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Report On

Radio Testing of the
Advanced Bionics
Naida CI Q70

FCC Part 15 Subpart C §15.209
IC RSS-210 Issue 8 December 2010


Report No. SC1211094A Rev.1

November 2012



America

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REPORT ON	Radio Testing of the Advanced Bionics CI Q70
TEST REPORT NUMBER	SC1211094A Rev.1
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DATED	_____ November 12 2012



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Revision History

SC1211094A Rev.1 Advanced Bionics Naida CI Q70					
DATE	OLD REVISION	NEW REVISION	REASON	PAGES AFFECTED	APPROVED BY
11/12/12	Initial Release				Ferdinand Custodio
03/05/13	Initial Release	1.0	<ul style="list-style-type: none">• Provided FCC ID and IC Number• Updated model name from "Pantera Behind the Ear Sound Processor" to Naida CI Q70	All	Ferdinand Custodio
03/05/13	Initial Release	1.0	Update Equipment List from Loop Antenna to Active Loop Antenna	28	Ferdinand Custodio



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SECTION 1

REPORT SUMMARY

Radio Testing of the
Advanced Bionics
CI Q70



1.1 INTRODUCTION

The information contained in this report is intended to show verification of the Advanced Bionics CI Q70 to the requirements of FCC Part 15 Subpart C §15.209 and IC RSS-210 Issue 8 December 2010.

Objective	To perform Radio Testing to determine the Equipment Under Test's (EUT's) compliance with the Test Specification, for the series of tests carried out.
Manufacturer	Advanced Bionics
Model Number(s) Verified	CI-5245, CI-5523, CI-5415 and CI-5835
Model(s) covered under this Test Report	CI-5245, CI-5523, CI-5517, CI-5511, CI-5500, CI-5415, CI-5710 and CI-5835
FCC ID Number	S2B-ABBTE
IC Number	10870A-ABBTE
Serial Number(s)	N/A
Number of Samples Tested	1
Test Specification/Issue/Date	<ul style="list-style-type: none">• FCC Part 15 Subpart C §15.209 (October 1, 2011).• RSS-210 - Licence-exempt Radio Apparatus (All Frequency Bands): Category I Equipment (Issue 8, December 2010).• RSS-Gen - General Requirements and Information for the Certification of Radio Apparatus (Issue 3, December 2010).
Start of Test	November 05, 2012
Finish of Test	November 11, 2012
Name of Engineer(s)	Ferdinand S. Custodio
Related Document(s)	None. Supporting documents for EUT certification are separate exhibits.



1.2 BRIEF SUMMARY OF RESULTS

A brief summary of the tests carried out in accordance with FCC Part 15 Subpart C §15.209 with cross-reference to the corresponding IC RSS standard is shown below.

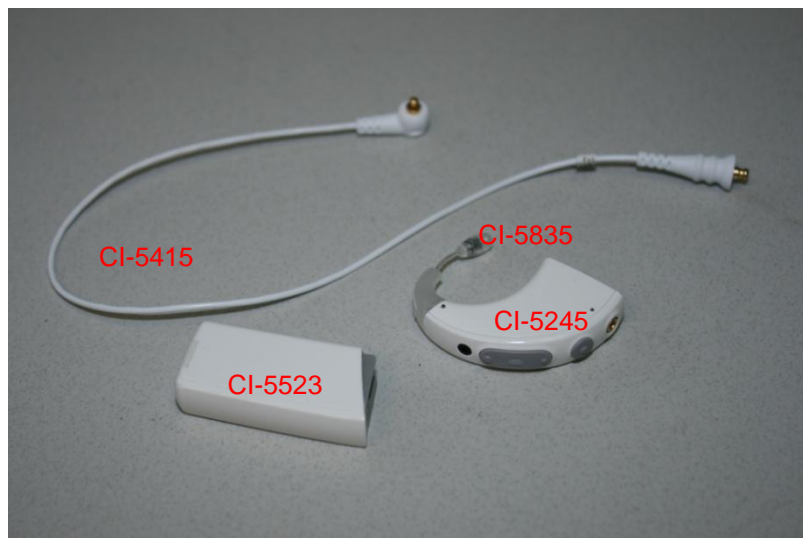
Section	Spec Clause	RSS	Test Description	Result	Comments/Base Standard
-	§15.207(a)	RSS-Gen 7.2.4	Conducted Emissions	N/A*	
2.1		RSS-Gen 4.6.1	99% Emission Bandwidth	Compliant	
2.2	§15.209(a) to (f)	RSS-210 2.5 RSS-Gen 7.2.5	Radiated Emission Limits; General Requirements (Fundamental Field Strength Measurement).	Compliant	
2.3	§15.209(a) to (f)	RSS-210 2.5 RSS-Gen 7.2.5	Radiated Emission Limits; General Requirements (Spurious Radiated Emissions).	Compliant	
-		RSS-Gen 4.10	Receiver Spurious Emissions	Compliant	

* Not applicable. EUT is battery powered.

1.3 PRODUCT INFORMATION

1.3.1 Technical Description

The Equipment Under Test (EUT) was an Advanced Bionics Naida CI Q70 as shown in the photograph below. The model verified was the Pantera Sound processor (CI-5245)+Pantera 230 mAh battery (CI-5523)+Pantera UHP RF cable (CI-5415)+Pantera T-mic (CI-5835). Models CI-5517, CI-5511 and CI-5500 are different power sources covered under this test report and represented by CI-5523 (worst case). These models are different battery models with different capacity with identical physical attributes. Model CI-5710 (Earhook) is the mechanical assembly version (no electrical connectivity) of Model CI-5835 (T-mic) also covered under this test report.



Equipment Under Test

1.3.2 EUT General Description

EUT Description	Behind the ear sound processor
Model Name	Naida CI Q70
Model Number(s)	CI-5245 with CI-5523 CI-5415 and CI-5835
Rated Voltage	4.2VDC from custom detachable battery
Output Power	-14.374 dbμV/m @ 30 meters
Frequency Range	10.20 MHz – 10.84 MHz base from 20 dB BW measurement. EUT is a single channel transmitter.
Number of Operating Frequencies	1
Channels Verified	10.5 MHz
20dB BW	635.461 kHz
99% OBW	596.821 kHz
Antenna Type (used during evaluation)	Integral (Complies with Part 15.203 requirements)
Modulation Used	FSK
Emission Designator	597kF1D

1.3.3 Reference Dimensions



1.4 EUT TEST CONFIGURATION

1.4.1 Test Configuration Description

Test Configuration	Description
Default	Test mode: Standalone operation , M=T=400, RF=4

1.4.2 EUT Exercise Software

Software installed during evaluation is SoundWave 2.2. It is a SoundWave fitting software and speech processor firmware.

1.4.3 Support Equipment and I/O cables

Manufacturer	Equipment/Cable	Description
N/A	N/A	N/A

1.4.4 Simplified Test Configuration Diagram

Not applicable. EUT was verified in a stand-alone configuration

1.4.5 Worst Case Configuration

The EUT is a portable device. For radiated measurements X, Y and Z orientations were verified. Worst case position is "Z".



1.5 DEVIATIONS FROM THE STANDARD

No deviations from the applicable test standards or test plan were made during testing.

1.6 MODIFICATION RECORD

Description of Modification	Modification Fitted By	Date Modification Fitted
Serial Number N/A		
N/A		

The table above details modifications made to the EUT during the test programme. The modifications incorporated during each test (if relevant) are recorded on the appropriate test pages.

1.7 TEST METHODOLOGY

All measurements contained in this report were conducted with ANSI C63.4-2009, American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the range of 9 kHz to 40 GHz.

For conducted and radiated emissions the equipment under test (EUT) was configured to measure its highest possible emission level. This level was based on the maximized cable configuration from exploratory testing per ANSI C63.4-2009. The test modes were adapted according to the Operating Instructions provided by the manufacturer/client.

1.8 TEST FACILITY

1.8.1 FCC – Registration No.: US5296

TUV SUD America Inc. (San Diego), is an accredited test facility with the site description report on file and has met all the requirements specified in §2.498 of the FCC rules. The acceptance letter from the FCC is maintained in our files and the Registration is US5296.

1.8.2 Industry Canada (IC) Registration No.: 3067A

The 10m Semi-anechoic chamber of TUV SUD America Inc. (San Diego), has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No. 3067A.



