

Report No.: SEWM2204000030RG04  
Rev.: 01  
Page: 1 of 35

# TEST REPORT

**Application No.:** SEWM2204000030RG  
**Applicant:** HMD Global Oy  
**Address of Applicant:** Bertel Jungin aukio 9, Espoo 02600, Finland  
**Manufacturer:** HMD Global Oy  
**Address of Manufacturer:** Bertel Jungin aukio 9, Espoo 02600, Finland  
**EUT Description:** Smart Phone  
**Model No.:** TA-1391  
**Trade Mark:** Nokia  
**FCC ID:** 2AJOTTA-1391  
**Standards:** FCC 47 CFR Part 2, Subpart J  
FCC 47 CFR Part 15, Subpart C  
**Date of Receipt:** 2021/4/1  
**Date of Test:** 2022/4/15 to 2022/5/19  
**Date of Issue:** 2022/5/20

<b>Test Result :</b>	<b>PASS *</b>
----------------------	---------------

\* In the configuration tested, the EUT detailed in this report complied with the standards specified above.

Authorized Signature:



Panta Sun  
Wireless Laboratory Manager



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Report No.: SEWM2204000030RG04  
 Rev.: 01  
 Page: 2 of 35

## 1 Version

### Revision Record

Version	Chapter	Date	Modifier	Remark
01		2022/5/20		Original

Prepared By		Weller Liu
<hr/> (Weller Liu) / Test Supervisor		
Checked By		Well Wei
<hr/> (Well Wei) / Reviewer		

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Report No.: SEWM2204000030RG04  
 Rev.: 01  
 Page: 3 of 35

## 2 Test Summary

Test Item	FCC Rule No.	Test Method	Test Result	Result
Antenna Requirement	15.203/15.247(b)	--	Refer to ZR/2021/3003304	PASS
AC Power Line Conducted Emission	15.207	ANSI C63.10 2013	Refer to ZR/2021/3003304	PASS
Duty Cycle	--	--	Refer to ZR/2021/3003304	Reporting only
Conducted Output Power	15.247 (b)(3)	ANSI C63.10 2013	Refer to ZR/2021/3003304	PASS
DTS (6 dB) Bandwidth & 99% Occupied Bandwidth	15.247 (a)(2)	ANSI C63.10 2013	Refer to ZR/2021/3003304	Reporting only
Power Spectral Density	15.247 (e)	ANSI C63.10 2013	Refer to ZR/2021/3003304	PASS
Band-edge for RF Conducted Emissions	15.247(d)	ANSI C63.10 2013	Refer to ZR/2021/3003304	PASS
RF Conducted Spurious Emissions	15.247(d)	ANSI C63.10 2013	Refer to ZR/2021/3003304	PASS
Radiated Spurious Emissions	15.247(d); 15.205/15.209	ANSI C63.10 2013	Clause 4.9	PASS
Restricted bands around fundamental frequency (Radiated Emission)	15.247(d); 15.205/15.209	ANSI C63.10 2013	Clause 4.10	PASS

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Report No.: SEWM2204000030RG04

Rev.: 01

Page: 4 of 35

**Remark:**

This test report (Report No.: SEWM2204000030RG04 issue on 2022/5/20) is based on the original FCC ID with ID number 2AJOTTA-1391 issued on 2021/4/21.

Review this report and original report, this report just changing the parts according to the declaration letter from client.

Considering to the difference, pre-scan were performed on the sample in this report to find the items which can be influential to the result in the original test report for fully retest.

Therefore in this report only radiated spurious emissions were performed based on the worst case of the original FCC ID with ID number 2AJOTTA-1391 issued on 2021/4/21 and other test data refer to the previous FCC ID with ID number 2AJOTTA-1391 issued on 2021/4/21.



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## Contents

1	Version .....	2
2	Test Summary.....	3
3	General Information .....	6
3.1	Details of Client.....	6
3.2	Test Location.....	6
3.3	Test Facility .....	6
3.4	General Description of EUT .....	7
3.5	Test Environment and Mode .....	9
3.6	Description of Support Units .....	9
3.7	Worst-case configuration and mode .....	9
4	Test results and Measurement Data .....	10
4.1	Antenna Requirement.....	10
4.2	AC Power Line Conducted Emissions .....	11
4.3	Duty Cycle .....	13
4.4	Conducted Output Power.....	13
4.5	DTS (6 dB) Bandwidth & 99% Occupied Bandwidth .....	14
4.6	Power Spectral Density .....	15
4.7	Band-edge for RF Conducted Emissions .....	16
4.8	RF Conducted Spurious Emissions.....	17
4.9	Radiated Spurious Emissions .....	18
4.10	Restricted bands around fundamental frequency .....	21
5	Measurement Uncertainty (95% confidence levels, k=2) .....	24
6	Equipment List .....	25
7	Photographs - Setup Photos .....	26



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Report No.: SEWM2204000030RG04  
Rev.: 01  
Page: 6 of 35

## 3 General Information

### 3.1 Details of Client

Applicant:	HMD Global Oy
Address of Applicant:	Bertel Jungin aukio 9, Espoo 02600, Finland
Manufacturer:	HMD Global Oy
Address of Manufacturer:	Bertel Jungin aukio 9, Espoo 02600, Finland

### 3.2 Test Location

Company:	SGS-CSTC Standards Technical Services (Suzhou) Co., Ltd
Address:	South of No. 6 Plant, No. 1, Runsheng Road, Suzhou Industrial Park, Suzhou Area, China (Jiangsu) Pilot Free Trade Zone
Post code:	215000
Test engineer:	King-p Li

### 3.3 Test Facility

The test facility is recognized, certified, or accredited by the following organizations:

• **A2LA (Certificate No. 6336.01)**

SGS-CSTC STANDARDS TECHNICAL SERVICES (SUZHOU) CO., LTD. is accredited by the American Association for Laboratory Accreditation(A2LA). Certificate No. 6336.01.

• **Innovation, Science and Economic Development Canada**

SGS-CSTC STANDARDS TECHNICAL SERVICES (SUZHOU) CO., LTD. has been recognized by ISED as an accredited testing laboratory.

CAB identifier: CN0120.

IC#: 27594.

• **FCC –Designation Number: CN1312**

SGS-CSTC STANDARDS TECHNICAL SERVICES (SUZHOU) CO., LTD. has been recognized as an accredited testing laboratory.

Designation Number: CN1312.

Test Firm Registration Number: 717327

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Report No.: SEWM2204000030RG04  
Rev.: 01  
Page: 7 of 35

### 3.4 General Description of EUT

EUT Description:	Smart Phone				
Model No.:	TA-1391				
Trade Mark:	Nokia				
Hardware Version:	19545_1_10				
Software Version:	V1.260_A01				
Operation Frequency:	802.11b/g/n(HT20):	2412MHz to 2472MHz			
Modulation Type:	802.11b:	DSSS (DBPSK, DQPSK, CCK)			
	802.11g/n:	OFDM (BPSK, QPSK, 16QAM, 64QAM)			
Number of Channels:	802.11b/g/n(HT20): 13				
Channel Spacing:	5MHz				
Smart System:	<input checked="" type="checkbox"/> SISO	802.11b/g/n			
		CDD: 802.11b/g/n/VHT/ax: Tx & Rx			
	<input type="checkbox"/> MIMO	STBC: 802.11n/VHT/ax: Tx & Rx			
		TXBF: 802.11n/VHT/ax: Tx & Rx			
	<input type="checkbox"/> Diversity	802.11b/g : Tx & Rx			
Antenna Type:	<input type="checkbox"/> External, <input checked="" type="checkbox"/> Integrated				
Antenna Gain*:	<input checked="" type="checkbox"/> Provided by client				
	0.7dBi;				
RF Cable*:	<input checked="" type="checkbox"/> Provided by client				
	0.5dB(0.6~1GHz)	0.8dB(1.4~2GHz)	1.0dB(2.1~2.7GHz)		
	1.5dB(3~4GHz)	1.8dB(4.4~6GHz)			
Note: *Since the above data and/or information is provided by the client relevant results or conclusions of this report are only made for these data and/or information , SGS is not responsible for the authenticity, integrity and results of the data and information and/or the validity of the conclusion.					
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Report No.: SEWM2204000030RG04  
Rev.: 01  
Page: 8 of 35

