RF TEST REPORT

Report No.: 15020078-FCC-R1
Supersede Report No.: N/A

Applicant	Shanghai Smarfid Security Equipment Co.,Ltd
Product Name	Slender Series 13.56 MHz Reader
Main Model No.	MW352-8K
Test Standard	FCC Part 15.225: 2014, ANSI C63.10: 2009
Test Date	March 11 to March 12, 2015
Issue Date	March 12, 2015
Test Result	☑ Pass ☐ Fail
Equipment complied with the specification	☑
Equipment did not comply with the specification	☐

William Long	Alex Liu	
William Long Test Engineer	Alex Liu 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 (Nanjing-China) Laboratories
2-1 Longcang Avenue Yuhua Economic and
Technology Development Park, Nanjing, China
Tel:+86(25)86730128/86730129 Fax:+86(25)86730127 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
15020078-FCC-R1	NONE	Original	March 12, 2015

2. Customer information

Applicant Name	Shanghai Smarfid Security Equipment Co.,Ltd
Applicant Address	Room 301,4th Bldg., No.4 TongLi Road, SongJiang District,Shanghai 201615,China
Manufacturer Name	Shanghai Smarfid Security Equipment Co.,Ltd
Manufacturer Address	Room 301,4th Bldg., No.4 TongLi Road, SongJiang District,Shanghai 201615,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.	986914
IC Test Site No.	4842B-1
Test Software	Labview of SIEMIC version 1.0

4. Equipment Under Test (EUT) Information

Description of EUT:	Slender Series 13.56 MHz Reader
Main Model:	MW352-8K
Serial Model:	MW352-8N, MW353-8K, MW353-8N
Date EUT received:	January 26, 2015
Test Date(s):	March 11 to March 12, 2015
Antenna Gain:	13.56MHz: 5 dBi
Type of Modulation:	ASK
RF Operating Frequency (ies):	13.56MHz
Number of Channels:	1 CH
Input Power:	DC 12V
Trade Name :	N/A
FCC ID:	X3A-SSMW35

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
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)	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.

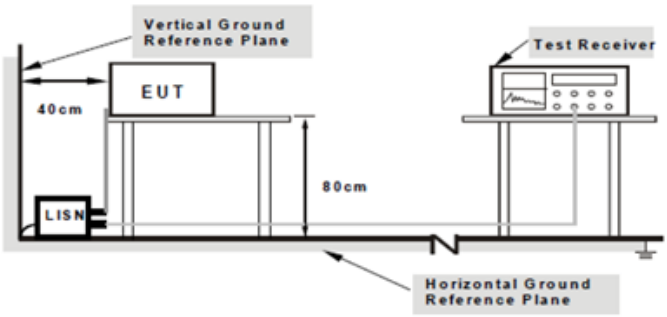
Result: Compliance.

6.2 Conducted Emissions Voltage

Temperature	20°C
Relative Humidity	50%
Atmospheric Pressure	1019mbar
Test date :	March 12, 2015
Tested By :	William Long

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

Frequency (MHz)	Quasi-Peak (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Average (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Factors (dB)
xxx	56.21	66.00	-9.79	39.20	56.00	-16.80	12.22

Frequency (MHz) = Emission frequency in MHz

Quais-Peak/Average (dBμV/m)=Receiver Reading(dBμV/m)+ Factor(dB)

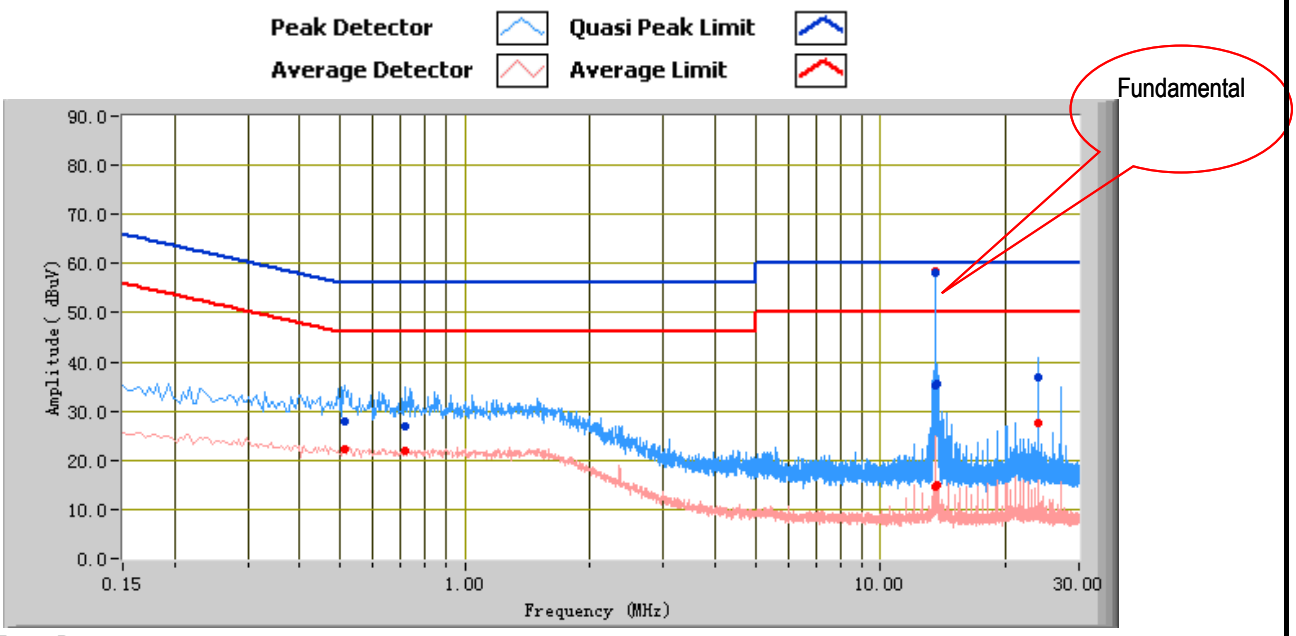
Limit(dBμV/m)=Limit stated in standard

Factor (dB)= cable loss+ Insertion loss of LISN+ Insertion loss of transient limiter (The transient limiter included 10dB attenuation)

Calculation Formula:

Margin (dB)=Quasi Peak / Average (dBμV/m) – limit (dBμV/m)

