

# EMC TEST REPORT



Report No.: 18070344-FCC-E

Supersede Report No: N/A

Applicant	NATCOM S.A	
Product Name	Mobile phone 3G	
Model No.	MANY NH35	
Serial No.	N/A	
Test Standard	FCC Part 15 Subpart B Class B, ANSI C63.4: 2014	
Test Date	April 28 to May 24, 2018	
Issue Date	May 25, 2018	
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"/>	
<i>Evans He</i>	<i>David Huang</i>
Evans He Test Engineer	David Huang Checked By
This test report may be reproduced in full only Test result presented in this test report is applicable to the tested sample only	

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
18070344-FCC-E	NONE	Original	May 25, 2018

## 2. Customer information

Applicant Name	NATCOM S.A
Applicant Add	Angle avenue Martin Luther King et Fernando , Pont-Morin Port-au-Prince , Haiti
Manufacturer	NATCOM S.A
Manufacturer Add	Angle avenue Martin Luther King et Fernando , Pont-Morin Port-au-Prince , Haiti

## 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.	535293
IC Test Site No.	4842E-1
Test Software of Radiated Emission	Radiated Emission Program-To Shenzhen v2.0
Test Software of Conducted Emission	EZ-EMC(ver.lcp-03A1)

## 4. Equipment under Test (EUT) Information

Description of EUT: Mobile phone 3G

Main Model: MANY NH35

Serial Model: N/A

GSM850: -1.0dBi

PCS1900: 1.61dBi

Antenna Gain: WIFI: -0.77dBi

Bluetooth: -0.77dBi

Antenna Type: PIFA antenna

Adapter :

Input: AC100-240V~50/60Hz,0.15A Max

Output: DC 5.0V, 500mAh

Input Power: Battery :

Model: Many NH3.5

Spec: 3.7V, 1200mAh

Charging limited voltage: 4.2V

Equipment Category : JBP

GSM / GPRS: GMSK

EGPRS: GMSK

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

Bluetooth: GFSK, π /4DQPSK, 8DPSK

GSM850 TX: 824.2 ~ 848.8 MHz; RX: 869.2 ~ 893.8 MHz

PCS1900 TX: 1850.2 ~ 1909.8 MHz; RX: 1930.2 ~ 1989.8 MHz

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

WIFI: 802.11n(40M): 2422-2452 MHz

Bluetooth: 2402-2480 MHz

GSM 850: 124CH

PCS1900: 299CH

Number of Channels: WIFI :802.11b/g/n(20M): 11CH  
WIFI :802.11n(40M): 7CH  
Bluetooth: 79CH

Port: Please refer to the user's manual

Trade Name : NATCOM

FCC ID: 2AMHXNH35

GPRS Multi-slot class 8/10/11/12

Date EUT received: April 27, 2018

Test Date(s): April 28 to May 24, 2018

## 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: 2014	AC Power Line Conducted Emissions	Compliance
§15.109; ANSI C63.4: 2014	Radiated Emissions	Compliance

### Measurement Uncertainty

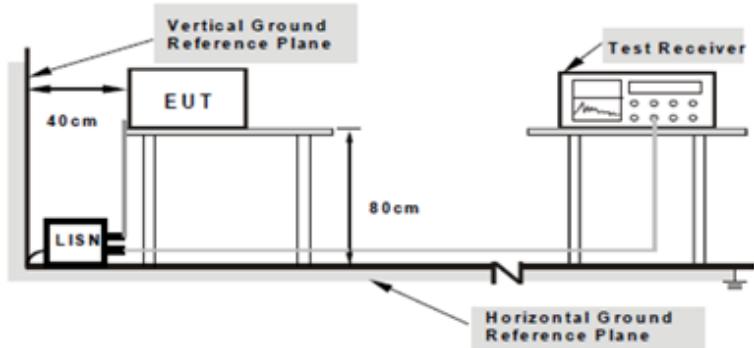
Parameter	Uncertainty
AC Power Line Conducted Emissions (150kHz~30MHz)	±3.11dB
Radiated Emission(30MHz~1GHz)	±5.12dB
Radiated Emission(1GHz~6GHz)	±5.34dB

## 6. Measurements, Examination And Derived Results

### 6.1 AC Power Line Conducted Emissions

Temperature	25°C
Relative Humidity	57%
Atmospheric Pressure	1014mbar
Test date :	May 20, 2018
Tested By :	Evans He