**Operation Frequency of each channel (802.11b/g/n HT20)**

Channel	Frequency	Channel	Frequency	Channel	Frequency	Channel	Frequency
1	2412MHz	4	2427MHz	7	2442MHz	10	2457MHz
2	2417MHz	5	2432MHz	8	2447MHz	11	2462MHz
3	2422MHz	6	2437MHz	9	2452MHz		

**Remark:**

In section 15.31(m), regards to the operating frequency range over 10 MHz, the Lowest frequency, the middle frequency, and the highest frequency of channel were selected to perform the test, and the selected channel see below:

Channel	Frequency for 802.11 b/g/n (HT20)
The Lowest channel	2412MHz
The Middle channel	2437MHz
The Highest channel	2462MHz

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Report No.: SEWM2204000030RG04  
Rev.: 01  
Page: 9 of 35

### 3.5 Test Environment and Mode

Environment Parameter	101.0 kPa Selected Values During Tests	
Relative Humidity	44-60 % RH Ambient	
Value	Temperature(°C)	Voltage(V)
NTNV	22~25	3.9
LTVN	-15	3.9
HTVN	55	3.9

Remark:  
NV: Normal Voltage  
NT: Normal Temperature  
LT: Low Extreme Test Temperature  
HT: High Extreme Test Temperature

### 3.6 Description of Support Units

The EUT has been tested as an independent unit.

### 3.7 Worst-case configuration and mode

Low data rate was used to test on antenna port conducted tests and radiated spurious emissions since it has the highest maximum power. Following are the worst-case data rates set for test:

Modulation Type	SISO - Data Rate	MIMO - Data Rate
802.11b	1 Mbps	/
802.11g	6 Mbps	/
802.11n (HT 20)	MCS0 (6.5 Mbps)	/

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Report No.: SEWM2204000030RG04  
Rev.: 01  
Page: 10 of 35

## 4 Test results and Measurement Data

### 4.1 Antenna Requirement

<b>Standard requirement:</b>	47 CFR Part 15C Section 15.203 /247(c)
15.203 requirement:	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, the manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.
15.247(b) (4) requirement:	The conducted output power limit specified in paragraph (b) of this section is based on the use of antennas with directional gains that do not exceed 6 dBi. Except as shown in paragraph (c) of this section, if transmitting antennas of directional gain greater than 6 dBi are used, the conducted output power from the intentional radiator shall be reduced below the stated values in paragraphs (b)(1), (b)(2), and (b)(3) of this section, as appropriate, by the amount in dB that the directional gain of the antenna exceeds 6 dBi.
The antenna is integrated and no consideration of replacement. The best case gain of the antenna is 0.7dBi.	

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Report No.: SEWM2204000030RG04  
 Rev.: 01  
 Page: 11 of 35

## 4.2 AC Power Line Conducted Emissions

Test Requirement:	47 CFR Part 15C Section 15.207		
Test Method:	ANSI C63.10: 2013		
Test Frequency Range:	150kHz to 30MHz		
Receiver Setup:	RBW = 9kHz, VBW = 30kHz		
Limit:	Frequency range (MHz)		Limit (dBuV)
			Quasi-peak      Average
	0.15-0.5	66 to 56*	56 to 46*
	0.5-5	56	46
	5-30	60	50
* Decreases with the logarithm of the frequency.			
Test Procedure:	<ol style="list-style-type: none"> <li>1) The mains terminal disturbance voltage test was conducted in a shielded room.</li> <li>2) The EUT was connected to AC power source through a LISN 1 (Line Impedance Stabilization Network) which provides a <math>50\Omega/50\mu\text{H} + 5\Omega</math> linear impedance. The power cables of all other units of the EUT were connected to a second LISN 2, which was bonded to the ground reference plane in the same way as the LISN 1 for the unit being measured. A multiple socket outlet strip was used to connect multiple power cables to a single LISN provided the rating of the LISN was not exceeded.</li> <li>3) The tabletop EUT was placed upon a non-metallic table 0.8m above the ground reference plane. And for floor-standing arrangement, the EUT was placed on the horizontal ground reference plane,</li> <li>4) The test was performed with a vertical ground reference plane. The rear of the EUT shall be 0.4 m from the vertical ground reference plane. The vertical ground reference plane was bonded to the horizontal ground reference plane. The LISN 1 was placed 0.8 m from the boundary of the unit under test and bonded to a ground reference plane for LISNs mounted on top of the ground reference plane. This distance was between the closest points of the LISN 1 and the EUT. All other units of the EUT and associated equipment was at least 0.8 m from the LISN 2. In order to find the maximum emission, the relative positions of equipment and all of the interface cables must be changed according to ANSI C63.10: 2013 on conducted measurement.</li> </ol>		

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Report No.: SEWM220400030RG04  
 Rev.: 01  
 Page: 12 of 35

Test Setup:	
Exploratory Test Mode:	Transmitting with all kind of modulations, data rates at lowest, middle and highest channel. Charge + Transmitting mode.
Final Test Mode:	Refer to section 3.7 for details. Only the worst case is recorded in the report.
Instruments Used:	Refer to section 6 for details.
Test Results:	Pass

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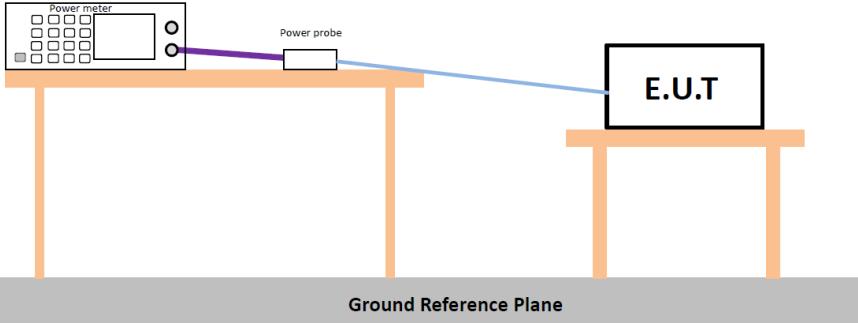


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Report No.: SEWM2204000030RG04  
 Rev.: 01  
 Page: 13 of 35

## 4.3 Duty Cycle

## 4.4 Conducted Output Power

Test Requirement:	47 CFR Part 15C Section 15.247 (b)(3)
Test Method:	ANSI C63.10 :2013 Section 11.9.1.3
Test Setup:	 <p>* Test with power meter (Detector function: Peak)</p>
Test Instruments:	Refer to section 6 for details.
Exploratory Test Mode:	Transmitting with all kind of modulations, data rates
Final Test Mode:	Refer to section 3.7 for details.
Limit:	30dBm
Test Results:	Pass

