R&TTE (EMC) TEST REPORT
for
High-Flying Electronics Technology Co., Ltd

Embedded Wi-Fi Module
Model No.: HF-LPT100

Prepared for	:	High-Flying Electronics Technology Co., Ltd
Address	:	Room 511, #7Building, No.365 Chuanhong Road, Pudong, Shanghai, China

Prepared By	:	Shenzhen Anbotek Compliance Laboratory Limited
Address	:	1/F., Building 1, SEC Industrial Park, No.0409 Qianhai Road, Nanshan District, Shenzhen, Guangdong, China Tel: (86) 755-26066544 Fax: (86) 755-26014772

Report Number	:	201311815E
Date of Test	:	Nov. 18~ 29, 2013
Date of Report	:	Nov. 29, 2013

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TEST REPORT

Applicant	:	High-Flying Electronics Technology Co., Ltd
Manufacturer	:	High-Flying Electronics Technology Co., Ltd
EUT	:	Embedded Wi-Fi Module
Model No.	:	HF-LPT100
Serial No.	:	N/A
Trade Mark	:	High-Flying
Rating	:	DC 3.1V-3.6V, 240mA

Measurement Procedure Used:
ETSI EN 301 489-1 V1.9.2 (2011-09)
ETSI EN 301 489-17 V2.2.1 (2012-09)

The device described above is tested by Shenzhen Anbotek Compliance Laboratory Limited to determine the maximum emission levels emanating from the device and the severe levels of the device can endure and its performance criterion. The measurement results are contained in this test report and Shenzhen Anbotek Compliance Laboratory Limited is assumed full of responsibility for the accuracy and completeness of these measurements. Also, this report shows that the EUT (Equipment Under Test) is technically compliant with the EN 301 489-1 & EN 301 489-17 requirements.

This report applies to above tested sample only and shall not be reproduced in part without written approval of Shenzhen Anbotek Compliance Laboratory Limited.

Date of Test : Nov. 18~ 29, 2013

Prepared by : Rock Zeng
(Engineer / Rock Zeng)

Reviewer : Sally Zhang
(Project Manager/Sally Zhang)

Approved & Authorized Signer : Tom Chen
(Manager/Tom Chen)

1. GENERAL INFORMATION

1.1. Description of Device (EUT)

EUT	:	Embedded Wi-Fi Module
Model Number	:	HF-LPT100
Test Power Supply	:	AC 230V, 50Hz for adapter
Adapter	:	AC/DC ADAPTER Model:FLDS1003-0501000C Input: AC 100-240V, 50/60Hz, 0.15A Max Output: DC 5V, 1mA
Frequency	:	2412 ~ 2472MHz (13 channels)
Antenna Gain	:	2dBi
Applicant	:	High-Flying Electronics Technology Co., Ltd
Address	:	Room 511, #7Building, No.365 Chuanhong Road, Pudong, Shanghai, China
Manufacturer	:	High-Flying Electronics Technology Co., Ltd
Address	:	Room 511, #7Building, No.365 Chuanhong Road, Pudong, Shanghai, China
Factory	:	Shanghai Quick Turn Electronic Co., Ltd.
Address	:	4F, Bldg. 1, No. 1069 Chuansha Road, Pudong New District, Shanghai, China
Date of receiver	:	Nov. 18, 2013
Date of Test	:	Nov. 18~ 29, 2013

1.2. Auxiliary Equipment Used during Test

N/A

1.3. Description of Test Facility

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

FCC-Registration No.: 752021
Shenzhen Anbotek Compliance Laboratory Limited, 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 752021, July 10, 2013.

IC-Registration No.: 8058A-1
Shenzhen Anbotek Compliance Laboratory Limited, EMC Laboratory has been registered and fully described in a report filed with the (IC) Industry Canada. The acceptance letter from the IC is maintained in our files. Registration 8058A-1, February 22, 2013.

CNAS - LAB Code: L3503
Shenzhen Anbotek Compliance Laboratory Limited., Laboratory has been assessed and in compliance with CNAS/CL01: 2006 accreditation criteria for testing laboratories (identical to ISO/IEC 17025: 2005 General Requirements) for the Competence of Testing Laboratories.

Test Location
All Emissions tests were performed
Shenzhen Anbotek Compliance Laboratory Limited. at 1/F., Building 1, SEC Industrial Park, No.0409 Qianhai Road, Nanshan District, Shenzhen, Guangdong, China

1.4. Measurement Uncertainty

Radiation Uncertainty	:	Ur = 4.3 dB
Conduction Uncertainty	:	Uc =3.4 dB

1.5. Test Standards

ETSI EN 301 489-1 V1.9.2 (2011-09) Electromagnetic compatibility and Radio spectrum Matters (ERM); Electromagnetic Compatibility (EMC) standard for radio equipment and services; Part 1: Common technical requirements **ETSI EN 301 489-17 V2.2.1 (2012-09)** Electromagnetic compatibility and Radio spectrum Matters (ERM); Electromagnetic Compatibility (EMC) standard for radio equipment and services; Part 17: Specific conditions for 2,4GHz wideband transmission systems and 5GHz high performance RLAN equipment

2. MEASURING DEVICE AND TEST EQUIPMENT

Test equipments list of Shenzhen Anbotek Compliance Laboratory Limited.

2.1. Conducted Emission Measurement

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	Two-Line V-network	Rohde & Schwarz	ENV216	100055	Apr. 23, 2013	1 Year
2.	EMI Test Receiver	Rohde & Schwarz	ESCI	100627	Apr. 23, 2013	1 Year
3.	RF Switching Unit	Compliance Direction	RSU-M2	38303	Apr. 23, 2013	1 Year

2.2. Radiated Emission Measurement

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	EMI Test Receiver	Rohde & Schwarz	ESPI	101604	Apr. 23, 2013	1 Year
2.	Bilog Broadband Antenna	Schwarzbeck	VULB9163	VULB 9163-289	May 14, 2013	3 Year
3.	Pre-amplifier	SONOMA	310N	186860	Aug. 09, 2013	1 Year

2.3. Harmonic and Flicker Measurement

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	Programmable AC Power source	SOPH POWER	PAG-1050	630250	Apr. 23, 2013	1 Year
2.	Harmonic and Flicker Analyzer	LAPLACE	AC2000A	272629	Apr. 23, 2013	1 Year

2.4. Electrostatic Discharge Measurement

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	ESD Simulators	KIKUSUI	KES4021	LJ003477	Apr. 25, 2013	1 Year

2.5. R/S Immunity Measurement

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	RF Power Meter. Dual Channel	BOONTON	4232A	10539	May 29, 2013	1 year
2.	50ohm Diode Power Sensor	BOONTON	51011EMC	34236/34238	May 29, 2013	1 year
3.	Broad-Band Horn Antenna	SCHWARZBECK	BBHA9120 L3F	332	May 29, 2013	1 year
4.	Power Amplifier	PRANA	AP32MT215	N/A	May 29, 2013	1 year
5.	Power Amplifier	MILMEGA	AS0102-55	N/A	May 29, 2013	1 year
6.	Signal Generator	AEROFLEX	2023B	N/A	May 29, 2013	1 year
7.	Field Strength Meter	HOLADAY	HI-6005	N/A	May 29, 2013	1 year
8.	RS232 Fiber Optic Modem	HOLADAY	HI-4413P	N/A	May 29, 2013	1 year
9.	Log.-Per. Antenna	SCHWARZBECK	VULP 9118E	N/A	May 29, 2013	1 year

2.6. Electrical Fast Transient/Burst Immunity Measurement

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	EFT Burst Simulator	PRIMA	EFT61004B	PR10114282	Apr. 23, 2013	1 Year

2.7. Surge Measurement

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	6kV Surge Generator	EMPEK	LSG-5060G	06010017N	Apr. 23, 2013	1 Year
2.	CDN	EMPEK	CDN-5110G	06110005N	Apr. 23, 2013	1 Year

2.8. Injected Currents Susceptibility Measurement

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	C/S Conducted Immunity Test System	FRANKONIA	CIT-10	126A1196/2012	Jul. 23, 2013	1 Year
2.	CDN	FRANKONIA	CDN - M2+ M3	A2210178/2012	Apr. 23, 2013	1 Year
3.	6dB attenuator	FRANKONIA	DAM 26W	1172202	Apr. 23, 2013	1 Year

