FCC PART 15.247

TEST REPORT

For

Portal 724, LLC

275 Hartz Way::105, Secaucus, New Jersey,United States, 07094

FCC ID: 2ABGJ-CN-MN724

Report Type:	Product Name:
Revised Report	Tablet PC

Test Engineer:	*Tom Tang*
Report Number:	RDG161110006C-M1
Report Date:	2017-02-07
Reviewed By:	Henry Ding EMC Leader
Test Laboratory:	Bay Area Compliance Laboratories Corp. (Chengdu) 5040, HuiLongWan Plaza, No. 1, ShaWan Road, JinNiu District, ChengDu, China Tel: 028-65523123, Fax: 028-65525125 www.baclcorp.com

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DOCUMENT REVISION HISTORY

Revision Number	Report Number	Description of Revision	Date of Revision
0	RDG161110006C	Original Report	2017-01-10
1	RDG161110006C-M1	Revised Report	2017-02-07

Note: This report is to supersede the original report: RDG161110006C.

GENERAL INFORMATION

Product Description for Equipment under Test (EUT)

The ***Portal 724, LLC*** 's product, model number: ***MN-724 (FCC ID: 2ABGJ-CN-MN724)*** (the "EUT") in this report was a ***Tablet PC,*** which was measured approximately: 20.06 cm (L) × 12.46 cm (W) × 1.41 cm (H), rated input voltage: DC3.7V battery or DC5V charging from adapter.

Adapter Information:
MODEL: KA1517-0502000USU
INPUT: 100-240V~ 50/60Hz 0.35A Max
OUTPUT: DC5V 2000mA

**All measurement and test data in this report was gathered from final production sample, serial number: 161110006 (assigned by the BACL, Chengdu). It may have deviation from any other sample. The EUT supplied by the applicant was received on 2016-11-14, and EUT conformed to test requirement.*

Objective

This report is prepared on behalf of ***Portal 724, LLC*** 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: 2ABGJ-CN-MN724.
FCC Part 15C DSS submissions with FCC ID: 2ABGJ-CN-MN724.
FCC Part 27 TNB submissions with FCC ID: 2ABGJ-CN-MN724.

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.

The uncertainty of any RF tests which use conducted method measurement is ±3.17 dB, the uncertainty of any radiation on emissions measurement is:

30M~200MHz: ±4.7 dB;
200M~1GHz: ±6.0 dB;
1G~6GHz: ±5.13dB;
6G~25GHz: ±5.47dB;

And the uncertainty will not be taken into consideration for all test data recorded in the report.

Test Facility

The test site used by BACL to collect test data is located in the 5040, HuiLongWan Plaza, No. 1, ShaWan Road, JinNiu District, ChengDu, China.

Test site at BACL 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 April 24, 2015. The facility also complies with the radiated and AC line conducted test site criteria set forth in ANSI C63.4-2014.

The Federal Communications Commission has the reports on file and is listed under FCC Registration No.: 560332. 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 testing 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 worst condition (maximum power) was setting by the Engineer Mode as following table:

Test Mode	Test Software Version	Engineer Mode		
802.11b	Test Frequency	2412MHz	2437MHz	2462MHz
	Data Rate	1Mbps	1Mbps	1Mbps
	Power Level Setting	42	42	43
802.11g	Test Frequency	2412MHz	2437MHz	2462MHz
	Data Rate	6Mbps	6Mbps	6Mbps
	Power Level Setting	42	42	43
802.11n ht20	Test Frequency	2412MHz	2437MHz	2462MHz
	Data Rate	MCS0	MCS0	MCS0
	Power Level Setting	43	43	43
802.11n ht40	Test Frequency	2422MHz	2437MHz	2452MHz
	Data Rate	MCS0	MCS0	MCS0
	Power Level Setting	43	43	43

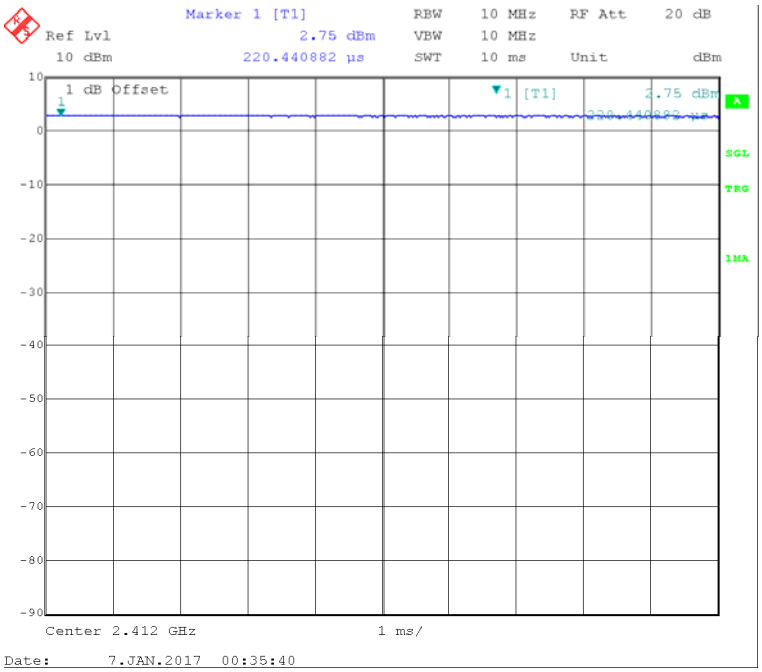
Note: BLE mode configured as maximum power by the system default setting.

The maximum duty cycle as following table:

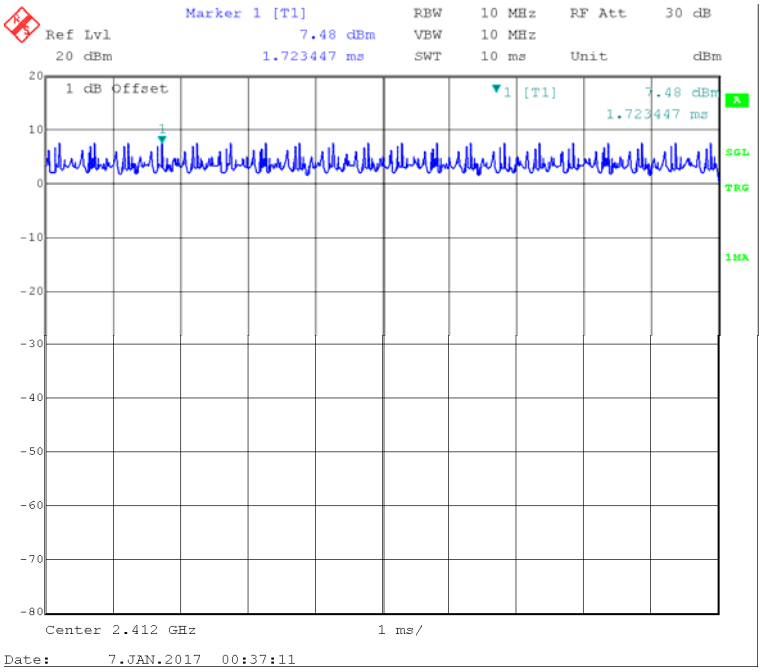
Test mode	T_{on} (ms)	T_{on+off} (ms)	Duty Cycle (%)
802.11b	10	10	100%
802.11g	10	10	100%
802.11n ht20	10	10	100%
802.11n ht40	10	10	100%
BLE	0.403	0.625	64.48%

The minimum transmission duration(T) is 0.403ms for BLE mode.

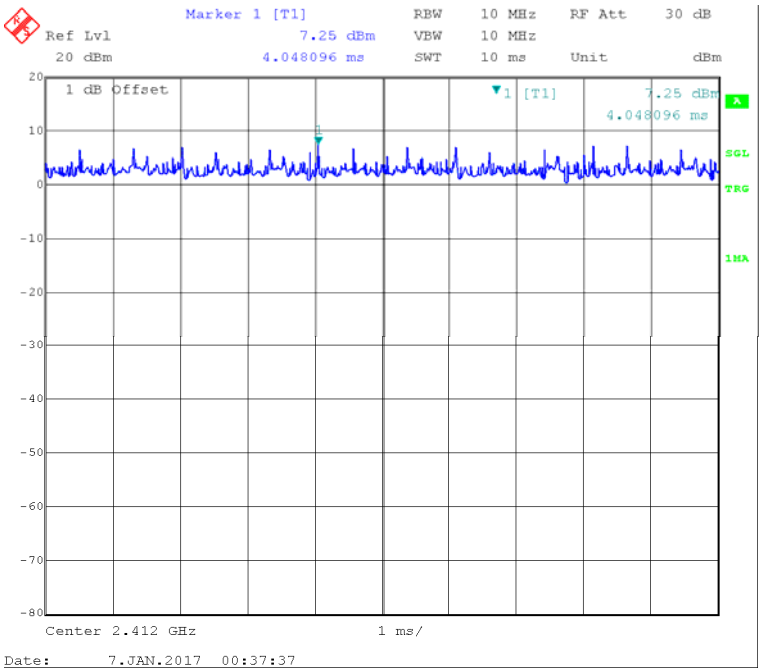
802.11b



802.11g



802.11n ht20



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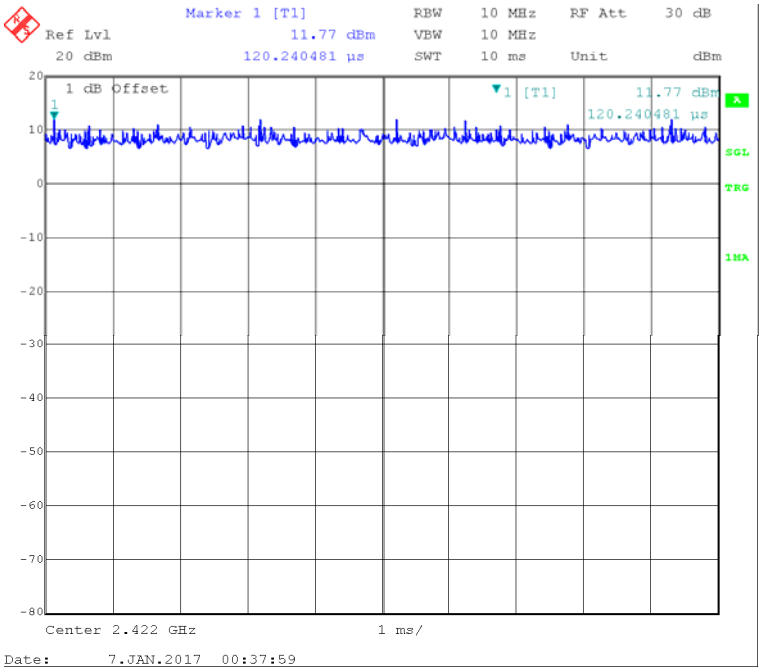
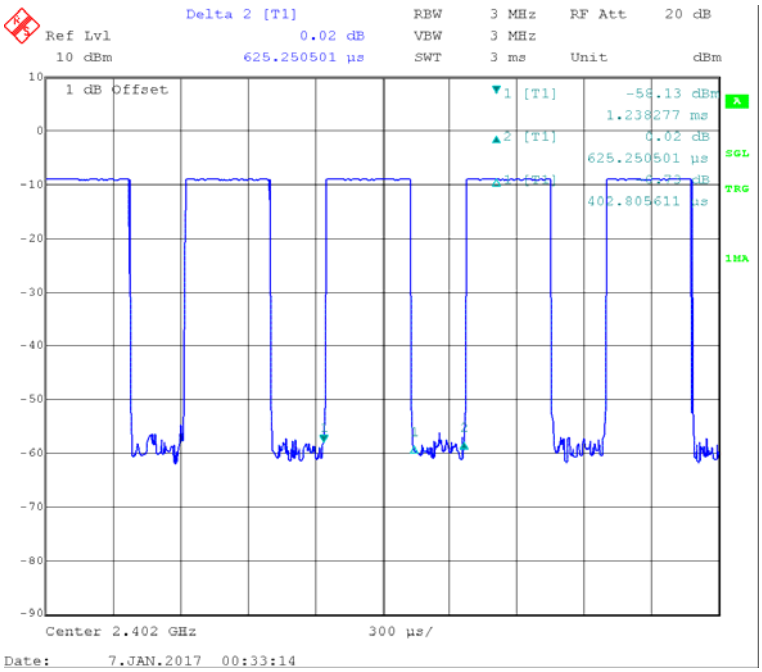


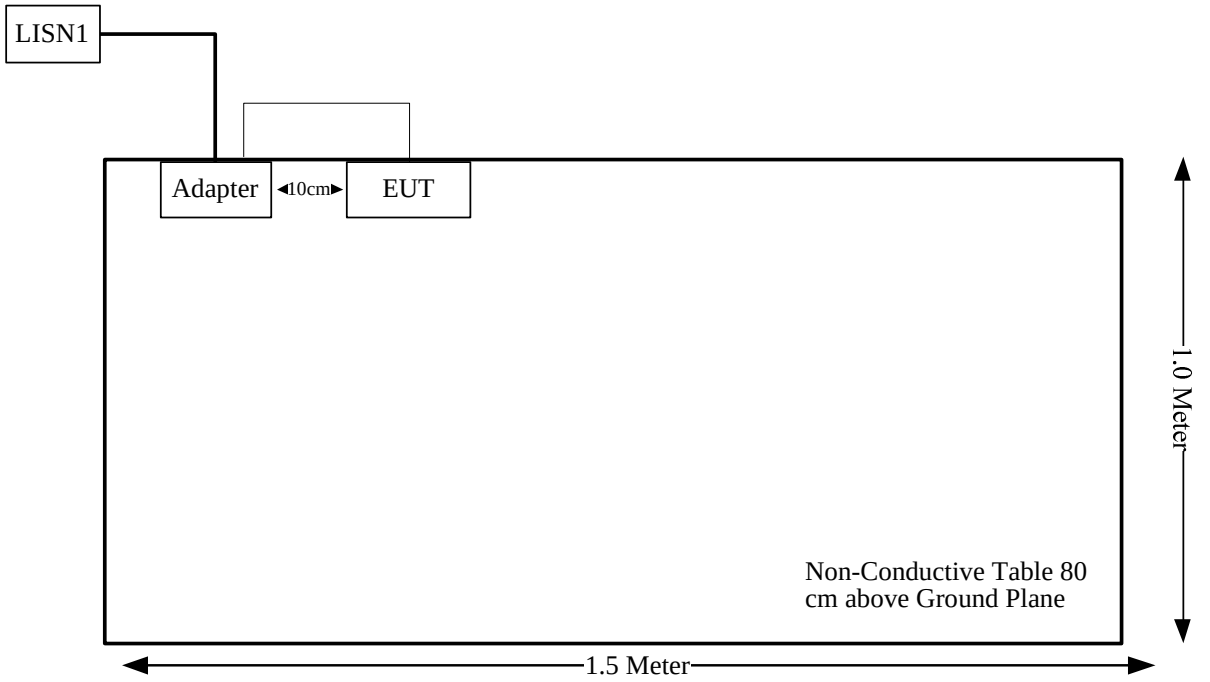
BLE



External Cable

Cable Description	Shielding Type	Ferrite Core	Length (m)	From Port	To
USB Cable	No	No	1.0	USB Port of Adapter	EUT

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
§15.205, §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:
[(max. power of channel, including tune-up tolerance, mW)/(min. test separation distance, mm)] · [√f(GHz)] ≤ 3.0 for 1-g SAR and ≤ 7.5 for 10-g extremity SAR, where

- f(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).
[(max. power of channel, mW)/(min. test separation distance, mm)][√f(GHz)]
= 9.55/5*(√2.462) = 3.0 ≤ 3.0

For bluetooth LE mode

The max tune-up conducted power is -2.0 dBm (0.35 mW).
[(max. power of channel, mW)/(min. test separation distance, mm)][√f(GHz)]
= 0.63/5*(√2.48) = 0.2 < 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 2.0 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:

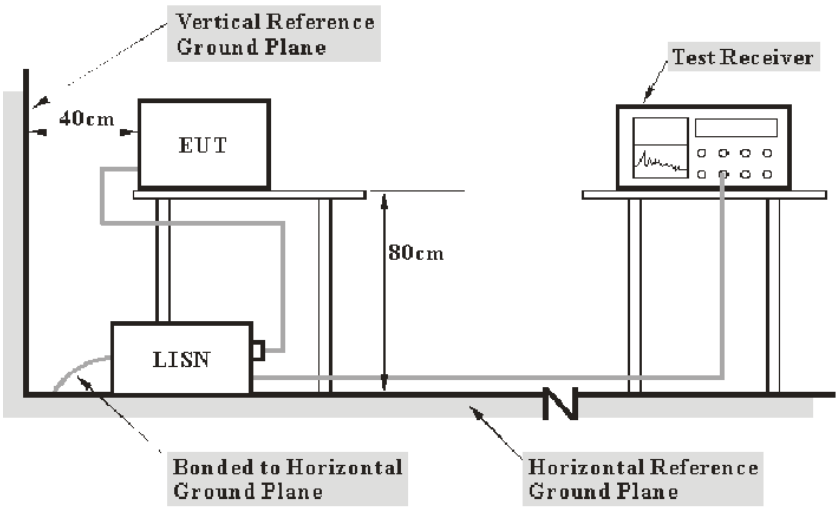
If U_{lab} is less than or equal to U_{cispr} of Table 1, then:
–compliance is deemed to occur if no measured disturbance level exceeds the disturbance limit;
–non - compliance is deemed to occur if any measured disturbance level exceeds the disturbance limit.
If U_{lab} is greater than U_{cispr} of Table 1, then:
–compliance is deemed to occur if no measured disturbance level, increased by (U_{lab} − U_{cispr}), exceeds the disturbance limit;
–non - compliance is deemed to occur if any measured disturbance level, increased by (U_{lab} − U_{cispr}), exceeds the disturbance limit.

