

FCC PART 15.249

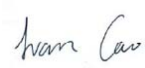
TEST REPORT

For

LifeWatch Technologies Ltd.

2 Pekeris Street, Rehovot, 7670202, Israel

FCC ID: SMTLWVGW

Report Type: Original Report		Product Type: GSM /WCDMA mobile phone	
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Report Number:	R2DG131209002-00E		
Report Date:	2014-01-07		
Reviewed By:	Ivan Cao  RF Leader		
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GENERAL INFORMATION

Product Description for Equipment under Test (EUT)

The *LifeWatch Technologies Ltd.*'s product, model *FGL-00005* (FCC ID: *SMTLWVGW*) (the "EUT") in this report is a *GSM /WCDMA mobile phone*, which measures approximately: 13.2 cm (L) x 7.0 cm (W) x 1.3 cm (H), input voltage: DC 3.7V from lithium battery or DC 5V from adapter.

Adapter Information:

Model: PA1005-050UIB070

Input: AC 100-240V, 50-60Hz 0.3A

Output: DC 5.0V, 0.7A

All measurement and test data in this report was gathered from production sample serial number: 131209002 (Assigned by BACL, Dongguan). The EUT was received on 2013-12-11

Objective

This type approval report is prepared on behalf of *LifeWatch Technologies 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, 15.207, 15.209 and 15.249 rules

Related Submittal(s)/Grant(s)

FCC Part 15B JBP submissions with FCC ID: *SMTLWVGW*

FCC Part15C DSS submissions with FCC ID: *SMTLWVGW for Bluetooth*

FCC Part 22H&24E PCE submissions with FCC ID: *SMTLWVGW*.

FCC Part 15C DTS submissions with FCC ID: *SMTLWVGW for Wi-Fi*.

Test Methodology

All measurements contained in this report were conducted with ANSI C63.4-2003, American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the range of 9 kHz to 40 GHz.

All radiated and conducted emissions measurement was performed at 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 02, 2012. The facility also complies with the radiated and AC line conducted test site criteria set forth in ANSI C63.4-2003.

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 configured as maximum power and switched the channels by keys.

39 channels were provided by the manufacturer:

Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
1	2404	5	...	19	2440	36	2474
2	2406	...	...	...	...	37	2476
3	2410	...	...	...	...	38	2478
4	2412	...	...	35	..	39	2480

EUT was tested with Channel 2404 MHz, 2440 MHz and 2480 MHz

EUT Exercise Software

The test software was built in the equipment, and the maximum power configured by the system.

Equipment Modifications

No modifications were made to the unit tested.

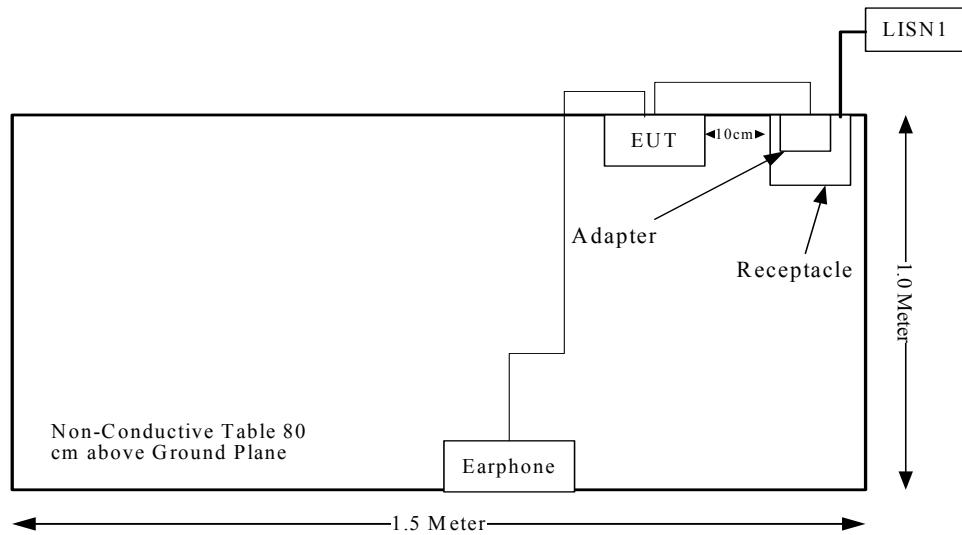
Support Equipment List and Details

Manufacturer	Description	Model	Serial Number
N/A	Earphone	N/A	N/A

External I/O Cable

Cable Description	Shielding Type	Ferrite Core	Length (m)	From Port	To
USB Cable	yes	No	1.75	Adapter	EUT
Earphone Cable	no	no	1.5	EUT	Earphone