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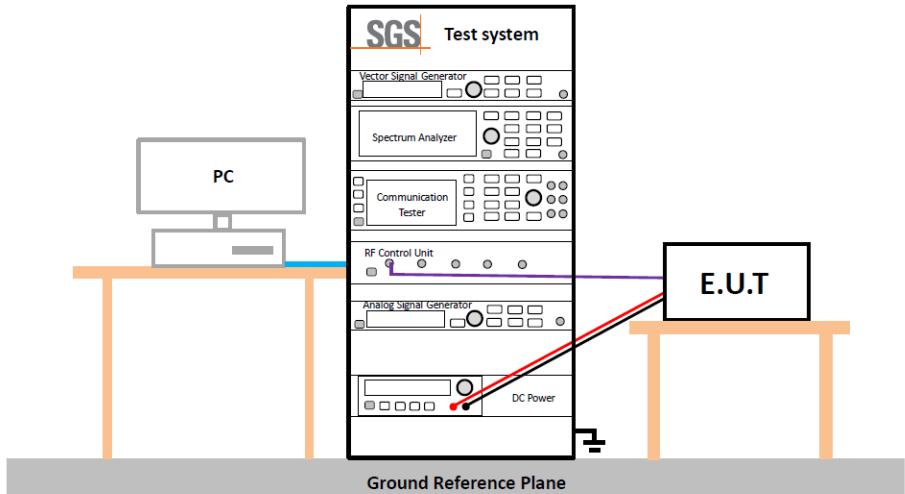
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Report No.: SEWM2204000030RG04  
 Rev.: 01  
 Page: 14 of 35

## 4.5 DTS (6 dB) Bandwidth & 99% Occupied Bandwidth

Test Requirement:	47 CFR Part 15C Section 15.247 (a)(2)
Test Method:	ANSI C63.10: 2013 Section 11.8.1 Option 1
Test Setup:	
Instruments Used:	Refer to section 6 for details.
Exploratory Test Mode:	Transmitting with all kind of modulations, data rates
Final Test Mode:	Refer to section 3.7 for details.
Limit:	$\geq 500$ kHz
Test Results:	Pass

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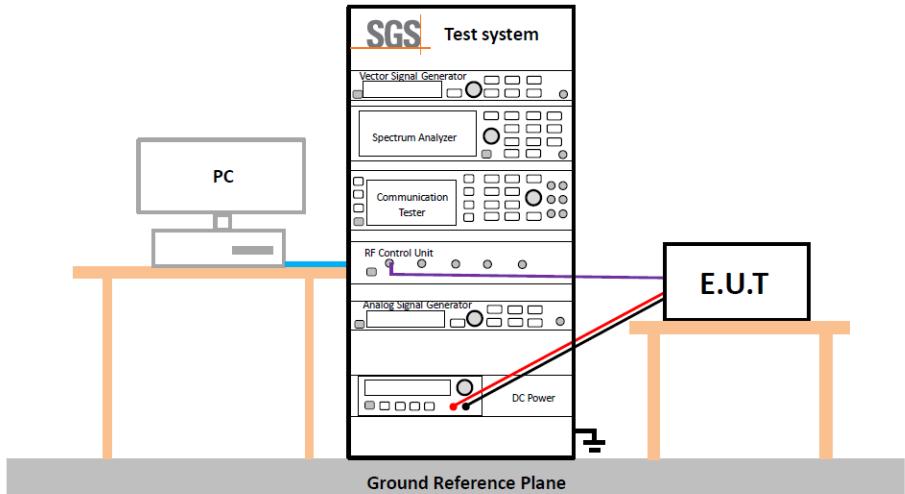
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 Rev.: 01  
 Page: 15 of 35

## 4.6 Power Spectral Density

Test Requirement:	47 CFR Part 15C Section 15.247 (e)
Test Method:	ANSI C63.10 :2013 Section 11.10.2
Test Setup:	
Test Instruments:	Refer to section 6 for details.
Exploratory Test Mode:	Transmitting with all kind of modulations, data rates
Final Test Mode:	Refer to section 3.7 for details.
Limit:	$\leq 8.00 \text{ dBm}/3\text{kHz}$
Test Results:	Pass

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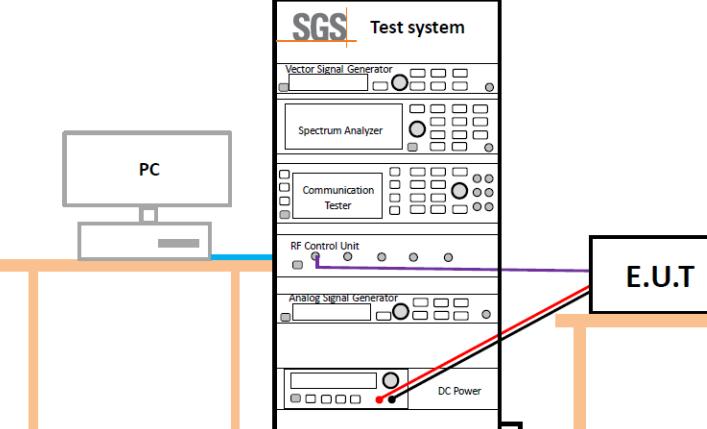
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Rev.: 01  
Page: 16 of 35

## 4.7 Band-edge for RF Conducted Emissions

Test Requirement:	47 CFR Part 15C Section 15.247 (d)
Test Method:	ANSI C63.10: 2013 Section 11.13
Test Setup:	 <p>The diagram illustrates the test setup. A PC is connected to a vertical stack of test equipment labeled 'Test system'. The 'Test system' includes a Vector Signal Generator, a Spectrum Analyzer, a Communication Tester, an RF Control Unit, an Analog Signal Generator, and a DC Power source at the bottom. A red line connects the PC to the RF Control Unit. Another red line connects the RF Control Unit to the 'E.U.T' (Equipment Under Test). The entire setup is positioned above a horizontal 'Ground Reference Plane'.</p>
Instruments Used:	Refer to section 6 for details.
Exploratory Test Mode:	Transmitting with all kind of modulations, data rates
Final Test Mode:	Refer to section 3.7 for details.
Limit:	In any 100 kHz bandwidth outside the frequency band in which the spread spectrum 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.
Test Results:	Pass

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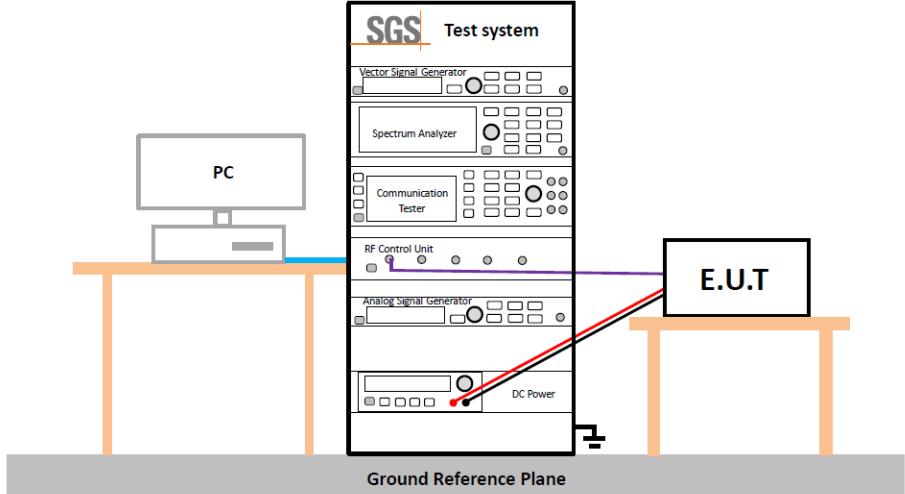
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Report No.: SEWM2204000030RG04  
 Rev.: 01  
 Page: 17 of 35

