Lab Code: 200707-0

FCC PART 15.247

MEASUREMENT AND TEST REPORT

For

Drift Innovation Ltd.

The Light Box Unit 125, 111 Power Road, London, UK.

FCC ID: P2FF9935

Report Type:	Product Type:
Original Report	HD Ghost (Camera Unit)

Test Engineer:	Mick Yin
Report Number:	RSZ120917005-00C1
Report Date:	2012-10-15
Reviewed By:	Sula Huang RF Engineer
Test Laboratory:	Bay Area Compliance Laboratories Corp. (Shenzhen) 6/F, the 3rd Phase of WanLi Industrial Building ShiHua Road, FuTian Free Trade Zone Shenzhen, Guangdong, China Tel: +86-755-33320018 Fax: +86-755-33320008 www.baclcorp.com.cn

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GENERAL INFORMATION

Product Description for Equipment under Test (EUT)

The *Drift Innovation Ltd.*'s product, model number: *FD9935 (FCC ID: P2FF9935)* or the "EUT" in this report was a camera unit of *HD Ghost,* which was measured approximately: 10.5 cm (L) x 5.2 cm (W) x 3.3 cm (H), rated input voltage: DC 3.7V Li-ion battery or DC 5V charging from USB port.

** All measurement and test data in this report was gathered from production sample serial number: 1209071 (Assigned by BACL, Shenzhen). The EUT was received on 2012-09-17.*

Objective

This report is prepared on behalf of *Drift Innovation Ltd. in* accordance with Part 2, Subpart J, 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 15.247 rules.

Related Submittal(s)/Grant(s)

FCC part 15.249 DXX submission of camera unit with ID: P2FF9935 and FCC part 15.249 DXX submission of remote unit with FCC ID: P2F-DI-RC505

Test Methodology

All measurements contained in this report were conducted with ANSI C63.4-2009, 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 emissions measurement was performed and Bay Area Compliance Laboratories Corp. (Shenzhen). The radiated testing was performed at an antenna-to-EUT distance of 3 meters.

Test Facility

The Test site used by Bay Area Compliance Laboratories Corp. (Shenzhen) to collect test data is located in the 6/F, the 3rd Phase of WanLi Industrial Building, Shihua Road, Futian Free Trade Zone Shenzhen, Guangdong, China.

Test site at Bay Area Compliance Laboratories Corp. (Shenzhen) 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 December 06, 2010. The facility also complies with the radiated and AC line conducted test site criteria set forth in ANSI C63.4-2009.

The Federal Communications Commission has the reports on file and is listed under FCC Registration No.: 382179. The test site has been approved by the FCC for public use and is listed in the FCC Public Access Link (PAL) database.

Additionally, Bay Area Compliance Laboratories Corp. (Shenzhen) is a National Institute of Standards and Technology (NIST) accredited laboratory, under the National Voluntary Laboratory Accredited Program (Lab Code 200707-0).

The current scope of accreditations can be found at http://ts.nist.gov/Standards/scopes/2007070.htm

SYSTEM TEST CONFIGURATION

Description of Test Configuration

For 802.11b, 802.11g mode, 11 channels are provided to testing:

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	/	/

EUT for 802.11b, 802.11g modes were tested with Channel 1, 6 and 11.

EUT Exercise Software

WiFi Test built-in the EUT
the test was performed under:
802.11b: Data rate: 1 Mbps.
802.11g: Data rate: 6 Mbps.

Equipment Modifications

No modification was made to the unit tested.

Support Equipment List and Details

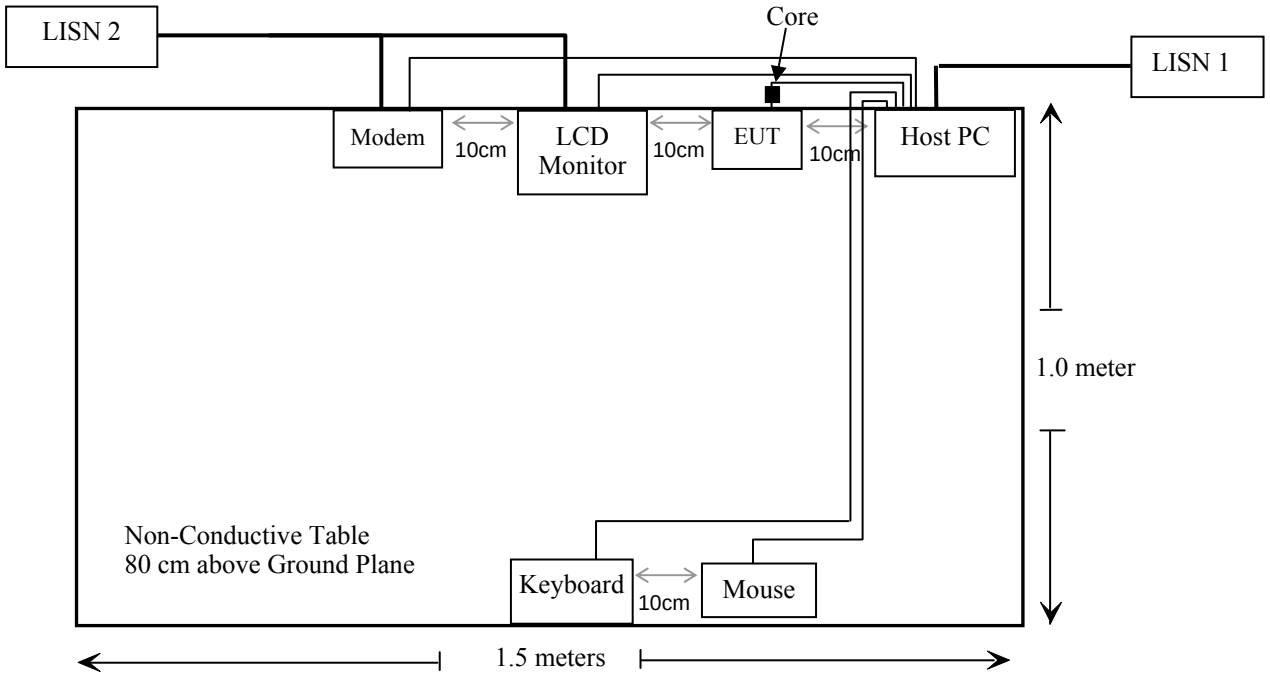
Manufacturer	Description	Model	Serial Number
DELL	PC	VOSTRO 220S	127BP2X
DELL	Keyboard	L100	CNORH656658907BL05DC
DELL	Mouse	MOC5UO	G1900NKD
DELL	LCD Monitor	E178WFPC	CN-OWY564-64180-7C4-2SQH
SAST	Modem	AEM-2100	0293

External I/O Cable

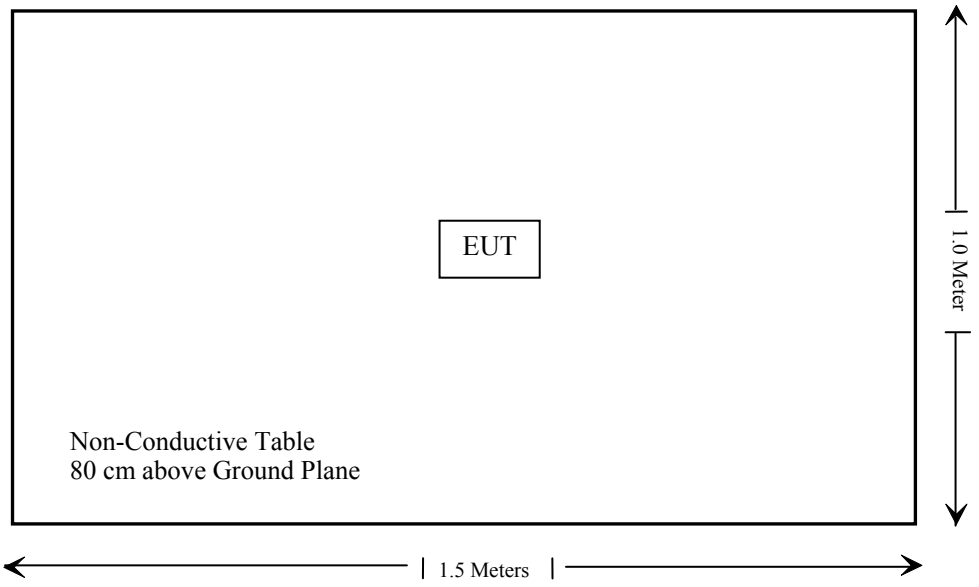
Cable Description	Length (m)	From/Port	To
Shielded Detachable USB Cable	1.5	Host PC	Mouse
Shielded Detachable Serial Cable	1.5	Host PC	Modem
Shielded Detachable K/B Cable	1.5	Host PC	Keyboard
Shielded Detachable VGA Cable	1.8	Host PC	LCD Monitor
Unshielded Detachable USB Cable with core	0.6	EUT	Host PC

Block Diagram of Test Setup

AC Line Conducted Emission:



Radiated Emission:



SUMMARY OF TEST RESULTS

FCC Rules	Description of Test	Result
§15.247 (i), §2.1093	RF exposure	Compliance
§15.203	Antenna Requirement	Compliance
§15.207 (a),	Conducted Emissions	Compliance
§15.247(d)	Spurious Emissions at Antenna Port	Compliance
§15.205, §15.209, §15.247(d)	Spurious Emissions	Compliance
§15.247 (a)(2)	6 dB Bandwidth	Compliance
§15.247(b)(3)	Maximum Peak Output Power	Compliance
§15.247(d)	100kHz Bandwidth of Frequency Band Edge	Compliance
§15.247(e)	Power Spectral Density	Compliance

FCC§15.247 (i), §1.1307 (b) (1) &§2.1093 – RF EXPOSURE

Standard Applicable

According to§15.247(i), §1.1307(b)(1) & §2.1093, systems operating under the provisions of this section shall be operated in a manner that ensure that the public is not exposed to radio frequency energy level in excess of the Commission's guideline.

According to KDB 447498 D01 Mobile Portable RF Exposure v03r03, no SAR required if power is lower than the flowing threshold:

When routine evaluation is required for SAR and the output power is ≤ 60/f(GHz) mW, the test reduction and test exclusion procedures given herein, or in KDB 616217 or KDB 648474, are applicable.

A device may be used in portable exposure conditions with no restrictions on host platforms when either the source-based time-averaged output power is ≤ 60/f(GHz) mW or all measured 1-g SAR are < 0.4 W/kg.10 When SAR evaluation is required, the most conservative exposure conditions for all expected operating configurations must be tested.

RF Exposure Evaluation

Max Peak output power: 2437 MHz: 11.65 dBm = 14.622 mW
SAR exclusion threshold =60/f (GHz) = 60/2.437 = 24.63 mW
The Max peak output power of EUT is less than 24.63 mW.

So the SAR measurement is not necessary.

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.

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

And according to FCC 47 CFR section 15.247 (b), if the transmitting antennas of directional gain greater than 6dBi are used, the power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

Antenna Connector Construction

The EUT has two integrated antenna arrangement which were permanently attached, one is for 2.4 GHz remote and the gain was 0 dBi, the other is for WiFi module and the gain was 1.72 dBi , fulfill the requirement of this section. Please refer to EUT photos.

Result: Compliance.

