TESTING LABORATORY
CERTIFICATE#4323.01

FCC PART 15.247

TEST REPORT

For

MeiG Smart Technology Co., LTD

3/F,No.88,Qinjiang Road,Xuhui District,Shanghai,China.

FCC ID: 2APJ4-SLM756

Report Type:	**Product Type:**
Original Report	Smart Module

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Report Number:	RSHA190110001-00C
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GENERAL INFORMATION

Product Description for Equipment under Test (EUT)

Applicant	MeiG Smart Technology Co., LTD
Tested Model	SLM756
Product Type	Smart Module
Dimension	44mm(L)*39mm(W)*3mm(H)
Power Supply	DC 3.8V

**All measurement and test data in this report was gathered from production sample serial number: 20190110001. (Assigned by the BACL. The EUT supplied by the applicant was received on 2019-01-10)*

Objective

This report is prepared on behalf of MeiG Smart Technology Co., LTD in accordance with Part 2-Subpart J, Part 15-Subparts A and C of the Federal Communication Commissions rules.

The tests were performed in order to determine Compliance with FCC Part 15, Subpart C, and section 15.203, 15.205, 15.207, 15.209 and 15.247 rules.

Related Submittal(s)/Grant(s)

FCC Part 15.247 DSS, Part 22H/24E/27 PCB submissions with FCC ID: 2APJ4-SLM756.

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 and FCC KDB 558074 D01 15.247 Meas Guidance v05.

All emissions measurement was performed at Bay Area Compliance Laboratories Corp. (Kunshan). The radiated testing was performed at an antenna-to-EUT distance of 3 meters.

Measurement Uncertainty

Item		Uncertainty
AC Power Lines Conducted Emissions		3.19dB
RF conducted test with spectrum		0.9dB
RF Output Power with Power meter		0.5dB
Radiated emission	30MHz~1GHz	6.11dB
	1GHz~6GHz	4.45dB
	6GHz~18GHz	5.23dB
	18GHz~40GHz	5.65dB
Occupied Bandwidth		0.5kHz
Temperature		1.0℃
Humidity		6%

Test Facility

The test site used by Bay Area Compliance Laboratories Corp. (Kunshan) to collect test data is located on the No.248 Chenghu Road, Kunshan, Jiangsu province, China.

Bay Area Compliance Laboratories Corp. (Kunshan) Lab is accredited to ISO/IEC 17025 by A2LA (Lab code: 4323.01) and the FCC designation No. CN1185 under the FCC KDB 974614 D01. The facility also complies with the radiated and AC line conducted test site criteria set forth in ANSI C63.4-2014.

SYSTEM TEST CONFIGURATION

Description of Test Configuration

Test channel list is as below:

For 802.11b, 802.11g and 802.11n-HT20 mode, EUT was tested with Channel 1, 6 and 11

For 802.11n-HT40 mode, EUT was tested with Channel 3, 6 and 9

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 BLE mode, EUT was tested with channel 0, 19 and 39.

Channel	Frequency (MHz)	Channel	Frequency (MHz)
0	2402	20	2442
1	2404	…	…
…	…	…	…
…	…	…	…
18	2438	38	2478
19	2440	39	2480

Equipment Modifications

No modification was made to the EUT tested.

EUT Exercise Software

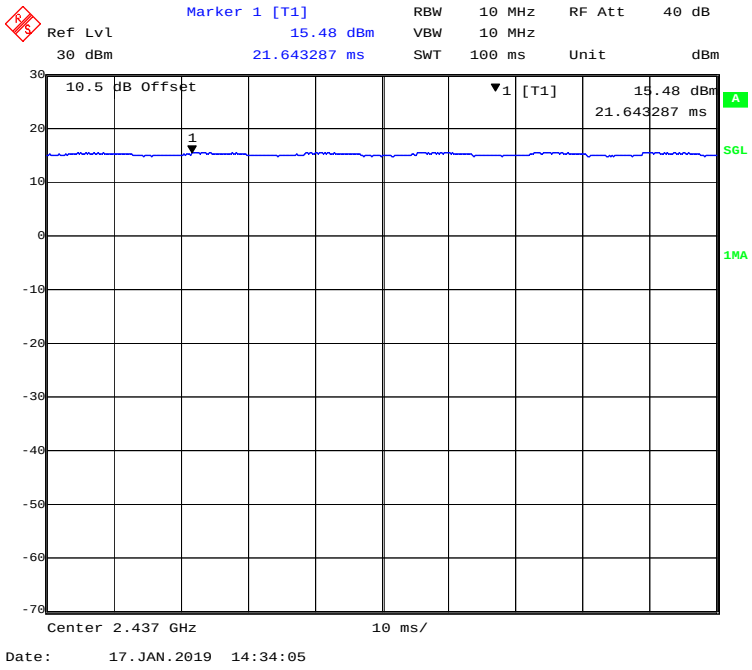
RF test software: QRCT

Pre-scan with all the data rates, and the worst case was performed as below:

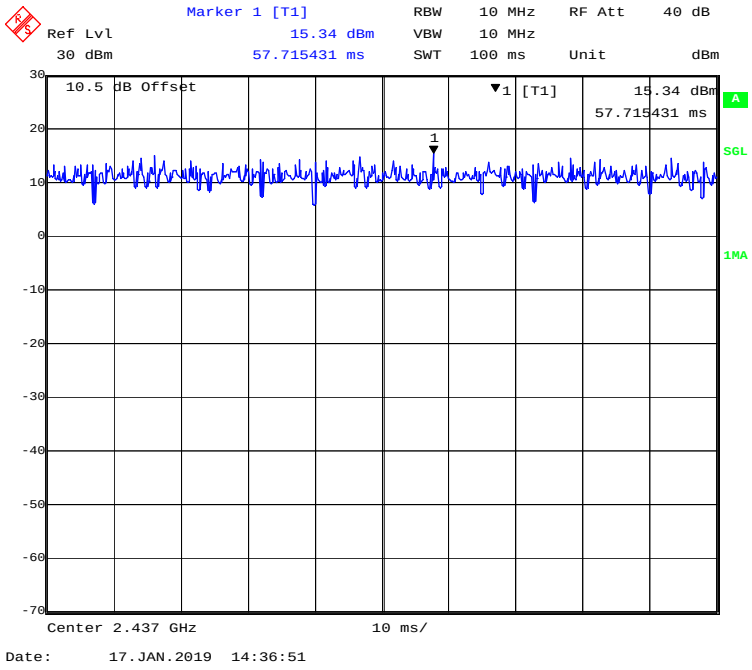
Mode	Data Rate	Channel	Power Level
802.11b	1 Mbps	Low	13
		Middle	13
		High	13
802.11g	6 Mbps	Low	8
		Middle	8
		High	8
802.11n-HT20	MCS0	Low	8
		Middle	8
		High	8
802.11n-HT40	MCS0	Low	8
		Middle	8
		High	8
BLE	1Mbps	/	Software default

Duty Cycle:

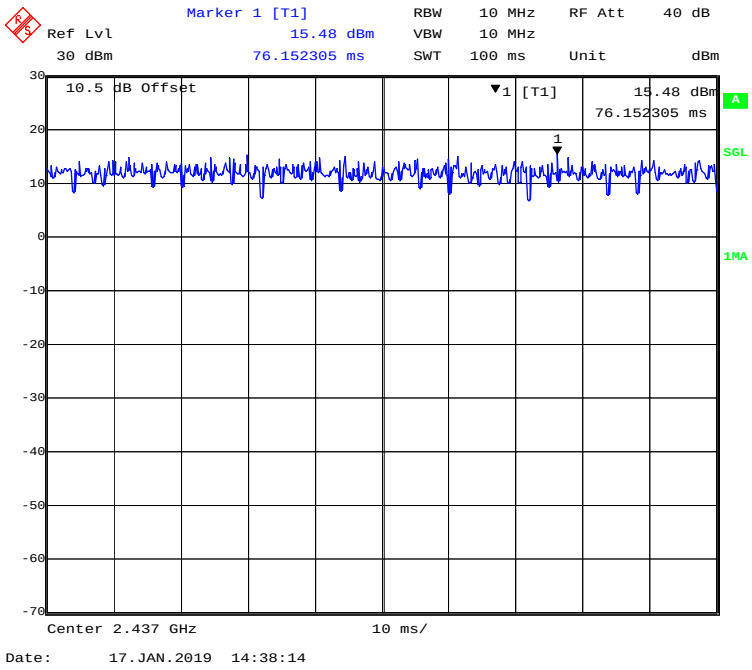
802.11b Mode Middle Channel



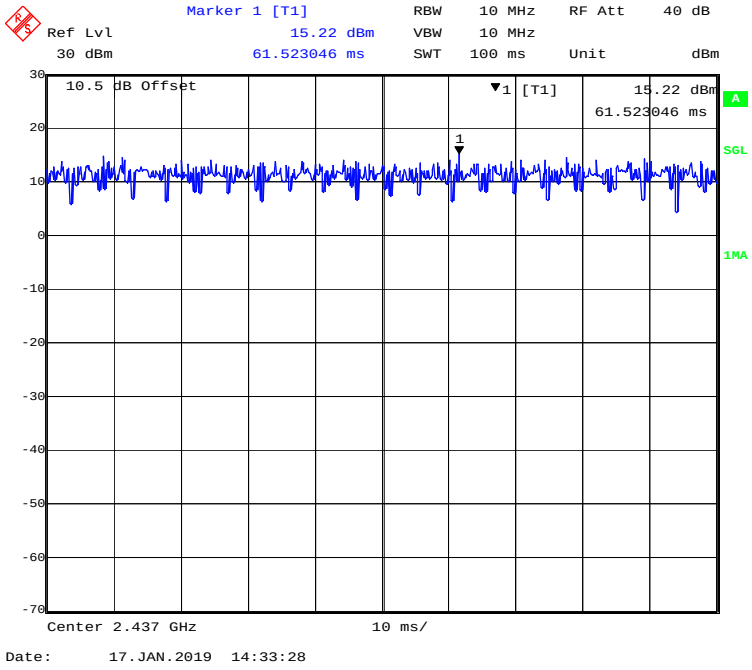
802.11g Mode Middle Channel



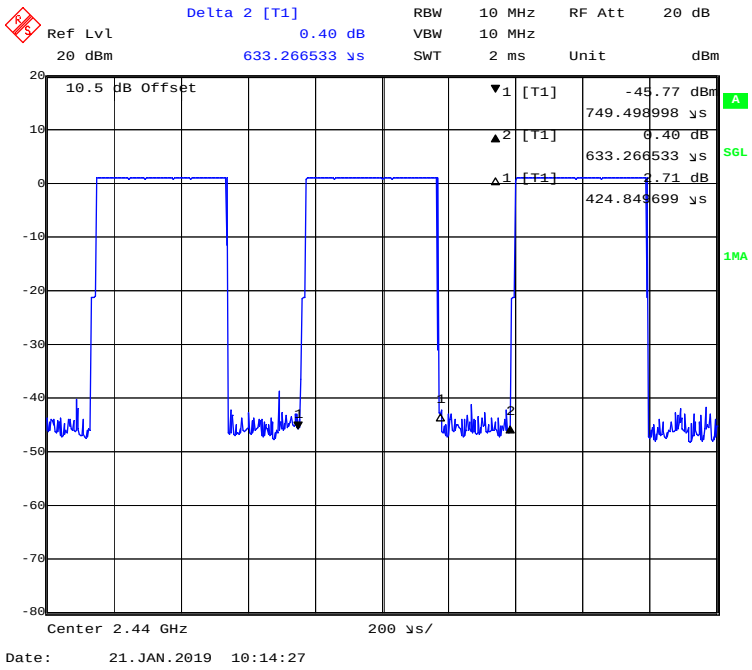
802.11n-HT20 Mode Middle Channel



802.11n-HT40 Mode Middle Channel



BLE Mode Middle Channel



Mode	Duty Cycle (%)	T(ms)	1/T(kHz)	10log(1/x)
802.11b	100.00	/	/	0.00
802.11g	100.00	/	/	0.00
802.11n-HT20	100.00	/	/	0.00
802.11n-HT40	100.00	/	/	0.00
BLE	67.14%	0.425	2.35	1.73

Note: “x” means the Duty Cycle.

Support Equipment List and Details

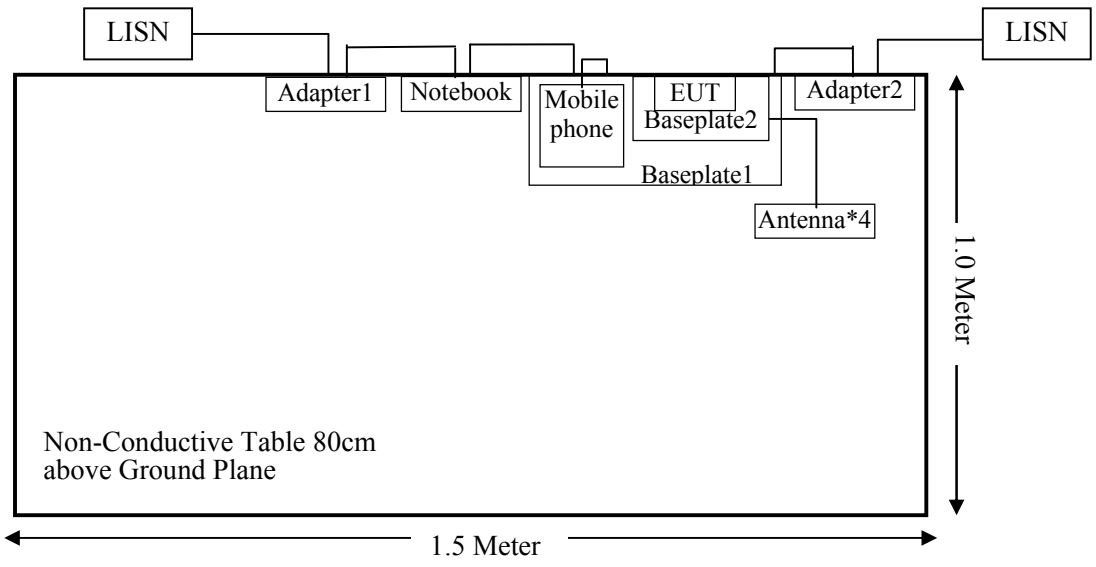
Manufacturer	Description	Model	Serial Number
HUAWEI	Mobile phone	EVA-TL00	862266039775394
DELL	Notebook	GX620	D65874152
DELL	Adapter1	LA65NS0-00	DF263
Dian Yuan Technology	Adapter2	DYS-0502000C	/
MEIG	Baseplate1	MEIG_EVB_V1.03	/
MEIG	Baseplate2	SLM756_ZB_ V1.03_PCB	/
MeiG Smart	Antenna*4	/	/

External I/O Cable

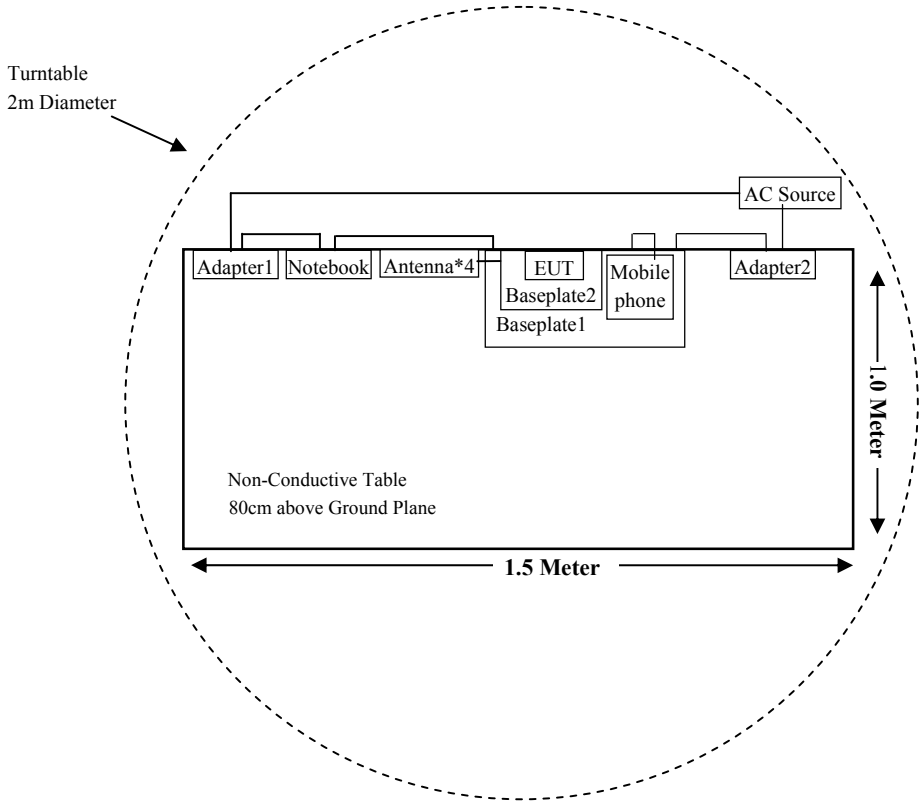
Cable Description	Length (m)	From Port	To
Power Cable	1.0	Baseplate1	Adapter2
Power Cable	1.0	Notebook	Adapter1
USB Cable	1.0	Baseplate1	Notebook
Data Cable	0.1	Baseplate1	Mobile phone
Antenna Cable*4	0.3	Baseplate2	MeiG Smart Antenna

Block Diagram of Test Setup

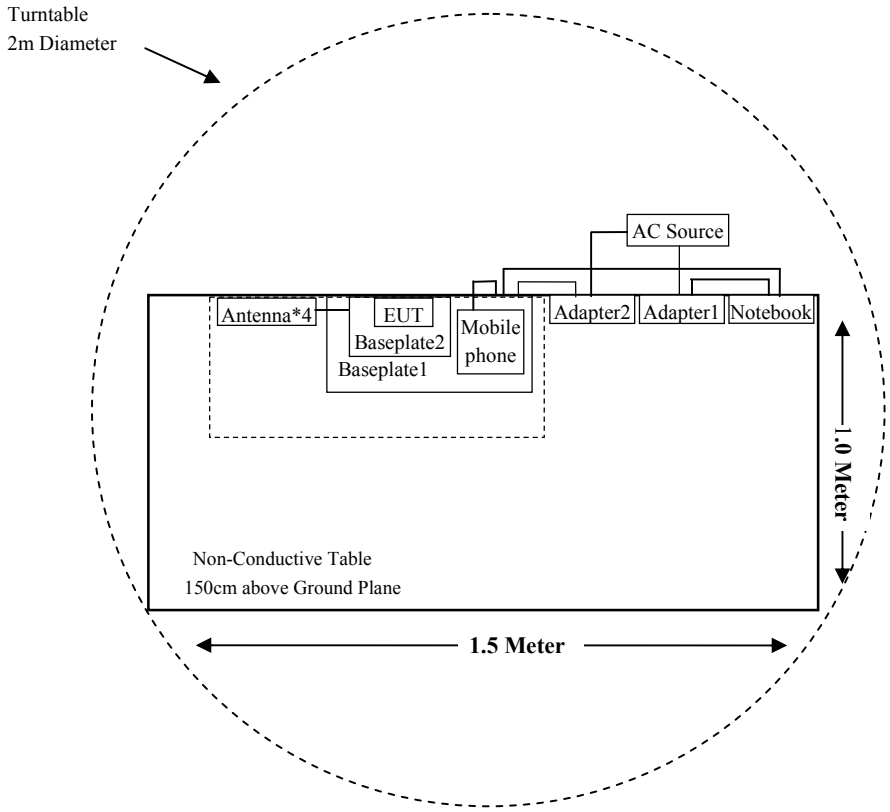
For Conducted Emissions:



For Radiated Emissions (Below 1GHz):



For Radiated Emissions (Above 1GHz):



SUMMARY OF TEST RESULTS

FCC Rules	Description of Test	Result
§15.247 (I), §1.1310 & §2.1091	MAXIMUM PERMISSIBLE EXPOSURE (MPE)	Compliant
§15.203	Antenna Requirement	Compliant
§15.207 (a)	AC Line Conducted Emissions	Compliant
§15.247(d)	Spurious Emissions at Antenna Port	Compliant
§15.205, §15.209, §15.247(d)	Spurious Emissions	Compliant
§15.247 (a)(2)	6 dB Emission Bandwidth	Compliant
§15.247(b)(3)	Maximum Conducted Output Power	Compliant
§15.247(d)	Band Edge	Compliant
§15.247(e)	Power Spectral Density	Compliant

TEST EQUIPMENT LIST

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Radiated Emission Test（Chamber 1#）					
Rohde & Schwarz	EMI Test Receiver	ESCI	100195	2018-11-12	2019-11-11
Sunol Sciences	Broadband Antenna	JB3	A090413-1	2016-12-26	2019-12-25
Sonoma Instrunent	Pre-amplifier	310N	171205	2018-08-15	2019-08-14
Rohde & Schwarz	Auto test Software	EMC32	100361	/	/
MICRO-COAX	Coaxial Cable	Cable-8	008	2018-08-15	2019-08-14
MICRO-COAX	Coaxial Cable	Cable-9	009	2018-08-15	2019-08-14
MICRO-COAX	Coaxial Cable	Cable-10	010	2018-08-15	2019-08-14
Radiated Emission Test（Chamber 2#）					
Rohde & Schwarz	EMI Test Receiver	ESU40	100207	2018-08-27	2019-08-26
ETS-LINDGREN	Horn Antenna	3115	6229	2019-01-11	2022-01-10
ETS-LINDGREN	Horn Antenna	3116	00084159	2016-10-18	2019-10-17
A.H.Systems, inc	Amplifier	2641-1	466	2018-09-11	2019-09-10
EM Electronics Corporation	Amplifier	EM18G40G	060726	2018-03-22	2019-03-21
MICRO-TRONICS	Band Reject Filter	BRM50702	G024	2018-08-05	2019-08-04
Narda	Attenuator	10dB	010	2018-08-15	2019-08-14
Rohde & Schwarz	Auto test Software	EMC32	100361	/	/
MICRO-COAX	Coaxial Cable	Cable-6	006	2018-08-15	2019-08-14
MICRO-COAX	Coaxial Cable	Cable-11	011	2018-08-15	2019-08-14
MICRO-COAX	Coaxial Cable	Cable-12	012	2018-08-15	2019-08-14
MICRO-COAX	Coaxial Cable	Cable-13	013	2018-08-15	2019-08-14
RF Conducted Test					
Rohde & Schwarz	Signal Analyzer	FSIQ26	836131/009	2018-11-12	2019-11-11
Narda	Attenuator	10dB	010	2018-08-15	2019-08-14
Agilent	Power Meter	N1912A	MY5000492	2018-11-18	2019-11-17
Agilent	Power Sensor	N1921A	MY54210024	2018-11-18	2019-11-17
MeiG Smart	RF Cable	MeiG SmartC01	C01	Each Time	/
Conducted Emission Test					
Rohde & Schwarz	EMI Test Receiver	ESCS30	834115/007	2018-11-30	2019-11-29
Rohde & Schwarz	LISN	ENV216	3560655016	2018-11-30	2019-11-29
Rohde & Schwarz	LISN	ESH3-Z5	862770/011	2018-11-30	2019-11-29
BACL	Auto test Software	BACL-EMC	CE001	/	/
Narda	Attenuator/6dB	10690812-2	26850-6	2019-01-10	2020-01-09
MICRO-COAX	Coaxial Cable	Cable-15	015	2018-08-15	2019-08-14

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

FCC §15.247 (I) & §1.1310 & §2.1091 - MAXIMUM PERMISSIBLE EXPOSURE (MPE)

Applicable Standard

According to subpart 15.247 (i) and subpart 1.1310, 2.1091 systems operating under the provisions of this section shall be operated in a manner that ensures the public is not exposed to RF energy level in excess of the communication guidelines.