## 4.8 RF Conducted Spurious Emissions

Test Requirement:	47 CFR Part 15C Section 15.247 (d)
Test Method:	ANSI C63.10: 2013 Section 11.11
Test Setup:	
Instruments Used:	Refer to section 6 for details.
Exploratory Test Mode:	Transmitting with all kind of modulations, data rates
Final Test Mode:	Refer to section 3.7 for details.
Limit:	In any 100 kHz bandwidth outside the frequency band in which the spread spectrum 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.
Test Results:	Pass

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Report No.: SEWM2204000030RG04  
 Rev.: 01  
 Page: 18 of 35

## 4.9 Radiated Spurious Emissions

Test Requirement:	47 CFR Part 15C Section 15.209 and 15.205				
Test Method:	ANSI C63.10 :2013 Section 11.12				
Test Site:	Measurement Distance: 3m (Semi-Anechoic Chamber)				
Receiver Setup:	Frequency	Detector	RBW	VBW	Remark
	0.009MHz-0.090MHz	Peak	10kHz	30kHz	Peak
	0.009MHz-0.090MHz	Average	10kHz	30kHz	Average
	0.090MHz-0.110MHz	Quasi-peak	10kHz	30kHz	Quasi-peak
	0.110MHz-0.490MHz	Peak	10kHz	30kHz	Peak
	0.110MHz-0.490MHz	Average	10kHz	30kHz	Average
	0.490MHz -30MHz	Quasi-peak	10kHz	30kHz	Quasi-peak
	30MHz-1GHz	Quasi-peak	120kHz	300kHz	Quasi-peak
	Above 1GHz	Peak	1MHz	3MHz	Peak
		Peak	1MHz	3MHz	Peak
Limit:	Frequency	Field strength (microvolt/meter)	Limit (dBuV/m)	Remark	Measurement distance (m)
	0.009MHz-0.490MHz	2400/F(kHz)	-	-	300
	0.490MHz-1.705MHz	24000/F(kHz)	-	-	30
	1.705MHz-30MHz	30	-	-	30
	30MHz-88MHz	100	40.0	Quasi-peak	3
	88MHz-216MHz	150	43.5	Quasi-peak	3
	216MHz-960MHz	200	46.0	Quasi-peak	3
	960MHz-1GHz	500	54.0	Quasi-peak	3
	Above 1GHz	500	54.0	Average	3
	Remark: 15.35(b), Unless otherwise specified, the limit on peak radio frequency emissions is 20dB above the maximum permitted average emission limit applicable to the equipment under test. This peak limit applies to the total peak emission level radiated by the device.				

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 Rev.: 01  
 Page: 19 of 35

Test Setup:

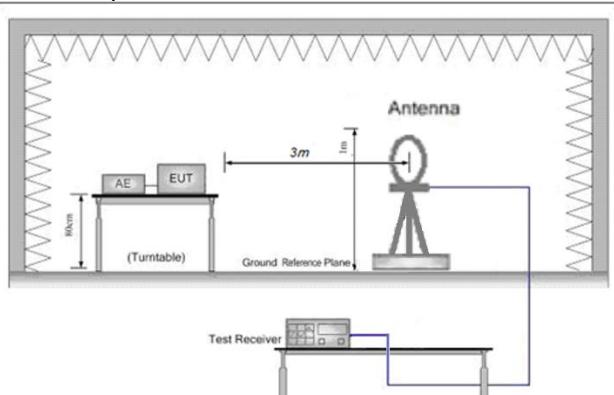


Figure 1. Below 30MHz

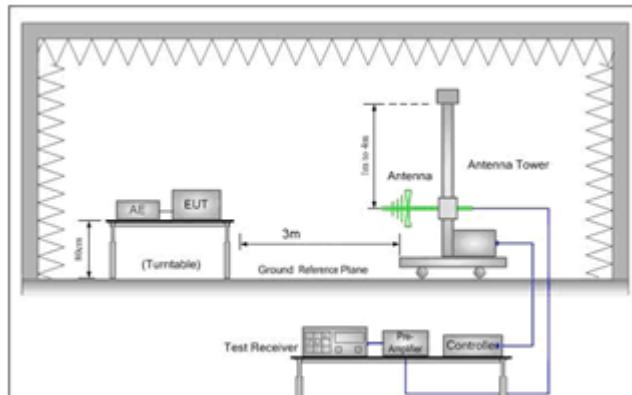


Figure 2. 30MHz to 1GHz

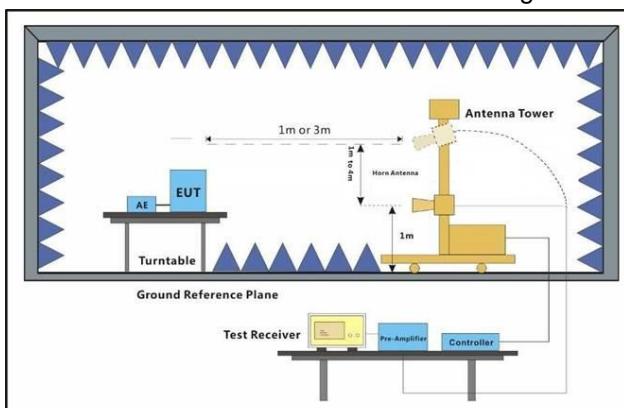


Figure 3. Above 1 GHz

Test Procedure:

- For below 1GHz, the EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 or 10 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
- For above 1GHz, the EUT was placed on the top of a rotating table 1.5 meters above the ground at a 3 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation (Distance from antenna to EUT is 1m for measurements >18GHz).
- The EUT was set 3 or 10 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters(for the test frequency of below 30MHz, the antenna was tuned to heights 1 meter) and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- The test-receiver system was set to Peak Detect Function and Specified



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Report No.: SEWM2204000030RG04

Rev.: 01

Page: 20 of 35

	<p>Bandwidth with Maximum Hold Mode.</p> <p>g. Test the EUT in the lowest channel, the middle channel, the Highest channel.</p> <p>h. The radiation measurements are performed in X, Y, Z axis positioning for Transmitting mode, And found the X axis positioning which it is worse case.</p> <p>i. Repeat above procedures until all frequencies measured was complete.</p> <p>j. The low frequency, which started from 9 kHz to 30MHz, was pre-scanned and the result which was 20dB lower than the limit line was not reported</p> <p>k. The disturbance above 18GHz was very low, and the harmonics were the highest point could be found when testing, so only the harmonics had been displayed.</p> <p>l. At a measurement distance of 1 meter the limit line was increased by <math>20 \times \log(3/1) = 9.54</math> dB.</p>
Test Configuration:	<p>Measurements Below 1000MHz</p> <ul style="list-style-type: none"> <li>• RBW = 120 kHz</li> <li>• VBW = 300 kHz</li> <li>• Detector = Peak</li> <li>• Trace mode = max hold</li> </ul> <p>Peak Measurements Above 1000 MHz</p> <ul style="list-style-type: none"> <li>• RBW = 1 MHz</li> <li>• VBW <math>\geq</math> 3 MHz</li> <li>• Detector = Peak</li> <li>• Sweep time = auto</li> <li>• Trace mode = max hold</li> </ul> <p>Average Measurements Above 1000MHz</p> <ul style="list-style-type: none"> <li>• RBW = 1 MHz</li> <li>• VBW <math>\geq</math> [3 * RBW]</li> <li>• Detector = RMS (power averaging), if span / (# of points in sweep) <math>\leq</math> (RBW / 2). Satisfying this condition may require increasing the number of points in the sweep or reducing the span. If this condition cannot be satisfied, then the detector mode shall be set to peak.</li> <li>• Sweep time = auto</li> <li>• Perform a trace average of at least 100 traces.</li> </ul> <p>Value = Reading + Factor(Antenna Factor + Cable loss – Preamplifier Factor).</p>
Exploratory Test Mode:	Transmitting with all kind of modulations, data rates. Charge + Transmitting mode.
Final Test Mode:	Refer to section 3.7 for details.
Instruments Used:	Refer to section 6 for details.
Test Results:	Pass
The detailed test data see: <b>Appendix</b>	

