



FCC PART 15, SUBPART C
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TEST AND MEASUREMENT REPORT

For

HAP Innovations

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USA

FCC ID: 2AIA7-SPN02
IC: 21622-SPN02

Report Type: Original Report	Model: SPN02
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* This report may contain data that are not covered by the A2LA accreditation and are marked with an asterisk “*”

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DOCUMENT REVISION HISTORY

Revision Number	Report Number	Description of Revision	Date of Revision
0	R1706142-247	Original Report	2017-07-12

1 General Description

1.1 Product Description for Equipment Under Test (EUT)

This test and measurement report was prepared on behalf of HAP Innovations and their product model: SPN02, The device Texas Instruments' Module WL1835MOD, FCC ID: Z64-WL18SBMOD; IC: 451I-WL18SBMO, which support Wi-Fi/BT radio (2400-2483.5MHz). The EUT is a spencer and contains a cellular radio (WCDMA Band II, IV, V and LTE Band II, IV, V, XII) and a Wi-Fi/Bluetooth radio (2400-2483.5MHz).

1.2 Mechanical Description of EUT

The EUT measures approximately 265 mm (L) x 125 mm (W) x 330 mm (H).

The test data gathered are from typical production sample, serial number: R1706142-1 assigned by BACL.

1.3 Objective

This report is prepared on behalf *HAP Innovations*, in accordance with Part 2, Subpart J, and Part 15, Subparts A and C of the Federal Communication Commission's rules and ISEDC RSS-247 Issue 2, FEBRUARY 2017.

The objective is to determine compliance with FCC Part 15.247 and ISEDC RSS-247 rules for Output Power, Antenna Requirements, 6 dB Bandwidth, Power Spectral Density, 100 kHz Bandwidth of Band Edges Measurement, Conducted and Radiated Spurious Emissions.

1.4 Related Submittal(s)/Grant(s)

R1706142-22, RS132/24, RS133/27, RS130, RS139

1.5 Test Methodology

All measurements contained in this report were conducted in accordance with ANSI C63.10-2013, American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices and FCC KDB 558074 D01 DTS Meas Guidance v04: Guidance for Performing Compliance Measurements on Digital Transmission Systems (DTS) Operating Under §15.247.

1.6 Measurement Uncertainty

All measurements involve certain levels of uncertainties, especially in the field of EMC. The factors contributing to uncertainties are spectrum analyzer, cable loss, antenna factor calibration, antenna directivity, antenna factor variation with height, antenna phase center variation, antenna factor frequency interpolation, measurement distance variation, site imperfections, mismatch (average), and system repeatability.

Parameter	Measurement uncertainty
Occupied Channel Bandwidth	± 5 %
RF output power, conducted	± 0.57 dB
Power Spectral Density, conducted	± 1.48 dB
Unwanted Emissions, conducted	± 1.57 dB
All emissions, radiated	± 4.0 dB
AC power line Conducted Emission	± 2.0 dB
Temperature	± 2 ° C
Humidity	± 5 %
DC and low frequency voltages	± 1.0 %
Time	± 2 %
Duty Cycle	± 3 %

1.7 Test Facility Registrations

BACL's test facilities that are used to perform Radiated and Conducted Emissions tests are currently recognized by the Federal Communications Commission as Accredited with NIST Designation Number US1129.

BACL's test facilities that are used to perform Radiated and Conducted Emissions tests are currently registered with Industry Canada under Registration Numbers: 3062A-1, 3062A-2, and 3062A-3.

BACL is a Chinese Taipei Bureau of Standards Metrology and Inspection (BSMI) validated Conformity Assessment Body (CAB), under Appendix B, Phase I Procedures of the APEC Mutual Recognition Arrangement (MRA). BACL's BSMI Lab Code Number is: SL2-IN-E-1002R

BACL's test facilities that are used to perform AC Line Conducted Emissions, Telecommunications Line Conducted Emissions, Radiated Emissions from 30 MHz to 1 GHz, and Radiated Emissions from 1 GHz to 6 GHz are currently recognized as Accredited in accordance with the Voluntary Control Council for Interference [VCCI] Article 15 procedures under Registration Number A-0027.

1.8 Test Facility Accreditations

Bay Area Compliance Laboratories Corp. (BACL) is:

A- An independent, 3rd-Party, Commercial Test Laboratory accredited to ISO/IEC 17025:2005 by A2LA (Test Laboratory Accreditation Certificate Number 3297.02), in the fields of: Electromagnetic Compatibility and Telecommunications. Unless noted by an Asterisk (*) in the Compliance Matrix (See Section 3 of this Test Report), BACL's ISO/IEC 17025:2005 Scope of Accreditation includes all of the Test Method Standards and/or the Product Family Standards detailed in this Test Report..

BACL's ISO/IEC 17025:2005 Scope of Accreditation includes a comprehensive suite of EMC Emissions, EMC Immunity, Radio, RF Exposure, Safety and wireline Telecommunications test methods applicable to a wide range of product categories. These product categories include Central Office Telecommunications Equipment [including NEBS - Network Equipment Building Systems], Unlicensed and Licensed Wireless and RF devices, Information Technology Equipment (ITE); Telecommunications Terminal Equipment (TTE); Medical Electrical Equipment; Industrial, Scientific and Medical Test Equipment; Professional Audio and Video Equipment; Industrial and Scientific Instruments and Laboratory Apparatus; Cable Distribution Systems, and Energy Efficient Lighting.

B- A Product Certification Body accredited to ISO/IEC 17065:2012 by A2LA (Product Certification Body Accreditation Certificate Number 3297.03) to certify

- For the USA (Federal Communications Commission):

- 1- All Unlicensed radio frequency devices within FCC Scopes A1, A2, A3, and A4;
- 2- All Licensed radio frequency devices within FCC Scopes B1, B2, B3, and B4;
- 3- All Telephone Terminal Equipment within FCC Scope C.

- For the Canada (Industry Canada):

- 1 All Scope 1-Licence-Exempt Radio Frequency Devices;
- 2 All Scope 2-Licensed Personal Mobile Radio Services;
- 3 All Scope 3-Licensed General Mobile & Fixed Radio Services;
- 4 All Scope 4-Licensed Maritime & Aviation Radio Services;
- 5 All Scope 5-Licensed Fixed Microwave Radio Services
- 6 All Broadcasting Technical Standards (BETS) in the Category I Equipment Standards List.

- For Singapore (Info-Communications Development Authority (IDA)):

- 1 All Line Terminal Equipment: All Technical Specifications for Line Terminal Equipment – Table 1 of IDA MRA Recognition Scheme: 2011, Annex 2
2. All Radio-Communication Equipment: All Technical Specifications for Radio-Communication Equipment – Table 2 of IDA MRA Recognition Scheme: 2011, Annex 2

- For the Hong Kong Special Administrative Region:

- 1 All Radio Equipment, per KHCA 10XX-series Specifications;
- 2 All GMDSS Marine Radio Equipment, per HKCA 12XX-series Specifications;
- 3 All Fixed Network Equipment, per HKCA 20XX-series Specifications.

