TEST REPORT

Applicant Name :	Zultys, Inc.
Address :	785 Lucerne Drive, Sunnyvale, California, 94085, United States
Report Number :	SZ1210916-48531E-RF-00C
FCC ID:	2APWA-ZIP47GE
IC:	4478A-ZIP47GE

Test Standard (s)

FCC PART 15.407; RSS-GEN ISSUE 5, FEBRUARY 2021 AMENDMENT 2; RSS-247, ISSUE 2, FEBRUARY 2017

Sample Description

Product Type:	Gigabit SIP IP Phone
Model No.:	ZIP 47GE
Multiple Model(s) No.:	N/A
Trade Mark:	Zultys
Date Received:	2021/09/16
Date of Test:	2021/09/27~2021/11/12
Report Date:	2021/11/12

Test Result:	Pass*

* In the configuration tested, the EUT complied with the standards above.

Prepared and Checked By:

Fan Yang
EMC Engineer

Approved By:

Candy Li
EMC Engineer

Note: This report may contain data that are not covered by the A2LA accreditation and are marked with an asterisk "★ ".
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GENERAL INFORMATION

Product Description for Equipment under Test (EUT)

Product	Gigabit SIP IP Phone
Tested Model	ZIP 47GE
HVIN	ZIP 47GE
Frequency Range	5G Wi-Fi: 5150-5250MHz; 5250-5350MHz; 5470-5725MHz; 5725-5850MHz Note : 5600-5650MHz should not apply for ISED
Mode	802.11a/n20
Maximum Conducted Average Ouput Power	5150-5250 MHz: 12.22dBm 5250-5350MHz: 10.81dBm 5470-5725MHz: 10.56dBm 5725-5850 MHz: 11.22dBm
Modulation Technique	OFDM
Antenna Specification*	Antenna gain: 3 dBi (It is provided by the manufacturer)
Voltage Range	DC48V from POE or DC5V from adapter
Sample serial number	CE&RE: SZ1210916-48531E-RF-S1, RF conducted: SZ1210916-48531E-RF-S2 (Assigned by ATC)
Received date	2021-09-16
Sample/EUT Status	Good condition
Adapter 1 information	Model: NSA10EU-05020002 Input: AC 100-240V, 50/60Hz, 0.5A Output: DC 5V, 2.0A
Adapter 2 information	Model: OH-1015A0502000U4-UL Input: AC 100-240V, 50/60Hz, 0.5A Output: DC 5V, 2.0A

Objective

This test report is in accordance with Part 2-Subpart J, Part 15-Subparts A and E of the Federal Communication Commissions rules and RSS-GEN Issue 5, February 2021 Amendment 2 and RSS-247, Issue 2, February 2017 of the Innovation, Science and Economic Development Canada rules.

The tests were performed in order to determine compliance with FCC Part 15, Subpart E, section 15.203, 15.205, 15.207, 15.209, 15.407 rules and RSS-Gen, RSS-247.

Test Methodology

All measurements contained in this report were conducted with ANSI C63.10-2013, American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices. And KDB789033 D02 General U-NII Test Procedures New Rules v02r01. RSS-GEN Issue 5, February 2021 Amendment 2 and RSS-247, Issue 2, February 2017.

All emissions measurement was performed at Shenzhen Accurate Technology Co., Ltd. The radiated testing was performed at an antenna-to-EUT distance of 3 meters.

Each test item follows test standards and with no deviation.

Measurement Uncertainty

Parameter		Uncertainty
Occupied Channel Bandwidth		5%
RF output power, conducted		0.73dB
Unwanted Emission, conducted		1.6dB
AC Power Lines Conducted Emissions		2.72dB
Emissions, Radiated	30MHz - 1GHz	4.28dB
	1GHz- 18GHz	4.98dB
	18GHz- 26.5GHz	5.06dB
	26.5GHz- 40GHz	4.72dB
Temperature		1℃
Humidity		6%
Supply voltages		0.4%

Note: The extended uncertainty given in this report is obtained by combining the standard uncertainty times the coverage factor K with the 95% confidence interval. Otherwise required by the applicant or Product Regulations, Decision Rule in this report did not consider the uncertainty.

Test Facility

The test site used by Shenzhen Accurate Technology Co., Ltd. to collect test data is located on the 1/F., Building A, Changyuan New Material Port, Science & Industry Park, Nanshan District, Shenzhen, Guangdong, P.R. China.

The test site has been approved by the FCC under the KDB 974614 D01 and is listed in the FCC Public Access Link (PAL) database, FCC Registration No.: 708358, the FCC Designation No.: CN1189. Accredited by American Association for Laboratory Accreditation (A2LA) The Certificate Number is 429 7.01.

Listed by Innovation, Science and Economic Development Canada (ISEDC), the Registration Number is 5077A.

SYSTEM TEST CONFIGURATION

Description of Test Configuration

The system was configured for testing in an engineering mode, which was provided by manufacturer.

The device only supports 5G Wi-Fi 802.11a/n20 modes.

For 5150-5250MHz Band, 4 channels are provided to testing:

Channel	Frequency (MHz)	Channel	Frequency (MHz)
36	5180	44	5220
40	5200	48	5240

For 802.11a, 802.11n20 mode: channel 36, 40, 48 were tested

For 5250-5350MHz Band, 4 channels are provided to testing:

Channel	Frequency (MHz)	Channel	Frequency (MHz)
52	5260	60	5300
56	5280	64	5320

For 802.11a, 802.11n20 mode: channel 52, 56, 64 were tested.

For 5470-5725MHz Band, 11 channels are provided to testing:

Channel	Frequency (MHz)	Channel	Frequency (MHz)
100	5500	124*	5620
104	5520	128*	5640
108	5540	132	5660
112	5560	136	5680
116	5580	140	5700
120*	5600	/	/

For 802.11a, 802.11n20 mode: channel 100, 116, 140 were tested.
Note*: channels are not available for ISED.

For 5725-5850MHz Band, 5 channels are provided to testing:

Channel	Frequency (MHz)	Channel	Frequency (MHz)
149	5745	161	5805
153	5765	165	5825
157	5785	/	/

For 802.11a, 802.11n20 mode: channel 149, 157, 165 were tested.

EUT Exercise Software

"Web explorer"* was used to the config EUT to test mode. The software and power level was provided by the applicant.

The worst case was performed under:

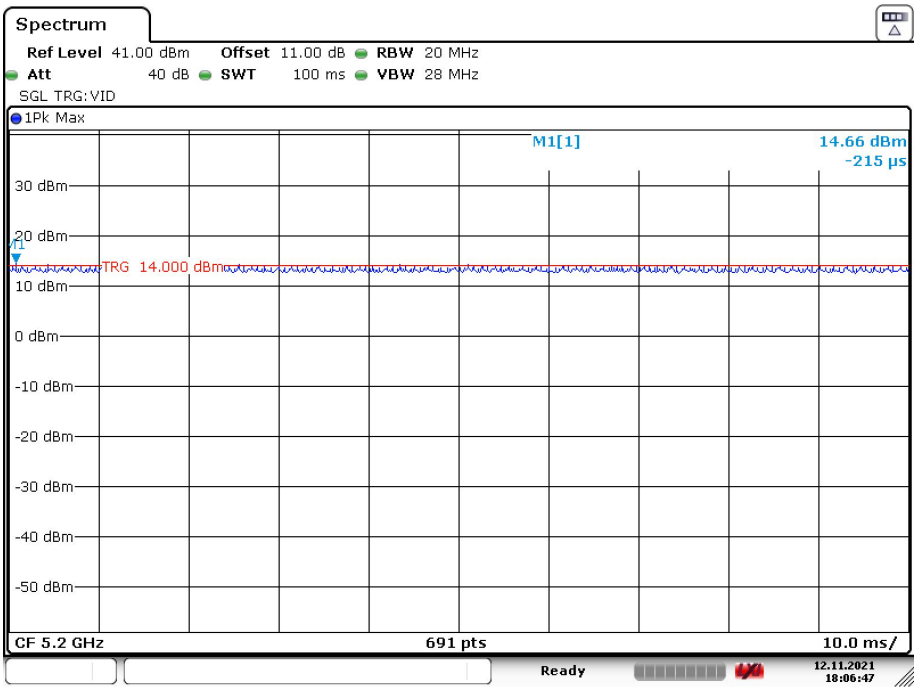
U-NII	Mode	Frequency (MHz)	Data Rate	Power Level*
5150 – 5250MHz	802.11 a	5180	6Mbps	10
		5200	6Mbps	10
		5240	6Mbps	10
	802.11 n20	5180	MCS0	10
		5200	MCS0	10
		5240	MCS0	10
5250 – 5350MHz	802.11 a	5260	6Mbps	10
		5280	6Mbps	10
		5320	6Mbps	10
	802.11 n20	5260	MCS0	10
		5280	MCS0	10
		5320	MCS0	10
5470 – 5725MHz	802.11 a	5500	6Mbps	10
		5580	6Mbps	10
		5700	6Mbps	10
	802.11 n20	5500	MCS0	10
		5580	MCS0	10
		5700	MCS0	10
5725 – 5850MHz	802.11 a	5745	6Mbps	10
		5785	6Mbps	10
		5825	6Mbps	10
	802.11 n20	5745	MCS0	10
		5785	MCS0	10
		5825	MCS0	10

The worse-case data rates are determined to be as follows for each mode based upon investigations by measuring the output power and PSD across all data rated bandwidths, and modulations.

