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Report On

EMC Evaluation of
Hunter Douglas Window Fashions
HD Platinum App Bridge and Repeater

FCC Part 15 Subpart B

Report No. SC1206696A

July 2012



America

TÜV SÜD America Inc., 10040 Mesa Rim Road, San Diego, CA 92121
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REPORT ON EMC Evaluation of the
Hunter Douglas Window Fashions
HD Platinum App Bridge and Repeater

TEST REPORT NUMBER SC1206696A

July 2012

PREPARED FOR Hunter Douglas Window Fashions
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DATED 24 July 2012



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Revision History

SC1206696A Hunter Douglas Window Fashions HD Platinum App Bridge and Repeater					
DATE	OLD REVISION	NEW REVISION	REASON	PAGES AFFECTED	APPROVED BY
07/24/12	Initial Release				Ferdinand Custodio

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SECTION 1

REPORT SUMMARY

EMC Evaluation of the
Hunter Douglas Window Fashions
Platinum App Bridge and Repeater



1.1 INTRODUCTION

The information contained in this report is intended to show verification of the Hunter Douglas Window Fashions Bridge and Repeater to the requirements of FCC Part 15 Subpart B.

Objective	To perform EMC Evaluation 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)	HD Platinum App
Serial Number(s)	N/A
Number of Samples Tested	2
Highest Frequency Generated or Used	2471MHz
Test Specification/Issue/Date	FCC Part 15 Subpart B (October 1, 2011)
Start of Test	July 03, 2012
Finish of Test	July 24, 2012
Name of Engineer(s)	Ferdie Custodio Juan Manuel Gonzalez
Related Document(s)	None



1.2 BRIEF SUMMARY OF RESULTS

A brief summary of the tests carried out in accordance with FCC Part 15 Subpart B is shown below.

Part 15	Test Description	Result	Comments/Base Standard
§15.107	Conducted Limits	Compliant	Class B requirement
§15.109	Radiated Emission Limits	Compliant	Class B requirement

1.3 PRODUCT INFORMATION

1.3.1 EUT General Description

The Equipment Under Test (EUT) was a Hunter Douglas Window Fashions HD Platinum App Bridge and Repeater as shown in the photograph below. The Platinum App Bridge is a wireless device acting as a "bridge" between Ethernet and a proprietary RF network. The Platinum App Repeater is a two-way RF repeater operating in the 2.4 GHz ISM band designed to extend the coverage of the same proprietary RF network.



Equipment Under Test

1.4 EUT TEST CONFIGURATION

1.4.1 Test Configuration Description

Test Configuration	Description
Default	Both Bridge and Repeater powered via USB connected to a support laptop. EUT were verified while on standby mode.

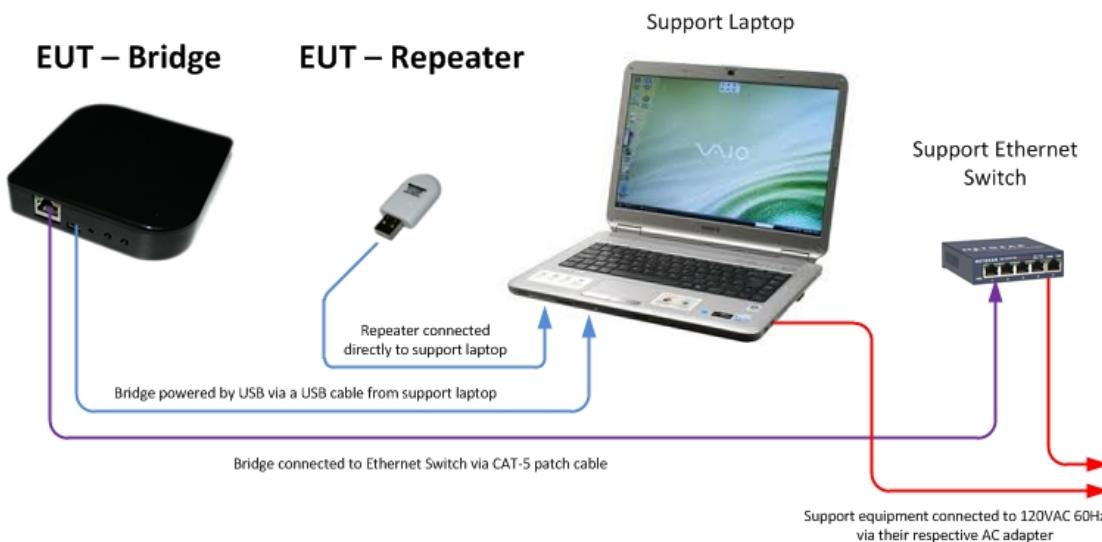
1.4.2 EUT Exercise Software

A test firmware was installed on the EUTs during investigation. For the Bridge, pressing the SW button will cycle the Bridge to transmit on all three channels, control channel, normal transmit mode (all three frequencies transmitting sequentially) and RF transmission off. For the repeater, the RF cycling is done by power cycling the unit.

1.4.3 Support Equipment and I/O cables

Manufacturer	Equipment/Cable	Description
Sony	Support Laptop	SDGE08739 NOTEBOOK VAIO VPCYB33KX SN 27545534 3006488
Sony	Support Laptop AC/DC Adapter	Model VGP-AC19V39 100~240VAC 50-60Hz/19.5VDC Output @ 2.0A
Netgear	Fast Ethernet Switch	5 Port 10/100 Mbps Model FS105
Netgear	I.T.E Power Supply for Ethernet Switch	Model No. MU08A9075100-A1 100~240VAC 50-60Hz/7.5VDC Output @ 1.0A
-	Ethernet Patch Cable (Bridge to Switch)	0.2m, unshielded, CAT-5 connector
Hannstar	USB cable (Bridge to unterminated)	0.9m, shielded, Type A to Mini-A connector, USB Revision 2.0

1.4.4 Simplified Test Configuration 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 (Bridge only) 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.

