

FCC PART 15.249

TEST REPORT

For

GODOX PHOTO EQUIPMENT CO.LTD

19th Floor, Room 1902, Building Jinshan, 5033 Shennan East Road, Luohu District, Shenzhen
518001, China

FCC ID: 2ABYNV850II

Report Type: Original Report		Product Type: Wireless Power-Control Flash Trigger	
Report Number:	RDG160822009-00		
Report Date:	2016-09-09		
Reviewed By:	Allen Qiao RF Engineer	<i>Allen Qiao</i>	
Approved By:	Sula Huang RF Leader	<i>Sula Huang</i>	
Test Laboratory:	Bay Area Compliance Laboratories Corp. (Dongguan) No.69 Pulongcun, Puxinhu Industrial Zone, Tangxia, Dongguan, Guangdong, China Tel: +86-769-86858888 Fax: +86-769-86858891 www.baclcorp.com.cn		

Note: This test report is prepared for the customer shown above and for the device described herein. It may not be duplicated or used in part without prior written consent from Bay Area Compliance Laboratories Corp.(Dongguan). This report may contain data or test methods that are not covered by the NVLAP accreditation scope and shall be marked with an asterisk "*" and noted.

TABLE OF CONTENTS

GENERAL INFORMATION.....	3
PRODUCT DESCRIPTION FOR EQUIPMENT UNDER TEST (EUT)	3
OBJECTIVE	3
RELATED SUBMITTAL(S)/GRANT(S).....	3
TEST METHODOLOGY	3
TEST FACILITY	3
SYSTEM TEST CONFIGURATION.....	4
JUSTIFICATION	4
EUT EXERCISE SOFTWARE	4
EQUIPMENT MODIFICATIONS	4
SUPPORT EQUIPMENT LIST AND DETAILS	5
BLOCK DIAGRAM OF TEST SETUP	5
SUMMARY OF TEST RESULTS	6
FCC§15.203 - ANTENNA REQUIREMENT.....	7
APPLICABLE STANDARD	7
ANTENNA CONNECTOR CONSTRUCTION	7
FCC§15.205, §15.209&§15.249- RADIATED EMISSIONS	8
APPLICABLE STANDARD	8
MEASUREMENT UNCERTAINTY.....	8
EUT SETUP.....	9
TEST EQUIPMENT SETUP	9
TEST PROCEDURE	10
CORRECTED AMPLITUDE & MARGIN CALCULATION	10
TEST EQUIPMENT LIST AND DETAILS.....	10
TEST RESULTS SUMMARY	11
TEST DATA	11
FCC §15.215(C) – 20 DB BANDWIDTH TESTING.....	15
APPLICABLE STANDARD	15
TEST PROCEDURE	15
TEST EQUIPMENT LIST AND DETAILS.....	15
TEST DATA	15

GENERAL INFORMATION

Product Description for Equipment under Test (EUT)

The *GODOX PHOTO EQUIPMENT CO.LTD*'s product, model number: *V850II (FCC ID: 2ABYNV850II)* (the "EUT") in this report was a *Wireless Power-Control Flash Trigger*, which was measured approximately: 18.8 cm (L) x 7.3 cm (W) x 5.5 cm (H), rated input voltage: DC 11.1V from battery .

All measurement and test data in this report was gathered from production sample serial number: 160822009 (Assigned byBACL, Dongguan). The EUT was received on 2016-08-24.

Objective

This type approval report is prepared on behalf of *GODOX PHOTO EQUIPMENT CO.LTD.* in accordance with Part 2-Subpart J, and Part 15-Subparts A, B and C of the Federal Communication Commissions rules.

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

Related Submittal(s)/Grant(s)

No related submittal(s)/grant(s).

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).

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 Industrial Zone, Tangxia, Dongguan, Guangdong, China

Test site at Bay Area Compliance Laboratories Corp. (Dongguan) has been fully described in reports submitted to the Federal Communication Commission (FCC). The details of these reports have been found to be in compliance with the requirements of Section 2.948 of the FCC Rules on February 06, 2015.

