



MRT Technology (Suzhou) Co., Ltd
Phone: +86-512-66308358
Fax: +86-512-66308368
Web: www.mrt-cert.com

Report No.: 1407RSU04206
Report Version: V01
Issue Date: 08-22-2014

MEASUREMENT REPORT

EN 301 489-1 & EN 301 489-17

Applicant: Compex Systems Pte Ltd

Address: 135, Joo Seng Road, #08-01 Singapore 368363

Product: WIRELESS ACCESS POINT

Model No.: WPJ342LV, WPJ342HV, MML342LV, MML342HV,
MMJ342LV, MMJ342HV, MMS342LV, MMS342HV

Brand Name: COMPEX

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

Result: Complies

Test Date: Aug. 03 ~ 21, 2014

Reviewed By : Robin Wu
(Robin Wu)

Approved By : Marlin Chen
(Marlin Chen)



The test results relate only to the samples tested.

The test results shown in the test report are traceable to the national/international standards through the calibration of the equipment and evaluated measurement uncertainty herein.

The test report shall not be reproduced except in full without the written approval of MRT Technology (Suzhou) Co., Ltd.

Revision History

Report No.	Version	Description	Issue Date
1407RSU04206	Rev. 01	Initial report	08-22-2014

CONTENTS

Description	Page
1. General Information.....	6
1.1. Applicant.....	6
1.2. Manufacturer	6
1.3. Testing Facility	6
1.4. Feature of Product.....	7
1.5. Description of Available Antennas.....	8
1.6. Standards Applicable for Testing	9
1.7. Performance Criteria.....	10
2. Test Configuration of Equipment under Test	16
2.1. Test Mode	16
2.2. Configuration of Tested System	16
2.3. Test System Details	18
2.4. Test Software.....	18
3. Test Summary	19
4. Conducted Emission	20
4.1. Limit of Conducted Emission	20
4.2. Test Setup	20
4.3. Test Procedure	21
4.4. Test Result.....	22
4.5. Test Photograph	30
5. Radiated Emission.....	34
5.1. Limit of Radiated Emission	34
5.2. Test Setup	34
5.3. Test Procedure	36
5.4. Test Result.....	37
5.5. Test Photograph	45
6. Harmonic Current Emissions.....	47
6.1. Limit of Harmonic Current Emissions.....	47
6.2. Test Setup	47
6.3. Test Procedure	47
6.4. Test Result.....	48
6.5. Test Photograph	52

7. Voltage Fluctuations and Flicker	53
7.1. Limit of Voltage Fluctuations and Flicker	53
7.2. Test Setup	54
7.3. Test Procedure	54
7.4. Test Result.....	55
7.5. Test Photograph	57
8. Electrostatic discharge.....	58
8.1. Limit of Electrostatic discharge	58
8.2. Test Setup	58
8.3. Test Procedure	59
8.4. Test Result.....	60
8.5. Test Photograph	62
9. Radio-frequency electromagnetic field	65
9.1. Limit of Radio-frequency electromagnetic field.....	65
9.2. Test Setup	65
9.3. Test Procedure	66
9.4. Test Result.....	67
9.5. Test Photograph	69
10. Electrical fast transients.....	71
10.1. Limit of Electrical fast transients.....	71
10.2. Test Setup	71
10.3. Test Procedure	71
10.4. Test Result.....	73
10.5. Test Photograph	75
11. Surges	77
11.1. Limit of Surges.....	77
11.2. Test Setup	77
11.3. Test Procedure	78
11.4. Test Result.....	79
11.5. Test Photograph	82
12. Radio-frequency common mode	84
12.1. Limit of Radio-frequency common mode.....	84
12.2. Test Setup	84
12.3. Test Procedure	84

12.4. Test Result.....	86
12.5. Test Photograph	87
13. Voltage dips and interruptions.....	89
13.1. Limit of Voltage dips and interruptions	89
13.2. Test Setup	89
13.3. Test Procedure	89
13.4. Test Result.....	90
13.5. Test Photograph	92
14. Uncertainty Measurement	93
15. List of Measuring Instrument.....	94
EUT Photograph	97

1. General Information

1.1. Applicant

Compex Systems Pte Ltd
135, Joo Seng Road, #08-01 Singapore 368363

1.2. Manufacturer

Compex Systems Pte Ltd
135, Joo Seng Road, #08-01 Singapore 368363

1.3. Testing Facility

Test Site

MRT Technology (Suzhou) Co., Ltd

Test Site Location

D8 Building, Youxin Industrial Park, No.2 Tian'edang Rd., Wuzhong Economic Development Zone, Suzhou, China

Radio-frequency Electromagnetic Field Test Site

CQC Intime (Suzhou) Testing Technology Co., Ltd.

Test Site Location

East Taihu Technology and Finance City, No. 1368, Wuzhong Dadao Road, Wuzhong District, Suzhou, Jiangsu, P.R. China

Test Facility / Accreditations

Measurements were performed at MRT Laboratory located in Tian'edang Rd., Suzhou, China.

- MRT Lab is accredited to ISO 17025 by the American Association for Laboratory Accreditation (A2LA) under the American Association for Laboratory Accreditation Program (A2LA Cert. No. 3628.01) in EMC, Telecommunications and Radio testing for FCC, Industry Canada, EU and TELEC Rules.
- MRT facility is a FCC registered (MRT Reg. No. 809388) test facility with the site description report on file and has met all the requirements specified in Section 2.948 of the FCC Rules and Industry Canada (11384A-1).
- MRT facility is an IC registered (11384A-1) test laboratory with the site description on file at Industry Canada.



1.4. Feature of Product

Product Name	WIRELESS ACCESS POINT
Model No.	WPJ342LV, WPJ342HV, MML342LV, MML342HV, MMJ342LV, MMJ342HV, MMS342LV, MMS342LV
Brand Name	COMPEX
Frequency Range	802.11a/n-HT20 5180 ~ 5240MHz; 5260 ~5320MHz; 5500 ~ 5700MHz; 5745 ~ 5825 MHz 802.11n-HT40MHz 5190 ~ 5230MHz; 5270 ~5310MHz; 5510 ~ 5670MHz
Adapter 1#	Power Over Ethernet (Gigabit) M/N: HS36-2401250EU Input: 100-240V ~ 50/60Hz 1.0A Output: +24V ~ 1.25A
Adapter 2#	Gigabit POE Injector Manufacturer: KANG PEI M/N: POEGP2408 Input: 100-240V ~ 50/60Hz 1.0A Output: +24V ~ 0.8A

Note: The difference of models is for different marketing requirement.

1.5. Description of Available Antennas

Antenna Type	Frequency Band (GHz)	Manufacturer	Tx Paths	Max Directional Gain (dBi)
Panel Antenna 1#	5.1 ~ 5.8	Lanbowan Communications Ltd.	2	25
Panel Antenna 2#	5.1 ~ 5.8	Kenbotong Communication LTD	2	19
Panel Antenna 3#	5.1 ~ 5.8	Compex Systems Pte Ltd	2	17
Panel Antenna 4#	5.1 ~ 5.8	Kenbotong Communication LTD	2	10
Panel Antenna 5#	5.1 ~ 5.8	Smart Ant Inc	2	7
Panel Antenna 6#	5.1 ~ 5.8	Compex Systems Pte Ltd	2	5
Panel Antenna 7#	5.1 ~ 5.8	Compex Systems Pte Ltd	2	5
Dipole Antenna 1#	5.1 ~ 5.8	Kunshan Wavelink Electronic Co., Ltd.	2	2

Note: We selected dipole antenna 1# for all EMC testing.

1.6. Standards Applicable for Testing

The EUT complies with the requirements of EN 3014 89-1 V1.9.2 & EN 301 489-17 V2.2.1.

EMI Test:

EN 55022 2010 (Conducted Emission)

EN 55022 2010(Radiated Emission)

EN 61000-3-2 2006+A1:2009+A2:2009 (Harmonic)

EN 61000-3-3: 2008 (Flicker)

EMS Test:

EN 61000-4-2: 2009 (ESD)

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

EN 61000-4-4: 2012 (EFT)

EN 61000-4-5: 2006 (Surge)

EN 61000-4-6: 2009 (CS)

EN 61000-4-11: 2004 (Dips)

1.7. Performance Criteria

General Requirements (ETSI EN 301489-1):

The performance criteria are used to take a decision on whether radio equipment passes or fails immunity tests.

For the purpose of the present document four categories of performance criteria apply:

- performance criteria for continuous phenomena applied to transmitters;
- performance criteria for transient phenomena applied to transmitters;
- performance criteria for continuous phenomena applied to receivers;
- performance criteria for transient phenomena applied to receivers.

Normally, the performance criteria depend on the type of radio equipment. Thus, the present document only contains general performance criteria commonly used for the assessment of radio equipment. More specific and product-related performance criteria for a dedicated type of radio equipment may be found in the part of EN 301 489 series dealing with the particular type of radio equipment.

Performance criteria for continuous phenomena applied to transmitters and receivers

If no further details are given in the relevant part of EN 301 489 series dealing with the particular type of radio equipment, the following general performance criteria for continuous phenomena shall apply.

During and after the test, the apparatus shall continue to operate as intended. No degradation of performance or loss of function is allowed a permissible performance level specified by the manufacturer when the apparatus is used as intended. In some cases this permissible performance level may be replaced by a permissible loss of performance.

During the test the EUT shall not unintentionally transmit or change its actual operating state and stored data.

If the minimum performance level or the permissible performance loss is not specified by the manufacturer, then either of these may be deduced from the product description and documentation and what the user may reasonably expect from the apparatus if used as intended.

Performance criteria for transient phenomena applied to transmitters and receivers

If no further details are given in the relevant part of EN 301 489 series dealing with the particular type of radio equipment, the following general performance criteria for transient phenomena shall apply.

After the test, the apparatus shall continue to operate as intended. No degradation of performance or loss of function is allowed below a permissible performance level specified by the manufacturer, when the apparatus is used as intended. In some cases this permissible performance level may be replaced by a permissible loss of performance.

During the EMC exposure to an electromagnetic phenomenon, a degradation of performance is, however, allowed. No change of the actual mode of operation (e.g. unintended transmission) or stored data is allowed.

If the minimum performance level or the permissible performance loss is not specified by the manufacturer, then either of these may be deduced from the product description and documentation and what the user may reasonably expect from the apparatus if used as intended.

Performance criteria for equipment which does not provide a continuous communication link

For radio equipment which does not provide a continuous communication link, the performance criteria described in clauses (1) and (2) are not appropriate, then the manufacturer shall declare, for inclusion in the test report, his own specification for an acceptable level of performance or degradation of performance during and/or after the immunity tests. The performance specification shall be included in the product description and documentation. The related specifications set out in clause 5.3 of EN 301 489-1 V1.9.2 (2010-09) have also to be taken into account.

The performance criteria specified by the manufacturer shall give the same degree of immunity protection as called for in clauses (1) and (2).

Performance criteria for ancillary equipment tested on a stand-alone basis

If ancillary equipment is intended to be tested on a stand-alone basis, the performance criteria described in clauses (1) and (2) are not appropriate, then the manufacturer shall declare, for inclusion in the test report, his own specification for an acceptable level of performance or degradation of performance during and/or after the immunity tests. The performance specification shall be included in the product description and documentation. The related specifications set out in clause 5.3 of EN 301 489-1 V1.9.2 (2010-09) have also to be taken into account.

The performance criteria specified by the manufacturer shall give the same degree of immunity protection as called for in clauses (1) and (2).

Special Performance Requirements (ETSI EN 301489-17):

The performance criteria are:

- performance criteria A for immunity tests with phenomena of a continuous nature;
- performance criteria B for immunity tests with phenomena of a transient nature;
- performance criteria C for immunity tests with power interruptions exceeding a certain time.

The equipment shall meet the minimum performance criteria as specified in the following clauses.

Performance criteria for Continuous phenomena applied to Transmitters (CT)

The performance criteria A shall apply.

Tests shall be repeated with the EUT in standby mode (if applicable) to ensure that unintentional transmission does not occur. In systems using acknowledgement signals, it is recognized that an ACKnowledgement (ACK) or Not ACKnowledgement (NACK) transmission may occur, and steps should be taken to ensure that any transmission resulting from the application of the test is correctly interpreted.

Performance criteria for Transient phenomena applied to Transmitters (TT)

The performance criteria B shall apply, except for voltage dips of 100 ms and voltage interruptions of 5000 ms duration, for which performance criteria C shall apply.

Tests shall be repeated with the EUT in standby mode (if applicable) to ensure that unintentional transmission does not occur. In systems using acknowledgement signals, it is recognized that an acknowledgement (ACK) or not-acknowledgement (NACK) transmission may occur, and steps should be taken to ensure that any transmission resulting from the application of the test is correctly interpreted.

Performance criteria for Continuous phenomena applied to Receivers (CR)

The performance criteria A shall apply.

Where the EUT is a transceiver, under no circumstances, shall the transmitter operate unintentionally during the test. In systems using acknowledgement signals, it is recognized that an ACK or NACK transmission may occur, and steps should be taken to ensure that any transmission resulting from the application of the test is correctly interpreted.

Performance criteria for Transient phenomena applied to Receivers (TR)

The performance criteria B shall apply, except for voltage dips of 100 ms and voltage interruptions of 5000 ms duration for which performance criteria C shall apply.

Where the EUT is a transceiver, under no circumstances, shall the transmitter operate unintentionally during the test. In systems using acknowledgement signals, it is recognized that an ACK or NACK transmission may occur, and steps should be taken to ensure that any transmission resulting from the application of the test is correctly interpreted.

EN 301 489 -17 Performance criteria		
Criteria	During Test	After test
A	Shall operate as intended May show degradation of performance (see note 1) 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 transmission	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 from the apparatus if used as intended.

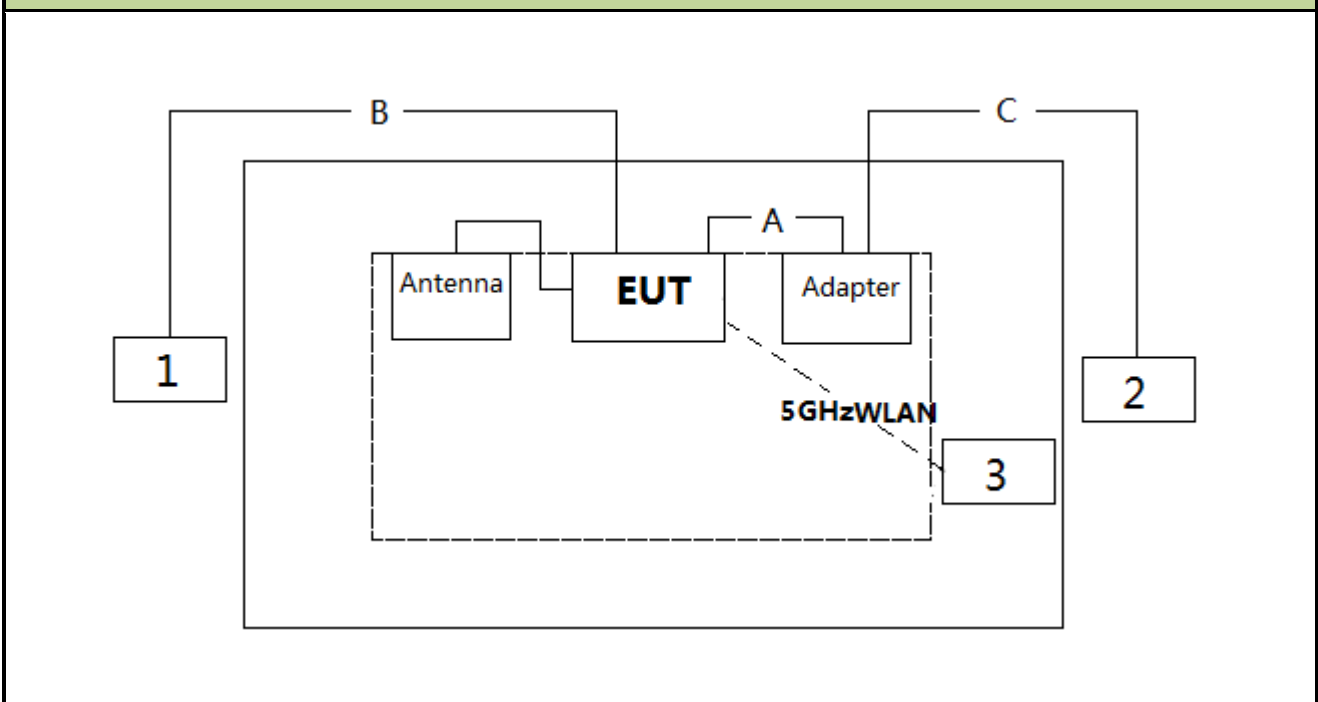
2. Test Configuration of Equipment under Test

2.1. Test Mode

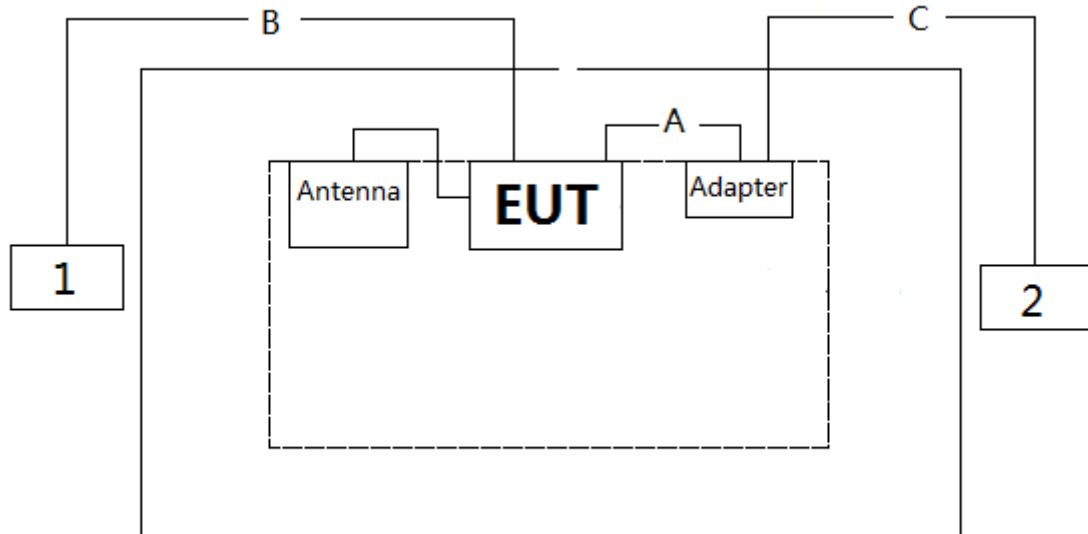
EMI Test Mode	Mode 1: Communication (Powered by Adapter 1#)
	Mode 2: Communication (Powered by Adapter 2#)
EMS Test Mode	Mode 1: Communication (Powered by Adapter 1#)
	Mode 2: Communication (Powered by Adapter 2#)
	Mode 3: Standby

2.2. Configuration of Tested System

Connection Diagram (Mode 1 ~ 2)



Connection Diagram (Mode 3)



Signal Cable Type		Signal Cable Description
A	LAN Cable	Non-shielding, 0.5m
B	LAN Cable	Non-shielding, >10m
C	LAN Cable	Non-shielding, >10m

2.3. Test System Details

The types for all equipments, plus descriptions of all cables used in the tested system (including inserted cards) are:

Product		Manufacturer	Model No.	Serial No.	Power Cord
1	Personal Computer	DELL	Vostro270	N/A	Non-Shielded, 1.8m
2	Personal Computer	DELL	Vostro270	N/A	Non-Shielded, 1.8m
3	Notebook	Lenovo	E430c	MP-4CFX213/10	Non-Shielded, 1.8m

2.4. Test Software

1	Setup the EUT and simulators as shown on above.
2	Turn on the power of all equipment.
3	Making EUT communicate with PC by LAN cable and communicate with notebook by Wi-Fi.

3. Test Summary

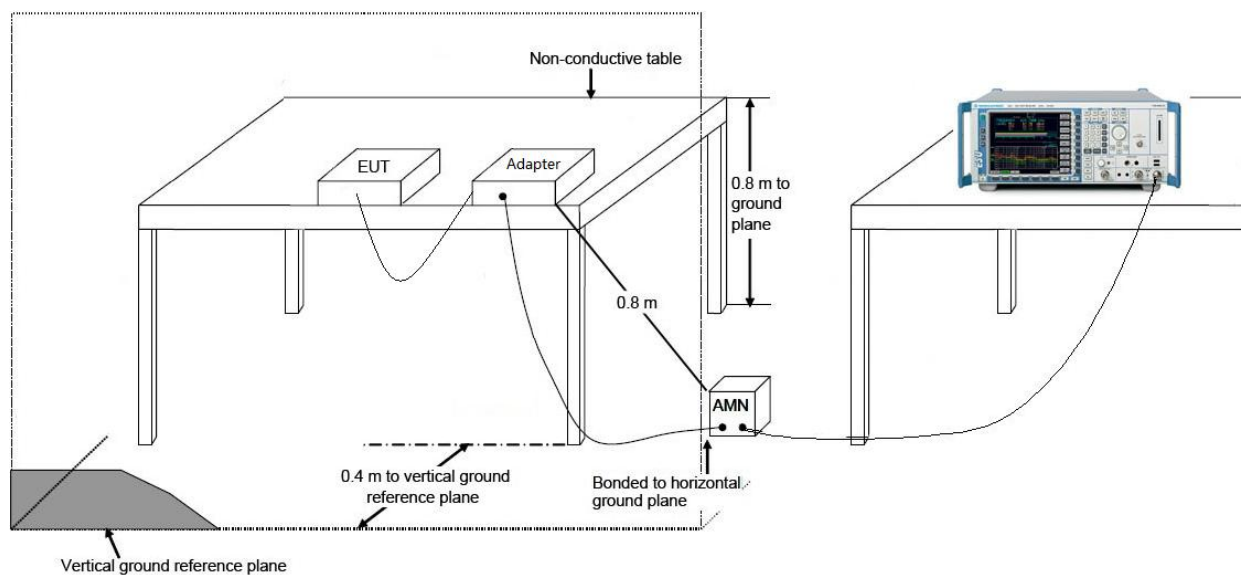
Clause	Test Item	Test Standard	Result (Pass/Fail)	Remark
Emission Measurements				
EN 301489-1 Clause 8.4	Conducted Emission	EN 55022	Pass	---
EN 301489-1 Clause 8.2	Radiated Emission	EN 55022	Pass	---
EN 301489-1 Clause 8.5	Harmonic current emissions	EN 61000-3-2	Pass	---
EN 301489-1 Clause 8.6	Voltage fluctuations and flicker	EN 61000-3-3	Pass	---
Immunity Measurements				
EN 301489-1 Clause 9.3	Electrostatic discharge	EN 61000-4-2	Pass	---
EN 301489-1 Clause 9.2	Radio-frequency electromagnetic field	EN 61000-4-3	Pass	---
EN 301489-1 Clause 9.4	Fast transients, common mode	EN 61000-4-4	Pass	---
EN 301489-1 Clause 9.8	Surges	EN 61000-4-5	Pass	---
EN 301489-1 Clause 9.5	Radio-frequency common mode	EN 61000-4-6	Pass	---
EN 301489-1 Clause 9.7	Voltage dips and interruptions	EN 61000-4-11	Pass	---

4. Conducted Emission

4.1. Limit of Conducted Emission

Limits of conducted emission for AC mains power input/output ports				
Frequency range MHz	Limits dB(μV)			
	Quasi-peak		Average	
0.15 to 0.50	66 to 56		56 to 46	
0.50 to 5	56		46	
5 to 30	60		50	
Limits of conducted emission for telecommunication ports				
Frequency range MHz	Voltage Limits dB(μV)		Current limits dB(μA)	
	Quasi-peak	Average	Quasi-peak	Average
0.15 to 0.50	84 to 74	74 to 64	40 to 30	30 to 20
0.50 to 30	74	64	30	20

4.2. Test Setup



4.3. Test Procedure

The receiver or associated equipment under measurement and the artificial mains network are disposed as shown in 3.2. Measurements shall be carried out using a selective voltmeter having a quasi-peak detector for broadband measurements and an average detector for narrow-band measurements in accordance with CISPR 16-1.

The mains lead shall be arranged to follow the shortest possible path between the receiver and artificial mains network on the ground. The mains lead in excess of 0,8 m separating the equipment under test from the artificial mains network shall be folded back and forth parallel to the lead so as to form a bundle with a length of 0,3 m to 0,4 m.

