

FCC PART 15.247 TEST REPORT

For

Shenzhen Ustellar Technology Ltd.

Rm.201, A Bldg., No. A Qianhai 1st Rd., Shen'gang Cooperation Zone, Qianhai, Shenzhen,
CHINA 518000

FCC ID: 2AWONNTF81


Report Type: Original Report	Product Name: Smart Flood Light
Report Number:	RDG210207004-00A
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TABLE OF CONTENTS

GENERAL INFORMATION.....	3
PRODUCT DESCRIPTION FOR EQUIPMENT UNDER TEST (EUT).....	3
OBJECTIVE	3
TEST METHODOLOGY	3
MEASUREMENT UNCERTAINTY	4
TEST FACILITY	4
DECLARATIONS.....	4
SYSTEM TEST CONFIGURATION.....	5
DESCRIPTION OF TEST CONFIGURATION	5
EQUIPMENT MODIFICATIONS	5
EUT EXERCISE SOFTWARE	6
BLOCK DIAGRAM OF TEST SETUP	7
SUMMARY OF TEST RESULTS	8
FCC §15.247 (i) & §1.1310 & §2.1091- MAXIMUM PERMISSIBLE EXPOSURE (MPE).....	9
APPLICABLE STANDARD	9
FCC §15.203 - ANTENNA REQUIREMENT.....	10
APPLICABLE STANDARD	10
ANTENNA CONNECTOR CONSTRUCTION	10
FCC §15.207 (a) – AC LINE CONDUCTED EMISSIONS	11
APPLICABLE STANDARD	11
EUT SETUP	11
EMI TEST RECEIVER SETUP.....	11
TEST PROCEDURE	12
CORRECTED AMPLITUDE & MARGIN CALCULATION	12
TEST EQUIPMENT LIST AND DETAILS.....	12
TEST DATA	13
FCC §15.209, §15.205 & §15.247(d) - SPURIOUS EMISSIONS.....	15
APPLICABLE STANDARD	15
EUT SETUP	15
EMI TEST RECEIVER & SPECTRUM ANALYZER SETUP	16
TEST PROCEDURE	16
CORRECTED AMPLITUDE & MARGIN CALCULATION	16
TEST EQUIPMENT LIST AND DETAILS.....	17
TEST DATA	17

GENERAL INFORMATION

Product Description for Equipment under Test (EUT)

EUT Name:	Smart Flood Light
EUT Model:	NTF81
Operation Frequency:	2412-2462 MHz(802.11b/g/n ht20) 2402-2480MHz(BLE)
Maximum Peak Output Power (Conducted):	13.92 dBm(802.11b/g/n) 4.94 dBm(BLE)
Modulation Type:	DSSS, OFDM,GFSK
Antenna Gain▲:	2 dBi
Rated Input Voltage:	AC 100-120V
Serial Number:	RDG210207004-RF-S1
EUT Received Date:	2021.02.08
EUT Received Status:	Good

Objective

This report is prepared on behalf of *Shenzhen Ustellar Technology Ltd.* in accordance with Part 2, Subpart J, Part 15, Subparts A and C of the Federal Communications Commission's rules.

The tests were performed in order to determine the compliance of the EUT with FCC Rules Part 15-Subpart C, section 15.203, 15.205, 15.207, 15.209 and 15.247 rules.

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 KDB 558074 D01 DTS Meas Guidance v05r02.

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 °C
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)

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

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.

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.

Equipment Modifications

No modification was made to the EUT.

EUT Exercise Software

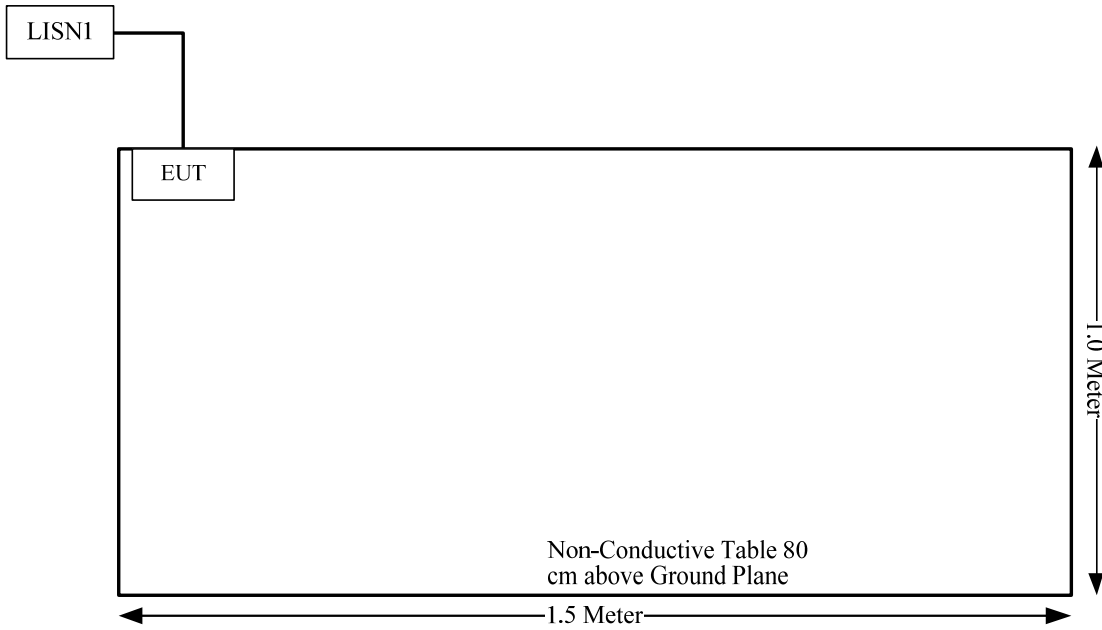
The software “Wifi Test Toolv1.4.1.exe” was used for testing, which was provided by manufacturer. The maximum power was configured as below table, that provided by the manufacturer ▲ :

Mode	Channel	Frequency (MHz)	Data rate	Power level Setting
802.11 b	Low	2412	1 Mbps	8
	Middle	2437	1 Mbps	8
	High	2462	1 Mbps	8
802.11 g	Low	2412	6 Mbps	9
	Middle	2437	6 Mbps	7
	High	2462	6 Mbps	6
802.11n ht20	Low	2412	MCS0	8
	Middle	2437	MCS0	6
	High	2462	MCS0	5
BLE	Low	2402	1Mbps	20
	Middle	2440	1Mbps	18
	High	2480	1Mbps	15

