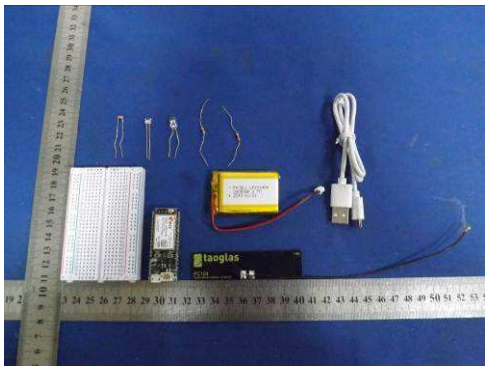
Test Lab
Cert 2951.01

TEST REPORT

Applicant	Particle Industries, Inc
Address	1400 Tennessee St, #4 San Francisco, CA 94107

Manufacturer or Supplier	Particle Industries, Inc
Address	1400 Tennessee St, #4 San Francisco, CA 94107
Product	ELECTRON
Brand Name	Particle
Model	G350
Additional Model & Model Difference	N/A
Date of tests	Dec. 01, 2015 ~ Jan. 26, 2016



The submitted sample of the above equipment has been tested according to the following European Directive - Radio Equipment and Telecommunications Terminal Equipment directive 1999/5/EC article 3.1(b) and the requirements of the following standards:

☒ **EN 301 489-1 V1.9.2 (2011-09)**
☒ **EN 301 489-7 V1.3.1 (2005-11)**

CONCLUSION: The submitted sample was found to COMPLY with the test requirement

Tested by Tom Chen Project Engineer / EMC Department	Approved by Madison Luo Supervisor / EMC Department
Tom	Date: Jan. 26, 2016

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RELEASE CONTROL RECORD

ISSUE NO.	REASON FOR CHANGE	DATE ISSUED
RM151201N020	Original release	Jan. 26, 2016

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1 SUMMARY OF TEST RESULTS

After estimating all the combination of every test mode, the result shown as below is the worst case.

The EUT has been tested according to the following specifications.

EMISSION			
Standard	**Test Type**	**Result**	**Remarks**
EN 55022:2010 + AC:2011, Class B	Radiated test (30MHz-1GHz)	PASS	Meets limits minimum passing margin is -4.31dB at 136.700MHz
	Radiated test (Above 1GHz)	PASS	Meet the requirement of limit. Minimum passing margin is -14.20dB at 1943.600MHz.

IMMUNITY			
Standard	**Test Type**	**Result**	**Remarks**
EN 61000-4-2:2009	Electrostatic discharge immunity test	PASS	Meets the requirements of Performance Criterion CT/CR
EN 61000-4-3:2006 + A1:2008 + A2:2010	Radiated, radio-frequency, electromagnetic field immunity test	PASS	Meets the requirements of Performance Criterion CT/CR

1.1 MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4-2:

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

Measurement	Frequency	Uncertainty
Radiated emissions	30MHz ~ 1GHz	+/- 4.10 dB
	1GHz ~ 6GHz	+/- 5.04 dB

2 GENERAL INFORMATION

2.1 GENERAL DESCRIPTION OF EUT

EUT	ELECTRON
MODEL NO.	G350
ADDITIONAL MODEL	N/A
POWER SUPPLY	DC 3.7V from Li-ion battery or DC 5V from Host Unit
DATA CABLE SUPPLIED	N/A
THE HIGHEST OPERATING FREQUENCY	1900MHz
I/O PORT	Refer to user's manual

NOTE:

1. For a more detailed features description, please refer to the manufacturer's specifications or the user's manual.
2. For the test results, the EUT had been tested with all conditions, but only the worst case was shown in test report.
3. Please refer to the EUT photo document (Reference No.: 151201N020) for detailed product photo.

2.2 DESCRIPTION OF TEST MODE

The EUT was tested under the following modes.

Test Mode	Test Condition
RADIATED EMISSION TESTS	
1	E-GSM900 link
2	**DCS 1800MHz link**
IMMUNITY TESTS	
1	**E-GSM900 link**
2	**DCS 1800MHz link**

2.3 GENERAL DESCRIPTION OF APPLIED STANDARD

The EUT is a RF product. According to the specifications of the manufacturer, it must comply with the requirements of the following standards:

EN 301 489-1 V1.9.2 (2011-09)

EN 301 489-7 V1.3.1 (2005-11)

EN 55022:2010 + AC:2011, Class B

EN 61000-4-2:2009

EN 61000-4-3:2006 + A1:2008 + A2:2010

Note: The above EN basic standards are applied with latest version if customer has no special requirement.

2.4 DESCRIPTION OF SUPPORT UNIT

The EUT has been tested as an independent unit without any other necessary accessory or support units.

3 EMISSION TEST

3.1 RADIATED EMISSION MEASUREMENT

3.1.1 LIMITS OF RADIATED EMISSION MEASUREMENT

TEST STANDARD: EN 55022 Class B
FOR FREQUENCY BELOW 1GHz

FREQUENCY (MHz)	Class A (at 10m) Quasi-Peak (dBuV/m)	Class B (at 10m) Quasi-Peak(dBuV/m)
30 – 230	40	30
230 – 1000	47	37

FREQUENCY RANGE OF RADIATED MEASUREMENT
(For unintentional radiators)

Highest frequency generated or Upper frequency of measurement used in the device or on which the device operates or tunes (MHz)	Range (MHz)
Below 108	1000
108 – 500	2000
500 – 1000	5000
Above 1000	Up to 5 times of the highest frequency or 6 GHz, whichever is less

FOR FREQUENCY ABOVE 1GHz

FREQUENCY (GHz)	Class A (dBuV/m) (at 3m)		Class B (dBuV/m) (at 3m)	
	PEAK	AVERAGE	PEAK	AVERAGE
1 to 3	76	56	70	50
3 to 6	80	60	74	54

NOTE: 1. The lower limit shall apply at the transition frequencies.
2. Emission level (dBuV/m) = 20 log Emission level (uV/m).
3. All emanation from a class A/B digital device or system, including any network of conductors and apparatus connected thereto, shall not exceed the level of field strengths specified above.

