

MEASUREMENT REPORT

EMC Test Report

Applicant: Compex Systems Pte Ltd

Address: No:9 Harrison Road, Harrison Industrial Building, #05-01,
Singapore 369651

Product: Wireless Access Point

Model No.: WPJ428HV

Serial Model: WPJ428LV, WPJ418LV, WPJ418HV, MMS428LV,
MMS428HV, MMS418LV, MMS418HV

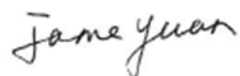
Brand Name: COMPEX

Standards: EN 301 489 - 1 V2.1.1 (2017-02)
EN 301 489 - 17 V3.1.1 (2017-02)

Result: Complies

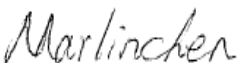
Test Date: April 20 ~ August 10, 2017

Reviewed By

: 

(Jame Yuan)

Approved By

: 

(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	Note
1704RSU00216	Rev. 01	Initial report	08-12-2017	Valid

CONTENTS

Description	Page
1. General Information.....	5
1.1. Applicant.....	5
1.2. Manufacturer	5
1.3. Testing Facility	5
1.4. Feature of Equipment under Test.....	6
1.5. Standards Applicable for Testing	6
1.6. Performance Criteria.....	7
2. Test Configuration of Equipment under Test	13
2.1. Test Mode	13
2.2. Configuration of Tested System	13
2.3. Test System Details	14
2.4. Test Procedure	14
3. Test Summary	15
4. Conducted Emission	16
4.1. Limit of Conducted Emission	16
4.2. Test Setup	16
4.3. Test Procedure	17
4.4. Test Result.....	18
5. Radiated Emission.....	28
5.1. Limit of Radiated Emission	28
5.2. Test Setup	28
5.3. Test Procedure	30
5.4. Test Result.....	31
6. Harmonic Current Emissions.....	39
6.1. Limit of Harmonic Current Emissions	39
6.2. Test Setup	39
6.3. Test Procedure	39
6.4. Test Result.....	40
7. Voltage Fluctuations and Flicker	44
7.1. Limit of Voltage Fluctuations and Flicker	44
7.2. Test Setup	45
7.3. Test Procedure	45

7.4.	Test Result.....	46
8.	Electrostatic Discharge	48
8.1.	Limit of Electrostatic Discharge.....	48
8.2.	Test Setup	48
8.3.	Test Procedure	49
8.4.	Test Result.....	50
9.	Radio-Frequency Electromagnetic Field.....	51
9.1.	Limit of Radio-Frequency Electromagnetic Field.....	51
9.2.	Test Setup	51
9.3.	Test Procedure	52
9.4.	Test Result.....	53
10.	Electrical Fast Transients	54
10.1.	Limit of Electrical Fast Transients	54
10.2.	Test Setup	54
10.3.	Test Procedure	55
10.4.	Test Result.....	56
11.	Surges	58
11.1.	Limit of Surges.....	58
11.2.	Test Setup	58
11.3.	Test Procedure	59
11.4.	Test Result.....	60
12.	Radio-Frequency Common Mode.....	62
12.1.	Limit of Radio-Frequency Common Mode.....	62
12.2.	Test Setup	62
12.3.	Test Procedure	63
12.4.	Test Result.....	64
13.	Voltage Dips and Interruptions	65
13.1.	Limit of Voltage Dips and Interruptions.....	65
13.2.	Test Setup	65
13.3.	Test Procedure	65
13.4.	Test Result.....	66
14.	Uncertainty Measurement	68
15.	List of Measuring Instrument.....	69

1. General Information

1.1. Applicant

Compex Systems Pte Ltd

No:9 Harrison Road, Harrison Industrial Building, #05-01, Singapore 369651

1.2. Manufacturer

Compex Systems Pte Ltd

No:9 Harrison Road, Harrison Industrial Building, #05-01, Singapore 369651

1.3. Testing Facility

Test Site

MRT Technology (Suzhou) Co., Ltd

Test Site Location

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

Test Facility / Accreditations

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

- 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.
- MRT facility is an IC registered (MRT Reg. No. 11384A-1) test laboratory with the site description on file at Industry Canada.
- MRT facility is a VCCI registered (R-4179, G-814, C-4664, T-2206) test laboratory with the site description on file at VCCI Council.
- 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.



1.4. Feature of Equipment under Test

Product Name:	Wireless Access Point
Model No.:	WPJ428HV
Serial Model:	WPJ428LV, WPJ418LV, WPJ418HV, MMS428LV, MMS428HV, MMS418LV, MMS418HV
Brand Name:	COMPEX
Wi-Fi Specification:	802.11a/b/g/n/ac
Components	
POE Adapter	Model No.: PoE35-54A INPUT: 100-240V ~ 50/60Hz 1.0A Max OUTPUT: 54Vdc, 0.65A
Adapter	Model No.: GRT-240100 INPUT: 100-240V ~ 50/60Hz 0.8A Max OUTPUT: 24V, 1.0A

1.5. Standards Applicable for Testing

The EUT complies with the requirements of EN 301 489-1 V2.1.1 & EN 301 489-17 V3.1.1.

EMI Test:

EN 55032: 2015 (Conducted Emission)

EN 55032: 2015 (Radiated Emission)

EN 61000-3-2: 2014 (Harmonic)

EN 61000-3-3: 2013 (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: 2014 (Surge)

EN 61000-4-6: 2014 (CS)

EN 61000-4-8: 2010 (PFM)

EN 61000-4-11: 2004 (Dips)

1.6. 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 and receivers;
- Performance criteria for transient phenomena applied to transmitters and receivers;
- Performance criteria for equipment which does not provide a continuous communication link;
- Performance criteria for ancillary equipment tested on a stand alone basis.

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 ETSI EN 301 489 series [i.13] 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 ETSI EN 301 489 series [i.13] dealing with the particular type of radio equipment, the following general performance criteria for continuous phenomena shall apply.

During and after the test, the equipment 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 equipment 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 equipment 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 ETSI EN 301 489 series [i.13] dealing with the particular type of radio equipment, the following general performance criteria for transient phenomena shall apply.

For surges applied to symmetrically operated wired network ports intended to be connected directly to outdoor lines the following criteria applies:

- For products with only one symmetrical port intended for connection to outdoor lines, loss of function is allowed, provided the function is self-recoverable, or can be restored by the operation of the controls by the user in accordance with the manufacturer's instructions. A SW reboot is not allowed. Information stored in non-volatile memory, or protected by a battery backup, shall not be lost.
- For products with more than one symmetrical port intended for connection to outdoor lines, loss of function on the port under test is allowed, provided the function is self-recoverable. A SW reboot is not allowed. Information stored in non-volatile memory, or protected by a battery backup, shall not be lost.

For all other ports the following applies:

- After the test, the equipment 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 equipment 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 equipment 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 6.1 and 6.2 are not appropriate, in these cases 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 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 6.1 and 6.2.

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 6.1 and 6.2 are not appropriate, in these cases 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 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 6.1 and 6.2.

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.

Criteria	During test	After test
A	<p>Shall operate as intended.</p> <p>May show degradation of performance (see note 1).</p> <p>Shall be no loss of function.</p> <p>Shall be no unintentional transmissions.</p>	<p>Shall operate as intended.</p> <p>Shall be no degradation of performance (see note 3). Shall be no loss of function.</p> <p>Shall be no loss of stored data or user programmable functions.</p>
B	<p>May show loss of function (one or more).</p> <p>May show degradation of performance (see note 1).</p> <p>No unintentional transmissions.</p>	<p>Functions shall be self-recoverable.</p> <p>Shall operate as intended after recovering.</p> <p>Shall be no degradation of performance (see note 3).</p> <p>Shall be no loss of stored data or user programmable functions.</p>
C	<p>May be loss of function (one or more).</p>	<p>Functions shall be recoverable by the operator.</p> <p>Shall operate as intended after recovering.</p> <p>Shall be no degradation of performance (see note 3).</p>
<p>NOTE 1: Operate as intended during the test allows a level of degradation 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.</p> <p>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.</p> <p>NOTE 2: 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.</p> <p>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</p>		

description and documentation (including leaflets and advertising) and what the user may reasonably expect from the apparatus if used as intended.

NOTE 3: 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.

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.

Note: According to the client, the criterion is defined as below:

Criterion A: Packet loss rate $< 1E-6$ during and after test.

Criterion B: Packet loss rate $< 1E-6$ after test.

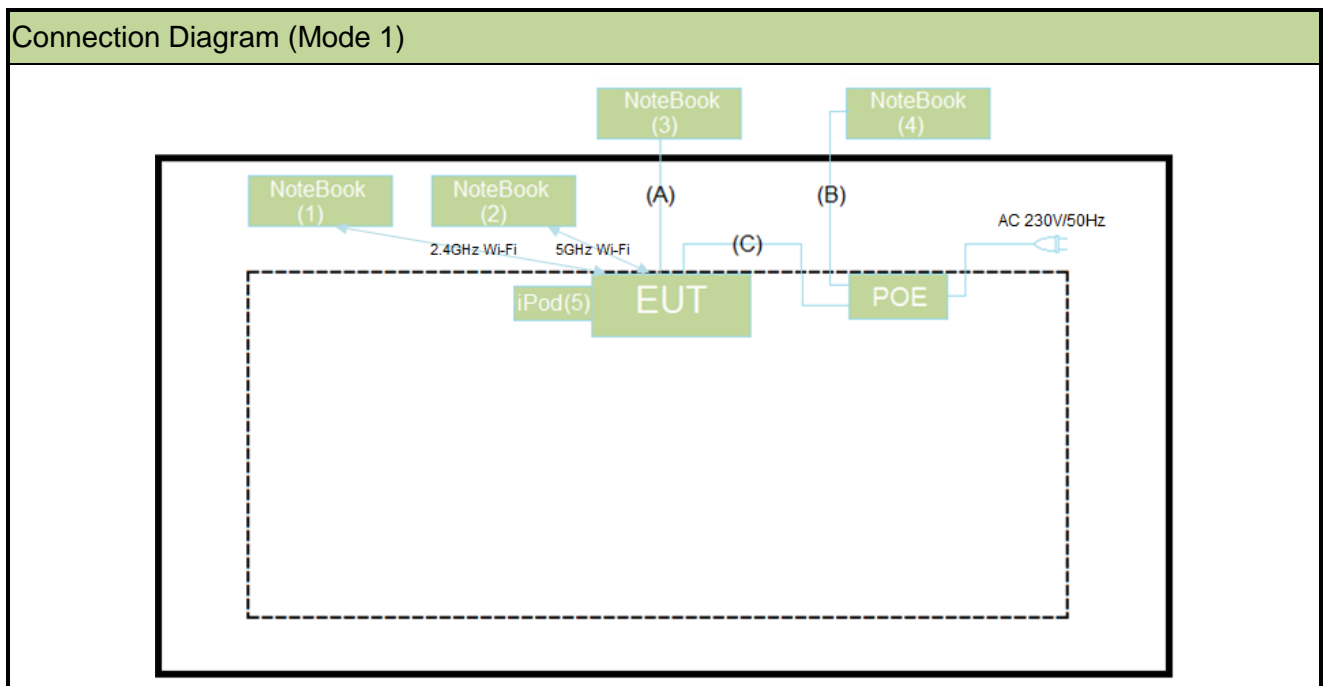
Criterion C: The EUT need to restart by operator.

2. Test Configuration of Equipment under Test

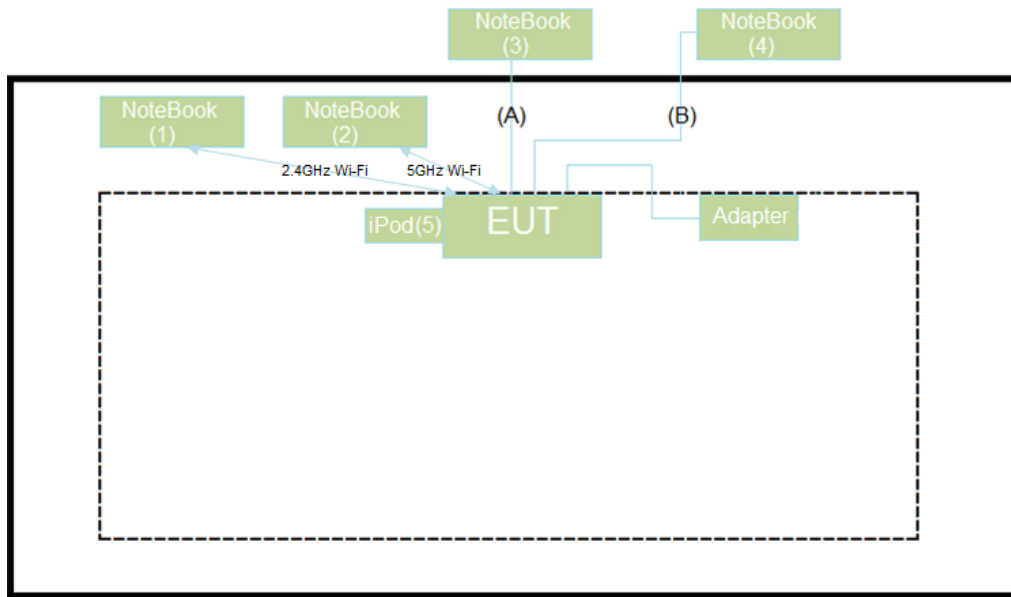
2.1. Test Mode

Test Mode	
EMI Mode	Mode 1: Wi-Fi 2.4GHz On, Wi-Fi 5GHz On, LAN Link with notebook, Powered by POE.
	Mode 2: Wi-Fi 2.4GHz On, Wi-Fi 5GHz On, LAN Link with notebook, Powered by Adapter.
EMS Mode	Mode 1: Wi-Fi 2.4GHz On, Wi-Fi 5GHz On, LAN Link with notebook, Powered by POE.
	Mode 2: Wi-Fi 2.4GHz On, Wi-Fi 5GHz On, LAN Link with notebook, Powered by Adapter.

2.2. Configuration of Tested System



Connection Diagram (Mode 2)



Signal Cable Type		Signal Cable Description
A	LAN Cable	Non-Shielded, >10m
B	LAN Cable	Non-Shielded, >10m
C	LAN Cable	Non-Shielded, 1.5m

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 Notebook	Lenovo	E430c	MP-4CFX213/10	Non-Shielded, 1.8m
2 Notebook	Dell	P48F	N/A	Non-Shielded, 1.8m
3 Notebook	Lenovo	X230	N/A	Non-Shielded, 1.8m
4 Notebook	Lenovo	X230i	N/A	Non-Shielded, 1.8m
5 iPod	Apple	A1373	N/A	N/A

2.4. Test Procedure

1	Setup the EUT and simulators as shown on above.
2	Turn on the power of all equipment.
3	Making EUT communication with PC and Wi-Fi works.

3. Test Summary

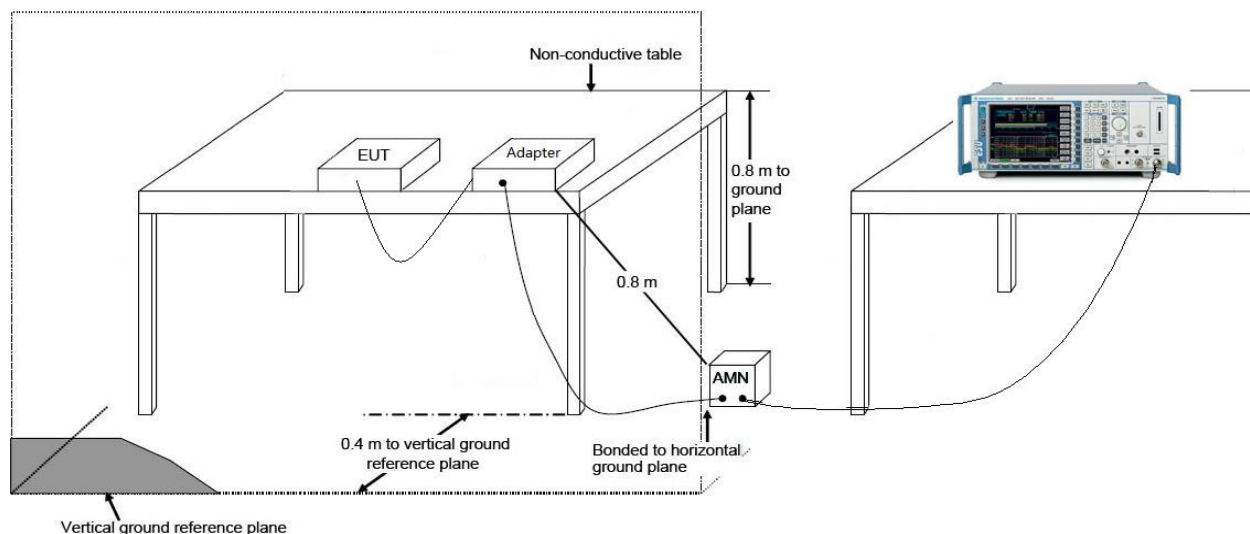
Test Reference Standard	Test Item	Result (Pass/Fail)	Remark
Emission Measurements			
EN 55032	Conducted Emission	Pass	--
EN 55032	Radiated Emission	Pass	--
EN 61000-3-2	Harmonic Current Emissions	Pass	--
EN 61000-3-3	Voltage Fluctuations and Flicker	Pass	--
Immunity Measurements			
EN 61000-4-2	Electrostatic Discharge	Pass	--
EN 61000-4-3	Radio-Frequency Electromagnetic Field	Pass	--
EN 61000-4-4	Fast Transients, Common Mode	Pass	--
EN 61000-4-5	Surges	Pass	--
EN 61000-4-6	Radio- Frequency Common Mode	Pass	--
EN 61000-4-11	Voltage Dips and Interruptions	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
Note 1: The lower limit shall apply at the transition frequencies.				
Note 2: The limit decreases linearly with the logarithm of the frequency in the range 0.15MHz to 0.50MHz.				

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.

