

# EMC TEST REPORT



Report No.: 14070564-FCC-E1

Supersede Report No.: N/A

Applicant	Wisdom International HongKong Co., Limited	
Product Name	MoonBox streaming player	
Model No.	MoonBox III	
Test Standard	FCC Part 15 Subpart B Class B:2013, ANSI C63.4: 2009	
Test Date	October 30 to November 04, 2014	
Issue Date	November 14, 2014	
Test Result	<input checked="" type="checkbox"/> Pass <input type="checkbox"/> Fail	
Equipment complied with the specification		<input checked="" type="checkbox"/>
Equipment did not comply with the specification		<input type="checkbox"/>
Lili.Xia	Alex.Liu	
Lili Xia Test Engineer	Alex Liu Checked By	
<p>This test report may be reproduced in full only Test result presented in this test report is applicable to the tested sample only</p>		

Issued by:

SIEMIC (SHENZHEN-CHINA) LABORATORIES

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## Laboratories Introduction

SIEMIC, headquartered in the heart of Silicon Valley, with superior facilities in US and Asia, is one of the leading independent testing and certification facilities providing customers with one-stop shop services for Compliance Testing and Global Certifications.



In addition to testing and certification, SIEMIC provides initial design reviews and compliance management throughout a project. Our extensive experience with China, Asia Pacific, North America, European, and International compliance requirements, assures the fastest, most cost effective way to attain regulatory compliance for the global markets.

### Accreditations for Conformity Assessment

Country/Region	Scope
USA	EMC, RF/Wireless, SAR, Telecom
Canada	EMC, RF/Wireless, SAR, Telecom
Taiwan	EMC, RF, Telecom, SAR, Safety
Hong Kong	RF/Wireless, SAR, Telecom
Australia	EMC, RF, Telecom, SAR, Safety
Korea	EMI, EMS, RF, SAR, Telecom, Safety
Japan	EMI, RF/Wireless, SAR, Telecom
Singapore	EMC, RF, SAR, Telecom
Europe	EMC, RF, SAR, Telecom, Safety

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## 1. Report Revision History

Report No.	Report Version	Description	Issue Date
14070564-FCC-E1	NONE	Original	November 14, 2014

## 2. Customer information

Applicant Name	Wisdom International HongKong Co., Limited
Applicant Add	Room 603, 6/F, Hang Pont Commercial Building, 31 Tonkin Street, Cheung Sha Wan, Kowloon, HongKong
Manufacturer	Wisdom International HongKong Co., Limited
Manufacturer Add	Room 603, 6/F, Hang Pont Commercial Building, 31 Tonkin Street, Cheung Sha Wan, Kowloon, HongKong

## 3. Test site information

Lab performing tests	SIEMIC (Shenzhen-China) LABORATORIES
Lab Address	Zone A, Floor 1, Building 2 Wan Ye Long Technology Park South Side of Zhoushi Road, Bao' an District, Shenzhen, Guangdong China 518108
FCC Test Site No.	718246
IC Test Site No.	4842E-1
Test Software	Labview of SIEMIC version 2.0

#### 4. Equipment under Test (EUT) Information

Description of EUT: MoonBox streaming player

Main Model: MoonBox III

Serial Model: N/A

Date EUT received: October 13, 2014

Test Date(s): October 30 to November 04, 2014

Antenna Gain: WIFI: 2.5 dBi

Type of Modulation: 802.11b/g/n: DSSS, OFDM

RF Operating Frequency (ies):  
 WIFI:802.11b/g/n(20M): 2412-2462 MHz  
 WIFI:802.11n(40M): 2422-2452 MHz

Number of Channels:  
 WIFI :802.11b/g/n(20M): 11CH  
 WIFI :802.11n(40M): 7CH

Port: Power Port, USB Port

Adapter:

Input Power:  
 Model: JK050200-S04USA  
 Input: AC 100-240V; 50/60Hz 0.5A  
 Output: DC 5.0V; 2000mA

Trade Name : N/A

FCC ID: 2ADET131010

## 5. Test Summary

The product was tested in accordance with the following specifications.

All testing has been performed according to below product classification:

FCC Rules	Description of Test	Result
§15.107; ANSI C63.4: 2009	AC Power Line Conducted Emissions	Compliance
§15.109; ANSI C63.4: 2009	Radiated Emissions	Compliance

### Measurement Uncertainty

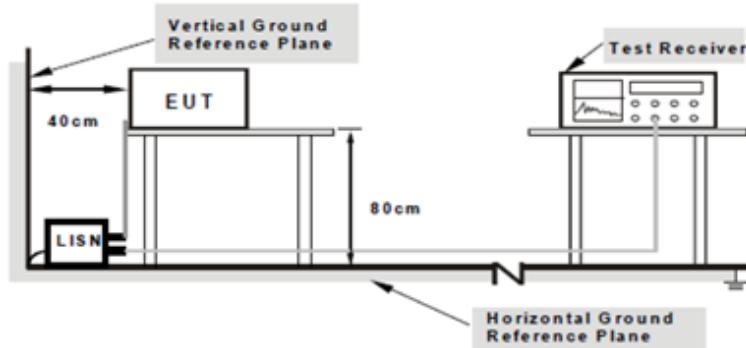
Emissions		
Test Item	Description	Uncertainty
Band Edge and Radiated Spurious Emissions	Confidence level of approximately 95% (in the case where distributions are normal), with a coverage factor of 2 (for EUTs < 0.5m X 0.5m X 0.5m)	+5.6dB/-4.5dB

## 6. Measurements, Examination and Derived Results

### 6.1 AC Power Line Conducted Emissions

Temperature	24°C
Relative Humidity	55%
Atmospheric Pressure	1012mbar
Test date :	October 30, 2014
Tested By :	Lili Xia