Test Mode:	Transmitting Mode

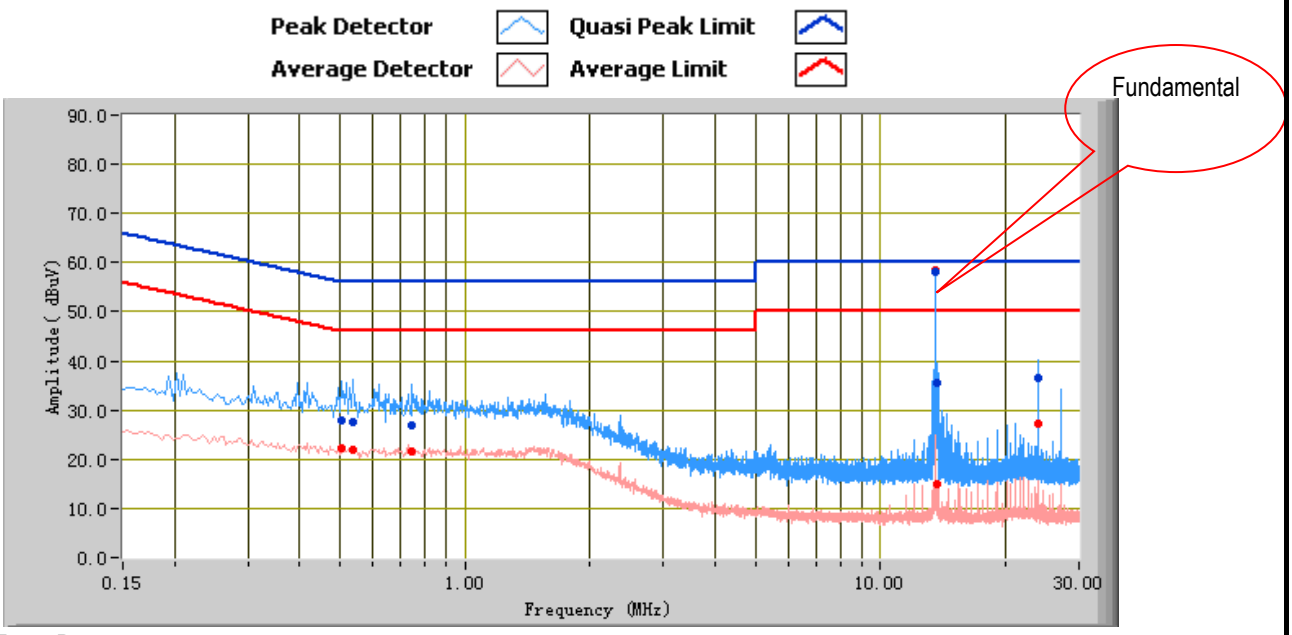


Test Data

Phase Line Plot at 120Vac, 60Hz

Frequency (MHz)	Quasi Peak (dBµV)	Limit (dBµV)	Margin (dB)	Average (dBµV)	Limit (dBµV)	Margin (dB)	Factors (dB)
13.56	58.27	60.00	-1.73	58.49	50.00	8.49	11.32
24.01	36.97	60.00	-23.03	27.43	50.00	-22.57	11.67
13.64	35.59	60.00	-24.41	14.83	50.00	-35.17	11.33
0.51	27.90	56.00	-28.10	22.09	46.00	-23.91	11.08
13.48	35.09	60.00	-24.91	14.63	50.00	-35.37	11.32
0.71	26.96	56.00	-29.04	21.81	46.00	-24.19	10.91

Test Mode:	Transmitting Mode



Test Data

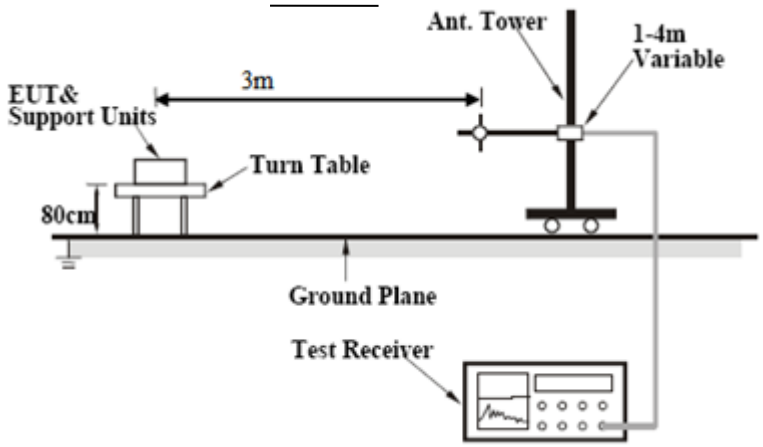
Phase Neutral Plot at 120Vac, 60Hz

Frequency (MHz)	Quasi Peak (dBµV)	Limit (dBµV)	Margin (dB)	Average (dBµV)	Limit (dBµV)	Margin (dB)	Factors (dB)
13.56	58.27	60.00	-1.73	58.48	50.00	8.48	11.33
0.54	27.47	56.00	-28.53	21.87	46.00	-24.13	11.03
24.01	36.65	60.00	-23.35	27.11	50.00	-22.89	11.70
0.50	28.05	56.00	-27.95	22.14	46.00	-23.86	11.06
13.64	35.59	60.00	-24.41	14.83	50.00	-35.17	11.33
0.75	26.92	56.00	-29.08	21.58	46.00	-24.42	10.88

6.3 Fundamental Field Strength Test Result

Temperature	20°C
Relative Humidity	50%
Atmospheric Pressure	1019mbar
Test date :	March 12, 2015
Tested By :	William Long

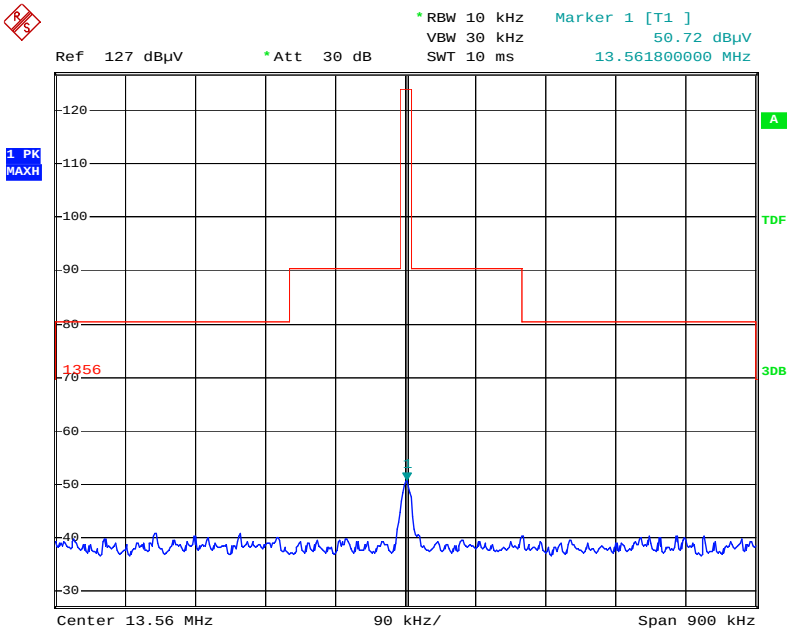
Requirement(s):

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

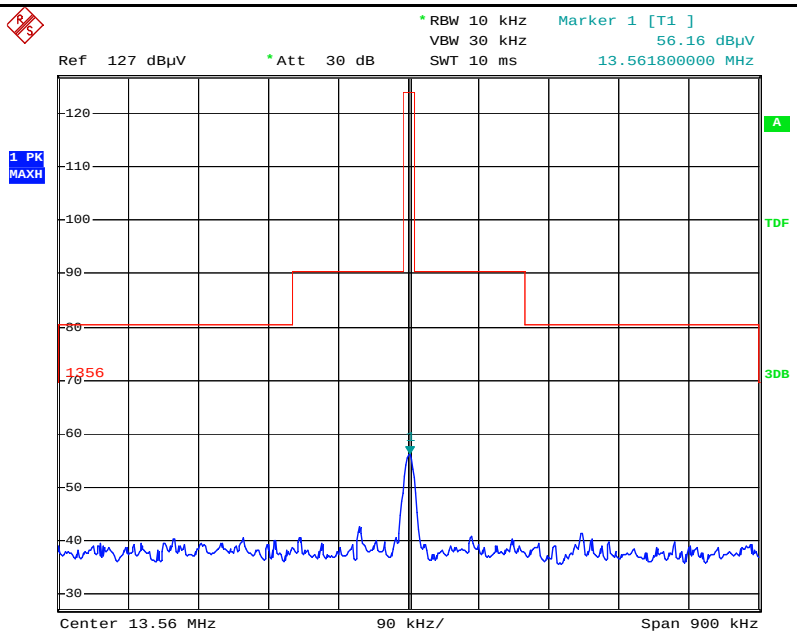
Test Plot ☑ Yes ☐ N/A

Test Plots
Fundamental Field Strength Measurement Result:



Date: 12.MAR.2015 09:09:34

Loop Antenna at 90 degree



Date: 12.MAR.2015 09:11:17

Loop Antenna at 0 degree

6.4 Radiated Spurious Emissions

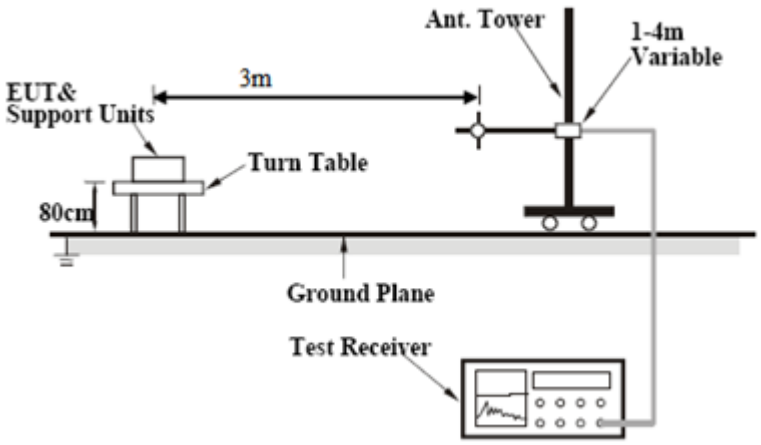
Temperature	20°C
Relative Humidity	50%
Atmospheric Pressure	1019mbar
Test date :	March 11, 2015
Tested By :	William Long

Requirement(s):

Spec	Item	Requirement	Applicable
§15.225(d)	a)	The field strength of any emissions appearing outside of the 3.110–14.010 MHz band shall not exceed the general radiated emission limits in § 15.209.	☑

Fundamental frequency (MHz)	Field strength (microvolts/meter)	Measurement distance (meters)
0.009-0.490	2400/F(kHz)	300
0.490-1.705	24000/F(kHz)	30
1.705-30.0	30	30
30-88	100**	3
88-246	150**	3
216-960	200**	3
Above 960	500	3

Test Setup



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 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.

Remark

Result ☑ Pass ☐ Fail

Test Data ☑ Yes ☐ N/A

Test Plot ☑ Yes (See below) ☐ N/A

Data sample

Frequency (MHz)	Quasi Peak (dBμV/m)	Azimuth	Polarity (H/V)	Height (cm)	Factors (dB)	Limit (dBμV/m)	Margin (dB)
xxx	32.23	181.00	H	350.00	-38.23	40.00	-7.77

Frequency (MHz) = Emission frequency in MHz

Quais-Peak (dBμV/m)= Receiver Reading(dBμV/m)+ Factor(dB)

Azimuth=Position of turn table

Polarity=Polarity of Receiver antenna

Height(cm)= Height of Receiver antenna

Factor (dB)=Antenna factor + cable loss- antenna gain

Limit (dBμV/m)=Limit stated in standard

Calculation Formula:

Margin (dB)=Quasi Peak (dBμV/m) – limit (dBμV/m)

Test Mode:	Transmitting

Loop Antenna at 0 degree@ 3M

Frequency (MHz)	Peak (Corrected) (dBµV/m)	Factor (dB)	Height (cm)	Azimuth (deg)	Limits @ 3m (dBµV/m)	Margin (dB)
15.26	58.15	18.7	121	180	69.54	-11.39
5.32	59.11	34.3	105	15	69.54	-10.43
7.88	60.26	35.15	132	165	69.54	-9.28

Loop Antenna at 90 degree@ 3M

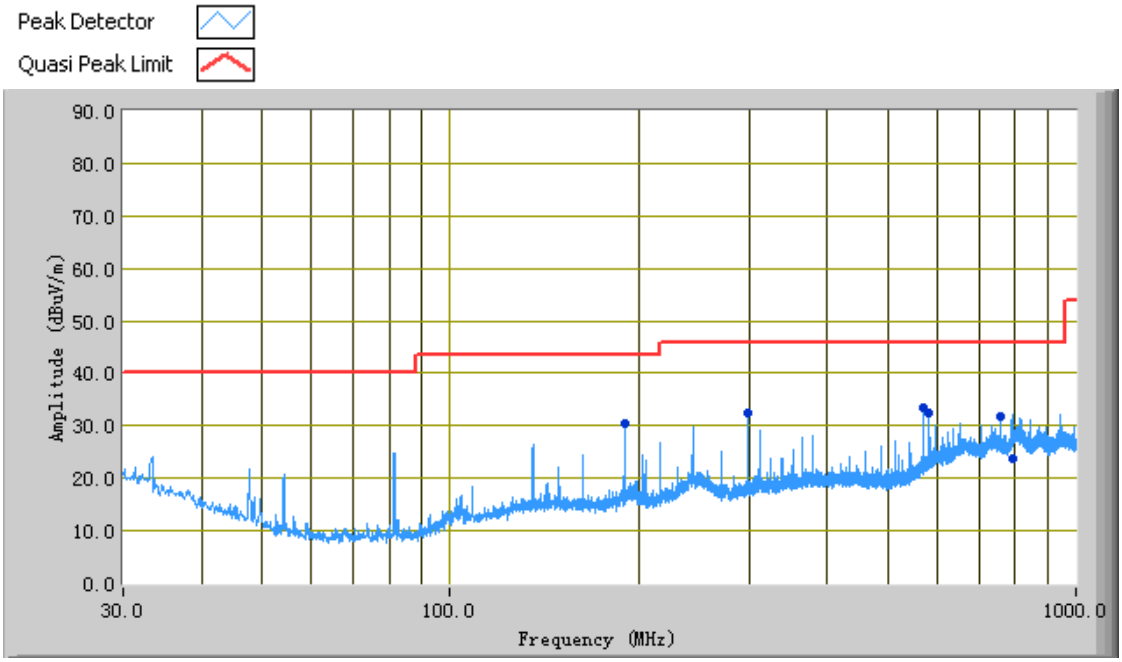
Frequency (MHz)	Peak (Corrected) (dBµV/m)	Factor (dB)	Height (cm)	Azimuth (deg)	Limits @ 3m (dBµV/m)	Margin (dB)
18.26	56.89	18.7	115	151	69.54	-12.65
17.33	57.69	18.5	151	25	69.54	-11.85
14.7	59.55	18.7	136	165	69.54	-9.99

Note：

Emissions from 9kHz to 1MHz is very low under transmit mode so test data is not presented in this report.

