

FCC PART 15.247

TEST REPORT

For

SWAGTEK

10205 NW 19th Street, STE101, Miami, Florida, United States, 33172

FCC ID: O55602516

Report Type: Original Report	Product Type: 6 inch Smart Phone
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Report Number:	<u>RDG160811001-00D</u>
Report Date:	<u>2016-09-25</u>
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Note: This test report is prepared for the customer shown above and for the device described herein. It may not be duplicated or used in part without prior written consent from Bay Area Compliance Laboratories Corp. (Dongguan).

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GENERAL INFORMATION

Product Description for Equipment under Test (EUT)

The SWAGTEK's product, model number: *Elite 6R PLUS(FCC ID: O55602516)* (the "EUT") in this report was a *6 inch Smart Phone*, which was measured approximately: 16.25 cm (L) × 8.35 cm (W) × 1.05 cm (H), rated input voltage: DC3.8V rechargeable Li-ion battery or DC5V from adapter.

Adapter information:

Model: TPA-46050150UU

Input: 100-240V~50/60hz 0.3A

Output: DC 5.0V, 1500mA

All measurement and test data in this report was gathered from production sample serial number: 160811001 (Assigned by BACL, Dongguan). The EUT was received on 2016-08-11.

Objective

This report is prepared on behalf of SWAGTEK in accordance with Part 2, Subpart J, Part 15, Subparts A, B and C of the Federal Communications Commission's rules

The tests were performed in order to determine the compliance of the EUT 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 submissions with FCC ID: O55602516

FCC Part 15C DSS submissions with FCC ID: O55602516

FCC Part 22H, 24E PCE submissions with FCC ID: O55602516

Test Methodology

All measurements contained in this report were conducted with ANSI C63.10-2013, American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices.

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

Test Facility

The Test site used by Bay Area Compliance Laboratories Corp. (Dongguan) to collect test data is located on the No.69 Pulongcun, Puxihu 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 Communications Commission (FCC). The details of these reports have been found to be in compliance with the requirements of Section 2.948 of the FCC Rules on February 06, 2015.

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

SYSTEM TEST CONFIGURATION

Description of Test Configuration

The system was configured for testing in engineering mode, which was provided by manufacturer. For 2.4GHz band, 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	/	/

For 802.11b, 802.11g, and 802.11n ht20 modes were tested with channel 1, 6 and 11.

For 802.11n ht40 mode were tested with Channel 3, 6 and 9.

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.

For Bluetooth LE mode, 40 channels are provided for testing:

Channel	Frequency (MHz)	Channel	Frequency (MHz)
0	2402	20	2442
1	2404	...	...
...	...	...	...
...	...	...	...
..	...	38	2478
19	2440	39	2480

EUT was tested with channel 0, 19 and 39.

Equipment Modifications

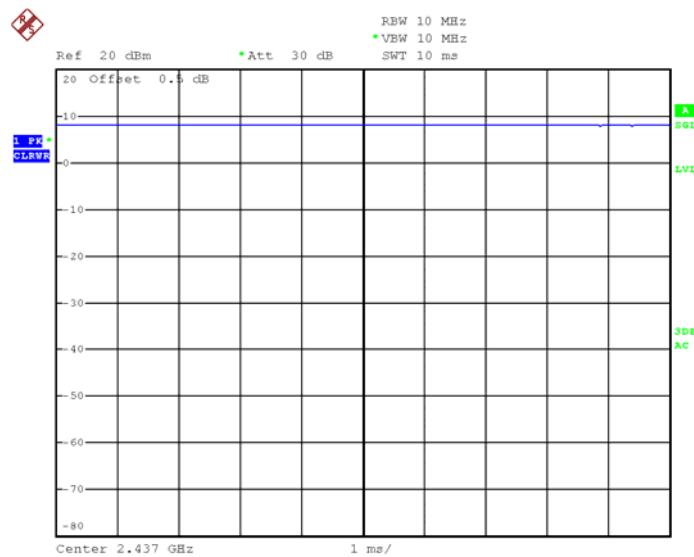
No modification was made to the EUT tested.

EUT Exercise Software

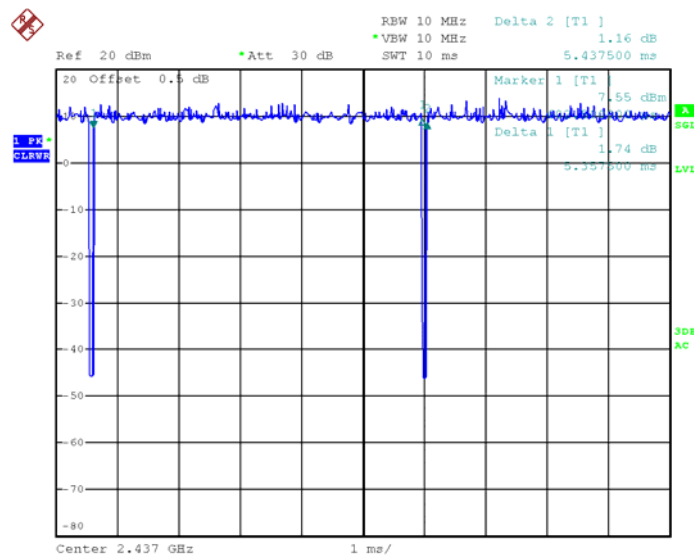
The maximum duty cycle was setting in engineering mode as following table:

Test mode	T _{on} (ms)	T _{on+off} (ms)	Duty Cycle (%)
802.11b	10	10	100%
802.11g	5.36	5.44	98.5%
802.11n ht20	4.96	5.02	98.8%
802.11n ht40	2.42	2.46	98.4%
BLE	0.62	0.72	86.1%

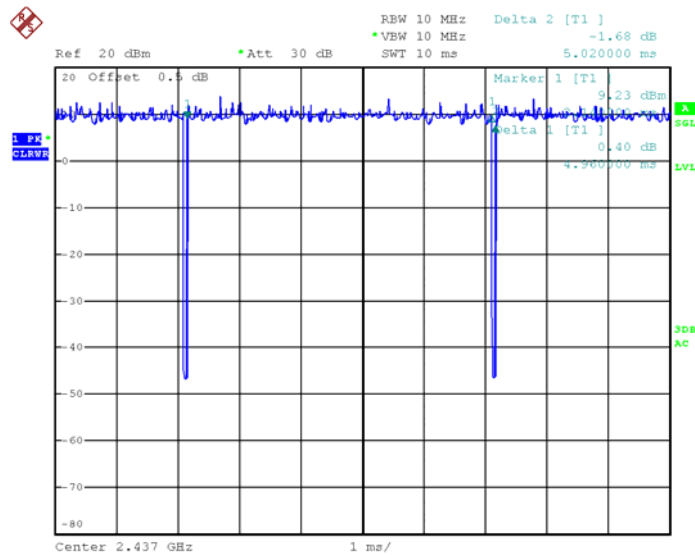
802.11b Middle Channel



Date: 24.SEP.2016 13:46:48

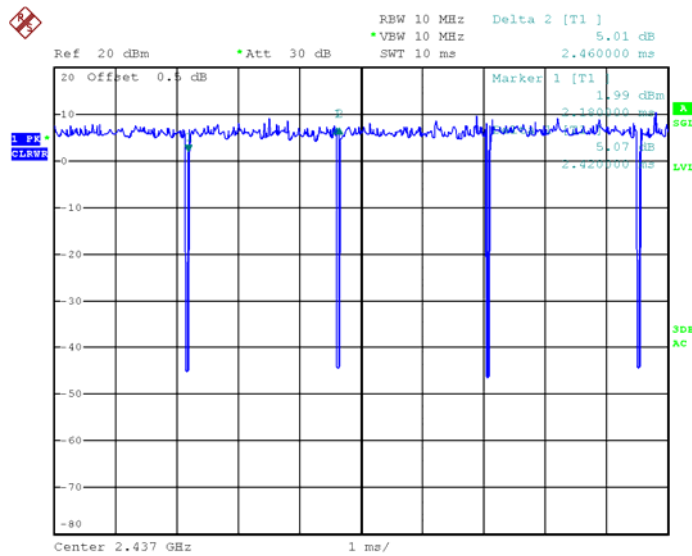
802.11g Middle Channel

Date: 24.SEP.2016 13:48:10

802.11n ht20 Middle Channel

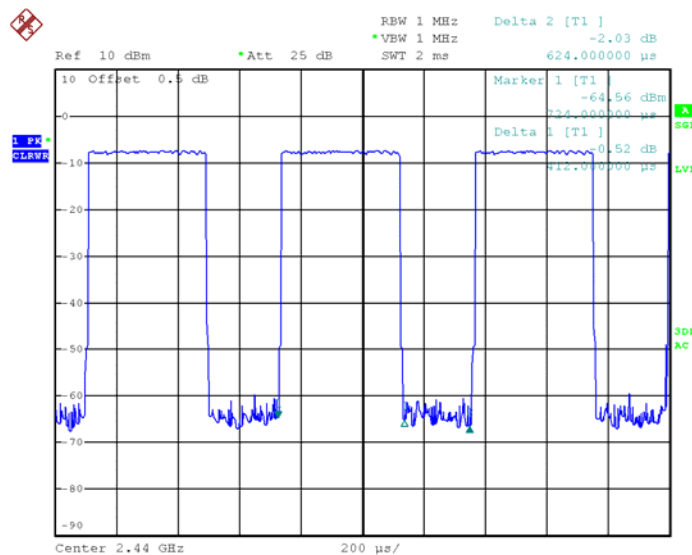
Date: 24.SEP.2016 13:48:49

802.11n ht40 Middle Channel



Date: 24.SEP.2016 13:51:17

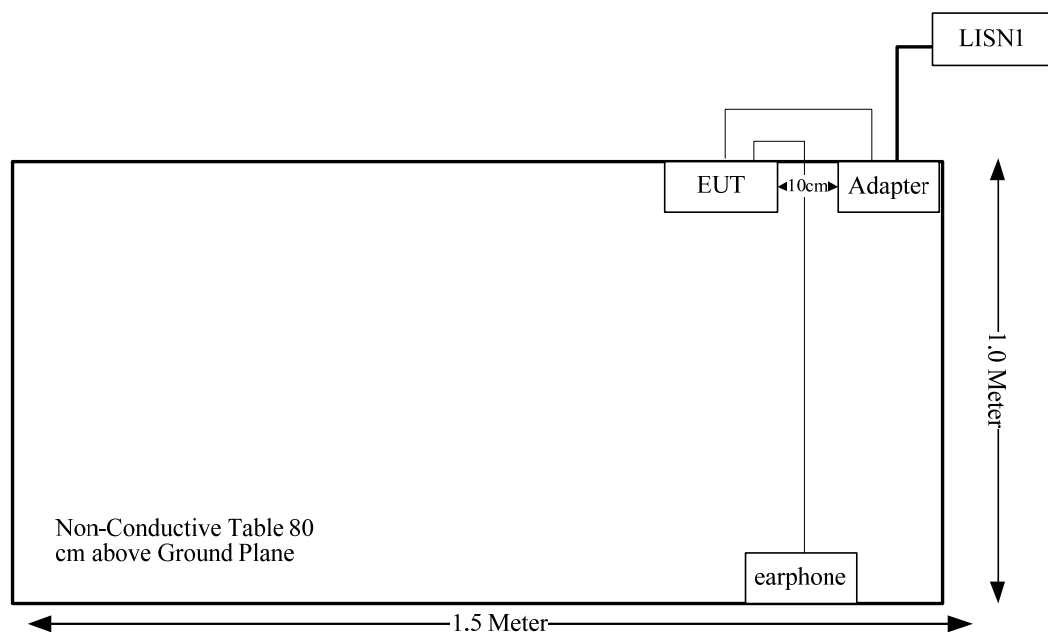
802.11n BLE Middle Channel



Date: 24.SEP.2016 17:12:42

External Cable

Cable Description	Shielding Type	Ferrite Core	Length (m)	From Port	To
USB Cable	Yes	No	1.0	USB Port of Adater	EUT
Earphone Cable	No	No	1.2	Audio Port of EUT	Earphone

Block Diagram of Test Setup

SUMMARY OF TEST RESULTS

FCC Rules	Description of Test	Result
FCC §15.247 (i) & §1.1310 & §2.1093	RF Exposure	Compliance
§15.203	Antenna Requirement	Compliance
§15.207 (a)	AC Line 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 Emission Bandwidth	Compliance
§15.247(b)(3)	Maximum conducted output power	Compliance
§15.247(d)	100 kHz Bandwidth of Frequency Band Edge	Compliance
§15.247(e)	Power Spectral Density	Compliance

FCC §15.247 (i) & §1.1310 & §2.1093- RF EXPOSURE

Applicable Standard

According to §15.247(i) and §1.1310, 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 KDB447498 D01 General RF Exposure Guidance v06:

The 1-g and 10-g SAR test exclusion thresholds for 100 MHz to 6 GHz at test separation distances ≤ 50 mm are determined by:

$[(\text{max. power of channel, including tune-up tolerance, mW})/(\text{min. test separation distance, mm})] \cdot [\sqrt{f(\text{GHz})}] \leq 3.0$ for 1-g SAR and ≤ 7.5 for 10-g extremity SAR, where

- $f(\text{GHz})$ is the RF channel transmit frequency in GHz
- Power and distance are rounded to the nearest mW and mm before calculation
- The result is rounded to one decimal place for comparison
- 3.0 and 7.5 are referred to as the numeric thresholds in the step 2 below

The test exclusions are applicable only when the minimum test separation distance is ≤ 50 mm and for transmission frequencies between 100 MHz and 6 GHz. When the minimum test separation distance is < 5 mm, a distance of 5 mm according to 5) in section 4.1 is applied to determine SAR test exclusion.

Measurement Result

For WiFi mode

The max tune-up conducted power is 9.8 dBm (9.55 mW).

$[(\text{max. power of channel, mW})/(\text{min. test separation distance, mm})][\sqrt{f(\text{GHz})}]$
 $= 9.55/5 \cdot (\sqrt{2.462}) = 3.0 \leq 3.0$

For bluetooth LE mode

The max tune-up conducted power is -6.7 dBm (0.21 mW).

$[(\text{max. power of channel, mW})/(\text{min. test separation distance, mm})][\sqrt{f(\text{GHz})}]$
 $= 0.21/5 \cdot (\sqrt{2.48}) = 0.067 < 3.0$

So the stand-alone SAR evaluation 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.

Antenna Connector Construction

The EUT has one internal antenna arrangement for Wifi/BT, and the antenna gain is 1.2 dBi, fulfill the requirement of this section. Please refer to the EUT photos.

Result: Compliance.

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:

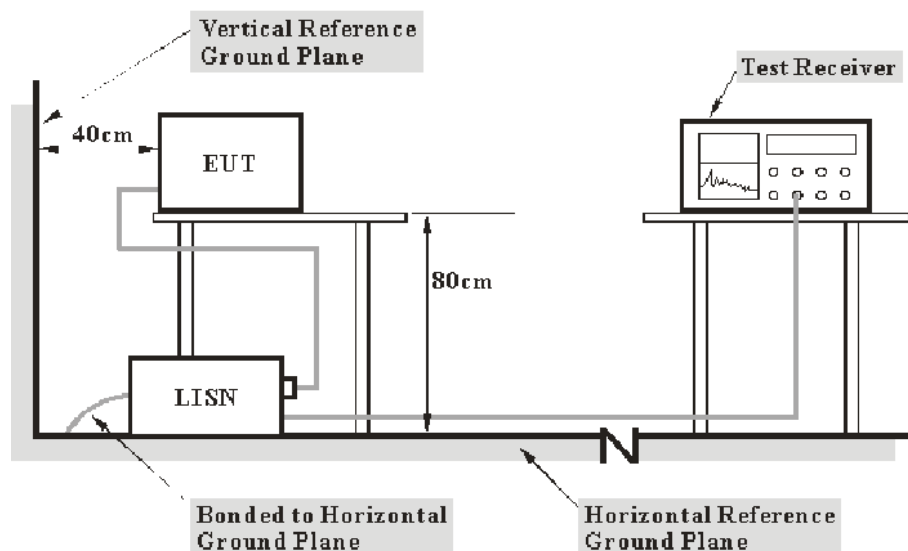
- compliance is deemed to occur if no measured disturbance level, increased by $(U_{lab} - U_{cisp})$, exceeds the disturbance limit;
- non-compliance is deemed to occur if any measured disturbance level, increased by $(U_{lab} - U_{cisp})$, exceeds the disturbance limit.

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 3.12 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 C63.10-2013 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 adapter was connected to 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	2015-12-10	2016-12-09
R&S	L.I.S.N	ESH2-Z5	892107/021	2016-07-16	2017-07-15
R&S	Two-line V-network	ENV 216	3560.6550.12	2015-11-26	2016-11-25
N/A	Coaxial Cable	1.8m	N/A	2016-05-06	2017-05-06
R&S	Test Software	EMC32	Version8.53.0	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 recorded data in following table, the EUT complied with the FCC Part 15.207.