3.1.2 TEST INSTRUMENTS

FREQUENCY BELOW 1GHz

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
EMI Test Receiver	Rohde&Schwarz	ESCI	100962	Mar. 05,15	Mar. 04,16
EMI Test Receiver	Rohde&Schwarz	ESCI	101418	Mar. 05,15	Mar. 04,16
Trilog-Broadband Antenna	SCHWARZBECK	VULB 9168	9168-555	Nov. 20, 15	Nov. 19, 16
Trilog-Broadband Antenna	SCHWARZBECK	VULB 9168	9168-554	Dec. 30, 15	Dec. 29, 16
Bilog Antenna	Teseq	CBL 6111D	27089	Jun. 25,15	Jun. 24,16
Signal Amplifier	Agilent	8447D	2944A10488	Jun. 25,15	Jun. 24,16
Signal Amplifier	Agilent	8447D	2944A11174	Jun. 25,15	Jun. 24,16
10m Semi-anechoic Chamber	CHANGLING	21.4m*12.1m*8.8m	NSEMC006	Jun. 10, 15	Jun. 09, 16
Test Software	ADT	ADT_Radiated_V8.7.x	N/A	N/A	N/A

Frequency Range above 1GHz

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
Signal and Spectrum Analyzer	Rohde&Schwarz	FSV40	101003	Apr. 07, 15	Apr. 06, 16
Pre-Amplifier (100MHz-26.5GHz)	EMCI	EMC 012645	980077	May 26,15	May 25,16
Pre-Amplifier (18GHz-40GHz)	EMCI	EMC 184045	980102	Nov. 11,15	Nov. 10,16
Test Software	ADT	ADT_Radiated_V8.7.x	N/A	N/A	N/A

NOTE: 1. The calibration interval of the above test instruments is 12 months. And the calibrations are traceable to CEPREI/CHINA, GRGT/CHINA and NIM/CHINA.
2. The test was performed in 10m Chamber.

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
Horn Antenna	ETS-Lindgren	3117	00085519	Dec. 30, 15	Dec. 29, 16

NOTE: 1. The calibration interval of the above test instruments is 24 months. And the calibrations are traceable to CEPREI/CHINA, GRGT/CHINA and NIM/CHINA.
2. The test was performed in 10m Chamber.

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
Horn Antenna	SCHWARZBECK	BBHA 9170	BBHA9170242	Feb. 13,14	Feb. 12,17

NOTE: 1. The calibration interval of the above test instruments is 36 months. And the calibrations are traceable to CEPREI/CHINA, GRGT/CHINA and NIM/CHINA.
2. The test was performed in 10m Chamber.

3.1.3 TEST PROCEDURE

<Frequency Range below 1GHz>

a. The EUT was placed on the top of a rotating table 0.8 meters above the ground In a 10 meter Semi-anechoic chamber room. The table was rotated 360 degrees to determine the position of the highest radiation.

b. The EUT was set 10 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.

c. The height of antenna is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.

d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the turn table was turned from 0 degrees to 360 degrees to find the maximum reading.

e. The test-receiver system was set to quasi-peak detect function and specified bandwidth with maximum hold mode when the test frequency is below 1 GHz.

NOTE:

1. The resolution bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection (QP) at frequency below 1GHz.
2. Emission level(dBuV/m)=Raw Value(dBuV) + Correction Factor(dB/m)
3. Correction Factor(dB/m) = Antenna Factor (dB/m) + Cable Factor (dB) (if the raw value not contains the amplifier);
4. Correction Factor(dB/m) = Antenna Factor (dB/m) + Cable Factor (dB) – Amplifier Gain(dB) (if the raw value contains the amplifier).
5. Margin value = Emission level – Limit value.

<Frequency Range above 1GHz>

a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 10 meter Semi-anechoic chamber room. The table was rotated 360 degrees to determine the position of the highest radiation.

b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.

c. The height of antenna can be varied from one meter-to four meters, the height of adjustment depends on the EUT height and the antenna 3dB beamwidth both, to detect the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement. The bore sight should be used during the test above 1GHz.

d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.

e. The test receiver/spectrum was set to peak and average detect function and specified bandwidth with maximum hold mode when the test frequency is above 1 GHz.

NOTE:

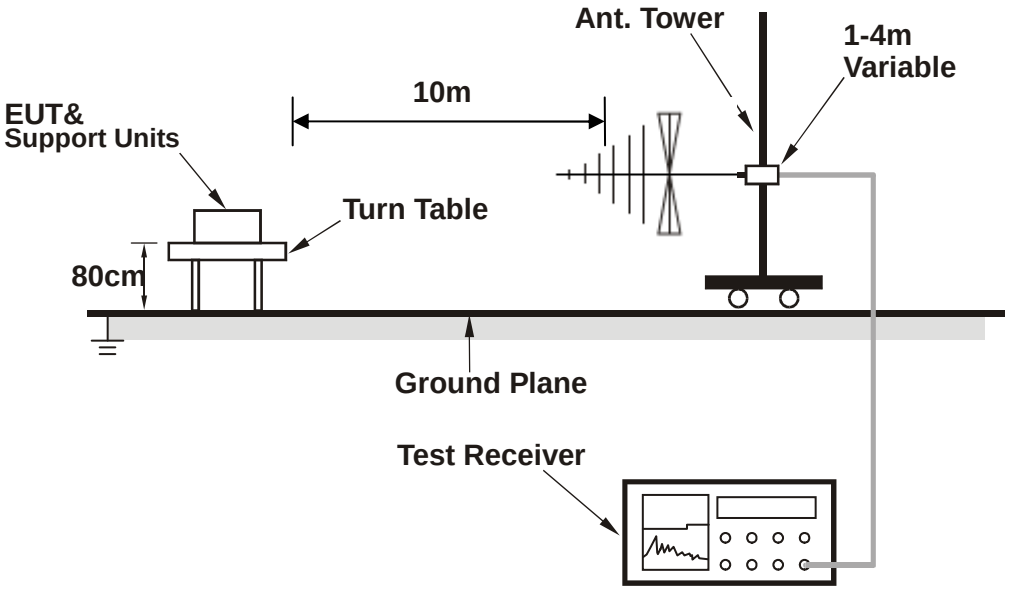
1. The resolution bandwidth is 1MHz and video bandwidth of test receiver/spectrum analyzer is 3MHz for Peak detection at frequency above 1GHz. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz for Average detection (AV) at frequency above 1GHz.
2. For measurement of frequency above 1000 MHz, the EUT was set 3 meters away from the receiver antenna.
3. Emission level(dBuV/m)=Raw Value(dBuV) + Correction Factor(dB/m);
4. Correction Factor(dB/m) = Antenna Factor (dB/m) + Cable Factor (dB) (if the raw value not contains the amplifier);
5. Correction Factor(dB/m) = Antenna Factor (dB/m) + Cable Factor (dB) – Amplifier Gain(dB) (if the raw value contains the amplifier);
6. Margin value = Emission level – Limit value.