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Report No.: SEWM2204000030RG04  
 Rev.: 01  
 Page: 21 of 35

## 4.10 Restricted bands around fundamental frequency

Test Requirement:	47 CFR Part 15C Section 15.209 and 15.205		
Test Method:	ANSI C63.10: 2013 Section 11.12		
Test Site:	Measurement Distance: 3m (Semi-Anechoic Chamber)		
Limit:	Frequency	Limit (dBuV/m)	Remark
	30MHz-88MHz	40.0	Quasi-peak
	88MHz-216MHz	43.5	Quasi-peak
	216MHz-960MHz	46.0	Quasi-peak
	960MHz-1GHz	54.0	Quasi-peak
	Above 1GHz	54.0	Average Value
		74.0	Peak Value

### Test Setup:

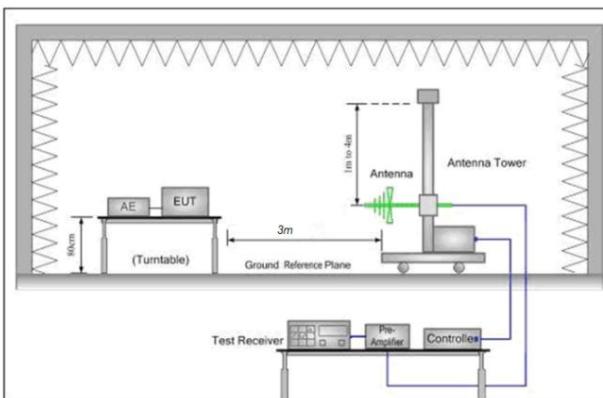


Figure 1. 30MHz to 1GHz

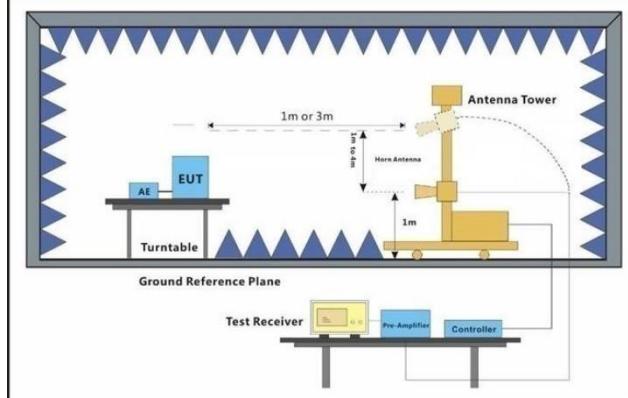


Figure 2. Above 1 GHz

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Report No.: SEWM2204000030RG04  
Rev.: 01  
Page: 22 of 35

Test Procedure:	<ol style="list-style-type: none"><li>a. For below 1GHz, the EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 or 10 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.</li><li>b. For above 1GHz, the EUT was placed on the top of a rotating table 1.5 meters above the ground at a 3 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.</li><li>c. The EUT was set 3 or 10 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.</li><li>d. The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.</li><li>e. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.</li><li>f. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.</li><li>g. Place a marker at the end of the restricted band closest to the transmit frequency to show compliance. Also measure any emissions in the restricted bands. Save the spectrum analyzer plot. Repeat for each power and modulation for lowest and highest channel</li><li>h. Test the EUT in the lowest channel , the Highest channel</li><li>i. The radiation measurements are performed in X, Y, Z axis positioning for Transmitting mode, And found the X axis positioning which it is worse case.</li><li>j. Repeat above procedures until all frequencies measured was complete.</li></ol>
Test Configuration:	<p>Measurements Below 1000MHz</p> <ul style="list-style-type: none"><li>• RBW = 120 kHz</li><li>• VBW = 300 kHz</li><li>• Detector = Peak</li><li>• Trace mode = max hold</li></ul> <p>Peak Measurements Above 1000 MHz</p> <ul style="list-style-type: none"><li>• RBW = 1 MHz</li><li>• VBW <math>\geq</math> 3 MHz</li><li>• Detector = Peak</li><li>• Sweep time = auto</li><li>• Trace mode = max hold</li></ul> <p>Average Measurements Above 1000MHz</p> <ul style="list-style-type: none"><li>• RBW = 1 MHz</li><li>• VBW <math>\geq</math> [3 *RBW]</li><li>• Detector = RMS (power averaging), if span / (# of points in sweep) <math>\leq</math> (RBW / 2). Satisfying this condition may require increasing the number of points in the sweep or reducing the span. If this condition cannot be satisfied, then the detector mode shall be set to peak.</li><li>• Sweep time = auto</li><li>• Perform a trace average of at least 100 traces.</li></ul> <p>Value = Reading + Factor(Antenna Factor + Cable loss).</p>
Exploratory Test Mode:	Transmitting with all kind of modulations, data rates.

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Report No.: SEWM2204000030RG04

Rev.: 01

Page: 23 of 35

	Charge + Transmitting mode.
Final Test Mode:	Refer to section 3.7 for details.
Instruments Used:	Refer to section 6 for details.
Test Results:	Pass
The detailed test data see: <b>Appendix</b>	



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Report No.: SEWM2204000030RG04  
Rev.: 01  
Page: 24 of 35

## 5 Measurement Uncertainty (95% confidence levels, k=2)

No.	Item	Measurement Uncertainty
1	Radiated Emission	± 3.13dB (9k -30MHz)
		± 4.8dB (30M -1GHz)
		± 4.8dB (1GHz to 18GHz)
		± 4.8dB (Above 18GHz)

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Report No.: SEWM2204000030RG04  
 Rev.: 01  
 Page: 25 of 35

## 6 Equipment List

RSE Test System					
Equipment	Manufacturer	Model No.	Inventory No.	Cal Date (yyyy-mm-dd)	Cal Due Date (yyyy-mm-dd)
Semi-Anechoic Chamber	Brilliant-emc	N/A	SUWI-04-02-01	2021/5/8	2024/5/7
Temperature and humidity meter	MingGao	TH101B	SUWI-01-01-05	2022/2/16	2023/2/15
Signal Analyzer	ROHDE&SCHWARZ	FSW43	SUWI-01-02-04	2021/5/28	2022/5/27
Signal Analyzer	KEYSIGHT	N9020A	SUWI-01-02-05	2021/12/4	2022/12/3
Test receiver	ROHDE&SCHWARZ	ESR7	SUWI-01-10-01	2022/2/19	2023/2/18
Receiving antenna	SCHWRZBECK MESS-ELEKTRONIK	VULB 9163	SUWI-01-11-01	2021/5/16	2023/5/15
Receiving antenna	SCHWRZBECK MESS-ELEKTRONIK	BBHA 9120D	SUWI-01-11-02	2021/5/16	2023/5/15
Receiving antenna	SCHWRZBECK MESS-ELEKTRONIK	BBHA 9170	SUWI-01-11-03	2021/5/14	2023/5/13
Amplifier	Tonscend	TAP9K3G40	SUWI-01-14-01	2022/2/15	2023/2/14
Amplifier	Tonscend	TAP01018050	SUWI-01-14-02	2022/2/15	2023/2/14
Amplifier	Tonscend	TAP18040048	SUWI-01-14-03	2022/2/19	2023/2/18
Active Loop Antenna	SCHWRZBECK MESS-ELEKTRONIK	FMZB 1519B	SUWI-01-21-01	2021/6/10	2022/6/9
Measurement Software	Tonscend	JS32-RE V4.0.0.0	SUWI-02-09-04	NCR	NCR
Measurement Software	Tonscend	JS32-RSE V4.0.0.0	SUWI-02-09-06	NCR	NCR

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Rev.: 01

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## 7 Photographs - Setup Photos

Refer to Appendix A.2 WLAN Setup Photos.



