

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

For

IP Phone

Model: OBi2182

Data Applies To: OBi2162

Trade Name: OBIHAI

Issued for

Obihai Technology, Inc.

51 E Campbell Ave. Campbell CA 95008 United States

Issued by

**Compliance Certification Services Inc.
Hsinchu Lab.**

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Revision History

Rev.	Issue Date	Revisions	Effect Page	Revised By
00	12/15/2017	Initial Issue	All Page 117	Gloria Chang
01	12/19/2017	Revised	P.112-113	Gloria Chang
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TABLE OF CONTENTS

TITLE	PAGE NO.
1. TEST REPORT CERTIFICATION.....	4
2. EUT DESCRIPTION.....	5
3. DESCRIPTION OF TEST MODES.....	8
4. TEST METHODOLOGY.....	10
5. FACILITIES AND ACCREDITATION.....	10
5.1 FACILITIES.....	10
5.2 ACCREDITATIONS	10
5.3 MEASUREMENT UNCERTAINTY.....	11
6. SETUP OF EQUIPMENT UNDER TEST	12
7. FCC PART 15.407 REQUIREMENTS.....	14
7.1 DUTY CYCLE MEASUREMENT	14
7.2 26dB BANDWIDTH.....	15
7.3 6dB BANDWIDTH.....	29
7.4 MAXIMUM CONDUCTED OUTPUT POWER.....	37
7.5 PEAK POWER SPECTRAL DENSITY	44
7.6 RADIATED EMISSION	62
7.7 CONDUCTED EMISSION.....	104
7.8 FREQUENCY STABILITY.....	111
8. APPENDIX SETUP PHOTOS.....	114

1. TEST REPORT CERTIFICATION

Applicant : Obihai Technology, Inc.
Address : 51 E Campbell Ave. Campbell CA 95008 United States
Equipment Under Test : IP Phone
Model : OBi2182
Data Apples To : OBi2162
Trade Name : OBIHAI
Tested Date : September 19 ~ October 19, 2017

APPLICABLE STANDARD	
Standard	Test Result
FCC Part 15 Subpart E 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:



Rueyyan Lin
Sr. Engineer

Reviewed by:



Gundam Lin
Sr. Engineer

2. EUT DESCRIPTION

Product Name	IP Phone
Model Number	OBI2182
Data Applies To	OBI2162
Identify Number	T170919S08
Received Date	September 19, 2017
Frequency Range	UNII Band 1: IEEE 802.11a, 802.11an/ac VHT20 Mode: 5180 MHz ~ 5240 MHz IEEE 802.11an/ac VHT40 Mode: 5190 MHz ~ 5230 MHz IEEE 802.11ac VHT80 Mode: 5210 MHz UNII Band 3: IEEE 802.11a, 802.11an/ac VHT20 Mode: 5745 MHz ~ 5825 MHz IEEE 802.11an/ac VHT40 Mode: 5755 MHz ~ 5795 MHz IEEE 802.11ac VHT80 Mode: 5775 MHz
Transmit Power	UNII Band 1: IEEE 802.11a Mode: 11.60 dBm (0.0145 W) IEEE 802.11ac VHT20 NSS1/MCS0 Mode: 11.64 dBm (0.0146 W) IEEE 802.11ac VHT40 NSS1/MCS0 Mode: 12.47 dBm (0.0177 W) IEEE 802.11ac VHT80 NSS1/MCS0 Mode: 9.73 dBm (0.0094 W) UNII Band 3: IEEE 802.11a Mode: 15.21 dBm (0.0332 W) IEEE 802.11ac VHT20 NSS1/MCS0 Mode: 15.13 dBm (0.0326 W) IEEE 802.11ac VHT40 NSS1/MCS0 Mode: 15.23 dBm (0.0333 W) IEEE 802.11ac VHT80 NSS1/MCS0 Mode: 14.86 dBm (0.0306 W)
TPC Function	<input type="checkbox"/> with TPC <input checked="" type="checkbox"/> without TPC
Channel Spacing	IEEE 802.11a, 802.11an/ac VHT20 Mode: 20MHz IEEE 802.11an/ac VHT40 Mode: 40MHz IEEE 802.11ac VHT80 Mode: 80MHz

Channel Number	IEEE 802.11a, 802.11an/ac VHT20 Mode: 5150MHz ~ 5250MHz: 4 Channels 5725MHz ~ 5825MHz: 5 Channels IEEE 802.11an/ac VHT40 Mode: 5150MHz ~ 5250MHz: 2 Channels 5725MHz ~ 5825MHz: 2 Channels IEEE 802.11ac VHT80 Mode: 5150MHz ~ 5250MHz: 1 Channels 5725MHz ~ 5825MHz: 1 Channels
Transmit Data Rate	IEEE 802.11a Mode: up to 54 Mbps IEEE 802.11an/ac VHT20 Mode (800ns GI): up to 78.00 Mbps IEEE 802.11an/ac VHT20 Mode (400ns GI): up to 86.70 Mbps IEEE 802.11an/ac VHT40 Mode (800ns GI): up to 180.00 Mbps IEEE 802.11an/ac VHT40 Mode (400ns GI): up to 200.00 Mbps IEEE 802.11ac VHT80 Mode (800ns GI): up to 390.00 Mbps IEEE 802.11ac VHT80 Mode (400ns GI): up to 433.30 Mbps
Type of Modulation	IEEE 802.11a Mode: OFDM (64QAM, 16QAM, QPSK, BPSK) IEEE 802.11an/ac VHT20/40 Mode: OFDM (256QAM, 64QAM, 16QAM, QPSK, BPSK) IEEE 802.11ac 80 Mode: OFDM (256QAM, 64QAM, 16QAM, QPSK, BPSK)
Antenna Type	PCB Antenna x 1, Antenna Gain : 4.25dBi
Power Rating	12Vdc
Test Voltage	120Vac, 60Hz
DC Power Cable Type	Non-shielded cable, 1.8m x 1 (Non-detachable)
I/O Port	RJ-9 Port x 2, RJ-11 Port x 1, RJ-45 Port x 2, USB Port x 2, Audio Port x 1, Power Port x 1
Signal Cable	Non-shielded RJ-9 cable, 0.65m x 1 (Detachable)
Support Equipment	Telephone handset

Power Adapter:

No.	Manufacturer	Model No.	Power Input	Power Output
1	AOEM	ADS012T-W120100	100-240Vac, 0.5A, 50-60Hz	12Vdc, 1.0A

The difference of the series model

Model Number	Difference		
	WiFi	Bluetooth	Number of line keys
OBI2182	V	V	12
OBI2162	V	V	6

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: 2ADXF-OBI2182 filing to comply with Section 15.207, 15.209 and 15.407 of the FCC Part 15, Subpart E Rules.
4. The model OBI2182 was considered the main model for testing.

3. DESCRIPTION OF TEST MODES

The EUT (IP Phone) had been tested under operating condition.

For IEEE 802.11a, 802.11ac VHT20/VHT40/VHT80 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	

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 802.11a, 802.11ac VHT20 Mode**

The EUT had been tested under operating condition.

There are three channels have been tested as following:

UNII Band	Channel	Frequency (MHz)
Band 1	Low	5180
	Middle	5220
	High	5240
Band 3	Low	5745
	Middle	5785
	High	5825

IEEE 802.11a Mode: 6Mbps data rate (worst case) was chosen for full testing.

IEEE 802.11ac VHT20 NSS1/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 two channels have been tested as following:

UNII Band	Channel	Frequency (MHz)
Band 1	Low	5190
	High	5230
Band 3	Low	5755
	High	5795

IEEE 802.11ac VHT40 NSS1/MCS0 Mode: 13.5Mbps data rate (worst case) was chosen for full testing.

IEEE 802.11ac VHT80 Mode

The EUT had been tested under operating condition.

There are one channels have been tested as following:

UNII Band	Channel	Frequency (MHz)
Band 1	Low	5210
Band 3	Low	5775

IEEE 802.11ac VHT80 NSS1/MCS0 Mode: 29.3 Mbps data rate (worst case) was chosen for full testing.

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, 15. 407 and KDB 789033 D02 General U-NII Test Procedures New Rules v02r01.

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, 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
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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 TW0240.

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_C) / Radiated Emission, 30 to 1000 MHz	+/- 3.97
Semi Anechoic Chamber (966 Chamber_C) / Radiated Emission, 1 to 18GHz	+/- 3.58
Semi Anechoic Chamber (966 Chamber_C) / Radiated Emission, 18 to 26 GHz	+/- 3.59
Semi Anechoic Chamber (966 Chamber_C) / 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 based on the results of the compliance measurement. Consequently the measured emissions being less than the maximum allowed emission result in this being a compliant test or passing test.

The acceptable measurement uncertainty value without requiring revision of the compliance statement is based 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	IBM (Lenovo)	ThinkPad T61 7663-AS6	L3F3864

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

SETUP DIAGRAM FOR TESTS

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

EUT OPERATING CONDITION

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

2. TX Mode:

⇒ **Data Rate:** 6Mbps Bandwidth 20 (IEEE 802.11a Mode)

6.5Mbps Bandwidth 20 (IEEE 802.11ac VHT20 NSS1/MCS0 Mode)

13.5Mbps Bandwidth 40 (IEEE 802.11ac VHT40 NSS1/MCS0 Mode)

29.3 Mbps Bandwidth 80 (IEEE 802.11ac VHT80 NSS1/MCS0 Mode)

⇒ **Power control**

Mode	UNII Band	Channel	Frequency (MHz)	Power Set
IEEE 802.11a	Band 1	Low	5180	46
		Middle	5220	46
		High	5240	46
	Band 3	Low	5745	58
		Middle	5785	58
		High	5825	58

Mode	UNII Band	Channel	Frequency (MHz)	Power Set
IEEE 802.11ac VHT20 NSS1/MCS0	Band 1	Low	5180	47
		Middle	5220	46
		High	5240	46
	Band 3	Low	5745	58
		Middle	5785	58
		High	5825	58

Mode	UNII Band	Channel	Frequency (MHz)	Power Set
IEEE 802.11ac VHT40 NSS1/MCS0	Band 1	Low	5190	45
		High	5230	48
	Band 3	Low	5755	58
		High	5795	58

Mode	UNII Band	Channel	Frequency (MHz)	Power Set
IEEE 802.11ac VHT80 NSS1/MCS0	Band 1	Low	5210	42
	Band 3	Low	5775	57

3. All of the functions are under run.

4. Start test.

7. FCC PART 15.407 REQUIREMENTS

7.1 DUTY CYCLE MEASUREMENT

Product Name	IP Phone	Test By	Rex Chiu
Test Model	OBI2182	Test Date	2017/09/25
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 802.11a	2.063	2.219	92.97%	0.32	0.485
IEEE 802.11ac VHT20	1.931	2.042	94.56%	0.24	0.518
IEEE 802.11ac VHT40	0.952	1.116	85.29%	0.69	1.051
IEEE 802.11ac VHT80	0.460	0.579	79.46%	1.00	2.173

7.2 26dB BANDWIDTH

LIMITS

§ 15.303 (c), For purposes of this subpart, the emission bandwidth shall be determined by measuring the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, that are 26 dB down relative to the maximum level of the modulated carrier. Determination of the emissions bandwidth is based on the use of measurement instrumentation employing a peak detector function with an instrument resolutions bandwidth approximately equal to 1.0 percent of the emission bandwidth of the device under measurement.

TEST EQUIPMENT

Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
EXA Signal Analyzer	Agilent	N9010A	MY52220817	03/07/2018
Test S/W	N/A			

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

TEST SETUP



TEST PROCEDURE

1. Set RBW = approximately 1% of the emission bandwidth.
2. Set the VBW > RBW.
3. Detector = Peak.
4. Trace mode = max hold.
5. Measure the maximum width of the emission that is 26 dB down from the peak of the emission. Compare this with the RBW setting of the analyzer. Readjust RBW and repeat measurement as needed until the RBW/EBW ratio is approximately 1%.

TEST RESULTS

Product Name	IP Phone	Test By	Rex Chiu
Test Model	OBI2182	Test Date	2017/10/17
Test Mode	TX Mode	Temp. & Humidity	27°C, 58%

IEEE 802.11a Mode

UNII Band	Channel	Channel Frequency (MHz)	26dB Bandwidth (MHz)
Band 1	Low	5180	21.13
	Middle	5220	21.04
	High	5240	21.18
Band 3	Low	5745	28.96
	Middle	5785	29.97
	High	5825	29.98

IEEE 802.11ac VHT20 NSS1/MCS0 Mode

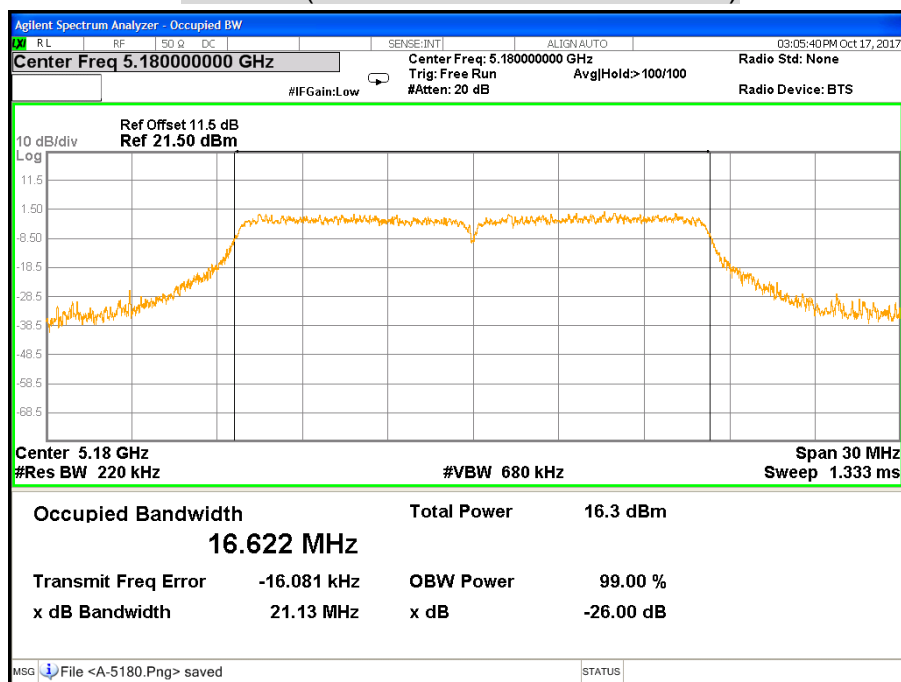
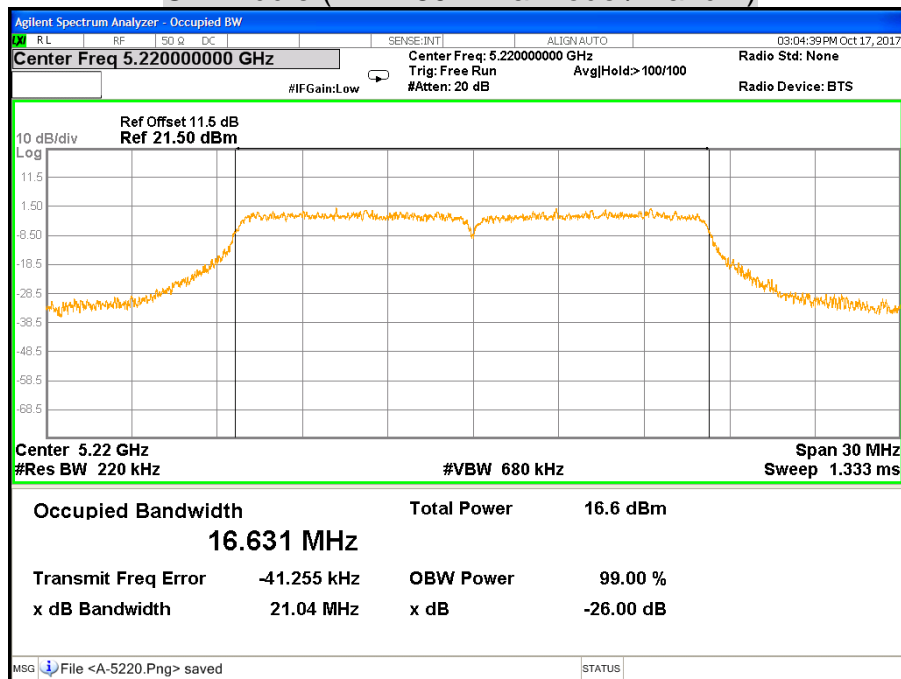
UNII Band	Channel	Channel Frequency (MHz)	26dB Bandwidth (MHz)
Band 1	Low	5180	21.38
	Middle	5220	21.56
	High	5240	21.07
Band 3	Low	5745	29.95
	Middle	5785	29.54
	High	5825	29.81

IEEE 802.11ac VHT40 NSS1/MCS0 Mode

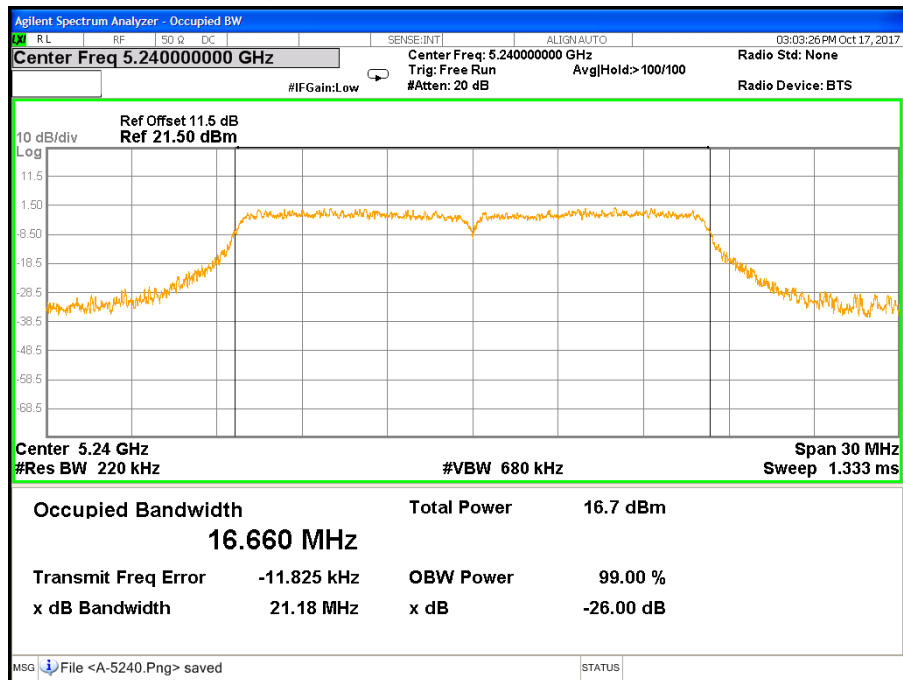
UNII Band	Channel	Channel Frequency (MHz)	26dB Bandwidth (MHz)
Band 1	Low	5190	42.75
	High	5230	53.85
Band 3	Low	5755	58.84
	High	5795	59.91

IEEE 802.11ac VHT80 NSS1/MCS0 Mode

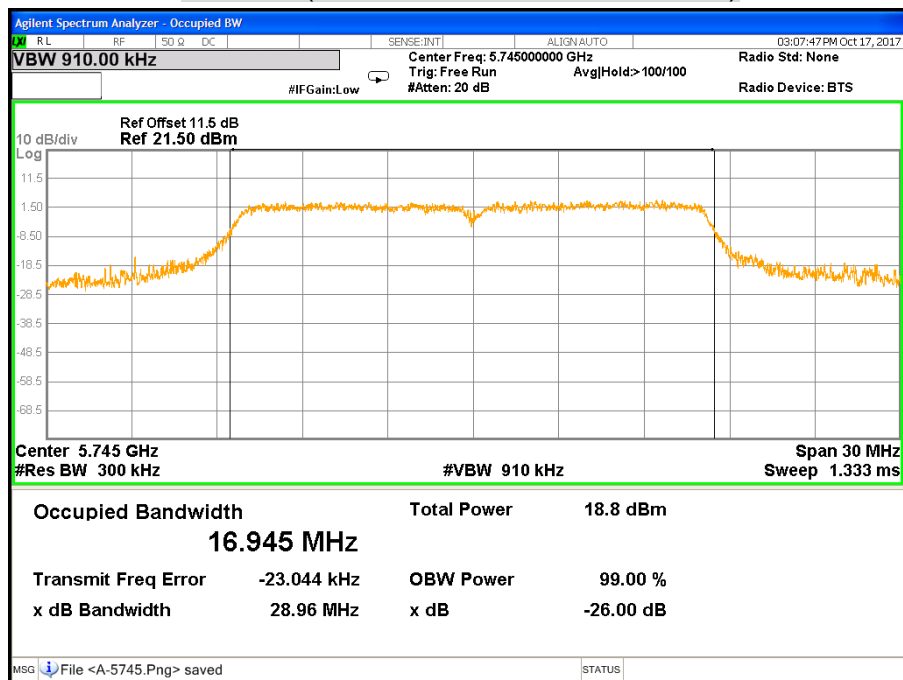
UNII Band	Channel	Channel Frequency (MHz)	26dB Bandwidth (MHz)
Band 1	Low	5210	80.59
Band 3	Low	5775	108.60

26dB BANDWIDTH**CH Low (IEEE 802.11a Mode / Band 1)****CH Middle (IEEE 802.11a Mode / Band 1)**

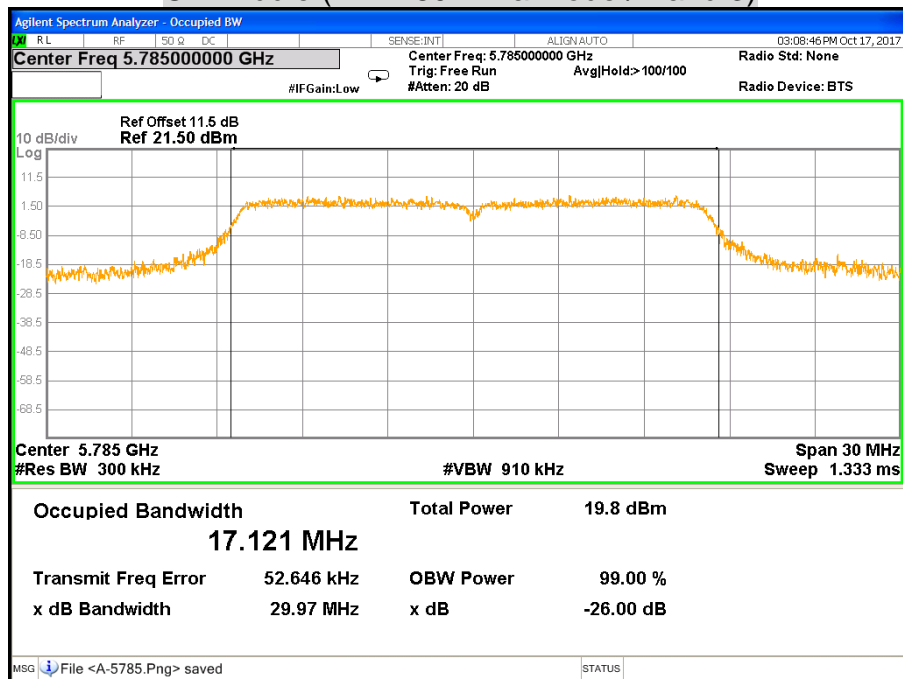
CH High (IEEE 802.11a Mode / Band 1)



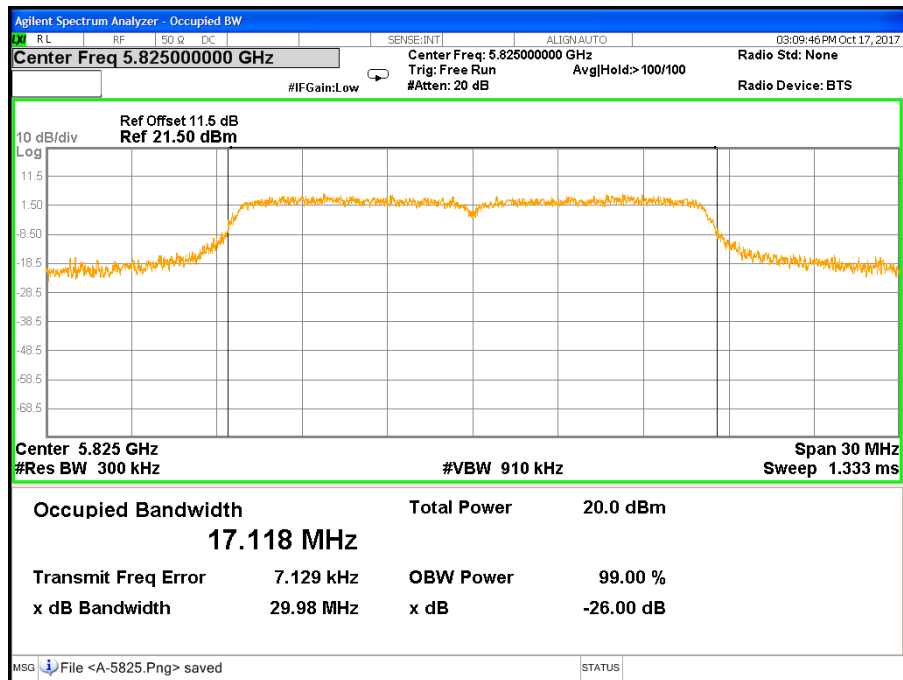
CH Low (IEEE 802.11a Mode / Band 3)



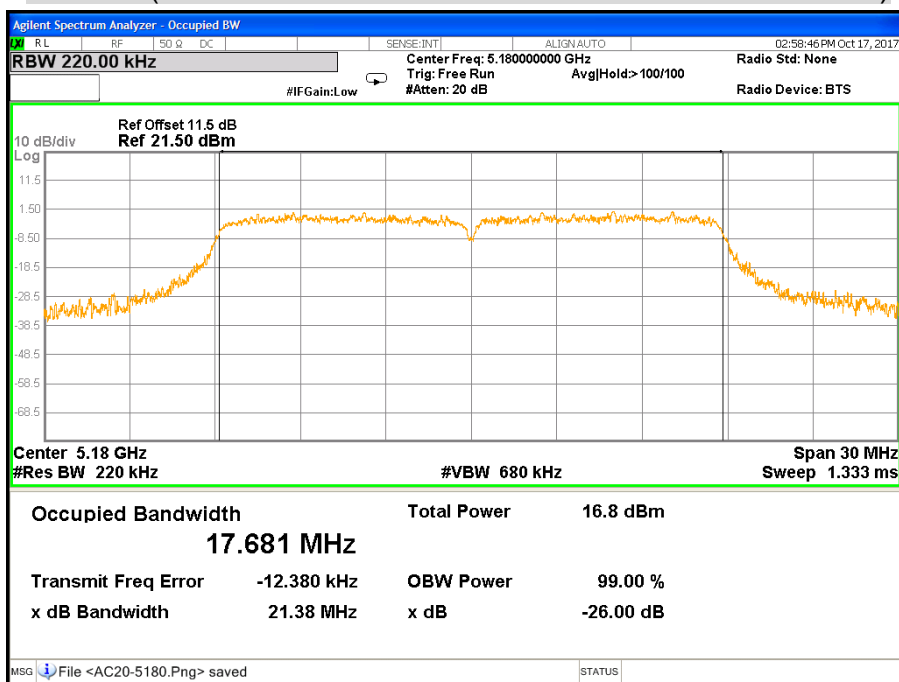
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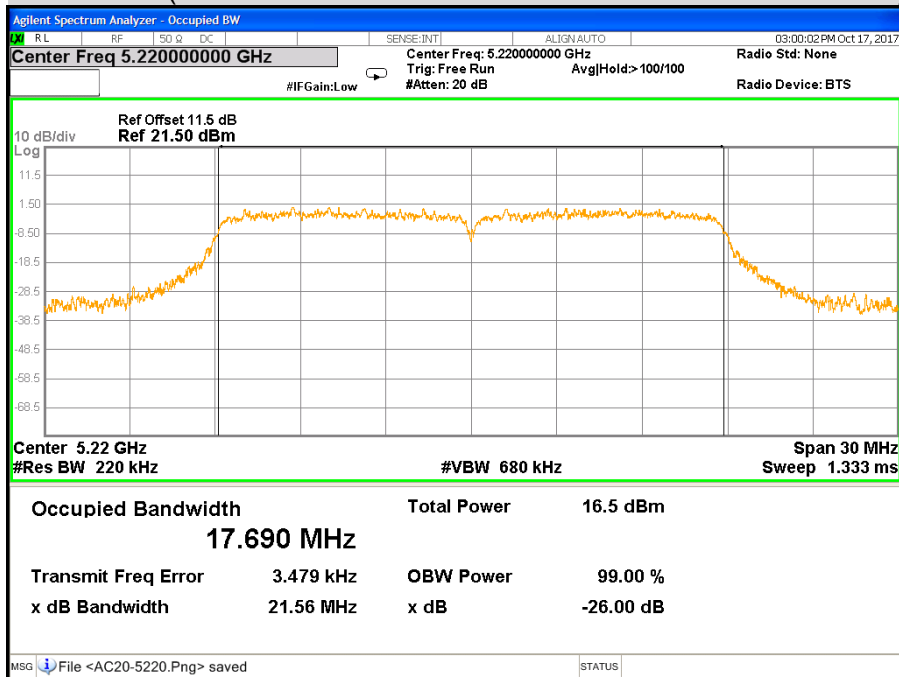
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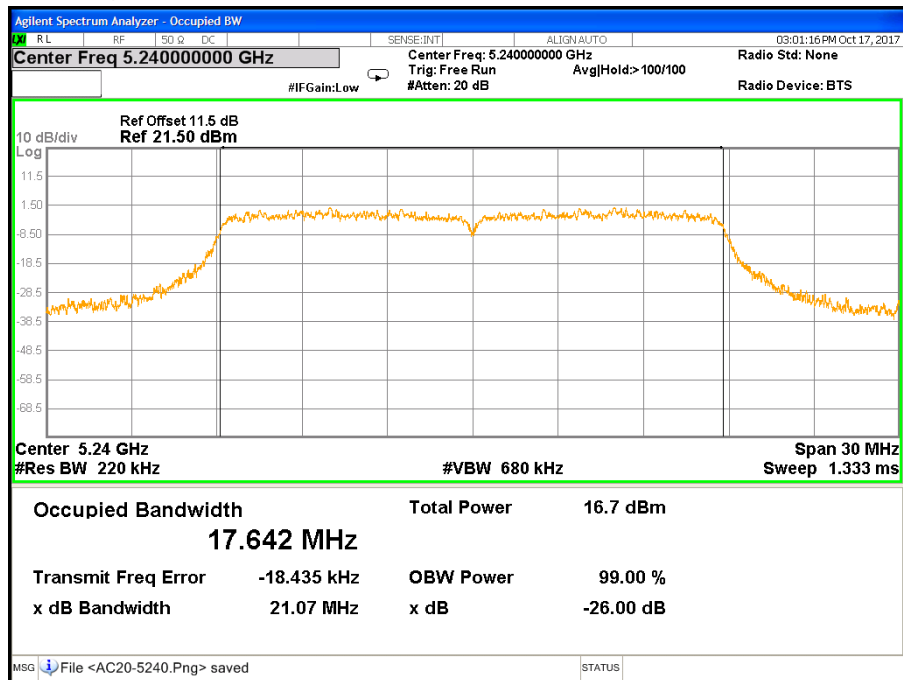
CH Low (IEEE 802.11ac VHT20 NSS1/MCS0 Mode / Band1)



