TESTING
No. L2264

EN301 489-1&-17
Test Report

Product Name	Embedded WiFi module
Model Name	HF-A11x
Client	Hi-flying Electronics Technology Co.,Ltd.

TA Technology (Shanghai) Co., Ltd.

GENERAL SUMMARY

Product Name	Embedded WiFi module	**Model Name**	HF-A11x
Report No.	RZA1202-0233EMC02R1		
Client	Hi-flying Electronics Technology Co.,Ltd.		
Manufacturer	Hi-flying Electronics Technology Co.,Ltd.		
Reference Standard(s)	**ETSI EN 301 489-1 V1.9.2** （**2011-09**）Electromagnetic compatibility and Radio spectrum Matters(ERM) ; Electro Magnetic Compatibility (EMC)standard for radio equipment and services; Part 1: Common technical requirements. **ETSI EN 301 489-17 V2.1.1 (2009-05)** Electromagnetic compatibility and Radio spectrum Matters (ERM); Electromagnetic Compatibility (EMC) standard for radio equipment and services; Part 17: Specific conditions for 2,4 GHz wideband transmission systems and 5 GHz high performance RLAN equipment.		
Conclusion	This portable wireless equipment has been measured in all cases requested by the relevant standards. Test results in Chapter 3 of this test report are below limits specified in the relevant standards. General Judgment: Pass (Stamp) **Date of issue: March 14th, 2012**		
Comment	The test result only responds to the measured sample.		

Approved by 杨伟中 **Revised by** 范小翔 **Performed by** 刘伟

Director EMC Manager EMC Engineer

TABLE OF CONTENT

1. Competence and Warranties

1.1. Notes of the test report

TA Technology (Shanghai) Co., Ltd. guarantees the reliability of the data presented in this test report, which is the results of measurements and tests performed for the items under test on the date and under the conditions stated in this test report and is based on the knowledge and technical facilities available at TA Technology (Shanghai) Co., Ltd. at the time of execution of the test.

TA Technology (Shanghai) Co., Ltd. is liable to the client for the maintenance by its personnel of the confidentiality of all information related to the items under test and the results of the test. This report only refers to the item that has undergone the test.

This report standalone dose not constitute or imply by its own an approval of the product by the certification Bodies or competent Authorities. This report cannot be used partially or in full for publicity and/or promotional purposes without previous written approval of **TA Technology (Shanghai) Co., Ltd.** and the Accreditation Bodies, if it applies.

If the electrical report is inconsistent with the printed one, it should be subject to the latter.

1.2. Testing laboratory

Company: TA Technology (Shanghai) Co., Ltd.
Address: No.145, Jintang Rd, Tangzhen Industry Park, Pudong
City: Shanghai
Post code: 201201
Country: P. R. China
Contact: Yang Weizhong
Telephone: +86-021-50791141/2/3
Fax: +86-021-50791141/2/3-8000
Website: http://www.ta-shanghai.com
E-mail: yangweizhong@ta-shanghai.com

1.3. Applicant Information

Company:	Hi-flying Electronics Technology Co.,Ltd.
Address:	Room B101,456 Bibo Road Pudong,SHANGHAI
City:	SHANGHAI
Postal Code:	/
Country:	CHINA
Contact:	SEN XIE
Telephone:	021-33908861-8017
Fax:	021-33908861-8004

1.4. Manufacturer Information

Company:	Hi-flying Electronics Technology Co.,Ltd.
Address:	Room B101,456 Bibo Road Pudong,SHANGHAI
City:	SHANGHAI
Postal Code:	/
Country:	CHINA
Telephone:	021-33908861-8017
Fax:	021-33908861-8004

1.5. Information of EUT

General information

Device Type:	Portable Device
Product Name:	Embedded WiFi module
IMEI:	/
Hardware Version:	V3.1
Software Version:	V3.1
Device Operating Configurations:	
Support Function(s)	802.11b, 802.11g, 802.11n HT20 , 802.11n HT40; (tested)
Power Supply:	DC Power
Extreme Voltage:	Minimum: 3.135 V Maximum: 3.465 V
Rated Power Supply Voltage:	3.3V
Operating Frequency range(s)	2400 MHz ~ 2483.5 MHz

Equipment Under Test (EUT) is a Embedded WiFi module. The EUT is only tested WIFI function in this report.

The sample under test was selected by the Client.

Components list please refer to documents of the manufacturer.

1.6. Test Date

The test is performed from March 1, 2012 to March 7, 2012.

2. Reference Standards

2.1. Radiated Emission

Standard: ETSI EN 301 489-1, ETSI EN 301 489-17
Limit: ETSI EN 301 489-1
Method: EN 55022

2.2. Conducted Emission

Standard: ETSI EN 301 489-1, ETSI EN 301 489-17
Limit: ETSI EN 301 489-1
Method: EN 55022

2.3. Electrostatic Discharge

Standard: ETSI EN 301 489-1, ETSI EN 301 489-17
Fail criteria: ETSI EN 301 489-1, ETSI EN 301 489-17
Method: EN 61000-4-2

2.4. RF Electromagnetic Field

Standard: ETSI EN 301 489-1, ETSI EN 301 489-17
Fail criteria: ETSI EN 301 489-1, ETSI EN 301 489-17
Method: EN 61000-4-3

2.5. Fast Transients Common Mode

Standard: ETSI EN 301 489-1, ETSI EN 301 489-17
Limit: EN 61000-4-4
Method: EN 61000-4-4

2.6. Surge

Standard: ETSI EN 301 489-1, ETSI EN 301 489-17
Fail criteria: ETSI EN 301 489-1, ETSI EN 301 489-17
Method: EN 61000-4-5

2.7. Radio Frequency Common Mode

Standard: ETSI EN 301 489-1, ETSI EN 301 489-17
Fail criteria: ETSI EN 301 489-1, ETSI EN 301 489-17
Method: EN 61000-4-6

2.8. Voltage Dips and Interruptions

Standard: ETSI EN 301 489-1, ETSI EN 301 489-17
Fail criteria: ETSI EN 301 489-1, ETSI EN 301 489-17
Method: EN 61000-4-11

3. Test results

3.1. Summary of measurement results

Number	Summary of measurements of results	Rules	Verdict
1	Radiated Emission	EN 55022:2006+A1: 2007	PASS
2	Conducted Emission	EN 55022: 2006+A1: 2007	PASS
3	Electrostatic discharge	EN 61000-4-2: 1995+A1:1998+A2:2001	PASS
4	RF electromagnetic Field	EN 61000-4-3:2006+A1:2008	PASS
5	Fast transients common mode	EN 61000-4-4:2004	PASS
6	Surge	EN 61000-4-5:2006	PASS
7	Radio frequency common mode	EN 61000-4-6:2007	PASS
8	Voltage dips and interruptions	EN 61000-4-11:2004	PASS

3.2. Radiated Emission

Ambient condition

Temperature	Relative humidity	Pressure
23°C ~26°C	45%~50%	101.5kPa

Methods of Measurement

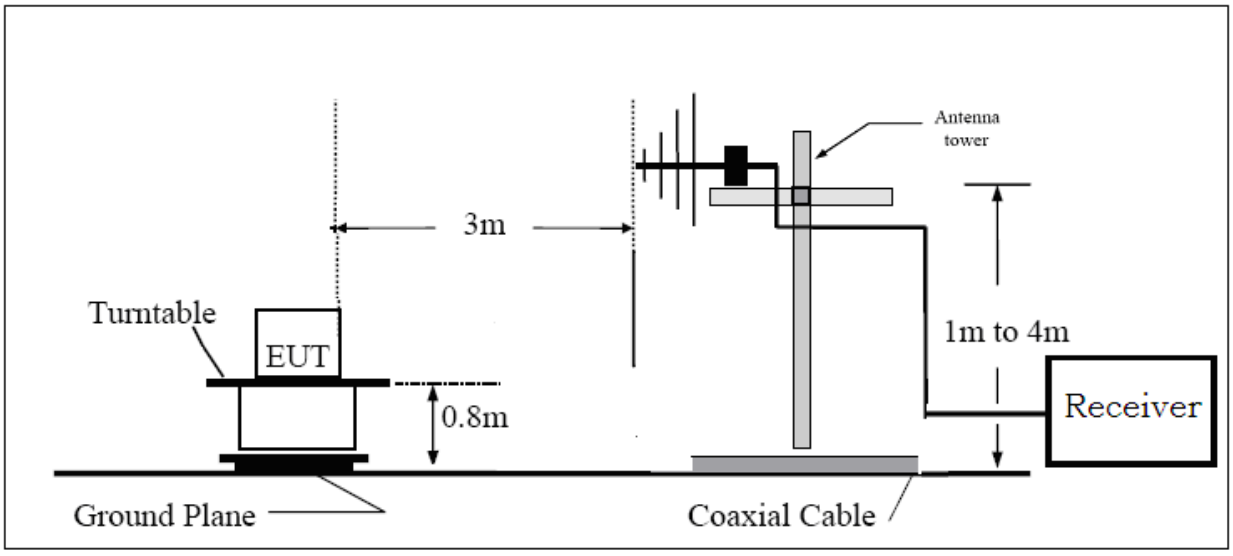
The EUT is placed on a non-metallic table 0.8m above the horizontal metal reference ground plane. The distance between EUT and receive antenna should be 3 meters. During the test, the EUT was operating in its typical mode. Sweep the whole frequency band through the range from 30MHz to 6 GHz. During the test, the height of receive antenna shall be moved from 1 to 4 meters, and the antenna shall be performed under horizontal and vertical polarization. The turn table shall be rotated from 0 to 360 degrees for detecting the maximum of radiated spurious signal level. The measurements shall be repeated with orthogonal polarization of the test antenna.

Below 1GHz, RBW is set to 100 kHz and VBW is set to 300kHz.Above 1GHz, RBW is set to 1MHz and VBW is set to 3MHz.

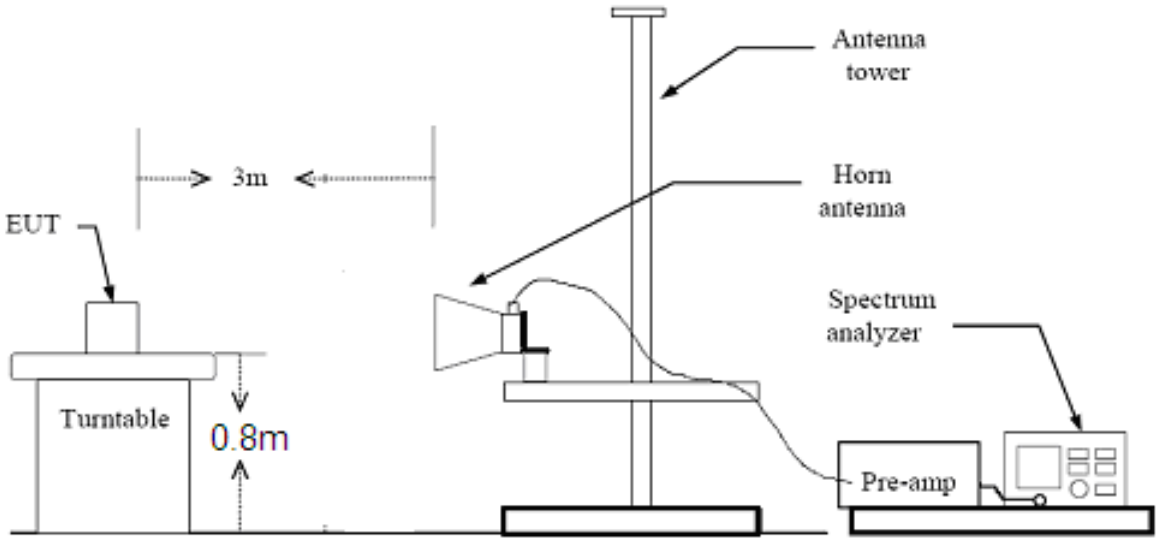
During the test, the EUT is worked at maximum output power. The Absolute Radio Frequency channel number is 7 in the case of WIFI.

Test Setup

Below 1 GHz



Above 1GHz



Limits

Frequency (MHz)	Quasi-peak (dBμV/m)	Measurement distance (m)
30 -230	40	3
230-1000	47	3

Frequency (MHz)	Average (dBμV/m)	Peak (dBμV/m)	Measurement distance (m)
1000 -3000	50	70	3
3000- 6000	54	74	3

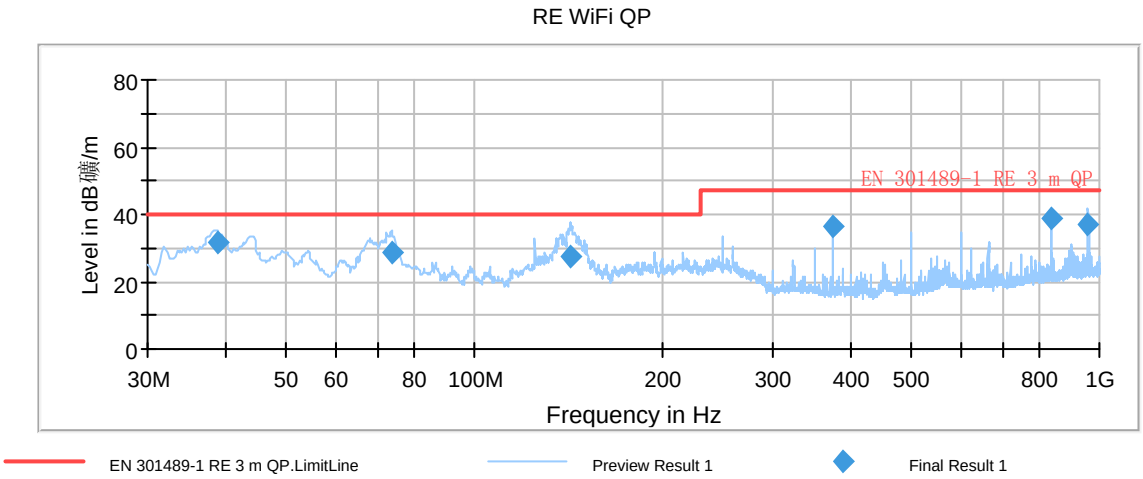
Measurement Uncertainty

The assessed measurement uncertainty to ensure 95% confidence level for the normal distribution is with the coverage factor k = 1.96.