The Federal Communications Commission has the reports on file and is listed under FCC Registration No.: 273710. The test site has been approved by the FCC for public use and is listed in the FCC Public Access Link (PAL) database.

SYSTEM TEST CONFIGURATION

Justification

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

The Engineering mode was switched channel by keys.

The device employed 32 operation Channels, as below table:

Channel Number	Frequency (MHz)	Channel Number	Frequency (MHz)
1	2413.0	17	2439.5
2	2414.5	18	2441.0
3	2416.0	19	2443.0
4	2418.0	20	2444.5
5	2419.5	21	2446.0
6	2421.0	22	2448.0
7	2423.0	23	2449.5
8	2424.5	24	2451.0
9	2426.0	25	2453.0
10	2428.0	26	2454.5
11	2429.5	27	2456.0
12	2431.0	28	2458.0
13	2433.0	29	2459.5
14	2434.5	30	2461.0
15	2436.0	31	2463.0
16	2438.0	32	2464.5

And channel 1, 16, 32 was chose for testing.

EUT Exercise Software

No software was used during testing.

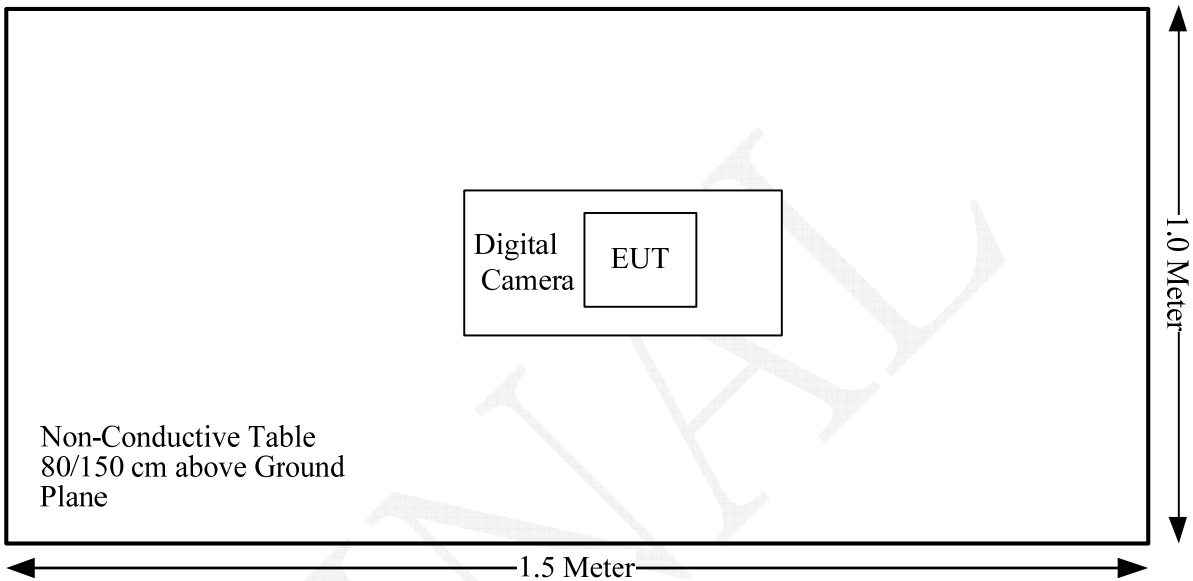
Equipment Modifications

No modifications were made to the EUT.

Support Equipment List and Details

Manufacturer	Description	Model	Serial Number
Canon	Digital Camera	DS126131	N/A

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: It is battery operated equipment.

Test Time: 2016-09-06 ~2016-09-07

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 an internal antenna, the antenna gain is 0dBi, fulfill the requirement of this section. Please refer to the EUT photos.

Result: Compliant.

FINAL

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.

Measurement Uncertainty

Compliance or non-compliance with a disturbance limit shall be determined in the following manner:

If U_{lab} is less than or equal to U_{cispr} of Table 1, then:

- compliance is deemed to occur if no measured disturbance level exceeds the disturbance limit;
- non-compliance is deemed to occur if any measured disturbance level exceeds the disturbance limit.

