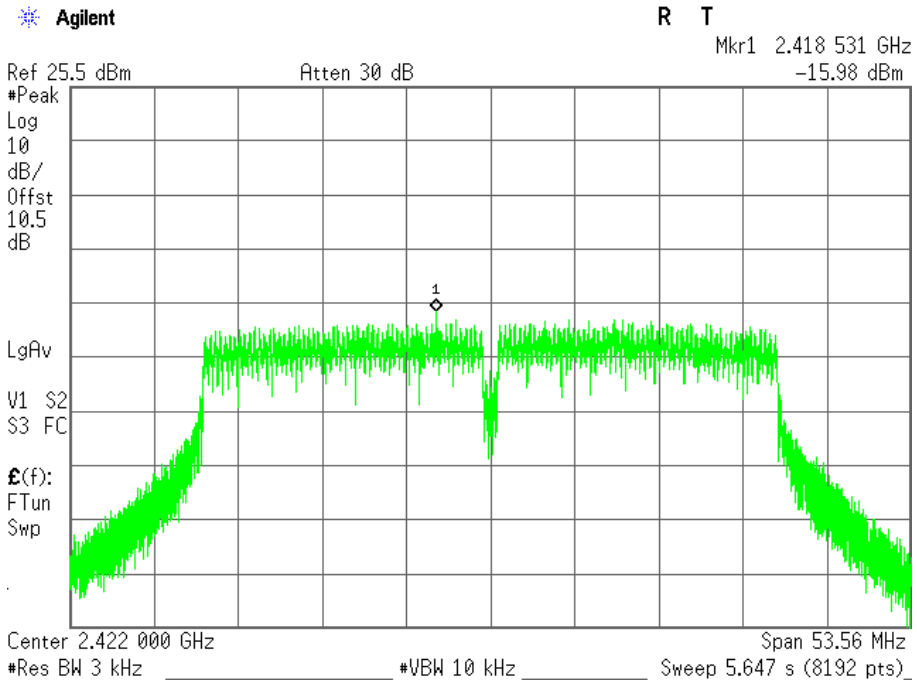
CH Middle (IEEE 802.11ac VHT40 MCS0 Mode / Chain 0)



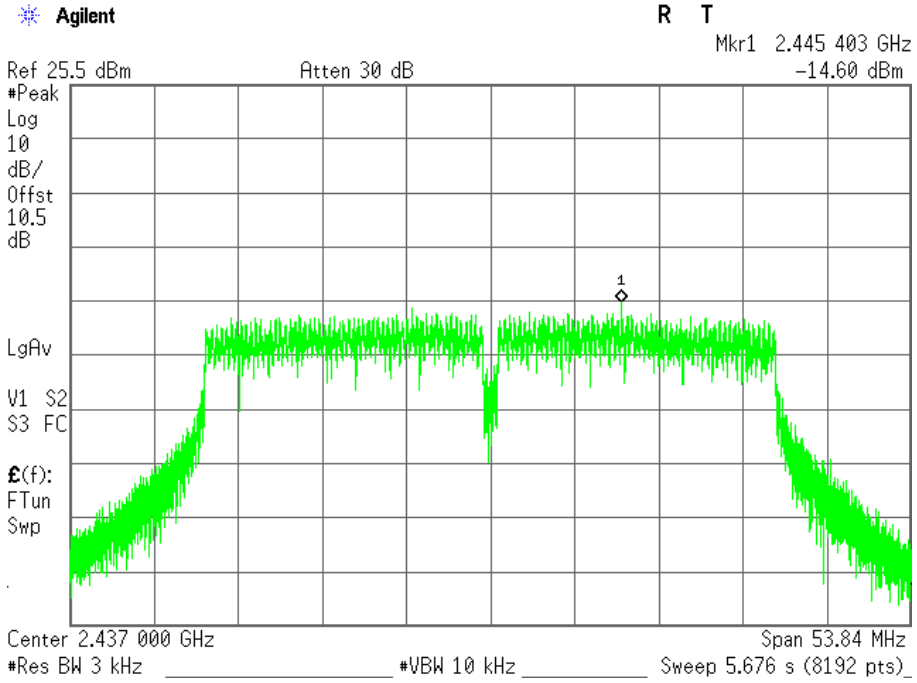
CH High (IEEE 802.11ac VHT40 MCS0 Mode / Chain 0)



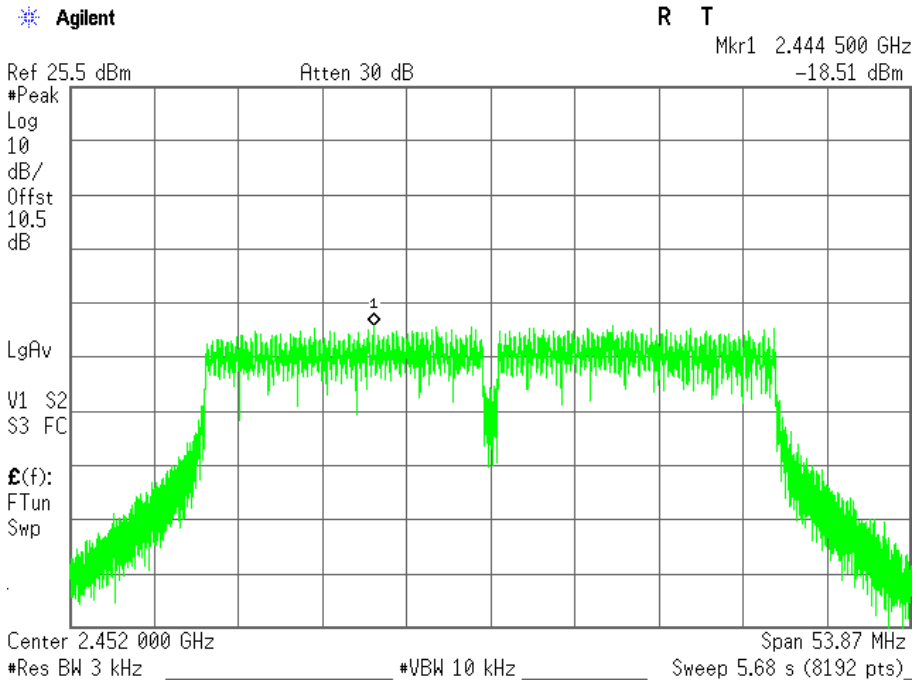
CH Low (IEEE 802.11ac VHT40 MCS0 Mode / Chain 1)



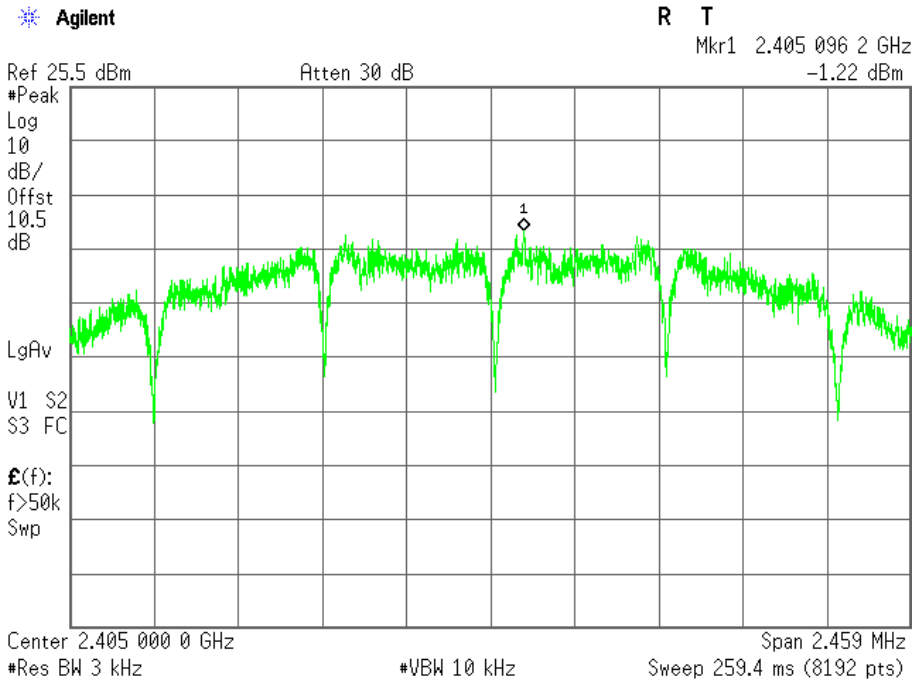
CH Middle (IEEE 802.11ac VHT40 MCS0 Mode / Chain 1)



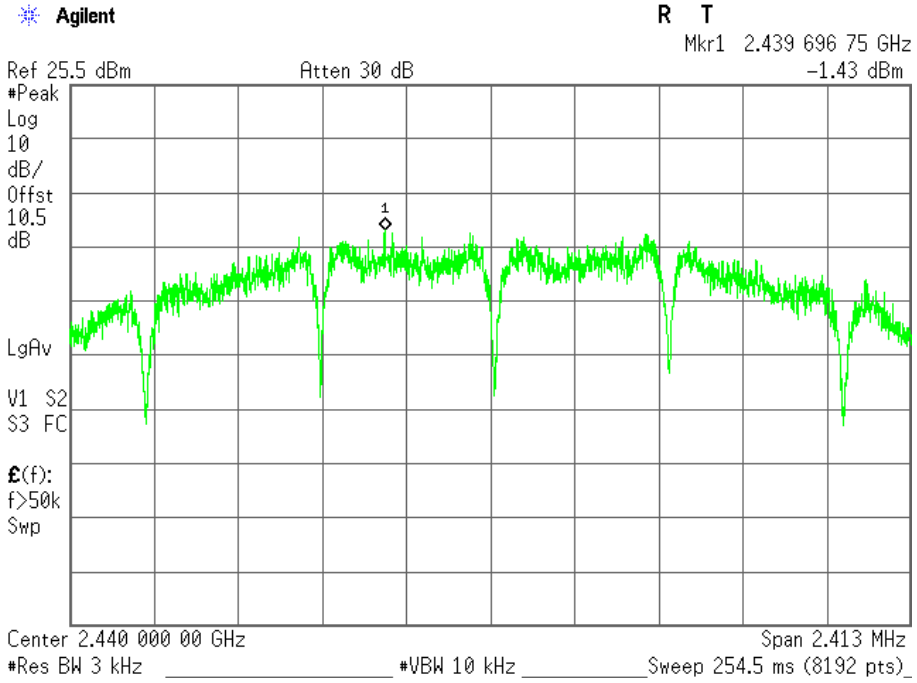
CH High (IEEE 802.11ac VHT40 MCS0 Mode / Chain 1)



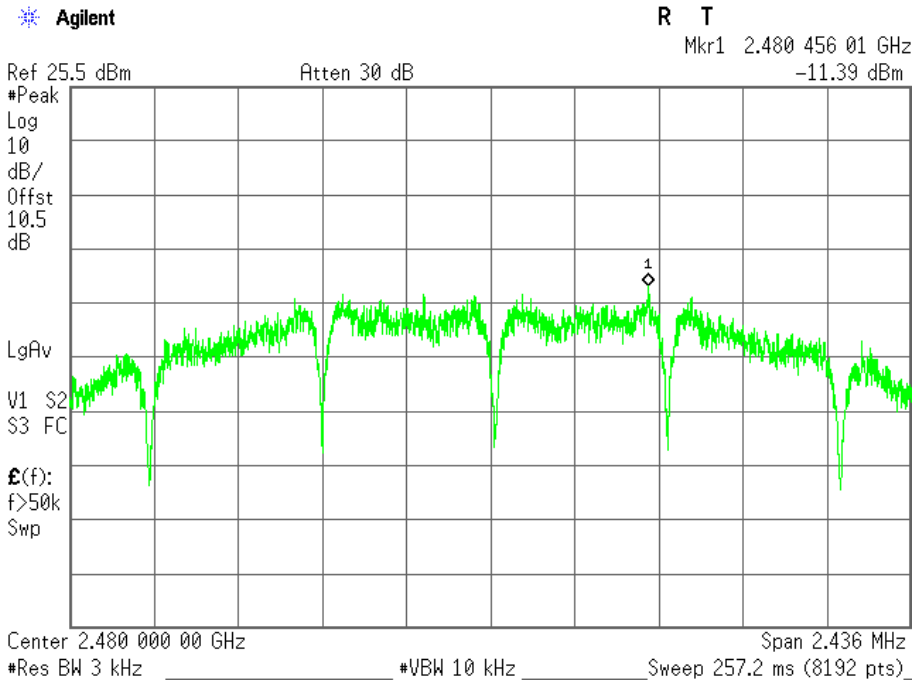
CH Low (ZigBee Mode)



CH Middle (ZigBee Mode)



CH High (ZigBee Mode)



7.6 CONDUCTED SPURIOUS EMISSION

LIMITS

§ 15.247(d) In any 100 kHz bandwidth outside the frequency band in which the spread spectrum intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the and that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement. Attenuation below the general limits specified in § 15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in § 15.205(a), must also comply with the radiated emission limits specified in § 15.209(a) (see § 15.205(c)).

TEST EQUIPMENT

Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
Spectrum Analyzer	Agilent	E4446A	MY43360132	05/31/2017
Test S/W	N/A			

Remark: *Each piece of equipment is scheduled for calibration once a year.*

TEST SETUP

TEST PROCEDURE

The transmitter output is connected to a spectrum analyzer. The resolution bandwidth is set to 100 kHz. The video bandwidth is set to 300 kHz.
The spectrum from 30 MHz to 26.5 GHz is investigated with the transmitter set to the lowest, middle, and highest channels in the 2.4 GHz band.

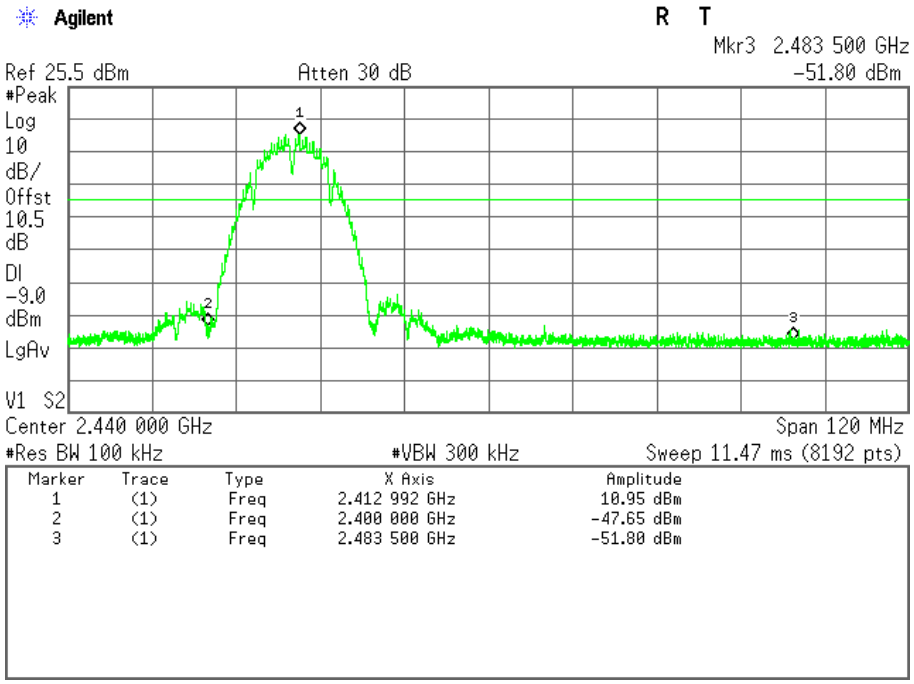
TEST RESULTS

Product Name	AC1300 IoT Router	Test By	Waternil Guan
Test Model	X10R	Test Date	2016/11/16
Test Mode	WiFi / TX Mode	Temp. & Humidity	25°C, 62%

Product Name	AC1300 IoT Router	Test By	Waternil Guan
Test Model	X10R	Test Date	2016/11/21
Test Mode	ZigBee / TX Mode	Temp. & Humidity	23°C, 66%

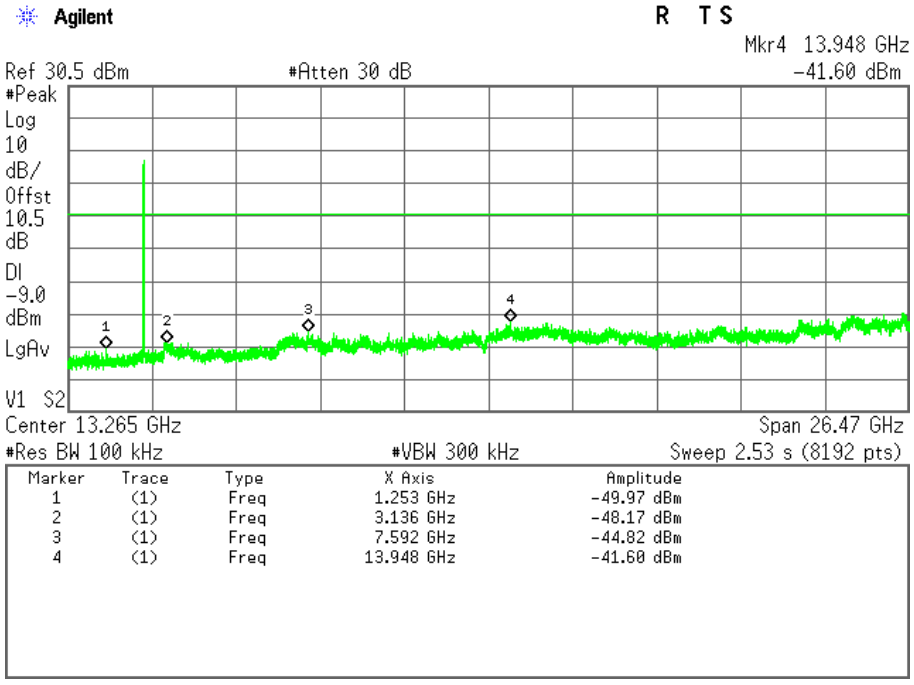
OUT-OF-BAND SPURIOUS EMISSIONS-CONDUCTED MEASUREMENT

CH Low (2.38GHz ~ 2.5GHz / IEEE 802.11b Mode / Chain 0)



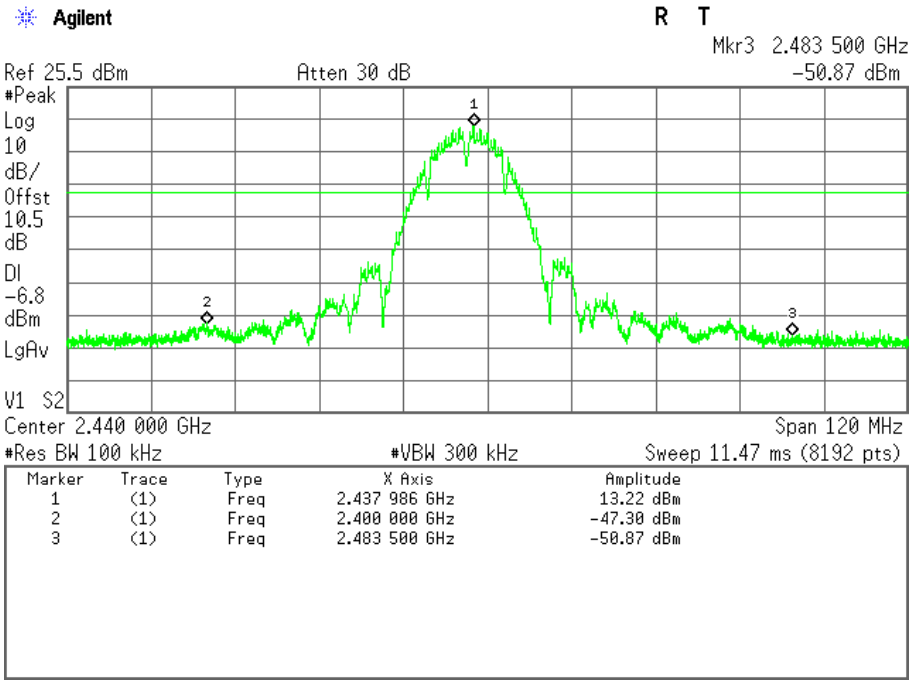
Marker	Trace	Type	X Axis	Amplitude
1	(1)	Freq	2.412 992 GHz	10.95 dBm
2	(1)	Freq	2.400 000 GHz	-47.65 dBm
3	(1)	Freq	2.483 500 GHz	-51.80 dBm

CH Low (30MHz ~ 26.5GHz / IEEE 802.11b Mode / Chain 0)

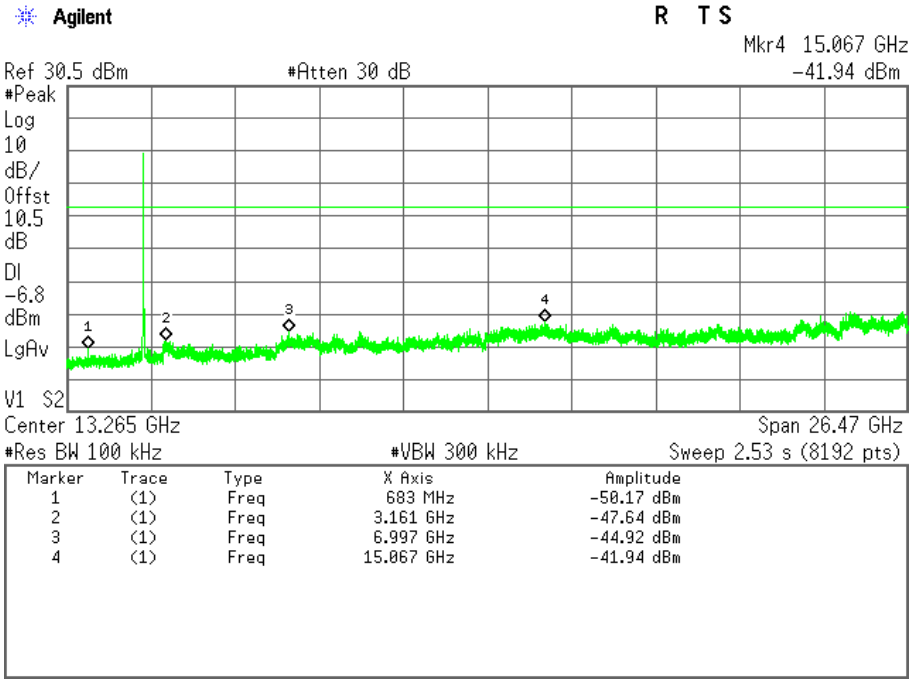


Marker	Trace	Type	X Axis	Amplitude
1	(1)	Freq	1.253 GHz	-49.97 dBm
2	(1)	Freq	3.136 GHz	-48.17 dBm
3	(1)	Freq	7.592 GHz	-44.82 dBm
4	(1)	Freq	13.948 GHz	-41.60 dBm

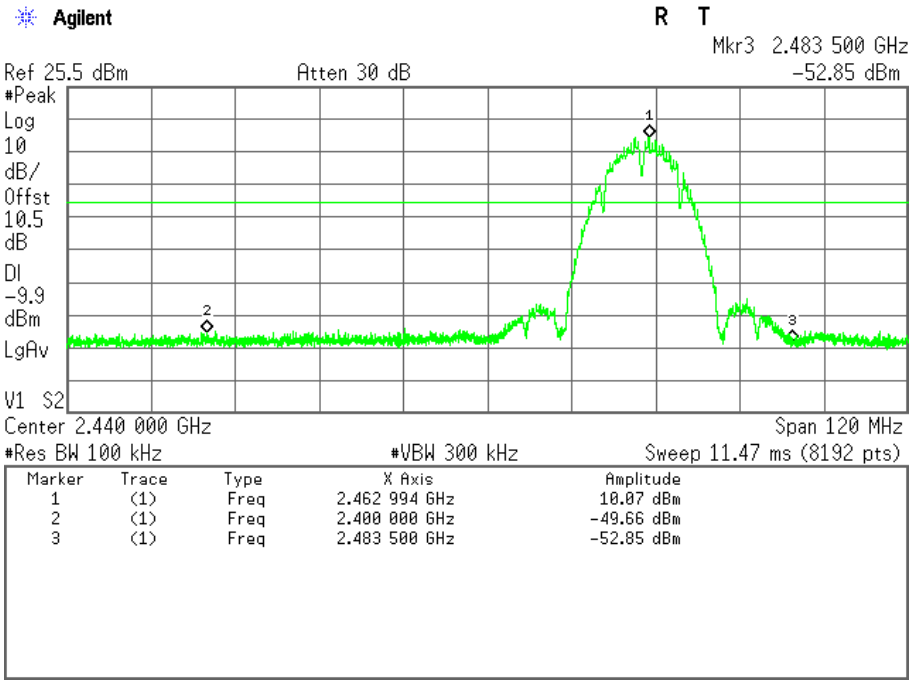
CH Middle (2.38GHz ~ 2.5GHz / IEEE 802.11b Mode / Chain 0)



CH Middle (30MHz ~ 26.5GHz / IEEE 802.11b Mode / Chain 0)

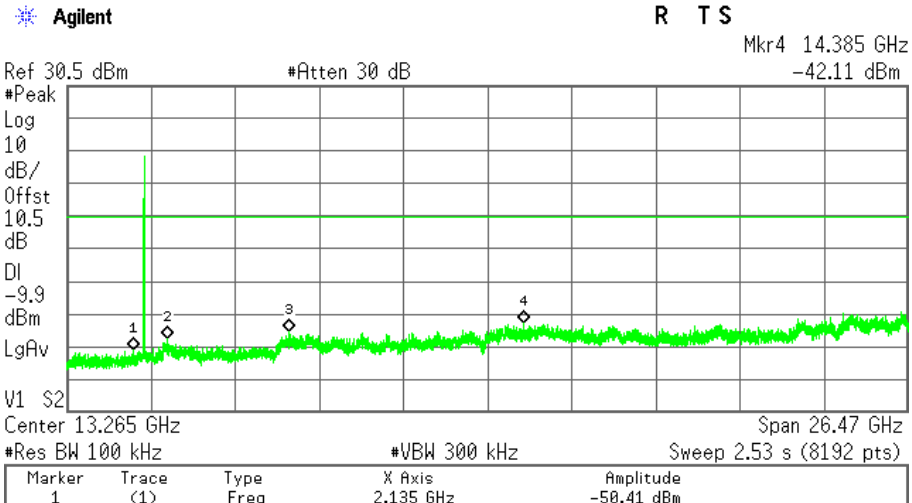


CH High (2.38GHz ~ 2.5GHz / IEEE 802.11b Mode / Chain 0)



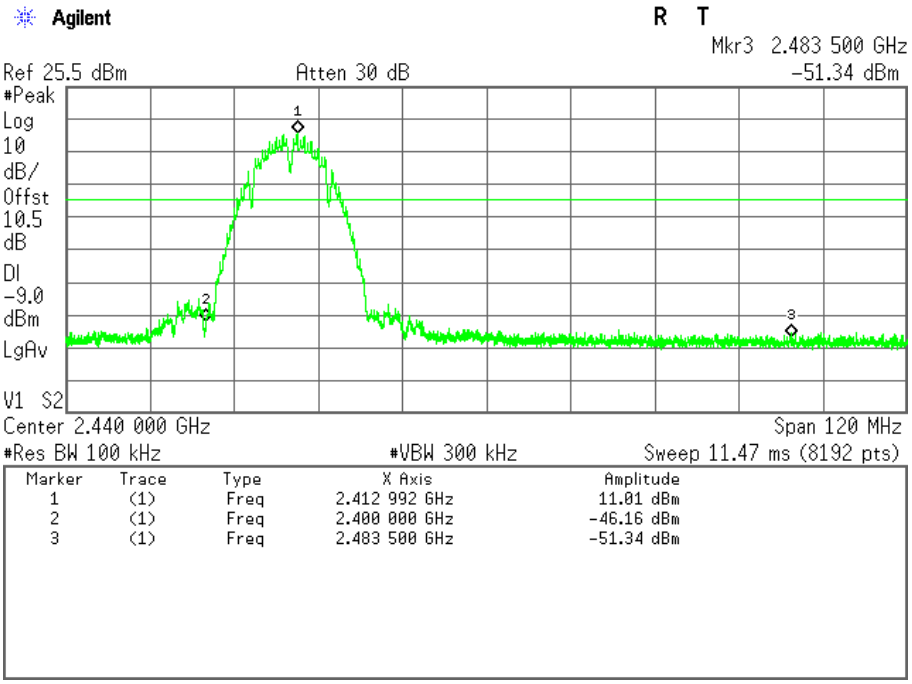
Marker	Trace	Type	X Axis	Amplitude
1	(1)	Freq	2.462 994 GHz	10.07 dBm
2	(1)	Freq	2.400 000 GHz	-49.66 dBm
3	(1)	Freq	2.483 500 GHz	-52.85 dBm

CH High (30MHz ~ 26.5GHz / IEEE 802.11b Mode / Chain 0)



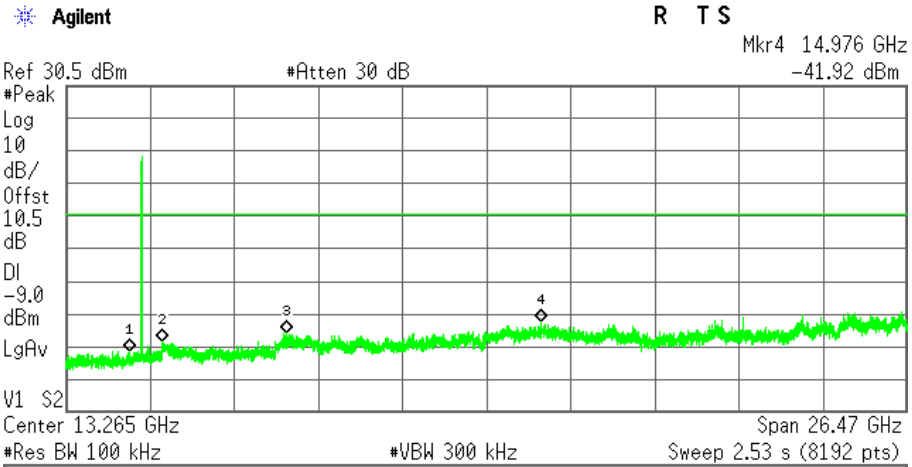
Marker	Trace	Type	X Axis	Amplitude
1	(1)	Freq	2.135 GHz	-50.41 dBm
2	(1)	Freq	3.203 GHz	-47.20 dBm
3	(1)	Freq	7.017 GHz	-44.89 dBm
4	(1)	Freq	14.385 GHz	-42.11 dBm

CH Low (2.38GHz ~ 2.5GHz / IEEE 802.11b Mode / Chain 1)



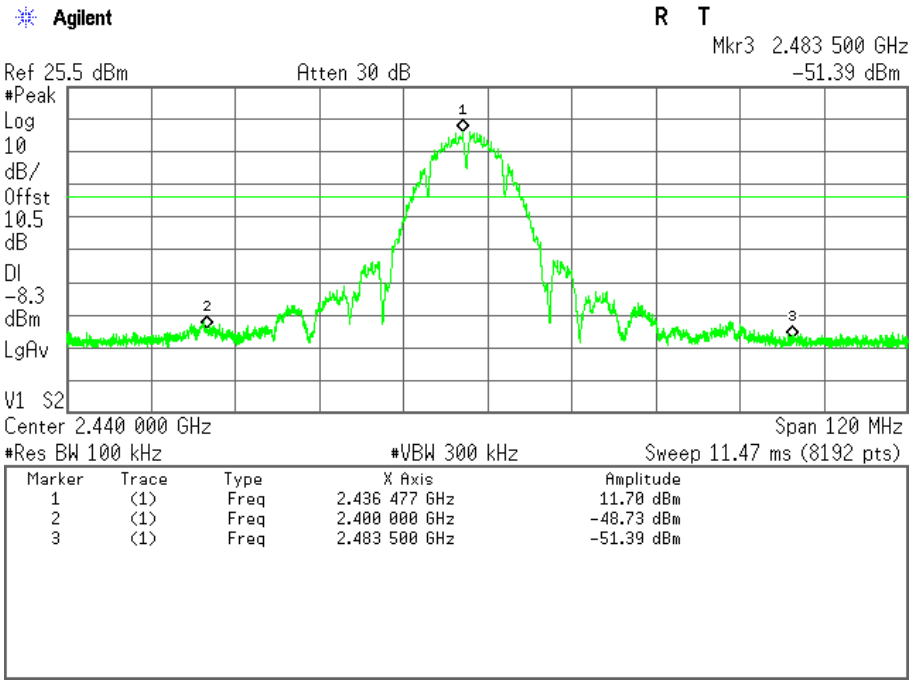
Marker	Trace	Type	X Axis	Amplitude
1	(1)	Freq	2.412 992 GHz	11.01 dBm
2	(1)	Freq	2.400 000 GHz	-46.16 dBm
3	(1)	Freq	2.483 500 GHz	-51.34 dBm

CH Low (30MHz ~ 26.5GHz / IEEE 802.11b Mode / Chain 1)



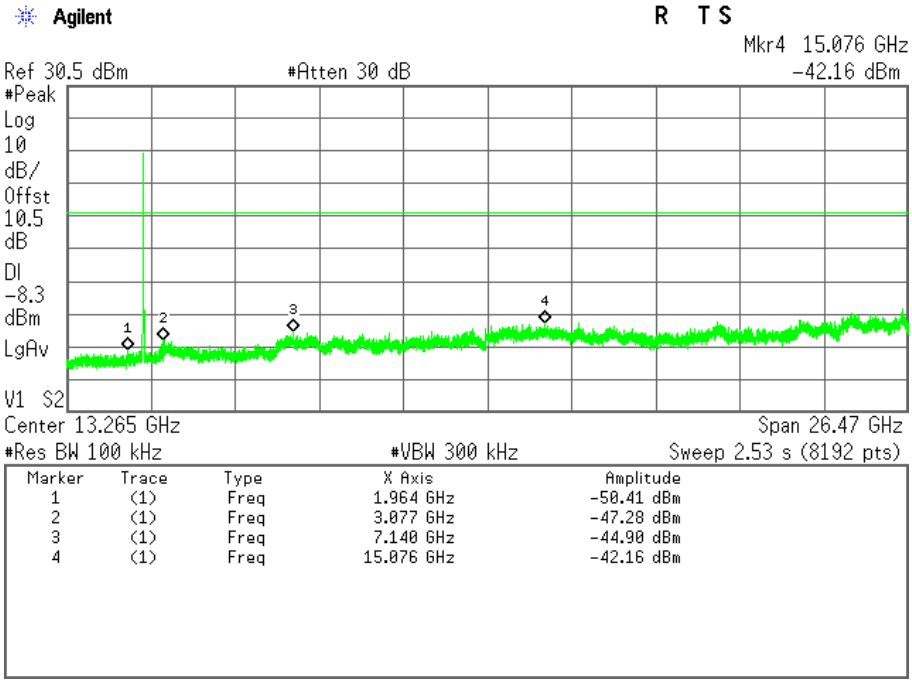
Marker	Trace	Type	X Axis	Amplitude
1	(1)	Freq	2.018 GHz	-50.89 dBm
2	(1)	Freq	3.071 GHz	-48.03 dBm
3	(1)	Freq	6.949 GHz	-45.25 dBm
4	(1)	Freq	14.976 GHz	-41.92 dBm

CH Middle (2.38GHz ~ 2.5GHz / IEEE 802.11b Mode / Chain 1)