The maximum duty cycle as following table:

Test mode	T _{on} (ms)	T _{on+off} (ms)	Duty Cycle (%)
802.11b	100	100	100
802.11g	0.186	0.420	44.29
802.11n ht20	0.060	0.298	20.13
BLE	100	100	100

Block Diagram of Test Setup



SUMMARY OF TEST RESULTS

FCC Rules	Description of Test	Result
FCC §15.247 (i) & §1.1310 & §2.1091	Maximum Permissible Exposure (MPE)	Compliance
§15.203	Antenna Requirement	Compliance
§15.207 (a)	AC Line Conducted Emissions	Compliance
§15.205, §15.209, §15.247(d)	Spurious Emissions	Compliance
§15.247 (a)(2)	6 dB Bandwidth	Compliance*
§15.247(b)(3)	Maximum Conducted Output Power	Compliance*
§15.247(d)	100 kHz Bandwidth of Frequency Band Edge	Compliance*
§15.247(e)	Power Spectral Density	Compliance*

Note:

Compliance*: This device contains one RF module which is same as NTF80's module and NTF80 has been tested and complies with Part 15.247, so the test data please refer to report of NTF80(FCC ID:2AWONNTF80): RDG210126014-00A.

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/cm²)	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;

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/cm²);

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 Modes	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)			
WLAN	2412-2462	2	1.58	14	25.12	20.00	0.008	1.0
BLE	2402-2480	2	1.58	5	3.16	20.00	0.001	1.0

The WLAN and BLE can't transmit simultaneously.

Result: The device meet FCC MPE at 20 cm distance

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.
- c. Unit must be professionally installed, and installer shall be responsible for verifying that the correct antenna is employed with the unit.

Antenna Connector Construction

The EUT has one internal PCB antenna and one internal Monopole antenna arrangement, fulfill the requirement of this section. Please refer to the EUT photos.

Antenna Type	input impedance (Ohm)	Antenna Gain /Frequency Range
PCB	50	2 dBi/2.4~2.5GHz
Monopole	50	2 dBi/2.4~2.5GHz

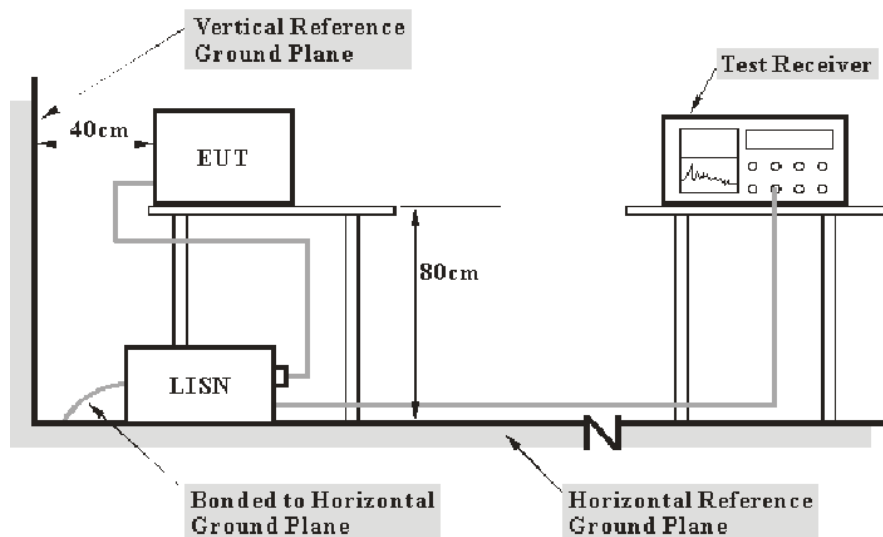
Result: Compliance.

FCC §15.207 (a) – AC LINE CONDUCTED EMISSIONS

Applicable Standard

FCC§15.207(a).

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.

The EUT 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 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:

$$\text{Margin} = \text{Limit} - \text{Corrected Amplitude}$$

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

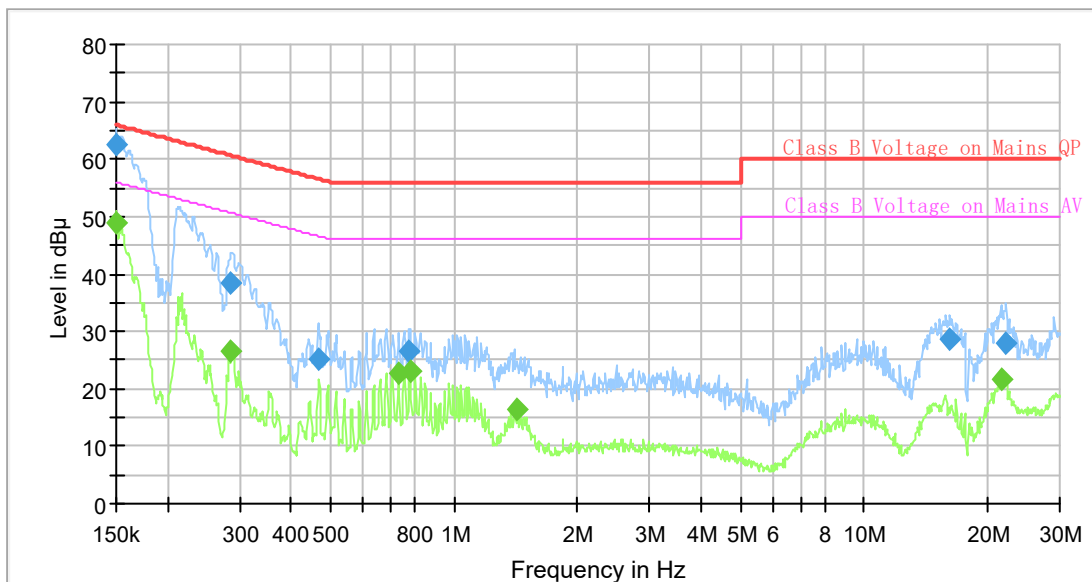
Environmental Conditions

Temperature:	25.1°C
Relative Humidity:	56%
ATM Pressure:	100.6kPa
Tester:	Walker Chen
Test Date:	2021-04-23

