



# TEST REPORT

Verified code: 203629

<b>Report No.:</b>	E202002244903-1	<b>Application No.:</b>	E202002244903
<b>Client:</b>	Winstars Technology Limited		
<b>Address:</b>	1-5F, NO.5, Taisong Industrial Zone, Dalang Community, Dalang Street, Longhua District, Shenzhen China		
<b>Sample Description:</b>	Wireless AC750 Dual-Band Range Extender		
<b>Model:</b>	WS-WN576A2		
<b>Serial Model NO.:</b>	WL-WN576A2, SWV 733 B3 (IAN: 324886)		
<b>Test Location:</b>	Guangzhou GRG Metrology & Test Co., Ltd.		
<b>Test Specification:</b>	Draft ETSI EN 301 489-17 V3.2.2: (2019-12) ETSI EN 301 489-1 V2.2.3: 2019 EN 55032: 2015 EN 61000-3-2: 2019 EN 61000-3-3: 2013 EN 61000-4-2: 2009 EN 61000-4-3: 2006+A1:2008+A2:2010 EN 61000-4-4: 2012 EN 61000-4-5: 2014 EN 61000-4-6: 2014 EN 61000-4-11: 2004		
<b>Issue Date:</b>	2020/05/26		
<b>Test Result:</b>	Pass		
<b>Prepared By:</b> Test Engineer  Li Qin	<b>Reviewed By:</b> Technical Manager  Wu Haoting	<b>Approved By:</b> Manager  Zhu Yan	
<b>Other Aspects:</b>			
Note: /			
Abbreviations: ok / P = passed; fail / F = failed; n.a. / N = not applicable;			
The test result in this test report refers exclusively to the presented test sample. This report shall not be reproduced except in full, without the written approval of GRGT.			



## **DIRECTIONS OF TEST**

1. This company carries out test task according to the national regulation of verifications which can be traced to National Primary Standards and BIPM.
2. The test report merely corresponds to the test sample. It is not permitted to copy extracts of these test result without the written permission of the test laboratory.
3. If there is any objection concerning the test, the client should inform the laboratory within 15 days from the date of receiving the test report.

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## 1. TEST RESULT SUMMARY

ETSI EN 301 489-17 v3.2.0: 2017 & ETSI EN 301 489-1 v2.2.3: 2019			
Standard	Item	Result	Remarks
EN 55032: 2015	Conducted Emission	PASS	Meets the Class B requirement
	Asymmetric mode conducted emissions	PASS	Meets the Class B requirement
	Conducted differential voltage emissions	N/A <sup>1)</sup>	not applicable
	Radiated Emission	PASS	Meets the Class B requirement
EN 61000-3-2: 2014	Harmonics Current	PASS	Class A
EN 61000-3-3: 2013	Voltage Fluctuation and Flicks	PASS	Meets the requirement
ETSI EN 301 489-17 v3.2.0: 2017 & ETSI EN 301 489-1 v2.2.3: 2019			
Standard	Item	Result	Remarks
EN 61000-4-2: 2009	Electrostatic discharge	PASS	Criterion B
EN 61000-4-3: 2006+A1:2008+A2:2010	Radio frequency electromagnetic field	PASS	Criterion A
EN 61000-4-4: 2012	Electrical fast transients, common mode	PASS	Criterion B
EN 61000-4-5: 2014 + A1:2017	Surges	PASS	Criterion B/C
EN 61000-4-6: 2014	Radio frequency, common mode	PASS	Criterion A
EN 61000-4-11: 2004	Voltage Dips & Interruptions	PASS	Criterion B/B/C/C

Note 1: Only apply to RF modulator output ports, TV broadcast receiver tuner and FM broadcast receiver tuner ports with an accessible connector.



## 2. GENERAL DESCRIPTION OF EUT

### 2.1. APPLICANT

Name: Winstars Technology Limited  
Address: 1-5F, NO.5, Taisong Industrial Zone, Dalang Community, Dalang Street, Longhua District, Shenzhen China

### 2.2. MANUFACTURER

Name: Winstars Technology Limited  
Address: 1-5F, NO.5, Taisong Industrial Zone, Dalang Community, Dalang Street, Longhua District, Shenzhen China

### 2.3. FACTORY

Name: Winstars Technology Limited  
Address: 1-5F, NO.5, Taisong Industrial Zone, Dalang Community, Dalang Street, Longhua District, Shenzhen China

### 2.4. BASIC DESCRIPTION OF EQUIPMENT UNDER TEST

Equipment: Wireless AC750 Dual-Band Range Extender  
Model No.: WS-WN576A2  
Serial Model: WL-WN576A2, SWV 733 B3 (IAN: 324886)  
Model discrepancy: Customer model SWV 733 B3 (IAN: 324886) is the same type as our company's models WS-WN576A2 and WL-WN576A2, only with different naming methods. Their electrical circuit design, layout, components used and internal wiring are identical.  
Power supply: AC 220V 50Hz  
Adapter 1 specification: Model:  
Input: AC 100~240V~50/60Hz, 100mA

Frequency Range: **2.4G wifi:**

2412MHz~2472MHz: 802.11b; 802.11g; 802.11n(HT20)

2422MHz~2462MHz: 802.11n(HT40);

**5G wifi:**

5150MHz~5250MHz

Sample  
submitting  
way :☒ Provided by customer ☐ Sampling

I/O Port :

RJ45 Port

## 2.5. TEST MODE

Mode No.	Description of the modes
1	Full load +LAN 100Mbps 10%
2	Full load +LAN 10Mbps 10%

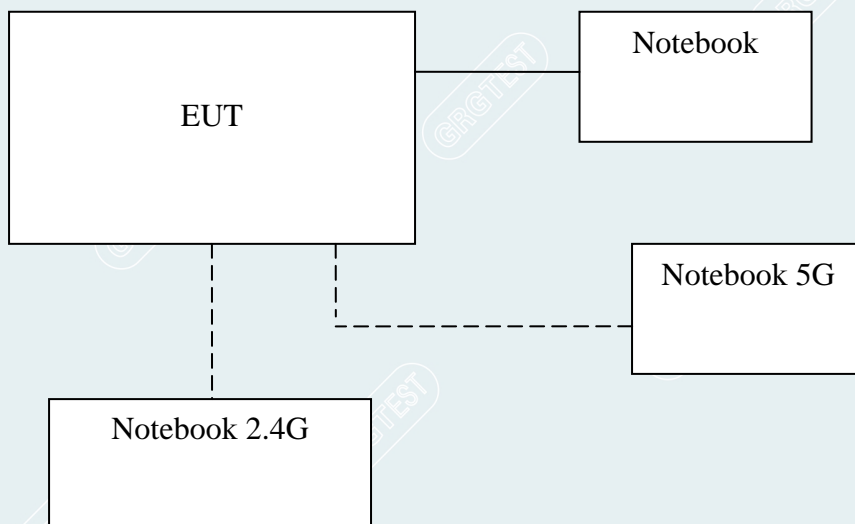
## 2.6. LOCAL SUPPORTIVE INSTRUMENTS

Name of Equipment	Manufacturer	Model	Serial Number	Note
Notebook	DELL	3490	0007	/
Notebook	DELL	3300	0003	/
Notebook	DELL	3300	0004	/
<b>Cable</b>				
RJ45 cable	/	CAT5	/	10m

## 2.7. MONITORING OF EUT FOR THE IMMUNITY TEST

- 1 Make a notebook connected the EUT by RJ45, and a notebook connected the EUT by wifi 2.4G and a notebook connect by wifi 5G.
- 2 Make their ping IP address each other, and make their network occupancy rate reached more than 20%.

## 2.8. CONFIGURATION OF SYSTEM UNDER TEST





### 3. LABORATORY AND ACCREDITATIONS

#### 3.1 LABORATORY

The tests and measurements refer to this report were performed by Shenzhen EMC Laboratory of Guangzhou GRG Metrology & Test Co., Ltd.

Add : No.1301 Guanguang Road Xinlan Community, Guanlan Street, Longhua District Shenzhen, 518110, People's Republic of China

P.C. : 518000

Tel : 0755-61180008

Fax : 0755-61180008

#### 3.2 ACCREDITATIONS

Our laboratories are accredited and approved by the following accreditation body according to ISO/IEC 17025.

**USA A2LA (2861.01)**

The measuring facility of laboratories has been authorized or registered by the following approval agencies.

**USA FCC**

**Canada INDUSTRY CANADA**

Copies of granted accreditation certificates are available for downloading from our web site, <http://www.grgtest.com>

#### 3.3 MEASUREMENT UNCERTAINTY

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

Measurement	Frequency	Uncertainty
Conduction Emissions	0.009MHz~0.15MHz	2.4dB
	0.15MHz~30MHz	2.6dB
Conduction Emissions (Asymmetric mode)	0.15MHz~30MHz	2.5dB
Radiated Emission(3m)	30MHz~1000MHz	4.3dB
	1000MHz~6000MHz	5.6dB

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

### 3.4 TEST INSTRUMENTS

Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
<b>Conducted Emission Measurement</b>				
EMI TEST RECEIVER	ROHDE&SCHWARZ	ESCI	100783	2020-11-27
LISN(EUT)	ROHDE&SCHWARZ	ENV216	101543	2021-03-14
ISN	TESEQ	ISN T8-CAT6	39886	2020-11-28
<b>Radiated Emission Measurement (Below 1GHz)</b>				
Antenna	Schwarzbrck	VULB9160	VULB9160-3401	2020-11-27
EMI TEST RECEIVER	R&S	ESU26	EMC2014-G260	2020-07-16
Preamplifier	EMEC	EM330	I00425	2021-04-01
<b>Radiated Emission Measurement (Above 1GHz)</b>				
Preamplifier	Agilent	8449B	3008A02060	2020-11-18
Antenna	Schwarzbeck	BBHA9120	D286	2020-11-27
EMI TEST RECEIVER	R&S	ESU26	EMC2014-G260	2020-07-16
<b>Voltage Dips &amp; Interruptions</b>				
Power Source	SCHAFFNER	NSG1007	54789	2021-04-13
Harmonic & Flicker Tester	SCHAFFNER	CCN1000	72045	2020-11-27
Proflin 2100 AC Switching Unit	TESEQ	NSG2200-1	A17820	2020-11-27
<b>Voltage Fluctuation/Flicker Measurement</b>				
Harmonic & Flicker Tester	SCHAFFNER	CCN1000	72045	2020-12-22
Power Source	SCHAFFNER	NSG1007	54789	2020-05-19
<b>ESD Test</b>				
Dito ESD Simulator	EM Test	dito	V0809103493	2020-12-30
<b>CS Test</b>				
Signal Generator	TESEQ	NSG4070	25807	2020-11-28
Attenuator	Weinschel Corp	40-6-34	QQ986	2020-11-28
CDN	TESEQ	CDN M316	24517	2020-11-27
EM-CLAMP	TESEQ	KEMZ801A	33441	2020-11-28
<b>Surge Test</b>				
Surge Coupling Decoupling Network	3ctest	SPN 3816T	ES0941720	2020-12-22
Telecom Wave	3ctest	CWS 600G	ES0381813	2020-12-22

Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
<b>Radiated Electromagnetic Field immunity Measurement</b>				
Signal Generator	ROHDE&SCHWARZ	SMA100A	100434	2020-11-28
RF-Switch Network	TOYO	BS5000	N/A	N/A
Power Amplifier	SCHAFFNER	CBA9433	3007	2020-04-19
Power Amplifier	TESEQ	CBA 3G-050	T44161	2020-06-16
Power Amplifier	Milmega	AS1860-50	1079232	2020-12-22
Directional Coupler	AR	DC6180A	328212	2020-11-27
Directional Coupler	AR	DC7144A	327057	2020-11-28
Bilog Antenna	SCHAFFNER	CBL6143	5082	2020-11-27
Stacked Double Log.-Per. Antenna	Schwarzbeck	STLP9149	9149-163	2020-11-30
EPM Series Power Meter	Keysight	N1914A	MY57090009	2020-11-18
Power Meter	Keysight	E9301A	MY57060008	2020-11-18
<b>CS Test</b>				
CS Signal Generator	TESEQ	NSG 3025	N/A	2020-11-27
CDN	TESEQ	CDN8014	26192	2020-11-27

## 4. EMISSION TEST

### 4.1 CONDUCTED EMISSION MEASUREMENT

#### 4.1.1 LIMITS

Frequency (MHz)	Class A (dBuV)		Class B (dBuV)	
	Quasi-peak	Average	Quasi-peak	Average
0.15 - 0.5	79	66	66 - 56	56 - 46
0.50 - 5.0	73	60	56	46
5.0 - 30.0	73	60	60	50

**NOTE:**

- (1) The lower limit shall apply at the transition frequencies.
- (2) The limit decreases in line with the logarithm of the frequency in the range of 0.15 to 0.50 MHz.
- (3) All emanations from a class A/B digital device or system, including any network of conductors and apparatus connected thereto, shall not exceed the level of field strengths specified above.

#### 4.1.2 TEST PROCEDURES

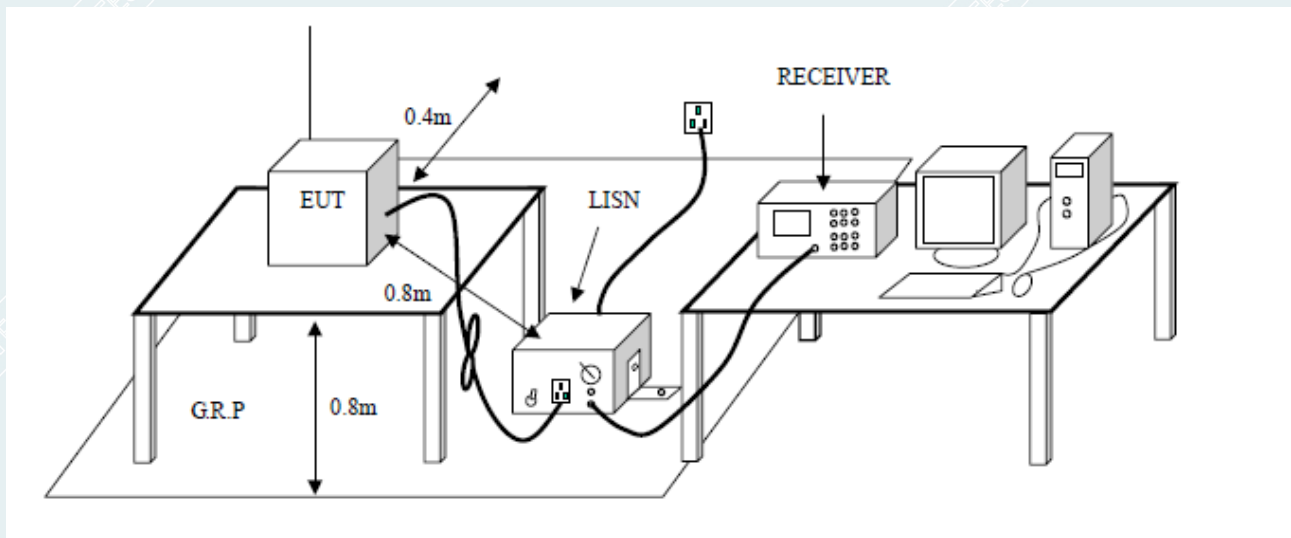
##### Procedure of Preliminary Test

- The EUT and Support equipment, if needed, was set up as per the test configuration to simulate typical usage per the user's manual. When the EUT is a tabletop system, a wooden table with a height of 0.8 meters is used and is placed on the ground plane as per EN 55032 (see Test Facility for the dimensions of the ground plane used). When the EUT is a floor standing equipment, it is placed on the ground plane, which has a 15 cm non-conductive covering to insulate the EUT from the ground plane.
- The EUT shall be insulated (by insulation of maximum thickness of 150 mm) from the horizontal reference ground plane. If the equipment requires a dedicated ground connection, this shall be provided and bonded to the RGP.
- Support equipment, if needed, was placed as per EN 55032.
- All I/O cables were positioned to simulate typical actual usage as per EN 55032.
- The operating ranges of voltage and frequency as specified for the EUT, having regard to the supply voltage and frequency for the intended market of the EUT. Measurement at two nominal voltages of 230 V ( $\pm 10$  V), using frequency of 50 Hz, is normally sufficient for an EUT intended for worldwide use.
- The test equipment EUT received DC power supplied by adapter, and the adapter received AC230V/50Hz main power, through a Line Impedance Stabilization Network (LISN), which supplied power source and was grounded to the ground plane.
- All support equipment power received from a second LISN.
- The EUT test program was started. Emissions were measured on each current carrying line of the EUT using an EMI Test Receiver connected to the LISN powering the EUT.
- The Receiver scanned from 150kHz to 30MHz for emissions in each of the test modes.
- During the above scans, the emissions were maximized by cable manipulation.
- The test mode(s) described in Item 4.1 were scanned during the preliminary test.
- After the preliminary scan, we found the test mode described in Item 4.1 producing the highest emission level.
- The EUT configuration and cable configuration of the above highest emission levels were recorded for reference of the final test.