Limits for General Population/Uncontrolled Exposure				
Frequency Range (MHz)	**Electric Field Strength (V/m)**	**Magnetic Field Strength (A/m)**	**Power Density (mW/cm^2)**	**Averaging Time (minutes)**
0.3-1.34	614	1.63	*(100)	30
1.34-30	824/f	2.19/f	*($180/f^2$)	30
30-300	27.5	0.073	0.2	30
300-1500	/		f/1500	30
1500-100,000	/		1.0	30

f = frequency in MHz; * = Plane-wave equivalent power density

Calculated Formulary:

Predication of MPE limit at a given distance

$S = PG/4\pi R^2$ = power density (in appropriate units, e.g. mW/cm^2);
P = power input to the antenna (in appropriate units, e.g., mW);
G = power gain of the antenna in the direction of interest relative to an isotropic radiator, the power gain factor, is normally numeric gain;
R = distance to the center of radiation of the antenna (appropriate units, e.g., cm);

For simultaneously transmit system, the calculated power density should comply with:

$$\sum_i \frac{S_i}{S_{Limit,i}} \leq 1$$

Calculated Data (worst case):

Mode	Frequency Range (MHz)	Maximum Antenna Gain		Tune-up Conducted Power		Evaluation Distance (cm)	Power Density (mW/cm^2)	MPE Limit (mW/cm^2)	MPE ratio
		(dBi)	(numeric)	(dBm)	(mW)				
802.11b	2412-2462	0.00	1.00	18.00	63.0957	20	0.0126	1.00	**0.0126**
802.11g		0.00	1.00	17.00	50.1187	20	0.0100	1.00	0.0100
802.11n-HT20		0.00	1.00	17.00	50.1187	20	0.0100	1.00	0.0100
802.11n-HT40	2422-2452	0.00	1.00	17.00	50.1187	20	0.0100	1.00	0.0100
BLE	2402-2480	0.00	1.00	1.00	1.2589	20	0.0003	1.00	0.0003
BT 3.0	2402-2480	0.00	1.00	12.00	15.8489	20	0.0032	1.00	0.0032

Calculation of maximum antenna gain based on ERP/EIRP

Mode	Max Tune-up Power (dBm)	ERP/EIRP Limit (dBm)	Max Antenna Gain (dBd)	Max Antenna Gain (dBi)
WCDMA Band II	23.00	33.00	/	10.00
WCDMA Band IV	23.00	30.00	/	7.00
WCDMA Band V	24.00	38.45	14.45	16.60
FDD (Band 2)	22.00	33.00	/	11.00
FDD (Band 4)	23.00	30.00	/	7.00
FDD (Band 5)	23.00	38.45	15.45	17.60
FDD (Band 7)	23.00	33.00	/	10.00
FDD (Band 12)	25.00	34.77	9.77	11.92
FDD (Band 13)	23.00	34.77	11.77	13.92
FDD (Band 17)	25.00	34.77	9.77	11.92

Note:0dBd=2.15dBi

Calculation of maximum antenna gain based on MPE Ratio

Mode	Frequency Range	Tune-up Conducted Power		Power Density Limit	Maximum Power Density	Evaluation Distance	Maximun Antenna Gain Allowed based on MPE		MPE ratio
	(MHz)	(dBm)	(mW)	(mW/cm^2)	(mW/cm^2)	(cm)	(numeric)	(dBi)	
WCDMA Band II	1850.0-1910.0	23.00	199.5262	1.00	0.9855	20	24.83	13.95	0.9855
WCDMA Band IV	1710.0-1755.0	23.00	199.5262	1.00	0.9855	20	24.83	13.95	0.9855
WCDMA Band V	824.0-849.0	24.00	251.1886	0.55	0.5416	20	10.84	10.35	0.9847
FDD (Band 2)	1850.0-1910.0	22.00	158.4893	1.00	0.9855	20	31.26	14.95	0.9855
FDD (Band 4)	1710.0-1755.0	23.00	199.5262	1.00	0.9855	20	24.83	13.95	0.9855
FDD (Band 5)	824.0-849.0	23.00	199.5262	0.55	0.5416	20	13.65	11.35	0.9847
FDD (Band 7)	2500.0-2570.0	23.00	199.5262	1.00	0.9855	20	24.83	13.95	0.9855
FDD (Band 12)	699.0-716.0	25.00	316.2278	0.47	0.4631	20	7.36	8.67	0.9853
FDD (Band 13)	777.0-787.0	23.00	199.5262	0.52	0.5125	20	12.91	11.11	**0.9856**
FDD (Band 17)	704.0-716.0	25.00	316.2278	0.47	0.4631	20	7.36	8.67	0.9853

Note: Wi-Fi/ BLE/ BT 3.0& WCDMA/FDD can transmit simultaneously; the worst condition is 802.11b of Wi-Fi & FDD (Band13), as below:

$$\sum_i \frac{S_i}{S_{Limit,i}} = 0.0126+0.9856=0.9982 < 1.0$$

Mode	Max Allow Antenna Gain (dBi)
WCDMA Band II/LTE Band 2	10.0
WCDMABand IV/ LTE Band 4	7.00
WCDMABand V/ LTE Band 5	10.35
LTE Band 7	10.00
LTE Band 12/ LTE Band 17	8.67
LTE Band 13	11.11

Result: To meet RF exposure & ERP/ERIP, the maximum net gains of antennas allowed are 10dBi@ WCDMA Band II/LTE Band 2 , 7dBi@ WCDMABand IV/ LTE Band 4 , 10.35dBi@ WCDMABand V/ LTE Band 5 ,10.00dBi @LTE Band 7, 8.67dBi @ LTE Band 12/LTE Band 17,11.11dBi @ LTE Band 13. The antenna(s) used for this transmitter must be installed to provide a separation distance of at least 20 from all persons and must not be co-located or operating in conjunction with any other antenna or transmitter.

FCC §15.203 - ANTENNA REQUIREMENT

Applicable Standard

According to § 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section. The manufacturer may design the unit so that a broken antenna can be replaced by the user, but the user of a standard antenna jack or electrical connector is prohibited. The structure and application of the EUT were analyzed to determine Compliance with section §15.203 of the rules. §15.203 state that the subject device must meet the following criteria:

a. Antenna must be permanently attached to the unit.
b. Antenna must use a unique type of connector to attach to the EUT.

Unit must be professionally installed, and installer shall be responsible for verifying that the correct antenna is employed with the unit.
And according to FCC 47 CFR section 15.247 (b), if the transmitting antennas of directional gain greater than 6dBi are used, the power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

Antenna Connector Construction

The EUT has been tested with an external antenna for WIFI&BLE, which the antenna gain is 0 dBi, fulfill the requirement of this section. Please refer to the EUT photos.

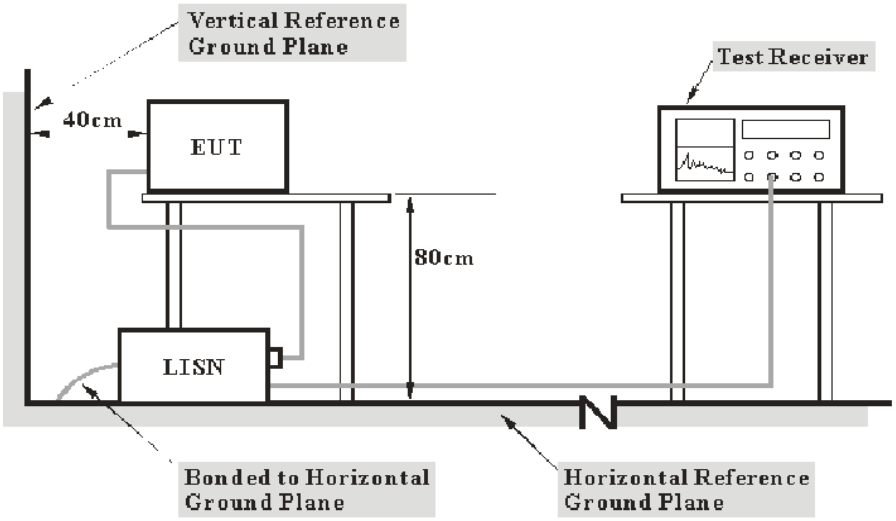
Result: Compliant.

FCC §15.207 (a) – AC LINE CONDUCTED EMISSIONS

Applicable Standard

FCC §15.207(a)

EUT Setup



Note: 1. Support units were connected to second LISN.
2. Both of LISNs (AMN) 80 cm from EUT and at the least 80 cm from other units and other metal planes support units.

The measurement procedure of EUT setup is according with ANSI C63.10-2013. The related limit was specified in FCC Part 15.207.

The spacing between the peripherals was 10 cm.

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

ANSI C63.10-2013 clause 6.2

During the conducted emission test, the adapter was connected to the outlet of the LISN.

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

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

Corrected Factor & Margin Calculation

The Corrected factor is calculated by adding LISN VDF (Voltage Division Factor), Cable Loss and Transient Limiter Attenuation. The basic equation is as follows:

Corrected Factor (dB) = LISN VDF (dB) + Cable Loss (dB) + Transient Limiter Attenuation (dB)

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

Margin (dB) = Limit (dBμV) – Corrected Amplitude (dBμV)

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:	20.2 ℃
Relative Humidity:	51 %
ATM Pressure:	101.3 kPa

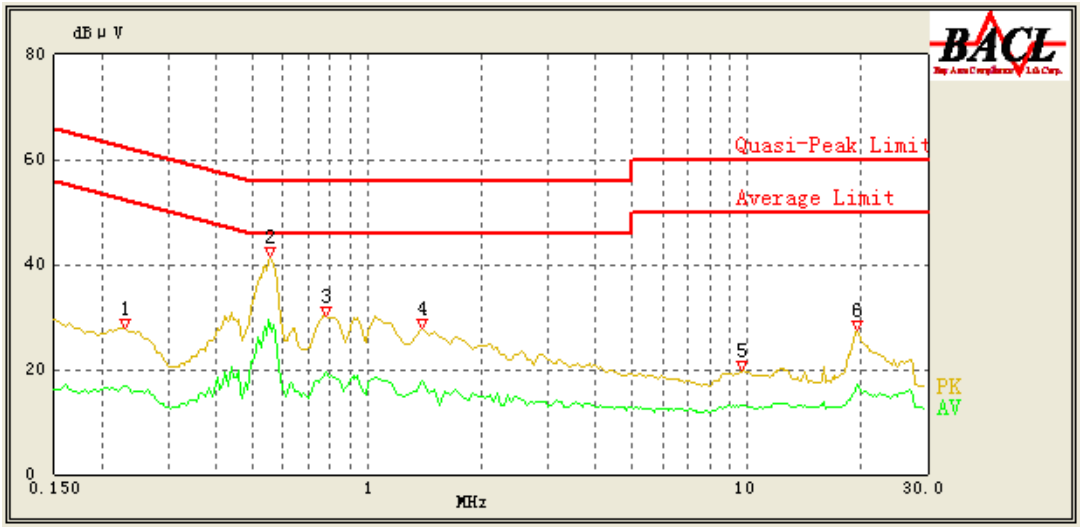
The testing was performed by Hope Zhang on 2019-01-25.

Test Result: Compliant.

For Wi-Fi Mode:

EUT operation mode: Transmitting in 802.11b mode low channel (worst case)

AC 120V/60 Hz, Line



Frequency (MHz)	Corrected Amplitude (dBμV)	Detector (PK/AV/QP)	Bandwidth (kHz)	Line	Corrected Factor (dB)	Limit (dBμV)	Margin (dB)	Comment
0.230	27.77	QP	9.000	L1	16.02	62.45	34.68	Compliance
0.230	16.78	AV	9.000	L1	16.02	52.45	35.67	Compliance
0.555	41.64	QP	9.000	L1	16.04	56.00	14.36	Compliance
0.555	29.34	AV	9.000	L1	16.05	46.00	16.66	Compliance
0.780	30.28	QP	9.000	L1	15.93	56.00	25.72	Compliance
0.780	19.53	AV	9.000	L1	15.93	46.00	26.47	Compliance
1.400	27.72	QP	9.000	L1	15.87	56.00	28.28	Compliance
1.400	17.72	AV	9.000	L1	15.87	46.00	28.28	Compliance
9.750	19.74	QP	9.000	L1	16.05	60.00	40.26	Compliance
9.750	13.02	AV	9.000	L1	16.06	50.00	36.98	Compliance
19.600	27.52	QP	9.000	L1	16.42	60.00	32.48	Compliance
19.600	17.04	AV	9.000	L1	16.42	50.00	32.96	Compliance

AC 120V/60 Hz, Neutral

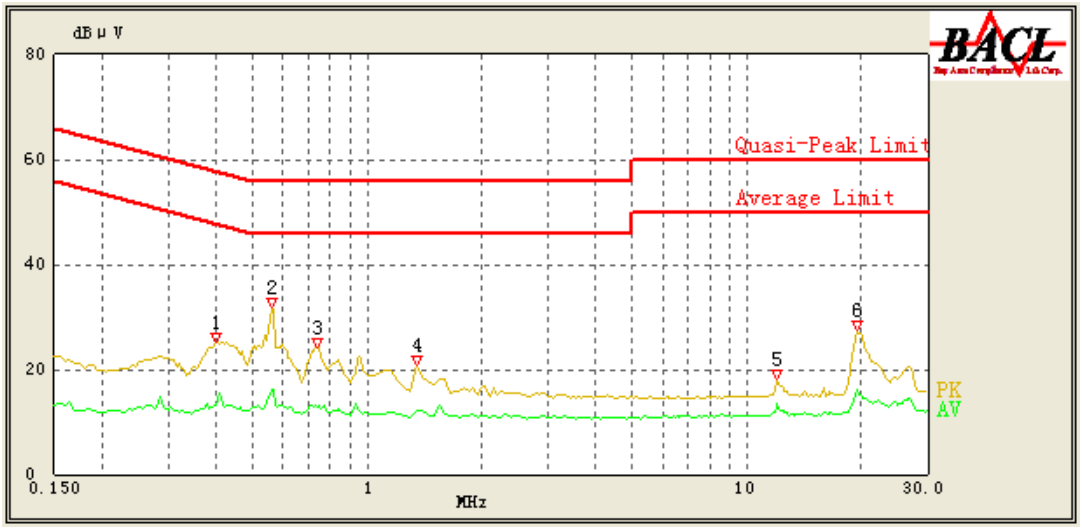
Frequency (MHz)	Corrected Amplitude (dBµV)	Detector (PK/AV/QP)	Bandwidth (kHz)	Line	Corrected Factor (dB)	Limit (dBµV)	Margin (dB)	Comment
0.230	31.03	QP	9.000	N	16.06	62.45	31.42	Compliance
0.230	22.78	AV	9.000	N	16.06	52.45	29.67	Compliance
0.565	48.45	QP	9.000	N	16.07	56.00	7.55	Compliance
0.565	38.84	AV	9.000	N	16.07	46.00	7.16	Compliance
1.100	36.05	QP	9.000	N	15.94	56.00	19.95	Compliance
1.100	24.76	AV	9.000	N	15.94	46.00	21.24	Compliance
1.550	34.04	QP	9.000	N	15.92	56.00	21.96	Compliance
1.550	24.49	AV	9.000	N	15.92	46.00	21.51	Compliance
6.550	26.24	QP	9.000	N	15.91	60.00	33.76	Compliance
6.550	17.83	AV	9.000	N	15.91	50.00	32.17	Compliance
19.450	26.48	QP	9.000	N	16.14	60.00	33.52	Compliance
19.450	17.63	AV	9.000	N	16.14	50.00	32.37	Compliance

Note:
1) Corrected Factor (dB) = LISN VDF (dB) + Cable Loss (dB) + Transient Limiter Attenuation (dB)
2) Margin (dB) = Limit (dBµV) – Corrected Amplitude (dBµV)

For BLE Mode:

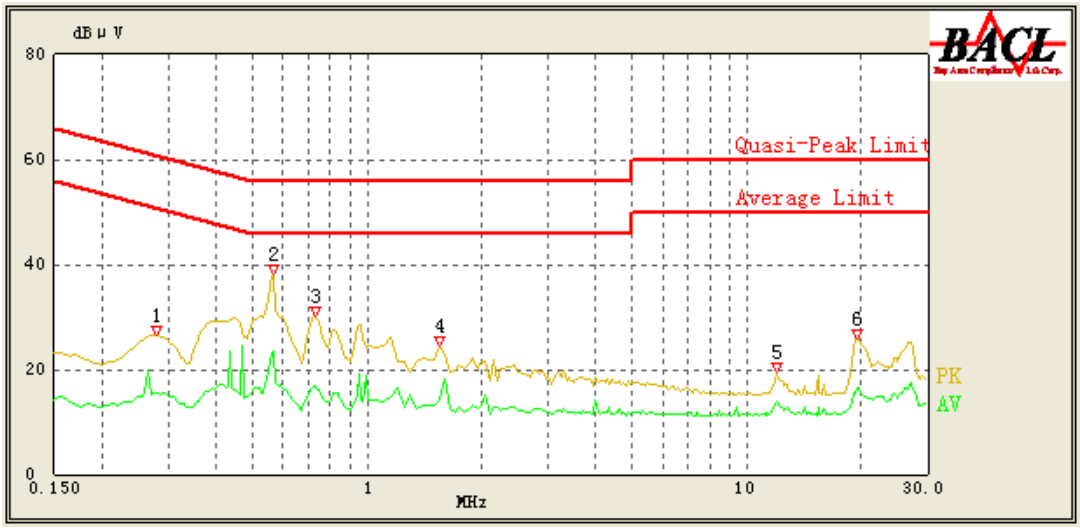
EUT operation mode: Transmitting in middle channel (worst case)

AC 120V/60 Hz, Line



Frequency (MHz)	Corrected Amplitude (dBμV)	Detector (PK/AV/QP)	Bandwidth (kHz)	Line	Corrected Factor (dB)	Limit (dBμV)	Margin (dB)	Comment
0.400	25.20	QP	9.000	L1	16.06	57.85	32.65	Compliance
0.400	13.04	AV	9.000	L1	16.06	47.85	34.81	Compliance
0.560	31.73	QP	9.000	L1	16.04	56.00	24.27	Compliance
0.560	16.32	AV	9.000	L1	16.04	46.00	29.68	Compliance
0.740	24.15	QP	9.000	L1	15.94	56.00	31.85	Compliance
0.740	12.91	AV	9.000	L1	15.94	46.00	33.09	Compliance
1.350	20.82	QP	9.000	L1	15.87	56.00	35.18	Compliance
1.350	12.18	AV	9.000	L1	15.87	46.00	33.82	Compliance
12.050	18.09	QP	9.000	L1	16.12	60.00	41.91	Compliance
12.050	13.34	AV	9.000	L1	16.12	50.00	36.66	Compliance
19.600	27.56	QP	9.000	L1	16.42	60.00	32.44	Compliance
19.600	16.08	AV	9.000	L1	16.42	50.00	33.92	Compliance

AC 120V/60 Hz, Neutral



Frequency (MHz)	Corrected Amplitude (dBµV)	Detector (PK/AV/QP)	Bandwidth (kHz)	Line	Corrected Factor (dB)	Limit (dBµV)	Margin (dB)	Comment
0.280	26.50	QP	9.000	N	16.07	60.82	34.32	Compliance
0.280	15.35	AV	9.000	N	16.07	50.82	35.47	Compliance
0.565	38.33	QP	9.000	N	16.07	56.00	17.67	Compliance
0.565	23.58	AV	9.000	N	16.07	46.00	22.42	Compliance
0.730	30.14	QP	9.000	N	15.98	56.00	25.86	Compliance
0.730	16.77	AV	9.000	N	15.98	46.00	29.23	Compliance
1.550	24.60	QP	9.000	N	15.92	56.00	31.40	Compliance
1.550	14.18	AV	9.000	N	15.92	46.00	31.82	Compliance
12.000	19.42	QP	9.000	N	16.00	60.00	40.58	Compliance
12.000	13.93	AV	9.000	N	16.00	50.00	36.07	Compliance
19.600	25.96	QP	9.000	N	16.15	60.00	34.04	Compliance
19.600	16.43	AV	9.000	N	16.14	50.00	33.57	Compliance

Note:
1) Corrected Factor (dB) = LISN VDF (dB) + Cable Loss (dB) + Transient Limiter Attenuation (dB)
2) Margin (dB) = Limit (dBµV) – Corrected Amplitude (dBµV)

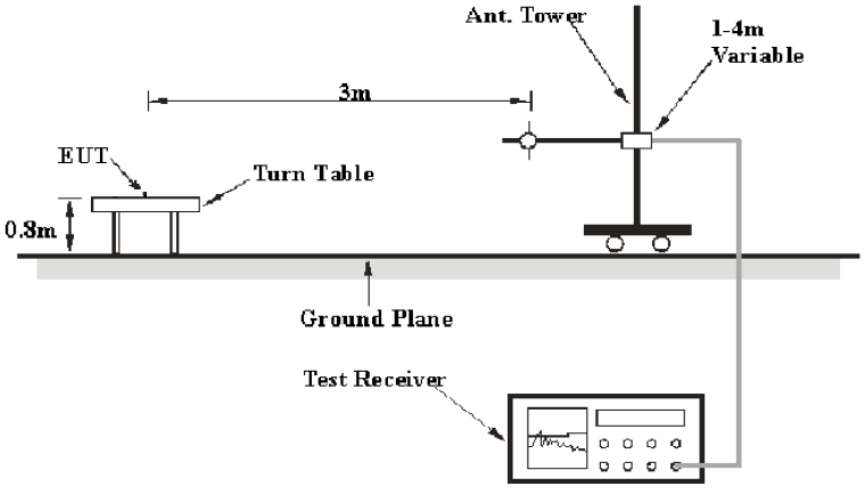
FCC §15.209, §15.205 & §15.247(d) - SPURIOUS EMISSIONS

Applicable Standard

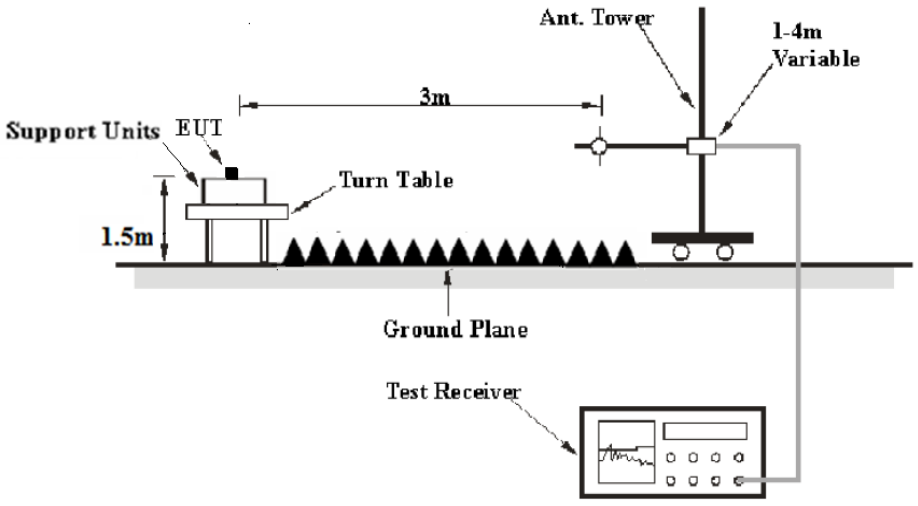
FCC §15.247 (d); §15.209; §15.205;

EUT Setup

Below 1 GHz:



Above 1GHz:



The radiated emission tests were performed in the 3 meters 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.

EMI Test Receiver Setup

The system was investigated from 30 MHz to 25 GHz.

During the radiated emission test, the EMI test receiver Setup was set with the following configurations:

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

Test Procedure

According to ANSI C63.10-2013 clause 6.5, 6.6 and 6.7.

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 mode for frequencies above 1 GHz.

Corrected Amplitude & Margin Calculation

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

> Corrected Amplitude (dBμV /m) = Meter Reading (dBμV) + Antenna Factor (dB/m) + Cable Loss (dB) - Amplifier Gain (dB)

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 (dB) = Limit (dBμV/m) – Corrected Amplitude (dBμV /m)

Test Results Summary

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

Test Data

Environmental Conditions

Temperature:	24.1-24.8 ℃
Relative Humidity:	48-50 %
ATM Pressure:	101.0-101.2kPa

The testing was performed by Hope Zhang from 2019-01-17 to 2019-01-31.

Test Result: Compliant.

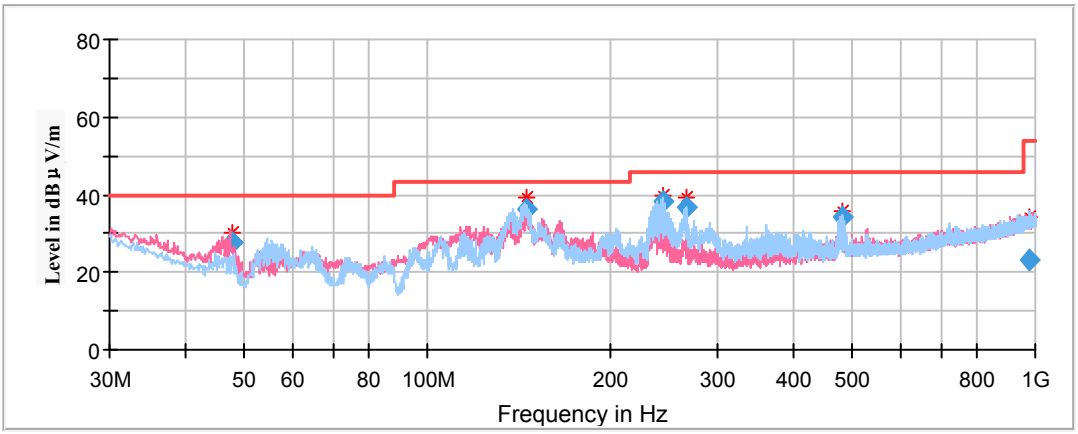
EUT operation mode: Transmitting

For Wi-Fi Mode:

Spurious Emission Test:

30MHz-1GHz:

*Pre-scan with 802.11b, 802.11g, 802.11n-HT20 and 802.11n-HT40 modes of operation in the X,Y and Z axes of orientation, the worst case **low channel of 802.11b mode in Z-axis of orientation** was recorded*



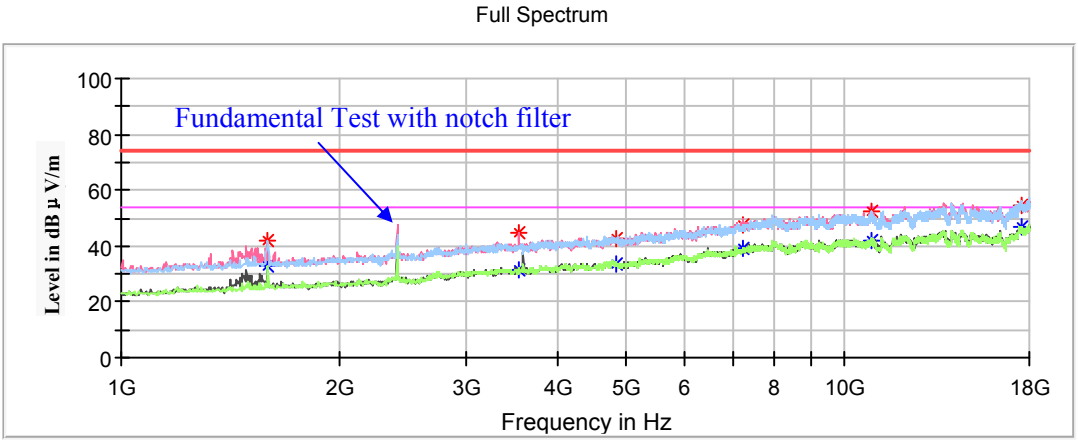
Frequency (MHz)	Corrected Amplitude	Rx Antenna		Turntable Degree	Corrected Factor (dB/m)	Limit (dBµV/m)	Margin (dB)
	QuasiPeak (dBµV/m)	Height (cm)	Polar (H/V)				
47.787600	27.54	101.0	V	275.0	-16.0	40.00	12.46
145.204900	36.40	199.0	H	13.0	-12.1	43.50	7.10
244.094900	38.18	101.0	H	142.0	-12.1	46.00	7.82
265.920100	36.75	101.0	H	132.0	-11.6	46.00	9.25
480.007400	34.11	199.0	H	0.0	-6.7	46.00	11.89
980.468000	22.90	101.0	H	199.0	1.9	53.90	31.00

1GHz-18GHz:

802.11b Mode:
*(Pre-scan in the X,Y and Z axes of orientation, the worst case **Z-axis of orientation** was recorded)*