Test Result: Compliance

Test Mode: Transmitting(802.11b mode high channel was the worst)

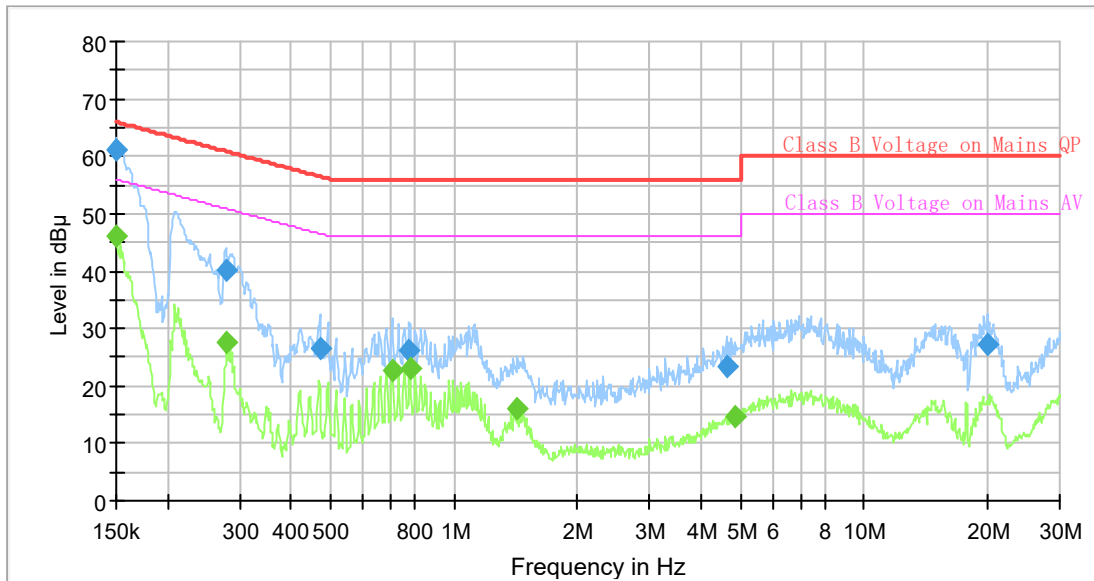
AC120 V, 60 Hz, Line:



Final Result

Frequency (MHz)	QuasiPeak (dB μV)	Average (dB μV)	Limit (dB μV)	Margin (dB)	Bandwidth (kHz)	Line	Corr. (dB)
0.150000	---	48.94	56.00	7.06	9.000	L1	9.6
0.150000	62.46	---	66.00	3.54	9.000	L1	9.6
0.285439	---	26.45	50.66	24.21	9.000	L1	9.6
0.285439	38.42	---	60.66	22.24	9.000	L1	9.6
0.465358	25.21	---	56.60	31.39	9.000	L1	9.6
0.732654	---	22.56	46.00	23.44	9.000	L1	9.7
0.777842	26.42	---	56.00	29.58	9.000	L1	9.7
0.781732	---	23.06	46.00	22.94	9.000	L1	9.7
1.429391	---	16.49	46.00	29.51	9.000	L1	9.7
16.218969	28.54	---	60.00	31.46	9.000	L1	10.1
21.768118	---	21.69	50.00	28.31	9.000	L1	10.0
22.206757	27.95	---	60.00	32.05	9.000	L1	10.0

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)
0.150000	---	46.06	56.00	9.94	9.000	N	9.6
0.150000	60.99	---	66.00	5.01	9.000	N	9.6
0.278409	---	27.72	50.86	23.14	9.000	N	9.6
0.278409	40.08	---	60.86	20.78	9.000	N	9.6
0.470023	26.48	---	56.51	30.03	9.000	N	9.6
0.707516	---	22.66	46.00	23.34	9.000	N	9.6
0.777842	26.13	---	56.00	29.87	9.000	N	9.6
0.781732	---	23.10	46.00	22.90	9.000	N	9.6
1.429391	---	16.20	46.00	29.80	9.000	N	9.6
4.615042	23.27	---	56.00	32.73	9.000	N	9.6
4.826922	---	14.58	46.00	31.42	9.000	N	9.6
19.998519	27.40	---	60.00	32.60	9.000	N	9.9

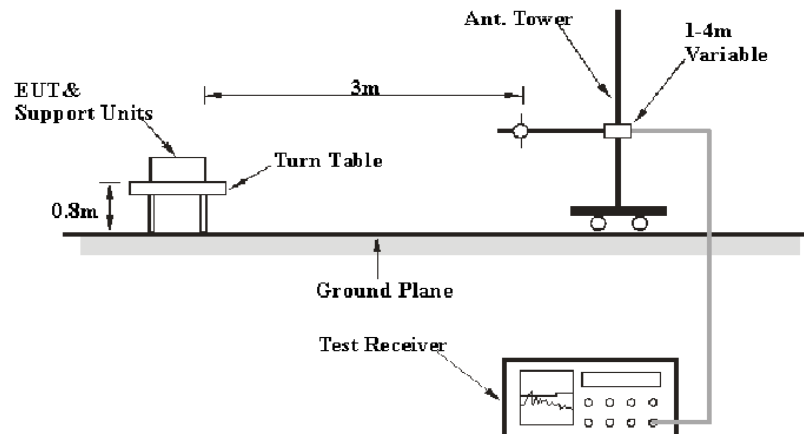
FCC §15.209, §15.205 & §15.247(d) - SPURIOUS EMISSIONS

Applicable Standard

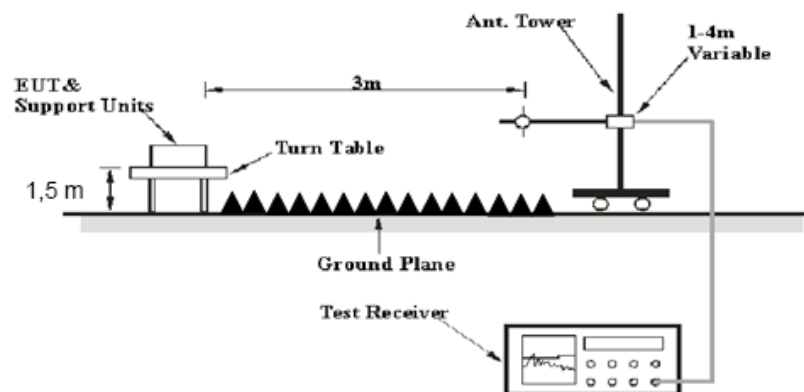
FCC §15.247 (d); §15.209; §15.205;

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 A, using the setup accordance with the ANSI C63.10-2013. The specification used was the FCC 15.209, and FCC 15.247 limits.

