


EMC TEST REPORT



Report No.: 18070022-FCC-E-V1

Supersede Report No: N/A

Applicant	Horizon Hobby, LLC	
Product Name	Glimpse	
Model No.	BLH2202	
Serial No.	N/A	
Test Standard	FCC Part 15 Subpart B Class B:2017, ANSI C63.4: 2014; IC ES-003 Issue 6, January 2016, ANSI C63.4: 2014	
Test Date	January 05 to 26, 2018	
Issue Date	February 09, 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
18070022-FCC-E	NONE	Original	January 27, 2018
18070022-FCC-E-V1	V1	Updated the Operating Frequency	February 09, 2018

2. Customer information

Applicant Name	Horizon Hobby, LLC
Applicant Add	4105 Fieldstone Road, Champaign, IL 61822, USA
Manufacturer	Yuneeec International(China) Co., Ltd
Manufacturer Add	No.388 East Zhengwei Road, Jinxi Town, Kunshan, Jiangsu, 215324, China

3. Test site information

Test Lab A:

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	Radiated Emission Program-To Shenzhen v2.0

Test Lab B:

Lab performing tests	BV 7LAYERS COMMUNICATION TRCHNOLOGY(SHENZHEN)CO.,LTD
Lab Address	No. B102, Dazu Cuangxin Mansion, North of Beihuan Avenue, North Area, Hi-Tech Industry Park, Nanshan District Shenzhen, Guangdong China
FCC Test Site No.	525120

Note: We just perform Radiated Spurious Emission above 18GHz in the test Lab. B.

4. Equipment under Test (EUT) Information

Description of EUT:	Glimpse
Main Model:	BLH2202
Serial Model:	N/A
Antenna Gain:	2.4G: 1dBi WIFI(5745-5825MHz): 1dBi
Antenna Type:	Internal antenna
Input Power:	Battery Spec: 3.7V, 500mAh, 1.9Wh
Equipment Category :	JBP
Type of Modulation:	2.4G: GFSK 802.11: OFDM(BPSK/QPSK/16QAM/64QAM/256QAM)
RF Operating Frequency (ies):	2.4G: 2404-2476 MHz 802.11a: 5745-5825 MHz; (TX/RX)
Number of Channels:	2.4G: 40CH WIFI : 24CH
Port:	Please refer to the user' s manual
Trade Name :	N/A
Date EUT received:	January 05, 2018
Test Date(s):	January 05 to 26, 2018

FCC ID: BRWBLH2202MD

IC 6157A-BLH2202MD

Product HW/SW version: A. Software: 1.0

Radio HW/SW version: B. Software: 2.0

Test SW version: 1

5. Test Summary

The product was tested in accordance with the following specifications.

All testing has been performed according to below product classification:

FCC/IC Rules	Description of Test	Result
§15.107; ANSI C63.4: 2014 IC ES-003 Issue 6, January 2016, ANSI C63.4: 2014	AC Power Line Conducted Emissions	Compliance
§15.109; ANSI C63.4: 2014 IC ES-003 Issue 6, January 2016, 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

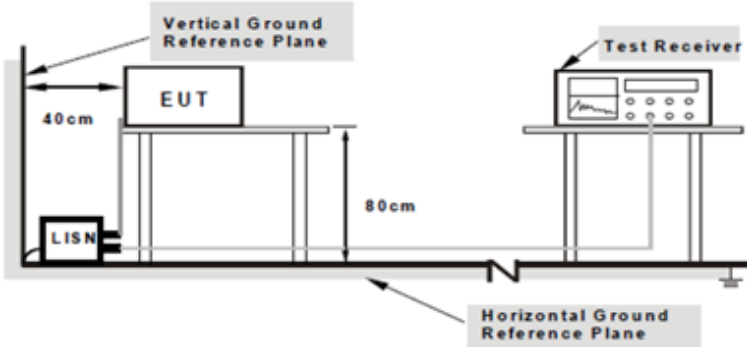
6. Measurements, Examination And Derived Results

6.1 AC Power Line Conducted Emissions

Temperature	25°C
Relative Humidity	55%
Atmospheric Pressure	1017mbar
Test date :	January 23, 2018
Tested By :	Evans He

Requirement(s):

Spec	Item	Requirement	Applicable														
47CFR§15.107/ IC ES-003 Issue 6	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 (dBµV)</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 (dBµV)		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 (dBµV)																
	QP	Average															
0.15 ~ 0.5	66 – 56	56 – 46															
0.5 ~ 5	56	46															
5 ~ 30	60	50															

Test Setup	 <p style="text-align: center;"> Note: 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>
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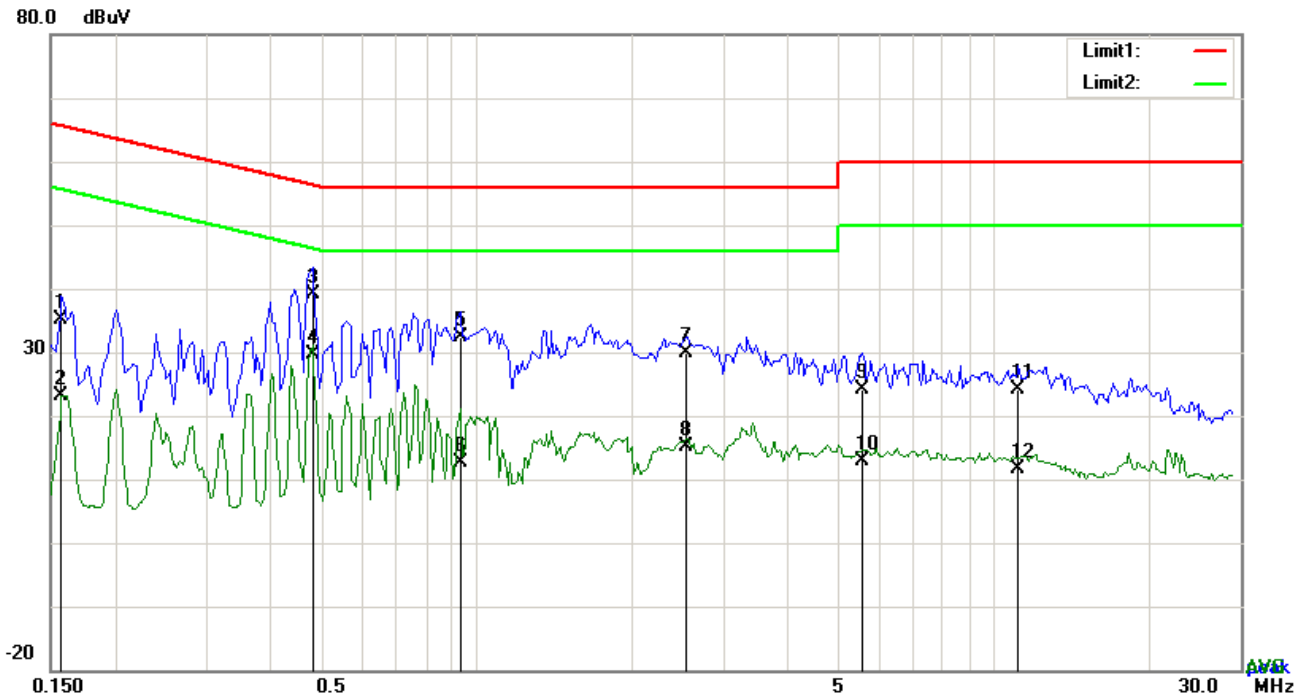
Procedure	<ol style="list-style-type: none"> The EUT and supporting equipment were set up in accordance with the requirements of the standard on top of a 1.5m x 1m x 0.8m high, non-metallic table. The power supply for the EUT was fed through a 50Ω /50mH EUT LISN, connected to filtered mains.
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	<ol style="list-style-type: none"> 3. The RF OUT of the EUT LISN was connected to the EMI test receiver via a low-loss coaxial cable. 4. All other supporting equipment were powered separately from another main supply. 5. The EUT was switched on and allowed to warm up to its normal operating condition. 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. 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. 8. Step 7 was then repeated for the LIVE line (for AC mains) or DC line (for DC power).
Remark	When the product is charging, it needs to remove the battery from the product.
Result	<input checked="" type="checkbox"/> Pass <input type="checkbox"/> Fail