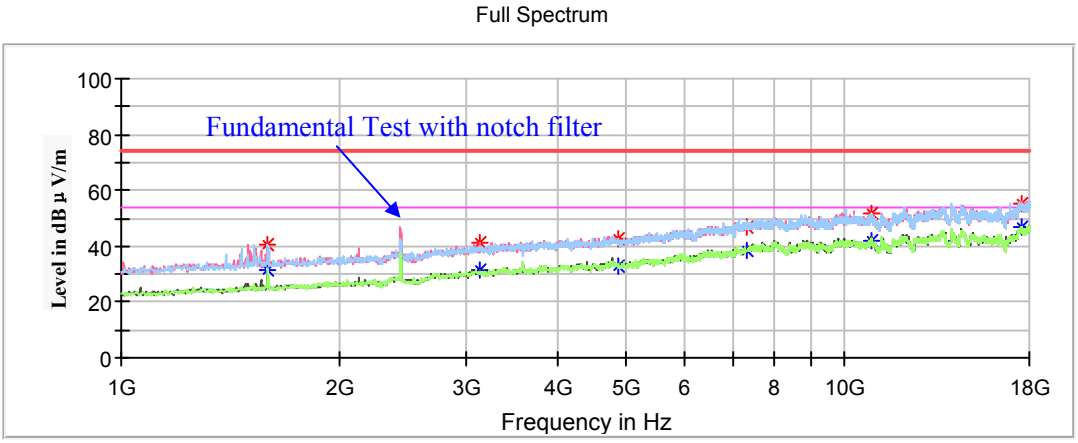
Note:
1. This test was performed with the 2.4-2.5GHz notch filter.
2. Corrected Factor (dB/m) = Antenna factor (RX) (dB/m) + Cable Loss (dB) – Amplifier Factor (dB)
   Corrected Amplitude (dBμV /m) = Corrected Factor (dB/m) + Reading (dBμV)
   Margin (dB) = Limit (dBμV/m) – Corrected Amplitude (dBμV /m)

Low Channel: 2412MHz



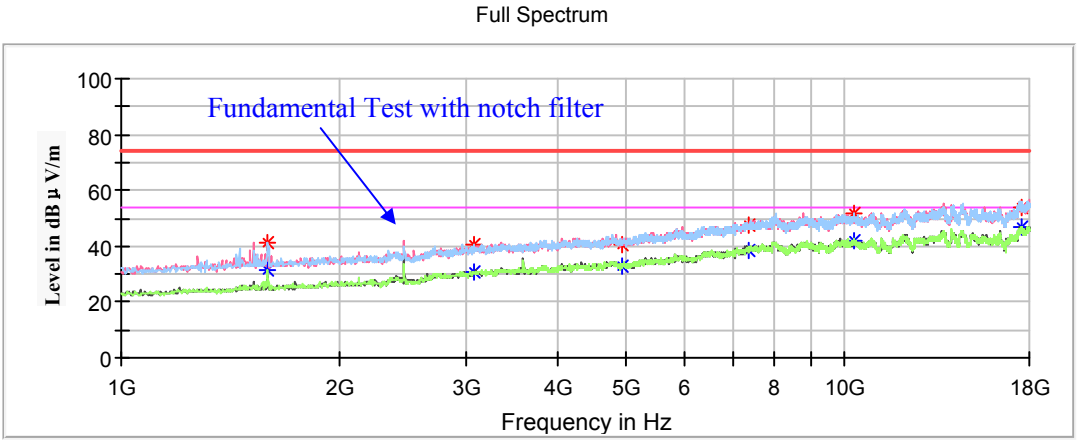
Frequency (MHz)	Corrected Amplitude		Rx Antenna		Turntable Degree	Corrected Factor (dB/m)	Limit (dBμV/m)	Margin (dB)
	MaxPeak (dBμV /m)	Average (dBμV /m)	Height (cm)	Polar (H/V)				
1595.000000	---	32.67	200.0	H	46.0	-7.2	54.00	21.33
1595.000000	42.27	---	200.0	H	46.0	-7.2	74.00	31.73
3543.200000	---	31.27	150.0	V	31.0	-0.7	54.00	22.73
3543.200000	44.59	---	150.0	V	31.0	-0.7	74.00	29.41
4824.000000	---	33.38	200.0	H	186.0	1.9	54.00	20.62
4824.000000	42.61	---	200.0	H	186.0	1.9	74.00	31.39
7236.000000	---	39.04	200.0	H	305.0	9.0	54.00	14.96
7236.000000	47.42	---	200.0	H	305.0	9.0	74.00	26.58
10911.000000	---	41.82	150.0	H	91.0	13.4	54.00	12.18
10911.000000	52.28	---	150.0	H	91.0	13.4	74.00	21.72
17554.600000	54.37	---	100.0	V	136.0	17.2	74.00	19.63
17554.600000	---	46.99	100.0	V	136.0	17.2	54.00	7.01

Middle Channel: 2437MHz



Frequency (MHz)	Corrected Amplitude		Rx Antenna		Turntable Degree	Corrected Factor (dB/m)	Limit (dBµV/m)	Margin (dB)
	MaxPeak (dBµV /m)	Average (dBµV /m)	Height (cm)	Polar (H/V)				
1591.600000	40.40	---	200.0	H	51.0	-7.2	74.00	33.60
1591.600000	---	31.59	200.0	H	51.0	-7.2	54.00	22.41
3128.400000	---	31.13	150.0	V	140.0	-1.4	54.00	22.87
3128.400000	41.13	---	150.0	V	140.0	-1.4	74.00	32.87
4874.000000	---	33.20	100.0	H	91.0	1.9	54.00	20.80
4874.000000	42.49	---	100.0	H	91.0	1.9	74.00	31.51
7311.000000	---	38.28	150.0	H	296.0	9.2	54.00	15.72
7311.000000	47.07	---	150.0	H	296.0	9.2	74.00	26.93
10866.800000	---	42.17	200.0	H	51.0	13.3	54.00	11.83
10866.800000	51.91	---	200.0	H	51.0	13.3	74.00	22.09
17561.400000	55.26	---	150.0	V	199.0	17.3	74.00	18.74
17561.400000	---	46.83	150.0	V	199.0	17.3	54.00	7.17

High Channel: 2462MHz

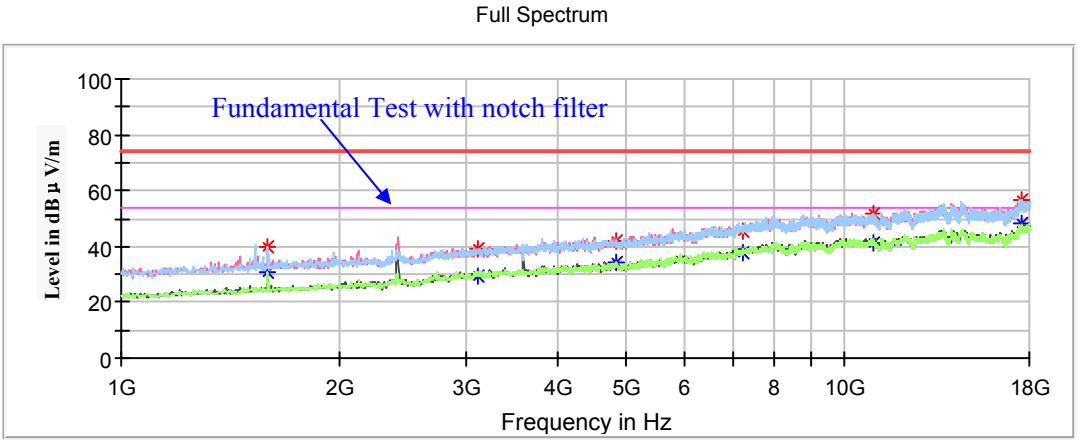


Frequency (MHz)	Corrected Amplitude		Rx Antenna		Turntable Degree	Corrected Factor (dB/m)	Limit (dBµV/m)	Margin (dB)
	MaxPeak (dBµV /m)	Average (dBµV /m)	Height (cm)	Polar (H/V)				
1591.600000	41.01	---	200.0	H	65.0	-7.2	74.00	32.99
1591.600000	---	31.26	200.0	H	65.0	-7.2	54.00	22.74
3070.600000	---	30.46	100.0	H	76.0	-1.5	54.00	23.54
3070.600000	40.31	---	100.0	H	76.0	-1.5	74.00	33.69
4924.000000	---	32.53	150.0	H	196.0	2.0	54.00	21.47
4924.000000	40.67	---	150.0	H	196.0	2.0	74.00	33.33
7386.000000	---	38.46	200.0	H	182.0	9.4	54.00	15.54
7386.000000	47.64	---	200.0	H	182.0	9.4	74.00	26.36
10309.200000	---	41.83	100.0	H	294.0	12.7	54.00	12.17
10309.200000	52.05	---	100.0	H	294.0	12.7	74.00	21.95
17598.800000	53.63	---	150.0	H	208.0	17.3	74.00	20.37
17598.800000	---	46.91	150.0	H	208.0	17.3	54.00	7.09

802.11g Mode:
*(Pre-scan in the X,Y and Z axes of orientation, the worst case **Z-axis of orientation** was recorded)*

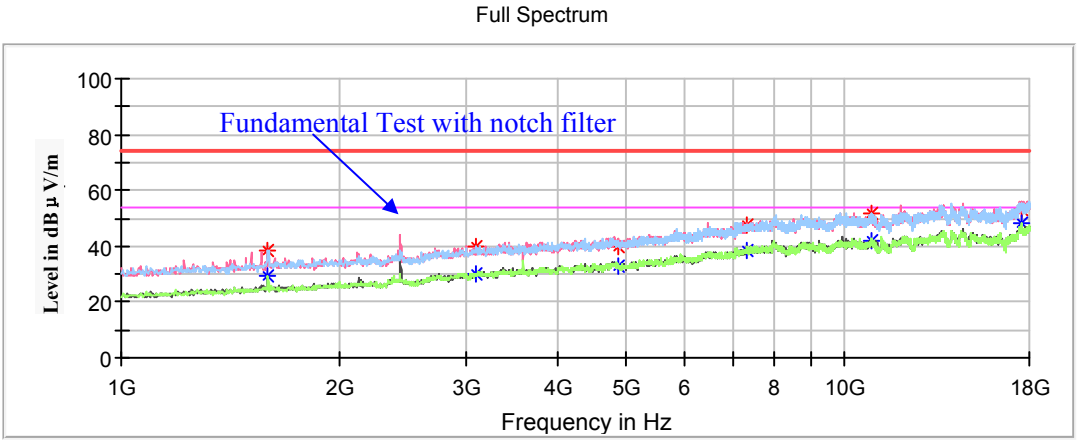
Note:
1. This test was performed with the 2.4-2.5GHz notch filter.
2. Corrected Factor (dB/m) = Antenna factor (RX) (dB/m) + Cable Loss (dB) – Amplifier Factor (dB)
   Corrected Amplitude (dBμV /m) = Corrected Factor (dB/m) + Reading (dBμV)
   Margin (dB) = Limit (dBμV/m) – Corrected Amplitude (dBμV /m)

Low Channel: 2412MHz



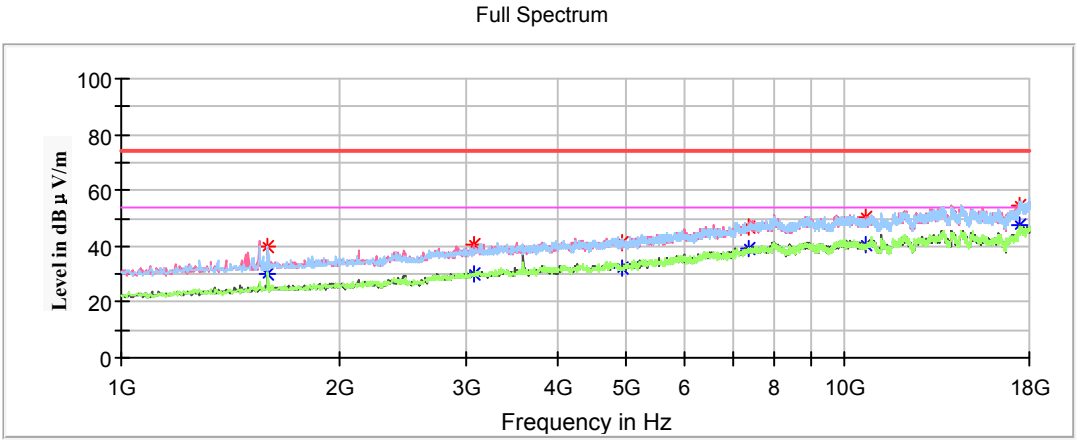
Frequency (MHz)	Corrected Amplitude		Rx Antenna		Turntable Degree	Corrected Factor (dB/m)	Limit (dBμV/m)	Margin (dB)
	MaxPeak (dBμV /m)	Average (dBμV /m)	Height (cm)	Polar (H/V)				
1591.600000	---	30.79	150.0	H	60.0	-7.2	54.00	23.21
1591.600000	39.96	---	150.0	H	60.0	-7.2	74.00	34.04
3114.800000	---	29.45	150.0	V	2.0	-1.4	54.00	24.55
3114.800000	39.39	---	150.0	V	2.0	-1.4	74.00	34.61
4824.000000	41.66	---	150.0	H	22.0	1.9	74.00	32.34
4824.000000	---	34.46	150.0	H	22.0	1.9	54.00	19.54
7236.000000	45.59	---	150.0	H	358.0	9.0	74.00	28.41
7236.000000	---	37.97	150.0	H	358.0	9.0	54.00	16.03
10934.800000	---	41.16	150.0	H	7.0	13.4	54.00	12.84
10934.800000	51.42	---	150.0	H	7.0	13.4	74.00	22.58
17524.000000	56.32	---	150.0	V	347.0	17.2	74.00	17.68
17524.000000	---	48.58	150.0	V	347.0	17.2	54.00	5.42

Middle Channel: 2437MHz



Frequency (MHz)	Corrected Amplitude		Rx Antenna		Turntable Degree	Corrected Factor (dB/m)	Limit (dBµV/m)	Margin (dB)
	MaxPeak (dBµV /m)	Average (dBµV /m)	Height (cm)	Polar (H/V)				
1595.000000	38.20	---	150.0	V	122.0	-7.2	74.00	35.80
1595.000000	---	29.16	150.0	V	122.0	-7.2	54.00	24.84
3087.600000	---	30.24	150.0	H	103.0	-1.5	54.00	23.76
3087.600000	40.05	---	150.0	H	103.0	-1.5	74.00	33.95
4874.000000	39.71	---	150.0	H	2.0	1.9	74.00	34.29
4874.000000	---	32.65	150.0	H	2.0	1.9	54.00	21.35
7311.000000	---	38.31	150.0	H	174.0	9.2	54.00	15.69
7311.000000	47.81	---	150.0	H	174.0	9.2	74.00	26.19
10873.600000	---	41.77	150.0	H	345.0	13.3	54.00	12.23
10873.600000	51.59	---	150.0	H	345.0	13.3	74.00	22.41
17571.600000	53.18	---	150.0	H	222.0	17.3	74.00	20.82
17571.600000	---	47.98	150.0	H	222.0	17.3	54.00	6.02

High Channel: 2462MHz

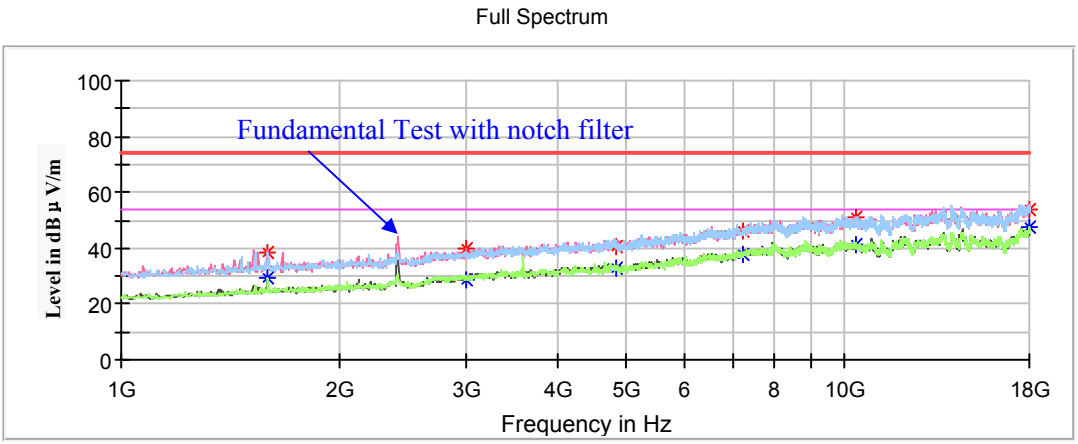


Frequency (MHz)	Corrected Amplitude		Rx Antenna		Turntable Degree	Corrected Factor (dB/m)	Limit (dBµV/m)	Margin (dB)
	MaxPeak (dBµV /m)	Average (dBµV /m)	Height (cm)	Polar (H/V)				
1591.600000	40.19	---	150.0	H	55.0	-7.2	74.00	33.81
1591.600000	---	30.35	150.0	H	55.0	-7.2	54.00	23.65
3063.800000	---	29.90	150.0	V	0.0	-1.5	54.00	24.10
3063.800000	40.49	---	150.0	V	0.0	-1.5	74.00	33.51
4924.000000	---	32.03	150.0	H	267.0	2.0	54.00	21.97
4924.000000	41.02	---	150.0	H	267.0	2.0	74.00	32.98
7386.000000	47.01	---	150.0	H	140.0	9.4	74.00	26.99
7386.000000	---	38.91	150.0	H	140.0	9.4	54.00	15.09
10686.600000	---	40.83	150.0	V	0.0	13.0	54.00	13.17
10686.600000	50.69	---	150.0	V	0.0	13.0	74.00	23.31
17496.800000	54.62	---	150.0	V	147.0	17.2	74.00	19.38
17496.800000	---	47.25	150.0	V	147.0	17.2	54.00	6.75

802.11n-HT20 Mode:
*(Pre-scan in the X,Y and Z axes of orientation, the worst case **Z-axis of orientation** was recorded)*

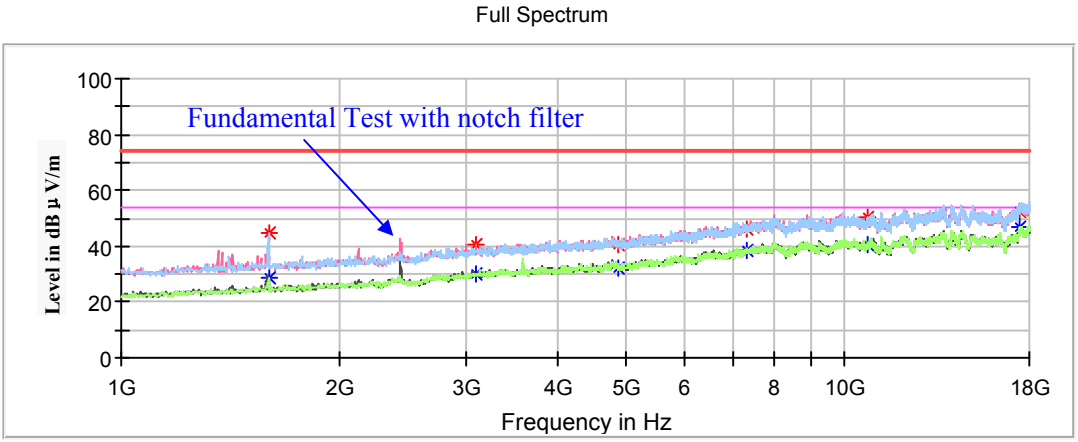
Note:
1. This test was performed with the 2.4-2.5GHz notch filter.
2. Corrected Factor (dB/m) = Antenna factor (RX) (dB/m) + Cable Loss (dB) – Amplifier Factor (dB)
   Corrected Amplitude (dBμV /m) = Corrected Factor (dB/m) + Reading (dBμV)
   Margin (dB) = Limit (dBμV/m) – Corrected Amplitude (dBμV /m)

Low Channel : 2412MHz



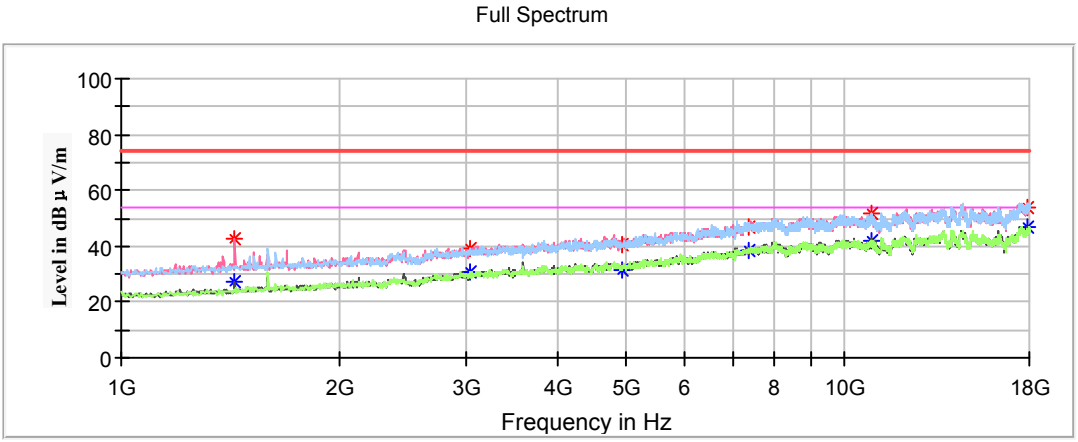
Frequency (MHz)	Corrected Amplitude		Rx Antenna		Turntable Degree	Corrected Factor (dB/m)	Limit (dBμV/m)	Margin (dB)
	MaxPeak (dBμV /m)	Average (dBμV /m)	Height (cm)	Polar (H/V)				
1595.000000	38.52	---	150.0	H	61.0	-7.2	74.00	35.48
1595.000000	---	29.27	150.0	H	61.0	-7.2	54.00	24.73
2999.200000	---	28.96	150.0	V	317.0	-1.6	54.00	25.04
2999.200000	39.52	---	150.0	V	317.0	-1.6	74.00	34.48
4824.000000	40.73	---	150.0	V	131.0	1.9	74.00	33.27
4824.000000	---	33.14	150.0	V	131.0	1.9	54.00	20.86
7236.000000	---	37.53	150.0	V	252.0	9.0	54.00	16.47
7236.000000	46.11	---	150.0	V	252.0	9.0	74.00	27.89
10384.000000	---	41.45	150.0	H	0.0	12.7	54.00	12.55
10384.000000	51.39	---	150.0	H	0.0	12.7	74.00	22.61
17989.800000	53.99	---	150.0	H	146.0	17.7	74.00	20.01
17989.800000	---	47.40	150.0	H	146.0	17.7	54.00	6.60

Middle Channel: 2437MHz



Frequency (MHz)	Corrected Amplitude		Rx Antenna		Turntable Degree	Corrected Factor (dB/m)	Limit (dBµV/m)	Margin (dB)
	MaxPeak (dBµV /m)	Average (dBµV /m)	Height (cm)	Polar (H/V)				
1598.400000	---	28.99	150.0	H	54.0	-7.2	54.00	25.01
1598.400000	44.62	---	150.0	H	54.0	-7.2	74.00	29.38
3094.400000	---	30.12	150.0	V	209.0	-1.5	54.00	23.88
3094.400000	40.25	---	150.0	V	209.0	-1.5	74.00	33.75
4874.000000	---	31.84	150.0	V	150.0	1.9	54.00	22.16
4874.000000	40.67	---	150.0	V	150.0	1.9	74.00	33.33
7311.000000	46.17	---	150.0	V	269.0	9.2	74.00	27.83
7311.000000	---	38.27	150.0	V	269.0	9.2	54.00	15.73
10758.000000	---	40.23	150.0	V	55.0	13.1	54.00	13.77
10758.000000	50.33	---	150.0	V	55.0	13.1	74.00	23.67
17469.600000	52.58	---	150.0	H	322.0	17.0	74.00	21.42
17469.600000	---	47.15	150.0	H	322.0	17.0	54.00	6.85

High Channel : 2462MHz

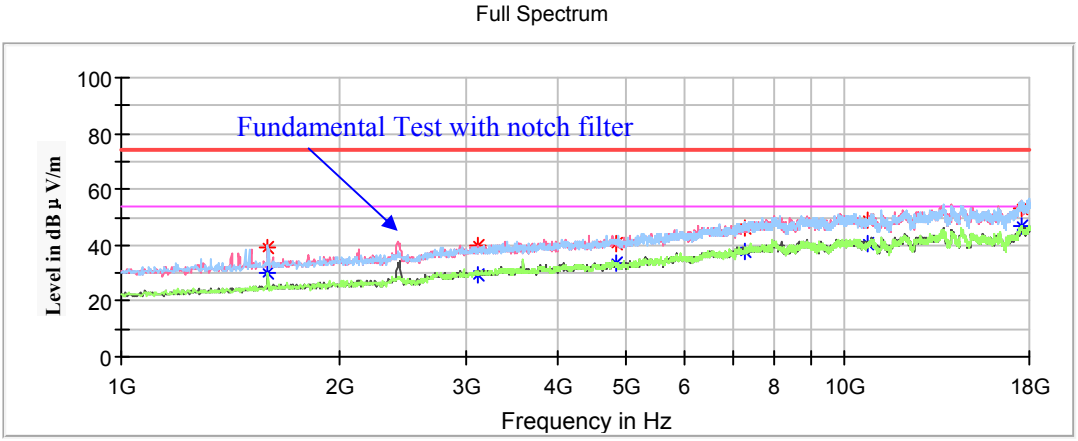


Frequency (MHz)	Corrected Amplitude		Rx Antenna		Turntable Degree	Corrected Factor (dB/m)	Limit (dBµV/m)	Margin (dB)
	MaxPeak (dBµV /m)	Average (dBµV /m)	Height (cm)	Polar (H/V)				
1435.200000	---	27.21	150.0	V	129.0	-7.9	54.00	26.79
1435.200000	42.86	---	150.0	V	129.0	-7.9	74.00	31.14
3029.800000	---	30.56	150.0	H	345.0	-1.6	54.00	23.44
3029.800000	39.45	---	150.0	H	345.0	-1.6	74.00	34.55
4924.000000	---	31.80	150.0	V	274.0	2.0	54.00	22.20
4924.000000	40.75	---	150.0	V	274.0	2.0	74.00	33.25
7386.000000	---	38.45	150.0	V	69.0	9.4	54.00	15.55
7386.000000	47.18	---	150.0	V	69.0	9.4	74.00	26.82
10866.800000	---	41.85	150.0	H	358.0	13.3	54.00	12.15
10866.800000	52.03	---	150.0	H	358.0	13.3	74.00	21.97
17894.600000	53.51	---	150.0	V	352.0	17.6	74.00	20.49
17894.600000	---	46.55	150.0	V	352.0	17.6	54.00	7.45

802.11n-HT40 Mode:
*(Pre-scan in the X,Y and Z axes of orientation, the worst case **Z-axis of orientation** was recorded)*