#### Requirement(s):

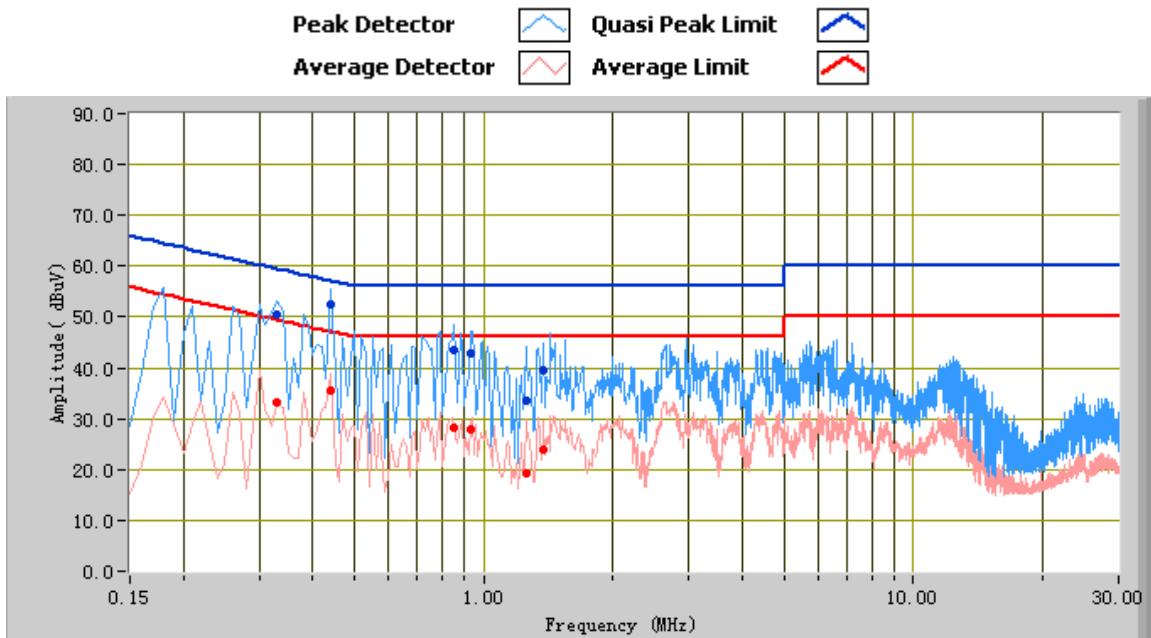
Spec	Item	Requirement	Applicable														
47CFR§15. 107	a)	<p>For Low-power radio-frequency devices that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies, within the band 150 kHz to 30 MHz, shall not exceed the limits in the following table, as measured using a 50 [mu] H/50 ohms line impedance stabilization network (LISN). The lower limit applies at the boundary between the frequencies ranges.</p> <table border="1"> <thead> <tr> <th rowspan="2">Frequency ranges (MHz)</th> <th colspan="2">Limit (dB<math>\mu</math>V)</th> </tr> <tr> <th>QP</th> <th>Average</th> </tr> </thead> <tbody> <tr> <td>0.15 ~ 0.5</td> <td>66 – 56</td> <td>56 – 46</td> </tr> <tr> <td>0.5 ~ 5</td> <td>56</td> <td>46</td> </tr> <tr> <td>5 ~ 30</td> <td>60</td> <td>50</td> </tr> </tbody> </table>	Frequency ranges (MHz)	Limit (dB $\mu$ V)		QP	Average	0.15 ~ 0.5	66 – 56	56 – 46	0.5 ~ 5	56	46	5 ~ 30	60	50	<input checked="" type="checkbox"/>
Frequency ranges (MHz)	Limit (dB $\mu$ V)																
	QP	Average															
0.15 ~ 0.5	66 – 56	56 – 46															
0.5 ~ 5	56	46															
5 ~ 30	60	50															
Test Setup	 <p>The diagram illustrates the test setup. An EUT (Equipment Under Test) is placed on a table. A LISN (Line Impedance Stabilization Network) is connected between the EUT and the power source. A Test Receiver is connected to the LISN. The setup is positioned on a horizontal ground reference plane. The distance between the LISN and the EUT is 40 cm, and the distance between the LISN and the Test Receiver is 80 cm. A vertical ground reference plane is also indicated.</p> <p><b>Note:</b>    1. Support units were connected to second LISN.    2. Both of LISNs (AMN) are 80cm from EUT and at least 80cm from other units and other metal planes support units.</p>																
Procedure	<ol style="list-style-type: none"> <li>The EUT and supporting equipment were set up in accordance with the requirements of the standard on top of a 1.5m x 1m x 0.8m high, non-metallic table.</li> <li>The power supply for the EUT was fed through a 50W/50mH EUT LISN, connected to filtered mains.</li> </ol>																

	<ol style="list-style-type: none"> <li>3. The RF OUT of the EUT LISN was connected to the EMI test receiver via a low-loss coaxial cable.</li> <li>4. All other supporting equipment were powered separately from another main supply.</li> <li>5. The EUT was switched on and allowed to warm up to its normal operating condition.</li> <li>6. A scan was made on the NEUTRAL line (for AC mains) or Earth line (for DC power) over the required frequency range using an EMI test receiver.</li> <li>7. High peaks, relative to the limit line, The EMI test receiver was then tuned to the selected frequencies and the necessary measurements made with a receiver bandwidth setting of 10 kHz.</li> <li>8. Step 7 was then repeated for the LIVE line (for AC mains) or DC line (for DC power).</li> </ol>
Remark	
Result	<input checked="" type="checkbox"/> Pass <input type="checkbox"/> Fail

Test Data  Yes  N/A

Test Plot  Yes (See below)  N/A

Test Mode: Multi-Media Mode

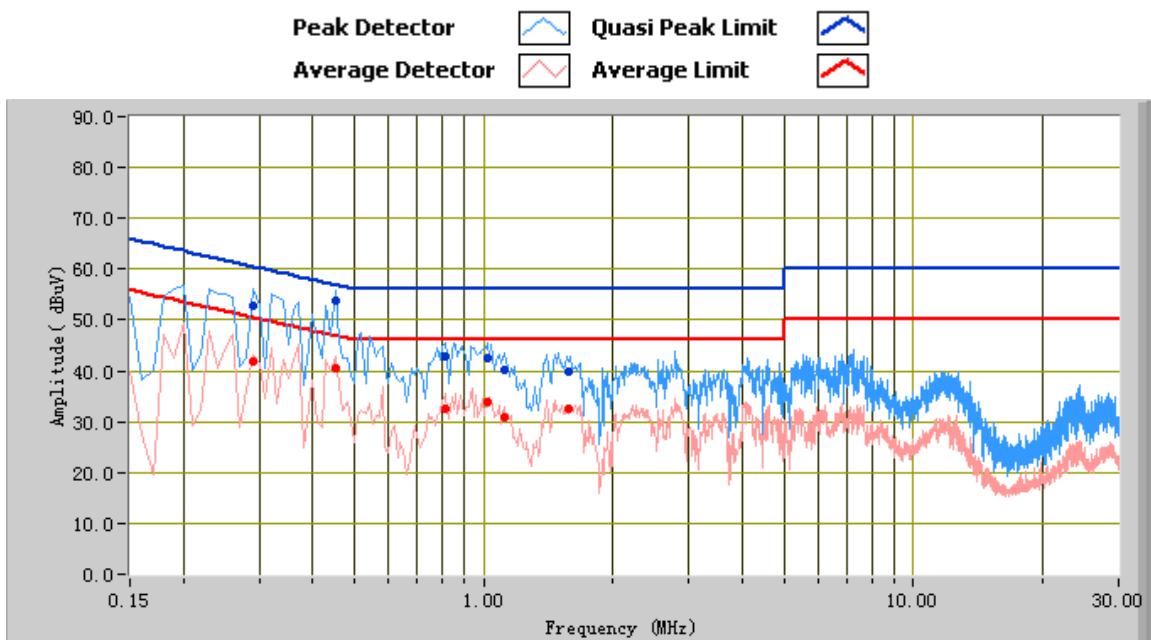


*Test Data*

Phase Line Plot at 120Vac, 60Hz

Frequency (MHz)	Quasi Peak (dB $\mu$ V)	Limit (dB $\mu$ V)	Margin (dB)	Average (dB $\mu$ V)	Limit (dB $\mu$ V)	Margin (dB)	Factors (dB)
0.44	52.50	57.06	-4.56	35.64	47.06	-11.42	10.81
0.33	50.62	59.45	-8.83	33.22	49.45	-16.23	11.34
0.85	43.65	56.00	-12.35	28.21	46.00	-17.79	10.37
0.93	42.96	56.00	-13.04	27.76	46.00	-18.24	10.33
1.38	39.66	56.00	-16.34	23.76	46.00	-22.24	10.33
1.25	33.60	56.00	-22.40	19.41	46.00	-26.59	10.31

