



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-M7DB7
IC: 8407A-M7DB7

Report Type	Original Report
Product Name:	Dual Band 802.11 a/b/g/n, Bluetooth 5.0 SIP Module
Model Name:	M7DB
Report Number :	RLK200203002-00D
Report Date :	2020/05/18
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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	RLK200203002-00D	2020/05/18	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	
Product (Equipment)	Dual Band 802.11 a/b/g/n, Bluetooth 5.0 SIP Module
Model Name	M7DB
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	<p><Dipole Antenna: TAOGLAS/GW.71.5153> IEEE 802.11b: 17.21 dBm (0.0526 W) IEEE 802.11g: 24.56 dBm (0.2858 W) IEEE 802.11n HT20: 24.74 dBm (0.2979 W) IEEE 802.11n HT40: 21.26 dBm (0.1337 W)</p> <p><Dipole Antenna: Inside WLAN/PRO-IS-299> IEEE 802.11b: 18.76 dBm (0.0752 W) IEEE 802.11g: 24.65 dBm (0.2917 W) IEEE 802.11n HT20: 24.77 dBm (0.2999 W) IEEE 802.11n HT40: 22.94 dBm (0.1968 W)</p> <p><PCB Antenna: Redpine Signals/RSIA7> IEEE 802.11b: 16.32 dBm (0.0429 W) IEEE 802.11g: 24.35 dBm (0.2723 W) IEEE 802.11n HT20: 24.74 dBm (0.2979 W) IEEE 802.11n HT40: 18.42 dBm (0.0659 W)</p> <p><PIFA Antenna: SMARTEQ/4211613980> IEEE 802.11b: 17.21 dBm (0.0526 W) IEEE 802.11g: 24.65 dBm (0.2917 W) IEEE 802.11n HT20: 24.74 dBm (0.2979 W) IEEE 802.11n HT40: 22.94 dBm (0.1968 W)</p>
Modulation Type	IEEE 802.11b: DSSS; IEEE 802.11 g/n HT20/n HT40: OFDM
Related Submittal(s)/Grant(s)	FCC Part 15.247 DTS with FCC ID: XF6-M7DB7 FCC Part 15.247 DSS with FCC ID: XF6-M7DB7 FCC Part 15.247 NII with FCC ID: XF6-M7DB7 IC RSS-247 DTS with IC: 8407A-M7DB7 IC RSS-247 FHSS with IC: 8407A-M7DB7 IC RSS-247 LE-LAN with IC: 8407A-M7DB7
Received Date	2020-02-03
Date of Test	2020-02-10 to 2020-04-30

*All measurement and test data in this report was gathered from production sample serial number: 190914002(Assigned by BACL, 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: 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: M7DB) 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 t 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

The test results with statement of conformity, the decision rules are based on the specifications and standards. The test results will not take the measurement uncertainty into account.

1.5 Environmental Conditions and Test Date

Test Site	Test Date	Temperature (°C)	Relative Humidity (% RH)	Test Engineer
Conduction (CON-01)	2020-02-07	22.3	53	Blake Wang
Radiated (966A)	2020-02-10 to 2020-03-23	19.5-22.9	58-62	Leo Cheng
Conducted (TH-02)	2020-02-18 to 2020-04-30	16.9-19.5	50-55	Blake Wang

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	8	2447
3	2422	9	2452
4	2427	10	2457
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.

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.

For Radiated Emission, Conducted Power, Conducted Band Edge and PSD had test for four antenna because the power setting is different, the result will be different. For Bandwidth, Conducted Emission only test one result that because the power not affect the result.

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

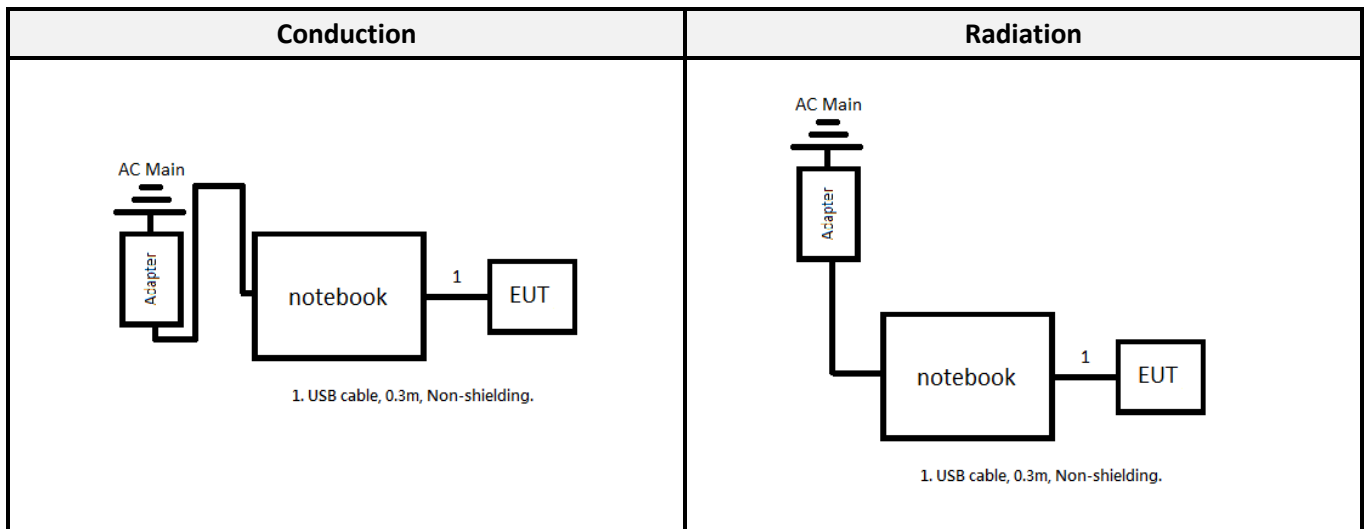
Worst Case of Power Setting				
EUT Exercise Software		FCC_PER_TEST_GUI.py		
Dipole antenna (TAOGLAS GW.71.5153)				
Configuration	NTX	Low CH	Mid CH	High CH
IEEE 802.11b	1	13	13	14
IEEE 802.11g	1	14	22	15
IEEE 802.11n HT 20	1	12	22	14
IEEE 802.11n HT 40	1	9	14	12
Dipole antenna (Inside WLAN PRO-IS-299)				
Configuration	NTX	Low CH	Mid CH	High CH
IEEE 802.11b	1	14	14	15
IEEE 802.11g	1	22	22	22
IEEE 802.11n HT 20	1	22	22	22
IEEE 802.11n HT 40	1	22	22	22
PCB Antenna (Redpine Signals RSIA7)				
Configuration	NTX	Low CH	Mid CH	High CH
IEEE 802.11b	1	13	13	13
IEEE 802.11g	1	14	22	11
IEEE 802.11n HT 20	1	12	22	10
IEEE 802.11n HT 40	1	9	12	8
PIFA Antenna (SMARTEQ 4211613980)				
Configuration	NTX	Low CH	Mid CH	High CH
IEEE 802.11b	1	13	14	14
IEEE 802.11g	1	22	22	18
IEEE 802.11n HT 20	1	12	22	18
IEEE 802.11n HT 40	1	22	22	22

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

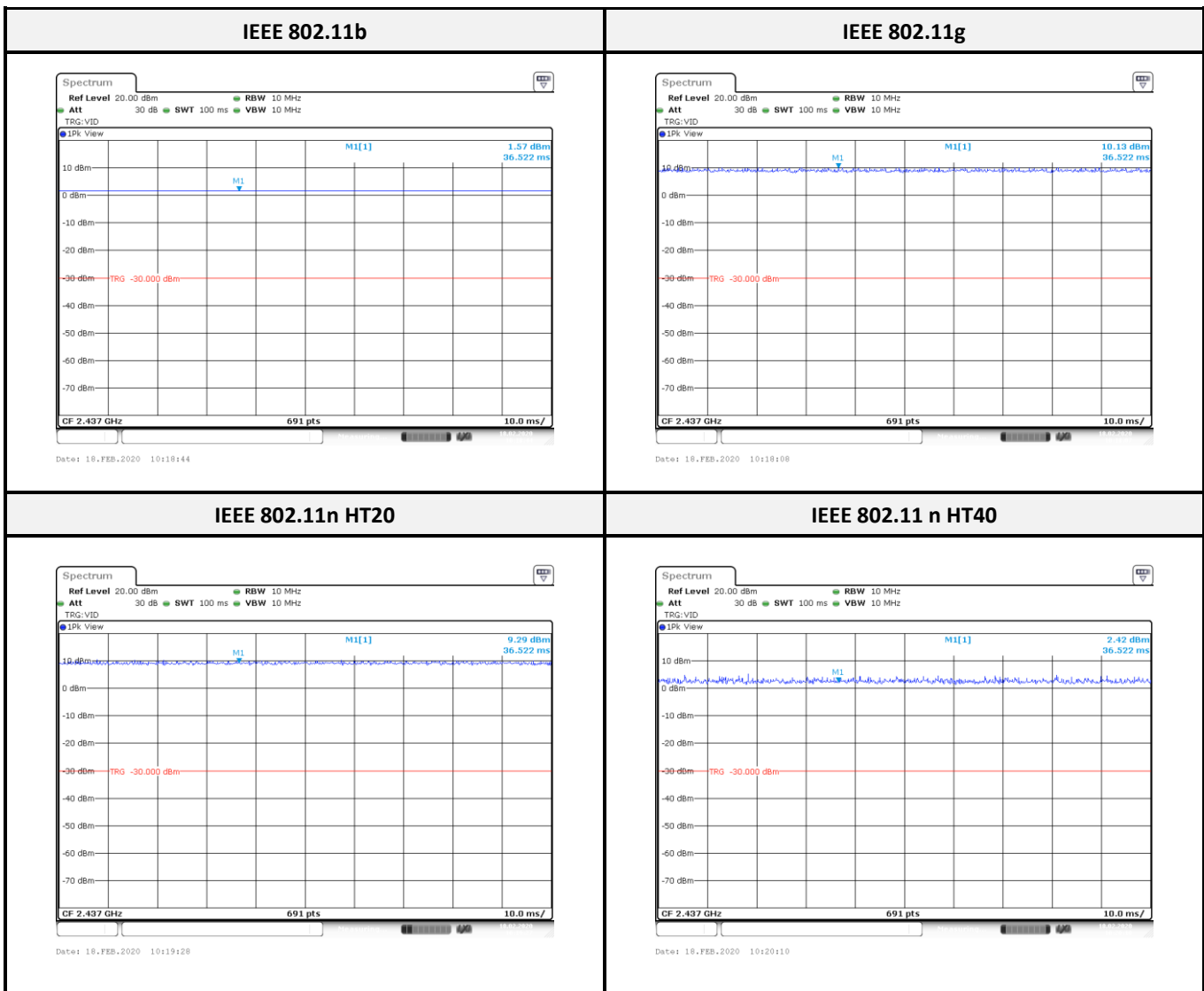
2.3 Block Diagram of Test Setup



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.

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*log (1/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 and Occupied Bandwidth	Compliance
§15.247(b)(3) ISED RSS-247 Sec5.4(d)	Maximum 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	3.80	2.3988	19.00	79.4328	20	0.0379	1
BR/EDR	2402-2480	3.80	2.3988	21.00	125.8925	20	0.0601	1
Wi-Fi 2.4G	2412-2472	3.80	2.3988	25.00	316.2278	20	0.1510	1
Wi-Fi 5G	5150-5850	5.50	3.5481	14.50	28.1838	20	0.0199	1

Note: Wi-Fi and BT 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 19.00 dBm (79.4328 mW) at 2402 MHz, Antenna Gain = 3.80 dBi, EIRP = 22.80 dBm (0.1906 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.

BR/EDR Max tune-up conducted output power is 21.00 dBm (125.8925 mW) at 2402 MHz, Antenna Gain = 3.80 dBi, EIRP = 24.80 dBm (0.3020 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 25.00 dBm (316.2278 mW) at 2437 MHz, Antenna Gain = 3.80 dBi, EIRP = 28.80 dBm (0.7586 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.