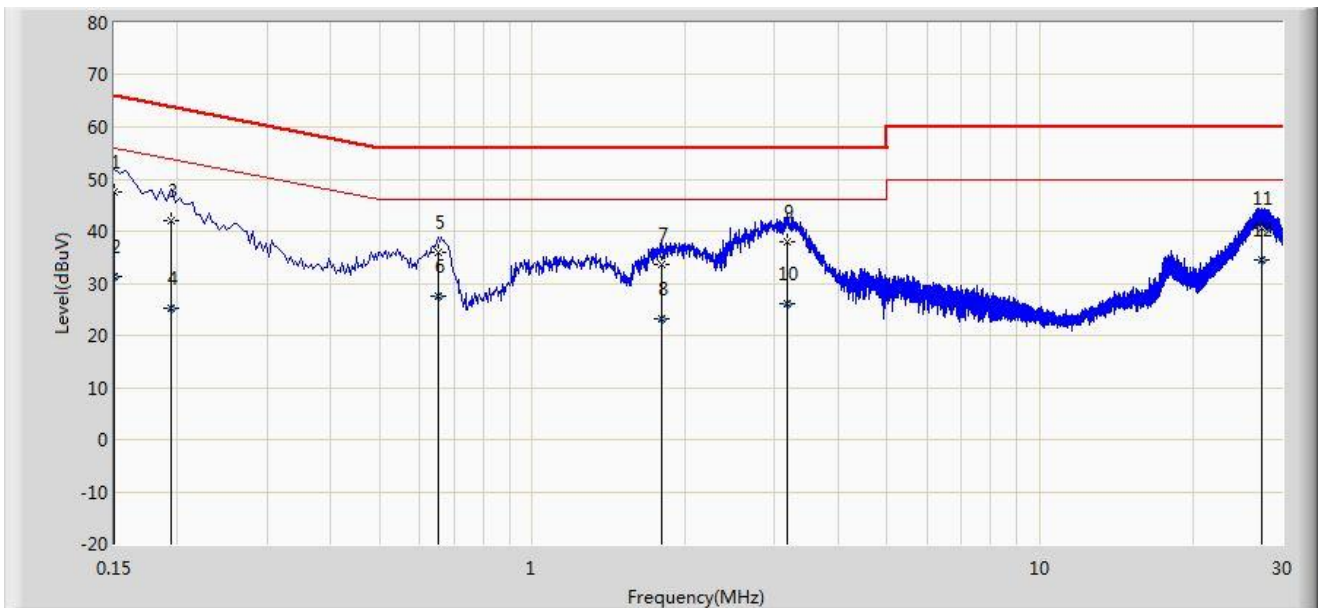
Earthing of the equipment under test if provided with a safety earth connection, shall be made to the earth terminal provided on the artificial mains network with the shortest possible lead.

If the equipment under test has a coaxial RF input connector, tests shall be performed with and without an earth connection made to the outer conductor screen of the coaxial RF input connector. When these tests are being carried out, no other earth connections shall be made to any additional earth terminal whatever.

If the equipment under test has no coaxial RF input connector and if it has an earth terminal, tests shall be performed with this terminal earthed.

4.4. Test Result

Engineer: Milo Li	
Site: SR2	Time: 2014/08/21 - 20:44
Limit: EN55022_CE_Mains_ClassB	Margin: 0
Probe: ENV216_101683_Filter On	Polarity: Line
EUT: WIRELESS ACCESS POINT	Power: AC 230V/50Hz
Note: Mode 1	

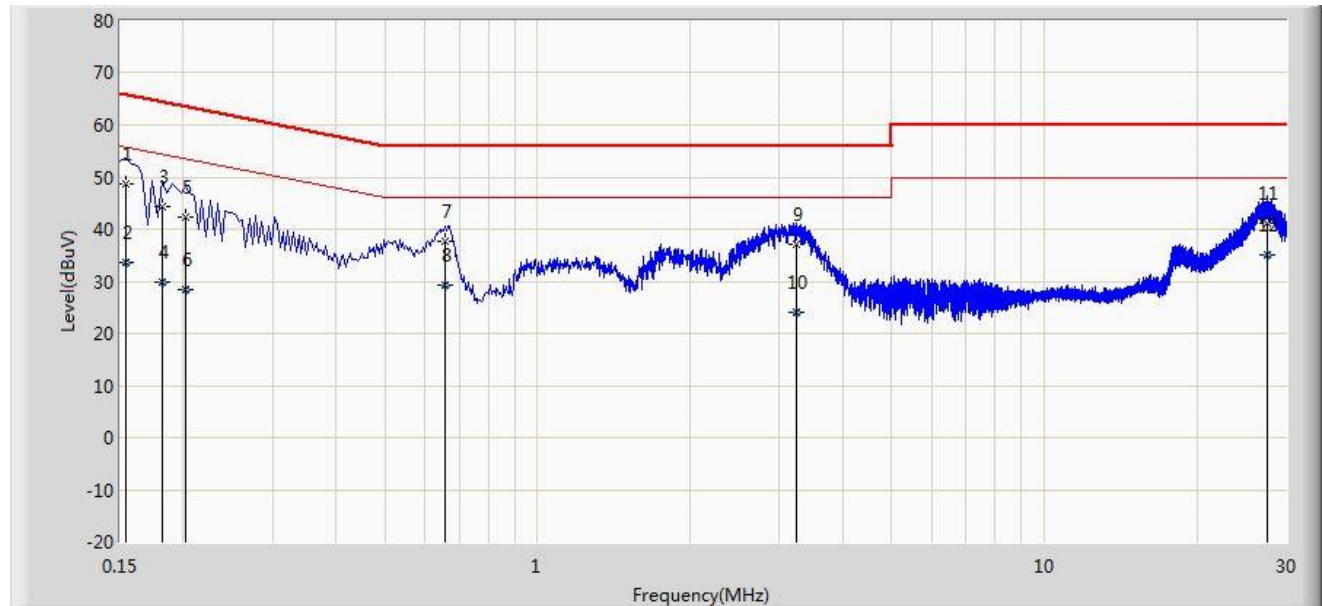


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV)	Factor (dB)	Type
1		*	0.150	47.659	36.491	-18.341	66.000	11.168	QP
2			0.150	31.214	20.046	-24.786	56.000	11.168	AV
3			0.194	41.930	31.914	-21.933	63.864	10.017	QP
4			0.194	25.349	15.333	-28.514	53.864	10.017	AV
5			0.654	36.076	25.989	-19.924	56.000	10.087	QP
6			0.654	27.609	17.522	-18.391	46.000	10.087	AV
7			1.794	33.662	23.784	-22.338	56.000	9.879	QP
8			1.794	23.129	13.250	-22.871	46.000	9.879	AV
9			3.186	37.956	28.092	-18.044	56.000	9.863	QP
10			3.186	25.962	16.099	-20.038	46.000	9.863	AV
11			27.422	40.479	30.232	-19.521	60.000	10.247	QP
12			27.422	34.615	24.368	-15.385	50.000	10.247	AV

Note: Measure Level (dBμV) = Reading Level (dBμV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + LISN Factor (dB).

Engineer: Milo Li	
Site: SR2	Time: 2014/08/21 - 21:36
Limit: EN55022_CE_Mains_ClassB	Margin: 0
Probe: ENV216_101683_Filter On	Polarity: Neutral
EUT: WIRELESS ACCESS POINT	Power: AC 230V/50Hz
Note: Mode 1	



No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV)	Factor (dB)	Type
1		*	0.154	48.669	37.953	-17.112	65.781	10.716	QP
2			0.154	33.661	22.945	-22.120	55.781	10.716	AV
3			0.182	44.464	34.422	-19.929	64.394	10.042	QP
4			0.182	29.830	19.788	-24.563	54.394	10.042	AV
5			0.202	42.338	32.330	-21.190	63.528	10.008	QP
6			0.202	28.267	18.259	-25.261	53.528	10.008	AV
7			0.658	37.608	27.509	-18.392	56.000	10.099	QP
8			0.658	29.420	19.322	-16.580	46.000	10.099	AV
9			3.250	37.008	27.123	-18.992	56.000	9.885	QP
10			3.250	23.960	14.075	-22.040	46.000	9.885	AV
11			27.590	41.236	30.867	-18.764	60.000	10.369	QP
12			27.590	34.960	24.591	-15.040	50.000	10.369	AV

Note: Measure Level (dBuV) = Reading Level (dBuV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + LISN Factor (dB).

Engineer: Milo Li

Site: SR2

Time: 2014/08/21 - 20:35

Limit: EN55022_CE_Mains_ClassB

Margin: 0

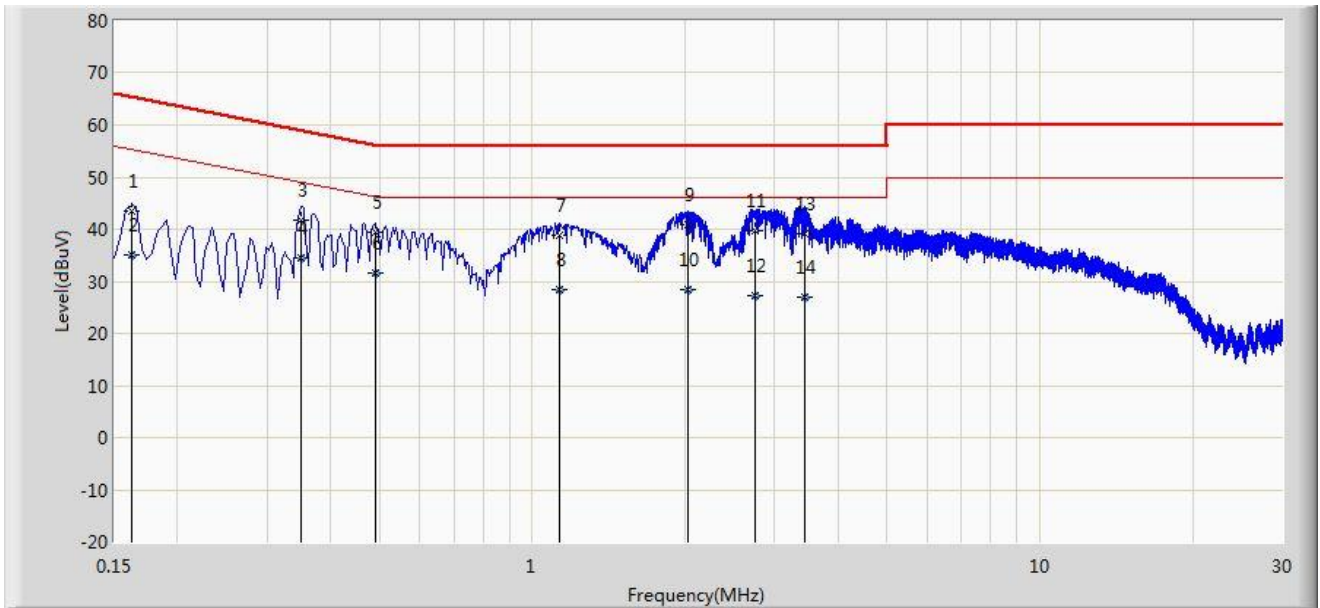
Probe: ENV216_101683_Filter On

Polarity: Line

EUT: WIRELESS ACCESS POINT

Power: AC 230V/50Hz

Note: Mode 2

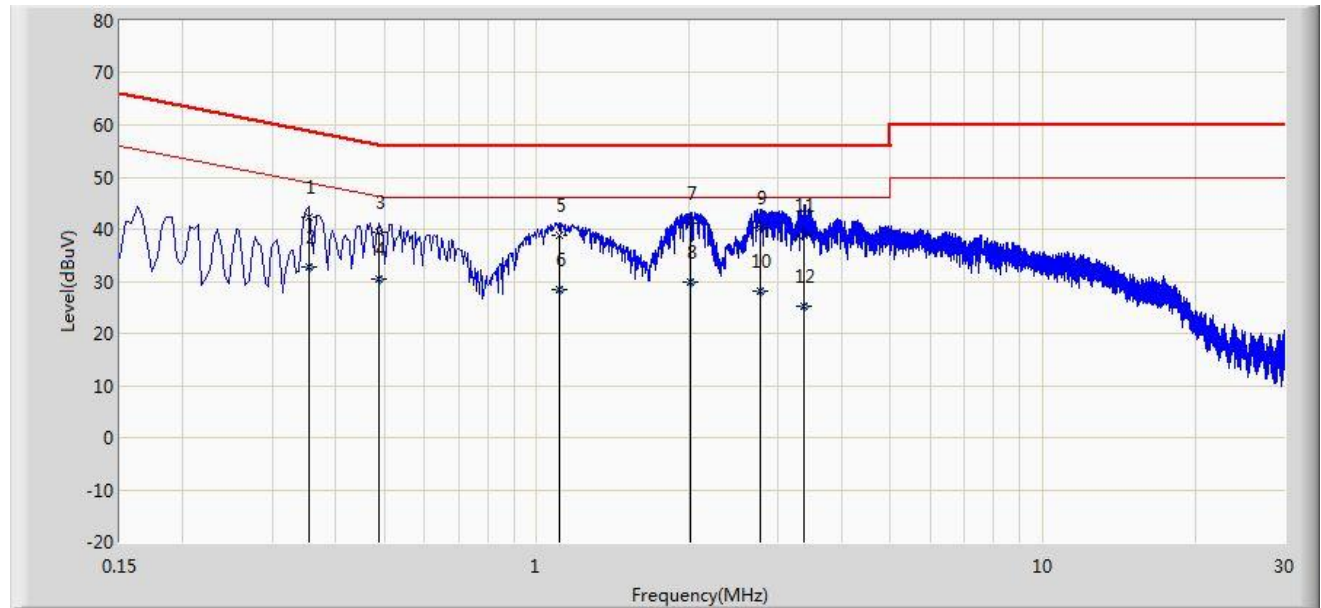


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV)	Factor (dB)	Type
1		*	0.162	43.591	33.493	-21.770	65.361	10.097	QP
2			0.162	34.968	24.871	-20.393	55.361	10.097	AV
3			0.350	41.639	31.594	-17.324	58.962	10.044	QP
4			0.350	34.473	24.429	-14.489	48.962	10.044	AV
5			0.490	39.416	29.258	-16.752	56.168	10.158	QP
6			0.490	31.535	21.377	-14.633	46.168	10.158	AV
7			1.130	38.940	29.036	-17.060	56.000	9.904	QP
8			1.130	28.334	18.430	-17.666	46.000	9.904	AV
9			2.022	40.776	30.905	-15.224	56.000	9.871	QP
10			2.022	28.519	18.648	-17.481	46.000	9.871	AV
11			2.746	39.836	29.988	-16.164	56.000	9.849	QP
12			2.746	27.196	17.347	-18.804	46.000	9.849	AV

Note: Measure Level (dBμV) = Reading Level (dBμV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + LISN Factor (dB).

Engineer: Milo Li	
Site: SR2	Time: 2014/08/21 - 20:41
Limit: EN55022_CE_Mains_ClassB	Margin: 0
Probe: ENV216_101683_Filter On	Polarity: Neutral
EUT: WIRELESS ACCESS POINT	Power: AC 230V/50Hz
Note: Mode 2	

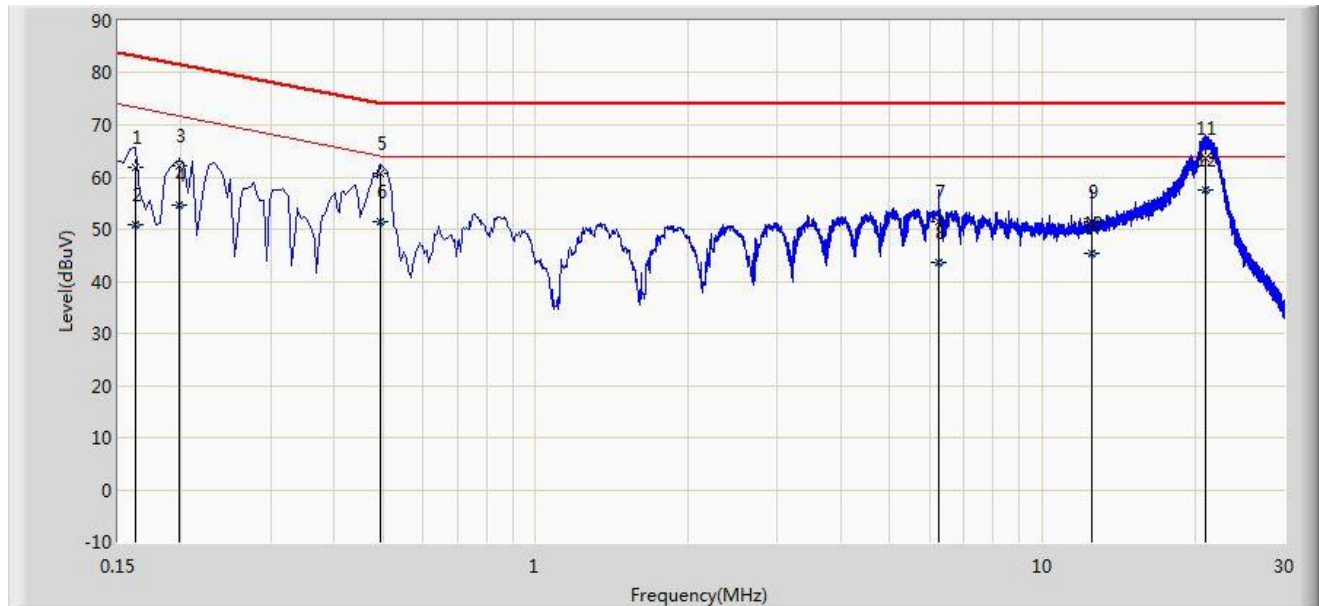


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV)	Factor (dB)	Type
1		*	0.354	42.219	32.141	-16.649	58.868	10.078	QP
2			0.354	32.883	22.805	-15.985	48.868	10.078	AV
3			0.486	39.489	29.313	-16.747	56.236	10.176	QP
4			0.486	30.392	20.215	-15.844	46.236	10.176	AV
5			1.106	38.834	28.930	-17.166	56.000	9.904	QP
6			1.106	28.339	18.434	-17.661	46.000	9.904	AV
7			2.006	41.034	31.161	-14.966	56.000	9.873	QP
8			2.006	29.874	20.001	-16.126	46.000	9.873	AV
9			2.758	40.262	30.410	-15.738	56.000	9.852	QP
10			2.758	28.224	18.371	-17.776	46.000	9.852	AV
11			3.366	38.980	29.077	-17.020	56.000	9.903	QP
12			3.366	25.295	15.392	-20.705	46.000	9.903	AV

Note: Measure Level (dBμV) = Reading Level (dBμV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + LISN Factor (dB).

Engineer: Milo Li	
Site: SR2	Time: 2014/08/22 - 15:27
Limit: EN55022_CE_ISN(Voltage)_Class B	Margin: 0
Probe: TESEQ-ISN-T800-Cat 5_24811	Polarity:
EUT: WIRELESS ACCESS POINT	Power: AC 230V/50Hz
Note: Mode 1: LAN-10Mbps	

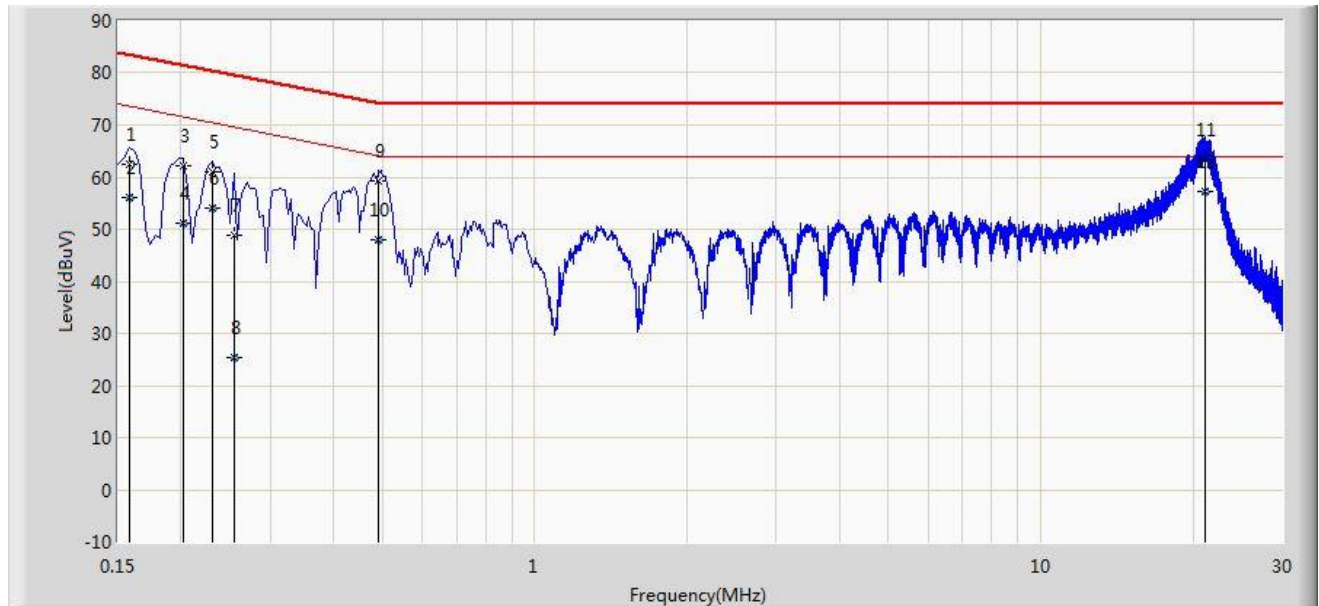


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV)	Factor (dB)	Type
1			0.162	61.747	51.647	-21.614	83.361	10.100	QP
2			0.162	50.942	40.842	-22.419	73.361	10.100	AV
3			0.198	62.035	52.005	-19.659	81.694	10.030	QP
4			0.198	54.741	44.711	-16.953	71.694	10.030	AV
5		*	0.494	60.716	50.965	-13.385	74.100	9.750	QP
6			0.494	51.427	41.677	-12.673	64.100	9.750	AV
7			6.250	51.368	41.443	-22.632	74.000	9.925	QP
8			6.250	43.695	33.770	-20.305	64.000	9.925	AV
9			12.502	51.397	41.545	-22.603	74.000	9.852	QP
10			12.502	45.400	35.548	-18.600	64.000	9.852	AV
11			21.018	63.564	53.443	-10.436	74.000	10.120	QP
12			21.018	57.491	47.371	-6.509	64.000	10.120	AV

Note: Measure Level (dBμV) = Reading Level (dBμV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + ISN Factor (dB).

Engineer: Milo Li	
Site: SR2	Time: 2014/08/22 - 15:32
Limit: EN55022_CE_ISN(Voltage)_Class B	Margin: 0
Probe: TESEQ-ISN-T800-Cat 5_24811	Polarity:
EUT: WIRELESS ACCESS POINT	Power: AC 230V/50Hz
Note: Mode 1: LAN-100Mbps	

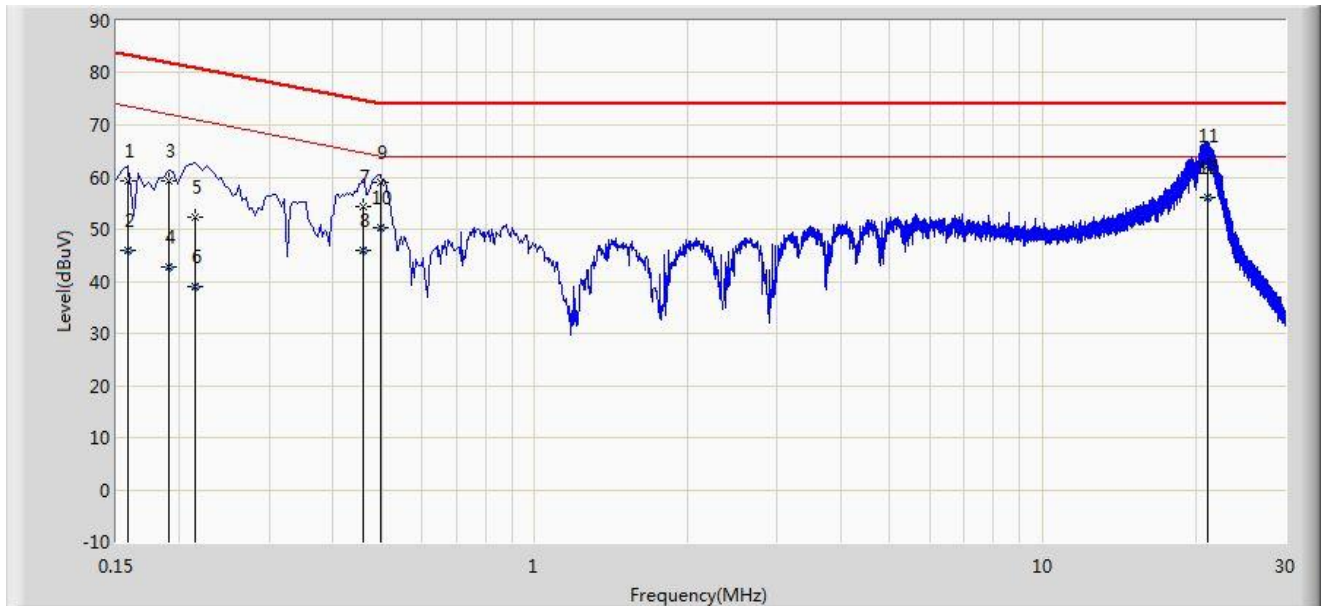


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV)	Factor (dB)	Type
1			0.158	62.327	52.220	-21.241	83.568	10.107	QP
2			0.158	56.003	45.895	-17.566	73.568	10.107	AV
3			0.202	62.174	52.152	-19.354	81.528	10.023	QP
4			0.202	51.273	41.251	-20.255	71.528	10.023	AV
5		*	0.230	60.995	51.026	-19.455	80.450	9.969	QP
6			0.230	53.939	43.970	-16.511	70.450	9.969	AV
7			0.254	48.737	38.814	-30.888	79.625	9.923	QP
8			0.254	25.253	15.330	-44.372	69.625	9.923	AV
9			0.490	59.393	49.641	-14.775	74.168	9.752	QP
10			0.490	47.855	38.103	-16.313	64.168	9.752	AV
11			21.062	63.330	53.210	-10.670	74.000	10.121	QP
12			21.062	57.250	47.129	-6.750	64.000	10.121	AV

Note: Measure Level (dBμV) = Reading Level (dBμV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + ISN Factor (dB).

