

FCC PART 15.247
MEASUREMENT AND TEST REPORT

For

Gajah International (HK) Co., Ltd

18/F Bel Trade Commercial Building, 1-3, Burrows Street, Wan Chai, Hong Kong

FCC ID: UFKMD7007C0

Report Type: Original Report	Product Type: 7'' MID
Test Engineer: Tiger Ye 	
Report Number: RSZ130327005-00B	
Report Date: 2013-04-26	
Reviewed By: RF Leader Alvin Huang 	
Prepared By: 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	

Note: This test report is prepared for the customer shown above and for the equipment described herein. It may not be duplicated or used in part without prior written consent from Bay Area Compliance Laboratories Corp.

TABLE OF CONTENTS

GENERAL INFORMATION.....	4
PRODUCT DESCRIPTION FOR EQUIPMENT UNDER TEST (EUT)	4
OBJECTIVE	4
RELATED SUBMITTAL(S)/GRANT(S)	4
TEST METHODOLOGY	4
TEST FACILITY	5
SYSTEM TEST CONFIGURATION.....	6
DESCRIPTION OF TEST CONFIGURATION	6
EUT EXERCISE SOFTWARE	6
EQUIPMENT MODIFICATIONS	6
SUPPORT EQUIPMENT LIST AND DETAILS	6
EXTERNAL I/O CABLING LIST AND DETAILS.....	6
BLOCK DIAGRAM OF TEST SETUP	7
SUMMARY OF TEST RESULTS.....	8
FCC §15.247 (i) & §2.1093 – RF EXPOSURE	9
APPLICABLE STANDARD	9
RESULT	9
FCC §15.203 - ANTENNA REQUIREMENT.....	10
APPLICABLE STANDARD	10
ANTENNA CONNECTOR CONSTRUCTION	10
FCC §15.207 (a) - CONDUCTED EMISSIONS	11
APPLICABLE STANDARD	11
MEASUREMENT UNCERTAINTY	11
EUT SETUP.....	11
EMI TEST RECEIVER SETUP.....	12
TEST EQUIPMENT LIST AND DETAILS.....	12
TEST PROCEDURE	12
TEST RESULTS SUMMARY	12
TEST DATA	12
FCC §15.209, §15.205 & §15.247(d) - SPURIOUS EMISSIONS.....	15
APPLICABLE STANDARD	15
MEASUREMENT UNCERTAINTY	15
EUT SETUP.....	15
EMI TEST RECEIVER & SPECTRUM ANALYZER SETUP	16
TEST EQUIPMENT LIST AND DETAILS.....	16
TEST PROCEDURE	16
CORRECTED AMPLITUDE & MARGIN CALCULATION	17
TEST RESULTS SUMMARY	17
TEST DATA	17
FCC §15.247(a) (2) – 6 dB BANDWIDTH.....	29
APPLICABLE STANDARD	29
TEST PROCEDURE	29
TEST EQUIPMENT LIST AND DETAILS.....	29
TEST DATA	29

FCC §15.247(b) (3) - MAXIMUM PEAK OUTPUT POWER	36
APPLICABLE STANDARD	36
TEST PROCEDURE	36
TEST EQUIPMENT LIST AND DETAILS.....	36
TEST DATA	36
FCC §15.247(d) – 100 kHz BANDWIDTH OF FREQUENCY BAND EDGE.....	43
APPLICABLE STANDARD	43
TEST PROCEDURE	43
TEST EQUIPMENT LIST AND DETAILS.....	43
TEST DATA	44
FCC §15.247(e) - POWER SPECTRAL DENSITY	48
APPLICABLE STANDARD	48
TEST PROCEDURE	48
TEST EQUIPMENT LIST AND DETAILS.....	48
TEST DATA	48

GENERAL INFORMATION

Product Description for Equipment under Test (EUT)

The *Gajah International (HK) Co., Ltd*'s product, model number: *MD7007C (FCC ID: UFKMD7007C0)* or the "EUT" as referred to in this report was a 7'' *MID*, which was measured approximately: 19.7 cm (L) x 12.5 cm (W) x 1.2 cm (H), rated input voltage: DC 3.7V battery and DC 5V charging from adapter.

Adapter information: AC/DC ADAPTER
Model: SK02G-0500200U
Input: AC100-240V~ 50/60Hz 0.35A max
Output: DC 5.0V 2A

** All measurement and test data in this report was gathered from production sample serial number: 1303108 (Assigned by the BACL, Shenzhen). The EUT supplied by the applicant was received on 2013-03-27.*

Objective

This report is prepared on behalf of *Gajah International (HK) Co., 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, section 15.203, 15.205, 15.207, 15.209 and 15.247 rules.

Related Submittal(s)/Grant(s)

FCC Part 15B JBP and 15.247 DSS (BT) submissions with FCC ID: UFKMD7007C0.

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 at 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.

SYSTEM TEST CONFIGURATION

Description of Test Configuration

For 802.11b, 802.11g and 802.11n-HT20 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 and 802.11n-HT20 modes were tested with Channel 1, 6 and 11.

The worst-case data rates are determined to be as follows for each mode based upon investigations by measuring the average power and PSD across all data rates bandwidths, and modulations.

EUT Exercise Software

Test with adb command.

The test was performed under:

802.11b: Data rate: 1 Mbps. Power level: 7

802.11g: Data rate: 6 Mbps. Power level: 4

802.11n-HT20: Data rate: MCS0. Power level: 3

Equipment Modifications

No modification was made to the EUT tested.

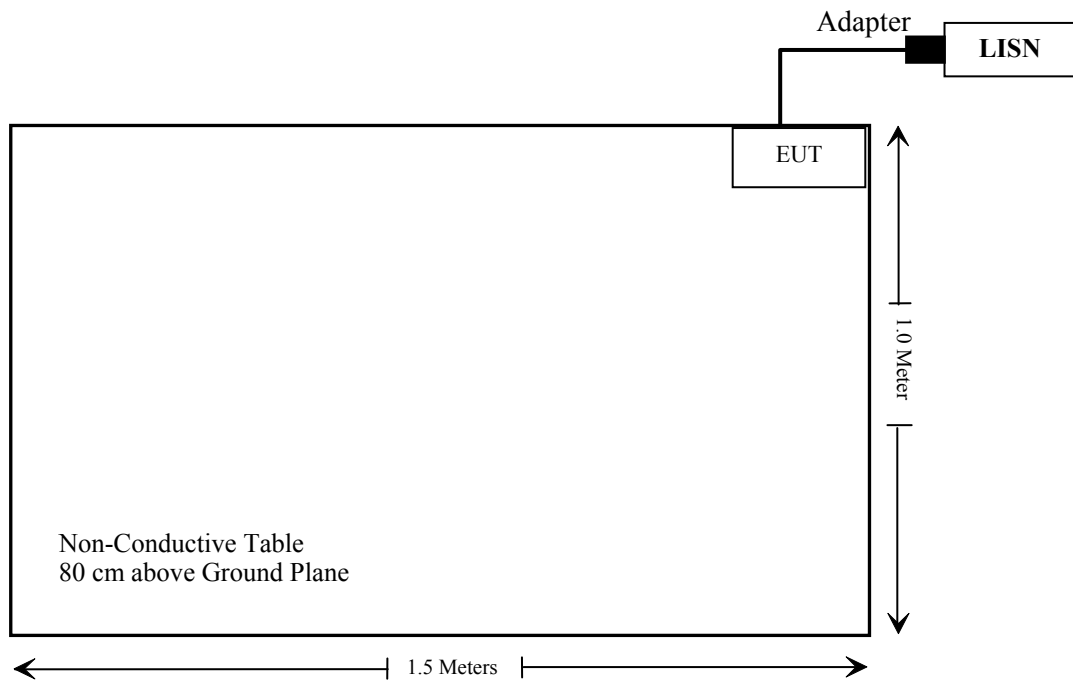
Support Equipment List and Details

Manufacturer	Description	Model	Serial Number
/	/	/	/

External I/O Cabling List and Details

Cable Description	Length (m)	From	To
Shielded Detachable USB Cable	1	EUT	Adapter

Block Diagram of Test Setup



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) & §2.1093 – RF EXPOSURE

Applicable Standard

According to FCC §2.1093 and §1.1307(b) (1), 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 General RF Exposure Guidance v05

Result

According to FCC KDB 447498 D01 General RF Exposure Guidance v05 generic portable criteria

The Max output power: 9.70 dBm=9.33 mW

According to the Appendix A of KDB 447498, the exclusion thresholds for 2450 MHz is 10 mW

Conclusion:

The time-averaged output power is 9.33 mW < the exclusion thresholds 10 mW, so stand-alone SAR evaluation is not required.

Result: Compliance

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.

Antenna Connector Construction

The EUT has an integrated antenna arrangement, which was permanently attached and the gain was -2 dBi, fulfill the requirement of this section. Please refer to the internal photos.

Result: Compliance.

FCC §15.207 (a) - CONDUCTED EMISSIONS

Applicable Standard

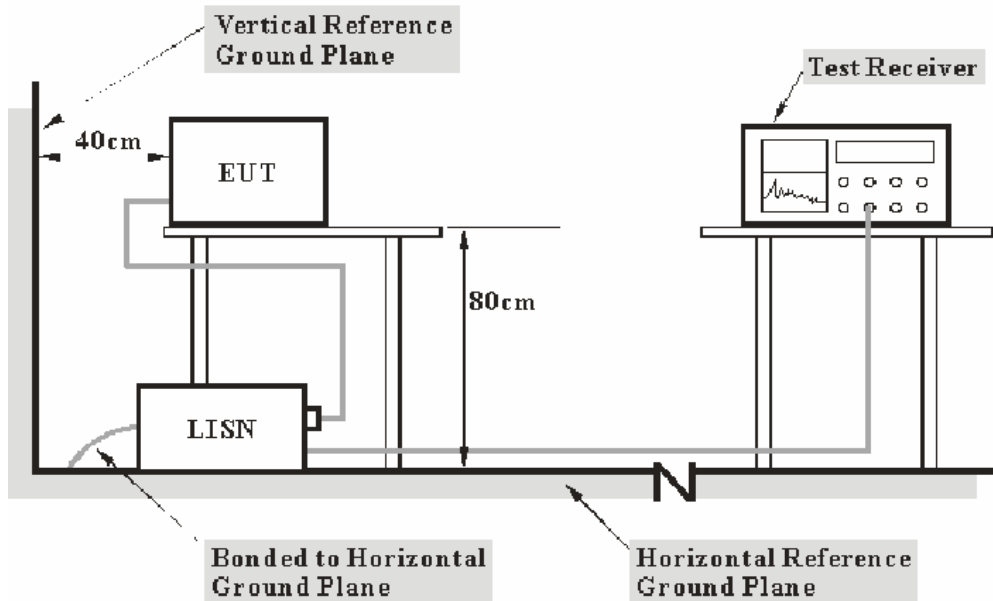
According to FCC§15.207

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 16-4-2, 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 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 setup of EUT is according with ANSI C63.4-2009 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 V_{AC}/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 Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Rohde & Schwarz	EMI Test Receiver	ESCS30	100176	2012-11-24	2013-11-23
Rohde & Schwarz	L.I.S.N.	ESH2-Z5	892107/021	2012-08-22	2013-08-21
Rohde & Schwarz	Transient Limiter	ESH3Z2	DE25985	2012-08-09	2013-08-09
BACL	CE Test software	BACL-CE	V1.0	-	-

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

Test Procedure

During the conducted emission test, the adapter was connected to the 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 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:

6.43 dB at 0.375 MHz in the Line conducted mode

Test Data

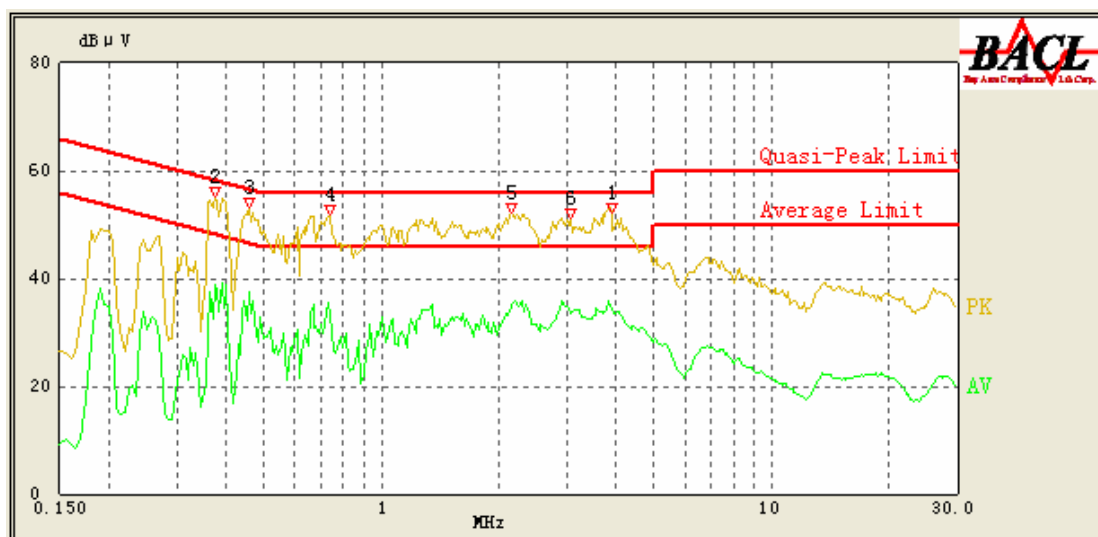
Environmental Conditions

Temperature:	24 °C
Relative Humidity:	50 %
ATM Pressure:	100.0 kPa

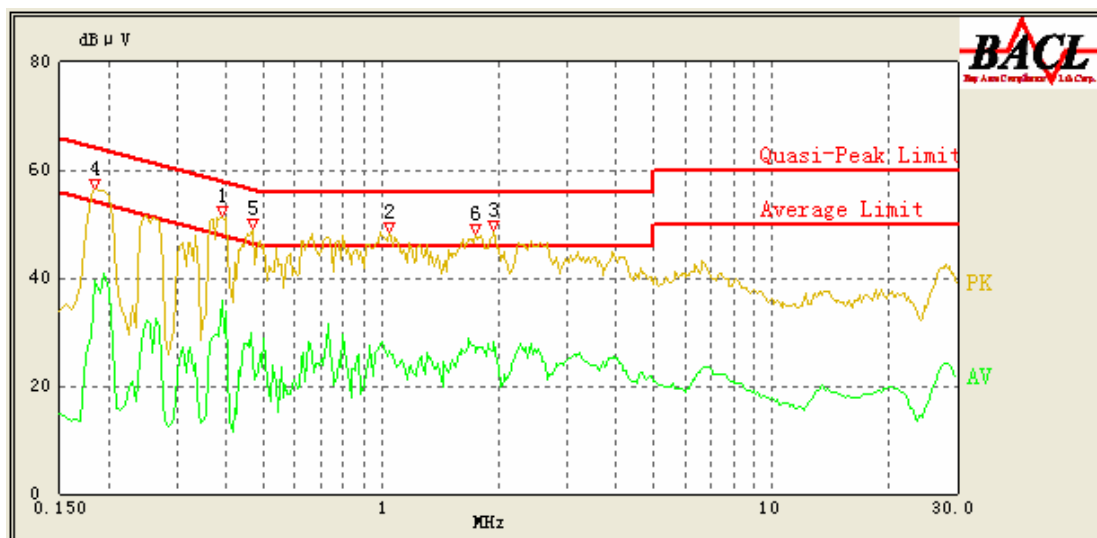
The testing was performed by Tiger Ye on 2013-04-13.

