RF TEST REPORT

Report No.: 16070984-FCC-R1

Supersede Report No.:N/A

Applicant	Freevision Technologies Co., Ltd
Product Name	Magikit Box BLE
Model No.	MAGIKIT ADV V1.1
Serial No.	MAGIKIT ADV V1.1, MAGIKIT ADV V1.2, MAGIKIT ADV V1.3, MAGIKIT ADV V1.4 , MAGIKIT ADV V1.5 , MAGIKIT ADV V1.6, MAGIKIT ADV V1.7, MAGIKIT ADV V1.8 , MAGIKIT ADV V1.9
Test Standard	FCC Part 15.225: 2015; ANSI C63.10: 2013
Test Date	June 12 to June 22, 2016
Issue Date	August 23, 2016
Test Result	☑ Pass ☐ Fail
Equipment complied with the specification	☑
Equipment did not comply with the specification	☐

Loren Luo	David Huang	
Loren Luo 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

Zone A, Floor 1, Building 2 Wan Ye Long Technology Park

South Side of Zhoushi Road, Bao' an District, Shenzhen, Guangdong China 518108

Phone: +86 0755 2601 4629801 Email: China@siemic.com.cn

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

This page has been left blank intentionally.

CONTENTS

1. Report Revision History

Report No.	Report Version	Description	Issue Date
16070984-FCC-R1	NONE	Original	August 23, 2016

2. Customer information

Applicant Name	Freevision Technologies Co., Ltd
Applicant Add	Floor 3，Building 8,No.999 Jiangyue Rd Minhang Dist, Shanghai, China
Manufacturer	Freevision Technologies Co., Ltd
Manufacturer Add	Floor 3，Building 8,No.999 Jiangyue Rd Minhang Dist, Shanghai, China

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	Radiated Emission Program-To Shenzhen v2.0

4. Equipment under Test (EUT) Information

Description of EUT:	Magikit Box BLE
Main Model:	MAGIKIT ADV V1.1
Serial Model:	MAGIKIT ADV V1.1, MAGIKIT ADV V1.2, MAGIKIT ADV V1.3, MAGIKIT ADV V1.4 , MAGIKIT ADV V1.5 , MAGIKIT ADV V1.6, MAGIKIT ADV V1.7, MAGIKIT ADV V1.8 , MAGIKIT ADV V1.9
Date EUT received:	June 12, 2016
Test Date(s):	June 12 to June 22, 2016
Equipment Category：	DXX
Antenna Gain:	RFID Low Frequency: 20dBi RFID High Frequency: 20dBi BLE: 0 dBi
Type of Modulation:	RFID Low Frequency: ASK RFID High Frequency: ASK BLE: GFSK
RF Operating Frequency (ies):	RFID Low Frequency: 125-150KHz RFID High Frequency: 13.56MHz BLE: 2402-2480MHZ
Port：	USB Port
Number of Channels:	RFID High Frequency: 1CH (ASK) BLE: 40CH
Input Power:	Battery: Spec: 3.7V，260mAh ，0.962Wh USB：5V

Trade Name : N/A

FCC ID: 2AIM881810M

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
15.203	Antenna Requirement	Pass
15.215(c)	20 dB Bandwidth&99% Occupied Bandwidth	Pass
15.225(a), 15.225(b), 15.225(c)	Field Strength Measurement	Pass
15.207(a)	Conducted Emissions	Pass
15.225(d),15.209	Radiated Emissions(Tx)	Pass
15.225(e)	Frequency Stability	Pass

6. Measurements, Examination And Derived Results

6.1 Antenna Requirement

Applicable Standard

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. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section. The manufacturer may design the unit so that a broken antenna can be replaced by the user, but the user of a standard antenna jack or electrical connector is prohibited.
The structure and application of the EUT were analyzed to determine compliance with section §15.203 of the rules. §15.203 state that the subject device must meet the following criteria:

a. Antenna must be permanently attached to the unit.
b. Antenna must use a unique type of connector to attach to the EUT.

Unit must be professionally installed, and installer shall be responsible for verifying that the correct antenna is employed with the unit.
And according to FCC 47 CFR section 15.247 (b), if the transmitting antennas of directional gain greater than 6dBi are used, the power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

Antenna Connector Construction

The EUT has 3 antennas:
A permanently attached PCB antenna for BLE, the gain is 0 dBi
A permanently attached Loop antenna for RFID Low Frequency, the gain is 20 dBi.
A permanently attached Loop antenna for RFID High Frequecy, the gain is 20 dBi.

Result: Compliance.

6.2 20 dB Bandwidth&99% Occupied Bandwidth

Temperature	23℃
Relative Humidity	55%
Atmospheric Pressure	1022mbar
Test date :	June 22, 2016
Tested By :	Loren Luo

1. Conducted Measurement
   EUT was set for low, mid, high channel with modulated mode and highest RF output power.
   The spectrum analyzer was connected to the antenna terminal.
2. Conducted Emissions Measurement Uncertainty
   All test measurements carried out are traceable to national standards. The uncertainty of the measurement at a confidence level of approximately 95% (in the case where distributions are normal), with a coverage factor of 2, in the range 9kHz – 40GHz is ±1.5dB.

Standard Requirement:

The bandwidth of a frequency hopping channel is the 20 dB emission bandwidth, measured with the hopping stopped. The system RF bandwidth is equal to the channel bandwidth multiplied by the number of channels in the hopset. The hopset shall be such that the near-term distribution of frequencies appears random, with sequential hops randomly distributed in both direction and magnitude of change in the hopset while the long-term distribution appears evenly distributed.

Procedures:

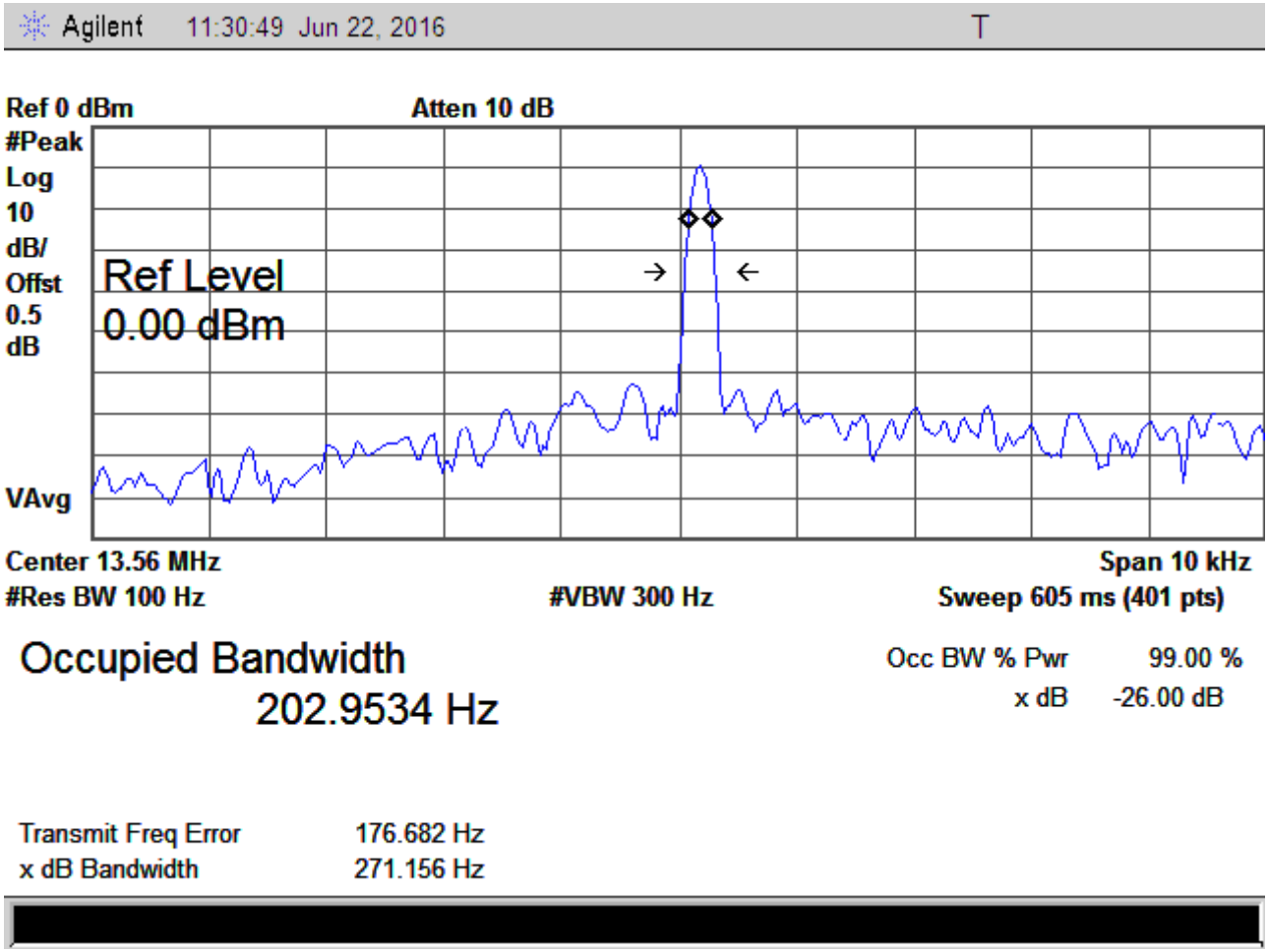
1. Place the EUT on the table and set it in transmitting mode.
2. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.
3. Set the spectrum analyzer as Span = approximately 2 to 3 times the 20 dB bandwidth, centered on a hopping channel, RBW ≥ 1% of the 20 dB bandwidth, VBW ≥ RBW, Sweep = auto, Detector function = peak, Trace = max hold.
4. Set the measured low, middle and high frequency and test 20dB bandwidth with spectrum analyzer.

Test Result: Pass

Test Mode:	Transmitting

Frequency (MHz)	20dB Bandwidth (KHz)	Test Result
13.56	271.156	PASS

The 20dB&99% bandwidth:



13.56MHz

6.3 Field Strength Measurement

Temperature	24℃
Relative Humidity	57%
Atmospheric Pressure	1015mbar
Test date :	June 15, 2016
Tested By :	Loren Luo

1. Radiated Measurement
   EUT was set for low, mid, high channel with modulated mode and highest RF output power.
2. Radiated Emissions Measurement Uncertainty
   All test measurements carried out are traceable to national standards. The uncertainty of the measurement at a confidence level of approximately 95% (in the case where distributions are normal), with a coverage factor of 2, in the range 9KHz – 40GHz is ±1.5dB.