Frequency	Uncertainty
30MHz-200MHz	4.19 dB
200MHz-1GHz	3.63 dB
1GHz – 6GHz	3.68 dB

Test Results:

802.11b



Radiated Emission 30M-1GHz,

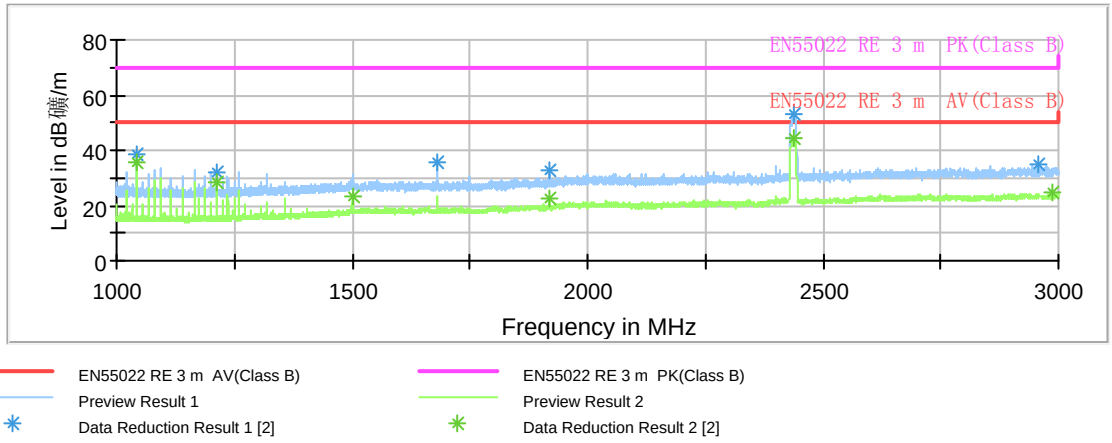
Frequency (MHz)	Quasi-Peak (dBuV/m)	Height (cm)	Polarization	Azimuth (deg)	Reading value (dBuV/m)	Correct Factor (dB)	Margin (dB)	Limit (dBuV/m)
38.845000	31.7	100.0	V	91.0	55.8	-24.1	8.3	40.0
73.610000	28.6	200.0	V	356.0	60.6	-32.0	11.4	40.0
142.240000	27.2	100.0	V	100.0	60	-32.8	12.8	40.0
374.997500	36.5	100.0	H	280.0	62.2	-25.7	10.5	47.0
839.992500	38.9	100.0	H	40.0	56.7	-17.8	8.1	47.0
959.987500	37.0	100.0	V	88.0	53.3	-16.3	10.0	47.0

Remark: 1. Quasi-Peak = Reading value + Correction factor

2. Correction Factor = Antenna factor+ Insertion loss(cable loss+amplifier gain)

3. Margin = Limit – Quasi-Peak

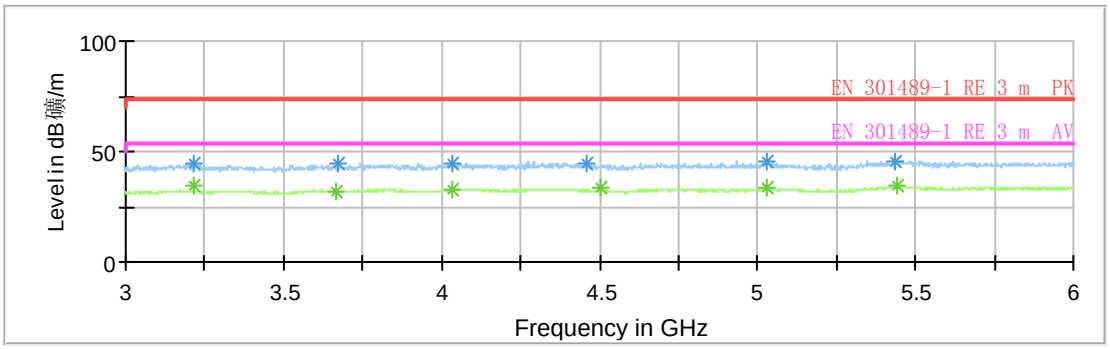
RE 1G-3GHz PK+AV



Note: The signal beyond the limit is carrier.

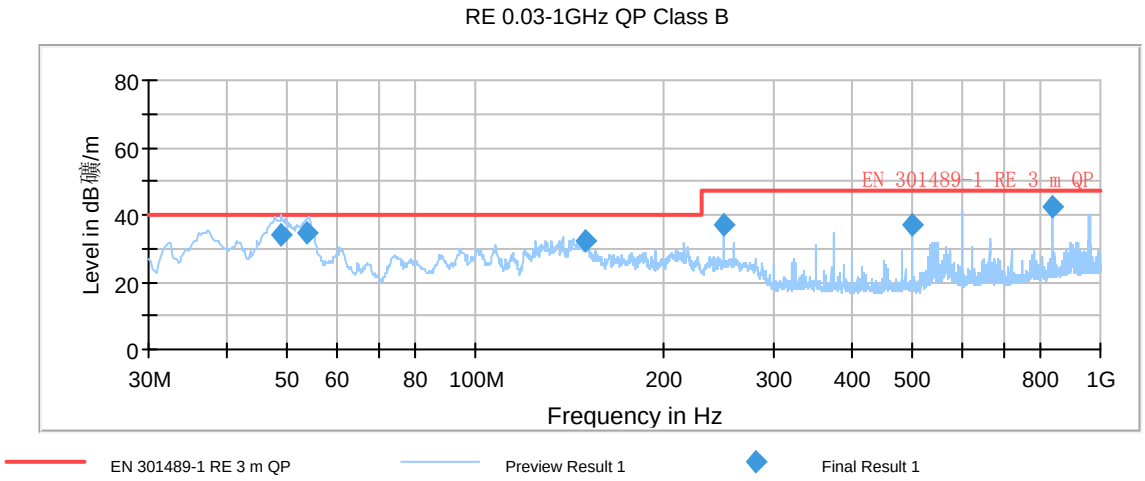
Radiated Emission 1G-3GHz

RE 3-18GHz PK+AV



Radiated Emission 3G-6GHz

802.11g



Radiated Emission 30M-1GHz

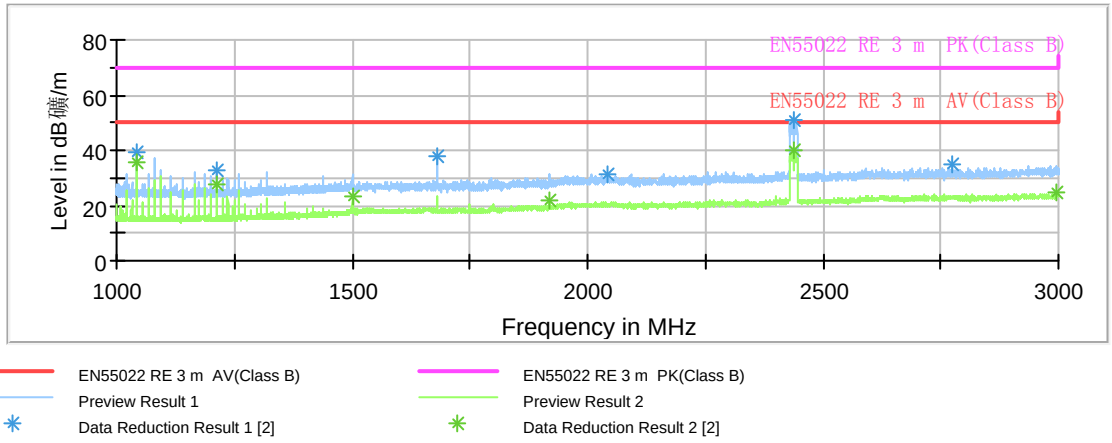
Frequency (MHz)	Quasi-Peak (dBuV/m)	Height (cm)	Polarization	Azimuth (deg)	Reading value (dBuV/m)	Correct Factor (dB)	Margin (dB)	Limit (dBuV/m)
48.715000	34.0	100.0	V	124.0	58.1	-24.1	6.0	40.0
53.930000	34.5	100.0	V	131.0	59.3	-24.8	5.5	40.0
149.995000	32.0	100.0	V	114.0	63.3	-31.3	8.0	40.0
249.987500	37.0	121.0	H	0.0	63.9	-26.9	10.0	47.0
500.005000	37.2	196.0	H	6.0	58.8	-21.6	9.8	47.0
839.992500	42.5	100.0	H	12.0	59.1	-16.6	4.5	47.0

Remark: 1. Quasi-Peak = Reading value + Correction factor

2. Correction Factor = Antenna factor+ Insertion loss(cable loss+amplifier gain)

3. Margin = Limit – Quasi-Peak

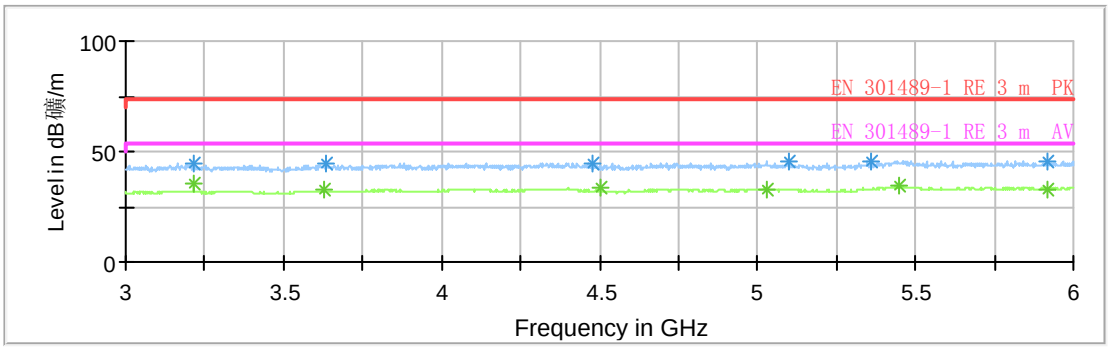
RE 1G-3GHz PK+AV



Note: The signal beyond the limit is carrier.

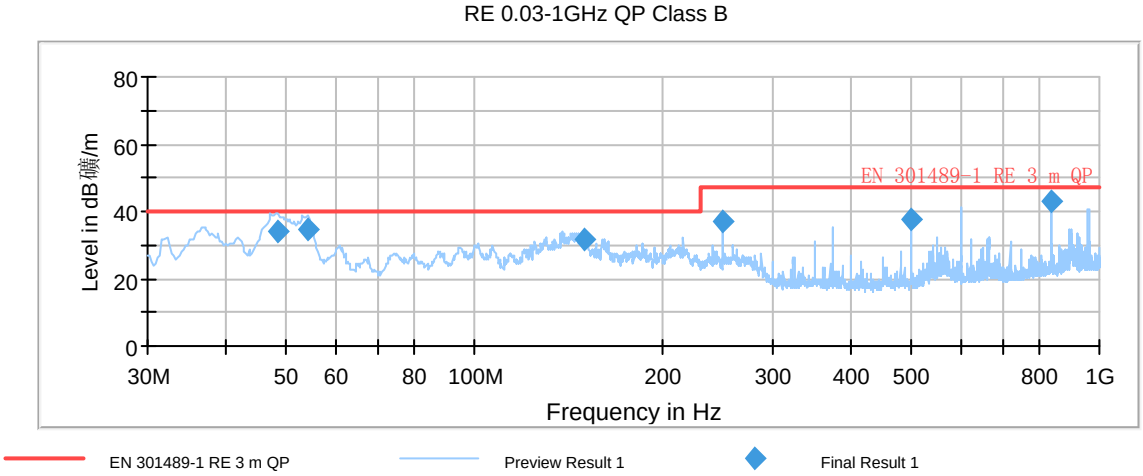
Radiated Emission 1G-3GHz

RE 3-18GHz PK+AV



Radiated Emission 3G-6GHz

802.11n HT20



Radiated Emission 30M-1GHz

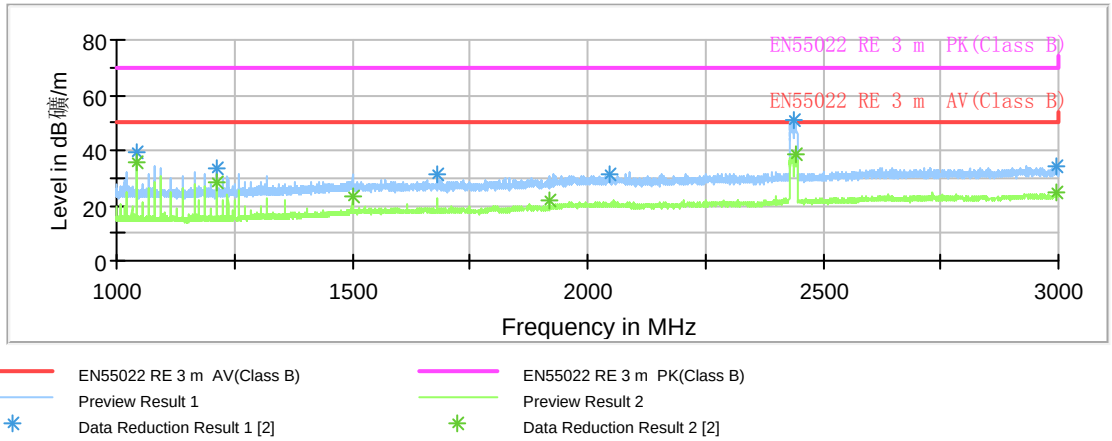
Frequency (MHz)	Quasi-Peak (dBuV/m)	Height (cm)	Polarization	Azimuth (deg)	Reading value (dBuV/m)	Correct Factor (dB)	Margin (dB)	Limit (dBuV/m)
48.587500	34.1	100.0	V	119.0	58.2	-24.1	5.9	40.0
53.967500	34.5	100.0	V	122.0	59.3	-24.8	5.5	40.0
149.995000	31.8	100.0	V	132.0	63.1	-31.3	8.2	40.0
249.987500	37.0	121.0	H	0.0	63.9	-26.9	10.0	47.0
500.005000	37.5	175.0	H	6.0	59.1	-21.6	9.5	47.0
839.992500	42.7	100.0	H	8.0	59.3	-16.6	4.3	47.0