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

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:

$$\text{Corrected Amplitude} = \text{Meter Reading} + \text{Antenna Factor} + \text{Cable Loss} - \text{Amplifier Gain}$$

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:

$$\text{Margin} = \text{Limit} - \text{Corrected Amplitude}$$

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Radiation 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
Radiation Above 1GHz					
ETS-Lindgren	Horn Antenna	3115	9912-5985	2020-10-13	2023-10-12
Ducommun Technologies	Horn Antenna	ARH-4223-02	1007726-01 1304	2020-12-05	2023-12-04
R&S	Spectrum Analyzer	FSP 38	100478	2020-07-07	2021-07-07
HUBER+SUHNER	Coaxial Cable	SUCOFLEX 126EA	MY369/26/26E A	2020-09-25	2021-09-25
Mini	Pre-amplifier	ZVA-183-S+	5969001149	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
Mini Circuits	High Pass Filter	VHF-6010+	31118	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:	25.6 °C	22.7°C
Relative Humidity:	49 %	65%
ATM Pressure:	100.6 kPa	100.6kPa
Tester:	King wang	Alex Hu
Test Date:	2021-04-23	2021-04-23

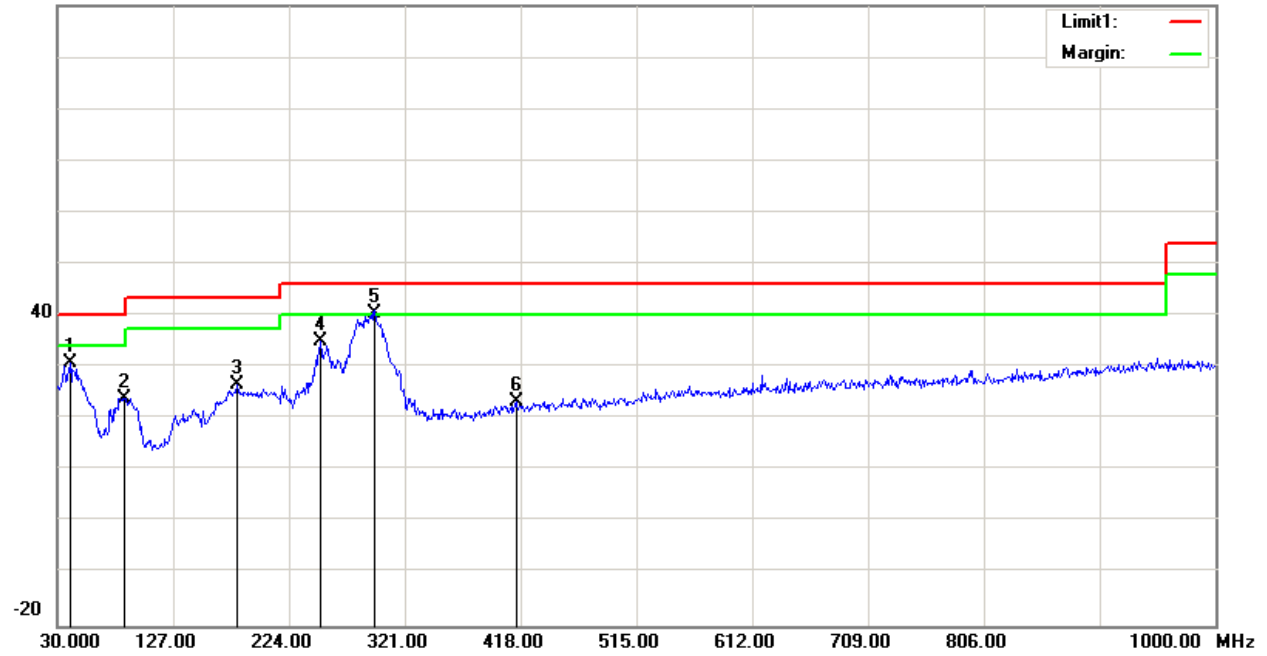
Test Result: Compliance, please Refer to the following data

Test Mode: Transmitting

1) 30MHz-1GHz

Horizontal:

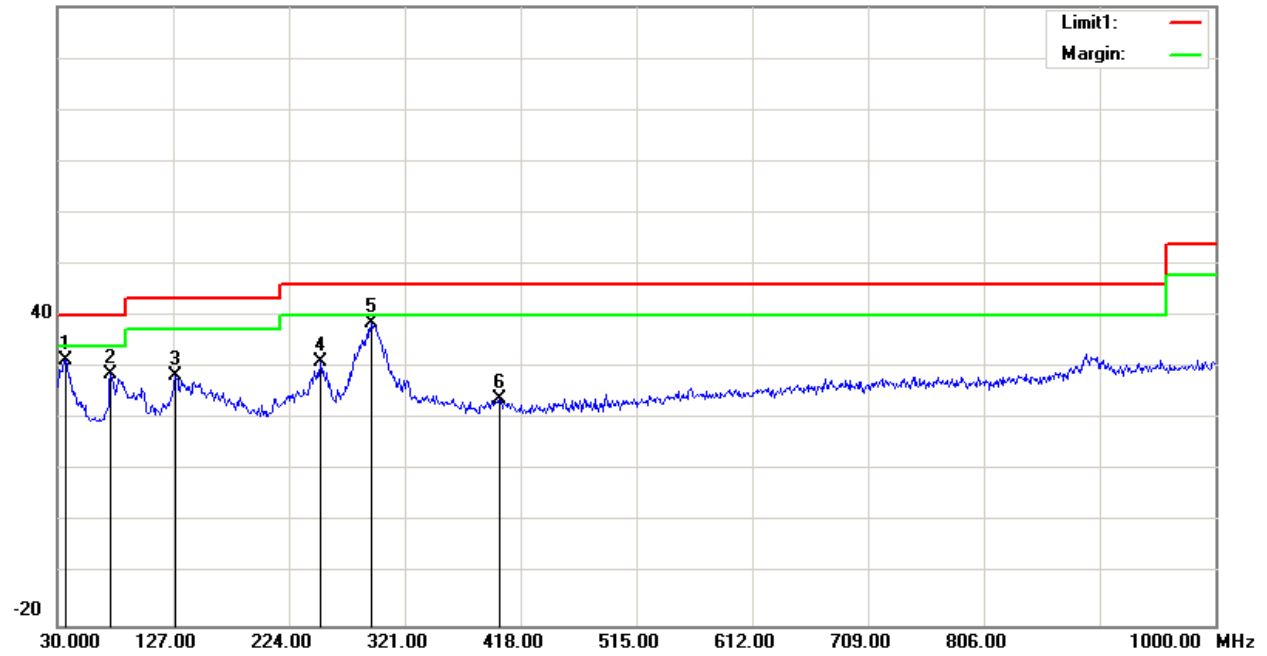
100.0 dBuV/m



Frequency (MHz)	Receiver Reading (dBuV)	Detector	Correction Factor (dB/m)	Cord. Amp. (dBuV/m)	Limit (dBuV/m)	Margin (dB)
40.6700	40.53	peak	-9.67	30.86	40.00	9.14
86.2600	39.28	peak	-15.32	23.96	40.00	16.04
180.3500	36.60	peak	-9.83	26.77	43.50	16.73
250.1900	44.75	peak	-9.73	35.02	46.00	10.98
295.7800	48.20	QP	-7.70	40.50	46.00	5.50
414.1200	28.08	peak	-4.83	23.25	46.00	22.75

Vertical:

100.0 dBuV/m



Frequency (MHz)	Receiver Reading (dBuV)	Detector	Correction Factor (dB/m)	Cord. Amp. (dBuV/m)	Limit (dBuV/m)	Margin (dB)
36.7900	39.10	peak	-7.63	31.47	40.00	8.53
74.6200	44.77	peak	-16.16	28.61	40.00	11.39
128.9400	38.37	peak	-10.02	28.35	43.50	15.15
250.1900	40.87	peak	-9.73	31.14	46.00	14.86
292.8700	46.25	peak	-7.74	38.51	46.00	7.49
400.5400	29.09	peak	-5.23	23.86	46.00	22.14

2) 1-25GHz:

802.11b Mode:

Frequency (MHz)	Receiver		Rx Antenna		Cable loss (dB)	Amplifier Gain (dB)	Corrected Amplitude (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)
	Reading (dB μ V)	Detector	Polar (H/V)	Factor (dB/m)					
Low Channel: 2412 MHz									
2412.00	71.92	PK	H	28.12	2.50	0.00	102.54	N/A	N/A
2412.00	65.86	AV	H	28.12	2.50	0.00	96.48	N/A	N/A
2412.00	79.11	PK	V	28.12	2.50	0.00	109.73	N/A	N/A
2412.00	72.77	AV	V	28.12	2.50	0.00	103.39	N/A	N/A
2390.00	26.74	PK	V	28.08	2.50	0.00	57.32	74.00	16.68
2390.00	14.70	AV	V	28.08	2.50	0.00	45.28	54.00	8.72
4824.00	41.56	PK	V	32.92	3.59	27.41	50.66	74.00	23.34
4824.00	35.64	AV	V	32.92	3.59	27.41	44.74	54.00	9.26
7236.00	36.80	PK	V	35.62	4.67	27.22	49.87	74.00	24.13
7236.00	24.43	AV	V	35.62	4.67	27.22	37.50	54.00	16.50
Middle Channel: 2437 MHz									
2437.00	72.35	PK	H	28.17	2.51	0.00	103.03	N/A	N/A
2437.00	66.59	AV	H	28.17	2.51	0.00	97.27	N/A	N/A
2437.00	79.63	PK	V	28.17	2.51	0.00	110.31	N/A	N/A
2437.00	73.17	AV	V	28.17	2.51	0.00	103.85	N/A	N/A
4874.00	39.13	PK	V	33.00	3.58	27.54	48.17	74.00	25.83
4874.00	32.77	AV	V	33.00	3.58	27.54	41.81	54.00	12.19
7311.00	36.24	PK	V	35.78	4.65	27.28	49.39	74.00	24.61
7311.00	24.05	AV	V	35.78	4.65	27.28	37.20	54.00	16.80
High Channel: 2462 MHz									
2462.00	72.41	PK	H	28.22	2.52	0.00	103.15	N/A	N/A
2462.00	66.39	AV	H	28.22	2.52	0.00	97.13	N/A	N/A
2462.00	79.58	PK	V	28.22	2.52	0.00	110.32	N/A	N/A
2462.00	73.07	AV	V	28.22	2.52	0.00	103.81	N/A	N/A
2483.50	28.00	PK	V	28.27	2.53	0.00	58.80	74.00	15.20
2483.50	16.03	AV	V	28.27	2.53	0.00	46.83	54.00	7.17
4924.00	37.06	PK	V	33.08	3.58	27.51	46.21	74.00	27.79
4924.00	30.25	AV	V	33.08	3.58	27.51	39.40	54.00	14.60
7386.00	36.33	PK	V	35.95	4.62	27.18	49.72	74.00	24.28
7386.00	24.15	AV	V	35.95	4.62	27.18	37.54	54.00	16.46

802.11g Mode:

Frequency (MHz)	Receiver		Rx Antenna		Cable loss (dB)	Amplifier Gain (dB)	Corrected Amplitude (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)
	Reading (dB μ V)	Detector	Polar (H/V)	Factor (dB/m)					
Low Channel: 2412 MHz									
2412.00	64.39	PK	H	28.12	2.50	0.00	95.01	N/A	N/A
2412.00	54.03	AV	H	28.12	2.50	0.00	84.65	N/A	N/A
2412.00	71.97	PK	V	28.12	2.50	0.00	102.59	N/A	N/A
2412.00	62.45	AV	V	28.12	2.50	0.00	93.07	N/A	N/A
2390.00	25.43	PK	V	28.08	2.50	0.00	56.01	74.00	17.99
2390.00	13.50	AV	V	28.08	2.50	0.00	44.08	54.00	9.92
4824.00	37.55	PK	V	32.92	3.59	27.41	46.65	74.00	27.35
4824.00	25.63	AV	V	32.92	3.59	27.41	34.73	54.00	19.27
7236.00	36.41	PK	V	35.62	4.67	27.22	49.48	74.00	24.52
7236.00	24.26	AV	V	35.62	4.67	27.22	37.33	54.00	16.67
Middle Channel: 2437 MHz									
2437.00	64.63	PK	H	28.17	2.51	0.00	95.31	N/A	N/A
2437.00	54.37	AV	H	28.17	2.51	0.00	85.05	N/A	N/A
2437.00	71.88	PK	V	28.17	2.51	0.00	102.56	N/A	N/A
2437.00	62.27	AV	V	28.17	2.51	0.00	92.95	N/A	N/A
4874.00	36.44	PK	V	33.00	3.58	27.54	45.48	74.00	28.52
4874.00	24.59	AV	V	33.00	3.58	27.54	33.63	54.00	20.37
7311.00	36.32	PK	V	35.78	4.65	27.28	49.47	74.00	24.53
7311.00	24.05	AV	V	35.78	4.65	27.28	37.20	54.00	16.80
High Channel: 2462 MHz									
2462.00	64.52	PK	H	28.22	2.52	0.00	95.26	N/A	N/A
2462.00	54.16	AV	H	28.22	2.52	0.00	84.90	N/A	N/A
2462.00	71.33	PK	V	28.22	2.52	0.00	102.07	N/A	N/A
2462.00	61.71	AV	V	28.22	2.52	0.00	92.45	N/A	N/A
2483.50	26.28	PK	V	28.27	2.53	0.00	57.08	74.00	16.92
2483.50	14.20	AV	V	28.27	2.53	0.00	45.00	54.00	9.00
4924.00	36.27	PK	V	33.08	3.58	27.51	45.42	74.00	28.58
4924.00	24.35	AV	V	33.08	3.58	27.51	33.50	54.00	20.50
7386.00	36.41	PK	V	35.95	4.62	27.18	49.80	74.00	24.20
7386.00	26.19	AV	V	35.95	4.62	27.18	39.58	54.00	14.42

802.11n ht20 Mode:

Frequency (MHz)	Receiver		Rx Antenna		Cable loss (dB)	Amplifier Gain (dB)	Corrected Amplitude (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)
	Reading (dB μ V)	Detector	Polar (H/V)	Factor (dB/m)					
Low Channel: 2412 MHz									
2412.00	63.56	PK	H	28.12	2.50	0.00	94.18	N/A	N/A
2412.00	54.73	AV	H	28.12	2.50	0.00	85.35	N/A	N/A
2412.00	70.32	PK	V	28.12	2.50	0.00	100.94	N/A	N/A
2412.00	61.48	AV	V	28.12	2.50	0.00	92.10	N/A	N/A
2390.00	25.16	PK	V	28.08	2.50	0.00	55.74	74.00	18.26
2390.00	13.70	AV	V	28.08	2.50	0.00	44.28	54.00	9.72
4824.00	35.64	PK	V	32.92	3.59	27.41	44.74	74.00	29.26
4824.00	23.42	AV	V	32.92	3.59	27.41	32.52	54.00	21.48
7236.00	36.35	PK	V	35.62	4.67	27.22	49.42	74.00	24.58
7236.00	24.13	AV	V	35.62	4.67	27.22	37.20	54.00	16.80
Middle Channel: 2437 MHz									
2437.00	63.45	PK	H	28.17	2.51	0.00	94.13	N/A	N/A
2437.00	54.51	AV	H	28.17	2.51	0.00	85.19	N/A	N/A
2437.00	70.36	PK	V	28.17	2.51	0.00	101.04	N/A	N/A
2437.00	61.33	AV	V	28.17	2.51	0.00	92.01	N/A	N/A
4874.00	35.57	PK	V	33.00	3.58	27.54	44.61	74.00	29.39
4874.00	23.31	AV	V	33.00	3.58	27.54	32.35	54.00	21.65
7311.00	36.53	PK	V	35.78	4.65	27.28	49.68	74.00	24.32
7311.00	24.26	AV	V	35.78	4.65	27.28	37.41	54.00	16.59
High Channel: 2462 MHz									
2462.00	62.69	PK	H	28.22	2.52	0.00	93.43	N/A	N/A
2462.00	52.73	AV	H	28.22	2.52	0.00	83.47	N/A	N/A
2462.00	69.78	PK	V	28.22	2.52	0.00	100.52	N/A	N/A
2462.00	60.67	AV	V	28.22	2.52	0.00	91.41	N/A	N/A
2483.50	26.88	PK	V	28.27	2.53	0.00	57.68	74.00	16.32
2483.50	14.43	AV	V	28.27	2.53	0.00	45.23	54.00	8.77
4924.00	35.36	PK	V	33.08	3.58	27.51	44.51	74.00	29.49
4924.00	23.28	AV	V	33.08	3.58	27.51	32.43	54.00	21.57
7386.00	36.48	PK	V	35.95	4.62	27.18	49.87	74.00	24.13
7386.00	24.33	AV	V	35.95	4.62	27.18	37.72	54.00	16.28

