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Report On

Radio Testing of the
Hunter Douglas Window Fashions
Platinum App Bridge

FCC Part 15 Subpart C §15.249
IC RSS-210 Issue 8 December 2010

Report No. SC1206696B July 2012

REPORT ON	Radio Testing of the Hunter Douglas Window Fashions Bridge
TEST REPORT NUMBER	SC1206696B
PREPARED FOR	Hunter Douglas Window Fashions One Duette Way, Boomfield, CO 80020
CONTACT PERSON	Leon Gateno Senior RF Engineer (619) 216-6425 lgateno@smkusa.com
PREPARED BY	Juan Manuel Gonzalez **Name**
APPROVED BY	Chip R. Fleury **Name** Authorized Signatory
DATED	July 25, 2012

CONTENTS

SECTION 1

REPORT SUMMARY

Radio Testing of the
Hunter Douglas Window Fashions
Bridge

1.1 INTRODUCTION

The information contained in this report is intended to show verification of the Hunter Douglas Window Fashions Bridge to the requirements of FCC Part 15 Subpart C §15.249 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	Hunter Douglas Window Fashions
Model Number(s)	1010520090
FCC ID Number	UXUPC
IC Number	7316A-PC
Serial Number(s)	N/A
Number of Samples Tested	**1**
Test Specification/ Issue/Date	• FCC Part 15 Subpart C §15.249 (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	June 21, 2012
Finish of Test	July 25, 2012
Name of Engineer(s)	Juan Manuel Gonzalez Kathy Mackenzie Ferdie Custodio
Related Document(s)	SC1206696A_FCC Subpart B Class B Test Report. Other supporting documents for EUT certification are separate exhibits.

1.2 BRIEF SUMMARY OF RESULTS

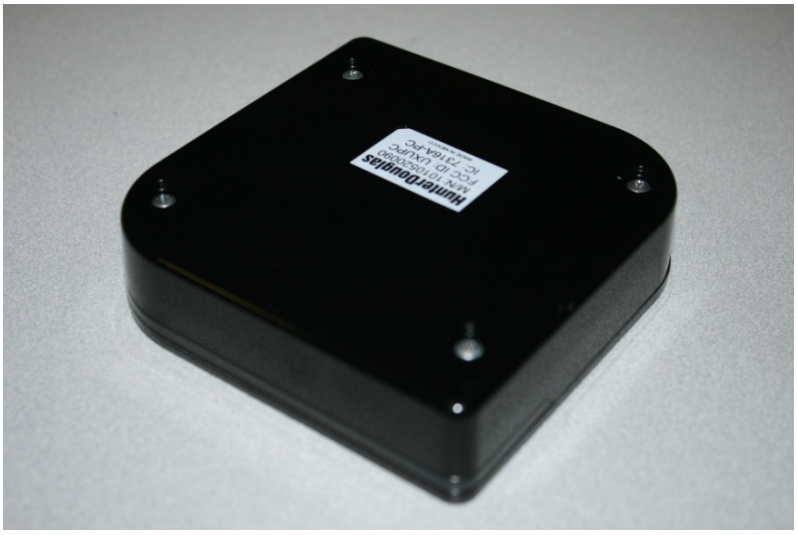
A brief summary of the tests carried out in accordance with FCC Part 15 Subpart C §15.249 with cross-reference to the corresponding IC RSS standard is shown below.

Section	Spec Clause	RSS	Test Description	Result	Comments/Base Standard
2.1	§15.207(a)	RSS-Gen 7.2.4	Conducted Emissions	Compliant	
2.2	§15.215(c)	RSS-Gen 4.6.3	20 dB Bandwidth	Compliant	
2.3		RSS-Gen 4.6.1	99% Emission Bandwidth	Compliant	
2.4	§15.249(a)	RSS-210 A2.9(a)	Field Strength Limits for Fundamental and Harmonics	Compliant	
2.5	§15.249(d)	RSS-210 A2.9(b)	Spurious Radiated Emissions	Compliant	
2.6		RSS-Gen 4.10	Receiver Spurious Emissions	Compliant	

1.3 PRODUCT INFORMATION

1.3.1 EUT General Description

The Equipment Under Test (EUT) was a Hunter Douglas Window Fashions Platinum App model no. 1010520090 Bridge as shown in the photograph below. The EUT is a wireless device acting as a "bridge" between Ethernet and a proprietary RF network.



Equipment Under Test

1.3.2 EUT General Description

EUT Description	Bridge
Model Name	Platinum App
Model Number(s)	1010520090
Rated Voltage	5.0VDC (USB Mini Port)
Output Power	92.49dBµV/m @ 3 meters (532 µW EIRP)
Frequency Range	2433 MHz to 2471 MHz in the 2400 MHz to 2483.5 MHz Band
Number of Operating Frequencies	4
Channels Verified	Low Channel 2433 MHz Control Channel 2440MHz Mid Channel 2452MHz High Channel 2471MHz Note.-2440MHz used for short period handshake communication between Bridge and Repeater (Shock Burst) main RF Signal Tx performed with 2433MHz,2452MHz and 2471MHz.
Antenna Type (used during evaluation)	Integral: Folded wire monopole (Complies with Part 15.203 requirements)
Antenna Gain	3.3 dBi
Modulation Used	GFSK

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1.4 EUT TEST CONFIGURATION

1.4.1 Test Configuration Description

Test Configuration	Description
A	EUT transmitting sequentially between three channels. EUT powered by the provided USB AC adapter.
B	Test configuration as stated under SC1206696A_FCC Subpart B Class B Test Report

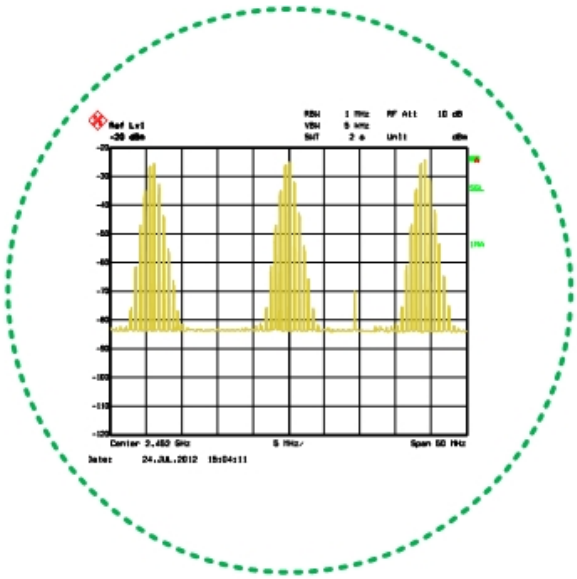
1.4.2 EUT Exercise Software

A test firmware was installed on the EUT during investigation. Pressing the SW button will cycle the EUT to transmit on all three channels, control channel, normal transmit mode (all three frequencies transmitting sequentially) and RF transmission off.

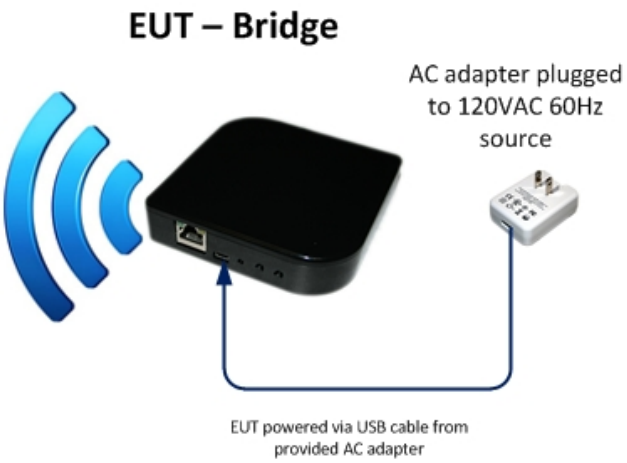
1.4.3 Support Equipment and I/O cables

Manufacturer	Equipment/Cable	Description
Iemrep.com	I.T.E Power Supply	Model GFP051-0505-1 100-240VAC 50/60Hz 0.2A. Output 5.0V 500mA

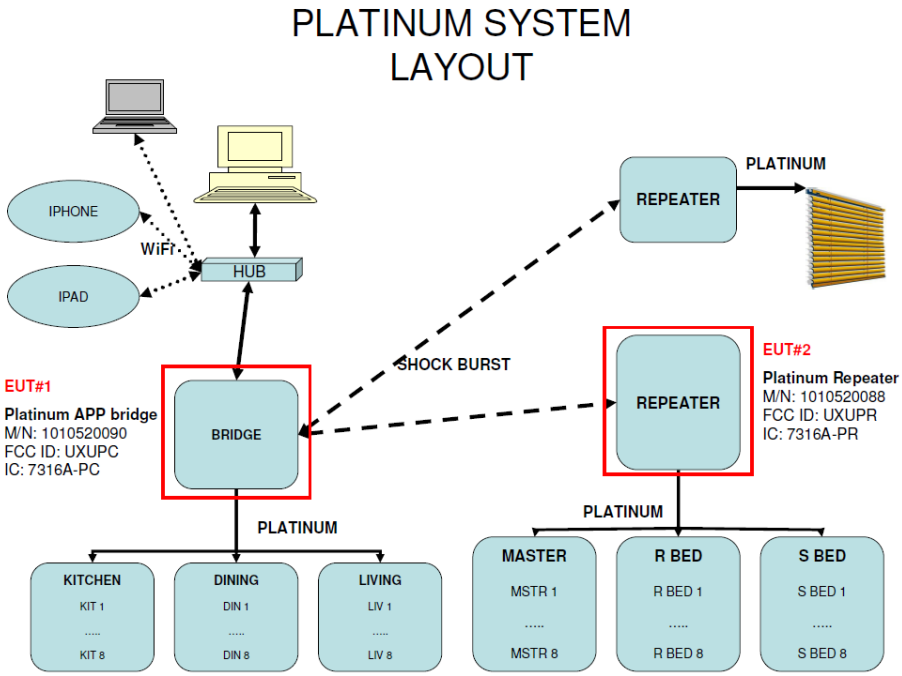
1.4.4 Simplified Test Configuration Diagram



Signal transmission as seen from a Spectrum Analyzer.
EUT is transmitting sequentially between three channels.



