



FCC Part 15.247

RSS-247 Issue 2, Feb 2017; RSS-Gen Issue 5, Mar 2019

TEST REPORT

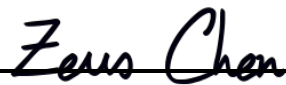
For

Redpine Signals Inc

2107 N First Street, Suite 540, San Jose, CA 95131-2019, USA

FCC ID: XF6-M4SB

IC: 8407A-M4SB

Report Type	Original Report
Product Name:	Single Band SIP Module, Small Form Factor Single Band 802.11b/g/n, Bluetooth 5.0, Zigbee Module
Model Name:	M4SB
Report Number :	RLK191015004-00C
Report Date :	2019/11/25
Reviewed By :	Zeus Chen 
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Note: This test report is prepared for the customer shown above and for the device described herein. It may not be duplicated or used in part without prior written consent from Bay Area Compliance Laboratories Corp. (Linkou Laboratory)

Revision History

Revision	Report Number	Issue Date	Description
1.0	RLK191015004-00C	2019/11/25	Original Report

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1 General Information

1.1 Product Description for Equipment under Test (EUT)

Applicant	Redpine Signals Inc 2107 N First Street, Suite 540, San Jose, CA 95131-2019, USA
Manufacturer	Redpine Signals Inc 2107 N First Street, Suite 540, San Jose, CA 95131-2019, USA
Brand Name	 REDPINE SIGNALS DRIVING WIRELESS CONVERGENCE
Product (Equipment)	Single Band SIP Module, Small Form Factor Single Band 802.11b/g/n, Bluetooth 5.0, Zigbee Module
Model Name	M4SB
Frequency Range	IEEE 802.11b/g/n HT20: 2412-2462 MHz IEEE 802.11n HT40: 2422-2452 MHz
Number of Channels	IEEE 802.11b/g/n HT20: 11 Channels IEEE 802.11n HT40: 9 Channels
Output Power	1.8Vdc: IEEE 802.11b: 18.39 dBm (0.0690 W) IEEE 802.11g: 18.68 dBm (0.0738 W) IEEE 802.11n HT20: 18.64 dBm (0.0731 W) IEEE 802.11n HT40: 17.01 dBm (0.0502 W) 3.3Vdc: IEEE 802.11b: 20.26 dBm (0.1062 W) IEEE 802.11g: 21.75 dBm (0.1496 W) IEEE 802.11n HT20: 21.75 dBm (0.1496 W) IEEE 802.11n HT40: 18.57 dBm (0.0719 W)
Modulation Type	IEEE 802.11b: DSSS IEEE 802.11 g/n HT20/n HT40: OFDM
Related Submittal(s)/Grant(s)	FCC Part 15.247 DSS with FCC ID: XF6-M4SB FCC Part 15.247 DTS with FCC ID: XF6-M4SB
Received Date	Oct. 15, 2019
Date of Test	Oct. 22, 2019 ~ Nov. 21, 2019

*All measurement and test data in this report was gathered from production sample serial number: 190914002(Assigned by BAAC, Linkou Laboratory).

1.2 Operation Condition of EUT

Power Operation (Voltage Range)	<input type="checkbox"/> AC 120 V/60 Hz
	<input type="checkbox"/> Adapter
	<input type="checkbox"/> By Power Cord.
	<input checked="" type="checkbox"/> DC Type
	<input checked="" type="checkbox"/> DC Power Supply: 1.8V, 3.3V
	<input type="checkbox"/> Battery:
	<input type="checkbox"/> External from USB Cable
	<input type="checkbox"/> External DC Adapter
	<input type="checkbox"/> Host System

1.3 Objective and Test Methodology

The Objective of this Test Report was to document the compliance of the Redpine Signals Inc. Appliance (Model: M4SB) to the requirements of the following Standards:

- Part 2, Subpart J, Part 15, Subparts A and C, section 15.247 of the Federal Communication Commission's rules.
- ANSI C63.10-2013 of the American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices.
- RSS-Gen Issue 5, Mar 2019— General Requirements for Compliance of Radio Apparatus
- RSS-247 Issue 2, Feb 2017— Digital Transmission Systems (DTSs), Frequency Hopping Systems (FHSs) and Licence-Exempt Local Area Network (LE-LAN) Devices

1.4 Measurement Uncertainty

Parameter	Expanded Measurement uncertainty
RF output power	± 1.488 dB
Occupied Channel Bandwidth	± 453.927 Hz
RF Conducted Emission test	± 2.77 dB
AC Power Line Conducted Emission	± 2.66 dB
Radiated Below 1G	± 3.57 dB
Radiated Above 1G	± 5.32 dB

1.5 Environmental Conditions and Test Date

Test Site	Test Date	Temperature (°C)	Relative Humidity (% RH)	Test Engineer
Conduction (CON-01)	2019-11-21	22.3	54	Leo Cheng
Radiated (966A)	2019-10-22 ~ 2019-11-18	20 ~ 24.3	45-51	Leo Cheng
Conducted (TH-02)	2019-11-04 ~ 2019-11-20	21.3 ~ 24.7	57 ~ 61	Ethan Shao

1.6 Test Facility

The Test site used by Bay Area Compliance Laboratories Corp. (Linkou Laboratory) to collect test data is located on

☒ No.6, Wende 2Rd., Guishan Dist., Taoyuan City 33382, Taiwan (R.O.C.).

Bay Area Compliance Laboratories Corp. (Linkou Laboratory) Lab is accredited to ISO 17025 by Taiwan Accreditation Foundation (TAF code: 3546) by Mutual Recognition Agreement (MRA). The test site has been approved by the FCC under the KDB 974614 D01 and is listed in the FCC Public Access Link (PAL) database. The FCC Registration No.: 0027578244. Designation No.: TW3546. The Test Firm Registration No.: 181430.

2 System Test Configuration

2.1 Test Channels and Description of Worst Test Configuration

The system was configured for testing in testing mode which was provided by manufacturer.

No special accessory, No modification was made to the EUT and No special equipment used during test.

For Wi-Fi, there are totally 11 channels.

Channel	Frequency (MHz)	Channel	Frequency (MHz)
1	2412	7	2442
2	2417 ^{Note1}	8	2447
3	2422	9	2452
4	2427	10	2457 ^{Note1}
5	2432	11	2462
6	2437	--	--

For IEEE802.11b/g/n HT20: Channel 1, 6 and 11 were tested. For IEEE802.11n HT40: Channel 3, 6 and 9 were tested.

Note1: Except above channel must be test, Chip Antenna with 1.8v had tested Channel 2 and 10.

The worst-case data rates are determined to be as follows for each mode based upon investigation by measuring the Peak power and PSD across all data rates bandwidths, and modulations. Radiated below 1G were tested worst output power.

Modulation Used for Conformance Test			
Configuration	NTX	Data Rate	Worst Data Rate
IEEE 802.11b	1	1-11 Mbps	1 Mbps
IEEE 802.11g	1	6-54 Mbps	6 Mbps
IEEE 802.11n HT 20	1	MCS 0-7	MCS 0
IEEE 802.11n HT 40	1	MCS 0-7	MCS 0

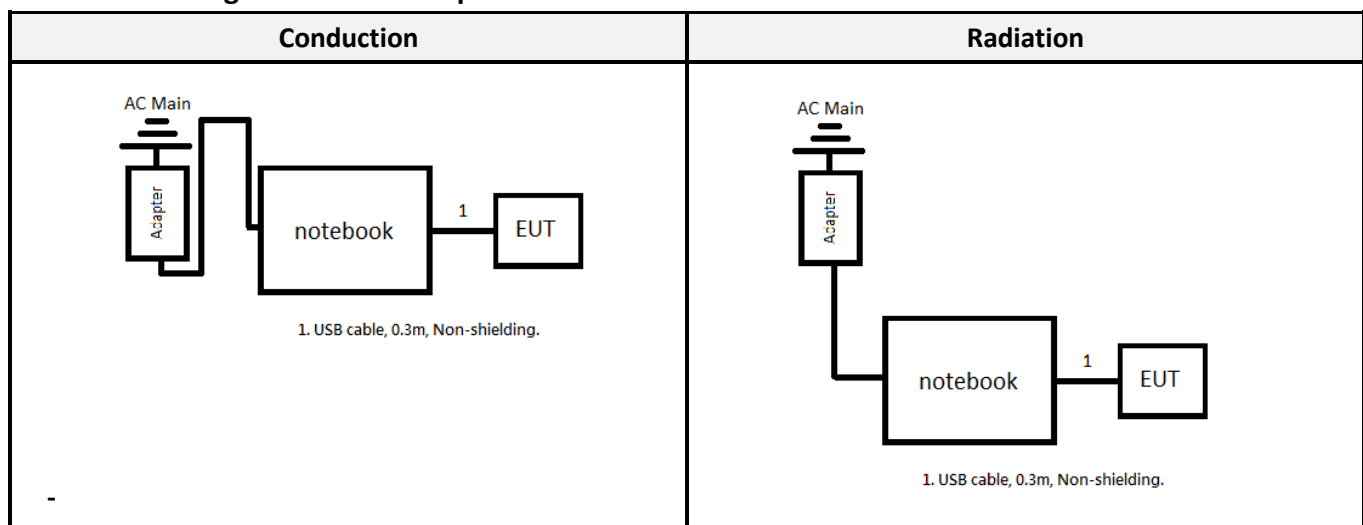
Worst Case of Power Setting						
EUT Exercise Software		FCC_PER_TEST_GUI.py				
Chip Antenna 1.8V						
Configuration	NTX	Low CH	CH 2	Mid CH	CH 10	High CH
IEEE 802.11b	1	12	13	22	12	12
IEEE 802.11g	1	12	13	22	22	13
IEEE 802.11n HT 20	1	12	13	22	22	13
IEEE 802.11n HT 40	1	3	-	6	-	5
Chip Antenna 3.3V						
Configuration	NTX	Low CH		Mid CH	High CH	
IEEE 802.11b	1	16		12	11	
IEEE 802.11g	1	16		22	16	
IEEE 802.11n HT 20	1	15		22	16	
IEEE 802.11n HT 40	1	7		10	8	

2.2 Support Equipment List and External Cable List

No.	Description	Manufacturer	Model Number
A	Notebook	DELL	Inspiron 15
B	Adapter	Chicony Power	HA65NS5-00 (DELL)

No.	Cable Description	Shielding Type	Length (m)	From	To
1	USB Cable	Non-Shielded	1	EUT	NB

2.3 Block Diagram of Test Setup



2.4 Duty Cycle

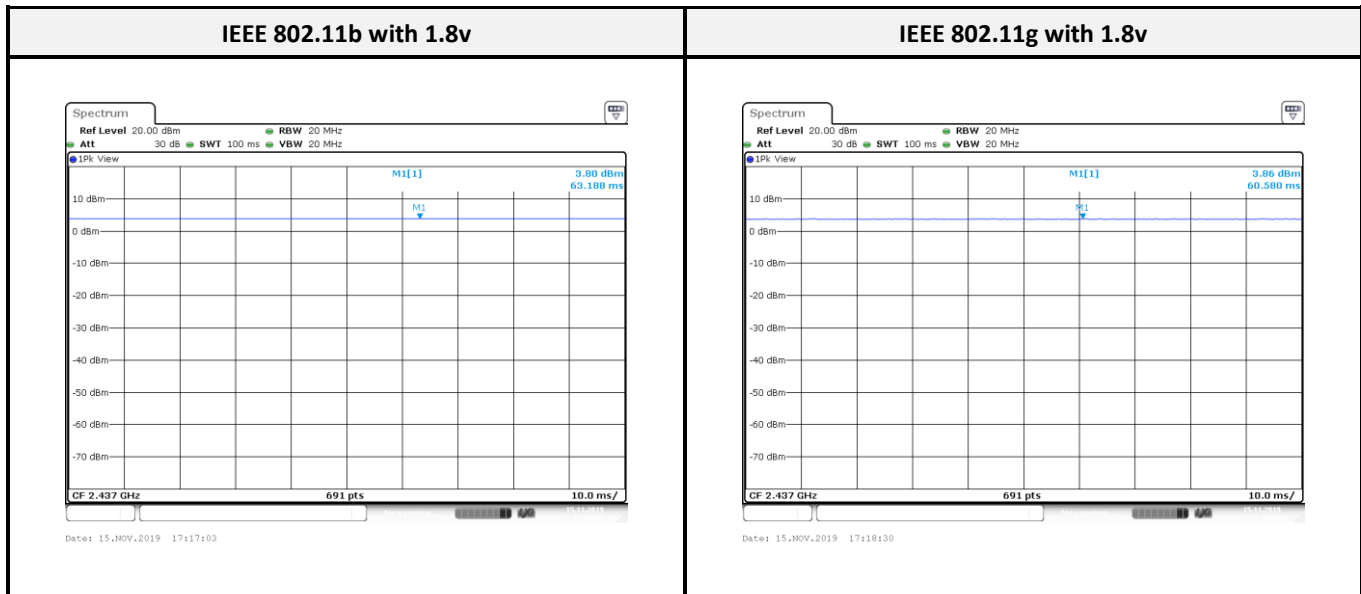
All measurements are to be performed with the EUT transmitting at 100% duty cycle at its maximum power control level; however, if 100% duty cycle cannot be achieved, measurements of duty cycle, x, and maximum power transmission duration, T, are required for each tested mode of operation.

<Chip Antenna 1.8V>

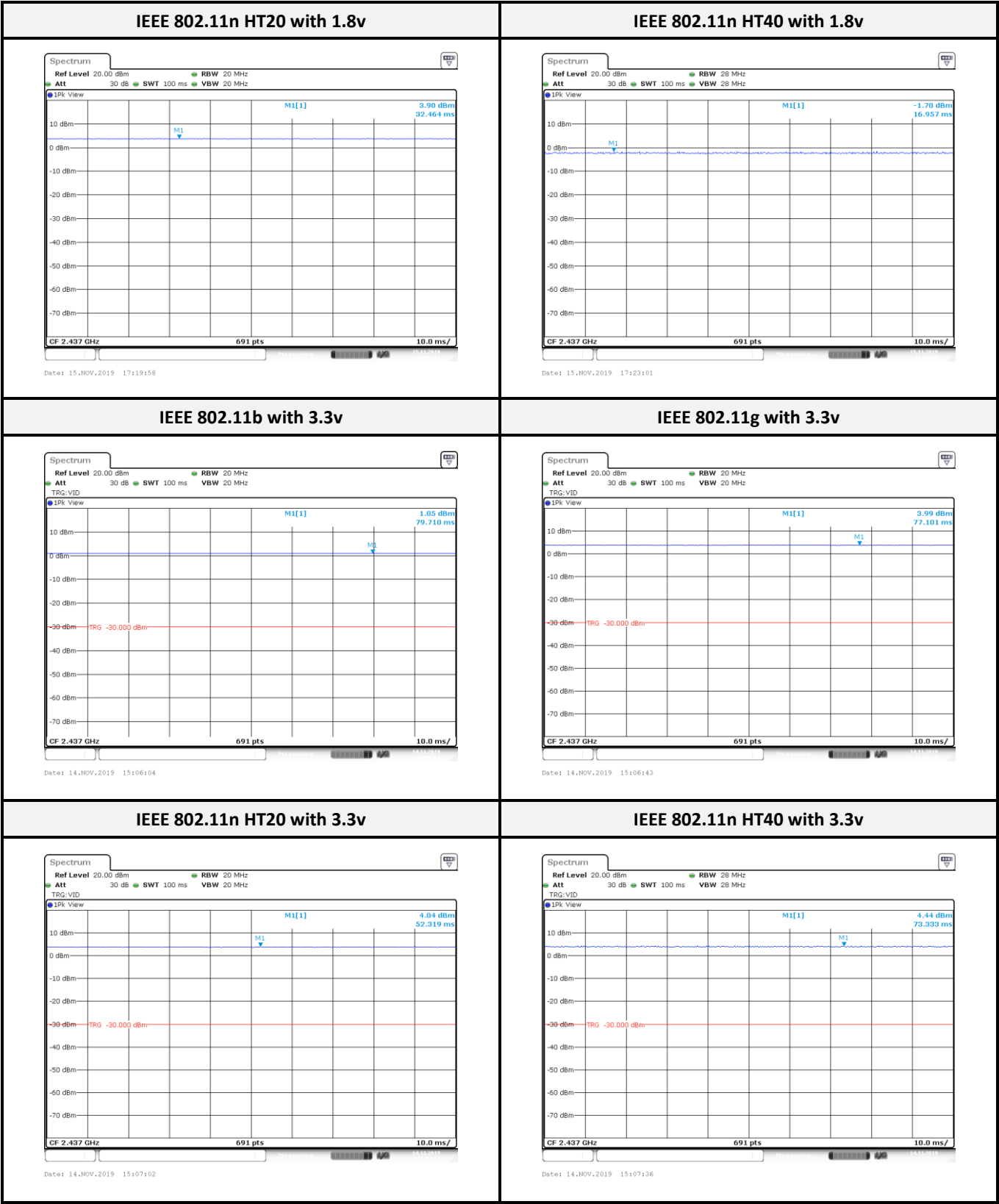
Configuration	On Time (ms)	Period (ms)	Duty Cycle (%)	Duty Factor (dB)
IEEE 802.11b	100	100	100	0.00
IEEE 802.11g	100	100	100	0.00
IEEE 802.11n HT 20	100	100	100	0.00
IEEE 802.11n HT 40	100	100	100	0.00