Test Requirement:

The field strength of any emission shall not exceed the following limits:

a. 15.848 microvolts/m (84 dBμ V/m) at 30 m, within the band 13.553– 13.567 MHz.

b. 334 microvolts/m (50.5 dBμ V/m) at 30 m, within the bands 13.410– 13.553 MHz and 13.567– 13.710 MHz.

c. 106 microvolts/m (40.5 dBμ V/m) at 30 m, within the bands 13.110– 13.410 MHz and 13.710– 14.010 MHz.

d. 30 microvolts/m (29.5 dBμ V/m) at 30 m, outside the band 13.110– 14.010 MHz.

Carrier frequency stability shall be maintained to ±0.01% (±100 ppm).

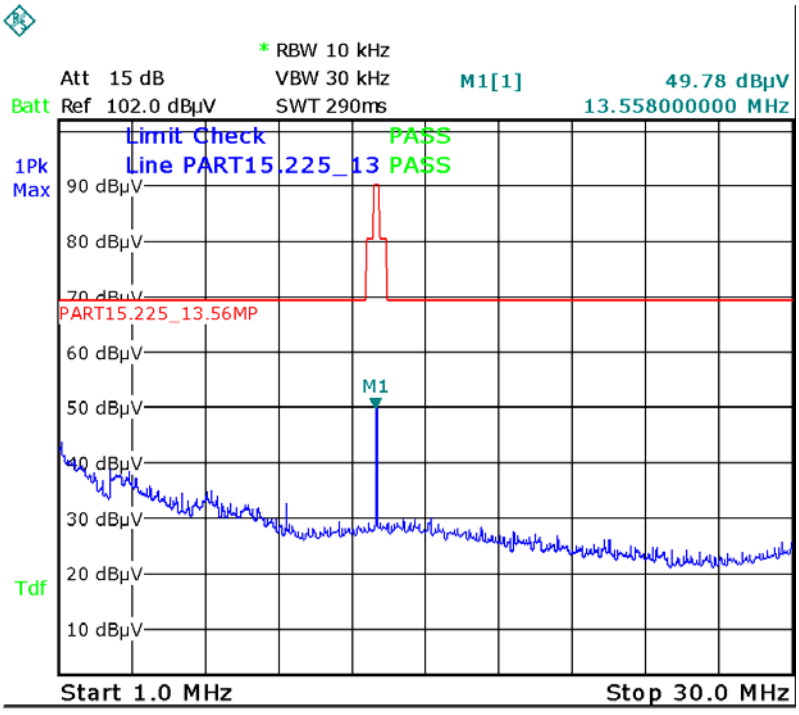
Test Result: Pass

Test Mode:	Transmitting

Fundamental Field Strength:

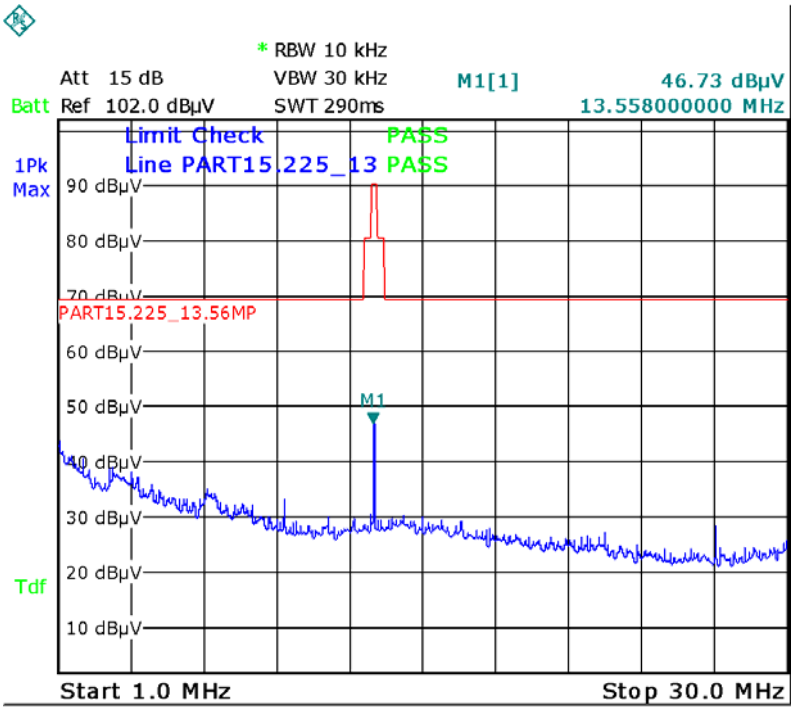
1 MHz- 30 MHz

Loop Antenna at 0 degree：



Date: 15.JUN.2016 14:33:38

Loop Antenna at 90 degree：



Date: 15.JUN.2016 14:37:32

6.4 Conducted emissions Test Result

Temperature	24℃
Relative Humidity	57%
Atmospheric Pressure	1015mbar
Test date :	June 15, 2016
Tested By :	Loren Luo

Standard Requirement:

Frequency of emission (MHz)	Conducted limit (dBμ V)	
	Quasi-peak	Average
0.15 – 0.5	66 to 56*	56 to 46*
0.5 – 5	56	46
5 – 30	60	50

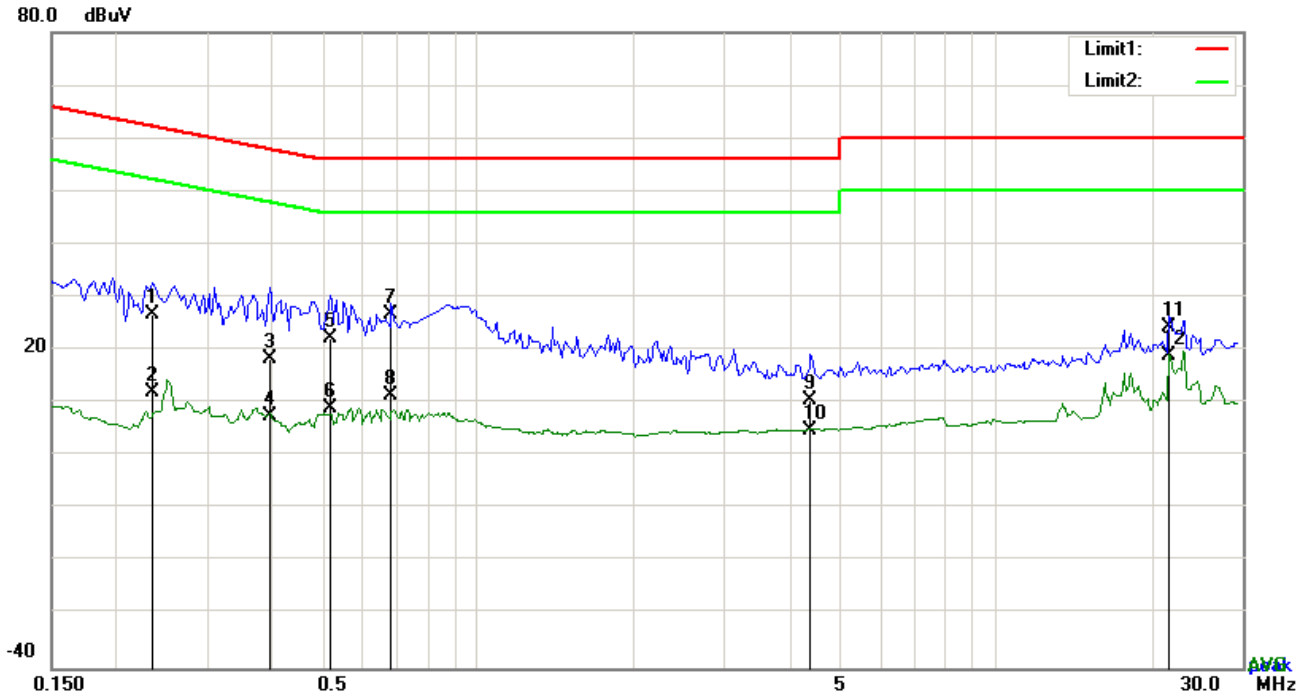
*Decreases with the logarithm of the frequency.

Procedures:

1. All possible modes of operation were investigated. Only the 6 worst case emissions measured, using the correct CISPR and Average detectors, are reported. All other emissions were relatively insignificant.
2. A "-ve" margin indicates a PASS as it refers to the margin present below the limit line at the particular frequency.
3. Conducted Emissions Measurement Uncertainty
   All test measurements carried out are traceable to national standards. The uncertainty of the measurement at a confidence level of approximately 95% (in the case where distributions are normal), with a coverage factor of 2, in the range 9kHz – 30MHz (Average & Quasi-peak) is ±3.5dB.