If U_{lab} is greater than U_{cispr} of Table 1, then:

- compliance is deemed to occur if no measured disturbance level, increased by $(U_{lab} - U_{cispr})$, exceeds the disturbance limit;
- non-compliance is deemed to occur if any measured disturbance level, increased by $(U_{lab} - U_{cispr})$, exceeds the disturbance limit.

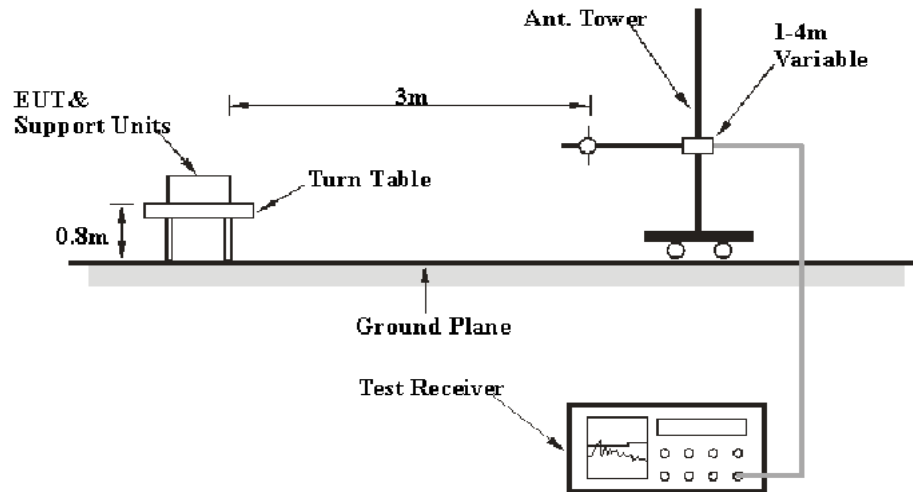
Based on CISPR 16-4-2: 2011, measurement uncertainty of radiated emission at a distance of 3m at Bay Area Compliance Laboratories Corp. (Dongguan) is: 30M~200MHz: 4.58 dB for Horizontal, 4.59 dB for Vertical; 200M~1GHz: 4.83 dB for Horizontal, 5.85 dB for Vertical; 1G~6GHz: 4.45 dB, 6G~18GHz: 5.23 dB

Table 1 – Values of U_{cispr}

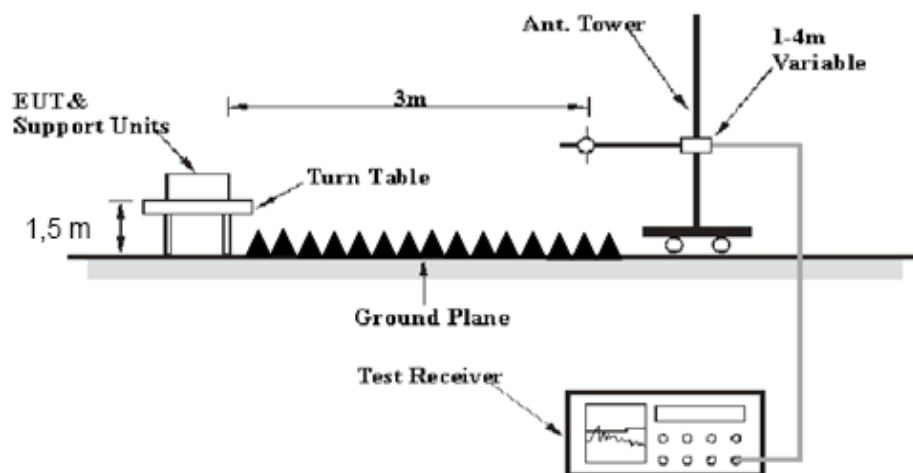
Measurement	U_{cispr}
Radiated disturbance (electric field strength at an OATS or in a SAC) (30 MHz to 1000 MHz)	6.3 dB
Radiated disturbance (electric field strength in a FAR) (1 GHz to 6 GHz)	5.2 dB
Radiated disturbance (electric field strength in a FAR) (6 GHz to 18 GHz)	5.5 dB