3.1.4 DEVIATION FROM TEST STANDARD

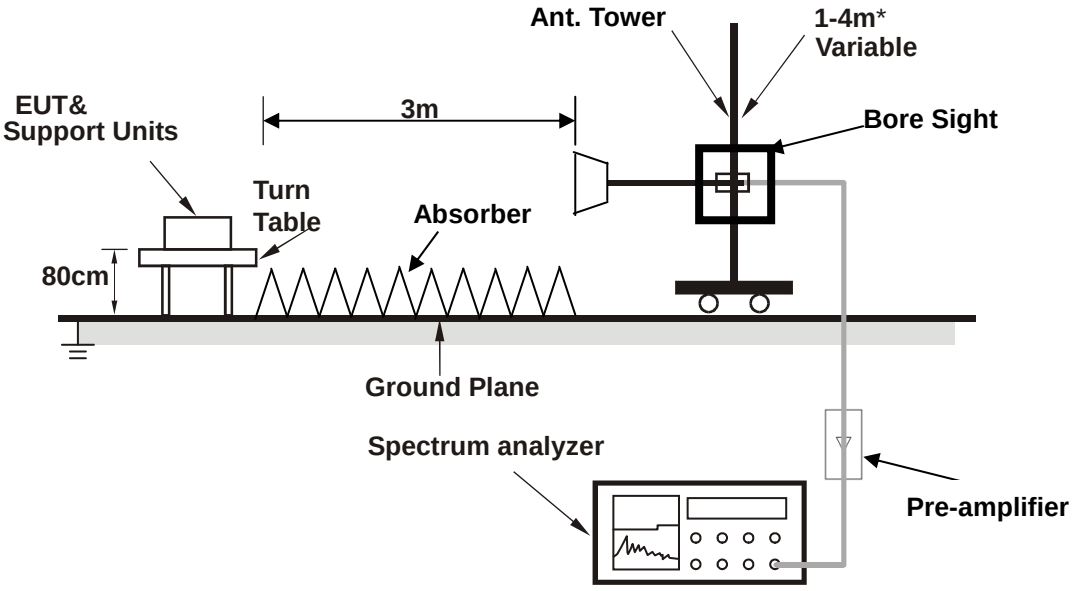
No deviation.

3.1.5 TEST SETUP

<Frequency Range below 1GHz>



<Frequency Range above 1GHz>



***** : depends on the EUT height and the antenna 3dB beamwidth both, refer to section 7.3 of CISPR 16-2-3

3.1.6 EUT OPERATING CONDITIONS

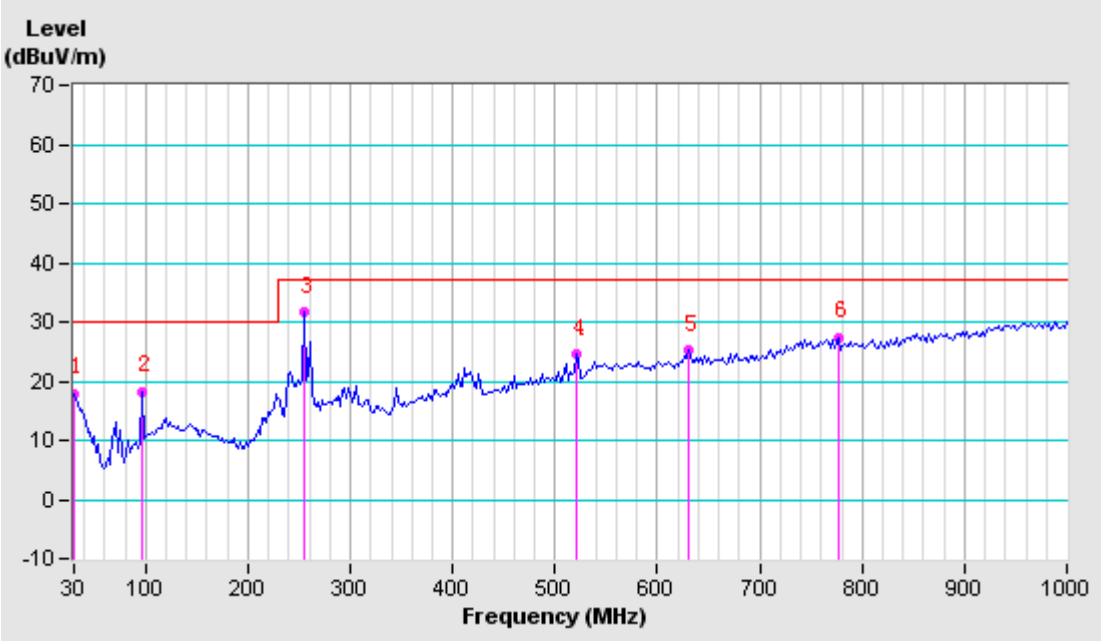
Same as item 3.1.6.

