RF TEST REPORT

Report No.: 16020756-FCC-R1
Supersede Report No.: N/A

Applicant	Shanghai Smarfid Security Equipment Co.,Ltd.
Product Name	Magic Series 13.56MHz&125KHz Reader
Main Model	LH322-8K
Serial Model	LH322-8N
Test Standard	FCC Part 15.225: 2016, ANSI C63.10: 2013
Test Date	October 25, 2017
Issue Date	October 30, 2017
Test Result	☒ Pass ☐ Fail
Equipment complied with the specification	☒
Equipment did not comply with the specification	☐

Trety Lu	Deon Dai	
Trety Lu Test Engineer	Deon Dai Engineer Reviewer	

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Test result presented in this test report is applicable to the tested sample only

Issued by:
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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
16020756-FCC-R1	NONE	Original	October 30, 2017

2. Customer information

Applicant Name	Shanghai Smarfid Security Equipment Co.,Ltd.
Applicant Address	No. 88, Lane 600, XinLi Road, Minhang District, Shanghai, China
Manufacturer Name	Shanghai Smarfid Security Equipment Co.,Ltd.
Manufacturer Address	No. 88, Lane 600, XinLi Road, Minhang District, Shanghai, China

3. Test site information

Lab performing tests	SIEMIC (Nanjing-China) Laboratories
Lab Address	2-1 Longcang Avenue Yuhua Economic and Technology Development Park, Nanjing, China
FCC Test Site No.	694825
IC Test Site No.	4842B-1
Test Software	EZ_EMC

4. Equipment Under Test (EUT) Information

Description of EUT:	Magic Series 13.56MHz&125KHz Reader
Main Model:	LH322-8K
Serial Model:	LH322-8N
Date EUT received:	October 23, 2017
Test Date(s):	October 25, 2017
Antenna Gain:	125KHz: 6dBi 13.56MHz: 6dBi
Type of Modulation:	125KHz: ASK、FSK 13.56MHz: ASK
RF Operating Frequency (ies):	125KHz&13.56MHz
Number of Channels:	125KHz: 1CH 13.56MHz: 1CH
Input Power:	DC 12V
Trade Name :	N/A
FCC ID:	X3A-LH3228K

Note: the difference between these models please refer to ANNEX E. DECLARATION OF SIMILARITY.

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	Compliance
§15.207(a)	Conducted Emissions Voltage	Compliance
§15.225(a)	Fundamental Field Strength	Compliance
§15.225(b)	Fundamental Field Strength	Compliance
§15.225(c)	Fundamental Field Strength	Compliance
§15.225(d),15.209	Radiated Emissions	Compliance
§15.225(e)	Frequency Stability	Compliance
§15.215(c)	Occupied Bandwidth	Compliance

Measurement Uncertainty

Emissions		
Test Item	Description	Uncertainty
Conducted Emissions &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)	1.634dB / 3.952dB

6. Measurements, Examination And Derived Results

6.1 Antenna Requirement

Applicable Standard

Requirement(s): 47 CFR §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.

Antenna requirement must meet at least one of the following:

a) Antenna must be permanently attached to the device.

b) Antenna must use a unique type of connector to attach to the device.

c) Device must be professionally installed. Installer shall be responsible for ensuring that the correct antenna is employed with the device.

The antenna is permanently attached to the device which meets the requirement.

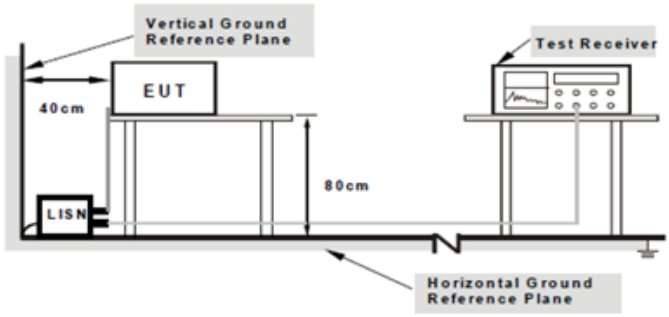
Result: Compliance.

6.2 Conducted Emissions Voltage

Temperature	25°C
Relative Humidity	50%
Atmospheric Pressure	1019mbar
Test date :	October 25, 2017
Tested By :	Trety Lu

Conducted Emission Limit

Frequency ranges (MHz)	Limit (dBμV)	
	QP	Average
0.15 ~ 0.5	66 – 56	56 – 46
0.5 ~ 5	56	46
5 ~ 30	60	50

Spec	Item	Requirement	Applicable
47CFR§15.207, RSS210 (A8.1)	a)	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 frequency ranges.	☒
Test Setup	 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.		
Procedure	- 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, as shown in Annex B. - The power supply for the EUT was fed through a 50W/50mH EUT LISN, connected to filtered mains. - The RF OUT of the EUT LISN was connected to the EMI test receiver via a low-loss coaxial cable. - All other supporting equipment were powered separately from another main supply.		
Remark			
Result	☒Pass ☐Fail		

Test Data ☒Yes ☐N/A

Test Plot ☒Yes (See below) ☐N/A

Data sample

Data sample

No.	Frequency	Reading	Detector	Lisn/lsn	Ps_Lmt	Cab_L	Result	Limit	Margin
	(MHz)	(dBμV)		(dB}	(dB)	(dB)	(dBμV)	(dBμV)	(dB)

Frequency (MHz) = Emission frequency in MHz

Reading (dBμV) = Receiver Reading Value

Detector=Quasi Peak Detector or Average Detector

Lisn/ISN= Insertion loss of LISN

Ps_Lmt= Insertion loss of transient limiter (The transient limiter included 10dB attenuation)

Cab_L= cable loss

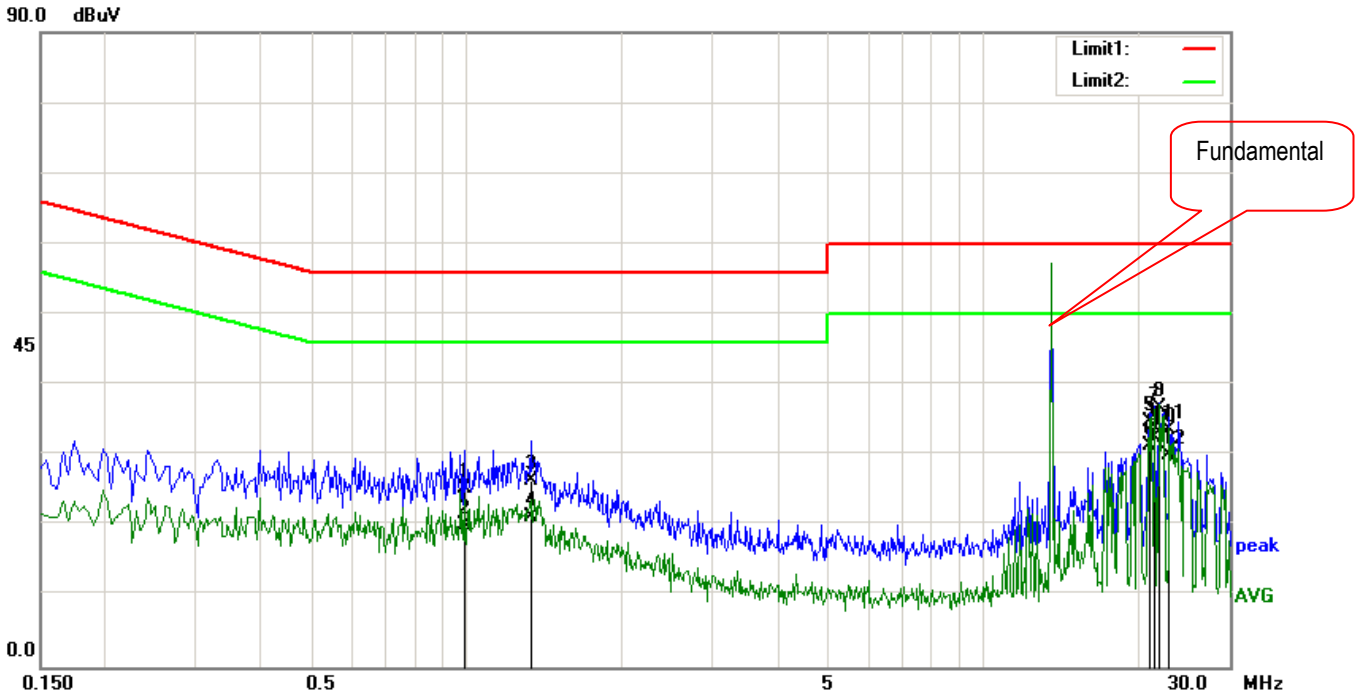
Result (dBμV) = Reading Value + Corrected Value

Limit (dBμV) = Limit stated in standard

Calculation Formula:

Margin (dB) = Result (dBμV) – limit (dBμV)

