FCC 47 CFR PART 15 SUBPART C
RF Test Report

Applicant	:	Phorus, Inc.
Applicant Address	:	16255 Ventura Boulevard, Encino,California, 91436 United States
Product Type	:	Play-Fi Module
Trade Name	:	DTS
Model Number	:	CAPRICA2L
Applicable Standard	:	FCC 47 CFR PART 15 SUBPART C ANSI C63.10:2013
Receive Date	:	Nov. 25, 2015
Test Period	:	Nov. 27 ~ Dec. 06, 2015
Issue Date	:	Dec. 15, 2015

Issue by

A Test Lab Techno Corp.
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Taiwan Accreditation Foundation accreditation number: 1330

Revision History

Rev.	Issue Date	Revisions	Revised By
00	Dec. 15, 2015	Initial Issue	

Verification of Compliance

Issued Date: 12/15/2015

Applicant	:	Phorus, Inc.
Address Applicant	:	16255 Ventura Boulevard, Encino,California, 91436 United States
Product Type	:	Play-Fi Module
Trade Name	:	DTS
Model Number	:	CAPRICA2L
FCC ID	:	2AAWQ-CAPRICA2L
EUT Rated Voltage	:	DC 5V / DC 3.3V / DC 1.8V / DC 1.1V
Test Voltage	:	120 Vac / 60 Hz
Applicable Standard	:	FCC 47 CFR PART 15 SUBPART C ANSI C63.10:2013
Test Result	:	Complied
Performing Lab.	:	A Test Lab Techno Corp. No. 140-1, Changan Street, Bade District, Taoyuan City 33465, Taiwan (R.O.C) Tel：+886-3-2710188 / Fax：+886-3-2710190 Taiwan Accreditation Foundation accreditation number: 1330 http://www.atl-lab.com.tw/e-index.htm

A Test Lab Techno Corp. tested the above equipment in accordance with the requirements set forth in the above standards. All indications of Pass/Fail in this report are opinions expressed by A Test Lab Techno Corp. based on interpretations and/or observations of test results. Measurement Uncertainties were not taken into account and are published for informational purposes only. The test results show that the equipment tested is capable of demonstrating compliance with the requirements as documented in this report.

Approved By	: Fly Lu	Reviewed By	: Eric Ou Yang	
(Manager)	(Fly Lu)	(Testing Engineer)	(Eric Ou Yang)	

TABLE OF CONTENTS

1 General Information

1.1 Summary of Test Result

Standard	Item	Result	Remark
15.247			
15.207	AC Power Conducted Emission	PASS	-----
Standard	Item	Result	Remark
15.247			
15.247(d)	Transmitter Radiated Emissions	PASS	-----
15.247(b)(3)	Max. Output Power	N/A	-----
15.247(a)(2)	6dB RF Bandwidth	N/A	-----
15.247(e)	Power Spectral Density	N/A	-----
15.247(d)	Out of Band Conducted Spurious Emission	N/A	-----
15.247(d)	Band Edge Measurement	PASS	-----
15.203	Antenna Requirement	PASS	-----

The test results of this report relate only to the tested sample(s) identified in this report. Manufacturer or whom it may concern should recognize the pass or fail of the test result.

Note: The devise is module: CAPRICA2L Adding new type antenna to do Class II Permissive Change report so it only test Conducted Emission, Transmitter Radiated Emissions and Band Edge Measurement.

1.2 Measurement Uncertainty

Test Item	Frequency Range		Uncertainty (dB)
Conducted Emission	9kHz ~ 30MHz		± 2.02
Radiated Emission	30MHz ~ 1000MHz	Horizontal	± 3.98
		Vertical	± 3.62
	1000MHz ~ 18000MHz	Horizontal	± 3.11
		Vertical	± 3.07
	18000MHz ~ 40000MHz	Horizontal	± 3.66
		Vertical	± 3.54

2 EUT Description

Applicant	Phorus, Inc.			
Applicant Address	16255 Ventura Boulevard, Encino,California, 91436 United States			
Manufacturer	LITE-ON Technology (Changzhou) Co., Ltd			
Manufacturer Address	A9 Building, No. 88, Yanghu Road, Wujin Hi-Tech Industrial Development Zone, Changzhou City, Jiangsu Province, P.R. China			
Product Type	Play-Fi Module			
Trade Name	DTS			
Model Number	CAPRICA2L			
FCC ID	2AAWQ-CAPRICA2L			
Class II Permissive Change	Adding new type antenna.			
Operate Freq. Band	Frequency Range (MHz)	Modulation	Channel Bandwidth	Data Rate
IEEE 802.11b	2412 ~ 2462	DSSS	20MHz	Up to 11Mbps
IEEE 802.11g	2412 ~ 2462	DSSS+OFDM	20MHz	Up to 54Mbps
IEEE 802.11n 2.4GHz 20MHz	2412 ~ 2462	OFDM	20MHz	Up to 72.2Mbps
IEEE 802.11n 2.4GHz 40MHz	2422 ~ 2452	OFDM	40MHz	Up to 150Mbps
Antenna Delivery	1TX + 1RX			
Antenna Used	Manufacturer	Model Number	Type	Max. Gain
	SUNG NAM ELECTRONICS(SHENZHEN) CO., LTD.	CSA3A020Z	Dipole Antenna	1.83 dBi
RF Output Power	IEEE 802.11b: 0.072 W /18.58 dBm IEEE 802.11g: 0.198 W / 22.97 dBm IEEE 802.11n 2.4GHz 20MHz: 0.135 W / 21.30 dBm IEEE 802.11n 2.4GHz 40MHz: 0.110 W / 20.43 dBm			

3 Test Methodology

3.1. Mode of Operation

Decision of Test ATL has verified the construction and function in typical operation. All the test modes were carried out with the EUT in normal operation, which was shown in this test report and defined as:

Test Mode
Mode 1: Normal operation mode
Mode 2: IEEE 802.11b link mode
Mode 3: IEEE 802.11g link mode
Mode 4: IEEE 802.11n 2.4GHz 20MHz link mode
Mode 5: IEEE 802.11n 2.4GHz 40MHz link mode

Software used to control the EUT for staying in continuous transmitting mode was programmed.

After verification, all tests were carried out with the worst case test modes as shown below except radiated spurious emission below 1GHz and power line conducted emissions below 30MHz, which worst case was in normal link mode only.

Test Mode	ANT-0	ANT-1	ANT-0+1
Mode 2: IEEE 802.11b link mode	V	V	---
Mode 3: IEEE 802.11g link mode	V	V	---
Mode 4: IEEE 802.11n 2.4GHz 20MHz link mode	V	V	---
Mode 5: IEEE 802.11n 2.4GHz 40MHz link mode	V	V	---

Test Mode	Antenna Delivery	Test Channel	Data Rate
Mode 2: IEEE 802.11b link mode	1TX / 1RX	1, 6, 11	1
Mode 3: IEEE 802.11g link mode	1TX / 1RX	1, 6, 11	6
Mode 4: IEEE 802.11n 2.4GHz 20MHz link mode	1TX / 1RX	1, 6, 11	6.5
Mode 5: IEEE 802.11n 2.4GHz 40MHz link mode	1TX / 1RX	3, 6, 9	13.5