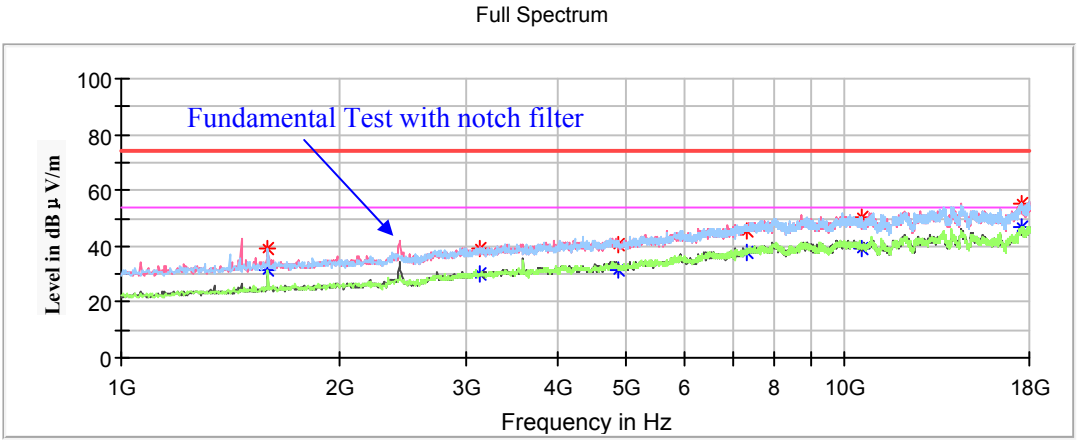
Note:
1. This test was performed with the 2.4-2.5GHz notch filter.
2. Corrected Factor (dB/m) = Antenna factor (RX) (dB/m) + Cable Loss (dB) – Amplifier Factor (dB)
   Corrected Amplitude (dBμV /m) = Corrected Factor (dB/m) + Reading (dBμV)
   Margin (dB) = Limit (dBμV/m) – Corrected Amplitude (dBμV /m)

Low Channel : 2422MHz



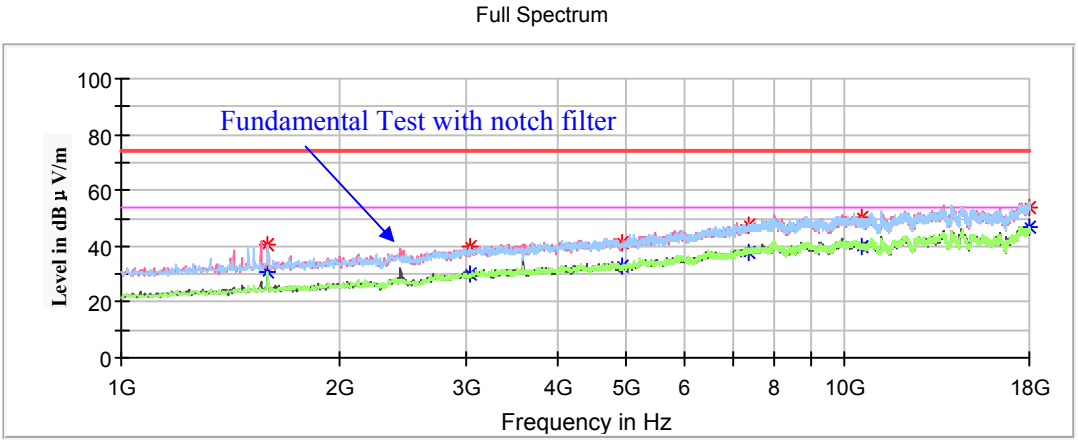
Frequency (MHz)	Corrected Amplitude		Rx Antenna		Turntable Degree	Corrected Factor (dB/m)	Limit (dBμV/m)	Margin (dB)
	MaxPeak (dBμV /m)	Average (dBμV /m)	Height (cm)	Polar (H/V)				
1595.000000	39.28	---	150.0	H	55.0	-7.2	74.00	34.72
1595.000000	---	30.16	150.0	H	55.0	-7.2	54.00	23.84
3104.600000	---	29.62	150.0	V	78.0	-1.5	54.00	24.38
3104.600000	39.56	---	150.0	V	78.0	-1.5	74.00	34.44
4844.000000	40.72	---	150.0	V	37.0	1.9	74.00	33.28
4844.000000	---	33.32	150.0	V	37.0	1.9	54.00	20.68
7266.000000	---	38.01	150.0	V	309.0	9.0	54.00	15.99
7266.000000	46.01	---	150.0	V	309.0	9.0	74.00	27.99
10744.400000	---	40.43	150.0	V	25.0	13.1	54.00	13.57
10744.400000	49.03	---	150.0	V	25.0	13.1	74.00	24.97
17561.400000	53.38	---	150.0	V	7.0	17.3	74.00	20.62
17561.400000	---	46.96	150.0	V	7.0	17.3	54.00	7.04

Middle Channel: 2437MHz



Frequency (MHz)	Corrected Amplitude		Rx Antenna		Turntable Degree	Corrected Factor (dB/m)	Limit (dBµV/m)	Margin (dB)
	MaxPeak (dBµV /m)	Average (dBµV /m)	Height (cm)	Polar (H/V)				
1595.000000	38.90	---	150.0	H	61.0	-7.2	74.00	35.10
1595.000000	---	31.25	150.0	H	61.0	-7.2	54.00	22.75
3121.600000	---	29.82	150.0	V	0.0	-1.4	54.00	24.18
3121.600000	39.45	---	150.0	V	0.0	-1.4	74.00	34.55
4874.000000	---	31.44	150.0	V	83.0	1.9	54.00	22.56
4874.000000	40.74	---	150.0	V	83.0	1.9	74.00	33.26
7311.000000	---	38.00	150.0	V	359.0	9.2	54.00	16.00
7311.000000	45.61	---	150.0	V	359.0	9.2	74.00	28.39
10537.000000	---	39.27	150.0	H	0.0	12.8	54.00	14.73
10537.000000	50.11	---	150.0	H	0.0	12.8	74.00	23.89
17507.000000	55.49	---	150.0	V	256.0	17.2	74.00	18.51
17507.000000	---	46.69	150.0	V	256.0	17.2	54.00	7.31

High Channel : 2452MHz

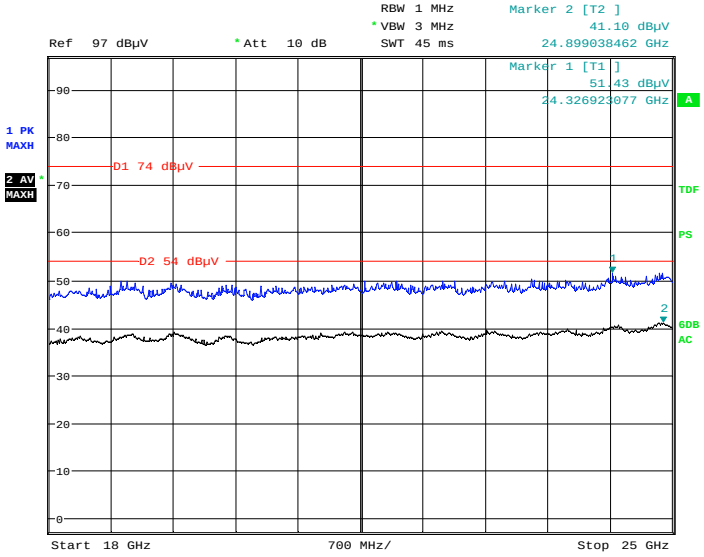


Frequency (MHz)	Corrected Amplitude		Rx Antenna		Turntable Degree	Corrected Factor (dB/m)	Limit (dBµV/m)	Margin (dB)
	MaxPeak (dBµV /m)	Average (dBµV /m)	Height (cm)	Polar (H/V)				
1591.600000	---	30.49	150.0	H	55.0	-7.2	54.00	23.51
1591.600000	40.30	---	150.0	H	55.0	-7.2	74.00	33.70
3026.400000	---	30.32	150.0	H	330.0	-1.6	54.00	23.68
3026.400000	39.72	---	150.0	H	330.0	-1.6	74.00	34.28
4904.000000	41.02	---	150.0	V	0.0	2.0	74.00	32.98
4904.000000	---	32.97	150.0	V	0.0	2.0	54.00	21.03
7356.000000	---	37.87	150.0	V	235.0	9.4	54.00	16.13
7356.000000	47.26	---	150.0	V	235.0	9.4	74.00	26.74
10560.800000	---	39.61	150.0	V	317.0	12.8	54.00	14.39
10560.800000	50.32	---	150.0	V	317.0	12.8	74.00	23.68
17962.600000	53.89	---	150.0	V	0.0	17.7	74.00	20.11
17962.600000	---	46.84	150.0	V	0.0	17.7	54.00	7.16

18GHz-25GHz:

*Pre-scan with 802.11b, 802.11g and 802.11n-HT20 modes of operation in the X,Y and Z axes of orientation, the worst case **low channel of 802.11b mode in Z-axis of orientation** was recorded*

Horizontal



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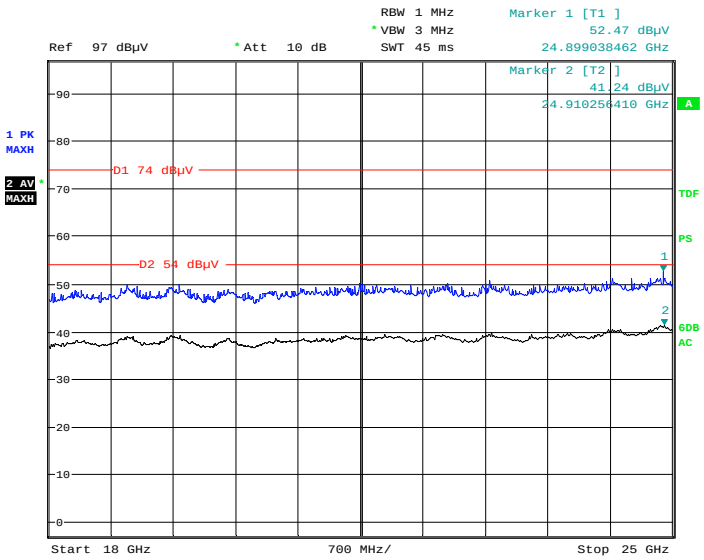
Horizontal



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Fundamental Test & Restricted Bands Emissions Test:

Note:
1. Corrected Factor (dB/m) = Antenna factor (RX) (dB/m) + Cable Loss (dB) – Amplifier Factor (dB)
   Corrected Amplitude (dBμV /m) = Corrected Factor (dB/m) + Reading (dBμV)
   Margin (dB) = Limit (dBμV/m) – Corrected Amplitude (dBμV /m)

802.11b Mode: *(Pre-scan in the X,Y and Z axes of orientation, the worst case Z-axis of orientation was recorded)*

Frequency (MHz)	Corrected Amplitude		Rx Antenna		Turntable Degree	Corrected Factor (dB/m)	Limit (dBμV/m)	Margin (dB)
	MaxPeak (dBμV /m)	Average (dBμV /m)	Height (cm)	Polar (H/V)				
Low Channel: 2412MHz								
2412.000000	106.01	---	100.0	H	344.0	6.1	/	/
2412.000000	---	103.68	100.0	H	344.0	6.1	/	/
2412.000000	103.98	---	200.0	V	68.0	6.1	/	/
2412.000000	---	101.21	200.0	V	68.0	6.1	/	/
2390.000000	---	39.60	150.0	H	111.0	6.0	54.00	14.40
2390.000000	48.57	---	150.0	H	111.0	6.0	74.00	25.43
Middle Channel: 2437MHz								
2437.000000	105.32	---	100.0	H	216.0	6.2	/	/
2437.000000	---	102.88	100.0	H	216.0	6.2	/	/
2437.000000	102.96	---	100.0	V	97.0	6.2	/	/
2437.000000	---	100.51	100.0	V	97.0	6.2	/	/
High Channel: 2462MHz								
2462.000000	105.22	---	250.0	H	311.0	6.2	/	/
2462.000000	---	102.90	250.0	H	311.0	6.2	/	/
2462.000000	103.08	---	250.0	V	42.0	6.2	/	/
2462.000000	---	100.84	250.0	V	42.0	6.2	/	/
2483.500000	47.85	---	100.0	H	260.0	6.3	74.00	26.15
2483.500000	---	39.88	100.0	H	260.0	6.3	54.00	14.12

802.11g Mode: *(Pre-scan in the X,Y and Z axes of orientation, the worst case Z-axis of orientation was recorded)*

Frequency (MHz)	Corrected Amplitude		Rx Antenna		Turntable Degree	Corrected Factor (dB/m)	Limit (dBμV/m)	Margin (dB)
	MaxPeak (dBμV /m)	Average (dBμV /m)	Height (cm)	Polar (H/V)				
Low Channel: 2412MHz								
2412.000000	97.83	---	250.0	H	122.0	6.1	/	/
2412.000000	---	90.71	250.0	H	122.0	6.1	/	/
2412.000000	95.43	---	150.0	V	358.0	6.1	/	/
2412.000000	---	88.41	150.0	V	358.0	6.1	/	/
2390.000000	---	40.68	200.0	H	311.0	6.0	54.00	13.32
2390.000000	48.74	---	200.0	H	311.0	6.0	74.00	25.26
Middle Channel: 2437MHz								
2437.000000	96.27	---	100.0	H	176.0	6.2	/	/
2437.000000	---	89.16	100.0	H	176.0	6.2	/	/
2437.000000	94.15	---	250.0	V	179.0	6.2	/	/
2437.000000	---	86.75	250.0	V	179.0	6.2	/	/
High Channel: 2462MHz								
2462.000000	96.27	---	200.0	H	103.0	6.2	/	/
2462.000000	---	89.34	200.0	H	103.0	6.2	/	/
2462.000000	94.12	---	100.0	V	127.0	6.2	/	/
2462.000000	---	86.87	100.0	V	127.0	6.2	/	/
2483.500000	48.35	---	200.0	H	345.0	6.3	74.00	25.65
2483.500000	---	39.44	200.0	H	345.0	6.3	54.00	14.56

802.11n-HT20 Mode: *(Pre-scan in the X,Y and Z axes of orientation, the worst case Z-axis of orientation was recorded)*

Frequency (MHz)	Corrected Amplitude		Rx Antenna		Turntable Degree	Corrected Factor (dB/m)	Limit (dBμV/m)	Margin (dB)
	MaxPeak (dBμV /m)	Average (dBμV /m)	Height (cm)	Polar (H/V)				
Low Channel: 2412MHz								
2412.000000	97.87	---	200.0	H	70.0	6.1	/	/
2412.000000	---	90.90	200.0	H	70.0	6.1	/	/
2412.000000	95.77	---	200.0	V	177.0	6.1	/	/
2412.000000	---	88.66	200.0	V	177.0	6.1	/	/
2390.000000	---	39.53	100.0	V	138.0	6.0	54.00	14.47
2390.000000	48.95	---	100.0	V	138.0	6.0	74.00	25.05
Middle Channel: 2437MHz								
2437.000000	96.81	---	200.0	H	50.0	6.2	/	/
2437.000000	---	89.74	200.0	H	50.0	6.2	/	/
2437.000000	94.31	---	100.0	V	323.0	6.2	/	/
2437.000000	---	87.29	100.0	V	323.0	6.2	/	/
High Channel: 2462MHz								
2462.000000	96.16	---	250.0	H	205.0	6.2	/	/
2462.000000	---	89.20	250.0	H	205.0	6.2	/	/
2462.000000	93.92	---	250.0	V	321.0	6.2	/	/
2462.000000	---	86.91	250.0	V	321.0	6.2	/	/
2483.500000	48.42	---	250.0	V	0.0	6.3	74.00	25.58
2483.500000	---	39.60	250.0	V	0.0	6.3	54.00	14.40

802.11n-HT40 Mode: *(Pre-scan in the X,Y and Z axes of orientation, the worst case Z-axis of orientation was recorded)*

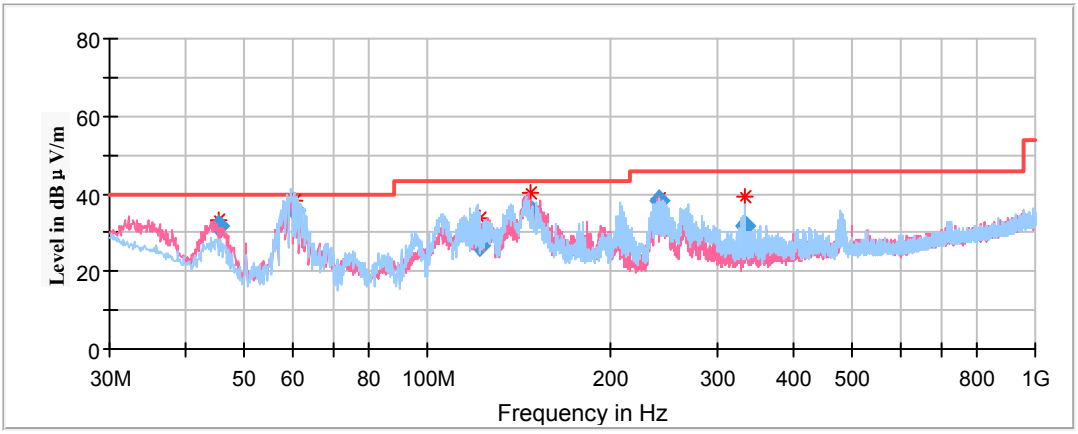
Frequency (MHz)	Corrected Amplitude		Rx Antenna		Turntable Degree	Corrected Factor (dB/m)	Limit (dBμV/m)	Margin (dB)
	MaxPeak (dBμV /m)	Average (dBμV /m)	Height (cm)	Polar (H/V)				
Low Channel: 2422MHz								
2422.000000	95.04	---	200.0	H	31.0	6.1	/	/
2422.000000	---	88.01	200.0	H	31.0	6.1	/	/
2422.000000	92.72	---	200.0	V	201.0	6.1	/	/
2422.000000	---	85.93	200.0	V	201.0	6.1	/	/
2390.000000	---	39.31	250.0	V	165.0	6.0	54.00	14.69
2390.000000	48.05	---	250.0	V	165.0	6.0	74.00	25.95
Middle Channel: 2437MHz								
2437.000000	95.41	---	100.0	H	195.0	6.2	/	/
2437.000000	---	88.29	100.0	H	195.0	6.2	/	/
2437.000000	93.20	---	200.0	V	326.0	6.2	/	/
2437.000000	---	85.91	200.0	V	326.0	6.2	/	/
High Channel: 2452MHz								
2452.000000	94.55	---	100.0	H	210.0	6.2	/	/
2452.000000	---	87.56	100.0	H	210.0	6.2	/	/
2452.000000	92.28	---	150.0	V	251.0	6.2	/	/
2452.000000	---	85.47	150.0	V	251.0	6.2	/	/
2483.500000	49.42	---	200.0	V	126.0	6.3	74.00	24.58
2483.500000	---	41.18	200.0	V	126.0	6.3	54.00	12.82

For BLE Mode:

Spurious Emission Test:

30MHz-1GHz

*(The worst case **middle channel of operation in the Z axis of orientation** was recorded)*



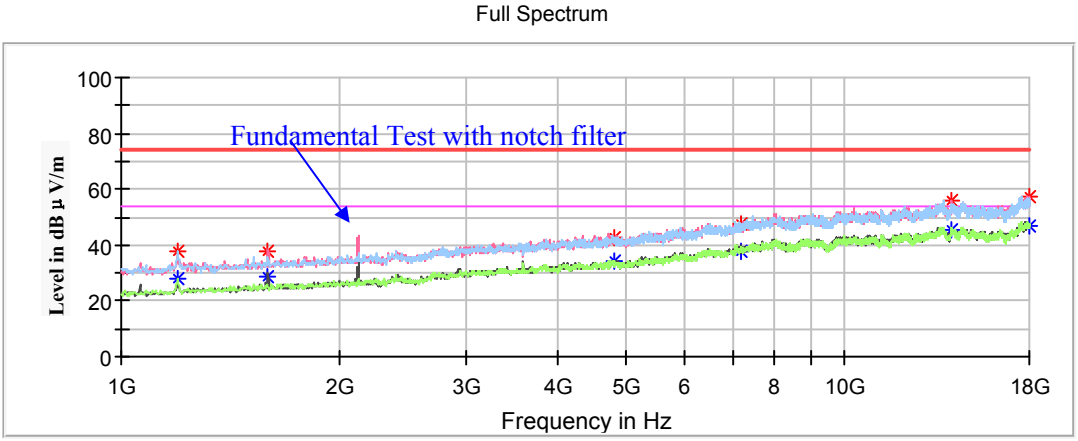
Frequency (MHz)	Corrected Amplitude	Rx Antenna		Turntable Degree	Corrected Factor (dB/m)	Limit (dBµV/m)	Margin (dB)
	QuasiPeak (dBµV/m)	Height (cm)	Polar (H/V)				
45.198700	31.62	101.0	V	293.0	-14.2	40.00	8.38
60.412100	35.82	199.0	H	306.0	-17.9	40.00	4.18
121.877600	26.91	199.0	H	359.0	-11.3	43.50	16.59
147.417850	35.50	101.0	V	190.0	-12.2	43.50	8.00
241.098350	38.27	199.0	V	216.0	-12.1	46.00	7.73
332.113200	31.67	101.0	H	306.0	-9.8	46.00	14.33

1GHz-18GHz

*(Pre-scan in the X,Y and Z axes of orientation, the worst case **Z-axis of orientation** was recorded)*

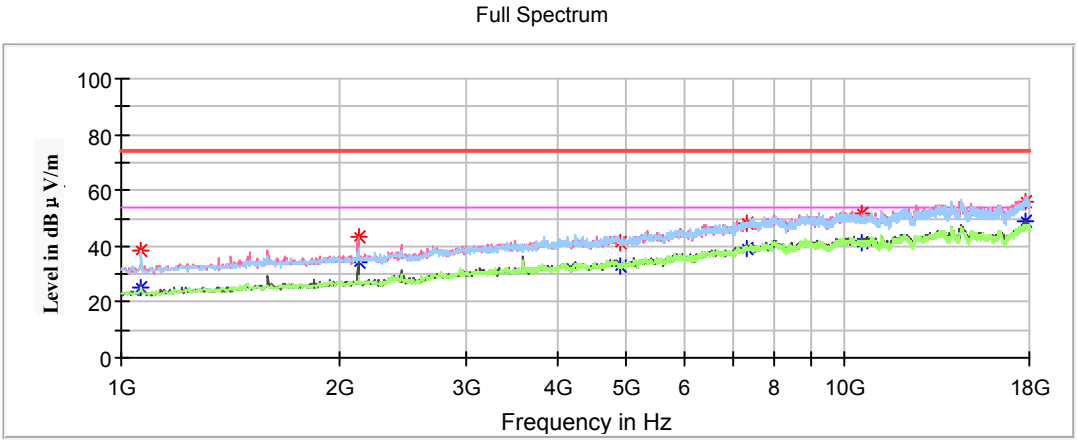
Note:
1. This test was performed with the 2.4-2.5GHz notch filter.
2. Corrected Factor (dB/m) = Antenna factor (RX) (dB/m) + Cable Loss (dB) – Amplifier Factor (dB)
   Corrected Amplitude (dBμV /m) = Corrected Factor (dB/m) + Reading (dBμV)
   Margin (dB) = Limit (dBμV/m) – Corrected Amplitude (dBμV /m)

Low Channel: 2402MHz



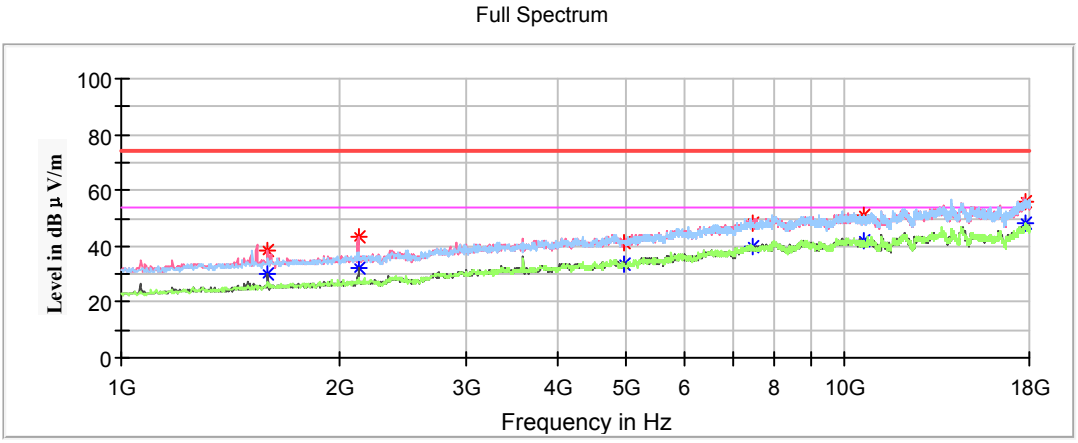
Frequency (MHz)	Corrected Amplitude		Rx Antenna		Turntable Degree	Corrected Factor (dB/m)	Limit (dBμV/m)	Margin (dB)
	MaxPeak (dBμV /m)	Average (dBμV /m)	Height (cm)	Polar (H/V)				
1197.200000	---	28.20	150.0	H	63.0	-9.3	54.00	25.80
1197.200000	38.10	---	150.0	H	63.0	-9.3	74.00	35.90
1591.600000	---	28.87	150.0	V	188.0	-7.2	54.00	25.13
1591.600000	37.56	---	150.0	V	188.0	-7.2	74.00	36.44
4804.000000	---	34.04	150.0	H	40.0	1.9	54.00	19.96
4804.000000	42.63	---	150.0	H	40.0	1.9	74.00	31.37
7206.000000	---	37.87	150.0	H	106.0	8.8	54.00	16.13
7206.000000	47.49	---	150.0	H	106.0	8.8	74.00	26.51
14015.200000	---	45.32	150.0	V	95.0	14.9	54.00	8.68
14015.200000	56.06	---	150.0	V	95.0	14.9	74.00	17.94
17966.000000	---	46.96	150.0	V	6.0	17.7	54.00	7.04
17966.000000	57.45	---	150.0	V	6.0	17.7	74.00	16.55

Middle Channel: 2440MHz



Frequency (MHz)	Corrected Amplitude		Rx Antenna		Turntable Degree	Corrected Factor (dB/m)	Limit (dBµV/m)	Margin (dB)
	MaxPeak (dBµV /m)	Average (dBµV /m)	Height (cm)	Polar (H/V)				
1064.600000	---	25.39	200.0	H	78.0	-10.1	54.00	28.61
1064.600000	38.65	---	200.0	H	78.0	-10.1	74.00	35.35
2125.400000	---	34.07	150.0	V	183.0	-5.4	54.00	19.93
2125.400000	43.21	---	150.0	V	183.0	-5.4	74.00	30.79
4880.000000	41.12	---	200.0	H	137.0	1.9	74.00	32.88
4880.000000	---	33.17	200.0	H	137.0	1.9	54.00	20.83
7320.000000	---	39.36	100.0	H	182.0	9.2	54.00	14.64
7320.000000	48.46	---	100.0	H	182.0	9.2	74.00	25.54
10571.000000	---	41.50	150.0	V	148.0	12.8	54.00	12.50
10571.000000	51.80	---	150.0	V	148.0	12.8	74.00	22.20
17826.600000	56.29	---	100.0	V	0.0	17.5	74.00	17.71
17826.600000	---	49.28	100.0	V	0.0	17.5	54.00	4.72

