TESTING LABORATORY
CERTIFICATE #4820.01

FCC PART 15.249

TEST REPORT

For

Shenzhen Qianhai Patuoxun Network&Technology co.,ltd

Wuhe RD 49#, Bantian District B-202 6th Building Shenzhen,Guangdong China

FCC ID: 2AOXY-PC189A

Report Type:	**Product Name:**
Original Report	Wireless Presenter

Report Number:	RDG190801004-00A
Report Date:	2019-09-04
Reviewed By:	Jerry Zhang EMC Manager
Test Laboratory:	Bay Area Compliance Laboratories Corp. (Dongguan) No.69 Pulongcun, Puxinhu Industry Area, Tangxia, 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:	Wireless Presenter
EUT Model:	PC189A
Operation Frequency:	2407-2463MHz
Modulation Type:	GFSK
Rated Input Voltage:	1.5Vdc from Battery
External Dimension:	139mm(L) * 18mm(W) * 15mm(H)
Serial Number:	190801004
EUT Received Date:	2019-08-01

Objective

This type approval report is prepared on behalf of ***Shenzhen Qianhai Patuoxun Network&Technology co.,ltd*** in accordance with Part 2-Subpart J, and Part 15-Subparts A and C of the Federal Communication Commissions rules.

The tests were performed in order to determine compliance with FCC Rules Part 15, Subpart C, and section 15.203, 15.205, 15.209 and 15.249 rules.

Related Submittal(s)/Grant(s)

No related submittal.

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.

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

Measurement Uncertainty

Parameter	Measurement Uncertainty
Occupied Channel Bandwidth	±5 %
Unwanted Emissions, radiated	30M~200MHz: 4.58 dB for Horizontal, 4.59 dB for Vertical 200M~1GHz: 4.83 dB for Horizontal, 5.85 dB for Vertical 1G~6GHz: 4.45 dB, 6G~26.5GHz: 5.23 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.69 Pulongcun, Puxinhu Industry Area, Tangxia, 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.

SYSTEM TEST CONFIGURATION

Justification

The EUT was configured in operating mode for testing which was provided by the manufacturer.

The device employs total 3channels as below:

Channel	Frequency (MHz)	Channel	Frequency (MHz)
1	2407	3	2463
2	2433	/	/

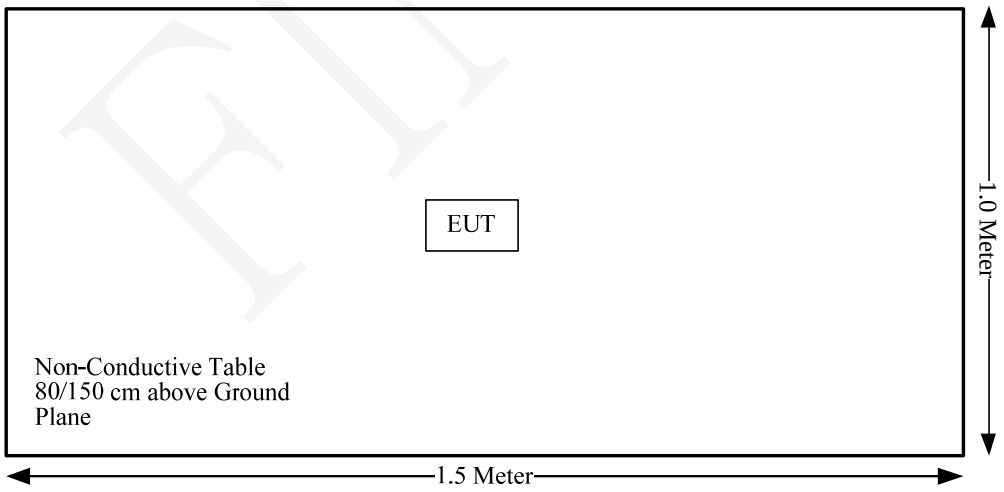
EUT Exercise Software

No software was used in test.

Equipment Modifications

No modifications were made to the EUT.

Block Diagram of Test Setup



SUMMARY OF TEST RESULTS

FCC Rules	Description of Test	Result
§15.203	Antenna Requirement	Compliance
§15.207(a)	Conduction Emissions	Not Applicable
15.205, §15.209, §15.249	Radiated Emissions	Compliance
§15.215 (c)	20 dB Bandwidth	Compliance

Note: the device was powered by battery.

FCC§15.203 - ANTENNA REQUIREMENT

Applicable Standard

For intentional device, 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.

Antenna Connector Construction

The EUT has one internal antenna arrangement, and the antenna gain is 0 dBi, fulfill the requirement of this section. Please refer to the EUT photos.

Result: Compliant.