Test Result: Pass

Test Mode:	Running

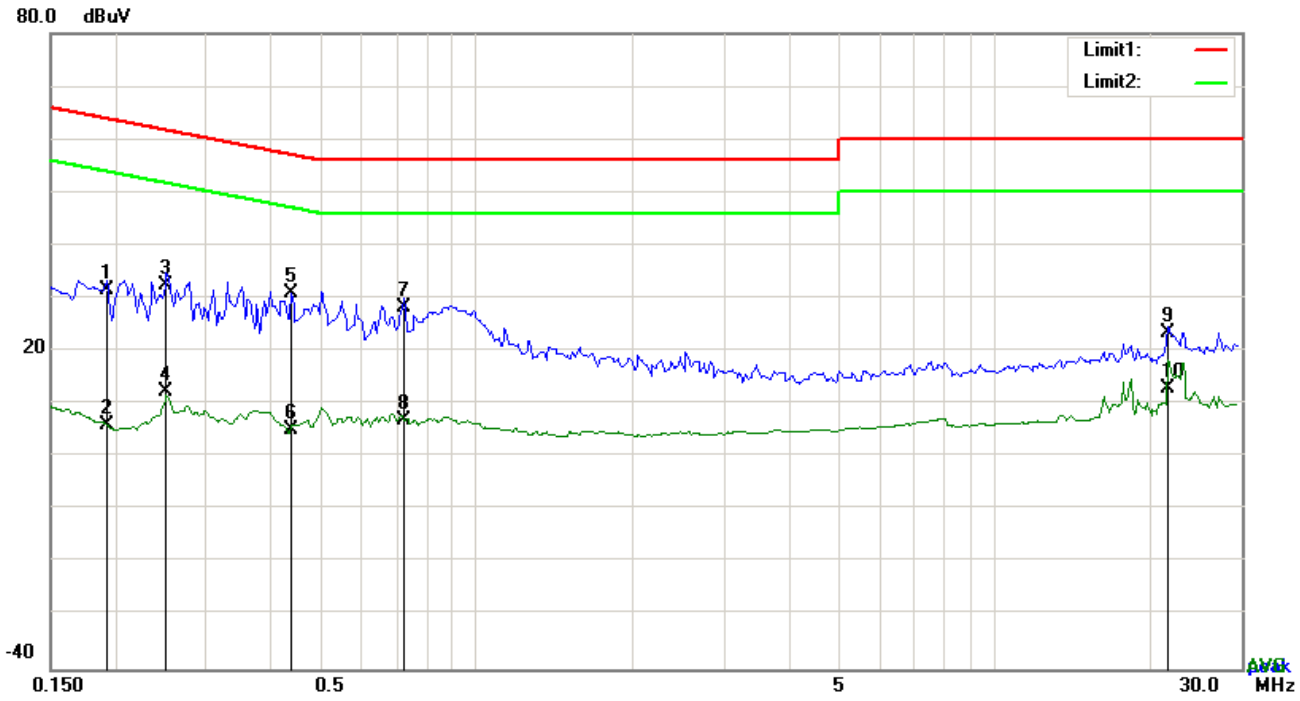


Test Data

Phase Line Plot at 120Vac, 60Hz

No.	P/L	Frequency	Reading	Detector	Corrected	Result	Limit	Margin
		(MHz)	(dBuV)		(dB}	(dBuV)	(dBuV)	(dB)
1	L1	0.2358	16.77	QP	10.03	26.80	62.24	-35.44
2	L1	0.2358	1.93	AVG	10.03	11.96	52.24	-40.28
3	L1	0.3957	8.38	QP	10.03	18.41	57.94	-39.53
4	L1	0.3957	-2.45	AVG	10.03	7.58	47.94	-40.36
5	L1	0.5205	12.37	QP	10.03	22.40	56.00	-33.60
6	L1	0.5205	-1.03	AVG	10.03	9.00	46.00	-37.00
7	L1	0.6804	16.70	QP	10.03	26.73	56.00	-29.27
8	L1	0.6804	1.51	AVG	10.03	11.54	46.00	-34.46
9	L1	4.4040	0.39	QP	10.07	10.46	56.00	-45.54
10	L1	4.4040	-5.14	AVG	10.07	4.93	46.00	-41.07
11	L1	21.6654	14.07	QP	10.33	24.40	60.00	-35.60
12	L1	21.6654	8.65	AVG	10.33	18.98	50.00	-31.02

Test Mode:	Running

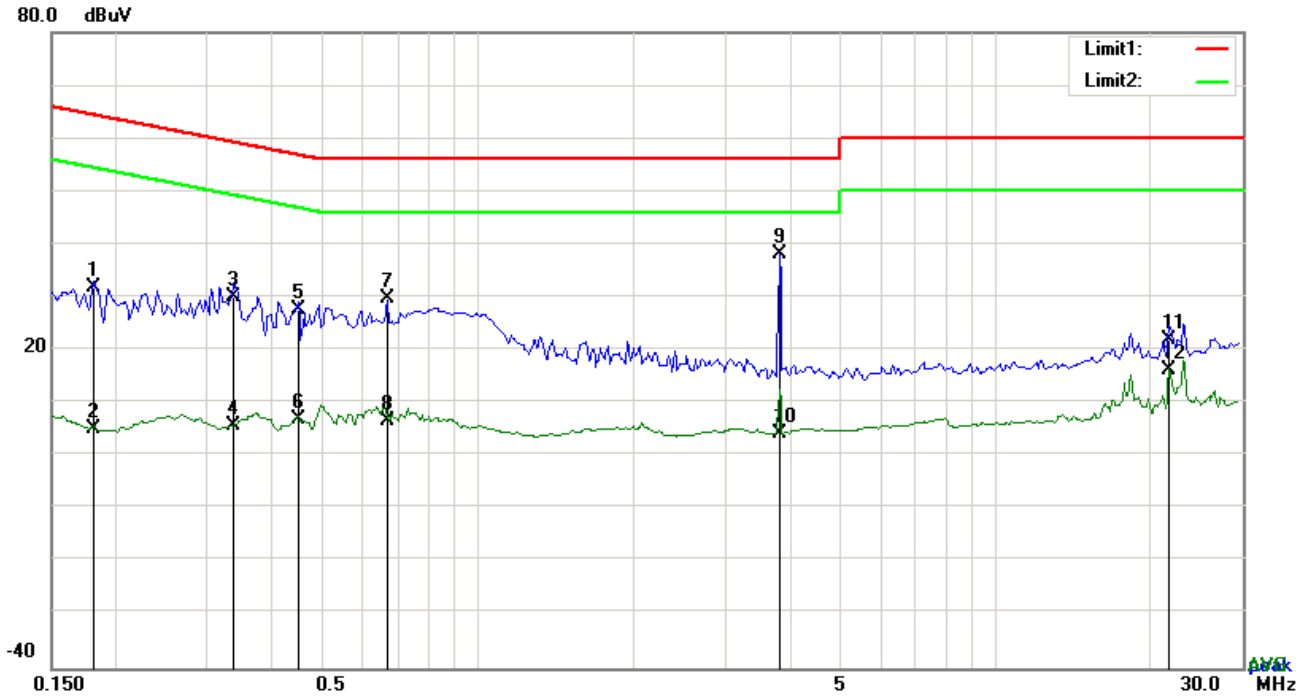


Test Data

Phase Neutral Plot at 120Vac, 60Hz

No.	P/L	Frequency	Reading	Detector	Corrected	Result	Limit	Margin
		(MHz)	(dBuV)		(dB}	(dBuV)	(dBuV)	(dB)
1	N	0.1929	21.41	QP	10.02	31.43	63.91	-32.48
2	N	0.1929	-3.84	AVG	10.02	6.18	53.91	-47.73
3	N	0.2514	22.50	QP	10.02	32.52	61.71	-29.19
4	N	0.2514	2.43	AVG	10.02	12.45	51.71	-39.26
5	N	0.4386	20.85	QP	10.02	30.87	57.09	-26.22
6	N	0.4386	-4.98	AVG	10.02	5.04	47.09	-42.05
7	N	0.7233	18.27	QP	10.02	28.29	56.00	-27.71
8	N	0.7233	-3.10	AVG	10.02	6.92	46.00	-39.08
9	N	21.6654	13.10	QP	10.29	23.39	60.00	-36.61
10	N	21.6654	2.65	AVG	10.29	12.94	50.00	-37.06
11	N	0.1929	21.41	QP	10.02	31.43	63.91	-32.48
12	N	0.1929	-3.84	AVG	10.02	6.18	53.91	-47.73

Test Mode:	Running

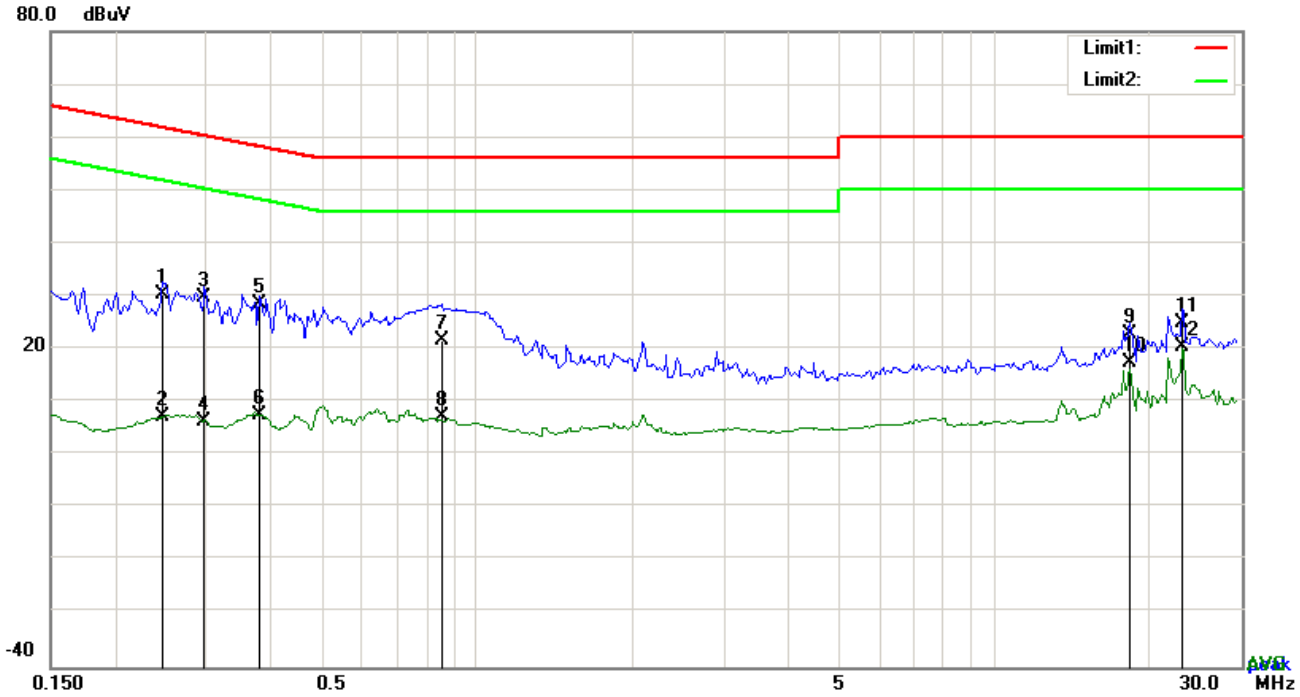


Test Data

Phase Line Plot at 240Vac, 60Hz

No.	P/L	Frequency	Reading	Detector	Corrected	Result	Limit	Margin
		(MHz)	(dBuV)		(dB}	(dBuV)	(dBuV)	(dB)
1	L1	0.1812	21.78	QP	10.03	31.81	64.43	-32.62
2	L1	0.1812	-4.75	AVG	10.03	5.28	54.43	-49.15
3	L1	0.3372	20.10	QP	10.03	30.13	59.27	-29.14
4	L1	0.3372	-4.35	AVG	10.03	5.68	49.27	-43.59
5	L1	0.4503	17.49	QP	10.03	27.52	56.87	-29.35
6	L1	0.4503	-2.97	AVG	10.03	7.06	46.87	-39.81
7	L1	0.6687	19.71	QP	10.03	29.74	56.00	-26.26
8	L1	0.6687	-3.39	AVG	10.03	6.64	46.00	-39.36
9	L1	3.8346	28.10	QP	10.07	38.17	56.00	-17.83
10	L1	3.8346	-5.86	AVG	10.07	4.21	46.00	-41.79
11	L1	21.6654	11.54	QP	10.33	21.87	60.00	-38.13
12	L1	21.6654	5.99	AVG	10.33	16.32	50.00	-33.68