#### Requirement(s):

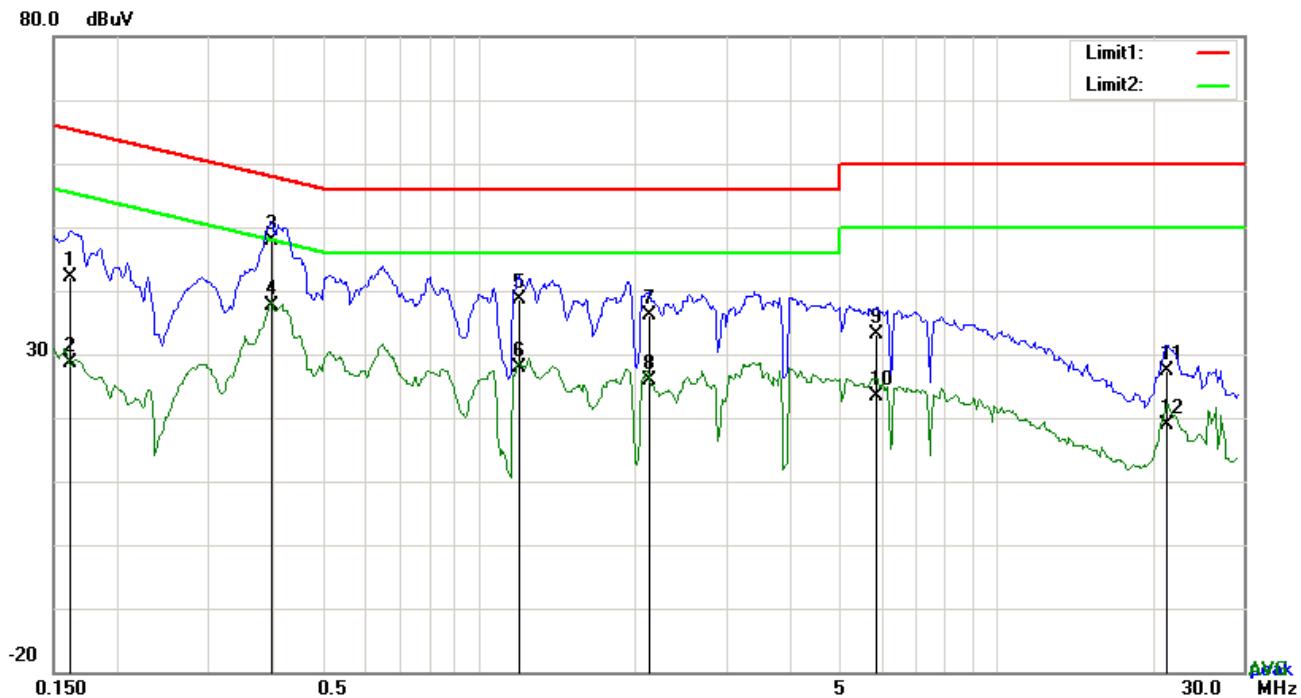
Spec	Item	Requirement	Applicable														
47CFR§15.107	a)	<p>For Low-power radio-frequency devices that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies, within the band 150 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. A 'Vertical Ground Reference Plane' is shown as a vertical line. A 'Horizontal Ground Reference Plane' is shown as a horizontal line. 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 distance between the LISN and the EUT is 40 cm. The distance between the LISN and the test receiver is 80 cm. The entire setup is on a 'Horizontal Ground Reference Plane'.</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 50Ω /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 : USB Mode