2.9. Voltage Dips and Interruptions Measurement

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	CYCLE SAG Simulator	PRIMA	DRP61011AG	PR12046234	Apr. 23, 2013	1 Year

3. Technical Test

3.1. Summary of Test Results

No Deviations from the technical specification(s) were ascertained in the course of the tests Performed	
Final Verdict: (only "Passed" if all single measurements are "Passed")	Passed

3.2. Test Report

Emission (EMI)

EMI Phenomenon	Port	Requirement		EUT Setup	Result	Applicability
		Standard	Basic Standard			
Conducted Interference Voltage	AC Mains	ETSI EN 301 489-1 Clause 8.4	EN 55022	Refer to Section 5	Complies	Applicable
Conducted Interference Voltage	DC Mains	ETSI EN 301 489-1 Clause 8.3	EN 55022	Refer to Section 4	N/A	Not Applicable
Radiated Interference Field Strength 30~1000MHz	Enclosure	ETSI EN 301 489-1 Clause 8.2	EN 55022	Refer to Section 4	Complies	Applicable
Harmonic Current Emissions	AC Mains Input Port	ETSI EN 301 489-1 Clause 8.5	EN 61000-3-2	Refer to Section 5	N/A	Not Applicable
Flicker & Voltage Fluctuation	AC Mains Input Port	ETSI EN 301 489-1 Clause 8.6	EN 61000-3-3	Refer to Section 5	Complies	Applicable

Immunity (EMS)

EMS Phenomenon	Port	Requirement		EUT Setup	Result	Applicability
		Standard	Basic Standard			
Electronic Discharge (ESD)	Enclosure	ETSI EN 301 489-1 Clause 9.3	IEC 61000-4-2	Refer to Section 5	Complies	Applicable
RF-Electro-Magnetic Field (80-1000MHz and 1400-2000 MHz)	Enclosure	ETSI EN 301 489-1 Clause 9.2	IEC 61000-4-3	Refer to Section 5	Complies	Applicable
Fast Transients, Burst	Power Line	ETSI EN 301 489-1 Clause 9.4	IEC 61000-4-4	Refer to Section 5	Complies	Applicable
Surge	Power Line (1 Phase)	ETSI EN 301 489-1 Clause 9.8	IEC 61000-4-5	Refer to Section 5	Complies	Applicable

Transients & Surges Vehicular Environment	Power Line (Car Charge)	ETSI EN 301 489-1 Clause 9.6	ISO 7367-1 ISO 7367-2	N/A	N/A	Not Applicable
RF Common Mode (0.15-80MHz)	Power Line	ETSI EN 301 489-1 Clause 9.5	IEC 61000-4-6	Refer to Section 5	Complies	Applicable
Vol. Dips, Interruptions & Fluctuations (AC Power)	Power Line	ETSI EN 301 489-1 Clause 9.7	IEC 61000-4-11	Refer to Section 5	Complies	Applicable

N/A=Not Applicable

- Performance criteria A for immunity tests with phenomena of a continuous nature;
  Communication between the Tx and Rx in the front of pings should not drop during the test.
- Performance criteria B for immunity tests with phenomena of a transient nature;
  N/A
- Performance criteria C for immunity tests with power interruptions exceeding a certain time.
  N/A
  Note: For details see subclause 6.2 ETSI EN 301 489-17.

Clause 8.2 Emission Test – Radiated Emissions

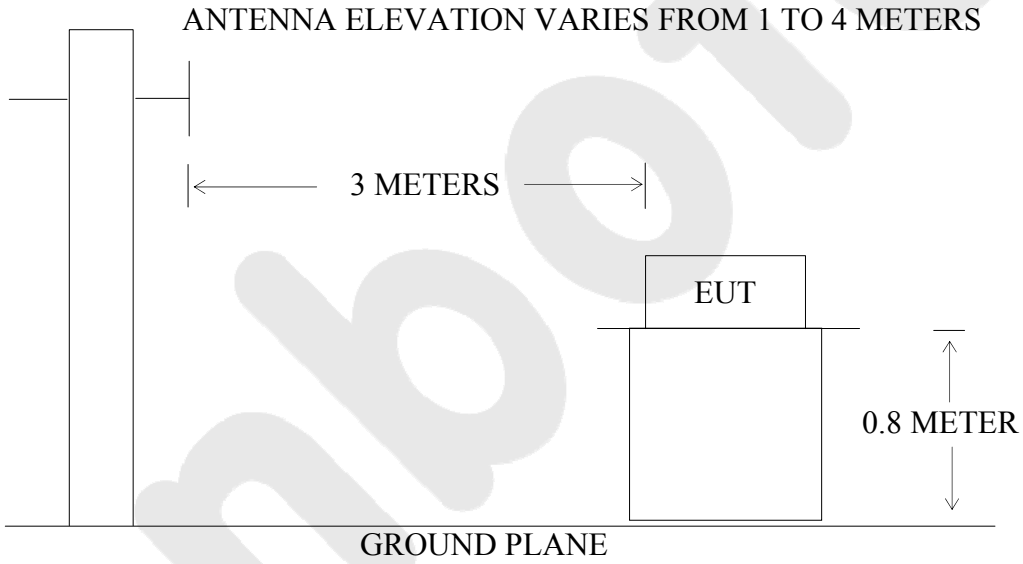
This test assesses that ability of ancillary equipment to limit their internal noise from being radiated from the enclosure.

According to EMC basic standard (EN 55022)

Measurement according to EMC basic standard, The test results correspond to the 3m-OATS result. The EUT and it simulators are placed on a turntable which is 0.8 meter above ground. The turntable can rotate 360 degrees to determine the position of the maximum emission level. The EUT was positioned such that the distance from antenna to the EUT was 3 meters.
The antenna can move up and down between 1 meter and 4 meters to find out the maximum emission level. Both horizontal and vertical polarization of the antenna is set on measurement. In order to find the maximum emission, all of the interface cables must be manipulated according to EN 55013 and EN 55022 on radiated measurement.
Radiated emissions were invested over the frequency range from 30MHz to 1GHz using a receiver bandwidth of 120kHz. Radiated was performed at an antenna to EUT distance of 3 meters.

Test Setup

EUT was setup on a 3m standard OATS



Limits

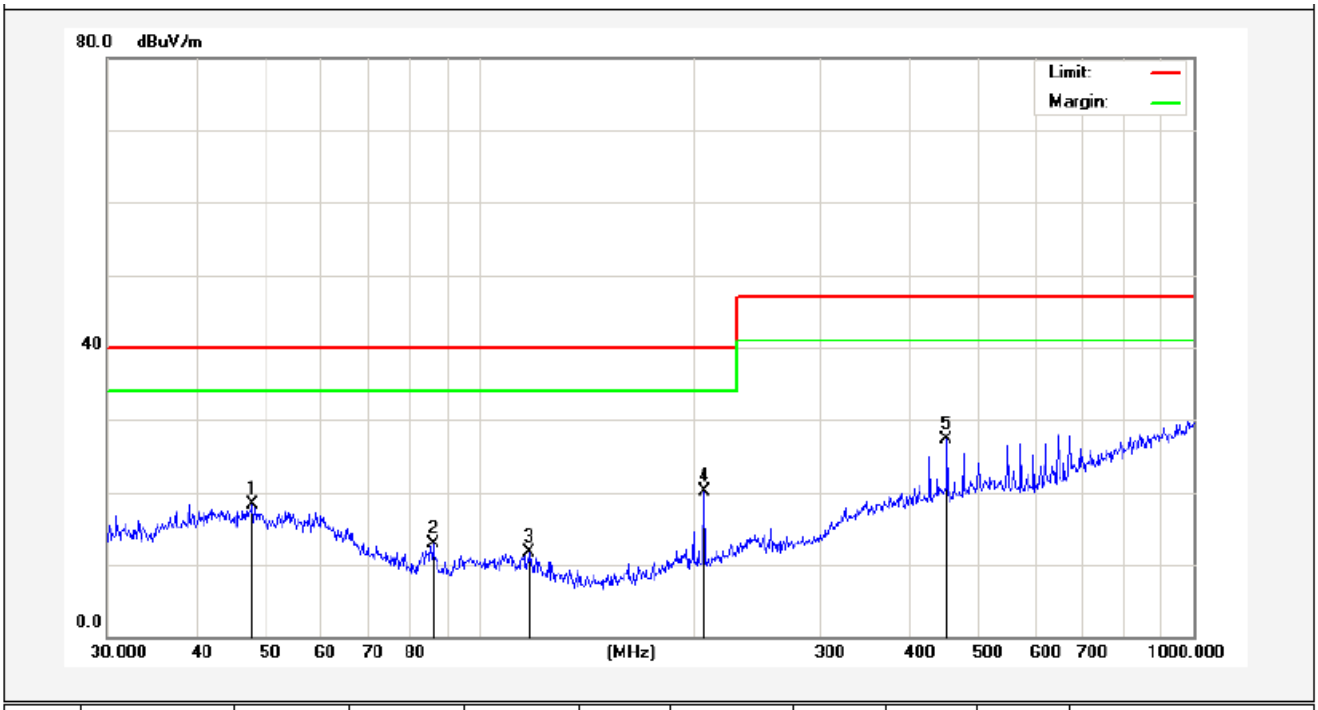
Freq. Range (MHz)	Distance (m)	Field Strength (dBμV/m)
30 – 230	3	40
230 – 1000	3	47