Test Mode:	Running



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	0.2475	20.45	QP	10.02	30.47	61.84	-31.37
2	N	0.2475	-2.65	AVG	10.02	7.37	51.84	-44.47
3	N	0.2982	19.81	QP	10.02	29.83	60.29	-30.46
4	N	0.2982	-3.62	AVG	10.02	6.40	50.29	-43.89
5	N	0.3801	18.66	QP	10.02	28.68	58.28	-29.60
6	N	0.3801	-2.50	AVG	10.02	7.52	48.28	-40.76
7	N	0.8559	11.64	QP	10.03	21.67	56.00	-34.33
8	N	0.8559	-2.83	AVG	10.03	7.20	46.00	-38.80
9	N	18.2451	12.72	QP	10.24	22.96	60.00	-37.04
10	N	18.2451	7.07	AVG	10.24	17.31	50.00	-32.69
11	N	23.1318	14.67	QP	10.31	24.98	60.00	-35.02
12	N	23.1318	10.29	AVG	10.31	20.60	50.00	-29.40

6.5 Radiated Emissions (TX)

Temperature	24℃
Relative Humidity	57%
Atmospheric Pressure	1015mbar
Test date :	June 15, 2016
Tested By :	Loren Luo

1. All possible modes of operation were investigated. Only the 6 worst case emissions measured, using the correct CISPR detectors, are reported. All other emissions were relatively insignificant.
2. A "-ve" margin indicates a PASS as it refers to the margin present below the limit line at the particular frequency.
3. Radiated Emissions Measurement Uncertainty
   All test measurements carried out are traceable to national standards. The uncertainty of the measurement at a confidence level of approximately 95% (in the case where distributions are normal), with a coverage factor of 2, in the range 1 MHz – 1GHz (3m & 10m) & 1GHz above (3m) is +5.6/-4.5dB.

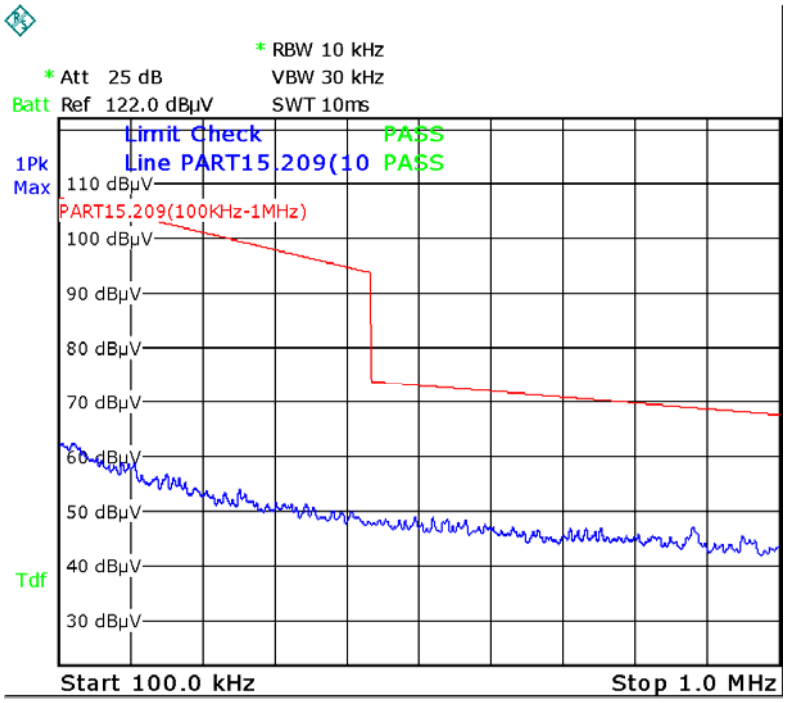
Standard Requirement:

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.
The spurious emission scanned frequency range is 1MHz – 1000 MHz.