Engineer: Milo Li	
Site: SR2	Time: 2014/08/22 - 15:47
Limit: EN55022_CE_ISN(Voltage)_Class B	Margin: 0
Probe: TESEQ-ISN-T800-Cat 5_24811	Polarity:
EUT: WIRELESS ACCESS POINT	Power: AC 230V/50Hz
Note: Mode 2: LAN-10Mbps	



No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV)	Factor (dB)	Type
1			0.158	59.416	49.309	-24.152	83.568	10.107	QP
2			0.158	45.892	35.785	-27.676	73.568	10.107	AV
3		*	0.190	59.241	49.195	-22.796	82.037	10.046	QP
4			0.190	42.631	32.586	-29.405	72.037	10.046	AV
5			0.214	52.416	42.416	-28.633	81.049	10.000	QP
6			0.214	38.919	28.919	-32.130	71.049	10.000	AV
7			0.458	54.340	44.575	-20.388	74.729	9.765	QP
8			0.458	46.074	36.309	-18.655	64.729	9.765	AV
9			0.498	58.920	49.171	-15.113	74.033	9.749	QP
10			0.498	50.418	40.669	-13.615	64.033	9.749	AV
11			21.070	62.131	52.010	-11.869	74.000	10.121	QP
12			21.070	56.160	46.040	-7.840	64.000	10.121	AV

Note: Measure Level (dBμV) = Reading Level (dBμV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + ISN Factor (dB).

Engineer: Milo Li

Site: SR2

Time: 2014/08/22 - 15:58

Limit: EN55022_CE_ISN(Voltage)_Class B

Margin: 0

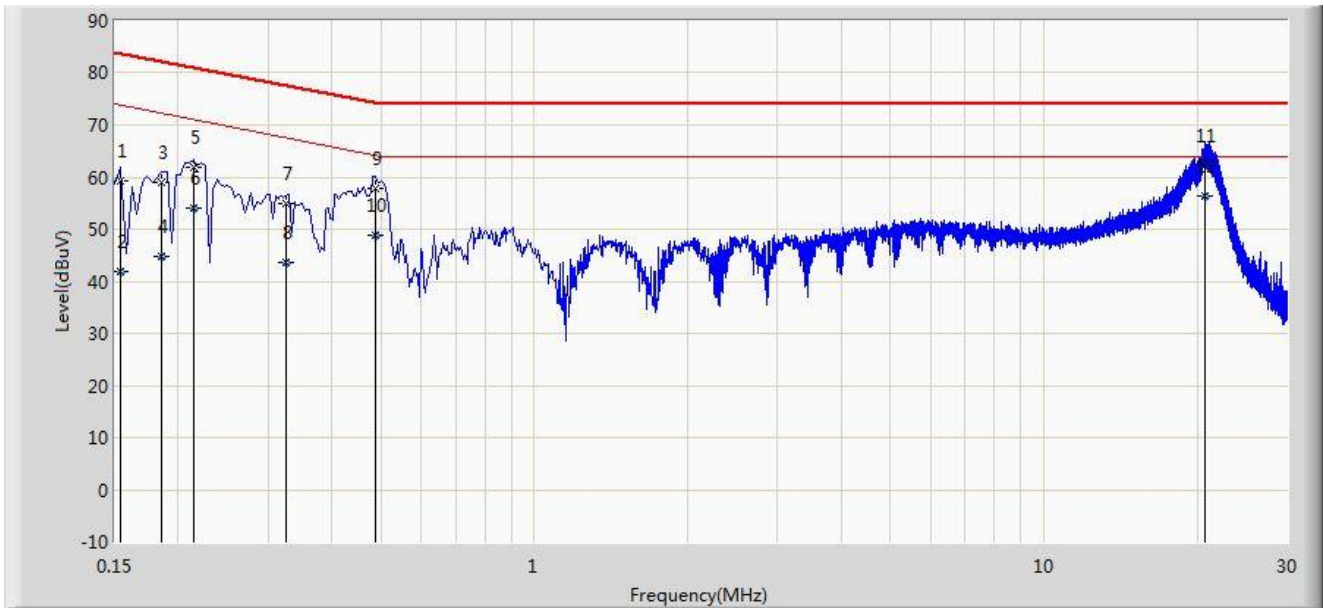
Probe: TESEQ-ISN-T800-Cat 5_24811

Polarity:

EUT: WIRELESS ACCESS POINT

Power: AC 230V/50Hz

Note: Mode 2: LAN-100Mbps



No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV)	Factor (dB)	Type
1		*	0.154	59.369	49.254	-24.412	83.781	10.115	QP
2			0.154	41.801	31.686	-31.980	73.781	10.115	AV
3			0.186	59.046	48.993	-23.167	82.213	10.053	QP
4			0.186	44.734	34.681	-27.479	72.213	10.053	AV
5			0.214	61.952	51.952	-19.097	81.049	10.000	QP
6			0.214	53.996	43.996	-17.053	71.049	10.000	AV
7			0.326	54.949	45.126	-22.604	77.552	9.822	QP
8			0.326	43.579	33.756	-23.974	67.552	9.822	AV
9			0.486	57.716	47.962	-16.520	74.236	9.753	QP
10			0.486	48.701	38.948	-15.535	64.236	9.753	AV
11			20.710	62.167	52.054	-11.833	74.000	10.113	QP
12			20.710	56.324	46.211	-7.676	64.000	10.113	AV

Note: Measure Level (dBμV) = Reading Level (dBμV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + ISN Factor (dB).

4.5. Test Photograph

Test Mode: Mode 1

Description: Front View Conducted Emission Test Setup for Main Port



Test Mode: Mode 1

Description: Back View Conducted Emission Test Setup for Main Port



Test Mode: Mode 2

Description: Front View Conducted Emission Test Setup for Main Port



Test Mode: Mode 2

Description: Back View Conducted Emission Test Setup for Main Port



Test Mode: Mode 1

Description: Front View Conducted Emission Test Setup for Signal Port



Test Mode: Mode 1

Description: Back View Conducted Emission Test Setup for Signal Port



Test Mode: Mode 2

Description: Front View Conducted Emission Test Setup for Signal Port



Test Mode: Mode 2

Description: Back View Conducted Emission Test Setup for Signal Port



5. Radiated Emission

5.1. Limit of Radiated Emission

Frequency range MHz	Quasi-peak limits dB(μ V/m)
30 to 230	40
230 to 1000	47

Note 1: The lower limit shall apply at the transition frequency.

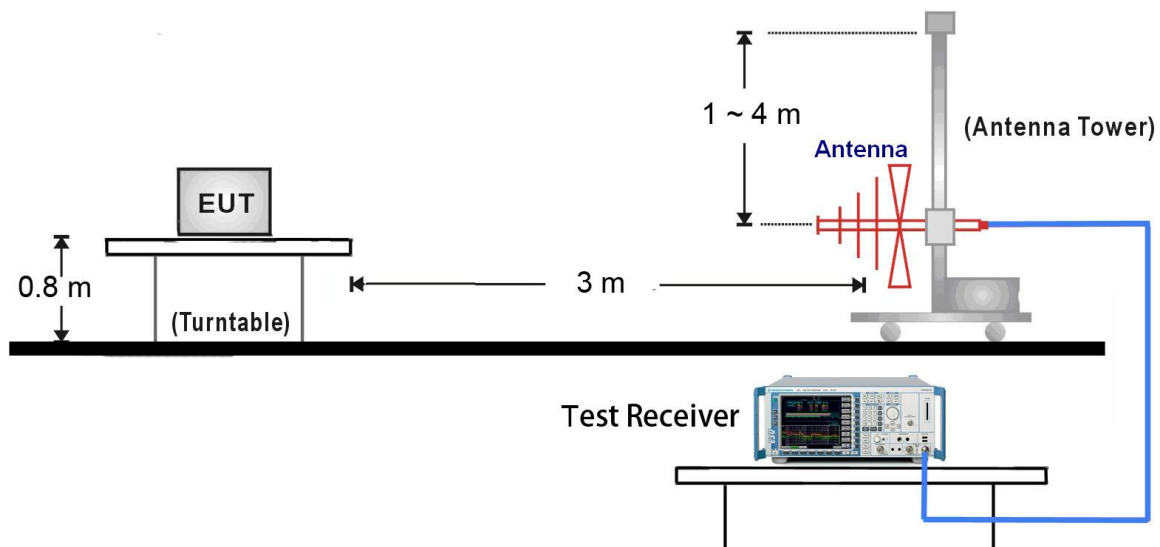
Note 2: Additional provisions may be required for cases where interference occurs.

Frequency range GHz	Average limit dB(μ V/m)	Peak limit dB(μ V/m)
1 to 3	50	70
3 to 6	54	74

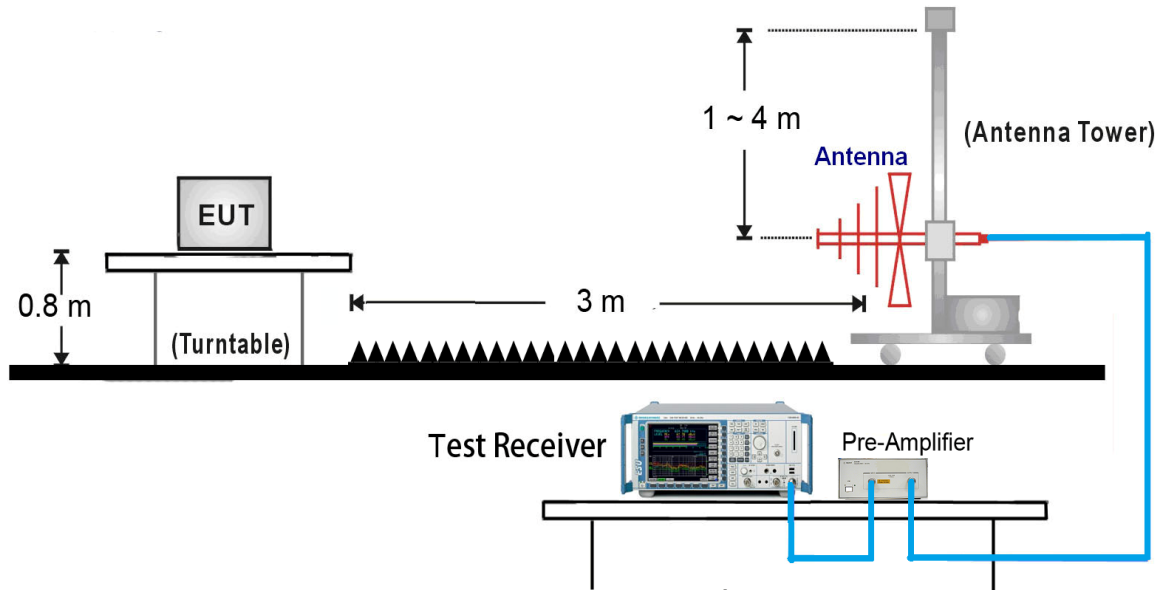
Note: The lower limit applies at the transition frequency.

5.2. Test Setup

30 MHz ~ 1000 MHz



1000 MHz ~ 6000 MHz



5.3. Test Procedure

Starting with the front of the receiver under test facing the measuring antenna, the measuring antenna is adjusted for horizontal polarization measurement and its height varied between 1 m and 4 m until the maximum reading is obtained.

The receiver under test is then rotated about its centre until the maximum meter reading is obtained, after which the measuring antenna height is again varied between 1 m and 4 m and the maximum reading noted.

The procedure is repeated for vertical polarization of the measuring antenna.

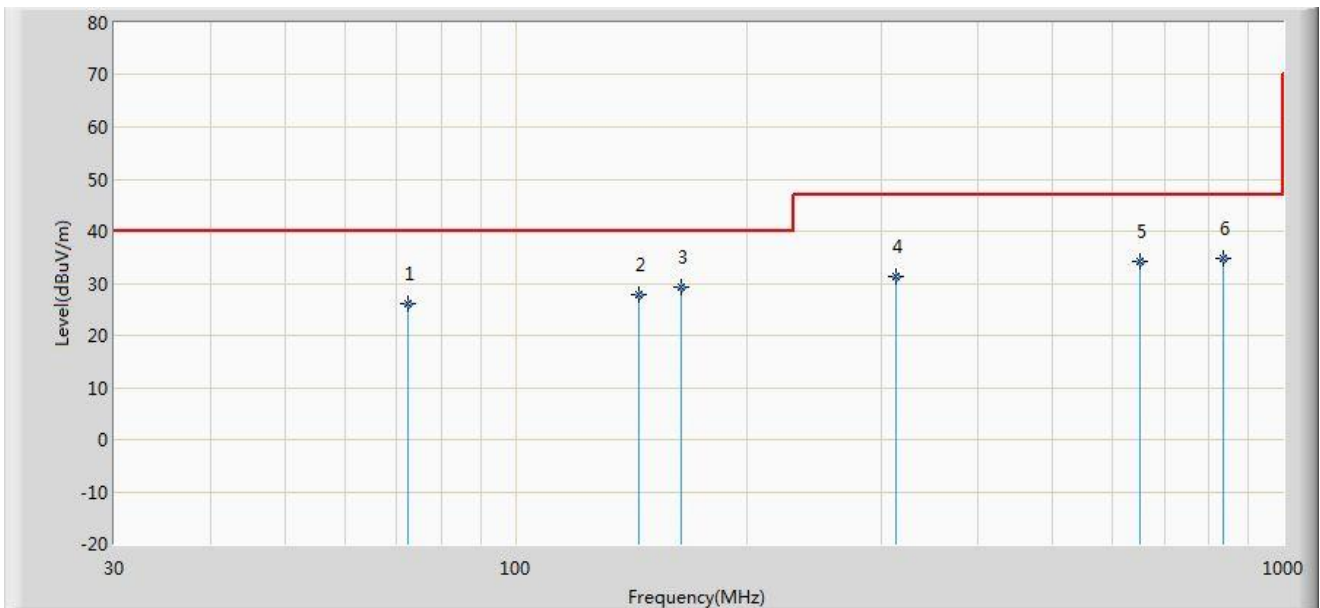
The highest value found, following this procedure, is defined as the radiation figure of the receiver.

If at certain frequencies the ambient signal field strength is high at the position of the receiving antenna, one of the following methods may be used to show compliance of the equipment under test.

- a) For small frequency bands with high ambient signals, the disturbance value may be interpolated from the adjacent values. The interpolated value shall lie on the curve describing a continuous function of the disturbance values adjacent to the ambient noise.
- b) Another possibility is to use the method described in annex C of CISPR 11.

5.4. Test Result

Engineer: Roy Cheng	
Site: AC1	Time: 2014/08/21 - 18:59
Limit: EN55022_RE(3m)_Class B	Margin: 0
Probe: VULB9162_0.03-8GHz	Polarity: Horizontal
EUT: WIRELESS ACCESS POINT	Power: AC 230V/50Hz
Note: Mode 1	

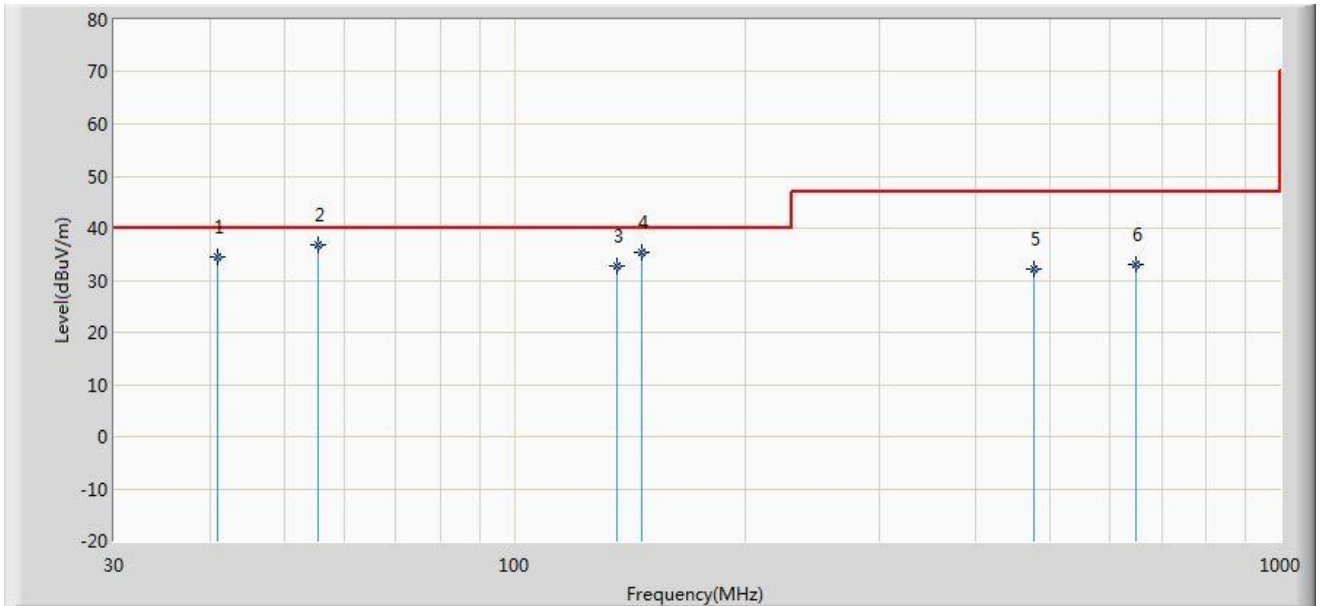


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1			72.559	26.205	16.111	-13.795	40.000	10.094	QP
2			144.945	27.867	18.709	-12.133	40.000	9.158	QP
3			164.587	29.228	19.530	-10.772	40.000	9.698	QP
4			312.997	31.275	16.837	-15.725	47.000	14.438	QP
5		*	651.285	34.096	14.051	-12.904	47.000	20.045	QP
6			835.464	34.817	12.190	-12.183	47.000	22.627	QP

Note: Measure Level (dBuV/m) = Reading Level (dBuV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m).

Engineer: Roy Cheng	
Site: AC1	Time: 2014/08/21 - 18:59
Limit: EN55022_RE(3m)_Class B	Margin: 0
Probe: VULB9162_0.03-8GHz	Polarity: Vertical
EUT: WIRELESS ACCESS POINT	Power: AC 230V/50Hz
Note: Mode 1	

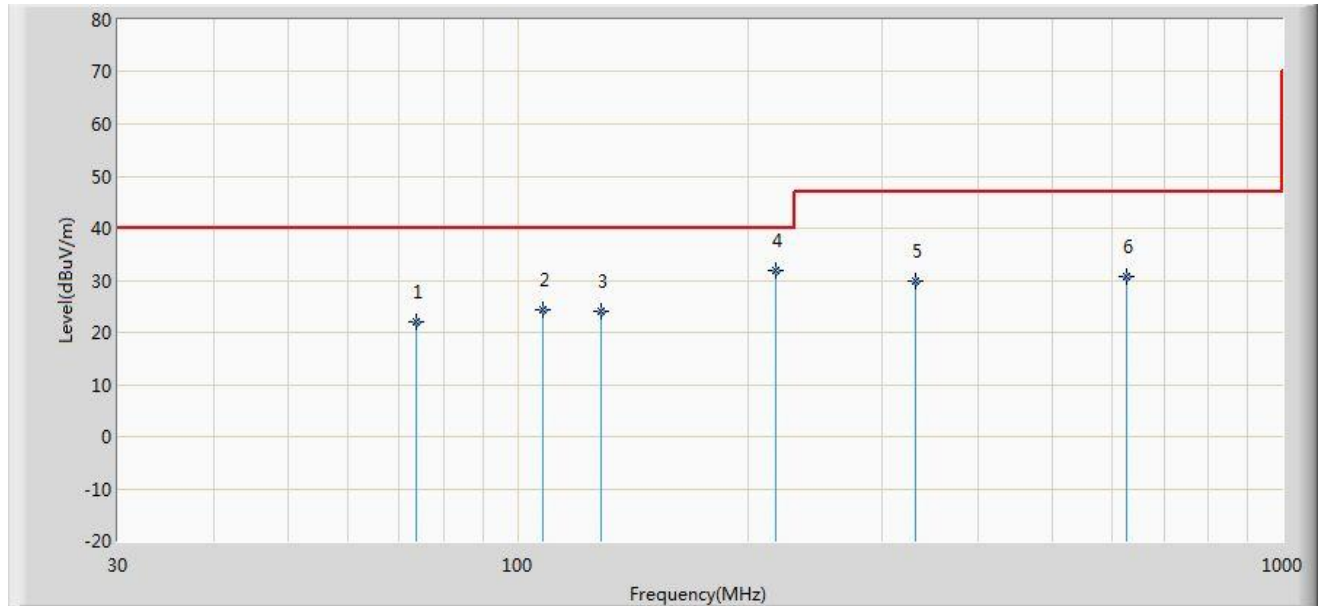


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1			40.912	34.478	20.591	-5.522	40.000	13.887	QP
2			55.341	36.771	22.324	-3.229	40.000	14.448	QP
3			135.973	32.751	23.361	-7.249	40.000	9.390	QP
4			146.643	35.381	26.223	-4.619	40.000	9.158	QP
5		*	477.655	32.084	14.709	-14.916	47.000	17.375	QP
6			647.769	32.953	12.963	-14.047	47.000	19.990	QP

Note: Measure Level (dBuV/m) = Reading Level (dBuV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m).

Engineer: Roy Cheng	
Site: AC1	Time: 2014/08/21 - 18:59
Limit: EN55022_RE(3m)_Class B	Margin: 0
Probe: VULB9162_0.03-8GHz	Polarity: Horizontal
EUT: WIRELESS ACCESS POINT	Power: AC 230V/50Hz
Note: Mode 2	

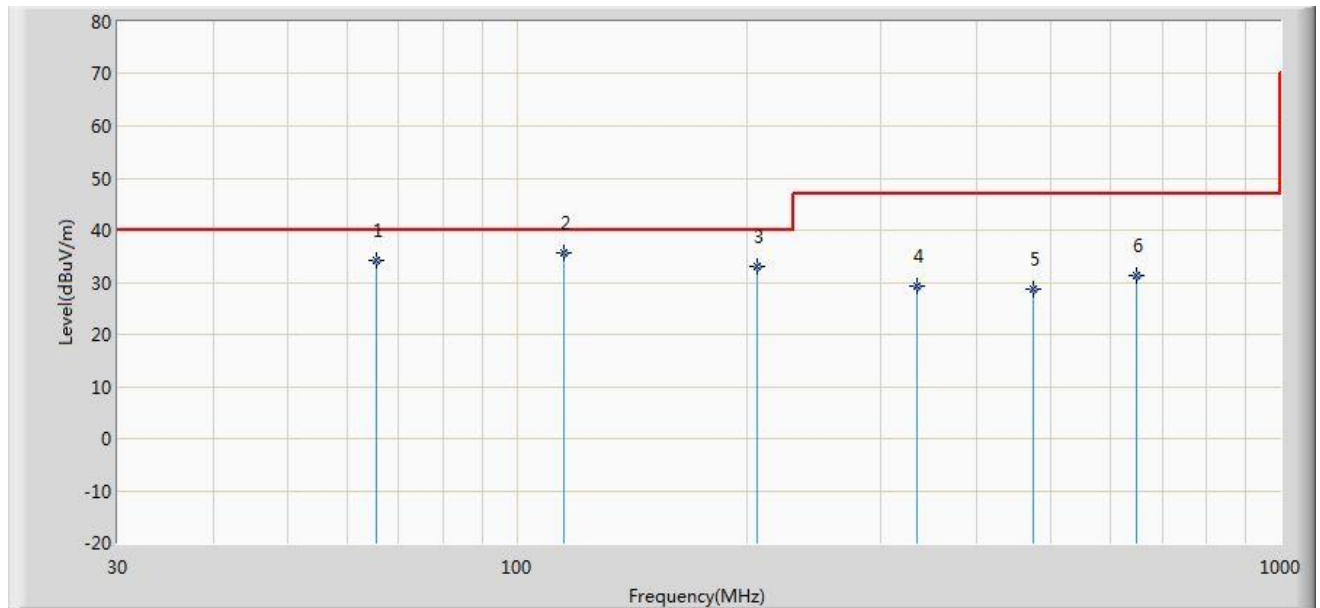


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1			73.529	22.002	12.133	-17.998	40.000	9.869	QP
2			107.964	24.312	11.559	-15.688	40.000	12.753	QP
3			128.697	23.962	14.057	-16.038	40.000	9.905	QP
4			217.331	31.873	19.658	-8.127	40.000	12.215	QP
5			331.185	29.993	15.043	-17.007	47.000	14.949	QP
6		*	625.580	30.728	10.999	-16.272	47.000	19.729	QP

Note: Measure Level (dBuV/m) = Reading Level (dBuV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m).