Duty cycle

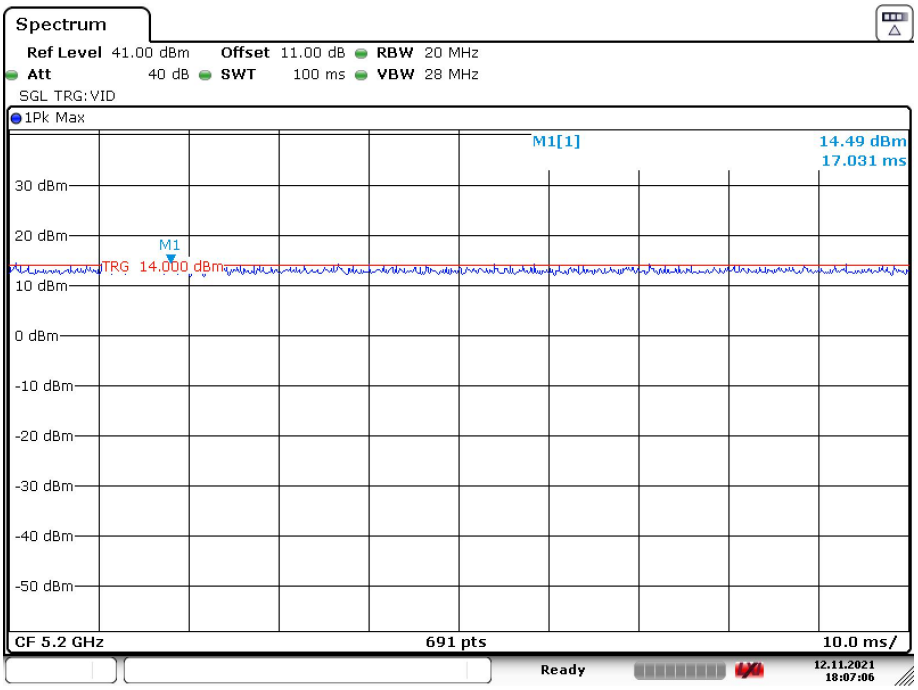
5150-5250 MHz

802.11a mode



Date: 12.NOV.2021 18:06:47

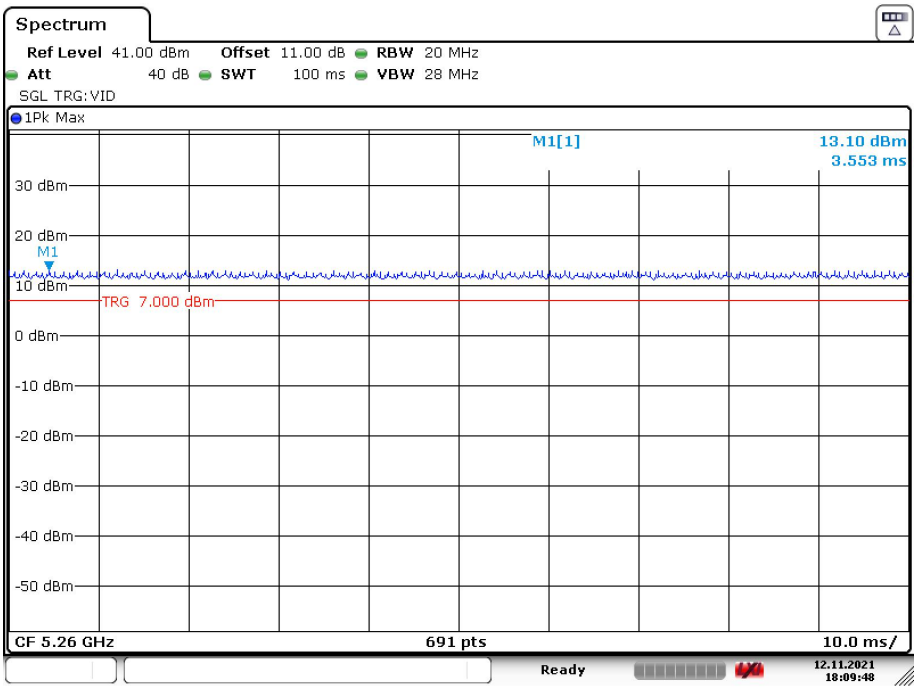
802.11n20 mode



Date: 12.NOV.2021 18:07:06

5250 MHz - 5350 MHz

802.11a mode



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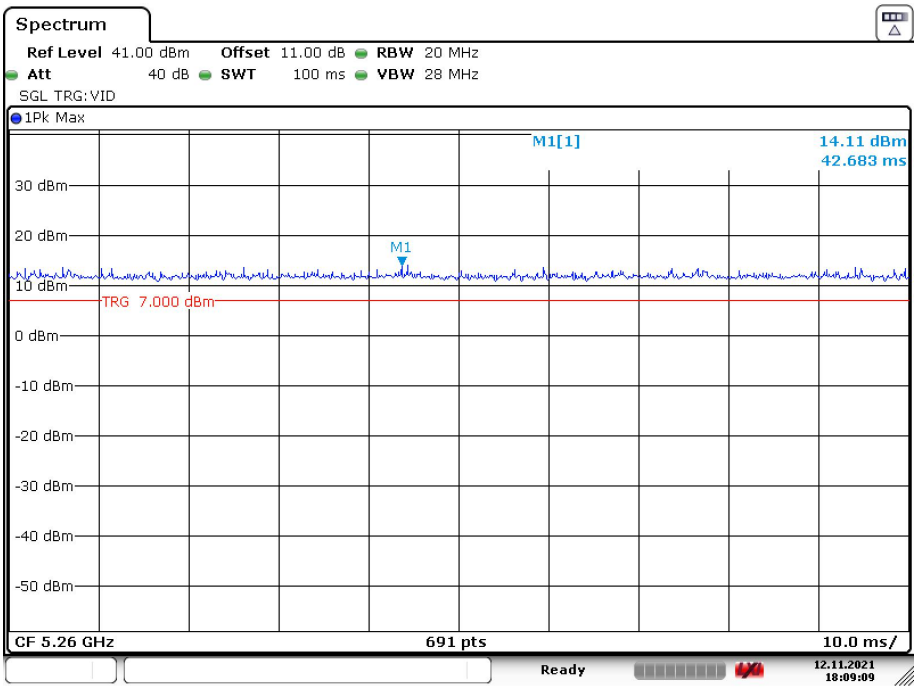
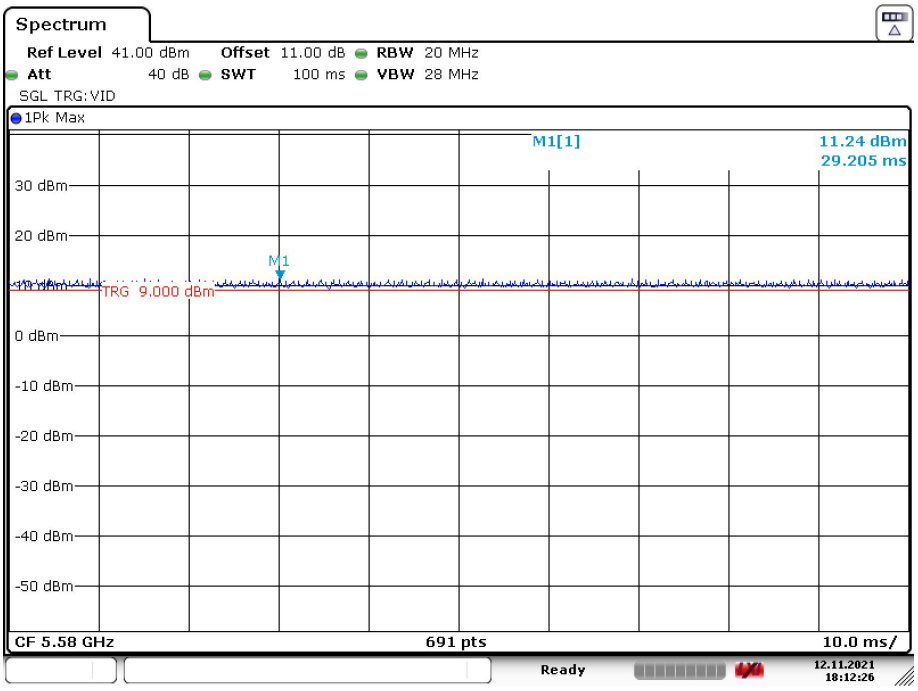
802.11n20 mode



Date: 12.NOV.2021 18:09:09

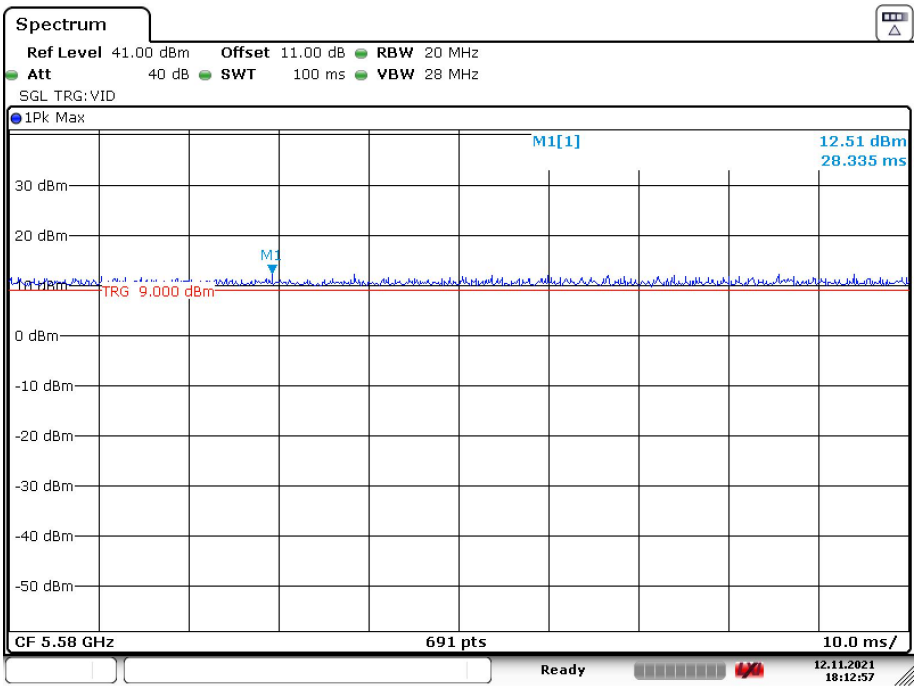
5470 MHz - 5725 MHz

802.11a mode



Date: 12.NOV.2021 18:12:26

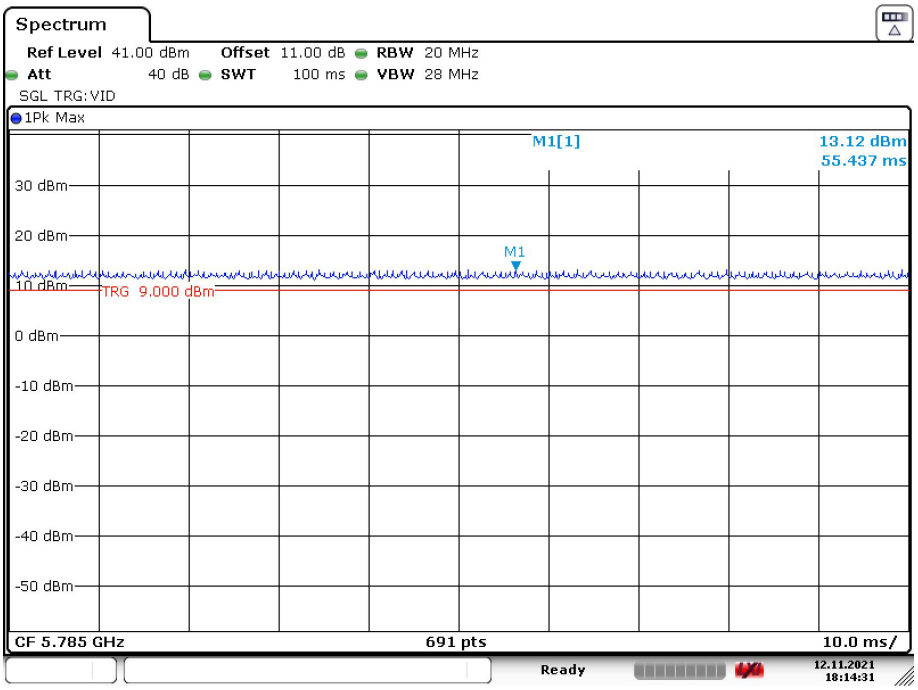
802.11n20 mode



Date: 12.NOV.2021 18:12:57

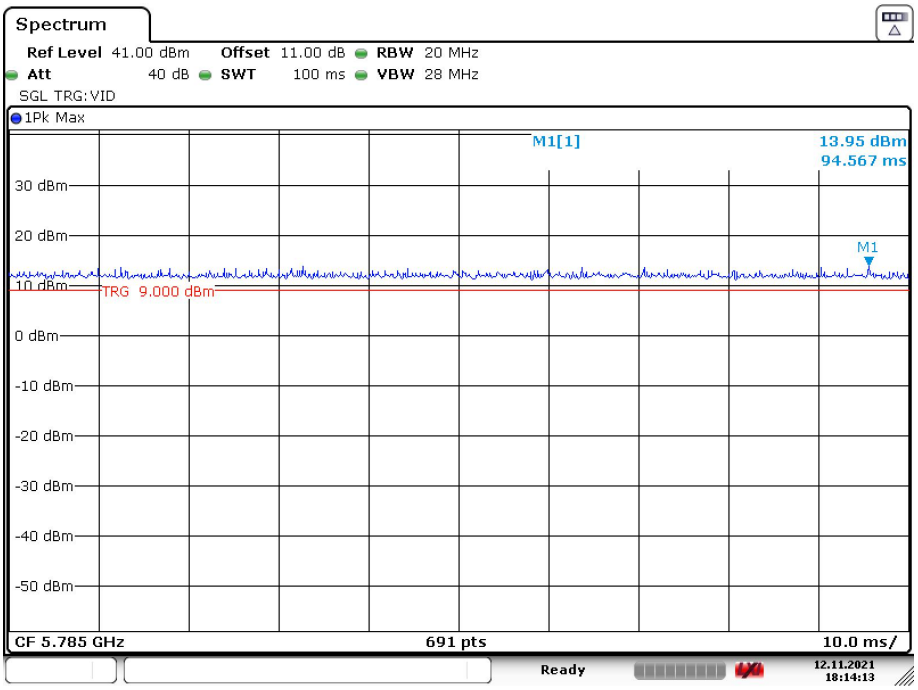
5725 MHz - 5850 MHz:

802.11a mode



Date: 12.NOV.2021 18:14:31

802.11n20 mode



Date: 12.NOV.2021 18:14:13

Mode	Frequency (MHz)	Ton(ms)	Ton+Toff(ms)	Duty cycle(%)
802.11 a	5200	-	-	100
	5260	-	-	100
	5580	-	-	100
	5785	-	-	100
802.11 n20	5200	-	-	100
	5260	-	-	100
	5580	-	-	100
	5785	-	-	100

Equipment Modifications

No modification was made to the EUT tested.