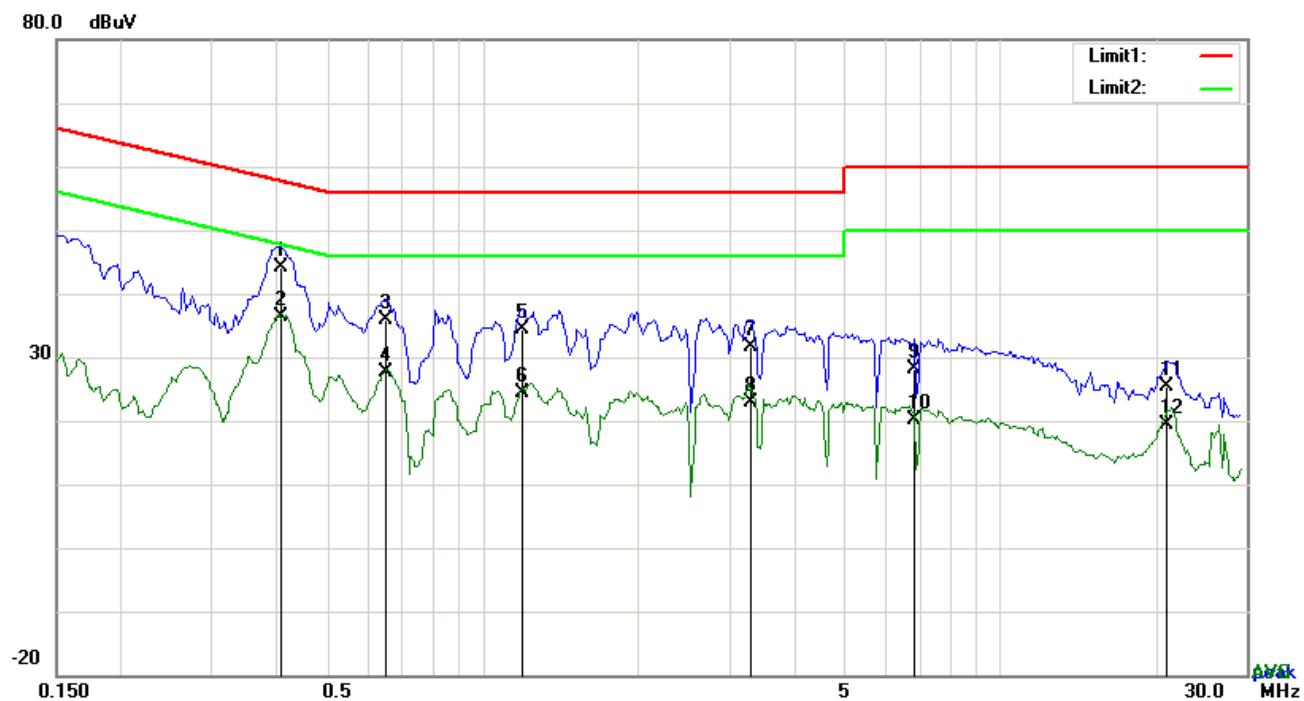


### Test Data

Phase Line Plot at 120Vac, 60Hz

No.	P/L	Frequency (MHz)	Reading (dBuV)	Detector	Corrected (dB)	Result (dBuV)	Limit (dBuV)	Margin (dB)
1	L1	0.1617	32.06	QP	10.03	42.09	65.38	-23.29
2	L1	0.1617	18.66	AVG	10.03	28.69	55.38	-26.69
3	L1	0.3957	37.91	QP	10.03	47.94	57.94	-10.00
4	L1	0.3957	27.61	AVG	10.03	37.64	47.94	-10.30
5	L1	1.1913	28.67	QP	10.03	38.70	56.00	-17.30
6	L1	1.1913	17.86	AVG	10.03	27.89	46.00	-18.11
7	L1	2.1234	26.15	QP	10.04	36.19	56.00	-19.81
8	L1	2.1234	15.91	AVG	10.04	25.95	46.00	-20.05
9	L1	5.8626	23.04	QP	10.09	33.13	60.00	-26.87
10	L1	5.8626	13.18	AVG	10.09	23.27	50.00	-26.73
11	L1	21.3612	17.09	QP	10.33	27.42	60.00	-32.58
12	L1	21.3612	8.47	AVG	10.33	18.80	50.00	-31.20

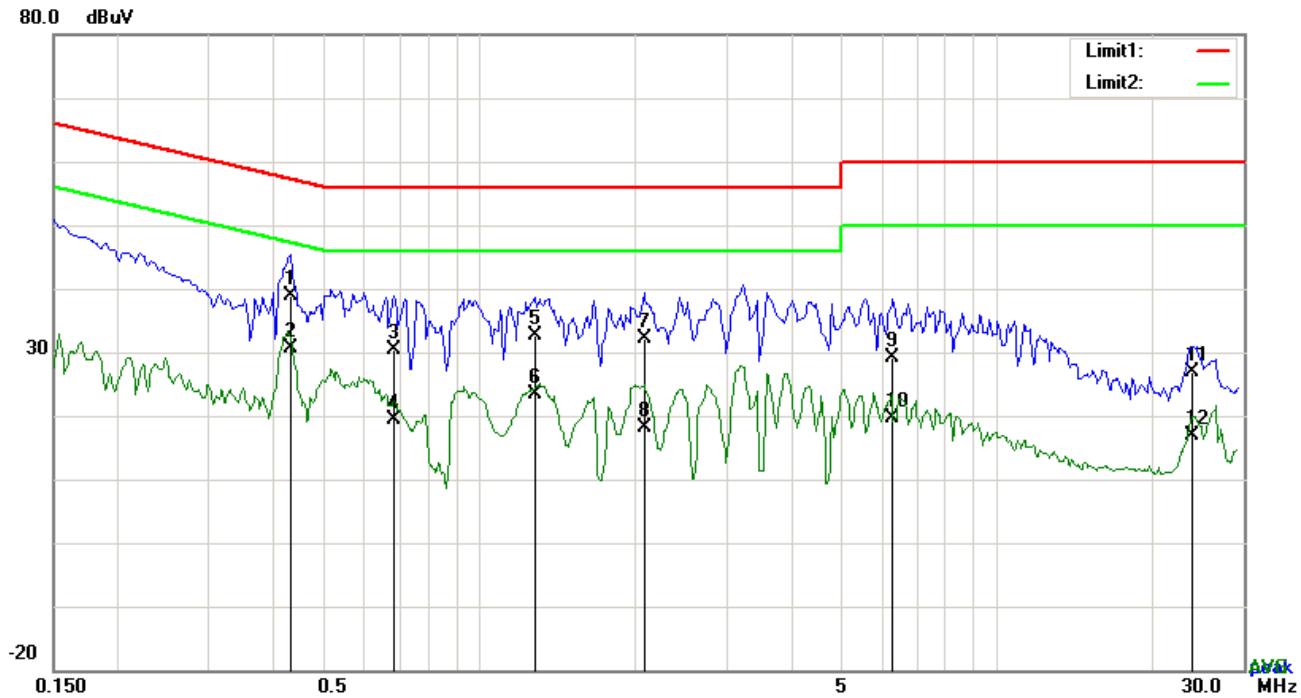
Test Mode: **USB Mode**



Phase Neutral Plot at 120Vac, 60Hz

No.	P/L	Frequency (MHz)	Reading (dBuV)	Detector	Corrected (dB)	Result (dBuV)	Limit (dBuV)	Margin (dB)
1	N	0.4074	34.05	QP	10.02	44.07	57.70	-13.63
2	N	0.4074	26.27	AVG	10.02	36.29	47.70	-11.41
3	N	0.6531	25.92	QP	10.02	35.94	56.00	-20.06
4	N	0.6531	17.70	AVG	10.02	27.72	46.00	-18.28
5	N	1.1913	24.42	QP	10.03	34.45	56.00	-21.55
6	N	1.1913	14.26	AVG	10.03	24.29	46.00	-21.71
7	N	3.3081	21.64	QP	10.05	31.69	56.00	-24.31
8	N	3.3081	12.89	AVG	10.05	22.94	46.00	-23.06
9	N	6.8727	18.12	QP	10.10	28.22	60.00	-31.78
10	N	6.8727	9.96	AVG	10.10	20.06	50.00	-29.94
11	N	21.1389	15.15	QP	10.28	25.43	60.00	-34.57
12	N	21.1389	9.12	AVG	10.28	19.40	50.00	-30.60