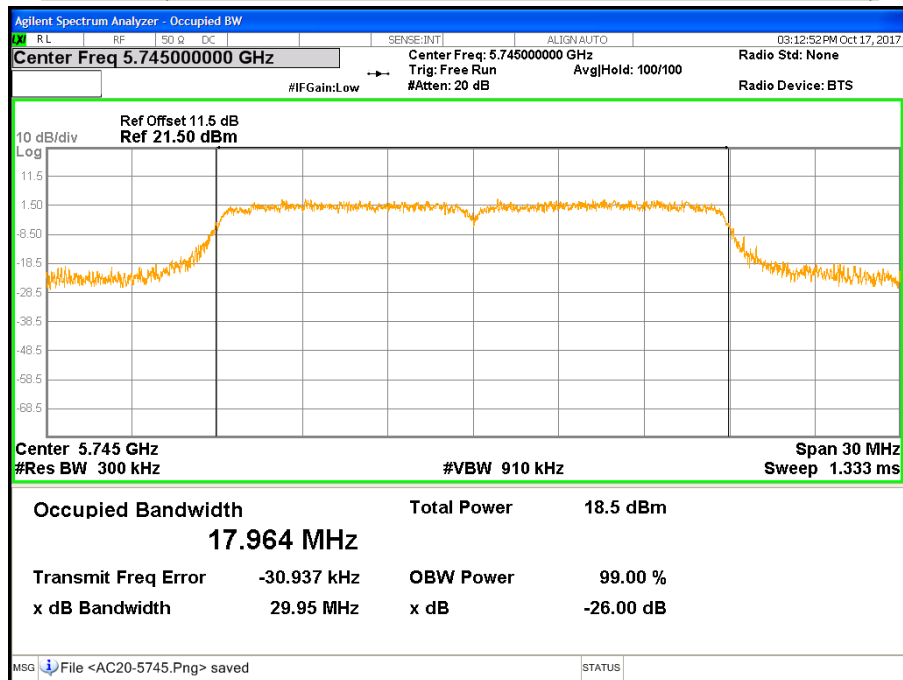
CH Middle (IEEE 802.11ac VHT20 NSS1/MCS0 Mode / Band1)



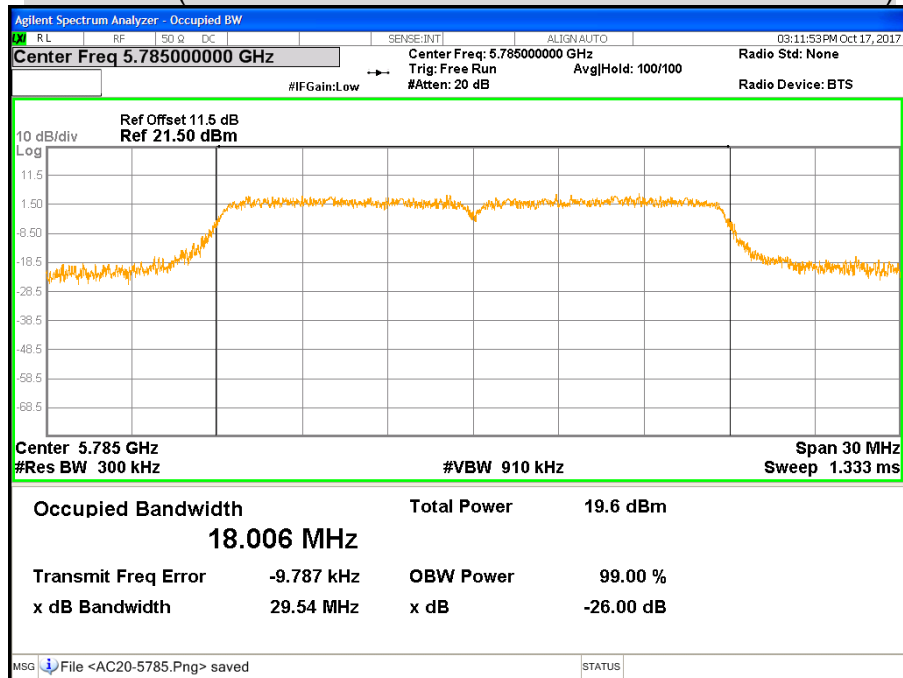
CH High (IEEE 802.11ac VHT20 NSS1/MCS0 Mode / Band 1)



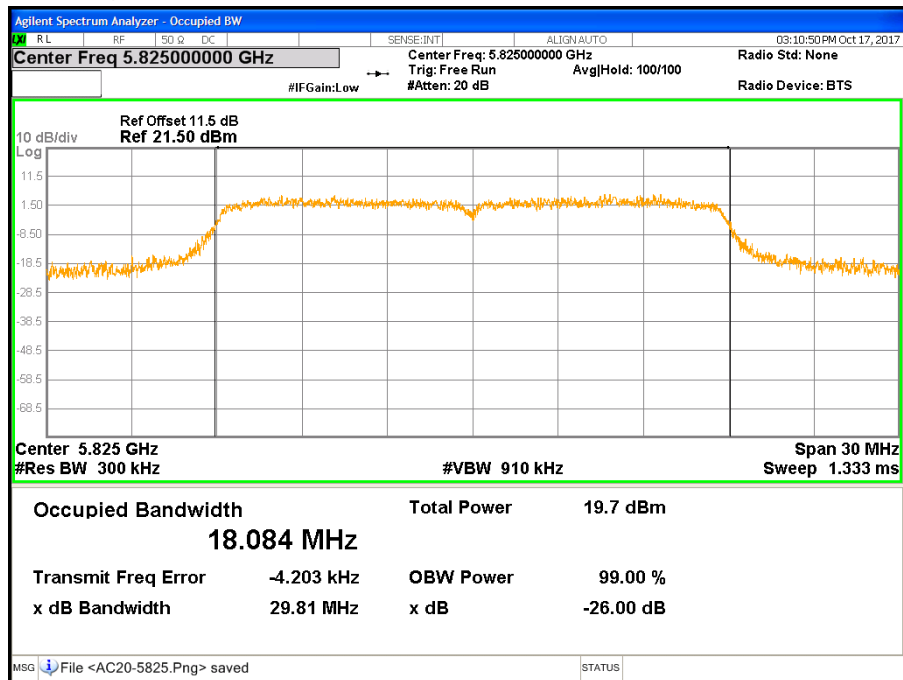
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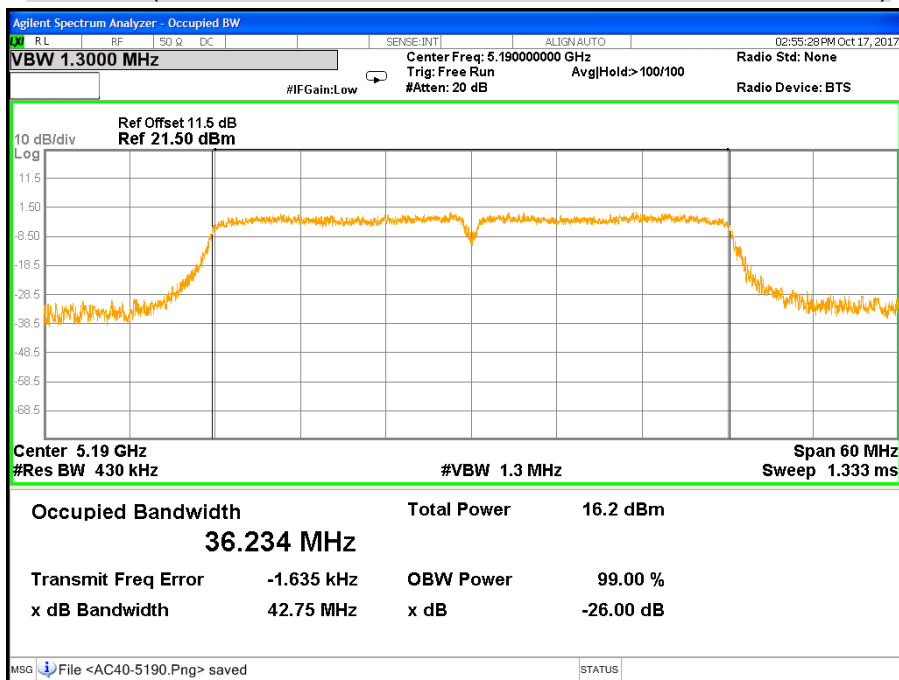
CH Middle (IEEE 802.11ac VHT20 NSS1/MCS0 Mode / Band 3)



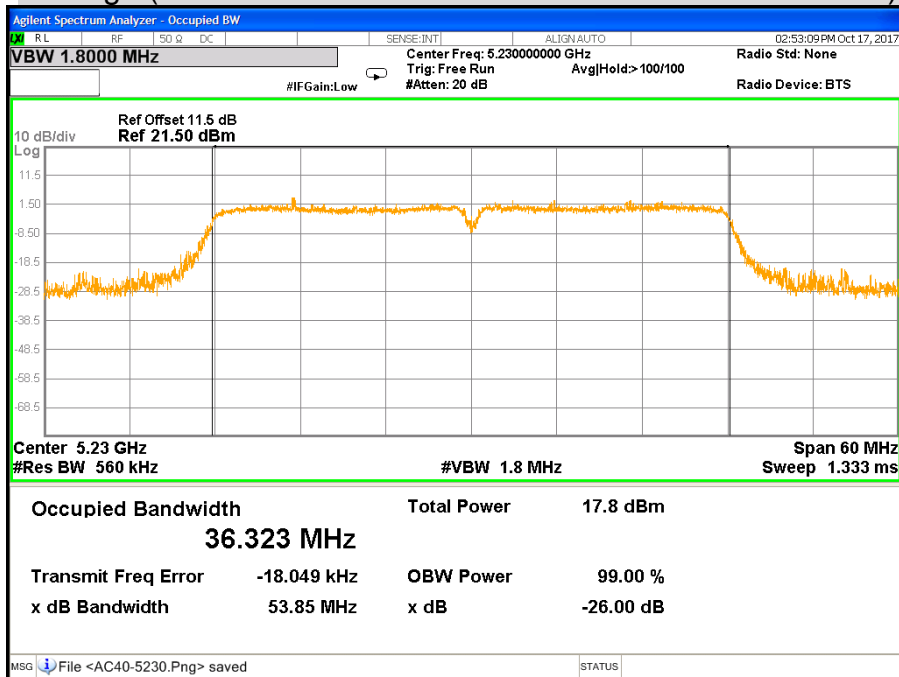
CH High (IEEE 802.11ac VHT20 NSS1/MCS0 Mode / Band 3)



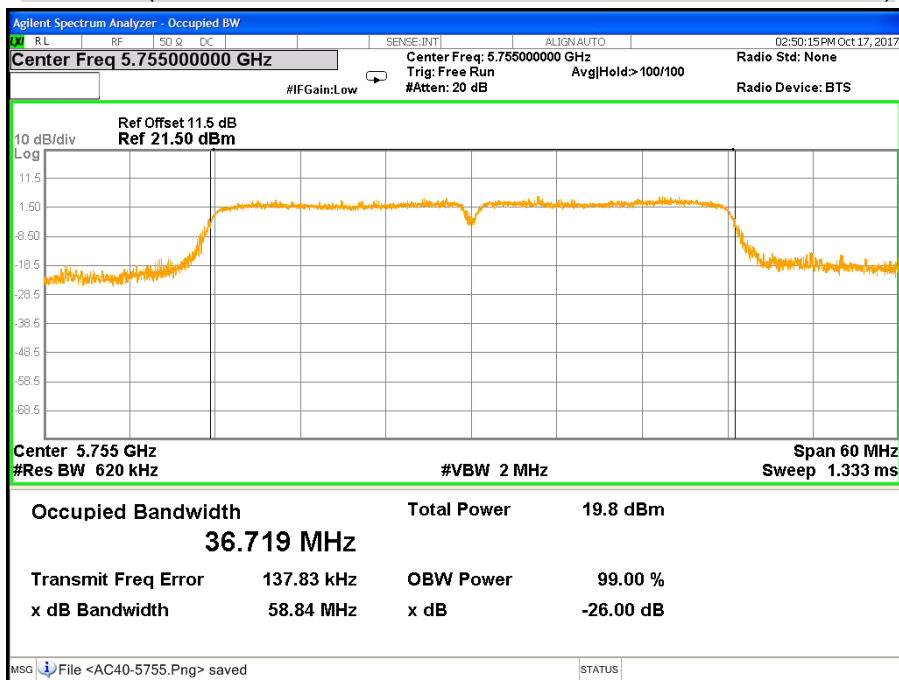
CH Low (IEEE 802.11ac VHT40 NSS1/MCS0 Mode / Band1)



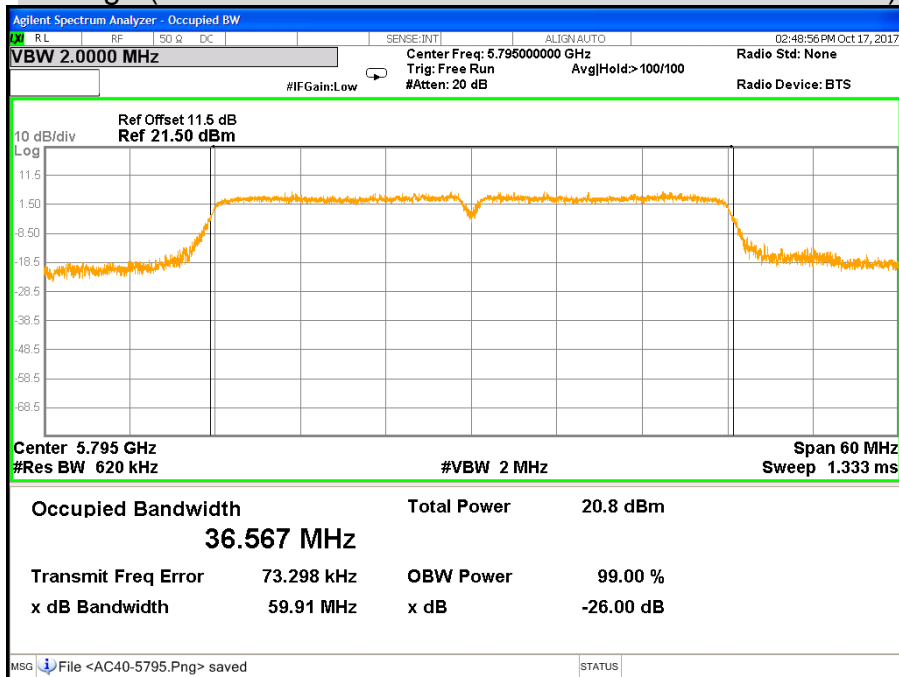
CH High (IEEE 802.11ac VHT40 NSS1/MCS0 Mode / Band 1)



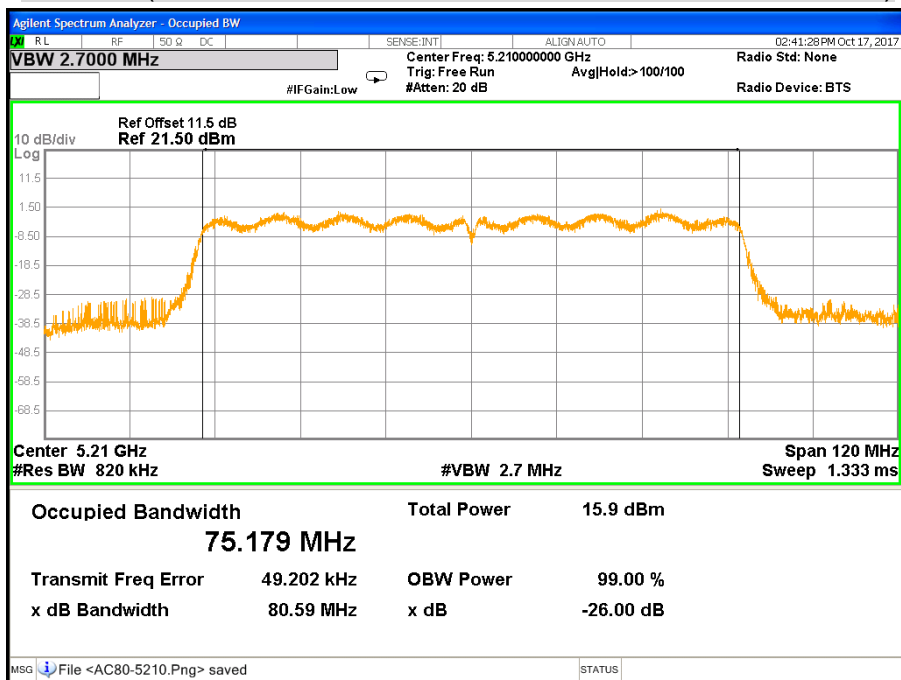
CH Low (IEEE 802.11ac VHT40 NSS1/MCS0 Mode / Band 3)



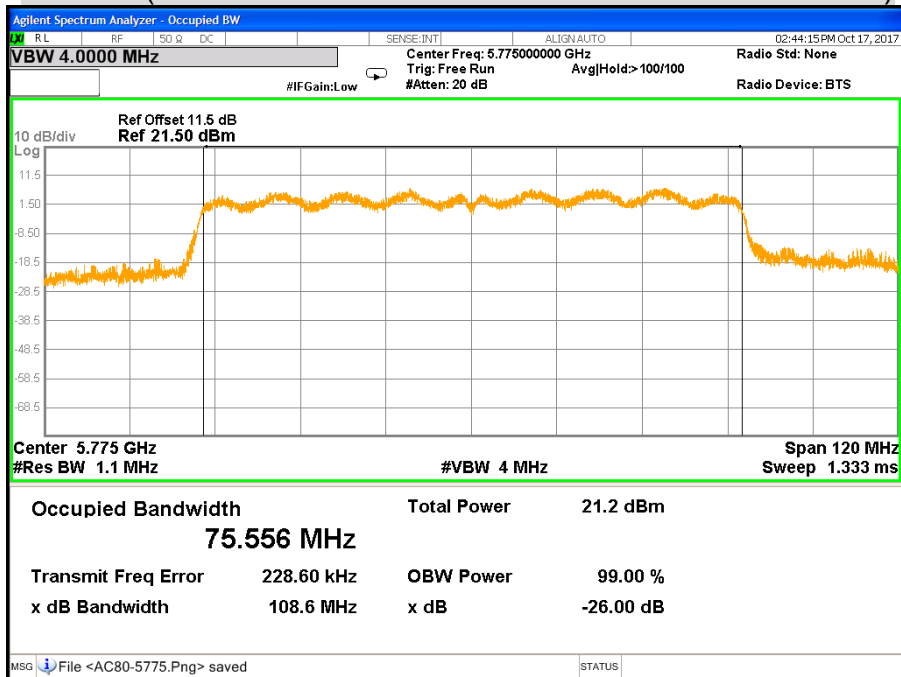
CH High (IEEE 802.11ac VHT40 NSS1/MCS0 Mode / Band 3)



CH Low (IEEE 802.11ac VHT80 NSS1/MCS0 Mode / Band 1)



CH Low (IEEE 802.11ac VHT80 NSS1/MCS0 Mode / Band 3)



7.3 6dB BANDWIDTH

LIMITS

According to § 15.407 (e), within the 5.725-5.85 GHz band, the minimum 6 dB bandwidth of U-NII devices shall be at least 500 kHz.

TEST EQUIPMENT

Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
EXA Signal Analyzer	Agilent	N9010A	MY52220817	03/07/2018
Test S/W	N/A			

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

TEST SETUP



TEST PROCEDURE

1. Place the EUT on the table and set it in the transmitting mode.
2. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.
3. Set the spectrum analyzer as RBW = 100kHz, VBW = 300kHz, Sweep = auto.
4. Mark the peak frequency and -6dB (upper and lower) frequency.
5. Repeat until all the rest channels are investigated.

TEST RESULTS

Product Name	IP Phone	Test By	Rex Chiu
Test Model	OBI2182	Test Date	2017/10/17
Test Mode	TX Mode	Temp. & Humidity	27°C, 58%

IEEE 802.11a Mode

UNII Band	Channel	Channel Frequency (MHz)	6dB Bandwidth (MHz)	Minimum Limit (kHz)
Band 3	Low	5745	16.34	500
	Middle	5785	15.82	500
	High	5825	16.31	500

IEEE 802.11ac VHT20 NSS1/MCS0 Mode

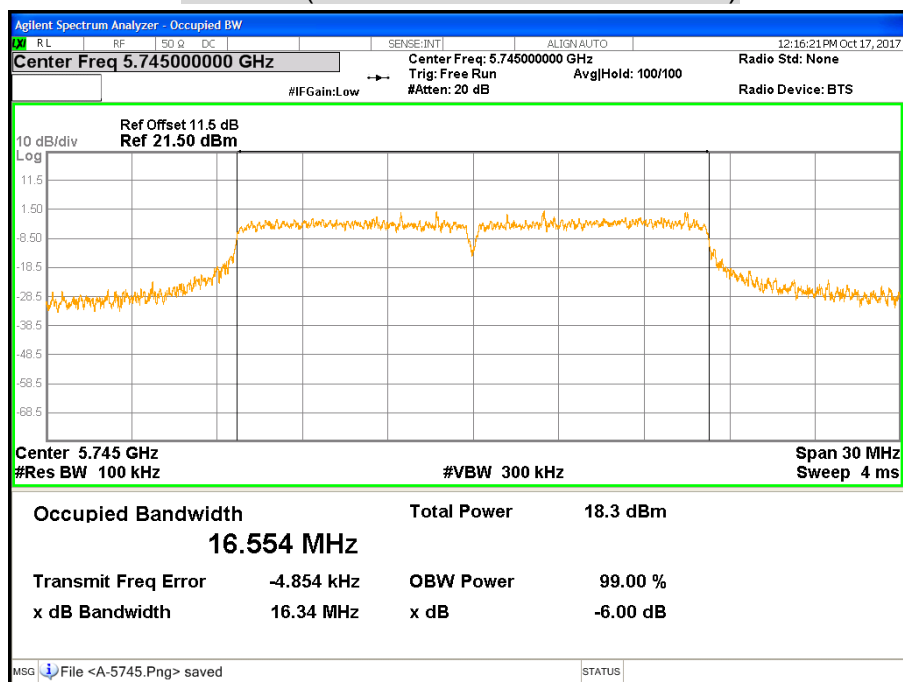
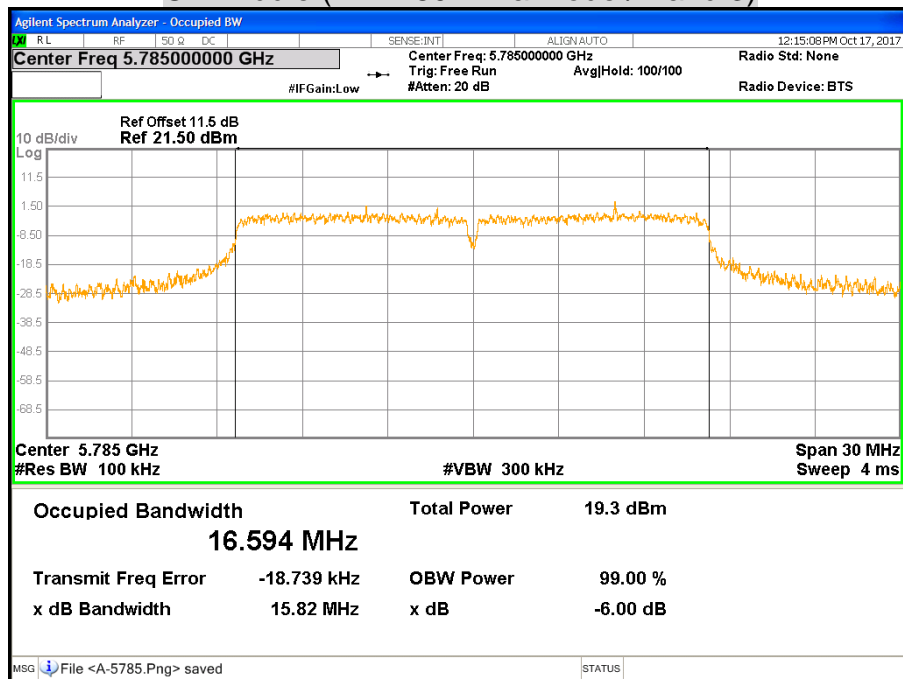
UNII Band	Channel	Channel Frequency (MHz)	6dB Bandwidth (MHz)	Minimum Limit (kHz)
Band 3	Low	5745	17.29	500
	Middle	5785	16.94	500
	High	5825	16.55	500

IEEE 802.11ac VHT40 NSS1/MCS0 Mode

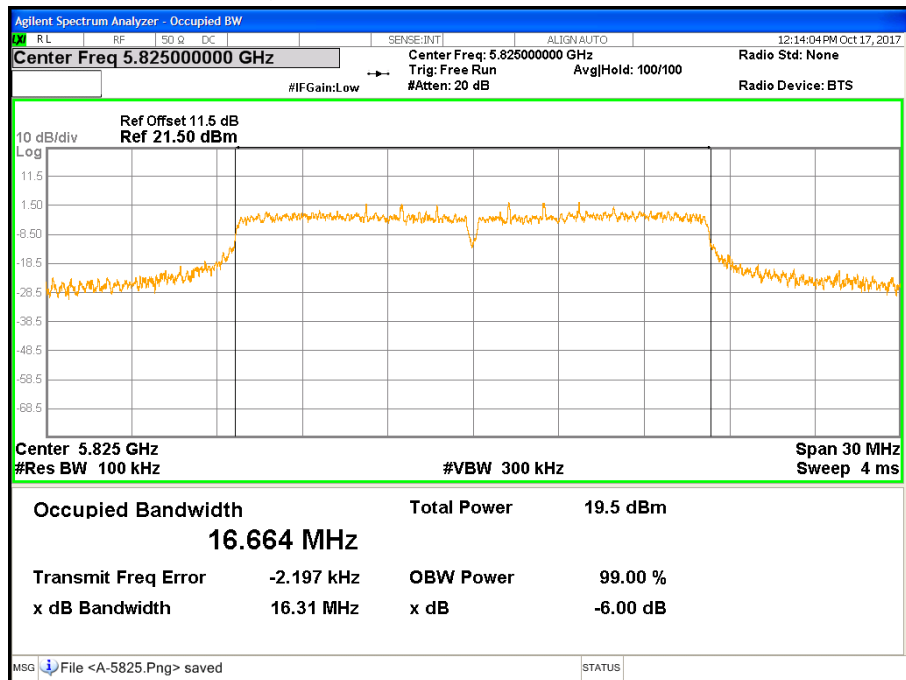
UNII Band	Channel	Channel Frequency (MHz)	6dB Bandwidth (MHz)	Minimum Limit (kHz)
Band 3	Low	5755	35.29	500
	High	5795	35.11	500

IEEE 802.11ac VHT80 NSS1/MCS0 Mode

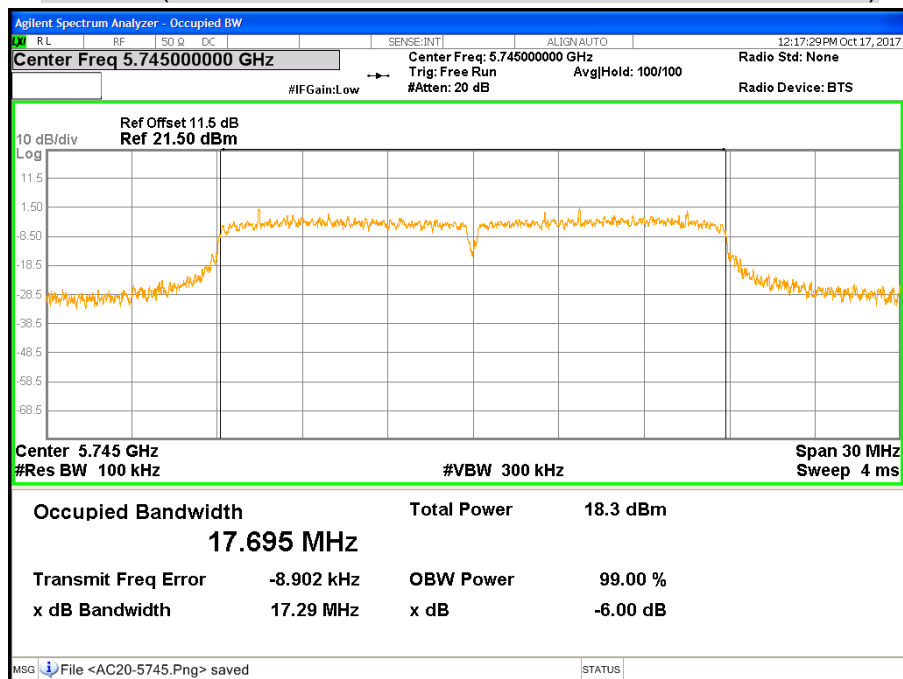
UNII Band	Channel	Channel Frequency (MHz)	6dB Bandwidth (MHz)	Minimum Limit (kHz)
Band 3	Low	5775	75.10	500

6dB BANDWIDTH**CH Low (IEEE 802.11a Mode / Band 3)****CH Middle (IEEE 802.11a Mode / Band 3)**

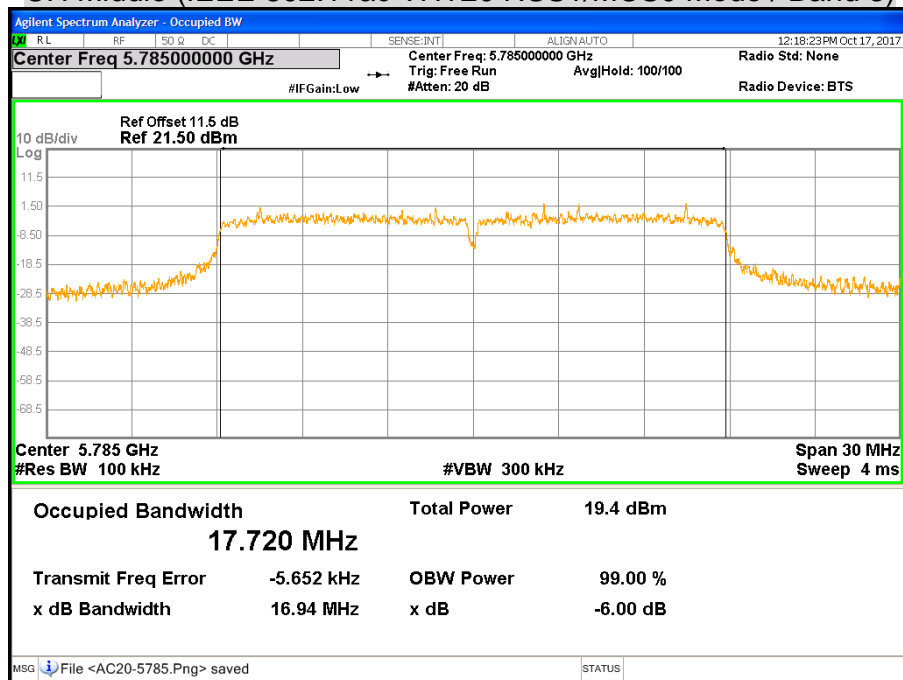
CH High (IEEE 802.11a Mode / Band 3)