EUT operation mode: Transmitting & charging

AC 120V / 60Hz - Line



Frequency (MHz)	Corrected Amplitude (dBμV)	Corrected Factor (dB)	Limit (dBμV)	Margin (dB)	Detector (PK /QP/Ave.)
0.375	53.14	10.20	59.57	6.43	QP
0.460	50.47	10.20	57.14	6.67	QP
0.740	48.50	10.20	56.00	7.50	QP
2.150	47.58	10.20	56.00	8.42	QP
0.460	37.62	10.20	47.14	9.52	AV
2.150	35.31	10.20	46.00	10.69	AV
0.375	38.73	10.20	49.57	10.84	AV
3.900	44.47	10.20	56.00	11.53	QP
3.885	34.44	10.20	46.00	11.56	AV
3.050	43.79	10.20	56.00	12.21	QP
3.050	33.52	10.20	46.00	12.48	AV
0.740	33.25	10.20	46.00	12.75	AV

Neutral:

Frequency (MHz)	Corrected Amplitude (dBμV)	Corrected Factor (dB)	Limit (dBμV)	Margin (dB)	Detector (PK/QP/Ave.)
1.940	39.37	10.20	56.00	16.63	QP
1.940	28.25	10.20	46.00	17.75	AV
0.470	25.08	10.17	46.86	21.78	AV
1.750	26.04	10.20	46.00	19.96	AV
0.470	48.52	10.17	56.86	8.34	QP
0.390	48.71	10.10	59.14	10.43	QP
1.045	43.70	10.20	56.00	12.30	QP
1.750	42.89	10.20	56.00	13.11	QP
0.390	35.81	10.10	49.14	13.33	AV
0.185	39.43	10.10	55.00	15.57	AV
0.185	46.58	10.10	65.00	18.42	QP
1.045	26.64	10.20	46.00	19.36	AV

Note:

- 1) Corrected Amplitude = Reading + Correction Factor
- 2) Correction Factor = LISN VDF + 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

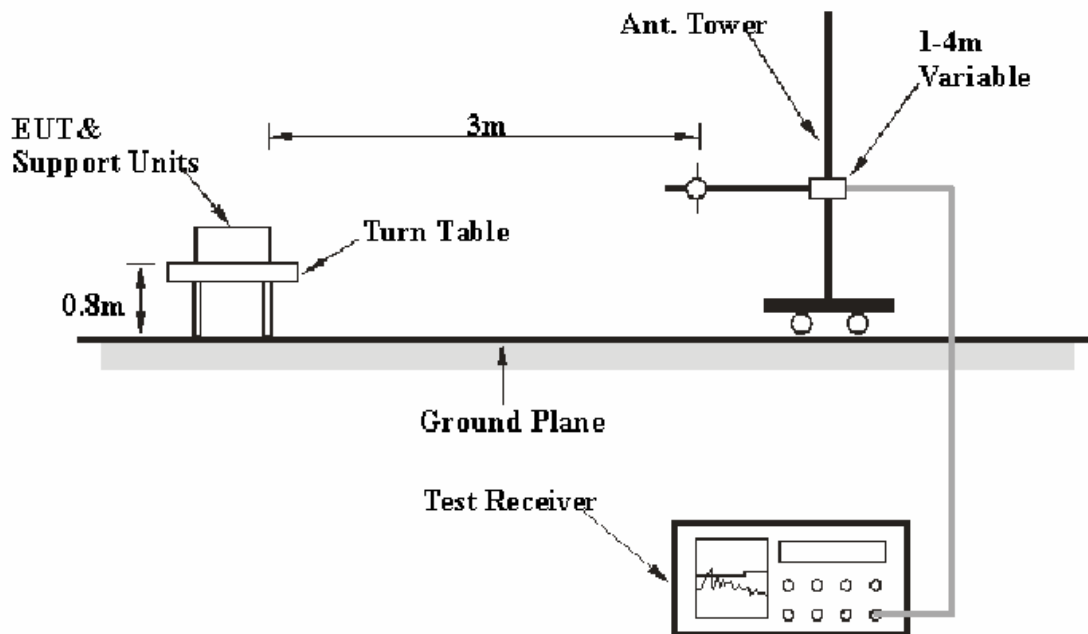
FCC §15.247 (d); §15.209; §15.205;

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 16-4-2, The Treatment of Uncertainty in EMC Measurements, the best estimate of the uncertainty of 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 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	IF B/W	Detector
30 MHz – 1000 MHz	100 kHz	300 kHz	120 kHz	QP
Above 1 GHz	1MHz	3 MHz	/	PK
	1MHz	10 Hz	/	Ave.

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
HP	Amplifier	8447E	1937A01046	2012-11-24	2013-11-23
Rohde & Schwarz	EMI Test Receiver	ESCI	101122	2012-08-08	2013-08-07
Sunol Sciences	Broadband Antenna	JB1	A040904-2	2011-11-28	2014-11-27
Mini-Circuits	Amplifier	ZVA-213+	N/A	2012-11-24	2013-11-23
Sunol Sciences	Horn Antenna	DRH-118	A052304	2011-12-01	2014-11-30
Rohde & Schwarz	Signal Analyzer	FSIQ26	8386001028	2012-11-24	2013-11-23
Agilent	Spectrum Analyzer	8564E	3943A01781	2012-05-17	2013-05-17
the electro-Mechanics Co.	Horn Antenna	3116	9510-2270	2010-10-14	2013-10-13

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

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.

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 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:

3.56 dB at 2389.8 MHz in the Horizontal polarization for 802.11g mode

Test Data

Environmental Conditions

Temperature:	24~26 °C
Relative Humidity:	50~55 %
ATM Pressure:	100.0~101.1 kPa

The testing was performed by Tiger Ye on 2013-04-13 and 2013-04-20.

EUT operation 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 15.247/15.205/15.209	
	Reading (dBμV)	Detector (PK/QP/Ave.)		Height (m)	Polar (H/V)			Limit (dBμV/m)	Margin (dB)
Low Channel (2412 MHz)									
2412.0	87.28	PK	35	1.1	H	6.13	93.41	/	/
2412.0	76.71	Ave.	35	1.1	H	6.13	82.84	/	/
2412.0	91.43	PK	112	1.3	V	6.13	97.56	/	/
2412.0	81.29	Ave.	112	1.3	V	6.13	87.42	/	/
9648.0	21.69	Ave.	25	1.2	V	19.29	40.98	54	13.02
7236.0	24.08	Ave.	93	1.3	H	16.62	40.7	54	13.3
4824.0	22.46	Ave.	113	1.1	H	12.40	34.86	54	19.14
9648.0	35.11	PK	25	1.2	V	19.29	54.4	74	19.6
7236.0	37.13	PK	93	1.3	H	16.62	53.75	74	20.25
2486.2	24.73	Ave.	36	1.3	H	7.21	31.94	54	22.06
4824.0	36.83	PK	113	1.1	H	12.40	49.23	74	24.77
2375.5	22.84	Ave.	11	1.2	V	6.13	28.97	54	25.03
2331.1	21.67	Ave.	58	1.1	V	5.48	27.15	54	26.85
2486.2	36.87	PK	36	1.3	H	7.21	44.08	74	29.92
2375.5	37.86	PK	11	1.2	V	6.13	43.99	74	30.01
2331.1	35.41	PK	58	1.1	V	5.48	40.89	74	33.11
Middle Channel (2437 MHz)									
2437.0	85.47	PK	55	1.2	H	7.21	92.68	/	/
2437.0	74.57	Ave.	55	1.2	H	7.21	81.78	/	/
2437.0	90.68	PK	13	1.1	V	7.21	97.89	/	/
2437.0	79.96	Ave.	13	1.1	V	7.21	87.17	/	/
7311.0	23.41	Ave.	102	1.2	V	16.49	39.90	54	14.10
9748.0	18.74	Ave.	11	1.0	H	19.40	38.14	54	15.86
7311.0	37.55	PK	102	1.2	V	16.49	54.04	74	19.96
4874.0	21.37	Ave.	69	1.3	V	12.46	33.83	54	20.17
9748.0	32.55	PK	11	1.0	H	19.40	51.95	74	22.05
4874.0	38.22	PK	69	1.3	V	12.46	50.68	74	23.32
2342.2	23.42	Ave.	125	1.2	H	5.48	28.90	54	25.10
2491.6	21.57	Ave.	13	1.1	V	7.21	28.78	54	25.22
2332.5	21.69	Ave.	66	1.3	H	5.48	27.17	54	26.83
2491.6	36.23	PK	13	1.1	V	7.21	43.44	74	30.56
2332.5	36.77	PK	66	1.3	H	5.48	42.25	74	31.75
2342.2	34.67	PK	125	1.2	H	5.48	40.15	74	33.85

Frequency (MHz)	Receiver		Turntable Degree	Rx Antenna		Corrected Factor (dB)	Corrected Amplitude (dBμV/m)	FCC Part 15.247/15.205/15.209	
	Reading (dBμV)	Detector (PK/QP/Ave.)		Height (m)	Polar (H/V)			Limit (dBμV/m)	Margin (dB)
High Channel(2462 MHz)									
2462.0	85.16	PK	67	1.2	V	7.21	92.37	/	/
2462.0	79.73	Ave.	67	1.2	V	7.21	86.94	/	/
2462.0	91.58	PK	113	1.1	H	7.21	98.79	/	/
2462.0	85.26	Ave.	113	1.1	H	7.21	92.47	/	/
7236.0	21.69	Ave.	82	1.1	V	16.62	38.31	54	15.69
9648.0	18.32	Ave.	31	1.3	H	19.40	37.72	54	16.28
4824.0	25.19	Ave.	111	1.2	V	12.40	37.59	54	16.41
9648.0	31.82	PK	31	1.3	H	19.40	51.22	74	22.78
7236.0	33.71	PK	82	1.1	V	16.62	50.33	74	23.67
2347.5	24.17	Ave.	82	1.2	V	5.48	29.65	54	24.35
2489.5	22.07	Ave.	102	1.1	V	7.21	29.28	54	24.72
4824.0	35.87	PK	111	1.2	V	12.40	48.27	74	25.73
2372.1	21.03	Ave.	64	1.3	H	6.13	27.16	54	26.84
2489.5	34.99	PK	102	1.1	V	7.21	42.20	74	31.80
2347.5	36.01	PK	82	1.2	V	5.48	41.49	74	32.51
2372.1	35.24	PK	64	1.3	H	6.13	41.37	74	32.63

802.11g mode:

Frequency (MHz)	Receiver		Turntable Degree	Rx Antenna		Corrected Factor (dB)	Corrected Amplitude (dBμV/m)	FCC Part 15.247/15.205/15.209	
	Reading (dBμV)	Detector (PK/QP/Ave.)		Height (m)	Polar (H/V)			Limit (dBμV/m)	Margin (dB)
Low Channel(2412 MHz)									
2412.0	83.8	PK	68	1.2	H	6.13	89.93	/	/
2412.0	59.78	Ave.	68	1.2	H	6.13	65.91	/	/
2412.0	87.08	PK	16	1.1	V	6.13	93.21	/	/
2412.0	62.72	Ave.	16	1.1	V	6.13	68.85	/	/
9648.0	19.07	Ave.	27	1.1	H	19.28	38.35	54	15.65
7236.0	20.13	Ave.	135	1.3	V	16.62	36.75	54	17.25
4824.0	22.89	Ave.	102	1.2	V	12.40	35.29	54	18.71
2495.0	24.40	Ave.	31	1.1	V	7.21	31.61	54	22.39
9648.0	31.12	PK	27	1.1	H	19.28	50.40	74	23.60
4824.0	36.85	PK	102	1.2	V	12.40	49.25	74	24.75
7236.0	32.05	PK	135	1.3	V	16.62	48.67	74	25.33
2345.2	21.74	Ave.	77	1.3	H	5.48	27.22	54	26.78
2372.5	20.94	Ave.	85	1.5	H	6.13	27.07	54	26.93
2495.0	37.02	PK	31	1.1	V	7.21	44.23	74	29.77
2345.2	36.66	PK	77	1.3	H	5.48	42.14	74	31.86
2372.5	35.87	PK	85	1.5	H	6.13	42.00	74	32.00
Middle Channel(2437 MHz)									
2437.0	81.78	PK	69	1.2	H	7.21	88.99	/	/
2437.0	59.78	Ave.	69	1.2	H	7.21	66.99	/	/
2437.0	87.08	PK	110	1.1	V	7.21	94.29	/	/
2437.0	62.72	Ave.	110	1.1	V	7.21	69.93	/	/
9748.0	19.83	Ave.	88	1.2	V	19.40	39.23	54	14.77
7311.0	21.69	Ave.	36	1.1	V	16.49	38.18	54	15.82
4874.0	22.41	Ave.	74	1.2	H	12.46	34.87	54	19.13
9748.0	31.77	PK	88	1.2	V	19.40	51.17	74	22.83
2492.5	23.65	Ave.	101	1.3	H	7.21	30.86	54	23.14
7311.0	32.97	PK	36	1.1	V	16.49	49.46	74	24.54
2386.1	22.14	Ave.	36	1.1	V	6.13	28.27	54	25.73
4874.0	35.74	PK	74	1.2	H	12.46	48.20	74	25.80
2361.6	21.18	Ave.	74	1.0	H	5.48	26.66	54	27.34
2492.5	36.87	PK	101	1.3	H	7.21	44.08	74	29.92
2386.1	35.91	PK	36	1.1	V	6.13	42.04	74	31.96
2361.6	34.67	PK	74	1.0	H	5.48	40.15	74	33.85

Frequency (MHz)	Receiver		Turntable Degree	Rx Antenna		Corrected Factor (dB)	Corrected Amplitude (dBµV/m)	FCC Part 15.247/15.205/15.209	
	Reading (dBµV)	Detector (PK/QP/Ave.)		Height (m)	Polar (H/V)			Limit (dBµV/m)	Margin (dB)
High Channel(2462 MHz)									
2462.0	82.02	PK	67	1.2	H	7.21	89.23	/	/
2462.0	60.44	Ave.	67	1.2	H	7.21	67.65	/	/
2462.0	87.25	PK	11	1.1	V	7.21	94.46	/	/
2462.0	63.41	Ave.	11	1.1	V	7.21	70.62	/	/
9748.0	24.73	Ave.	36	1.1	H	19.40	44.13	54	9.87
7386.0	22.74	Ave.	21	1.2	V	15.91	38.65	54	15.35
9748.0	37.93	PK	36	1.1	H	19.40	57.33	74	16.67
4924.0	21.09	Ave.	74	1.4	H	12.50	33.59	54	20.41
7386.0	36.74	PK	21	1.2	V	15.91	52.65	74	21.35
2493.2	24.71	Ave.	36	1.1	H	7.21	31.92	54	22.08
2483.7	22.78	Ave.	24	1.2	V	7.21	29.99	54	24.01
4924.0	35.59	PK	74	1.4	H	12.50	48.09	74	25.91
2332.1	21.58	Ave.	85	1.3	V	5.48	27.06	54	26.94
2493.2	36.85	PK	36	1.1	H	7.21	44.06	74	29.94
2483.7	35.16	PK	24	1.2	V	7.21	42.37	74	31.63
2332.1	33.74	PK	85	1.3	V	5.48	39.22	74	34.78

802.11n-HT20 mode:

Frequency (MHz)	Receiver		Turntable Degree	Rx Antenna		Corrected Factor (dB)	Corrected Amplitude (dBμV/m)	FCC Part 15.247/15.205/15.209	
	Reading (dBμV)	Detector (PK/QP/Ave.)		Height (m)	Polar (H/V)			Limit (dBμV/m)	Margin (dB)
Low Channel(2412 MHz)									
2412.0	83.57	PK	67	1.2	H	6.13	89.70	/	/
2412.0	61.49	Ave.	67	1.2	H	6.13	67.62	/	/
2412.0	88.81	PK	113	1.1	V	6.13	94.94	/	/
2412.0	65.55	Ave.	113	1.1	V	6.13	71.68	/	/
4824.0	25.15	Ave.	223	1.2	H	12.40	37.55	54	16.45
9648.0	18.21	Ave.	41	1.2	V	19.29	37.50	54	16.50
7236.0	18.26	Ave.	25	1.2	H	16.62	34.88	54	19.12
2389.3	27.25	Ave.	123	1.1	H	6.13	33.38	54	20.62
9648.0	32.88	PK	41	1.2	V	19.29	52.17	74	21.83
2483.4	24.44	Ave.	99	1.2	V	6.81	31.25	54	22.75
4824.0	38.25	PK	223	1.2	H	12.40	50.65	74	23.35
7236.0	33.65	PK	25	1.2	H	16.62	50.27	74	23.73
2332.6	24.11	Ave.	12	1.3	V	5.48	29.59	54	24.41
2389.3	43.29	PK	123	1.1	H	6.13	49.42	74	24.58
2483.4	40.17	PK	99	1.2	V	6.81	46.98	74	27.02
2332.6	40.26	PK	12	1.3	V	5.48	45.74	74	28.26
Middle Channel(2437 MHz)									
2437.0	83.22	PK	32	1.2	H	7.21	90.43	/	/
2437.0	61.03	Ave.	32	1.2	H	7.21	68.24	/	/
2437.0	87.42	PK	114	1.1	V	7.21	94.63	/	/
2437.0	64.32	Ave.	114	1.1	V	7.21	71.53	/	/
4874.0	26.65	Ave.	33	1.3	H	12.46	39.11	54	14.89
9748.0	17.15	Ave.	254	1.1	V	19.40	36.55	54	17.45
7311.0	18.89	Ave.	15	1.1	H	16.49	35.38	54	18.62
9748.0	32.96	PK	254	1.1	V	19.40	52.36	74	21.64
4874.0	39.63	PK	33	1.3	H	12.46	52.09	74	21.91
2490.8	24.46	Ave.	58	1.2	V	6.81	31.27	54	22.73
7311.0	33.69	PK	15	1.1	H	16.49	50.18	74	23.82
2387.6	23.29	Ave.	36	1.3	H	6.13	29.42	54	24.58
2343.0	23.65	Ave.	62	1.3	V	5.48	29.13	54	24.87
2490.8	40.28	PK	58	1.2	V	6.81	47.09	74	26.91
2387.6	40.14	PK	36	1.3	H	6.13	46.27	74	27.73
2343.0	39.63	PK	62	1.3	V	5.48	45.11	74	28.89