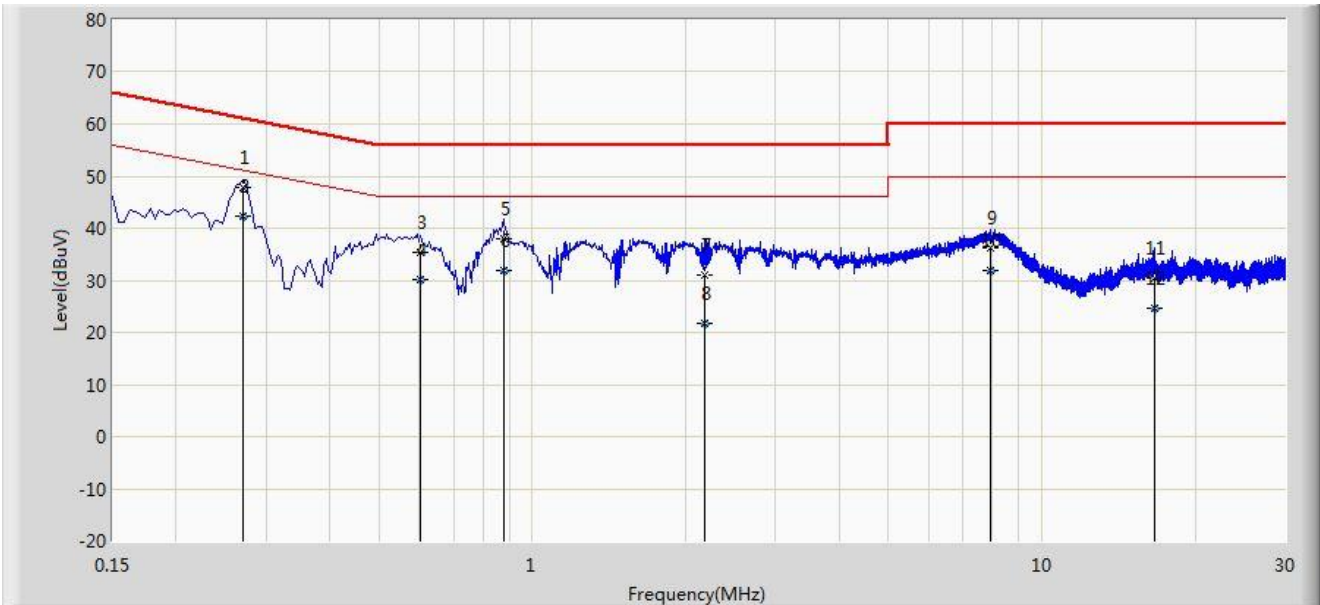
Earthing of the equipment under test if provided with a safety earth connection, shall be made to the earth terminal provided on the artificial mains network with the shortest possible lead.

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

Site: SR2	Time: 2017/06/27 - 14:04
Limit: EN55032_CE_Mains_Class B	Engineer: Bacon Dong
Probe: ENV216_101683_Filter On	Polarity: Line
EUT: Wireless Access Point	Power: AC 230V/50Hz
Test Mode: Mode 1, POE's Power Port	

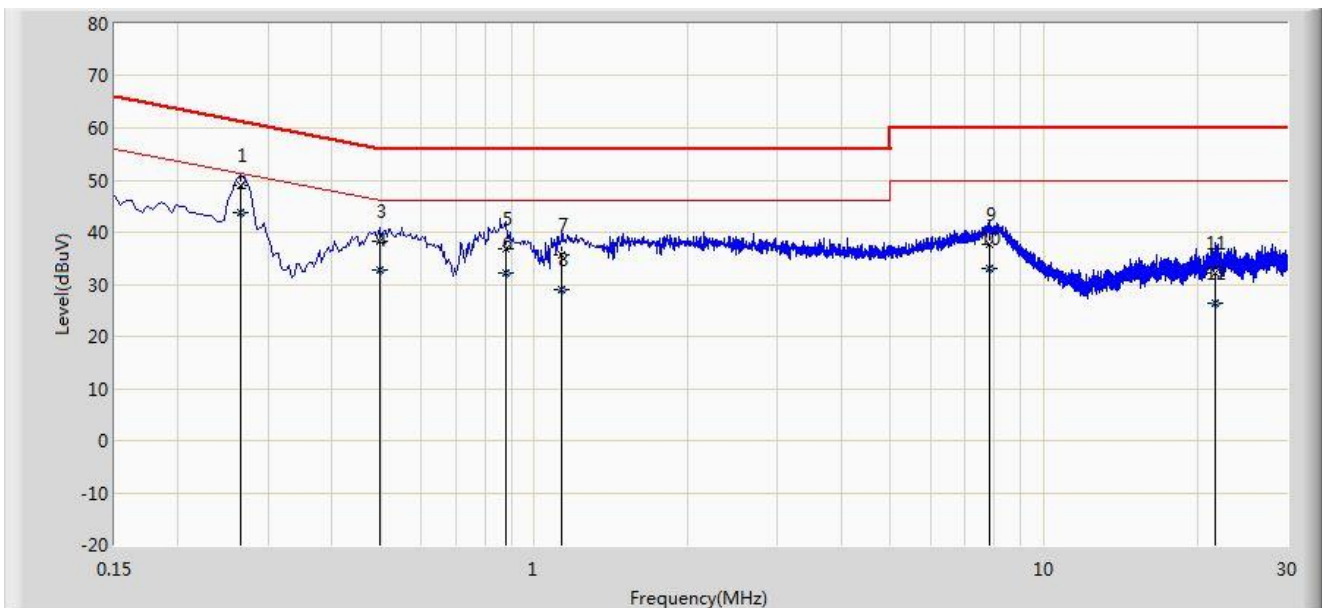


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV)	Factor (dB)	Type
1			0.270	47.714	37.734	-13.404	61.118	9.980	QP
2		*	0.270	42.354	32.374	-8.764	51.118	9.980	AV
3			0.602	35.409	25.295	-20.591	56.000	10.114	QP
4			0.602	30.149	20.035	-15.851	46.000	10.114	AV
5			0.878	37.970	27.998	-18.030	56.000	9.972	QP
6			0.878	31.758	21.786	-14.242	46.000	9.972	AV
7			2.178	30.939	21.072	-25.061	56.000	9.866	QP
8			2.178	21.737	11.871	-24.263	46.000	9.866	AV
9			7.906	36.284	26.115	-23.716	60.000	10.169	QP
10			7.906	31.806	21.637	-18.194	50.000	10.169	AV
11			16.602	30.512	20.437	-29.488	60.000	10.075	QP
12			16.602	24.718	14.643	-25.282	50.000	10.075	AV

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

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

Site: SR2	Time: 2017/06/27 - 14:10
Limit: EN55032_CE_Mains_Class B	Engineer: Bacon Dong
Probe: ENV216_101683_Filter On	Polarity: Neutral
EUT: Wireless Access Point	Power: AC 230V/50Hz
Test Mode: Mode 1, POE's Power Port	

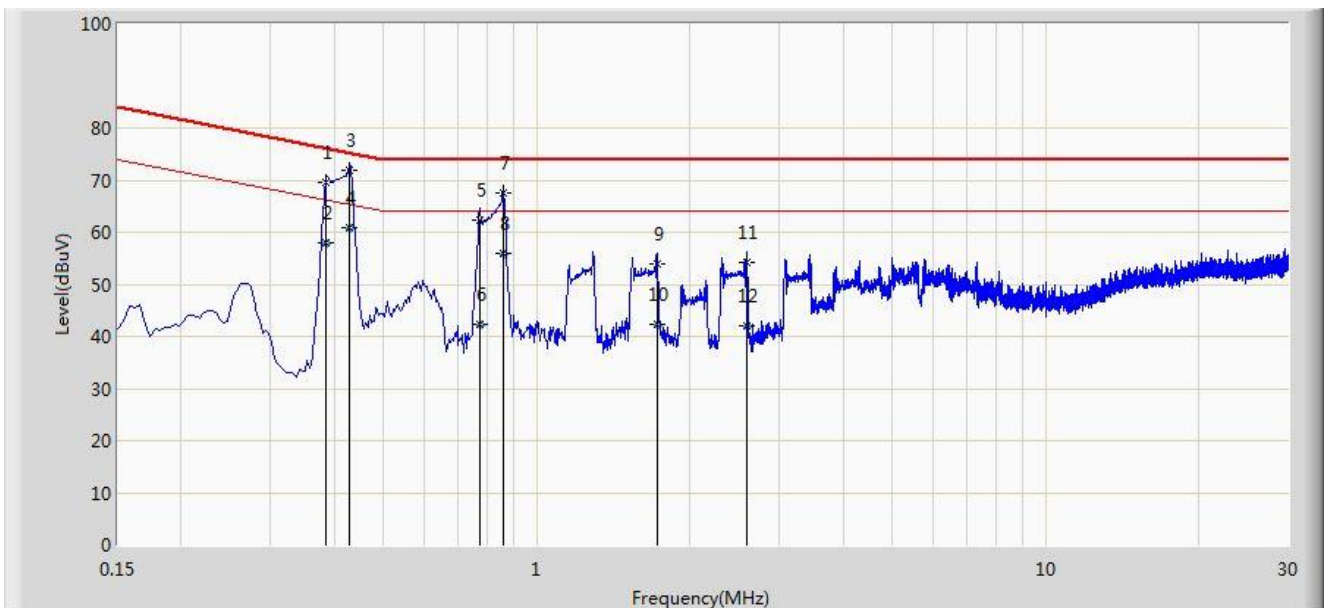


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV)	Factor (dB)	Type
1			0.266	49.112	39.099	-12.130	61.242	10.013	QP
2		*	0.266	43.898	33.885	-7.344	51.242	10.013	AV
3			0.498	38.195	28.017	-17.839	56.033	10.178	QP
4			0.498	32.723	22.545	-13.310	46.033	10.178	AV
5			0.882	36.894	26.920	-19.106	56.000	9.974	QP
6			0.882	32.057	22.083	-13.943	46.000	9.974	AV
7			1.134	35.754	25.850	-20.246	56.000	9.905	QP
8			1.134	28.889	18.985	-17.111	46.000	9.905	AV
9			7.830	37.662	27.471	-22.338	60.000	10.191	QP
10			7.830	33.051	22.859	-16.949	50.000	10.191	AV
11			21.634	32.105	21.886	-27.895	60.000	10.219	QP
12			21.634	26.258	16.039	-23.742	50.000	10.219	AV

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

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

Site: SR2	Time: 2017/06/27 - 14:43
Limit: EN55032_CE_ISN(Voltage)_Class B	Engineer: Bacon Dong
Probe: TESEQ-ISN-T800-Cat 5_24811	Polarity:
EUT: Wireless Access Point	Power: AC 230V/50Hz
Test Mode: Mode 1, POE's POE Port	

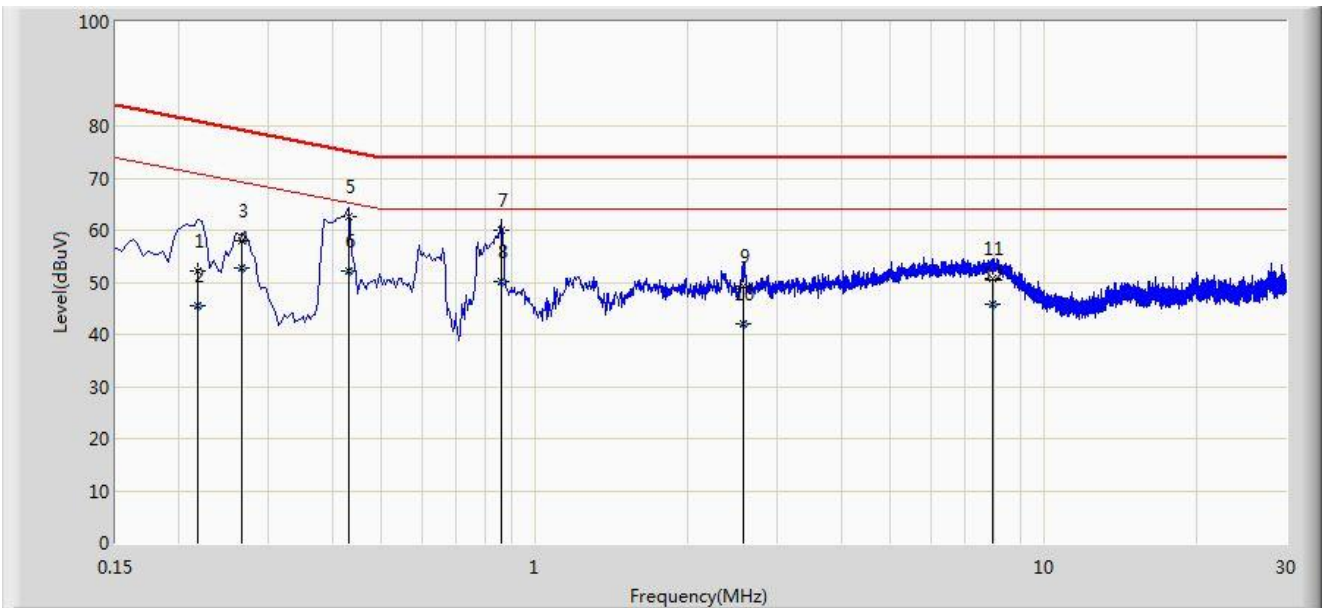


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV)	Factor (dB)	Type
1			0.386	69.644	59.848	-6.505	76.149	9.796	QP
2			0.386	58.080	48.284	-8.069	66.149	9.796	AV
3		*	0.429	71.878	62.100	-3.394	75.272	9.778	QP
4			0.429	60.978	51.200	-4.294	65.272	9.778	AV
5			0.774	62.251	52.548	-11.749	74.000	9.703	QP
6			0.774	42.326	32.623	-21.674	64.000	9.703	AV
7			0.858	67.585	57.894	-6.415	74.000	9.690	QP
8			0.858	55.995	46.304	-8.005	64.000	9.690	AV
9			1.722	53.901	44.273	-20.099	74.000	9.628	QP
10			1.722	42.382	32.755	-21.618	64.000	9.628	AV
11			2.586	54.132	44.522	-19.868	74.000	9.609	QP
12			2.586	42.048	32.439	-21.952	64.000	9.609	AV

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

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

Site: SR2	Time: 2017/06/27 - 14:23
Limit: EN55032_CE_ISN(Voltage)_Class B	Engineer: Bacon Dong
Probe: TESEQ-ISN-T800-Cat 5_24811	Polarity:
EUT: Wireless Access Point	Power: AC 230V/50Hz
Test Mode: Mode 1, POE's Data Port	

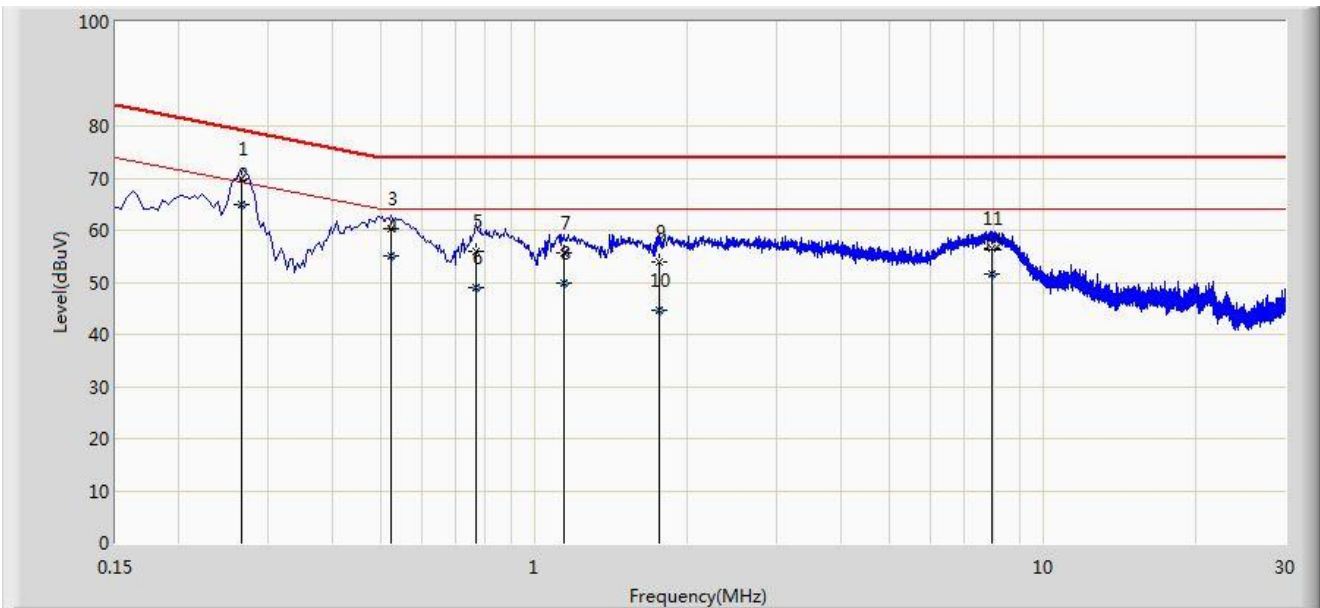


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV)	Factor (dB)	Type
1			0.218	52.140	42.149	-28.754	80.895	9.992	QP
2			0.218	45.569	35.577	-25.326	70.895	9.992	AV
3			0.266	57.941	48.042	-21.301	79.242	9.900	QP
4			0.266	52.873	42.973	-16.369	69.242	9.900	AV
5		*	0.430	62.490	52.712	-12.763	75.253	9.778	QP
6			0.430	52.039	42.261	-13.214	65.253	9.778	AV
7			0.858	60.130	50.439	-13.870	74.000	9.690	QP
8			0.858	50.116	40.425	-13.884	64.000	9.690	AV
9			2.566	49.178	39.568	-24.822	74.000	9.610	QP
10			2.566	41.903	32.293	-22.097	64.000	9.610	AV
11			7.938	50.659	40.705	-23.341	74.000	9.953	QP
12			7.938	45.825	35.872	-18.175	64.000	9.953	AV

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

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

Site: SR2	Time: 2017/06/27 - 14:52
Limit: EN55032_CE_ISN(Voltage)_Class B	Engineer: Bacon Dong
Probe: TESEQ-ISN-T800-Cat 5_24811	Polarity:
EUT: Wireless Access Point	Power: AC 230V/50Hz
Test Mode: Mode 1, EUT's POE Port	