FCC§15.205, §15.209&§15.249- RADIATED EMISSIONS

Applicable Standard

As per FCC§15.249 (a), except as provided in paragraph (b) of this section, the field strength of emissions from intentional radiators operated within these frequency bands shall comply with the following:

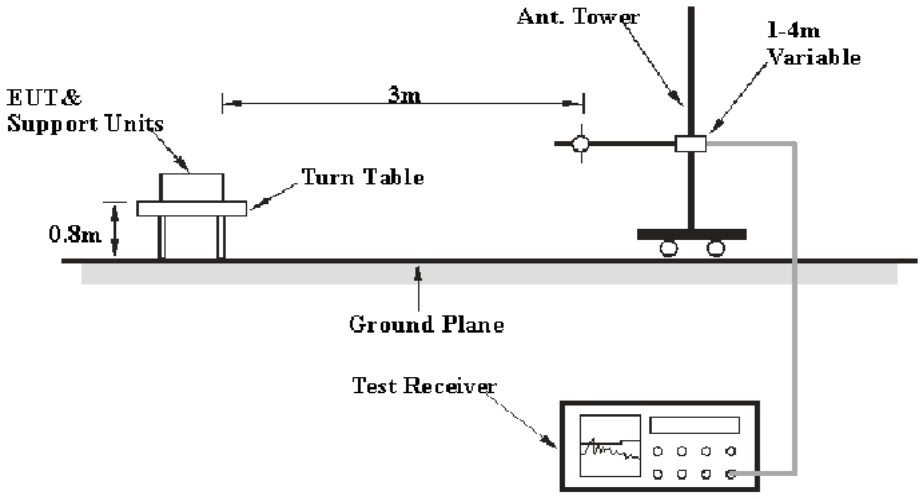
Fundamental frequency	Field strength of fundamental (millivolts/meter)	Field strength of harmonics (microvolts/meter)
902–928 MHz	50	500
2400–2483.5 MHz	50	500
5725–5875 MHz	50	500
24.0–24.25 GHz	250	2500

As per FCC§15.249 (c), Field strength limits are specified at a distance of 3 meters.

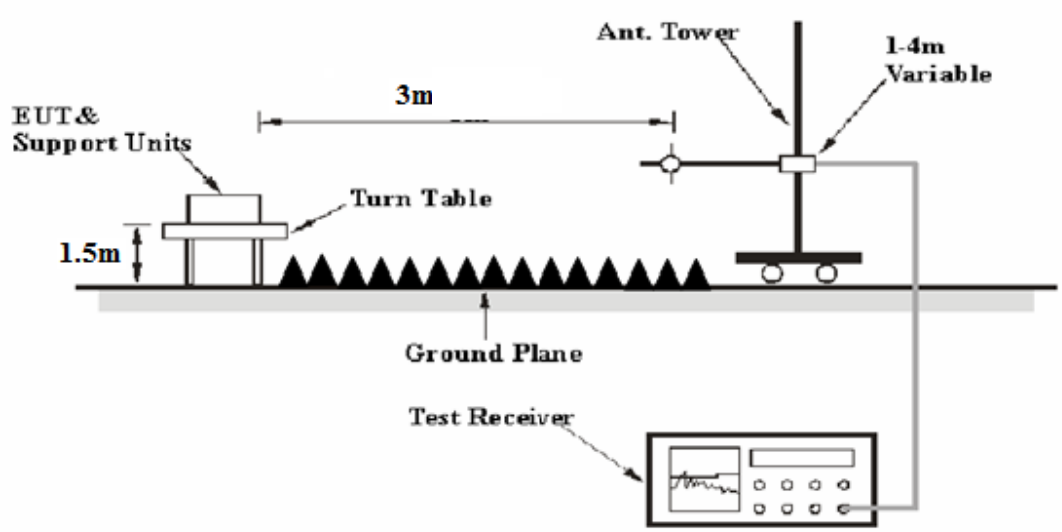
(d) Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50 dB below the level of the fundamental or to the general radiated emission limits in §15.209, whichever is the lesser attenuation.

EUT Setup

Below 1 GHz:



Above 1 GHz:



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 15.249 limits.

Test Equipment 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:

Frequency Range	RBW	Video B/W	IF B/W	Measurement
30 MHz – 1000 MHz	120 kHz	300 kHz	120 kHz	QP
Above 1 GHz	1MHz	3 MHz	/	PK
	1MHz	10 Hz	/	AV

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.