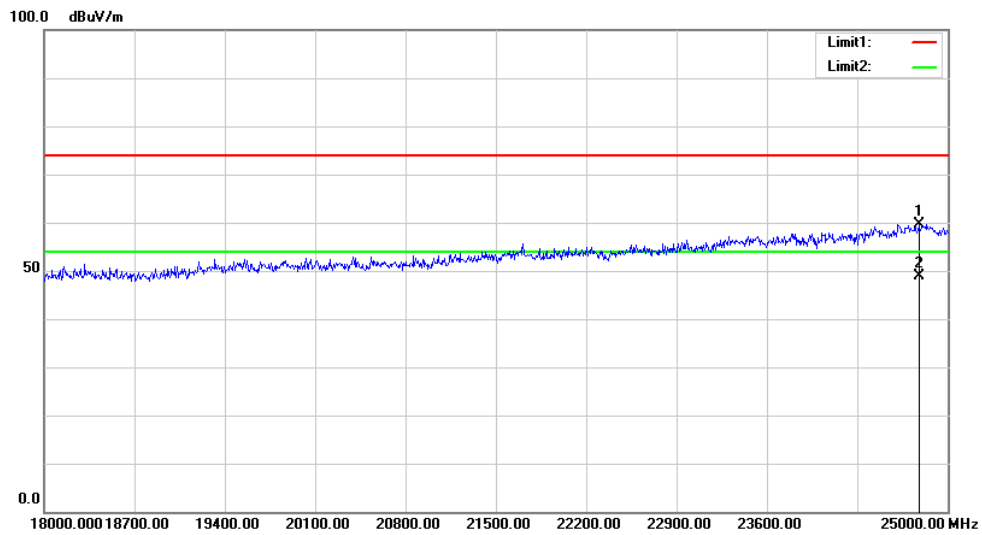
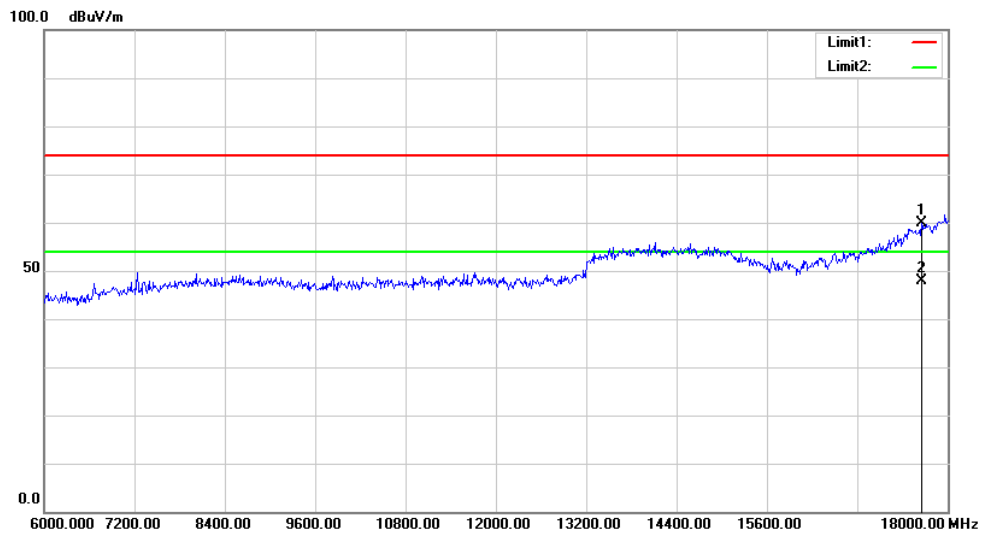
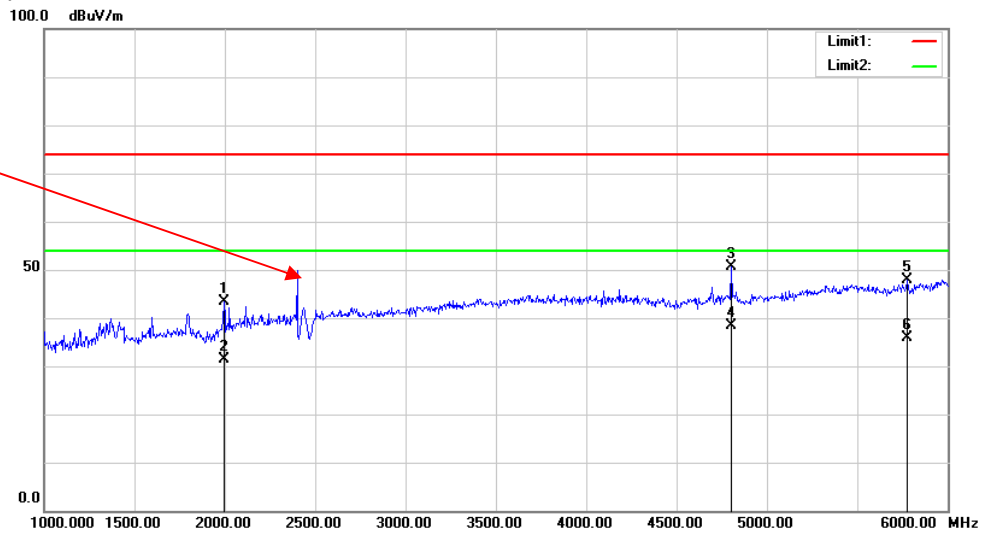
BLE:

Frequency (MHz)	Receiver		Rx Antenna		Cable loss (dB)	Amplifier Gain (dB)	Corrected Amplitude (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)
	Reading (dB μ V)	Detector	Polar (H/V)	Factor (dB/m)					
Low Channel: 2402 MHz									
2402.00	66.99	PK	H	28.10	2.50	0.00	97.59	N/A	N/A
2402.00	65.91	AV	H	28.10	2.50	0.00	96.51	N/A	N/A
2402.00	73.24	PK	V	28.10	2.50	0.00	103.84	N/A	N/A
2402.00	73.12	AV	V	28.10	2.50	0.00	103.72	N/A	N/A
2390.00	25.45	PK	V	28.08	2.50	0.00	56.03	74.00	17.97
2390.00	13.24	AV	V	28.08	2.50	0.00	43.82	54.00	10.18
4804.00	44.66	PK	V	32.89	3.59	27.36	53.78	74.00	20.22
4804.00	39.98	AV	V	32.89	3.59	27.36	49.10	54.00	4.90
7206.00	35.65	PK	V	35.55	4.68	27.19	48.69	74.00	25.31
7206.00	22.88	AV	V	35.55	4.68	27.19	35.92	54.00	18.08
Middle Channel: 2440 MHz									
2440.00	67.21	PK	H	28.18	2.51	0.00	97.90	N/A	N/A
2440.00	67.06	AV	H	28.18	2.51	0.00	97.75	N/A	N/A
2440.00	73.58	PK	V	28.18	2.51	0.00	104.27	N/A	N/A
2440.00	73.53	AV	V	28.18	2.51	0.00	104.22	N/A	N/A
4880.00	39.45	PK	V	33.01	3.58	27.55	48.49	74.00	25.51
4880.00	31.80	AV	V	33.01	3.58	27.55	40.84	54.00	13.16
7320.00	35.17	PK	V	35.80	4.64	27.26	48.35	74.00	25.65
7320.00	22.72	AV	V	35.80	4.64	27.26	35.90	54.00	18.10
High Channel: 2480 MHz									
2480.00	68.73	PK	H	28.26	2.52	0.00	99.51	N/A	N/A
2480.00	68.72	AV	H	28.26	2.52	0.00	99.50	N/A	N/A
2480.00	74.82	PK	V	28.26	2.52	0.00	105.60	N/A	N/A
2480.00	73.56	AV	V	28.26	2.52	0.00	104.34	N/A	N/A
2483.50	30.55	PK	V	28.27	2.53	0.00	61.35	74.00	12.65
2483.50	19.05	AV	V	28.27	2.53	0.00	49.85	54.00	4.15
4960.00	39.42	PK	V	33.14	3.59	27.37	48.78	74.00	25.22
4960.00	29.47	AV	V	33.14	3.59	27.37	38.83	54.00	15.17
7440.00	35.23	PK	V	36.07	4.61	27.22	48.69	74.00	25.31
7440.00	22.42	AV	V	36.07	4.61	27.22	35.88	54.00	18.12