Results

Receiving Antenna Directed to	Angle of Turntable	Hori. / Vert.	Comment	Result (Passed / Failed)
--	0° - 360°	H/V	EUT Operating Normal	Passed

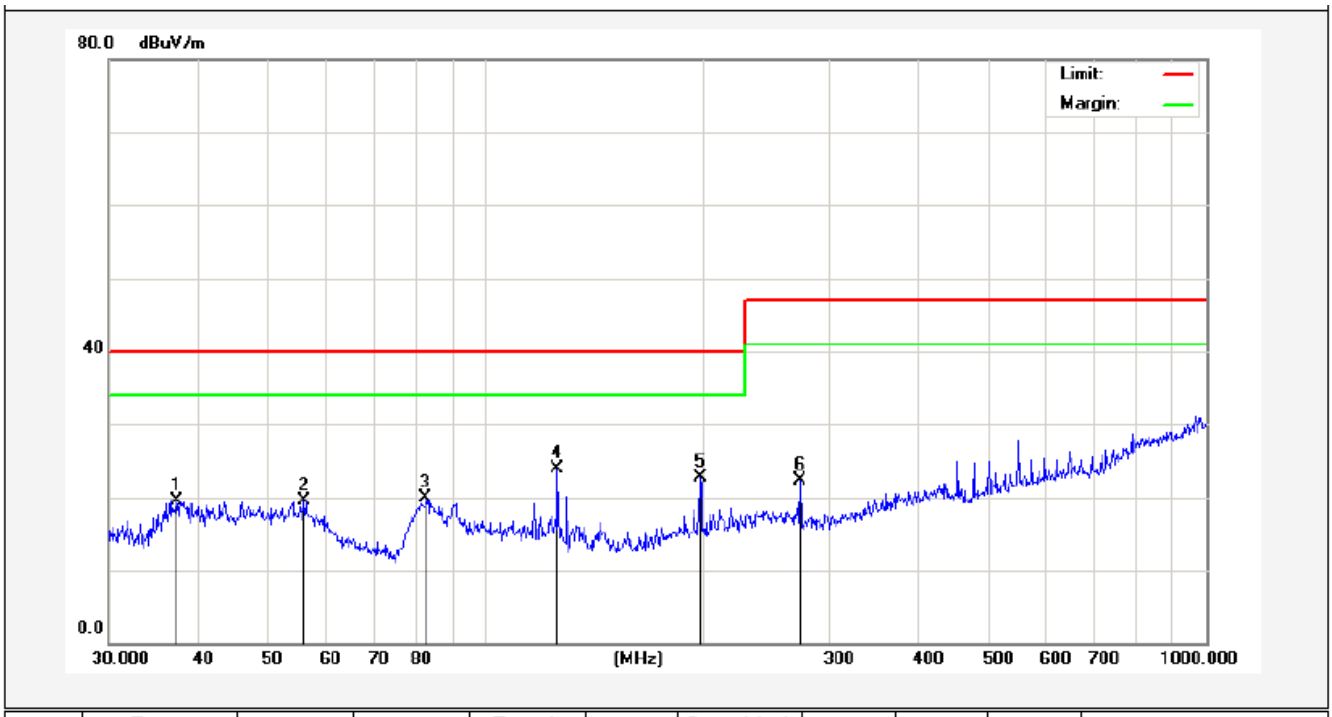
Please refer the following pages.

Job No.:	**AT1311755S**	**Polarization:**	**Horizontal**
Standard:	**(RE)EN301489_Class B_3m**	**Power Source:**	**DC 5V via adapter AC 230V, 50Hz**
Test item:	**Radiation Test**	**Date:**	**2013/11/25**
Temp.(C)/Hum.(%RH):	**24.3(C)/55%RH**	**Test By:**	**Kebo Zhang**
EUT:	**Embedded Wi-Fi Module**	**Distance:**	**3m**
Model:	**HF-LPT100**		
Note:	**On**		



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/	Over Limit (dB)	Detector	Height (cm)	degree (deg)	Remark
1	47.9940	32.87	-14.47	18.40	40.00	-21.60	peak			
2	85.8984	33.64	-20.79	12.85	40.00	-27.15	peak			
3	117.3603	32.87	-21.14	11.73	40.00	-28.27	peak			
4	206.3976	40.64	-20.63	20.01	40.00	-19.99	peak			
5	451.1350	39.44	-12.15	27.29	47.00	-19.71	peak			

Job No.:	**AT1311755S**	**Polarization:**	**Vertical**
Standard:	**(RE)EN301489_Class B_3m**	**Power Source:**	**DC 5V via adapter AC 230V, 50Hz**
Test item:	**Radiation Test**	**Date:**	**2013/11/25**
Temp.(C)/Hum.(%RH):	**24.3(C)/55%RH**	**Test By:**	**Kebo Zhang**
EUT:	**Embedded Wi-Fi Module**	**Distance:**	**3m**
Model:	**HF-LPT100**		
Note:	**On**		



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/	Over Limit (dB)	Detector	Height (cm)	degree (deg)	Remark
1	37.2855	34.84	-15.41	19.43	40.00	-20.57	peak			
2	56.0007	34.63	-15.03	19.60	40.00	-20.40	peak			
3	82.6482	39.06	-19.11	19.95	40.00	-20.05	peak			
4	125.8864	41.17	-17.20	23.97	40.00	-16.03	peak			
5	198.5880	38.58	-15.88	22.70	40.00	-17.30	peak			
6	273.2341	37.15	-14.81	22.34	47.00	-24.66	peak			

Clause 8.4 Emission Test – AC Mains Power Line Conducted Emissions

This test is applicable for radio equipment and ancillary equipment for fixed use that may have DC cables longer than 3 m (see clause 5.1 - manufacturer's declaration) and for vehicular use irrespective of cable length.

According to EMC basic standard (EN 55022)

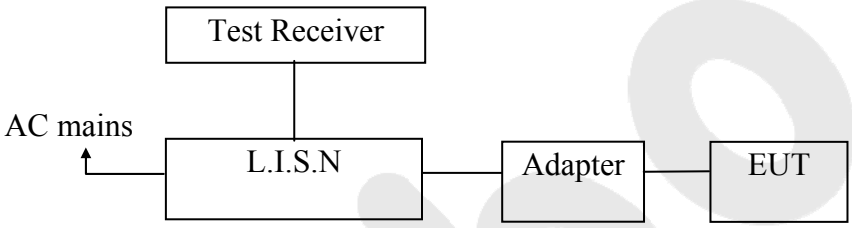
The test method shall be in accordance with EN 55022 [7] and the Artificial Mains Networks (AMNs) shall be connected to the AC mains power source.

The measurement frequency range extends from 150 kHz to 30 MHz. When the EUT is a transmitter operating at frequencies below 30 MHz, then the exclusion band for transmitters applies (see clause 4.3) for measurements in the transmit mode of operation.

For emission measurements on AC output ports of the EUT the relevant port shall be connected via an AMN to a load drawing the rated current of the source. In case where the AC output port is directly connected (or via a circuit breaker) to the AC power input port of the EUT the AC power output port need not to be tested.