Test Data Yes N/A

Test Plot Yes (See below) N/A

Test Mode : Charging Mode

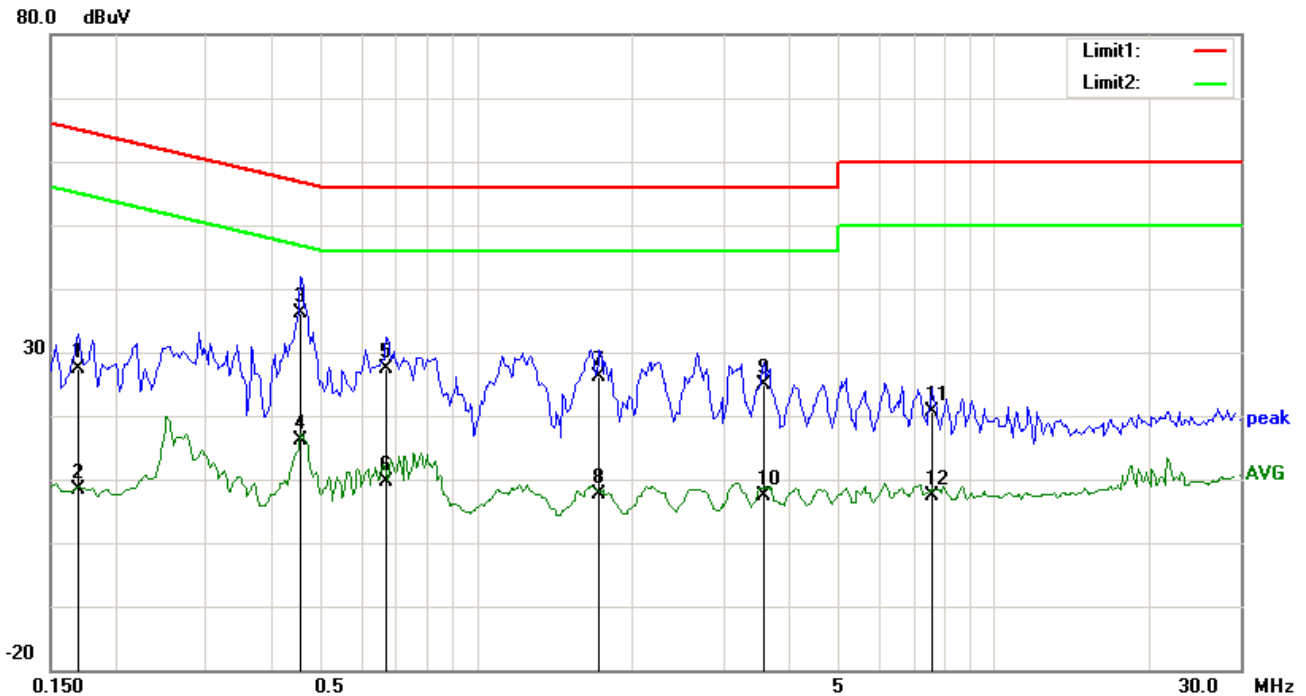


Test Data

Phase Line Plot at 120Vac, 60Hz

No.	P/L	Frequency	Reading	Detector	Corrected	Result	Limit	Margin
		(MHz)	(dBuV)		(dB)	(dBuV)	(dBuV)	(dB)
1	L1	0.1578	25.20	QP	10.03	35.23	65.58	-30.35
2	L1	0.1578	13.20	AVG	10.03	23.23	55.58	-32.35
3	L1	0.4815	28.98	QP	10.03	39.01	56.31	-17.30
4	L1	0.4815	19.71	AVG	10.03	29.74	46.31	-16.57
5	L1	0.9300	22.44	QP	10.03	32.47	56.00	-23.53
6	L1	0.9300	2.70	AVG	10.03	12.73	46.00	-33.27
7	L1	2.5524	19.93	QP	10.05	29.98	56.00	-26.02
8	L1	2.5524	5.08	AVG	10.05	15.13	46.00	-30.87
9	L1	5.5857	14.07	QP	10.09	24.16	60.00	-35.84
10	L1	5.5857	2.79	AVG	10.09	12.88	50.00	-37.12
11	L1	11.1627	13.94	QP	10.17	24.11	60.00	-35.89
12	L1	11.1627	1.58	AVG	10.17	11.75	50.00	-38.25