Test Result: Pass

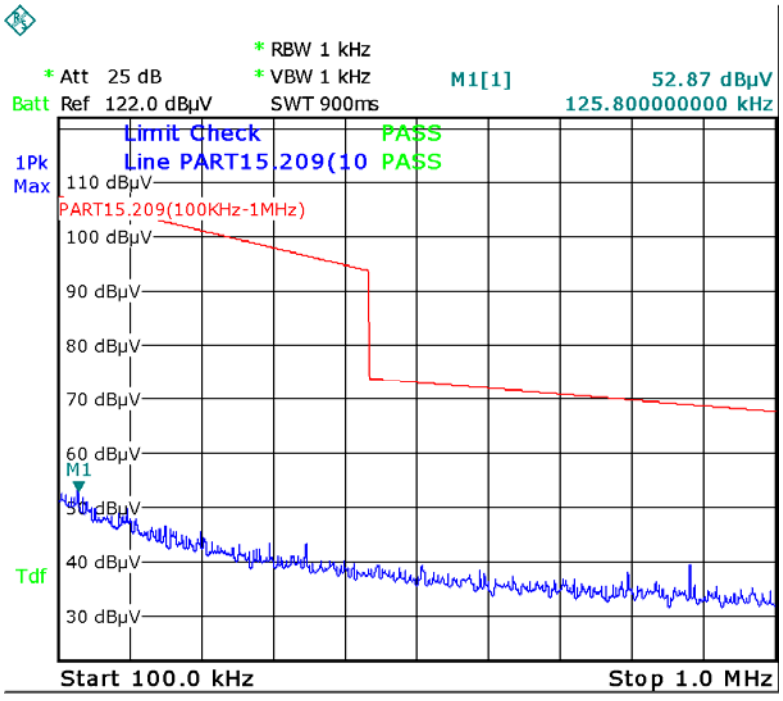
0.1 MHz- 1 MHz

Loop Antenna at 0 degree：



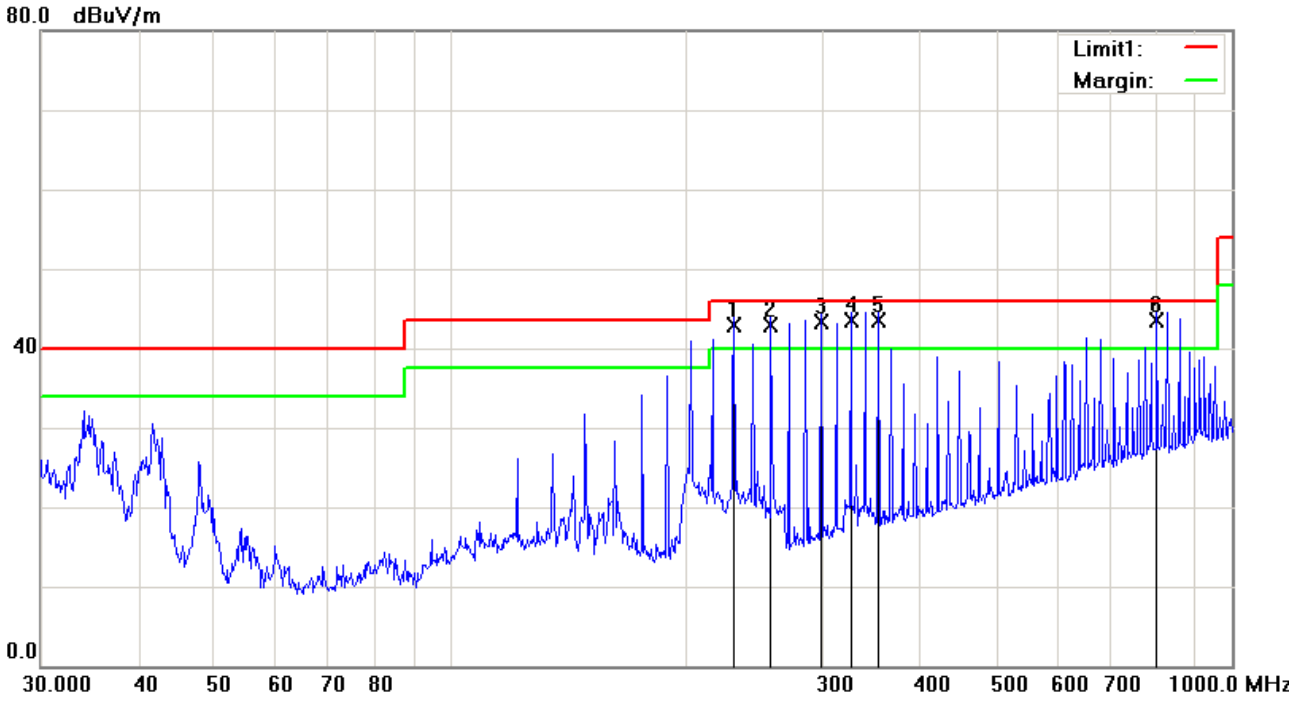
Date: 15.JUN.2016 14:55:12

Loop Antenna at 90 degree：



Date: 15.JUN.2016 15:16:07

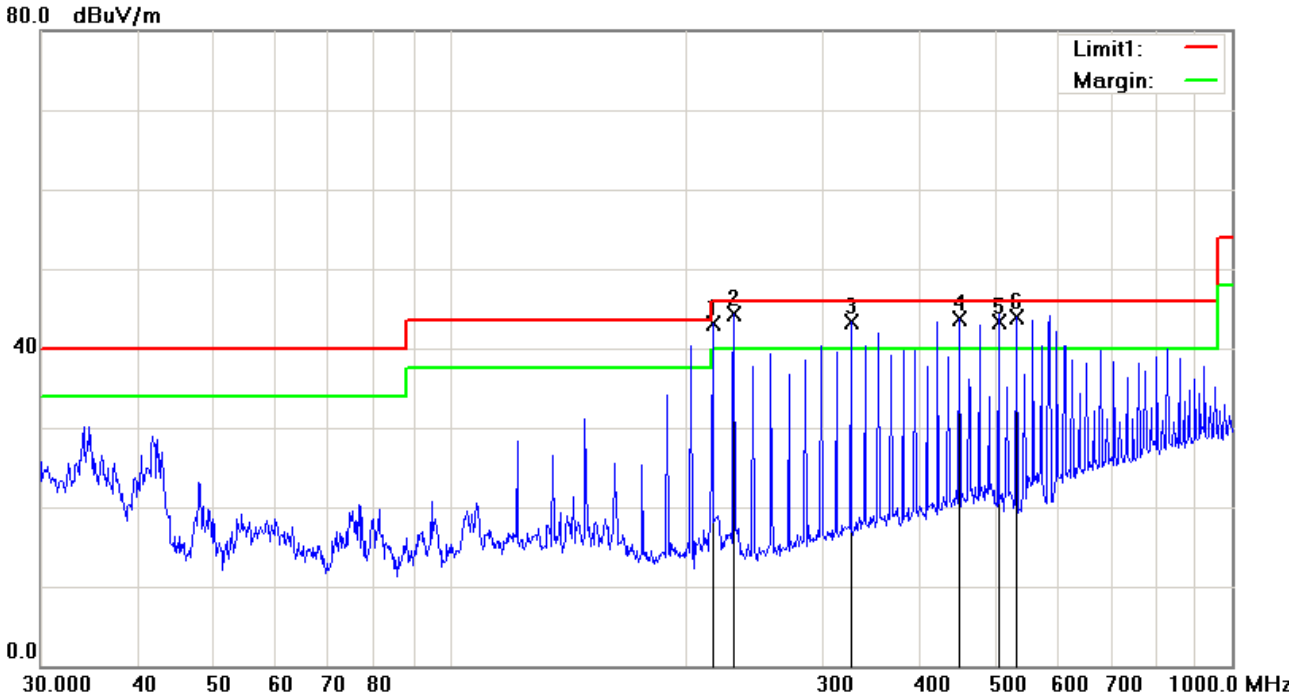
Test Mode:	Transmitting



Test Data

Horizontal Polarity Plot @3m

No.	P/L	Frequency	Reading	Detector	Corrected	Result	Limit	Margin	Height	Degree
		(MHz)	(dBuV/m)		(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	(cm)	( )
1	H	230.9068	51.92	QP	-9.01	42.91	46.00	-3.09	100	129
2	H	257.4222	51.69	QP	-8.85	42.84	46.00	-3.16	100	53
3	H	298.2681	50.34	QP	-6.98	43.36	46.00	-2.64	100	131
4	H	325.5958	49.57	QP	-6.16	43.41	46.00	-2.59	100	176
5	H	352.9434	48.87	QP	-5.39	43.48	46.00	-2.52	100	221
6	H	801.7863	40.18	QP	3.23	43.41	46.00	-2.59	100	168



Test Data

Vertical Polarity Plot @3m

No.	P/L	Frequency	Reading	Detector	Corrected	Result	Limit	Margin	Height	Degree
		(MHz)	(dBuV/m)		(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	(cm)	( )
1	V	216.7828	51.92	QP	-8.89	43.03	46.00	-2.97	100	185
2	V	230.9068	53.22	QP	-9.01	44.21	46.00	-1.79	100	140
3	V	325.5958	49.39	QP	-6.16	43.23	46.00	-2.77	100	226
4	V	447.9822	46.83	QP	-3.12	43.71	46.00	-2.29	100	311
5	V	502.9395	44.90	QP	-1.64	43.26	46.00	-2.74	100	215
6	V	530.1014	45.00	QP	-1.16	43.84	46.00	-2.16	100	180

6.6 Frequency Stability

Temperature	22℃
Relative Humidity	54%
Atmospheric Pressure	1021mbar
Test date :	June 21, 2016
Tested By :	Loren Luo

Requirement(s): 47 CFR §15.225(e)

Procedures: Frequency Stability was measured according to 47 CFR§2.1055. Measurement was taken with spectrum analyzer. The spectrum analyzer bandwidth and span was set to read in hertz. A voltmeter was used to monitor when varying the voltage.

Limit: ±0.01% of 13.56MHz=1356Hz

The result: Pass

Frequency Stability versus Temperature: The Frequency tolerance of the carrier signal shall be maintained within ±0.01% of the operating frequency over a temperature variation of -20oC to +50oC at normal supply voltage.

Reference Frequency: 13.56MHz at -20°C to +50°C 3.7V AC

Temperature (°C)	Measured Freq. (MHz)	Freq. Drift (Hz)	Freq. Deviation (Limit: 0.01%)	Pass/Fail
50	13.5603	300	< 0.01	Pass
40	13.5604	400	< 0.01	Pass
30	13.5606	600	< 0.01	Pass
20	13.5605	500	< 0.01	Pass
10	13.5606	600	< 0.01	Pass
0	13.5603	300	< 0.01	Pass
-10	13.5604	400	< 0.01	Pass
-20	13.5602	200	< 0.01	Pass

Frequency Stability versus Input Voltage: The frequency tolerance of the carrier signal shall be maintained within ±0.01%, the frequency of the transmitter was measured at 85% and at 115% of the rated power supply voltage at 20°C environmental temperature.

Carrier Frequency: 13.56MHz at 20°C at 3.7 V AC

Measured Voltage ±15% of nominal(DC)	Measured Freq. (MHz)	Freq. Drift (Hz)	Freq. Deviation (Limit: 0.01%)	Pass/Fail
10.8	13.5604	400	< 0.01	Pass
13.2	13.5607	700	< 0.01	Pass

Annex A. TEST INSTRUMENT

Annex A. i.EST INSTRUMENT

Instrument	Model	Serial #	Cal Date	Cal Due	In use
AC Line Conducted					
EMI test receiver	ESCS30	8471241027	09/17/2015	09/16/2016	☑
Line Impedance	LI-125A	191106	09/25/2015	09/24/2016	☑
Line Impedance	LI-125A	191107	09/25/2015	09/24/2016	☑
LISN	ISN T800	34373	09/25/2015	09/24/2016	☑
Double Ridge Horn Antenna (1 ~18GHz)	AH-118	71283	09/24/2015	09/23/2016	☑
Transient Limiter	LIT-153	531118	09/01/2015	08/31/2016	☑
RF conducted test					
Agilent ESA-E SERIES	E4407B	MY45108319	09/17/2015	09/16/2016	☑
Power Splitter	1#	1#	09/01/2015	08/31/2016	☑
DC Power Supply	E3640A	MY40004013	09/17/2015	09/16/2016	☑
Temperature/Humidity	UHL-270	001	10/09/2015	10/08/2016	☑
Radiated Emissions					
EMI test receiver	ESL6	100262	09/17/2015	09/16/2016	☑
Positioning Controller	UC3000	MF780208282	11/19/2015	11/18/2016	☑
OPT 010 AMPLIFIER (0.1-1300MHz)	8447E	2727A02430	09/01/2015	08/31/2016	☑
Microwave Preamplifier (1 ~ 26.5GHz)	8449B	3008A02402	03/24/2016	03/23/2017	☑
Bilog Antenna (30MHz~6GHz)	JB6	A110712	09/21/2015	09/20/2016	☑
Double Ridge Horn Antenna (1 ~18GHz)	AH-118	71283	09/24/2015	09/23/2016	☑
Universal Radio Communication Tester	CMU200	121393	09/24/2015	09/23/2016	☑
Active loop antenna	AL-130	121031	08/15/2015	08/14/2016	☑

Annex A. ii RADIATED EMISSIONS TEST DESCRIPTION

Limit

1. 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 (mV/m)	Measurement Distance (m)
30-88	100*	3
88-216	150*	3
216-960	200*	3
Above 960	500	3

Remark: 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.

2. In the above emission table, the tighter limit applies at the band edges.

Frequency (Hz)	Field Strength (μ V/m at 3-meter)	Field Strength (dBμ V/m at 3-meter)
30-88	100	40
88-216	150	43.5
216-960	200	46
Above 960	500	54

EUT Characterisation

EUT characterisation, over the frequency range from 30MHz to 10th Harmonic, was done in order to minimise radiated emissions testing time while still maintaining high confidence in the test results.

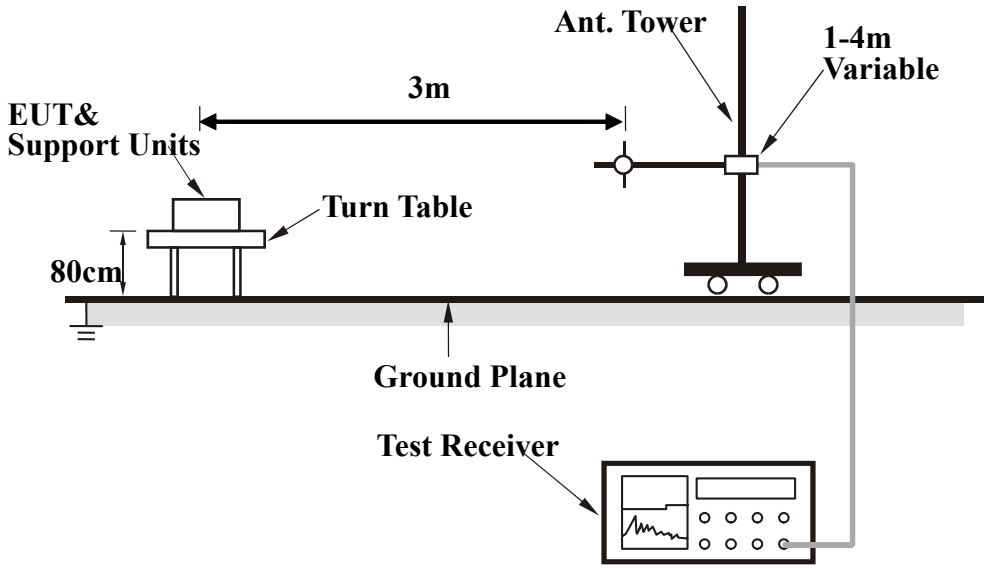
The EUT was placed in the chamber, at a height of about 0.8m on a turntable. Its radiated emissions frequency profile was observed, using a spectrum analyzer /receiver with the appropriate broadband antenna placed 3m away from the EUT. Radiated emissions from the EUT were maximised by rotating the turntable manually, changing the antenna polarisation and manipulating the EUT cables while observing the frequency profile on the spectrum analyzer / receiver. Frequency points at which maximum emissions occurred, clock frequencies and operating frequencies were then noted for the formal radiated emissions test at the Open Area Test Site (OATS) or 3m EMC chamber.

Test Set-up

1. The EUT and supporting equipment were set up in accordance with the requirements of the standard on top of a 1.5m X 1.0m X 0.8m high, non-metallic table.