3.1.7 TEST RESULTS (BELOW 1GHZ)

TEST MODE	DCS 1800MHz link	**FREQUENCY RANGE**	30-1000 MHz
TEST VOLTAGE	DC 3.7V from battery	**DETECTOR FUNCTION & BANDWIDTH**	Quasi-Peak, 120kHz
ENVIRONMENTAL CONDITIONS	20deg. C, 55% RH	**TESTED BY**: Ian xie	

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 10 M								
No.	Freq. (MHz)	Correction Factor (dB/m)	Raw Value （dBuV）	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)
1	30.000	-8.39	26.33	17.94	30.00	-12.06	300	38
2	95.960	-16.75	35.01	18.26	30.00	-11.74	300	227
3	255.040	-11.76	43.30	31.54	37.00	-5.46	400	70
4	520.820	-6.83	31.24	24.41	37.00	-12.59	200	80
5	629.460	-3.61	28.73	25.12	37.00	-11.88	400	31
6	776.900	-0.33	27.69	27.36	37.00	-9.64	100	26

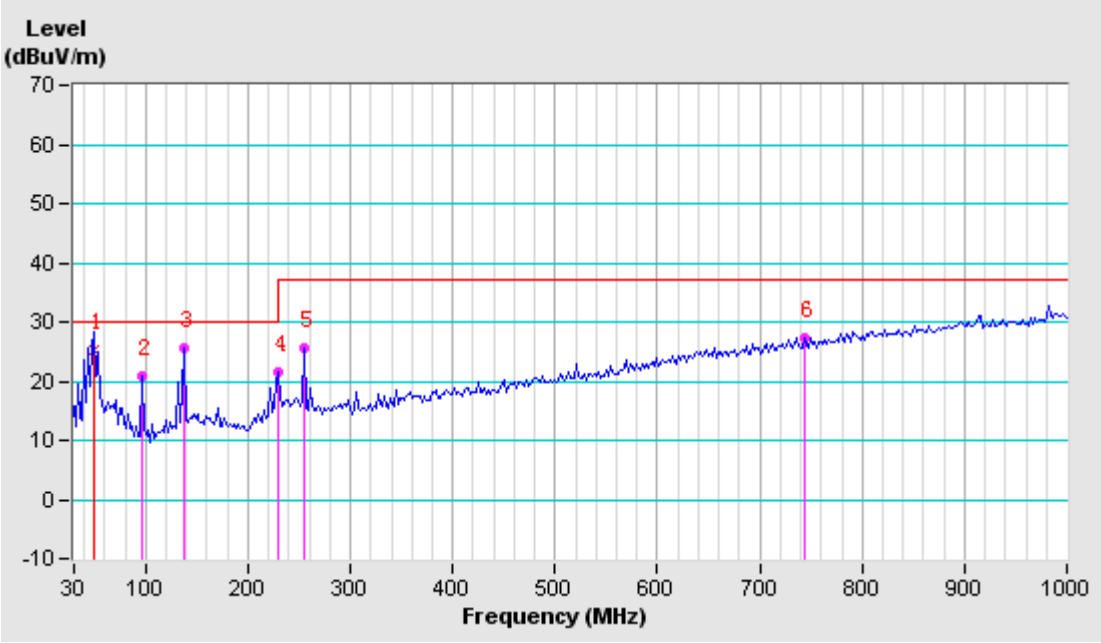
REMARKS: 1. Peak detector quick scan is showed on the graph and final quasi-peak detector data is measured corresponding to relevant limit and recorded in the data table.
2. Negative sign (-) in the margin column signify levels below the limit.
3. Frequency range scanned: 30MHz to 1000MHz.
4. Only emissions significantly above equipment noise floor are reported.



TEST MODE	DCS 1800MHz link	**FREQUENCY RANGE**	30-1000 MHz
TEST VOLTAGE	DC 3.7V from battery	**DETECTOR FUNCTION & BANDWIDTH**	Quasi-Peak, 120kHz
ENVIRONMENTAL CONDITIONS	20deg. C, 55% RH	**TESTED BY**: Ian xie	

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 10 M								
No.	Freq. (MHz)	Correction Factor (dB/m)	Raw Value （dBuV）	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)
1	50.100	-13.24	38.44	25.20	30.00	-4.80	100	310
2	95.960	-17.35	38.29	20.94	30.00	-9.06	200	338
3	**136.700**	**-13.79**	**39.48**	**25.69**	**30.00**	**-4.31**	**100**	**357**
4	229.820	-13.69	35.14	21.45	30.00	-8.55	100	357
5	255.040	-12.47	38.21	25.74	37.00	-11.26	400	49
6	743.920	0.09	27.24	27.33	37.00	-9.67	400	23

REMARKS: 1. Peak detector quick scan is showed on the graph and final quasi-peak detector data is measured corresponding to relevant limit and recorded in the data table.
2. Negative sign (-) in the margin column signify levels below the limit.
3. Frequency range scanned: 30MHz to 1000MHz.
4. Only emissions significantly above equipment noise floor are reported.



3.1.8 TEST RESULTS (ABOVE 1GHz)

TEST MODE	DCS 1800MHz link	**FREQUENCY RANGE**	1GHz-6GHz
TEST VOLTAGE	DC 3.7V from battery	**DETECTOR FUNCTION & BANDWIDTH**	Peak , Average, 1MHz
ENVIRONMENTAL CONDITIONS	21deg. C, 50% RH	**TESTED BY**: Ian xie	

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
No.	Freq. (MHz)	Correction Factor (dB/m)	Raw Value （dBuV）	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)
1	**1943.600 PK**	**-5.76**	**61.56**	**55.80**	**74.00**	**-14.20**	**192**	**143**
2	1943.600 AV	-5.76	31.66	25.90	54.00	-24.10	192	143
3	4037.800 PK	0.02	55.58	55.60	74.00	-18.40	172	188
4	4037.800 AV	0.02	25.18	25.20	54.00	-28.80	172	188
5	5043.230 PK	1.35	54.15	55.50	74.00	-18.50	163	129
6	5043.230 AV	1.35	23.75	25.10	54.00	-28.90	163	129

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
No.	Freq. (MHz)	Correction Factor (dB/m)	Raw Value （dBuV）	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)
1	1678.600 PK	-8.15	63.35	55.20	70.00	-14.80	182	165
2	1678.600 AV	-8.15	33.45	25.30	50.00	-24.70	182	165
3	3867.000 PK	-0.33	56.23	55.90	74.00	-18.10	146	163
4	3867.000 AV	-0.33	26.13	25.80	54.00	-28.20	146	163
5	5569.230 PK	2.05	54.25	56.30	74.00	-17.70	195	158
6	5569.230 AV	2.05	23.85	25.90	54.00	-28.10	195	158

REMARKS: 1. Peak detector quick scan is showed on the graph and final quasi-peak detector data is measured corresponding to relevant limit and recorded in the data table.
2. Negative sign (-) in the margin column signify levels below the limit.
3. Frequency range scanned: 1GHz to 6GHz.
4. Only emissions significantly above equipment noise floor are reported.