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





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 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

TÜV SÜD 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 TÜV SÜD 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

EMC Evaluation of the
Hunter Douglas Window Fashions
Platinum App Bridge and Repeater

2.1 CONDUCTED LIMITS

2.1.1 Specification Reference

Part 15 Subpart B §15.107(a)

2.1.2 Standard Applicable

Except for Class A digital devices, for equipment 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 μ H/50 ohms line impedance stabilization network (LISN). Compliance with the provisions of this paragraph shall be based on the measurement of the radio frequency voltage between each power line and ground at the power terminal. The lower limit applies at the band edges

Frequency of emission (MHz)	Conducted limit (dB μ V)	
	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 / Default Test Configuration

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	22.9°C
Relative Humidity	55.4%
ATM Pressure	99.1 kPa

2.1.7 Additional Observations

- 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.

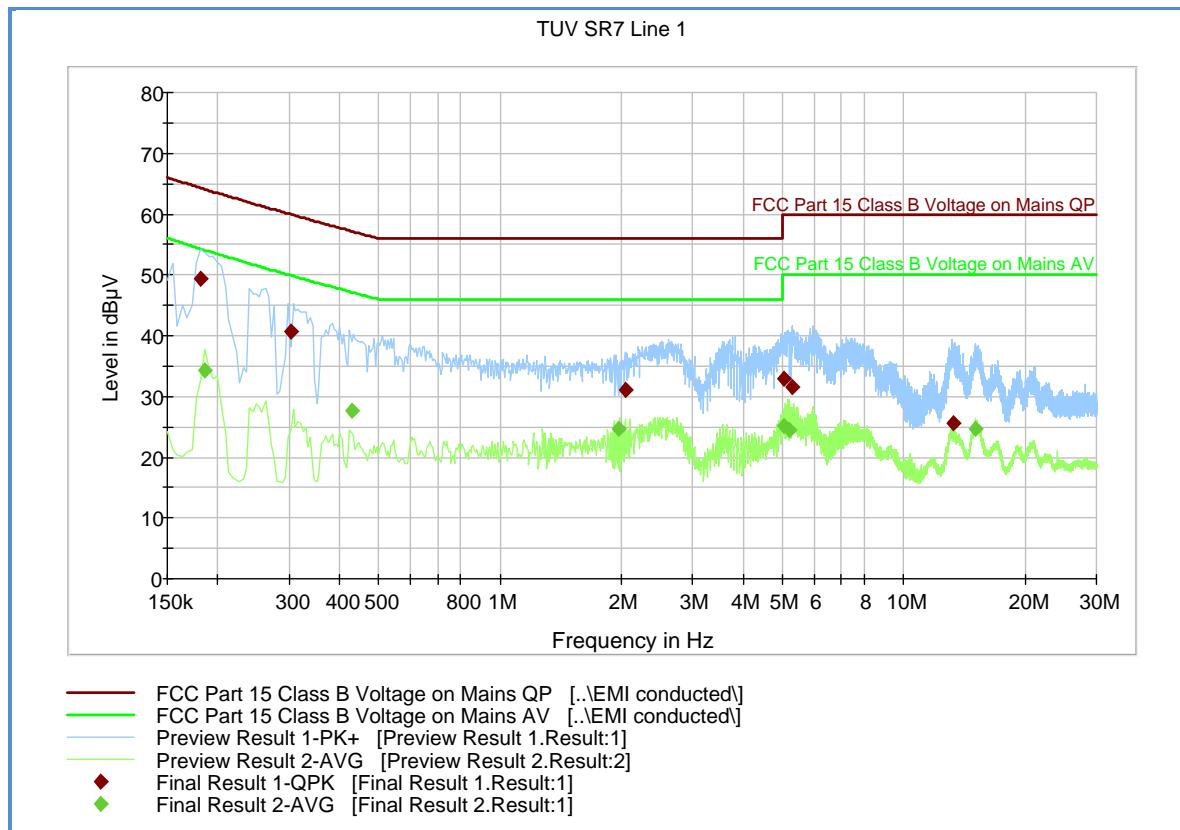
2.1.8 Sample Computation (Conducted Emission – Quasi Peak)

Measuring equipment raw measurement (db μ V) @ 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# 7568 (LISN)	0.30	
Reported QuasiPeak Final Measurement (db μ V) @ 150kHz			26.2

2.1.9 Test Results

Compliant. See attached plots and tables.