FCC §15.207 (a) - CONDUCTED EMISSIONS

Applicable Standard

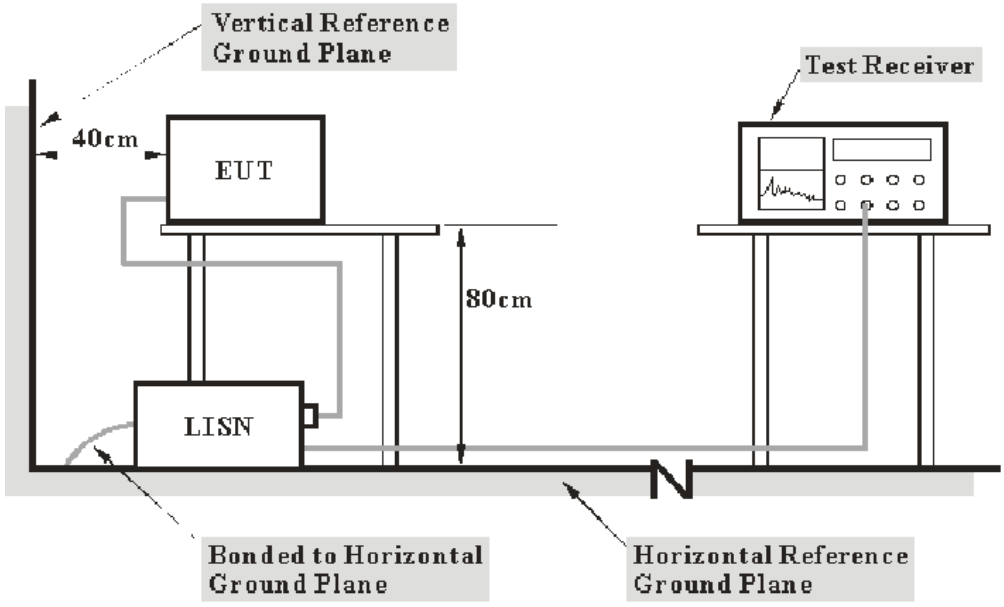
FCC§15.207

Measurement Uncertainty

All measurements involve certain levels of uncertainties, especially in field of EMC. The factors contributing to uncertainties are spectrum analyzer, cable loss, and LISN.

Based on CISPR 16-4-4, The Treatment of Uncertainty in EMC Measurements, the best estimate of the uncertainty of any conducted emissions measurement at Bay Area Compliance Laboratory Corp. (Shenzhen) is 2.4 dB (k=2, 95% level of confidence), and the uncertainty will not be taken into consideration for all the test data recorded in the report.

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 measurement procedure of EUT setup is according with ANSI C63.4-2009. The related limit was specified in FCC Part 15.207.

The spacing between the peripherals was 10 cm.

The host PC 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 host PC was conncected to the outlet of the first LISN, and the other relevant equipments were connected to the second 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.

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Rohde & Schwarz	EMI Test Receiver	ESCS30	100176	2011-11-24	2012-11-23
Rohde & Schwarz	L.I.S.N.	ESH2-Z5	892107/021	2011-11-17	2012-11-16
Com-Power	L.I.S.N.	LI-200	12005	N/A	N/A
Com-Power	L.I.S.N.	LI-200	12208	N/A	N/A
Rohde & Schwarz	Pulse limiter	ESH3Z2	DE25985	2012-07-08	2013-07-07
BACL	CE Test software	BACL-CE	V1.0	-	-

*** Statement of Traceability:** Bay Area Compliance Laboratory Corp. (Shenzhen) attests that all calibrations have been performed in accordance to NVLAP requirements, traceable to the NIST.

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:

8.88 dB at **1.105 MHz** in the **Neutral** conducted mode

Test Data

Environmental Conditions

Temperature:	25°C
Relative Humidity:	48 %
ATM Pressure:	100.0 kPa

The testing was performed by Mick Yin on 2012-09-19.

Test Mode: Charging

AC 120V / 60Hz - Line

Frequency (MHz)	Corrected Result (dBµV)	Corrected Factor (dB)	Limit (dBµV)	Margin (dB)	Detector (PK /QP/Ave.)
1.105	33.71	10.17	46.00	12.29	Ave.
1.610	32.77	10.19	46.00	13.23	Ave.
14.680	35.92	11.27	50.00	14.08	Ave.
8.845	35.66	10.45	50.00	14.34	Ave.
0.200	39.82	10.27	54.57	14.75	Ave.
2.110	30.57	10.21	46.00	15.43	Ave.
1.610	36.85	10.19	56.00	19.15	QP
14.855	38.46	11.30	60.00	21.54	QP
1.105	34.05	10.17	56.00	21.95	QP
8.850	37.72	10.45	60.00	22.28	QP
0.200	41.46	10.27	64.57	23.11	QP
2.110	32.16	10.21	56.00	23.84	QP

Neutral:

Frequency (MHz)	Corrected Result (dBµV)	Corrected Factor (dB)	Limit (dBµV)	Margin (dB)	Detector (PK /QP/Ave.)
1.105	37.12	10.17	46.00	8.88	Ave.
9.250	40.12	10.46	50.00	9.88	Ave.
1.610	36.03	10.19	46.00	9.97	Ave.
0.605	35.40	10.23	46.00	10.60	Ave.
7.035	37.67	10.37	50.00	12.33	Ave.
14.585	36.44	11.18	50.00	13.56	Ave.
1.610	38.09	10.19	56.00	17.91	QP
1.105	37.72	10.17	56.00	18.28	QP
9.245	40.25	10.46	60.00	19.75	QP
0.605	35.49	10.23	56.00	20.51	QP
14.585	38.95	11.18	60.00	21.05	QP
7.035	38.15	10.37	60.00	21.85	QP

Note:
1) Corrected Amplitude = Reading + Correction Factor
2) Correction Factor =LISN/ISN VDF (Voltage Division Factor) + Cable Loss + Pulse Limiter Attenuation
The corrected factor has been input into the transducer of the test software.
3) Margin = Limit – Corrected Amplitude

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

Applicable Standard

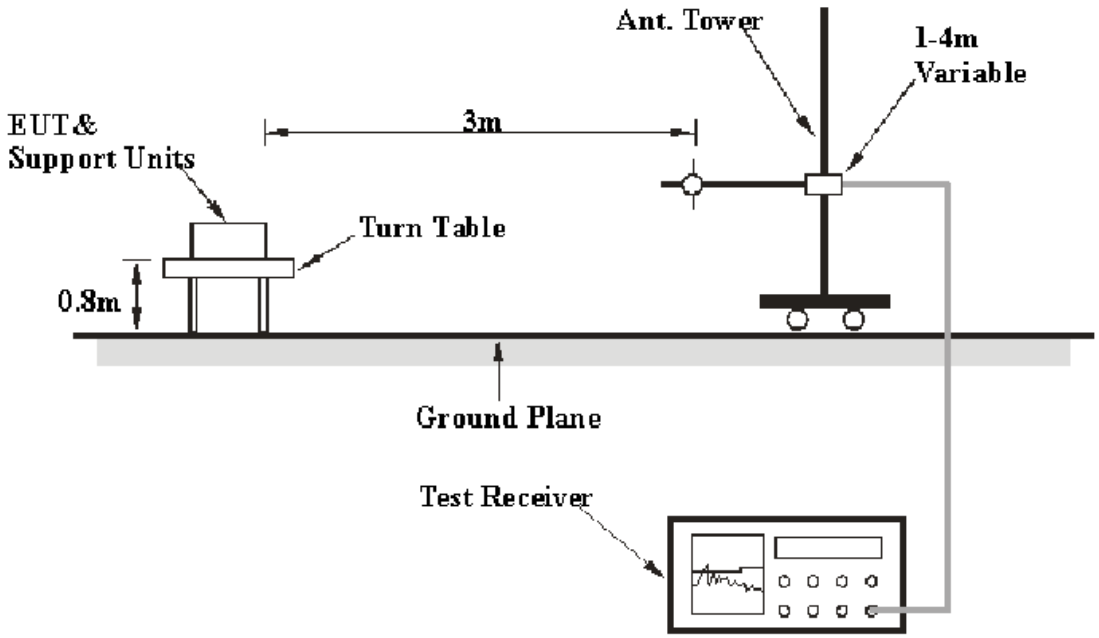
FCC §15.247 (d); §15.209; §15.205;

Measurement Uncertainty

All measurements involve certain levels of uncertainties, especially in field of EMC. The factors contributing to uncertainties are spectrum analyzer, cable loss, antenna factor calibration, antenna directivity, antenna factor variation with height, antenna phase center variation, antenna factor frequency interpolation, measurement distance variation, site imperfections, mismatch (average), and system repeatability.

Based on CISPR 16-4-4, The Treatment of Uncertainty in EMC Measurements, the best estimate of the uncertainty of a radiation emissions measurement at Bay Area Compliance Laboratories Corp. (Shenzhen) is 4.0 dB(k=2, 95% level of confidence), and the uncertainty will not be taken into consideration for all the test data recorded in the report.

EUT Setup



The radiated emission tests were performed in the 3 meters test site, using the setup accordance with the ANSI C63.4-2009. 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:

Frequency Range	***RBW***	***Video B/W***	***Detector***
30MHz – 1000 MHz	100 kHz	300 kHz	QP
1000 MHz – 25 GHz	1 MHz	3 MHz	PK
1000 MHz – 25 GHz	1 MHz	10 Hz	Ave.

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 and peak and Average detection modes for frequencies above 1 GHz.

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
HP	Amplifier	HP8447D	2944A09795	2011-11-24	2012-11-23
Rohde & Schwarz	EMI Test Receiver	ESCI	101122	2012-08-08	2012-08-07
Sunol Sciences	Broadband Antenna	JB1	A040904-1	2012-03-17	2013-03-16
Mini-Circuits	Amplifier	ZVA-213+	T-E27H	2012-03-08	2013-03-08
Sunol Sciences	Horn Antenna	DRH-118	A052304	2011-12-01	2012-11-30
Rohde & Schwarz	Signal Analyzer	FSIQ26	8386001028	2011-11-24	2012-11-23
the electro-Mechanics Co.	Horn Antenna	3116	9510-2270	2011-10-14	2012-10-13
R&S	Auto test Software	EMC32	V6.30	-	-

*** Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Shenzhen) attests that all calibrations have been performed in accordance to NVLAP requirements, traceable to the NIST.