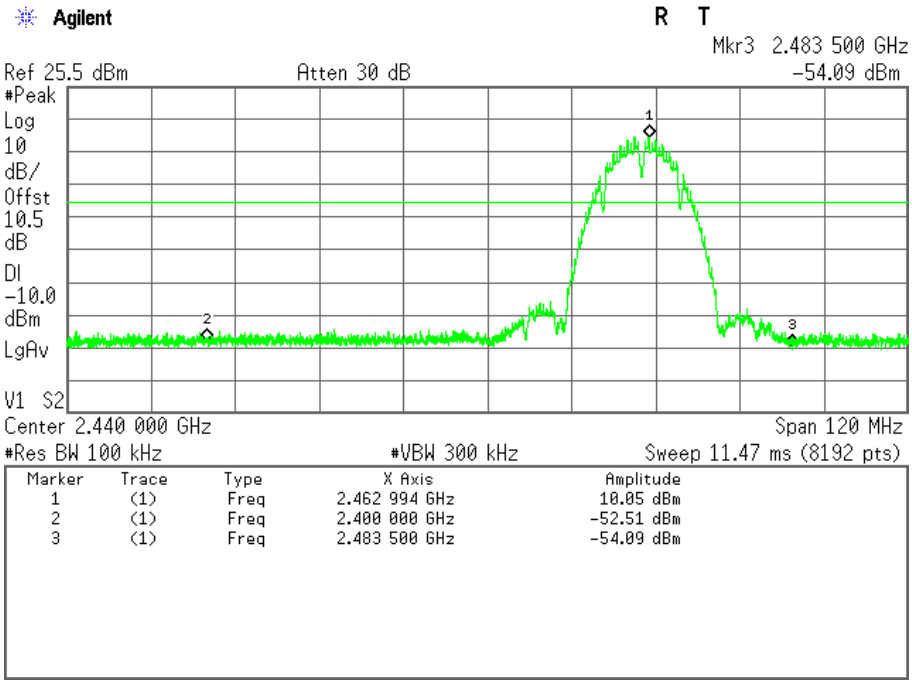
Marker	Trace	Type	X Axis	Amplitude
1	(1)	Freq	2.436 477 GHz	11.70 dBm
2	(1)	Freq	2.400 000 GHz	-48.73 dBm
3	(1)	Freq	2.483 500 GHz	-51.39 dBm

CH Middle (30MHz ~ 26.5GHz / IEEE 802.11b Mode / Chain 1)



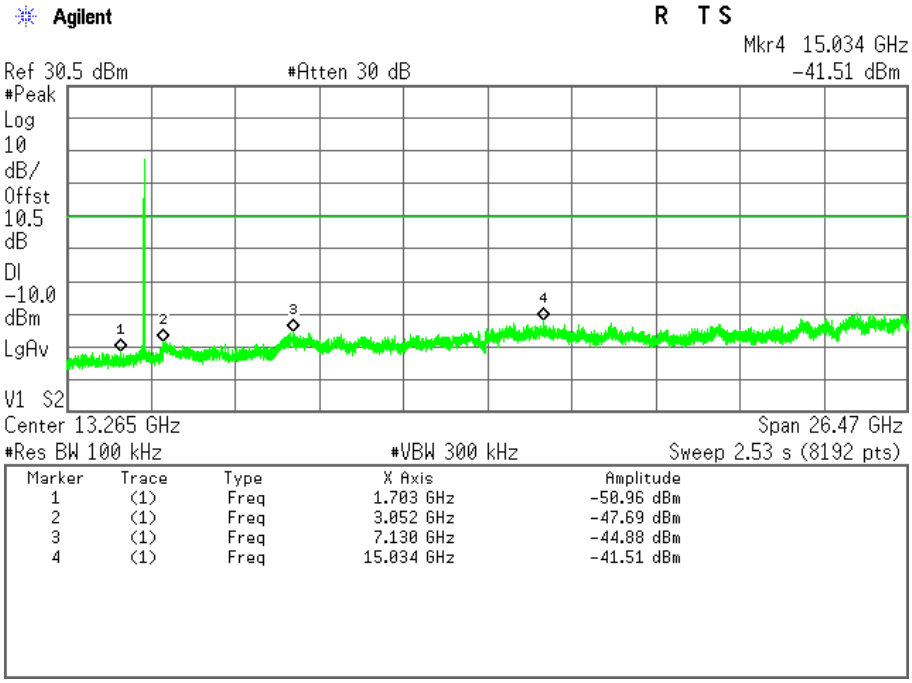
Marker	Trace	Type	X Axis	Amplitude
1	(1)	Freq	1.964 GHz	-50.41 dBm
2	(1)	Freq	3.077 GHz	-47.28 dBm
3	(1)	Freq	7.140 GHz	-44.90 dBm
4	(1)	Freq	15.076 GHz	-42.16 dBm

CH High (2.38GHz ~ 2.5GHz / IEEE 802.11b Mode / Chain 1)



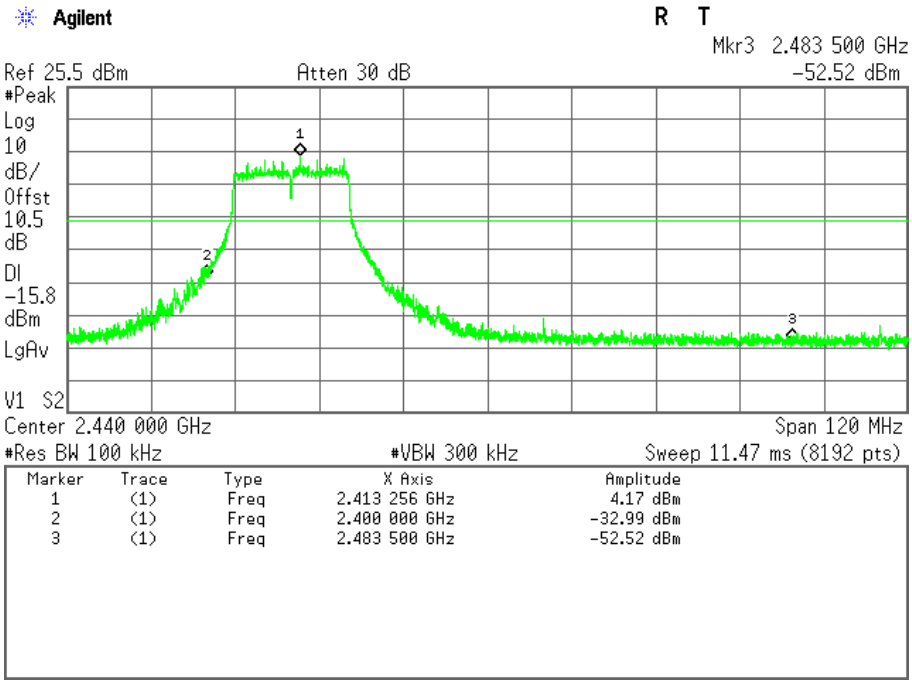
Marker	Trace	Type	X Axis	Amplitude
1	(1)	Freq	2.462 994 GHz	10.05 dBm
2	(1)	Freq	2.400 000 GHz	-52.51 dBm
3	(1)	Freq	2.483 500 GHz	-54.09 dBm

CH High (30MHz ~ 26.5GHz / IEEE 802.11b Mode / Chain 1)



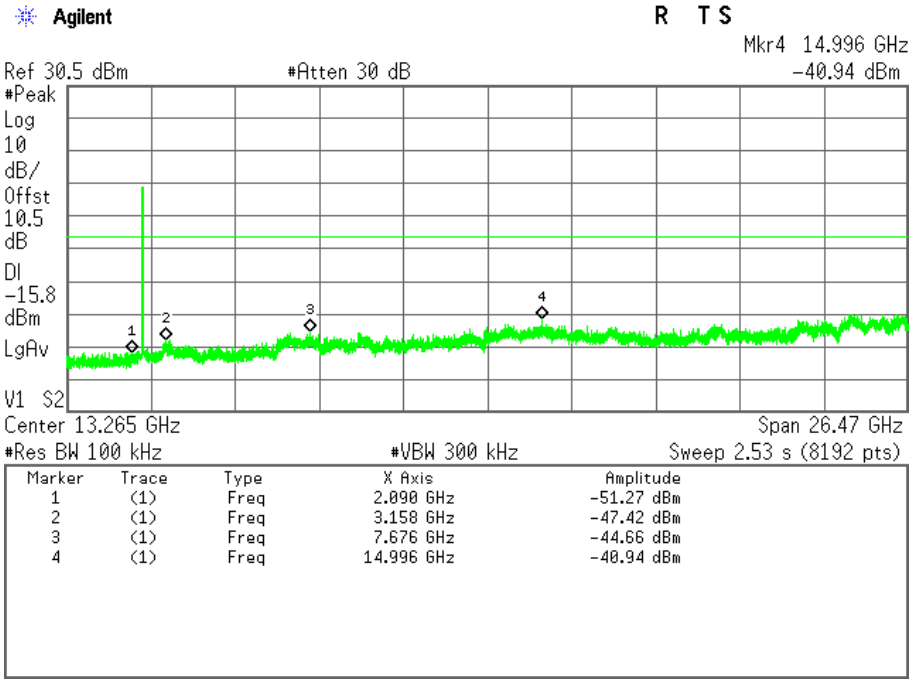
Marker	Trace	Type	X Axis	Amplitude
1	(1)	Freq	1.703 GHz	-50.96 dBm
2	(1)	Freq	3.052 GHz	-47.69 dBm
3	(1)	Freq	7.130 GHz	-44.88 dBm
4	(1)	Freq	15.034 GHz	-41.51 dBm

CH Low (2.38GHz ~ 2.5GHz / IEEE 802.11g Mode / Chain 0)



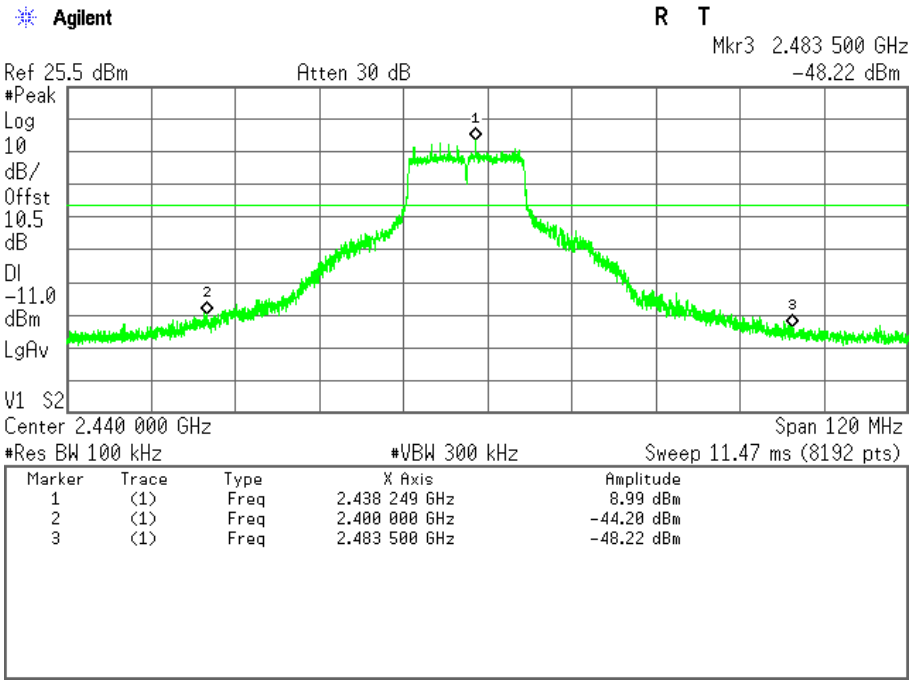
Marker	Trace	Type	X Axis	Amplitude
1	(1)	Freq	2.413 256 GHz	4.17 dBm
2	(1)	Freq	2.400 000 GHz	-32.99 dBm
3	(1)	Freq	2.483 500 GHz	-52.52 dBm

CH Low (30MHz ~ 26.5GHz / IEEE 802.11g Mode / Chain 0)



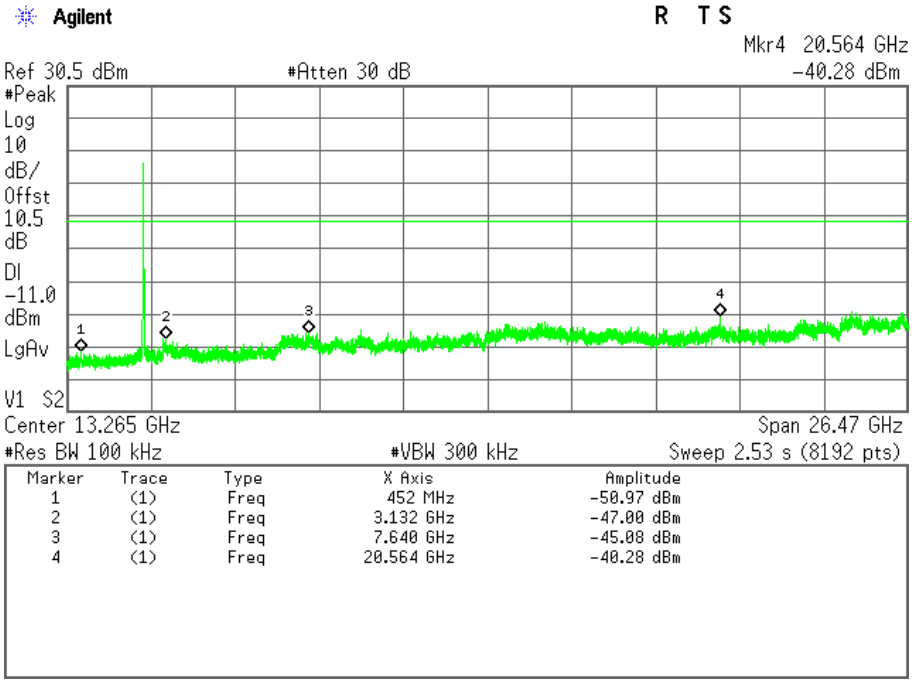
Marker	Trace	Type	X Axis	Amplitude
1	(1)	Freq	2.090 GHz	-51.27 dBm
2	(1)	Freq	3.158 GHz	-47.42 dBm
3	(1)	Freq	7.676 GHz	-44.66 dBm
4	(1)	Freq	14.996 GHz	-40.94 dBm

CH Middle (2.38GHz ~ 2.5GHz / IEEE 802.11g Mode / Chain 0)



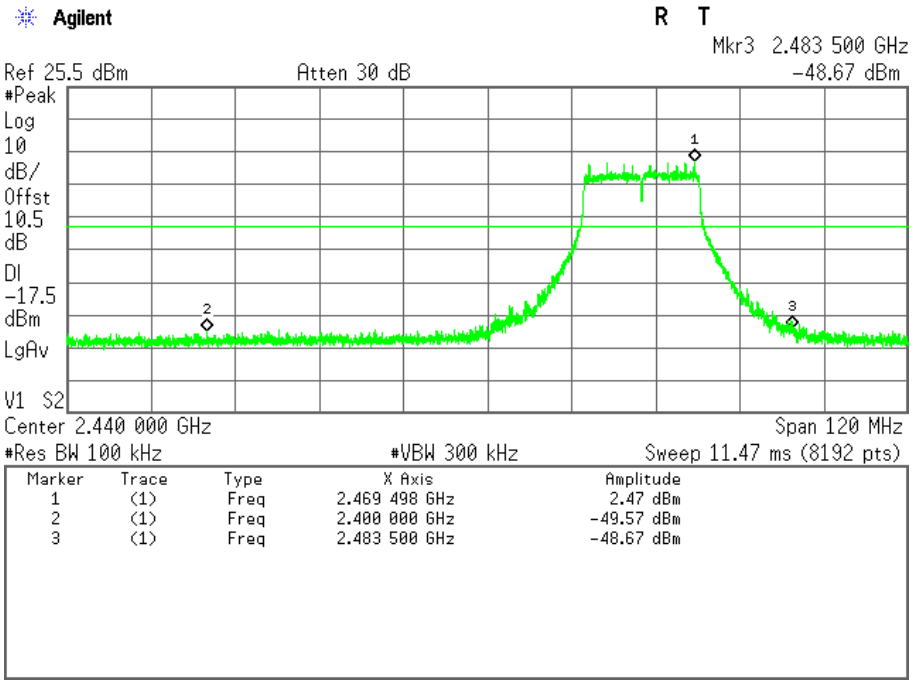
Marker	Trace	Type	X Axis	Amplitude
1	(1)	Freq	2.438 249 GHz	8.99 dBm
2	(1)	Freq	2.400 000 GHz	-44.20 dBm
3	(1)	Freq	2.483 500 GHz	-48.22 dBm

CH Middle (30MHz ~ 26.5GHz / IEEE 802.11g Mode / Chain 0)



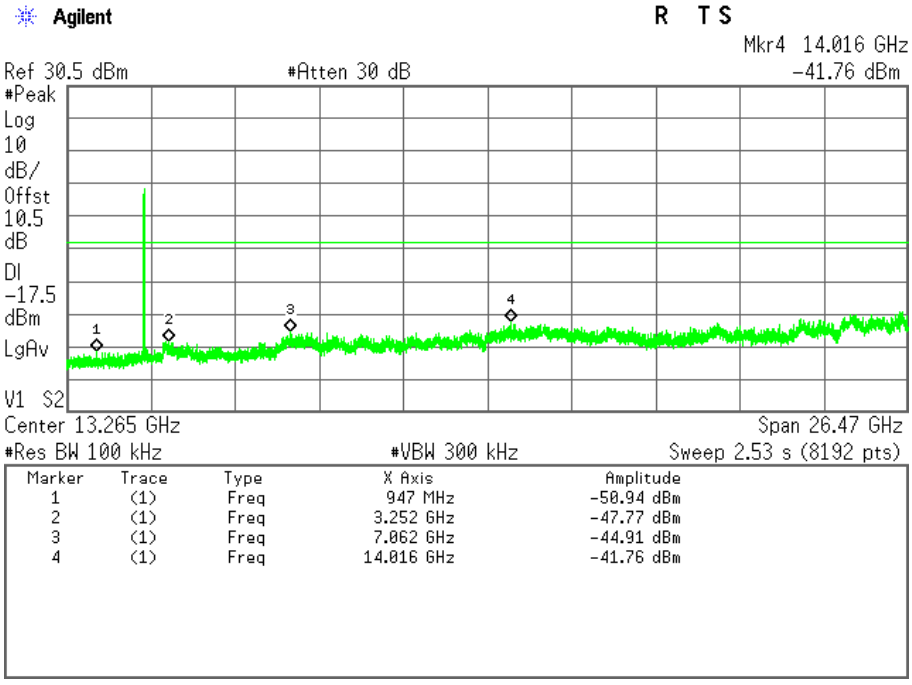
Marker	Trace	Type	X Axis	Amplitude
1	(1)	Freq	452 MHz	-50.97 dBm
2	(1)	Freq	3.132 GHz	-47.00 dBm
3	(1)	Freq	7.640 GHz	-45.08 dBm
4	(1)	Freq	20.564 GHz	-40.28 dBm

CH High (2.38GHz ~ 2.5GHz / IEEE 802.11g Mode / Chain 0)



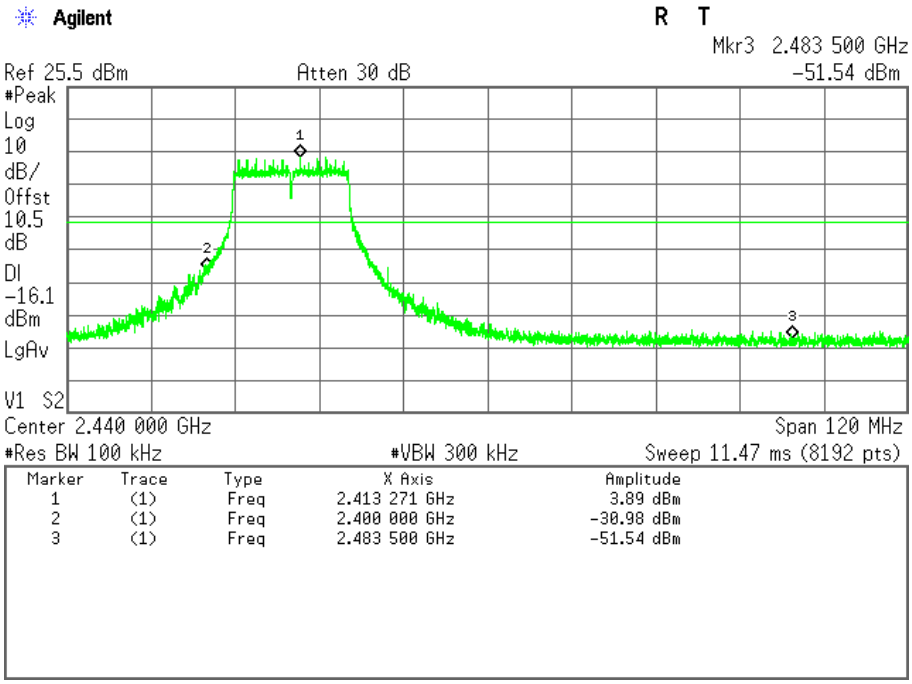
Marker	Trace	Type	X Axis	Amplitude
1	(1)	Freq	2.469 498 GHz	2.47 dBm
2	(1)	Freq	2.400 000 GHz	-49.57 dBm
3	(1)	Freq	2.483 500 GHz	-48.67 dBm

CH High (30MHz ~ 26.5GHz / IEEE 802.11g Mode / Chain 0)



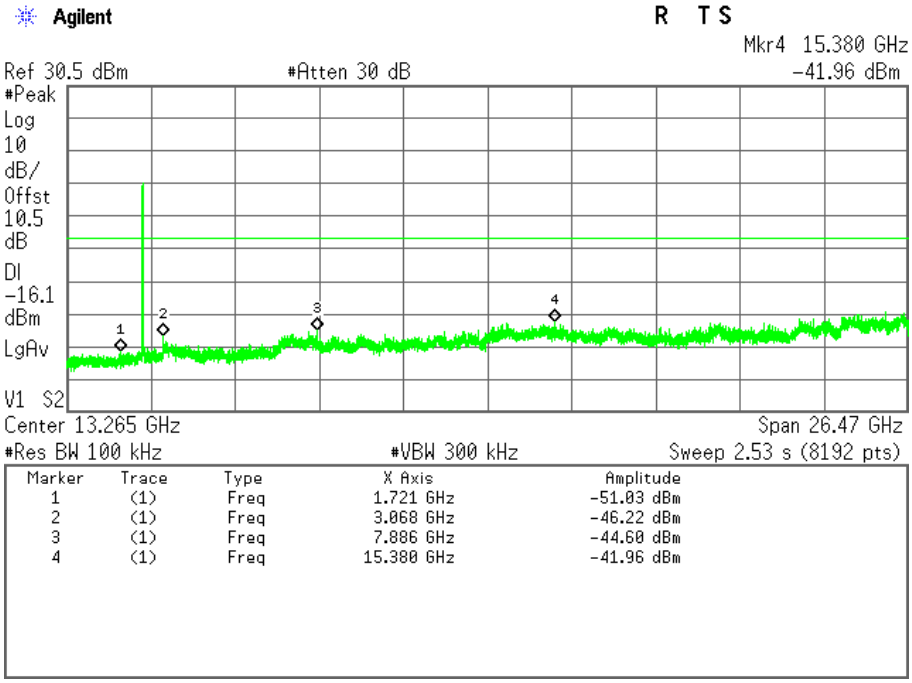
Marker	Trace	Type	X Axis	Amplitude
1	(1)	Freq	947 MHz	-50.94 dBm
2	(1)	Freq	3.252 GHz	-47.77 dBm
3	(1)	Freq	7.062 GHz	-44.91 dBm
4	(1)	Freq	14.016 GHz	-41.76 dBm

CH Low (2.38GHz ~ 2.5GHz / IEEE 802.11g Mode / Chain 1)



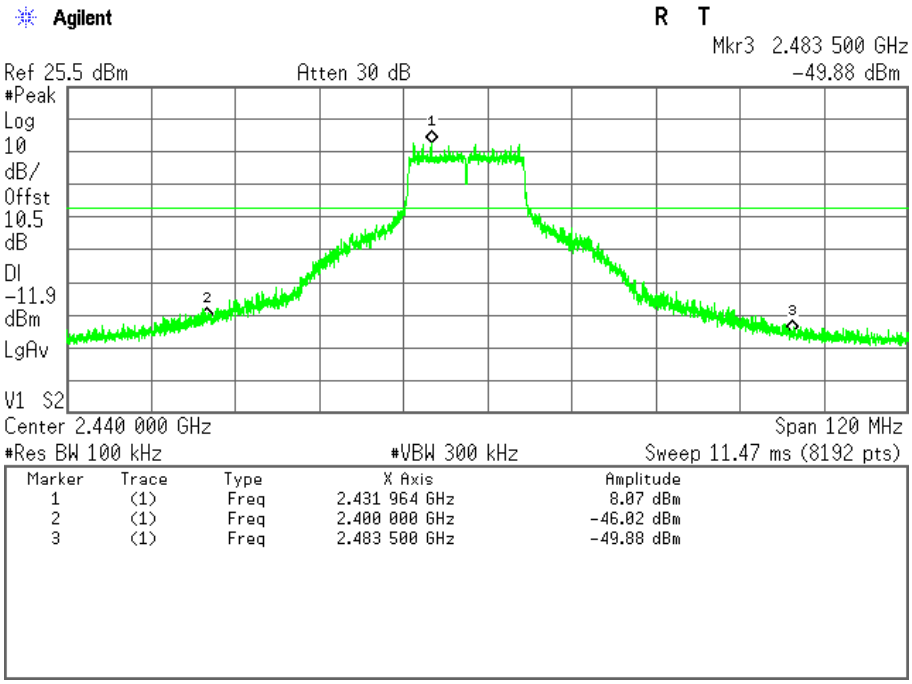
Marker	Trace	Type	X Axis	Amplitude
1	(1)	Freq	2.413 271 GHz	3.89 dBm
2	(1)	Freq	2.400 000 GHz	-30.98 dBm
3	(1)	Freq	2.483 500 GHz	-51.54 dBm

CH Low (30MHz ~ 26.5GHz / IEEE 802.11g Mode / Chain 1)



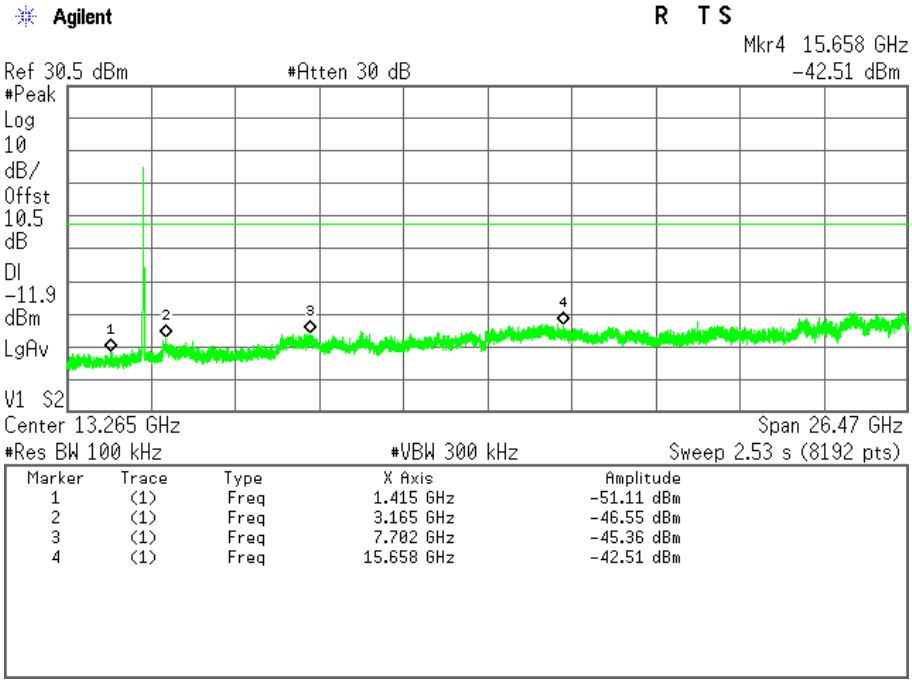
Marker	Trace	Type	X Axis	Amplitude
1	(1)	Freq	1.721 GHz	-51.03 dBm
2	(1)	Freq	3.068 GHz	-46.22 dBm
3	(1)	Freq	7.886 GHz	-44.60 dBm
4	(1)	Freq	15.380 GHz	-41.96 dBm

CH Middle (2.38GHz ~ 2.5GHz / IEEE 802.11g Mode / Chain 1)



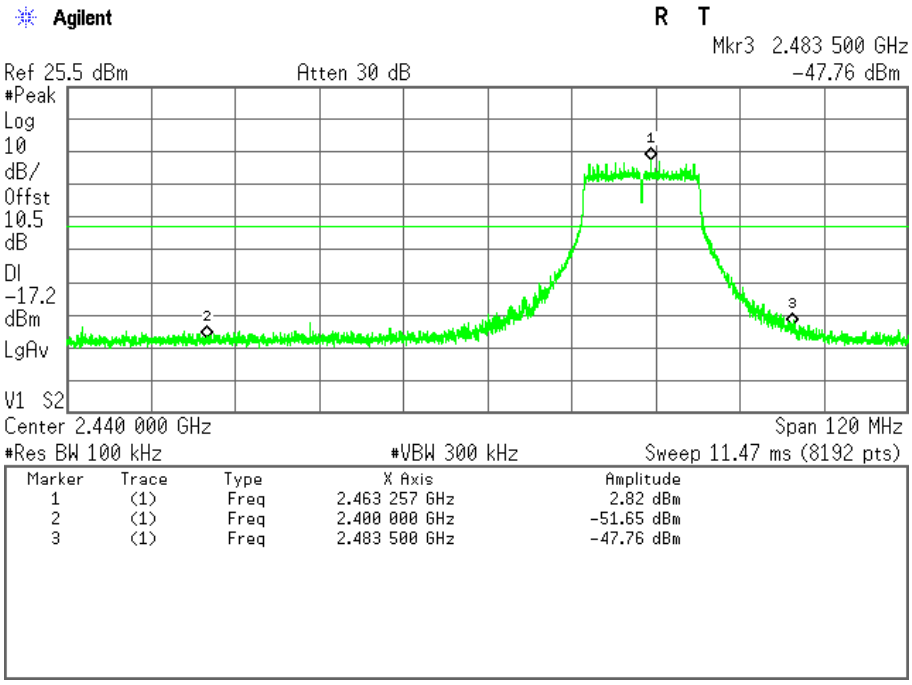
Marker	Trace	Type	X Axis	Amplitude
1	(1)	Freq	2.431 964 GHz	8.07 dBm
2	(1)	Freq	2.400 000 GHz	-46.02 dBm
3	(1)	Freq	2.483 500 GHz	-49.88 dBm

CH Middle (30MHz ~ 26.5GHz / IEEE 802.11g Mode / Chain 1)



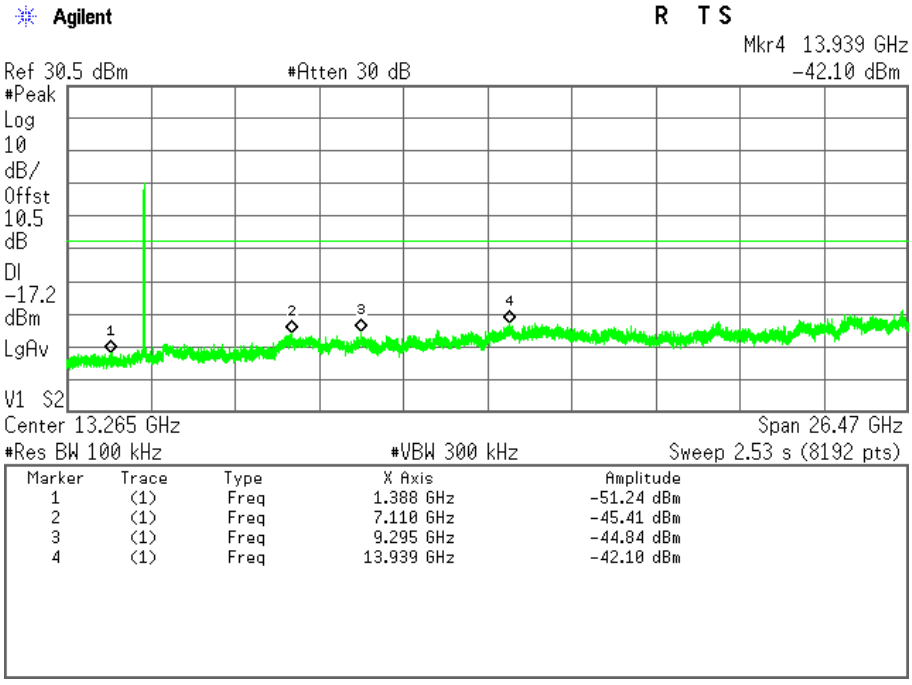
Marker	Trace	Type	X Axis	Amplitude
1	(1)	Freq	1.415 GHz	-51.11 dBm
2	(1)	Freq	3.165 GHz	-46.55 dBm
3	(1)	Freq	7.702 GHz	-45.36 dBm
4	(1)	Freq	15.658 GHz	-42.51 dBm

CH High (2.38GHz ~ 2.5GHz / IEEE 802.11g Mode / Chain 1)



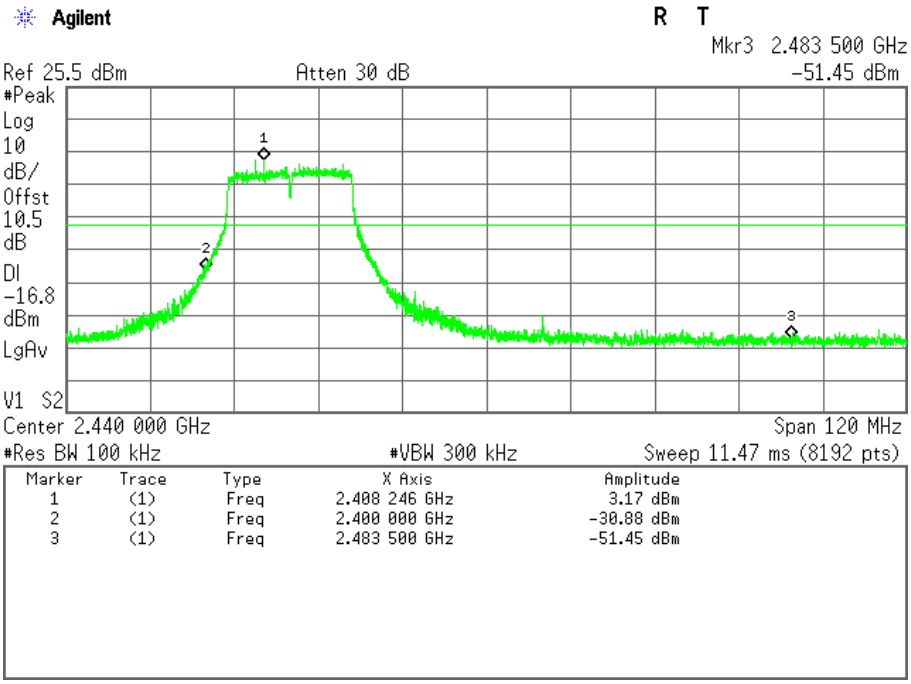
Marker	Trace	Type	X Axis	Amplitude
1	(1)	Freq	2.463 257 GHz	2.82 dBm
2	(1)	Freq	2.400 000 GHz	-51.65 dBm
3	(1)	Freq	2.483 500 GHz	-47.76 dBm