Based on CISPR 16-4-2:2011, measurement uncertainty of conducted disturbance at mains port using AMN at Bay Area Compliance Laboratories Corp. (Chengdu) is ±3.17 dB (150 kHz to 30 MHz).

Table 1 – Values of U_{cispr}

Measurement	U_{cispr}
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 V/60 Hz AC 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:

Margin = Limit – Corrected Amplitude

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Rohde & Schwarz	EMI Test Receiver	ESCS 30	836858/0016	2016-12-02	2017-12-01
Rohde & Schwarz	L.I.S.N.	ENV216	3560.6550.06	2016-12-02	2017-12-01
Rohde & Schwarz	PULSE LIMITER	ESH3Z2	357.8810.52	2016-10-31	2017-10-30
N/A	Conducted Cable	NO.5	N/A	2016-11-10	2017-11-09
R&S	Test Software	EMC32	Version8.53.0	N/A	N/A

*** Statement of Traceability:** BACL (Chengdu) attested that all calibrations have been performed, traceable to National Primary Standards and International System of Units (SI).

Test Data

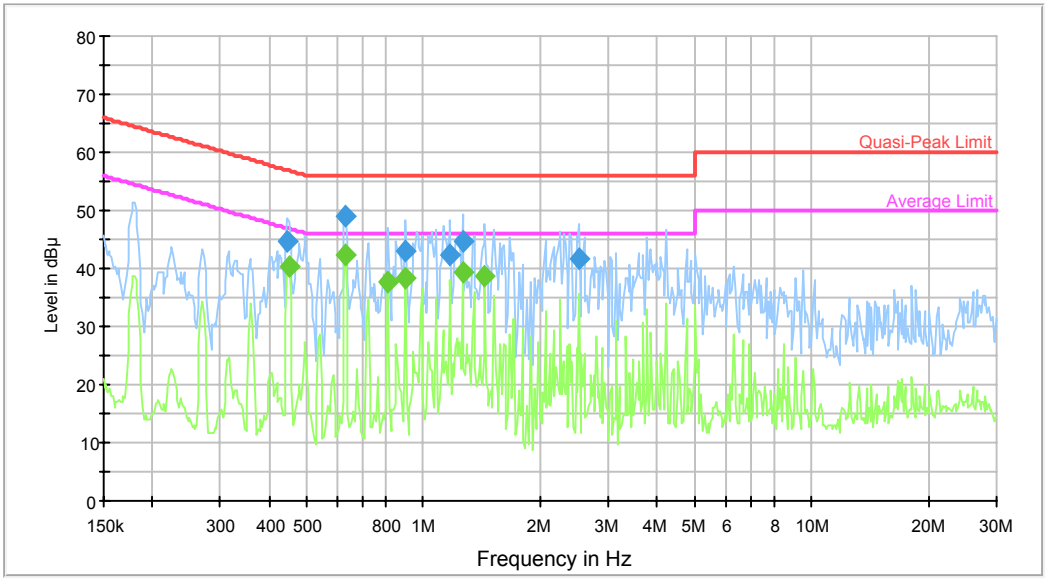
Environmental Conditions

Temperature:	26 °C
Relative Humidity:	40 %
ATM Pressure:	100 kPa

The testing was performed by Tom Tang on 2017-01-07.

Test Mode: Transmitting (Wi-Fi)

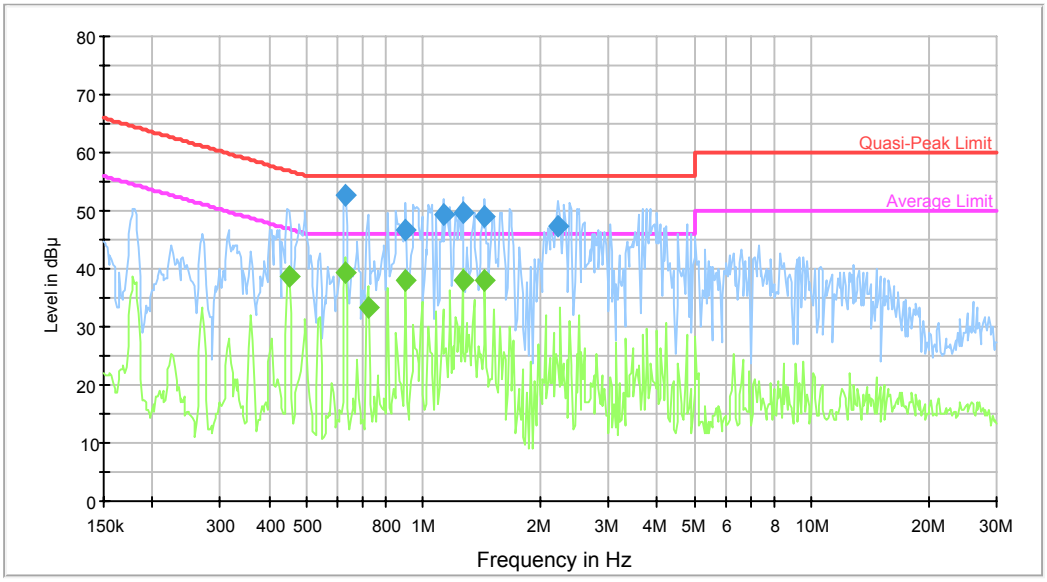
AC120 V, 60 Hz, Line:



Frequency (MHz)	QuasiPeak (dBµV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)	Comment
0.446873	44.5	9.000	L1	19.7	12.4	56.9	Compliance
0.629488	49.0	9.000	L1	19.7	7.0	56.0	Compliance
0.900972	43.1	9.000	L1	19.7	12.9	56.0	Compliance
1.171949	42.4	9.000	L1	19.7	13.6	56.0	Compliance
1.259081	44.8	9.000	L1	19.7	11.2	56.0	Compliance
2.518372	41.5	9.000	L1	19.7	14.5	56.0	Compliance

Frequency (MHz)	Average (dBµV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)	Comment
0.450448	40.4	9.000	L1	19.7	6.5	46.9	Compliance
0.629488	42.4	9.000	L1	19.7	3.6	46.0	Compliance
0.805868	37.6	9.000	L1	19.7	8.4	46.0	Compliance
0.900972	38.4	9.000	L1	19.7	7.6	46.0	Compliance
1.259081	39.2	9.000	L1	19.7	6.8	46.0	Compliance
1.441726	38.8	9.000	L1	19.7	7.2	46.0	Compliance

AC120 V, 60 Hz, Neutral:

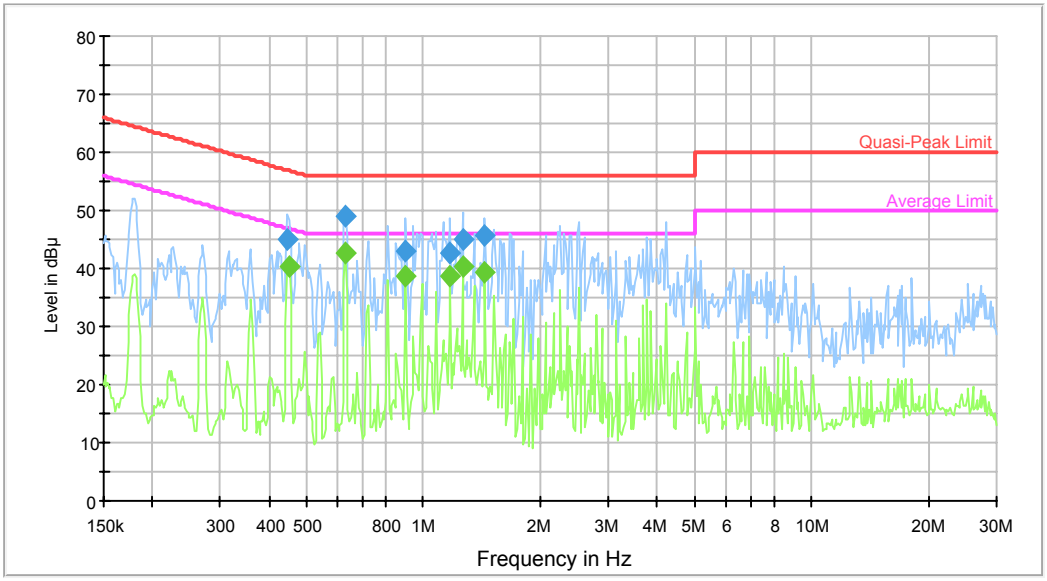


Frequency (MHz)	QuasiPeak (dBµV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)	Comment
0.629488	52.8	9.000	N	19.6	3.2	56.0	Compliance
0.900972	46.7	9.000	N	19.7	9.3	56.0	Compliance
1.126176	49.2	9.000	N	19.7	6.8	56.0	Compliance
1.259081	49.8	9.000	N	19.6	6.2	56.0	Compliance
1.441726	48.9	9.000	N	19.7	7.1	56.0	Compliance
2.216927	47.2	9.000	N	19.7	8.8	56.0	Compliance

Frequency (MHz)	Average (dBµV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)	Comment
0.450448	38.8	9.000	N	19.6	8.1	46.9	Compliance
0.629488	39.4	9.000	N	19.6	6.6	46.0	Compliance
0.720803	33.3	9.000	N	19.6	12.7	46.0	Compliance
0.900972	38.0	9.000	N	19.7	8.0	46.0	Compliance
1.259081	37.9	9.000	N	19.6	8.1	46.0	Compliance
1.441726	37.9	9.000	N	19.7	8.1	46.0	Compliance

Test Mode: Transmitting (BLE)

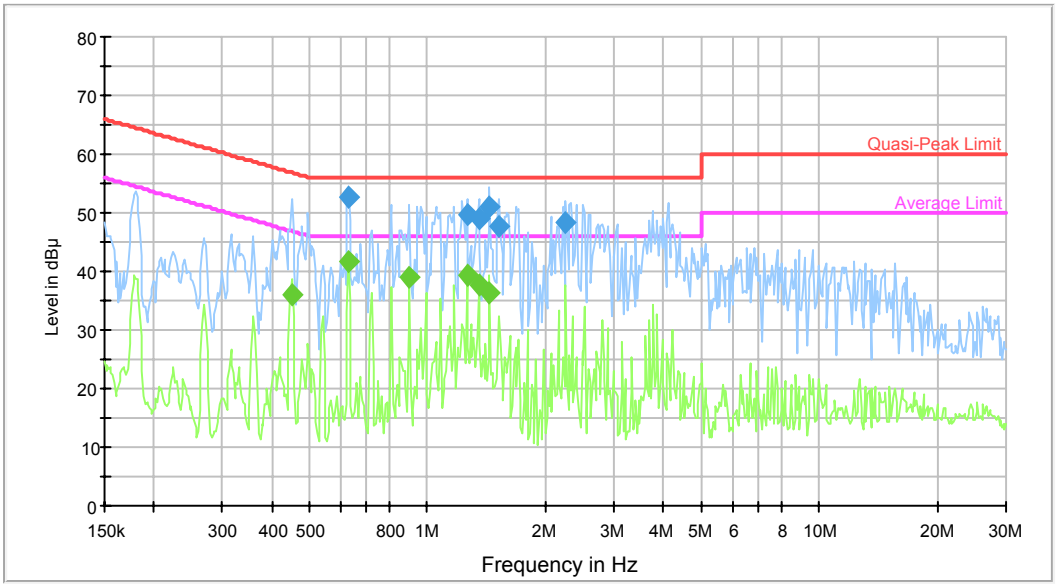
AC120 V, 60 Hz, Line:



Frequency (MHz)	QuasiPeak (dBµV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)	Comment
0.446873	44.9	9.000	L1	19.7	12.0	56.9	Compliance
0.629488	49.0	9.000	L1	19.7	7.0	56.0	Compliance
0.900972	43.2	9.000	L1	19.7	12.8	56.0	Compliance
1.171949	42.6	9.000	L1	19.7	13.4	56.0	Compliance
1.259081	44.9	9.000	L1	19.7	11.1	56.0	Compliance
1.441726	45.7	9.000	L1	19.7	10.3	56.0	Compliance

Frequency (MHz)	Average (dBµV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)	Comment
0.450448	40.2	9.000	L1	19.7	6.7	46.9	Compliance
0.629488	42.6	9.000	L1	19.7	3.4	46.0	Compliance
0.900972	38.7	9.000	L1	19.7	7.3	46.0	Compliance
1.171949	38.6	9.000	L1	19.7	7.4	46.0	Compliance
1.259081	40.4	9.000	L1	19.7	5.6	46.0	Compliance
1.441726	39.3	9.000	L1	19.7	6.7	46.0	Compliance

AC120 V, 60 Hz, Neutral:



Frequency (MHz)	QuasiPeak (dBµV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)	Comment
0.629488	52.6	9.000	N	19.6	3.4	56.0	Compliance
1.259081	49.7	9.000	N	19.6	6.3	56.0	Compliance
1.352690	48.9	9.000	N	19.7	7.1	56.0	Compliance
1.441726	51.1	9.000	N	19.7	4.9	56.0	Compliance
1.524426	47.6	9.000	N	19.7	8.4	56.0	Compliance
2.252540	48.3	9.000	N	19.7	7.7	56.0	Compliance

Frequency (MHz)	Average (dBµV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)	Comment
0.450448	36.1	9.000	N	19.6	10.8	46.9	Compliance
0.629488	41.7	9.000	N	19.6	4.3	46.0	Compliance
0.900972	38.9	9.000	N	19.7	7.1	46.0	Compliance
1.259081	39.3	9.000	N	19.6	6.7	46.0	Compliance
1.352690	37.5	9.000	N	19.7	8.5	46.0	Compliance
1.441726	36.2	9.000	N	19.7	9.8	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_{cispr} 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_{cispr} of Table 2, then:
–compliance is deemed to occur if no measured disturbance level, increased by ($U_{lab} - U_{cispr}$), exceeds the disturbance limit;
–non - compliance is deemed to occur if any measured disturbance level, increased by ($U_{lab} - U_{cispr}$), exceeds the disturbance limit.

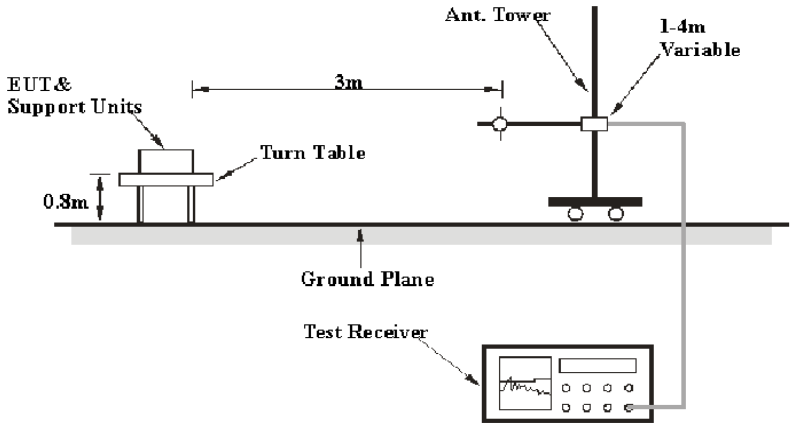
Based on CISPR 16-4-2-2011, measurement uncertainty of radiated emission at a distance of 3m at Bay Area Compliance Laboratories Corp. (Chengdu) is:
30M~200MHz: ±4.7 dB;
200M~1GHz: ±6.0 dB;
1G~6GHz: ±5.13dB;
6G~25GHz: ±5.47 dB;

Table 2 – Values of U_{cispr}

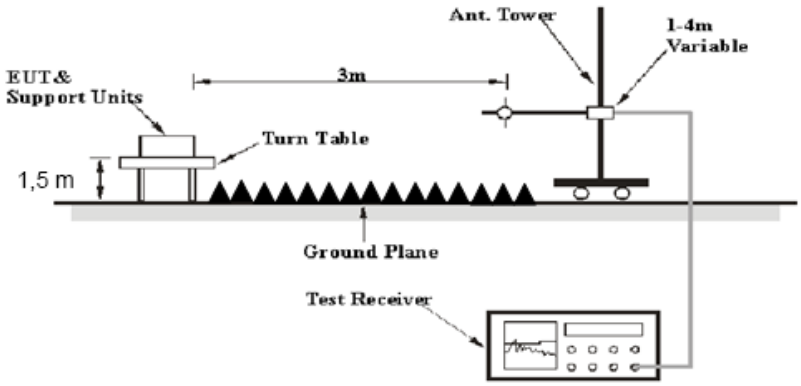
Measurement		U_{cispr}
Radiated disturbance (electric field strength at an OATS or in a SAC)	(30 MHz to 1000 MHz)	6.3 dB
Radiated disturbance (electric field strength in a FAR)	(1 GHz to 6 GHz)	5.2 dB
Radiated disturbance (electric field strength in a FAR)	(6 GHz to 18 GHz)	5.5 dB

EUT Setup

Below 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:

30MHz-1000MHz:

Detector	RBW	Video B/W	IF B/W
QP	120 kHz	300 kHz	120kHz

1GHz- 25GHz:

Detector	Duty cycle	RBW	Video B/W
PK	Any	1MHz	3 MHz
Ave.	>98%	1MHz	10 Hz
	<98%	1MHz	1/T

Note: T is minimum transmission duration

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

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:

Corrected Amplitude = Meter Reading + Antenna Loss + Cable Loss - Amplifier Gain

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

Margin = Limit –Corrected Amplitude

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Agilent	Amplifier	8447D	2944A10442	2016-12-02	2017-12-01
Rohde & Schwarz	EMI Test Receiver	ESCI	100028	2016-12-02	2017-12-01
Sunol Sciences	Broadband Antenna	JB3	A101808	2016-04-10	2019-04-09
Rohde & Schwarz	Spectrum Analyzer	FSEM30	100018	2016-12-02	2017-12-01
ETS	Horn Antenna	3115	003-6076	2016-12-02	2017-12-01
Ducommun Technologies	Horn Antenna	ARH-4223-02	1007726-0113024	2014-06-16	2017-06-15
Mini-circuits	Amplifier	ZVA-183-S+	771001215	2016-05-20	2017-05-19
HP	Amplifier	8449B	3008A00277	2016-12-02	2017-12-01
EMCT	Semi-Anechoic Chamber	966	N/A	2015-04-24	2018-04-23
N/A	RF Cable (below 1GHz)	NO.1	N/A	2016-11-10	2017-11-09
N/A	RF Cable (below 1GHz)	NO.4	N/A	2016-11-10	2017-11-09
N/A	RF Cable (above 1GHz)	NO.2	N/A	2016-11-10	2017-11-09

*** Statement of Traceability:** BACL (Chengdu) attested that all calibrations have been performed, traceable to National Primary Standards and International System of Units (SI).