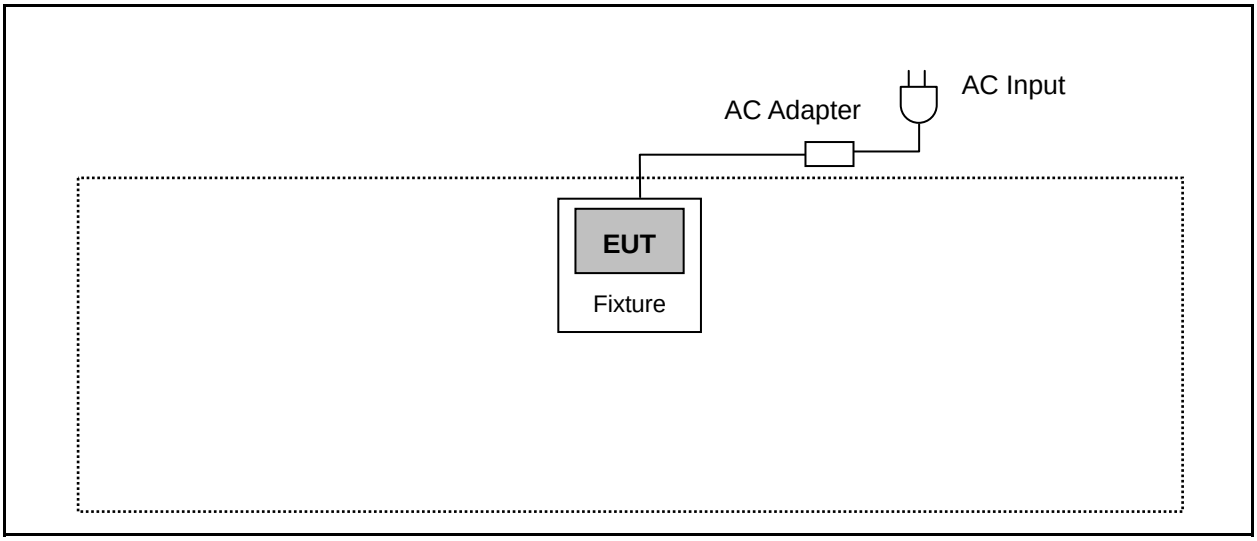
3.2. EUT Exercise Software

1.	Setup the EUT shown on 3.3.
2.	Turn on the power of all equipment.
3.	Turn on Wi-Fi function.
4.	EUT run test program.

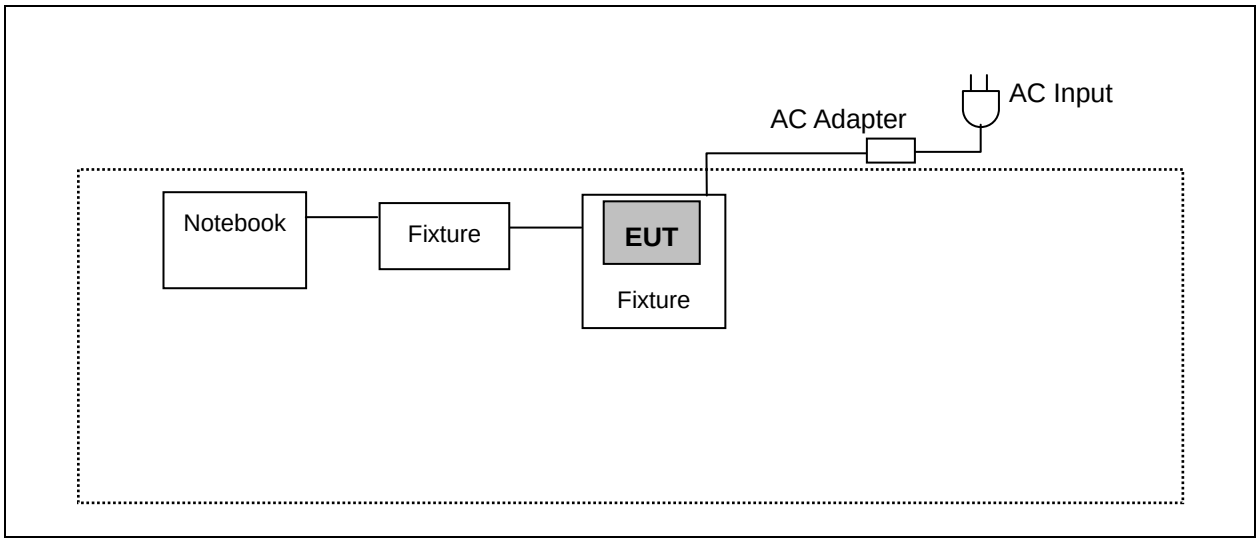
Measurement Software	
1	EZ-EMC Ver. ATL-03A1-1
2	EZ-EMC Ver ATL-ITC-3A1-1

3.3. Configuration of Test System Details

Conducted Emissions



Radiated Emissions



3.4. Test Site Environment

Items	Required (IEC 60068-1)	Actual
Temperature (°C)	15-35	26
Humidity (%RH)	25-75	60
Barometric pressure (mbar)	860-1060	950

4 Conducted Emission Measurement

4.1. Limit

Frequency (MHz)	Quasi-peak	Average
0.15 - 0.5	66 to 56	56 to 46
0.50 - 5.0	56	46
5.0 - 30.0	60	50

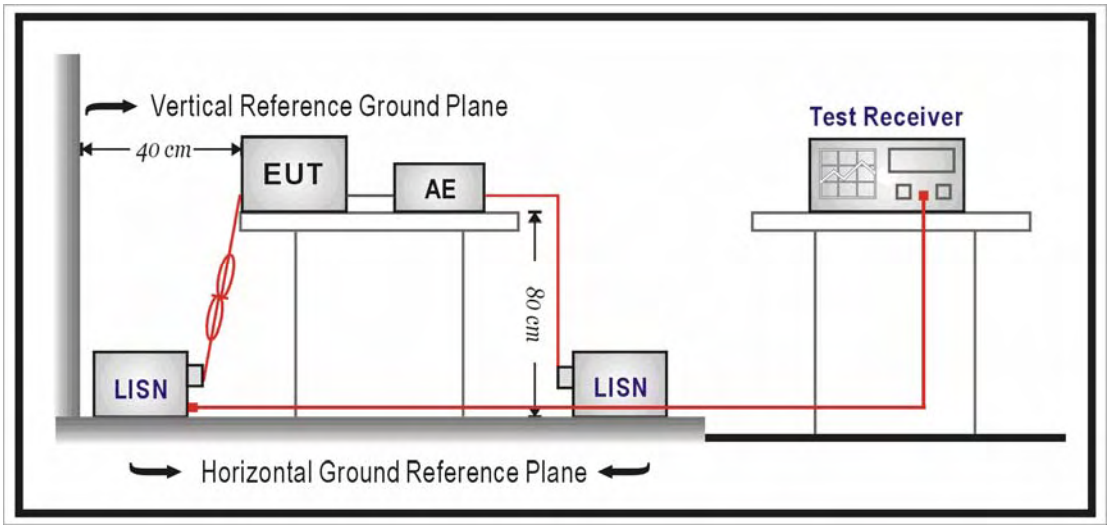
4.2. Test Instruments

Describe	Manufacturer	Model Number	Serial Number	Cal. Date	Remark
Test Receiver	R&S	ESCI	100367	06/25/2015	(1)
LISN	R&S	ENV216	101040	03/10/2015	(1)
LISN	R&S	ENV216	101041	03/06/2015	(1)
RF Cable	Woken	00100D1380194M	TE-02-02	06/26/2015	(1)
Test Site	ATL	TE02	TE02	N.C.R.	-----

Remark: (1) Calibration period 1 year. (2) Calibration period 2 years. (3) Calibration period 3 years.