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 Results Summary

According to the recorded data in following table, the EUT complied with the FCC Title 47, Part 15, Subpart C, section 15.205, 15.209 and 15.247, with the worst margin reading of:

2.58 dB at **2486.5 MHz** in the **Horizontal** polarization for mode 802.11b

Test Data

Environmental Conditions

Temperature:	25 ° C
Relative Humidity:	48 %
ATM Pressure:	100.0 kPa

The testing was performed by Mick Yin on 2012-10-11

Test Mode: Transmitting

30 MHz-25 GHz
802.11b mode:

Frequency (MHz)	Receiver		Turntable Degree	Rx Antenna		Corrected Factor (dB)	Corrected Amplitude (dBμV/m)	FCC Part 15.247205/209	
	Reading (dBμV)	Detector (PK/QP/Ave.)		Height (m)	Polar (H/V)			Limit (dBμV/m)	Margin (dB)
Low Channel (2412 MHz)									
2412	66.23	PK	78	1.1	H	32.63	98.86	/	/
2412	60.98	Ave.	78	1.1	H	32.63	93.61	/	/
2412	65.65	PK	61	1.3	V	32.63	98.28	/	/
2412	60.53	Ave.	61	1.3	V	32.63	93.16	/	/
2369.2	16.93	Ave.	18	1.3	H	32.63	49.56	54	4.44
2334.5	17.32	Ave.	112	1.1	V	31.98	49.30	54	4.70
2489.5	14.53	Ave.	181	1.2	V	33.71	48.24	54	5.76
2334.5	29.76	PK	112	1.1	V	31.98	61.74	74	12.26
2489.5	27.96	PK	181	1.2	V	33.71	61.67	74	12.33
2369.2	27.84	PK	18	1.3	H	32.63	60.47	74	13.53
246.9	48.02	QP	63	1.6	H	-15.9	32.12	46	13.88
4824.0	19.49	Ave.	93	1.4	H	12.40	31.89	54	22.11
4824.0	34.79	PK	93	1.4	H	12.40	47.19	74	26.81
9648.0	32.04	PK	221	1.5	V	19.29	51.33	78.86	27.53
7236.0	32.31	PK	68	1.2	V	16.62	48.93	78.86	29.93
9648.0	16.96	Ave.	221	1.5	V	19.29	36.25	73.61	37.36
7236.0	17.98	Ave.	68	1.2	V	16.62	34.60	73.61	39.01
Middle Channel (2437 MHz)									
2437	67.18	PK	63	1.1	H	32.63	99.81	/	/
2437	61.09	Ave.	63	1.1	H	32.63	93.72	/	/
2437	66.32	PK	221	1.3	V	32.63	98.95	/	/
2437	60.83	Ave.	221	1.3	V	32.63	93.46	/	/
2496.6	17.46	Ave.	89	1.1	H	33.71	51.17	54	2.83*
2343.7	16.95	Ave.	25	1.2	H	31.98	48.93	54	5.07
2485.7	15.13	Ave.	117	1.0	H	33.71	48.84	54	5.16
2496.3	29.73	PK	89	1.1	H	33.71	63.44	74	10.56
2485.7	27.11	PK	117	1.0	H	33.71	60.82	74	13.18
2343.7	28.83	PK	25	1.2	H	31.98	60.81	74	13.19
246.9	48.25	QP	147	1.6	H	-15.9	32.35	46	13.65
4874.0	26.43	Ave.	39	1.2	V	12.46	38.89	54	15.11
7311.0	18.11	Ave.	153	1.6	V	16.49	34.60	54	19.40
7311.0	33.45	PK	153	1.6	V	16.49	49.94	74	24.06
4874.0	35.12	PK	39	1.2	V	12.46	47.58	74	26.42
9748.0	31.32	PK	164	1.1	V	19.40	50.72	79.81	29.09
9748.0	17.02	Ave.	164	1.1	V	19.40	36.42	73.72	37.30

Frequency (MHz)	Receiver		Turntable Degree	Rx Antenna		Corrected Factor (dB)	Corrected Amplitude (dBuV/m)	FCC Part 15.247/205/209	
	Reading (dBµV)	Detector (PK/QP/Ave.)		Height (m)	Polar (H/V)			Limit (dBuV/m)	Margin (dB)
High Channel(2462 MHz)									
2462	65.86	PK	74	1.1	H	33.71	99.57	/	/
2462	59.86	Ave.	74	1.1	H	33.71	93.57	/	/
2462	64.73	PK	213	1.2	V	33.71	98.44	/	/
2462	59.11	Ave.	213	1.2	V	33.71	92.82	/	/
2486.5	17.71	Ave.	76	1.3	H	33.71	51.42	54	2.58*
2493.6	16.85	Ave.	225	1.7	V	33.71	50.56	54	3.44*
2317.6	16.58	Ave.	115	1.1	H	31.98	48.56	54	5.44
2486.5	30.02	PK	76	1.3	H	33.71	63.73	74	10.27
2317.6	31.66	PK	115	1.1	H	31.98	63.64	74	10.36
2493.6	29.12	PK	225	1.7	V	33.71	62.83	74	11.17
246.9	48.16	QP	201	1.6	H	-15.9	32.26	46	13.74
4924.0	25.71	Ave.	113	1.1	V	12.50	38.21	54	15.79
7386.0	18.17	Ave.	126	1.3	V	15.91	34.08	54	19.92
4924.0	36.52	PK	113	1.1	V	12.50	49.02	74	24.98
7386.0	31.83	PK	126	1.3	V	15.91	47.74	74	26.26
9848.0	31.26	PK	108	1.2	V	19.39	50.65	79.57	28.92
9848.0	17.03	Ave.	108	1.2	V	19.39	36.42	73.57	37.15

802.11g mode:

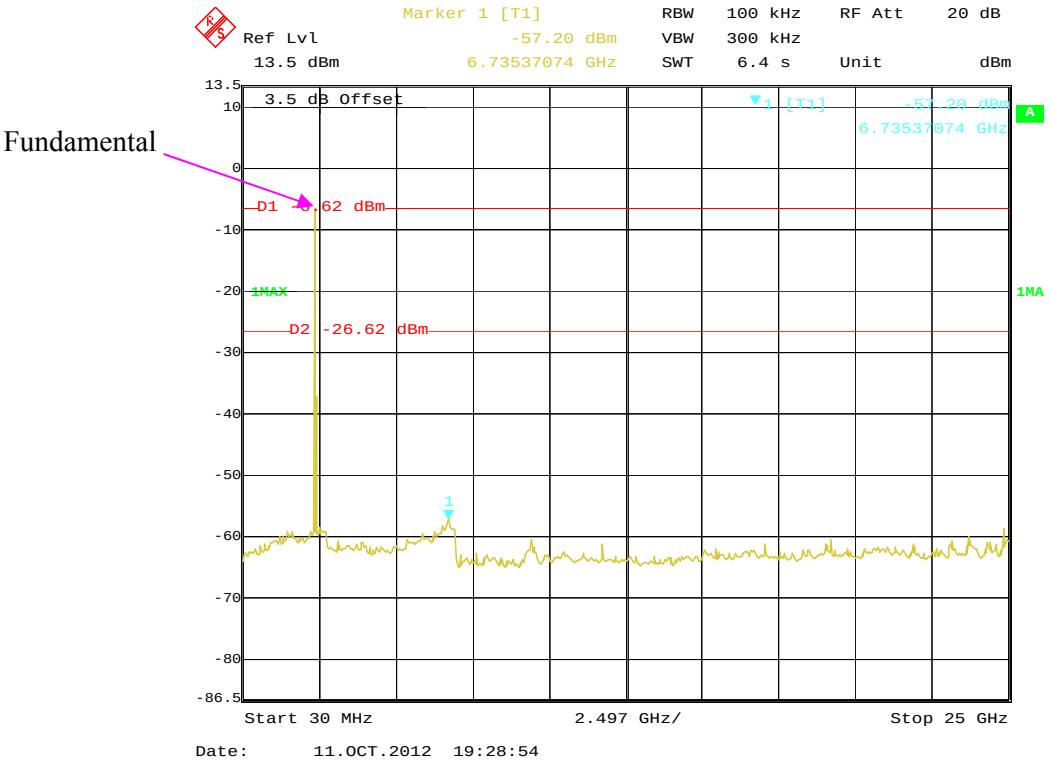
Frequency (MHz)	Receiver		Turntable Degree	Rx Antenna		Corrected Factor (dB)	Corrected Amplitude (dBμV/m)	FCC Part 15.247205/209	
	Reading (dBμV)	Detector (PK/QP/Ave.)		Height (m)	Polar (H/V)			Limit (dBμV/m)	Margin (dB)
Low Channel (2412 MHz)									
2412	63.28	PK	113	1.6	H	32.63	95.91	/	/
2412	50.11	Ave.	113	1.6	H	32.63	82.74	/	/
2412	63.57	PK	28	1.8	V	32.63	96.20	/	/
2412	51.28	Ave.	28	1.8	V	32.63	83.91	/	/
2390.0	17.57	Ave.	258	1.3	V	32.63	50.20	54	3.80*
2498.5	15.07	Ave.	93	1.1	H	33.71	48.78	54	5.22
2390.0	34.38	PK	258	1.3	V	32.63	67.01	74	6.99
2344.6	13.94	Ave.	33	1.2	H	31.98	45.92	54	8.08
2498.5	28.31	PK	93	1.1	H	33.71	62.02	74	11.98
2344.6	29.18	PK	33	1.2	H	31.98	61.16	74	12.84
246.9	48.38	QP	154	1.6	H	-15.9	32.48	46	13.52
4824.0	22.78	Ave.	168	1.4	V	12.40	35.18	54	18.82
4824.0	42.35	PK	168	1.4	V	12.40	54.75	74	19.25
9648.0	31.08	PK	225	1.1	H	19.29	50.37	76.20	25.83
9648.0	17.54	Ave.	225	1.1	H	19.29	36.83	63.91	27.08
7236.0	31.17	PK	138	1.2	V	16.62	47.79	76.20	28.41
7236.0	18.22	Ave.	138	1.2	V	16.62	34.84	63.91	29.07
Middle Channel (2437 MHz)									
2437	62.29	PK	116	1.2	H	33.71	96.00	/	/
2437	49.83	Ave.	116	1.2	H	33.71	83.54	/	/
2437	62.76	PK	89	1.3	V	33.71	96.47	/	/
2437	50.12	Ave.	89	1.3	V	33.71	83.83	/	/
2492.3	15.12	Ave.	87	1.1	V	33.71	48.83	54	5.17
2386.5	15.73	Ave.	22	1.2	V	32.63	48.36	54	5.64
2316.8	14.33	Ave.	36	1.1	V	31.98	46.31	54	7.69
2386.5	29.72	PK	22	1.2	V	32.63	62.35	74	11.65
2492.3	28.47	PK	87	1.1	V	33.71	62.18	74	11.82
246.9	48.47	QP	36	1.6	H	-15.9	32.57	46	13.43
2316.8	28.34	PK	36	1.1	V	31.98	60.32	74	13.68
7311.0	18.14	Ave.	416	1.2	V	16.49	34.63	54	19.37
4874.0	20.76	Ave.	358	1.1	V	12.46	33.22	54	20.78
4874.0	40.71	PK	358	1.1	V	12.46	53.17	74	20.83
7311.0	32.82	PK	416	1.2	V	16.49	49.31	74	24.69
9748.0	31.73	PK	332	1.0	H	19.40	51.13	76.47	25.34
9748.0	18.63	Ave.	332	1.0	H	19.40	38.03	63.83	25.80

Frequency (MHz)	Receiver		Turntable Degree	Rx Antenna		Corrected Factor (dB)	Corrected Amplitude (dBμV/m)	FCC Part 15.247/205/209	
	Reading (dBμV)	Detector (PK/QP/Ave.)		Height (m)	Polar (H/V)			Limit (dBμV/m)	Margin (dB)
High Channel(2462 MHz)									
2462	62.26	PK	87	1.3	H	33.71	95.97	/	/
2462	50.07	Ave.	87	1.3	H	33.71	83.78	/	/
2462	63.96	PK	223	1.1	V	33.71	97.67	/	/
2462	51.72	Ave.	223	1.1	V	33.71	85.43	/	/
2388.1	18.69	Ave.	231	1.1	H	32.63	51.32	54	2.68*
2491.3	17.11	Ave.	147	1.1	H	33.71	50.82	54	3.18*
2322.2	16.89	Ave.	136	1.2	H	31.98	48.87	54	5.13
2491.3	34.25	PK	147	1.1	H	33.71	67.96	74	6.04
2388.1	31.58	PK	231	1.1	H	32.63	64.21	74	9.79
2322.2	30.56	PK	136	1.2	H	31.98	62.54	74	11.46
246.9	48.23	QP	122	1.6	H	-15.9	32.33	46	13.67
7356.0	23.56	Ave.	69	1.2	H	15.91	39.47	54	14.53
4904.0	24.13	Ave.	32	1.3	V	12.46	36.59	54	17.41
7356.0	40.03	PK	69	1.2	H	15.91	55.94	74	18.06
9808.0	37.69	PK	79	1.1	H	19.29	56.98	77.67	20.69
4904.0	40.12	PK	32	1.3	V	12.46	52.58	74	21.42
9808.0	18.37	Ave.	79	1.1	H	19.29	37.66	65.43	27.77