High Channel: 2480MHz

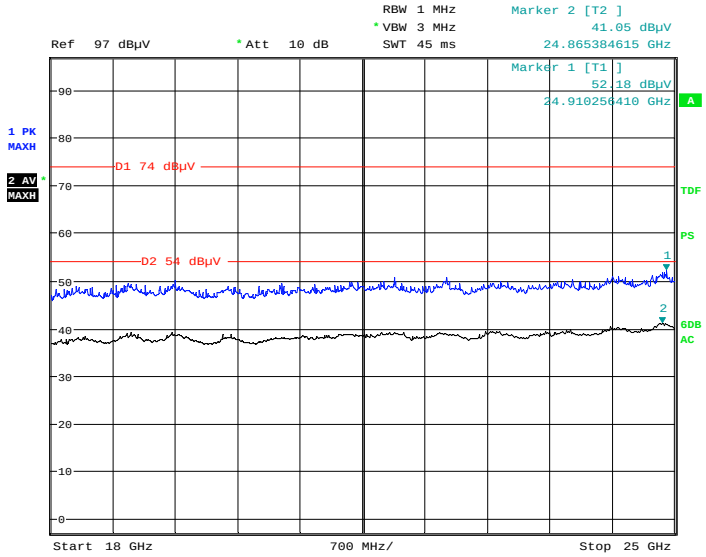


Frequency (MHz)	Corrected Amplitude		Rx Antenna		Turntable Degree	Corrected Factor (dB/m)	Limit (dBµV/m)	Margin (dB)
	MaxPeak (dBµV /m)	Average (dBµV /m)	Height (cm)	Polar (H/V)				
1591.600000	38.31	---	200.0	V	225.0	-7.2	74.00	35.69
1591.600000	---	30.33	200.0	V	225.0	-7.2	54.00	23.67
2128.800000	43.41	---	200.0	V	236.0	-5.4	74.00	30.59
2128.800000	---	32.37	200.0	V	236.0	-5.4	54.00	21.63
4960.000000	---	33.72	100.0	V	357.0	2.1	54.00	20.28
4960.000000	41.28	---	100.0	V	357.0	2.1	74.00	32.72
7440.000000	---	39.78	150.0	V	146.0	9.6	54.00	14.22
7440.000000	48.43	---	150.0	V	146.0	9.6	74.00	25.57
10605.000000	50.99	---	200.0	H	318.0	12.9	74.00	23.01
10605.000000	---	41.74	200.0	H	318.0	12.9	54.00	12.26
17792.600000	55.86	---	200.0	H	211.0	17.5	74.00	18.14
17796.000000	---	47.91	200.0	H	217.0	17.5	54.00	6.09

18GHz-25GHz

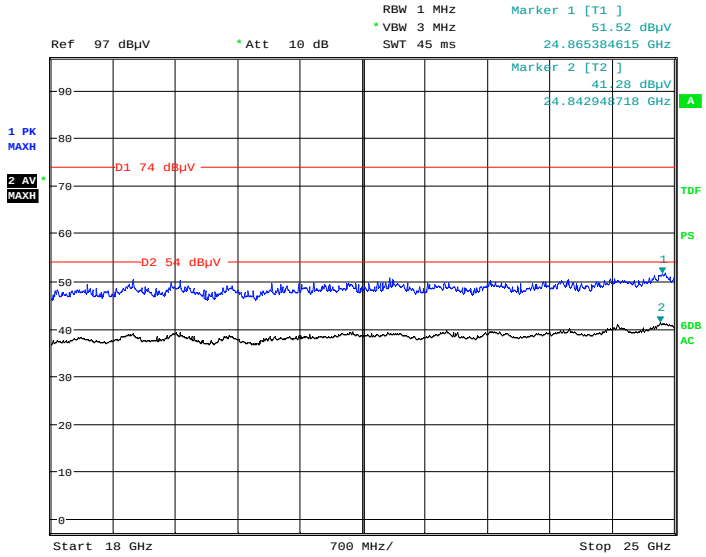
*(The worst case **middle channel of operation in the Z axis of orientation** was recorded)*

Horizontal



Date: 31.JAN.2019 10:23:19

Vertical



Date: 31.JAN.2019 10:39:29

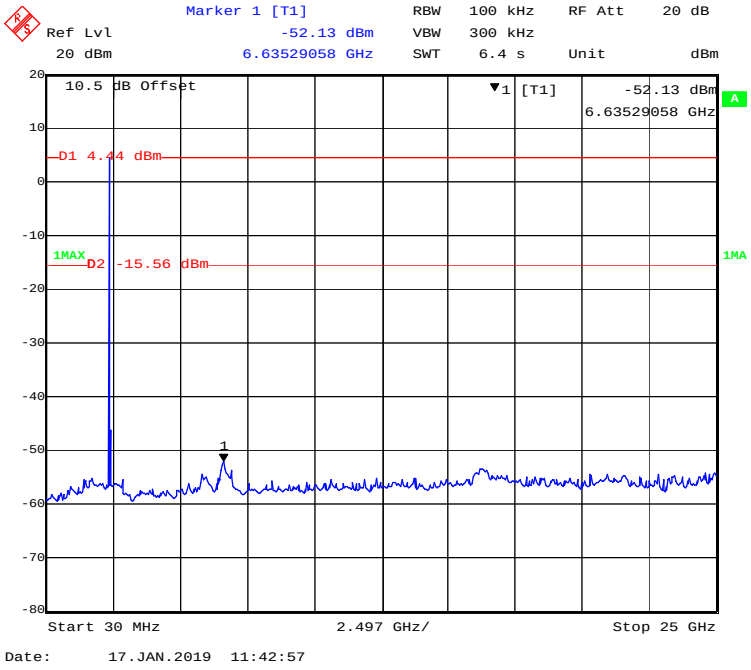
Fundamental Test & Restricted Bands Emissions Test:
*(Pre-scan in the X,Y and Z axes of orientation, the worst case **Z-axis of orientation** was recorded)*

Note:
1. Corrected Factor (dB/m) = Antenna factor (RX) (dB/m) + Cable Loss (dB) – Amplifier Factor (dB)
Corrected Amplitude (dBμV /m) = Corrected Factor (dB/m) + Reading (dBμV)
Margin (dB) = Limit (dBμV/m) – Corrected Amplitude (dBμV /m)

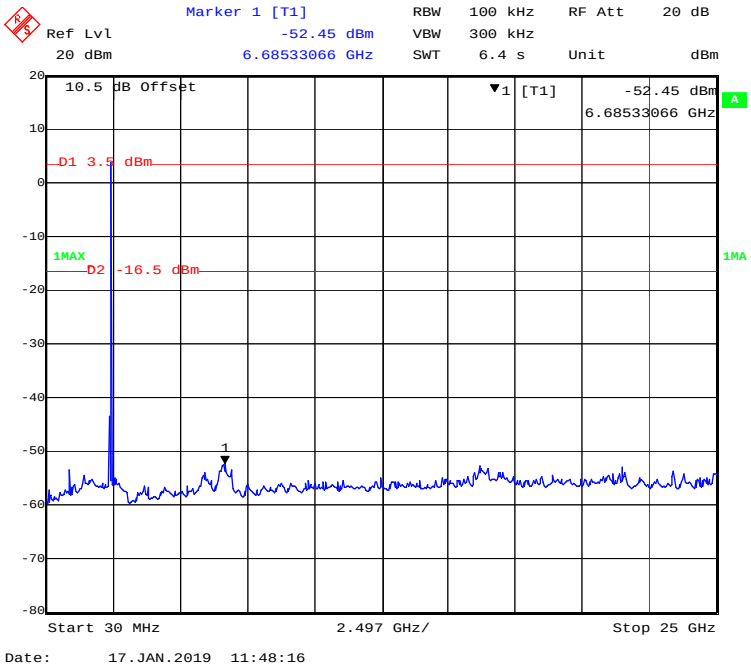
Frequency (MHz)	Corrected Amplitude		Rx Antenna		Turntable Degree	Corrected Factor (dB/m)	Limit (dBμV/m)	Margin (dB)
	MaxPeak (dBμV /m)	Average (dBμV /m)	Height (cm)	Polar (H/V)				
Low Channe: 2402MHz								
2402.000000	91.90	---	250.0	H	122.0	6.1	/	/
2402.000000	---	90.95	250.0	H	122.0	6.1	/	/
2402.000000	89.45	---	150.0	V	61.0	6.1	/	/
2402.000000	---	88.52	150.0	V	61.0	6.1	/	/
2390.000000	---	39.49	200.0	H	68.0	6.0	54.00	14.51
2390.000000	47.46	---	200.0	H	68.0	6.0	74.00	26.54
Middle Channel: 2440MHz								
2440.000000	95.74	---	200.0	H	70.0	6.2	/	/
2440.000000	---	94.82	200.0	H	70.0	6.2	/	/
2440.000000	93.30	---	250.0	V	182.0	6.2	/	/
2440.000000	---	92.47	250.0	V	182.0	6.2	/	/
High Channel: 2480MHz								
2480.000000	93.43	---	150.0	H	227.0	6.3	/	/
2480.000000	---	92.42	150.0	H	227.0	6.3	/	/
2480.000000	90.98	---	250.0	V	114.0	6.3	/	/
2480.000000	---	90.00	250.0	V	114.0	6.3	/	/
2483.500000	50.06	---	150.0	H	247.0	6.3	74.00	23.94
2483.500000	---	40.17	150.0	H	247.0	6.3	54.00	13.83

