TEST REPORT

Applicant Name :	YEALINK (XIAMEN) NETWORK TECHNOLOGY CO., LTD.
Address :	309, 3rd Floor, No.16, Yun Ding North Road, Huli District, Xiamen City, Fujian, China
Report Number :	SZNS220428-17358E-RF-00A1
FCC ID:	T2C-YL430132

Test Standard (s)

FCC PART 15.407

Sample Description

Product Type:	Module
Model No.:	YL430132
Multiple Model(s) No.:	N/A
Trade Mark:	YEALINK
Date Received:	2022/04/28
Report Date:	2022/06/16

Test Result:	Pass*

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

Prepared and Checked By:

Andy Yu
EMC Engineer

Approved By:

Robert Li
EMC Engineer

Note: This report may contain data that are not covered by the A2LA accreditation and are marked with an asterisk "★ ".
Shenzhen Accurate Technology Co., Ltd. is not responsible for the authenticity of any test data provided by the applicant. Data included from the applicant that may affect test results are marked with an asterisk '*'. Customer model name, addresses, names, trademarks etc. are not considered data.
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GENERAL INFORMATION

Product Description for Equipment under Test (EUT)

Frequency Range	5G Wi-Fi: 5150-5250MHz; 5250-5350MHz; 5470-5725MHz; 5725-5850MHz
Mode	802.11a/n20
Maximum Conducted Average Ouput Power	5150-5250MHz: 12.88dBm(802.11a), 12.89dBm(802.11n20) 5250-5350MHz: 12.10dBm(802.11a), 12.60dBm(802.11n20) 5470-5725MHz: 14.67dBm(802.11a), 14.88dBm(802.11n20) 5725-5850MHz: 15.25dBm(802.11a), 15.27dBm(802.11n20)
Modulation Technique	OFDM
Antenna Specification*	3.0dBi (It is provided by the manufacturer)
Voltage Range	DC 3.3V
Sample number	SZNS220428-17358E-RFA1-S1 (Assigned by ATC)
Sample/EUT Status	Good condition

Objective

This test report is in accordance with Part 2-Subpart J, Part 15-Subparts A and E of the Federal Communication Commissions 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 and 15.407 rules.

This a Class II permissive change of the device, the differences between the original device and the current device are as follows:

(1) Adding a kind of antenna.

Based on above differences listed, the modifications will impact the test item of "RF Exposure Evaluation", "Antenna Requirement", "Conducted Emissions" and "Undesirable Emission& Restricted Bands", so in this report, we will updated those items and related photos, the other test data and photos please refer to the original report.

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.

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 Frequency		$0.082*10^{-7}$
RF output power, conducted		0.73dB
Unwanted Emission, conducted		1.6dB
AC Power Lines Conducted Emissions		2.72dB
Emissions, Radiated	9kHz - 30MHz	2.66dB
	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 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, 60, 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.

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/ac20 mode: channel 149, 157, 165 were tested.

EUT Exercise Software

"AuthenticTool"* exercise software was used. 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	16
		5200	6Mbps	16
		5240	6Mbps	16
	802.11 n20	5180	MCS0	16
		5200	MCS0	16
		5240	MCS0	16
5250 – 5350MHz	802.11 a	5260	6Mbps	16
		5300	6Mbps	16
		5320	6Mbps	16
	802.11 n20	5260	MCS0	16
		5300	MCS0	16
		5320	MCS0	16
5470 – 5725MHz	802.11 a	5500	6Mbps	16
		5580	6Mbps	16
		5700	6Mbps	16
	802.11 n20	5500	MCS0	16
		5580	MCS0	16
		5700	MCS0	16
5725 – 5850MHz	802.11 a	5745	6Mbps	16
		5785	6Mbps	16
		5825	6Mbps	16
	802.11 n20	5745	MCS0	16
		5785	MCS0	16
		5825	MCS0	16

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.

Equipment Modifications

No modification was made to the EUT tested.

Support Equipment List and Details

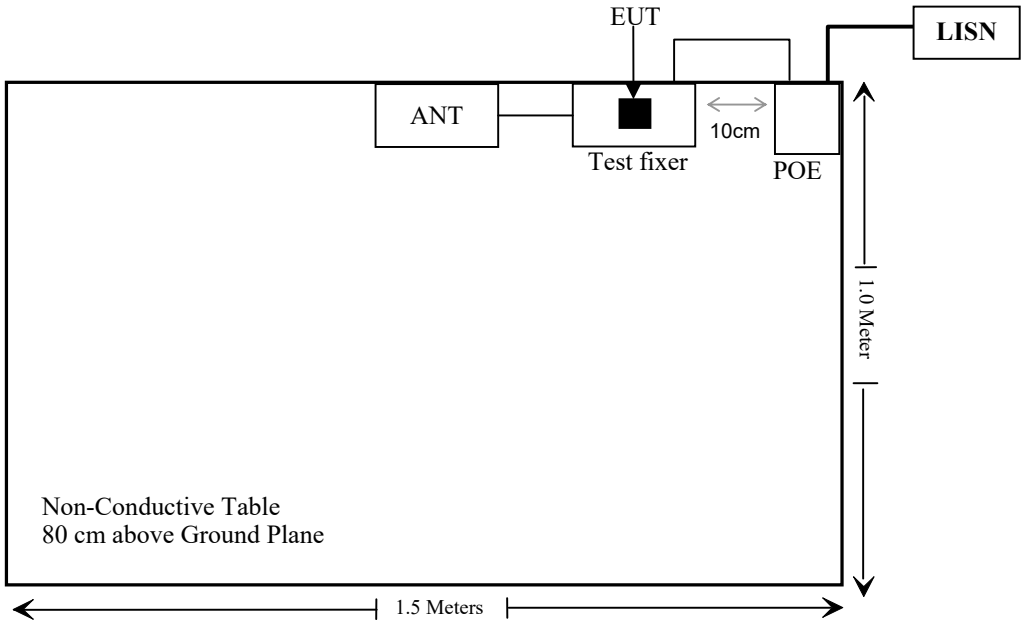
Manufacturer	Description	Model	Serial Number
YEALINK	Test fixer	Unknown	Unknown
YEALINK	POE	YLPOE30	SU10551

External I/O Cable

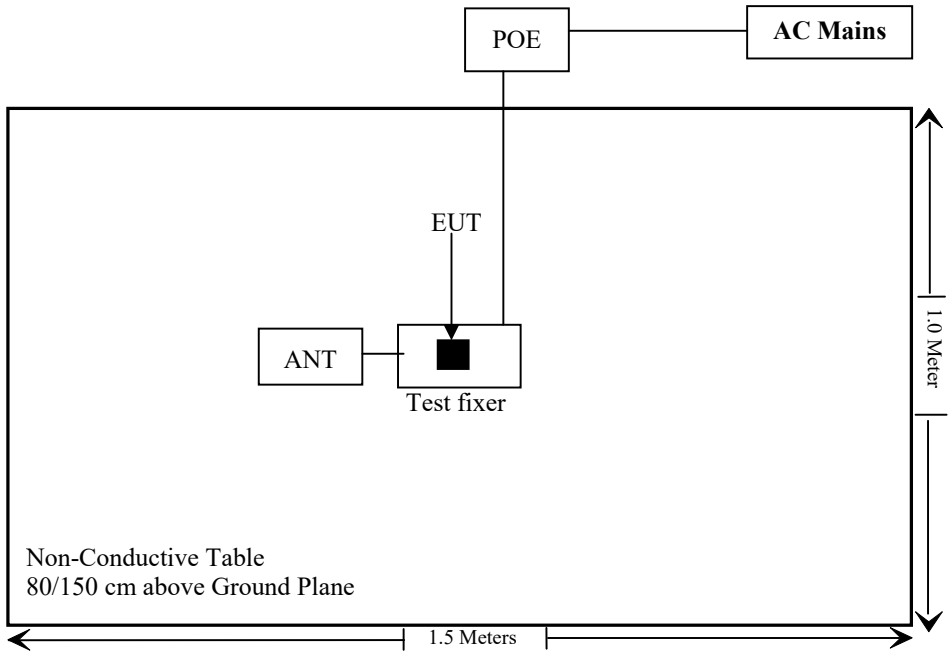
Cable Description	Length (m)	From Port	To
Un-shielding Un-Detachable RJ45 Cable	6.0	POE	Test fixer
Un-shielding Detachable AC Cable	1.5	LISN	POE