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	Compliance
15.205, §15.209, §15.249	Radiated Emissions	Compliance
§15.215 (c)	20 dB Bandwidth	Compliance

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 permanently soldering on the printed circuit board, which complied with 15.203, the maximum gain was 4 dBi. Please refer to the internal photos.

Result: Compliant.

FCC §15.207 (a) – AC LINE CONDUCTED EMISSIONS

Applicable Standard

FCC§15.207

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_{cisp} 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_{cisp} of Table 1, then:

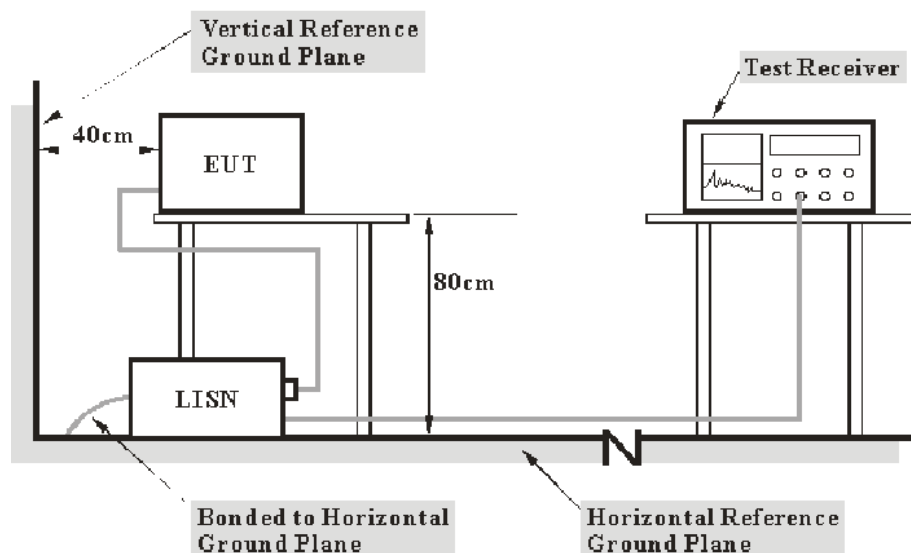
- compliance is deemed to occur if no measured disturbance level, increased by $(U_{lab} - U_{cisp})$, exceeds the disturbance limit;
- non-compliance is deemed to occur if any measured disturbance level, increased by $(U_{lab} - U_{cisp})$, exceeds the disturbance limit.

Based on CISPR 16-4-2-2011, measurement uncertainty of conducted disturbance at mains port using AMN at Bay Area Compliance Laboratories Corp. (Dongguan) is 3.46 dB (150 kHz to 30 MHz).

Table 1 – Values of U_{cisp}

Measurement	U_{cisp}
Conducted disturbance at mains port using AMN (150 kHz to 30 MHz)	3.4 dB

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 C63.4-2003 measurement procedure. The specification used was with the FCC Part 15.207 limits.

The spacing between the peripherals was 10 cm.

The adapter was connected to a 120 VAC/60 Hz 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.

Maximizing procedure was performed on the six (6) highest emissions of the EUT.

All data was recorded in the Quasi-peak and average detection mode.