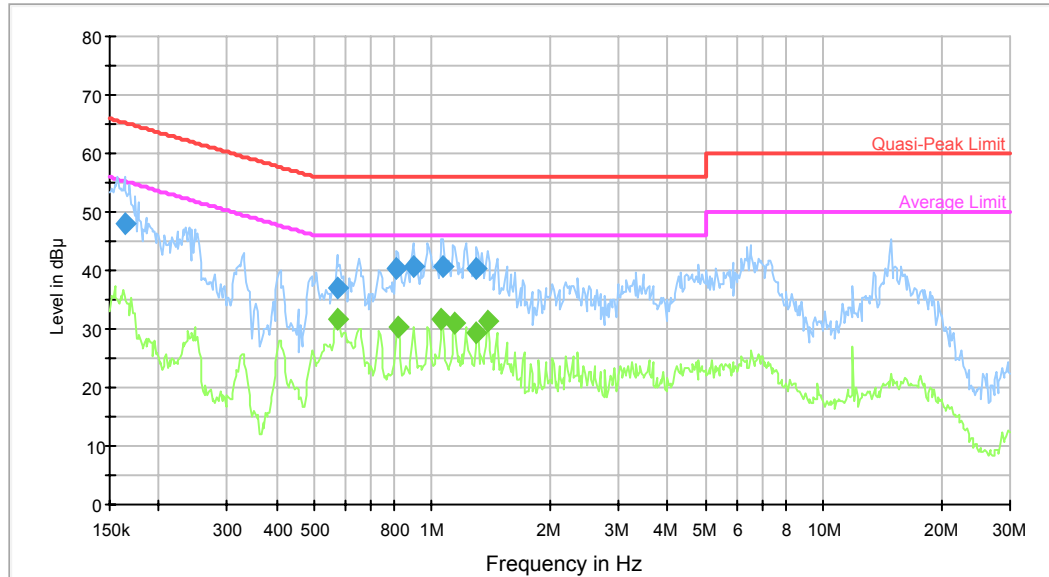
Test Data**Environmental Conditions**

Temperature:	27.5°C
Relative Humidity:	61 %
ATM Pressure:	99.7 kPa

The testing was performed by Lion Xiao on 2016-08-11.

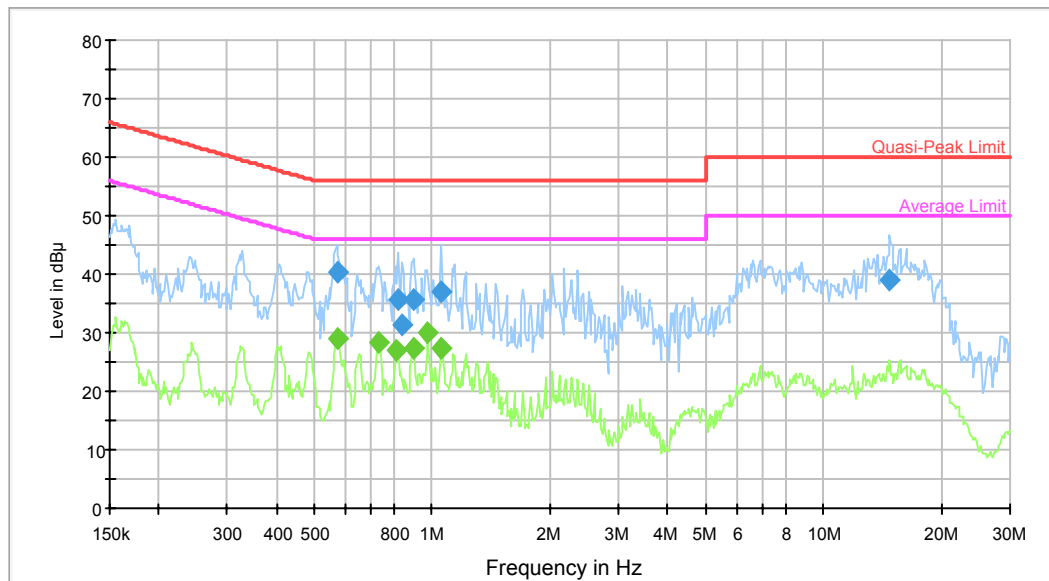
Test Mode: Transmitting (Wi-Fi)

AC120 V, 60 Hz, Line:



Frequency (MHz)	QuasiPeak (dBμV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)	Comment
0.163741	48.0	9.000	L1	10.1	17.3	65.3	Compliance
0.572086	37.1	9.000	L1	10.2	18.9	56.0	Compliance
0.812315	40.2	9.000	L1	10.4	15.8	56.0	Compliance
0.893821	40.8	9.000	L1	10.4	15.2	56.0	Compliance
1.065081	40.8	9.000	L1	10.4	15.2	56.0	Compliance
1.299858	40.4	9.000	L1	10.4	15.6	56.0	Compliance

Frequency (MHz)	Average (dBμV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)	Comment
0.572086	31.6	9.000	L1	10.2	14.4	46.0	Compliance
0.818813	30.5	9.000	L1	10.4	15.5	46.0	Compliance
1.056628	31.6	9.000	L1	10.4	14.4	46.0	Compliance
1.144267	31.0	9.000	L1	10.4	15.0	46.0	Compliance
1.299858	29.3	9.000	L1	10.4	16.7	46.0	Compliance
1.385415	31.5	9.000	L1	10.4	14.5	46.0	Compliance

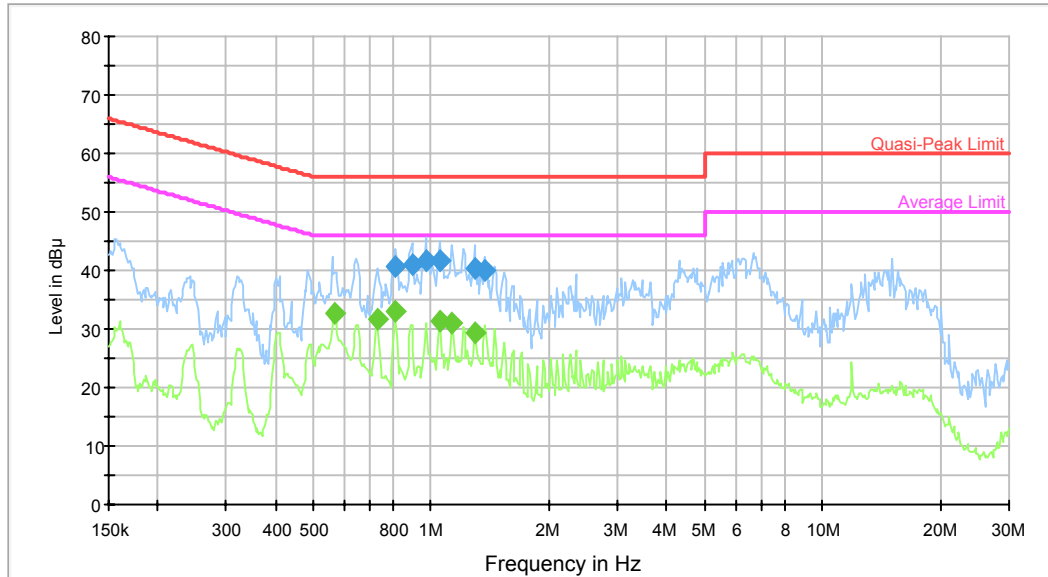
AC120 V, 60 Hz, Neutral:

Frequency (MHz)	QuasiPeak (dB μ V)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dB μ V)	Comment
0.572086	40.5	9.000	N	10.1	15.5	56.0	Compliance
0.818813	35.6	9.000	N	10.3	20.4	56.0	Compliance
0.838622	31.3	9.000	N	10.3	24.7	56.0	Compliance
0.900972	35.7	9.000	N	10.4	20.3	56.0	Compliance
1.056628	36.9	9.000	N	10.4	19.1	56.0	Compliance
14.769236	38.9	9.000	N	10.7	21.1	60.0	Compliance

Frequency (MHz)	Average (dB μ V)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dB μ V)	Comment
0.572086	28.9	9.000	N	10.1	17.1	46.0	Compliance
0.732382	28.2	9.000	N	10.4	17.8	46.0	Compliance
0.812315	27.2	9.000	N	10.3	18.8	46.0	Compliance
0.893821	27.2	9.000	N	10.4	18.8	46.0	Compliance
0.975701	30.0	9.000	N	10.4	16.0	46.0	Compliance
1.056628	27.2	9.000	N	10.4	18.8	46.0	Compliance

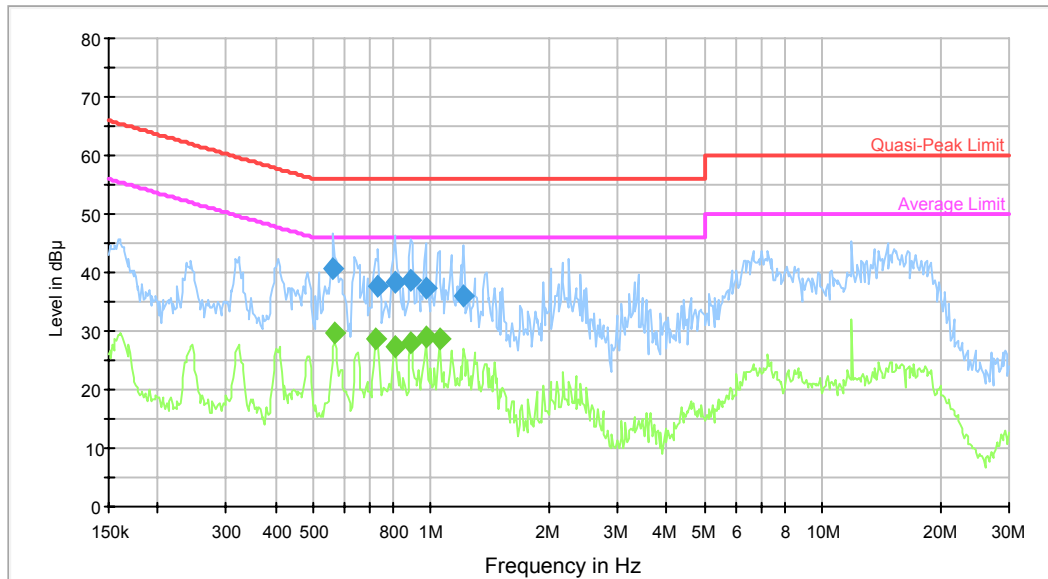
Test Mode: Transmitting (BLE)

AC120 V, 60 Hz, Line:



Frequency (MHz)	QuasiPeak (dBμV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)	Comment
0.812315	40.6	9.000	L1	10.4	15.4	56.0	Compliance
0.893821	41.0	9.000	L1	10.4	15.0	56.0	Compliance
0.967957	41.5	9.000	L1	10.4	14.5	56.0	Compliance
1.048242	41.7	9.000	L1	10.4	14.3	56.0	Compliance
1.289541	40.2	9.000	L1	10.4	15.8	56.0	Compliance
1.374420	40.1	9.000	L1	10.4	15.9	56.0	Compliance

Frequency (MHz)	Average (dBμV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)	Comment
0.567545	32.8	9.000	L1	10.1	13.2	46.0	Compliance
0.726569	31.6	9.000	L1	10.4	14.4	46.0	Compliance
0.812315	33.0	9.000	L1	10.4	13.0	46.0	Compliance
1.048242	31.3	9.000	L1	10.4	14.7	46.0	Compliance
1.135185	31.0	9.000	L1	10.4	15.0	46.0	Compliance
1.289541	29.2	9.000	L1	10.4	16.8	46.0	Compliance

AC120 V, 60 Hz, Neutral:

Frequency (MHz)	QuasiPeak (dBμV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)	Comment
0.563041	40.6	9.000	N	10.1	15.4	56.0	Compliance
0.732382	37.8	9.000	N	10.4	18.2	56.0	Compliance
0.805868	38.3	9.000	N	10.3	17.7	56.0	Compliance
0.886728	38.5	9.000	N	10.4	17.5	56.0	Compliance
0.967957	37.5	9.000	N	10.4	18.5	56.0	Compliance
1.209904	36.1	9.000	N	10.4	19.9	56.0	Compliance

Frequency (MHz)	Average (dBμV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)	Comment
0.567545	29.6	9.000	N	10.1	16.4	46.0	Compliance
0.720803	28.5	9.000	N	10.4	17.5	46.0	Compliance
0.805868	27.3	9.000	N	10.3	18.7	46.0	Compliance
0.886728	28.0	9.000	N	10.4	18.0	46.0	Compliance
0.967957	29.1	9.000	N	10.4	16.9	46.0	Compliance
1.048242	28.8	9.000	N	10.4	17.2	46.0	Compliance

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

Applicable Standard

FCC §15.247 (d); §15.209; §15.205;

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 2, 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 2, 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.

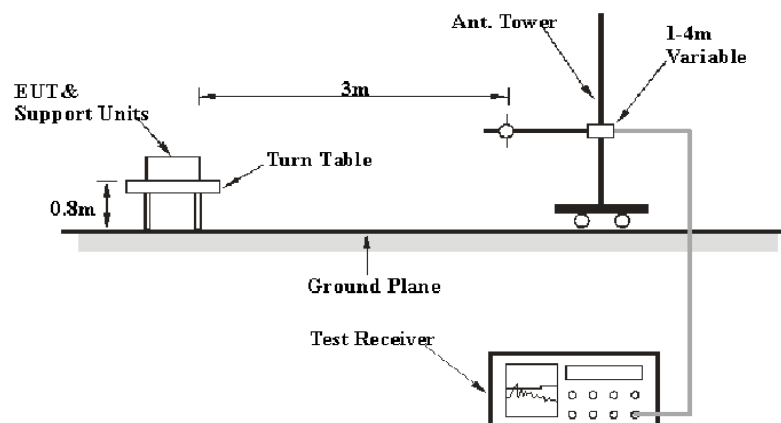
Based on CISPR 16-4-2-2011, measurement uncertainty of radiated emission at a distance of 3m at Bay Area Compliance Laboratories Corp. (Dongguan) is: 30M~200MHz: 4.58 dB for Horizontal, 4.59 dB for Vertical; 200M~1GHz: 4.83 dB for Horizontal, 5.85 dB for Vertical; 1G~6GHz: 4.45 dB, 6G~18GHz: 5.23 dB

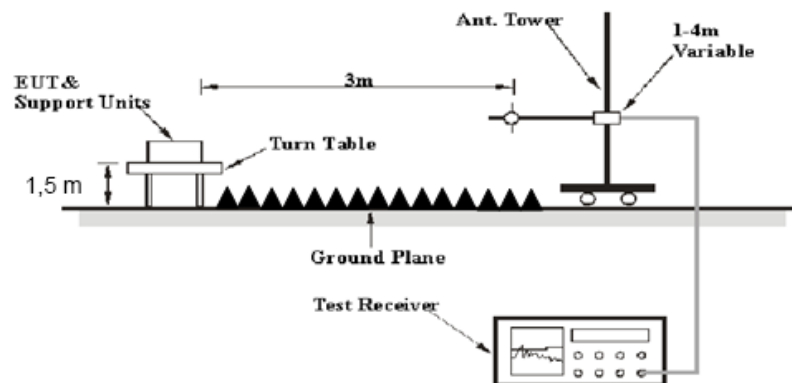
Table 2 – Values of U_{cisp}

Measurement	U_{cisp}
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 1GHz:



Above 1GHz:

The radiated emission tests were performed in the 3 meters chamber test site, using the setup accordance with the ANSI C63.10-2013. The specification used was the FCC 15.209, 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:

for Wifi, duty cycle: $\geq 98\%$

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

for BLE,

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

Note: Video B/W $> 1/T_{on} = 1/0.624 = 1.6\text{kHz}$

Test Procedure

Maximizing procedure was performed on the highest emissions to ensure that the EUT complied with all installation combinations.

Corrected Amplitude & Margin Calculation

The Corrected Amplitude is calculated by adding the Antenna Loss and Cable Loss, and subtracting the Amplifier Gain from the Meter Reading. The basic equation is as follows:

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

The “**Margin**” column of the following data tables indicates the degree of compliance with the applicable limit. For example, a margin of 7dB means the emission is 7dB below the limit. The equation for margin calculation is as follows:

$$\text{Margin} = \text{Limit} - \text{Corrected Amplitude}$$

Test Equipment List and Details

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

* **Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Dongguan) attests that all calibrations have been performed, 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 Title 47, Part 15, Subpart C, and section 15.205, 15.209 and 15.247.