Wi-Fi 5G Max tune-up conducted output power is 14.50. dBm (28.1839 mW) at 5825 MHz, Antenna Gain = 5.50 dBi, EIRP = 20.00 dBm (0.1000 W), so the maximum conducted and E.I.R.P. source-based, time-averaged output is less than 4.90 W for general public use.

Note: Wi-Fi and BT 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 (dBi)	Result
TAOGLAS	GW.71.5153	Dipole	3.80	Compliance
SMARTEQ	4211613980	PIFA	0.00	Compliance
Inside WLAN	PRO-IS-299	Dipole	2.50	Compliance
Redpine Signals	RSIA7	PCB Antenna	0.71	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 μH/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.

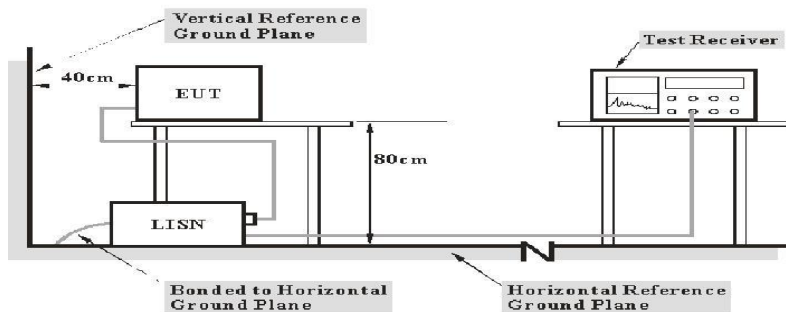
According to RSS-Gen 8.8 Conducted limits:

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 μH/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 and RSS-Gen 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

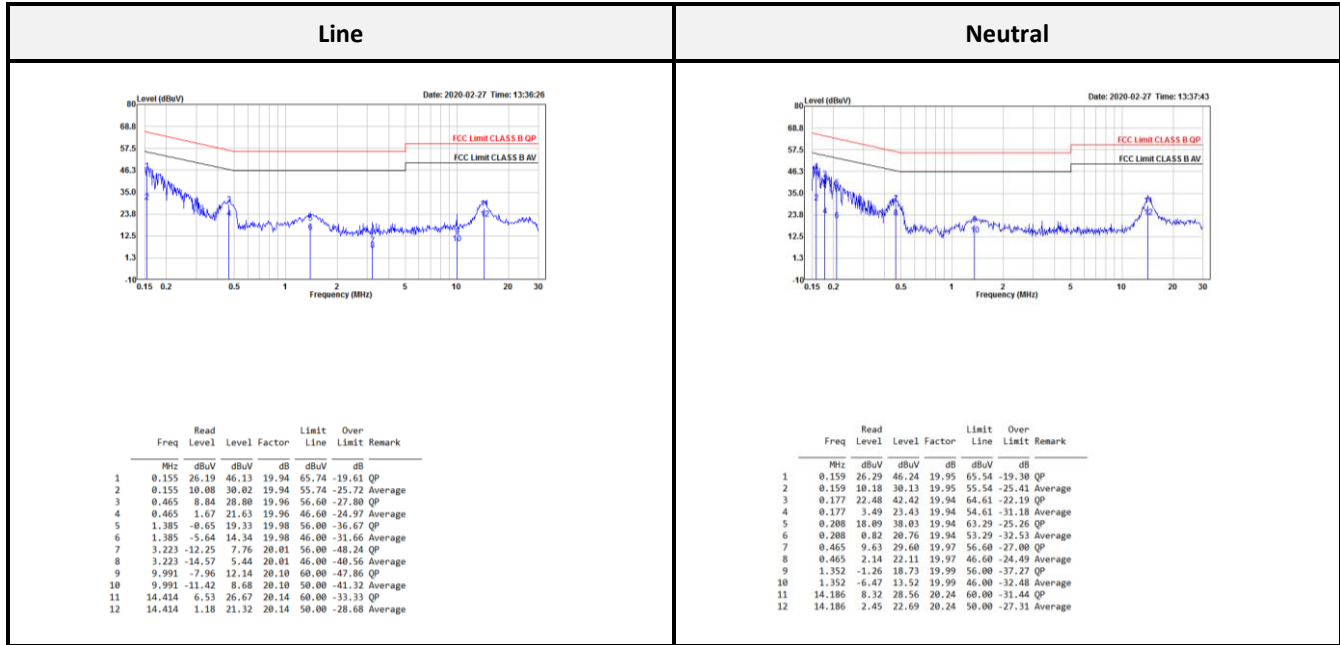
During the conducted emission test, the adapter was connected to the outlet of the LISN. Maximizing procedure was performed on the six (6) highest emissions of the EUT. All data was recorded in the Quasi-peak and average detection mode.

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
EMI Test Receiver	Rohde & Schwarz	ESR3	102448	2019/06/27	2020/06/23
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



Note1: Transmit Mode

Note2:

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

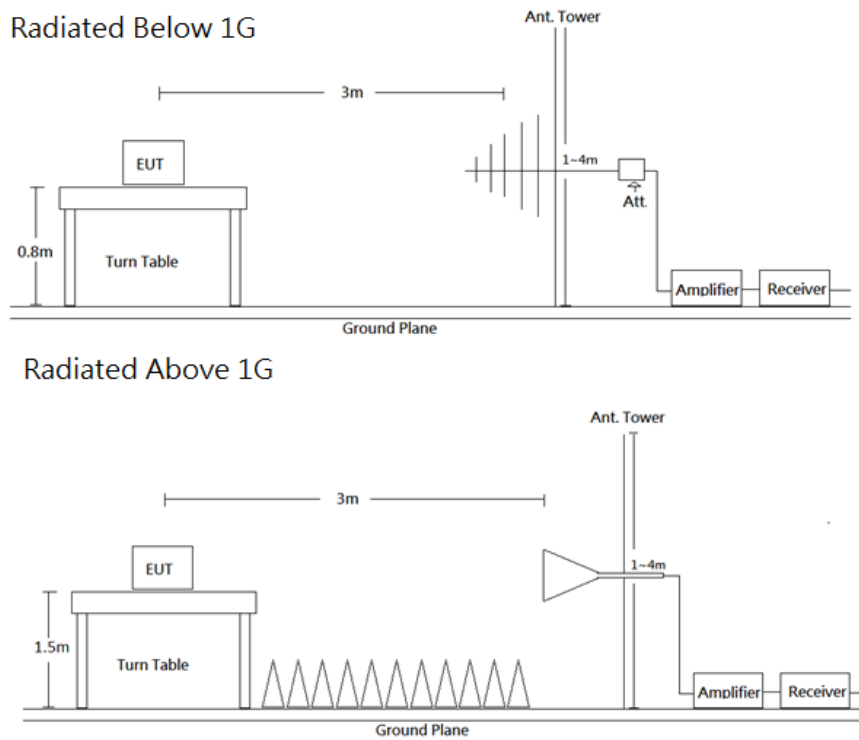
Frequency (MHz)	Field Strength ($\mu\text{V/m}$ at 3 metres)
30-88	100
88-216	150
216-960	200
Above 960*	500

* 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	2020/03/16	2021/03/15
Bilog Antenna/6 dB Attenuator	SUNOL SCIENCES & EMEC /EMCI	JB3/N-6-06	A111513/AT-N0668	2020/03/19	2021/03/18
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-0118	470	2020/03/16	2021/03/15
Preamplifier	A.H. Systems	PAM-1840VH	174	2020/03/25	2021/03/24
Signal and Spectrum Analyzer	Rohde & Schwarz	FSV40	101456	2019/07/12	2020/07/11
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 Analyzer 40GHZ	Rohde & Schwarz	FSV40-N	102248	2019/09/11	2020/09/10
RF Cable	MTJ	MT40S	MT40S-001	Each Use	/

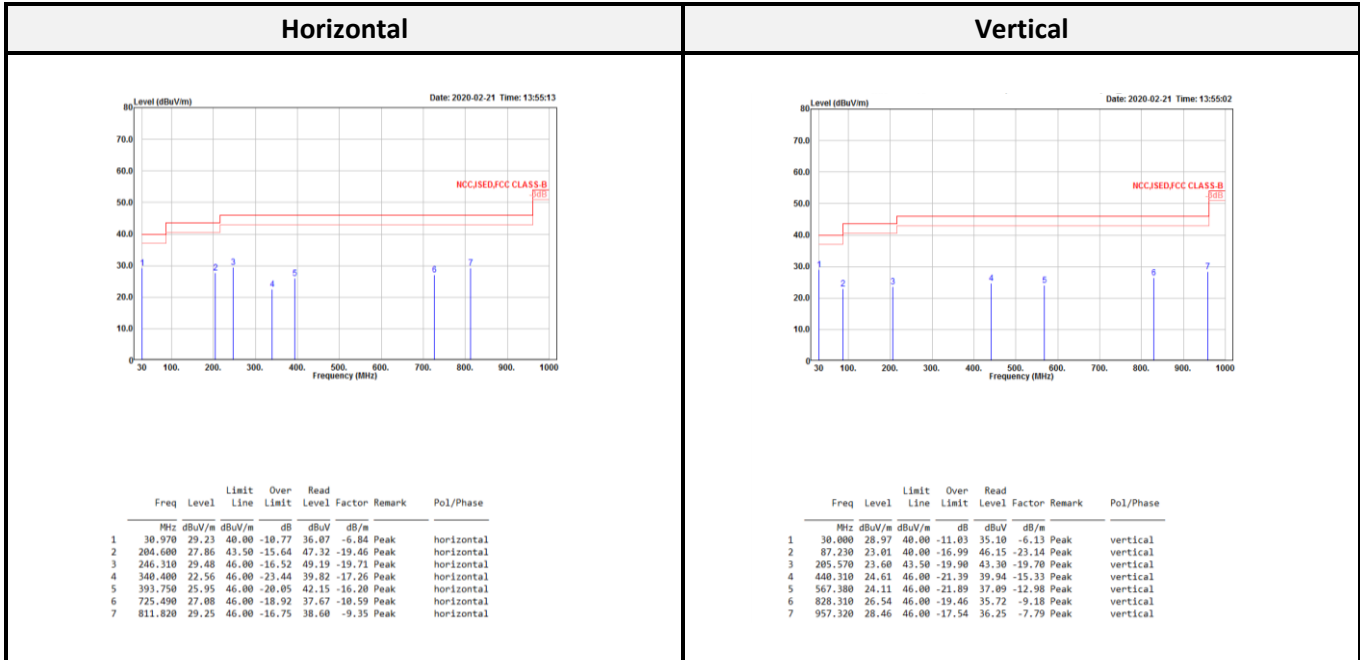
***Statement of Traceability:** The testing equipment's listed above have finished the calibration by Electronics Testing Center, Taiwan (ETC) or other laboratories which were accredited by TAF or equivalent organizations. The calibration result could be traceable to the International System of Units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