Test Setup

EUT was setup as before.



Limits

Frequency (MHz)	Limit (dBμV)	
	Quasi-peak Level	Average Level
0.15 ~ 0.50	66.0 ~ 56.0 *	56.0 ~ 46.0 *
0.50 ~ 5.00	56.0	46.0
5.00 ~ 30.00	60.0	50.0
NOTE1-The lower limit shall apply at the transition frequencies. NOTE2-The limit decreases linearly with the logarithm of the frequency in the range 0.15MHz to 0.50MHz.		

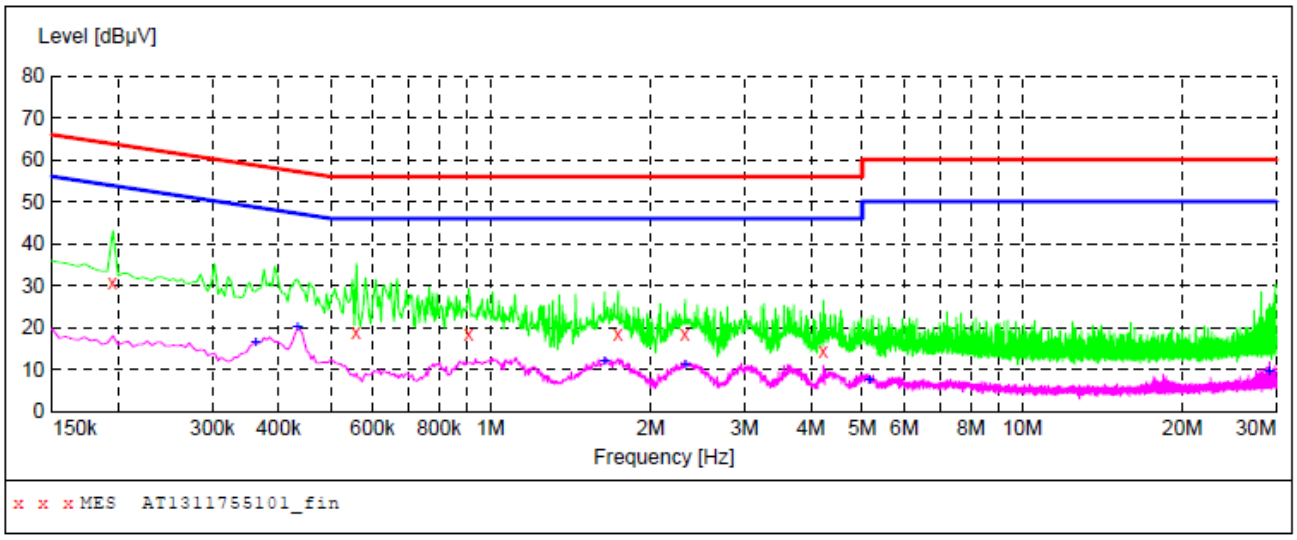
Results

Please refer the following pages.

CONDUCTED EMISSION TEST DATA

EUT:	Embedded Wi-Fi Module M/N: HF-LPT100
Operating Condition:	On
Test Site:	1# Shielded Room
Operator:	Bevan Zhang
Test Specification:	DC 5V via adapter AC 230V, 50Hz
Comment:	Live Line
	Tem:25℃ Hum:50%

SCAN TABLE: "Voltage(150K~30M)FIN"
Short Description: 150K-30M Disturbance Voltages



MEASUREMENT RESULT: "AT1311755101_fin"

11/25/2013 9:56AM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.195000	30.70	20.1	64	33.1	QP	L1	GND
0.559500	18.70	20.1	56	37.3	QP	L1	GND
0.910500	18.40	20.1	56	37.6	QP	L1	GND
1.738000	18.40	20.3	56	37.6	QP	L1	GND
2.323000	18.40	20.3	56	37.6	QP	L1	GND
4.222000	14.20	20.5	56	41.8	QP	L1	GND

MEASUREMENT RESULT: "AT1311755101_fin2"

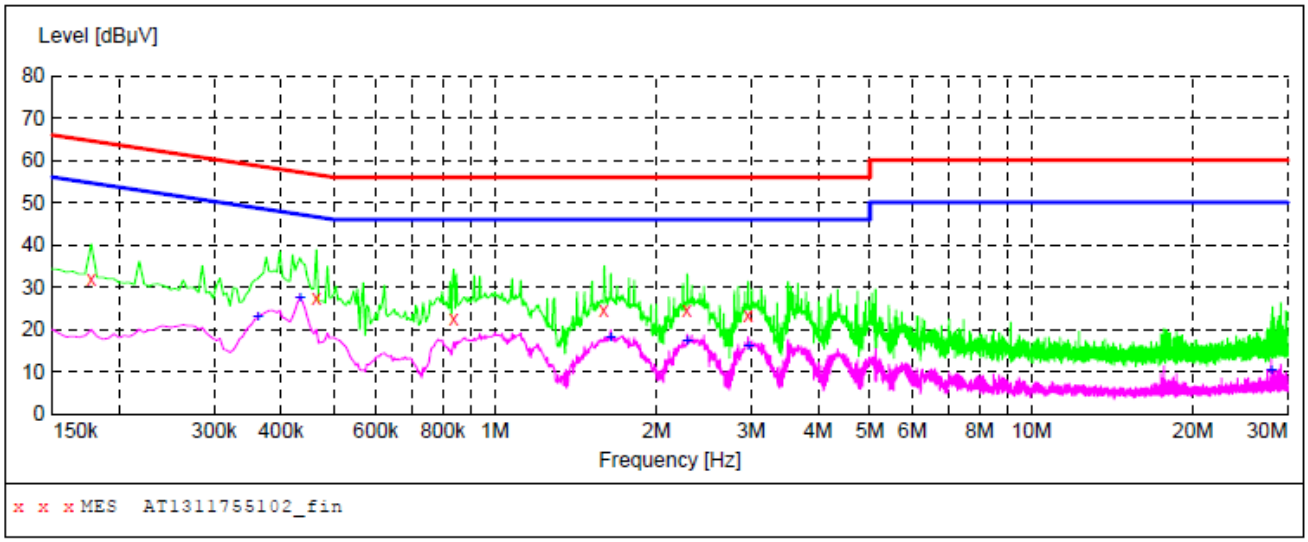
11/25/2013 9:56AM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.361500	16.20	20.1	49	32.5	AV	L1	GND
0.433500	19.90	20.1	47	27.3	AV	L1	GND
1.639000	11.80	20.3	46	34.2	AV	L1	GND
2.323000	11.20	20.3	46	34.8	AV	L1	GND
5.149000	7.60	20.5	50	42.4	AV	L1	GND
29.120500	9.40	20.9	50	40.6	AV	L1	GND

CONDUCTED EMISSION TEST DATA

EUT:	Embedded Wi-Fi Module M/N: HF-LPT100
Operating Condition:	On
Test Site:	1# Shielded Room
Operator:	Bevan Zhang
Test Specification:	DC 5V via adapter AC 230V, 50Hz
Comment:	Neutral Line
	Tem:25℃ Hum:50%

SCAN TABLE: "Voltage(150K~30M)FIN"
Short Description: 150K-30M Disturbance Voltages



MEASUREMENT RESULT: "AT1311755102_fin"

11/25/2013 10:00AM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.177000	31.90	20.1	65	32.7	QP	N	GND
0.465000	27.40	20.1	57	29.2	QP	N	GND
0.838500	22.50	20.1	56	33.5	QP	N	GND
1.598500	24.60	20.3	56	31.4	QP	N	GND
2.282500	24.50	20.3	56	31.5	QP	N	GND
2.966500	23.40	20.4	56	32.6	QP	N	GND

MEASUREMENT RESULT: "AT1311755102_fin2"

11/25/2013 10:00AM

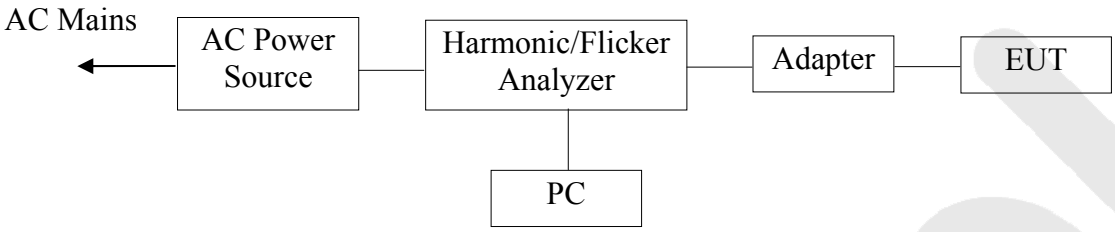
Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.361500	23.10	20.1	49	25.6	AV	N	GND
0.433500	27.40	20.1	47	19.8	AV	N	GND
1.643500	18.20	20.3	46	27.8	AV	N	GND
2.282500	17.10	20.3	46	28.9	AV	N	GND
2.966500	16.10	20.4	46	29.9	AV	N	GND
27.977500	10.40	20.9	50	39.6	AV	N	GND

Clause 8.5 Emission Test –Harmonic current emissions (AC mains input port)

The appropriate requirements of EN 61000-3-2/A1 [16] for harmonic current emission apply for equipment covered by the scope of the present document with an input current up to and including 16A per phase.