2. The filtered power supply for the EUT and supporting equipment were tapped from the appropriate power sockets located on the turntable.

3. The relevant broadband antenna was set at the required test distance away from the EUT and supporting equipment boundary.



Test Method

The following procedure was performed to determine the maximum emission axis of EUT:

1. With the receiving antenna is H polarization, rotate the EUT in turns with three orthogonal axes to determine the axis of maximum emission.
2. With the receiving antenna is V polarization, rotate the EUT in turns with three orthogonal axes to determine the axis of maximum emission.
3. Compare the results derived from above two steps. So, the axis of maximum emission from EUT was determined and the configuration was used to perform the final measurement.

Final Radiated Emission Measurement

1. Setup the configuration according to figure 1. Turn on EUT and make sure that it is in normal function.

2. For emission frequencies measured below 1 GHz, a pre-scan is performed in a shielded chamber to determine the accurate frequencies of higher emissions will be checked on a open test site. As the same purpose, for emission frequencies measured above 1 GHz, a pre-scan also be performed with a 1 meter measuring distance before final test.

3. For emission frequencies measured below and above 1 GHz, set the spectrum analyzer on a 100 kHz and 1 MHz resolution bandwidth respectively for each frequency measured in step 2.

4. The search antenna is to be raised and lowered over a range from 1 to 4 meters in horizontally polarized orientation. Position the highness when the highest value is indicated on spectrum analyzer, then change the orientation of EUT on test table over a range from 0。 to 360。with a speed as slow as possible, and keep the azimuth that highest emission is indicated on the spectrum analyzer. Vary the antenna position again and record the highest value as a final reading.

5. Repeat step 4 until all frequencies need to be measured was complete.

6. Repeat step 5 with search antenna in vertical polarized orientations.

During the radiated emission test, the Spectrum Analyzer was set with the following configurations:

Frequency Band (MHz)	Function	Resolution bandwidth	Video Bandwidth
30 to 1000	Peak	100 kHz	100 kHz
Above 1000	Peak	1 MHz	1 MHz
	Average	1 MHz	10 Hz

Description of Radiated Emissions Program

This EMC Measurement software run LabView automation software and offers a common user interface for electromagnetic interference (EMI) measurements. This software is a modern and powerful tool for controlling and monitoring EMI test receivers and EMC test systems. It guarantees reliable collection, evaluation, and documentation of measurement results. Basically, this program will run a pre-scan measurement before it proceeds with the final measurement. The pre-scan routine will run the scan on four different antenna heights, 2 antenna polarity, and 360 degrees table rotation. For example, the program was set to run 30 MHz to 1 GHz scan; the program will first start from a meter antenna height and divide the 30 MHz to 1 GHz into 10 separate parts of maximum hold sweeps. Each parts of maximum hold sweep, the program will collect the data from 0 degree to 360 degrees table rotation. After the program complete the 1m scan, the antenna continues to rise to 2m and continue the scan. The step will repeated for all specified antenna height and polarity. This program will perform the Quasi Peak measurement after the signal maximization process and pre-scan routine. The final measurement will be base on the pre-scan data reduction result.

Sample Calculation Example

The field strength is calculated by adding the Antenna Factor and Cable Factor, and subtracting the Amplifier Gain (if any) from the measured reading. For the limit is employed average value, therefore the peak value can be transferred to average value by subtracting the duty factor. The basic equation with a sample calculation is as follows:

Peak = Reading + Corrected Factor

where

Corr. Factor = Antenna Factor + Cable Factor - Amplifier Gain (if any)

And the average value is

Average = Peak Value + Duty Factor or

Set RBW = 1MHz, VBW = 10Hz.

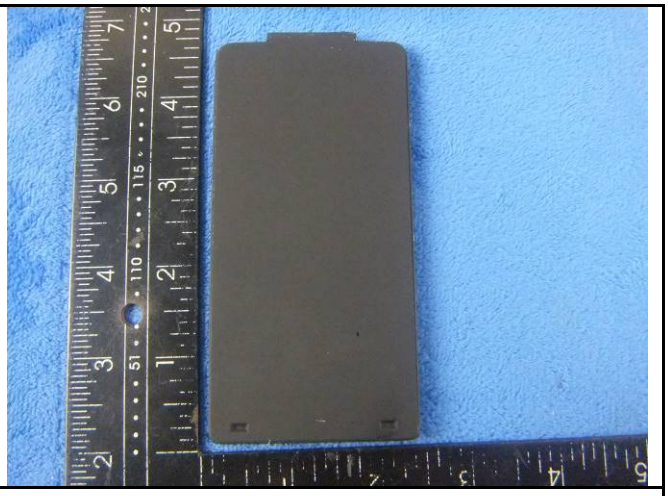
Note:

If the measured frequencies are fall in the restricted frequency band, the limit employed must be quasi peak value when frequencies are below or equal to 1 GHz. And the measuring instrument is set to quasi peak detector function.