Remark: 1. Quasi-Peak = Reading value + Correction factor

2. Correction Factor = Antenna factor+ Insertion loss(cable loss+amplifier gain)

3. Margin = Limit – Quasi-Peak

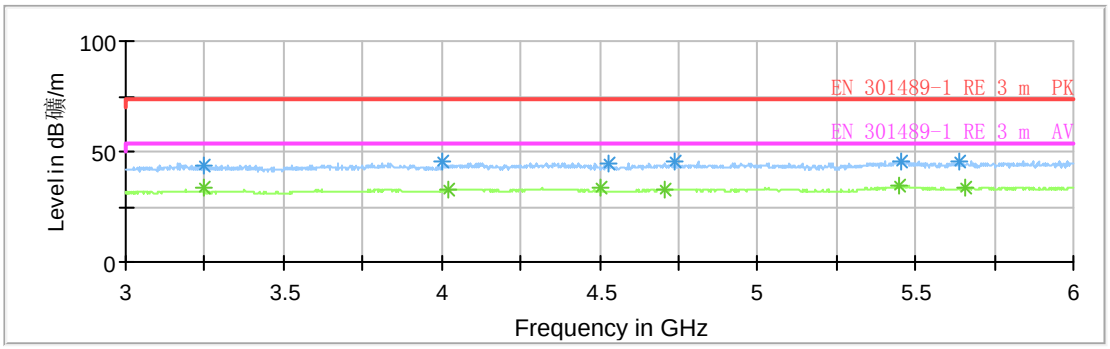
RE 1G-3GHz PK+AV



Note: The signal beyond the limit is carrier.

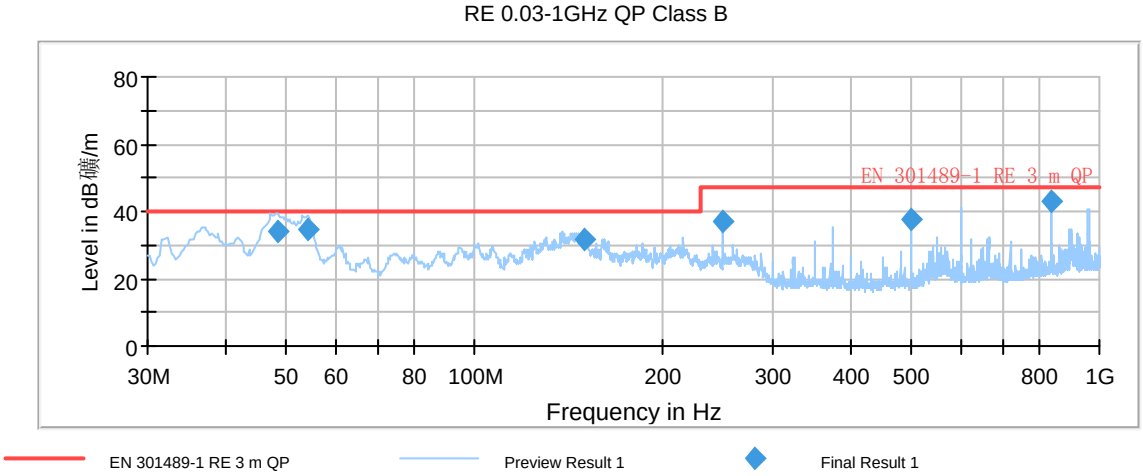
Radiated Emission 1G-3GHz

RE 3-18GHz PK+AV



Radiated Emission 3G-6GHz

802.11n HT40



Radiated Emission 30M-1GHz

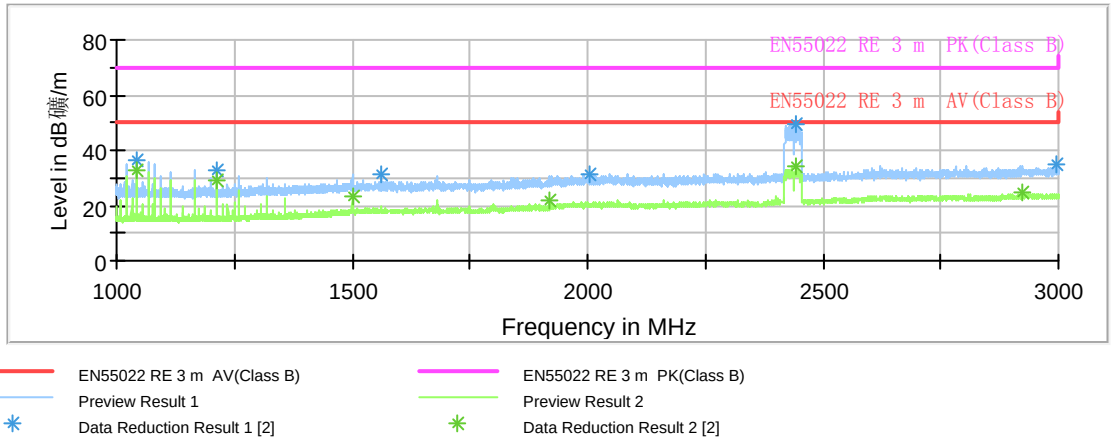
Frequency (MHz)	Quasi-Peak (dBuV/m)	Height (cm)	Polarization	Azimuth (deg)	Reading value (dBuV/m)	Correct Factor (dB)	Margin (dB)	Limit (dBuV/m)
48.587500	34.1	100.0	V	119.0	58.2	-24.1	5.9	40.0
53.967500	34.5	100.0	V	122.0	59.3	-24.8	5.5	40.0
149.995000	31.8	100.0	V	132.0	63.1	-31.3	15.2	40.0
249.987500	37.0	121.0	H	0.0	63.9	-26.9	10.0	47.0
500.005000	37.5	175.0	H	6.0	59.1	-21.6	9.5	47.0
839.992500	42.7	100.0	H	8.0	59.3	-16.6	4.3	47.0

Remark: 1. Quasi-Peak = Reading value + Correction factor

2. Correction Factor = Antenna factor+ Insertion loss(cable loss+amplifier gain)

3. Margin = Limit – Quasi-Peak

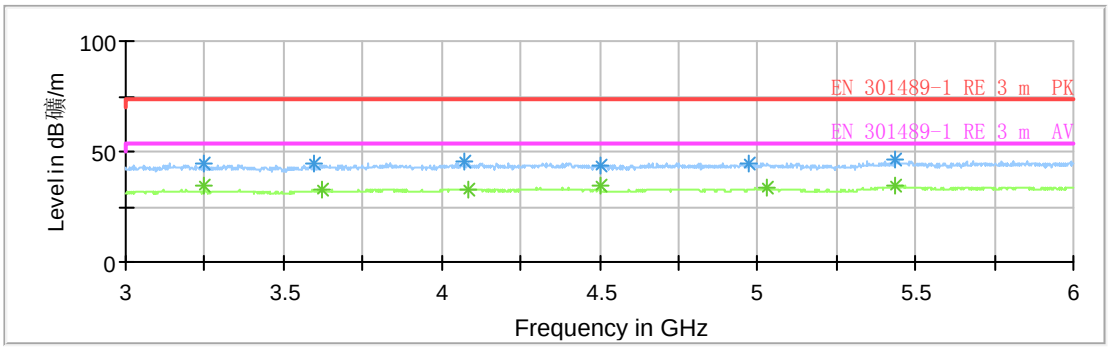
RE 1G-3GHz PK+AV



Note: The signal beyond the limit is carrier.

Radiated Emission 1G-3GHz

RE 3-18GHz PK+AV



Radiated Emission 3G-6GHz

3.3. Conducted Emission

Ambient condition

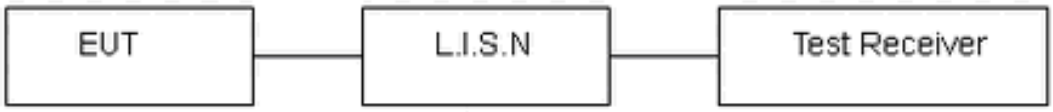
Temperature	Relative humidity	Pressure
23°C ~26°C	45%~50%	101.5kPa

Methods of Measurement

The EUT is placed on a non-metallic table of 80cm height above the horizontal metal reference ground plane. The frequency band range is from 150 kHz to 30 MHz. RBW is set to 9 kHz and VBW is set to 30 kHz on spectrum analyzer. During the test, the EUT was operating in its typical mode. Connect the DC power line of the EUT to the L.I.S.N. Use EMI receiver to detect the average and Quasi-peak value. The measurement result should include both L line and N line.

The EUT operated at maximum output power. The Absolute Radio Frequency channel number is 7 in the case of WIFI.

Test Setup



Limits

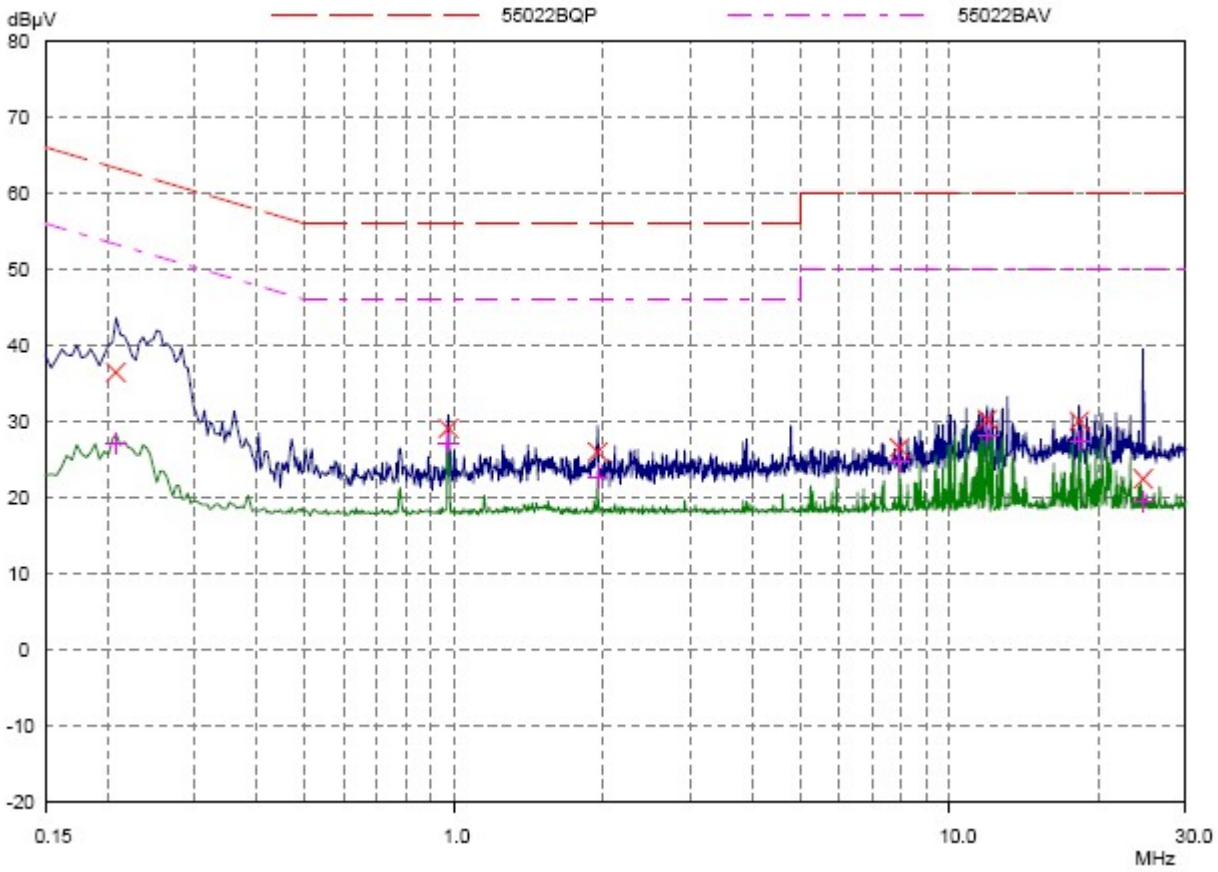
Frequency (MHz)	Conducted Limits(dBμV)	
	Quasi-Peak	Average
0.15 - 0.5	66 to 56 *	56 to 46*
0.5 - 5	56	46
5 - 30	60	50
*: Decreases with the logarithm of the frequency.		