Test Mode:	Transmitting Mode

Below 1GHz



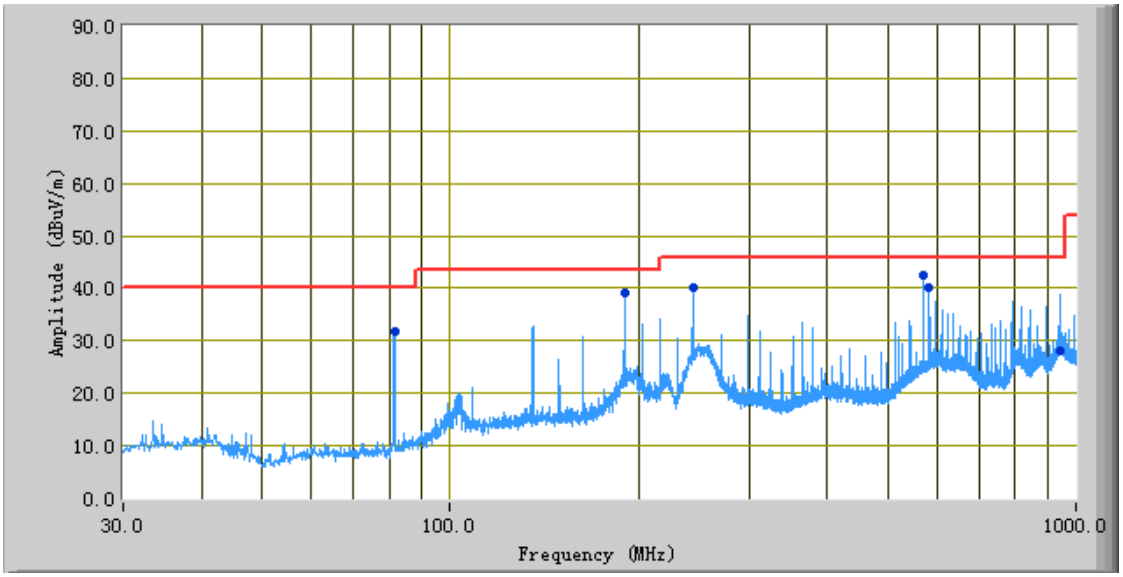
Test Data

Vertical Polarity Plot at 3m

Frequency (MHz)	Quasi Peak (dBuV/m)	Azimuth	Polarity (H/V)	Height (cm)	Factors (dB)	Limit (dBuV/m)	Margin (dB)
569.53	33.43	93.00	V	187.00	-25.43	46.00	-12.57
189.83	30.46	106.00	V	119.00	-31.87	43.50	-13.04
298.32	32.32	263.00	V	202.00	-29.64	46.00	-13.68
759.37	31.75	214.00	V	198.00	-18.66	46.00	-14.25
583.17	32.51	89.00	V	184.00	-24.41	46.00	-13.49
794.62	23.59	248.00	V	361.00	-17.62	46.00	-22.41

Test Mode:	Transmitting Mode

Below 1GHz



Horizontal Polarity Plot at 3m

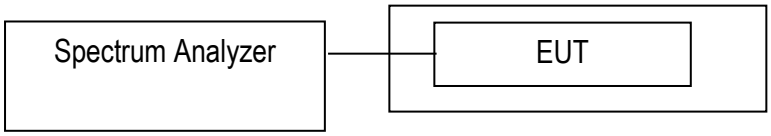
Frequency (MHz)	Quasi Peak (dBuV/m)	Azimuth	Polarity (H/V)	Height (cm)	Factors (dB)	Limit (dBuV/m)	Margin (dB)
569.54	42.54	33.00	H	194.00	-22.88	46.00	-3.46
189.84	39.06	181.00	H	124.00	-31.52	43.50	-4.44
244.11	40.02	227.00	H	117.00	-28.54	46.00	-5.98
583.09	40.00	30.00	H	175.00	-21.92	46.00	-6.00
943.81	28.27	360.00	H	104.00	-16.89	46.00	-17.73
81.36	31.85	176.00	H	217.00	-37.01	40.00	-8.15

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	20°C
Relative Humidity	50%
Atmospheric Pressure	1019mbar
Test date :	March 12, 2015
Tested By :	William Long

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 Setup	 Temperature/Humidity Chamber		
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	13.5596	400	< 0.01	Pass
40	13.5597	300	< 0.01	Pass
30	13.5596	400	< 0.01	Pass
20	Reference			
10	13.5596	400	< 0.01	Pass
0	13.5597	300	< 0.01	Pass
-10	13.5596	400	< 0.01	Pass
-20	13.5596	400	< 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	13.5596	400	＜0.01	Pass
13.8	13.5597	300	＜0.01	Pass

6.6 20dB Occupied Bandwidth

Temperature	20°C
Relative Humidity	50%
Atmospheric Pressure	1019mbar
Test date :	March 11, 2015
Tested By :	William Long

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 a 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 Setup		Spectrum Analyzer — EUT	
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