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Report No.: SEWM2204000030RG04

Rev.: 01

Page: 27 of 35

# Appendix



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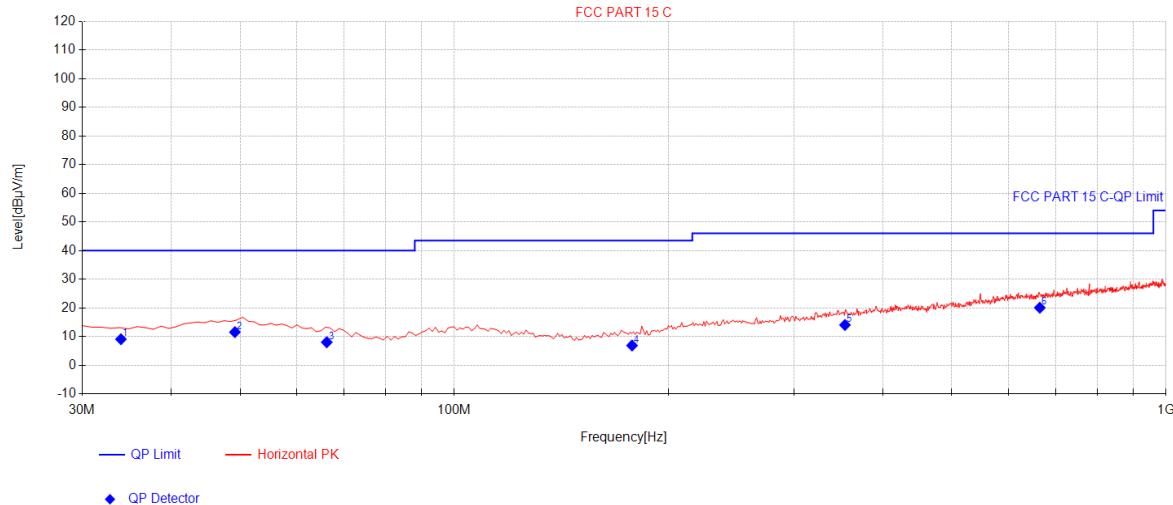
Report No.: SEWM2204000030RG04  
 Rev.: 01  
 Page: 28 of 35

## Test on the worst case:

### Radiated Spurious Emissions

#### Radiated emission below 1GHz

#### Worst case Mode: 2.4GWIFI \_ Channel 01



Final Data List									
NO.	Frequency [MHz]	Reading [dBμV]	Factor [dB]	QP Value [dBμV/m]	QP Limit [dBμV/m]	QP Margin [dB]	Height [cm]	Angle [°]	Polarity
1	34.0104	26.85	-17.78	9.07	40.00	30.93	220	350	Horizontal
2	49.1755	25.84	-14.29	11.55	40.00	28.45	208	327	Horizontal
3	66.1902	25.93	-17.90	8.03	40.00	31.97	189	330	Horizontal
4	177.7162	25.31	-18.42	6.89	43.50	36.61	111	128	Horizontal
5	353.8993	25.03	-11.00	14.03	46.00	31.97	189	129	Horizontal
6	664.7331	24.72	-4.66	20.06	46.00	25.94	193	238	Horizontal

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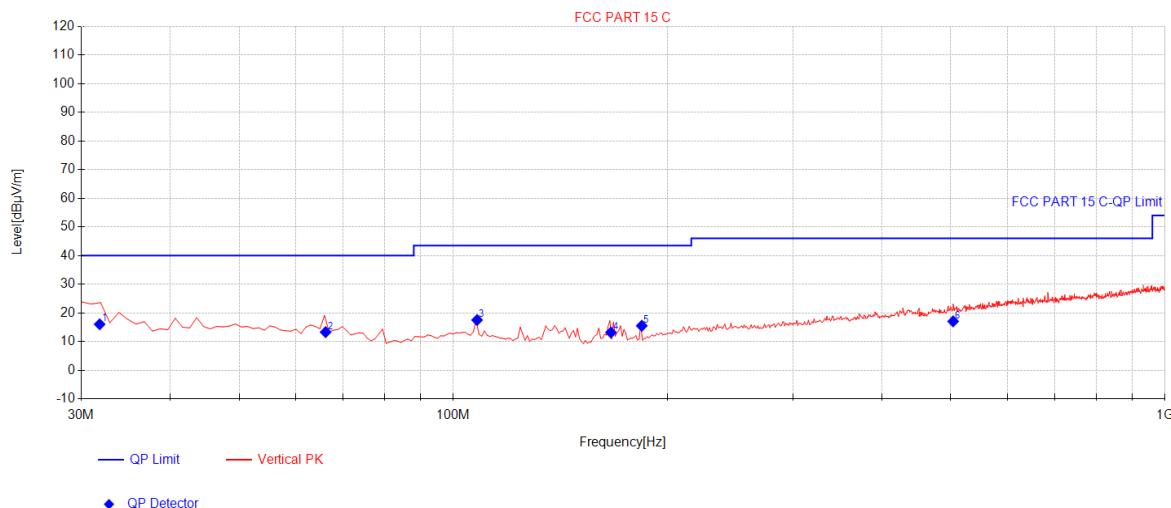
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Report No.: SEWM2204000030RG04  
 Rev.: 01  
 Page: 29 of 35



Final Data List									
NO.	Frequency [MHz]	Reading [dBµV]	Factor [dB]	QP Value [dBµV/m]	QP Limit [dBµV/m]	QP Margin [dB]	Height [cm]	Angle [°]	Polarity
1	31.8504	34.05	-18.02	16.03	40.00	23.97	107	150	Vertical
2	66.1568	31.20	-17.90	13.30	40.00	26.70	106	5	Vertical
3	107.9971	34.21	-16.69	17.52	43.50	25.98	106	146	Vertical
4	166.5362	31.89	-18.73	13.16	43.50	30.34	117	117	Vertical
5	183.9761	33.67	-18.17	15.50	43.50	28.00	106	104	Vertical
6	503.8332	24.86	-7.81	17.05	46.00	28.95	218	30	Vertical

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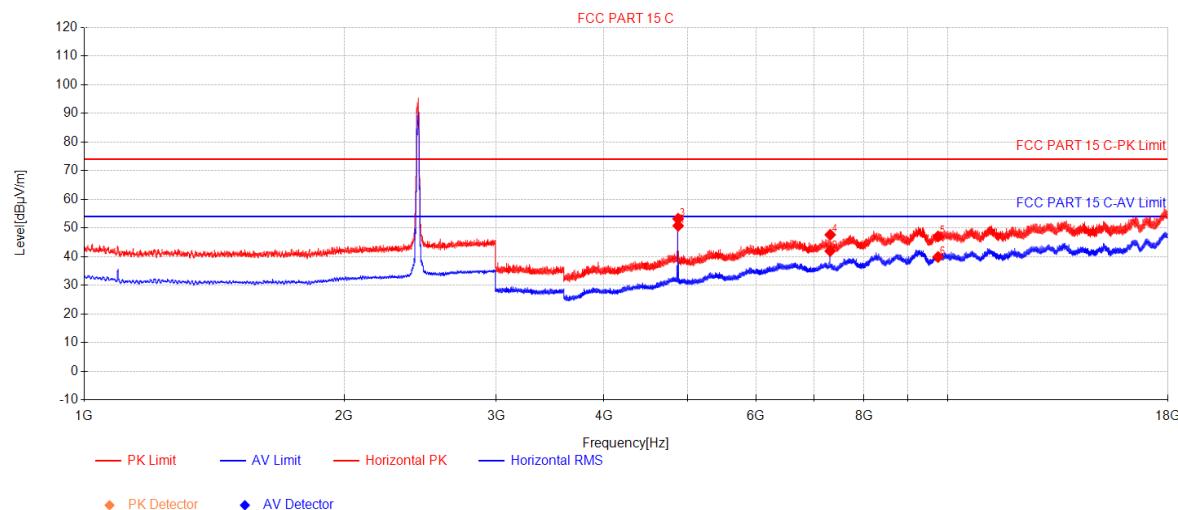
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Report No.: SEWM2204000030RG04  
 Rev.: 01  
 Page: 30 of 35