2.1.10 Line 1



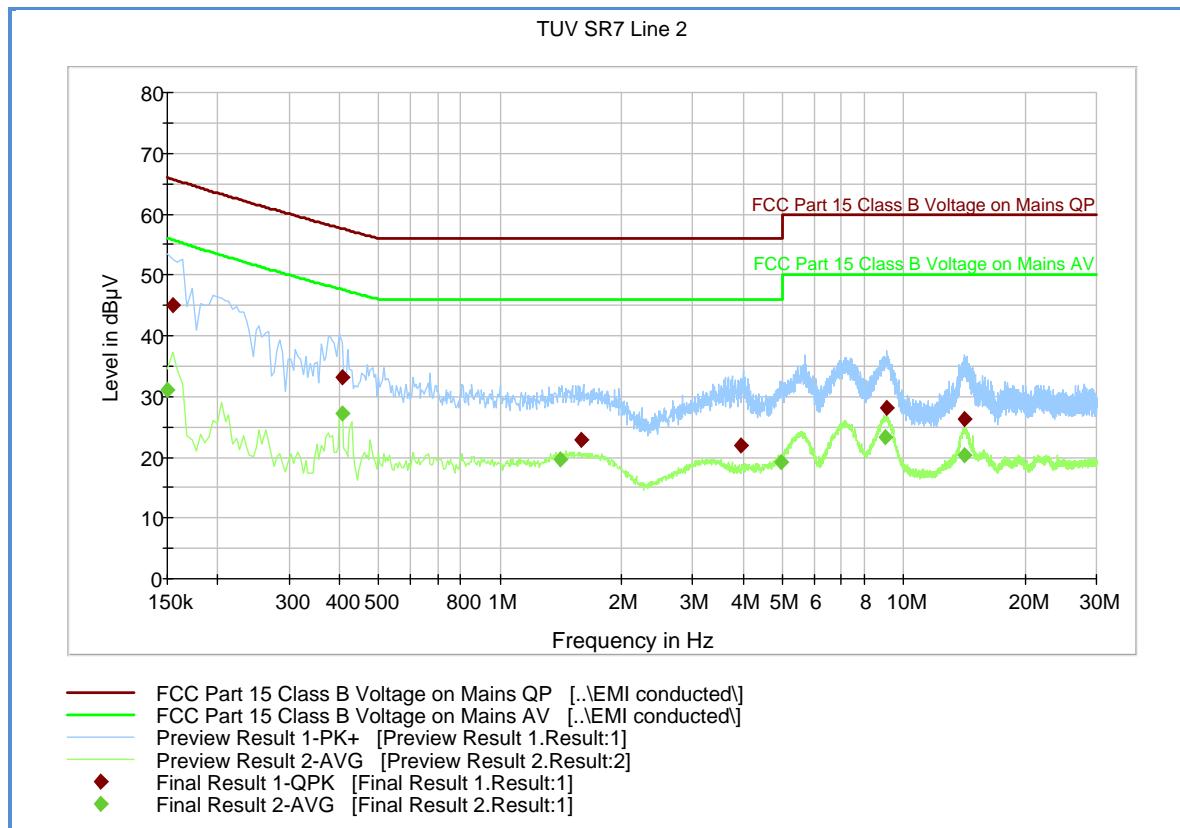
Quasi Peak

Frequency (MHz)	QuasiPeak (dB μ V)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin - QPK (dB)	Limit - QPK (dB μ V)
0.181500	49.3	1000.0	9.000	Off	L1	20.5	15.0	64.3
0.303000	40.6	1000.0	9.000	Off	L1	20.3	19.3	60.0
2.044500	31.1	1000.0	9.000	Off	L1	20.1	24.9	56.0
5.046000	33.0	1000.0	9.000	Off	L1	20.3	27.0	60.0
5.275500	31.6	1000.0	9.000	Off	L1	20.3	28.4	60.0
13.240500	25.6	1000.0	9.000	Off	L1	20.5	34.4	60.0

Average

Frequency (MHz)	Average (dB μ V)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin - Ave (dB)	Limit - Ave (dB μ V)
0.186000	34.4	1000.0	9.000	Off	L1	20.5	19.7	54.1
0.429000	27.7	1000.0	9.000	Off	L1	20.2	19.5	47.2
1.972500	24.6	1000.0	9.000	Off	L1	20.1	21.4	46.0
5.046000	25.2	1000.0	9.000	Off	L1	20.3	24.8	50.0
5.212500	24.5	1000.0	9.000	Off	L1	20.3	25.5	50.0
15.027000	24.6	1000.0	9.000	Off	L1	20.6	25.4	50.0

2.1.11 Line 2



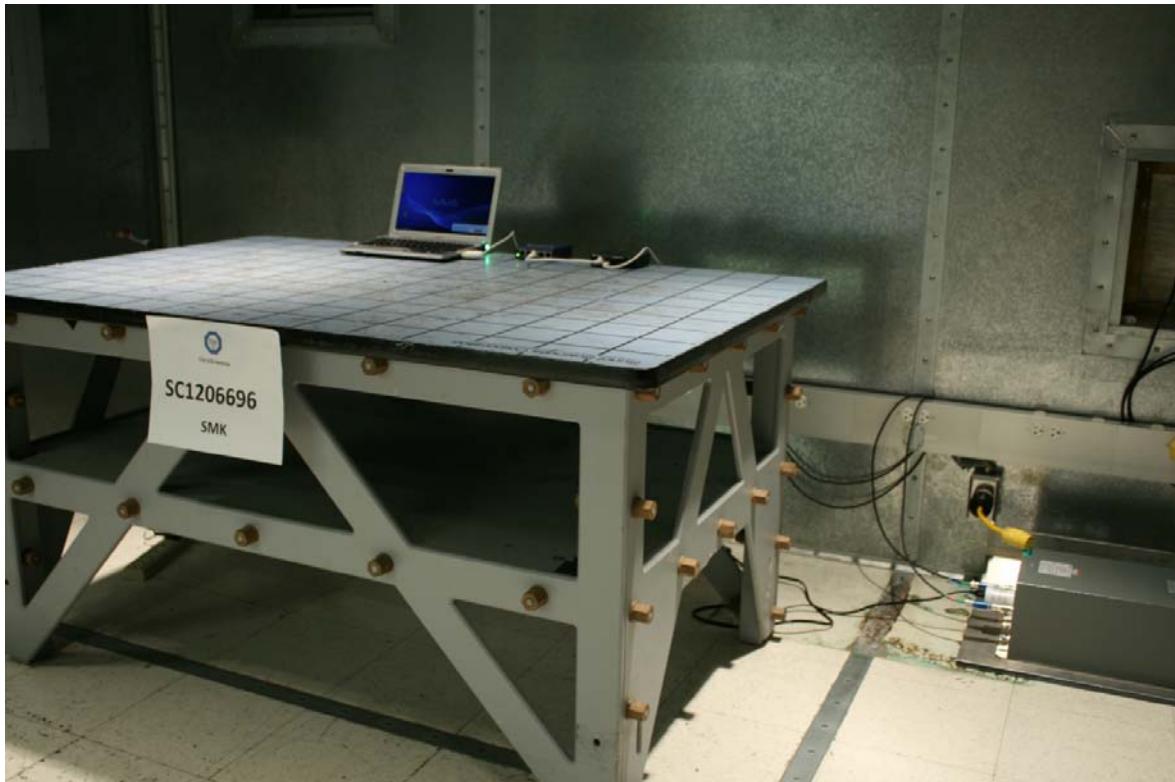
Quasi Peak

Frequency (MHz)	QuasiPeak (dBµV)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin - QPK (dB)	Limit - QPK (dBµV)
0.154500	45.0	1000.0	9.000	Off	N	21.0	20.7	65.7
0.406500	33.0	1000.0	9.000	Off	N	20.6	24.6	57.6
1.594500	22.9	1000.0	9.000	Off	N	20.5	33.1	56.0
3.943500	22.0	1000.0	9.000	Off	N	20.6	34.0	56.0
9.069000	28.2	1000.0	9.000	Off	N	20.8	31.8	60.0
14.131500	26.2	1000.0	9.000	Off	N	20.9	33.8	60.0