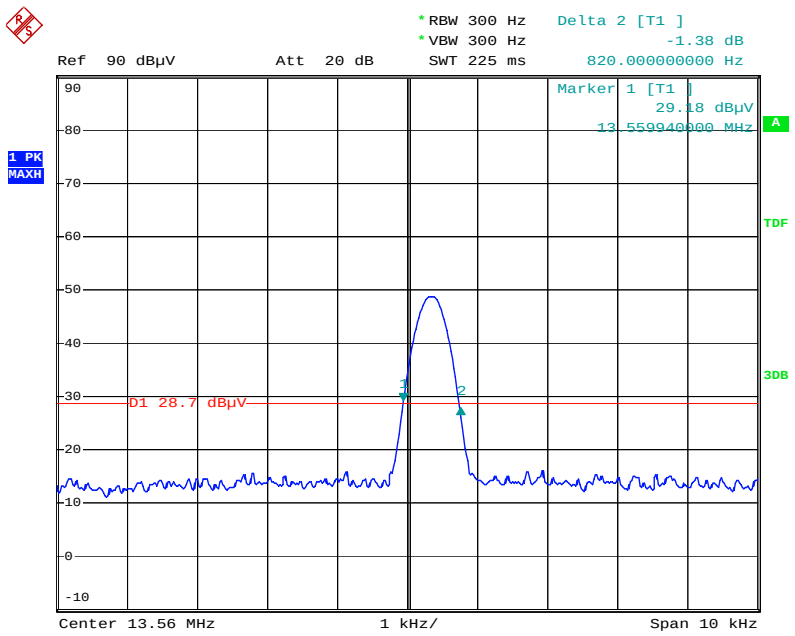
Test Plot ☑ Yes ☐ N/A

20dB Bandwidth measurement result

Frequency (MHz)	20dB BW (kHz)	Test Result
13.55994	1.22	PASS

Test Plots

20dB Bandwidth measurement result



20dB Bandwidth

Annex A. TEST INSTRUMENT

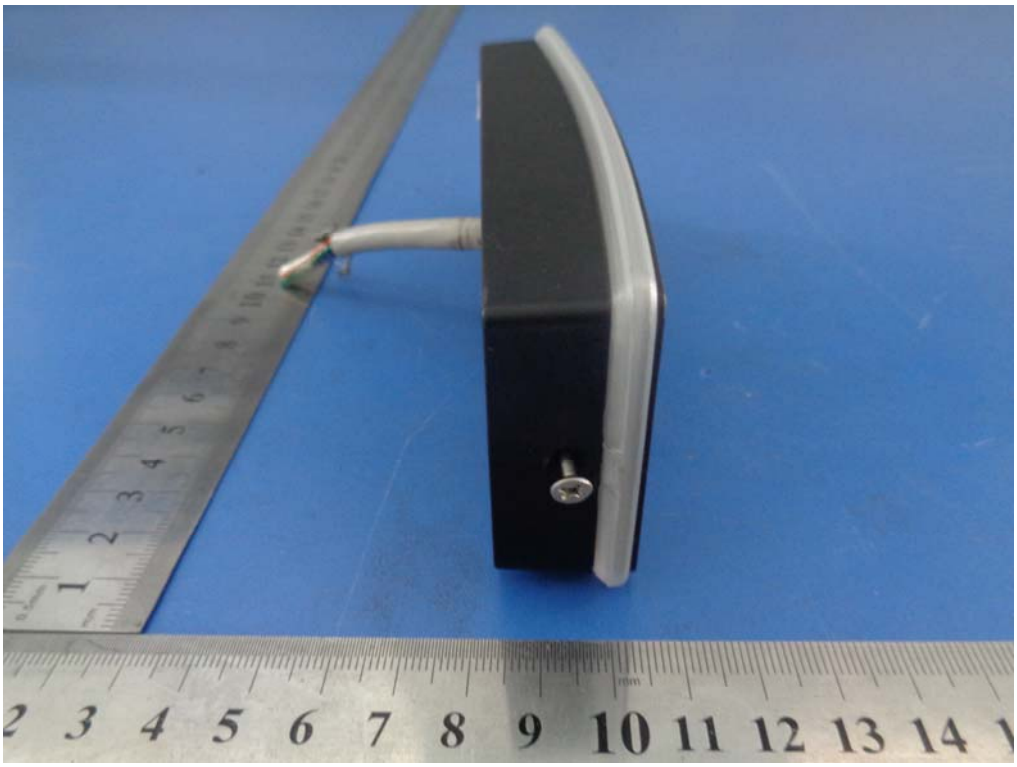
Instrument	Model	Serial #	Cal Date	Cal Due	In use
RF Conducted Test					
R&S EMI Receiver	ESPI3	101216	11/04/2014	11/03/2015	☑
Power Splitter	1#	1#	02/02/2015	02/01/2016	☑
Hp Spectrum Analyzer	8563E	3821A09023	10/09/2014	10/08/2015	☑
Temperature/Humidity Chamber	1007H	N/A	01/07/2015	01/06/2016	☑
Radiated Emissions					
Hp Spectrum Analyzer	8563E	3821A09023	10/09/2014	10/08/2015	☑
R&S EMI Receiver	ESPI3	101216	11/04/2014	11/03/2015	☑
Antenna (30MHz~6GHz)	JB6	A121411	04/15/2014	04/14/2015	☑
EMCO Passive Loop Antenna	6509	9909-1469	10/09/2014	10/08/2015	☑
EMCO Horn Antenna (1 ~18GHz)	3115	N/A	11/15/2014	11/14/2015	
INFOMW Antenna (1 ~18GHz)	JXTXLB-10180	J2031081120092	10/09/2014	10/08/2015	
Horn Antenna (18~40GHz)	AH-840	101013	04/22/2014	04/22/2015	
Microwave Pre-Amp (18~40GHz)	PA-840	181250	05/29/2014	05/28/2015	
Hp Agilent Pre-Amplifier	8447F	1937A01160	10/27/2014	10/26/2015	☑
MITEQ Pre-Amplifier (0.1 ~ 18GHz)	AMF-7D-00101800-30-10P	1451709	10/27/2014	10/26/2015	

Annex B. EUT And Test Setup Photographs

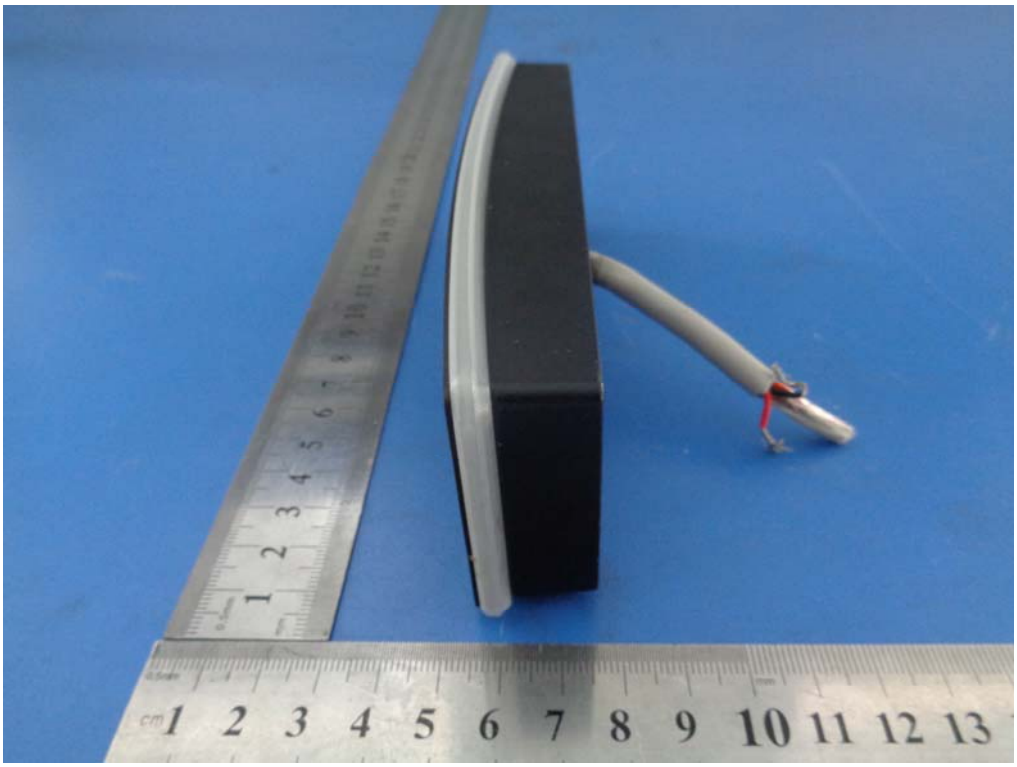
Annex B.i. Photograph EUT External Photo