Engineer: Roy Cheng	
Site: AC1	Time: 2014/08/21 - 18:59
Limit: EN55022_RE(3m)_Class B	Margin: 0
Probe: VULB9162_0.03-8GHz	Polarity: Vertical
EUT: WIRELESS ACCESS POINT	Power: AC 230V/50Hz
Note: Mode 2	

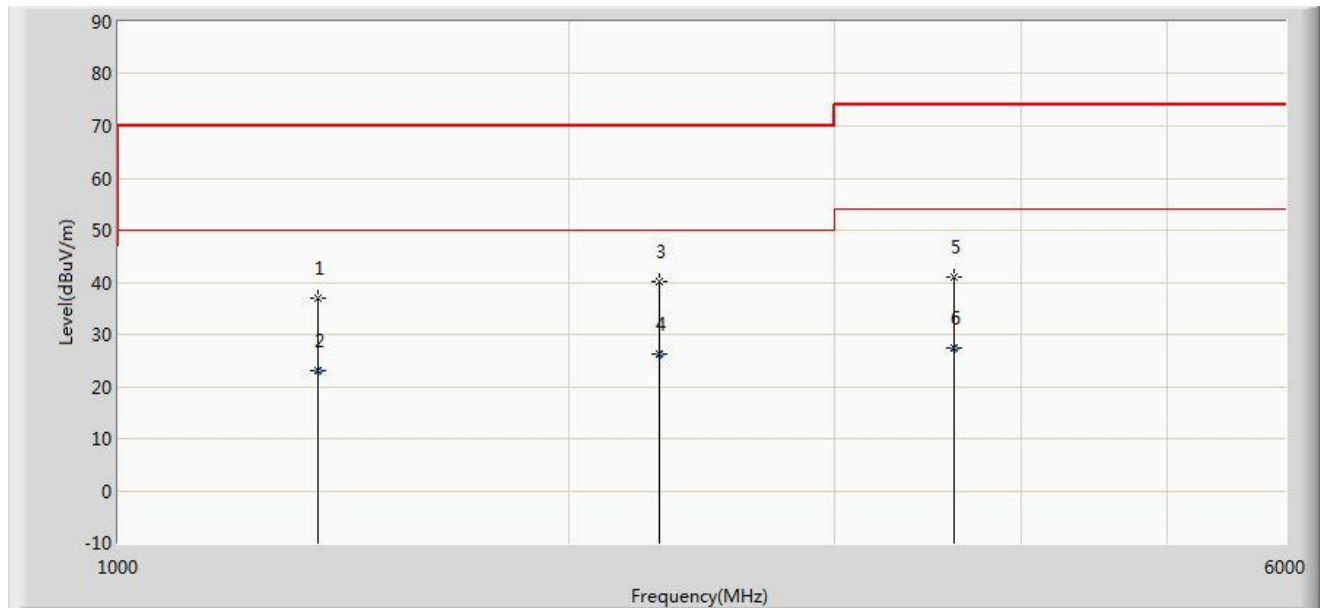


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		*	65.526	34.129	21.963	-5.871	40.000	12.166	QP
2			115.360	35.718	23.963	-4.282	40.000	11.755	QP
3			206.176	33.069	21.056	-6.931	40.000	12.013	QP
4			334.459	29.366	14.306	-17.634	47.000	15.060	QP
5			474.503	28.730	11.419	-18.270	47.000	17.311	QP
6			646.799	31.307	11.332	-15.693	47.000	19.975	QP

Note: Measure Level (dBμV/m) = Reading Level (dBμV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m).

Engineer: Milo Li	
Site: AC1	Time: 2014/08/21 - 18:59
Limit: EN55022_RE(3m)_Class B	Margin: 0
Probe: BBHA9120D_1-18GHz	Polarity: Horizontal
EUT: WIRELESS ACCESS POINT	Power: AC 230V/50Hz
Note: Mode 1	

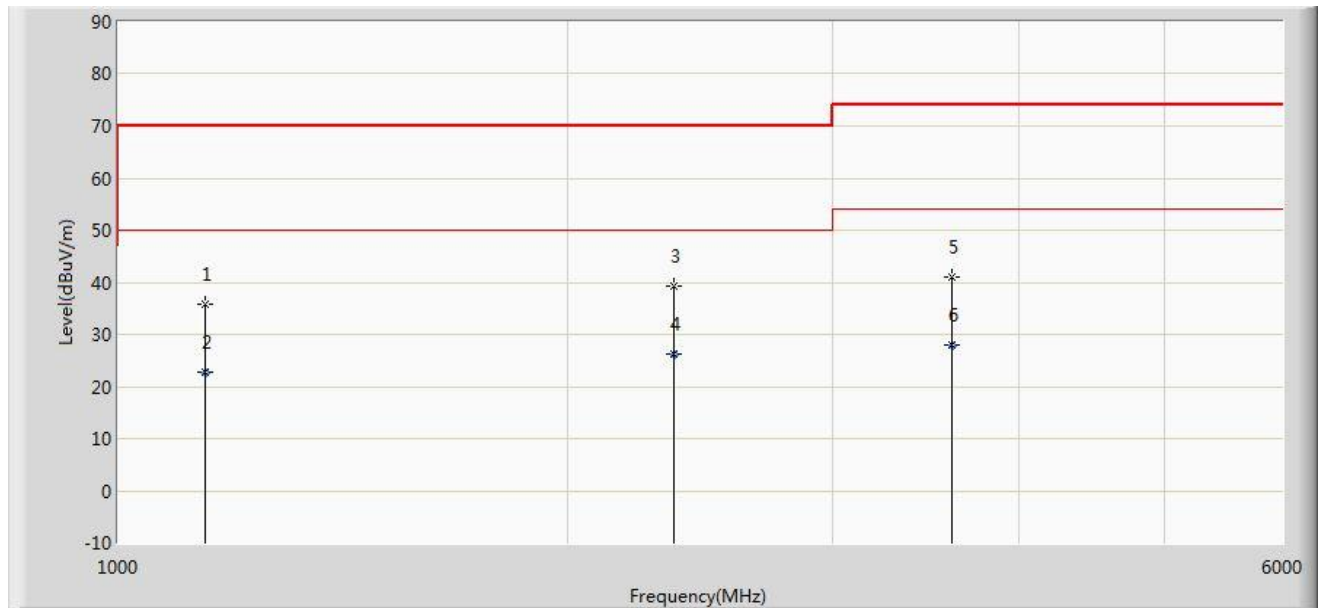


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1			1360.000	37.086	38.491	-32.914	70.000	-1.404	AV
2			1361.035	23.095	24.500	-26.905	50.000	-1.404	PK
3			2295.000	40.095	37.062	-29.905	70.000	3.033	AV
4			2295.245	26.133	23.100	-23.867	50.000	3.033	PK
5			3607.500	41.122	37.150	-32.878	74.000	3.973	PK
6		*	3607.698	27.372	23.400	-26.628	54.000	3.973	AV

Note: Measure Level (dBuV/m) = Reading Level (dBuV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m) – Pre_Amplifier Gain (dB).

Engineer: Milo Li	
Site: AC1	Time: 2014/08/21 - 18:59
Limit: EN55022_RE(3m)_ClassB	Margin: 0
Probe: BBHA9120D_1-18GHz	Polarity: Vertical
EUT: WIRELESS ACCESS POINT	Power: AC 230V/50Hz
Note: Mode 1	

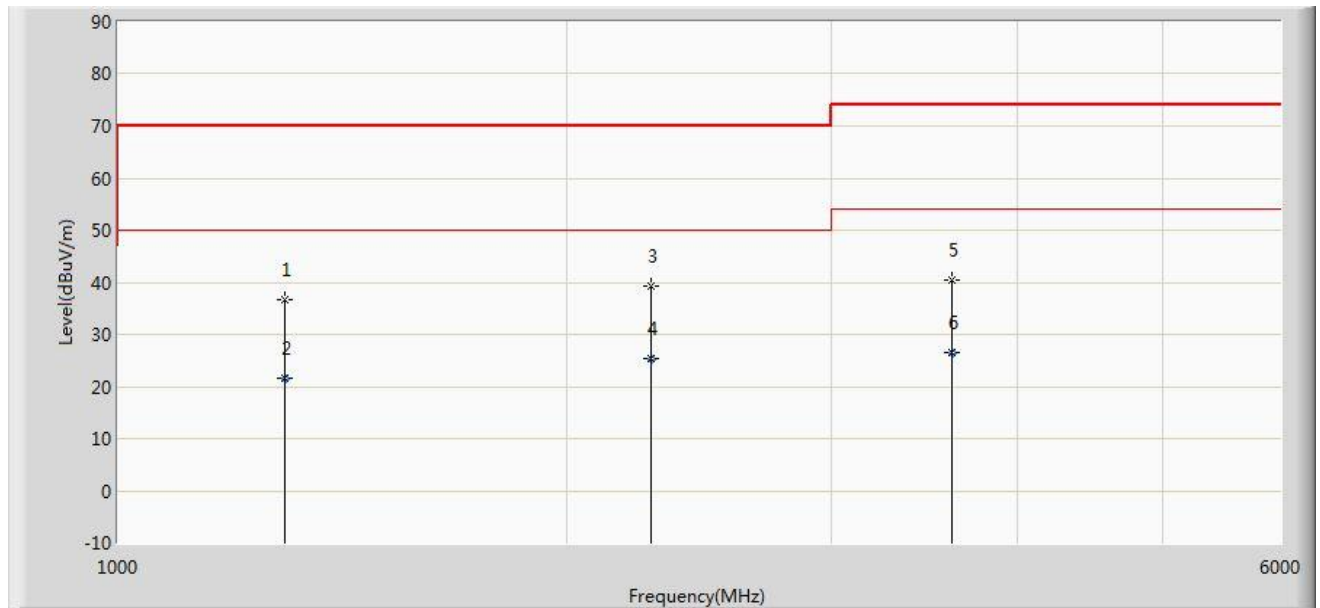


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1			1145.000	35.734	38.781	-34.266	70.000	-3.046	AV
2			1144.998	22.753	25.800	-27.247	50.000	-3.046	PK
3			2355.000	39.347	36.550	-30.653	70.000	2.797	PK
4			2354.976	26.297	23.500	-23.703	50.000	2.797	AV
5			3605.000	40.915	36.936	-33.085	74.000	3.979	PK
6		*	3605.268	28.079	24.100	-25.921	54.000	3.979	AV

Note: Measure Level (dBμV/m) = Reading Level (dBμV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m) – Pre_Amplifier Gain (dB).

Engineer: Milo Li	
Site: AC1	Time: 2014/08/21 - 19:00
Limit: EN55022_RE(3m)_ClassB	Margin: 0
Probe: BBHA9120D_1-18GHz	Polarity: Horizontal
EUT: WIRELESS ACCESS POINT	Power: AC 230V/50Hz
Note: Mode 2	

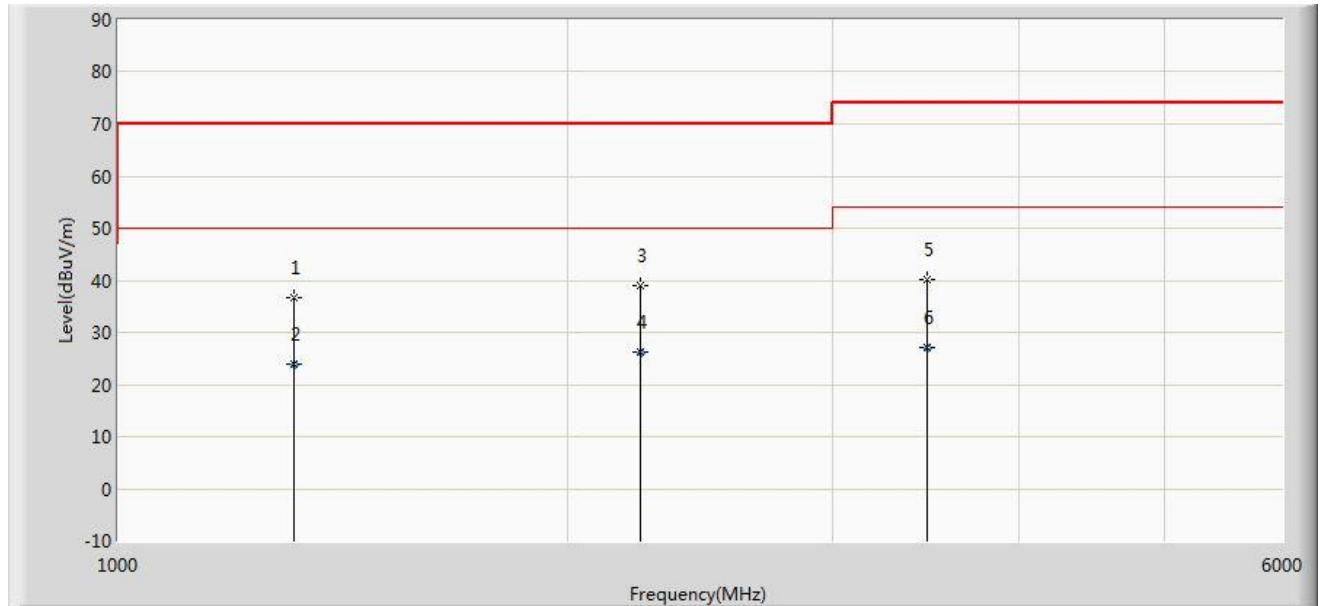


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1			1295.145	36.599	38.302	-33.401	70.000	-1.703	PK
2			1295.035	21.597	23.300	-28.403	50.000	-1.703	AV
3			2275.095	39.192	36.132	-30.808	70.000	3.060	PK
4			2275.102	25.360	22.300	-24.640	50.000	3.060	AV
5			3615.000	40.301	36.348	-33.699	74.000	3.954	PK
6		*	3615.024	26.653	22.700	-27.347	54.000	3.954	AV

Note: Measure Level (dBuV/m) = Reading Level (dBuV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m) – Pre_Amplifier Gain (dB).

Engineer: Milo Li	
Site: AC1	Time: 2014/08/21 - 19:00
Limit: EN55022_RE(3m)_ClassB	Margin: 0
Probe: BBHA9120D_1-18GHz	Polarity: Vertical
EUT: WIRELESS ACCESS POINT	Power: AC 230V/50Hz
Note: Mode 2	



No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1			1312.498	36.745	38.348	-33.255	70.000	-1.603	PK
2			1312.521	23.797	25.400	-26.203	50.000	-1.603	AV
3			2232.520	39.128	36.058	-30.872	70.000	3.070	PK
4			2232.518	26.170	23.100	-23.830	50.000	3.070	AV
5			3474.983	40.115	36.393	-33.885	74.000	3.723	PK
6		*	3475.124	27.122	23.400	-26.878	54.000	3.723	AV

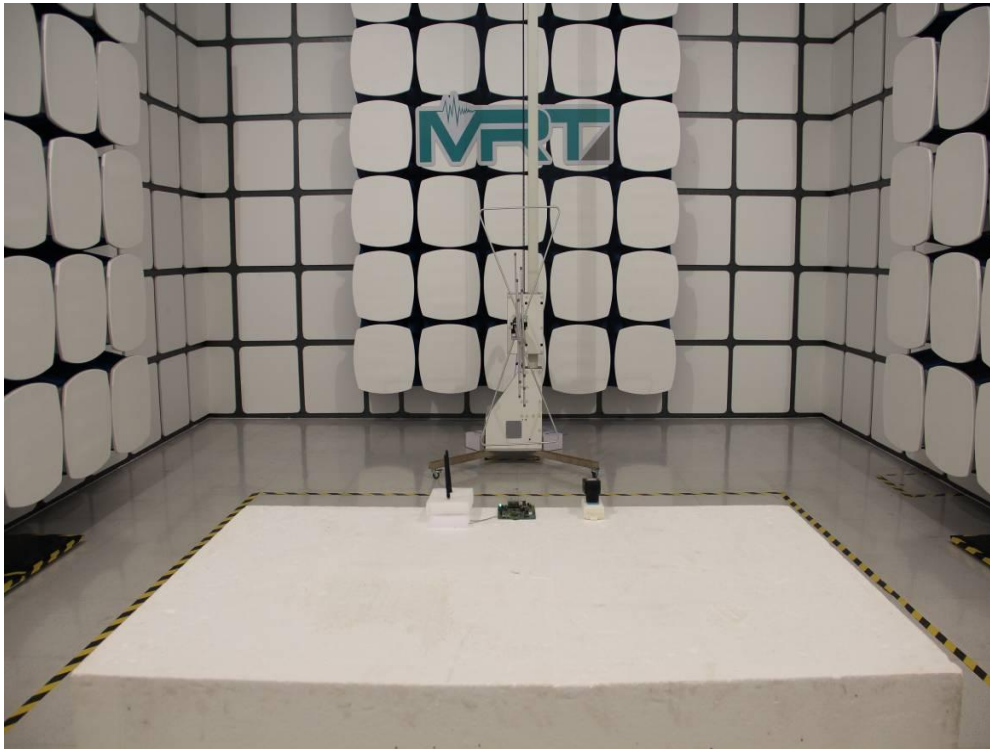
Note: Measure Level (dBuV/m) = Reading Level (dBuV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m) – Pre_Amplifier Gain (dB).

5.5. Test Photograph

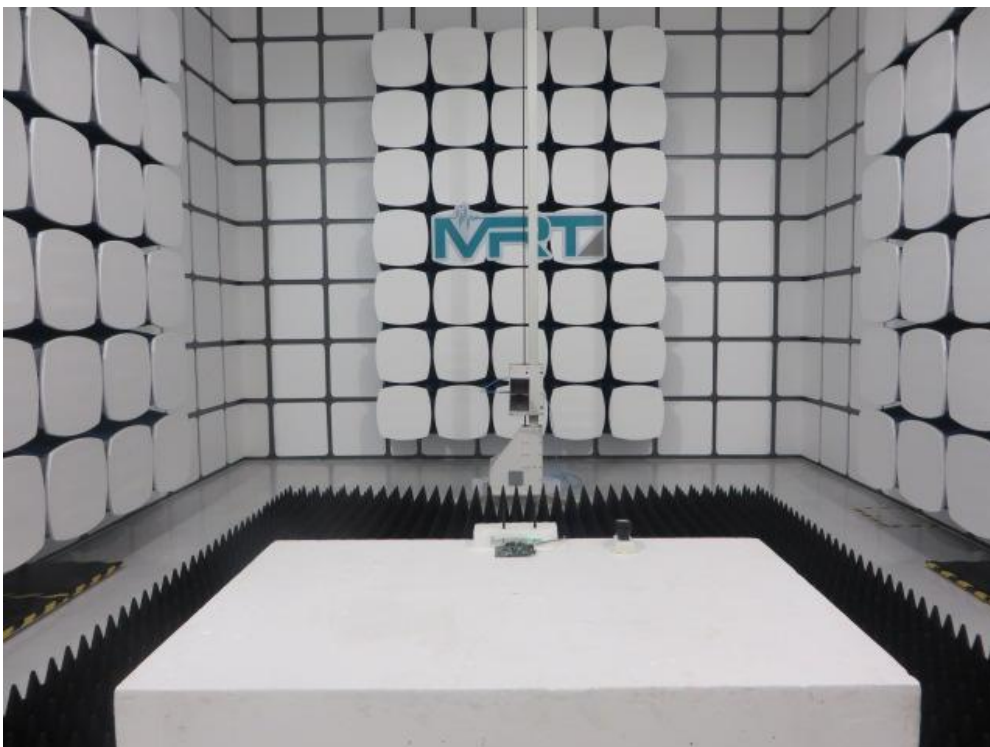
Test Mode: Mode 1

Description: Radiated Emission Test Setup (30MHz ~ 1GHz)



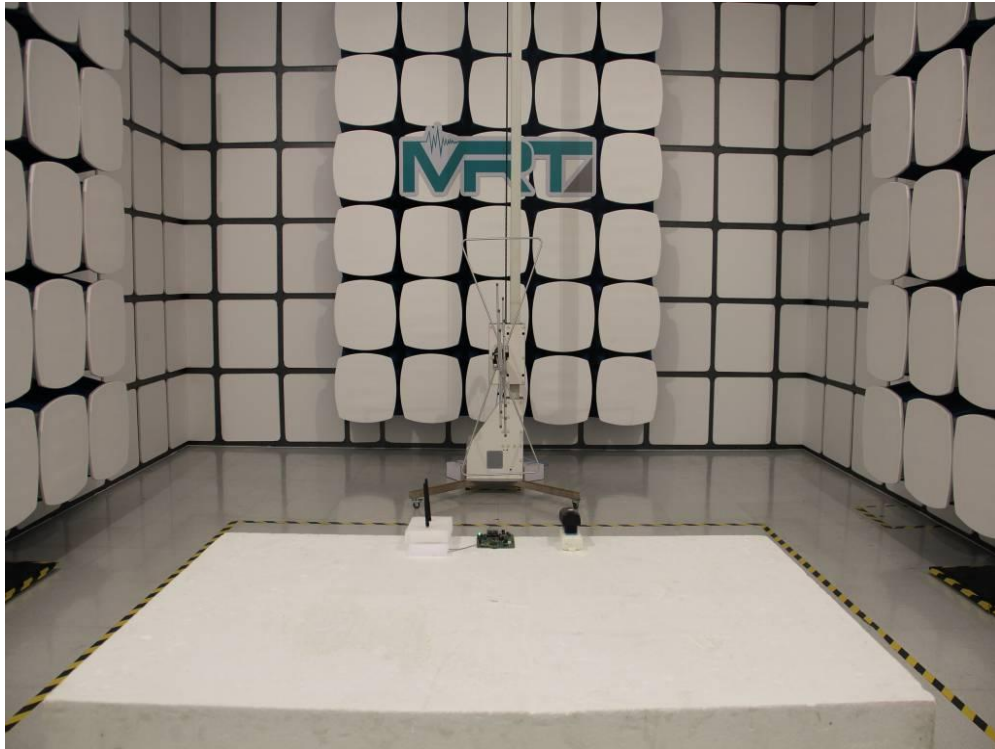
Test Mode: Mode 1

Description: Radiated Emission Test Setup (1GHz ~ 6GHz)



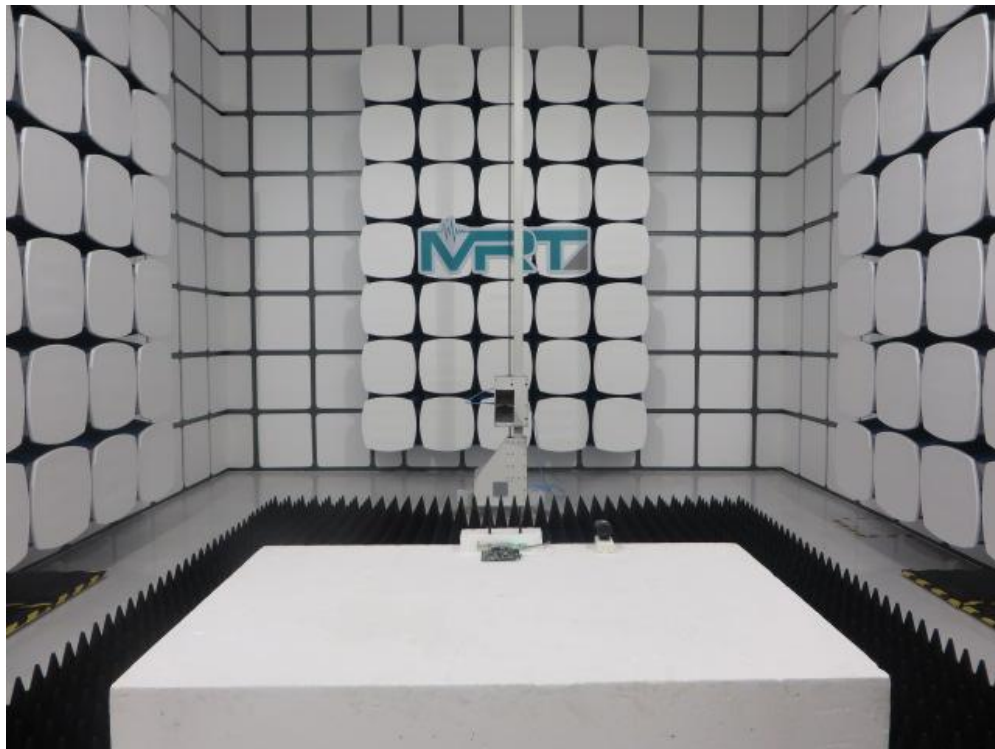
Test Mode: Mode 2

Description: Radiated Emission Test Setup (30MHz ~ 1GHz)



Test Mode: Mode 2

Description: Radiated Emission Test Setup (1GHz ~ 6GHz)



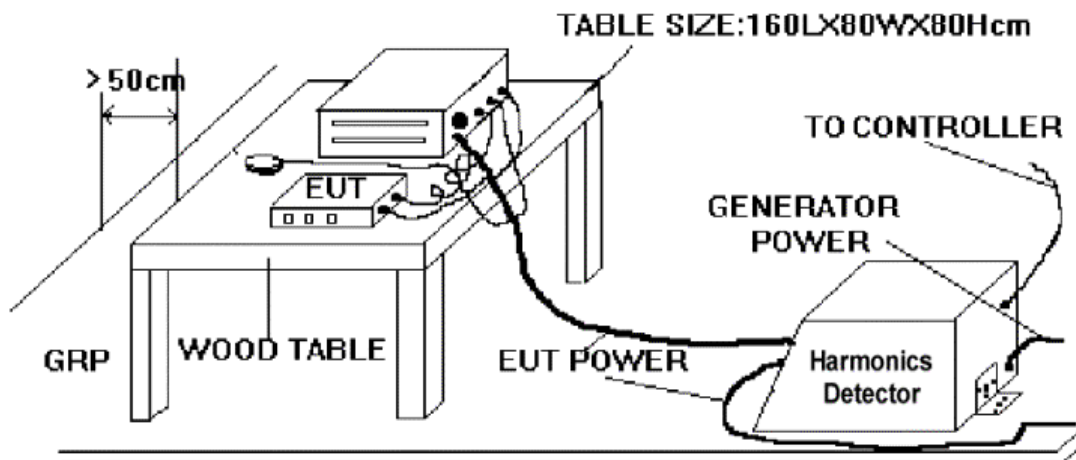
6. Harmonic Current Emissions

6.1. Limit of Harmonic Current Emissions

Limits of Class A Harmonics Currents

Harmonics Order n	Maximum Permissible harmonic current A	Harmonics Order n	Maximum Permissible harmonic current A
Odd harmonics		Even harmonics	
3	2.30	2	1.08
5	1.14	4	0.43
7	0.77	6	0.30
9	0.40	$8 \leq n \leq 40$	$0.23 * 8/n$
11	0.33	--	--
13	0.21	--	--
$15 \leq n \leq 39$	$0.15 * 15/n$	--	--

6.2. Test Setup



6.3. Test Procedure

The EUT is supplied in series with power analyzer from a power source having the same normal voltage and frequency as the rated supply voltage and the equipment under test. And the rated voltage at the supply voltage of EUT of 0.98 times and 1.02 times shall be performed.