Conducted Spurious Emissions at Antenna Port

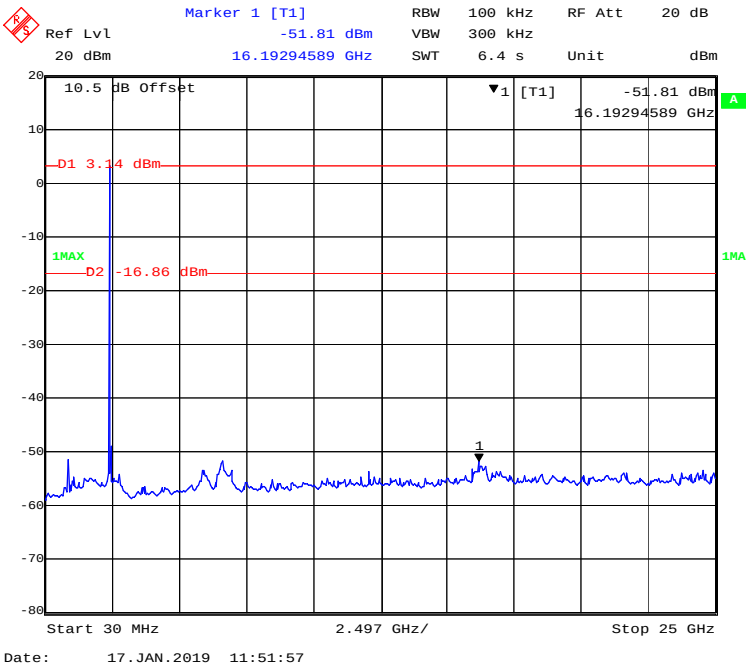
802.11b Mode Low Channel



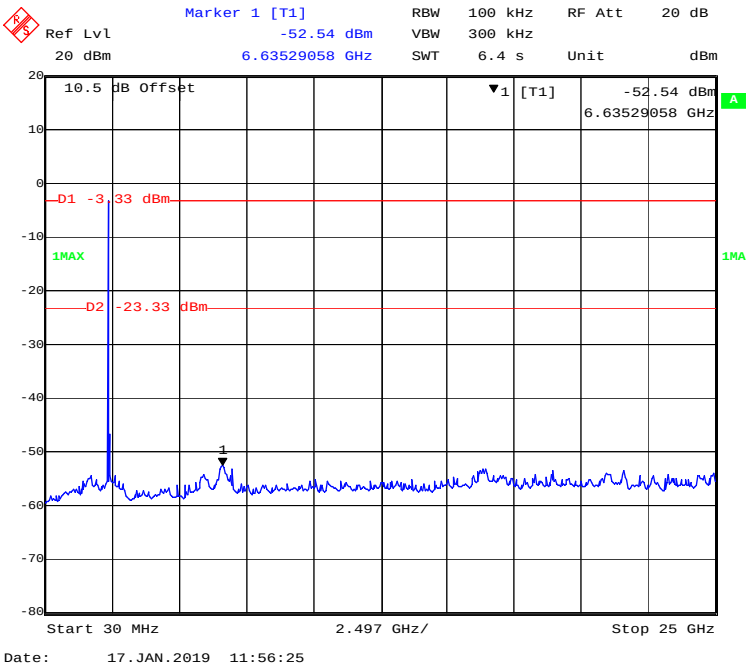
802.11b Mode Middle Channel



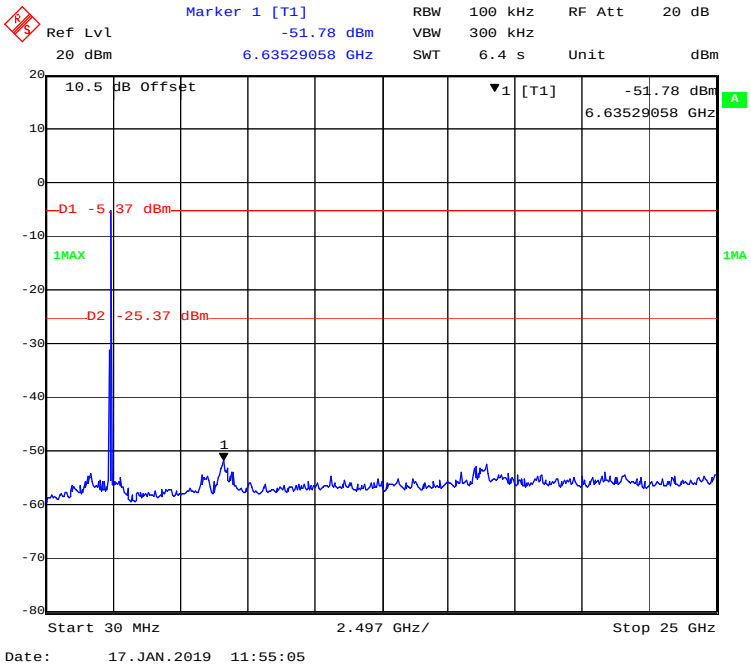
802.11b Mode High Channel



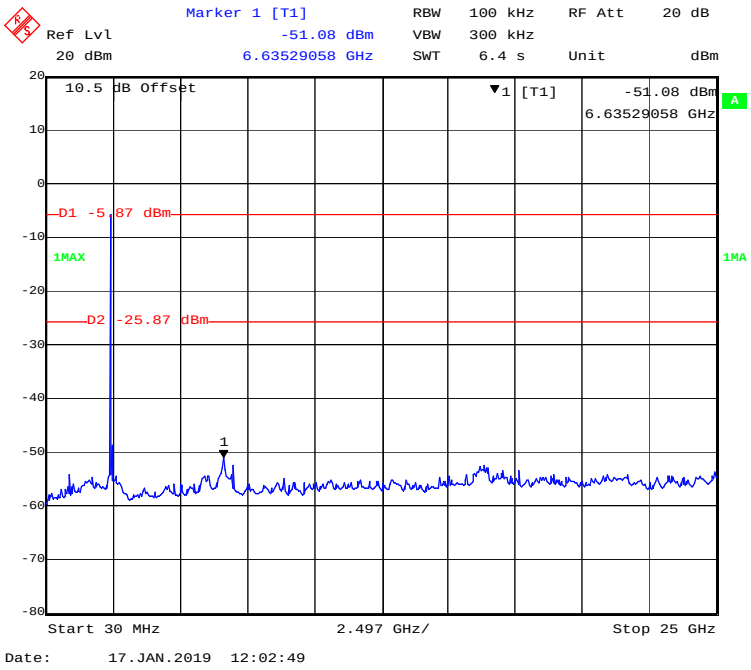
802.11g Mode Low Channel



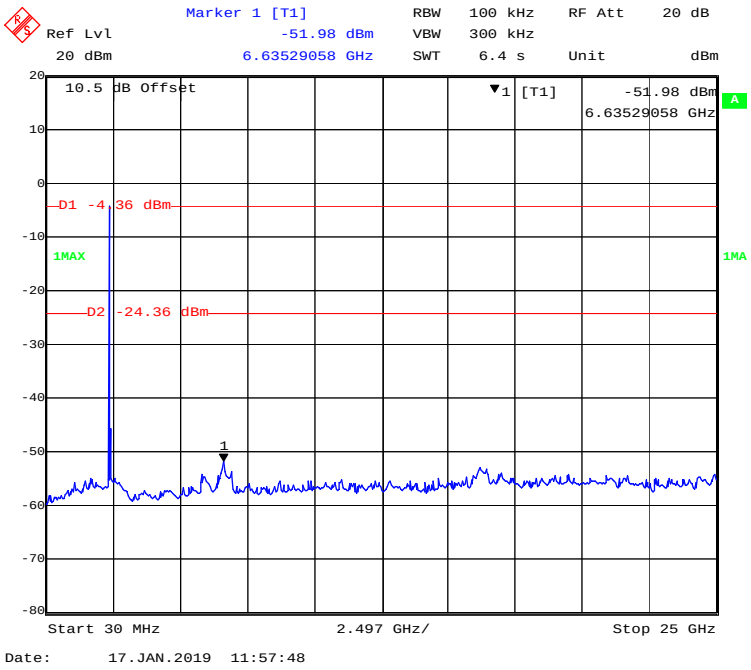
802.11g Mode Middle Channel



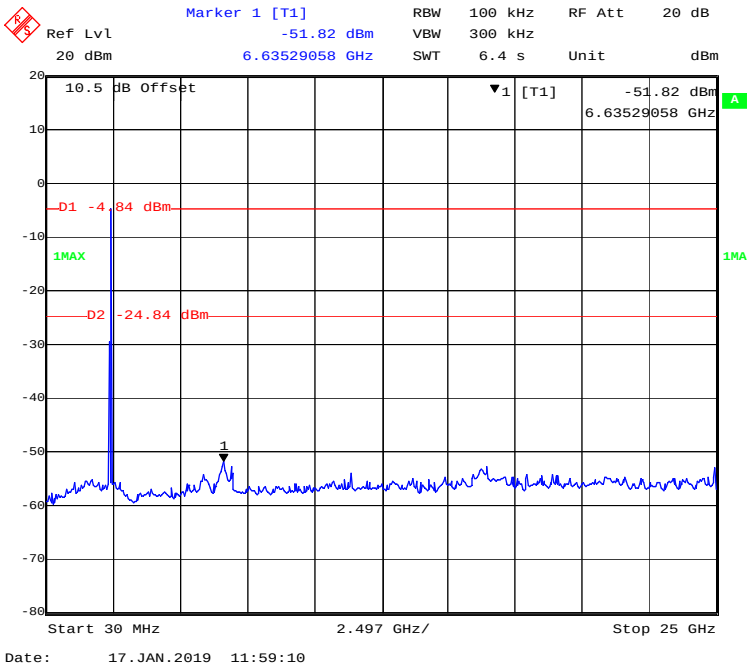
802.11g Mode High Channel



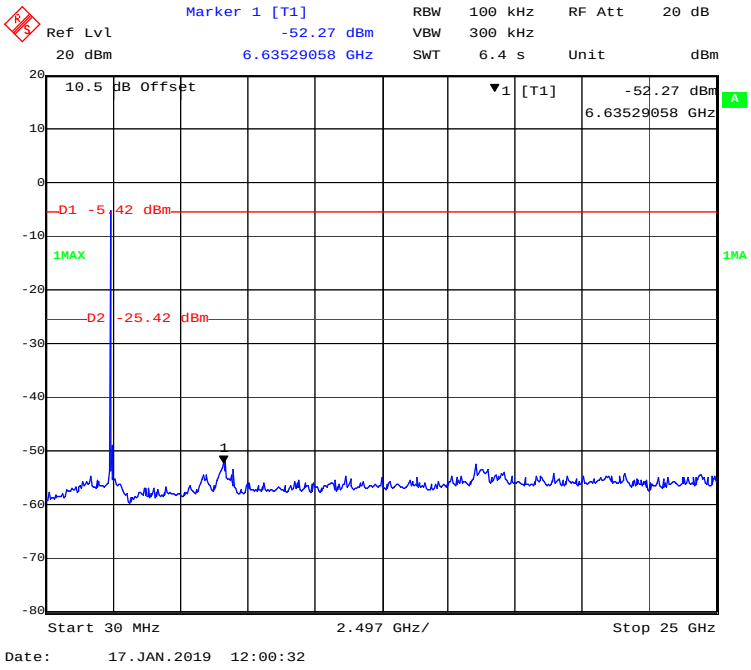
802.11n-HT20 Mode Low Channel



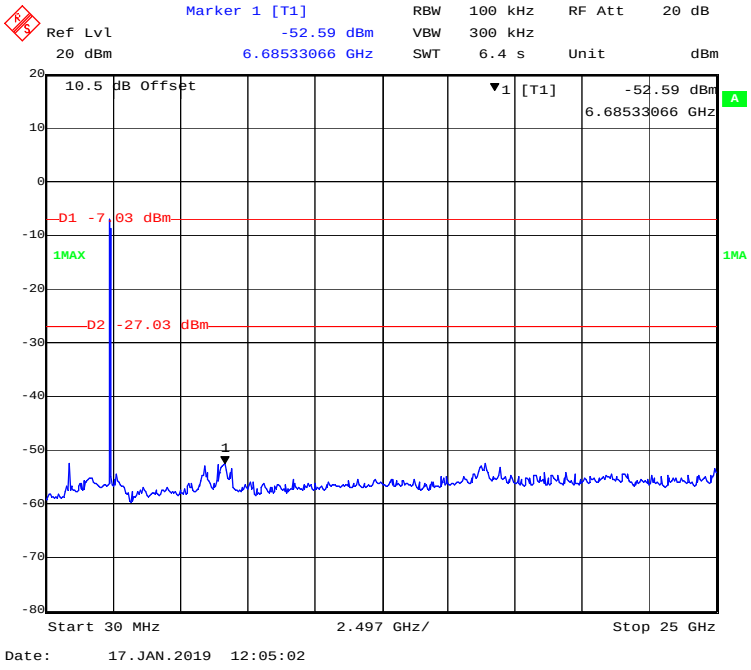
802.11n-HT20 Mode Middle Channel



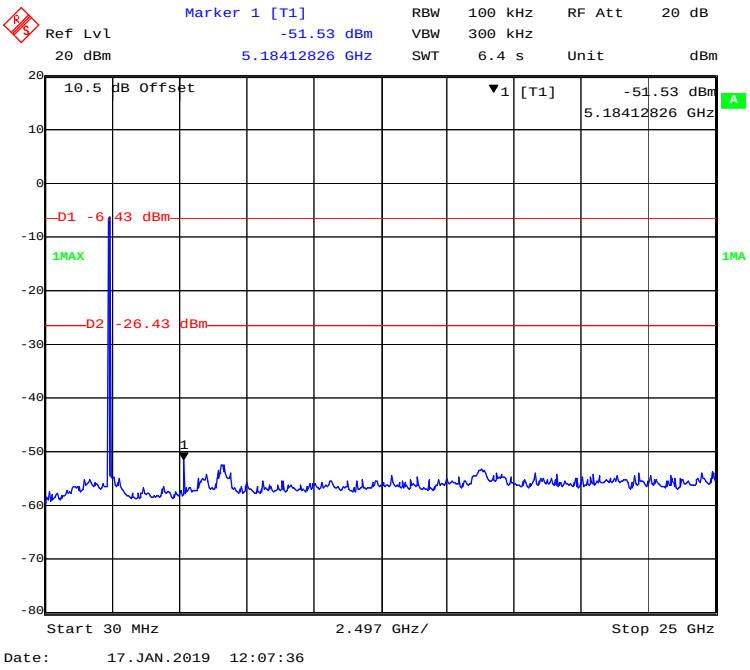
802.11n-HT20 Mode High Channel



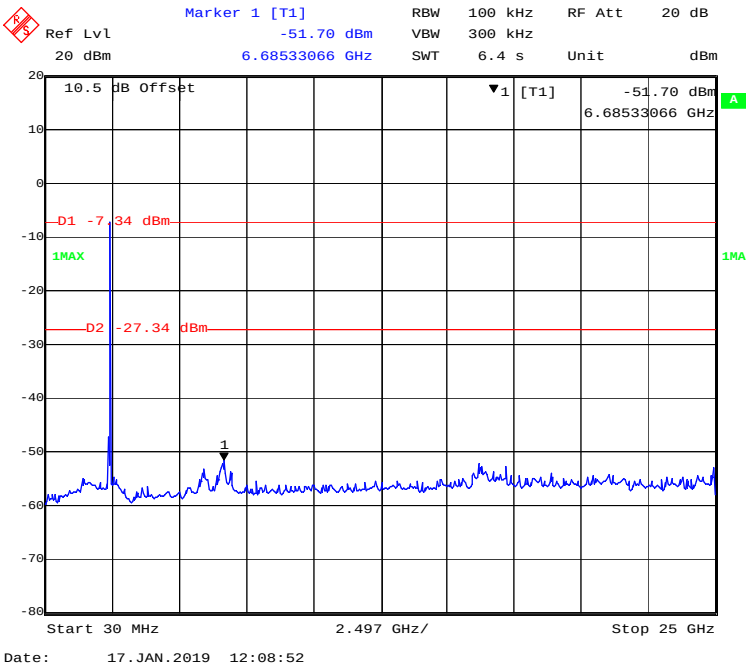
802.11n-HT40 Mode Low Channel



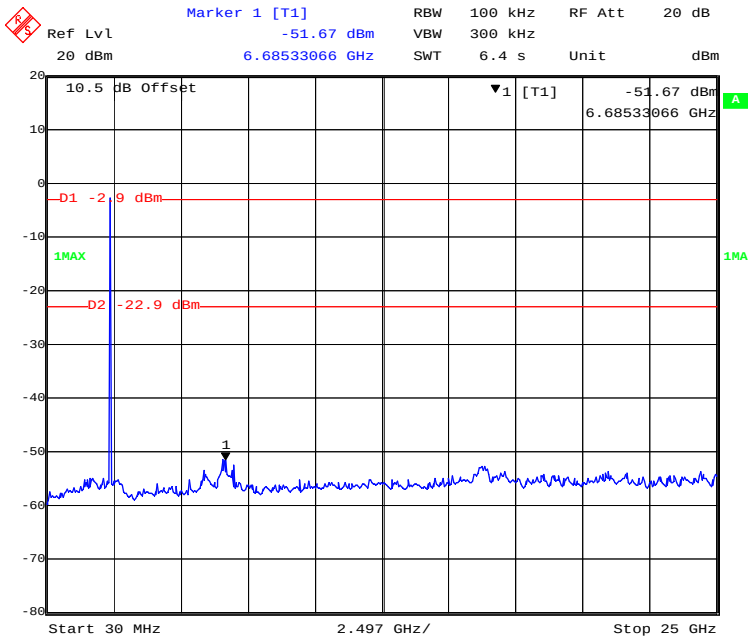
802.11n-HT40 Mode Middle Channel



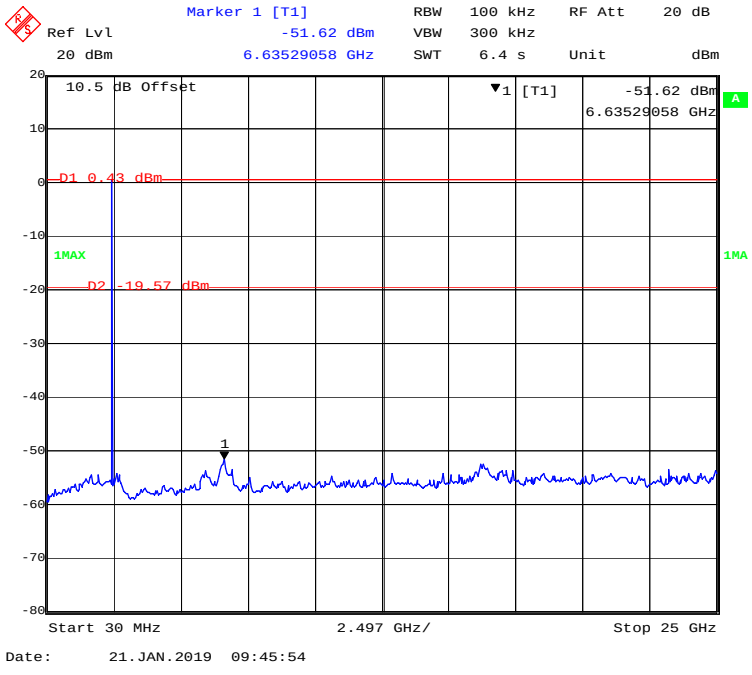
802.11n-HT40 Mode High Channel



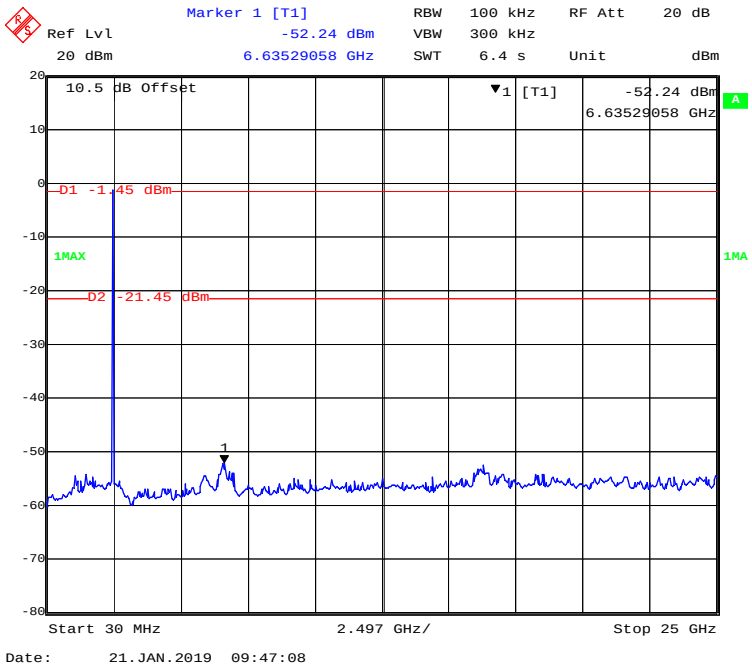
BLE Mode Low Channel



BLE Mode Middle Channel



BLE Mode High Channel



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

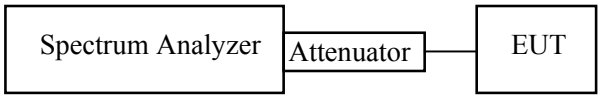
Applicable Standard

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

According to ANSI C63.10-2013 sub-clause 11.8.1

1. Set RBW = 100 kHz.
2. Set the video bandwidth (VBW) ≥ 3 x RBW.
3. Detector = Peak.
4. Trace mode = max hold.
5. Sweep = auto couple.
6. Allow the trace to stabilize.
7. 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 Data

Environmental Conditions

Temperature:	24.1-24.5 ℃
Relative Humidity:	48-50 %
ATM Pressure:	101.0-101.2kPa

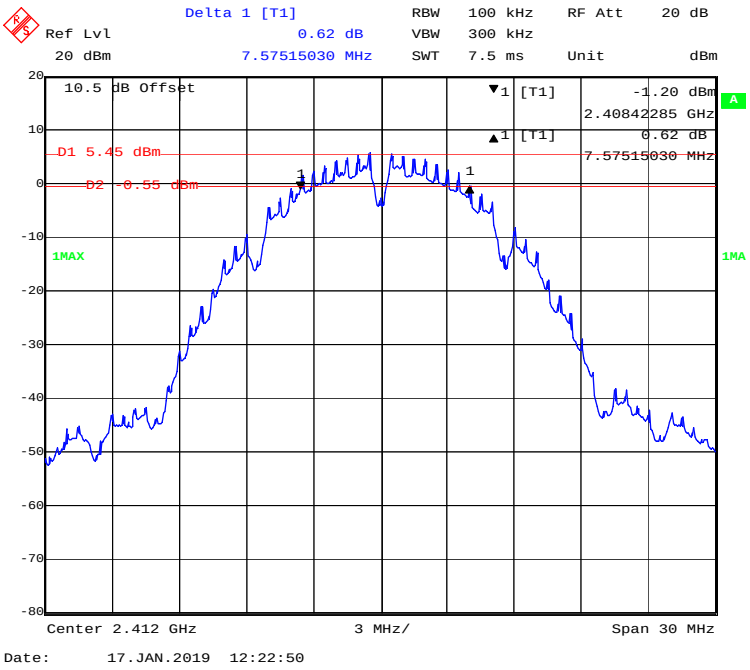
The testing was performed by Hope Zhang from 2019-01-17 to 2019-01-21.

Test Result: Compliant.

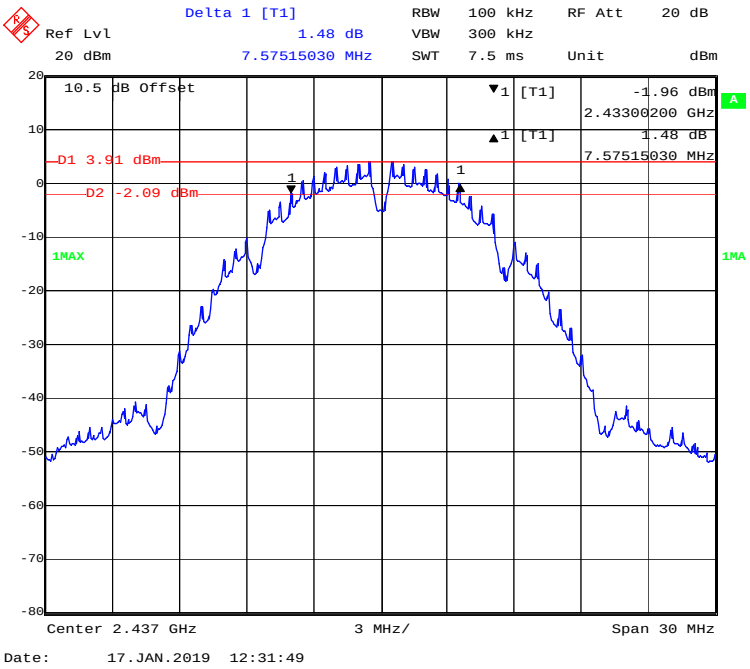
EUT operation mode: Transmitting

Channel	Frequency (MHz)	6 dB Emission Bandwidth (MHz)	Limit (MHz)
802.11b Mode			
1	2412	7.58	≥0.5
6	2437	7.58	≥0.5
11	2462	8.00	≥0.5
802.11g Mode			
1	2412	16.41	≥0.5
6	2437	16.53	≥0.5
11	2462	16.53	≥0.5
802.11n-HT20 Mode			
1	2412	17.49	≥0.5
6	2437	17.62	≥0.5
11	2462	17.62	≥0.5
802.11n-HT40 Mode			
3	2422	35.35	≥0.5
6	2437	35.47	≥0.5
9	2452	35.95	≥0.5
BLE Mode			
0	2402	0.739	≥0.5
19	2440	0.745	≥0.5
39	2480	0.739	≥0.5