<Chip Antenna 3.3V>

Configuration	On Time (ms)	Period (ms)	Duty Cycle (%)	Duty Factor (dB)
IEEE 802.11b	100	100	100	0.00
IEEE 802.11g	100	100	100	0.00
IEEE 802.11n HT 20	100	100	100	0.00
IEEE 802.11n HT 40	100	100	100	0.00



*Note: Duty Factor = $10 \cdot \log(1/\text{Duty cycle})$



3 Summary of Test Results

FCC/ISED Rules	Description of Test	Result
§15.247(i), §1.1310, §2.1091	Maximum Permissible Exposure (MPE)	Compliance
ISED RSS-102 Sec 2.5.2	Exemption Limits for Routine Evaluation – RF Exposure Evaluation	Compliance
§15.203 ISED RSS-Gen Sec 6.8	Antenna Requirement	Compliance
§15.207(a) ISED RSS-Gen Sec 6.8	AC Line Conducted Emissions	Compliance
§15.205, §15.209, §15.247(d) ISED RSS-Gen Sec 8.9 and 8.10 ISED RSS-247 Sec 5.5	Spurious Emissions	Compliance
§15.247(a)(2) ISED RSS-247 Sec 5.2 ISED RSS-Gen Sec 6.7	6 dB Emission Bandwidth	Compliance
§15.247(b)(3) ISED RSS-247 Sec 5.4(d)	Maximum Peak Output Power	Compliance
§15.247(d) ISED RSS-247 Sec 5.5	100 kHz Bandwidth of Frequency Band Edge	Compliance
§15.247(e) ISED RSS-247 Sec 5.2(b)	Power Spectral Density	Compliance

4 FCC§15.247(i), §1.1310, § 2.1091 - Maximum Permissible Exposure (MPE)

4.1 Applicable Standard

According to subpart 15.247(i) and subpart §1.1310, systems operating under the provisions of this section shall be operated in a manner that ensures that the public is not exposed to radio frequency energy level in excess of the Commission's guidelines.

Limits for Maximum Permissible Exposure (MPE) (§1.1310, §2.1091)

(B) 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;

According to §1.1310, and §2.1091 RF exposure is calculated.

Calculated Formulary: Predication of MPE limit at a given distance

$S = PG/4\pi R^2$ = power density (in appropriate units, e.g. mW/cm²);

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);

4.2 RF Exposure Evaluation Result

Mode	Frequency Range (MHz)	Antenna Gain		Target Power		Evaluation Distance (cm)	Power Density (mW/cm ²)	MPE Limit (mW/cm ²)
		(dBi)	(numeric)	(dBm)	(mW)			
BLE	2402-2480	1.00	1.2589	21.00	125.8925	20	0.0315	1
Zigbee	2405-2480	1.00	1.2589	20.00	100.0000	20	0.0397	1
Wi-Fi 2.4G	2412-2462	1.00	1.2589	22.00	158.4893	20	0.0251	1

Note: Wi-Fi, BT and Zigbee can't simultaneously.

Result: MPE evaluation meet 20 cm the requirement of standard.

5 RSS-102 Sec 2.5.2- Exemption Limits for Routine Evaluation – RF Exposure Evaluation

5.1 Applicable Standard

According to subpart RSS-102 Sec 2.5.2,

RF exposure evaluation is required if the separation distance between the user and/or bystander and the device's radiating element is greater than 20 cm, except when the device operates as follows:

- below 20 MHz⁶ and the source-based, time-averaged maximum e.i.r.p. of the device is equal to or less than 1 W (adjusted for tune-up tolerance);
- at or above 20 MHz and below 48 MHz and the source-based, time-averaged maximum e.i.r.p. of the device is equal to or less than $4.49/f^{0.5}$ W (adjusted for tune-up tolerance), where f is in MHz;
- at or above 48 MHz and below 300 MHz and the source-based, time-averaged maximum e.i.r.p. of the device is equal to or less than 0.6 W (adjusted for tune-up tolerance);
- at or above 300 MHz and below 6 GHz and the source-based, time-averaged maximum e.i.r.p. of the device is equal to or less than $1.31 \times 10^{-2} f^{0.6834}$ W (adjusted for tune-up tolerance), where f is in MHz;
- at or above 6 GHz and the source-based, time-averaged maximum e.i.r.p. of the device is equal to or less than 5 W (adjusted for tune-up tolerance).

In these cases, the information contained in the RF exposure technical brief may be limited to information that demonstrates how the e.i.r.p. was derived.

5.2 RF Exposure Evaluation Result

BLE Max tune-up conducted output power is 21 dBm (125.8925 mW) at 2402 MHz, Antenna Gain = 1 dBi, EIRP = 22 dBm (0.1585 W), so the maximum conducted and E.I.R.P. source-based, time-averaged output is less than 2.68 W for general public use.

Zigbee Max tune-up conducted output power is 20 dBm (100.0000 mW) at 2405 MHz, Antenna Gain = 1 dBi, EIRP = 21 dBm (0.1259 W), so the maximum conducted and E.I.R.P. source-based, time-averaged output is less than 2.68 W for general public use.

Wi-Fi 2.4G Max tune-up conducted output power is 22 dBm (158.4893 mW) at 2437 MHz, Antenna Gain = 1 dBi, EIRP = 23 dBm (0.1995 W), so the maximum conducted and E.I.R.P. source-based, time-averaged output is less than 2.70 W for general public use.

Note: Wi-Fi, BT and Zigbee can't simultaneously.

Result: MPE test exempted.

6 FCC §15.203 and RSS-247 Sec 6.8 - Antenna Requirements

6.1 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.

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 does not exceed 6dBi

According to RSS-Gen 6.3: Transmitter Antenna for Licence-Exempt Radio Apparatus

The applicant for equipment certification, as per RSP-100, must provide a list of all antenna types that may be used with the licence-exempt transmitter, indicating the maximum permissible antenna gain (in dBi) and the required impedance for each antenna.

Licence-exempt transmitters that have received equipment certification may operate with different types of antennas. However, it is not permissible to exceed the maximum equivalent isotropically radiated power (e.i.r.p.) limits specified in the applicable standard (RSS) for the licence-exempt apparatus.

Testing shall be performed using the highest gain antenna of each combination of licence-exempt transmitter and antenna type, with the transmitter output power set at the maximum level. Footnote 8 When a measurement at the antenna connector is used to determine RF output power, the effective gain of the device's antenna shall be stated, based on a measurement or on data from the antenna manufacturer.

User manuals for transmitters equipped with detachable antennas shall also contain the following notice in a conspicuous location:

This radio transmitter (identify the device by certification number) has been approved by Industry Canada to operate with the antenna types listed below with the maximum permissible gain indicated. Antenna types not included in this list, having a gain greater than the maximum gain indicated for that type, are strictly prohibited for use with this device. Immediately following the above notice, the manufacturer shall provide a list of all antenna types approved for use with the transmitter, indicating the maximum permissible antenna gain (in dBi).

6.2 Antenna List and Details

Brand	Model	Antenna Type	Antenna Gain	Result
Redpine	Redpine Chip	Chip Antenna	1.00 dBi	Compliance

The EUT has an internal antenna arrangement, which was permanently attached, fulfill the requirement of this section.

7 FCC §15.207 and RSS-Gen Sec 6.8 - AC Line Conducted Emissions

7.1 Applicable Standard

According to FCC §15.207,

For an intentional radiator that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the band 150 kHz to 30 MHz shall not exceed the limits in the following table, as measured using a 50 μ H/50 ohms line impedance stabilization network (LISN). Compliance with the provisions of this paragraph shall be based on the measurement of the radio frequency voltage between each power line and ground at the power terminal. The lower limit applies at the boundary between the frequencies ranges.

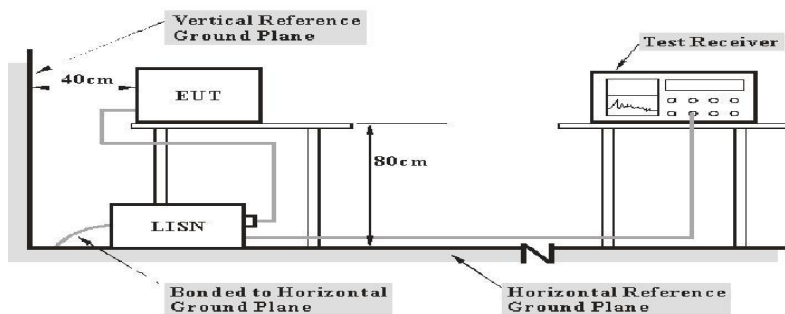
According to RSS-Gen 8.8 Conducted limits:

For an intentional radiator that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the band 150 kHz to 30 MHz shall not exceed the limits in the following table, as measured using a 50 μ H/50 ohms line impedance stabilization network (LISN). Compliance with the provisions of this paragraph shall be based on the measurement of the radio frequency voltage between each power line and ground at the power terminal. The lower limit applies at the boundary between the frequencies ranges.

Frequency (MHz)	Conducted Limit (dBuV)	
	Quasi-Peak	Average
0.15-0.5	66 to 56 ^{Note 1}	56 to 46 ^{Note 2}
0.5-5	56	46
5-30	60	50

Note 1: Decreases with the logarithm of the frequency. Note 2: A linear average detector is required

7.2 EUT Setup and Test Procedure



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 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	Receiver RBW
150 kHz - 30 MHz	9 kHz

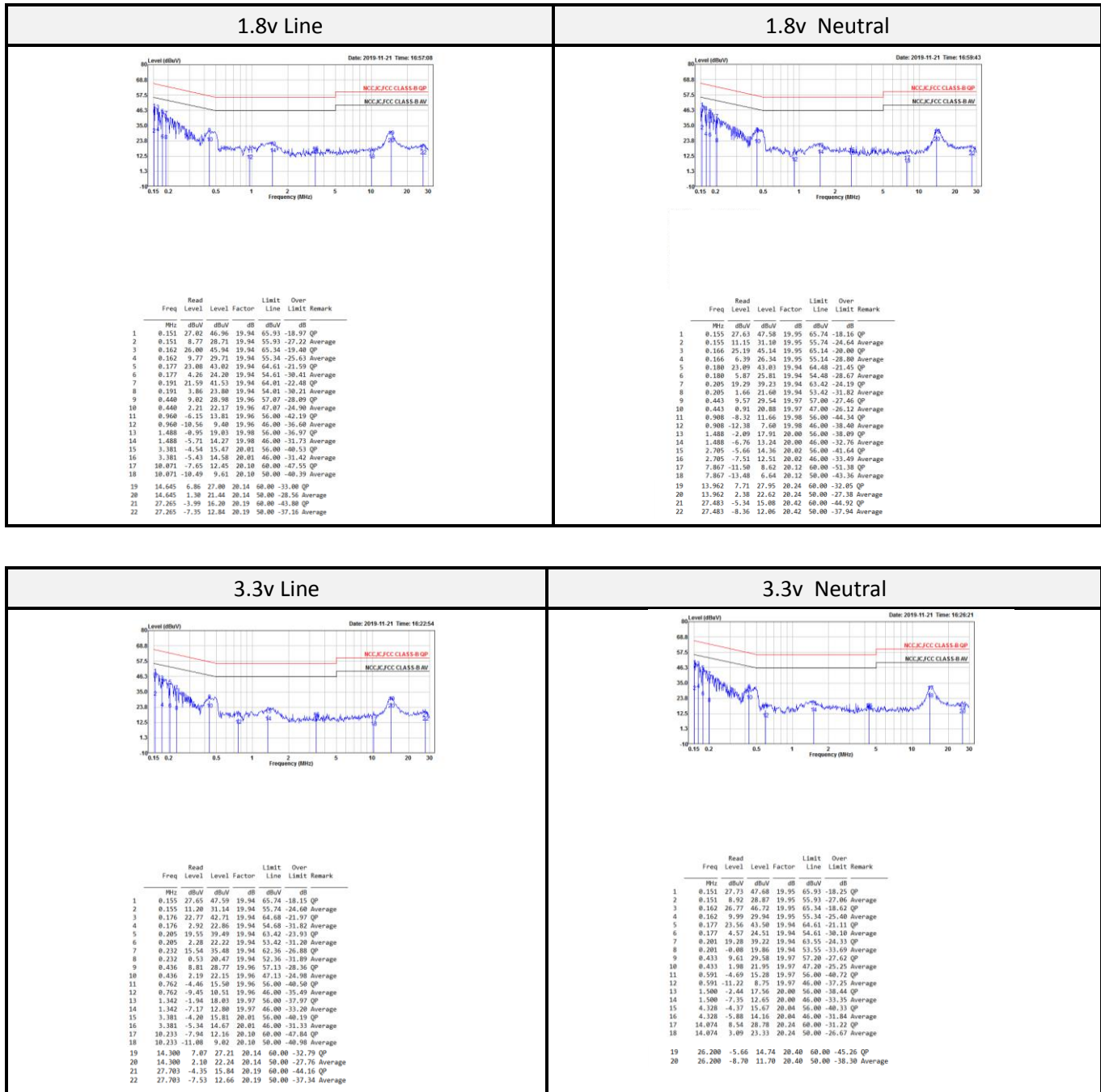
During the conducted emission test, the adapter was connected to the outlet of the LISN. Maximizing procedure was performed on the six (6) highest emissions of the EUT. All data was recorded in the Quasi-peak and average detection mode.

7.3 Test Equipment List and Details

Description	Manufacture	Model	Serial No.	Cal. Date.	Cal. Due.
AC Line Conduction Room (CON-01)					
Two-Line V-Network	Rohde & Schwarz	ENV216	100010	2019/09/02	2020/09/01
Pulse Limiter	SCHWARZBECK	VSTD 9561-F	00432	2019/08/28	2020/08/27
ESR EMI Test Receiver	Rohde & Schwarz	ESR3	102430	2019/03/27	2020/03/26
RF Cable	EMCI	EMCCFD300-BM-BM-8000	180526	2019/08/08	2020/08/07
Software	Audix	e3 v9	E3LK-03	N.C.R	N.C.R

***Statement of Traceability:** The testing equipment's listed above have finished the calibration by Electronics Testing Center, Taiwan (ETC) or other laboratories which were accredited by TAF or equivalent organizations. The calibration result could be traceable to the International System of Units (SI).

7.4 Test Data and Test Plot



Note:

Level = Reading Level + Correct Factor

Over Limit = Level – Limit

Factor = (LISN, ISN, PLC or current probe) Factor + Cable Loss + Attenuator

8 FCC §15.209, §15.205, §15.247, RSS-Gen Sec 8.9, 8.10 and RSS-247 Sec 5.5 (d) – Spurious Emissions

8.1 Applicable Standard

As per FCC §15.35(d): Unless otherwise specified, on any frequency or frequencies above 1000 MHz, the radiated emission limits are based on the use of measurement instrumentation employing an average detector function. Unless otherwise specified, measurements above 1000 MHz shall be performed using a minimum resolution bandwidth of 1MHz.