All data was recorded in the Quasi-peak detection mode from 30 MHz to 1GHz, peak and average detection mode 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
R&S	EMI Test Receiver	ESR3	102453	2019-06-26	2020-06-26
Farad	Test Software	EZ-EMC	V1.1.4.2	N/A	N/A
Sunol Sciences	Antenna	JB3	A060611-2	2017-08-25	2020-08-25
Unknown	Coaxial Cable	C-NJNJ-50	C-1000-01	2018-09-05	2019-09-05
Unknown	Coaxial Cable	C-NJNJ-50	C-0400-02	2018-09-05	2019-09-05
Unknown	Coaxial Cable	C-NJNJ-50	C-0530-01	2018-09-24	2019-09-24
HP	Amplifier	8447F	2443A01912	2018-09-05	2019-09-05
Agilent	Spectrum Analyzer	E4440A	SG43360054	2019-05-09	2020-05-09
ETS-Lindgren	Horn Antenna	3115	000 527 35	2018-10-12	2021-10-12
Ducommun Technolagies	Horn Antenna	ARH-4223-02	1007726-01 1304	2016-11-18	2019-11-18
Unknown	Coaxial Cable	C-SJSJ-50	C-0800-01	2018-09-05	2019-09-05
MITEQ	Amplifier	AFS42-00101800-25-S-42	2001271	2018-09-05	2019-09-05
Quinstar	Amplifier	QLW-18405536-JO	15964001001	2019-06-27	2020-06-27
E-Microwave	Band-stop Filters	OBSF-2400-2483.5-S	OE01601525	2019-06-16	2020-06-16
Micro-tronics	High Pass Filter	HPM50111	S/N-G217	2019-06-16	2020-06-16

*** 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

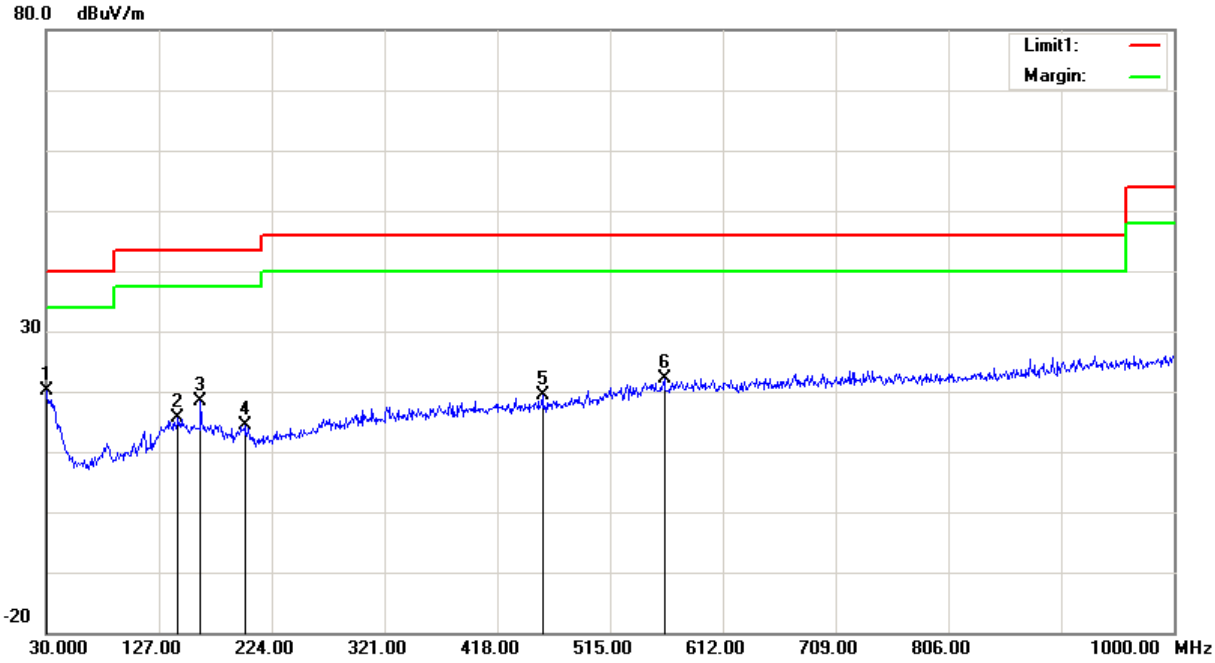
Environmental Conditions

Test Items	Radiation Below 1GHz	Radiation Above 1GHz
Temperature:	25.9°C	27.5°C
Relative Humidity:	62%	60%
ATM Pressure:	100.6 kPa	100.8 kPa
Tester:	Jackson Zhang	Lucy Lu
Test Date:	2019-08-27	2019-08-28