SECTION 2

TEST DETAILS

Radio Testing of the
Advanced Bionics
CI Q70



2.1 99% EMISSION BANDWIDTH

2.1.1 Specification Reference

RSS-Gen Clause 4.6.1

2.1.2 Standard Applicable

When an occupied bandwidth value is not specified in the applicable RSS, the transmitted signal bandwidth to be reported is to be its 99% emission bandwidth, as calculated or measured.

The transmitter shall be operated at its maximum carrier power measured under normal test conditions. The span of the analyzer shall be set to capture all products of the modulation process, including the emission skirts. The resolution bandwidth shall be set to as close to 1% of the selected span as is possible without being below 1%. The video bandwidth shall be set to 3 times the resolution bandwidth. Video averaging is not permitted. Where practical, a sampling detector shall be used given that a peak or peak hold may produce a wider bandwidth than actual.

The trace data points are recovered and directly summed in linear terms. The recovered amplitude data points, beginning at the lowest frequency, are placed in a running sum until 0.5% of the total is reached and that frequency recorded. The process is repeated for the highest frequency data points. This frequency is recorded. The span between the two recorded frequencies is the occupied bandwidth.

2.1.3 Equipment Under Test and Modification State

Serial No: N/A / Default Test Configuration

2.1.4 Date of Test/Initial of test personnel who performed the test

November 05, 2012/FSC

2.1.5 Test Equipment Used

The major items of test equipment used for the above tests are identified in Section 3.1.

2.1.6 Environmental Conditions

Ambient Temperature	22.2°C
Relative Humidity	43.2%
ATM Pressure	99.2 kPa

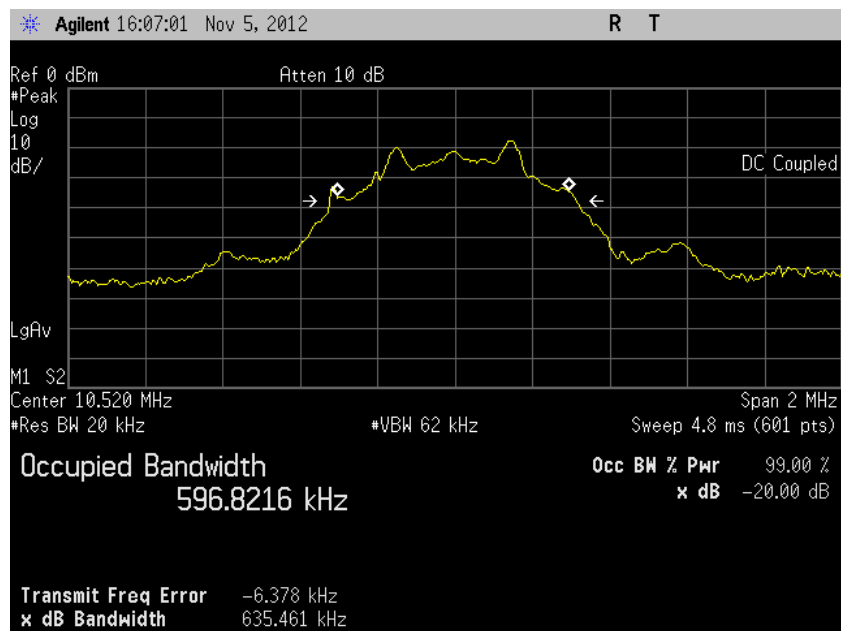
2.1.7 Additional Observations

- This is a radiated test.
- Span is wide enough to capture the channel transmission.
- RBW is 1% of the span.
- VBW is 3X RBW.
- Sweep is auto.
- Detector is peak.

- The % Power Bandwidth setting in the spectrum analyzer was set to 99% (default).
- The Channel Bandwidth measurement function of the spectrum analyzer was used for this test.

2.1.8 Test Results (For reporting purposes only)

99% OBW (10.52 MHz)	20dB BW (10.52 MHz)
596.821 kHz	635.461 kHz



99% OBW Plot

2.2 RADIATED EMISSION LIMITS; GENERAL REQUIREMENTS (FUNDAMENTAL FIELD STRENGTH MEASUREMENT)

2.2.1 Specification Reference

Part 15 Subpart C §15.209(a)

2.2.2 Standard Applicable

(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 (microvolts/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., §§ 15.231 and 15.241.*

2.2.3 Equipment Under Test and Modification State

Serial No: N/A / Default Test Configuration

2.2.4 Date of Test/Initial of test personnel who performed the test

November 09, 2012/FSC

2.2.5 Test Equipment Used

The major items of test equipment used for the above tests are identified in Section 3.1.

2.2.6 Environmental Conditions

Ambient Temperature	23.1°C
Relative Humidity	43.5%
ATM Pressure	99.0 kPa

2.2.7 Additional Observations

- This is a radiated test at one (1) meter measurement distance.
- RBW is 9kHz while VBW is 100kHz.
- Offset of 19.8 is from antenna factor and cable used.
- The spectrum analyzer built-in preamp was used for this test.
- The EUT was maximized along its axis (See Section 1.4.5 for details)
- Using a peak detector and a span encompassing the entire fundamental emission, the highest peak emission was determined.
- The peak emission was centered and the setting changed to zero span.
- Final measurement was performed using quasi-peak detector.
- The measured level is corrected to 30 meters using 40dB/decade correction factor.

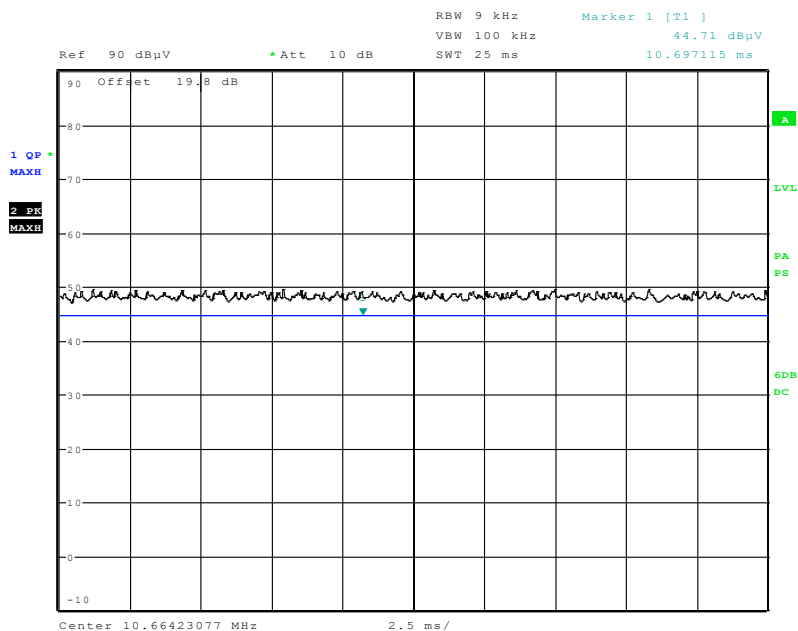
$$= 44.71 \text{ dB}\mu\text{V/m} + 40\log(1\text{meter}/30\text{meters})$$

$$= 44.71 \text{ dB}\mu\text{V/m} + (-59.084)$$

$$= -14.374 \text{ dB}\mu\text{V/m}$$

2.2.8 Test Results

Frequency	Measured level @ 1 meter	Calculated level at 30 meters
10.66 MHz	44.71 dB μ V/m	-14.374 dB μ V/m
	Complies with the limit of 29.54 dB μ V/m @ 30 meters	



Date: 9.NOV.2012 15:48:14

2.3 RADIATED EMISSION LIMITS; GENERAL REQUIREMENTS (SPURIOUS RADIATED EMISSIONS).

2.3.1 Specification Reference

Part 15 Subpart C §15.209(a)

2.3.2 Standard Applicable

(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 (microvolts/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., §§ 15.231 and 15.241.*

2.3.3 Equipment Under Test and Modification State

Serial No: N/A / Default Test Configuration

2.3.4 Date of Test/Initial of test personnel who performed the test

November 11, 2012/FSC

2.3.5 Test Equipment Used

The major items of test equipment used for the above tests are identified in Section 3.1.