- For Japan:

- 1 MIC Telecommunication Business Law (Terminal Equipment):
 - All Scope A1 - Terminal Equipment for the Purpose of Calls;
 - All Scope A2 - Other Terminal Equipment
- 2 Radio Law (Radio Equipment):
 - All Scope B1 - Specified Radio Equipment specified in Article 38-2-2, paragraph 1, item 1 of the Radio Law
 - All Scope B2 - Specified Radio Equipment specified in Article 38-2-2, paragraph 1, item 2 of the Radio Law
 - All Scope B3 - Specified Radio Equipment specified in Article 38-2-2, paragraph 1, item 3 of the Radio Law

C- A Product Certification Body accredited to ISO/IEC 17065:2012 by A2LA (Product Certification Body Accreditation Certificate Number 3297.01) to certify Products to USA's Environmental Protection Agency (EPA) ENERGY STAR Product Specifications for:

- 1 Electronics and Office Equipment:
 - for Telephony (ver. 3.0)
 - for Audio/Video (ver. 3.0)
 - for Battery Charging Systems (ver. 1.1)
 - for Set-top Boxes & Cable Boxes (ver. 4.1)
 - for Televisions (ver. 6.1)
 - for Computers (ver. 6.0)
 - for Displays (ver. 6.0)
 - for Imaging Equipment (ver. 2.0)
 - for Computer Servers (ver. 2.0)
- 2 Commercial Food Service Equipment
 - for Commercial Dishwashers (ver. 2.0)
 - for Commercial Ice Machines (ver. 2.0)
 - for Commercial Ovens (ver. 2.1)
 - for Commercial Refrigerators and Freezers
- 3 Lighting Products
 - For Decorative Light Strings (ver. 1.5)
 - For Luminaires (including sub-components) and Lamps (ver. 1.2)
 - For Compact Fluorescent Lamps (CFLs) (ver. 4.3)
 - For Integral LED Lamps (ver. 1.4)
- 4 Heating, Ventilation, and AC Products
 - for Residential Ceiling Fans (ver. 3.0)
 - for Residential Ventilating Fans (ver. 3.2)
- 5 Other
 - For Water Coolers (ver. 3.0)

D. A NIST Designated Phase-I and Phase-II Conformity Assessment Body (CAB) for the following economies and regulatory authorities under the terms of the stated MRAs/Treaties:

- Australia: ACMA (Australian Communication and Media Authority) – APEC Tel MRA -Phase I;
- Canada: (Industry Canada - IC) Foreign Certification Body – FCB – APEC Tel MRA -Phase I & Phase II;
- Chinese Taipei (Republic of China – Taiwan):
 - o BSMI (Bureau of Standards, Metrology and Inspection) APEC Tel MRA -Phase I;
 - o NCC (National Communications Commission) APEC Tel MRA -Phase I;
- European Union:
 - o Radio & Teleterminal Equipment (R&TTE) Directive 1995/5/EC
 - US -EU EMC & Telecom MRA CAB
- Hong Kong Special Administrative Region: (Office of the Telecommunications Authority – OFTA) APEC Tel MRA -Phase I & Phase II
- Israel – US-Israel MRA Phase I
- Republic of Korea (Ministry of Communications - Radio Research Laboratory) APEC Tel MRA -Phase I
- Singapore: (Infocomm Development Authority - IDA) APEC Tel MRA -Phase I & Phase II;
- Japan: VCCI - Voluntary Control Council for Interference US-Japan Telecom Treaty VCCI Side Letter-
- USA:
 - o ENERGY STAR Recognized Test Laboratory – US EPA
 - o Telecommunications Certification Body (TCB) – US FCC;
- Vietnam: APEC Tel MRA -Phase I;

2 System Test Configuration

2.1 Justification

The EUT was configured for testing according to ANSI C63.10-2013 and FCC KDB 558074 D01 DTS Meas Guidance v04.

The EUT was tested in a testing mode to represent worst-case results during the final qualification test.

The worst-case data rates are determined to be as follows for each mode based upon investigation by measuring the average power, peak power and PSD across all data rates bandwidths, and modulations.

2.2 EUT Exercise Software

N/A

2.3 Equipment Modifications

N/A

2.4 Local Support Equipment

Manufacturer/Product Type	Description	Model No.	Serial No.
Dell	Windows Laptop	E6410	-

2.5 Support Equipment

There was no support equipment included, or intended for use with EUT during these tests.

2.6 Interface Ports and Cabling

N/A

3 Summary of Test Results

Results reported relate only to the product tested.

FCC/ ISEDC Rules	Description of Test	Results
FCC §2.1053, §15.205, §15.209, §15.247 (d) ISED RSS-247 §5.5 ISED RSS-Gen §8.9 & §8.10	Radiated Spurious Emissions	Compliant

4 FCC §15.205, §15.209, §15.247(d), ISEDC RSS-247 §5.5, & ISEDC RSS-GEN §8.9 & §8.10 - Spurious Radiated Emissions

4.1 Applicable Standards

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 1 MHz.

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	16.42 – 16.423		4.5 – 5.15
0.495 – 0.505	16.69475 – 16.69525	960 – 1240	5.35 – 5.46
2.1735 – 2.1905	25.5 – 25.67	1300 – 1427	7.25 – 7.75
4.125 – 4.128	37.5 – 38.25	1435 – 1626.5	8.025 – 8.5
4.17725 – 4.17775	73 – 74.6	1645.5 – 1646.5	9.0 – 9.2
4.20725 – 4.20775	74.8 – 75.2	1660 – 1710	9.3 – 9.5
6.215 – 6.218	108 – 121.94	1718.8 – 1722.2	10.6 – 12.7
6.26775 – 6.26825	123 – 138	2200 – 2300	13.25 – 13.4
6.31175 – 6.31225	149.9 – 150.05	2310 – 2390	14.47 – 14.5
8.291 – 8.294	156.52475 – 156.52525	2483.5 – 2500	15.35 – 16.2
8.362 – 8.366	156.7 – 156.9	2690 – 2900	17.7 – 21.4
8.37625 – 8.38675	162.0125 – 167.17	3260 – 3267	22.01 – 23.12
8.41425 – 8.41475	167.72 – 173.2	3.332 – 3.339	23.6 – 24.0
12.29 – 12.293	240 – 285	3.3458 – 3.358	31.2 – 31.8
12.51975 – 12.52025	322 – 335.4	3.600 – 4.400	36.43 – 36.5
12.57675 – 12.57725	399.9 – 410		Above 38.6
13.36 – 13.41	608 – 614		

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 470-806 MHz.

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 20 dB. Attenuation below the general limits specified in §15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a) (see §15.205(c)).

As per ISED 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 or 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

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 specified RSS.

As per ISED 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.

4.2 Test Setup

The radiated emissions tests were performed in the 5-meter Chamber, using the setup in accordance with ANSI C63.10-2013. The specification used was the FCC 15 Subpart limits.