1.4.5 Platinum System Layout and Bridge Block Diagram



1.5 DEVIATIONS FROM THE STANDARD

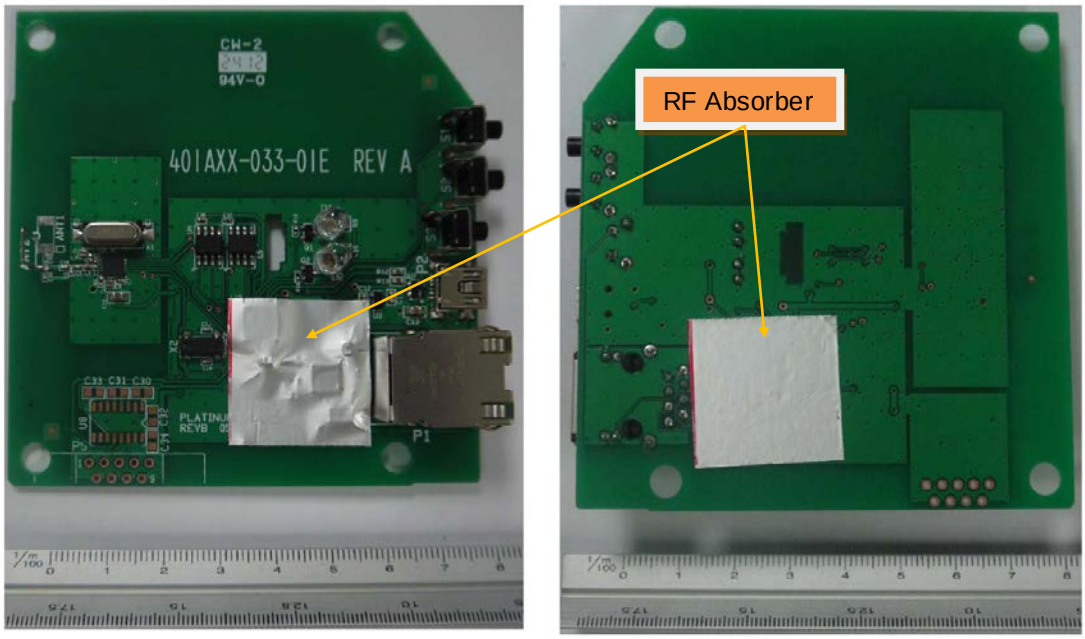
No deviations from the applicable test standards or test plan were made during testing.

1.6 MODIFICATION RECORD

Description of Modification	Modification Fitted By	Date Modification Fitted
Serial Number N/A		
Add RF Suppressor to main IC (A & B Side). Size: 25x28mm, per our customer declaration there are 3 parts with same performance that can be used. For our test only part (2) was tested. (1).- TDK IRJ17. 0.5mm magnetic sheet only (2).-TDK IRJH3. 0.5mm magnetic sheet only (3).-3M.AB6005S. 0.1mm absorber + shielding *See below pictures for RF Absorber location.	Toshi Ido	07/03/12

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.

IC: 7316A-PC



Top View (Main PCB)

Bottom View (Main PCB)

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.: US5281

TUV SUD America Inc. (San Diego), a §2.498 listed test firm operates the EMC Laboratory registered under Sony Electronics Inc. Product Quality Division EMC. This laboratory has been registered and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files and the Registration is US5281.

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
Hunter Douglas Window Fashions
Bridge

2.1 CONDUCTED EMISSIONS

2.1.1 Specification Reference

Part 15 Subpart C §15.207(a)

2.1.2 Standard Applicable

An intentional radiator that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies, within the band 150 kHz to 30 MHz, shall not exceed the limits in the following table, as measured using a 50 µH/50 ohms line impedance stabilization network (LISN).

Frequency of emission (MHz)	Conducted limit (dBµV)	
	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.*

2.1.3 Equipment Under Test and Modification State

Serial No: N/A / Test Configuration A

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

July 24, 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	23.1°C
Relative Humidity	47.9%
ATM Pressure	99.1 kPa

2.1.7 Additional Observations

- The EUT is a USB powered device.
- Verification was performed using the supplied USB AC adapter.
- Measurement was done using EMC32 V8.52 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 2.1.8 for sample computation.

2.1.8 Sample Computation (Conducted Emission – Quasi Peak)

Measuring equipment raw measurement (dbµV) @ 150kHz			5.5
Correction Factor (dB)	Asset# 8607 (20 dB attenuator)	19.9	20.7
	Asset# 1177 (cable)	0.15	
	Asset# 1176 (cable)	0.35	
	Asset# 7567 (LISN)	0.30	
Reported QuasiPeak Final Measurement (dbµV) @ 150kHz			**26.2**

2.1.9 Test Results

Compliant. See attached plots and tables.

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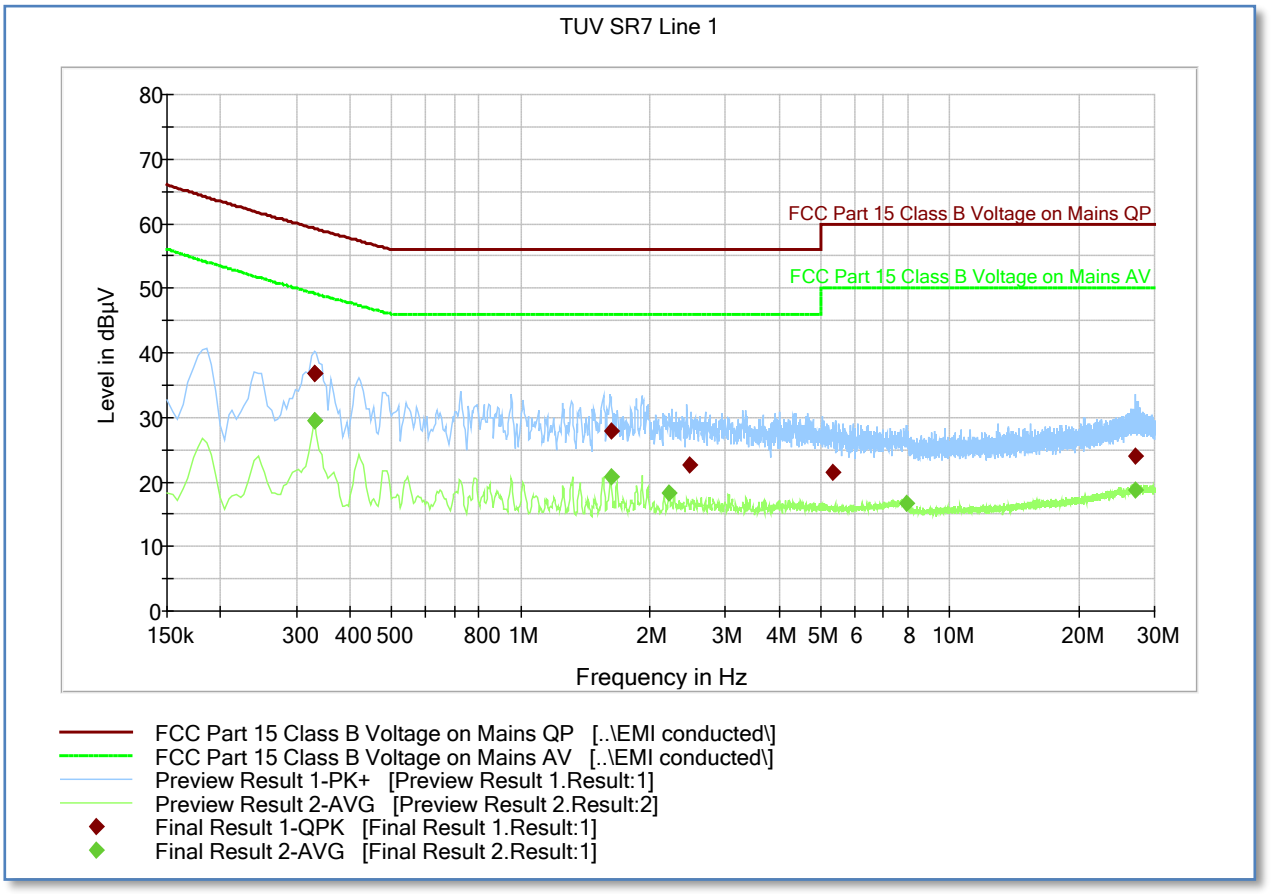
2.1.10 Line 1 (Hot)



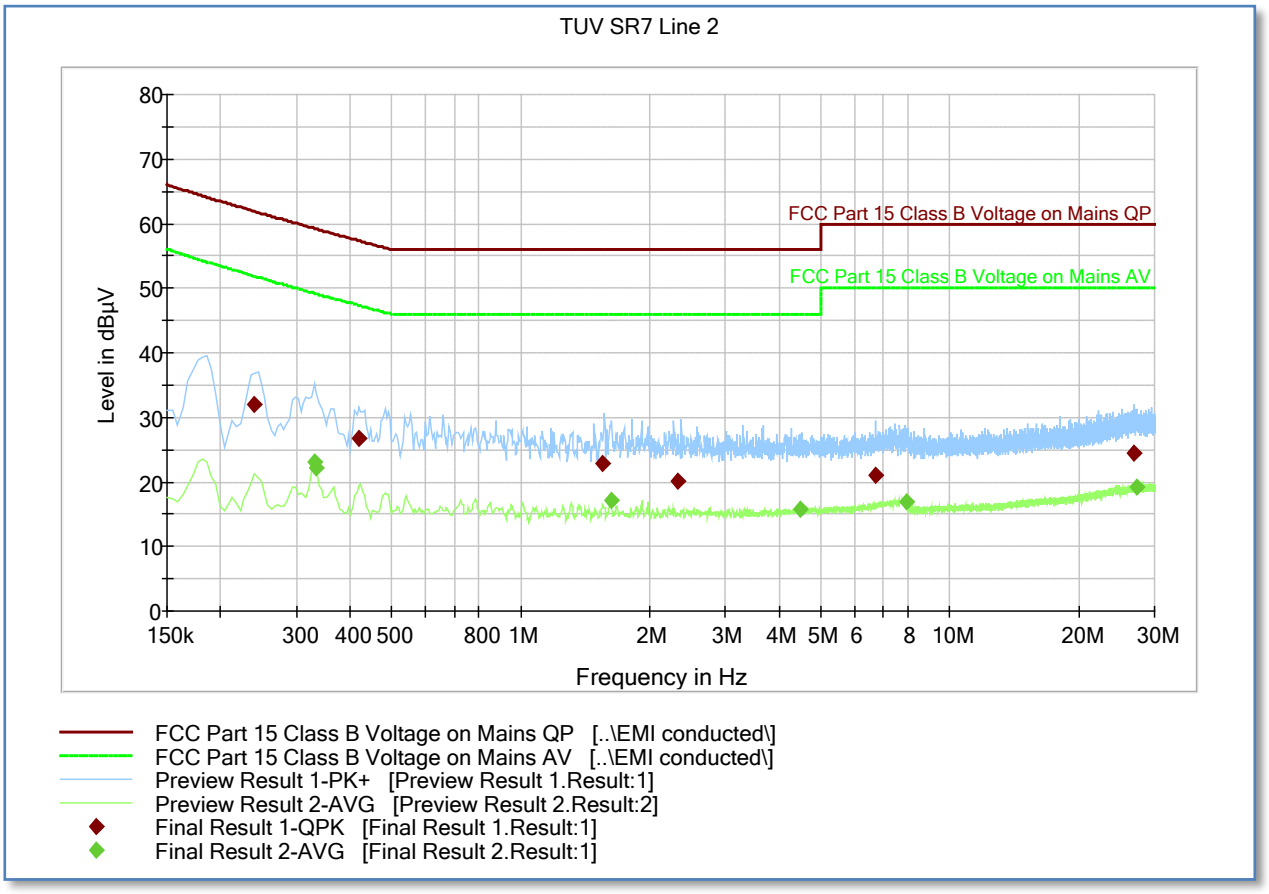
Quasi Peak

Frequency (MHz)	QuasiPeak (dBµV)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin - QPK (dB)	Limit - QPK (dBµV)
0.330000	36.9	1000.0	9.000	Off	L1	20.2	22.4	59.3
0.330000	36.9	1000.0	9.000	Off	L1	20.2	22.4	59.3
1.626000	27.8	1000.0	9.000	Off	L1	20.1	28.2	56.0
2.467500	22.7	1000.0	9.000	Off	L1	20.1	33.3	56.0
5.352000	21.5	1000.0	9.000	Off	L1	20.3	38.5	60.0
27.127500	24.1	1000.0	9.000	Off	L1	21.2	35.9	60.0