Test Setup

EUT was setup as before.



Results

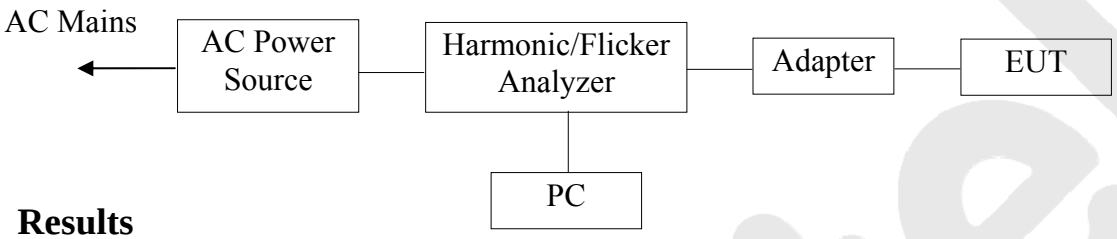
The active input power of the EUT is less than 75W. Therefore, according to EN 61000-3-2, no limits are necessary.

Clause 8.6 Emission Test – Voltage fluctuations and flicker (AC mains input port)

The appropriate requirements of EN 61000-3-3 [17] for voltage fluctuations and flicker apply for equipment covered by the scope of the present document with an input current up to and including 16A per phase.

Test Setup

EUT was setup as before.



Results

PASS

Please refer the following pages.

Flicker Test Summary per EN/IEC61000-3-3 (Run time)

HA-PC Link Plus. Software v2.02. Firmware v2.81
Report Number : 201311815E Overload. Test Stopped
Tested On : 25 Nov. 2013 13:59 for 600 Seconds.
Equipment Under Test : Embedded Wi-Fi Module M/N:HF-LPT100
Serial Number : AT1311755S
Tested by : Jimly Chen

Supply Voltage : 229.2 Vrms 324.9 Vpk Frequency : 50.00 Hz
Load Current : 9.6 to 11.4 mArms 72.4 to 80.3 mApk Crest Factor: 7.577

Test Method: EN61000-3-3:2008

Voltage Variations :

Highest Level:	+0.54%	
Lowest Level:	-0.72%	
d(max):	1.26%	PASS
Highest d(t) of 500ms:	0.00%	PASS
Present d(t) over 3.33%:	0.00 Seconds	
Longest d(t) over 3.33%:	0.02 Seconds	
Highest Steady State:	-0.34%	
Lowest Steady State:	-0.35%	
Max d(c) Between Adjacent:	0.01%	PASS
Max d(c) Between Any:	0.01%	
Short Term Flicker Pst:	0.45	PASS

Flicker Results :

Pst Classifier Duration	Flicker	Plt Calculation Interval	Pst
0.1%	3.92		
0.7%	0.72		
1.0%	0.41		
1.5%	0.34		
2.2%	0.33		
3%	0.31		
4%	0.31		
6%	0.28		
8%	0.27		
10%	0.02		
13%	0.02		
17%	0.00		
30%	0.00		
50%	0.00		
80%	0.00		

Clause 9.2 Immunity Test – Radiated, RF Electromagnetic Fields

According to EMC basic standard (IEC 61000-4-3)

- Type of Port: Enclosure
- Performance Criterion: CT/CR
- The distance between the turn-table axis and TX&RX antenna is 3m.
- Field strength = 3V/m
- Start Frequency: 80MHz ~ 1000MHz, 1400MHz ~ 2700 MHz
- Frequency Step = lin 1MHz
- Modulation = AM, 400Hz, 1kHz, 80%
- Test Mode: On

Results

Frequency (MHz)	Antenna Polarity	Radiation to	Reaction of the EUT During and after test	Result
80-1000, 1400-2700	Horizontal	Front	No reactions recognized	Passed
80-1000, 1400-2700	Vertical	Front	No reactions recognized	Passed
80-1000, 1400-2700	Horizontal	Rear	No reactions recognized	Passed
80-1000, 1400-2700	Vertical	Rear	No reactions recognized	Passed
80-1000, 1400-2700	Horizontal	Left	No reactions recognized	Passed
80-1000, 1400-2700	Vertical	Left	No reactions recognized	Passed
80-1000, 1400-2700	Horizontal	Right	No reactions recognized	Passed
80-1000, 1400-2700	Vertical	Right	No reactions recognized	Passed

Note: Performance criteria A observed.

Test Procedure

The EUT and load, which are placed on a table that is 0.8 meter above ground, are placed with one coincident with the calibration plane such that the distance from antenna to the EUT was 3 meters. Both horizontal and vertical polarization of the antenna and four sides of the EUT are set on measurement.
In order to judge the EUT performance, a CCD camera is used to monitor EUT screen.

Clause 9.3 Immunity Test – Electrostatic Discharge

According to EMC basic standard (IEC 61000-4-2)

- Type of Port: Enclosure
- Performance Criterion: CT/CR
  For the table top EUT the distance to the reference ground plane should be 80cm.
  Direct contact discharge on conducting surfaces of EUT
  Indirect air discharge on insulating surfaces of EUT
  ±2kV, ±4kV direct discharge & ±2kV, ±4kV, ±8kV air discharge
- Test Mode: On

Test Results

Item	Contact Discharge to conducted surfaces and to coupling planes		Air Discharge at insulating surfaces
	Direct Contact Discharge	Indirect Contact Discharge	
Test Voltage	Reaction of EUT / Result	Reaction of EUT / Result	Reaction of EUT / Result
+2kV	n.r.r. Passed	n.r.r. Passed	n.r.r. Passed
-2kV	n.r.r. Passed	n.r.r. Passed	n.r.r. Passed
+4kV	n.r.r. Passed	n.r.r. Passed	n.r.r. Passed
-4kV	n.r.r. Passed	n.r.r. Passed	n.r.r. Passed
+6kV	-	-	-
-6kV	-	-	-
+8kV	-	-	n.r.r. Passed
-8kV	-	-	n.r.r. Passed

Remarks: n.r.r. = no reaction recognized
Performance Criteria A observed and No any function degraded during the tests.

Clause 9.4 Immunity Test –Fast transients, common mode

Severity Levels and Performance Criterion (IEC 61000-4-4)

Open Circuit Output Test Voltage ±10%		
Level	**On Power Supply Lines**	**On I/O (Input/Output) Signal data and control lines**
1.	**0.5 kV**	**0.25 kV**
2.	**1 kV**	**0.5 kV**
3.	**2 kV**	**1 kV**
4.	**4 kV**	**2 kV**
X	**Special**	**Special**

Severity Level, Level 2: 1kV
Performance criterion: **B**

Test Procedure

The EUT is put on the table which is 0.8 meter high above the ground. This reference ground plane shall project beyond the EUT by at least 0.1m on all sides and the minimum distance between EUT and all other conductive structure, except the ground plane beneath the EUT, shall be more than 0.5m.

Test Results

Passed.