As Per FCC §15.205(a) except as show in paragraph (d) of this section, only spurious emissions are permitted in any of the frequency bands listed below:

MHz	MHz	MHz	GHz
0.090-0.110	13.36-13.41	399.9-410	4.5-5.15
0.495-0.505	16.42-16.423	608-614	5.35-5.46
2.1735-2.1905	16.69475-16.69525	960-1240	7.25-7.75
4.125-4.128	25.5-25.67	1300-1427	8.025-8.5
4.17725-4.17775	37.5-38.25	1435-1626.5	9.0-9.2
4.20725-4.20775	73-74.6	1645.5-1646.5	9.3-9.5
6.215-6.218	74.8-75.2	1660-1710	10.6-12.7
6.26775-6.26825	108-121.94	1718.8-1722.2	13.25-13.4
6.31175-6.31225	123-138	2200-2300	14.47-14.5
8.291-8.294	149.9-150.05	2310-2390	15.35-16.2
8.362-8.366	156.52475-156.52525	2483.5-2500	17.7-21.4
8.37625-8.38675	156.7-156.9	2690-2900	22.01-23.12
8.41425-8.41475	162.0125-167.17	3260-3267	23.6-24.0
12.29-12.293	167.72-173.2	3332-3339	31.2-31.8
12.51975-12.52025	240-285	3345.8-3358	36.43-36.5
12.57675-12.57725	322-335.4	3600-4400	Above 38.6

As per FCC §15.209(a): Except as provided elsewhere in this Subpart, the emissions from an intentional radiator shall not exceed the field strength levels specified in the following table:

Frequency (MHz)	Field Strength (micro volts/meter)	Measurement Distance (meters)
0.009 - 0.490	2400/F(kHz)	300
0.490 - 1.705	24000/F(kHz)	30
1.705 - 30.0	30	30
30 - 88	100**	3
88 - 216	150**	3
216 - 960	200**	3
Above 960	500	3

** Except as provided in paragraph (g), fundamental emissions from intentional radiators operating under this Section shall not be located in the frequency bands 54-72 MHz, 76-88 MHz, 174-216 MHz or 470-806MHz. However, operation within these frequency bands is permitted under other sections of this Part, e.g., Sections 15.231 and 15.241.

As per FCC §15.247 (d) 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 20dB. 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)).

As per RSS-Gen 8.9,

Except when the requirements applicable to a given device state otherwise, emissions from licence-exempt transmitters shall comply with the field strength limits shown in Table 4 and Table 5 below. Additionally, the level of any transmitter emission shall not exceed the level of the transmitter's fundamental emission.

Table 4 – General Field Strength Limits for Licence-Exempt Transmitters at Frequencies Above 30 MHz

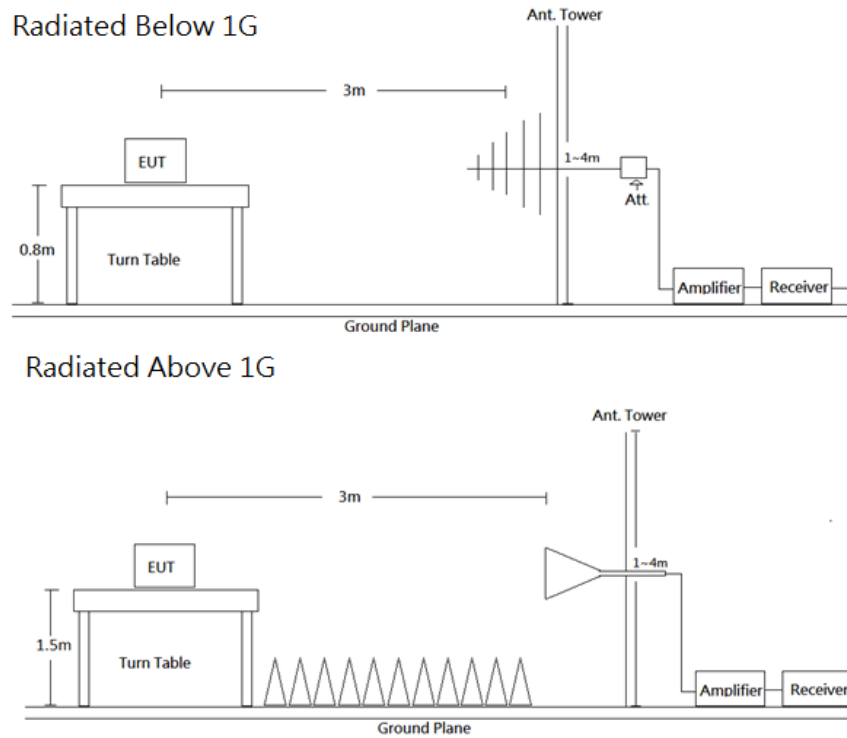
Frequency (MHz)	Field Strength ($\mu\text{V/m}$ at 3 metres)
30-88	100
88-216	150
216-960	200
Above 960*	500

* Unless otherwise specified, for all frequencies greater than 1 GHz, the radiated emission limits for licence-exempt radio apparatus stated in applicable RSSs (including RSS-Gen) are based on measurements using a linear average detector function having a minimum resolution bandwidth of 1 MHz. If an average limit is specified for the EUT, then the peak emission shall also be measured with instrumentation properly adjusted for such factors as pulse desensitization to ensure the peak emission is less than 20 dB above the average limit.

Note: Transmitting devices are not permitted in restricted frequency bands unless stated otherwise in the specific RSS.

As per RSS-247 §5.5, in any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated device is operating, the RF power that is produced 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 that the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of root-mean-square averaging over a time interval, as permitted under Section 5.4(4), the attenuation required shall be 30 dB instead of 20 dB. Attenuation below the general field strength limits specified in RSS-Gen is not required.

8.2 EUT Setup and Test Procedure



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 Part 15.209 and FCC 15.247 Limits.

The system was investigated from 30 MHz to 26.5 GHz. During the radiated emission test, the EMI test receiver was set with the following configurations measurement method 6.3 in ANSI C63.10.

Frequency Range	RBW	VBW	Duty cycle	Measurement method
30-1000 MHz	120 kHz	/	-	QP
Above 1 GHz	1 MHz	3 MHz	-	PK
	1 MHz	10 Hz	>98%	Ave
	1 MHz	1/T	<98%	Ave

Maximizing procedure was performed on the highest emissions to ensure that the EUT complied with all installation combinations. All data was recorded in the Quasi-peak detector mode from 30 MHz to 1 GHz and PK and average detector modes for frequencies above 1 GHz.

8.3 Test Equipment List and Details

Description	Manufacture	Model	Serial No.	Cal. Date.	Cal. Due.
Radiation 3M Room (966A)					
Active Loop	EMCO	6502	0001-3322	2019/03/15	2020/03/14
Bilog Antenna/6 dB Attenuator	SUNOL SCIENCES & EMEC /EMCI	JB3/N-6-06	A111513/AT-N0668	2019/03/29	2020/03/28
Signal and Spectrum Analyzer	Rohde & Schwarz	FSV40	101434	2019/04/17	2020/04/16
Horn Antenna	ETS-Lindgren	3115	00109141	2019/07/05	2020/07/04
Horn Antenna	ETS-Lindgren	3160-09	00123852	2019/07/11	2020/07/10
Preamplifier	A.H. Systems	PAM-1840VH	174	2019/02/18	2020/02/17
Preamplifier	A.H. Systems	PAM-0118	478	2019/03/28	2020/03/27
Microflex Cable (1m)	EMCI	EMC106-SM-SM-2000	180515	2019/08/07	2020/08/06
Microflex Cable (2m)	MTJ	H0919	00000-MT28A-100	2019/08/07	2020/08/06
Microflex Cable (8m)	UTIFLEX	UFA210A-1-3149-300300	MFR 64639 232490-001	2019/08/07	2020/08/06
Turn Table	Chaintek	T-200-S-1	003501	N.C.R	N.C.R
Antenna Tower	Chaintek	MBD-400-1	003504	N.C.R	N.C.R
Controller	Chaintek	3000-1	003507	N.C.R	N.C.R
Software	Audix	e3 v9	E3LK-01	N.C.R	N.C.R
Conducted Room(TH-02)					
Signal and Spectrum Analyzer	Rohde & Schwarz	FSV40	101457	2019/06/24	2020/06/23
Cable	MTJ	MT40S	620620-MT40S-100	2018/12/28	2019/12/27

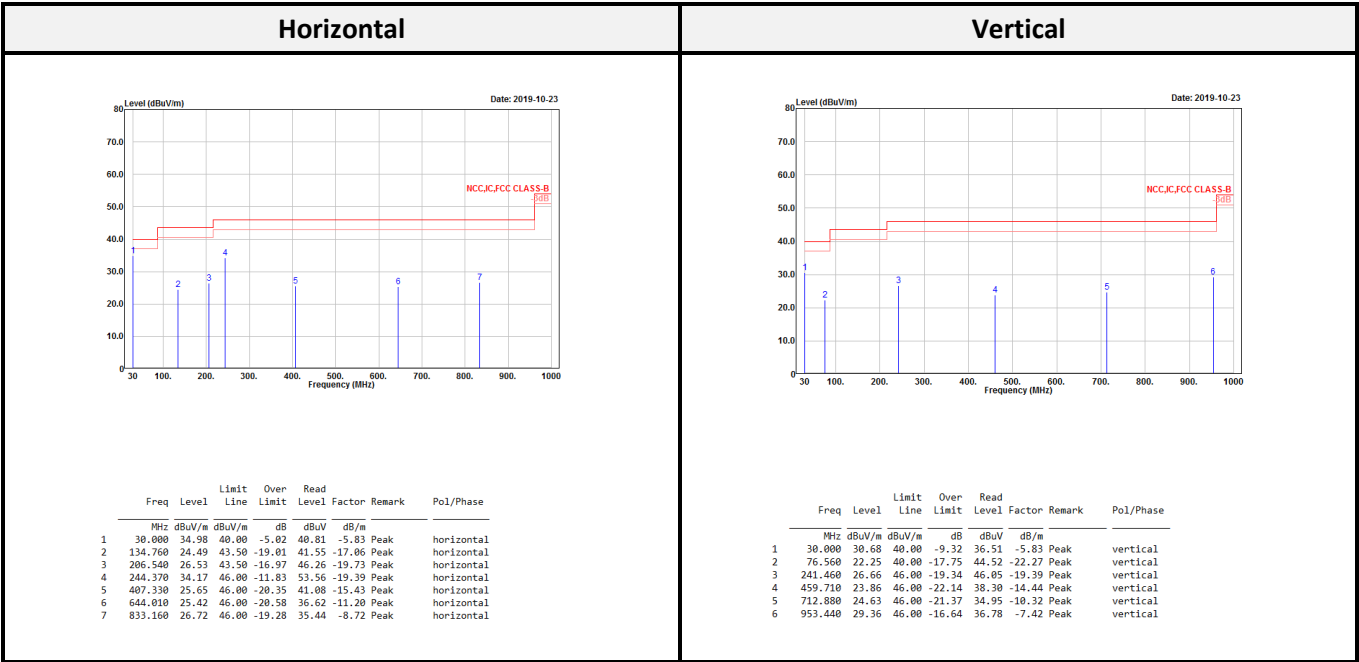
***Statement of Traceability:** The testing equipment's listed above have finished the calibration by Electronics Testing Center, Taiwan (ETC) or other laboratories which were accredited by TAF or equivalent organizations. The calibration result could be traceable to the International System of Units (SI).

8.4 Test Result

<Chip Antenna 1.8V>

Transmitting mode (Pre-scan with three orthogonal axis, and worse case as Z axis)

Below 1G (30 MHz-1 GHz) test the worst mode



Level = Reading Level + Correct Factor

Over Limit = Level – Limit

Correct Factor = Antenna Factor + Cable Loss – Amplifier Gain

Spurious emissions more than 20 dB below the limit were not reported

Above 1G (1 GHz-26.5 GHz)

IEEE 802.11b:

Low CH													
Horizontal							Vertical						
Freq	Level	Limit Line	Over Limit	Read Level	Factor	Remark	Freq	Level	Limit Line	Over Limit	Read Level	Factor	Remark
MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m		MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m	
2386.048	53.79	54.00	-0.21	61.43	-7.64	Average	2387.280	41.35	54.00	-12.65	48.99	-7.64	Average
2386.048	60.42	74.00	-13.58	68.06	-7.64	Peak	2387.280	51.95	74.00	-22.05	59.59	-7.64	Peak
2412.928	101.60			109.19	-7.59	Average	2411.360	92.57			100.17	-7.60	Average
2412.928	104.35			111.94	-7.59	Peak	2411.360	95.35			102.95	-7.60	Peak
3216.000	47.21	54.00	-6.79	51.44	-4.23	Average	3216.000	43.28	54.00	-10.72	47.51	-4.23	Average
3216.000	49.48	74.00	-24.52	53.71	-4.23	Peak	3216.000	47.22	74.00	-26.78	51.45	-4.23	Peak
4824.000	53.02	54.00	-0.98	52.38	0.64	Average	4824.000	52.28	54.00	-1.72	51.64	0.64	Average
4824.000	56.61	74.00	-17.39	55.97	0.64	Peak	4824.000	55.24	74.00	-18.76	54.60	0.64	Peak
7236.000	34.76	54.00	-19.24	29.38	5.38	Average	7236.000	34.48	54.00	-19.52	29.10	5.38	Average
7236.000	47.84	74.00	-26.16	42.46	5.38	Peak	7236.000	48.08	74.00	-25.92	42.70	5.38	Peak

Middle CH													
Horizontal							Vertical						
Freq	Level	Limit Line	Over Limit	Read Level	Factor	Remark	Freq	Level	Limit Line	Over Limit	Read Level	Factor	Remark
MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m		MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m	
2343.880	41.69	54.00	-12.31	49.45	-7.76	Average	2330.086	37.33	54.00	-16.67	45.13	-7.80	Average
2343.880	54.05	74.00	-19.95	61.81	-7.76	Peak	2330.086	51.07	74.00	-22.93	58.87	-7.80	Peak
2436.324	103.07			110.61	-7.54	Average	2436.324	92.90			100.44	-7.54	Average
2436.324	105.92			113.46	-7.54	Peak	2436.324	95.76			103.30	-7.54	Peak
2503.358	40.96	54.00	-13.04	48.27	-7.31	Average	2519.330	38.01	54.00	-15.99	45.27	-7.26	Average
2503.358	54.10	74.00	-19.90	61.41	-7.31	Peak	2519.330	51.33	74.00	-22.67	58.59	-7.26	Peak
3249.300	46.43	54.00	-7.57	50.50	-4.07	Average	3249.300	44.50	54.00	-9.50	48.57	-4.07	Average
3249.300	49.24	74.00	-24.76	53.31	-4.07	Peak	3249.300	46.52	74.00	-27.48	50.59	-4.07	Peak
4874.000	53.53	54.00	-0.47	52.73	0.80	Average	4874.000	52.87	54.00	-1.13	52.07	0.80	Average
4874.000	56.66	74.00	-17.34	55.86	0.80	Peak	4874.000	55.14	74.00	-18.86	54.34	0.80	Peak
7311.000	40.12	54.00	-13.88	34.48	5.64	Average	7311.000	40.94	54.00	-13.06	35.30	5.64	Average
7311.000	50.08	74.00	-23.92	44.44	5.64	Peak	7311.000	50.38	74.00	-23.62	44.74	5.64	Peak

High CH													
Horizontal							Vertical						
Freq	Level	Limit Line	Over Limit	Read Level	Factor	Remark	Freq	Level	Limit Line	Over Limit	Read Level	Factor	Remark
MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m		MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m	
2462.900	100.78			108.20	-7.42	Average	2461.100	91.20			98.63	-7.43	Average
2462.900	103.53			110.95	-7.42	Peak	2461.100	94.03			101.46	-7.43	Peak
2486.700	51.45	54.00	-2.55	58.79	-7.34	Average	2487.700	40.24	54.00	-13.76	47.57	-7.33	Average
2486.700	58.90	74.00	-15.10	66.24	-7.34	Peak	2487.700	52.47	74.00	-21.53	59.80	-7.33	Peak
3282.600	45.15	54.00	-8.85	49.11	-3.96	Average	3282.600	43.35	54.00	-10.65	47.31	-3.96	Average
3282.600	47.78	74.00	-26.22	51.74	-3.96	Peak	3282.600	46.70	74.00	-27.30	50.66	-3.96	Peak
4924.000	53.18	54.00	-0.82	52.35	0.83	Average	4924.000	52.86	54.00	-1.14	52.03	0.83	Average
4924.000	56.14	74.00	-17.86	55.31	0.83	Peak	4924.000	55.44	74.00	-18.56	54.61	0.83	Peak
7386.000	37.13	54.00	-16.87	31.21	5.92	Average	7386.000	38.37	54.00	-15.63	32.45	5.92	Average
7386.000	49.36	74.00	-24.64	43.44	5.92	Peak	7386.000	49.39	74.00	-24.61	43.47	5.92	Peak