The spacing between the peripherals was 10 centimeters.

External I/O cables were draped along the edge of the test table and bundle when necessary.

4.3 Test Procedure

For the radiated emissions test, the EUT host, and all support equipment power cords were connected to the AC floor outlet.

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

The EUT was set 3 meter away from the testing antenna, which was varied from 1-4 meter, and the EUT was placed on a turntable, which was 0.8 meter and 1.5 meter above the ground plane for below and above 1000 MHz measurements, the table shall be rotated for 360 degrees to find out the highest emission. The receiving antenna's polarity should be changed between horizontal and vertical.

The spectrum analyzer or receiver was set as:

DTS:

Below 1000 MHz:

$RBW = 100 \text{ kHz} / VBW = 300 \text{ kHz} / \text{Sweep} = \text{Auto}$

Above 1000 MHz:

- (1) Peak: $RBW = 1\text{MHz} / VBW = 1\text{MHz} / \text{Sweep} = \text{Auto}$
- (2) Average: $RBW = 1\text{MHz} / VBW = 10\text{Hz} / \text{Sweep} = \text{Auto}$

DSS:

Below 1000 MHz:

$RBW = 100 \text{ kHz} / VBW = 300 \text{ kHz} / \text{Sweep} = \text{Auto}$

Above 1000 MHz:

- (1) Peak: $RBW = 1\text{MHz} / VBW = 1\text{MHz} / \text{Sweep} = \text{Auto}$
- (2) Fundamental and harmonics : Average = Peak + Duty cycle correction factor(-24.79, according to the module report FR3N2752-01
- (3) Except (2), Average: $RBW = 1\text{MHz} / VBW = 10\text{Hz} / \text{Sweep} = \text{Auto}$

4.4 Corrected Amplitude & Margin Calculation

The Corrected Amplitude (CA) is calculated by adding the Antenna Factor (AF), the Cable Loss (CL), the Attenuator Factor (Atten) and subtracting the Amplifier Gain (Ga) to indicated Amplitude (Ai) reading. The basic equation is as follows:

$$CA = Ai + AF + CL + Atten - Ga$$

For example, a corrected amplitude of 40.3 dBuV/m = Indicated Reading (32.5 dBuV) + Antenna Factor (+23.5dB) + Cable Loss (3.7 dB) + Attenuator (10 dB) - Amplifier Gain (29.4 dB)

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

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

4.5 Test Equipment List and Details

Manufacturer	Description	Model No.	Serial No.	Calibration Date	Calibration Interval
Rohde & Schwarz	Receiver, EMI Test	ESCI 1166.5950K03	100338	2016-02-04	2 year
Agilent	Analyzer, Spectrum	E4440A	US45303156	2017-02-24	1 year
Sunol Science Corp	System Controller	SC99V	011003-1	N/R	N/R
Sunol Sciences	Antenna, Biconi-Log	JB3	A020106-2	2015-07-11	2 Years
EMCO	Antenna, Horn	3115	9511-4627	2016-01-28	2 years
HP	Amplifier, Pre	8447D	2944A06639	2017-06-20	1 year
IW Microwave	High Frequency Cable	DC-1438	SPS-2303- 3840-SPS	2017-01-23	1 year
Wainwright Instruments	Band Reject Filter	WRCGV900/930- 880/950-40/8SS	-	Each time1	1 year
-	SMA cable	-	C0002	Each time1	N/A
Vasona	Test software	V6.0 build 11	10400213	N/R	N/R

Note¹: cable and attenuator included in the test set-up will be checked each time before testing.

Statement of Traceability: *BACL attests that all calibrations have been performed per the A2LA requirements, traceable to NIST.*

4.6 Test Environmental Conditions

Temperature:	21°C
Relative Humidity:	39 %
ATM Pressure:	101.2 kPa

The testing was performed by Dean Liu on 2017- 06-26 in 5 Meter Chamber 3.

4.7 Summary of Test Results

According to the data hereinafter, the EUT complied with FCC Title 47, Part 15C, ISEDC RSS-GEN, and ISEDC RSS-247 standards' radiated emissions limits, and had the worst margin of:

2400 – 2483.5MHz

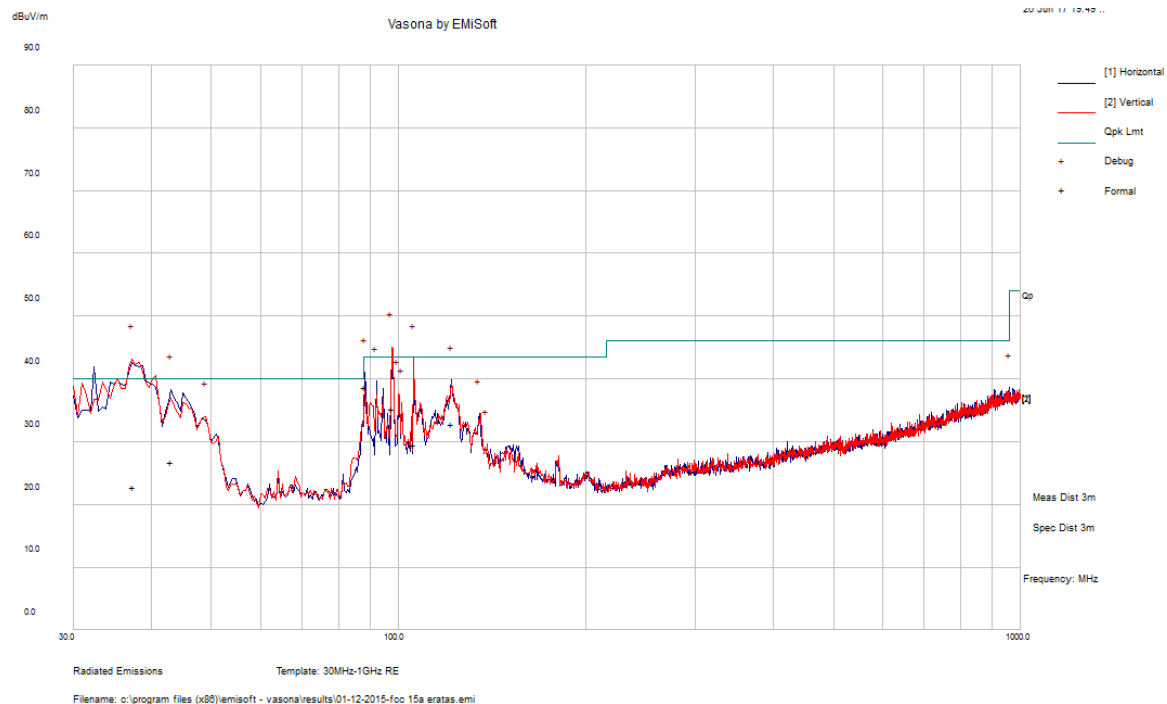
Mode: Transmitting			
Margin (dB)	Frequency (MHz)	Polarization (Horizontal/Vertical)	Mode, channel
-0.229	2390	Vertical	n20, 2412MHz