CH High (30MHz ~ 26.5GHz / IEEE 802.11g Mode / Chain 1)

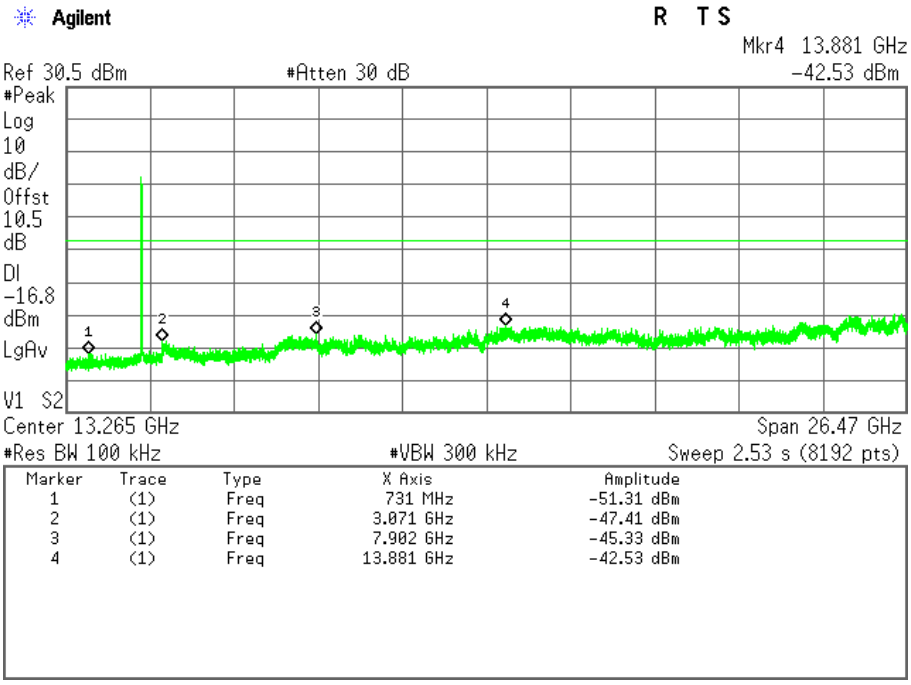


Marker	Trace	Type	X Axis	Amplitude
1	(1)	Freq	1.388 GHz	-51.24 dBm
2	(1)	Freq	7.110 GHz	-45.41 dBm
3	(1)	Freq	9.295 GHz	-44.84 dBm
4	(1)	Freq	13.939 GHz	-42.10 dBm

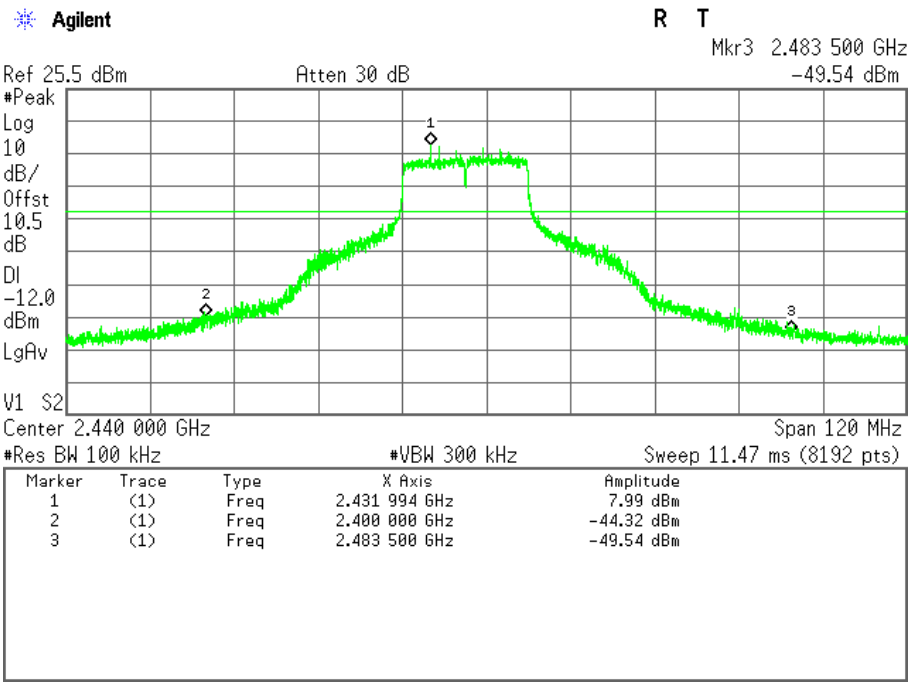
CH Low (2.38GHz ~ 2.5GHz / IEEE 802.11ac VHT20 MCS0 Mode / Chain 0)



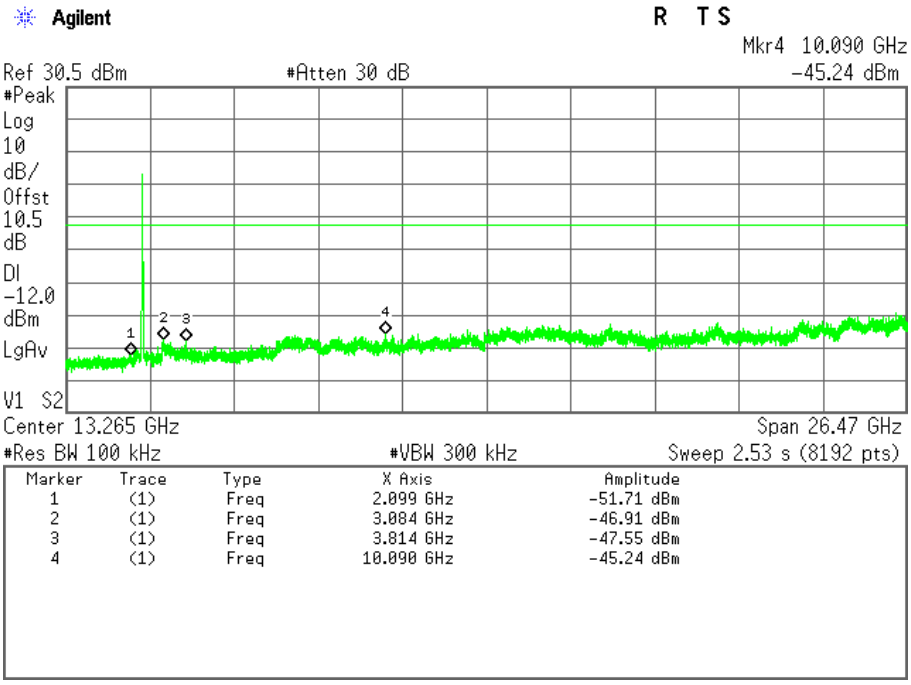
CH Low (30MHz ~ 26.5GHz / IEEE 802.11ac VHT20 MCS0 Mode / Chain 0)



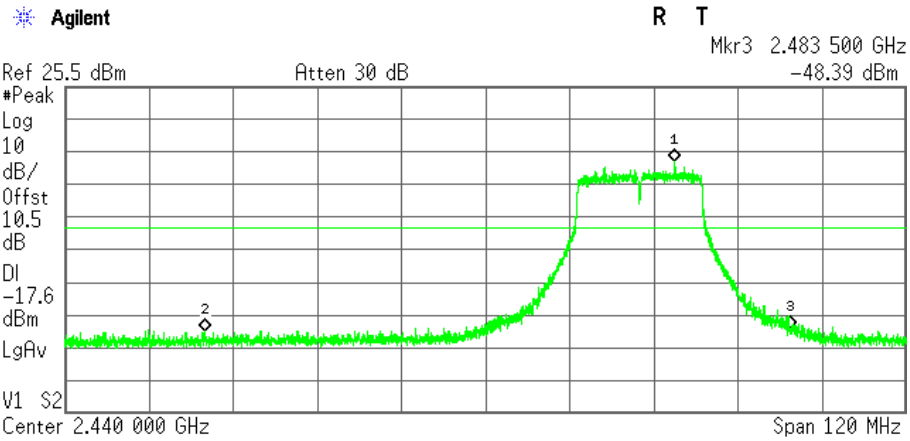
CH Middle (2.38GHz ~ 2.5GHz / IEEE 802.11ac VHT20 MCS0 Mode / Chain 0)



CH Middle (30MHz ~ 26.5GHz / IEEE 802.11ac VHT20 MCS0 Mode / Chain 0)

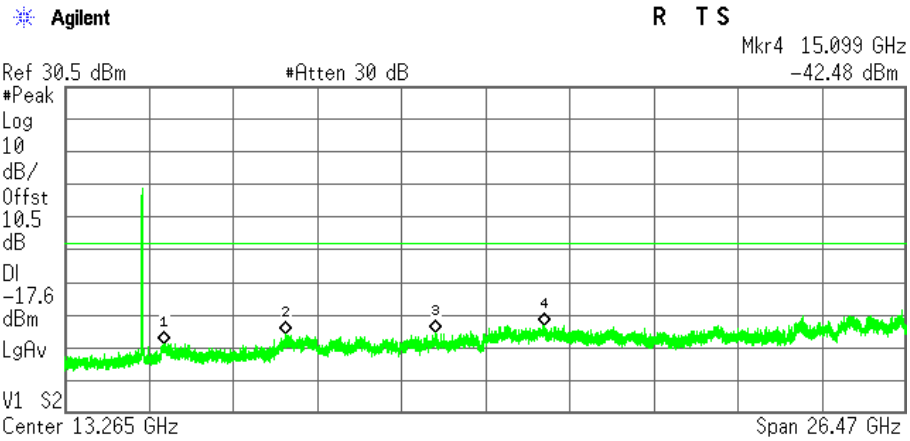


CH High (2.38GHz ~ 2.5GHz / IEEE 802.11ac VHT20 MCS0 Mode / Chain 0)



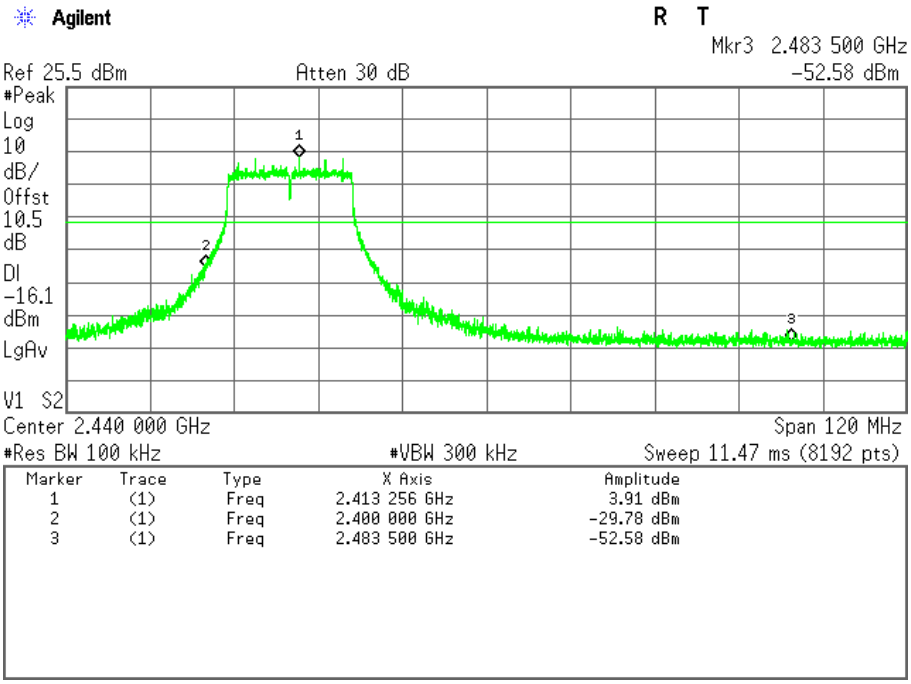
Marker	Trace	Type	X Axis	Amplitude
1	(1)	Freq	2.466 993 GHz	2.36 dBm
2	(1)	Freq	2.400 000 GHz	-49.37 dBm
3	(1)	Freq	2.483 500 GHz	-48.39 dBm

CH High (30MHz ~ 26.5GHz / IEEE 802.11ac VHT20 MCS0 Mode / Chain 0)



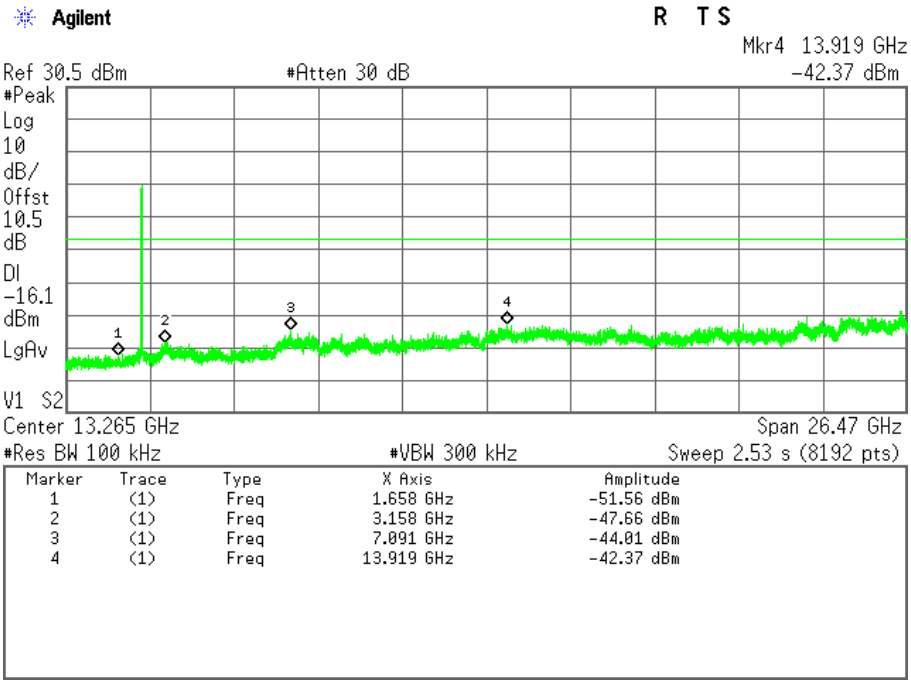
Marker	Trace	Type	X Axis	Amplitude
1	(1)	Freq	3.132 GHz	-48.11 dBm
2	(1)	Freq	6.988 GHz	-45.42 dBm
3	(1)	Freq	11.673 GHz	-44.87 dBm
4	(1)	Freq	15.099 GHz	-42.48 dBm

CH Low (2.38GHz ~ 2.5GHz / IEEE 802.11ac VHT20 MCS0 Mode / Chain 1)



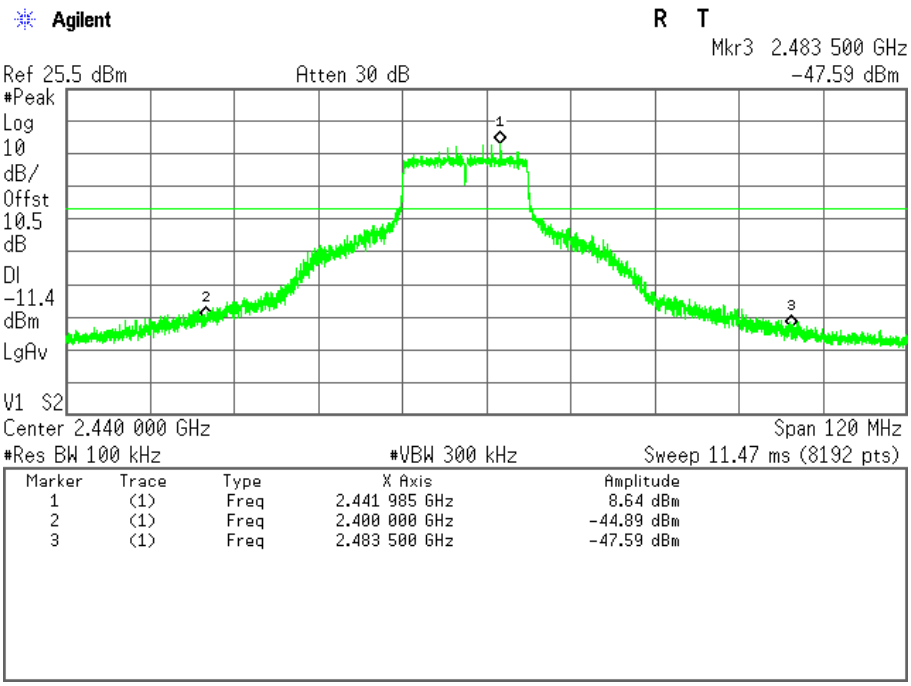
Marker	Trace	Type	X Axis	Amplitude
1	(1)	Freq	2.413 256 GHz	3.91 dBm
2	(1)	Freq	2.400 000 GHz	-29.78 dBm
3	(1)	Freq	2.483 500 GHz	-52.58 dBm

CH Low (30MHz ~ 26.5GHz / IEEE 802.11ac VHT20 MCS0 Mode / Chain 1)

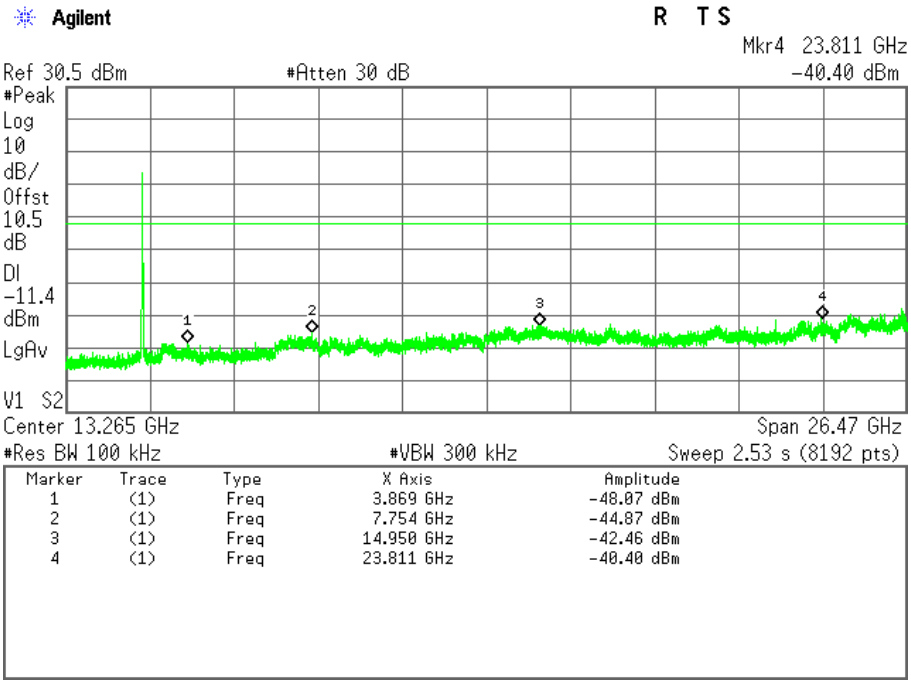


Marker	Trace	Type	X Axis	Amplitude
1	(1)	Freq	1.658 GHz	-51.56 dBm
2	(1)	Freq	3.158 GHz	-47.66 dBm
3	(1)	Freq	7.091 GHz	-44.01 dBm
4	(1)	Freq	13.919 GHz	-42.37 dBm

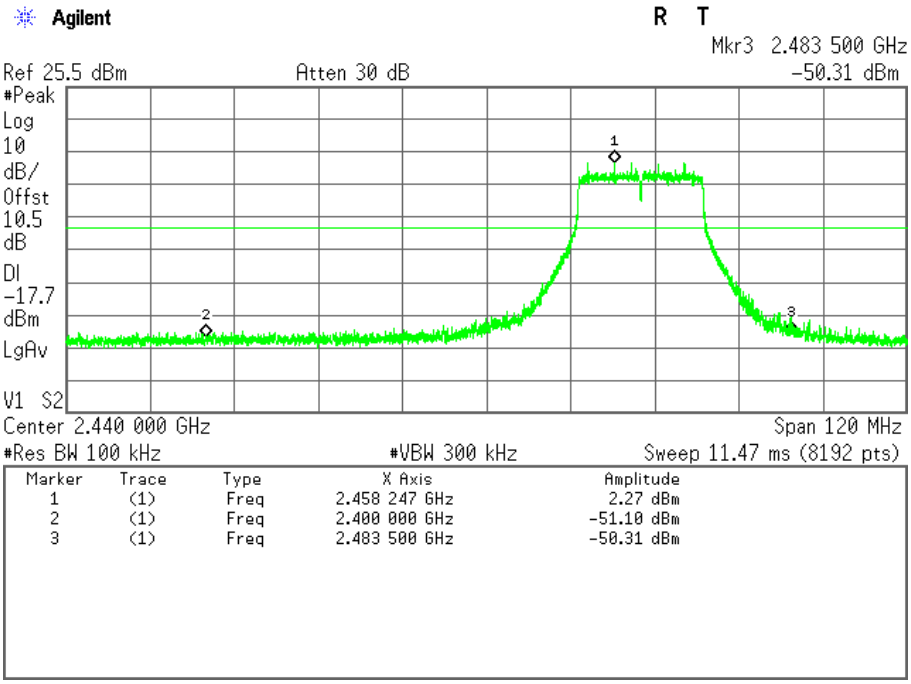
CH Middle (2.38GHz ~ 2.5GHz / IEEE 802.11ac VHT20 MCS0 Mode / Chain 1)



CH Middle (30MHz ~ 26.5GHz / IEEE 802.11ac VHT20 MCS0 Mode / Chain 1)

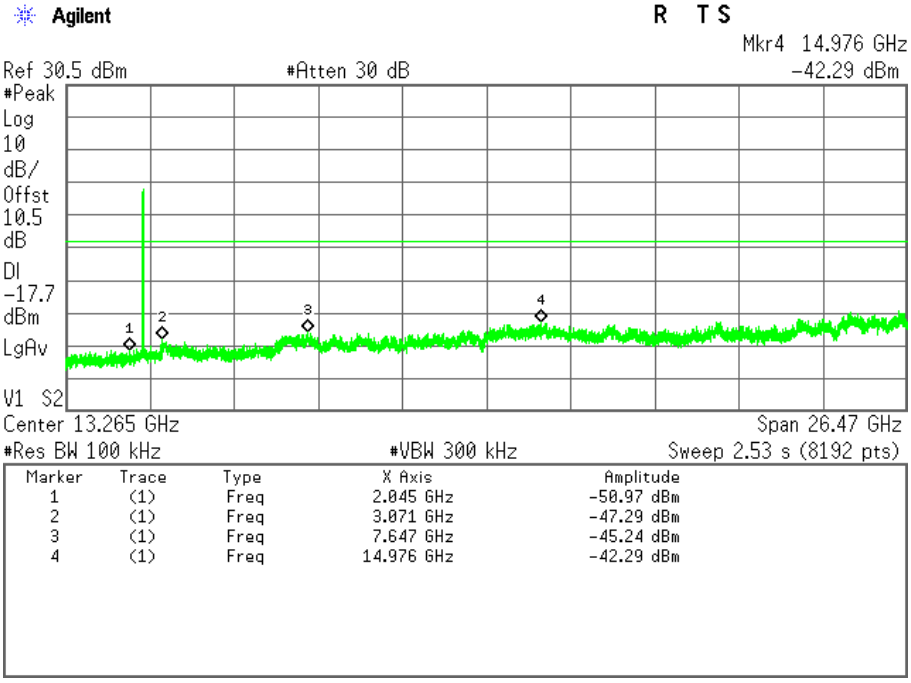


CH High (2.38GHz ~ 2.5GHz / IEEE 802.11ac VHT20 MCS0 Mode / Chain 1)



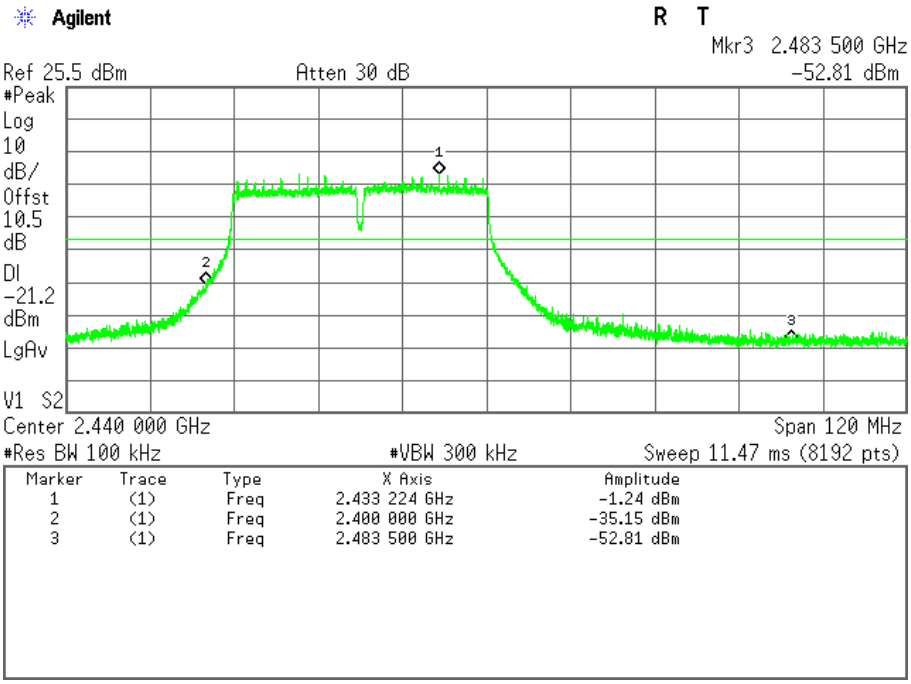
Marker	Trace	Type	X Axis	Amplitude
1	(1)	Freq	2.458 247 GHz	2.27 dBm
2	(1)	Freq	2.400 000 GHz	-51.10 dBm
3	(1)	Freq	2.483 500 GHz	-50.31 dBm

CH High (30MHz ~ 26.5GHz / IEEE 802.11ac VHT20 MCS0 Mode / Chain 1)

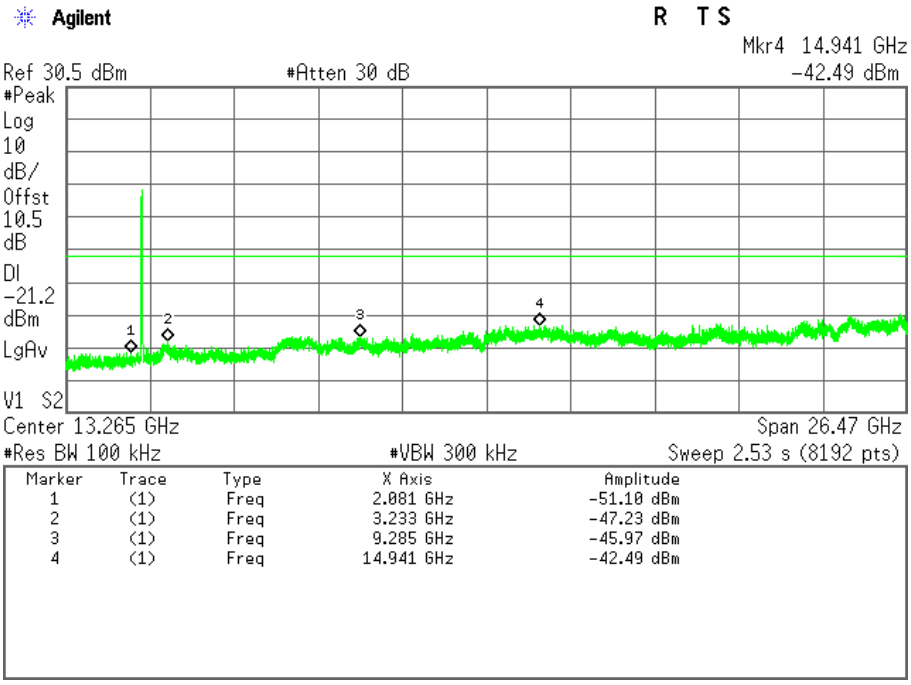


Marker	Trace	Type	X Axis	Amplitude
1	(1)	Freq	2.045 GHz	-50.97 dBm
2	(1)	Freq	3.071 GHz	-47.29 dBm
3	(1)	Freq	7.647 GHz	-45.24 dBm
4	(1)	Freq	14.976 GHz	-42.29 dBm

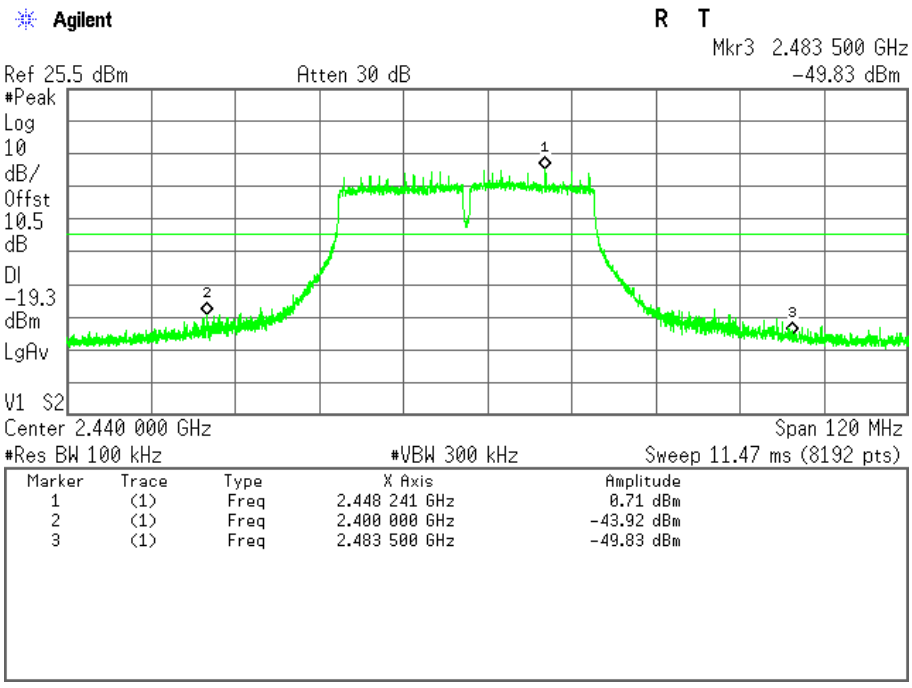
CH Low (2.38GHz ~ 2.5GHz / IEEE 802.11ac VHT40 MCS0 Mode / Chain 0)



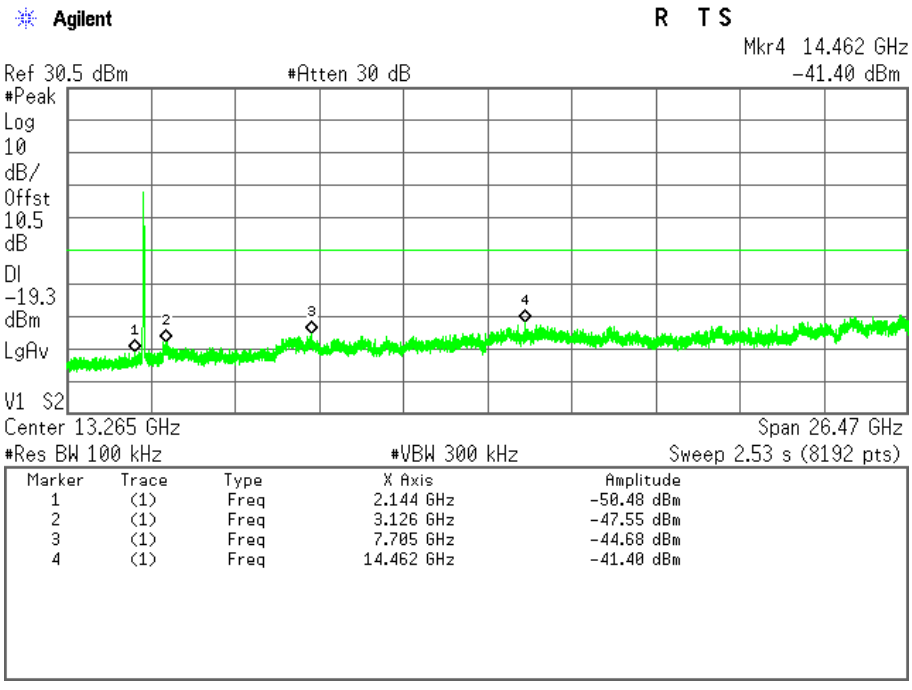
CH Low (30MHz ~ 26.5GHz / IEEE 802.11ac VHT40 MCS0 Mode / Chain 0)



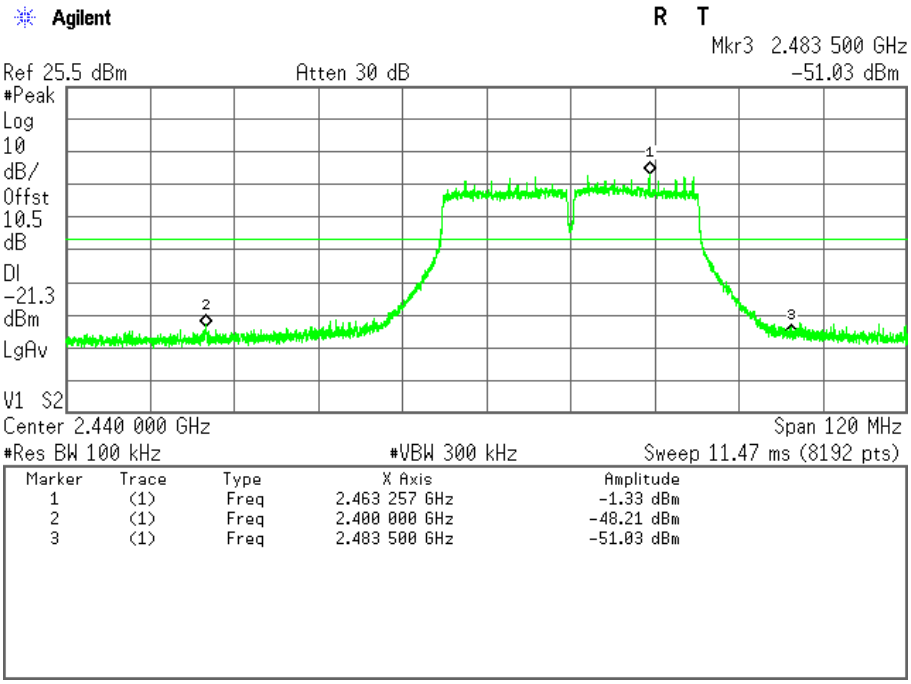
CH Middle (2.38GHz ~ 2.5GHz / IEEE 802.11ac VHT40 MCS0 Mode / Chain 0)