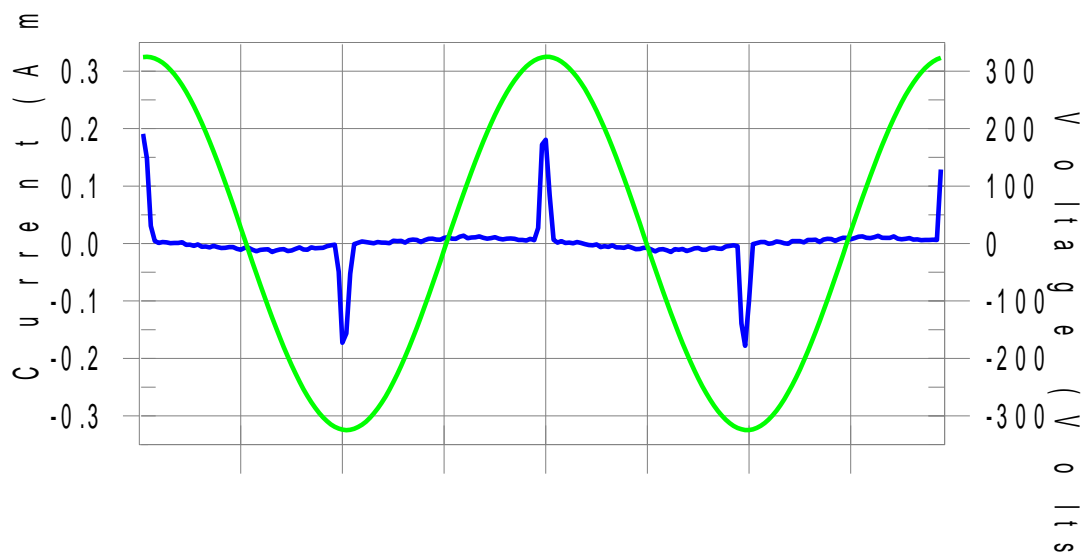
6.4. Test Result

Product	WIRELESS ACCESS POINT	Temperature	26°C
Test Engineer	Milo Li	Relative Humidity	54%
Test Mode	Mode 1	Date of Test	2014/08/20

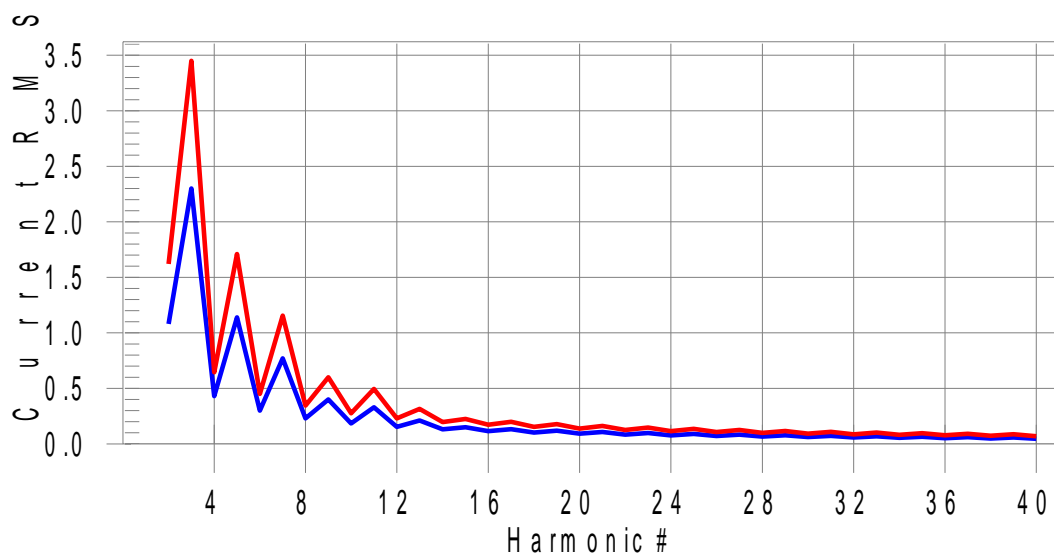
Test Result: Pass

Source qualification: Normal

Current & voltage waveforms



Harmonics and Class A limit line European Limits



Test result: Pass Worst harmonic was #21 with 5.55% of the limit.

Test Result: Pass

Source qualification: Normal

THC(A): 0.03

I-THD(%): 192.35

POHC(A): 0.008

POHC Limit(A): 0.251

Highest parameter values during test:

V_RMS (Volts): 229.89

Frequency(Hz): 50.00

I_Peak (Amps): 0.198

I_RMS (Amps): 0.036

I_Fund (Amps): 0.015

Crest Factor: 6.018

Power (Watts): 3.0

Power Factor: 0.406

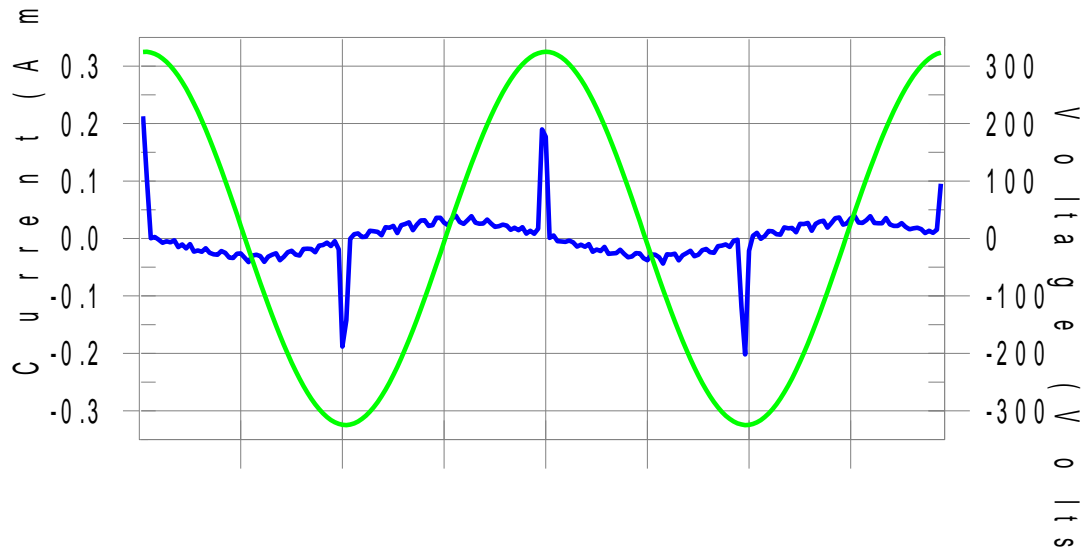
Harm#	Harms(avg)	100%Limit	%of Limit	Harms(max)	150%Limit	%of Limit	Status
2	0.001	1.080	0.1	0.001	1.620	0.06	Pass
3	0.010	2.300	0.4	0.011	3.450	0.31	Pass
4	0.001	0.430	0.1	0.001	0.645	0.11	Pass
5	0.010	1.140	0.9	0.010	1.710	0.58	Pass
6	0.000	0.300	0.1	0.000	0.450	0.08	Pass
7	0.009	0.770	1.2	0.010	1.155	0.84	Pass
8	0.000	0.230	0.1	0.000	0.345	0.08	Pass
9	0.009	0.400	2.3	0.009	0.600	1.55	Pass
10	0.000	0.184	0.1	0.000	0.276	0.10	Pass
11	0.009	0.330	2.7	0.009	0.495	1.79	Pass
12	0.000	0.153	0.1	0.000	0.230	0.11	Pass
13	0.008	0.210	3.9	0.008	0.315	2.66	Pass
14	0.000	0.131	0.1	0.000	0.197	0.11	Pass
15	0.008	0.150	5.2	0.008	0.225	3.49	Pass
16	0.000	0.115	0.1	0.000	0.173	0.10	Pass
17	0.007	0.132	5.4	0.007	0.199	3.66	Pass
18	0.000	0.102	0.1	0.000	0.153	0.11	Pass
19	0.007	0.118	5.6	0.007	0.178	3.73	Pass
20	0.000	0.092	0.1	0.000	0.138	0.11	Pass
21	0.006	0.107	5.6	0.006	0.161	3.74	Pass
22	0.000	0.084	0.1	0.000	0.125	0.11	Pass
23	0.005	0.098	5.4	0.005	0.147	3.65	Pass
24	0.000	0.077	0.1	0.000	0.115	0.13	Pass
25	0.005	0.090	5.2	0.005	0.135	3.49	Pass
26	0.000	0.071	0.1	0.000	0.106	0.14	Pass
27	0.004	0.083	4.9	0.004	0.125	3.26	Pass
28	0.000	0.066	0.2	0.000	0.099	0.15	Pass
29	0.003	0.078	4.4	0.003	0.116	2.98	Pass
30	0.000	0.061	0.1	0.000	0.092	0.15	Pass
31	0.003	0.073	3.9	0.003	0.109	2.64	Pass
32	0.000	0.058	0.2	0.000	0.086	0.17	Pass
33	0.002	0.068	3.4	0.002	0.102	2.29	Pass
34	0.000	0.054	0.2	0.000	0.081	0.16	Pass
35	0.002	0.064	2.8	0.002	0.096	1.89	Pass
36	0.000	0.051	0.2	0.000	0.077	0.17	Pass
37	0.001	0.061	2.2	0.001	0.091	1.50	Pass
38	0.000	0.048	0.2	0.000	0.073	0.16	Pass
39	0.001	0.058	1.7	0.001	0.087	1.12	Pass
40	0.000	0.046	0.2	0.000	0.069	0.17	Pass

Product	WIRELESS ACCESS POINT	Temperature	26°C
Test Engineer	Milo Li	Relative Humidity	54%
Test Mode	Mode 2	Date of Test	2014/08/20

Test Result: Pass

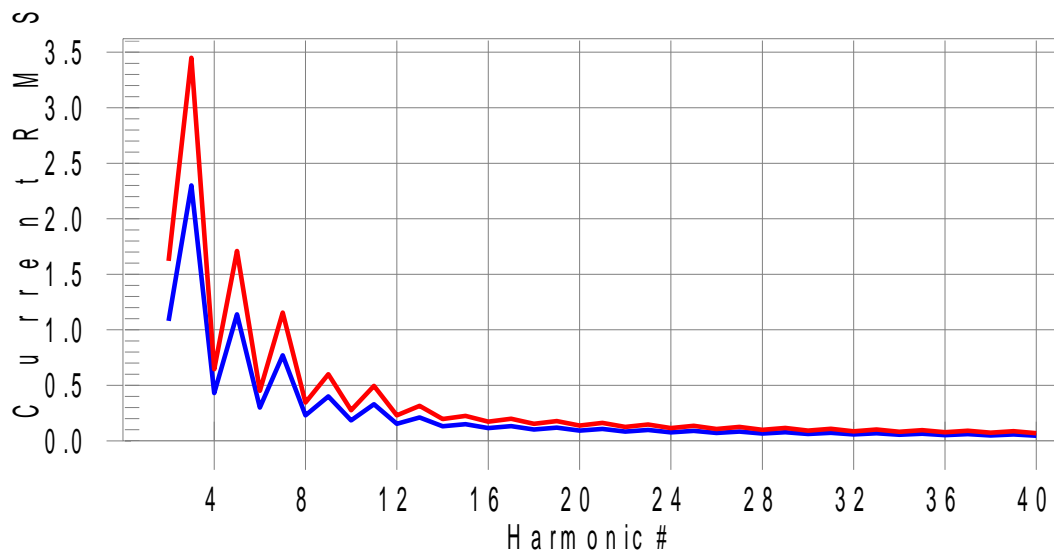
Source qualification: Normal

Current & voltage waveforms



Harmonics and Class A limit line

European Limits



Test result: Pass Worst harmonic was #25 with 7.09% of the limit.

Test Result: Pass

Source qualification: Normal

THC(A): 0.03

I-THD(%): 120.29

POHC(A): 0.014

POHC Limit(A): 0.251

Highest parameter values during test:

V_RMS (Volts): 229.91

Frequency(Hz): 50.00

I_Peak (Amps): 0.252

I_RMS (Amps): 0.042

I_Fund (Amps): 0.026

Crest Factor: 6.166

Power (Watts): 2.9

Power Factor: 0.308

Harm#	Harms(avg)	100%Limit	%of Limit	Harms(max)	150%Limit	%of Limit	Status
2	0.001	1.080	0.1	0.001	1.620	0.07	Pass
3	0.010	2.300	0.4	0.011	3.450	0.31	Pass
4	0.001	0.430	0.2	0.001	0.645	0.13	Pass
5	0.010	1.140	0.8	0.010	1.710	0.57	Pass
6	0.000	0.300	0.1	0.001	0.450	0.14	Pass
7	0.010	0.770	1.2	0.010	1.155	0.85	Pass
8	0.000	0.230	0.1	0.000	0.345	0.13	Pass
9	0.009	0.400	2.3	0.009	0.600	1.56	Pass
10	0.000	0.184	0.2	0.000	0.276	0.17	Pass
11	0.009	0.330	2.7	0.009	0.495	1.85	Pass
12	0.000	0.153	0.2	0.000	0.230	0.20	Pass
13	0.009	0.210	4.2	0.009	0.315	2.80	Pass
14	0.000	0.131	0.2	0.000	0.197	0.21	Pass
15	0.008	0.150	5.6	0.008	0.225	3.77	Pass
16	0.000	0.115	0.3	0.000	0.173	0.22	Pass
17	0.008	0.132	6.1	0.008	0.199	4.07	Pass
18	0.000	0.102	0.3	0.000	0.153	0.25	Pass
19	0.008	0.118	6.5	0.008	0.178	4.34	Pass
20	0.000	0.092	0.3	0.000	0.138	0.26	Pass
21	0.007	0.107	6.8	0.007	0.161	4.51	Pass
22	0.000	0.084	0.3	0.000	0.125	0.29	Pass
23	0.007	0.098	7.0	0.007	0.147	4.69	Pass
24	0.000	0.077	0.4	0.000	0.115	0.31	Pass
25	0.006	0.090	7.1	0.006	0.135	4.75	Pass
26	0.000	0.071	0.4	0.000	0.106	0.32	Pass
27	0.006	0.083	7.1	0.006	0.125	4.76	Pass
28	0.000	0.066	0.4	0.000	0.099	0.37	Pass
29	0.005	0.078	7.0	0.005	0.116	4.72	Pass
30	0.000	0.061	0.4	0.000	0.092	0.35	Pass
31	0.005	0.073	6.8	0.005	0.109	4.60	Pass
32	0.000	0.058	0.5	0.000	0.086	0.41	Pass
33	0.004	0.068	6.6	0.005	0.102	4.44	Pass
34	0.000	0.054	0.4	0.000	0.081	0.33	Pass
35	0.004	0.064	6.3	0.004	0.096	4.24	Pass
36	0.000	0.051	0.3	0.000	0.077	0.32	Pass
37	0.004	0.061	5.9	0.004	0.091	3.98	Pass
38	0.000	0.048	0.3	0.000	0.073	0.30	Pass
39	0.003	0.058	5.5	0.003	0.087	3.67	Pass
40	0.000	0.046	0.3	0.000	0.069	0.31	Pass

6.5. Test Photograph

Test Mode: Mode 1

Description: Harmonic current emissions Test Setup



Test Mode: Mode 2

Description: Harmonic current emissions Test Setup



7. Voltage Fluctuations and Flicker

7.1. Limit of Voltage Fluctuations and Flicker

The following limits apply:

- the value of P_{st} shall not be greater than 1.0;
- the value of P_{lt} shall not be greater than 0.65;
- the value of $d(t)$ during a voltage change shall not exceed 3.3% for more than 500ms;
- the relative steady-state voltage change, d_c , shall not exceed 3.3%;
- the maximum relative voltage change, d_{max} , shall not exceed:
 - a) 4% without additional conditions;
 - b) 6% for equipment which is:
 - switched manually, or
 - switched automatically more frequently than twice per day, and also has either a delayed restart (the delay being not less than a few tens of seconds), or manual restart, after a power supply interruption.

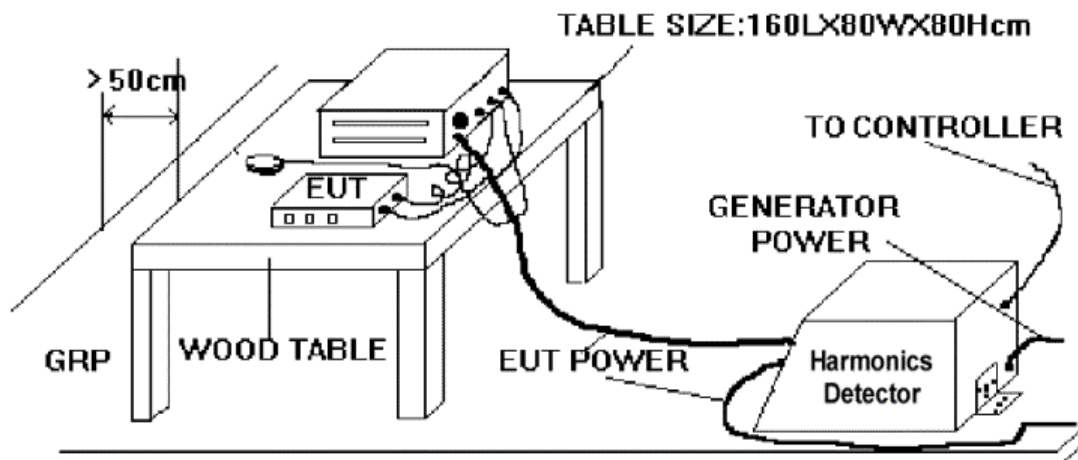
NOTE: The cycling frequency will be further limited by the P_{st} and P_{lt} limit.

For example: a d_{max} of 6% producing a rectangular voltage change characteristic twice per hour will give a P_{lt} of about 0.65.

- c) 7% for equipment which is:
 - attended whilst in use (for example: hair dryers, vacuum cleaners, kitchen equipment such as mixers, garden equipment such as lawn mowers, portable tools such as electric drills), or
 - switched on automatically, or is intended to be switched on manually, no more than twice per day, and also has either a delayed restart (the delay being not less than a few tens of seconds) or manual restart, after a power supply interruption.

P_{st} and P_{lt} requirements shall not be applied to voltage changes caused by manual switching.

7.2. Test Setup



7.3. Test Procedure

The EUT is supplied in series with power analyzer from a power source having the same normal voltage and frequency as the rated supply voltage and the equipment under test. And the rated voltage at the supply voltage of EUT of 0.98 times and 1.02 times shall be performed.

7.4. Test Result

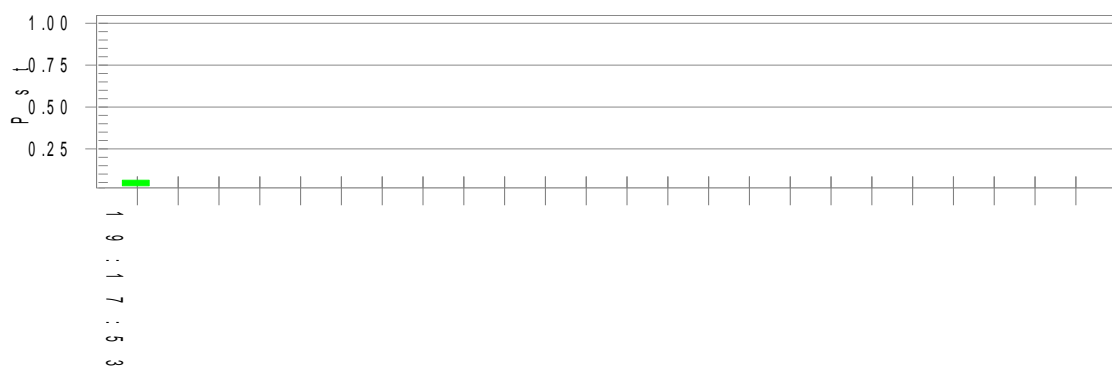
Product	WIRELESS ACCESS POINT	Temperature	26°C
Test Engineer	Milo Li	Relative Humidity	54%
Test Mode	Mode 1	Date of Test	2014/08/20

Test Result: Pass

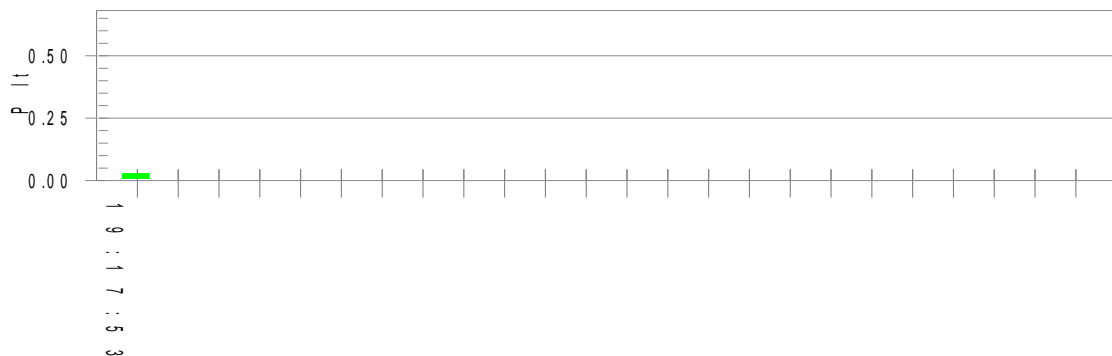
Status: Test Completed

Pst_i and limit line

European Limits



Plt and limit line



Parameter values recorded during the test:

Vrms at the end of test (Volt):	229.90		
Highest dt (%):	0.00	Test limit (%):	3.30 Pass
Time(mS) > dt:	0.0	Test limit (mS):	500.0 Pass
Highest dc (%):	0.00	Test limit (%):	3.30 Pass
Highest dmax (%):	0.00	Test limit (%):	4.00 Pass
Highest Pst (10 min. period):	0.064	Test limit:	1.000 Pass
Highest Plt (2 hr. period):	0.028	Test limit:	0.650 Pass

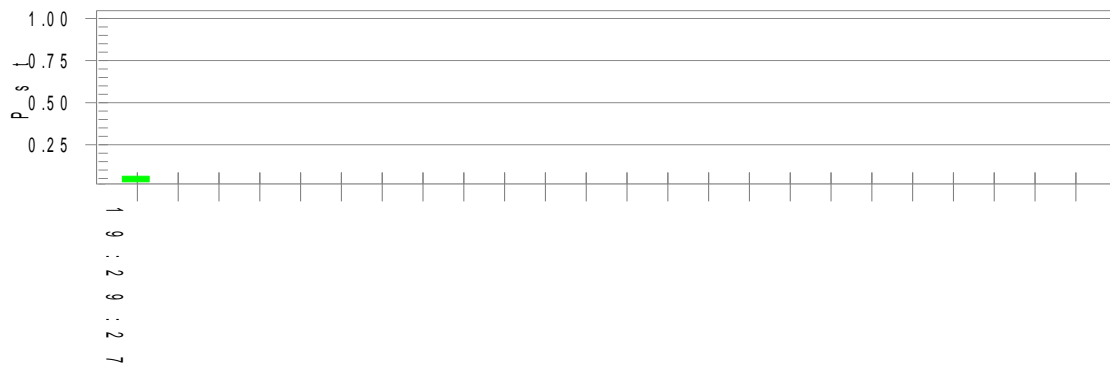
Product	WIRELESS ACCESS POINT	Temperature	26°C
Test Engineer	Milo Li	Relative Humidity	54%
Test Mode	Mode 2	Date of Test	2014/08/20

Test Result: Pass

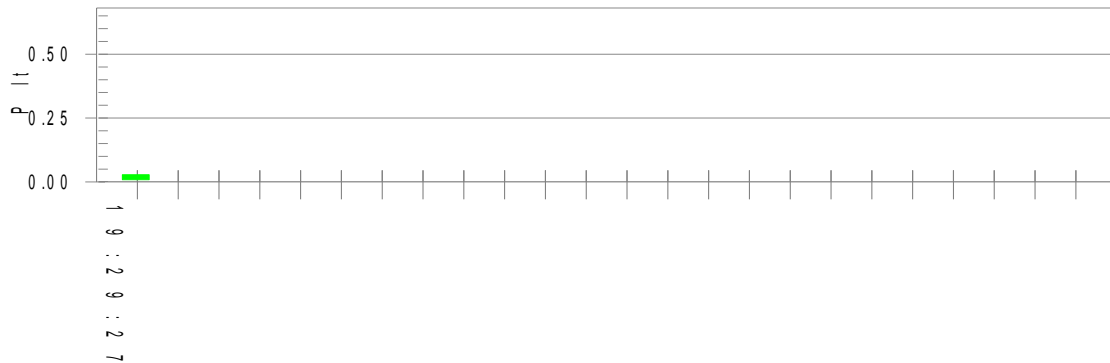
Status: Test Completed

Pst_i and limit line

European Limits



Plt and limit line



Parameter values recorded during the test:

Vrms at the end of test (Volt):	229.89			
Highest dt (%):	0.00	Test limit (%):	3.30	Pass
Time(mS) > dt:	0.0	Test limit (mS):	500.0	Pass
Highest dc (%):	0.00	Test limit (%):	3.30	Pass
Highest dmax (%):	0.00	Test limit (%):	4.00	Pass
Highest Pst (10 min. period):	0.064	Test limit:	1.000	Pass
Highest Plt (2 hr. period):	0.028	Test limit:	0.650	Pass

7.5. Test Photograph

Test Mode: Mode 1

Description: Voltage Fluctuation and Flicker Test Setup



Test Mode: Mode 2

Description: Voltage Fluctuation and Flicker Test Setup

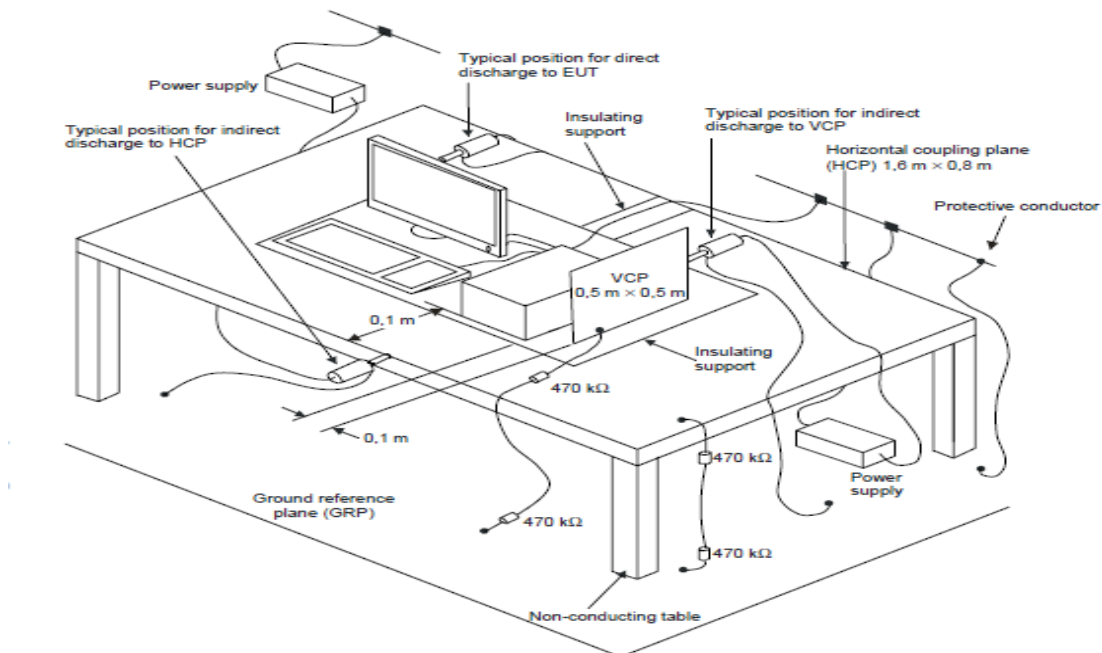


8. Electrostatic discharge

8.1. Limit of Electrostatic discharge

Environmental phenomenon	Test specification	Units	Performance criterion
Enclosure port			
Electrostatic discharge	± 4 (Contact discharge)	kV (Charge voltage)	B
	± 8 (Air discharge)	kV (Charge voltage)	

8.2. Test Setup



8.3. Test Procedure

Direct application of discharges to the EUT:

Contact discharge was applied only to conductive surfaces of the EUT.

