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FCC PART 15 SUBPART B TEST REPORT

FCC Part 15B

Report Reference No......: **CTL1308271355-WD**

Compiled by

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Test Engineer Tracy Qi

Tracy Qi

(position+printed name+signature)...:

Approved by

(position+printed name+signature)...: Manager Tracy Qi

Tracy Qi

Date of issue.....: Sept. 29, 2013

Representative Laboratory Name : **Shenzhen CTL Electromagnetic Technology Co., Ltd.**

Address.....: Floor 1-A, Baisha Technology Park, No.3011, Shahexi Road, Nanshan District, Shenzhen, China 518055

Test Firm.....: **Bontek Compliance Testing Laboratory Ltd**

Address.....: 1/F, Block East H-3, OCT Eastern Ind. Zone, Qiaocheng East Road, Nanshan, Shenzhen, China

Applicant's name.....: **INMOTION Technologies Co., Ltd**

Address.....: 1st Floor, Building No.711, West Side of Pengji Industrial Zone, Liantang, Luohu District, Shenzhen City, Guangdong Province, P.R. China

Test specification:

Standard: FCC Part 15B: Unintentional Radiators

TRF Originator.....: Shenzhen CTL Electromagnetic Technology Co., Ltd.

Master TRF.....: Dated 2011-01

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Test item description: **INMOTION SCV**

FCC ID.....: **2AA73INMOTIONR1**

Trade Mark: INMOTION

Model/Type reference.....: INMOTION R1

Listed Models: INMOTION R1X, INMOTION R1XX (XX is variable can be A-Z and 0-9)

Power Supply: DC 72V from battery

Result.....: **Positive**

TEST REPORT

Test Report No. :	CTL1308271355-WD	Sept. 29, 2013
		Date of issue

Equipment under Test : **INMOTION SCV**

Model /Type : **INMOTION R1**

Listed Models : INMOTION R1X, INMOTION R1XX (XX is variable can be A-Z and 0-9)

Difference Description : Only the model's name and color are different.

Applicant : **INMOTION Technologies Co., Ltd**

Address : 1st Floor, Building No.711, West Side of PengJi Industrial Zone, Liantang, Luohu District, Shenzhen City, Guangdong Province, P.R. China

Manufacturer **INMOTION Technologies Co., Ltd**

Address 1st Floor, Building No.711, West Side of PengJi Industrial Zone, Liantang, Luohu District, Shenzhen City, Guangdong Province, P.R. China

Test Result according to the standards on page 4:

Positive

The test report merely corresponds to the test sample.

It is not permitted to copy extracts of these test result without the written permission of the test laboratory.

Contents

1. TEST STANDARDS	4
2. SUMMARY	5
2.1. General Remarks	5
2.2. Equipment Under Test	5
2.3. Short description of the Equipment under Test (EUT)	5
2.4. EUT operation mode	5
2.5. EUT configuration	6
2.6. Related Submittal(s) / Grant (s)	6
2.7. Modifications	6
3. TEST ENVIRONMENT	7
3.1. Address of the test laboratory	7
3.2. Test Facility	7
3.3. Environmental conditions	7
3.4. Configuration of Tested System	7
3.5. Statement of the measurement uncertainty	8
3.6. Equipments Used during the Test	8
3.7. Summary of Test Result	9
3.8. Test Software	9
4. TEST CONDITIONS AND RESULTS	10
4.1. Conducted Emissions Test	10
4.2. Radiated Emissions Test	13
5. TEST SETUP PHOTOS OF THE EUT	17
6. EXTERNAL AND INTERNAL PHOTOS OF THE EUT	19

1. TEST STANDARDS

The tests were performed according to following standards:

[FCC Part 15B: Unintentional Radiators](#)

[ANCI C63.4: 2003](#)



2. SUMMARY

2.1. General Remarks

Date of receipt of test sample : August 28, 2013

Testing commenced on : August 28, 2013

Testing concluded on : September 23, 2013

2.2. Equipment Under Test

Power supply system utilised

Power supply voltage : ☒ 120V / 60 Hz ☐ 115V / 60Hz
☐ 12 V DC ☐ 24 V DC
☒ Other (specified in blank below)

DC 72V from battery

2.3. Short description of the Equipment under Test (EUT)

The device is a INMOTION SCV, the device contains GSM Transmitter Module FCC ID: UDV-2011091310088 and Wifi Transmitter Module FCC ID: AZYHF-A11X.

For more details, refer to the user's manual of the EUT.

Serial number: Prototype

2.4. EUT operation mode

Test Mode(TM)	Description	Remark
TM1	Charging	Charged by Adapter
TM2	USB Disk	Data Transfer

The field strength of radiation emission was measured in the following position: EUT stand-up position (Y axis), lie-down position (X, Z axis).

The following data show only with the worst case setup.

The worst case of Y axis was reported.

Based on client request, all normal using modes of the normal function were tested but only the worst test data of the worst mode is reported by this report.

The worst case of AC Conducted Emission is mode 1; the test data of this mode was reported.

2.5. EUT configuration

The following peripheral devices and interface cables were connected during the measurement:

- - supplied by the manufacturer
- - supplied by the lab

- U disk

Manufacturer : Kingston

Model No. : DTIG3/8GB

2.6. Related Submittal(s) / Grant (s)

This submittal(s) (test report) is intended for FCC ID: 2AA73INMOTIONR1 filing to comply with of the FCC Part 15B Rules.

2.7. Modifications

No modifications were implemented to meet testing criteria.



3. TEST ENVIRONMENT

3.1. Address of the test laboratory

Bontek Compliance Testing Laboratory Ltd
1/F, Block East H-3, OCT Eastern Ind. Zone, Qiaocheng East Road, Nanshan, Shenzhen, China

The sites are constructed in conformance with the requirements of ANSI C63.7, ANSI C63.4 (2003) and CISPR Publication 22.

3.2. Test Facility

The test facility is recognized, certified, or accredited by the following organizations:

IC Registration No.: 7631A

The 3m alternate test site of Bontek Compliance Testing Laboratory Ltd EMC Laboratory has been registered by Certification and Engineer Bureau of Industry Canada for the performance of with Registration NO.: 7631A on March, 2011.

FCC-Registration No.: 338263

Bontek Compliance Testing Laboratory Ltd EMC Laboratory has been registered and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files. Registration 338263, March 24, 2008.