**Test Mode :** USB Mode

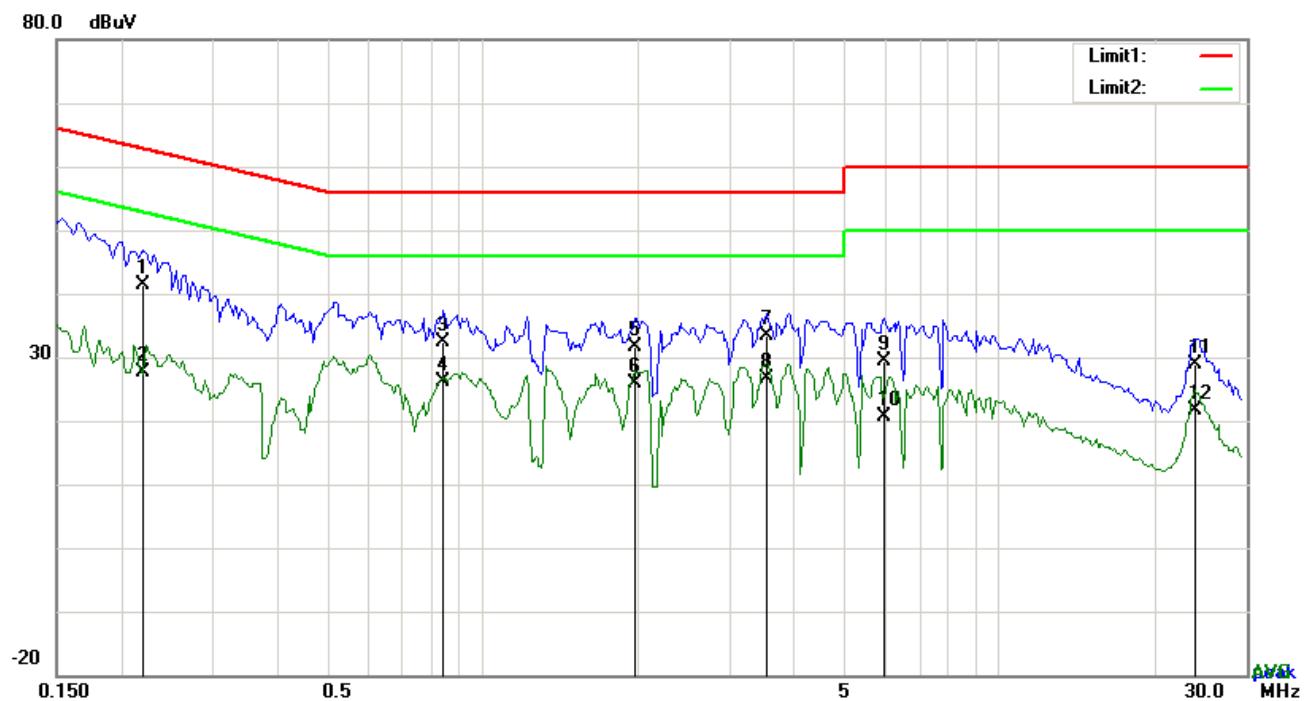


### Test Data

Phase Line Plot at 240Vac, 60Hz

No.	P/L	Frequency (MHz)	Reading (dBuV)	Detector	Corrected (dB)	Result (dBuV)	Limit (dBuV)	Margin (dB)
1	L1	0.4308	28.90	QP	10.03	38.93	57.24	-18.31
2	L1	0.4308	20.51	AVG	10.03	30.54	47.24	-16.70
3	L1	0.6843	20.30	QP	10.03	30.33	56.00	-25.67
4	L1	0.6843	9.23	AVG	10.03	19.26	46.00	-26.74
5	L1	1.2810	22.58	QP	10.03	32.61	56.00	-23.39
6	L1	1.2810	13.33	AVG	10.03	23.36	46.00	-22.64
7	L1	2.0805	22.07	QP	10.04	32.11	56.00	-23.89
8	L1	2.0805	8.15	AVG	10.04	18.19	46.00	-27.81
9	L1	6.2994	18.97	QP	10.10	29.07	60.00	-30.93
10	L1	6.2994	9.44	AVG	10.10	19.54	50.00	-30.46
11	L1	23.7987	16.53	QP	10.37	26.90	60.00	-33.10
12	L1	23.7987	6.62	AVG	10.37	16.99	50.00	-33.01