Channel 2													
Horizontal							Vertical						
Freq	Level	Limit Line	Over Limit	Read Level	Factor	Remark	Freq	Level	Limit Line	Over Limit	Read Level	Factor	Remark
MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m		MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m	
2390.000	53.17	54.00	-0.83	60.80	-7.63	Average	2389.680	42.13	54.00	-11.87	49.76	-7.63	Average
2390.000	60.52	74.00	-13.48	68.15	-7.63	Peak	2389.680	52.16	74.00	-21.84	59.79	-7.63	Peak
2418.000	100.94			108.52	-7.58	Average	2416.320	91.97			99.56	-7.59	Average
2418.000	103.64			111.22	-7.58	Peak	2416.320	94.70			102.29	-7.59	Peak
3222.600	47.79	54.00	-6.21	52.02	-4.23	Average	3222.600	44.29	54.00	-9.71	48.52	-4.23	Average
3222.600	49.96	74.00	-24.04	54.19	-4.23	Peak	3222.600	47.49	74.00	-26.51	51.72	-4.23	Peak
4834.000	53.08	54.00	-0.92	52.44	0.64	Average	4834.000	50.84	54.00	-3.16	50.20	0.64	Average
4834.000	54.46	74.00	-19.54	53.82	0.64	Peak	4834.000	54.19	74.00	-19.81	53.55	0.64	Peak
7251.000	38.31	54.00	-15.69	32.89	5.42	Average	7251.000	38.40	54.00	-15.60	32.98	5.42	Average
7251.000	49.78	74.00	-24.22	44.36	5.42	Peak	7251.000	49.48	74.00	-24.52	44.06	5.42	Peak

Channel 10													
Horizontal							Vertical						
Freq	Level	Limit Line	Over Limit	Read Level	Factor	Remark	Freq	Level	Limit Line	Over Limit	Read Level	Factor	Remark
MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m		MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m	
2456.128	99.93			107.38	-7.45	Average	2457.840	90.69			98.13	-7.44	Average
2456.128	102.76			110.21	-7.45	Peak	2457.840	93.34			100.78	-7.44	Peak
2483.520	50.48	54.00	-3.52	57.82	-7.34	Average	2484.376	40.89	54.00	-13.11	48.23	-7.34	Average
2483.520	58.02	74.00	-15.98	65.36	-7.34	Peak	2484.376	52.29	74.00	-21.71	59.63	-7.34	Peak
3276.000	44.87	54.00	-9.13	48.83	-3.96	Average	3276.000	43.28	54.00	-10.72	47.24	-3.96	Average
3276.000	48.57	74.00	-25.43	52.53	-3.96	Peak	3276.000	46.68	74.00	-27.32	50.64	-3.96	Peak
4914.000	53.81	54.00	-0.19	52.97	0.84	Average	4914.000	52.88	54.00	-1.12	52.04	0.84	Average
4914.000	55.73	74.00	-18.27	54.89	0.84	Peak	4914.000	56.05	74.00	-17.95	55.21	0.84	Peak
7371.000	40.52	54.00	-13.48	34.64	5.88	Average	7371.000	42.57	54.00	-11.43	36.69	5.88	Average
7371.000	49.89	74.00	-24.11	44.01	5.88	Peak	7371.000	50.82	74.00	-23.18	44.94	5.88	Peak

IEEE 802.11g:

Low CH													
Horizontal							Vertical						
Freq	Level	Limit Line	Over Limit	Read Level	Factor	Remark	Freq	Level	Limit Line	Over Limit	Read Level	Factor	Remark
MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m		MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m	
2388.848	53.13	54.00	-0.87	60.76	-7.63	Average	2389.856	44.35	54.00	-9.65	51.98	-7.63	Average
2388.848	71.74	74.00	-2.26	79.37	-7.63	Peak	2389.856	61.34	74.00	-12.66	68.97	-7.63	Peak
2406.096	95.66			103.27	-7.61	Average	2404.752	87.49			95.10	-7.61	Average
2406.096	106.79			114.40	-7.61	Peak	2404.752	97.54			105.15	-7.61	Peak
3216.000	47.51	54.00	-6.49	51.74	-4.23	Average	3216.000	43.28	54.00	-10.72	47.51	-4.23	Average
3216.000	49.58	74.00	-24.42	53.81	-4.23	Peak	3216.000	46.50	74.00	-27.50	50.73	-4.23	Peak
4824.000	35.02	54.00	-18.98	34.38	0.64	Average	4824.000	33.28	54.00	-20.72	33.07	0.21	Average
4824.000	49.25	74.00	-24.75	48.61	0.64	Peak	4824.000	46.81	74.00	-27.19	46.60	0.21	Peak
7236.000	33.80	54.00	-20.20	28.42	5.38	Average	7236.000	33.94	54.00	-20.06	28.56	5.38	Average
7236.000	47.33	74.00	-26.67	41.95	5.38	Peak	7236.000	46.64	74.00	-27.36	41.26	5.38	Peak

Middle CH													
Horizontal							Vertical						
Freq	Level	Limit Line	Over Limit	Read Level	Factor	Remark	Freq	Level	Limit Line	Over Limit	Read Level	Factor	Remark
MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m		MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m	
2389.134	48.86	54.00	-5.14	56.49	-7.63	Average	2389.618	40.25	54.00	-13.75	47.88	-7.63	Average
2389.134	65.92	74.00	-8.08	73.55	-7.63	Peak	2389.618	55.61	74.00	-18.39	63.24	-7.63	Peak
2430.274	98.66			106.22	-7.56	Average	2430.032	87.63			95.19	-7.56	Average
2430.274	108.79			116.35	-7.56	Peak	2430.032	97.88			105.44	-7.56	Peak
2483.756	44.07	54.00	-9.93	51.41	-7.34	Average	2546.192	38.87	54.00	-15.13	46.02	-7.15	Average
2483.756	57.30	74.00	-16.70	64.64	-7.34	Peak	2546.192	52.64	74.00	-21.36	59.79	-7.15	Peak
3249.300	46.39	54.00	-7.61	50.46	-4.07	Average	3249.300	44.60	54.00	-9.40	48.67	-4.07	Average
3249.300	48.71	74.00	-25.29	52.78	-4.07	Peak	3249.300	47.27	74.00	-26.73	51.34	-4.07	Peak
4874.000	39.61	54.00	-14.39	38.81	0.80	Average	4874.000	38.30	54.00	-15.70	37.50	0.80	Average
4874.000	53.48	74.00	-20.52	52.68	0.80	Peak	4874.000	52.12	74.00	-21.88	51.32	0.80	Peak
7311.000	34.94	54.00	-19.06	29.30	5.64	Average	7311.000	35.25	54.00	-18.75	29.63	5.62	Average
7311.000	49.15	74.00	-24.85	43.51	5.64	Peak	7311.000	48.98	74.00	-25.02	43.36	5.62	Peak

High CH													
Horizontal							Vertical						
Freq	Level	Limit Line	Over Limit	Read Level	Factor	Remark	Freq	Level	Limit Line	Over Limit	Read Level	Factor	Remark
MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m		MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m	
2456.000	95.25			102.70	-7.45	Average	2456.000	86.43			93.88	-7.45	Average
2456.000	105.66			113.11	-7.45	Peak	2456.000	96.84			104.29	-7.45	Peak
2484.200	51.52	54.00	-2.48	58.86	-7.34	Average	2485.000	40.49	54.00	-13.51	47.83	-7.34	Average
2484.200	65.33	74.00	-8.67	72.67	-7.34	Peak	2485.000	55.83	74.00	-18.17	63.17	-7.34	Peak
3282.600	44.91	54.00	-9.09	48.87	-3.96	Average	3282.600	43.72	54.00	-10.28	47.68	-3.96	Average
3282.600	47.34	74.00	-26.66	51.30	-3.96	Peak	3282.600	47.12	74.00	-26.88	51.08	-3.96	Peak
4924.000	39.80	54.00	-14.20	38.97	0.83	Average	4924.000	39.27	54.00	-14.73	38.44	0.83	Average
4924.000	54.58	74.00	-19.42	53.75	0.83	Peak	4924.000	53.68	74.00	-20.32	52.85	0.83	Peak
7386.000	34.57	54.00	-19.43	28.65	5.92	Average	7386.000	34.43	54.00	-19.57	28.51	5.92	Average
7386.000	47.46	74.00	-26.54	41.54	5.92	Peak	7386.000	47.69	74.00	-26.31	41.77	5.92	Peak

Channel 2													
Horizontal							Vertical						
Freq	Level	Limit Line	Over Limit	Read Level	Factor	Remark	Freq	Level	Limit Line	Over Limit	Read Level	Factor	Remark
MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m		MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m	
2382.480	52.16	54.00	-1.84	59.81	-7.65	Average	2382.240	41.03	54.00	-12.97	48.68	-7.65	Average
2382.480	68.81	74.00	-5.19	76.46	-7.65	Peak	2382.240	58.59	74.00	-15.41	66.24	-7.65	Peak
2411.040	94.97			102.57	-7.60	Average	2411.160	86.27			93.87	-7.60	Average
2411.040	105.25			112.85	-7.60	Peak	2411.160	96.64			104.24	-7.60	Peak
3222.600	47.94	54.00	-6.06	52.17	-4.23	Average	3222.600	44.19	54.00	-9.81	48.42	-4.23	Average
3222.600	50.14	74.00	-23.86	54.37	-4.23	Peak	3222.600	47.51	74.00	-26.49	51.74	-4.23	Peak
4834.000	37.11	54.00	-16.89	36.47	0.64	Average	4834.000	34.90	54.00	-19.10	34.25	0.65	Average
4834.000	51.20	74.00	-22.80	50.56	0.64	Peak	4834.000	48.96	74.00	-25.04	48.31	0.65	Peak
7251.000	34.67	54.00	-19.33	29.25	5.42	Average	7251.000	35.79	54.00	-18.21	30.37	5.42	Average
7251.000	46.27	74.00	-27.73	40.85	5.42	Peak	7251.000	46.75	74.00	-27.25	41.33	5.42	Peak

Channel 10													
Horizontal							Vertical						
Freq	Level	Limit Line	Over Limit	Read Level	Factor	Remark	Freq	Level	Limit Line	Over Limit	Read Level	Factor	Remark
MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m		MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m	
2451.099	95.89			103.36	-7.47	Average	2450.992	86.11	54.00	32.11	93.58	-7.47	Average
2451.099	106.37			113.84	-7.47	Peak	2450.992	96.62	74.00	22.62	104.09	-7.47	Peak
2489.512	47.65	54.00	-6.35	54.98	-7.33	Average	2490.154	39.98			47.31	-7.33	Average
2489.512	62.64	74.00	-11.36	69.97	-7.33	Peak	2490.154	54.50			61.83	-7.33	Peak
3276.000	46.10	54.00	-7.90	50.06	-3.96	Average	3276.000	44.44	54.00	-9.56	48.40	-3.96	Average
3276.000	48.31	74.00	-25.69	52.27	-3.96	Peak	3276.000	48.13	74.00	-25.87	52.09	-3.96	Peak
4914.000	41.15	54.00	-12.85	40.32	0.83	Average	4914.000	40.25	54.00	-13.75	39.41	0.84	Average
4914.000	55.17	74.00	-18.83	54.34	0.83	Peak	4914.000	54.51	74.00	-19.49	53.67	0.84	Peak
7371.000	35.00	54.00	-19.00	29.12	5.88	Average	7371.000	35.12	54.00	-18.88	29.24	5.88	Average
7371.000	46.55	74.00	-27.45	40.67	5.88	Peak	7371.000	46.76	74.00	-27.24	40.88	5.88	Peak

IEEE 802.11n HT20:

Low CH													
Horizontal							Vertical						
Freq	Level	Limit Line	Over Limit	Read Level	Factor	Remark	Freq	Level	Limit Line	Over Limit	Read Level	Factor	Remark
MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m		MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m	
2389.520	53.65	54.00	-0.35	61.28	-7.63	Average	2388.848	44.67	54.00	-9.33	52.30	-7.63	Average
2389.520	69.86	74.00	-4.14	77.49	-7.63	Peak	2388.848	60.77	74.00	-13.23	68.40	-7.63	Peak
2404.864	95.14			102.75	-7.61	Average	2405.536	87.20			94.81	-7.61	Average
2404.864	105.83			113.44	-7.61	Peak	2405.536	97.68			105.29	-7.61	Peak
3216.000	47.48	54.00	-6.52	51.71	-4.23	Average	3216.000	43.10	54.00	-10.90	47.33	-4.23	Average
3216.000	49.39	74.00	-24.61	53.62	-4.23	Peak	3216.000	46.61	74.00	-27.39	50.84	-4.23	Peak
4824.000	34.98	54.00	-19.02	34.36	0.62	Average	4824.000	33.23	54.00	-20.77	33.02	0.21	Average
4824.000	48.43	74.00	-25.57	47.81	0.62	Peak	4824.000	46.83	74.00	-27.17	46.62	0.21	Peak
7236.000	34.69	54.00	-19.31	29.31	5.38	Average	7236.000	34.68	54.00	-19.32	29.30	5.38	Average
7236.000	47.05	74.00	-26.95	41.67	5.38	Peak	7236.000	47.68	74.00	-26.32	42.30	5.38	Peak

Middle CH													
Horizontal							Vertical						
Freq	Level	Limit Line	Over Limit	Read Level	Factor	Remark	Freq	Level	Limit Line	Over Limit	Read Level	Factor	Remark
MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m		MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m	
2389.860	48.72	54.00	-5.28	56.35	-7.63	Average	2389.860	40.59	54.00	-13.41	48.22	-7.63	Average
2389.860	65.04	74.00	-8.96	72.67	-7.63	Peak	2389.860	55.31	74.00	-18.69	62.94	-7.63	Peak
2430.032	98.44			106.00	-7.56	Average	2429.548	87.71			95.27	-7.56	Average
2430.032	108.86			116.42	-7.56	Peak	2429.548	97.83			105.39	-7.56	Peak
2487.386	44.19	54.00	-9.81	51.53	-7.34	Average	2488.596	38.49	54.00	-15.51	45.82	-7.33	Average
2487.386	57.57	74.00	-16.43	64.91	-7.34	Peak	2488.596	51.83	74.00	-22.17	59.16	-7.33	Peak
3249.300	46.63	54.00	-7.37	50.70	-4.07	Average	3249.300	44.67	54.00	-9.33	48.74	-4.07	Average
3249.300	48.85	74.00	-25.15	52.92	-4.07	Peak	3249.300	47.39	74.00	-26.61	51.46	-4.07	Peak
4874.000	39.89	54.00	-14.11	39.16	0.73	Average	4874.000	38.24	54.00	-15.76	37.44	0.80	Average
4874.000	53.55	74.00	-20.45	52.82	0.73	Peak	4874.000	52.11	74.00	-21.89	51.31	0.80	Peak
7311.000	34.78	54.00	-19.22	29.14	5.64	Average	7311.000	34.96	54.00	-19.04	29.32	5.64	Average
7311.000	44.83	74.00	-29.17	39.19	5.64	Peak	7311.000	48.03	74.00	-25.97	42.39	5.64	Peak

High CH													
Horizontal							Vertical						
Freq	Level	Limit Line	Over Limit	Read Level	Factor	Remark	Freq	Level	Limit Line	Over Limit	Read Level	Factor	Remark
MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m		MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m	
2455.200	95.15			102.60	-7.45	Average	2454.900	86.30			93.76	-7.46	Average
2455.200	105.66			113.11	-7.45	Peak	2454.900	97.18			104.64	-7.46	Peak
2485.600	51.22	54.00	-2.78	58.56	-7.34	Average	2485.500	40.91	54.00	-13.09	48.25	-7.34	Average
2485.600	66.59	74.00	-7.41	73.93	-7.34	Peak	2485.500	56.97	74.00	-17.03	64.31	-7.34	Peak
3282.600	45.05	54.00	-8.95	49.01	-3.96	Average	3282.600	43.51	54.00	-10.49	47.47	-3.96	Average
3282.600	47.67	74.00	-26.33	51.63	-3.96	Peak	3282.600	47.25	74.00	-26.75	51.21	-3.96	Peak
4924.000	39.72	54.00	-14.28	38.88	0.84	Average	4924.000	39.17	54.00	-14.83	38.33	0.84	Average
4924.000	53.59	74.00	-20.41	52.75	0.84	Peak	4924.000	53.40	74.00	-20.60	52.56	0.84	Peak
7386.000	35.07	54.00	-18.93	29.15	5.92	Average	7386.000	34.80	54.00	-19.20	28.88	5.92	Average
7386.000	47.08	74.00	-26.92	41.16	5.92	Peak	7386.000	47.81	74.00	-26.19	41.89	5.92	Peak