Corrected 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 maximum 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	ESCS 30	830245/006	2013-11-20	2014-11-19
R&S	Two-line V-network	ENV216	3560.6550.12	2013-2-18	2014-2-17
R&S	L.I.S.N	ESH3-Z5	100113	N/A	N/A
BACL	Test Software	BACL-EMC	V1.0-2010	N/A	N/A

* **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 recorded data in following table, the EUT complied with the FCC Part 15.207, with the worst margin reading of:

10.56 dB at 0.830 MHz in the **Neutral** conducted mode

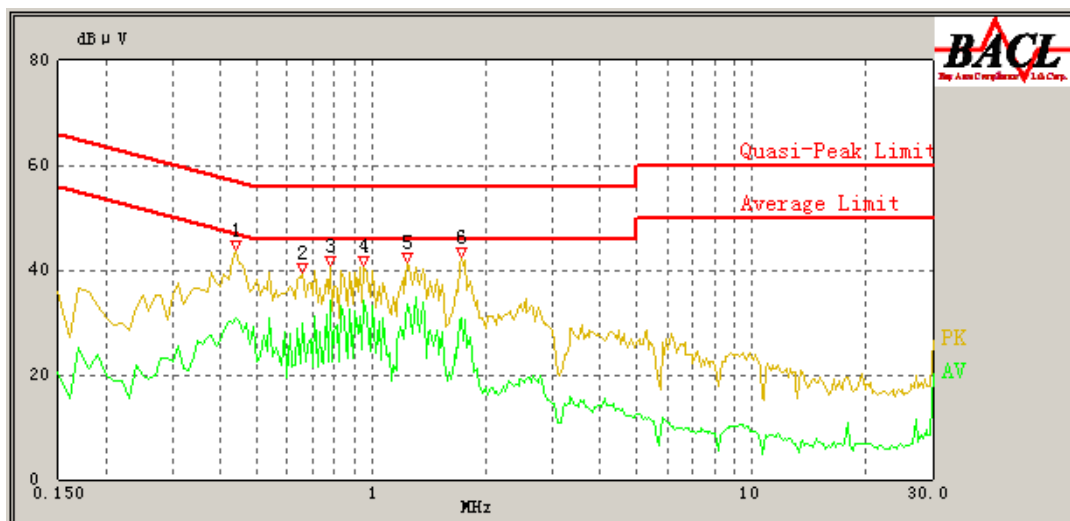
Test Data**Environmental Conditions**

Temperature:	19.8 ° C
Relative Humidity:	50 %
ATM Pressure:	101.1 kPa

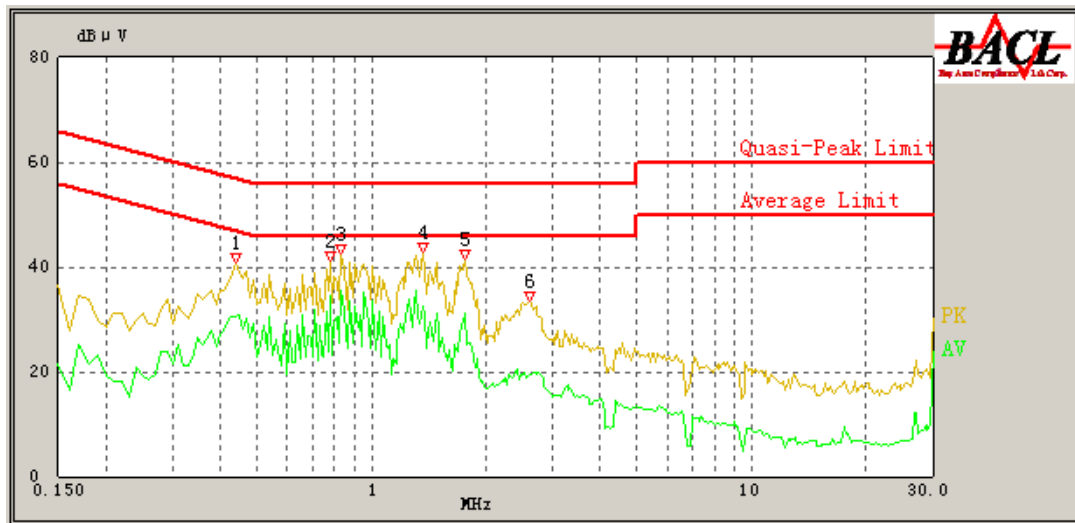
The testing was performed by Ares Liu on 2014-01-04.