Test Data

Environmental Conditions

Temperature:	24.4 °C
Relative Humidity:	51 %
ATM Pressure:	101.3 kPa

** The testing was performed by Tom Tang on 2016-12-22.*

Test Mode: Transmitting

30MHz-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	69.61	PK	H	23.50	3.00	0.00	96.11	N/A	N/A
2412	64.57	AV	H	23.50	3.00	0.00	91.07	N/A	N/A
2412	64.58	PK	V	23.50	3.00	0.00	91.08	N/A	N/A
2412	59.34	AV	V	23.50	3.00	0.00	85.84	N/A	N/A
2390	25.58	PK	H	23.57	3.00	0.00	52.15	74.00	21.85
2390	15.23	AV	H	23.57	3.00	0.00	41.80	54.00	12.20
4824	36.35	PK	H	30.84	5.11	26.87	45.43	74.00	28.57
4824	30.43	AV	H	30.84	5.11	26.87	39.51	54.00	14.49
7236	33.68	PK	H	34.77	6.18	26.36	48.27	74.00	25.73
7236	27.54	AV	H	34.77	6.18	26.36	42.13	54.00	11.87
2032	33.42	PK	H	24.79	3.05	26.82	34.44	74.00	39.56
2032	27.23	AV	H	24.79	3.05	26.82	28.25	54.00	25.75
218.18	42.99	QP	V	11.55	1.00	27.68	27.86	46.00	18.14
244.37	43.02	QP	V	12.30	1.14	27.54	28.92	46.00	17.08
Middle Channel: 2437 MHz									
2437	69.69	PK	H	23.41	3.00	0.00	96.10	N/A	N/A
2437	64.43	AV	H	23.41	3.00	0.00	90.84	N/A	N/A
2437	64.94	PK	V	23.41	3.00	0.00	91.35	N/A	N/A
2437	59.75	AV	V	23.41	3.00	0.00	86.16	N/A	N/A
4874	35.67	PK	H	31.00	5.09	26.87	44.89	74.00	29.11
4874	30.91	AV	H	31.00	5.09	26.87	40.13	54.00	13.87
7311	34.45	PK	H	34.92	6.21	26.40	49.18	74.00	24.82
7311	27.32	AV	H	34.92	6.21	26.40	42.05	54.00	11.95
1435	33.79	PK	H	23.93	2.58	26.39	33.91	74.00	40.09
1435	27.11	AV	H	23.93	2.58	26.39	27.23	54.00	26.77
2136	33.42	PK	H	24.44	3.03	26.84	34.05	74.00	39.95
2136	27.37	AV	H	24.44	3.03	26.84	28.00	54.00	26.00
218.18	43.16	QP	V	11.55	1.00	27.68	28.03	46.00	17.97
244.37	42.73	QP	V	12.30	1.14	27.54	28.63	46.00	17.37
High Channel: 2462 MHz									
2462	69.32	PK	H	23.33	2.99	0.00	95.64	N/A	N/A
2462	64.17	AV	H	23.33	2.99	0.00	90.49	N/A	N/A
2462	64.37	PK	V	23.33	2.99	0.00	90.69	N/A	N/A
2462	59.2	AV	V	23.33	2.99	0.00	85.52	N/A	N/A
2483.5	25.35	PK	H	23.26	2.99	0.00	51.60	74.00	22.40
2483.5	13.68	AV	H	23.26	2.99	0.00	39.93	54.00	14.07
4924	36.89	PK	H	31.16	5.07	26.88	46.24	74.00	27.76
4924	30.06	AV	H	31.16	5.07	26.88	39.41	54.00	14.59
7386	34.09	PK	H	35.07	6.25	26.43	48.98	74.00	25.02
7386	27.55	AV	H	35.07	6.25	26.43	42.44	54.00	11.56
3131	33.42	PK	H	24.93	3.63	26.46	35.52	74.00	38.48
3131	27.65	AV	H	24.93	3.63	26.46	29.75	54.00	24.25
218.18	43.22	QP	V	11.55	1.00	27.68	28.09	46.00	17.91
244.37	42.9	QP	V	12.30	1.14	27.54	28.80	46.00	17.20

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	68.57	PK	H	23.50	3.00	0.00	95.07	N/A	N/A
2412	58.25	AV	H	23.50	3.00	0.00	84.75	N/A	N/A
2412	64.33	PK	V	23.50	3.00	0.00	90.83	N/A	N/A
2412	53.72	AV	V	23.50	3.00	0.00	80.22	N/A	N/A
2390	26.03	PK	H	23.57	3.00	0.00	52.60	74.00	21.40
2390	13.46	AV	H	23.57	3.00	0.00	40.03	54.00	13.97
4824	37.59	PK	H	30.84	5.11	26.87	46.67	74.00	27.33
4824	27.34	AV	H	30.84	5.11	26.87	36.42	54.00	17.58
7236	35.25	PK	H	34.77	6.18	26.36	49.84	74.00	24.16
7236	25.13	AV	H	34.77	6.18	26.36	39.72	54.00	14.28
1623	33.66	PK	H	24.30	2.76	26.45	34.27	74.00	39.73
1623	23.27	AV	H	24.30	2.76	26.45	23.88	54.00	30.12
218.18	42.97	QP	V	11.55	1.00	27.68	27.84	46.00	18.16
244.37	42.65	QP	V	12.30	1.14	27.54	28.55	46.00	17.45
Middle Channel: 2437 MHz									
2437	68.83	PK	H	23.41	3.00	0.00	95.24	N/A	N/A
2437	57.94	AV	H	23.41	3.00	0.00	84.35	N/A	N/A
2437	63.93	PK	V	23.41	3.00	0.00	90.34	N/A	N/A
2437	53.38	AV	V	23.41	3.00	0.00	79.79	N/A	N/A
4874	37.42	PK	H	31.00	5.09	26.87	46.64	74.00	27.36
4874	26.9	AV	H	31.00	5.09	26.87	36.12	54.00	17.88
7311	34.96	PK	H	34.92	6.21	26.40	49.69	74.00	24.31
7311	25.34	AV	H	34.92	6.21	26.40	40.07	54.00	13.93
1405	33.77	PK	H	23.85	2.54	26.42	33.74	74.00	40.26
1405	23.53	AV	H	23.85	2.54	26.42	23.50	54.00	30.50
3026	33.45	PK	H	24.35	3.47	26.42	34.85	74.00	39.15
3026	23.08	AV	H	24.35	3.47	26.42	24.48	54.00	29.52
218.18	43.14	QP	V	11.55	1.00	27.68	28.01	46.00	17.99
244.37	42.36	QP	V	12.30	1.14	27.54	28.26	46.00	17.74
High Channel: 2462 MHz									
2462	68.35	PK	H	23.33	2.99	0.00	94.67	N/A	N/A
2462	57.96	AV	H	23.33	2.99	0.00	84.28	N/A	N/A
2462	64.02	PK	V	23.33	2.99	0.00	90.34	N/A	N/A
2462	53.49	AV	V	23.33	2.99	0.00	79.81	N/A	N/A
2483.5	25.58	PK	H	23.26	2.99	0.00	51.83	74.00	22.17
2483.5	13.34	AV	H	23.26	2.99	0.00	39.59	54.00	14.41
4924	37.41	PK	H	31.16	5.07	26.88	46.76	74.00	27.24
4924	27.65	AV	H	31.16	5.07	26.88	37.00	54.00	17.00
7386	34.77	PK	H	35.07	6.25	26.43	49.66	74.00	24.34
7386	24.43	AV	H	35.07	6.25	26.43	39.32	54.00	14.68
2950	33.6	PK	H	24.10	3.39	26.46	34.63	74.00	39.37
2950	23.01	AV	H	24.10	3.39	26.46	24.04	54.00	29.96
218.18	42.75	QP	V	11.55	1.00	27.68	27.62	46.00	18.38
244.37	42.83	QP	V	12.30	1.14	27.54	28.73	46.00	17.27

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	68.21	PK	H	23.50	3.00	0.00	94.71	N/A	N/A
2412	58.63	AV	H	23.50	3.00	0.00	85.13	N/A	N/A
2412	63.84	PK	V	23.50	3.00	0.00	90.34	N/A	N/A
2412	53.92	AV	V	23.50	3.00	0.00	80.42	N/A	N/A
2390	32.46	PK	H	23.57	3.00	0.00	59.03	74.00	14.97
2390	18.59	AV	H	23.57	3.00	0.00	45.16	54.00	8.84
4824	37.56	PK	H	30.84	5.11	26.87	46.64	74.00	27.36
4824	26.43	AV	H	30.84	5.11	26.87	35.51	54.00	18.49
7236	35.68	PK	H	34.77	6.18	26.36	50.27	74.00	23.73
7236	25.05	AV	H	34.77	6.18	26.36	39.64	54.00	14.36
1352	33.59	PK	H	23.72	2.47	26.47	33.31	74.00	40.69
1352	22.74	AV	H	23.72	2.47	26.47	22.46	54.00	31.54
218.18	43.64	QP	V	11.55	1.00	27.68	28.51	46.00	17.49
244.37	43.08	QP	V	12.30	1.14	27.54	28.98	46.00	17.02
Middle Channel: 2437 MHz									
2437	68.48	PK	H	23.41	3.00	0.00	94.89	N/A	N/A
2437	58.75	AV	H	23.41	3.00	0.00	85.16	N/A	N/A
2437	64.67	PK	V	23.41	3.00	0.00	91.08	N/A	N/A
2437	53.7	AV	V	23.41	3.00	0.00	80.11	N/A	N/A
4874	37.5	PK	H	31.00	5.09	26.87	46.72	74.00	27.28
4874	26.73	AV	H	31.00	5.09	26.87	35.95	54.00	18.05
7311	36.13	PK	H	34.92	6.21	26.40	50.86	74.00	23.14
7311	25.27	AV	H	34.92	6.21	26.40	40.00	54.00	14.00
1665	33.35	PK	H	24.36	2.80	26.49	34.02	74.00	39.98
1665	23.2	AV	H	24.36	2.80	26.49	23.87	54.00	30.13
3109	33.41	PK	H	24.81	3.59	26.45	35.36	74.00	38.64
3109	22.69	AV	H	24.81	3.59	26.45	24.64	54.00	29.36
218.18	43.81	QP	V	11.55	1.00	27.68	28.68	46.00	17.32
244.37	42.79	QP	V	12.30	1.14	27.54	28.69	46.00	17.31
High Channel: 2462 MHz									
2462	68.99	PK	H	23.33	2.99	0.00	95.31	N/A	N/A
2462	57.96	AV	H	23.33	2.99	0.00	84.28	N/A	N/A
2462	64.64	PK	V	23.33	2.99	0.00	90.96	N/A	N/A
2462	53.22	AV	V	23.33	2.99	0.00	79.54	N/A	N/A
2483.5	32.44	PK	H	23.26	2.99	0.00	58.69	74.00	15.31
2483.5	18.95	AV	H	23.26	2.99	0.00	45.20	54.00	8.80
4924	37.26	PK	H	31.16	5.07	26.88	46.61	74.00	27.39
4924	26.43	AV	H	31.16	5.07	26.88	35.78	54.00	18.22
7386	35.85	PK	H	35.07	6.25	26.43	50.74	74.00	23.26
7386	24.77	AV	H	35.07	6.25	26.43	39.66	54.00	14.34
2033	33.34	PK	H	24.79	3.05	26.82	34.36	74.00	39.64
2033	23.05	AV	H	24.79	3.05	26.82	24.07	54.00	29.93
218.18	43.87	QP	V	11.55	1.00	27.68	28.74	46.00	17.26
244.37	42.96	QP	V	12.30	1.14	27.54	28.86	46.00	17.14

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	67.8	PK	H	23.47	3.00	0.00	94.27	N/A	N/A
2422	56.43	AV	H	23.47	3.00	0.00	82.90	N/A	N/A
2422	64.56	PK	V	23.47	3.00	0.00	91.03	N/A	N/A
2422	53.71	AV	V	23.47	3.00	0.00	80.18	N/A	N/A
2390	32.69	PK	H	23.57	3.00	0.00	59.26	74.00	14.74
2390	18.34	AV	H	23.57	3.00	0.00	44.91	54.00	9.09
4844	37.99	PK	H	30.90	5.10	26.87	47.12	74.00	26.88
4844	26.08	AV	H	30.90	5.10	26.87	35.21	54.00	18.79
7266	35.3	PK	H	34.83	6.19	26.38	49.94	74.00	24.06
7266	24.87	AV	H	34.83	6.19	26.38	39.51	54.00	14.49
2163	33.46	PK	H	24.35	3.03	26.84	34.00	74.00	40.00
2163	23.23	AV	H	24.35	3.03	26.84	23.77	54.00	30.23
218.18	43.62	QP	V	11.55	1.00	27.68	28.49	46.00	17.51
244.37	42.71	QP	V	12.30	1.14	27.54	28.61	46.00	17.39
Middle Channel: 2437 MHz									
2437	68.21	PK	H	23.41	3.00	0.00	94.62	N/A	N/A
2437	58.06	AV	H	23.41	3.00	0.00	84.47	N/A	N/A
2437	64.24	PK	V	23.41	3.00	0.00	90.65	N/A	N/A
2437	54.11	AV	V	23.41	3.00	0.00	80.52	N/A	N/A
4874	37.84	PK	H	31.00	5.09	26.87	47.06	74.00	26.94
4874	26.21	AV	H	31.00	5.09	26.87	35.43	54.00	18.57
7311	35.4	PK	H	34.92	6.21	26.40	50.13	74.00	23.87
7311	24.63	AV	H	34.92	6.21	26.40	39.36	54.00	14.64
1338	34.17	PK	H	23.68	2.45	26.49	33.81	74.00	40.19
1338	23.09	AV	H	23.68	2.45	26.49	22.73	54.00	31.27
2902	33.75	PK	H	24.00	3.34	26.50	34.59	74.00	39.41
2902	22.77	AV	H	24.00	3.34	26.50	23.61	54.00	30.39
218.18	43.79	QP	V	11.55	1.00	27.68	28.66	46.00	17.34
244.37	42.42	QP	V	12.30	1.14	27.54	28.32	46.00	17.68
High Channel: 2452 MHz									
2452	67.83	PK	H	23.36	3.00	0.00	94.19	N/A	N/A
2452	57.91	AV	H	23.36	3.00	0.00	84.27	N/A	N/A
2452	64.17	PK	V	23.36	3.00	0.00	90.53	N/A	N/A
2452	53.41	AV	V	23.36	3.00	0.00	79.77	N/A	N/A
2483.5	32.31	PK	H	23.26	2.99	0.00	58.56	74.00	15.44
2483.5	18.64	AV	H	23.26	2.99	0.00	44.89	54.00	9.11
4904	38.47	PK	H	31.09	5.08	26.87	47.77	74.00	26.23
4904	26.12	AV	H	31.09	5.08	26.87	35.42	54.00	18.58
7356	35.72	PK	H	35.01	6.23	26.42	50.54	74.00	23.46
7356	24.94	AV	H	35.01	6.23	26.42	39.76	54.00	14.24
1774	33.75	PK	H	24.54	2.88	26.60	34.57	74.00	39.43
1774	23.51	AV	H	24.54	2.88	26.60	24.33	54.00	29.67
218.18	43.4	QP	V	11.55	1.00	27.68	28.27	46.00	17.73
244.37	42.89	QP	V	12.30	1.14	27.54	28.79	46.00	17.21