Note: N.C.R. = No Calibration Request.

4.3. Test Setup



4.4. Test Procedure

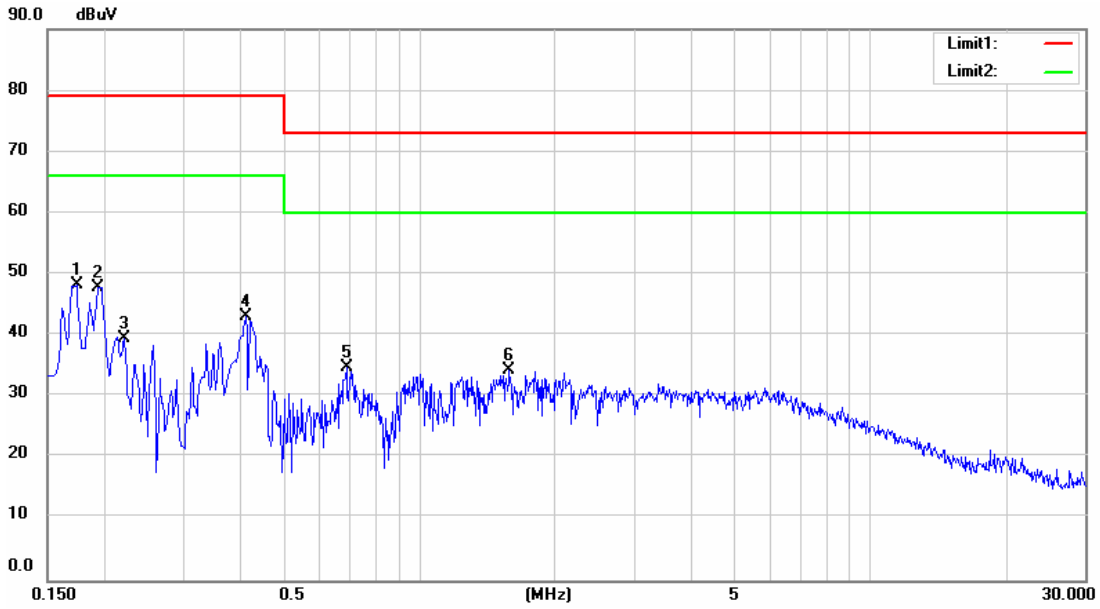
The power line conducted emission measurements were performed in a shielded enclosure. The EUT was assembled on a wooden table which is 80 centimeters high, was placed 40 centimeters from the back wall and at least 1 meter from the sidewall.

Power was fed to the EUT from the public utility power grid through a line filter and EMCO Model 3162/2 SH Line Impedance Stabilization Networks (LISN). The LISN housing, measuring instrumentation case, ground plane, etc., were electrically bonded together at the same RF potential. The Spectrum analyzer was connected to the AC line through an isolation transformer. The 50-ohm output of the LISN was connected to the spectrum analyzer directly. Conducted emission levels were in the CISPR quasi-peak detection mode. The analyzer's 6 dB bandwidth was set to 9 KHz. No post-detector video filter was used.

The spectrum was scanned from 150 KHz to 30 MHz. The physical arrangement of the test system and associated cabling was varied (within the scope of arrangements likely to be encountered in actual use) to determine the effect on the unit's emanations in amplitude and frequency. All spurious emission frequencies were observed. The highest emission amplitudes relative to the appropriate limit were measured and have been recorded in paragraph 4.1.

4.5. Test Result

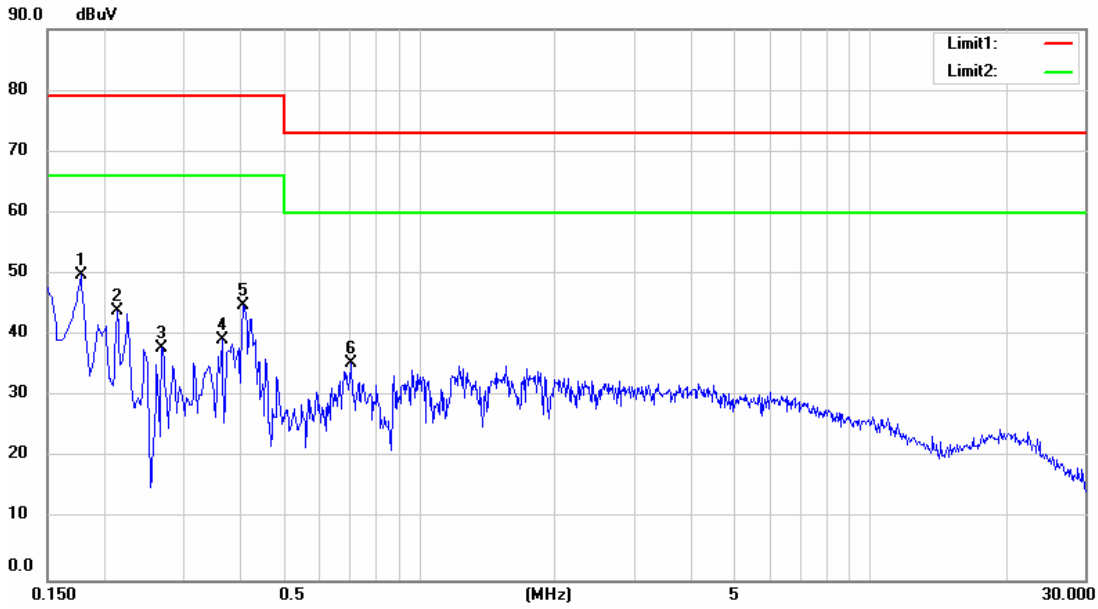
Standard:	FCC Part 15C	Line:	L1
Test item:	Conducted Emission	Power:	AC 120V/60Hz
Model Number:	CAPRICA2L	Temp.(℃)/Hum.(%RH):	26(℃)/60%RH
Mode:	Mode 1	Date:	11/27/2015
		Test By:	Eric Ou Yang
Description:			



No.	Frequency (MHz)	QP reading (dBuV)	AVG reading (dBuV)	Correction factor (dB)	QP result (dBuV)	AVG result (dBuV)	QP limit (dBuV)	AVG limit (dBuV)	QP margin (dB)	AVG margin (dB)	Remark
1	0.1740	35.97	20.39	9.69	45.66	30.08	79.00	66.00	-33.34	-35.92	Pass
2	0.1940	34.28	21.31	9.68	43.96	30.99	79.00	66.00	-35.04	-35.01	Pass
3	0.2220	29.10	18.70	9.68	38.78	28.38	79.00	66.00	-40.22	-37.62	Pass
4	0.4140	33.04	25.22	9.69	42.73	34.91	79.00	66.00	-36.27	-31.09	Pass
5	0.6900	21.93	13.82	9.71	31.64	23.53	73.00	60.00	-41.36	-36.47	Pass
6	1.5860	20.54	12.48	9.75	30.29	22.23	73.00	60.00	-42.71	-37.77	Pass

Note: 1. Result (dBuV) = Correction factor (dB) + Reading(dBuV).
2. Correction factor (dB) = Cable loss (dB) + L.I.S.N. factor (dB).