Support Equipment List and Details

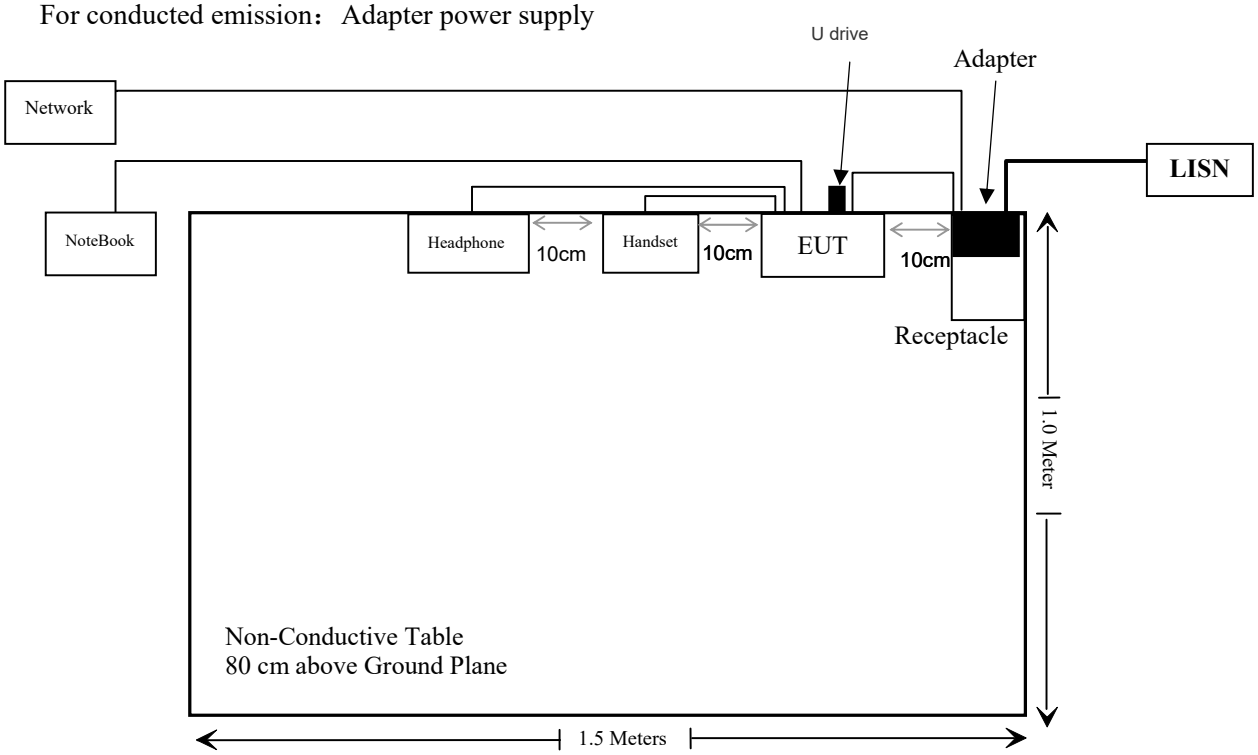
Manufacturer	Description	Model	Serial Number
DELL	NoteBook	Latitude E4710	PC201911252059
Grandstream	Headphone	Unknown	Unknown
Aigo	U drive	U268	Unknown
GOSPELL	POE	G0720-480-050	212701319

External I/O Cable

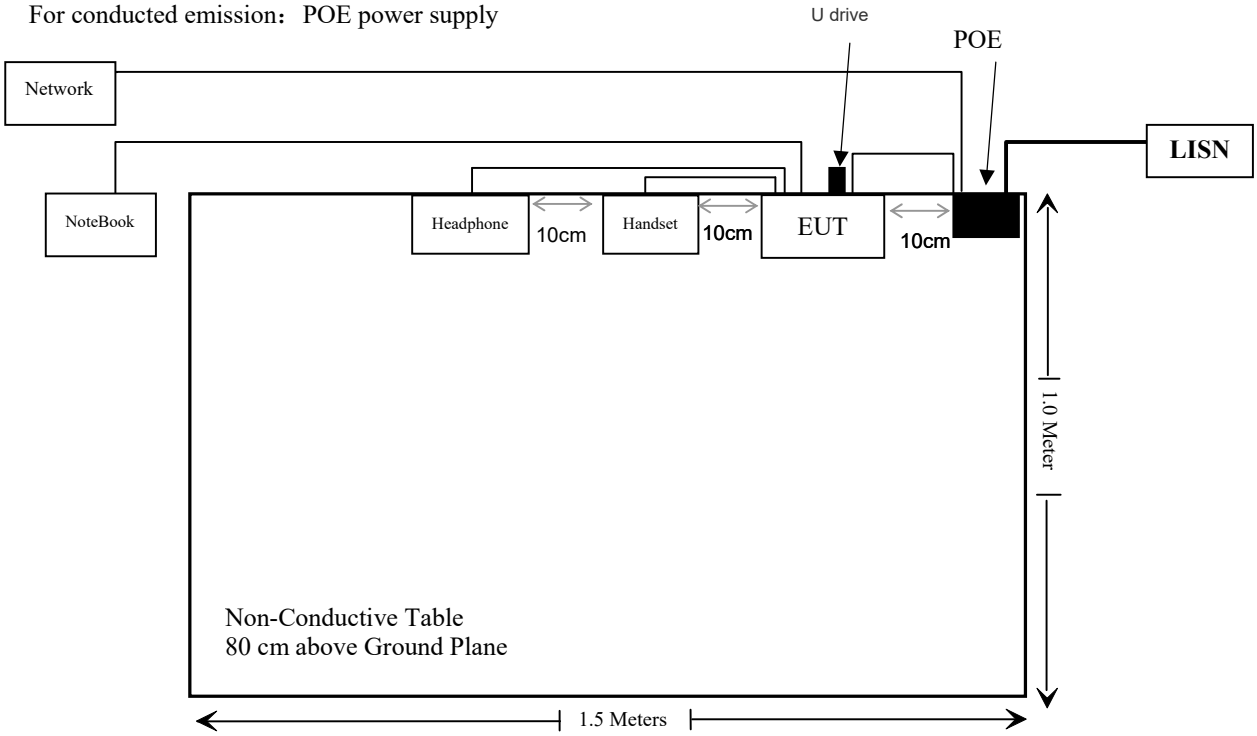
Cable Description	Length (m)	From Port	To
Un-shielding Un-Detachable AC Cable	1.2	LISN	Receptacle
Un-shielding Un-Detachable DC Cable	1.8	Adapter	EUT
Un-shielding Un-Detachable earphone Cable	1.5	EUT	Headphone
Un-shielding Detachable network Cable	6.0	EUT	Network
Un-shielding Detachable network Cable	6.0	EUT	NoteBook
Un-shielding Detachable network Cable	6.0	POE	Network
Un-shielding Detachable network Cable	1.0	POE	EUT

Block Diagram of Test Setup

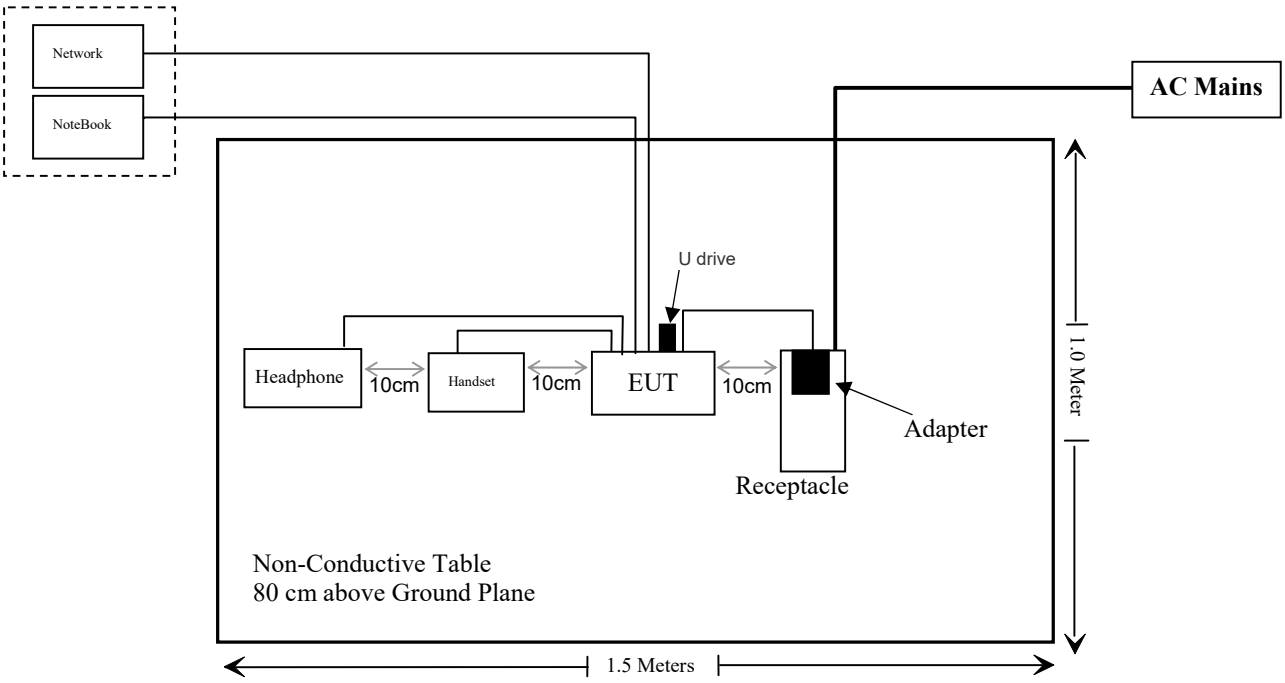
For conducted emission：Adapter power supply



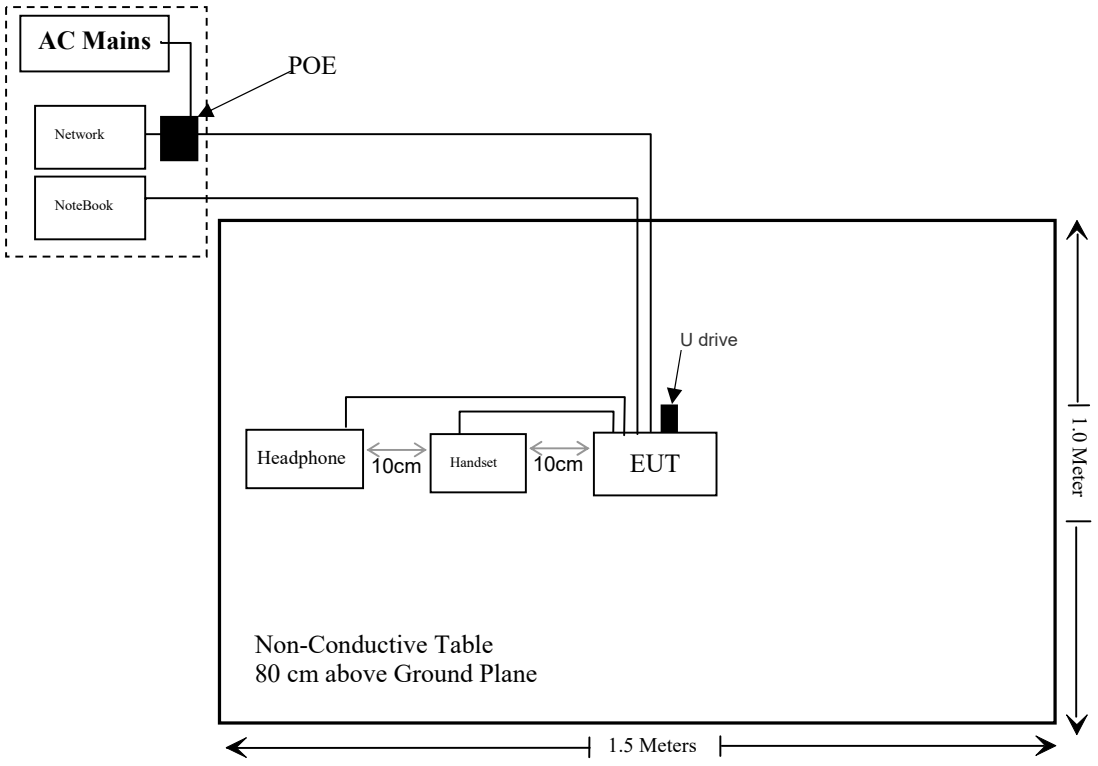
For conducted emission：POE power supply



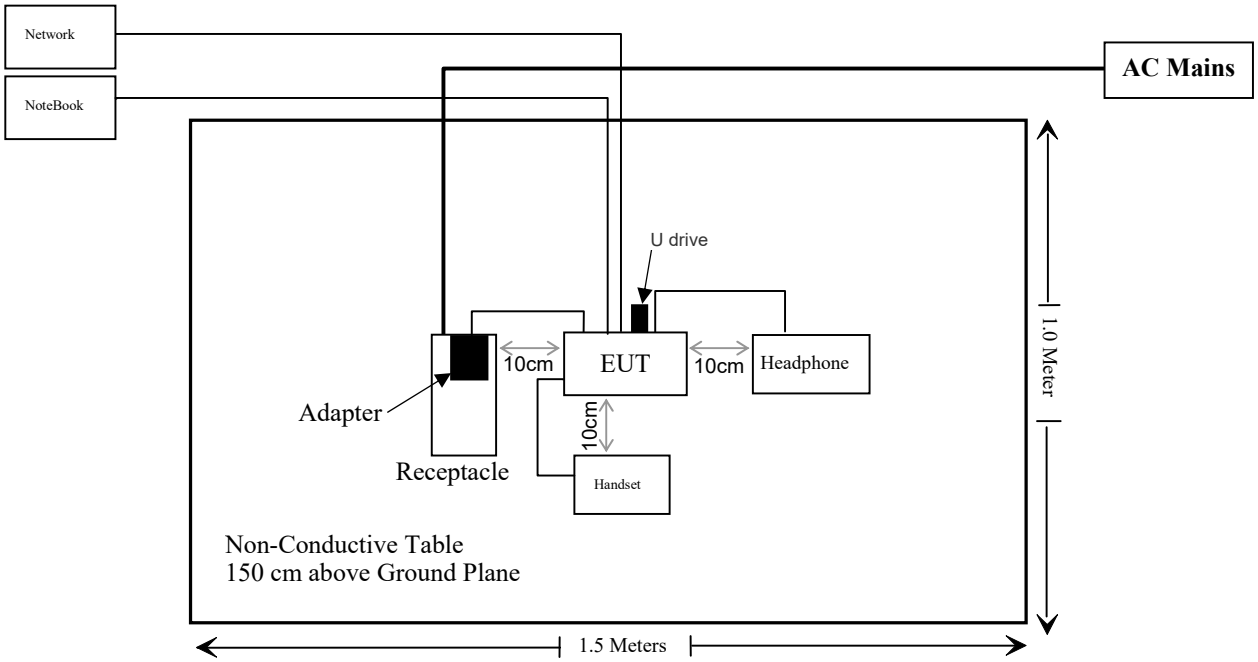
For Radiated emission(below 1G): Adapter power supply