Test Mode:	ASK Transmitting Mode

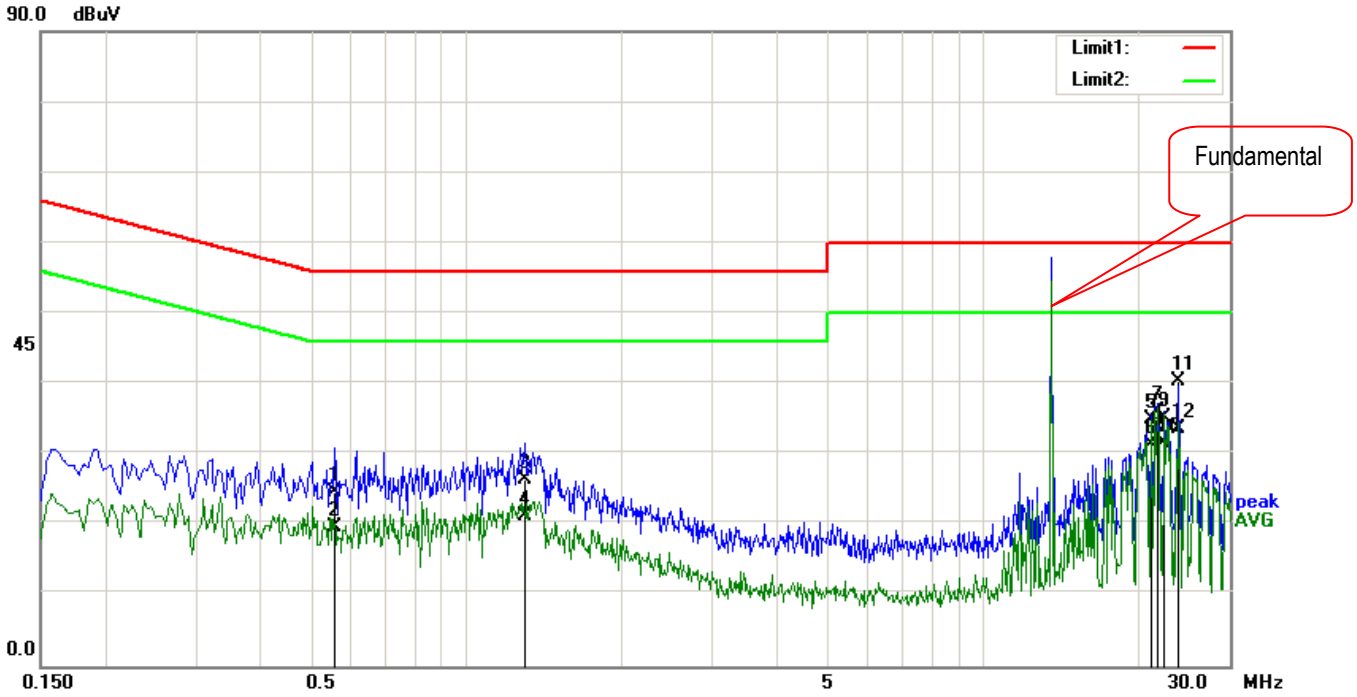


Test Data

Phase Line Plot at DC12V

No.	Frequency (MHz)	Reading (dBµV)	Detector	Lisn/Isn (dB}	Ps_Lmt (dB)	Cab_L (dB)	Result (dBµV)	Limit (dBµV)	Margin (dB)
1	0.9900	14.88	QP	0.14	-10.00	0.19	25.21	56.00	-30.79
2	0.9900	9.71	AVG	0.14	-10.00	0.19	20.04	46.00	-25.96
3	1.3340	16.00	QP	0.15	-10.00	0.21	26.36	56.00	-29.64
4	1.3340	10.91	AVG	0.15	-10.00	0.21	21.27	46.00	-24.73
5	21.0020	23.05	QP	1.12	-10.00	0.67	34.84	60.00	-25.16
6	21.0020	19.57	AVG	1.12	-10.00	0.67	31.36	50.00	-18.64
7	21.5020	24.24	QP	1.14	-10.00	0.66	36.04	60.00	-23.96
8	21.5020	20.66	AVG	1.14	-10.00	0.66	32.46	50.00	-17.54
9	22.0020	24.93	QP	1.16	-10.00	0.65	36.74	60.00	-23.26
10	22.0020	21.46	AVG	1.16	-10.00	0.65	33.27	50.00	-16.73
11	23.0020	21.86	QP	1.21	-10.00	0.65	33.72	60.00	-26.28
12	23.0020	18.26	AVG	1.21	-10.00	0.65	30.12	50.00	-19.88

Test Mode:	ASK Transmitting Mode



Test Data

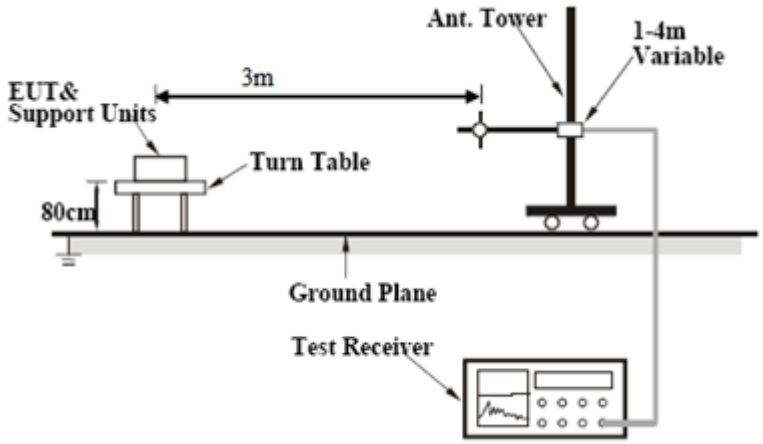
Phase Neutral Plot at DC12V

No.	Frequency (MHz)	Reading (dBµV)	Detector	Lisn/Isn (dB}	Ps_Lmt (dB)	Cab_L (dB)	Result (dBµV)	Limit (dBµV)	Margin (dB)
1	0.5580	14.43	QP	0.11	-10.00	0.21	24.75	56.00	-31.25
2	0.5580	9.26	AVG	0.11	-10.00	0.21	19.58	46.00	-26.42
3	1.2980	16.01	QP	0.14	-10.00	0.21	26.36	56.00	-29.64
4	1.2980	10.86	AVG	0.14	-10.00	0.21	21.21	46.00	-24.79
5	21.2500	23.03	QP	1.25	-10.00	0.66	34.94	60.00	-25.06
6	21.2500	19.52	AVG	1.25	-10.00	0.66	31.43	50.00	-18.57
7	21.7500	24.15	QP	1.28	-10.00	0.65	36.08	60.00	-23.92
8	21.7500	20.69	AVG	1.28	-10.00	0.65	32.62	50.00	-17.38
9	22.5020	23.35	QP	1.31	-10.00	0.66	35.32	60.00	-24.68
10	22.5020	19.75	AVG	1.31	-10.00	0.66	31.72	50.00	-18.28
11	24.0100	28.34	QP	1.38	-10.00	0.65	40.37	60.00	-19.63
12	24.0100	21.71	AVG	1.38	-10.00	0.65	33.74	50.00	-16.26

6.3 Fundamental Field Strength Test Result

Temperature	25°C
Relative Humidity	50%
Atmospheric Pressure	1019mbar
Test date :	October 25, 2017
Tested By :	Trety Lu

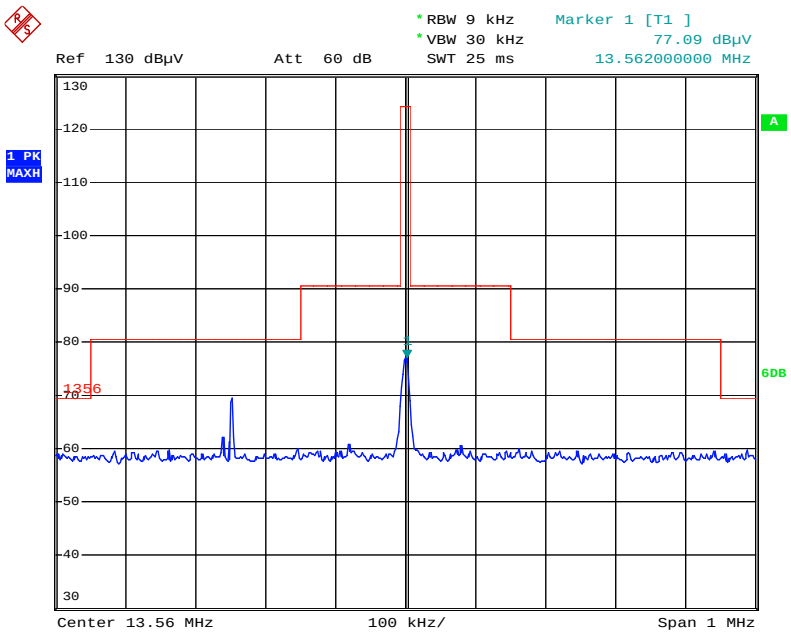
Requirement(s):

Spec	Item	Requirement	Applicable
§15.225(a) §15.225(b) §15.225(c)	a)	The field strength of any emissions within the band 13.553 –13.567 MHz shall not exceed 15,848 microvolts/meter at 30 meters.	☒
	b)	The bands 13.410 –13.553 MHz and 13.567–13.710 MHz, the field strength of any emissions shall not exceed 334 microvolts/meter at 30 meters.	☐
	c)	The bands 13.110 –13.410 MHz and 13.710–14.010 MHz the field strength of any emissions shall not exceed 106 microvolts/meter at 30 meters.	☐
Test Setup			
Test Procedure	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 characterisation. Maximization of the emissions, was carried out by rotating the EUT, changing the antenna polarization, and adjusting the antenna height in the following manner: a. Vertical or horizontal polarisation (whichever gave the higher emission level over a full rotation of the EUT) was chosen. b. The EUT was then rotated to the direction that gave the maximum emission. c. Finally, the antenna height was adjusted to the height that gave the maximum emission. 3. A peak measurement was then made for that frequency point. 4. Steps 2 and 3 were repeated for the next frequency point, until all selected frequency points were measured.		
Remark			
Result	☒Pass ☐Fail		