### Procedure of Final Test

- EUT and support equipment were set up on the test bench as per the configuration with highest emission level in the preliminary test.
- A scan was taken on both power lines, Line 1 and Line 2, recording at least the six highest emissions. Emission frequency and amplitude were recorded into a computer in which correction factors were used to calculate the emission level and compare reading to the applicable limit.
- The test data of the worst-case condition(s) was recorded.

### 4.1.3 TEST SETUP



### 4.1.4 DATA SAMPLE

Frequency (MHz)	QuasiPeak Reading (dBuV)	Average Reading (dBuV)	Correction Factor (dB)	QuasiPeak Result (dBuV)	Average Result (dBuV)	QuasiPeak Limit (dBuV)	Average Limit (dBuV)	QuasiPeak Margin (dB)	Average Margin (dB)	Remark (Pass/Fail)
X.XXXX	32.69	25.65	11.52	44.21	37.17	65.78	55.79	-21.57	-18.62	Pass

Factor = Insertion loss of LISN + Cable Loss

Result = Quasi-peak Reading/ Average Reading + Factor

Limit = Limit stated in standard

Margin = Result (dBuV) – Limit (dBuV)

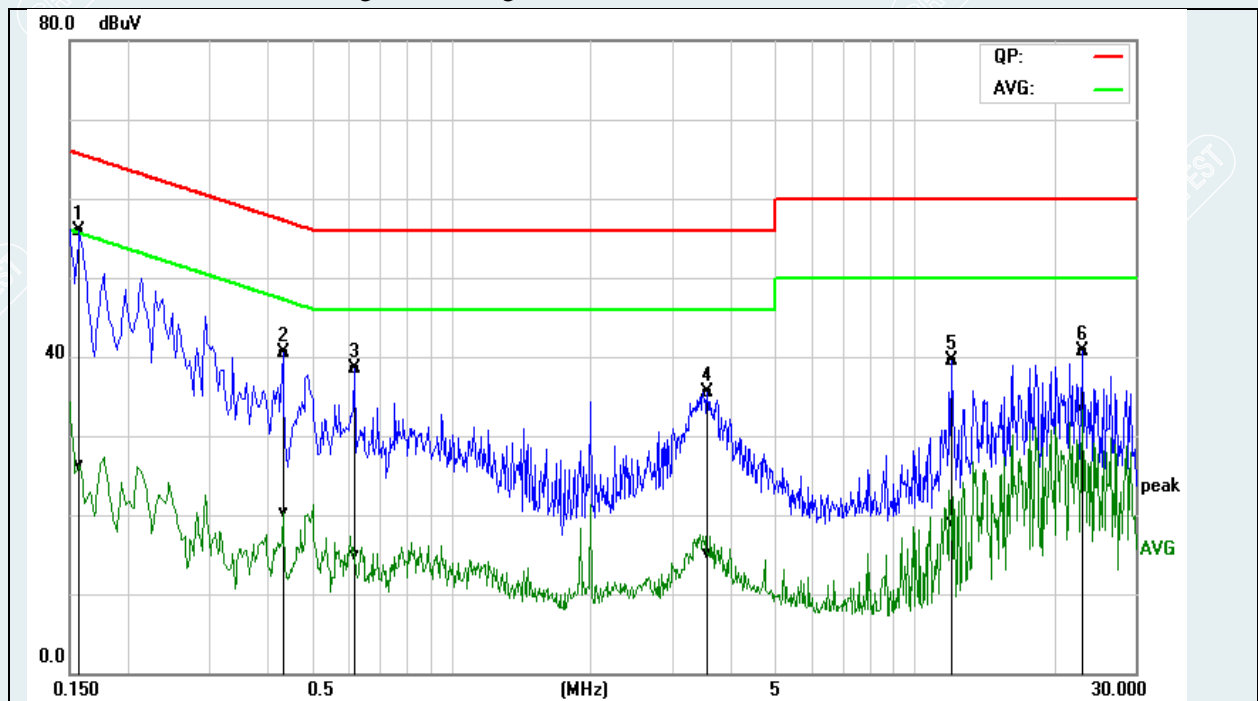


### 4.1.5 TEST RESULTS

Pre-test Mode 1, Mode 2, found that Mode 1 is the worst case.

<b>Model No.</b>	WS-WN576A2	<b>RBW,VBW</b>	9 kHz
<b>Environmental Conditions</b>	26°C, 55% RH	<b>Test Mode</b>	Mode 1
<b>Tested by</b>	Lin Qin	<b>Line</b>	L
<b>Tested Date</b>	2020/03/12	<b>Tested Voltage</b>	AC230V/50Hz
<b>Sample NO. in Lab</b>	0001		

(The chart below shows the highest readings taken from the final data.)

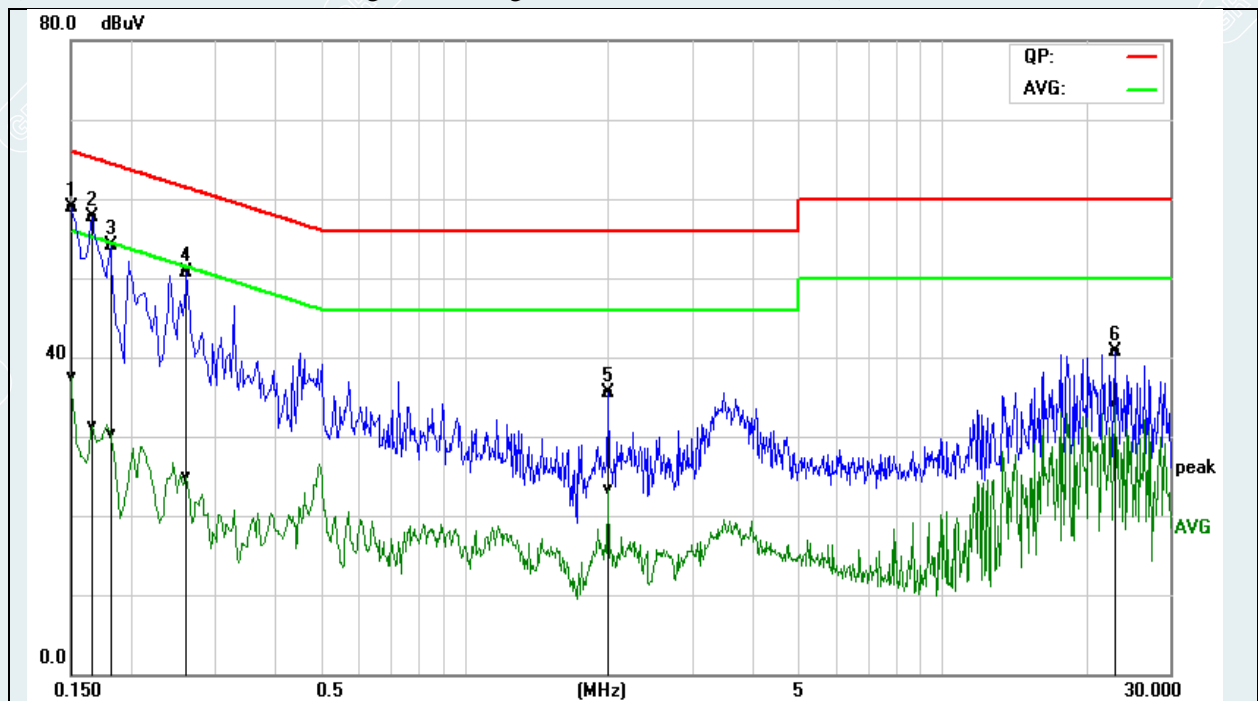


Frequency (MHz)	QuasiPeak Reading (dBuV)	Average Reading (dBuV)	Correction Factor (dB)	QuasiPeak Result (dBuV)	Average Result (dBuV)	QuasiPeak Limit (dBuV)	Average Limit (dBuV)	QuasiPeak Margin (dB)	Average Margin (dB)	Remark (Pass/Fail)
0.1580	45.92	16.39	9.89	55.81	26.28	65.56	55.57	-9.75	-29.29	Pass
0.4340	30.78	10.58	9.79	40.57	20.37	57.18	47.18	-16.61	-26.81	Pass
0.6180	28.63	5.21	9.79	38.42	15.00	56.00	46.00	-17.58	-31.00	Pass
3.5660	25.68	5.39	9.80	35.48	15.19	56.00	46.00	-20.52	-30.81	Pass
12.0260	29.80	9.41	9.77	39.57	19.18	60.00	50.00	-20.43	-30.82	Pass
23.1299	31.06	23.73	9.60	40.66	33.33	60.00	50.00	-19.34	-16.67	Pass

**REMARKS:** L = Live Line

Model No.	WS-WN576A2	RBW,VBW	9 kHz
Environmental Conditions	26°C, 55% RH	Test Mode	Mode 1
Tested by	Lin Qin	Line	N
Tested Date	2020/03/12	Tested Voltage	AC230V/50Hz
Sample NO. in Lab	0001		

(The chart below shows the highest readings taken from the final data.)

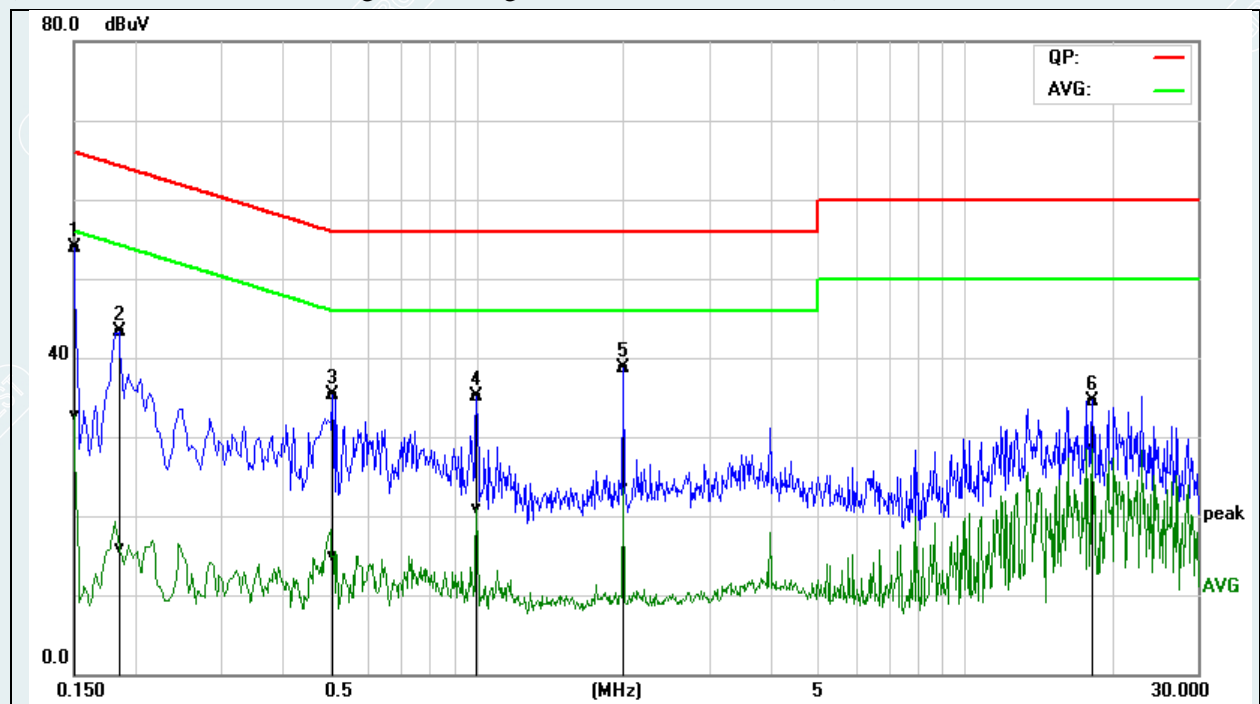


Frequency (MHz)	QuasiPeak Reading (dBuV)	Average Reading (dBuV)	Correction Factor (dB)	QuasiPeak Result (dBuV)	Average Result (dBuV)	QuasiPeak Limit (dBuV)	Average Limit (dBuV)	QuasiPeak Margin (dB)	Average Margin (dB)	Remark (Pass/Fail)
0.1500	49.10	27.54	9.87	58.97	37.41	65.99	56.00	-7.02	-18.59	Pass
0.1660	47.76	21.50	9.85	57.61	31.35	65.15	55.16	-7.54	-23.81	Pass
0.1819	44.31	20.39	9.84	54.15	30.23	64.39	54.40	-10.24	-24.17	Pass
0.2620	40.91	15.06	9.82	50.73	24.88	61.36	51.37	-10.63	-26.49	Pass
2.0020	25.74	13.43	9.79	35.53	23.22	56.00	46.00	-20.47	-22.78	Pass
23.1259	31.14	24.21	9.60	40.74	33.81	60.00	50.00	-19.26	-16.19	Pass

**REMARKS:** N = Neutral Line

<b>Model No.</b>	WS-WN576A2	<b>RBW,VBW</b>	9 kHz
<b>Environmental Conditions</b>	26°C, 55% RH	<b>Test Mode</b>	Mode 1
<b>Tested by</b>	Lin Qin	<b>Line</b>	L
<b>Tested Date</b>	2020/03/12	<b>Tested Voltage</b>	AC230V/50Hz
<b>Sample NO. in Lab</b>	0002		

(The chart below shows the highest readings taken from the final data.)