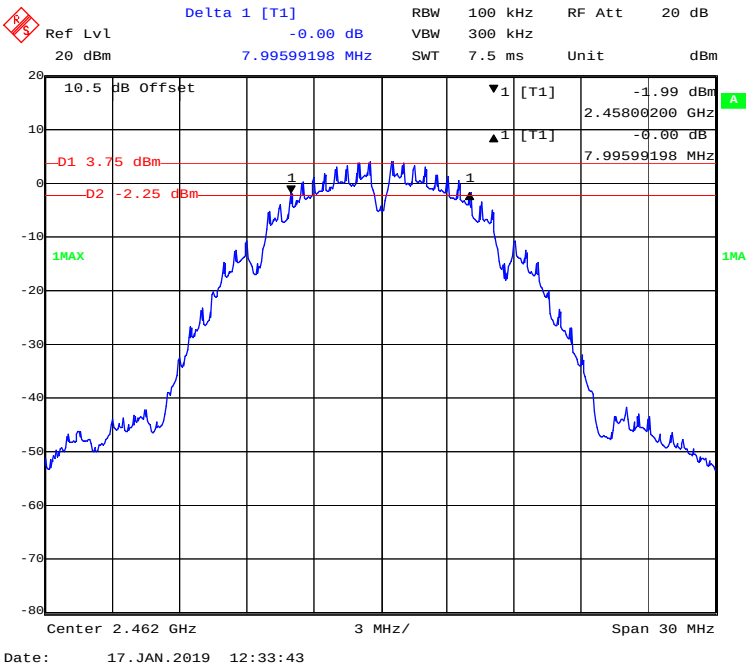
802.11b Mode Low Channel



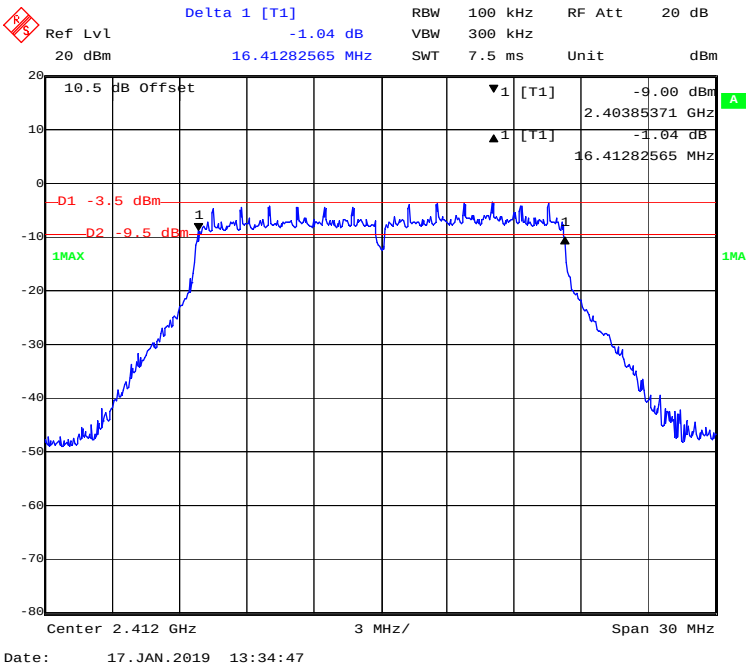
802.11b Mode Middle Channel



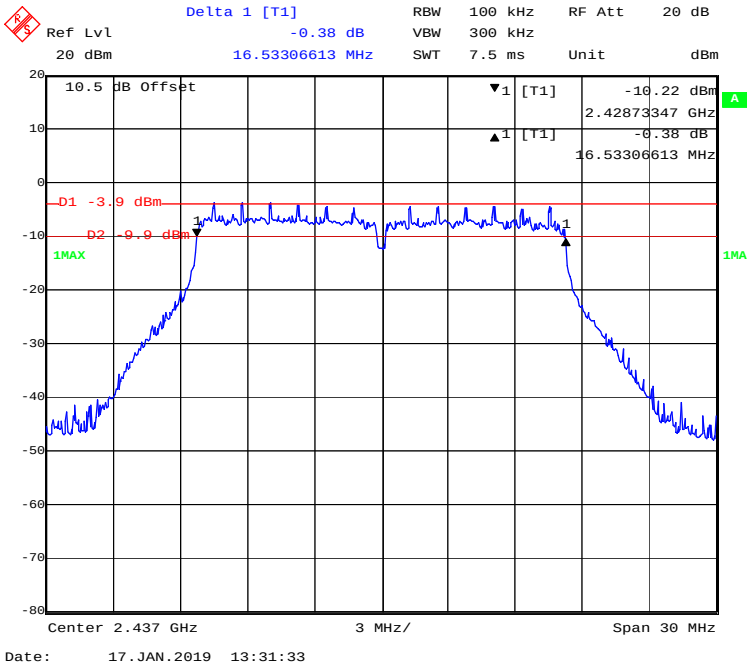
802.11b Mode High Channel



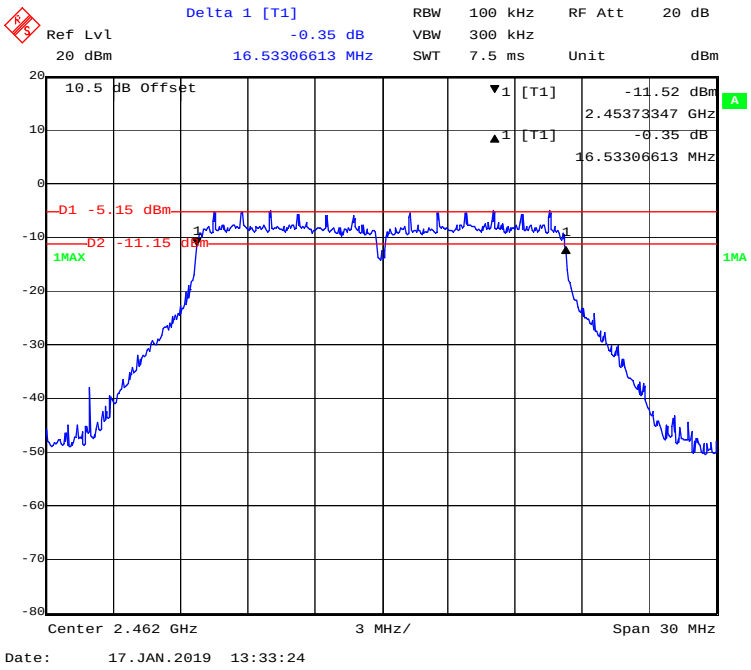
802.11g Mode Low Channel



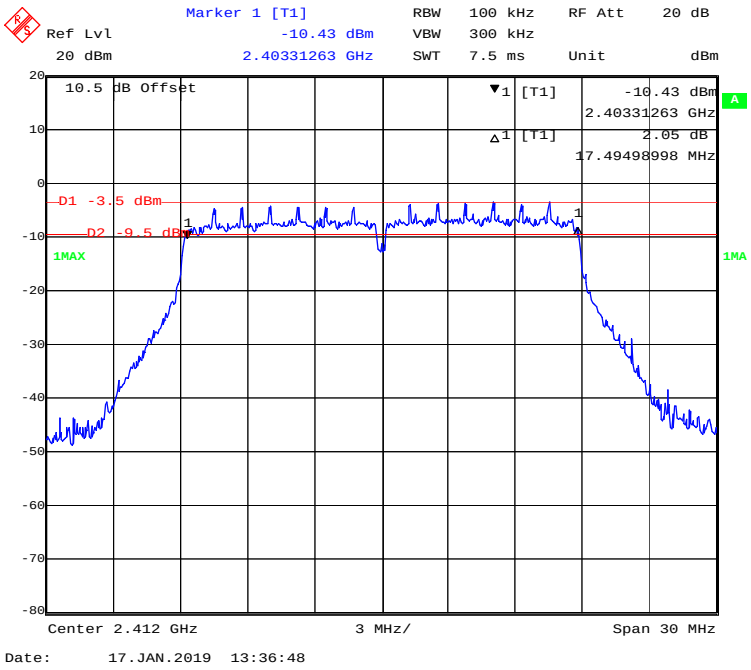
802.11g Mode Middle Channel



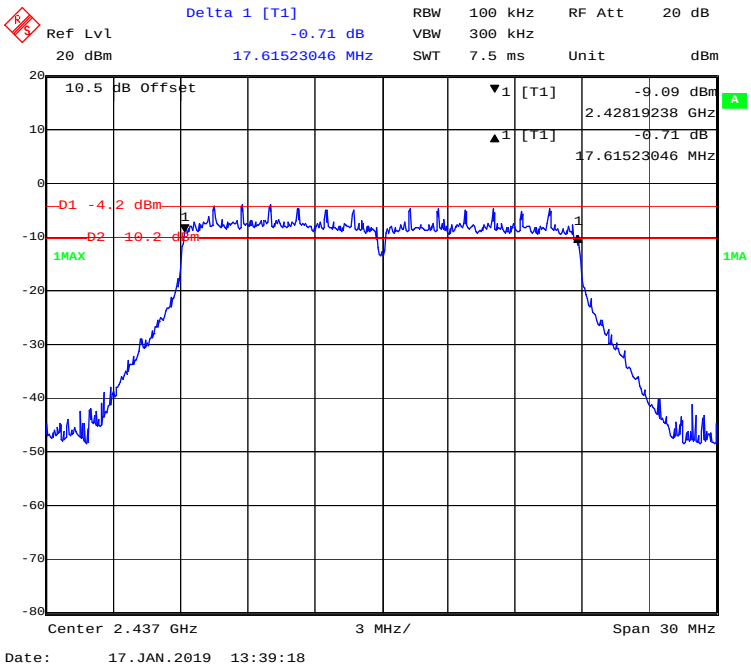
802.11g Mode High Channel



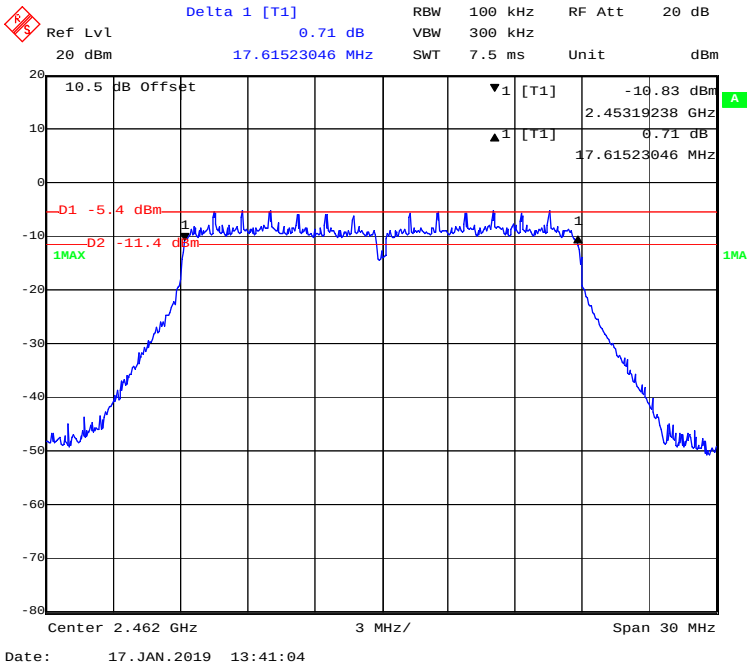
802.11n-HT20 Mode Low Channel



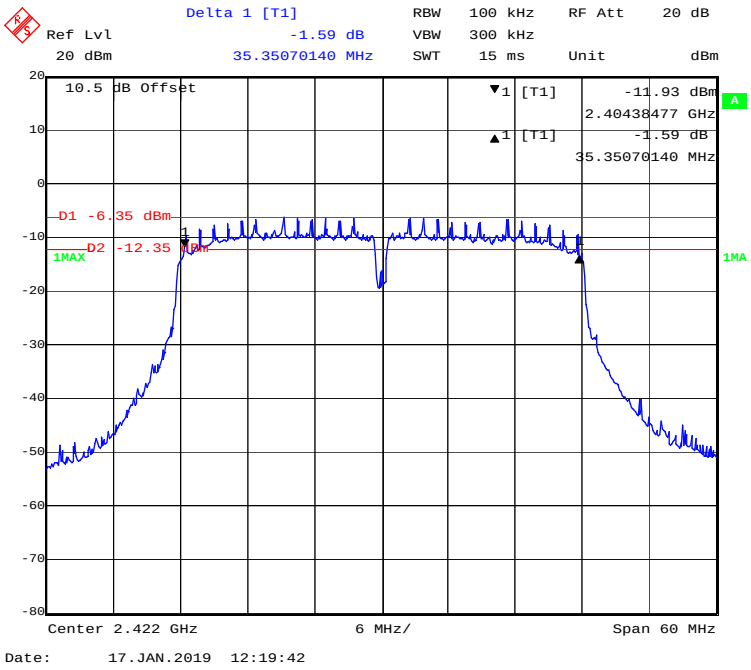
802.11n-HT20 Mode Middle Channel



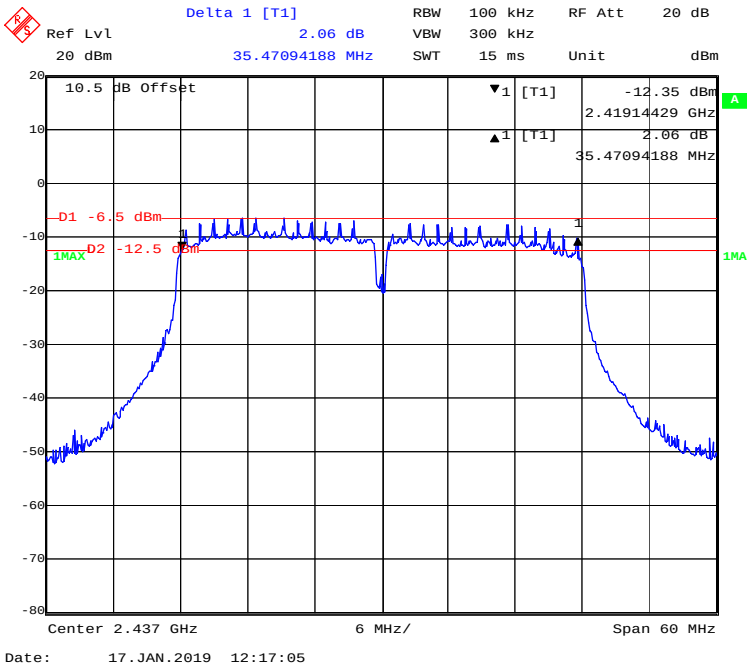
802.11n-HT20 Mode High Channel



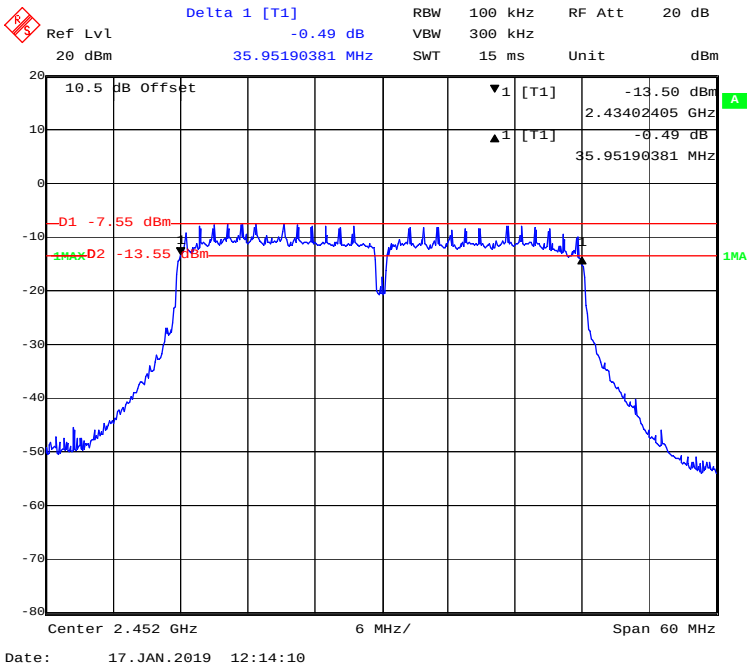
802.11n-HT40 Mode Low Channel



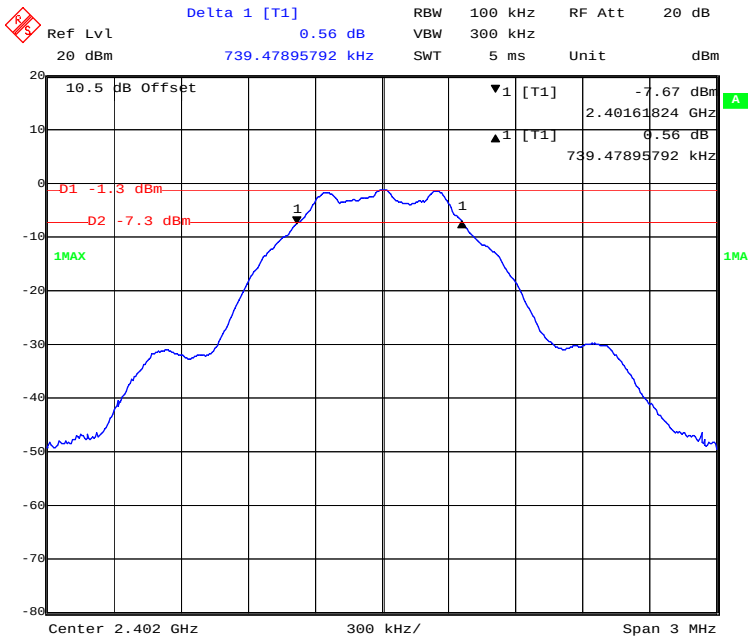
802.11n-HT40 Mode Middle Channel



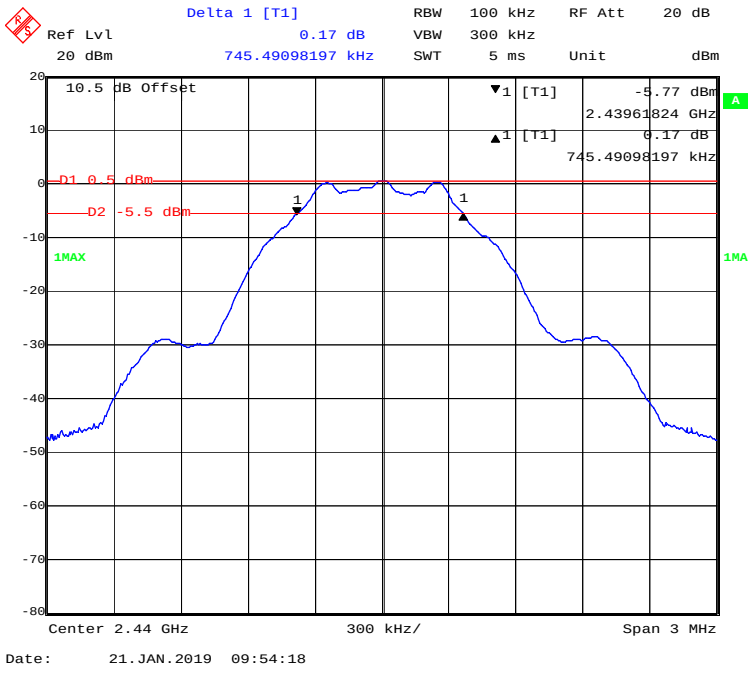
802.11n-HT40 Mode High Channel



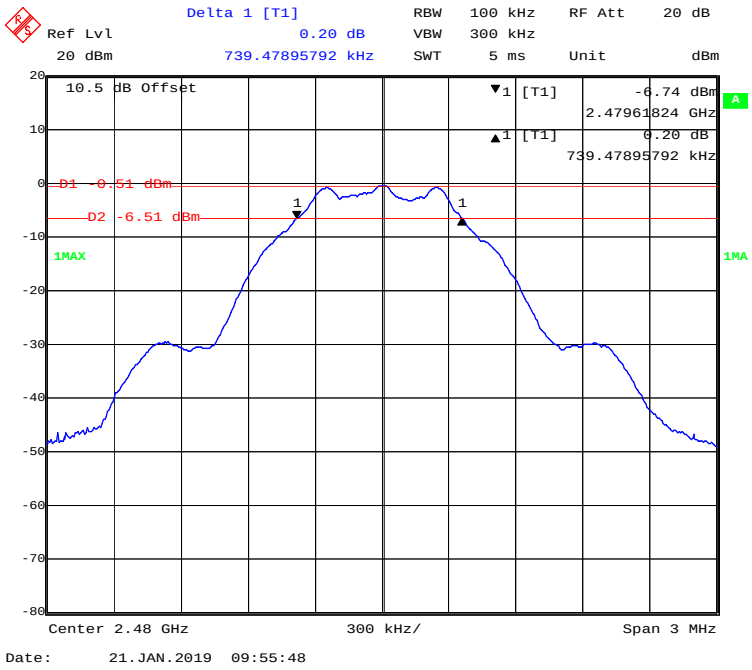
BLE Mode Low Channel



BLE Mode Middle Channel



BLE Mode High Channel



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

Applicable Standard

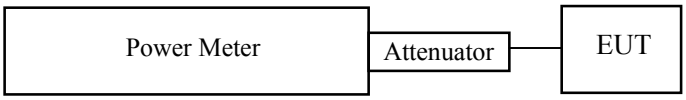
According to FCC §15.247(b) (3), for systems using digital modulation in the 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz bands: 1 Watt. As an alternative to a peak power measurement, Compliance with the one Watt limit can be based on a measurement of the maximum conducted output power. Maximum Conducted 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

For Wi-Fi:

According to ANSI C63.10-2013 sub-clause 11.9.1.3

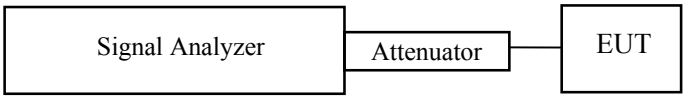
The maximum peak conducted output power may be measured using a broadband peak RF power meter. The power meter shall have a video bandwidth that is greater than or equal to the DTS bandwidth and shall use a fast-responding diode detector.



For BLE:

According to ANSI C63.10-2013 sub-clause 11.9.1.1

1. Set the RBW ≥ DTS bandwidth.
2. Set VBW ≥ 3 x RBW.
3. Set span ≥ 3 x RBW
4. Sweep time = auto couple.
5. Detector = peak.
6. Trace mode = max hold.
7. Allow trace to fully stabilize.
8. Use peak marker function to determine the peak amplitude level.



Test Data

Environmental Conditions

Temperature:	24.1 ℃
Relative Humidity:	50 %
ATM Pressure:	101.2kPa

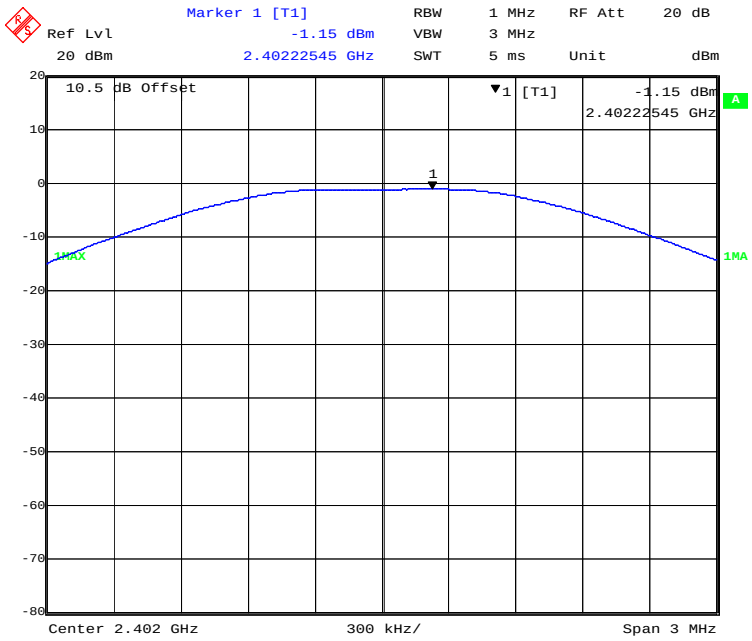
The testing was performed by Hope Zhang on 2019-01-21.

Test Result: Compliant.

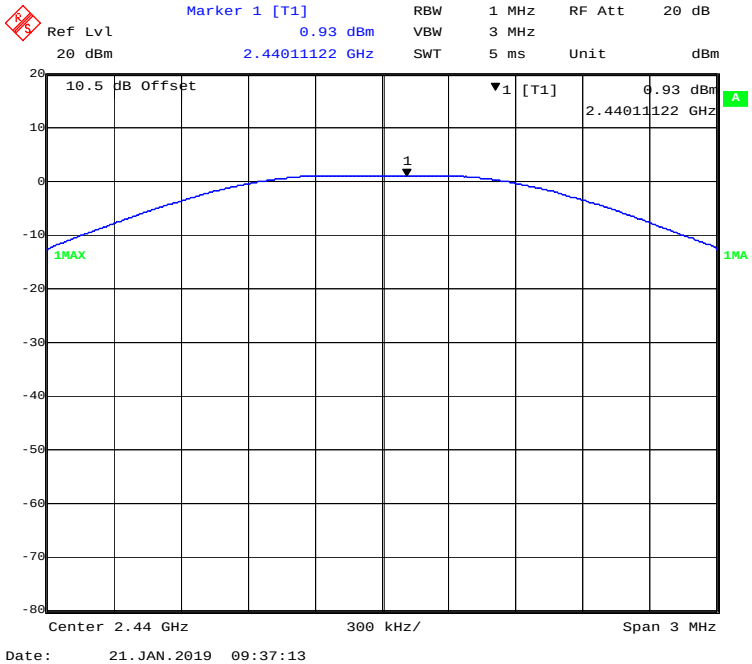
EUT operation mode: Transmitting

Channel	Frequency (MHz)	Max Conducted Peak Output Power (dBm)	Limit (dBm)	Result
802.11b Mode				
Low	2412	17.33	30	Pass
Middle	2437	15.09	30	Pass
High	2462	15.20	30	Pass
802.11g Mode				
Low	2412	16.08	30	Pass
Middle	2437	15.58	30	Pass
High	2462	15.02	30	Pass
802.11n-HT20 Mode				
Low	2412	16.23	30	Pass
Middle	2437	15.74	30	Pass
High	2462	15.01	30	Pass
802.11n-HT40 Mode				
Low	2422	16.20	30	Pass
Middle	2437	15.87	30	Pass
High	2452	14.90	30	Pass
BLE Mode				
Low	2402	-1.15	30	Pass
Middle	2440	0.93	30	Pass
High	2480	-0.16	30	Pass

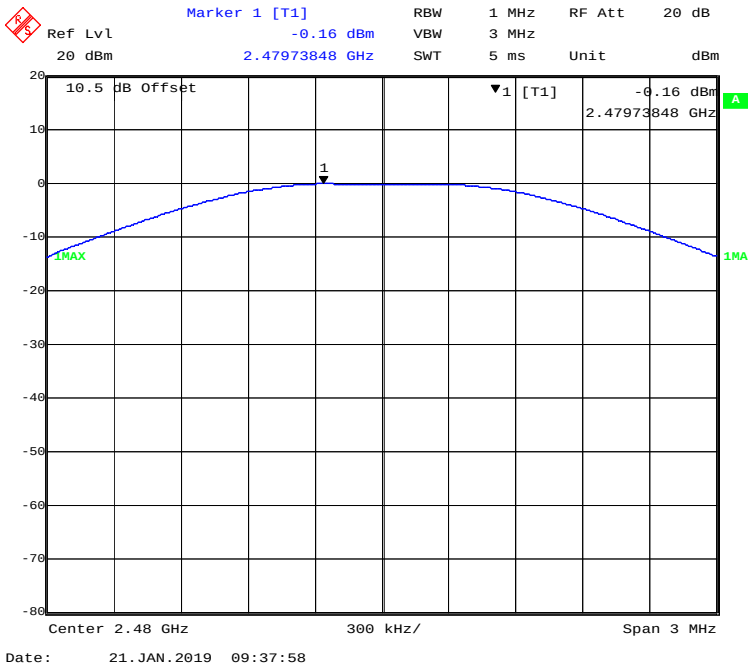
BLE Mode Low Channel



BLE Mode Middle Channel



BLE Mode High Channel



FCC §15.247(d) – BAND EDGE

Applicable Standard

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

Test Procedure

According to ANSI C63.10-2013 sub-clause 6.10.

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 Data

Environmental Conditions

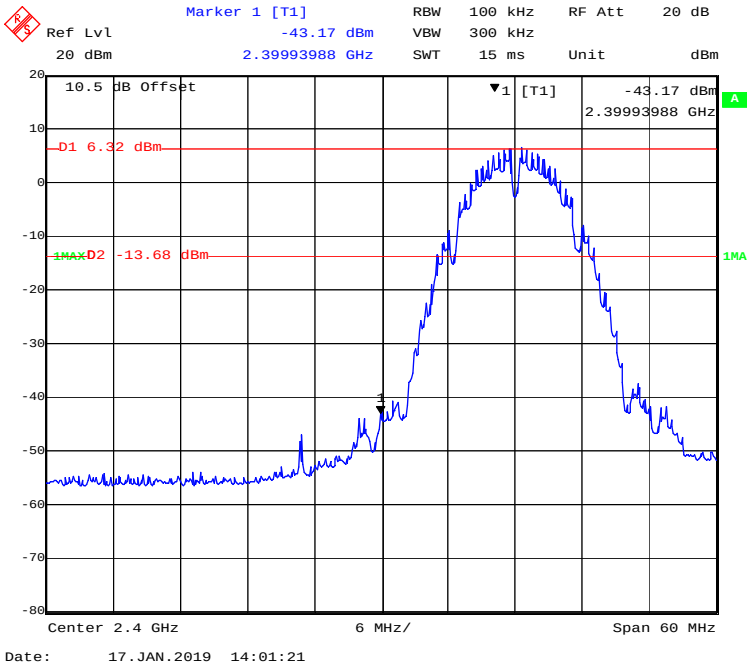
Temperature:	24.1-24.8 ℃
Relative Humidity:	48-50 %
ATM Pressure:	101.0-101.2kPa

The testing was performed by Hope Zhang from 2019-01-17 to 2019-01-21.

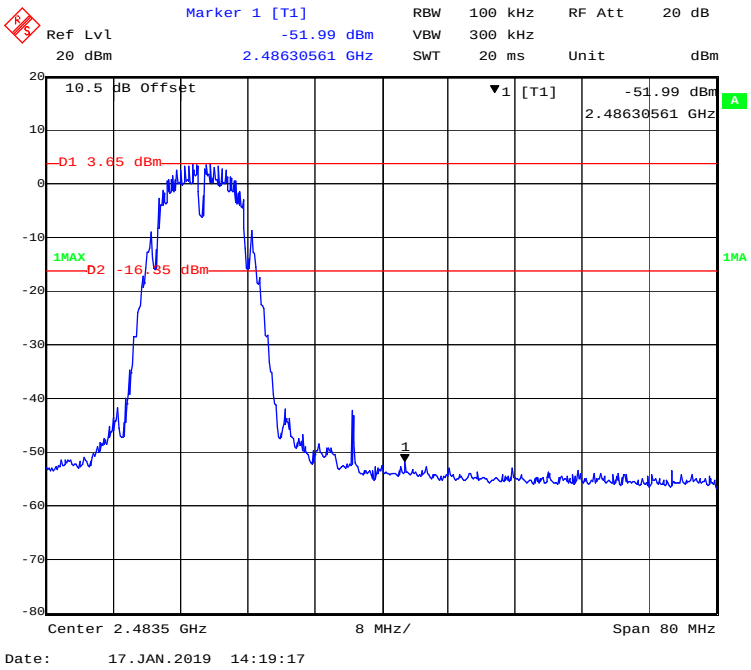
Test Result: Compliant.

EUT operation mode: Transmitting

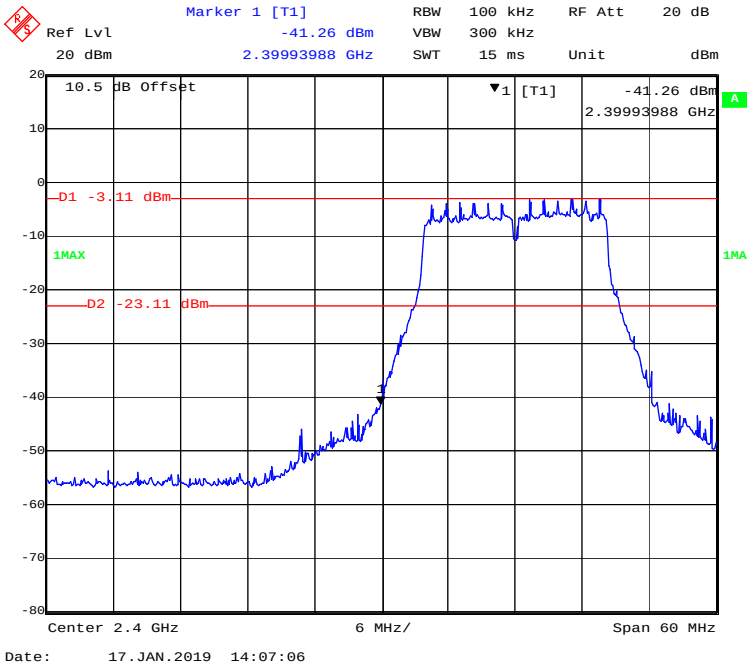
802.11b Mode Left Side



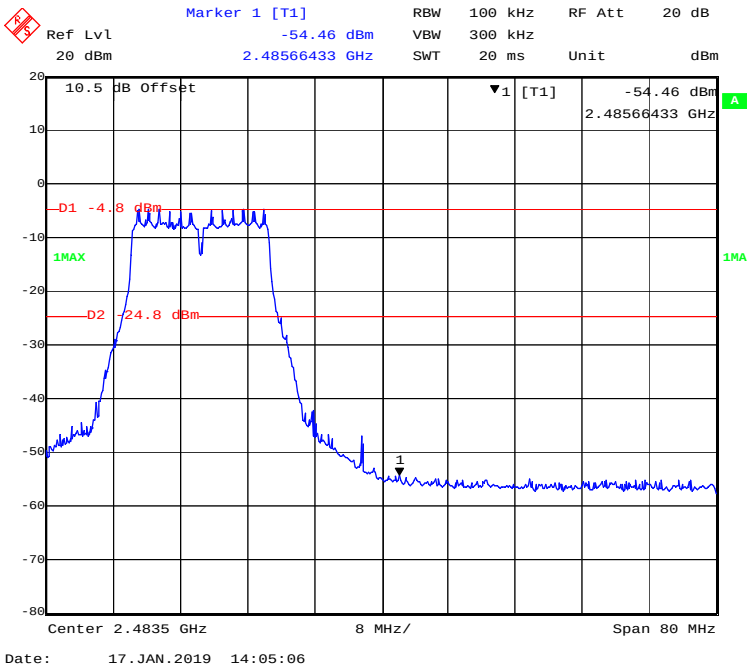
802.11b Mode Right Side



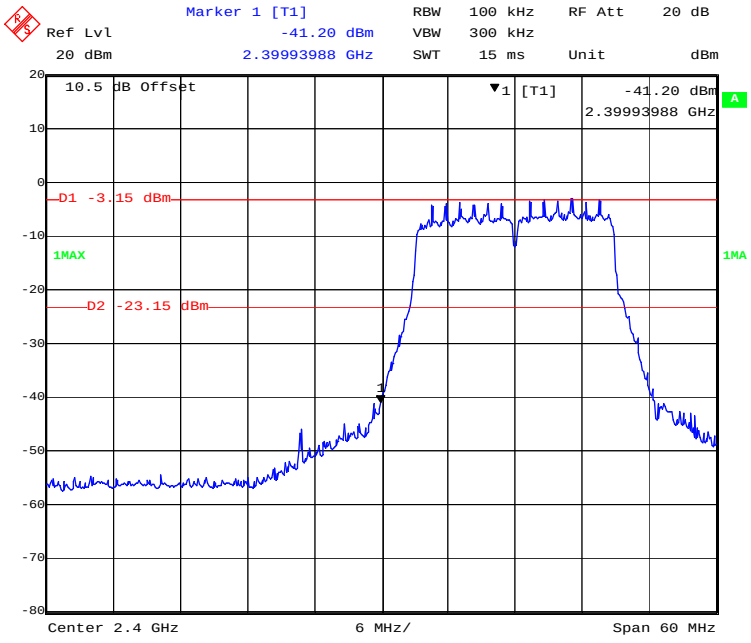
802.11g Mode Left Side



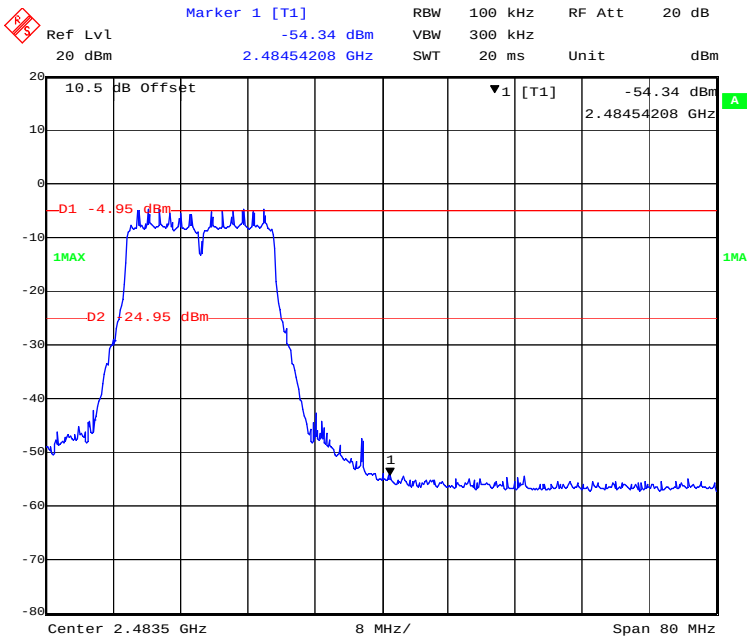
802.11g Mode Right Side



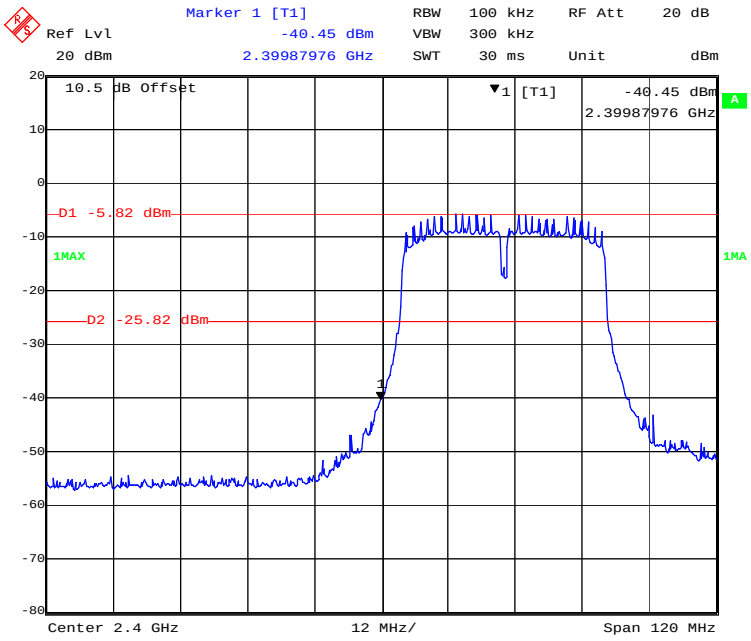
802.11n-HT20 Mode Left Side



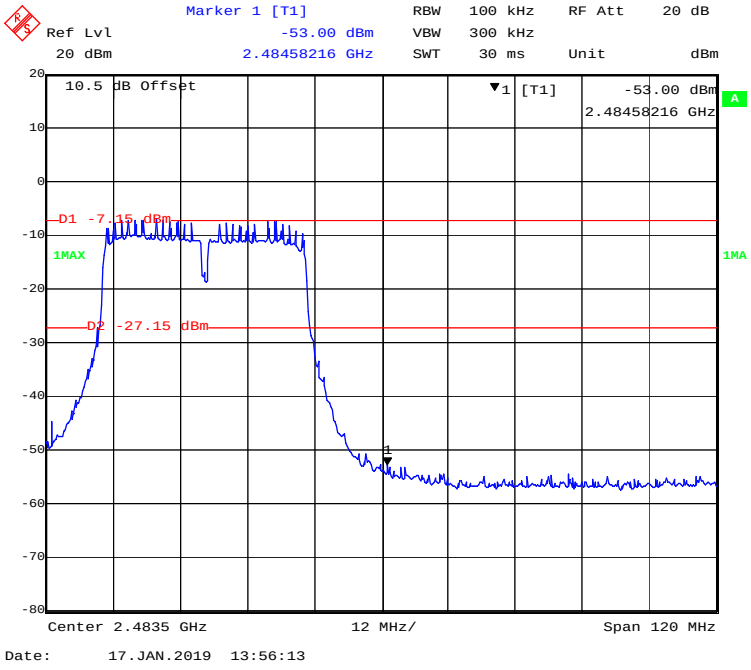
802.11n-HT20 Mode Right Side



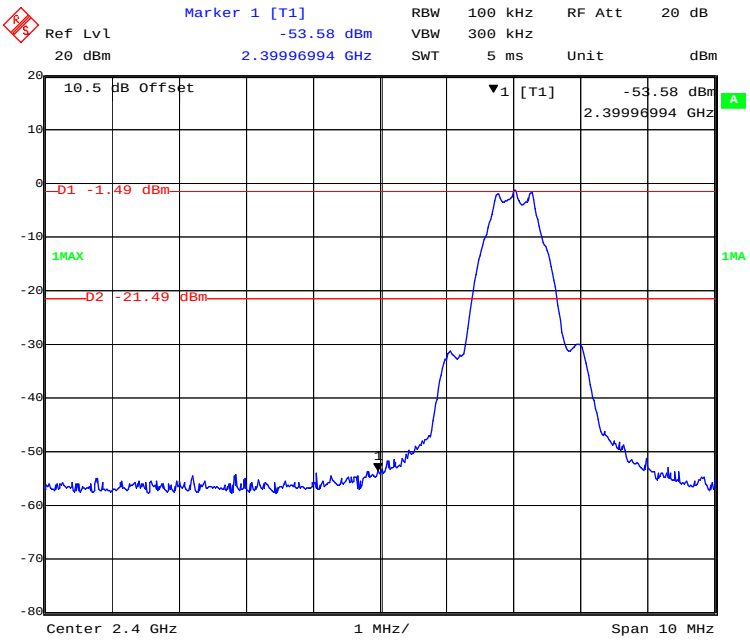
802.11n-HT40 Mode Left Side



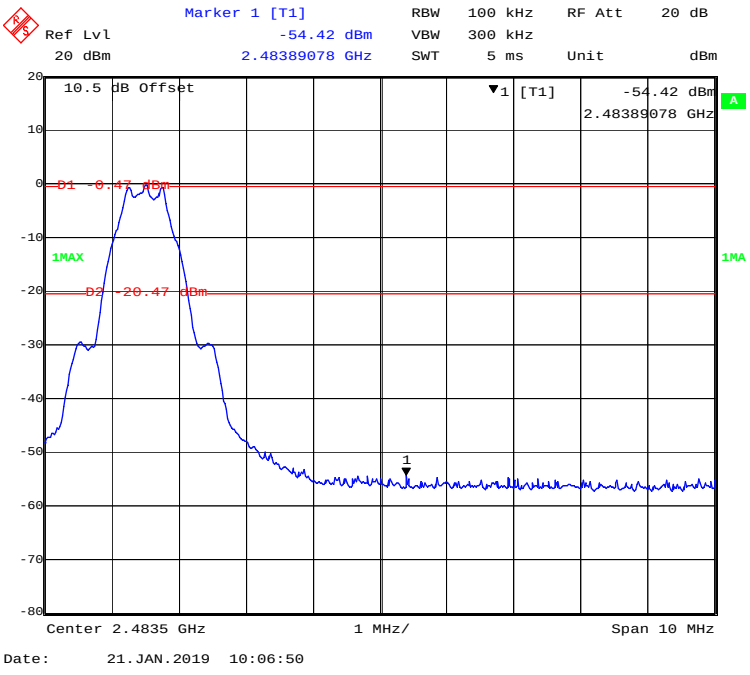
802.11n-HT40 Mode Right Side



BLE Mode Left Side



BLE Mode 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

According to ANSI C63.10-2013 sub-clause 11.10.2

The following procedure shall be used if maximum peak conducted output power was used to determine compliance, and it is optional if the maximum conducted (average) output power was used to determine compliance:

1. Set the RBW to: 3kHz≤ RBW≤100 kHz.
2. Set the VBW ≥ 3xRBW.
3. Set the span to 1.5 times the DTS bandwidth.
4. Detector = peak.
5. Sweep time = auto couple.
6. Trace mode = max hold.
7. Allow trace to fully stabilize.
8. Use the peak marker function to determine the maximum amplitude level within the RBW.
9. If measured value exceeds limit, reduce RBW (no less than 3 kHz) and repeat.

