TESTING LABORATORY
CERTIFICATE #4820.01

FCC PART 15.247

RSS-GEN, ISSUE 5, MARCH 2019 AMENDMENT 1

RSS-247, ISSUE 2, FEBRUARY 2017

TEST REPORT

For

YEALINK(XIAMEN) NETWORK TECHNOLOGY CO.,LTD.

FCC: 309, 3rd Floor, No.16, Yun Ding North Road, Huli District, Xiamen City, Fujian, China
IC: 309, 3rd Floor, No.16, Yun Ding North Road, Huli District Xiamen City Fujian 361008 China (Peoples Republic Of)

FCC ID: T2C-58
IC: 10741A-58

Report Type:	**Product Name:**
Original Report	Smart Business Phone

Report Number:	RSZ201207003-00B
Report Date:	2021-02-04
Reviewed By:	Ivan Cao Assistant Manager
Test Laboratory:	Bay Area Compliance Laboratories Corp. (Dongguan) No.12, Pulong East 1st Road, Tangxia Town, Dongguan, Guangdong, China Tel: +86-769-86858888 Fax: +86-769-86858891 www.baclcorp.com.cn

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GENERAL INFORMATION

Product Description for Equipment under Test (EUT)

EUT Name:		Smart Business Phone
EUT Model:		SIP-T58W
Multiple Model:		MP58
Operation Frequency:		802.11b/g/n20: 2412-2462 MHz 802.11 n40: 2422-2452 MHz BLE: 2402-2480 MHz
Maximum Peak Output Power (Conducted):		802.11 b/g/n: 19.09 dBm BLE: -1.66 dBm
Modulation Type:		802.11:DSSS, OFDM BLE: GFSK
Antenna Gain▲:		3.0 dBi
Adapter 1# Information	**Model:**	YLPS052000B1-US
	Input:	100-240Vac 50/60Hz 0.5A
	Output:	5.0Vdc 2.0A
Adapter 2# Information	**Model:**	YLPS052000C1-US
	Input:	100-240Vac 50/60Hz 0.5A
	Output:	5.0Vdc 2.0A
Rated Input Voltage:		DC 5V from adapter
Serial Number:		RSZ201207003-RF-S1
EUT Received Date:		2020.12.07

Note: The series product, models MP58, SIP-T58W are electrically identical, the model SIP-T58W was fully tested. The difference between them please refer to the declaration letter for details.

Objective

This report is prepared on behalf of ***YEALINK(XIAMEN) NETWORK TECHNOLOGY CO.,LTD.*** in accordance with Part 2, Subpart J, Part 15, Subparts A and C of the Federal Communications Commission's rules and RSS-247, Issue 2, February 2017, RSS-Gen, Issue 5, March 2019 Amendment 1 of the Innovation, Science and Economic Development Canada.

The tests were performed in order to determine the EUT compliance with FCC Rules Part 15, Subpart C, and section 15.203, 15.205, 15.207, 15.209 and 15.247 rules and RSS-247, Issue 2, February 2017, RSS-Gen, Issue 5,March 2019 Amendment 1 of the Innovation, Science and Economic Development Canada.

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 558074 D01 15.247 Meas Guidance v05r02, RSS-247, Issue 2, February 2017, RSS-Gen Issue 5, April 2018 of the Innovation, Science and Economic Development Canada.

All emissions measurement was performed and Bay Area Compliance Laboratories Corp. (Dongguan).

Measurement Uncertainty

Parameter	Measurement Uncertainty
Occupied Channel Bandwidth	±5 %
RF output power, conducted	±0.61dB
Power Spectral Density, conducted	±0.61 dB
Unwanted Emissions, radiated	30M~200MHz: 4.55 dB,200M~1GHz: 5.92 dB,1G~6GHz: 4.98 dB, 6G~18GHz: 5.89 dB,18G~26.5G:5.47 dB,26.5G~40G:5.63 dB
Unwanted Emissions, conducted	±1.5 dB
Temperature	±1℃
Humidity	±5%
DC and low frequency voltages	±0.4%
Duty Cycle	1%
AC Power Lines Conducted Emission	3.12 dB (150 kHz to 30 MHz)

Test Facility

The Test site used by Bay Area Compliance Laboratories Corp. (Dongguan) to collect test data is located on the No.12, Pulong East 1st Road, Tangxia Town, Dongguan, Guangdong, China.

The lab has been recognized as the FCC accredited lab under the KDB 974614 D01 and is listed in the FCC Public Access Link (PAL) database, FCC Registration No. : 897218, the FCC Designation No. : CN1220.

The lab has been recognized by Innovation, Science and Economic Development Canada to test to Canadian radio equipment requirements, the CAB identifier: CN0022.

Declarations

BACL 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 a triangle symbol "▲". Customer model name, addresses, names, trademarks etc. are not considered data.

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested.

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SYSTEM TEST CONFIGURATION

Description of Test Configuration

The system was configured for testing in Engineering Mode, which was provided by the manufacturer.

For 2.4GHz band, total 11 channels are provided:

Channel	Frequency (MHz)	Channel	Frequency (MHz)
1	2412	7	2442
2	2417	8	2447
3	2422	9	2452
4	2427	10	2457
5	2432	11	2462
6	2437	/	/

For 802.11b, 802.11g, and 802.11n ht20 modes were test with channel 1,6,11.
For 802.11n ht40 modes were test with channel 3,6,9.

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

For Bluetooth LE mode, 40 channels are provided for testing:

Channel	Frequency (MHz)	Channel	Frequency (MHz)
0	2402	20	2442
1	2404	…	…
…	…	…	…
…	…	…	…
..	…	38	2478
19	2440	39	2480

EUT was tested with channel 0, 19 and 39.

EUT Exercise Software

The software "QRCT 3" was used for testing, which was provided by manufacturer. The maximum power was configured as below table, that provided by the manufacturer▲:

Mode	Channel	Frequency (MHz)	Data rate	Power level Setting
802.11 b	Low	2412	1 Mbps	15
	Middle	2437	1 Mbps	15
	High	2462	1 Mbps	15
802.11 g	Low	2412	6 Mbps	15
	Middle	2437	6 Mbps	15
	High	2462	6 Mbps	15
802.11n ht20	Low	2412	MCS0	15
	Middle	2437	MCS0	15
	High	2462	MCS0	15
802.11n ht40	Low	2422	MCS0	15
	Middle	2437	MCS0	15
	High	2452	MCS0	15
BLE	Low	2402	1Mbps	Default
	Middle	2440	1Mbps	Default
	High	2480	1Mbps	Default

Equipment Modifications

No modification was made to the EUT.