Test Data ☒Yes ☐N/A

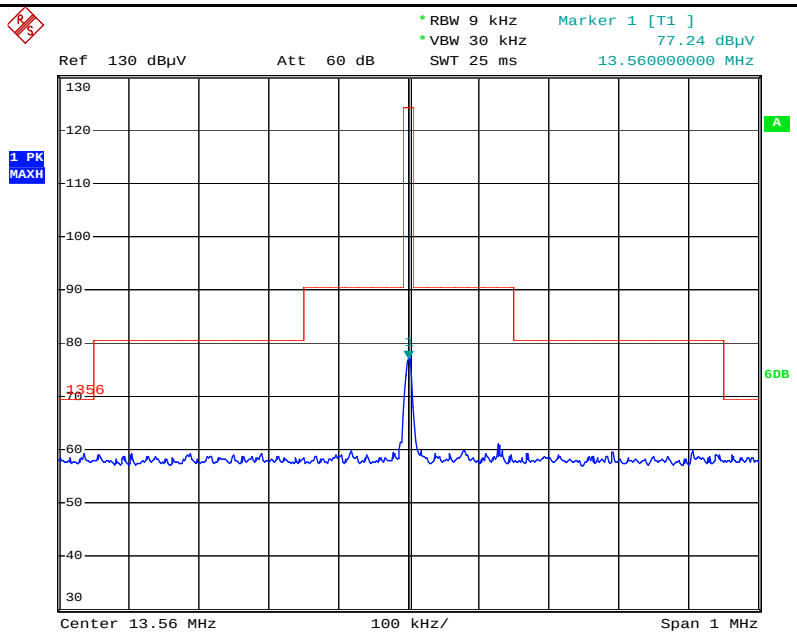
Test Plot ☒Yes ☐N/A

Test Plots
Fundamental Field Strength Measurement Result:



Date: 25.OCT.2017 16:59:27

Loop Antenna at 90 degree



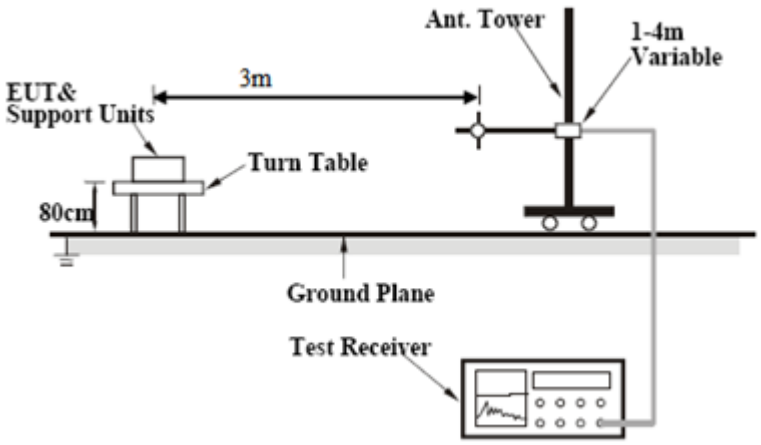
Date: 25.OCT.2017 17:03:44

Loop Antenna at 0 degree

6.4 Radiated Spurious Emissions

Temperature	25°C
Relative Humidity	50%
Atmospheric Pressure	1019mbar
Test date :	October 25, 2017
Tested By :	Trety Lu

Requirement(s):

<table>
<tr><th>Spec</th><th>Item</th><th>Requirement</th><th>Applicable</th></tr>
<tr><td>§15.225(d) , 15.209</td><td>a)</td><td>The field strength of any emissions appearing outside of the 13.110–14.010 MHz band shall not exceed the general radiated emission limits in § 15.209.
<table>
<tr><th>Fundamental frequency (MHz)</th><th>Field strength (microvolts/meter)</th><th>Measurement distance (meters)</th></tr>
<tr><td>0.009-0.490</td><td>2400/F(kHz)</td><td>300</td></tr>
<tr><td>0.490-1.705</td><td>24000/F(kHz)</td><td>30</td></tr>
<tr><td>1.705-30.0</td><td>30</td><td>30</td></tr>
<tr><td>30-88</td><td>100**</td><td>3</td></tr>
<tr><td>88-246</td><td>150**</td><td>3</td></tr>
<tr><td>216-960</td><td>200**</td><td>3</td></tr>
<tr><td>Above 960</td><td>500</td><td>3</td></tr>
</table></td><td>☒</td></tr>
<tr><td>Test Setup</td><td colspan="3"> 
</td></tr>
<tr><td>Procedure</td><td colspan="3">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 characterisation. Maximization of the emissions, was carried out by rotating the EUT, changing the antenna polarization, and adjusting the antenna height in the following manner:
a. Vertical or horizontal polarisation (whichever gave the higher emission level over a full rotation of the EUT) was chosen.
b. The EUT was then rotated to the direction that gave the maximum emission.
c. Finally, the antenna height was adjusted to the height that gave the maximum emission.
3. A Quasi-peak measurement was then made for that frequency point.
4. Steps 2 and 3 were repeated for the next frequency point, until all selected frequency points were measured.</td></tr>
<tr><td>Remark</td><td colspan="3"></td></tr>
<tr><td>Result</td><td colspan="3">☒Pass ☐Fail</td></tr>
</table>

Test Data ☒Yes ☐N/A

Test Plot ☒Yes ☐N/A

Data sample

No.	Frequency	Reading	Detector	Ant_F	PA_G	Cab_L	Result	Limit	Margin	Height	Degree
	(MHz)	(dBμV/m)		(dB/m)	(dB)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	(cm)	(°)

Frequency (MHz) = Emission frequency in MHz

Reading (dBμV/m) = Receiver Reading Value

Detector= Peak Detector or Quasi Peak Detector

Ant_F=Antenna Factor

PA_G=Pre-Amplifier Gain

Cab_L=Cable Loss

Result (dBμV/m) = Read ing Value + Corrected Value

Limit (dBμV/m) = Limit stated in standard

Height (cm) = Height of Receiver antenna

Degree = Turn table degree

Calculation Formula:

Margin (dB) = Result (dBμV/m) – limit (dBμV/m)

Test Mode:	ASK Transmitting Mode

Loop Antenna at 0 degree:

@ 3M

Frequency	Peak (Corrected)	Factor	Height	Azimuth	Limits @ 3m	Margin
(MHz)	(dBµV/m)	(dB)	(cm)	(deg)	(dBµV/m)	(dB)
1.32	62.20	54.3	120	210	125.19	-62.99
29.30	53.53	35.8	150	175	69.54	-16.01
15.30	52.58	37.1	130	10	69.54	-16.96

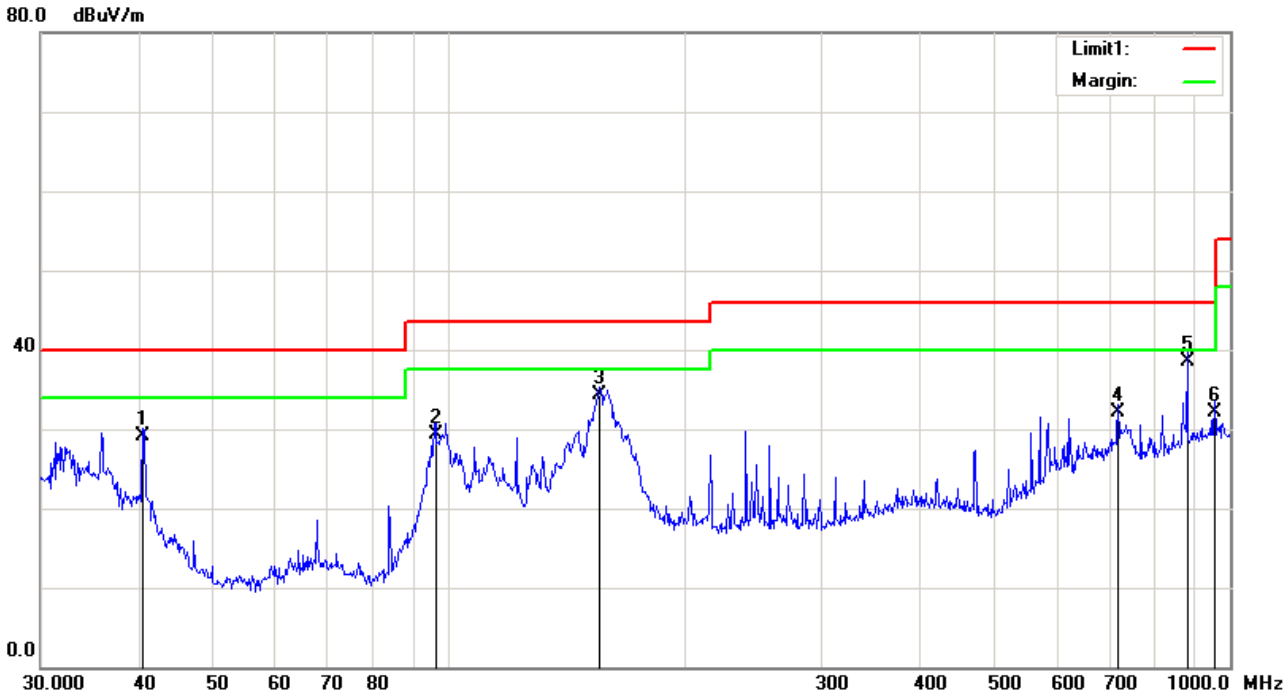
Loop Antenna at 90 degree:

@ 3M

Frequency	Peak (Corrected)	Factor	Height	Azimuth	Limits @ 3m	Margin
(MHz)	(dBµV/m)	(dB)	(cm)	(deg)	(dBµV/m)	(dB)
1.23	61.03	54.3	200	190	125.81	-64.78
29.01	53.99	35.8	160	174	69.54	-15.55
15.44	53.63	37.1	300	171	69.54	-15.91

Test Mode:	ASK Transmitting Mode

Below 1GHz



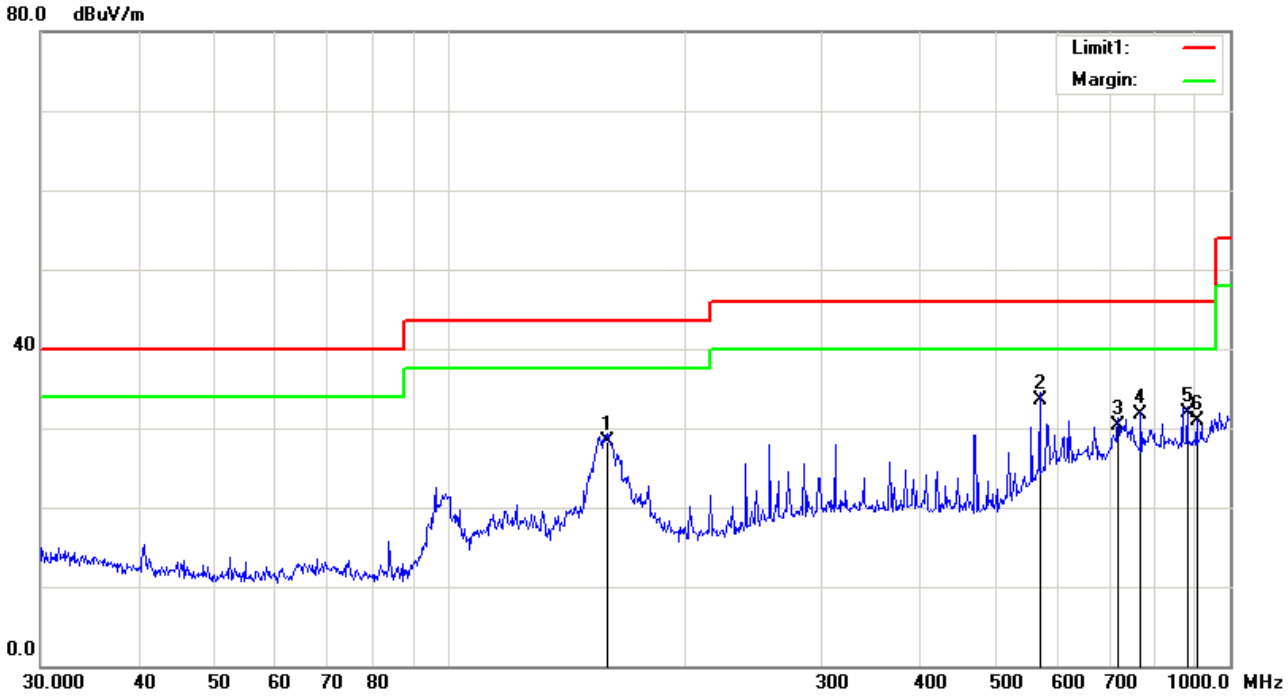
Test Data

Vertical Polarity Plot at 3m

No.	Frequency	Reading	Detector	Ant_F	PA_G	Cab_L	Result	Limit	Margin	Height	Degree
	(MHz)	(dBµV/m)		(dB/m)	(dB)	(dB)	(dBµV/m)	(dBµV/m)	(dB)	(cm)	(°)
1	40.5591	58.42	QP	15.40	45.73	1.06	29.15	40.00	-10.85	100	356
2	96.0986	64.14	QP	10.28	46.66	1.57	29.33	43.50	-14.17	100	250
3	155.9101	66.25	QP	13.60	47.57	2.08	34.36	43.50	-9.14	100	308
4	719.1995	51.22	QP	22.39	45.75	4.31	32.17	46.00	-13.83	200	7
5	881.4067	56.38	QP	23.28	45.95	4.80	38.51	46.00	-7.49	100	92
6	955.4381	49.74	QP	23.64	46.16	4.97	32.19	46.00	-13.81	100	108

Test Mode:	ASK Transmitting Mode

Below 1GHz



Horizontal Polarity Plot at 3m

No.	Frequency	Reading	Detector	Ant_F	PA_G	Cab_L	Result	Limit	Margin	Height	Degree
	(MHz)	(dBµV/m)		(dB/m)	(dB)	(dB)	(dBµV/m)	(dBµV/m)	(dB)	(cm)	(°)
1	159.7844	61.01	QP	12.51	47.30	2.07	28.29	43.50	-15.21	300	233
2	570.6100	58.37	QP	19.71	48.43	3.82	33.47	46.00	-12.53	200	269
3	719.1995	49.20	QP	22.52	45.75	4.31	30.28	46.00	-15.72	300	102
4	768.7482	49.99	QP	22.81	45.46	4.45	31.79	46.00	-14.21	200	230
5	881.4067	50.27	QP	22.76	45.95	4.80	31.88	46.00	-14.12	300	23
6	906.4824	49.71	QP	22.86	46.63	4.87	30.81	46.00	-15.19	200	294

Note: The highest frequency of the internal sources of the EUT is less than 108MHz, so the measurement shall only be made up to 1GHz.

6.5 Frequency Stability

Temperature	25°C
Relative Humidity	50%
Atmospheric Pressure	1019mbar
Test date :	October 25, 2017
Tested By :	Trety Lu

Requirement(s):

Spec	Item	Requirement	Applicable
§15.225(e)	a)	The Frequency tolerance of the carrier signal shall be maintained within ±0.01% of the operating frequency over a temperature variation of -20°C to +50°C at normal supply voltage.	☒
	b)	The frequency of the transmitter was measured at 85% and at 115% of the rated power supply voltage at 20°C environmental temperature.	☒
Test Procedure	1> Place the de-energized EUT in an environmental temperature test chamber. Supply the EUT with nominal ac voltage, or install a new or fully charged battery in the EUT. An antenna should be connected to the antenna output connector of the EUT if possible. Use of a dummy load could affect the output frequency of the EUT. If the EUT is equipped with or uses an adjustable-length antenna, it should be fully extended. 2> Turn the EUT on, and couple its output to a frequency counter or other frequency-measuring device of sufficient accuracy, considering the frequency tolerance with which the EUT shall comply. 3> Turn the EUT off, and place it inside an environmental chamber set to the highest temperature specified by the procuring or regulatory agency. For devices that are normally operated continuously, the EUT may be energized while inside the test chamber. For devices that have oscillator heaters, energize only the heater circuit while the EUT is inside the chamber. 4> Allow sufficient time (approximately 30 minutes) for the temperature of the chamber to stabilize. While maintaining a constant temperature inside the environmental chamber, turn the EUT on and measure the EUT operating frequency at startup, and two, five, and ten minutes after startup. Four measurements in total are made. 5> If 13.1.1 requires measurements on only one operating frequency, proceed to step f); otherwise, successively tune the EUT to each of the additional operating frequencies specified in 13.1.1 and repeat step d). 6> Repeat step d) and step e) with the temperature chamber set to the lowest temperature specified by the procuring or regulatory agency. Be sure to allow the environmental chamber temperature to stabilize before performing these measurements.		
Remark			
Result	☒Pass ☐Fail		

Test Data ☒Yes ☐N/A

Test Plot ☐Yes ☒N/A

Carrier Frequency: 13.56MHz at -20°C to +50°C, DC12V

Temperature (oC)	Measured Freq. (MHz)	Freq. Drift (Hz)	Freq. Deviation (Limit: 0.01%)	Pass/Fail
50	13.56090	900	< 0.01	Pass
40	13.56090	900	< 0.01	Pass
30	13.56090	900	< 0.01	Pass
20	Reference			
10	13.56090	900	< 0.01	Pass
0	13.56090	900	< 0.01	Pass
-10	13.56090	900	< 0.01	Pass
-20	13.56090	900	< 0.01	Pass

Carrier Frequency: 13.56MHz at 20°C at DC12V

Measured Voltage ±15% of nominal	Measured Freq. (MHz)	Freq. Drift (Hz)	Freq. Deviation (Limit: 0.01%)	Pass/Fail
10.2	13.56100	1000	＜0.01	Pass
13.8	13.56100	1000	＜0.01	Pass

6.6 20dB Occupied Bandwidth

Temperature	25°C
Relative Humidity	50%
Atmospheric Pressure	1019mbar
Test date :	October 25, 2017
Tested By :	Trety Lu

Requirement(s):