Air discharges were applied only to non-conductive surfaces of the EUT.

During the test, it was performed with single discharges. For the single discharge time between successive single discharges will be keep longer 1 second. It was at least twenty-five single discharges with positive and negative at the same selected point.

The selected point, which was performed with electrostatic discharge, was marked on the red label of the EUT.

Indirect application of discharges to the EUT:

Vertical Coupling Plane (VCP):

The coupling plane, of dimensions 0.5m x 0.5m, is placed parallel to, and positioned at a distance 0.1m from the EUT, with the Discharge Electrode touching the coupling plane.

The four faces of the EUT will be performed with electrostatic discharge. It was at least twenty-five single discharges with positive and negative at the same selected point.

Horizontal Coupling Plane (HCP):

The coupling plane is placed under to the EUT. The generator shall be positioned vertically at a distance of 0.1m from the EUT, with the Discharge Electrode touching the coupling plane.

The four faces of the EUT will be performed with electrostatic discharge. It was at least twenty-five single discharges with positive and negative at the same selected point.

8.4. Test Result

EUT	WIRELESS ACCESS POINT	Temperature	23°C
Test Engineer	Milo Li	Relative Humidity	54%
Test Mode	Mode 1	Date of Test	2014/08/18

Direct Application		Test Result	
Test Location	Test Level	Air Discharge	Contact Discharge
1 ~ 4	±2kV, ±4kV, ±8kV	Pass	N/A
11 ~ 12	±4kV	N/A	Pass

Indirect Application		Test Result	
Test Location	Test Level	Horizontal Coupling	Vertical Coupling
Front, Rear Left, Right	±4kV	Pass	Pass

Note: There is no any degradation of performance and function.

EUT	WIRELESS ACCESS POINT	Temperature	23°C
Test Engineer	Milo Li	Relative Humidity	54%
Test Mode	Mode 2	Date of Test	2014/08/18

Direct Application		Test Result	
Test Location	Test Level	Air Discharge	Contact Discharge
5 ~ 10	±2kV, ±4kV, ±8kV	Pass	N/A
11 ~ 12	±4kV	N/A	Pass

Indirect Application		Test Result	
Test Location	Test Level	Horizontal Coupling	Vertical Coupling
Front, Rear Left, Right	±4kV	Pass	Pass

Note: There is no any degradation of performance and function.

EUT	WIRELESS ACCESS POINT	Temperature	23°C
Test Engineer	Milo Li	Relative Humidity	54%
Test Mode	Mode 3	Date of Test	2014/08/18

Direct Application		Test Result	
Test Location	Test Level	Air Discharge	Contact Discharge
1 ~ 4	±2kV, ±4kV, ±8kV	Pass	N/A
11 ~ 12	±4kV	N/A	Pass

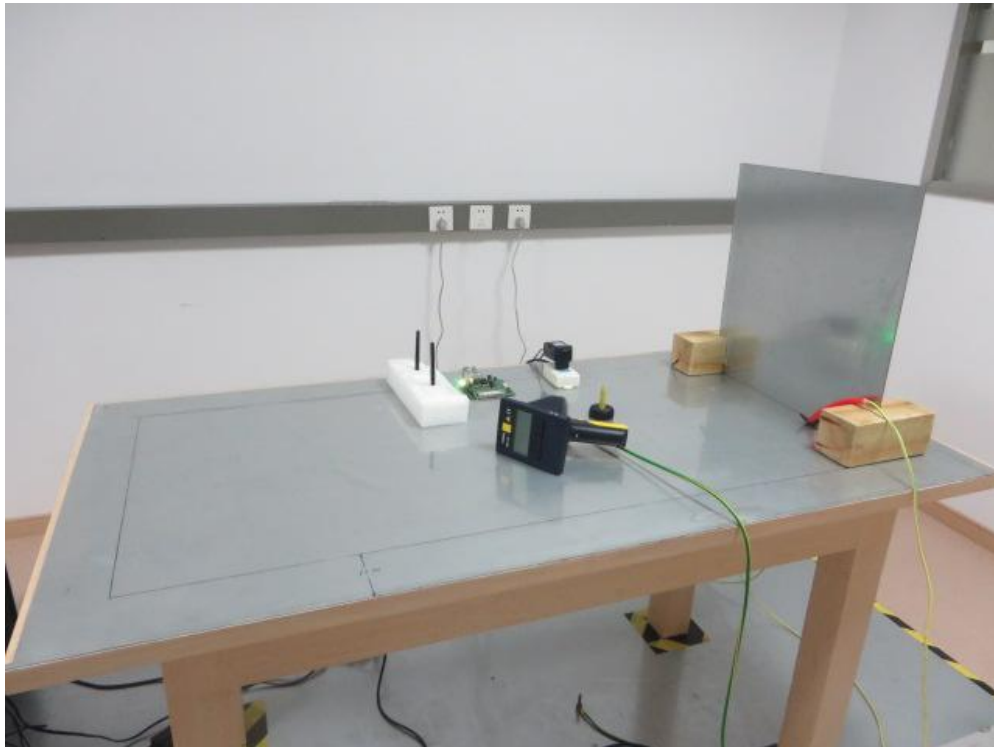
Indirect Application		Test Result	
Test Location	Test Level	Horizontal Coupling	Vertical Coupling
Front, Rear Left, Right	±4kV	Pass	Pass

Note: There is no any degradation of performance and function.

8.5. Test Photograph

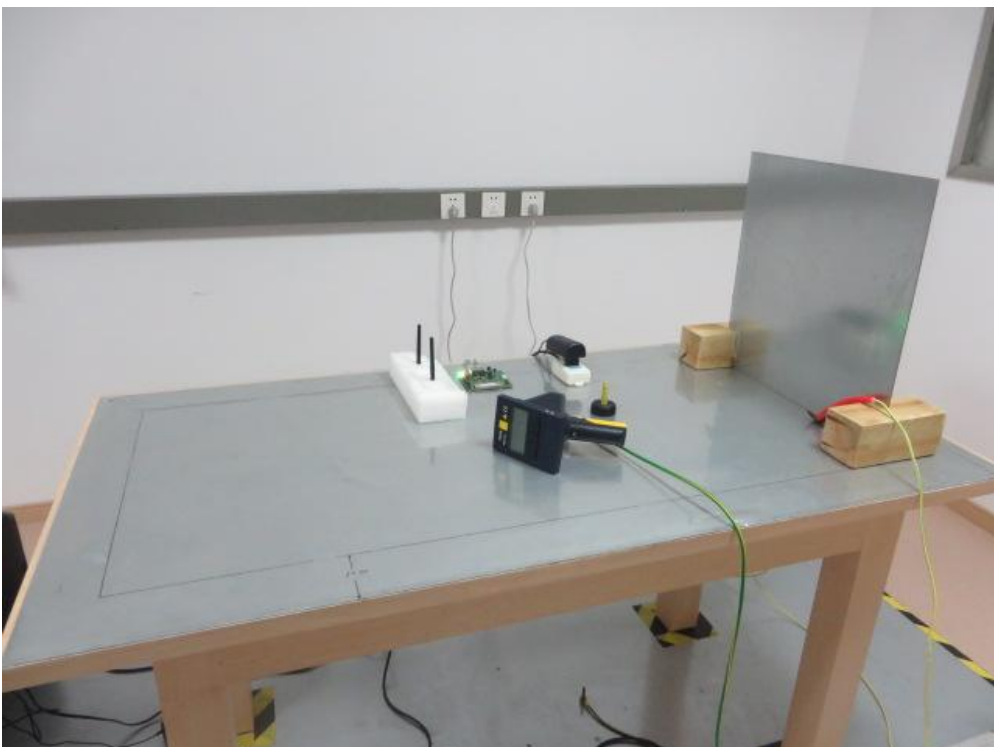
Test Mode: Mode 1 & 3

Description: Electrostatic discharge Test Setup



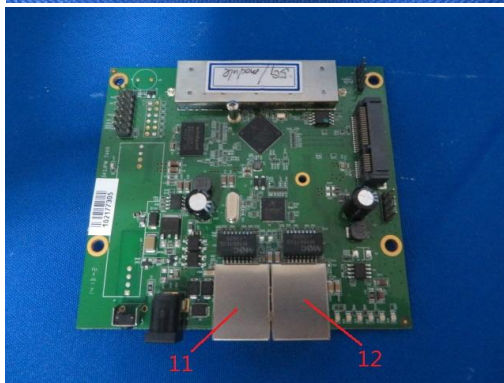
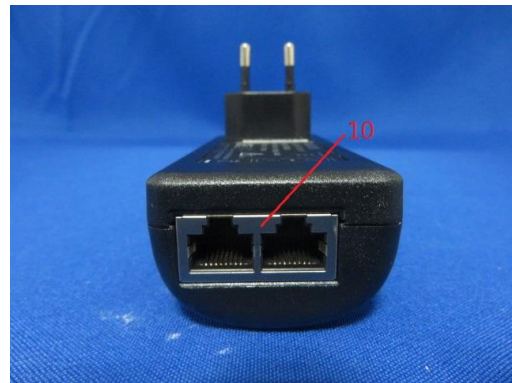
Test Mode: Mode 2

Description: Electrostatic discharge Test Setup



Electrostatic discharge Test Location



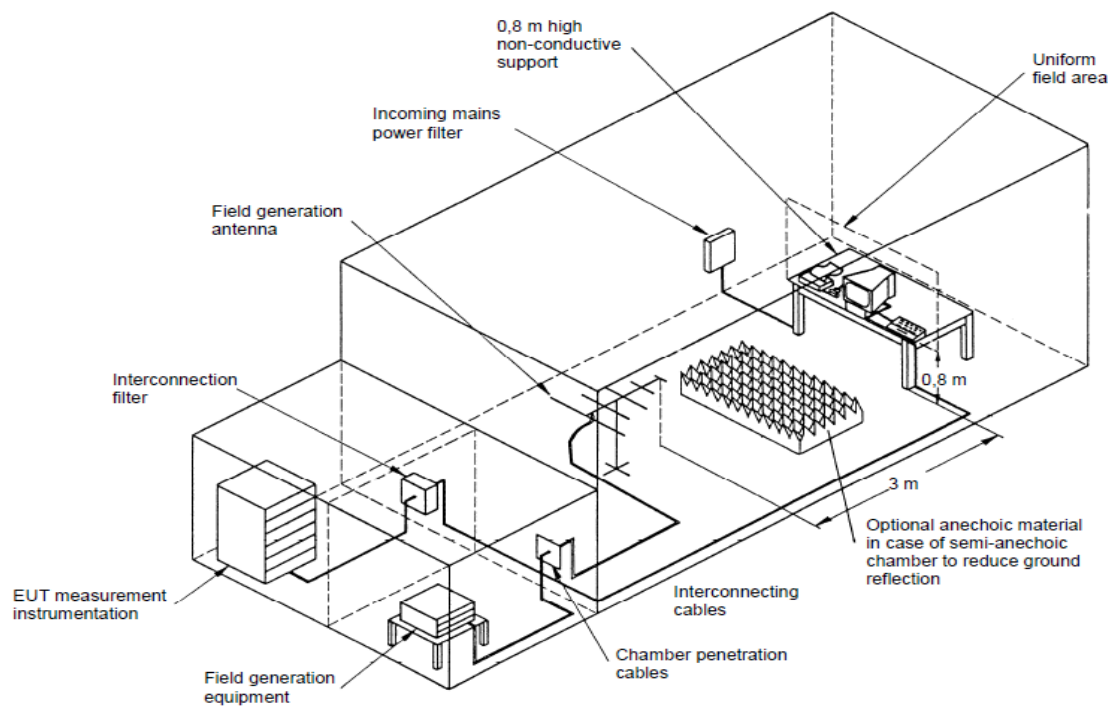


9. Radio-frequency electromagnetic field

9.1. Limit of Radio-frequency electromagnetic field

Environmental phenomenon	Test specification	Units	Performance criterion
Enclosure port			
Radio frequency electromagnetic field	80 - 1000, 1400 - 2700	MHz	A
	3	V/m (unmodulated, r.m.s)	
	80	% AM (1kHz)	
Note 1: If the wanted signal is modulated at 1000Hz, then an audio signal of 400Hz shall be used. Note 2: The test shall be performed over the frequency range 80MHz to 1000MHz and 1400MHz to 2700MHz with the exception of the exclusion band for transmitters, receivers and duplex transceivers [see clause 4 of EN 301 489-1 V1.9.2 (2010-09)], as appropriate.			

9.2. Test Setup



9.3. 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.

All the scanning conditions are as follows:

	Condition of Test	Remarks
1.	Field Strength	3V/m
2.	Radiated Signal	AM 80% Modulated with 1kHz
3.	Scanning Frequency	80 - 1000MHz, 1.4GHz - 2.7GHz
4	Dwell Time	3 Seconds
5.	Frequency Step Size Δf	1%

9.4. Test Result

EUT	WIRELESS ACCESS POINT	Temperature	23°C
Test Engineer	Milo Li	Relative Humidity	54%
Test Mode	Mode 1	Date of Test	2014/08/20

Frequency (MHz)	Polarity	Test Position	Field Strength (V/m)	Test Result
80-1000	Horizontal/Vertical	Front	3	Pass
		Rear		Pass
		Left		Pass
		Right		Pass
1400-2700	Horizontal/Vertical	Front	3	Pass
		Rear		Pass
		Left		Pass
		Right		Pass

Note: There is no any degradation of performance and function.

EUT	WIRELESS ACCESS POINT	Temperature	23°C
Test Engineer	Milo Li	Relative Humidity	54%
Test Mode	Mode 2	Date of Test	2014/08/20

Frequency (MHz)	Polarity	Test Position	Field Strength (V/m)	Test Result
80-1000	Horizontal/Vertical	Front	3	Pass
		Rear		Pass
		Left		Pass
		Right		Pass
1400-2700	Horizontal/Vertical	Front	3	Pass
		Rear		Pass
		Left		Pass
		Right		Pass

Note: There is no any degradation of performance and function.

EUT	WIRELESS ACCESS POINT	Temperature	23°C
Test Engineer	Milo Li	Relative Humidity	54%
Test Mode	Mode 3	Date of Test	2014/08/20

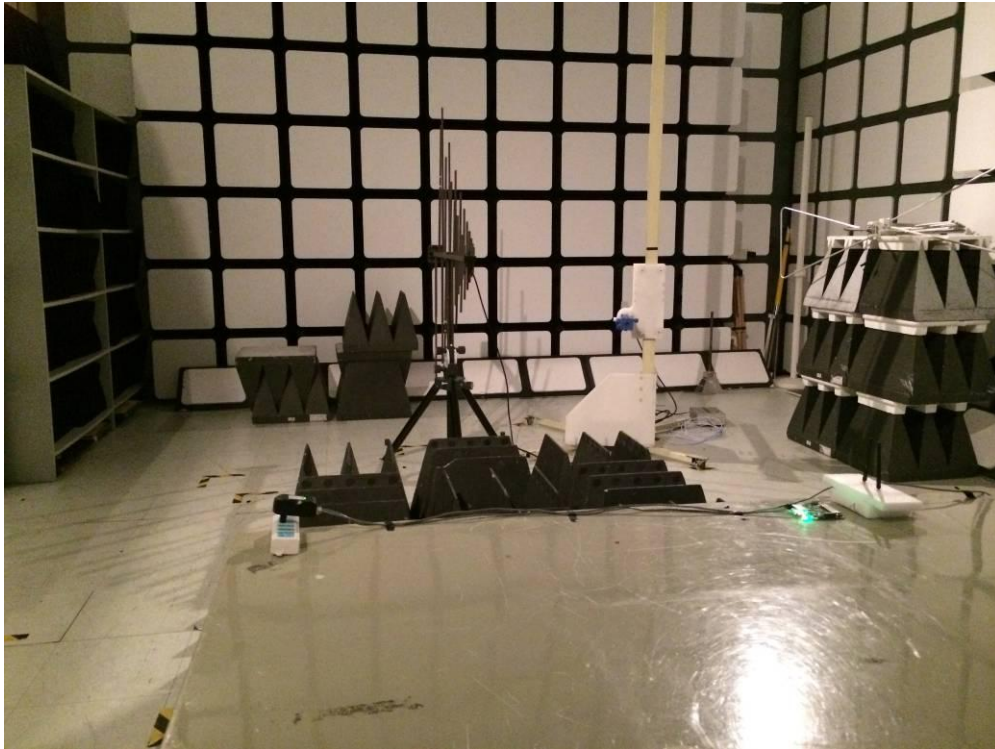
Frequency (MHz)	Polarity	Test Position	Field Strength (V/m)	Test Result
80-1000	Horizontal/Vertical	Front	3	Pass
		Rear		Pass
		Left		Pass
		Right		Pass
1400-2700	Horizontal/Vertical	Front	3	Pass
		Rear		Pass
		Left		Pass
		Right		Pass

Note: There is no any degradation of performance and function.

9.5. Test Photograph

Test Mode: Mode 1 & 3

Description: Radio-frequency Electromagnetic Field Test Setup (80-1000MHz)



Test Mode: Mode 1 & 3

Description: Radio-frequency Electromagnetic Field Test Setup (1400-2700MHz)



Test Mode: Mode 2

Description: Radio-frequency Electromagnetic Field Test Setup (80-1000MHz)



Test Mode: Mode 2

Description: Radio-frequency Electromagnetic Field Test Setup (1400-2700MHz)

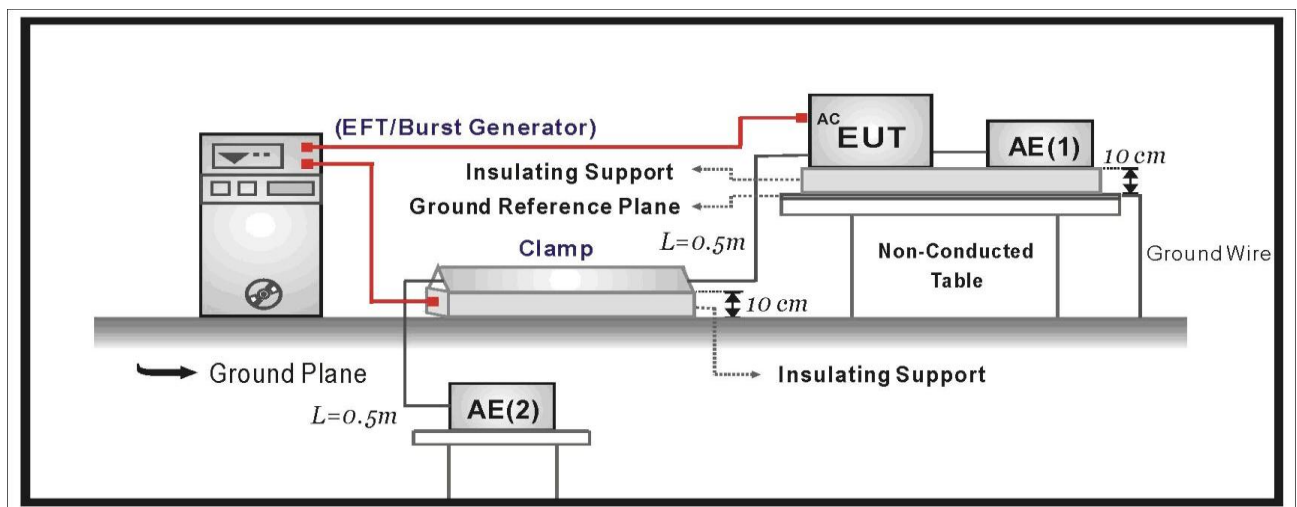


10. Electrical fast transients

10.1. Limit of Electrical fast transients

Environmental phenomenon	Test specification	Units	Performance criterion
Input AC power ports			
Electrical fast transients	± 1 5/50 5	kV (open circuit test voltage) Tr/Th (ns) Repetition frequency (kHz)	B
Signal ports, telecommunication ports, and control ports (See Note)			
Fast transients common mode	± 0.5 5/50 5	kV (peak) Tr/Th ns Repetition frequency (kHz)	B
NOTE: This test shall be additionally performed on signal ports, telecommunication ports, control ports, and DC power ports, of radio equipment and associated ancillary equipment, if the cables may be longer than 3m.			

10.2. Test Setup



10.3. Test Procedure

The EUT is placed on a table that is 0.8 meter height. A ground reference plane is placed on the table, and uses a 0.1m insulation between the EUT and ground reference plane.

The minimum area of the ground reference plane is 1m*1m, and 0.65mm thick min, and projected beyond the EUT by at least 0.1m on all sides.

For input AC power ports:

The EUT is connected to the power mains through a coupling device that directly couples the EFT/B interference signal.

Each of the line conductors is impressed with burst noise for 1 minute.

The length of the power lines between the coupling device and the EUT is 0.5m.

For signal ports, telecommunication ports, and control ports:

The EFT interference signal is through a coupling clamp device couples to the signal of the EUT with burst noise for 1 minute.

The length of the signal lines between the coupling device and the EUT is 0.5m.

10.4. Test Result

Product	WIRELESS ACCESS POINT	Temperature	26°C
Test Engineer	Line Chen	Relative Humidity	54%
Test Mode	Mode 1	Date of Test	2014/08/18

Inject Line	Polarity	Test Level (kV)	Test Duration (second)	Inject Method	Observation	Result
L	+	1	60	Direct	Note	Pass
L	-	1	60	Direct	Note	Pass
N	+	1	60	Direct	Note	Pass
N	-	1	60	Direct	Note	Pass
L+N	+	1	60	Direct	Note	Pass
L+N	-	1	60	Direct	Note	Pass
Signal Cable	+	0.5	60	Clamp	Note	Pass
Signal Cable	-	0.5	60	Clamp	Note	Pass

Note: There is no any degradation of performance and function.

Product	WIRELESS ACCESS POINT	Temperature	26°C
Test Engineer	Line Chen	Relative Humidity	54%
Test Mode	Mode 2	Date of Test	2014/08/18

Inject Line	Polarity	Test Level (kV)	Test Duration (second)	Inject Method	Observation	Result
L	+	1	60	Direct	Note	Pass
L	-	1	60	Direct	Note	Pass
N	+	1	60	Direct	Note	Pass
N	-	1	60	Direct	Note	Pass
L+N	+	1	60	Direct	Note	Pass
L+N	-	1	60	Direct	Note	Pass
Signal Cable	+	0.5	60	Clamp	Note	Pass
Signal Cable	-	0.5	60	Clamp	Note	Pass

Note: There is no any degradation of performance and function.