For Radiated emission(below 1G): POE power supply



For Radiated emission(above 1G):



SUMMARY OF TEST RESULTS

FCC Rules	ISEDC Rules	Description of Test	Result
§1.1307 (b) (1) & §2.1091	RSS-102 § 2.5.2	MaximuM Permissible exposure (MPE) & Exemption Limits for Routine Evaluation – RF Exposure Evaluation	Compliant
§15.203	RSS-Gen §6.8	Antenna Requirement	Compliant
§15.407(b)(9)& §15.207(a)	RSS-Gen §8.8	Conducted Emissions	Compliant
§15.205& §15.209 &§15.407(b)	RSS-Gen §8.10&RSS-247§6.2	Undesirable Emission& Restricted Bands	Compliant
§15.407(a) (e)	RSS- Gen§6.7, RSS-247 § 6.2	26dB&6dBEmission Bandwidth & 99% Occupied Bandwidth	Compliant
§15.407(a)	RSS-247 §6.2	Conducted Transmitter Output Power	Compliant
§15.407 (a)	RSS-247 §6.2	Power Spectral Density	Compliant
§15.407 (h)	RSS-247 §6.3	Transmit Power Control (TPC)	Not Applicable
§15.407 (h)	RSS-247 §6.3	Dynamic Frequency Selection (DFS)	Compliant*
/	RSS-247 §6.4	Additional Requirements	Compliant

Not Applicable: the EUT has no TPC function which was declarded by the applicant.
Compliant*: Please refer to the DFS report: SZ1210916-48531E-RF-00D.

TEST EQUIPMENT LIST

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Conducted emission test					
Rohde& Schwarz	Test Receiver	ESPI3	100396	2020/12/24	2021/12/23
R & S	L.I.S.N.	ENV216	101314	2020/12/25	2021/12/24
Anritsu Corp	50ΩCoaxial Switch	MP59B	6200506474	2020/12/25	2021/12/24
Unknown	RF Coaxial Cable	N-2m	No.2	2020/12/25	2021/12/24
Conducted Emission Test Software: ES-K1 V1.71					
Radiated emission test					
Rohde& Schwarz	Test Receiver	ESR	101817	2020/12/24	2021/12/23
Rohde&Schwarz	Spectrum Analyzer	FSV40	101495	2020/12/24	2021/12/23
SONOMA INSTRUMENT	Amplifier	310 N	186131	2020/12/25	2021/12/24
A.H. Systems, inc.	Preamplifier	PAM-0118P	531	2021/07/08	2022/07/07
Quinstar	Amplifier	QLW-18405536-J0	15964001002	2020/11/28	2021/11/27
Anritsu Corp	50 Coaxial Switch	MP59B	6100237248	2020/12/25	2021/12/24
Schwarzbeck	Bilog Antenna	VULB9163	9163-323	2020/01/05	2023/01/04
Schwarzbeck	Horn Antenna	BBHA9120D	9120D-1067	2020/01/05	2023/01/04
Schwarzbeck	HORN ANTENNA	BBHA9170	9170-359	2020/01/05	2023/01/04
Radiated Emission Test Software: EZ_EMC V 1.1.4.2					
Unknown	RF Coaxial Cable	N-5m	No.3	2020/12/25	2021/12/24
Unknown	RF Coaxial Cable	N-5m	No.4	2020/12/25	2021/12/24
Unknown	RF Coaxial Cable	N-1m	No.5	2020/12/25	2021/12/24
Unknown	RF Coaxial Cable	N-1m	No.6	2020/12/25	2021/12/24
CD	Band Reject Filter	BRM-5.15/5.35g-45	075	2020/12/25	2021/12/24
CD	Band Reject Filter	BRM-5.47/5.725G-45	075	2020/12/25	2021/12/24
CD	Band Reject Filter	BRM-5.725/5.875G-45	065	2020/12/25	2021/12/24

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
RF conducted test					
Rohde & Schwarz	Spectrum Analyzer	FSV-40	101495	2020/12/24	2021/12/23
Rohde & Schwarz	Open Switch and Control Unit	OSP120 + OSP-B157	101244 + 100866	2020/12/24	2021/12/23

*** Statement of Traceability:** Shenzhen Accurate Technology Co., Ltd. attests that all calibrations have been performed in accordance to requirements that traceable to National Primary Standards and International System of Units (SI).

1.1307 (b) (1) & §2.1091- MAXIMUM PERMISSIBLE EXPOSURE (MPE)

Applicable Standard

According to subpart 1.1307 (b)(1), 2.1091 systems operating under the provisions of this section shall be operated in a manner that ensures the public is not exposed to RF energy level in excess of the communication guidelines.

Limits for General Population/Uncontrolled Exposure

Limits for General Population/Uncontrolled Exposure				
Frequency Range (MHz)	**Electric Field Strength (V/m)**	**Magnetic Field Strength (A/m)**	**Power Density (mW/cm^2)**	**Averaging Time (Minutes)**
0.3-1.34	614	1.63	*(100)	30
1.34-30	824/f	2.19/f	*($180/f^2$)	30
30-300	27.5	0.073	0.2	30
300-1500	/	/	f/1500	30
1500-100,000	/	/	1.0	30

f = frequency in MHz
* = Plane-wave equivalent power density
a)

Result

Calculated Formulary:

Predication of MPE limit at a given distance

$$S = \frac{PG}{4\pi R^2}$$

S = power density (in appropriate units, e.g. mW/cm^2)
P = power input to the antenna (in appropriate units, e.g., mW).
G = power gain of the antenna in the direction of interest relative to an isotropic radiator, the power gain factor, is normally numeric gain.
R = distance to the center of radiation of the antenna (appropriate units, e.g., cm)

Mode	Frequency (MHz)	Antenna Gain		Tune up conducted power		Evaluation Distance (cm)	Power Density (mW/cm^2)	MPE Limit (mW/cm^2)
		(dBi)	(numeric)	(dBm)	(mW)			
5G Wi-Fi	5150-5250	3.0	2.0	12.5	17.78	20	0.0071	1
5G Wi-Fi	5250-5350	3.0	2.0	11.0	12.59	20	0.0050	1
5G Wi-Fi	5470-5725	3.0	2.0	11.0	12.59	20	0.0050	1
5G Wi-Fi	5725-5850	3.0	2.0	11.5	14.13	20	0.0056	1

Note: 1. The tune up conducted power was declared by the applicant.
2. The Bluetooth, 2.4GHz Wi-Fi and 5GHz Wi-Fi cannot transmit at same time

To maintain compliance with the FCC's RF exposure guidelines, place the equipment at least 20cm from nearby persons.

Result: Pass

RSS-102 § 2.5.2 –EXEMPTION LIMITS FOR ROUTINE EVALUATION-RF EXPOSURE EVALUATION

Applicable Standard

According to RSS-102 § (2.5.2):

RF exposure evaluation is required if the separation distance between the user and/or bystander and the device's radiating element is greater than 20 cm, except when the device operates as follows:
• below 20 MHz and the source-based, time-averaged maximum e.i.r.p. of the device is equal to or less than 1 W (adjusted for tune-up tolerance);
• at or above 20 MHz and below 48 MHz and the source-based, time-averaged maximum e.i.r.p. of the device is equal to or less than $4.49/f^{0.5}$ W (adjusted for tune-up tolerance), where f is in MHz;
• at or above 48 MHz and below 300 MHz and the source-based, time-averaged maximum e.i.r.p. of the device is equal to or less than 0.6 W (adjusted for tune-up tolerance);
• at or above 300 MHz and below 6 GHz and the source-based, time-averaged maximum e.i.r.p. of the device is equal to or less than $1.31 \times 10^{-2} f^{0.6834}$ W (adjusted for tune-up tolerance), where f is in MHz;
• at or above 6 GHz and the source-based, time-averaged maximum e.i.r.p. of the device is equal to or less than 5 W (adjusted for tune-up tolerance). In these cases, the information contained in the RF exposure technical brief may be limited to information that demonstrates how the e.i.r.p. was derived.

Result

Calculated Data:

For 5GHz Wi-Fi:
The maximum tune-up conducted output power is 12.5 dBm, antenna gain is 3.0dBi.
So the maximum e.i.r.p. of the device is 12.5dBm + 3.0dBi = 15.5dBm =0.035W<4.53W

The worst case is f = 5180 MHz:
The limit is $1.31 \times 10^{-2} f^{0.6834}$ W=4.53W

So EUT meet the RF Exposure evaluation.

FCC §15.203 & RSS-Gen §6.8 ANTENNA REQUIREMENT

Applicable Standard

According to § 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section. The manufacturer may design the unit so that a broken antenna can be replaced by the user, but the user of a standard antenna jack or electrical connector is prohibited. The structure and application of the EUT were analyzed to determine compliance with section §15.203 of the rules. §15.203 state that the subject device must meet the following criteria:

b. Antenna must be permanently attached to the unit.
c. Antenna must use a unique type of connector to attach to the EUT.
Unit must be professionally installed, and installer shall be responsible for verifying that the correct antenna is employed with the unit.

The applicant for equipment certification shall provide a list of all antenna types that may be used with the transmitter, where applicable (i.e. for transmitters with detachable antenna), indicating the maximum permissible antenna gain (in dBi) and the required impedance for each antenna. The test report shall demonstrate the compliance of the transmitter with the limit for maximum equivalent isotropically radiated power (e.i.r.p.) specified in the applicable RSS, when the transmitter is equipped with any antenna type, selected from this list.

For expediting the testing, measurements may be performed using only the antenna with highest gain of each combination of transmitter and antenna type, with the transmitter output power set at the maximum level. However, the transmitter shall comply with the applicable requirements under all operational conditions and when in combination with any type of antenna from the list provided in the test report (and in the notice to be included in the user manual, provided below).

When measurements at the antenna port are used to determine the RF output power, the effective gain of the device's antenna shall be stated, based on a measurement or on data from the antenna's manufacturer.

The test report shall state the RF power, output power setting and spurious emission measurements with each antenna type that is used with the transmitter being tested.

For licence-exempt equipment with detachable antennas, the user manual shall also contain the following notice in a conspicuous location:

This radio transmitter [enter the device's ISED certification number] has been approved by Innovation, Science and Economic Development Canada to operate with the antenna types listed below, with the maximum permissible gain indicated. Antenna types not included in this list that have a gain greater than the maximum gain indicated for any type listed are strictly prohibited for use with this device.
Immediately following the above notice, the manufacturer shall provide a list of all antenna types which can be used with the transmitter, indicating the maximum permissible antenna gain (in dBi) and the required impedance for each antenna type.

Antenna Connector Construction

The EUT has one internal antennas arrangement for 5G Wi-Fi which were permanently attached. Please refer to the EUT photos.

Type	Antenna Gain	Impedance	Frequency Range
PCB	3.0dBi	50 Ω	5150-5850MHz

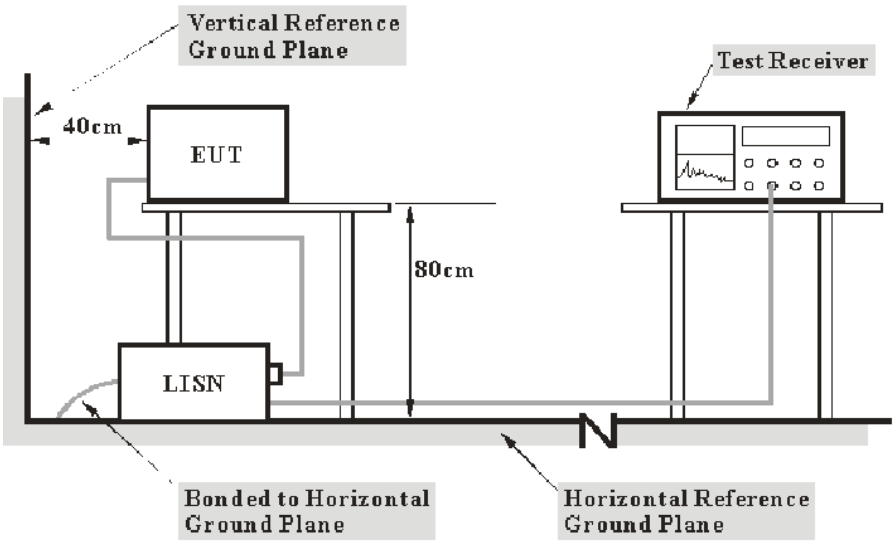
Result: Compliant.