Please refer to the following table and plots for specific test result details

4.8 Radiated Emissions Test Results

1) 30 MHz – 1 GHz Worst Case, Measured at 3 meters

2400 – 2483.5 MHz



Frequency (MHz)	Corrected Amplitude (dBμV/m)	Antenna Height (cm)	Antenna Polarity (H/V)	Turntable Azimuth (degrees)	Limit (dBμV/m)	Margin (dB)	
37.3875	22.87	211	V	152	40	-17.13	QP
97.6575	35.32	357	V	64	43.5	-8.18	QP
105.7093	29.59	310	V	209	43.5	-13.91	QP
43.1255	26.77	160	H	300	40	-13.23	QP
88.4425	38.73	131	H	255	43.5	-4.77	QP
121.8763	32.86	106	H	337	43.5	-10.64	QP

2) 1–10 GHz Measured at 3 meters

b mode

Frequency (MHz)	S.A. Reading (dBμV)	Turntable Azimuth (degrees)	Test Antenna			Cable Loss (dB)	Pre- Amp. (dB)	Cord. Reading (dBμV/m)	FCC		Comments
			Height (cm)	Polarity (H/V)	Factor (dB/m)				Limit (dBμV/m)	Margin (dB)	
Low Channel 2412 MHz											
2412	65.34	77	159	H	29.042	6.29	0	100.672	-	-	Peak
2412	62.29	79	154	H	29.042	6.29	0	97.622	-	-	Ave
2412	71.8	74	147	V	29.042	6.29	0	107.132	-	-	Peak
2412	67.89	76	155	V	29.042	6.29	0	103.222	-	-	Ave
2390	27.12	0	100	H	29.042	6.29	0	62.452	74	-11.548	Peak
2390	13.02	0	100	H	29.042	6.29	0	48.352	54	-5.648	Ave
2390	27.24	0	100	V	29.042	6.29	0	62.572	74	-11.428	Peak
2390	15.16	0	100	V	29.042	6.29	0	50.492	54	-3.508	Ave
4824	47.93	0	300	V	32.472	8.416	38.56	50.258	74	-23.742	Peak
4824	33.75	0	300	V	32.472	8.416	38.56	36.078	54	-17.922	Ave
7236	47.29	0	100	V	36.69	10.211	37.9	56.291	74	-17.709	Peak
7236	32.51	0	100	V	36.39	10.211	37.9	41.211	54	-12.789	Ave
9648	47.82	0	100	V	37.77	11.621	38.29	58.921	74	-15.079	Peak
9648	32.96	0	100	V	37.77	11.621	38.29	44.061	54	-9.939	Ave
Frequency (MHz)	S.A. Reading (dBμV)	Turntable Azimuth (degrees)	Test Antenna			Cable Loss (dB)	Pre- Amp. (dB)	Cord. Reading (dBμV/m)	FCC		Comments
			Height (cm)	Polarity (H/V)	Factor (dB/m)				Limit (dBμV/m)	Margin (dB)	
Middle Channel 2437 MHz											
2437	63.36	77	131	H	29.042	6.29	0	98.692	-	-	Peak
2437	59.89	77	131	H	29.042	6.29	0	95.222	-	-	Ave
2437	70.52	76	162	V	29.042	6.29	0	105.852	-	-	Peak
2437	67.13	76	162	V	29.042	6.29	0	102.462	-	-	Ave
4874	47.64	0	100	V	32.64	8.416	38.54	50.156	74	-23.844	Peak
4874	33.67	0	100	V	32.64	8.416	38.54	36.186	54	-17.814	Ave
7311	45.64	0	100	V	37.148	10.211	37.9	55.099	74	-18.901	Peak
7311	32.22	0	100	V	37.148	10.211	37.9	41.679	54	-12.321	Ave

Frequency (MHz)	S.A. Reading (dBμV)	Turntable Azimuth (degrees)	Test Antenna			Cable Loss (dB)	Pre- Amp. (dB)	Cord. Reading (dBμV/m)	FCC		Comments
			Height (cm)	Polarity (H/V)	Factor (dB/m)				Limit (dBμV/m)	Margin (dB)	
High Channel 2462 MHz											
2462	58.01	80	148	H	29.413	6.29	0	93.713	-	-	Peak
2462	54.45	80	148	H	29.413	6.29	0	90.153	-	-	Ave
2462	61.98	81	180	V	29.413	6.29	0	97.683	-	-	Peak
2462	58.33	81	180	V	29.413	6.29	0	94.033	-	-	Ave
2483.5	28	0	100	H	29.413	6.29	0	63.703	74	-10.297	Peak
2483.5	13.58	0	100	H	29.413	6.29	0	49.283	54	-4.717	Ave
2483.5	28.09	0	100	V	29.413	6.29	0	63.793	74	-10.207	Peak
2483.5	13.54	0	100	V	29.413	6.29	0	49.243	54	-4.757	Ave
4924	47.55	0	100	V	32.64	8.416	38.54	50.066	74	-23.934	Peak
4924	33.49	0	100	V	32.64	8.416	38.54	36.006	54	-17.994	Ave
7386	46.97	0	100	V	37.139	10.211	37.89	56.43	74	-17.57	Peak
7386	32.27	0	100	V	37.139	10.211	37.89	41.73	54	-12.27	Ave
9848	46.58	158	100	V	37.99	11.621	38.33	57.861	74	-16.139	Peak
9848	32.17	158	100	V	37.99	11.621	38.33	43.451	54	-10.549	Ave