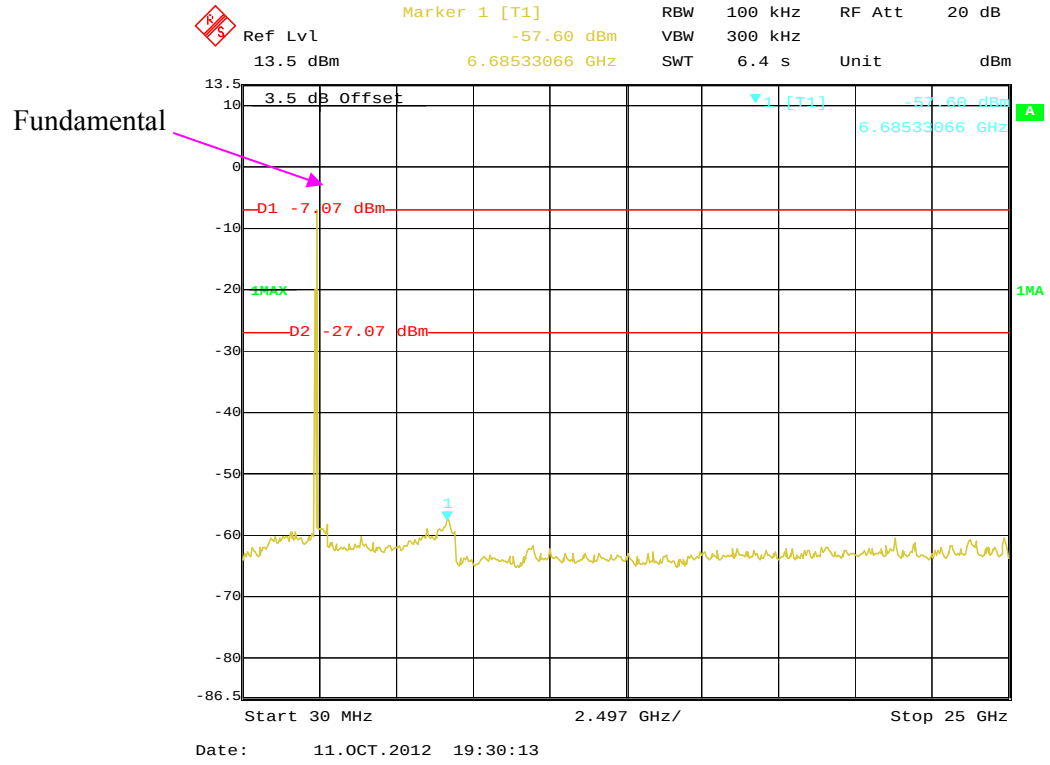
Note:
1. Corrected Factor=Antenna factor (RX) +cable loss – amplifier factor
2. Corrected Amplitude = Corrected Factor + Receiver Reading
3. Margin = Limit- Corrected. Amplitude
4. *Within measurement uncertainty.

Conducted Spurious Emissions at Antenna Port:

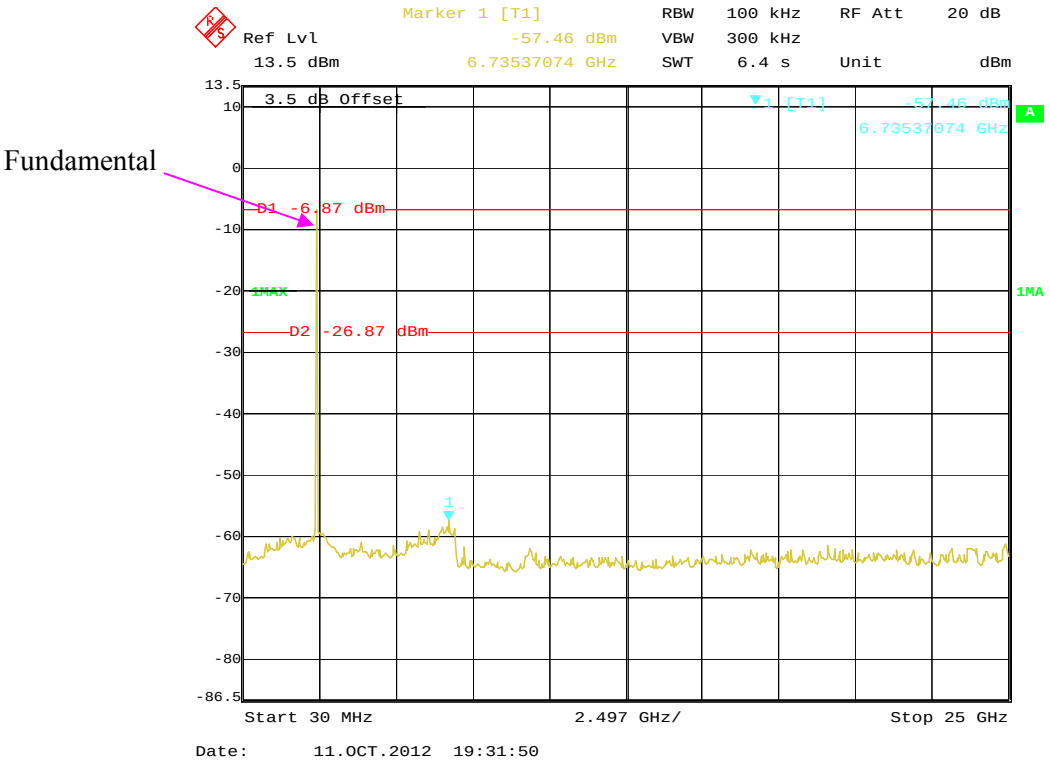
802.11b Low Channel



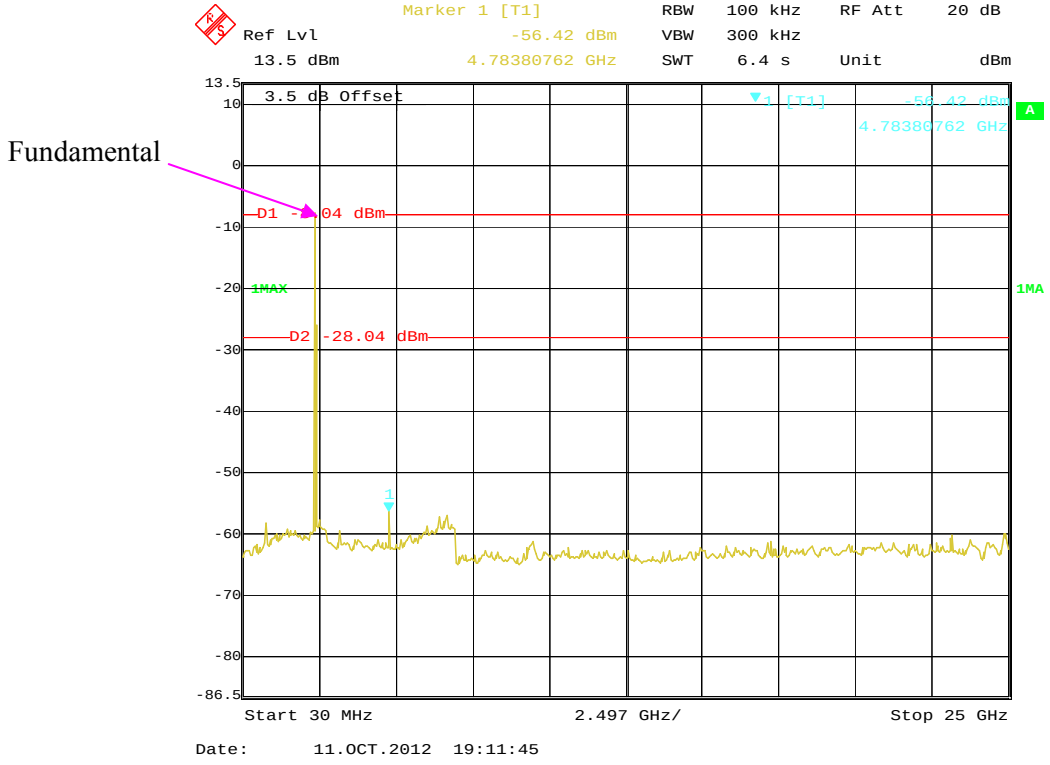
802.11b Middle Channel



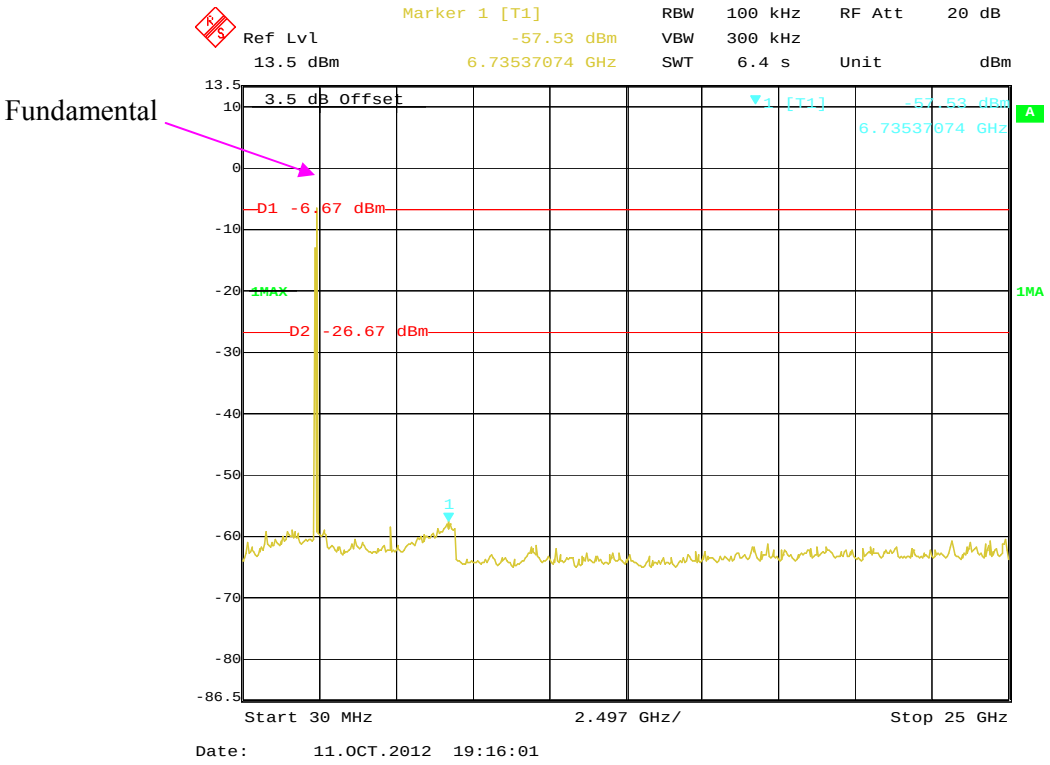
802.11b High Channel



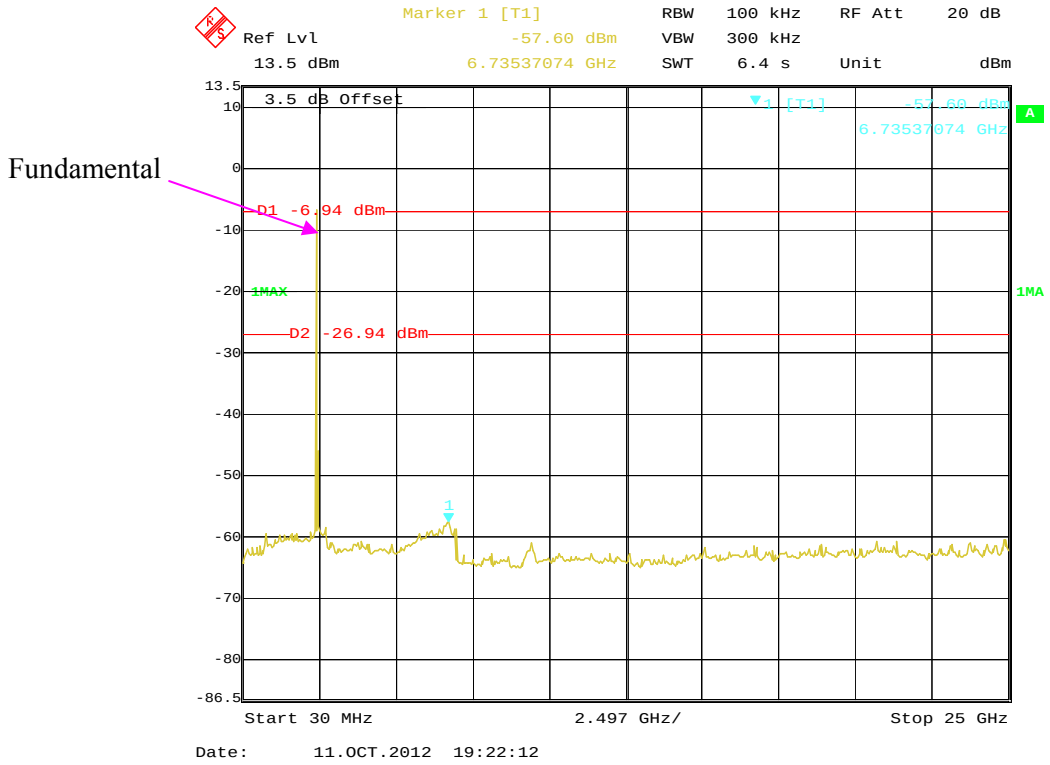
802.11g Low Channel



802.11g Middle Channel



802.11g High Channel



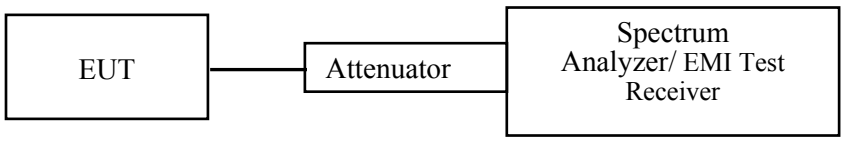
FCC §15.247(a) (2) – 6 dB BANDWIDTH TESTING

Applicable Standard

Systems using digital modulation techniques may operate in the 902–928 MHz, 2400–2483.5 MHz, and 5725–5850 MHz bands. The minimum 6 dB bandwidth shall be at least 500 kHz.

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 without connection to measurement instrument. Turn on the EUT and connect it to measurement instrument. 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 6 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
Rohde & Schwarz	EMI Test Receiver	ESCI	101122	2012-08-08	2013-08-07

*** Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Shenzhen) attests that all calibrations have been performed in accordance to NVLAP requirements, traceable to the NIST.

Test Data

Environmental Conditions

Temperature:	25 °C
Relative Humidity:	48%
ATM Pressure:	100.0kPa

The testing was performed by Mick Yin from 2012-09-25

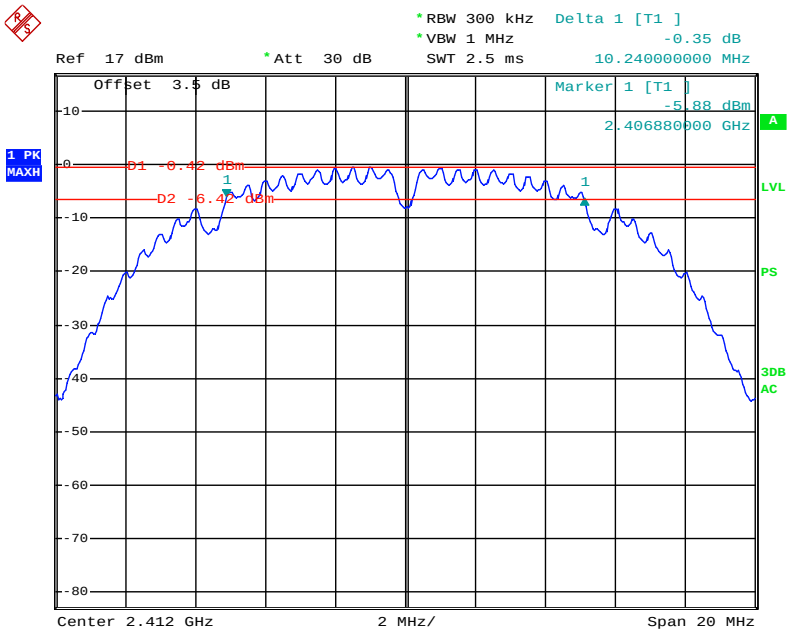
Test Mode: Transmitting

Test Result: Pass.

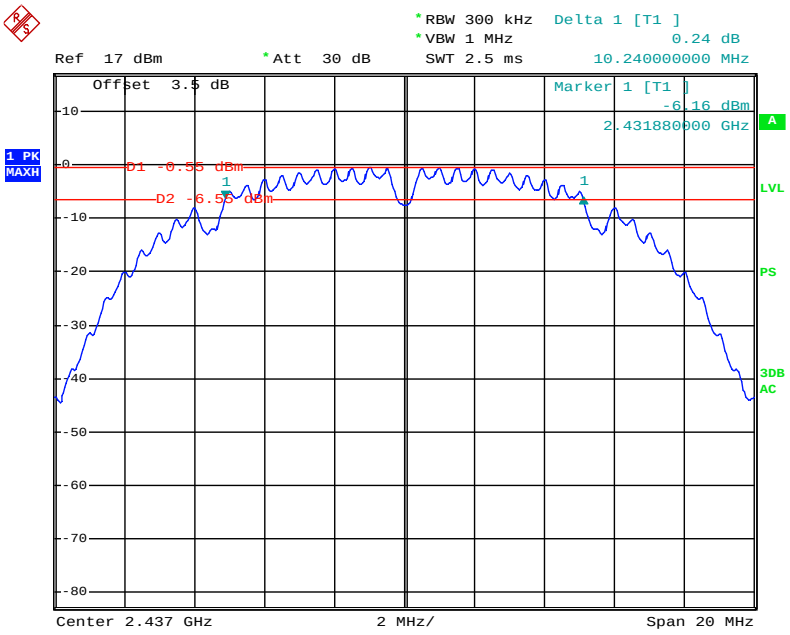
Please refer to the following tables and plots.

Channel	Frequency (MHz)	Data Rate (Mbps)	6dB bandwidth (MHz)	Limit (kHz)	Result
802.11b mode					
Low	2412	1	10.24	≥500	Pass
Middle	2437	1	10.24	≥500	Pass
High	2462	1	10.24	≥500	Pass
802.11g mode					
Low	2412	6	16.64	≥500	Pass
Middle	2437	6	16.64	≥500	Pass
High	2462	6	16.64	≥500	Pass