2.3.6 Environmental Conditions

Ambient Temperature	22.4°C
Relative Humidity	44.7%
ATM Pressure	99.6 kPa



2.3.7 Additional Observations

- This is a radiated test. The spectrum was searched beyond the 10th harmonic (106 MHz) because of the incorporation of a digital device.
- Radiated measurements from 9 kHz to 30MHz were performed at 3 meters distance. The limit was corrected from 30 meters to 3 meters using 40dB/decade distance correction factor.
- Measurement was done using EMC32 V8.53 automated software. Reported level is the actual level with all the correction factors factored in. Correction Factor column is for informational purposes only. See Section 2.3.8 for sample computation.

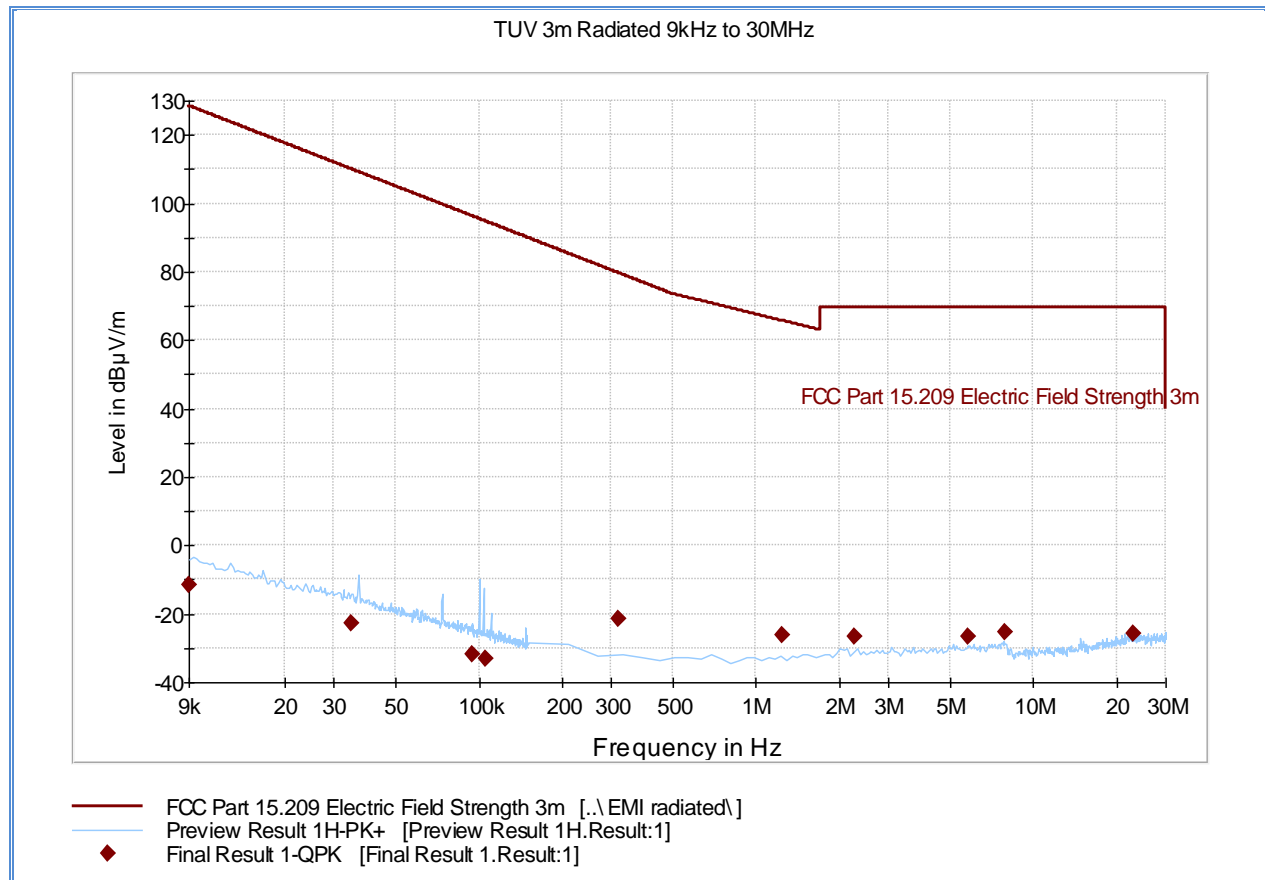
2.3.8 Sample Computation (Radiated Emission)

Measuring equipment raw measurement (db μ V) @ 2400 MHz			58.4
Correction Factor (dB)	Asset# 1153 (cable)	3.3	-4.8
	Asset# 8628 (preamplifier)	-36.4	
	Asset# 6669 (antenna)	28.3	
Reported Peak Final Measurement (db μ V/m) @ 2400 MHz			53.6

2.3.9 Test Results

See attached plots.

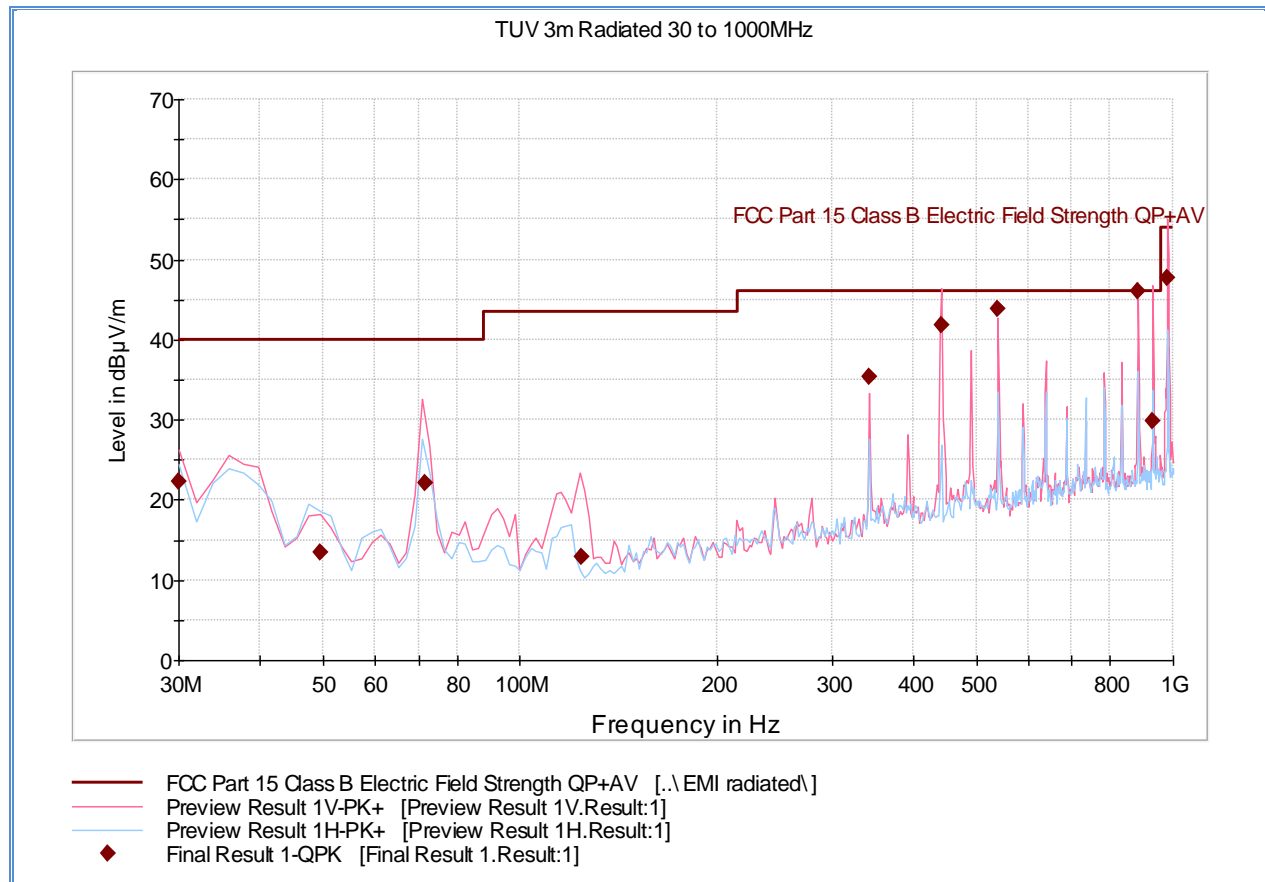
2.3.10 Test Results Radiated Emissions from 9kHz to 30MHz (3 meters)