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	61.3	PK	V	23.53	3.00	0.00	87.83	N/A	N/A
2402	50.74	AV	V	23.53	3.00	0.00	77.27	N/A	N/A
2402	66.47	PK	H	23.53	3.00	0.00	93.00	N/A	N/A
2402	55.24	AV	H	23.53	3.00	0.00	81.77	N/A	N/A
2390	26.55	PK	H	23.57	3.00	0.00	53.12	74.00	20.88
2390	13.6	AV	H	23.57	3.00	0.00	40.17	54.00	13.83
4804	43.47	PK	H	30.77	5.12	26.87	52.49	74.00	21.51
4804	31.19	AV	H	30.77	5.12	26.87	40.21	54.00	13.79
7206	39.23	PK	H	34.71	6.16	26.35	53.75	74.00	20.25
7206	27.42	AV	H	34.71	6.16	26.35	41.94	54.00	12.06
1664	34.73	PK	H	24.36	2.79	26.49	35.39	74.00	38.61
1664	23.61	AV	H	24.36	2.79	26.49	24.27	54.00	29.73
218.18	43.08	QP	V	11.55	1.00	27.68	27.95	46.00	18.05
244.37	42.85	QP	V	12.30	1.14	27.54	28.75	46.00	17.25
Middle Channel: 2440 MHz									
2440	60.93	PK	V	23.40	3.00	0.00	87.33	N/A	N/A
2440	50.89	AV	V	23.40	3.00	0.00	77.29	N/A	N/A
2440	66.36	PK	H	23.40	3.00	0.00	92.76	N/A	N/A
2440	55.5	AV	H	23.40	3.00	0.00	81.90	N/A	N/A
4880	43.65	PK	H	31.02	5.09	26.87	52.89	74.00	21.11
4880	31.9	AV	H	31.02	5.09	26.87	41.14	54.00	12.86
7320	38.42	PK	H	34.94	6.22	26.40	53.18	74.00	20.82
7320	27.9	AV	H	34.94	6.22	26.40	42.66	54.00	11.34
2063	34.24	PK	H	24.69	3.04	26.83	35.14	74.00	38.86
2063	24.19	AV	H	24.69	3.04	26.83	25.09	54.00	28.91
3152	33.41	PK	H	25.05	3.66	26.46	35.66	74.00	38.34
3152	22.76	AV	H	25.05	3.66	26.46	25.01	54.00	28.99
218.18	43.25	QP	V	11.55	1.00	27.68	28.12	46.00	17.88
244.37	42.56	QP	V	12.30	1.14	27.54	28.46	46.00	17.54
High Channel: 2480 MHz									
2480	60.27	PK	V	23.27	2.99	0.00	86.53	N/A	N/A
2480	53.84	AV	V	23.27	2.99	0.00	80.10	N/A	N/A
2480	66.52	PK	H	23.27	2.99	0.00	92.78	N/A	N/A
2480	53.35	AV	H	23.27	2.99	0.00	79.61	N/A	N/A
2483.5	25.37	PK	H	23.26	2.99	0.00	51.62	74.00	22.38
2483.5	13.71	AV	H	23.26	2.99	0.00	39.96	54.00	14.04
4960	42.8	PK	H	31.27	5.05	26.88	52.24	74.00	21.76
4960	30.44	AV	H	31.27	5.05	26.88	39.88	54.00	14.12
7440	37.21	PK	H	35.18	6.27	26.45	52.21	74.00	21.79
7440	25.48	AV	H	35.18	6.27	26.45	40.48	54.00	13.52
2116	33.87	PK	H	24.51	3.04	26.84	34.58	74.00	39.42
2116	24.65	AV	H	24.51	3.04	26.84	25.36	54.00	28.64
218.18	43.31	QP	V	11.55	1.00	27.68	28.18	46.00	17.82
244.37	42.73	QP	V	12.30	1.14	27.54	28.63	46.00	17.37

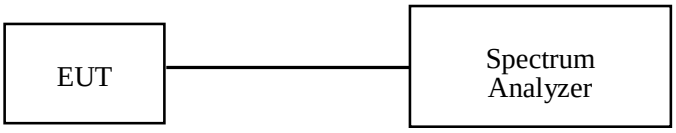
FCC §15.247(a) (2) – 6 dB EMISSION BANDWIDTH

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

a) Set RBW = 100 kHz.
b) Set the video bandwidth (VBW) ≥ 3×RBW
c) Detector = Peak.
d) Trace mode = max hold.
e) Sweep = auto couple.
f) Allow the trace to stabilize.
g) 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
Rohde & Schwarz	Signal Analyzer	FSIQ26	831929/005	2016-09-21	2017-09-20
N/A	RF Cable	N/A	N/A	Each Time	/

*** Statement of Traceability:** BACL (Chengdu) attested that all calibrations have been performed, traceable to National Primary Standards and International System of Units (SI).

Test Data

Environmental Conditions

Temperature:	26.5 °C
Relative Humidity:	41 %
ATM Pressure:	101 kPa

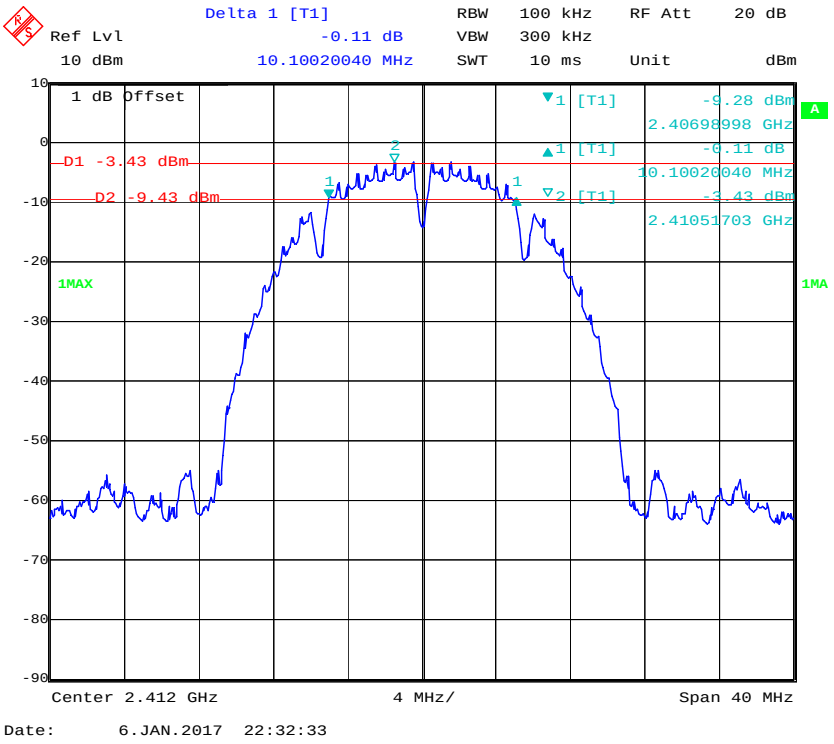
** The testing was performed by Tom Tang on 2017-01-06.*

Test Mode: Transmitting

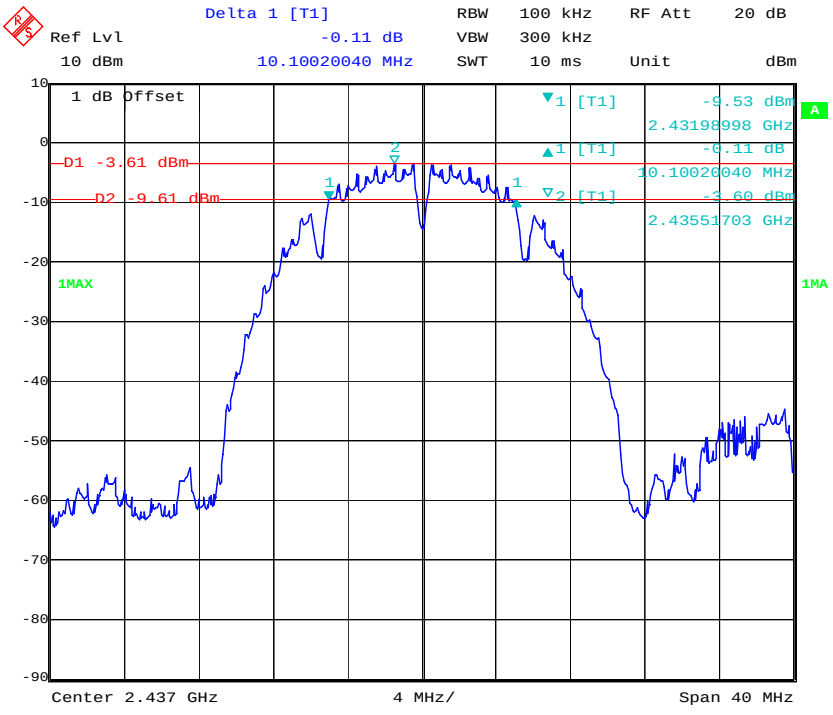
Test Result: Compliant. Please refer to the following table and plots.

Test mode	Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Limit (MHz)
802.11b	Low	2412	10.1	≥0.5
	Middle	2437	10.1	≥0.5
	High	2462	10.1	≥0.5
802.11g	Low	2412	16.51	≥0.5
	Middle	2437	16.51	≥0.5
	High	2462	16.51	≥0.5
802.11n20	Low	2412	17.72	≥0.5
	Middle	2437	17.72	≥0.5
	High	2462	17.64	≥0.5
802.11n40	Low	2422	36.39	≥0.5
	Middle	2437	36.39	≥0.5
	High	2452	36.23	≥0.5
BLE	Low	2402	0.73	≥0.5
	Middle	2440	0.72	≥0.5
	High	2480	0.72	≥0.5