Test Mode : Charging Mode

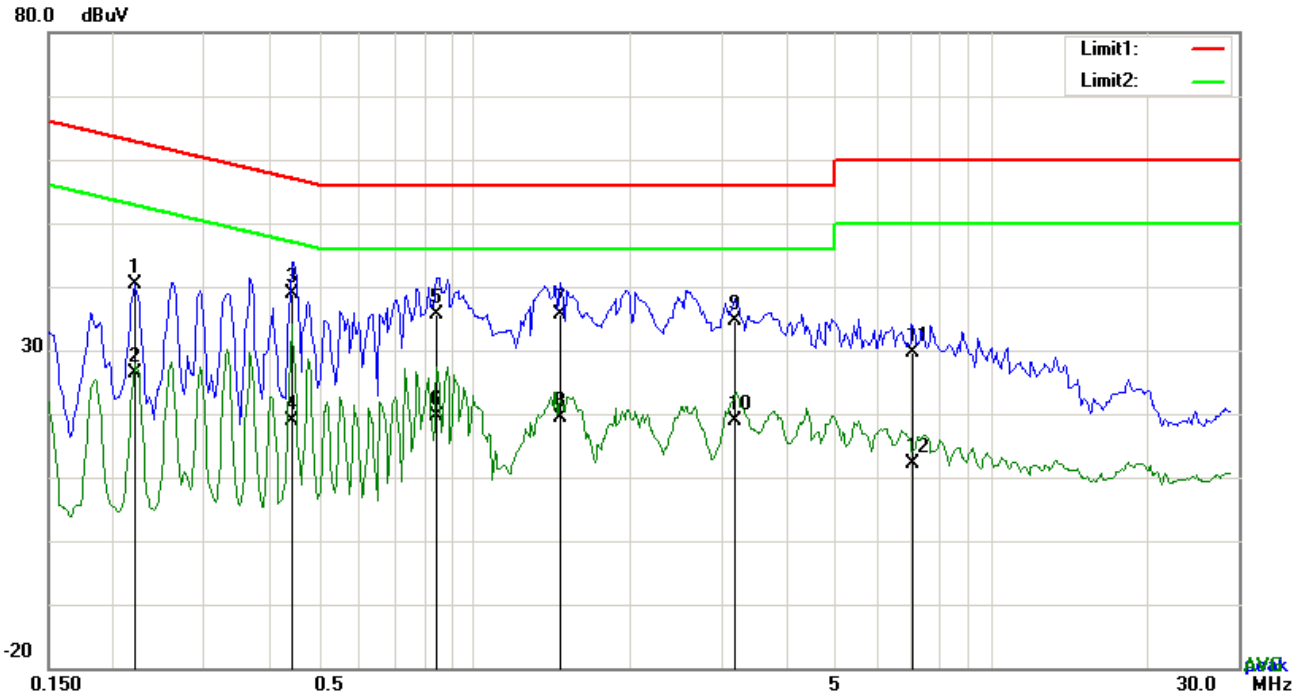


Test Data

Phase Neutral Plot at 120Vac, 60Hz

No.	P/L	Frequency	Reading	Detector	Corrected	Result	Limit	Margin
		(MHz)	(dBuV)		(dB)	(dBuV)	(dBuV)	(dB)
1	N	0.1695	17.33	QP	10.02	27.35	64.98	-37.63
2	N	0.1695	-1.69	AVG	10.02	8.33	54.98	-46.65
3	N	0.4581	26.05	QP	10.02	36.07	56.73	-20.66
4	N	0.4581	6.10	AVG	10.02	16.12	46.73	-30.61
5	N	0.6687	17.28	QP	10.02	27.30	56.00	-28.70
6	N	0.6687	-0.30	AVG	10.02	9.72	46.00	-36.28
7	N	1.7334	16.05	QP	10.04	26.09	56.00	-29.91
8	N	1.7334	-2.34	AVG	10.04	7.70	46.00	-38.30
9	N	3.5967	14.77	QP	10.06	24.83	56.00	-31.17
10	N	3.5967	-2.80	AVG	10.06	7.26	46.00	-38.74
11	N	7.5942	10.62	QP	10.11	20.73	60.00	-39.27
12	N	7.5942	-2.64	AVG	10.11	7.47	50.00	-42.53

Test Mode : Charging Mode

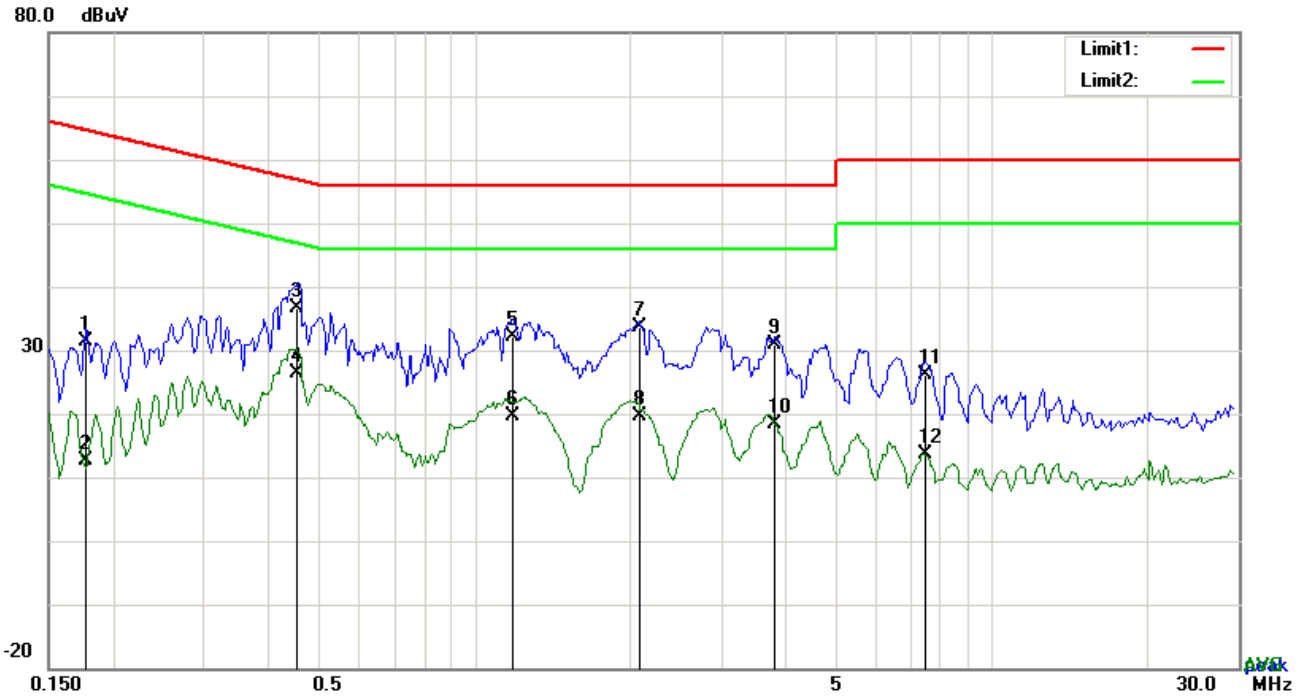


Test Data

Phase Line Plot at 240Vac, 60Hz

No.	P/L	Frequency	Reading	Detector	Corrected	Result	Limit	Margin
		(MHz)	(dBuV)		(dB}	(dBuV)	(dBuV)	(dB)
1	L1	0.2202	30.39	QP	10.03	40.42	62.81	-22.39
2	L1	0.2202	16.40	AVG	10.03	26.43	52.81	-26.38
3	L1	0.4464	28.83	QP	10.03	38.86	56.94	-18.08
4	L1	0.4464	8.97	AVG	10.03	19.00	46.94	-27.94
5	L1	0.8442	25.62	QP	10.03	35.65	56.00	-20.35
6	L1	0.8442	9.65	AVG	10.03	19.68	46.00	-26.32
7	L1	1.4643	25.57	QP	10.04	35.61	56.00	-20.39
8	L1	1.4643	9.35	AVG	10.04	19.39	46.00	-26.61
9	L1	3.1755	24.62	QP	10.06	34.68	56.00	-21.32
10	L1	3.1755	8.86	AVG	10.06	18.92	46.00	-27.08
11	L1	7.0249	19.64	QP	10.11	29.75	60.00	-30.25
12	L1	7.0249	1.96	AVG	10.11	12.07	50.00	-37.93

Test Mode : Charging Mode



Test Data

Phase Neutral Plot at 240Vac, 60Hz

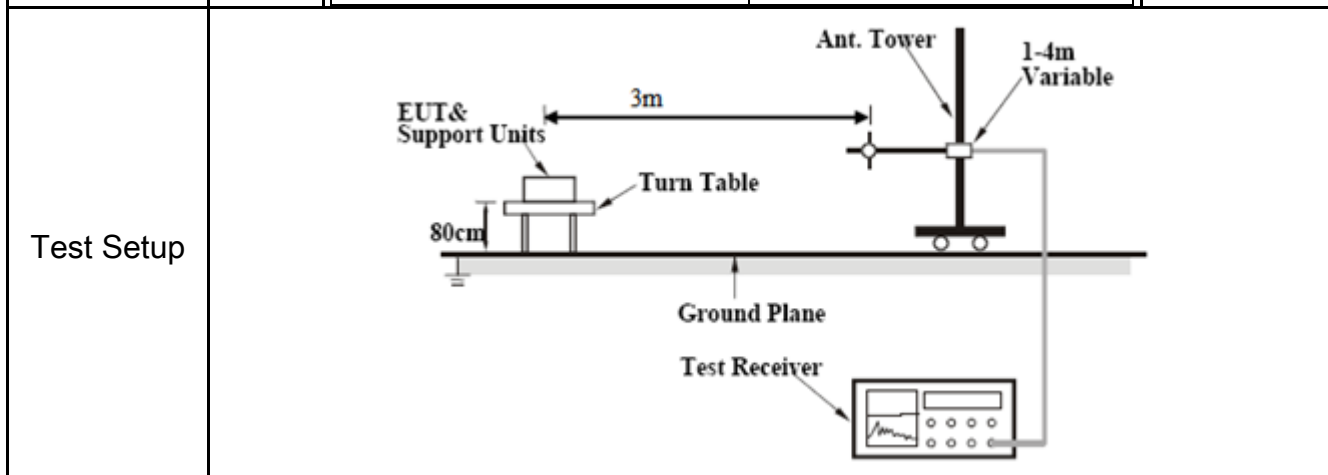
No.	P/L	Frequency	Reading	Detector	Corrected	Result	Limit	Margin
		(MHz)	(dBuV)		(dB}	(dBuV)	(dBuV)	(dB)
1	N	0.1773	21.40	QP	10.02	31.42	64.61	-33.19
2	N	0.1773	2.66	AVG	10.02	12.68	54.61	-41.93
3	N	0.4542	26.73	QP	10.02	36.75	56.80	-20.05
4	N	0.4542	16.37	AVG	10.02	26.39	46.80	-20.41
5	N	1.1874	22.09	QP	10.03	32.12	56.00	-23.88
6	N	1.1874	9.59	AVG	10.03	19.62	46.00	-26.38
7	N	2.0805	23.71	QP	10.04	33.75	56.00	-22.25
8	N	2.0805	9.56	AVG	10.04	19.60	46.00	-26.40
9	N	3.8190	20.87	QP	10.06	30.93	56.00	-25.07
10	N	3.8190	8.29	AVG	10.06	18.35	46.00	-27.65
11	N	7.4655	16.11	QP	10.10	26.21	60.00	-33.79
12	N	7.4655	3.50	AVG	10.10	13.60	50.00	-36.40