Quasi Peak Data

Frequency (MHz)	QuasiPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)
0.009000	-11.4	1000.0	0.200	100.0	H	176.0	-26.7	139.9	128.5
0.034691	-22.9	1000.0	0.200	100.0	H	10.0	-30.6	133.0	110.0
0.094269	-31.7	1000.0	0.200	100.0	H	14.0	-31.9	128.0	96.4
0.105942	-33.3	1000.0	0.200	100.0	H	308.0	-32.1	128.1	94.8
0.318918	-21.6	1000.0	9.000	100.0	H	148.0	-32.5	101.3	79.7
1.237114	-26.2	1000.0	9.000	100.0	H	168.0	-31.9	92.0	65.8
2.253507	-26.7	1000.0	9.000	100.0	H	216.0	-31.9	96.2	69.5
5.802685	-26.7	1000.0	9.000	100.0	H	188.0	-31.6	96.2	69.5
7.896914	-25.4	1000.0	9.000	100.0	H	340.0	-31.7	94.9	69.5
22.890742	-25.6	1000.0	9.000	100.0	H	88.0	-28.5	95.1	69.5

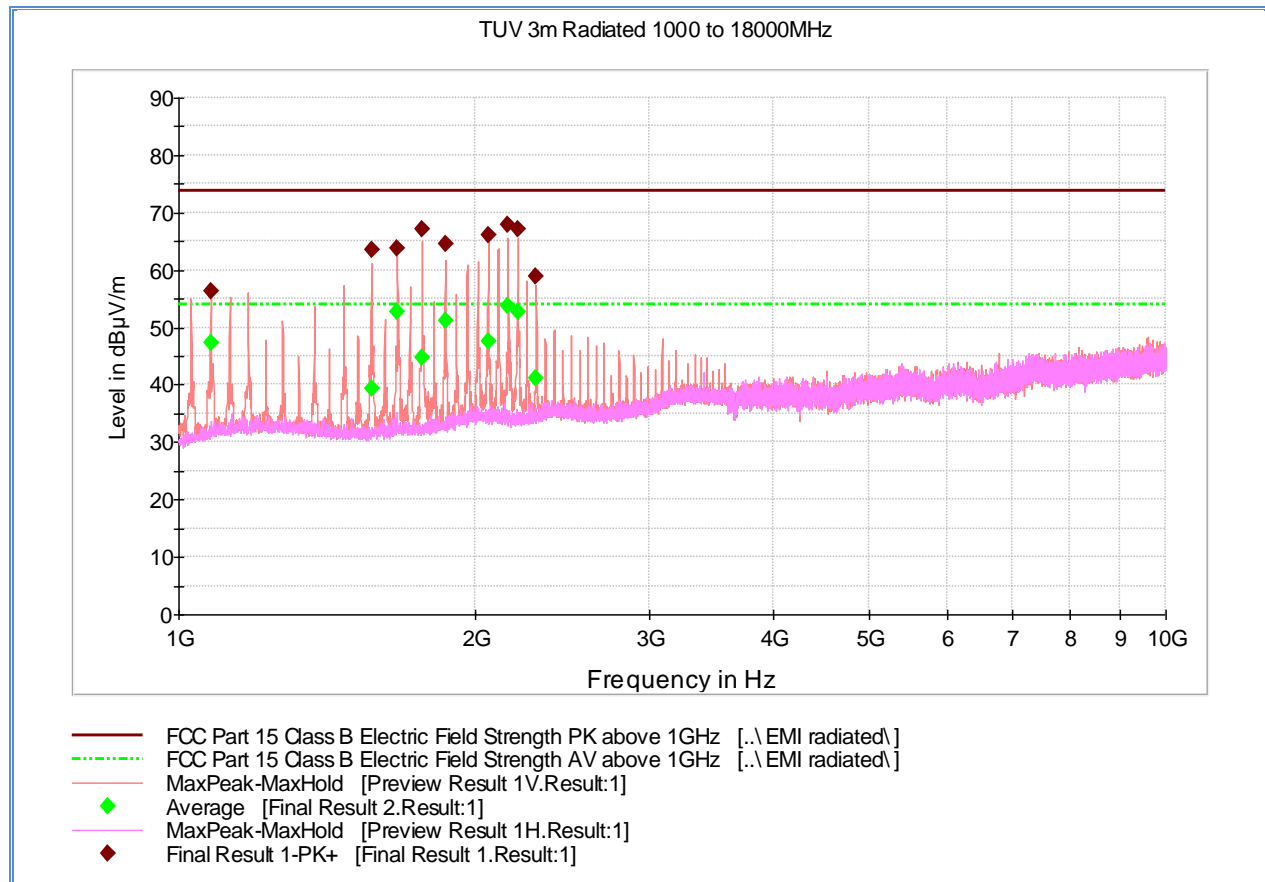
2.3.11 Test Results Radiated Emissions from 30kHz to 1000MHz (3 meters)



Quasi Peak Data

Frequency (MHz)	QuasiPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)
30.000000	22.4	1000.0	120.000	120.0	V	0.0	-12.0	17.6	40.0
49.334990	13.5	1000.0	120.000	181.0	H	349.0	-20.0	26.5	40.0
71.621643	22.2	1000.0	120.000	102.0	V	167.0	-21.9	17.8	40.0
124.106613	12.9	1000.0	120.000	102.0	V	8.0	-20.7	30.6	43.5
343.045932	35.3	1000.0	120.000	140.0	V	155.0	-10.9	10.7	46.0
441.024208	41.9	1000.0	120.000	113.0	V	102.0	-8.5	4.1	46.0
539.098597	43.9	1000.0	120.000	102.0	V	84.0	-5.9	2.1	46.0
882.166733	46.0	1000.0	120.000	119.0	V	3.0	-1.6	0.0	46.0
930.043928	29.8	1000.0	120.000	102.0	V	46.0	-0.4	16.2	46.0
980.681122	47.6	1000.0	120.000	102.0	V	23.0	0.7	6.3	53.9

2.3.12 Test Results Radiated Emissions from 1GHz to 10GHz (3 meters)



Peak Data

Frequency (MHz)	MaxPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)
1078.14000	56.2	1000.0	1000.000	102.0	V	326.0	-10.6	17.7	73.9
1568.26000	63.4	1000.0	1000.000	102.0	V	270.0	-8.9	10.5	73.9
1666.25333	63.7	1000.0	1000.000	102.0	V	265.0	-8.4	10.2	73.9
1764.28666	67.1	1000.0	1000.000	131.0	V	300.0	-7.4	6.9	73.9
1862.32000	64.5	1000.0	1000.000	120.0	V	314.0	-6.8	9.4	73.9
2058.30666	66.2	1000.0	1000.000	102.0	V	169.0	-6.2	7.8	73.9
2156.34000	67.9	1000.0	1000.000	102.0	V	292.0	-6.1	6.0	73.9
2205.36000	67.0	1000.0	1000.000	102.0	V	32.0	-6.1	6.9	73.9
2303.35333	58.9	1000.0	1000.000	102.0	V	33.0	-5.6	15.0	73.9

Average Data

Frequency (MHz)	Average (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)
1078.14000	47.4	1000.0	1000.000	102.0	V	326.0	-10.6	6.5	53.9
1568.26000	39.4	1000.0	1000.000	102.0	V	270.0	-8.9	14.5	53.9
1666.25333	52.8	1000.0	1000.000	102.0	V	265.0	-8.4	1.1	53.9
1764.28666	44.7	1000.0	1000.000	131.0	V	300.0	-7.4	9.2	53.9
1862.32000	51.2	1000.0	1000.000	120.0	V	314.0	-6.8	2.7	53.9



2058.30666	47.6	1000.0	1000.000	102.0	V	169.0	-6.2	6.3	53.9
2156.34000	53.8	1000.0	1000.000	102.0	V	292.0	-6.1	0.1	53.9
2205.36000	52.8	1000.0	1000.000	102.0	V	32.0	-6.1	1.1	53.9
2303.35333	41.1	1000.0	1000.000	102.0	V	33.0	-5.6	12.8	53.9

Test Notes: All emissions above the Average limit during prescan were verified, only worst emissions per representative range are presented. There are no emissions observed above 4GHz.