Standard:	FCC Part 15C	Line:	N
Test item:	Conducted Emission	Power:	AC 120V/60Hz
Model Number:	CAPRICA2L	Temp.(℃)/Hum.(%RH):	26(℃)/60%RH
Mode:	Mode 1	Date:	11/27/2015
		Test By:	Eric Ou Yang
Description:			



No.	Frequency (MHz)	QP reading (dBuV)	AVG reading (dBuV)	Correction factor (dB)	QP result (dBuV)	AVG result (dBuV)	QP limit (dBuV)	AVG limit (dBuV)	QP margin (dB)	AVG margin (dB)	Remark
1	0.1780	36.63	22.92	9.65	46.28	32.57	79.00	66.00	-32.72	-33.43	Pass
2	0.2140	30.94	19.90	9.65	40.59	29.55	79.00	66.00	-38.41	-36.45	Pass
3	0.2700	21.88	7.44	9.66	31.54	17.10	79.00	66.00	-47.46	-48.90	Pass
4	0.3660	26.63	17.74	9.66	36.29	27.40	79.00	66.00	-42.71	-38.60	Pass
5	0.4100	32.51	24.16	9.66	42.17	33.82	79.00	66.00	-36.83	-32.18	Pass
6	0.7100	22.65	14.76	9.68	32.33	24.44	73.00	60.00	-40.67	-35.56	Pass

Note: 1. Result (dBuV) = Correction factor (dB) + Reading(dBuV).
2. Correction factor (dB) = Cable loss (dB) + L.I.S.N. factor (dB).

5 Radiated Emission Measurement

5.1. Limit

According to §15.209(a), except as provided elsewhere in this subpart, the emissions from an intentional radiator shall not exceed the field strength levels specified in the following table:

Frequency (MHz)	Field Strength (μV/m at meter)	Measurement Distance (meters)
0.009 – 0.490	2400 / F (kHz)	300
0.490 – 1.705	24000 / F (kHz)	30
1.705 – 30.0	30	30
30 - 88	100**	3
88-216	150**	3
216-960	200**	3
Above 960	500	3

** Except as provided in paragraph (g), fundamental emissions from intentional radiators operating under this Section shall not be located in the frequency bands 54-72 MHz, 76-88 MHz, 174-216 MHz or 470-806 MHz. However, operation within these frequency bands is permitted under other sections of this Part, e.g., Sections 15.231 and 15.241.

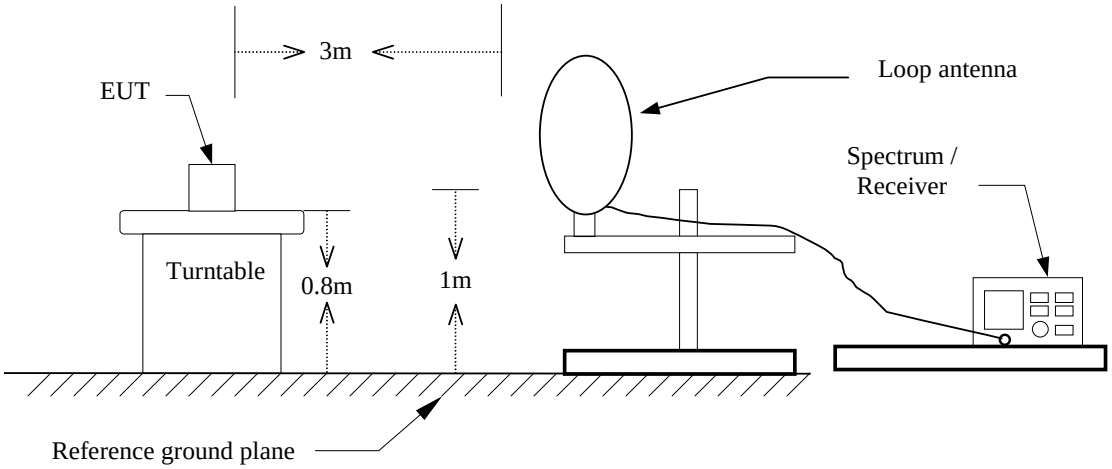
5.2. Test Instruments

3 Meter Chamber					
Equipment	Manufacturer	Model Number	Serial Number	Cal. Date	Remark
RF Pre-selector	Agilent	N9039A	MY46520256	01/06/2015	(1)
Spectrum Analyzer	Agilent	E4446A	MY46180578	01/06/2015	(1)
Pre Amplifier	Agilent	8449B	3008A02237	02/24/2015	(1)
Pre Amplifier	Agilent	8447D	2944A10961	02/24/2015	(1)
Broadband Antenna (30MHz~1GHz)	SCHWARZBECK MESS-ELEKTRONIK	VULB9163	9163-270	08/11/2015	(1)
Horn Antenna (1~18GHz)	SCHWARZBECK MESS-ELEKTRONIK	BBHA9120D	9120D-550	06/12/2015	(1)
Horn Antenna (18~40GHz)	SCHWARZBECK MESS-ELEKTRONIK	BBHA9170	9170-320	07/06/2015	(1)
Loop Antenna	COM-POWER CORPORATION	AL-130	121014	02/02/2015	(1)
Microwave Cable	EMCI	EMC-104-SM-SM-14000	140202	02/24/2015	(1)
Microwave Cable	EMCI	EMC104-SM-SM-600	140301	02/24/2015	(1)
Test Site	ATL	TE01	888001	08/27/2015	(1)

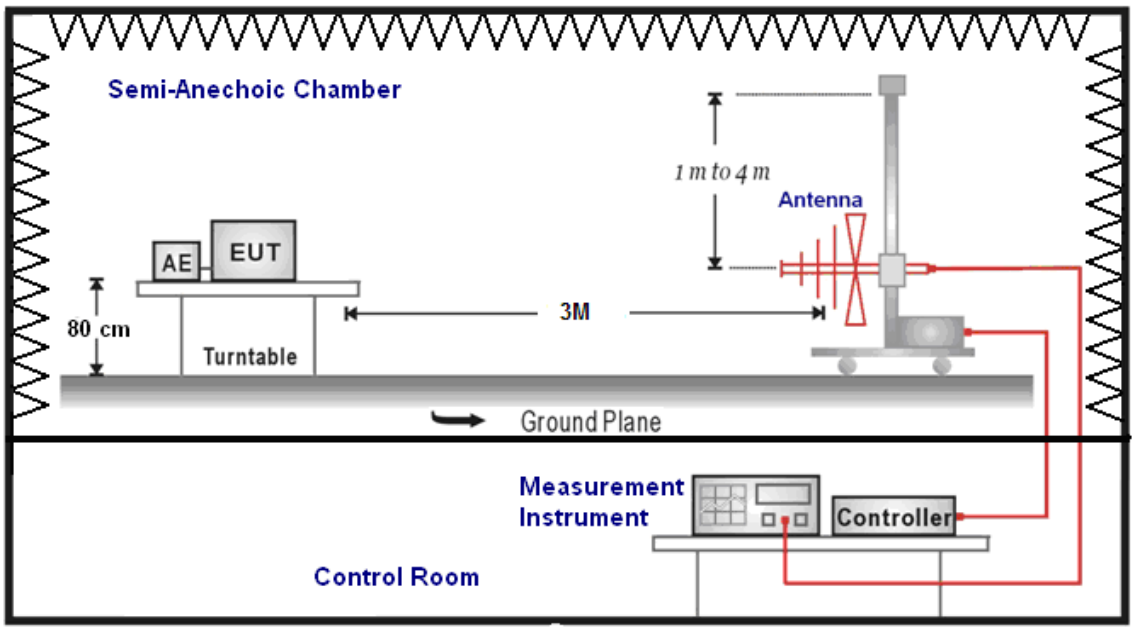
Remark: (1) Calibration period 1 year. (2) Calibration period 2 years. (3) Calibration period 3 years.
Note: N.C.R. = No Calibration Request.