Channel 2													
Horizontal							Vertical						
Freq	Level	Limit Line	Over Limit	Read Level	Factor	Remark	Freq	Level	Limit Line	Over Limit	Read Level	Factor	Remark
MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m		MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m	
2383.680	53.10	54.00	-0.90	60.74	-7.64	Average	2383.680	43.12	54.00	-10.88	50.76	-7.64	Average
2383.680	69.68	74.00	-4.32	77.32	-7.64	Peak	2383.680	59.62	74.00	-14.38	67.26	-7.64	Peak
2409.960	95.84			103.44	-7.60	Average	2409.720	86.72			94.32	-7.60	Average
2409.960	106.68			114.28	-7.60	Peak	2409.720	97.18			104.78	-7.60	Peak
3222.600	47.22	54.00	-6.78	51.45	-4.23	Average	3222.600	44.17	54.00	-9.83	48.40	-4.23	Average
3222.600	50.46	74.00	-23.54	54.69	-4.23	Peak	3222.600	47.52	74.00	-26.48	51.75	-4.23	Peak
4834.000	36.61	54.00	-17.39	35.96	0.65	Average	4834.000	34.60	54.00	-19.40	33.96	0.64	Average
4834.000	50.63	74.00	-23.37	49.98	0.65	Peak	4834.000	48.18	74.00	-25.82	47.54	0.64	Peak
7251.000	34.60	54.00	-19.40	29.18	5.42	Average	7251.000	34.28	54.00	-19.72	28.86	5.42	Average
7251.000	46.86	74.00	-27.14	41.44	5.42	Peak	7251.000	48.93	74.00	-25.07	43.51	5.42	Peak

Channel 10													
Horizontal							Vertical						
Freq	Level	Limit Line	Over Limit	Read Level	Factor	Remark	Freq	Level	Limit Line	Over Limit	Read Level	Factor	Remark
MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m		MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m	
2450.029	96.17			103.65	-7.48	Average	2449.708	86.48			93.96	-7.48	Average
2450.029	107.09			114.57	-7.48	Peak	2449.708	97.07			104.55	-7.48	Peak
2490.154	48.21	54.00	-5.79	55.54	-7.33	Average	2490.796	40.54	54.00	-13.46	47.87	-7.33	Average
2490.154	62.63	74.00	-11.37	69.96	-7.33	Peak	2490.796	55.34	74.00	-18.66	62.67	-7.33	Peak
3276.000	45.77	54.00	-8.23	49.73	-3.96	Average	3276.000	44.48	54.00	-9.52	48.44	-3.96	Average
3276.000	48.37	74.00	-25.63	52.33	-3.96	Peak	3276.000	47.64	74.00	-26.36	51.60	-3.96	Peak
4914.000	41.21	54.00	-12.79	40.37	0.84	Average	4914.000	38.96	54.00	-15.04	38.12	0.84	Average
4914.000	55.72	74.00	-18.28	54.88	0.84	Peak	4914.000	54.82	74.00	-19.18	53.98	0.84	Peak
7371.000	34.72	54.00	-19.28	28.84	5.88	Average	7371.000	35.28	54.00	-18.72	29.40	5.88	Average
7371.000	48.57	74.00	-25.43	42.69	5.88	Peak	7371.000	49.02	74.00	-24.98	43.14	5.88	Peak

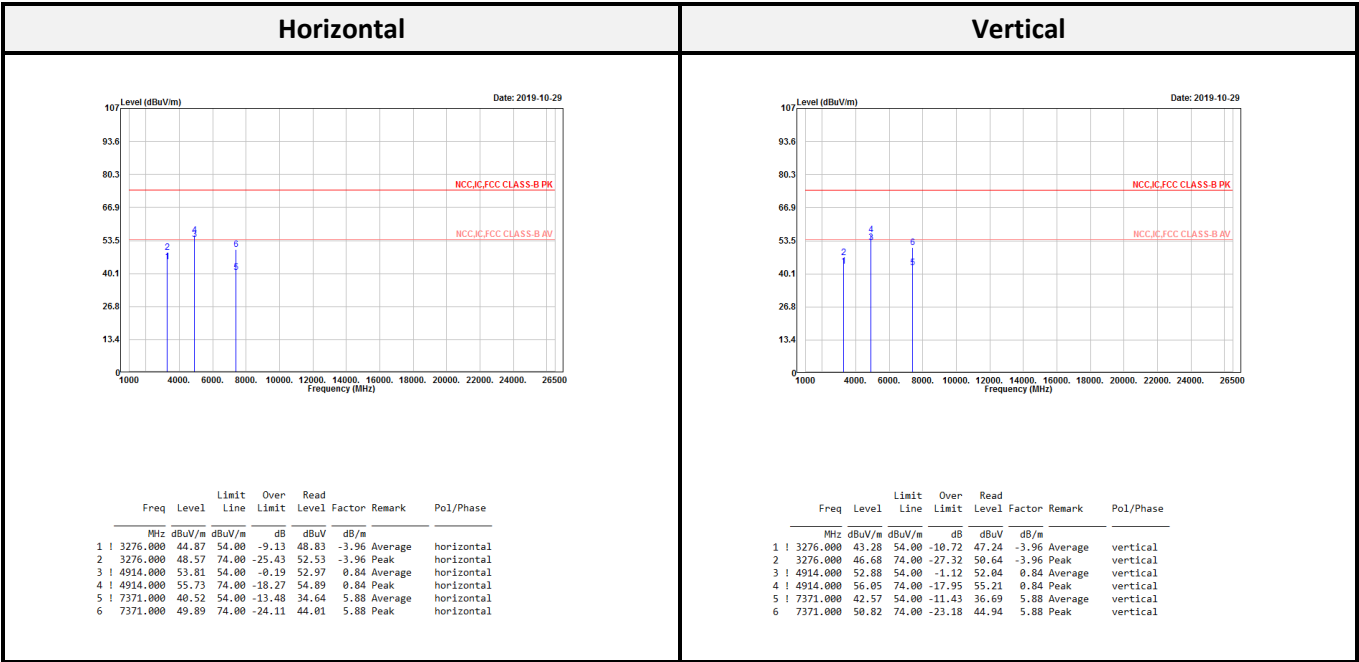
IEEE 802.11n HT40:

Low CH													
Horizontal							Vertical						
Freq	Level	Limit Line	Over Limit	Read Level	Factor	Remark	Freq	Level	Limit Line	Over Limit	Read Level	Factor	Remark
MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m		MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m	
2387.616	52.98	54.00	-1.02	60.61	-7.63	Average	2385.240	43.84	54.00	-10.16	51.48	-7.64	Average
2387.616	67.73	74.00	-6.27	75.36	-7.63	Peak	2385.240	58.00	74.00	-16.00	65.64	-7.64	Peak
2426.820	83.97			91.54	-7.57	Average	2411.376	74.31			81.91	-7.60	Average
2426.820	94.85			102.42	-7.57	Peak	2411.376	85.55			93.15	-7.60	Peak
3229.300	46.08	54.00	-7.92	50.22	-4.14	Average	3229.300	42.27	54.00	-11.73	46.41	-4.14	Average
3229.300	48.83	74.00	-25.17	52.97	-4.14	Peak	3229.300	46.08	74.00	-27.92	50.22	-4.14	Peak
4844.000	32.26	54.00	-21.74	31.56	0.70	Average	4844.000	31.14	54.00	-22.86	30.44	0.70	Average
4844.000	44.27	74.00	-29.73	43.57	0.70	Peak	4844.000	44.56	74.00	-29.44	43.86	0.70	Peak
7266.000	34.66	54.00	-19.34	29.23	5.43	Average	7266.000	34.08	54.00	-19.92	28.65	5.43	Average
7266.000	47.70	74.00	-26.30	42.27	5.43	Peak	7266.000	47.41	74.00	-26.59	41.98	5.43	Peak

Middle CH													
Horizontal							Vertical						
Freq	Level	Limit Line	Over Limit	Read Level	Factor	Remark	Freq	Level	Limit Line	Over Limit	Read Level	Factor	Remark
MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m		MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m	
2388.650	53.47	54.00	-0.53	61.10	-7.63	Average	2389.376	43.79	54.00	-10.21	51.42	-7.63	Average
2388.650	69.88	74.00	-4.12	77.51	-7.63	Peak	2389.376	60.83	74.00	-13.17	68.46	-7.63	Peak
2426.402	88.47			96.04	-7.57	Average	2419.626	79.12			86.70	-7.58	Average
2426.402	99.77			107.34	-7.57	Peak	2419.626	89.21			96.79	-7.58	Peak
2483.998	48.20	54.00	-5.80	55.54	-7.34	Average	2485.450	40.20	54.00	-13.80	47.54	-7.34	Average
2483.998	65.48	74.00	-8.52	72.82	-7.34	Peak	2485.450	53.70	74.00	-20.30	61.04	-7.34	Peak
3249.300	46.48	54.00	-7.52	50.55	-4.07	Average	3249.300	44.37	54.00	-9.63	48.44	-4.07	Average
3249.300	48.98	74.00	-25.02	53.05	-4.07	Peak	3249.300	47.37	74.00	-26.63	51.44	-4.07	Peak
4874.000	31.69	54.00	-22.31	30.90	0.79	Average	4874.000	31.99	54.00	-22.01	31.20	0.79	Average
4874.000	41.66	74.00	-32.34	40.87	0.79	Peak	4874.000	45.66	74.00	-28.34	44.87	0.79	Peak
7311.000	35.05	54.00	-18.95	29.41	5.64	Average	7311.000	34.66	54.00	-19.34	29.02	5.64	Average
7311.000	48.17	74.00	-25.83	42.53	5.64	Peak	7311.000	46.69	74.00	-27.31	41.05	5.64	Peak

High CH													
Horizontal							Vertical						
Freq	Level	Limit Line	Over Limit	Read Level	Factor	Remark	Freq	Level	Limit Line	Over Limit	Read Level	Factor	Remark
MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m		MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m	
2436.560	87.02			94.56	-7.54	Average	2436.440	76.72			84.26	-7.54	Average
2436.560	98.11			105.65	-7.54	Peak	2436.440	88.00			95.54	-7.54	Peak
2483.840	53.19	54.00	-0.81	60.53	-7.34	Average	2487.440	43.01	54.00	-10.99	50.35	-7.34	Average
2483.840	68.74	74.00	-5.26	76.08	-7.34	Peak	2487.440	57.33	74.00	-16.67	64.67	-7.34	Peak
3269.300	45.61	54.00	-8.39	49.63	-4.02	Average	3269.300	42.89	54.00	-11.11	46.91	-4.02	Average
3269.300	48.54	74.00	-25.46	52.56	-4.02	Peak	3269.300	46.31	74.00	-27.69	50.33	-4.02	Peak
4904.000	32.43	54.00	-21.57	31.58	0.85	Average	4904.000	31.02	54.00	-22.98	30.17	0.85	Average
4904.000	46.48	74.00	-27.52	45.63	0.85	Peak	4904.000	45.05	74.00	-28.95	44.20	0.85	Peak
7356.000	34.50	54.00	-19.50	28.68	5.82	Average	7356.000	34.31	54.00	-19.69	28.49	5.82	Average
7356.000	46.90	74.00	-27.10	41.08	5.82	Peak	7356.000	46.27	74.00	-27.73	40.45	5.82	Peak

Above 1G (1 GHz-26.5 GHz): The worst mode



Level = Reading Level + Correct Factor

Over Limit = Level – Limit

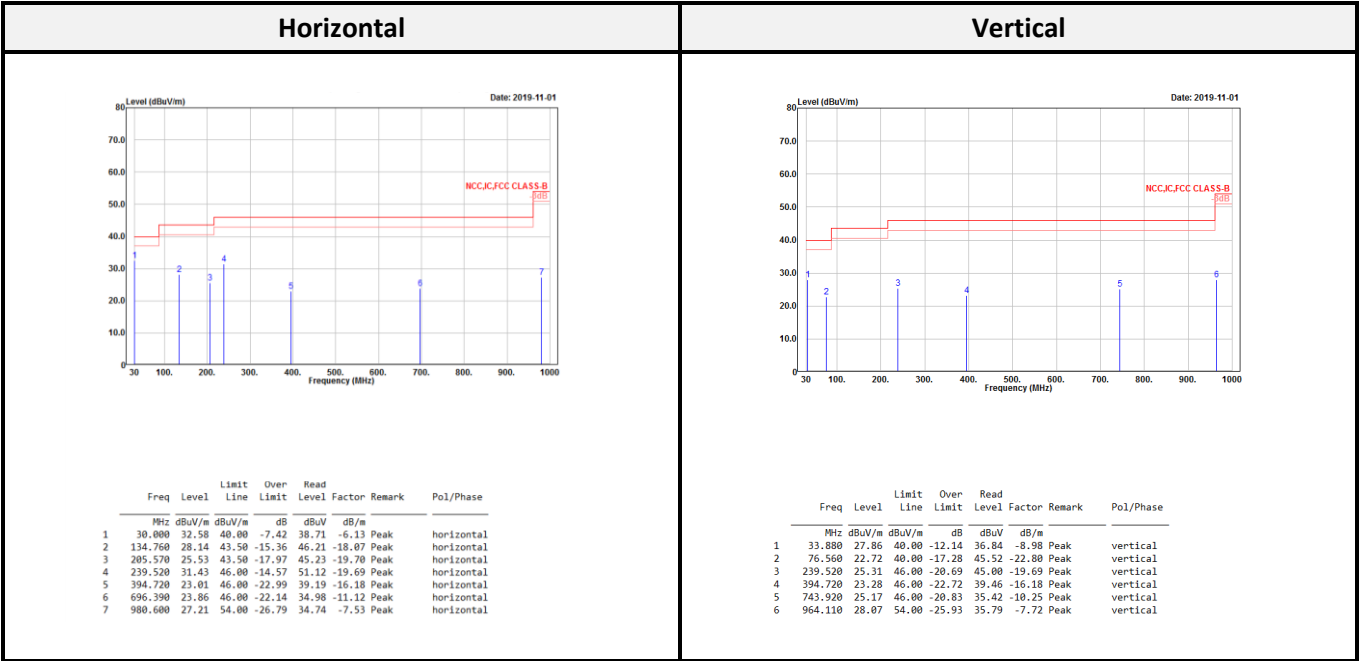
Correct Factor = Antenna Factor + Cable Loss – Amplifier Gain

Spurious emissions more than 20 dB below the limit were not reported

<Chip Antenna 3.3V>

Transmitting mode (Pre-scan with three orthogonal axis, and worse case as Z axis)

Below 1G (30 MHz-1 GHz) test the worst mode



Level = Reading Level + Correct Factor

Over Limit = Level – Limit

Correct Factor = Antenna Factor + Cable Loss – Amplifier Gain

Spurious emissions more than 20 dB below the limit were not reported

Above 1G (1 GHz-26.5 GHz)**IEEE 802.11b:**

Low CH													
Horizontal							Vertical						
Freq	Level	Limit Line	Over Limit	Read Level	Factor	Remark	Freq	Level	Limit Line	Over Limit	Read Level	Factor	Remark
MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m		MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m	
2385.600	48.76	54.00	-5.24	56.40	-7.64	Average	2387.504	38.79	54.00	-15.21	46.42	-7.63	Average
2385.600	58.33	74.00	-15.67	65.97	-7.64	Peak	2387.504	52.49	74.00	-21.51	60.12	-7.63	Peak
2413.040	103.12			110.71	-7.59	Average	2411.248	94.53			102.13	-7.60	Average
2413.040	105.85			113.44	-7.59	Peak	2411.248	97.25			104.85	-7.60	Peak
3216.000	47.71	54.00	-6.29	51.94	-4.23	Average	3216.000	45.19	54.00	-8.81	49.42	-4.23	Average
3216.000	50.21	74.00	-23.79	54.44	-4.23	Peak	3216.000	48.41	74.00	-25.59	52.64	-4.23	Peak
4824.000	53.38	54.00	-0.62	52.74	0.64	Average	4824.000	52.63	54.00	-1.37	51.99	0.64	Average
4824.000	56.85	74.00	-17.15	56.21	0.64	Peak	4824.000	54.98	74.00	-19.02	54.34	0.64	Peak
7236.000	43.48	54.00	-10.52	38.10	5.38	Average	7236.000	45.13	54.00	-8.87	39.20	5.93	Average
7236.000	51.80	74.00	-22.20	46.42	5.38	Peak	7236.000	52.21	74.00	-21.79	46.28	5.93	Peak