Test Data**Environmental Conditions**

Temperature:	27 °C
Relative Humidity:	46%
ATM Pressure:	99.7 kPa

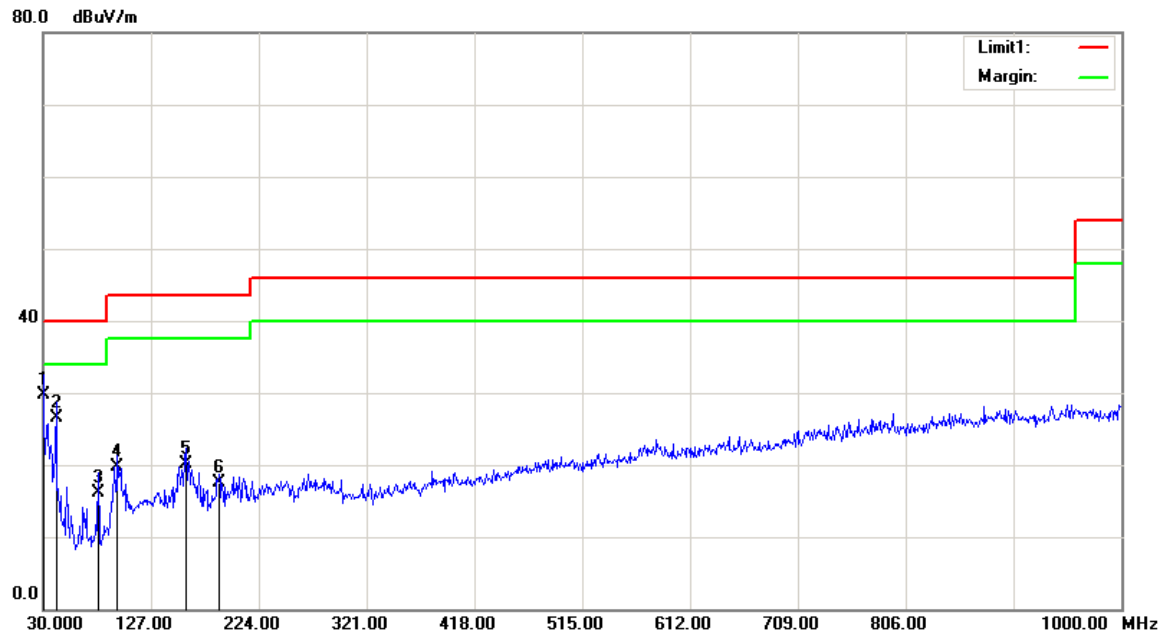
** The testing was performed by Lion Xiao on 2016-08-21.*

Test Mode: Transmitting

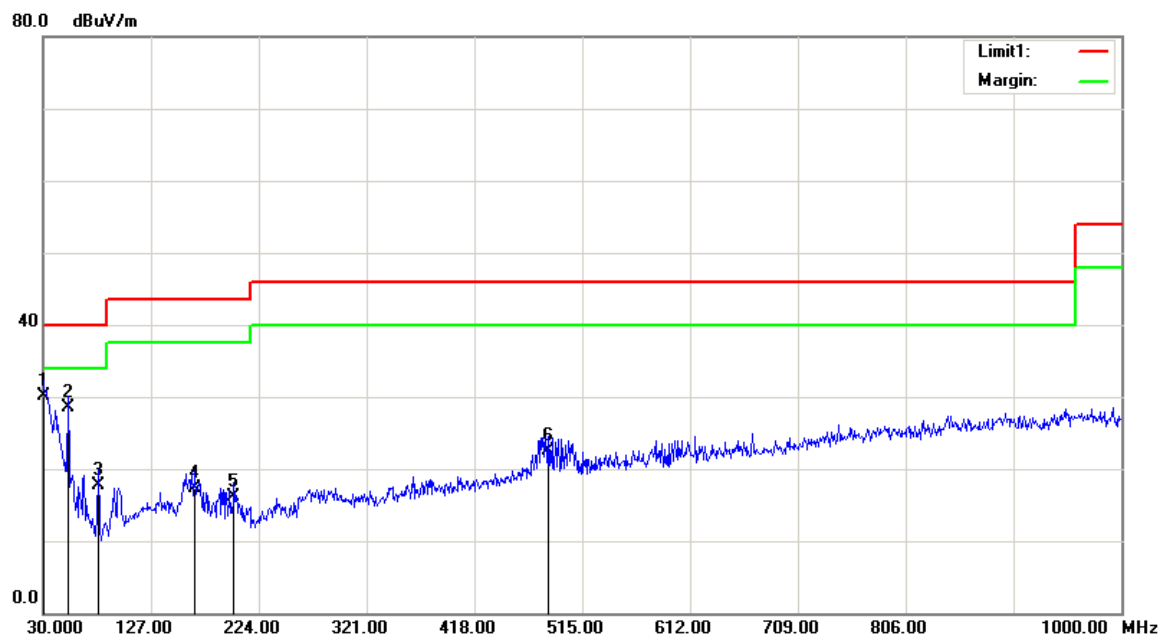
1) Below 1GHz(802.11b mode middle channel was the worst case):

Wifi:

Horizontal

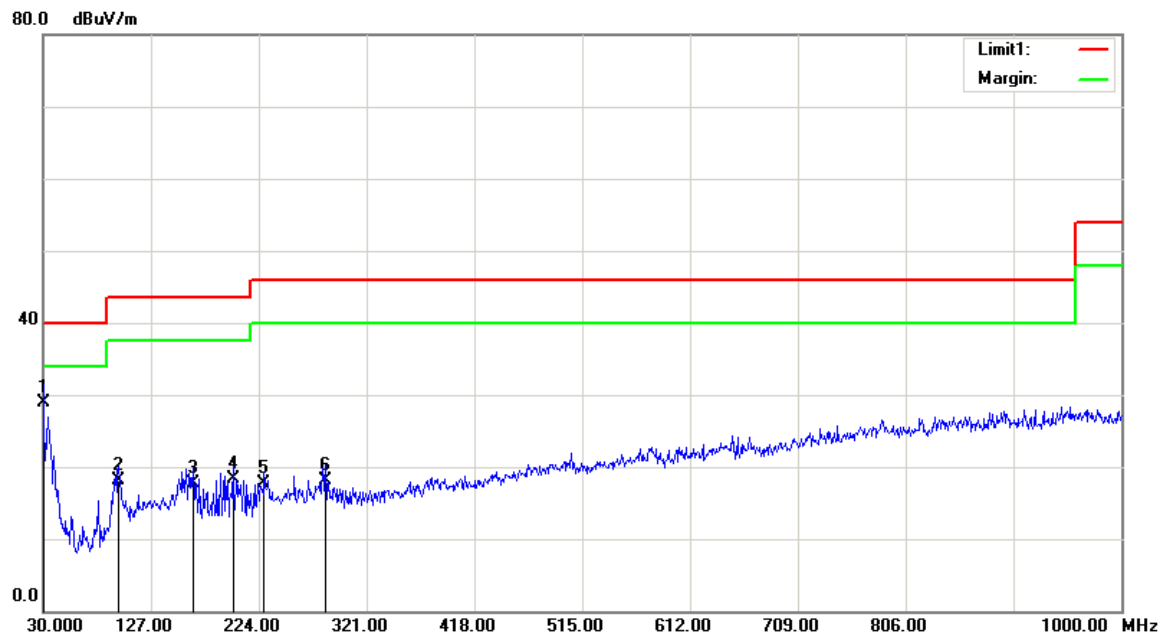


Frequency (MHz)	Receiver Reading (dBμV)	Detector	Correction Factor (dB/m)	Cord. Amp. (dBμV/m)	Limit (dBμV/m)	Margin (dB)
30.0000	28.75	QP	0.95	29.70	40.00	10.30
41.6400	34.15	QP	-7.65	26.50	40.00	13.50
79.4700	28.12	QP	-12.02	16.10	40.00	23.90
96.9300	30.27	QP	-10.47	19.80	43.50	23.70
158.0400	27.29	QP	-7.09	20.20	43.50	23.30
188.1100	25.88	QP	-8.28	17.60	43.50	25.90

Vertical

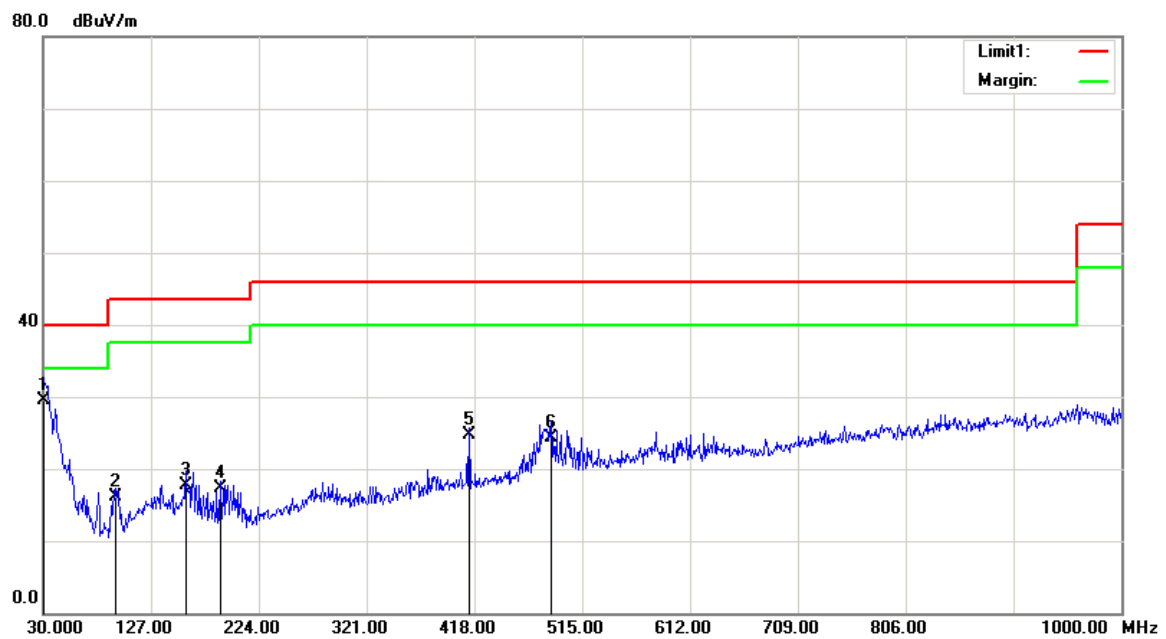
Frequency (MHz)	Receiver Reading (dBμV)	Detector	Correction Factor (dB/m)	Cord. Amp. (dBμV/m)	Limit (dBμV/m)	Margin (dB)
30.0000	29.25	QP	0.95	30.20	40.00	9.80
52.3100	41.07	QP	-12.57	28.50	40.00	11.50
79.4700	29.82	QP	-12.02	17.80	40.00	22.20
165.8000	24.87	QP	-7.57	17.30	43.50	26.20
201.6900	23.40	QP	-7.30	16.10	43.50	27.40
484.9300	24.21	QP	-1.71	22.50	46.00	23.50

BLE:

Horizontal

Frequency (MHz)	Receiver Reading (dBμV)	Detector	Correction Factor (dB/m)	Cord. Amp. (dBμV/m)	Limit (dBμV/m)	Margin (dB)
30.0000	27.95	QP	0.95	28.90	40.00	11.10
97.9000	28.43	QP	-10.23	18.20	43.50	25.30
164.8300	25.32	QP	-7.52	17.80	43.50	25.70
200.7200	25.69	QP	-7.29	18.40	43.50	25.10
228.8500	25.90	QP	-8.20	17.70	46.00	28.30
284.1400	24.14	QP	-5.94	18.20	46.00	27.80

Vertical



Frequency (MHz)	Receiver Reading (dBμV)	Detector	Correction Factor (dB/m)	Cord. Amp. (dBμV/m)	Limit (dBμV/m)	Margin (dB)
30.0000	28.65	QP	0.95	29.60	40.00	10.40
94.9900	27.16	QP	-10.96	16.20	43.50	27.30
158.0400	24.79	QP	-7.09	17.70	43.50	25.80
189.0800	25.70	QP	-8.30	17.40	43.50	26.10
413.1500	28.06	QP	-3.36	24.70	46.00	21.30
486.8700	25.99	QP	-1.69	24.30	46.00	21.70

2) 1-25GHz:

802.11b Mode

Frequency (MHz)	Receiver		Rx Antenna		Cable loss (dB)	Amplifier Gain (dB)	Corrected Amplitude (dBμV/m)	Limit (dBμV/m)	Margin (dB)
	Reading (dBμV)	Detector	Polar (H/V)	Factor (dB)					
Low Channel: 2412 MHz									
2412	65.67	PK	H	25.67	3.68	0.00	95.02	N/A	N/A
2412	62.71	AV	H	25.67	3.68	0.00	92.06	N/A	N/A
2412	58.18	PK	V	25.67	3.68	0.00	87.53	N/A	N/A
2412	54.67	AV	V	25.67	3.68	0.00	84.02	N/A	N/A
2390	29.26	PK	H	25.61	3.63	0.00	58.50	74.00	15.50
2390	15.32	AV	H	25.61	3.63	0.00	44.56	54.00	9.44
4824	34.02	PK	H	30.64	5.03	27.41	42.28	74.00	31.72
4824	22.64	AV	H	30.64	5.03	27.41	30.90	54.00	23.10
7236	33.03	PK	H	34.17	6.65	25.90	47.95	74.00	26.05
7236	20.67	AV	H	34.17	6.65	25.90	35.59	54.00	18.41
3625	39.17	PK	H	29.08	4.58	27.28	45.55	74.00	28.45
3625	33.23	AV	H	29.08	4.58	27.28	39.61	54.00	14.39
Middle Channel: 2437 MHz									
2437	65.56	PK	H	25.74	3.75	0.00	95.05	N/A	N/A
2437	62.57	AV	H	25.74	3.75	0.00	92.06	N/A	N/A
2437	58.06	PK	V	25.74	3.75	0.00	87.55	N/A	N/A
2437	54.49	AV	V	25.74	3.75	0.00	83.98	N/A	N/A
4874	34.95	PK	H	30.77	5.14	27.42	43.44	74.00	30.56
4874	22.67	AV	H	30.77	5.14	27.42	31.16	54.00	22.84
7311	33.96	PK	H	34.35	6.74	25.88	49.17	74.00	24.83
7311	20.66	AV	H	34.35	6.74	25.88	35.87	54.00	18.13
3324	35.62	PK	H	28.24	4.97	27.26	41.57	74.00	32.43
3324	24.68	AV	H	28.24	4.97	27.26	30.63	54.00	23.37
3625	39.09	PK	H	29.08	4.58	27.28	45.47	74.00	28.53
3625	33.2	AV	H	29.08	4.58	27.28	39.58	54.00	14.42
High Channel: 2462 MHz									
2462	65.39	PK	H	25.80	3.75	0.00	94.94	N/A	N/A
2462	62.49	AV	H	25.80	3.75	0.00	92.04	N/A	N/A
2462	57.88	PK	V	25.80	3.75	0.00	87.43	N/A	N/A
2462	54.4	AV	V	25.80	3.75	0.00	83.95	N/A	N/A
2483.5	30.65	PK	H	25.86	3.67	0.00	60.18	74.00	13.82
2483.5	16.68	AV	H	25.86	3.67	0.00	46.21	54.00	7.79
4924	34.78	PK	H	30.90	5.34	27.43	43.59	74.00	30.41
4924	21.63	AV	H	30.90	5.34	27.43	30.44	54.00	23.56
7386	33.08	PK	H	34.53	6.83	25.86	48.58	74.00	25.42
7386	20.41	AV	H	34.53	6.83	25.86	35.91	54.00	18.09
3625	40.21	PK	H	29.08	4.58	27.28	46.59	74.00	27.41
3625	33.65	AV	H	29.08	4.58	27.28	40.03	54.00	13.97

802.11g Mode

Frequency (MHz)	Receiver		Rx Antenna		Cable loss (dB)	Amplifier Gain (dB)	Corrected Amplitude (dBμV/m)	Limit (dBμV/m)	Margin (dB)
	Reading (dBμV)	Detector	Polar (H/V)	Factor (dB)					
Low Channel: 2412 MHz									
2412	64.75	PK	H	25.67	3.68	0.00	94.10	N/A	N/A
2412	54.59	AV	H	25.67	3.68	0.00	83.94	N/A	N/A
2412	56.71	PK	V	25.67	3.68	0.00	86.06	N/A	N/A
2412	46.38	AV	V	25.67	3.68	0.00	75.73	N/A	N/A
2390	31.54	PK	H	25.61	3.63	0.00	60.78	74.00	13.22
2390	16.59	AV	H	25.61	3.63	0.00	45.83	54.00	8.17
4824	35.26	PK	H	30.64	5.03	27.41	43.52	74.00	30.48
4824	23.01	AV	H	30.64	5.03	27.41	31.27	54.00	22.73
7236	34.41	PK	H	34.17	6.65	25.90	49.33	74.00	24.67
7236	22.87	AV	H	34.17	6.65	25.90	37.79	54.00	16.21
3625	38.23	PK	H	29.08	4.58	27.28	44.61	74.00	29.39
3625	28.88	AV	H	29.08	4.58	27.28	35.26	54.00	18.74
Middle Channel: 2437 MHz									
2437	64.69	PK	H	25.74	3.75	0.00	94.18	N/A	N/A
2437	54.25	AV	H	25.74	3.75	0.00	83.74	N/A	N/A
2437	56.47	PK	V	25.74	3.75	0.00	85.96	N/A	N/A
2437	46.34	AV	V	25.74	3.75	0.00	75.83	N/A	N/A
4874	35.19	PK	H	30.77	5.14	27.42	43.68	74.00	30.32
4874	22.95	AV	H	30.77	5.14	27.42	31.44	54.00	22.56
7311	34.35	PK	H	34.35	6.74	25.88	49.56	74.00	24.44
7311	22.8	AV	H	34.35	6.74	25.88	38.01	54.00	15.99
3140	34.63	PK	H	27.65	6.95	27.42	41.81	74.00	32.19
3140	23.84	AV	H	27.65	6.95	27.42	31.02	54.00	22.98
3625	39.55	PK	H	29.08	4.58	27.28	45.93	74.00	28.07
3625	32.97	AV	H	29.08	4.58	27.28	39.35	54.00	14.65
High Channel: 2462 MHz									
2462	64.67	PK	H	25.80	3.75	0.00	94.22	N/A	N/A
2462	55.33	AV	H	25.80	3.75	0.00	84.88	N/A	N/A
2462	57.43	PK	V	25.80	3.75	0.00	86.98	N/A	N/A
2462	47.16	AV	V	25.80	3.75	0.00	76.71	N/A	N/A
2483.5	32.67	PK	H	25.86	3.67	0.00	62.20	74.00	11.80
2483.5	17.34	AV	H	25.86	3.67	0.00	46.87	54.00	7.13
4924	35.19	PK	H	30.90	5.34	27.43	44.00	74.00	30.00
4924	22.94	AV	H	30.90	5.34	27.43	31.75	54.00	22.25
7386	34.39	PK	H	34.53	6.83	25.86	49.89	74.00	24.11
7386	22.84	AV	H	34.53	6.83	25.86	38.34	54.00	15.66
3625	38.95	PK	H	29.08	4.58	27.28	45.33	74.00	28.67
3625	31.51	AV	H	29.08	4.58	27.28	37.89	54.00	16.11