Average

Frequency (MHz)	Average (dBµV)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin - Ave (dB)	Limit – Ave (dBµV)
0.330000	29.5	1000.0	9.000	Off	L1	20.2	19.7	49.2
0.330000	29.5	1000.0	9.000	Off	L1	20.2	19.7	49.2
1.621500	20.8	1000.0	9.000	Off	L1	20.1	25.2	46.0
2.224500	18.4	1000.0	9.000	Off	L1	20.1	27.6	46.0
7.930500	16.7	1000.0	9.000	Off	L1	20.3	33.3	50.0
27.078000	18.8	1000.0	9.000	Off	L1	21.2	31.2	50.0

2.1.11 Line 2 (Neutral)



Quasi Peak

Frequency (MHz)	QuasiPeak (dBµV)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin - QPK (dB)	Limit - QPK (dBµV)
0.240000	32.0	1000.0	9.000	Off	N	20.7	29.9	61.9
0.420000	26.7	1000.0	9.000	Off	N	20.6	30.6	57.3
1.554000	22.8	1000.0	9.000	Off	N	20.5	33.2	56.0
2.323500	20.2	1000.0	9.000	Off	N	20.5	35.8	56.0
6.702000	21.1	1000.0	9.000	Off	N	20.7	38.9	60.0
26.916000	24.5	1000.0	9.000	Off	N	21.6	35.5	60.0

Average

Frequency (MHz)	Average (dBµV)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin - Ave (dB)	Limit – Ave (dBµV)
0.330000	23.0	1000.0	9.000	Off	N	20.6	26.2	49.2
0.334500	22.2	1000.0	9.000	Off	N	20.6	26.9	49.1
1.621500	17.0	1000.0	9.000	Off	N	20.5	29.0	46.0
4.497000	15.8	1000.0	9.000	Off	N	20.7	30.2	46.0
7.921500	17.0	1000.0	9.000	Off	N	20.7	33.0	50.0
27.379500	19.1	1000.0	9.000	Off	N	21.6	30.9	50.0

2.2 20 dB BANDWIDTH

2.2.1 Specification Reference

Part 15 Subpart C §15.215(c)

2.2.2 Standard Applicable

(c) Intentional radiators operating under the alternative provisions to the general emission limits, as contained in §§15.217 through 15.257 and in Subpart E of this part, must be designed to ensure that the 20 dB bandwidth of the emission, or whatever bandwidth may otherwise be specified in the specific rule section under which the equipment operates, is contained within the frequency band designated in the rule section under which the equipment is operated. The requirement to contain the designated bandwidth of the emission within the specified frequency band includes the effects from frequency sweeping, frequency hopping and other modulation techniques that may be employed as well as the frequency stability of the transmitter over expected variations in temperature and supply voltage. If a frequency stability is not specified in the regulations, it is recommended that the fundamental emission be kept within at least the central 80% of the permitted band in order to minimize the possibility of out-of-band operation.

2.2.3 Equipment Under Test and Modification State

Serial No: N/A / Test Configuration A

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

July 25, 2012/FC

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	23.0°C
Relative Humidity	48.8%
ATM Pressure	99.0 kPa

2.2.7 Additional Observations

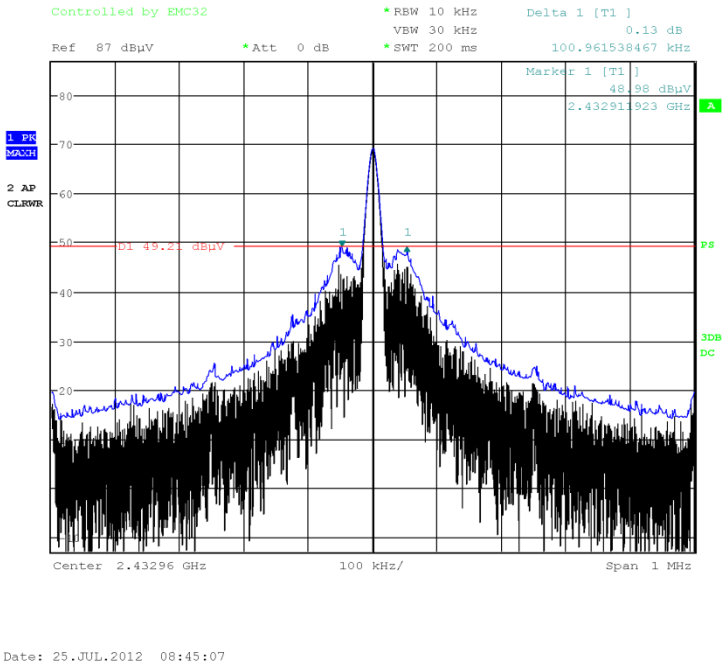
- This is a radiated test.
- A peak output reading was taken. A display line was drawn 20dB below the peak level.
- 20dB bandwidth verified using delta-marker measurements from the line drawn.
- Span is wide enough to capture the channel transmission.
- RBW is 1% of the span.
- VBW is 3X RBW.

- Sweep is auto.
- Detector is peak.
- Trace is max hold.

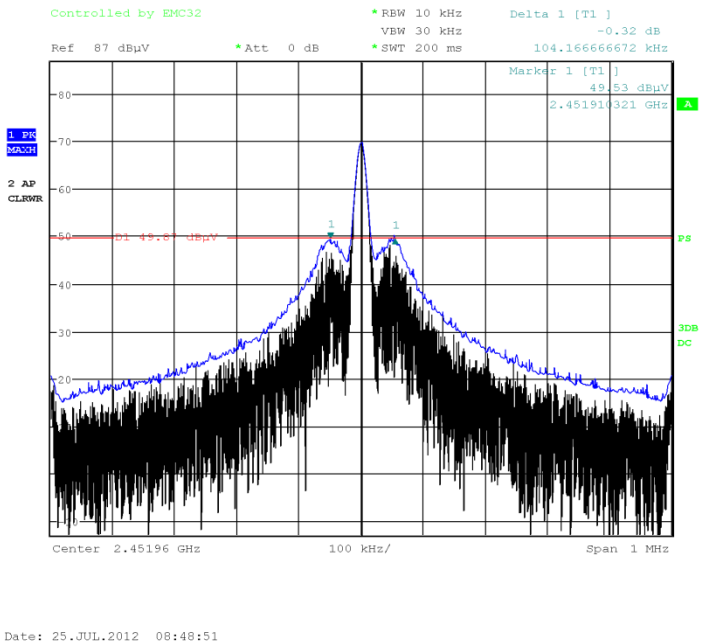
2.2.8 Test Results

Low Channel (2433 MHz)	Mid Channel (2452MHz)	High Channel (2471MHz)	Control Channel (2440MHz)
100.96KHz	104.16KHz	110.57 KHz	83.33 KHz

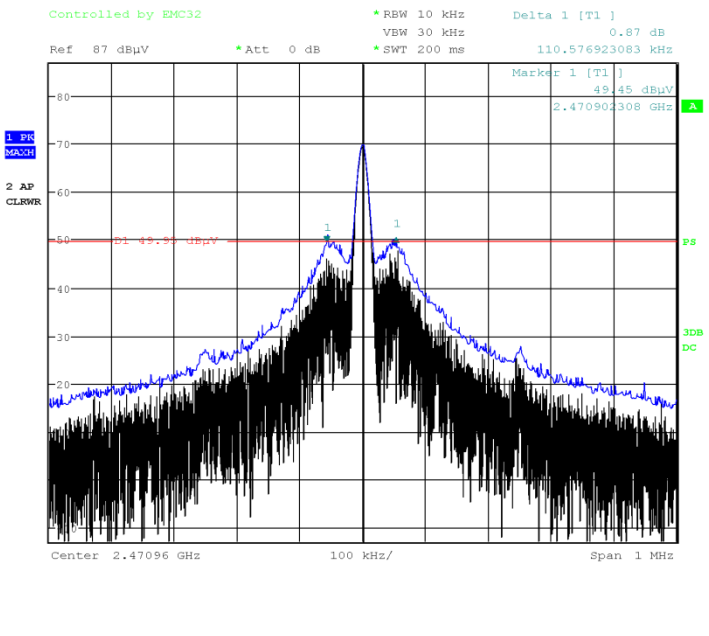
2433.00 MHz – (20dB BW/2) = 2432.95MHz (within the frequency band - **Compliant**)
2471.00MHz + (20dB BW/2) = 2471.05 MHz (within the frequency band - **Compliant**)



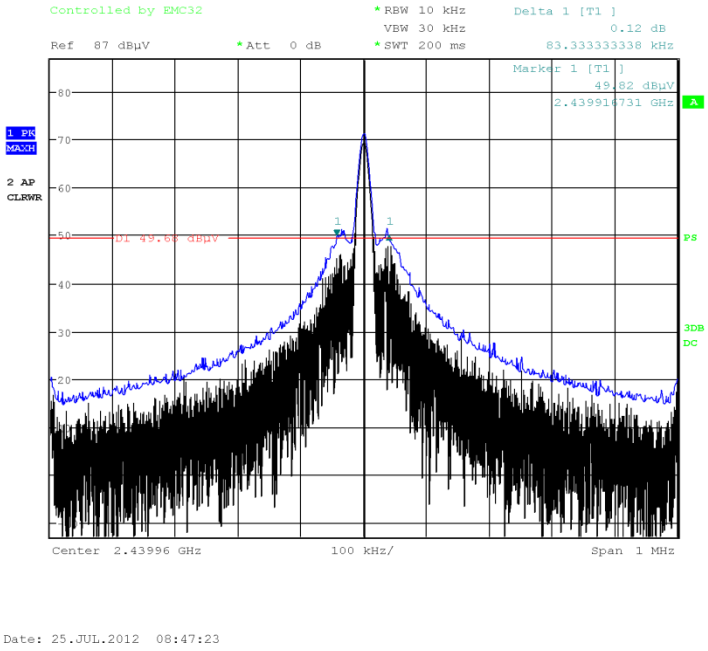
Low Channel



Mid Channel



High Channel



Control Channel

2.3 99% EMISSION BANDWIDTH

2.3.1 Specification Reference

RSS-Gen Clause 4.6.1

2.3.2 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.