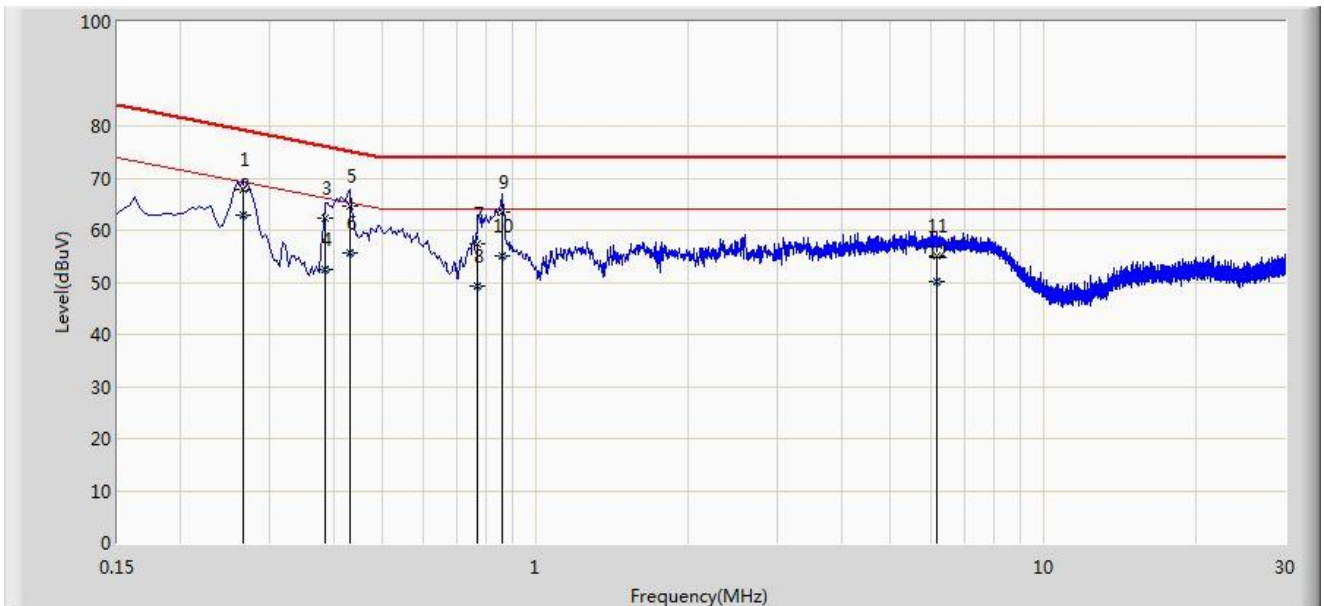


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV)	Factor (dB)	Type
1			0.266	69.939	60.040	-9.302	79.242	9.900	QP
2		*	0.266	64.946	55.047	-4.295	69.242	9.900	AV
3			0.522	60.205	50.462	-13.795	74.000	9.743	QP
4			0.522	55.196	45.453	-8.804	64.000	9.743	AV
5			0.770	56.038	46.334	-17.962	74.000	9.704	QP
6			0.770	49.084	39.380	-14.916	64.000	9.704	AV
7			1.142	55.797	46.136	-18.203	74.000	9.662	QP
8			1.142	49.793	40.132	-14.207	64.000	9.662	AV
9			1.758	53.968	44.342	-20.032	74.000	9.626	QP
10			1.758	44.726	35.100	-19.274	64.000	9.626	AV
11			7.966	56.541	46.588	-17.459	74.000	9.953	QP
12			7.966	51.555	41.602	-12.445	64.000	9.953	AV

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

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

Site: SR2	Time: 2017/06/27 - 14:30
Limit: EN55032_CE_ISN(Voltage)_Class B	Engineer: Bacon Dong
Probe: TESEQ-ISN-T800-Cat 5_24811	Polarity:
EUT: Wireless Access Point	Power: AC 230V/50Hz
Test Mode: Mode 1, EUT's LAN Port	

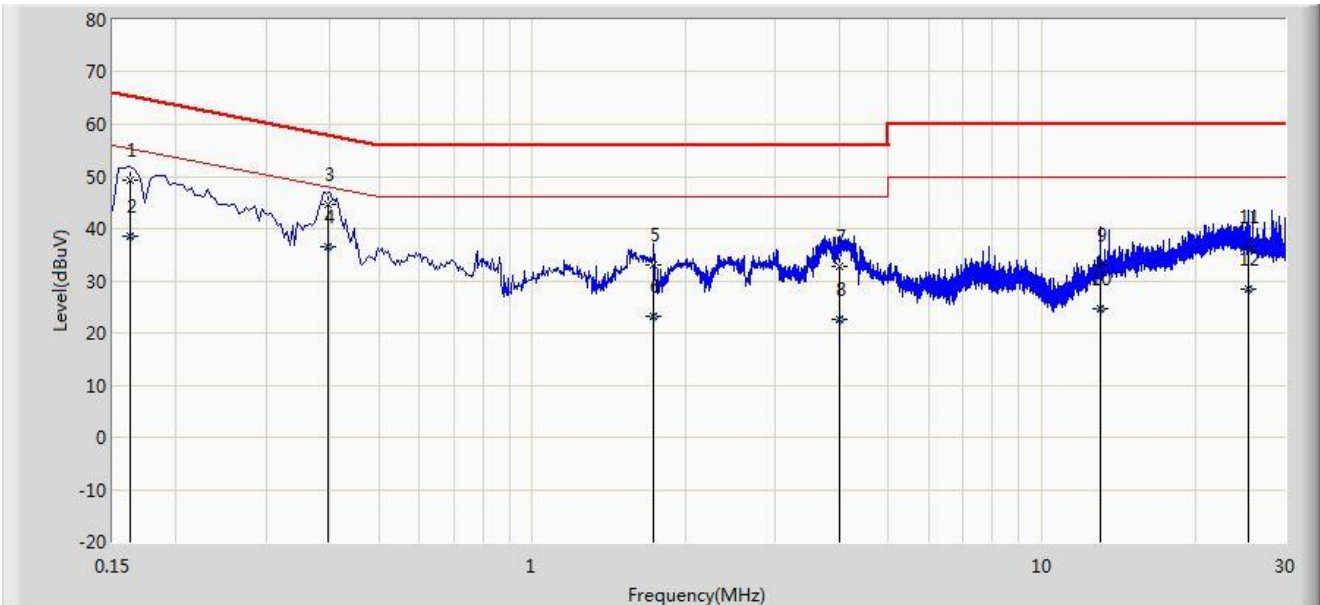


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV)	Factor (dB)	Type
1			0.266	67.918	58.018	-11.324	79.242	9.900	QP
2		*	0.266	62.834	52.935	-6.408	69.242	9.900	AV
3			0.386	62.338	52.542	-13.811	76.149	9.796	QP
4			0.386	52.462	42.666	-13.687	66.149	9.796	AV
5			0.430	64.605	54.827	-10.648	75.253	9.778	QP
6			0.430	55.608	45.830	-9.645	65.253	9.778	AV
7			0.770	57.514	47.810	-16.486	74.000	9.704	QP
8			0.770	49.341	39.637	-14.659	64.000	9.704	AV
9			0.858	63.623	53.933	-10.377	74.000	9.690	QP
10			0.858	55.077	45.386	-8.923	64.000	9.690	AV
11			6.170	54.959	45.043	-19.041	74.000	9.916	QP
12			6.170	50.114	40.198	-13.886	64.000	9.916	AV

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

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

Site: SR2	Time: 2017/08/10 - 09:51
Limit: EN55032_CE_Mains_Class B	Engineer: Cat Hu
Probe: ENV216_101683_Filter On	Polarity: Line
EUT: Wireless Access Point	Power: AC 230V/50Hz
Test Mode: Mode 2, Power Port	

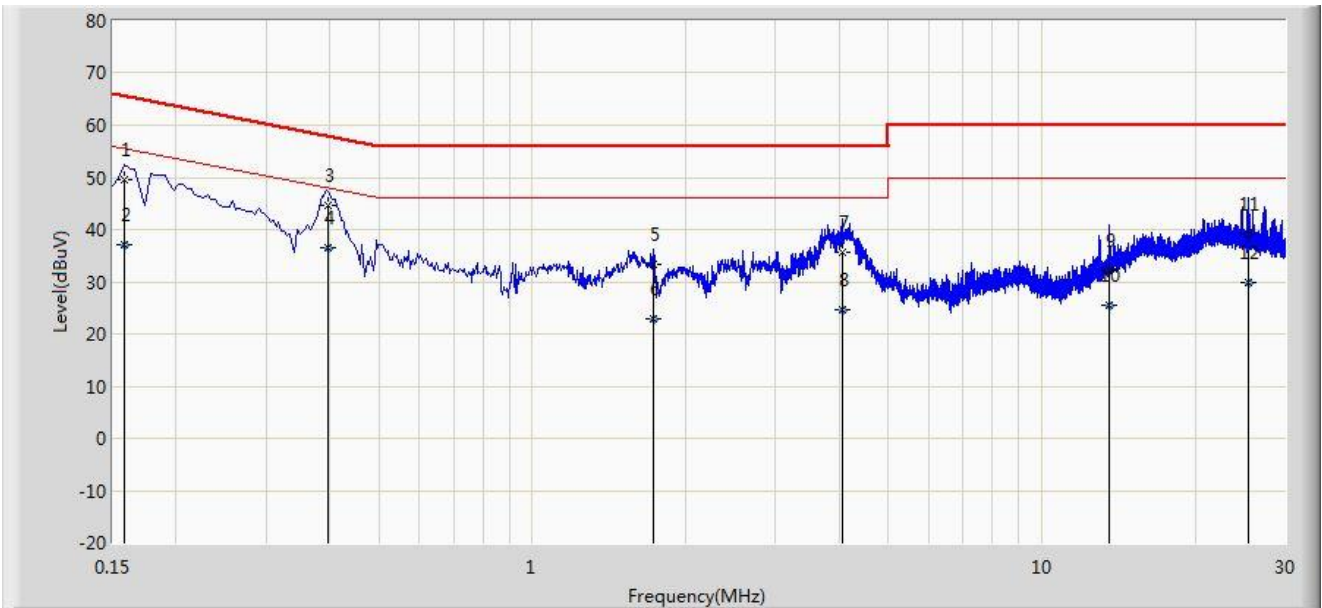


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV)	Factor (dB)	Type
1			0.162	49.376	39.279	-15.985	65.361	10.097	QP
2			0.162	38.668	28.571	-16.693	55.361	10.097	AV
3			0.398	44.753	34.670	-13.142	57.895	10.084	QP
4		*	0.398	36.650	26.566	-11.245	47.895	10.084	AV
5			1.726	33.110	23.230	-22.890	56.000	9.880	QP
6			1.726	23.319	13.439	-22.681	46.000	9.880	AV
7			3.994	32.867	22.903	-23.133	56.000	9.964	QP
8			3.994	22.490	12.526	-23.510	46.000	9.964	AV
9			13.006	33.142	23.072	-26.858	60.000	10.070	QP
10			13.006	24.633	14.562	-25.367	50.000	10.070	AV
11			25.342	36.573	26.347	-23.427	60.000	10.226	QP
12			25.342	28.295	18.069	-21.705	50.000	10.226	AV

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

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

Site: SR2	Time: 2017/08/10 - 09:56
Limit: EN55032_CE_Mains_Class B	Engineer: Cat Hu
Probe: ENV216_101683_Filter On	Polarity: Neutral
EUT: Wireless Access Point	Power: AC 230V/50Hz
Test Mode: Mode 2, Power Port	

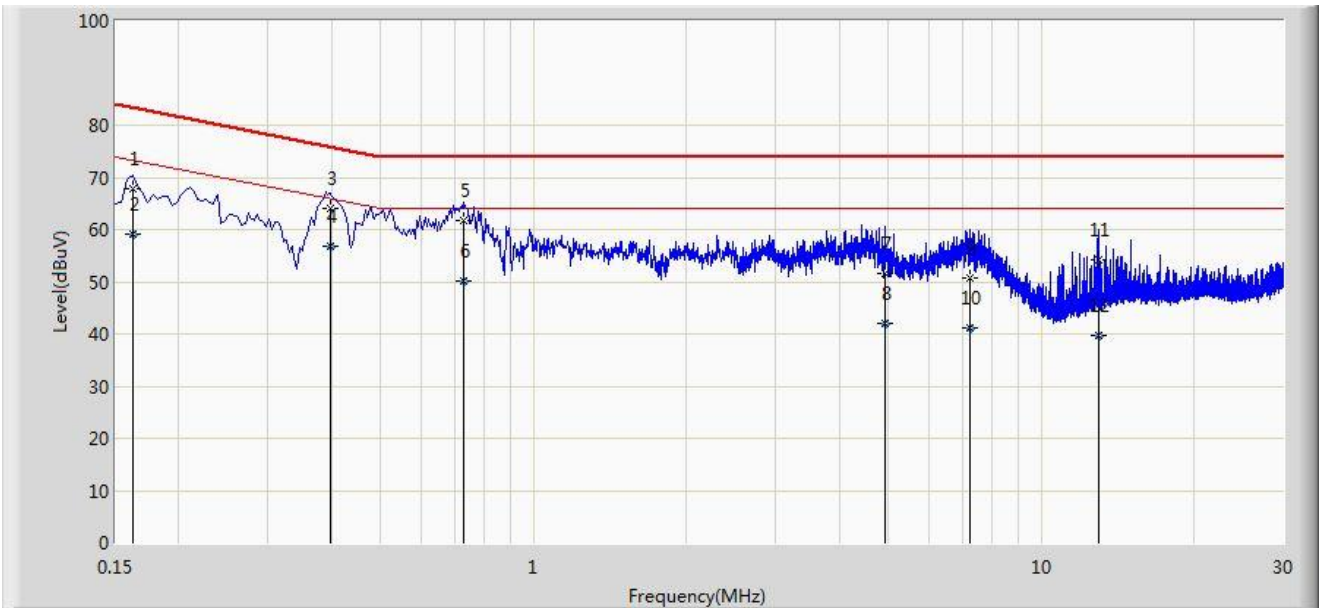


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV)	Factor (dB)	Type
1			0.158	49.695	39.405	-15.874	65.568	10.290	QP
2			0.158	37.223	26.934	-18.345	55.568	10.290	AV
3			0.398	44.733	34.622	-13.162	57.895	10.111	QP
4		*	0.398	36.520	26.409	-11.375	47.895	10.111	AV
5			1.726	33.225	23.343	-22.775	56.000	9.882	QP
6			1.726	22.978	13.096	-23.022	46.000	9.882	AV
7			4.066	35.612	25.636	-20.388	56.000	9.977	QP
8			4.066	24.559	14.583	-21.441	46.000	9.977	AV
9			13.558	32.030	21.930	-27.970	60.000	10.100	QP
10			13.558	25.542	15.443	-24.458	50.000	10.100	AV
11			25.342	39.022	28.700	-20.978	60.000	10.322	QP
12			25.342	29.779	19.457	-20.221	50.000	10.322	AV

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

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

Site: SR2	Time: 2017/08/10 - 10:00
Limit: EN55032_CE_ISN(Voltage)_Class B	Engineer: Cat Hu
Probe: TESEQ-ISN-T800-Cat 5_24811	Polarity:
EUT: Wireless Access Point	Power: AC 230V/50Hz
Test Mode: Mode 2, POE Port	

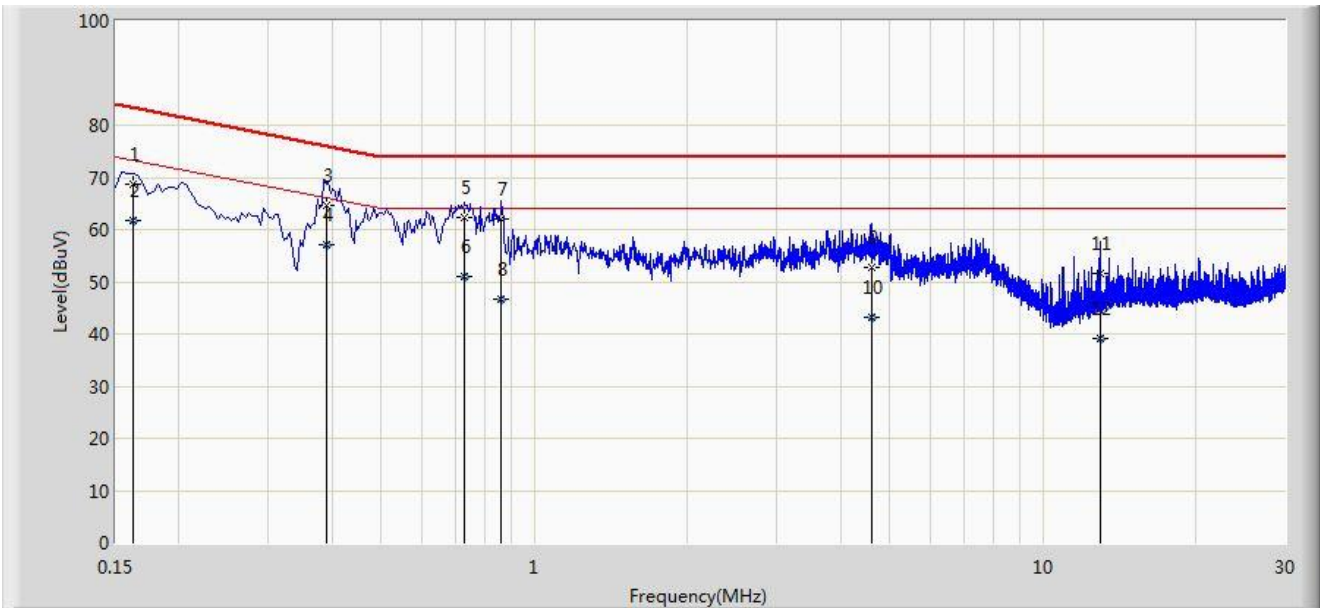


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV)	Factor (dB)	Type
1			0.162	67.781	57.681	-15.580	83.361	10.100	QP
2			0.162	59.229	49.129	-14.132	73.361	10.100	AV
3			0.397	64.091	54.300	-11.824	75.916	9.791	QP
4		*	0.397	56.791	47.000	-9.124	65.916	9.791	AV
5			0.726	61.820	52.110	-12.180	74.000	9.711	QP
6			0.726	50.239	40.529	-13.761	64.000	9.711	AV
7			4.926	51.653	41.821	-22.347	74.000	9.832	QP
8			4.926	42.093	32.261	-21.907	64.000	9.832	AV
9			7.222	50.680	40.726	-23.320	74.000	9.955	QP
10			7.222	41.120	31.166	-22.880	64.000	9.955	AV
11			13.006	54.135	44.276	-19.865	74.000	9.858	QP
12			13.006	39.816	29.957	-24.184	64.000	9.858	AV

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

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

Site: SR2	Time: 2017/08/10 - 10:07
Limit: EN55032_CE_ISN(Voltage)_Class B	Engineer: Cat Hu
Probe: TESEQ-ISN-T800-Cat 5_24811	Polarity:
EUT: Wireless Access Point	Power: AC 230V/50Hz
Test Mode: Mode 2, LAN Port	



No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV)	Factor (dB)	Type
1			0.162	68.572	58.472	-14.789	83.361	10.100	QP
2			0.162	61.658	51.559	-11.703	73.361	10.100	AV
3			0.391	64.694	54.900	-11.348	76.042	9.794	QP
4		*	0.391	56.994	47.200	-9.048	66.042	9.794	AV
5			0.730	62.339	52.629	-11.661	74.000	9.710	QP
6			0.730	51.035	41.326	-12.965	64.000	9.710	AV
7			0.862	62.121	52.432	-11.879	74.000	9.690	QP
8			0.862	46.581	36.891	-17.419	64.000	9.690	AV
9			4.598	52.874	43.076	-21.126	74.000	9.798	QP
10			4.598	43.259	33.461	-20.741	64.000	9.798	AV
11			13.006	51.592	41.733	-22.408	74.000	9.858	QP
12			13.006	38.999	29.141	-25.001	64.000	9.858	AV

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

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

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.