802.11 n ht20 Mode

Frequency (MHz)	Receiver		Rx Antenna		Cable loss (dB)	Amplifier Gain (dB)	Corrected Amplitude (dBμV/m)	Limit (dBμV/m)	Margin (dB)
	Reading (dBμV)	Detector	Polar (H/V)	Factor (dB)					
Low Channel: 2412 MHz									
2412	64.82	PK	H	25.67	3.68	0.00	94.17	N/A	N/A
2412	56.71	AV	H	25.67	3.68	0.00	86.06	N/A	N/A
2412	58.74	PK	V	25.67	3.68	0.00	88.09	N/A	N/A
2412	50.37	AV	V	25.67	3.68	0.00	79.72	N/A	N/A
2390	30.19	PK	H	25.61	3.63	0.00	59.43	74.00	14.57
2390	16.67	AV	H	25.61	3.63	0.00	45.91	54.00	8.09
4824	34.92	PK	H	30.64	5.03	27.41	43.18	74.00	30.82
4824	22.71	AV	H	30.64	5.03	27.41	30.97	54.00	23.03
7236	34.13	PK	H	34.17	6.65	25.90	49.05	74.00	24.95
7236	22.59	AV	H	34.17	6.65	25.90	37.51	54.00	16.49
3625	38.91	PK	H	29.08	4.58	27.28	45.29	74.00	28.71
3625	31.46	AV	H	29.08	4.58	27.28	37.84	54.00	16.16
Middle Channel: 2437 MHz									
2437	64.05	PK	H	25.74	3.75	0.00	93.54	N/A	N/A
2437	55.97	AV	H	25.74	3.75	0.00	85.46	N/A	N/A
2437	58.03	PK	V	25.74	3.75	0.00	87.52	N/A	N/A
2437	49.63	AV	V	25.74	3.75	0.00	79.12	N/A	N/A
4874	34.87	PK	H	30.77	5.14	27.42	43.36	74.00	30.64
4874	22.58	AV	H	30.77	5.14	27.42	31.07	54.00	22.93
7311	33.97	PK	H	34.35	6.74	25.88	49.18	74.00	24.82
7311	22.42	AV	H	34.35	6.74	25.88	37.63	54.00	16.37
3214	34.86	PK	H	27.88	6.14	27.36	41.52	74.00	32.48
3214	22.42	AV	H	27.88	6.14	27.36	29.08	54.00	24.92
3625	39.6	PK	H	29.08	4.58	27.28	45.98	74.00	28.02
3625	33.18	AV	H	29.08	4.58	27.28	39.56	54.00	14.44
High Channel: 2462 MHz									
2462	64.65	PK	H	25.80	3.75	0.00	94.20	N/A	N/A
2462	56.56	AV	H	25.80	3.75	0.00	86.11	N/A	N/A
2462	58.56	PK	V	25.80	3.75	0.00	88.11	N/A	N/A
2462	50.22	AV	V	25.80	3.75	0.00	79.77	N/A	N/A
2483.5	34.91	PK	H	25.86	3.67	0.00	64.44	74.00	9.56
2483.5	17.35	AV	H	25.86	3.67	0.00	46.88	54.00	7.12
4924	34.6	PK	H	30.90	5.34	27.43	43.41	74.00	30.59
4924	22.44	AV	H	30.90	5.34	27.43	31.25	54.00	22.75
7386	33.88	PK	H	34.53	6.83	25.86	49.38	74.00	24.62
7386	22.34	AV	H	34.53	6.83	25.86	37.84	54.00	16.16
3625	38.82	PK	H	29.08	4.58	27.28	45.20	74.00	28.80
3625	31.44	AV	H	29.08	4.58	27.28	37.82	54.00	16.18

802.11 n ht40 Mode

Frequency (MHz)	Receiver		Rx Antenna		Cable loss (dB)	Amplifier Gain (dB)	Corrected Amplitude (dBμV/m)	Limit (dBμV/m)	Margin (dB)
	Reading (dBμV)	Detector	Polar (H/V)	Factor (dB)					
Low Channel: 2422 MHz									
2422	64.97	PK	H	25.70	3.71	0.00	94.38	N/A	N/A
2422	54.77	AV	H	25.70	3.71	0.00	84.18	N/A	N/A
2422	60.44	PK	V	25.70	3.71	0.00	89.85	N/A	N/A
2422	50.15	AV	V	25.70	3.71	0.00	79.56	N/A	N/A
2390	32.81	PK	H	25.61	3.63	0.00	62.05	74.00	11.95
2390	17.22	AV	H	25.61	3.63	0.00	46.46	54.00	7.54
4844	35.27	PK	H	30.69	4.99	27.42	43.53	74.00	30.47
4844	22.41	AV	H	30.69	4.99	27.42	30.67	54.00	23.33
7266	33.63	PK	H	34.24	6.68	25.89	48.66	74.00	25.34
7266	21.11	AV	H	34.24	6.68	25.89	36.14	54.00	17.86
3625	39.54	PK	H	29.08	4.58	27.28	45.92	74.00	28.08
3625	32.91	AV	H	29.08	4.58	27.28	39.29	54.00	14.71
Middle Channel: 2437 MHz									
2437	64.77	PK	H	25.74	3.75	0.00	94.26	N/A	N/A
2437	54.68	AV	H	25.74	3.75	0.00	84.17	N/A	N/A
2437	60.18	PK	V	25.74	3.75	0.00	89.67	N/A	N/A
2437	50.14	AV	V	25.74	3.75	0.00	79.63	N/A	N/A
4874	36.51	PK	H	30.77	5.14	27.42	45.00	74.00	29.00
4874	35.2	AV	H	30.77	5.14	27.42	43.69	54.00	10.31
7311	33.72	PK	H	34.35	6.74	25.88	48.93	74.00	25.07
7311	20.21	AV	H	34.35	6.74	25.88	35.42	54.00	18.58
3201	35.48	PK	H	27.84	6.08	27.37	42.03	74.00	31.97
3201	22.83	AV	H	27.84	6.08	27.37	29.38	54.00	24.62
3625	39.57	PK	H	29.08	4.58	27.28	45.95	74.00	28.05
3625	32.96	AV	H	29.08	4.58	27.28	39.34	54.00	14.66
High Channel: 2452 MHz									
2452	64.41	PK	H	25.78	3.78	0.00	93.97	N/A	N/A
2452	54.47	AV	H	25.78	3.78	0.00	84.03	N/A	N/A
2452	59.82	PK	V	25.78	3.78	0.00	89.38	N/A	N/A
2452	49.88	AV	V	25.78	3.78	0.00	79.44	N/A	N/A
2483.5	34.69	PK	H	25.86	3.67	0.00	64.22	74.00	9.78
2483.5	17.78	AV	H	25.86	3.67	0.00	47.31	54.00	6.69
4904	35.6	PK	H	30.85	5.31	27.43	44.33	74.00	29.67
4904	22.65	AV	H	30.85	5.31	27.43	31.38	54.00	22.62
7356	35.74	PK	H	34.45	6.79	25.87	51.11	74.00	22.89
7356	23.14	AV	H	34.45	6.79	25.87	38.51	54.00	15.49
3625	39.84	PK	H	29.08	4.58	27.28	46.22	74.00	27.78
3625	30.74	AV	H	29.08	4.58	27.28	37.12	54.00	16.88

BLE Mode

Frequency (MHz)	Receiver		Rx Antenna		Cable loss (dB)	Amplifier Gain (dB)	Corrected Amplitude (dBμV/m)	Limit (dBμV/m)	Margin (dB)
	Reading (dBμV)	Detector	Polar (H/V)	Factor (dB)					
Low Channel: 2402 MHz									
2402	56.65	PK	H	25.65	3.66	0.00	85.96	N/A	N/A
2402	51.51	AV	H	25.65	3.66	0.00	80.82	N/A	N/A
2402	50.66	PK	V	25.65	3.66	0.00	79.97	N/A	N/A
2402	45.16	AV	V	25.65	3.66	0.00	74.47	N/A	N/A
2400	24.51	PK	H	25.64	3.65	0.00	53.80	74.00	20.20
2400	13.34	AV	H	25.64	3.65	0.00	42.63	54.00	11.37
4804	30.65	PK	H	30.59	5.06	27.41	38.89	74.00	35.11
4804	18.34	AV	H	30.59	5.06	27.41	26.58	54.00	27.42
7206	30.13	PK	H	34.09	6.61	25.91	44.92	74.00	29.08
7206	17.82	AV	H	34.09	6.61	25.91	32.61	54.00	21.39
3124	32.69	PK	H	27.60	6.91	27.43	39.77	74.00	34.23
3124	20.36	AV	H	27.60	6.91	27.43	27.44	54.00	26.56
Middle Channel: 2440 MHz									
2440	55.95	PK	H	25.74	3.76	0.00	85.45	N/A	N/A
2440	50.23	AV	H	25.74	3.76	0.00	79.73	N/A	N/A
2440	49.89	PK	V	25.74	3.76	0.00	79.39	N/A	N/A
2440	43.87	AV	V	25.74	3.76	0.00	73.37	N/A	N/A
4880	30.94	PK	H	30.79	5.18	27.42	39.49	74.00	34.51
4880	18.57	AV	H	30.79	5.18	27.42	27.12	54.00	26.88
7320	30.39	PK	H	34.37	6.75	25.88	45.63	74.00	28.37
7320	18.04	AV	H	34.37	6.75	25.88	33.28	54.00	20.72
3035	32.97	PK	H	27.31	6.69	27.50	39.47	74.00	34.53
3035	20.61	AV	H	27.31	6.69	27.50	27.11	54.00	26.89
3610	35.06	PK	H	29.04	4.61	27.28	41.43	74.00	32.57
3610	22.33	AV	H	29.04	4.61	27.28	28.70	54.00	25.30
High Channel: 2480 MHz									
2480	56.86	PK	H	25.85	3.68	0.00	86.39	N/A	N/A
2480	50.35	AV	H	25.85	3.68	0.00	79.88	N/A	N/A
2480	50.95	PK	V	25.85	3.68	0.00	80.48	N/A	N/A
2480	44.28	AV	V	25.85	3.68	0.00	73.81	N/A	N/A
2483.5	24.63	PK	H	25.86	3.67	0.00	54.16	74.00	19.84
2483.5	12.86	AV	H	25.86	3.67	0.00	42.39	54.00	11.61
4960	31.18	PK	H	31.00	5.34	27.43	40.09	74.00	33.91
4960	18.87	AV	H	31.00	5.34	27.43	27.78	54.00	26.22
7440	30.63	PK	H	34.66	6.89	25.97	46.21	74.00	27.79
7440	18.29	AV	H	34.66	6.89	25.97	33.87	54.00	20.13
3210	33.19	PK	H	27.87	6.13	27.36	39.83	74.00	34.17
3210	20.83	AV	H	27.87	6.13	27.36	27.47	54.00	26.53

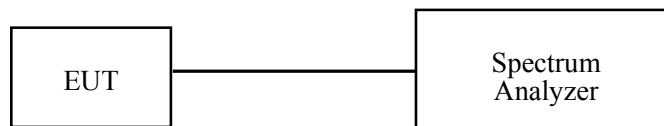
FCC §15.247(a) (2) – 6 dB EMISSION BANDWIDTH

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

- Set RBW = 100 kHz.
- Set the video bandwidth (VBW) $\geq 3 \times \text{RBW}$
- Detector = Peak.
- Trace mode = max hold.
- Sweep = auto couple.
- Allow the trace to stabilize.
- Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission.



Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Agilent	Spectrum Analyzer	E4440A	SG43360054	2015-11-23	2016-11-22
N/A	Coaxial Cable	0.1m	N/A	2016-05-06	2017-05-06
E-Microwave	DC Blocking	EMDCB-00036	0E01201047	2016-05-06	2017-05-06

* **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:	30.5 °C
Relative Humidity:	50%
ATM Pressure:	100 kPa

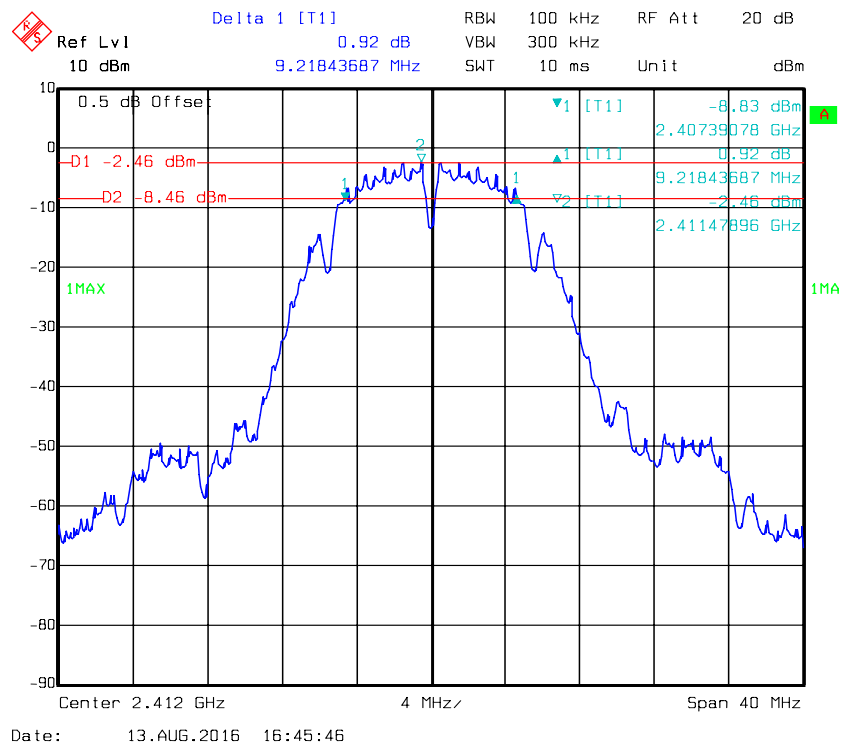
* The testing was performed by Lion Xiao on 2016-08-13.

Test Mode: Transmitting

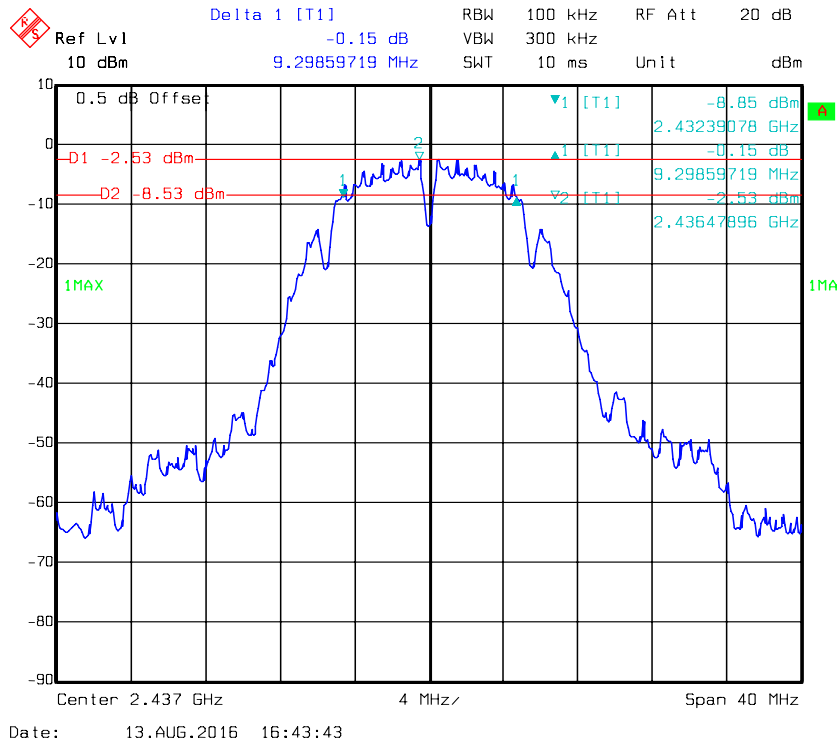
Test Result: Compliant. Please refer to the following table and plots.