2.4 RECEIVER SPURIOUS EMISSIONS

2.4.1 Specification Reference

RSS-Gen 4.10

2.4.2 Standard Applicable

The receiver shall be operated in the normal receive mode near the mid-point of the band in which the receiver is designed to operate.

Radiated emission measurements are to be performed on a test site registered with Industry Canada. As an alternative, the conducted measurement method may be used when the antenna is detachable. In such a case, the receiver spurious signal may be measured at the antenna port.

If the receiver is super-regenerative, stabilize it by coupling to it an unmodulated carrier on the receiver frequency (antenna conducted measurement) or by transmitting an unmodulated carrier on the receiver frequency from an antenna in the proximity of the receiver (radiated measurement). Taking care not to overload the receiver, vary the amplitude and frequency of the stabilizing signal to obtain the highest level of the spurious emissions from the receiver. For either method, the search for spurious emissions shall be from the lowest frequency internally generated or used in the receiver (e.g. local oscillator, intermediate or carrier frequency), or 30 MHz, whichever is higher, to at least 3 times the highest tuneable or local oscillator frequency, whichever is higher, without exceeding 40 GHz.

For emissions below 1000 MHz, measurements shall be performed using a CISPR quasi-peak detector and the related measurement bandwidth. As an alternative to CISPR quasi-peak measurement, compliance with the emission limit can be demonstrated using measuring equipment employing a peak detector function properly adjusted for factors such as pulse desensitization as required, with an equal or greater measurement bandwidth relative to the applicable CISPR quasi-peak bandwidth.

Above 1000 MHz, measurements shall be performed using an average detector with a minimum resolution bandwidth of 1 MHz

2.4.3 Equipment Under Test and Modification State

Serial No: N/A / Default Test Configuration

2.4.4 Date of Test/Initial of test personnel who performed the test

November 11, 2012/FSC

2.4.5 Test Equipment Used

The major items of test equipment used for the above tests are identified in Section 3.1.

2.4.6 Environmental Conditions

Ambient Temperature	22.4°C
Relative Humidity	44.7%
ATM Pressure	99.6 kPa



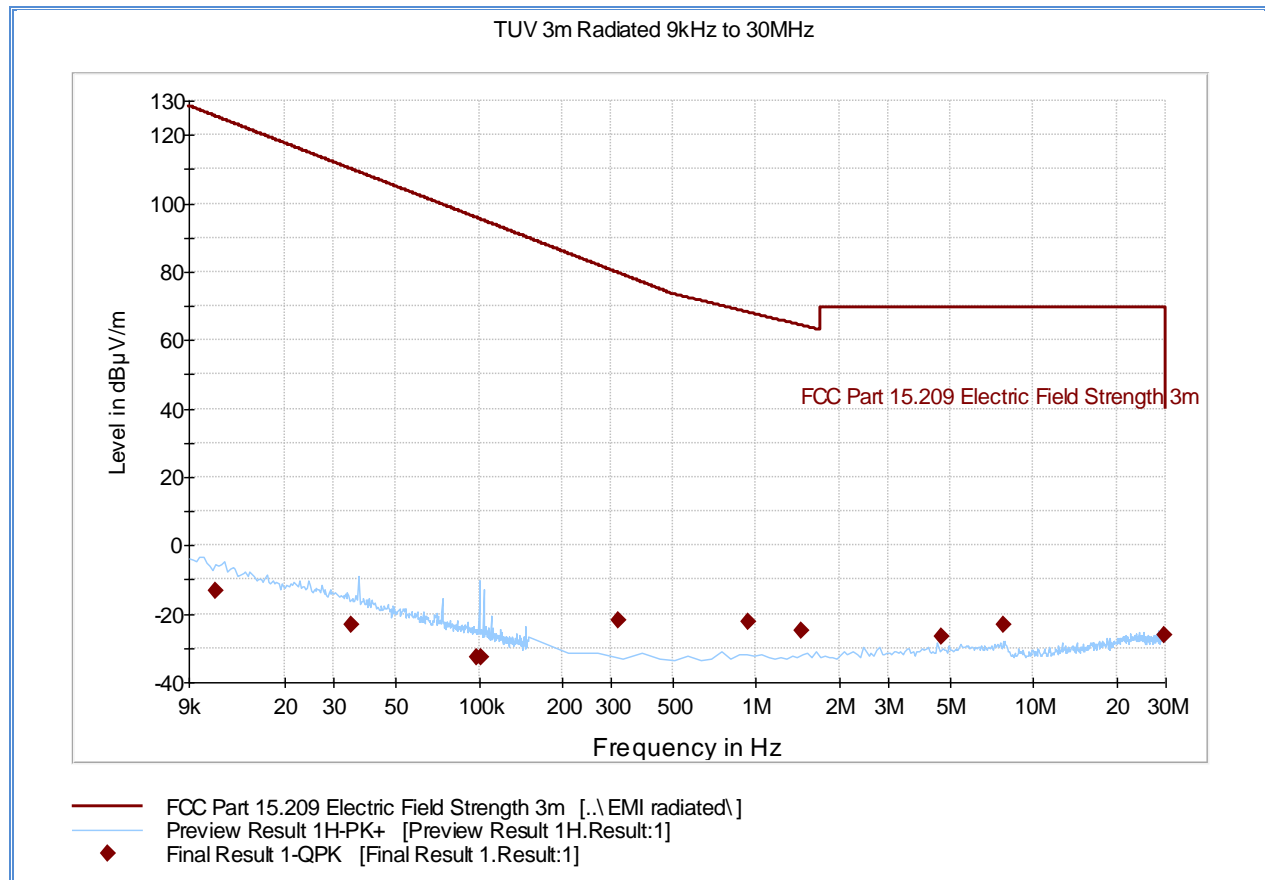
2.4.7 Additional Observations

- This is a radiated test. The spectrum was searched from 9kHz to the 18GHz (RSS-Gen requirement is from 30MHz to at least 3 times the highest tuneable or local oscillator frequency, whichever is higher – the highest frequency generated by the EUT is 49MHz, requirement is therefore up to 150MHz only).
- Limit used is from FCC §15.209 which is identical to RSS-Gen limits (>30MHz only).
- All emissions observed above 200MHz are noise floor measurements.
- Measurement was done using EMC32 automated software. Reported level is the actual level with all the correction factors factored in. Correction Factor column is for informational purposes only.

2.4.8 Test Results

See attached plots.