Spec	Item	Requirement	Applicable
§15.215(c)	a)	Intentional radiators operating under the alternative provisions to the general emission limits, as contained in §§ 15.217 through 15.257 and in Subpart E of this part, must be designed to ensure that the 20 dB bandwidth of the emission, or whatever bandwidth may otherwise be specified in the specific rule section under which the equipment equipment operates, is contained within the frequency band designated in the rule section under which the equipment is operated. The requirement to contain the designated bandwidth of the emission within the specified frequency band includes the effects from frequency sweeping, frequency hopping and other modulation techniques that may be employed as well as the frequency stability of the transmitter over expected variations in temperature and supply voltage. If frequency stability is not specified in the regulations, it is recommended that the fundamental emission be kept within at least the central 80% of the permitted band in order to minimize the possibility of out-of-band operation.	☒
Test Procedure	20dB Emission bandwidth measurement procedure - Set RBW = 300 Hz. - Set the video bandwidth (VBW) ≥ 3 ´ RBW. - Detector = Peak. - Trace mode = max hold. - Sweep = auto couple. - Allow the trace to stabilize. Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 20 dB relative to the maximum level measured in the fundamental emission.		
Remark			
Result	☒Pass ☐Fail		

Test Data ☒Yes ☐N/A

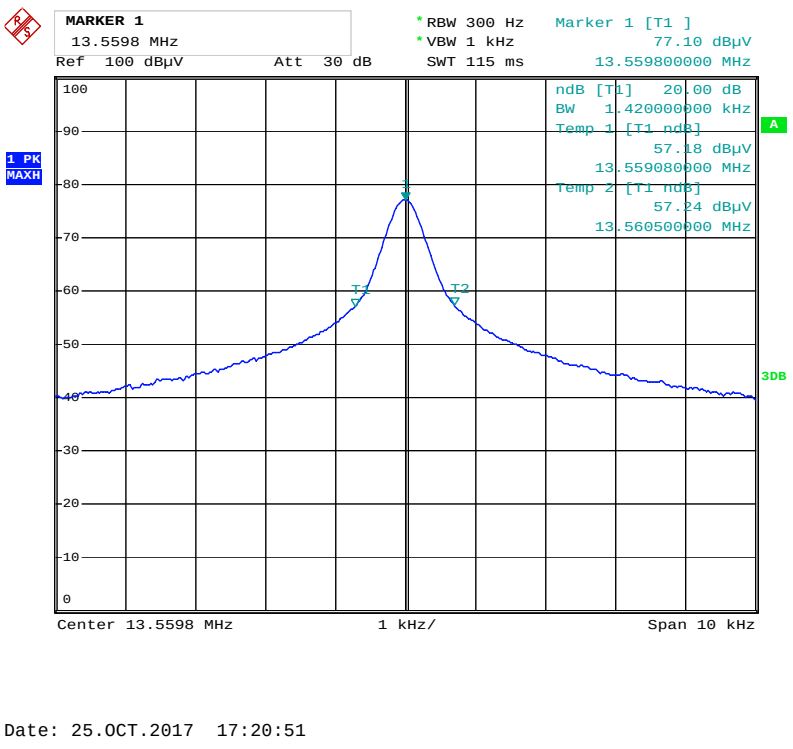
Test Plot ☒Yes ☐N/A

20dB Bandwidth measurement result

Frequency (MHz)	20dB BW (kHz)	Frequency range (MHz) F Low	Frequency range (MHz) F High	Test Result
13.5598	1.42	13.55908	13.5605	PASS

Test Plots

20dB Bandwidth measurement result



20dB Bandwidth

Annex A. TEST INSTRUMENT

Instrument	Model	Serial #	Cal Date	Cal Due	In use
Conducted Emissions					
R&S EMI Receiver	ESPI3	101216	05/03/2017	05/03/2017	☒
V-LISN	ESH3-Z5	838979/005	05/15/2017	05/15/2017	☒
Com-Power LISN	LI-115	241091	05/15/2017	05/15/2017	☒
SIEMIC EZ_EMC Conducted Emissions software	Ver.ICP-03A1	N/A	N/A	N/A	☒
Radiated Emissions					
Agilent Technologies Spectrum Analyzer	N9010A	MY47191130	05/03/2017	05/03/2017	☒
R&S EMI Receiver	ESPI3	101216	05/03/2017	05/03/2017	☒
Antenna (30MHz~6GHz)	JB6	A121411	10/31/2016	10/31/2017	☒
EMCO Passive Loop Antenna	6509	9909-1469	10/09/2017	10/08/2018	☒
Hp Agilent Pre-Amplifier	8447F	1937A01160	10/27/2016	10/26/2017	☒
SIEMIC EZ_EMC Radiated Emissions software	Ver.ICP-03A1	N/A	N/A	N/A	☒