3.3. Environmental conditions

During the measurement the environmental conditions were within the listed ranges:

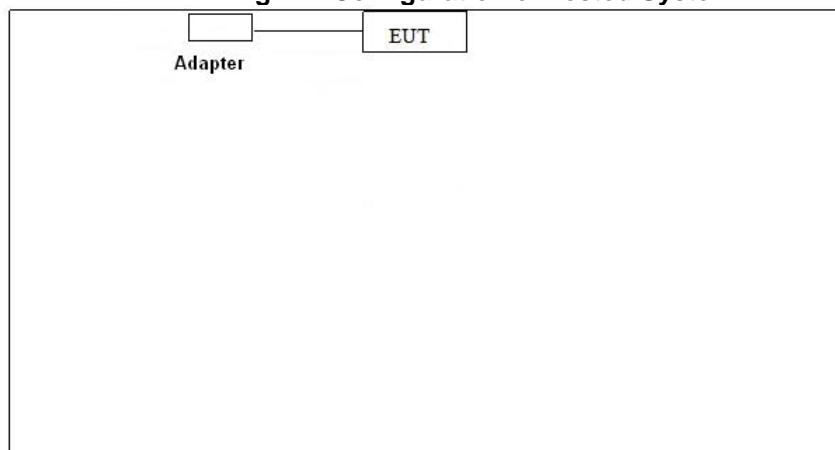
Temperature: 15-35 ° C

Humidity: 30-60 %

Atmospheric pressure: 950-1050mbar

3.4. Configuration of Tested System

Fig. 2-1 Configuration of Tested System



3.5. Statement of the measurement uncertainty

The data and results referenced in this document are true and accurate. The reader is cautioned that there may be errors within the calibration limits of the equipment and facilities. The measurement uncertainty was calculated for all measurements listed in this test report acc. to CISPR 16 - 4 „Specification for radio disturbance and immunity measuring apparatus and methods – Part 4: Uncertainty in EMC Measurements“ and is documented in the Bontek Compliance Testing Laboratory Ltd quality system acc. to DIN EN ISO/IEC 17025. Furthermore, component and process variability of devices similar to that tested may result in additional deviation. The manufacturer has the sole responsibility of continued compliance of the device.

Hereafter the best measurement capability for Bontek laboratory is reported:

Test	Range	Measurement Uncertainty	Notes
Radiated Emission	30~1000MHz	4.10dB	(1)
Radiated Emission	1~12.75GHz	4.32dB	(1)
Conducted Disturbance	0.15~30MHz	3.20dB	(1)

(1) This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

3.6. Equipments Used during the Test

Item	Test Equipment	Manufacturer	Model No.	Last Cal.	Due. Date
1	EMI Test Receiver	ROHDE & SCHWARZ	ESCI	2013/04/14	2014/04/13
2	Radio Communication Tester	ROHDE & SCHWARZ	CMU200	2013/04/14	2014/04/13
3	Dual Directional Coupler	Agilent	778D	2013/04/14	2014/04/13
4	10dB attenuator	SCHWARZBECK	MTAIMP-136	2013/04/14	2014/04/13
5	Tunable Bandreject filter	K&L	3TNF-800	2013/04/14	2014/04/13
6	Tunable Bandreject filter	K&L	5TNF-1700	2013/04/14	2014/04/13
7	High-Pass Filter	K&L	9SH10-2700/X12750-O/O	2013/04/14	2014/04/13
8	High-Pass Filter	K&L	41H10-1375/U12750-O/O	2013/04/14	2014/04/13
9	Coaxial Cable	Huber+Suhner	AC4-RF-H	2013/04/14	2014/04/13
10	AC Power Supply	IDRC	CF-500TP	2013/04/14	2014/04/13
11	DC Power Supply	IDRC	CD-035-020PR	2013/04/14	2014/04/13
12	RF Current Probe	FCC	F-33-4	2013/04/14	2014/04/13
13	Temperature /Humidity Meter	zhicheng	ZC1-2	2013/04/14	2014/04/13
14	MICROWAVE AMPLIFIER	HP	8349B	2013/04/14	2014/04/13
15	Amplifier	HP	8447D	2013/04/14	2014/04/13
16	SIGNAL GENERATOR	HP	8647A	2013/04/14	2014/04/13
17	Log Periodic Antenna	ELECTRO-METRICS	EM-6950	2013/04/14	2014/04/13
18	Horn Antenna	Schwarzbeck	BBHA9120A	2013/04/14	2014/04/13
19	EMI Test Receiver	R&S	ESPI	2013/04/14	2014/04/13
20	Loop Antenna	ZHINAN	ZN30900A	2013/04/14	2014/04/13
21	Horn Antenna	Schwarzbeck	BBHA9120D	2013/04/14	2014/04/13
22	Horn Antenna	Schwarzbeck	BBHA9170	2013/04/14	2014/04/13

3.7. Summary of Test Result

No deviations from the test standards

Test Item	Test Requirement	Standard Paragraph	Result
Radiated Emission	FCC PART 15	Section 15.109	PASS
Conducted Emission	FCC PART 15	Section 15.107	PASS

3.8. Test Software

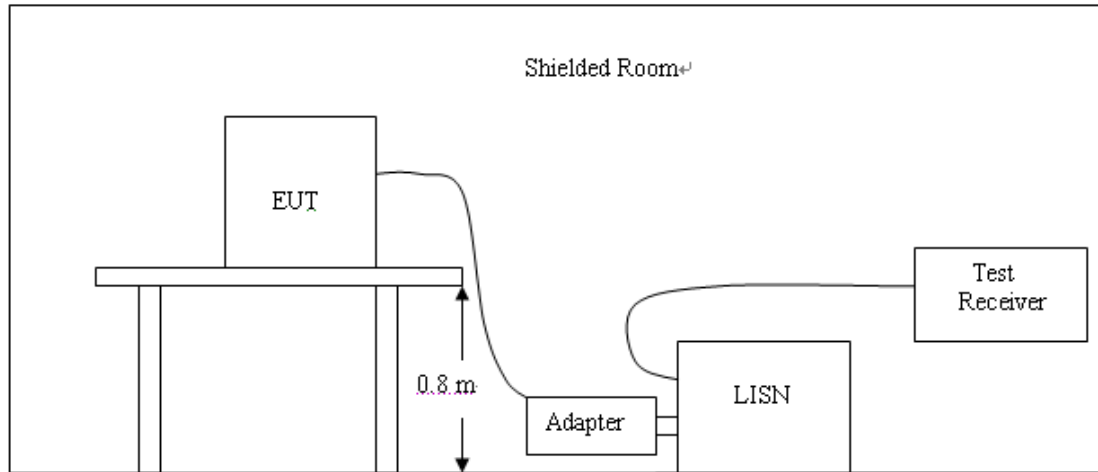
There was no software used during the tests.



4. TEST CONDITIONS AND RESULTS

4.1. Conducted Emissions Test

TEST CONFIGURATION



TEST PROCEDURE

For unintentional device, according to § 15.107(a) Line Conducted Emission Limits is as following:

Frequency (MHz)	Maximum RF Line Voltage (dB μ v)			
	CLASS A		CLASS B	
	Q.P.	Ave.	Q.P.	Ave.
0.15 - 0.50	79	66	66-56*	56-46*
0.50 - 5.00	73	60	56	46
5.00 - 30.0	73	60	60	50

* Decreasing linearly with the logarithm of the frequency

For intentional device, according to §15.207(a) Line Conducted Emission Limit is same as above table.