Product	WIRELESS ACCESS POINT	Temperature	26°C
Test Engineer	Line Chen	Relative Humidity	54%
Test Mode	Mode 3	Date of Test	2014/08/18

Inject Line	Polarity	Test Level (kV)	Test Duration (second)	Inject Method	Observation	Result
L	+	1	60	Direct	Note	Pass
L	-	1	60	Direct	Note	Pass
N	+	1	60	Direct	Note	Pass
N	-	1	60	Direct	Note	Pass
L+N	+	1	60	Direct	Note	Pass
L+N	-	1	60	Direct	Note	Pass
Signal Cable	+	0.5	60	Clamp	Note	Pass
Signal Cable	-	0.5	60	Clamp	Note	Pass

Note: There is no any degradation of performance and function.

10.5. Test Photograph

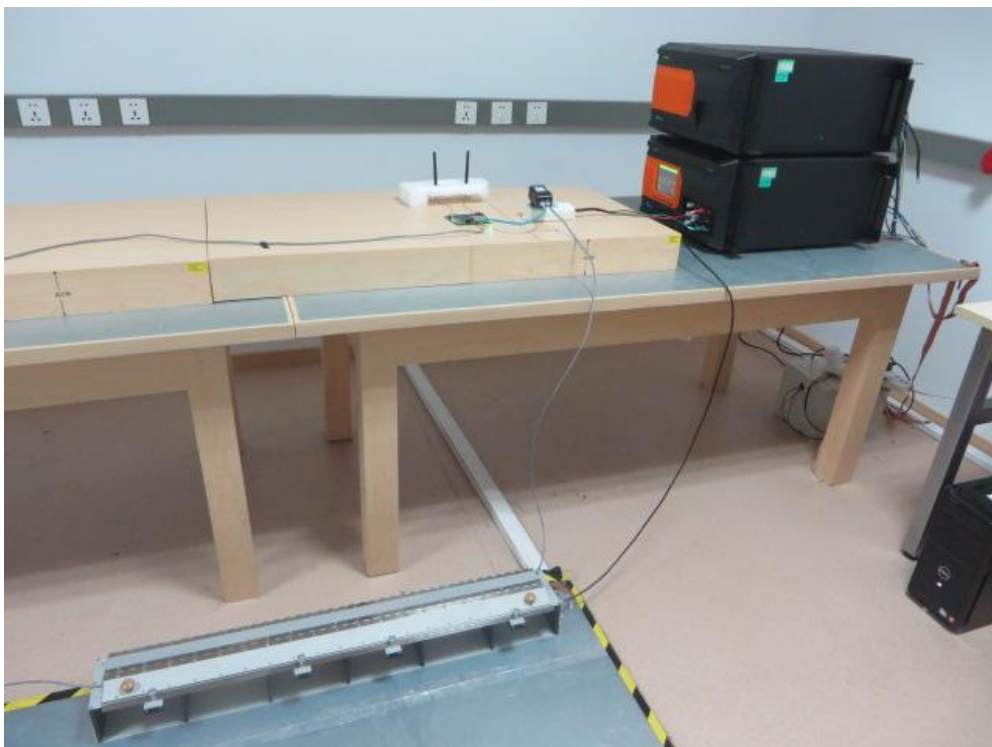
Test Mode: Mode 1 & 3

Description: Electrical fast transients Test Setup for Main Port



Test Mode: Mode 1 & 3

Description: Electrical fast transients Test Setup for Signal Port



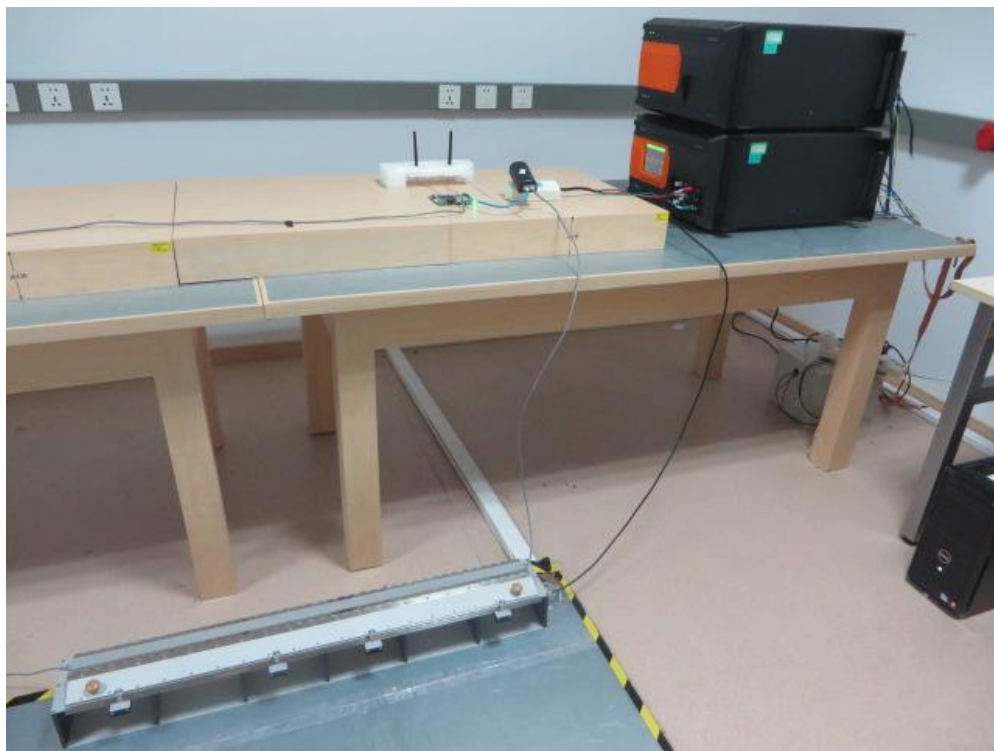
Test Mode: Mode 2

Description: Electrical fast transients Test Setup for Main Port



Test Mode: Mode 2

Description: Electrical fast transients Test Setup for Signal Port

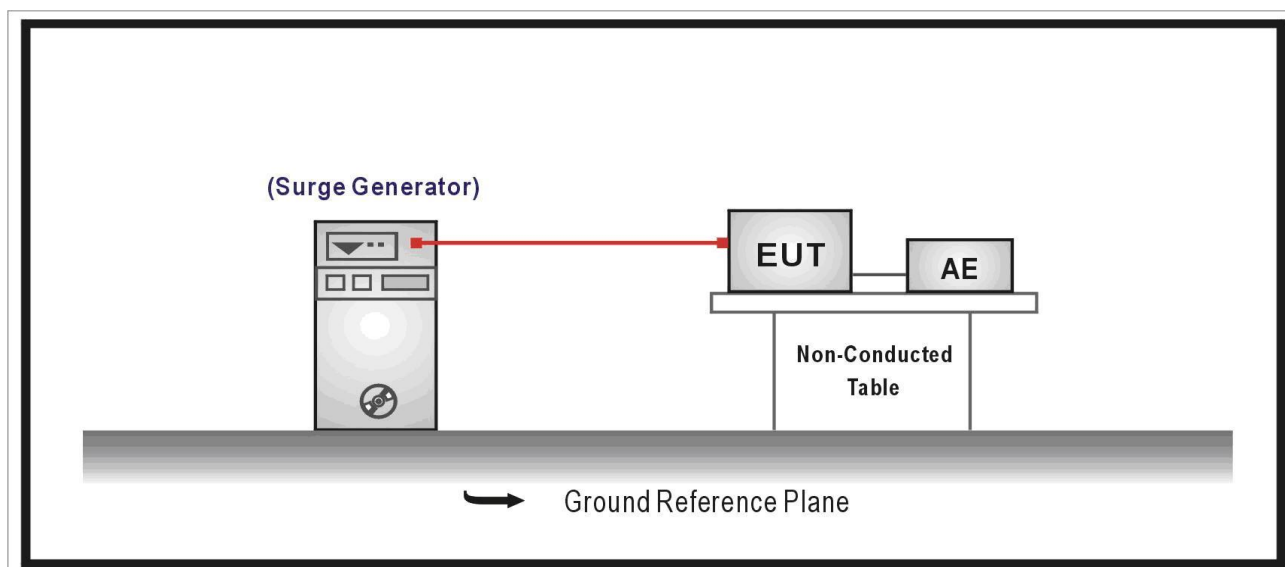


11. Surges

11.1. Limit of Surges

Environmental phenomenon	Test specification	Units	Performance criterion
Input AC power ports (See Note 1)			
Surges	1.2/50 (8/20) ±1 line to line ±2 line to earth	Tr/Th (us) kV (open circuit test voltage) kV (open circuit test voltage)	B
Telecommunication ports directly connected to indoor cables (See Note 1 and 2)			
Surges	1.2/50 (8/20) 0.5 line to ground	Tr/Th us kV (peak)	B
NOTE 1: Where normal functioning cannot be achieved because of the impact of the CDN on the EUT, no test shall be required.			
NOTE 2: The test level for telecommunication ports, intended to be connected to indoor cables (longer than 10m) shall be 0.5kV line to ground.			

11.2. Test Setup



11.3. Test Procedure

The EUT is placed on a table that is 0.8 meter above a metal ground plane measured 1m*1m minimum and 0.65mm thick minimum and projected beyond the EUT by at least 0.1m on all sides. The length of power cord between the coupling device and the EUT shall be 2m or less.

For input AC power ports:

The EUT is connected to the power mains through a coupling device that directly couples the surge interference signal.

The surge noise shall be applied synchronized to the voltage phase at 0° , 90° , 180° , 270° and the peak value of the AC voltage wave. (Positive and negative)

Each of Line to Earth and Line to Line is impressed with a sequence of five surge voltages with interval of 1 minute.

For telecommunication ports:

The signal line of EUT is connected to coupling and decoupling network that directly couples the surge interference signal.

Only Line to ground is impressed with a sequence of five surge voltages with interval of 1 minute.

11.4. Test Result

Product	WIRELESS ACCESS POINT	Temperature	26°C
Test Engineer	Line Chen	Relative Humidity	54%
Test Mode	Mode 1	Date of Test	2014/08/15

Inject Line	Polarity	Angle (degree)	Test Level (kV)	Test Interval (second)	Observation	Result
L+N	+	0	1	60	Note	Pass
L+N	-	0	1	60	Note	Pass
L+N	+	90	1	60	Note	Pass
L+N	-	90	1	60	Note	Pass
L+N	+	180	1	60	Note	Pass
L+N	-	180	1	60	Note	Pass
L+N	+	270	1	60	Note	Pass
L+N	-	270	1	60	Note	Pass
LAN (Line to Ground)	+	N/A	0.5	60	Note	Pass
LAN (Line to Ground)	-	N/A	0.5	60	Note	Pass

Note: There is no any degradation of performance and function.

Product	WIRELESS ACCESS POINT	Temperature	26°C
Test Engineer	Line Chen	Relative Humidity	54%
Test Mode	Mode 2	Date of Test	2014/08/15

Inject Line	Polarity	Angle (degree)	Test Level (kV)	Test Interval (second)	Observation	Result
L+N	+	0	1	60	Note	Pass
L+N	-	0	1	60	Note	Pass
L+N	+	90	1	60	Note	Pass
L+N	-	90	1	60	Note	Pass
L+N	+	180	1	60	Note	Pass
L+N	-	180	1	60	Note	Pass
L+N	+	270	1	60	Note	Pass
L+N	-	270	1	60	Note	Pass
LAN (Line to Ground)	+	N/A	0.5	60	Note	Pass
LAN (Line to Ground)	-	N/A	0.5	60	Note	Pass

Note: There is no any degradation of performance and function.

Product	WIRELESS ACCESS POINT	Temperature	26°C
Test Engineer	Line Chen	Relative Humidity	54%
Test Mode	Mode 3	Date of Test	2014/08/15

Inject Line	Polarity	Angle (degree)	Test Level (kV)	Test Interval (second)	Observation	Result
L+N	+	0	1	60	Note	Pass
L+N	-	0	1	60	Note	Pass
L+N	+	90	1	60	Note	Pass
L+N	-	90	1	60	Note	Pass
L+N	+	180	1	60	Note	Pass
L+N	-	180	1	60	Note	Pass
L+N	+	270	1	60	Note	Pass
L+N	-	270	1	60	Note	Pass
LAN (Line to Ground)	+	N/A	0.5	60	Note	Pass
LAN (Line to Ground)	-	N/A	0.5	60	Note	Pass

Note: There is no any degradation of performance and function.

11.5. Test Photograph

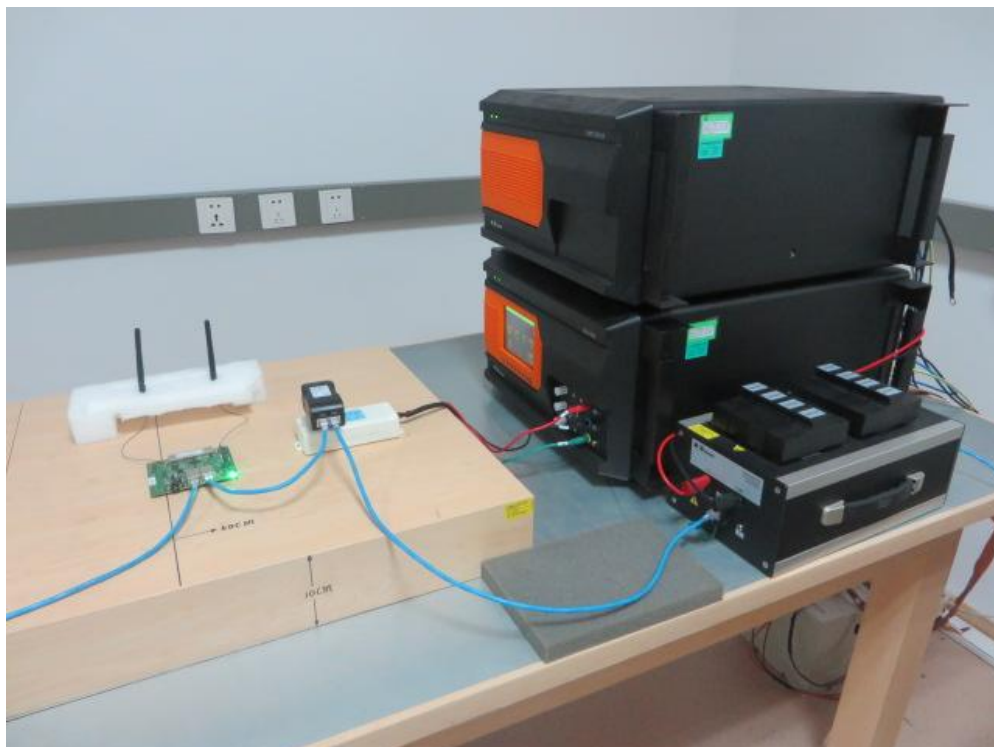
Test Mode: Mode 1 & 3

Description: Surge Test Setup for Main Port



Test Mode: Mode 1 & 3

Description: Surge Test Setup for Signal Port



Test Mode: Mode 2

Description: Surge Test Setup for Main Port



Test Mode: Mode 2

Description: Surge Test Setup for Signal Port



12. Radio-frequency common mode

12.1. Limit of Radio-frequency common mode

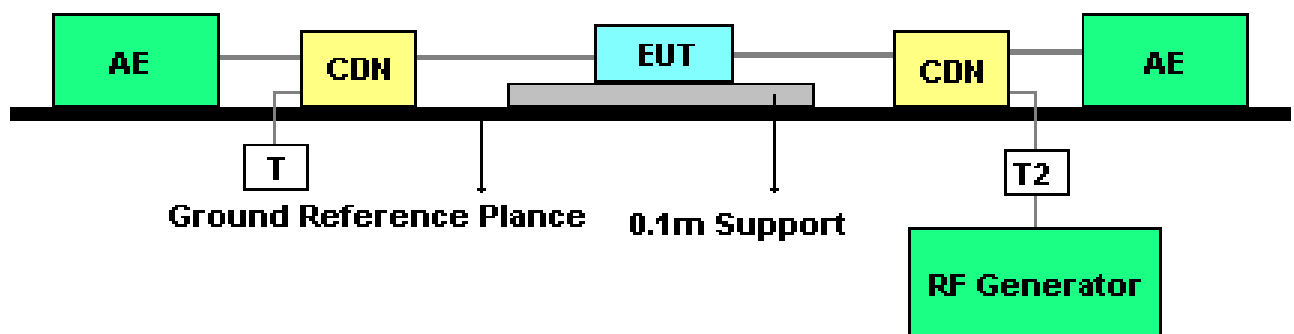
Environmental phenomenon	Test specification	Units	Performance criterion
Input AC power ports (See Note 1 and 2)			
Radio-frequency common mode	0.15 - 80	MHz	A
	3	V (unmodulated, r.m.s)	
	80	% AM (1kHz)	
Signal ports, telecommunication ports, and control ports (See Note 1, 2 and 3)			
Radio frequency common mode	0.15 - 80	MHz	A
	3	V (unmodulated, r.m.s)	
	80	% AM (1kHz)	
NOTE 1: If the wanted signal is modulated at 1000Hz, then an audio signal of 400Hz shall be used. NOTE 2: The test shall be performed over the frequency range 150kHz to 80MHz with the exception of the exclusion band for transmitters, and for receivers and duplex transceivers [see clause 4 of EN 301 489-1 V1.9.2 (2011-09)]. NOTE 3: This test shall be additionally performed on signal ports, telecommunication ports, control ports, and DC power ports, of radio equipment and associated ancillary equipment, if the cables may be longer than 3m.			

12.2. Test Setup

CDN Test Setup

T : 50 ohm

T2: Power attenuator(6dB)



12.3. Test Procedure

The EUT is placed on a table that is 0.8 meter height, and a ground reference plane on the table, EUT is placed upon table and use 0.1m insulation between the EUT and ground reference plane.

For input AC power ports:

The EUT is connected to the power mains through a coupling and decoupling networks for power supply lines. And directly couples the disturbances signal into EUT.

For signal ports, telecommunication ports, and control ports:

The disturbance signal is through a coupling and decoupling networks (CDN) or EM-clamp device couples to the signal and telecommunication lines of the EUT.

	Condition of Test	Remarks
1.	Field Strength	3V
2.	Radiated Signal	AM 80% Modulated with 1kHz
3.	Scanning Frequency	0.15 - 80MHz
4	Dwell Time	3 Seconds
5.	Frequency Step Size Δf	1%

12.4. Test Result

Product	WIRELESS ACCESS POINT	Temperature	26°C
Test Engineer	Line Chen	Relative Humidity	54%
Test Mode	Mode 1	Date of Test	2014/08/14

Frequency (MHz)	Inject Voltage (V)	Inject Ports	Inject Method	Observation	Result
0.15-80	3	AC Mains	CDN	Note	Pass
0.15-80	3	Signal Cable	CDN	Note	Pass

Note: There is no any degradation of performance and function.

Product	WIRELESS ACCESS POINT	Temperature	26°C
Test Engineer	Line Chen	Relative Humidity	54%
Test Mode	Mode 2	Date of Test	2014/08/14

Frequency (MHz)	Inject Voltage (V)	Inject Ports	Inject Method	Observation	Result
0.15-80	3	AC Mains	CDN	Note	Pass
0.15-80	3	Signal Cable	CDN	Note	Pass

Note: There is no any degradation of performance and function.

Product	WIRELESS ACCESS POINT	Temperature	26°C
Test Engineer	Line Chen	Relative Humidity	54%
Test Mode	Mode 3	Date of Test	2014/08/14

Frequency (MHz)	Inject Voltage (V)	Inject Ports	Inject Method	Observation	Result
0.15-80	3	AC Mains	CDN	Note	Pass
0.15-80	3	Signal Cable	CDN	Note	Pass

Note: There is no any degradation of performance and function.

12.5. Test Photograph

Test Mode: Mode 1 & 3

Description: Radio-frequency Common Mode Test Setup for Main Port



Test Mode: Mode 1 & 3

Description: Radio-frequency Common Mode Test Setup for Signal Port



Test Mode: Mode 2

Description: Radio-frequency Common Mode Test Setup for Main Port



Test Mode: Mode 2

Description: Radio-frequency Common Mode Test Setup for Signal Port

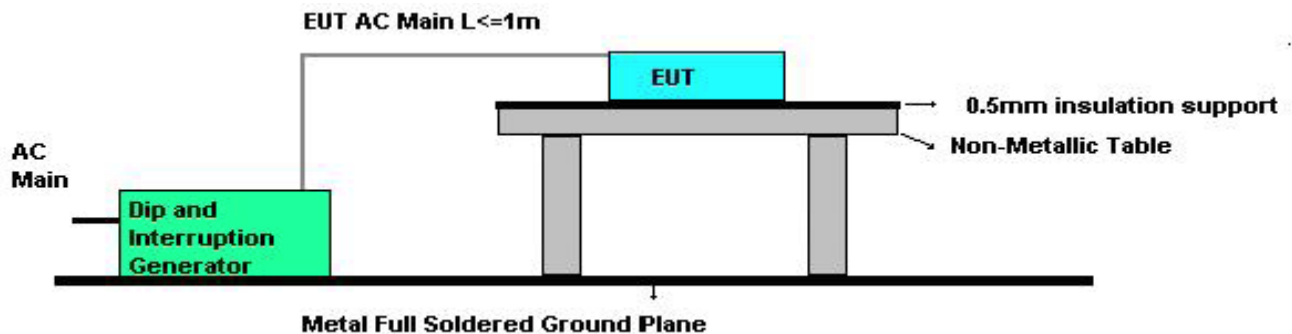


13. Voltage dips and interruptions

13.1. Limit of Voltage dips and interruptions

Environmental phenomenon	Test specification	Units	Performance criterion
Input AC power ports			
Voltage dips	0	% residual	B
	0.5	cycle	
	0	% residual	B
	1	cycle	
Voltage interruptions	70	% residual	C
	25	cycle	
	0	% residual	C
	250	cycle	

13.2. Test Setup



13.3. Test Procedure

The EUT is placed on a table which is 0.8 meter above a metal ground plane measured 1m*1m minimum, and 0.65mm thick minimum, and projected beyond the EUT by at least 0.1m on all sides. The power cord shall be used the shortest power cord as specified by the manufacturer.

For Voltage dips and interruptions test:

The selection of test voltage is based on the rated power range. If the operation range is large than 20% of lower power range, both end of specified voltage shall be tested. Otherwise, the typical voltage specification is selected as test voltage.

The EUT is connected to the power mains through a coupling device that directly couples to the voltage dips and interruption generator.

13.4. Test Result

Product	WIRELESS ACCESS POINT	Temperature	26°C
Test Engineer	Line Chen	Relative Humidity	54%
Test Mode	Mode 1	Date of Test	2014/08/17

Voltage % Residual	Test Duration (ms)	Observation	Result
0	10	Note 1	Pass
0	20	Note 1	Pass
70	500	Note 1	Pass
0	5000	Note 1, 2	Pass

Note 1: There is no any degradation of performance and function.

Note 2: The power consumption of EUT has shut down, but self-recoverable after the test.

Product	WIRELESS ACCESS POINT	Temperature	26°C
Test Engineer	Line Chen	Relative Humidity	54%
Test Mode	Mode 2	Date of Test	2014/08/17

Voltage % Residual	Test Duration (ms)	Observation	Result
0	10	Note 1	Pass
0	20	Note 1	Pass
70	500	Note 1	Pass
0	5000	Note 1, 2	Pass

Note 1: There is no any degradation of performance and function.

Note 2: The power consumption of EUT has shut down, but self-recoverable after the test.

Product	WIRELESS ACCESS POINT	Temperature	26°C
Test Engineer	Line Chen	Relative Humidity	54%
Test Mode	Mode 3	Date of Test	2014/08/17

Voltage % Residual	Test Duration (ms)	Observation	Result
0	10	Note 1	Pass
0	20	Note 1	Pass
70	500	Note 1	Pass
0	5000	Note 1, 2	Pass

Note 1: There is no any degradation of performance and function.

Note 2: The power consumption of EUT has shut down, but self-recoverable after the test.