Measurement Uncertainty

The assessed measurement uncertainty to ensure 95% confidence level for the normal distribution is with the coverage factor k = 1.96, U= 2.69 dB.

Test Results:

802.11b

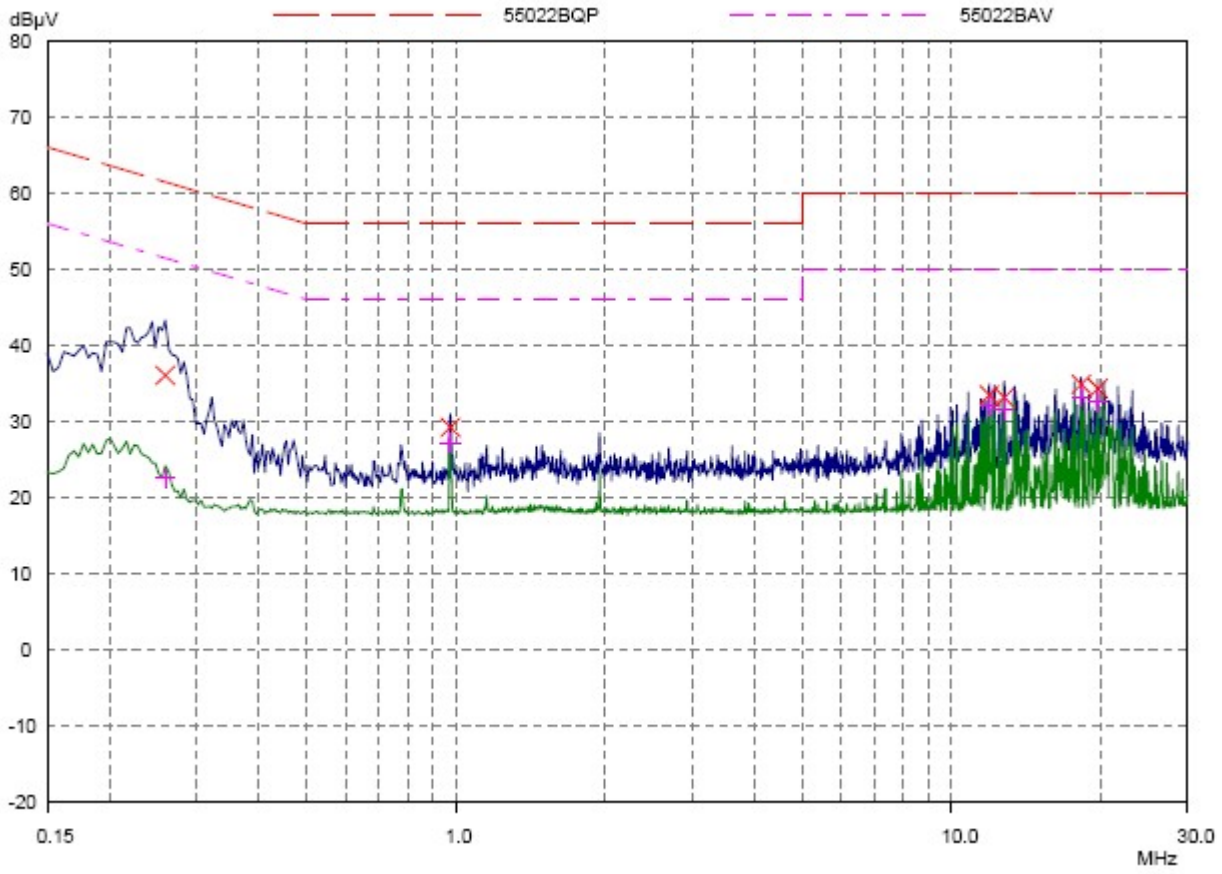


L Line

Final Measurement Results

Frequency MHz	QP Level dBµV	QP Limit dBµV	QP Delta dB	Phase -	PE -
0.20859	36.38	63.26	26.88	L1	gnd
0.97421	29.02	56.00	26.98	L1	gnd
1.94687	25.94	56.00	30.06	L1	gnd
7.92343	26.50	60.00	33.50	L1	gnd
11.89218	30.22	60.00	29.78	L1	gnd
18.24375	29.98	60.00	30.02	L1	gnd
24.5289	22.40	60.00	37.60	L1	gnd

Frequency MHz	AV Level dBµV	AV Limit dBµV	AV Delta dB	Phase -	PE -
0.20859	27.10	53.26	26.16	L1	gnd
0.97421	27.16	46.00	18.84	L1	gnd
1.94687	22.56	46.00	23.44	L1	gnd
7.92343	24.60	50.00	25.40	L1	gnd
11.89218	28.15	50.00	21.85	L1	gnd
18.24375	27.41	50.00	22.59	L1	gnd
24.5289	19.45	50.00	30.55	L1	gnd



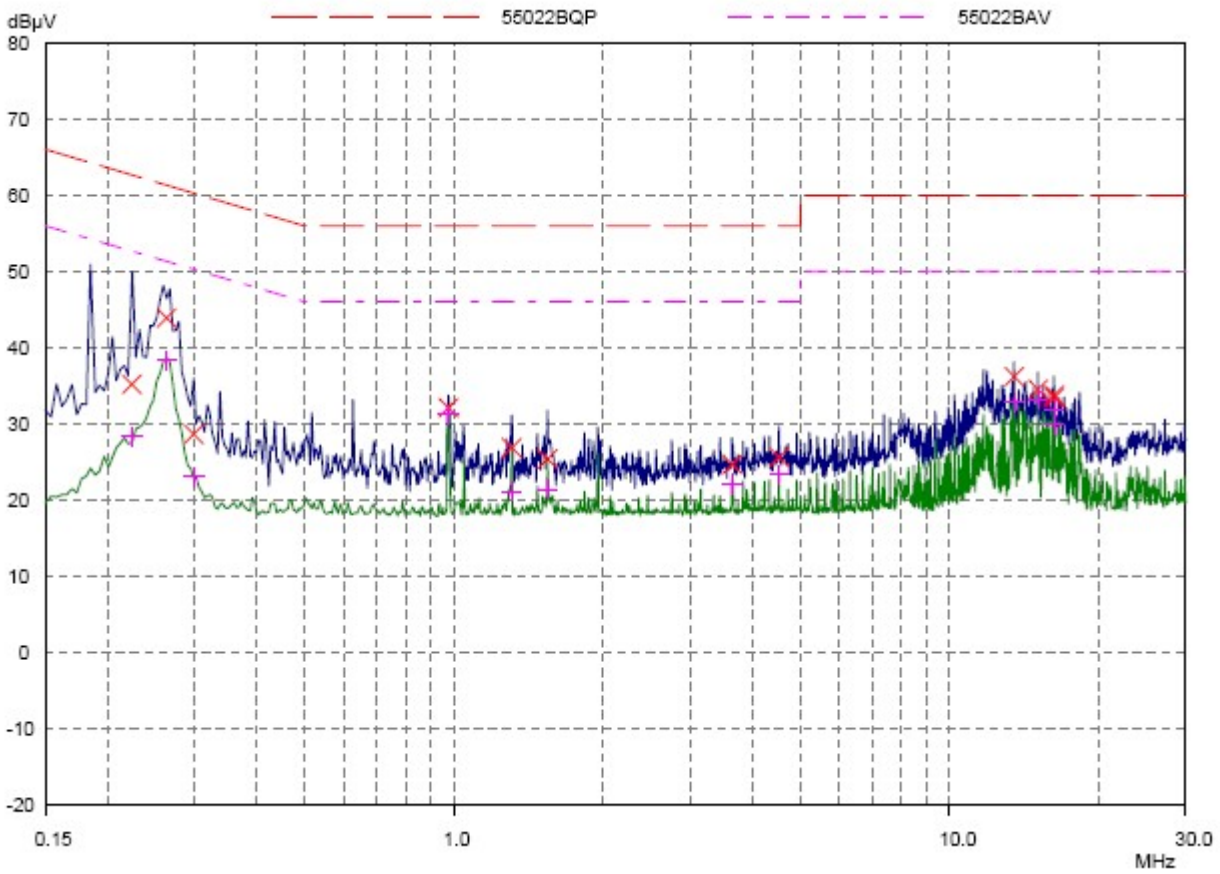
N Line

Final Measurement Results

Frequency MHz	QP Level dBµV	QP Limit dBµV	QP Delta dB	Phase -	PE -
0.25937	35.98	61.45	25.47	N	gnd
0.97421	29.20	56.00	26.80	N	gnd
11.89218	33.42	60.00	26.58	N	gnd
12.74765	33.08	60.00	26.92	N	gnd
18.24375	34.82	60.00	25.18	N	gnd
19.70859	34.28	60.00	25.72	N	gnd

Frequency MHz	AV Level dBµV	AV Limit dBµV	AV Delta dB	Phase -	PE -
0.25937	22.46	51.45	28.99	N	gnd
0.97421	27.16	46.00	18.84	N	gnd
11.89218	32.00	50.00	18.00	N	gnd
12.74765	31.49	50.00	18.51	N	gnd
18.24375	33.18	50.00	16.82	N	gnd
19.70859	32.55	50.00	17.45	N	gnd

802.11g



L Line

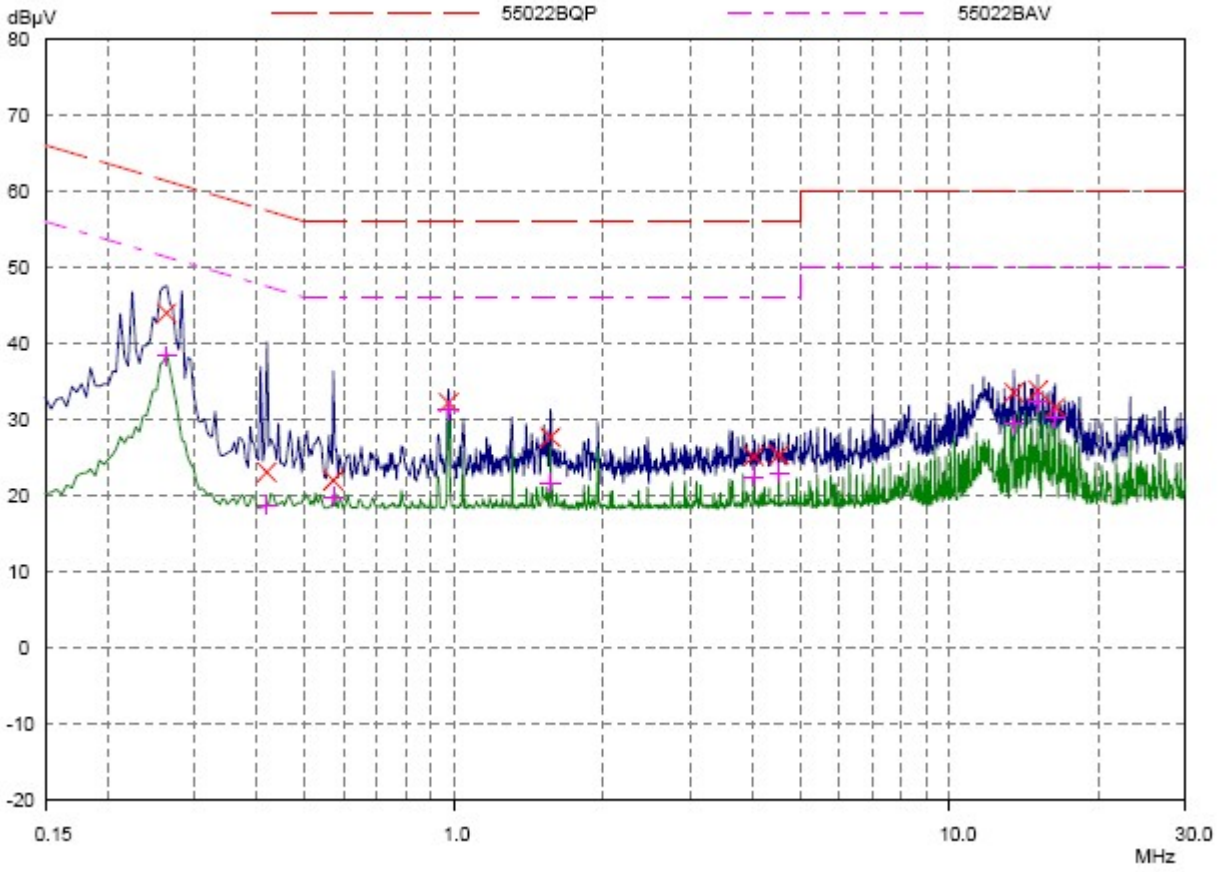
Final Measurement Results

Frequency MHz	QP Level dBµV	QP Limit dBµV	QP Delta dB	Phase -	PE -
0.22421	35.12	62.66	27.54	L1	gnd
0.26328	43.88	61.33	17.45	L1	gnd
0.29843	28.60	60.29	31.69	L1	gnd
0.97421	32.08	56.00	23.92	L1	gnd
1.30625	26.80	56.00	29.20	L1	gnd
1.54453	25.36	56.00	30.64	L1	gnd
3.64218	24.60	56.00	31.40	L1	gnd
4.525	25.58	56.00	30.42	L1	gnd
13.47812	36.14	60.00	23.86	L1	gnd
15.05234	34.48	60.00	25.52	L1	gnd
16.22812	33.72	60.00	26.28	L1	gnd
16.23203	33.42	60.00	26.58	L1	gnd