802.11b Low Channel

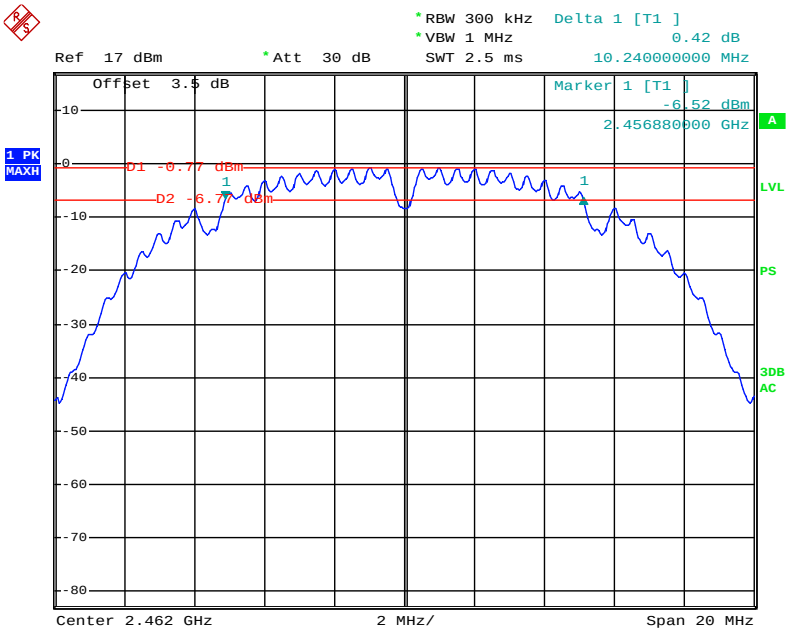


802.11b Middle Channel



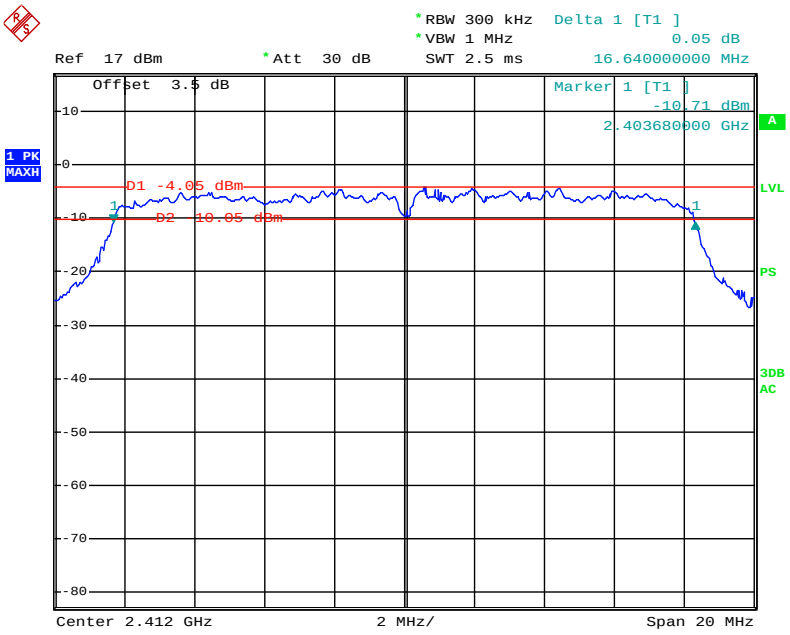
Date: 25.SEP.2012 19:34:02

802.11b High Channel



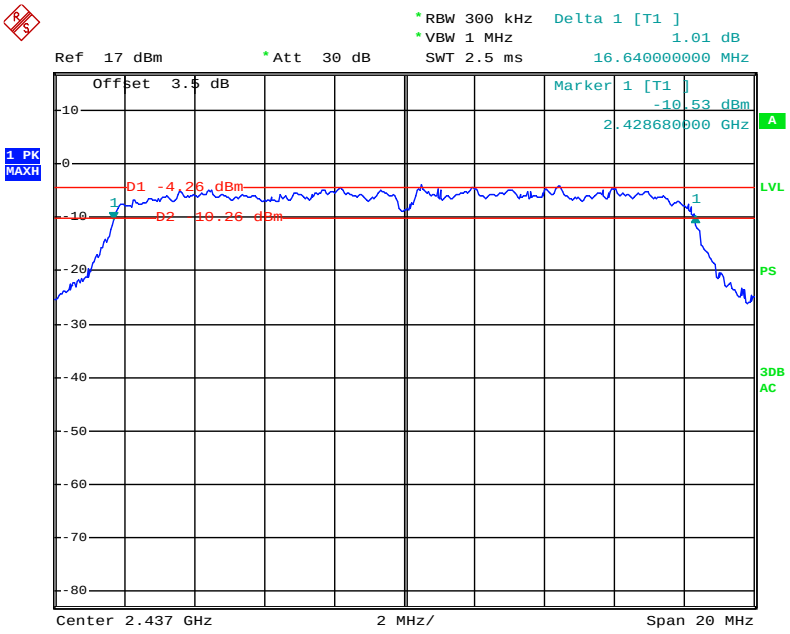
Date: 25.SEP.2012 19:35:22

802.11g Low Channel



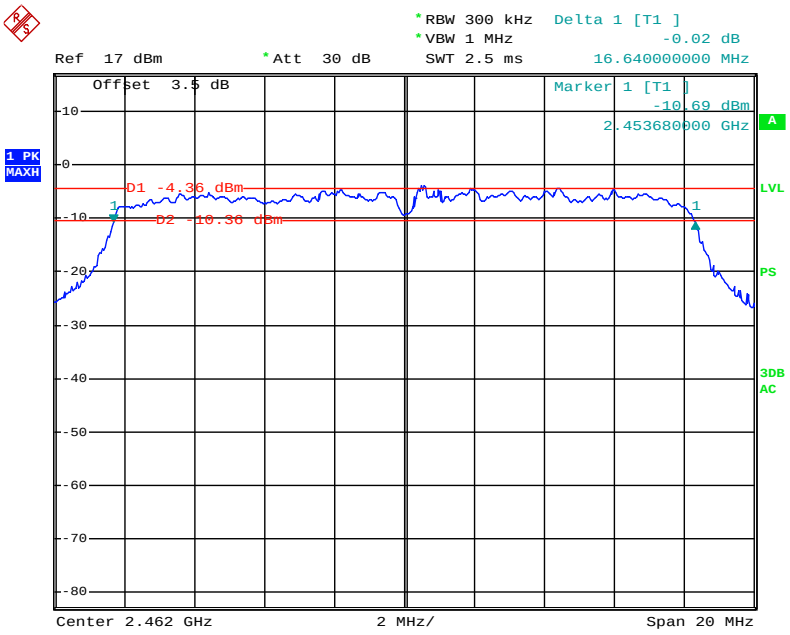
Date: 25.SEP.2012 21:45:23

802.11g Middle Channel



Date: 25.SEP.2012 21:43:06

802.11g High Channel



Date: 25.SEP.2012 21:44:07

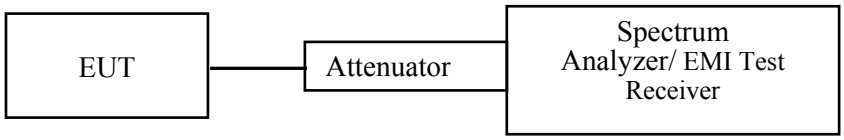
FCC §15.247(b) (3) - MAXIMUM PEAK OUTPUT POWER

Applicable Standard

According to §15.247(b) (3), for systems using digital modulation in the 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz bands: 1 Watt. As an alternative to a peak power measurement, compliance with the one Watt limit can be based on a measurement of the maximum conducted output power. Maximum Conducted Output Power is defined as the total transmit power delivered to all antennas and antenna elements averaged across all symbols in the signaling alphabet when the transmitter is operating at its maximum power control level. Power must be summed across all antennas and antenna elements. The average must not include any time intervals during which the transmitter is off or is transmitting at a reduced power level. If multiple modes of operation are possible (e.g., alternative modulation methods), the maximum conducted output power is the highest total transmit power occurring in any mode.

Test Procedure

1. Place the EUT on a bench and set it in transmitting mode.
2. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to an EMI Test Receiver.
3. Add a correction factor to the display.



Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Rohde & Schwarz	Signal Analyzer	FSIQ26	8386001028	2011-11-24	2012-11-23
Rohde & Schwarz	EMI Test Receiver	ESCI	101122	2012-08-08	2013-08-07

*** Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Shenzhen) attests that all calibrations have been performed in accordance to NVLAP requirements, traceable to the NIST.

Test Data

Environmental Conditions

Temperature:	25 ° C
Relative Humidity:	48%
ATM Pressure:	100.0 kPa

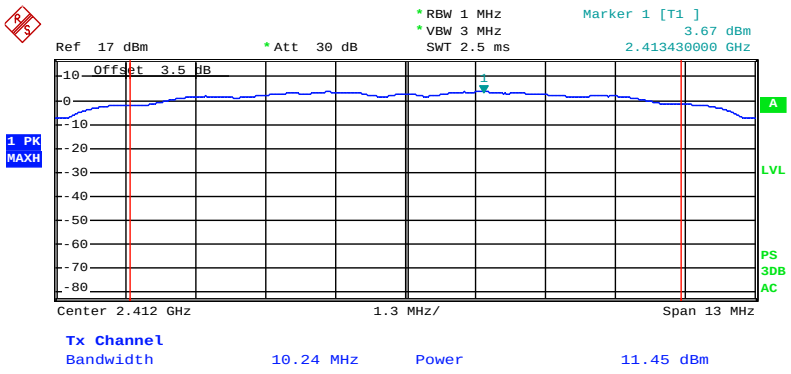
The testing was performed by Mick Yin on 2012-09-25

Test Mode: Transmitting

Test result: Compliance, please refer to the below table and plots

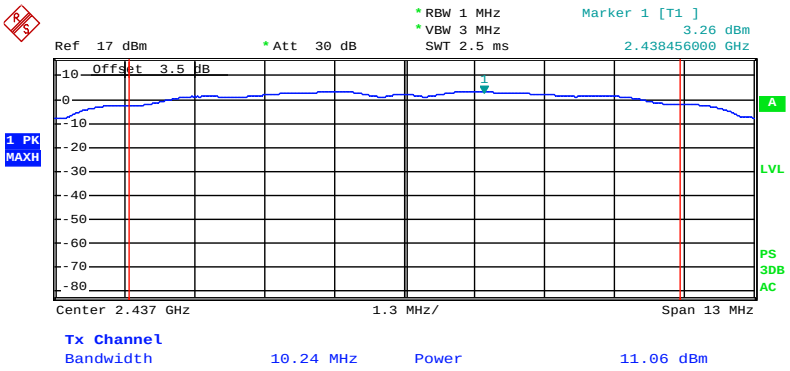
Channel	Frequency (MHz)	Data Rate (Mbps)	Output Power (dBm)	Limit (dBm)	Result
802.11b mode					
Low	2412	1	11.45	30	Pass
Middle	2437	1	11.06	30	Pass
High	2462	1	10.80	30	Pass
802.11g mode					
Low	2412	6	11.52	30	Pass
Middle	2437	6	11.65	30	Pass
High	2462	6	11.59	30	Pass

802.11b RF Output Power, Low Channel



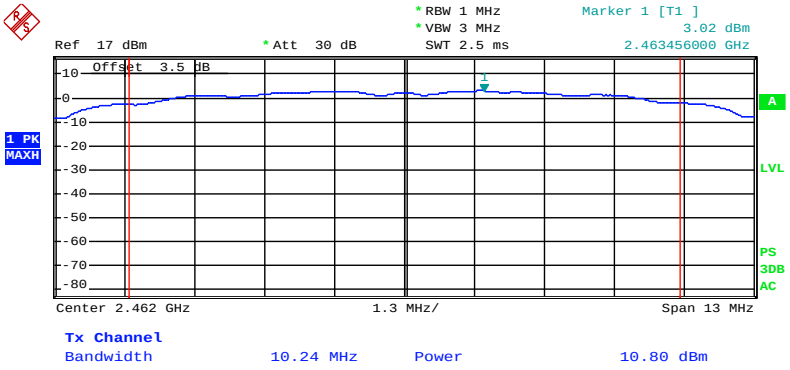
Date: 25.SEP.2012 19:44:25

802.11b RF Output Power, Middle Channel



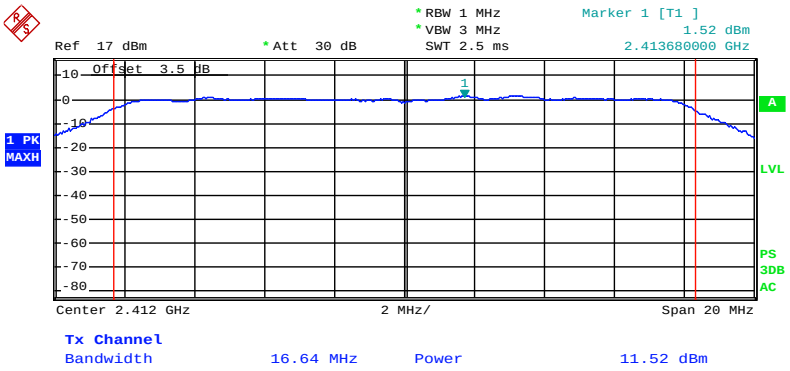
Date: 25.SEP.2012 19:45:06

802.11b RF Output Power, High Channel



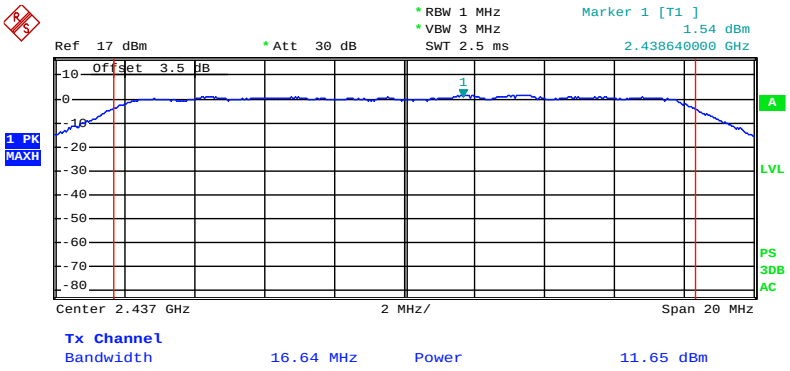
Date: 25.SEP.2012 19:45:53

802.11g RF Output Power, Low Channel



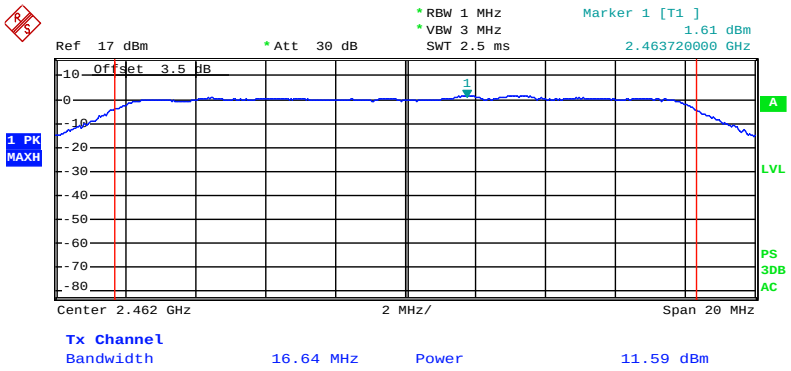
Date: 25.SEP.2012 21:46:01

802.11g RF Output Power, Middle Channel



Date: 25.SEP.2012 21:46:49

802.11g RF Output Power, High Channel



Date: 25.SEP.2012 21:47:17

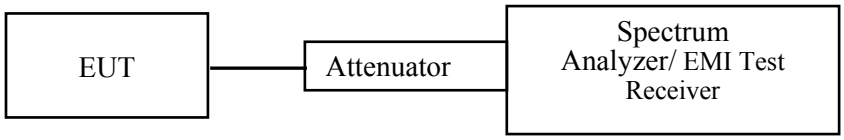
FCC §15.247(d) – 100 kHz BANDWIDTH OF FREQUENCY BAND EDGE

Applicable Standard

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in §15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a) (see §15.205(c)).