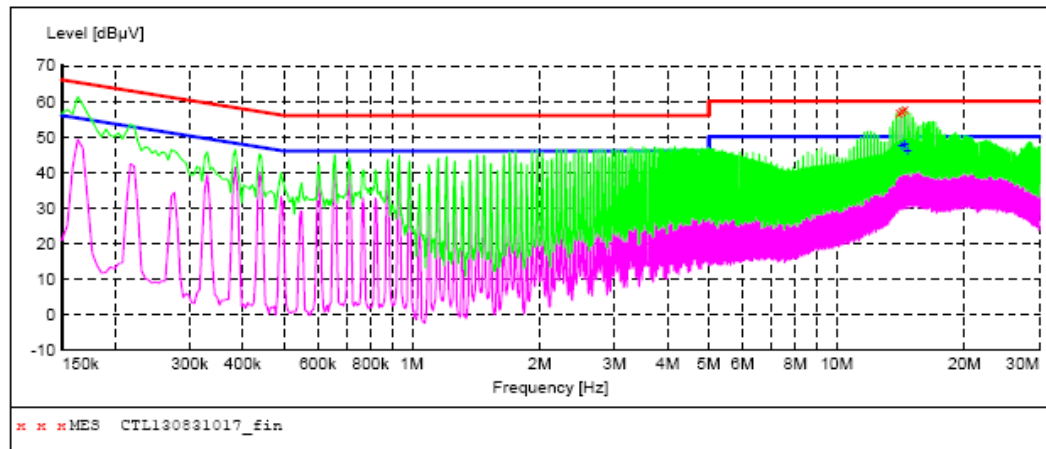
1. Please follow the guidelines in ANSI C63.4-2003.
2. The EUT was placed 0.4 meter from the conducting wall of the shielding room was kept at least 80 centimeters from any other grounded conducting surface.
3. Connect EUT to the power mains through a line impedance stabilization network (LISN).
4. All the support units are connecting to the other LISN.
5. The LISN provides 50 ohm coupling impedance for the measuring instrument.
6. The FCC states that a 50 ohm, 50 microhenry LISN should be used.
7. Both sides of AC line were checked for maximum conducted interference.
8. The frequency range from 150 kHz to 30 MHz was searched.
9. Set the test-receiver system to Peak Detect Function and specified bandwidth with Maximum Hold Mode.

The RBW/VBW for 150KHz to 30MHz: 9KHz

TEST RESULTS**Charging mode:**

SCAN TABLE: "Voltage (9K-30M)FIN"

Short Description: 150K-30M Voltage



MEASUREMENT RESULT: "CTL130831017_fin"

8/31/2013 10:16AM

Frequency MHz	Level dBuV	Transd dB	Limit dBuV	Margin dB	Detector	Line	PE
14.014500	57.10	10.3	60	2.9	QP	N	GND
14.235000	57.60	10.3	60	2.4	QP	N	GND
14.451000	57.80	10.3	60	2.2	QP	N	GND

MEASUREMENT RESULT: "CTL130831017_fin2"

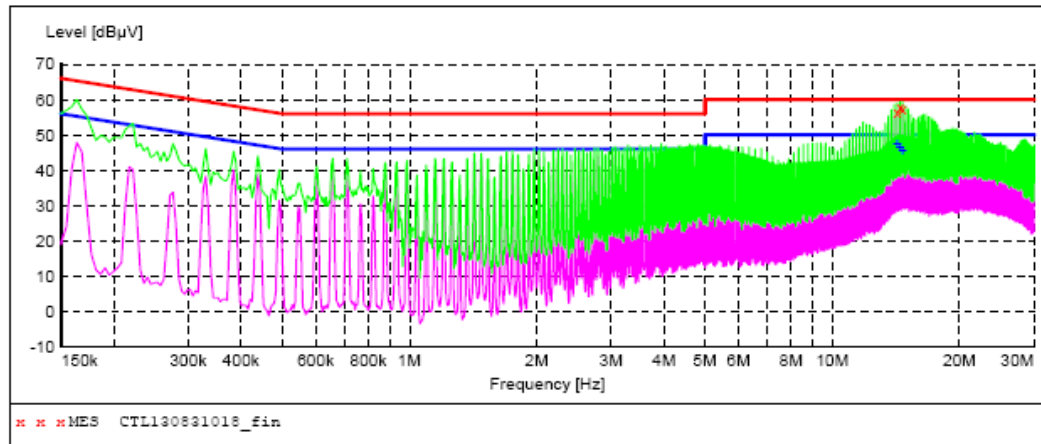
8/31/2013 10:16AM

Frequency MHz	Level dBuV	Transd dB	Limit dBuV	Margin dB	Detector	Line	PE
14.235000	47.50	10.3	50	2.5	AV	N	GND
14.451000	47.70	10.3	50	2.3	AV	N	GND
14.671500	46.20	10.3	50	3.8	AV	N	GND



SCAN TABLE: "Voltage (9K-30M)FIN"

Short Description: 150K-30M Voltage

**MEASUREMENT RESULT: "CTL130831018_fin"**

8/31/2013 10:19AM

Frequency MHz	Level dBuV	Transd dB	Limit dBuV	Margin dB	Detector	Line	PE
14.235000	56.60	10.3	60	3.4	QP	L1	GND
14.451000	58.10	10.3	60	1.9	QP	L1	GND
14.671500	57.20	10.3	60	2.8	QP	L1	GND

MEASUREMENT RESULT: "CTL130831018_fin2"

8/31/2013 10:19AM

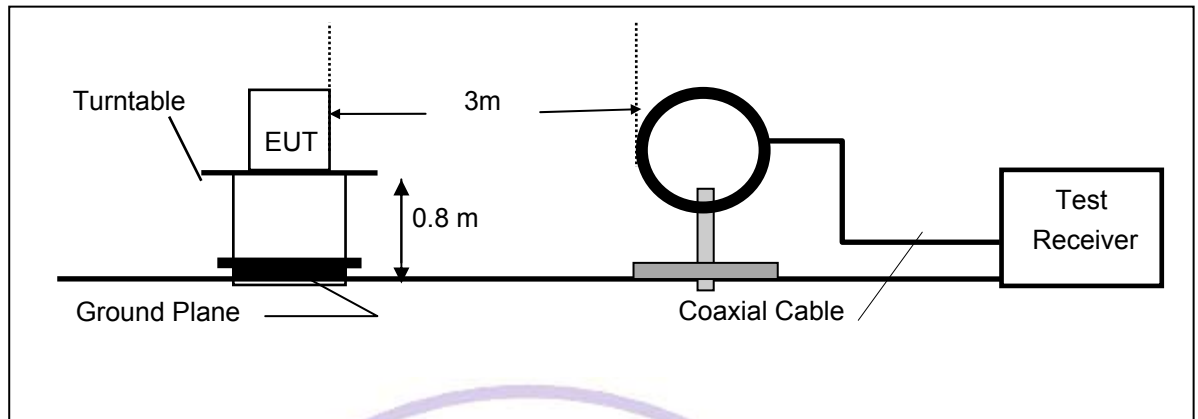
Frequency MHz	Level dBuV	Transd dB	Limit dBuV	Margin dB	Detector	Line	PE
14.235000	47.50	10.3	50	2.5	AV	L1	GND
14.451000	46.60	10.3	50	3.4	AV	L1	GND
14.671500	45.60	10.3	50	4.4	AV	L1	GND