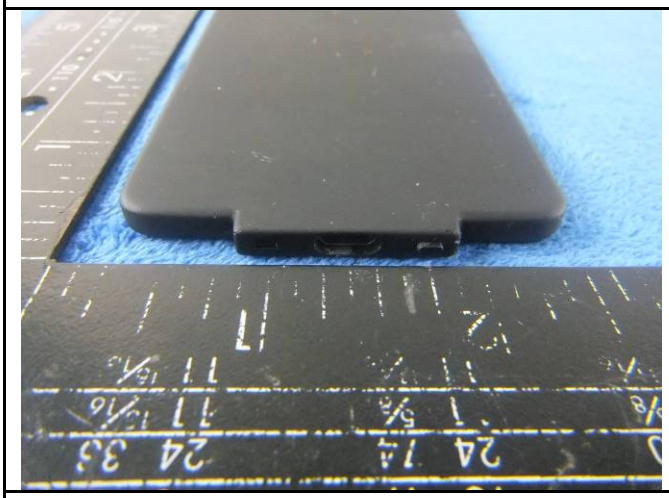
Annex B. EUT AND TEST SETUP PHOTOGRAPHS

Annex B.i. Photograph: EUT External Photo

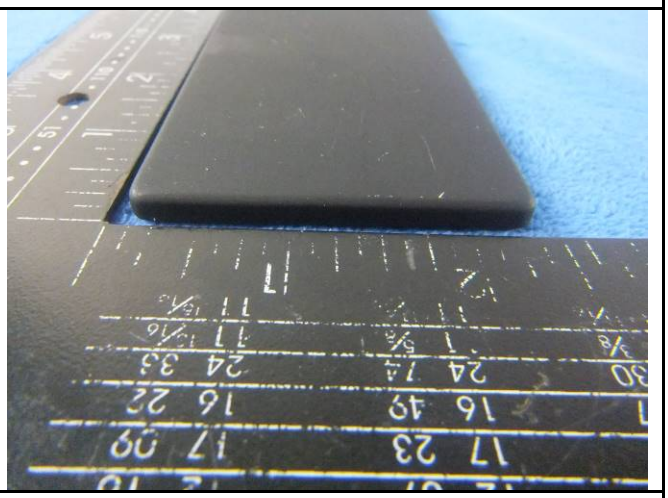
EUT - Front View



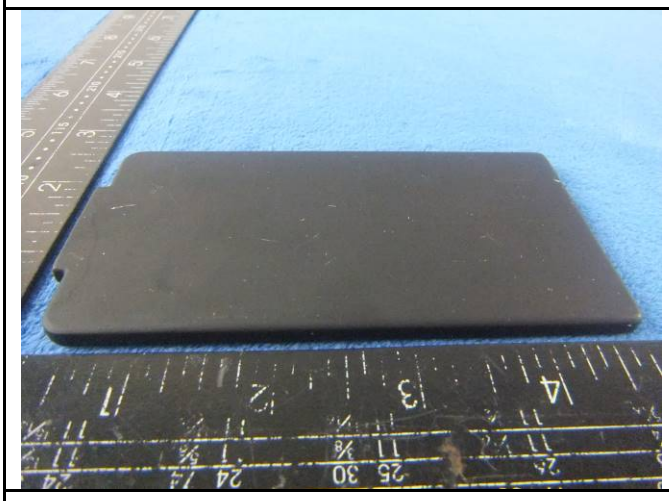
EUT - Rear View



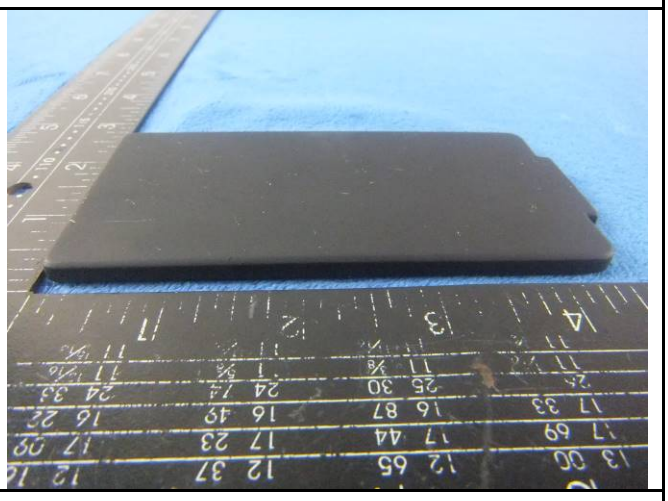
EUT - Top View



EUT - Bottom View



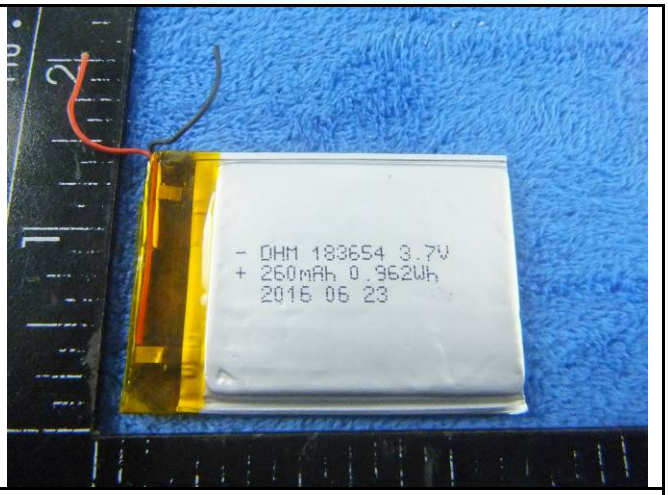
EUT - Left View



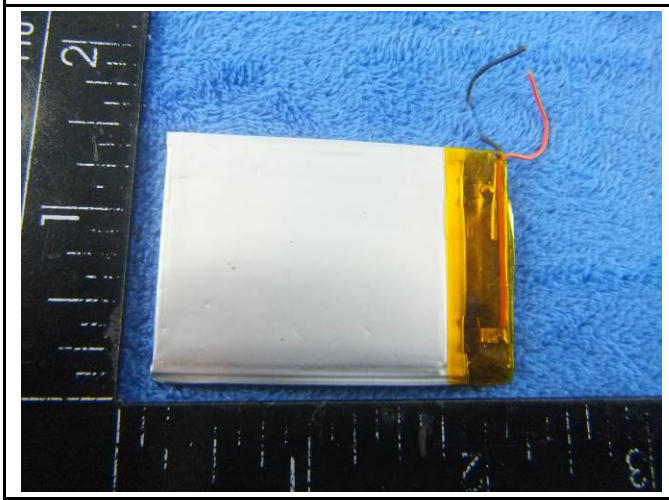
EUT - Right View

Annex B.ii. Photograph: EUT Internal Photo

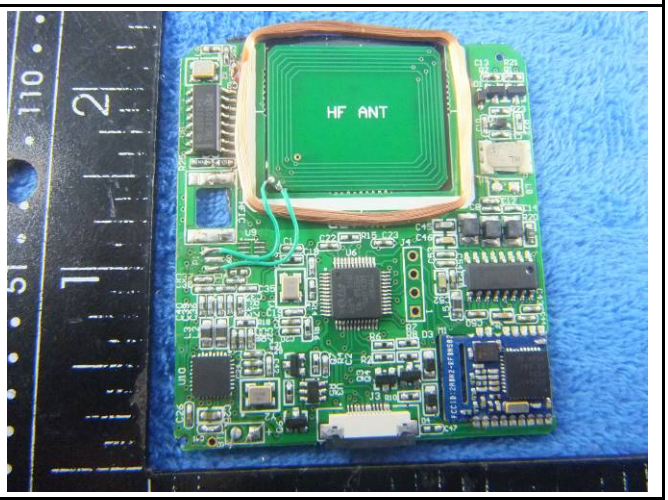
Cover Off - Top View 1



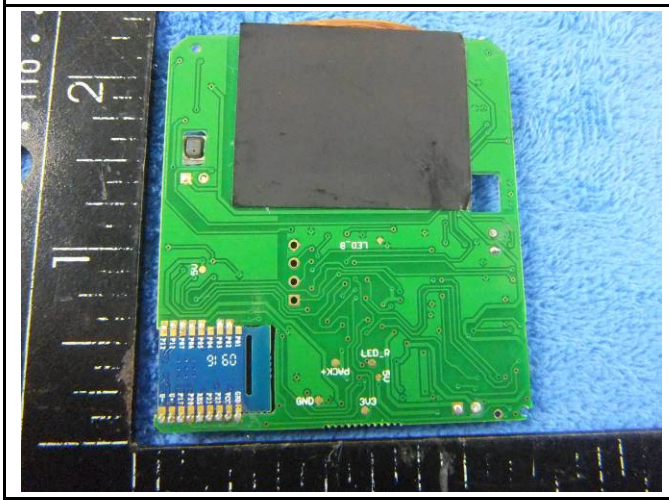
Battery - Front View



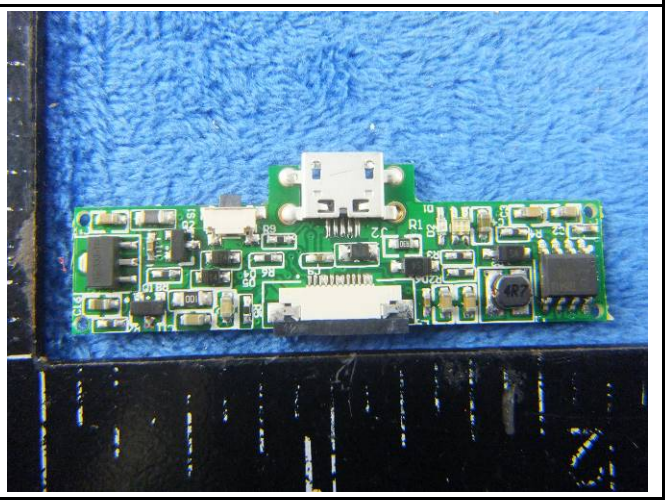
Battery - Rear View



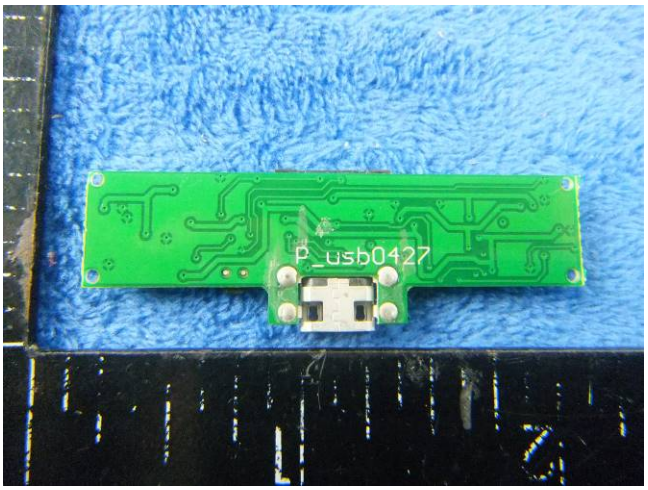
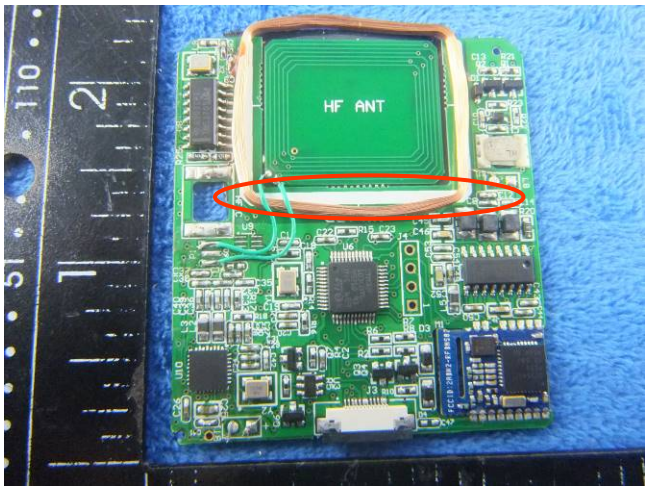
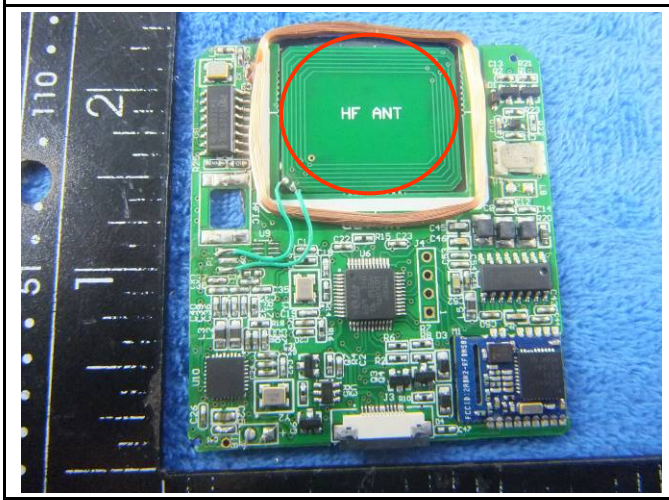
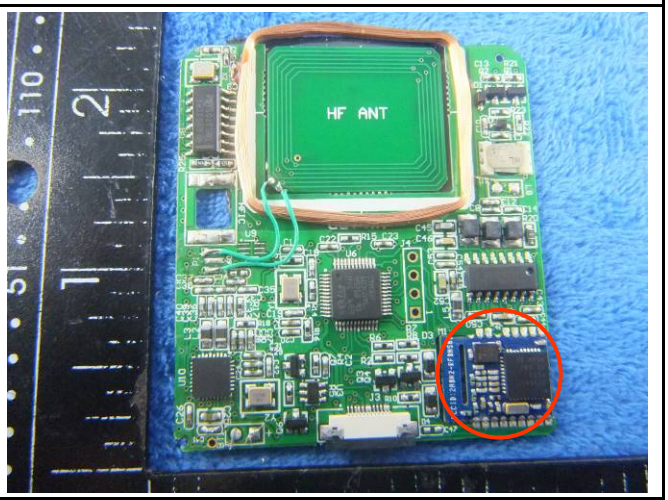
Mainborad - Front View



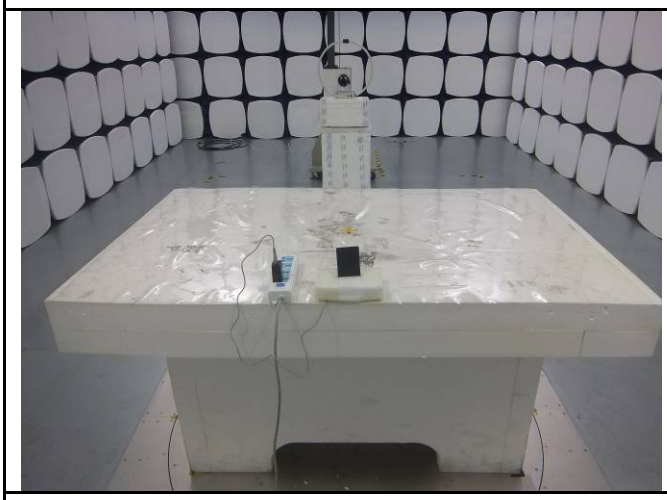
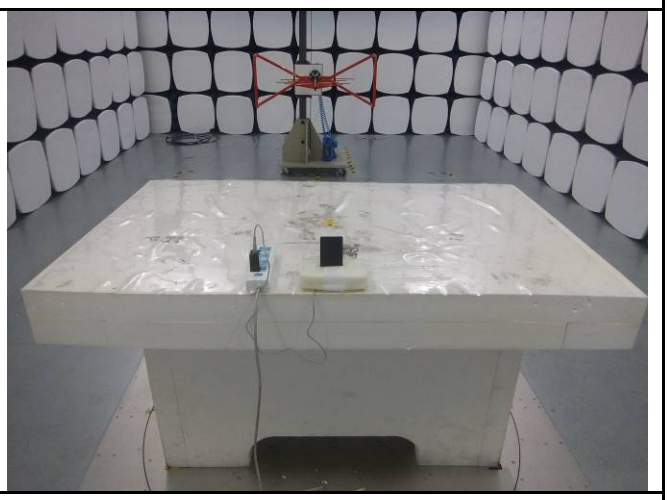
Mainborad - Rear View