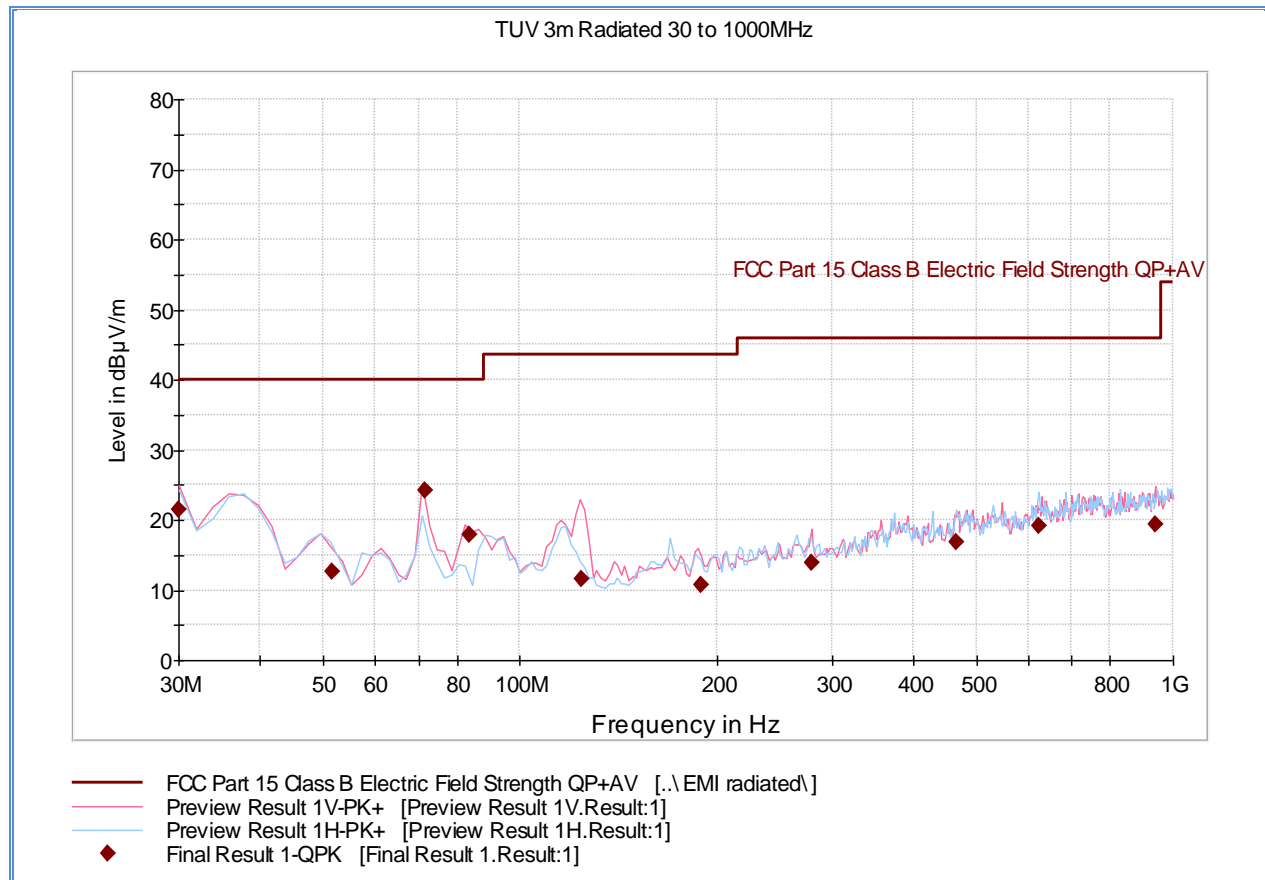
2.4.9 Test Results Radiated Emissions from 9kHz to 30MHz (3 meters)



Quasi Peak Data

Frequency (MHz)	QuasiPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)
0.011194	-13.5	1000.0	0.200	100.0	H	338.0	-27.9	139.0	125.5
0.034691	-23.2	1000.0	0.200	100.0	H	132.0	-30.6	133.2	110.0
0.098269	-32.9	1000.0	0.200	100.0	H	330.0	-32.0	128.7	95.8
0.102224	-32.8	1000.0	0.200	100.0	H	44.0	-32.1	128.0	95.3
0.318918	-22.0	1000.0	9.000	100.0	H	88.0	-32.5	101.7	79.7
0.937295	-22.4	1000.0	9.000	100.0	H	199.0	-32.2	90.6	68.2
1.455491	-24.7	1000.0	9.000	100.0	H	286.0	-31.9	89.0	64.3
4.646834	-26.7	1000.0	9.000	100.0	H	133.0	-31.6	96.3	69.5
7.797094	-23.1	1000.0	9.000	100.0	H	221.0	-31.7	92.6	69.5
29.810000	-26.3	1000.0	9.000	100.0	H	218.0	-27.7	95.9	69.5

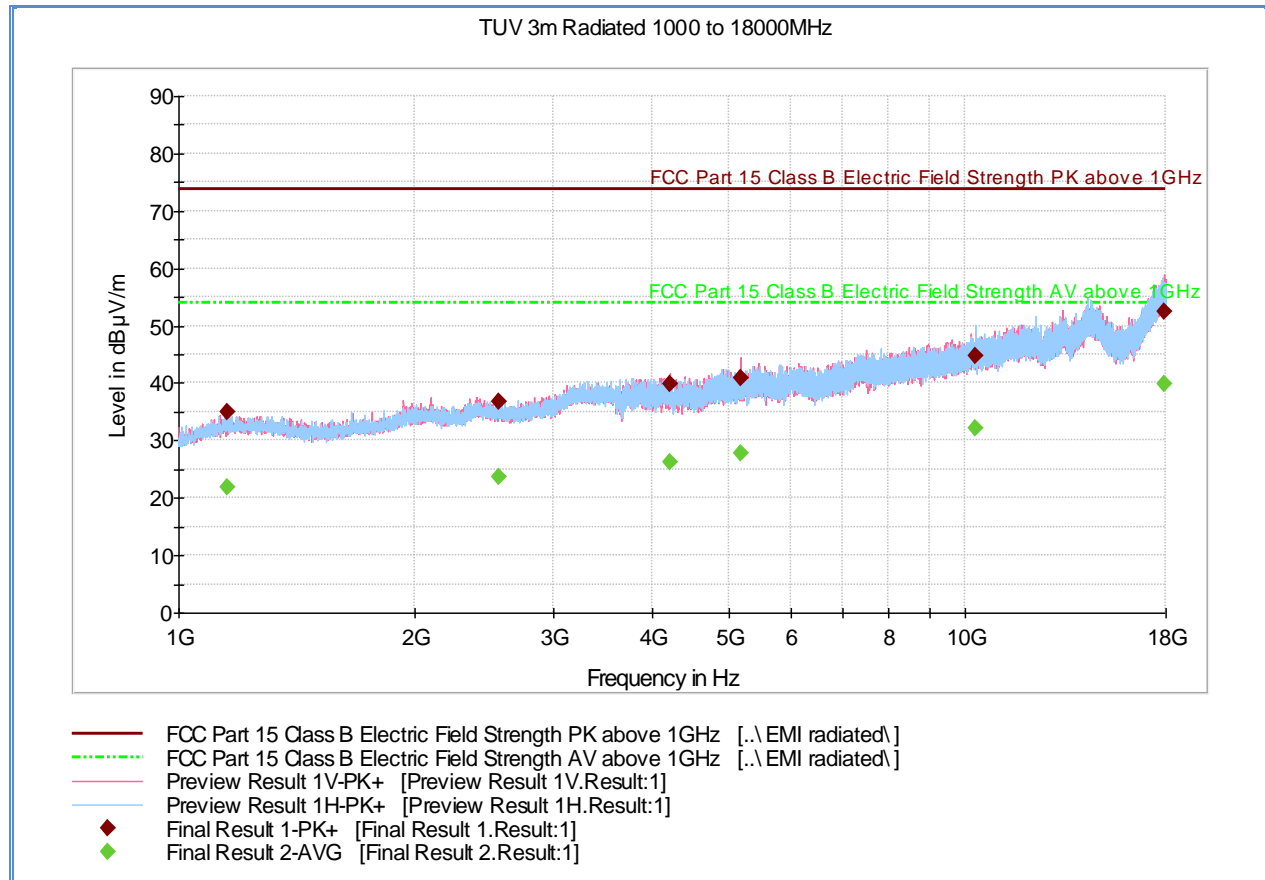
2.4.10 Test Results Radiated Emissions from 30kHz to 1000MHz (3 meters)



Quasi Peak Data

Frequency (MHz)	QuasiPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)
30.000000	21.5	1000.0	120.000	100.0	V	96.0	-12.0	18.5	40.0
51.438878	12.7	1000.0	120.000	230.0	V	162.0	-20.4	27.3	40.0
71.461643	24.1	1000.0	120.000	204.0	V	340.0	-21.9	15.9	40.0
83.812745	17.9	1000.0	120.000	324.0	V	217.0	-21.3	22.1	40.0
124.146613	11.6	1000.0	120.000	100.0	V	161.0	-20.7	31.9	43.5
189.454910	10.7	1000.0	120.000	143.0	V	9.0	-16.2	32.8	43.5
279.817635	13.9	1000.0	120.000	185.0	V	300.0	-12.4	32.1	46.0
464.950862	16.9	1000.0	120.000	381.0	H	176.0	-7.3	29.1	46.0
621.645772	19.1	1000.0	120.000	241.0	H	267.0	-3.1	26.9	46.0
937.275591	19.4	1000.0	120.000	350.0	V	311.0	0.0	26.6	46.0