6.2 Radiated Emissions

Temperature	25°C
Relative Humidity	55%
Atmospheric Pressure	1017mbar
Test date :	January 23, 2018
Tested By :	Evans He

Requirement(s):

Spec	Item	Requirement	Applicable										
47CFR§15.109(d)/ IC ES-003 Issue 6	a)	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	<input checked="" type="checkbox"/>										
		<table border="1"> <thead> <tr> <th>Frequency range (MHz)</th> <th>Field Strength ($\mu\text{V}/\text{m}$)</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 ($\mu\text{V}/\text{m}$)	30 – 88	100	88 – 216	150	216 - 960	200	Above 960	500
		Frequency range (MHz)		Field Strength ($\mu\text{V}/\text{m}$)									
		30 – 88		100									
		88 – 216		150									
216 - 960	200												
Above 960	500												



Procedure	<ol style="list-style-type: none"> 1. The EUT was switched on and allowed to warm up to its normal operating condition. 2. 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"> a. Vertical or horizontal polarization (whichever gave the higher emission level
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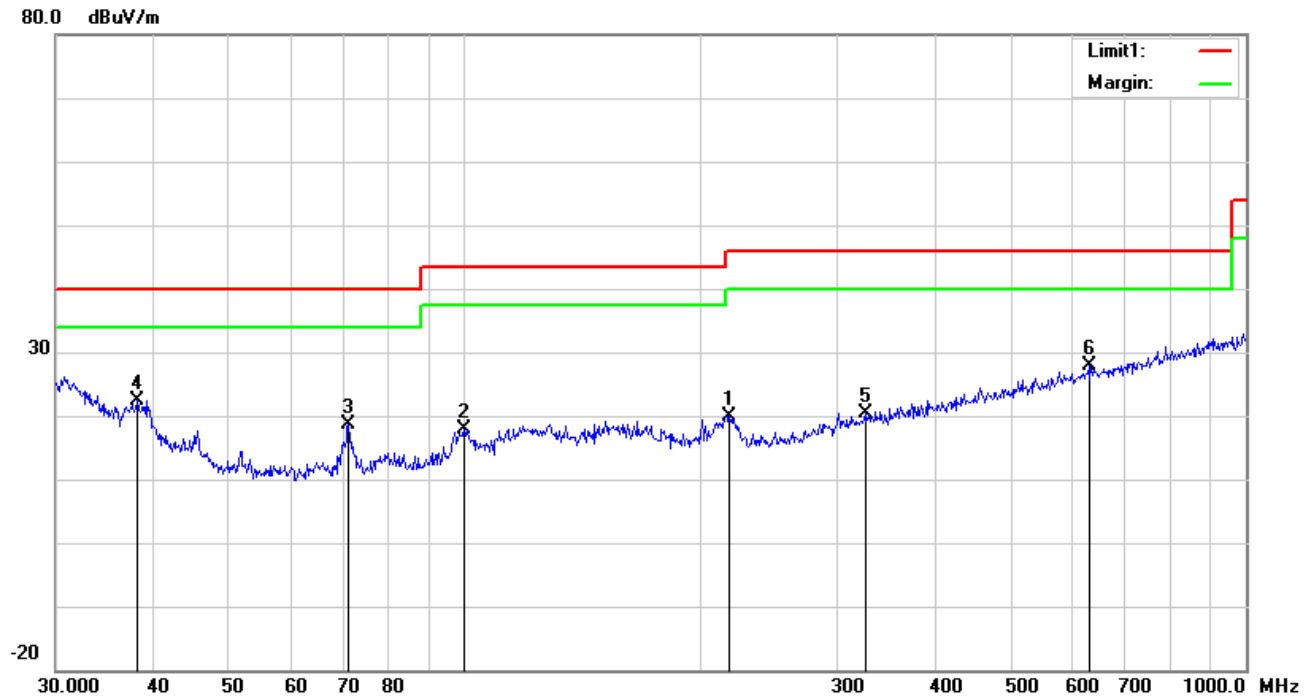
	<p>over a full rotation of the EUT) was chosen.</p> <p>b. The EUT was then rotated to the direction that gave the maximum emission.</p> <p>c. Finally, the antenna height was adjusted to the height that gave the maximum emission.</p> <p>3. The resolution bandwidth and video bandwidth of test receiver/spectrum 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"> ■ 1 kHz (Duty cycle < 98%) □ 10 Hz (Duty cycle > 98%) <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 :	Charging Mode
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Below 1GHz