Clause 9.5 Immunity Test –Radio frequency, common mode

According to EMC basic standard (IEC 61000-4-6)

The test method shall be in accordance with IEC 61000-4-6 [12].
The following requirements and evaluation of test results shall apply:

• the test level shall be severity level 2 as given in IEC 61000-4-6 [12] corresponding to 3 V rms unmodulated.
The test signal shall then be amplitude modulated to a depth of 80 % by a sinusoidal audio signal of 1 000 Hz.
If the wanted signal is modulated at 1 000 Hz, then the test signal of 400 Hz shall be used;

• the test shall be performed over the frequency range 150 kHz to 80 MHz with the exception of an exclusion band for transmitters, and for receivers and duplex transceivers, (see clause 4);

• for receivers and transmitters the stepped frequency increments shall be 1 % frequency increment of the momentary frequency in the frequency range 150 kHz to 80 MHz, unless specified otherwise in the part of EN 301 489 series [22] dealing with the particular type of radio equipment;

• the injection method to be used shall be selected according to the basic standard IEC 61000-4-6 [12];

• responses on receivers or receiver parts of transceivers occurring at discrete frequencies which are narrow band responses (spurious responses), are disregarded from the test, (see clause 4);

• the frequencies of the immunity test signal selected and used during the test shall be recorded in the test report.

Severity Levels and Performance Criterion

Level	Field Strength V(rms)
1.	1
2.	3
3.	10
X	Special

Severity Level, Level 2: 3V (rms)
Performance criterion: **A**

Test Procedure

The EUT are placed on an insulating support 0.1m high above a ground reference plane. CDN (coupling and decoupling device) is placed on the ground plane about 0.3m from EUT. Cables between CDN and EUT are as short as possible, and their height above the ground reference plane shall be between 30 and 50 mm (where possible).

Test Results

Passed.

Clause 9.7 Immunity Test – Voltage dips and interruptions

According to EMC basic standard (IEC 61000-4-11)

The following requirements and evaluation of test results shall apply.
The test method shall be in accordance with IEC 61000-4-11 [13].
The test levels shall be:

• a voltage dip corresponding to a reduction of the supply voltage of 30 % for 10 ms; and

• a voltage dip corresponding to a reduction of the supply voltage of 60 % for 100 ms; and

• a voltage interruption corresponding to a reduction of the supply voltage of greater than 95 % for 5 000 ms.

Severity Levels and Performance Criterion

Test Level %U_T	Voltage dip and short interruptions %U_T	Duration (in period)
0	100	0.5 1 5 10 25 50 *
40	60	
70	30	

Performance criterion**: B&C**

Test Results

Passed.

Clause 9.8 Immunity Test – Surges

According to EMC basic standard (IEC 61000-4-5)

The test method shall be in accordance with IEC 61000-4-5 [11].

The requirements and evaluation of test results given in clause 9.8.2.1 (telecommunication ports, outdoor cables),

clause 9.8.2.2 (telecommunication ports, indoor cables) and clause 9.8.2.3 (mains ports) shall apply, but no test shall be required where normal functioning cannot be achieved, because of the impact of the CDN on the EUT.

Severity Levels and Performance Criterion

Severity Level	Open-Circuit Test Voltage kV
1	0.5
2	1.0
3	2.0
4	4.0
*	Special

Performance criterion**: B**

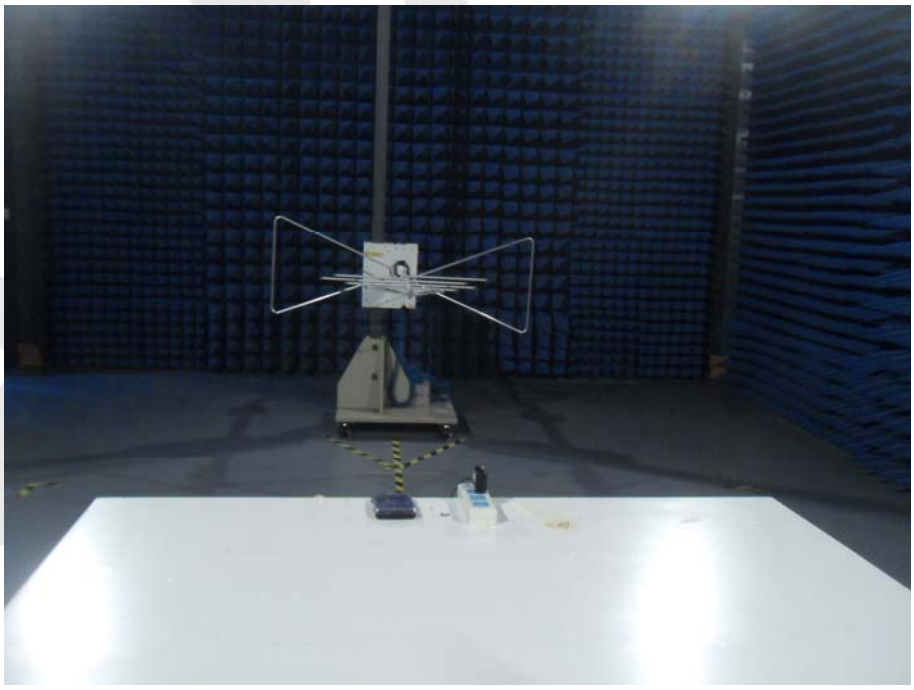
Test Results

Passed.

APPENDIX I (TEST PHOTOGRAPHS)

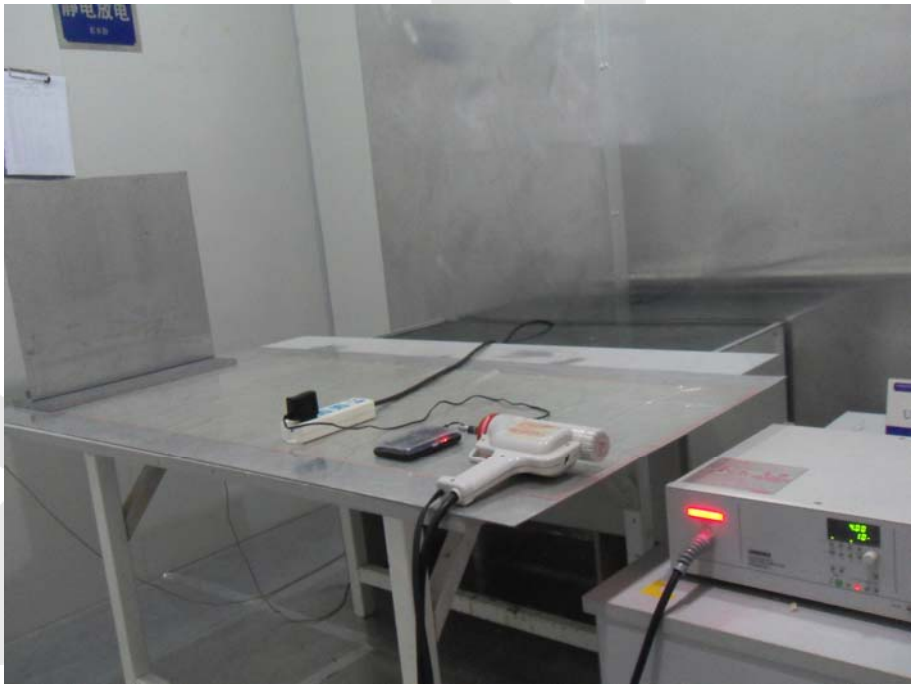
1. Photo of Power Line Conducted Emission Test