g mode

Frequency (MHz)	S.A. Reading (dBμV)	Turntable Azimuth (degrees)	Test Antenna			Cable Loss (dB)	Pre- Amp. (dB)	Cord. Reading (dBμV/m)	FCC		Comments
			Height (cm)	Polarity (H/V)	Factor (dB/m)				Limit (dBμV/m)	Margin (dB)	
Low Channel 2412 MHz											
2412	60.93	54	205	H	29.042	6.29	0	96.262	-	-	Peak
2412	50.05	54	208	H	29.042	6.29	0	85.382	-	-	Ave
2412	67.81	44	211	V	29.042	6.29	0	103.142	-	-	Peak
2412	56.56	44	211	V	29.042	6.29	0	91.892	-	-	Ave
2390	27.35	0	100	H	29.042	6.29	0	62.682	74	-11.318	Peak
2390	13.68	0	100	H	29.042	6.29	0	49.012	54	-4.988	Ave
2390	30.98	0	100	V	29.042	6.29	0	66.312	74	-7.688	Peak
2390	13.7	0	100	V	29.042	6.29	0	49.032	54	-4.968	Ave
4824	45.79	0	100	V	32.472	8.416	38.56	48.118	74	-25.882	Peak
4824	31.91	0	100	V	32.472	8.416	38.56	34.238	54	-19.762	Ave
7236	46.7	0	100	V	36.69	10.211	37.9	55.701	74	-18.299	Peak
7236	32.67	0	100	V	36.39	10.211	37.9	41.371	54	-12.629	Ave
9648	46.5	134	100	V	37.77	11.621	38.29	57.601	74	-16.399	Peak
9648	32.83	134	100	V	37.77	11.621	38.29	43.931	54	-10.069	Ave
Frequency (MHz)	S.A. Reading (dBμV)	Turntable Azimuth (degrees)	Test Antenna			Cable Loss (dB)	Pre- Amp. (dB)	Cord. Reading (dBμV/m)	FCC		Comments
			Height (cm)	Polarity (H/V)	Factor (dB/m)				Limit (dBμV/m)	Margin (dB)	
Middle Channel 2437 MHz											
2437	62.23	79	138	H	29.042	6.29	0	97.562	-	-	Peak
2437	51.79	79	138	H	29.042	6.29	0	87.122	-	-	Ave
2437	67.38	79	141	V	29.042	6.29	0	102.712	-	-	Peak
2437	56.45	79	141	V	29.042	6.29	0	91.782	-	-	Ave
4874	44.43	180	100	V	32.64	8.416	38.54	46.946	74	-27.054	Peak
4874	30.58	180	100	V	32.64	8.416	38.54	33.096	54	-20.904	Ave
7311	44.25	0	100	V	37.148	10.211	37.9	53.709	74	-20.291	Peak
7311	30.24	0	100	V	37.148	10.211	37.9	39.699	54	-14.301	Ave
9748	45.31	0	100	V	37.92	11.621	38.29	56.561	74	-17.439	Peak
9748	31.43	0	100	V	37.92	11.621	38.29	42.681	54	-11.319	Ave

Frequency (MHz)	S.A. Reading (dBμV)	Turntable Azimuth (degrees)	Test Antenna			Cable Loss (dB)	Pre- Amp. (dB)	Cord. Reading (dBμV/m)	FCC		Comments
			Height (cm)	Polarity (H/V)	Factor (dB/m)				Limit (dBμV/m)	Margin (dB)	
High Channel 2462 MHz											
2462	60.3	81	135	H	29.413	6.29	0	96.003	-	-	Peak
2462	49.34	84	135	H	29.413	6.29	0	85.043	-	-	Ave
2462	64.98	79	134	V	29.413	6.29	0	100.683	-	-	Peak
2462	53.78	79	136	V	29.413	6.29	0	89.483	-	-	Ave
2483.5	27.86	0	100	H	29.413	6.29	0	63.563	74	-10.437	Peak
2483.5	13.58	0	100	H	29.413	6.29	0	49.283	54	-4.717	Ave
2483.5	28.56	300	100	V	29.413	6.29	0	64.263	74	-9.737	Peak
2483.5	13.56	300	100	V	29.413	6.29	0	49.263	54	-4.737	Ave
4924	46.61	0	100	V	32.64	8.416	38.54	49.126	74	-24.874	Peak
4924	31.96	0	100	V	32.64	8.416	38.54	34.476	54	-19.524	Ave
7386	46.38	0	100	V	37.139	10.211	37.89	55.84	74	-18.16	Peak
7386	32.35	0	100	V	37.139	10.211	37.89	41.81	54	-12.19	Ave
9848	46.17	0	100	V	37.99	11.621	38.33	57.451	74	-16.549	Peak
9848	31.58	0	100	V	37.99	11.621	38.33	42.861	54	-11.139	Ave

n20 mode

Frequency (MHz)	S.A. Reading (dBμV)	Turntable Azimuth (degrees)	Test Antenna			Cable Loss (dB)	Pre- Amp. (dB)	Cord. Reading (dBμV/m)	FCC		Comments
			Height (cm)	Polarity (H/V)	Factor (dB/m)				Limit (dBμV/m)	Margin (dB)	
Low Channel 2412 MHz											
2412	66.74	274	143	H	29.042	6.29	0	102.072	-	-	Peak
2412	57.27	274	143	H	29.042	6.29	0	92.602	-	-	Ave
2412	74.24	277	143	V	29.042	6.29	0	109.572	-	-	Peak
2412	64.73	277	143	V	29.042	6.29	0	100.062	-	-	Ave
2390	31.12	210	100	H	29.042	6.29	0	66.452	74	-7.548	Peak
2390	16.69	210	100	H	29.042	6.29	0	52.022	54	-1.978	Ave
2390	76.79	279	134	V	29.042	6.29	39.466	72.656	74	-1.344	Peak
2390	57.91	279	134	V	29.042	6.29	39.466	53.776	54	-0.224	Ave
4824	47.52	0	100	V	32.472	8.416	38.56	49.848	74	-24.152	Peak
4824	34.94	0	100	V	32.472	8.416	38.56	37.268	54	-16.732	Ave
7236	46.59	0	100	V	36.69	10.211	37.9	55.591	74	-18.409	Peak
7236	34.31	0	100	V	36.39	10.211	37.9	43.011	54	-10.989	Ave
9648	46.9	0	100	V	37.77	11.621	38.29	58.001	74	-15.999	Peak
9648	34.41	0	100	V	37.77	11.621	38.29	45.511	54	-8.489	Ave

Frequency (MHz)	S.A. Reading (dBμV)	Turntable Azimuth (degrees)	Test Antenna			Cable Loss (dB)	Pre- Amp. (dB)	Cord. Reading (dBμV/m)	FCC		Comments
			Height (cm)	Polarity (H/V)	Factor (dB/m)				Limit (dBμV/m)	Margin (dB)	
Middle Channel 2437 MHz											
2437	66.59	256	116	H	29.042	6.29	0	101.922	-	-	Peak
2437	56.32	256	116	H	29.042	6.29	0	91.652	-	-	Ave
2437	73.35	269	148	V	29.042	6.29	0	108.682	-	-	Peak
2437	63.63	269	148	V	29.042	6.29	0	98.962	-	-	Ave
4874	47.18	0	100	V	32.64	8.416	38.54	49.696	74	-24.304	Peak
4874	35.7	0	100	V	32.64	8.416	38.54	38.216	54	-15.784	Ave
7311	44.97	0	100	V	37.148	10.211	37.9	54.429	74	-19.571	Peak
7311	33.76	0	100	V	37.148	10.211	37.9	43.219	54	-10.781	Ave
9748	47.44	0	100	V	37.92	11.621	38.29	58.691	74	-15.309	Peak
9748	35.53	0	100	V	37.92	11.621	38.29	46.781	54	-7.219	Ave