Test Mode: Transmitting

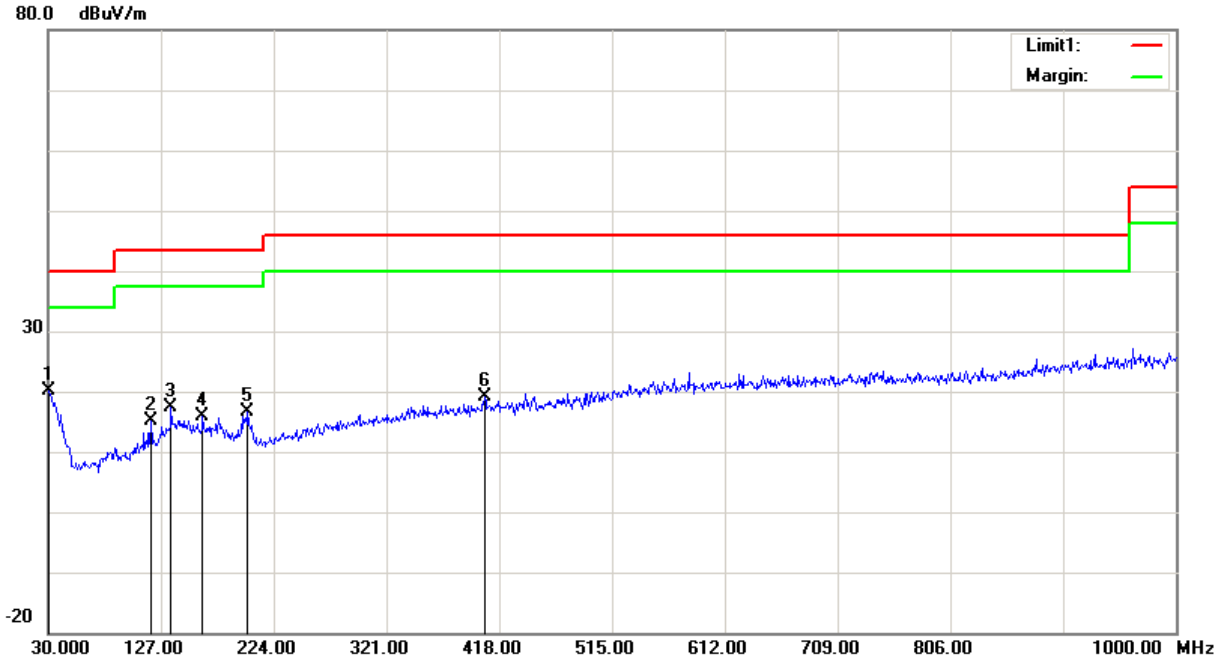
1) 30MHz-1GHz*(Low channel is the worst)***:**

Horizontal:



Frequency (MHz)	Receiver Reading (dBuV)	Detector	Correction Factor (dB/m)	Cord. Amp. (dBuV/m)	Limit (dBuV/m)	Margin (dB)
30.0000	28.17	peak	-7.95	20.22	40.00	19.78
143.4900	28.45	peak	-12.72	15.73	43.50	27.77
162.8900	31.38	peak	-12.88	18.50	43.50	25.00
200.7200	27.19	peak	-12.90	14.29	43.50	29.21
456.8000	26.65	peak	-7.25	19.40	46.00	26.60
561.5600	26.06	peak	-3.84	22.22	46.00	23.78

Vertical:



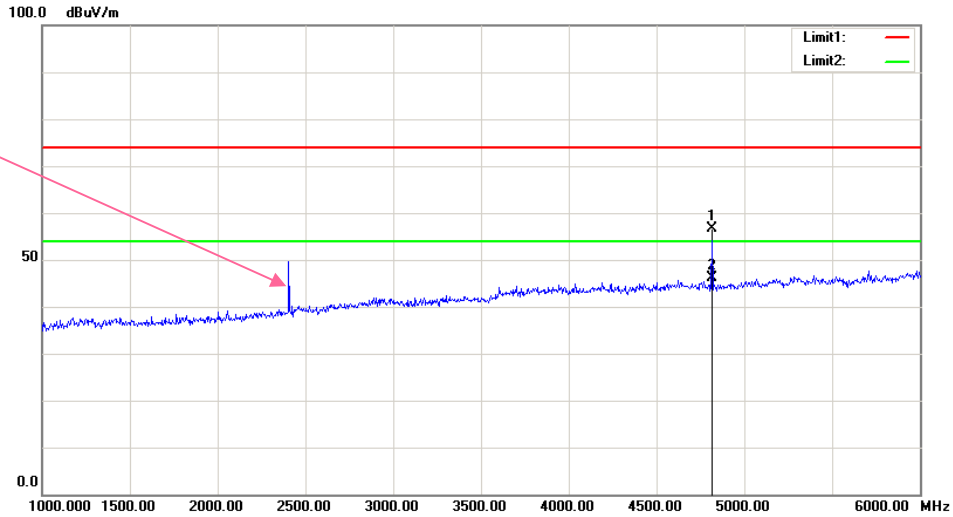
Frequency (MHz)	Receiver Reading (dBuV)	Detector	Correction Factor (dB/m)	Cord. Amp. (dBuV/m)	Limit (dBuV/m)	Margin (dB)
30.9700	28.65	peak	-8.40	20.25	40.00	19.75
118.2700	31.41	peak	-16.29	15.12	43.50	28.38
135.7300	30.36	peak	-13.01	17.35	43.50	26.15
162.8900	28.75	peak	-12.88	15.87	43.50	27.63
201.6900	29.71	peak	-13.08	16.63	43.50	26.87
405.3900	27.33	peak	-8.08	19.25	46.00	26.75