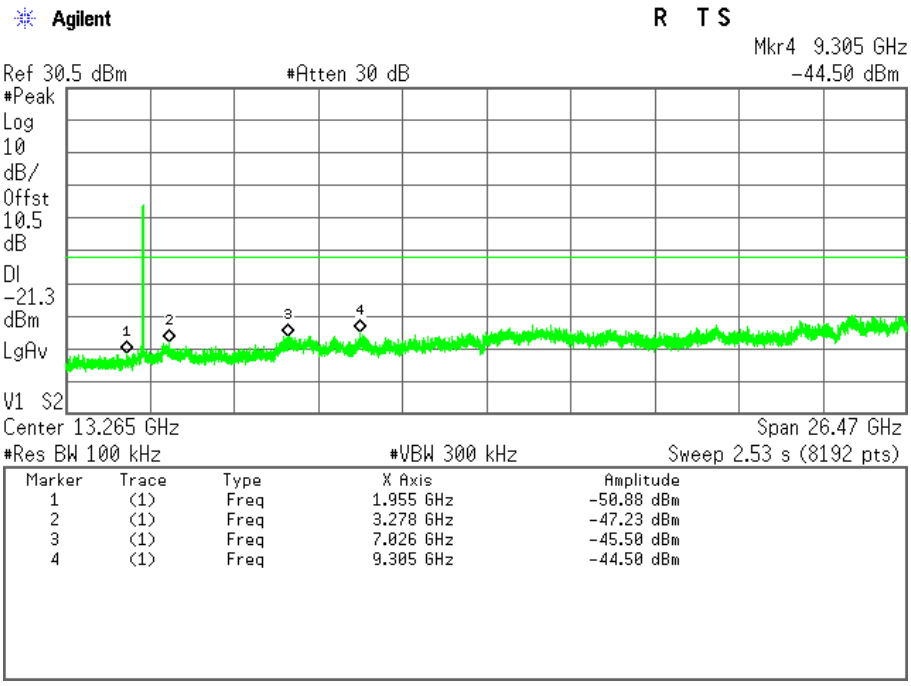
CH Middle (30MHz ~ 26.5GHz / IEEE 802.11ac VHT40 MCS0 Mode / Chain 0)



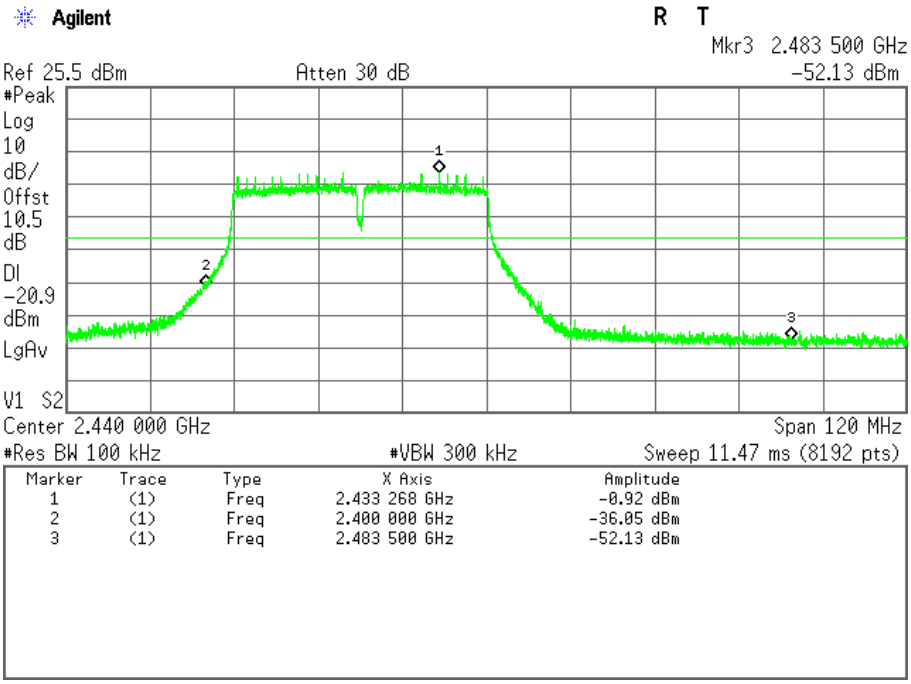
CH High (2.38GHz ~ 2.5GHz / IEEE 802.11ac VHT40 MCS0 Mode / Chain 0)



CH High (30MHz ~ 26.5GHz / IEEE 802.11ac VHT40 MCS0 Mode / Chain 0)

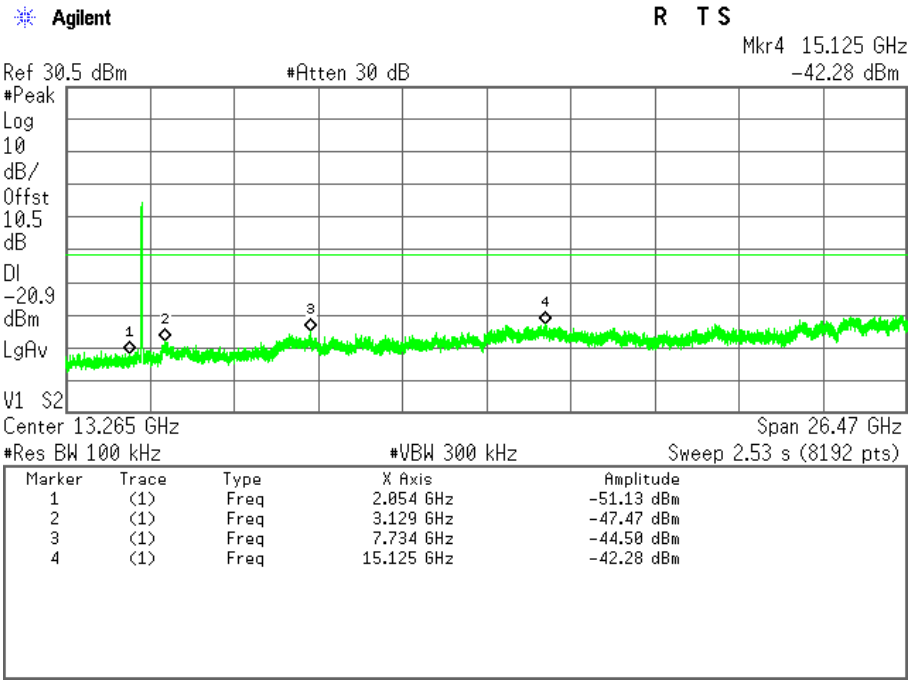


CH Low (2.38GHz ~ 2.5GHz / IEEE 802.11ac VHT40 MCS0 Mode / Chain 1)



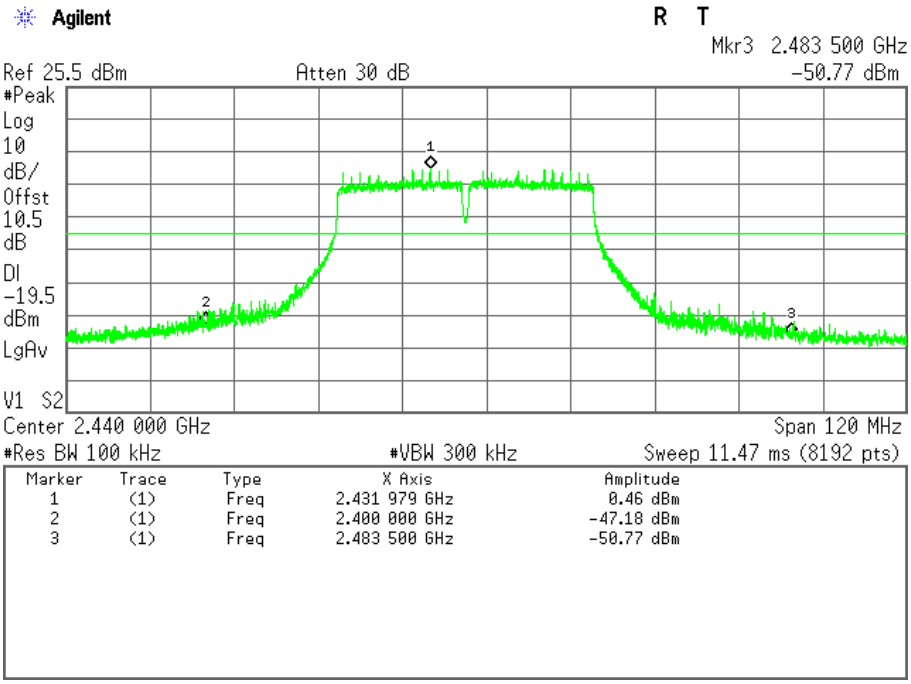
Marker	Trace	Type	X Axis	Amplitude
1	(1)	Freq	2.433 268 GHz	-0.92 dBm
2	(1)	Freq	2.400 000 GHz	-36.05 dBm
3	(1)	Freq	2.483 500 GHz	-52.13 dBm

CH Low (30MHz ~ 26.5GHz / IEEE 802.11ac VHT40 MCS0 Mode / Chain 1)



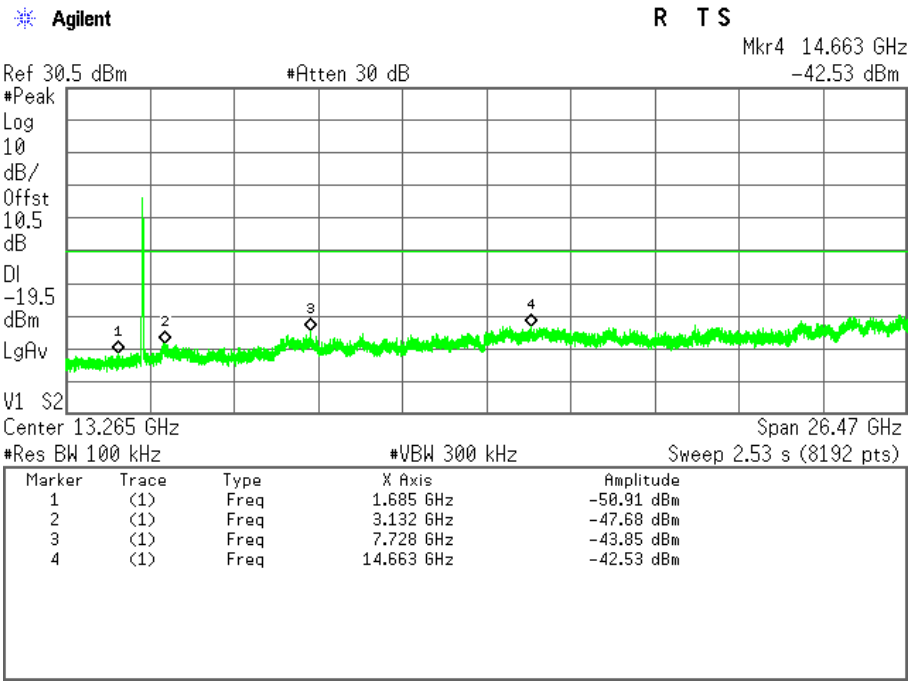
Marker	Trace	Type	X Axis	Amplitude
1	(1)	Freq	2.054 GHz	-51.13 dBm
2	(1)	Freq	3.129 GHz	-47.47 dBm
3	(1)	Freq	7.734 GHz	-44.50 dBm
4	(1)	Freq	15.125 GHz	-42.28 dBm

CH Middle (2.38GHz ~ 2.5GHz / IEEE 802.11ac VHT40 MCS0 Mode / Chain 1)



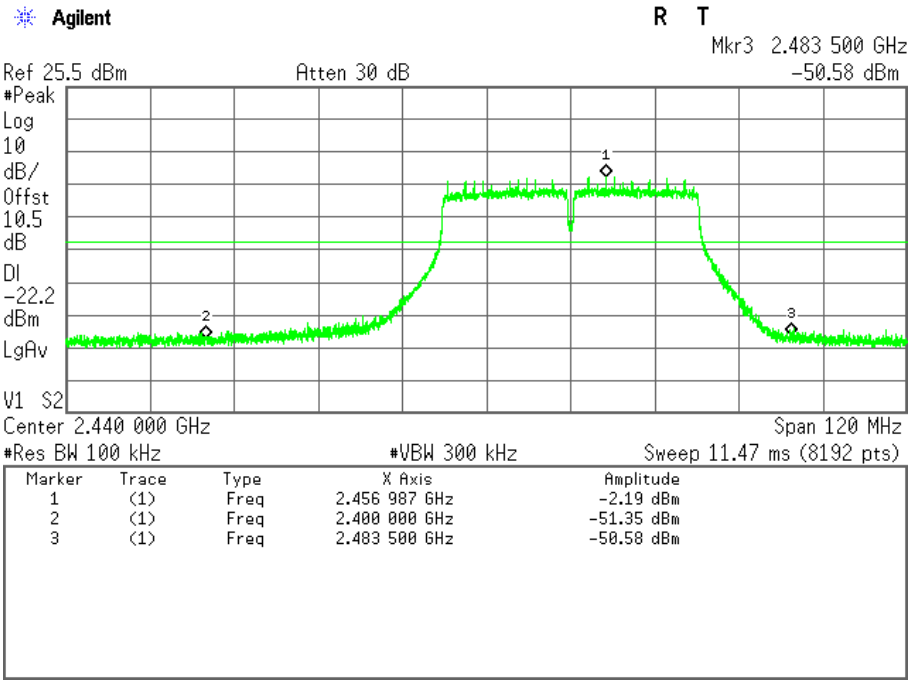
Marker	Trace	Type	X Axis	Amplitude
1	(1)	Freq	2.431 979 GHz	0.46 dBm
2	(1)	Freq	2.400 000 GHz	-47.18 dBm
3	(1)	Freq	2.483 500 GHz	-50.77 dBm

CH Middle (30MHz ~ 26.5GHz / IEEE 802.11ac VHT40 MCS0 Mode / Chain 1)



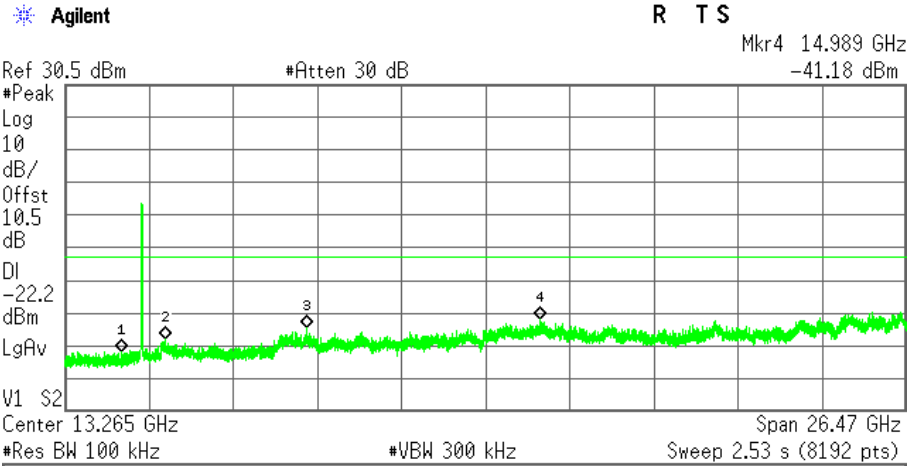
Marker	Trace	Type	X Axis	Amplitude
1	(1)	Freq	1.685 GHz	-50.91 dBm
2	(1)	Freq	3.132 GHz	-47.68 dBm
3	(1)	Freq	7.728 GHz	-43.85 dBm
4	(1)	Freq	14.663 GHz	-42.53 dBm

CH High (2.38GHz ~ 2.5GHz / IEEE 802.11ac VHT40 MCS0 Mode / Chain 1)



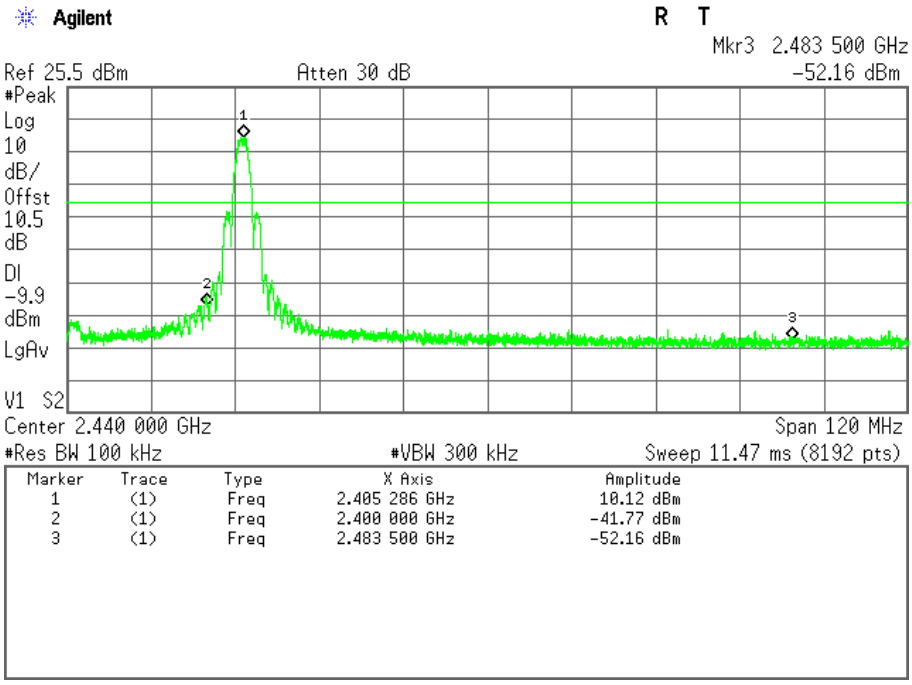
Marker	Trace	Type	X Axis	Amplitude
1	(1)	Freq	2.456 987 GHz	-2.19 dBm
2	(1)	Freq	2.400 000 GHz	-51.35 dBm
3	(1)	Freq	2.483 500 GHz	-50.58 dBm

CH High (30MHz ~ 26.5GHz / IEEE 802.11ac VHT40 MCS0 Mode / Chain 1)



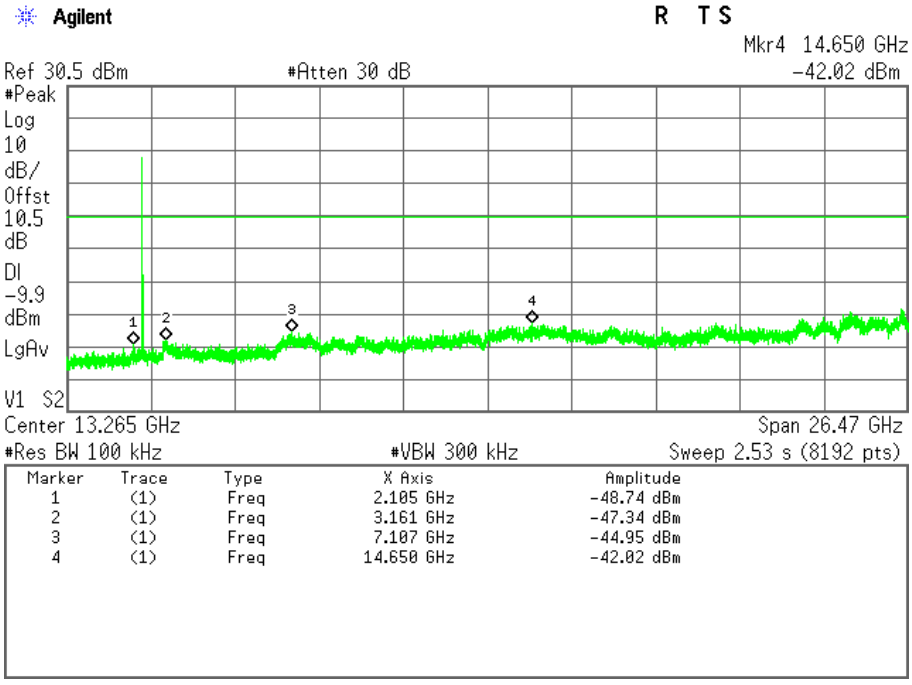
Marker	Trace	Type	X Axis	Amplitude
1	(1)	Freq	1.829 GHz	-51.29 dBm
2	(1)	Freq	3.178 GHz	-47.51 dBm
3	(1)	Freq	7.624 GHz	-43.81 dBm
4	(1)	Freq	14.989 GHz	-41.18 dBm

CH Low (2.38GHz ~ 2.5GHz / ZigBee Mode)



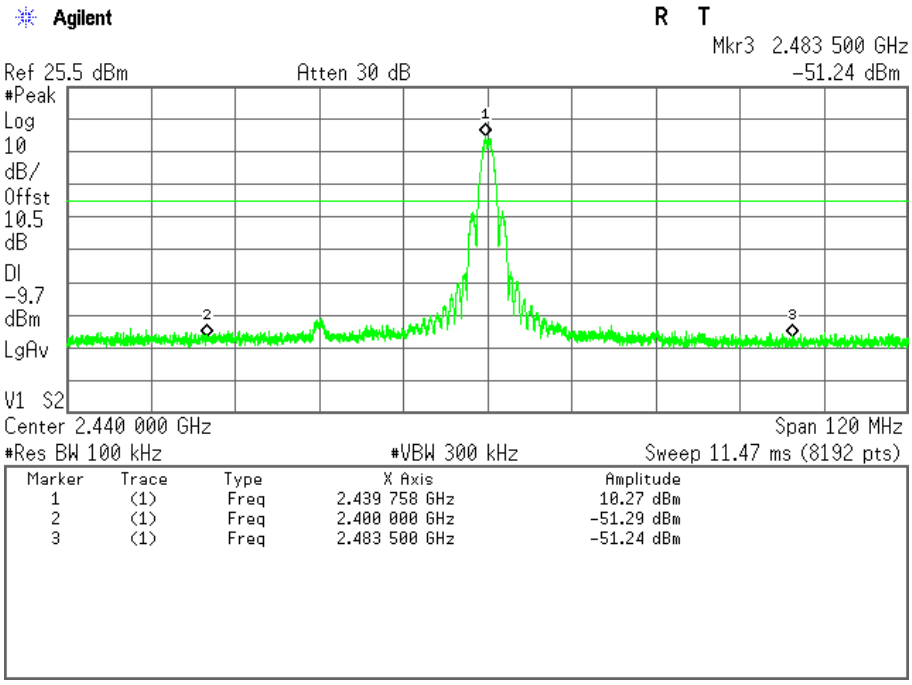
Marker	Trace	Type	X Axis	Amplitude
1	(1)	Freq	2.405 286 GHz	10.12 dBm
2	(1)	Freq	2.400 000 GHz	-41.77 dBm
3	(1)	Freq	2.483 500 GHz	-52.16 dBm

CH Low (30MHz ~ 26.5GHz / ZigBee Mode)

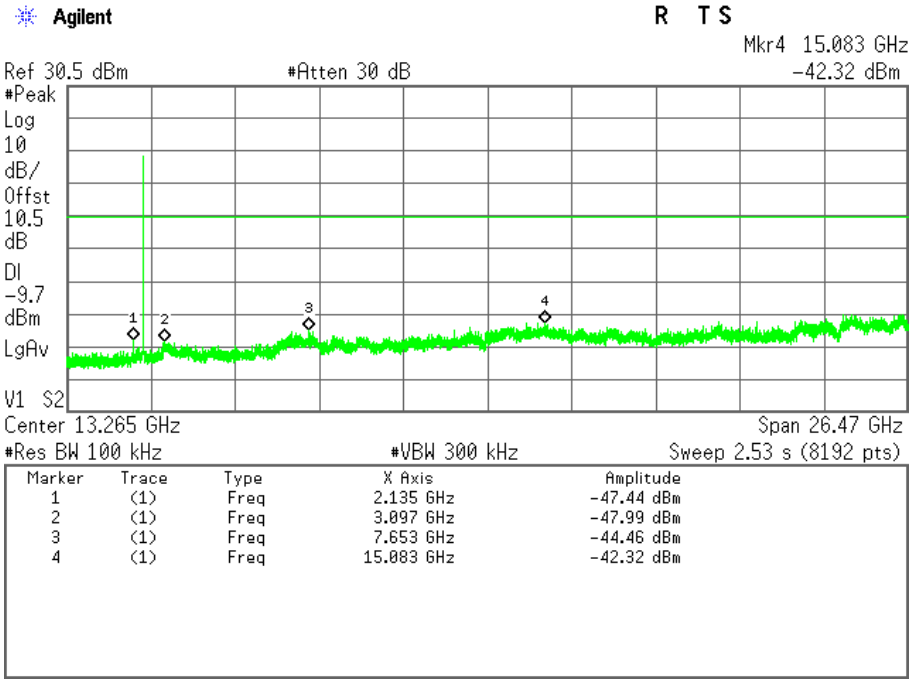


Marker	Trace	Type	X Axis	Amplitude
1	(1)	Freq	2.105 GHz	-48.74 dBm
2	(1)	Freq	3.161 GHz	-47.34 dBm
3	(1)	Freq	7.107 GHz	-44.95 dBm
4	(1)	Freq	14.650 GHz	-42.02 dBm

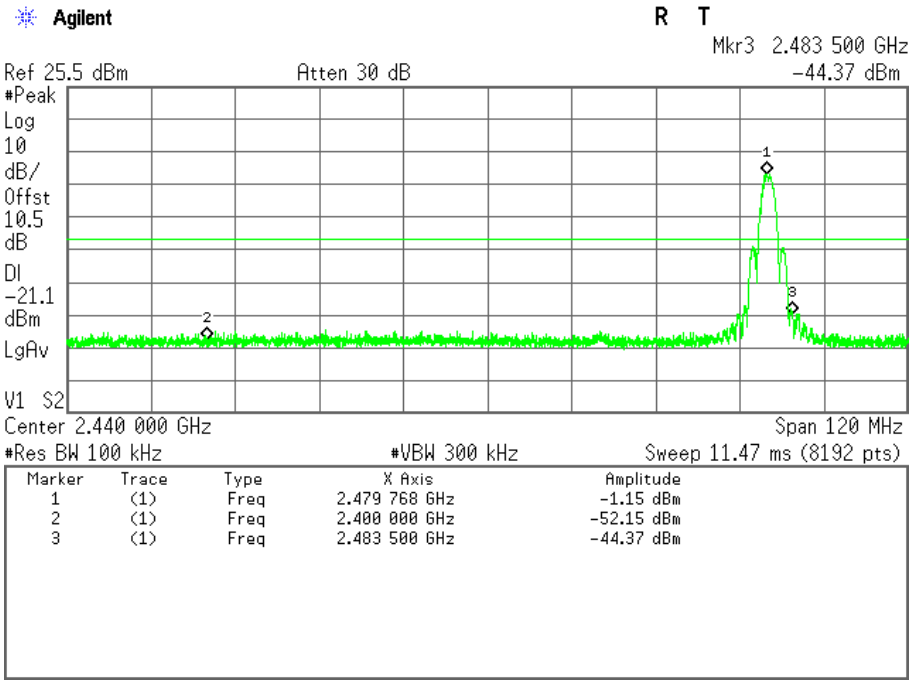
CH Middle (2.38GHz ~ 2.5GHz / ZigBee Mode)



CH Middle (30MHz ~ 26.5GHz / ZigBee Mode)

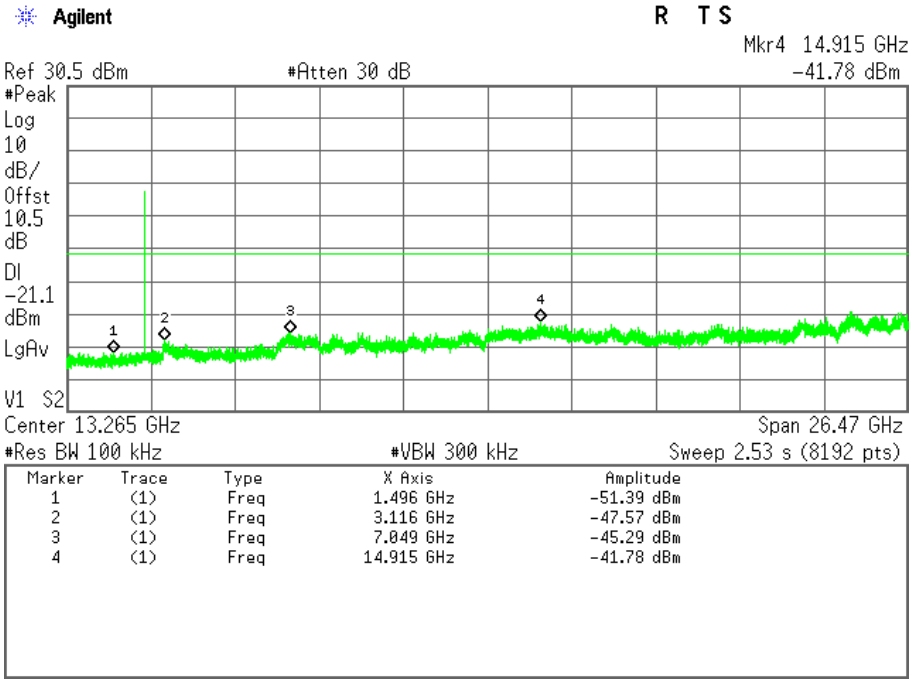


CH High (2.38GHz ~ 2.5GHz / ZigBee Mode)



Marker	Trace	Type	X Axis	Amplitude
1	(1)	Freq	2.479 768 GHz	-1.15 dBm
2	(1)	Freq	2.400 000 GHz	-52.15 dBm
3	(1)	Freq	2.483 500 GHz	-44.37 dBm

CH High (30MHz ~ 26.5GHz / ZigBee Mode)



Marker	Trace	Type	X Axis	Amplitude
1	(1)	Freq	1.496 GHz	-51.39 dBm
2	(1)	Freq	3.116 GHz	-47.57 dBm
3	(1)	Freq	7.049 GHz	-45.29 dBm
4	(1)	Freq	14.915 GHz	-41.78 dBm

7.7 RADIATED EMISSION

LIMITS

(1) According to § 15.205 (a) Except as shown in paragraph (d) of this section, only spurious emissions are permitted in any of the frequency bands listed below:

MHz	MHz	MHz	GHz
0.090 - 0.110	16.42 - 16.423	399.9 - 410	4.5 - 5.15
[1]0.495 - 0.505	16.69475 - 16.69525	608 - 614	5.35 - 5.46
2.1735 - 2.1905	16.80425 - 16.80475	960 - 1240	7.25 - 7.75
4.125 - 4.128	25.5 - 25.67	1300 - 1427	8.025 - 8.5
4.17725 - 4.17775	37.5 - 38.25	1435 - 1626.5	9.0 - 9.2
4.20725 - 4.20775	73 - 74.6	1645.5 - 1646.5	9.3 - 9.5
6.215 - 6.218	74.8 - 75.2	1660 -1710	10.6 -12.7
6.26775 - 6.26825	108 -121.94	1718.8 - 1722.2	13.25 -13.4
6.31175 - 6.31225	123 - 138	2200 - 2300	14.47 – 14.5
8.291 - 8.294	149.9 - 150.05	2310 - 2390	15.35 -16.2
8.362 - 8.366	156.52475 - 156.52525	2483.5 - 2500	17.7 - 21.4
8.37625 - 8.38675	156.7 - 156.9	2655 - 2900	22.01 - 23.12
8.41425 - 8.41475	162.0125 - 167.17	3260 - 3267	23.6 - 24.0
12.29 - 12.293	167.72 - 173.2	3332 - 3339	31.2 - 31.8
12.51975 - 12.52025	240 - 285	3345.8 - 3338	36.43 - 36.5
12.57675 - 12.57725	322 -335.4	3600 - 4400	([2])
13.36 - 13.41			

Remark:
1. [1] Until February 1, 1999, this restricted band shall be 0.490-0.510 MHz.
2. [2] Above 38.6

(2) According to § 15.205 (b) Except as provided in paragraphs (d) and (e), the field strength of emissions appearing within these frequency bands shall not exceed the limits shown is Section 15.209. At frequencies equal to or less than 1000 MHz, compliance with the limits in Section 15.209 shall be demonstrated using measurement instrumentation employing a CISPR quasi-peak detector. Above 1000 MHz, compliance with the emission limits in Section 15.209 shall be demonstrated based on the average value of the measured emissions. The provisions in Section 15.35 apply to these measurements.

(3) According to § 15.209 (a) Except as provided elsewhere in this Subpart, the emissions from an intentional radiator shall not exceed the field strength levels specified in the following table:

Frequency (MHz)	Field Strength (microvolts/meter)	Measurement Distance (meters)
0.009 – 0.490	2400/F(KHz)	300
0.490 – 1.705	24000/F(KHz)	30
1.705 – 30.0	30	30
30 - 88	100 **	3
88 - 216	150 **	3
216 - 960	200 **	3
Above 960	500	3

Remark: ***Except as provided in paragraph (g), fundamental emissions from intentional radiators operating under this Section shall not be located in the frequency bands 54-72 MHz, 76-88 MHz, 174-216 MHz or 470-806 MHz. However, operation within these frequency bands is permitted under other sections of this Part, e.g., Sections 15.231 and 15.241.*

(4) According to § 15.209 (b) In the emission table above, the tighter limit applies at the band edges.

TEST EQUIPMENT

Radiated Emission / 966Chamber_B

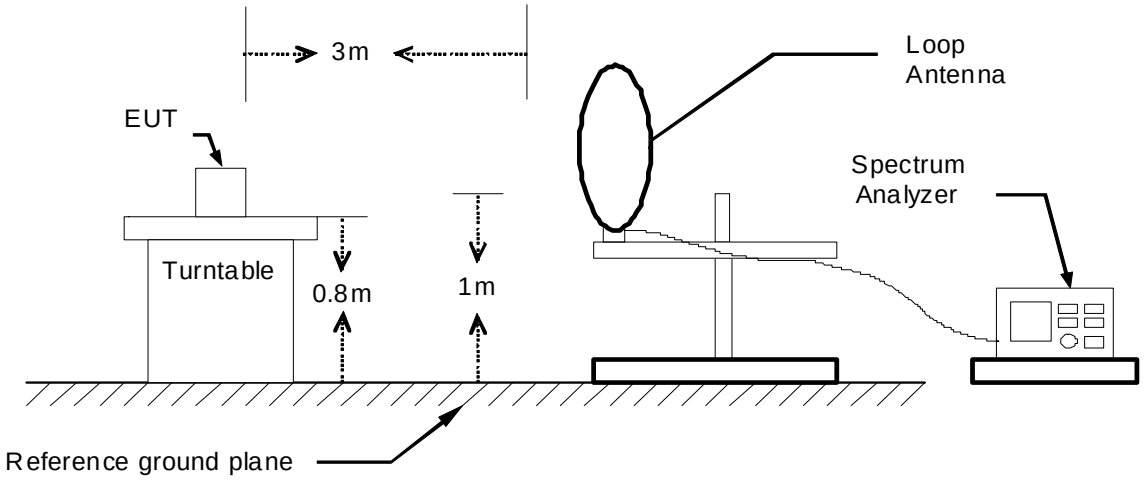
Name of Equipment	Manufacture	Model	Serial Number	Calibration Due
Spectrum Analyzer	Agilent	E4446A	MY46180323	04/12/2017
EMI Test Receiver	Rohde & Schwarz	ESCI	100221	04/26/2017
Bi-log Antenna	TESEQ	CBL 6112D	35403	07/02/2017
Broad-Band Horn Antenna	Schwarzbeck	BBHA 9120 D	9120D-778	07/14/2017
Double-Ridged Waveguide Horn	ETS-LINDGREN	3117	00078733	11/16/2017
Horn Antenna	COM-POWER	AH-840	03077	12/01/2017
Pre-Amplifier	Agilent	8447D	2944A10052	07/12/2017
Pre-Amplifier	Agilent	8449B	3008A01916	07/12/2017
LOOP Antenna	COM-POWER	AL-130	121060	05/23/2017
Test S/W	E3.815206a			

Remark: *Each piece of equipment is scheduled for calibration once a year.*

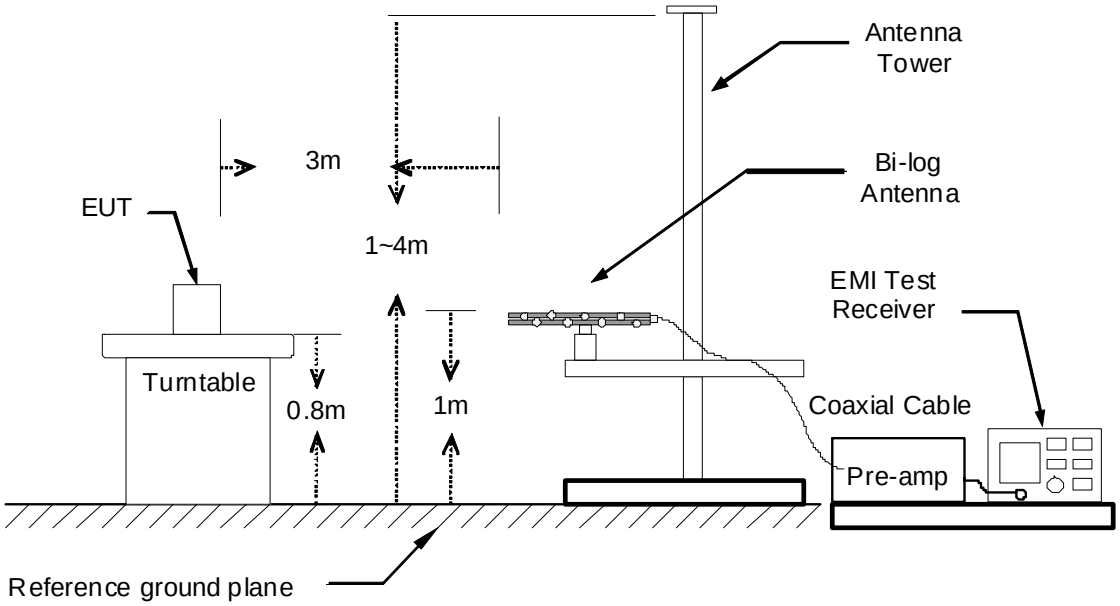
TEST SETUP

The diagram below shows the test setup that is utilized to make the measurements for emission below 1GHz.