8.4 Test Result

<Dipole Antenna: TAOGLAS/GW.71.5153>

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	
2371.600	36.93	54.00	-17.07	44.61	-7.68	Average	2370.256	40.54	54.00	-13.46	48.22	-7.68	Average
2371.600	50.77	74.00	-23.23	58.45	-7.68	Peak	2370.256	53.07	74.00	-20.93	60.75	-7.68	Peak
2411.360	93.02			100.62	-7.60	Average	2411.360	100.86			108.46	-7.60	Average
2411.360	95.71			103.31	-7.60	Peak	2411.360	103.47			111.07	-7.60	Peak
3216.000	36.12	54.00	-17.88	40.35	-4.23	Average	3216.000	42.62	54.00	-11.38	46.85	-4.23	Average
3216.000	42.91	74.00	-31.09	47.14	-4.23	Peak	3216.000	45.91	74.00	-28.09	50.14	-4.23	Peak
4824.000	46.91	54.00	-7.09	46.27	0.64	Average	4824.000	52.69	54.00	-1.31	52.05	0.64	Average
4824.000	50.73	74.00	-23.27	50.09	0.64	Peak	4824.000	55.27	74.00	-18.73	54.63	0.64	Peak
7236.000	38.58	54.00	-15.42	33.19	5.39	Average	7236.000	47.49	54.00	-6.51	42.10	5.39	Average
7236.000	49.06	74.00	-24.94	43.67	5.39	Peak	7236.000	53.48	74.00	-20.52	48.09	5.39	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	
2355.254	36.93	54.00	-17.07	44.65	-7.72	Average	2389.618	39.82	54.00	-14.18	47.45	-7.63	Average
2355.254	50.81	74.00	-23.19	58.53	-7.72	Peak	2389.618	52.65	74.00	-21.35	60.28	-7.63	Peak
2436.324	95.35			102.89	-7.54	Average	2436.324	101.80			109.34	-7.54	Average
2436.324	98.14			105.68	-7.54	Peak	2436.324	104.21			111.75	-7.54	Peak
2509.408	37.93	54.00	-16.07	45.22	-7.29	Average	2532.398	39.75	54.00	-14.25	46.97	-7.22	Average
2509.408	51.34	74.00	-22.66	58.63	-7.29	Peak	2532.398	51.73	74.00	-22.27	58.95	-7.22	Peak
3249.300	37.80	54.00	-16.20	41.87	-4.07	Average	3249.300	42.79	54.00	-11.21	46.86	-4.07	Average
3249.300	44.46	74.00	-29.54	48.53	-4.07	Peak	3249.300	46.58	74.00	-27.42	50.65	-4.07	Peak
4874.000	46.66	54.00	-7.34	45.87	0.79	Average	4874.000	52.97	54.00	-1.03	52.17	0.80	Average
4874.000	51.00	74.00	-23.00	50.21	0.79	Peak	4874.000	55.63	74.00	-18.37	54.83	0.80	Peak
7311.000	42.19	54.00	-11.81	36.55	5.64	Average	7311.000	46.11	54.00	-7.89	40.49	5.62	Average
7311.000	50.94	74.00	-23.06	45.30	5.64	Peak	7311.000	52.85	74.00	-21.15	47.23	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	
2461.100	94.67			102.10	-7.43	Average	2461.100	102.28			109.71	-7.43	Average
2461.100	97.33			104.76	-7.43	Peak	2461.100	105.12			112.55	-7.43	Peak
2485.400	39.40	54.00	-14.60	46.74	-7.34	Average	2487.000	46.83	54.00	-7.17	54.17	-7.34	Average
2485.400	51.69	74.00	-22.31	59.03	-7.34	Peak	2487.000	56.17	74.00	-17.83	63.51	-7.34	Peak
3282.700	36.33	54.00	-17.67	40.29	-3.96	Average	3282.700	42.60	54.00	-11.40	46.56	-3.96	Average
3282.700	44.42	74.00	-29.58	48.38	-3.96	Peak	3282.700	46.87	74.00	-27.13	50.83	-3.96	Peak
4924.000	52.63	54.00	-1.37	51.79	0.84	Average	4924.000	53.52	54.00	-0.48	52.69	0.83	Average
4924.000	55.44	74.00	-18.56	54.60	0.84	Peak	4924.000	56.68	74.00	-17.32	55.85	0.83	Peak
7386.000	45.32	54.00	-8.68	39.40	5.92	Average	7386.000	51.64	54.00	-2.36	45.72	5.92	Average
7386.000	52.66	74.00	-21.34	46.74	5.92	Peak	7386.000	56.74	74.00	-17.26	50.82	5.92	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	
2389.744	42.78	54.00	-11.22	50.41	-7.63	Average	2389.744	52.61	54.00	-1.39	60.24	-7.63	Average
2389.744	59.58	74.00	-14.42	67.21	-7.63	Peak	2389.744	71.25	74.00	-2.75	78.88	-7.63	Peak
2414.160	87.04			94.63	-7.59	Average	2414.160	94.03			101.62	-7.59	Average
2414.160	97.93			105.52	-7.59	Peak	2414.160	105.18			112.77	-7.59	Peak
3216.000	37.13	54.00	-16.87	41.32	-4.19	Average	3216.000	42.18	54.00	-11.82	46.37	-4.19	Average
3216.000	44.34	74.00	-29.66	48.53	-4.19	Peak	3216.000	47.14	74.00	-26.86	51.33	-4.19	Peak
4824.000	36.19	54.00	-17.81	35.55	0.64	Average	4824.000	40.89	54.00	-13.11	40.25	0.64	Average
4824.000	51.08	74.00	-22.92	50.44	0.64	Peak	4824.000	56.55	74.00	-17.45	55.91	0.64	Peak
7236.000	35.27	54.00	-18.73	29.88	5.39	Average	7236.000	38.71	54.00	-15.29	33.32	5.39	Average
							7236.000	52.57	74.00	-21.43	47.19	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	
2388.166	40.36	54.00	-13.64	47.99	-7.63	Average	2389.134	45.22	54.00	-8.78	52.85	-7.63	Average
2388.166	61.66	74.00	-12.34	69.29	-7.63	Peak	2389.134	68.44	74.00	-5.56	76.07	-7.63	Peak
2434.388	91.31			98.85	-7.54	Average	2439.470	97.66			105.18	-7.52	Average
2434.388	102.07			109.61	-7.54	Peak	2439.470	107.99			115.51	-7.52	Peak
2485.934	39.16	54.00	-14.84	46.50	-7.34	Average	2486.176	43.31	54.00	-10.69	50.65	-7.34	Average
2485.934	57.72	74.00	-16.28	65.06	-7.34	Peak	2486.176	64.33	74.00	-9.67	71.67	-7.34	Peak
3249.300	38.08	54.00	-15.92	42.13	-4.05	Average	3249.300	42.14	54.00	-11.86	46.19	-4.05	Average
3249.300	44.58	74.00	-29.42	48.63	-4.05	Peak	3249.300	47.09	74.00	-26.91	51.14	-4.05	Peak
4874.000	40.43	54.00	-13.57	39.64	0.79	Average	4874.000	45.29	54.00	-8.71	44.50	0.79	Average
4874.000	53.39	74.00	-20.61	52.60	0.79	Peak	4874.000	59.40	74.00	-14.60	58.61	0.79	Peak
7311.000	40.32	54.00	-13.68	34.68	5.64	Average	7311.000	46.24	54.00	-7.76	40.60	5.64	Average
7311.000	54.55	74.00	-19.45	48.93	5.62	Peak	7311.000	60.44	74.00	-13.56	54.82	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	
2464.000	86.00			93.42	-7.42	Average	2464.000	93.77			101.19	-7.42	Average
2464.000	96.97			104.39	-7.42	Peak	2464.000	104.86			112.28	-7.42	Peak
2483.700	42.71	54.00	-11.29	50.05	-7.34	Average	2483.600	52.26	54.00	-1.74	59.60	-7.34	Average
2483.700	63.79	74.00	-10.21	71.13	-7.34	Peak	2483.600	73.87	74.00	-0.13	81.21	-7.34	Peak
3282.700	37.64	54.00	-16.36	41.59	-3.95	Average	3282.700	42.90	54.00	-11.10	46.85	-3.95	Average
3282.700	44.76	74.00	-29.24	48.71	-3.95	Peak	3282.700	47.41	74.00	-26.59	51.36	-3.95	Peak
4924.000	37.70	54.00	-16.30	36.86	0.84	Average	4924.000	41.69	54.00	-12.31	40.85	0.84	Average
4924.000	52.56	74.00	-21.44	51.72	0.84	Peak	4924.000	56.26	74.00	-17.74	55.42	0.84	Peak
7386.000	37.20	54.00	-16.80	31.27	5.93	Average	7386.000	37.74	54.00	-16.26	31.82	5.92	Average
7386.000	51.17	74.00	-22.83	45.25	5.92	Peak	7386.000	51.73	74.00	-22.27	45.85	5.88	Peak

IEEE 802.11n HT20:

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	45.02	54.00	-8.98	52.65	-7.63	Average	2389.408	53.65	54.00	-0.35	61.28	-7.63	Average
2389.744	63.54	74.00	-10.46	71.17	-7.63	Peak	2389.408	72.81	74.00	-1.19	80.44	-7.63	Peak
2404.640	85.84			93.45	-7.61	Average	2410.576	93.90			101.50	-7.60	Average
2404.640	95.88			103.49	-7.61	Peak	2410.576	104.09			111.69	-7.60	Peak
3216.000	37.18	54.00	-16.82	41.37	-4.19	Average	3216.000	42.63	54.00	-11.37	46.82	-4.19	Average
3216.000	44.44	74.00	-29.56	48.63	-4.19	Peak	3216.000	46.73	74.00	-27.27	50.92	-4.19	Peak
4824.000	35.15	54.00	-18.85	34.51	0.64	Average	4824.000	39.49	54.00	-14.51	38.85	0.64	Average
4824.000	49.42	74.00	-24.58	48.78	0.64	Peak	4824.000	54.37	74.00	-19.63	53.73	0.64	Peak
7236.000	34.89	54.00	-19.11	29.50	5.39	Average	7236.000	39.66	54.00	-14.34	34.27	5.39	Average
7236.000	48.82	74.00	-25.18	43.44	5.38	Peak	7236.000	53.99	74.00	-20.01	48.61	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	
2388.408	41.88	54.00	-12.12	49.51	-7.63	Average	2388.408	47.22	54.00	-6.78	54.85	-7.63	Average
2388.408	62.97	74.00	-11.03	70.60	-7.63	Peak	2388.408	69.76	74.00	-4.24	77.39	-7.63	Peak
2438.502	91.48			99.00	-7.52	Average	2436.082	97.68			105.22	-7.54	Average
2438.502	102.21			109.73	-7.52	Peak	2436.082	108.20			115.74	-7.54	Peak
2483.756	39.45	54.00	-14.55	46.79	-7.34	Average	2483.514	45.32	54.00	-8.68	52.66	-7.34	Average
2483.756	58.00	74.00	-16.00	65.34	-7.34	Peak	2483.514	67.95	74.00	-6.05	75.29	-7.34	Peak
3249.300	37.31	54.00	-16.69	41.36	-4.05	Average	3249.300	43.17	54.00	-10.83	47.22	-4.05	Average
3249.300	44.88	74.00	-29.12	48.93	-4.05	Peak	3249.300	48.25	74.00	-25.75	52.30	-4.05	Peak
4874.000	39.10	54.00	-14.90	38.31	0.79	Average	4874.000	45.09	54.00	-8.91	44.30	0.79	Average
4874.000	54.00	74.00	-20.00	53.21	0.79	Peak	4874.000	59.62	74.00	-14.38	58.83	0.79	Peak
7311.000	40.34	54.00	-13.66	34.72	5.62	Average	7311.000	46.00	54.00	-8.00	40.36	5.64	Average
7311.000	54.74	74.00	-19.26	49.10	5.64	Peak	7311.000	60.68	74.00	-13.32	55.06	5.62	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	
2460.200	85.97			93.40	-7.43	Average	2460.700	92.77			100.20	-7.43	Average
2460.200	96.45			103.88	-7.43	Peak	2460.700	103.62			111.05	-7.43	Peak
2483.600	43.88	54.00	-10.12	51.22	-7.34	Average	2483.600	52.06	54.00	-1.94	59.40	-7.34	Average
2483.600	63.84	74.00	-10.16	71.18	-7.34	Peak	2483.600	73.17	74.00	-0.83	80.51	-7.34	Peak
3282.700	37.88	54.00	-16.12	41.83	-3.95	Average	3282.700	42.61	54.00	-11.39	46.57	-3.96	Average
3282.700	47.88	74.00	-26.12	51.83	-3.95	Peak	3282.700	46.70	74.00	-27.30	50.66	-3.96	Peak
4924.000	35.49	54.00	-18.51	34.66	0.83	Average	4924.000	40.13	54.00	-13.87	39.29	0.84	Average
4924.000	50.64	74.00	-23.36	49.81	0.83	Peak	4924.000	54.82	74.00	-19.18	53.98	0.84	Peak
7386.000	34.53	54.00	-19.47	28.61	5.92	Average	7386.000	35.79	54.00	-18.21	29.87	5.92	Average
7386.000	48.86	74.00	-25.14	42.94	5.92	Peak	7386.000	50.20	74.00	-23.80	44.28	5.92	Peak