Average

Frequency (MHz)	Average (dBµV)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin - Ave (dB)	Limit - Ave (dBµV)
0.150000	31.0	1000.0	9.000	Off	N	21.0	25.0	56.0
0.406500	27.3	1000.0	9.000	Off	N	20.6	20.3	47.6
1.410000	19.6	1000.0	9.000	Off	N	20.5	26.4	46.0
4.974000	19.2	1000.0	9.000	Off	N	20.7	26.8	46.0
9.028500	23.3	1000.0	9.000	Off	N	20.8	26.7	50.0
14.190000	20.2	1000.0	9.000	Off	N	20.9	29.8	50.0

2.1.12 Test Setup Photo (Front)



2.1.1 Test Setup Photo (Back)





2.2 RADIATED EMISSION LIMITS

2.2.1 Specification Reference

Part 15 Subpart B §15.109(a)

2.2.2 Standard Applicable

(a) Except for Class A digital devices, the field strength of radiated emissions from unintentional radiators at a distance of 3 meters shall not exceed the following values:

Frequency of emission (MHz)	Field Strength (microvolts/meter)
30-88	100
88-216	150
216-960	200
Above 960	500

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

July 03, 2012/JMG

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	49.2%
ATM Pressure	98.60 kPa

2.2.7 Additional Observations

- The spectrum was searched from 30MHz to 18GHz and verified to Class B limits.
- 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 2.2.8 for sample computation.

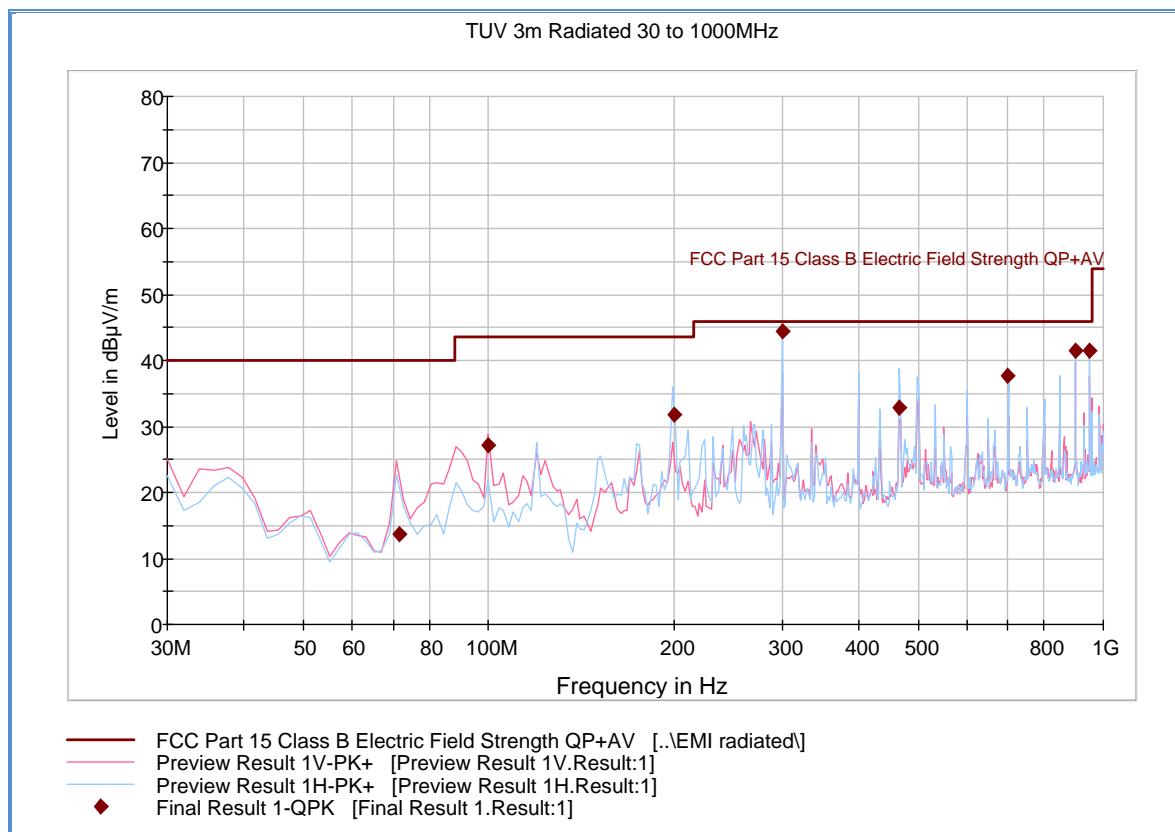
2.2.8 Sample Computation (Radiated Emission)

Measuring equipment raw measurement (db μ V) @ 30 MHz			24.4
Correction Factor (dB)	Asset# 1066 (cable)	0.3	-12.6
	Asset# 1172 (cable)	0.3	
	Asset# 1016 (preamplifier)	-30.7	
	Asset# 1175(cable)	0.3	
	Asset# 1002 (antenna)	17.2	
	Reported QuasiPeak Final Measurement (db μ V/m) @ 30MHz		11.8

2.2.9 Test Results

See attached plots.