Test Mode : **USB Mode**



### Test Data

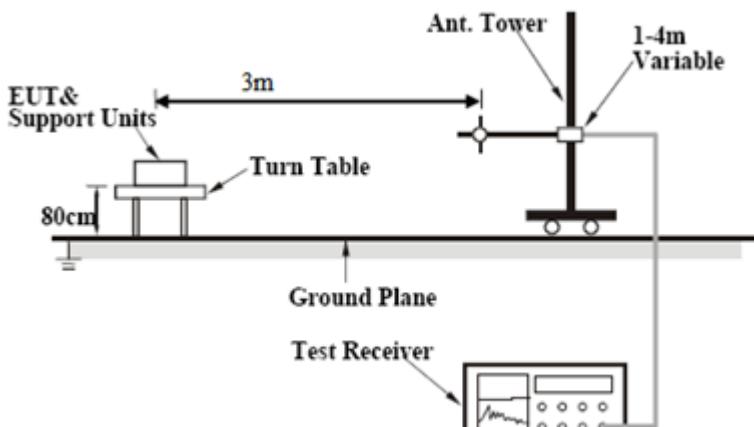
Phase Neutral Plot at 240Vac, 60Hz

No.	P/L	Frequency (MHz)	Reading (dBuV)	Detector	Corrected (dB)	Result (dBuV)	Limit (dBuV)	Margin (dB)
1	N	0.2202	31.24	QP	10.02	41.26	62.81	-21.55
2	N	0.2202	17.71	AVG	10.02	27.73	52.81	-25.08
3	N	0.8403	22.32	QP	10.03	32.35	56.00	-23.65
4	N	0.8403	16.16	AVG	10.03	26.19	46.00	-19.81
5	N	1.9713	21.67	QP	10.04	31.71	56.00	-24.29
6	N	1.9713	15.78	AVG	10.04	25.82	46.00	-20.18
7	N	3.5382	23.34	QP	10.06	33.40	56.00	-22.60
8	N	3.5382	16.56	AVG	10.06	26.62	46.00	-19.38
9	N	5.9640	19.36	QP	10.08	29.44	60.00	-30.56
10	N	5.9640	10.58	AVG	10.08	20.66	50.00	-29.34
11	N	23.8260	18.56	QP	10.32	28.88	60.00	-31.12
12	N	23.8260	11.21	AVG	10.32	21.53	50.00	-28.47

## 6.2 Radiated Emissions

Temperature	25°C
Relative Humidity	57%
Atmospheric Pressure	1014mbar
Test date :	May 20, 2018
Tested By :	Evans He

### Requirement(s):

Spec	Item	Requirement	Applicable										
47CFR§15. 109(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. A 'Turn Table' is positioned on a 'Ground Plane'. An 'EUT &amp; Support Units' is mounted on the turn table. A vertical 'Ant. Tower' is connected to the turn table. The distance between the EUT and the Ant. Tower is 3m. The height of the EUT is 80cm. The height of the Ant. Tower is adjustable, indicated as '1-4m Variable'. A 'Test Receiver' is connected to the Ant. Tower.</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>											

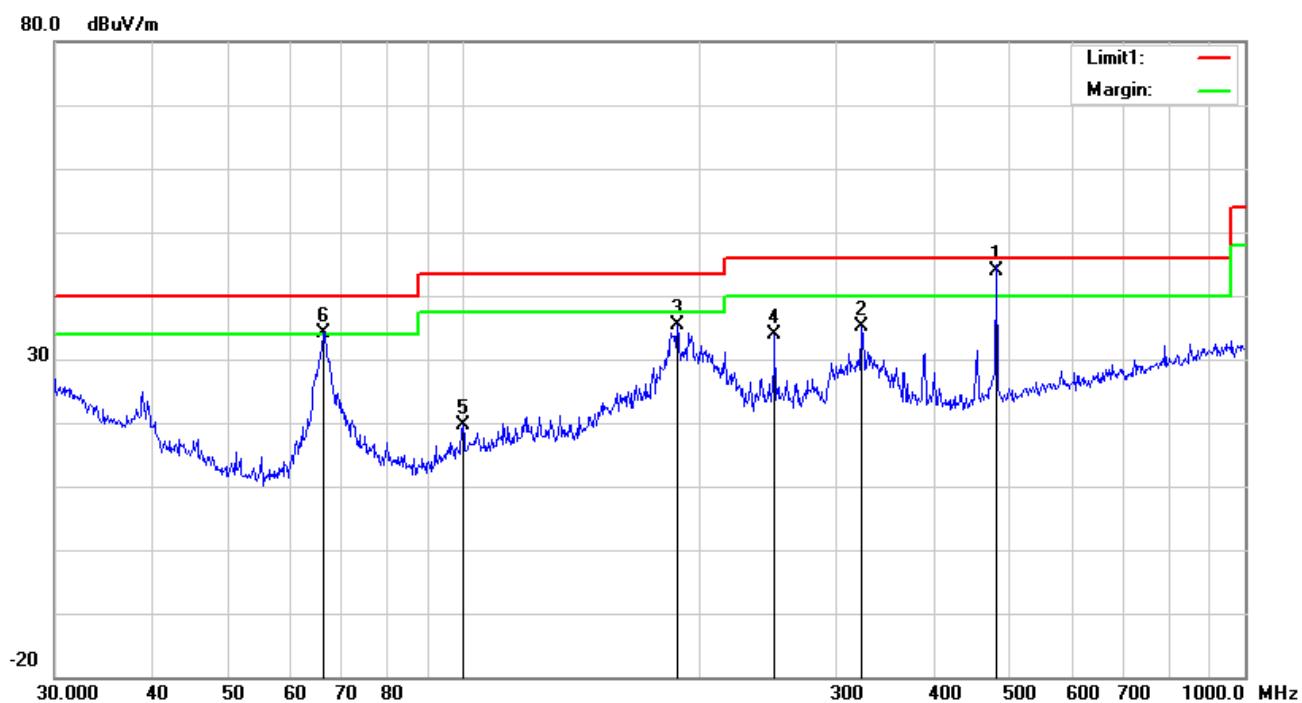
	<p>over a full rotation of the EUT) was chosen.</p> <p>b. The EUT was then rotated to the direction that gave the maximum emission.</p> <p>c. Finally, the antenna height was adjusted to the height that gave the maximum emission.</p> <p>3. The resolution bandwidth and video bandwidth of test receiver/spectrum 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 with Peak detection for Average Measurement as below at frequency above 1GHz.</p> <ul style="list-style-type: none"> <li>■ 1 kHz (Duty cycle &lt; 98%) <input type="checkbox"/> 10 Hz (Duty cycle &gt; 98%)</li> </ul> <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 : USB Mode