**Transmitter emission Above 1GHz****11b\_Channel 06**

Final Data List										
NO.	Frequency [MHz]	Reading [dBμV]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity	
1	4874.5	63.20	50.73	-12.47	54.00	3.27	263	75	Horizontal	
2	7310.5	47.32	41.92	-5.40	54.00	12.08	241	253	Horizontal	
3	4874	65.64	53.17	-12.47	74.00	20.83	175	75	Horizontal	
4	7312	53.00	47.60	-5.40	74.00	26.40	263	253	Horizontal	
5	9748	45.99	47.00	1.01	74.00	27.00	266	96	Horizontal	
6	9748	38.84	39.85	1.01	54.00	14.15	244	75	Horizontal	

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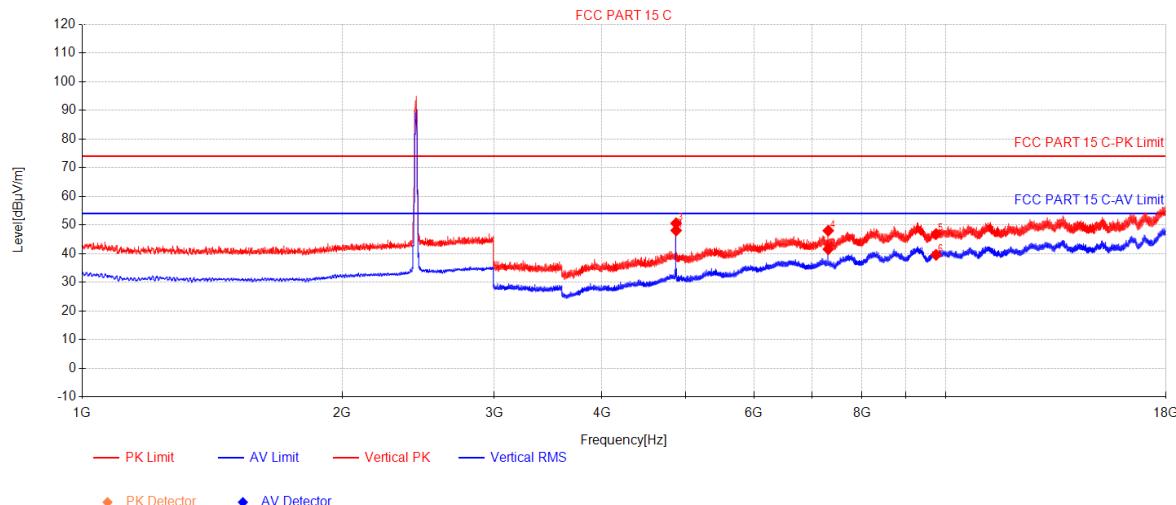
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Report No.: SEWM2204000030RG04  
 Rev.: 01  
 Page: 31 of 35

## 11b\_Channel 06



Final Data List									
NO.	Frequency [MHz]	Reading [dBμV]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	4874.5	60.52	48.05	-12.47	54.00	5.95	263	125	Vertical
2	7312.5	46.93	41.53	-5.40	54.00	12.47	254	228	Vertical
3	4874	63.00	50.53	-12.47	74.00	23.47	185	125	Vertical
4	7313	53.38	47.98	-5.40	74.00	26.02	263	0	Vertical
5	9748	45.80	46.81	1.01	74.00	27.19	255	98	Vertical
6	9748	38.53	39.54	1.01	54.00	14.46	187	46	Vertical

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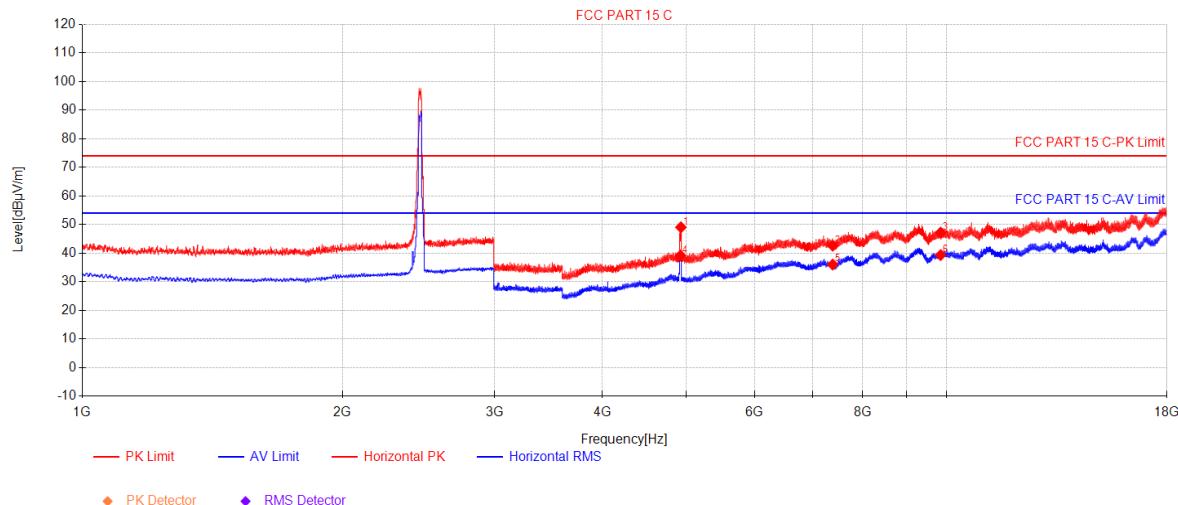
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Report No.: SEWM2204000030RG04  
 Rev.: 01  
 Page: 32 of 35

## 11g\_Channel 11



Final Data List									
NO.	Frequency [MHz]	Reading [dBμV]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	4929.5	61.48	49.01	-12.47	74.00	24.99	263	254	Horizontal
2	7386	48.10	42.58	-5.52	74.00	31.42	254	326	Horizontal
3	9848	46.03	47.17	1.14	74.00	26.83	175	326	Horizontal
4	4924	51.62	39.14	-12.48	54.00	14.86	265	188	Horizontal
5	7386	41.50	35.98	-5.52	54.00	18.02	284	261	Horizontal
6	9848	38.15	39.29	1.14	54.00	14.71	176	58	Horizontal