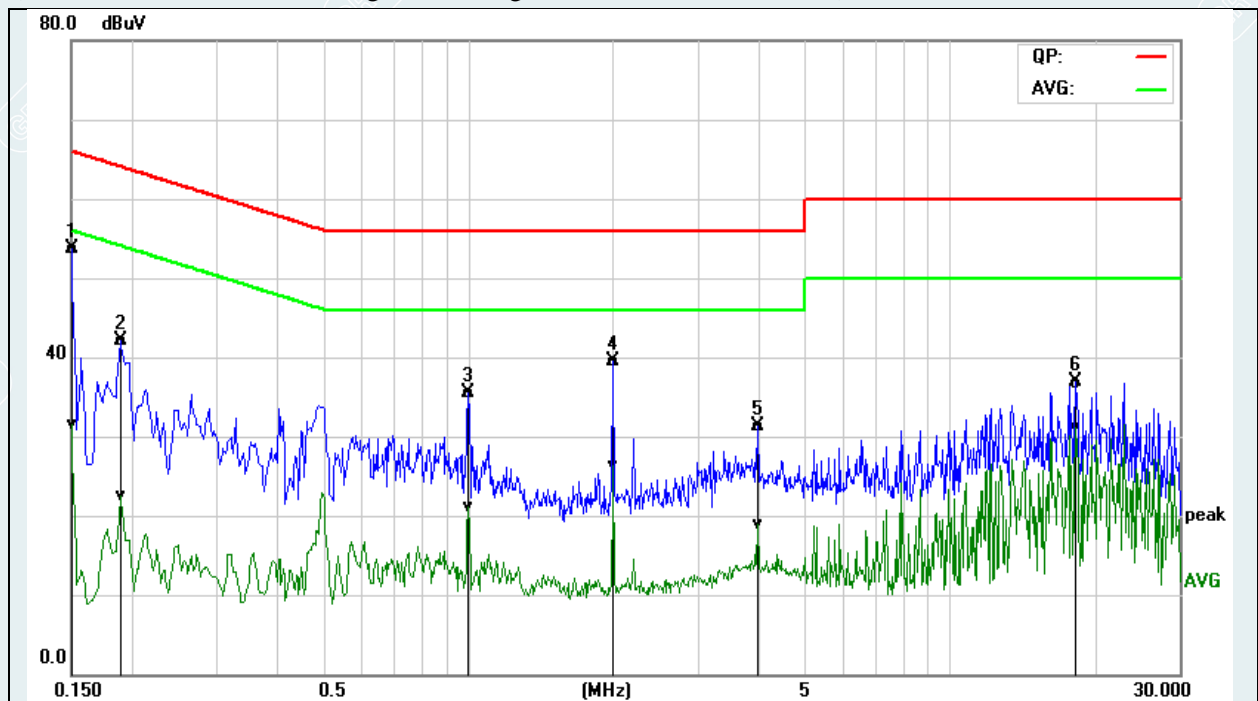


Frequency (MHz)	QuasiPeak Reading (dBuV)	Average Reading (dBuV)	Correction Factor (dB)	QuasiPeak Result (dBuV)	Average Result (dBuV)	QuasiPeak Limit (dBuV)	Average Limit (dBuV)	QuasiPeak Margin (dB)	Average Margin (dB)	Remark (Pass/Fail)
0.1500	44.02	22.80	9.88	53.90	32.68	65.99	56.00	-12.09	-23.32	Pass
0.1860	33.33	6.10	9.89	43.22	15.99	64.21	54.21	-20.99	-38.22	Pass
0.5100	25.44	5.20	9.79	35.23	14.99	56.00	46.00	-20.77	-31.01	Pass
1.0020	25.29	11.12	9.79	35.08	20.91	56.00	46.00	-20.92	-25.09	Pass
2.0020	28.94	13.73	9.79	38.73	23.52	56.00	46.00	-17.27	-22.48	Pass
18.2420	24.90	18.85	9.70	34.60	28.55	60.00	50.00	-25.40	-21.45	Pass

**REMARKS:** L = Live Line

Model No.	WS-WN576A2	RBW,VBW	9 kHz
Environmental Conditions	26°C, 55% RH	Test Mode	Mode 1
Tested by	Lin Qin	Line	N
Tested Date	2020/03/12	Tested Voltage	AC230V/50Hz
Sample NO. in Lab	0002		

(The chart below shows the highest readings taken from the final data.)



Frequency (MHz)	QuasiPeak Reading (dBuV)	Average Reading (dBuV)	Correction Factor (dB)	QuasiPeak Result (dBuV)	Average Result (dBuV)	QuasiPeak Limit (dBuV)	Average Limit (dBuV)	QuasiPeak Margin (dB)	Average Margin (dB)	Remark (Pass/Fail)
0.1500	43.91	21.63	9.87	53.78	31.50	65.99	56.00	-12.21	-24.50	Pass
0.1900	32.22	12.70	9.84	42.06	22.54	64.03	54.04	-21.97	-31.50	Pass
1.0020	25.75	11.30	9.79	35.54	21.09	56.00	46.00	-20.46	-24.91	Pass
2.0020	29.76	16.53	9.79	39.55	26.32	56.00	46.00	-16.45	-19.68	Pass
4.0020	21.53	9.13	9.79	31.32	18.92	56.00	46.00	-24.68	-27.08	Pass
18.2420	27.13	21.34	9.67	36.80	31.01	60.00	50.00	-23.20	-18.99	Pass

REMARKS: N = Neutral Line

## 4.2 ASYMMETRIC MODE CONDUCTED EMISSIONS MEASUREMENT

### 4.2.1 LIMITS

For Class A Equipment

FREQUENCY (MHz)	Voltage Limit (dBuV)		Current Limit (dBuA)	
	Quasi-peak	Average	Quasi-peak	Average
0.15 ~ 0.5	97 ~ 87	84 ~ 74	53 ~ 43	40 ~ 30
0.5 ~ 30.0	87	74	43	30

**Note:** The limits decrease linearly with the logarithm of the frequency in the range 0.15 MHz to 0.5 MHz.

For Class B Equipment

FREQUENCY (MHz)	Voltage Limit (dBuV)		Current Limit (dBuA)	
	Quasi-peak	Average	Quasi-peak	Average
0.15 - 0.5	84 ~ 74	74 ~ 64	40 ~ 30	30 ~ 20
0.5 - 30.0	74	64	30	20

**Note:** The limits decrease linearly with the logarithm of the frequency in the range 0.15 MHz to 0.5 MHz.

### 4.2.2 TEST PROCEDURES

Selecting ISN for unscreened cable or a current probe for screened cable to take measurement.

The port of the EUT was connected to the remote side support equipment through the ISN/Current Probe and communication in normal condition.

Making a overall range scan by using the test receiver controlled by controller and record at least six highest emissions for showing in the test report.

Emission frequency and amplitude were recorded into a computer in which correction factors were used to calculate the emission level and compare reading to the applicable limit.

In case of measuring on the screened cable, the current limit shall be applied; otherwise the voltage limit should be applied.

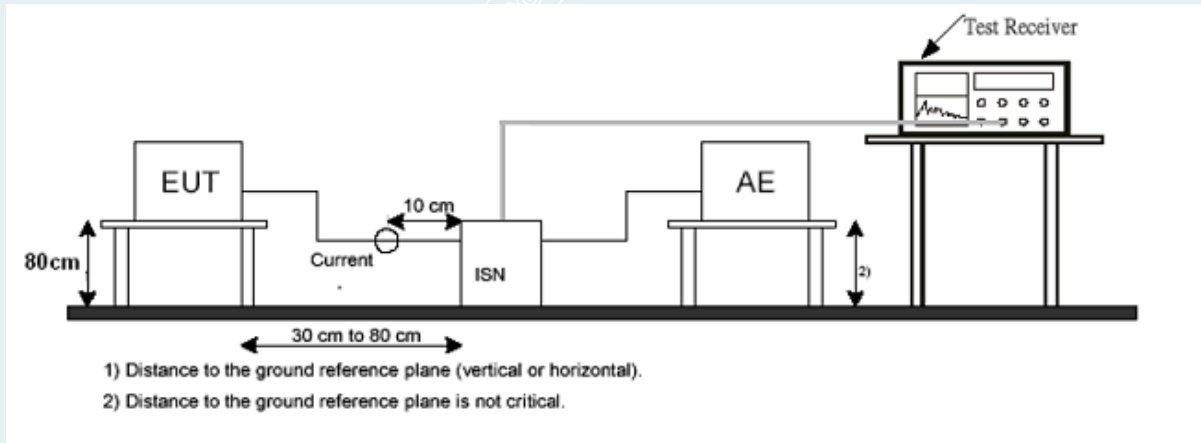
The test mode(s) described in Item 4.1 were scanned during the preliminary test.

After the preliminary scan, we found the test mode described in Item 4.1 producing the highest emission level.

The EUT configuration and cable configuration of the above highest emission levels were recorded for reference of the final test.



### 4.2.3 TEST SETUP



### 4.2.4 DATA SAMPLE

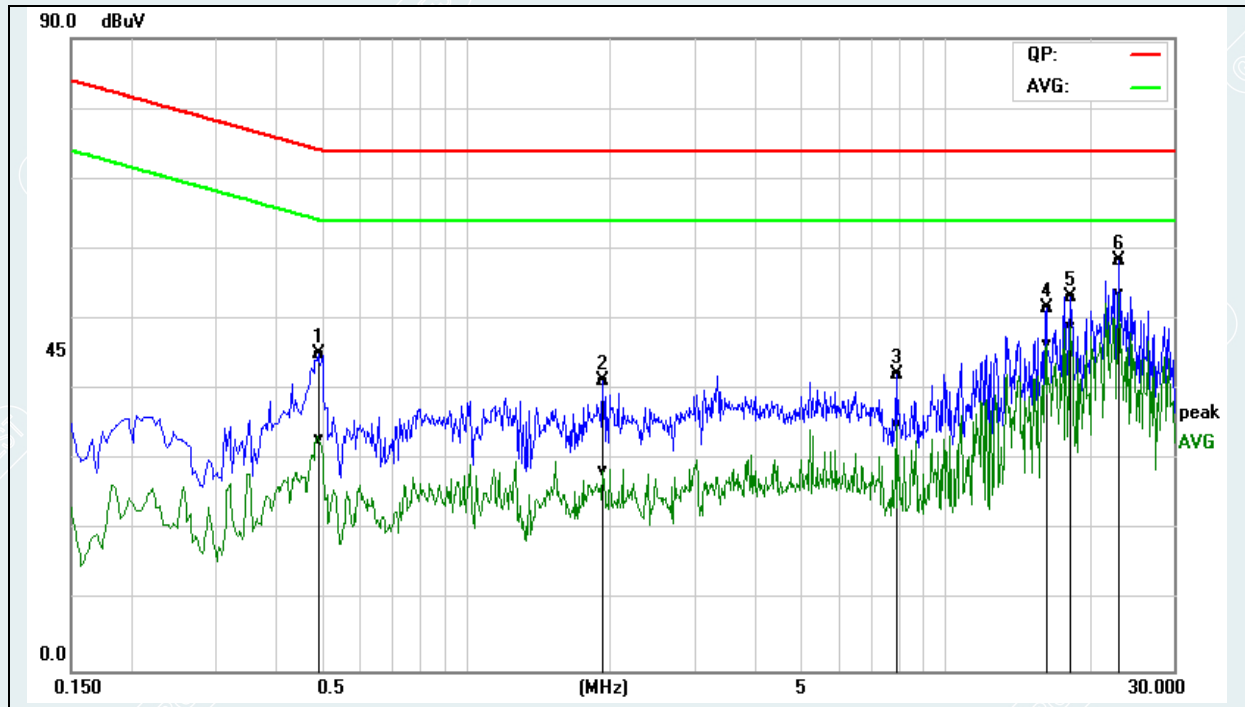
Frequency (MHz)	QuasiPeak Reading (dBuV)	Average Reading (dBuV)	Correction Factor (dB)	QuasiPeak Result (dBuV)	Average Result (dBuV)	QuasiPeak Limit (dBuV)	Average Limit (dBuV)	QuasiPeak Margin (dB)	Average Margin (dB)	Remark (Pass/Fail)
X.XXXX	32.69	25.65	11.52	44.21	37.17	65.78	55.79	-21.57	-18.62	Pass

Factor = Insertion loss of LISN + Cable Loss  
 Result = Quasi-peak Reading/ Average Reading + Factor  
 Limit = Limit stated in standard  
 Margin = Result (dBuV) – Limit (dBuV)

#### 4.2.5 TEST RESULTS

Model No.	WS-WN576A2	RBW,VBW	9 kHz
Environmental Conditions	26°C, 60% RH	Test Mode	Mode 1
Tested by	Lin Qin	Tested Date	2020/3/12
Sample NO. in Lab	0001		

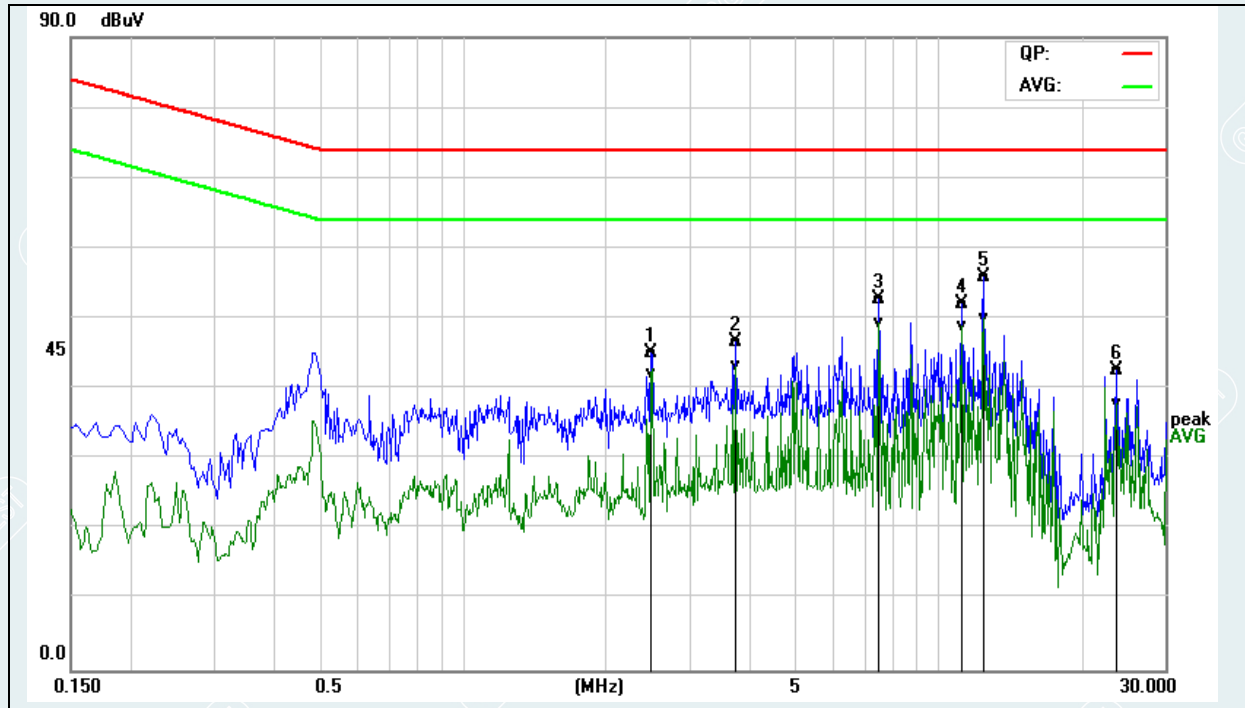
(The chart below shows the highest readings taken from the final data.)



Frequency (MHz)	QuasiPeak Reading (dBuV)	Average Reading (dBuV)	Correction Factor (dB)	QuasiPeak Result (dBuV)	Average Result (dBuV)	QuasiPeak Limit (dBuV)	Average Limit (dBuV)	QuasiPeak Margin (dB)	Average Margin (dB)	Remark (Pass/Fail)
0.4940	35.22	23.26	9.80	45.02	33.06	74.10	64.10	-29.08	-31.04	Pass
1.9380	31.50	18.66	9.71	41.21	28.37	74.00	64.00	-32.79	-35.63	Pass
7.9220	32.77	25.42	9.50	42.27	34.92	74.00	64.00	-31.73	-29.08	Pass
16.2260	42.21	37.14	9.32	51.53	46.46	74.00	64.00	-22.47	-17.54	Pass
18.2420	43.88	39.66	9.36	53.24	49.02	74.00	64.00	-20.76	-14.98	Pass
23.1299	49.04	44.43	9.27	58.31	53.70	74.00	64.00	-15.69	-10.30	Pass

<b>Model No.</b>	WS-WN576A2	<b>RBW,VBW</b>	9 kHz
<b>Environmental Conditions</b>	26°C, 60% RH	<b>Test Mode</b>	Mode 2
<b>Tested by</b>	Lin Qin	<b>Tested Date</b>	2020/3/12
<b>Sample NO. in Lab</b>	0001		

(The chart below shows the highest readings taken from the final data.)