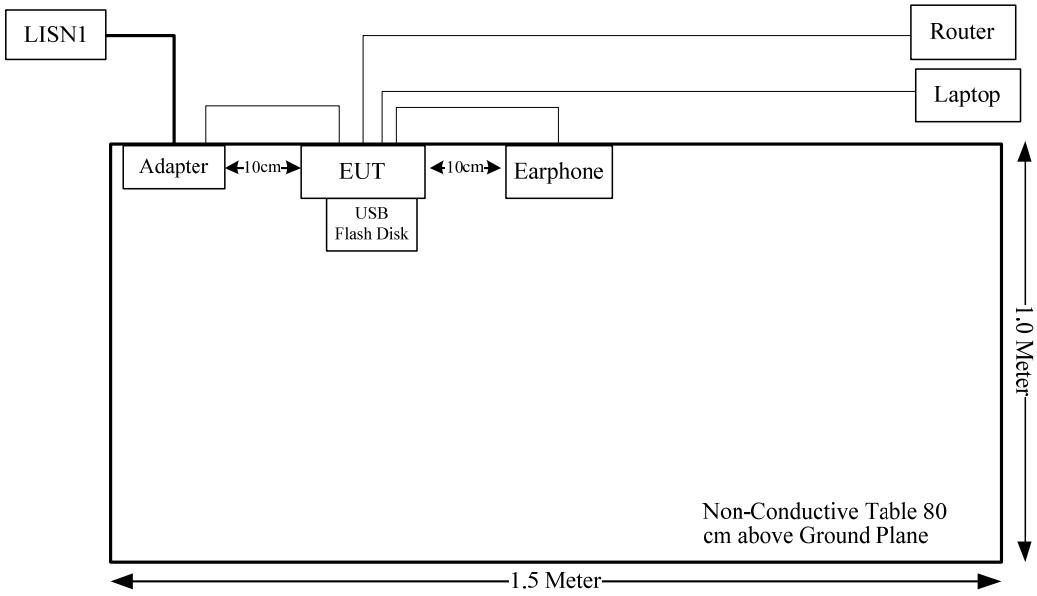
Support Equipment List and Details

Manufacturer	Description	Model	Serial Number
Lenovo	Laptop	Legion Y7000 2019 PG0	PF21N40H
zioncom	Router	A3700R	200622002S1
Kinston	Flash Disk	4G	4G-1
Yealink	Earphone	MP58	RSZ201207003-RF-S2

Support Cable List and Details

Cable Description	Shielding Type	Ferrite Core	Length (m)	From Port	To
RJ45 Cable	No	No	10	EUT	Laptop
RJ45 Cable	No	No	10	EUT	Router
RJ11 Cable	No	No	2	EUT	Earphone

Block Diagram of Test Setup



SUMMARY OF TEST RESULTS

Rules	Description of Test	Result
§15.247 (i) & §1.1310 & §2.1091	Maximum Permissible Exposure (MPE)	Compliance
RSS-102 Clause 2.5.2	Exemption Limits For Routine Evaluation-RF Exposure Evaluation	Compliance
FCC §15.203, RSS-GEN Clause 6.8	Antenna Requirement	Compliance
FCC §15.207 (a); RSS-Gen Clause 8.8	AC Line Conducted Emissions	Compliance
FCC §15.205, §15.209, §15.247(d); RSS-247 Clause 5.5 RSS-Gen Clause 8.10	Spurious Emissions	Compliance
FCC §15.247 (a)(2); RSS-247 Clause 5.2 a) RSS-Gen Clause 6.7	6 dB Bandwidth and 99% Occupied Bandwidth	Compliance*
FCC §15.247(b)(3); RSS-247 Clause 5.4 d)	Maximum Conducted Output Power	Compliance*
FCC §15.247(d); RSS-247 Clause5.5	100 kHz Bandwidth of Frequency Band Edge	Compliance*
FCC §15.247(e) RSS-247 Clause5.2 b)	Power Spectral Density	Compliance*

Compliance*: The device built in a certified RF module, FCC ID: T2C-YL1023, IC: 10741A-YL1023. The RF Port conducted test please refer to the Module report: ES180426020W03 for 802.11b/g/n and ES180426020W01 for BLE, which was issued on 2018-04-29 by EMTEK(SHENZHEN) CO., LTD.

FCC §15.247 (i) & §1.1310 & §2.1091- MAXIMUM PERMISSIBLE EXPOSURE (MPE)

Applicable Standard

According to subpart 15.247(i)and subpart §1.1310, systems operating under the provisions of this section shall be operated in a manner that ensures that the public is not exposed to radio frequency energy level in excess of the Commission's guidelines.

Limits for Maximum Permissible Exposure (MPE) (§1.1310, §2.1091)

(B) 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/f²)	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;

According to §1.1310 and §2.1091 RF exposure is calculated.

Calculation formula:

Prediction of power density at the distance of the applicable MPE limit
$S = PG/4\pi R^2$ = 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);

Calculated Data:

Operation Mode	**Frequency (MHz)**	**Antenna Gain**		**Conducted output power including Tune-up Tolerance**		**Evaluation Distance (cm)**	**Power Density (mW/cm^2)**	**MPE Limit (mW/cm^2)**
		(dBi)	**(numeric)**	**(dBm)**	**(mW)**			
Bluetooth	2402-2480	3	2.00	7	5.01	20.00	0.002	1.0
2.4G Wi-Fi	2412-2462	3	2.00	20	100.00	20.00	0.04	1.0
5G Wi-Fi	5150-5250	3	2.00	14	25.12	20.00	0.01	1.0
	5250-5350	3	2.00	15	31.62	20.00	0.01	1.0
	5470-5725	3	2.00	17	50.12	20.00	0.02	1.0
	5725-5850	3	2.00	14	25.12	20.00	0.01	1.0

Note: Non of those modes can`t transmit simultenuously.
Result: The device meet FCC MPE at 20 cm distance

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.

Calculated Data:

Operation Mode	Frequency (MHz)	Antenna Gain	Conducted output power including Tune-up Tolerance	EIRP		Exemption limits (mW)
		(dBi)	(dBm)	(dBm)	(mW)	
Bluetooth	2402-2480	3	7	10	10.00	2676
2.4G Wi-Fi	2412-2462	3	20	23	199.53	2684
5G Wi-Fi	5150-5250	3	14	17	50.12	4507
	5250-5350	3	15	18	63.10	4567
	5470-5725	3	17	20	100.00	4697
	5725-5850	3	14	17	50.12	4845

Note: Non of those modes can`t transmit simultenuously.

Result: Compliance. The device is compliance exemption from Routine Evaluation Limits –RF exposure Evaluation.

FCC §15.203, RSS-GEN CLAUSE 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:

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

According to RSS-Gen §6.8, 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 PCB antenna arrangement for BT/WLAN, fulfill the requirement of this section. Please refer to the EUT photos.