EUT Setup

Below 1 GHz:



Above 1 GHz:



The radiated emission and out of band emission tests were performed in the 3 meters chamber test site, using the setup accordance with the ANSI C63.10-2013 The specification used was the FCC 15.209/15.205 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	Detector
30 MHz – 1000 MHz	120 kHz	300 kHz	120 kHz	QP
Above 1 GHz	1MHz	3 MHz	/	PK
	1MHz	10 Hz	/	AV

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:

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

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
R&S	EMI Test Receiver	ESCI	100224	2016-08-03	2017-08-02
Sunol Sciences	Antenna	JB3	A060611-3	2014-11-06	2017-11-05
HP	Amplifier	8447E	2434A02181	2016-09-01	2017-09-01
Agilent	Spectrum Analyzer	E4440A	SG43360054	2015-11-23	2016-11-22
ETS-Lindgren	Horn Antenna	3115	9808-5557	2015-09-06	2018-09-06
Mini-Circuit	Amplifier	ZVA-213-S+	054201245	2016-02-19	2017-02-19
R&S	Spectrum Analyzer	FSP 38	100478	2015-11-23	2016-11-22
Ducommun Technologies	Horn Antenna	ARH-4223-02	1007726-01 1304	2014-06-16	2017-06-15
Quinstar	Amplifier	QLW-18405536-JO	15964001001	2015-09-06	2016-09-06
N/A	Coaxial Cable	14m	N/A	2016-05-06	2017-05-06
N/A	Coaxial Cable	8m	N/A	2016-05-06	2017-05-06

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

Test Results Summary

According to the data in the following table, the EUT complied with the FCC Part 15.209 &15.205 & 15.249.

Test Data**Environmental Conditions**

Temperature:	26.9 °C
Relative Humidity:	47 %
ATM Pressure:	100.4 kPa

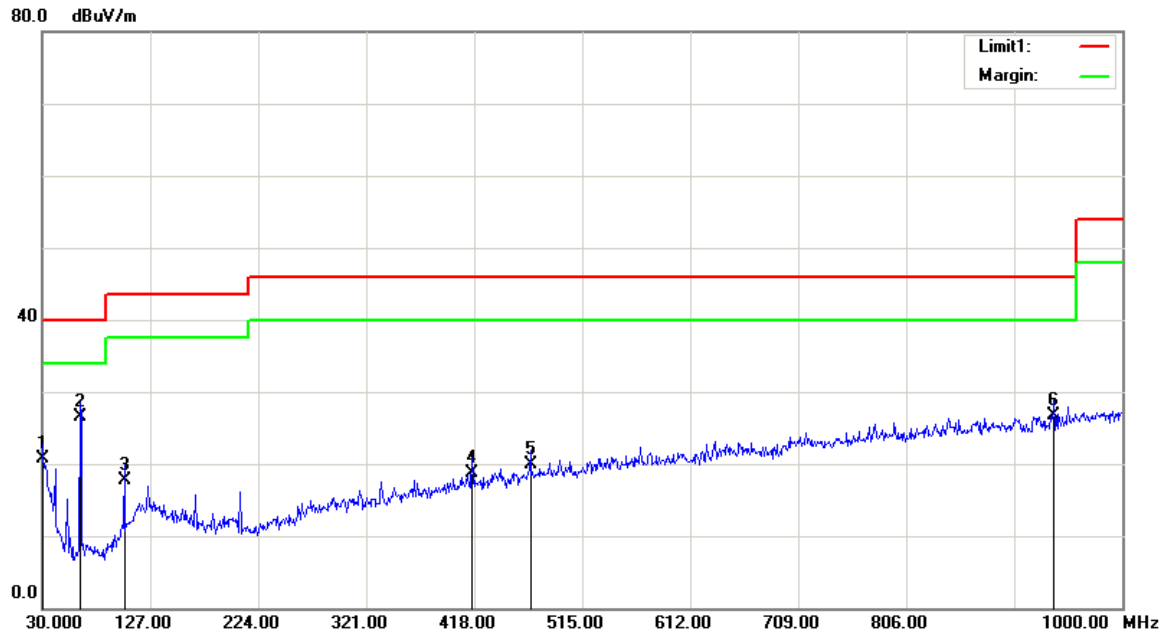
The testing was performed by Emily Wang on 2016-09-06