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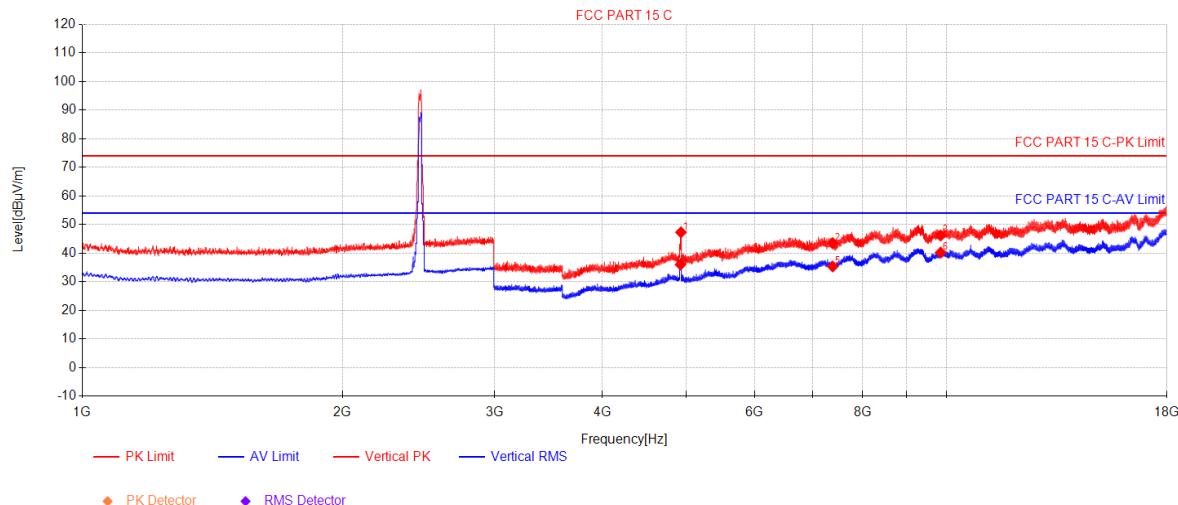
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Report No.: SEWM2204000030RG04  
 Rev.: 01  
 Page: 33 of 35

## 11g\_Channel 11



Final Data List									
NO.	Frequency [MHz]	Reading [dBμV]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	4930	59.71	47.24	-12.47	74.00	26.76	252	328	Vertical
2	7386	49.00	43.48	-5.52	74.00	30.52	263	56	Vertical
3	9848	44.99	46.13	1.14	74.00	27.87	100	328	Vertical
4	4924	48.45	35.97	-12.48	54.00	18.03	400	328	Vertical
5	7386	40.83	35.31	-5.52	54.00	18.69	265	0	Vertical
6	9848	39.03	40.17	1.14	54.00	13.83	254	328	Vertical

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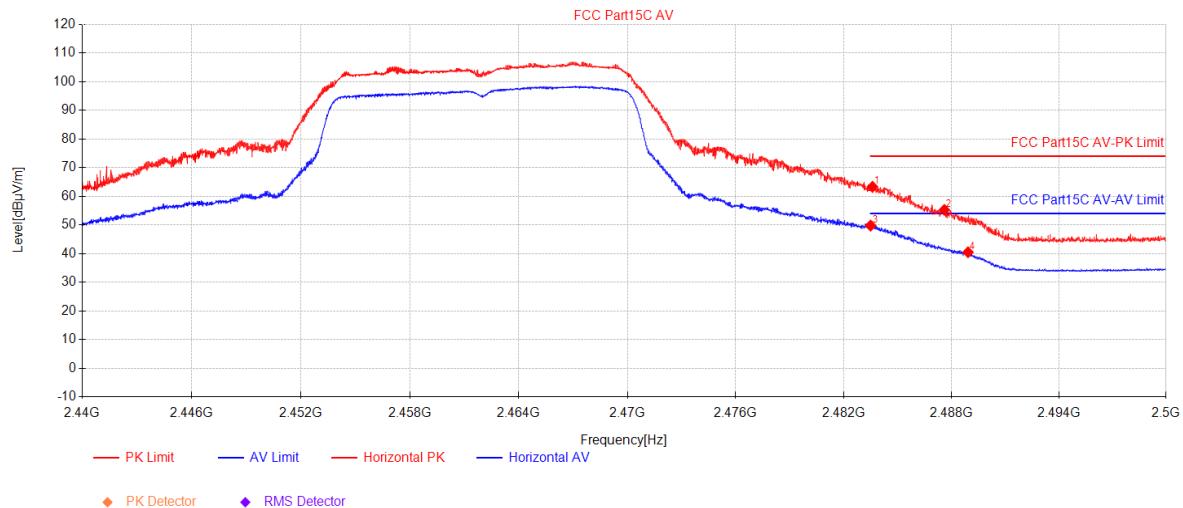


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 Rev.: 01  
 Page: 34 of 35

## Restricted bands around fundamental frequency

### 11g\_Channel 11



#### Final Data List

NO.	Frequency [MHz]	Reading [dB $\mu$ V]	Level [dB $\mu$ V/m]	Factor [dB]	Limit [dB $\mu$ V/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	2483.605	59.38	63.29	3.91	74.00	10.71	112	309	Horizontal
2	2487.61	51.28	55.22	3.94	74.00	18.78	112	309	Horizontal
3	2483.5	45.83	49.74	3.91	54.00	4.26	112	309	Horizontal
4	2488.93	36.51	40.46	3.95	54.00	13.54	112	309	Horizontal

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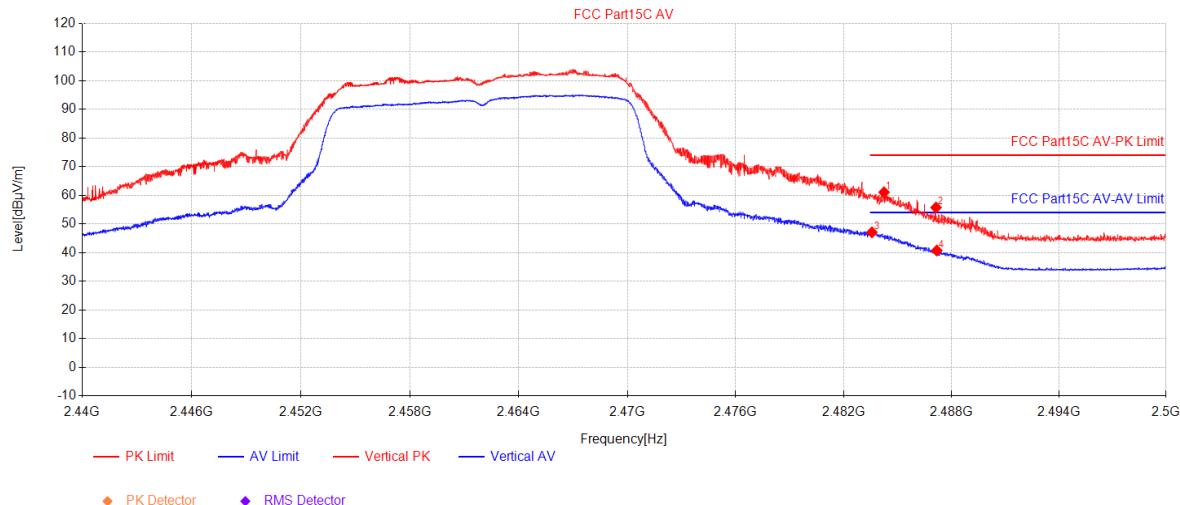


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 Rev.: 01  
 Page: 35 of 35

## 11g\_Channel 11



Final Data List										
NO.	Frequency [MHz]	Reading [dBμV]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity	
1	2484.25	57.11	61.03	3.92	74.00	12.97	363	253	Vertical	
2	2487.145	51.76	55.70	3.94	74.00	18.30	363	253	Vertical	
3	2483.575	43.14	47.05	3.91	54.00	6.95	363	253	Vertical	
4	2487.19	36.77	40.71	3.94	54.00	13.29	363	253	Vertical	

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