Antenna Type	input impedance (Ohm)	Antenna Gain /Frequency Range
FPC	50	3.0 dBi/2.4~2.5GHz

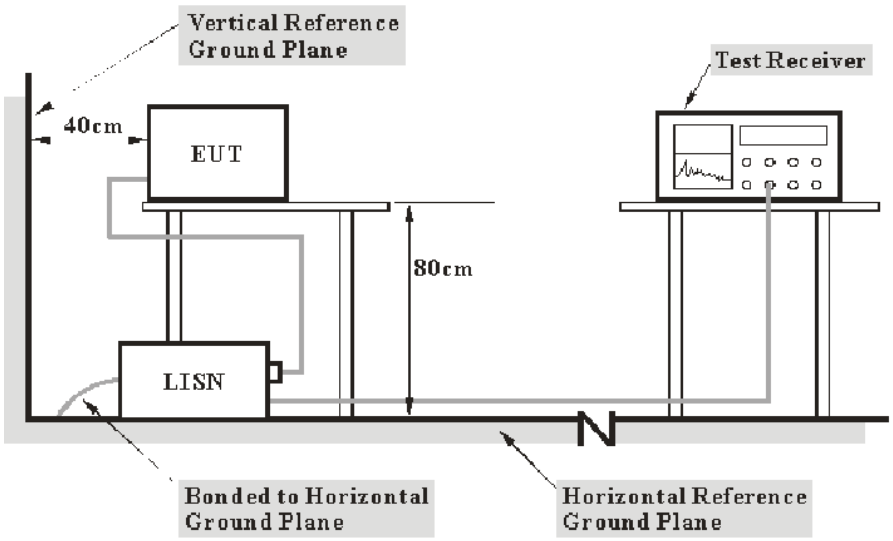
Result: Compliance.

FCC §15.207 (a), RSS-GEN CLAUSE 8.8 – AC LINE CONDUCTED EMISSIONS

Applicable Standard

FCC§15.207(a), 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 and the RSS-Gen limits.

The spacing between the peripherals was 10 cm.

The adapter was connected to the main lisn with a 120 V/60 Hz AC power source.

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 first LISN.

Maximizing procedure was performed on the six (6) highest emissions of the EUT.
During the conducted emission test, the EUT was connected to the outlet of the first LISN.

The frequency and amplitude of the six highest ac power-line conducted emissions relative to the limit, measured over all the current-carrying conductors of the EUT power cords, and the operating frequency or frequency to which the EUT is tuned (if appropriate), should be reported, unless such emissions are more than 20 dB below the limit. AC power-line conducted emissions measurements are to be separately carried out only on each of the phase ("hot") line(s) and (if used) on the neutral line(s), but not on the ground [protective earth] line(s). If less than six emission frequencies are within 20 dB of the limit, then the noise level of the measuring instrument at representative frequencies should be reported. The specific conductor of the power-line cord for each of the reported emissions should be identified. Measure the six highest emissions with respect to the limit on each current-carrying conductor of each power cord associated with the EUT (but not the power cords of associated or peripheral equipment that are part of the test configuration). Then, report the six highest emissions with respect to the limit from among all the measurements identifying the frequency and specific current-carrying conductor identified with the emission. The six highest emissions should be reported for each of the current-carrying conductors, or the six highest emissions may be reported over all the current-carrying conductors.

Corrected Amplitude & Margin Calculation

The basic equation is as follows:

$V_C = V_R + A_C + VDF$
$C_f = A_C + VDF$

Herein,
V_C (cord. Reading): corrected voltage amplitude
V_R: reading voltage amplitude
A_c: attenuation caused by cable loss
VDF: voltage division factor of AMN
C_f: Correction Factor

The "**Margin**" column of the following data tables indicates the degree of compliance within 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 = Limit – Corrected Amplitude

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
R&S	LISN	ENV 216	101614	2020-09-12	2021-09-12
R&S	EMI Test Receiver	ESCI	101121	2020-07-07	2021-07-07
MICRO-COAX	Coaxial Cable	C-NJNJ-50	C-0200-01	2020-09-05	2021-09-05
R&S	Test Software	EMC32	Version 9.10.00	N/A	N/A

*** Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Dongguan) attests that all calibrations have been performed, traceable to National Primary Standards and International System of Units (SI).

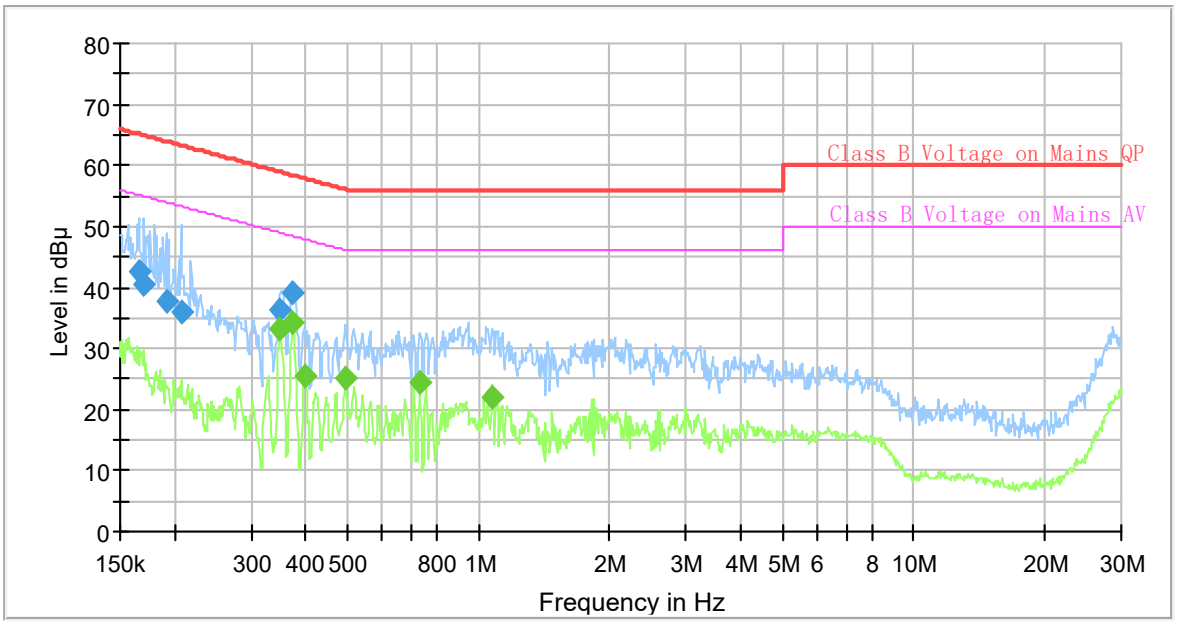
Test Data

Environmental Conditions

Temperature:	18.9℃
Relative Humidity:	39%
ATM Pressure:	101.6kPa
Tester:	Barry Yang
Test Date:	2020-12-22

Test Mode: Transmitting (Wi-Fi mode 802.11b middle channel was the worst)