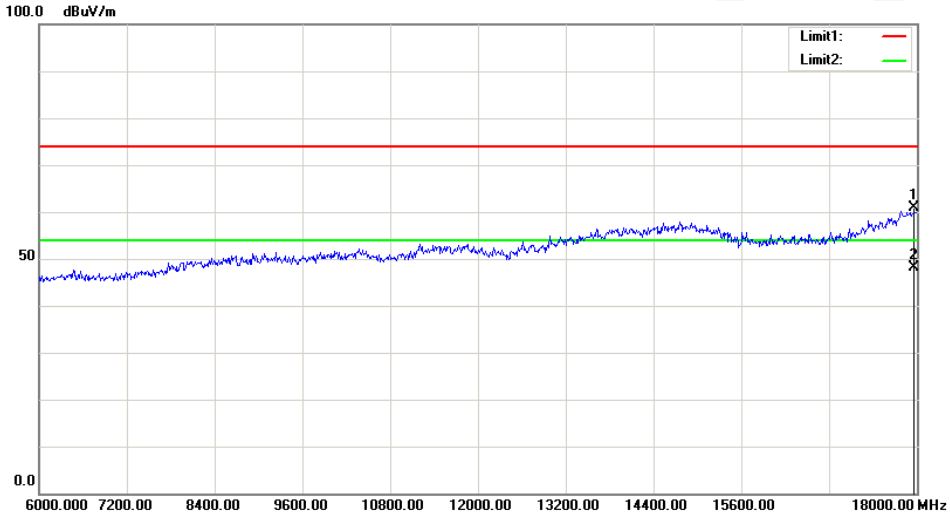
2) 1GHz-25GHz

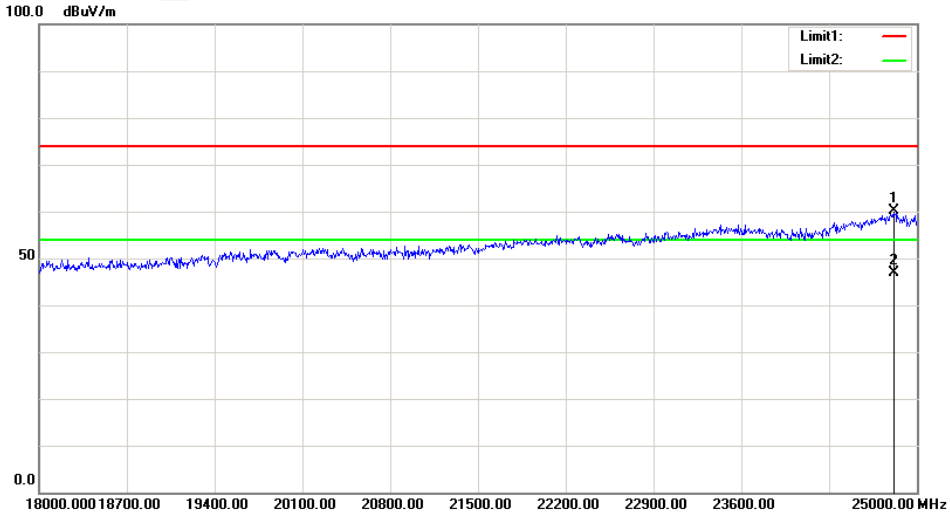
Frequency (MHz)	Receiver		Rx Antenna		Cable loss (dB)	Amplifier Gain (dB)	Corrected Amplitude (dBμV/m)	Limit (dBμV/m)	Margin (dB)
	Reading (dBμV)	Detector	Polar (H/V)	Factor (dB/m)					
Low Channel: 2407 MHz									
2407.00	49.05	PK	H	28.11	1.80	0.00	78.96	113.98	35.02
2407.00	31.34	AV	H	28.11	1.80	0.00	61.25	93.98	32.73
2407.00	59.21	PK	V	28.11	1.80	0.00	89.12	113.98	24.86
2407.00	38.12	AV	V	28.11	1.80	0.00	68.03	93.98	25.95
2400.00	31.65	PK	V	28.10	1.80	0.00	61.55	74.00	12.45
2400.00	12.95	AV	V	28.10	1.80	0.00	42.85	54.00	11.15
4814.00	63.25	PK	V	32.93	3.18	37.20	62.16	74.00	11.84
4814.00	42.38	AV	V	32.93	3.18	37.20	41.29	54.00	12.71
7221.00	45.92	PK	V	35.77	4.80	37.25	49.24	74.00	24.76
7221.00	32.65	AV	V	35.77	4.80	37.25	35.97	54.00	18.04
Middle Channel: 2433 MHz									
2433.00	48.54	PK	H	28.17	1.82	0.00	78.53	113.98	35.45
2433.00	31.04	AV	H	28.17	1.82	0.00	61.03	93.98	32.95
2433.00	58.77	PK	V	28.17	1.82	0.00	88.76	113.98	25.22
2433.00	37.28	AV	V	28.17	1.82	0.00	67.27	93.98	26.71
4866.00	61.37	PK	V	33.03	3.25	37.21	60.44	74.00	13.56
4866.00	41.39	AV	V	33.03	3.25	37.21	40.46	54.00	13.54
7299.00	46.35	PK	V	35.98	4.66	37.35	49.64	74.00	24.36
7299.00	32.54	AV	V	35.98	4.66	37.35	35.83	54.00	18.17
High Channel: 2463 MHz									
2463.00	46.41	PK	H	28.23	1.83	0.00	76.47	113.98	37.51
2463.00	29.09	AV	H	28.23	1.83	0.00	59.15	93.98	34.83
2463.00	57.56	PK	V	28.23	1.83	0.00	87.62	113.98	26.36
2463.00	36.50	AV	V	28.23	1.83	0.00	66.56	93.98	27.42
2483.50	25.62	PK	V	28.27	1.84	0.00	55.73	74.00	18.27
2483.50	13.49	AV	V	28.27	1.84	0.00	43.60	54.00	10.40
4926.00	62.68	PK	V	33.15	3.27	37.23	61.87	74.00	12.13
4926.00	42.73	AV	V	33.15	3.27	37.23	41.92	54.00	12.08
7389.00	45.51	PK	V	36.21	4.50	37.46	48.76	74.00	25.24
7389.00	32.15	AV	V	36.21	4.50	37.46	35.40	54.00	18.60