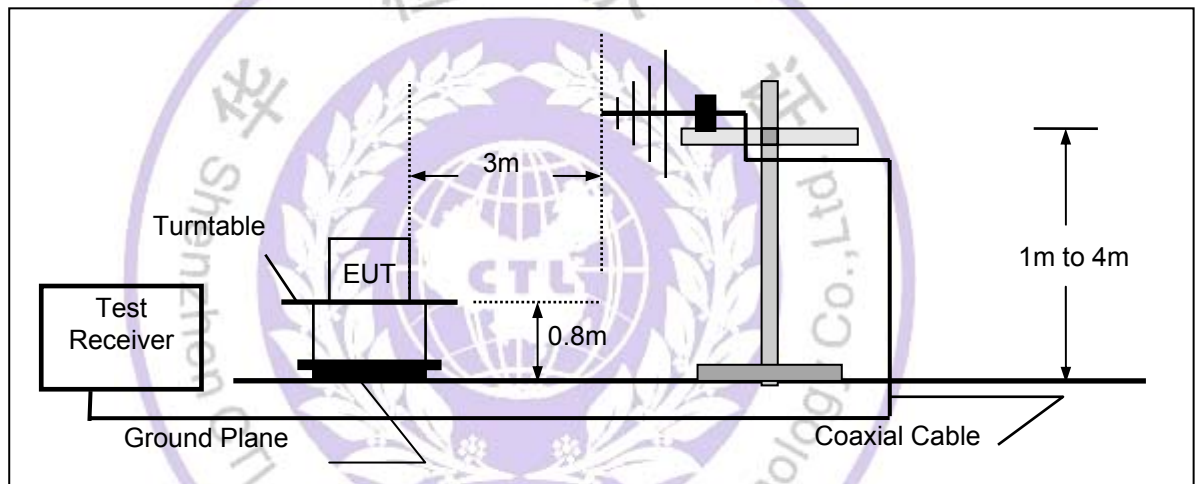
4.2. Radiated Emissions Test

TEST CONFIGURATION

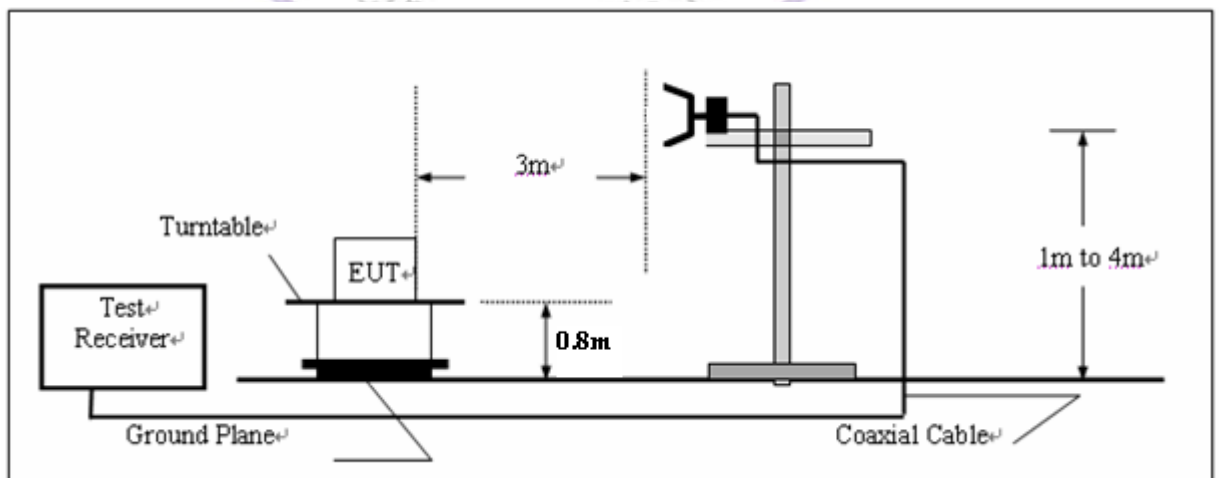
(A) Radiated Emission Test Set-Up, Frequency Below 30MHz



(B) Radiated Emission Test Set-Up, Frequency Below 1000MHz



(C) Radiated Emission Test Set-Up, Frequency above 1000MHz



LIMIT

The emissions from an intentional radiator shall not exceed the field strength levels specified in the following table:

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 – 216	150	3
216 - 960	200	3
Above 960	500	3

FIELD STRENGTH CALCULATION

The field strength is calculated by adding the Antenna Factor and Cable Factor and subtracting the Amplifier Gain and Duty Cycle Correction Factor(if any) from the measured reading. The basic equation with a sample calculation is as follows:

$$FS = RA + AF + CL - AG$$

Where FS = Field Strength	CL = Cable Attenuation Factor (Cable Loss)
RA = Reading Amplitude	AG = Amplifier Gain
AF = Antenna Factor	

TEST PROCEDURE

1. The testing follows the guidelines in ANSI C63.4-2003.
2. The EUT was placed on a turn table which is 0.8m above ground plane.
3. Maximum procedure was performed by raising the receiving antenna from 1m to 4m and rotating the turn table from 0° to 360° to acquire the highest emissions from EUT
4. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
5. Repeat above procedures until all frequency measurements have been completed.
6. Based on the Frequency Generator in the device include 32KHz, 26MHz, so the test frequency range from 9KHz to 1GHz per FCC PART 15.33(a) and 1.33(b)(1).