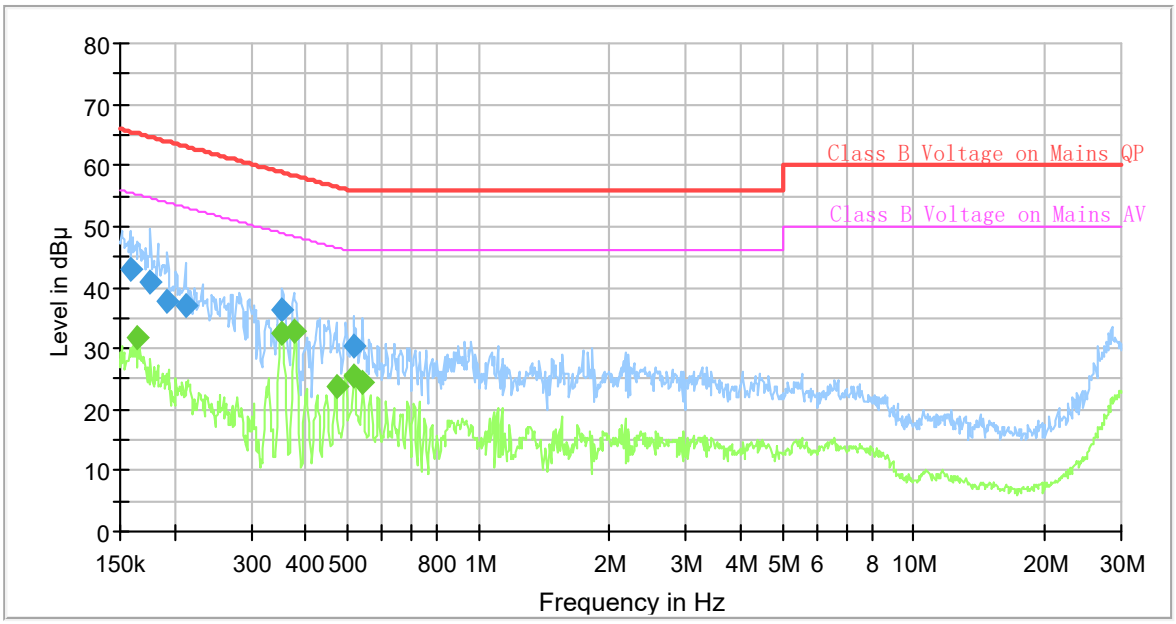
AC120 V, 60 Hz, Line:



Final_Result

Frequency (MHz)	QuasiPeak (dB µ V)	Average (dB µ V)	Limit (dB µ V)	Margin (dB)	Bandwidth (kHz)	Line	Corr. (dB)
0.165734	42.63	---	65.17	22.54	9.000	L1	9.6
0.169919	40.41	---	64.96	24.55	9.000	L1	9.6
0.191526	37.75	---	63.97	26.22	9.000	L1	9.6
0.207437	35.93	---	63.31	27.38	9.000	L1	9.6
0.348462	---	33.18	49.00	15.82	9.000	L1	9.6
0.348462	36.36	---	59.00	22.64	9.000	L1	9.6
0.373663	---	34.16	48.42	14.26	9.000	L1	9.6
0.373663	39.15	---	58.42	19.27	9.000	L1	9.6
0.398694	---	25.67	47.88	22.21	9.000	L1	9.6
0.494060	---	24.98	46.10	21.12	9.000	L1	9.6
0.732654	---	24.31	46.00	21.69	9.000	L1	9.7
1.075686	---	22.03	46.00	23.97	9.000	L1	9.7

AC120 V, 60 Hz, Neutral:



Final_Result

Frequency (MHz)	QuasiPeak (dB µ V)	Average (dB µ V)	Limit (dB µ V)	Margin (dB)	Bandwidth (kHz)	Line	Corr. (dB)
0.158459	42.82	---	65.54	22.72	9.000	N	9.6
0.163273	---	31.94	55.30	23.36	9.000	N	9.6
0.175956	40.99	---	64.67	23.68	9.000	N	9.6
0.192484	37.90	---	63.93	26.03	9.000	N	9.6
0.211616	37.08	---	63.14	26.06	9.000	N	9.6
0.352462	---	32.45	49.00	16.55	9.000	N	9.6
0.353715	36.34	---	58.87	22.53	9.000	N	9.6
0.377409	---	32.67	48.34	15.67	9.000	N	9.6
0.470023	---	23.89	46.51	22.62	9.000	N	9.6
0.516743	---	25.41	46.00	20.59	9.000	N	9.6
0.516743	30.41	---	56.00	25.59	9.000	N	9.6
0.540467	---	24.40	46.00	21.60	9.000	N	9.6

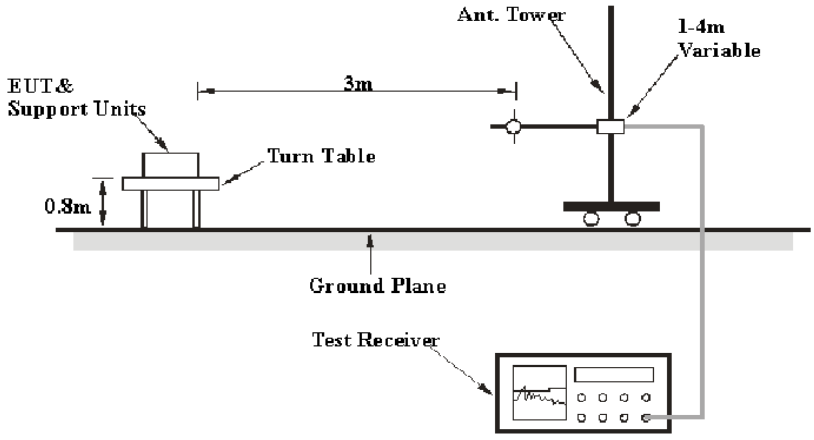
FCC §15.209, §15.205 & §15.247(d), RSS-247 CLAUSE 5.5, RSS-GEN CLAUSE 8.10 - SPURIOUS EMISSIONS

Applicable Standard

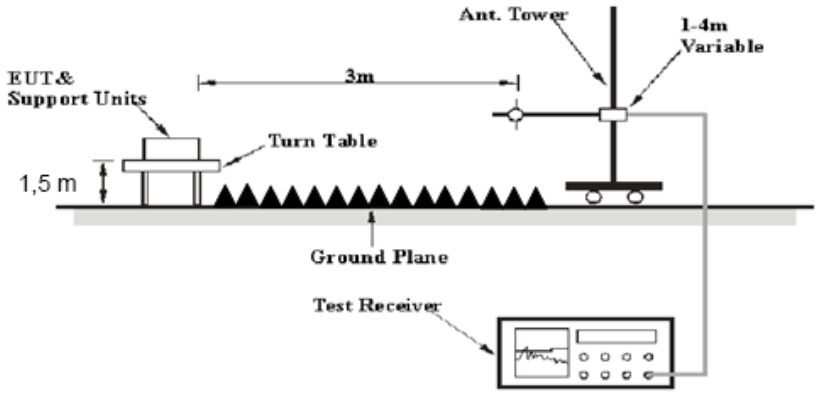
FCC §15.247 (d); §15.209; §15.205; RSS-247 §5.5, RSS-GEN §8.10.

EUT Setup

Below 1GHz:



Above 1GHz:



The radiated emission below 1GHz tests were performed in the 10 meters chamber test site, above 1GHz tests were performed in the 3 meters chamber test site B, using the setup accordance with the ANSI C63.10-2013. The specification used was the FCC 15.209, and FCC 15.247 limits.

The spacing between the peripherals was 10 cm.

EMI Test Receiver & Spectrum Analyzer Setup

The system was investigated from 30 MHz to 25 GHz.