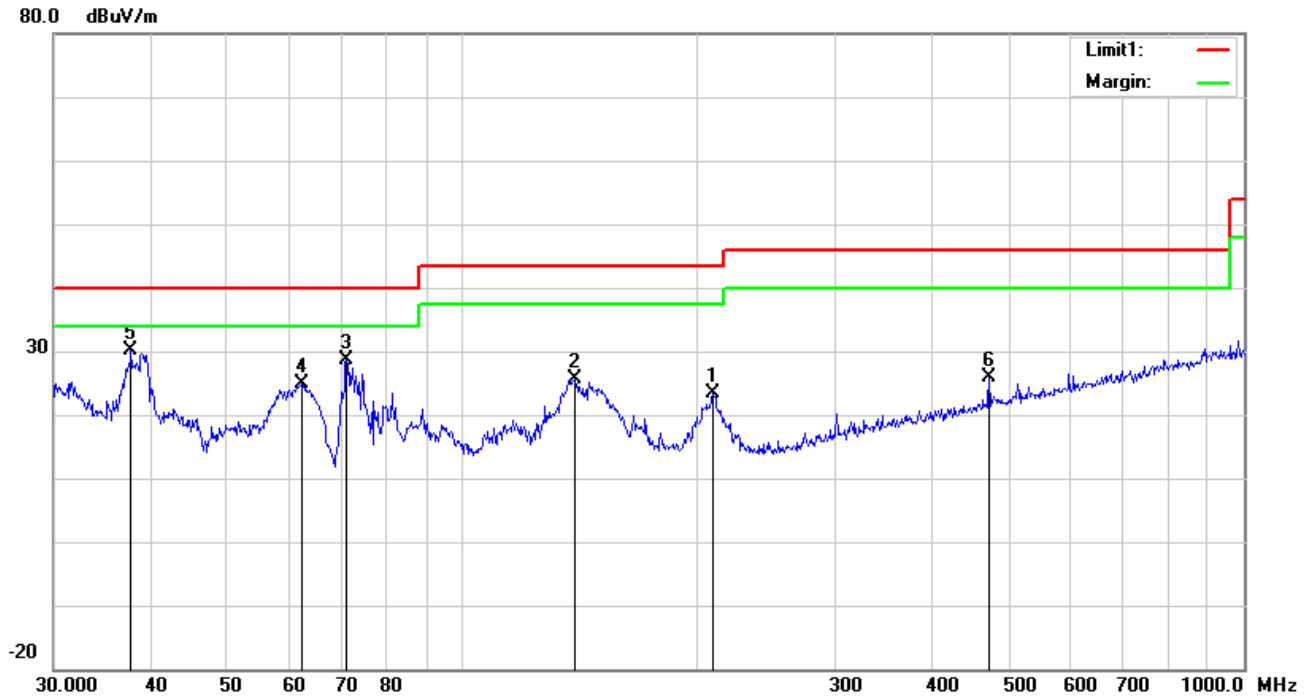


Test Data

Horizontal Polarity Plot @3m

No.	P/L	Frequency (MHz)	Reading (dBuV/m)	Detector	Ant_F (dB/m)	PA_G (dB)	Cab_L (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Degree (°)
1	H	218.3085	28.86	peak	11.84	22.35	1.60	19.95	46.00	-26.05	100	175
2	H	99.8777	28.63	peak	10.37	22.32	1.12	17.80	43.50	-25.70	100	264
3	H	71.0803	32.18	peak	7.78	22.38	0.98	18.56	40.00	-21.44	100	233
4	H	38.2120	28.64	peak	15.21	22.27	0.78	22.36	40.00	-17.64	100	177
5	H	325.5958	26.48	peak	14.14	22.22	1.92	20.32	46.00	-25.68	100	55
6	H	629.4772	27.37	peak	19.42	21.52	2.57	27.84	46.00	-18.16	100	229

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	209.3129	32.24	peak	11.97	22.36	1.57	23.42	43.50	-20.08	100	28
2	V	139.3613	34.05	peak	12.64	22.41	1.27	25.55	43.50	-17.95	100	24
3	V	71.0803	42.32	peak	7.78	22.38	0.98	28.70	40.00	-11.30	100	218
4	V	62.2128	39.04	peak	7.41	22.40	0.81	24.86	40.00	-15.14	100	189
5	V	37.6798	36.10	peak	15.59	22.27	0.78	30.20	40.00	-9.80	200	354
6	V	472.1760	28.34	peak	17.14	21.87	2.26	25.87	46.00	-20.13	100	175

Above 1GHz

Frequency (MHz)	Read_level (dB μ V/m)	Azimuth	Height (cm)	Polarity (H/V)	Level (dB μ V/m)	Factors (dB)	Limit (dB μ V/m)	Margin (dB)	Detector (PK/AV)
1417.17	67.87	162	100	V	-19.18	48.69	74	-25.31	PK
1924.3	63.89	241	100	V	-16.05	47.84	74	-26.16	PK
2810.37	60.69	221	100	V	-13.17	47.52	74	-26.48	PK
1637.79	62.52	4	100	H	-16.84	45.68	74	-28.32	PK
2479.25	61.32	201	100	H	-14.41	46.91	74	-27.09	PK
3798.59	58.34	339	100	H	-11.05	47.29	74	-26.71	PK

*Note 1: The highest frequency of the EUT is 5825 MHz, so the testing has been conformed to 5*5825MHz
=29.125MHz.*

Note 2: The frequency that above 3GHz is mainly from the environment noise.

Note 3: The AV measurement performed, more than 20dB below limit so AV test data was not presented.

Note 4: The radiated spurious test above 18GHz is subcontracted to "BV 7LAYERS COMMUNICATION TECHNOLOGY(SHENZHEN)CO.,LTD" Laboratories. and found 30dB below the limit at least.

Annex A. TEST INSTRUMENT

Instrument	Model	Serial #	Cal Date	Cal Due	In use
AC Line Conducted Emissions					
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"/>
LISN	ISN T800	34373	09/23/2017	09/22/2018	<input checked="" type="checkbox"/>
Transient Limiter	LIT-153	531118	08/30/2017	08/29/2018	<input checked="" type="checkbox"/>
Radiated Emissions					
EMI test receiver	ESL6	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	03/23/2017	03/22/2018	<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"/>
Horn Antenna	BBHA9170	3145226D1	09/27/2017	09/26/2018	<input checked="" type="checkbox"/>