Frequency MHz	AV Level dBµV	AV Limit dBµV	AV Delta dB	Phase -	PE -
0.22421	28.32	52.66	24.34	L1	gnd
0.26328	38.30	51.33	13.03	L1	gnd
0.29843	23.02	50.29	27.27	L1	gnd
0.97421	31.18	46.00	14.82	L1	gnd
1.30625	21.08	46.00	24.92	L1	gnd
1.54453	21.39	46.00	24.61	L1	gnd
3.64218	22.08	46.00	23.92	L1	gnd
4.525	23.27	46.00	22.73	L1	gnd
13.47812	32.81	50.00	17.19	L1	gnd

Final Measurement Results (continued)

Frequency MHz	AV Level dBµV	AV Limit dBµV	AV Delta dB	Phase -	PE -
15.05234	33.18	50.00	16.82	L1	gnd
16.22812	31.86	50.00	18.14	L1	gnd
16.23203	29.98	50.00	20.02	L1	gnd



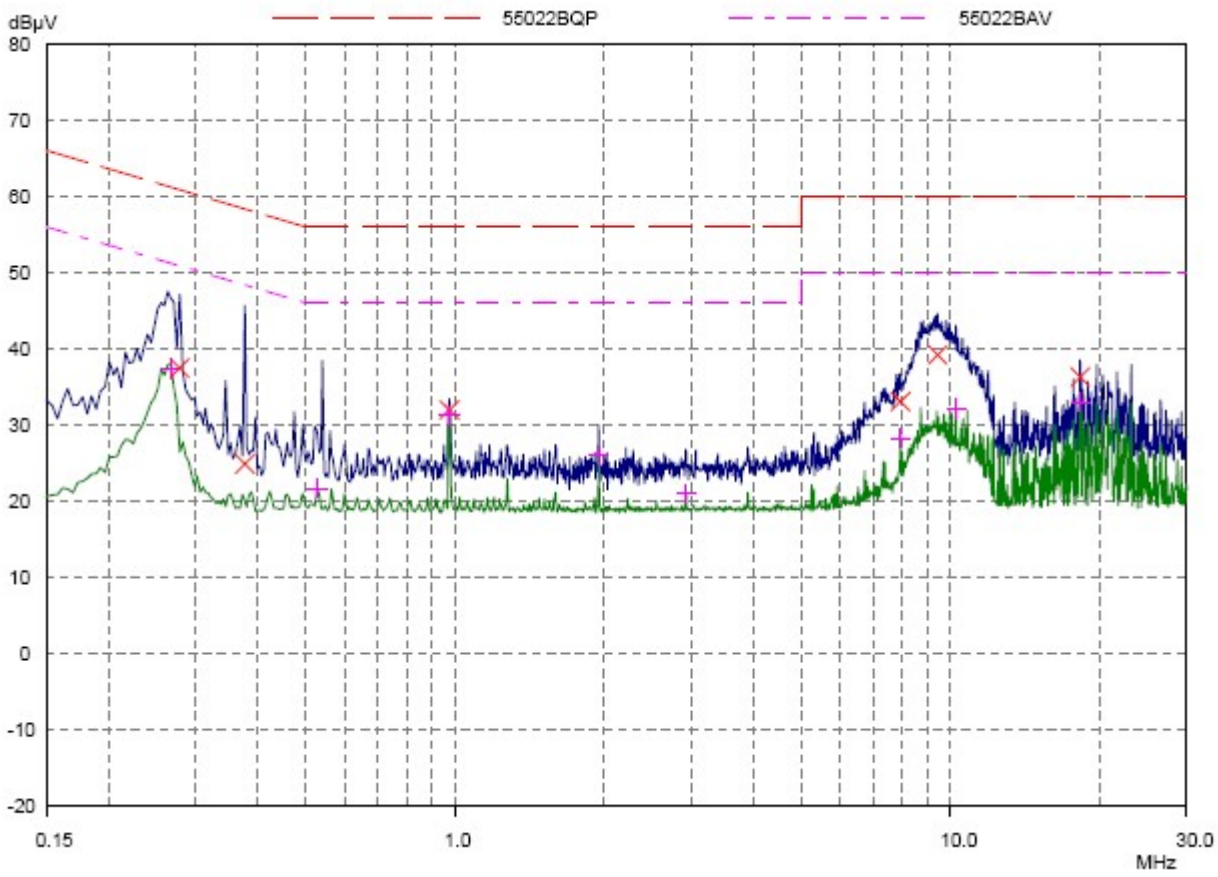
N Line

Final Measurement Results

Frequency MHz	QP Level dBµV	QP Limit dBµV	QP Delta dB	Phase -	PE -
0.26328	43.90	61.33	17.43	N	gnd
0.41953	23.02	57.46	34.44	N	gnd
0.57187	21.92	56.00	34.08	N	gnd
0.97421	32.14	56.00	23.86	N	gnd
1.56796	27.58	56.00	28.42	N	gnd
4.0328	25.08	56.00	30.92	N	gnd
4.525	25.28	56.00	30.72	N	gnd
13.48203	33.50	60.00	26.50	N	gnd
15.05625	33.76	60.00	26.24	N	gnd
16.33359	31.54	60.00	28.46	N	gnd

Frequency MHz	AV Level dBµV	AV Limit dBµV	AV Delta dB	Phase -	PE -
0.26328	38.30	51.33	13.03	N	gnd
0.41953	18.67	47.46	28.79	N	gnd
0.57187	19.74	46.00	26.26	N	gnd
0.97421	31.18	46.00	14.82	N	gnd
1.56796	21.62	46.00	24.38	N	gnd
4.0328	22.40	46.00	23.60	N	gnd
4.525	22.92	46.00	23.08	N	gnd
13.48203	29.33	50.00	20.67	N	gnd
15.05625	32.34	50.00	17.66	N	gnd
16.33359	30.07	50.00	19.93	N	gnd

802.11n HT20

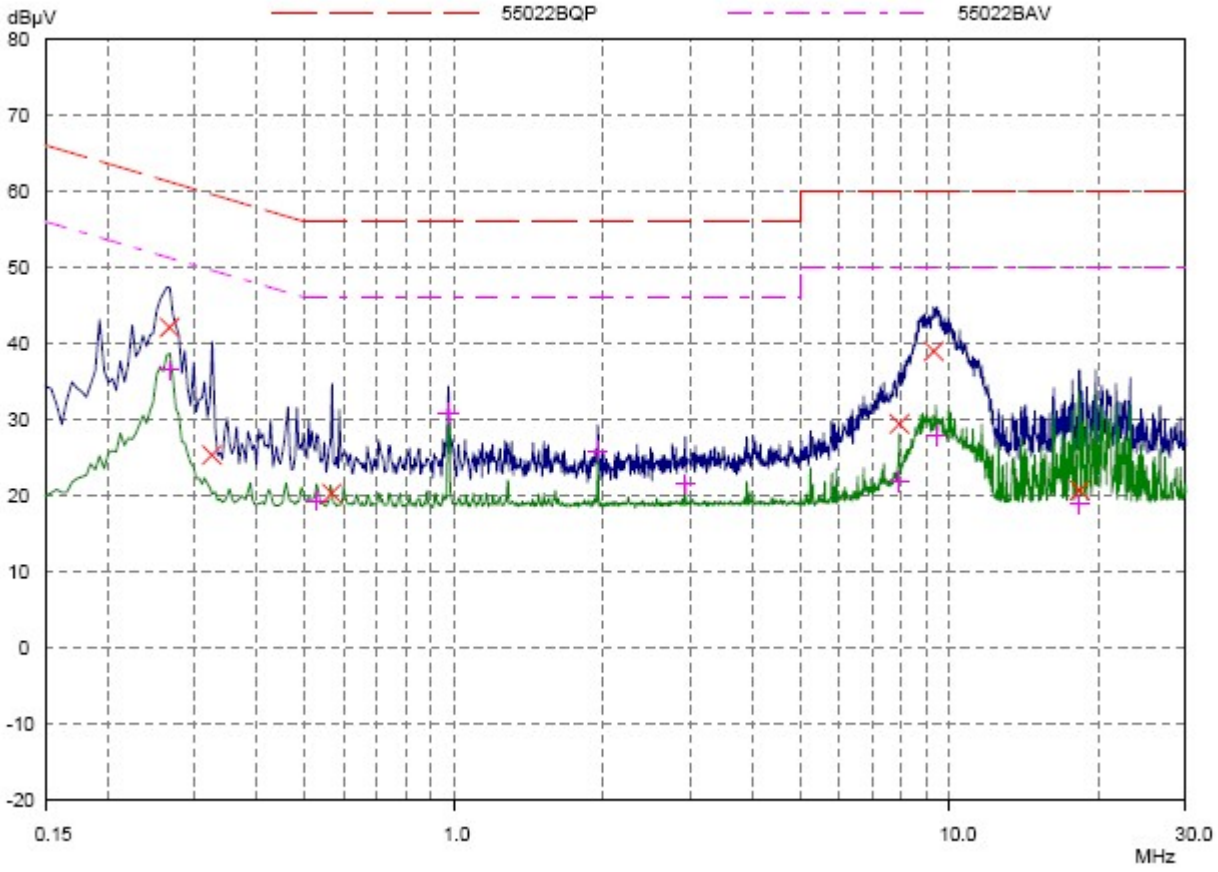


L Line

Final Measurement Results

Frequency MHz	QP Level dBµV	QP Limit dBµV	QP Delta dB	Phase -	PE -
0.2789	37.38	60.85	23.47	L1	gnd
0.37656	24.82	58.35	33.53	L1	gnd
0.97421	31.90	56.00	24.10	L1	gnd
7.92343	33.00	60.00	27.00	L1	gnd
9.41171	39.12	60.00	20.88	L1	gnd
18.24375	36.22	60.00	23.78	L1	gnd

Frequency MHz	AV Level dBµV	AV Limit dBµV	AV Delta dB	Phase -	PE -
0.26718	37.36	51.21	13.85	L1	gnd
0.5289	21.57	46.00	24.43	L1	gnd
0.97421	31.18	46.00	14.82	L1	gnd
1.95078	25.98	46.00	20.02	L1	gnd
2.92734	20.89	46.00	25.11	L1	gnd
7.92343	28.21	50.00	21.79	L1	gnd
10.24375	32.07	50.00	17.93	L1	gnd
18.24375	32.93	50.00	17.07	L1	gnd



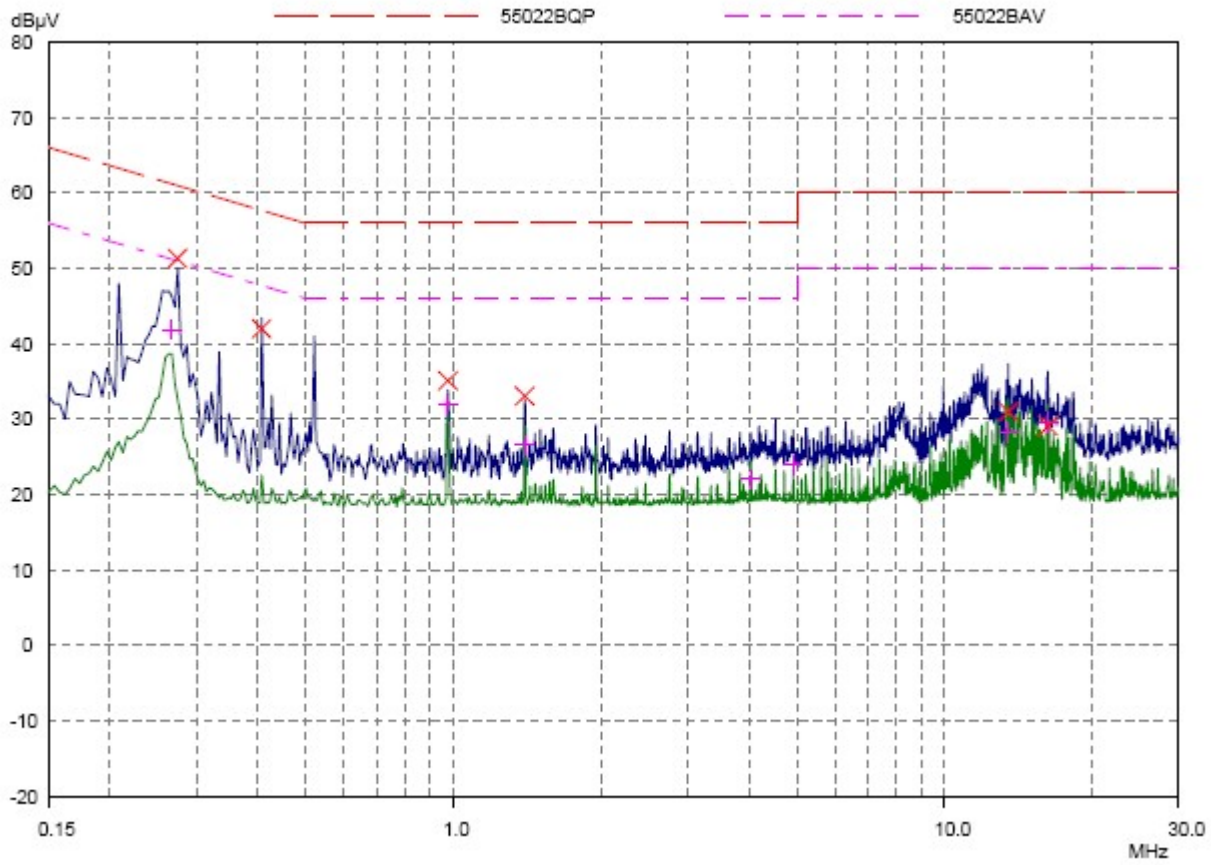
N Line

Final Measurement Results

Frequency MHz	QP Level dBµV	QP Limit dBµV	QP Delta dB	Phase -	PE -
0.26718	42.02	61.21	19.19	N	gnd
0.32578	25.24	59.56	34.32	N	gnd
0.56796	20.24	56.00	35.76	N	gnd
7.92343	29.38	60.00	30.62	N	gnd
9.28281	38.92	60.00	21.08	N	gnd
18.30234	20.66	60.00	39.34	N	gnd