**Test Mode:** Multi-Media Mode

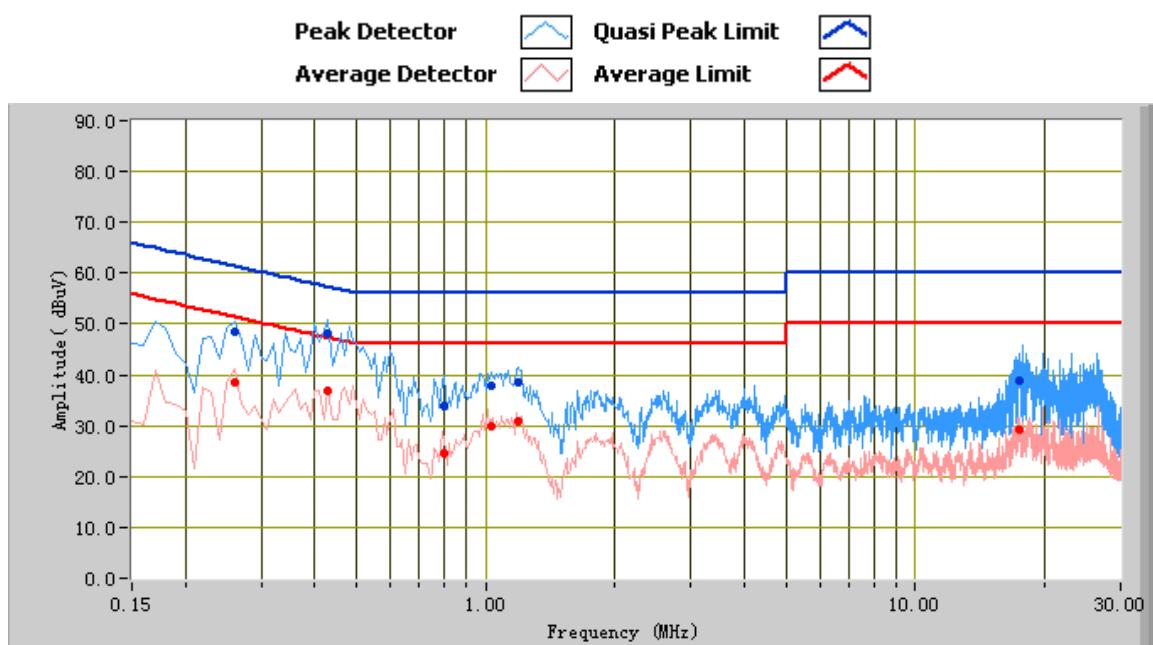


### Test Data

#### Phase Neutral Plot at 120Vac, 60Hz

Frequency (MHz)	Quasi Peak (dB $\mu$ V)	Limit (dB $\mu$ V)	Margin (dB)	Average (dB $\mu$ V)	Limit (dB $\mu$ V)	Margin (dB)	Factors (dB)
0.45	53.71	56.87	-3.17	40.44	46.87	-6.43	10.79
0.29	52.89	60.52	-7.63	41.88	50.52	-8.64	11.57
0.81	42.91	56.00	-13.09	32.60	46.00	-13.40	10.39
1.02	42.61	56.00	-13.39	33.74	46.00	-12.26	10.29
1.12	40.15	56.00	-15.85	30.92	46.00	-15.08	10.29
1.58	39.95	56.00	-16.05	32.58	46.00	-13.42	10.36

Test Mode: Ethernet Mode

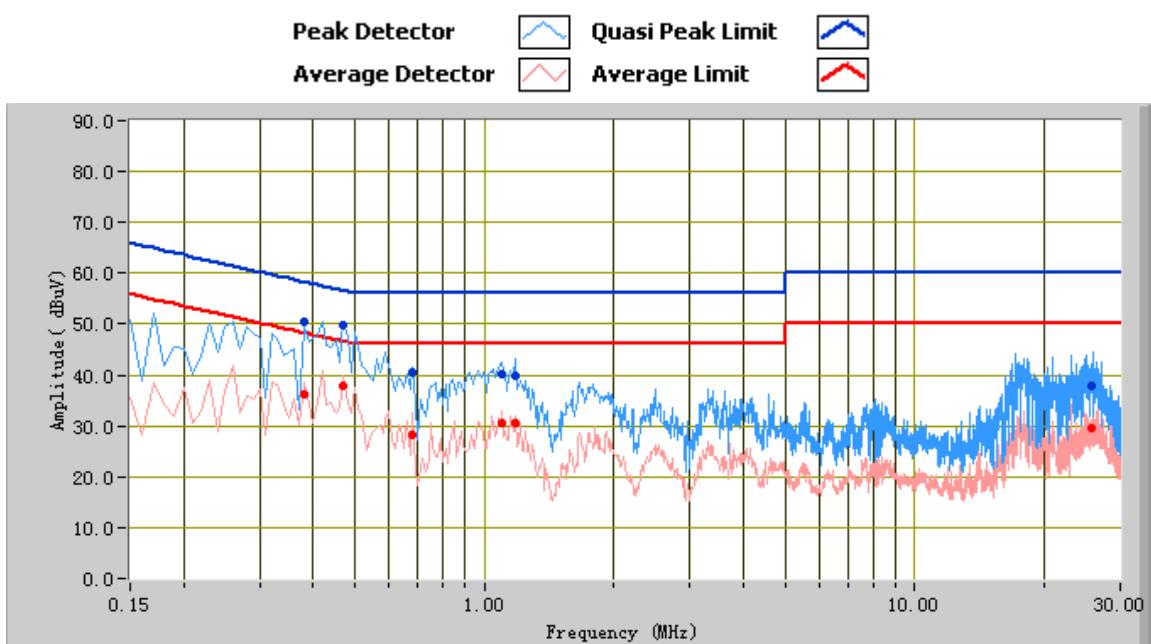


*Test Data*

Phase Line Plot at 120Vac, 60Hz

Frequency (MHz)	Quasi Peak (dB $\mu$ V)	Limit (dB $\mu$ V)	Margin (dB)	Average (dB $\mu$ V)	Limit (dB $\mu$ V)	Margin (dB)	Factors (dB)
0.43	48.04	57.25	-9.21	36.99	47.25	-10.26	10.86
0.26	48.41	61.43	-13.02	38.48	51.43	-12.95	11.74
1.19	38.50	56.00	-17.50	30.90	46.00	-15.10	10.30
1.03	37.88	56.00	-18.12	29.86	46.00	-16.14	10.29
0.80	33.76	56.00	-22.24	24.70	46.00	-21.30	10.40
17.42	38.77	60.00	-21.23	29.16	50.00	-20.84	14.10