Below 1GHz

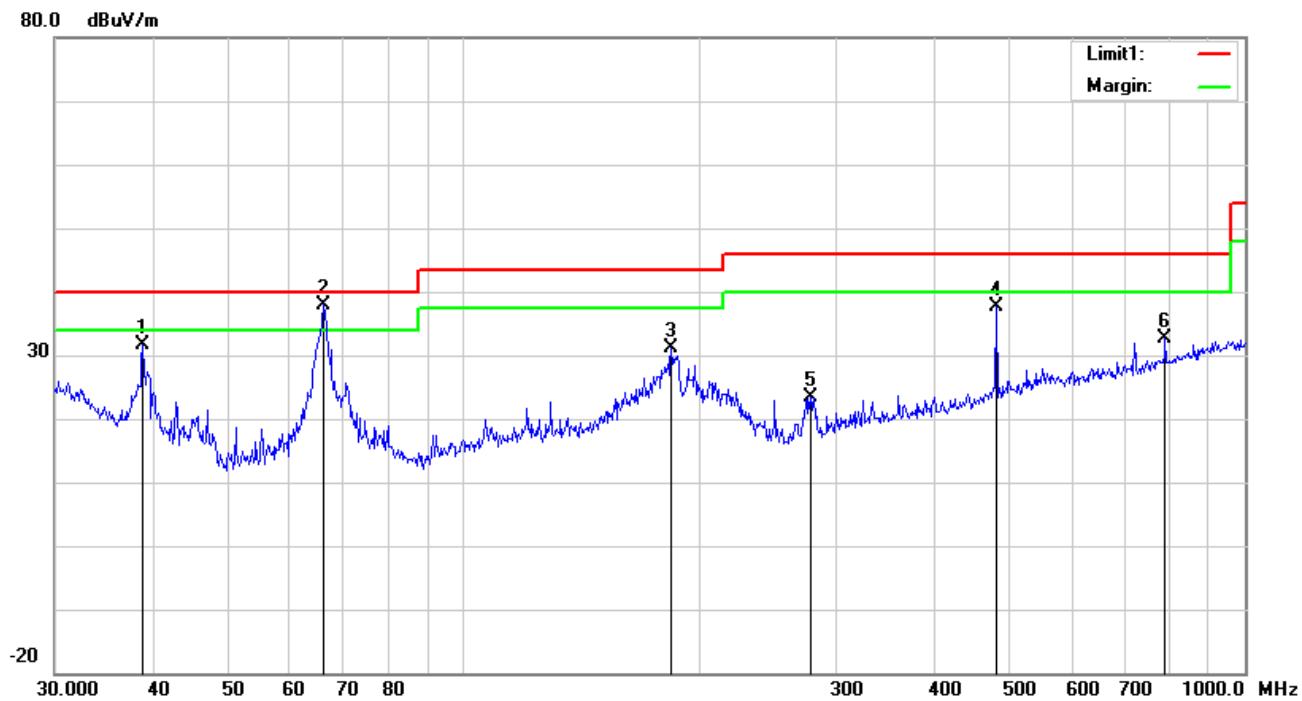


### Test Data

Horizontal Polarity Plot @3m

No.	P/L	Frequency	Reading	Detector	Ant_F	PA_G	Cab_L	Result	Limit	Margin	Height	Degree
		(MHz)	(dBuV/m)		(dB/m)	(dB)	(dB)	(dBuV/m)	(dBuV/m)	(dB)	(cm)	(°)
1	H	480.5276	46.01	QP	17.31	21.85	2.31	43.78	46.00	-2.22	100	300
2	H	323.3204	41.38	peak	14.09	22.22	1.91	35.16	46.00	-10.84	100	185
3	H	187.7530	44.68	peak	11.43	22.30	1.50	35.31	43.50	-8.19	100	191
4	H	250.3012	42.99	peak	11.41	22.29	1.70	33.81	46.00	-12.19	100	313
5	H	99.8777	30.41	peak	10.37	22.32	1.12	19.58	43.50	-23.92	100	359
6	H	66.2662	48.06	QP	7.61	22.39	0.91	34.19	40.00	-5.81	100	294

### Below 1GHz



### Test Data

Vertical Polarity Plot @3m

No.	P/L	Frequency	Reading	Detector	Ant_F	PA_G	Cab_L	Result	Limit	Margin	Height	Degree
		(MHz)	(dBuV/m)		(dB/m)	(dB)	(dB)	(dBuV/m)	(dBuV/m)	(dB)	(cm)	(°)
1	V	38.8879	38.35	peak	14.71	22.27	0.78	31.57	40.00	-8.43	100	27
2	V	66.2662	51.67	QP	7.61	22.39	0.91	37.80	40.00	-2.20	100	62
3	V	184.4898	40.68	peak	11.25	22.28	1.44	31.09	43.50	-12.41	200	281
4	V	480.5276	39.74	peak	17.31	21.85	2.31	37.51	46.00	-8.49	100	181
5	V	278.0669	31.29	peak	12.63	22.29	1.75	23.38	46.00	-22.62	100	88
6	V	790.6188	29.60	peak	21.29	21.17	2.94	32.66	46.00	-13.34	100	229

### Above 1GHz

Frequency (MHz)	Read_level (dB $\mu$ V/m)	Azimuth	Height (cm)	Polarity (H/V)	Factors (dB)	Level (dB $\mu$ V/m)	Limit (dB $\mu$ V/m)	Margin (dB)	Detector (PK/AV)
1232.53	68.81	231	100	V	-19.42	49.39	74	-24.61	PK
1196.3	67.51	23	100	V	-20.28	47.23	74	-26.77	PK
1508.18	67.95	151	100	V	-18.09	49.86	74	-24.14	PK
1039.47	69.14	160	100	H	-19.95	49.19	74	-24.81	PK
1867.97	64.27	256	100	H	-16.34	47.93	74	-26.07	PK
1251.5	65.08	169	100	H	-18.79	46.29	74	-27.71	PK