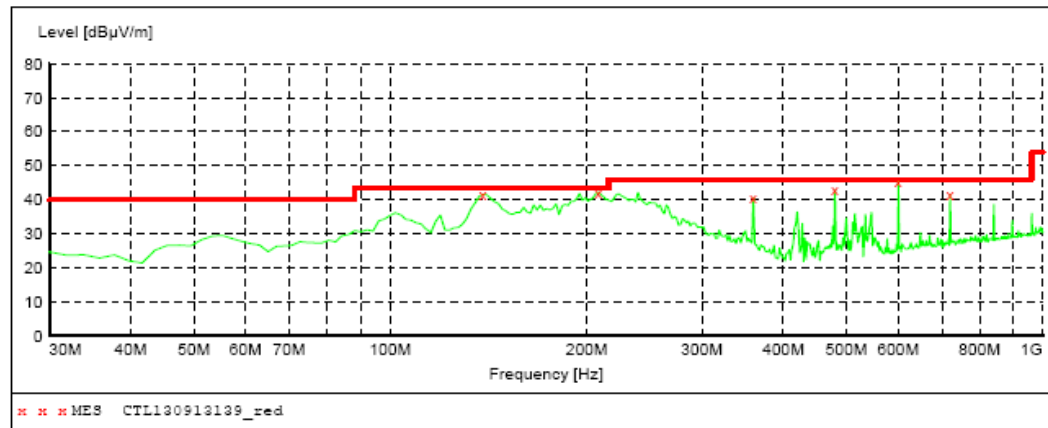
TEST RESULTS

All the test modes (TM1, TM2) completed for test. The worst case of Radiated Emission is mode 1; the test data of this mode was reported.

TM 1:

SWEEP TABLE: "test (30M-1G)"

Short Description:		Field Strength			
Start	Stop	Detector	Meas.	IF	Transducer
Frequency	Frequency		Time	Bandw.	
30.0 MHz	1.0 GHz	MaxPeak	300.0 ms	120 kHz	JB1



MEASUREMENT RESULT: "CTL130913139_red"

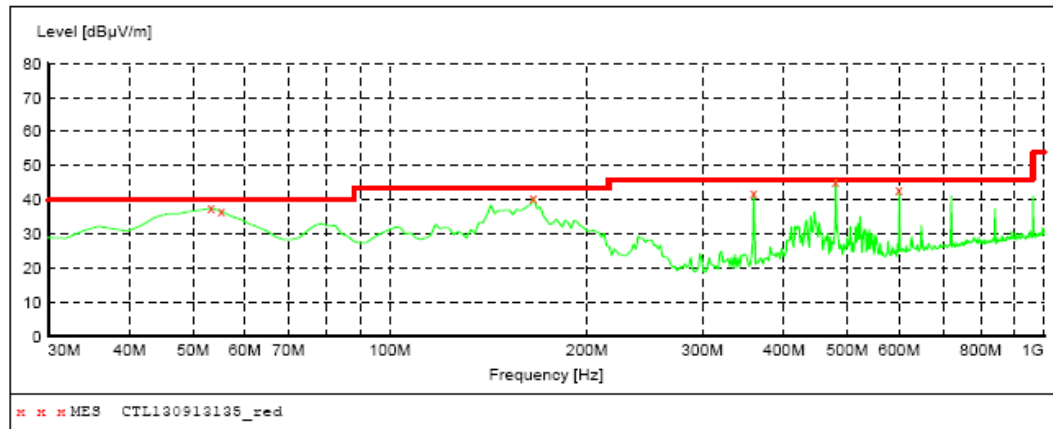
9/13/2013 1:22PM

Frequency MHz	Level dBμV/m	Transd dB	Limit dBμV/m	Margin dB	Det.	Height cm	Azimuth deg	Polarization
138.640000	41.60	14.7	43.5	1.9	---	0.0	0.00	HORIZONTAL
208.480000	42.30	14.3	43.5	1.2	---	0.0	0.00	HORIZONTAL
359.800000	40.60	17.3	46.0	5.4	---	0.0	0.00	HORIZONTAL
480.080000	42.80	20.1	46.0	3.2	---	0.0	0.00	HORIZONTAL
600.360000	45.20	21.8	46.0	0.8	---	0.0	0.00	HORIZONTAL
720.640000	41.50	23.7	46.0	4.5	---	0.0	0.00	HORIZONTAL



SWEEP TABLE: "test (30M-1G)"

Short Description:		Field Strength			
Start	Stop	Detector	Meas.	IF	Transducer
Frequency	Frequency		Time	Bandw.	
30.0 MHz	1.0 GHz	MaxPeak	300.0 ms	120 kHz	JB1

***MEASUREMENT RESULT: "CTL130913135_red"***

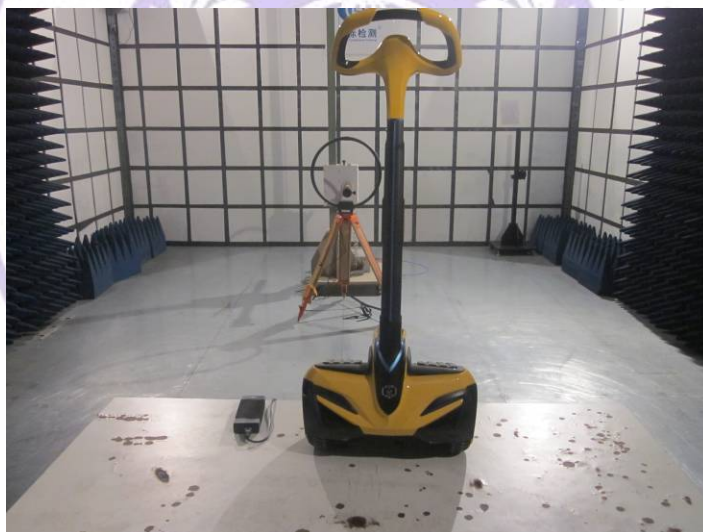
9/13/2013 12:45PM

Frequency MHz	Level dBuV/m	Transd dB	Limit dBuV/m	Margin dB	Det.	Height cm	Azimuth deg	Polarization
53.280000	37.60	8.3	40.0	2.4	---	0.0	0.00	VERTICAL
55.220000	36.60	8.3	40.0	3.4	---	0.0	0.00	VERTICAL
165.800000	40.50	13.8	43.5	3.0	---	0.0	0.00	VERTICAL
359.800000	42.20	17.3	46.0	3.8	---	0.0	0.00	VERTICAL
480.080000	45.60	20.1	46.0	0.4	---	0.0	0.00	VERTICAL
600.360000	43.10	21.8	46.0	2.9	---	0.0	0.00	VERTICAL

Remark:

- (1) Measuring frequencies from 9 KHz to the 1GHz, Loop Antenna used below 30MHz. See Section 3.6 table item 20. Radiated emission test from 9KHz to 30MHz, above 1GHz were verified, and no any emission was found except system noise floor.
- (2) "F" denotes fundamental frequency; "H" denotes spurious frequency. "E" denotes band edge frequency.
- (3) * denotes emission frequency which appearing within the Restricted Bands specified in provision of 15.205, then the general radiated emission limits in 15.209 apply.
- (4) Datas of measurement within this frequency range shown "-" in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured. The test results from 9KHz to 30MHz, above 1GHz are not reported because the emissions levels that are 20dB below the official limit.
- (5) The IF bandwidth of EMI Test Receiver between 30MHz to 1GHz was 100KHz. Below 30MHz was 10KHz. Above 1GHz was 1MHz.