4 IMMUNITY TEST

4.1 GENERAL DESCRIPTION

Product Standard	**EN 301 489-1 V1.9.2 (2011-09)** **EN 301 489-7 V1.3.1 (2005-11)**	
Basic Standard, Specification, and Performance Criterion required	EN 61000-4-2	Electrostatic Discharge – ESD: 2, 4, 8 kV air discharge, 2, 4 kV contact discharge, Performance Criterion B
	EN 61000-4-3	Radio-Frequency Electromagnetic Field Susceptibility Test – RS: 80~1000 MHz, 1400~2700 MHz, 3 V/m, 80% AM (1 kHz), Performance Criterion A

4.1.1 GENERAL PERFORMANCE CRITERIA DESCRIPTION

The Requirement of Performance Criteria		
1	Performance criteria for continuous phenomena applied to transmitters (CT)	Criterion A of the applicable class shall apply
2	Performance criteria for transient phenomena applied to transmitters (TT)	Criterion B of the applicable class shall apply
3	Performance criteria for continuous phenomena applied to receivers (CR)	Criterion A of the applicable class shall apply
4	Performance criteria for transient phenomena applied to receivers (TR)	Criterion B of the applicable class shall apply

For EN 301 489-7

The phenomena allowed during and after test in each criterion are clearly stated in the following table.

Performance criteria		
Criteria	**During test**	**After test**
A	Shall operate as intended. May show degradation of performance (see note1). Shall be no loss of function. Shall be no unintentional transmissions.	Shall operate as intended. Shall be no degradation of performance (see note 2). Shall be no loss of function. Shall be no loss of stored data or user programmable functions.
B	May show loss of function (one or more). May show degradation of performance (see note 1). No unintentional transmissions.	Functions shall be self-recoverable. Shall operate as intended after recovering. Shall be no degradation of performance (see note 2). Shall be no loss of stored data or user programmable functions.
C	May be loss of function (one or more).	Functions shall be recoverable by the operator. Shall operate as intended after recovering. Shall be no degradation of performance (see note 2).

NOTE 1: Degradation of performance during the test is understood as a degradation to a level not below a minimum performance level specified by the manufacturer for the use of the apparatus as intended. In some cases the specified minimum performance level may be replaced by a permissible degradation of performance.
If the minimum performance level or the permissible performance degradation is not specified by the manufacturer then either of these may be derived from the product description and documentation (including leaflets and advertising) and what the user may reasonably expect from the apparatus if used as intended.

NOTE 2: No degradation of performance after the test is understood as no degradation below a minimum performance level specified by the manufacturer for the use of the apparatus as intended. In some cases the specified minimum performance level may be replaced by a permissible degradation of performance. After the test no change of actual operating data or user retrievable data is allowed.
If the minimum performance level or the permissible performance degradation is not specified by the manufacturer then either of these may be derived from the product description and documentation (including leaflets and advertising) and what the user may reasonably expect form the apparatus if used as intended.

NOTE 3: During the test, used the software to monitor the EUT's output data.

4.2 ELECTROSTATIC DISCHARGE IMMUNITY TEST (ESD)

4.2.1 TEST SPECIFICATION

Basic Standard:	EN 61000-4-2
Discharge Impedance:	330 ohm / 150 pF
Discharge Voltage:	Air Discharge: 2, 4, 8 kV (Direct)
	Contact Discharge: 2, 4 kV (Direct and Indirect)
Polarity:	Positive & Negative
Number of Discharge:	20 times at each test point
Discharge Mode:	Single Discharge
Discharge Period:	1 second

4.2.2 TEST INSTRUMENT

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
ESD Generator	TESEQ	NSG 437	279	Feb. 03, 15	Feb. 02, 16
Test Software	TESEQ	V03.03	N/A	N/A	N/A
ESD Generator	EM TEST	Dito	V1211112265	Aug. 08,15	Aug. 07,16
Test Software	EM TEST	V 2.31	N/A	N/A	N/A

NOTE: 1. The test was performed in ESD Room.
2. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to CEPREI/CHINA, GRGT/CHINA and NIM/CHINA.

4.2.3 TEST PROCEDURE

a. Electrostatic discharges were applied only to those points and surfaces of the EUT that are accessible to users during normal operation.

b. The test was performed with at least ten single discharges on the pre-selected points in the most sensitive polarity.

c. The time interval between two successive single discharges was at least 1 second.

d. The ESD generator was held perpendicularly to the surface to which the discharge was applied and the return cable was at least 0.2 meters from the EUT.

e. Contact discharges were applied to the non-insulating coating, with the pointed tip of the generator penetrating the coating and contacting the conducting substrate.

f. Air discharges were applied with the round discharge tip of the discharge electrode approaching the EUT as fast as possible (without causing mechanical damage) to touch the EUT. After each discharge, the ESD generator was removed from the EUT and re-triggered for a new single discharge. The test was repeated until all discharges were complete.

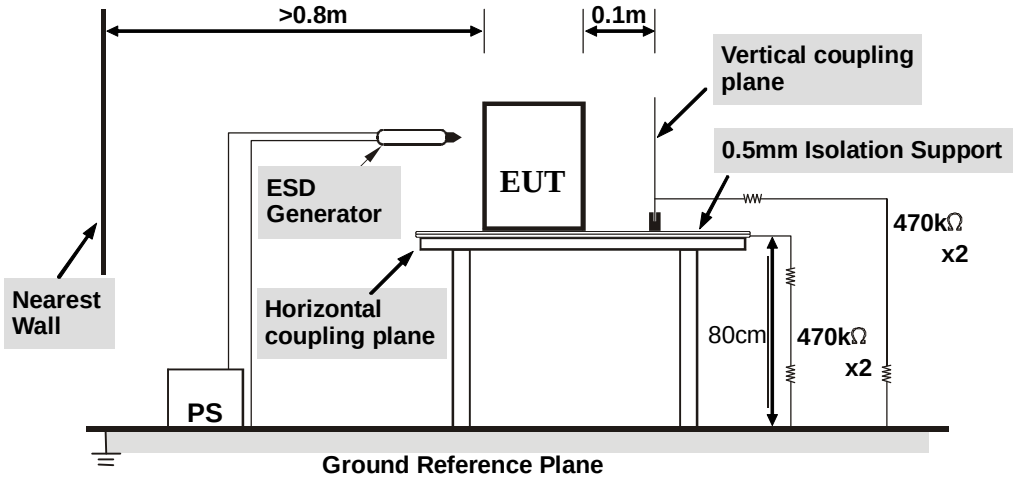
g. At least ten single discharges (in the most sensitive polarity) were applied to the **H**orizontal **C**oupling **P**lane at points on each side of the EUT. The ESD generator was positioned horizontally at a distance of 0.1 meters from the EUT with the discharge electrode touching the **HCP.**

h. At least ten single discharges (in the most sensitive polarity) were applied to the center of one vertical edge of the **V**ertical **C**oupling **P**lane in sufficiently different positions that the four faces of the EUT were completely illuminated. The **VCP** (dimensions 0.5m x 0.5m) was placed vertically to and 0.1 meters from the EUT.