2.3.3 Equipment Under Test and Modification State

Serial No: N/A / Test Configuration A

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

July 25, 2012/FC

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	23.0°C
Relative Humidity	48.8%
ATM Pressure	99.0 kPa

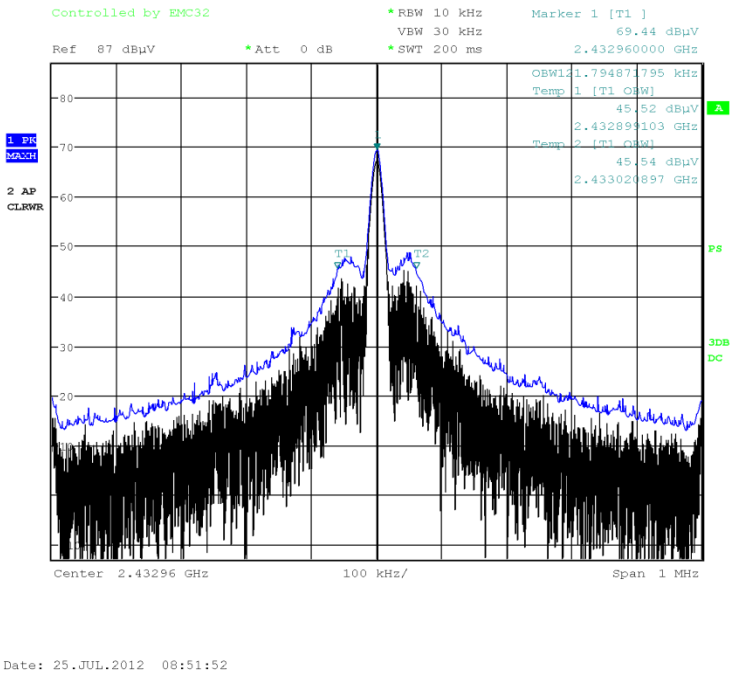
2.3.7 Additional Observations

- 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.

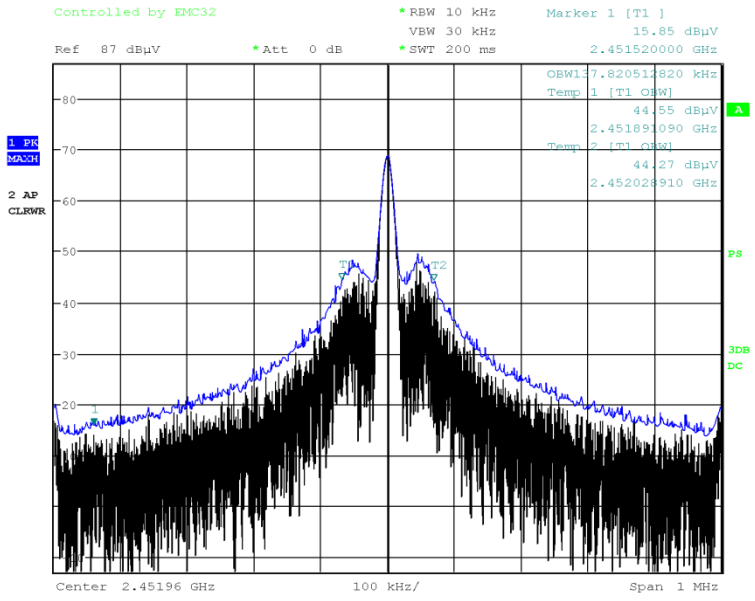
- The % Power Bandwidth setting in the spectrum analyzer was set to 99% (default).
- The Channel Bandwidth measurement function of the spectrum analyzer was used for this test.

2.3.8 Test Results

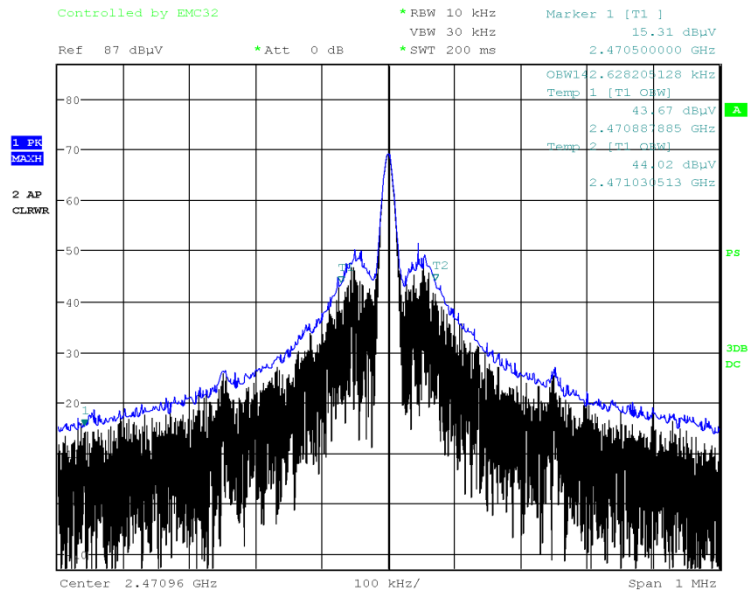
Low Channel (2433 MHz)	Mid Channel (2452MHz)	High Channel (2471MHz)	Control Channel (2440MHz)
121.79 KHz	137.82 KHz	142.62 KHz	137.82 KHz



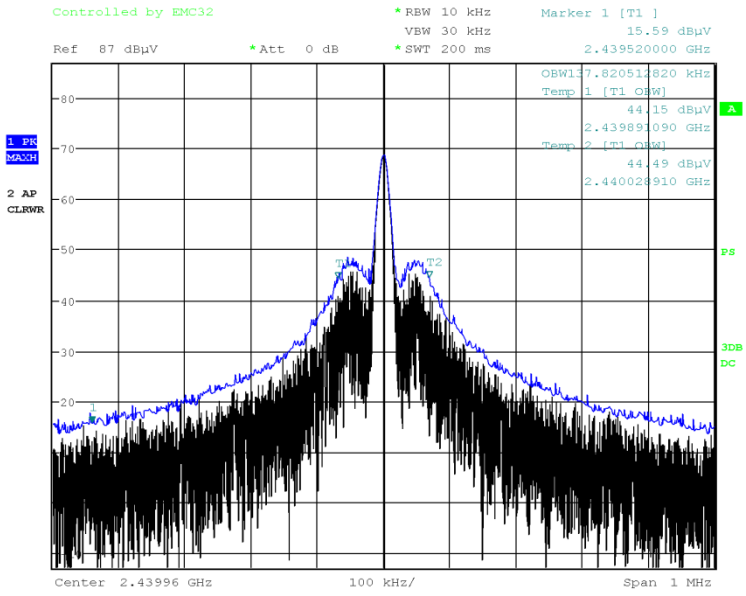
Low Channel



Mid Channel



High Channel



Control Channel

2.4 FIELD STRENGTH LIMITS FOR FUNDAMENTAL AND HARMONICS

2.4.1 Specification Reference

Part 15 Subpart C §15.249(a)

2.4.2 Standard Applicable

(a) The field strength of emissions from intentional radiators operated within these frequency bands shall comply with the following:

Fundamental frequency	Field strength of fundamental (millivolts/meter)	Field strength of harmonics (microvolts/meter)
902–928 MHz	50	500
2400–2483.5 MHz	50	500
5725–5875 MHz	50	500
24.0–24.25 GHz	250	2500

2.4.3 Equipment Under Test and Modification State

Serial No: N/A / Test Configuration A

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

July 03, 2012/JMG

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	23.1°C
Relative Humidity	43.5%
ATM Pressure	99.0 kPa

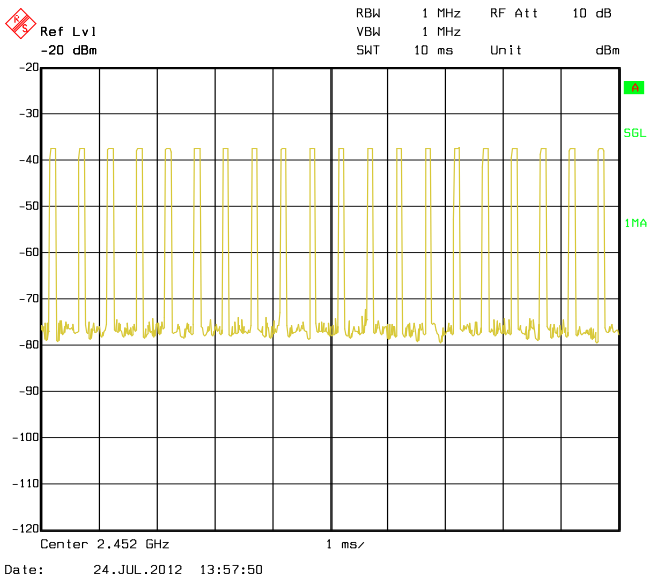
2.4.7 Additional Observations

- This is a radiated test. The spectrum was searched from 1GHz to the 10th harmonic (25GHz).
- During fundamental measurements, harmonics scanned during the sweep are ignored. A separate harmonics measurements were performed with a notch filter installed attenuating the fundamental frequencies.
- Measurement was done using EMC32 V8.52 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 2.4.8 for sample computation.

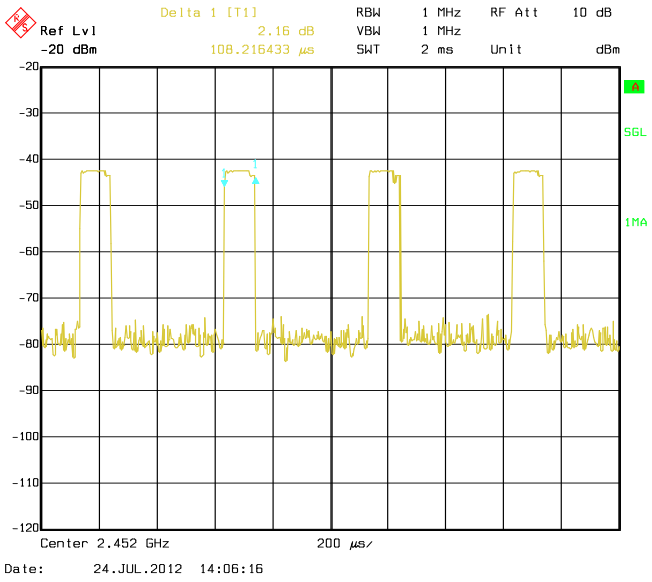
2.4.8 Sample Computation (Radiated Emission)

Measuring equipment raw measurement (dbµV) **@ 2400 MHz**			58.4
Correction Factor (dB)	Asset# 1153 (cable)	3.3	**-4.8**
	Asset# 8628 (preamplifier)	-36.4	
	Asset# 1051 (antenna)	28.3	
Reported Peak Final Measurement (dbµV/m) @ 2400 MHz			**53.6**

2.4.9 Duty Cycle Correction Factor Calculation



10ms sweep (representative channel)



2ms sweep (representative channel)

Duty Cycle Calculation:	= 20x “on” time per 10ms
	= 200x “on” time per 100ms (20 x 10ms)
	= 0.108 ms x 200
	= 21.6 ms “On” time per 100 ms sweep
Duty Cycle Correction Factor	= 20 log (0.216)
	= **-13.31dB**

2.4.10 Test Results

See attached plots.