5.3. Setup

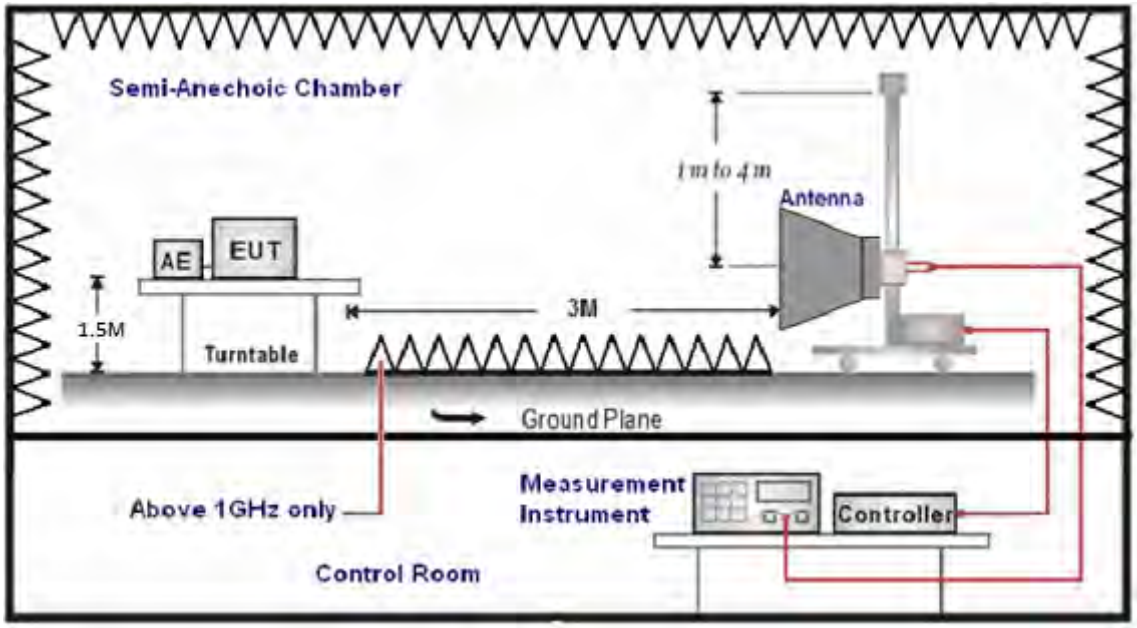
9kHz ~ 30MHz



Below 1GHz



Above 1GHz


Semi-Anechoic Chamber
1 m to 4 m
Antenna
AE
EUT
1.5M
3M
Turntable
Ground Plane
Above 1GHz only
Measurement
Instrument
Controller
Control Room

5.4. Test Procedure

Final radiation measurements were made on a three-meter, Semi Anechoic Chamber. The EUT system was placed on a nonconductive turntable which is 0.8 or 1.5 meters height(below 1GHz use 0.8m turntable / above 1GHz use 1.5m turntable), top surface 1.0 x 1.5 meter. The spectrum was examined from 250 MHz to 2.5 GHz in order to cover the whole spectrum below 10th harmonic which could generate from the EUT. During the test, EUT was set to transmit continuously & Measurements spectrum range from 9 kHz to 26.5 GHz is investigated.

For measurements below 1 GHz the resolution bandwidth is set to 100 kHz for peak detection measurements or 120 kHz for quasi-peak detection measurements. Peak detection is used unless otherwise noted as quasi-peak.

For measurements above 1 GHz the resolution bandwidth is set to 1 MHz, and then the video bandwidth is set to 1 MHz for peak measurements and 10 Hz for average measurements when Duty cycle >0.98 / 1/T for average measurements when Duty cycle <0.98. A nonconductive material surrounded the EUT to supporting the EUT for standing on tree orthogonal planes. At each condition, the EUT was rotated 360 degrees, and the antenna was raised and lowered from one to four meters to find the maximum emission levels. Measurements were taken using both horizontal and vertical antenna polarization.

SCHWARZBECK MESS-ELEKTRONIK Biconilog Antenna (mode VULB9163) at 3 Meter and the SCHWARZBECK Double Ridged Guide Antenna (model BBHA9120D&9170) was used in frequencies 1 – 26.5 GHz at a distance of 1 meter. All test results were extrapolated to equivalent signal at 3 meters utilizing an inverse linear distance extrapolation Factor (20dB/decade).

For testing above 1GHz, the emission level of the EUT in peak mode was 20dB lower than average limit (that means the emission level in peak mode also complies with the limit in average mode), then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions will be measured in average mode again and reported.

Appropriate preamplifiers were used for improving sensitivity and precautions were taken to avoid overloading or desensitizing the spectrum analyzer. No post – detector video filters were used in the test.

The spectrum analyzer's 6 dB bandwidth was set to 1 MHz, and the analyzer was operated in the peak detection mode, for frequencies both below and up 1 GHz. The average levels were obtained by subtracting the duty cycle correction factor from the peak readings.

The following procedures were used to convert the emission levels measured in decibels referenced to 1 microvolt (dBuV) into field intensity in micro volts pre meter (uV/m).

The actual field intensity in decibels referenced to 1 microvolt in to field intensity in micro colts per meter (dBuV/m).

The actual field is intensity in referenced to 1 microvolt per meter (dBuV/m) is determined by algebraically adding the measured reading in dBuV, the antenna factor (dB), and cable loss (dB) and Subtracting the gain of preamplifier (dB) is auto calculate in spectrum analyzer.

(1) Amplitude (dBuV/m) = FI (dBuV) +AF (dBuV) +CL (dBuV)-Gain (dB)
FI= Reading of the field intensity.
AF= Antenna factor.
CL= Cable loss.
P.S Amplitude is auto calculate in spectrum analyzer.

(2) Actual Amplitude (dBuV/m) = Amplitude (dBuV)-Dis(dB)
The FCC specified emission limits were calculated according the EUT operating frequency and by following linear interpolation equations:
(a) For fundamental frequency : Transmitter Output < +30dBm
(b) For spurious frequency : Spurious emission limits = fundamental emission limit /10

Data of measurement within this frequency range without mark in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

5.5. Test Result

Below 1GHz

Standard:	FCC Part 15C	Test Distance:	3m
Test item:	Radiated Emission	Power:	AC 120V/60Hz
Model Number:	CAPRICA2L	Temp.(℃)/Hum.(%RH):	26(℃)/60%RH
Mode:	Mode 1	Date:	12/06/2015
		Test By:	Eric Ou Yang

Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant.Polar. H / V
217.0000	31.85	-12.71	19.14	46.00	-26.86	QP	H
360.0000	36.38	-8.08	28.30	46.00	-17.70	QP	H
497.5000	30.39	-5.36	25.03	46.00	-20.97	QP	H
676.5000	31.36	-1.77	29.59	46.00	-16.41	QP	H
792.0000	28.18	0.43	28.61	46.00	-17.39	QP	H
903.5000	28.83	2.82	31.65	46.00	-14.35	QP	H
199.5000	37.23	-13.73	23.50	43.50	-20.00	QP	V
312.0000	35.79	-9.00	26.79	46.00	-19.21	QP	V
429.5000	42.95	-6.63	36.32	46.00	-9.68	QP	V
501.0000	41.61	-5.30	36.31	46.00	-9.69	QP	V
676.5000	36.91	-1.77	35.14	46.00	-10.86	QP	V
796.5000	37.40	0.49	37.89	46.00	-8.11	QP	V

Note: No emission found between lowest internal used/generated frequency to 30MHz (9kHz~30MHz).