Frequency (MHz)	QuasiPeak Reading (dBuV)	Average Reading (dBuV)	Correction Factor (dB)	QuasiPeak Result (dBuV)	Average Result (dBuV)	QuasiPeak Limit (dBuV)	Average Limit (dBuV)	QuasiPeak Margin (dB)	Average Margin (dB)	Remark (Pass/Fail)
2.4980	35.52	32.60	9.67	45.19	42.27	74.00	64.00	-28.81	-21.73	Pass
3.7500	37.06	33.62	9.58	46.64	43.20	74.00	64.00	-27.36	-20.80	Pass
7.5020	43.23	39.99	9.50	52.73	49.49	74.00	64.00	-21.27	-14.51	Pass
11.2500	42.61	39.53	9.45	52.06	48.98	74.00	64.00	-21.94	-15.02	Pass
12.5020	46.62	40.64	9.40	56.02	50.04	74.00	64.00	-17.98	-13.96	Pass
23.7500	33.38	28.63	9.25	42.63	37.88	74.00	64.00	-31.37	-26.12	Pass

## 4.3 RADIATED EMISSION MEASUREMENT

### 4.3.1 LIMITS

#### Below 1GHz

Frequency (MHz)	Class A limit dB(uV/m)		Class B limit dB(uV/m)	
	10m	3m	10m	3m
$30 \leq F \leq 230$	40	50	30	40
$230 \leq F \leq 1000$	47	57	37	47

**Note:**

- (1) The lower limit shall apply at the transition frequencies.
- (2) Emission level (dBuV/m) = 20 log Emission level (uV/m)

Frequency (MHz)	10m Class B limit dB(uV/m)		3m Class B limit dB(uV/m)	
	Fundamental	Harmonics	Fundamental	Harmonics
$30 \leq F \leq 230$	50	42	60	52
$230 \leq F \leq 300$		42		52
$300 \leq F \leq 1000$		46		56

**Note:**

- (1) Apply for FM receivers.
- (2) The lower limit shall apply at the transition frequencies.
- (3) Emission level (dBuV/m) = 20 log Emission level (uV/m)

#### Above 1GHz

Frequency (MHz)	Class A dB(uV/m) (At 3m)		Class B dB(uV/m) (At 3m)	
	Average	Peak	Average	Peak
$1000 \leq F \leq 3000$	56	76	50	70
$3000 \leq F \leq 6000$	60	80	54	74

#### Required highest frequency for radiated measurement

Highest internal frequency(Fx)	Highest measured frequency
$F_x \leq 108 \text{ MHz}$	1 GHz
$108 \text{ MHz} < F_x \leq 500 \text{ MHz}$	2 GHz
$500 \text{ MHz} < F_x \leq 1 \text{ GHz}$	5 GHz
$F_x > 1 \text{ GHz}$	$5 \times F_x$ up to a maximum of 6 GHz

NOTE 1: For FM and TV broadcast receivers, Fx is determined from the highest frequency generated or used excluding the local oscillator and tuned frequencies.

NOTE 2: Fx is defined in 3.1.18.

NOTE 3: For outdoor units of home satellite receiving systems highest measured frequency shall be 18GHz.

Where Fx is unknown, the radiated emission measurements shall be performed up to 6 GHz.

## 4.3.2 TEST PROCEDURE

### Procedure of Preliminary Test

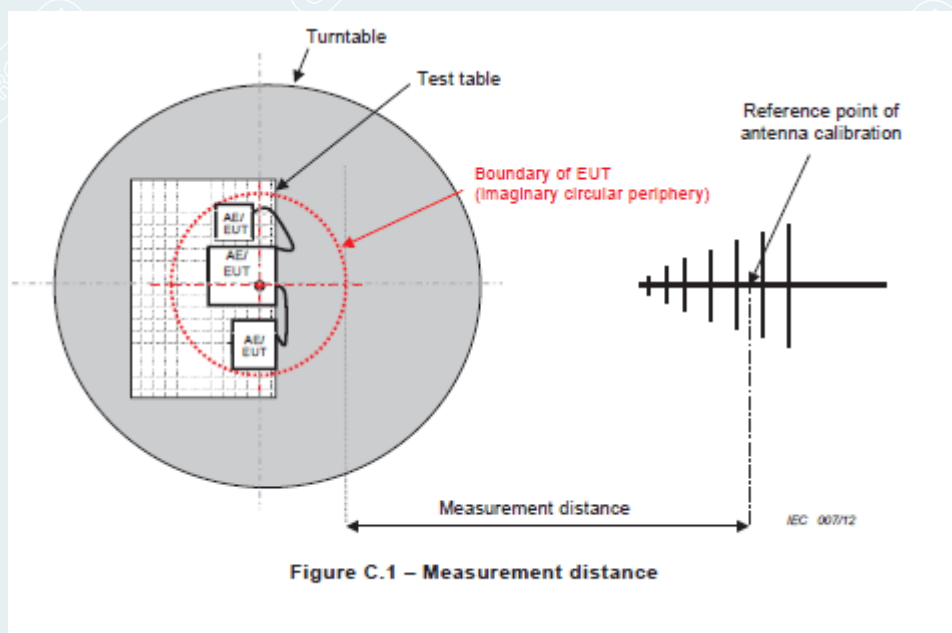
- The equipment was set up as per the test configuration to simulate typical usage per the user's manual. When the EUT is a tabletop system, a wooden turntable with a height of 0.8 meters is used which is placed on the ground plane. When the EUT is a floor standing equipment, it is placed on the ground plane which has a 3-12 mm non-conductive covering to insulate the EUT from the ground plane.
- The EUT shall be insulated (by insulation of maximum thickness of 150 mm) from the horizontal reference ground plane. If the equipment requires a dedicated ground connection, this shall be provided and bonded to the RGP.
- Support equipment, if needed, was placed as per EN 55032.
- All I/O cables were positioned to simulate typical usage as per EN 55032.
- The operating ranges of voltage and frequency as specified for the EUT, having regard to the supply voltage and frequency for the intended market of the EUT. Measurement at two nominal voltages of 230 V ( $\pm 10$  V), using frequency of 50 Hz, is normally sufficient for an EUT intended for worldwide use.
- The EUT received DC power supplied by adapter, and adapter received AC 230V/50Hz main power from the outlet socket under the turntable. All support equipment power received from another socket under the turntable.
- The antenna was placed at 3 meter away from the EUT as stated in EN 55032. The antenna connected to the Spectrum Analyzer via a cable and at times a pre-amplifier would be used.
- The Analyzer / Receiver quickly scanned from 30MHz to 6000MHz. The EUT test program was started. Emissions were scanned and measured rotating the EUT to 360 degrees and positioning the antenna 1 to 4 meters (For Below 1GHz) or 1 meter (For Above 1GHz) above the ground plane, in both the vertical and the horizontal polarization, to maximize the emission reading level.
- The test mode(s) described in Item 4.1 were scanned during the preliminary test:
- After the preliminary scan, we found the test mode described in Item 4.1 producing the highest emission level.
- The EUT and cable configuration, antenna position, polarization and turntable position of the above highest emission level were recorded for the final test.

### Procedure of Final Test

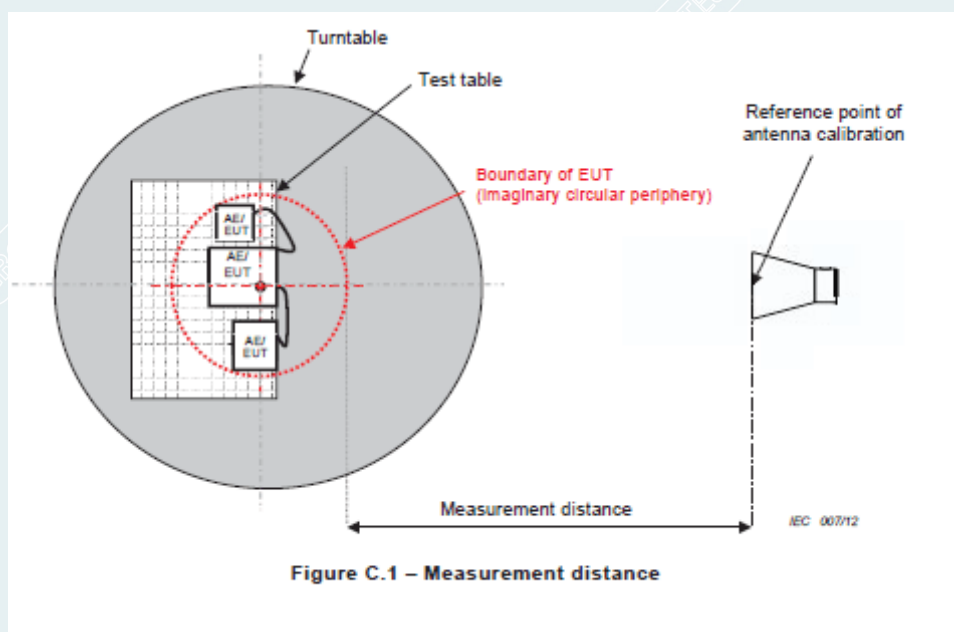
- EUT and support equipment were set up on the turntable as per the configuration with highest emission level in the preliminary test.
- The Analyzer / Receiver scanned from 30MHz to 6000MHz. Emissions were scanned and measured rotating the EUT to 360 degrees, varying cable placement and positioning the antenna 1 to 4 meters above the ground plane, in both the vertical and the horizontal polarization, to maximize the emission reading level.
- Recorded at least the six highest emissions. Emission frequency, amplitude, antenna position, polarization and turntable position were recorded into a computer in which correction factors were used to calculate the emission level and compare reading to the applicable limit and only Q.P. (For Below 1GHz) or Peak/Average (For Above 1GHz) reading is presented.
- The test data of the worst-case condition(s) was recorded.



### 4.3.3 TEST SETUP



Below the frequency of 1GHz



Above the frequency of 1GHz

### 4.3.4 DATA SAMPLE

#### Below 1GHz

Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Pole (V/H)	Remark
X.XXXX	37.47	-16.41	21.06	30.00	-8.94	V	QP

Frequency (MHz)	= Emission frequency in MHz
Reading (dBuV)	= Uncorrected Analyzer / Receiver reading
Correct Factor (dB/m)	= Antenna factor + Cable loss – Amplifier gain
Result (dBuV/m)	= Reading (dBuV) + Corr. Factor (dB/m)
Limit (dBuV/m)	= Limit stated in standard
Margin (dB)	= Result (dBuV/m) – Limit (dBuV/m)
Peak	= Peak Reading
Q.P.	= Quasi-peak Reading

#### Above 1GHz

Frequency (MHz)	Reading (dBuV)	Correction Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Pole (V/H)	Remark
X.XXXX	55.54	4.56	60.10	70.00	-9.90	V	Peak
X.XXXX	29.66	4.56	34.22	50.00	-15.78	V	AVG

Frequency (MHz)	= Emission frequency in MHz
Reading (dBuV)	= Uncorrected Analyzer / Receiver reading
Correction Factor (dB/m)	= Antenna factor + Cable loss – Amplifier gain
Result (dBuV/m)	= Reading (dBuV) + Corr. Factor (dB/m)
Limit (dBuV/m)	= Limit stated in standard
Margin (dB)	= Result (dBuV/m) – Limit (dBuV/m)
Peak	= Peak Reading
AVG	= Average Reading

#### Calculation Formula

Margin (dB) = Result (dBuV/m) – Limits (dBuV/m)

Result (dBuV/m) = Reading (dBuV) + Correction Factor (dB/m)

### 4.3.5 TEST RESULTS

#### Below 1GHz

Pre-test Mode 1~Mode 2, found that Mode 1 is the worst case.

Model No.	WS-WN576A2	Test Mode	Mode 1
Environmental Conditions	25°C, 60% RH	RBW,VBW	120 kHz
Antenna Pole	Vertical	Antenna Distance	3m
Detector Function	QP	Tested By	Lin Qin
Tested Date	2020/03/16	Tested Voltage	AC 230V/50Hz
Sample NO. in Lab	0001		

(The chart below shows the highest readings taken from the final data.)



Freq. [MHz]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Trace	Height [cm]	Angle [°]	Polarity
159.980	24.32	-24.16	40.00	15.68	QP	200	230	Vertical
207.510	25.26	-26.64	40.00	14.74	QP	200	294	Vertical
250.190	27.25	-25.19	47.00	19.75	QP	100	98	Vertical
332.640	30.34	-22.35	47.00	16.66	QP	100	357	Vertical
636.250	34.13	-14.35	47.00	12.87	QP	100	201	Vertical
767.200	28.18	-12.11	47.00	18.82	QP	200	323	Vertical

**Remarks:** 1. QP= Quasi-peak Reading

2. The other emission levels were very low against the limit.

Model No.	WS-WN576A2	Test Mode	Mode 1
Environmental Conditions	25°C, 60% RH	RBW,VBW	120 kHz
Antenna Pole	Horizontal	Antenna Distance	3m
Detector Function	QP	Tested By	Lin Qin
Tested Date	2020/03/16	Tested Voltage	AC 230V/50Hz
Sample NO. in Lab	0001		

(The chart below shows the highest readings taken from the final data.)



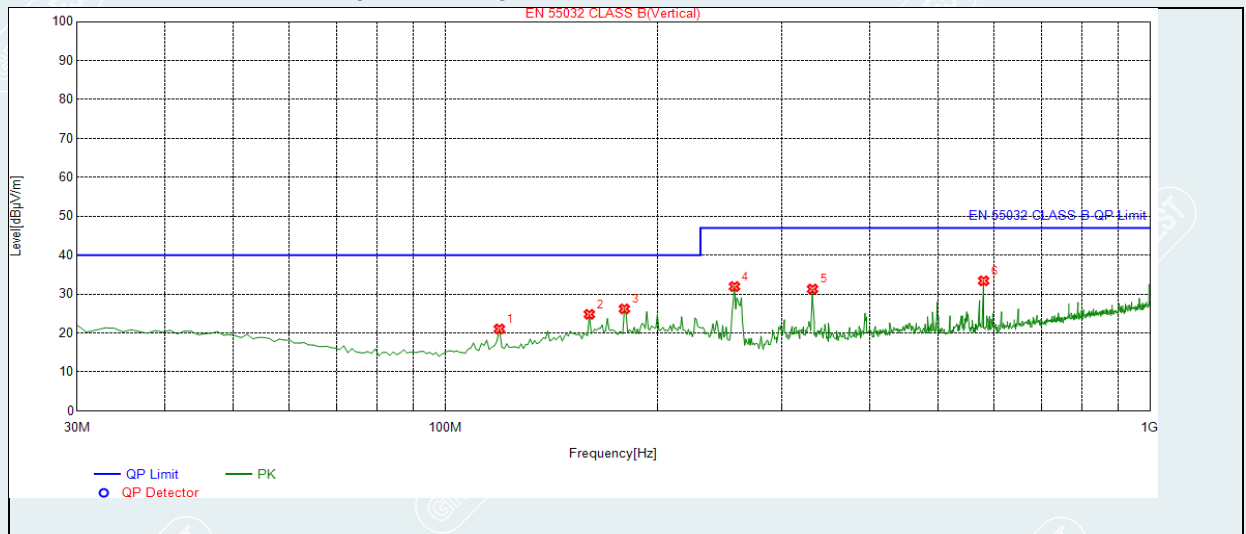
Freq. [MHz]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Trace	Height [cm]	Angle [°]	Polarity
79.4700	24.30	-30.41	40.00	15.70	QP	100	293	Horizontal
139.610	26.99	-24.74	40.00	13.01	QP	100	316	Horizontal
332.640	23.76	-22.35	47.00	23.24	QP	100	8	Horizontal
498.510	30.34	-17.72	47.00	16.66	QP	100	84	Horizontal
644.980	33.84	-14.22	47.00	13.16	QP	200	249	Horizontal
840.920	34.28	-10.61	47.00	12.72	QP	200	249	Horizontal

**Remarks:** 1. QP= Quasi-peak Reading

2. The other emission levels were very low against the limit.

<b>Model No.</b>	WS-WN576A2	<b>Test Mode</b>	Mode 1
<b>Environmental Conditions</b>	25°C, 60% RH	<b>RBW,VBW</b>	120 kHz
<b>Antenna Pole</b>	Vertical	<b>Antenna Distance</b>	3m
<b>Detector Function</b>	QP	<b>Tested By</b>	Lin Qin
<b>Tested Date</b>	2020/03/16	<b>Tested Voltage</b>	AC 230V/50Hz
<b>Sample NO. in Lab</b>	0002		

(The chart below shows the highest readings taken from the final data.)