Mini Mainborad - Front View

<table>
<tr><td> 
</td><td> 
</td></tr>
<tr><td>Mini Mainborad - Rear View</td><td>125-150KHz - Antenna View</td></tr>
<tr><td> 
</td><td> 
</td></tr>
<tr><td>13.56MHz - Antenna View</td><td>BLE - Antenna View</td></tr>
</table>

Annex B.iii. Photograph: Test Setup Photo

<table>
<tr><td>  </td><td>  </td></tr>
<tr><td>Conducted Emissions Test Setup – Front View</td><td>Conducted Emissions Test Setup – Side View</td></tr>
<tr><td>  </td><td>  </td></tr>
<tr><td>Radiated Spurious Emissions Test Setup 0.1MHz-30MHz</td><td>Radiated Spurious Emissions Test Setup 30MHz-1G</td></tr>
</table>

Annex C. TEST SETUP AND SUPPORTING EQUIPMENT

EUT TEST CONDITIONS

Annex C. i. SUPPORTING EQUIPMENT DESCRIPTION

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

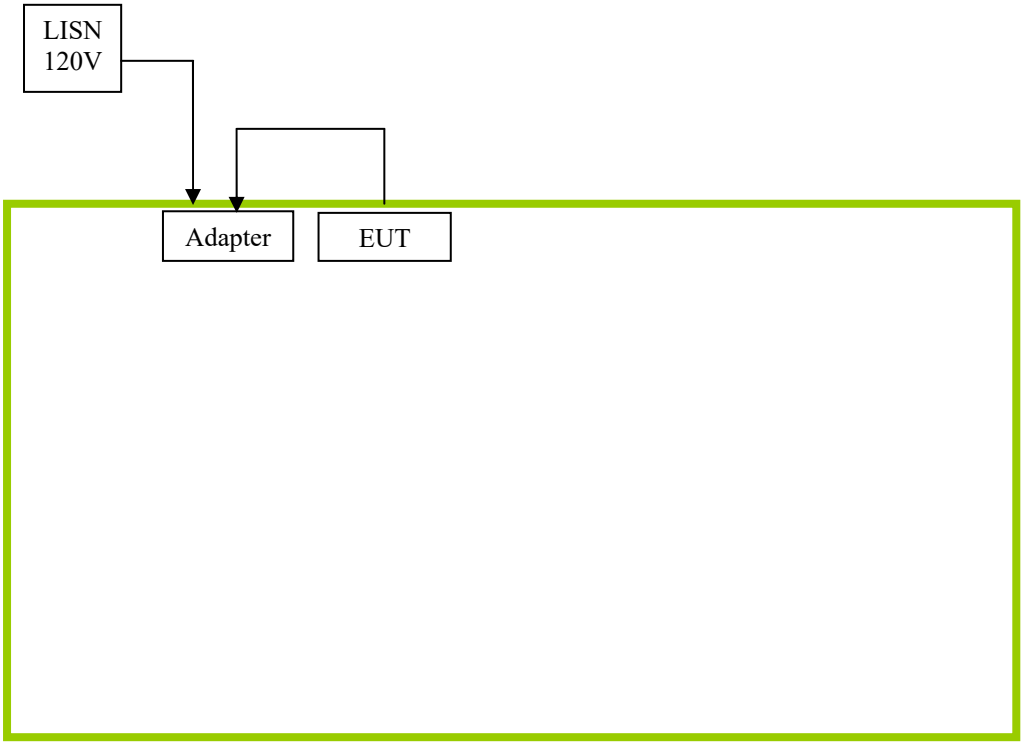
Supporting Equipment:

Manufacturer	Equipment Description	Model	Serial No
HTC	Adapter	ST15001	CN013302452
Com-power	Active loop antenna	AL-130	121031

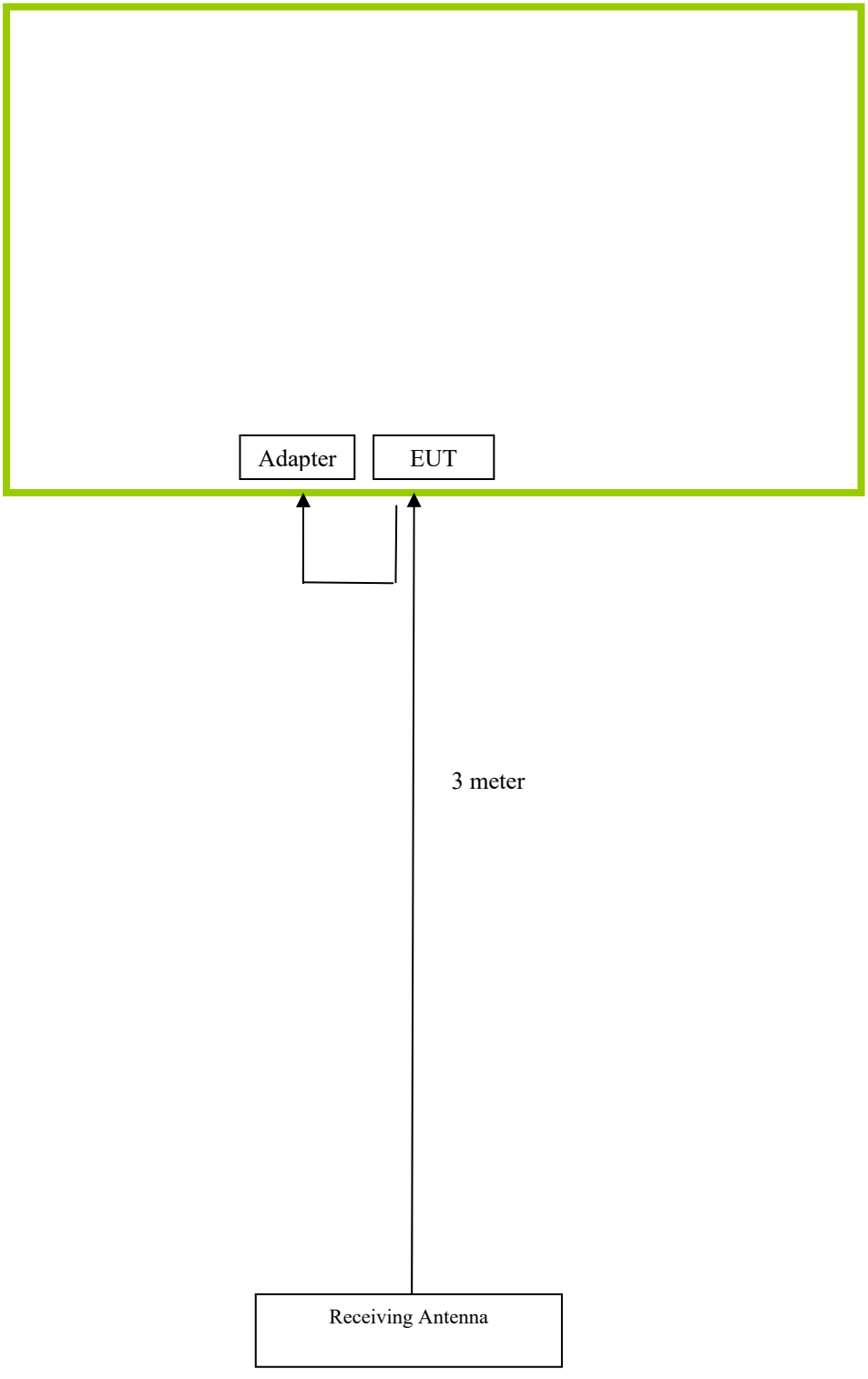
Supporting Cable:

Cable type	Shield Type	Ferrite Core	Length	Serial No
USB Cable	Un-shielding	No	0.8m	CN013302452

Block Configuration Diagram for Conducted Emissions



Block Configuration Diagram for Radiated Emissions



Annex C.ii. EUT OPERATING CONDITIONS

The following is the description of how the EUT is exercised during testing.

Test	Description Of Operation
Emissions Testing	The EUT was continuously transmitting to stimulate the worst case.

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

Please see attachment

Annex E. DECLARATION OF SIMILARITY

Freevision Technologies Co., Ltd

To ：775 Montague Expressway Mlpitas,CA 95035,USA

Declaration Letter

Dear Sir ’

For our business issue and marketing requirement, we would like to list Magikit Box BLE model numbers on
The FCC reports, as following:

Model No: MAGIKIT ADV V1.1
Trade: /

We declare that : MAGIKIT ADV V1.1, MAGIKIT ADV V1.2, MAGIKIT ADV V1.3, MAGIKIT ADV V1.4 , MAGIKIT ADV V1.5 ’MAGIKIT ADV V1.6, MAGIKIT ADV V1.7, MAGIKIT ADV V1.8 , MAGIKIT ADV V1.9, All models the same PCB and Appearance shape, accessories ,the difference of these is listed as below:

Main Model No	Serial Model No	Difference
MAGIKIT ADV V1.1	MAGIKIT ADV V1.1	Functionalities: Bluetooth, HF Reader & Writer,LF Reader & Writer ,HDX Reader, Tags
	MAGIKIT ADV V1.2,	Functionalities: Bluetooth, HF Reader & Writer,LF Reader & Writer,HDX Reader
	MAGIKIT ADV V1.3,	Functionalities: Bluetooth, HF Reader & Writer, LF Reader & Writer, Tags
	MAGIKIT ADV V1.4 ,	Functionalities: Bluetooth, HF Reader & Writer, Tags
	MAGIKIT ADV V1.5 ’	Functionalities: Bluetooth, HF Reader & Writer
	MAGIKIT ADV V1.6,	Functionalities: Bluetooth, LF Reader & Writer, HDX Reader, Tags
	MAGIKIT ADV V1.7,	Functionalities: Bluetooth, LF Reader & Writer, HDX Reader
	MAGIKIT ADV V1.8 ,	Functionalities: Bluetooth, LF Reader & Writer , Tags
	MAGIKIT ADV V1.9	Functionalities: Bluetooth, LF Reader & Writer

Thank you!
Sincerely,
Client's signature··
Client's name / title·· Zoe Zheng / Manager
Contact information : 0086-021-24282670
Address : Floor 3 ’Building 8,No.999 Jiangyue Rd Minhang Dist, Shanghai, China