Above 1GHz

Standard:	FCC Part 15C	Test Distance:	3m
Test item:	Radiated Emission	Power:	AC 120V/60Hz
Model Number:	CAPRICA2L	Temp.(℃)/Hum.(%RH):	26(℃)/60%RH
Mode:	Mode 2	Date:	12/06/2015
Frequency:	2412MHz	Test By:	Eric Ou Yang

Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant.Polar. H / V
3107.000	33.87	1.82	35.69	74.00	-38.31	peak	H
4563.000	29.98	6.55	36.53	74.00	-37.47	peak	H
6670.000	28.72	11.96	40.68	74.00	-33.32	peak	H
3002.000	33.90	1.32	35.22	74.00	-38.78	peak	V
4824.000	39.41	7.46	46.87	74.00	-27.13	peak	V
6677.000	30.33	11.97	42.30	74.00	-31.70	peak	V

Standard:	FCC Part 15C	Test Distance:	3m
Test item:	Radiated Emission	Power:	AC 120V/60Hz
Model Number:	CAPRICA2L	Temp.(℃)/Hum.(%RH):	26(℃)/60%RH
Mode:	Mode 2	Date:	12/06/2015
Frequency:	2437MHz	Test By:	Eric Ou Yang

Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant.Polar. H / V
3058.000	33.91	1.58	35.49	74.00	-38.51	peak	H
4577.000	28.87	6.59	35.46	74.00	-38.54	peak	H
6705.000	29.15	12.04	41.19	74.00	-32.81	peak	H
3037.000	33.02	1.48	34.50	74.00	-39.50	peak	V
4874.000	40.11	7.63	47.74	74.00	-26.26	peak	V
6691.000	28.93	12.00	40.93	74.00	-33.07	peak	V
7311.000	36.23	13.53	49.76	54.00	-4.24	AVG	V

Standard:	FCC Part 15C	Test Distance:	3m
Test item:	Radiated Emission	Power:	AC 120V/60Hz
Model Number:	CAPRICA2L	Temp.(℃)/Hum.(%RH):	26(℃)/60%RH
Mode:	Mode 2	Date:	12/06/2015
Frequency:	2462MHz	Test By:	Eric Ou Yang

Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant.Polar. H / V
3065.000	31.88	1.62	33.50	74.00	-40.50	peak	H
4675.000	26.63	6.93	33.56	74.00	-40.44	peak	H
6677.000	28.59	11.97	40.56	74.00	-33.44	peak	H
3023.000	35.13	1.42	36.55	74.00	-37.45	peak	V
4924.000	39.19	7.81	47.00	74.00	-27.00	peak	V
6705.000	30.20	12.04	42.24	74.00	-31.76	peak	V

Standard:	FCC Part 15C	Test Distance:	3m
Test item:	Radiated Emission	Power:	AC 120V/60Hz
Model Number:	CAPRICA2L	Temp.(℃)/Hum.(%RH):	26(℃)/60%RH
Mode:	Mode 3	Date:	12/06/2015
Frequency:	2412MHz	Test By:	Eric Ou Yang

Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant.Polar. H / V
3009.000	32.18	1.35	33.53	74.00	-40.47	peak	H
4619.000	27.58	6.74	34.32	74.00	-39.68	peak	H
6670.000	29.31	11.96	41.27	74.00	-32.73	peak	H
3037.000	33.98	1.48	35.46	74.00	-38.54	peak	V
4824.000	36.34	7.46	43.80	74.00	-30.20	peak	V
6677.000	28.73	11.97	40.70	74.00	-33.30	peak	V

Standard:	FCC Part 15C	Test Distance:	3m
Test item:	Radiated Emission	Power:	AC 120V/60Hz
Model Number:	CAPRICA2L	Temp.(℃)/Hum.(%RH):	26(℃)/60%RH
Mode:	Mode 3	Date:	12/06/2015
Frequency:	2437MHz	Test By:	Eric Ou Yang

Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant.Polar. H / V
3065.000	31.30	1.62	32.92	74.00	-41.08	peak	H
4633.000	26.87	6.79	33.66	74.00	-40.34	peak	H
6754.000	29.13	12.15	41.28	74.00	-32.72	peak	H
3079.000	33.81	1.68	35.49	74.00	-38.51	peak	V
4874.000	37.78	7.63	45.41	74.00	-28.59	peak	V
6747.000	31.13	12.13	43.26	74.00	-30.74	peak	V

Standard:	FCC Part 15C	Test Distance:	3m
Test item:	Radiated Emission	Power:	AC 120V/60Hz
Model Number:	CAPRICA2L	Temp.(℃)/Hum.(%RH):	26(℃)/60%RH
Mode:	Mode 3	Date:	12/06/2015
Frequency:	2462MHz	Test By:	Eric Ou Yang

Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant.Polar. H / V
3079.000	31.98	1.68	33.66	74.00	-40.34	peak	H
4605.000	28.81	6.69	35.50	74.00	-38.50	peak	H
6726.000	29.10	12.09	41.19	74.00	-32.81	peak	H
3058.000	35.00	1.58	36.58	74.00	-37.42	peak	V
4591.000	30.52	6.64	37.16	74.00	-36.84	peak	V
6733.000	30.34	12.11	42.45	74.00	-31.55	peak	V

Standard:	FCC Part 15C	Test Distance:	3m
Test item:	Radiated Emission	Power:	AC 120V/60Hz
Model Number:	CAPRICA2L	Temp.(℃)/Hum.(%RH):	26(℃)/60%RH
Mode:	Mode 4	Date:	12/06/2015
Frequency:	2412MHz	Test By:	Eric Ou Yang

Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant.Polar. H / V
3002.000	32.41	1.32	33.73	74.00	-40.27	peak	H
4549.000	28.02	6.49	34.51	74.00	-39.49	peak	H
6677.000	28.43	11.97	40.40	74.00	-33.60	peak	H
3058.000	31.45	1.58	33.03	74.00	-40.97	peak	V
4563.000	26.62	6.55	33.17	74.00	-40.83	peak	V
6677.000	27.93	11.97	39.90	74.00	-34.10	peak	V

Standard:	FCC Part 15C	Test Distance:	3m
Test item:	Radiated Emission	Power:	AC 120V/60Hz
Model Number:	CAPRICA2L	Temp.(℃)/Hum.(%RH):	26(℃)/60%RH
Mode:	Mode 4	Date:	12/06/2015
Frequency:	2437MHz	Test By:	Eric Ou Yang

Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant.Polar. H / V
3002.000	33.57	1.32	34.89	74.00	-39.11	peak	H
4626.000	27.97	6.77	34.74	74.00	-39.26	peak	H
6754.000	27.71	12.15	39.86	74.00	-34.14	peak	H
2995.000	33.91	1.30	35.21	74.00	-38.79	peak	V
4563.000	26.72	6.55	33.27	74.00	-40.73	peak	V
6691.000	27.04	12.00	39.04	74.00	-34.96	peak	V

Standard:	FCC Part 15C	Test Distance:	3m
Test item:	Radiated Emission	Power:	AC 120V/60Hz
Model Number:	CAPRICA2L	Temp.(℃)/Hum.(%RH):	26(℃)/60%RH
Mode:	Mode 4	Date:	12/06/2015
Frequency:	2462MHz	Test By:	Eric Ou Yang

Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant.Polar. H / V
3037.000	31.13	1.48	32.61	74.00	-41.39	peak	H
4598.000	26.71	6.67	33.38	74.00	-40.62	peak	H
6677.000	27.65	11.97	39.62	74.00	-34.38	peak	H
3051.000	32.95	1.55	34.50	74.00	-39.50	peak	V
4570.000	27.68	6.57	34.25	74.00	-39.75	peak	V
6677.000	28.91	11.97	40.88	74.00	-33.12	peak	V

Standard:	FCC Part 15C	Test Distance:	3m
Test item:	Radiated Emission	Power:	AC 120V/60Hz
Model Number:	CAPRICA2L	Temp.(℃)/Hum.(%RH):	26(℃)/60%RH
Mode:	Mode 5	Date:	12/06/2015
Frequency:	2422MHz	Test By:	Eric Ou Yang

Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant.Polar. H / V
3065.000	32.43	1.62	34.05	74.00	-39.95	peak	H
4598.000	28.82	6.67	35.49	74.00	-38.51	peak	H
6670.000	29.46	11.96	41.42	74.00	-32.58	peak	H
3030.000	32.36	1.46	33.82	74.00	-40.18	peak	V
4619.000	27.89	6.74	34.63	74.00	-39.37	peak	V
6663.000	27.46	11.93	39.39	74.00	-34.61	peak	V

Standard:	FCC Part 15C	Test Distance:	3m
Test item:	Radiated Emission	Power:	AC 120V/60Hz
Model Number:	CAPRICA2L	Temp.(℃)/Hum.(%RH):	26(℃)/60%RH
Mode:	Mode 5	Date:	12/06/2015
Frequency:	2437MHz	Test By:	Eric Ou Yang

Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant.Polar. H / V
3065.000	31.25	1.62	32.87	74.00	-41.13	peak	H
4675.000	27.18	6.93	34.11	74.00	-39.89	peak	H
6726.000	28.34	12.09	40.43	74.00	-33.57	peak	H
3058.000	31.35	1.58	32.93	74.00	-41.07	peak	V
4626.000	28.04	6.77	34.81	74.00	-39.19	peak	V
6775.000	27.87	12.20	40.07	74.00	-33.93	peak	V

Standard:	FCC Part 15C	Test Distance:	3m
Test item:	Radiated Emission	Power:	AC 120V/60Hz
Model Number:	CAPRICA2L	Temp.(℃)/Hum.(%RH):	26(℃)/60%RH
Mode:	Mode 5	Date:	12/06/2015
Frequency:	2452MHz	Test By:	Eric Ou Yang

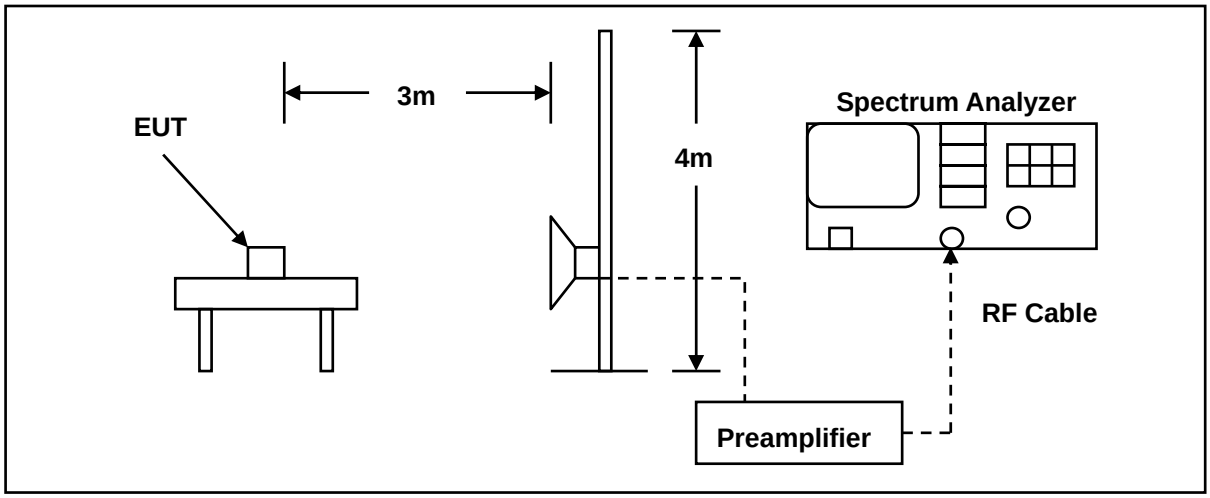
Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant.Polar. H / V
3058.000	31.84	1.58	33.42	74.00	-40.58	peak	H
4661.000	27.66	6.89	34.55	74.00	-39.45	peak	H
6866.000	29.78	12.42	42.20	74.00	-31.80	peak	H
3051.000	31.66	1.55	33.21	74.00	-40.79	peak	V
4577.000	26.54	6.59	33.13	74.00	-40.87	peak	V
6705.000	28.17	12.04	40.21	74.00	-33.79	peak	V

6 Band Edges Measurement

6.1. Limit

In any 100 kHz bandwidth outside the intentional radiation frequency band, the radio frequency power shall be at least 20 dB below the highest level of the radiated power. In addition, radiated emissions which fall in the restricted bands must also comply with the radiated emission limits.

6.2. Test Setup



6.3. Test Instruments

3 Meter Chamber					
Equipment	Manufacturer	Model Number	Serial Number	Cal. Date	Remark
RF Pre-selector	Agilent	N9039A	MY46520256	01/06/2015	(1)
Spectrum Analyzer	Agilent	E4446A	MY46180578	01/06/2015	(1)
Pre Amplifier	Agilent	8449B	3008A02237	02/24/2015	(1)
Pre Amplifier	Agilent	8447D	2944A10961	02/24/2015	(1)
Horn Antenna (1~18GHz)	SCHWARZBECK MESS-ELEKTRONIK	BBHA9120D	9120D-550	06/12/2015	(1)
Microwave Cable	EMCI	EMC-104-SM-SM-14000	140202	02/24/2015	(1)
Microwave Cable	EMCI	EMC104-SM-SM-600	140301	02/24/2015	(1)
Test Site	ATL	TE01	888001	08/27/2015	(1)

Remark: (1) Calibration period 1 year. (2) Calibration period 2 years. (3) Calibration period 3 years.
Note: N.C.R. = No Calibration Request.

6.4. Test Procedure

The EUT tested to DTS test procedure of KDB558074D01 for compliance to FCC 47CFR 15.247 requirements.

The emissions on the harmonics frequencies, the limits, and the margin of compliance are presented. These tests were made when the transmitter was in full radiated power. The additional test was performed to show compliance with the requirement at the band-edge frequency 2483.5 MHz and up to 2500 MHz and at 2390.0 MHz.

The transmitter was configured with the worst case antenna and setup to transmit at the highest channel. Then the field strength was measured at 2483.5 MHz.

The transmitter was then configured with the worst case antenna and setup to transmit at the lowest channel. Then the field strength was measured at 2390.0 MHz. These tests were performed at 4 different bit rates.

For measurements above 1 GHz the resolution bandwidth is set to 1 MHz, and then the video bandwidth is set to 1 MHz for peak measurements and 10 Hz for average measurements when Duty cycle >0.98 / 1/T for average measurements when Duty cycle <0.98.