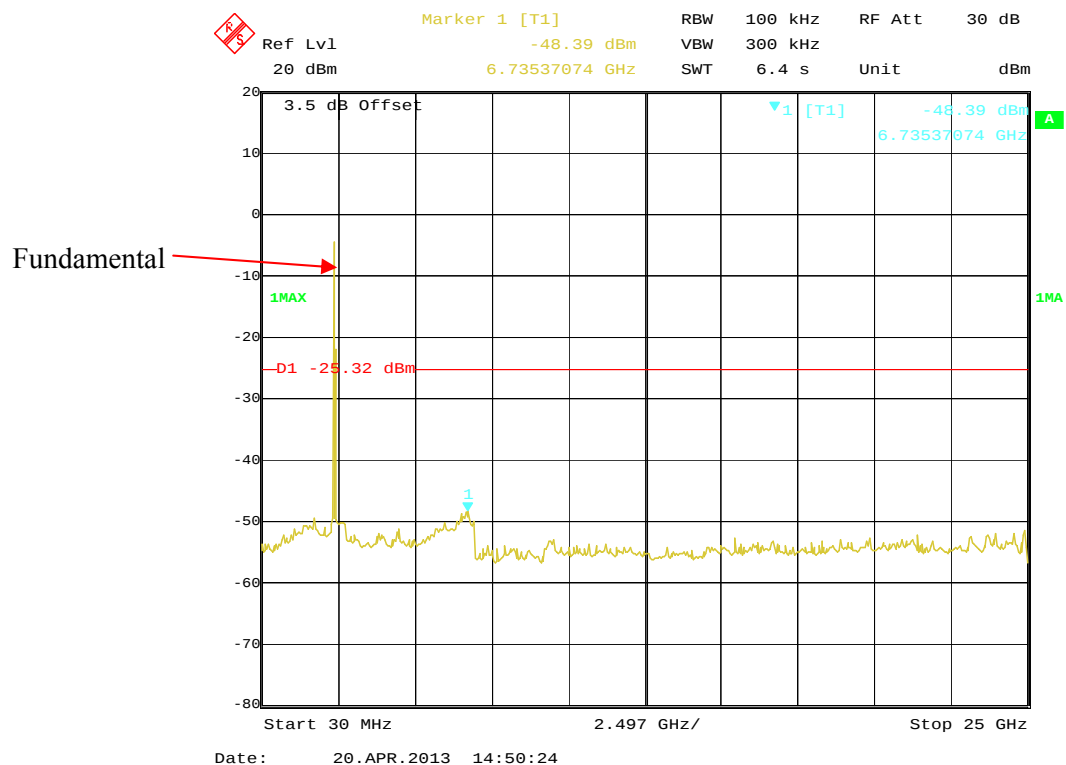
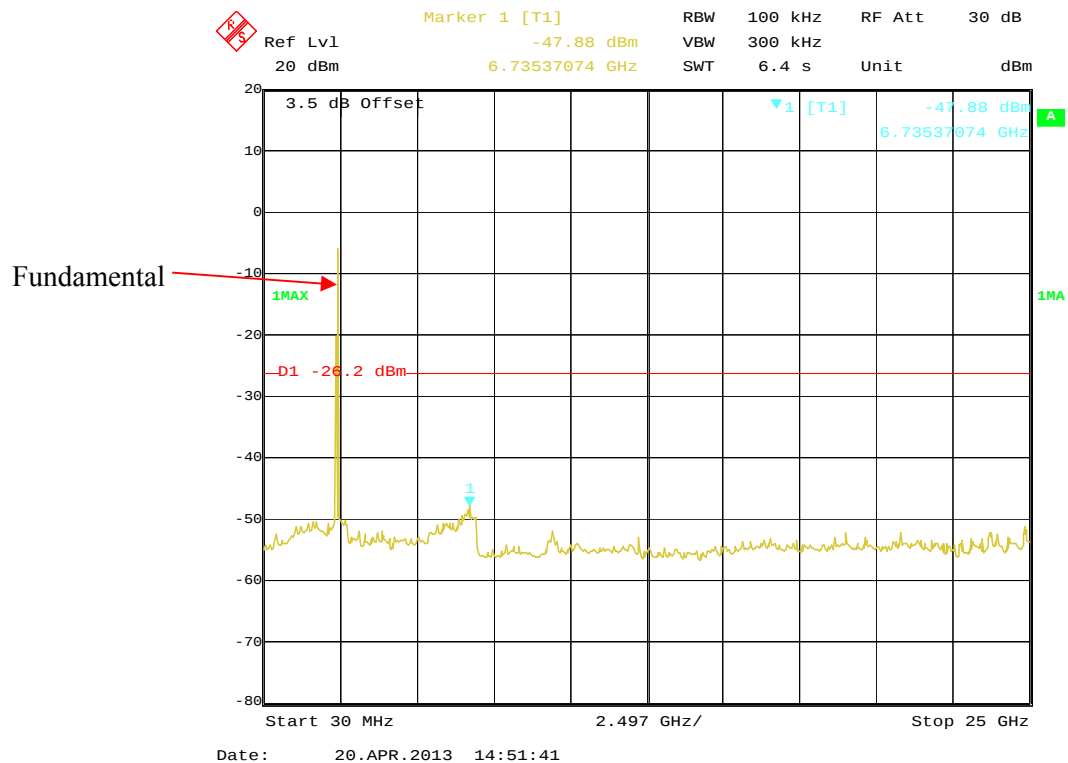
Frequency (MHz)	Receiver		Turntable Degree	Rx Antenna		Corrected Factor (dB)	Corrected Amplitude (dBμV/m)	FCC Part 15.247/15.205/15.209	
	Reading (dBμV)	Detector (PK/QP/Ave.)		Height (m)	Polar (H/V)			Limit (dBμV/m)	Margin (dB)
High Channel(2462 MHz)									
2462.0	82.32	PK	22	1.2	H	7.21	89.53	/	/
2462.0	60.53	Ave.	22	1.2	H	7.21	67.74	/	/
2462.0	87.05	PK	13	1.1	V	7.21	94.26	/	/
2462.0	63.87	Ave.	13	1.1	V	7.21	71.08	/	/
4924.0	26.15	Ave.	66	1.0	H	12.50	38.65	54	15.35
9848.0	17.33	Ave.	14	1.0	V	19.39	36.72	54	17.28
7386.0	18.89	Ave.	15	1.1	H	15.91	34.80	54	19.20
2491.7	27.88	Ave.	26	1.2	V	6.81	34.69	54	19.31
9848.0	32.57	PK	14	1.0	V	19.39	51.96	74	22.04
4924.0	39.37	PK	66	1.0	H	12.50	51.87	74	22.13
2382.2	24.29	Ave.	251	1.3	H	6.13	30.42	54	23.58
2491.7	43.29	PK	26	1.2	V	6.81	50.10	74	23.90
7386.0	33.96	PK	15	1.1	H	15.91	49.87	74	24.13
2335.6	22.15	Ave.	55	1.3	V	5.48	27.63	54	26.37
2382.2	40.11	PK	251	1.3	H	6.13	46.24	74	27.76
2335.6	38.52	PK	55	1.3	V	5.48	44.00	74	30.00

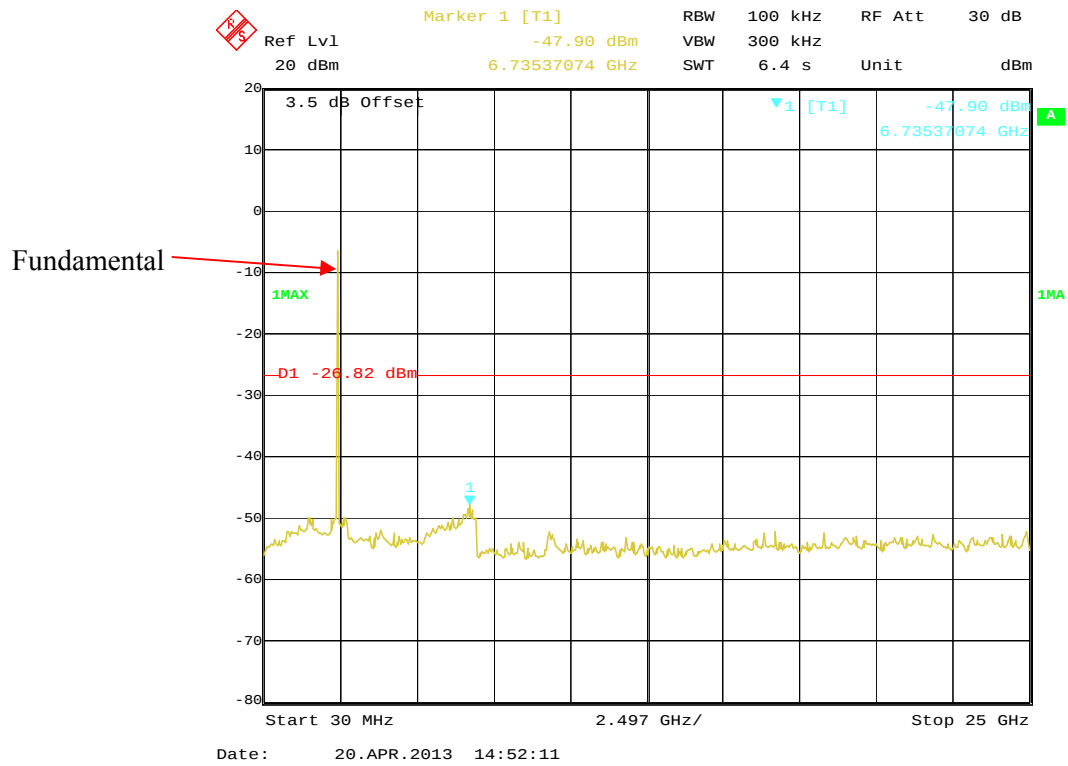
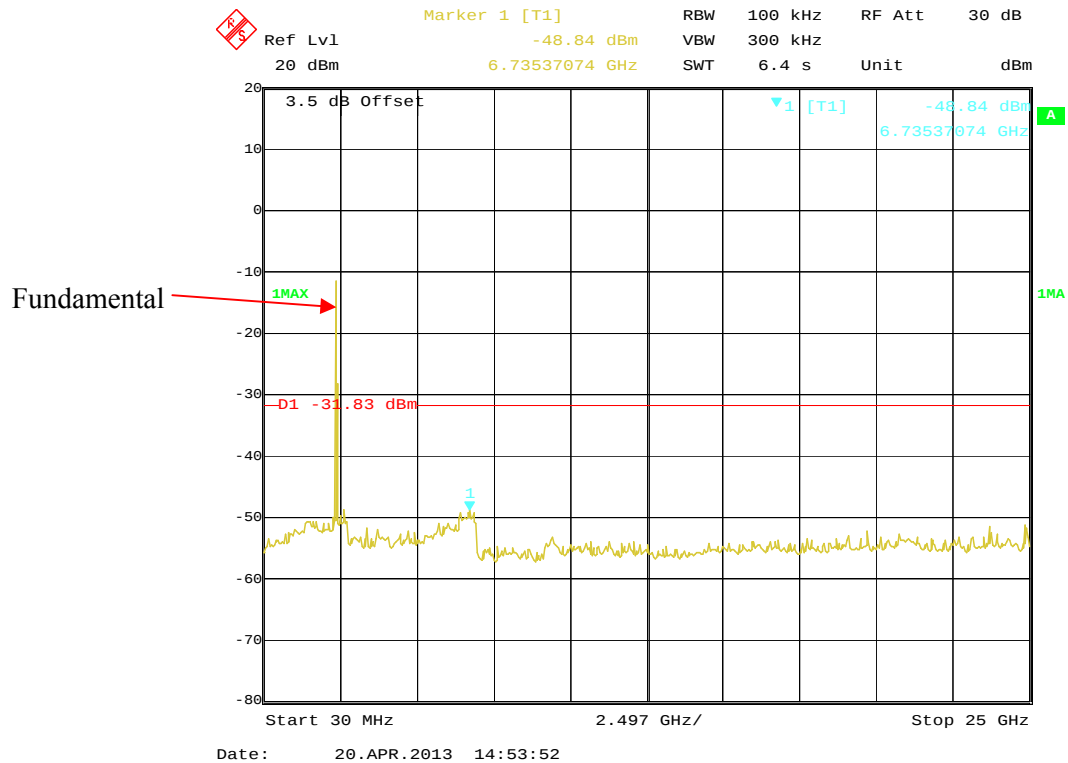
Note:

Corrected Amplitude = Corrected Factor + Reading

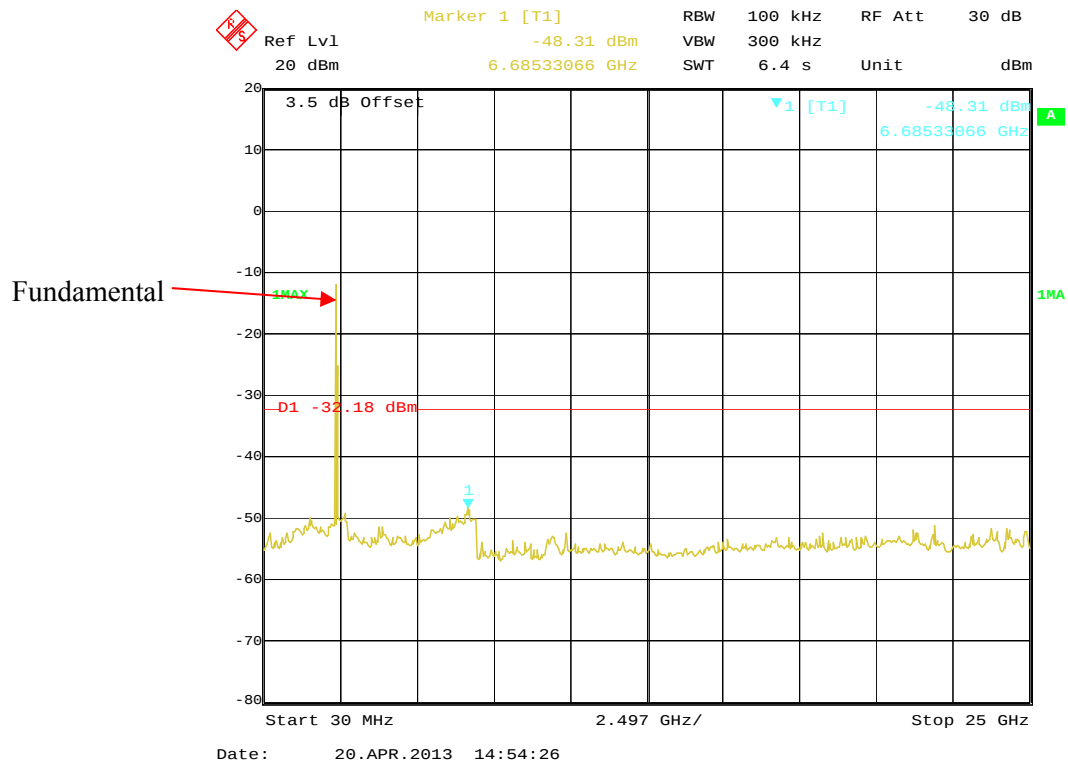
Corrected Factor=Antenna factor (RX) + cable loss – amplifier factor