Block Diagram of Test Setup

For conducted emission



For Radiated Emissions:



SUMMARY OF TEST RESULTS

FCC Rules	Description of Test	Result
§15.247 (i) &§1.1307 (b) (3)	RF Exposure Evaluation	Compliant
§15.203	Antenna Requirement	Compliant
§15.407(b)(9)& §15.207(a)	Conducted Emissions	Compliant
§15.205& §15.209 &§15.407(b)	Undesirable Emission& Restricted Bands	Compliant
§15.407(a) (e)	26 dB Emission Bandwidth & 6dB Bandwidth	Compliant*
§15.407(a)	Conducted Transmitter Output Power	Compliant*
§15.407 (a)	Power Spectral Density	Compliant*
§15.407 (h)	Transmit Power Control (TPC)	Not Applicable*
§15.407 (h)	Dynamic Frequency Selection (DFS)	Compliant*

Not Applicable*: the EUT has no TPC function which was declarded by the applicant.
Compliant*: Please refer to the original report GZCR211002125804 with FCC ID: T2C-YL430132, which tested and granted by SGS-CSTC Standards Technical Services Co., Ltd. Guangzhou Branch.

TEST EQUIPMENT LIST

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Conducted emission test					
Rohde& Schwarz	EMI Test Receiver	ESCI	100784	2021/12/13	2022/12/12
Rohde & Schwarz	L.I.S.N.	ENV216	101314	2021/12/13	2022/12/12
Anritsu Corp	50 Coaxial Switch	MP59B	6100237248	2021/12/13	2022/12/12
Unknown	RF Coaxial Cable	No.17	N0350	2021/12/14	2022/12/13
Conducted Emission Test Software: e3 19821b (V9)					
Radiated emission test					
Rohde& Schwarz	Test Receiver	ESR	102725	2021/12/13	2022/12/12
Rohde&Schwarz	Spectrum Analyzer	FSV40	101949	2021/12/13	2022/12/12
SONOMA INSTRUMENT	Amplifier	310 N	186131	2021/11/09	2022/11/08
A.H. Systems, inc.	Preamplifier	PAM-0118P	135	2021/11/09	2022/11/08
Quinstar	Amplifier	QLW-18405536-J0	15964001002	2021/11/11	2022/11/10
Schwarzbeck	Bilog Antenna	VULB9163	9163-323	2021/07/06	2024/07/05
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: e3 19821b (V9)					
Unknown	RF Coaxial Cable	No.10	N050	2021/12/14	2022/12/13
Unknown	RF Coaxial Cable	No.11	N1000	2021/12/14	2022/12/13
Unknown	RF Coaxial Cable	No.12	N040	2021/12/14	2022/12/13
Unknown	RF Coaxial Cable	No.13	N300	2021/12/14	2022/12/13
Unknown	RF Coaxial Cable	No.14	N800	2021/12/14	2022/12/13
Unknown	RF Coaxial Cable	No.15	N600	2021/12/14	2022/12/13
Unknown	RF Coaxial Cable	No.16	N650	2021/12/14	2022/12/13
CD	Band Reject Filter	BRM-5.15/5.35g-45	075	2021/12/14	2022/12/13
CD	Band Reject Filter	BRM-5.47/5.725G-45	055	2021/12/14	2022/12/13
CD	Band Reject Filter	BRM-5.725/5.875G-45	065	2021/12/14	2022/12/13

*** 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).

FCC §15.247 (i) &§1.1307 (b) (3) - RF EXPOSURE EVALUATION

Applicable Standard

According to subpart 15.247 (i) and §1.1307(b) (3), 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.

According to KDB 447498 D04 Interim General RF Exposure Guidance

SAR-Based Exemption:

SAR-based thresholds are derived based on frequency, power, and separation distance of the RF source. The formula defines the thresholds in general for either available maximum timeaveraged power or maximum time-averaged ERP, whichever is greater.

Per § 1.1307(b)(3)(i)(B), for single RF sources (i.e., any single fixed RF source, mobile device, or portable device, as defined in paragraph (b)(2) of this section): A single RF source is exempt if:

the available maximum time-averaged power or effective radiated power (ERP), whichever is greater, is less than or equal to the threshold P_{th} (mW) described in the following formula. This method shall only be used at separation distances (cm) from 0.5 centimeters to 40 centimeters and at frequencies from 0.3 GHz to 6 GHz (inclusive). P_{th} is given by:

$$P_{th}\ (\text{mW}) = \begin{cases} ERP_{20\ cm}(d/20\ \text{cm})^{x} & d \le 20\ \text{cm} \\ ERP_{20\ cm} & 20\ \text{cm} < d \le 40\ \text{cm} \end{cases}$$

Where

$$x = -\log_{10}\left(\frac{60}{ERP_{20\ cm}\sqrt{f}}\right) \text{ and } f \text{ is in GHz;}$$

and

$$ERP_{20\ cm}\ (\text{mW}) = \begin{cases} 2040f & 0.3\ \text{GHz} \le f < 1.5\ \text{GHz} \\ 3060 & 1.5\ \text{GHz} \le f \le 6\ \text{GHz} \end{cases}$$

d = the separation distance (cm);

Result

Mode	Frequency (MHz)	P_{th}		Maximum tune-up conducted power	Maximum ERP	Exemption
		(mW)	(dBm)	(dBm)	(dBm)	
5.2G Wi-Fi	5180-5240	3060	34.86	13.0	13.85	Compliant
5.3G Wi-Fi	5260-5320	3060	34.86	13.0	13.85	Compliant
5.6G Wi-Fi	5500-5720	3060	34.86	15.0	15.85	Compliant
5.8G Wi-Fi	5745-5825	3060	34.86	15.5	16.35	Compliant

Note: 1. The tune up conducted power was declared by the applicant.
2. The antenna gain is 3dBi(0.85dBd), so the ERP was used for evaluation.
3. The Wi-Fi and Bluetooth can't transmit simultaneously.
4. To maintain compliance with the FCC's RF exposure guidelines, place the equipment at least 20cm from nearby persons.

Result: Compliant.

FCC §15.203 – 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:

a. Antenna must be permanently attached to the unit.
b. 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.

And according to FCC 47 CFR section 15.407 (a), if the transmitting antennas of directional gain greater than 6dBi are used, the transmit power and power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

Antenna Connector Construction

The EUT has one FPC antenna arrangement which was integrated on the main PCB use the MHF-Type connector and no consideration of replacement, fulfill the requirement of this section.