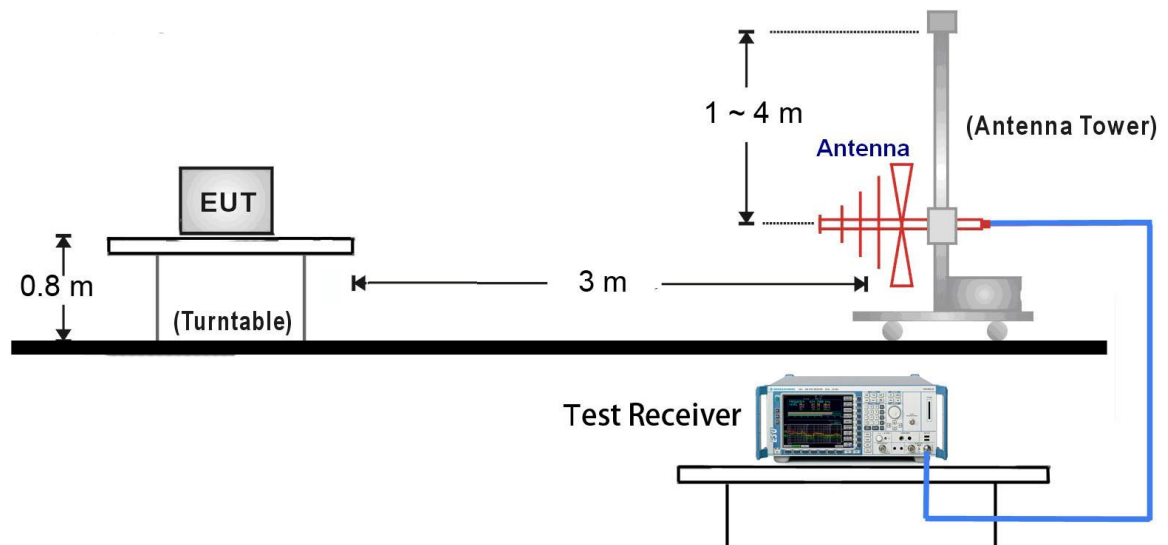
Note 2: Additional provisions may be required for cases where interference occurs.

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

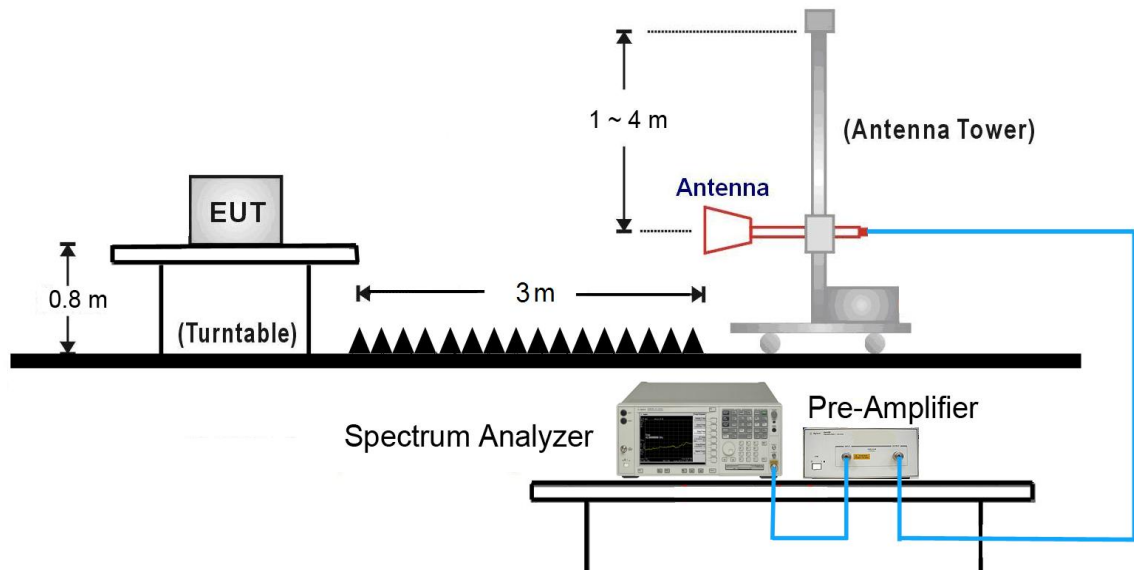
Note: The lower limit applies at the transition frequency.

5.2. Test Setup

30 ~ 1000 MHz



1000 ~ 6000 MHz



Note: About the radiated test setup, the EUT and local AE shall be arranged in the most compact practical arrangement within the test volume, while respecting typical spacing and the requirements defined in EN55032 Annex D. The central point of the arrangement shall be positioned at the centre of the turntable. The measurement distance is the shortest horizontal distance between an imaginary circular periphery just encompassing this arrangement and the calibration point of the antenna. See below Figure 1 and Figure 2.

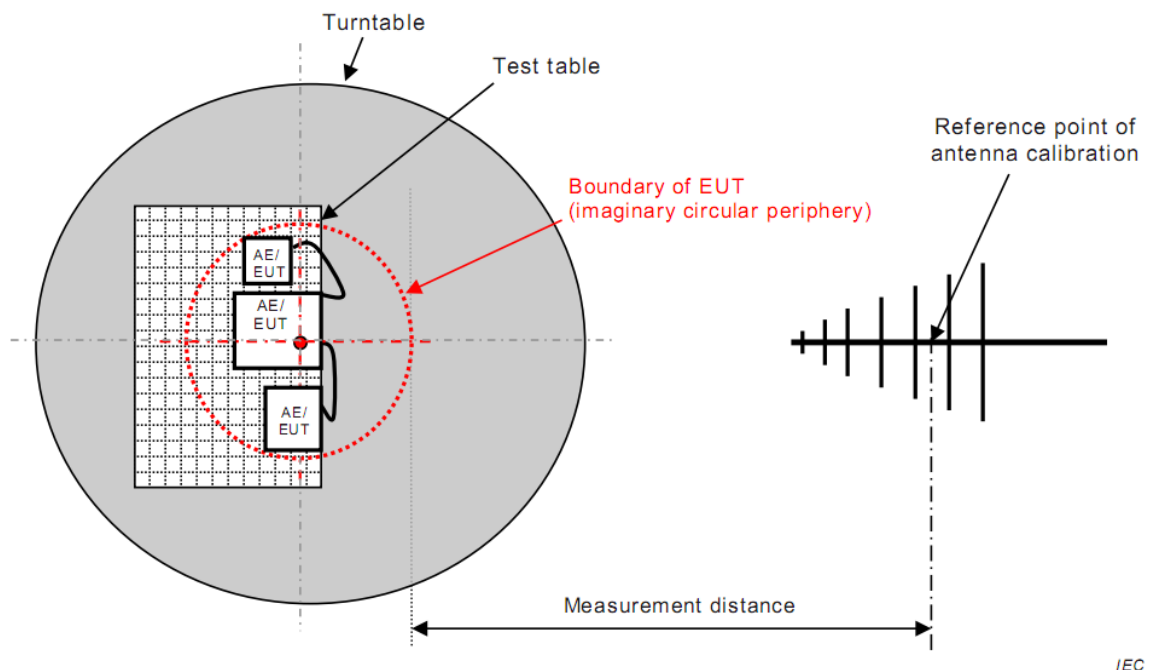


Figure 1

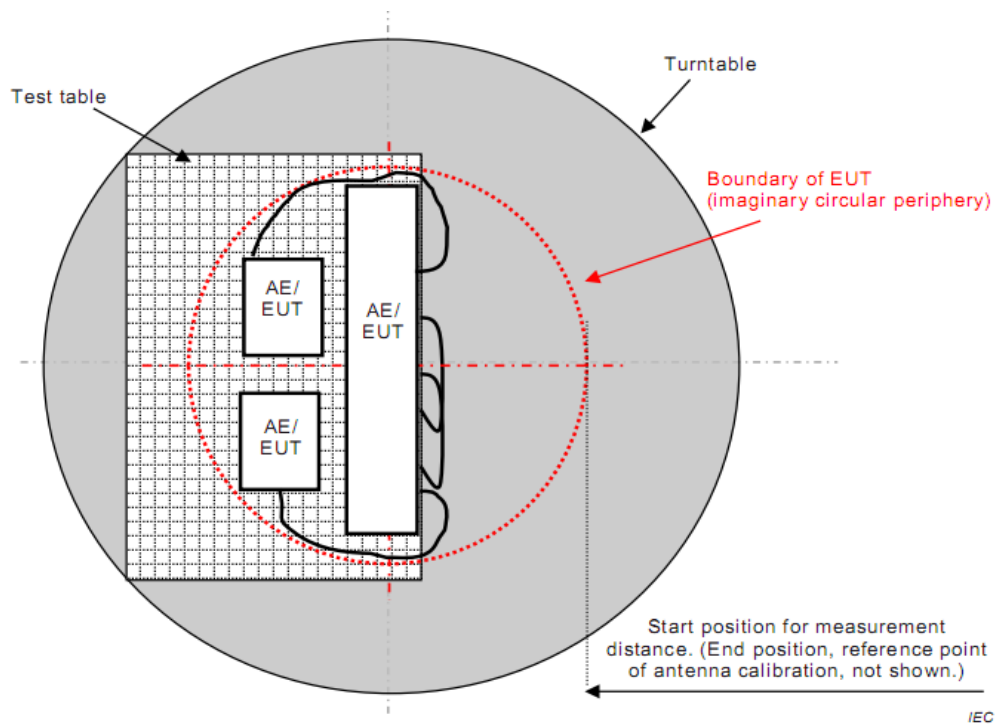


Figure 2

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.

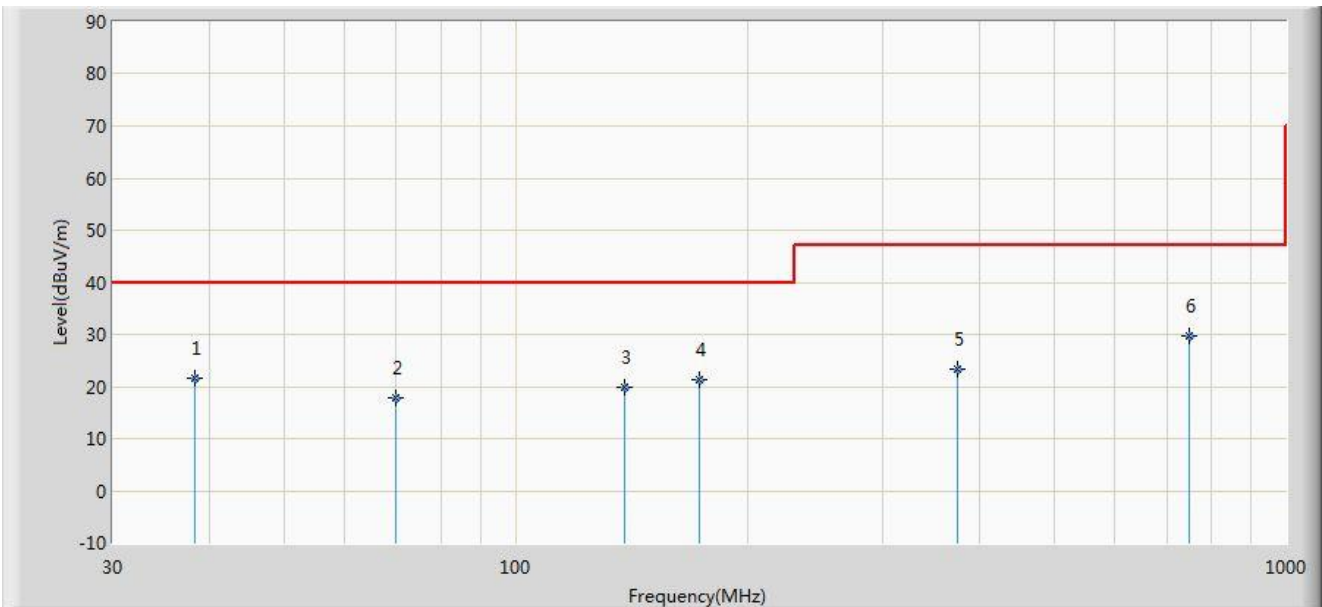
The highest value found, following this procedure, is defined as the radiation figure of the receiver.

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.

- 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.
- Another possibility is to use the method described in annex C of CISPR 11.

5.4. Test Result

Site: AC2	Time: 2017/06/29 - 17:38
Limit: EN55032_RE(3m)_Class B	Engineer: Flag Yang
Probe: VULB 9168 _20-2000MHz	Polarity: Horizontal
EUT: Wireless Access Point	Power: AC 230V/50Hz
Test Mode: Mode 1	

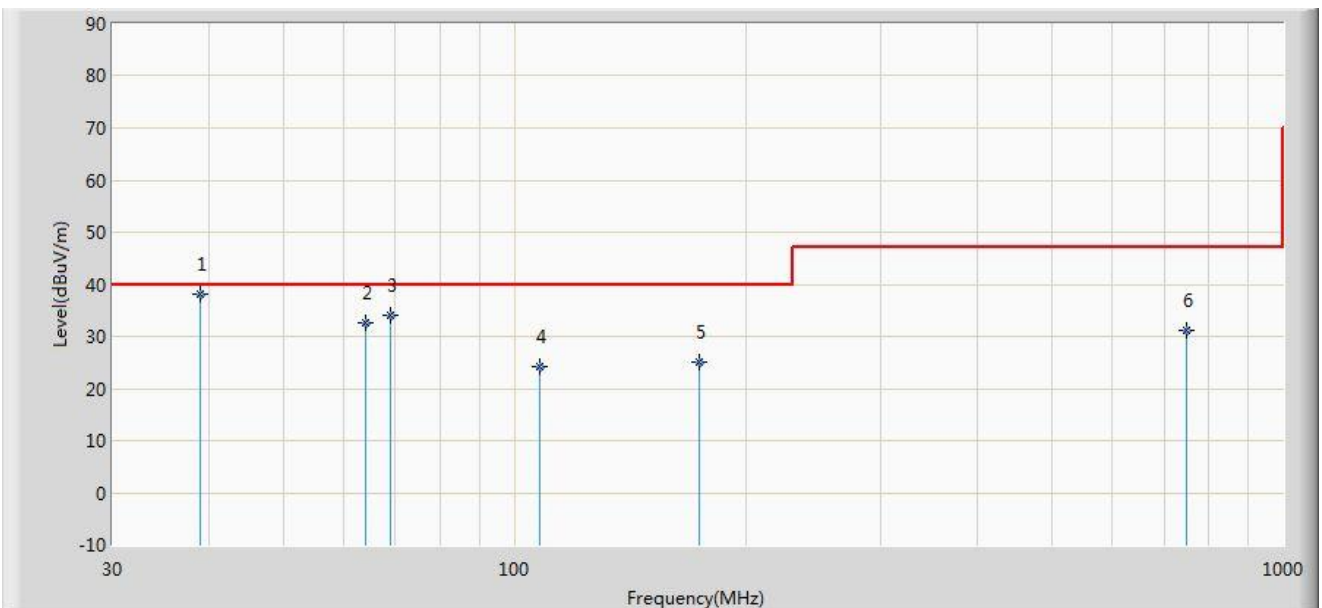


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1			38.430	21.557	7.230	-18.443	40.000	14.327	QP
2			70.020	17.922	6.420	-22.078	40.000	11.502	QP
3			138.560	19.978	5.600	-20.022	40.000	14.378	QP
4			173.230	21.175	7.380	-18.825	40.000	13.794	QP
5			374.300	23.451	7.460	-23.549	47.000	15.991	QP
6		*	750.120	29.597	6.890	-17.403	47.000	22.706	QP

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

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

Site: AC2	Time: 2017/06/29 - 17:38
Limit: EN55032_RE(3m)_Class B	Engineer: Flag Yang
Probe: VULB 9168 _20-2000MHz	Polarity: Vertical
EUT: Wireless Access Point	Power: AC 230V/50Hz
Test Mode: Mode 1	