Margin = Limit- Corr. Amplitude

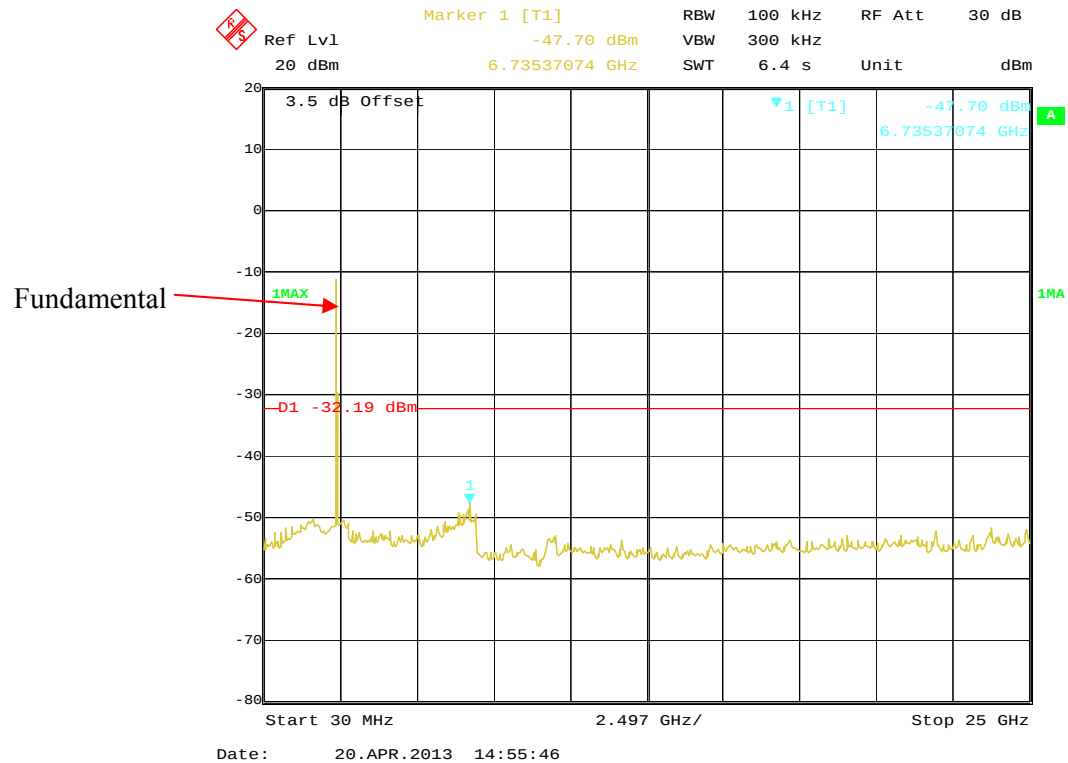
Conducted Spurious Emissions at Antenna Port:**802.11b Low Channel****802.11b Middle Channel**

802.11b High Channel**802.11g Low Channel**

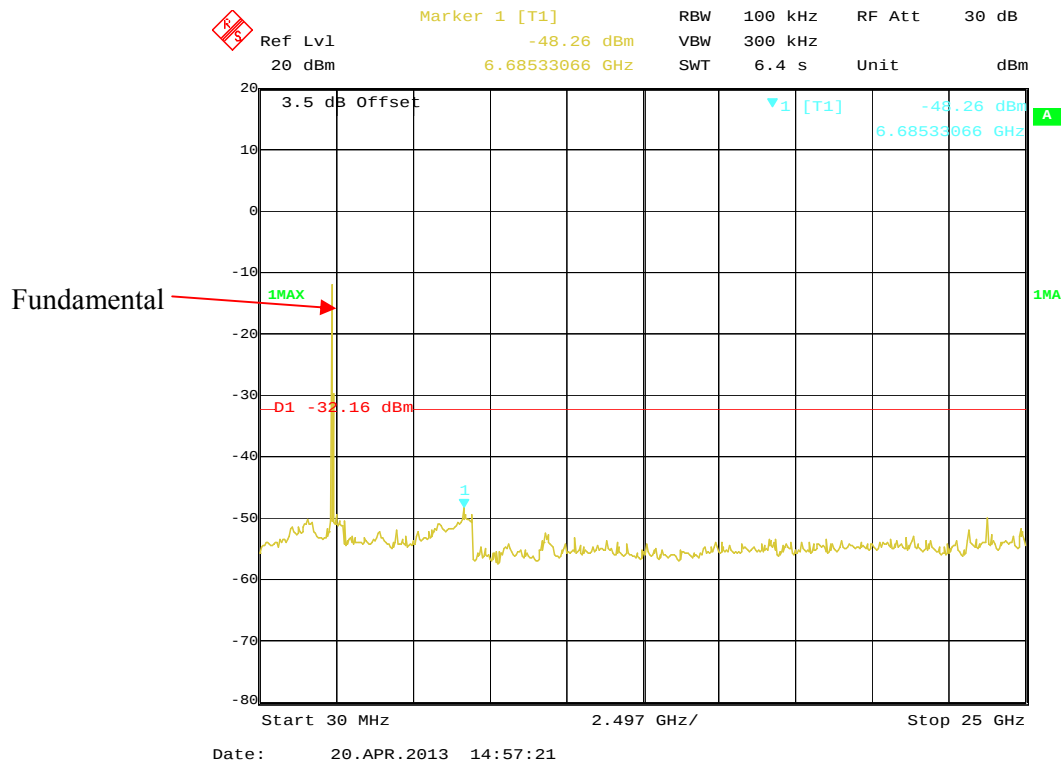
802.11g Middle Channel



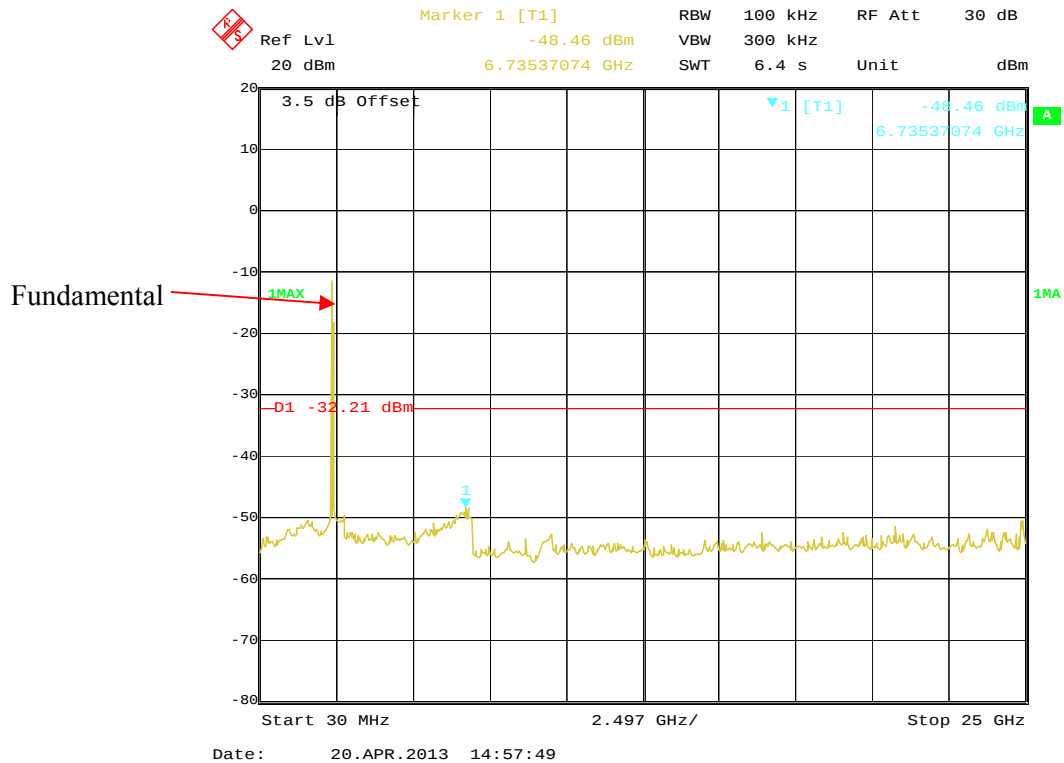
802.11g High Channel



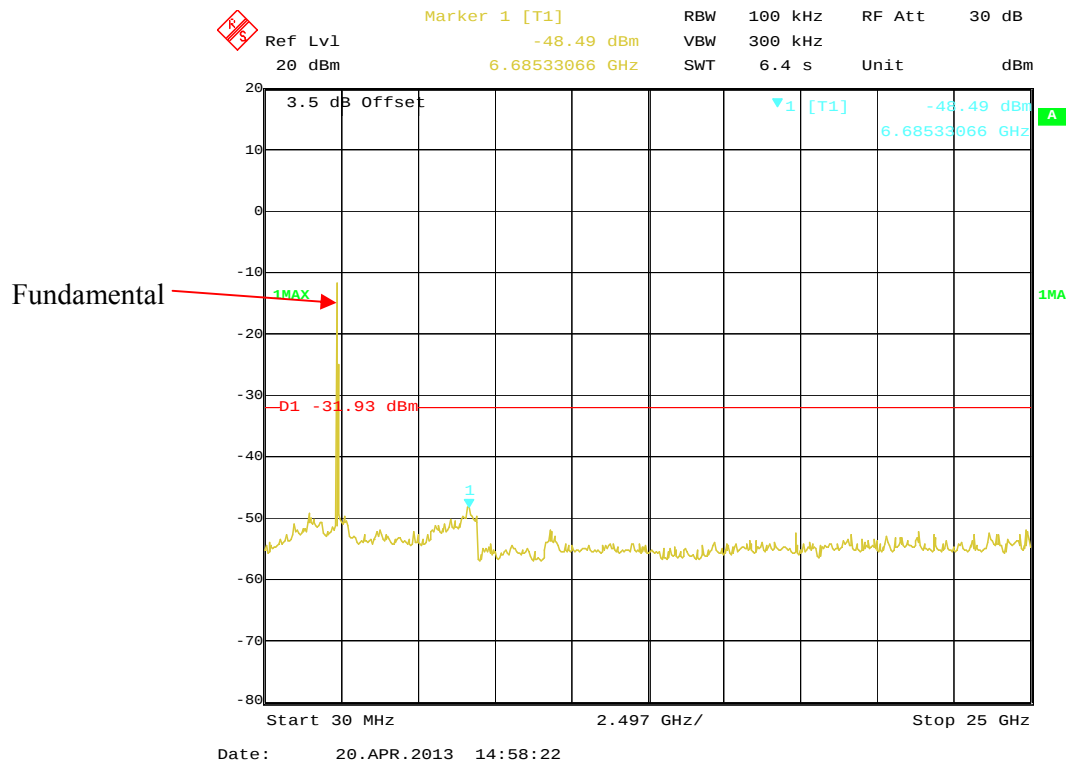
802.11n-HT20 Low Channel



802.11n-HT20 Middle Channel



802.11n-HT20 High Channel



FCC §15.247(a) (2) – 6 dB BANDWIDTH

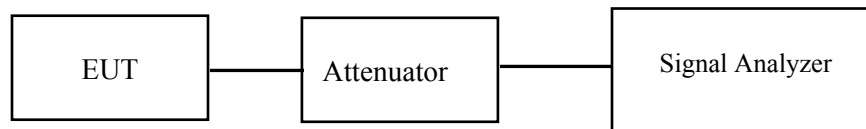
Applicable Standard

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

According to KDB 558074 D01 DTS Meas Guidance v02

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	Signal Analyzer	FSIQ26	8386001028	2012-11-24	2013-11-23

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

Test Data

Environmental Conditions

Temperature:	24 °C
Relative Humidity:	50 %
ATM Pressure:	100.0 kPa

The testing was performed by Tiger Ye on 2013-04-13.

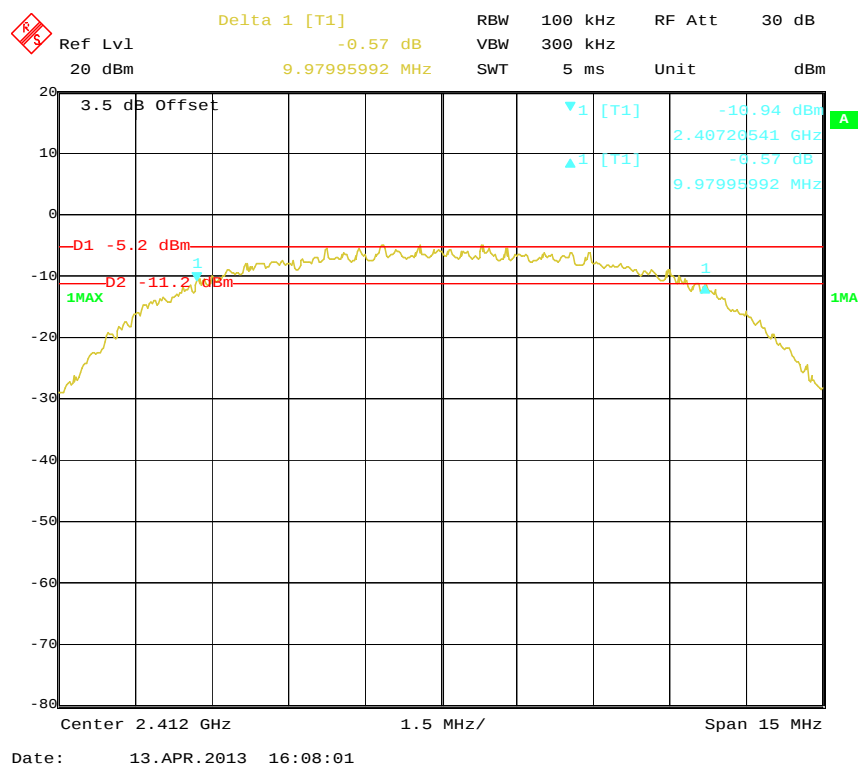
EUT operation mode: Transmitting

Test Result: Pass.

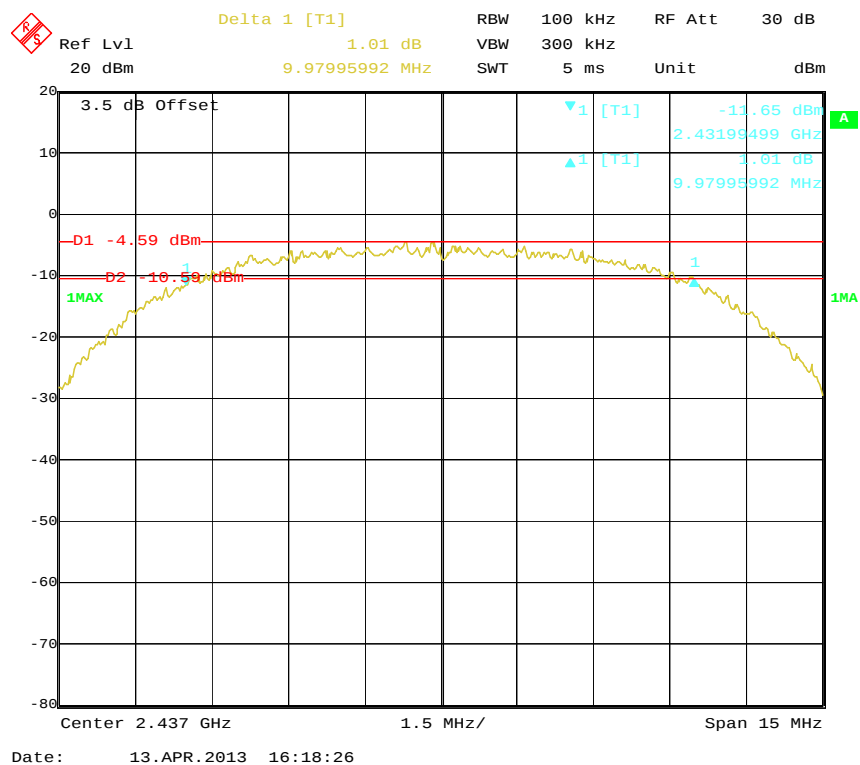
Please refer to the following tables and plots.