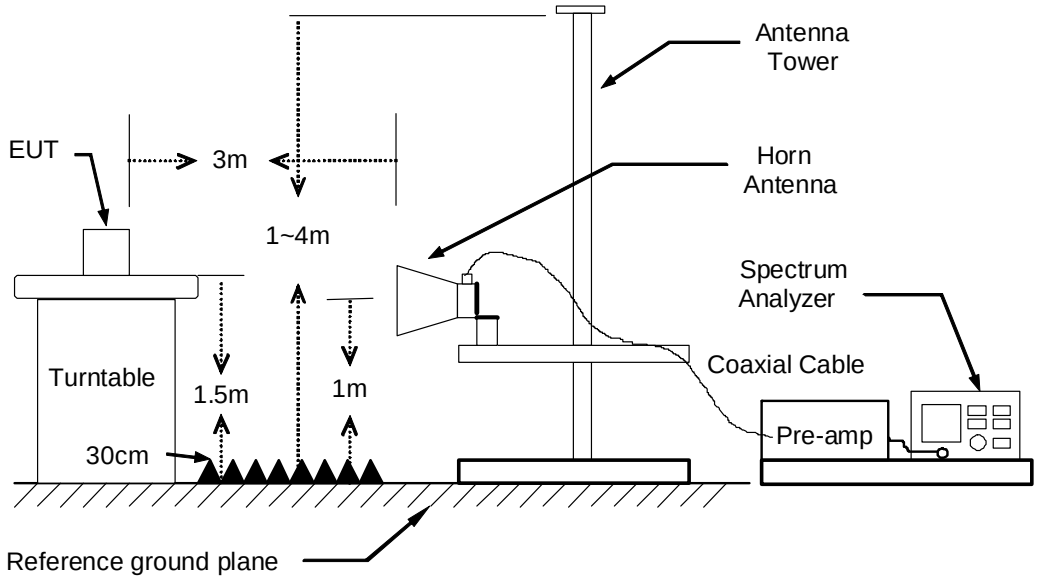
9kHz ~ 30MHz



30MHz ~ 1GHz



The diagram below shows the test setup that is utilized to make the measurements for emission above 1GHz.



TEST PROCEDURE

1. The EUT was placed on the top of a rotating table 0.8 and 1.5 meters above the ground. The table was rotated 360 degrees to determine the position of the highest radiation.
2. While measuring the radiated emission below 1GHz, the EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower. While measuring the radiated emission above 1GHz, the EUT was set 3 meters away from the interference-receiving antenna.
3. The antenna is a broadband antenna, and its height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarization of the antenna are set to make the measurement.
4. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the table was turned from 0 degrees to 360 degrees to find the maximum reading.
5. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold mode.
6. If the emission level of the EUT in peak mode was 10 dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10 dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.

Remark:

1. *The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120 KHz for Peak detection (PK) and Quasi-peak detection (QP) at frequency below 1GHz.*
2. *The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 1 MHz for Peak detection and frequency above 1GHz.*
3. *The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 10 Hz for Average detection (AV) at frequency above 1GHz.*

TEST RESULTS

Below 1 GHz (9kHz ~ 30MHz)

No emission found between lowest internal used/generated frequency to 30MHz.

Below 1 GHz (30MHz ~ 1GHz)

Product Name	AC1300 IoT Router	Test By	Rex Chiu
Test Model	X10R	Test Date	2016/11/09
Test Mode	WiFi / Mode 1	Temp. & Humidity	25°C, 50%

966Chamber_B at 3Meter / Horizontal

Freq. MHz	Reading dBuV	C.F. dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Azimuth deg	Height cm	Remark
62.98	42.09	-20.88	21.21	40.00	-18.79	271	200	Peak
104.69	44.90	-15.28	29.62	43.50	-13.88	310	200	Peak
157.07	46.45	-15.83	30.62	43.50	-12.88	290	200	Peak
285.11	34.90	-11.89	23.01	46.00	-22.99	174	100	Peak
666.32	32.29	-5.99	26.30	46.00	-19.70	217	100	Peak
807.94	29.36	-4.09	25.27	46.00	-20.73	358	100	Peak
953.44	28.80	-2.39	26.41	46.00	-19.59	157	100	Peak

966Chamber_B at 3Meter / Vertical

Freq. MHz	Reading dBuV	C.F. dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Azimuth deg	Height cm	Remark
39.70	47.38	-13.65	33.73	40.00	-6.27	359	100	Peak
61.04	48.41	-20.96	27.45	40.00	-12.55	351	100	Peak
157.07	43.63	-15.83	27.80	43.50	-15.70	40	200	Peak
384.05	32.09	-9.47	22.62	46.00	-23.38	144	100	Peak
500.45	32.70	-8.13	24.57	46.00	-21.43	183	100	Peak
666.32	32.11	-5.99	26.12	46.00	-19.88	43	100	Peak
813.76	29.03	-4.01	25.02	46.00	-20.98	11	100	Peak

Remark:

1. *Quasi-peak test would be performed if the peak result were greater than the quasi-peak limit.*
2. *Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Loss (dB) – PreAmp.Gain (dB)*
3. *Result (dBuV/m) = Reading (dBuV) + Correction Factor (dB/m)*
4. *Margin (dB) = Remark result (dBuV/m) - Quasi-peak limit (dBuV/m).*

Product Name	AC1300 IoT Router	Test By	Rex Chiu
Test Model	X10R	Test Date	2016/11/23
Test Mode	ZigBee / Mode 1	Temp. & Humidity	25°C, 58%

966Chamber_B at 3Meter / Horizontal

Freq. MHz	Reading dBuV	C.F. dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Azimuth deg	Height cm	Remark
104.69	42.56	-11.52	31.04	43.50	-12.46	283	200	Peak
123.12	37.55	-10.75	26.80	43.50	-16.70	98	200	Peak
148.34	44.34	-12.10	32.24	43.50	-11.26	267	200	Peak
157.07	45.93	-12.54	33.39	43.50	-10.11	113	200	Peak
189.08	36.36	-13.26	23.10	43.50	-20.40	251	100	Peak
293.84	31.09	-8.40	22.69	46.00	-23.31	229	100	Peak
666.32	31.77	-2.79	28.98	46.00	-17.02	196	100	Peak

966Chamber_B at 3Meter / Vertical

Freq. MHz	Reading dBuV	C.F. dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Azimuth deg	Height cm	Remark
49.40	46.10	-15.14	30.96	40.00	-9.04	330	100	Peak
109.54	39.98	-11.09	28.89	43.50	-14.61	292	100	Peak
147.37	42.48	-12.04	30.44	43.50	-13.06	344	100	Peak
157.07	43.67	-12.54	31.13	43.50	-12.37	339	100	Peak
194.90	37.47	-13.09	24.38	43.50	-19.12	201	200	Peak
450.98	30.50	-5.39	25.11	46.00	-20.89	220	100	Peak
631.40	30.58	-3.04	27.54	46.00	-18.46	208	100	Peak

Remark:

1. *Quasi-peak test would be performed if the peak result were greater than the quasi-peak limit.*
2. *Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Loss (dB) – PreAmp.Gain (dB)*
3. *Result (dBuV/m) = Reading (dBuV) + Correction Factor (dB/m)*
4. *Margin (dB) = Remark result (dBuV/m) - Quasi-peak limit (dBuV/m).*

Above 1 GHz

Product Name	AC1300 IoT Router	Test By	Rex Chiu
Test Model	X10R	Test Date	2016/11/07
Test Mode	IEEE 802.11b Mode / TX / CH Low	Temp. & Humidity	25°C, 50%

966Chamber_B at 3Meter / Horizontal

Freq. MHz	Reading dBuV	C.F. dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Azimuth deg	Height cm	Remark
2308.00	51.31	-2.97	48.34	74.00	-25.66	194	100	Peak
2702.00	51.41	-1.61	49.80	74.00	-24.20	0	100	Peak
3666.00	43.44	1.24	44.68	74.00	-29.32	178	200	Peak
4824.00	42.79	5.24	48.03	74.00	-25.97	109	100	Peak
7236.00	38.60	12.39	50.99	54.00	-3.01	238	200	Average
7236.00	41.89	12.39	54.28	74.00	-19.72	238	200	Peak
9504.00	37.01	14.30	51.31	74.00	-22.69	329	200	Peak

966Chamber_B at 3Meter / Vertical

Freq. MHz	Reading dBuV	C.F. dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Azimuth deg	Height cm	Remark
1906.00	51.95	-4.56	47.39	74.00	-26.61	137	100	Peak
2496.00	52.15	-2.21	49.94	74.00	-24.06	123	200	Peak
3666.00	44.31	1.24	45.55	74.00	-28.45	171	100	Peak
4824.00	40.55	5.24	45.79	74.00	-28.21	315	200	Peak
7236.00	41.20	12.39	53.59	54.00	-0.41	204	100	Average
7236.00	44.89	12.39	57.28	74.00	-16.72	204	100	Peak
9852.00	36.87	14.91	51.78	74.00	-22.22	72	200	Peak

Remark:

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *Average test would be performed if the peak result were greater than the average limit.*
3. *Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*
4. *Result = Reading + Correction Factor*
   Margin = Result – Limit
   Remark Peak = Result(PK) – Limit(PK)
   Remark AVG = Result(AV) – Limit(AV)

Product Name	AC1300 IoT Router	Test By	Rex Chiu
Test Model	X10R	Test Date	2016/11/07
Test Mode	IEEE 802.11b Mode / TX / CH Middle	Temp. & Humidity	25°C, 50%

966Chamber_B at 3Meter / Horizontal

Freq. MHz	Reading dBuV	C.F. dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Azimuth deg	Height cm	Remark
2312.00	51.18	-2.95	48.23	74.00	-25.77	141	200	Peak
2484.00	50.14	-2.25	47.89	74.00	-26.11	162	200	Peak
3996.00	41.23	2.56	43.79	74.00	-30.21	137	200	Peak
4875.00	44.03	5.38	49.41	74.00	-24.59	155	200	Peak
7308.00	37.00	12.44	49.44	54.00	-4.56	230	100	Average
7308.00	40.19	12.44	52.63	74.00	-21.37	230	100	Peak
10236.00	36.42	15.79	52.21	74.00	-21.79	111	200	Peak

966Chamber_B at 3Meter / Vertical

Freq. MHz	Reading dBuV	C.F. dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Azimuth deg	Height cm	Remark
2354.00	51.18	-2.78	48.40	74.00	-25.60	10	200	Peak
2484.00	52.10	-2.25	49.85	54.00	-4.15	346	200	Average
2484.00	57.06	-2.25	54.81	74.00	-19.19	346	200	Peak
3996.00	43.54	2.56	46.10	74.00	-27.90	202	100	Peak
4875.00	44.84	5.38	50.22	74.00	-23.78	202	100	Peak
7308.00	40.00	12.44	52.44	54.00	-1.56	194	200	Average
7308.00	43.04	12.44	55.48	74.00	-18.52	194	200	Peak
10416.00	35.96	16.26	52.22	74.00	-21.78	167	200	Peak

Remark:

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *Average test would be performed if the peak result were greater than the average limit.*
3. *Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*
4. *Result = Reading + Correction Factor*
   Margin = Result – Limit
   Remark Peak = Result(PK) – Limit(PK)
   Remark AVG = Result(AV) – Limit(AV)

Product Name	AC1300 IoT Router	Test By	Rex Chiu
Test Model	X10R	Test Date	2016/11/07
Test Mode	IEEE 802.11b Mode / TX / CH High	Temp. & Humidity	25°C, 50%

966Chamber_B at 3Meter / Horizontal

Freq. MHz	Reading dBuV	C.F. dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Azimuth deg	Height cm	Remark
2304.00	51.10	-2.98	48.12	74.00	-25.88	228	100	Peak
2976.00	50.81	-0.82	49.99	74.00	-24.01	345	100	Peak
3666.00	42.72	1.24	43.96	74.00	-30.04	190	200	Peak
4923.00	42.55	5.50	48.05	74.00	-25.95	163	200	Peak
7380.00	36.70	12.48	49.18	54.00	-4.82	118	200	Average
7380.00	40.13	12.48	52.61	74.00	-21.39	118	200	Peak
9360.00	37.57	14.13	51.70	74.00	-22.30	106	100	Peak

966Chamber_B at 3Meter / Vertical

Freq. MHz	Reading dBuV	C.F. dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Azimuth deg	Height cm	Remark
2332.00	51.68	-2.87	48.81	74.00	-25.19	356	100	Peak
2986.00	50.47	-0.79	49.68	74.00	-24.32	335	100	Peak
3666.00	45.66	1.24	46.90	74.00	-27.10	168	100	Peak
4923.00	41.41	5.50	46.91	74.00	-27.09	216	100	Peak
7380.00	37.20	12.48	49.68	54.00	-4.32	211	100	Average
7380.00	40.48	12.48	52.96	74.00	-21.04	211	100	Peak
9612.00	36.38	14.49	50.87	74.00	-23.13	182	200	Peak

Remark:

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *Average test would be performed if the peak result were greater than the average limit.*
3. *Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*
4. *Result = Reading + Correction Factor*
   Margin = Result – Limit
   Remark Peak = Result(PK) – Limit(PK)
   Remark AVG = Result(AV) – Limit(AV)

Product Name	AC1300 IoT Router	Test By	Rex Chiu
Test Model	X10R	Test Date	2016/11/07
Test Mode	IEEE 802.11g Mode / TX / CH Low	Temp. & Humidity	25°C, 50%

966Chamber_B at 3Meter / Horizontal

Freq. MHz	Reading dBuV	C.F. dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Azimuth deg	Height cm	Remark
2120.00	51.26	-3.73	47.53	74.00	-26.47	154	200	Peak
2764.00	51.01	-1.43	49.58	74.00	-24.42	338	200	Peak
3666.00	42.44	1.24	43.68	74.00	-30.32	183	200	Peak
4824.00	39.19	5.24	44.43	74.00	-29.57	323	100	Peak
7224.00	37.82	12.38	50.20	74.00	-23.80	0	100	Peak
9696.00	36.10	14.63	50.73	74.00	-23.27	329	200	Peak

966Chamber_B at 3Meter / Vertical

Freq. MHz	Reading dBuV	C.F. dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Azimuth deg	Height cm	Remark
2304.00	51.85	-2.98	48.87	74.00	-25.13	262	200	Peak
2496.00	54.12	-2.21	51.91	74.00	-22.09	6	200	Peak
3216.00	47.73	-0.18	47.55	74.00	-26.45	45	200	Peak
4824.00	38.68	5.24	43.92	74.00	-30.08	12	200	Peak
7224.00	38.13	12.38	50.51	74.00	-23.49	170	200	Peak
9684.00	36.63	14.61	51.24	74.00	-22.76	255	200	Peak

Remark:

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *Average test would be performed if the peak result were greater than the average limit.*
3. *Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*
4. *Result = Reading + Correction Factor*
   Margin = Result – Limit
   Remark Peak = Result(PK) – Limit(PK)
   Remark AVG = Result(AV) – Limit(AV)

Product Name	AC1300 IoT Router	Test By	Rex Chiu
Test Model	X10R	Test Date	2016/11/07
Test Mode	IEEE 802.11g Mode / TX / CH Middle	Temp. & Humidity	25°C, 50%

966Chamber_B at 3Meter / Horizontal

Freq. MHz	Reading dBuV	C.F. dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Azimuth deg	Height cm	Remark
2390.00	46.50	-2.63	43.87	54.00	-10.13	0	100	Average
2390.00	61.83	-2.63	59.20	74.00	-14.80	0	100	Peak
2484.00	44.50	-2.25	42.25	54.00	-11.75	0	100	Average
2484.00	57.38	-2.25	55.13	74.00	-18.87	0	100	Peak
3666.00	42.92	1.24	44.16	74.00	-29.84	182	100	Peak
4875.00	41.29	5.38	46.67	74.00	-27.33	159	100	Peak
7308.00	33.60	12.44	46.04	54.00	-7.96	229	100	Average
7308.00	42.43	12.44	54.87	74.00	-19.13	229	100	Peak
9432.00	36.22	14.21	50.43	74.00	-23.57	317	100	Peak

966Chamber_B at 3Meter / Vertical

Freq. MHz	Reading dBuV	C.F. dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Azimuth deg	Height cm	Remark
2390.00	53.90	-2.63	51.27	54.00	-2.73	98	145	Average
2390.00	69.12	-2.63	66.49	74.00	-7.51	98	200	Peak
2484.00	54.62	-2.25	52.37	54.00	-1.63	20	166	Average
2484.00	67.00	-2.25	64.75	74.00	-9.25	20	200	Peak
3666.00	44.58	1.24	45.82	74.00	-28.18	139	100	Peak
4875.00	43.97	5.38	49.35	74.00	-24.65	162	200	Peak
7308.00	35.40	12.44	47.84	54.00	-6.16	200	100	Average
7308.00	44.30	12.44	56.74	74.00	-17.26	200	100	Peak
9636.00	36.42	14.53	50.95	74.00	-23.05	33	100	Peak

Remark:

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *Average test would be performed if the peak result were greater than the average limit.*
3. *Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*
4. *Result = Reading + Correction Factor*
   Margin = Result – Limit
   Remark Peak = Result(PK) – Limit(PK)
   Remark AVG = Result(AV) – Limit(AV)

Product Name	AC1300 IoT Router	Test By	Rex Chiu
Test Model	X10R	Test Date	2016/11/07
Test Mode	IEEE 802.11g Mode / TX / CH High	Temp. & Humidity	25°C, 50%

966Chamber_B at 3Meter / Horizontal

Freq. MHz	Reading dBuV	C.F. dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Azimuth deg	Height cm	Remark
2360.00	50.98	-2.76	48.22	74.00	-25.78	45	200	Peak
2914.00	50.48	-1.00	49.48	74.00	-24.52	333	100	Peak
3330.00	43.47	0.13	43.60	74.00	-30.40	242	200	Peak
4923.00	38.72	5.50	44.22	74.00	-29.78	88	100	Peak
7272.00	36.95	12.41	49.36	74.00	-24.64	172	100	Peak
10236.00	36.43	15.79	52.22	74.00	-21.78	194	100	Peak

966Chamber_B at 3Meter / Vertical

Freq. MHz	Reading dBuV	C.F. dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Azimuth deg	Height cm	Remark
2350.00	52.40	-2.80	49.60	74.00	-24.40	360	100	Peak
2934.00	49.81	-0.94	48.87	74.00	-25.13	266	100	Peak
3666.00	44.93	1.24	46.17	74.00	-27.83	171	100	Peak
4608.00	40.02	4.68	44.70	74.00	-29.30	4	200	Peak
7212.00	36.95	12.38	49.33	74.00	-24.67	0	200	Peak
9468.00	36.44	14.25	50.69	74.00	-23.31	160	100	Peak

Remark:

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *Average test would be performed if the peak result were greater than the average limit.*
3. *Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*
4. *Result = Reading + Correction Factor*
   Margin = Result – Limit
   Remark Peak = Result(PK) – Limit(PK)
   Remark AVG = Result(AV) – Limit(AV)

Product Name	AC1300 IoT Router	Test By	Rex Chiu
Test Model	X10R	Test Date	2016/11/07
Test Mode	IEEE 802.11ac VHT20 MCS0 Mode / TX / CH Low	Temp. & Humidity	25°C, 50%

966Chamber_B at 3Meter / Horizontal

Freq. MHz	Reading dBuV	C.F. dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Azimuth deg	Height cm	Remark
2294.00	50.88	-3.02	47.86	74.00	-26.14	171	100	Peak
2916.00	51.01	-0.99	50.02	74.00	-23.98	82	200	Peak
4587.00	39.58	4.63	44.21	74.00	-29.79	5	200	Peak
4824.00	39.51	5.24	44.75	74.00	-29.25	2	100	Peak
7236.00	36.74	12.39	49.13	74.00	-24.87	78	200	Peak
9444.00	37.76	14.23	51.99	74.00	-22.01	171	100	Peak

966Chamber_B at 3Meter / Vertical

Freq. MHz	Reading dBuV	C.F. dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Azimuth deg	Height cm	Remark
2090.00	52.35	-3.85	48.50	74.00	-25.50	273	100	Peak
2488.00	54.31	-2.24	52.07	74.00	-21.93	349	200	Peak
3216.00	47.75	-0.18	47.57	74.00	-26.43	37	100	Peak
3996.00	43.13	2.56	45.69	74.00	-28.31	201	100	Peak
7236.00	38.64	12.39	51.03	74.00	-22.97	204	200	Peak
9864.00	36.39	14.93	51.32	74.00	-22.68	240	200	Peak

Remark:

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *Average test would be performed if the peak result were greater than the average limit.*
3. *Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*
4. *Result = Reading + Correction Factor*
   Margin = Result – Limit
   Remark Peak = Result(PK) – Limit(PK)
   Remark AVG = Result(AV) – Limit(AV)

Product Name	AC1300 IoT Router	Test By	Rex Chiu
Test Model	X10R	Test Date	2016/11/07
Test Mode	IEEE 802.11ac VHT20 MCS0 Mode / TX / CH Middle	Temp. & Humidity	25°C, 50%

966Chamber_B at 3Meter / Horizontal

Freq. MHz	Reading dBuV	C.F. dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Azimuth deg	Height cm	Remark
2390.00	42.70	-2.63	40.07	54.00	-13.93	108	200	Average
2390.00	54.90	-2.63	52.27	74.00	-21.73	108	200	Peak
2484.00	43.20	-2.25	40.95	54.00	-13.05	172	100	Average
2484.00	54.33	-2.25	52.08	74.00	-21.92	172	100	Peak
3330.00	44.14	0.13	44.27	74.00	-29.73	238	200	Peak
4869.00	42.59	5.36	47.95	74.00	-26.05	152	200	Peak
7308.00	31.90	12.44	44.34	54.00	-9.66	242	100	Average
7308.00	42.19	12.44	54.63	74.00	-19.37	242	100	Peak
9360.00	36.96	14.13	51.09	74.00	-22.91	129	200	Peak

966Chamber_B at 3Meter / Vertical

Freq. MHz	Reading dBuV	C.F. dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Azimuth deg	Height cm	Remark
2390.00	52.60	-2.63	49.97	54.00	-4.03	343	175	Average
2390.00	64.90	-2.63	62.27	74.00	-11.73	343	200	Peak
2484.00	54.20	-2.25	51.95	54.00	-2.05	336	223	Average
2484.00	65.01	-2.25	62.76	74.00	-11.24	336	200	Peak
3666.00	44.64	1.24	45.88	74.00	-28.12	162	100	Peak
4884.00	43.45	5.40	48.85	74.00	-25.15	162	200	Peak
7308.00	35.20	12.44	47.64	54.00	-6.36	216	100	Average
7308.00	44.35	12.44	56.79	74.00	-17.21	216	100	Peak
9768.00	37.40	14.76	52.16	74.00	-21.84	27	200	Peak

Remark:

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *Average test would be performed if the peak result were greater than the average limit.*
3. *Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*
4. *Result = Reading + Correction Factor*
   Margin = Result – Limit
   Remark Peak = Result(PK) – Limit(PK)
   Remark AVG = Result(AV) – Limit(AV)

Product Name	AC1300 IoT Router	Test By	Rex Chiu
Test Model	X10R	Test Date	2016/11/07
Test Mode	IEEE 802.11ac VHT20 MCS0 Mode / TX / CH High	Temp. & Humidity	25°C, 50%

966Chamber_B at 3Meter / Horizontal

Freq. MHz	Reading dBuV	C.F. dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Azimuth deg	Height cm	Remark
2278.00	51.26	-3.09	48.17	74.00	-25.83	276	200	Peak
2942.00	50.19	-0.92	49.27	74.00	-24.73	177	100	Peak
3666.00	42.99	1.24	44.23	74.00	-29.77	175	100	Peak
4923.00	38.23	5.50	43.73	74.00	-30.27	86	100	Peak
7368.00	37.38	12.48	49.86	74.00	-24.14	306	100	Peak
9816.00	37.01	14.85	51.86	74.00	-22.14	288	100	Peak

966Chamber_B at 3Meter / Vertical

Freq. MHz	Reading dBuV	C.F. dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Azimuth deg	Height cm	Remark
2388.00	52.63	-2.64	49.99	74.00	-24.01	167	100	Peak
2928.00	50.59	-0.96	49.63	74.00	-24.37	64	200	Peak
3666.00	45.35	1.24	46.59	74.00	-27.41	162	100	Peak
4929.00	39.15	5.52	44.67	74.00	-29.33	164	200	Peak
7368.00	38.02	12.48	50.50	74.00	-23.50	56	200	Peak
10248.00	36.29	15.82	52.11	74.00	-21.89	329	200	Peak

Remark:

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *Average test would be performed if the peak result were greater than the average limit.*
3. *Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*
4. *Result = Reading + Correction Factor*
   Margin = Result – Limit
   Remark Peak = Result(PK) – Limit(PK)
   Remark AVG = Result(AV) – Limit(AV)

Product Name	AC1300 IoT Router	Test By	Rex Chiu
Test Model	X10R	Test Date	2016/11/07
Test Mode	IEEE 802.11ac VHT40 MCS0 Mode / TX / CH Low	Temp. & Humidity	25°C, 50%

966Chamber_B at 3Meter / Horizontal

Freq. MHz	Reading dBuV	C.F. dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Azimuth deg	Height cm	Remark
2148.00	51.19	-3.61	47.58	74.00	-26.42	231	200	Peak
2638.00	51.72	-1.79	49.93	74.00	-24.07	120	200	Peak
3996.00	40.75	2.56	43.31	74.00	-30.69	234	100	Peak
4845.00	39.76	5.30	45.06	74.00	-28.94	98	100	Peak
7032.00	36.94	12.26	49.20	74.00	-24.80	195	100	Peak
9696.00	36.82	14.63	51.45	74.00	-22.55	344	100	Peak

966Chamber_B at 3Meter / Vertical

Freq. MHz	Reading dBuV	C.F. dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Azimuth deg	Height cm	Remark
2276.00	51.01	-3.09	47.92	74.00	-26.08	35	200	Peak
2496.00	42.20	-2.21	39.99	54.00	-14.01	9	100	Average
2496.00	55.12	-2.21	52.91	74.00	-21.09	9	100	Peak
3228.00	45.81	-0.14	45.67	74.00	-28.33	142	100	Peak
4845.00	37.63	5.30	42.93	74.00	-31.07	336	100	Peak
7080.00	37.17	12.29	49.46	74.00	-24.54	332	100	Peak
9444.00	37.23	14.23	51.46	74.00	-22.54	47	200	Peak

Remark:

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *Average test would be performed if the peak result were greater than the average limit.*
3. *Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*
4. *Result = Reading + Correction Factor*
   Margin = Result – Limit
   Remark Peak = Result(PK) – Limit(PK)
   Remark AVG = Result(AV) – Limit(AV)

Product Name	AC1300 IoT Router	Test By	Rex Chiu
Test Model	X10R	Test Date	2016/11/07
Test Mode	IEEE 802.11ac VHT40 MCS0 Mode / TX / CH Middle	Temp. & Humidity	25°C, 50%

966Chamber_B at 3Meter / Horizontal

Freq. MHz	Reading dBuV	C.F. dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Azimuth deg	Height cm	Remark
2390.00	38.60	-2.63	35.97	54.00	-18.03	84	200	Average
2390.00	53.15	-2.63	50.52	74.00	-23.48	84	200	Peak
2484.00	39.60	-2.25	37.35	54.00	-16.65	142	200	Average
2484.00	53.91	-2.25	51.66	74.00	-22.34	142	200	Peak
3996.00	41.26	2.56	43.82	74.00	-30.18	140	200	Peak
4869.00	40.28	5.36	45.64	74.00	-28.36	186	200	Peak
7008.00	37.40	12.25	49.65	74.00	-24.35	276	200	Peak
9348.00	36.81	14.11	50.92	74.00	-23.08	122	100	Peak

966Chamber_B at 3Meter / Vertical

Freq. MHz	Reading dBuV	C.F. dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Azimuth deg	Height cm	Remark
2390.00	49.30	-2.63	46.67	54.00	-7.33	328	200	Average
2390.00	62.86	-2.63	60.23	74.00	-13.77	328	200	Peak
2484.00	51.60	-2.25	49.35	54.00	-4.65	201	163	Average
2484.00	65.64	-2.25	63.39	74.00	-10.61	201	200	Peak
3666.00	44.43	1.24	45.67	74.00	-28.33	136	100	Peak
4875.00	39.90	5.38	45.28	74.00	-28.72	198	100	Peak
7296.00	36.88	12.43	49.31	74.00	-24.69	199	200	Peak
9468.00	35.99	14.25	50.24	74.00	-23.76	324	200	Peak

Remark:

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *Average test would be performed if the peak result were greater than the average limit.*
3. *Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*
4. *Result = Reading + Correction Factor*
   Margin = Result – Limit
   Remark Peak = Result(PK) – Limit(PK)
   Remark AVG = Result(AV) – Limit(AV)

Product Name	AC1300 IoT Router	Test By	Rex Chiu
Test Model	X10R	Test Date	2016/11/07
Test Mode	IEEE 802.11ac VHT40 MCS0 Mode / TX / CH High	Temp. & Humidity	25°C, 50%

966Chamber_B at 3Meter / Horizontal

Freq. MHz	Reading dBuV	C.F. dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Azimuth deg	Height cm	Remark
2322.00	51.65	-2.91	48.74	74.00	-25.26	27	100	Peak
2952.00	49.97	-0.89	49.08	74.00	-24.92	136	200	Peak
3666.00	42.88	1.24	44.12	74.00	-29.88	168	100	Peak
4905.00	40.06	5.45	45.51	74.00	-28.49	75	100	Peak
7212.00	37.09	12.38	49.47	74.00	-24.53	189	200	Peak
9456.00	36.32	14.24	50.56	74.00	-23.44	258	100	Peak

966Chamber_B at 3Meter / Vertical

Freq. MHz	Reading dBuV	C.F. dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Azimuth deg	Height cm	Remark
2390.00	51.72	-2.63	49.09	74.00	-24.91	360	200	Peak
2940.00	50.32	-0.92	49.40	74.00	-24.60	89	100	Peak
3666.00	45.46	1.24	46.70	74.00	-27.30	166	100	Peak
4905.00	38.22	5.45	43.67	74.00	-30.33	359	200	Peak
7320.00	36.90	12.44	49.34	74.00	-24.66	15	200	Peak
9612.00	36.12	14.49	50.61	74.00	-23.39	291	100	Peak

Remark:

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *Average test would be performed if the peak result were greater than the average limit.*
3. *Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*
4. *Result = Reading + Correction Factor*
   Margin = Result – Limit
   Remark Peak = Result(PK) – Limit(PK)
   Remark AVG = Result(AV) – Limit(AV)

Product Name	AC1300 IoT Router	Test By	Waternil Guan
Test Model	X10R	Test Date	2016/11/18
Test Mode	ZigBee Mode / TX / CH Low	Temp. & Humidity	25°C, 58%

966Chamber_B at 3Meter / Horizontal

Freq. MHz	Reading dBuV	C.F. dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Azimuth deg	Height cm	Remark
2104.00	52.03	-3.79	48.24	74.00	-25.76	8	200	Peak
2254.00	53.48	-3.18	50.30	74.00	-23.70	1	150	Peak
2556.00	52.72	-2.03	50.69	74.00	-23.31	167	150	Peak
3330.00	44.15	0.13	44.28	74.00	-29.72	250	200	Peak
4647.00	40.30	4.78	45.08	74.00	-28.92	81	150	Peak
5262.00	38.57	6.29	44.86	74.00	-29.14	283	150	Peak
7200.00	37.49	12.37	49.86	74.00	-24.14	183	200	Peak
7980.00	36.77	13.08	49.85	74.00	-24.15	24	150	Peak
9492.00	37.00	14.28	51.28	74.00	-22.72	76	200	Peak

966Chamber_B at 3Meter / Vertical

Freq. MHz	Reading dBuV	C.F. dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Azimuth deg	Height cm	Remark
1992.00	56.39	-4.24	52.15	74.00	-21.85	204	100	Peak
2048.00	55.78	-4.02	51.76	74.00	-22.24	64	100	Peak
2156.00	53.74	-3.58	50.16	74.00	-23.84	259	150	Peak
3330.00	44.21	0.13	44.34	74.00	-29.66	181	100	Peak
3891.00	45.95	2.14	48.09	74.00	-25.91	4	150	Peak
3996.00	43.13	2.56	45.69	74.00	-28.31	208	150	Peak
6780.00	37.80	11.79	49.59	74.00	-24.41	350	100	Peak
7752.00	37.08	12.83	49.91	74.00	-24.09	52	100	Peak
8652.00	37.41	13.41	50.82	74.00	-23.18	327	200	Peak

Remark:

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *Average test would be performed if the peak result were greater than the average limit.*
3. *Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*
4. *Result = Reading + Correction Factor*
   Margin = Result – Limit
   Remark Peak = Result(PK) – Limit(PK)
   Remark AVG = Result(AV) – Limit(AV)

Product Name	AC1300 IoT Router	Test By	Waternil Guan
Test Model	X10R	Test Date	2016/11/18
Test Mode	ZigBee Mode / TX / CH Middle	Temp. & Humidity	25°C, 58%