Test Mode: Ethernet Mode



### Test Data

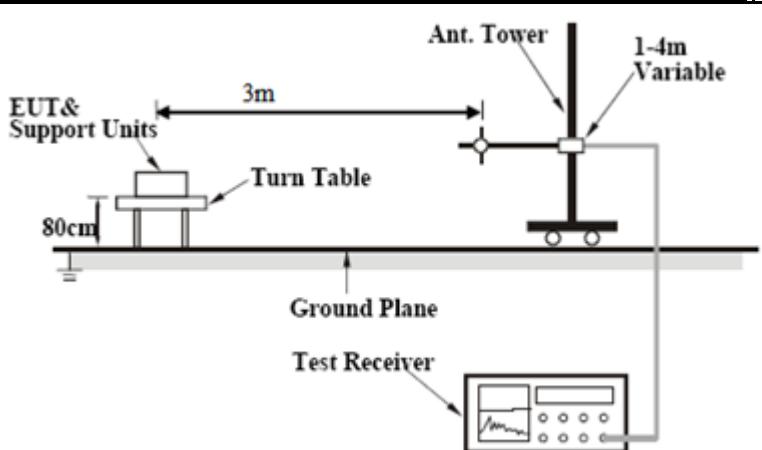
Phase Neutral Plot at 120Vac, 60Hz

Frequency (MHz)	Quasi Peak (dB $\mu$ V)	Limit (dB $\mu$ V)	Margin (dB)	Average (dB $\mu$ V)	Limit (dB $\mu$ V)	Margin (dB)	Factors (dB)
0.47	49.94	56.51	-6.57	37.70	46.51	-8.81	10.70
0.38	50.59	58.28	-7.69	36.16	48.28	-12.12	11.08
1.18	39.73	56.00	-16.27	30.45	46.00	-15.55	10.29
1.10	40.11	56.00	-15.89	30.65	46.00	-15.35	10.29
0.68	40.57	56.00	-15.43	28.36	46.00	-17.64	10.46
25.82	37.86	60.00	-22.14	29.48	50.00	-20.52	15.73

## 6.2 Radiated Emissions

Temperature	22°C
Relative Humidity	55%
Atmospheric Pressure	1012mbar
Test date :	November 04, 2014
Tested By :	Lili Xia

### Requirement(s):

Spec	Item	Requirement	Applicable										
47CFR§15. 107(d)	a)	<p>Except higher limit as specified elsewhere in other section, the emissions from the low-power radio-frequency devices shall not exceed the field strength levels specified in the following table and the level of any unwanted emissions shall not exceed the level of the fundamental emission. The tighter limit applies at the band edges</p> <table border="1"> <thead> <tr> <th>Frequency range (MHz)</th> <th>Field Strength (<math>\mu</math>V/m)</th> </tr> </thead> <tbody> <tr> <td>30 – 88</td> <td>100</td> </tr> <tr> <td>88 – 216</td> <td>150</td> </tr> <tr> <td>216 – 960</td> <td>200</td> </tr> <tr> <td>Above 960</td> <td>500</td> </tr> </tbody> </table>	Frequency range (MHz)	Field Strength ( $\mu$ V/m)	30 – 88	100	88 – 216	150	216 – 960	200	Above 960	500	<input checked="" type="checkbox"/>
Frequency range (MHz)	Field Strength ( $\mu$ V/m)												
30 – 88	100												
88 – 216	150												
216 – 960	200												
Above 960	500												
Test Setup		 <p>The diagram illustrates the test setup for radiated emissions. A 'Turn Table' is positioned 80cm above a 'Ground Plane'. An 'EUT &amp; Support Units' is placed on the turn table. A vertical 'Ant. Tower' is positioned 3m away from the EUT. The antenna height is adjustable, indicated as '1-4m Variable'. A 'Test Receiver' is connected to the antenna to measure the signal levels.</p>											
Procedure		<ol style="list-style-type: none"> <li>The EUT was switched on and allowed to warm up to its normal operating condition.</li> <li>The test was carried out at the selected frequency points obtained from the EUT characterization. Maximization of the emissions, was carried out by rotating the EUT, changing the antenna polarization, and adjusting the antenna height in the following manner:           <ol style="list-style-type: none"> <li>Vertical or horizontal polarization (whichever gave the higher emission level)</li> </ol> </li> </ol>											

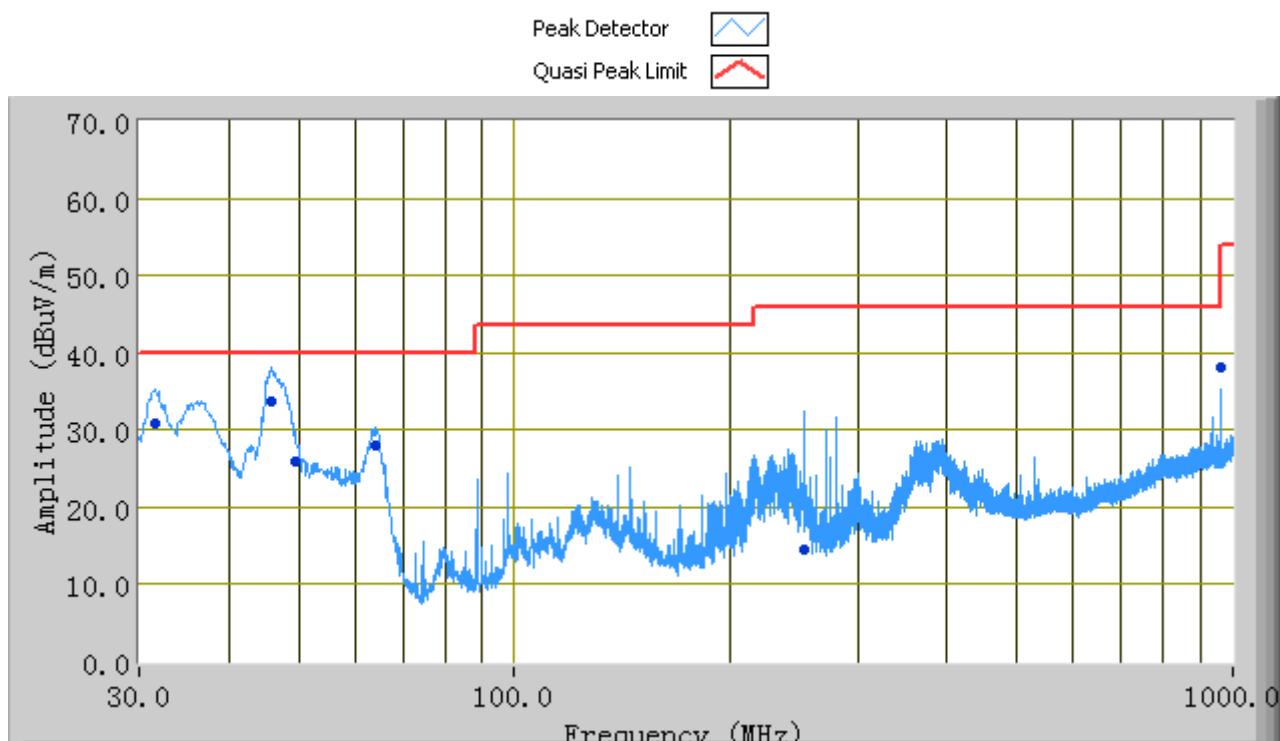
	<p>over a full rotation of the EUT) was chosen.</p> <p>b. The EUT was then rotated to the direction that gave the maximum emission.</p> <p>c. Finally, the antenna height was adjusted to the height that gave the maximum emission.</p> <p>3. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120 kHz for Quasiy Peak detection at frequency below 1GHz.</p> <p>4. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and video bandwidth is 3MHz with Peak detection for Peak Measurement at frequency above 1GHz.</p> <p>The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and the video bandwidth is 10Hz with Peak detection for Average Measurement at frequency above 1GHz.</p> <p>5. Steps 2 and 3 were repeated for the next frequency point, until all selected frequency points were measured.</p>
Remark	
Result	<input checked="" type="checkbox"/> Pass <input type="checkbox"/> Fail