Annex B. EUT And Test Setup Photographs

Annex B.i. Photograph: EUT External Photo

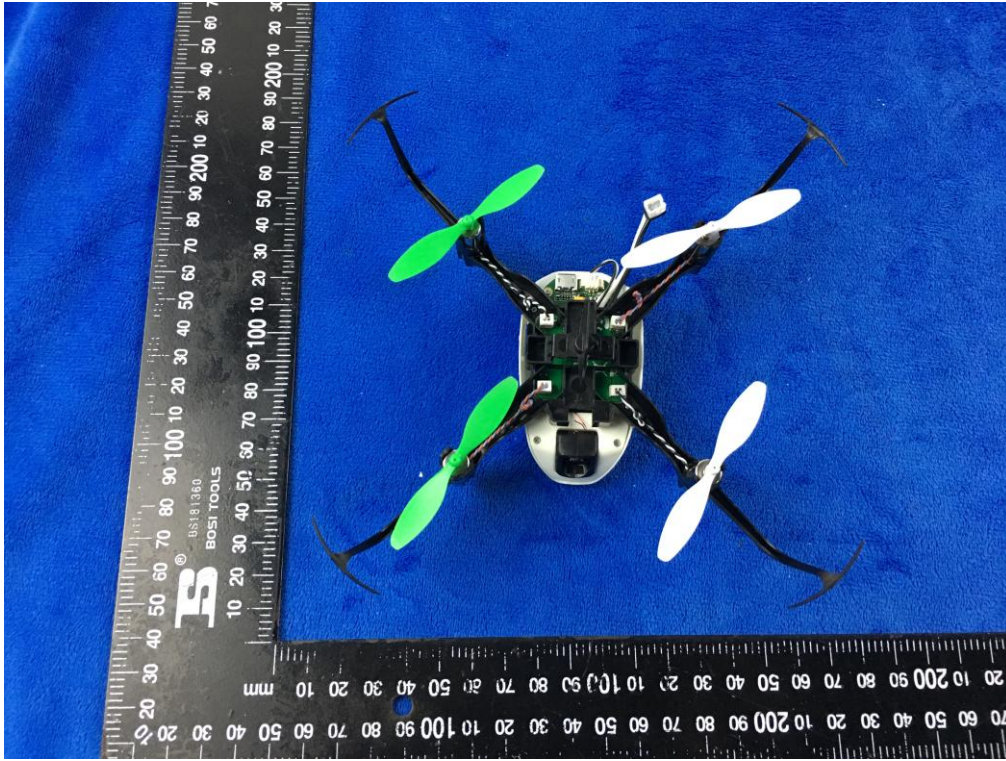
Whole package View



EUT - Front View



EUT - Rear View



EUT - Top View



EUT - Bottom View



EUT - Left View

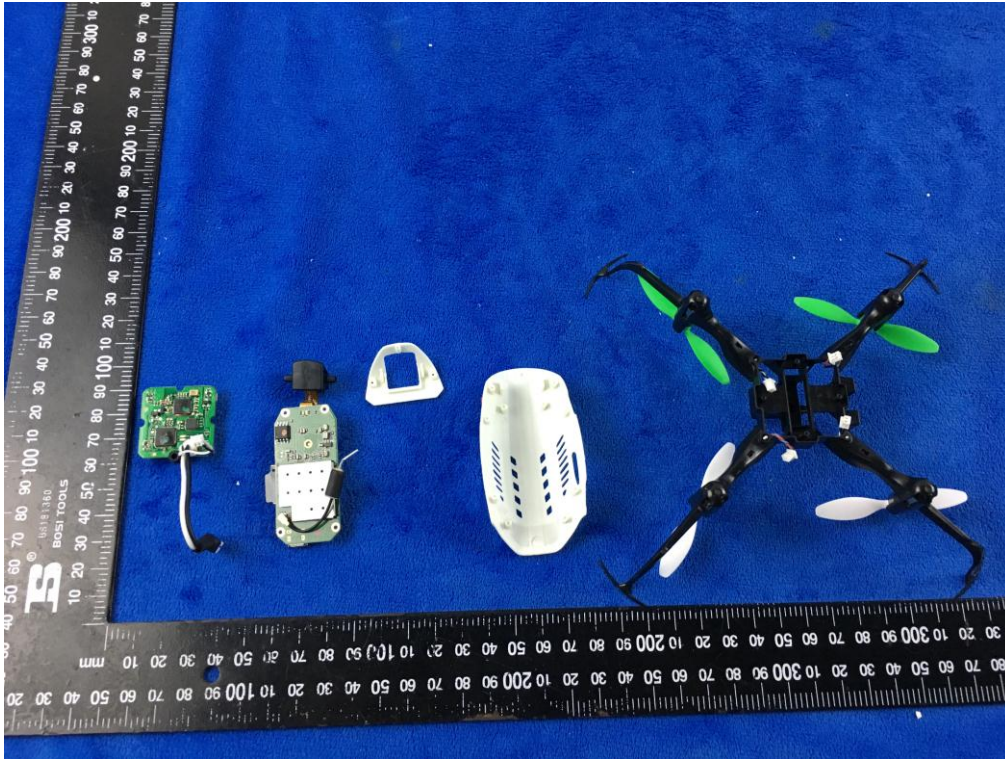


EUT - Right View



Annex B.ii. Photograph: EUT Internal Photo

Cover Off - Top View



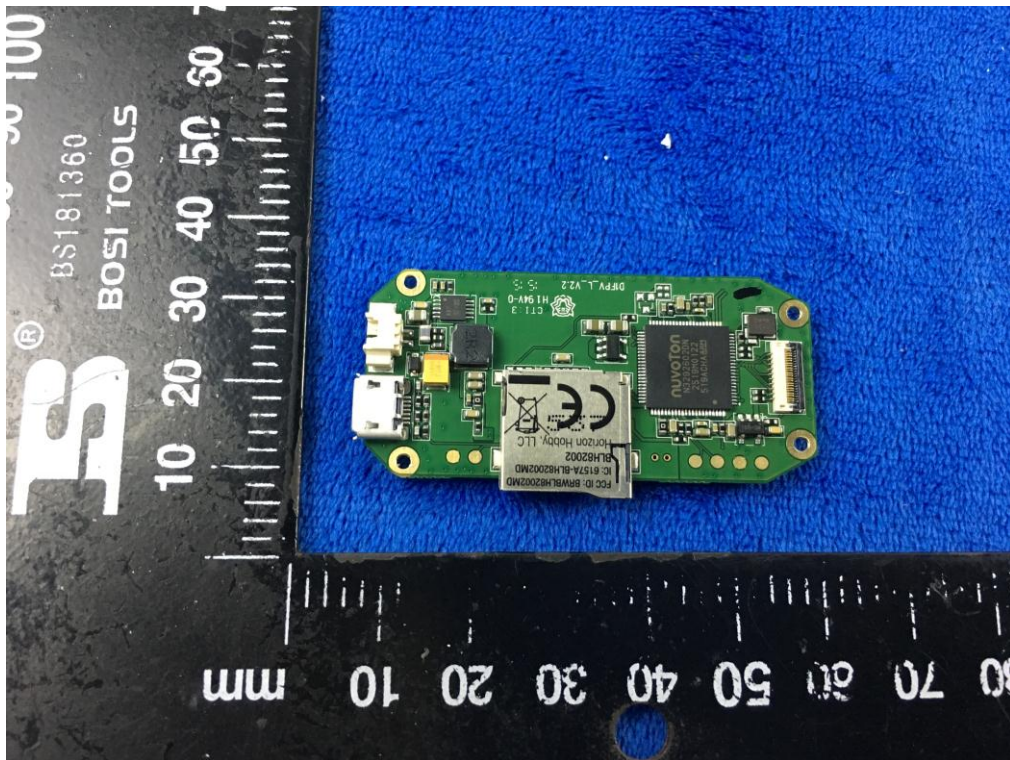
Battery - Front View