Test Mode: Transmitting

120 V, 60 Hz, Line:



Frequency (MHz)	Cord. Reading (dBμV)	Correction Factor (dB)	Limit (dBμV)	Margin (dB)	Detector (PK/AV/QP)
0.440	38.55	9.67	57.06	18.51	QP
0.440	30.78	9.67	47.06	16.28	AV
0.660	35.62	9.67	56.00	20.38	QP
0.660	29.98	9.67	46.00	16.02	AV
0.780	38.59	9.67	56.00	17.41	QP
0.780	34.15	9.67	46.00	11.85	AV
0.950	38.81	9.68	56.00	17.19	QP
0.950	34.08	9.68	46.00	11.92	AV
1.240	39.44	9.68	56.00	16.56	QP
1.240	33.49	9.68	46.00	12.51	AV
1.720	38.87	9.68	56.00	17.13	QP
1.720	30.70	9.68	46.00	15.30	AV

120 V, 60 Hz, Neutral:

Frequency (MHz)	Cord. Reading (dBμV)	Correction Factor (dB)	Limit (dBμV)	Margin (dB)	Detector (PK/AV/QP)
0.440	35.74	9.67	57.06	21.32	QP
0.440	30.34	9.67	47.06	16.72	AV
0.780	40.79	9.68	56.00	15.21	QP
0.780	34.56	9.68	46.00	11.44	AV
0.830	40.90	9.68	56.00	15.10	QP
0.830	35.44	9.68	46.00	10.56	AV
1.360	38.65	9.69	56.00	17.35	QP
1.360	32.35	9.69	46.00	13.65	AV
1.770	34.26	9.68	56.00	21.74	QP
1.770	31.02	9.68	46.00	14.98	AV
2.610	27.45	9.69	56.00	28.55	QP
2.610	19.51	9.69	46.00	26.49	AV

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_{cisprr} 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_{cisprr} of Table 1, then:

- compliance is deemed to occur if no measured disturbance level, increased by $(U_{lab} - U_{cisprr})$, exceeds the disturbance limit;
- non - compliance is deemed to occur if any measured disturbance level, increased by $(U_{lab} - U_{cisprr})$, 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: 5.0 dB