Frequency (MHz)	S.A. Reading (dBμV)	Turntable Azimuth (degrees)	Test Antenna			Cable Loss (dB)	Pre- Amp. (dB)	Cord. Reading (dBμV/m)	FCC		Comments
			Height (cm)	Polarity (H/V)	Factor (dB/m)				Limit (dBμV/m)	Margin (dB)	
High Channel 2462 MHz											
2462	67.06	256	226	H	29.413	6.29	0	102.763	-	-	Peak
2462	57.18	256	226	H	29.413	6.29	0	92.883	-	-	Ave
2462	74.45	246	218	V	29.413	6.29	0	110.153	-	-	Peak
2462	64.14	246	218	V	29.413	6.29	0	99.843	-	-	Ave
2483.5	68.87	256	226	H	29.413	6.29	39.466	65.107	74	-8.893	Peak
2483.5	49.75	256	226	H	29.413	6.29	39.466	45.987	54	-8.013	Ave
2483.5	74.81	246	218	V	29.413	6.29	39.466	71.047	74	-2.953	Peak
2483.5	54.75	246	218	V	29.413	6.29	39.466	50.987	54	-3.013	Ave
4924	47.42	0	100	V	32.64	8.42	38.54	49.94	74.00	-24.06	Peak
4924	35.43	0	100	V	32.64	8.42	38.54	37.95	54.00	-16.05	Ave
7386	45.35	0	100	V	37.14	10.21	37.89	54.81	74.00	-19.19	Peak
7386	33.71	0	100	V	37.14	10.21	37.89	43.17	54.00	-10.83	Ave

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Frequency (MHz)	S.A. Reading (dBμV)	Turntable Azimuth (degrees)	Test Antenna			Cable Loss (dB)	Pre- Amp. (dB)	Cord. Reading (dBμV/m)	FCC		Comments
			Height (cm)	Polarity (H/V)	Factor (dB/m)				Limit (dBμV/m)	Margin (dB)	
Low Channel 2402 MHz											
2402	74.45	270	150	V	28.944	6.249	0	109.643	-	-	Peak
2402	67.28	260	180	H	28.944	6.249	0	102.473	-	-	Peak
2402	49.66	270	150	V	28.944	6.249	0	84.853	-	-	Ave
2402	42.49	260	180	H	28.944	6.249	0	77.683	-	-	Ave
2390	29.09	260	100	V	28.944	6.237	0	64.271	74	-9.729	Peak
2390	28.71	170	220	H	28.944	6.237	0	63.891	74	-10.109	Peak
2390	17.05	265	100	V	28.944	6.237	0	52.231	54	-1.769	Ave
2390	16.49	260	200	H	28.944	6.237	0	51.671	54	-2.329	Ave
4804	55.70	240	100	V	32.56	9.646	38.56	59.346	74	-14.654	Peak
4804	30.91	240	100	V	32.56	9.646	38.56	34.556	54	-19.444	Ave
7206	47.32	310	280	V	36.729	12.291	37.94	58.4	74	-15.6	Peak
7206	22.53	310	280	V	36.729	12.291	37.94	33.61	54	-20.39	Ave
9608	46.31	345	100	V	37.843	14.811	38.17	60.794	74	-13.206	Peak
9608	21.52	345	100	V	37.843	14.811	38.17	36.004	54	-17.996	Ave

Frequency (MHz)	S.A. Reading (dBμV)	Turntable Azimuth (degrees)	Test Antenna			Cable Loss (dB)	Pre- Amp. (dB)	Cord. Reading (dBμV/m)	FCC		Comments
			Height (cm)	Polarity (H/V)	Factor (dB/m)				Limit (dBμV/m)	Margin (dB)	
Middle Channel 2441 MHz											
2441	73.21	285	130	V	29.185	6.219	0	108.614	-	-	Peak
2441	67.37	285	140	H	29.185	6.219	0	102.774	-	-	Peak
2441	48.42	285	130	V	29.185	6.219	0	83.824	-	-	Ave
2441	42.58	285	140	H	29.185	6.219	0	77.984	-	-	Ave
4882	51.60	230	130	V	32.807	9.886	39.32	54.973	74	-19.027	Peak
4882	26.81	230	130	V	32.807	9.886	39.32	30.183	54	-23.817	Ave
7323	46.45	35	100	V	37.056	12.578	37.94	58.144	74	-15.856	Peak
7323	21.66	35	100	V	37.056	12.578	37.94	33.354	54	-20.646	Ave
9764	47.08	340	100	V	37.947	14.695	38.17	61.552	74	-12.448	Peak
9764	22.29	340	100	V	37.947	14.695	38.17	36.762	54	-17.238	Ave

Frequency (MHz)	S.A. Reading (dBμV)	Turntable Azimuth (degrees)	Test Antenna			Cable Loss (dB)	Pre- Amp. (dB)	Cord. Reading (dBμV/m)	FCC		Comments
			Height (cm)	Polarity (H/V)	Factor (dB/m)				Limit (dBμV/m)	Margin (dB)	
High Channel 2480 MHz											
2480	73.06	270	150	V	29.251	6.183	0	108.494	-	-	Peak
2480	68.15	260	200	H	29.251	6.183	0	103.584	-	-	Peak
2480	48.27	270	150	V	29.251	6.183	0	83.704	-	-	Ave
2480	43.36	260	200	H	29.251	6.183	0	78.794	-	-	Ave
2483.5	29.88	220	250	V	29.251	6.241	0	65.372	74	-8.628	Peak
2483.5	29.6	0	100	H	29.251	6.241	0	65.092	74	-8.908	Peak
2483.5	17.82	275	100	V	29.251	6.241	0	53.312	54	-0.688	Ave
2483.5	17.52	260	100	H	29.251	6.241	0	53.012	54	-0.988	Ave
4960	52.03	230	100	V	32.792	9.922	36.281	58.463	74	-15.537	Peak
4960	27.24	230	100	V	32.792	9.932	36.281	33.683	54	-20.317	Ave
7440	45.02	120	100	V	37.073	12.38	36.405	58.068	74	-15.932	Peak
7440	20.23	120	100	V	37.073	12.38	36.405	33.278	54	-20.722	Ave
9920	41.07	230	100	V	38.144	15.066	36.382	57.898	74	-16.102	Peak
9920	16.28	230	100	V	38.144	15.066	36.382	33.108	54	-20.892	Ave

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Frequency (MHz)	S.A. Reading (dBμV)	Turntable Azimuth (degrees)	Test Antenna			Cable Loss (dB)	Pre- Amp. (dB)	Cord. Reading (dBμV/m)	FCC		Comments
			Height (cm)	Polarity (H/V)	Factor (dB/m)				Limit (dBμV/m)	Margin (dB)	
Low Channel 2402 MHz											
2402	69.96	290	130	V	28.944	6.249	0	105.153	-	-	Peak
2402	61.81	270	100	H	28.944	6.249	0	97.003	-	-	Peak
2402	45.17	290	130	V	28.944	6.249	0	80.363	-	-	Ave
2402	37.02	270	100	H	28.944	6.249	0	72.213	-	-	Ave
2390	29.41	245	100	V	28.944	6.237	0	64.591	74	-9.409	Peak
2390	29.01	325	100	H	28.944	6.237	0	64.191	74	-9.809	Peak
2390	16.14	270	230	V	28.944	6.237	0	51.321	54	-2.679	Ave
2390	16.03	325	100	H	28.944	6.237	0	51.211	54	-2.789	Ave
4804	50.08	230	100	V	32.56	9.646	36.361	55.925	74	-18.075	Peak
4804	25.29	230	100	V	32.56	9.646	36.361	31.135	54	-22.865	Ave
7206	44.23	305	100	V	36.729	12.291	36.38	56.87	74	-17.13	Peak
7206	19.44	305	100	V	36.729	12.291	36.38	32.08	54	-21.92	Ave
9608	39.90	0	100	V	37.843	14.811	36.433	56.121	74	-17.879	Peak
9608	15.11	0	100	V	37.843	14.811	36.433	31.331	54	-22.669	Ave