13.5. Test Photograph

Test Mode: Mode 1 & 3

Description: Voltage dips and interruptions Test Setup



Test Mode: Mode 2

Description: Voltage dips and interruptions Test Setup



14. Uncertainty Measurement

Conducted Emission
<p>The maximum measurement uncertainty is evaluated as:</p> <p>9kHz~150kHz: 3.84dB</p> <p>150kHz~30MHz: 3.46dB</p>
Radiated disturbance
<p>The maximum measurement uncertainty is evaluated as:</p> <p>Horizontal: 30MHz~300MHz: 4.07dB</p> <p>300MHz~1GHz: 3.63 dB</p> <p>Vertical: 30MHz~300MHz: 4.18 dB</p> <p>300MHz~1GHz: 3.60 dB</p>
Radiated disturbance
<p>The maximum measurement uncertainty is evaluated as:</p> <p>Horizontal: 1GHz~18GHz: 4.16 dB</p> <p>Vertical: 1GHz~18GHz: 4.76 dB</p>
Harmonic current emissions
<p>The maximum measurement uncertainty is evaluated as $\pm 0.2\%$.</p>
Voltage fluctuation and flicker
<p>The maximum measurement uncertainty is evaluated as d_c and d_{max}: $\pm 0.095\%$, P_{st} and P_{lt}: $\pm 4\%$, $d_{(t)}$: $\pm 1.5\%$.</p>
Electrostatic discharge
<p>The maximum measurement uncertainty is evaluated as Voltage: $\pm 1\%$, Time: $\pm 6.4\%$.</p>
Radio-frequency electromagnetic field
<p>The maximum measurement uncertainty is evaluated as $\pm 2.72\text{dB}$.</p>
Fast transients
<p>The maximum measurement uncertainty is evaluated as Voltage: $\pm 4\%$, Time: $\pm 3\%$.</p>
Surges
<p>The maximum measurement uncertainty is evaluated as Voltage: $\pm 4\%$, Time: $\pm 2\%$.</p>
Radio-frequency common mode
<p>The maximum measurement uncertainty is evaluated as $\pm 3.72\text{dB}$.</p>
Voltage dips and interruptions
<p>The maximum measurement uncertainty is evaluated as Voltage: $\pm 4\%$, Time: $\pm 1\%$.</p>

15. List of Measuring Instrument

Conducted Emission

Instrument	Manufacturer	Type No.	Cali. Interval	Cali. Due Date
EMI Test Receiver	R&S	ESR7	1 year	2014/11/08
Two-Line V-Network	R&S	ENV216	1 year	2014/11/08
Two-Line V-Network	R&S	ENV216	1 year	2014/11/08
Temperature/Humidity Meter	Anymetre	TH101B	1 year	2014/11/15

Radiated disturbance

Instrument	Manufacturer	Type No.	Cali. Interval	Cali. Due Date
EMI Test Receiver	R&S	ESR7	1 year	2014/11/08
Bilog Period Antenna	Schwarzbeck	VULB 9162	1 year	2014/11/24
Horn Antenna	Schwarzbeck	BBHA 9120D	1 year	2014/11/24
Preamplifier	MRT	AP01G18	1 year	2014/12/14
Temperature/Humidity Meter	Anymetre	TH101B	1 year	2014/11/15

Harmonic current emissions

Instrument	Manufacturer	Type No.	Cali. Interval	Cali. Due Date
Power Analyzer	California	PACS-1	1 year	2015/01/02
AC Power Source	California	3001iX	1 year	2015/01/02

Voltage fluctuation and flicker

Instrument	Manufacturer	Type No.	Cali. Interval	Cali. Due Date
Power Analyzer	California	PACS-1	1 year	2015/01/02
AC Power Source	California	3001iX	1 year	2015/01/02

Electrostatic discharge

Instrument	Manufacturer	Type No.	Cali. Interval	Cali. Due Date
ESD Simulator	Teseq GmbH	NSG 435 / INA 402	1 year	2014/11/13
Barometer	BaoPing	DYM3	1 year	2014/11/18
Temperature/Humidity Meter	Anymetre	TH101B	1 year	2014/11/15

Radio-frequency electromagnetic field

Instrument	Manufacturer	Type No.	Cali. Interval	Cali. Due Date
Signal Generator	R&S	SML03	1 year	2014/09/16
Power Meter	Boonton	4231A	1 year	2014/09/16
Power Sensor	Boonton	51011-EMC	1 year	2014/09/16
Power Meter	Agilent	E4416A	1 year	2014/09/16
Power Sensor	Agilent	E9304A	1 year	2014/09/16
RF Switch	MF	SW1072	1 year	N/A
Power Amplifier	Schaffner	CBA9413B	1 year	NA
Power Amplifier	Schaffner	CBA9428	1 year	NA
Directional Coupler	Schaffner	CHA 9652B	1 year	N/A
Directional Coupler	A&R	DC7144A	1 year	N/A
E-Field Probe Type 8.3	Narda	2244/90.21	1 year	2015/03/28
EMR-20C Radiation Meter	Narda	BN 2244/70	1 year	2015/03/28
Bilog Antenna	Schaffner	CBL6141A	1 year	N/A
Horn Antenna	A&R	AT4002A	1 year	N/A
Temperature/Humidity Meter	Zhicheng	ZC1-2	1 year	2015/01/11

Fast transients

Instrument	Manufacturer	Type No.	Cali. Interval	Cali. Due Date
Compact Immunity Test System	3cTest	CCS 600	1 year	2015/04/11
Capacitive coupling clamp	3cTest	EFTC	1 year	2015/04/11
Temperature/Humidity Meter	Anymetre	TH101B	1 year	2014/11/15

Surges

Instrument	Manufacturer	Type No.	Cali. Interval	Cali. Due Date
Compact Immunity Test System	3cTest	CCS 600	1 year	2015/04/11
Combination wave Surge simulator	3cTest	CWS 600T	1 year	2015/04/11
CDN	3cTest	CDN-405T8	1 year	2015/04/11
Temperature/Humidity Meter	Anymetre	TH101B	1 year	2014/11/15

Radio-frequency common mode

Instrument	Manufacturer	Type No.	Cali. Interval	Cali. Due Date
Conducted Immunity Tester	Frankonia	CIT-10/75	1 year	2014/11/08
CDN	Frankonia	CDN M2+M3	1 year	2014/12/14
Temperature/Humidity Meter	Anymetre	TH101B	1 year	2014/11/15
Audio Analyzer	R&S	UPV	1 year	2015/03/04
Radio Communication Tester	R&S	CMU200	1 year	2014/12/14
Sound Calibration	B&K	4231	1 year	2015/03/11
Conditioning Amplifier	B&K	2690-OS2	1 year	2015/03/11
Microphone	B&K	2669	1 year	2015/03/11
Microphone	B&K	4192	1 year	2015/03/11
Probe Microphone	B&K	4182	1 year	2015/03/11
Mouth Simulator	B&K	4227	1 year	2015/03/11
Telephone Test Head	B&K	4602B	1 year	N/A

Voltage dips and interruptions

Instrument	Manufacturer	Type No.	Cali. Interval	Cali. Due Date
Compact Immunity Test System	3cTest	CCS 600	1 year	2015/04/11
CDN	3cTest	VMT 2612S	1 year	2015/04/11
Temperature/Humidity Meter	Anymetre	TH101B	1 year	2014/11/15

Appendix

EUT Photograph

(1) EUT Photo



(2) EUT Photo



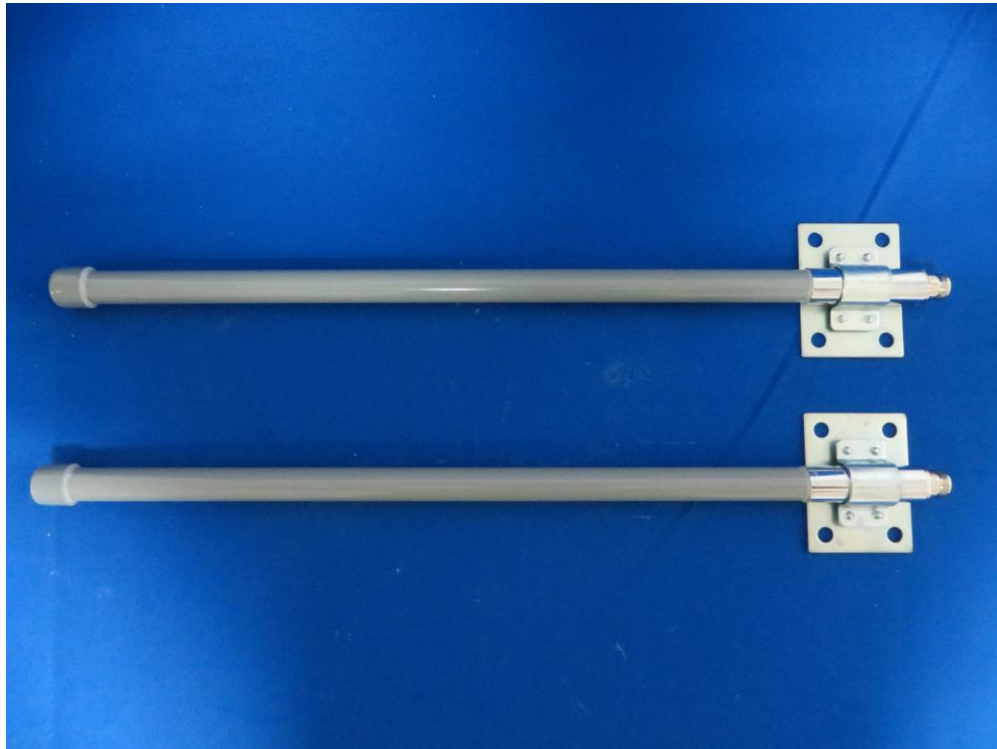
(3) EUT Photo (Dipole Antenna 1#)



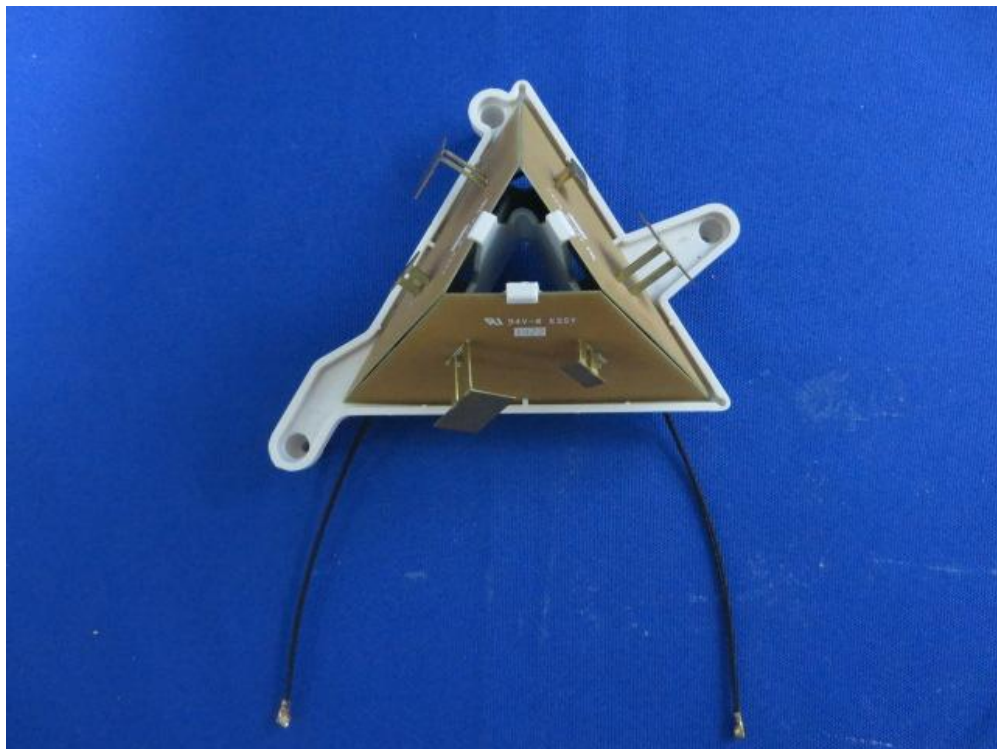
(4) EUT Photo (Panel Antenna 5#)



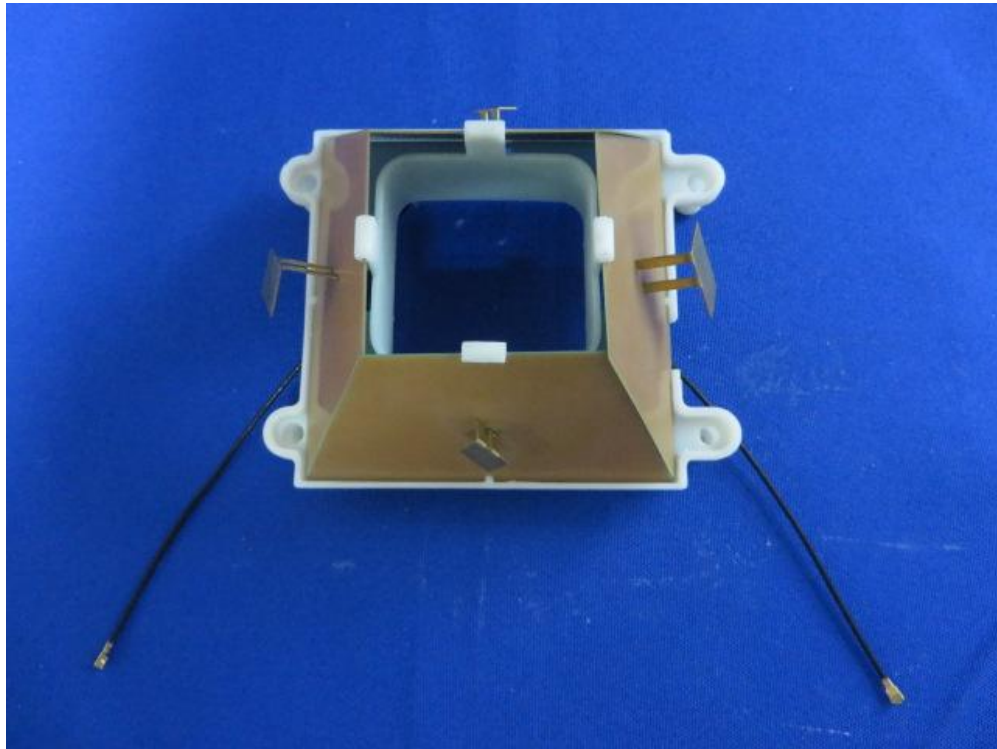
(5) EUT Photo (Panel Antenna 4#)



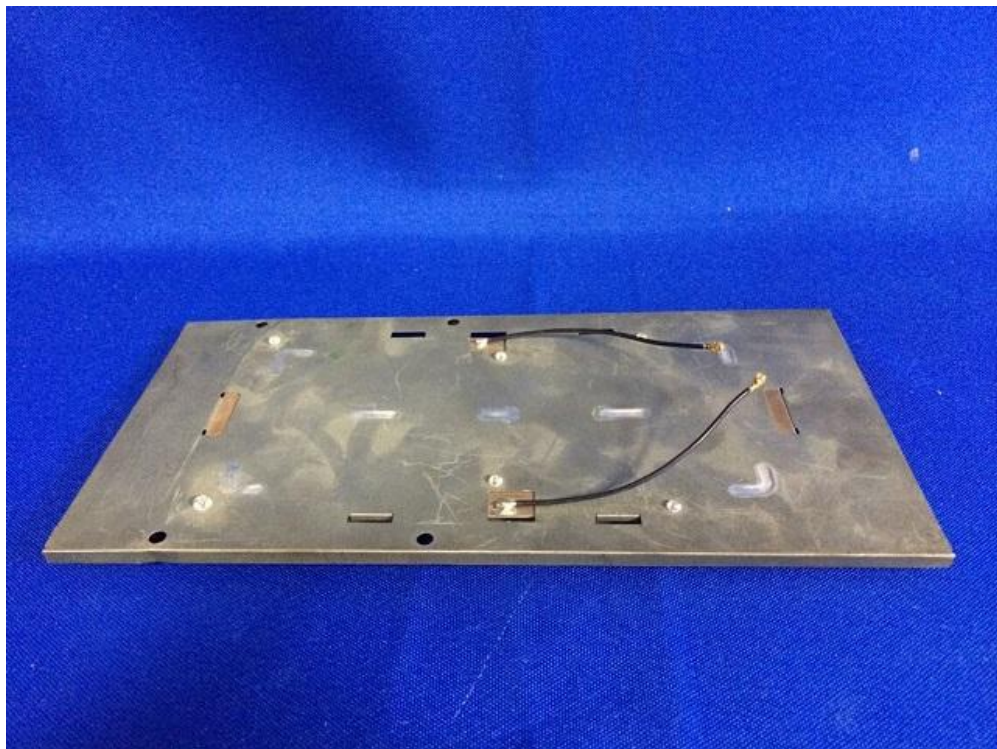
(6) EUT Photo (Panel Antenna 6#)



(7) EUT Photo (Panel Antenna 7#)



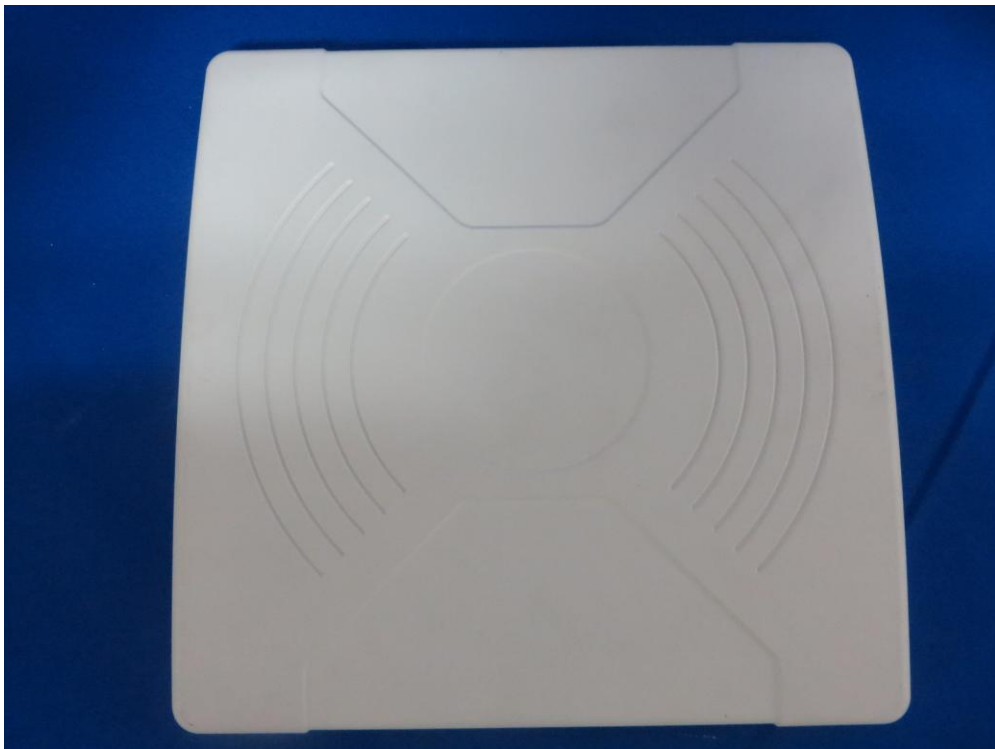
(8) EUT Photo (Panel Antenna 3#)



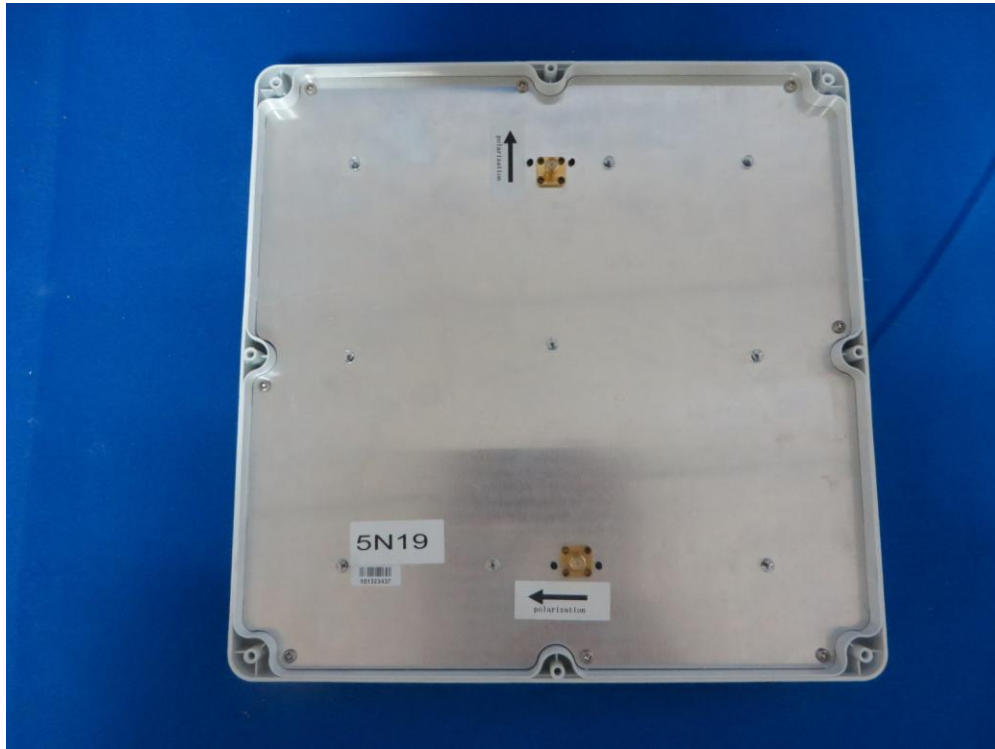
(9) EUT Photo (Panel Antenna 3#)



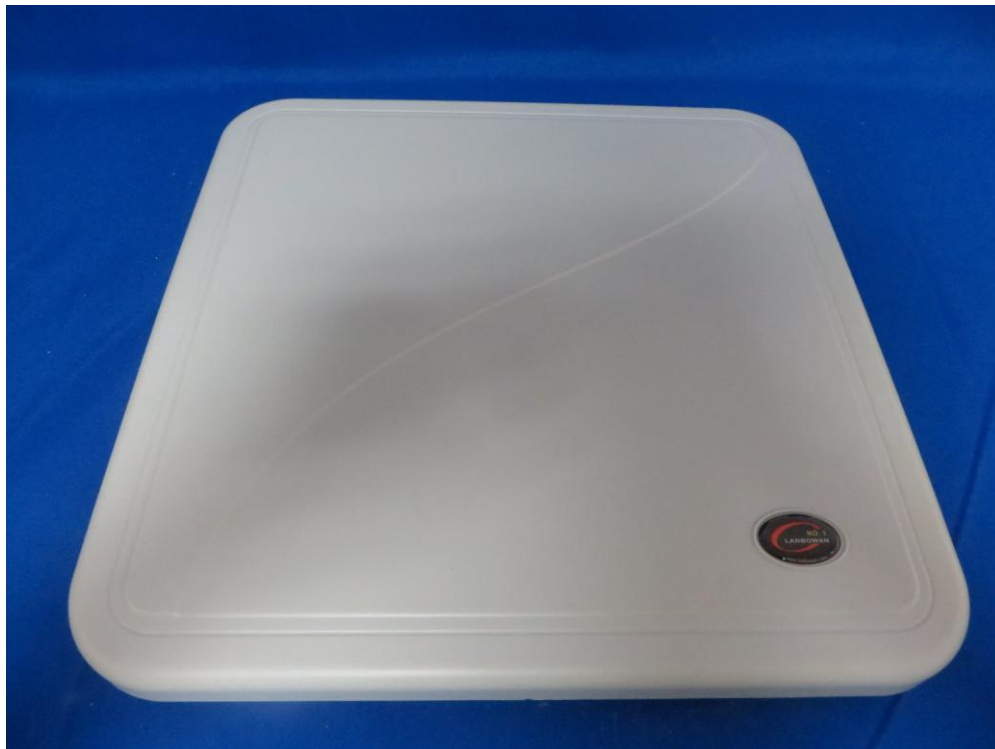
(10) EUT Photo (Panel Antenna 2#)



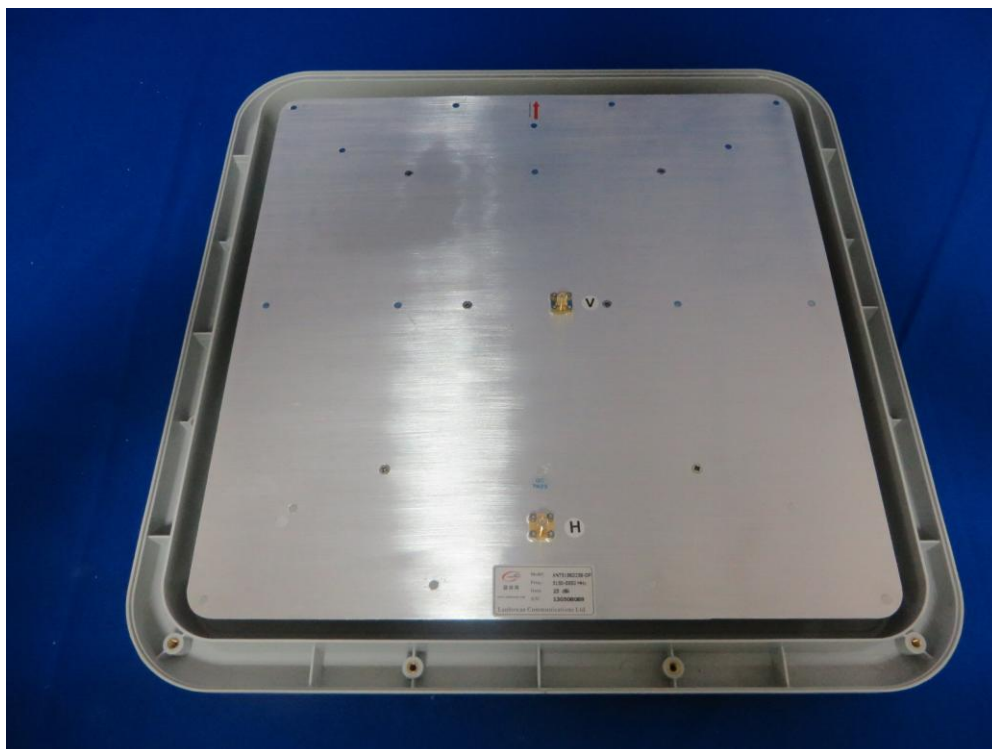
(11) EUT Photo (Panel Antenna 2#)



(12) EUT Photo (Panel Antenna 1#)



(13) EUT Photo (Panel Antenna 1#)



(14) EUT Photo (Adapter 1#)



(15) EUT Photo (Adapter 1#)



(16) EUT Photo (Adapter 1#)



(17) EUT Photo (Adapter 2#)



(18) EUT Photo (Adapter 2#)



(19) EUT Photo (Adapter 2#)



(20) EUT Photo (Adapter 2#)



_____ The End _____