*Note1: The highest frequency of the EUT is 2480 MHz, so the testing has been conformed to 5\*2480MHz=12,400MHz.*

*Note2: The frequency that above 3GHz is mainly from the environment noise.*

*Note3: The AV measurement performed, more than 20dB below limit so AV test data was not presented.*

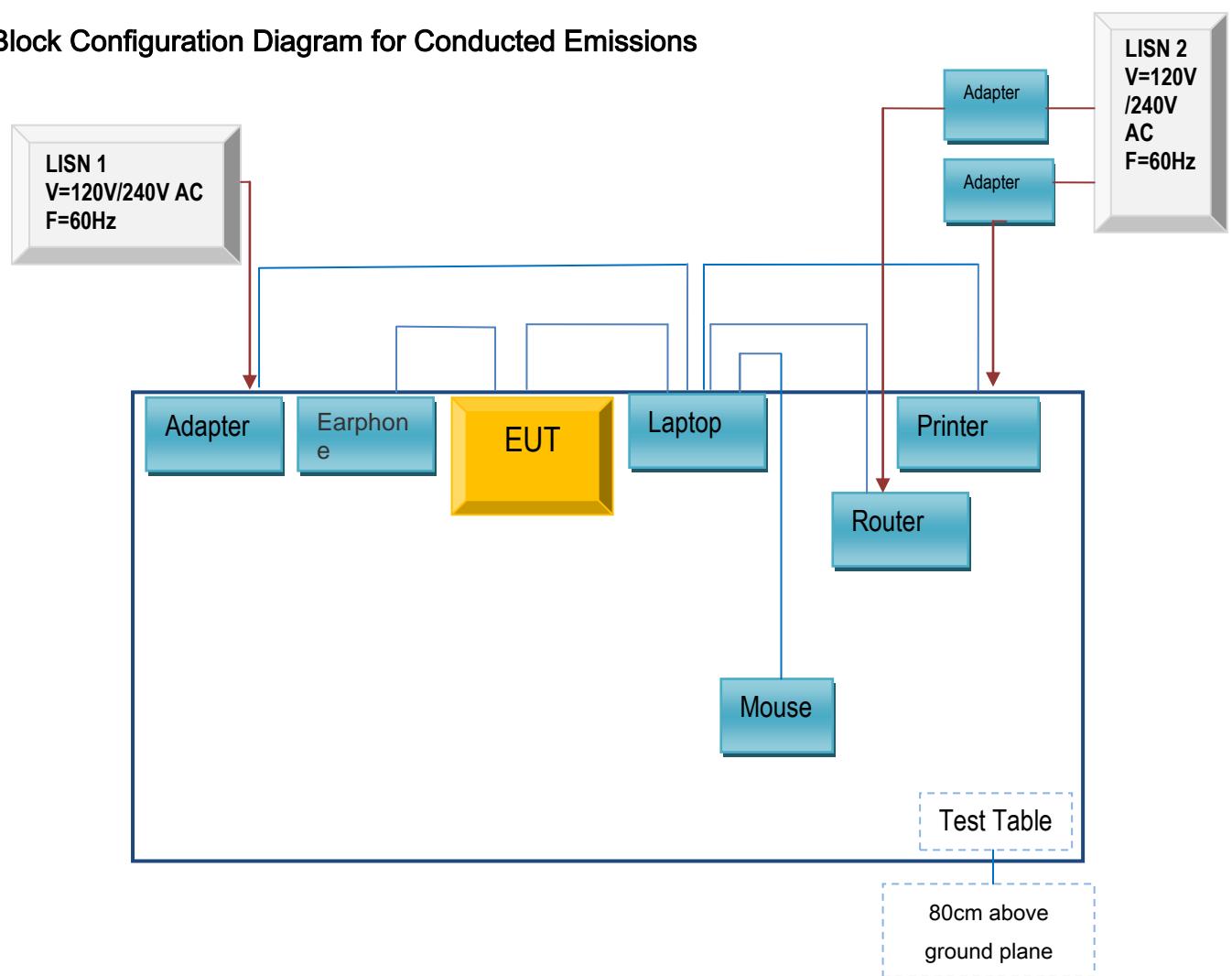
## Annex A. TEST INSTRUMENT

Instrument	Model	Serial #	Cal Date	Cal Due	In use
<b>AC Line Conducted Emissions</b>					
EMI test receiver	ESCS30	8471241027	09/15/2017	09/14/2018	<input checked="" type="checkbox"/>
Line Impedance Stabilization Network	LI-125A	191106	09/23/2017	09/22/2018	<input checked="" type="checkbox"/>
Line Impedance Stabilization Network	LI-125A	191107	09/23/2017	09/22/2018	<input checked="" type="checkbox"/>
ISN	ISN T800	34373	09/23/2017	09/22/2018	<input type="checkbox"/>
Transient Limiter	LIT-153	531118	08/30/2017	08/29/2018	<input checked="" type="checkbox"/>
<b>Radiated Emissions</b>					
EMI test receiver	E SL6	100262	09/15/2017	09/14/2018	<input checked="" type="checkbox"/>
OPT 010 AMPLIFIER (0.1-1300MHz)	8447E	2727A02430	08/30/2017	08/29/2018	<input checked="" type="checkbox"/>
Microwave Preamplifier (1 ~ 26.5GHz)	8449B	3008A02402	03/22/2018	03/21/2019	<input checked="" type="checkbox"/>
Bilog Antenna (30MHz~6GHz)	JB6	A110712	09/19/2017	09/18/2018	<input checked="" type="checkbox"/>
Double Ridge Horn Antenna	AH-118	71259	09/22/2017	09/21/2018	<input checked="" type="checkbox"/>