Frequency (MHz)	S.A. Reading (dBμV)	Turntable Azimuth (degrees)	Test Antenna			Cable Loss (dB)	Pre- Amp. (dB)	Cord. Reading (dBμV/m)	FCC		Comments
			Height (cm)	Polarity (H/V)	Factor (dB/m)				Limit (dBμV/m)	Margin (dB)	
Middle Channel 2441 MHz											
2441	71.08	275	175	V	29.185	6.219	0	106.484	-	-	Peak
2441	66.54	260	200	H	29.185	6.219	0	101.944	-	-	Peak
2441	46.29	275	175	V	29.185	6.219	0	81.694	-	-	Ave
2441	41.75	260	200	H	29.185	6.219	0	77.154	-	-	Ave
4882	46.10	0	100	V	32.807	9.886	36.327	52.466	74	-21.534	Peak
4882	21.31	0	100	V	32.807	9.886	36.327	27.676	54	-26.324	Ave
7323	43.76	0	100	V	37.056	12.578	36.401	56.993	74	-17.007	Peak
7323	18.97	0	100	V	37.056	12.578	36.401	32.203	54	-21.797	Ave
9764	41.49	140	100	V	37.947	14.695	36.446	57.686	74	-16.314	Peak
9764	16.70	140	100	V	37.947	14.695	36.446	32.896	54	-21.104	Ave

Frequency (MHz)	S.A. Reading (dBμV)	Turntable Azimuth (degrees)	Test Antenna			Cable Loss (dB)	Pre- Amp. (dB)	Cord. Reading (dBμV/m)	FCC		Comments
			Height (cm)	Polarity (H/V)	Factor (dB/m)				Limit (dBμV/m)	Margin (dB)	
High Channel 2480 MHz											
2480	68.5	275	100	V	29.251	6.183	0	103.934	-	-	Peak
2480	65.48	262	195	H	29.251	6.183	0	100.914	-	-	Peak
2480	43.71	275	100	V	29.251	6.183	0	79.144	-	-	Ave
2480	40.69	262	195	H	29.251	6.183	0	76.124	-	-	Ave
2483.5	29.3	90	100	V	29.251	6.241	0	64.792	74	-9.208	Peak
2483.5	29.8	30	100	H	29.251	6.241	0	65.292	74	-8.708	Peak
2483.5	17.43	257	180	V	29.251	6.241	0	52.922	54	-1.078	Ave
2483.5	16.82	202	100	H	29.251	6.241	0	52.312	54	-1.688	Ave
4960	45.43	275	100	V	32.792	9.922	36.281	51.863	74	-22.137	Peak
4960	20.64	275	100	V	32.792	9.932	36.281	27.083	54	-26.917	Ave
7440	44.89	0	100	V	37.073	12.38	36.405	57.938	74	-16.062	Peak
7440	20.10	0	100	V	37.073	12.38	36.405	33.148	54	-20.852	Ave
9920	35.58	0	100	V	38.144	15.066	36.382	52.408	74	-21.592	Peak
9920	10.79	0	100	V	38.144	15.066	36.382	27.618	54	-26.382	Ave

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Frequency (MHz)	S.A. Reading (dBμV)	Turntable Azimuth (degrees)	Test Antenna			Cable Loss (dB)	Pre- Amp. (dB)	Cord. Reading (dBμV/m)	FCC		Comments
			Height (cm)	Polarity (H/V)	Factor (dB/m)				Limit (dBμV/m)	Margin (dB)	
Low Channel 2402 MHz											
2402	70.39	278	165	V	28.944	6.249	0	105.583	-	-	Peak
2402	63.1	278	100	H	28.944	6.249	0	98.293	-	-	Peak
2402	45.6	278	165	V	28.944	6.249	0	80.793	-	-	Ave
2402	38.31	278	100	H	28.944	6.249	0	73.503	-	-	Ave
2390	29.5	265	100	V	28.944	6.237	0	64.681	74	-9.319	Peak
2390	30.56	208	150	H	28.944	6.237	0	65.741	74	-8.259	Peak
2390	16.76	265	150	V	28.944	6.237	0	51.941	54	-2.059	Ave
2390	16.58	0	100	H	28.944	6.237	0	51.761	54	-2.239	Ave
4804	48.48	233	100	V	32.56	9.646	36.361	54.325	74	-19.675	Peak
4804	23.69	230	120	V	32.56	9.646	36.361	29.535	54	-24.465	Ave
7206	45.15	307	100	V	36.729	12.291	36.38	57.79	74	-16.21	Peak
7206	20.36	307	100	V	36.729	12.291	36.38	33	54	-21	Ave
9608	43.40	147	100	V	37.843	14.811	36.433	59.621	74	-14.379	Peak
9608	18.61	147	100	V	37.843	14.811	36.433	34.831	54	-19.169	Ave

Frequency (MHz)	S.A. Reading (dBμV)	Turntable Azimuth (degrees)	Test Antenna			Cable Loss (dB)	Pre- Amp. (dB)	Cord. Reading (dBμV/m)	FCC		Comments
			Height (cm)	Polarity (H/V)	Factor (dB/m)				Limit (dBμV/m)	Margin (dB)	
Middle Channel 2441 MHz											
2441	71.29	255	155	V	29.185	6.219	0	106.694	-	-	Peak
2441	64.37	265	180	H	29.185	6.219	0	99.774	-	-	Peak
2441	46.5	255	155	V	29.185	6.219	0	81.904	-	-	Ave
2441	39.58	265	180	H	29.185	6.219	0	74.984	-	-	Ave
4882	46.33	305	100	V	32.807	9.886	36.327	52.696	74	-21.304	Peak
4882	21.54	305	100	V	32.807	9.886	36.327	27.906	54	-26.094	Ave
7323	42.79	200	215	V	37.056	12.578	36.401	56.023	74	-17.977	Peak
7323	18.00	200	215	V	37.056	12.578	36.401	31.233	54	-22.767	Ave
9764	41.99	55	100	V	37.947	14.695	36.446	58.186	74	-15.814	Peak
9764	17.20	55	100	V	37.947	14.695	36.446	33.396	54	-20.604	Ave