Test mode	Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Limit (MHz)
802.11b	Low	2412	9.22	≥ 0.5
	Middle	2437	9.3	≥ 0.5
	High	2462	9.22	≥ 0.5
802.11g	Low	2412	16.43	≥ 0.5
	Middle	2437	16.43	≥ 0.5
	High	2462	16.43	≥ 0.5
802.11n20	Low	2412	17.72	≥ 0.5
	Middle	2437	17.72	≥ 0.5
	High	2462	17.72	≥ 0.5
802.11n40	Low	2422	36.39	≥ 0.5
	Middle	2437	36.39	≥ 0.5
	High	2452	36.07	≥ 0.5
BLE	Low	2402	0.73	≥ 0.5
	Middle	2440	0.73	≥ 0.5
	High	2480	0.73	≥ 0.5

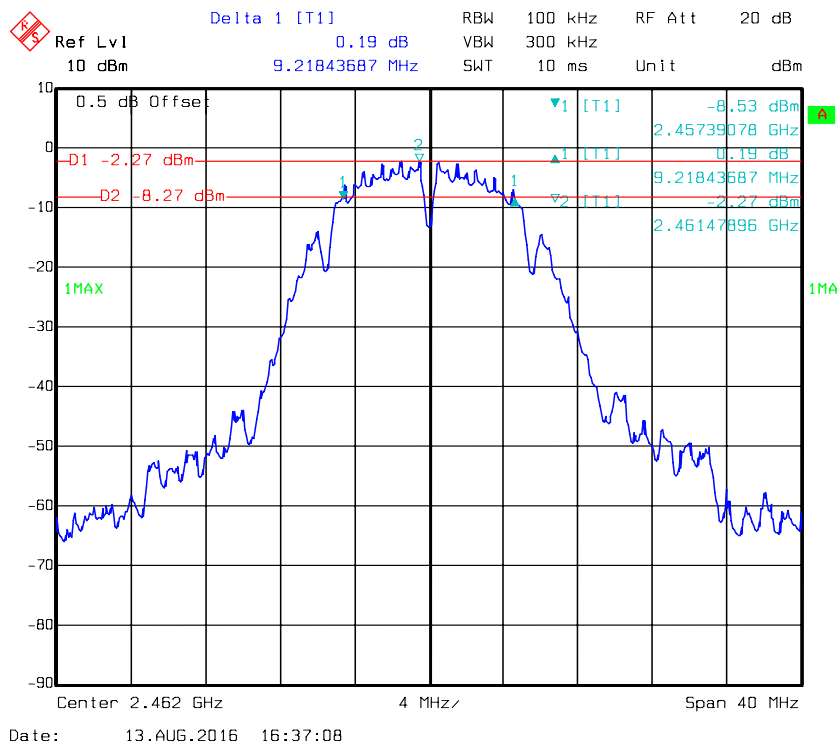
802.11b Low Channel



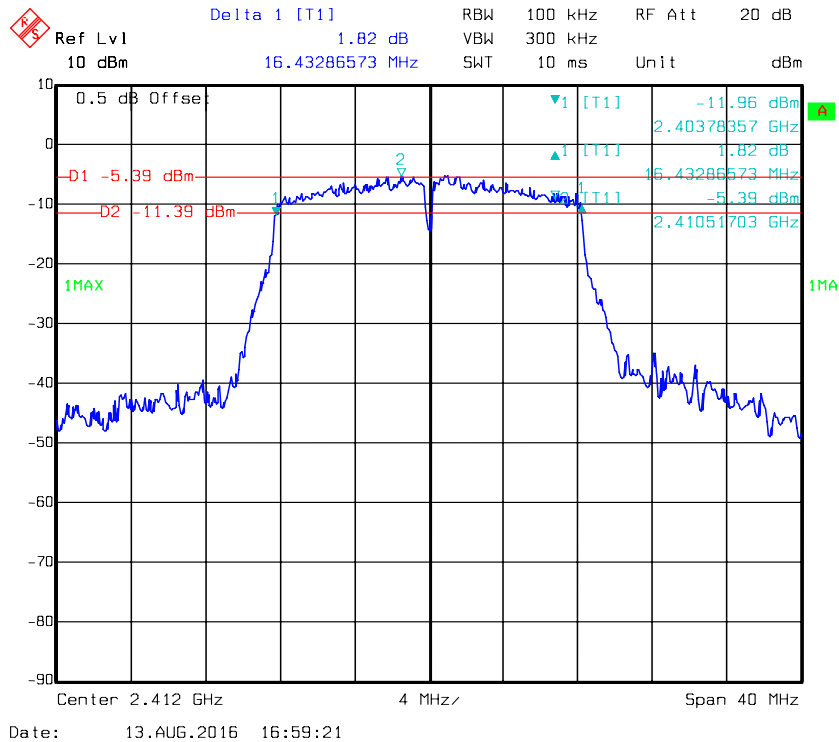
802.11b Middle Channel



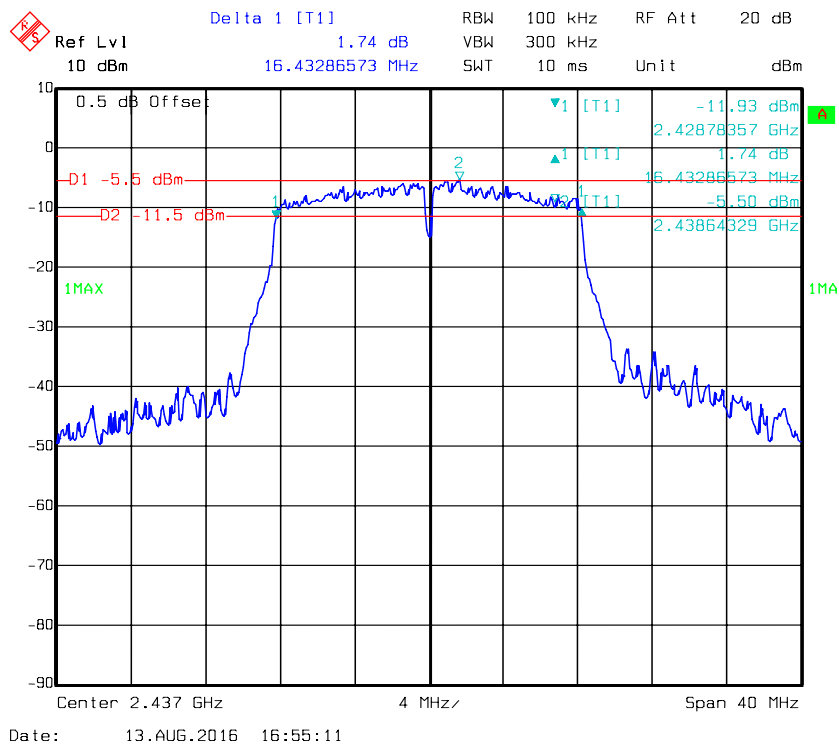
802.11b High Channel



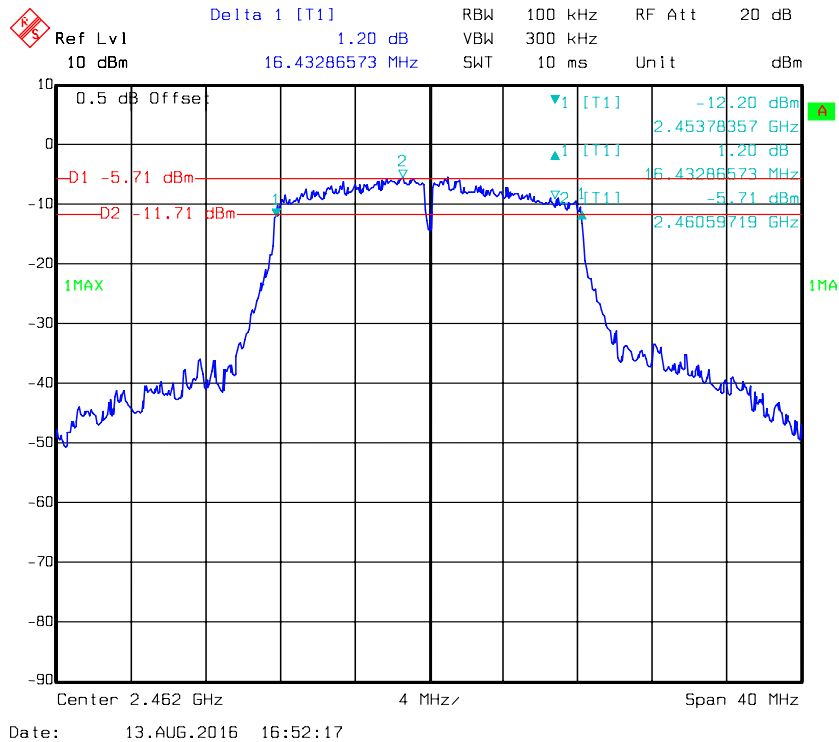
802.11g Low Channel



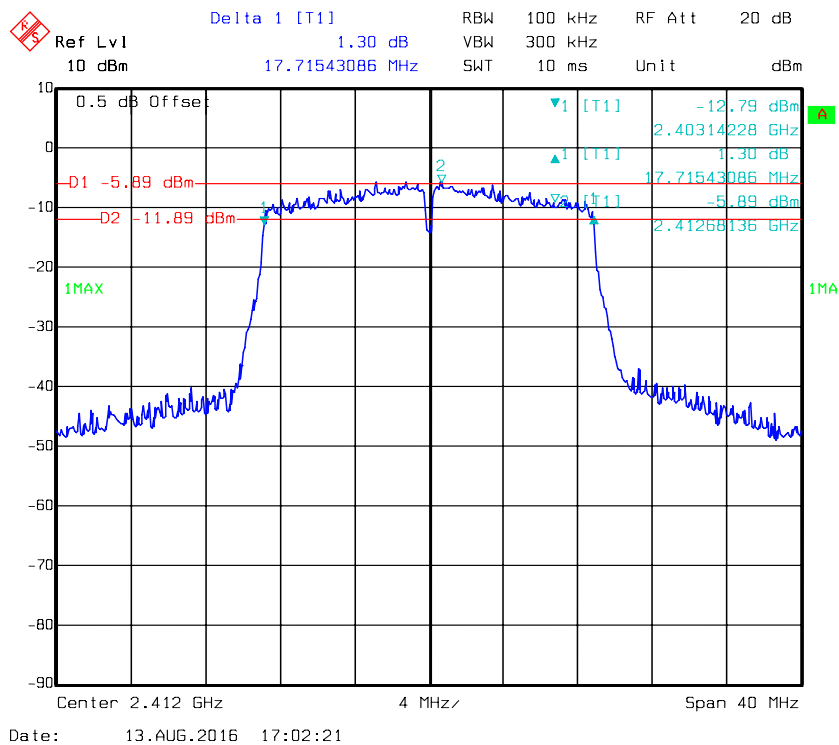
802.11g Middle Channel



802.11g High Channel



802.11n ht20 Low Channel



Ref Lvl 10 dBm Delta 1 [T1] 1.46 dB RBW 100 kHz RF Att 20 dB
 10 dBm 17.71543086 MHz VSWR 300 kHz SWF 10 ms Unit dBm

0.5 dB Offset

-D1 -6.01 dBm -D2 -12.01 dBm

1MAX

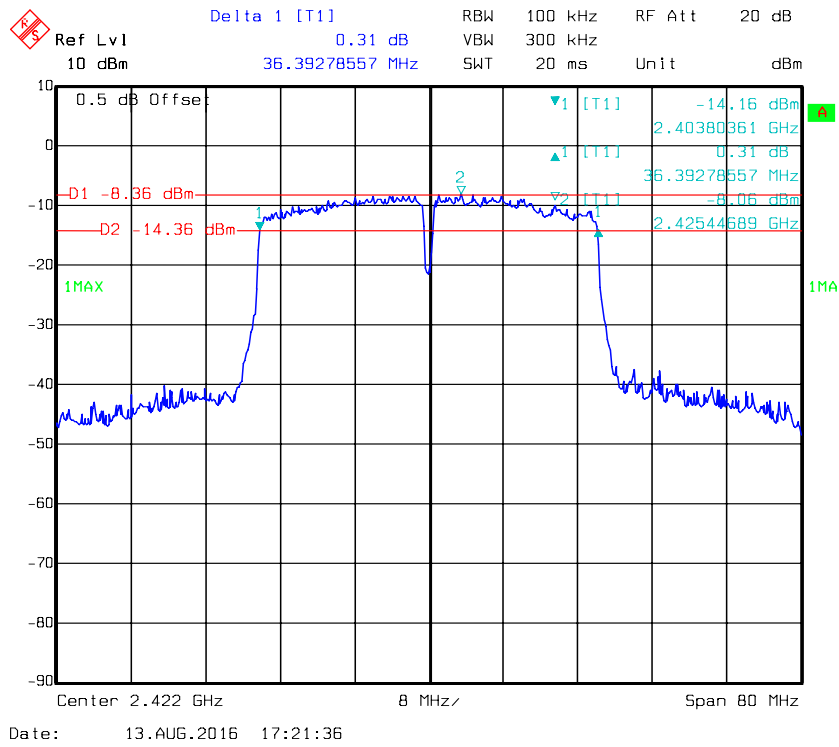
[T1] -12.91 dBm [T1] 1.46 dB [T1] 17.71543086 MHz [T1] -6.01 dBm [T1] 2.43760120 GHz

Center 2.437 GHz 4 MHz/ Span 40 MHz

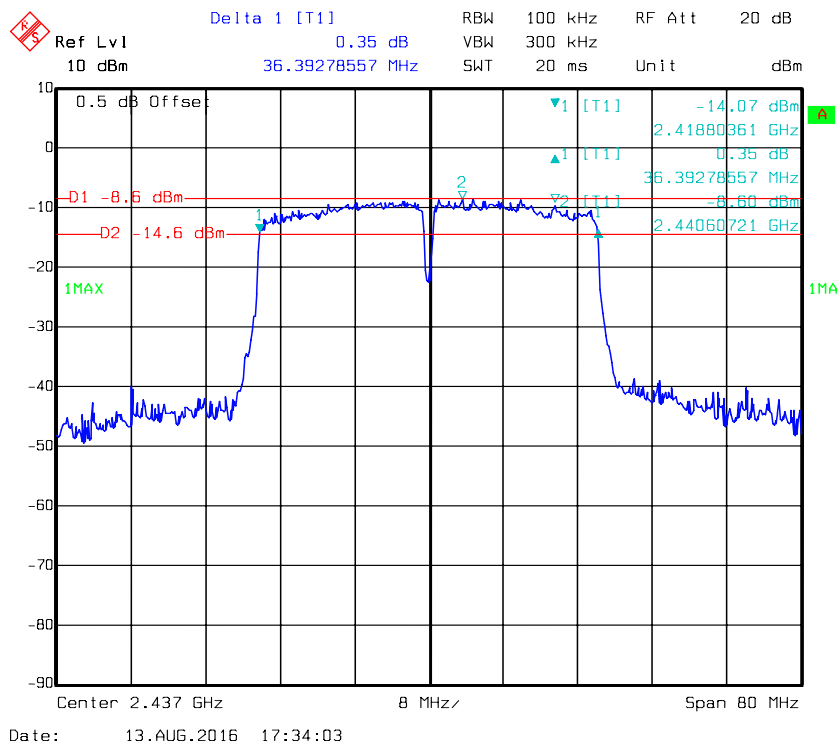
Date: 13.AUG.2016 17:10:27

[illegible]