Test Data  Yes  N/A

Test Plot  Yes (See below)  N/A

Test Mode:	Multi-Media Mode
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(Below 1GHz)



### Test Data

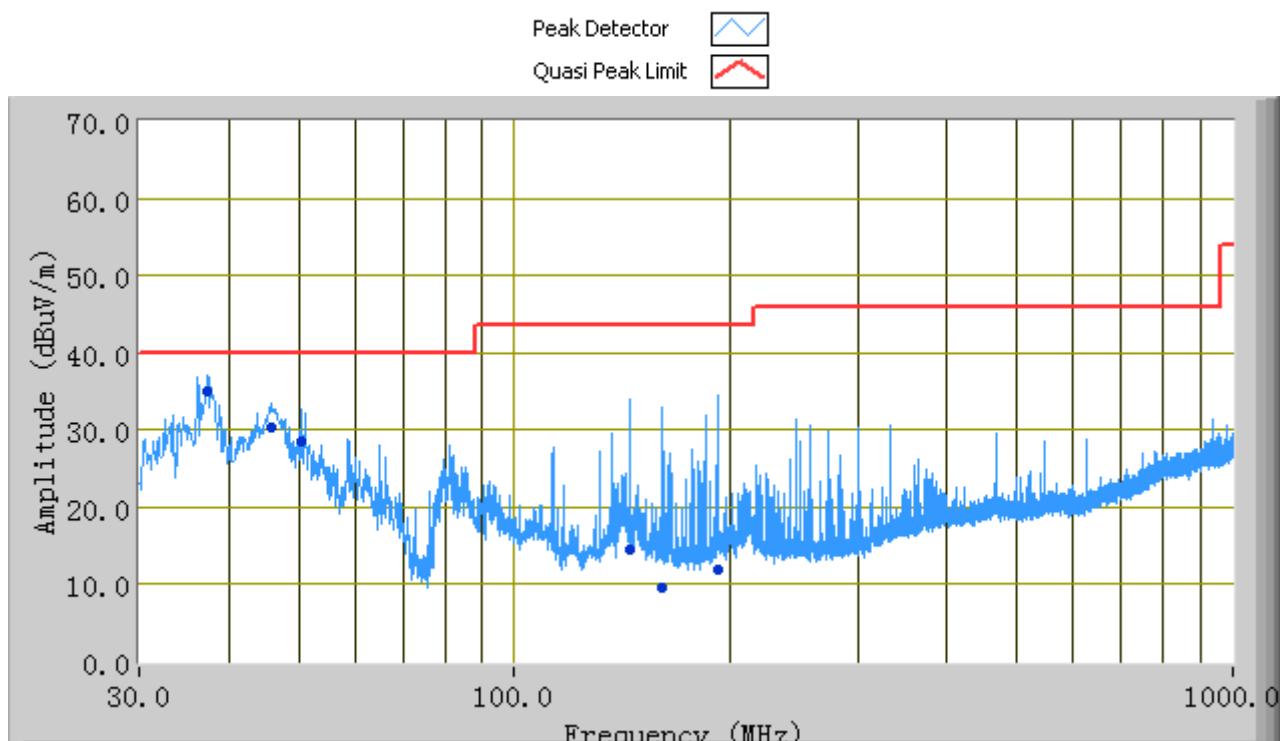
#### Vertical & Horizontal Polarity Plot @3m

Frequency (MHz)	Quasi Peak (dB $\mu$ V/m)	Azimuth	Polarity (H/V)	Height (cm)	Factors (dB)	Limit (dB $\mu$ V/m)	Margin (dB)
45.85	33.60	327.00	V	135.00	-11.93	40.00	-6.40
31.58	30.98	134.00	V	114.00	-2.48	40.00	-9.02
63.90	27.98	50.00	V	102.00	-13.84	40.00	-12.02
49.54	25.85	344.00	V	122.00	-13.71	40.00	-14.15
960.01	38.12	157.00	H	123.00	5.72	46.00	-7.88
253.27	14.43	245.00	H	100.00	-7.35	46.00	-31.57

Note: The above 1GHz frequency was pre-scanned and the result which was 20dB lower than the limit line per 15.109 was not recorded.

Test Mode:	Ethernet Mode
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(Below 1GHz)



### Test Data

#### Vertical & Horizontal Polarity Plot @3m

Frequency (MHz)	Quasi Peak (dB $\mu$ V/m)	Azimuth	Polarity (H/V)	Height (cm)	Factors (dB)	Limit (dB $\mu$ V/m)	Margin (dB)
37.37	34.94	196.00	V	102.00	-5.69	40.00	-5.06
45.83	30.26	110.00	V	100.00	-11.99	40.00	-9.74
50.41	28.64	273.00	V	111.00	-14.00	40.00	-11.36
191.33	12.03	279.00	H	100.00	-8.45	43.52	-31.49
144.59	14.60	105.00	H	202.00	-7.22	43.52	-28.92
159.93	9.49	228.00	V	284.00	-8.15	43.52	-34.03