5. Test Setup Photos of the EUT





6. External and Internal Photos of the EUT

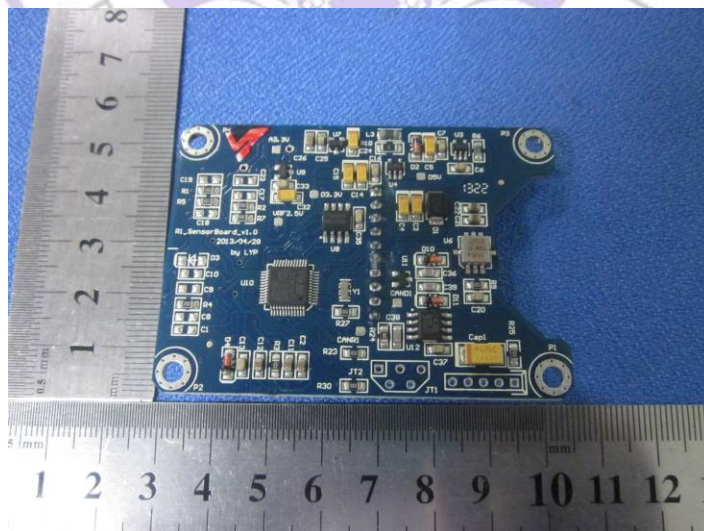
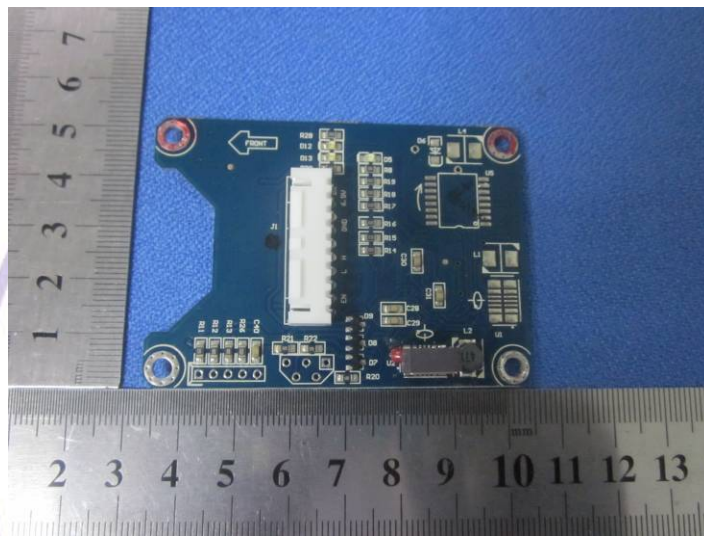
External Photos of EUT

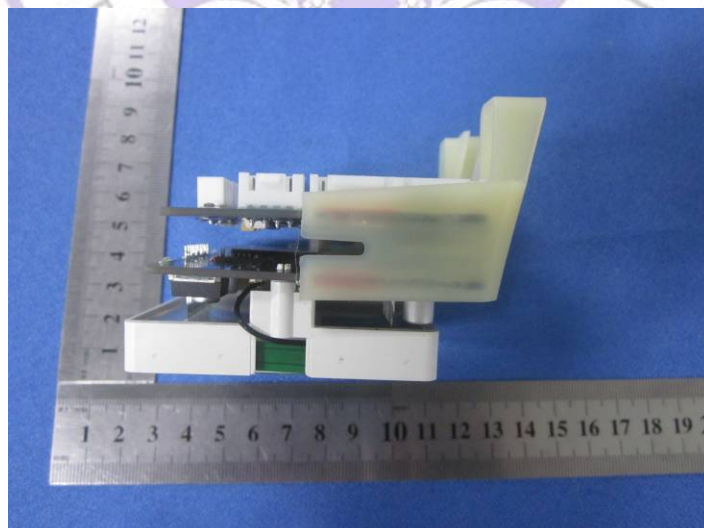
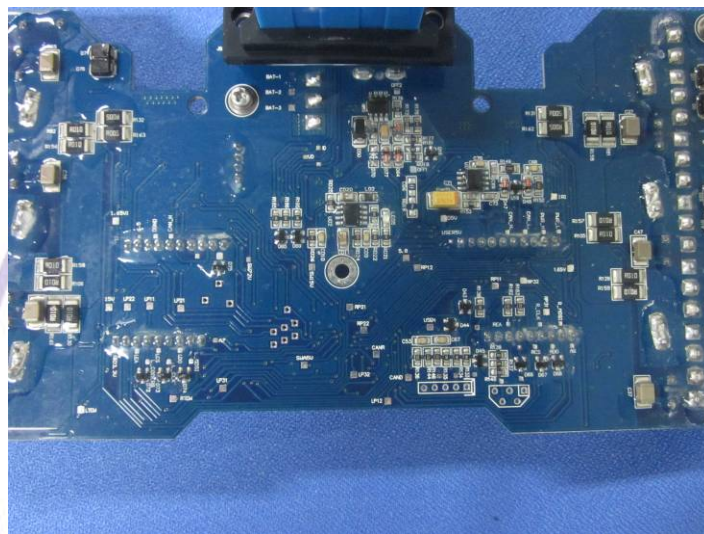
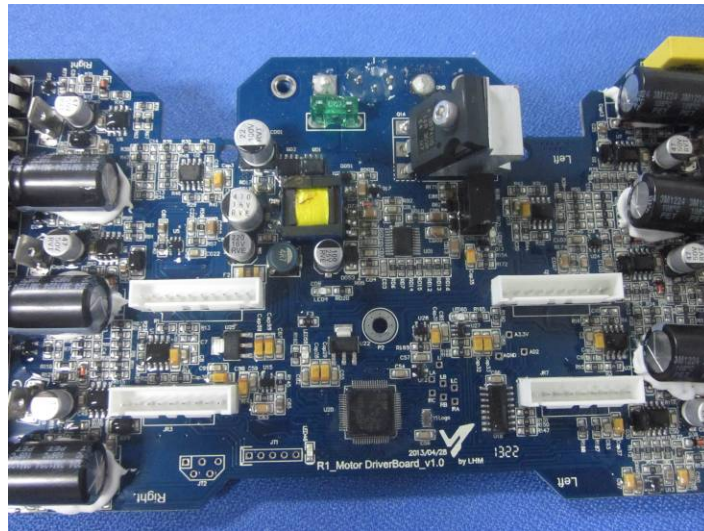