Frequency MHz	AV Level dBµV	AV Limit dBµV	AV Delta dB	Phase -	PE -
0.26718	36.48	51.21	14.73	N	gnd
0.5289	19.22	46.00	26.78	N	gnd
0.97421	30.79	46.00	15.21	N	gnd
1.95078	25.84	46.00	20.16	N	gnd
2.92734	21.45	46.00	24.55	N	gnd
7.92343	21.80	50.00	28.20	N	gnd
9.38828	27.87	50.00	22.13	N	gnd
18.24375	18.83	50.00	31.17	N	gnd

802.11n HT40

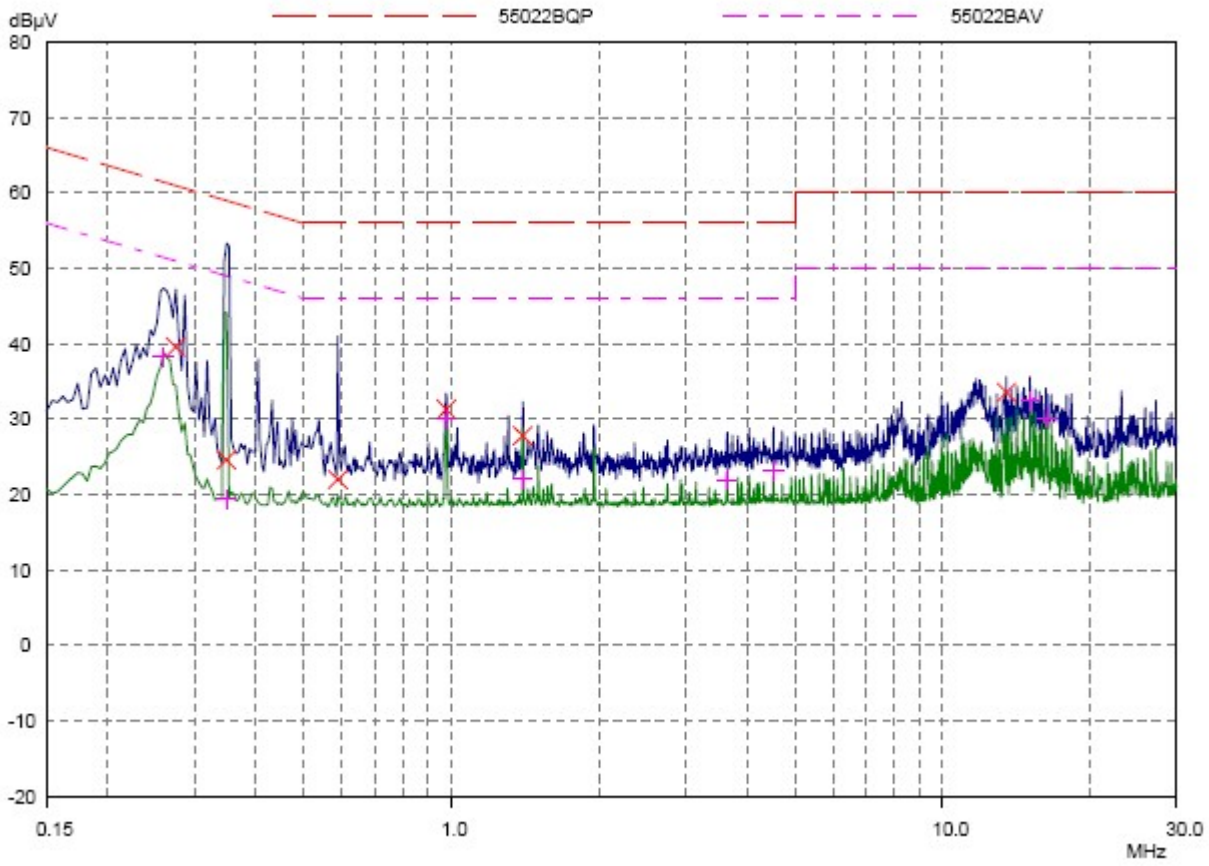


L Line

Final Measurement Results

Frequency MHz	QP Level dBµV	QP Limit dBµV	QP Delta dB	Phase -	PE -
0.275	51.32	60.97	9.65	L1	gnd
0.40781	41.96	57.69	15.73	L1	gnd
0.97421	35.04	56.00	20.96	L1	gnd
1.39609	33.02	56.00	22.98	L1	gnd
13.47812	30.92	60.00	29.08	L1	gnd
16.23203	29.06	60.00	30.94	L1	gnd

Frequency MHz	AV Level dBµV	AV Limit dBµV	AV Delta dB	Phase -	PE -
0.26718	41.84	51.21	9.37	L1	gnd
0.97421	31.86	46.00	14.14	L1	gnd
1.39609	26.53	46.00	19.47	L1	gnd
4.0328	21.97	46.00	24.03	L1	gnd
4.91953	23.87	46.00	22.13	L1	gnd
13.47812	28.21	50.00	21.79	L1	gnd
16.22812	29.52	50.00	20.48	L1	gnd



N Line

Final Measurement Results

Frequency MHz	QP Level dBµV	QP Limit dBµV	QP Delta dB	Phase -	PE -
0.275	39.54	60.97	21.43	N	gnd
0.34921	24.52	58.98	34.46	N	gnd
0.5875	21.96	56.00	34.04	N	gnd
0.97812	31.26	56.00	24.74	N	gnd
1.39609	27.76	56.00	28.24	N	gnd
13.48203	33.50	60.00	26.50	N	gnd

Frequency MHz	AV Level dBµV	AV Limit dBµV	AV Delta dB	Phase -	PE -
0.25937	38.16	51.45	13.29	N	gnd
0.34921	19.30	48.98	29.68	N	gnd
0.97812	29.98	46.00	16.02	N	gnd
1.39609	21.97	46.00	24.03	N	gnd
3.63828	21.91	46.00	24.09	N	gnd
4.525	23.02	46.00	22.98	N	gnd
15.05625	32.34	50.00	17.66	N	gnd
16.33359	30.20	50.00	19.80	N	gnd

3.4. Electrostatic Discharge

Ambient condition

Temperature	Relative humidity	Pressure
23°C ~25°C	40%~45%	101.5kPa

General

During the test, the EUT was operating in its typical mode. The Absolute Radio Frequency channel number is 7 in the case of WIFI.

The EUT is placed on a non-metallic table of 80cm height above the ground reference plane.

A horizontal coupling plane (HCP) is placed on the table. The EUT and its cables shall be isolated from the coupling plane by an insulating support (0,5 ± 0,05) mm in thickness. The recommendation is criteria B.

Test Specifications

Criteria	During test	After Test
A	Shall operate as intended May show degradation of performance Shall be no loss of function Shall be no unintentional transmissions	Shall operate as intended May show degradation of performance 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 No unintentional all transmissions	Function shall be self-recoverable Shall operate as intended after recovering Shall be no degradation of performance 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 degradation of performance

Test Results

802.11b

Coupling	Voltage	Performance Criterion	Required Passing Criterion	Results
Air Discharge	±2kV	A	B	PASS
	±4kV	A	B	PASS
	±8kV	A	B	PASS
Contact Discharge	±2kV	A	B	PASS
	±4kV	A	B	PASS
Horizontal Coupling Plane	±2kV	A	B	PASS
	±4kV	A	B	PASS
Vertical Coupling Plane	±2kV	A	B	PASS
	±4kV	A	B	PASS

802.11g

Coupling	Voltage	Performance Criterion	Required Passing Criterion	Results
Air Discharge	±2kV	A	B	PASS
	±4kV	A	B	PASS
	±8kV	A	B	PASS
Contact Discharge	±2kV	A	B	PASS
	±4kV	A	B	PASS
Horizontal Coupling Plane	±2kV	A	B	PASS
	±4kV	A	B	PASS
Vertical Coupling Plane	±2kV	A	B	PASS
	±4kV	A	B	PASS

802.11n HT20

Coupling	Voltage	Performance Criterion	Required Passing Criterion	Results
Air Discharge	±2kV	A	B	PASS
	±4kV	A	B	PASS
	±8kV	A	B	PASS
Contact Discharge	±2kV	A	B	PASS
	±4kV	A	B	PASS
Horizontal Coupling Plane	±2kV	A	B	PASS
	±4kV	A	B	PASS
Vertical Coupling Plane	±2kV	A	B	PASS
	±4kV	A	B	PASS

802.11n HT40

Coupling	Voltage	Performance Criterion	Required Passing Criterion	Results
Air Discharge	±2kV	A	B	PASS
	±4kV	A	B	PASS
	±8kV	A	B	PASS
Contact Discharge	±2kV	A	B	PASS
	±4kV	A	B	PASS
Horizontal Coupling Plane	±2kV	A	B	PASS
	±4kV	A	B	PASS
Vertical Coupling Plane	±2kV	A	B	PASS
	±4kV	A	B	PASS

3.5. RF Electromagnetic Field (RS)

Ambient condition

Temperature	Relative humidity	Pressure
23°C ~25°C	45%~50%	101.5kPa

General

Before testing, the intensity of the established of field strength is checked by the field sensor for the calibration, after that the EUT is placed in the center of the enclosure on a wooden table.

During the test, the EUT was operating in its typical mode. The test frequency range is from 80MHz to 1000MHz and 1400MHz to 2700MHz, severity level of 3V/m .The recommendation criteria is criteria A.

The operator shall observe whether the communication link is maintained. It should be not more than 3. Use an audio analyzer such as UPV to measure uplink and downlink speech output levels to see whether audio breakthroughs are at least 35 dB less than reference measurement values of audio calibration. The test is performed as link mode.

The Absolute Radio Frequency channel number is 7 in the case of WIFI.

Test Specifications

Criteria	During test	After Test
A	Shall operate as intended May show degradation of performance Shall be no loss of function Shall be no unintentional transmissions	Shall operate as intended May show degradation of performance 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 No unintentional all transmissions	Function shall be self-recoverable Shall operate as intended after recovering Shall be no degradation of performance 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 degradation of performance

Measurement Uncertainty

The assessed measurement uncertainty to ensure 95% confidence level for the normal distribution is with the coverage factor k = 1.96, U= 2.60dB.

Test Results:

802.11b

Range	Level	Modulation	Performance Criterion	Required Passing Criterion	Results
80-1000MHz	3V/m	80 % AM (1kHz)	A	A	PASS
1400-2700MHz	3V/m	80 % AM (1kHz)	A	A	PASS

802.11g

Range	Level	Modulation	Performance Criterion	Required Passing Criterion	Results
80-1000MHz	3V/m	80 % AM (1kHz)	A	A	PASS
1400-2700MHz	3V/m	80 % AM (1kHz)	A	A	PASS

802.11n HT20

Range	Level	Modulation	Performance Criterion	Required Passing Criterion	Results
80-1000MHz	3V/m	80 % AM (1kHz)	A	A	PASS
1400-2700MHz	3V/m	80 % AM (1kHz)	A	A	PASS

802.11n HT40

Range	Level	Modulation	Performance Criterion	Required Passing Criterion	Results
80-1000MHz	3V/m	80 % AM (1kHz)	A	A	PASS
1400-2700MHz	3V/m	80 % AM (1kHz)	A	A	PASS

3.6. Fast Transients Common Mode (EFT)

Ambient condition

Temperature	Relative humidity	Pressure
23°C ~25°C	45%~50%	101.5kPa

General

The test intended to show the immunity of the EUT when subjected to type of transient interference such as originating from switching transients. Bursts consisting of a number of transient are employed, coupled into power supply, control and signal inputs of EUT, The transients must be short rise-time, the repetition rate and the low energy. The recommendation criteria is criteria B.

The EUT is arranged and connected according to its normal installation requirements. The length of the signal and power lines between the coupling device (clamp) and the EUT is 0.5m±0.05m. If a non-detachable cable more than 0.5m long with the equipment, the excess length of this cable is gathered into a flat coil with 0.4m diameter and situated at a distance of 0.1m above the ground reference plane. Bursts of 5ns/50ns pluses at a repetition rate of 5kHz with a duration of 15ms and period of 300ms, applied in both polarities between power supply terminals (including the protective earth) and a reference ground plane, or via a capacitate coupling clamp onto I/O circuits and communication lines for 3 minutes. The test level is 1kV on power supply, 0.5kV on I/O signal, data and control lines. The 0.5kV is applicable only to ports interfacing with cables whose total length according to the manufacturer's functional specification may exceed 3m.

The test is performed as link mode, The Absolute Radio Frequency channel number is 7 in the case of WIFI.