FCC §15.407 (b) (6) §15.207 (a) & RSS-GEN §8.8 – CONDUCTED EMISSIONS

Applicable Standard

FCC §15.207, §15.407(b) (6) & RSS-GEN §8.8

EUT Setup



Note: 1. Support units were connected to second LISN.
2. Both of LISNs (AMN) 80 cm from EUT and at the least 80 cm from other units and other metal planes support units.

The setup of EUT is according with per ANSI C63.10-2013 measurement procedure. The specification used was with the FCC Part 15.207 limits and RSS-GEN.

The spacing between the peripherals was 10 cm.

EMI Test Receiver Setup

The EMI test receiver was set to investigate the spectrum from 150 kHz to 30 MHz.

During the conducted emission test, the EMI test receiver was set with the following configurations:

Frequency Range	IF B/W
150 kHz – 30 MHz	9 kHz

Test Procedure

During the conducted emission test, the adapter was connected to the LISN.

Maximizing procedure was performed on the six (6) highest emissions of the EUT.

All data was recorded in the Quasi-peak and Average detection mode.

Test Data

Environmental Conditions

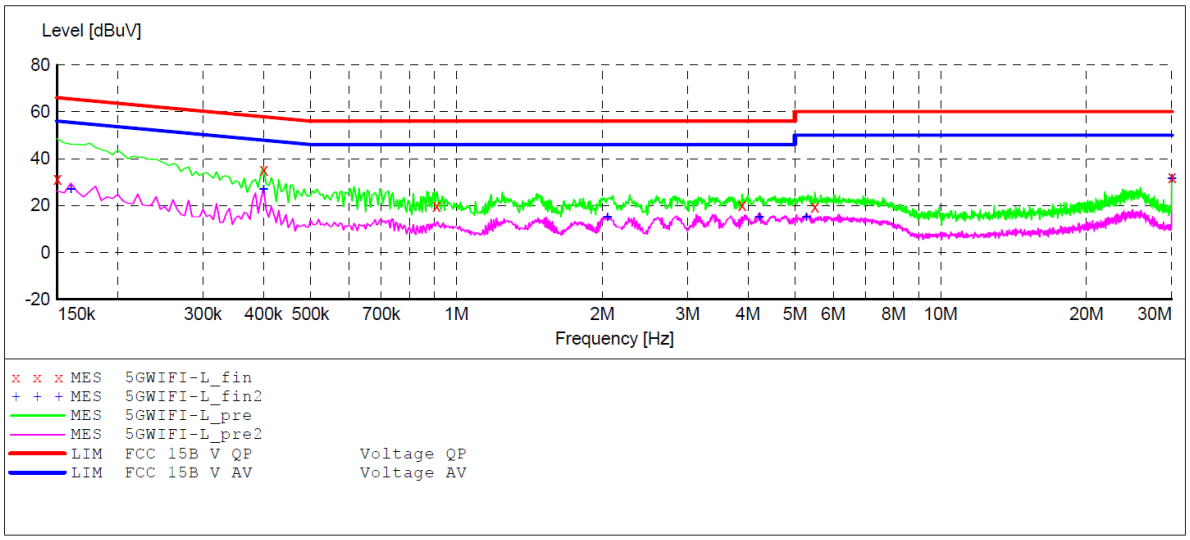
Temperature:	25 ℃
Relative Humidity:	50 %
ATM Pressure:	101.0 kPa

The testing was performed by Caro hu on 2021-10-02 and 2021-10-21.

EUT operation mode: Transmitting

For POE:

AC 120V/60 Hz, Line



MEASUREMENT RESULT: "5GWIFI-L_fin"

2021-10-21 11:05

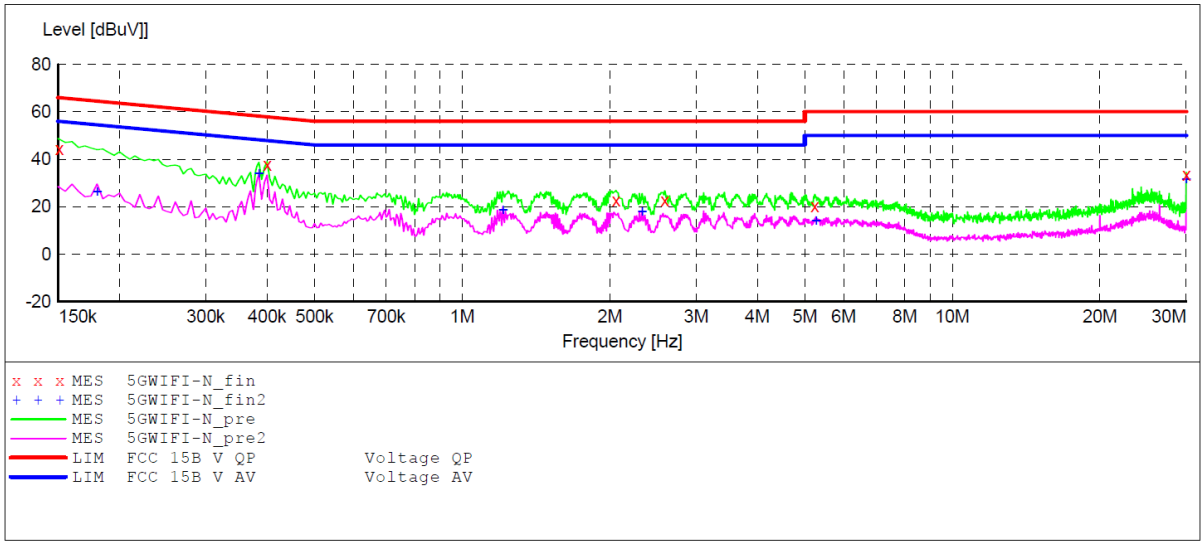
Frequency MHz	Level dBuV	Transd dB	Limit dBuV	Margin dB	Detector	Line	PE
0.150000	31.30	10.8	66	34.7	QP	L1	GND
0.400000	35.10	11.0	58	22.9	QP	L1	GND
0.910000	19.90	11.1	56	36.1	QP	L1	GND
3.890000	20.00	11.4	56	36.0	QP	L1	GND
5.500000	19.50	11.5	60	40.5	QP	L1	GND
30.000000	32.20	11.8	60	27.8	QP	L1	GND

MEASUREMENT RESULT: "5GWIFI-L_fin2"

2021-10-21 11:05

Frequency MHz	Level dBuV	Transd dB	Limit dBuV	Margin dB	Detector	Line	PE
0.160000	26.80	10.8	56	29.2	AV	L1	GND
0.400000	26.70	11.0	48	21.3	AV	L1	GND
2.050000	14.80	11.3	46	31.2	AV	L1	GND
4.220000	14.90	11.4	46	31.1	AV	L1	GND
5.280000	15.00	11.4	50	35.0	AV	L1	GND
30.000000	31.20	11.8	50	18.8	AV	L1	GND

AC 120V/60 Hz, Neutral



MEASUREMENT RESULT: "5GWIFI-N_fin"

2021-10-21 11:08

Frequency MHz	Level dBuV	Transd dB	Limit dBuV	Margin dB	Detector	Line	PE
0.150000	42.20	10.8	66	23.8	QP	N	GND
0.400000	37.80	11.0	58	20.2	QP	N	GND
2.060000	22.70	11.3	56	33.3	QP	N	GND
2.590000	22.50	11.3	56	33.5	QP	N	GND
5.240000	20.30	11.4	60	39.7	QP	N	GND
30.000000	33.30	11.8	60	26.7	QP	N	GND

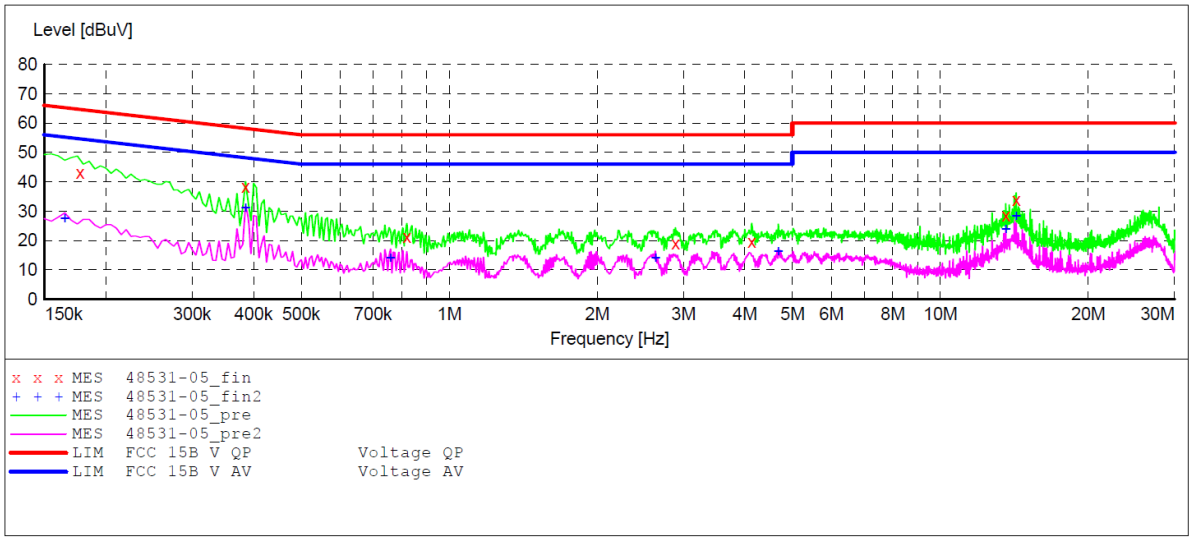
MEASUREMENT RESULT: "5GWIFI-N_fin2"

2021-10-21 11:08

Frequency MHz	Level dBuV	Transd dB	Limit dBuV	Margin dB	Detector	Line	PE
0.180000	26.30	10.8	55	28.7	AV	N	GND
0.385000	33.80	10.9	48	14.2	AV	N	GND
1.210000	18.40	11.2	46	27.6	AV	N	GND
2.330000	17.80	11.3	46	28.2	AV	N	GND
5.270000	14.00	11.4	50	36.0	AV	N	GND
30.000000	31.30	11.8	50	18.7	AV	N	GND

For adapter NSA10EU-05020002:

AC 120V/60 Hz, Line



MEASUREMENT RESULT: "48531-05_fin"

2021-10-2 11:57

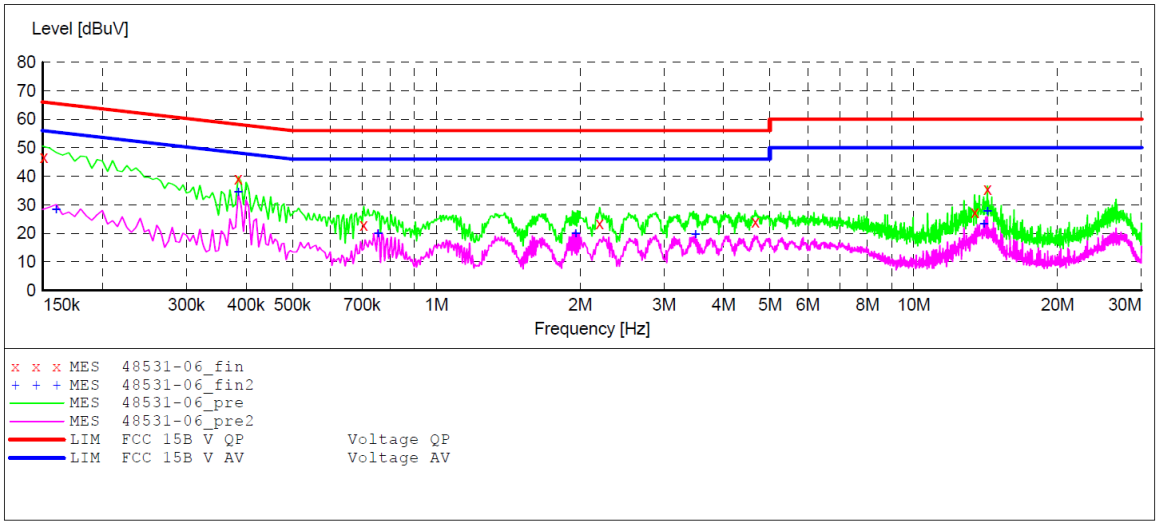
Frequency MHz	Level dBuV	Transd dB	Limit dBuV	Margin dB	Detector	Line	PE
0.175000	28.60	10.8	65	36.4	QP	L1	GND
0.385000	38.30	10.9	58	19.7	QP	L1	GND
0.820000	21.30	11.1	56	34.7	QP	L1	GND
2.890000	19.00	11.3	56	37.0	QP	L1	GND
4.130000	19.50	11.4	56	36.5	QP	L1	GND
13.600000	28.40	11.6	60	31.6	QP	L1	GND
14.275000	33.80	11.6	60	26.2	QP	L1	GND

MEASUREMENT RESULT: "48531-05_fin2"