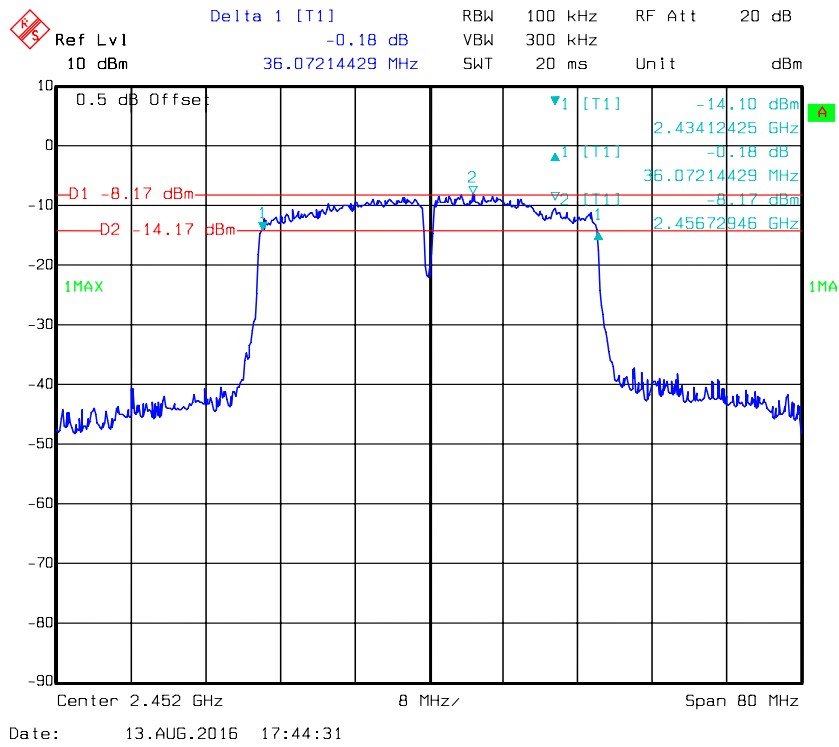
802.11n ht40 Low Channel



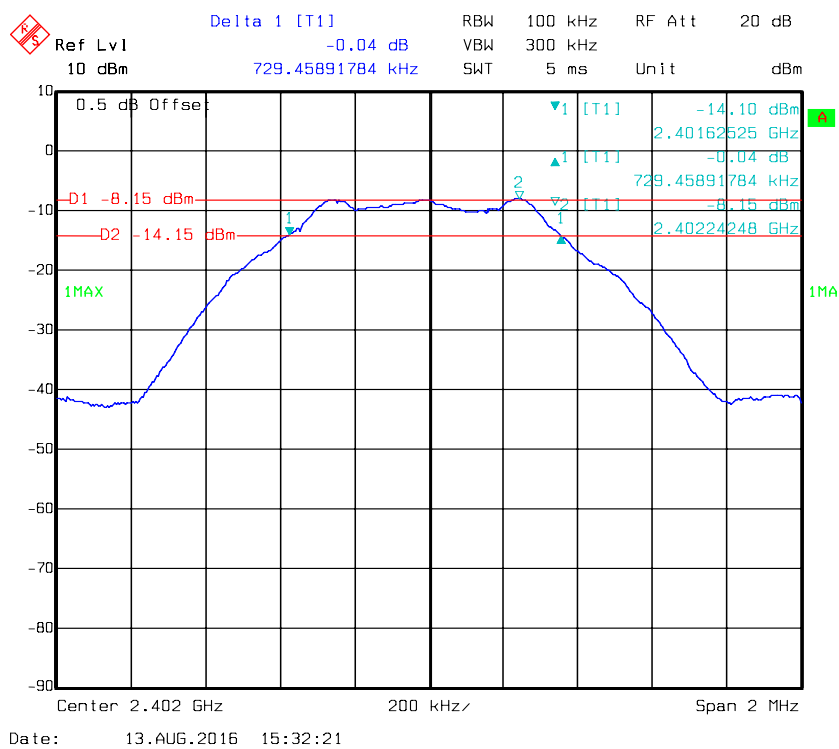
802.11n ht40 Middle Channel



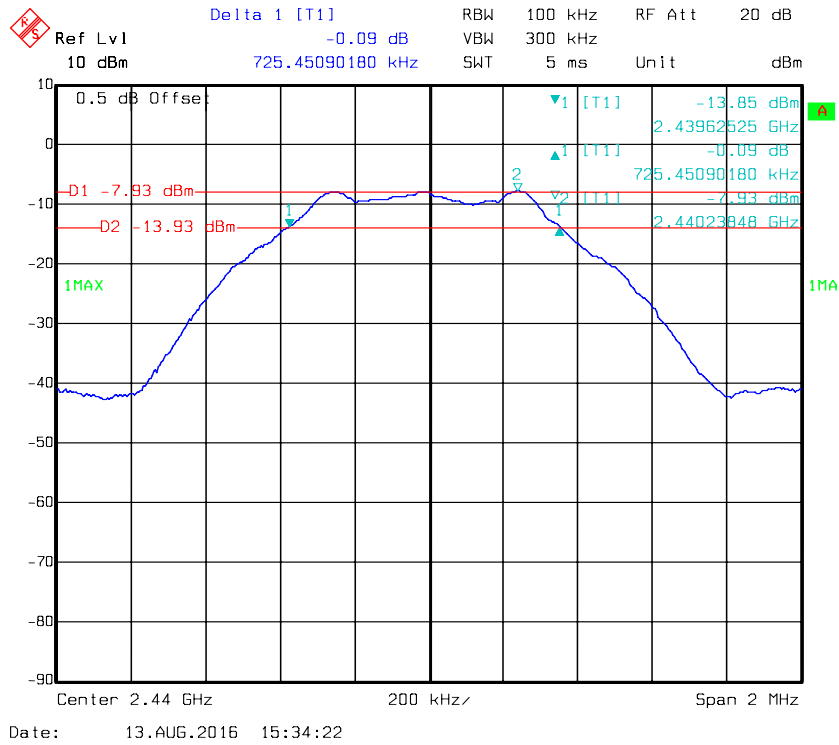
802.11n ht40 High Channel



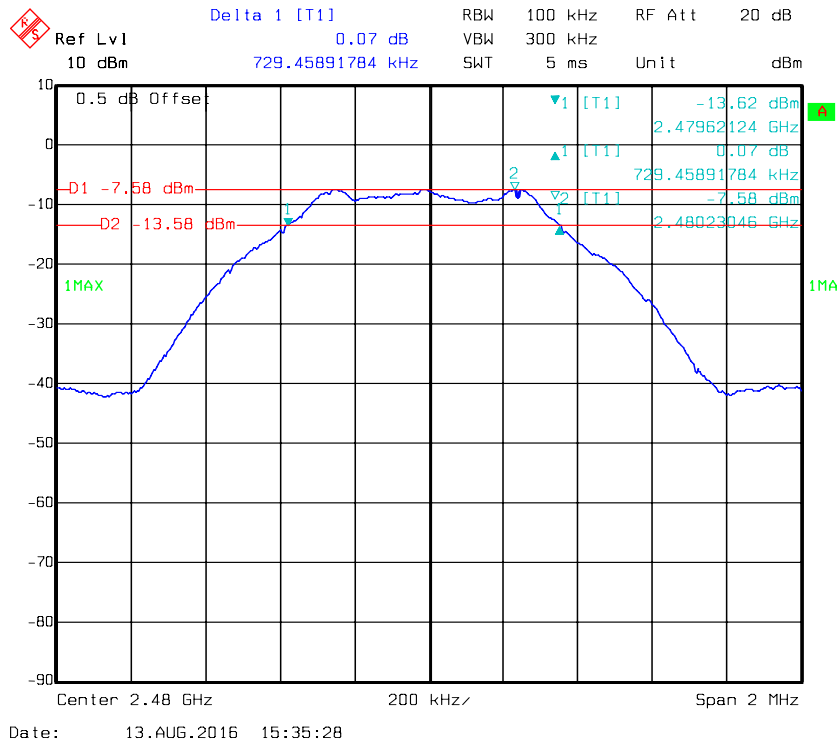
BLE Low Channel



BLE Middle Channel



BLE High Channel



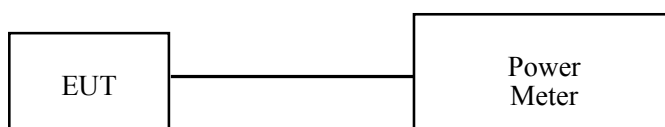
FCC §15.247(b) (3) - MAXIMUM CONDUCTED OUTPUT POWER

Applicable Standard

According to FCC §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 test equipment.
3. Add a correction factor to the display.



Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Agilent	Wideband Power Sensor	N1921A	MY54210016	2015-11-03	2016-11-03
Agilent	Wideband Power Sensor	N1921A	MY54170013	2015-11-03	2016-11-03
Agilent	P-Series Power Meter	N1912A	MY5000448	2015-11-03	2016-11-03
N/A	Coaxial Cable	0.1m	N/A	2016-05-06	2017-05-06
E-Microwave	DC Blocking	EMDCB-00036	0E01201047	2016-05-06	2017-05-06

* **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:	30.5 °C
Relative Humidity:	50%
ATM Pressure:	100 kPa

* The testing was performed by Lion Xiao on 2016-08-13.

Test Mode: Transmitting

Test Result: Compliant. Please refer to the following table.

Test mode	Channel	Frequency	Max Peak Conducted Output Power	Max Conducted Average Output Power	Limit
		(MHz)	(dBm)	(dBm)	(dBm)
802.11b	Low	2412	11.70	9.78	30
	Middle	2437	11.46	9.60	30
	High	2462	11.61	9.73	30
802.11g	Low	2412	14.43	9.64	30
	Middle	2437	14.21	9.41	30
	High	2462	14.30	9.56	30
802.11n20	Low	2412	14.90	9.69	30
	Middle	2437	14.77	9.60	30
	High	2462	14.82	9.65	30
802.11n40	Low	2422	15.97	9.38	30
	Middle	2437	16.24	9.59	30
	High	2452	16.12	9.52	30
BLE	Low	2402	-7.57	/	30
	Middle	2440	-7.31	/	30
	High	2480	-6.92	/	30

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
Agilent	Spectrum Analyzer	E4440A	SG43360054	2015-11-23	2016-11-22
N/A	Coaxial Cable	0.1m	N/A	2016-05-06	2017-05-06
E-Microwave	DC Blocking	EMDCB-00036	0E01201047	2016-05-06	2017-05-06

* **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:	30.5 °C
Relative Humidity:	50%
ATM Pressure:	100 kPa

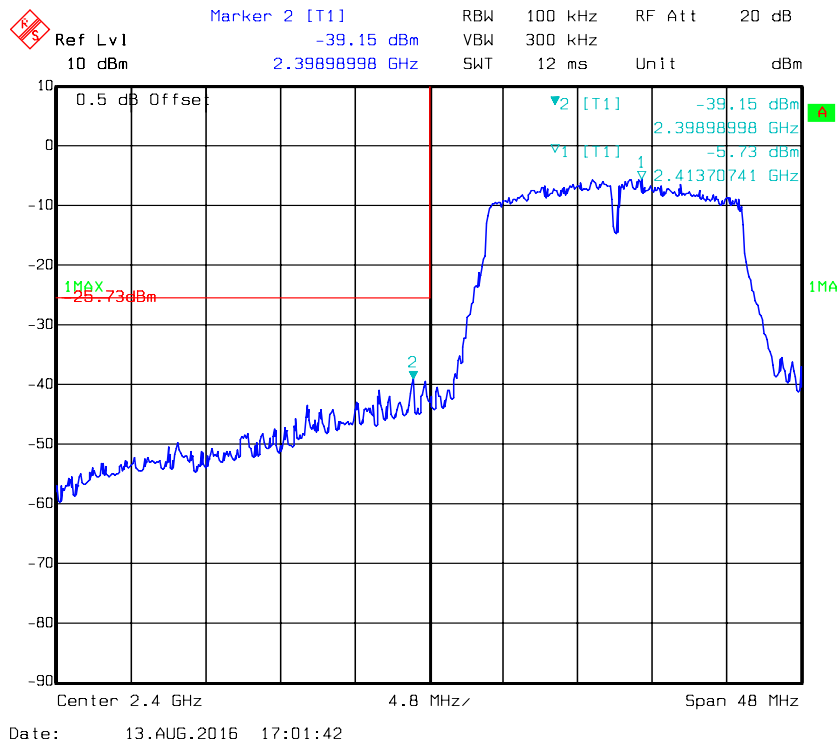
* The testing was performed by Lion Xiao on 2016-08-13.