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

30MHz-1000MHz:

Measurement	RBW	Video B/W	IF B/W
QP	120 kHz	300 kHz	120kHz

1GHz- 25GHz:

Measurement	Duty cycle	RBW	Video B/W
PK	Any	1MHz	3 MHz
AV	>98%	1MHz	10 Hz
	<98%	1MHz	1/T

Note: T is minimum transmission duration

If the maximized peak measured value complies with under the QP/Average limit more than 6dB, then it is unnecessary to perform an QP/Average measurement.

Test Procedure

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

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

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 = Limit – Corrected Amplitude

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Radiated emissions Below 1GHz					
Sunol Sciences	Antenna	JB3	A060611-2	2020-08-25	2023-08-25
R&S	EMI Test Receiver	ESCI	100224	2020-09-12	2021-09-12
Unknown	Coaxial Cable	C-NJNJ-50	C-1000-01	2020-09-05	2021-09-05
Unknown	Coaxial Cable	C-NJNJ-50	C-0400-02	2020-09-05	2021-09-05
Unknown	Coaxial Cable	C-NJNJ-50	C-0530-01	2020-09-24	2021-09-24
Sonoma	Amplifier	310N	185914	2020-10-13	2021-10-13
Farad	Test Software	EZ-EMC	V1.1.4.2	N/A	N/A
Radiated emissions Above 1GHz					
ETS-Lindgren	Horn Antenna	3115	000 527 35	2018-10-12	2021-10-12
Ducommun Technolagies	Horn Antenna	ARH-4223-02	1007726-01 1304	2020-12-05	2023-12-04
Agilent	Spectrum Analyzer	E4440A	SG43360054	2020-07-07	2021-07-07
Unknown	Coaxial Cable	C-SJSJ-50	C-0800-01	2020-09-05	2021-09-05
Unknown	Coaxial Cable	C-2.4J2.4J-50	C-0700-02	2020-06-27	2021-06-27
Mini-Circuit	Amplifier	ZVA-213-S+	54201245	2020-09-05	2021-09-05
Quinstar	Amplifier	QLW-18405536-JO	15964001001	2020-06-27	2021-06-27
Farad	Test Software	EZ-EMC	V1.1.4.2	N/A	N/A
E-Microwave	Band-stop Filters	OBSF-2400-2483.5-S	OE01601525	2020-06-16	2021-06-16
Micro-tronics	High Pass Filter	HPM50111	S/N-G217	2020-06-16	2021-06-16

*** Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Dongguan) attests that all calibrations have been performed, traceable to National Primary Standards and International System of Units (SI).

Test Data

Environmental Conditions

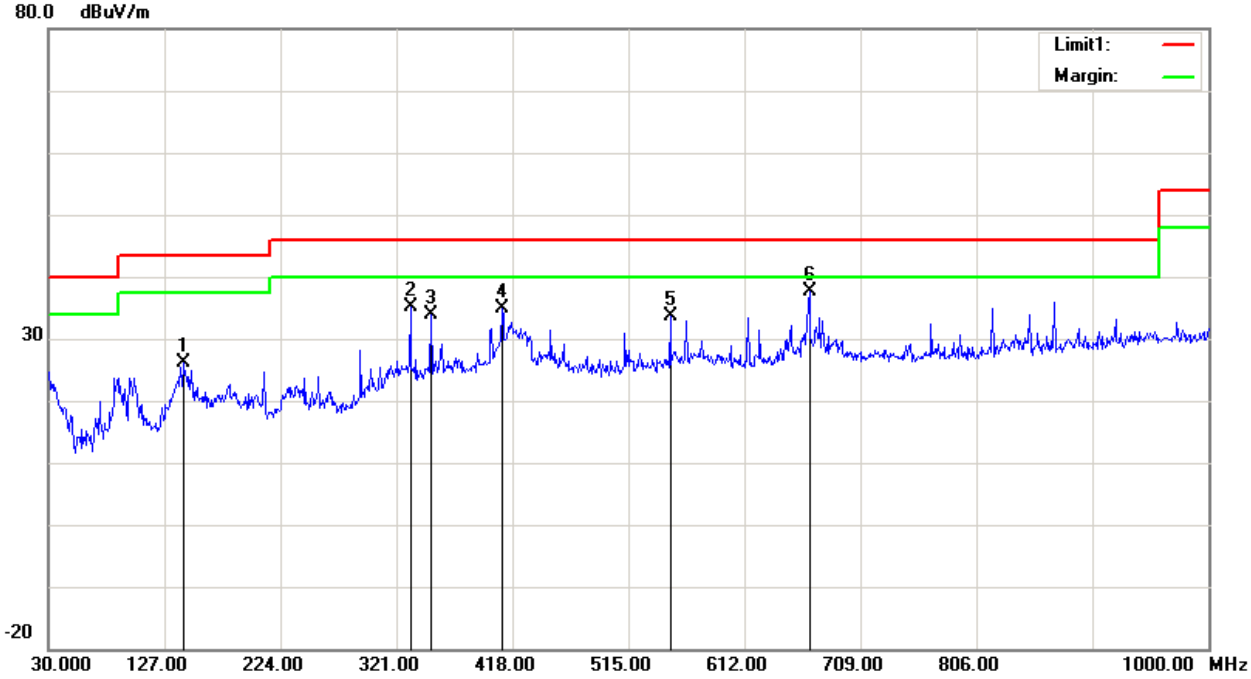
Test Items	Radiation Below 1GHz	Radiation Above 1GHz
Temperature:	18.1°C	21.8~22.8 °C
Relative Humidity:	29%	29~54%
ATM Pressure:	101.3 kPa	101~101.9 kPa
Tester:	Jalon Liu	Lee Li
Test Date:	2021-01-27	2020.12.29~2020.12.30