4.2.4 DEVIATION FROM TEST STANDARD

No deviation.

4.2.5 TEST SETUP



For the actual test configuration, please refer to the related item – Photographs of the Test Configuration.

NOTE:
TABLE-TOP EQUIPMENT
The configuration consisted of a wooden table 0.8 meters high standing on the **G**round **R**eference **P**lane. The **GRP** consisted of a sheet of aluminum at least 0.25mm thick, and 2.5 meters square connected to the protective grounding system. A **H**orizontal **C**oupling **P**lane (1.6m x 0.8m) was placed on the table and attached to the **GRP** by means of a cable with 940kΩ total impedance. The equipment under test, was installed in a representative system as described in section 7 of EN 61000-4-2 and its cables were placed on the **HCP** and isolated by an insulating support of 0.5mm thickness. A distance of 1-meter minimum was provided between the EUT and the walls of the laboratory and any other metallic structure.

4.2.6 TEST RESULTS

TEST VOLTAGE	See section 2.2	**ENVIRONMENTAL CONDITIONS**	23.5deg. C, 44.5% RH, 101.5 kPa
TESTED BY	Paul Liang		

Direct Discharge Application				
Test Level (kV)	**Polarity**	**Test Point**	**Test Result of Contact Discharge**	**Test Result of Air Discharge**
2, 4	+/-	All Metal Part	N/A	N/A
2, 4, 8	+/-	All Non-metal Part	N/A	N/A

Indirect Discharge Application				
Discharge Level (kV)	**Polarity**	**Test Point**	**Test Result of HCP**	**Test Result of VCP**
2, 4	+/-	HCP	CT/CR	N/A
2, 4	+/-	VCP	N/A	CT/CR

NOTE: CT/CR: There was no change compared with initial operation during and after the test.

4.3 RADIATED, RADIO-FREQUENCY, ELECTROMAGNETIC FIELD IMMUNITY TEST (RS)

4.3.1 TEST SPECIFICATION

Basic Standard:	EN 61000-4-3
Frequency Range:	80 MHz ~ 1000 MHz
	1400 MHz ~ 2700 MHz
Field Strength:	3 V/m
Modulation:	1 kHz Sine Wave, 80%, AM Modulation
Frequency Step:	1 % of preceding frequency value
Polarity of Antenna:	Horizontal and Vertical
Antenna Height:	1.5 m
Dwell Time:	3 seconds

4.3.2 TEST INSTRUMENT

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
Signal Generator	Agilent	N5181A	MY50142530	Oct. 12,15	Oct. 11,16
Bilog Antenna	Teseq	CBL 6111D	27089	Jun. 25,15	Jun. 24,16
Antenna Log-Periodic	CORAD	ATS700M11G	0336821	N/A	N/A
Switch Controller	CORAD	SC1000	0337343	N/A	N/A
RF Power Meter	ESE	4242	13984	Nov. 09,15	Nov. 08,16
Power Sensor	ESE	51011EMC	35716	Nov. 09,15	Nov. 08,16
Power Sensor	ESE	51011EMC	35715	Nov. 09,15	Nov. 08,16
E-Field probe	Narda	NBM-520	2403/01B	May 28,15	May 27,16
Power Amplifier	TESEQ	CBA 1G-150	T44029	N/A	N/A
Power Amplifier	TESEQ	CBA 3G-100	T44030	N/A	N/A
Power Amplifier	TESEQ	CBA 6G-050	1041204	N/A	N/A
Dual Directional Coupler	TESEQ	C5982	95208	Nov. 09,15	Nov. 08,16
Dual Directional Coupler	TESEQ	C6187	95175	Nov. 09,15	Nov. 08,16
Dual Directional Coupler	TESEQ	CPH-274F	M251304-01	Nov. 09,15	Nov. 08,16
Sound Calibrator	B&K	Type 4231	2463874	Aug. 13,15	Aug.12,16
Mouth Simulator	B&K	Type 2716C	2411656	N/A	N/A
Universal Radio Communication Tester	Rohde&Schwarz	CMU 200	123259	Apr.07, 15	Apr.06, 16
Conditioning Amplifier	Rohde&Schwarz	2690A0S2	2437856	Aug. 13,15	Aug.12,16
EAR SIMULATOR	B&K	4192	2743508	Aug. 13,15	Aug.12,16
Audio analyzer	Rohde&Schwarz	UPV	101397	Sep. 18,15	Sep. 17,16
Test Software	ADT	BVADT_RS_V7.6.4-DG	N/A	N/A	N/A

NOTE: 1. The test was performed in RS chamber.

2. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to CEPREI/CHINA, GRGT/CHINA and NIM/CHINA.

4.3.3 TEST PROCEDURE

The test procedure was in accordance with EN 61000-4-3.

a. The testing was performed in a fully-anechoic chamber.

b. The frequency range is swept from 80 MHz to 1000 MHz & 1400 MHz to 2700 MHz with the signal 80% amplitude modulated with a 1 kHz sine wave.

c. The dwell time at each frequency shall not be less than the time necessary for the EUT to be exercised and to respond, but shall in no case be less than 0.5s.