Front View of EUT

Rear View of EUT

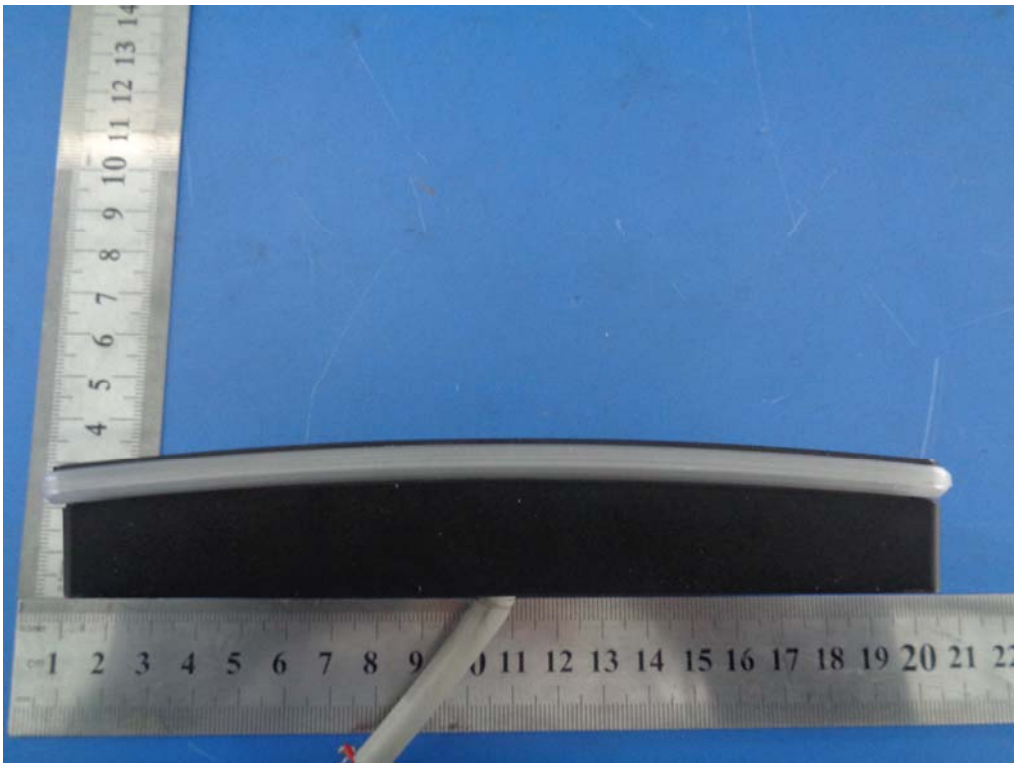


Top View of EUT



Bottom View of EUT

Left View of EUT

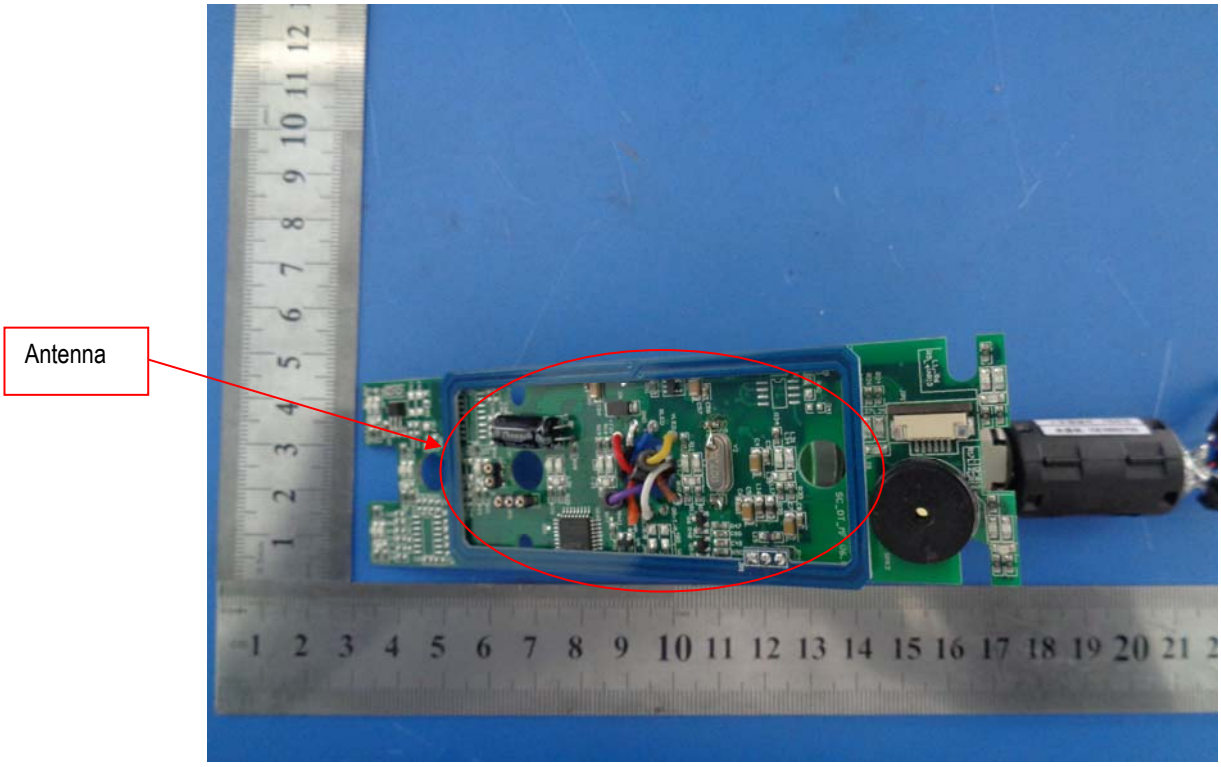


Right View of EUT

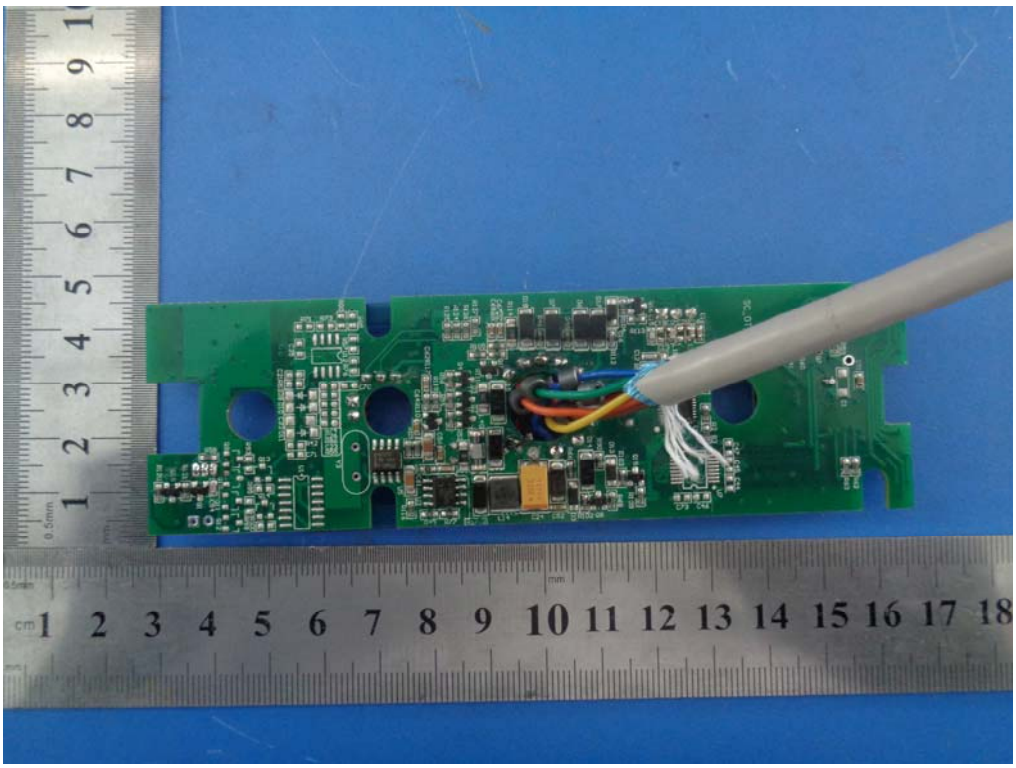
Annex B.ii. Photograph EUT Internal Photo