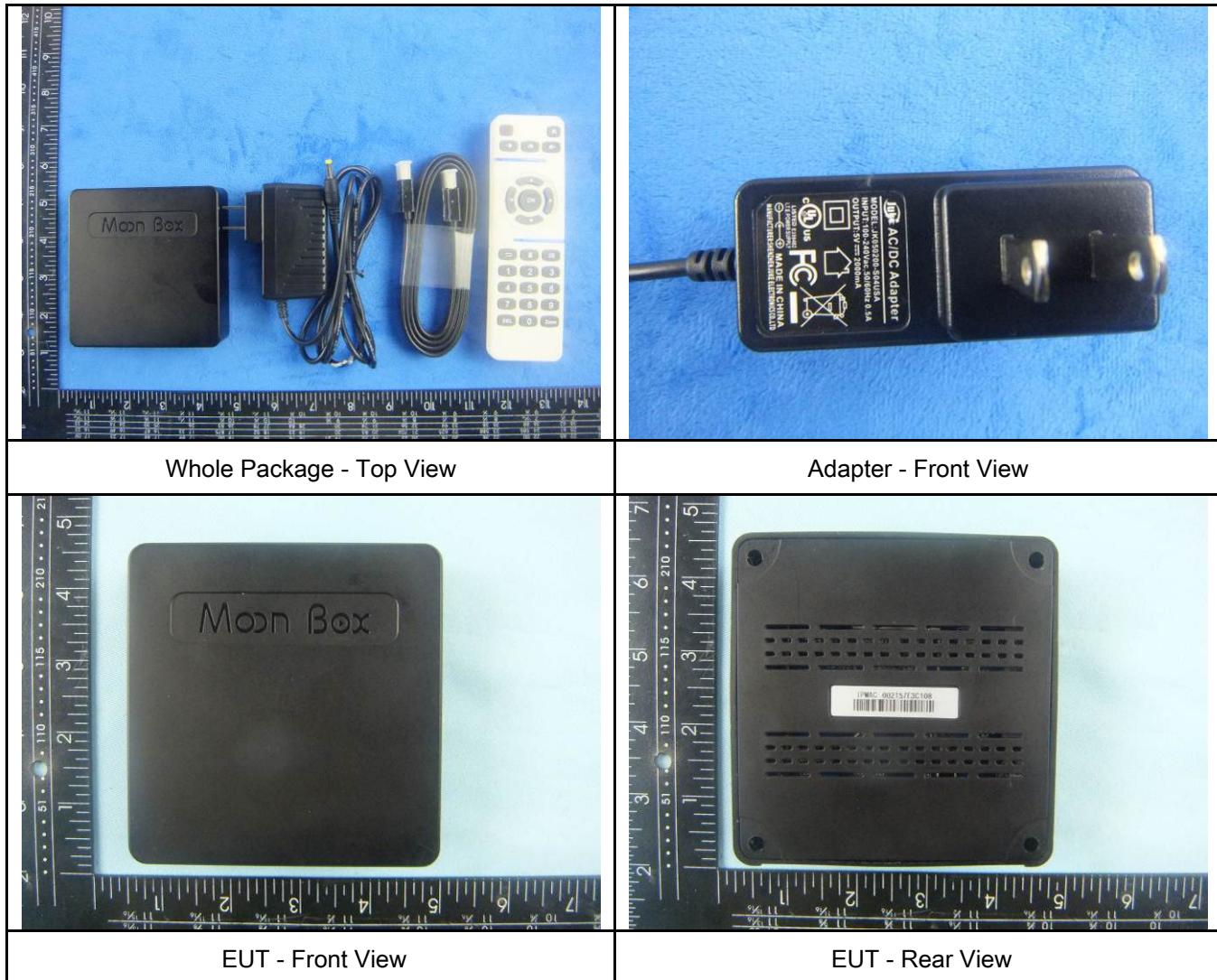
Note: The above 1GHz frequency was pre-scanned and the result which was 20dB lower than the limit line per 15.109 was not recorded.

## Annex A. TEST INSTRUMENT

Instrument	Model	Serial #	Cal Date	Cal Due	In use
<b>AC Line Conducted Emissions</b>					
EMI test receiver	ESCS30	8471241027	09/18/2014	09/17/2015	<input checked="" type="checkbox"/>
Line Impedance Stabilization Network	LI-125A	191106	09/26/2014	09/25/2015	<input checked="" type="checkbox"/>
Line Impedance Stabilization Network	LI-125A	191107	09/26/2014	09/25/2015	<input checked="" type="checkbox"/>
LISN	ISN T800	34373	09/26/2014	09/25/2015	<input checked="" type="checkbox"/>
Transient Limiter	LIT-153	531118	09/02/2014	09/01/2015	<input checked="" type="checkbox"/>
<b>Radiated Emissions</b>					
EMI test receiver	ESL6	100262	09/18/2014	09/17/2015	<input checked="" type="checkbox"/>
OPT 010 AMPLIFIER (0.1-1300MHz)	8447E	2727A02430	09/02/2014	09/01/2015	<input checked="" type="checkbox"/>
Microwave Preamplifier (0.5 ~ 18GHz)	PAM-118	443008	09/02/2014	09/01/2015	<input checked="" type="checkbox"/>
Bilog Antenna (30MHz~6GHz)	JB6	A110712	09/22/2014	09/21/2015	<input checked="" type="checkbox"/>
Double Ridge Horn Antenna	AH-118	71259	09/25/2014	09/24/2015	<input checked="" type="checkbox"/>