200M~1GHz: 6.2 dB

1G~6GHz: 4.45 dB

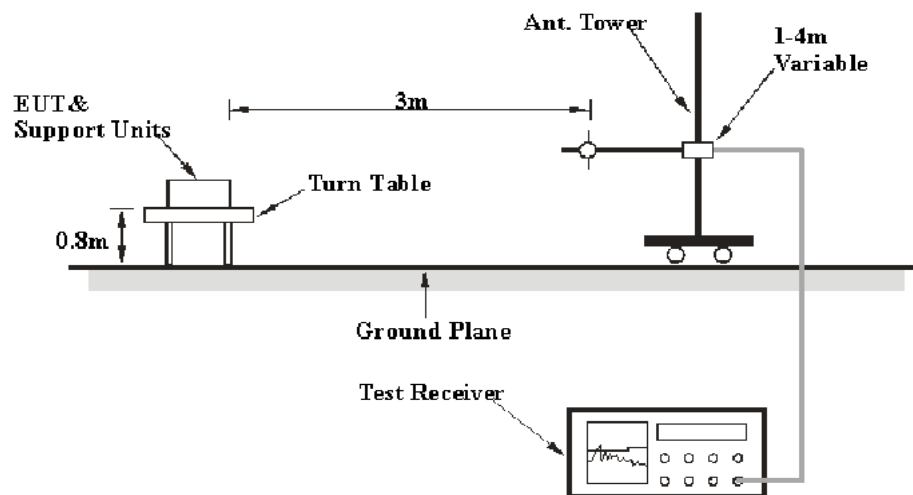
6G~18GHz: 5.23 dB

Table 1 – Values of U_{cispr}

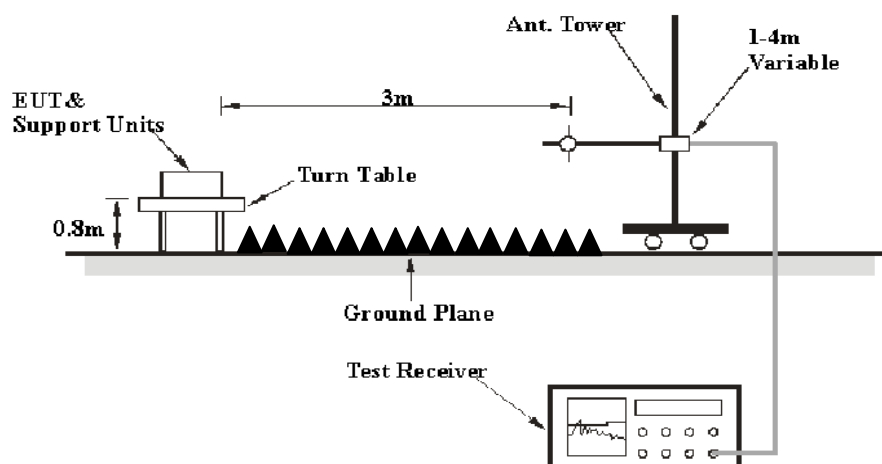
Measurement	U_{cispr}
Radiated disturbance (electric field strength at an OATS or in a SAC) (30 MHz to 1000 MHz)	6.3 dB
Radiated disturbance (electric field strength in a FAR) (1 GHz to 6 GHz)	5.2 dB
Radiated disturbance (electric field strength in a FAR) (6 GHz to 18 GHz)	5.5 dB

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 C63.4-2003. The specification used was the FCC 15.209/15.205 and FCC 15.249 limits.

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

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
30MHz – 1000 MHz	120 kHz	300 kHz	120kHz	QP
Above 1 GHz	1MHz	3 MHz	/	PK
	1MHz	10 Hz	/	Ave.

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 30MHz 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:

$$\text{Margin} = \text{Limit} - \text{Extrapolation result}$$

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
R&S	EMI TEST RECEIVER	ESCI	100224	2013-5-6	2014-5-5
Sunol Sciences	Antenna	JB3	A060611-1	2011-9-6	2014-9-5
HP	AMPLIFIER	8447E	2434A02181	N/A	N/A
R&S	Spectrum analyzer	FSEM	DE31388	2013-5-7	2014-5-6
ETS-Lindgren	horn antenna	3115	000 527 35	2012-9-6	2015-9-5
Mini-Circuit	Amplifier	ZVA-213-S+	054201245	N/A	N/A
Ducommun Technologies	Horn antenna	ARH-4223-02	1007726-02-1304	2013-6-16	2014-6-15
Quinstar	Amplifier	QLW-18405536-JO	15964001001	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 Results Summary

According to the data in the following table, the EUT complied with the FCC Part 15.209 & 15.205 & 15.249, with the worst margin reading of:

6.17 dB at 2483.5MHz in the Horizontal polarization

Test Data**Environmental Conditions**

Temperature:	21.8 °C
Relative Humidity:	47 %
ATM Pressure:	101.1kPa

The testing was performed by Ares Liu on 2014-01-04.