Freq. [MHz]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Trace	Height [cm]	Angle [°]	Polarity
119.240	21.05	-27.17	40.00	18.95	QP	200	257	Vertical
159.980	24.80	-24.16	40.00	15.20	QP	200	77	Vertical
179.380	26.20	-25.29	40.00	13.80	QP	200	90	Vertical
256.980	31.94	-24.93	47.00	15.06	QP	100	56	Vertical
331.670	31.30	-22.38	47.00	15.70	QP	100	350	Vertical
579.990	33.41	-15.73	47.00	13.59	QP	200	72	Vertical

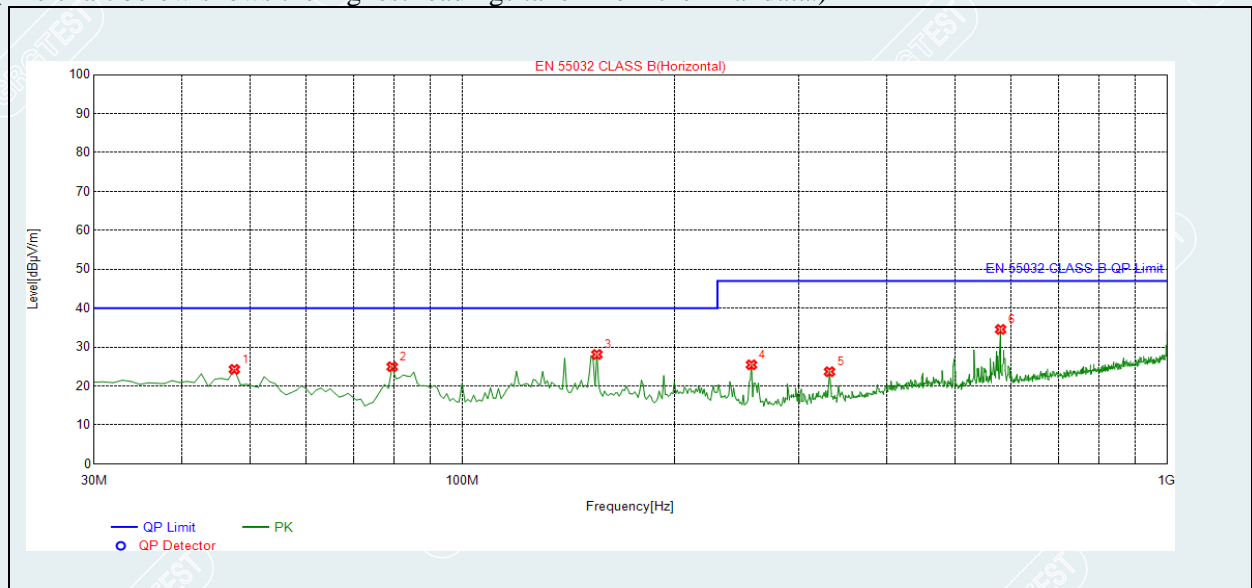
**Remarks:** 1. QP= Quasi-peak Reading

2. The other emission levels were very low against the limit.



<b>Model No.</b>	WS-WN576A2	<b>Test Mode</b>	Mode 1
<b>Environmental Conditions</b>	25°C, 60% RH	<b>RBW,VBW</b>	120 kHz
<b>Antenna Pole</b>	Horizontal	<b>Antenna Distance</b>	3m
<b>Detector Function</b>	QP	<b>Tested By</b>	Lin Qin
<b>Tested Date</b>	2020/03/16	<b>Tested Voltage</b>	AC 230V/50Hz
<b>Sample NO. in Lab</b>	0002		

(The chart below shows the highest readings taken from the final data.)



Freq. [MHz]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Trace	Height [cm]	Angle [°]	Polarity
47.4600	24.27	-27.82	40.00	15.73	QP	200	9	Horizontal
79.4700	24.95	-30.41	40.00	15.05	QP	100	264	Horizontal
155.130	28.11	-24.04	40.00	11.89	QP	100	203	Horizontal
256.980	25.45	-24.93	47.00	21.55	QP	200	130	Horizontal
331.670	23.68	-22.38	47.00	23.32	QP	200	125	Horizontal
579.990	34.54	-15.73	47.00	12.46	QP	100	280	Horizontal

**Remarks:** 1. QP= Quasi-peak Reading

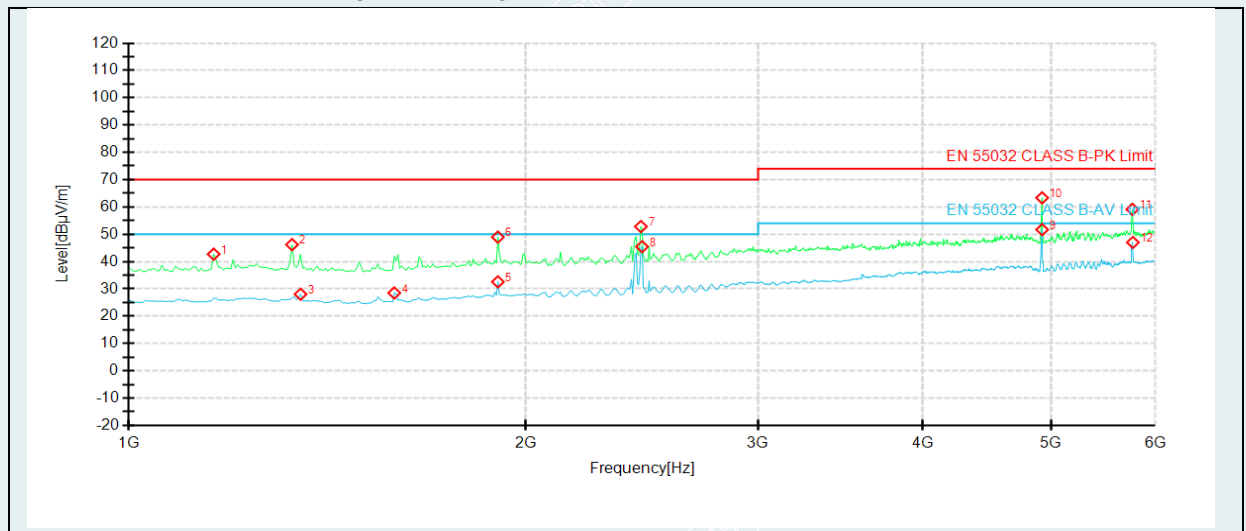
2. The other emission levels were very low against the limit.

**Above 1GHz**

Pre-test Mode 1~Mode 2, found that Mode 1 is the worst case.

<b>Model No.</b>	WS-WN576A2	<b>Test Mode</b>	Mode 1
<b>Environmental Conditions</b>	25°C, 60% RH	<b>RBW,VBW</b>	1MHz
<b>Antenna Pole</b>	Vertical	<b>Antenna Distance</b>	3m
<b>Detector Function</b>	Peak/Average	<b>Tested By</b>	Lin Qin
<b>Tested Date</b>	2020/03/16	<b>Tested Voltage</b>	AC 230V/50Hz
<b>Sample NO. in Lab</b>	0002		

(The chart below shows the highest readings taken from the final data.)

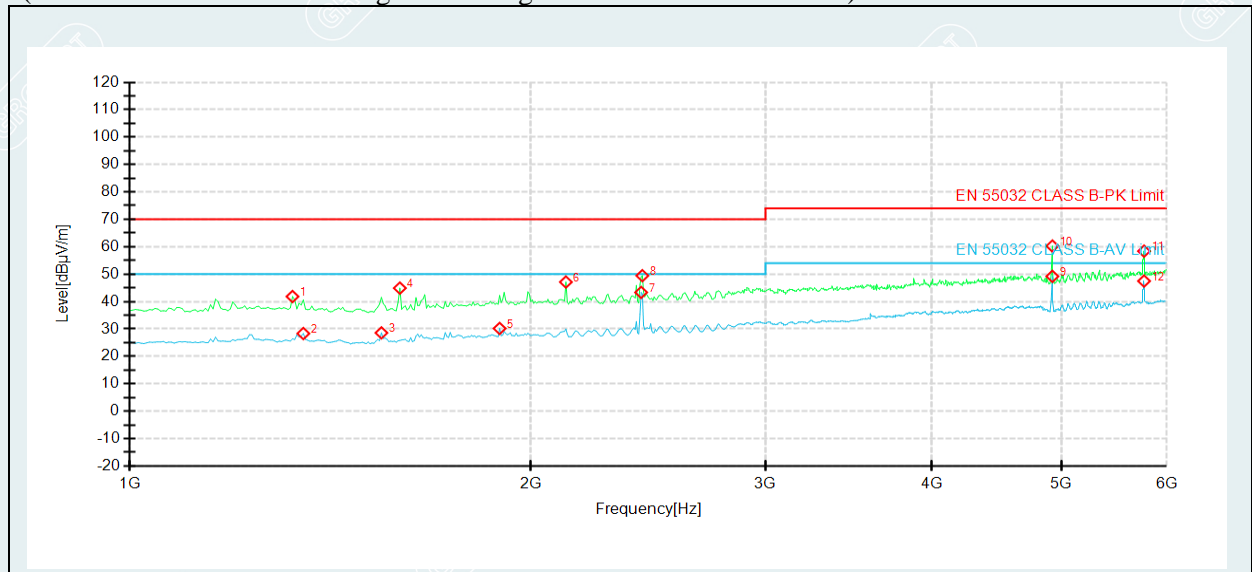


Freq. [MHz]	Reading [dBμV/m]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1160.0000	70.76	42.71	-28.05	70.00	27.29	200	300	Vertical
1330.0000	73.55	46.20	-27.35	70.00	23.80	100	92	Vertical
1350.0000	55.34	28.04	-27.30	50.00	21.96	100	210	Vertical
1590.0000	55.26	28.50	-26.76	50.00	21.50	100	49	Vertical
1905.0000	58.07	32.58	-25.49	50.00	17.42	100	228	Vertical
1905.0000	74.45	48.96	-25.49	70.00	21.04	100	228	Vertical
2445.0000	75.89	52.82	-23.07	70.00	17.18	200	7	Vertical
2450.0000	68.49	45.45	-23.04	50.00	4.55	200	7	Vertical
4925.0000	66.53	51.71	-14.82	54.00	2.29	200	250	Vertical
4925.0000	78.16	63.34	-14.82	74.00	10.66	200	250	Vertical
5765.0000	72.19	59.13	-13.06	74.00	14.87	200	166	Vertical
5770.0000	60.08	47.02	-13.06	54.00	6.98	200	67	Vertical

**Remarks:** 1. Peak= peak Reading; AVG=Average Reading  
2. The other emission levels were very low against the limit.

<b>Model No.</b>	WS-WN576A2	<b>Test Mode</b>	Mode 1
<b>Environmental Conditions</b>	25°C, 60% RH	<b>RBW,VBW</b>	1MHz
<b>Antenna Pole</b>	Horizontal	<b>Antenna Distance</b>	3m
<b>Detector Function</b>	Peak/Average	<b>Tested By</b>	Luja Huang
<b>Tested Date</b>	2020/03/16	<b>Tested Voltage</b>	AC 230V/50Hz
<b>Sample NO. in Lab</b>	0002		

(The chart below shows the highest readings taken from the final data.)



Suspected Data List									
NO.	Freq. [MHz]	Reading [dBμV/m]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	1325.0000	69.19	41.83	-27.36	70.00	28.17	100	345	Horizont
2	1350.0000	55.63	28.33	-27.30	50.00	21.67	100	34	Horizont
3	1545.0000	55.49	28.58	-26.91	50.00	21.42	200	260	Horizont
4	1595.0000	71.65	44.90	-26.75	70.00	25.10	100	60	Horizont
5	1895.0000	55.71	30.18	-25.53	50.00	19.82	100	301	Horizont
6	2125.0000	71.88	47.12	-24.76	70.00	22.88	200	320	Horizont
7	2420.0000	66.54	43.33	-23.21	50.00	6.67	200	357	Horizont
8	2425.0000	72.62	49.44	-23.18	70.00	20.56	200	0	Horizont
9	4925.0000	64.01	49.19	-14.82	54.00	4.81	200	30	Horizont
10	4925.0000	75.07	60.25	-14.82	74.00	13.75	200	30	Horizont
11	5770.0000	71.44	58.38	-13.06	74.00	15.62	100	215	Horizont
12	5770.0000	60.53	47.47	-13.06	54.00	6.53	100	212	Horizont

**Remarks:** 1. Peak= peak Reading; AVG=Average Reading  
2. The other emission levels were very low against the limit.

## 4.4 HARMONICS CURRENT MEASUREMENT

### 4.4.1 LIMITS

Limits for Class A equipment		Limits for Class D equipment		
Harmonics Order n	Max. permissible harmonics current A	Harmonics Order n	Max. permissible harmonics current per watt mA/W	Max. permissible harmonics current A
Odd harmonics		Odd Harmonics only		
3	2.30	3	3.4	2.30
5	1.14	5	1.9	1.14
7	0.77	7	1.0	0.77
9	0.40	9	0.5	0.40
11	0.33	11	0.35	0.33
13	0.21	13	0.30	0.21
15<=n<=39	0.15x15/n	15<=n<=39	3.85/n	0.15x15/n
Even harmonics				
2	1.08			
4	0.43			
6	0.30			
8<=n<=40	0.23x8/n			

**Note:**

1. Class A and Class D are classified according to item 7.4.3.
2. According to section 7 of EN 61000-3-2, the above limits for all equipment except for lighting equipment having an active input power > 75 W and no limits apply for equipment with an active input power up to and including 75 W.

### 4.4.2 TEST PROCEDURE

The EUT was placed on the top of a wooden table 0.8 meters above the ground and operated to produce the maximum harmonic components under normal operating conditions for each successive harmonic component in turn.

The classification of EUT is according to section 5 of EN 61000-3-2.

The EUT is classified as follows:

Class A: Balanced three-phase equipment, Household appliances excluding equipment as Class D, Tools excluding portable tools, Dimmers for incandescent lamps, audio equipment, equipment not specified in one of the three other classes.

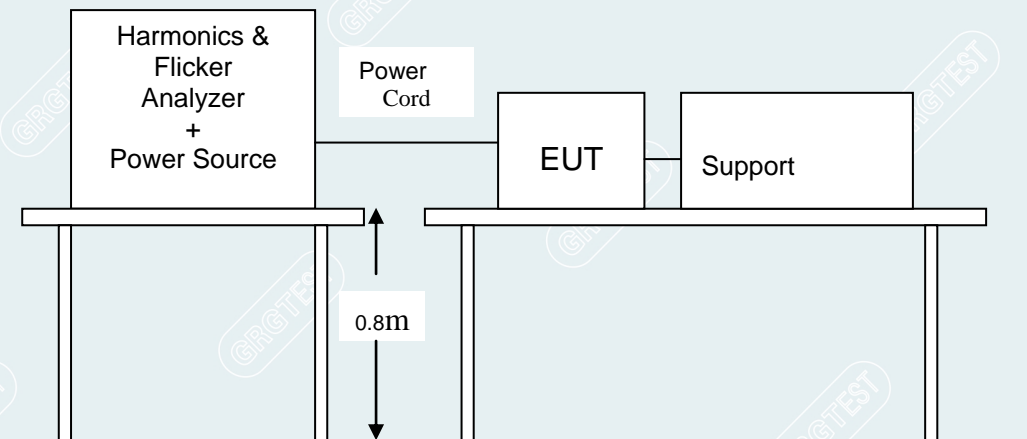
Class B: Portable tools; Arc welding equipment which is not professional equipment.

Class C: Lighting equipment.

Class D: Equipment having a specified power less than or equal to 600 W of the following types: Personal computers and personal computer monitors and television receivers.

The correspondent test program of test instrument to measure the current harmonics emanated from EUT is chosen. The measure time shall be not less than the time necessary for the EUT to be exercised.