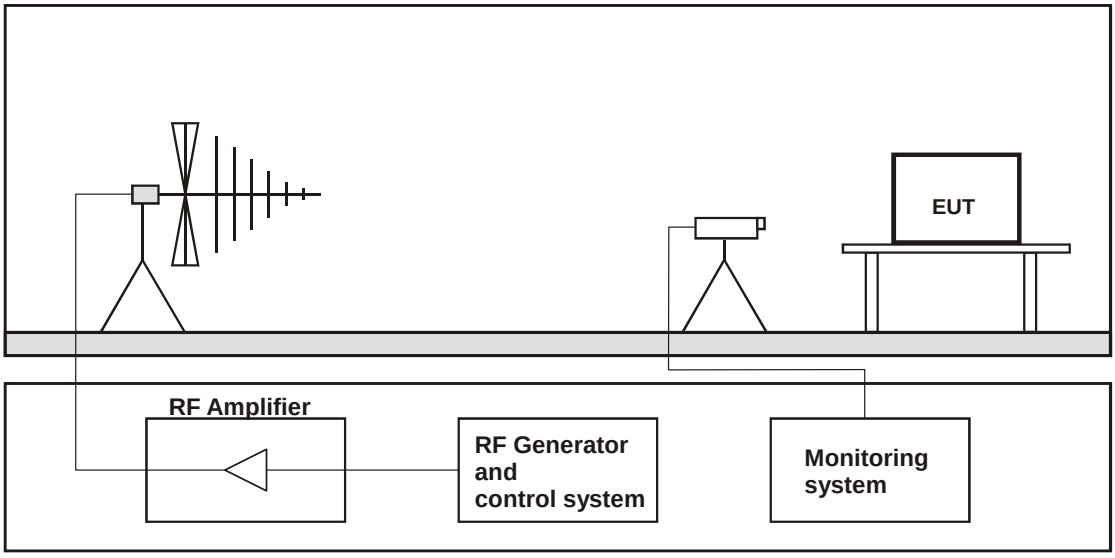
d. The field strength level was 3 V/m.

e. The test was performed with the EUT exposed to both vertically and horizontally polarized fields on each of the four sides.

4.3.4 DEVIATION FROM TEST STANDARD

No deviation.

4.3.5 TEST SETUP



For the actual test configuration, please refer to the related item – Photographs of the Test Configuration.

NOTE:
TABLETOP EQUIPMENT
The EUT installed in a representative system as described in section 7 of EN 61000-4-3 was placed on a non-conductive table 0.8 meters in height. The system under test was connected to the power and signal wire according to relevant installation instructions.

4.3.6 TEST RESULTS

TEST VOLTAGE	DC 3.7V from battery	ENVIRONMENTAL CONDITIONS	22.3 deg. C, 46.7% RH
TESTED BY	Paul Liang		

Field Strength (V/m)	Test Frequency Note#1 (MHz)	Polarization of antenna (Horizontal / Vertical)	Azimuth (0)	Test Distance (m)	Test Result	Remark
3	80 - 1000	H&V	0/90/180/ 270	3	CT/CR	NOTE 1
3	1400-2700	H&V	0/90/180/ 270	3	CT/CR	NOTE 1
3	80 - 1000	H&V	0/90/180/ 270	3	PASS	NOTE 2
3	1400-2700	H&V	0/90/180/ 270	3	PASS	NOTE 2

NOTE:

1. For normal operating function: There was no change compared with the initial operation during the test.
2. For the BER/BLER Measurement: During the test, the measured BER shall not exceed 0.001 during the test sequence; the measured BLER shall not exceed 0.01 during the test sequence.

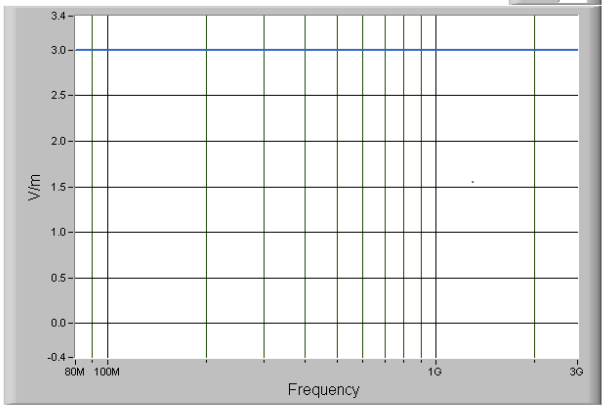
4.3.7 DATA TRANSFER MEASUREMENT RESULTS

The worst result: DCS 1800

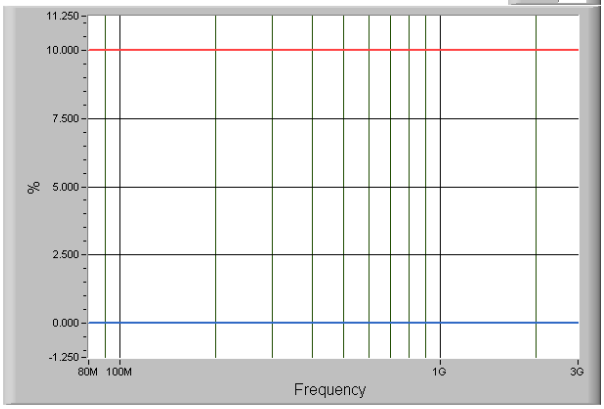
Audio Breakthrough Measurement Result GSM+GPRS (Data transfer)

(This data is for evaluation purposes only. It cannot be used for EMC approvals unless it contains the approved signature.)