2. Photo of Radiated Emission Test

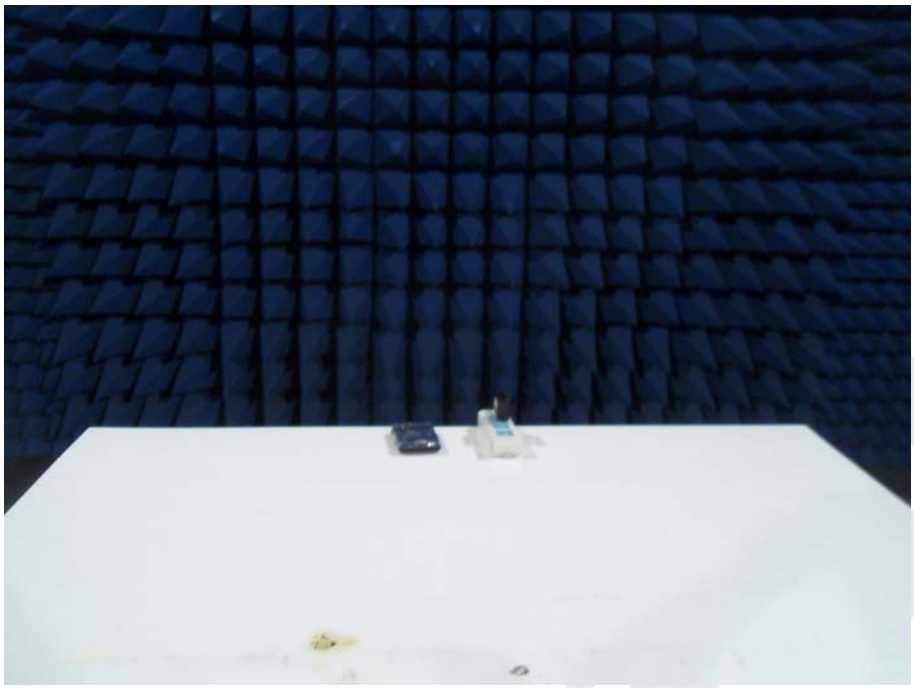


3. Photo of Flicker Test

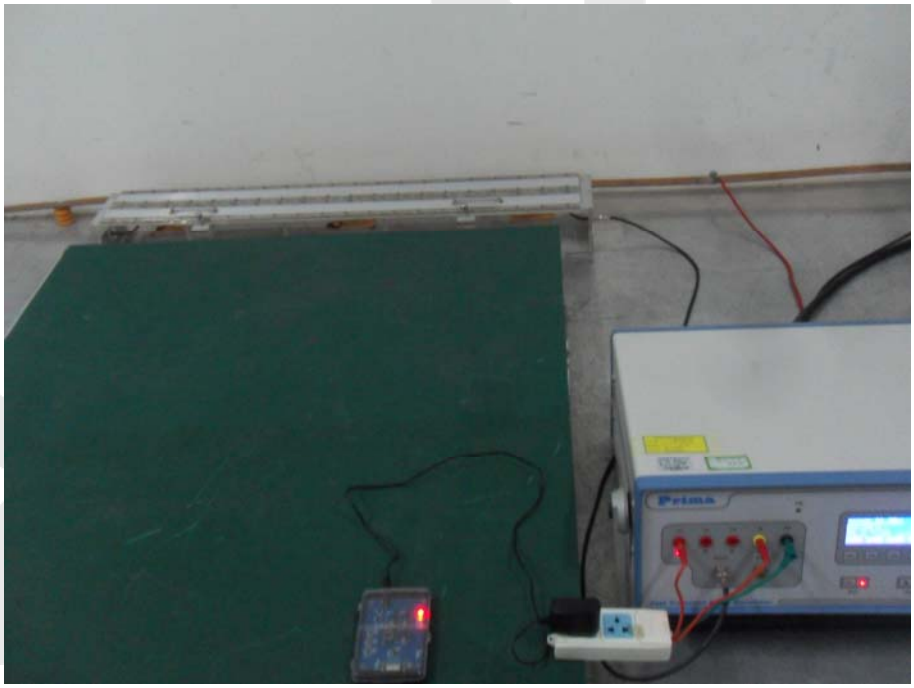
4. Photo of Electrostatic Discharge Test



5. Photo of RF Field Strength Susceptibility Test

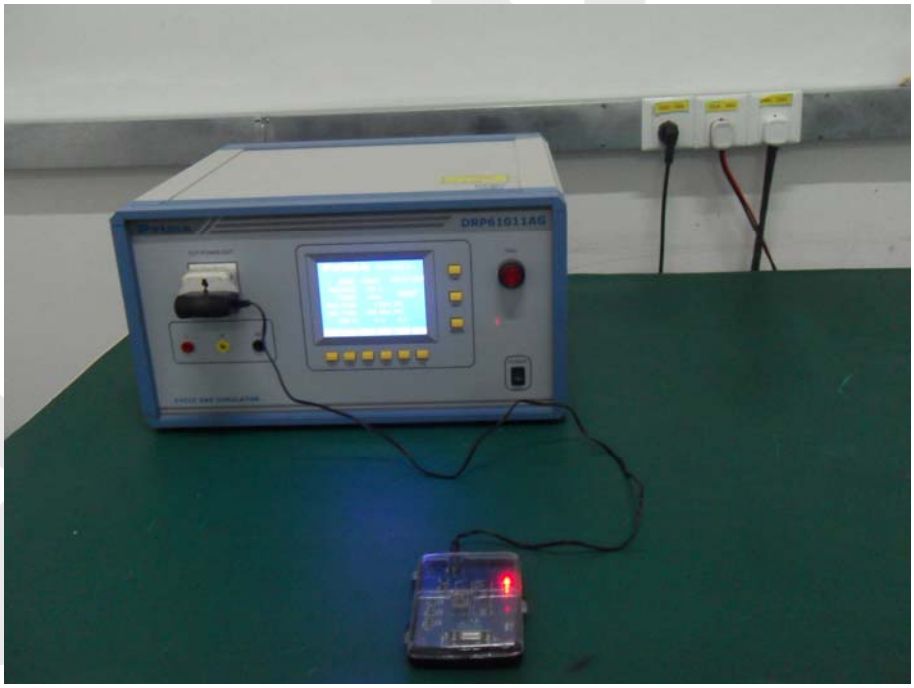


6. Photo of Electrical Fast Transient /Burst Immunity Test



7. Photo of Surge Test

8. Photo of Dips Immunity Test



9. Photo of C/S Test

APPENDIX II (EXTERNAL PHOTOS)

Figure 1
The Overall View (With EUT Inside)