Test mode: Transmitting

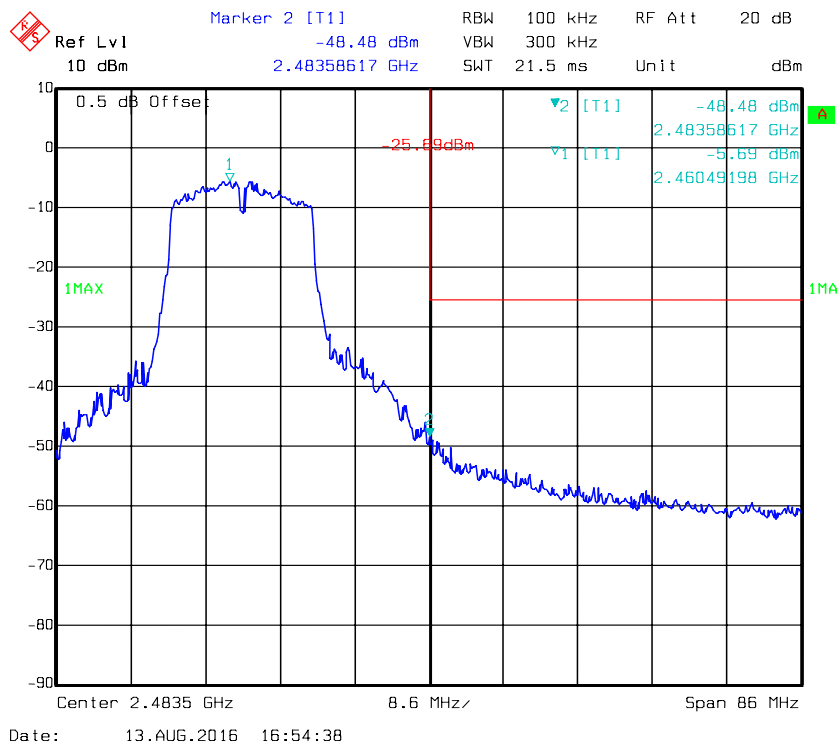
802.11b: Band Edge, Left Side



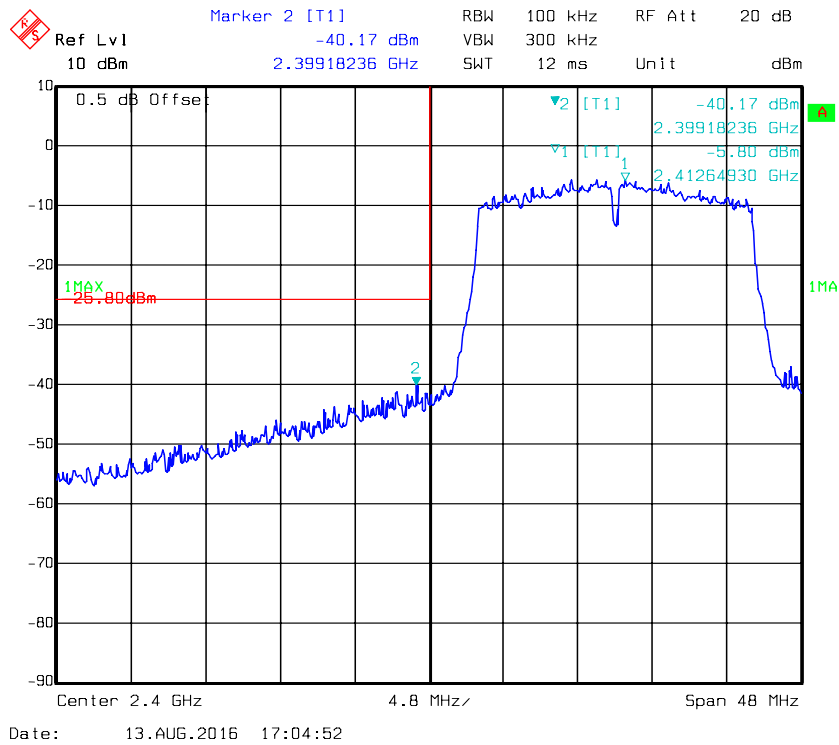
802.11g: Band Edge, Left Side



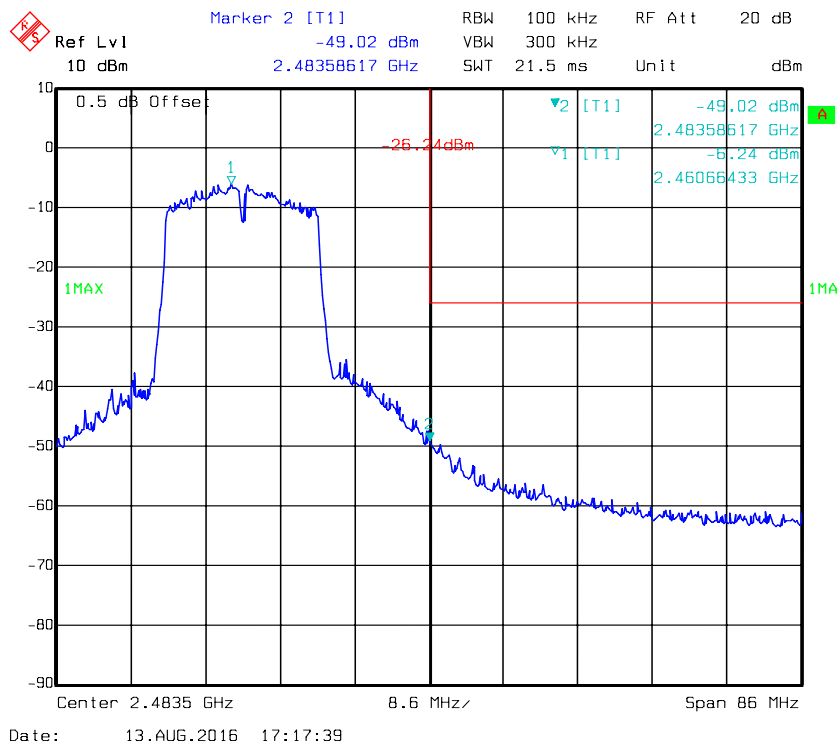
802.11g: Band Edge, Right Side



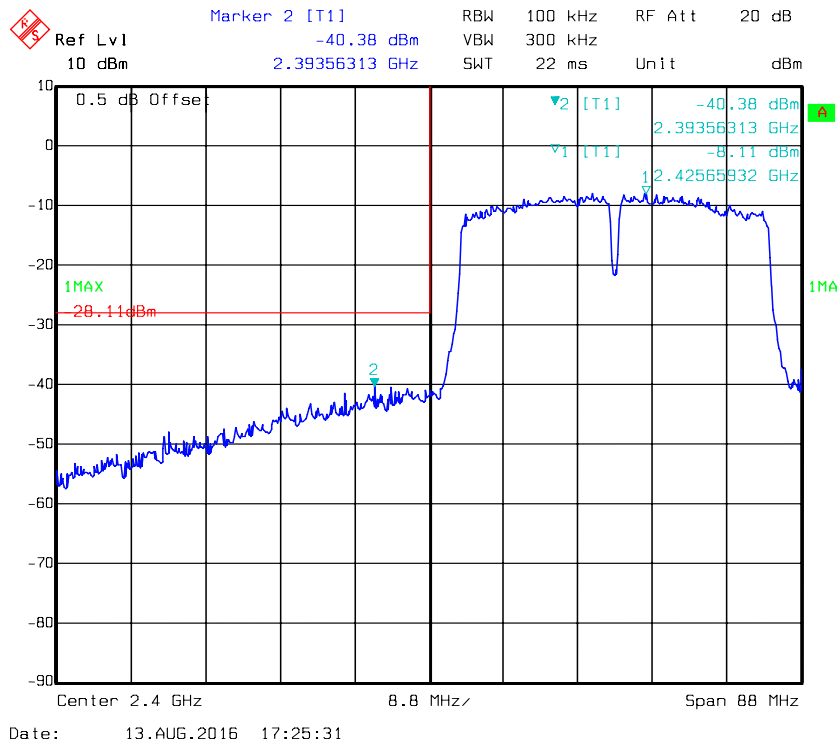
802.11n ht20 Band Edge, Left Side



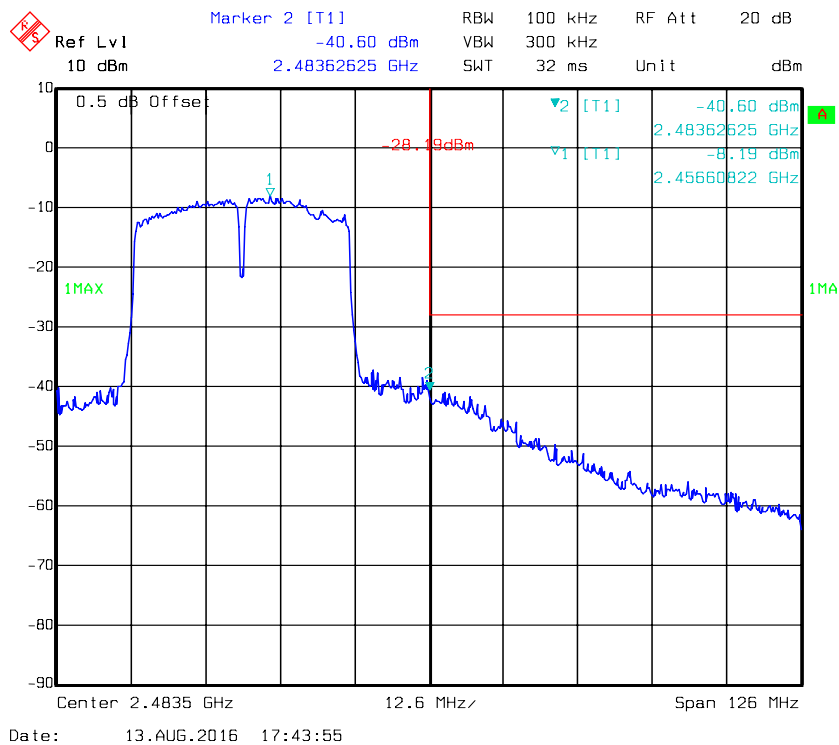
802.11n ht20 Band Edge, Right Side



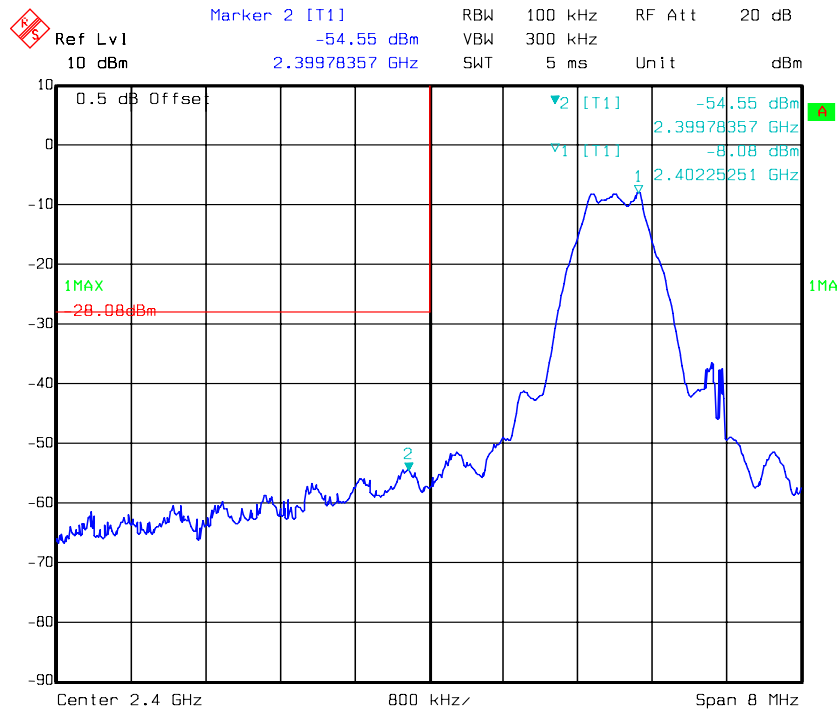
802.11n ht40 Band Edge, Left Side



802.11n ht40 Band Edge, Right Side

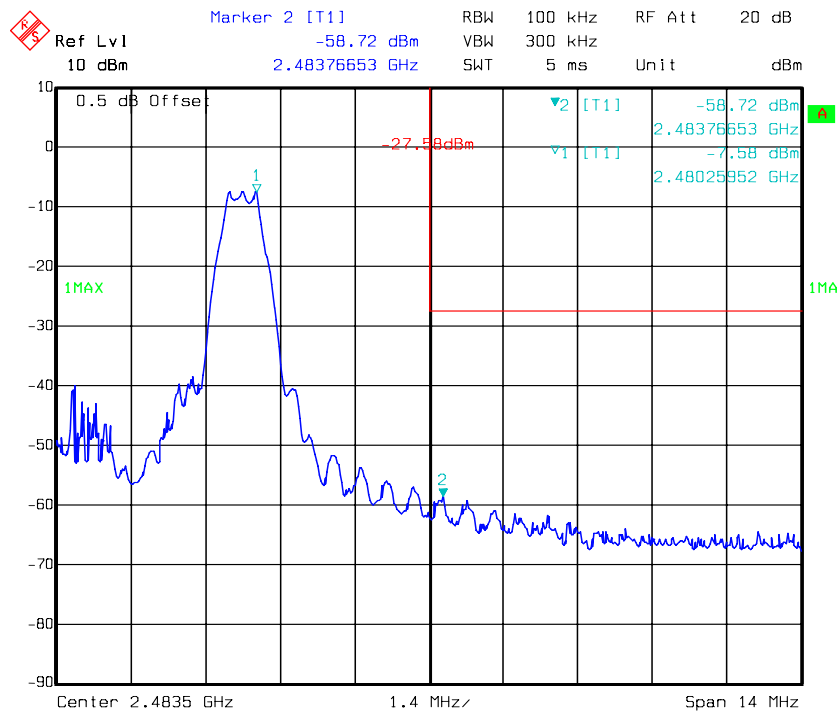


BLE Band Edge , Left Side



Date: 13.AUG.2016 15:33:26

BLE Band Edge, Right Side



Date: 13.AUG.2016 15:36:49

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

- Set analyzer center frequency to DTS channel center frequency.
- Set the span to 1.5 times the DTS bandwidth.
- Set the RBW to: $3 \text{ kHz} \leq \text{RBW} \leq 100 \text{ kHz}$.
- Set the VBW $\geq 3 \times \text{RBW}$.
- Detector = peak.
- Sweep time = auto couple.
- Trace mode = max hold.
- Allow trace to fully stabilize.
- Use the peak marker function to determine the maximum amplitude level within the RBW.
- If measured 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
Agilent	Spectrum Analyzer	E4440A	SG43360054	2015-11-23	2016-11-22
N/A	Coaxial Cable	0.1m	N/A	2016-05-06	2017-05-06
E-Microwave	DC Blocking	EMDCB-00036	0E01201047	2016-05-06	2017-05-06

* **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:	30.5 °C
Relative Humidity:	50%
ATM Pressure:	100 kPa

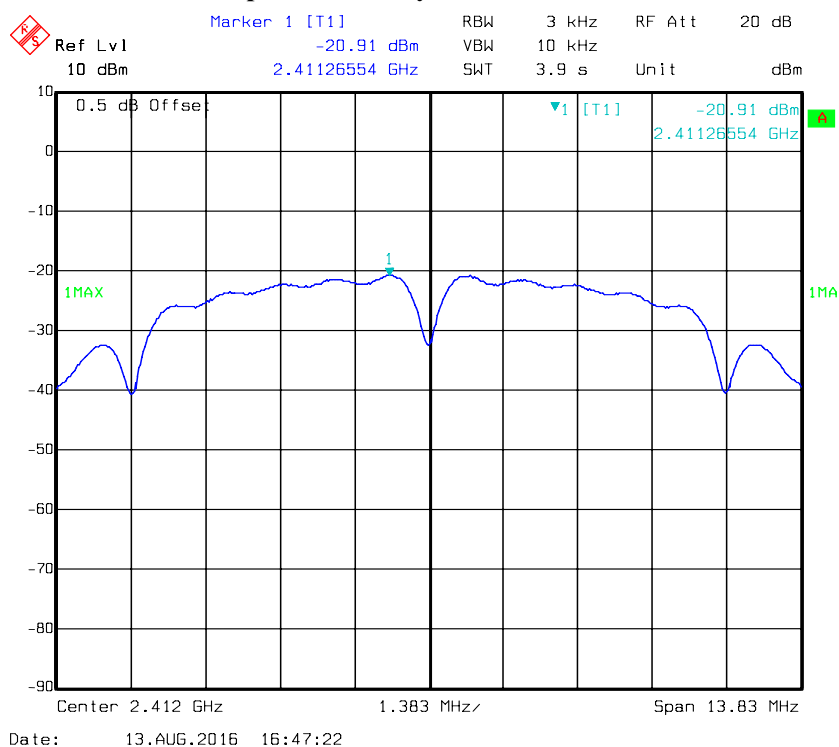
* The testing was performed by Lion Xiao on 2016-08-13.

Test Mode: Transmitting

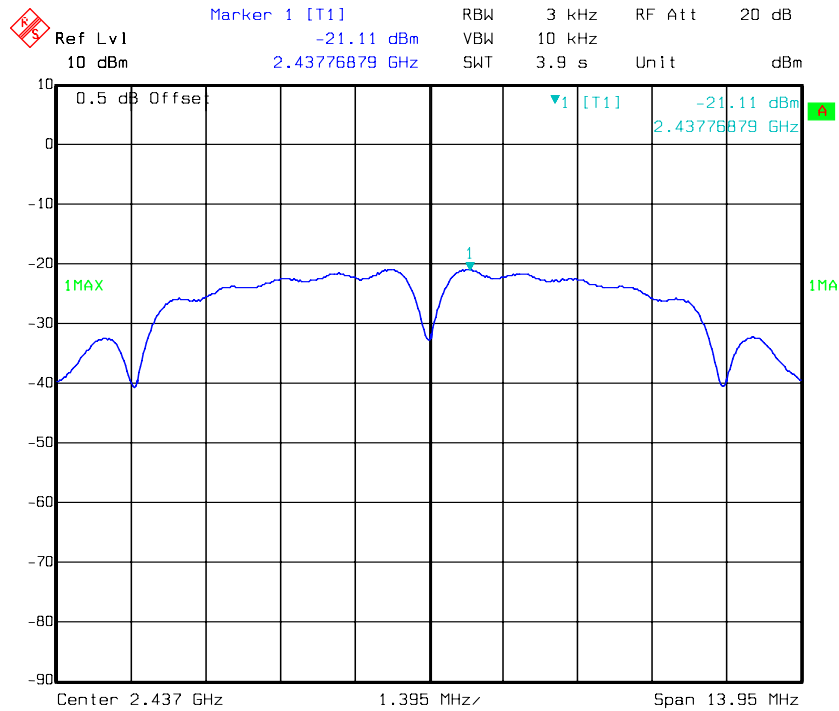
Test Result: Compliant. Please refer to the following table and plots

Test mode	Channel	Frequency (MHz)	PSD (dBm/3kHz)	Limit (dBm/3kHz)
802.11b	Low	2412	-20.91	≤ 8
	Middle	2437	-21.11	≤ 8
	High	2462	-20.93	≤ 8
802.11g	Low	2412	-20.13	≤ 8
	Middle	2437	-20.29	≤ 8
	High	2462	-20.18	≤ 8
802.11n20	Low	2412	-20.03	≤ 8
	Middle	2437	-20.06	≤ 8
	High	2462	-20.04	≤ 8
802.11n40	Low	2422	-21.27	≤ 8
	Middle	2437	-21.10	≤ 8
	High	2452	-21.12	≤ 8
BLE	Low	2402	-23.06	≤ 8
	Middle	2440	-22.90	≤ 8
	High	2480	-22.42	≤ 8

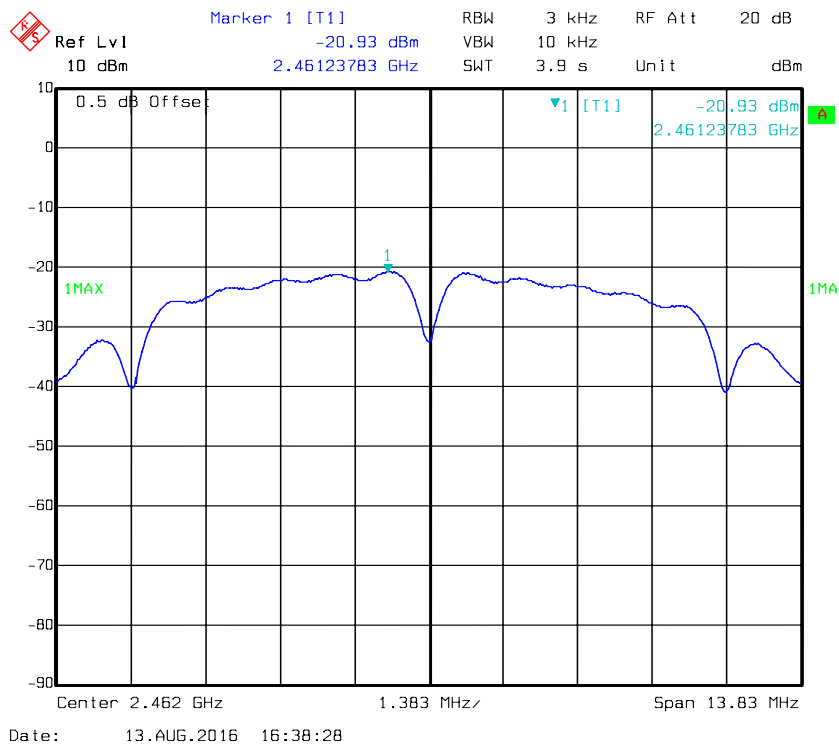
Power Spectral Density, 802.11b Low Channel



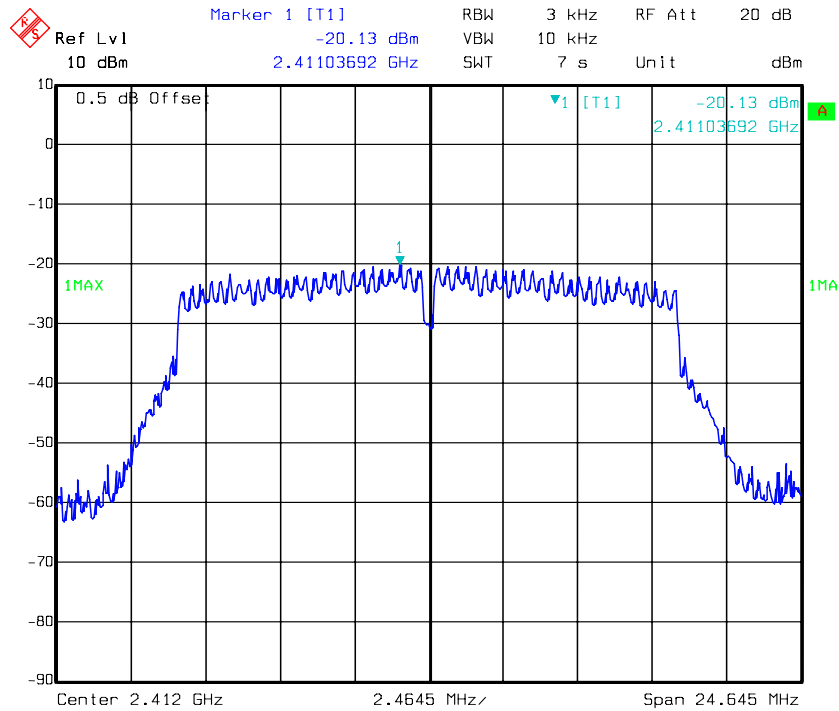
Power Spectral Density, 802.11b Middle Channel