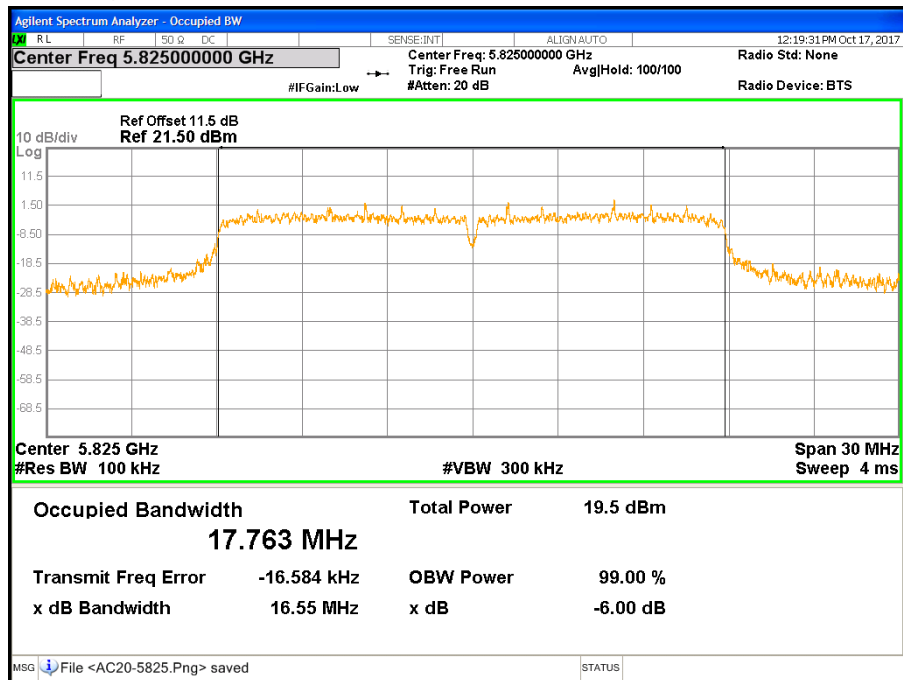
CH Low (IEEE 802.11ac VHT20 NSS1/MCS0 Mode / Band 3)



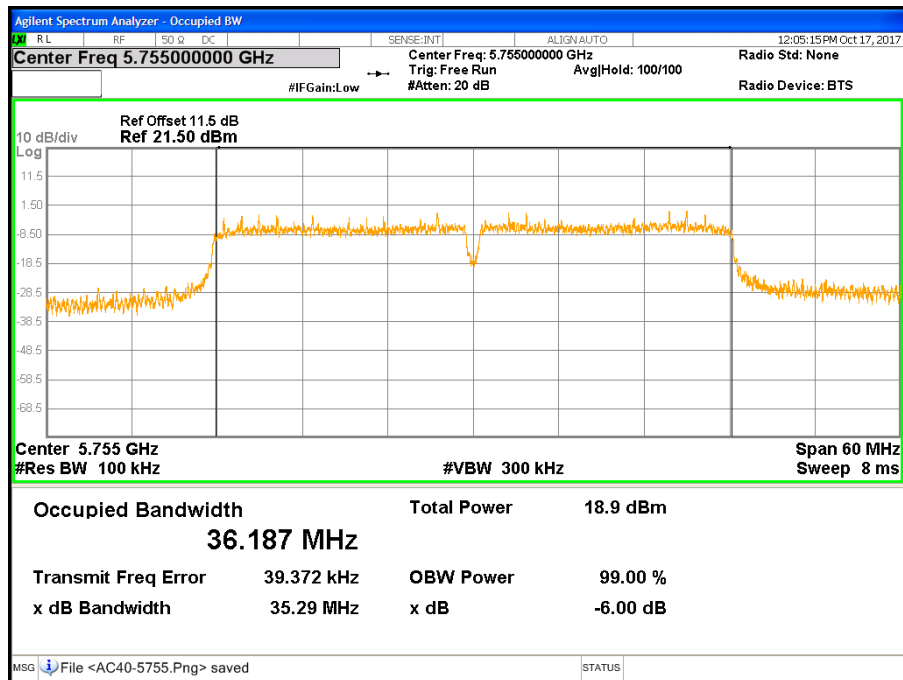
CH Middle (IEEE 802.11ac VHT20 NSS1/MCS0 Mode / Band 3)



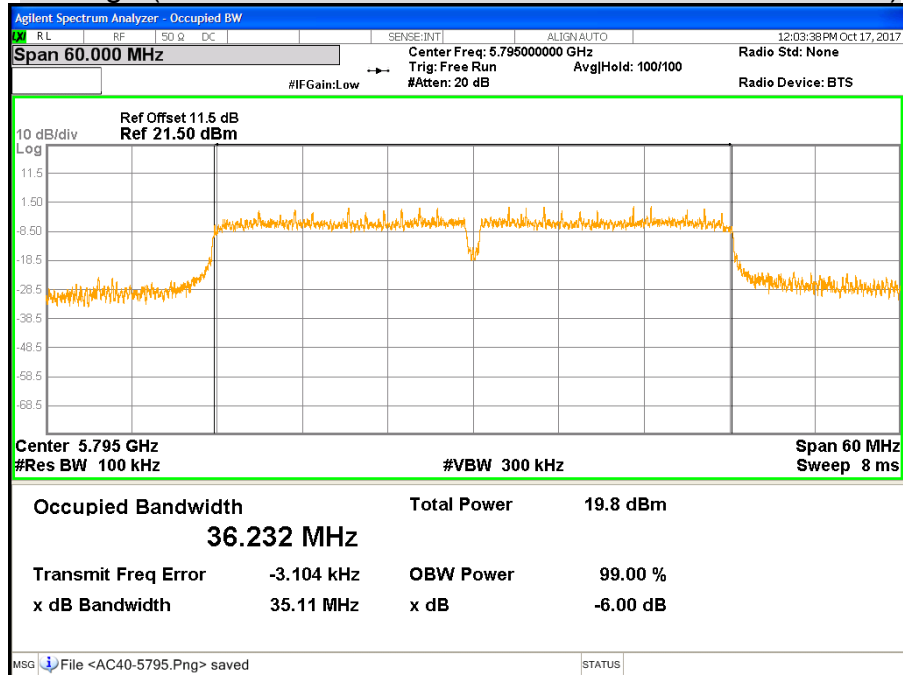
CH High (IEEE 802.11ac VHT20 NSS1/MCS0 Mode / Band 3)



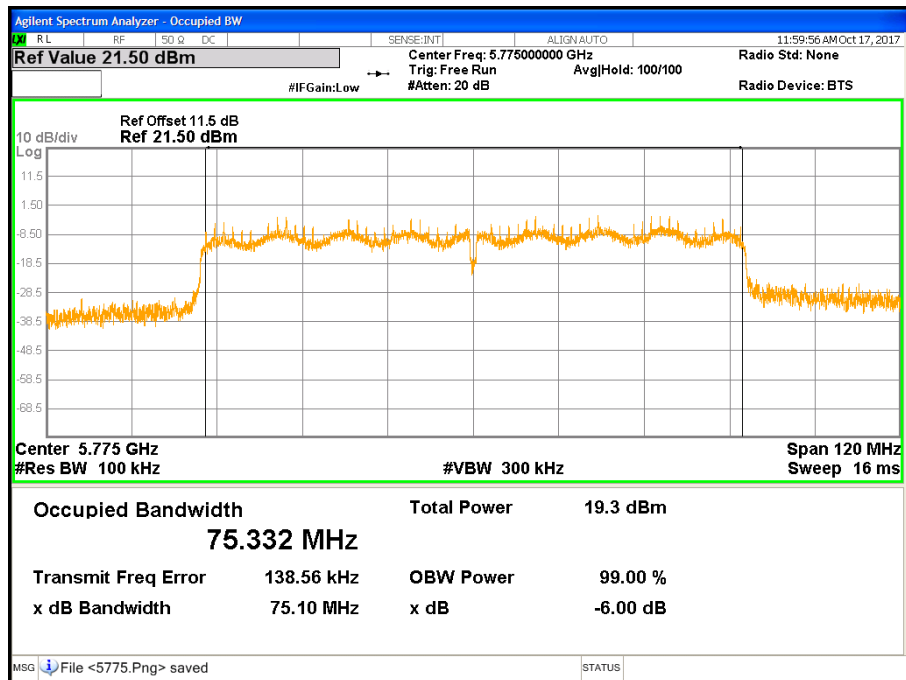
CH Low (IEEE 802.11ac VHT40 NSS1/MCS0 Mode / Band 3)



CH High (IEEE 802.11ac VHT40 NSS1/MCS0 Mode / Band 3)



CH Low (IEEE 802.11ac VHT80 NSS1/MCS0 Mode / Band 3)



7.4 MAXIMUM CONDUCTED OUTPUT POWER

LIMITS

§ 15.407(a)

(1) For the band 5.15-5.25 GHz,

- (I) For an outdoor access point operating in the band 5.15-5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1W provided the maximum antenna gain does not exceed 6 dBi. In addition, the maximum power spectral density shall not exceed 17 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi. The maximum e.i.r.p. at any elevation angle above 30 degrees as measured from the horizon must not exceed 125 mW (21 dBm).
- (II) For an indoor access point operating in the band 5.15-5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1W provided the maximum antenna gain does not exceed 6 dBi. In addition, the maximum power spectral density shall not exceed 17dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6dBi.
- (III) For fixed point-to-point access points operating in the band 5.15-5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W. Fixed point-to-point U-NII devices may employ antennas with directional gain up to 23 dBi without any corresponding reduction in the maximum conducted output power or maximum power spectral density. For fixed point-to-point transmitters that employ a directional antenna gain greater than 23 dBi, a 1 dB reduction in maximum conducted output power and maximum power spectral density is required for each 1 dB of antenna gain in excess of 23 dBi. Fixed, point-to-point operations exclude the use of point-to-multipoint systems, omnidirectional applications, and multiple collocated transmitters transmitting the same information. The operator of the U-NII device, or if the equipment is professionally installed, the installer, is responsible for ensuring that systems employing high gain directional antennas are used exclusively for fixed, point-to-point operations.

- (IV) For mobile and portable client devices in the 5.15-5.25 GHz band, the maximum conducted output power over the frequency band of operation shall not exceed 250 mW provided the maximum antenna gain does not exceed 6 dBi. In addition, the maximum power spectral density shall not exceed 11 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.
- (2) For the 5.25-5.35 GHz and 5.47-5.725 GHz bands, the maximum conducted output power over the frequency bands of operation shall not exceed the lesser of 250 mW or 11 dBm $10 \log B$, where B is the 26 dB emission bandwidth in megahertz. In addition, the maximum power spectral density shall not exceed 11 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.
- (3) For the band 5.725-5.85 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W. In addition, the maximum power spectral density shall not exceed 30 dBm in any 500-kHz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi. However, fixed point-to-point U-NII devices operating in this band may employ transmitting antennas with directional gain greater than 6 dBi without any corresponding reduction in transmitter conducted power. Fixed, point-to-point operations exclude the use of point-to-multipoint systems, omnidirectional applications, and multiple collocated transmitters transmitting the same information. The operator of the U-NII device, or if the equipment is professionally installed, the installer, is responsible for ensuring that systems employing high gain directional antennas are used exclusively for fixed, point-to-point operations.

§ 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:

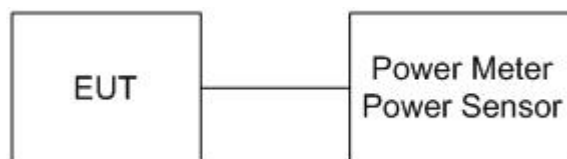
Directional gain may be calculated by using the formulas applicable to equal gain antennas with G_{ANT} set equal to the gain of the antenna having the highest gain; or,

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

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 power detection.

TEST RESULTS

Product Name	IP Phone	Test By	Rex Chiu
Test Model	OBI2182	Test Date	2017/10/17
Test Mode	TX Mode	Temp. & Humidity	27°C, 58%

IEEE 802.11a Mode

Function	UNII Band	Channel	Channel Frequency (MHz)	Maximum Conducted Output Power		Limit		Result
				(dBm)	(W)	(dBm)	(W)	
Client	Band 1	Low	5180	11.39	0.0138	24.00	0.2512	PASS
		Middle	5220	11.44	0.0139	24.00	0.2512	PASS
		High	5240	11.60	0.0145	24.00	0.2512	PASS
Master	Band 1	Low	5180	11.39	0.0138	30.00	1.0000	PASS
		Middle	5220	11.44	0.0139	30.00	1.0000	PASS
		High	5240	11.60	0.0145	30.00	1.0000	PASS

Remark:

1. At final test to get the worst-case emission at 6Mbps.
2. The cable assembly insertion loss of 11.5 dB (including 10 dB pad and 1.5 dB cable) was entered as an offset in the power meter to allow for direct reading of power.
3. The maximum antenna gain is 4.25 dBi which is less than 6dBi, the limit should be 24/30 dBm.

UNII Band	Channel	Channel Frequency (MHz)	Maximum Conducted Output Power		Limit		Result
			(dBm)	(W)	(dBm)	(W)	
Band 3	Low	5745	14.67	0.0293	30.00	1.0000	PASS
	Middle	5785	15.17	0.0329	30.00	1.0000	PASS
	High	5825	15.21	0.0332	30.00	1.0000	PASS

Remark:

1. At final test to get the worst-case emission at 6Mbps.
2. The cable assembly insertion loss of 11.5 dB (including 10 dB pad and 1.5 dB cable) was entered as an offset in the power meter to allow for direct reading of power.
3. The maximum antenna gain is 4.25 dBi which is less than 6dBi, the limit should be 30 dBm.

IEEE 802.11ac VHT20 NSS1/MCS0 Mode

Function	UNII Band	Channel	Channel Frequency (MHz)	Maximum Conducted Output Power		Limit		Result
				(dBm)	(W)	(dBm)	(W)	
Client	Band 1	Low	5180	11.64	0.0146	24.00	0.2512	PASS
		Middle	5220	11.31	0.0135	24.00	0.2512	PASS
		High	5240	11.40	0.0138	24.00	0.2512	PASS
Master	Band 1	Low	5180	11.64	0.0146	30.00	1.0000	PASS
		Middle	5220	11.31	0.0135	30.00	1.0000	PASS
		High	5240	11.40	0.0138	30.00	1.0000	PASS

Remark:

1. At final test to get the worst-case emission at 6.5Mbps.
2. The cable assembly insertion loss of 11.5 dB (including 10 dB pad and 1.5 dB cable) was entered as an offset in the power meter to allow for direct reading of power.
3. The maximum antenna gain is 4.25 dBi which is less than 6dBi, the limit should be 24/30 dBm.

UNII Band	Channel	Channel Frequency (MHz)	Maximum Conducted Output Power		Limit		Result
			(dBm)	(W)	(dBm)	(W)	
Band 3	Low	5745	14.47	0.0280	30.00	1.0000	PASS
	Middle	5785	15.08	0.0322	30.00	1.0000	PASS
	High	5825	15.13	0.0326	30.00	1.0000	PASS

Remark:

1. At final test to get the worst-case emission at 6.5Mbps.
2. The cable assembly insertion loss of 11.5 dB (including 10 dB pad and 1.5 dB cable) was entered as an offset in the power meter to allow for direct reading of power.
3. The maximum antenna gain is 4.25 dBi which is less than 6dBi, the limit should be 30 dBm.

IEEE 802.11ac VHT40 NSS1/MCS0 Mode

Function	UNII Band	Channel	Channel Frequency (MHz)	Maximum Conducted Output Power		Limit		Result
				(dBm)	(W)	(dBm)	(W)	
Client	Band 1	Low	5190	11.03	0.0127	24.00	0.2512	PASS
		High	5230	12.47	0.0177	24.00	0.2512	PASS
Master	Band 1	Low	5190	11.03	0.0127	30.00	1.0000	PASS
		High	5230	12.47	0.0177	30.00	1.0000	PASS

Remark:

1. At final test to get the worst-case emission at 13.5Mbps.
2. The cable assembly insertion loss of 11.5 dB (including 10 dB pad and 1.5 dB cable) was entered as an offset in the power meter to allow for direct reading of power.
3. The maximum antenna gain is 4.25 dBi which is less than 6dBi, the limit should be 24/30 dBm.

UNII Band	Channel	Channel Frequency (MHz)	Maximum Conducted Output Power		Limit		Result
			(dBm)	(W)	(dBm)	(W)	
Band 3	Low	5755	14.87	0.0307	30.00	1.0000	PASS
	High	5795	15.23	0.0333	30.00	1.0000	PASS

Remark:

1. At final test to get the worst-case emission at 13.5Mbps.
2. The cable assembly insertion loss of 11.5 dB (including 10 dB pad and 1.5 dB cable) was entered as an offset in the power meter to allow for direct reading of power.
3. The maximum antenna gain is 4.25 dBi which is less than 6dBi, the limit should be 30 dBm.

IEEE 802.11ac VHT80 NSS1/MCS0 Mode

Function	UNII Band	Channel	Channel Frequency (MHz)	Maximum Conducted Output Power		Limit		Result
				(dBm)	(W)	(dBm)	(W)	
Client	Band 1	Low	5210	9.73	0.0094	24.00	0.2512	PASS
Master	Band 1	Low	5210	9.73	0.0094	30.00	1.0000	PASS

Remark:

1. At final test to get the worst-case emission at 29.3 Mbps.
2. The cable assembly insertion loss of 11.5 dB (including 10 dB pad and 1.5 dB cable) was entered as an offset in the power meter to allow for direct reading of power.
3. The maximum antenna gain is 4.25 dBi which is less than 6dBi, the limit should be 24/30 dBm.

UNII Band	Channel	Channel Frequency (MHz)	Maximum Conducted Output Power		Limit		Result
			(dBm)	(W)	(dBm)	(W)	
Band 3	Low	5775	14.86	0.0306	30.00	1.0000	PASS

Remark:

1. At final test to get the worst-case emission at 29.3 Mbps.
2. The cable assembly insertion loss of 11.5 dB (including 10 dB pad and 1.5 dB cable) was entered as an offset in the power meter to allow for direct reading of power.
3. The maximum antenna gain is 4.25 dBi which is less than 6dBi, the limit should be 30 dBm.

7.5 PEAK POWER SPECTRAL DENSITY

LIMITS

§ 15.407 (a)

(1) For the band 5.15-5.25 GHz

- (I) For an outdoor access point operating in the band 5.15-5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W provided the maximum antenna gain does not exceed 6 dBi. In addition, the maximum power spectral density shall not exceed 17 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6dBi. The maximum e.i.r.p. at any elevation angle above 30 degrees as measured from the horizon must not exceed 125 mW (21 dBm).
- (II) For an indoor access point operating in the band 5.15-5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W provided the maximum antenna gain does not exceed 6 dBi. In addition, the maximum power spectral density shall not exceed 17 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6dBi.
- (III) For mobile and portable client devices in the 5.15-5.25 GHz band, the maximum conducted output power over the frequency band of operation shall not exceed 250 mW provided the maximum antenna gain does not exceed 6 dBi. In addition, the maximum power spectral density shall not exceed 11 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6dBi.

- (2) For the 5.25-5.35 GHz and 5.47-5.725 GHz bands, the maximum conducted output power over the frequency bands of operation shall not exceed the lesser of 250 mW or 11 dBm 10 log B, where B is the 26 dB emission bandwidth in megahertz. In addition, the maximum power spectral density shall not exceed 11 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.
- (3) For the band 5.725-5.85 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W. In addition, the maximum power spectral density shall not exceed 30 dBm in any 500-kHz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi. However, fixed point-to-point U-NII devices operating in this band may employ transmitting antennas with directional gain greater than 6 dBi without any corresponding reduction in transmitter conducted power. Fixed, point-to-point operations exclude the use of point-to-multipoint systems, omnidirectional applications, and multiple collocated transmitters transmitting the same information. The operator of the U-NII device, or if the equipment is professionally installed, the installer, is responsible for ensuring that systems employing high gain directional antennas are used exclusively for fixed, point-to-point operations.

§ 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:

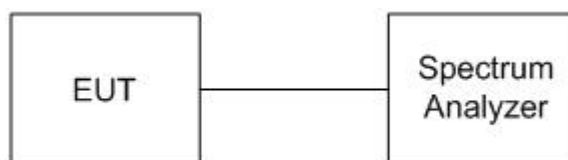
Directional gain may be calculated by using the formulas applicable to equal gain antennas with G_{ANT} set equal to the gain of the antenna having the highest gain; or,

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

TEST EQUIPMENT

Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
EXA Signal Analyzer	Agilent	N9010A	MY52220817	03/07/2018
Test S/W	N/A			

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

TEST SETUP**TEST PROCEDURE**

1. Place the EUT on the table and set it in transmitting mode.
Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.
2. Set the spectrum analyzer as RBW = 1MHz, VBW = 3MHz, Span = Sweep= AUTO
3. Record the max. reading.
4. Repeat the above procedure until the measurements for all frequencies are completed.

TEST RESULTS

Product Name	IP Phone	Test By	Rex Chiu
Test Model	OBI2182	Test Date	2017/10/17
Test Mode	TX Mode	Temp. & Humidity	27°C, 58%

IEEE 802.11a Mode

Function	UNII Band	Channel	Channel Frequency (MHz)	Peak Power Spectral Density (dBm/MHz)		Result
				Measured Value	Limit	
Client	Band 1	Low	5180	0.726	11	PASS
		Middle	5220	0.591	11	PASS
		High	5240	0.454	11	PASS
Master	Band 1	Low	5180	0.726	17	PASS
		Middle	5220	0.591	17	PASS
		High	5240	0.454	17	PASS

Remark:

1. At final test to get the worst-case emission at 6Mbps.
2. The cable assembly insertion loss of 11.5 dB (including 10 dB pad and 1.5 dB cable) was entered as an offset in the spectrum analyzer to allow for direct reading of power.
3. The maximum antenna gain is 4.25 dBi which is less than 6dBi, the limit should be 11/17 dBm.

UNII Band	Channel	Channel Frequency (MHz)	Peak Power Spectral Density (dBm/500kHz)		Result
			Measured Value	Limit	
Band 3	Low	5745	2.992	30	PASS
	Middle	5785	3.617	30	PASS
	High	5825	3.581	30	PASS

Remark:

1. At final test to get the worst-case emission at 6Mbps.
2. The cable assembly insertion loss of 11.5 dB (including 10 dB pad and 1.5 dB cable) was entered as an offset in the spectrum analyzer to allow for direct reading of power.
3. The maximum antenna gain is 4.25 dBi which is less than 6dBi, the limit should be 30 dBm.

IEEE 802.11ac VHT20 NSS1/MCS0 Mode

Function	UNII Band	Channel	Channel Frequency (MHz)	Peak Power Spectral Density (dBm/MHz)		Result
				Measured Value	Limit	
Client	Band 1	Low	5180	0.044	11	PASS
		Middle	5220	-0.196	11	PASS
		High	5240	0.161	11	PASS
Master	Band 1	Low	5180	0.044	17	PASS
		Middle	5220	-0.196	17	PASS
		High	5240	0.161	17	PASS

Remark:

1. At final test to get the worst-case emission at 6.5Mbps.
2. The cable assembly insertion loss of 11.5 dB (including 10 dB pad and 1.5 dB cable) was entered as an offset in the spectrum analyzer to allow for direct reading of power.
3. The maximum antenna gain is 4.25 dBi which is less than 6dBi, the limit should be 11/17 dBm.

UNII Band	Channel	Channel Frequency (MHz)	Peak Power Spectral Density (dBm/500kHz)		Result
			Measured Value	Limit	
Band 3	Low	5745	2.338	30	PASS
	Middle	5785	3.178	30	PASS
	High	5825	3.532	30	PASS

Remark:

1. At final test to get the worst-case emission at 6.5Mbps.
2. The cable assembly insertion loss of 11.5 dB (including 10 dB pad and 1.5 dB cable) was entered as an offset in the spectrum analyzer to allow for direct reading of power.
3. The maximum antenna gain is 4.25 dBi which is less than 6dBi, the limit should be 30 dBm.

IEEE 802.11ac VHT40 NSS1/MCS0 Mode

Function	UNII Band	Channel	Channel Frequency (MHz)	Peak Power Spectral Density (dBm/MHz)		Result
				Measured Value	Limit	
Client	Band 1	Low	5190	-3.421	11	PASS
		High	5230	-2.080	11	PASS
Master	Band 1	Low	5190	-3.421	17	PASS
		High	5230	-2.080	17	PASS

Remark:

1. At final test to get the worst-case emission at 13.5Mbps.
2. The cable assembly insertion loss of 11.5 dB (including 10 dB pad and 1.5 dB cable) was entered as an offset in the spectrum analyzer to allow for direct reading of power.
3. The maximum antenna gain is 4.25 dBi which is less than 6dBi, the limit should be 11/17 dBm.

UNII Band	Channel	Channel Frequency (MHz)	Peak Power Spectral Density (dBm/500kHz)		Result
			Measured Value	Limit	
Band 3	Low	5755	0.049	30	PASS
	High	5795	0.305	30	PASS

Remark:

1. At final test to get the worst-case emission at 13.5Mbps.
2. The cable assembly insertion loss of 11.5 dB (including 10 dB pad and 1.5 dB cable) was entered as an offset in the spectrum analyzer to allow for direct reading of power.
3. The maximum antenna gain is 4.25 dBi which is less than 6dBi, the limit should be 30 dBm.

IEEE 802.11ac VHT80 NSS1/MCS0 Mode

Function	UNII Band	Channel	Channel Frequency (MHz)	Peak Power Spectral Density (dBm/MHz)		Result
				Measured Value	Limit	
Client	Band 1	Low	5210	-6.944	11	PASS
Master	Band 1	Low	5210	-6.944	17	PASS

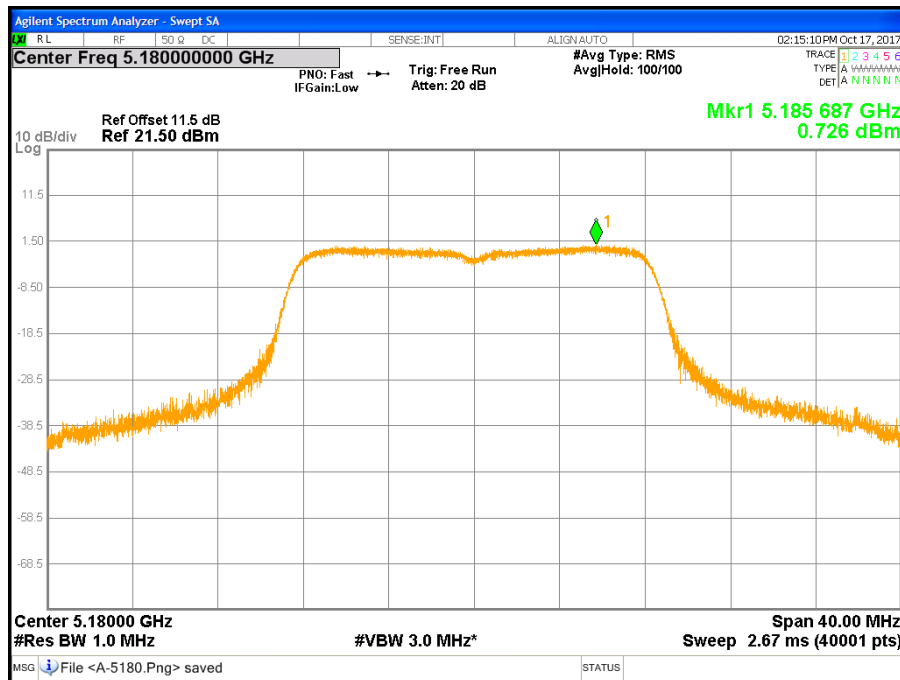
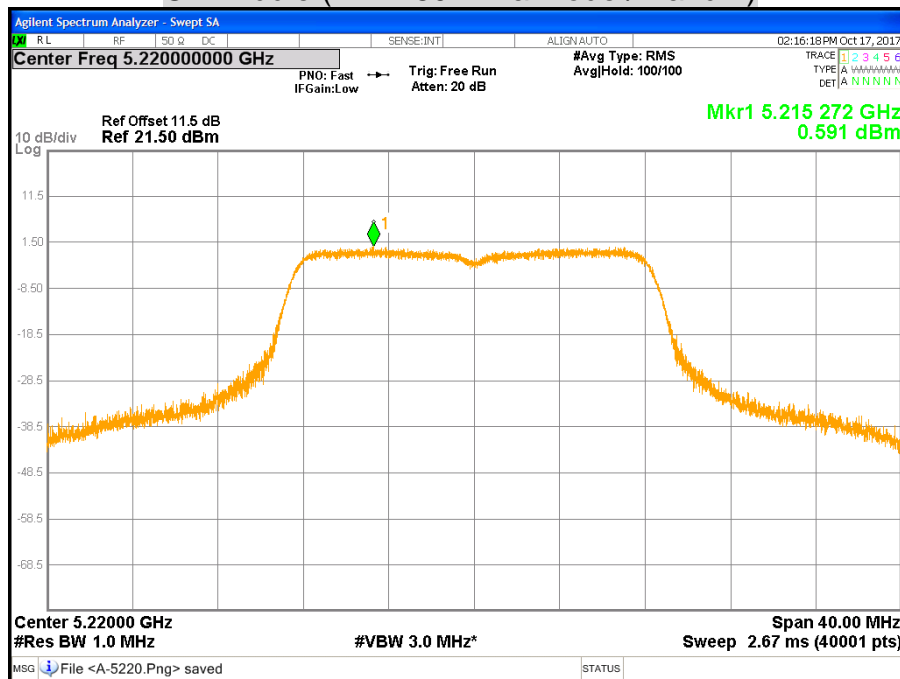
Remark:

1. At final test to get the worst-case emission at 29.3 Mbps.
2. The cable assembly insertion loss of 11.5 dB (including 10 dB pad and 1.5 dB cable) was entered as an offset in the spectrum analyzer to allow for direct reading of power.
3. The maximum antenna gain is 4.25 dBi which is less than 6dBi, the limit should be 11/17 dBm.

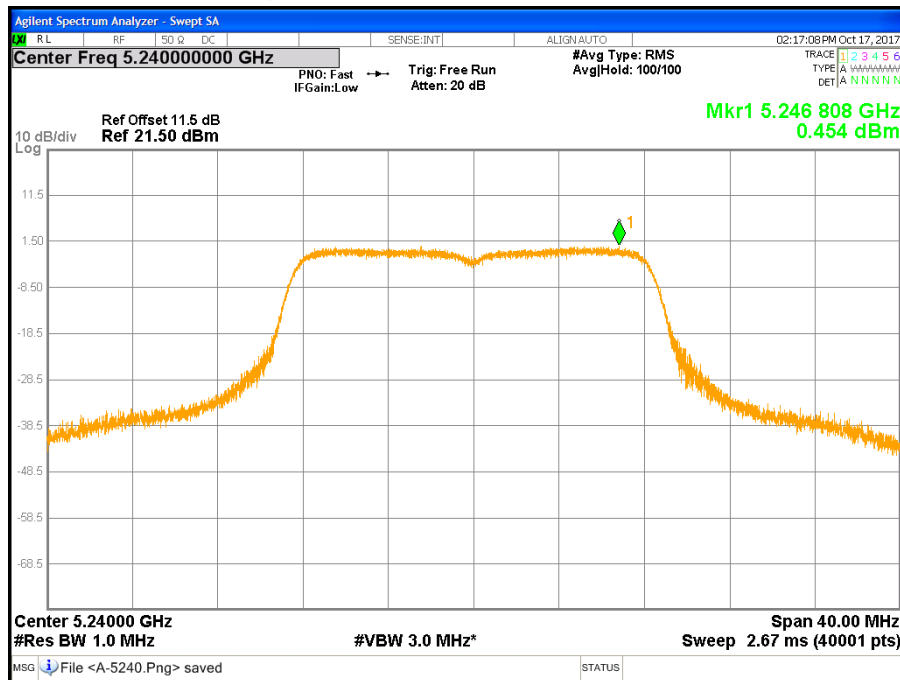
UNII Band	Channel	Channel Frequency (MHz)	Peak Power Spectral Density (dBm/500kHz)		Result
			Measured Value	Limit	
Band 3	Low	5775	-1.898	30	PASS

Remark:

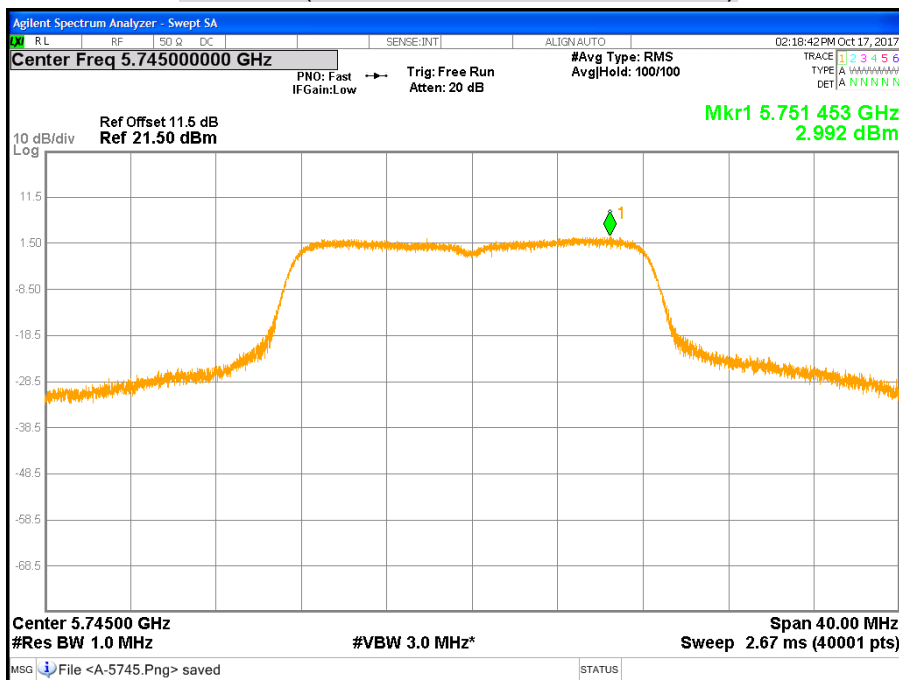
1. At final test to get the worst-case emission at 29.3 Mbps.
2. The cable assembly insertion loss of 11.5 dB (including 10 dB pad and 1.5 dB cable) was entered as an offset in the spectrum analyzer to allow for direct reading of power.
3. The maximum antenna gain is 4.25 dBi which is less than 6dBi, the limit should be 30 dBm.