2021-10-2 11:57

Frequency MHz	Level dBuV	Transd dB	Limit dBuV	Margin dB	Detector	Line	PE
0.165000	27.50	10.8	55	27.5	AV	L1	GND
0.385000	31.00	10.9	48	17.0	AV	L1	GND
0.760000	14.00	11.1	46	32.0	AV	L1	GND
2.630000	14.10	11.3	46	31.9	AV	L1	GND
4.680000	16.30	11.4	46	29.7	AV	L1	GND
13.600000	23.90	11.6	50	26.1	AV	L1	GND
14.275000	28.10	11.6	50	21.9	AV	L1	GND

AC 120V/60 Hz, Neutral



MEASUREMENT RESULT: "48531-06_fin"

2021-10-2 11:59

Frequency MHz	Level dBuV	Transd dB	Limit dBuV	Margin dB	Detector	Line	PE
0.150000	47.10	10.8	66	18.9	QP	N	GND
0.385000	39.20	10.9	58	18.8	QP	N	GND
0.705000	23.00	11.1	56	33.0	QP	N	GND
2.200000	23.40	11.3	56	32.6	QP	N	GND
4.660000	24.10	11.4	56	31.9	QP	N	GND
13.425000	27.30	11.6	60	32.7	QP	N	GND
14.275000	35.40	11.6	60	24.6	QP	N	GND

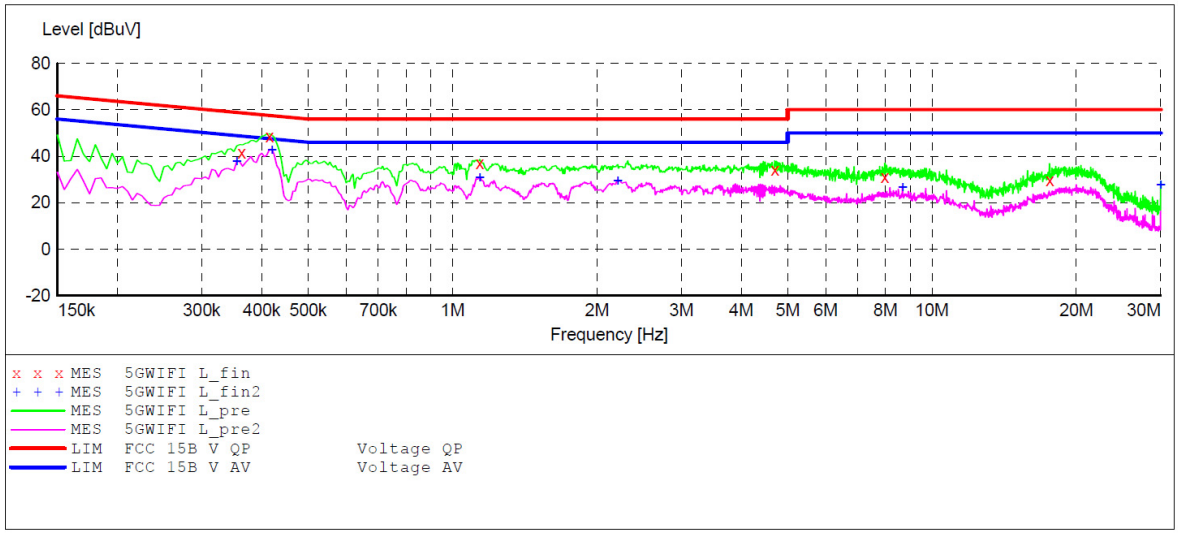
MEASUREMENT RESULT: "48531-06_fin2"

2021-10-2 11:59

Frequency MHz	Level dBuV	Transd dB	Limit dBuV	Margin dB	Detector	Line	PE
0.160000	28.10	10.8	56	27.9	AV	N	GND
0.385000	34.30	10.9	48	13.7	AV	N	GND
0.755000	19.90	11.1	46	26.1	AV	N	GND
1.960000	19.80	11.3	46	26.2	AV	N	GND
3.490000	19.60	11.4	46	26.4	AV	N	GND
14.025000	23.10	11.6	50	26.9	AV	N	GND
14.275000	27.80	11.6	50	22.2	AV	N	GND

For adapter OH-1015A0502000U4-UL:

AC 120V/60 Hz, Line



MEASUREMENT RESULT: "5GWIFI L_fin"

2021-10-21 03:07

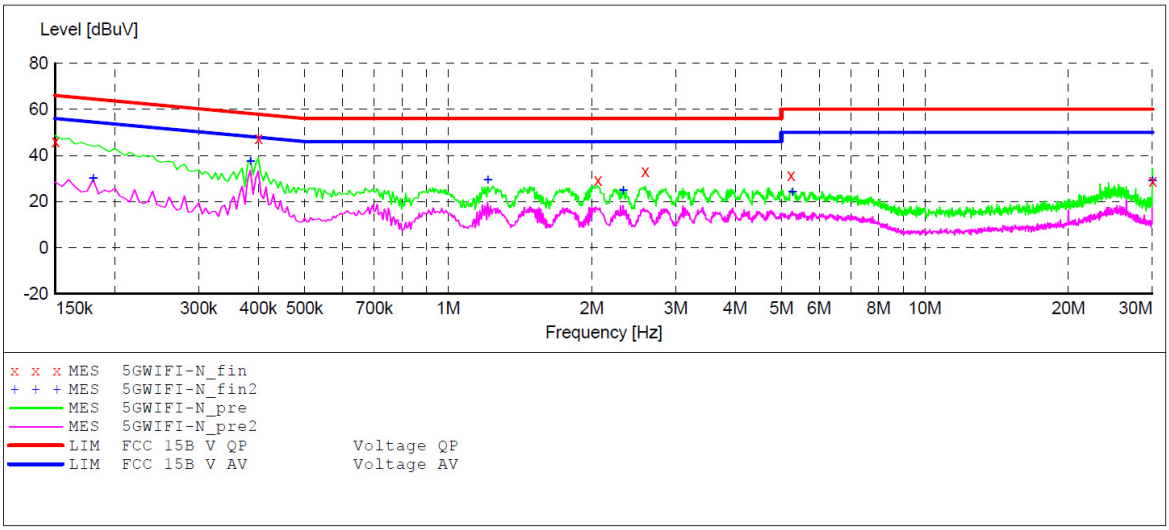
Frequency MHz	Level dBuV	Transd dB	Limit dBuV	Margin dB	Detector	Line	PE
0.360000	40.80	10.9	59	18.2	QP	L1	GND
0.415000	48.40	11.0	58	9.6	QP	L1	GND
1.140000	36.80	11.2	56	19.2	QP	L1	GND
4.700000	34.30	11.4	56	21.7	QP	L1	GND
7.970000	30.90	11.5	60	29.1	QP	L1	GND
17.600000	29.50	11.7	60	30.5	QP	L1	GND

MEASUREMENT RESULT: "5GWIFI L_fin2"

2021-10-21 03:07

Frequency MHz	Level dBuV	Transd dB	Limit dBuV	Margin dB	Detector	Line	PE
0.355000	37.60	10.9	49	11.4	AV	L1	GND
0.420000	42.50	11.0	47	4.5	AV	L1	GND
1.140000	30.70	11.2	46	15.3	AV	L1	GND
2.210000	29.40	11.3	46	16.6	AV	L1	GND
8.680000	26.50	11.5	50	23.5	AV	L1	GND
30.000000	27.70	11.8	50	22.3	AV	L1	GND

AC 120V/60 Hz, Neutral



MEASUREMENT RESULT: "5GWIFI-N_fin"

2021-10-21 03:02

Frequency MHz	Level dBuV	Transd dB	Limit dBuV	Margin dB	Detector	Line	PE
0.150000	42.80	10.8	66	23.2	QP	N	GND
0.400000	47.30	11.0	58	10.7	QP	N	GND
2.060000	29.40	11.3	56	26.6	QP	N	GND
2.590000	33.00	11.3	56	23.0	QP	N	GND
5.240000	31.30	11.4	60	28.7	QP	N	GND
30.000000	29.00	11.8	60	31.0	QP	N	GND

MEASUREMENT RESULT: "5GWIFI-N_fin2"

2021-10-21 03:02

Frequency MHz	Level dBuV	Transd dB	Limit dBuV	Margin dB	Detector	Line	PE
0.180000	29.90	10.8	55	25.1	AV	N	GND
0.385000	37.30	10.9	48	10.7	AV	N	GND
1.210000	29.30	11.2	46	16.7	AV	N	GND
2.330000	24.80	11.3	46	21.2	AV	N	GND
5.270000	24.00	11.4	50	26.0	AV	N	GND
30.000000	28.80	11.8	50	21.2	AV	N	GND

FCC §15.205 & §15.209 & §15.407(B)& RSS-GEN § 8.10 & RSS-247 § 6.2– UNDESIRABLE EMISSION

Applicable Standard

FCC §15.407 (b); §15.209; §15.205;

(b) Undesirable emission limits. Except as shown in paragraph (b)(7) of this section, the maximum emissions outside of the frequency bands of operation shall be attenuated in accordance with the following limits:
(1) For transmitters operating in the 5.15-5.25 GHz band: All emissions outside of the 5.15-5.35 GHz band shall not exceed an e.i.r.p. of −27 dBm/MHz.
(2) For transmitters operating in the 5.25-5.35 GHz band: All emissions outside of the 5.15-5.35 GHz band shall not exceed an e.i.r.p. of −27 dBm/MHz.
(3) For transmitters operating in the 5.47-5.725 GHz band: All emissions outside of the 5.47-5.725 GHz band shall not exceed an e.i.r.p. of −27 dBm/MHz.
(4) For transmitters operating in the 5.725-5.85 GHz band:
(i) 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.

Unwanted emissions below 1 GHz must comply with the general field strength limits set forth in §15.209.

RSS-247 § 6.2:

Frequency band 5150-5250 MHz

6.2.1.2 Unwanted emission limits

For transmitters with operating frequencies in the band 5150-5250 MHz, all emissions outside the band 5150-5350 MHzshall not exceed -27 dBm/MHz e.i.r.p. Any unwanted emissions that fall into the band 5250-5350 MHz shall be attenuated below the channel power by at least 26 dB, when measured using a resolution bandwidth between 1 and 5% of the occupied bandwidth (i.e. 99% bandwidth), above 5250 MHz. The 26 dB bandwidth may fall into the 5250-5350 MHz band; however, if the occupied bandwidth also falls within the 5250-5350 MHz band, the transmission is considered as intentional and the devices shall comply with all requirements in the band 5250-5350 MHz including implementing dynamic frequency selection (DFS) and TPC, on the portion of the emission that resides in the 5250-5350 MHz band.

Frequency band 5250-5350 MHz

6.2.2.2 Unwanted emission limits

Devices shall comply with the following:
a.All emissions outside the band 5250-5350 MHz shall not exceed -27 dBm/MHz e.i.r.p.; or
b.All emissions outside the band 5150-5350 MHz shall not exceed -27 dBm/MHz e.i.r.p. and its power shall comply with the spectral power density for operation within the band 5150-5250 MHz. The device, except devices installed in vehicles, shall be labelled or include in the user manual the following text “for indoor use only.”

Frequency band 5470-5600 MHz and 5650-5725 MHz

6.2.3.2 Unwanted emission limits

Emissions outside the band 5470-5725 MHz shall not exceed -27 dBm/MHz e.i.r.p. However, devices with bandwidth overlapping the band edge of 5725 MHz can meet the emission limit of -27 dBm/MHz e.i.r.p.at 5850 MHz instead of 5725 MHz.

Frequency band 5725-5850 MHz

6.2.4.2 Unwanted emission limits

Devices operating in the band 5725-5850 MHz with antenna gain greater than 10 dBi can have unwanted emissions that comply with either the limits in this section or in section 5.5 until six (6) months after the publication date of this standard for certification. Certified devices that do not comply with emission limits in this section shall not be manufactured, imported, distributed, leased, offered for sale or sold after April 1, 2018.

Devices operating in the band 5725-5850 MHz with antenna gain of 10 dBi or less can have unwanted emissions that comply with either the limits in this section or in section 5.5 until April 1, 2018 for certification. Certified devices that do not comply with emission limits in this section shall not be manufactured, imported, distributed, leased, offered for sale or sold after April 1, 2020.