2.4.11 Test Results Radiated Emissions from 1GHz to 10GHz (3 meters)



Peak Data

Frequency (MHz)	MaxPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)
1154.68000	35.0	1000.0	1000.000	182.0	H	338.0	-10.0	38.9	73.9
2557.01333	36.9	1000.0	1000.000	183.0	V	15.0	-4.4	37.0	73.9
4210.43333	39.9	1000.0	1000.000	196.0	V	67.0	0.6	34.0	73.9
5195.58000	40.8	1000.0	1000.000	284.0	V	299.0	3.5	33.1	73.9
10291.9733	44.9	1000.0	1000.000	374.0	H	261.0	10.4	29.0	73.9
17954.9666	52.4	1000.0	1000.000	102.0	V	37.0	21.6	21.5	73.9

Average Data

Frequency (MHz)	Average (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)
1154.68000	21.8	1000.0	1000.000	182.0	H	338.0	-10.0	32.1	53.9
2557.01333	23.7	1000.0	1000.000	183.0	V	15.0	-4.4	30.2	53.9
4210.43333	26.3	1000.0	1000.000	196.0	V	67.0	0.6	27.6	53.9
5195.58000	27.7	1000.0	1000.000	284.0	V	299.0	3.5	26.2	53.9
10291.9733	32.2	1000.0	1000.000	374.0	H	261.0	10.4	21.7	53.9
17954.9666	39.9	1000.0	1000.000	102.0	V	37.0	21.6	14.0	53.9



SECTION 3

TEST EQUIPMENT USED



3.1 TEST EQUIPMENT USED

List of absolute measuring and other principal items of test equipment.

ID Number (SDGE/SDRB)	Test Equipment	Type	Serial Number	Manufacturer	Cal Date	Cal Due Date
6628	ActiveLoop Antenna	HFH 2 –Z2	880 458/25	Rhode & Schwarz	05/09/12	05/09/13
1033	Bilog Antenna	3142C	00044556	EMCO	05/23/12	05/23/13
1040	EMI Test Receiver	ESIB40	100292	Rhode & Schwarz	08/10/12	08/10/13
1049	EMI Test Receiver	ESU	100133	Rhode & Schwarz	06/13/12	06/13/13
6815	2.4GHz Band Notch Filter	BRM50702	008	Micro-Tronics	Verified by 1040	
1051	Double-ridged waveguide horn antenna	3115	9408-4329	EMCO	01/04/12	01/04/13
1016	Pre-amplifier	PAM-0202	187	PAM	09/24/12	09/24/13
7546	Signal Generator	SMP-02	1035.5005.02	Rhode & Schwarz	06/15/12	06/15/13
1150	Horn antenna	RA42-K-F-4B-C	012054-004	CMT	Verified by 7546 and 1049	
1151	Pre-amplifier	TS-PR26	100026	Rhode & Schwarz	Verified by 7546 and 1049	
8628	Pre-amplifier	QLJ 01182835-JO	8986002	QuinStar Technologies Inc.	09/21/12	09/21/13
8543	High-frequency cable	Micropore 19057793	N/A	United Microwave Products	09/21/12	09/21/13
6452	Multimeter	3478A	2911A52177	Hewlett Packard	07/16/12	07/16/13
	Test Software	EMC32	V8.52	Rhode & Schwarz	N/A	

3.2 MEASUREMENT UNCERTAINTY

For a 95% confidence level, the measurement uncertainties for defined systems are:

3.2.1 Radiated Emission Measurements (Below 1GHz)

Contribution		Probability Distribution Type	Probability Distribution x_i	Standard Uncertainty $u(x_i)$	$[u(x_i)]^2$
1	Receiver/Spectrum Analyzer	Rectangular	0.45	0.26	0.07
2	Cables	Rectangular	0.50	0.29	0.08
3	Preamp	Rectangular	0.50	0.29	0.08
4	Antenna	Rectangular	0.75	0.43	0.19
5	Site	Rectangular	3.55	2.05	4.20
6	EUT Setup	Rectangular	1.00	0.58	0.33
Combined Uncertainty (u_c):					2.23
Coverage Factor (k):					2
Expanded Uncertainty:					4.45

3.2.2 Radiated Emission Measurements (Above 1GHz)

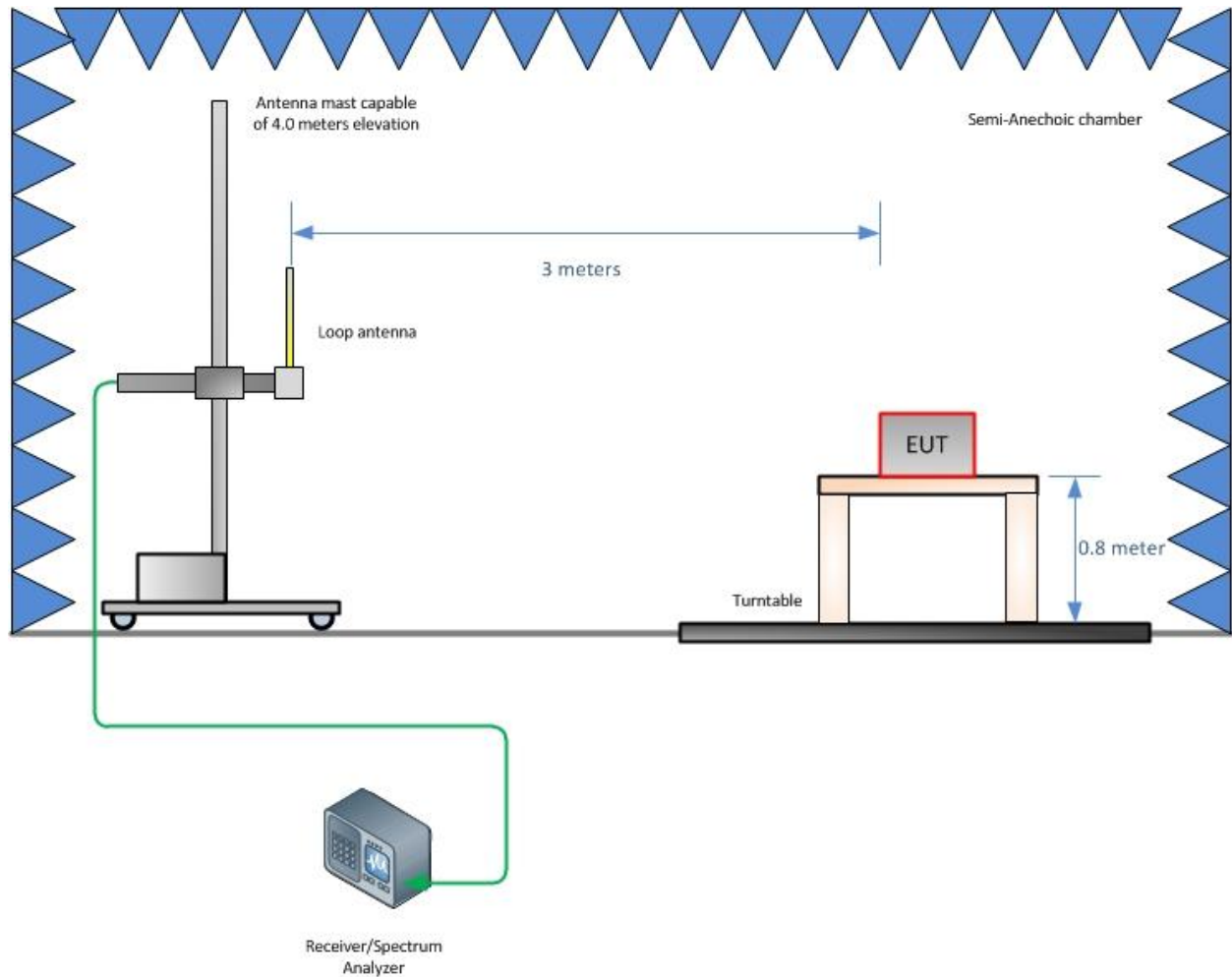
Contribution		Probability Distribution Type	Probability Distribution x_i	Standard Uncertainty $u(x_i)$	$[u(x_i)]^2$
1	Receiver/Spectrum Analyzer	Rectangular	0.57	0.33	0.11
2	Cables	Rectangular	0.70	0.40	0.16
3	Preamp	Rectangular	0.50	0.29	0.08
4	Antenna	Rectangular	0.37	0.21	0.05
5	Site	Rectangular	3.55	2.05	4.20
6	EUT Setup	Rectangular	1.00	0.58	0.33
Combined Uncertainty (u_c):					2.22
Coverage Factor (k):					2
Expanded Uncertainty:					4.44