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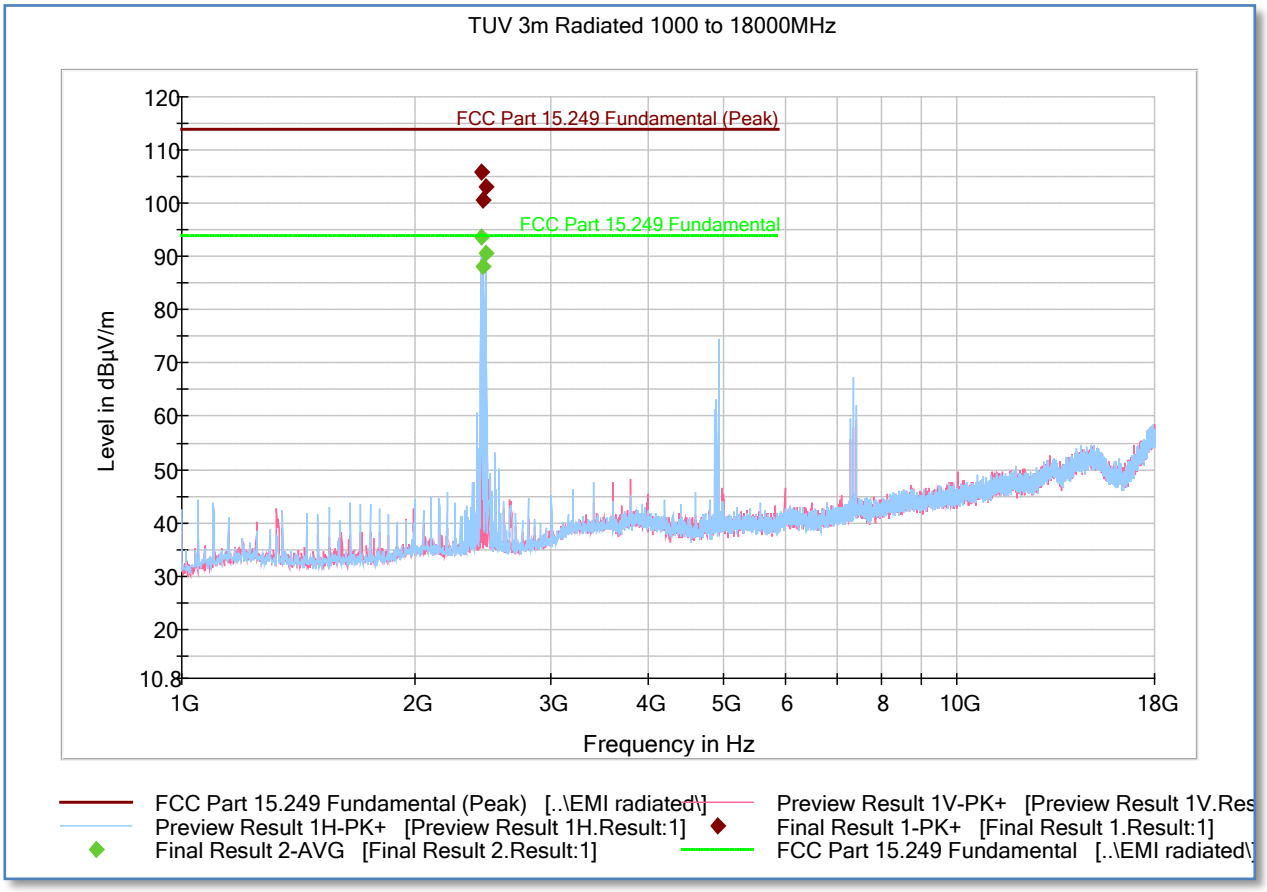
2.4.11 Test Results Fundamental Frequencies



Peak Data

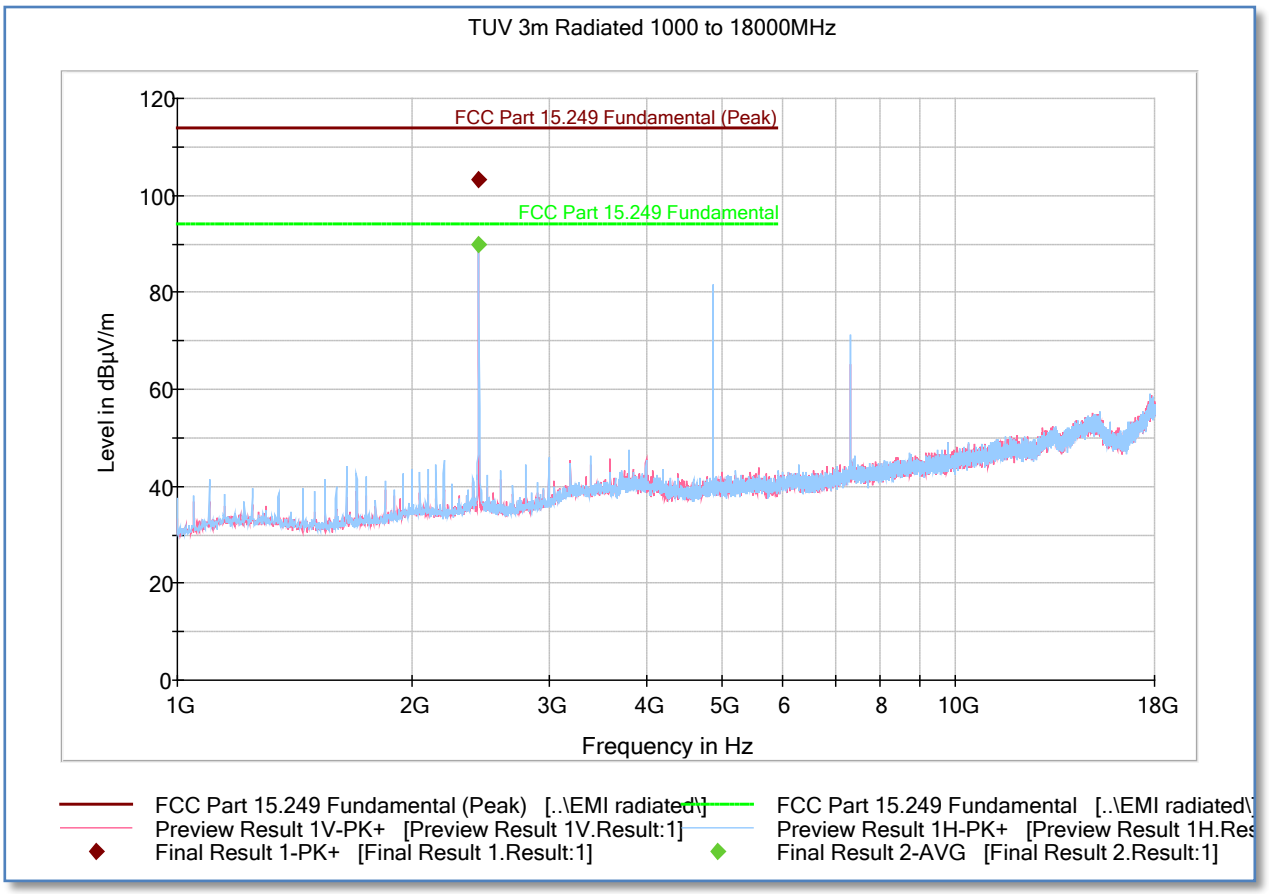
Frequency (MHz)	MaxPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)
2432.96000	105.8	1000.0	1000.000	100.0	H	45.0	-4.7	8.2	114.0
2451.94000	100.6	1000.0	1000.000	100.0	H	301.0	-4.7	13.4	114.0
2470.96000	103.0	1000.0	1000.000	100.0	H	15.0	-4.6	10.9	114.0

Average Data

Frequency (MHz)	Average (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)
2432.96000	92.49							1.51	94.0
2451.94000	87.29							6.71	94.0
2470.96000	89.69							4.31	94.0

Test Notes: Average data are from Peak data with Duty Cycle correction factor applied. Sample computation:
2432.960 MHz (Low Channel) = 105.8 dBµV/m (Peak)
= 105.8 dBµV/m + (-13.31 dB DCCF)
= 92.49 dBµV/m (Average)

2.4.12 Test Results Fundamental (Default configuration, Control Channel)



Peak Data

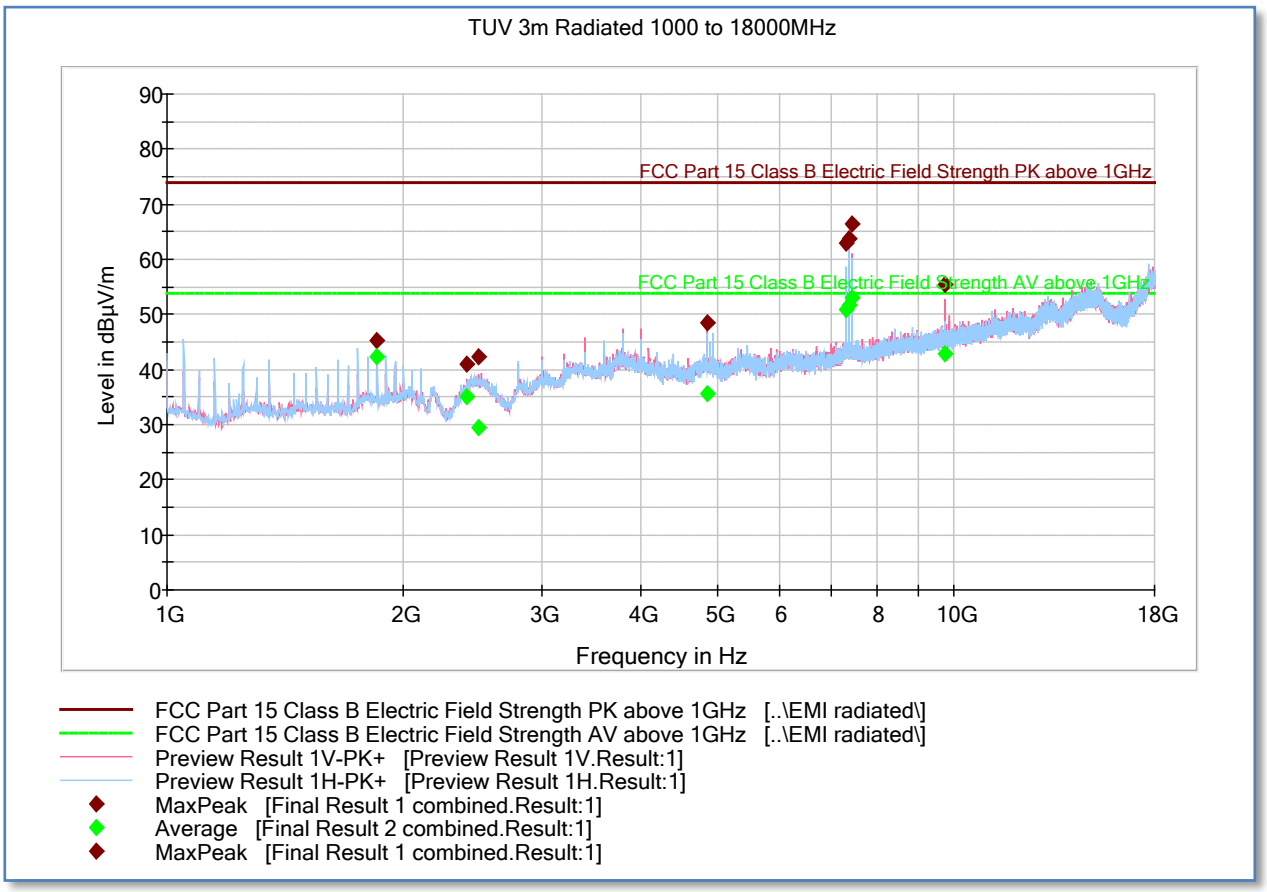
Frequency (MHz)	MaxPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)
2439.96000	103.3	1000.0	1000.000	100.0	H	65.0	-4.7	10.7	114.0