Test Mode: Transmitting

Frequency (MHz)	Receiver		Rx Antenna		Cable loss (dB)	Amplifier Gain (dB)	Corrected Amplitude (dBμV/m)	Limit (dBμV/m)	Margin (dB)
	Reading (dBμV)	Detector (PK/QP/AV)	Polar (H/V)	Factor (dB(1/m))					
frequency: 2404MHz									
2404	53.59	PK	H	25.65	4.42	0.00	83.66	114.00	30.34
2404	38.07	AV	H	25.65	4.42	0.00	68.14	94.00	25.86
2404	45.76	PK	V	25.65	4.42	0.00	75.83	114.00	38.17
2404	32.81	AV	V	25.65	4.42	0.00	62.88	94.00	31.12
2390	27.68	PK	H	25.61	4.39	0.00	57.68	74.00	16.32
2390	14.03	AV	H	25.61	4.39	0.00	44.03	54.00	9.97
4808	40.77	PK	H	30.60	5.99	27.26	50.10	74.00	23.90
4808	29.05	AV	H	30.60	5.99	27.26	38.38	54.00	15.62
7212	38.02	PK	H	34.11	7.45	26.31	53.27	74.00	20.73
7212	20.11	AV	H	34.11	7.45	26.31	35.36	54.00	18.64
9616	32.58	PK	H	35.98	8.80	26.19	51.17	74.00	22.83
9616	20.19	AV	H	35.98	8.80	26.19	38.78	54.00	15.22
2879	35.64	PK	H	26.89	6.27	27.41	41.39	74.00	32.61
2879	20.52	AV	H	26.89	6.27	27.41	26.27	54.00	27.73
975	32.6	QP	H	23.67	3.85	22.04	38.08	54.00	15.92
frequency: 2440MHz									
2440	55.94	PK	H	25.74	4.40	0.00	86.08	114.00	27.92
2440	39.36	AV	H	25.74	4.40	0.00	69.50	94.00	24.50
2440	48.24	PK	V	25.74	4.40	0.00	78.38	114.00	35.62
2440	36.52	AV	V	25.74	4.40	0.00	66.66	94.00	27.34
4880	39.52	PK	H	30.79	6.08	27.26	49.13	74.00	24.87
4880	27.85	AV	H	30.79	6.08	27.26	37.46	54.00	16.54
7320	36.79	PK	H	34.37	7.51	26.53	52.14	74.00	21.86
7320	25.11	AV	H	34.37	7.51	26.53	40.46	54.00	13.54
9760	33.14	PK	H	36.32	8.83	25.63	52.66	74.00	21.34
9760	20.45	AV	H	36.32	8.83	25.63	39.97	54.00	14.03
2879	36.04	PK	H	26.89	6.27	27.41	41.79	74.00	32.21
2879	20.38	AV	H	26.89	6.27	27.41	26.13	54.00	27.87
1720	32.89	PK	H	24.04	3.51	26.97	33.47	74.00	40.53
1720	21.03	AV	H	24.04	3.51	26.97	21.61	54.00	32.39
975	31.8	QP	H	23.67	3.85	22.04	37.28	54.00	16.72
frequency: 2480MHz									
2480	59	PK	H	25.85	4.48	0.00	89.33	114.00	24.67
2480	41.38	AV	H	25.85	4.48	0.00	71.71	94.00	22.29
2480	53.12	PK	V	25.85	4.48	0.00	83.45	114.00	30.55
2480	36.77	AV	V	25.85	4.48	0.00	67.10	94.00	26.90
2483.5	37.48	PK	H	25.86	4.49	0.00	67.83	74.00	6.17
2483.5	14.09	AV	H	25.86	4.49	0.00	44.44	54.00	9.56
4960	37.66	PK	H	31.00	5.90	27.27	47.29	74.00	26.71
4960	26.06	AV	H	31.00	5.90	27.27	35.69	54.00	18.31
7440	39.65	PK	H	34.66	7.58	26.56	55.33	74.00	18.67
7440	24.76	AV	H	34.66	7.58	26.56	40.44	54.00	13.56
9920	33.09	PK	H	36.71	8.87	25.50	53.17	74.00	20.83
9920	20.62	AV	H	36.71	8.87	25.50	40.70	54.00	13.30
2879	35.97	PK	H	26.89	6.27	27.41	41.72	74.00	32.28
2879	22.09	AV	H	26.89	6.27	27.41	27.84	54.00	26.16
975	32.1	QP	H	23.67	3.85	22.04	37.58	54.00	16.42

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	2013-6-16	2014-6-15

* **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:	21.8 °C
Relative Humidity:	47 %
ATM Pressure:	101.1 kPa

* The testing was performed by Ares Liu on 2014-01-04.

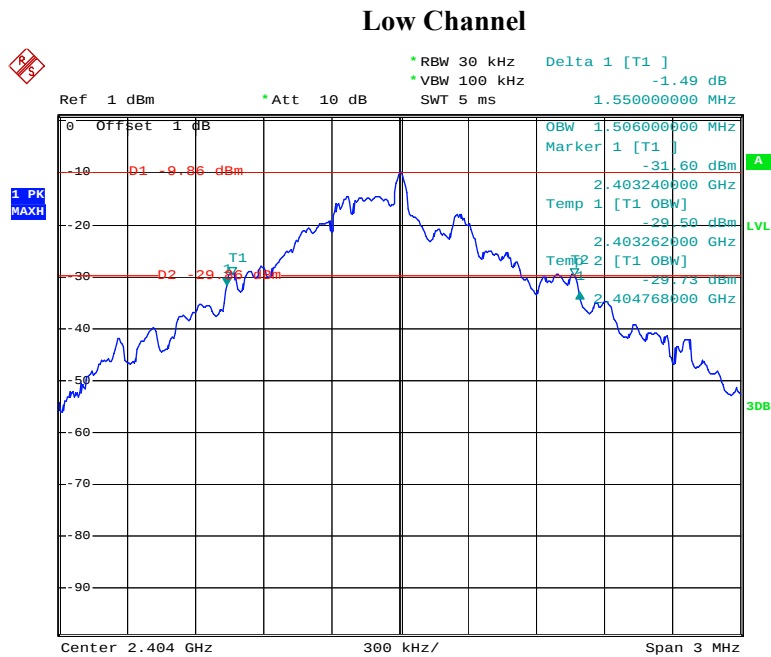
Test Result: Compliance.