#### 4.4.3 TEST SETUP



#### 4.4.4 TEST RESULTS

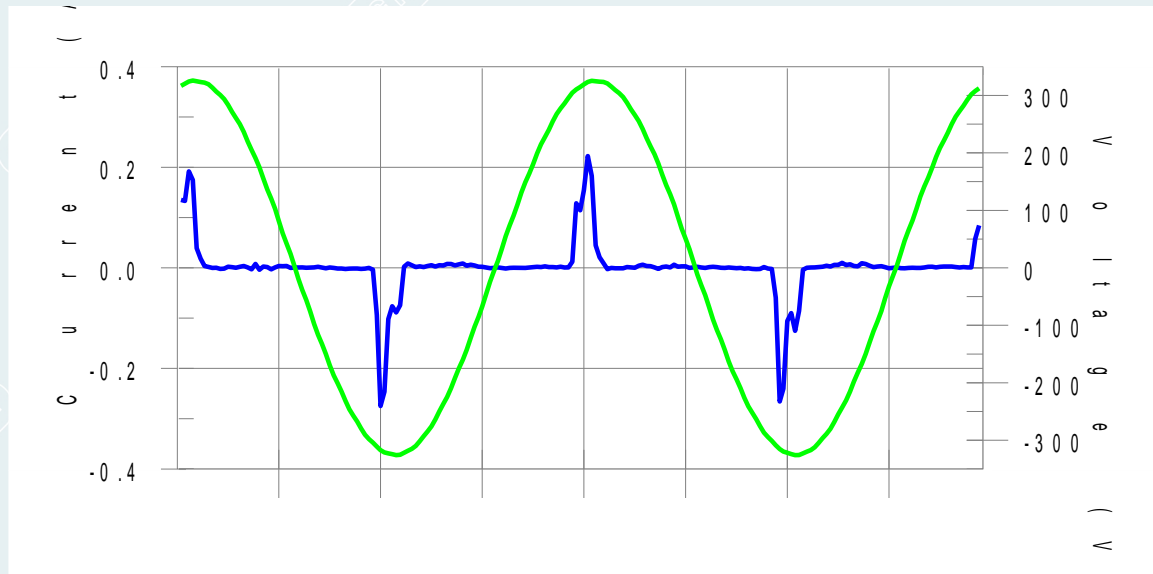
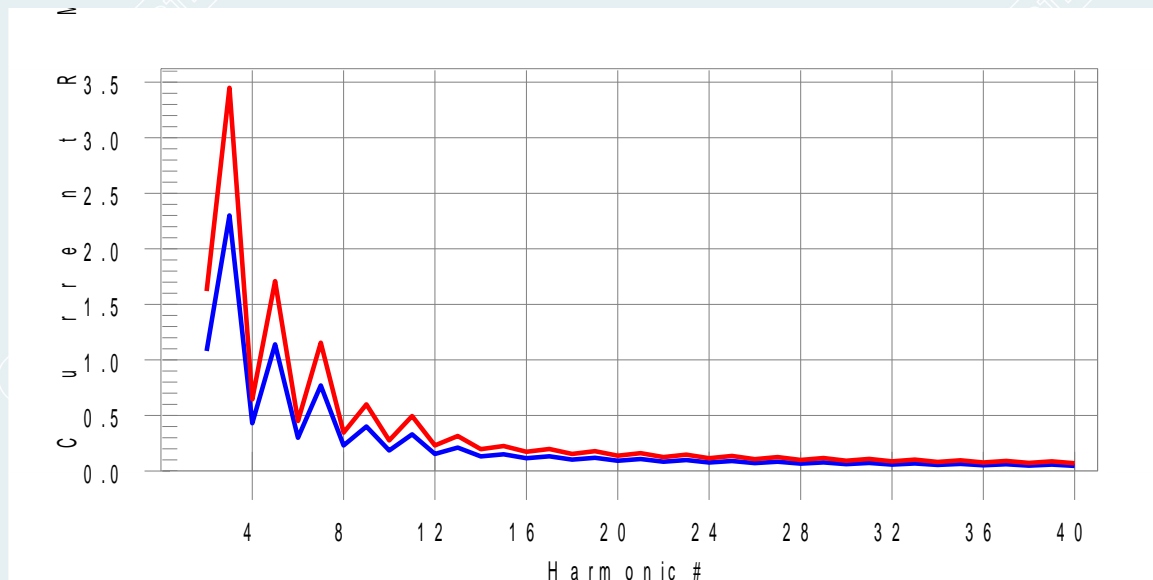
Power Consumption	2.7W	Test Results	PASS
Environmental Conditions	Tem:24.2℃ Hum:69%RH 101.1kPa	Limits	Class <input checked="" type="checkbox"/> A <input type="checkbox"/> B <input type="checkbox"/> C <input type="checkbox"/> D
Test Mode	Mode 1	Tested By	Li Qin
Sample NO. in Lab	0001		

Power Consumption	2.8W	Test Results	PASS
Environmental Conditions	Tem:24.2℃ Hum:69%RH 101.1kPa	Limits	Class <input checked="" type="checkbox"/> A <input type="checkbox"/> B <input type="checkbox"/> C <input type="checkbox"/> D
Test Mode	Mode 1	Tested By	Li Qin
Sample NO. in Lab	0002		

**Note:**

- Limits classified according to item 7.4.3.
- The statements of test result on the above are decided by the request of test standard only; the measurement uncertainties are not factored into this compliance determination.



**Sample NO. in Lab : 0001**  
**Harmonics – Class-A****EUT: Wireless AC750 DUAL-Band Range Extender****Test category: Class-A (European limits)****Test date: 2020/3/12****Start time: 16:24:43****Test duration (min): 10****Data file name: H-000122.cts\_data****Comment: WS-WN576A2****Customer: Winstars Technology Limited****Tested by: Li Qin****Test Margin: 100****End time: 16:33:54****Test Result: Pass**      **Source qualification: Normal****Current & voltage waveforms****Harmonics and Class A limit line****European Limits****Test result: Pass**      **Worst harmonics H13-1.9% of 150% limit, H13-2.6% of 100% limit**

**Current Test Result Summary (Run time)**

EUT: Wireless AC750 DUAL-Band Range Extender  
 Test category: Class-A (European limits)  
 Test date: 2020/3/12 Start time: 16:24:43  
 Test duration (min): 10 Data file name: H-000122.cts\_data  
 Comment: WS-WN576A2  
 Customer: Winstars Technology Limited

Tested by: Li Qin  
 Test Margin: 100  
 End time: 16:33:54

Test Result: Pass Source qualification: Normal  
 THC(A): 0.021 I-THD(%): 175.0 POHC(A): 0.003 POHC Limit(A): 0.251

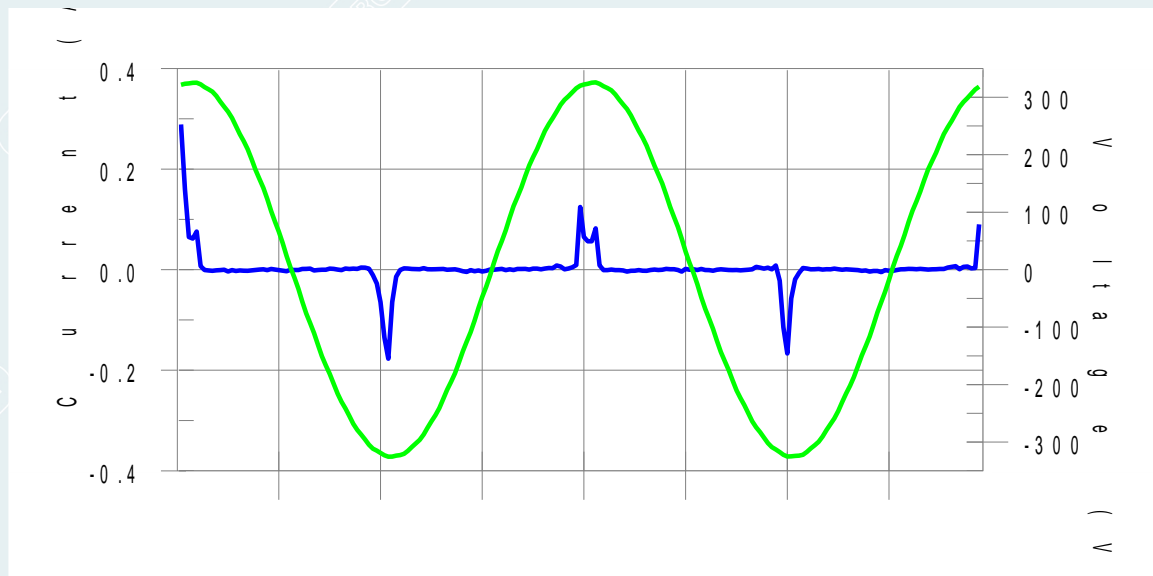
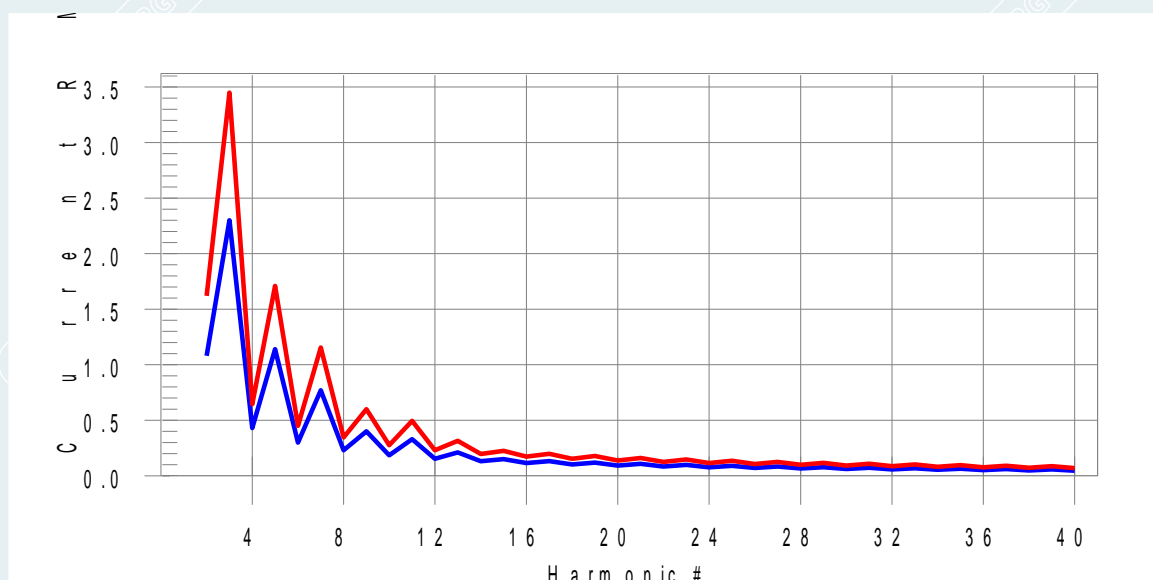
**Highest parameter values during test:**

V\_RMS (Volts): 230.12  
 I\_Peak (Amps): 0.292  
 I\_Fund (Amps): 0.012  
 Power (Watts): 2.7

Frequency(Hz): 50.00  
 I\_RMS (Amps): 0.044  
 Crest Factor: 9.756  
 Power Factor: 0.421

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	0.010	2.300	0.4	0.012	3.450	0.3	Pass
4	0.001	0.430	N/A	0.001	0.645	N/A	Pass
5	0.009	1.140	0.8	0.011	1.710	0.6	Pass
6	0.000	0.300	N/A	0.000	0.450	N/A	Pass
7	0.008	0.770	1.1	0.010	1.155	0.8	Pass
8	0.000	0.230	N/A	0.000	0.345	N/A	Pass
9	0.008	0.400	1.9	0.009	0.600	1.4	Pass
10	0.000	0.184	N/A	0.000	0.276	N/A	Pass
11	0.007	0.330	2.0	0.007	0.495	1.5	Pass
12	0.000	0.153	N/A	0.000	0.230	N/A	Pass
13	0.005	0.210	2.6	0.006	0.315	1.9	Pass
14	0.000	0.131	N/A	0.000	0.197	N/A	Pass
15	0.004	0.150	N/A	0.005	0.225	N/A	Pass
16	0.000	0.115	N/A	0.000	0.173	N/A	Pass
17	0.003	0.132	N/A	0.003	0.198	N/A	Pass
18	0.000	0.102	N/A	0.000	0.153	N/A	Pass
19	0.002	0.118	N/A	0.002	0.178	N/A	Pass
20	0.000	0.092	N/A	0.000	0.138	N/A	Pass
21	0.002	0.107	N/A	0.002	0.161	N/A	Pass
22	0.000	0.084	N/A	0.000	0.125	N/A	Pass
23	0.001	0.098	N/A	0.001	0.147	N/A	Pass
24	0.000	0.077	N/A	0.000	0.115	N/A	Pass
25	0.001	0.090	N/A	0.001	0.135	N/A	Pass
26	0.000	0.071	N/A	0.000	0.107	N/A	Pass
27	0.001	0.083	N/A	0.001	0.125	N/A	Pass
28	0.000	0.066	N/A	0.000	0.099	N/A	Pass
29	0.001	0.078	N/A	0.001	0.116	N/A	Pass
30	0.000	0.061	N/A	0.000	0.092	N/A	Pass
31	0.001	0.073	N/A	0.001	0.109	N/A	Pass
32	0.000	0.058	N/A	0.000	0.086	N/A	Pass
33	0.001	0.068	N/A	0.001	0.102	N/A	Pass
34	0.000	0.054	N/A	0.000	0.081	N/A	Pass
35	0.000	0.064	N/A	0.001	0.096	N/A	Pass
36	0.000	0.051	N/A	0.000	0.077	N/A	Pass
37	0.000	0.061	N/A	0.000	0.091	N/A	Pass
38	0.000	0.048	N/A	0.000	0.073	N/A	Pass
39	0.000	0.058	N/A	0.000	0.087	N/A	Pass
40	0.000	0.046	N/A	0.000	0.069	N/A	Pass

Sample NO. in Lab : 0002

**Harmonics – Class-A****EUT: Wireless AC750 DUAL-Band Range Extender****Test category: Class-A (European limits)****Test date: 2020/3/12****Test duration (min): 10****Comment: WS-WN576A2****Customer: Winstars Technology Limited****Tested by: Li Qin****Test Margin: 100****End time: 16:21:45****Start time: 16:11:34****Data file name: H-000121.cts\_data****Test Result: Pass**      **Source qualification: Normal****Current & voltage waveforms****Harmonics and Class A limit line****European Limits****Test result: Pass**      **Worst harmonics H13-2.0% of 150% limit, H13-2.9% of 100% limit**

**Current Test Result Summary (Run time)**

EUT: Wireless AC750 DUAL-Band Range Extender  
 Test category: Class-A (European limits)  
 Test date: 2020/3/12 Start time: 16:11:34 End time: 16:21:45  
 Test duration (min): 10 Data file name: H-000121.cts\_data  
 Comment: on (min): 10 Data file name: H-000121.cts\_data  
 Comment: WS-WN576A2  
 Customer: Winstars Technology Limited

Test Result: Pass Source qualification: Normal  
 THC(A): 0.024 I-THD(%): 191.9 POHC(A): 0.003 POHC Limit(A): 0.251

**Highest parameter values during test:**

V\_RMS (Volts): 230.10 Frequency(Hz): 50.00  
 I\_Peak (Amps): 0.289 I\_RMS (Amps): 0.033  
 I\_Fund (Amps): 0.012 Crest Factor: 9.045  
 Power (Watts): 2.8 Power Factor: 0.417

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	0.012	2.300	0.5	0.012	3.450	0.4	Pass
4	0.001	0.430	N/A	0.001	0.645	N/A	Pass
5	0.011	1.140	1.0	0.011	1.710	0.7	Pass
6	0.000	0.300	N/A	0.000	0.450	N/A	Pass
7	0.010	0.770	1.3	0.010	1.155	0.9	Pass
8	0.000	0.230	N/A	0.000	0.345	N/A	Pass
9	0.009	0.400	2.2	0.009	0.600	1.5	Pass
10	0.000	0.184	N/A	0.000	0.276	N/A	Pass
11	0.007	0.330	2.2	0.008	0.495	1.5	Pass
12	0.000	0.153	N/A	0.000	0.230	N/A	Pass
13	0.006	0.210	2.9	0.006	0.315	2.0	Pass
14	0.000	0.131	N/A	0.000	0.197	N/A	Pass
15	0.005	0.150	N/A	0.005	0.225	N/A	Pass
16	0.000	0.115	N/A	0.000	0.173	N/A	Pass
17	0.003	0.132	N/A	0.004	0.198	N/A	Pass
18	0.000	0.102	N/A	0.000	0.153	N/A	Pass
19	0.002	0.118	N/A	0.002	0.178	N/A	Pass
20	0.000	0.092	N/A	0.000	0.138	N/A	Pass
21	0.002	0.107	N/A	0.002	0.161	N/A	Pass
22	0.000	0.084	N/A	0.000	0.125	N/A	Pass
23	0.001	0.098	N/A	0.001	0.147	N/A	Pass
24	0.000	0.077	N/A	0.000	0.115	N/A	Pass
25	0.001	0.090	N/A	0.001	0.135	N/A	Pass
26	0.000	0.071	N/A	0.000	0.107	N/A	Pass
27	0.001	0.083	N/A	0.001	0.125	N/A	Pass
28	0.000	0.066	N/A	0.000	0.099	N/A	Pass
29	0.001	0.078	N/A	0.001	0.116	N/A	Pass
30	0.000	0.061	N/A	0.000	0.092	N/A	Pass
31	0.001	0.073	N/A	0.001	0.109	N/A	Pass
32	0.000	0.058	N/A	0.000	0.086	N/A	Pass
33	0.001	0.068	N/A	0.001	0.102	N/A	Pass
34	0.000	0.054	N/A	0.000	0.081	N/A	Pass
35	0.000	0.064	N/A	0.001	0.096	N/A	Pass
36	0.000	0.051	N/A	0.000	0.077	N/A	Pass
37	0.000	0.061	N/A	0.000	0.091	N/A	Pass
38	0.000	0.048	N/A	0.000	0.073	N/A	Pass
39	0.000	0.058	N/A	0.000	0.087	N/A	Pass
40	0.000	0.046	N/A	0.000	0.069	N/A	Pass