Frequency (MHz)	S.A. Reading (dBμV)	Turntable Azimuth (degrees)	Test Antenna			Cable Loss (dB)	Pre- Amp. (dB)	Cord. Reading (dBμV/m)	FCC		Comments
			Height (cm)	Polarity (H/V)	Factor (dB/m)				Limit (dBμV/m)	Margin (dB)	
High Channel 2480 MHz											
2480	70.17	260	185	V	29.251	6.183	0	105.604	-	-	Peak
2480	63.86	268	210	H	29.251	6.183	0	99.294	-	-	Peak
2480	45.38	258	185	V	29.251	6.183	0	80.814	-	-	Ave
2480	39.07	265	175	H	29.251	6.183	0	74.504	-	-	Ave
2483.5	33.41	250	175	V	29.251	6.241	0	68.902	74	-5.098	Peak
2483.5	30.69	275	100	H	29.251	6.241	0	66.182	74	-7.818	Peak
2483.5	17.34	258	175	V	29.251	6.241	0	52.832	54	-1.168	Ave
2483.5	16.49	275	100	H	29.251	6.241	0	51.982	54	-2.018	Ave
4960	46.70	230	200	V	32.792	9.922	36.281	53.133	74	-20.867	Peak
4960	21.91	230	100	V	32.792	9.932	36.281	28.353	54	-25.647	Ave
7440	43.30	150	100	V	37.073	12.38	36.405	56.348	74	-17.652	Peak
7440	18.51	95	100	V	37.073	12.38	36.405	31.558	54	-22.442	Ave
9920	45.13	185	100	V	38.144	15.066	36.382	61.958	74	-12.042	Peak
9920	20.34	0	100	V	38.144	15.066	36.382	37.168	54	-16.832	Ave

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Frequency (MHz)	S.A. Reading (dBμV)	Turntable Azimuth (degrees)	Test Antenna			Cable Loss (dB)	Pre- Amp. (dB)	Cord. Reading (dBμV/m)	FCC		Comments
			Height (cm)	Polarity (H/V)	Factor (dB/m)				Limit (dBμV/m)	Margin (dB)	
Low Channel 2402 MHz											
2402	71.13	288	180	V	28.944	6.249	0	106.323	-	-	Peak
2402	60.84	284	100	H	28.944	6.249	0	96.033	-	-	Peak
2402	70.99	288	180	V	28.944	6.249	0	106.183	-	-	Ave
2402	60.71	284	100	H	28.944	6.249	0	95.903	-	-	Ave
2390	28.19	110	100	V	28.944	6.237	0	63.371	74	-10.629	Peak
2390	27.67	0	270	H	28.944	6.237	0	62.851	74	-11.149	Peak
2390	14.93	155	100	V	28.944	6.237	0	50.111	54	-3.889	Ave
2390	14.32	0	100	H	28.944	6.237	0	49.501	54	-4.499	Ave
4804	53.01	250	110	V	32.56	9.646	38.564	56.652	74	-17.348	Peak
4804	48.52	305	110	H	32.56	9.646	38.564	52.162	74	-21.838	Peak
4804	46.71	265	110	V	32.56	9.646	38.564	50.352	54	-3.648	Ave
4804	37.77	300	100	H	32.56	9.646	38.564	41.412	54	-12.588	Ave
7206	48.40	0	300	V	36.729	12.291	37.907	59.513	74	-14.487	Peak
7206	47.47	40	100	H	36.729	12.291	37.907	58.583	74	-15.417	Peak
7206	36.98	85	250	V	36.729	12.291	37.907	48.093	54	-5.907	Ave
7206	36.89	64	100	H	36.729	12.291	37.907	48.003	54	-5.997	Ave
9608	48.03	115	100	V	37.843	14.811	38.292	62.392	74	-11.608	Peak
9608	48.15	240	100	H	37.843	14.811	38.292	62.512	74	-11.488	Peak
9608	35.02	230	100	V	37.843	14.811	38.292	49.382	54	-4.618	Ave
9608	34.90	270	130	H	37.843	14.811	38.292	49.262	54	-4.738	Ave

Frequency (MHz)	S.A. Reading (dBμV)	Turntable Azimuth (degrees)	Test Antenna			Cable Loss (dB)	Pre- Amp. (dB)	Cord. Reading (dBμV/m)	FCC		Comments
			Height (cm)	Polarity (H/V)	Factor (dB/m)				Limit (dBμV/m)	Margin (dB)	
Middle Channel 2440 MHz											
2440	70.27	275	165	V	29.185	6.219	0	105.674	-	-	Peak
2440	63.29	265	180	H	29.185	6.219	0	98.694	-	-	Peak
2440	69.41	280	180	V	29.185	6.219	0	104.814	-	-	Ave
2440	61.62	270	185	H	29.185	6.219	0	97.024	-	-	Ave
4880	48.38	230	130	V	32.807	9.886	38.564	52.509	74	-21.491	Peak
4880	37.47	240	210	V	32.807	9.886	38.564	41.599	54	-12.401	Ave
7320	47.57	160	100	V	37.056	12.578	37.907	59.297	74	-14.703	Peak
7320	35.90	95	100	V	37.056	12.578	37.907	47.627	54	-6.373	Ave
9760	47.90	0	100	V	37.947	14.695	38.292	62.25	74	-11.75	Peak
9760	34.99	290	100	V	37.947	14.695	38.292	49.34	54	-4.66	Ave

Frequency y (MHz)	S.A. Reading (dBμV)	Turntable Azimuth (degrees)	Test Antenna			Cable Loss (dB)	Pre- Amp. (dB)	Cord. Reading (dBμV/m)	FCC		Comments
			Height (cm)	Polarity (H/V)	Factor (dB/m)				Limit (dBμV/m)	Margin (dB)	
High Channel 2480 MHz											
2480	68.86	300	0	V	29.251	6.183	0	104.294	-	-	Peak
2480	62.52	255	180	H	29.251	6.183	0	97.954	-	-	Peak
2480	68.69	280	150	V	29.251	6.183	0	104.124	-	-	Ave
2480	62.76	265	180	H	29.251	6.183	0	98.194	-	-	Ave
2483.5	27.89	260	100	V	29.251	6.241	0	63.382	74	-10.618	Peak
2483.5	27.95	115	100	H	29.251	6.241	0	63.442	74	-10.558	Peak
2483.5	15.22	310	100	V	29.251	6.241	0	50.712	54	-3.288	Ave
2483.5	14.84	280	100	H	29.251	6.241	0	50.332	54	-3.668	Ave
4960	49.33	255	100	V	32.792	9.922	38.535	53.509	74	-20.491	Peak
4960	39.11	240	200	V	32.792	9.932	38.535	43.299	54	-10.701	Ave
7440	46.90	210	100	V	37.073	12.38	37.89	58.463	74	-15.537	Peak
7440	34.82	210	100	V	37.073	12.38	37.89	46.383	54	-7.617	Ave
9920	46.58	0	100	V	38.144	15.066	38.326	61.464	74	-12.536	Peak
9920	34.17	0	100	V	38.144	15.066	38.326	49.054	54	-4.946	Ave