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 without connection to measurement instrument. Turn on the EUT and connect its antenna terminal to measurement instrument via a low loss cable. Then set it to any one measured frequency within its operating range, and make sure the instrument is operated in its linear range.
3. Set RBW to 100 kHz and VBW of spectrum analyzer to 300 kHz with a convenient frequency span including 100 kHz bandwidth from band edge.
4. Measure the highest amplitude appearing on spectral display and set it as a reference level. Plot the graph with marking the highest point and edge frequency.
5. Repeat above procedures until all measured frequencies were complete.



Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Rohde & Schwarz	EMI Test Receiver	ESCI	101122	2012-08-08	2013-08-07

*** Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Shenzhen) attests that all calibrations have been performed in accordance to NVLAP requirements, traceable to the NIST.

Test Data

Environmental Conditions

Temperature:	25 ° C
Relative Humidity:	48
ATM Pressure:	100.0 kPa

The testing was performed by Mick Yin on 2012-09-25

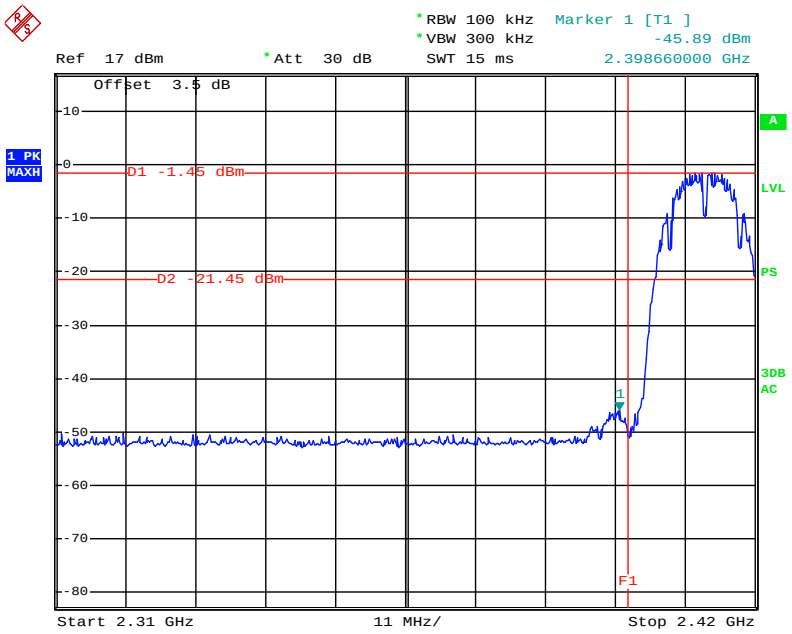
Test Mode: Transmitting

Test Result: *Compliance, please refer to the below table and plots*

Frequency (MHz)	Delta Peak to band emission (dBc)	Limit (dBc)	Result
802.11b mode			
2398.66	44.44	20	Pass
2487.67	48.80	20	Pass
802.11g mode			
2399.54	31.42	20	Pass
2484.07	42.81	20	Pass

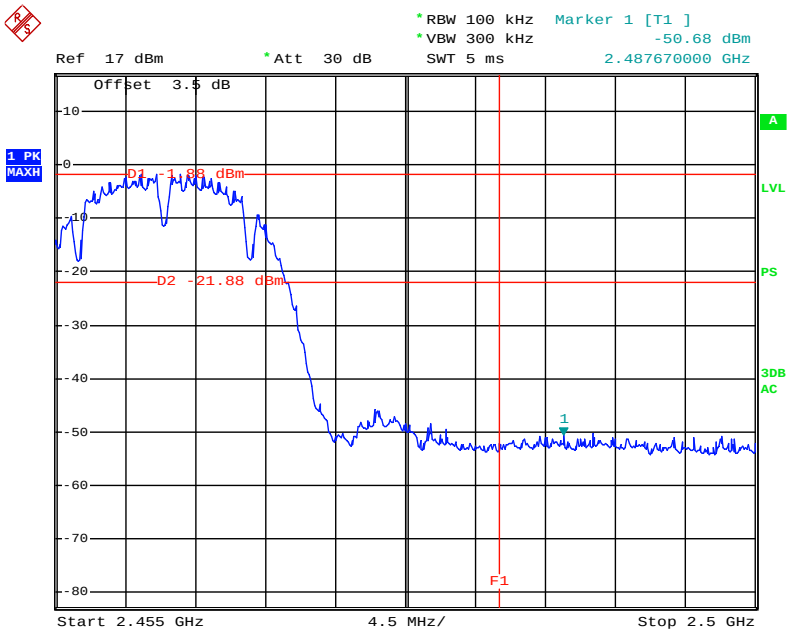
Please refer to following plots.

802.11b Band Edge, Left Side



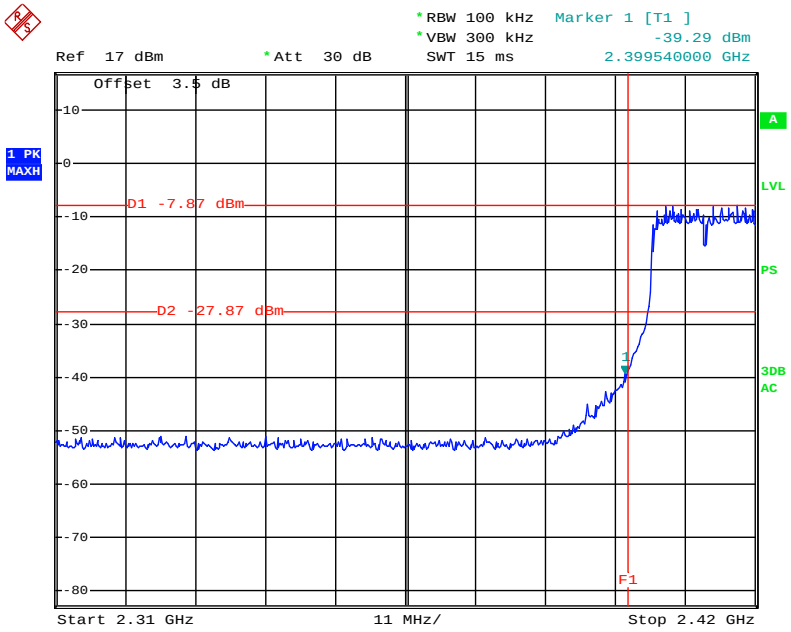
Date: 25.SEP.2012 20:40:34

802.11b Band Edge, Right Side



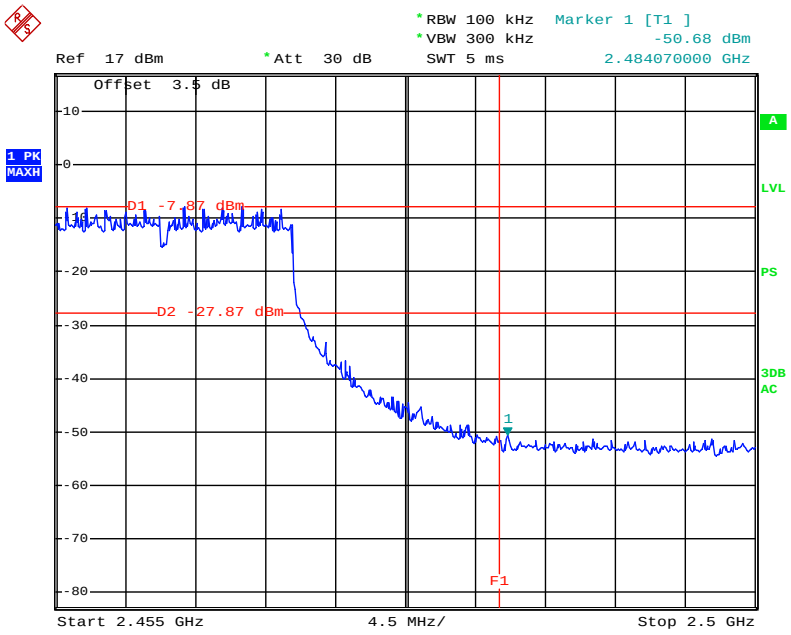
Date: 25.SEP.2012 20:44:35

802.11g Band Edge, Left Side



Date: 25.SEP.2012 21:51:08

802.11g Band Edge, Right Side



Date: 25.SEP.2012 21:52:31

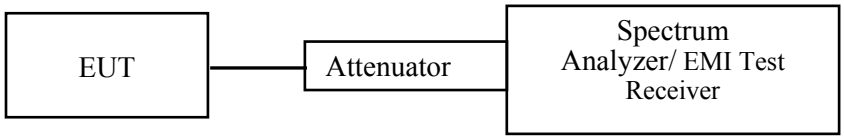
FCC §15.247(e) - POWER SPECTRAL DENSITY

Applicable Standard

For digitally modulated systems, the power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission. This power spectral density shall be determined in accordance with the provisions of paragraph (b) of this section. The same method of determining the conducted output power shall be used to determine the power spectral density.

Test Procedure

1. Use this procedure when the maximum peak conducted output power in the fundamental emission is used to demonstrate compliance.
2. Set the RBW = 100 kHz.
3. Set the VBW ≥ 300 kHz.
4. Set the span to 5-30 % greater than the EBW.
5. Detector = peak.
6. Sweep time = auto couple.
7. Trace mode = max hold.
8. Allow trace to fully stabilize.
9. Use the peak marker function to determine the maximum power level in any 100 kHz band segment within the fundamental EBW.
10. Scale the observed power level to an equivalent value in 3 kHz by adjusting (reducing) the measured power by a bandwidth correction factor (BWCF) where BWCF = 10log (3 kHz/100 kHz = -15.2 dB).
11. The resulting peak PSD level must be ≤ 8 dBm.



Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Rohde & Schwarz	EMI Test Receiver	ESCI	101122	2012-08-08	2013-08-07

*** Statement of Traceability:** Bay Area Compliance Lab Corp. (Shenzhen) attests that all calibrations have been performed in accordance to NVLAP requirements, traceable to the NIST.