Worst mode Test plots(Low channel)
Horizontal

Fundamental test with Filter

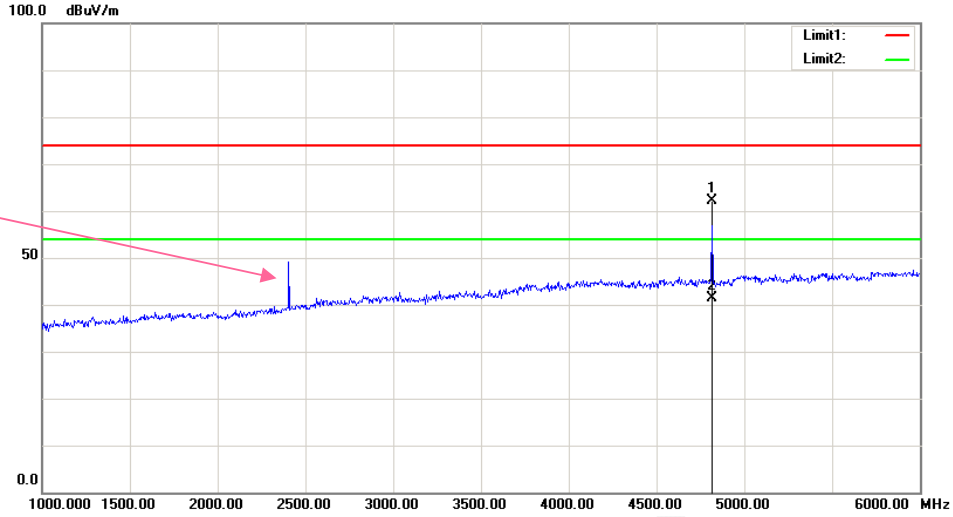


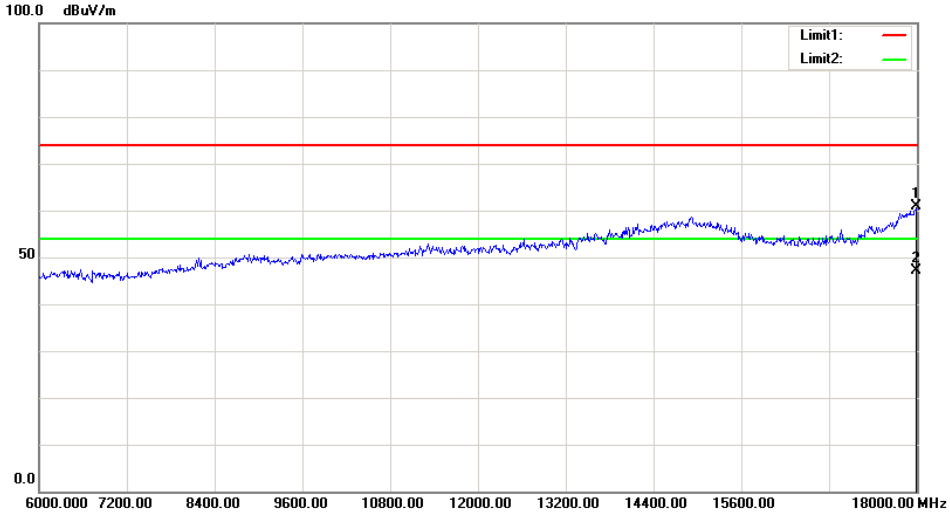


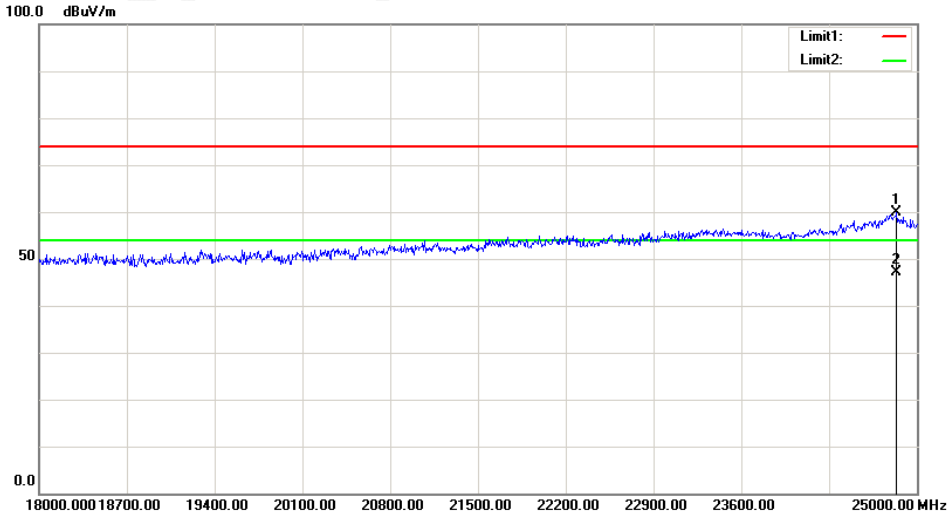


Vertical

Fundamental test with Filter







FCC §15.215(c) – 20 dB BANDWIDTH TESTING

Applicable Standard

Intentional radiators operating under the alternative provisions to the general emission limits, as contained in §§ 15.217 through 15.257 and in Subpart E of this part, must be designed to ensure that the 20 dB bandwidth of the emission, or whatever bandwidth may otherwise be specified in the specific rule section under which the equipment operates, is contained within the frequency band designated in the rule section under which the equipment is operated.