Test Mode: Transmitting

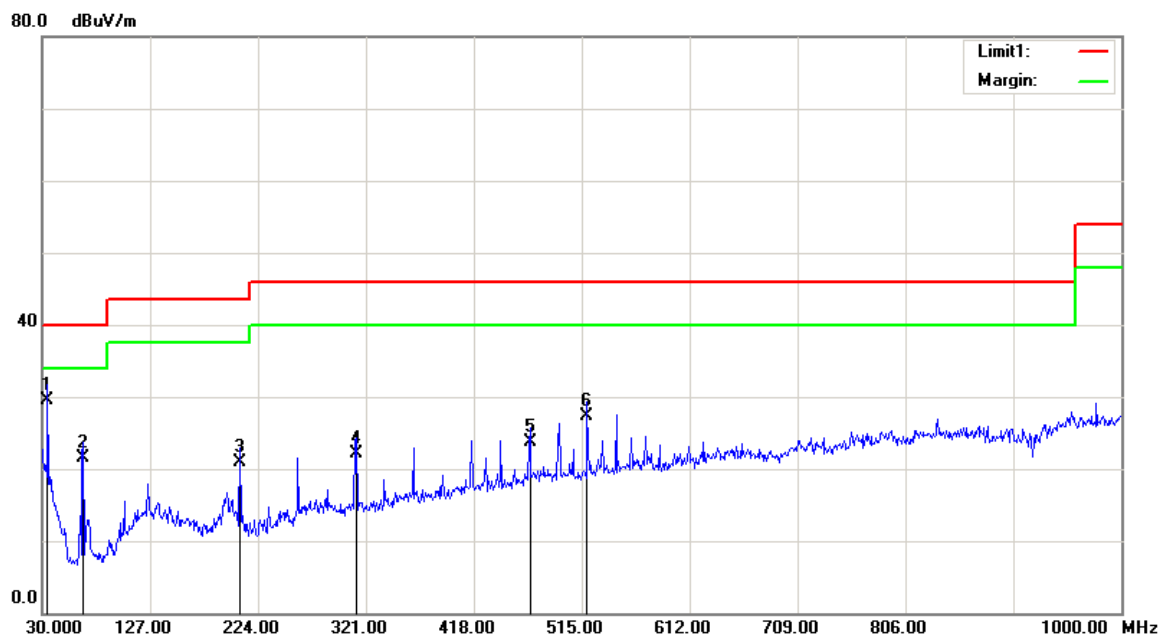
Below 1 G:

Test mode: Operating (Low channel is the worst case)

Horizontal:



Frequency (MHz)	Receiver Reading (dBuV)	Detector (PK/QP/Ave)	Correction Factor (dB/m)	Cord. Amp. (dBuV/m)	Limit (dBuV/m)	Margin (dB)
30.0000	19.67	QP	1.03	20.70	40.00	19.30
63.9500	39.19	QP	-12.69	26.50	40.00	13.50
103.7200	26.69	QP	-8.89	17.80	43.50	25.70
416.0600	21.89	QP	-3.09	18.80	46.00	27.20
468.4400	21.68	QP	-1.68	20.00	46.00	26.00
938.8900	22.13	QP	4.67	26.80	46.00	19.20

Vertical:

Frequency (MHz)	Receiver Reading (dBuV)	Detector (PK/QP/Ave)	Correction Factor (dB/m)	Cord. Amp. (dBuV/m)	Limit (dBuV/m)	Margin (dB)
34.8500	32.27	QP	-2.67	29.60	40.00	10.40
66.8600	34.08	QP	-12.48	21.60	40.00	18.40
207.5100	29.80	QP	-8.90	20.90	43.50	22.60
312.2700	27.74	QP	-5.54	22.20	46.00	23.80
468.4400	25.38	QP	-1.68	23.70	46.00	22.30
519.8500	28.73	QP	-1.43	27.30	46.00	18.70