966Chamber_B at 3Meter / Horizontal

Freq. MHz	Reading dBuV	C.F. dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Azimuth deg	Height cm	Remark
2286.00	53.38	-3.05	50.33	74.00	-23.67	34	200	Peak
2390.00	50.54	-2.63	47.91	74.00	-26.09	360	100	Peak
2484.00	49.95	-2.25	47.70	74.00	-26.30	312	100	Peak
3330.00	43.15	0.13	43.28	74.00	-30.72	230	200	Peak
3996.00	41.61	2.56	44.17	74.00	-29.83	143	200	Peak
4995.00	39.50	5.69	45.19	74.00	-28.81	159	150	Peak
6420.00	36.57	11.06	47.63	74.00	-26.37	220	150	Peak
7176.00	37.01	12.35	49.36	74.00	-24.64	311	150	Peak
8700.00	36.49	13.45	49.94	74.00	-24.06	24	200	Peak

966Chamber_B at 3Meter / Vertical

Freq. MHz	Reading dBuV	C.F. dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Azimuth deg	Height cm	Remark
1992.00	53.77	-4.24	49.53	74.00	-24.47	331	150	Peak
2390.00	49.88	-2.63	47.25	74.00	-26.75	125	200	Peak
2484.00	49.70	-2.25	47.45	74.00	-26.55	359	150	Peak
3492.00	51.01	0.56	51.57	74.00	-22.43	355	100	Peak
4152.00	48.89	3.13	52.02	74.00	-21.98	160	100	Peak
4899.00	45.44	5.44	50.88	74.00	-23.12	182	100	Peak
6288.00	38.62	10.79	49.41	74.00	-24.59	7	100	Peak
6660.00	40.63	11.55	52.18	74.00	-21.82	182	150	Peak
9792.00	37.70	14.80	52.50	74.00	-21.50	359	100	Peak

Remark:

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *Average test would be performed if the peak result were greater than the average limit.*
3. *Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*
4. *Result = Reading + Correction Factor*
   Margin = Result – Limit
   Remark Peak = Result(PK) – Limit(PK)
   Remark AVG = Result(AV) – Limit(AV)

Product Name	AC1300 IoT Router	Test By	Waternil Guan
Test Model	X10R	Test Date	2016/11/18
Test Mode	ZigBee Mode / TX / CH High	Temp. & Humidity	25°C, 58%

966Chamber_B at 3Meter / Horizontal

Freq. MHz	Reading dBuV	C.F. dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Azimuth deg	Height cm	Remark
1332.00	53.84	-7.17	46.67	74.00	-27.33	181	200	Peak
2054.00	52.61	-3.99	48.62	74.00	-25.38	238	200	Peak
2244.00	51.12	-3.22	47.90	74.00	-26.10	326	150	Peak
3330.00	44.12	0.13	44.25	74.00	-29.75	238	200	Peak
3996.00	41.87	2.56	44.43	74.00	-29.57	148	100	Peak
5994.00	39.40	7.79	47.19	74.00	-26.81	196	100	Peak
7104.00	37.55	12.31	49.86	74.00	-24.14	178	100	Peak
7776.00	37.54	12.86	50.40	74.00	-23.60	88	100	Peak
8640.00	36.70	13.40	50.10	74.00	-23.90	244	100	Peak

966Chamber_B at 3Meter / Vertical

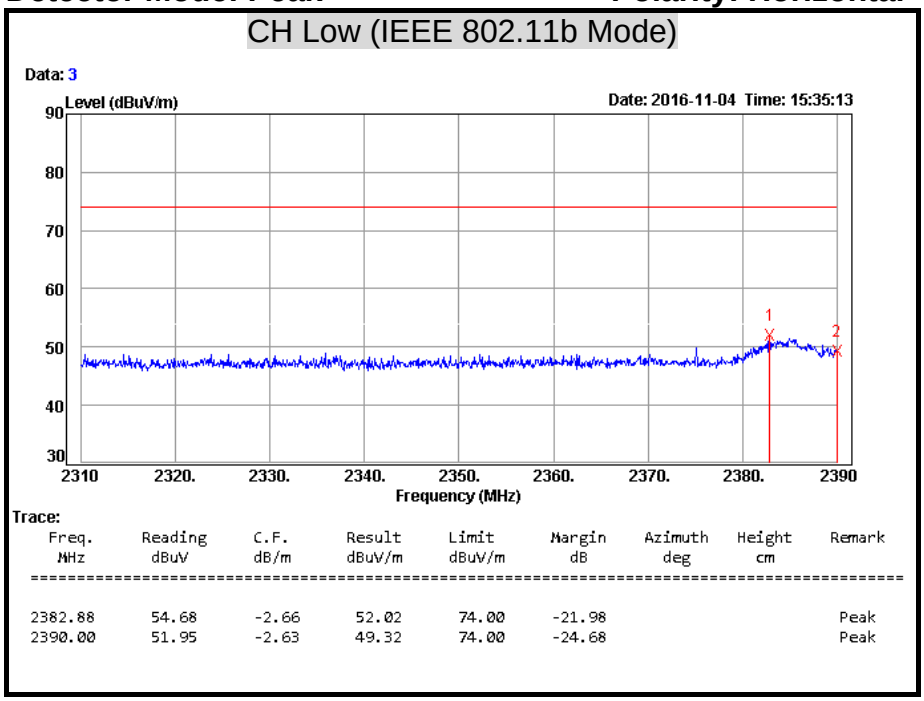
Freq. MHz	Reading dBuV	C.F. dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Azimuth deg	Height cm	Remark
1026.00	57.40	-9.17	48.23	74.00	-25.77	30	100	Peak
1074.00	60.08	-8.86	51.22	74.00	-22.78	201	100	Peak
1198.00	59.44	-8.05	51.39	74.00	-22.61	49	100	Peak
3033.00	48.92	-0.66	48.26	74.00	-25.74	354	150	Peak
4995.00	45.97	5.69	51.66	74.00	-22.34	335	150	Peak
5517.00	41.07	6.86	47.93	74.00	-26.07	359	100	Peak
6252.00	38.69	10.71	49.40	74.00	-24.60	336	200	Peak
7260.00	37.66	12.41	50.07	74.00	-23.93	279	200	Peak
9384.00	38.30	14.16	52.46	74.00	-21.54	166	100	Peak

Remark:

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *Average test would be performed if the peak result were greater than the average limit.*
3. *Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*
4. *Result = Reading + Correction Factor*
   Margin = Result – Limit
   Remark Peak = Result(PK) – Limit(PK)
   Remark AVG = Result(AV) – Limit(AV)

Restricted Band Edges

Detector Mode: Peak **Polarity: Horizontal**

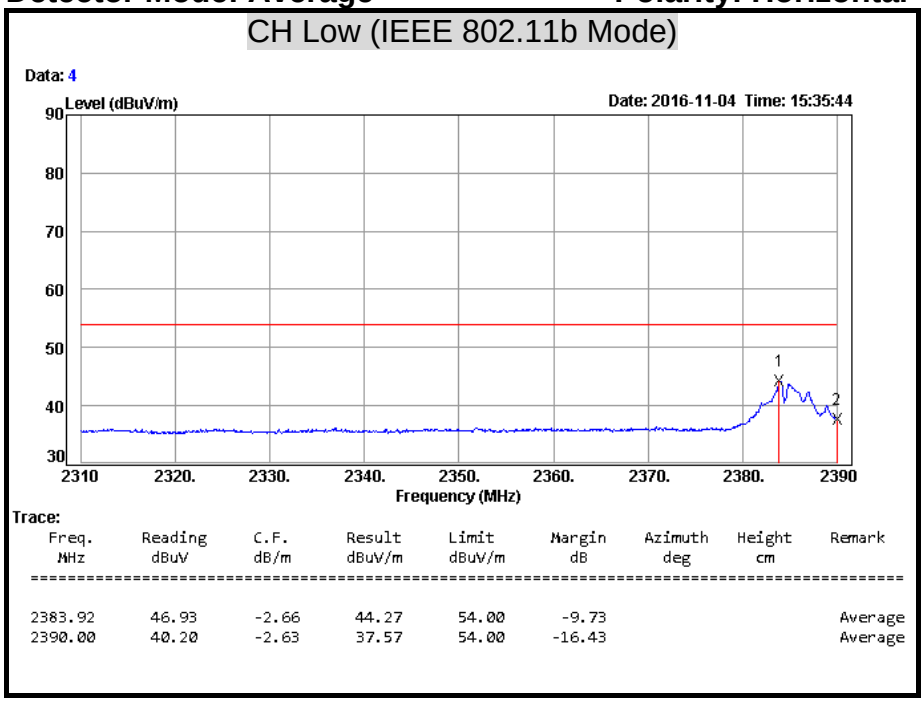


Trace:

Freq. MHz	Reading dBuV	C.F. dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Azimuth deg	Height cm	Remark
2382.88	54.68	-2.66	52.02	74.00	-21.98			Peak
2390.00	51.95	-2.63	49.32	74.00	-24.68			Peak

Remark: *Result = Reading + Correction Factor*
Margin = Result – Limit
Remark Peak = Result(PK) – Limit(PK)

Detector Mode: Average **Polarity: Horizontal**

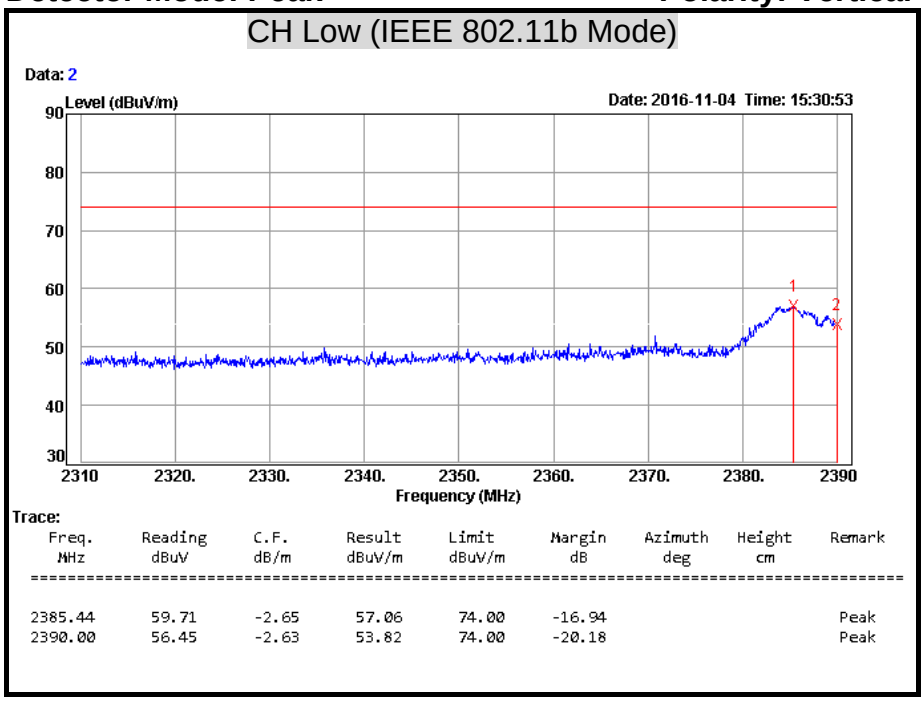


Trace:

Freq. MHz	Reading dBuV	C.F. dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Azimuth deg	Height cm	Remark
2383.92	46.93	-2.66	44.27	54.00	-9.73			Average
2390.00	40.20	-2.63	37.57	54.00	-16.43			Average

Remark: *Result = Reading + Correction Factor*
Margin = Result – Limit
Remark AVG = Result(AV) – Limit(AV)

Detector Mode: Peak **Polarity: Vertical**

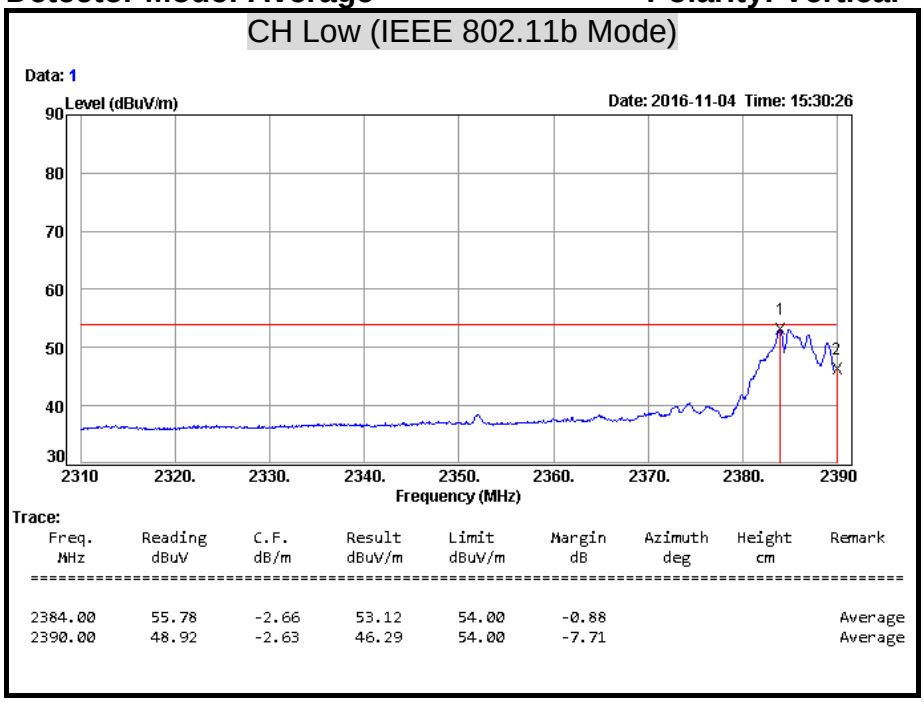


Trace:

Freq. MHz	Reading dBuV	C.F. dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Azimuth deg	Height cm	Remark
2385.44	59.71	-2.65	57.06	74.00	-16.94			Peak
2390.00	56.45	-2.63	53.82	74.00	-20.18			Peak

Remark: *Result = Reading + Correction Factor*
Margin = Result – Limit
Remark Peak = Result(PK) – Limit(PK)

Detector Mode: Average **Polarity: Vertical**



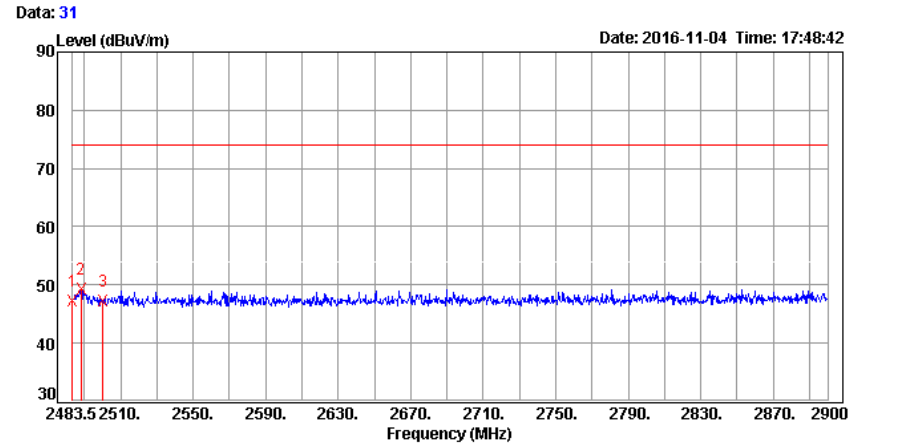
Trace:

Freq. MHz	Reading dBuV	C.F. dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Azimuth deg	Height cm	Remark
2384.00	55.78	-2.66	53.12	54.00	-0.88			Average
2390.00	48.92	-2.63	46.29	54.00	-7.71			Average

Remark: *Result = Reading + Correction Factor*
Margin = Result – Limit
Remark AVG = Result(AV) – Limit(AV)

Detector Mode: Peak **Polarity: Horizontal**

CH High (IEEE 802.11b Mode)



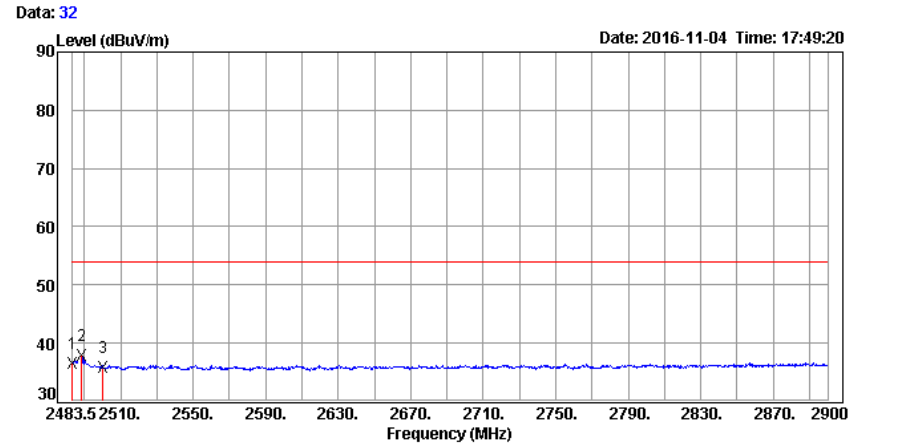
Trace:

Freq. MHz	Reading dBuV	C.F. dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Azimuth deg	Height cm	Remark
2483.50	49.58	-2.26	47.32	74.00	-26.68			Peak
2488.08	51.60	-2.24	49.36	74.00	-24.64			Peak
2500.16	49.41	-2.19	47.22	74.00	-26.78			Peak

Remark: *Result = Reading + Correction Factor*
Margin = Result – Limit
Remark Peak = Result(PK) – Limit(PK)

Detector Mode: Average **Polarity: Horizontal**

CH High (IEEE 802.11b Mode)



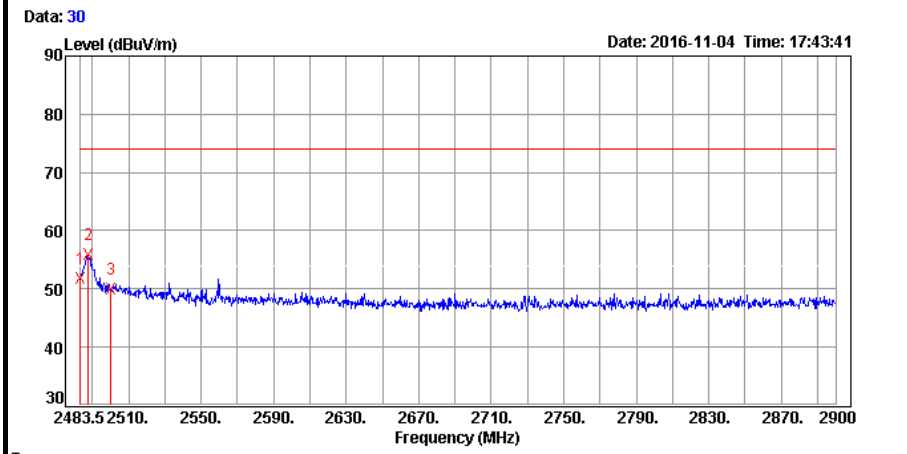
Trace:

Freq. MHz	Reading dBuV	C.F. dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Azimuth deg	Height cm	Remark
2483.50	38.78	-2.26	36.52	54.00	-17.48			Average
2488.50	40.11	-2.24	37.87	54.00	-16.13			Average
2500.16	38.01	-2.19	35.82	54.00	-18.18			Average

Remark: *Result = Reading + Correction Factor*
Margin = Result – Limit
Remark AVG = Result(AV) – Limit(AV)

Detector Mode: Peak **Polarity: Vertical**

CH High (IEEE 802.11b Mode)



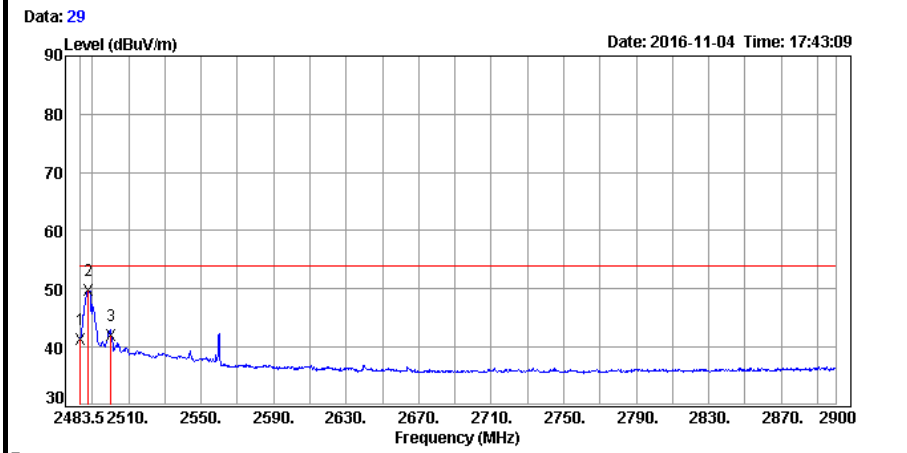
Trace:

Freq. MHz	Reading dBuV	C.F. dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Azimuth deg	Height cm	Remark
2483.50	53.95	-2.26	51.69	74.00	-22.31			Peak
2487.67	58.14	-2.24	55.90	74.00	-18.10			Peak
2500.16	52.05	-2.19	49.86	74.00	-24.14			Peak

Remark: *Result = Reading + Correction Factor*
Margin = Result – Limit
Remark Peak = Result(PK) – Limit(PK)

Detector Mode: Average **Polarity: Vertical**

CH High (IEEE 802.11b Mode)

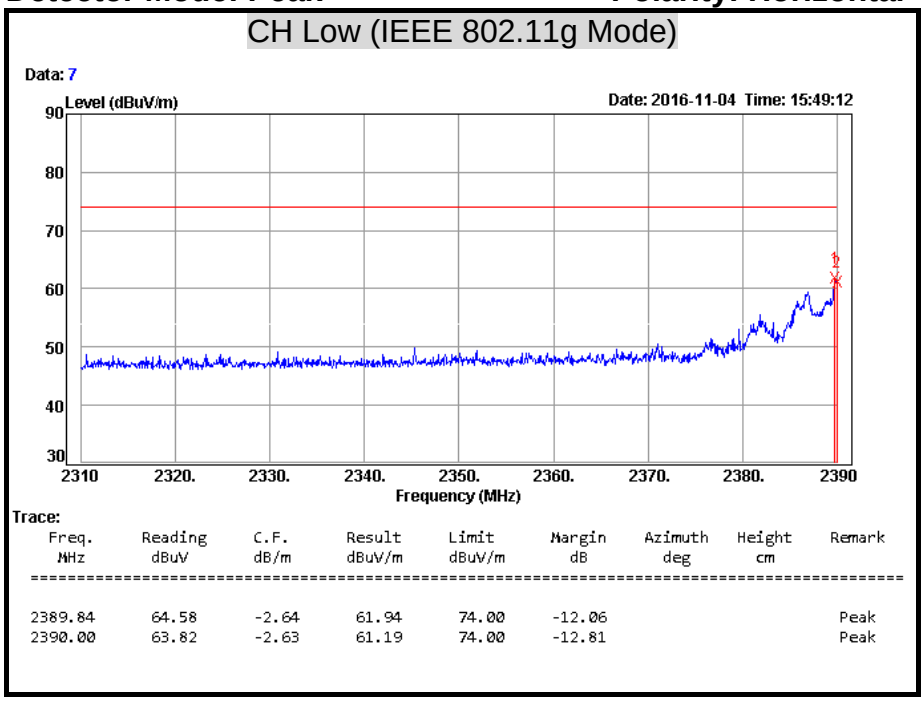


Trace:

Freq. MHz	Reading dBuV	C.F. dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Azimuth deg	Height cm	Remark
2483.50	43.58	-2.26	41.32	54.00	-12.68			Average
2487.67	52.00	-2.24	49.76	54.00	-4.24			Average
2500.16	44.27	-2.19	42.08	54.00	-11.92			Average

Remark: *Result = Reading + Correction Factor*
Margin = Result – Limit
Remark AVG = Result(AV) – Limit(AV)

Detector Mode: Peak **Polarity: Horizontal**

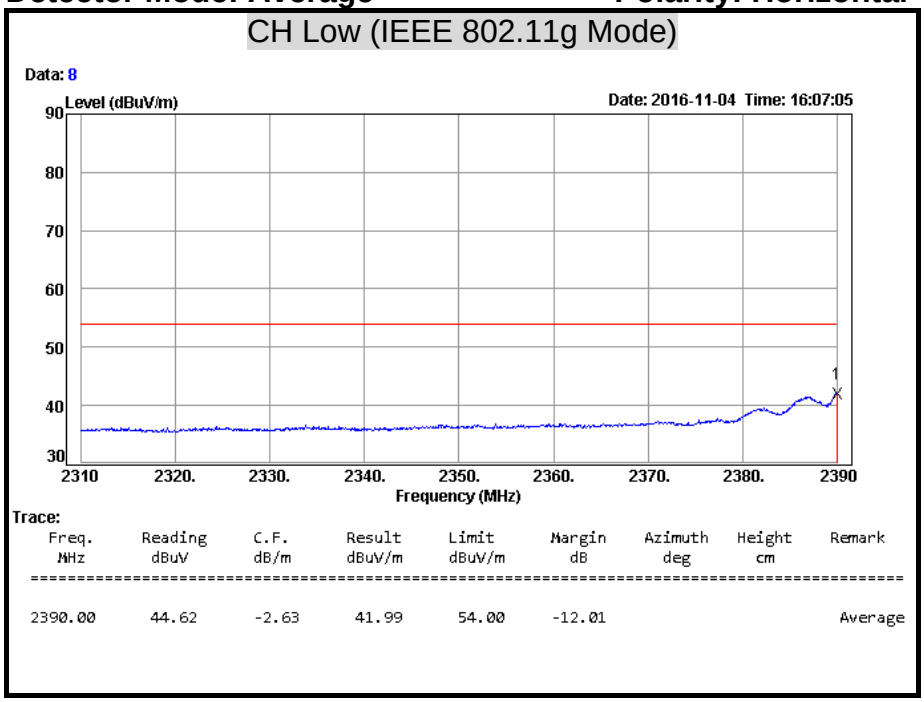


Trace:

Freq. MHz	Reading dBuV	C.F. dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Azimuth deg	Height cm	Remark
2389.84	64.58	-2.64	61.94	74.00	-12.06			Peak
2390.00	63.82	-2.63	61.19	74.00	-12.81			Peak

Remark: *Result = Reading + Correction Factor*
Margin = Result – Limit
Remark Peak = Result(PK) – Limit(PK)

Detector Mode: Average **Polarity: Horizontal**

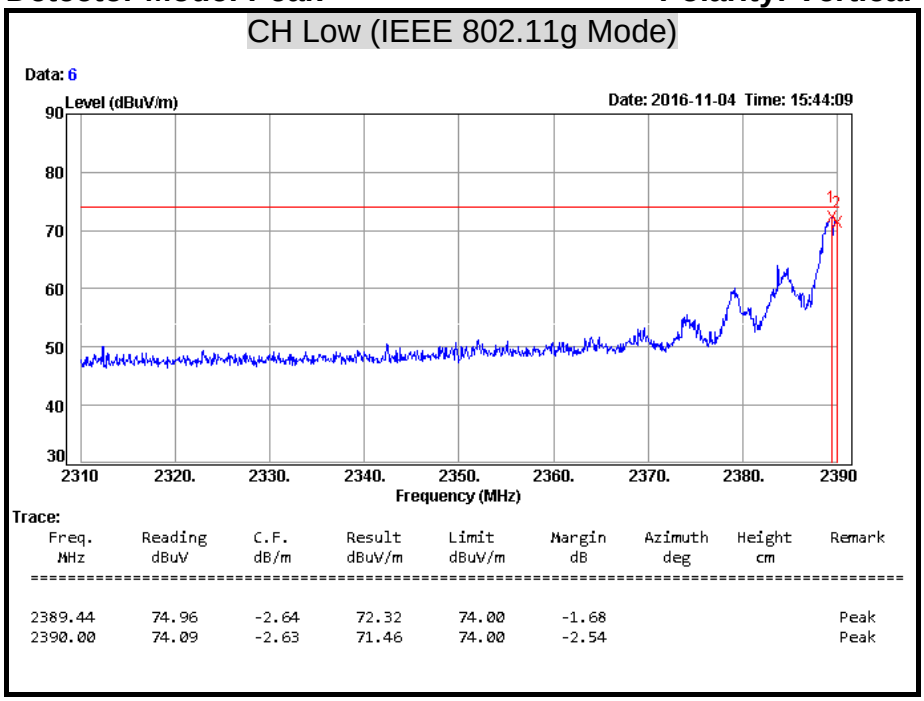


Trace:

Freq. MHz	Reading dBuV	C.F. dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Azimuth deg	Height cm	Remark
2390.00	44.62	-2.63	41.99	54.00	-12.01			Average

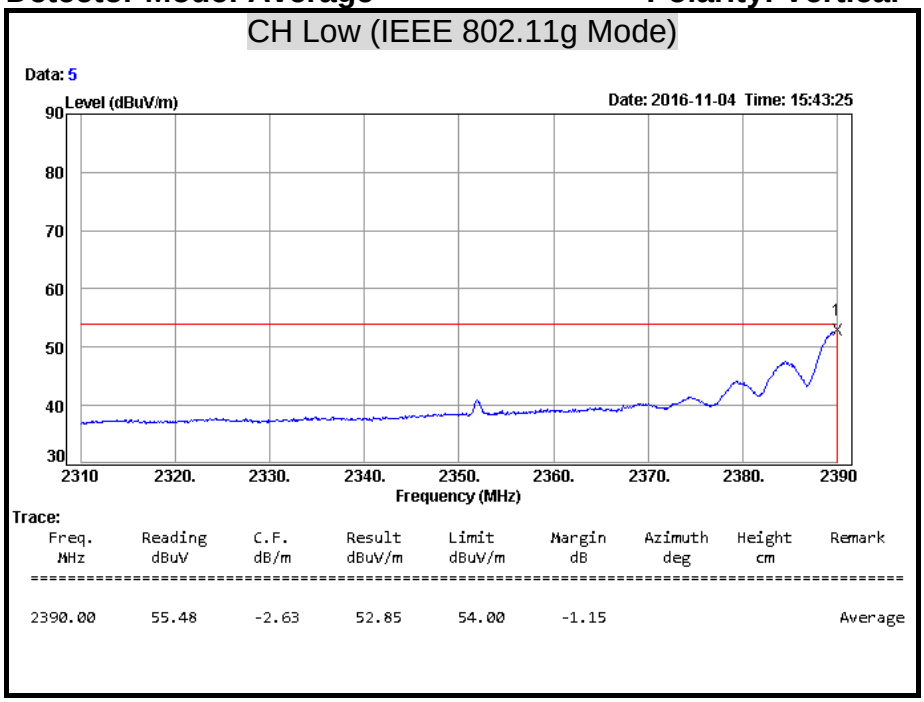
Remark: *Result = Reading + Correction Factor*
Margin = Result – Limit
Remark AVG = Result(AV) – Limit(AV)

Detector Mode: Peak **Polarity: Vertical**



Remark: *Result = Reading + Correction Factor*
Margin = Result – Limit
Remark Peak = Result(PK) – Limit(PK)

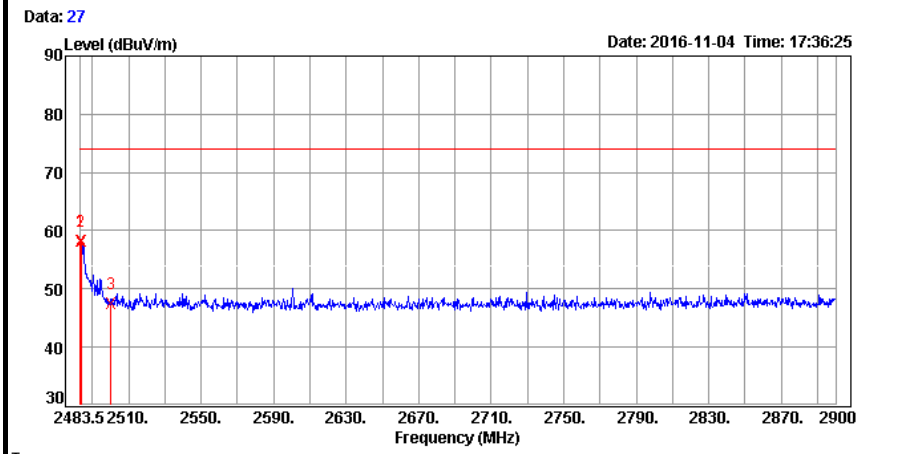
Detector Mode: Average **Polarity: Vertical**



Remark: *Result = Reading + Correction Factor*
Margin = Result – Limit
Remark AVG = Result(AV) – Limit(AV)

Detector Mode: Peak **Polarity: Horizontal**

CH High (IEEE 802.11g Mode)



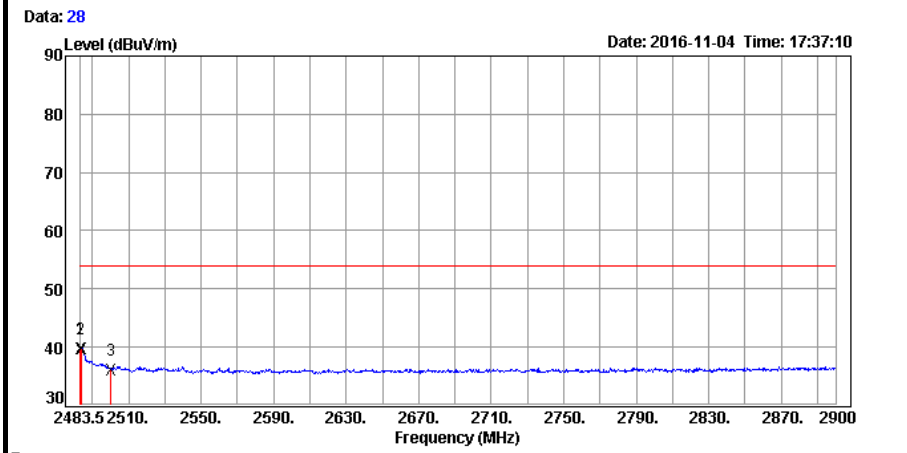
Trace:

Freq. MHz	Reading dBuV	C.F. dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Azimuth deg	Height cm	Remark
2483.50	60.42	-2.26	58.16	74.00	-15.84			Peak
2483.92	60.46	-2.25	58.21	74.00	-15.79			Peak
2500.16	49.62	-2.19	47.43	74.00	-26.57			Peak

Remark: *Result = Reading + Correction Factor*
Margin = Result – Limit
Remark Peak = Result(PK) – Limit(PK)

Detector Mode: Average **Polarity: Horizontal**

CH High (IEEE 802.11g Mode)



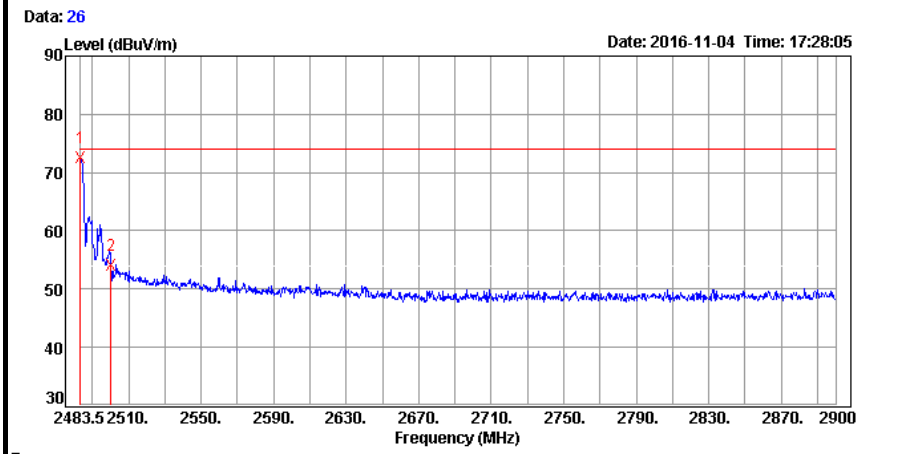
Trace:

Freq. MHz	Reading dBuV	C.F. dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Azimuth deg	Height cm	Remark
2483.50	42.00	-2.26	39.74	54.00	-14.26			Average
2483.92	42.03	-2.25	39.78	54.00	-14.22			Average
2500.16	38.32	-2.19	36.13	54.00	-17.87			Average

Remark: *Result = Reading + Correction Factor*
Margin = Result – Limit
Remark AVG = Result(AV) – Limit(AV)

Detector Mode: Peak **Polarity: Vertical**

CH High (IEEE 802.11g Mode)



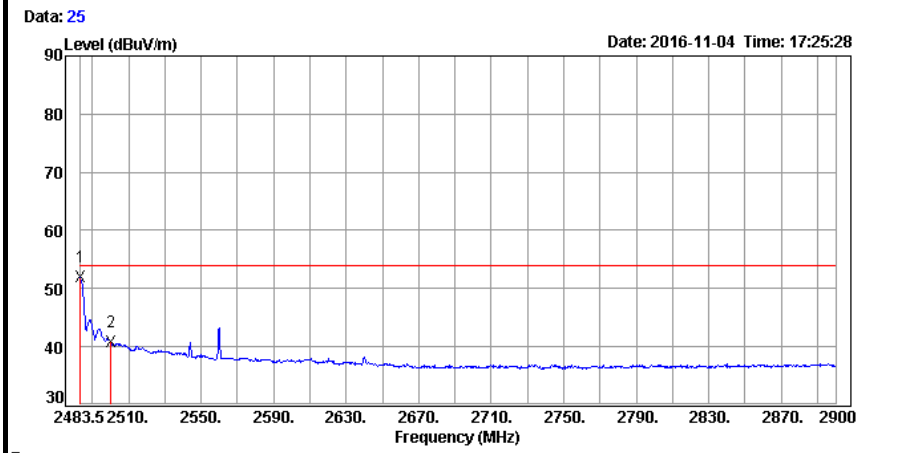
Trace:

Freq. MHz	Reading dBuV	C.F. dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Azimuth deg	Height cm	Remark
2483.50	74.84	-2.26	72.58	74.00	-1.42			Peak
2500.16	56.27	-2.19	54.08	74.00	-19.92			Peak

Remark: *Result = Reading + Correction Factor*
Margin = Result – Limit
Remark Peak = Result(PK) – Limit(PK)

Detector Mode: Average **Polarity: Vertical**

CH High (IEEE 802.11g Mode)



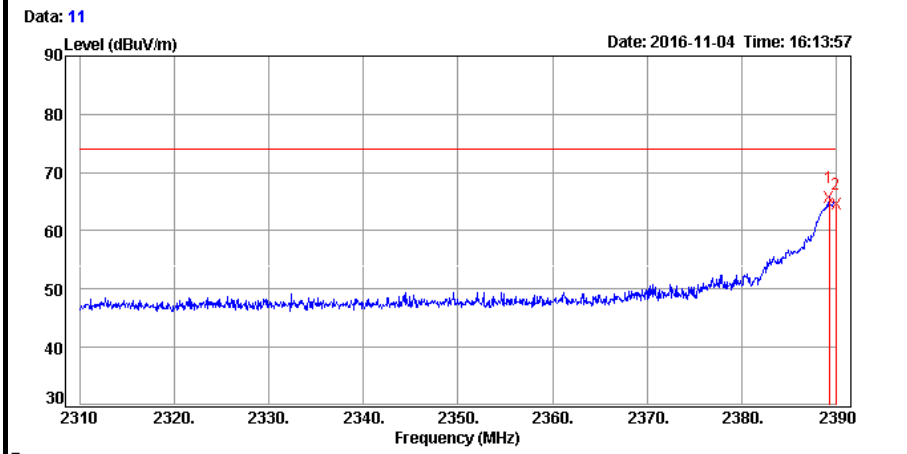
Trace:

Freq. MHz	Reading dBuV	C.F. dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Azimuth deg	Height cm	Remark
2483.50	54.23	-2.26	51.97	54.00	-2.03			Average
2500.16	43.10	-2.19	40.91	54.00	-13.09			Average

Remark: *Result = Reading + Correction Factor*
Margin = Result – Limit
Remark AVG = Result(AV) – Limit(AV)

Detector Mode: Peak **Polarity: Horizontal**

CH Low (IEEE 802.11ac VHT20 MCS0 Mode)



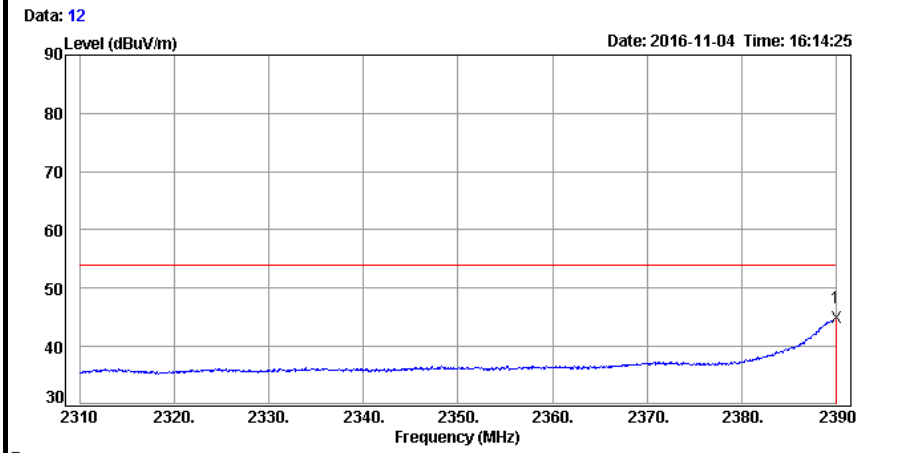
Trace:

Freq. MHz	Reading dBuV	C.F. dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Azimuth deg	Height cm	Remark
2389.28	68.38	-2.64	65.74	74.00	-8.26			Peak
2390.00	67.09	-2.63	64.46	74.00	-9.54			Peak

Remark: *Result = Reading + Correction Factor*
Margin = Result – Limit
Remark Peak = Result(PK) – Limit(PK)

Detector Mode: Average **Polarity: Horizontal**

CH Low (IEEE 802.11ac VHT20 MCS0 Mode)



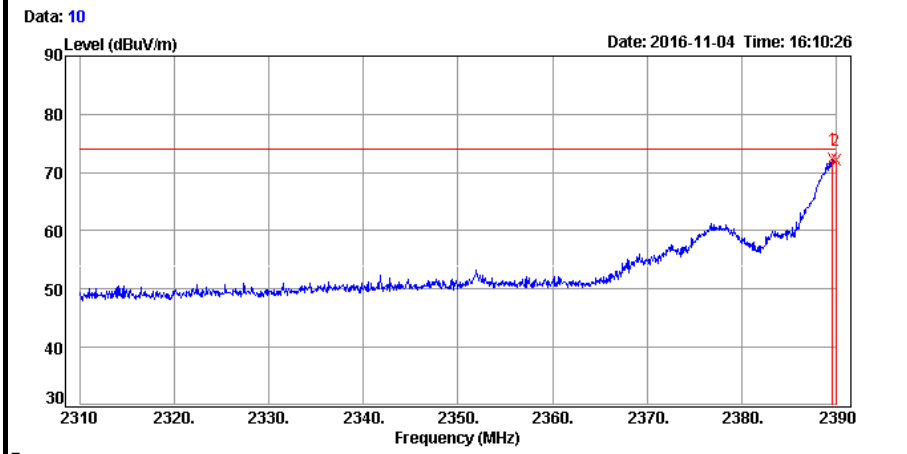
Trace:

Freq. MHz	Reading dBuV	C.F. dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Azimuth deg	Height cm	Remark
2390.00	47.46	-2.63	44.83	54.00	-9.17			Average

Remark: *Result = Reading + Correction Factor*
Margin = Result – Limit
Remark AVG = Result(AV) – Limit(AV)

Detector Mode: Peak **Polarity: Vertical**

CH Low (IEEE 802.11ac VHT20 MCS0 Mode)



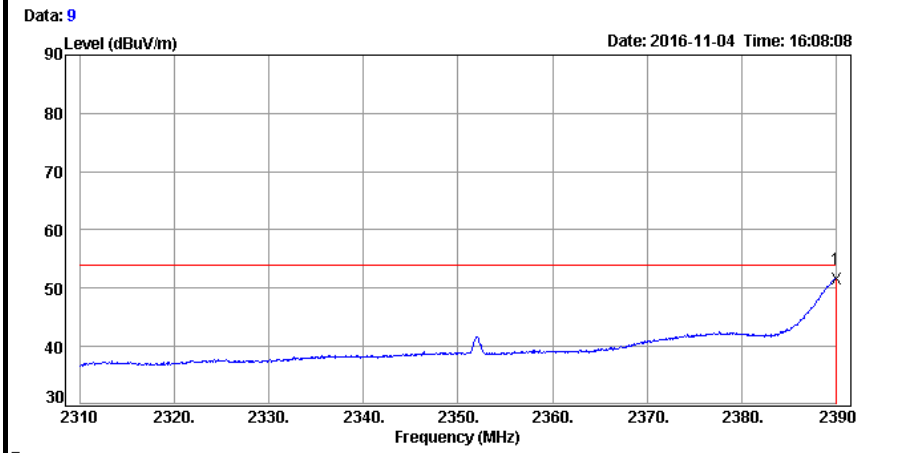
Trace:

Freq. MHz	Reading dBuV	C.F. dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Azimuth deg	Height cm	Remark
2389.68	74.91	-2.64	72.27	74.00	-1.73			Peak
2390.00	74.69	-2.63	72.06	74.00	-1.94			Peak

Remark: *Result = Reading + Correction Factor*
Margin = Result – Limit
Remark Peak = Result(PK) – Limit(PK)

Detector Mode: Average **Polarity: Vertical**

CH Low (IEEE 802.11ac VHT20 MCS0 Mode)



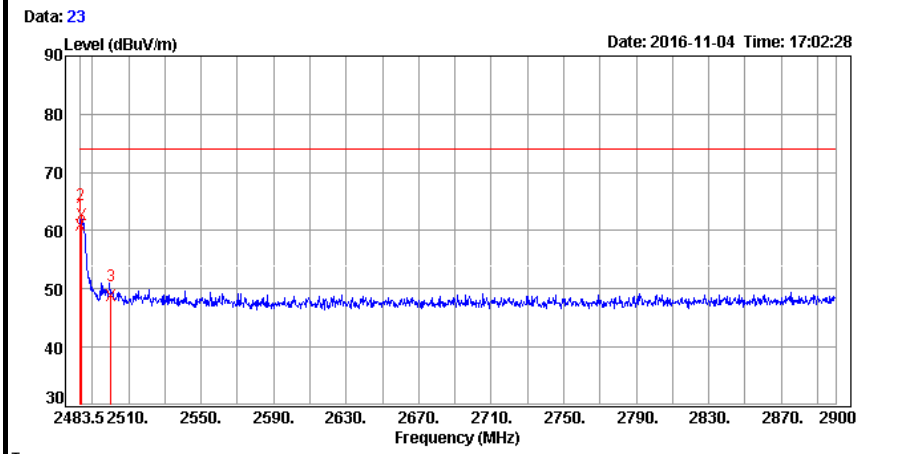
Trace:

Freq. MHz	Reading dBuV	C.F. dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Azimuth deg	Height cm	Remark
2390.00	54.30	-2.63	51.67	54.00	-2.33			Average

Remark: *Result = Reading + Correction Factor*
Margin = Result – Limit
Remark AVG = Result(AV) – Limit(AV)

Detector Mode: Peak **Polarity: Horizontal**

CH High (IEEE 802.11ac VHT20 MCS0 Mode)



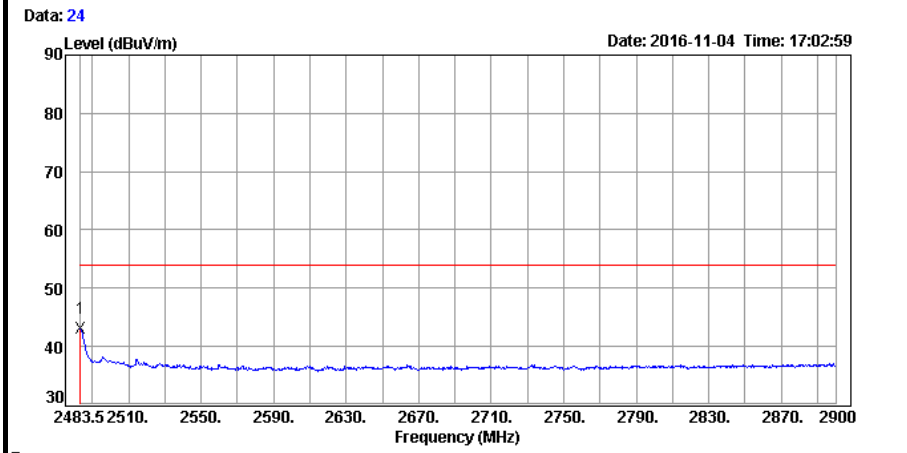
Trace:

Freq. MHz	Reading dBuV	C.F. dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Azimuth deg	Height cm	Remark
2483.50	63.19	-2.26	60.93	74.00	-13.07			Peak
2483.92	65.08	-2.25	62.83	74.00	-11.17			Peak
2500.16	51.10	-2.19	48.91	74.00	-25.09			Peak

Remark: *Result = Reading + Correction Factor*
Margin = Result – Limit
Remark Peak = Result(PK) – Limit(PK)

Detector Mode: Average **Polarity: Horizontal**

CH High (IEEE 802.11ac VHT20 MCS0 Mode)



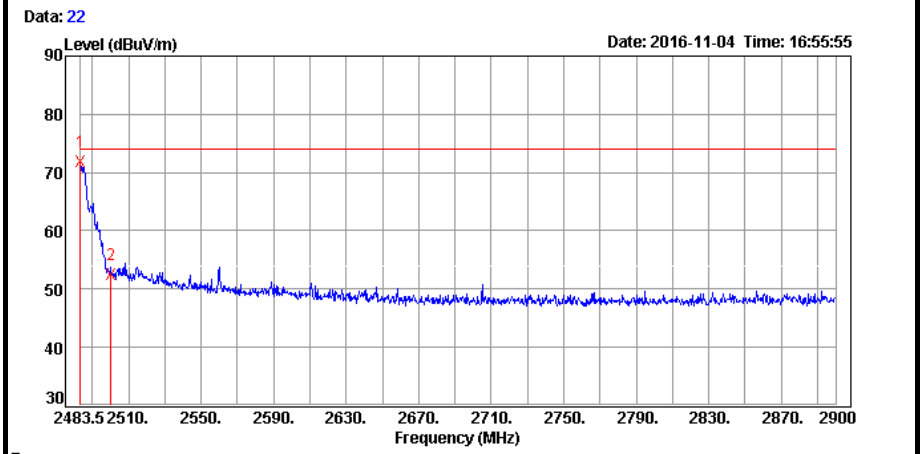
Trace:

Freq. MHz	Reading dBuV	C.F. dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Azimuth deg	Height cm	Remark
2483.50	45.38	-2.26	43.12	54.00	-10.88			Average

Remark: *Result = Reading + Correction Factor*
Margin = Result – Limit
Remark AVG = Result(AV) – Limit(AV)

Detector Mode: Peak **Polarity: Vertical**

CH High (IEEE 802.11ac VHT20 MCS0 Mode)



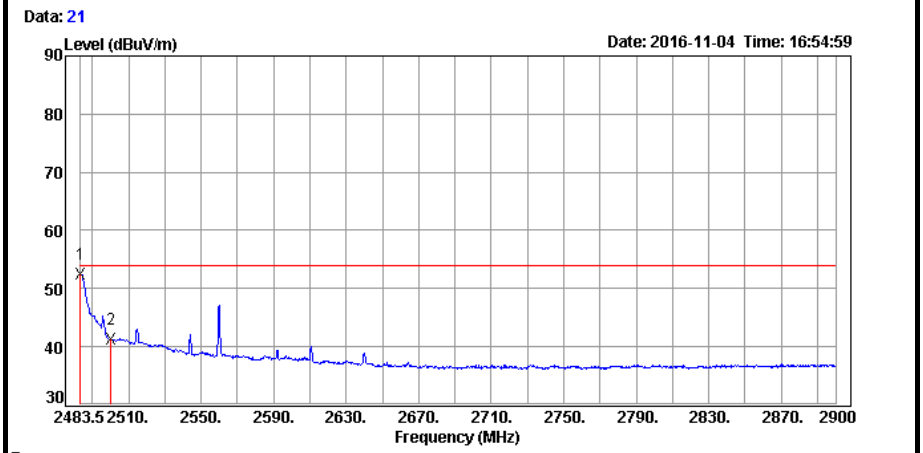
Trace:

Freq. MHz	Reading dBuV	C.F. dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Azimuth deg	Height cm	Remark
2483.50	74.19	-2.26	71.93	74.00	-2.07			Peak
2500.16	54.72	-2.19	52.53	74.00	-21.47			Peak

Remark: *Result = Reading + Correction Factor*
Margin = Result – Limit
Remark Peak = Result(PK) – Limit(PK)

Detector Mode: Average **Polarity: Vertical**

CH High (IEEE 802.11ac VHT20 MCS0 Mode)



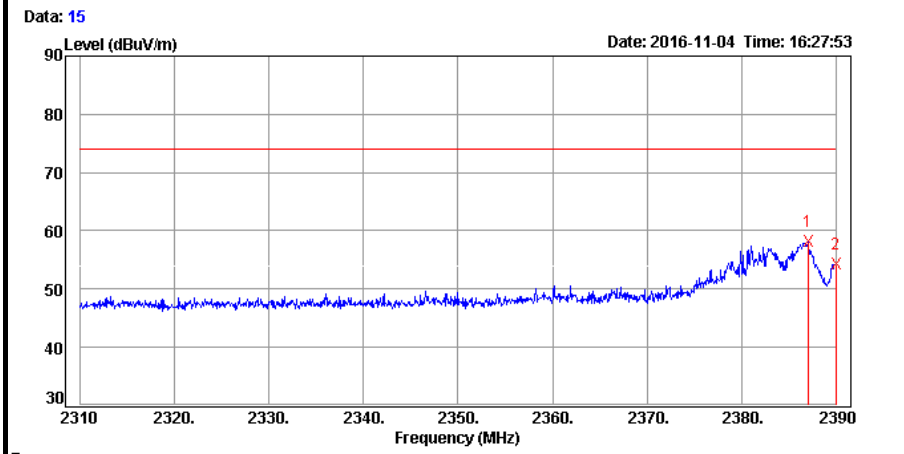
Trace:

Freq. MHz	Reading dBuV	C.F. dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Azimuth deg	Height cm	Remark
2483.50	54.74	-2.26	52.48	54.00	-1.52			Average
2500.16	43.58	-2.19	41.39	54.00	-12.61			Average

Remark: *Result = Reading + Correction Factor*
Margin = Result – Limit
Remark AVG = Result(AV) – Limit(AV)

Detector Mode: Peak **Polarity: Horizontal**

CH Low (IEEE 802.11ac VHT40 MCS0 Mode)



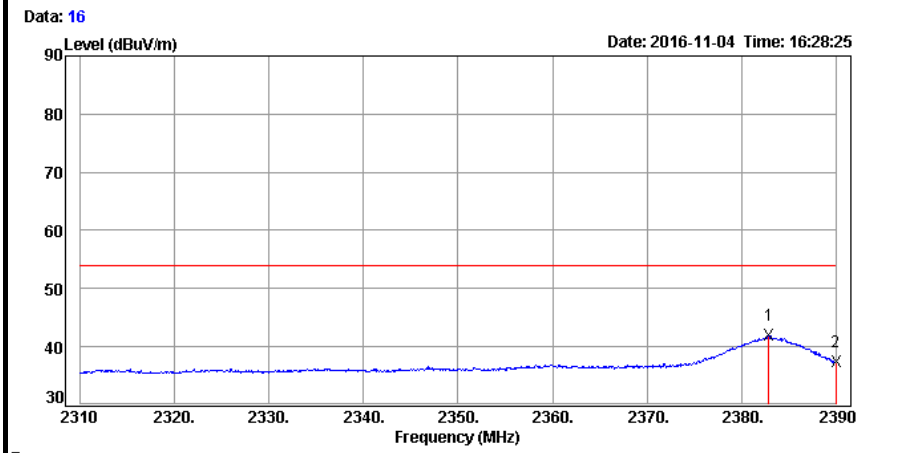
Trace:

Freq. MHz	Reading dBuV	C.F. dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Azimuth deg	Height cm	Remark
2387.04	60.81	-2.65	58.16	74.00	-15.84			Peak
2390.00	56.82	-2.63	54.19	74.00	-19.81			Peak

Remark: *Result = Reading + Correction Factor*
Margin = Result – Limit
Remark Peak = Result(PK) – Limit(PK)

Detector Mode: Average **Polarity: Horizontal**

CH Low (IEEE 802.11ac VHT40 MCS0 Mode)



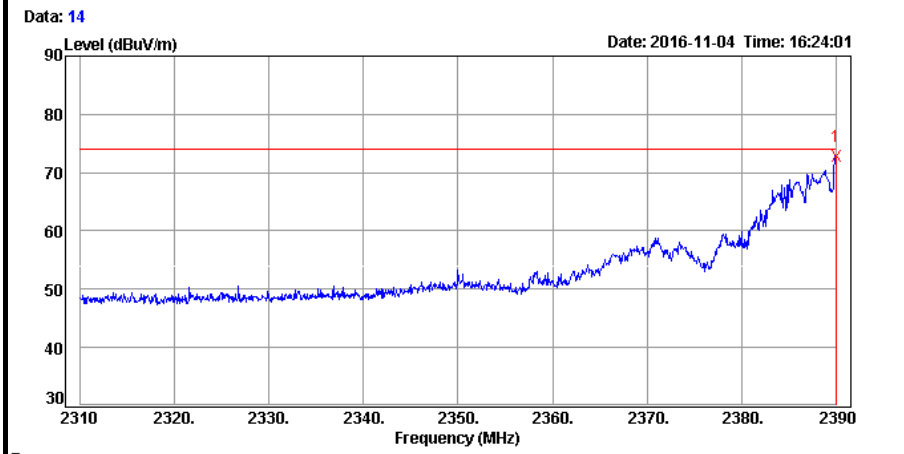
Trace:

Freq. MHz	Reading dBuV	C.F. dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Azimuth deg	Height cm	Remark
2382.88	44.61	-2.66	41.95	54.00	-12.05			Average
2390.00	40.00	-2.63	37.37	54.00	-16.63			Average

Remark: *Result = Reading + Correction Factor*
Margin = Result – Limit
Remark AVG = Result(AV) – Limit(AV)

Detector Mode: Peak **Polarity: Vertical**

CH Low (IEEE 802.11ac VHT40 MCS0 Mode)



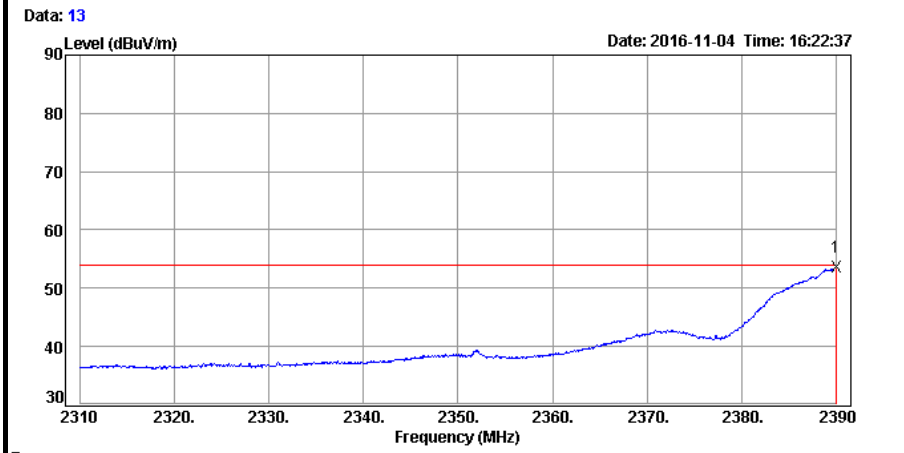
Trace:

Freq. MHz	Reading dBuV	C.F. dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Azimuth deg	Height cm	Remark
2390.00	75.44	-2.63	72.81	74.00	-1.19			Peak

Remark: *Result = Reading + Correction Factor*
Margin = Result – Limit
Remark Peak = Result(PK) – Limit(PK)

Detector Mode: Average **Polarity: Vertical**

CH Low (IEEE 802.11ac VHT40 MCS0 Mode)



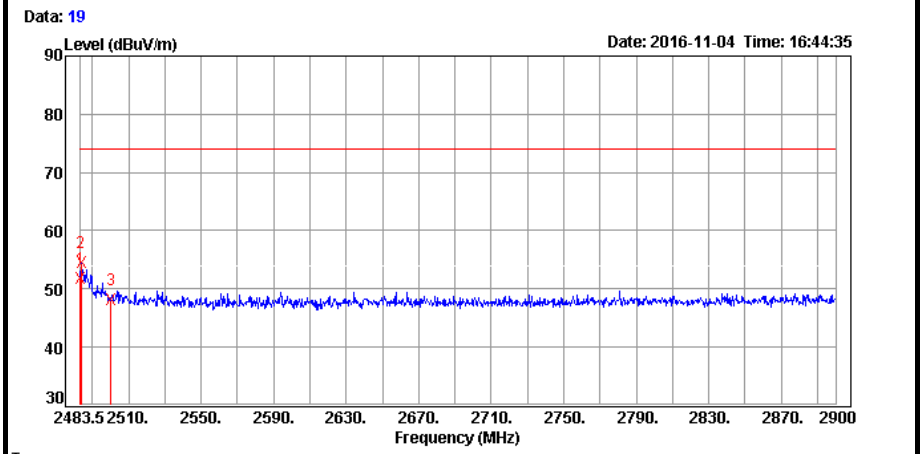
Trace:

Freq. MHz	Reading dBuV	C.F. dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Azimuth deg	Height cm	Remark
2390.00	56.13	-2.63	53.50	54.00	-0.50			Average

Remark: *Result = Reading + Correction Factor*
Margin = Result – Limit
Remark AVG = Result(AV) – Limit(AV)

Detector Mode: Peak **Polarity: Horizontal**

CH High (IEEE 802.11ac VHT40 MCS0 Mode)



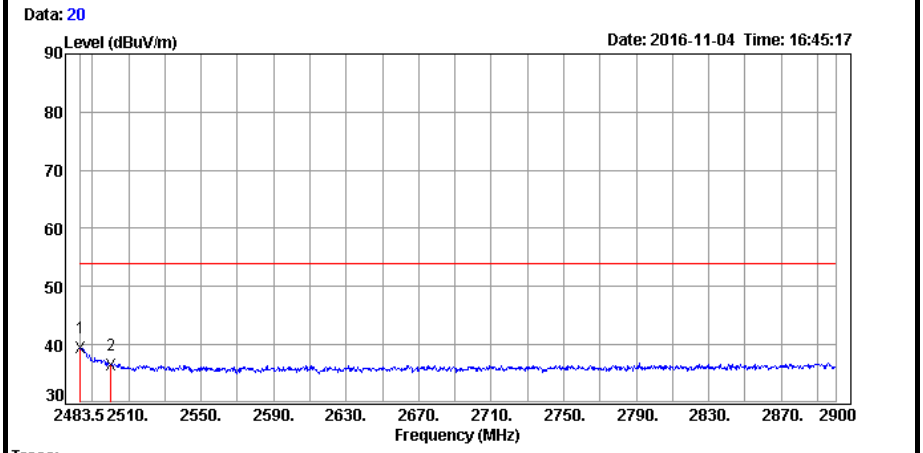
Trace:

Freq. MHz	Reading dBuV	C.F. dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Azimuth deg	Height cm	Remark
2483.50	54.13	-2.26	51.87	74.00	-22.13			Peak
2483.92	56.71	-2.25	54.46	74.00	-19.54			Peak
2500.16	50.29	-2.19	48.10	74.00	-25.90			Peak

Remark: *Result = Reading + Correction Factor*
Margin = Result – Limit
Remark Peak = Result(PK) – Limit(PK)

Detector Mode: Average **Polarity: Horizontal**

CH High (IEEE 802.11ac VHT40 MCS0 Mode)



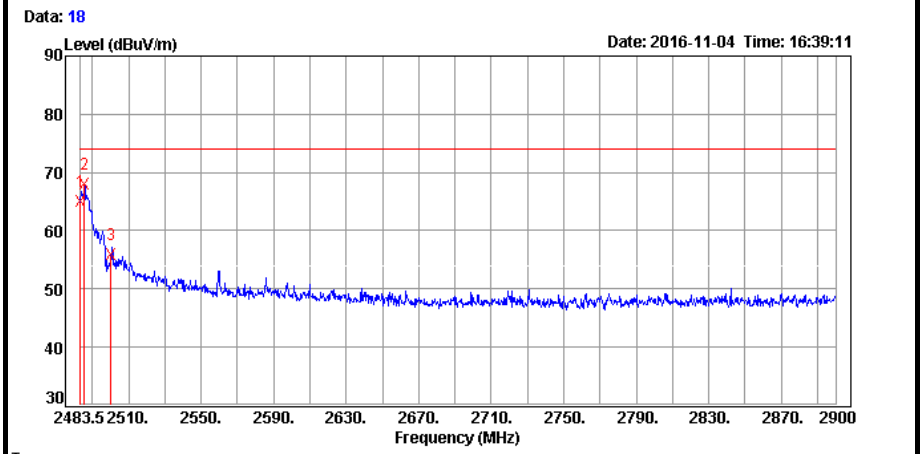
Trace:

Freq. MHz	Reading dBuV	C.F. dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Azimuth deg	Height cm	Remark
2483.50	41.67	-2.26	39.41	54.00	-14.59			Average
2500.16	38.76	-2.19	36.57	54.00	-17.43			Average

Remark: *Result = Reading + Correction Factor*
Margin = Result – Limit
Remark AVG = Result(AV) – Limit(AV)

Detector Mode: Peak **Polarity: Vertical**

CH High (IEEE 802.11ac VHT40 MCS0 Mode)



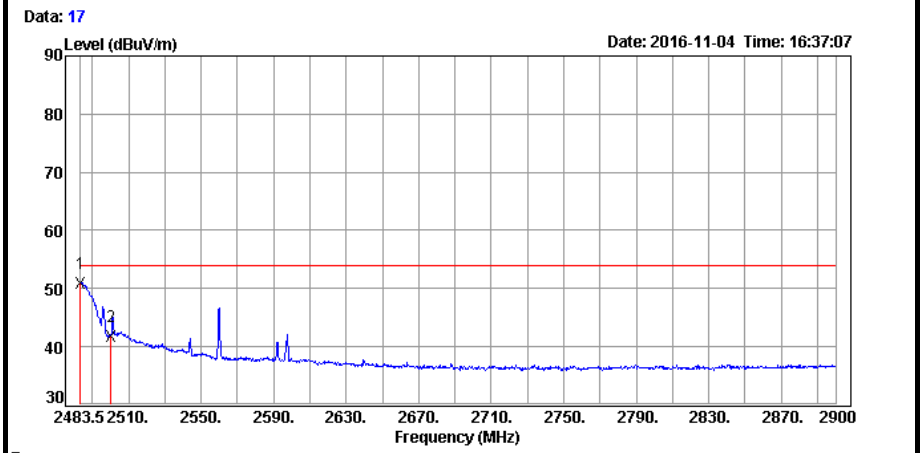
Trace:

Freq. MHz	Reading dBuV	C.F. dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Azimuth deg	Height cm	Remark
2483.50	67.27	-2.26	65.01	74.00	-8.99			Peak
2485.58	70.30	-2.25	68.05	74.00	-5.95			Peak
2500.16	58.03	-2.19	55.84	74.00	-18.16			Peak

Remark: *Result = Reading + Correction Factor*
Margin = Result – Limit
Remark Peak = Result(PK) – Limit(PK)

Detector Mode: Average **Polarity: Vertical**

CH High (IEEE 802.11ac VHT40 MCS0 Mode)



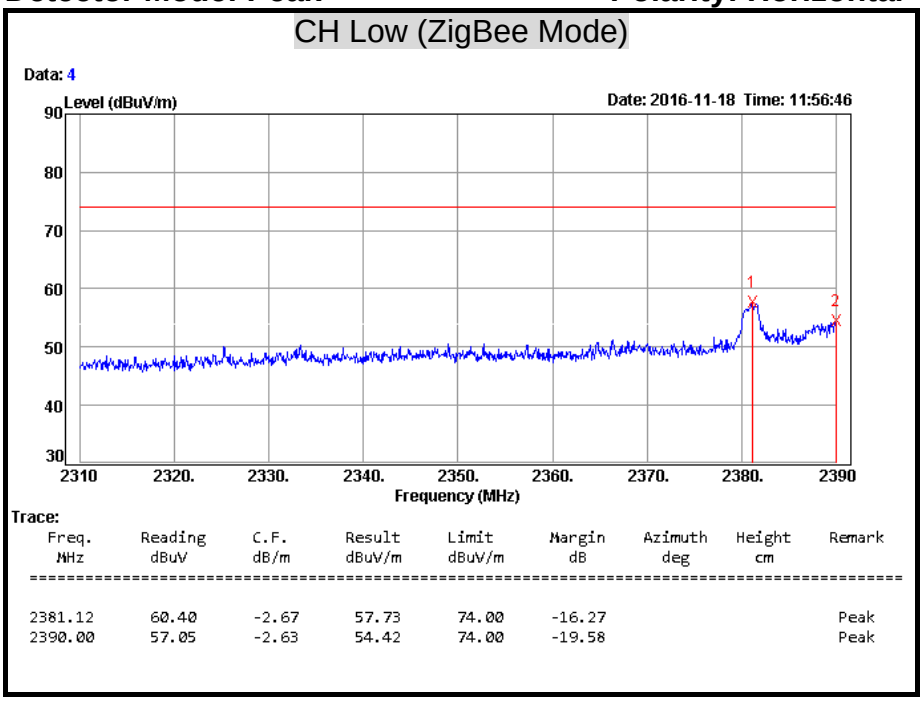
Trace:

Freq. MHz	Reading dBuV	C.F. dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Azimuth deg	Height cm	Remark
2483.50	53.20	-2.26	50.94	54.00	-3.06			Average
2500.16	43.98	-2.19	41.79	54.00	-12.21			Average

Remark: *Result = Reading + Correction Factor*
Margin = Result – Limit
Remark AVG = Result(AV) – Limit(AV)

Detector Mode: Peak **Polarity: Horizontal**

CH Low (ZigBee Mode)