Test Procedure

1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
2. Measure the frequency difference of two frequencies that were attenuated 20 dB from the reference level. Record the frequency difference as the emission bandwidth.
3. Repeat above procedures until all frequencies measured were complete.

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
R&S	Spectrum Analyzer	FSV40	101474	2019-01-09	2020-01-09
Unknown	Coaxial Cable	C-SJ00-0010	C0010/01	Each time	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:	28°C
Relative Humidity:	62%
ATM Pressure:	100.2 kPa
Tester:	Lucy Lu
Test Date:	2019-09-03

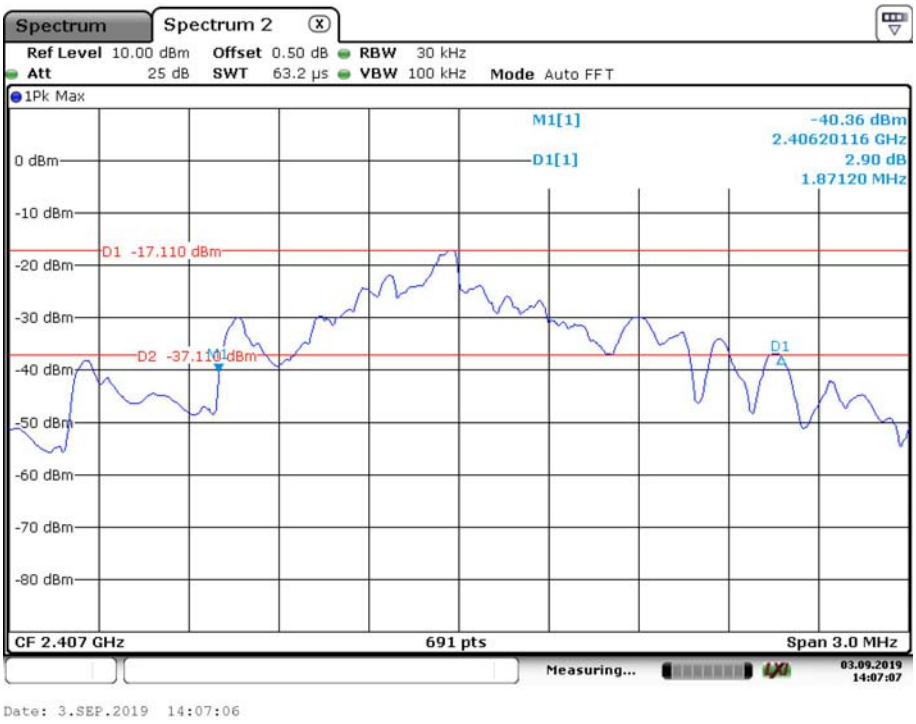
Test Result: Compliant.