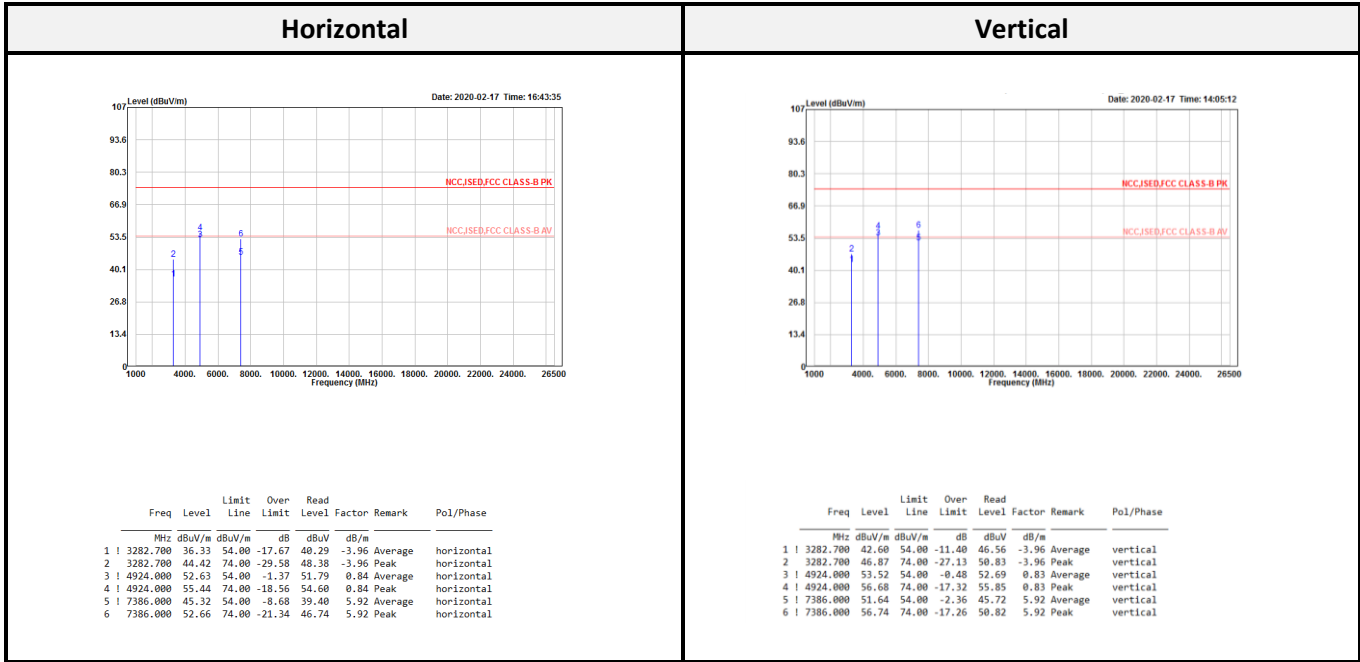
IEEE 802.11n HT40:

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	
2385.768	44.57	54.00	-9.43	52.21	-7.64	Average	2388.012	53.43	54.00	-0.57	61.06	-7.63	Average
2385.768	60.98	74.00	-13.02	68.62	-7.64	Peak	2388.012	69.46	74.00	-4.54	77.09	-7.63	Peak
2404.908	80.01			87.62	-7.61	Average	2416.524	87.23			94.82	-7.59	Average
2404.908	90.26			97.87	-7.61	Peak	2416.524	98.31			105.90	-7.59	Peak
3229.300	36.09	54.00	-17.91	40.23	-4.14	Average	3229.300	42.29	54.00	-11.71	46.43	-4.14	Average
3229.300	43.85	74.00	-30.15	47.99	-4.14	Peak	3229.300	46.28	74.00	-27.72	50.42	-4.14	Peak
4844.000	31.60	54.00	-22.40	30.90	0.70	Average	4844.000	34.72	54.00	-19.28	34.02	0.70	Average
4844.000	44.48	74.00	-29.52	43.78	0.70	Peak	4844.000	49.09	74.00	-24.91	48.39	0.70	Peak
7266.000	34.03	54.00	-19.97	28.60	5.43	Average	7266.000	34.68	54.00	-19.32	29.25	5.43	Average
7266.000	46.62	74.00	-27.38	41.19	5.43	Peak	7266.000	46.72	74.00	-27.28	41.29	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	
2387.924	46.46	54.00	-7.54	54.09	-7.63	Average	2389.376	53.73	54.00	-0.27	61.36	-7.63	Average
2387.924	63.51	74.00	-10.49	71.14	-7.63	Peak	2389.376	71.51	74.00	-2.49	79.14	-7.63	Peak
2434.146	83.78			91.32	-7.54	Average	2440.922	90.36			97.88	-7.52	Average
2434.146	95.04			102.58	-7.54	Peak	2440.922	101.62			109.14	-7.52	Peak
2484.240	44.43	54.00	-9.57	51.77	-7.34	Average	2484.240	51.96	54.00	-2.04	59.30	-7.34	Average
2484.240	64.55	74.00	-9.45	71.89	-7.34	Peak	2484.240	73.01	74.00	-0.99	80.35	-7.34	Peak
3249.300	37.10	54.00	-16.90	41.17	-4.07	Average	3249.300	42.96	54.00	-11.04	47.03	-4.07	Average
3249.300	44.01	74.00	-29.99	48.08	-4.07	Peak	3249.300	47.22	74.00	-26.78	51.29	-4.07	Peak
4874.000	34.25	54.00	-19.75	33.46	0.79	Average	4874.000	38.00	54.00	-16.00	37.21	0.79	Average
4874.000	48.04	74.00	-25.96	47.25	0.79	Peak	4874.000	51.93	74.00	-22.07	51.14	0.79	Peak
7311.000	35.39	54.00	-18.61	29.75	5.64	Average	7311.000	38.28	54.00	-15.72	32.64	5.64	Average
7311.000	49.26	74.00	-24.74	43.62	5.64	Peak	7311.000	51.60	74.00	-22.40	45.96	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	
2435.960	81.34			88.88	-7.54	Average	2447.240	86.94			94.43	-7.49	Average
2435.960	91.90			99.44	-7.54	Peak	2447.240	98.46			105.95	-7.49	Peak
2484.440	46.06	54.00	-7.94	53.40	-7.34	Average	2484.320	53.11	54.00	-0.89	60.45	-7.34	Average
2484.440	64.32	74.00	-9.68	71.66	-7.34	Peak	2484.320	71.14	74.00	-2.86	78.48	-7.34	Peak
3269.300	37.21	54.00	-16.79	41.23	-4.02	Average	3269.300	42.57	54.00	-11.43	46.59	-4.02	Average
3269.300	43.97	74.00	-30.03	47.99	-4.02	Peak	3269.300	47.09	74.00	-26.91	51.11	-4.02	Peak
4904.000	33.17	54.00	-20.83	32.32	0.85	Average	4904.000	35.78	54.00	-18.22	34.93	0.85	Average
4904.000	46.48	74.00	-27.52	45.63	0.85	Peak	4904.000	50.65	74.00	-23.35	49.80	0.85	Peak
7356.000	33.99	54.00	-20.01	28.17	5.82	Average	7356.000	34.14	54.00	-19.86	28.32	5.82	Average
7356.000	47.23	74.00	-26.77	41.41	5.82	Peak	7356.000	47.71	74.00	-26.29	41.89	5.82	Peak

Above 1G (1 GHz-26.5 GHz): The worst mode: 802.11b High CH.



Level = Reading Level + Correct Factor

Over Limit = Level – Limit

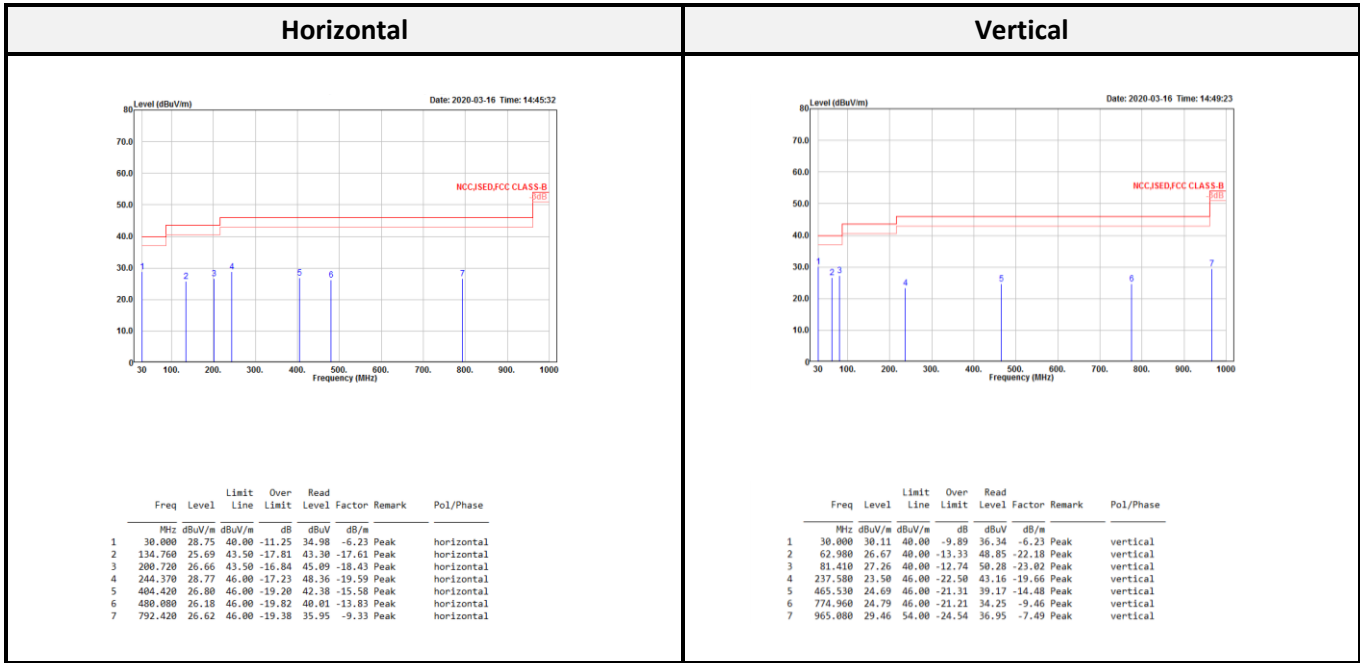
Correct Factor = Antenna Factor + Cable Loss – Amplifier Gain