Test Specifications

Criteria	During test	After Test
A	Shall operate as intended May show degradation of performance Shall be no loss of function Shall be no unintentional transmissions	Shall operate as intended May show degradation of performance 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 No unintentional all transmissions	Function shall be self-recoverable Shall operate as intended after recovering Shall be no degradation of performance 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 degradation of performance

Results

802.11b

Connected	Voltage	Test Line	Performance Criterion	Required Passing Criterion	Results
Power Line	±1.0 KV	L	A	B	PASS
Power Line	±1.0 KV	N	A	B	PASS
Power Line	±1.0 KV	L+N	A	B	PASS

802.11g

Connected	Voltage	Test Line	Performance Criterion	Required Passing Criterion	Results
Power Line	±1.0 KV	L	A	B	PASS
Power Line	±1.0 KV	N	A	B	PASS
Power Line	±1.0 KV	L+N	A	B	PASS

802.11n HT20

Connected	Voltage	Test Line	Performance Criterion	Required Passing Criterion	Results
Power Line	±1.0 KV	L	A	B	PASS
Power Line	±1.0 KV	N	A	B	PASS
Power Line	±1.0 KV	L+N	A	B	PASS

802.11n HT40

Connected	Voltage	Test Line	Performance Criterion	Required Passing Criterion	Results
Power Line	±1.0 KV	L	A	B	PASS
Power Line	±1.0 KV	N	A	B	PASS
Power Line	±1.0 KV	L+N	A	B	PASS

3.7. Surge

Ambient condition

Temperature	Relative humidity	Pressure
23°C ~25°C	45%~50%	101.5kPa

General

The object of this section to establish a common reference for evaluating the performance of equipment when subjected to high-energy disturbances on the power and interconnection lines. The test is to find the reaction of the EUT under specified operational conditions caused by surge voltages form switching and lighting effects at certain threat levels. The recommendation criteria is criteria B.
During the test, the EUT was operating in its typical mode. The Absolute Radio Frequency channel number is 7 in the case of WIFI.

Test Specifications

Criteria	During test	After Test
A	Shall operate as intended May show degradation of performance Shall be no loss of function Shall be no unintentional transmissions	Shall operate as intended May show degradation of performance 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 No unintentional all transmissions	Function shall be self-recoverable Shall operate as intended after recovering Shall be no degradation of performance 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 degradation of performance

Results

802.11b

Connected	Voltage	Angle	Duration	Performance Criterion	Required Passing Criterion	Results
Power Line (L-N)	±1.0KV(1.2/50μs)	0	1 Minute / time	A	B	PASS
Power Line (L-N)	±1.0KV(1.2/50μs)	90	1 Minute / time	A	B	PASS
Power Line (L-N)	±1.0KV(1.2/50μs)	180	1 Minute / time	A	B	PASS
Power Line (L-N)	±1.0KV(1.2/50μs)	270	1 Minute / time	A	B	PASS

802.11g

Connected	Voltage	Angle	Duration	Performance Criterion	Required Passing Criterion	Results
Power Line (L-N)	±1.0KV(1.2/50μs)	0	1 Minute / time	A	B	PASS
Power Line (L-N)	±1.0KV(1.2/50μs)	90	1 Minute / time	A	B	PASS
Power Line (L-N)	±1.0KV(1.2/50μs)	180	1 Minute / time	A	B	PASS
Power Line (L-N)	±1.0KV(1.2/50μs)	270	1 Minute / time	A	B	PASS

802.11n HT20

Connected	Voltage	Angle	Duration	Performance Criterion	Required Passing Criterion	Results
Power Line (L-N)	±1.0KV(1.2/50μs)	0	1 Minute / time	A	B	PASS
Power Line (L-N)	±1.0KV(1.2/50μs)	90	1 Minute / time	A	B	PASS
Power Line (L-N)	±1.0KV(1.2/50μs)	180	1 Minute / time	A	B	PASS
Power Line (L-N)	±1.0KV(1.2/50μs)	270	1 Minute / time	A	B	PASS

802.11n HT40

Connected	Voltage	Angle	Duration	Performance Criterion	Required Passing Criterion	Results
Power Line (L-N)	±1.0KV(1.2/50μs)	0	1 Minute / time	A	B	PASS
Power Line (L-N)	±1.0KV(1.2/50μs)	90	1 Minute / time	A	B	PASS
Power Line (L-N)	±1.0KV(1.2/50μs)	180	1 Minute / time	A	B	PASS
Power Line (L-N)	±1.0KV(1.2/50μs)	270	1 Minute / time	A	B	PASS

3.8. Radio Frequency Common Mode (CS)

Ambient condition

Temperature	Relative humidity	Pressure
23°C~26°C	45%~50%	101.5kPa

General

Most electronic product is in some manner affected by environmental electromagnetic radiation; the performance will be degraded or totally un function. The object of this part is to evaluate the susceptibility of the EUT whether it can operate property in the electromagnetic environment. The recommendation criteria is criteria A.

The operator shall observe whether the communication link is maintained. The test is performed as link mode. The Absolute Radio Frequency channel number is 7 in the case of WIFI.

Test Specifications

Criteria	During test	After Test
A	Shall operate as intended May show degradation of performance Shall be no loss of function Shall be no unintentional transmissions	Shall operate as intended May show degradation of performance 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 No unintentional all transmissions	Function shall be self-recoverable Shall operate as intended after recovering Shall be no degradation of performance 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 degradation of performance

Measurement Uncertainty

The assessed measurement uncertainty to ensure 95% confidence level for the normal distribution is with the coverage factor k = 1.96, U= 2.76dB.

Test Results

802.11b

Range (MHz)	Level	Connected	Performance Criterion	Required Passing Criterion	Results
0.15-50	3Vrms	Power Port	A	A	PASS
50-80	3Vrms	Power Port	A	A	PASS

802.11g

Range (MHz)	Level	Connected	Performance Criterion	Required Passing Criterion	Results
0.15-50	3Vrms	Power Port	A	A	PASS
50-80	3Vrms	Power Port	A	A	PASS

802.11n HT20

Range (MHz)	Level	Connected	Performance Criterion	Required Passing Criterion	Results
0.15-50	3Vrms	Power Port	A	A	PASS
50-80	3Vrms	Power Port	A	A	PASS

802.11n HT40

Range (MHz)	Level	Connected	Performance Criterion	Required Passing Criterion	Results
0.15-50	3Vrms	Power Port	A	A	PASS
50-80	3Vrms	Power Port	A	A	PASS

3.9. Voltage dips and interruptions

Ambient condition

Temperature	Relative humidity	Pressure
23°C~26°C	45%~50%	101.5kPa

General

The section of EN 61000-4-11 defines the immunity test methods and range of preferred test levels for electrical and electronic equipment connected to low – voltage power supply for voltage dips, Short interruptions and voltage variations. The standard applied to electrical and electronic equipment having a rated input current not exceeding 16A per phase. A performance criteria is classified as A, B, C.

The test is performed as link mode, The Absolute Radio Frequency channel number is 7 in the case of WIFI.

Criteria	During test	After Test
A	Shall operate as intended May show degradation of performance Shall be no loss of function Shall be no unintentional transmissions	Shall operate as intended May show degradation of performance 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 No unintentional all transmissions	Function shall be self-recoverable Shall operate as intended after recovering Shall be no degradation of performance 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 degradation of performance

Test Results

802.11b

Level	Duration	Connected	Performance Criterion	Required Passing Criterion	Results
0%	0.5 Cycle	Power Port	A	B	PASS
0%	1 Cycle	Power Port	A	B	PASS
70%	25 Cycle	Power Port	A	C	PASS
0%	250 Cycle	Power Port	A	C	PASS

802.11g

Level	Duration	Connected	Performance Criterion	Required Passing Criterion	Results
0%	0.5 Cycle	Power Port	A	B	PASS
0%	1 Cycle	Power Port	A	B	PASS
70%	25 Cycle	Power Port	A	C	PASS
0%	250 Cycle	Power Port	A	C	PASS

802.11n HT20

Level	Duration	Connected	Performance Criterion	Required Passing Criterion	Results
0%	0.5 Cycle	Power Port	A	B	PASS
0%	1 Cycle	Power Port	A	B	PASS
70%	25 Cycle	Power Port	A	C	PASS
0%	250 Cycle	Power Port	A	C	PASS

802.11n HT40

Level	Duration	Connected	Performance Criterion	Required Passing Criterion	Results
0%	0.5 Cycle	Power Port	A	B	PASS
0%	1 Cycle	Power Port	A	B	PASS
70%	25 Cycle	Power Port	A	C	PASS
0%	250 Cycle	Power Port	A	C	PASS

4. Main Test Instrument

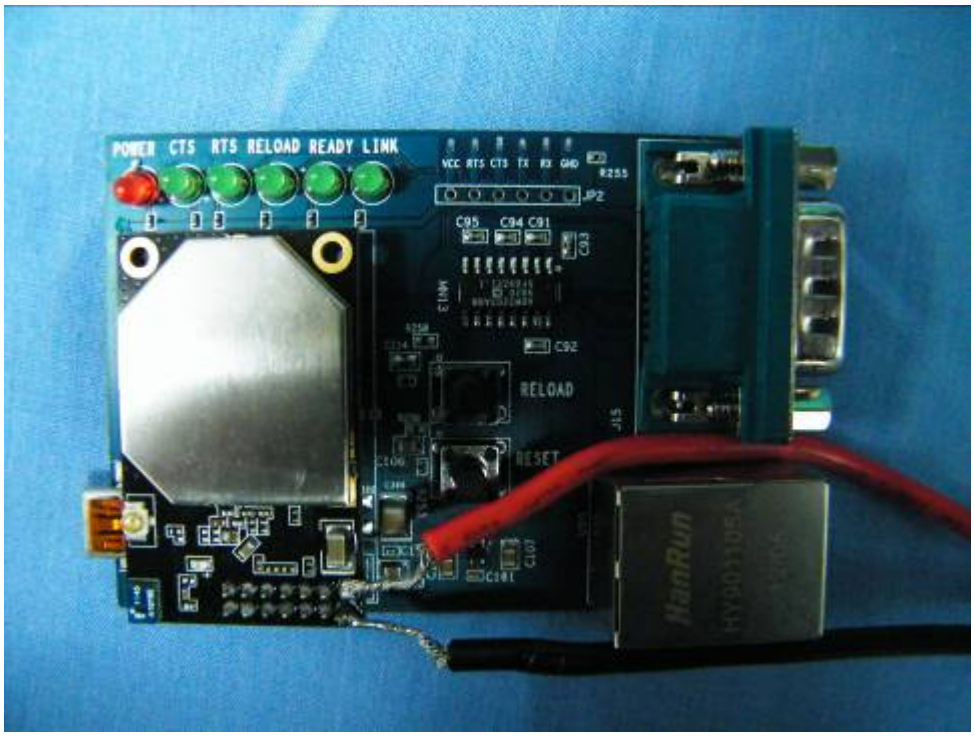
Table 1: List of Main Instruments

No.	Name	Type	Manufacturer	Serial Number	Calibration Date	Valid Period
01	Signal Analyzer	FSV	R&S	100815	2011-06-27	One year
02	EMI Test Receiver	ESCI	R&S	100948	2011-06-30	One year
03	Signal Generator	SMB100A	R&S	102594	2011-06-30	One year
04	TRILOG Broadband Antenna	VULB 9163	Schwarzbeck	201	2010-06-29	Two years
05	Double Ridged Waveguide Horn Antenna	HF907	R&S	100126	2011-07-01	Two years
06	EMI Test Receiver	ESCS30	R&S	100138	2012-01-16	One year
07	Artificial main network	ENV216	R&S	101171	2010-04-16	Two years
08	Single phase Harmonics& Flicker Analyzer	DPA 500N	EM TEST	V0902104586	2009-05-12	Three years
09	Electro-Static Discharger Generator	Nosieken	ESS-2002EX	ES1111144	2011-03-19	One year
10	Compact Simulator Of Conducted Immunity	UCS 500N6	EM TEST	V0902104581	2009-05-18	Three years
11	Audio Analyzer	UPV	R&S	101372	2011-06-30	One year
12	Power Amplifier	75A250A	AR	0331553	NA	NA
13	Signal Generator	SMB100A	R&S	102594	2011-06-30	One year
14	High Gain Log-Periodic Antenna	HL046E	R&S	100063	NA	NA

*****END OF REPORT *****

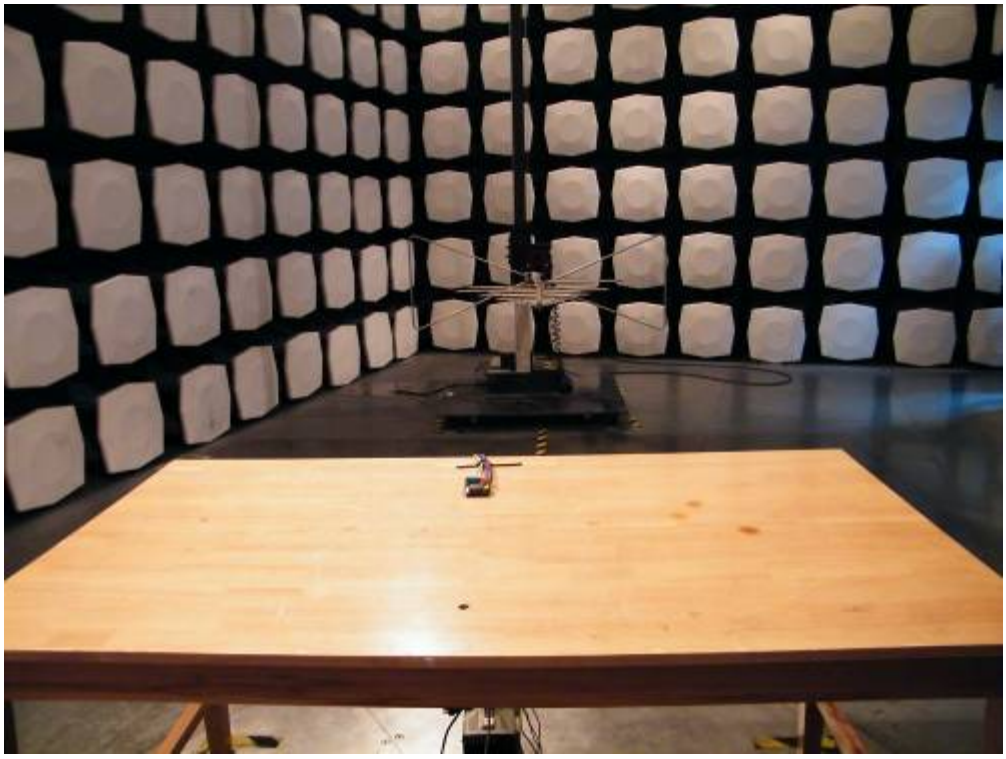
ANNEX A： The EUT Appearance and Test Configuration