POWER SPECTRAL DENSITY**CH Low (IEEE 802.11a Mode / Band 1)****CH Middle (IEEE 802.11a Mode / Band 1)**

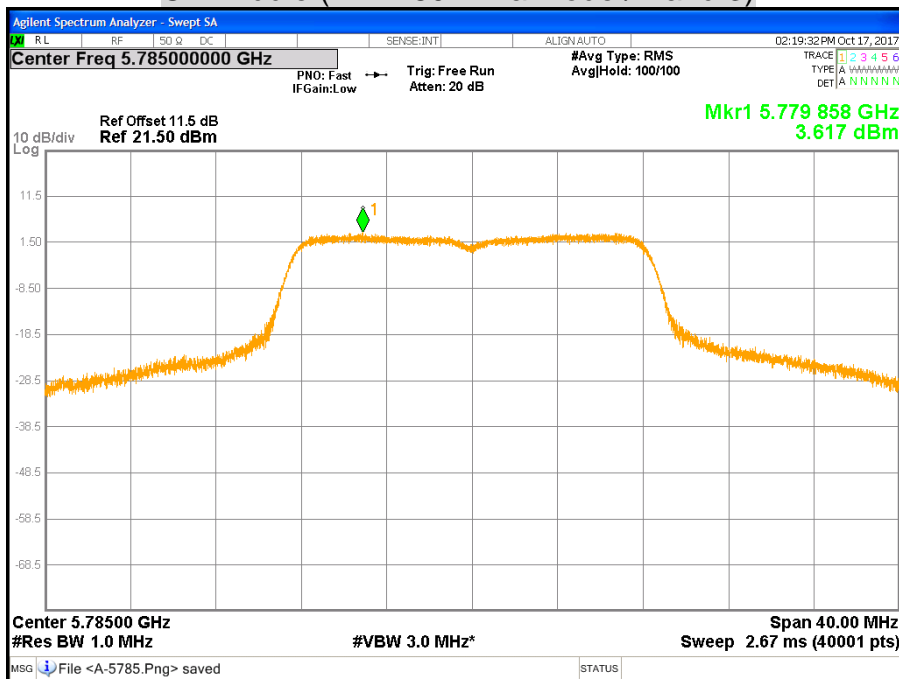
CH High (IEEE 802.11a Mode / Band 1)



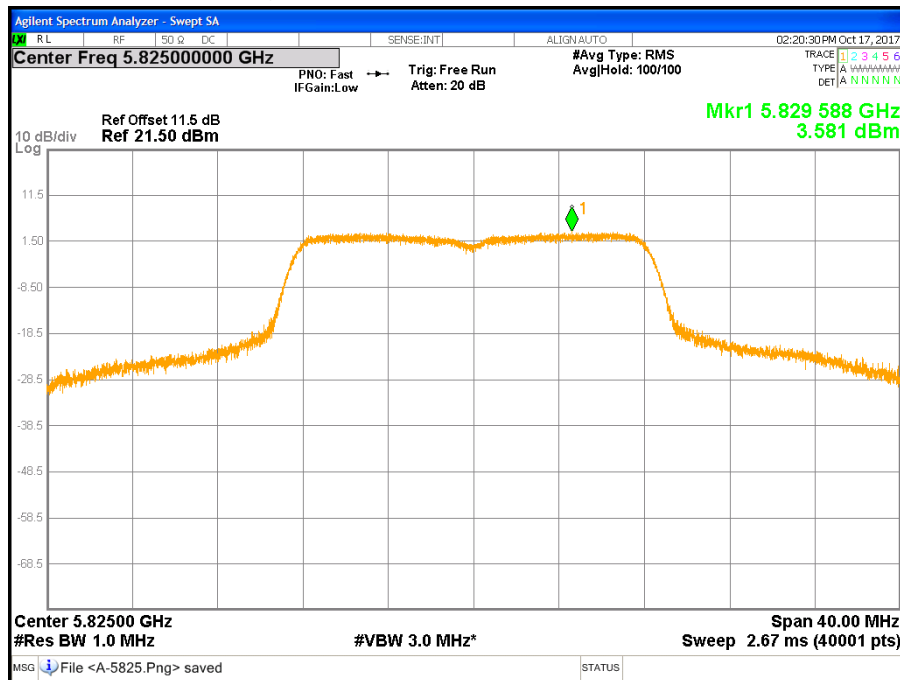
CH Low (IEEE 802.11a Mode / Band 3)



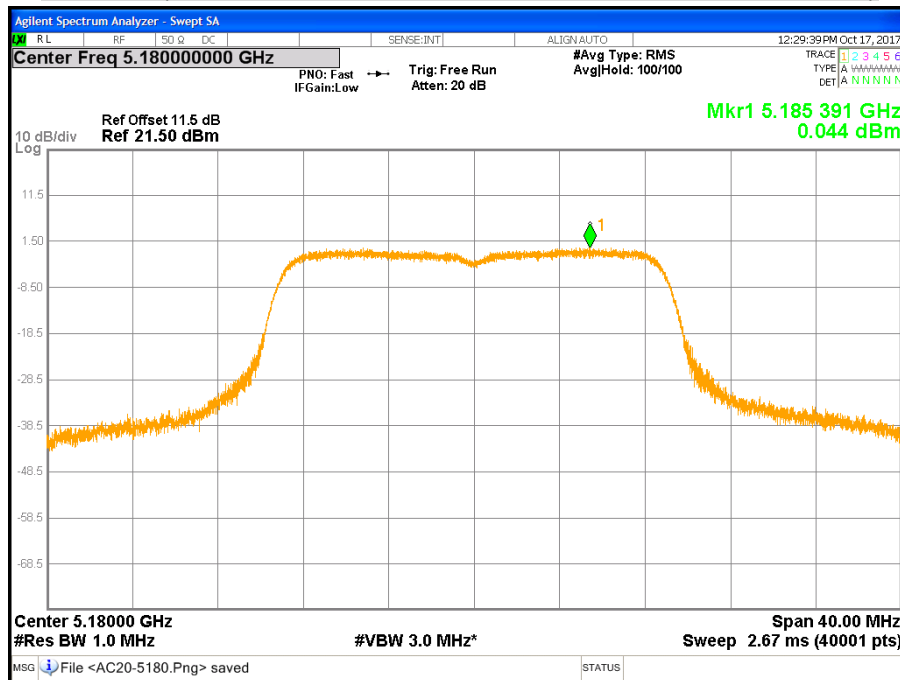
CH Middle (IEEE 802.11a Mode / Band 3)



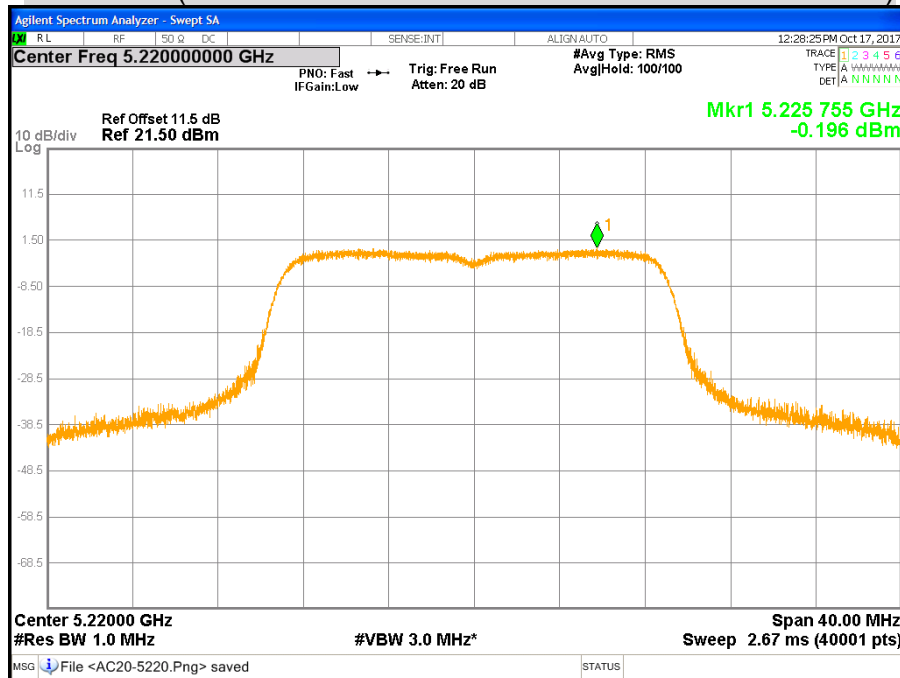
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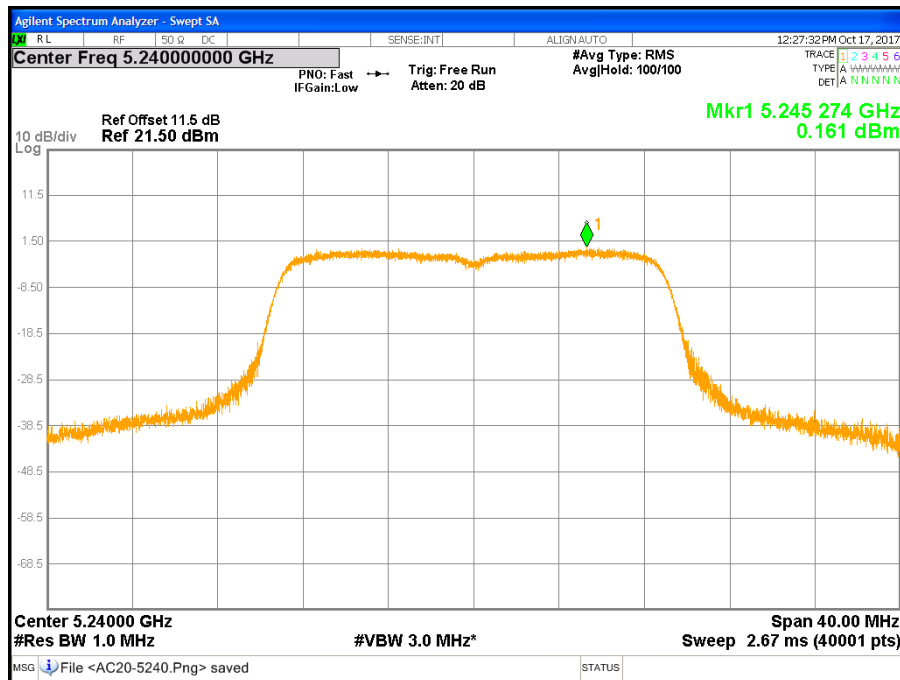
CH Low (IEEE 802.11ac VHT20 NSS1/MCS0 Mode / Band 1)



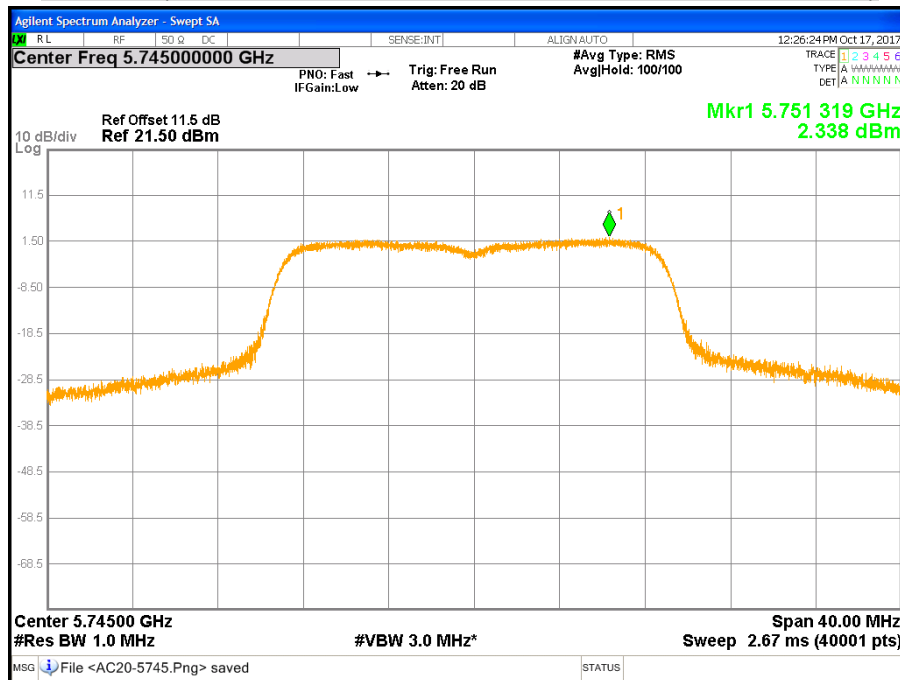
CH Middle (IEEE 802.11ac VHT20 NSS1/MCS0 Mode / Band 1)



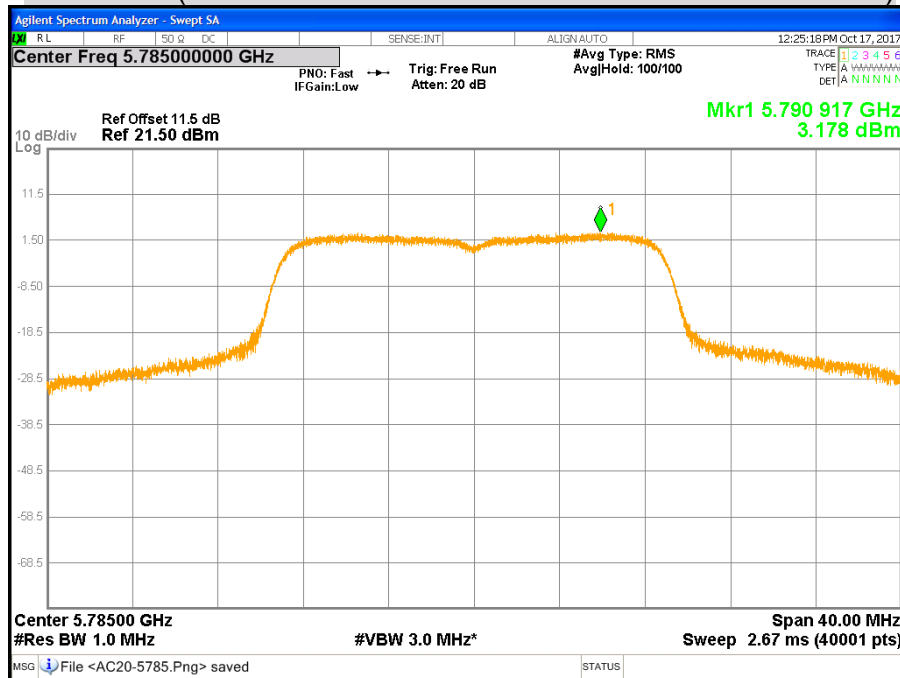
CH High (IEEE 802.11ac VHT20 NSS1/MCS0Mode / Band 1)



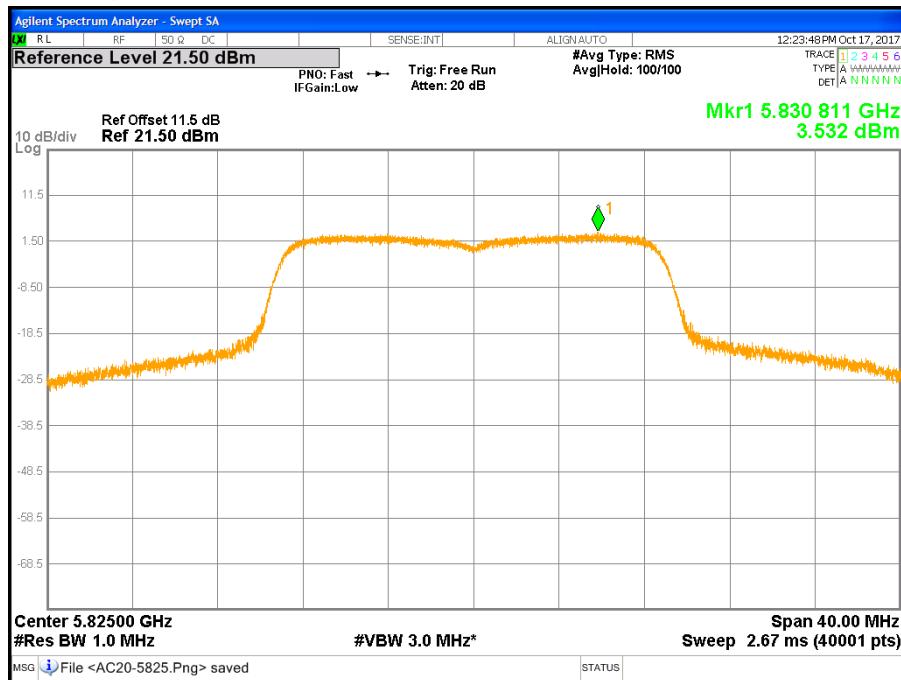
CH Low (IEEE 802.11ac VHT20 NSS1/MCS0 Mode / Band 3)



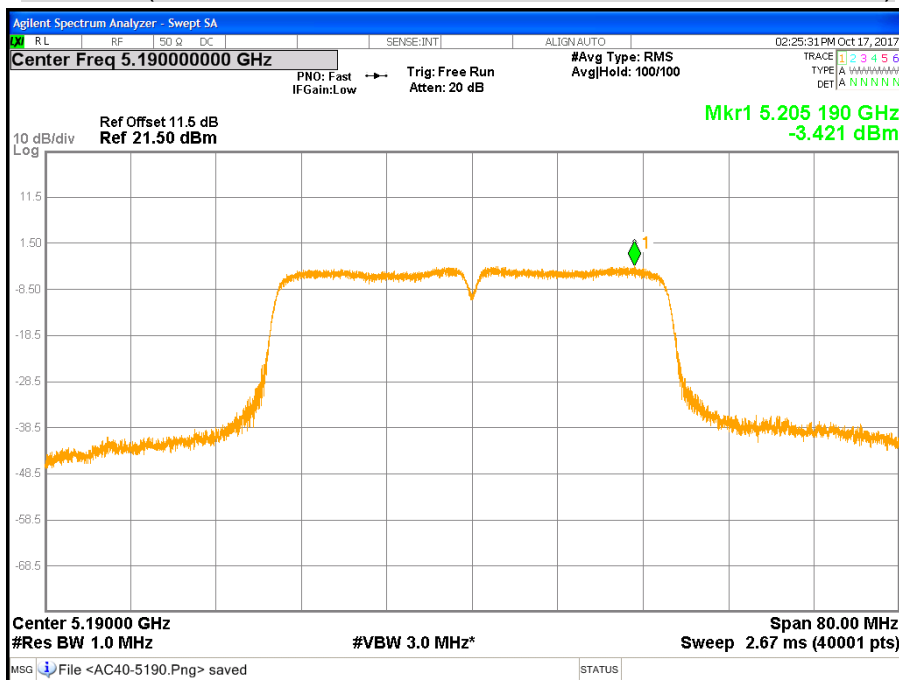
CH Middle (IEEE 802.11ac VHT20 NSS1/MCS0 Mode / Band 3)



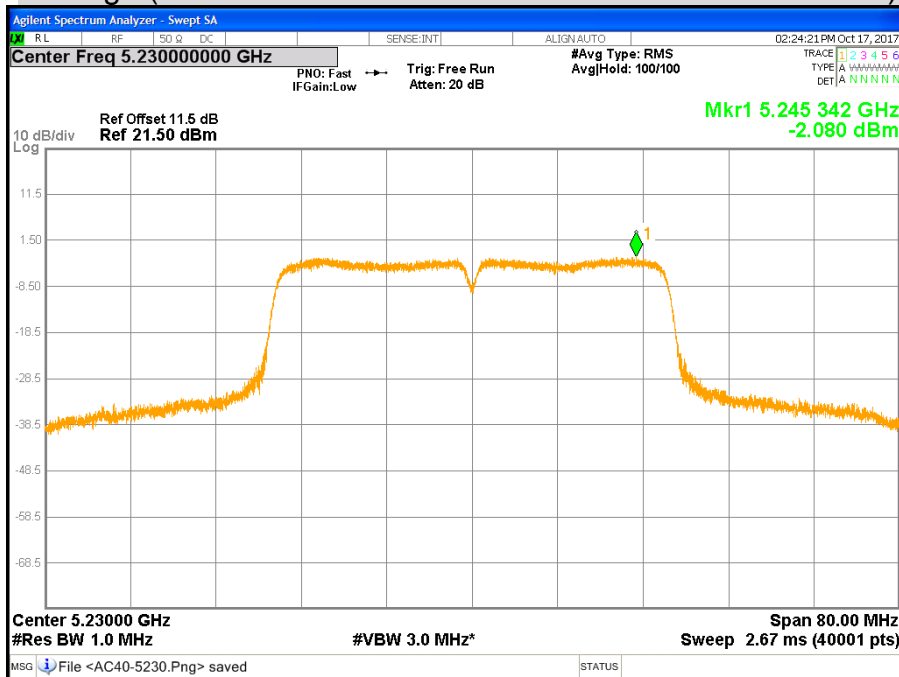
CH High (IEEE 802.11ac VHT20 NSS1/MCS0 Mode / Band 3)



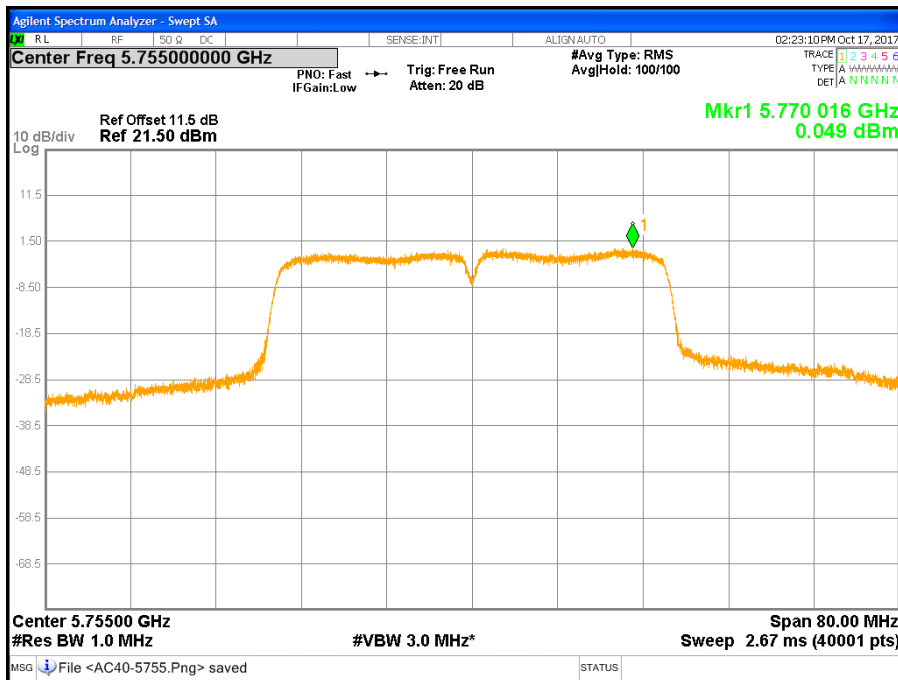
CH Low (IEEE 802.11ac VHT40 NSS1/MCS0 Mode / Band 1)



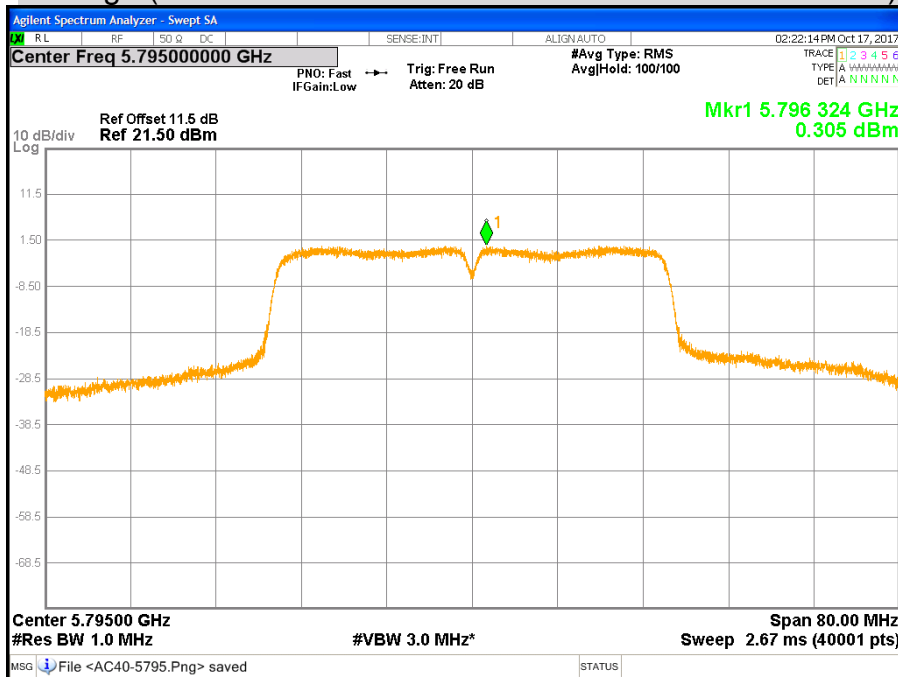
CH High (IEEE 802.11ac VHT40 NSS1/MCS0 Mode / Band 1)



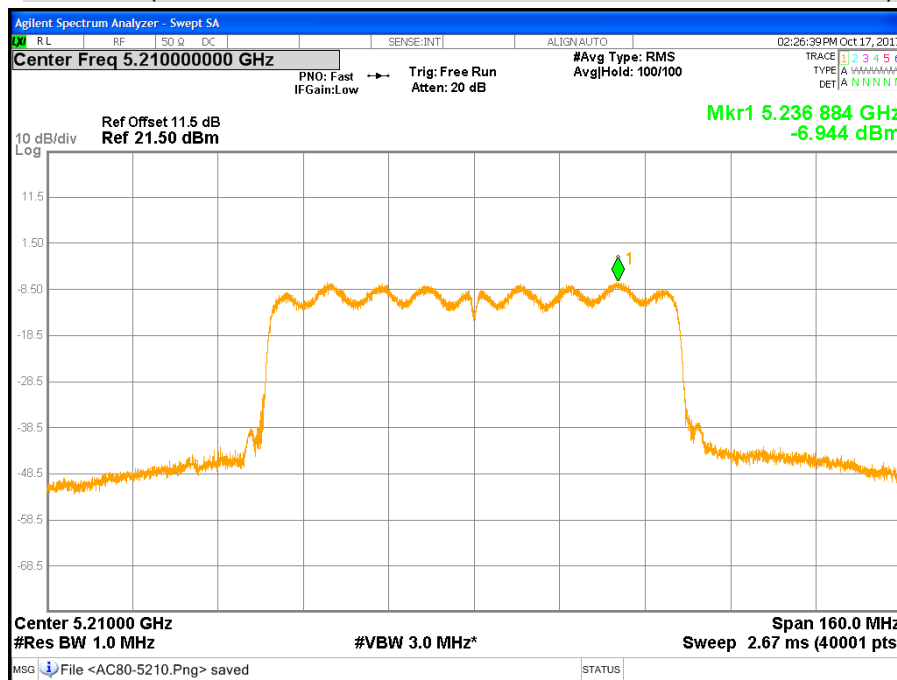
CH Low (IEEE 802.11ac VHT40 NSS1/MCS0 Mode / Band 3)



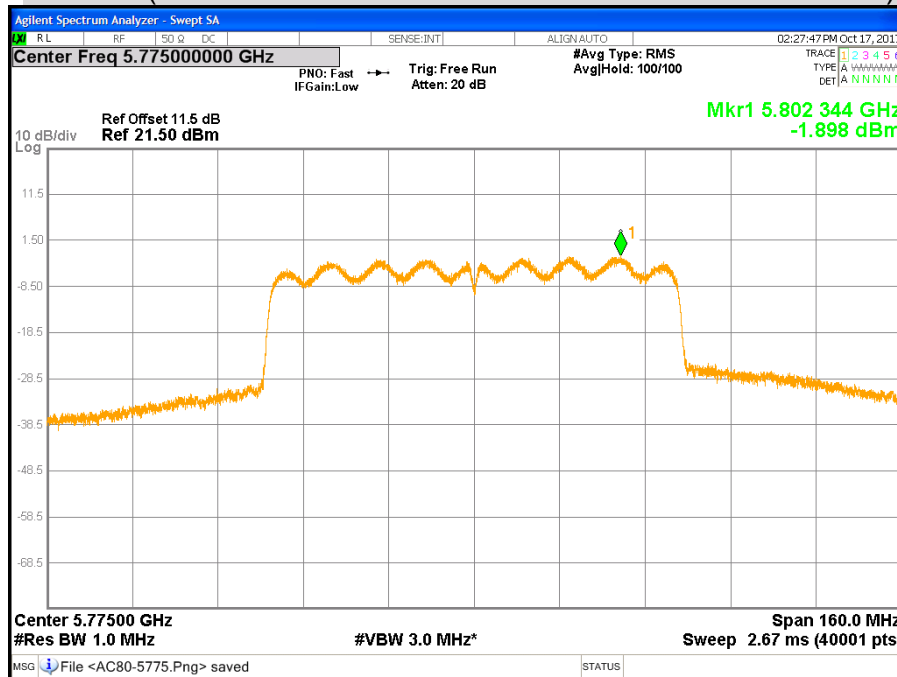
CH High (IEEE 802.11ac VHT40 NSS1/MCS0 Mode / Band 3)



CH Low (IEEE 802.11ac VHT80 NSS1/MCS0 Mode / Band 1)



CH Low (IEEE 802.11ac VHT80 NSS1/MCS0 Mode / Band 3)



7.6 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) of this section, the field strength of emissions appearing within these frequency bands shall not exceed the limits shown in §15.209. At frequencies equal to or less than 1000 MHz, compliance with the limits in §15.209 shall be demonstrated using measurement instrumentation employing a CISPR quasi-peak detector. Above 1000 MHz, compliance with the emission limits in §15.209 shall be demonstrated based on the average value of the measured emissions. The provisions in §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.
- (5) According to § 15.407 (4)(i), for transmitters operating in the 5.725-5.85 GHz band, all emissions shall be limited to a level of -27 dBm/MHz at 75 MHz or more above or below the band edge increasing linearly to 10 dBm/MHz at 25 MHz above or below the band edge, and from 25 MHz above or below the band edge increasing linearly to a level of 15.6 dBm/MHz at 5 MHz above or below the band edge, and from 5 MHz above or below the band edge increasing linearly to a level of 27 dBm/MHz at the band edge.