Middle CH													
Horizontal							Vertical						
Freq	Level	Limit Line	Over Limit	Read Level	Factor	Remark	Freq	Level	Limit Line	Over Limit	Read Level	Factor	Remark
MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m		MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m	
2385.262	39.36	54.00	-14.64	47.00	-7.64	Average	2374.856	37.02	54.00	-16.98	44.68	-7.66	Average
2385.262	52.13	74.00	-21.87	59.77	-7.64	Peak	2374.856	51.06	74.00	-22.94	58.72	-7.66	Peak
2436.324	100.39			107.93	-7.54	Average	2438.018	88.39			95.91	-7.52	Average
2436.324	103.21			110.75	-7.54	Peak	2438.018	91.22			98.74	-7.52	Peak
2524.412	39.37	54.00	-14.63	46.62	-7.25	Average	2521.992	37.74	54.00	-16.26	45.00	-7.26	Average
2524.412	51.86	74.00	-22.14	59.11	-7.25	Peak	2521.992	50.79	74.00	-23.21	58.05	-7.26	Peak
3249.300	45.26	54.00	-8.74	49.33	-4.07	Average	3249.300	45.47	54.00	-8.53	49.54	-4.07	Average
3249.300	48.33	74.00	-25.67	52.40	-4.07	Peak	3249.300	48.65	74.00	-25.35	52.72	-4.07	Peak
4874.000	53.26	54.00	-0.74	52.46	0.80	Average	4874.000	53.84	54.00	-0.16	53.04	0.80	Average
4874.000	56.52	74.00	-17.48	55.72	0.80	Peak	4874.000	57.26	74.00	-16.74	56.46	0.80	Peak
7311.000	37.12	54.00	-16.88	31.48	5.64	Average	7311.000	39.64	54.00	-14.36	34.00	5.64	Average
7311.000	49.14	74.00	-24.86	43.50	5.64	Peak	7311.000	50.04	74.00	-23.96	44.40	5.64	Peak

High CH													
Horizontal							Vertical						
Freq	Level	Limit Line	Over Limit	Read Level	Factor	Remark	Freq	Level	Limit Line	Over Limit	Read Level	Factor	Remark
MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m		MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m	
2462.900	97.15			104.57	-7.42	Average	2461.200	87.47			94.90	-7.43	Average
2462.900	99.92			107.34	-7.42	Peak	2461.200	90.22			97.65	-7.43	Peak
2506.100	41.12	54.00	-12.88	48.42	-7.30	Average	2502.000	37.79	54.00	-16.21	45.10	-7.31	Average
2506.100	54.18	74.00	-19.82	61.48	-7.30	Peak	2502.000	51.59	74.00	-22.41	58.90	-7.31	Peak
3282.600	44.79	54.00	-9.21	48.75	-3.96	Average	3282.600	43.80	54.00	-10.20	47.76	-3.96	Average
3282.600	47.93	74.00	-26.07	51.89	-3.96	Peak	3282.600	47.36	74.00	-26.64	51.32	-3.96	Peak
4924.000	53.05	54.00	-0.95	52.22	0.83	Average	4924.000	52.34	54.00	-1.66	51.51	0.83	Average
4924.000	55.61	74.00	-18.39	54.78	0.83	Peak	4924.000	55.50	74.00	-18.50	54.67	0.83	Peak
7386.000	34.42	54.00	-19.58	28.50	5.92	Average	7386.000	35.37	54.00	-18.63	29.45	5.92	Average
7386.000	48.38	74.00	-25.62	42.46	5.92	Peak	7386.000	49.46	74.00	-24.54	43.54	5.92	Peak

IEEE 802.11g:

Low CH													
Horizontal							Vertical						
Freq	Level	Limit	Over	Read			Freq	Level	Limit	Over	Read		
		Line	Limit	Level	Factor	Remark			Line	Limit	Level	Factor	Remark
MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m		MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m	
2389.744	53.50	54.00	-0.50	61.13	-7.63	Average	2380.560	44.18	54.00	-9.82	51.83	-7.65	Average
2389.744	70.23	74.00	-3.77	77.86	-7.63	Peak	2380.560	58.97	74.00	-15.03	66.62	-7.65	Peak
2405.984	97.16			104.77	-7.61	Average	2405.984	89.75			97.36	-7.61	Average
2405.984	107.90			115.51	-7.61	Peak	2405.984	100.08			107.69	-7.61	Peak
3216.000	47.65	54.00	-6.35	51.88	-4.23	Average	3216.000	45.11	54.00	-8.89	49.34	-4.23	Average
3216.000	49.66	74.00	-24.34	53.89	-4.23	Peak	3216.000	48.11	74.00	-25.89	52.34	-4.23	Peak
4824.000	39.78	54.00	-14.22	39.16	0.62	Average	4824.000	38.05	54.00	-15.95	37.41	0.64	Average
4824.000	54.33	74.00	-19.67	53.71	0.62	Peak	4824.000	53.09	74.00	-20.91	52.45	0.64	Peak
7236.000	34.81	54.00	-19.19	29.43	5.38	Average	7236.000	35.65	54.00	-18.35	30.27	5.38	Average
7236.000	47.23	74.00	-26.77	41.85	5.38	Peak	7236.000	48.04	74.00	-25.96	42.66	5.38	Peak

Middle CH													
Horizontal							Vertical						
Freq	Level	Limit	Over	Read			Freq	Level	Limit	Over	Read		
		Line	Limit	Level	Factor	Remark			Line	Limit	Level	Factor	Remark
MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m		MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m	
2389.618	46.27	54.00	-7.73	53.90	-7.63	Average	2389.134	39.66	54.00	-14.34	47.29	-7.63	Average
2389.618	61.71	74.00	-12.29	69.34	-7.63	Peak	2389.134	54.44	74.00	-19.56	62.07	-7.63	Peak
2431.242	98.82			106.38	-7.56	Average	2429.790	88.54			96.10	-7.56	Average
2431.242	109.05			116.61	-7.56	Peak	2429.790	98.72			106.28	-7.56	Peak
2483.756	43.54	54.00	-10.46	50.88	-7.34	Average	2523.202	38.43	54.00	-15.57	45.69	-7.26	Average
2483.756	57.04	74.00	-16.96	64.38	-7.34	Peak	2523.202	52.05	74.00	-21.95	59.31	-7.26	Peak
3249.300	46.25	54.00	-7.75	50.32	-4.07	Average	3249.300	45.84	54.00	-8.16	49.91	-4.07	Average
3249.300	48.85	74.00	-25.15	52.92	-4.07	Peak	3249.300	48.69	74.00	-25.31	52.76	-4.07	Peak
4874.000	44.07	54.00	-9.93	43.27	0.80	Average	4874.000	43.24	54.00	-10.76	42.44	0.80	Average
4874.000	58.13	74.00	-15.87	57.33	0.80	Peak	4874.000	57.49	74.00	-16.51	56.69	0.80	Peak
7311.000	34.97	54.00	-19.03	29.33	5.64	Average	7311.000	36.06	54.00	-17.94	30.42	5.64	Average
7311.000	47.17	74.00	-26.83	41.53	5.64	Peak	7311.000	48.68	74.00	-25.32	43.04	5.64	Peak

High CH													
Horizontal							Vertical						
Freq	Level	Limit	Over	Read			Freq	Level	Limit	Over	Read		
		Line	Limit	Level	Factor	Remark			Line	Limit	Level	Factor	Remark
MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m		MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m	
2468.200	96.02			103.42	-7.40	Average	2454.800	86.94			94.40	-7.46	Average
2468.200	106.73			114.13	-7.40	Peak	2454.800	97.22			104.68	-7.46	Peak
2484.500	53.19	54.00	-0.81	60.53	-7.34	Average	2484.500	41.94	54.00	-12.06	49.28	-7.34	Average
2484.500	72.85	74.00	-1.15	80.19	-7.34	Peak	2484.500	59.31	74.00	-14.69	66.65	-7.34	Peak
3282.600	45.02	54.00	-8.98	48.98	-3.96	Average	3282.600	44.63	54.00	-9.37	48.59	-3.96	Average
3282.600	47.72	74.00	-26.28	51.68	-3.96	Peak	3282.600	47.75	74.00	-26.25	51.71	-3.96	Peak
4924.000	45.64	54.00	-8.36	44.80	0.84	Average	4924.000	45.16	54.00	-8.84	44.32	0.84	Average
4924.000	59.46	74.00	-14.54	58.62	0.84	Peak	4924.000	53.52	74.00	-20.48	52.68	0.84	Peak
7386.000	35.23	54.00	-18.77	29.31	5.92	Average	7386.000	36.16	54.00	-17.84	30.24	5.92	Average
7386.000	47.22	74.00	-26.78	41.30	5.92	Peak	7386.000	48.20	74.00	-25.80	42.28	5.92	Peak

IEEE 802.11n HT20:

Low CH													
Horizontal							Vertical						
Freq	Level	Limit Line	Over Limit	Read Level	Factor	Remark	Freq	Level	Limit Line	Over Limit	Read Level	Factor	Remark
MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m		MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m	
2390.000	52.72	54.00	-1.28	60.35	-7.63	Average	2389.520	43.36	54.00	-10.64	50.99	-7.63	Average
2390.000	66.53	74.00	-7.47	74.16	-7.63	Peak	2389.520	58.02	74.00	-15.98	65.65	-7.63	Peak
2404.976	96.99			104.60	-7.61	Average	2405.200	88.74			96.35	-7.61	Average
2404.976	107.45			115.06	-7.61	Peak	2405.200	99.45			107.06	-7.61	Peak
3216.000	47.59	54.00	-6.41	51.82	-4.23	Average	3216.000	45.06	54.00	-8.94	49.29	-4.23	Average
3216.000	49.97	74.00	-24.03	54.20	-4.23	Peak	3216.000	48.66	74.00	-25.34	52.89	-4.23	Peak
4824.000	39.04	54.00	-14.96	38.40	0.64	Average	4824.000	37.11	54.00	-16.89	36.47	0.64	Average
4824.000	53.28	74.00	-20.72	52.64	0.64	Peak	4824.000	52.04	74.00	-21.96	51.40	0.64	Peak
7236.000	34.81	54.00	-19.19	29.43	5.38	Average	7236.000	34.70	54.00	-19.30	29.32	5.38	Average
7236.000	46.62	74.00	-27.38	41.24	5.38	Peak	7236.000	47.71	74.00	-26.29	42.33	5.38	Peak

Middle CH													
Horizontal							Vertical						
Freq	Level	Limit Line	Over Limit	Read Level	Factor	Remark	Freq	Level	Limit Line	Over Limit	Read Level	Factor	Remark
MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m		MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m	
2388.892	47.02	54.00	-6.98	54.65	-7.63	Average	2389.376	39.51	54.00	-14.49	47.14	-7.63	Average
2388.892	62.41	74.00	-11.59	70.04	-7.63	Peak	2389.376	52.34	74.00	-21.66	59.97	-7.63	Peak
2429.790	98.68			106.24	-7.56	Average	2430.032	88.82			96.38	-7.56	Average
2429.790	109.15			116.71	-7.56	Peak	2430.032	99.17			106.73	-7.56	Peak
2489.080	43.88	54.00	-10.12	51.21	-7.33	Average	2494.404	38.84	54.00	-15.16	46.17	-7.33	Average
2489.080	56.88	74.00	-17.12	64.21	-7.33	Peak	2494.404	51.77	74.00	-22.23	59.10	-7.33	Peak
3249.300	46.40	54.00	-7.60	50.47	-4.07	Average	3249.300	45.80	54.00	-8.20	49.87	-4.07	Average
3249.300	49.36	74.00	-24.64	53.43	-4.07	Peak	3249.300	48.76	74.00	-25.24	52.83	-4.07	Peak
4874.000	43.67	54.00	-10.33	42.94	0.73	Average	4874.000	43.12	54.00	-10.88	42.39	0.73	Average
4874.000	58.33	74.00	-15.67	57.60	0.73	Peak	4874.000	57.64	74.00	-16.36	56.91	0.73	Peak
7311.000	34.89	54.00	-19.11	29.25	5.64	Average	7311.000	34.99	54.00	-19.01	29.35	5.64	Average
7311.000	46.49	74.00	-27.51	40.85	5.64	Peak	7311.000	47.96	74.00	-26.04	42.32	5.64	Peak

High CH													
Horizontal							Vertical						
Freq	Level	Limit Line	Over Limit	Read Level	Factor	Remark	Freq	Level	Limit Line	Over Limit	Read Level	Factor	Remark
MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m		MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m	
2454.900	95.18			102.64	-7.46	Average	2454.800	87.26			94.72	-7.46	Average
2454.900	106.50			113.96	-7.46	Peak	2454.800	98.08			105.54	-7.46	Peak
2485.000	53.83	54.00	-0.17	61.17	-7.34	Average	2485.100	43.27	54.00	-10.73	50.61	-7.34	Average
2485.000	72.86	74.00	-1.14	80.20	-7.34	Peak	2485.100	61.62	74.00	-12.38	68.96	-7.34	Peak
3282.600	45.35	54.00	-8.65	49.31	-3.96	Average	3282.600	44.65	54.00	-9.35	48.60	-3.95	Average
3282.600	48.29	74.00	-25.71	52.25	-3.96	Peak	3282.600	48.25	74.00	-25.75	52.21	-3.96	Peak
4924.000	46.44	54.00	-7.56	45.60	0.84	Average	4924.000	44.94	54.00	-9.06	44.11	0.83	Average
4924.000	59.27	74.00	-14.73	58.43	0.84	Peak	4924.000	59.44	74.00	-14.56	58.61	0.83	Peak
7386.000	35.16	54.00	-18.84	29.24	5.92	Average	7386.000	35.35	54.00	-18.65	29.43	5.92	Average
7386.000	47.19	74.00	-26.81	41.27	5.92	Peak	7386.000	47.79	74.00	-26.21	41.87	5.92	Peak

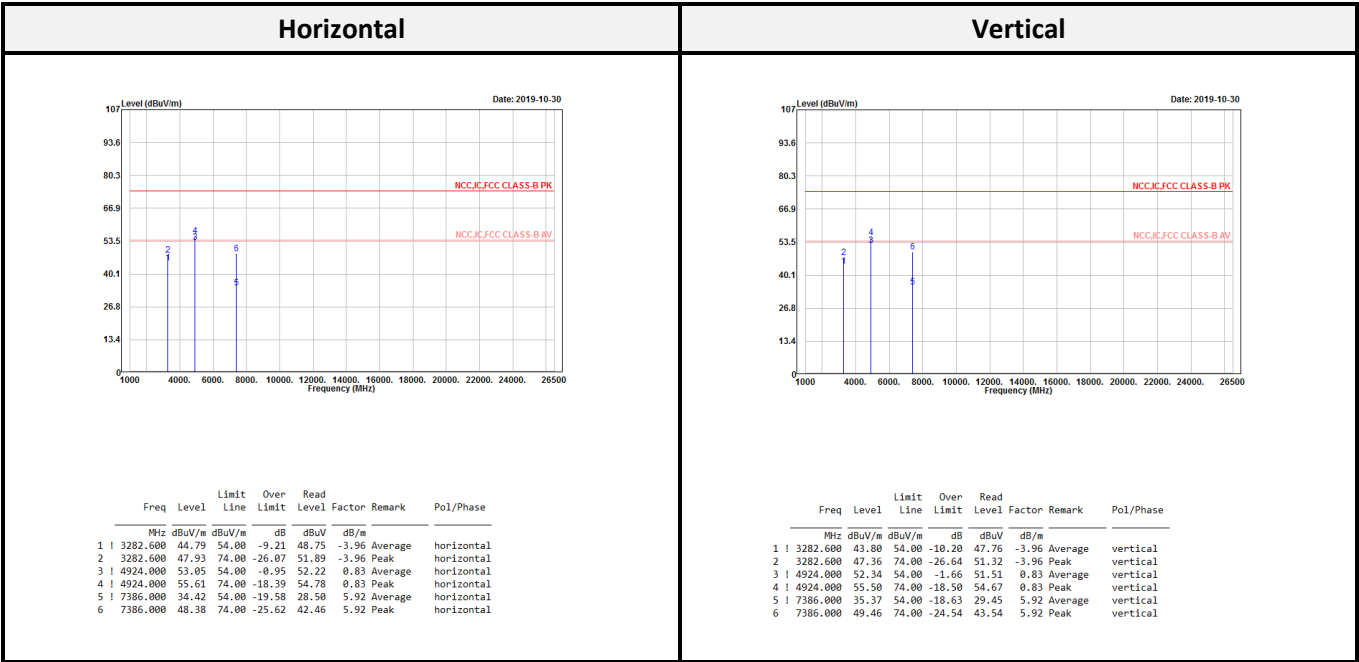
IEEE 802.11n HT40:

Low CH													
Horizontal							Vertical						
Freq	Level	Limit Line	Over Limit	Read Level	Factor	Remark	Freq	Level	Limit Line	Over Limit	Read Level	Factor	Remark
MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m		MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m	
2384.976	53.65	54.00	-0.35	61.29	-7.64	Average	2377.452	43.27	54.00	-10.73	50.92	-7.65	Average
2384.976	70.00	74.00	-4.00	77.64	-7.64	Peak	2377.452	58.39	74.00	-15.61	66.04	-7.65	Peak
2416.788	87.71			95.30	-7.59	Average	2405.700	79.49			87.10	-7.61	Average
2416.788	98.90			106.49	-7.59	Peak	2405.700	90.03			97.64	-7.61	Peak
3229.300	47.21	54.00	-6.79	51.35	-4.14	Average	3229.300	45.08	54.00	-8.92	49.22	-4.14	Average
3229.300	49.70	74.00	-24.30	53.84	-4.14	Peak	3229.300	49.28	74.00	-24.72	53.42	-4.14	Peak
4844.000	33.81	54.00	-20.19	33.11	0.70	Average	4844.000	33.03	54.00	-20.97	32.33	0.70	Average
4844.000	47.24	74.00	-26.76	46.54	0.70	Peak	4844.000	46.25	74.00	-27.75	45.55	0.70	Peak
7266.000	34.75	54.00	-19.25	29.32	5.43	Average	7266.000	34.56	54.00	-19.44	29.13	5.43	Average
7266.000	46.44	74.00	-27.56	41.01	5.43	Peak	7266.000	46.42	74.00	-27.58	40.99	5.43	Peak

Middle CH													
Horizontal							Vertical						
Freq	Level	Limit Line	Over Limit	Read Level	Factor	Remark	Freq	Level	Limit Line	Over Limit	Read Level	Factor	Remark
MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m		MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m	
2388.166	53.68	54.00	-0.32	61.31	-7.63	Average	2388.166	43.84	54.00	-10.16	51.47	-7.63	Average
2388.166	71.59	74.00	-2.41	79.22	-7.63	Peak	2388.166	60.87	74.00	-13.13	68.50	-7.63	Peak
2421.562	90.62			98.20	-7.58	Average	2421.562	81.12			88.70	-7.58	Average
2421.562	101.30			108.88	-7.58	Peak	2421.562	91.67			99.25	-7.58	Peak
2484.240	50.09	54.00	-3.91	57.43	-7.34	Average	2484.240	40.38	54.00	-13.62	47.72	-7.34	Average
2484.240	69.33	74.00	-4.67	76.67	-7.34	Peak	2484.240	55.80	74.00	-18.20	63.14	-7.34	Peak
3249.300	46.77	54.00	-7.23	50.84	-4.07	Average	3249.300	46.11	54.00	-7.89	50.18	-4.07	Average
3249.300	49.75	74.00	-24.25	53.82	-4.07	Peak	3249.300	48.45	74.00	-25.55	52.52	-4.07	Peak
4874.000	37.89	54.00	-16.11	37.16	0.73	Average	4874.000	37.39	54.00	-16.61	36.59	0.80	Average
4874.000	52.11	74.00	-21.89	51.38	0.73	Peak	4874.000	51.47	74.00	-22.53	50.67	0.80	Peak
7311.000	34.86	54.00	-19.14	29.22	5.64	Average	7311.000	35.29	54.00	-18.71	29.65	5.64	Average
7311.000	47.76	74.00	-26.24	42.12	5.64	Peak	7311.000	47.26	74.00	-26.74	41.62	5.64	Peak

High CH													
Horizontal							Vertical						
Freq	Level	Limit Line	Over Limit	Read Level	Factor	Remark	Freq	Level	Limit Line	Over Limit	Read Level	Factor	Remark
MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m		MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m	
2436.440	88.98			96.52	-7.54	Average	2436.680	79.68			87.22	-7.54	Average
2436.440	100.42			107.96	-7.54	Peak	2436.680	90.99			98.53	-7.54	Peak
2488.640	52.87	54.00	-1.13	60.20	-7.33	Average	2491.880	41.27	54.00	-12.73	48.60	-7.33	Average
2488.640	68.31	74.00	-5.69	75.64	-7.33	Peak	2491.880	55.92	74.00	-18.08	63.25	-7.33	Peak
3269.300	45.82	54.00	-8.18	49.84	-4.02	Average	3269.300	44.44	54.00	-9.56	48.46	-4.02	Average
3269.300	48.86	74.00	-25.14	52.88	-4.02	Peak	3269.300	47.66	74.00	-26.34	51.68	-4.02	Peak
4904.000	35.74	54.00	-18.26	34.89	0.85	Average	4904.000	36.31	54.00	-17.69	35.46	0.85	Average
4904.000	50.73	74.00	-23.27	49.88	0.85	Peak	4904.000	50.50	74.00	-23.50	49.65	0.85	Peak
7356.000	35.47	54.00	-18.53	29.65	5.82	Average	7356.000	35.36	54.00	-18.64	29.54	5.82	Average
7356.000	46.90	74.00	-27.10	41.08	5.82	Peak	7356.000	48.11	74.00	-25.89	42.29	5.82	Peak

Above 1G (1 GHz-26.5 GHz): The worst mode



Level = Reading Level + Correct Factor

Over Limit = Level – Limit

Correct Factor = Antenna Factor + Cable Loss – Amplifier Gain

Spurious emissions more than 20 dB below the limit were not reported

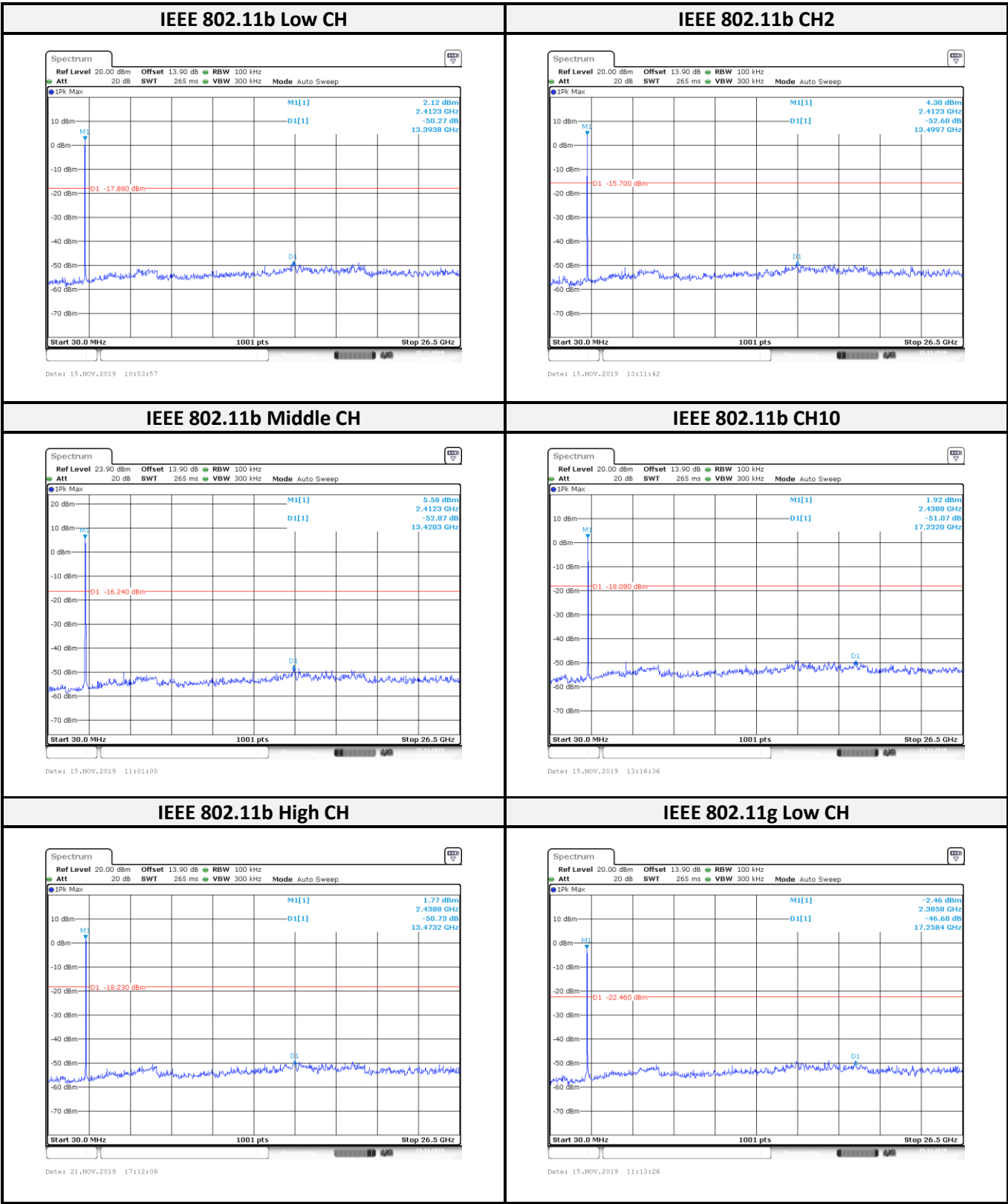
Conducted Spurious Emissions:**<Chip Antenna 1.8V>**

Configuration	Channel	Frequency (MHz)	Delta Peak to Band Emission (dBc)	Limit (dBc)	Result
IEEE 802.11b	Low	2412	50.27	≥ 20	Compliance
	Ch2	2417	52.60	≥ 20	Compliance
	Mid	2437	52.87	≥ 20	Compliance
	Ch10	2457	51.07	≥ 20	Compliance
	High	2462	50.73	≥ 20	Compliance
IEEE 802.11g	Low	2412	46.60	≥ 20	Compliance
	Ch2	2417	46.66	≥ 20	Compliance
	Mid	2437	49.85	≥ 20	Compliance
	Ch10	2457	49.86	≥ 20	Compliance
	High	2462	47.03	≥ 20	Compliance
IEEE 802.11n HT20	Low	2412	46.36	≥ 20	Compliance
	Ch2	2417	48.10	≥ 20	Compliance
	Mid	2437	49.93	≥ 20	Compliance
	Ch10	2457	49.74	≥ 20	Compliance
	High	2462	47.80	≥ 20	Compliance
IEEE 802.11n HT40	Low	2422	34.54	≥ 20	Compliance
	Mid	2437	37.33	≥ 20	Compliance
	High	2452	35.72	≥ 20	Compliance

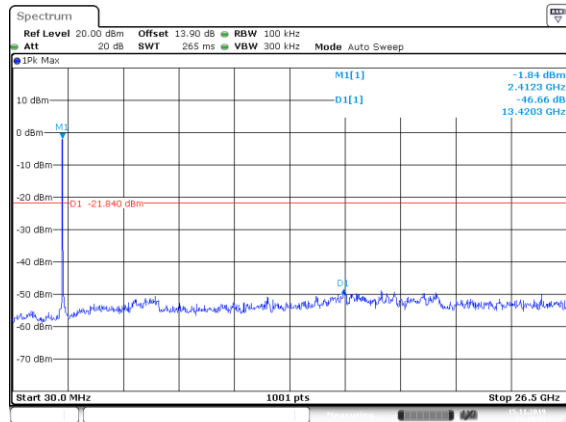
<Chip Antenna 3.3V>

Configuration	Channel	Frequency (MHz)	Delta Peak to Band Emission (dBc)	Limit (dBc)	Result
IEEE 802.11b	Low	2412	51.61	≥ 20	Compliance
	Mid	2437	48.74	≥ 20	Compliance
	High	2462	48.67	≥ 20	Compliance
IEEE 802.11g	Low	2412	52.08	≥ 20	Compliance
	Mid	2437	50.84	≥ 20	Compliance
	High	2462	51.76	≥ 20	Compliance
IEEE 802.11n HT20	Low	2412	49.52	≥ 20	Compliance
	Mid	2437	52.32	≥ 20	Compliance
	High	2462	50.88	≥ 20	Compliance
IEEE 802.11n HT40	Low	2422	41.25	≥ 20	Compliance
	Mid	2437	44.76	≥ 20	Compliance
	High	2452	40.31	≥ 20	Compliance

<Chip Antenna 1.8V>

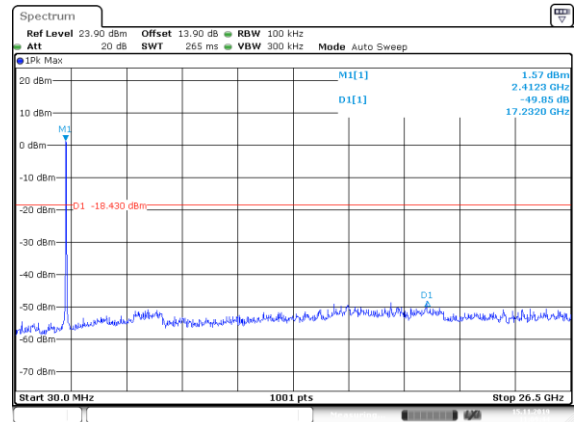


IEEE 802.11g CH2



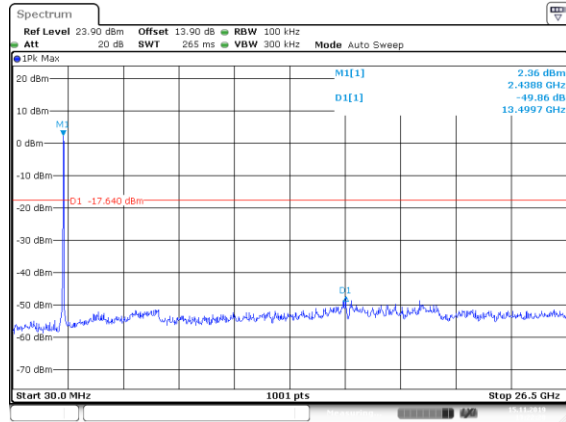
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IEEE 802.11g Middle CH



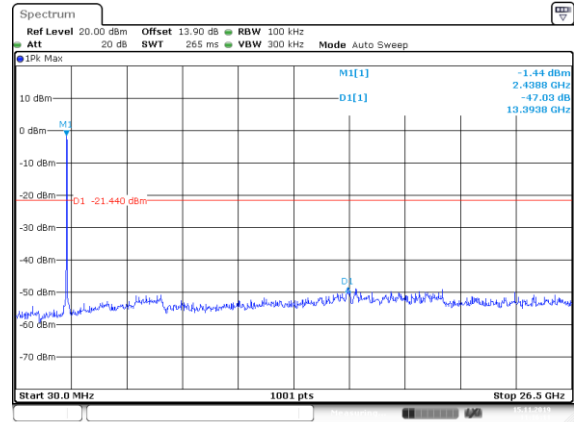
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IEEE 802.11g CH10