Type	Antenna Gain	Impedance
FPC	3.0 dBi	50 Ω

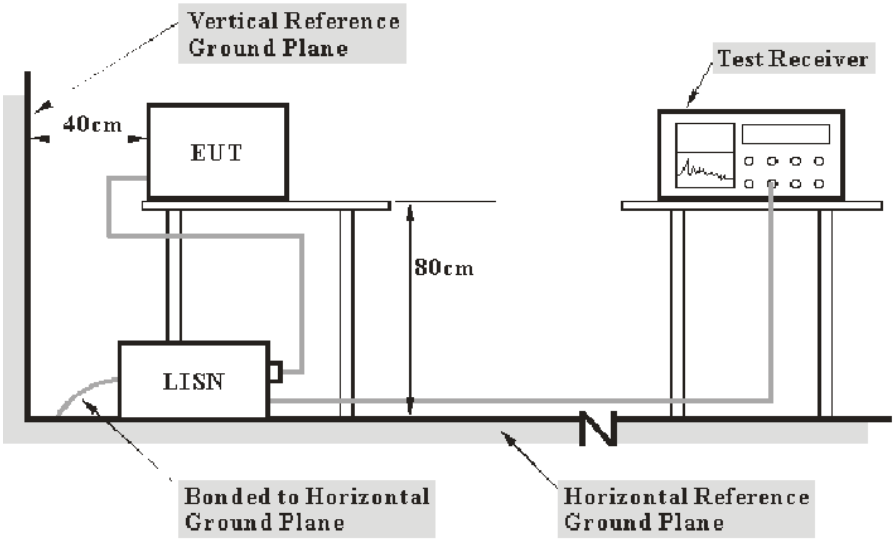
Result: Compliant.

FCC §15.407 (b) (6) §15.207 (a) – CONDUCTED EMISSIONS

Applicable Standard

FCC §15.207, §15.407(b) (6)

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.

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.

Corrected Factor & Margin Calculation

The Transd factor is calculated by adding LISN VDF (Voltage Division Factor), Cable Loss. The basic equation is as follows:

Factor = LISN VDF + Cable Loss

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

Over Limit = level – Limit
Level= reading level+ Transd Factor

Test Data

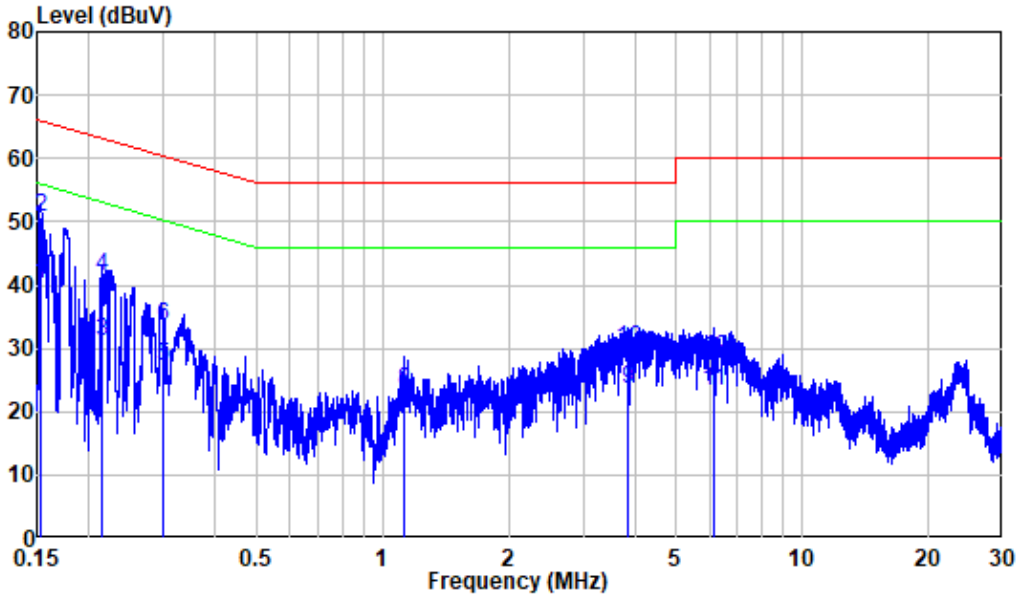
Environmental Conditions

Temperature:	23 ℃
Relative Humidity:	52 %
ATM Pressure:	101.0 kPa

The testing was performed by Jason Liu on 2022-06-06.

EUT operation mode: Transmitting (worst case is 802.11a mode, 5180MHz)

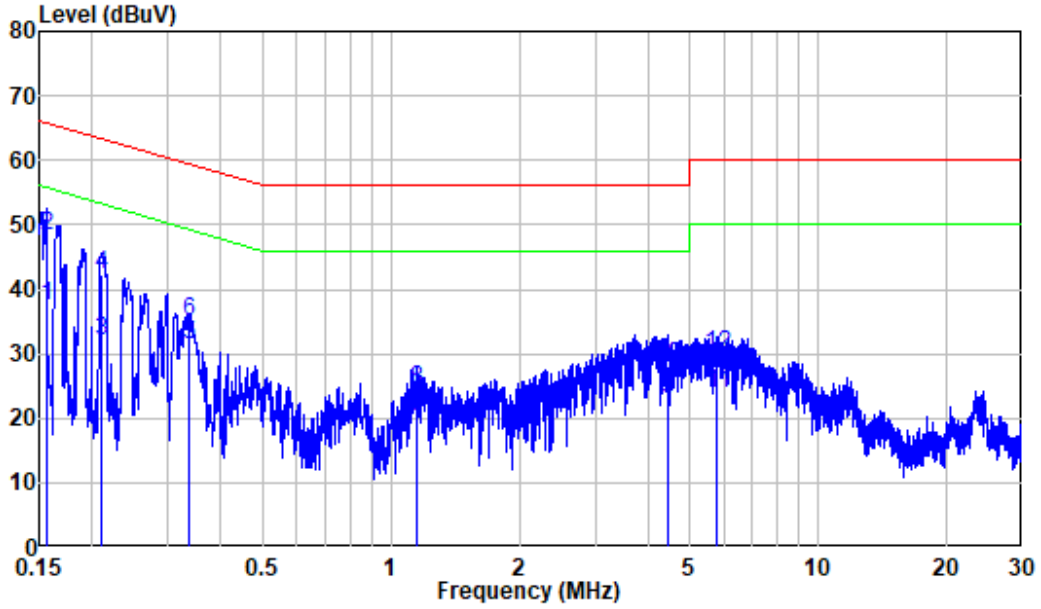
AC 120V/60 Hz, Line:



Site : Shielding Room
Condition: Line
Mode : 5G WIFI
Model : YL430132
Power : AC 120V 60Hz

	Freq	Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB	dBuV	dBuV	dBuV	dB	
1	0.153	9.80	30.32	40.12	55.86	-15.74	Average
2	0.153	9.80	40.84	50.64	65.86	-15.22	QP
3	0.215	9.80	21.15	30.95	53.01	-22.06	Average
4	0.215	9.80	31.54	41.34	63.01	-21.67	QP
5	0.300	9.80	17.43	27.23	50.25	-23.02	Average
6	0.300	9.80	23.64	33.44	60.25	-26.81	QP
7	1.120	9.81	9.75	19.56	46.00	-26.44	Average
8	1.120	9.81	13.55	23.36	56.00	-32.64	QP
9	3.848	9.84	13.85	23.69	46.00	-22.31	Average
10	3.848	9.84	20.10	29.94	56.00	-26.06	QP
11	6.137	9.86	13.27	23.13	50.00	-26.87	Average
12	6.137	9.86	18.60	28.46	60.00	-31.54	QP

AC 120V/60 Hz, Neutral:



Site : Shielding Room
Condition: Neutral
Mode : 5G WIFI
Model : YL430132
Power : AC 120V 60Hz