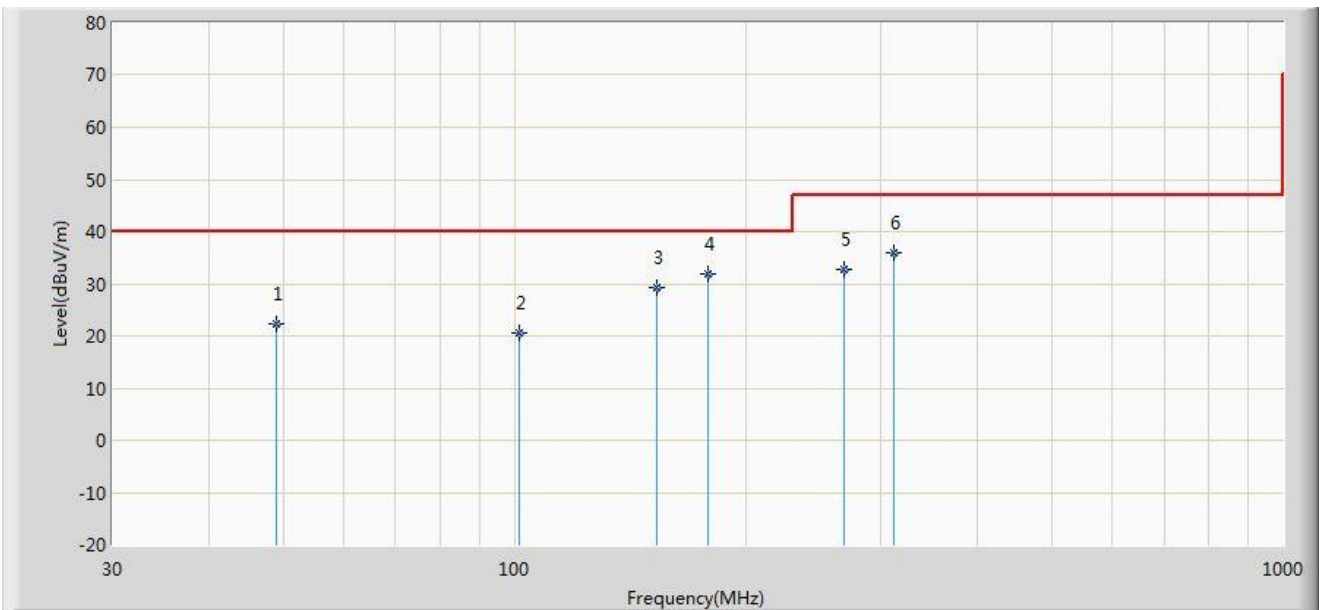


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		*	39.040	38.034	23.620	-1.966	40.000	14.414	QP
2			64.000	32.718	20.090	-7.282	40.000	12.628	QP
3			69.030	34.155	22.480	-5.845	40.000	11.675	QP
4			108.060	24.207	12.420	-15.793	40.000	11.787	QP
5			173.630	25.124	11.390	-14.876	40.000	13.734	QP
6			750.000	31.234	8.530	-15.766	47.000	22.704	QP

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

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

Site: AC2	Time: 2017/08/10 - 20:25
Limit: EN55032_RE(3m)_Class B	Engineer: Jone Zhang
Probe: VULB9162_0.03-8GHz	Polarity: Horizontal
EUT: Wireless Access Point	Power: AC 230V/50Hz
Test Mode: Mode 2	

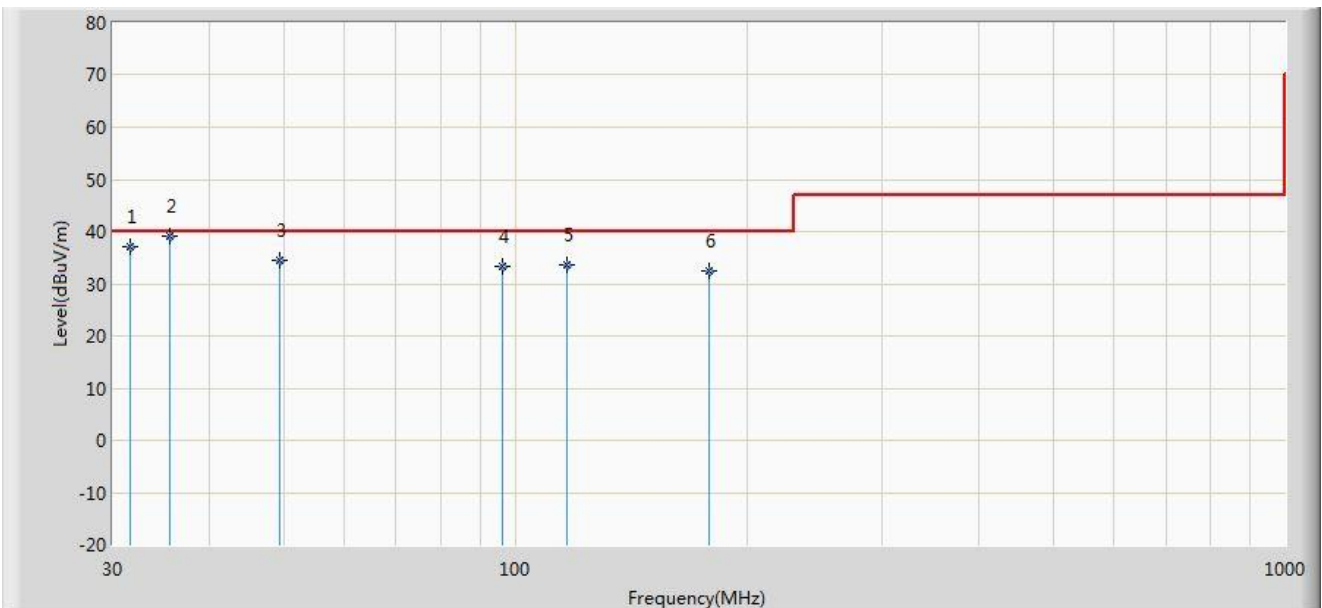


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1			48.915	22.388	7.423	-17.612	40.000	14.965	QP
2			101.295	20.574	7.426	-19.426	40.000	13.149	QP
3			153.190	29.328	19.725	-10.672	40.000	9.603	QP
4			178.410	31.777	20.964	-8.223	40.000	10.813	QP
5			268.620	32.788	18.742	-14.212	47.000	14.046	QP
6			311.785	35.836	20.964	-11.164	47.000	14.872	QP

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

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

Site: AC2	Time: 2017/08/10 - 20:25
Limit: EN55032_RE(3m)_Class B	Engineer: Jone Zhang
Probe: VULB9162_0.03-8GHz	Polarity: Vertical
EUT: Wireless Access Point	Power: AC 230V/50Hz
Test Mode: Mode 2	

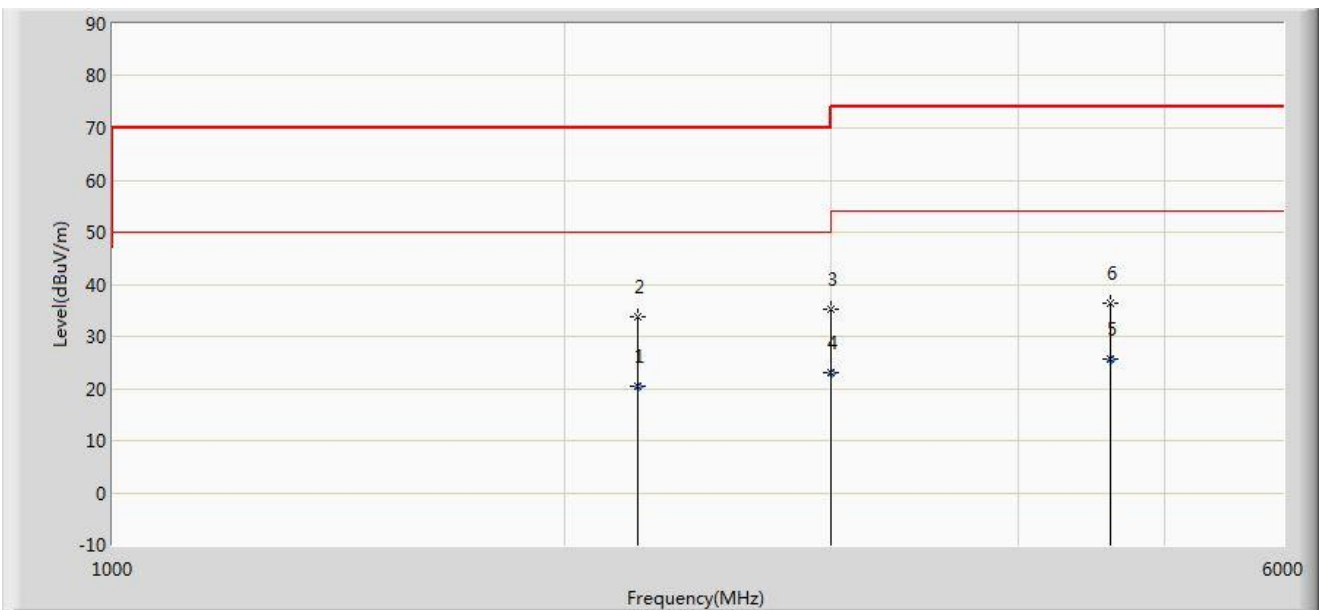


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1			31.652	37.025	24.690	-2.975	40.000	12.335	QP
2			35.610	39.108	26.060	-0.892	40.000	13.047	QP
3			49.400	34.497	19.534	-5.503	40.000	14.963	QP
4			96.260	33.419	20.920	-6.581	40.000	12.499	QP
5			116.815	33.550	21.768	-6.450	40.000	11.782	QP
6			178.410	32.542	21.729	-7.458	40.000	10.813	QP

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

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

Site: AC2	Time: 2017/06/29 - 17:38
Limit: EN55032_RE(3m)_Class B	Engineer: Flag Yang
Probe: BBHA9120D_1-18GHz	Polarity: Horizontal
EUT: Wireless Access Point	Power: AC 230V/50Hz
Test Mode: Mode 1	

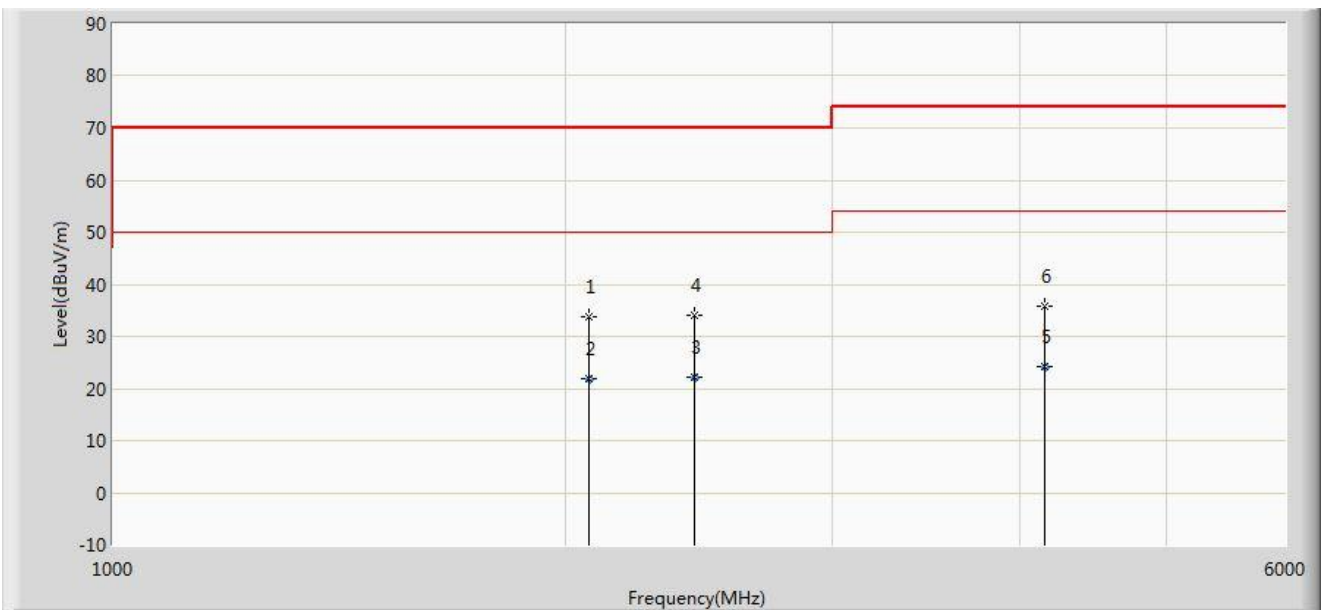


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1			2232.460	20.558	24.060	-29.442	50.000	-3.503	AV
2			2232.500	33.883	37.385	-36.117	70.000	-3.503	PK
3			3005.000	35.121	37.251	-38.879	74.000	-2.130	PK
4			3005.000	22.900	25.030	-31.100	54.000	-2.130	AV
5		*	4602.430	25.665	23.650	-28.335	54.000	2.015	AV
6			4602.500	36.495	34.480	-37.505	74.000	2.015	PK

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

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

Site: AC2	Time: 2017/06/29 - 17:38
Limit: EN55032_RE(3m)_Class B	Engineer: Flag Yang
Probe: BBHA9120D_1-18GHz	Polarity: Vertical
EUT: Wireless Access Point	Power: AC 230V/50Hz
Test Mode: Mode 1	

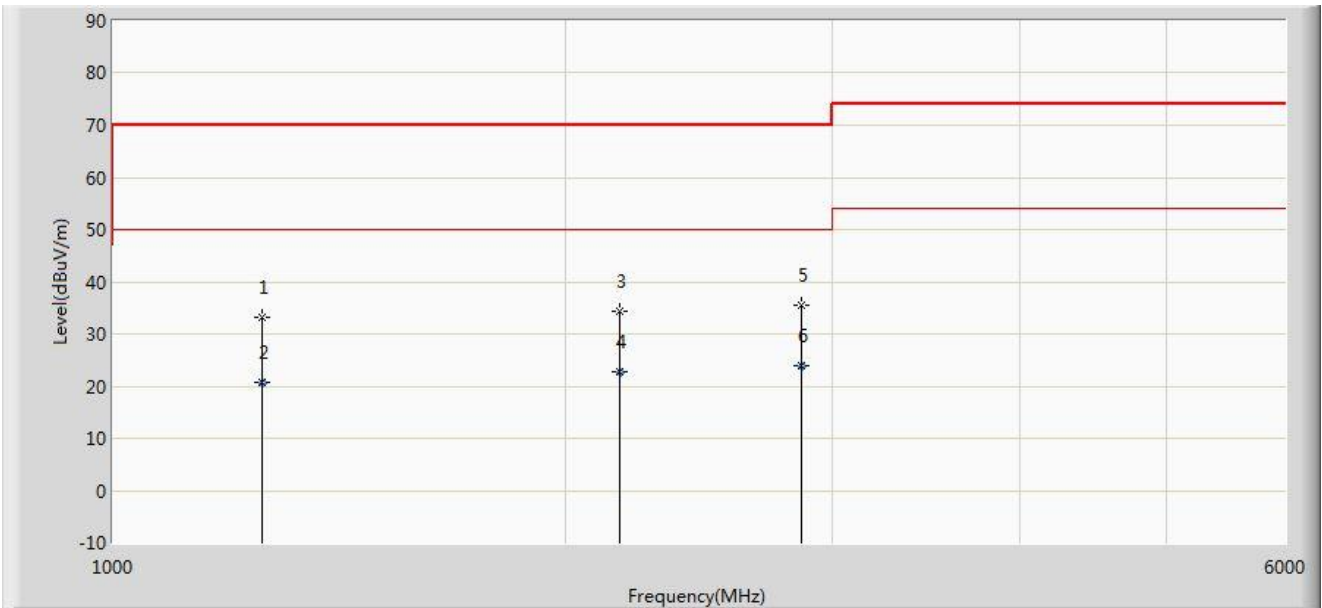


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1			2072.500	33.770	38.782	-36.230	70.000	-5.012	PK
2			2072.500	21.918	26.930	-28.082	50.000	-5.012	AV
3		*	2434.830	22.136	25.920	-27.864	50.000	-3.784	AV
4			2435.000	34.153	37.937	-35.847	70.000	-3.784	PK
5			4157.450	24.293	23.560	-29.707	54.000	0.734	AV
6			4157.500	35.938	35.205	-38.062	74.000	0.734	PK

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

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

Site: AC2	Time: 2017/08/10 - 20:24
Limit: EN55032_RE(3m)_Class B	Engineer: Jone Zhang
Probe: BBHA9120D_1-18GHz	Polarity: Horizontal
EUT: Wireless Access Point	Power: AC 230V/50Hz
Test Mode: Mode 2	

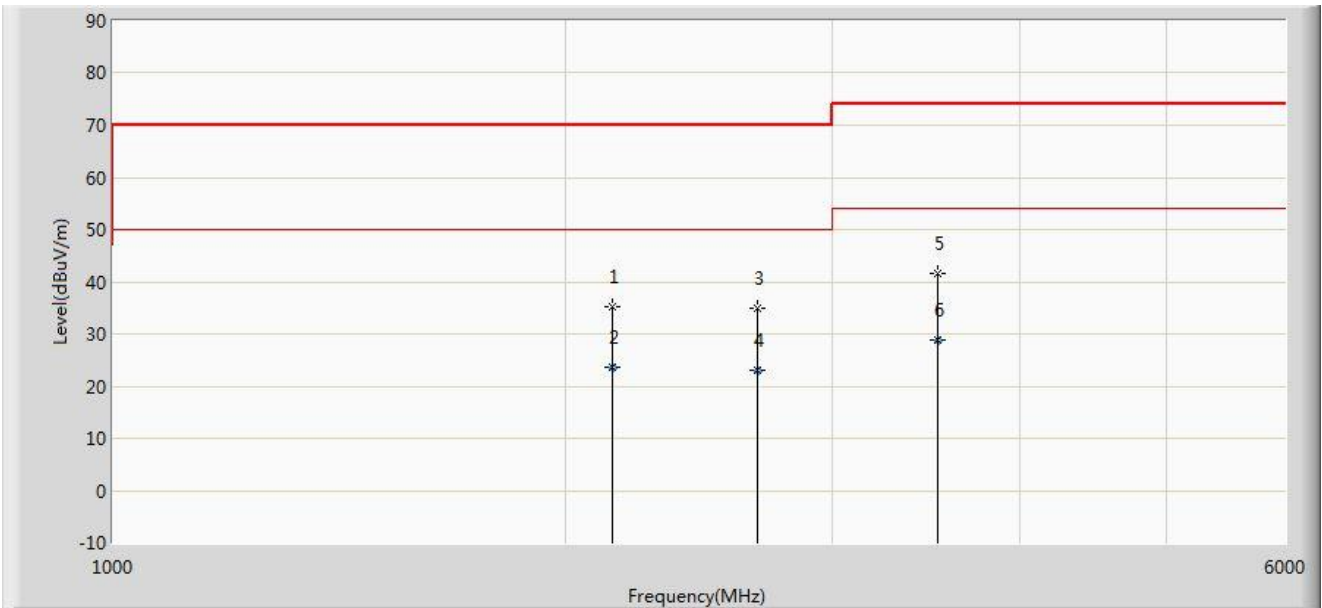


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1			1257.500	33.212	38.807	-36.788	70.000	-5.595	PK
2			1257.500	20.842	26.437	-29.158	50.000	-5.595	AV
3			2172.500	34.242	37.043	-35.758	70.000	-2.801	PK
4			2172.500	22.612	25.413	-27.388	50.000	-2.801	AV
5			2862.500	35.400	38.295	-34.600	70.000	-2.895	PK
6			2862.500	23.829	26.724	-26.171	50.000	-2.895	AV

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

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

Site: AC2	Time: 2017/08/10 - 20:25
Limit: EN55032_RE(3m)_Class B	Engineer: Jone Zhang
Probe: BBHA9120D_1-18GHz	Polarity: Vertical
EUT: Wireless Access Point	Power: AC 230V/50Hz
Test Mode: Mode 2	



No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1			2147.500	35.309	38.359	-34.691	70.000	-3.050	PK
2			2147.500	23.665	26.715	-26.335	50.000	-3.050	AV
3			2677.500	34.949	37.357	-35.051	70.000	-2.409	PK
4			2677.500	23.054	25.462	-26.946	50.000	-2.409	AV
5			3527.500	41.700	42.972	-32.300	74.000	-1.272	PK
6			3527.500	28.855	30.127	-25.145	54.000	-1.272	AV

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

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

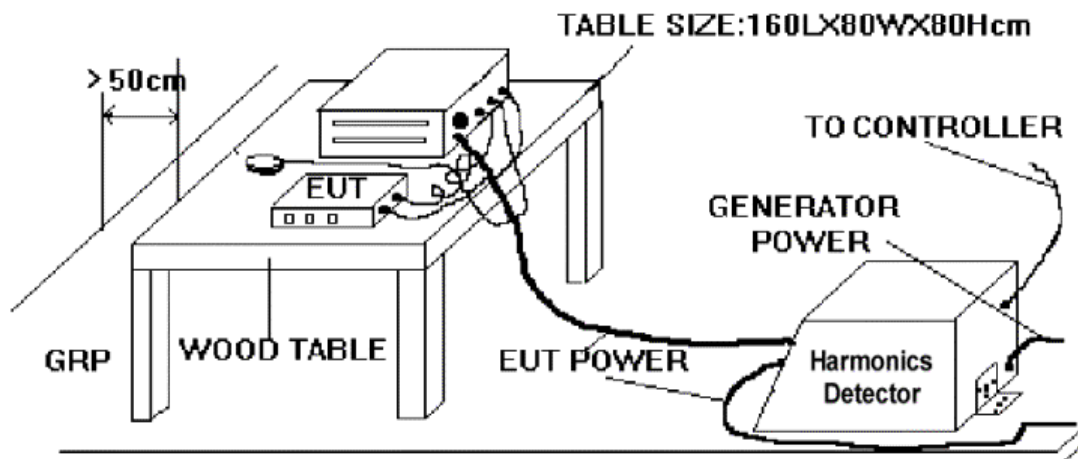
6. Harmonic Current Emissions

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.