Devices operating in the band 5725-5850 MHz shall have e.i.r.p. of unwanted emissions comply with the following:

a) 27 dBm/MHz at frequencies from the band edges decreasing linearly to 15.6 Bm/MHz at 5 MHz above or below the band edges;

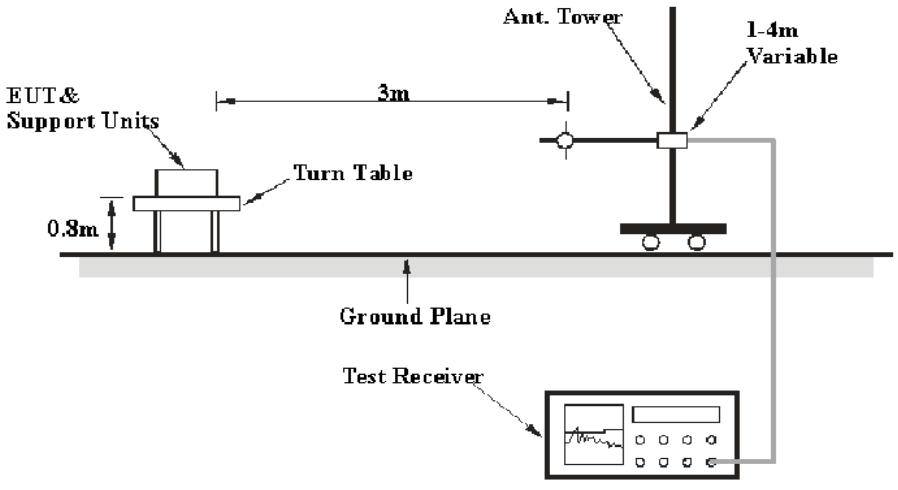
b) 15.6 dBm/MHz at 5 MHz above or below the band edges decreasing linearly to 10 dBm/MHz at 25 MHz above or below the band edges;

c) 10 dBm/MHz at 25 MHz above or below the band edges decreasing linearly to -27 dBm/MHz at 75 MHz above or below the band edges; and

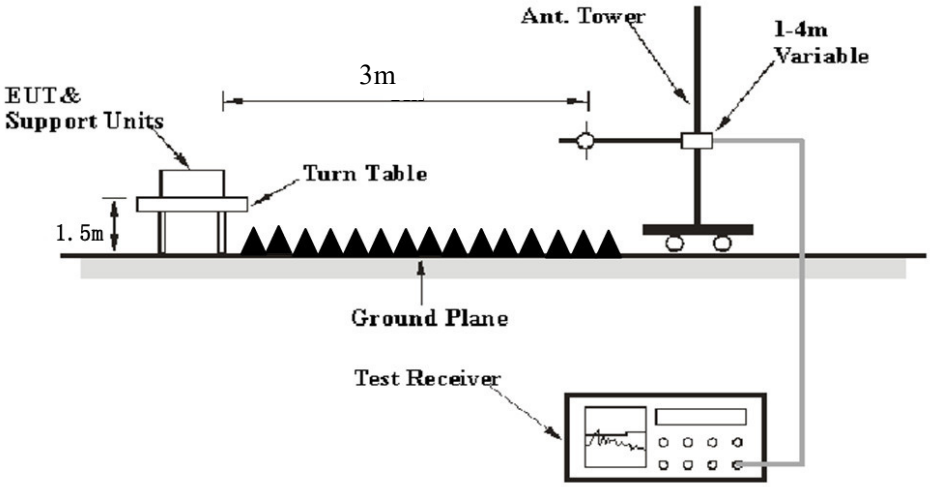
d) -27 dBm/MHz at frequencies more than 75 MHz above or below the band edges.

EUT Setup

Below 1 GHz:



Above 1 GHz:



The setup of EUT is according with per ANSI C63.10-2013 measurement procedure. The specification used was with the FCC 15.209, FCC 15.407, RSS-Gen&RSS-247 limits.

The external I/O cables were draped along the test table and formed a bundle 30 to 40 cm long in the middle.

EMI Test Receiver & Spectrum Analyzer Setup

The system was investigated from 30 MHz to 40 GHz.

During the radiated emission test, the EMI test receiver & Spectrum Analyzer Setup were set with the following configurations:

Frequency Range	RBW	Video B/W	IF B/W	Measurement
30 MHz – 1000 MHz	100 kHz	300 kHz	120 kHz	QP
Above 1 GHz	1 MHz	3 MHz	/	PK
	1MHz	10 Hz Note 1	/	Average
	1MHz	＞1/T Note 2	/	Average

Note 1: when duty cycle is no less than 98%
Note 2: when duty cycle is less than 98%

Test Procedure

Radiated Spurious Emission

During the radiated emission test, the adapter was connected to the AC floor outlet.

Maximizing procedure was performed on the highest emissions to ensure that the EUT complied with all the installation combinations.

Data was recorded in Quasi-peak detection mode for frequency range of 30 MHz-1GHz, peak and Average detection modes for frequencies above 1GHz.

Corrected Amplitude & Margin Calculation

The Corrected Amplitude is calculated by adding the Antenna Factor and Cable Loss, and subtracting the Amplifier Gain from the Meter Reading. The basic equation is as follows:

Corrected Amplitude = Meter Reading + Antenna Factor + Cable Loss - Amplifier Gain

The "**Margin**" column of the following data tables indicates the degree of compliance with the applicable limit. For example, a margin of -7dB means the emission is 7dB below the limit. The equation for margin calculation is as follows:

Margin = Corrected – Amplitude Limit

Test Data

Environmental Conditions

Temperature:	20~23 ℃
Relative Humidity:	45~50 %
ATM Pressure:	101.0~103.0 kPa

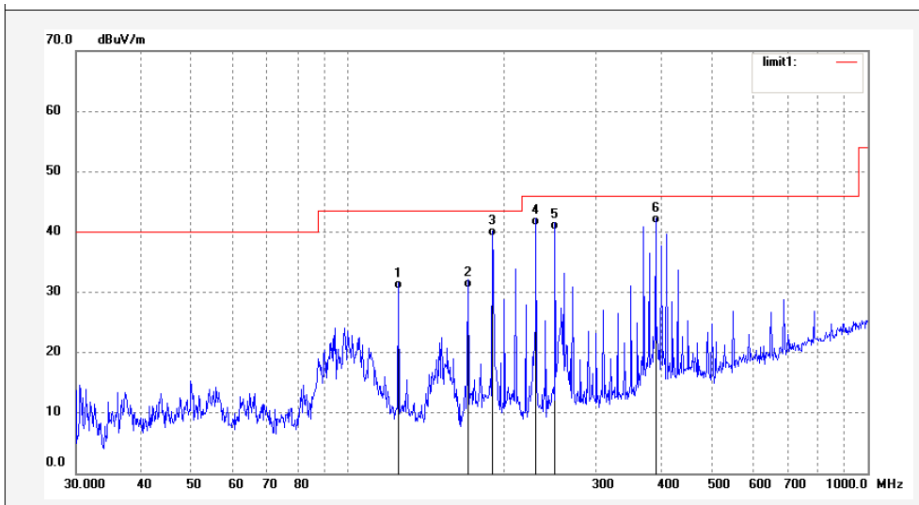
The testing was performed by Icey on 2021-10-23 for below 1GHz and Chao Mo on 2021-10-15 for above 1GHz.

EUT operation mode: Transmitting

30 MHz – 1 GHz:

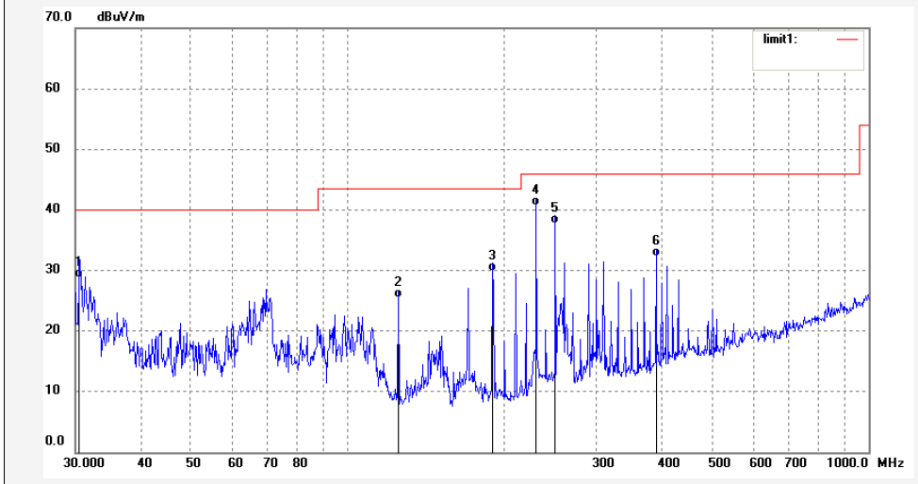
For POE

Horizontal



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	125.0066	49.22	-18.67	30.55	43.50	-12.95	QP			
2	170.1947	49.37	-18.69	30.68	43.50	-12.82	QP			
3	189.7384	56.98	-17.77	39.21	43.50	-4.29	QP			
4	230.0985	57.86	-16.79	41.07	46.00	-4.93	QP			
5	250.3011	56.76	-16.44	40.32	46.00	-5.68	QP			
6	390.7225	54.12	-12.79	41.33	46.00	-4.67	QP			

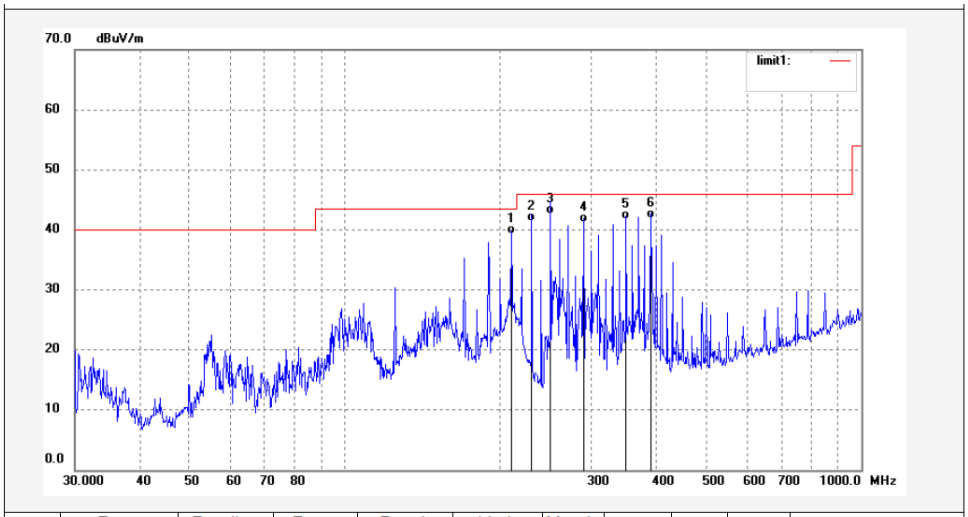
Vertical



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	30.5305	42.55	-13.71	28.84	40.00	-11.16	QP			
2	125.0066	44.13	-18.67	25.46	43.50	-18.04	QP			
3	189.7384	47.64	-17.77	29.87	43.50	-13.63	QP			
4	230.0985	57.41	-16.79	40.62	46.00	-5.38	QP			
5	250.3011	54.09	-16.44	37.65	46.00	-8.35	QP			
6	390.7225	45.11	-12.79	32.32	46.00	-13.68	QP			

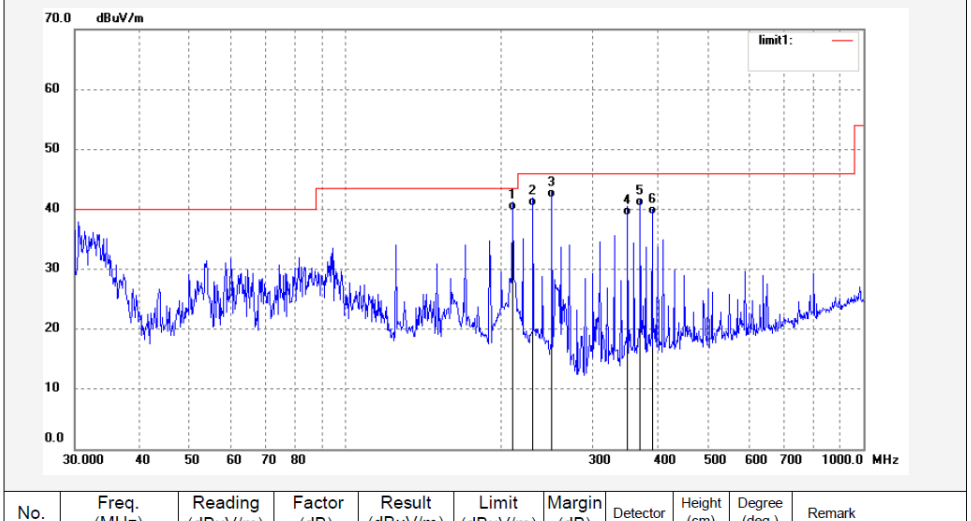
For adapter NSA10EU-05020002:

Horizontal



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	210.0482	56.75	-17.46	39.29	43.50	-4.21	QP			
2	230.0985	58.21	-16.79	41.42	46.00	-4.58	QP			
3	250.3012	59.12	-16.44	42.68	46.00	-3.32	QP			
4	290.0172	56.12	-14.91	41.21	46.00	-4.79	QP			
5	350.4768	55.01	-13.30	41.71	46.00	-4.29	QP			
6	390.7225	54.67	-12.79	41.88	46.00	-4.12	QP			