Please refer to following tables and plots

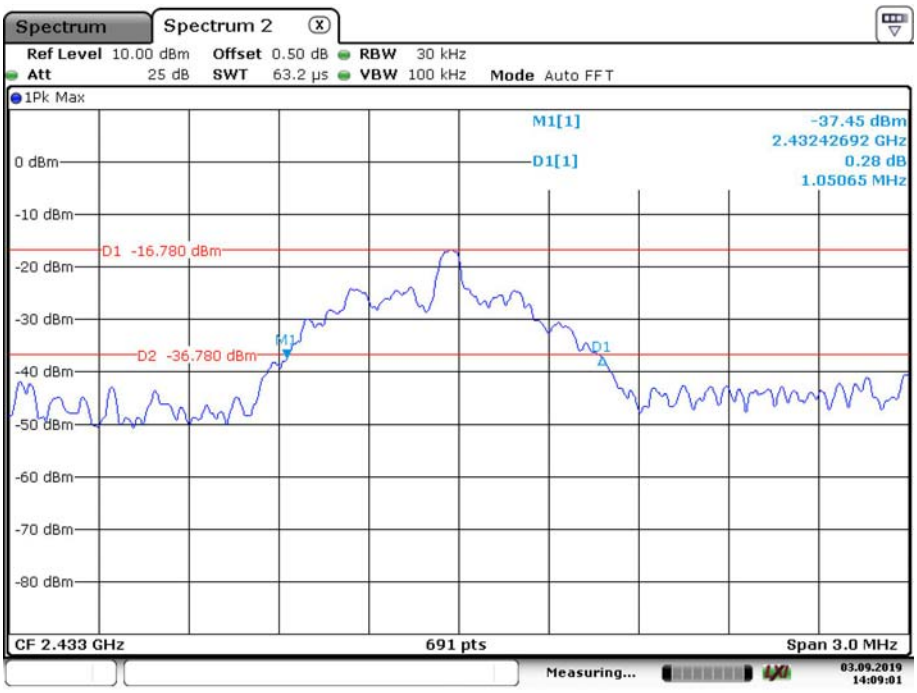
Test Mode: Transmitting

Channel	Frequency (MHz)	20 dB Bandwidth (MHz)
Low	2407	1.871
Middle	2433	1.051
High	2463	1.615

Low Channel



Middle Channel



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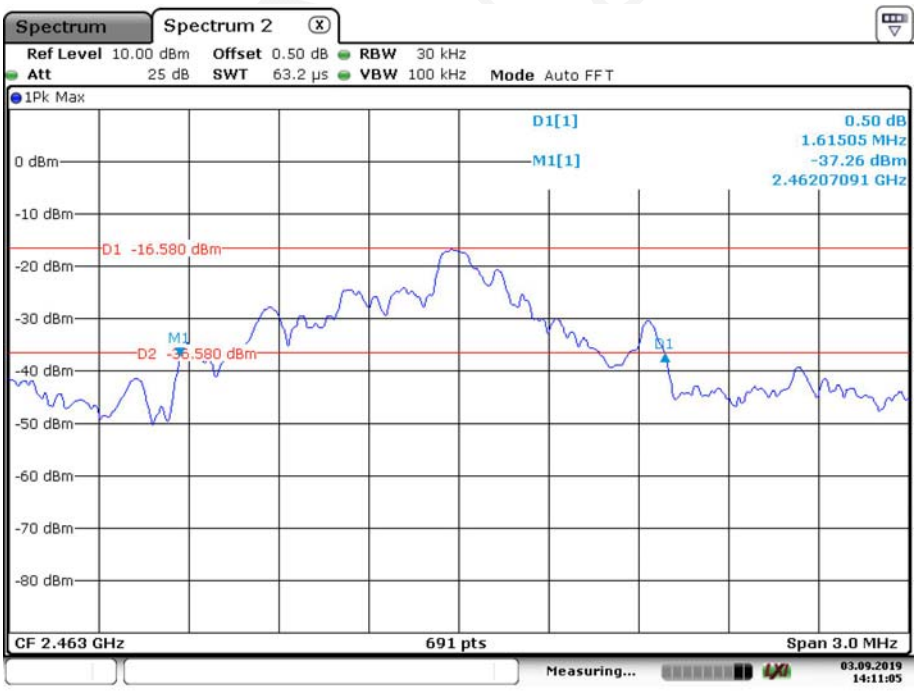
High Channel



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