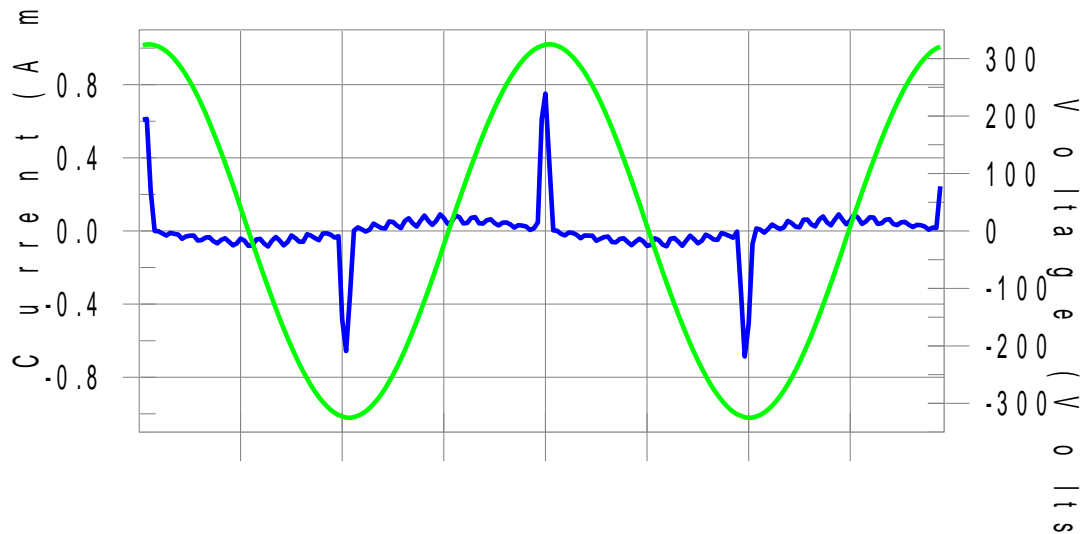
6.4. Test Result

Product	Wireless Access Point	Temperature	25°C
Test Engineer	Bacon Dong	Relative Humidity	51%
Test Mode	Mode 1	Date of Test	2017/04/26

Test Result: Pass

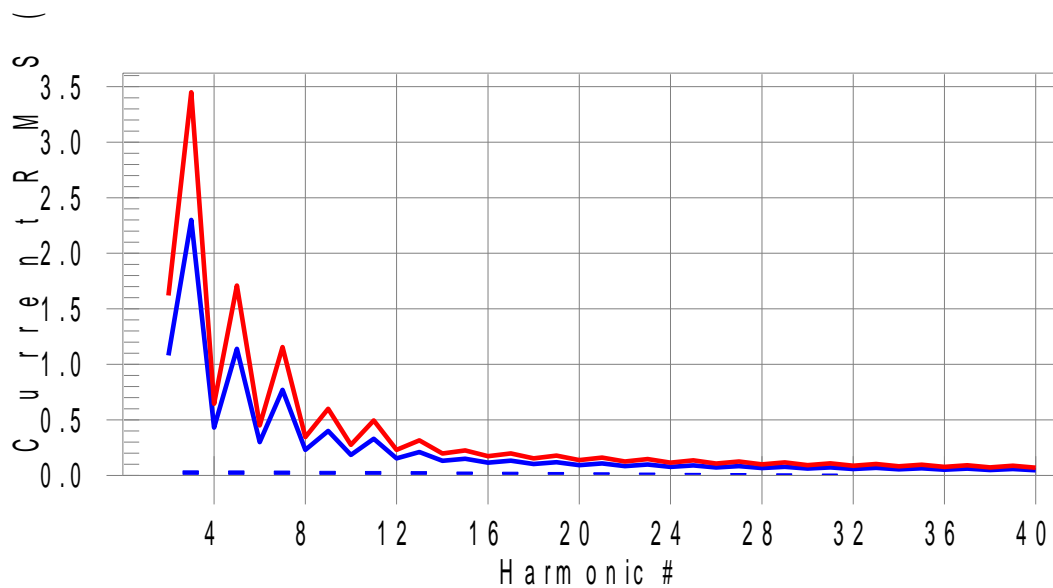
Source qualification: Normal

Current & voltage waveforms



Harmonics and Class A limit line

European Limits



Test result: Pass **Worst harmonic was #19 with 22.2% of the limit.**

Test Result: Pass Source qualification: Normal
 THC(A): 0.014 I-THD(%): 184.3 POHC(A): 0.045 POHC Limit(A): 0.251
 Highest parameter values during test:
 V_RMS (Volts): 229.80 Frequency(Hz): 50.00
 I_Peak (Amps): 0.773 I_RMS (Amps): 0.138
 I_Fund (Amps): 0.063 Crest Factor: 5.872
 Power (Watts): 9.8 Power Factor: 0.329

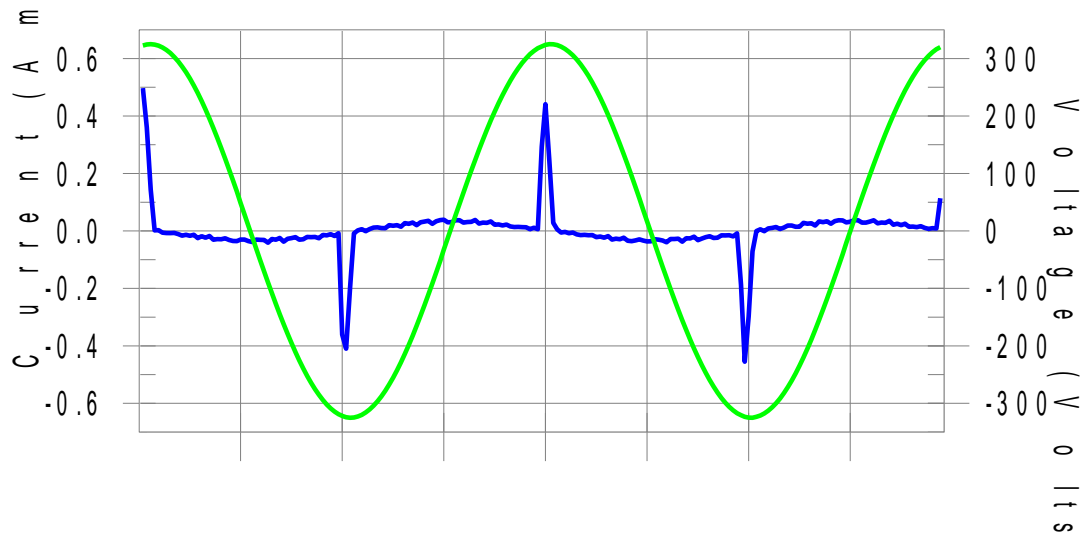
Harm#	Harms(avg)	100%Limit	%of Limit	Harms(max)	150%Limit	%of Limit	Status
2	0.001	1.080	N/A	0.001	1.620	N/A	Pass
3	0.041	2.300	1.8	0.042	3.450	1.2	Pass
4	0.001	0.430	N/A	0.001	0.645	N/A	Pass
5	0.039	1.140	3.5	0.040	1.710	2.4	Pass
6	0.001	0.300	N/A	0.001	0.450	N/A	Pass
7	0.038	0.770	5.0	0.039	1.155	3.4	Pass
8	0.001	0.230	N/A	0.001	0.345	N/A	Pass
9	0.037	0.400	9.2	0.038	0.600	6.3	Pass
10	0.001	0.184	N/A	0.001	0.276	N/A	Pass
11	0.035	0.330	10.7	0.036	0.495	7.2	Pass
12	0.001	0.153	N/A	0.001	0.230	N/A	Pass
13	0.033	0.210	15.9	0.034	0.315	10.7	Pass
14	0.001	0.131	N/A	0.001	0.197	N/A	Pass
15	0.031	0.150	20.7	0.031	0.225	14.0	Pass
16	0.001	0.115	N/A	0.001	0.173	N/A	Pass
17	0.029	0.132	21.8	0.029	0.198	14.7	Pass
18	0.000	0.102	N/A	0.001	0.153	N/A	Pass
19	0.026	0.118	22.2	0.026	0.178	14.9	Pass
20	0.000	0.092	N/A	0.001	0.138	N/A	Pass
21	0.024	0.107	22.1	0.024	0.161	14.8	Pass
22	0.000	0.084	N/A	0.001	0.125	N/A	Pass
23	0.021	0.098	21.5	0.021	0.147	14.4	Pass
24	0.000	0.077	N/A	0.001	0.115	N/A	Pass
25	0.018	0.090	20.4	0.019	0.135	13.7	Pass
26	0.000	0.071	N/A	0.001	0.107	N/A	Pass
27	0.016	0.083	19.0	0.016	0.125	12.8	Pass
28	0.000	0.066	N/A	0.001	0.099	N/A	Pass
29	0.013	0.078	17.2	0.013	0.116	11.6	Pass
30	0.000	0.061	N/A	0.001	0.092	N/A	Pass
31	0.011	0.073	15.2	0.011	0.109	10.3	Pass
32	0.000	0.058	N/A	0.001	0.086	N/A	Pass
33	0.009	0.068	13.0	0.009	0.102	8.8	Pass
34	0.000	0.054	N/A	0.000	0.081	N/A	Pass
35	0.007	0.064	10.7	0.007	0.096	7.2	Pass
36	0.000	0.051	N/A	0.000	0.077	N/A	Pass
37	0.005	0.061	8.4	0.005	0.091	5.7	Pass
38	0.000	0.048	N/A	0.000	0.073	N/A	Pass
39	0.004	0.058	N/A	0.004	0.087	N/A	Pass
40	0.000	0.046	N/A	0.000	0.069	N/A	Pass

Product	Wireless Access Point	Temperature	24°C
Test Engineer	Bacon Dong	Relative Humidity	54%
Test Mode	Mode 2	Date of Test	2017/08/10

Test Result: Pass

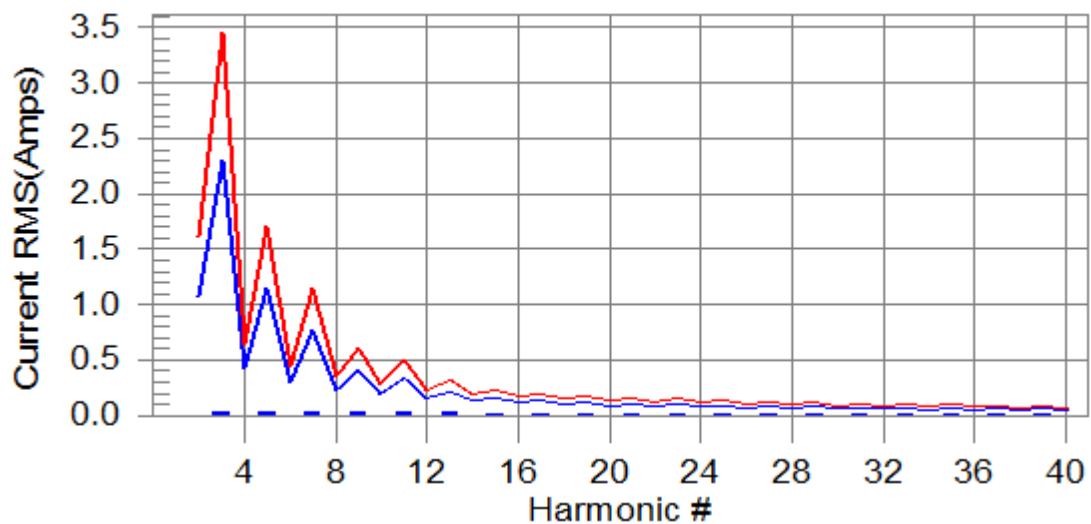
Source qualification: Normal

Current & voltage waveforms



Harmonics and Class A limit line

European Limits



Test result: Pass Worst harmonic was #19 with 14.6% of the limit.

Test Result: Pass **Source qualification: Normal**
THC(A): 0.076 **I-THD(%): 198.6** **POHC(A): 0.030** **POHC Limit(A): 0.251**
Highest parameter values during test:
 V_RMS (Volts): 229.83 **Frequency(Hz): 50.00**
 I_Peak (Amps): 0.515 **I_RMS (Amps): 0.086**
 I_Fund (Amps): 0.039 **Crest Factor: 6.010**
 Power (Watts): 6.6 **Power Factor: 0.338**

Harm#	Harms(avg)	100%Limit	%of Limit	Harms(max)	150%Limit	%of Limit	Status
2	0.001	1.080	N/A	0.001	1.620	N/A	Pass
3	0.027	2.300	1.2	0.028	3.450	0.8	Pass
4	0.001	0.430	N/A	0.001	0.645	N/A	Pass
5	0.026	1.140	2.3	0.027	1.710	1.6	Pass
6	0.000	0.300	N/A	0.001	0.450	N/A	Pass
7	0.026	0.770	3.3	0.026	1.155	2.3	Pass
8	0.000	0.230	N/A	0.000	0.345	N/A	Pass
9	0.025	0.400	6.2	0.025	0.600	4.1	Pass
10	0.000	0.184	N/A	0.000	0.276	N/A	Pass
11	0.024	0.330	7.1	0.024	0.495	4.8	Pass
12	0.000	0.153	N/A	0.000	0.230	N/A	Pass
13	0.022	0.210	10.6	0.022	0.315	7.1	Pass
14	0.000	0.131	N/A	0.000	0.197	N/A	Pass
15	0.021	0.150	13.8	0.021	0.225	9.2	Pass
16	0.000	0.115	N/A	0.000	0.173	N/A	Pass
17	0.019	0.132	14.4	0.019	0.198	9.6	Pass
18	0.000	0.102	N/A	0.000	0.153	N/A	Pass
19	0.017	0.118	14.6	0.017	0.178	9.8	Pass
20	0.000	0.092	N/A	0.000	0.138	N/A	Pass
21	0.016	0.107	14.6	0.016	0.161	9.7	Pass
22	0.000	0.084	N/A	0.000	0.125	N/A	Pass
23	0.014	0.098	14.2	0.014	0.147	9.5	Pass
24	0.000	0.077	N/A	0.000	0.115	N/A	Pass
25	0.012	0.090	13.5	0.012	0.135	9.0	Pass
26	0.000	0.071	N/A	0.000	0.107	N/A	Pass
27	0.010	0.083	12.5	0.011	0.125	8.4	Pass
28	0.000	0.066	N/A	0.000	0.099	N/A	Pass
29	0.009	0.078	11.5	0.009	0.116	7.7	Pass
30	0.000	0.061	N/A	0.000	0.092	N/A	Pass
31	0.007	0.073	10.3	0.008	0.109	6.9	Pass
32	0.000	0.058	N/A	0.000	0.086	N/A	Pass
33	0.006	0.068	9.0	0.006	0.102	6.2	Pass
34	0.000	0.054	N/A	0.000	0.081	N/A	Pass
35	0.005	0.064	7.9	0.005	0.096	5.3	Pass
36	0.000	0.051	N/A	0.000	0.077	N/A	Pass
37	0.004	0.061	N/A	0.004	0.091	N/A	Pass
38	0.000	0.048	N/A	0.000	0.073	N/A	Pass
39	0.003	0.058	N/A	0.003	0.087	N/A	Pass
40	0.000	0.046	N/A	0.000	0.069	N/A	Pass

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.