Test Level



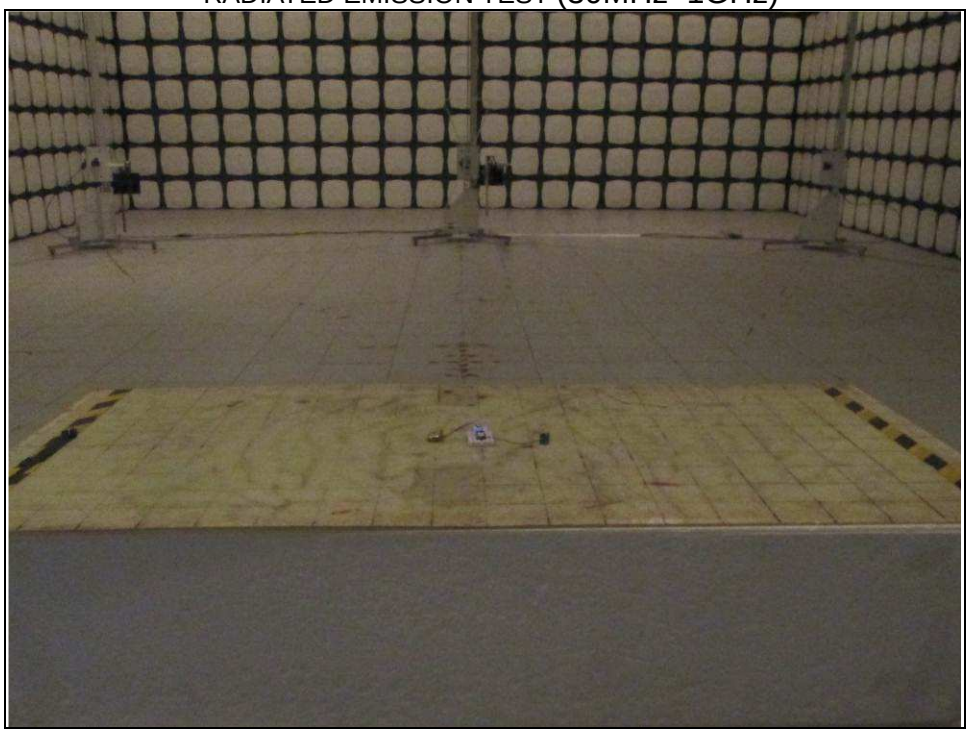
Block Error Rate



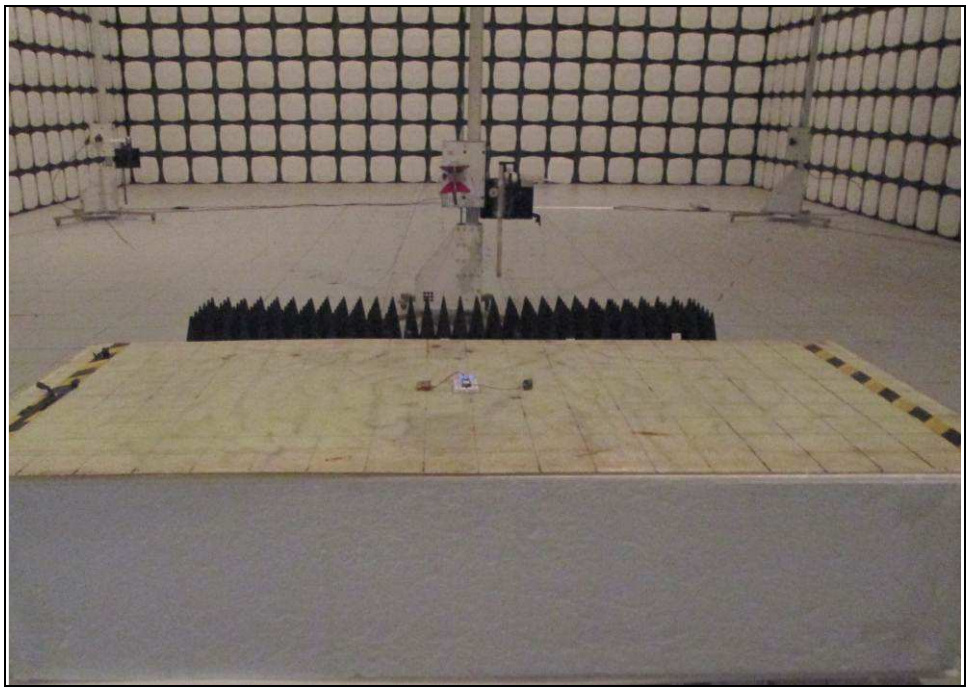
Block Error Rate Test PASS
Worst. value is 0.0000 % at 80.000M Hz (Margin 10.0000 %)

5 PHOTOGRAPHS OF THE TEST CONFIGURATION

RADIATED EMISSION TEST (30MHz~1GHz)

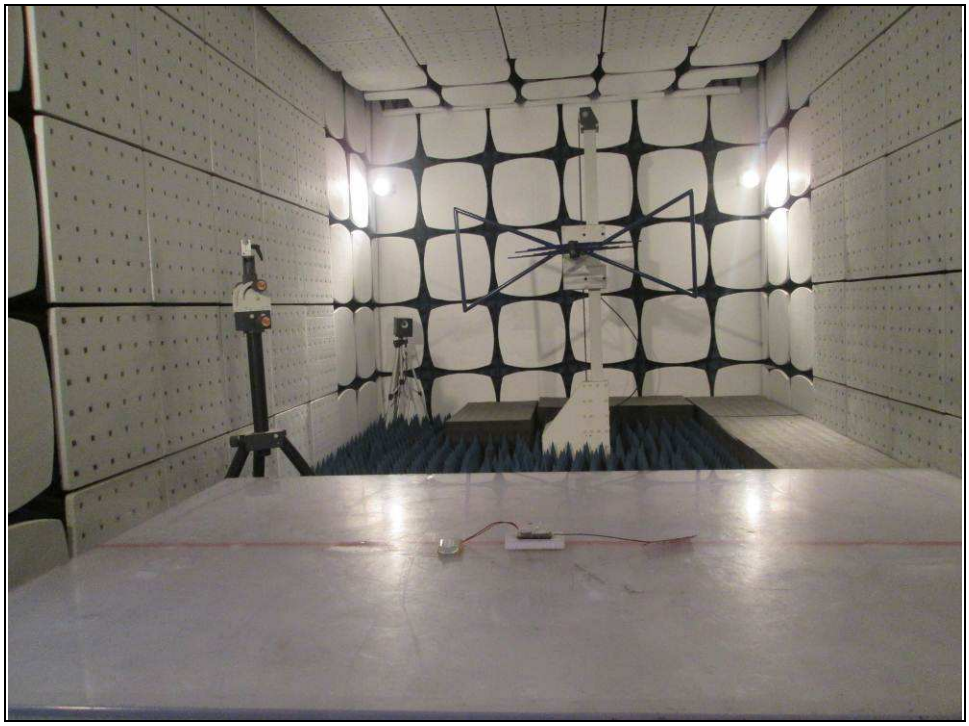


RADIATED EMISSION TEST< Above 1GHz>



ESD TEST

RS IMMUNITY TEST



6 APPENDIX A – MODIFICATIONS RECORDERS FOR ENGINEERING CHANGES TO THE EUT BY THE LAB

No any modifications were made to the EUT by the lab during the test.

---END---