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

< Dipole antenna (Inside WLAN PRO-IS-299) >

Transmitting mode (Pre-scan with three orthogonal axis, and worse case as Y 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	
2371.488	36.21	54.00	-17.79	43.89	-7.68	Average	2388.512	36.59	54.00	-17.41	44.22	-7.63	Average
2371.488	49.97	74.00	-24.03	57.65	-7.68	Peak	2388.512	50.80	74.00	-23.20	58.43	-7.63	Peak
2411.248	73.82			81.42	-7.60	Average	2411.360	88.25			95.85	-7.60	Average
2411.248	76.54			84.14	-7.60	Peak	2411.360	91.01			98.61	-7.60	Peak
3216.000	34.63	54.00	-19.37	38.82	-4.19	Average	3216.000	37.06	54.00	-16.94	41.25	-4.19	Average
3216.000	42.79	74.00	-31.21	46.98	-4.19	Peak	3216.000	43.39	74.00	-30.61	47.58	-4.19	Peak
4824.000	47.73	54.00	-6.27	47.09	0.64	Average	4824.000	53.27	54.00	-0.73	52.63	0.64	Average
4824.000	51.27	74.00	-22.73	50.63	0.64	Peak	4824.000	55.13	74.00	-18.87	54.49	0.64	Peak
7236.000	42.03	54.00	-11.97	36.65	5.38	Average	7236.000	43.08	54.00	-10.92	37.70	5.38	Average
7236.000	50.83	74.00	-23.17	45.45	5.38	Peak	7236.000	52.37	74.00	-21.63	46.99	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	
2350.898	36.08	54.00	-17.92	43.82	-7.74	Average	2359.852	36.24	54.00	-17.76	43.95	-7.71	Average
2350.898	50.06	74.00	-23.94	57.80	-7.74	Peak	2359.852	50.58	74.00	-23.42	58.29	-7.71	Peak
2436.566	74.87			82.41	-7.54	Average	2438.018	89.39			96.91	-7.52	Average
2436.566	77.29			84.83	-7.54	Peak	2438.018	92.13			99.65	-7.52	Peak
2539.658	37.14	54.00	-16.86	44.32	-7.18	Average	2545.950	37.49	54.00	-16.51	44.64	-7.15	Average
2539.658	51.02	74.00	-22.98	58.20	-7.18	Peak	2545.950	50.91	74.00	-23.09	58.06	-7.15	Peak
3249.300	35.09	54.00	-18.91	39.14	-4.05	Average	3249.300	37.41	54.00	-16.59	41.46	-4.05	Average
3249.300	41.80	74.00	-32.20	45.85	-4.05	Peak	3249.300	44.64	74.00	-29.36	48.69	-4.05	Peak
4874.000	45.70	54.00	-8.30	44.90	0.80	Average	4874.000	53.20	54.00	-0.80	52.40	0.80	Average
4874.000	50.37	74.00	-23.63	49.58	0.79	Peak	4874.000	55.54	74.00	-18.46	54.75	0.79	Peak
7311.000	39.30	54.00	-14.70	33.66	5.64	Average	7311.000	40.18	54.00	-13.82	34.54	5.64	Average
7311.000	49.59	74.00	-24.41	43.95	5.64	Peak	7311.000	50.45	74.00	-23.55	44.81	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	
2462.300	75.58			83.01	-7.43	Average	2462.900	90.15			97.57	-7.42	Average
2462.300	78.71			86.14	-7.43	Peak	2462.900	92.73			100.15	-7.42	Peak
2548.400	37.30	54.00	-16.70	44.44	-7.14	Average	2487.300	39.71	54.00	-14.29	47.05	-7.34	Average
2548.400	51.61	74.00	-22.39	58.75	-7.14	Peak	2487.300	51.95	74.00	-22.05	59.29	-7.34	Peak
3282.700	35.27	54.00	-18.73	39.22	-3.95	Average	3282.700	37.99	54.00	-16.01	41.94	-3.95	Average
3282.700	43.24	74.00	-30.76	47.19	-3.95	Peak	3282.700	44.29	74.00	-29.71	48.24	-3.95	Peak
4924.000	47.71	54.00	-6.29	46.88	0.83	Average	4924.000	53.34	54.00	-0.66	52.51	0.83	Average
4924.000	51.60	74.00	-22.40	50.76	0.84	Peak	4924.000	55.71	74.00	-18.29	54.87	0.84	Peak
7386.000	41.81	54.00	-12.19	35.89	5.92	Average	7386.000	41.82	54.00	-12.18	35.90	5.92	Average
7386.000	50.72	74.00	-23.28	44.80	5.92	Peak	7386.000	50.82	74.00	-23.18	44.90	5.92	Peak

IEEE 802.11g:

Low CH													
Horizontal							Vertical						
Freq	Level	Limit	Over	Read		Remark	Freq	Level	Limit	Over	Read		Remark
MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m		MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m	
2388.848	37.07	54.00	-16.93	44.70	-7.63	Average	2389.968	45.85	54.00	-8.15	53.48	-7.63	Average
2388.848	51.27	74.00	-22.73	58.90	-7.63	Peak	2389.968	66.44	74.00	-7.56	74.07	-7.63	Peak
2414.272	68.67			76.26	-7.59	Average	2414.272	83.28			90.87	-7.59	Average
2414.272	80.00			87.59	-7.59	Peak	2414.272	94.50			102.09	-7.59	Peak
3216.000	44.91	54.00	-9.09	49.10	-4.19	Average	3216.000	37.21	54.00	-16.79	41.40	-4.19	Average
3216.000	43.73	74.00	-30.27	47.92	-4.19	Peak	3216.000	44.28	74.00	-29.72	48.47	-4.19	Peak
4824.000	37.41	54.00	-16.59	36.77	0.64	Average	4824.000	43.42	54.00	-10.58	42.78	0.64	Average
4824.000	51.24	74.00	-22.76	50.60	0.64	Peak	4824.000	58.09	74.00	-15.91	57.45	0.64	Peak
7236.000	38.59	54.00	-15.41	33.21	5.38	Average	7236.000	38.69	54.00	-15.31	33.31	5.38	Average
7236.000	53.34	74.00	-20.66	47.96	5.38	Peak	7236.000	53.23	74.00	-20.77	47.85	5.38	Peak

Middle CH													
Horizontal							Vertical						
Freq	Level	Limit	Over	Read		Remark	Freq	Level	Limit	Over	Read		Remark
MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m		MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m	
2384.294	36.46	54.00	-17.54	44.10	-7.64	Average	2388.166	37.23	54.00	-16.77	44.86	-7.63	Average
2384.294	50.27	74.00	-23.73	57.91	-7.64	Peak	2388.166	54.47	74.00	-19.53	62.10	-7.63	Peak
2438.986	69.85			77.37	-7.52	Average	2439.228	84.86			92.38	-7.52	Average
2438.986	80.52			88.04	-7.52	Peak	2439.228	96.30			103.82	-7.52	Peak
2539.900	37.12	54.00	-16.88	44.30	-7.18	Average	2491.500	38.63	54.00	-15.37	45.96	-7.33	Average
2539.900	51.43	74.00	-22.57	58.61	-7.18	Peak	2491.500	53.23	74.00	-20.77	60.56	-7.33	Peak
3249.300	35.16	54.00	-18.84	39.21	-4.05	Average	3249.300	37.43	54.00	-16.57	41.48	-4.05	Average
3249.300	43.23	74.00	-30.77	47.28	-4.05	Peak	3249.300	44.17	74.00	-29.83	48.22	-4.05	Peak
4874.000	36.70	54.00	-17.30	35.91	0.79	Average	4874.000	43.46	54.00	-10.54	42.67	0.79	Average
4874.000	51.28	74.00	-22.72	50.48	0.80	Peak	4874.000	57.66	74.00	-16.34	56.96	0.70	Peak
7311.000	37.59	54.00	-16.41	31.95	5.64	Average	7311.000	39.49	54.00	-14.51	33.85	5.64	Average
7311.000	52.84	74.00	-21.16	47.20	5.64	Peak	7311.000	54.54	74.00	-19.46	48.90	5.64	Peak

High CH													
Horizontal							Vertical						
Freq	Level	Limit	Over	Read		Remark	Freq	Level	Limit	Over	Read		Remark
MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m		MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m	
2459.300	70.41			77.85	-7.44	Average	2464.200	85.10			92.51	-7.41	Average
2459.300	81.39			88.83	-7.44	Peak	2464.200	96.18			103.59	-7.41	Peak
2483.500	37.94	54.00	-16.06	45.28	-7.34	Average	2483.600	46.78	54.00	-7.22	54.12	-7.34	Average
2483.500	55.91	74.00	-18.09	63.25	-7.34	Peak	2483.600	71.63	74.00	-2.37	78.97	-7.34	Peak
3282.700	35.30	54.00	-18.70	39.25	-3.95	Average	3282.700	37.82	54.00	-16.18	41.77	-3.95	Average
3282.700	44.59	74.00	-29.41	48.54	-3.95	Peak	3282.700	44.79	74.00	-29.21	48.74	-3.95	Peak
4924.000	35.34	54.00	-18.66	34.50	0.84	Average	4924.000	42.26	54.00	-11.74	41.43	0.83	Average
4924.000	49.51	74.00	-24.49	48.68	0.83	Peak	4924.000	56.62	74.00	-17.38	55.78	0.84	Peak
7386.000	36.71	54.00	-17.29	30.79	5.92	Average	7386.000	41.42	54.00	-12.58	35.50	5.92	Average
7386.000	50.53	74.00	-23.47	44.61	5.92	Peak	7386.000	56.59	74.00	-17.41	50.67	5.92	Peak

IEEE 802.11n HT20:

Low CH													
Horizontal							Vertical						
Freq	Level	Limit	Over	Read		Remark	Freq	Level	Limit	Over	Read		Remark
MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m		MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m	
2389.744	37.81	54.00	-16.19	45.44	-7.63	Average	2389.632	46.82	54.00	-7.18	54.45	-7.63	Average
2389.744	54.87	74.00	-19.13	62.50	-7.63	Peak	2389.632	66.62	74.00	-7.38	74.25	-7.63	Peak
2413.712	69.69			77.28	-7.59	Average	2413.600	83.63			91.22	-7.59	Average
2413.712	80.98			88.57	-7.59	Peak	2413.600	94.81			102.40	-7.59	Peak
3216.000	35.66	54.00	-18.34	39.85	-4.19	Average	3216.000	0.03	54.00	-53.97	4.22	-4.19	Average
3216.000	42.18	74.00	-31.82	46.37	-4.19	Peak	3216.000	42.97	74.00	-31.03	47.16	-4.19	Peak
4824.000	37.18	54.00	-16.82	36.54	0.64	Average	4824.000	42.22	54.00	-11.78	41.58	0.64	Average
4824.000	51.27	74.00	-22.73	50.63	0.64	Peak	4824.000	57.48	74.00	-16.52	56.84	0.64	Peak
7236.000	37.97	54.00	-16.03	32.59	5.38	Average	7236.000	39.68	54.00	-14.32	34.30	5.38	Average
7236.000	52.25	74.00	-21.75	46.87	5.38	Peak	7236.000	54.89	74.00	-19.11	49.51	5.38	Peak

Middle CH													
Horizontal							Vertical						
Freq	Level	Limit	Over	Read		Remark	Freq	Level	Limit	Over	Read		Remark
MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m		MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m	
2388.650	36.37	54.00	-17.63	44.00	-7.63	Average	2387.924	37.47	54.00	-16.53	45.10	-7.63	Average
2388.650	51.15	74.00	-22.85	58.78	-7.63	Peak	2387.924	54.15	74.00	-19.85	61.78	-7.63	Peak
2439.228	69.79			77.31	-7.52	Average	2438.744	84.63			92.15	-7.52	Average
2439.228	80.55			88.07	-7.52	Peak	2438.744	95.11			102.63	-7.52	Peak
2522.960	37.27	54.00	-16.73	44.53	-7.26	Average	2485.208	38.47	54.00	-15.53	45.81	-7.34	Average
2522.960	51.25	74.00	-22.75	58.51	-7.26	Peak	2485.208	54.68	74.00	-19.32	62.02	-7.34	Peak
3249.300	35.57	54.00	-18.43	39.62	-4.05	Average	3249.300	37.59	54.00	-16.41	41.64	-4.05	Average
3249.300	43.23	74.00	-30.77	47.28	-4.05	Peak	3249.300	44.38	74.00	-29.62	48.43	-4.05	Peak
4874.000	36.63	54.00	-17.37	35.83	0.80	Average	4874.000	42.78	54.00	-11.22	41.98	0.80	Average
4874.000	50.64	74.00	-23.36	49.85	0.79	Peak	4874.000	56.40	74.00	-17.60	55.61	0.79	Peak
7311.000	36.32	54.00	-17.68	30.68	5.64	Average	7311.000	38.08	54.00	-15.92	32.44	5.64	Average
7311.000	50.49	74.00	-23.51	44.85	5.64	Peak	7311.000	53.49	74.00	-20.51	47.85	5.64	Peak