Channel	Frequency (MHz)	Data Rate (Mbps)	6dB bandwidth (MHz)	Limit (kHz)	Result
802.11b mode					
Low	2412	1	9.98	≥ 500	Pass
Middle	2437	1	9.98	≥ 500	Pass
High	2462	1	9.98	≥ 500	Pass
802.11g mode					
Low	2412	6	16.63	≥ 500	Pass
Middle	2437	6	16.63	≥ 500	Pass
High	2462	6	16.63	≥ 500	Pass
802.11n-HT20 mode					
Low	2412	MCS0	17.84	≥ 500	Pass
Middle	2437	MCS0	17.84	≥ 500	Pass
High	2462	MCS0	17.84	≥ 500	Pass

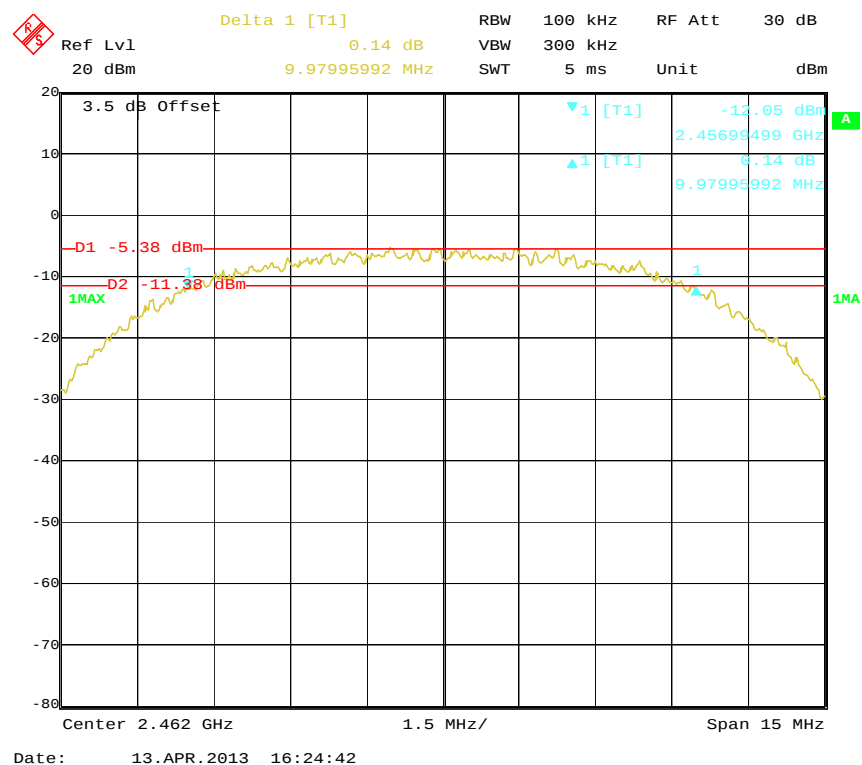
802.11b Low Channel



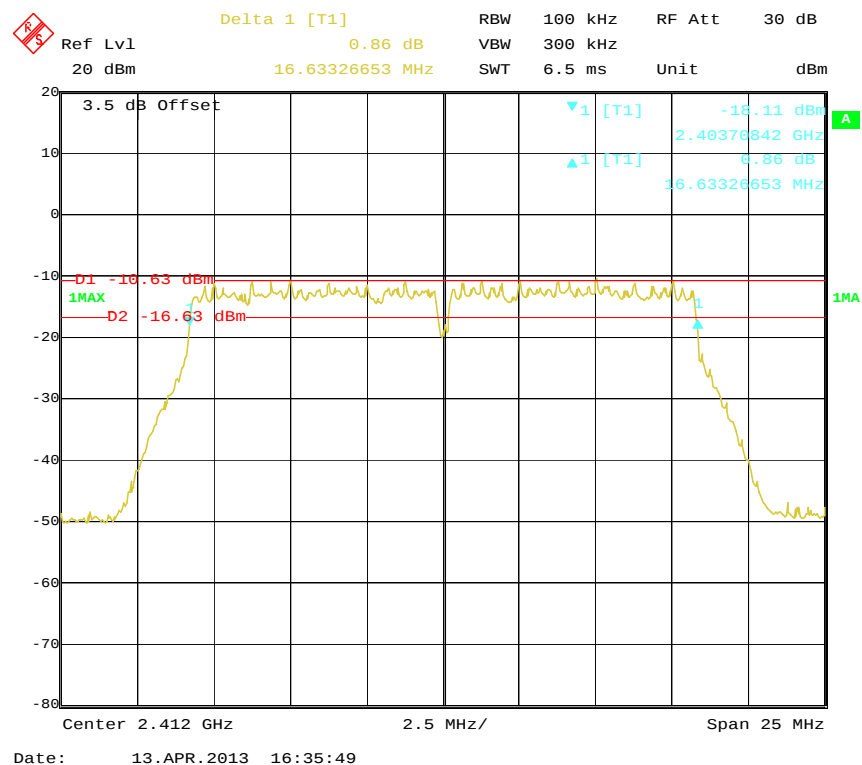
802.11b Middle Channel

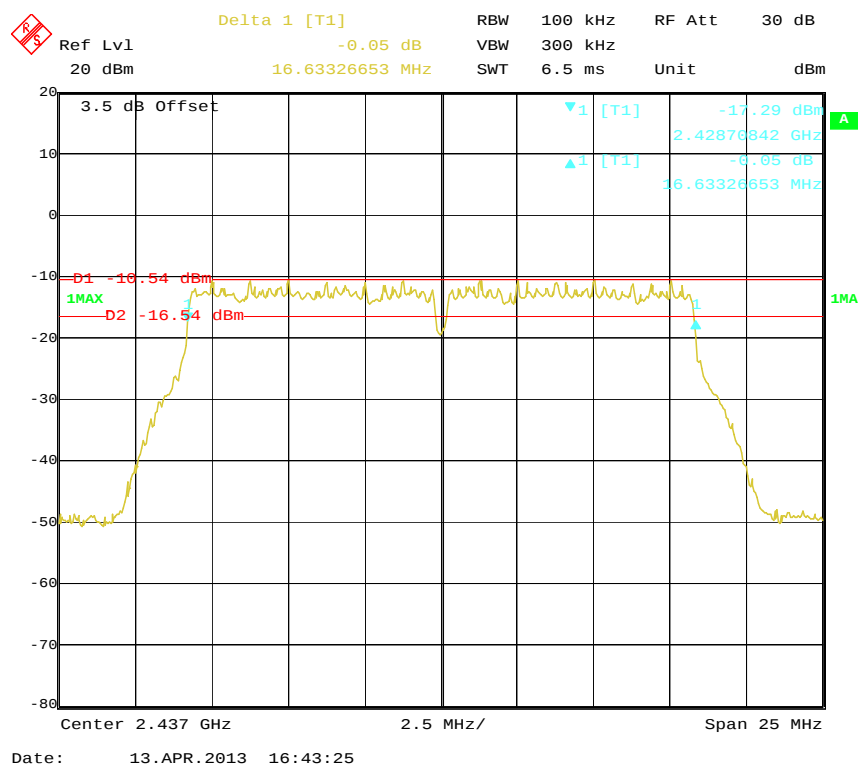
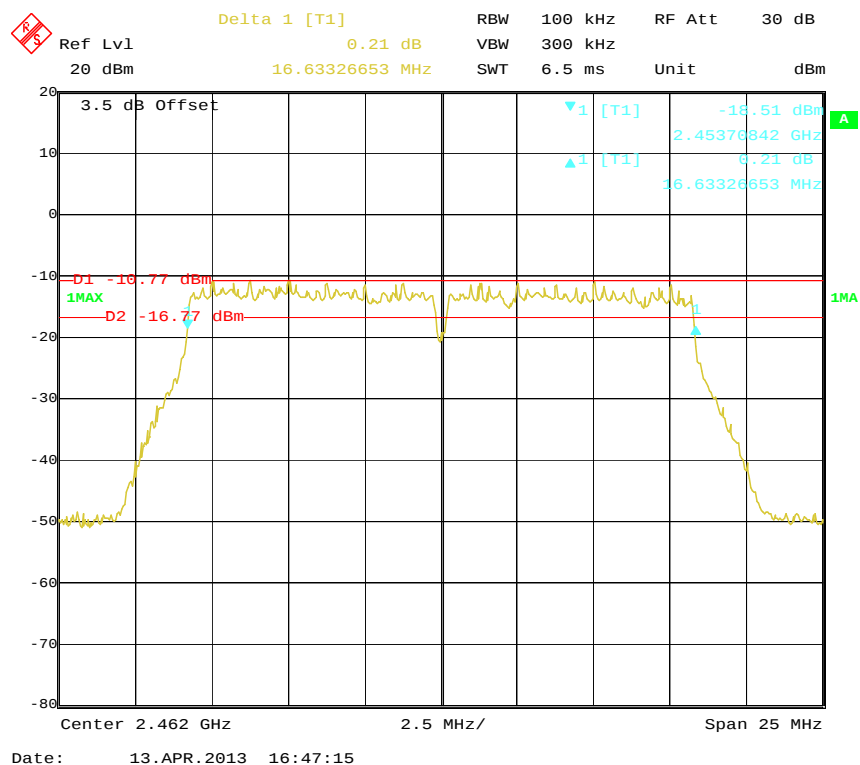


802.11b High Channel

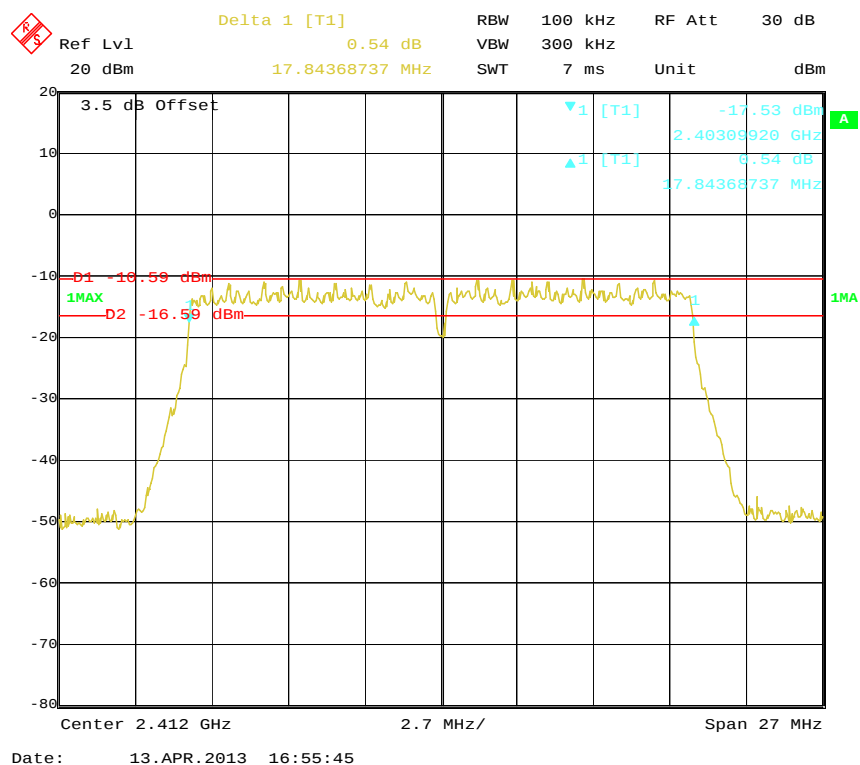


802.11g Low Channel

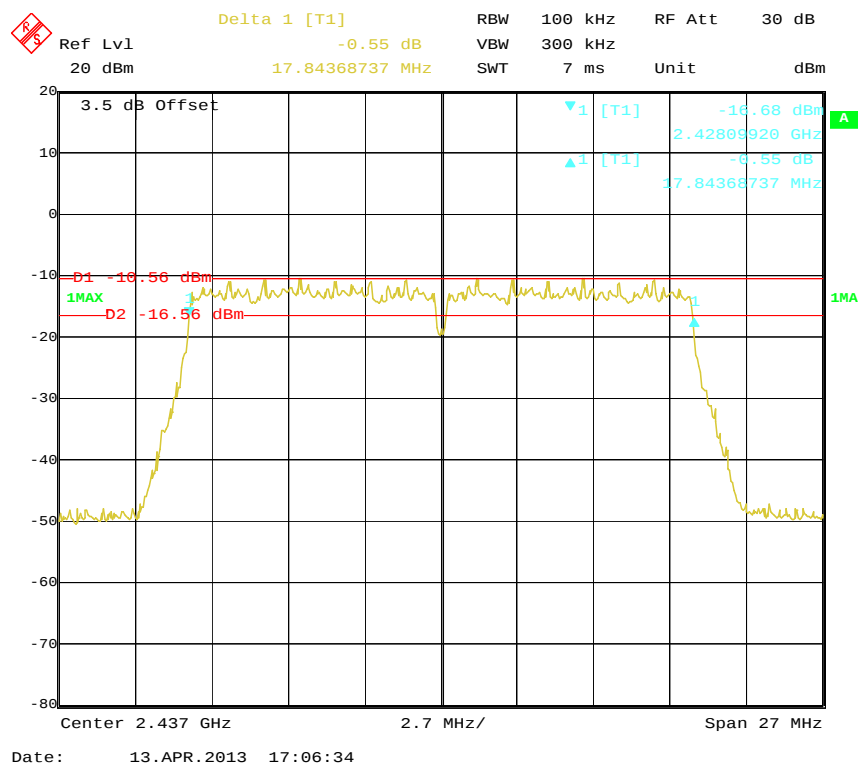


802.11g Middle Channel**802.11g High Channel**

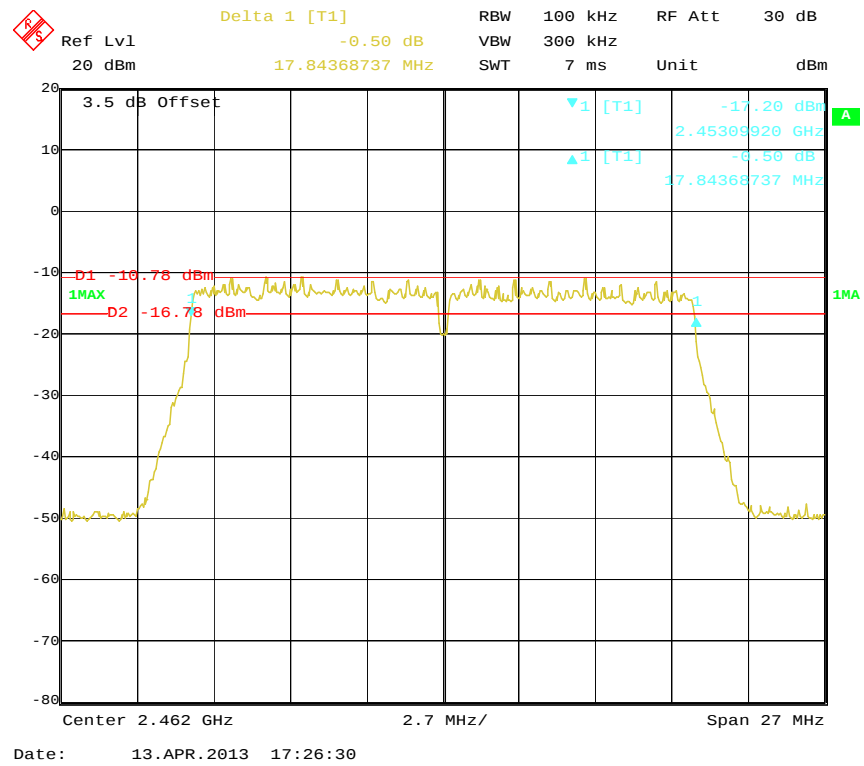
802.11n-HT20 Low Channel



802.11n-HT20 Middle Channel



802.11n-HT20 High Channel



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

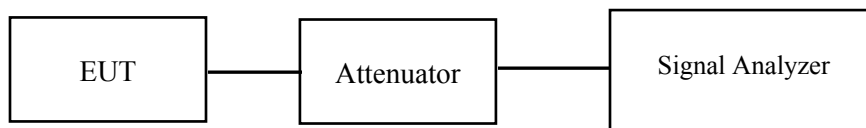
Applicable Standard

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

According to KDB 558074 D01 DTS Meas Guidance v02

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	2012-11-24	2013-11-23

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

Test Data

Environmental Conditions

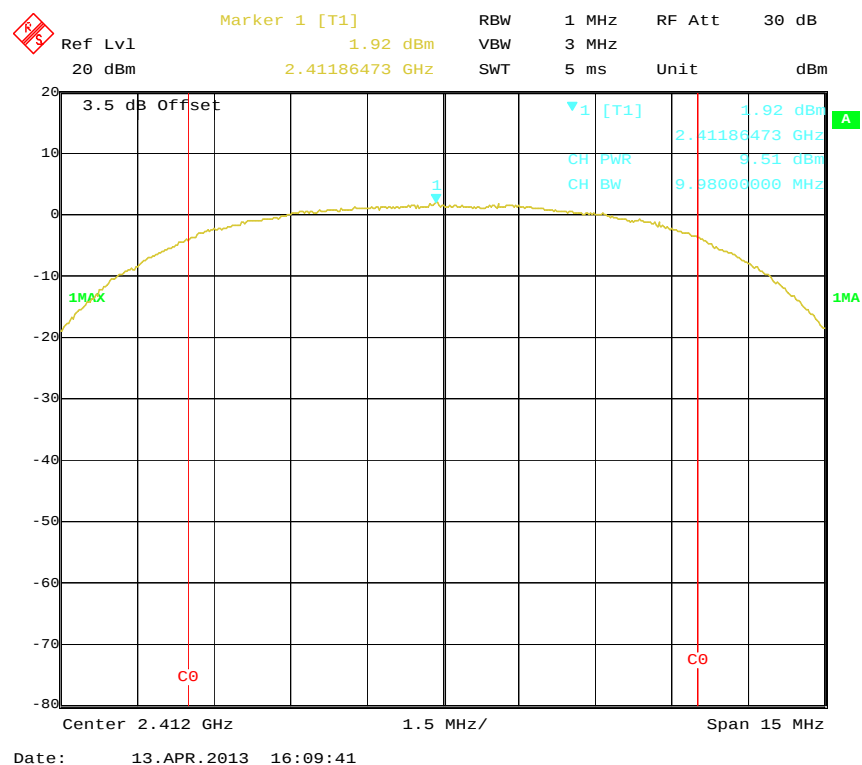
Temperature:	24 °C
Relative Humidity:	50 %
ATM Pressure:	100.0 kPa

The testing was performed by Tiger Ye on 2013-04-13.