	Freq	Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB	dBuV	dBuV	dBuV	dB	
1	0.156	9.80	27.71	37.51	55.65	-18.14	Average
2	0.156	9.80	38.59	48.39	65.65	-17.26	QP
3	0.211	9.80	22.10	31.90	53.18	-21.28	Average
4	0.211	9.80	32.36	42.16	63.18	-21.02	QP
5	0.335	9.80	21.56	31.36	49.33	-17.97	Average
6	0.335	9.80	25.25	35.05	59.33	-24.28	QP
7	1.146	9.81	10.49	20.30	46.00	-25.70	Average
8	1.146	9.81	14.68	24.49	56.00	-31.51	QP
9	4.425	9.86	13.07	22.93	46.00	-23.07	Average
10	4.425	9.86	18.07	27.93	56.00	-28.07	QP
11	5.805	9.93	13.98	23.91	50.00	-26.09	Average
12	5.805	9.93	19.89	29.82	60.00	-30.18	QP

§15.205 & §15.209 & §15.407(B)– UNDESIRABLE EMISSION

Applicable Standard

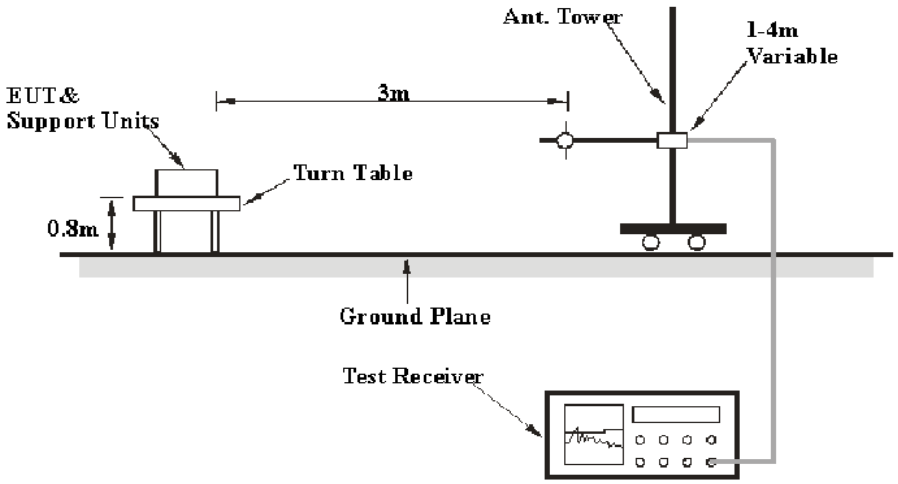
FCC §15.407 (b); §15.209; §15.205;

(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.

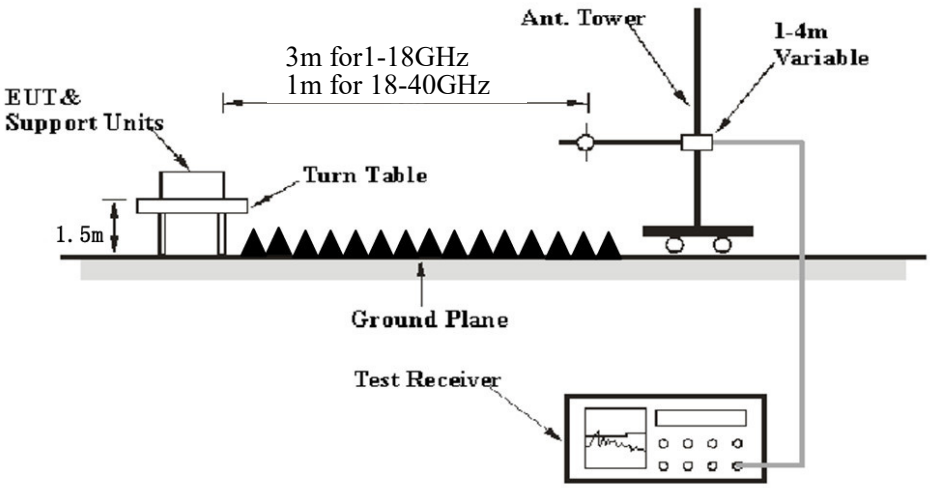
Unwanted emissions below 1 GHz must comply with the general field strength limits set forth in §15.209.

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 and FCC 15.407 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.

According to ANSI C63.10-2013,9.4: For field strength measurements made at other than the distance at which the applicable limit is specified, extrapolate the measured field strength to the field strength at the distance specified by the limit using an inverse distance correction factor (20 dB/decade of distance). In some cases, a different distance correction factor may be required;

$$E_{\mathrm{SpecLimit}} = E_{\mathrm{Meas}} + 20\log\left(\frac{d_{\mathrm{Meas}}}{d_{\mathrm{SpecLimit}}}\right)$$

where

$E_{\mathrm{SpecLimit}}$	is the field strength of the emission at the distance specified by the limit, in dBμV/m
E_{Meas}	is the field strength of the emission at the measurement distance, in dBμV/m
d_{Meas}	is the measurement distance, in m
$d_{\mathrm{SpecLimit}}$	is the distance specified by the limit, in m

So the extrapolation factor of 1m is 20*log(1/3)= -9.5 dB, for 18-40GHz range, the limit of 1m distance was added by 9.5dB from limit of 3m to compared with the result measurement at 1m distance.

Corrected Factor & Margin Calculation

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

Factor = Antenna Factor + Cable Loss - Amplifier Gain

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

Over Limit/Margin = Level / Corrected Amplitude – Limit
Level / Corrected Amplitude = Read Level + Factor

Test Data

Environmental Conditions

Temperature:	25~29 ℃
Relative Humidity:	63~64 %
ATM Pressure:	101.0 kPa

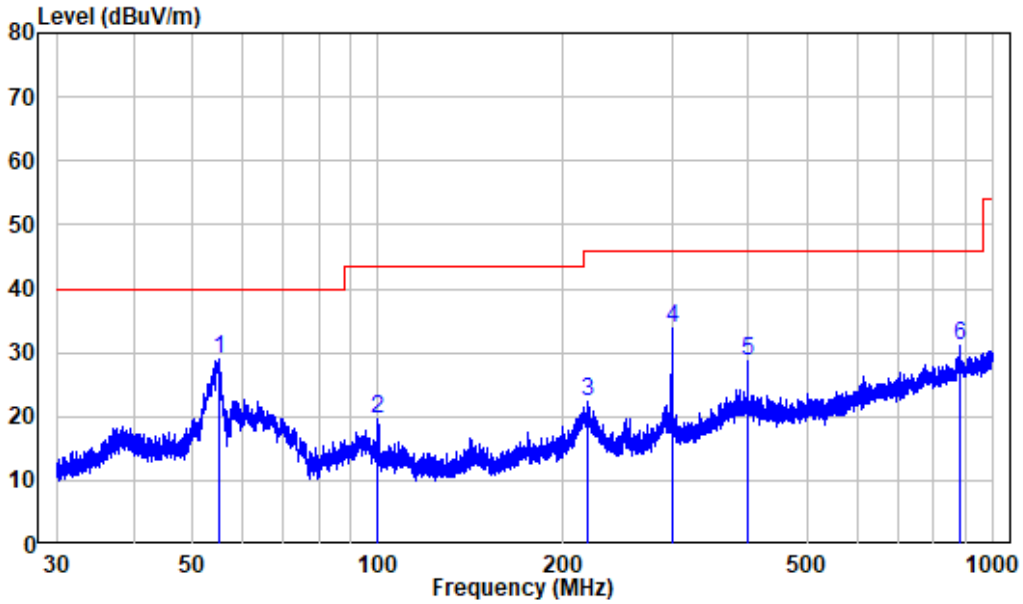
The testing was performed by Level Li on 2022-06-01 for below 1GHz, and Jeff Jiang on 2022-06-09 for above 1GHz.