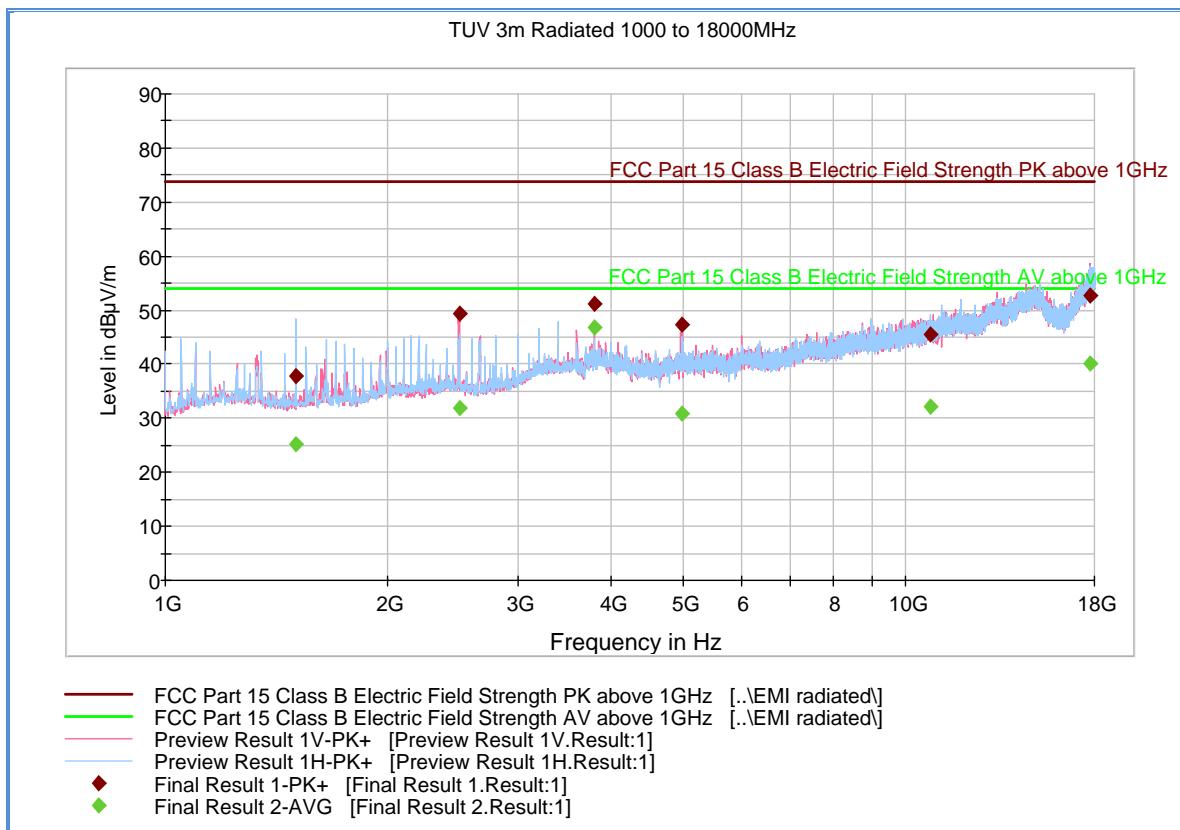
2.2.9.1 Below 1GHz Radiated Emission Test



Quasi-Peak Data

Frequency (MHz)	QuasiPeak (dB μ V/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dB μ V/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