802.11b Low Channel

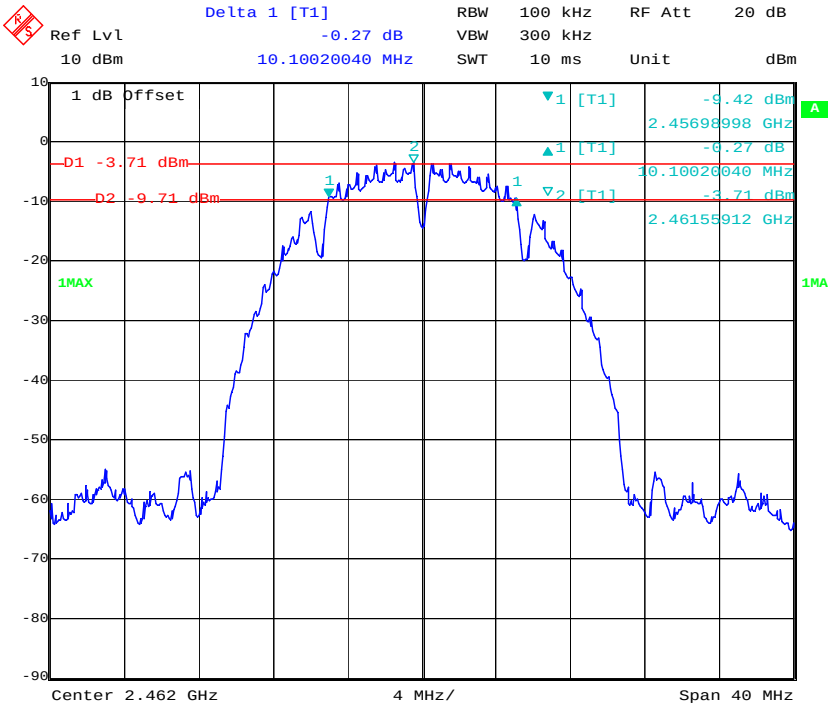


802.11b Middle Channel



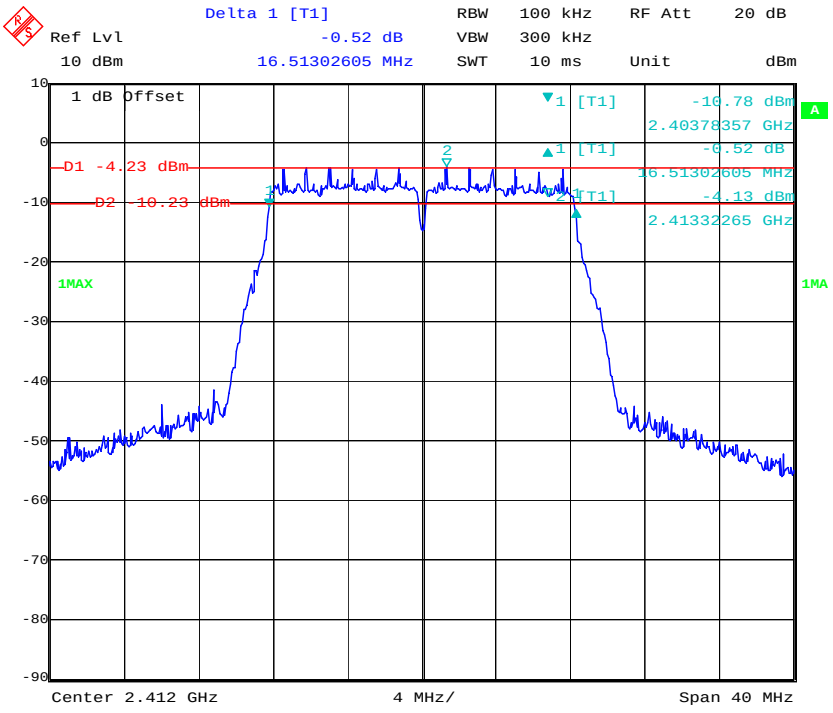
Date: 6.JAN.2017 22:40:18

802.11b High Channel



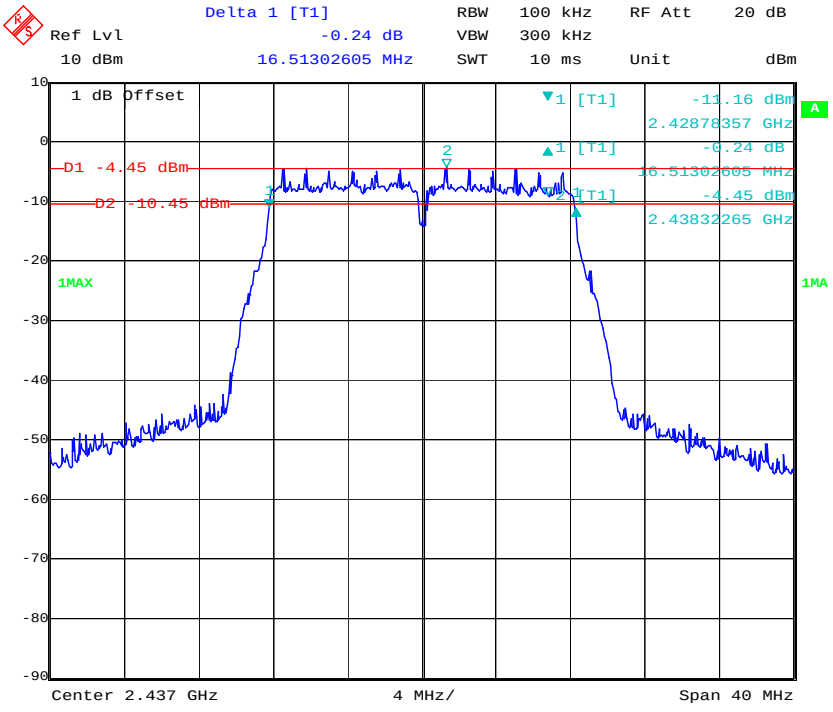
Date: 6.JAN.2017 22:43:02

802.11g Low Channel



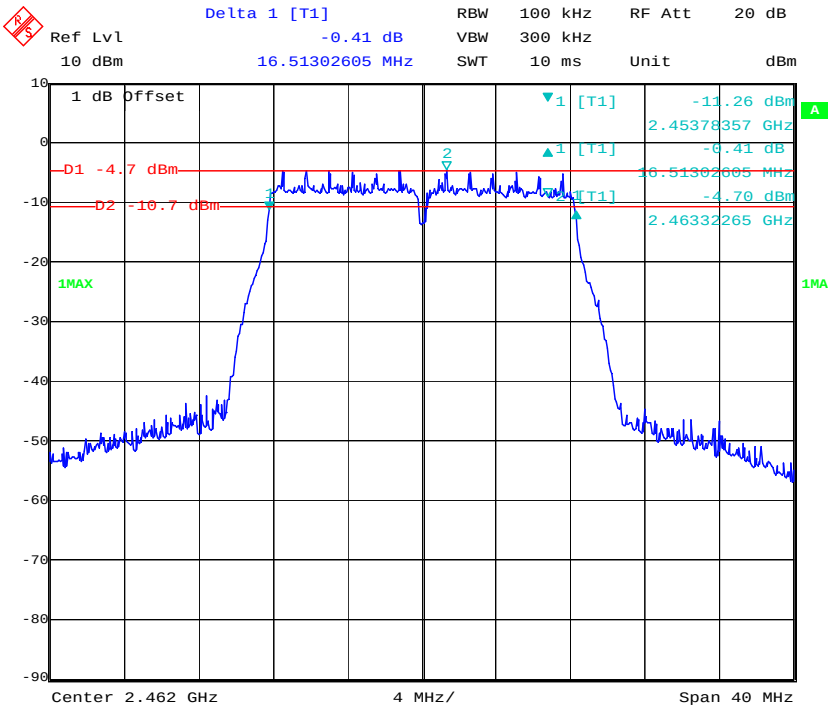
Date: 6.JAN.2017 22:47:58

802.11g Middle Channel



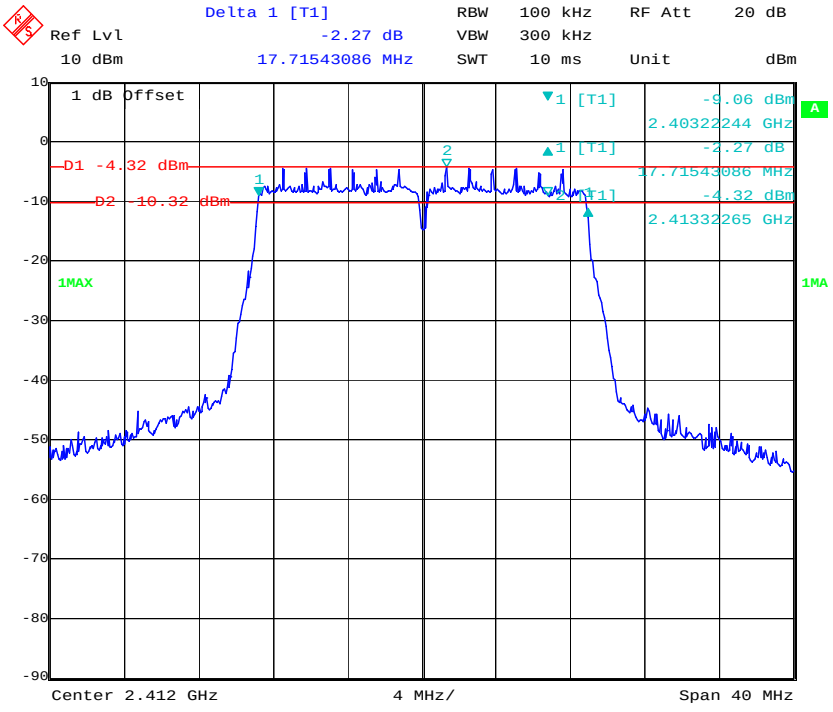
Date: 6.JAN.2017 22:54:50

802.11g High Channel



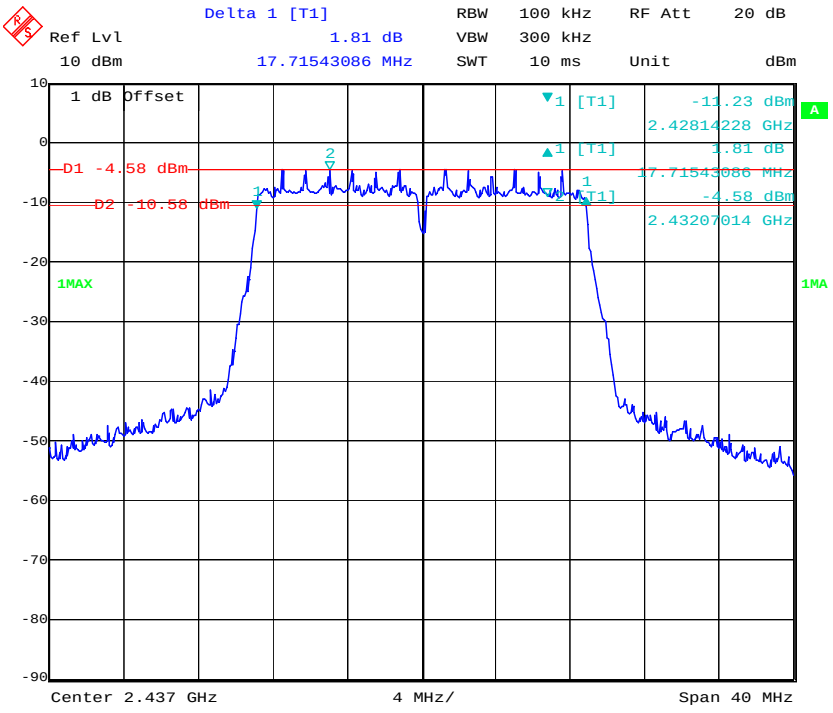
Date: 6.JAN.2017 22:59:12

802.11n ht20 Low Channel

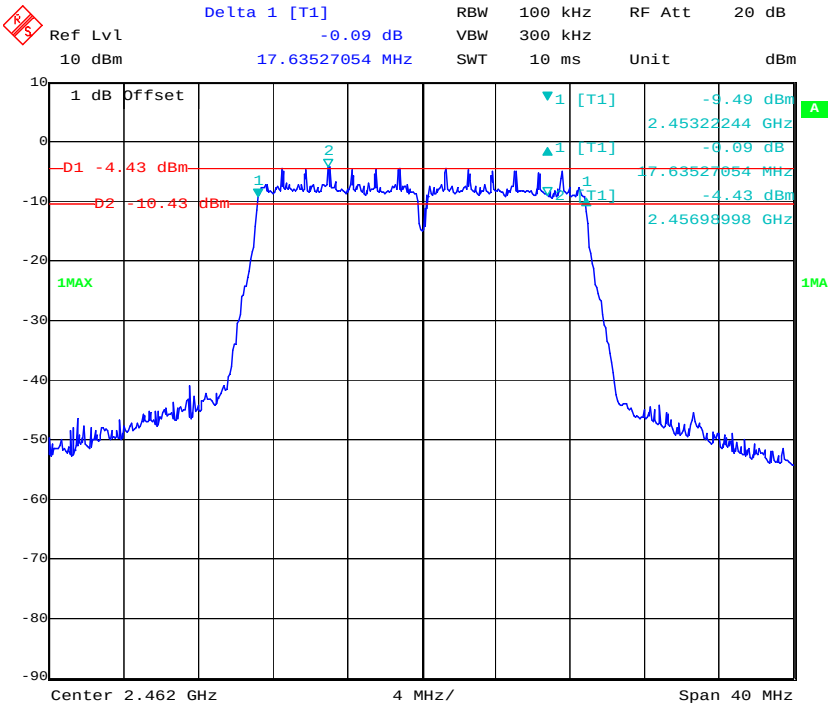


Date: 6.JAN.2017 23:03:37

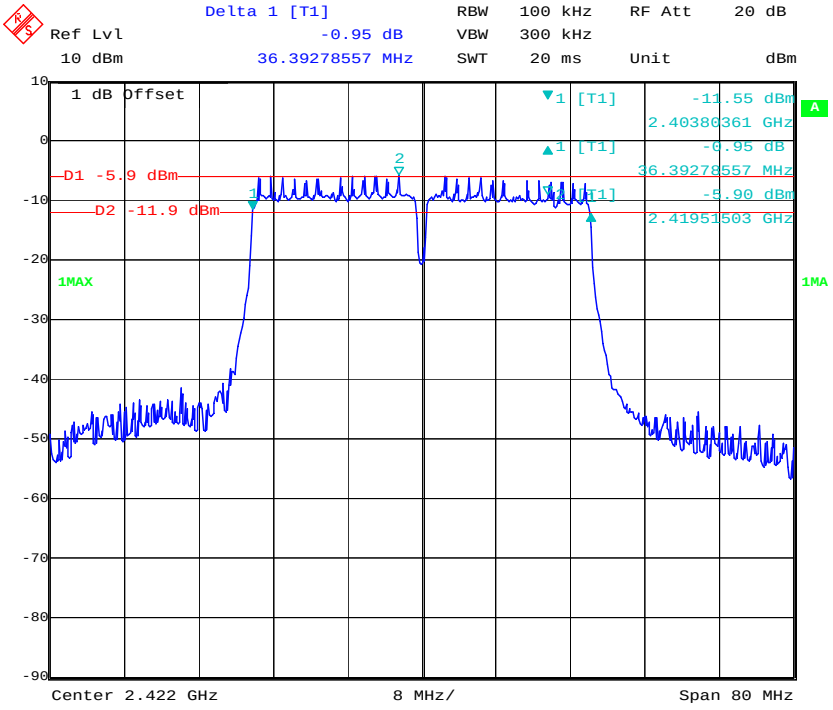
802.11n ht20 Middle Channel



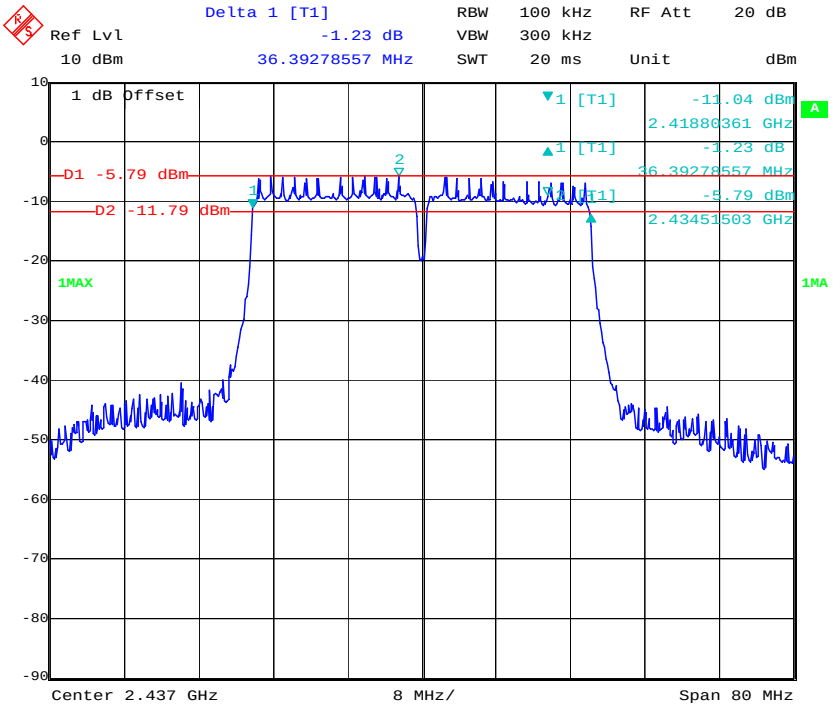
802.11n ht20 High Channel



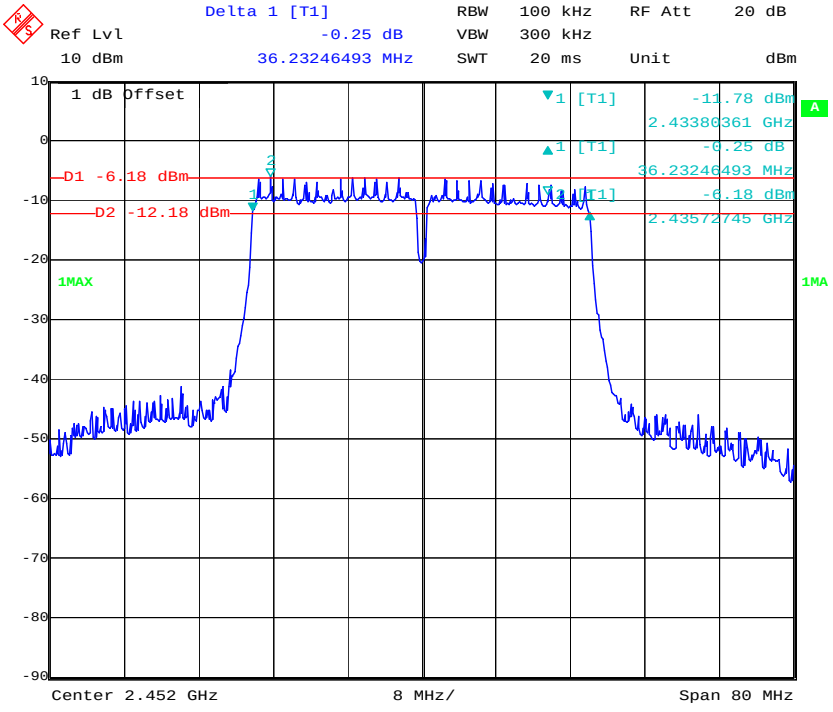
802.11n ht40 Low Channel



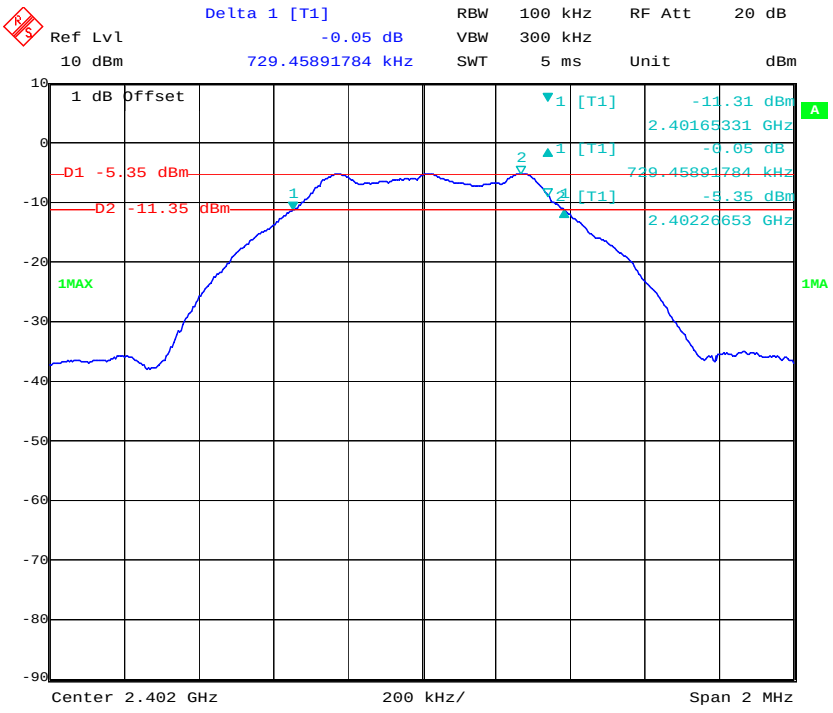
802.11n ht40 Middle Channel



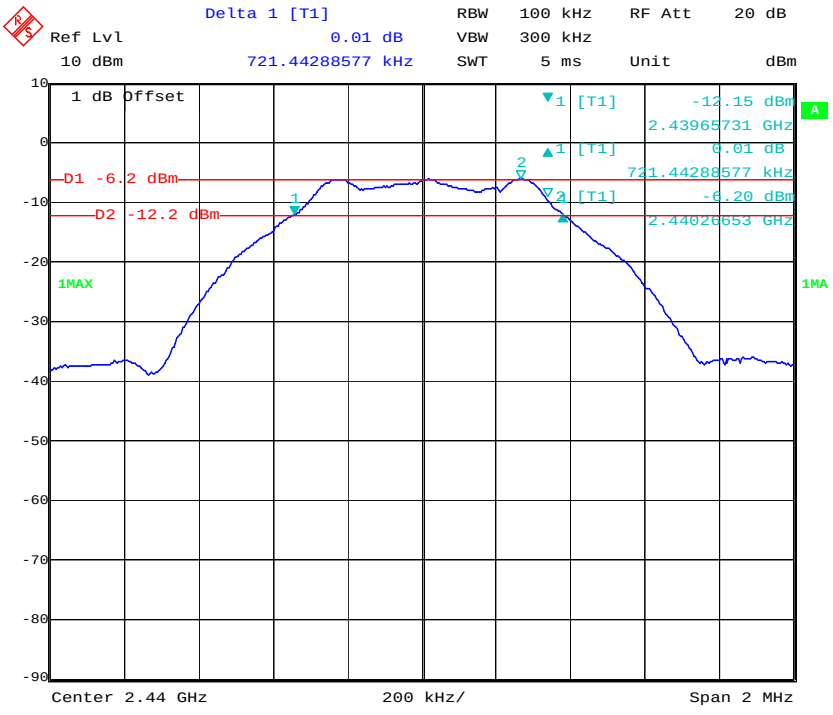
802.11n ht40 High Channel



BLE Low Channel

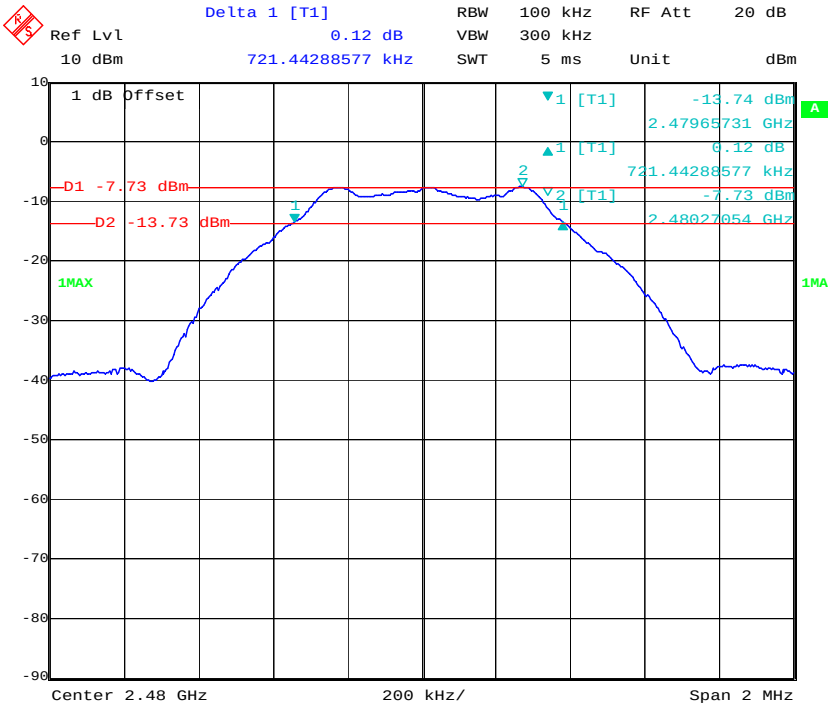


BLE Middle Channel



Date: 6.JAN.2017 22:21:03

BLE High Channel



Date: 6.JAN.2017 22:22:39

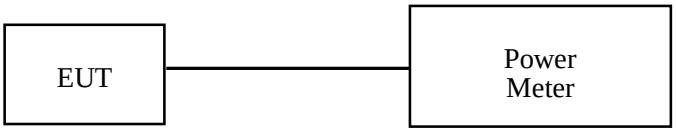
FCC §15.247(b) (3) - MAXIMUM CONDUCTED OUTPUT POWER

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	MY54170074	2017-01-03	2018-01-02
Agilent	P-Series Power Meter	N1912A	MY5000798	2017-01-03	2018-01-02
N/A	RF Cable	N/A	N/A	Each Time	/

*** Statement of Traceability:** BACL (Chengdu) attested that all calibrations have been performed, traceable to National Primary Standards and International System of Units (SI).