EUT operation mode: Transmitting

30 MHz – 1 GHz: *(the worst case is 802.11a mode, 5180MHz)*

Note: When the test result of peak was less than the limit of QP more than 6dB, just peak value were recorded.

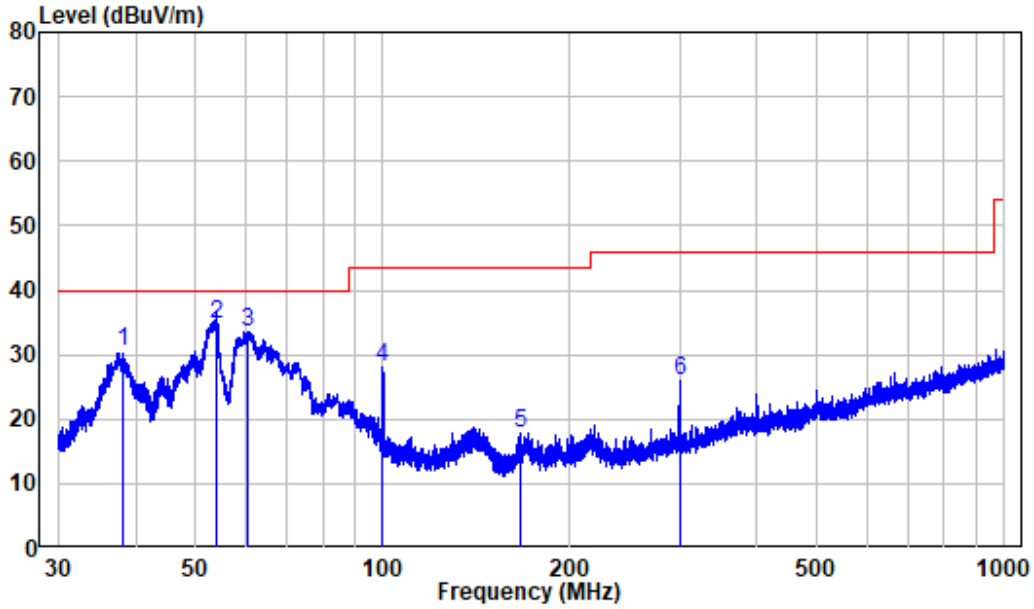
Horizontal



Site : chamber
Condition: 3m HORIZONTAL
Job No. : SZNS220428-17358E-RFA1
Test Mode: 5G WIFI
Note : POE

	Freq	Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB/m	dBuV	dBuV/m	dBuV/m	dB	
1	55.003	-10.28	39.12	28.84	40.00	-11.16	Peak
2	100.009	-11.80	31.55	19.75	43.50	-23.75	Peak
3	218.979	-11.46	33.94	22.48	46.00	-23.52	Peak
4	299.973	-9.23	43.01	33.78	46.00	-12.22	Peak
5	400.081	-6.73	35.38	28.65	46.00	-17.35	Peak
6	884.891	1.04	30.10	31.14	46.00	-14.86	Peak

Vertical



Site : chamber
Condition: 3m VERTICAL
Job No. : SZNS220428-17358E-RFA1
Test Mode: 5G WIFI
Note : POE

	Freq	Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB/m	dBuV	dBuV/m	dBuV/m	dB	
1	38.078	-10.80	41.14	30.34	40.00	-9.66	Peak
2	53.953	-10.34	44.99	34.65	40.00	-5.35	QP
3	60.518	-10.84	44.27	33.43	40.00	-6.57	Peak
4	99.965	-11.81	39.94	28.13	43.50	-15.37	Peak
5	166.214	-13.96	31.87	17.91	43.50	-25.59	Peak
6	299.973	-9.23	35.27	26.04	46.00	-19.96	Peak

1 GHz-40 GHz:

5150-5250 MHz:

Frequency (MHz)	Receiver		Turn-Table Angle Degree	Rx Antenna		Corrected Factor (dB/m)	Corrected Amplitude (dBμV/m)	FCC Part 15.407	
	Reading (dBμV)	PK/QP/AV		Height (m)	Polar (H / V)			Limit (dBμV/m)	Margin (dB)
802.11a									
5180 MHz									
4500	64.09	PK	79	1.7	H	-4.72	59.37	74	-14.63
4500	51.22	AV	79	1.7	H	-4.72	46.5	54	-7.5
4500	64.52	PK	100	1.5	V	-4.72	59.8	74	-14.2
4500	51.19	AV	100	1.5	V	-4.72	46.47	54	-7.53
5150	72.08	PK	252	1.8	H	-2.73	69.35	74	-4.65
5150	53.01	AV	252	1.8	H	-2.73	50.28	54	-3.72
5150	70.8	PK	257	1	V	-2.73	68.07	74	-5.93
5150	52.02	AV	257	1	V	-2.73	49.29	54	-4.71
10360	42.12	PK	12	2.4	H	8.12	50.24	68.2	-17.96
10360	41.61	PK	319	1.4	V	8.12	49.73	68.2	-18.47
5200 MHz									
10400	41.87	PK	209	1.2	H	8.24	50.11	68.2	-18.09
10400	41.29	PK	340	1.5	V	8.24	49.53	68.2	-18.67
5240 MHz									
5350	63.4	PK	12	2.3	H	-2.33	61.07	74	-12.93
5350	50.45	AV	12	2.3	H	-2.33	48.12	54	-5.88
5350	62.94	PK	158	1.9	V	-2.33	60.61	74	-13.39
5350	50.81	AV	158	1.9	V	-2.33	48.48	54	-5.52
5460	64.45	PK	218	1.7	H	-2.26	62.19	74	-11.81
5460	52.06	AV	218	1.7	H	-2.26	49.8	54	-4.2
5460	63.95	PK	44	1.8	V	-2.26	61.69	74	-12.31
5460	51.65	AV	44	1.8	V	-2.26	49.39	54	-4.61
10480	41.31	PK	1	1.3	H	8.56	49.87	68.2	-18.33
10480	40.8	PK	22	1.1	V	8.56	49.36	68.2	-18.84

Frequency (MHz)	Receiver		Turn-Table Angle Degree	Rx Antenna		Corrected Factor (dB/m)	Corrected Amplitude (dBμV/m)	FCC Part 15.407	
	Reading (dBμV)	PK/QP/AV		Height (m)	Polar (H / V)			Limit (dBμV/m)	Margin (dB)
802.11n20									
5180 MHz									
4500	64.4	PK	216	1.1	H	-4.72	59.68	74	-14.32
4500	51.09	AV	216	1.1	H	-4.72	46.37	54	-7.63
4500	64.21	PK	275	1.6	V	-4.72	59.49	74	-14.51
4500	51.09	AV	275	1.6	V	-4.72	46.37	54	-7.63
5150	71.75	PK	251	2.3	H	-2.73	69.02	74	-4.98
5150	52.66	AV	251	2.3	H	-2.73	49.93	54	-4.07
5150	70.86	PK	241	1.2	V	-2.73	68.13	74	-5.87
5150	51.97	AV	241	1.2	V	-2.73	49.24	54	-4.76
10360	41.9	PK	299	1.4	H	8.12	50.02	68.2	-18.18
10360	41.38	PK	26	1.7	V	8.12	49.5	68.2	-18.70
5200 MHz									
10400	41.85	PK	249	1.3	H	8.24	50.09	68.2	-18.11
10400	41.51	PK	310	1.7	V	8.24	49.75	68.2	-18.45
5240 MHz									
5350	63.33	PK	152	1.1	H	-2.33	61	74	-13.00
5350	50.82	AV	152	1.1	H	-2.33	48.49	54	-5.51
5350	63.21	PK	286	1.8	V	-2.33	60.88	74	-13.12
5350	50.75	AV	286	1.8	V	-2.33	48.42	54	-5.58
5460	64.15	PK	74	1	H	-2.26	61.89	74	-12.11
5460	51.73	AV	74	1	H	-2.26	49.47	54	-4.53
5460	63.96	PK	263	2	V	-2.26	61.7	74	-12.3
5460	52.1	AV	263	2	V	-2.26	49.84	54	-4.16
10480	41.35	PK	42	2.2	H	8.56	49.91	68.2	-18.29
10480	40.8	PK	310	2.2	V	8.56	49.36	68.2	-18.84