Annex B. EUT And Test Setup Photographs

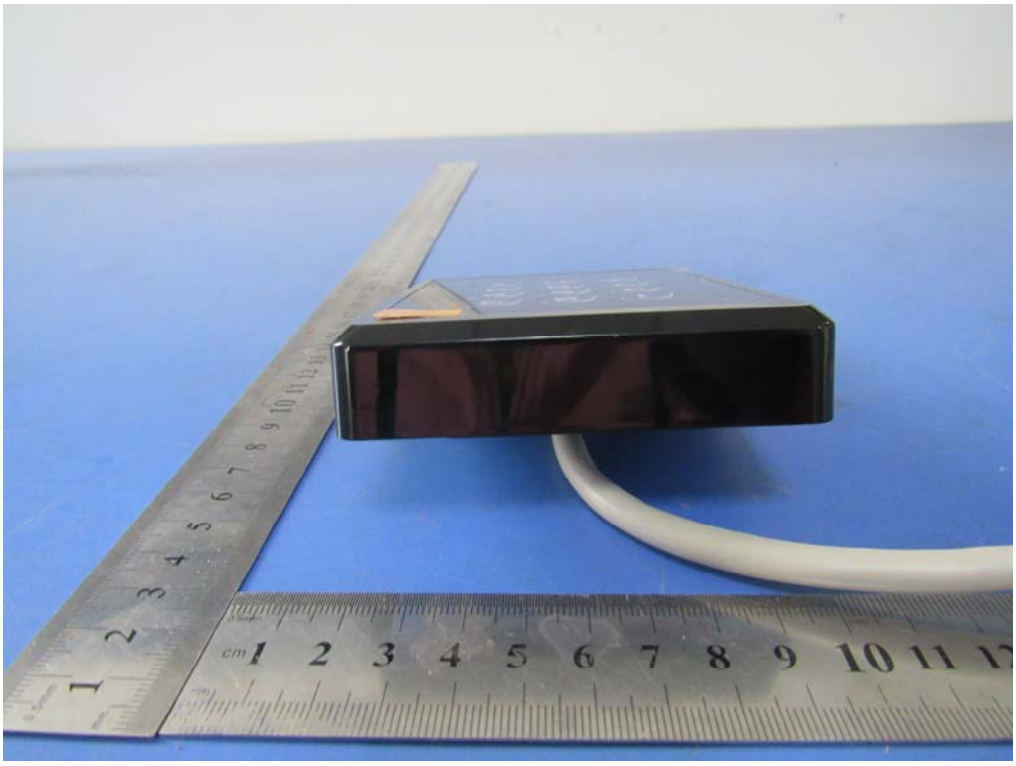
Annex B. EUT And Test Setup Photographs

Annex B.i. Photograph: EUT External Photo

EUT – Front View

EUT – Rear View

EUT – Top View



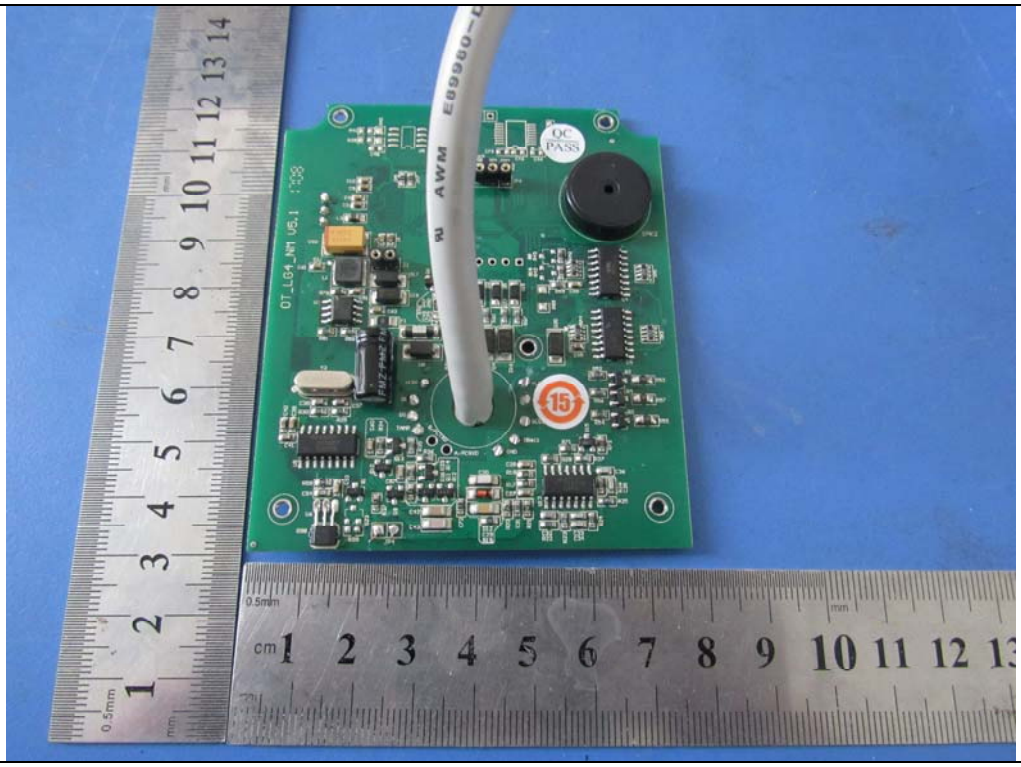
EUT – Bottom View

EUT – Left View

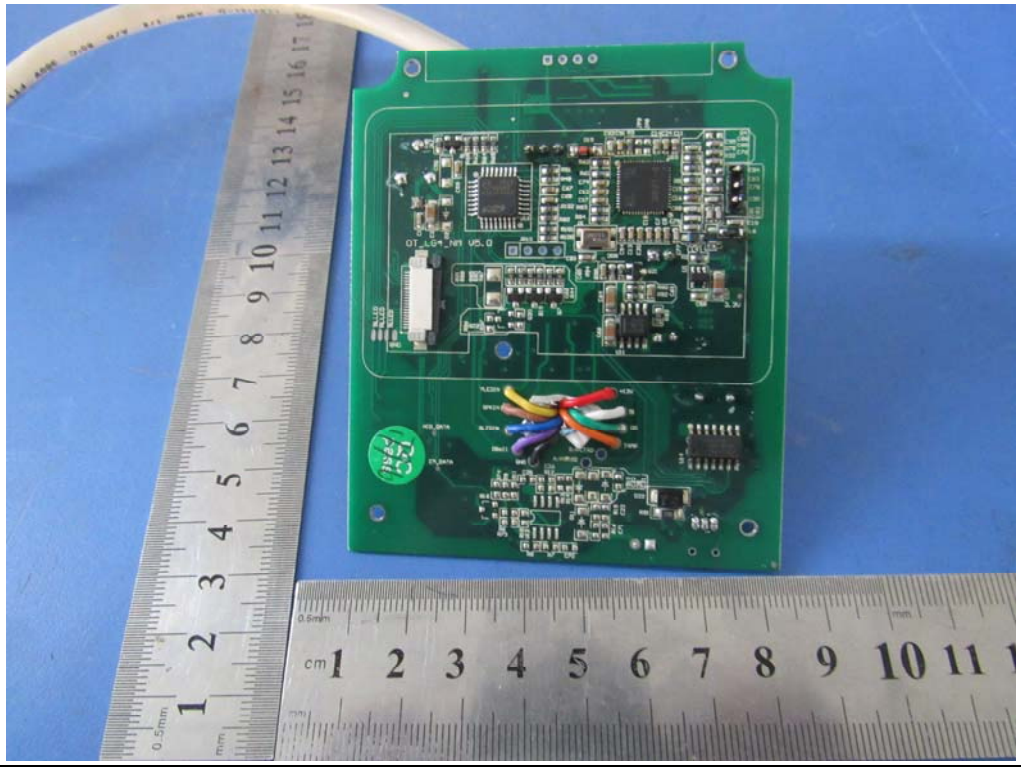
EUT – Right View

Annex B.ii. Photograph: EUT Internal Photo

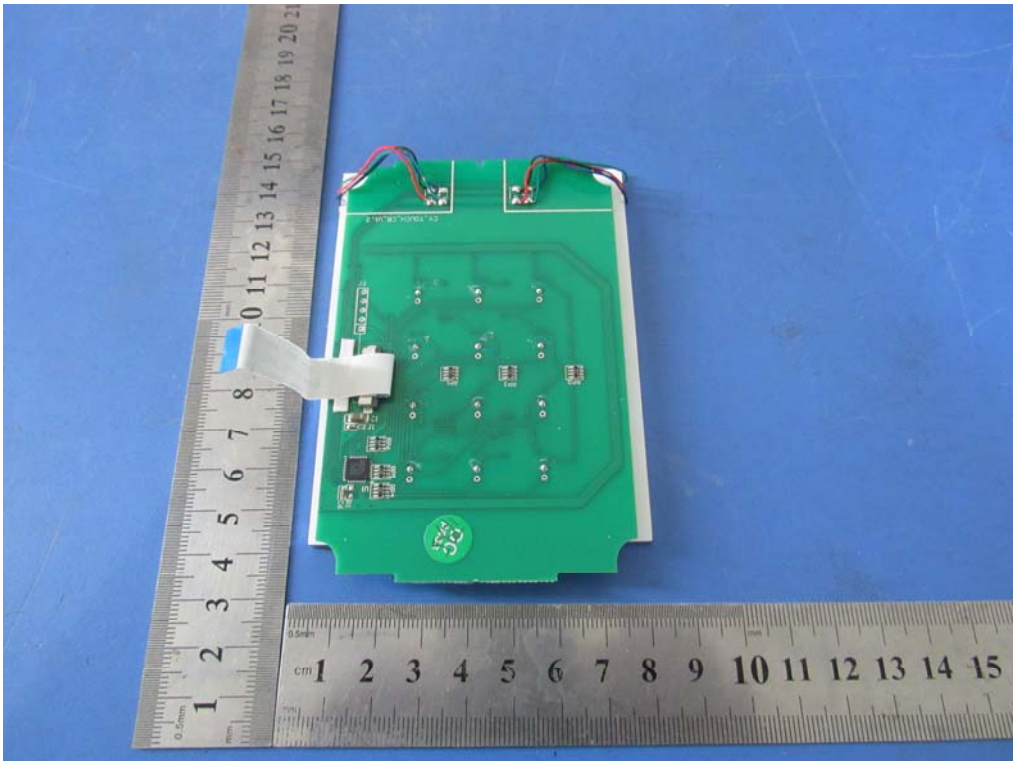
EUT – Uncover Front View 1



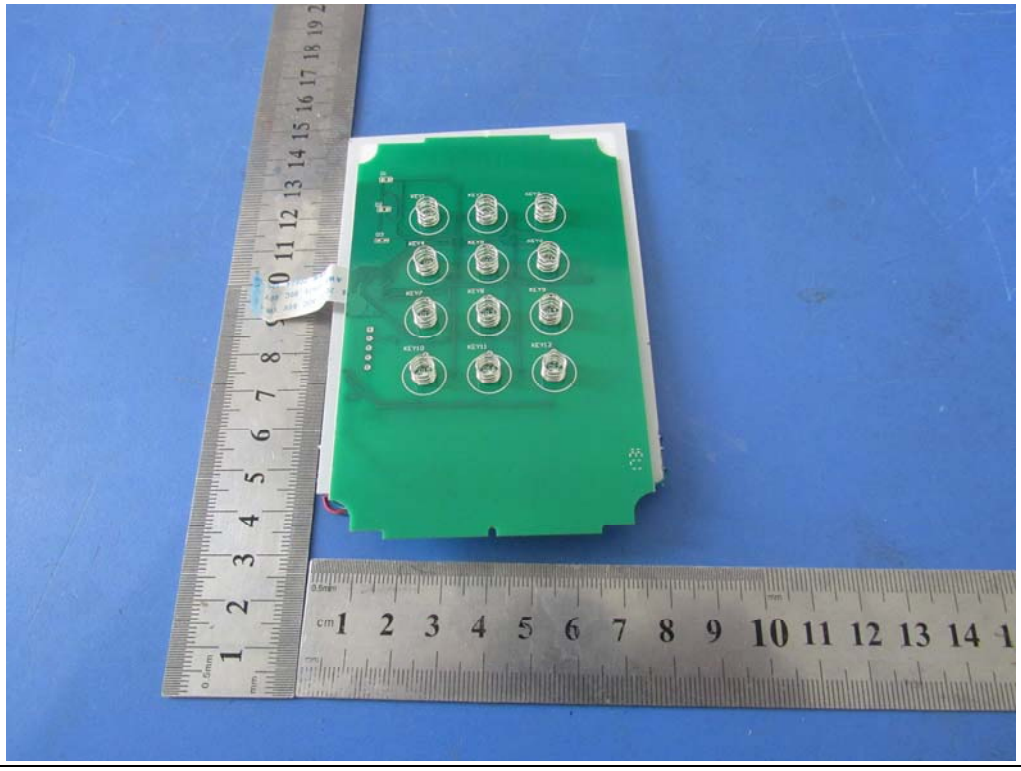
EUT – PCBA 1 Front View



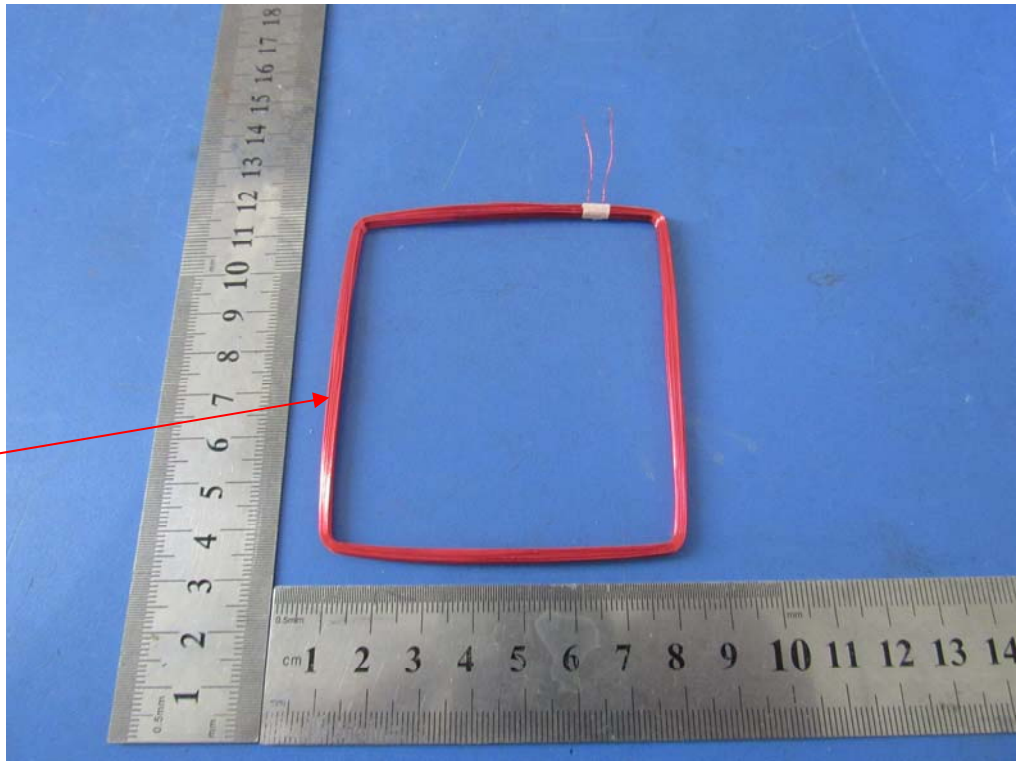
EUT – PCBA 1 Rear View



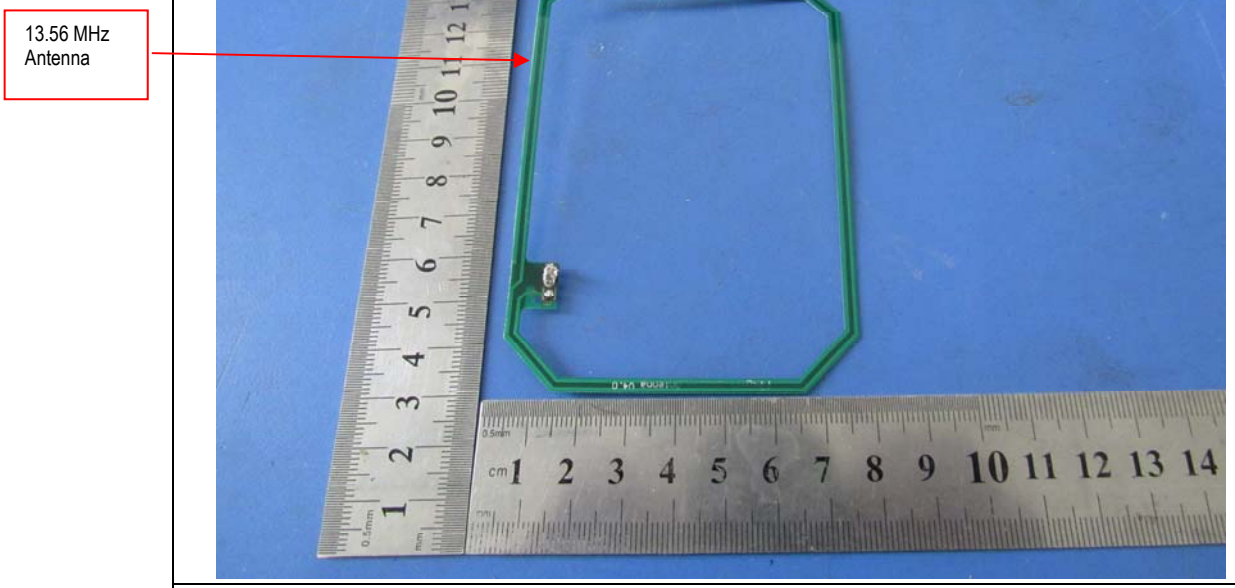
EUT – PCBA 2 Front View



EUT – PCBA 2 Rear View



EUT – Antenna Front View



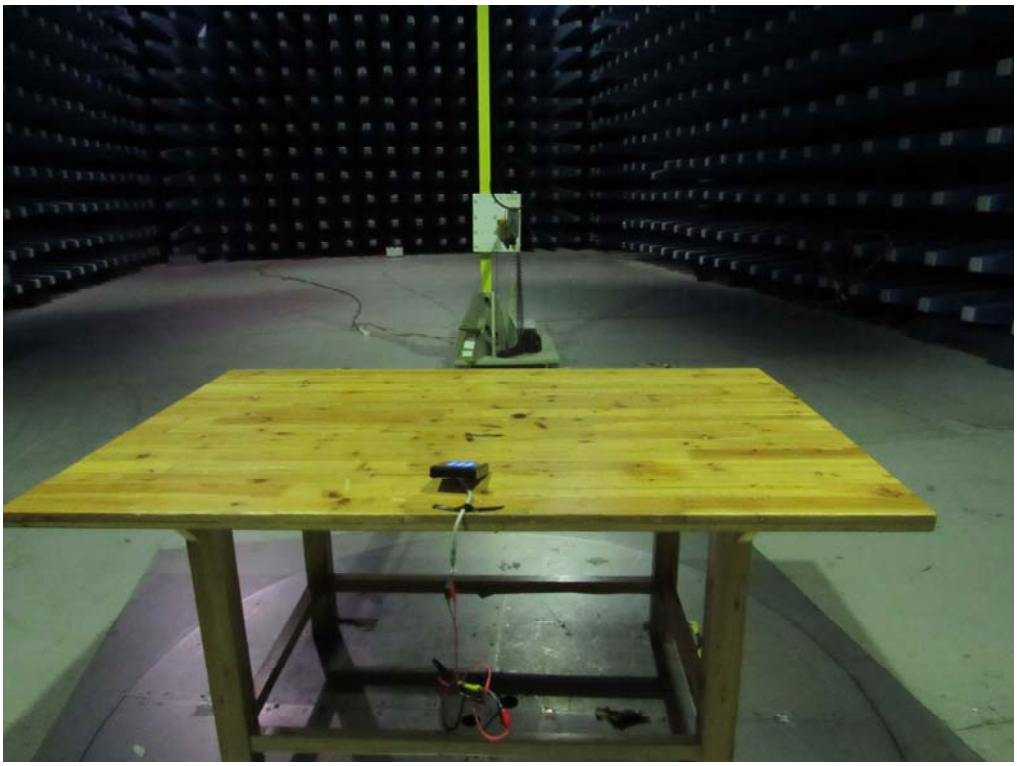
EUT – Antenna Front View