Test Data

Environmental Conditions

Temperature:	26 °C
Relative Humidity:	40 %
ATM Pressure:	100 kPa

** The testing was performed by Tom Tang on 2017-01-07.*

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	11.02	9.17	30
	Middle	2437	10.79	8.94	30
	High	2462	10.76	8.95	30
802.11g	Low	2412	14.07	9.28	30
	Middle	2437	13.98	9.17	30
	High	2462	13.9	9.03	30
802.11n20	Low	2412	13.86	9.18	30
	Middle	2437	14.05	9.28	30
	High	2462	13.62	8.97	30
802.11n40	Low	2422	16.44	9.25	30
	Middle	2437	16.52	9.37	30
	High	2452	16.07	8.89	30
BLE	Low	2402	-4.7	/	30
	Middle	2440	-5.52	/	30
	High	2480	-7.03	/	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
Rohde & Schwarz	Signal Analyzer	FSIQ26	831929/005	2016-09-21	2017-09-20
N/A	RF Cable	N/A	N/A	Each Time	/

*** Statement of Traceability:** BACL (Chengdu) attested that all calibrations have been performed, traceable to National Primary Standards and International System of Units (SI).

Test Data

Environmental Conditions

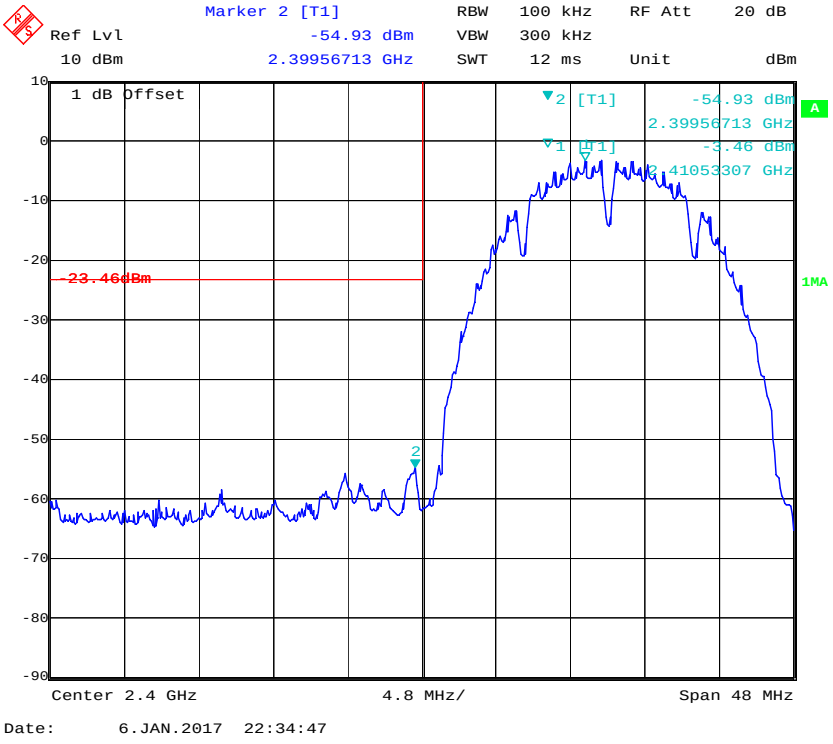
Temperature:	26.5 °C
Relative Humidity:	41 %
ATM Pressure:	101 kPa

** The testing was performed by Tom Tang on 2017-01-06.*

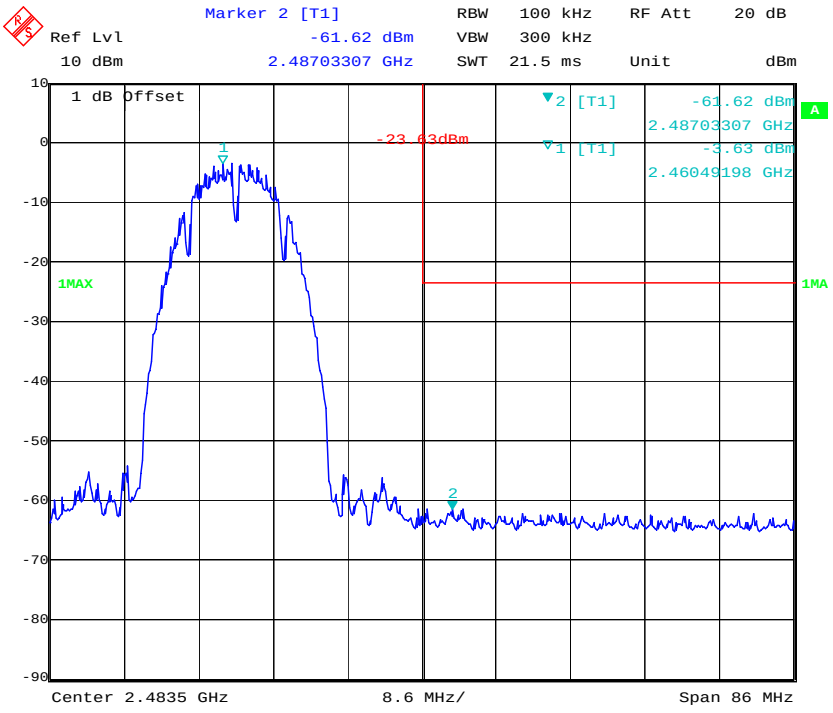
Test mode: Transmitting

Test Result: Compliant. Please refer to following plots.