Average Data

Frequency (MHz)	Average (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)
2439.96000	89.99							4.01	94.0

Test Notes: Average data are from Peak data with Duty Cycle correction factor applied. Sample computation:
2439.960 MHz (Control Channel) = 103.3 dBµV/m (Peak)
= 103.3 dBµV/m + (-13.31 dB DCCF)
= 89.99 dBµV/m (Average)

2.4.13 Test Results Harmonics including Band Edges



Peak Data

Frequency (MHz)	MaxPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)
1850.060000	45.3	1000.0	1000.000	100.0	H	67.0	-6.8	28.6	73.9
2400.100000	41.1	100.0	1000.000	100.0	H	36.0	4.7	32.8	73.9
2483.560000	42.3	100.0	1000.000	100.0	H	39.0	5.6	31.6	73.9
4865.940000	48.5	1000.0	1000.000	139.0	V	155.0	2.2	25.4	73.9
7298.880000	63.1	1000.0	1000.000	100.0	H	295.0	7.0	10.8	73.9
7355.880000	63.8	1000.0	1000.000	112.0	H	290.0	7.2	10.1	73.9
7412.860000	66.4	1000.0	1000.000	166.0	V	232.0	7.2	7.5	73.9
9731.860000	55.5	1000.0	1000.000	161.0	V	254.0	9.5	18.4	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)
1850.060000	31.99							21.91	53.9
2400.100000	27.79							26.11	53.9
2483.560000	28.99							24.91	53.9
4865.940000	35.19							18.71	53.9
7298.880000	49.79							4.11	53.9
7355.880000	50.49							3.41	53.9
7412.860000	53.09							0.81	53.9
9731.860000	42.19							11.71	53.9

Test Notes 1: Measurement was performed with a 2.4GHz notch filter. Band edge measurements were performed with the notch filter removed. Worst band edge measurements presented from Low and High Channel.

Test Notes 2: Average data are from Peak data with Duty Cycle correction factor applied. Sample computation:

1850.06 MHz = 45.3 dBµV/m (Peak)
= 45.3 dBµV/m + (-13.31 dB DCCF)
= 31.99 dBµV/m (Average)

2.5 SPURIOUS RADIATED EMISSIONS

2.5.1 Specification Reference

Part 15 Subpart C §15.249(d)

2.5.2 Standard Applicable

(d) Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50 dB below the level of the fundamental or to the general radiated emission limits in §15.209, whichever is the lesser attenuation.

2.5.3 Equipment Under Test and Modification State

Serial No: N/A / Test Configuration A

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

July 25, 2012/FC

2.5.5 Test Equipment Used

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

2.5.6 Environmental Conditions

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

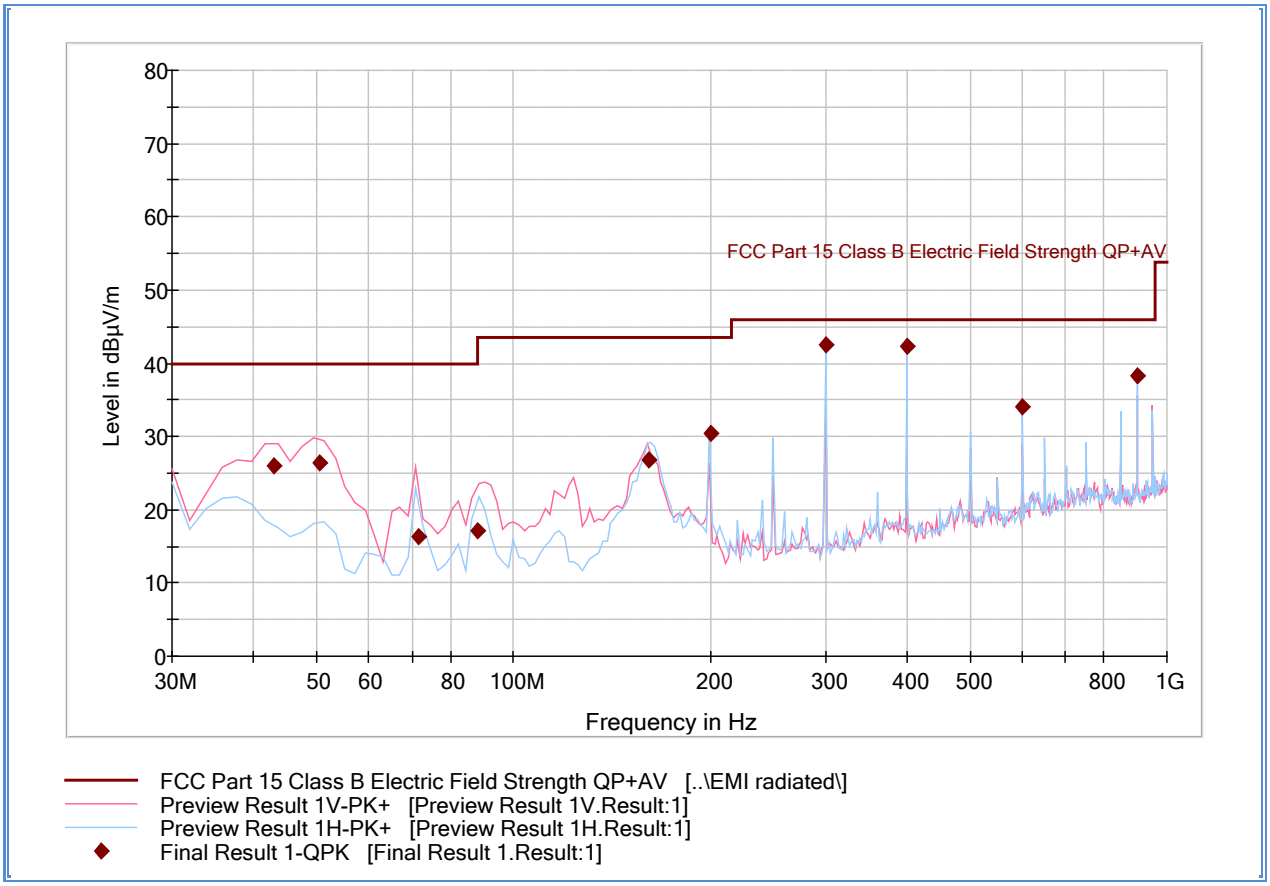
2.5.7 Additional Observations

- This is a radiated test. The spectrum was searched from 30MHz to the 10th harmonic (25GHz). There are no emissions observed beyond 18GHz.
- Above 1GHz measurement results are identical to test results presented under Section 2.4.13 of this test report. No other spurious emissions observed other than harmonics of the fundamental frequency.
- Measurement was done using EMC32 V8.52 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 2.5.8 for sample computation.

2.5.8 Sample Computation (Radiated Emission)

Measuring equipment raw measurement (dbµV) **@ 2400 MHz**			58.4
Correction Factor (dB)	Asset# 1153 (cable)	3.3	**-4.8**
	Asset# 8628 (preamplifier)	-36.4	
	Asset# 1051 (antenna)	28.3	
Reported Peak Final Measurement (dbµV/m) @ 2400 MHz			**53.6**

2.5.9 Test Results Below 1GHz (Default Configuration)



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)
42.943327	26.0	1000.0	120.000	100.0	V	14.0	-18.5	14.0	40.0
50.558878	26.4	1000.0	120.000	100.0	V	66.0	-20.6	13.6	40.0
71.421643	16.3	1000.0	120.000	100.0	V	274.0	-22.2	23.7	40.0
88.012745	17.0	1000.0	120.000	150.0	V	230.0	-21.2	26.5	43.5
161.384369	26.8	1000.0	120.000	215.0	H	274.0	-17.8	16.7	43.5
199.998236	30.4	1000.0	120.000	156.0	H	2.0	-16.5	13.1	43.5
300.000401	42.5	1000.0	120.000	100.0	H	320.0	-13.1	3.5	46.0
400.018677	42.4	1000.0	120.000	100.0	H	72.0	-9.7	3.6	46.0
600.023006	34.1	1000.0	120.000	139.0	H	17.0	-5.8	11.9	46.0
900.021723	38.3	1000.0	120.000	100.0	H	33.0	-0.2	7.7	46.0

2.6 RECEIVER SPURIOUS EMISSIONS

2.6.1 Specification Reference

RSS-Gen 4.10

2.6.2 Standard Applicable

The receiver shall be operated in the normal receive mode near the mid-point of the band over which the receiver is designed to operate. Spurious Emission Limits for Receivers

Fundamental frequency	Field strength of harmonics (microvolts/m at 3meters)
30–88 MHz	100
88–216 MHz	150
216–960 MHz	200
Above 960 MHz	500