SECTION 4

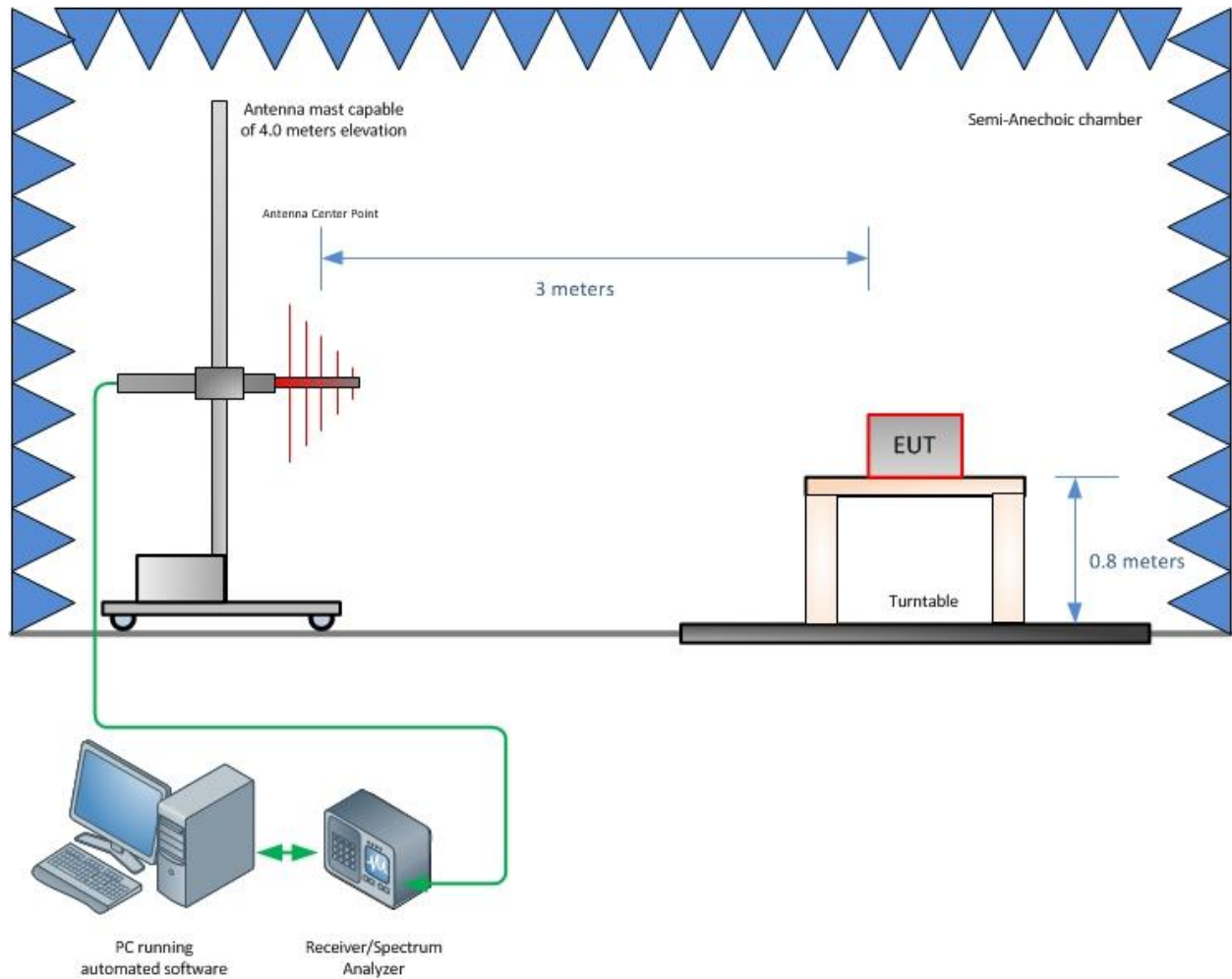
DIAGRAM OF TEST SETUP

4.1 TEST SETUP DIAGRAM

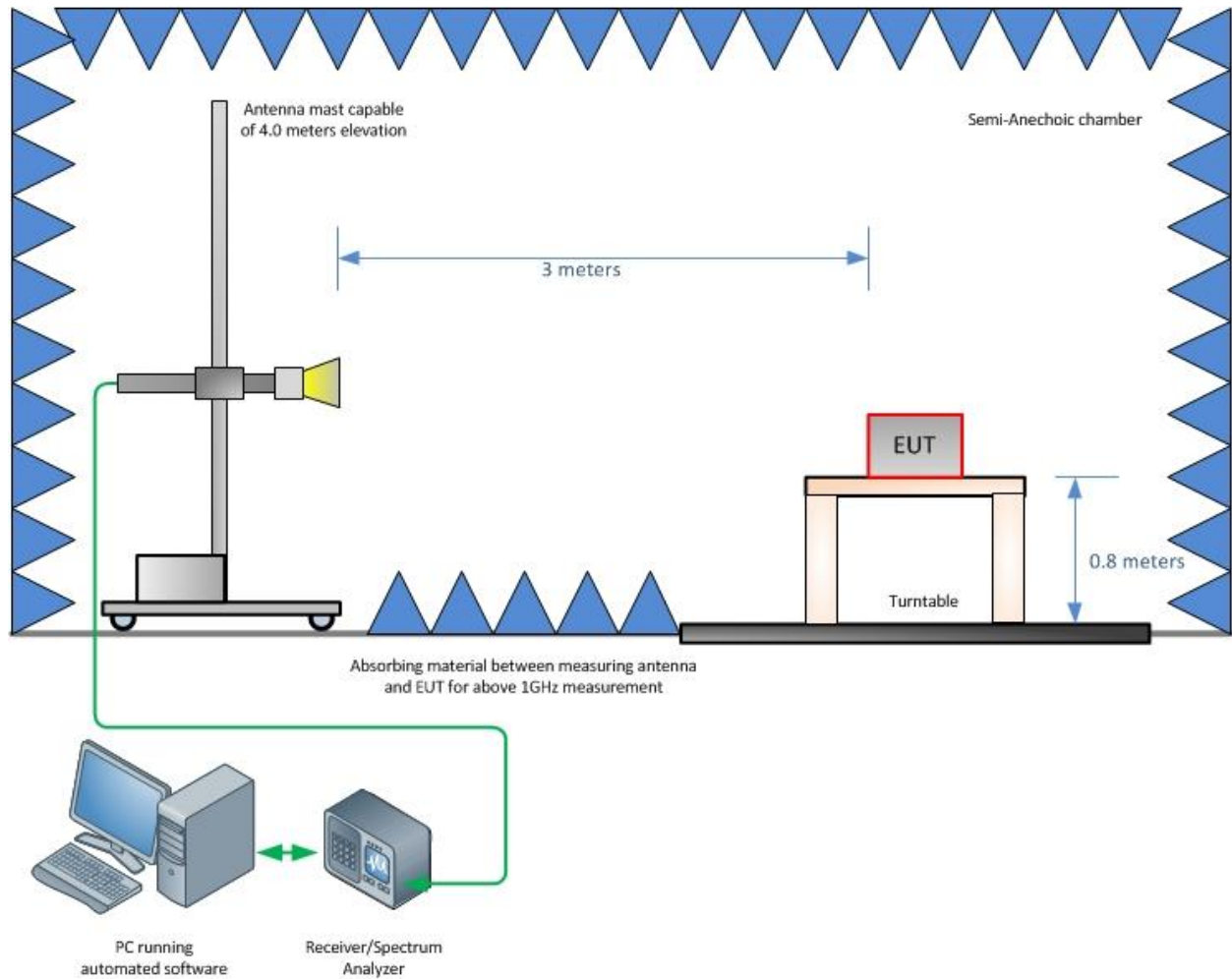


Radiated Emission Test Setup (Below 30 MHz)

Test Notes: Verification performed at both 1 meter and 3 meters.



Radiated Emission Test Setup (Between 30MHz and 1GHz)



Radiated Emission Test Setup (Above 1GHz)



SECTION 5

ACCREDITATION, DISCLAIMERS AND COPYRIGHT



5.1 ACCREDITATION, DISCLAIMERS AND COPYRIGHT

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