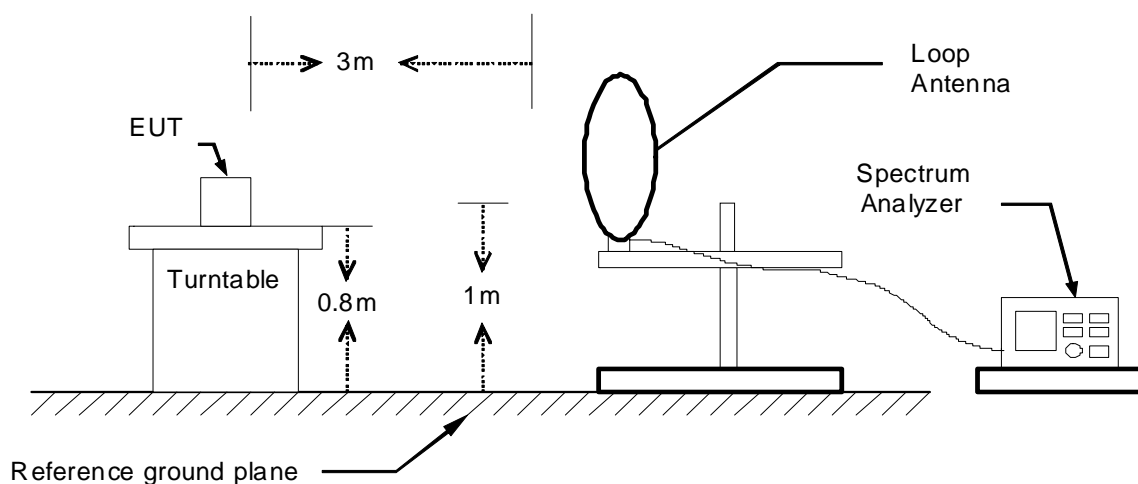
TEST EQUIPMENT**Radiated Emission / 966Chamber_C**

Name of Equipment	Manufacture	Model	Serial Number	Calibration Due
Spectrum Analyzer	Agilent	E4446A	MY48250064	04/19/2018
EMI Test Receiver	Rohde & Schwarz	ESCI	100782	06/11/2018
Bi-log Antenna	TESEQ	CBL 6112D	35404	08/06/2018
Broad-Band Horn Antenna	Schwarzbeck	BBHA 9120 D	9120D-285	04/24/2018
Pre-Amplifier	EMCI	EMC001625	980243	04/10/2018
Pre-Amplifier	COM-POWER	PAM-118A	551043	04/10/2018
Double Ridged Guide Horn Antenna	ETS • LINDGREN	3117	00078732	07/05/2018
Horn Antenna	COM-POWER	AH-840	03077	12/01/2017
Loop Antenna	COM-POWER	AL-130	121060	05/14/2018
Test S/W	E3.815206a			

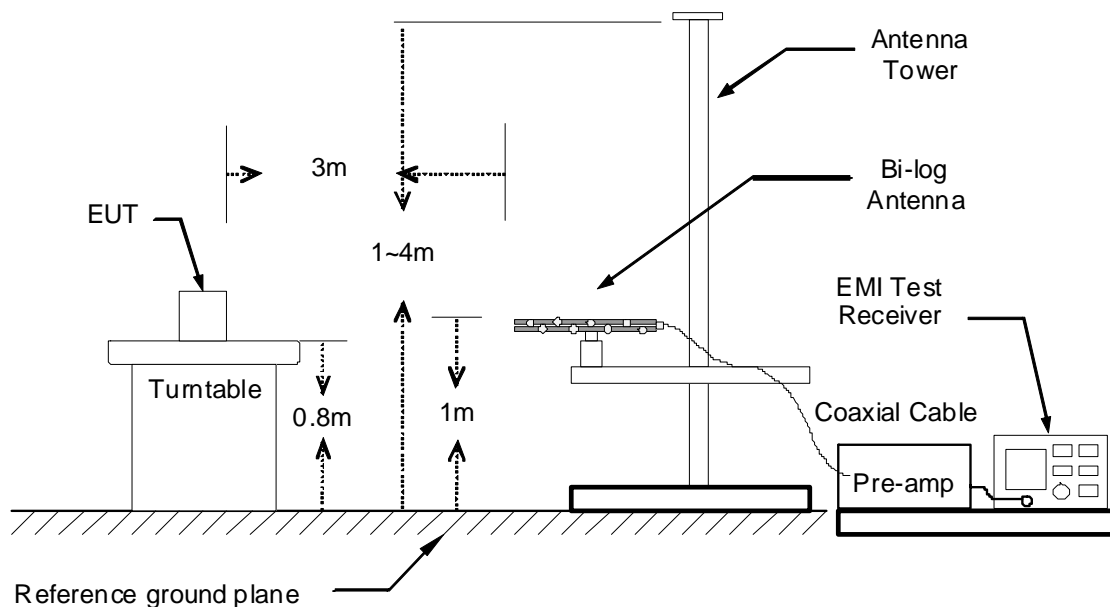
Remark: Each piece of equipment is scheduled for calibration once a year.

TEST SETUP

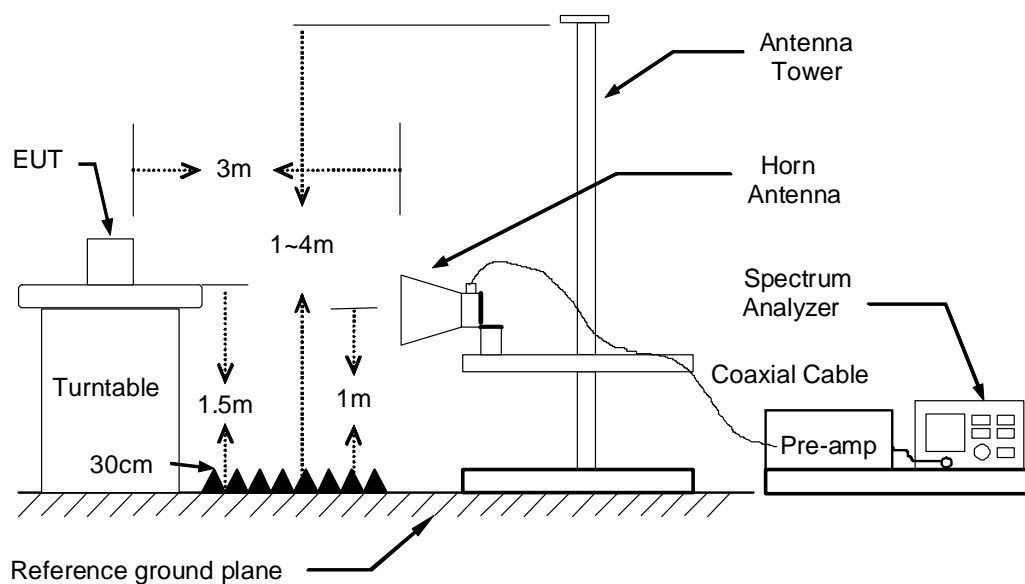
The diagram below shows the test setup that is utilized to make the measurements for emission below 1GHz.

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	IP Phone	Test By	Rex Chiu
Test Model	OBI2182	Test Date	2017/10/12
Test Mode	UNII Band 1 / Mode 1	Temp. & Humidity	25°C, 50%

966Chamber_C at 3Meter / Horizontal

Freq. MHz	Reading dBuV	C.F. dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Azimuth deg	Height cm	Remark
132.82	39.82	-6.60	33.22	43.50	-10.28	228	200	Peak
238.55	42.90	-6.67	36.23	46.00	-9.77	332	100	Peak
250.19	44.56	-5.40	39.16	46.00	-6.84	251	100	Peak
375.32	45.45	-3.04	42.41	46.00	-3.59	323	100	Peak
625.58	32.52	1.05	33.57	46.00	-12.43	132	200	Peak
850.62	33.51	2.81	36.32	46.00	-9.68	178	100	Peak
875.84	36.88	2.79	39.67	46.00	-6.33	160	100	Peak

966Chamber_C at 3Meter / Vertical

Freq. MHz	Reading dBuV	C.F. dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Azimuth deg	Height cm	Remark
54.25	45.74	-11.22	34.52	40.00	-5.48	265	100	Peak
250.19	40.46	-5.40	35.06	46.00	-10.94	193	200	Peak
375.32	40.73	-3.04	37.69	46.00	-8.31	156	100	Peak
515.97	36.30	-0.07	36.23	46.00	-9.77	102	100	Peak
649.83	35.12	1.45	36.57	46.00	-9.43	341	100	Peak
750.71	32.96	2.38	35.34	46.00	-10.66	356	200	Peak
850.62	30.64	2.81	33.45	46.00	-12.55	136	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	IP Phone	Test By	Rex Chiu
Test Model	OBI2182	Test Date	2017/10/12
Test Mode	UNII Band 3 / Mode 1	Temp. & Humidity	25°C, 50%

966Chamber_C at 3Meter / Horizontal

Freq. MHz	Reading dBuV	C.F. dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Azimuth deg	Height cm	Remark
=====								
137.67	41.37	-6.91	34.46	43.50	-9.04	259	200	Peak
238.55	42.65	-6.67	35.98	46.00	-10.02	326	100	Peak
250.19	44.20	-5.40	38.80	46.00	-7.20	265	100	Peak
375.32	45.40	-3.04	42.36	46.00	-3.64	342	100	Peak
625.58	33.66	1.05	34.71	46.00	-11.29	126	100	Peak
649.83	33.43	1.45	34.88	46.00	-11.12	142	100	Peak
875.84	36.53	2.79	39.32	46.00	-6.68	166	100	Peak

966Chamber_C at 3Meter / Vertical

Freq. MHz	Reading dBuV	C.F. dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Azimuth deg	Height cm	Remark
=====								
52.31	45.38	-10.93	34.45	40.00	-5.55	343	100	Peak
250.19	40.58	-5.40	35.18	46.00	-10.82	204	200	Peak
375.32	41.20	-3.04	38.16	46.00	-7.84	149	100	Peak
450.01	37.63	-1.39	36.24	46.00	-9.76	353	100	Peak
512.09	34.66	-0.17	34.49	46.00	-11.51	10	100	Peak
625.58	33.53	1.05	34.58	46.00	-11.42	335	100	Peak
941.80	31.40	2.88	34.28	46.00	-11.72	207	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 1GHz

Product Name	IP Phone	Test By	Rex Chiu
Test Model	OBI2182	Test Date	2017/10/05
Test Mode	UNII Band 1 / IEEE 802.11a Mode TX / CH Low	Temp. & Humidity	25°C, 50%

966Chamber_C at 3Meter / Horizontal

Freq. MHz	Reading dBuV	C.F. dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Azimuth deg	Height cm	Remark
1500.00	49.22	-6.49	42.73	74.00	-31.27	359	200	Peak
1875.00	50.57	-5.67	44.90	74.00	-29.10	30	100	Peak
5375.00	41.09	3.76	44.85	74.00	-29.15	164	200	Peak
6372.00	39.17	8.33	47.50	74.00	-26.50	44	100	Peak
8448.00	40.39	11.19	51.58	74.00	-22.42	215	100	Peak
10368.00	35.90	12.33	48.23	54.00	-5.77	360	200	Average
10368.00	46.08	12.33	58.41	74.00	-15.59	360	200	Peak

966Chamber_C at 3Meter / Vertical

Freq. MHz	Reading dBuV	C.F. dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Azimuth deg	Height cm	Remark
1135.00	53.58	-8.38	45.20	74.00	-28.80	12	200	Peak
1875.00	49.51	-5.67	43.84	74.00	-30.16	346	200	Peak
5405.00	42.36	3.80	46.16	74.00	-27.84	3	200	Peak
6528.00	39.24	8.23	47.47	74.00	-26.53	273	100	Peak
7776.00	41.36	9.87	51.23	74.00	-22.77	97	200	Peak
10356.00	39.90	12.35	52.25	54.00	-1.75	355	200	Average
10356.00	51.96	12.35	64.31	74.00	-9.69	355	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	IP Phone	Test By	Rex Chiu
Test Model	OBI2182	Test Date	2017/10/05
Test Mode	UNII Band 1 / IEEE 802.11a Mode TX / CH Middle	Temp. & Humidity	25°C, 50%

966Chamber_C at 3Meter / Horizontal

Freq. MHz	Reading dBuV	C.F. dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Azimuth deg	Height cm	Remark
=====								
1875.00	49.50	-5.67	43.83	74.00	-30.17	37	100	Peak
4805.00	41.91	2.72	44.63	74.00	-29.37	292	200	Peak
5460.00	41.19	3.88	45.07	74.00	-28.93	353	200	Peak
6384.00	39.45	8.32	47.77	74.00	-26.23	130	200	Peak
8520.00	40.77	11.37	52.14	74.00	-21.86	106	200	Peak
10440.00	34.30	12.16	46.46	54.00	-7.54	134	200	Average
10440.00	45.06	12.16	57.22	74.00	-16.78	134	200	Peak

966Chamber_C at 3Meter / Vertical

Freq. MHz	Reading dBuV	C.F. dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Azimuth deg	Height cm	Remark
=====								
1125.00	55.64	-8.43	47.21	74.00	-26.79	359	100	Peak
5045.00	42.21	3.28	45.49	74.00	-28.51	120	200	Peak
5440.00	40.92	3.85	44.77	74.00	-29.23	33	100	Peak
6216.00	39.01	8.49	47.50	74.00	-26.50	0	100	Peak
8544.00	40.44	11.40	51.84	74.00	-22.16	299	100	Peak
10440.00	40.80	12.16	52.96	54.00	-1.04	357	200	Average
10440.00	51.99	12.16	64.15	74.00	-9.85	357	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	IP Phone	Test By	Rex Chiu
Test Model	OBI2182	Test Date	2017/10/05
Test Mode	UNII Band 1 / IEEE 802.11a Mode TX / CH High	Temp. & Humidity	25°C, 50%

966Chamber_C at 3Meter / Horizontal

Freq. MHz	Reading dBuV	C.F. dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Azimuth deg	Height cm	Remark
=====								
1500.00	47.31	-6.49	40.82	74.00	-33.18	351	200	Peak
1875.00	49.86	-5.67	44.19	74.00	-29.81	34	100	Peak
5355.00	41.11	3.73	44.84	74.00	-29.16	236	100	Peak
6240.00	38.62	8.47	47.09	74.00	-26.91	113	100	Peak
8436.00	40.82	11.16	51.98	74.00	-22.02	230	200	Peak
10476.00	37.20	12.08	49.28	54.00	-4.72	129	200	Average
10476.00	45.10	12.08	57.18	74.00	-16.82	129	200	Peak

966Chamber_C at 3Meter / Vertical

Freq. MHz	Reading dBuV	C.F. dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Azimuth deg	Height cm	Remark
=====								
1500.00	51.85	-6.49	45.36	74.00	-28.64	335	200	Peak
1875.00	49.69	-5.67	44.02	74.00	-29.98	340	200	Peak
5400.00	41.24	3.80	45.04	74.00	-28.96	156	100	Peak
6408.00	39.53	8.29	47.82	74.00	-26.18	253	100	Peak
8508.00	40.29	11.36	51.65	74.00	-22.35	108	100	Peak
10476.00	41.07	12.08	53.15	54.00	-0.85	360	200	Average
10476.00	48.95	12.08	61.03	74.00	-12.97	360	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	IP Phone	Test By	Rex Chiu
Test Model	OBI2182	Test Date	2017/10/05 2017/10/06
Test Mode	UNII Band 1 / IEEE 802.11ac VHT20 NSS1/MCS0 Mode TX / CH Low	Temp. & Humidity	25°C, 50%

966Chamber_C at 3Meter / Horizontal

Freq. MHz	Reading dBuV	C.F. dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Azimuth deg	Height cm	Remark
=====								
1500.00	47.62	-6.49	41.13	74.00	-32.87	349	200	Peak
1875.00	48.91	-5.67	43.24	74.00	-30.76	46	100	Peak
5385.00	40.81	3.77	44.58	74.00	-29.42	219	100	Peak
6312.00	39.09	8.39	47.48	74.00	-26.52	299	100	Peak
8496.00	40.53	11.34	51.87	74.00	-22.13	260	200	Peak
10356.00	34.60	12.35	46.95	54.00	-7.05	246	200	Average
10356.00	44.01	12.35	56.36	74.00	-17.64	246	200	Peak

966Chamber_C at 3Meter / Vertical

Freq. MHz	Reading dBuV	C.F. dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Azimuth deg	Height cm	Remark
=====								
1500.00	49.04	-6.49	42.55	74.00	-31.45	322	200	Peak
1875.00	50.70	-5.67	45.03	74.00	-28.97	345	200	Peak
5410.00	41.38	3.81	45.19	74.00	-28.81	52	200	Peak
6504.00	39.20	8.20	47.40	74.00	-26.60	72	100	Peak
8532.00	40.52	11.39	51.91	74.00	-22.09	16	100	Peak
10368.00	40.30	12.33	52.63	54.00	-1.37	360	200	Average
10368.00	50.00	12.33	62.33	74.00	-11.67	360	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	IP Phone	Test By	Rex Chiu
Test Model	OBI2182	Test Date	2017/10/05 2017/10/06
Test Mode	UNII Band 1 / IEEE 802.11ac VHT20 NSS1/MCS0 Mode TX / CH Middle	Temp. & Humidity	25°C, 50%

966Chamber_C at 3Meter / Horizontal

Freq. MHz	Reading dBuV	C.F. dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Azimuth deg	Height cm	Remark
=====								
1500.00	50.80	-6.49	44.31	74.00	-29.69	351	200	Peak
1875.00	53.68	-5.67	48.01	74.00	-25.99	41	100	Peak
5415.00	41.96	3.82	45.78	74.00	-28.22	116	200	Peak
6492.00	40.02	8.21	48.23	74.00	-25.77	104	100	Peak
7788.00	40.52	9.87	50.39	74.00	-23.61	304	100	Peak
10440.00	33.00	12.16	45.16	54.00	-8.84	333	200	Average
10440.00	44.14	12.16	56.30	74.00	-17.70	333	200	Peak

966Chamber_C at 3Meter / Vertical

Freq. MHz	Reading dBuV	C.F. dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Azimuth deg	Height cm	Remark
=====								
1150.00	59.51	-8.30	51.21	74.00	-22.79	318	100	Peak
1875.00	55.44	-5.67	49.77	74.00	-24.23	340	200	Peak
5435.00	42.36	3.85	46.21	74.00	-27.79	113	200	Peak
6396.00	39.02	8.31	47.33	74.00	-26.67	5	200	Peak
8460.00	40.73	11.23	51.96	74.00	-22.04	265	200	Peak
10440.00	40.65	12.16	52.81	54.00	-1.19	0	200	Average
10440.00	52.00	12.16	64.16	74.00	-9.84	0	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	IP Phone	Test By	Rex Chiu
Test Model	OBI2182	Test Date	2017/10/05 2017/10/06
Test Mode	UNII Band 1 / IEEE 802.11ac VHT20 NSS1/MCS0 Mode TX / CH High	Temp. & Humidity	25°C, 50%

966Chamber_C at 3Meter / Horizontal

Freq. MHz	Reading dBuV	C.F. dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Azimuth deg	Height cm	Remark
=====								
1500.00	51.24	-6.49	44.75	74.00	-29.25	0	200	Peak
1875.00	52.42	-5.67	46.75	74.00	-27.25	319	200	Peak
5365.00	42.35	3.75	46.10	74.00	-27.90	332	200	Peak
6240.00	38.78	8.47	47.25	74.00	-26.75	0	200	Peak
8412.00	40.43	11.08	51.51	74.00	-22.49	11	100	Peak
10476.00	34.30	12.08	46.38	54.00	-7.62	3	200	Average
10476.00	44.48	12.08	56.56	74.00	-17.44	3	200	Peak

966Chamber_C at 3Meter / Vertical

Freq. MHz	Reading dBuV	C.F. dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Azimuth deg	Height cm	Remark
=====								
1080.00	55.73	-8.67	47.06	74.00	-26.94	26	100	Peak
1875.00	55.55	-5.67	49.88	74.00	-24.12	348	200	Peak
5400.00	41.95	3.80	45.75	74.00	-28.25	59	200	Peak
6360.00	39.05	8.34	47.39	74.00	-26.61	169	100	Peak
7776.00	40.88	9.87	50.75	74.00	-23.25	162	200	Peak
10488.00	40.94	12.05	52.99	54.00	-1.01	360	200	Average
10488.00	51.19	12.05	63.24	74.00	-10.76	360	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	IP Phone	Test By	Rex Chiu
Test Model	OBI2182	Test Date	2017/10/05 2017/10/06
Test Mode	UNII Band 1 / IEEE 802.11ac VHT40 NSS1/MCS0 Mode TX / CH Low	Temp. & Humidity	25°C, 50%

966Chamber_C at 3Meter / Horizontal

Freq. MHz	Reading dBuV	C.F. dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Azimuth deg	Height cm	Remark
=====								
1500.00	50.68	-6.49	44.19	74.00	-29.81	0	200	Peak
1875.00	51.83	-5.67	46.16	74.00	-27.84	304	200	Peak
5425.00	41.49	3.83	45.32	74.00	-28.68	5	100	Peak
6504.00	38.89	8.20	47.09	74.00	-26.91	118	200	Peak
7776.00	42.02	9.87	51.89	74.00	-22.11	155	100	Peak
9384.00	40.38	11.88	52.26	74.00	-21.74	248	200	Peak

966Chamber_C at 3Meter / Vertical

Freq. MHz	Reading dBuV	C.F. dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Azimuth deg	Height cm	Remark
=====								
1135.00	47.90	-8.38	39.52	54.00	-14.48	340	200	Average
1135.00	61.33	-8.38	52.95	74.00	-21.05	340	200	Peak
1875.00	55.10	-5.67	49.43	74.00	-24.57	336	200	Peak
5385.00	42.33	3.77	46.10	74.00	-27.90	38	100	Peak
6408.00	39.52	8.29	47.81	74.00	-26.19	202	100	Peak
8388.00	41.49	11.01	52.50	74.00	-21.50	40	100	Peak
10380.00	37.60	12.30	49.90	54.00	-4.10	0	200	Average
10380.00	47.52	12.30	59.82	74.00	-14.18	0	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	IP Phone	Test By	Rex Chiu
Test Model	OBI2182	Test Date	2017/10/05 2017/10/06
Test Mode	UNII Band 1 / IEEE 802.11ac VHT40 NSS1/MCS0 Mode TX / CH High	Temp. & Humidity	25°C, 50%

966Chamber_C at 3Meter / Horizontal

Freq. MHz	Reading dBuV	C.F. dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Azimuth deg	Height cm	Remark
=====								
1500.00	50.14	-6.49	43.65	74.00	-30.35	356	100	Peak
1875.00	52.62	-5.67	46.95	74.00	-27.05	20	100	Peak
4845.00	41.76	2.82	44.58	74.00	-29.42	299	100	Peak
6360.00	39.48	8.34	47.82	74.00	-26.18	145	100	Peak
8508.00	40.64	11.36	52.00	74.00	-22.00	150	100	Peak
10464.00	35.20	12.10	47.30	54.00	-6.70	337	200	Average
10464.00	45.74	12.10	57.84	74.00	-16.16	337	200	Peak

966Chamber_C at 3Meter / Vertical

Freq. MHz	Reading dBuV	C.F. dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Azimuth deg	Height cm	Remark
=====								
1115.00	60.38	-8.48	51.90	74.00	-22.10	8	100	Peak
1875.00	55.72	-5.67	50.05	74.00	-23.95	339	200	Peak
5410.00	42.64	3.81	46.45	74.00	-27.55	31	100	Peak
6300.00	39.17	8.40	47.57	74.00	-26.43	359	200	Peak
8448.00	40.61	11.19	51.80	74.00	-22.20	61	100	Peak
10464.00	40.63	12.10	52.73	54.00	-1.27	0	200	Average
10464.00	52.65	12.10	64.75	74.00	-9.25	0	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	IP Phone	Test By	Rex Chiu
Test Model	OBI2182	Test Date	2017/10/05 2017/10/06
Test Mode	UNII Band 1 / IEEE 802.11ac VHT80 NSS1/MCS0 Mode TX / CH Low	Temp. & Humidity	25°C, 50%

966Chamber_C at 3Meter / Horizontal

Freq. MHz	Reading dBuV	C.F. dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Azimuth deg	Height cm	Remark
=====								
1500.00	50.70	-6.49	44.21	74.00	-29.79	355	200	Peak
1875.00	52.54	-5.67	46.87	74.00	-27.13	321	200	Peak
5440.00	41.11	3.85	44.96	74.00	-29.04	225	200	Peak
6324.00	39.71	8.38	48.09	74.00	-25.91	40	100	Peak
7740.00	41.16	9.88	51.04	74.00	-22.96	36	100	Peak
9264.00	40.42	11.90	52.32	74.00	-21.68	18	200	Peak

966Chamber_C at 3Meter / Vertical

Freq. MHz	Reading dBuV	C.F. dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Azimuth deg	Height cm	Remark
=====								
1135.00	56.70	-8.38	48.32	74.00	-25.68	301	200	Peak
1875.00	54.77	-5.67	49.10	74.00	-24.90	344	200	Peak
5390.00	42.74	3.78	46.52	74.00	-27.48	55	200	Peak
6408.00	39.58	8.29	47.87	74.00	-26.13	155	200	Peak
8460.00	41.10	11.23	52.33	74.00	-21.67	282	100	Peak
10416.00	35.60	12.21	47.81	54.00	-6.19	1	200	Average
10416.00	43.76	12.21	55.97	74.00	-18.03	1	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	IP Phone	Test By	Rex Chiu
Test Model	OBI2182	Test Date	2017/10/05
Test Mode	UNII Band 3 / IEEE 802.11a Mode TX / CH Low	Temp. & Humidity	25°C, 50%

966Chamber_C at 3Meter / Horizontal

Freq. MHz	Reading dBuV	C.F. dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Azimuth deg	Height cm	Remark
=====								
1875.00	54.43	-5.67	48.76	74.00	-25.24	38	100	Peak
5045.00	46.45	3.28	49.73	74.00	-24.27	82	200	Peak
5440.00	45.67	3.85	49.52	74.00	-24.48	280	100	Peak
6228.00	40.10	8.48	48.58	74.00	-25.42	360	100	Peak
7728.00	41.17	9.88	51.05	74.00	-22.95	102	200	Peak
9180.00	40.02	11.92	51.94	74.00	-22.06	224	100	Peak

966Chamber_C at 3Meter / Vertical

Freq. MHz	Reading dBuV	C.F. dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Azimuth deg	Height cm	Remark
=====								
1875.00	55.72	-5.67	50.05	74.00	-23.95	335	200	Peak
4985.00	46.45	3.18	49.63	74.00	-24.37	59	100	Peak
5410.00	46.16	3.81	49.97	74.00	-24.03	66	100	Peak
6228.00	38.79	8.48	47.27	74.00	-26.73	360	200	Peak
8664.00	40.01	11.55	51.56	74.00	-22.44	250	100	Peak
11496.00	30.60	15.18	45.78	54.00	-8.22	326	200	Average
11496.00	40.58	15.18	55.76	74.00	-18.24	326	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	IP Phone	Test By	Rex Chiu
Test Model	OBI2182	Test Date	2017/10/05
Test Mode	UNII Band 3 / IEEE 802.11a Mode TX / CH Middle	Temp. & Humidity	25°C, 50%

966Chamber_C at 3Meter / Horizontal

Freq. MHz	Reading dBuV	C.F. dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Azimuth deg	Height cm	Remark
=====								
1875.00	53.64	-5.67	47.97	74.00	-26.03	32	100	Peak
4925.00	47.16	3.03	50.19	74.00	-23.81	0	200	Peak
5415.00	46.64	3.82	50.46	74.00	-23.54	3	200	Peak
6444.00	38.78	8.26	47.04	74.00	-26.96	20	200	Peak
7704.00	41.02	9.88	50.90	74.00	-23.10	338	100	Peak
9192.00	39.91	11.92	51.83	74.00	-22.17	151	100	Peak

966Chamber_C at 3Meter / Vertical

Freq. MHz	Reading dBuV	C.F. dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Azimuth deg	Height cm	Remark
=====								
1750.00	58.14	-5.94	52.20	74.00	-21.80	129	100	Peak
4905.00	47.00	2.97	49.97	74.00	-24.03	357	200	Peak
5425.00	46.59	3.83	50.42	74.00	-23.58	194	200	Peak
6456.00	38.89	8.24	47.13	74.00	-26.87	254	200	Peak
8400.00	40.66	11.05	51.71	74.00	-22.29	3	100	Peak
11580.00	31.60	15.23	46.83	54.00	-7.17	104	200	Average
11580.00	41.34	15.23	56.57	74.00	-17.43	104	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	IP Phone	Test By	Rex Chiu
Test Model	OBI2182	Test Date	2017/10/05
Test Mode	UNII Band 3 / IEEE 802.11a Mode TX / CH High	Temp. & Humidity	25°C, 50%

966Chamber_C at 3Meter / Horizontal

Freq. MHz	Reading dBuV	C.F. dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Azimuth deg	Height cm	Remark
=====								
1875.00	53.75	-5.67	48.08	74.00	-25.92	323	200	Peak
5020.00	46.49	3.25	49.74	74.00	-24.26	235	200	Peak
5455.00	45.81	3.88	49.69	74.00	-24.31	121	200	Peak
6372.00	39.18	8.33	47.51	74.00	-26.49	271	200	Peak
8448.00	40.57	11.19	51.76	74.00	-22.24	172	100	Peak
11652.00	31.70	15.28	46.98	54.00	-7.02	14	200	Average
11652.00	41.45	15.28	56.73	74.00	-17.27	14	200	Peak

966Chamber_C at 3Meter / Vertical

Freq. MHz	Reading dBuV	C.F. dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Azimuth deg	Height cm	Remark
=====								
1875.00	55.74	-5.67	50.07	74.00	-23.93	340	100	Peak
5035.00	46.72	3.27	49.99	74.00	-24.01	103	200	Peak
5410.00	46.13	3.81	49.94	74.00	-24.06	187	200	Peak
6288.00	38.88	8.42	47.30	74.00	-26.70	145	200	Peak
8544.00	40.47	11.40	51.87	74.00	-22.13	57	200	Peak
11664.00	32.50	15.28	47.78	54.00	-6.22	0	200	Average
11664.00	42.27	15.28	57.55	74.00	-16.45	0	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	IP Phone	Test By	Rex Chiu
Test Model	OBI2182	Test Date	2017/10/05
Test Mode	UNII Band 3 / IEEE 802.11ac VHT20 NSS1/MCS0 Mode TX / CH Low	Temp. & Humidity	25°C, 50%

966Chamber_C at 3Meter / Horizontal

Freq. MHz	Reading dBuV	C.F. dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Azimuth deg	Height cm	Remark
=====								
1875.00	54.13	-5.67	48.46	74.00	-25.54	36	200	Peak
4805.00	46.99	2.72	49.71	74.00	-24.29	271	200	Peak
5355.00	45.91	3.73	49.64	74.00	-24.36	141	200	Peak
6468.00	39.38	8.23	47.61	74.00	-26.39	73	100	Peak
7728.00	41.11	9.88	50.99	74.00	-23.01	16	100	Peak
8532.00	40.29	11.39	51.68	74.00	-22.32	262	200	Peak