Test Data

Environmental Conditions

Temperature:	24.1-24.8 ℃
Relative Humidity:	48-50 %
ATM Pressure:	101.0-101.2kPa

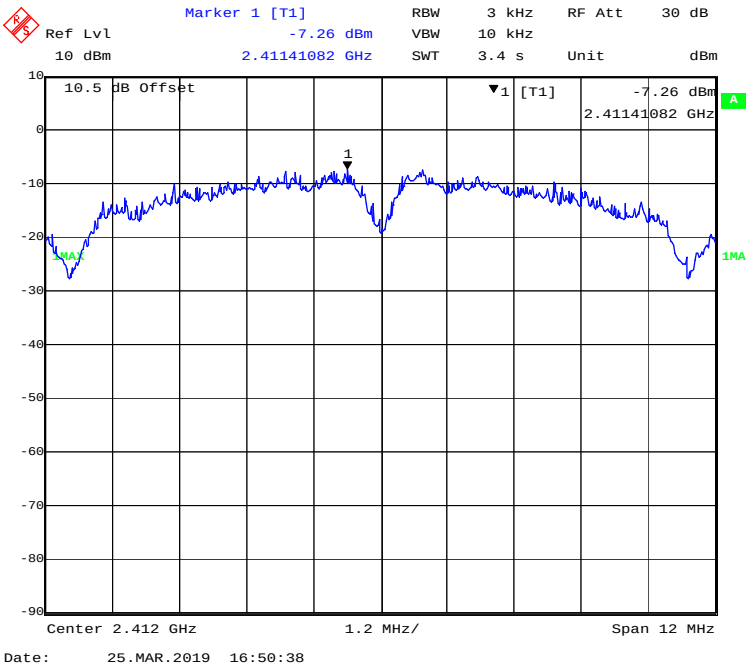
The testing was performed by Hope Zhang from 2019-01-17 to 2019-03-25.

Test Result: Compliant.

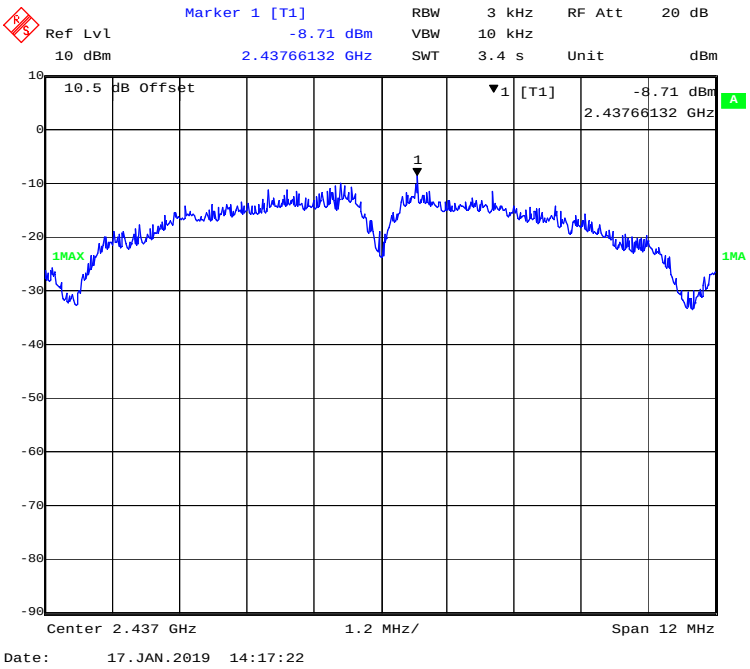
EUT operation mode: Transmitting

Channel	Frequency (MHz)	PSD (dBm/3kHz)	Limit (dBm/3kHz)
802.11b mode			
Low	2412	-7.26	≤8
Middle	2437	-8.71	≤8
High	2462	-8.75	≤8
802.11g mode			
Low	2412	-17.28	≤8
Middle	2437	-17.99	≤8
High	2462	-18.62	≤8
802.11n-HT20 mode			
Low	2412	-16.98	≤8
Middle	2437	-17.78	≤8
High	2462	-18.80	≤8
802.11n-HT40 mode			
Low	2422	-20.71	≤8
Middle	2437	-20.00	≤8
High	2452	-20.87	≤8
BLE mode			
Low	2402	-16.47	≤8
Middle	2440	-14.15	≤8
High	2480	-15.16	≤8

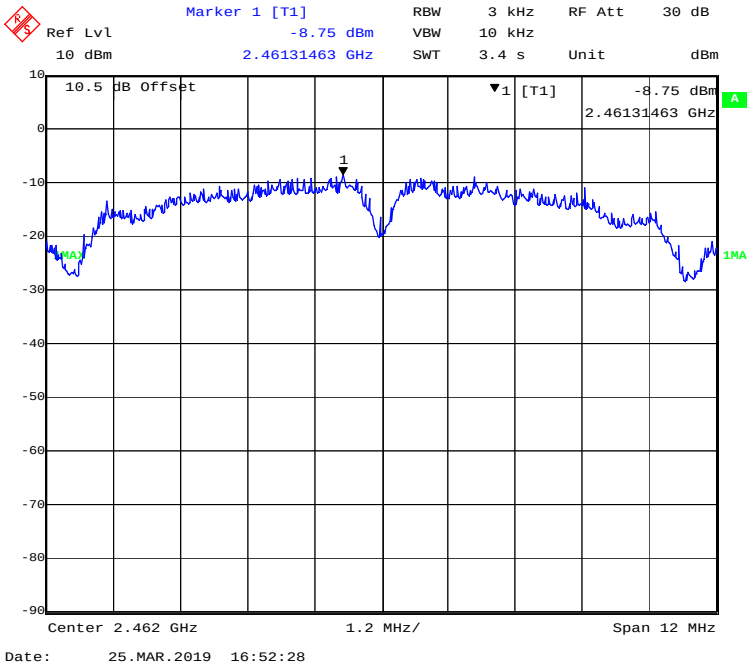
802.11b Mode Low Channel



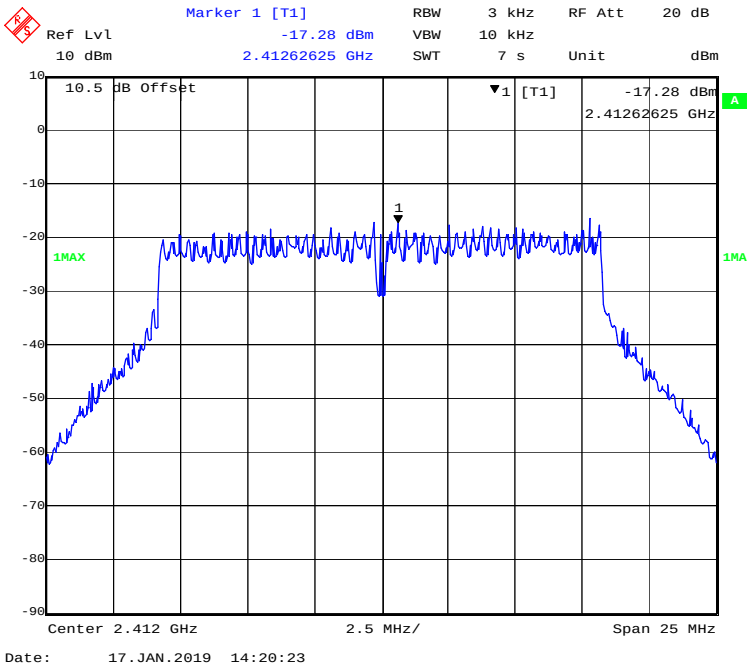
802.11b Mode Middle Channel



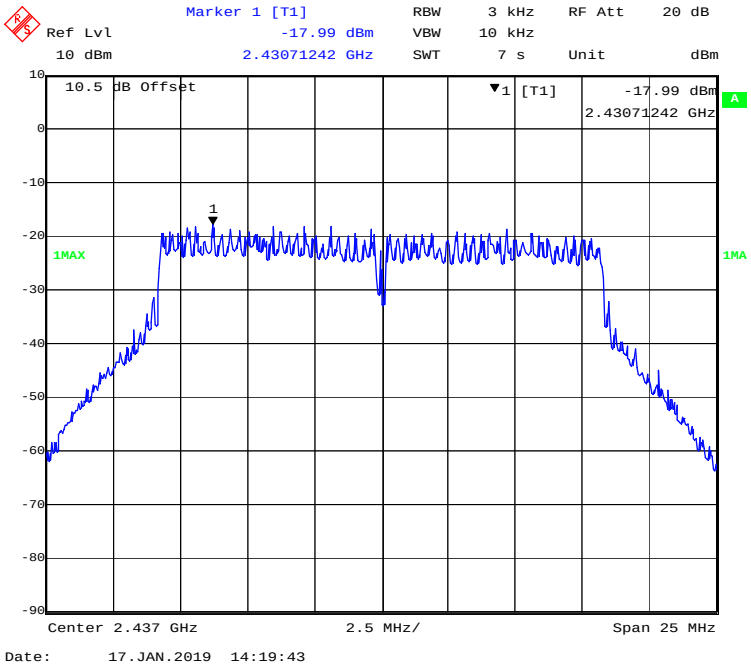
802.11b Mode High Channel



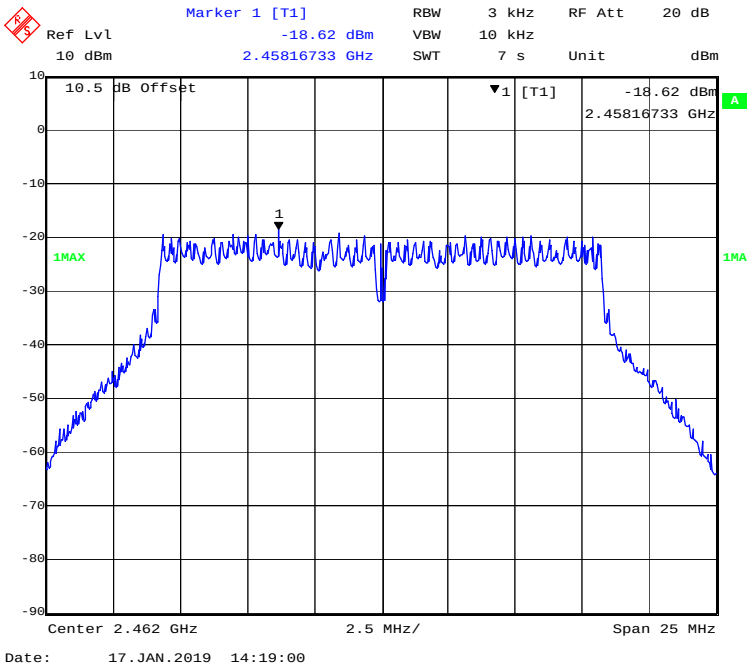
802.11g Mode Low Channel



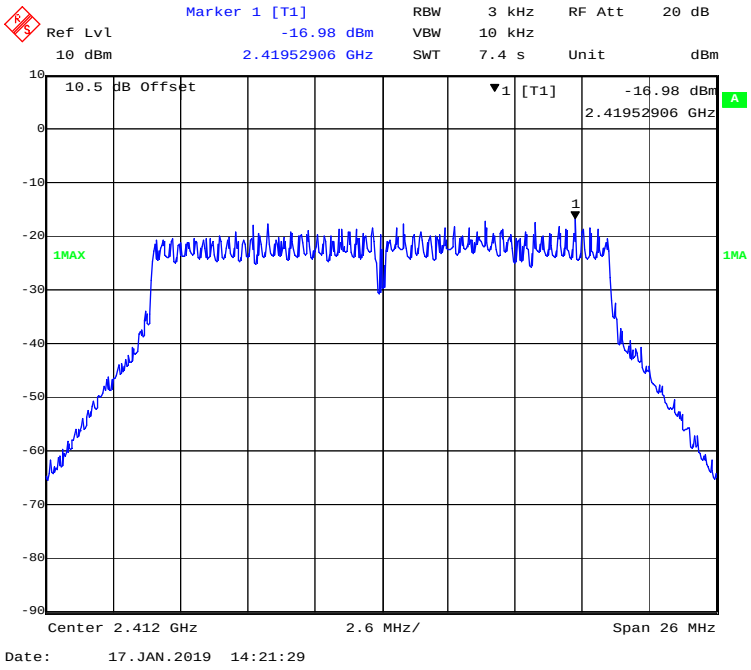
802.11g Mode Middle Channel



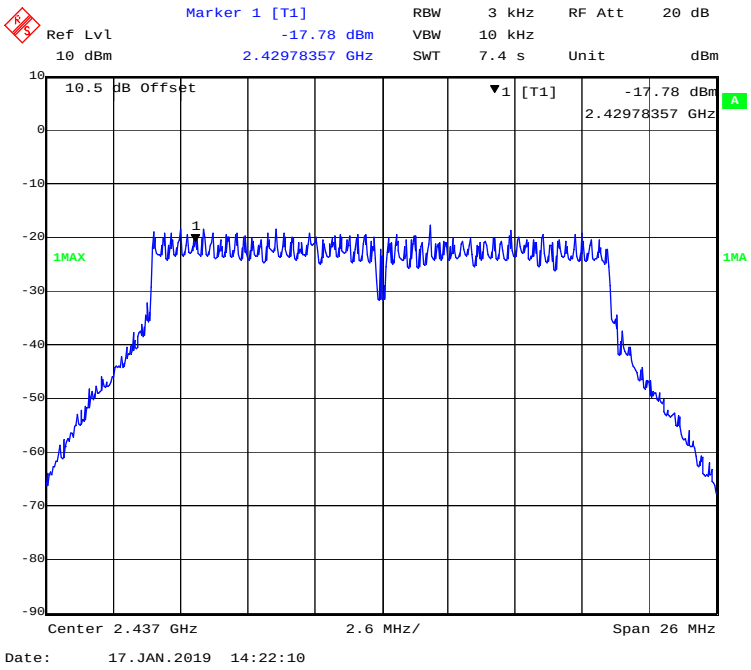
802.11g Mode High Channel



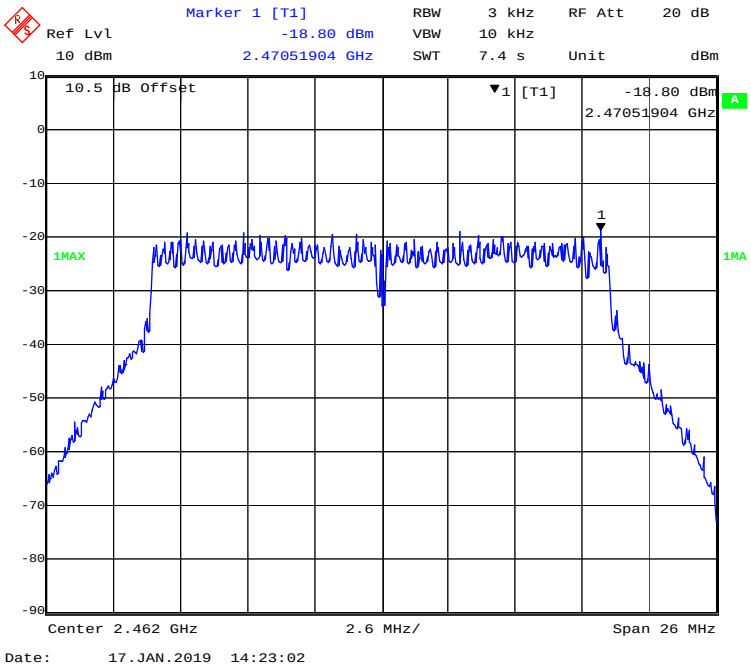
802.11n-HT20 Mode Low Channel



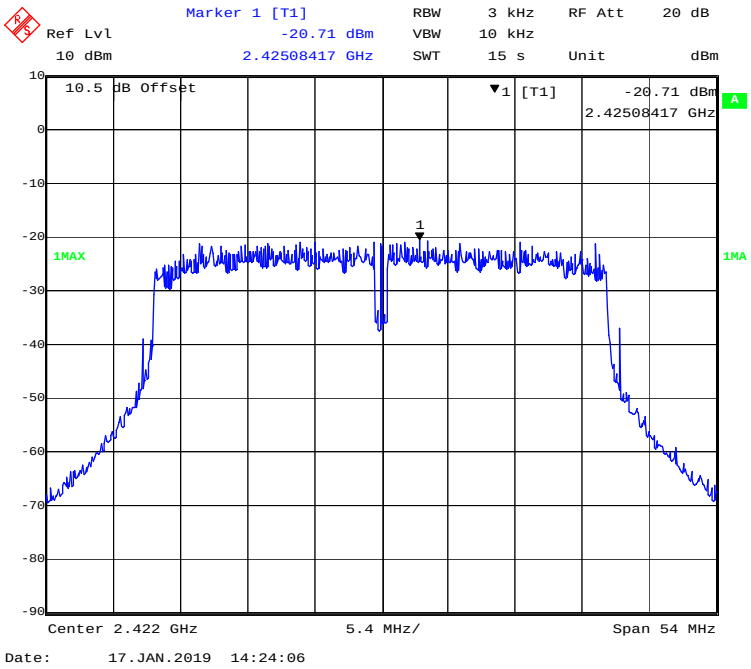
802.11n-HT20 Mode Middle Channel



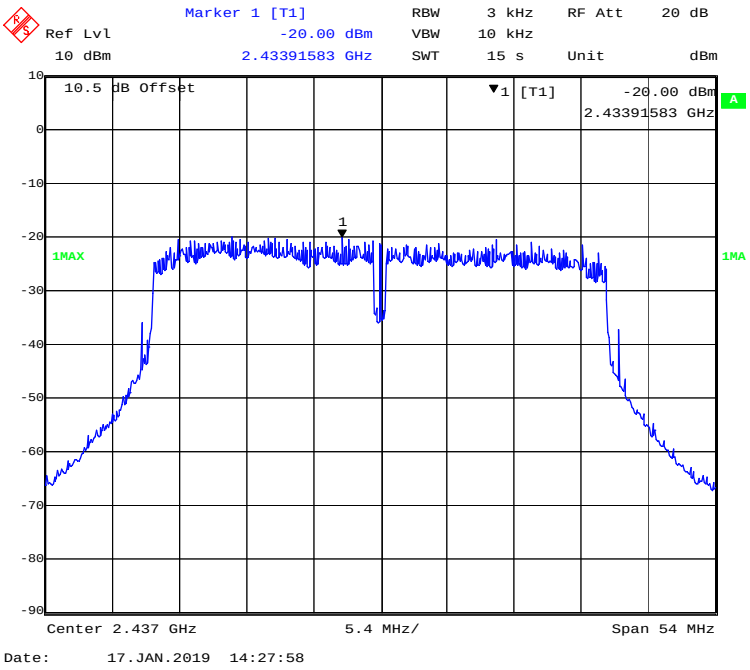
802.11n-HT20 Mode High Channel



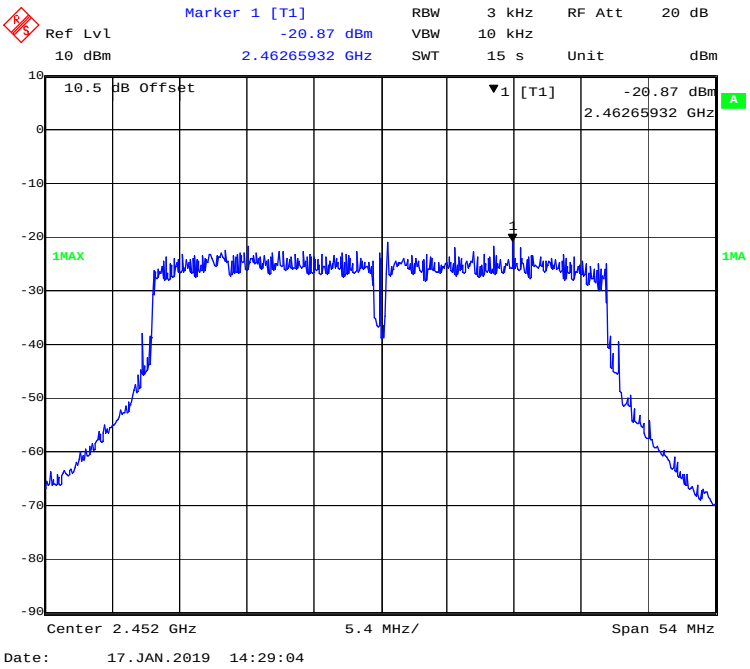
802.11n-HT40 Mode Low Channel



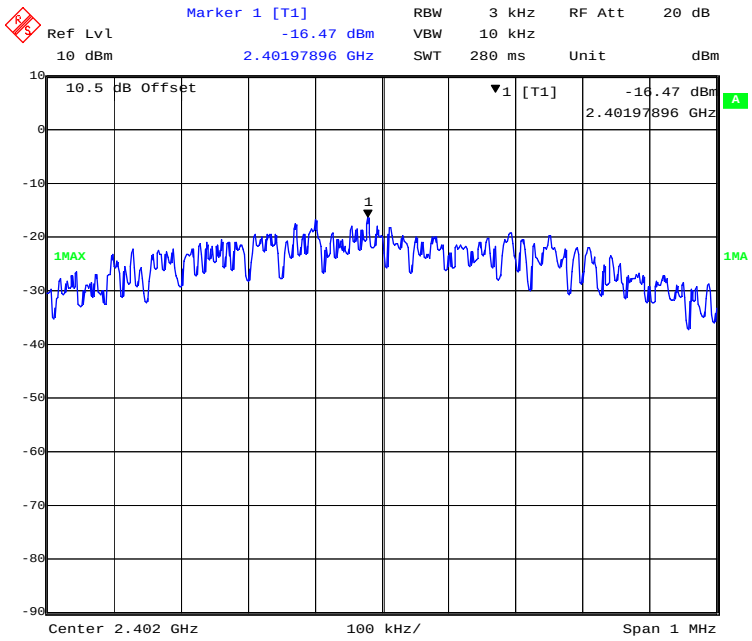
802.11n-HT40 Mode Middle Channel



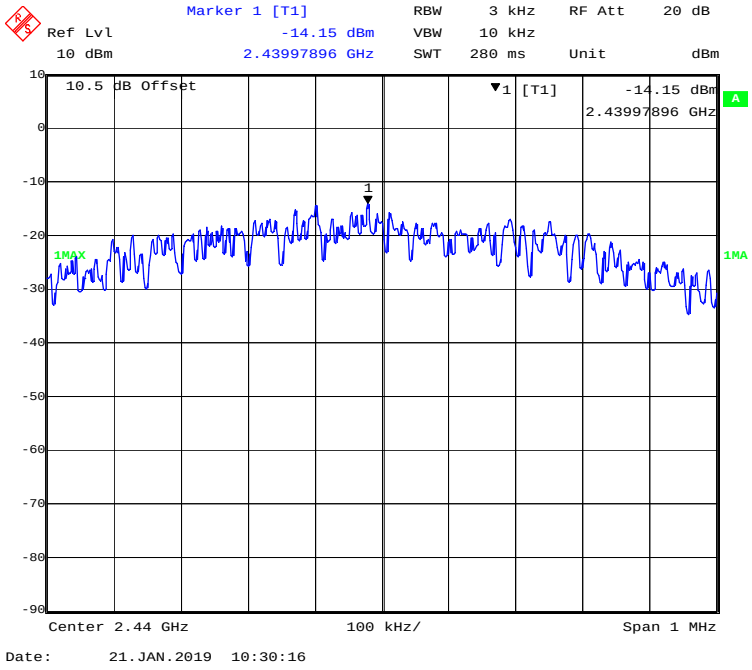
802.11n-HT40 Mode High Channel



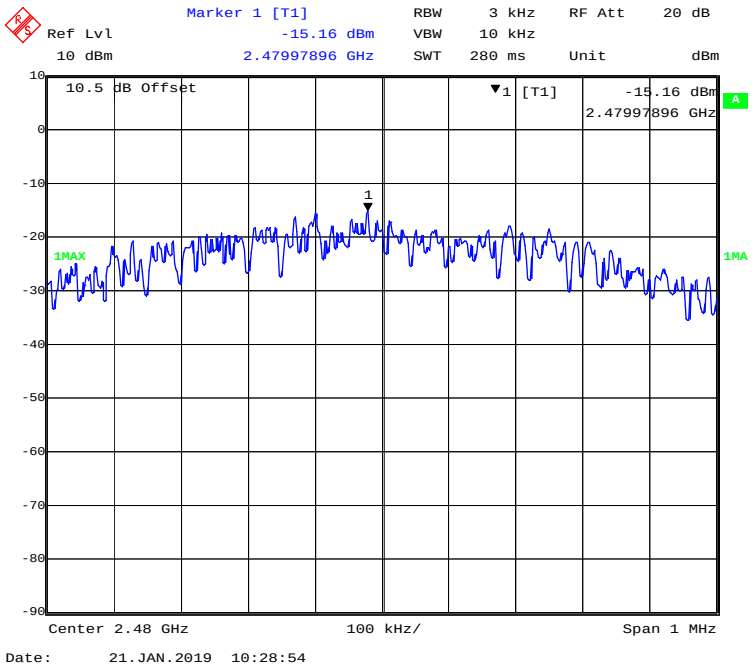
BLE Mode Low Channel



BLE Mode Middle Channel



BLE Mode High Channel



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