2.6.3 Equipment Under Test and Modification State

Serial No: N/A / Test configuration B

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

July 24, 2012/JMG

2.6.5 Test Equipment Used

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

2.6.6 Environmental Conditions

Ambient Temperature	27.8°C
Relative Humidity	48.8%
ATM Pressure	98.9 kPa

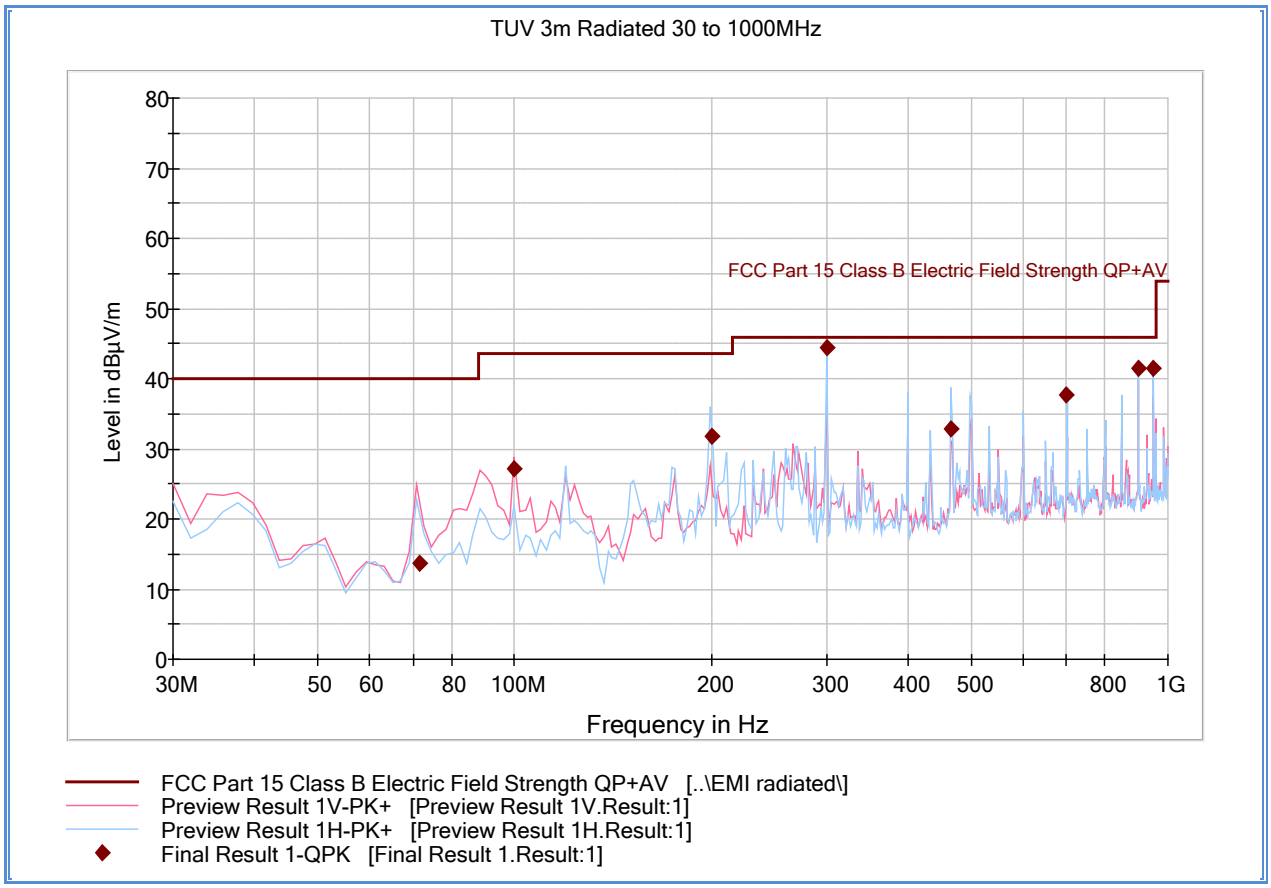
2.6.7 Additional Observations

- This is a radiated test. The spectrum was searched from 30MHz to the 18GHz (6GHz as per requirement).
- Limit used is from FCC §15.209 which is identical to RSS-Gen limits.
- All emissions within 10dB of the limit were verified coming from the support equipment and not the EUT.
- 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.

2.6.8 Test Results

See attached plots.

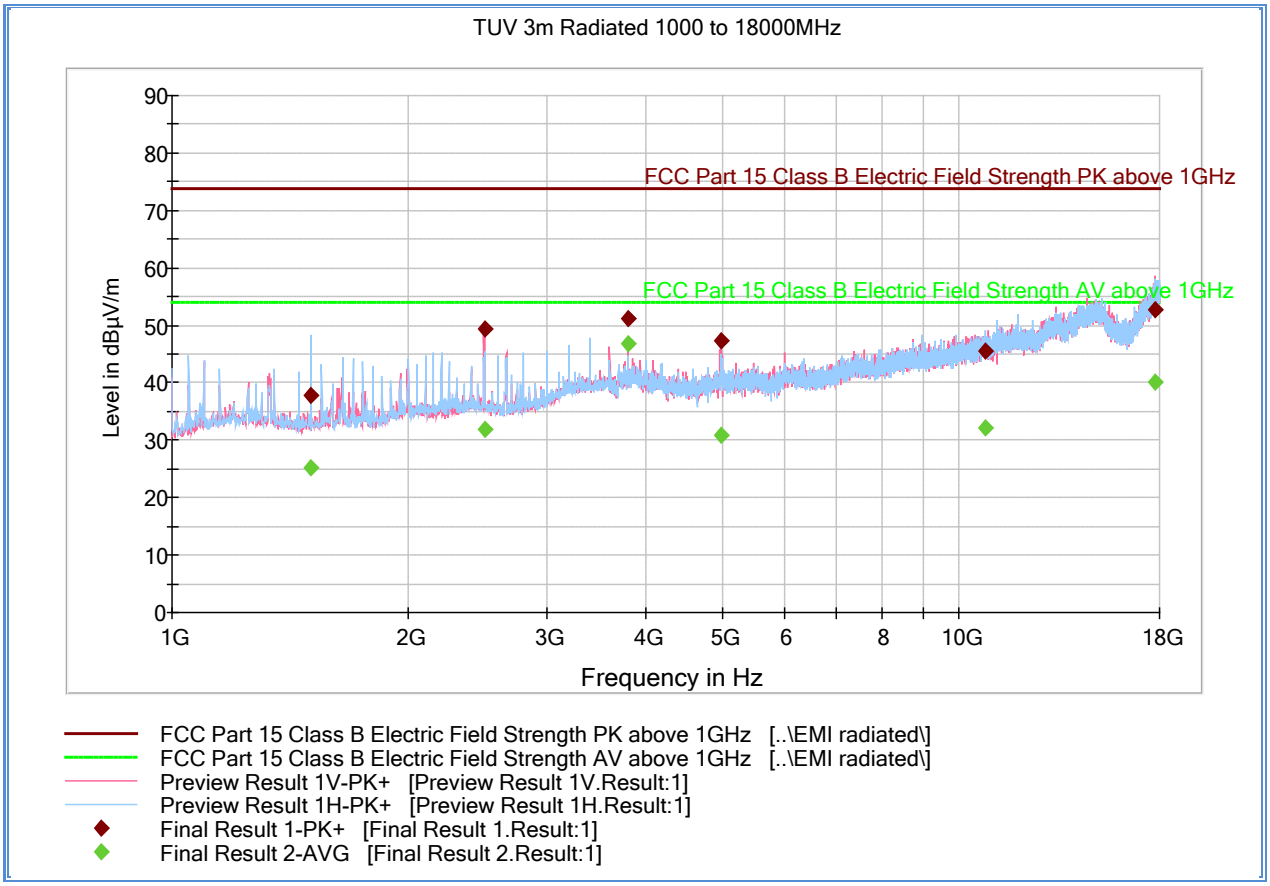
2.6.9 Test Results Below 1GHz



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)
71.581643	13.7	1000.0	120.000	100.0	V	262.0	-22.2	26.3	40.0
100.019960	27.1	1000.0	120.000	106.0	V	74.0	-20.3	16.4	43.5
200.038236	31.7	1000.0	120.000	146.0	H	350.0	-16.5	11.8	43.5
300.000401	44.5	1000.0	120.000	100.0	H	72.0	-13.1	1.5	46.0
466.590862	32.8	1000.0	120.000	184.0	H	236.0	-7.5	13.2	46.0
700.001283	37.7	1000.0	120.000	100.0	H	262.0	-3.7	8.3	46.0
900.021723	41.5	1000.0	120.000	100.0	H	46.0	-0.2	4.5	46.0
950.042806	41.5	1000.0	120.000	100.0	H	42.0	-0.3	4.5	46.0

2.6.10 Test Results Above 1GHz



Peak Data

Frequency (MHz)	Max Peak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)
1500.020000	37.9	1000.0	1000.000	100.0	H	268.0	-9.0	36.0	73.9
2495.460000	49.3	1000.0	1000.000	100.0	V	88.0	-4.6	24.6	73.9
3800.120000	51.1	1000.0	1000.000	100.0	V	31.0	3.1	22.8	73.9
4988.460000	47.2	1000.0	1000.000	158.0	V	309.0	2.4	26.7	73.9
10793.48000	45.5	1000.0	1000.000	239.0	H	229.0	11.2	28.4	73.9
17773.60000	52.8	1000.0	1000.000	173.0	V	342.0	20.8	21.1	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)
1500.020000	25.2	1000.0	1000.000	100.0	H	268.0	-9.0	28.8	53.9
2495.460000	31.9	1000.0	1000.000	100.0	V	88.0	-4.6	22.0	53.9
3800.120000	46.7	1000.0	1000.000	100.0	V	31.0	3.1	7.2	53.9
4988.460000	31.0	1000.0	1000.000	158.0	V	309.0	2.4	22.9	53.9
10793.48000	32.3	1000.0	1000.000	239.0	H	229.0	11.2	21.6	53.9
17773.60000	40.2	1000.0	1000.000	173.0	V	342.0	20.8	13.7	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
1033	Bilog Antenna	3142C	00058717	EMCO	12/06/11	12/06/12
1024	EMI Test Receiver	ESCS 30	847793/001	Rhode & Schwarz	02/29/12	02/28/13
1040	EMI Test Receiver	ESIB40	100292	Rhode & Schwarz	08/10/11	08/10/12
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	9412-4364	EMCO	11/07/11	11/07/12
1016	Pre-amplifier	PAM-0202	187	PAM	08/17/11	08/17/12
1003	Signal Generator	SMR-40	1104.0002.40	Rhode & Schwarz	10/13/11	10/13/12
1150	Horn antenna	RA42-K-F-4B-C	012054-004	CMT	Verified by 1003 and 1049	
1151	Pre-amplifier	TS-PR26	100026	Rhode & Schwarz	Verified by 1003 and 1049	
8628	Pre-amplifier	QLJ 01182835-JO	8986002	QuinStar Technologies Inc.	08/17/11	08/17/12
8543	High-frequency cable	Micropore 19057793	N/A	United Microwave Products	08/17/11	08/17/12
1173	Low-loss coaxial cable	Nokia Kabel RG213	N/A	Chase London	04/15/12	04/15/13
8607	20dB Attenuator	CAT-20	N/A	MCL HAT-20	07/29/11	07/29/12
8609	20dB Attenuator	CAT-20	N/A	MCL HAT-20	07/29/11	07/29/12
7567	LISN	FCC-LISN-50-25-2-10	120304	Fischer Custom Comm.	05/24/12	05/24/13
7568	LISN	FCC-LISN-50-25-2-10	120305	Fischer Custom Comm.	05/24/12	05/24/13
1123	DC Power Supply	E3631A	N/A	Hewlett Packard	Verified by 7514	
7514	Multimeter	34410A	MY45002624	Agilent	08/01/11	08/01/12
	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