2.2.9.2 Above 1GHz Radiated Emission Test



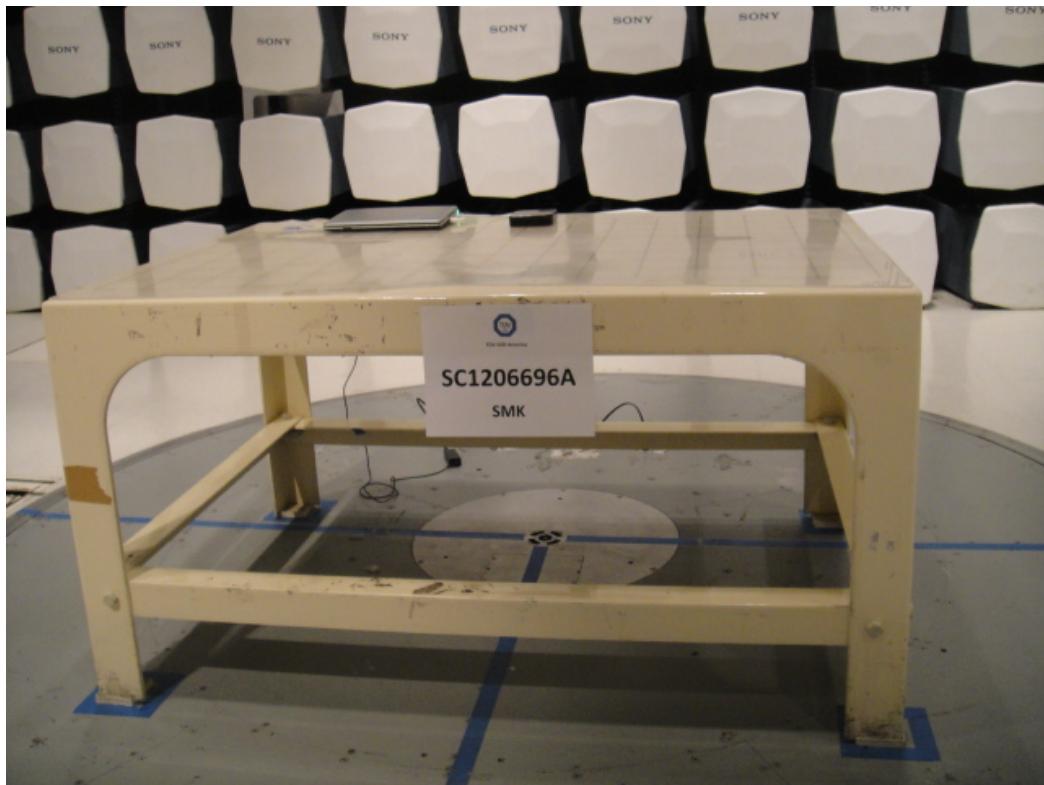
Peak Data

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

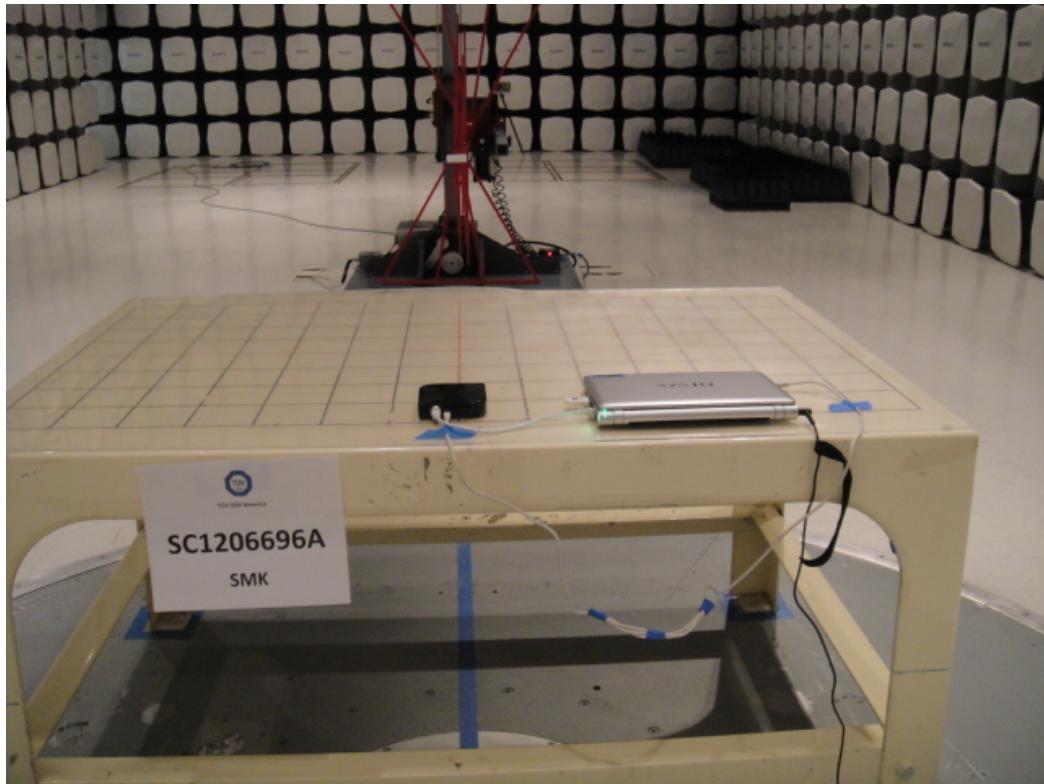
Average Data

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

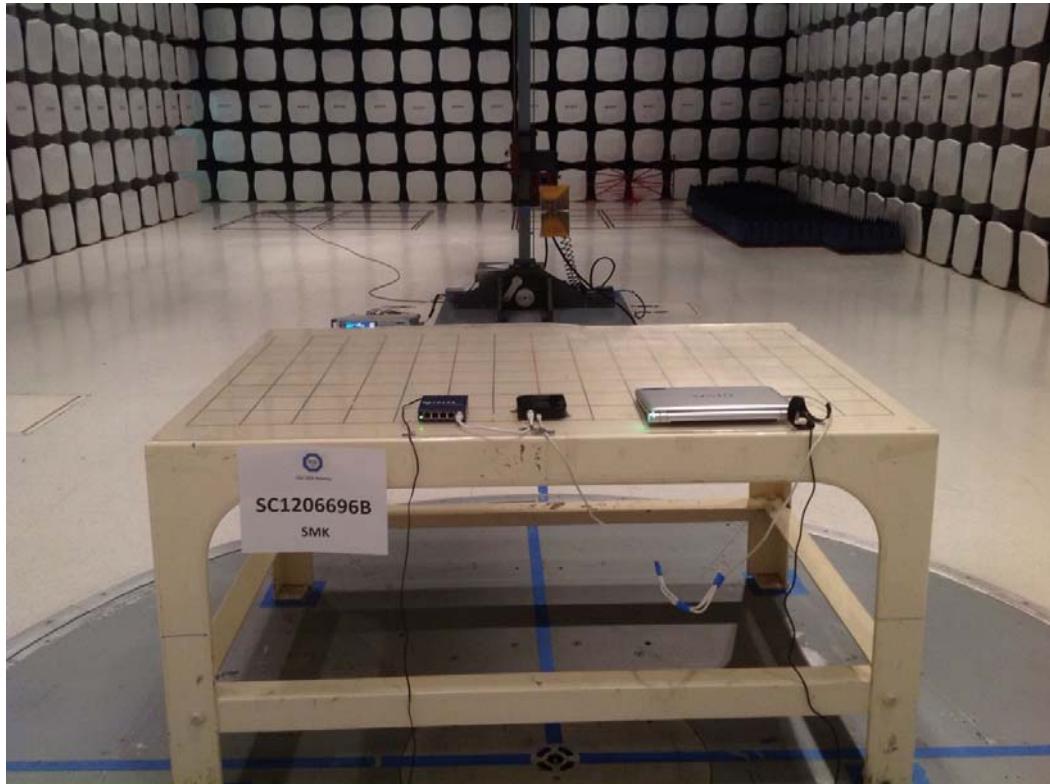
2.2.10 Test Setup Photo (Below 1GHz Front)



2.2.11 Test Setup Photo (Below 1GHz Back)



2.2.12 Test Setup Photo (Above 1GHz Back)





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
Conducted Emissions						
1024	EMI Test Receiver	ESCS 30	847793/001	Rhode & Schwarz	02/29/12	02/28/13
7568	LISN	FCC-LISN-50-25-2-10	120305	Fischer Custom Comm.	05/24/12	05/24/13
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
Radiated Emissions						
1002	Bilog Antenna	3142C	00058717	ETS-Lindgren	12/06/11	12/06/12
6669	Double-ridged waveguide horn antenna	3115	94124364	EMCO	11/07/11	11/07/12
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
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
1016	Pre-amplifier	PAM-0202	187	PAM	08/17/11	08/17/12