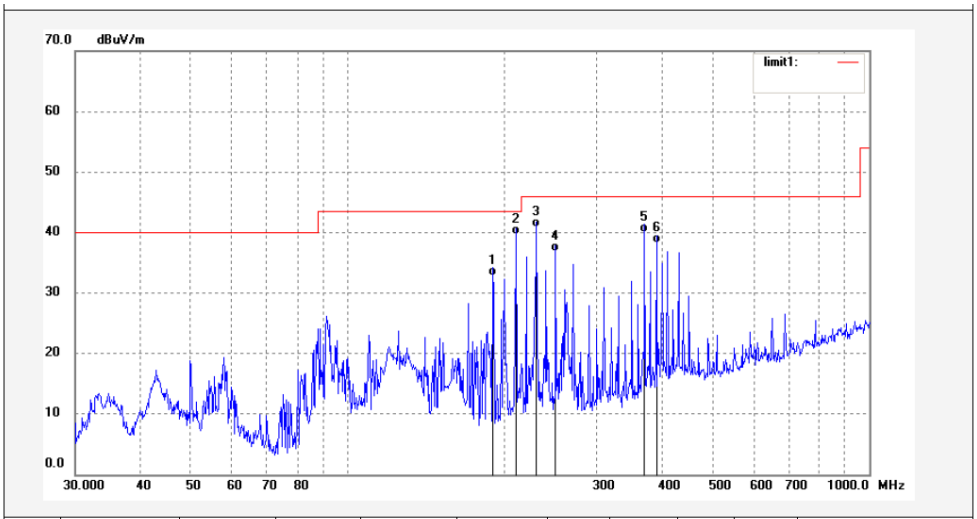
Vertical



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	210.0482	57.35	-17.46	39.89	43.50	-3.61	QP			
2	230.0985	57.23	-16.79	40.44	46.00	-5.56	QP			
3	250.3012	58.32	-16.44	41.88	46.00	-4.12	QP			
4	350.4768	52.21	-13.30	38.91	46.00	-7.09	QP			
5	370.7023	53.61	-13.07	40.54	46.00	-5.46	QP			
6	390.7225	51.89	-12.79	39.10	46.00	-6.90	QP			

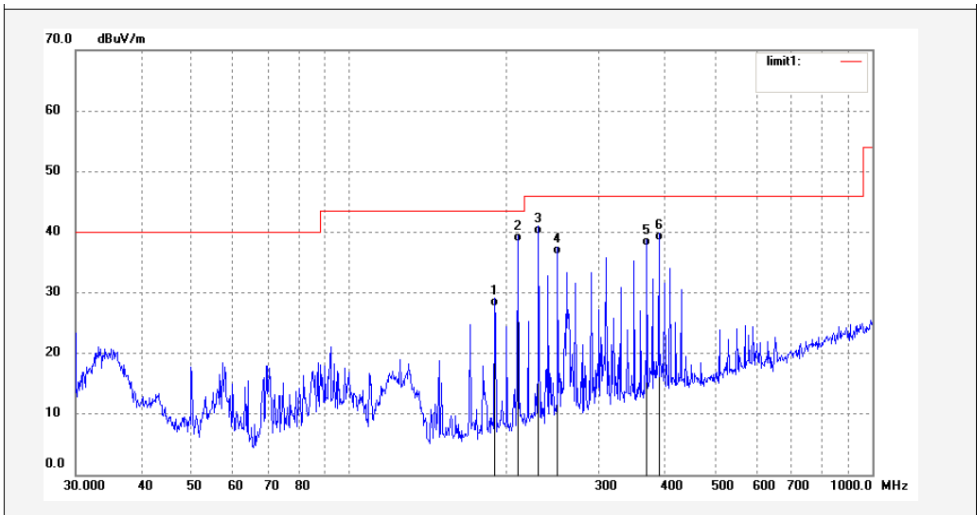
For adapter OH-1015A0502000U4-UL:

Horizontal



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	189.7384	50.51	-17.77	32.74	43.50	-10.76	QP			
2	210.0482	57.02	-17.46	39.56	43.50	-3.94	QP			
3	230.0985	57.68	-16.79	40.89	46.00	-5.11	QP			
4	250.3011	53.21	-16.44	36.77	46.00	-9.23	QP			
5	370.7022	53.11	-13.07	40.04	46.00	-5.96	QP			
6	390.7225	51.07	-12.79	38.28	46.00	-7.72	QP			

Vertical



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	189.7384	45.46	-17.77	27.69	43.50	-15.81	QP			
2	210.0482	55.88	-17.46	38.42	43.50	-5.08	QP			
3	230.0985	56.47	-16.79	39.68	46.00	-6.32	QP			
4	250.3011	52.68	-16.44	36.24	46.00	-9.76	QP			
5	370.7022	50.77	-13.07	37.70	46.00	-8.30	QP			
6	390.7225	51.43	-12.79	38.64	46.00	-7.36	QP			

1GHz – 40GHz: *(worst case is adapter NSA10EU-05020002)*

5150-5250 MHz:

Frequency (MHz)	Receiver		Turn-Table	Rx Antenna		Corrected Factor (dB/m)	Corrected Amplitude (dBμV/m)	FCC Part 15.407	
	Reading (dBμV)	PK/QP/Ave.	Angle Degree	Height (m)	Polar (H / V)			Limit (dBμV/m)	Margin (dB)
802.11a 11a									
5180MHz									
4500	39.43	PK	265	1.8	H	1.89	41.32	74	-32.68
4500	40.09	PK	298	1.2	V	1.89	41.98	74	-32.02
5150	43.74	PK	298	1.2	H	3.37	47.11	74	-26.89
5150	43.68	PK	336	1.1	V	3.37	47.05	74	-26.95
10360	34.04	PK	336	1.1	H	14.41	48.45	68.2	-19.75
10360	35.66	PK	259	1.9	V	14.41	50.07	68.2	-18.13
5200MHz									
10400	32.08	PK	33	14.5	H	14.46	46.54	68.2	-21.66
10400	33.36	PK	146	14.5	V	14.46	47.82	68.2	-20.38
5240MHz									
5350	40.46	PK	89	1.7	H	3.33	43.79	74	-30.21
5350	39.42	PK	46	2.5	V	3.33	42.75	74	-31.25
5460	39.5	PK	89	1.7	H	3.31	42.81	74	-31.19
5460	39.48	PK	99	1.2	V	3.31	42.79	74	-31.21
10480	32.7	PK	162	1.9	H	14.53	47.23	68.2	-20.97
10480	33.79	PK	352	1.4	V	14.53	48.32	68.2	-19.88
802.11n20									
5180MHz									
4500	40.56	PK	345	1.5	H	1.89	42.45	74	-31.55
4500	40.43	PK	154	1.2	V	1.89	42.32	74	-31.68
5150	44.69	PK	154	1.2	H	3.37	48.06	74	-25.94
5150	45.14	PK	200	1.2	V	3.37	48.51	74	-25.49
10360	33.48	PK	200	1.2	H	14.41	47.89	68.2	-20.31
10360	34.7	PK	176	1.4	V	14.41	49.11	68.2	-19.09
5200MHz									
10400	30.8	PK	88	14.5	H	14.46	45.26	68.2	-22.94
10400	32.28	PK	103	14.5	V	14.46	46.74	68.2	-21.46
5240MHz									
5350	39.45	PK	285	1.7	H	3.33	42.78	74	-31.22
5350	39.99	PK	46	2.5	V	3.33	43.32	74	-30.68
5460	38.23	PK	285	1.7	H	3.31	41.54	74	-32.46
5460	38.84	PK	319	1.2	V	3.31	42.15	74	-31.85
10480	31.98	PK	327	2.0	H	14.53	46.51	68.2	-21.69
10480	33.2	PK	266	1.8	V	14.53	47.73	68.2	-20.47

5250-5350 MHz:

Frequency (MHz)	Receiver		Turn-Table	Rx Antenna		Corrected Factor (dB/m)	Corrected Amplitude (dBμV/m)	FCC Part15.407	
	Reading (dBμV)	PK/QP/Ave.	Angle Degree	Height (m)	Polar (H / V)			Limit (dBμV/m)	Margin (dB)
802.11a									
5260MHz									
4500	39.43	PK	21	1.6	H	1.89	41.32	74	-32.68
4500	40.55	PK	359	1.6	V	1.89	42.44	74	-31.56
5150	43.5	PK	359	1.6	H	3.37	46.87	74	-27.13
5150	43.9	PK	157	1.8	V	3.37	47.27	74	-26.73
10520	32.59	PK	157	1.8	H	14.61	47.2	68.2	-21
10520	34.73	PK	347	2.1	V	14.61	49.34	68.2	-18.86
5280MHz									
10560	32.17	PK	154	14.5	H	14.68	46.85	68.2	-21.35
10560	32.66	PK	146	14.5	V	14.68	47.34	68.2	-20.86
5320MHz									
5350	40.15	PK	64	1.9	H	3.33	43.48	74	-30.52
5350	40.24	PK	46	2.5	V	3.33	43.57	74	-30.43
5460	39.47	PK	64	1.9	H	3.31	42.78	74	-31.22
5460	40.6	PK	325	1.9	V	3.31	43.91	74	-30.09
10640	31.27	PK	214	2.1	H	15.04	46.31	74	-27.69
10640	32.9	PK	304	2.1	V	15.04	47.94	74	-26.06
802.11n20									
5260MHz									
4500	40.23	PK	266	1.2	H	1.89	42.12	74	-31.88
4500	41.02	PK	251	1.1	V	1.89	42.91	74	-31.09
5150	43.86	PK	251	1.1	H	3.37	47.23	74	-26.77
5150	43.79	PK	164	1.7	V	3.37	47.16	74	-26.84
10520	31.93	PK	164	1.7	H	14.61	46.54	68.2	-21.66
10520	33.15	PK	212	1.5	V	14.61	47.76	68.2	-20.44
5280MHz									
10560	32.53	PK	353	14.5	H	14.68	47.21	68.2	-20.99
10560	33.11	PK	26	14.5	V	14.68	47.79	68.2	-20.41
5320MHz									
5350	39.41	PK	112	1.2	H	3.33	42.74	74	-31.26
5350	40.12	PK	46	2.5	V	3.33	43.45	74	-30.55
5460	38.58	PK	112	1.2	H	3.31	41.89	74	-32.11
5460	39.15	PK	17	1.8	V	3.31	42.46	74	-31.54
10640	32.53	PK	210	1.5	H	15.04	47.57	74	-26.43
10640	32.86	PK	198	1.0	V	15.04	47.9	74	-26.1

5470-5725 MHz:

Frequency (MHz)	Receiver		Turn-Table	Rx Antenna		Corrected Factor (dB/m)	Corrected Amplitude (dBμV/m)	FCC Part15.407	
	Reading (dBμV)	PK/QP/Ave.	Angle Degree	Height (m)	Polar (H / V)			Limit (dBμV/m)	Margin (dB)
802.11a									
5500MHz									
5400	38.5	PK	283	1.5	H	3.33	41.83	74	-32.17
5400	38.49	PK	37	1.3	V	3.33	41.82	74	-32.18
5470	34.83	PK	63	1.4	H	3.31	38.14	68.2	-30.06
5470	35.03	PK	2	2.1	V	3.31	38.34	68.2	-29.86
11000	30.81	PK	143	1.1	H	16.3	47.11	74	-26.89
11000	31.6	PK	157	2.3	V	16.3	47.9	74	-26.10
5580MHz									
11160	31.15	PK	190	14.5	H	15.53	46.68	74	-27.32
11160	32.05	PK	287	14.5	V	15.53	47.58	74	-26.42
5700MHz									
5725	42.49	PK	211	1.8	H	3.89	46.38	68.2	-21.82
5725	43.62	PK	331	1.8	V	3.89	47.51	68.2	-20.69
5745	33.52	PK	118	1.5	H	4.03	37.55	68.2	-30.65
5745	34.33	PK	268	1.7	V	4.03	38.36	68.2	-29.84
11400	31.78	PK	12	2.1	H	15.06	46.84	74	-27.16
11400	32.92	PK	290	1	V	15.06	47.98	74	-26.02
802.11n20									
5500MHz									
5400	39.41	PK	145	2.2	H	3.33	42.74	74	-31.26
5400	39.24	PK	110	1.2	V	3.33	42.57	74	-31.43
5470	34.76	PK	110	1.7	H	3.31	38.07	68.2	-30.13
5470	34.87	PK	27	2	V	3.31	38.18	68.2	-30.02
11000	31.22	PK	189	2.3	H	16.3	47.52	74	-26.48
11000	31.59	PK	223	1.2	V	16.3	47.89	74	-26.11
5580MHz									
11160	32.06	PK	6	14.5	H	15.53	47.59	74	-26.41
11160	32.09	PK	148	14.5	V	15.53	47.62	74	-26.38
5700MHz									
5725	43.82	PK	196	2.3	H	3.89	47.71	68.2	-20.49
5725	43.34	PK	165	1.9	V	3.89	47.23	68.2	-20.97
5745	32.91	PK	188	2	H	4.03	36.94	68.2	-31.26
5745	33.74	PK	46	2.1	V	4.03	37.77	68.2	-30.43
11400	30.45	PK	327	1.8	H	15.06	45.51	74	-28.49
11400	32.51	PK	154	2	V	15.06	47.57	74	-26.43