Uncover- Front View 1

Uncover- Front View 2

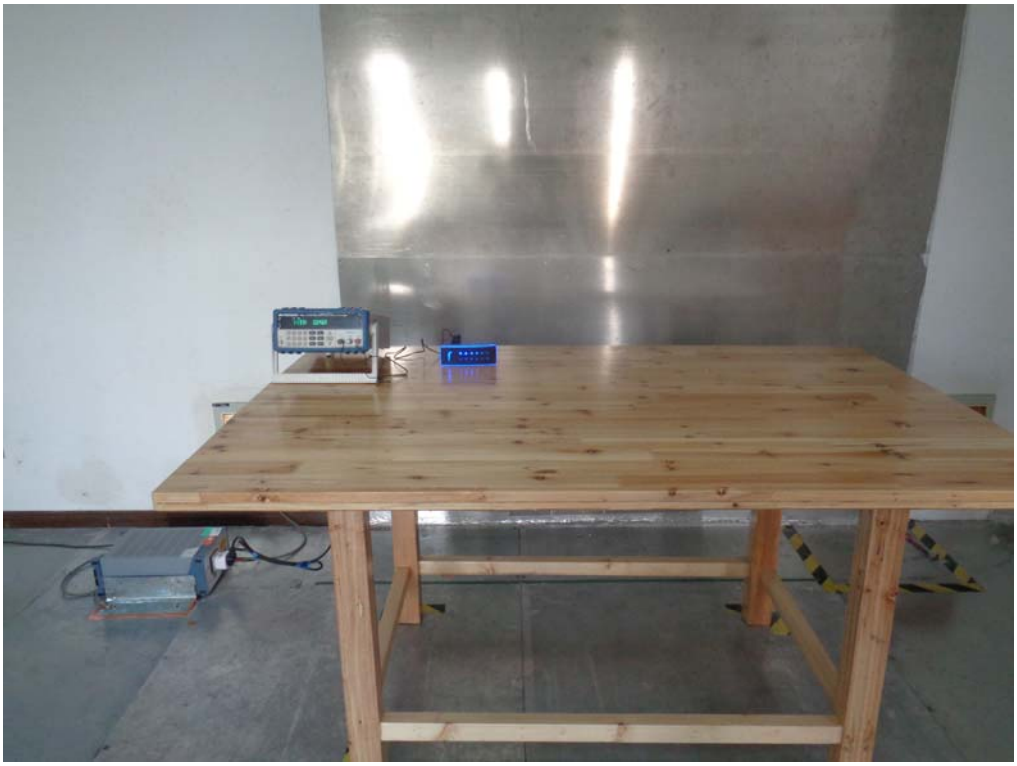


EUT PCBA – Front View



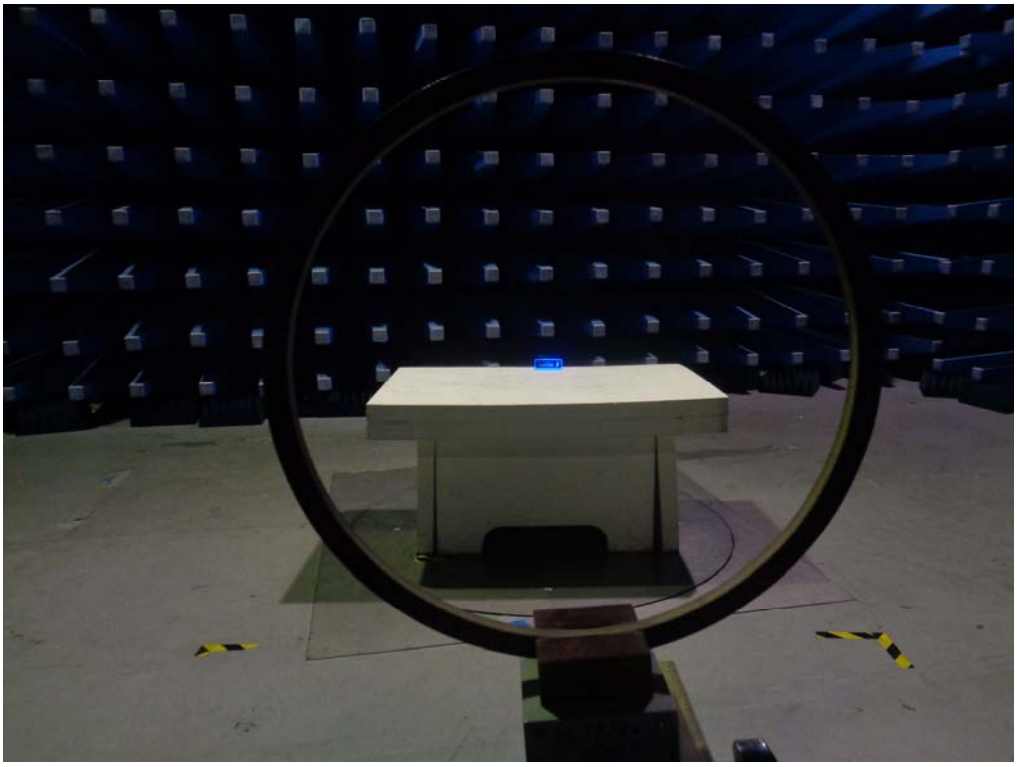
EUT PCBA – Rear View

Annex B.iii. Photograph Test Setup Photo

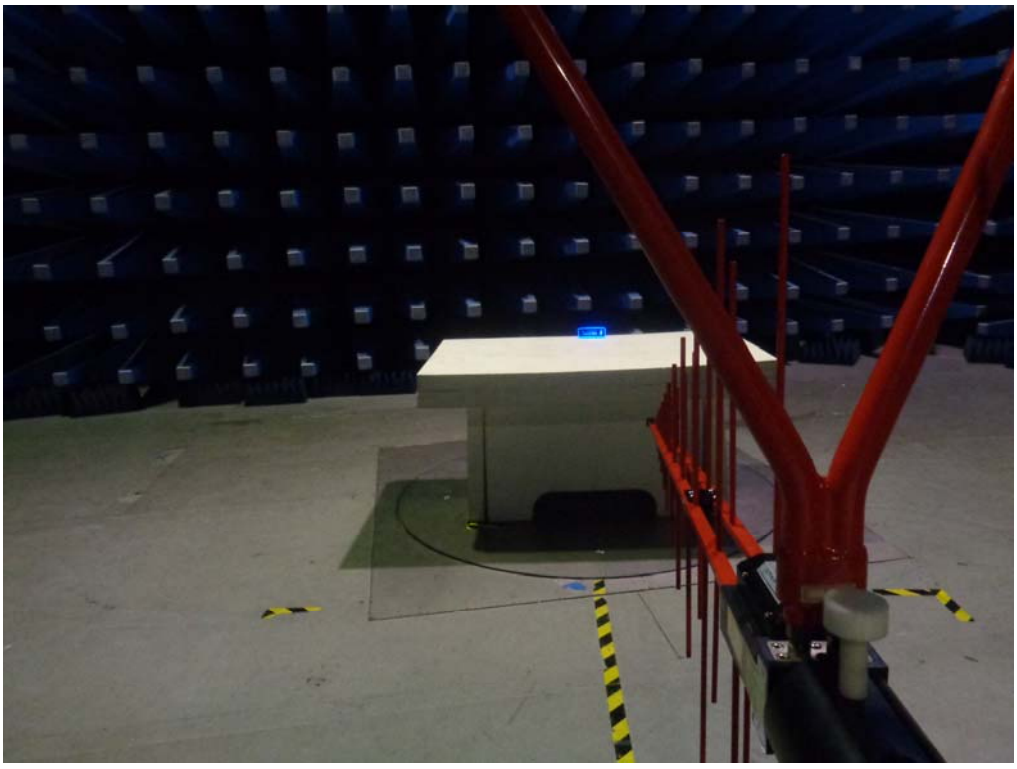


Conducted Emissions Setup Front View

Conducted Emissions Setup Side View



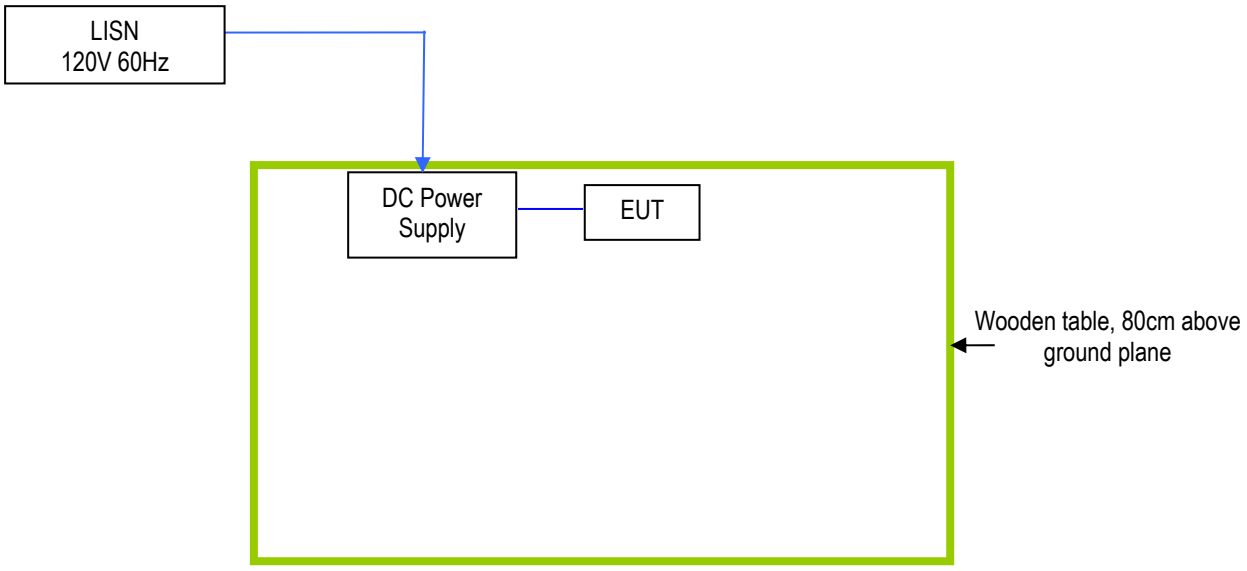
Front View of Radiated Emissions Test Setup below 30MHz



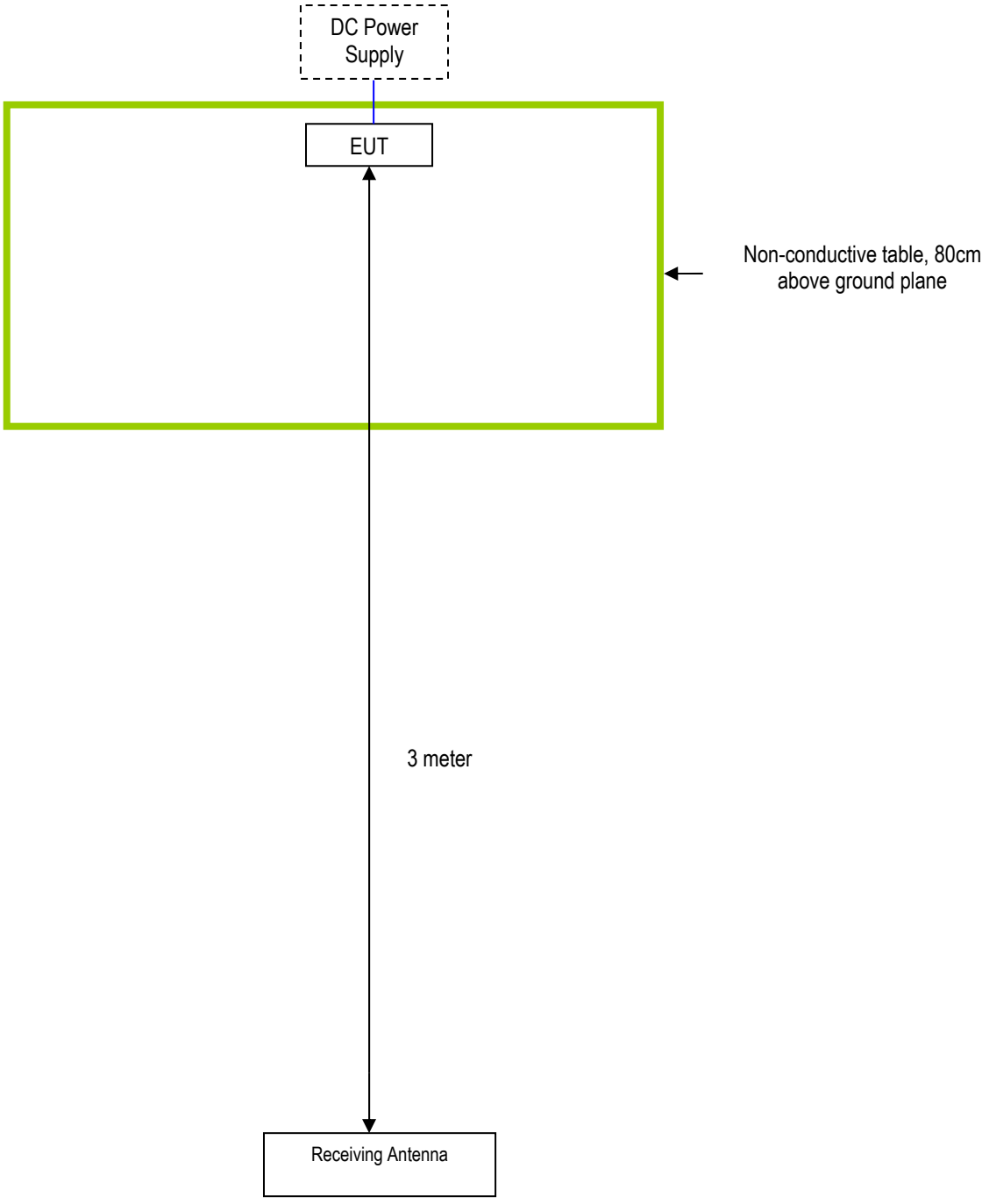
Front View of Radiated Emissions Test Setup (30MHz-1GHz)

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	10/27/2014	10/26/2015

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

Please see attachment

Annex E. DECLARATION OF SIMILARITY

SMARFID

Shanghai Smarfid Security Equipment Co., Ltd.
Add: Room 301, 4th Bldg., No.4 TongLi Road, SongJiang District, Shanghai 201615, China
Tel: (86-21) 54260103, 54260132 ext.215 Fax: (86-21) 54260132 ext.222

To: SIEMIC INC

Declaration letter

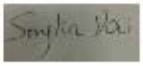
Dear :

For our business issue and marketing requirement, we would like to list different models numbers on the FCC certificates and reports, as following:
Model No: MW352-8K
MW352-8N,MW353-8K,MW353-8N
FCC ID: X3A-SSMW35
The four models have the same Circuits, components and color.

The difference of these models are have different model name, but others differences as follows:
MW352-8K、MW353-8K has buttons but MW352-8N、MW353-8N has no buttons.

The firmware is different of MW352 and MW353.
(Mifare card has divided into 2 parts: 1.CSN; 2.sectors. CSN had been programmed by manufactory when produce,it is 32 bits. There are total 16 sectors in Mifare card.User can be programmed the data into the sector.User can be programmed the custom data into those sectors.So,MW352 support Mifare CSN reading (32bits) and MW353 support custom Mifare sector reading.)
MW352 and MW353 use the same hardware and 13.56 MHz RF transmission circuit, so,the RF power is the same.

Thank you!

Signature: 

Printed name/title: Songlin Dai