A.1 EUT Appearance



Picture 1 Constituents of EUT

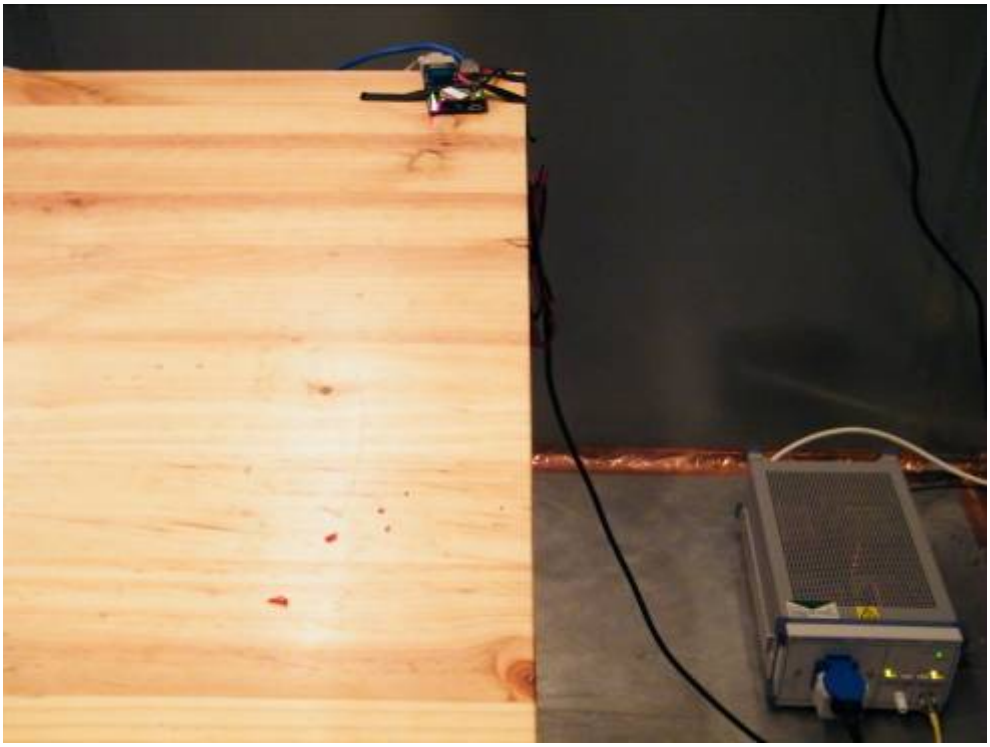
A.2 Test Setup



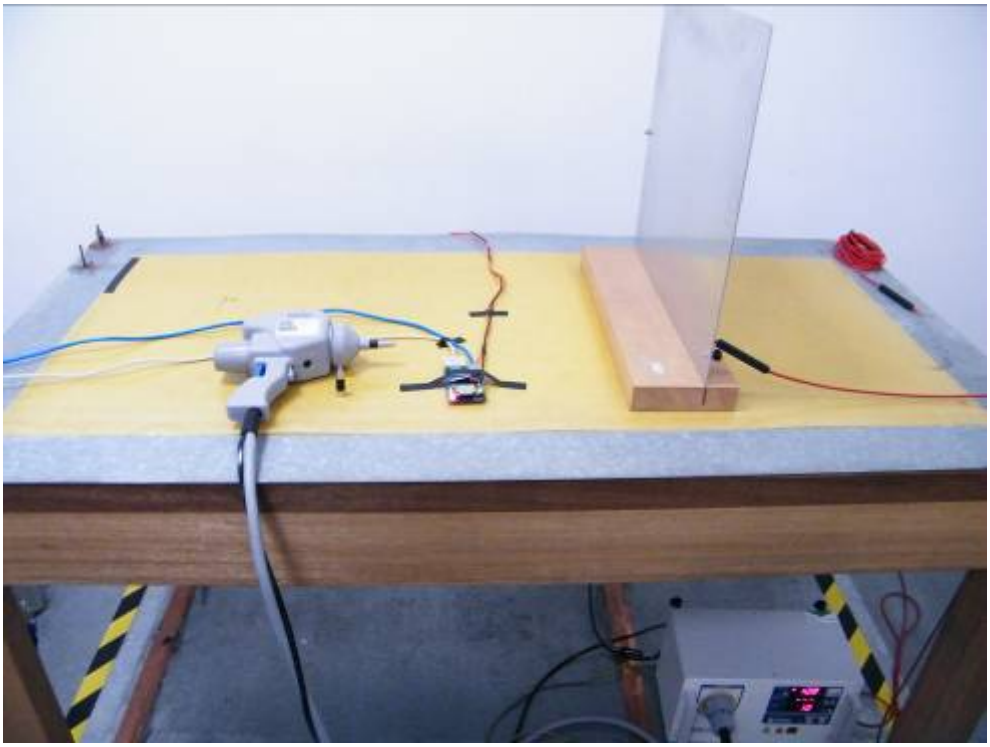
Below 1GHz

Above 1GHz

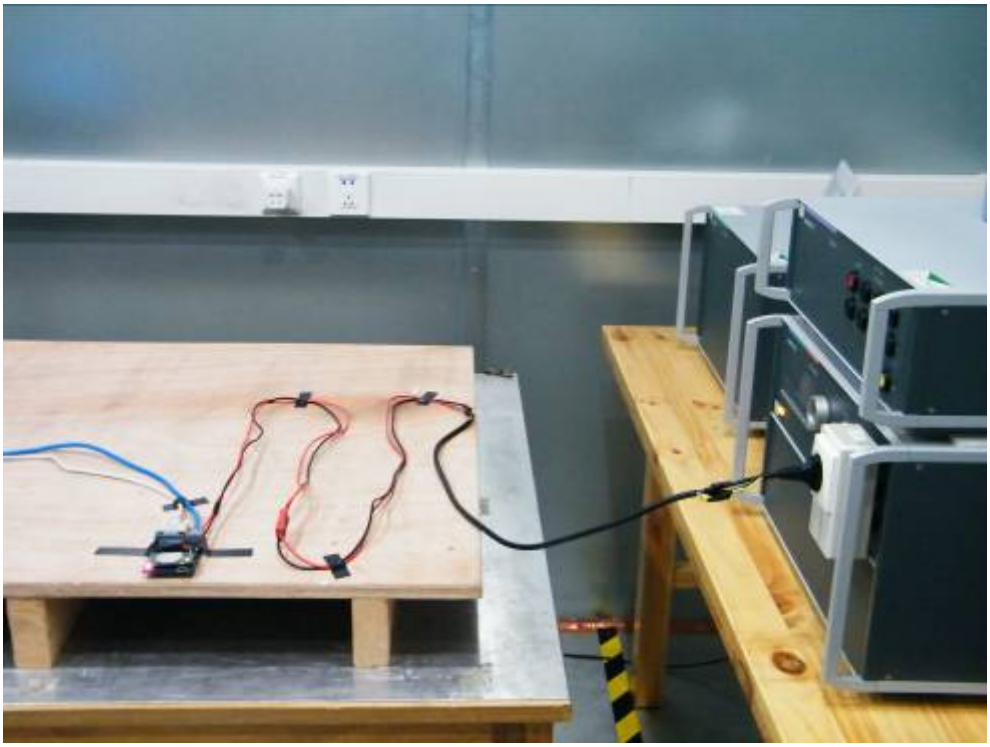
Picture 2 Radiated Emission Test Setup



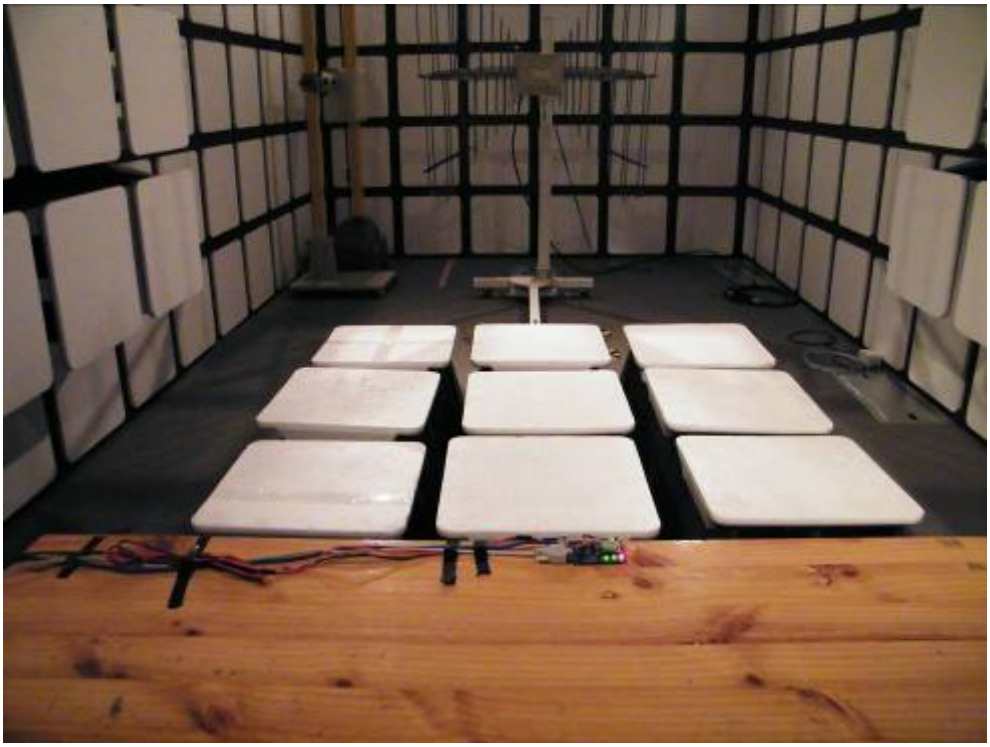
Picture 3 Conducted Emission Test Setup



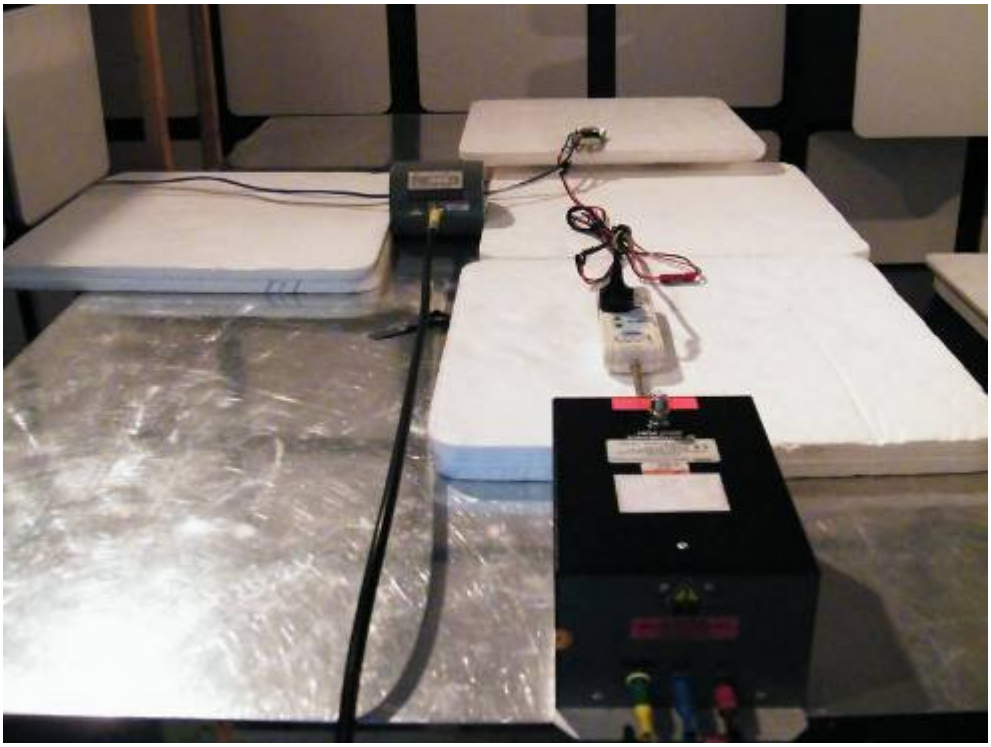
Picture 4 Electrostatic Discharge Test Setup



Picture 5 EFT& Surge &Dips Test Setup



Picture 6 RF Electromagnetic Field (RS) Test Setup



Picture 7: Radio Frequency Common Mode (CS) Test Setup