5250-5350 MHz:

Frequency (MHz)	Receiver		Turn-Table Angle Degree	Rx Antenna		Corrected Factor (dB/m)	Corrected Amplitude (dBμV/m)	FCC Part 15.407	
	Reading (dBμV)	PK/QP/AV		Height (m)	Polar (H / V)			Limit (dBμV/m)	Margin (dB)
802.11a									
5260MHz									
4500	64.12	PK	106	2.2	H	-4.72	59.4	74	-14.6
4500	51.14	AV	106	2.2	H	-4.72	46.42	54	-7.58
4500	64.27	PK	138	1.1	V	-4.72	59.55	74	-14.45
4500	51.26	AV	138	1.1	V	-4.72	46.54	54	-7.46
5150	64.03	PK	197	1.2	H	-2.73	61.3	74	-12.7
5150	51.17	AV	197	1.2	H	-2.73	48.44	54	-5.56
5150	63.9	PK	355	1.7	V	-2.73	61.17	74	-12.83
5150	51.47	AV	355	1.7	V	-2.73	48.74	54	-5.26
10520	41.34	PK	268	2.5	H	8.65	49.99	68.2	-18.21
10520	40.86	PK	122	1.3	V	8.65	49.51	68.2	-18.69
5300 MHz									
10600	47.63	PK	229	1.2	H	8.89	56.52	74	-17.48
10600	46.82	PK	292	1.6	V	8.89	55.71	74	-18.29
5320 MHz									
5350	70.42	PK	175	2.3	H	-2.33	68.09	74	-5.91
5350	53.28	AV	175	2.3	H	-2.33	50.95	54	-3.05
5350	70.24	PK	90	1.8	V	-2.33	67.91	74	-6.09
5350	53.12	AV	90	1.8	V	-2.33	50.79	54	-3.21
5460	64.63	PK	270	2.4	H	-2.26	62.37	74	-11.63
5460	50.95	AV	270	2.4	H	-2.26	48.69	54	-5.31
5460	64.23	PK	132	1.1	V	-2.26	61.97	74	-12.03
5460	50.69	AV	132	1.1	V	-2.26	48.43	54	-5.57
10640	41.71	PK	29	2.1	H	8.92	50.63	74	-23.37
10640	41.67	PK	187	2.4	V	8.92	50.59	74	-23.41

Frequency (MHz)	Receiver		Turn-Table Angle Degree	Rx Antenna		Corrected Factor (dB/m)	Corrected Amplitude (dBμV/m)	FCC Part 15.407	
	Reading (dBμV)	PK/QP/AV		Height (m)	Polar (H / V)			Limit (dBμV/m)	Margin (dB)
802.11n20									
5260MHz									
4500	63.7	PK	234	1.4	H	-4.72	58.98	74	-15.02
4500	51.1	AV	234	1.4	H	-4.72	46.38	54	-7.62
4500	63.94	PK	239	2.3	V	-4.72	59.22	74	-14.78
4500	51.3	AV	239	2.3	V	-4.72	46.58	54	-7.42
5150	63.68	PK	68	1.1	H	-2.73	60.95	74	-13.05
5150	51.15	AV	68	1.1	H	-2.73	48.42	54	-5.58
5150	63.88	PK	16	1.9	V	-2.73	61.15	74	-12.85
5150	51.19	AV	16	1.9	V	-2.73	48.46	54	-5.54
10520	41.54	PK	158	1.8	H	8.65	50.19	68.2	-18.01
10520	40.65	PK	357	1.1	V	8.65	49.3	68.2	-18.90
5300 MHz									
10600	47.69	PK	79	1.4	H	8.89	56.58	74	-17.42
10600	47.01	PK	272	2.2	V	8.89	55.90	74	-18.10
5320 MHz									
5350	70.1	PK	187	2.1	H	-2.33	67.77	74	-6.23
5350	53.34	AV	187	2.1	H	-2.33	51.01	54	-2.99
5350	70.08	PK	161	2.4	V	-2.33	67.75	74	-6.25
5350	53.36	AV	161	2.4	V	-2.33	51.03	54	-2.97
5460	64.27	PK	342	1.4	H	-2.26	62.01	74	-11.99
5460	50.72	AV	342	1.4	H	-2.26	48.46	54	-5.54
5460	64.42	PK	209	1	V	-2.26	62.16	74	-11.84
5460	50.74	AV	209	1	V	-2.26	48.48	54	-5.52
10640	41.77	PK	289	1.2	H	8.92	50.69	74	-23.31
10640	41.67	PK	77	1.3	V	8.92	50.59	74	-23.41

5470-5725MHz:

Frequency (MHz)	Receiver		Turn-Table Angle Degree	Rx Antenna		Corrected Factor (dB/m)	Corrected Amplitude (dBμV/m)	FCC Part 15.407	
	Reading (dBμV)	PK/QP/AV		Height (m)	Polar (H / V)			Limit (dBμV/m)	Margin (dB)
802.11a									
5500 MHZ									
5460	64.15	PK	171	2	H	-2.26	61.89	74	-12.11
5460	51.12	AV	171	2	H	-2.26	48.86	54	-5.14
5460	64.46	PK	43	2	V	-2.26	62.20	74	-11.8
5460	51.04	AV	43	2	V	-2.26	48.78	54	-5.22
5470	67.35	PK	292	1.8	H	-2.22	65.13	68.2	-3.07
5470	66.39	PK	170	2.4	V	-2.22	64.17	68.2	-4.03
11000	40.79	PK	221	2.4	H	9.67	50.46	74	-23.54
11000	40.09	PK	131	1.4	V	9.67	49.76	74	-24.24
5580 MHz									
11160	41.38	PK	12	2.2	H	8.68	50.06	74	-23.94
11160	40.93	PK	249	2.3	V	8.68	49.61	74	-24.39
5700 MHz									
5725	65.24	PK	244	2.1	H	-1.96	63.28	68.2	-4.92
5725	65.42	PK	215	1.7	V	-1.96	63.46	68.2	-4.74
5745	64.43	PK	118	1.2	H	-1.91	62.52	68.2	-5.68
5745	64.85	PK	0	1.6	V	-1.91	62.94	68.2	-5.26
11400	43.02	PK	243	2.1	H	7.26	50.28	74	-23.72
11400	42.66	PK	75	1.7	V	7.26	49.92	74	-24.08