## 4.5 VOLTAGE FLUCTUATION AND FLICKER MEASUREMENT

### 4.5.1 LIMITS

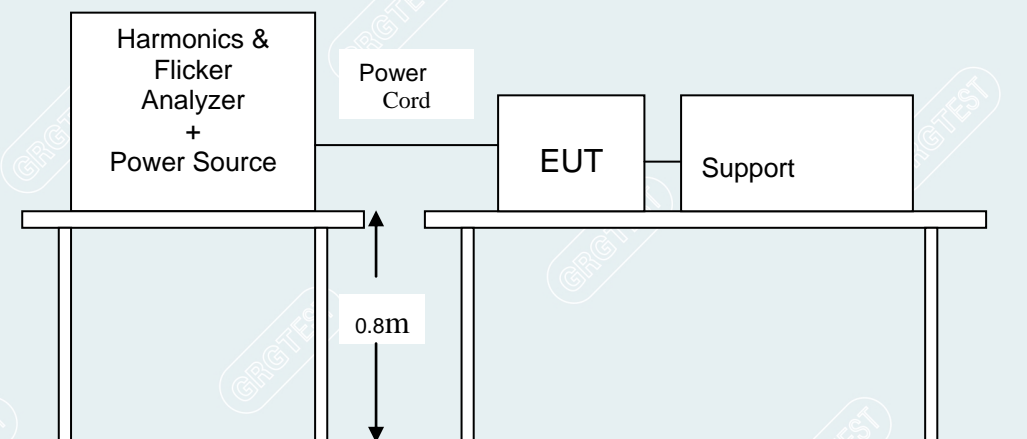
TEST ITEM	LIMIT	REMARK
$P_{st}$	1.0	$P_{st}$ means short-term flicker indicator.
$P_{lt}$	0.65	$P_{lt}$ means long-term flicker indicator.
$T_{dt}$ (ms)	500	$T_{dt}$ means maximum time that $dt$ exceeds 3.3 %.
$d_{max}$ (%)	4%	$d_{max}$ means maximum relative voltage change.
dc (%)	3.3%	dc means relative steady-state voltage change

### 4.5.2 TEST PROCEDURE

The EUT was placed on the top of a wooden table 0.8 meters above the ground and operated to produce the most unfavorable sequence of voltage changes under normal operating conditions.

During the flicker measurement, the measure time shall include that part of whole operation cycle in which the EUT produce the most unfavorable sequence of voltage changes. The observation period for short-term flicker indicator is 10 minutes and the observation period for long-term flicker indicator is 2 hours.

### 4.5.3 TEST SETUP





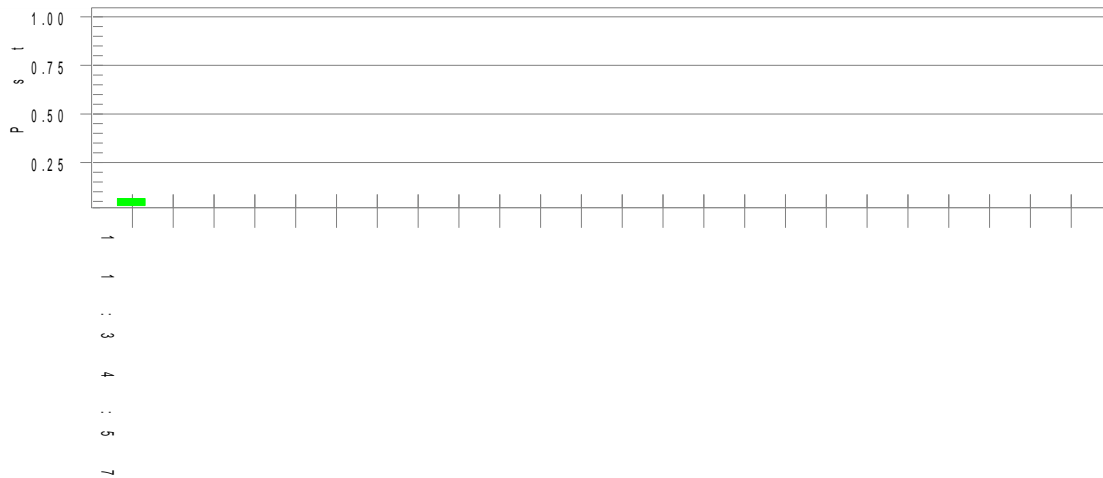
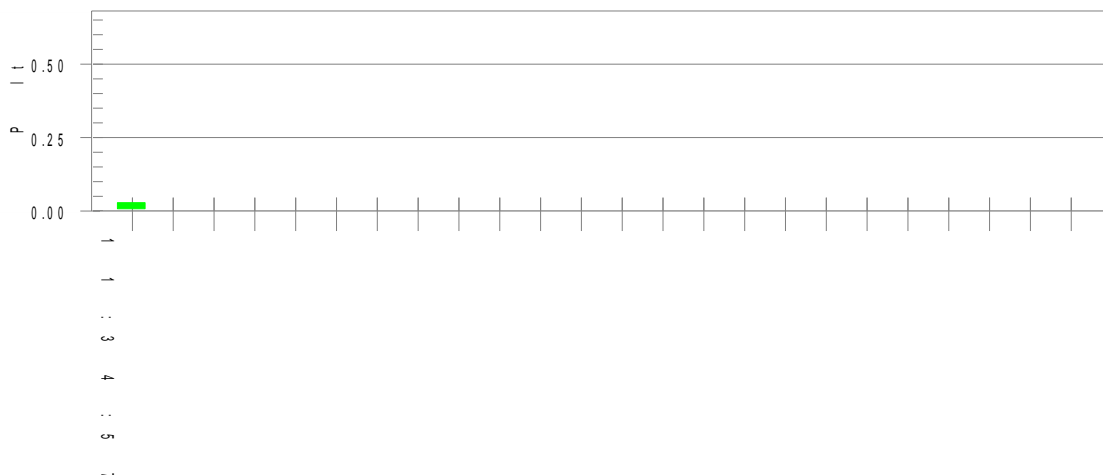
#### 4.5.4 TEST RESULTS

**0001:**

<b>Observation Period (Tp)</b>	10mins	<b>Test Mode</b>	Mode 1
<b>Environmental Conditions</b>	Tem:23.2℃ Hum:67%RH 101.1kPa	<b>Tested By</b>	Li Qin
<b>Sample NO. in Lab</b>	0002		

**0002:**

<b>Observation Period (Tp)</b>	10mins	<b>Test Mode</b>	Mode 1
<b>Environmental Conditions</b>	Tem:23.2℃ Hum:67%RH 101.1kPa	<b>Tested By</b>	Li Qin
<b>Sample NO. in Lab</b>	0002		

**Sample NO. in Lab : 0001**  
**Flicker Test Summary****EUT: Wireless AC750 DUAL-Band Range Extender****Tested by: Li Qin****Test category: All parameters (European limits)****Test Margin: 100****Test date: 2020/3/12****Start time: 16:11:36****End time: 16:22:03****Test duration (min): 10****Data file name: F-000123.cts\_data****Comment: WS-WN576A2****Customer: Winstars Technology Limited****Test Result: Pass****Status: Test Completed****Pst<sub>i</sub> and limit line****European Limits****Plt and limit line****Parameter values recorded during the test:****Vrms at the end of test (Volt): 230.08****T-max (mS): 0****Highest dc (%): 0.00****Highest dmax (%): 0.00****Highest Pst (10 min. period): 0.064****Highest Plt (2 hr. period): 0.028****Test limit (mS): 500.0 Pass****Test limit (%): 3.30 Pass****Test limit (%): 4.00 Pass****Test limit: 1.000 Pass****Test limit: 0.650 Pass**

**Sample NO. in Lab : 0002**  
**Flicker Test Summary****EUT: Wireless AC750 DUAL-Band Range Extender****Tested by: Li Qin****Test category: All parameters (European limits)****Test Margin: 100****Test date: 2020/3/12****Start time: 15:59:16****End time: 16:09:43****Test duration (min): 10****Data file name: F-000120.cts\_data****Comment: WS-WN576A2****Customer: Winstars Technology Limited****Test Result: Pass****Status: Test Completed****Pst<sub>i</sub> and limit line****European Limits****Plt and limit line****Parameter values recorded during the test:****Vrms at the end of test (Volt): 230.07****T-max (mS): 0****Highest dc (%): 0.00****Highest dmax (%): 0.00****Highest Pst (10 min. period): 0.064****Highest Plt (2 hr. period): 0.028****Test limit (mS): 500.0 Pass****Test limit (%): 3.30 Pass****Test limit (%): 4.00 Pass****Test limit: 1.000 Pass****Test limit: 0.650 Pass**

## 5. IMMUNITY TEST

### 5.1 GENERAL DESCRIPTION

Basic Standard	Immunity Test	
	Test Type	Minimum Requirement
EN 61000-4-2	Electrostatic discharge	Electrostatic Discharge – ESD: ±8kV air discharge, ±4kV Contact discharge, Performance Criterion B
EN 61000-4-3	Radio frequency electromagnetic field	Radio-Frequency Electromagnetic Field Test – RS: 80 ~6000 MHz, 3V/m, 80% AM(1kHz), Performance Criterion A
EN 61000-4-4	Electrical fast transients, common mode	Electrical Fast transients, common mode - EFT, AC Power Port:: ±1 kV ; DC Power Port:: ±0.5 kV Signal/Control Port: ±0.5 kV (excluding DSL) Performance Criterion B
EN 61000-4-5	Surges	Surge Immunity Test: 1.2/50 us Open Circuit Voltage, 10/700µs Signal and Telecommunication AC Power Port ~ line to line: ±1kV, line to ground: ±2kV Signal and Telecommunication Ports ~ Line to line: ±0.5kV; line to ground (or shield to ground): ±1kV Performance Criterion B  10/700µs Signal and Telecommunication Signal and Telecommunication Ports ~ line to ground: ±1kV Performance Criterion C
EN 61000-4-6	Radio frequency, common mode	Radio frequency, common mode Test –CS: 0.15 ~ 80 MHz, 3Vrms, 80% AM, 1kHz, Performance Criterion A
EN 61000-4-11	Voltage Dips & Voltage interruption:	Voltage dip: 0 % residual voltage for 0,5 cycle 0 % residual voltage for 1 cycle 70 % residual voltage for 25 cycles (at 50 Hz). Performance Criterion B Voltage interruption: 0 % residual voltage for 250 cycles (at 50 Hz). Performance Criterion C

## 5.2 GENERAL PERFORMANCE CRITERIA DESCRIPTION

Performance table for ETSI EN 301 489-17		
Criteria	During test	After test
A	Shall operate as intended. (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 3). 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 2). Shall be no unintentional transmissions.	Functions shall be self-recoverable. Shall operate as intended after recovering. Shall be no degradation of performance (see note 3). 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 3).
<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. 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. 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 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.</p>		



**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 5 000 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 5 000 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.

## 5.3 ELECTROSTATIC DISCHARGE (ESD)

### 5.3.1 TEST SPECIFICATION

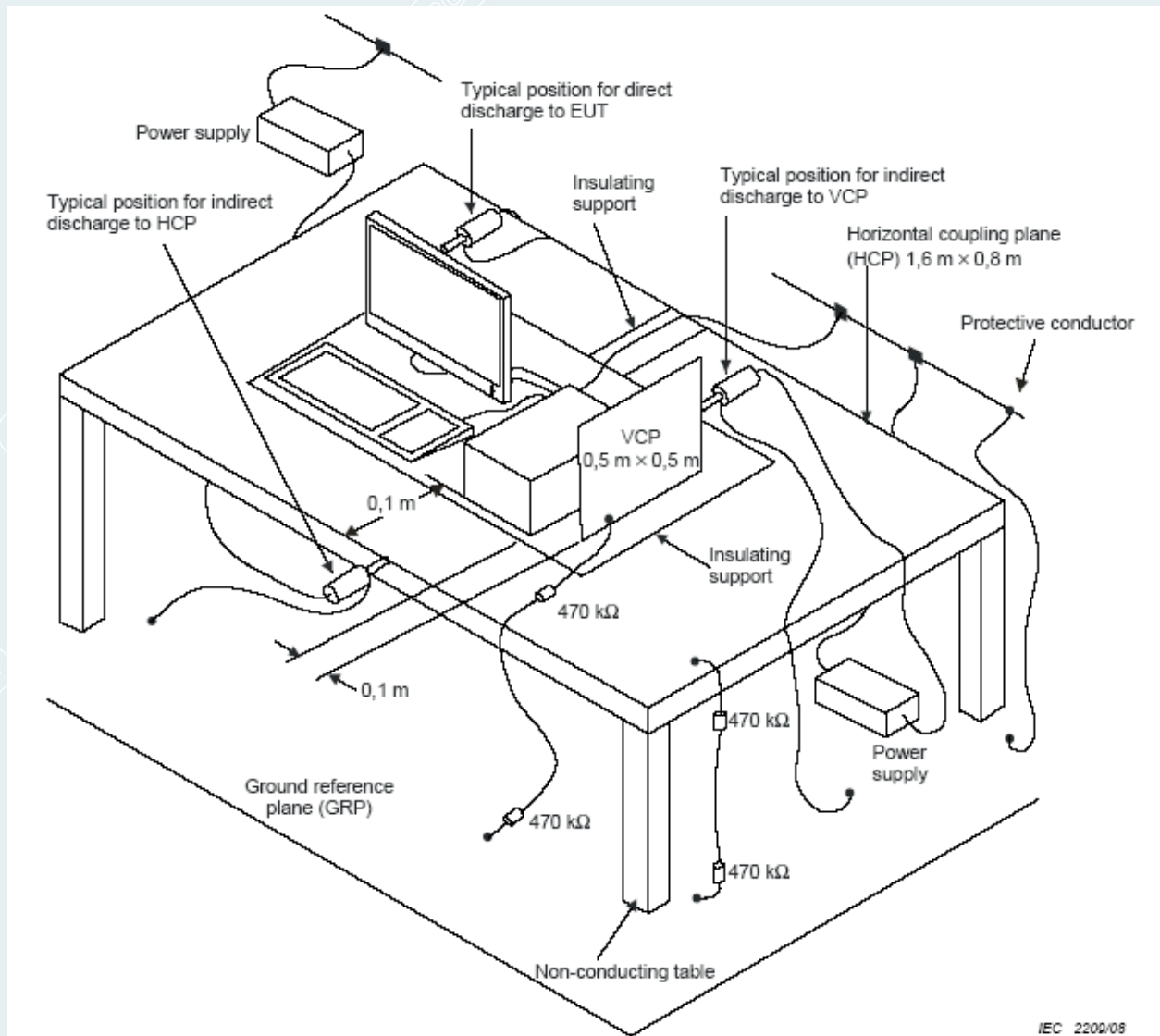
Basic Standard	EN 61000-4-2
Discharge Impedance	330 ohm / 150 pF
Discharge Voltage	Air Discharge : $\pm 8$ kV (Direct); Contact Discharge : $\pm 4$ kV (Direct/Indirect)
Polarity	Positive & Negative
Number of Discharge	Minimum 10 times at each test point
Discharge Mode	Single Discharge 1 second minimum

### 5.3.2 TEST PROCEDURE

**The basic test procedure was in accordance with EN 61000-4-2:**

- The EUT was located 0.1 m minimum from all side of the HCP (dimensions 1.6m \* 0.8m).
- The support units were located another table 30 cm away from the EUT, but direct support unit was/were located at same location as EUT on the HCP and keep at a distance of 10 cm with EUT.
- The time interval between two successive single discharges was at least 1 second.
- Contact discharges were applied to the non-insulating coating, with the pointed tip of the generator penetrating the coating and contacting the conducting substrate.
- Air discharges were applied with the round discharge tip of the discharge eleCar Radioode approaching the EUT as fast as possible (without causing mechanical damage) to touch the EUT. After each discharge, the ESD generator was removed from the EUT and re-triggered for a new single discharge. The test was repeated until all discharges were complete.
- At least ten single discharges (in the most sensitive polarity) were applied at the front edge of each HCP opposite the center point of each unit of the EUT and 0.1 meters from the front of the EUT. The long axis of the discharge eleCar Radioode was in the plane of the HCP and perpendicular to its front edge during the discharge.
- At least ten single discharges (in the most sensitive polarity) were applied to the center of one vertical edge of the Vertical Coupling Plane (VCP) in sufficiently different positions that the four faces of the EUT were completely illuminated. The VCP (dimensions 0.5m \* 0.5m) was placed vertically to and 0.1 m

### 5.3.3 TEST SETUP



**NOTE:**

**TABLE-TOP EQUIPMENT**

The configuration consisted of a wooden table 0.8 meters high standing on the Ground Reference Plane. The GRP consisted of a sheet of aluminum at least 0.25mm thick, and 2.5 meters square connected to the protective grounding system. A Horizontal Coupling Plane (1.6m \* 0.8m) was placed on the ground and attached to the GRP by means of a cable with 940kΩ total impedance. The equipment under test, was installed in a representative system as described in section 7 of CENELEC EN 61000-4-2, and its cables were placed on the HCP and isolated by an insulating support of 0.5mm thickness. A distance of 1-meter minimum was provided between the EUT and the walls of the laboratory and any other metallic structure.