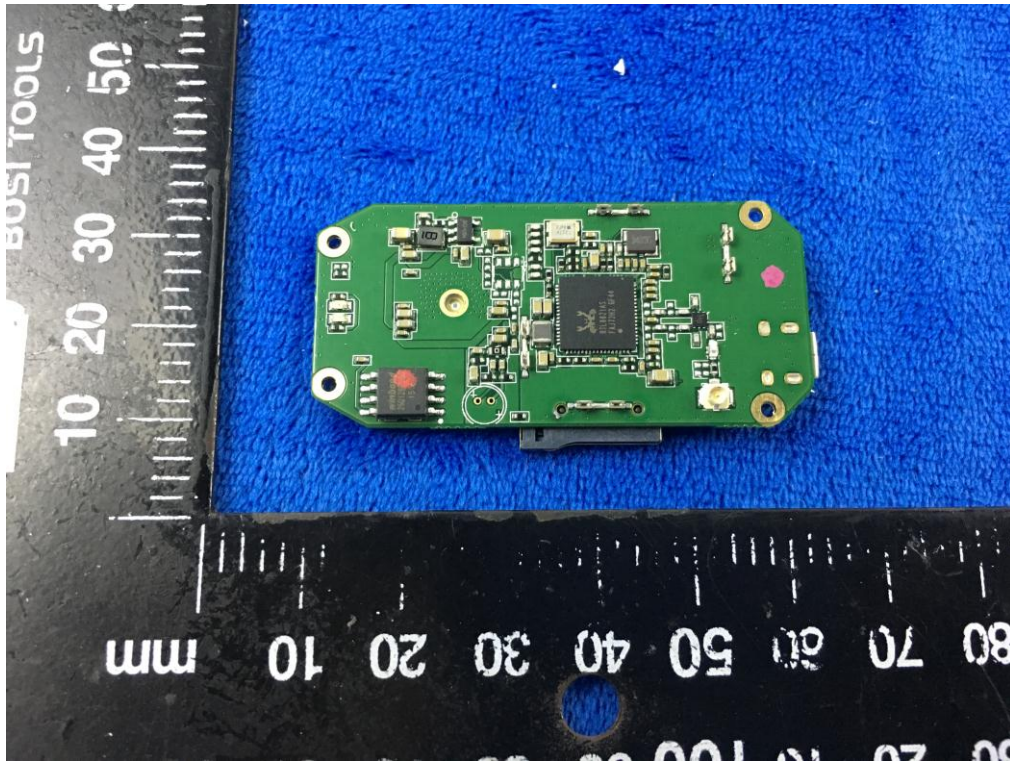
Battery - Rear View



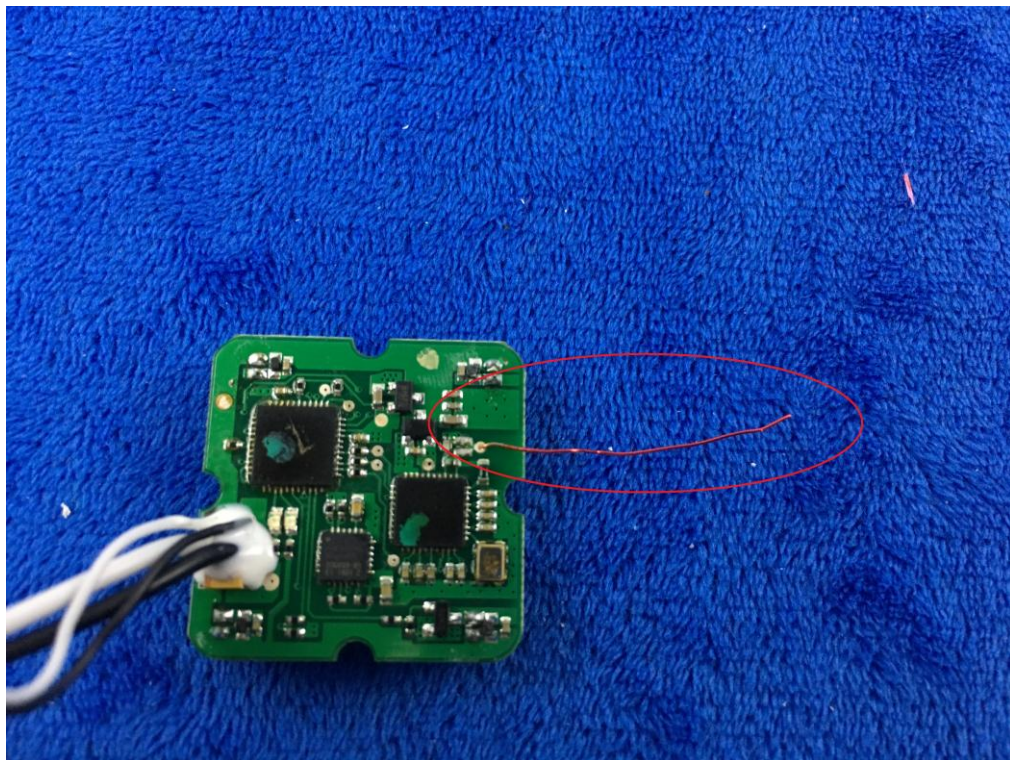
Mainboard - Front View



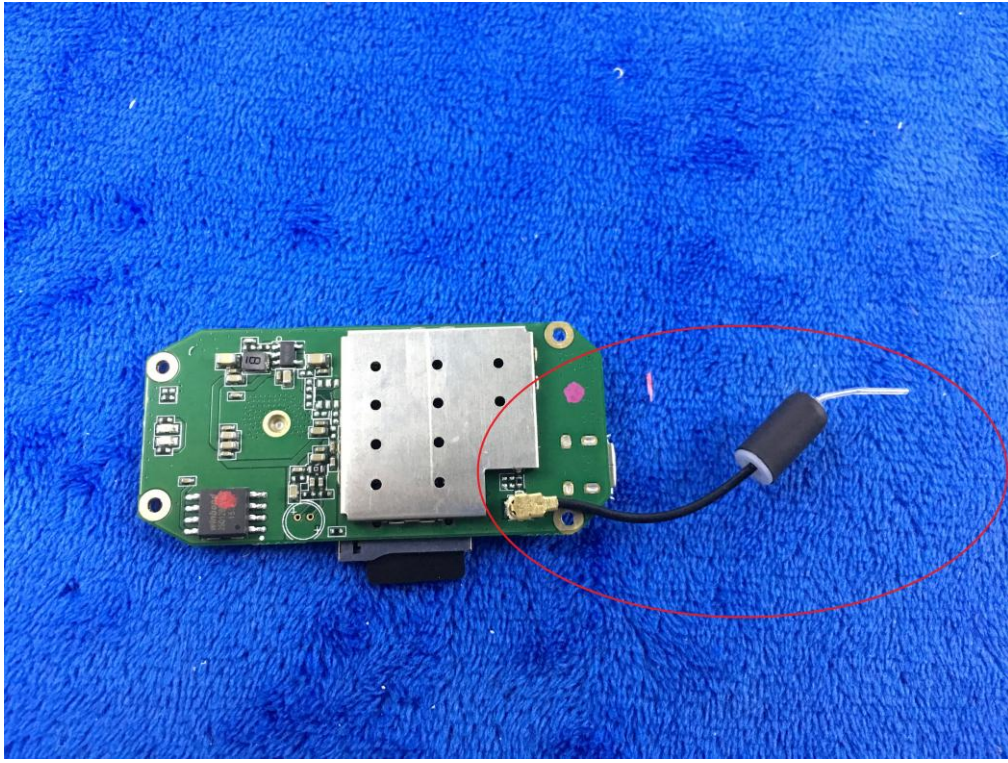
Mainboard - Rear View



2.4G - Antenna View



5.8G - Antenna View



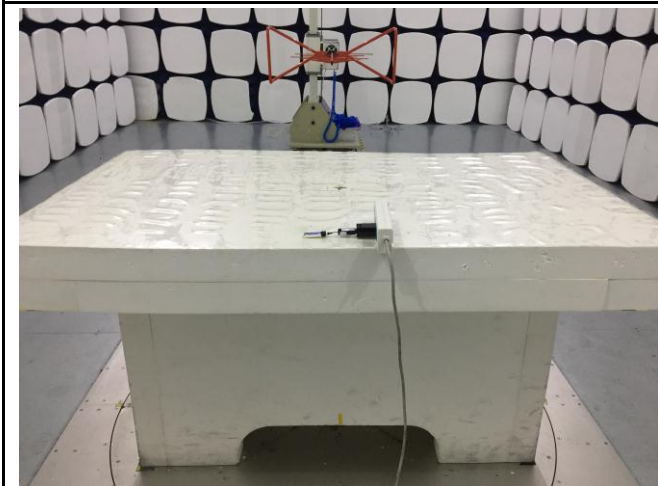
Annex B.iii. Photograph: Test Setup Photo



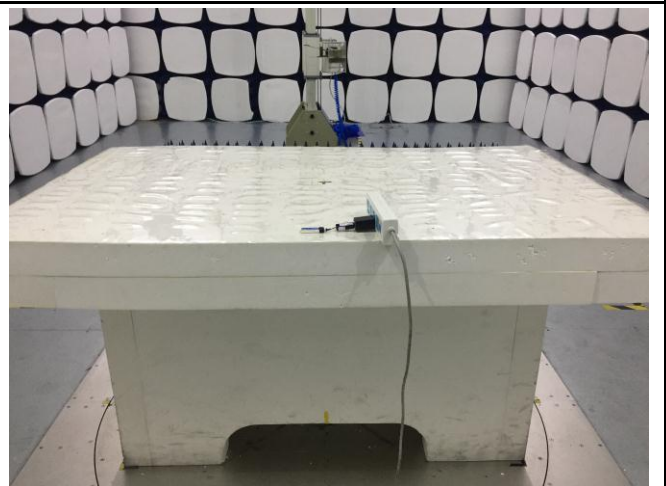
Conducted Emissions Test Setup – Front View