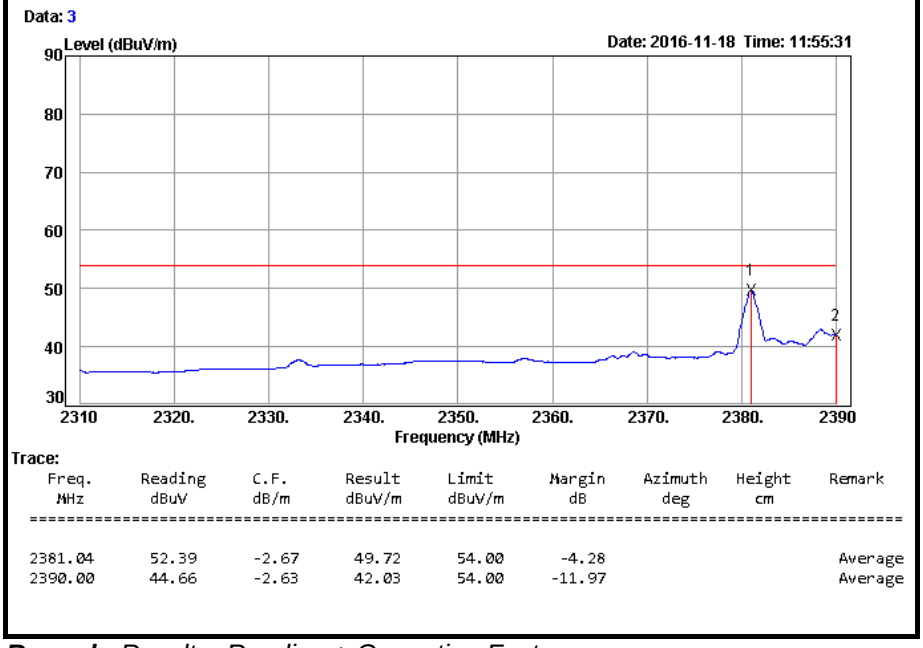
Trace:

Freq. MHz	Reading dBuV	C.F. dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Azimuth deg	Height cm	Remark
2381.12	60.40	-2.67	57.73	74.00	-16.27			Peak
2390.00	57.05	-2.63	54.42	74.00	-19.58			Peak

Remark: *Result = Reading + Correction Factor*
Margin = Result – Limit
Remark Peak = Result(PK) – Limit(PK)

Detector Mode: Average **Polarity: Horizontal**

CH Low (ZigBee Mode)

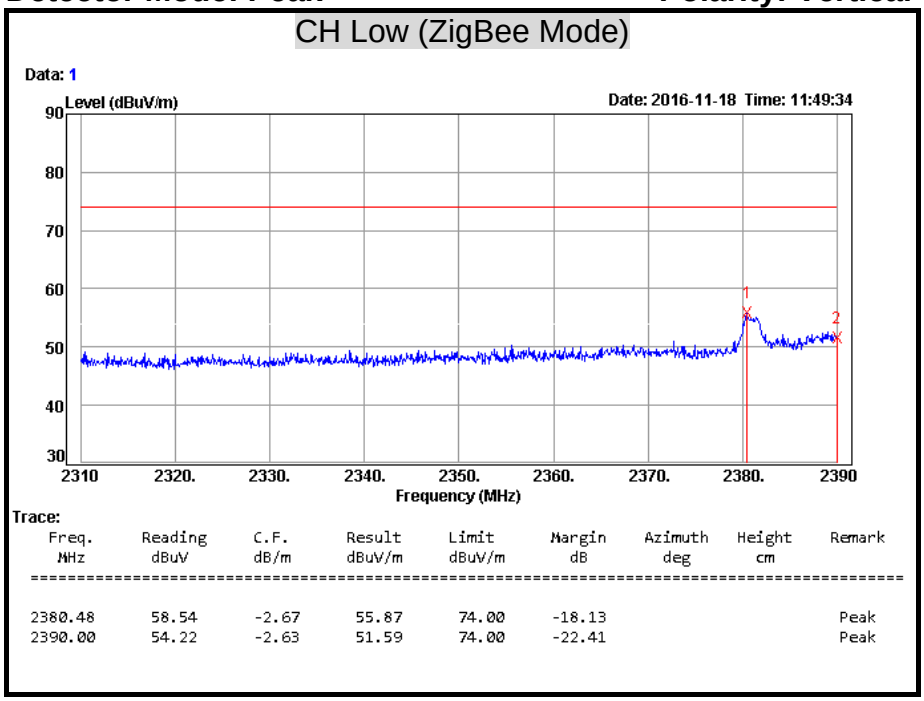


Trace:

Freq. MHz	Reading dBuV	C.F. dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Azimuth deg	Height cm	Remark
2381.04	52.39	-2.67	49.72	54.00	-4.28			Average
2390.00	44.66	-2.63	42.03	54.00	-11.97			Average

Remark: *Result = Reading + Correction Factor*
Margin = Result – Limit
Remark AVG = Result(AV) – Limit(AV)

Detector Mode: Peak **Polarity: Vertical**

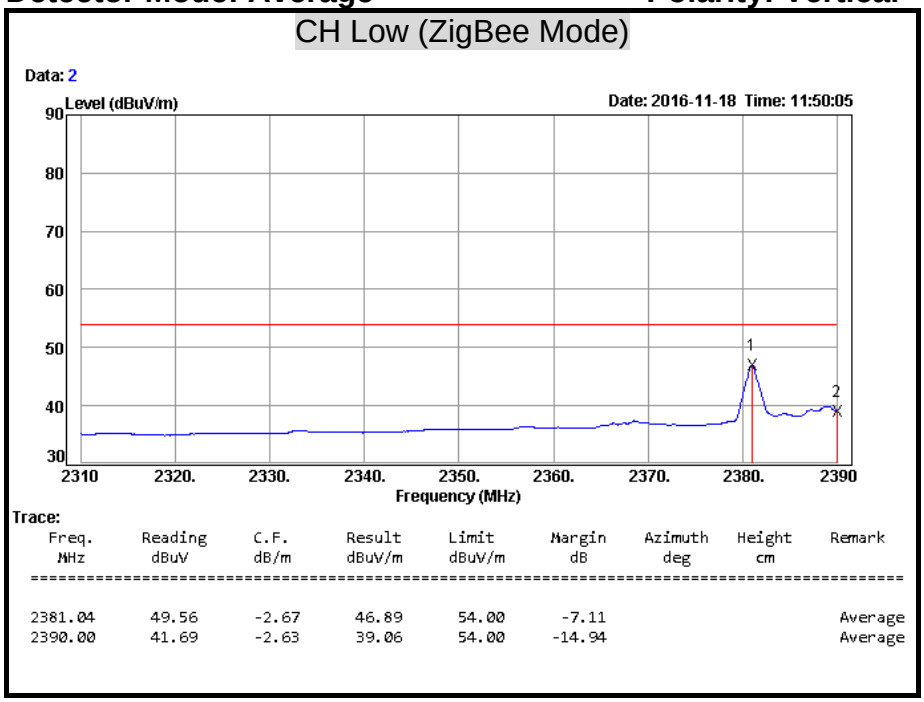


Trace:

Freq. MHz	Reading dBuV	C.F. dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Azimuth deg	Height cm	Remark
2380.48	58.54	-2.67	55.87	74.00	-18.13			Peak
2390.00	54.22	-2.63	51.59	74.00	-22.41			Peak

Remark: *Result = Reading + Correction Factor*
Margin = Result – Limit
Remark Peak = Result(PK) – Limit(PK)

Detector Mode: Average **Polarity: Vertical**



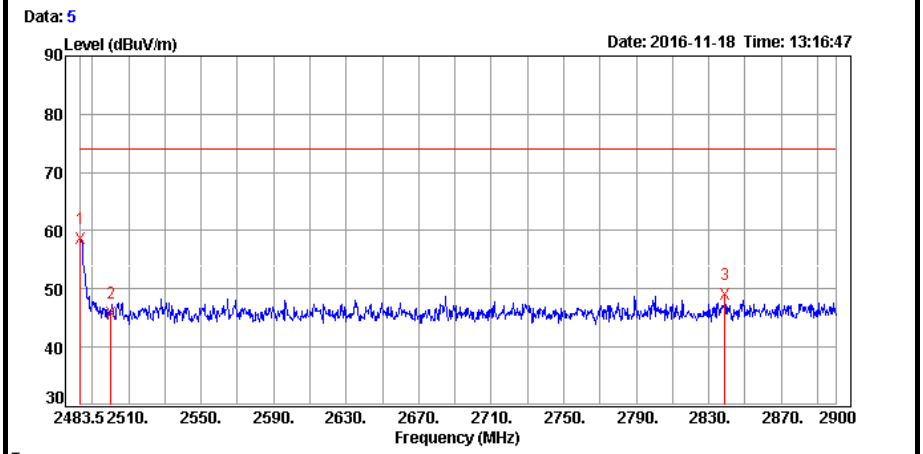
Trace:

Freq. MHz	Reading dBuV	C.F. dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Azimuth deg	Height cm	Remark
2381.04	49.56	-2.67	46.89	54.00	-7.11			Average
2390.00	41.69	-2.63	39.06	54.00	-14.94			Average

Remark: *Result = Reading + Correction Factor*
Margin = Result – Limit
Remark AVG = Result(AV) – Limit(AV)

Detector Mode: Peak **Polarity: Horizontal**

CH High (ZigBee Mode)



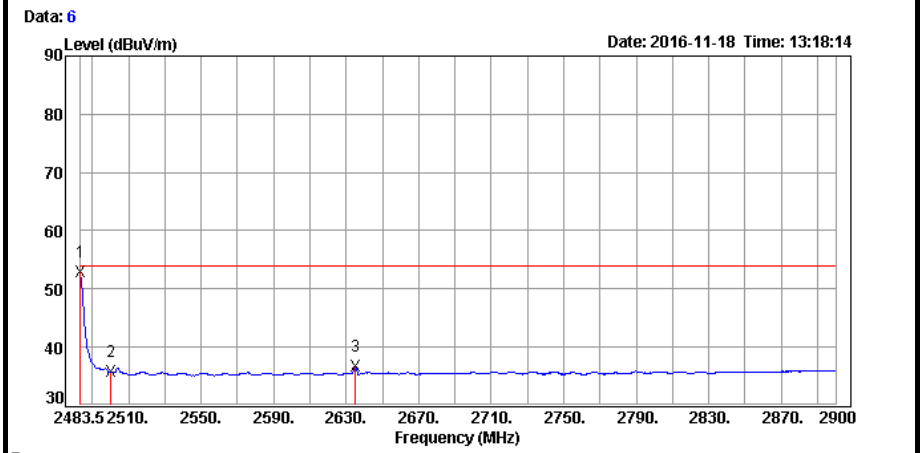
Trace:

Freq. MHz	Reading dBuV	C.F. dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Azimuth deg	Height cm	Remark
2483.50	60.90	-2.26	58.64	74.00	-15.36			Peak
2500.16	47.98	-2.19	45.79	74.00	-28.21			Peak
2838.77	50.31	-1.21	49.10	74.00	-24.90			Peak

Remark: *Result = Reading + Correction Factor*
Margin = Result – Limit
Remark Peak = Result(PK) – Limit(PK)

Detector Mode: Average **Polarity: Horizontal**

CH High (ZigBee Mode)



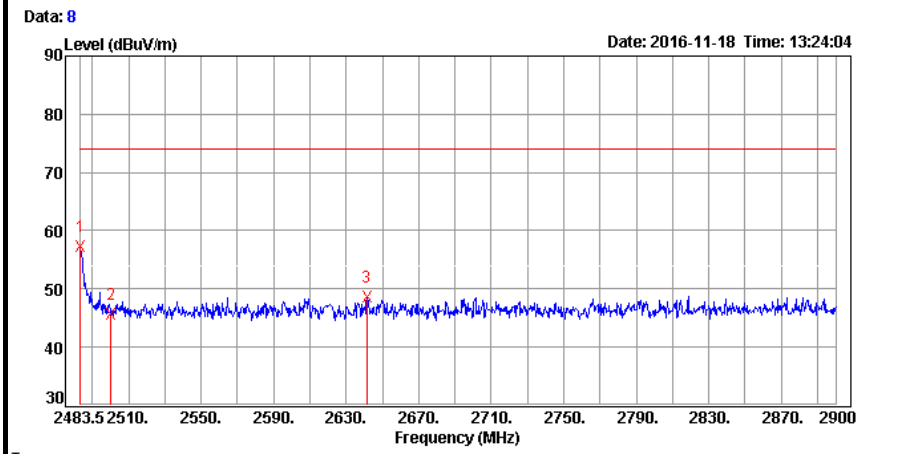
Trace:

Freq. MHz	Reading dBuV	C.F. dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Azimuth deg	Height cm	Remark
2483.50	55.25	-2.26	52.99	54.00	-1.01			Average
2500.16	37.99	-2.19	35.80	54.00	-18.20			Average
2635.11	38.62	-1.80	36.82	54.00	-17.18			Average

Remark: *Result = Reading + Correction Factor*
Margin = Result – Limit
Remark AVG = Result(AV) – Limit(AV)

Detector Mode: Peak **Polarity: Vertical**

CH High (ZigBee Mode)



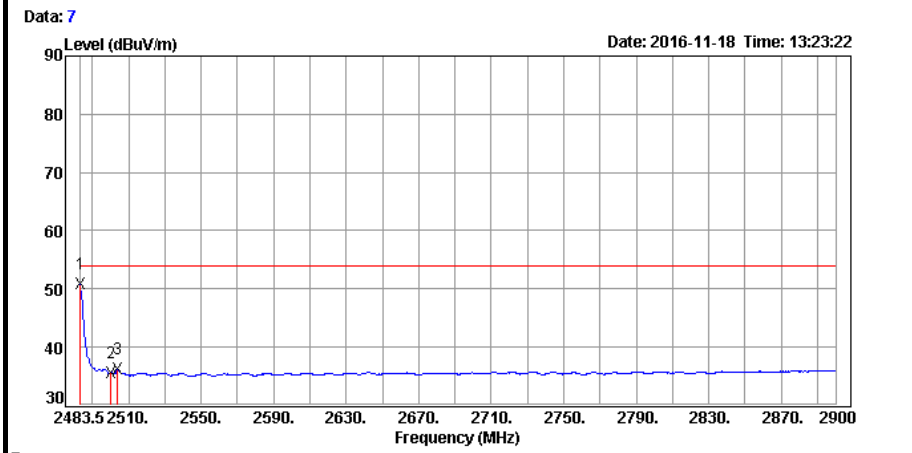
Trace:

Freq. MHz	Reading dBuV	C.F. dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Azimuth deg	Height cm	Remark
2483.50	59.53	-2.26	57.27	74.00	-16.73			Peak
2500.16	47.77	-2.19	45.58	74.00	-28.42			Peak
2641.35	50.36	-1.78	48.58	74.00	-25.42			Peak

Remark: *Result = Reading + Correction Factor*
Margin = Result – Limit
Remark Peak = Result(PK) – Limit(PK)

Detector Mode: Average **Polarity: Vertical**

CH High (ZigBee Mode)



Trace:

Freq. MHz	Reading dBuV	C.F. dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Azimuth deg	Height cm	Remark
2483.50	53.05	-2.26	50.79	54.00	-3.21			Average
2500.16	37.84	-2.19	35.65	54.00	-18.35			Average
2503.91	38.41	-2.18	36.23	54.00	-17.77			Average

Remark: *Result = Reading + Correction Factor*
Margin = Result – Limit
Remark AVG = Result(AV) – Limit(AV)

7.8 CONDUCTED EMISSION

LIMITS

§ 15.207 (a) Except as shown in paragraph (b) and (c) this section, for an intentional radiator that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the band 150 kHz to 30 MHz shall not exceed the limits in the following table, as measured using a 50 μH/50 ohms line impedance stabilization network (LISN). Compliance with the provisions of this paragraph shall be based on the measurement of the radio frequency voltage between each power line and ground at the power terminal.

The lower limit applies at the boundary between the frequency ranges.

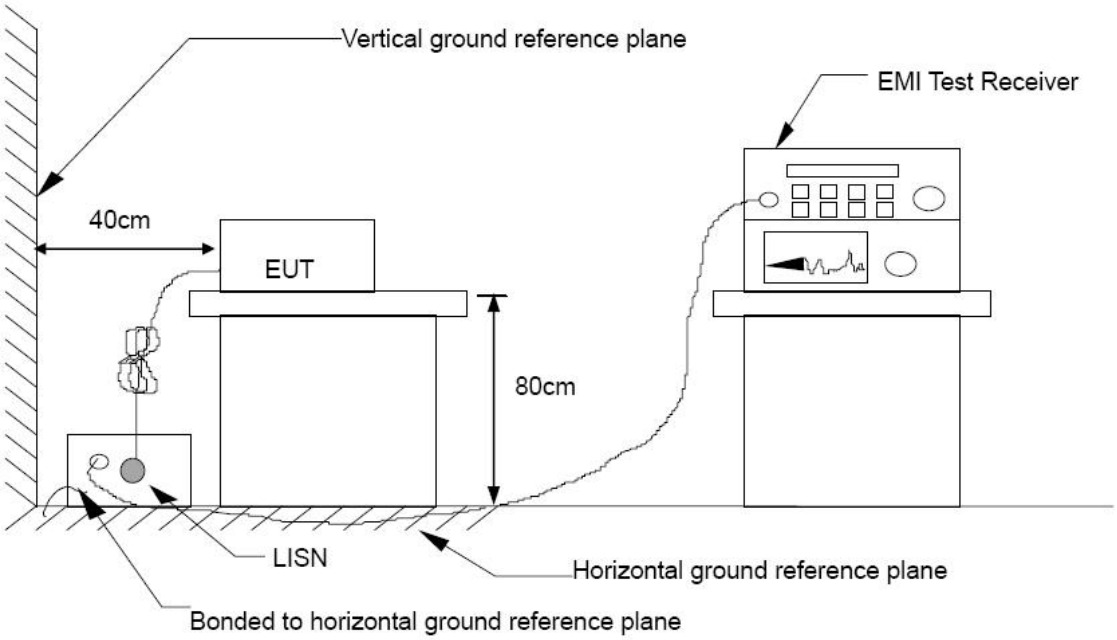
Frequency Range (MHz)	Conducted Limit (dBμv)	
	Quasi-peak	Average
0.15 - 0.50	66 to 56	56 to 46
0.50 - 5.00	56	46
5.00 - 30.0	60	50

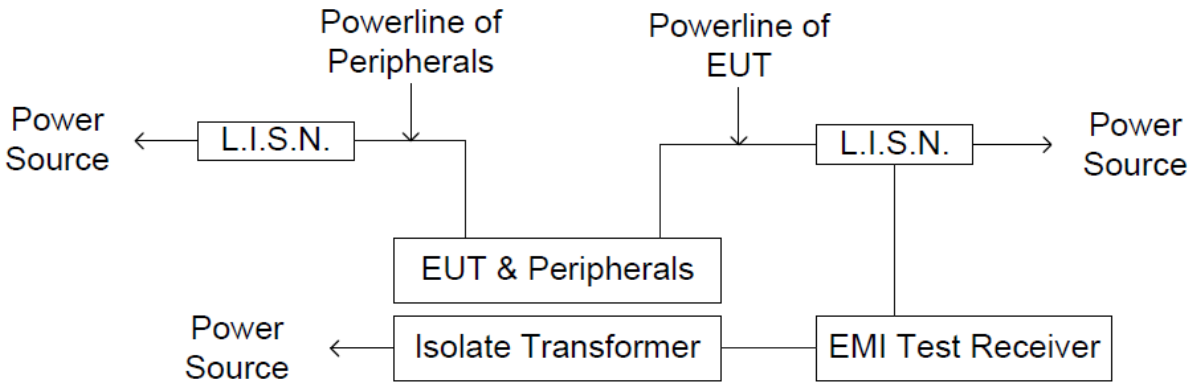
TEST EQUIPMENT

Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
L.I.S.N	Schwarzbeck	NSLK 8127	8127465	07/28/2017
L.I.S.N	Schwarzbeck	NSLK 8127	8127473	03/10/2017
EMI Test Receiver	Rohde & Schwarz	ESHS 30	838550/003	10/25/2017
Pulse Limiter	Rohde & Schwarz	ESH3-Z2	100111	06/27/2017
Test S/W	E3.815206a			

Remark: *Each piece of equipment is scheduled for calibration once a year.*

TEST SETUP





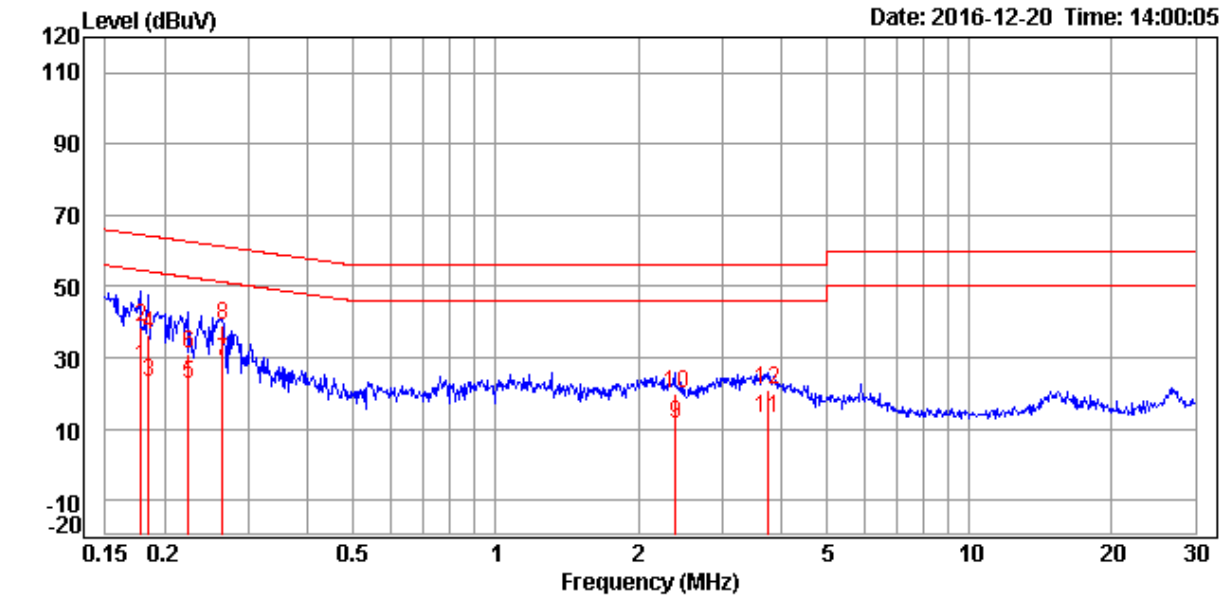
TEST PROCEDURE

The basic test procedure was in accordance with ANSI C63.10:2013.
The test procedure is performed in a 4m × 3m × 2.4m (L×W×H) shielded room.
The EUT along with its peripherals were placed on a 1.0m (W) × 1.5m (L) and 0.8m in height wooden table and the EUT was adjusted to maintain a 0.4 meter space from a vertical reference plane.
The EUT was connected to power mains through a line impedance stabilization network (LISN) which provides 50 ohm coupling impedance for measuring instrument and the chassis ground was bounded to the horizontal ground plane of shielded room. All peripherals were connected to the second LISN and the chassis ground also bounded to the horizontal ground plane of shielded room.
The EUT was located so that the distance between the boundary of the EUT and the closest surface of the LISN is 0.8 m. Where a mains flexible cord was provided by the manufacturer shall be 1 m long, or if in excess of 1 m, the excess cable was folded back and forth as far as possible so as to form a bundle not exceeding 0.4 m in length.

TEST RESULTS

Product Name	AC1300 IoT Router	Test By	Allen Liu
Test Model	X10R	Test Date	2016/12/20
Test Mode	WiFi / Mode 1	Temp. & Humidity	26°C, 46%

LINE



Trace:

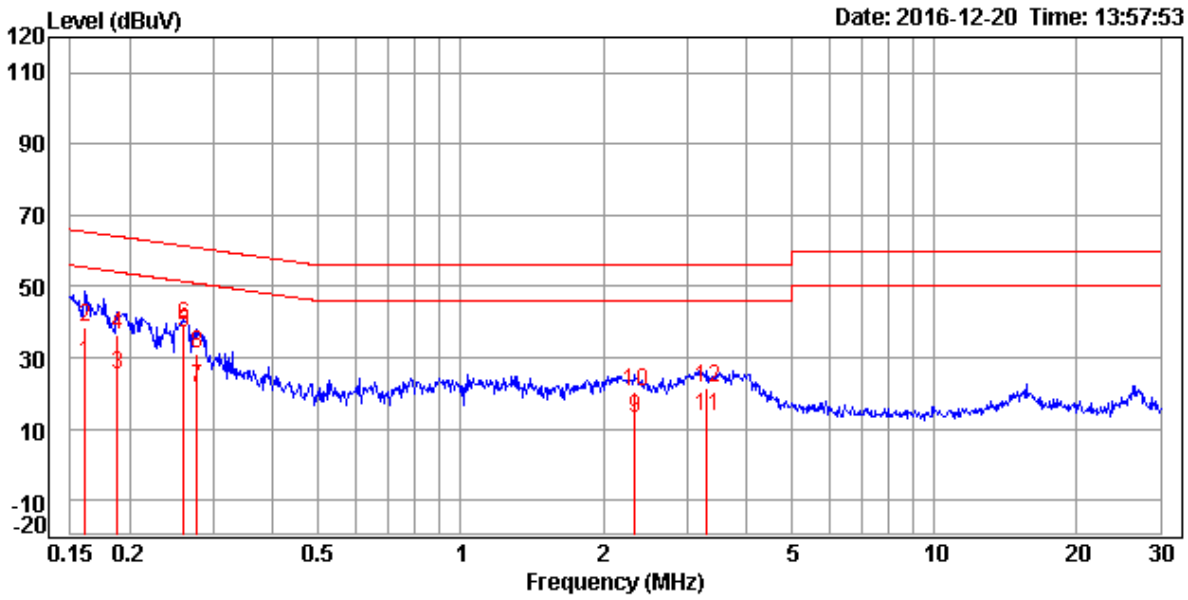
Freq. MHz	Reading dBuV Q.P.	Reading dBuV AV.	C.F. dB	Result dBuV Q.P.	Result dBuV AV.	Limit dBuV Q.P.	Limit dBuV AV.	Margin dB Q.P.	Margin dB AV.
0.178	28.42	17.62	9.98	38.40	27.60	64.59	54.59	-26.19	-26.99
0.184	26.54	13.32	9.98	36.52	23.30	64.28	54.28	-27.76	-30.98
0.223	21.02	12.73	9.95	30.97	22.68	62.70	52.70	-31.73	-30.02
0.264	29.29	19.15	9.92	39.21	29.07	61.29	51.29	-22.08	-22.22
2.384	9.93	1.38	10.08	20.01	11.46	56.00	46.00	-35.99	-34.54
3.740	11.08	2.80	10.16	21.24	12.96	56.00	46.00	-34.76	-33.04

Remark:

1. *Correction Factor = Insertion loss + Cable loss*
2. *Result level = Reading Value + Correction factor*
3. *Margin value = Result level – Limit value*

Product Name	AC1300 IoT Router	Test By	Allen Liu
Test Model	X10R	Test Date	2016/12/20
Test Mode	WiFi / Mode 1	Temp. & Humidity	26°C, 46%

NEUTRAL



Trace:

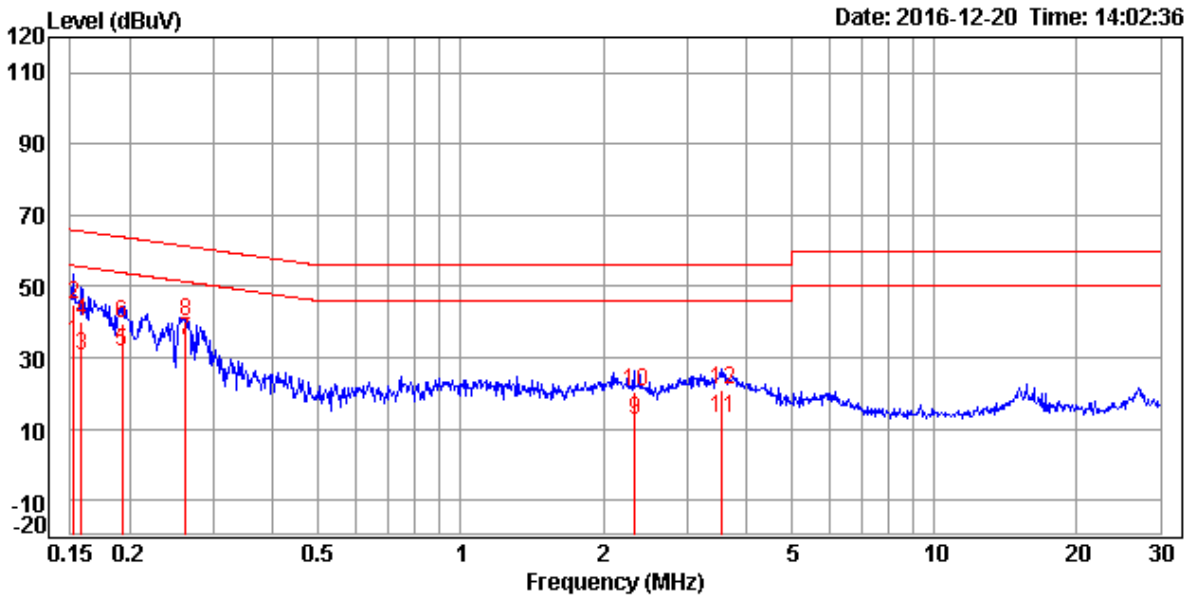
Freq. MHz	Reading dBuV Q.P.	Reading dBuV AV.	C.F. dB	Result dBuV Q.P.	Result dBuV AV.	Limit dBuV Q.P.	Limit dBuV AV.	Margin dB Q.P.	Margin dB AV.
0.161	28.48	18.64	9.99	38.47	28.63	65.43	55.43	-26.96	-26.80
0.187	26.48	15.37	10.00	36.48	25.37	64.15	54.15	-27.67	-28.78
0.260	29.08	27.06	9.94	39.02	37.00	61.42	51.42	-22.40	-14.42
0.276	21.08	11.45	9.92	31.00	21.37	60.94	50.94	-29.94	-29.57
2.334	10.58	3.04	10.06	20.64	13.10	56.00	46.00	-35.36	-32.90
3.293	11.52	3.20	10.12	21.64	13.32	56.00	46.00	-34.36	-32.68

Remark:

1. *Correction Factor = Insertion loss + Cable loss*
2. *Result level = Reading Value + Correction factor*
3. *Margin value = Result level – Limit value*

Product Name	AC1300 IoT Router	Test By	Allen Liu
Test Model	X10R	Test Date	2016/12/20
Test Mode	ZigBee / Mode 1	Temp. & Humidity	26°C, 46%

LINE



Trace:

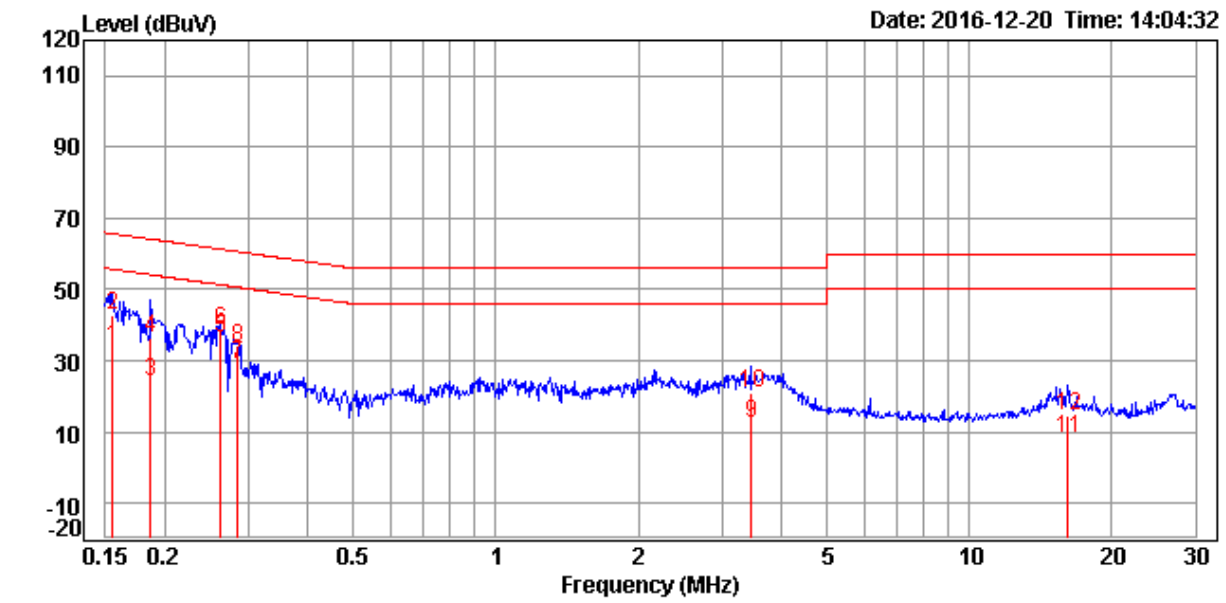
Freq. MHz	Reading dBuV Q.P.	Reading dBuV AV.	C.F. dB	Result dBuV Q.P.	Result dBuV AV.	Limit dBuV Q.P.	Limit dBuV AV.	Margin dB Q.P.	Margin dB AV.
0.152	34.79	24.22	10.00	44.79	34.22	65.91	55.91	-21.12	-21.69
0.158	30.05	20.32	10.00	40.05	30.32	65.56	55.56	-25.51	-25.24
0.192	29.75	21.75	9.97	39.72	31.72	63.93	53.93	-24.21	-22.21
0.262	30.01	24.65	9.92	39.93	34.57	61.38	51.38	-21.45	-16.81
2.321	10.64	2.55	10.08	20.72	12.63	56.00	46.00	-35.28	-33.37
3.547	10.98	2.82	10.15	21.13	12.97	56.00	46.00	-34.87	-33.03

Remark:

1. *Correction Factor = Insertion loss + Cable loss*
2. *Result level = Reading Value + Correction factor*
3. *Margin value = Result level – Limit value*

Product Name	AC1300 IoT Router	Test By	Allen Liu
Test Model	X10R	Test Date	2016/12/20
Test Mode	ZigBee / Mode 1	Temp. & Humidity	26°C, 46%

NEUTRAL



Trace:

Freq. MHz	Reading dBuV Q.P.	Reading dBuV AV.	C.F. dB	Result dBuV Q.P.	Result dBuV AV.	Limit dBuV Q.P.	Limit dBuV AV.	Margin dB Q.P.	Margin dB AV.
0.155	32.58	23.78	9.99	42.57	33.77	65.74	55.74	-23.17	-21.97
0.186	26.32	14.31	10.00	36.32	24.31	64.20	54.20	-27.88	-29.89
0.263	28.84	26.73	9.94	38.78	36.67	61.34	51.34	-22.56	-14.67
0.285	24.03	19.23	9.92	33.95	29.15	60.68	50.68	-26.73	-21.53
3.454	11.07	2.18	10.13	21.20	12.31	56.00	46.00	-34.80	-33.69
16.055	3.88	-2.06	10.53	14.41	8.47	60.00	50.00	-45.59	-41.53

Remark:

1. *Correction Factor = Insertion loss + Cable loss*
2. *Result level = Reading Value + Correction factor*
3. *Margin value = Result level – Limit value*