High CH													
Horizontal							Vertical						
Freq	Level	Limit	Over	Read		Remark	Freq	Level	Limit	Over	Read		Remark
MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m		MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m	
2459.900	70.48			77.91	-7.43	Average	2463.500	85.17			92.59	-7.42	Average
2459.900	81.49			88.92	-7.43	Peak	2463.500	96.42			103.84	-7.42	Peak
2484.300	38.61	54.00	-15.39	45.95	-7.34	Average	2483.800	49.11	54.00	-4.89	56.45	-7.34	Average
2484.300	56.71	74.00	-17.29	64.05	-7.34	Peak	2483.800	70.40	74.00	-3.60	77.74	-7.34	Peak
3282.700	35.04	54.00	-18.96	38.99	-3.95	Average	3282.700	38.62	54.00	-15.38	42.57	-3.95	Average
3282.700	42.29	74.00	-31.71	46.24	-3.95	Peak	3282.700	44.42	74.00	-29.58	48.37	-3.95	Peak
4924.000	35.27	54.00	-18.73	34.44	0.83	Average	4924.000	42.34	54.00	-11.66	41.50	0.84	Average
4924.000	49.29	74.00	-24.71	48.45	0.84	Peak	4924.000	56.54	74.00	-17.46	55.71	0.83	Peak
7386.000	36.69	54.00	-17.31	30.77	5.92	Average	7386.000	40.62	54.00	-13.38	34.70	5.92	Average
7386.000	50.70	74.00	-23.30	44.78	5.92	Peak	7386.000	56.70	74.00	-17.30	50.78	5.92	Peak

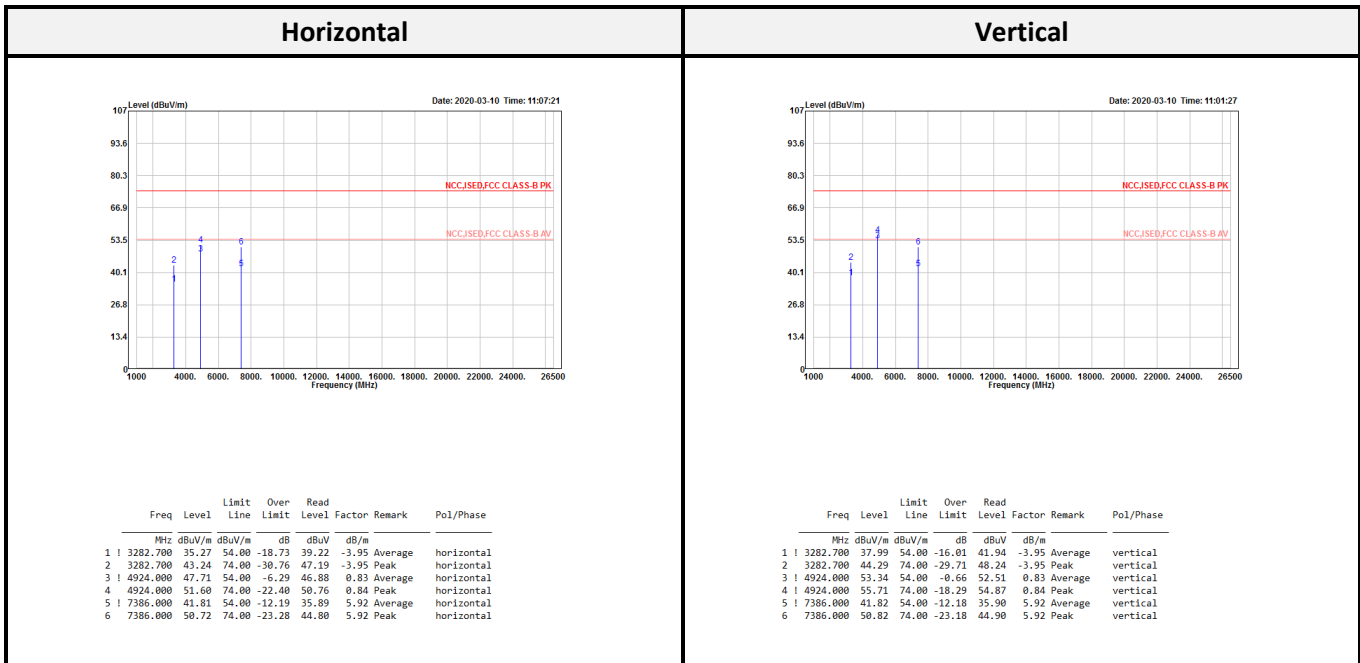
IEEE 802.11n HT40:

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	
2389.728	37.33	54.00	-16.67	44.96	-7.63	Average	2386.296	47.29	54.00	-6.71	54.93	-7.64	Average
2389.728	50.87	74.00	-23.13	58.50	-7.63	Peak	2386.296	64.04	74.00	-9.96	71.68	-7.64	Peak
2426.028	64.15			71.72	-7.57	Average	2438.700	78.74			86.26	-7.52	Average
2426.028	75.37			82.94	-7.57	Peak	2438.700	89.43			96.95	-7.52	Peak
3229.300	36.80	54.00	-17.20	40.92	-4.12	Average	3229.300	37.23	54.00	-16.77	41.35	-4.12	Average
3229.300	43.80	74.00	-30.20	47.92	-4.12	Peak	3229.300	43.28	74.00	-30.72	47.40	-4.12	Peak
4844.000	33.39	54.00	-20.61	32.69	0.70	Average	4844.000	38.19	54.00	-15.81	37.49	0.70	Average
4844.000	48.23	74.00	-25.77	47.53	0.70	Peak	4844.000	53.39	74.00	-20.61	52.69	0.70	Peak
7266.000	33.58	54.00	-20.42	28.15	5.43	Average	7266.000	34.43	54.00	-19.57	29.00	5.43	Average
7266.000	48.60	74.00	-25.40	43.17	5.43	Peak	7266.000	48.39	74.00	-25.61	42.96	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	
2367.354	36.56	54.00	-17.44	44.25	-7.69	Average	2388.892	42.22	54.00	-11.78	49.85	-7.63	Average
2367.354	50.70	74.00	-23.30	58.39	-7.69	Peak	2388.892	58.36	74.00	-15.64	65.99	-7.63	Peak
2442.616	64.93			72.43	-7.50	Average	2441.164	79.06			86.58	-7.52	Average
2442.616	76.20			83.70	-7.50	Peak	2441.164	90.06			97.58	-7.52	Peak
2548.370	37.38	54.00	-16.62	44.52	-7.14	Average	2483.756	44.23	54.00	-9.77	51.57	-7.34	Average
2548.370	51.21	74.00	-22.79	58.35	-7.14	Peak	2483.756	63.29	74.00	-10.71	70.63	-7.34	Peak
3249.300	34.73	54.00	-19.27	38.78	-4.05	Average	3249.300	37.50	54.00	-16.50	41.55	-4.05	Average
3249.300	42.69	74.00	-31.31	46.74	-4.05	Peak	3249.300	43.93	74.00	-30.07	47.98	-4.05	Peak
4874.000	33.44	54.00	-20.56	32.64	0.80	Average	4874.000	38.35	54.00	-15.65	37.55	0.80	Average
4874.000	47.64	74.00	-26.36	46.85	0.79	Peak	4874.000	53.42	74.00	-20.58	52.63	0.79	Peak
7311.000	34.12	54.00	-19.88	28.48	5.64	Average	7311.000	34.99	54.00	-19.01	29.35	5.64	Average
7311.000	47.61	74.00	-26.39	41.97	5.64	Peak	7311.000	48.66	74.00	-25.34	43.02	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	
2457.680	65.42			72.86	-7.44	Average	2468.240	79.34			86.74	-7.40	Average
2457.680	76.75			84.19	-7.44	Peak	2468.240	90.31			97.71	-7.40	Peak
2483.960	38.55	54.00	-15.45	45.89	-7.34	Average	2484.560	48.31	54.00	-5.69	55.65	-7.34	Average
2483.960	54.37	74.00	-19.63	61.71	-7.34	Peak	2484.560	68.87	74.00	-5.13	76.21	-7.34	Peak
3269.300	34.80	54.00	-19.20	38.79	-3.99	Average	3269.300	37.53	54.00	-16.47	41.52	-3.99	Average
3269.300	42.88	74.00	-31.12	46.87	-3.99	Peak	3269.300	43.37	74.00	-30.63	47.36	-3.99	Peak
4904.000	32.43	54.00	-21.57	31.58	0.85	Average	4904.000	38.15	54.00	-15.85	37.30	0.85	Average
4904.000	46.63	74.00	-27.37	45.78	0.85	Peak	4904.000	53.50	74.00	-20.50	52.65	0.85	Peak
7206.000	32.91	54.00	-21.09	27.66	5.25	Average	7206.000	32.81	54.00	-21.19	27.56	5.25	Average
7206.000	46.87	74.00	-27.13	41.62	5.25	Peak	7206.000	47.39	74.00	-26.61	42.14	5.25	Peak

Above 1G (1 GHz-26.5 GHz): The worst mode: 802.11b High CH.



Level = Reading Level + Correct Factor

Over Limit = Level – Limit

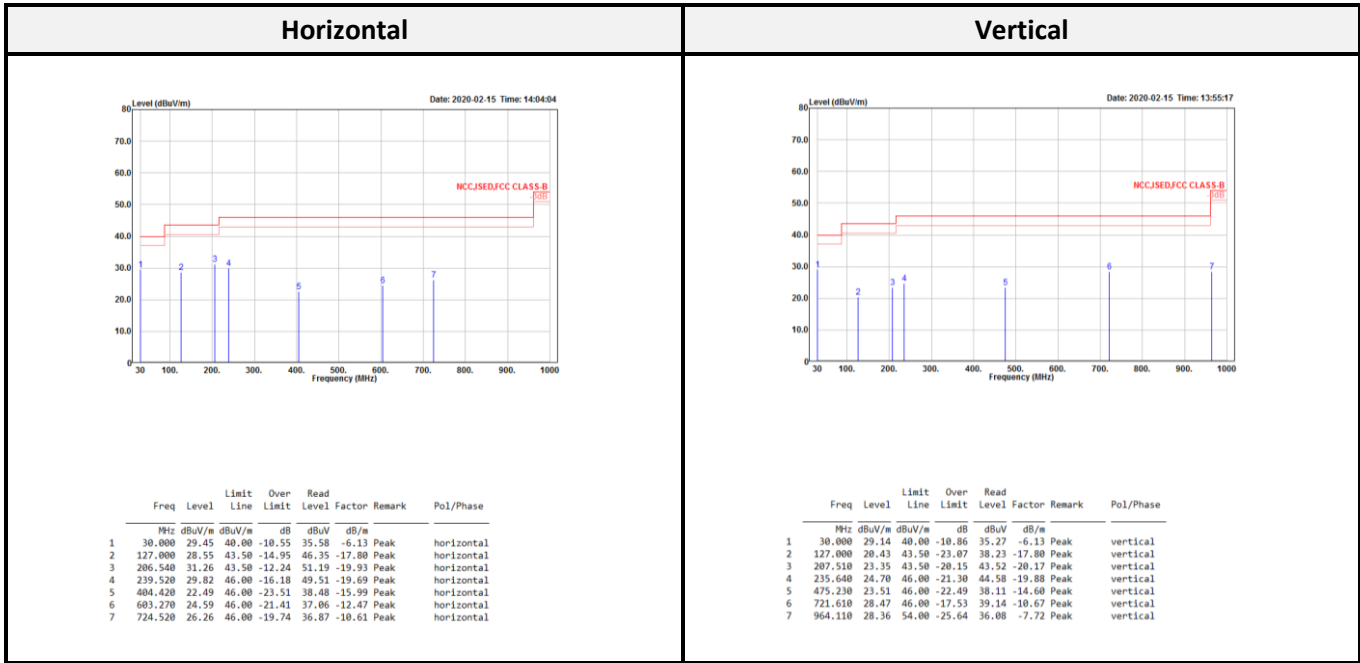
Correct Factor = Antenna Factor + Cable Loss – Amplifier Gain