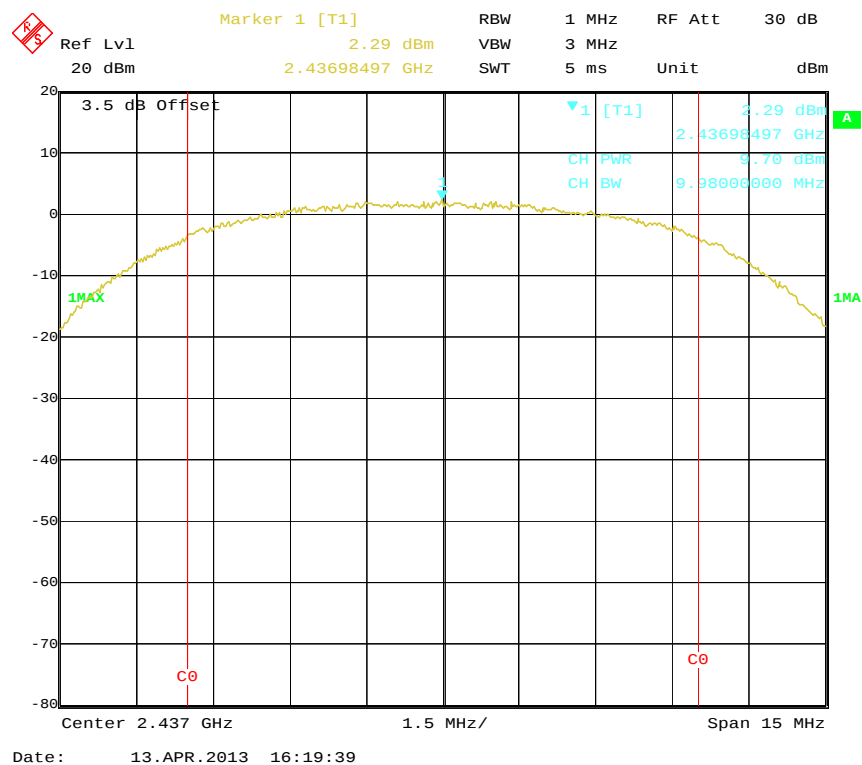
EUT operation mode: Transmitting

Channel	Frequency (MHz)	Data Rate (Mbps)	Output Power (dBm)	Limit (dBm)	Result
802.11b mode					
Low	2412	1	9.51	30	Pass
Middle	2437	1	9.70	30	Pass
High	2462	1	9.36	30	Pass
802.11g mode					
Low	2412	6	9.35	30	Pass
Middle	2437	6	9.48	30	Pass
High	2462	6	9.30	30	Pass
802.11n-HT20 mode					
Low	2412	MCS0	9.34	30	Pass
Middle	2437	MCS0	9.49	30	Pass
High	2462	MCS0	9.24	30	Pass

802.11b RF Output Power, Low Channel



802.11b RF Output Power, Middle Channel



K S

Ref Lvl 20 dBm	Marker 1 [T1] 1.23 dBm 2.46207515 GHz	RBW 1 MHz	RF Att 30 dB
		VBW 3 MHz	
		SWT 5 ms	Unit dBm

3.5 dB Offset

▼ 1 [T1] 1.23 dBm
2.46207515 GHz

CH PWR 9.36 dBm
CH BW 9.98000000 MHz

1MAX

C0

Center 2.462 GHz 1.5 MHz/ Span 15 MHz

Date: 13.APR.2013 16:23:35

Ref Lvl 20 dBm
 Marker 1 [T1] -0.97 dBm
 RBW 1 MHz
 VBW 3 MHz
 SWT 5 ms
 RF Att 30 dB
 Unit dBm

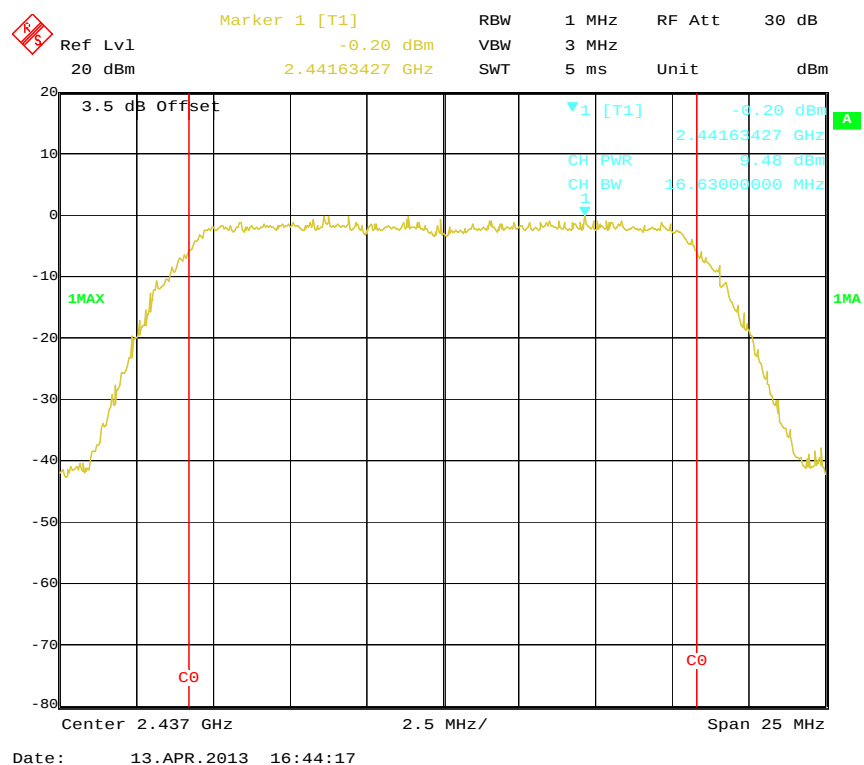
3.5 dB Offset
 2.41768637 GHz
 -6.97 dBm
 9.35 dBm
 16.63000000 MHz
 -41.10 dBm
 98697395 MHz

1MAX
 1MA

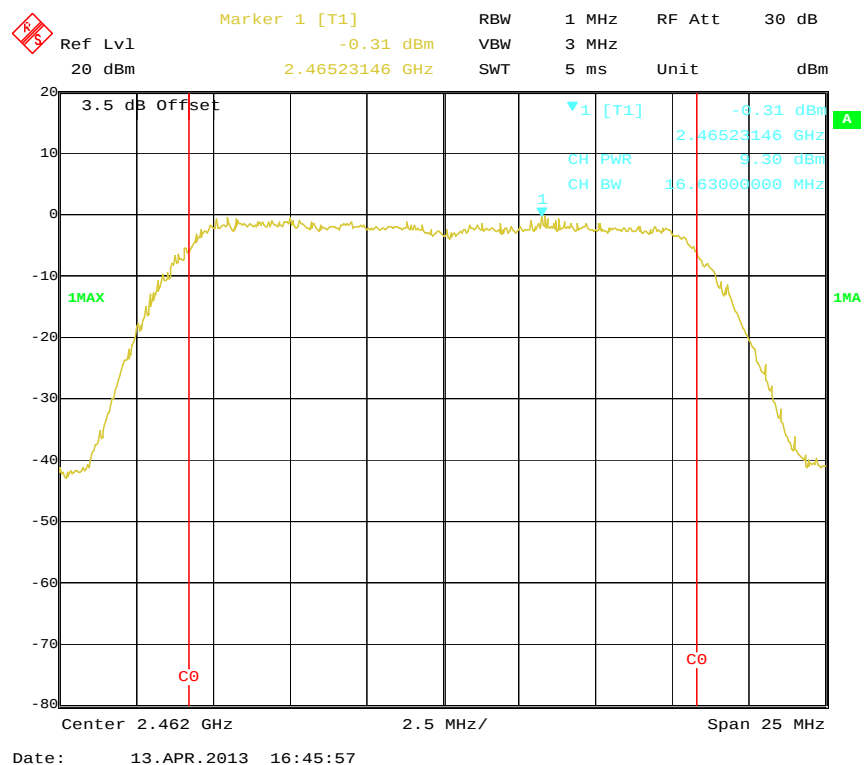
Center 2.412 GHz
 Span 25 MHz

Date: 13.APR.2013 16:37:55

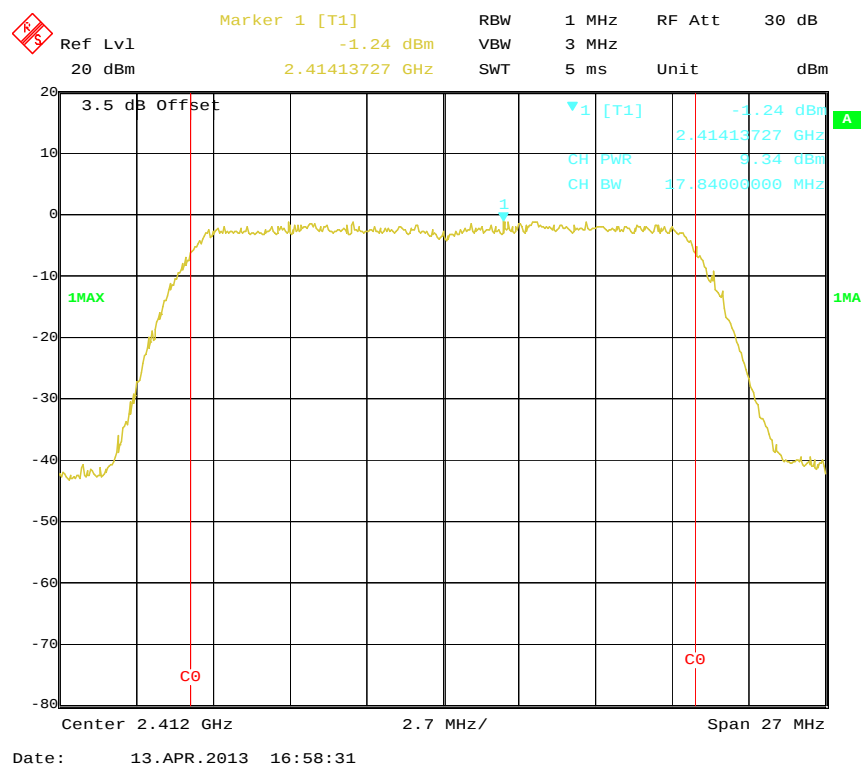
802.11g RF Output Power, Middle Channel



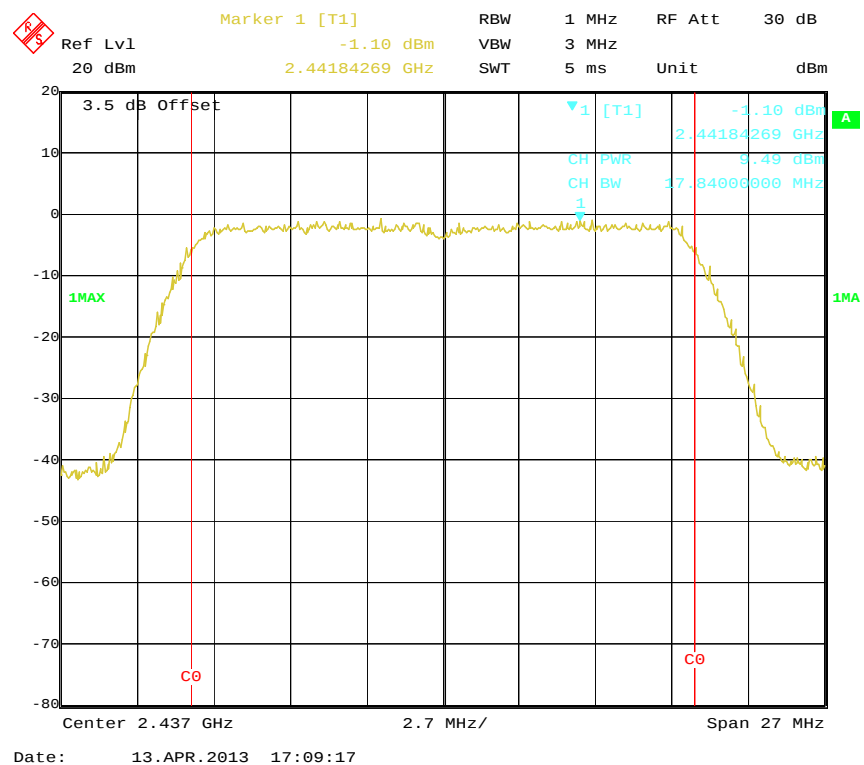
802.11g RF Output Power, High Channel



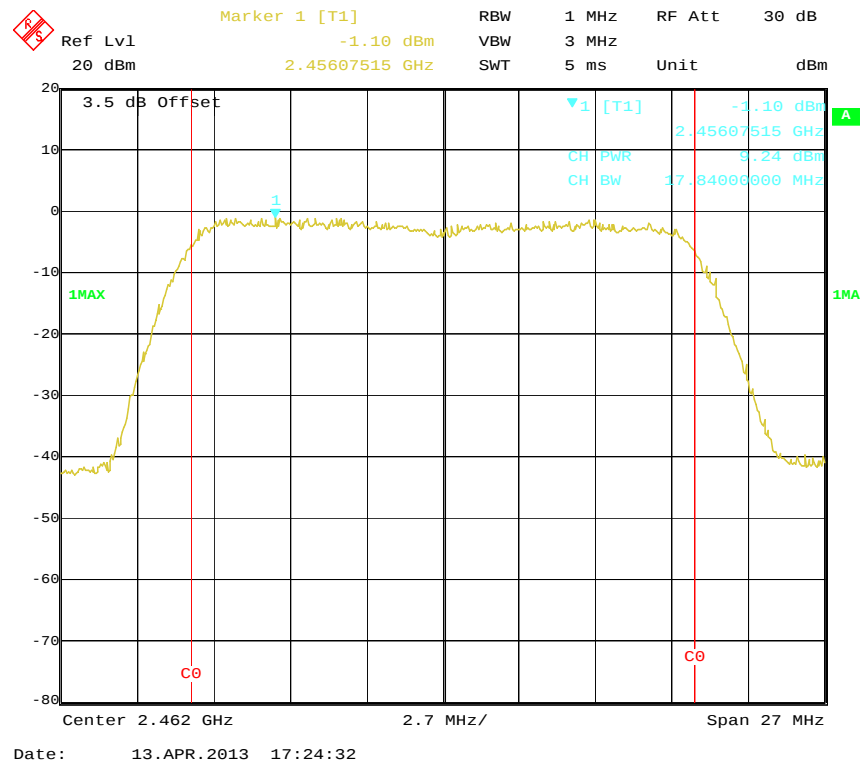
802.11n-HT20 RF Output Power, Low Channel