6.5. Test Result

Standard:	FCC Part 15C	Test Distance:	3m
Test item:	Radiated Emission	Power:	AC 120V/60Hz
Model Number:	CAPRICA2L	Temp.(℃)/Hum.(%RH):	26(℃)/60%RH
Mode:	Mode 2	Date:	12/03/2015
Frequency:	2412 MHz	Test By:	Eric Ou Yang

Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant.Polar. H / V
2387.220	50.08	-0.33	49.75	74.00	-24.25	peak	H
2390.000	48.59	-0.33	48.26	74.00	-25.74	peak	H
2387.990	51.46	-0.33	51.13	74.00	-22.87	peak	V
2390.000	50.63	-0.33	50.30	74.00	-23.70	peak	V

Standard:	FCC Part 15C	Test Distance:	3m
Test item:	Radiated Emission	Power:	AC 120V/60Hz
Model Number:	CAPRICA2L	Temp.(℃)/Hum.(%RH):	26(℃)/60%RH
Mode:	Mode 2	Date:	12/03/2015
Frequency:	2462 MHz	Test By:	Eric Ou Yang

Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant.Polar. H / V
2483.500	47.77	0.03	47.80	74.00	-26.20	peak	H
2491.920	49.39	0.06	49.45	74.00	-24.55	peak	H
2483.500	51.80	0.03	51.83	74.00	-22.17	peak	V
2487.040	54.12	0.04	54.16	74.00	-19.84	peak	V
2487.040	44.10	0.04	44.14	54.00	-9.86	AVG	V

Standard:	FCC Part 15C	Test Distance:	3m
Test item:	Radiated Emission	Power:	AC 120V/60Hz
Model Number:	CAPRICA2L	Temp.(℃)/Hum.(%RH):	26(℃)/60%RH
Mode:	Mode 3	Date:	12/03/2015
Frequency:	2412 MHz	Test By:	Eric Ou Yang

Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant.Polar. H / V
2389.420	58.92	-0.33	58.59	74.00	-15.41	peak	H
2389.420	46.01	-0.33	45.68	54.00	-8.32	AVG	H
2390.000	57.57	-0.33	57.24	74.00	-16.76	peak	H
2390.000	46.40	-0.33	46.07	54.00	-7.93	AVG	H
2389.750	65.65	-0.33	65.32	74.00	-8.68	peak	V
2389.750	52.55	-0.33	52.22	54.00	-1.78	AVG	V
2390.000	62.81	-0.33	62.48	74.00	-11.52	peak	V
2390.000	52.75	-0.33	52.42	54.00	-1.58	AVG	V

Standard:	FCC Part 15C	Test Distance:	3m
Test item:	Radiated Emission	Power:	AC 120V/60Hz
Model Number:	CAPRICA2L	Temp.(℃)/Hum.(%RH):	26(℃)/60%RH
Mode:	Mode 3	Date:	12/03/2015
Frequency:	2462 MHz	Test By:	Eric Ou Yang

Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant.Polar. H / V
2483.500	48.07	0.03	48.10	74.00	-25.90	peak	H
2493.160	50.05	0.06	50.11	74.00	-23.89	peak	H
2483.500	51.24	0.03	51.27	74.00	-22.73	peak	V
2485.960	52.39	0.03	52.42	74.00	-21.58	peak	V
2485.960	43.53	0.03	43.56	54.00	-10.44	AVG	V

Standard:	FCC Part 15C	Test Distance:	3m
Test item:	Radiated Emission	Power:	AC 120V/60Hz
Model Number:	CAPRICA2L	Temp.(℃)/Hum.(%RH):	26(℃)/60%RH
Mode:	Mode 4	Date:	12/03/2015
Frequency:	2412 MHz	Test By:	Eric Ou Yang

Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant.Polar. H / V
2389.640	60.18	-0.33	59.85	74.00	-14.15	peak	H
2389.640	45.94	-0.33	45.61	54.00	-8.39	AVG	H
2390.000	57.03	-0.33	56.70	74.00	-17.30	peak	H
2390.000	46.28	-0.33	45.95	54.00	-8.05	AVG	H
2389.090	65.32	-0.33	64.99	74.00	-9.01	peak	V
2389.090	50.84	-0.33	50.51	54.00	-3.49	AVG	V
2390.000	67.53	-0.33	67.20	74.00	-6.80	peak	V
2390.000	51.90	-0.33	51.57	54.00	-2.43	AVG	V

Standard:	FCC Part 15C	Test Distance:	3m
Test item:	Radiated Emission	Power:	AC 120V/60Hz
Model Number:	CAPRICA2L	Temp.(℃)/Hum.(%RH):	26(℃)/60%RH
Mode:	Mode 4	Date:	12/03/2015
Frequency:	2462 MHz	Test By:	Eric Ou Yang

Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant.Polar. H / V
2483.500	46.71	0.03	46.74	74.00	-27.26	peak	H
2485.080	49.87	0.03	49.90	74.00	-24.10	peak	H
2483.500	48.73	0.03	48.76	74.00	-25.24	peak	V
2487.200	52.73	0.04	52.77	74.00	-21.23	peak	V
2487.200	43.36	0.04	43.40	54.00	-10.60	AVG	V

Standard:	FCC Part 15C	Test Distance:	3m
Test item:	Radiated Emission	Power:	AC 120V/60Hz
Model Number:	CAPRICA2L	Temp.(℃)/Hum.(%RH):	26(℃)/60%RH
Mode:	Mode 5	Date:	12/03/2015
Frequency:	2422 MHz	Test By:	Eric Ou Yang

Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant.Polar. H / V
2344.320	49.90	-0.50	49.40	74.00	-24.60	peak	H
2390.000	47.54	-0.33	47.21	74.00	-26.79	peak	H
2320.680	50.02	-0.60	49.42	74.00	-24.58	peak	V
2390.000	47.90	-0.33	47.57	74.00	-26.43	peak	V

Standard:	FCC Part 15C	Test Distance:	3m
Test item:	Radiated Emission	Power:	AC 120V/60Hz
Model Number:	CAPRICA2L	Temp.(℃)/Hum.(%RH):	26(℃)/60%RH
Mode:	Mode 5	Date:	12/03/2015
Frequency:	2452 MHz	Test By:	Eric Ou Yang

Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant.Polar. H / V
2483.500	54.13	0.03	54.16	74.00	-19.84	peak	H
2483.500	45.29	0.03	45.32	54.00	-8.68	AVG	H
2487.150	57.90	0.04	57.94	74.00	-16.06	peak	H
2487.150	44.11	0.04	44.15	54.00	-9.85	AVG	H
2483.500	65.12	0.03	65.15	74.00	-8.85	peak	V
2483.500	53.11	0.03	53.14	54.00	-0.86	AVG	V
2487.950	68.47	0.04	68.51	74.00	-5.49	peak	V
2487.950	50.18	0.04	50.22	54.00	-3.78	AVG	V

7 Antenna Measurement

7.1. Limit

For intentional device, according to 15.203, 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.

And According to 15.247 (b), if transmitting antennas of directional gain greater than 6 dBi are used, the power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6dBi.

7.2. Antenna Connector Construction

The antenna used in this product is listed as below:

Antenna Used	Manufacturer	Model Number	Type	Max. Gain
	SUNG NAM ELECTRONICS(SHENZHEN) CO., LTD.	CSA3A020Z	Dipole Antenna (I-PEX Connector)	1.83 dBi