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

< PCB Antenna (Redpine Signals RSIA7) >

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	
2388.736	40.28	54.00	-13.72	47.91	-7.63	Average	2380.896	36.84	54.00	-17.16	44.49	-7.65	Average
2388.736	53.14	74.00	-20.86	60.77	-7.63	Peak	2380.896	51.08	74.00	-22.92	58.73	-7.65	Peak
2413.040	100.63			108.22	-7.59	Average	2413.040	92.40			99.99	-7.59	Average
2413.040	103.28			110.87	-7.59	Peak	2413.040	95.20			102.79	-7.59	Peak
3216.000	41.21	54.00	-12.79	45.42	-4.21	Average	3216.000	39.42	54.00	-14.58	43.63	-4.21	Average
3216.000	45.26	74.00	-28.74	49.47	-4.21	Peak	3216.000	44.21	74.00	-29.79	48.42	-4.21	Peak
4824.000	47.21	54.00	-6.79	46.57	0.64	Average	4824.000	53.13	54.00	-0.87	52.49	0.64	Average
4824.000	51.41	74.00	-22.59	50.77	0.64	Peak	4824.000	55.38	74.00	-18.62	54.74	0.64	Peak
7236.000	36.90	54.00	-17.10	31.52	5.38	Average	7236.000	44.13	54.00	-9.87	38.75	5.38	Average
7236.000	48.99	74.00	-25.01	43.61	5.38	Peak	7236.000	51.76	74.00	-22.24	46.38	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	
2382.842	38.47	54.00	-15.53	46.11	-7.64	Average	2384.778	36.86	54.00	-17.14	44.50	-7.64	Average
2382.842	51.76	74.00	-22.24	59.40	-7.64	Peak	2384.778	50.74	74.00	-23.26	58.38	-7.64	Peak
2436.324	102.12			109.66	-7.54	Average	2436.324	93.58			101.12	-7.54	Average
2436.324	104.96			112.50	-7.54	Peak	2436.324	96.38			103.92	-7.54	Peak
2492.952	40.06	54.00	-13.94	47.39	-7.33	Average	2524.654	37.60	54.00	-16.40	44.85	-7.25	Average
2492.952	53.03	74.00	-20.97	60.36	-7.33	Peak	2524.654	51.33	74.00	-22.67	58.58	-7.25	Peak
3249.300	41.19	54.00	-12.81	45.23	-4.04	Average	3249.300	37.82	54.00	-16.18	41.86	-4.04	Average
3249.300	46.19	74.00	-27.81	50.23	-4.04	Peak	3249.300	43.80	74.00	-30.20	47.84	-4.04	Peak
4874.000	46.90	54.00	-7.10	46.12	0.78	Average	4874.000	53.54	54.00	-0.46	52.76	0.78	Average
4874.000	51.17	74.00	-22.83	50.39	0.78	Peak	4874.000	56.29	74.00	-17.71	55.51	0.78	Peak
7311.000	36.29	54.00	-17.71	30.65	5.64	Average	7311.000	43.20	54.00	-10.80	37.56	5.64	Average
7311.000	49.31	74.00	-24.69	43.67	5.64	Peak	7311.000	51.14	74.00	-22.86	45.50	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	102.25			109.67	-7.42	Average	2461.100	93.81			101.24	-7.43	Average
2462.900	104.89			112.31	-7.42	Peak	2461.100	96.65			104.08	-7.43	Peak
2504.300	42.14	54.00	-11.86	49.44	-7.30	Average	2503.600	37.79	54.00	-16.21	45.10	-7.31	Average
2504.300	55.49	74.00	-18.51	62.79	-7.30	Peak	2503.600	51.64	74.00	-22.36	58.95	-7.31	Peak
3282.700	45.81	54.00	-8.19	49.78	-3.97	Average	3282.700	39.16	54.00	-14.84	43.13	-3.97	Average
3282.700	46.81	74.00	-27.19	50.78	-3.97	Peak	3282.700	43.89	74.00	-30.11	47.86	-3.97	Peak
4924.000	45.84	54.00	-8.16	45.00	0.84	Average	4924.000	53.21	54.00	-0.79	52.37	0.84	Average
4924.000	50.81	74.00	-23.19	49.97	0.84	Peak	4924.000	55.35	74.00	-18.65	54.51	0.84	Peak
7386.000	37.55	54.00	-16.45	31.63	5.92	Average	7386.000	43.97	54.00	-10.03	38.05	5.92	Average
7386.000	49.24	74.00	-24.76	43.32	5.92	Peak	7386.000	51.42	74.00	-22.58	45.50	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	
2390.000	52.19	54.00	-1.81	59.82	-7.63	Average	2389.968	42.63	54.00	-11.37	50.26	-7.63	Average
2390.000	71.80	74.00	-2.20	79.43	-7.63	Peak	2389.968	59.50	74.00	-14.50	67.13	-7.63	Peak
2414.160	94.75			102.34	-7.59	Average	2414.160	87.12			94.71	-7.59	Average
2414.160	105.96			113.55	-7.59	Peak	2414.160	98.63			106.22	-7.59	Peak
3216.000	41.16	54.00	-12.84	45.37	-4.21	Average	3216.000	38.35	54.00	-15.65	42.56	-4.21	Average
3216.000	46.17	74.00	-27.83	50.38	-4.21	Peak	3216.000	43.96	74.00	-30.04	48.17	-4.21	Peak
4824.000	35.60	54.00	-18.40	34.96	0.64	Average	4824.000	42.21	54.00	-11.79	41.57	0.64	Average
4824.000	50.76	74.00	-23.24	50.12	0.64	Peak	4824.000	57.48	74.00	-16.52	56.84	0.64	Peak
7236.000	34.36	54.00	-19.64	28.98	5.38	Average	7236.000	38.98	54.00	-15.02	33.60	5.38	Average
7236.000	49.63	74.00	-24.37	44.25	5.38	Peak	7236.000	54.03	74.00	-19.97	48.65	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	
2388.650	45.82	54.00	-8.18	53.45	-7.63	Average	2388.892	39.82	54.00	-14.18	47.45	-7.63	Average
2388.650	70.06	74.00	-3.94	77.69	-7.63	Peak	2388.892	61.62	74.00	-12.38	69.25	-7.63	Peak
2439.228	99.90			107.42	-7.52	Average	2434.388	92.37			99.91	-7.54	Average
2439.228	110.51			118.03	-7.52	Peak	2434.388	103.18			110.72	-7.54	Peak
2483.514	48.99	54.00	-5.01	56.33	-7.34	Average	2483.756	40.91	54.00	-13.09	48.25	-7.34	Average
2483.514	72.12	74.00	-1.88	79.46	-7.34	Peak	2483.756	61.84	74.00	-12.16	69.18	-7.34	Peak
3249.300	41.32	54.00	-12.68	45.39	-4.07	Average	3249.300	38.81	54.00	-15.19	42.88	-4.07	Average
3249.300	45.43	74.00	-28.57	49.50	-4.07	Peak	3249.300	44.09	74.00	-29.91	48.16	-4.07	Peak
4874.000	40.68	54.00	-13.32	39.88	0.80	Average	4874.000	45.07	54.00	-8.93	44.27	0.80	Average
4874.000	53.65	74.00	-20.35	52.85	0.80	Peak	4874.000	59.34	74.00	-14.66	58.54	0.80	Peak
7311.000	39.31	54.00	-14.69	33.67	5.64	Average	7311.000	44.38	54.00	-9.62	38.76	5.64	Average
7311.000	53.59	74.00	-20.41	47.95	5.64	Peak	7311.000	59.11	74.00	-14.89	53.49	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	
2464.200	94.20			101.61	-7.41	Average	2464.300	85.31			92.72	-7.41	Average
2464.200	105.61			113.02	-7.41	Peak	2464.300	96.40			103.81	-7.41	Peak
2483.500	52.45	54.00	-1.55	59.79	-7.34	Average	2483.800	42.18	54.00	-11.82	49.52	-7.34	Average
2483.500	72.86	74.00	-1.14	80.20	-7.34	Peak	2483.800	60.79	74.00	-13.21	68.13	-7.34	Peak
3282.700	41.67	54.00	-12.33	45.63	-3.96	Average	3282.700	39.71	54.00	-14.29	43.67	-3.96	Average
3282.700	44.61	74.00	-29.39	48.57	-3.96	Peak	3282.700	44.17	74.00	-29.83	48.13	-3.96	Peak
4924.000	34.79	54.00	-19.21	33.95	0.84	Average	4924.000	40.15	54.00	-13.85	39.31	0.84	Average
4924.000	48.72	74.00	-25.28	47.88	0.84	Peak	4924.000	54.36	74.00	-19.64	53.52	0.84	Peak
7386.000	35.17	54.00	-18.83	29.25	5.92	Average	7386.000	37.58	54.00	-16.42	31.66	5.92	Average
7386.000	47.13	74.00	-26.87	41.21	5.92	Peak	7386.000	52.49	74.00	-21.51	46.57	5.92	Peak

IEEE 802.11n HT20:

Low CH													
Horizontal							Vertical						
Freq	Level	Limit	Over	Read		Remark	Freq	Level	Limit	Over	Read		Remark
MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m		MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m	
2389.520	52.51	54.00	-1.49	60.14	-7.63	Average	2388.960	43.28	54.00	-10.72	50.91	-7.63	Average
2389.520	72.29	74.00	-1.71	79.92	-7.63	Peak	2388.960	61.73	74.00	-12.27	69.36	-7.63	Peak
2413.488	93.85			101.44	-7.59	Average	2414.384	85.70			93.29	-7.59	Average
2413.488	104.73			112.32	-7.59	Peak	2414.384	96.50			104.09	-7.59	Peak
3216.000	42.10	54.00	-11.90	46.33	-4.23	Average	3216.000	39.34	54.00	-14.66	43.41	-4.07	Average
3216.000	44.10	74.00	-29.90	48.33	-4.23	Peak	3216.000	44.13	74.00	-29.87	48.20	-4.07	Peak
4824.000	35.61	54.00	-18.39	34.97	0.64	Average	4824.000	42.15	54.00	-11.85	41.51	0.64	Average
4824.000	49.42	74.00	-24.58	48.78	0.64	Peak	4824.000	56.43	74.00	-17.57	55.79	0.64	Peak
7236.000	35.50	54.00	-18.50	30.12	5.38	Average	7236.000	38.17	54.00	-15.83	32.79	5.38	Average
7236.000	47.63	74.00	-26.37	42.25	5.38	Peak	7236.000	52.88	74.00	-21.12	47.50	5.38	Peak

Middle CH													
Horizontal							Vertical						
Freq	Level	Limit	Over	Read		Remark	Freq	Level	Limit	Over	Read		Remark
MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m		MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m	
2389.520	52.51	54.00	-1.49	60.14	-7.63	Average	2388.166	40.17	54.00	-13.83	47.80	-7.63	Average
2389.520	72.29	74.00	-1.71	79.92	-7.63	Peak	2388.166	59.53	74.00	-14.47	67.16	-7.63	Peak
2413.488	93.85			101.44	-7.59	Average	2438.502	92.35			99.87	-7.52	Average
2413.488	104.73			112.32	-7.59	Peak	2438.502	103.45			110.97	-7.52	Peak
3216.000	42.10	54.00	-11.90	46.33	-4.23	Average	2485.450	41.91	54.00	-12.09	49.25	-7.34	Average
3216.000	44.10	74.00	-29.90	48.33	-4.23	Peak	2485.450	62.53	74.00	-11.47	69.87	-7.34	Peak
4824.000	35.61	54.00	-18.39	34.97	0.64	Average	3249.300	39.58	54.00	-14.42	43.65	-4.07	Average
4824.000	49.42	74.00	-24.58	48.78	0.64	Peak	3249.300	44.74	74.00	-29.26	48.81	-4.07	Peak
7236.000	35.50	54.00	-18.50	30.12	5.38	Average	4874.000	46.00	54.00	-8.00	45.21	0.79	Average
7236.000	47.63	74.00	-26.37	42.25	5.38	Peak	4874.000	59.48	74.00	-14.52	58.69	0.79	Peak
							7311.000	44.90	54.00	-9.10	39.26	5.64	Average
							7311.000	59.51	74.00	-14.49	53.87	5.64	Peak