802.11b: Band Edge, Left Side

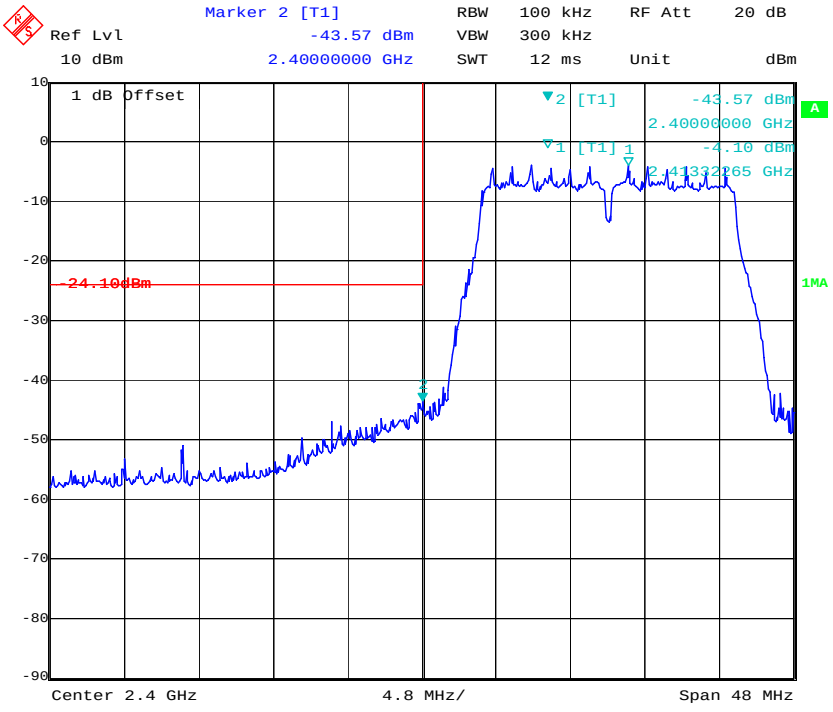


802.11b: Band Edge, Right Side



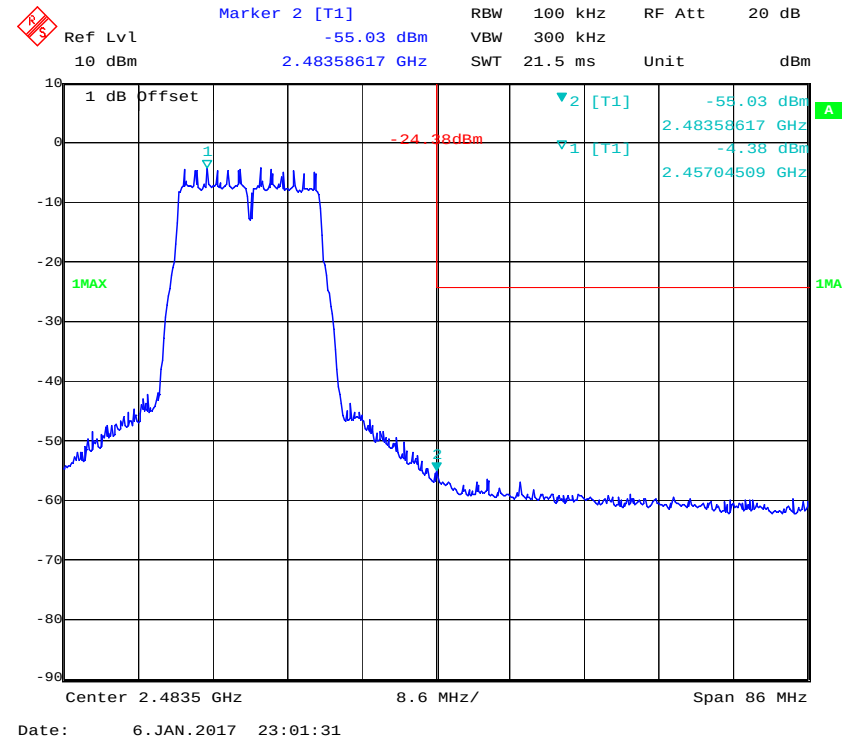
Date: 6.JAN.2017 22:45:20

802.11g: Band Edge, Left Side

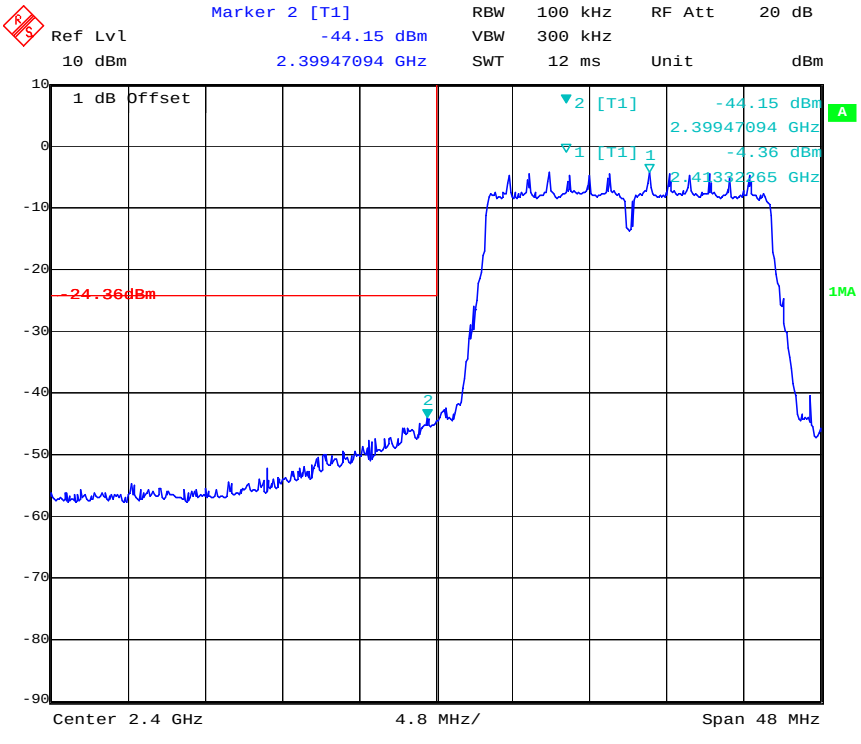


Date: 6.JAN.2017 22:50:28

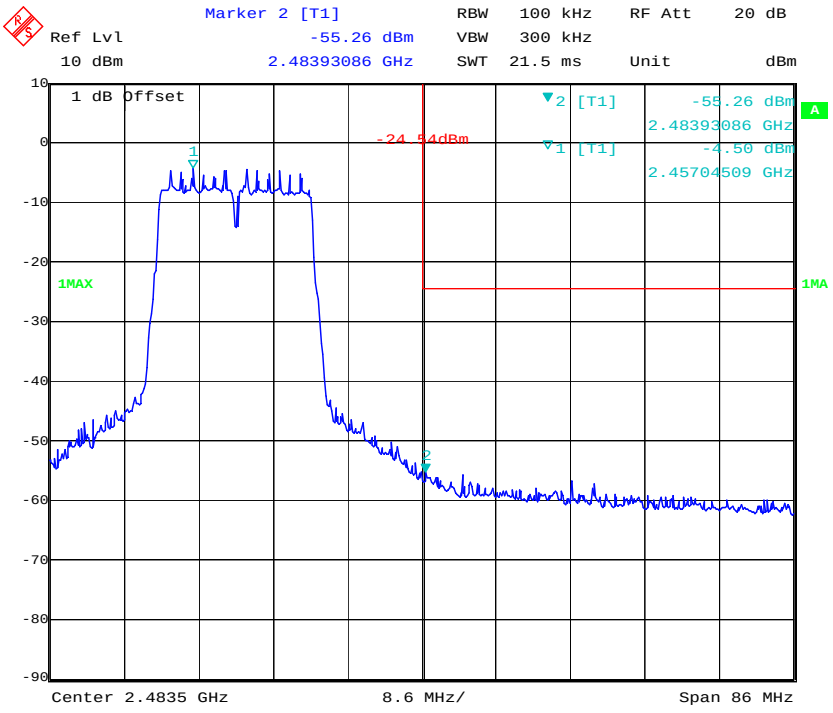
802.11g: Band Edge, Right Side



802.11n ht20 Band Edge, Left Side

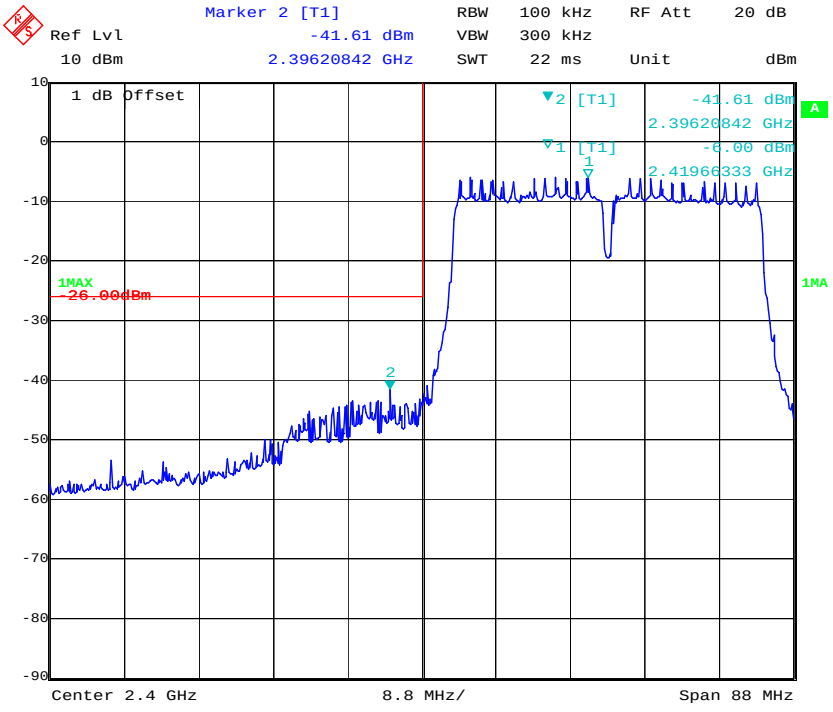


802.11n ht20 Band Edge, Right Side



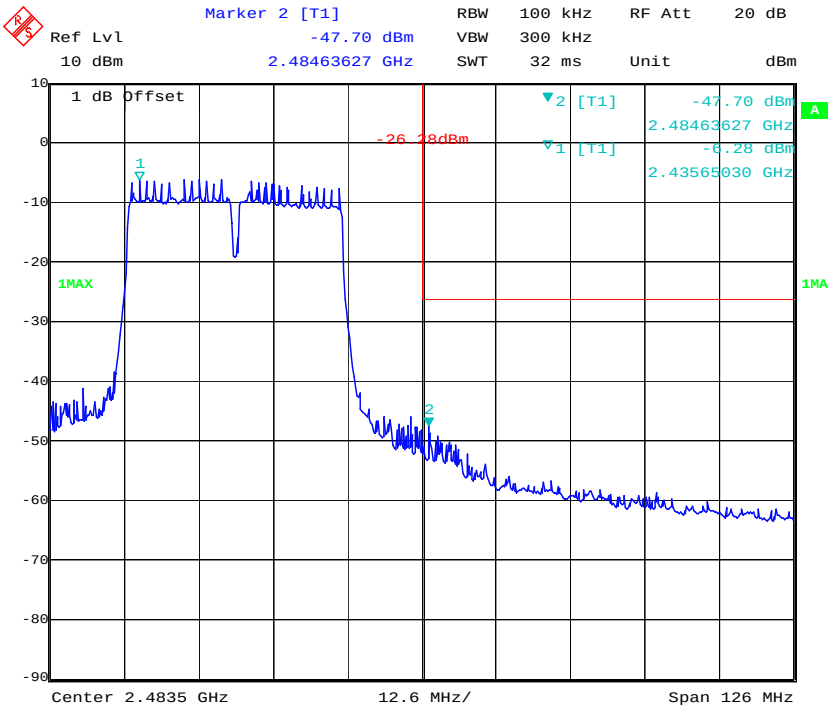
Date: 6.JAN.2017 23:13:09

802.11n ht40 Band Edge, Left Side



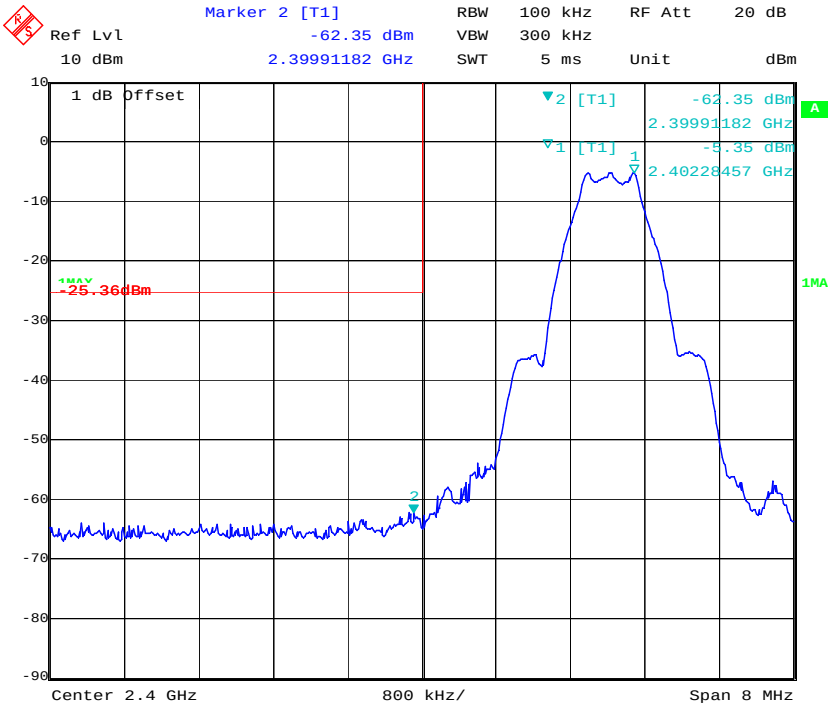
Date: 6.JAN.2017 23:19:43

802.11n ht40 Band Edge, Right Side



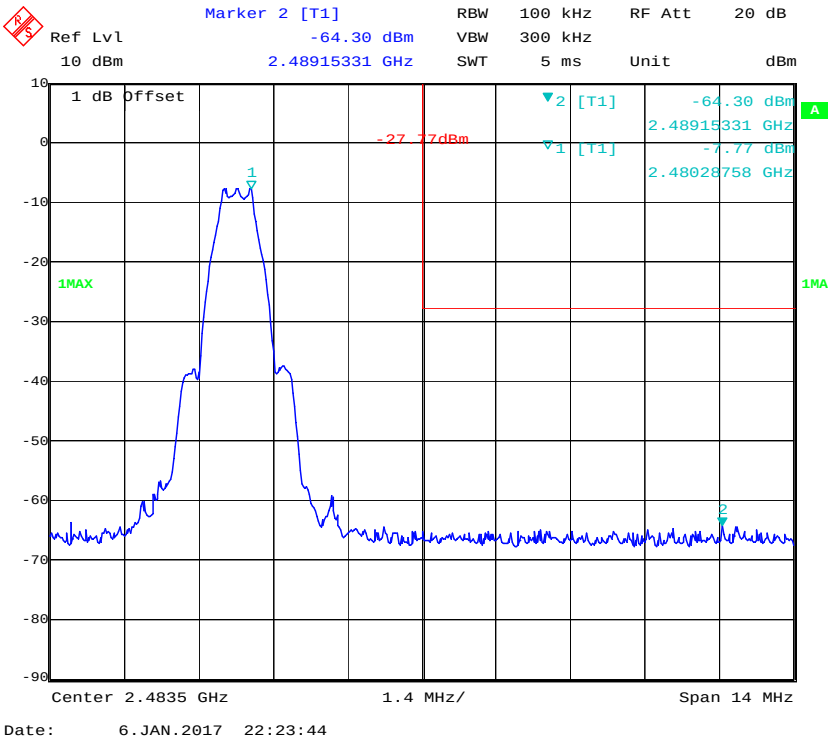
Date: 6.JAN.2017 23:31:04

BLE Band Edge， Left Side



Date: 6.JAN.2017 22:18:49

BLE Band Edge, Right Side



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

a) Set analyzer center frequency to DTS channel center frequency.
b) Set the span to 1.5 times the DTS bandwidth.
c) Set the RBW to: 3 kHz ≤ RBW ≤ 100 kHz.
d) Set the VBW ≥ 3×RBW.
e) Detector = peak.
f) Sweep time = auto couple.
g) Trace mode = max hold.
h) Allow trace to fully stabilize.
i) Use the peak marker function to determine the maximum amplitude level within the RBW.
j) 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
Rohde & Schwarz	Signal Analyzer	FSIQ26	831929/005	2016-09-21	2017-09-20
N/A	RF Cable	N/A	N/A	Each Time	/

*** Statement of Traceability:** BACL (Chengdu) attested that all calibrations have been performed, traceable to National Primary Standards and International System of Units (SI).

Test Data

Environmental Conditions

Temperature:	26.5 °C
Relative Humidity:	41 %
ATM Pressure:	101 kPa

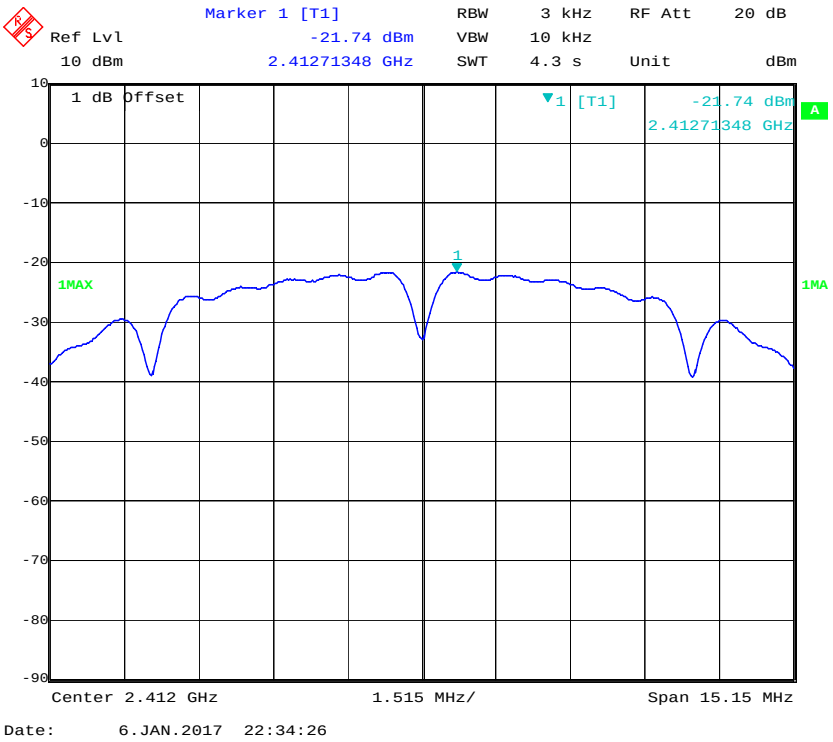
** The testing was performed by Tom Tang on 2017-01-06.*

Test Mode: Transmitting

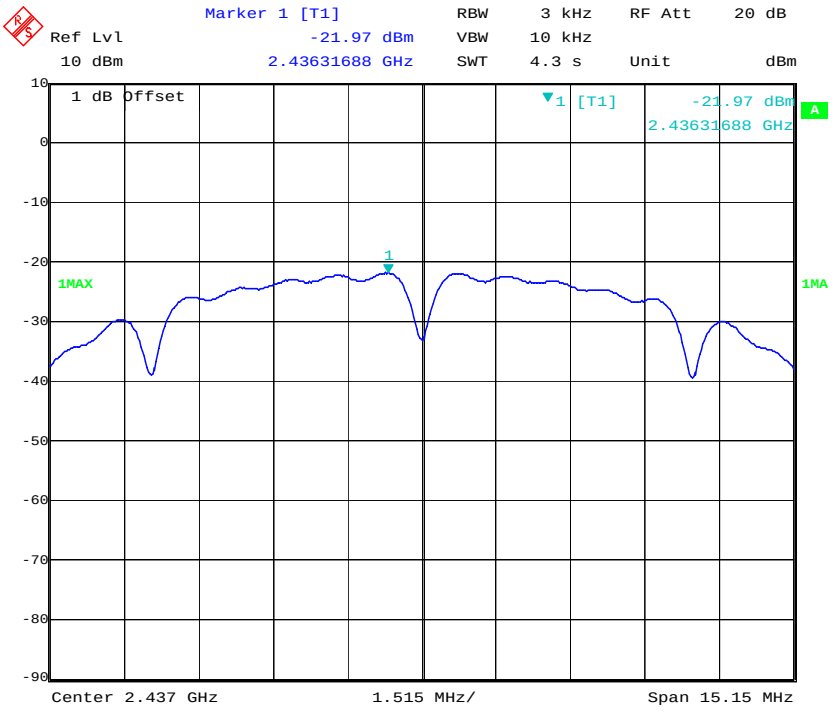
Test Result: Compliant. Please refer to the following table and plots

Test mode	Channel	Frequency (MHz)	PSD (dBm/3kHz)	Limit (dBm/3kHz)
802.11b	Low	2412	-21.74	≤8
	Middle	2437	-21.97	≤8
	High	2462	-22.01	≤8
802.11g	Low	2412	-17.71	≤8
	Middle	2437	-18.95	≤8
	High	2462	-18.68	≤8
802.11n20	Low	2412	-18.45	≤8
	Middle	2437	-16.55	≤8
	High	2462	-17.91	≤8
802.11n40	Low	2422	-19.86	≤8
	Middle	2437	-19.7	≤8
	High	2452	-19.14	≤8
BLE	Low	2402	-19.76	≤8
	Middle	2440	-20.65	≤8
	High	2480	-22.08	≤8

Power Spectral Density, 802.11b Low Channel

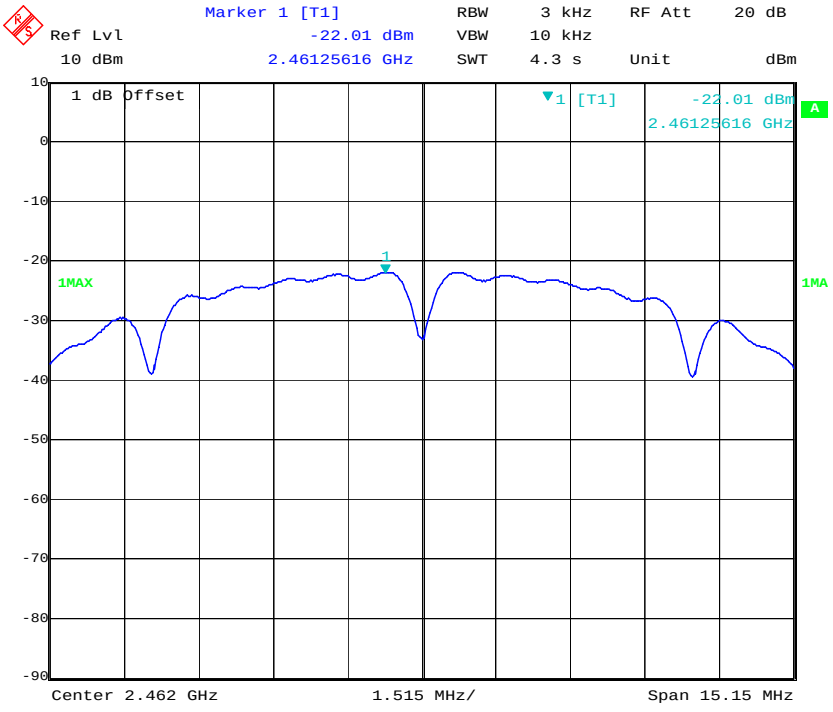


Power Spectral Density, 802.11b Middle Channel



Date: 6.JAN.2017 22:42:01

Power Spectral Density, 802.11b High Channel



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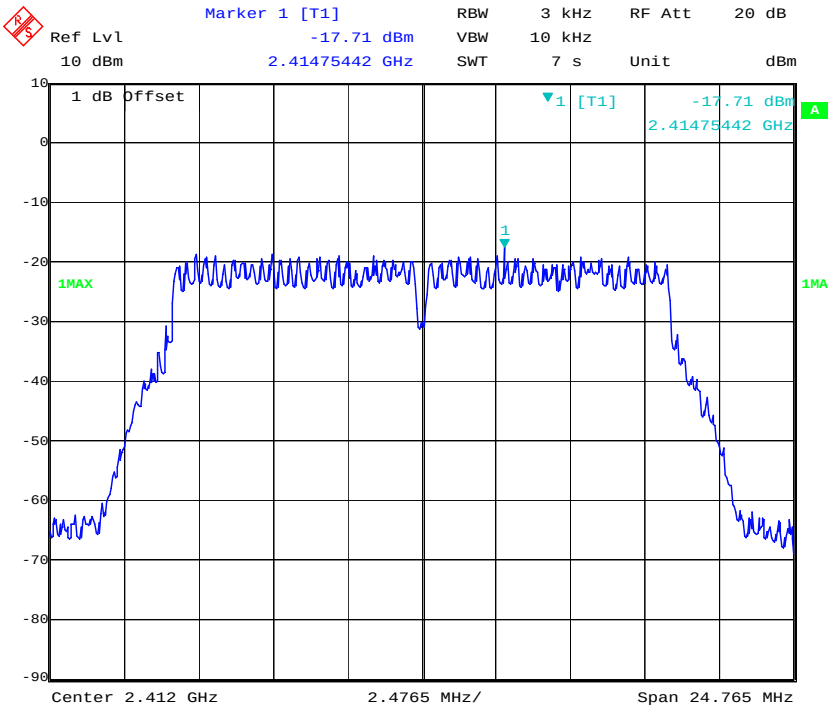
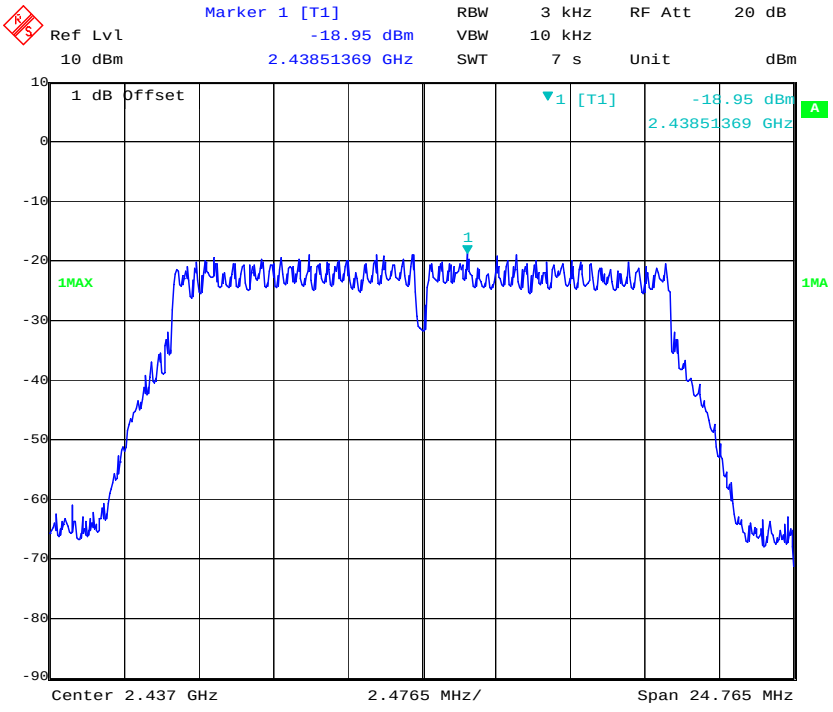
Power Spectral Density, 802.11g Low Channel