802.11n-HT20 RF Output Power, Middle Channel



802.11n-HT20 RF Output Power, High Channel



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

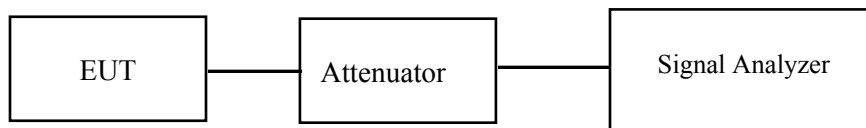
Applicable Standard

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

According to KDB 558074 D01 DTS Meas Guidance v02

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	Signal Analyzer	FSIQ26	8386001028	2012-11-24	2013-11-23

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

Test Data**Environmental Conditions**

Temperature:	24 °C
Relative Humidity:	50 %
ATM Pressure:	100.0 kPa

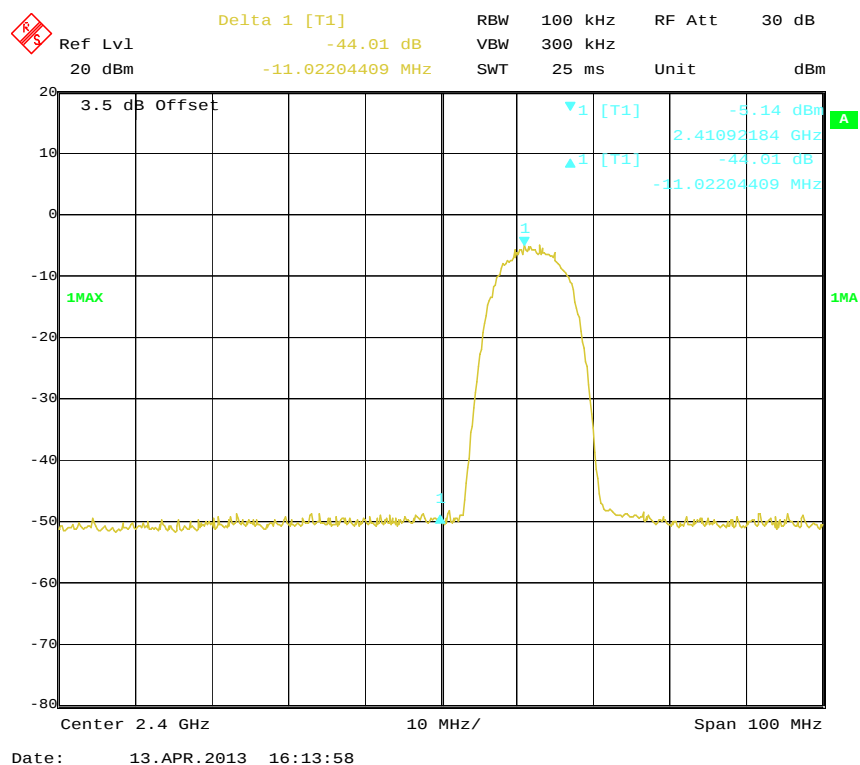
The testing was performed by Tiger Ye on 2013-04-13.

EUT operation mode: Transmitting

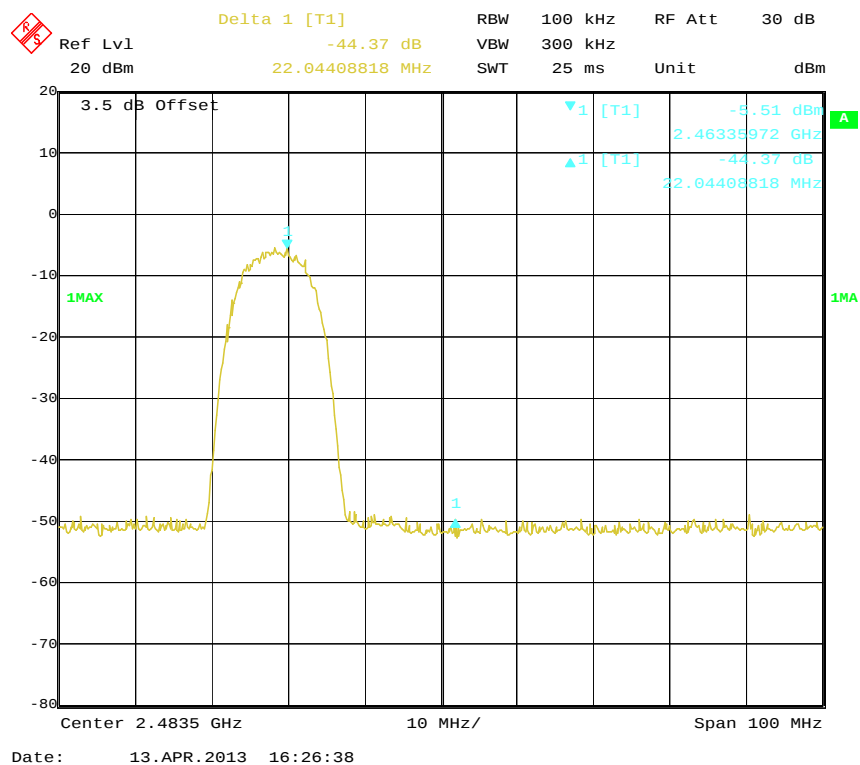
Test Result: Compliance. Please refer to following table and plots.

Frequency Band	Delta Peak to band emission (dBc)	> Delta Limit (dBc)	Result
802.11b mode			
Left Band	44.01	20	Pass
Right Band	44.37	20	Pass
802.11g mode			
Left Band	38.57	20	Pass
Right Band	39.07	20	Pass
802.11n-HT20 mode			
Left Band	38.81	20	Pass
Right Band	38.48	20	Pass

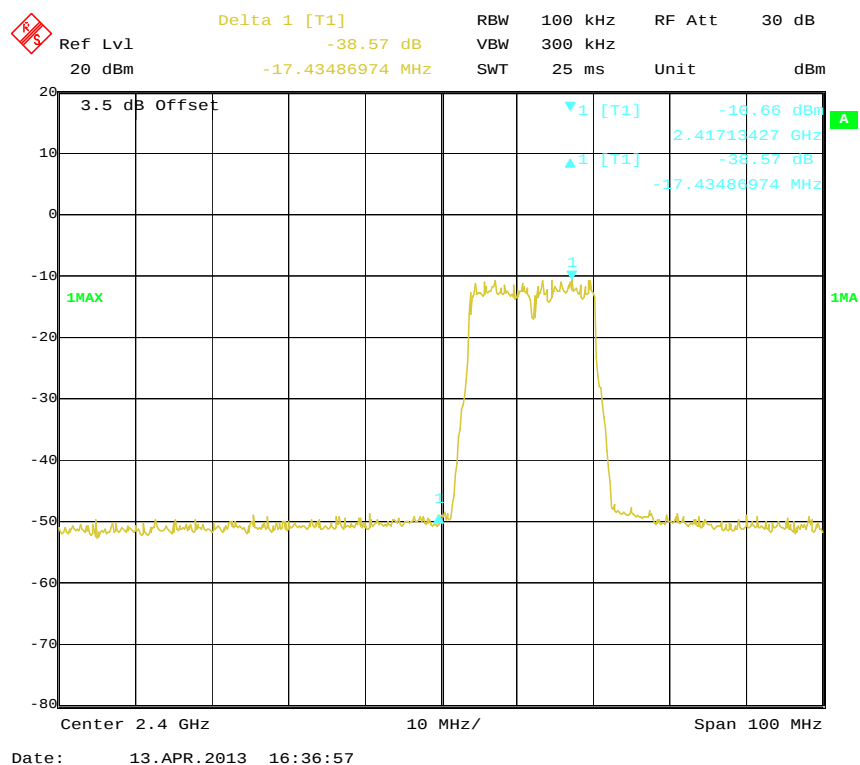
802.11b Band Edge, Left Side



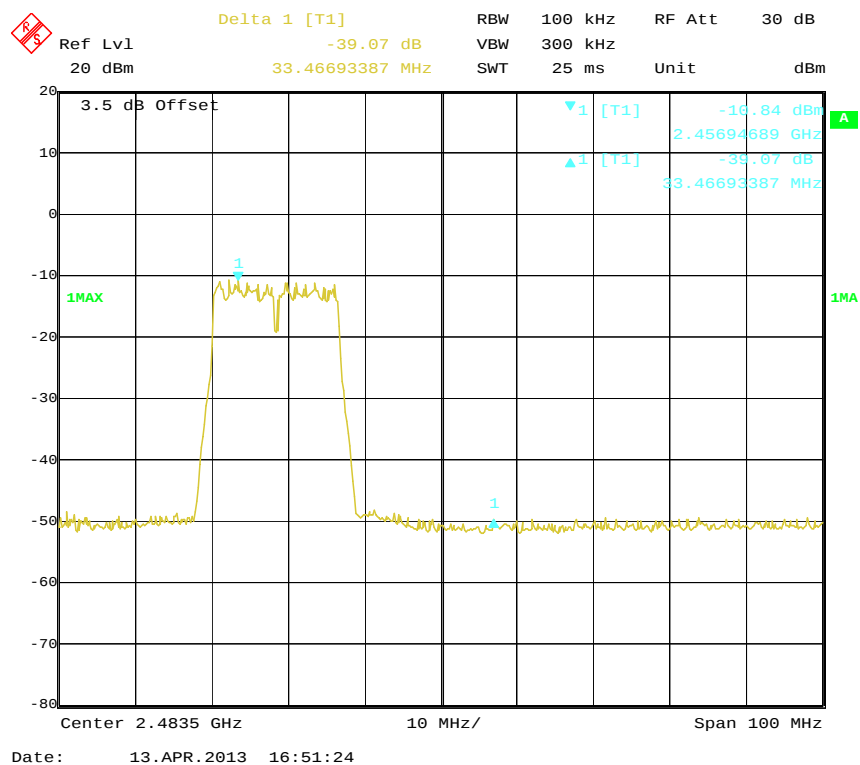
802.11b Band Edge, Right Side



802.11g Band Edge, Left Side



802.11g Band Edge, Right Side



Delta 1 [T1] RBW 100 kHz RF Att 30 dB
 Ref Lvl -38.81 dB VBW 300 kHz
 20 dBm -19.63927856 MHz SWT 25 ms Unit dBm

3.5 dB Offset
 1MAX
 1 [T1] -10.65 dBm
 2.41713427 GHz
 -38.81 dB
 -19.63927856 MHz
 1
 1
 Center 2.4 GHz 10 MHz/ Span 100 MHz

Date: 13.APR.2013 17:03:27

Ref Lvl 20 dBm Delta 1 [T1] -38.48 dB RBW 100 kHz RF Att 30 dB

3.5 dB Offset 33.46693387 MHz VBW 300 kHz Unit dBm

SWT 25 ms

1 [T1] -10.76 dBm 2.45694689 GHz

1 [Y1] -38.48 dB 33.46693387 MHz

1MAX

Center 2.4835 GHz 10 MHz/ Span 100 MHz

Date: 13.APR.2013 17:27:28

FCC §15.247(e) - POWER SPECTRAL DENSITY

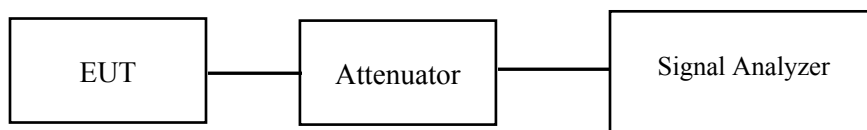
Applicable Standard

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

According to KDB 558074 D01 DTS Meas Guidance v02 Clause 9.1 Option 1

1. Set analy center frequency to DTS channel center frequency.
2. Set the span to 1.5 times the DTS channel bandwidth.
3. Set the RBW ≥ 3 kHz.
4. Set the VBW $\geq 3 \times$ RBW.
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.
10. If measurement value exceeds limit, reduce RBW (no less than 3 kHz) and repeat.



Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Rohde & Schwarz	Signal Analyzer	FSIQ26	8386001028	2012-11-24	2013-11-23

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

Test Data

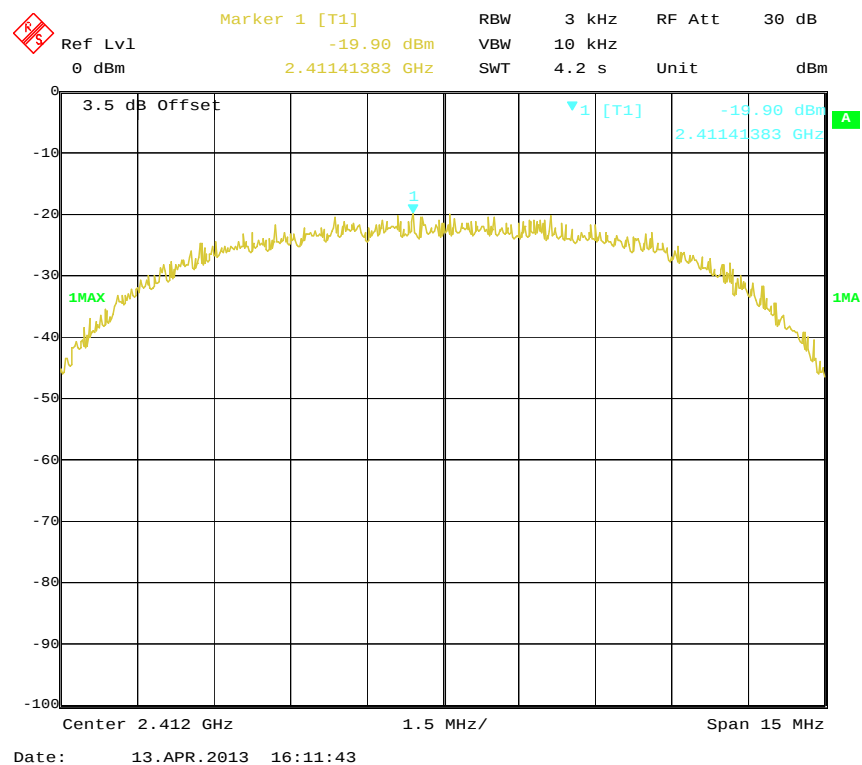
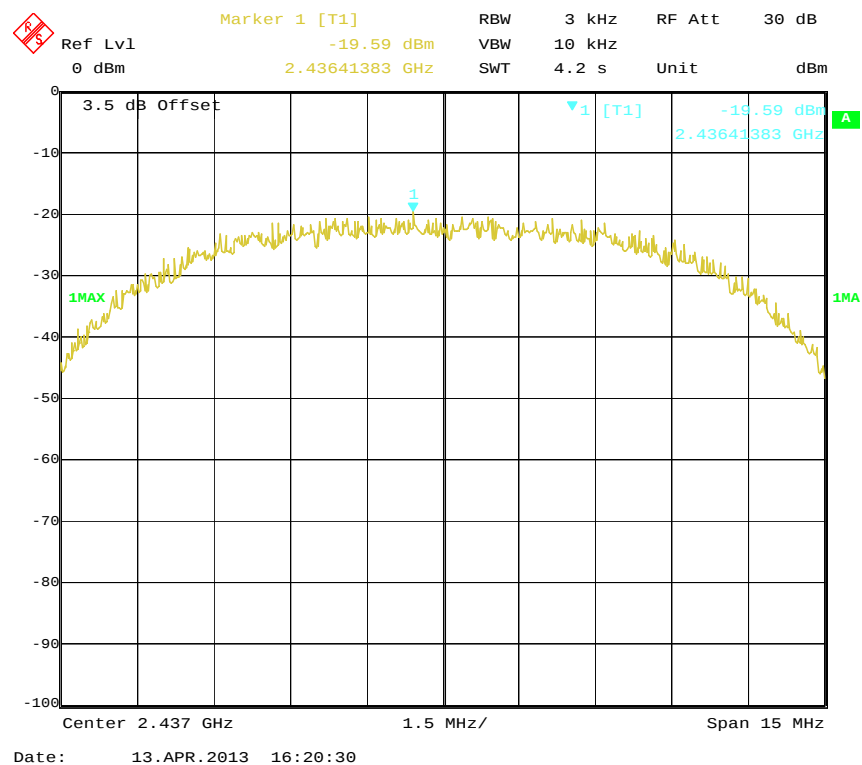
Environmental Conditions