High CH													
Horizontal							Vertical						
Freq	Level	Limit	Over	Read		Remark	Freq	Level	Limit	Over	Read		Remark
MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m		MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m	
2460.600	93.50			100.93	-7.43	Average	2460.400	84.60			92.03	-7.43	Average
2460.600	104.45			111.88	-7.43	Peak	2460.400	95.57			103.00	-7.43	Peak
2483.600	52.93	54.00	-1.07	60.27	-7.34	Average	2484.600	43.11	54.00	-10.89	50.45	-7.34	Average
2483.600	73.72	74.00	-0.28	81.06	-7.34	Peak	2484.600	61.35	74.00	-12.65	68.69	-7.34	Peak
3282.700	42.12	54.00	-11.88	46.08	-3.96	Average	3282.700	39.70	54.00	-14.30	43.66	-3.96	Average
3282.700	45.37	74.00	-28.63	49.33	-3.96	Peak	3282.700	44.26	74.00	-29.74	48.22	-3.96	Peak
4924.000	33.94	54.00	-20.06	33.10	0.84	Average	4924.000	39.18	54.00	-14.82	38.34	0.84	Average
4924.000	47.38	74.00	-26.62	46.54	0.84	Peak	4924.000	53.52	74.00	-20.48	52.68	0.84	Peak
7386.000	35.12	54.00	-18.88	29.20	5.92	Average	7386.000	35.99	54.00	-18.01	30.07	5.92	Average
7386.000	48.12	74.00	-25.88	42.20	5.92	Peak	7386.000	48.95	74.00	-25.05	43.03	5.92	Peak

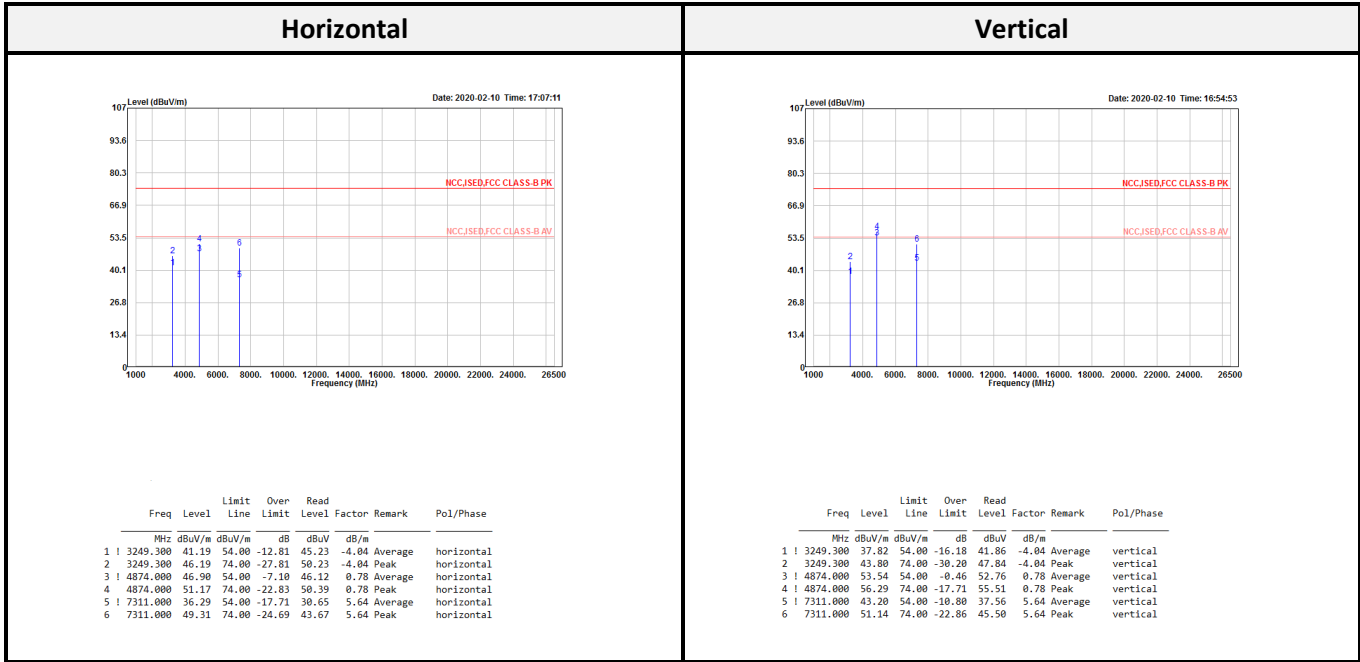
IEEE 802.11n HT40:

Low CH													
Horizontal							Vertical						
Freq	Level	Limit	Over	Read		Remark	Freq	Level	Limit	Over	Read		Remark
MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m		MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m	
2387.880	52.89	54.00	-1.11	60.52	-7.63	Average	2387.352	42.95	54.00	-11.05	50.59	-7.64	Average
2387.880	69.17	74.00	-4.83	76.80	-7.63	Peak	2387.352	59.61	74.00	-14.39	67.25	-7.64	Peak
2427.876	88.63			96.19	-7.56	Average	2427.612	80.19			87.75	-7.56	Average
2427.876	99.76			107.32	-7.56	Peak	2427.612	91.71			99.27	-7.56	Peak
3229.300	42.01	54.00	-11.99	46.15	-4.14	Average	3229.300	40.08	54.00	-13.92	44.22	-4.14	Average
3229.300	45.52	74.00	-28.48	49.66	-4.14	Peak	3229.300	44.63	74.00	-29.37	48.77	-4.14	Peak
4844.000	32.26	54.00	-21.74	31.56	0.70	Average	4844.000	36.31	54.00	-17.69	35.61	0.70	Average
4844.000	45.19	74.00	-28.81	44.49	0.70	Peak	4844.000	50.15	74.00	-23.85	49.45	0.70	Peak
7266.000	35.45	54.00	-18.55	30.02	5.43	Average	7266.000	34.56	54.00	-19.44	29.13	5.43	Average
7266.000	47.52	74.00	-26.48	42.09	5.43	Peak	7266.000	48.33	74.00	-25.67	42.90	5.43	Peak

Middle CH													
Horizontal							Vertical						
Freq	Level	Limit	Over	Read		Remark	Freq	Level	Limit	Over	Read		Remark
MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m		MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m	
2387.682	49.23	54.00	-4.77	56.86	-7.63	Average	2386.230	41.12	54.00	-12.88	48.76	-7.64	Average
2387.682	68.50	74.00	-5.50	76.13	-7.63	Peak	2386.230	59.29	74.00	-14.71	66.93	-7.64	Peak
2441.890	90.98			98.49	-7.51	Average	2442.858	82.41			89.91	-7.50	Average
2441.890	102.06			109.57	-7.51	Peak	2442.858	93.82			101.32	-7.50	Peak
2483.756	53.27	54.00	-0.73	60.61	-7.34	Average	2483.756	43.80	54.00	-10.20	51.14	-7.34	Average
2483.756	73.68	74.00	-0.32	81.02	-7.34	Peak	2483.756	62.45	74.00	-11.55	69.79	-7.34	Peak
3249.300	42.18	54.00	-11.82	46.25	-4.07	Average	3249.300	39.40	54.00	-14.60	43.47	-4.07	Average
3249.300	45.60	74.00	-28.40	49.67	-4.07	Peak	3249.300	44.37	74.00	-29.63	48.44	-4.07	Peak
4874.000	32.24	54.00	-21.76	31.45	0.79	Average	4874.000	38.12	54.00	-15.88	37.33	0.79	Average
4874.000	45.88	74.00	-28.12	45.09	0.79	Peak	4874.000	52.24	74.00	-21.76	51.45	0.79	Peak
7311.000	35.79	54.00	-18.21	30.15	5.64	Average	7311.000	37.11	54.00	-16.89	31.47	5.64	Average
7311.000	47.67	74.00	-26.33	42.03	5.64	Peak	7311.000	52.68	74.00	-21.32	47.04	5.64	Peak

High CH													
Horizontal							Vertical						
Freq	Level	Limit	Over	Read		Remark	Freq	Level	Limit	Over	Read		Remark
MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m		MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m	
2455.760	88.16			95.61	-7.45	Average	2457.680	79.48			86.92	-7.44	Average
2455.760	99.26			106.71	-7.45	Peak	2457.680	90.74			98.18	-7.44	Peak
2484.000	53.61	54.00	-0.39	60.95	-7.34	Average	2484.560	43.46	54.00	-10.54	50.80	-7.34	Average
2484.000	71.83	74.00	-2.17	79.17	-7.34	Peak	2484.560	59.50	74.00	-14.50	66.84	-7.34	Peak
3269.300	42.25	54.00	-11.75	46.27	-4.02	Average	3269.300	39.63	54.00	-14.37	43.65	-4.02	Average
3269.300	45.51	74.00	-28.49	49.53	-4.02	Peak	3269.300	44.51	74.00	-29.49	48.53	-4.02	Peak
4904.000	32.21	54.00	-21.79	31.36	0.85	Average	4904.000	34.45	54.00	-19.55	33.60	0.85	Average
4904.000	44.65	74.00	-29.35	43.80	0.85	Peak	4904.000	48.73	74.00	-25.27	47.88	0.85	Peak
7356.000	36.02	54.00	-17.98	30.20	5.82	Average	7356.000	38.06	54.00	-15.94	32.24	5.82	Average
7356.000	49.02	74.00	-24.98	43.20	5.82	Peak	7356.000	50.75	74.00	-23.25	44.93	5.82	Peak

Above 1G (1 GHz-26.5 GHz): The worst mode: 802.11b Middle CH.



Level = Reading Level + Correct Factor

Over Limit = Level – Limit

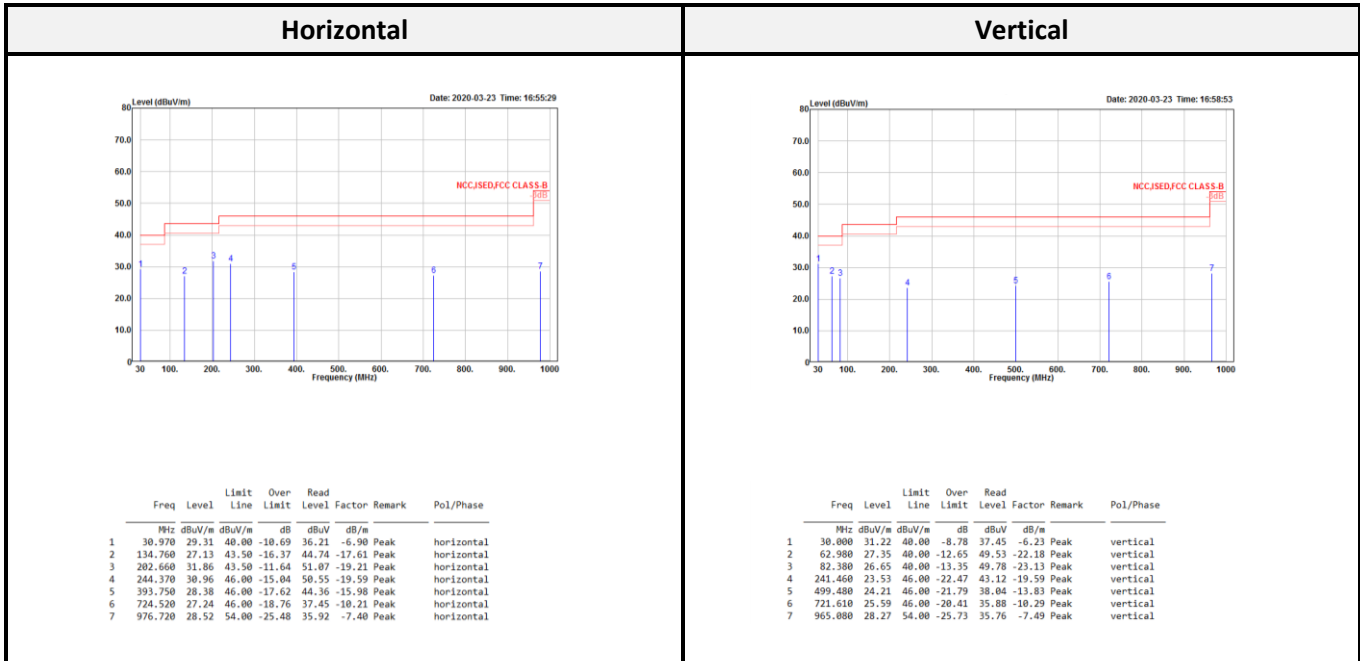
Correct Factor = Antenna Factor + Cable Loss – Amplifier Gain

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

< PIFA Antenna (SMARTEQ 4211613980) >

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