Please refer to following tables and plots

Test Mode: Transmitting

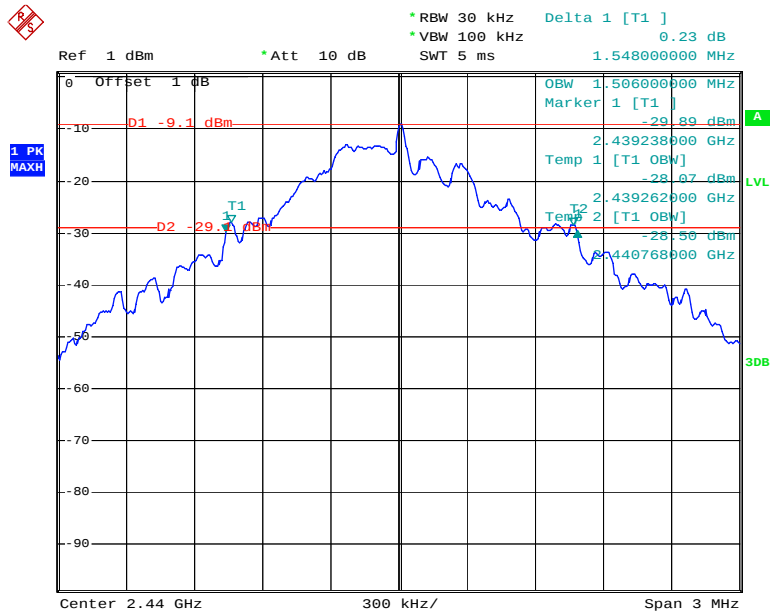
Channel	Frequency (MHz)	20 dB Bandwidth (MHz)
Low	2404	1.550
Middle	2440	1.548
High	2480	1.848

Please refer to the following plots.



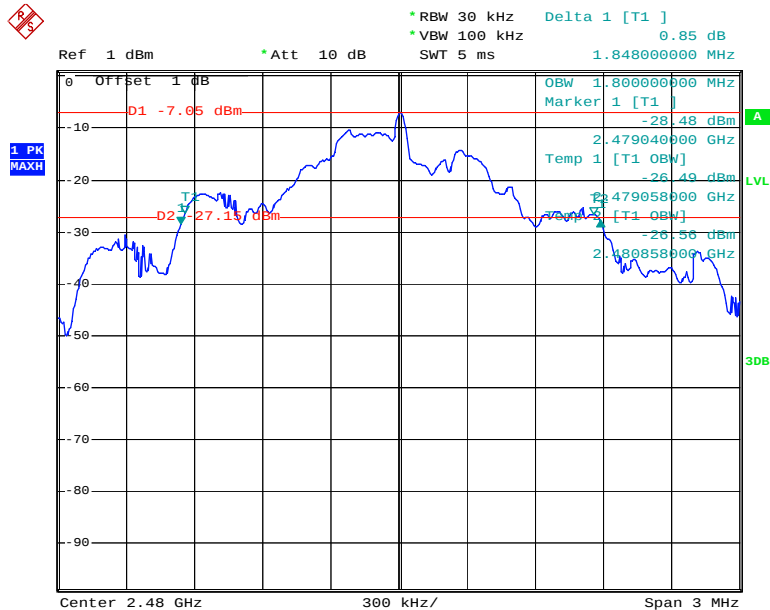
Date: 4.JAN.2014 17:06:20

Middle Channel



Date: 4.JAN.2014 17:12:54

High Channel



Date: 4.JAN.2014 17:12:16

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