966Chamber_C at 3Meter / Vertical

Freq. MHz	Reading dBuV	C.F. dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Azimuth deg	Height cm	Remark
=====								
1875.00	56.10	-5.67	50.43	74.00	-23.57	340	200	Peak
4805.00	47.01	2.72	49.73	74.00	-24.27	233	100	Peak
5375.00	47.26	3.76	51.02	74.00	-22.98	311	100	Peak
6384.00	39.20	8.32	47.52	74.00	-26.48	78	200	Peak
7740.00	40.62	9.88	50.50	74.00	-23.50	357	200	Peak
9156.00	39.96	11.93	51.89	74.00	-22.11	31	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	IP Phone	Test By	Rex Chiu
Test Model	OBI2182	Test Date	2017/10/05
Test Mode	UNII Band 3 / IEEE 802.11ac VHT20 NSS1/MCS0 Mode TX / CH Middle	Temp. & Humidity	25°C, 50%

966Chamber_C at 3Meter / Horizontal

Freq. MHz	Reading dBuV	C.F. dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Azimuth deg	Height cm	Remark
=====								
1735.00	57.78	-5.98	51.80	74.00	-22.20	337	100	Peak
4905.00	46.57	2.97	49.54	74.00	-24.46	267	100	Peak
5420.00	46.01	3.82	49.83	74.00	-24.17	355	200	Peak
6372.00	39.11	8.33	47.44	74.00	-26.56	214	200	Peak
7740.00	41.19	9.88	51.07	74.00	-22.93	102	200	Peak
9096.00	39.93	11.94	51.87	74.00	-22.13	25	200	Peak

966Chamber_C at 3Meter / Vertical

Freq. MHz	Reading dBuV	C.F. dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Azimuth deg	Height cm	Remark
=====								
1875.00	55.48	-5.67	49.81	74.00	-24.19	332	200	Peak
4880.00	46.89	2.91	49.80	74.00	-24.20	182	100	Peak
5350.00	46.86	3.72	50.58	74.00	-23.42	330	200	Peak
6300.00	38.55	8.40	46.95	74.00	-27.05	163	100	Peak
7572.00	40.54	9.90	50.44	74.00	-23.56	143	200	Peak
11580.00	31.90	15.23	47.13	54.00	-6.87	334	200	Average
11580.00	41.80	15.23	57.03	74.00	-16.97	334	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	IP Phone	Test By	Rex Chiu
Test Model	OBI2182	Test Date	2017/10/05
Test Mode	UNII Band 3 / IEEE 802.11ac VHT20 NSS1/MCS0 Mode TX / CH High	Temp. & Humidity	25°C, 50%

966Chamber_C at 3Meter / Horizontal

Freq. MHz	Reading dBuV	C.F. dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Azimuth deg	Height cm	Remark
=====								
1875.00	54.50	-5.67	48.83	74.00	-25.17	25	100	Peak
4775.00	46.92	2.64	49.56	74.00	-24.44	170	100	Peak
5345.00	45.86	3.72	49.58	74.00	-24.42	251	100	Peak
6420.00	39.24	8.28	47.52	74.00	-26.48	261	200	Peak
7692.00	40.89	9.88	50.77	74.00	-23.23	183	100	Peak
9804.00	39.81	12.66	52.47	74.00	-21.53	308	100	Peak

966Chamber_C at 3Meter / Vertical

Freq. MHz	Reading dBuV	C.F. dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Azimuth deg	Height cm	Remark
=====								
1875.00	55.30	-5.67	49.63	74.00	-24.37	336	100	Peak
4920.00	46.35	3.01	49.36	74.00	-24.64	204	200	Peak
5430.00	46.30	3.84	50.14	74.00	-23.86	127	100	Peak
6432.00	39.03	8.27	47.30	74.00	-26.70	137	200	Peak
8832.00	40.52	11.76	52.28	74.00	-21.72	256	100	Peak
11652.00	33.10	15.28	48.38	54.00	-5.62	2	200	Average
11652.00	42.97	15.28	58.25	74.00	-15.75	2	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	IP Phone	Test By	Rex Chiu
Test Model	OBI2182	Test Date	2017/10/05
Test Mode	UNII Band 3 / IEEE 802.11ac VHT40 NSS1/MCS0 Mode TX / CH Low	Temp. & Humidity	25°C, 50%

966Chamber_C at 3Meter / Horizontal

Freq. MHz	Reading dBuV	C.F. dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Azimuth deg	Height cm	Remark
=====								
1875.00	53.93	-5.67	48.26	74.00	-25.74	303	200	Peak
4875.00	46.68	2.90	49.58	74.00	-24.42	266	200	Peak
5425.00	47.81	3.83	51.64	74.00	-22.36	191	100	Peak
6396.00	39.59	8.31	47.90	74.00	-26.10	222	200	Peak
7704.00	41.60	9.88	51.48	74.00	-22.52	231	200	Peak
9276.00	40.09	11.90	51.99	74.00	-22.01	80	200	Peak

966Chamber_C at 3Meter / Vertical

Freq. MHz	Reading dBuV	C.F. dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Azimuth deg	Height cm	Remark
=====								
1875.00	55.97	-5.67	50.30	74.00	-23.70	352	200	Peak
4860.00	46.98	2.86	49.84	74.00	-24.16	239	200	Peak
5330.00	46.22	3.70	49.92	74.00	-24.08	67	200	Peak
6456.00	39.12	8.24	47.36	74.00	-26.64	34	100	Peak
7728.00	40.89	9.88	50.77	74.00	-23.23	124	100	Peak
9372.00	40.34	11.88	52.22	74.00	-21.78	116	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	IP Phone	Test By	Rex Chiu
Test Model	OBI2182	Test Date	2017/10/05
Test Mode	UNII Band 3 / IEEE 802.11ac VHT40 NSS1/MCS0 Mode TX / CH High	Temp. & Humidity	25°C, 50%

966Chamber_C at 3Meter / Horizontal

Freq. MHz	Reading dBuV	C.F. dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Azimuth deg	Height cm	Remark
=====								
1875.00	54.28	-5.67	48.61	74.00	-25.39	321	200	Peak
5080.00	46.37	3.34	49.71	74.00	-24.29	80	100	Peak
5395.00	46.30	3.79	50.09	74.00	-23.91	246	100	Peak
6336.00	39.07	8.37	47.44	74.00	-26.56	112	200	Peak
7788.00	40.87	9.87	50.74	74.00	-23.26	250	100	Peak
8928.00	39.64	11.87	51.51	74.00	-22.49	308	200	Peak

966Chamber_C at 3Meter / Vertical

Freq. MHz	Reading dBuV	C.F. dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Azimuth deg	Height cm	Remark
=====								
1875.00	56.21	-5.67	50.54	74.00	-23.46	349	200	Peak
4790.00	47.17	2.68	49.85	74.00	-24.15	27	100	Peak
5455.00	46.92	3.88	50.80	74.00	-23.20	16	200	Peak
6384.00	39.86	8.32	48.18	74.00	-25.82	157	200	Peak
7644.00	40.66	9.89	50.55	74.00	-23.45	177	100	Peak
9204.00	40.31	11.92	52.23	74.00	-21.77	127	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	IP Phone	Test By	Rex Chiu
Test Model	OBI2182	Test Date	2017/10/05
Test Mode	UNII Band 3 / IEEE 802.11ac VHT80 NSS1/MCS0 Mode TX / CH Low	Temp. & Humidity	25°C, 50%

966Chamber_C at 3Meter / Horizontal

Freq. MHz	Reading dBuV	C.F. dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Azimuth deg	Height cm	Remark
=====								
1875.00	54.58	-5.67	48.91	74.00	-25.09	318	200	Peak
4545.00	47.34	2.05	49.39	74.00	-24.61	126	200	Peak
5435.00	46.04	3.85	49.89	74.00	-24.11	79	100	Peak
6300.00	38.68	8.40	47.08	74.00	-26.92	12	200	Peak
7656.00	40.90	9.89	50.79	74.00	-23.21	122	200	Peak
9636.00	40.06	12.21	52.27	74.00	-21.73	333	100	Peak

966Chamber_C at 3Meter / Vertical

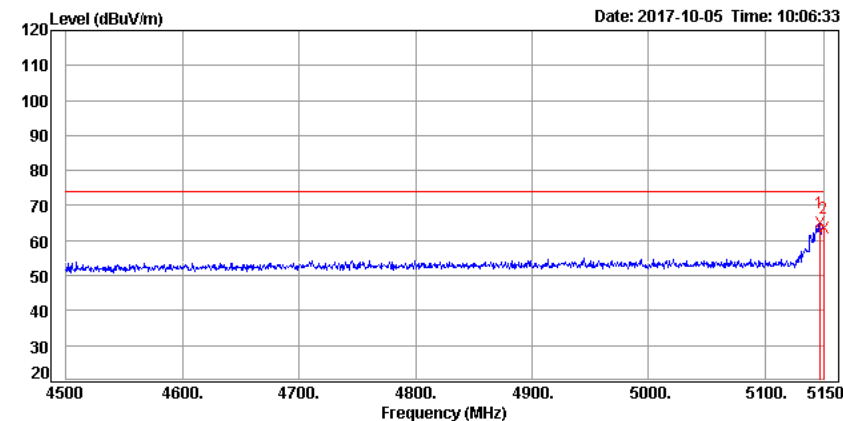
Freq. MHz	Reading dBuV	C.F. dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Azimuth deg	Height cm	Remark
=====								
1875.00	55.60	-5.67	49.93	74.00	-24.07	345	100	Peak
4890.00	46.54	2.94	49.48	74.00	-24.52	112	200	Peak
5355.00	46.35	3.73	50.08	74.00	-23.92	276	200	Peak
6144.00	38.95	8.56	47.51	74.00	-26.49	0	200	Peak
7776.00	40.59	9.87	50.46	74.00	-23.54	169	100	Peak
9060.00	40.33	11.95	52.28	74.00	-21.72	143	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****CH Low (IEEE 802.11a Mode / Band 1)**

Data: 4



Trace:

Freq. MHz	Reading dBuV	C.F. dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Azimuth deg	Height cm	Remark
5146.75	61.50	3.43	64.93	74.00	-9.07			Peak
5150.00	60.20	3.44	63.64	74.00	-10.36			Peak

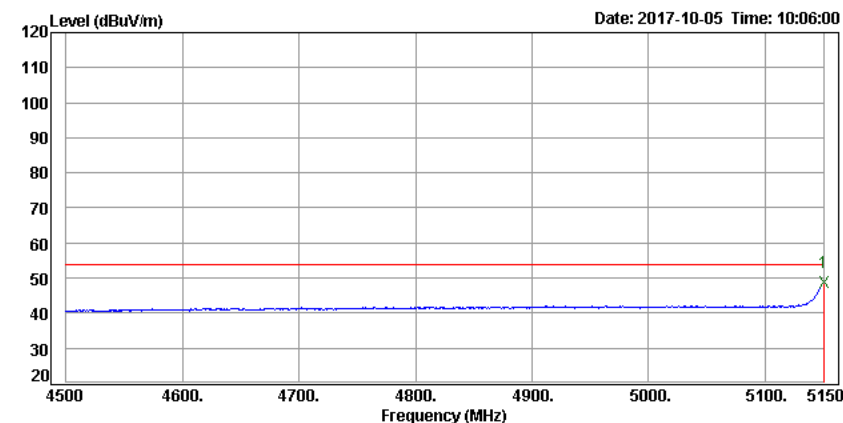
Remark: Result = Reading + Correction Factor

Margin = Result – Limit

Remark Peak = Result(PK) – Limit(PK)

Detector Mode: Average**Polarity: Horizontal****CH Low (IEEE 802.11a Mode / Band 1)**

Data: 3



Trace:

Freq. MHz	Reading dBuV	C.F. dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Azimuth deg	Height cm	Remark
5150.00	45.26	3.44	48.70	54.00	-5.30			Average

Remark: Result = Reading + Correction Factor

Margin = Result – Limit

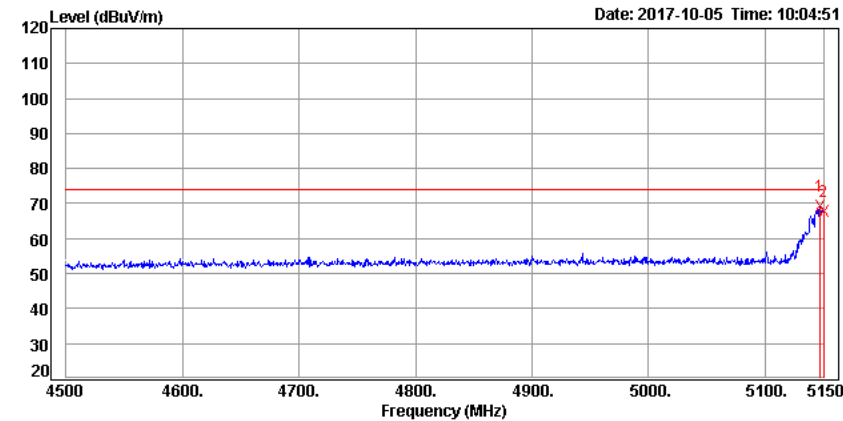
Remark AVG = Result(AV) – Limit(AV)

Detector Mode: Peak

Polarity: Vertical

CH Low (IEEE 802.11a Mode / Band 1)

Data: 2



Trace:								
Freq. MHz	Reading dBuV	C.F. dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Azimuth deg	Height cm	Remark
5146.75	65.67	3.43	69.10	74.00	-4.90			Peak
5150.00	64.43	3.44	67.87	74.00	-6.13			Peak

Remark: Result = Reading + Correction Factor

Margin = Result – Limit

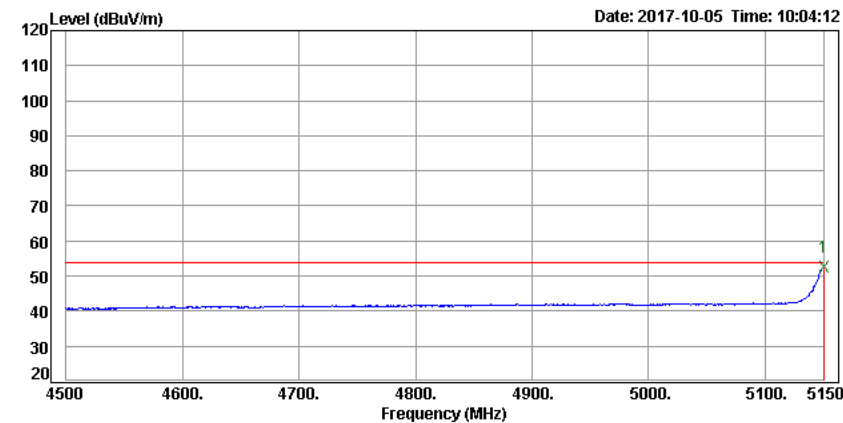
Remark Peak = Result(PK) – Limit(PK)

Detector Mode: Average

Polarity: Vertical

CH Low (IEEE 802.11a Mode / Band 1)

Data: 1



Trace:								
Freq. MHz	Reading dBuV	C.F. dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Azimuth deg	Height cm	Remark
5150.00	49.05	3.44	52.49	54.00	-1.51			Average

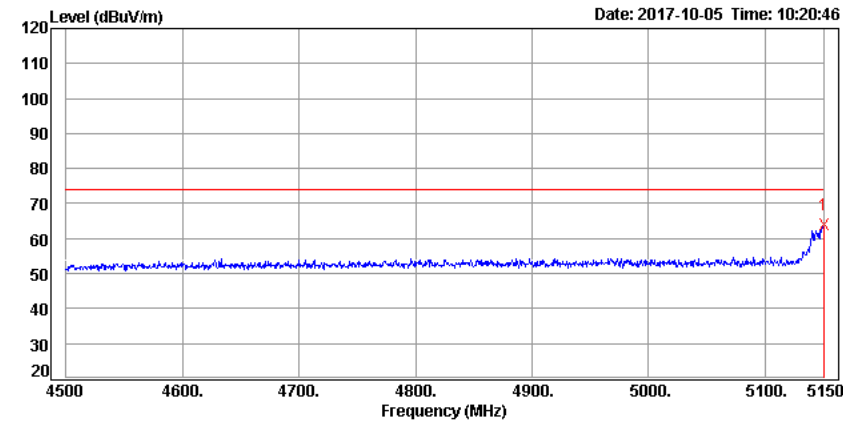
Remark: Result = Reading + Correction Factor

Margin = Result – Limit

Remark AVG = Result(AV) – Limit(AV)

Detector Mode: Peak**Polarity: Horizontal****CH Low (IEEE 802.11ac VHT20 NSS1/MCS0 Mode / Band 1)**

Data: 8



Trace:								
Freq. MHz	Reading dBuV	C.F. dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Azimuth deg	Height cm	Remark
5150.00	60.31	3.44	63.75	74.00	-10.25			Peak

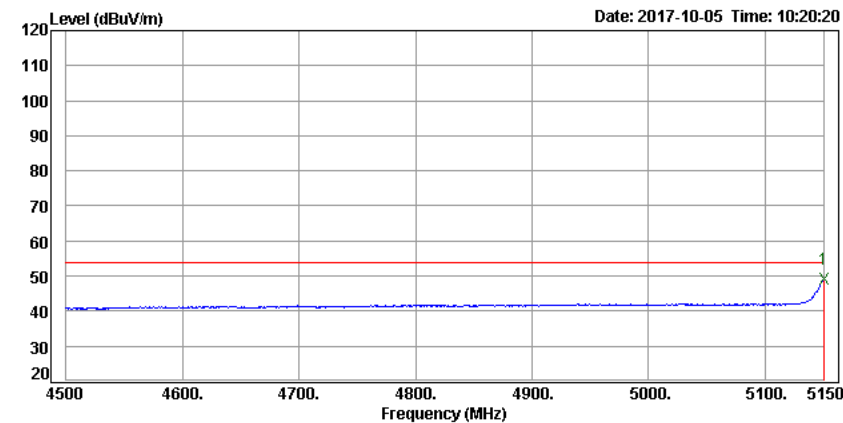
Remark: Result = Reading + Correction Factor

Margin = Result – Limit

Remark Peak = Result(PK) – Limit(PK)

Detector Mode: Average**Polarity: Horizontal****CH Low (IEEE 802.11ac VHT20 NSS1/MCS0 Mode / Band 1)**

Data: 7



Trace:								
Freq. MHz	Reading dBuV	C.F. dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Azimuth deg	Height cm	Remark
5150.00	45.53	3.44	48.97	54.00	-5.03			Average

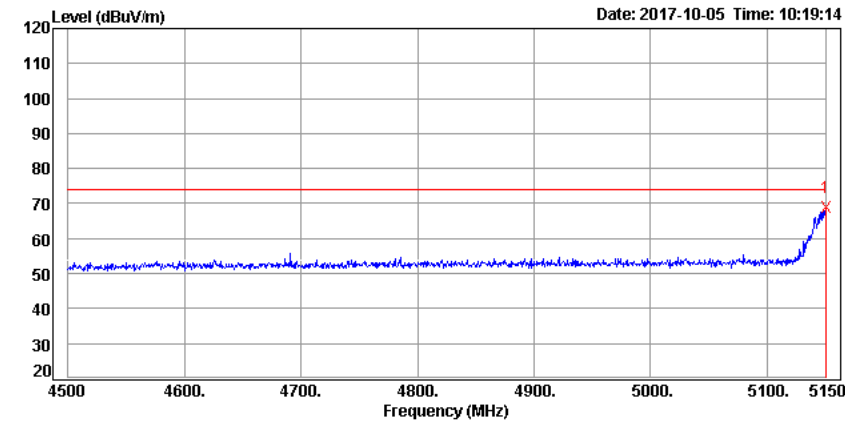
Remark: Result = Reading + Correction Factor

Margin = Result – Limit

Remark AVG = Result(AV) – Limit(AV)

Detector Mode: Peak**Polarity: Vertical****CH Low (IEEE 802.11ac VHT20 NSS1/MCS0 Mode / Band 1)**

Data: 6



Trace:	Freq. MHz	Reading dBuV	C.F. dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Azimuth deg	Height cm	Remark
=====	5150.00	65.50	3.44	68.94	74.00	-5.06			Peak

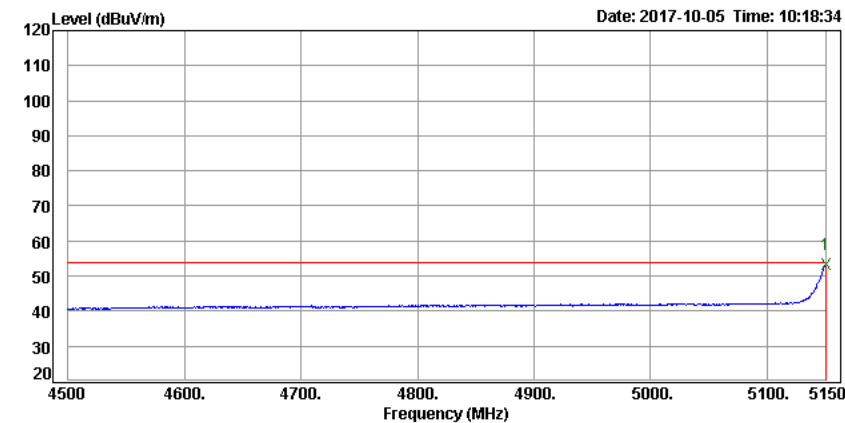
Remark: Result = Reading + Correction Factor

Margin = Result – Limit

Remark Peak = Result(PK) – Limit(PK)

Detector Mode: Average**Polarity: Vertical****CH Low (IEEE 802.11ac VHT20 NSS1/MCS0 Mode / Band 1)**

Data: 5



Trace:	Freq. MHz	Reading dBuV	C.F. dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Azimuth deg	Height cm	Remark
=====	5150.00	49.65	3.44	53.09	54.00	-0.91			Average

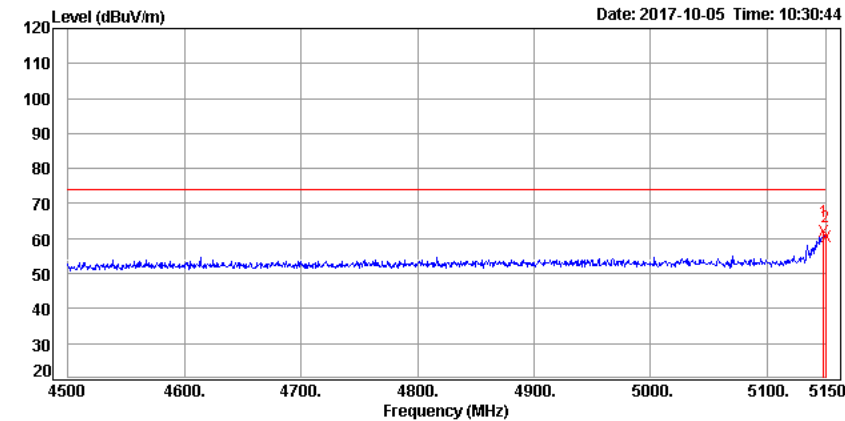
Remark: Result = Reading + Correction Factor

Margin = Result – Limit

Remark AVG = Result(AV) – Limit(AV)

Detector Mode: Peak**Polarity: Horizontal****CH Low (IEEE 802.11ac VHT40 NSS1/MCS0 Mode / Band 1)**

Data: 12



Trace:	Freq. MHz	Reading dBuV	C.F. dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Azimuth deg	Height cm	Remark
-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
	5148.70	58.51	3.43	61.94	74.00	-12.06			Peak
	5150.00	57.17	3.44	60.61	74.00	-13.39			Peak

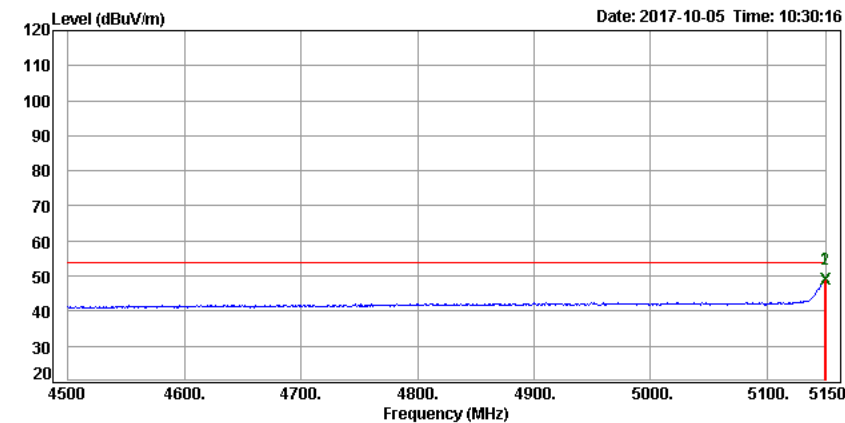
Remark: Result = Reading + Correction Factor

Margin = Result – Limit

Remark Peak = Result(PK) – Limit(PK)

Detector Mode: Average**Polarity: Horizontal****CH Low (IEEE 802.11ac VHT40 NSS1/MCS0 Mode / Band 1)**

Data: 11



Trace:	Freq. MHz	Reading dBuV	C.F. dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Azimuth deg	Height cm	Remark
-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
	5149.35	45.70	3.44	49.14	54.00	-4.86			Average
	5150.00	45.68	3.44	49.12	54.00	-4.88			Average

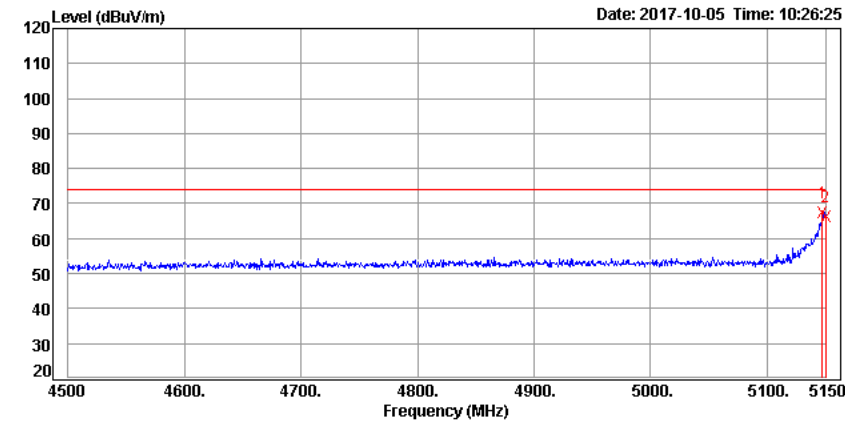
Remark: Result = Reading + Correction Factor

Margin = Result – Limit

Remark AVG = Result(AV) – Limit(AV)

Detector Mode: Peak**Polarity: Vertical****CH Low (IEEE 802.11ac VHT40 NSS1/MCS0 Mode / Band 1)**

Data: 10



Trace:

Freq. MHz	Reading dBuV	C.F. dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Azimuth deg	Height cm	Remark
5147.40	64.01	3.43	67.44	74.00	-6.56			Peak
5150.00	62.89	3.44	66.33	74.00	-7.67			Peak

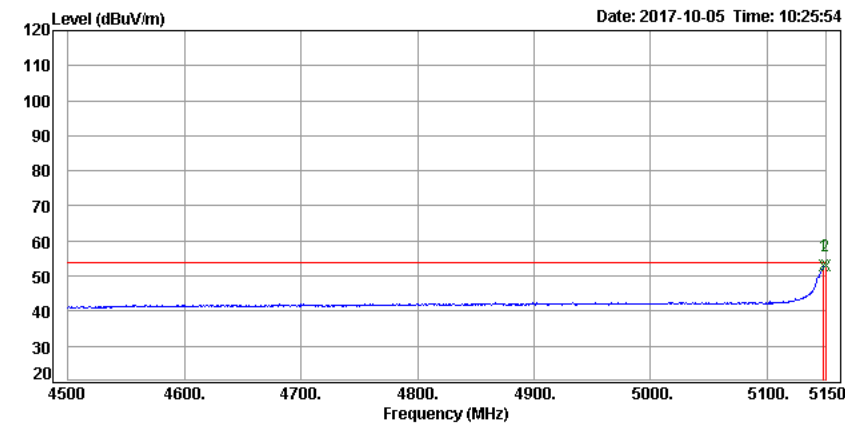
Remark: Result = Reading + Correction Factor

Margin = Result – Limit

Remark Peak = Result(PK) – Limit(PK)

Detector Mode: Average**Polarity: Vertical****CH Low (IEEE 802.11ac VHT40 NSS1/MCS0 Mode / Band 1)**

Data: 9



Trace:

Freq. MHz	Reading dBuV	C.F. dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Azimuth deg	Height cm	Remark
5148.70	49.29	3.43	52.72	54.00	-1.28			Average
5150.00	49.27	3.44	52.71	54.00	-1.29			Average

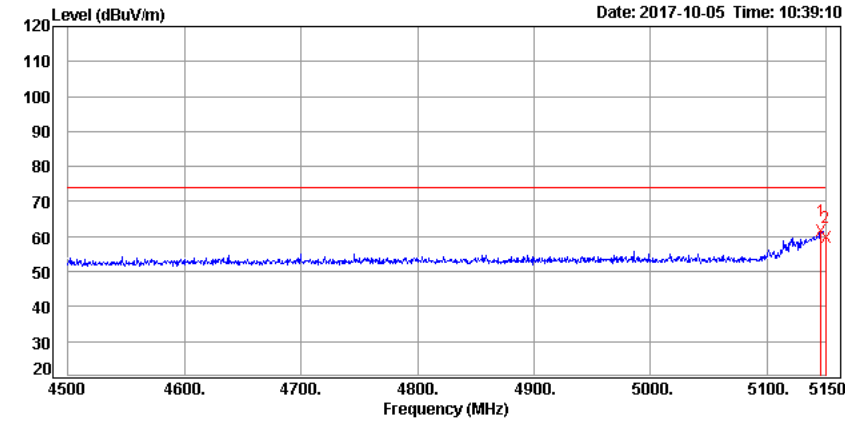
Remark: Result = Reading + Correction Factor

Margin = Result – Limit

Remark AVG = Result(AV) – Limit(AV)

Detector Mode: Peak**Polarity: Horizontal****CH Low (IEEE 802.11ac VHT80 NSS1/MCS0 Mode / Band 1)**

Data: 16



Trace:

Freq. MHz	Reading dBuV	C.F. dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Azimuth deg	Height cm	Remark
5146.10	58.31	3.43	61.74	74.00	-12.26			Peak
5150.00	56.38	3.44	59.82	74.00	-14.18			Peak

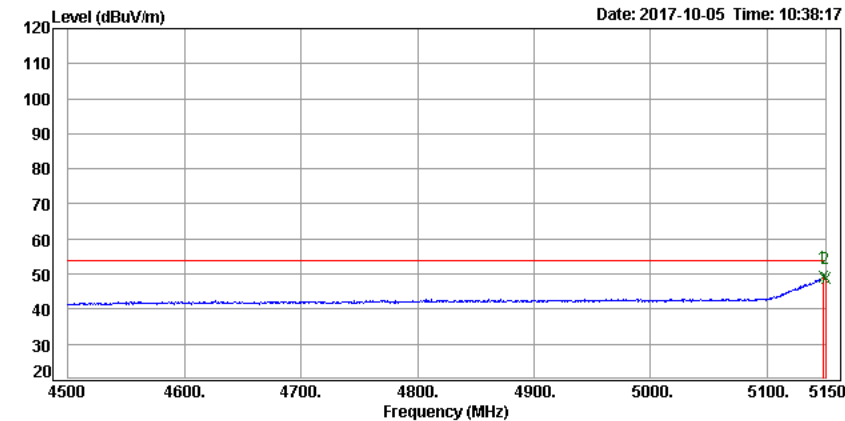
Remark: Result = Reading + Correction Factor