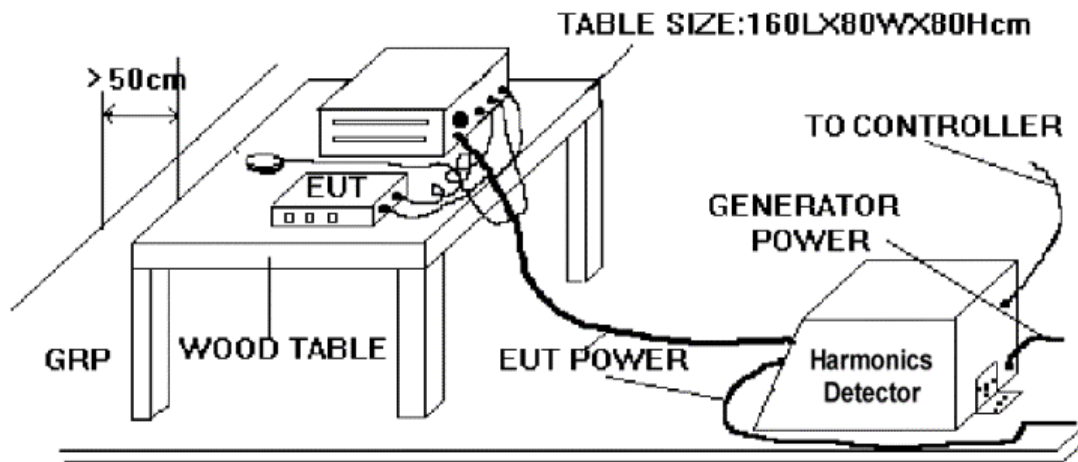
NOTE: The cycling frequency will be further limited by the P_{st} and P_{lt} limit.

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

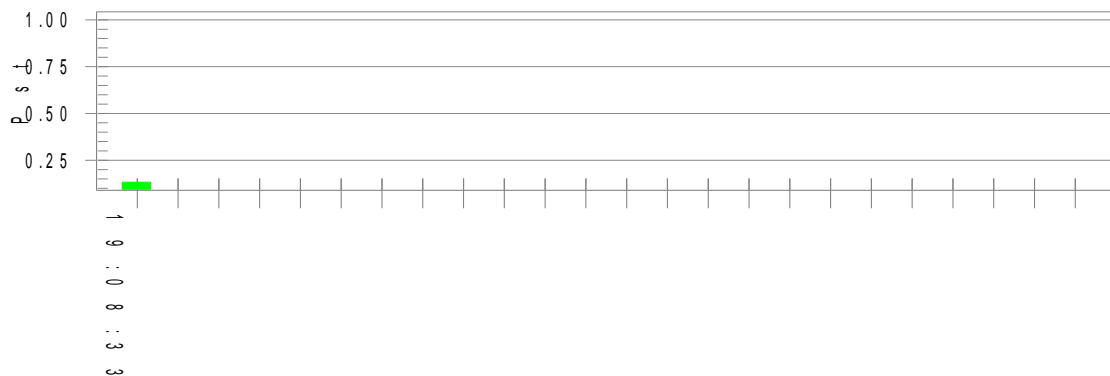
Product	Wireless Access Point	Temperature	25°C
Test Engineer	Bacon Dong	Relative Humidity	51%
Test Mode	Mode 1	Date of Test	2017/04/26

Test Result: Pass

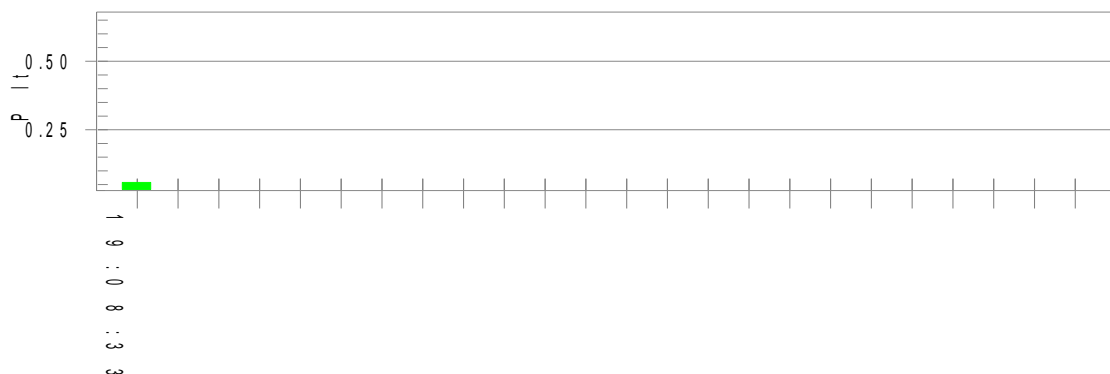
Status: Test Completed

Pst_i and limit line

European Limits



Plt and limit line



Parameter values recorded during the test:

Vrms at the end of test (Volt):	229.77		
Highest dt (%):	0.00	Test limit (%):	N/A
T-max (mS):	0	Test limit (mS):	500.0
Highest dc (%):	0.00	Test limit (%):	3.30
Highest dmax (%):	0.05	Test limit (%):	4.00
Highest Pst (10 min. period):	0.133	Test limit:	1.000
Highest Plt (2 hr. period):	0.058	Test limit:	0.650

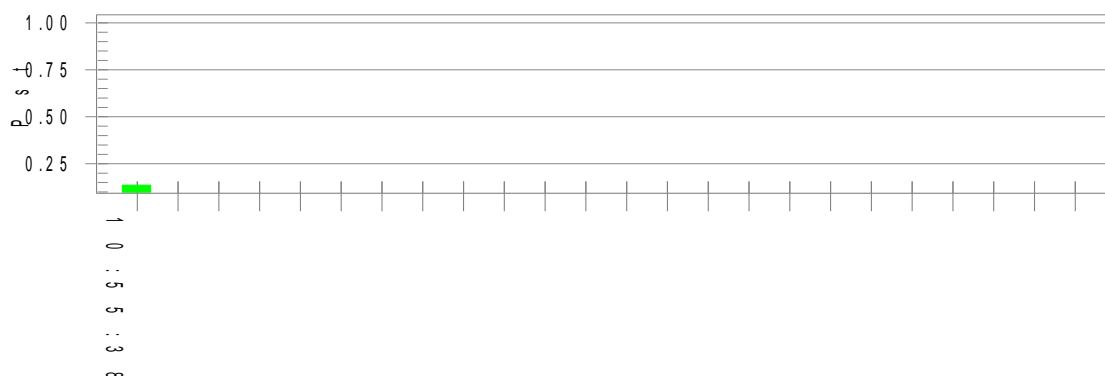
Product	Wireless Access Point	Temperature	24°C
Test Engineer	Bacon Dong	Relative Humidity	54%
Test Mode	Mode 2	Date of Test	2017/08/10

Test Result: Pass

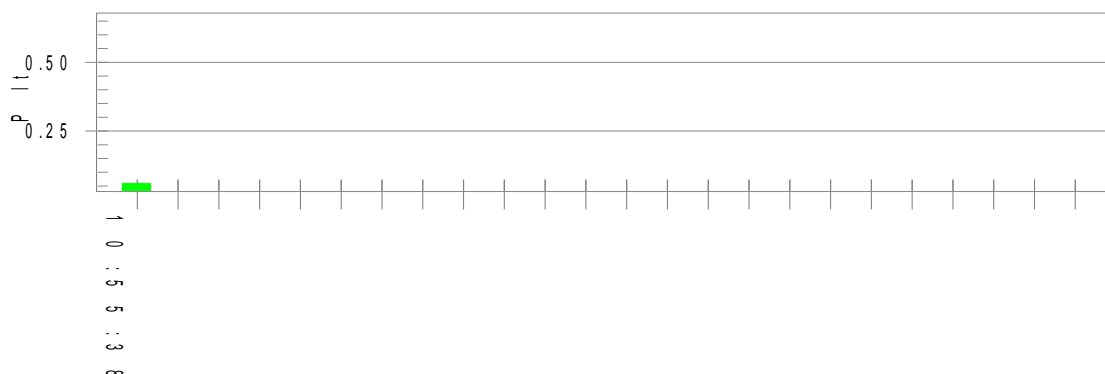
Status: Test Completed

Pst_i and limit line

European Limits



Plt and limit line



Parameter values recorded during the test:

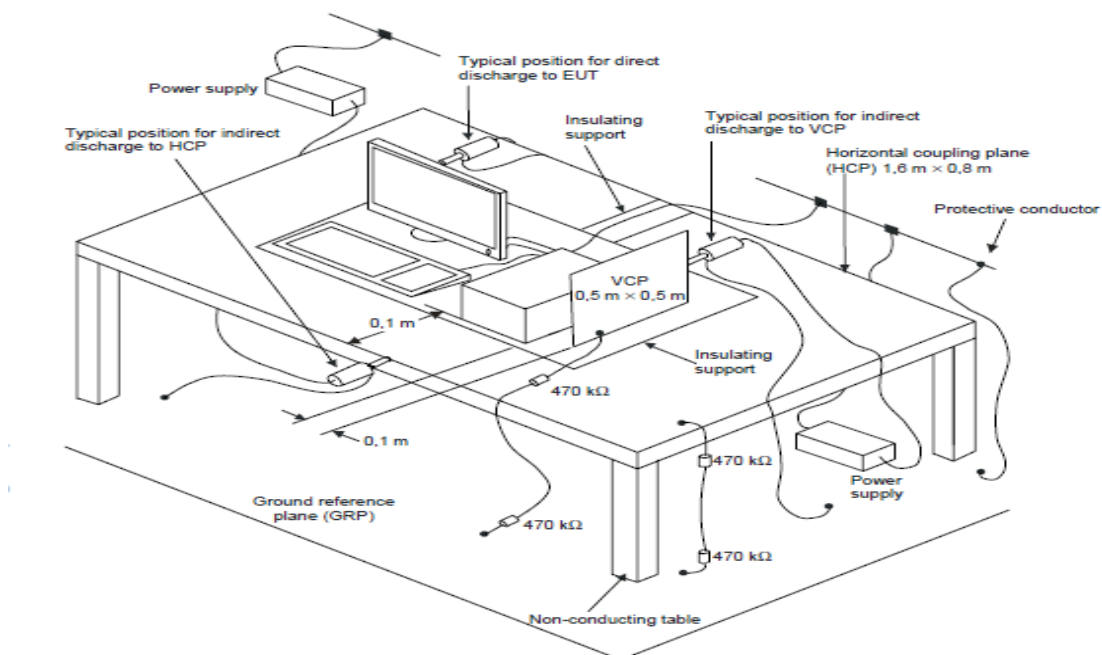
Vrms at the end of test (Volt):	229.80		
Highest dt (%):	0.00	Test limit (%):	N/A
T-max (mS):	0	Test limit (mS):	500.0
Highest dc (%):	0.00	Test limit (%):	3.30
Highest dmax (%):	0.04	Test limit (%):	4.00
Highest Pst (10 min. period):	0.136	Test limit:	1.000
Highest Plt (2 hr. period):	0.059	Test limit:	0.650

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

Product	Wireless Access Point	Temperature	22°C
Test Engineer	Polly Zong	Relative Humidity	52%
Test Mode	Mode 1	Date of Test	2017/04/28

Direct Application		Test Result	
Test Location	Test Level	Air Discharge	Contact Discharge
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A

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

Note: The EUT performance complied with performance criteria for CT & CR to MS Function and there is no any degradation of performance and function, and performance criterion was A.

Product	Wireless Access Point	Temperature	25°C
Test Engineer	Polly Zong	Relative Humidity	51%
Test Mode	Mode 2	Date of Test	2017/08/08

Direct Application		Test Result	
Test Location	Test Level	Air Discharge	Contact Discharge
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A

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

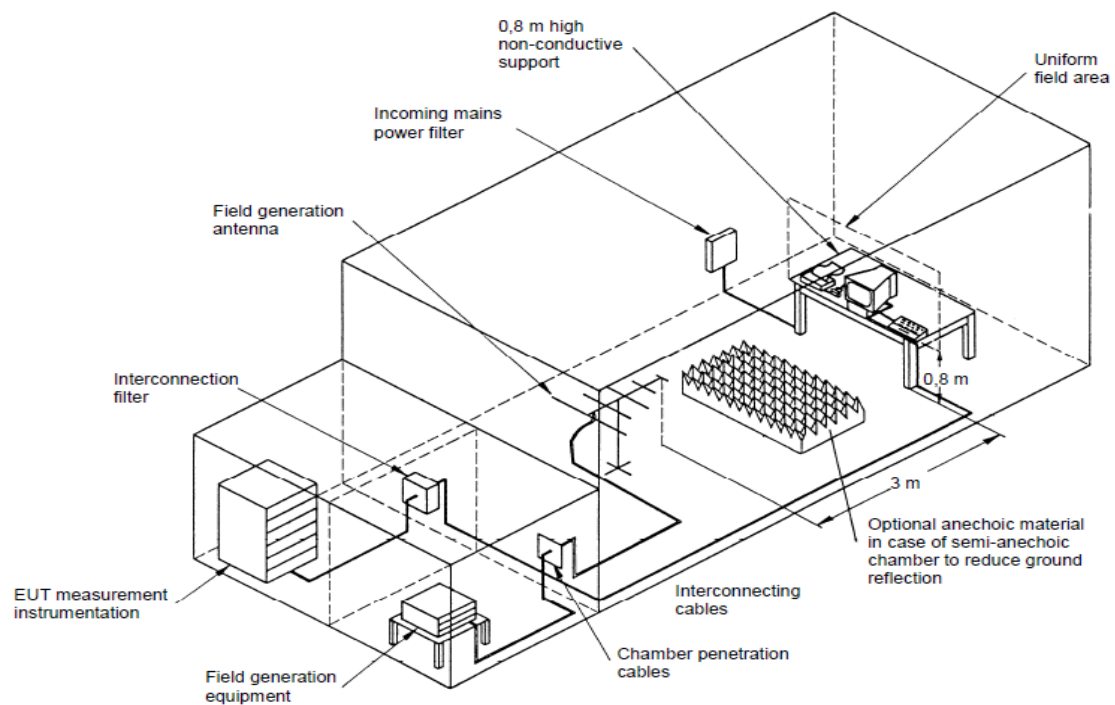
Note: The EUT performance complied with performance criteria for CT & CR to MS Function and there is no any degradation of performance and function, and performance criterion was A.

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 - 6000	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 6000MHz with the exception of the exclusion band for transmitters, receivers and duplex transceivers of EN 301 489-1, 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 the notebook.

All the scanning conditions are as follows:

	Condition of Test	Remarks
1.	Field Strength	3V/m
2.	Radiated Signal	AM 80% Modulated with 1kHz & Pluses 100% Modulated with 200Hz
3.	Scanning Frequency	80MHz - 6GHz
4.	Dwell Time	3 Seconds
5.	Frequency Step Size Δf	1%

9.4. Test Result

EUT	Wireless Access Point	Temperature	24°C
Test Engineer	Snake Ni	Relative Humidity	52%
Test Mode	Mode 1	Date of Test	2017/05/18

Frequency (MHz)	Polarity	Radiated Signal	Test Position	Field Strength (V/m)	Test Result
80 - 6000	Horizontal/ Vertical	AM 80% Modulated with 1kHz	Front	3	Pass
			Rear		Pass
			Left		Pass
			Right		Pass
			Top		Pass
			Bottom		Pass

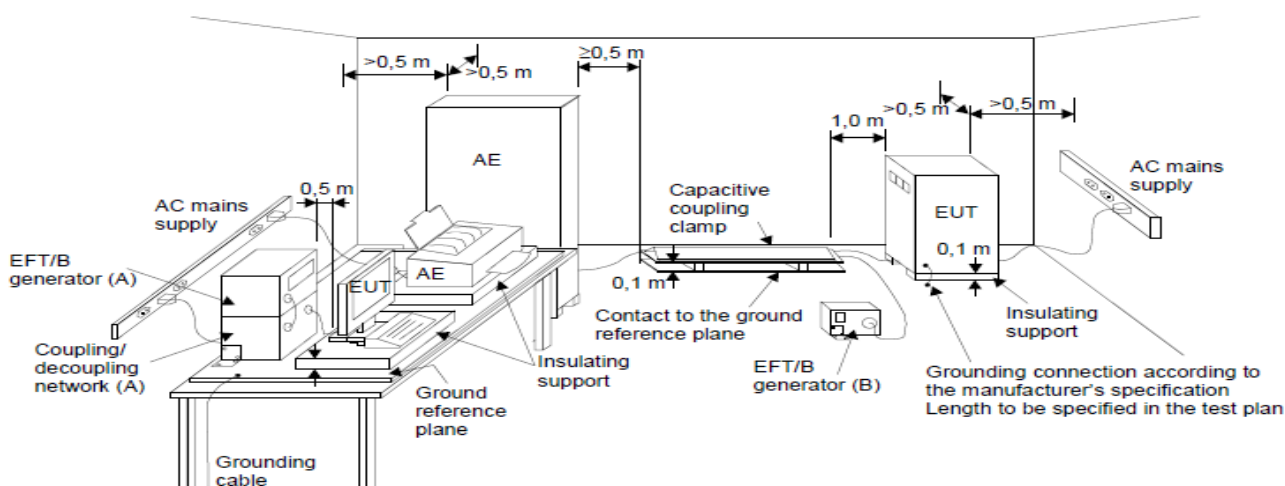
Note: The EUT performance complied with performance criteria for CT & CR to MS Function and there is no any degradation of performance and function, and performance criterion was A.

EUT	Wireless Access Point	Temperature	25°C
Test Engineer	Snake Ni	Relative Humidity	54%
Test Mode	Mode 2	Date of Test	2017/08/08

Frequency (MHz)	Polarity	Radiated Signal	Test Position	Field Strength (V/m)	Test Result
80 - 6000	Horizontal/ Vertical	AM 80% Modulated with 1kHz	Front	3	Pass
			Rear		Pass
			Left		Pass
			Right		Pass
			Top		Pass
			Bottom		Pass

Note: The EUT performance complied with performance criteria for CT & CR to MS Function and there is no any degradation of performance and function, and performance criterion was A.

10.1. Limit of Electrical Fast Transients



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	25°C
Test Engineer	Jone Zhang	Relative Humidity	52%
Test Mode	Mode 1	Date of Test	2017/05/15

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
POE's POE Port	+	0.5	60	Clamp	Note	Pass
POE's POE Port	-	0.5	60	Clamp	Note	Pass
POE's Data Port	+	0.5	60	Clamp	Note	Pass
POE's Data Port	-	0.5	60	Clamp	Note	Pass
LAN Port	+	0.5	60	Clamp	Note	Pass
LAN Port	-	0.5	60	Clamp	Note	Pass
POE Port	+	0.5	60	Clamp	Note	Pass
POE Port	-	0.5	60	Clamp	Note	Pass

Note: The EUT performance complied with performance criteria for TT & TR to MS Function and the “ping” function was interrupted during the test and can be self recover, and performance criterion was B.