Frequency (MHz)	Receiver		Turn-Table Angle Degree	Rx Antenna		Corrected Factor (dB/m)	Corrected Amplitude (dBμV/m)	FCC Part 15.407	
	Reading (dBμV)	PK/QP/AV		Height (m)	Polar (H / V)			Limit (dBμV/m)	Margin (dB)
802.11n20									
5500 MHz									
5460	64.25	PK	357	1.2	H	-2.26	61.99	74	-12.01
5460	51.04	AV	357	1.2	H	-2.26	48.78	54	-5.22
5460	64.29	PK	198	2	V	-2.26	62.03	74	-11.97
5460	51.12	AV	198	2	V	-2.26	48.86	54	-5.14
5470	66.58	PK	89	2	H	-2.22	64.36	68.2	-3.84
5470	65.24	PK	57	1.9	V	-2.22	63.02	68.2	-5.18
11000	40.79	PK	357	1.5	H	9.67	50.46	74	-23.54
11000	40.07	PK	224	1	V	9.67	49.74	74	-24.26
5580 MHz									
11160	41.34	PK	251	1.4	H	8.68	50.02	74	-23.98
11160	40.83	PK	194	1.7	V	8.68	49.51	74	-24.49
5700 MHz									
5725	65.34	PK	113	2.3	H	-1.96	63.38	68.2	-4.82
5725	65.42	PK	34	1.3	V	-1.96	63.46	68.2	-4.74
5745	64.62	PK	7	1	H	-1.91	62.71	68.2	-5.49
5745	64.81	PK	199	1.2	V	-1.91	62.9	68.2	-5.30
11400	43.12	PK	129	1.6	H	7.26	50.38	74	-23.62
11400	42.68	PK	208	1.3	V	7.26	49.94	74	-24.06

5725-5850 MHz:

Frequency (MHz)	Receiver		Turn-Table Angle Degree	Rx Antenna		Corrected Factor (dB/m)	Corrected Amplitude (dBμV/m)	FCC Part 15.407	
	Reading (dBμV)	PK/QP/AV		Height (m)	Polar (H / V)			Limit (dBμV/m)	Margin (dB)
802.11a									
5745 MHz									
5650	65.02	PK	143	1.4	H	-1.95	63.07	68.2	-5.13
5700	65.13	PK	77	1.3	H	-2.02	63.11	105.2	-42.09
5720	68.15	PK	318	1.1	H	-1.97	66.18	110.8	-44.62
5725	71.96	PK	87	1.6	H	-1.96	70	122.2	-52.2
5650	65.25	PK	216	2.4	V	-1.95	63.3	68.2	-4.9
5700	65.07	PK	151	1.2	V	-2.02	63.05	105.2	-42.15
5720	67.15	PK	66	1.7	V	-1.97	65.18	110.8	-45.62
5725	69.98	PK	119	1.3	V	-1.96	68.02	122.2	-54.18
11490	43.45	PK	167	1.2	H	6.63	50.08	74	-23.92
11490	42.93	PK	274	2.1	V	6.63	49.56	74	-24.44
5785 MHz									
11570	43.73	PK	28	1.9	H	6.59	50.32	74	-23.68
11570	43	PK	24	2.1	V	6.59	49.59	74	-24.41
5825 MHz									
5850	67.19	PK	32	1.1	H	-1.81	65.38	122.2	-56.82
5855	67.64	PK	80	1.1	H	-1.82	65.82	110.8	-44.98
5875	66.44	PK	260	2.2	H	-1.84	64.6	105.2	-40.6
5925	65.94	PK	62	1.1	H	-1.82	64.12	68.2	-4.08
5850	67.65	PK	110	1.7	V	-1.81	65.84	122.2	-56.36
5855	67.63	PK	209	1.8	V	-1.82	65.81	110.8	-44.99
5875	66.81	PK	66	1.1	V	-1.84	64.97	105.2	-40.23
5925	65.31	PK	14	2.5	V	-1.82	63.49	68.2	-4.71
11650	41.96	PK	190	1.5	H	6.77	48.73	74	-25.27
11650	41.87	PK	215	2.1	V	6.77	48.64	74	-25.36

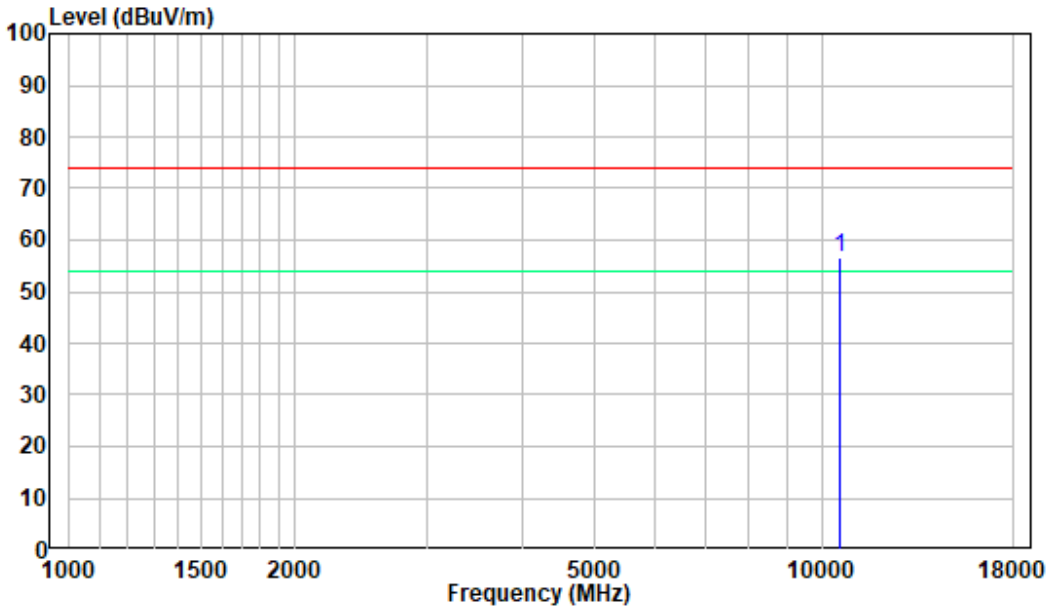
Frequency (MHz)	Receiver		Turn-Table Angle Degree	Rx Antenna		Corrected Factor (dB/m)	Corrected Amplitude (dBμV/m)	FCC Part 15.407	
	Reading (dBμV)	PK/QP/AV		Height (m)	Polar (H / V)			Limit (dBμV/m)	Margin (dB)
802.11n20									
5745MHz									
5650	65.35	PK	141	1.1	H	-1.95	63.4	68.2	-4.8
5700	65.37	PK	137	1.7	H	-2.02	63.35	105.2	-41.85
5720	68.28	PK	80	2.1	H	-1.97	66.31	110.8	-44.49
5725	73.24	PK	11	2.1	H	-1.96	71.28	122.2	-50.92
5650	65.34	PK	180	2.2	V	-1.95	63.39	68.2	-4.81
5700	65.35	PK	150	1.4	V	-2.02	63.33	105.2	-41.87
5720	66.98	PK	48	1.5	V	-1.97	65.01	110.8	-45.79
5725	70.03	PK	45	1.9	V	-1.96	68.07	122.2	-54.13
11490	43.67	PK	278	2	H	6.63	50.3	74	-23.70
11490	42.87	PK	140	1.3	V	6.63	49.5	74	-24.50
5785 MHZ									
11570	43.9	PK	153	1.6	H	6.59	50.49	74	-23.51
11570	43.1	PK	311	2.2	V	6.59	49.69	74	-24.31
5825 MHZ									
5850	67.47	PK	133	2.3	H	-1.81	65.66	122.2	-56.54
5855	67.6	PK	154	1.3	H	-1.82	65.78	110.8	-45.02
5875	67.02	PK	212	2.1	H	-1.84	65.18	105.2	-40.02
5925	65.79	PK	330	2.5	H	-1.82	63.97	68.2	-4.23
5850	67.59	PK	80	1.7	V	-1.81	65.78	122.2	-56.42
5855	67.35	PK	182	1.6	V	-1.82	65.53	110.8	-45.27
5875	66.44	PK	32	1.7	V	-1.84	64.6	105.2	-40.6
5925	65.7	PK	74	1.6	V	-1.82	63.88	68.2	-4.32
11650	41.99	PK	153	1.6	H	6.77	48.76	74	-25.24
11650	41.52	PK	236	2	V	6.77	48.29	74	-25.71

Note:
Corrected Factor = Antenna factor (RX) + Cable Loss – Amplifier Factor
Corrected Amplitude = Corrected Factor + Reading
Margin = Corrected Amplitude – Limit
The other spurious emission which is in the noise floor level was not recorded.
The test result of peak was less than the limit of average, so just peak values were recorded.