Margin = Result – Limit

Remark Peak = Result(PK) – Limit(PK)

Detector Mode: Average**Polarity: Horizontal****CH Low (IEEE 802.11ac VHT80 NSS1/MCS0 Mode / Band 1)**

Data: 15



Trace:

Freq. MHz	Reading dBuV	C.F. dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Azimuth deg	Height cm	Remark
5148.05	45.79	3.43	49.22	54.00	-4.78			Average
5150.00	45.23	3.44	48.67	54.00	-5.33			Average

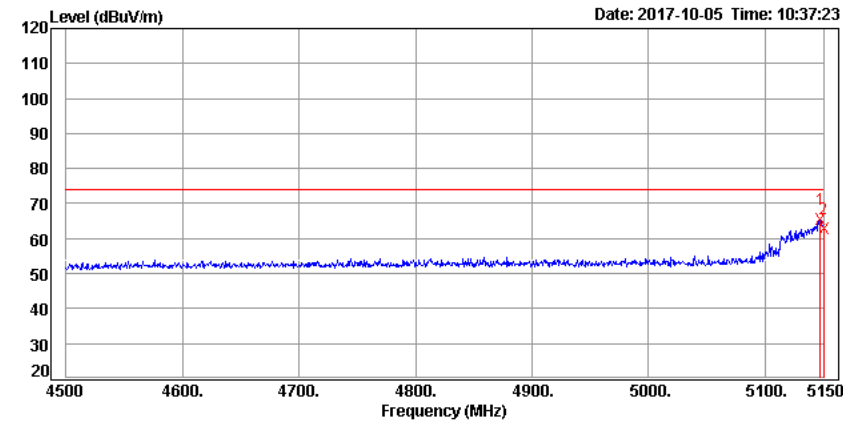
Remark: Result = Reading + Correction Factor

Margin = Result – Limit

Remark AVG = Result(AV) – Limit(AV)

Detector Mode: Peak**Polarity: Vertical****CH Low (IEEE 802.11ac VHT80 NSS1/MCS0 Mode / Band 1)**

Data: 14



Trace:

Freq. MHz	Reading dBuV	C.F. dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Azimuth deg	Height cm	Remark
5147.40	61.84	3.43	65.27	74.00	-8.73			Peak
5150.00	59.52	3.44	62.96	74.00	-11.04			Peak

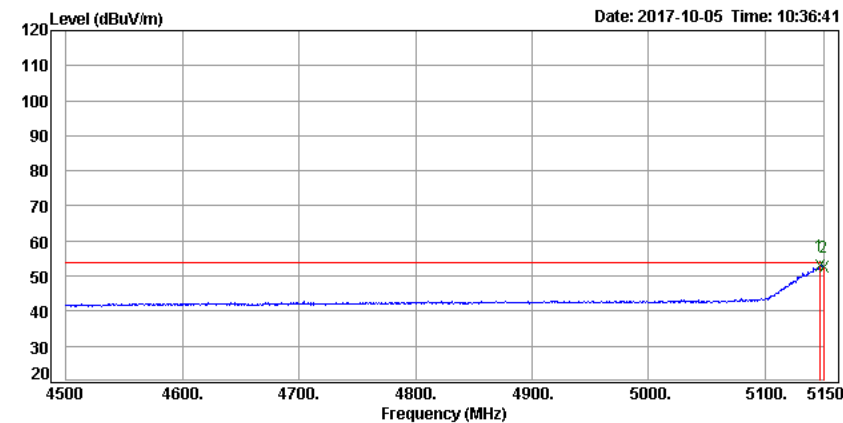
Remark: Result = Reading + Correction Factor

Margin = Result – Limit

Remark Peak = Result(PK) – Limit(PK)

Detector Mode: Average**Polarity: Vertical****CH Low (IEEE 802.11ac VHT80 NSS1/MCS0 Mode / Band 1)**

Data: 13



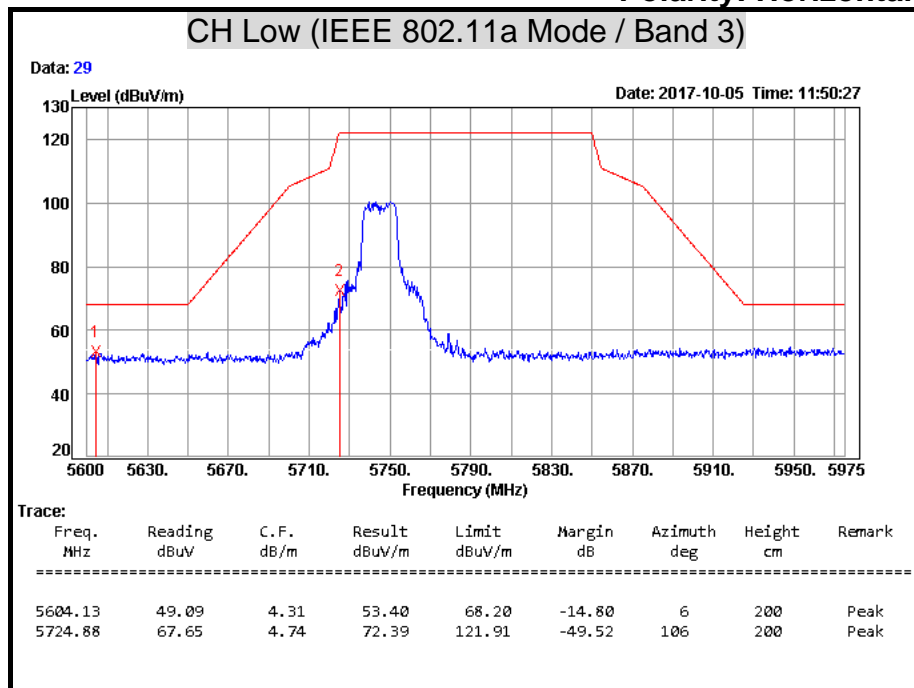
Trace:

Freq. MHz	Reading dBuV	C.F. dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Azimuth deg	Height cm	Remark
5146.75	49.56	3.43	52.99	54.00	-1.01			Average
5150.00	49.17	3.44	52.61	54.00	-1.39			Average

Remark: Result = Reading + Correction Factor

Margin = Result – Limit

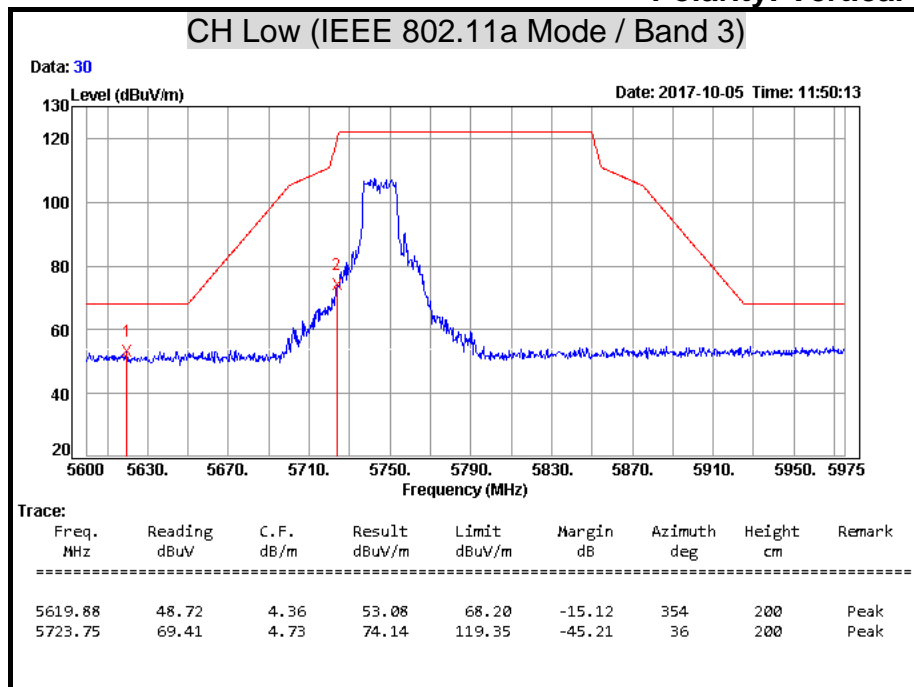
Remark AVG = Result(AV) – Limit(AV)

Polarity: Horizontal

Remark: Result = Reading + Correction Factor

Margin = Result – Limit

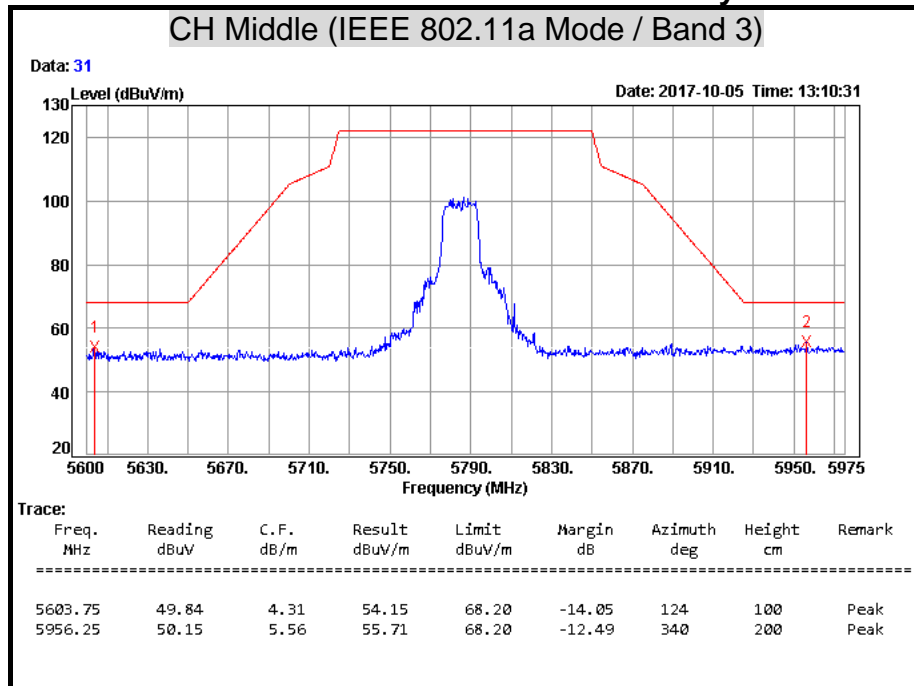
Remark Peak = Result(PK) – Limit(PK)

Polarity: Vertical

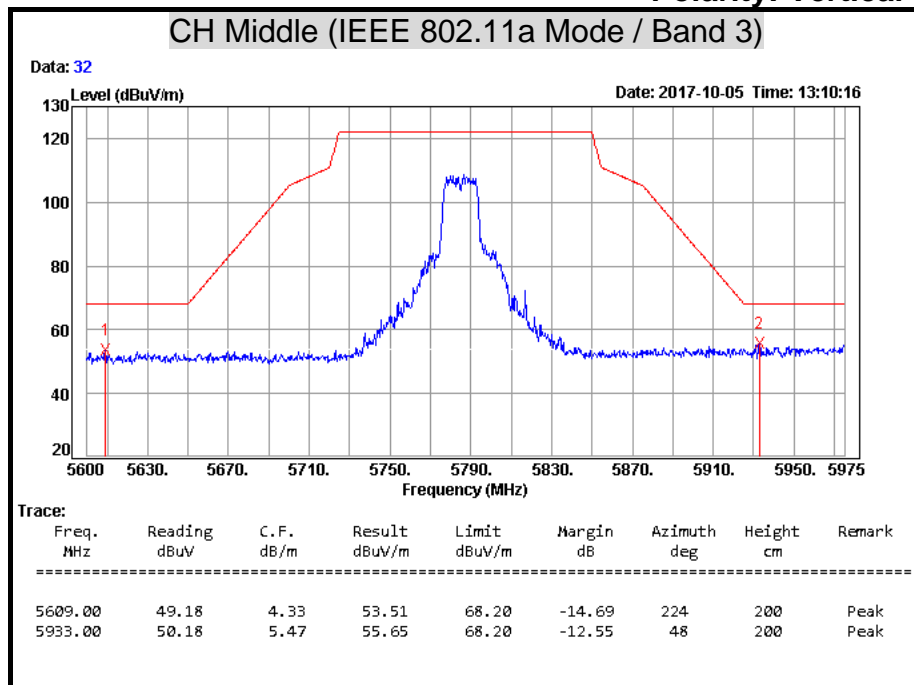
Remark: Result = Reading + Correction Factor

Margin = Result – Limit

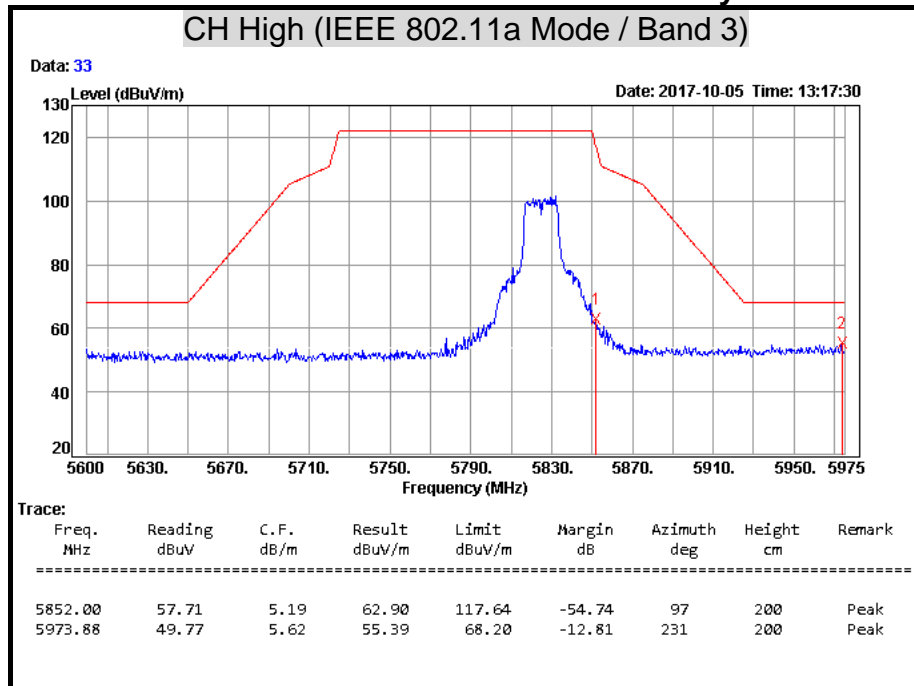
Remark Peak = Result(PK) – Limit(PK)

Polarity: Horizontal

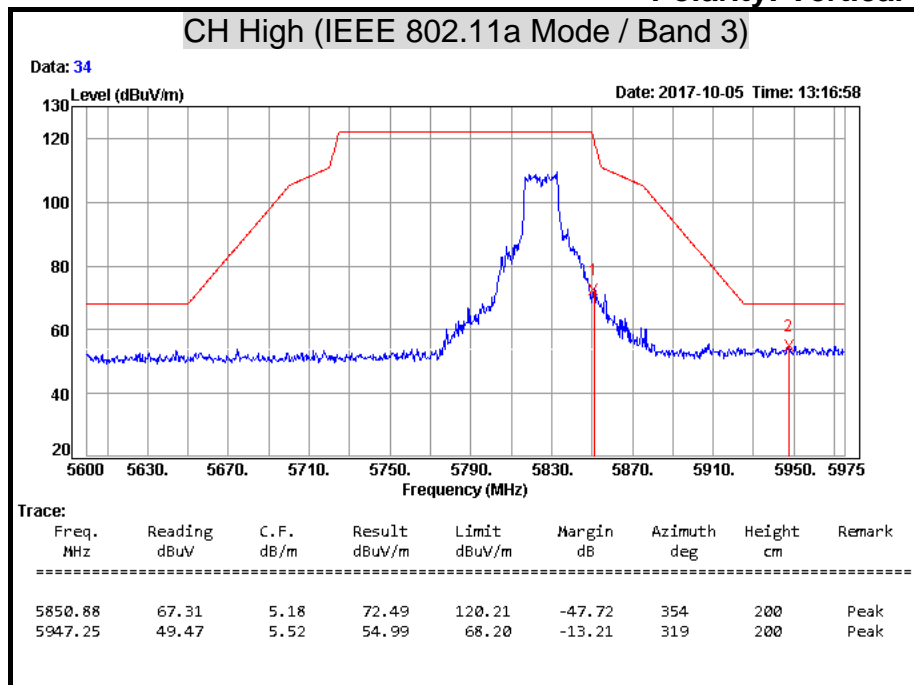
Remark: Result = Reading + Correction Factor
Margin = Result – Limit
Remark Peak = Result(PK) – Limit(PK)

Polarity: Vertical

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

Polarity: Horizontal

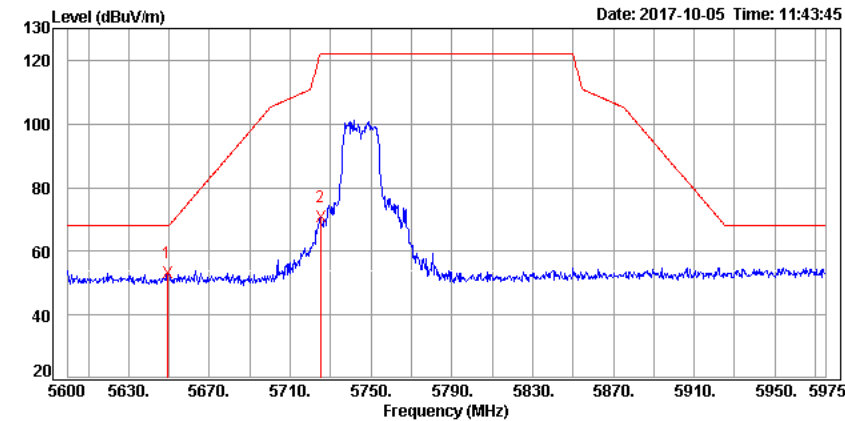
Remark: Result = Reading + Correction Factor
Margin = Result – Limit
Remark Peak = Result(PK) – Limit(PK)

Polarity: Vertical

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

Polarity: Horizontal**CH Low (IEEE 802.11ac VHT20 NSS1/MCS0 Mode / Band 3)**

Data: 27



Trace:

Freq. MHz	Reading dBuV	C.F. dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Azimuth deg	Height cm	Remark
5649.13	48.97	4.47	53.44	68.20	-14.76	219	100	Peak
5724.88	65.94	4.74	70.68	121.91	-51.23	222	200	Peak

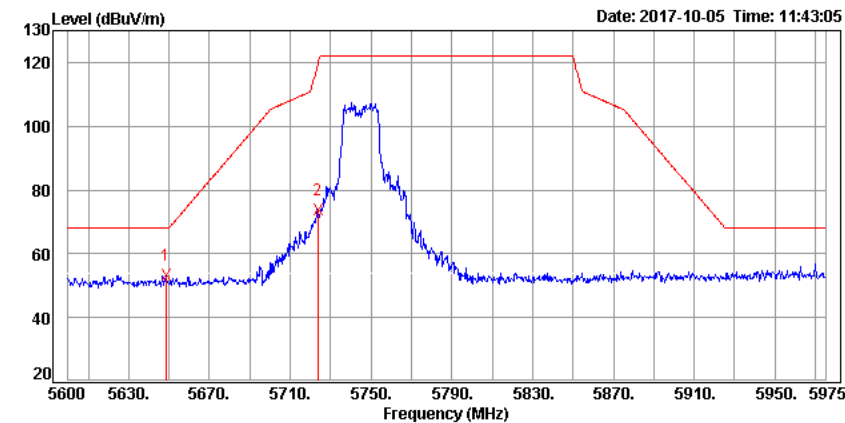
Remark: Result = Reading + Correction Factor

Margin = Result – Limit

Remark Peak = Result(PK) – Limit(PK)

Polarity: Vertical**CH Low (IEEE 802.11ac VHT20 NSS1/MCS0 Mode / Band 3)**

Data: 28



Trace:

Freq. MHz	Reading dBuV	C.F. dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Azimuth deg	Height cm	Remark
5648.38	48.62	4.47	53.09	68.20	-15.11	113	200	Peak
5723.75	69.19	4.73	73.92	119.35	-45.43	189	200	Peak

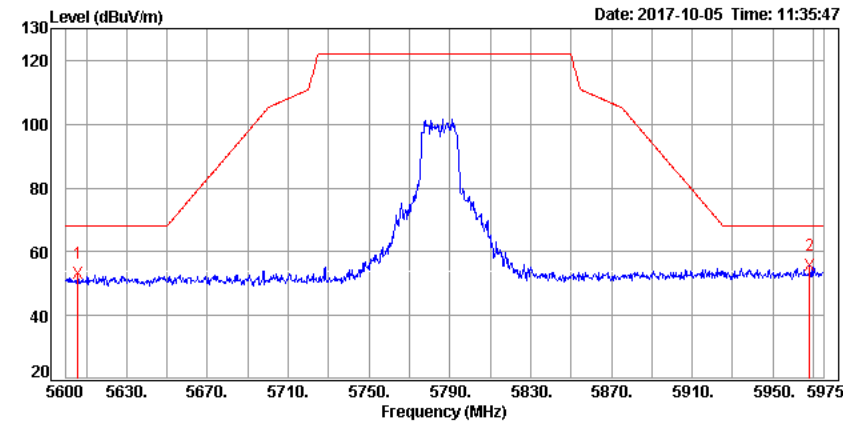
Remark: Result = Reading + Correction Factor

Margin = Result – Limit

Remark Peak = Result(PK) – Limit(PK)

Polarity: Horizontal**CH Middle (IEEE 802.11ac VHT20 NSS1/MCS0 Mode / Band 3)**

Data: 25



Trace:

Freq. MHz	Reading dBuV	C.F. dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Azimuth deg	Height cm	Remark
5606.00	49.02	4.32	53.34	68.20	-14.86	325	200	Peak
5968.25	50.15	5.60	55.75	68.20	-12.45	297	200	Peak

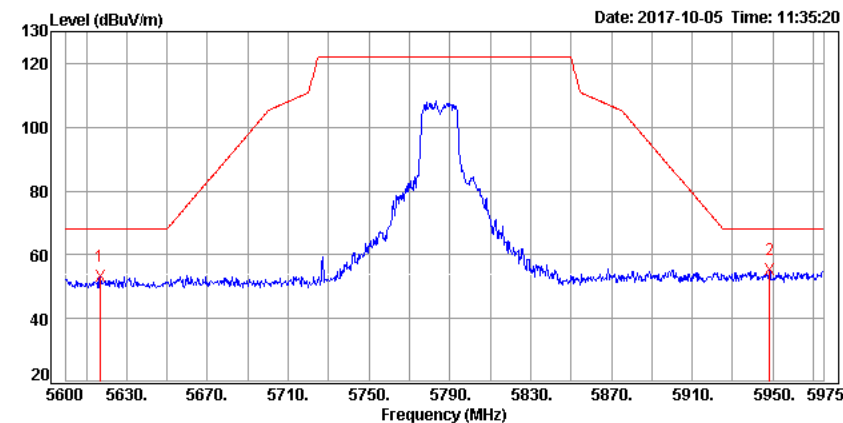
Remark: Result = Reading + Correction Factor

Margin = Result – Limit

Remark Peak = Result(PK) – Limit(PK)

Polarity: Vertical**CH Middle (IEEE 802.11ac VHT20 NSS1/MCS0 Mode / Band 3)**

Data: 26



Trace:

Freq. MHz	Reading dBuV	C.F. dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Azimuth deg	Height cm	Remark
5616.88	48.76	4.35	53.11	68.20	-15.09	262	100	Peak
5948.38	49.62	5.53	55.15	68.20	-13.05	300	200	Peak

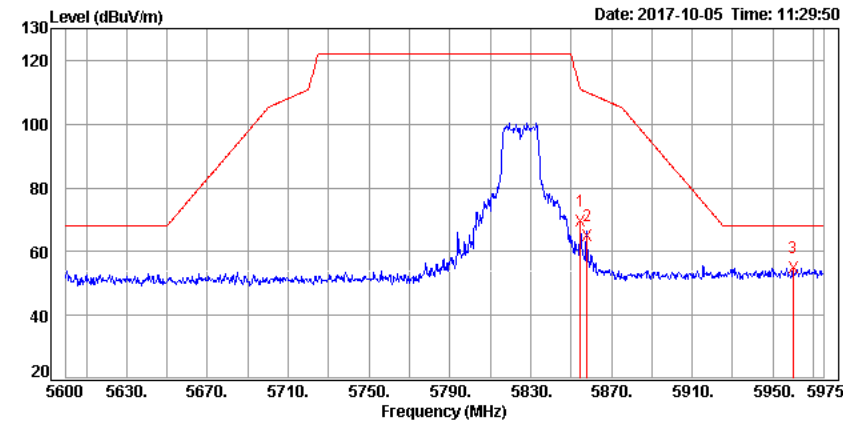
Remark: Result = Reading + Correction Factor

Margin = Result – Limit

Remark Peak = Result(PK) – Limit(PK)

Polarity: Horizontal**CH High (IEEE 802.11ac VHT20 NSS1/MCS0 Mode / Band 3)**

Data: 23



Trace:

Freq. MHz	Reading dBuV	C.F. dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Azimuth deg	Height cm	Remark
5854.63	64.51	5.20	69.71	111.65	-41.94	100	200	Peak
5858.00	59.58	5.21	64.79	109.96	-45.17	150	200	Peak
5960.00	49.48	5.57	55.05	68.20	-13.15	18	100	Peak

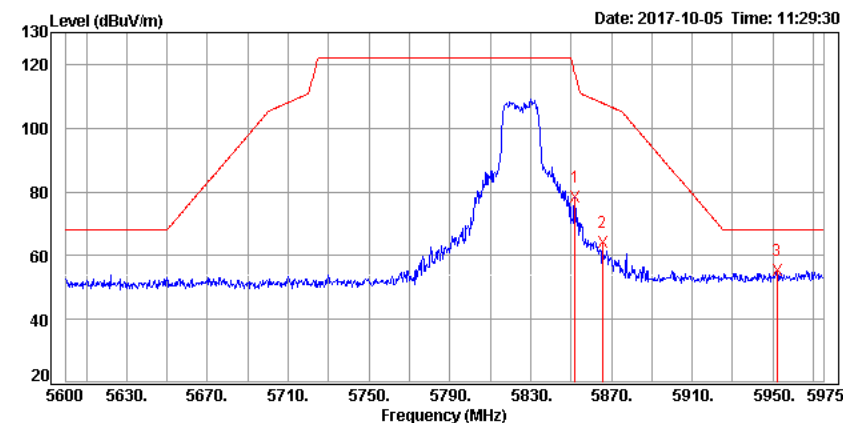
Remark: Result = Reading + Correction Factor

Margin = Result – Limit

Remark Peak = Result(PK) – Limit(PK)

Polarity: Vertical**CH High (IEEE 802.11ac VHT20 NSS1/MCS0 Mode / Band 3)**

Data: 24



Trace:

Freq. MHz	Reading dBuV	C.F. dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Azimuth deg	Height cm	Remark
5852.00	72.95	5.19	78.14	117.64	-39.50	360	200	Peak
5865.50	59.09	5.23	64.32	107.86	-43.54	95	200	Peak
5952.13	49.97	5.54	55.51	68.20	-12.69	304	200	Peak

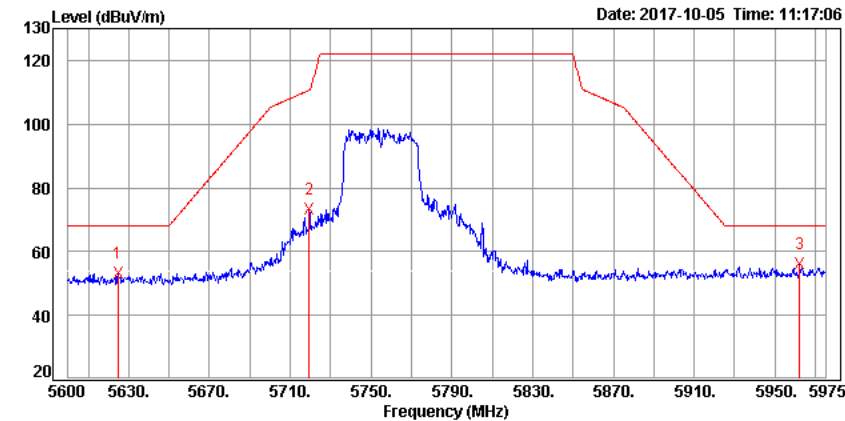
Remark: Result = Reading + Correction Factor

Margin = Result – Limit

Remark Peak = Result(PK) – Limit(PK)

Polarity: Horizontal**CH Low (IEEE 802.11ac VHT40 NSS1/MCS0 Mode / Band 3)**

Data: 19



Trace:

Freq. MHz	Reading dBuV	C.F. dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Azimuth deg	Height cm	Remark
5624.75	48.74	4.38	53.12	68.20	-15.08	129	100	Peak
5719.25	68.52	4.72	73.24	110.59	-37.35	99	200	Peak
5962.25	50.50	5.58	56.08	68.20	-12.12	331	200	Peak

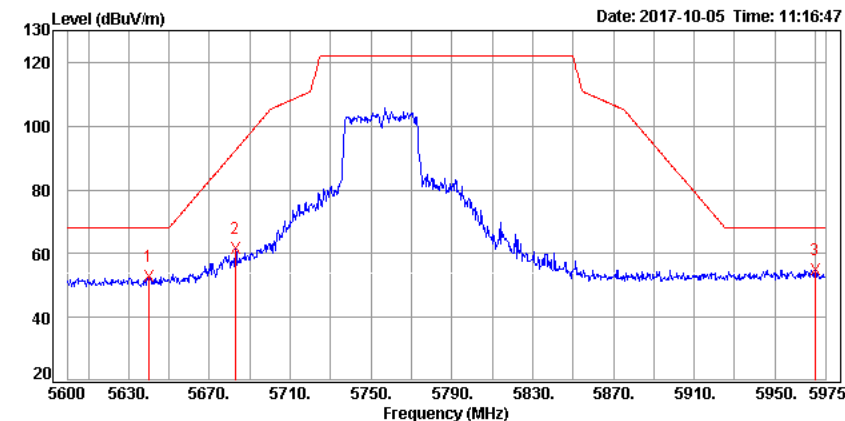
Remark: Result = Reading + Correction Factor

Margin = Result – Limit

Remark Peak = Result(PK) – Limit(PK)

Polarity: Vertical**CH Low (IEEE 802.11ac VHT40 NSS1/MCS0 Mode / Band 3)**

Data: 20



Trace:

Freq. MHz	Reading dBuV	C.F. dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Azimuth deg	Height cm	Remark
5639.75	48.60	4.43	53.03	68.20	-15.17	309	200	Peak
5682.88	56.89	4.59	61.48	92.53	-31.05	39	200	Peak
5969.75	49.22	5.60	54.82	68.20	-13.38	354	100	Peak