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 Emissions Measurement

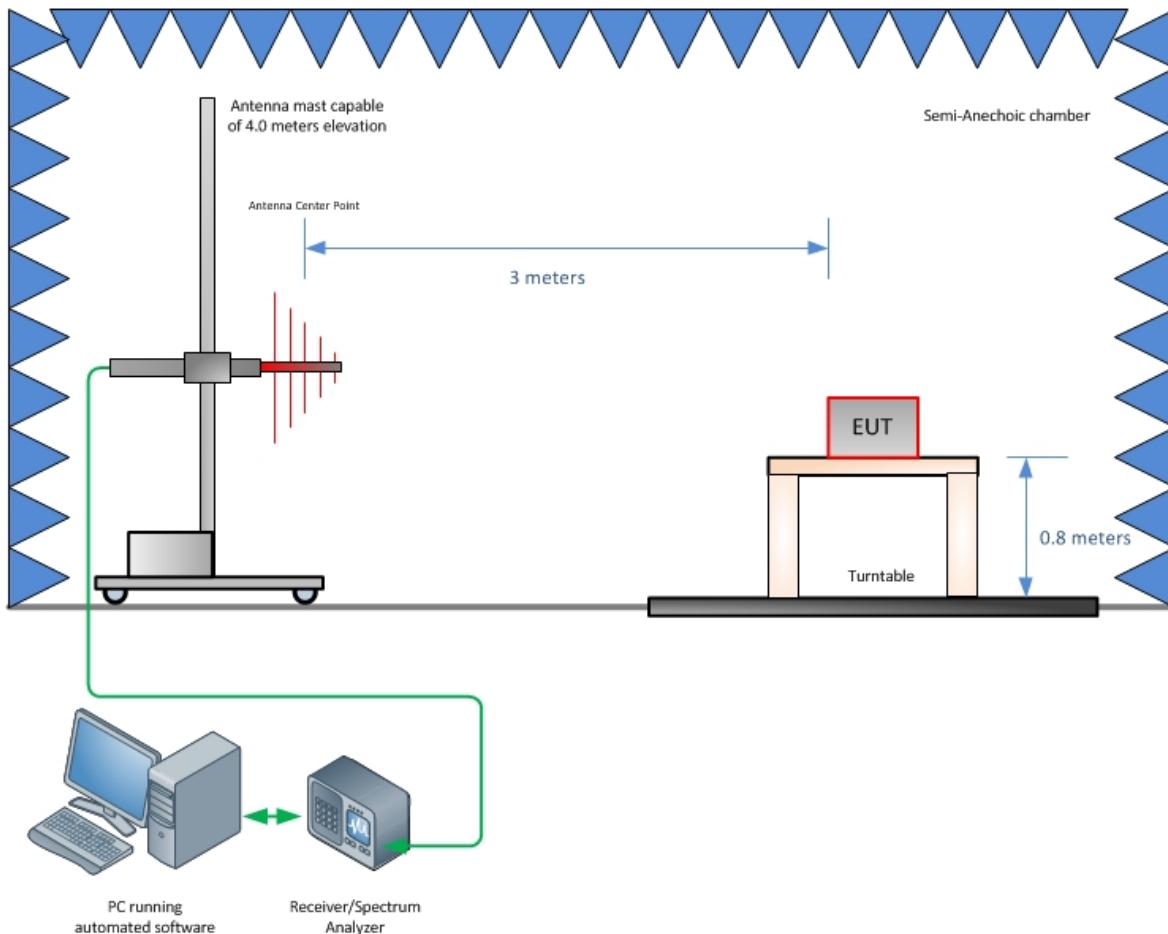
Contribution		Probability Distribution Type	Probability Distribution x_i	Standard Uncertainty $u(x_i)$	$[u(x_i)]^2$
1	Receiver/Spectrum Analyzer	Rectangular	0.36	0.21	0.04
2	Cables	Rectangular	0.50	0.29	0.08
3	LISN	Rectangular	0.66	0.38	0.15
4	Attenuator	Rectangular	0.30	0.17	0.03
				Combined Uncertainty (u_c):	0.80
				Coverage Factor (k):	2
				Expanded Uncertainty:	1.59