Test Data

Environmental Conditions

Temperature:	25 °C
Relative Humidity:	48%
ATM Pressure:	100.0 kPa

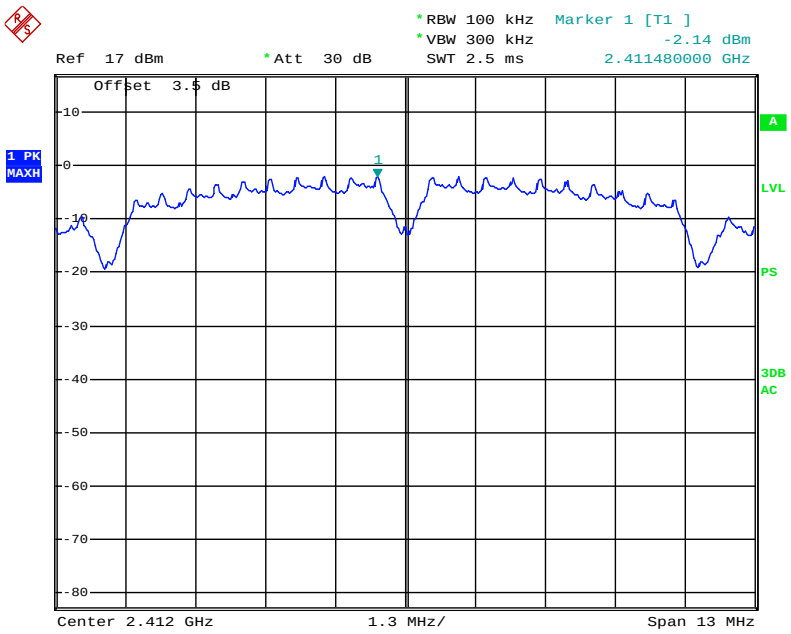
The testing was performed by Mick Yin on 2012-09-25

Test Mode: Transmitting

Test Result: Pass, please refer to the below table and plots

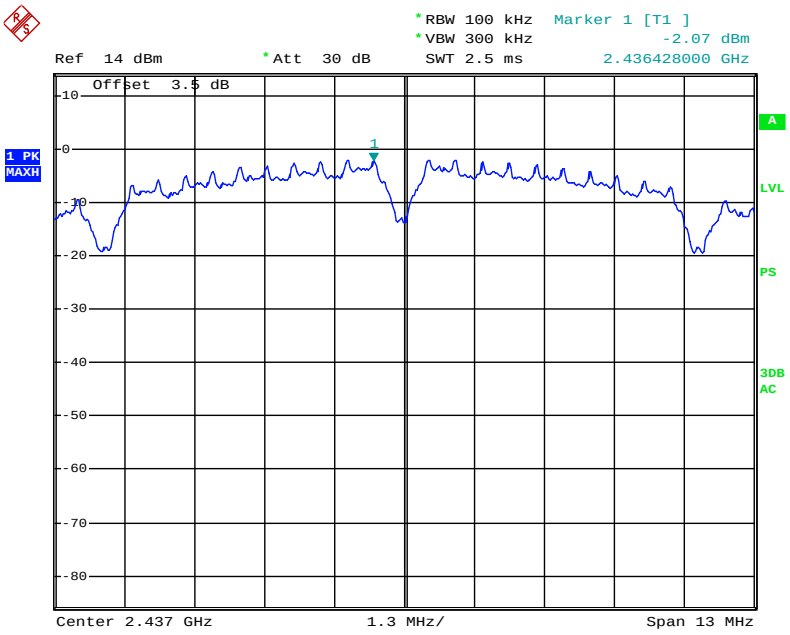
Channel	Frequency (MHz)	Data Rate (Mbps)	Power spectral density (dBm/100kHz)	BWCF (dB)	Power spectral density (dBm/3kHz)	Limit (dBm/3kHz)
802.11b mode						
Low	2412	1	-2.14	-15.2	-17.34	8
Middle	2437	1	-2.07	-15.2	-17.27	8
High	2462	1	-2.17	-15.2	-17.37	8
802.11g mode						
Low	2412	6	-7.86	-15.2	-23.06	8
Middle	2437	6	-7.65	-15.2	-22.85	8
High	2462	6	-7.78	-15.2	-22.98	8

Power Spectral Density, 802.11b Low Channel



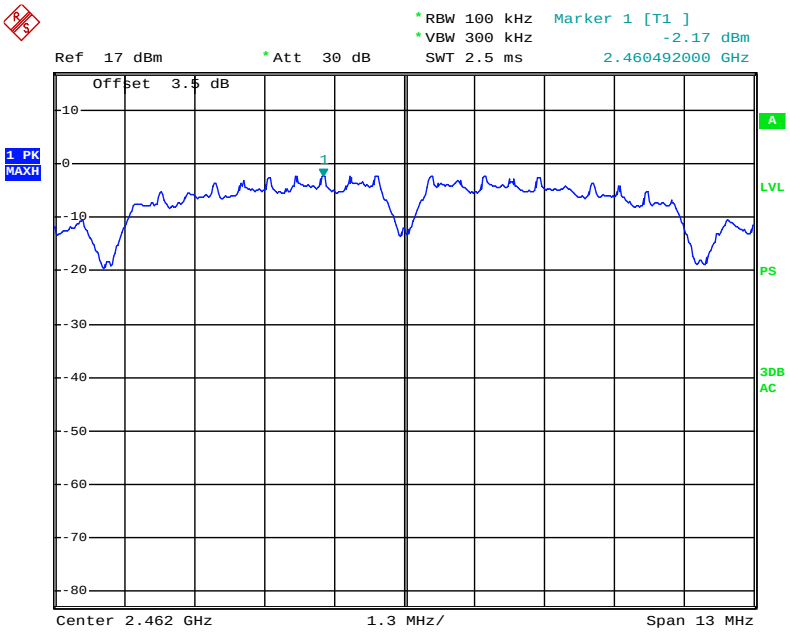
Date: 25.SEP.2012 19:49:13

Power Spectral Density, 802.11b Middle Channel



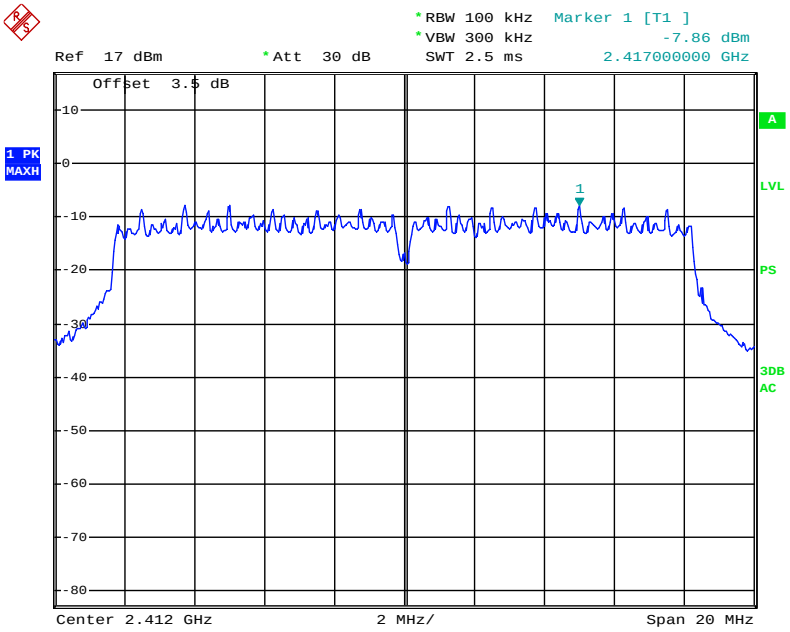
Date: 9.OCT.2012 22:04:13

Power Spectral Density, 802.11b High Channel



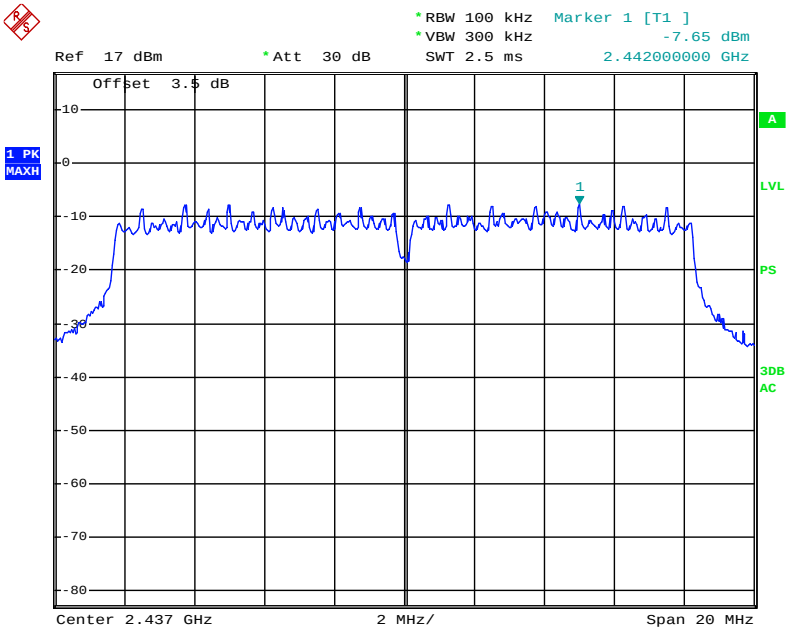
Date: 25.SEP.2012 19:50:48

Power Spectral Density, 802.11g Low Channel



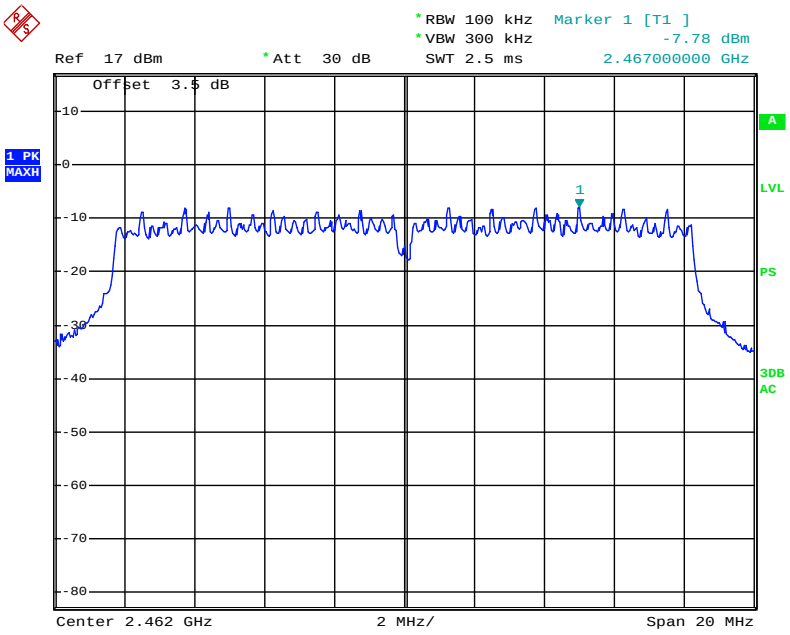
Date: 25.SEP.2012 21:48:33

Power Spectral Density, 802.11g Middle Channel



Date: 25.SEP.2012 21:49:08

Power Spectral Density, 802.11g High Channel



Date: 25.SEP.2012 21:53:18

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