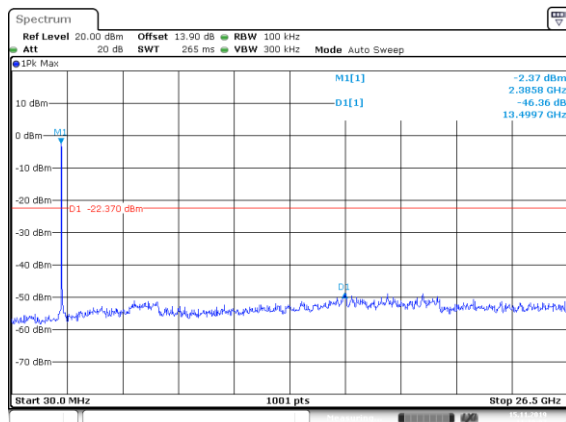
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IEEE 802.11g High CH



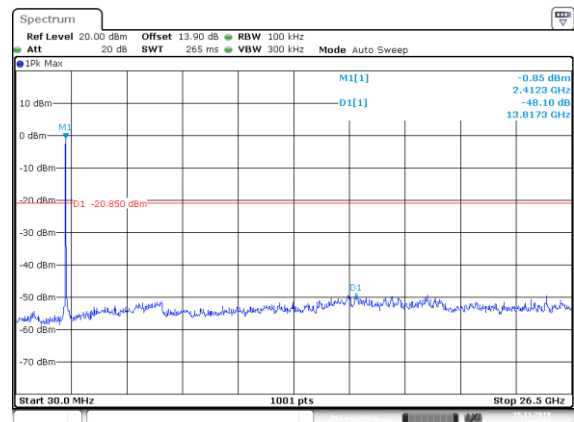
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IEEE 802.11n HT20 Low CH



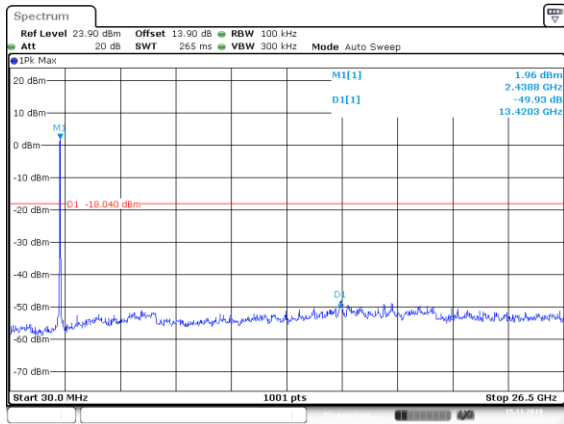
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IEEE 802.11n HT20 CH2



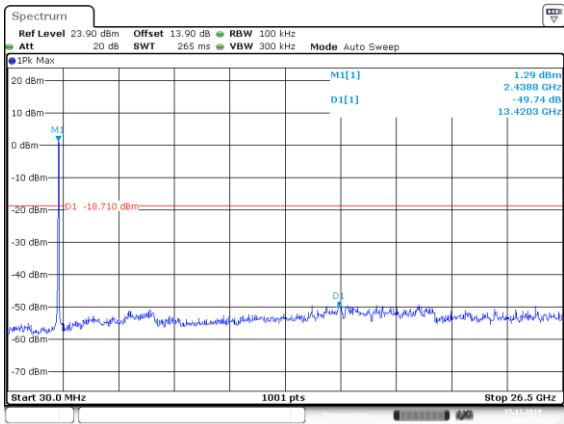
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IEEE 802.11n HT20 Middle CH



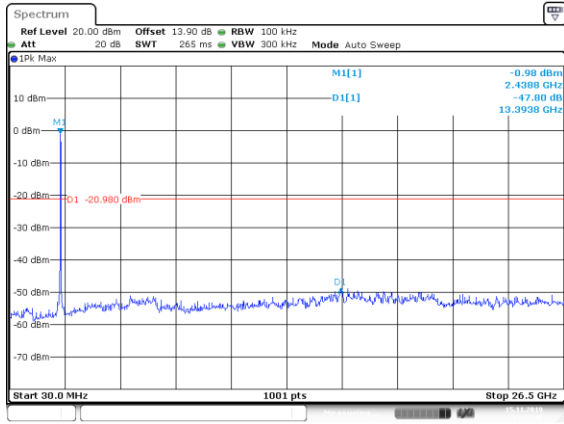
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IEEE 802.11n HT20 CH10



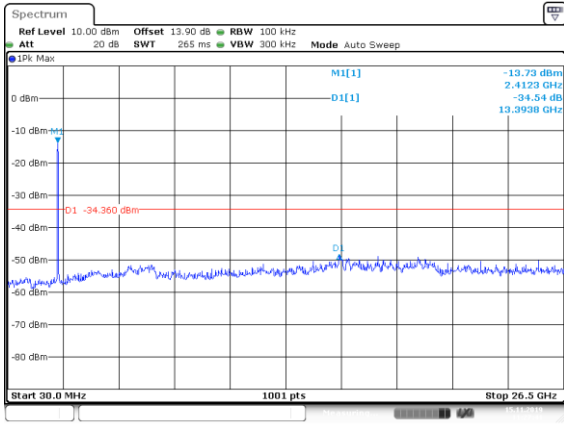
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IEEE 802.11n HT20 High CH



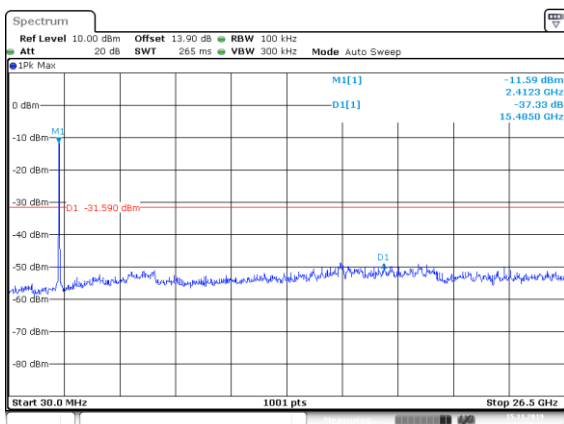
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IEEE 802.11n HT40 Low CH



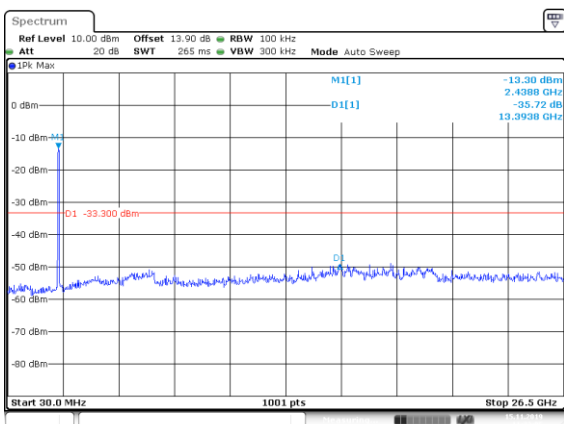
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IEEE 802.11n HT40 Middle CH



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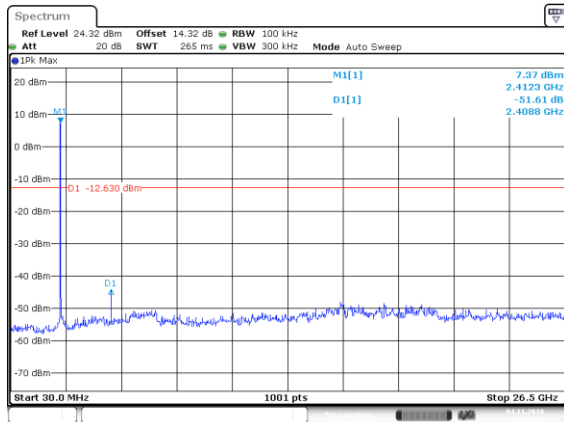
IEEE 802.11n HT40 High CH



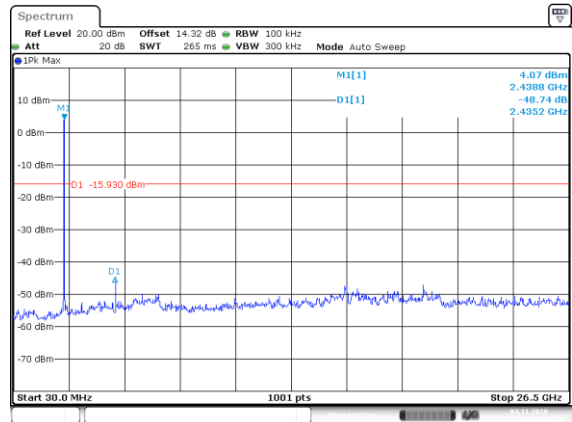
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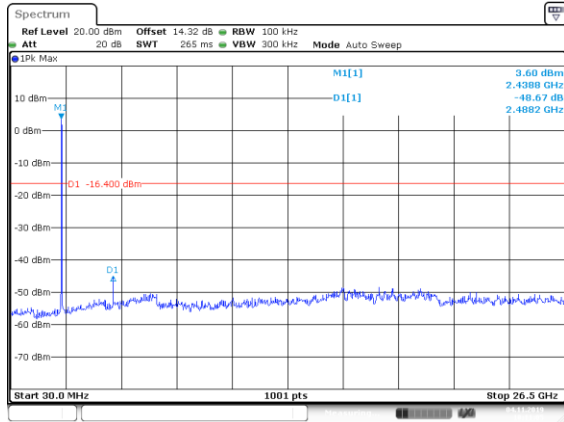
IEEE 802.11b Low CH



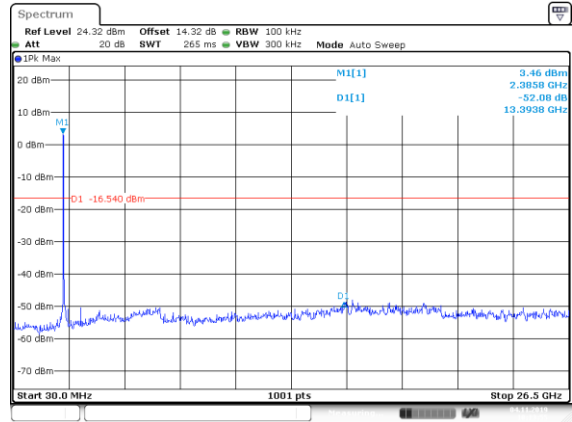
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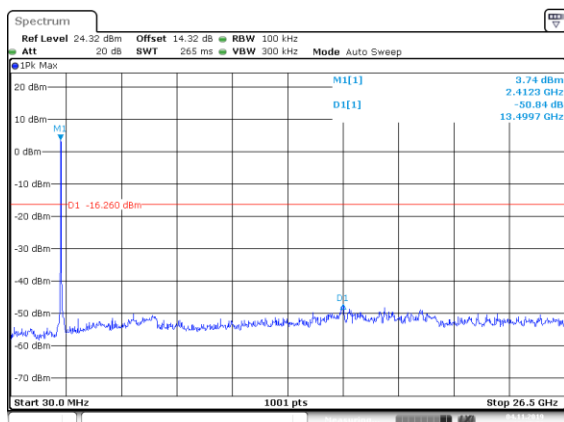
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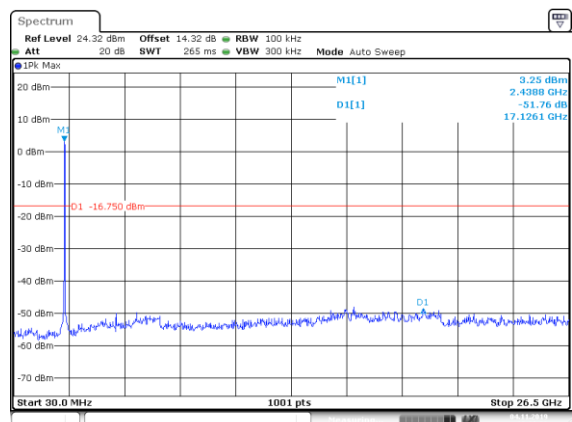
IEEE 802.11g Low CH



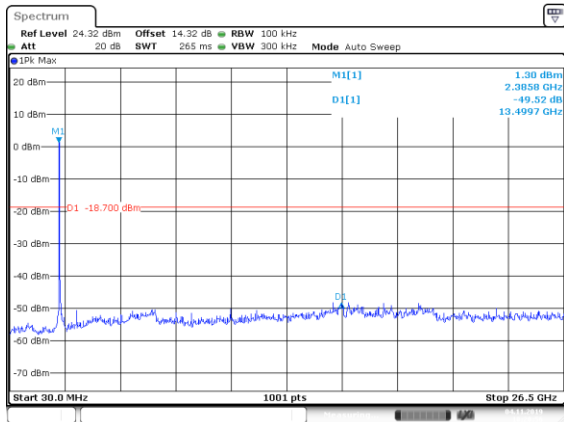
IEEE 802.11g Middle CH



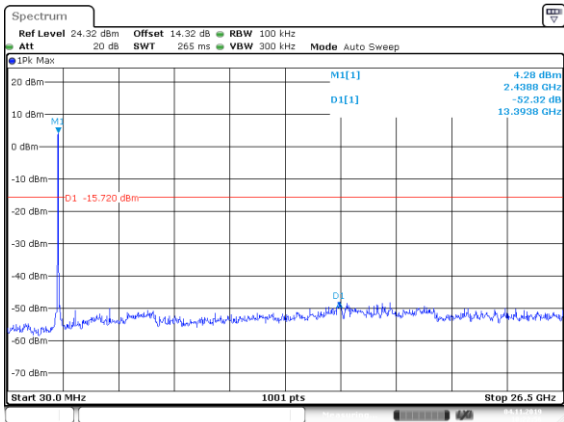
IEEE 802.11g High CH



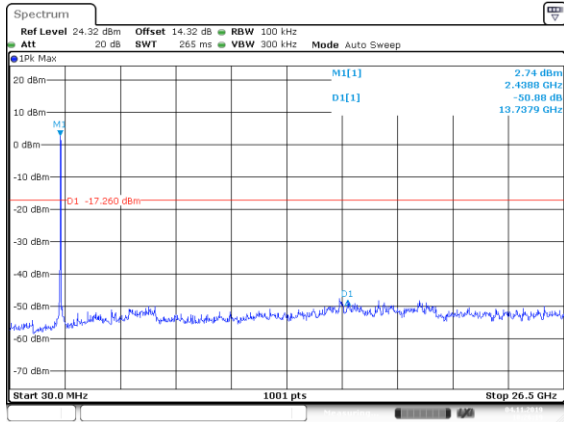
IEEE 802.11n HT20 Low CH



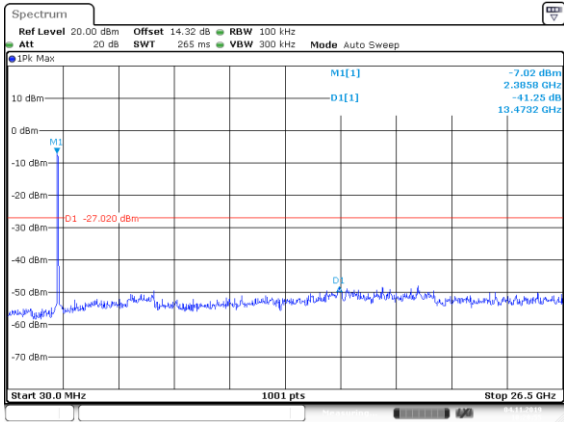
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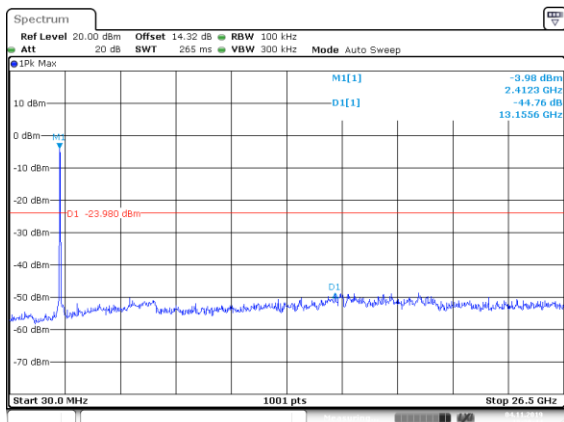
IEEE 802.11n HT20 High CH



IEEE 802.11n HT40 Low CH



IEEE 802.11n HT40 Middle CH



IEEE 802.11n HT40 High CH