Above 1 G:

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(1/m))					
frequency: 2413 MHz									
2413	59.35	PK	H	25.67	3.69	0.00	88.71	114.00	25.29
2413	54.14	AV	H	25.67	3.69	0.00	83.50	94.00	10.50
2413	60.46	PK	V	25.67	3.69	0.00	89.82	114.00	24.18
2413	55.3	AV	V	25.67	3.69	0.00	84.66	94.00	9.34
2390	25.86	PK	V	25.61	3.63	0.00	55.10	74.00	18.90
2390	13.34	AV	V	25.61	3.63	0.00	42.58	54.00	11.42
4826	38.57	PK	V	30.65	5.02	27.41	46.83	74.00	27.17
4826	33.17	AV	V	30.65	5.02	27.41	41.43	54.00	12.57
7239	33.09	PK	V	34.17	6.65	25.90	48.01	74.00	25.99
7239	27.51	AV	V	34.17	6.65	25.90	42.43	54.00	11.57
3292	33.1	PK	V	28.13	5.33	27.29	39.27	74.00	34.73
3292	22.75	AV	V	28.13	5.33	27.29	28.92	54.00	25.08
frequency: 2438 MHz									
2438	57.21	PK	H	25.74	3.76	0.00	86.71	114.00	27.29
2438	51.51	AV	H	25.74	3.76	0.00	81.01	94.00	12.99
2438	58.82	PK	V	25.74	3.76	0.00	88.32	114.00	25.68
2438	53.64	AV	V	25.74	3.76	0.00	83.14	94.00	10.86
4876	37.46	PK	V	30.78	5.15	27.42	45.97	74.00	28.03
4876	30.47	AV	V	30.78	5.15	27.42	38.98	54.00	15.02
7314	34.17	PK	V	34.35	6.74	25.88	49.38	74.00	24.62
7314	27.99	AV	V	34.35	6.74	25.88	43.20	54.00	10.80
3070	32.7	PK	V	27.42	6.72	27.47	39.37	74.00	34.63
3070	20.14	AV	V	27.42	6.72	27.47	26.81	54.00	27.19
3607	32.38	PK	V	29.04	4.62	27.27	38.77	74.00	35.23
3607	21.06	AV	V	29.04	4.62	27.27	27.45	54.00	26.55
frequency: 2464.5 MHz									
2464.5	54.21	PK	H	25.81	3.74	0.00	83.76	114.00	30.24
2464.5	49.04	AV	H	25.81	3.74	0.00	78.59	94.00	15.41
2464.5	56.16	PK	V	25.81	3.74	0.00	85.71	114.00	28.29
2464.5	50.88	AV	V	25.81	3.74	0.00	80.43	94.00	13.57
2483.5	24.88	PK	V	25.86	3.67	0.00	54.41	74.00	19.59
2483.5	13.87	AV	V	25.86	3.67	0.00	43.40	54.00	10.60
4929	37.24	PK	V	30.92	5.34	27.43	46.07	74.00	27.93
4929	31.7	AV	V	30.92	5.34	27.43	40.53	54.00	13.47
7393.5	33.93	PK	V	34.54	6.83	25.86	49.44	74.00	24.56
7393.5	27.64	AV	V	34.54	6.83	25.86	43.15	54.00	10.85
3222	33.18	PK	V	27.91	6.18	27.35	39.92	74.00	34.08
3222	21	AV	V	27.91	6.18	27.35	27.74	54.00	26.26

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. Position the EUT on the test table without connection to measurement instrument. Turn on the EUT. Then set it to any one convenient frequency within its operating range. Set a reference level on the measuring instrument equal to the highest peak value.
3. Measure the frequency difference of two frequencies that were attenuated 20 dB from the reference level. Record the frequency difference as the emission bandwidth.
4. 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	FSP 38	100478	2015-11-23	2016-11-22
E-Microwave	DC Blocking	EMDCB-00036	0E01201047	2016-05-06	2017-05-06
N/A	Coaxial Cable	0.1m	N/A	2016-05-06	2017-05-06

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

Test Data**Environmental Conditions**

Temperature:	2 °C
Relative Humidity:	45 %
ATM Pressure:	99.8 kPa

The testing was performed by Emily Wang on 2016-09-07.