Conducted Emissions Test Setup – Side View



Radiated Emissions Test Setup Below 1GHz

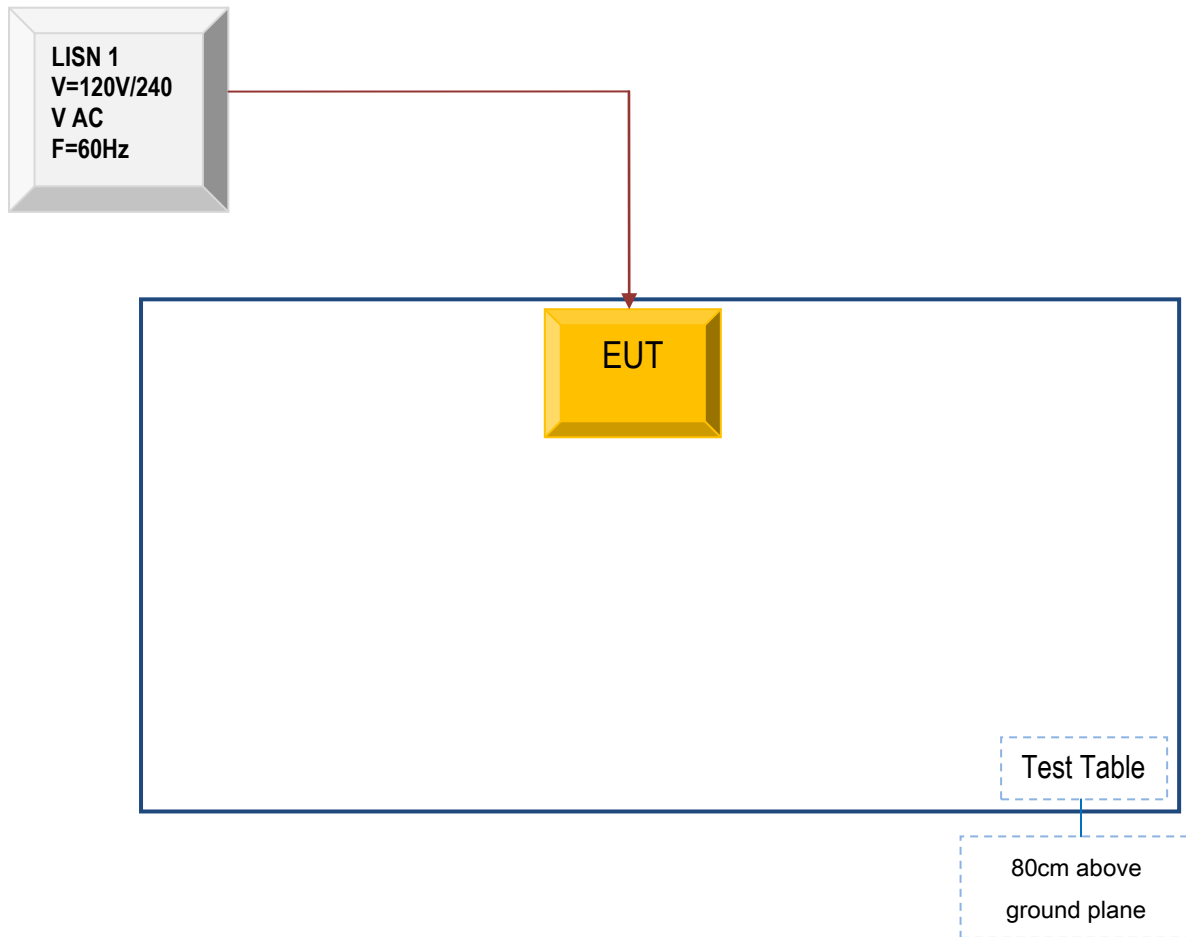


Radiated Emissions Test Setup Above 1GHz

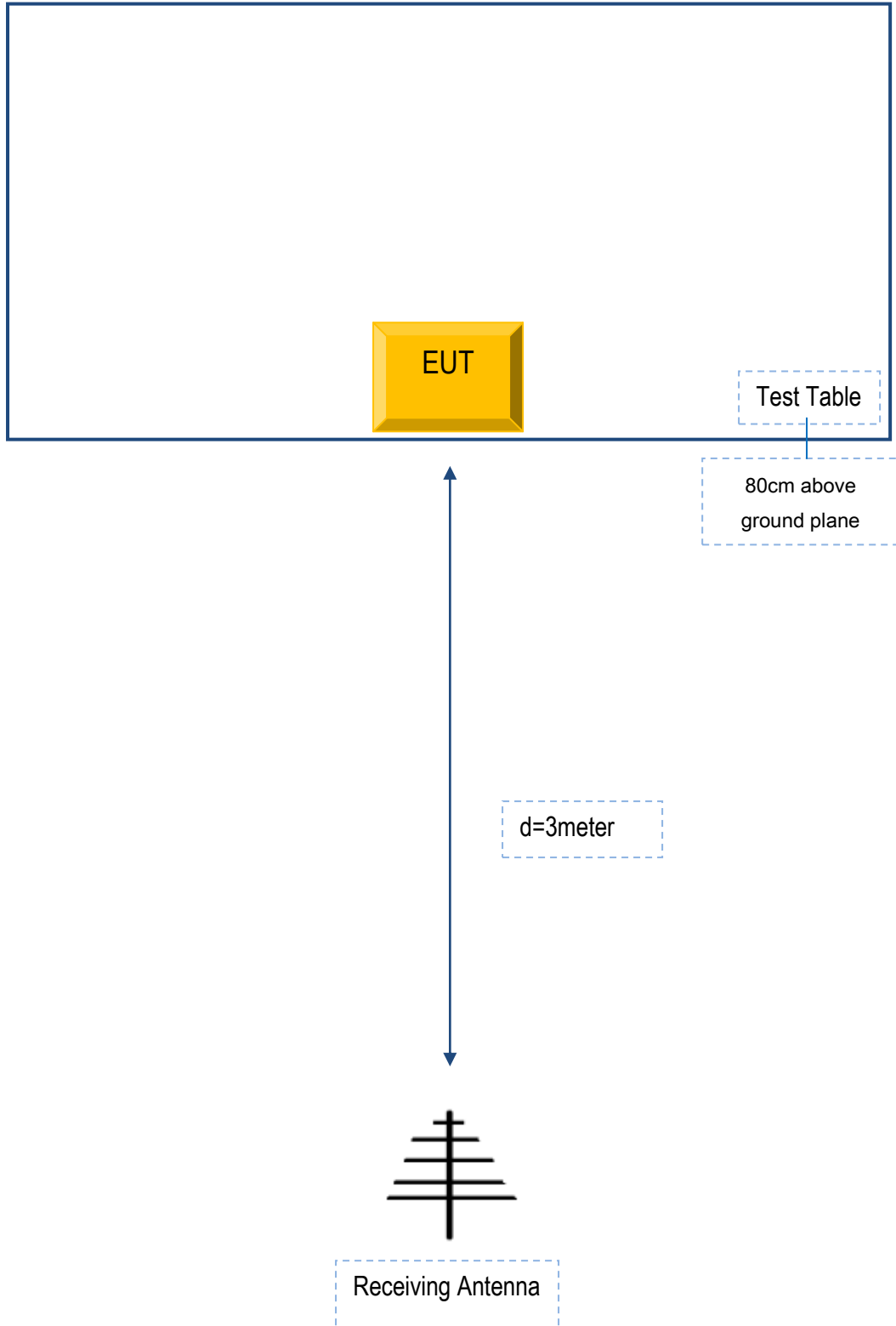
Annex C. TEST SETUP AND SUPPORTING EQUIPMENT

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.

Supporting Equipment:

Manufacturer	Equipment Description	Model	Serial No
N/A	N/A	N/A	N/A

Supporting Cable:

Cable type	Shield Type	Ferrite Core	Length	Serial No
N/A	N/A	N/A	N/A	N/A

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

Please see the attachment

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Annex E. DECLARATION OF SIMILARITY

N/A