Power Spectral Density, 802.11b High Channel

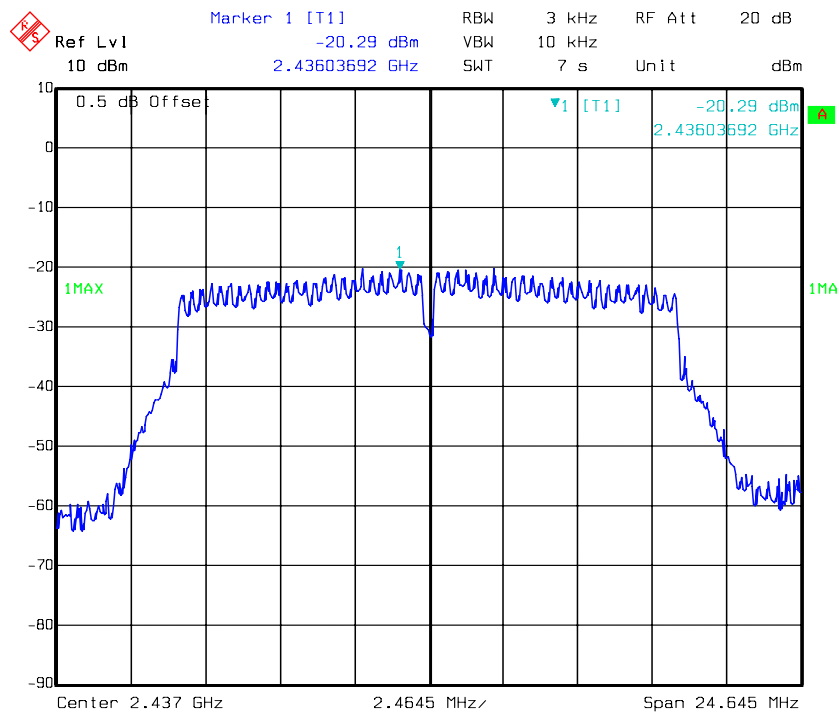


Power Spectral Density, 802.11g Low Channel



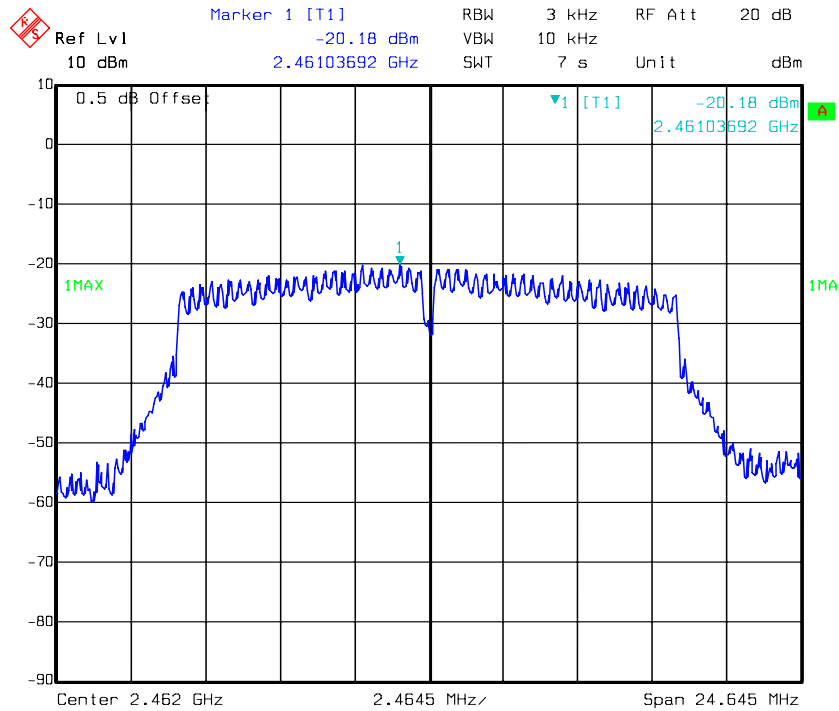
Date: 13.AUG.2016 17:01:22

Power Spectral Density, 802.11g Middle Channel

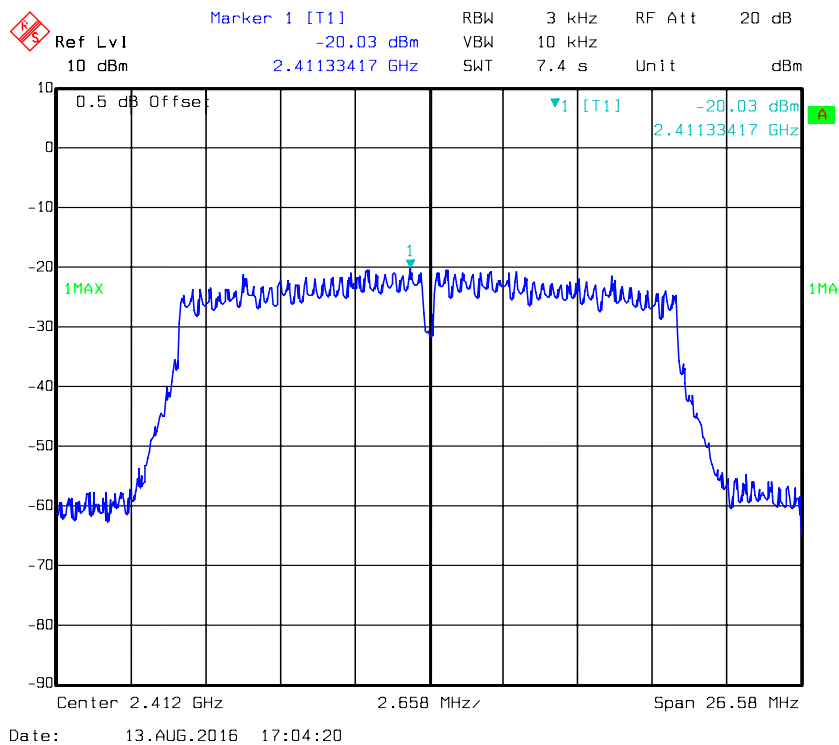


Date: 13.AUG.2016 16:57:08

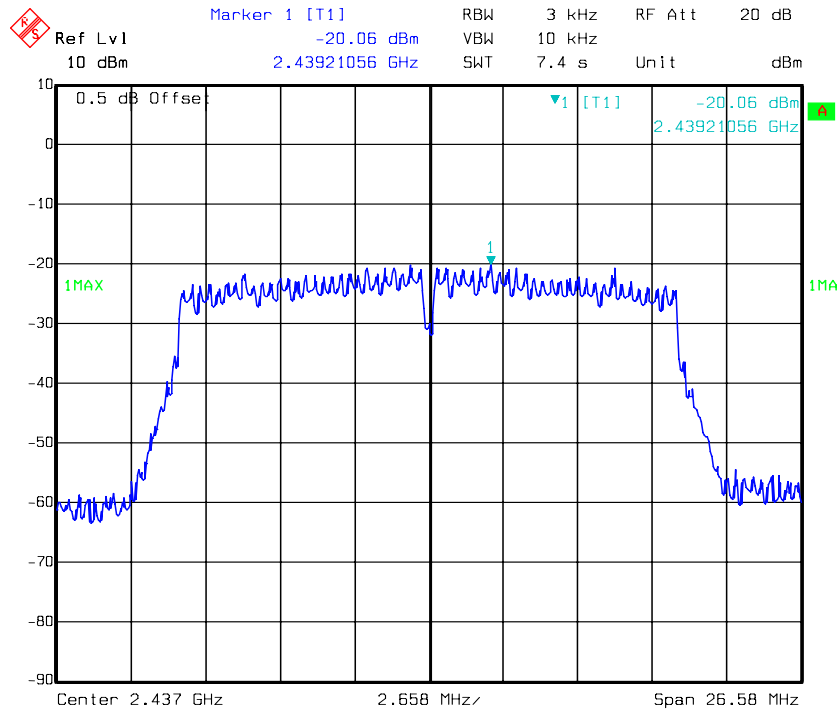
Power Spectral Density, 802.11g High Channel



Power Spectral Density, 802.11n ht20 Low Channel

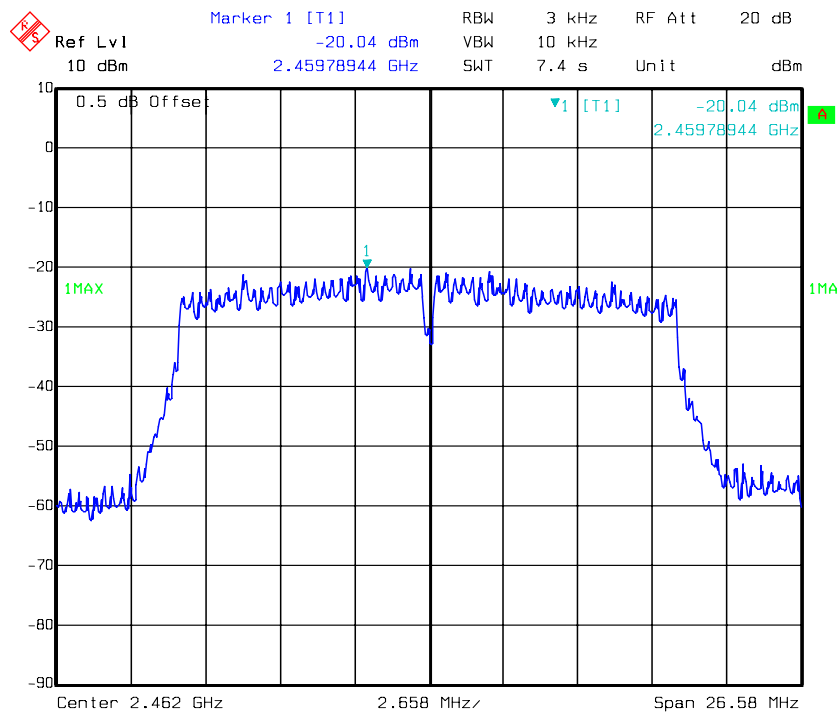


Power Spectral Density, 802.11n ht20 Middle Channel



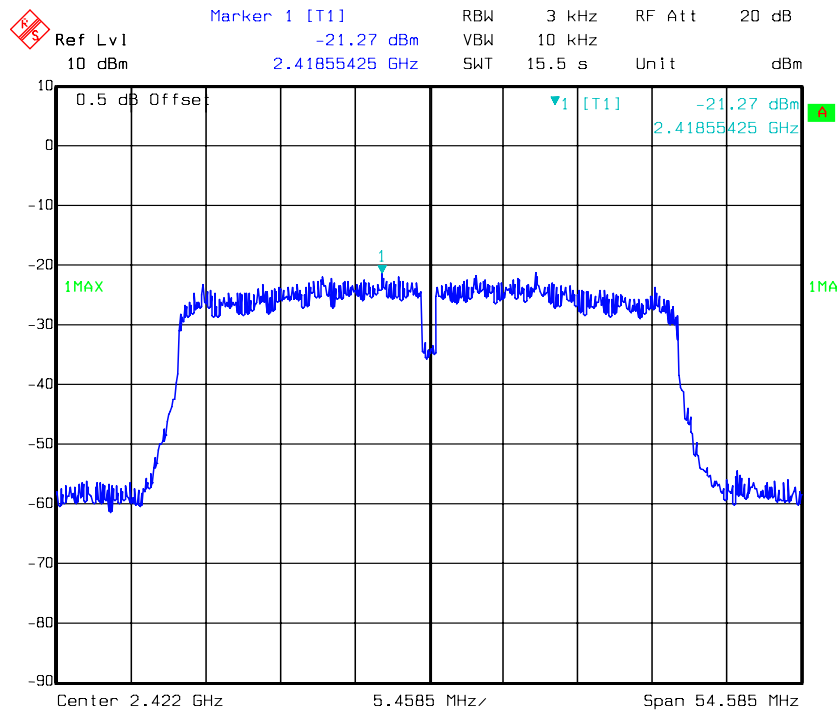
Date: 13.AUG.2016 17:09:52

Power Spectral Density, 802.11n ht20 High Channel

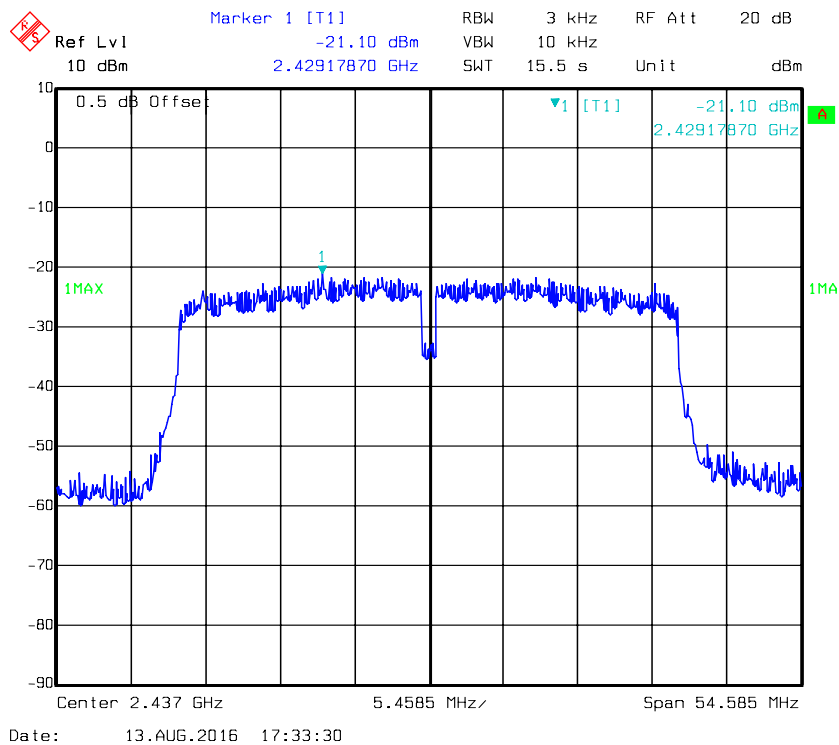


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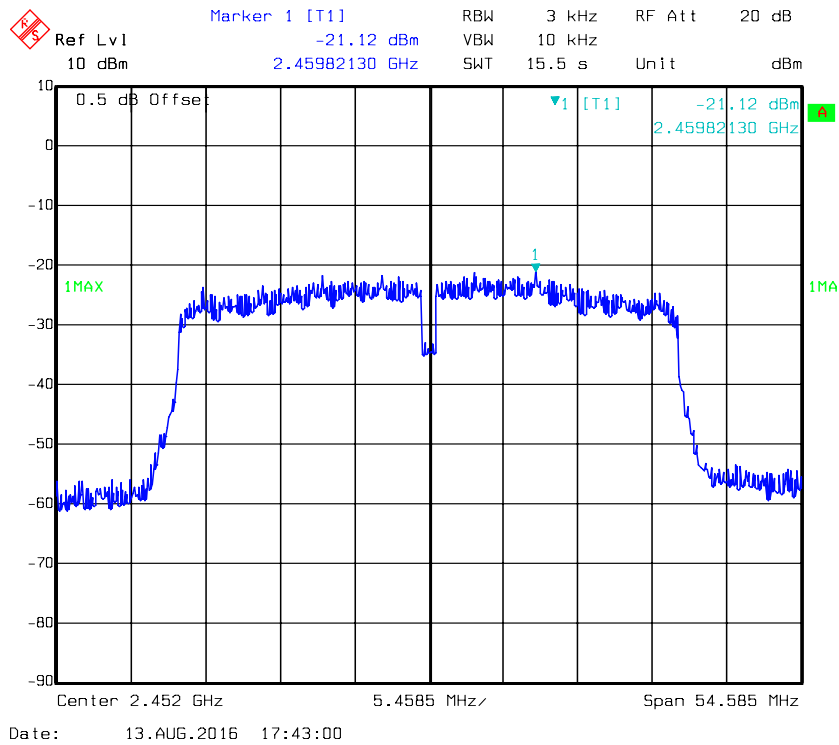
Power Spectral Density, 802.11n ht40 Low Channel



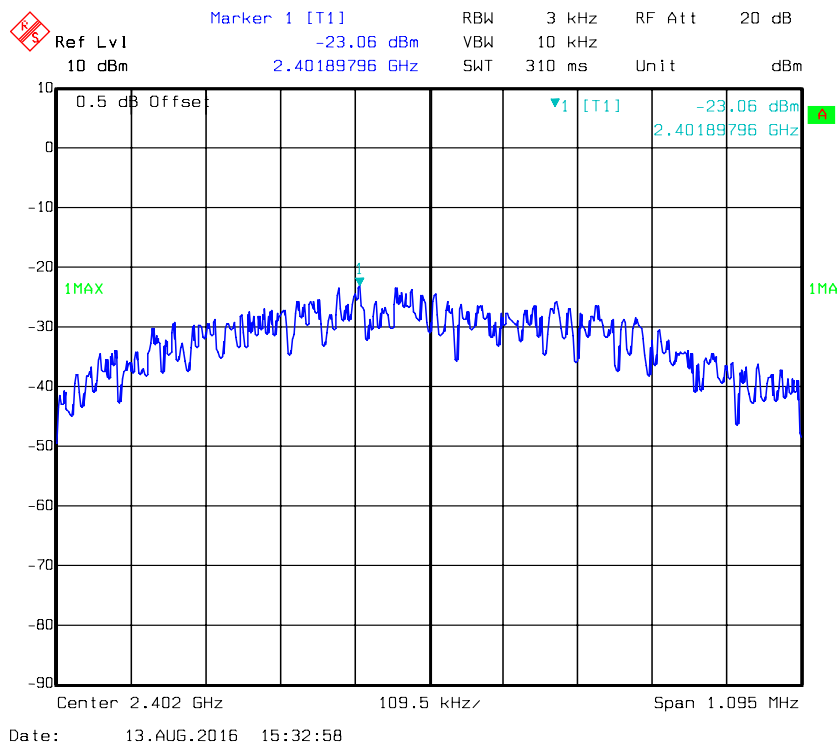
Power Spectral Density, 802.11n ht40 Middle Channel



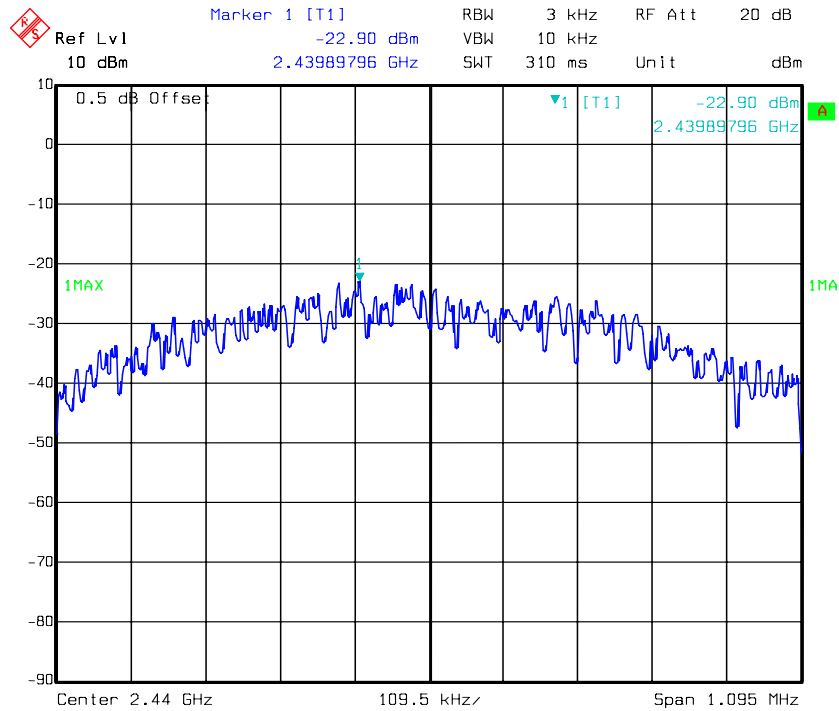
Power Spectral Density, 802.11n ht40 High Channel



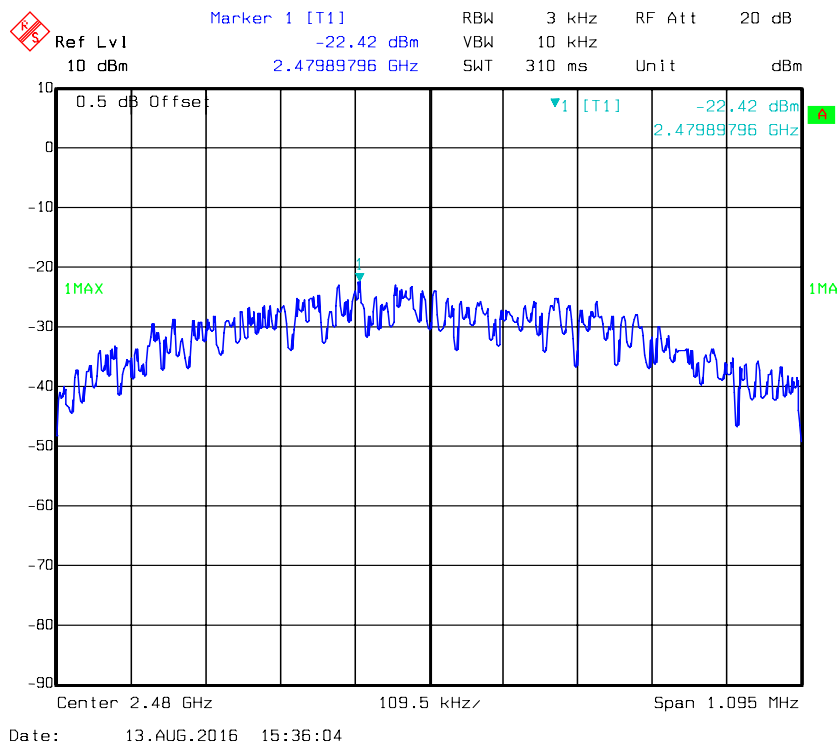
Power Spectral Density, BLE Low Channel



Power Spectral Density, BLE Middle Channel



Power Spectral Density, BLE High Channel



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