## Annex B. EUT And Test Setup Photographs

### Annex B.i. Photograph: EUT External Photo

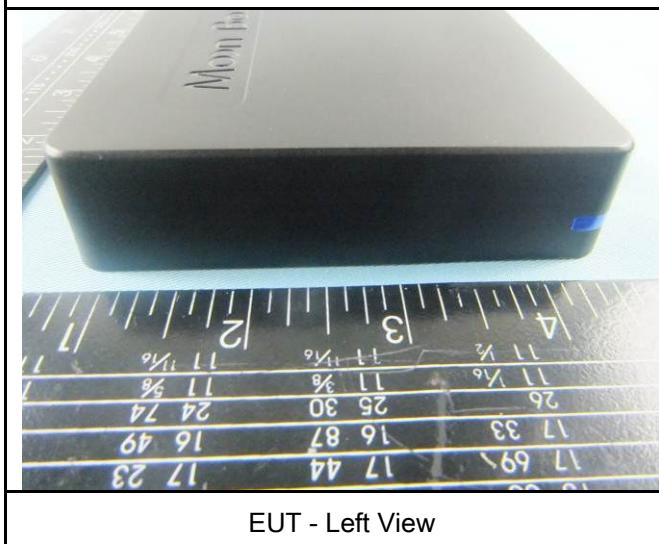




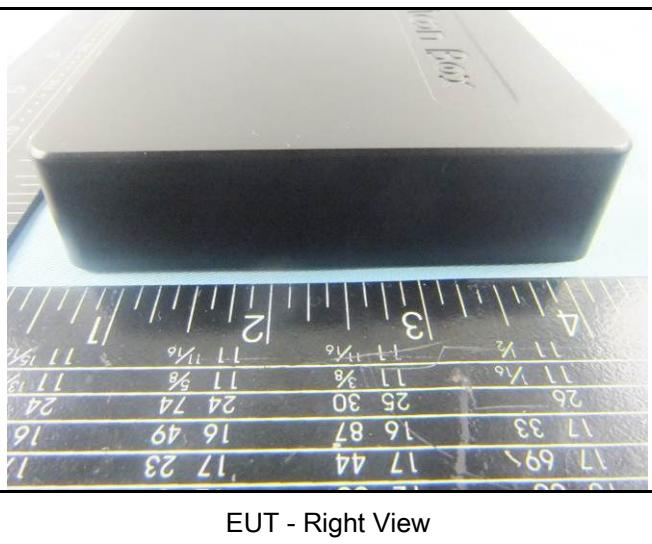
EUT - Top View



EUT - Bottom View

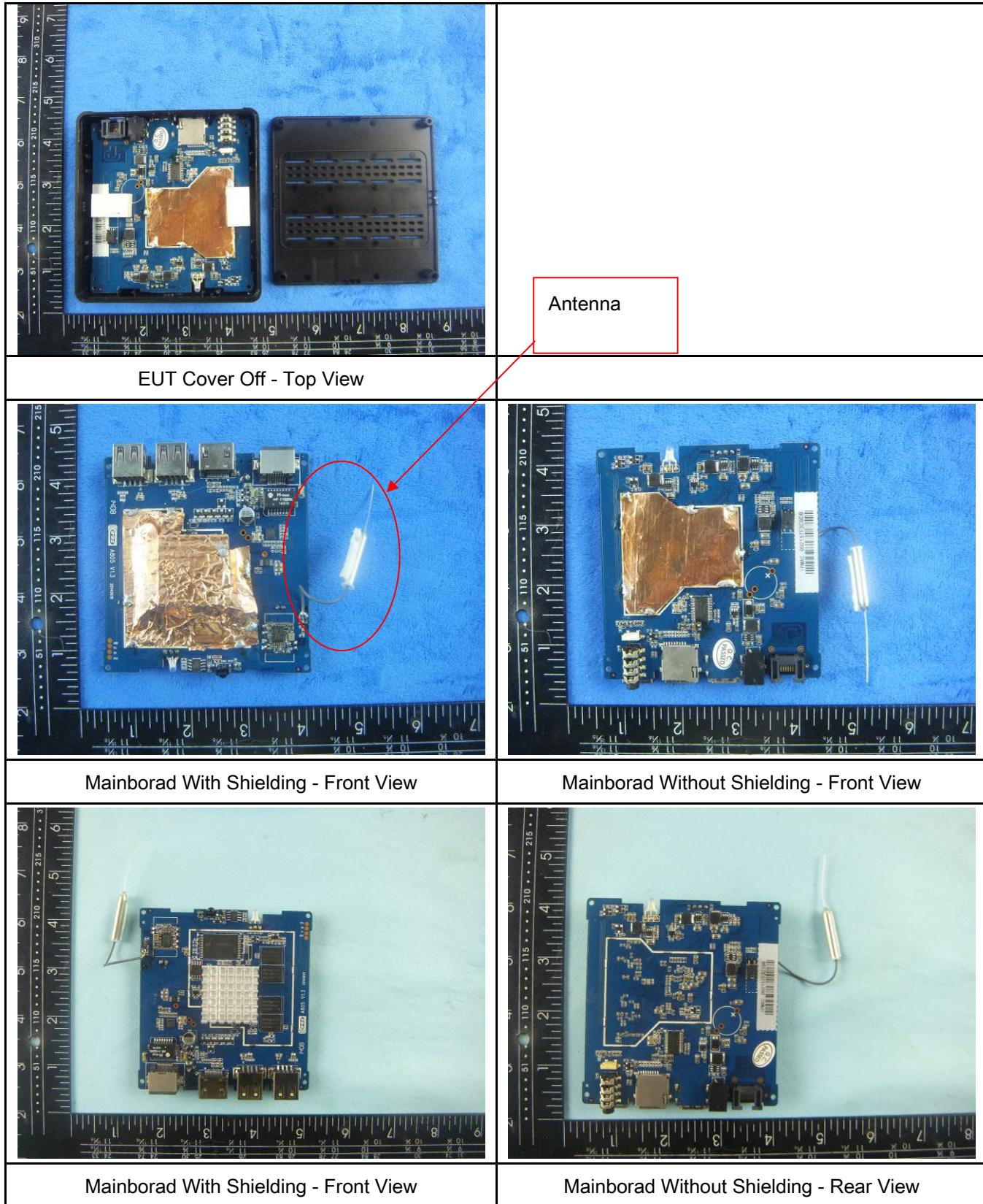


EUT - Left View

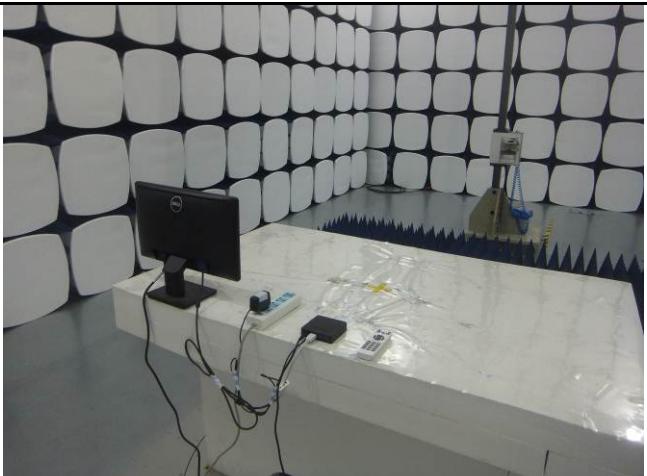


EUT - Right View

Annex B.ii. Photograph: EUT Internal Photo



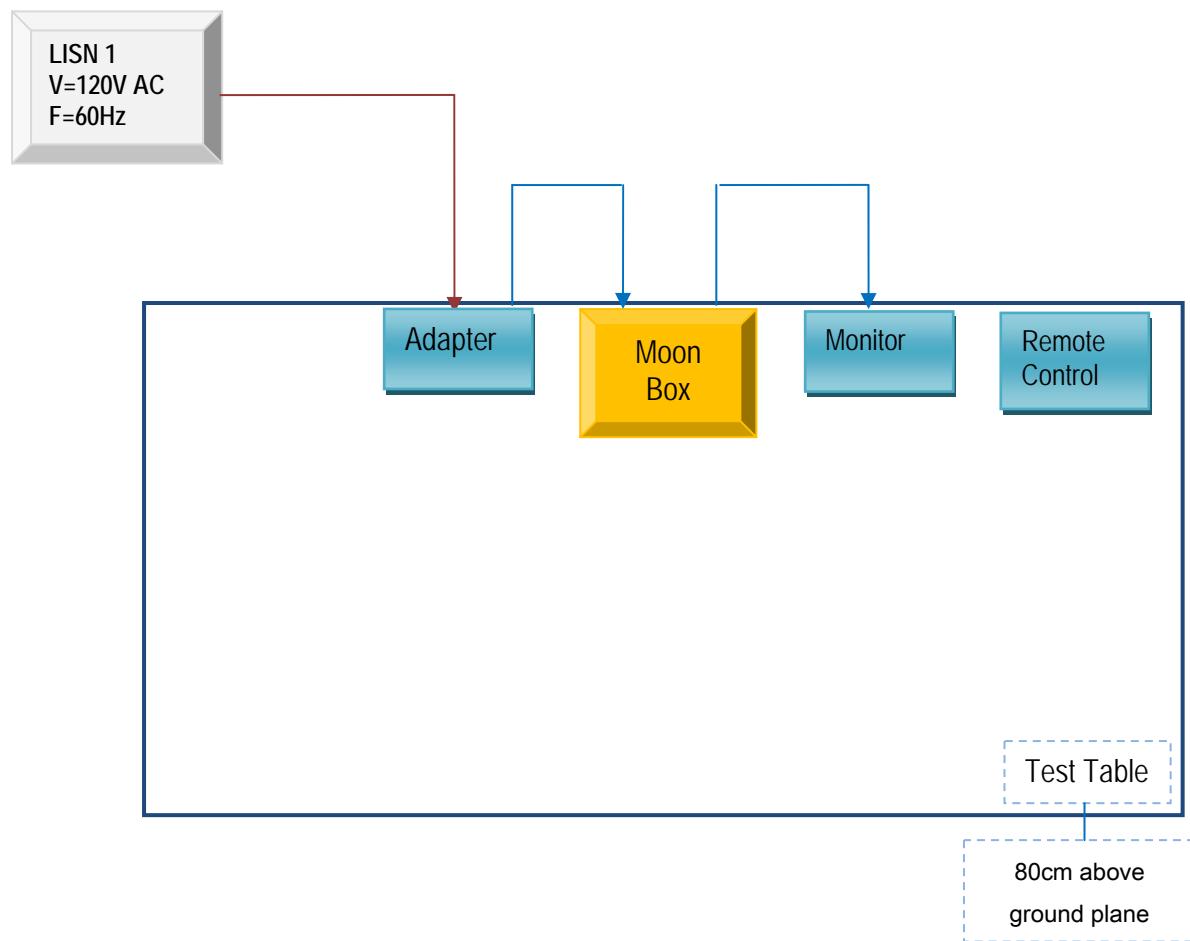
**Annex B.iii. Photograph: Test Setup Photo**