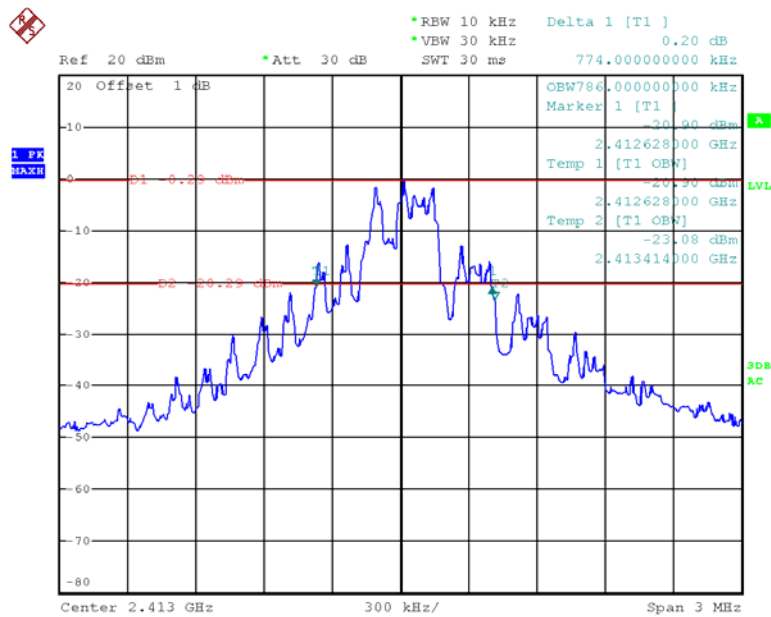
Test Result: Compliant.

Please refer to following tables and plots

Test Mode: Transmitting

Channel	Frequency (MHz)	20 dB Bandwidth (MHz)
Low	2413	0.774
Middle	2438	0.774
High	2464.5	0.774

Low Channel



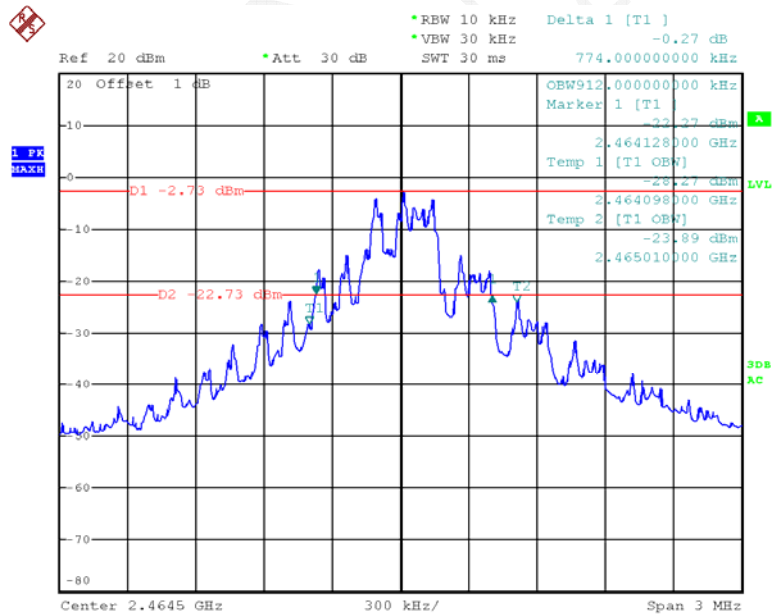
Date: 7.SEP.2016 18:21:50

Middle Channel



Date: 7.SEP.2016 18:23:14

High Channel



Date: 7.SEP.2016 18:19:34

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