Annex B.iii. Photograph Test Setup Photo

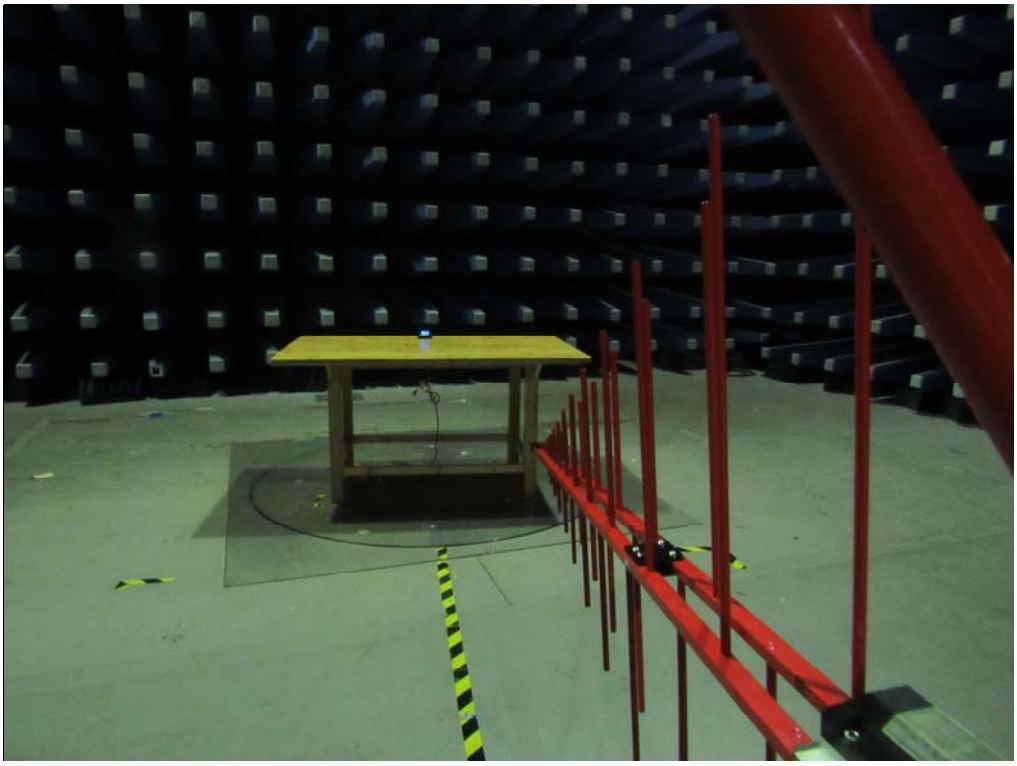
Conducted Emissions Setup Front View

Conducted Emissions Setup Side View

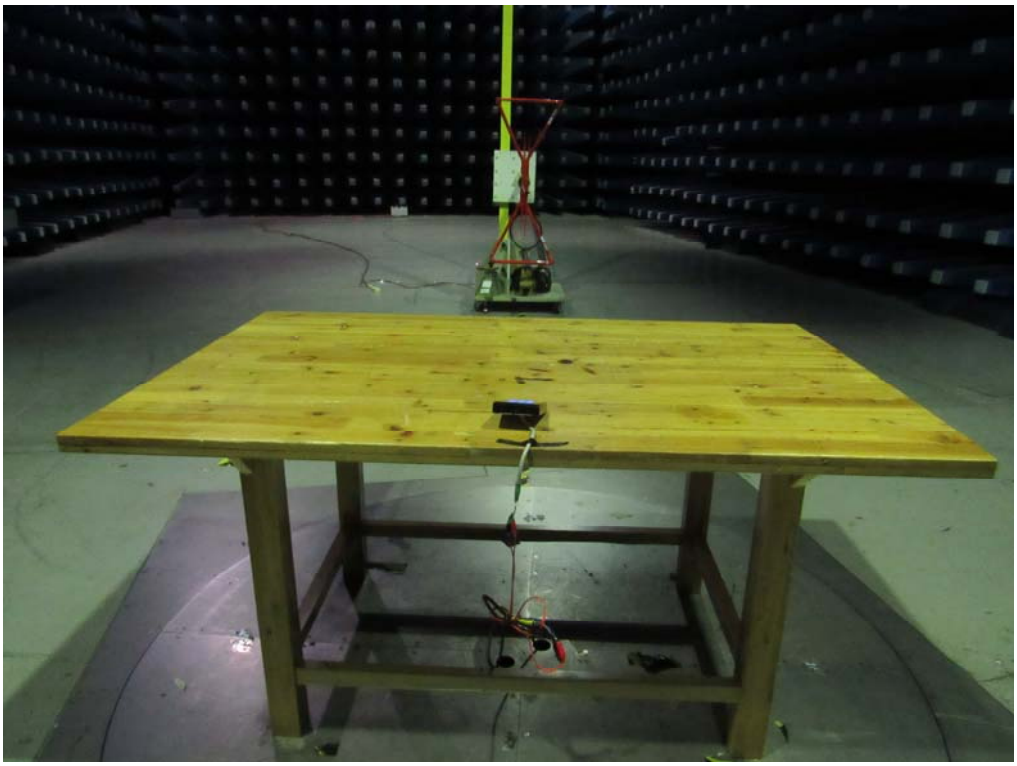
Front View of Radiated Emissions Test Setup below 30MHz



Rear View of Radiated Emissions Test Setup below 30MHz



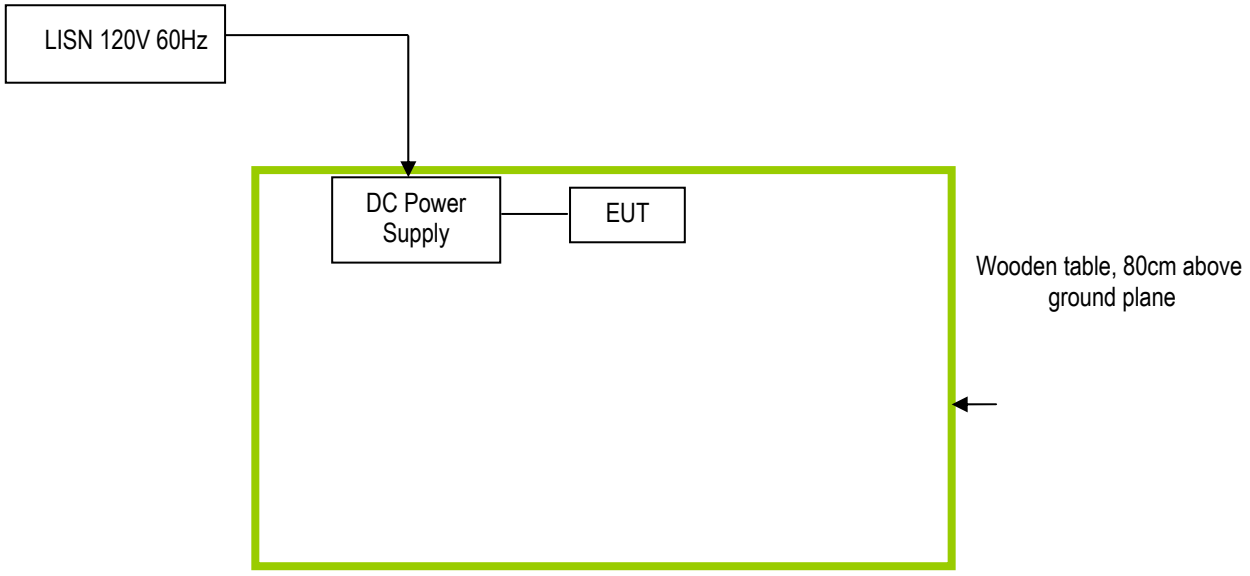
Radiated Emissions Setup Below 1GHz Front View



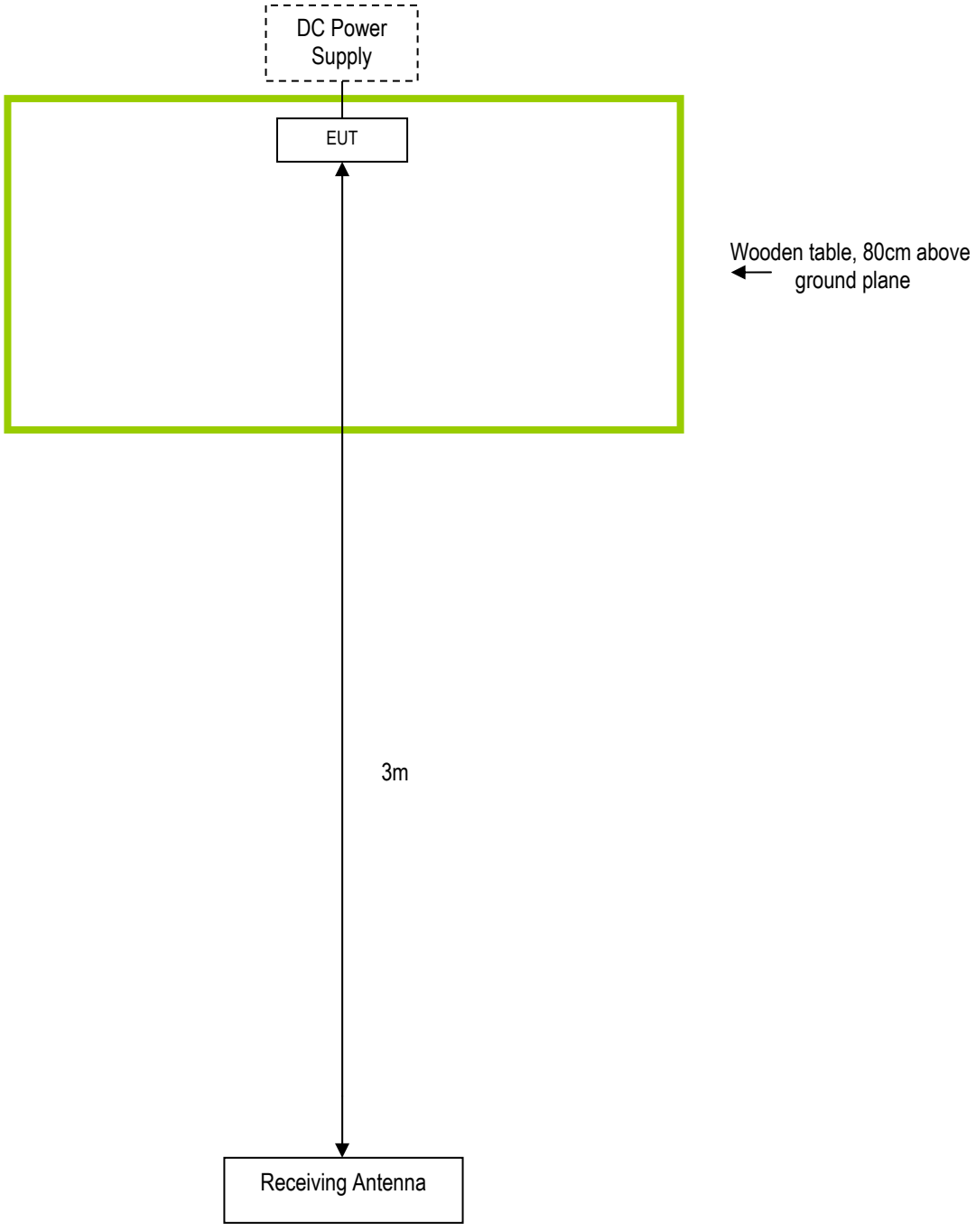
Radiated Emissions Setup Below 1GHz Rear View

Annex C. TEST SETUP AND SUPPORTING EQUIPMENT

Annex C.i. TEST SET UP BLOCK



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
BK PRECISION	DC Power Supply	1786B	10/27/2016	10/26/2017

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

Please see attachment

Annex E. DECLARATION OF SIMILARITY

SMARFID

Shanghai Smarfid Security Equipment Co., Ltd.
Add: No. 88, Lane 600, XinLi Road, Minhang District, Shanghai, 201199, China
Tel: (86-21) 54260103, 54260132 ext.215 Fax: (86-21) 54260132 ext.222

To:

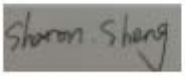
Declaration letter

Dear Sir/Madam:

For our business issue and marketing requirement, we would like to list different models numbers on the FCC ID certificates and reports, as following:
FCC ID: X3ALH3228K
Model No: LH322-8K、
LH322-8N
The two models have the same Circuits, components and color.

Apart from the different model name, the two models differ from each other by:
LH322-8K has the button function, but LH322-8N has no button function.

Thank you!

Signature: 

Printed name/title: Sharon Sheng