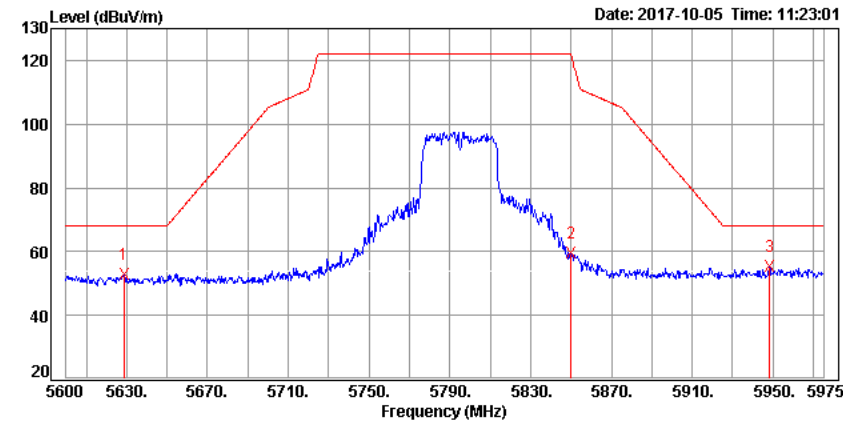
Remark: Result = Reading + Correction Factor

Margin = Result – Limit

Remark Peak = Result(PK) – Limit(PK)

Polarity: Horizontal**CH High (IEEE 802.11ac VHT40 NSS1/MCS0 Mode / Band 3)**

Data: 21



Trace:

Freq. MHz	Reading dBuV	C.F. dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Azimuth deg	Height cm	Remark
5628.50	48.44	4.39	52.83	68.20	-15.37	297	200	Peak
5850.13	54.33	5.18	59.51	121.91	-62.40	96	200	Peak
5948.38	49.61	5.53	55.14	68.20	-13.06	116	200	Peak

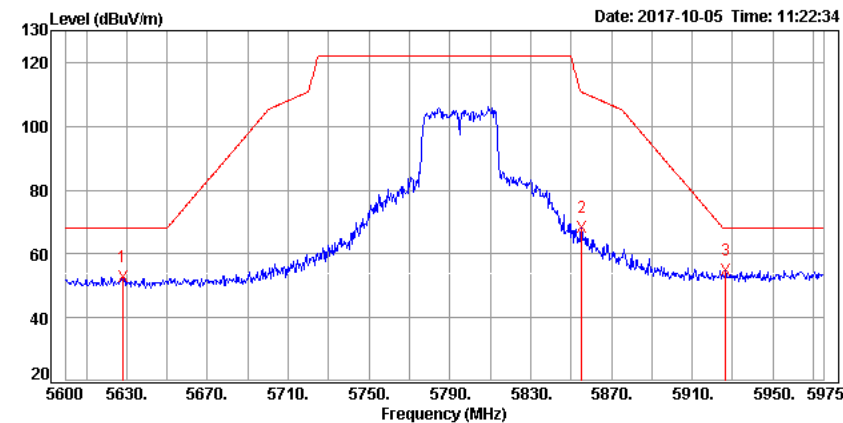
Remark: Result = Reading + Correction Factor

Margin = Result – Limit

Remark Peak = Result(PK) – Limit(PK)

Polarity: Vertical**CH High (IEEE 802.11ac VHT40 NSS1/MCS0 Mode / Band 3)**

Data: 22



Trace:

Freq. MHz	Reading dBuV	C.F. dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Azimuth deg	Height cm	Remark
5628.13	48.46	4.39	52.85	68.20	-15.35	33	100	Peak
5855.38	62.98	5.20	68.18	110.69	-42.51	359	200	Peak
5926.63	49.27	5.45	54.72	68.20	-13.48	24	100	Peak

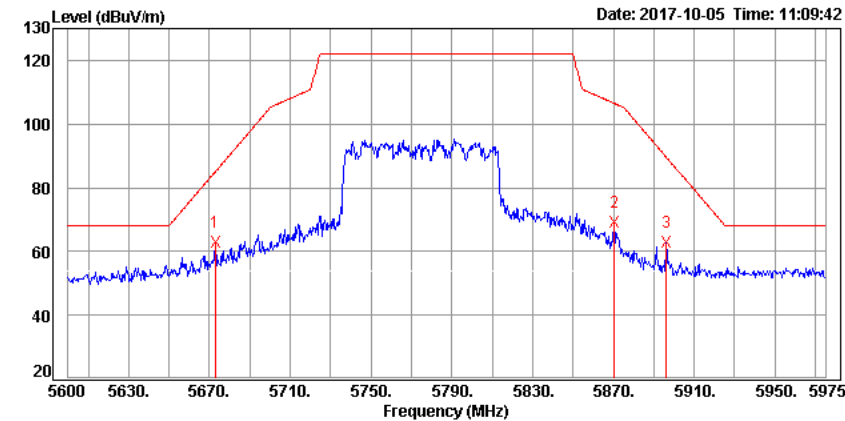
Remark: Result = Reading + Correction Factor

Margin = Result – Limit

Remark Peak = Result(PK) – Limit(PK)

Polarity: Horizontal**CH Low (IEEE 802.11ac VHT80 NSS1/MCS0 Mode / Band 3)**

Data: 17



Trace:

Freq. MHz	Reading dBuV	C.F. dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Azimuth deg	Height cm	Remark
5672.75	58.43	4.55	62.98	85.03	-22.05	103	200	Peak
5870.38	64.10	5.25	69.35	106.49	-37.14	103	200	Peak
5896.25	57.47	5.34	62.81	89.47	-26.66	96	200	Peak

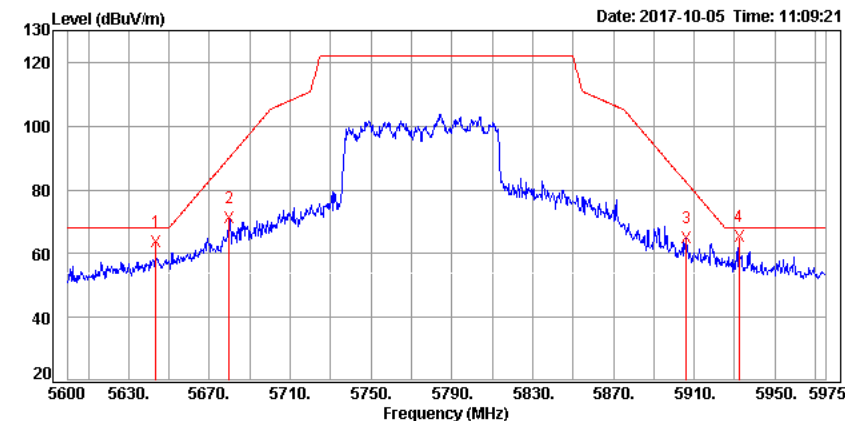
Remark: Result = Reading + Correction Factor

Margin = Result – Limit

Remark Peak = Result(PK) – Limit(PK)

Polarity: Vertical**CH Low (IEEE 802.11ac VHT80 NSS1/MCS0 Mode / Band 3)**

Data: 18



Trace:

Freq. MHz	Reading dBuV	C.F. dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Azimuth deg	Height cm	Remark
5643.50	59.40	4.45	63.85	68.20	-4.35	40	161	Peak
5679.88	66.80	4.58	71.38	90.31	-18.93	36	200	Peak
5906.00	59.55	5.38	64.93	82.26	-17.33	29	200	Peak
5932.25	59.73	5.47	65.20	68.20	-3.00	30	161	Peak

Remark: Result = Reading + Correction Factor

Margin = Result – Limit

Remark Peak = Result(PK) – Limit(PK)

7.7 CONDUCTED EMISSION

LIMITS

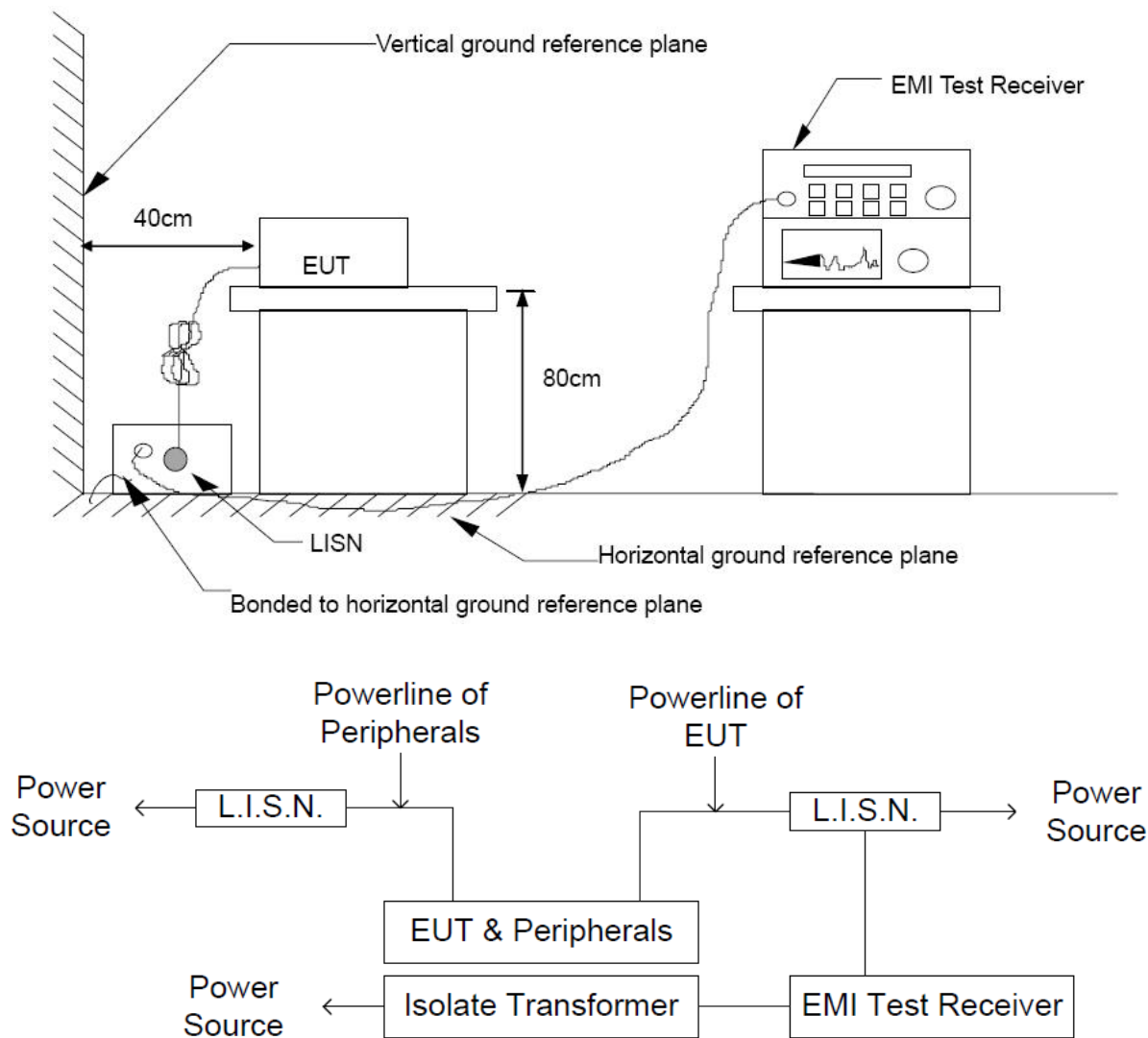
§ 15.207 (a) Except as shown in paragraph (b) and (c) this section, for an intentional radiator that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the band 150 kHz to 30 MHz shall not exceed the limits in the following table, as measured using a 50 μ H/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 (dB μ V)	
	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	08/14/2018
L.I.S.N	Schwarzbeck	NSLK 8127	8127473	03/12/2018
EMI Test Receiver	Rohde & Schwarz	ESHS 30	838550/003	10/25/2017
Pulse Limiter	Rohde & Schwarz	ESH3-Z2	100111	06/26/2018
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.

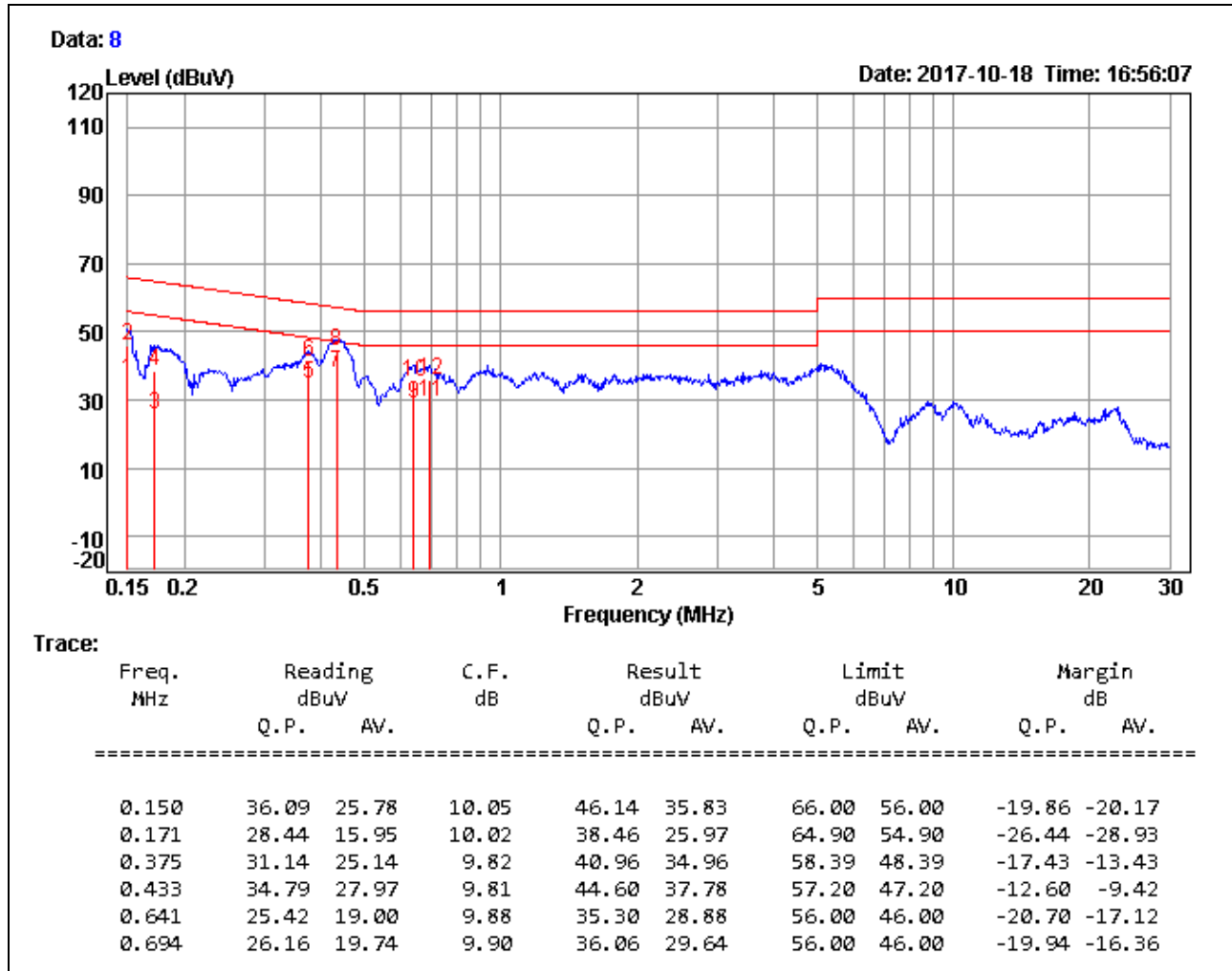
The EUT along with its peripherals were placed on a 1.0m (W) × 1.5m (L) and 0.8m in height wooden table and the EUT was adjusted to maintain a 0.4 meter space from a vertical reference plane.

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.

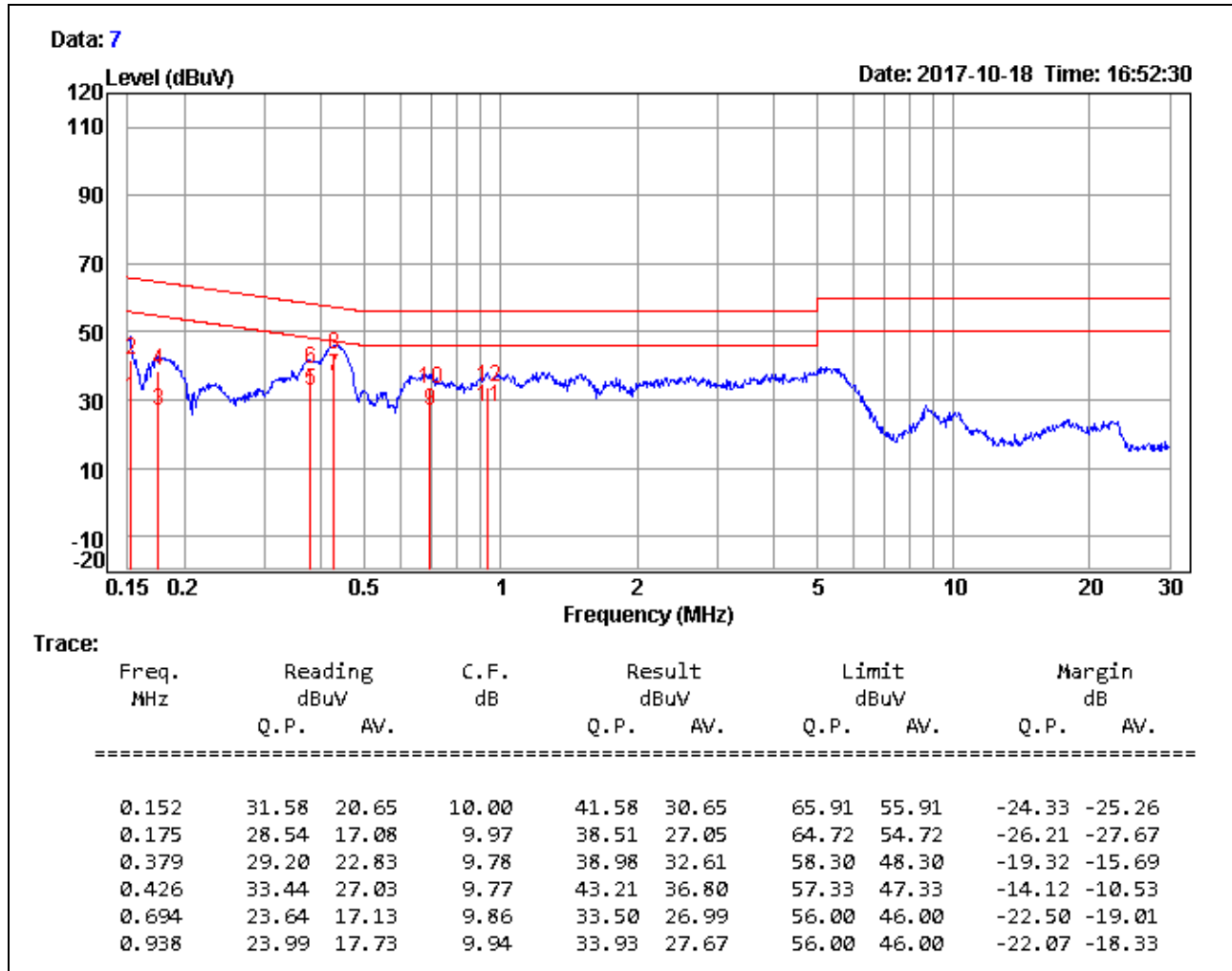
TEST RESULTS

Product Name	IP Phone	Test By	Waternil Guan
Test Model	OBI2182	Test Date	2017/10/18
Test Mode	UNII Band 1 / Mode 1	Temp. & Humidity	28.9°C, 52%

LINE**Remark:**

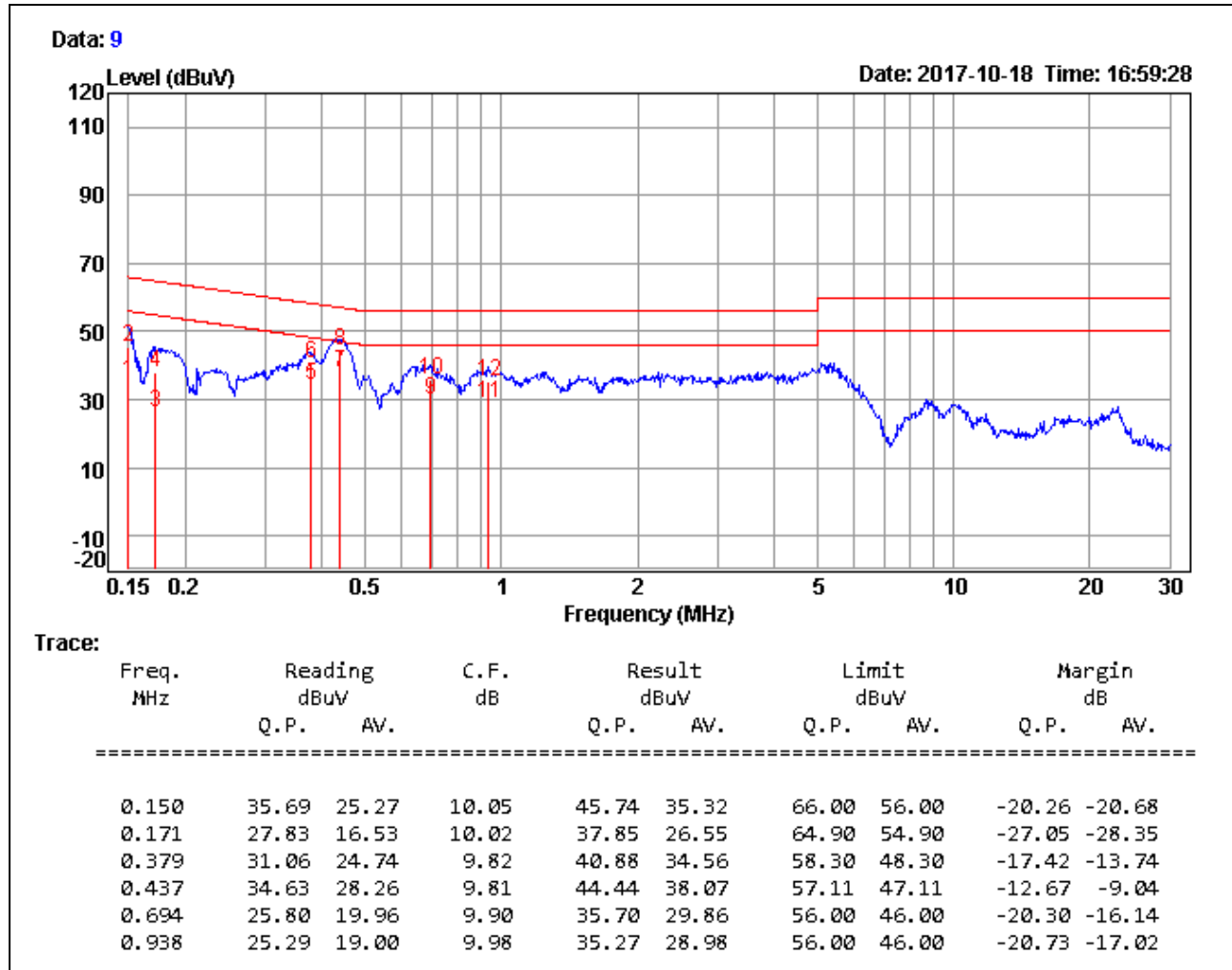
1. Correction Factor = Insertion loss + Cable loss
2. Result level = Reading Value + Correction factor
3. Margin value = Result level – Limit value

Product Name	IP Phone	Test By	Waternil Guan
Test Model	OBI2182	Test Date	2017/10/18
Test Mode	UNII Band 1 / Mode 1	Temp. & Humidity	28.9°C, 52%

NEUTRAL**Remark:**

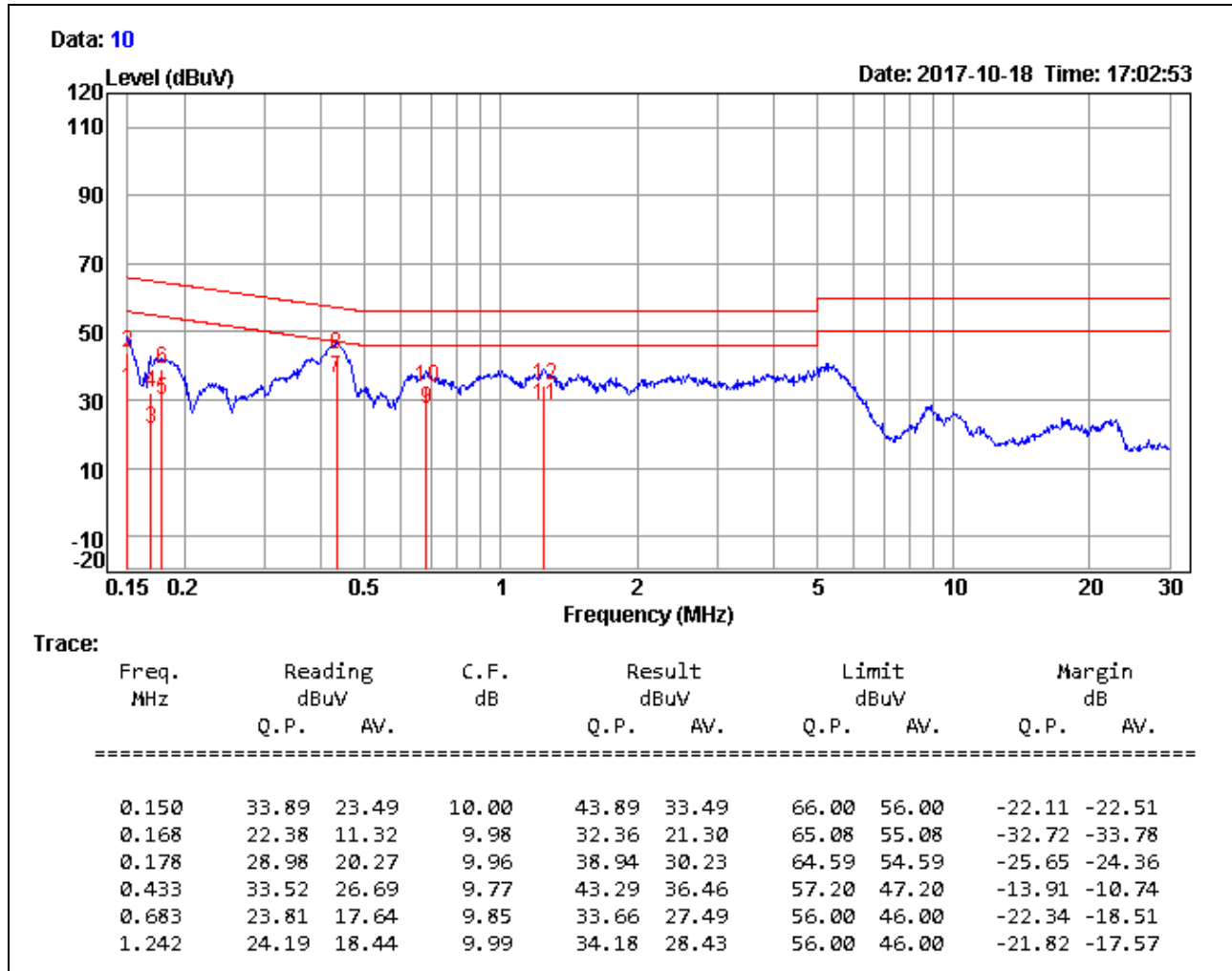
1. Correction Factor = Insertion loss + Cable loss
2. Result level = Reading Value + Correction factor
3. Margin value = Result level – Limit value

Product Name	IP Phone	Test By	Waternil Guan
Test Model	OBI2182	Test Date	2017/10/18
Test Mode	UNII Band 3 / Mode 1	Temp. & Humidity	28.9°C, 52%

LINE**Remark:**

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

Product Name	IP Phone	Test By	Waternil Guan
Test Model	OBI2182	Test Date	2017/10/18
Test Mode	UNII Band 3 / Mode 1	Temp. & Humidity	28.9°C, 52%

NEUTRAL**Remark:**

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

7.8 FREQUENCY STABILITY

LIMITS

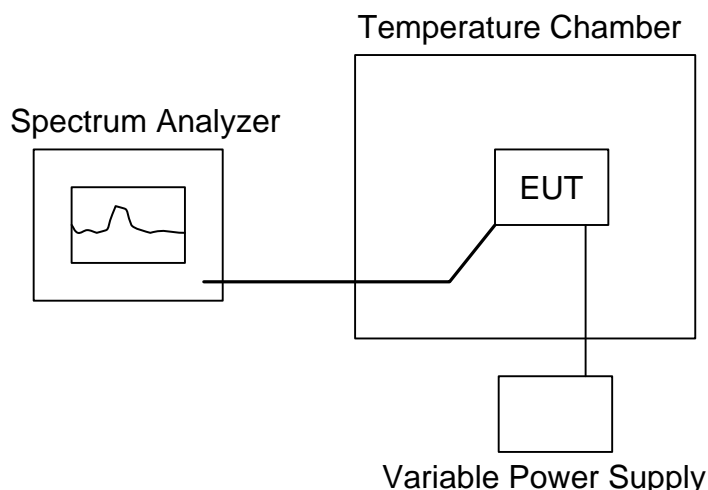
§ 15.407 (g) manufacturers of U-NII devices are responsible for ensuring frequency stability such that an emission is maintained within the band of operation under all conditions of normal operation as specified in the user's manual.

TEST EQUIPMENT

Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
Temp. & Humid. Chamber	TERCHY	MHC-120L	960424	09/06/2018
EXA Signal Analyzer	Agilent	N9010A	MY52220817	03/07/2018
Test S/W	N/A			

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

TEST SETUP



TEST PROCEDURE

1. Place the EUT on the table and set it in the transmitting mode.
2. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.
3. Set the environment into appropriate environment.
4. Set the spectrum analyzer as RBW=1kHz, VBW = RBW, Span = 200kHz, Sweep = auto.
5. Mark the peak frequency and measure the frequency tolerance using frequency counter function.
6. Repeat until all the results are investigated.

TEST RESULTS

Product Name	IP Phone	Test By	Rex Chiu
Test Model	OBI2182	Test Date	2017/10/17
Test Mode	TX Mode	Temp. & Humidity	27°C, 58%

IEEE 802.11a Mode

UNII Band	Channel	Channel Frequency (MHz)	Measured Frequency (MHz)	Delta Frequency (kHz)	Margin (kHz)
Band 1	Low	5180	5179.983919	-16.08	-87.52
	Middle	5220	5219.958745	-41.26	-63.14
	High	5240	5239.988175	-11.82	-92.98
Band 3	Low	5745	5744.995146	-4.85	-110.05
	Middle	5785	5784.981261	-18.74	-96.96
	High	5825	5824.997803	-2.20	-114.30

IEEE 802.11ac VHT20 NSS1/MCS0 Mode

UNII Band	Channel	Channel Frequency (MHz)	Measured Frequency (MHz)	Delta Frequency (kHz)	Margin (kHz)
Band 1	Low	5180	5179.987620	-12.38	-91.22
	Middle	5220	5220.003479	3.48	-100.92
	High	5240	5239.981565	-18.43	-86.37
Band 3	Low	5745	5744.991098	-8.90	-106.00
	Middle	5785	5784.994348	-5.65	-110.05
	High	5825	5824.983416	-16.58	-99.92

IEEE 802.11ac VHT40 NSS1/MCS0 Mode

UNII Band	Channel	Channel Frequency (MHz)	Measured Frequency (MHz)	Delta Frequency (kHz)	Margin (kHz)
Band 1	Low	5190	5189.998365	-1.63	-102.17
	High	5230	5229.981951	-18.05	-86.55
Band 3	Low	5755	5755.039372	39.37	-75.73
	High	5795	5794.996896	-3.10	-112.80

IEEE 802.11ac VHT80 NSS1/MCS0 Mode

UNII Band	Channel	Channel Frequency (MHz)	Measured Frequency (MHz)	Delta Frequency (kHz)	Margin (kHz)
Band 1	Low	5210	5210.049202	49.20	-55.00
Band 3	Low	5775	5775.110000	110.00	-5.50