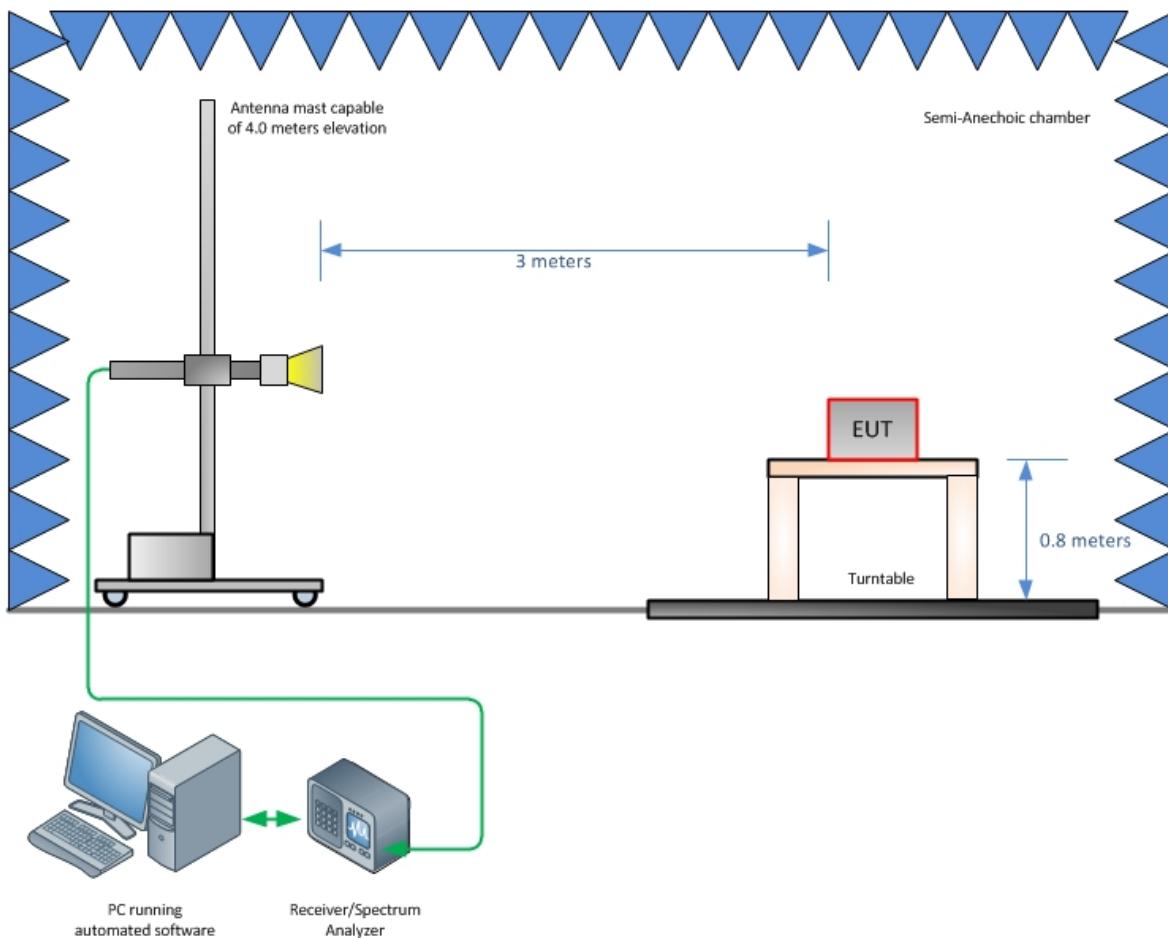
SECTION 4

DIAGRAM OF TEST SETUP

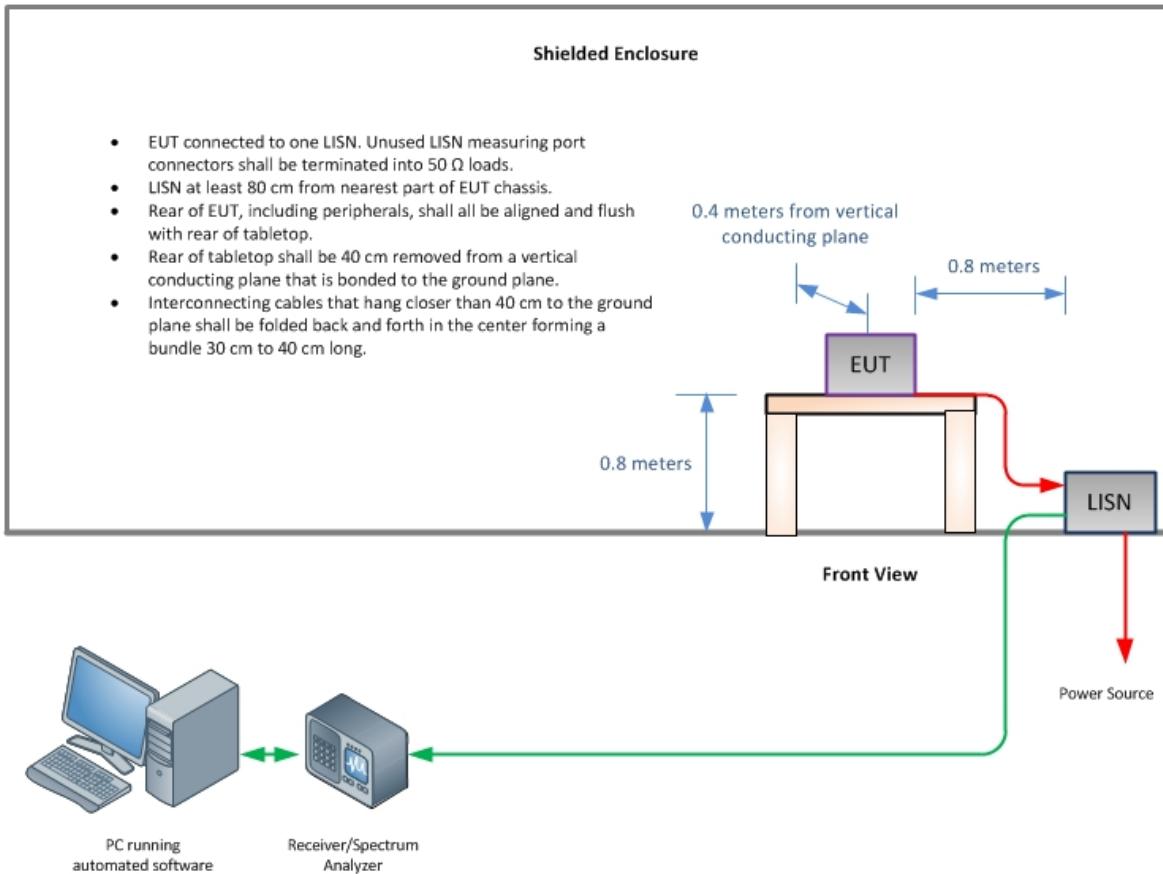
4.1 RADIATED EMISSION TEST SETUP (BELOW 1GHZ)



4.2 RADIATED EMISSION TEST SETUP (ABOVE 1GHZ)



4.3 CONDUCTED EMISSION TEST SETUP





SECTION 5

ACCREDITATION, DISCLAIMERS AND COPYRIGHT



5.1 ACCREDITATION, DISCLAIMERS AND COPYRIGHT

TÜV SÜD America Inc.'s reports apply only to the specific sample tested under stated test conditions. It is the manufacturer's responsibility to assure the continued compliance of production units of this model. TÜV SÜD America, Inc. shall have no liability for any deductions, inferences or generalizations drawn by the client or others from TÜV SÜD America, Inc.'s issued reports.

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