Test Result: Compliance, please Refer to the following data

Test Mode: Transmitting

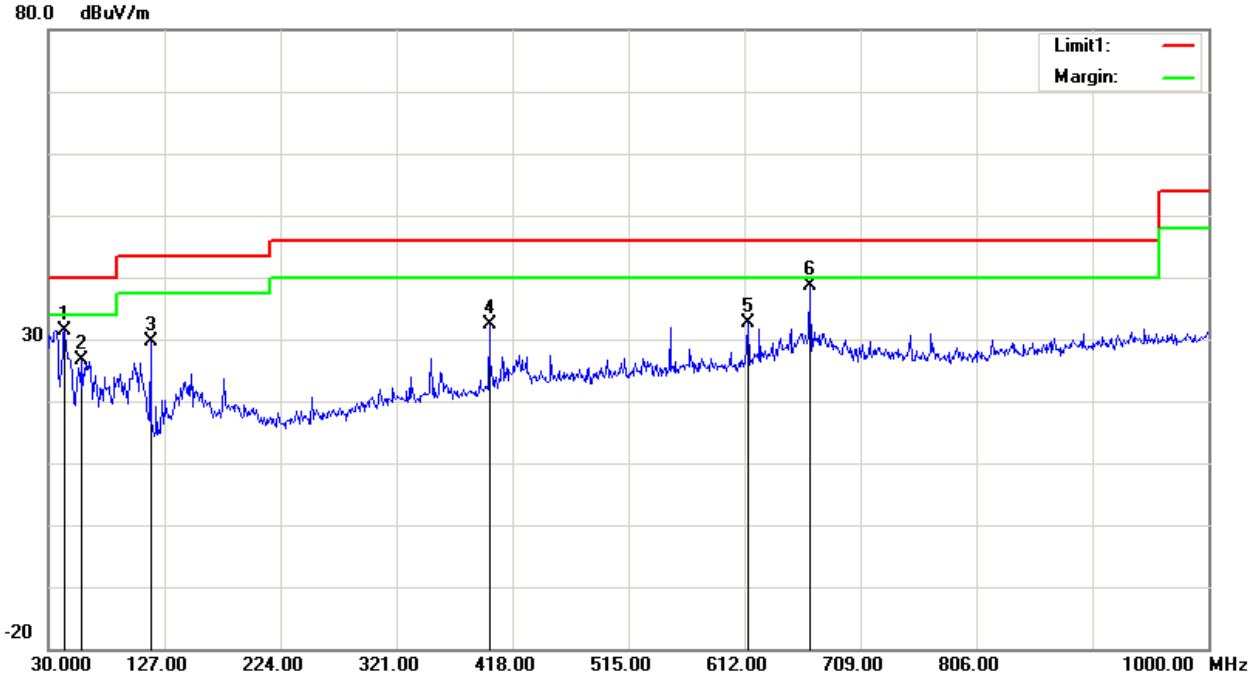
1) 30MHz-1GHz(802.11b mode low channel was the worst)

Horizontal:



Frequency (MHz)	Receiver Reading (dBuV)	Detector	Correction Factor (dB/m)	Cord. Amp. (dBuV/m)	Limit (dBuV/m)	Margin (dB)
142.5200	35.31	peak	-9.11	26.20	43.50	17.30
332.6400	42.20	peak	-6.96	35.24	46.00	10.76
350.1000	40.14	peak	-6.37	33.77	46.00	12.23
409.2700	39.73	peak	-4.91	34.82	46.00	11.18
549.9200	35.46	peak	-1.82	33.64	46.00	12.36
666.3200	37.73	peak	-0.12	37.61	46.00	8.39

Vertical:



Frequency (MHz)	Receiver Reading (dBuV)	Detector	Correction Factor (dB/m)	Cord. Amp. (dBuV/m)	Limit (dBuV/m)	Margin (dB)
43.5800	43.08	peak	-11.72	31.36	40.00	8.64
58.1300	43.05	peak	-16.51	26.54	40.00	13.46
115.3600	42.42	peak	-12.76	29.66	43.50	13.84
398.6000	37.76	peak	-5.29	32.47	46.00	13.53
614.9100	33.55	peak	-0.92	32.63	46.00	13.37
666.3200	38.72	peak	-0.12	38.60	46.00	7.40

2) 1-25GHz:
802.11b Mode:

Frequency (MHz)	Receiver		Rx Antenna		Cable loss (dB)	Amplifier Gain (dB)	Corrected Amplitude (dBμV/m)	Limit (dBμV/m)	Margin (dB)
	Reading (dBμV)	Detector	Polar (H/V)	Factor (dB/m)					
Low Channel: 2412 MHz									
2390.00	26.09	PK	V	28.08	1.80	0.00	55.97	74.00	18.03
2390.00	14.25	AV	V	28.08	1.80	0.00	44.13	54.00	9.87
4824.00	36.71	PK	V	32.95	3.19	25.62	47.23	74.00	26.77
4824.00	23.42	AV	V	32.95	3.19	25.62	33.94	54.00	20.06
7236.00	36.86	PK	V	35.81	4.77	25.64	51.80	74.00	22.20
7236.00	23.51	AV	V	35.81	4.77	25.64	38.45	54.00	15.55
Middle Channel: 2437 MHz									
4874.00	36.42	PK	V	33.05	3.26	25.65	47.08	74.00	26.92
4874.00	23.17	AV	V	33.05	3.26	25.65	33.83	54.00	20.17
7311.00	36.21	PK	V	36.01	4.64	25.71	51.15	74.00	22.85
7311.00	23.53	AV	V	36.01	4.64	25.71	38.47	54.00	15.53
High Channel: 2462 MHz									
2483.50	27.69	PK	V	28.27	1.84	0.00	57.80	74.00	16.20
2483.50	15.27	AV	V	28.27	1.84	0.00	45.38	54.00	8.62
4924.00	36.75	PK	V	33.15	3.27	25.65	47.52	74.00	26.48
4924.00	23.93	AV	V	33.15	3.27	25.65	34.70	54.00	19.30
7386.00	36.45	PK	V	36.20	4.51	25.79	51.37	74.00	22.63
7386.00	23.81	AV	V	36.20	4.51	25.79	38.73	54.00	15.27

802.11g Mode:

Frequency (MHz)	Receiver		Rx Antenna		Cable loss (dB)	Amplifier Gain (dB)	Corrected Amplitude (dBμV/m)	Limit (dBμV/m)	Margin (dB)
	Reading (dBμV)	Detector	Polar (H/V)	Factor (dB/m)					
Low Channel: 2412 MHz									
2390.00	25.36	PK	V	28.08	1.80	0.00	55.24	74.00	18.76
2390.00	13.36	AV	V	28.08	1.80	0.00	43.24	54.00	10.76
4824.00	36.37	PK	V	32.95	3.19	25.62	46.89	74.00	27.11
4824.00	23.48	AV	V	32.95	3.19	25.62	34.00	54.00	20.00
7236.00	36.45	PK	V	35.81	4.77	25.64	51.39	74.00	22.61
7236.00	23.37	AV	V	35.81	4.77	25.64	38.31	54.00	15.69
Middle Channel: 2437 MHz									
4874.00	36.46	PK	V	33.05	3.26	25.65	47.12	74.00	26.88
4874.00	22.95	AV	V	33.05	3.26	25.65	33.61	54.00	20.39
7311.00	36.24	PK	V	36.01	4.64	25.71	51.18	74.00	22.82
7311.00	22.86	AV	V	36.01	4.64	25.71	37.80	54.00	16.20
High Channel: 2462 MHz									
2483.50	28.39	PK	V	28.27	1.84	0.00	58.50	74.00	15.50
2483.50	15.51	AV	V	28.27	1.84	0.00	45.62	54.00	8.38
4924.00	36.45	PK	V	33.15	3.27	25.65	47.22	74.00	26.78
4924.00	23.19	AV	V	33.15	3.27	25.65	33.96	54.00	20.04
7386.00	36.51	PK	V	36.20	4.51	25.79	51.43	74.00	22.57
7386.00	23.28	AV	V	36.20	4.51	25.79	38.20	54.00	15.80

802.11n ht20 Mode:

Frequency (MHz)	Receiver		Rx Antenna		Cable loss (dB)	Amplifier Gain (dB)	Corrected Amplitude (dBμV/m)	Limit (dBμV/m)	Margin (dB)
	Reading (dBμV)	Detector	Polar (H/V)	Factor (dB/m)					
Low Channel: 2412 MHz									
2390.00	27.76	PK	V	28.08	1.80	0.00	57.64	74.00	16.36
2390.00	13.40	AV	V	28.08	1.80	0.00	43.28	54.00	10.72
4824.00	36.45	PK	V	32.95	3.19	25.62	46.97	74.00	27.03
4824.00	23.36	AV	V	32.95	3.19	25.62	33.88	54.00	20.12
7236.00	36.19	PK	V	35.81	4.77	25.64	51.13	74.00	22.87
7236.00	23.09	AV	V	35.81	4.77	25.64	38.03	54.00	15.97
Middle Channel: 2437 MHz									
4874.00	36.41	PK	V	33.05	3.26	25.65	47.07	74.00	26.93
4874.00	23.17	AV	V	33.05	3.26	25.65	33.83	54.00	20.17
7311.00	35.59	PK	V	36.01	4.64	25.71	50.53	74.00	23.47
7311.00	22.90	AV	V	36.01	4.64	25.71	37.84	54.00	16.16
High Channel: 2462 MHz									
2483.50	28.50	PK	V	28.27	1.84	0.00	58.61	74.00	15.39
2483.50	15.71	AV	V	28.27	1.84	0.00	45.82	54.00	8.18
4924.00	36.14	PK	V	33.15	3.27	25.65	46.91	74.00	27.09
4924.00	23.21	AV	V	33.15	3.27	25.65	33.98	54.00	20.02
7386.00	36.35	PK	V	36.20	4.51	25.79	51.27	74.00	22.73
7386.00	23.54	AV	V	36.20	4.51	25.79	38.46	54.00	15.54

802.11n ht40 Mode:

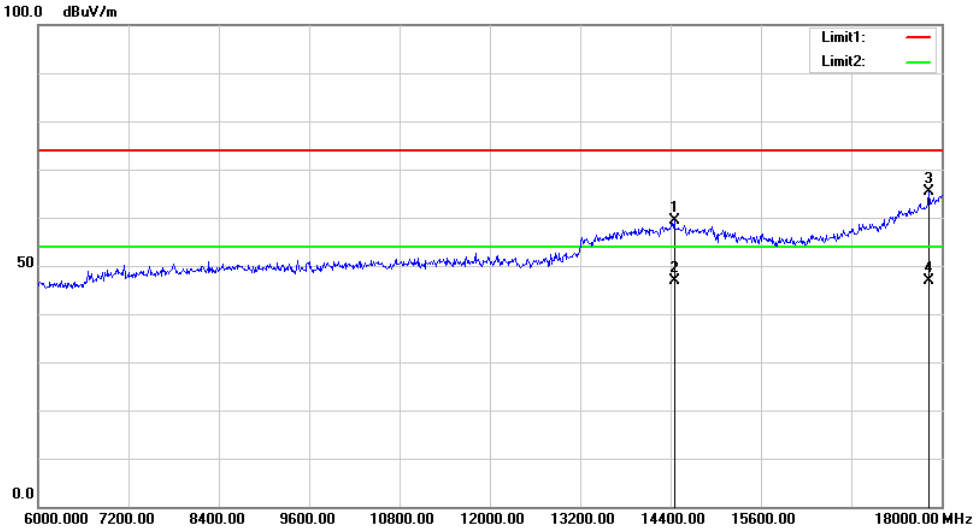
Frequency (MHz)	Receiver		Rx Antenna		Cable loss (dB)	Amplifier Gain (dB)	Corrected Amplitude (dBμV/m)	Limit (dBμV/m)	Margin (dB)
	Reading (dBμV)	Detector	Polar (H/V)	Factor (dB/m)					
Low Channel: 2422 MHz									
2390.00	31.01	PK	V	28.08	1.80	0.00	60.89	74.00	13.11
2390.00	18.50	AV	V	28.08	1.80	0.00	48.38	54.00	5.62
4844.00	36.81	PK	V	32.99	3.22	25.63	47.39	74.00	26.61
4844.00	23.12	AV	V	32.99	3.22	25.63	33.70	54.00	20.30
7266.00	35.30	PK	V	35.89	4.72	25.67	50.24	74.00	23.76
7266.00	23.03	AV	V	35.89	4.72	25.67	37.97	54.00	16.03
Middle Channel: 2437 MHz									
4874.00	36.42	PK	V	33.05	3.26	25.65	47.08	74.00	26.92
4874.00	22.97	AV	V	33.05	3.26	25.65	33.63	54.00	20.37
7311.00	36.06	PK	V	36.01	4.64	25.71	51.00	74.00	23.00
7311.00	22.99	AV	V	36.01	4.64	25.71	37.93	54.00	16.07
High Channel: 2452 MHz									
2483.50	31.05	PK	V	28.27	1.84	0.00	61.16	74.00	12.84
2483.50	18.56	AV	V	28.27	1.84	0.00	48.67	54.00	5.33
4904.00	36.24	PK	V	33.11	3.30	25.67	46.98	74.00	27.02
4904.00	22.90	AV	V	33.11	3.30	25.67	33.64	54.00	20.36
7356.00	35.86	PK	V	36.13	4.56	25.76	50.79	74.00	23.21
7356.00	23.32	AV	V	36.13	4.56	25.76	38.25	54.00	15.75

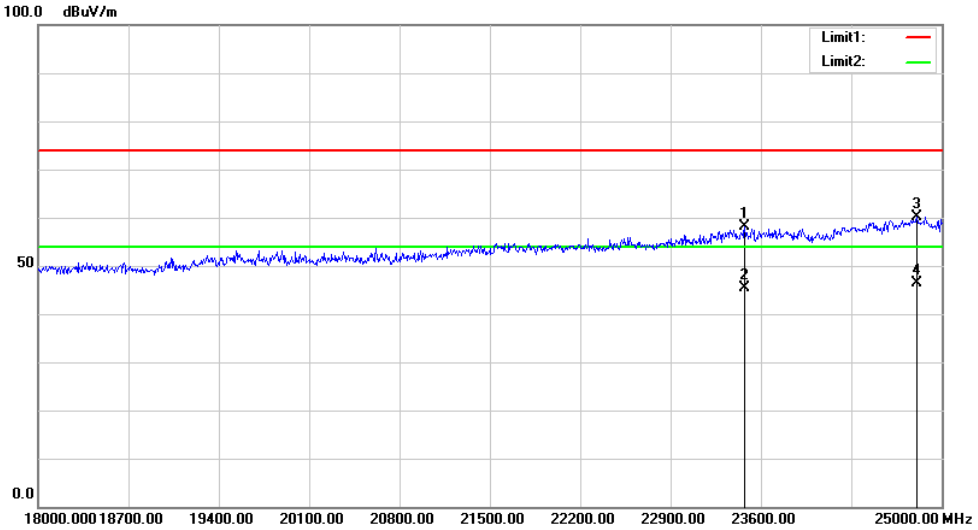
BLE Mode:

Frequency (MHz)	Receiver		Rx Antenna		Cable loss (dB)	Amplifier Gain (dB)	Corrected Amplitude (dBμV/m)	Limit (dBμV/m)	Margin (dB)
	Reading (dBμV)	Detector	Polar (H/V)	Factor (dB/m)					
Low Channel: 2402 MHz									
2390.00	26.12	PK	H	28.08	1.80	0.00	56.00	74.00	18.00
2390.00	13.35	AV	H	28.08	1.80	0.00	43.23	54.00	10.77
4804.00	36.58	PK	H	32.91	3.17	25.60	47.06	74.00	26.94
4804.00	24.44	AV	H	32.91	3.17	25.60	34.92	54.00	19.08
7206.00	35.89	PK	H	35.74	4.82	25.60	50.85	74.00	23.15
7206.00	23.81	AV	H	35.74	4.82	25.60	38.77	54.00	15.23
Middle Channel: 2440 MHz									
4880.00	36.29	PK	H	33.06	3.27	25.66	46.96	74.00	27.04
4880.00	24.15	AV	H	33.06	3.27	25.66	34.82	54.00	19.18
7320.00	35.60	PK	H	36.03	4.62	25.72	50.53	74.00	23.47
7320.00	23.52	AV	H	36.03	4.62	25.72	38.45	54.00	15.55
High Channel: 2480 MHz									
2483.50	26.28	PK	H	28.27	1.84	0.00	56.39	74.00	17.61
2483.50	14.56	AV	H	28.27	1.84	0.00	44.67	54.00	9.33
4960.00	36.77	PK	H	33.22	3.23	25.63	47.59	74.00	26.41
4960.00	24.60	AV	H	33.22	3.23	25.63	35.42	54.00	18.58
7440.00	36.05	PK	H	36.34	4.41	25.85	50.95	74.00	23.05
7440.00	23.94	AV	H	36.34	4.41	25.85	38.84	54.00	15.16

Test plots(802.11b High channel was the worst)
Horizontal:

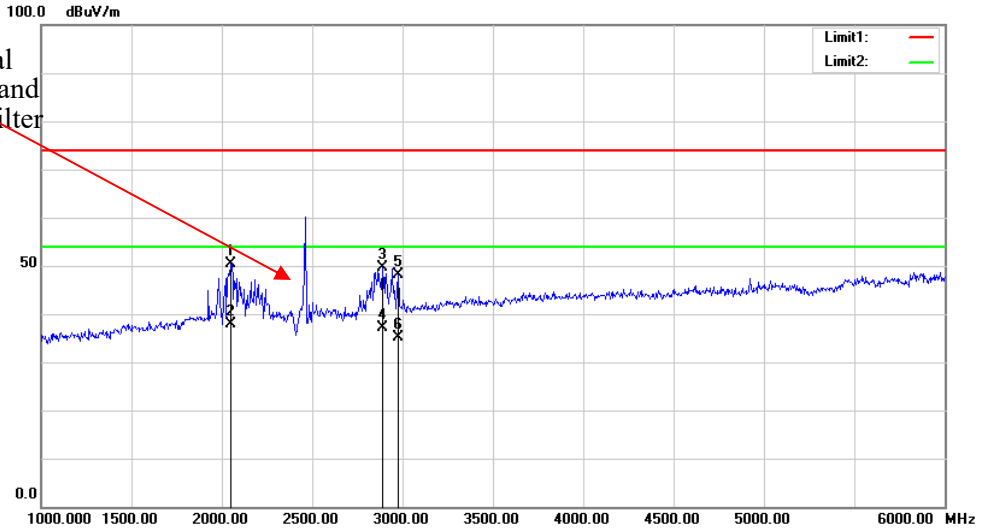
Fundamental Test with Band Rejection Filter

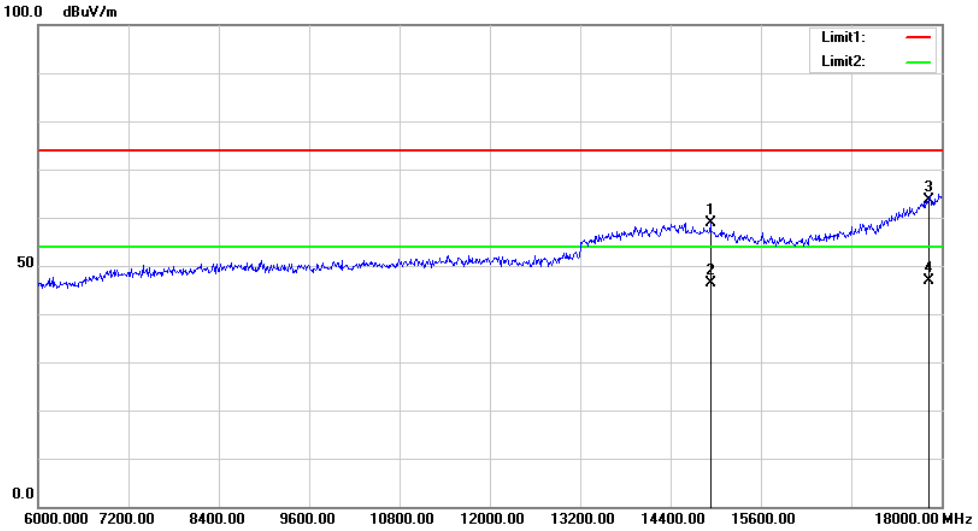


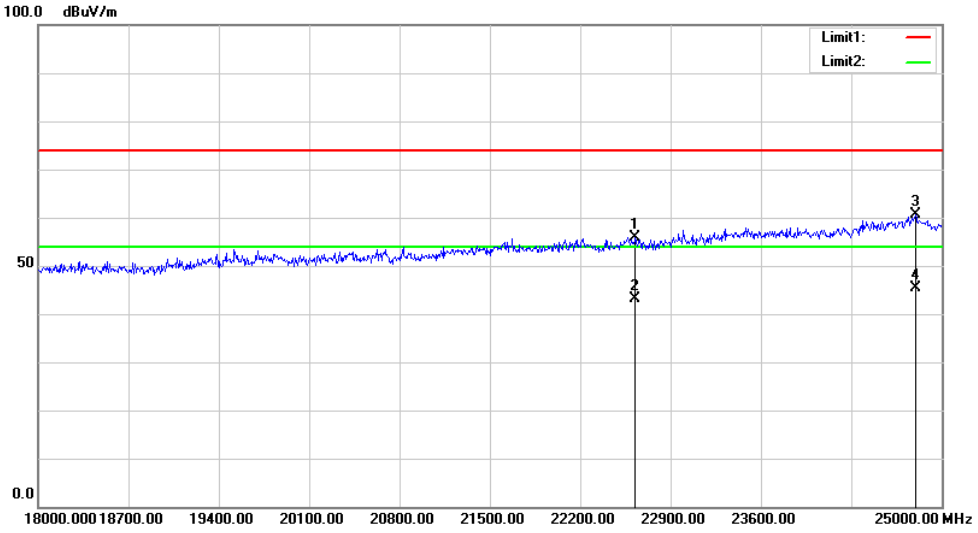


Vertical:

Fundamental Test with Band Rejection Filter







******* END OF REPORT *******