Test plots(BLE Low channel was the worst)

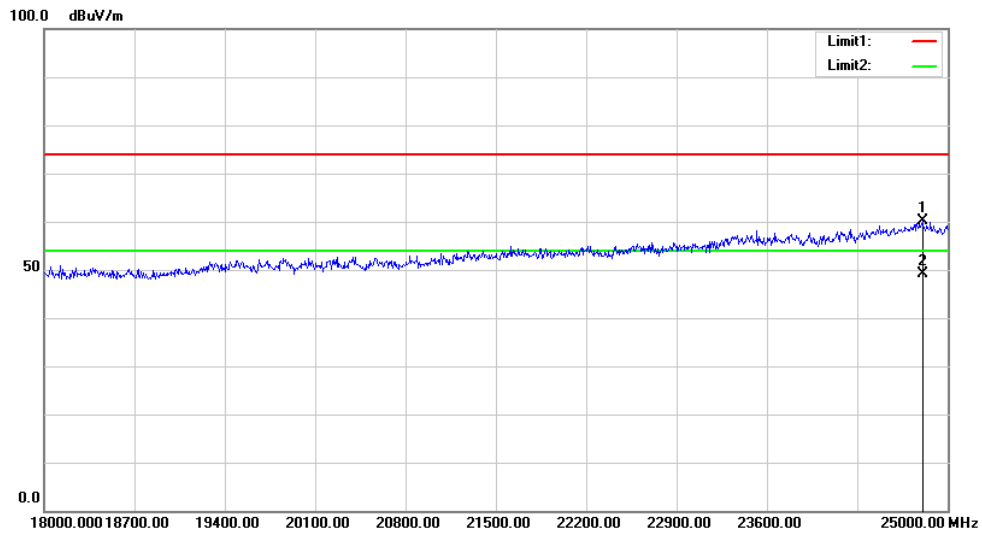
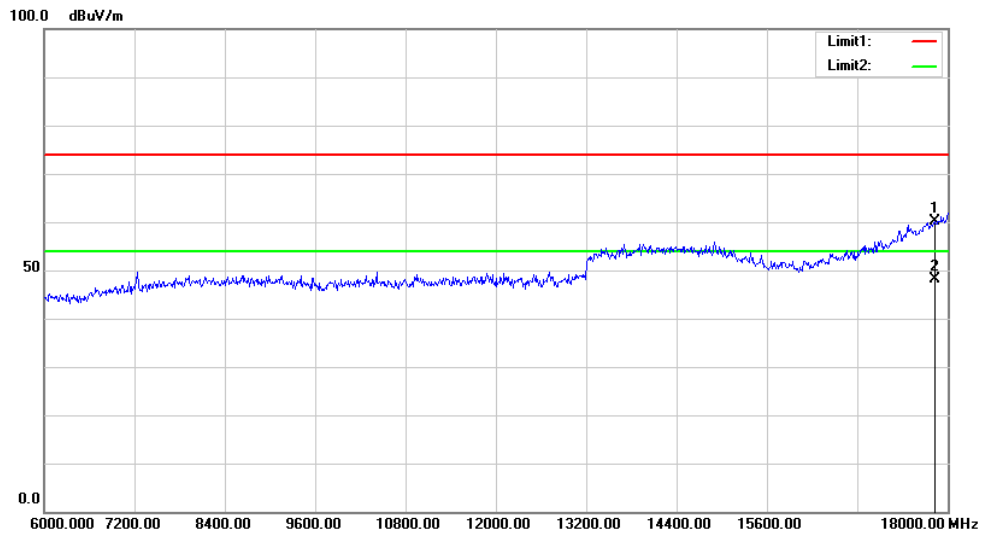
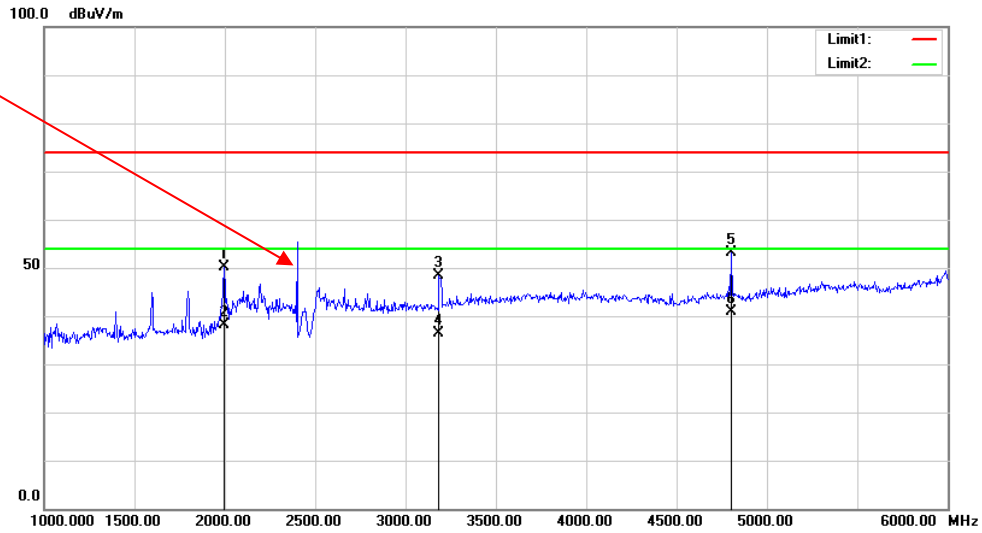
Horizontal:

Fundamental
Test with Band
Rejection Filter



Vertical:

Fundamental
Test with Band
Rejection Filter



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