 A photograph showing a wooden table with a computer monitor on it. To the left, there is a blue power distribution unit (PDU) connected to various devices. The setup is in a room with a light-colored wall.	 A photograph showing a side view of the conducted emissions test setup. A computer monitor is on a stand, and a power strip with multiple outlets is visible on the wooden table. A white fabric screen is partially visible on the right.
Conducted Emissions Test Setup – Front View	Conducted Emissions Test Setup – Side View
 A photograph showing a white marble-topped table with a computer monitor on a stand. Various cables and a power strip are on the table. The background features a wall covered in white and black acoustic panels.	 A photograph showing a white marble-topped table with a computer monitor on a stand. Various cables and a power strip are on the table. The background features a wall covered in white and black acoustic panels.
Radiated Spurious Emissions Test Setup Below 1GHz	Radiated Spurious Emissions Test Setup Above 1GHz

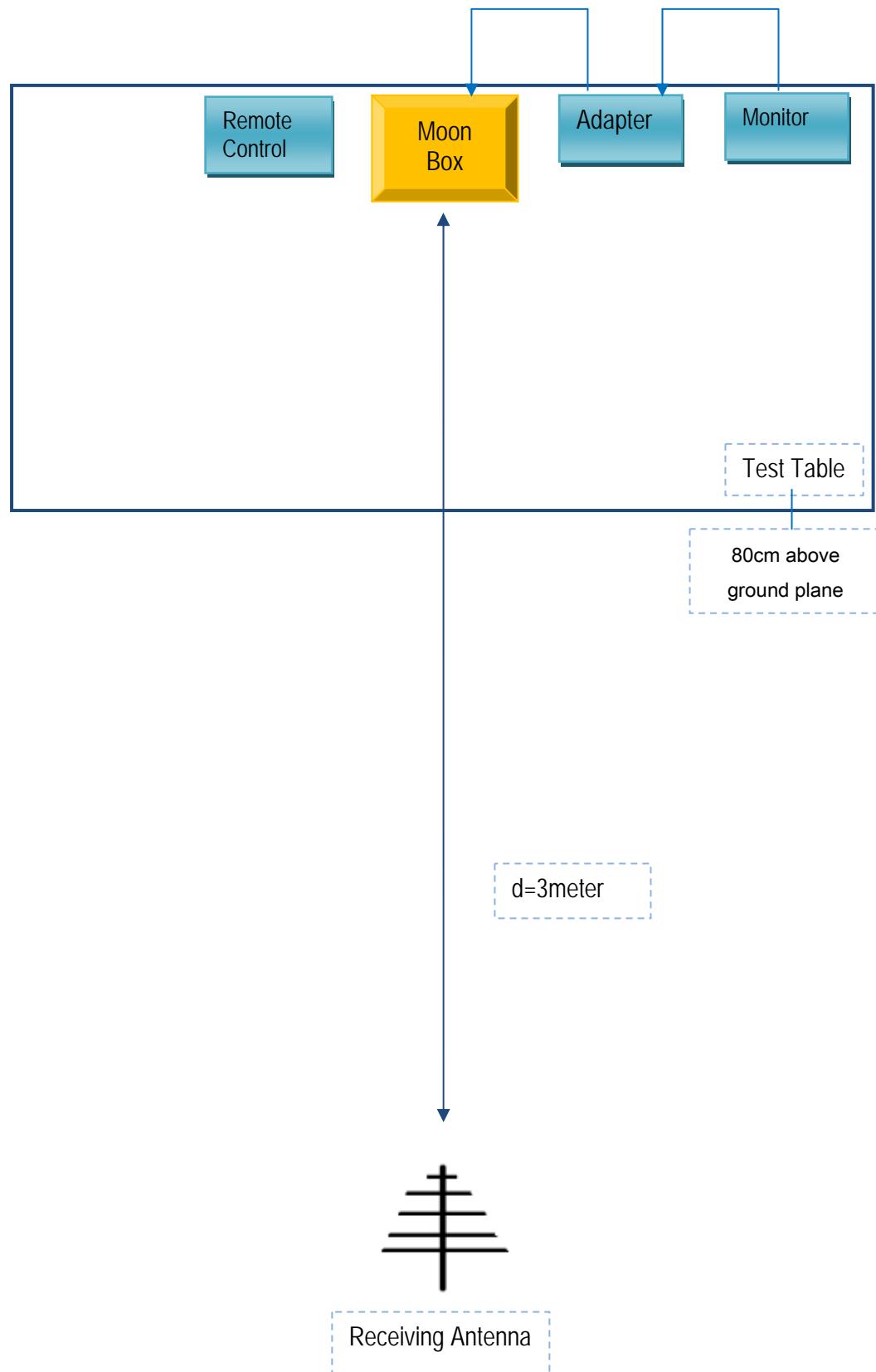
## Annex C. TEST SETUP AND SUPPORTING EQUIPMENT

### Annex C.ii. TEST SET UP BLOCK

Block Configuration Diagram for Conducted Emissions



### Block Configuration Diagram for Radiated Emissions



### Annex C. ii. SUPPORTING EQUIPMENT DESCRIPTION

The following is a description of supporting equipment and details of cables used with the EUT.

Manufacturer	Equipment Description	Model	Calibration Date	Calibration Due Date
DELL	Monitor	IN1940MW	N/A	N/A

## Annex D. User Manual / Block Diagram / Schematics / Partlist

Please see Attachment

## Annex E. DECLARATION OF SIMILARITY

N/A