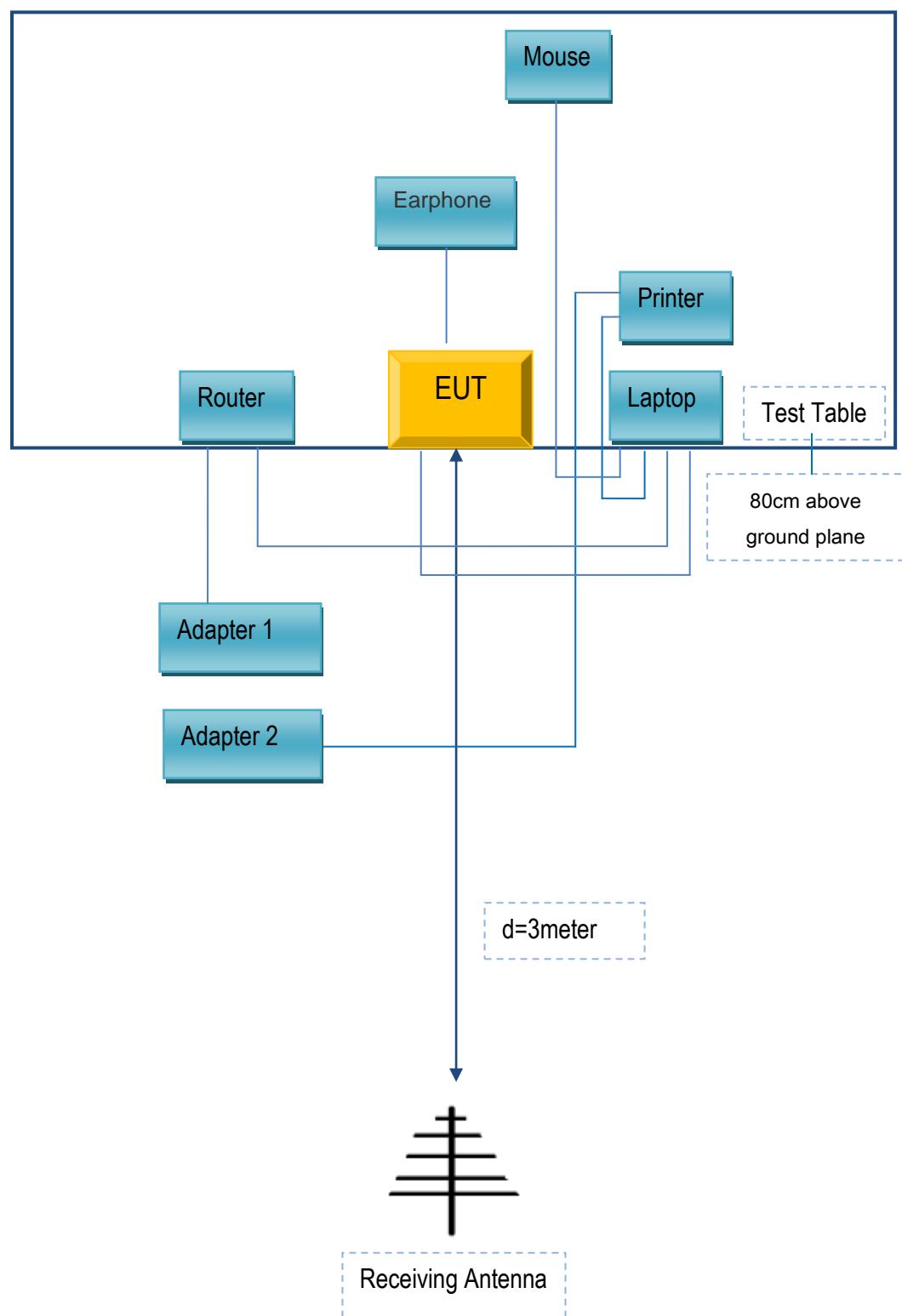
## Annex B. TEST SETUP AND SUPPORTING EQUIPMENT

### Annex B.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.

### Supporting Equipment:

Manufacturer	Equipment Description	Model	Serial No
Lenovo	Laptop	E40	LR-1EHRX
GOLDWEB	Router	R102	1202032094
Lenovo	AC Adapter	42T4416	21D9JU
HP	Printer	VCVRA-1003	CN36M19JWX
DELL	Mouse	E100	912NMTUT41481
BULL	Socket	GN-403	GN201203
SAMSUNG	headset	HS330	N/A

### Supporting Cable:

Cable type	Shield Type	Ferrite Core	Length	Serial No
USB Cable	Un-shielding	No	2m	JX120051274
USB Cable	Un-shielding	No	2m	CBA3000AH0C1
RJ45 Cable	Un-shielding	No	2m	KX156327541
Router Power cable	Un-shielding	No	2m	13274630Z
Printer Power cable	Un-shielding	No	2m	127581031
Power Cable	Un-shielding	No	0.8m	GT211032

## Annex C. User Manual / Block Diagram / Schematics / Partlist/ DECLARATION OF SIMILARITY

Please see the attachment