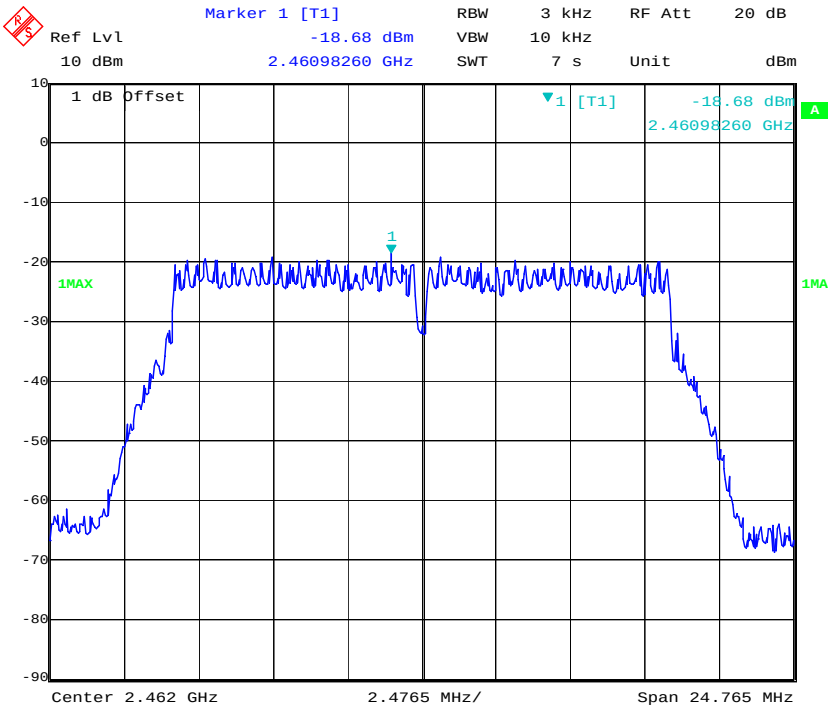
Date: 6.JAN.2017 22:50:00

Power Spectral Density, 802.11g Middle Channel



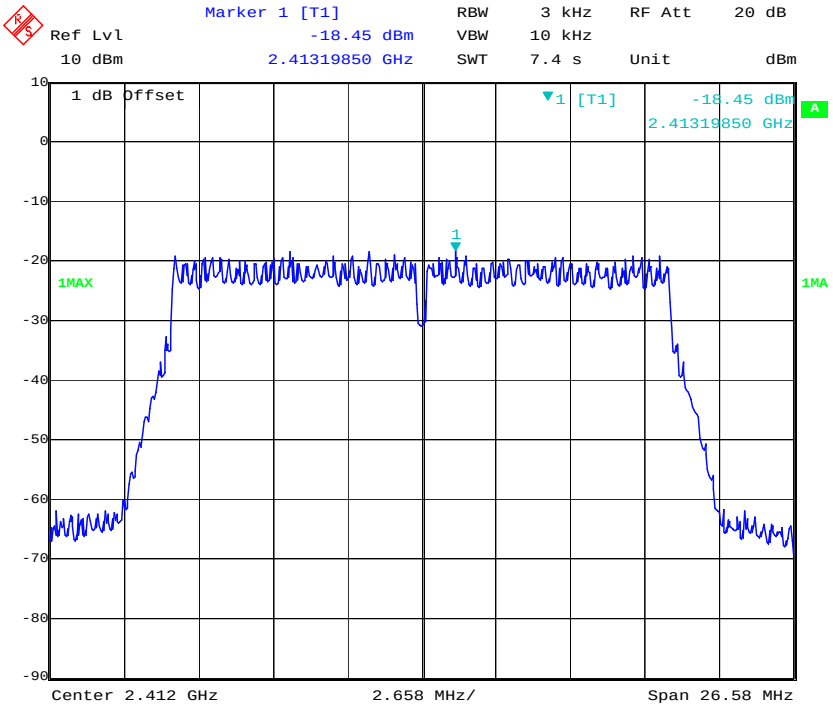
Date: 6.JAN.2017 22:56:38

Power Spectral Density, 802.11g High Channel



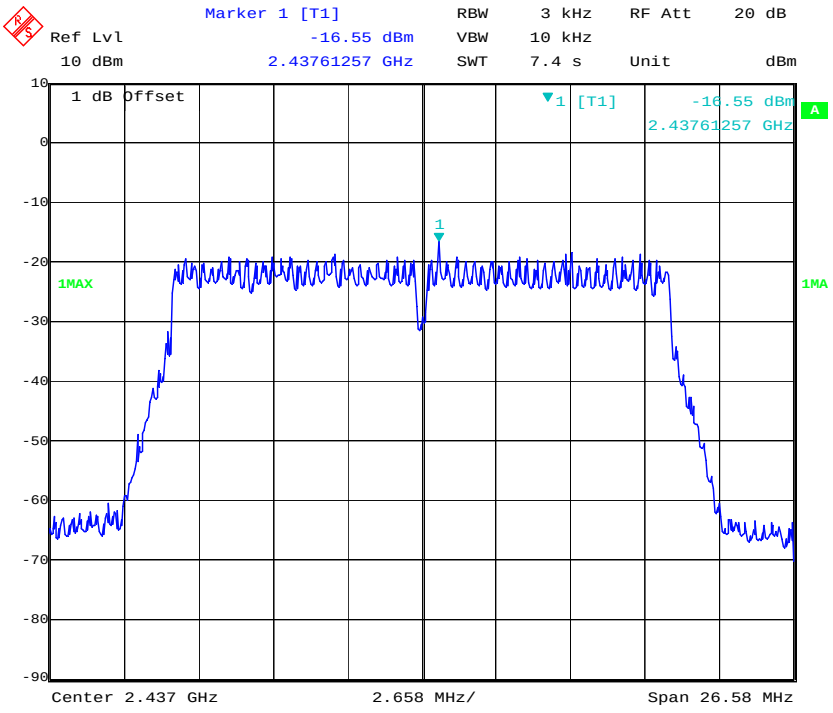
Date: 6.JAN.2017 23:01:04

Power Spectral Density, 802.11n ht20 Low Channel



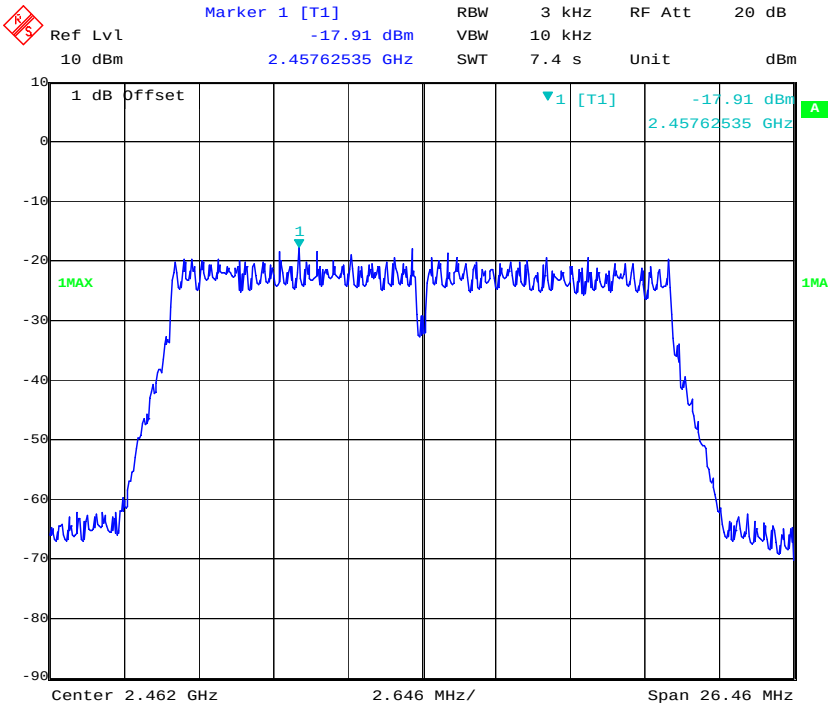
Date: 6.JAN.2017 23:05:57

Power Spectral Density, 802.11n ht20 Middle Channel



Date: 6.JAN.2017 23:09:32

Power Spectral Density, 802.11n ht20 High Channel



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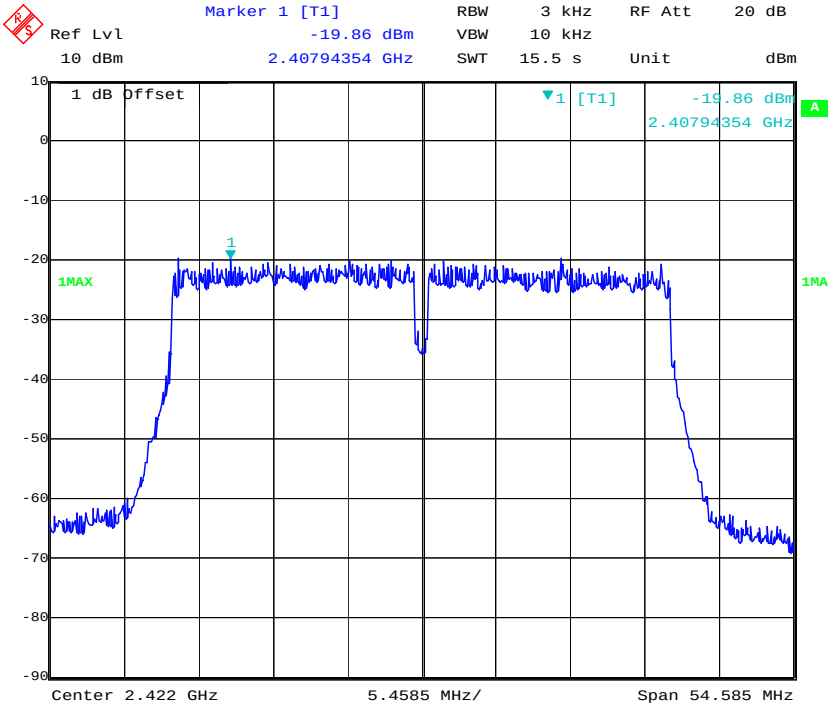
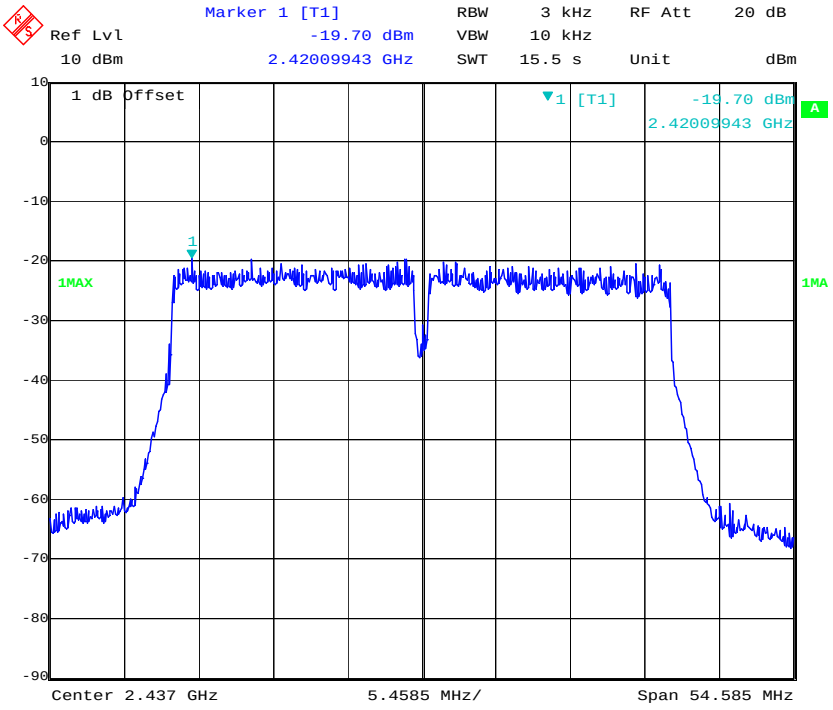
Power Spectral Density, 802.11n ht40 Low Channel



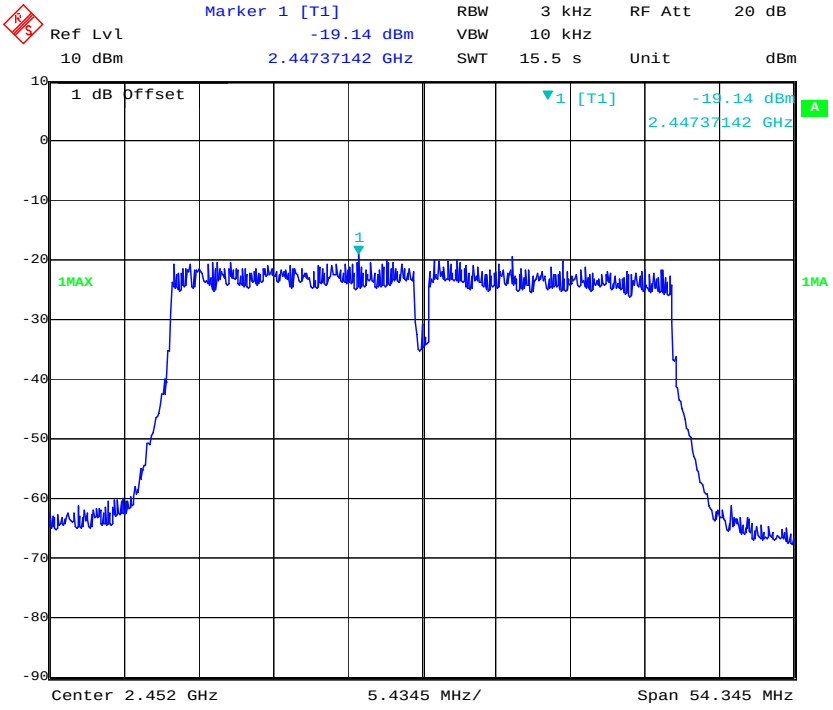
Date: 6.JAN.2017 23:19:12

Power Spectral Density, 802.11n ht40 Middle Channel



Date: 6.JAN.2017 23:24:17

Power Spectral Density, 802.11n ht40 High Channel



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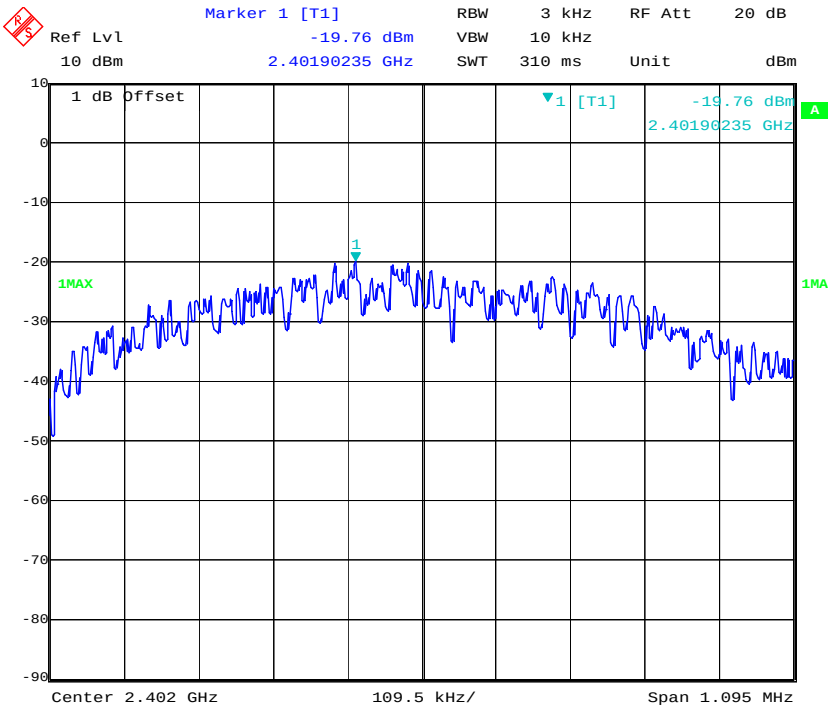
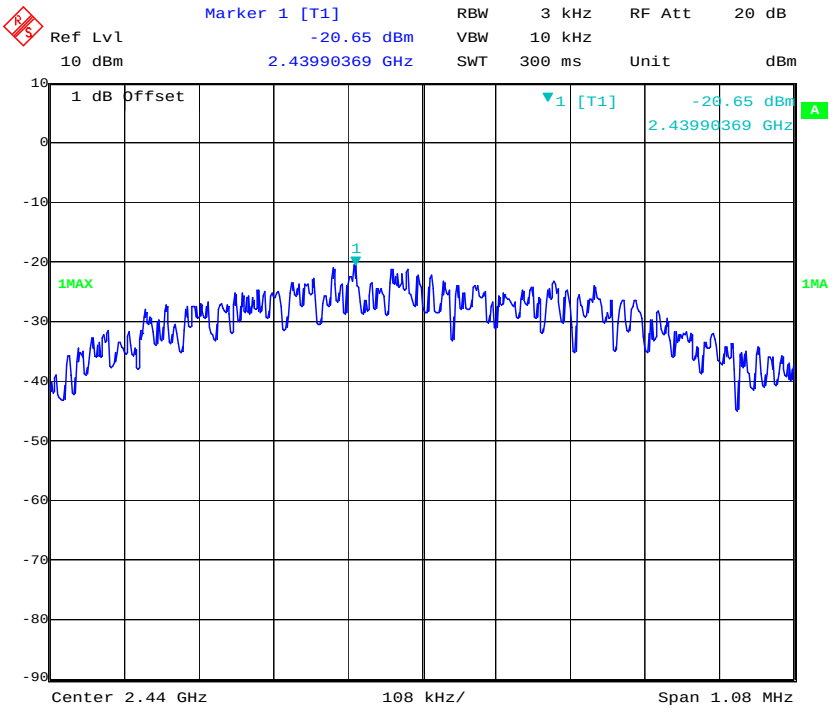
Power Spectral Density, BLE Low Channel



Date: 6.JAN.2017 22:18:21

Power Spectral Density, BLE Middle Channel



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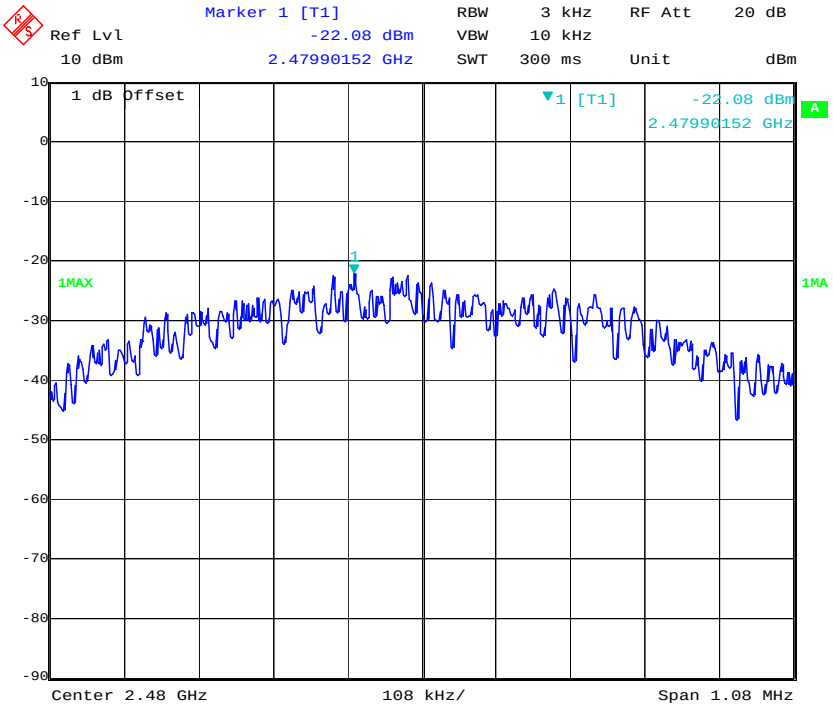
Power Spectral Density, BLE High Channel



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