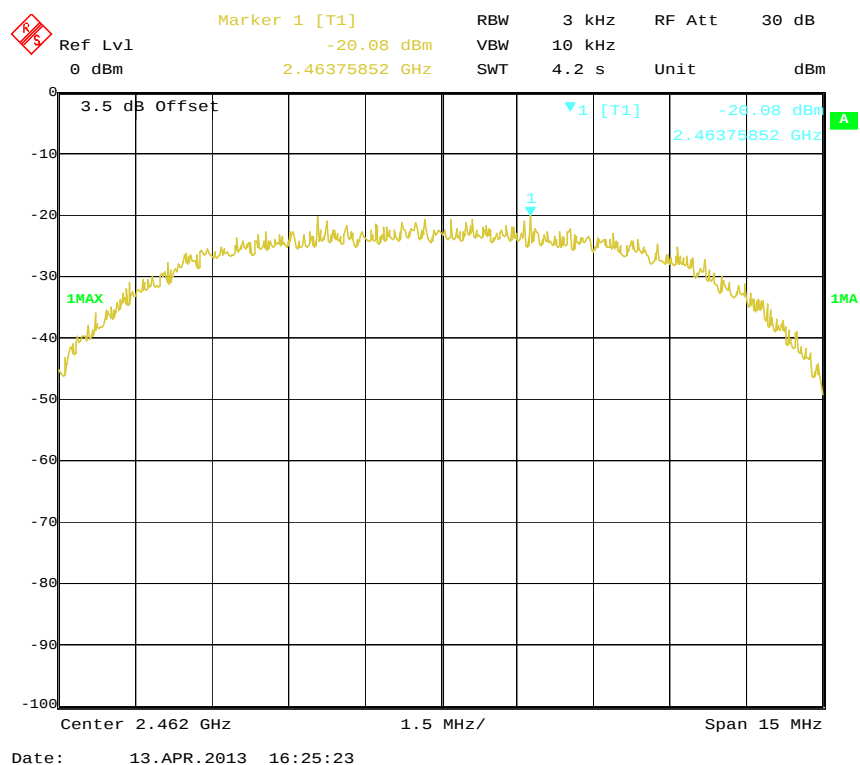
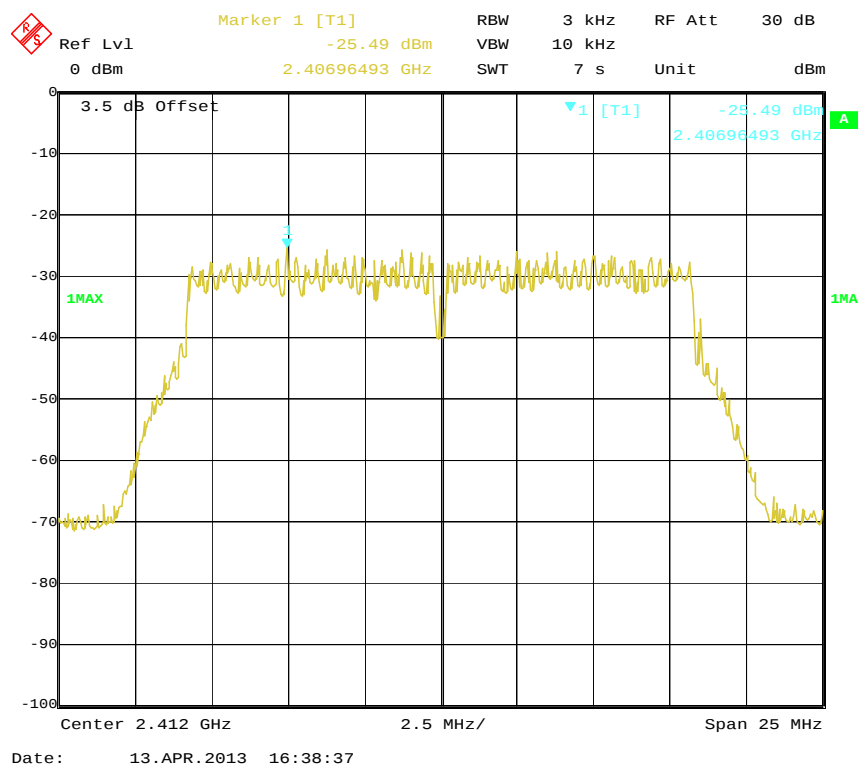
Temperature:	24 °C
Relative Humidity:	50 %
ATM Pressure:	100.0 kPa

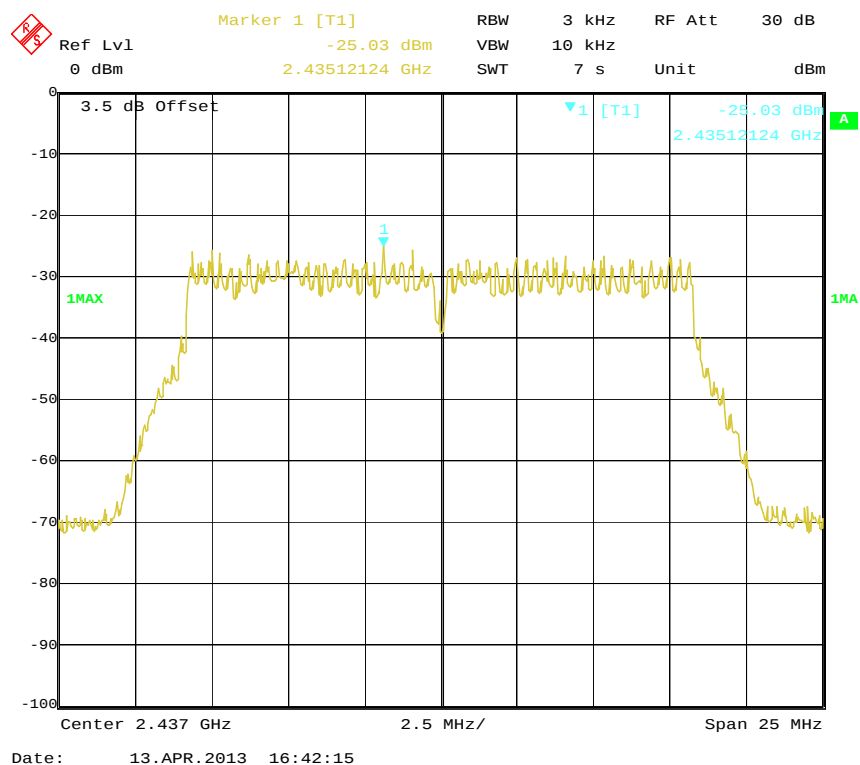
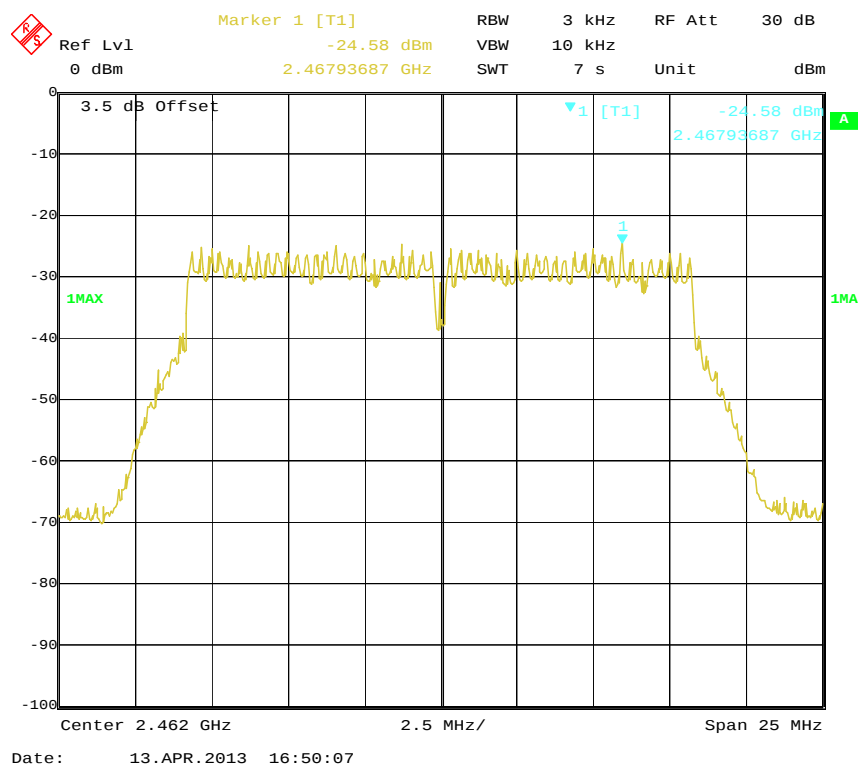
The testing was performed by Tiger Ye on 2013-04-13.

*EUT operation mode: Transmitting***Test Result:** Pass

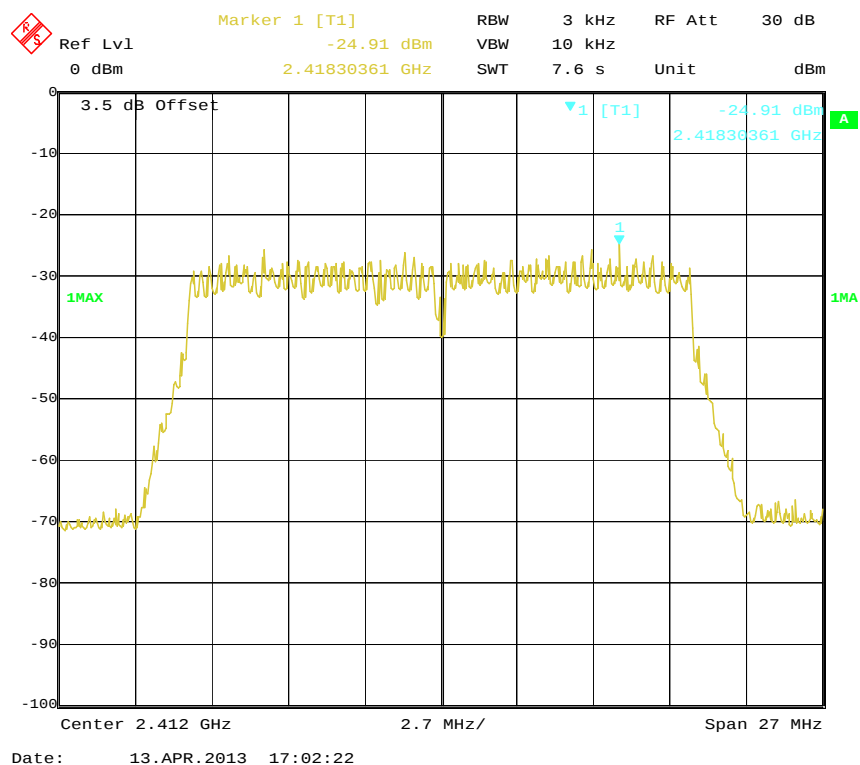
Channel	Frequency (MHz)	Data Rate (Mbps)	Power spectral density (dBm/3 kHz)	≤Limit (dBm)
802.11b mode				
Low	2412	1	-19.90	8
Middle	2437	1	-19.59	8
High	2462	1	-20.08	8
802.11g mode				
Low	2412	6	-25.49	8
Middle	2437	6	-25.03	8
High	2462	6	-24.58	8
802.11n-HT20 mode				
Low	2412	MCS0	-24.91	8
Middle	2437	MCS0	-24.69	8
High	2462	MCS0	-24.69	8

Power Spectral Density, 802.11b Low Channel**Power Spectral Density, 802.11b Middle Channel**

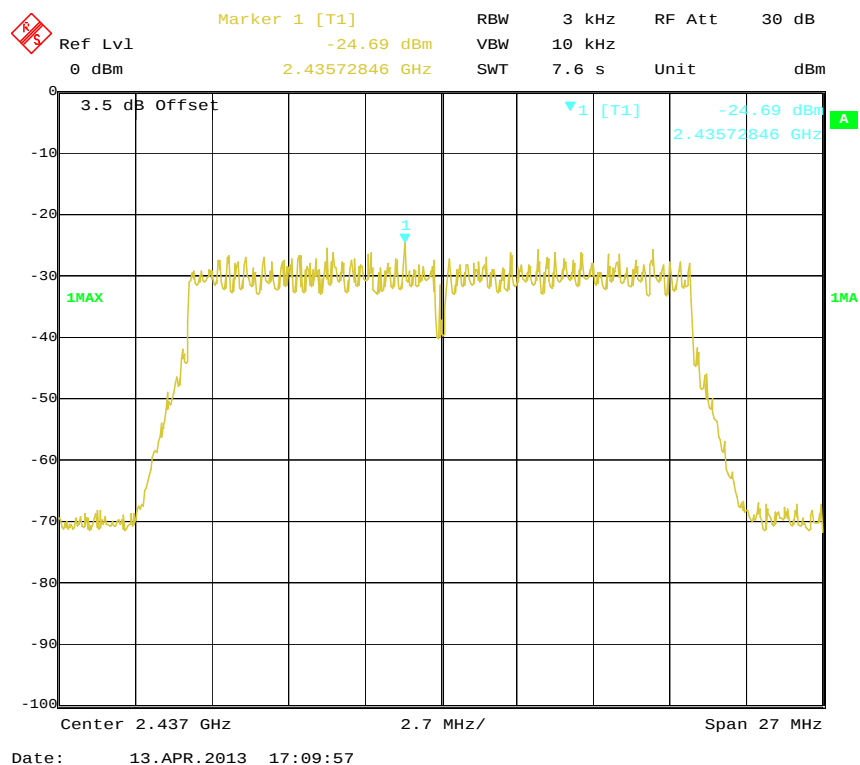
Power Spectral Density, 802.11b High Channel**Power Spectral Density, 802.11g Low Channel**

Power Spectral Density, 802.11g Middle Channel**Power Spectral Density, 802.11g High Channel**

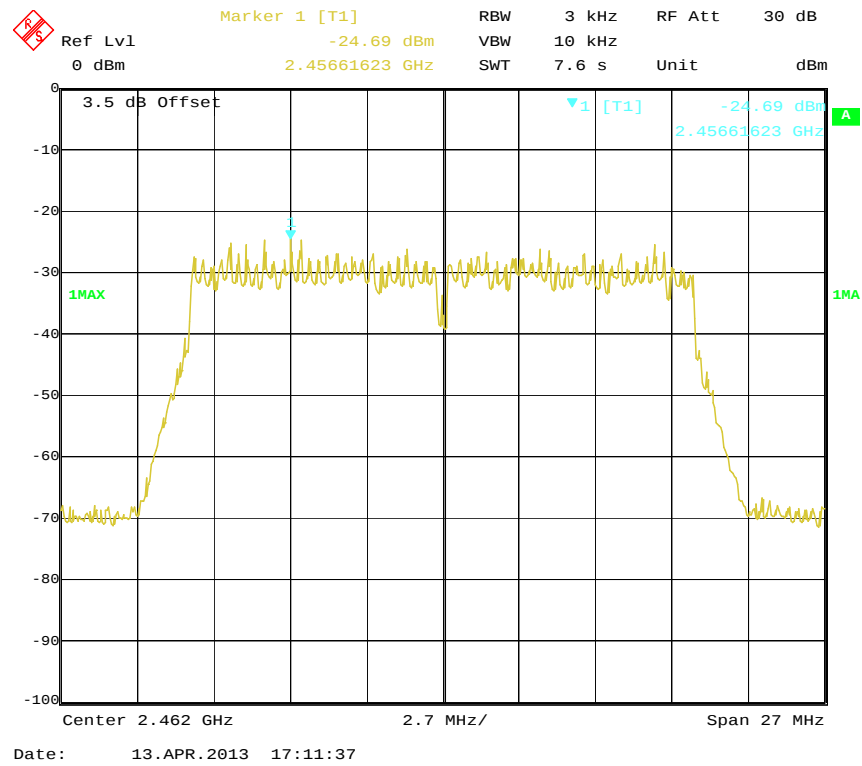
Power Spectral Density, 802.11n-HT20 Low Channel



Power Spectral Density, 802.11n-HT20 Middle Channel



Power Spectral Density, 802.11n-HT20 High Channel



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