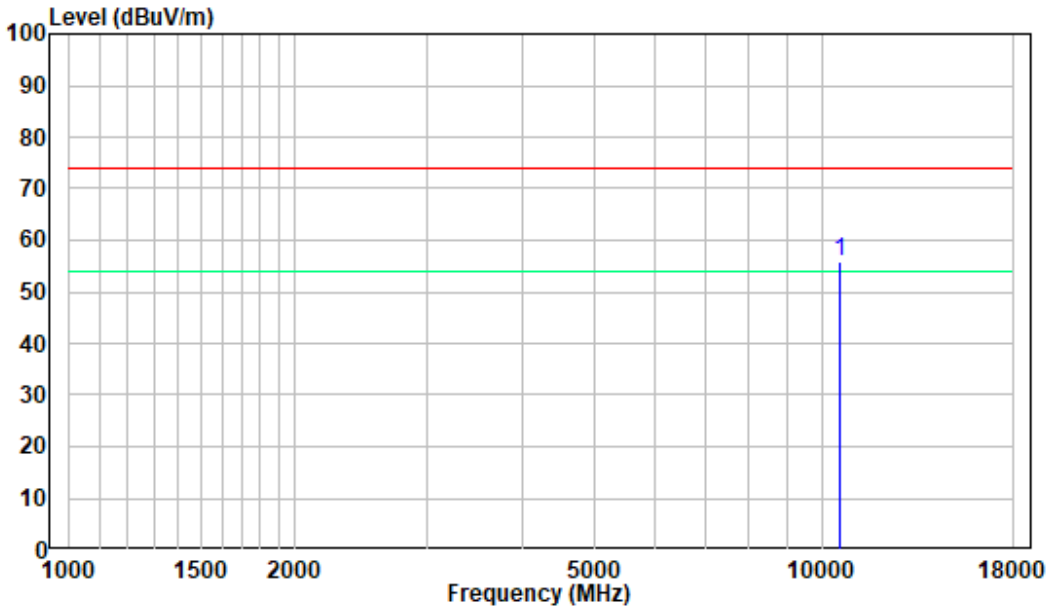
1 GHz - 18 GHz: (Pre-Scan plots)

802.11 n20 mode, 5300MHz

Horizontal



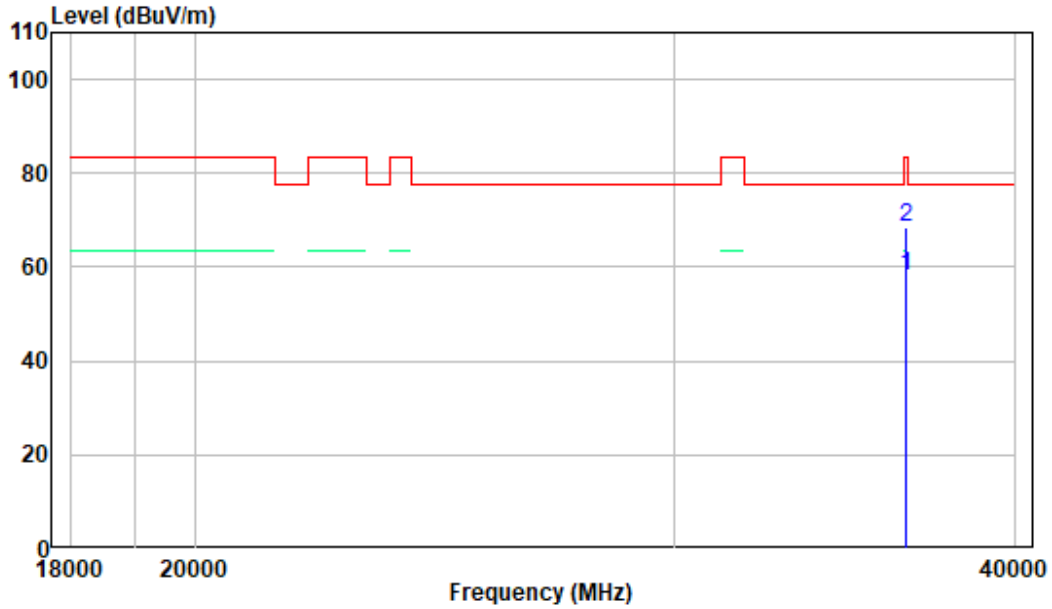
Vertical



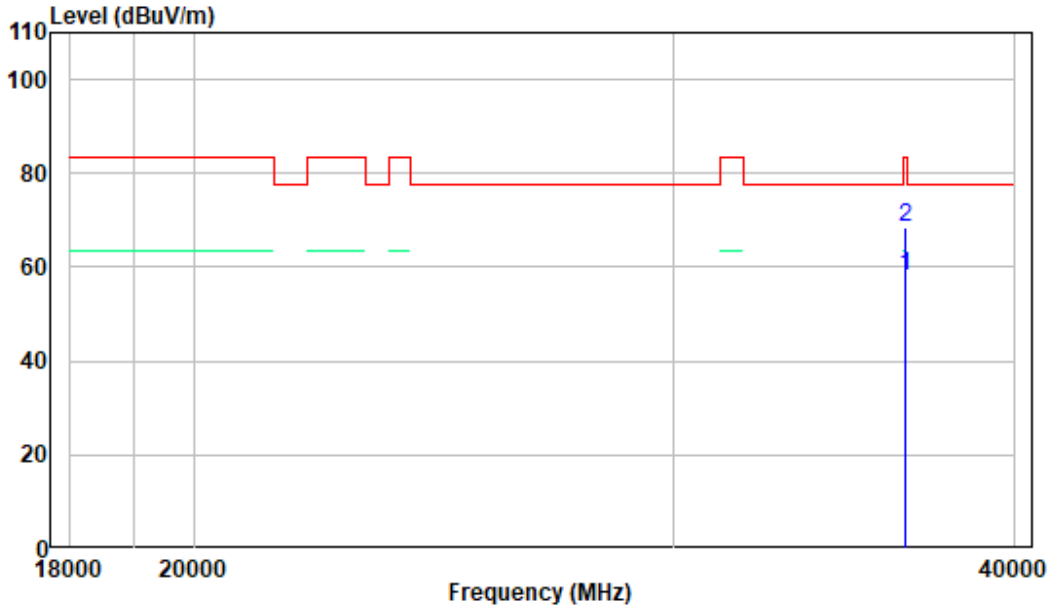
18-40GHz: (Pre-Scan plots)

802.11 n20 mode, 5300MHz

Horizontal



Vertical



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