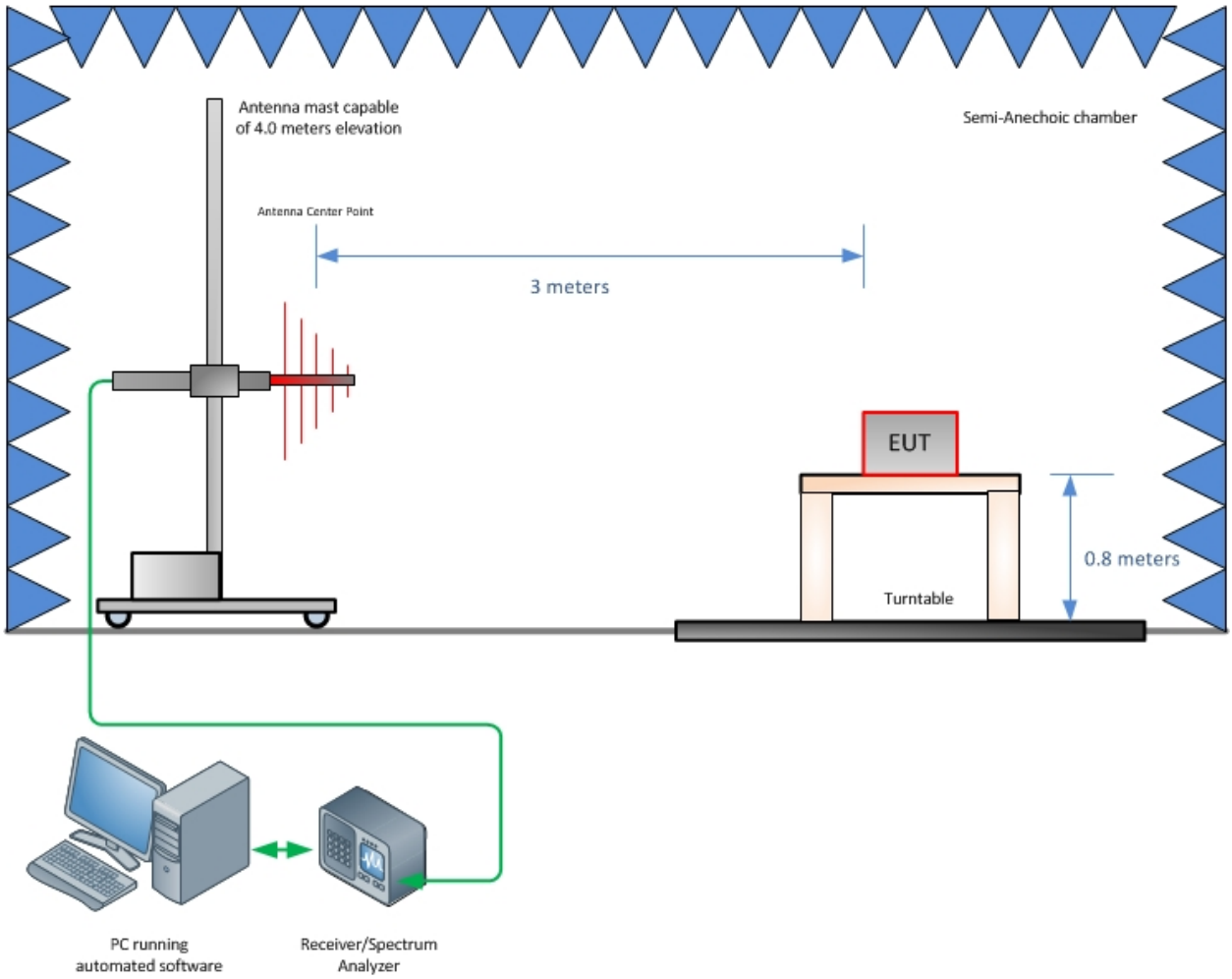
3.2.3 Conducted Antenna Port Measurement

	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	0.50	0.29	0.08
3	EUT Setup	Rectangular	1.00	0.58	0.33
				Combined Uncertainty (u_c):	0.72
				Coverage Factor (k):	2
				Expanded Uncertainty:	1.45

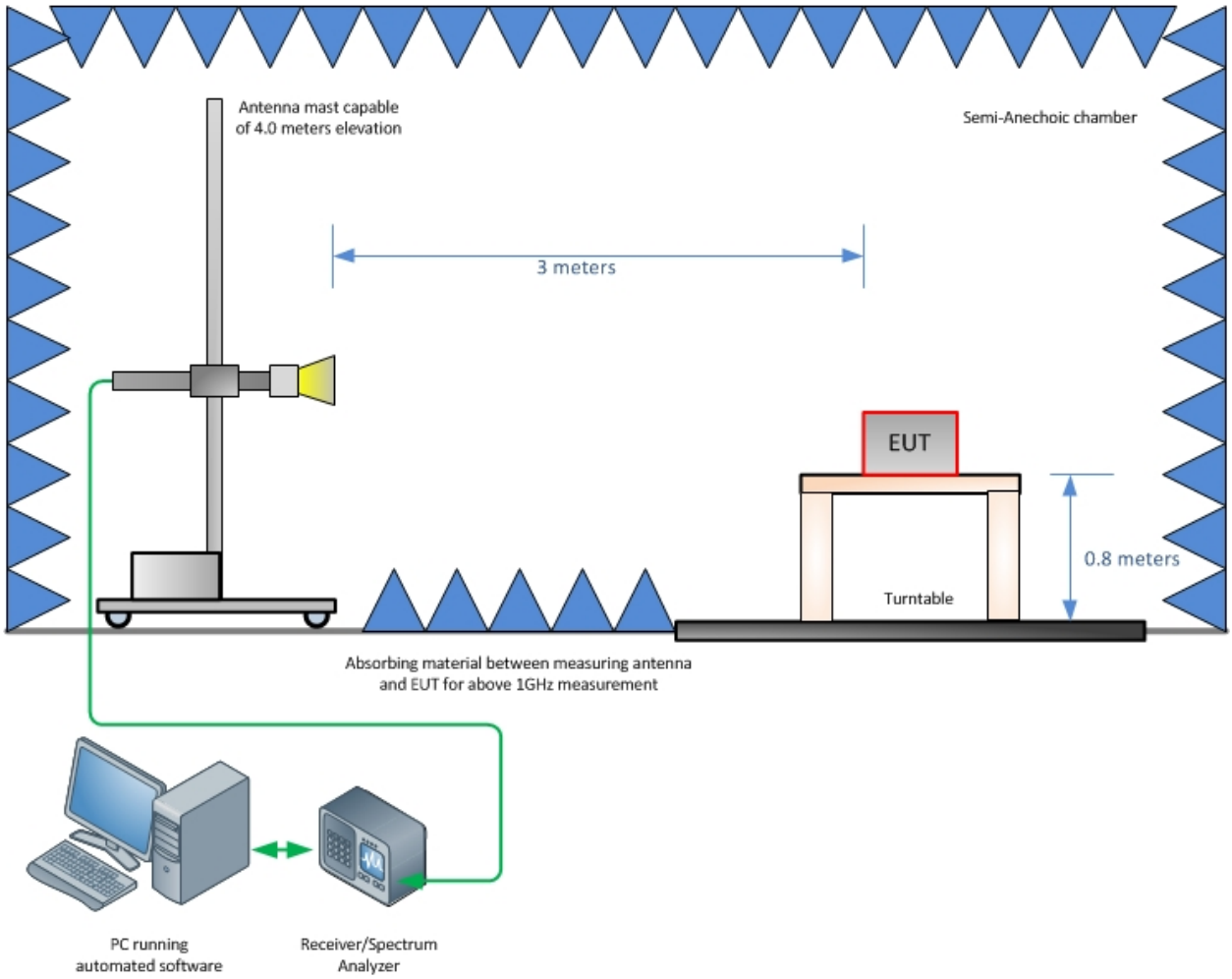
SECTION 4

DIAGRAM OF TEST SETUP

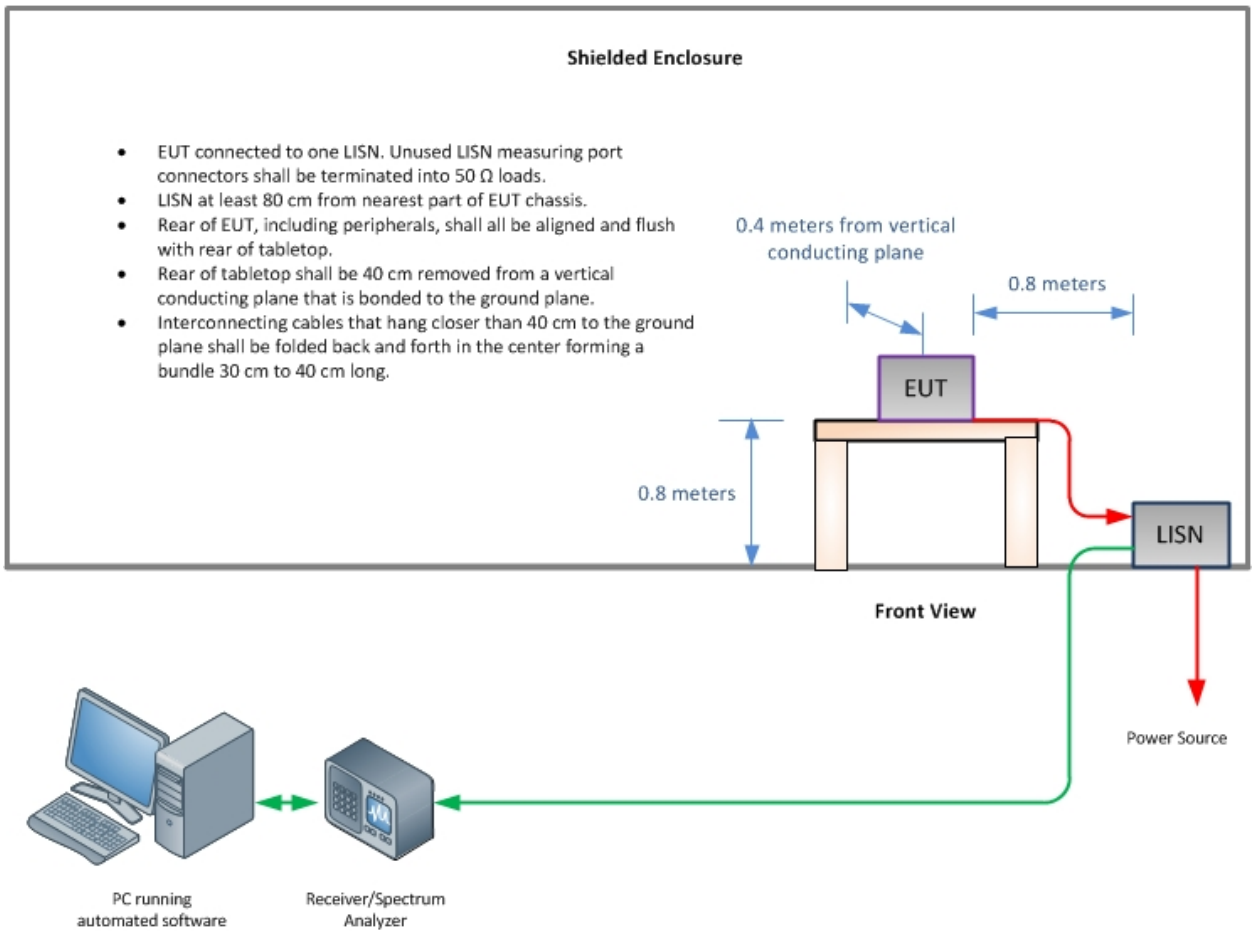
4.1 TEST SETUP DIAGRAM



Radiated Emission Test Setup (Below 1GHz)



Radiated Emission Test Setup (Above 1GHz)



Conducted Emissions Test Setup

SECTION 5

ACCREDITATION, DISCLAIMERS AND COPYRIGHT

5.1 ACCREDITATION, DISCLAIMERS AND COPYRIGHT

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