Product	Wireless Access Point	Temperature	25°C
Test Engineer	Jone Zhang	Relative Humidity	54%
Test Mode	Mode 2	Date of Test	2017/08/07

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
LAN Port	+	0.5	60	Clamp	Note	Pass
LAN Port	-	0.5	60	Clamp	Note	Pass
POE Port	+	0.5	60	Clamp	Note	Pass
POE Port	-	0.5	60	Clamp	Note	Pass

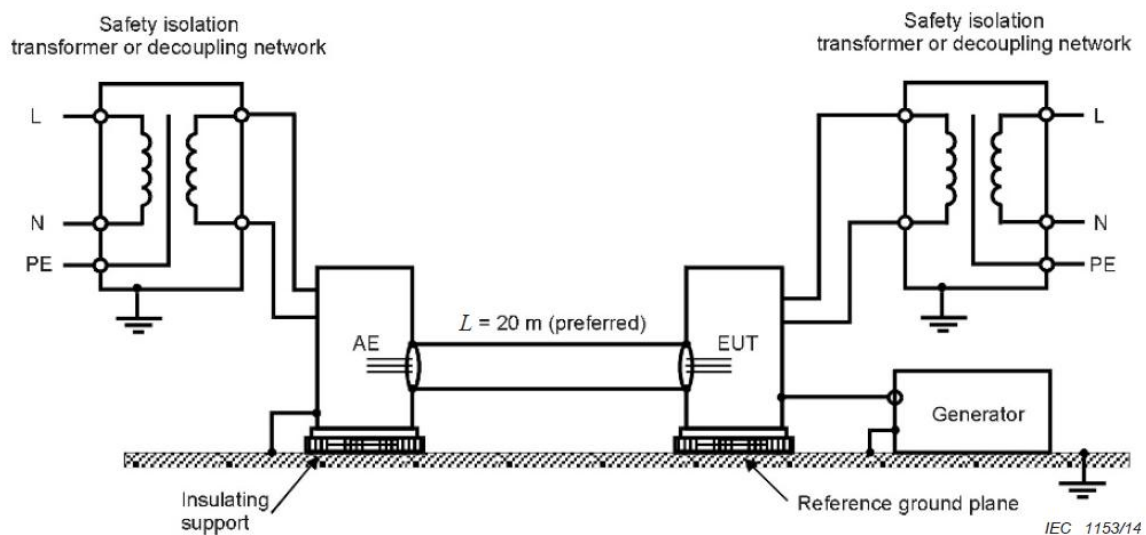
Note: The EUT performance complied with performance criteria for TT & TR to MS Function and the “ping” function was interrupted during the test and can be self recover, and performance criterion was B.

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
<p>Note 1: Where normal functioning cannot be achieved because of the impact of the CDN on the EUT, no test shall be required.</p> <p>Note 2: The test level for wired network ports, intended to be connected to indoor cables (longer than 30 m) shall be 0,5 kV (applied line to ground, or shield to ground)</p>			

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	25°C
Test Engineer	Jone Zhang	Relative Humidity	52%
Test Mode	Mode 1	Date of Test	2017/05/15

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

Note: The EUT performance complied with performance criteria for TT & TR to MS Function and the "ping" function was interrupted during the test and can be self recover, and performance criterion was B.

Product	Wireless Access Point	Temperature	25°C
Test Engineer	Jone Zhang	Relative Humidity	54%
Test Mode	Mode 2	Date of Test	2017/08/07

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

Note: The EUT performance complied with performance criteria for TT & TR to MS Function and the “ping” function was interrupted during the test and can be self recover, and performance criterion was B.

12. Radio-Frequency Common Mode

12.1. Limit of Radio-Frequency Common Mode

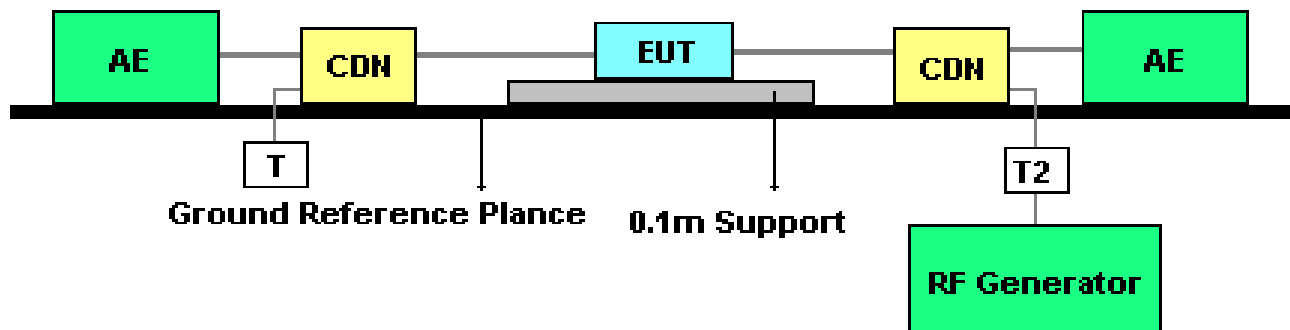
Environmental phenomenon	Test specification	Units	Performance criterion
Input AC power ports (See Note 1 and 2)			
Radio-frequency common mode	0.15 - 80	MHz	A
	3	V (unmodulated, r.m.s)	
	80	% AM (1kHz)	
Signal ports, telecommunication ports, and control ports (See Note 1, 2 and 3)			
Radio frequency common mode	0.15 - 80	MHz	A
	3	V (unmodulated, r.m.s)	
	80	% AM (1kHz)	
<p>NOTE 1: If the wanted signal is modulated at 1000Hz, then an audio signal of 400Hz shall be used.</p> <p>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.</p> <p>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.</p>			

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	0.15MHz - 80MHz
4.	Dwell Time	3 Seconds
5.	Frequency Step Size Δf	1%

12.4. Test Result

Product	Wireless Access Point	Temperature	25°C
Test Engineer	Jone Zhang	Relative Humidity	52%
Test Mode	Mode 1	Date of Test	2017/05/15

Frequency (MHz)	Inject Voltage (V)	Inject Ports	Inject Method	Observation	Result
0.15 ~ 80	3	AC Mains	CDN	Note	Pass
0.15 ~ 80	3	POE's POE Port	CDN	Note	Pass
0.15 ~ 80	3	POE's Data Port	CDN	Note	Pass
0.15 ~ 80	3	LAN Port	CDN	Note	Pass
0.15 ~ 80	3	POE Port	CDN	Note	Pass

Note: The EUT performance complied with performance criteria for CT & CR to MS Function and there is no any degradation of performance and function, and performance criterion was A.

Product	Wireless Access Point	Temperature	25°C
Test Engineer	Jone Zhang	Relative Humidity	54%
Test Mode	Mode 2	Date of Test	2017/08/07

Frequency (MHz)	Inject Voltage (V)	Inject Ports	Inject Method	Observation	Result
0.15 ~ 80	3	AC Mains	CDN	Note	Pass
0.15 ~ 80	3	LAN Port	CDN	Note	Pass
0.15 ~ 80	3	POE Port	CDN	Note	Pass

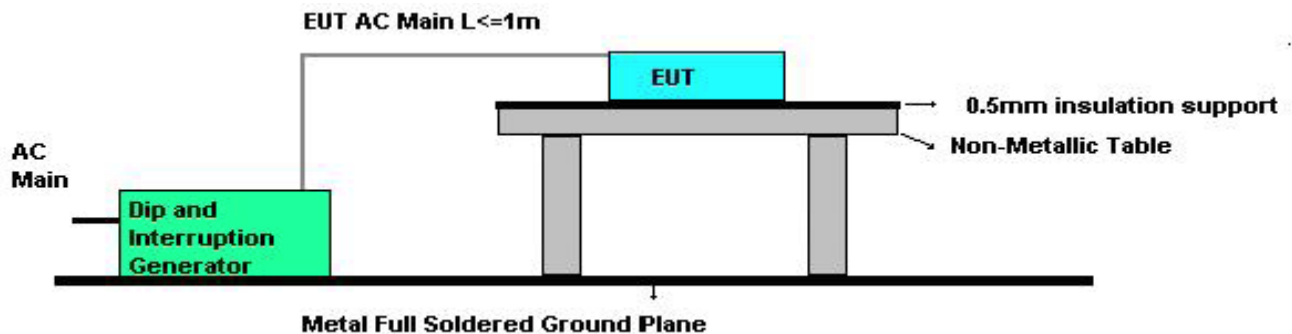
Note: The EUT performance complied with performance criteria for CT & CR to MS Function and there is no any degradation of performance and function, and performance criterion was A.

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	
	70	% residual	C
	25	cycle	
Voltage interruptions	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	25°C
Test Engineer	Jone Zhang	Relative Humidity	52%
Test Mode	Mode 1	Date of Test	2017/05/15
Voltage	AC 230V/50Hz		

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 2	Pass

Note 1: The EUT performance complied with performance criteria for TT & TR to MS Function and there is no any degradation of performance and function, and performance criterion was A.

Note 2: The system shut down during the test, but the function can be restored by the operation after the test, and the performance criterion C.

Product	Wireless Access Point	Temperature	25°C
Test Engineer	Jone Zhang	Relative Humidity	54%
Test Mode	Mode 2	Date of Test	2017/08/07
Voltage	AC 230V/50Hz		

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 2	Pass

Note 1: The EUT performance complied with performance criteria for TT & TR to MS Function and there is no any degradation of performance and function, and performance criterion was A.

Note 2: The system shut down during the test, but the function can be restored by the operation after the test, and the performance criterion C.

Product	Wireless Access Point	Temperature	25°C
Test Engineer	Jone Zhang	Relative Humidity	52%
Test Mode	Mode 1	Date of Test	2017/05/15
Voltage	AC 100V/50Hz		

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 2	Pass

Note 1: The EUT performance complied with performance criteria for TT & TR to MS Function and there is no any degradation of performance and function, and performance criterion was A.

Note 2: The system shut down during the test, but the function can be restored by the operation after the test, and the performance criterion C.

Product	Wireless Access Point	Temperature	25°C
Test Engineer	Jone Zhang	Relative Humidity	54%
Test Mode	Mode 2	Date of Test	2017/08/07
Voltage	AC 100V/50Hz		

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 2	Pass

Note 1: The EUT performance complied with performance criteria for TT & TR to MS Function and there is no any degradation of performance and function, and performance criterion was A.

Note 2: The system shut down during the test, but the function can be restored by the operation after the test, and the performance criterion C.

14. Uncertainty Measurement

Conducted Emission - SR2
<p>The maximum measurement uncertainty is evaluated as:</p> <p>9kHz~150kHz: $\pm 3.84\text{dB}$</p> <p>150kHz~30MHz: $\pm 3.46\text{dB}$</p>
Radiated Disturbance - AC2
<p>The maximum measurement uncertainty is evaluated as:</p> <p>Horizontal: 30MHz~300MHz: $\pm 4.07\text{dB}$</p> <p>300MHz~1GHz: $\pm 3.63\text{ dB}$</p> <p>Vertical: 30MHz~300MHz: $\pm 4.18\text{ dB}$</p> <p>300MHz~1GHz: $\pm 3.60\text{ dB}$</p>
Radiated Disturbance - AC2
<p>The maximum measurement uncertainty is evaluated as:</p> <p>Horizontal: 1GHz~6GHz: $\pm 4.16\text{ dB}$</p> <p>Vertical: 1GHz~6GHz: $\pm 4.76\text{ dB}$</p>
Harmonic Current Emissions - SR2
<p>The maximum measurement uncertainty is evaluated as $\pm 0.2\%$.</p>
Voltage Fluctuation and Flicker - SR2
<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>

15. List of Measuring Instrument

Conducted Emission - SR2

Instrument	Manufacturer	Type No.	Asset No.	Cali. Interval	Cali. Due Date
EMI Test Receiver	R&S	ESR7	MRTSUE06001	1 year	2018/06/20
Two-Line V-Network	R&S	ENV216	MRTSUE06002	1 year	2018/06/20
Two-Line V-Network	R&S	ENV216	MRTSUE06003	1 year	2018/06/20
Temperature/Humidity Meter	Yuhuaze	HTC-2	MRTSUE06181	1 year	2017/12/20
Shielding Anechoic Chamber	Mikebang	Chamber-SR2	MRTSUE06214	1 year	2018/05/10

Radiated Disturbance - AC2

Instrument	Manufacturer	Type No.	Asset No.	Cali. Interval	Cali. Due Date
EMI Test Receiver	R&S	ESR7	MRTSUE06001	1 year	2018/06/20
Broadband Coaxial Preamp	Schwarzbeck	BBV 9718	MRTSUE06176	1 year	2017/11/06
Bilog Period Antenna	Schwarzbeck	VULB 9162	MRTSUE06022	1 year	2017/11/06
Horn Antenna	Schwarzbeck	BBHA9120D	MRTSUE06171	1 year	2017/12/10
Digital Thermometer & Hygrometer	Minggao	ETH529	MRTSUE06170	1 year	2017/11/29
Anechoic Chamber	RIKEN	Chamber-AC2	MRTSUE06213	1 year	2018/05/10

Harmonic Current Emissions - SR2

Instrument	Manufacturer	Type No.	Asset No.	Cali. Interval	Cali. Due Date
Power Analyzer	California	PACS-1	MRTSUE06010	1 year	2018/01/21
AC Power Source	California	3001iX	MRTSUE06011	1 year	2018/01/21
Temperature/Humidity Meter	Yuhuaze	HTC-2	MRTSUE06214	1 year	2017/12/20
Shielding Anechoic Chamber	Mikebang	Chamber-SR2	MRTSUE06214	1 year	2018/05/10

Voltage Fluctuation and Flicker - SR2

Instrument	Manufacturer	Type No.	Asset No.	Cali. Interval	Cali. Due Date
Power Analyzer	California	PACS-1	MRTSUE06010	1 year	2018/01/21
AC Power Source	California	3001iX	MRTSUE06011	1 year	2018/01/21
Temperature/Humidity Meter	Yuhuaze	HTC-2	MRTSUE06214	1 year	2017/12/20
Shielding Anechoic Chamber	Mikebang	Chamber-SR2	MRTSUE06214	1 year	2018/05/10

Electrostatic Discharge - TR2

Instrument	Manufacturer	Type No.	Asset No.	Cali. Interval	Cali. Due Date
ESD Generator	EM TEST GmbH	Dito	MRTSUE06225	1 year	2018/01/09
Barometer	BaoPing	DYM3	MRTSUE06044	1 year	2017/11/08
Temperature/Humidity Meter	Yuhuaze	HTC-2	MRTSUE06179	1 year	2017/12/20

Radio-Frequency Electromagnetic Field - AC2

Instrument	Manufacturer	Type No.	Asset No.	Cali. Interval	Cali. Due Date
Signal Generator	Agilent	E4438C	MRTSUE06081	1 year	2017/12/06
EPM Series Power Meter	Agilent	E4418B	MRTSUE06204	1 year	2018/06/26
Power Sensor	Agilent	E9301H	MRTSUE06205	1 year	2018/06/26
Power Amplifier	AR	150W1000M1	MRTSUE06146	N/A	N/A
Power Amplifier	rflight	NTWPAS-1025100	MRTSUE06264	1 year	2018/04/12
Power Amplifier	rflight	NTWPAS-2560100	MRTSUE06263	1 year	2018/04/12
High-Gain Horn Antenna	AR	ATH800M5GA	MRTSUE06144	N/A	N/A
Log-Periodic Antenna	AR	ATR80M6G	MRTSUE06145	N/A	N/A
Digital Thermometer & Hygrometer	Minggao	ETH529	MRTSUE06170	1 year	2017/11/29
Anechoic Chamber	RIKEN	Chamber-AC2	MRTSUE06213	1 year	2018/05/10

Electrical Fast Transients - TR1

Instrument	Manufacturer	Type No.	Asset No.	Cali. Interval	Cali. Due Date
Ultra Compact Simulator	EM TEST GmbH	UCS500N7	MRTSUE06228	1 year	2018/01/09
Temperature/Humidity Meter	Yuhuaze	HTC-2	MRTSUE06178	1 year	2017/12/20

Surges - TR1

Instrument	Manufacturer	Type No.	Asset No.	Cali. Interval	Cali. Due Date
Ultra Compact Simulator	EM TEST GmbH	UCS500N7	MRTSUE06228	1 year	2018/01/09
Temperature/Humidity Meter	Yuhuaze	HTC-2	MRTSUE06178	1 year	2017/12/20

Radio-Frequency Common Mode - TR1

Instrument	Manufacturer	Type No.	Asset No.	Cali. Interval	Cali. Due Date
Compact Immunity Test System	TESEQ	TESEQ NSG4070-35	MRTSUE06237	1 year	2018/01/09
CDN	TESEQ	TESEQ M016S	MRTSUE06238	1 year	2018/01/09
Temperature/Humidity Meter	Yuhuaze	HTC-2	MRTSUE06178	1 year	2017/12/20

Power-Frequency Magnetic Field - TR1

Instrument	Manufacturer	Type No.	Asset No.	Cali. Interval	Cali. Due Date
Ultra Compact Simulator	EM TEST GmbH	UCS500N7	MRTSUE06228	1 year	2018/01/09
Motorized Variac	EM TEST GmbH	variac NX1-260-16	MRTSUE06229	1 year	2018/01/09
Temperature/Humidity Meter	Yuhuaze	HTC-2	MRTSUE06178	1 year	2017/12/20

Voltage Dips and Interruptions - TR1

Instrument	Manufacturer	Type No.	Asset No.	Cali. Interval	Cali. Due Date
Ultra Compact Simulator	EM TEST GmbH	UCS500N7	MRTSUE06228	1 year	2018/01/09
Motorized Variac	EM TEST GmbH	variac NX1-260-16	MRTSUE06229	1 year	2018/01/09
Temperature/Humidity Meter	Yuhuaze	HTC-2	MRTSUE06178	1 year	2017/12/20

Software	Version	Function
e3	v 8.3.5	EMI Test Software
Compliance Test System	v 4.6.2	Harmonic & Flicker
JS32-RS	v 1.0.0.1	RS Test Software
NSG 4070 CTRL	v 1.3.0.1	CS Test Software
IEC CTRL	v 6.0.1	EMS Test Software

The End