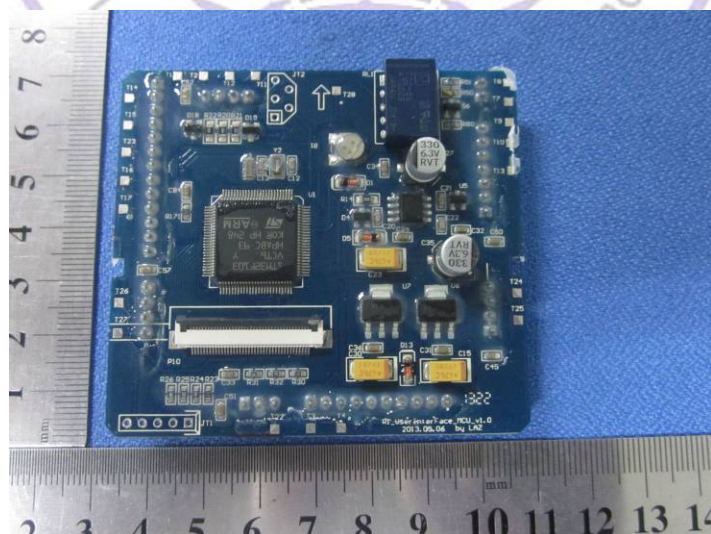
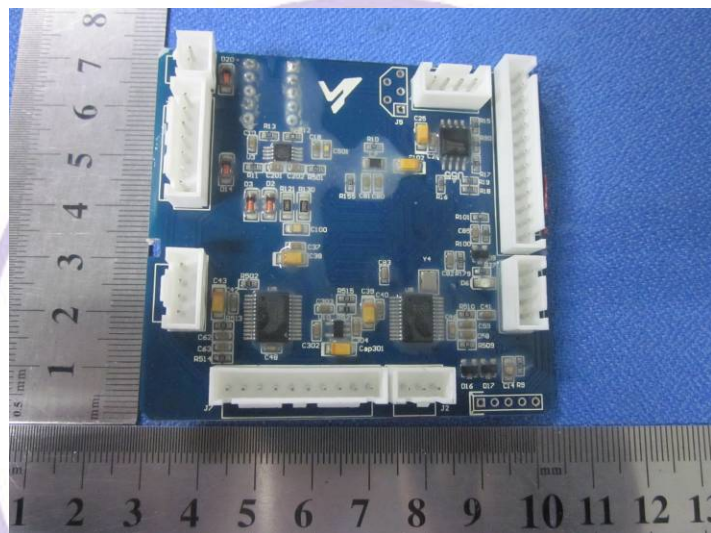
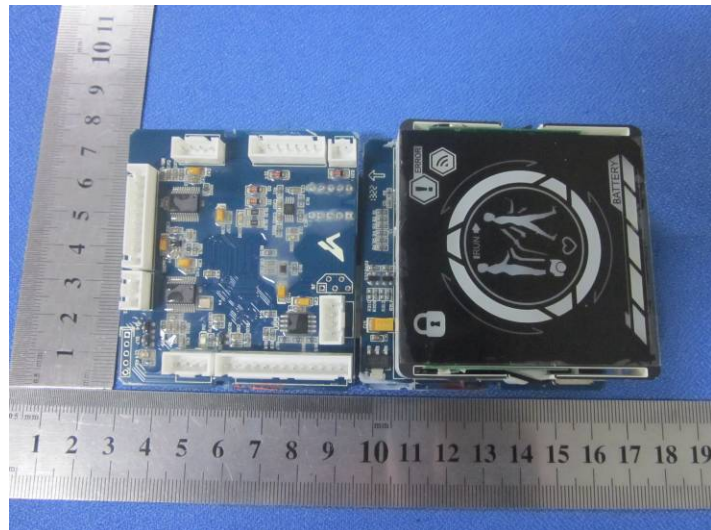


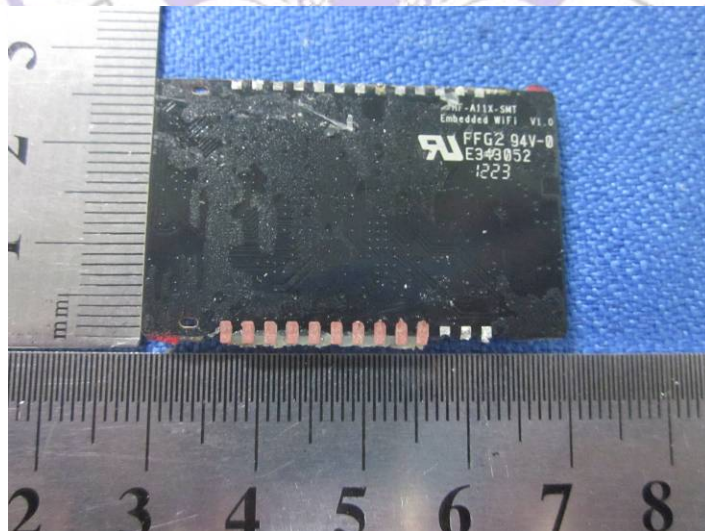
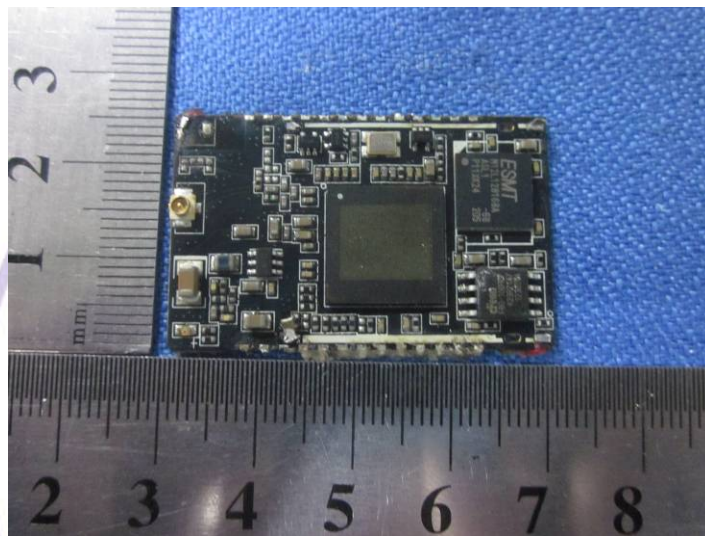
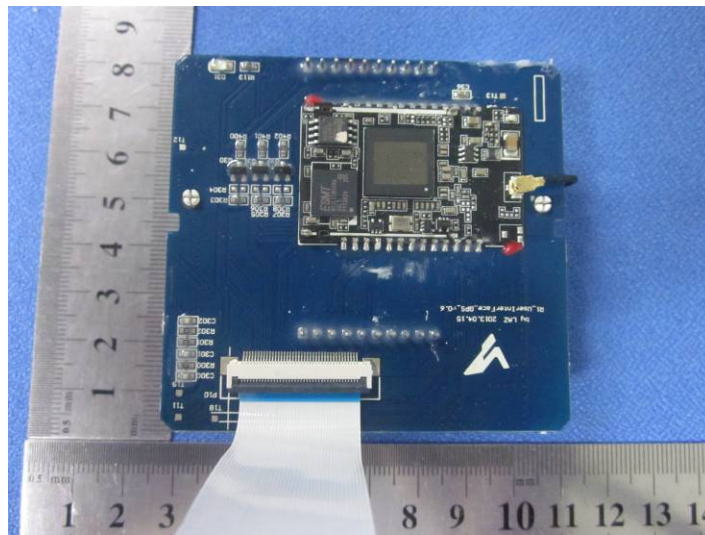