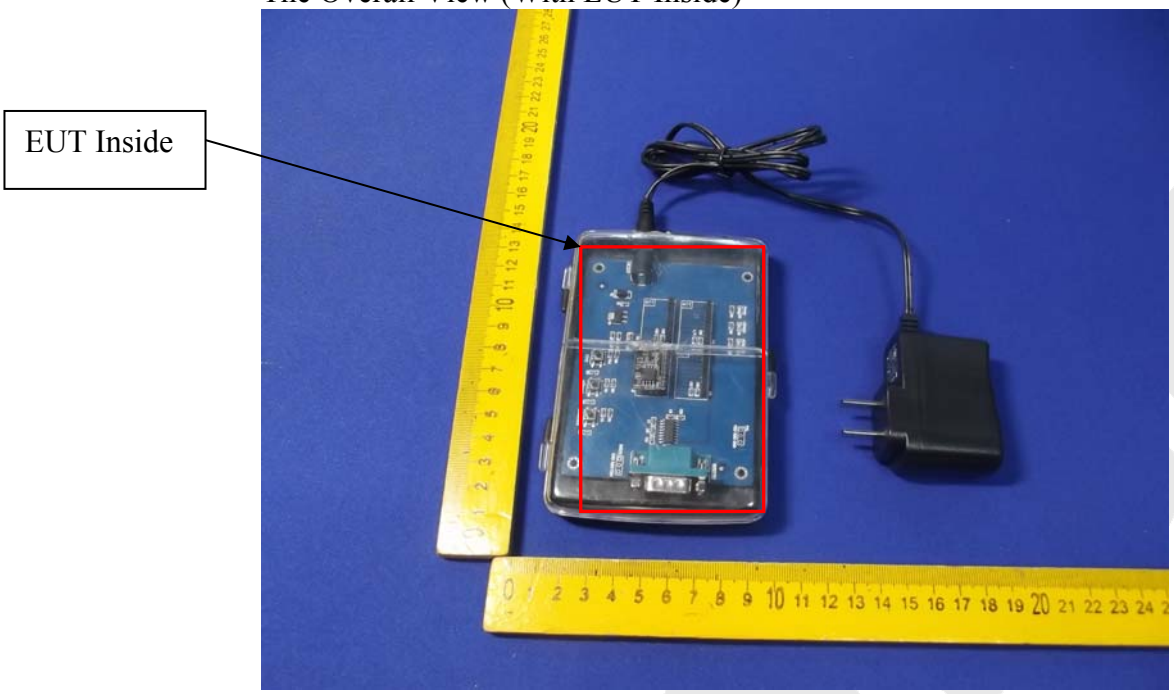


Figure 2
The EUT-Front View

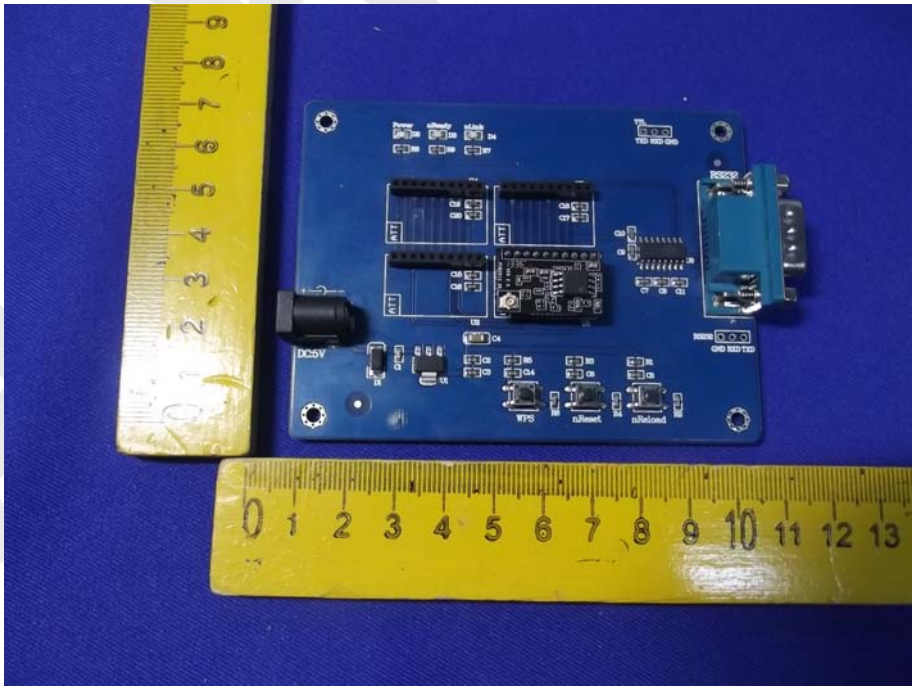
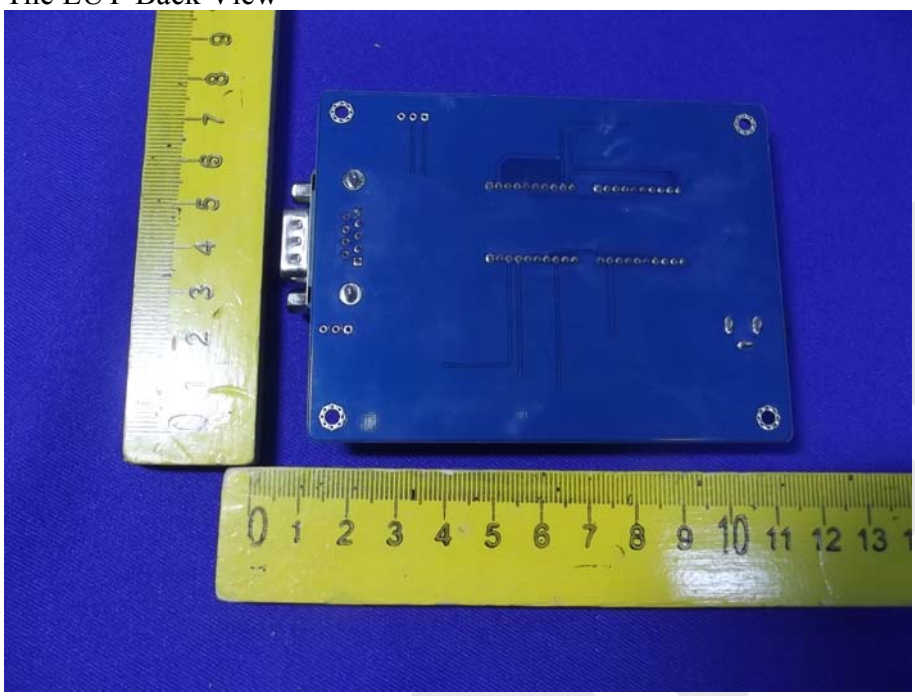


Figure 3
The EUT-Back View



APPENDIX III (INTERNALPHOTOS)

Figure 4
The EUT-Inside View

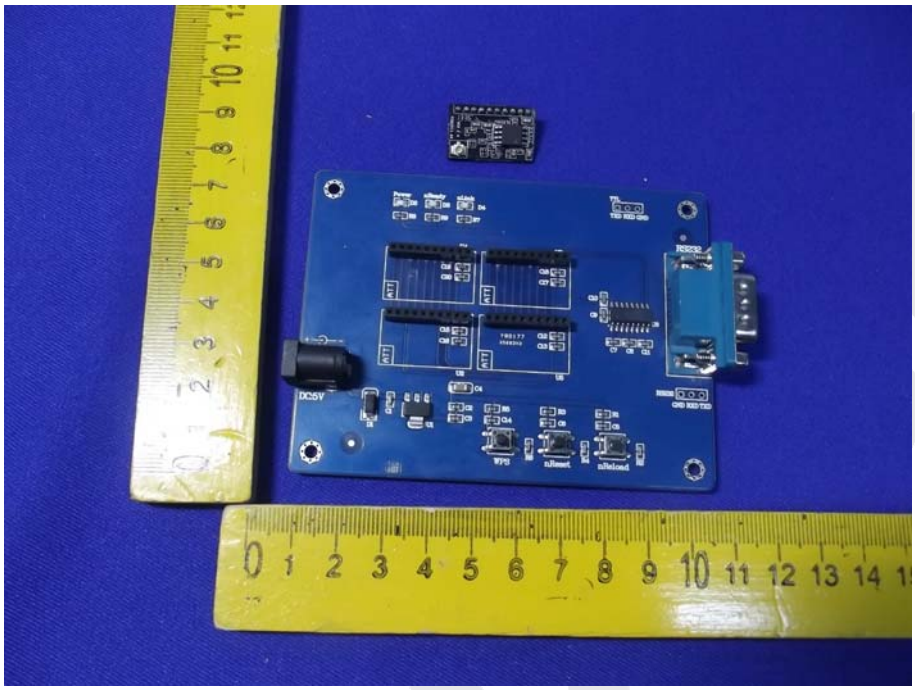


Figure 5
PCB of the EUT-Front View

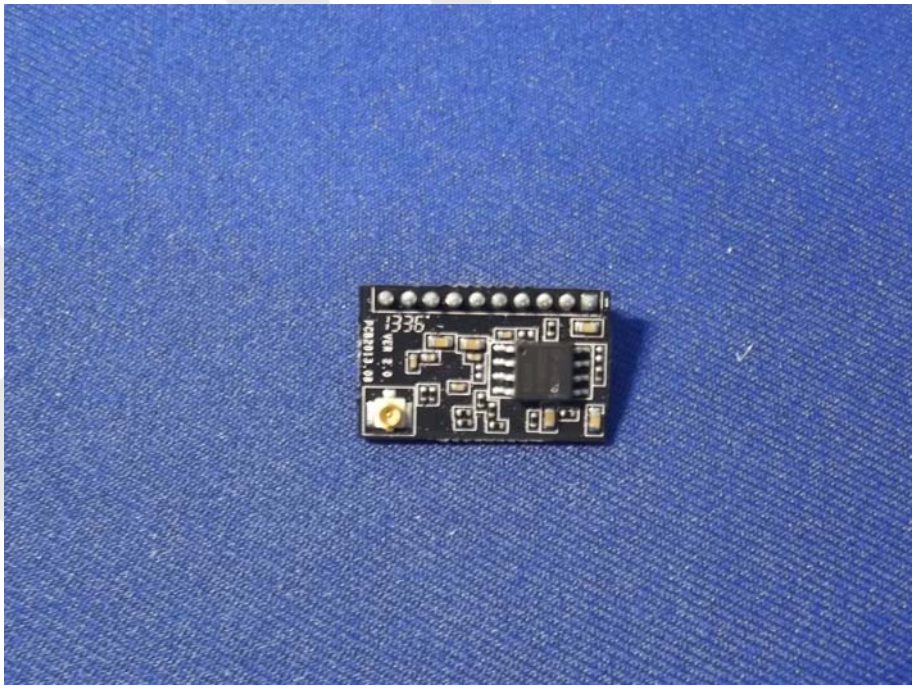


Figure 6
PCB of the EUT-Back View