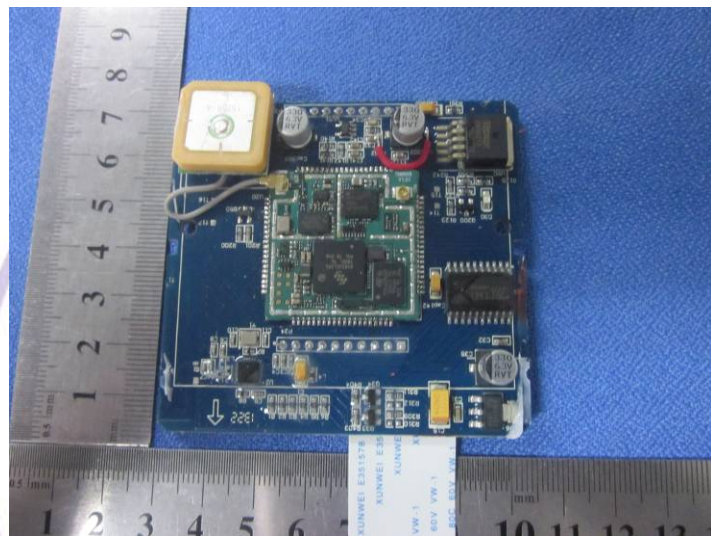
Internal Photos of EUT

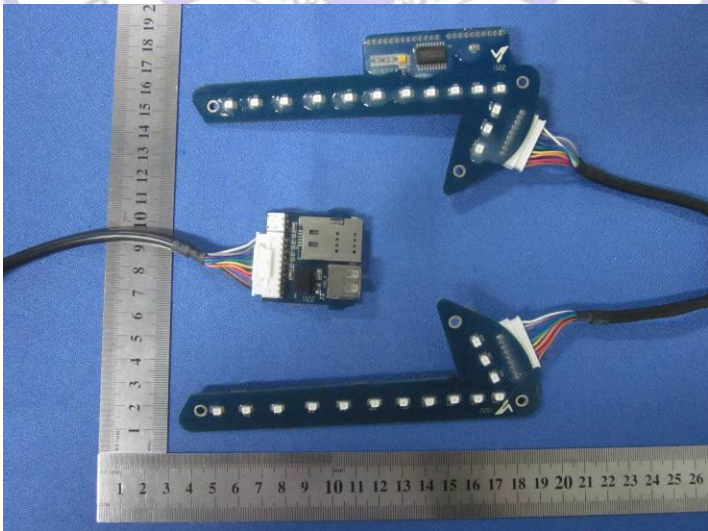
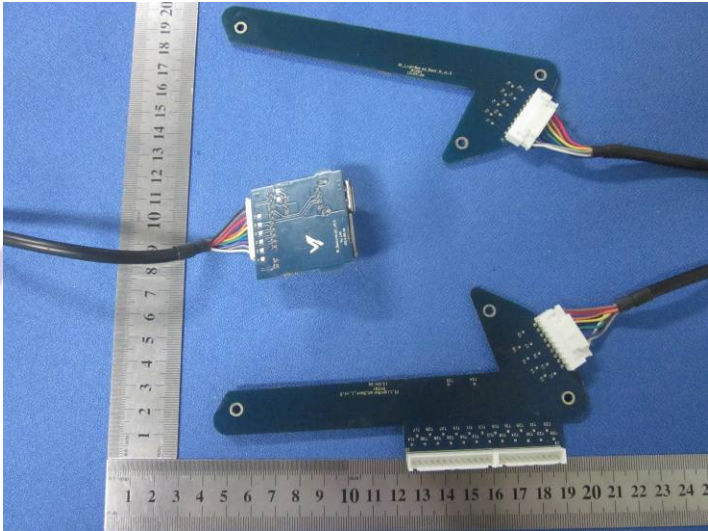
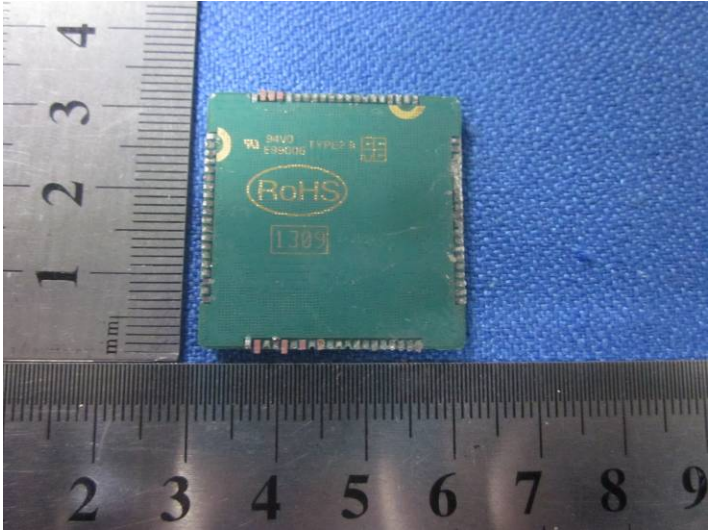


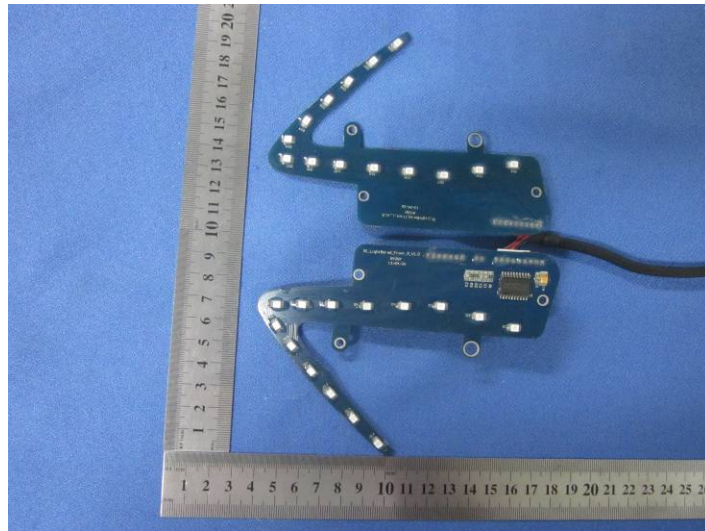












.....End of Report.....