**FLOOR-STANDING EQUIPMENT**

The equipment under test was installed in a representative system as described in section 7 of CENELEC EN 61000-4-2, and its cables were isolated from the Ground Reference Plane by an insulating support of 0.1-meter thickness. The GRP consisted of a sheet of aluminum that is at least 0.25mm thick, and 2.5 meters square connected to the protective grounding system and extended at least 0.5 meters from the EUT on all sides.

## 5.3.4 TEST RESULTS

<b>EUT</b>	Wireless AC750 Dual-Band Range Extender		
	WS-WN576A2		
<b>Operation Mode</b>	Mode 1	<b>Test date</b>	2020/03/18
<b>Voltage Supply</b>	230VAC/50Hz	<b>Test Engineer</b>	Li Qin
<b>Environment</b>	Tem:23.1℃ Hum:46%RH 101.1kPa		
<b>Sample NO. in Lab</b>	0001		

Discharge point	Discharge voltage	C-Conduct A-Air	Required Passing Performance	Actual performance	Result
Crevice	±2, 4, 6, 8 kV	A	Criterion B	Criterion A <sup>1)</sup>	PASS
LAN Port	±2, 4, 6, 8 kV	A	Criterion B	Criterion A <sup>1)</sup>	PASS
HCP	±2, 4 kV	C	Criterion B	Criterion A <sup>1)</sup>	PASS
VCP	±2, 4 kV	C	Criterion B	Criterion A <sup>1)</sup>	PASS

Note:A<sup>1)</sup>: There was no network interruption during the test, and after test, the EUT can work as normal.

<b>EUT</b>	Wireless AC750 Dual-Band Range Extender		
	WS-WN576A2		
<b>Operation Mode</b>	Mode 1	<b>Test date</b>	2020/03/18
<b>Voltage Supply</b>	230VAC/50Hz	<b>Test Engineer</b>	Li Qin
<b>Environment</b>	Tem:23.1℃ Hum:46%RH 101.1kPa		
<b>Sample NO. in Lab</b>	0002		

Discharge point	Discharge voltage	C-Conduct A-Air	Required Passing Performance	Actual performance	Result
Crevice	±2, 4, 6, 8 kV	A	Criterion B	Criterion A <sup>1)</sup>	PASS
LAN Port	±2, 4, 6, 8 kV	A	Criterion B	Criterion A <sup>1)</sup>	PASS
HCP	±2, 4 kV	C	Criterion B	Criterion A <sup>1)</sup>	PASS
VCP	±2, 4 kV	C	Criterion B	Criterion A <sup>1)</sup>	PASS

Note:A<sup>1)</sup>: There was no network interruption during the test, and after test, the EUT can work as normal.



## 5.4 RADIO FREQUENCY ELECTROMAGNETIC FIELD

### 5.4.1 TEST SPECIFICATION

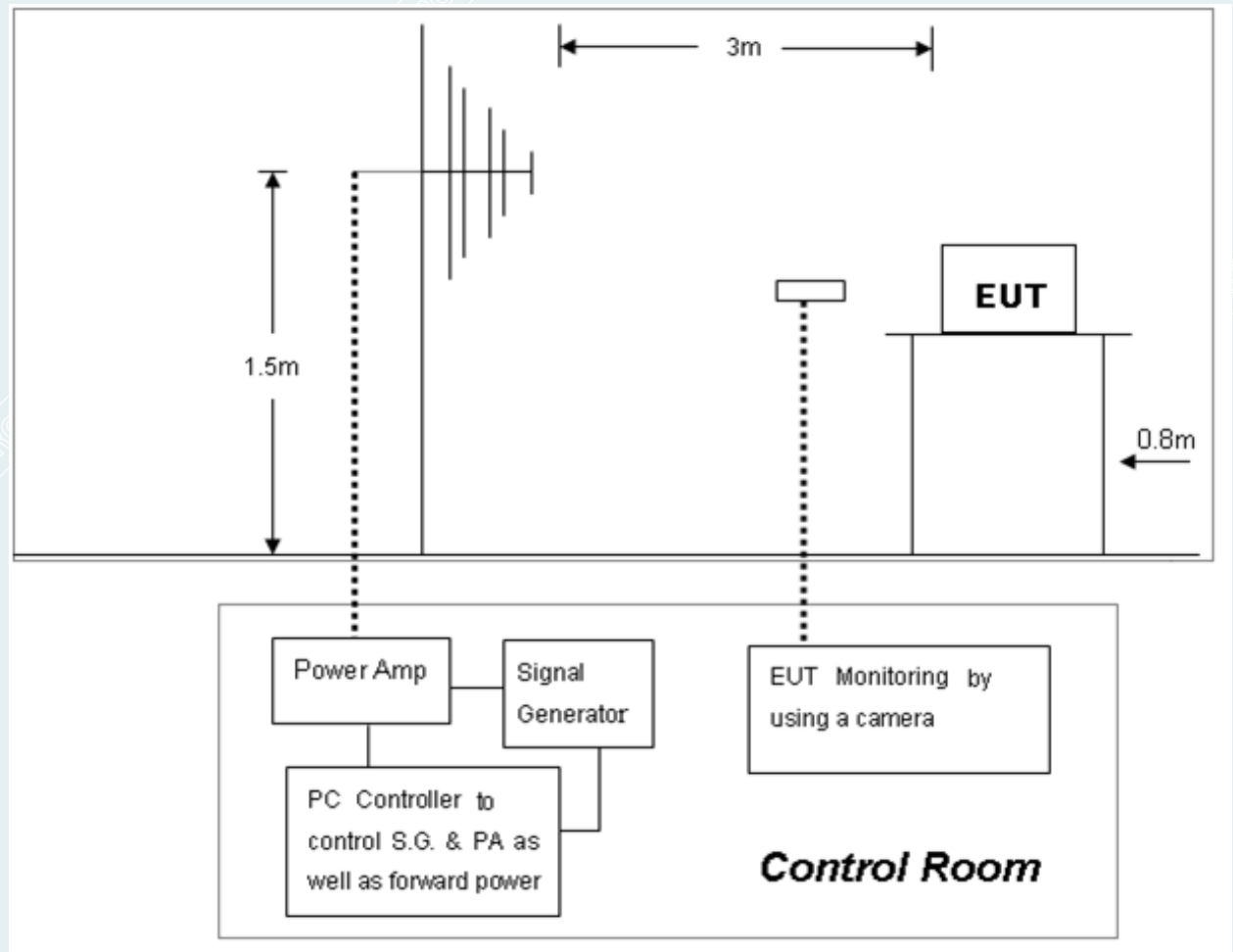
Basic Standard	EN 61000-4-3
Frequency Range	80 MHz ~6000 MHz
Field Strength	3V/m
Modulation	1kHz Sine Wave, 80%, AM Modulation
Frequency Step	1 % of preceding frequency value
Polarity of Antenna	Horizontal and Vertical
Test Distance:	3 m
Antenna Height:	1.5m

### 5.4.2 TEST PROCEDURE

- The testing was performed in a fully anechoic chamber. The transmit antenna was located at a distance of 3 meters from the EUT.
- The frequency range is swept from 80 MHz to 6000 MHz with the signal 80% amplitude modulated with a 1 kHz sine-wave. The rate of sweep did not exceed  $1.5 \times 10^{-3}$  decade/s, where the frequency range is swept incrementally; the step size was 1% of preceding frequency value.
- The dwell time at each frequency shall be not less than the time necessary for the EUT to be able to respond.
- The test was performed with the EUT exposed to both vertically and horizontally polarized fields on each of the four sides.



### 5.4.3 TEST SETUP



**NOTE:**

#### TABLETOP EQUIPMENT

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

#### FLOOR STANDING EQUIPMENT

The EUT installed in a representative system as described in section 7 of EN 61000-4-3 was placed on a non-conductive wood support 0.1 meters in height. The system under test was connected to the power and signal wire according to relevant installation instructions.

### 5.4.4 TEST RESULTS

<b>EUT</b>	Wireless AC750 Dual-Band Range Extender		
	WS-WN576A2		
<b>Operation Mode</b>	Mode 1	<b>Test date</b>	2020/03/12
<b>Voltage Supply</b>	230VAC/50Hz	<b>Test Engineer</b>	Li Qin
<b>Environment</b>	Tem:23.2℃ RH:61% 101.0kPa		
<b>Sample NO. in Lab</b>	0001		

Frequency (MHz)	Polarity	Azimuth	Field Strength (V/m)	Required Passing Performance	Actual performance	Result
80 ~ 1000	V&H	Front	3	Criterion A	Criterion A <sup>1)</sup>	PASS
80 ~ 1000	V&H	Rear	3	Criterion A	Criterion A <sup>1)</sup>	PASS
80 ~ 1000	V&H	Right	3	Criterion A	Criterion A <sup>1)</sup>	PASS
80 ~ 1000	V&H	Left	3	Criterion A	Criterion A <sup>1)</sup>	PASS
1000~ 2700	V&H	Front	3	Criterion A	Criterion A <sup>1)</sup>	PASS
1000~ 2700	V&H	Rear	3	Criterion A	Criterion A <sup>1)</sup>	PASS
1000~ 2700	V&H	Right	3	Criterion A	Criterion A <sup>1)</sup>	PASS
1000~ 2700	V&H	Left	3	Criterion A	Criterion A <sup>1)</sup>	PASS
2700~ 6000	V&H	Front	3	Criterion A	Criterion A <sup>1)</sup>	PASS
2700~ 6000	V&H	Rear	3	Criterion A	Criterion A <sup>1)</sup>	PASS
2700~ 6000	V&H	Right	3	Criterion A	Criterion A <sup>1)</sup>	PASS
2700~ 6000	V&H	Left	3	Criterion A	Criterion A <sup>1)</sup>	PASS

Note:A<sup>1)</sup>: There was no network interruption during the test, and after test, the EUT can work as normal.

<b>EUT</b>	Wireless AC750 Dual-Band Range Extender		
	WS-WN576A2		
<b>Operation Mode</b>	Mode 1	<b>Test date</b>	2020/03/12
<b>Voltage Supply</b>	230VAC/50Hz	<b>Test Engineer</b>	Li Qin
<b>Environment</b>	Tem:23.2℃ RH:61% 101.0kPa		
<b>Sample NO. in Lab</b>	0002		

Frequency (MHz)	Polarity	Azimuth	Field Strength (V/m)	Required Passing Performance	Actual performance	Result
80 ~ 1000	V&H	Front	3	Criterion A	Criterion A <sup>1)</sup>	PASS
80 ~ 1000	V&H	Rear	3	Criterion A	Criterion A <sup>1)</sup>	PASS
80 ~ 1000	V&H	Right	3	Criterion A	Criterion A <sup>1)</sup>	PASS
80 ~ 1000	V&H	Left	3	Criterion A	Criterion A <sup>1)</sup>	PASS
1000~ 2700	V&H	Front	3	Criterion A	Criterion A <sup>1)</sup>	PASS
1000~ 2700	V&H	Rear	3	Criterion A	Criterion A <sup>1)</sup>	PASS
1000~ 2700	V&H	Right	3	Criterion A	Criterion A <sup>1)</sup>	PASS
1000~ 2700	V&H	Left	3	Criterion A	Criterion A <sup>1)</sup>	PASS
2700~ 6000	V&H	Front	3	Criterion A	Criterion A <sup>1)</sup>	PASS
2700~ 6000	V&H	Rear	3	Criterion A	Criterion A <sup>1)</sup>	PASS
2700~ 6000	V&H	Right	3	Criterion A	Criterion A <sup>1)</sup>	PASS
2700~ 6000	V&H	Left	3	Criterion A	Criterion A <sup>1)</sup>	PASS

Note:A<sup>1)</sup>: There was no network interruption during the test, and after test, the EUT can work as normal.

## 5.5 ELECTRICAL FAST TRANSIENT/BURST

### 5.5.1 TEST SPECIFICATION

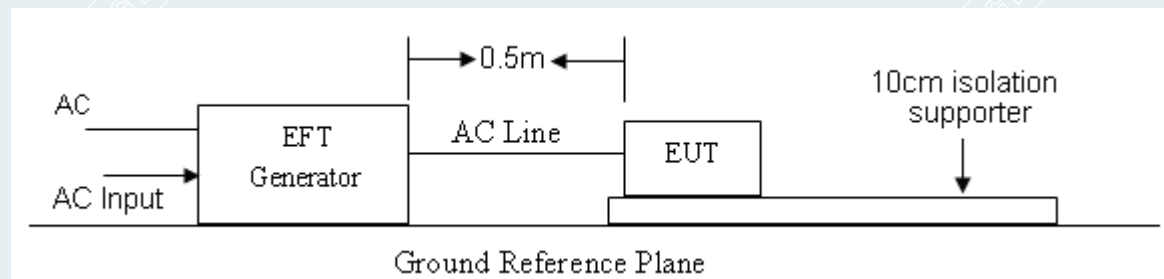
Basic Standard	EN 61000-4-4
Test Voltage	AC Power Port: $\pm 1$ kV Signal/Control Port: $\pm 0.5$ kV
Polarity	Positive and Negative
Impulse Frequency	5 kHz
Impulse Wave-shape	5 ns/50ns for voltage
Burst Duration	15 ms
Burst Period	300 ms
Test Duration	2 minutes

### 5.5.2 TEST PROCEDURE

The EUT and its simulators shall be placed 0.1m high above the ground reference plane which is a min. 1m×1m metallic sheet with 0.65mm minimum thickness. This reference ground plane shall project beyond the EUT by at least 0.1m on all sides and the minimum distance between EUT and all other conductive structure, except the ground plane beneath the EUT, shall be more than 0.5m. For input and AC power ports:

The EUT is connected to the power mains by using a coupling device which couples the EFT interference signal to AC power lines. Fast transients are carried out with a minimum duration of 2 min with a positive polarity and a minimum of 2 min with a negative polarity.

### 5.5.3 TEST SETUP



#### NOTE:

#### TABLETOP EQUIPMENT

The configuration consisted of a wooden table (0.8m high) standing on the Ground Reference Plane. The GRP consisted of a sheet of aluminum (at least 0.25mm thick and 2.5m square) connected to the protective grounding system. A minimum distance of 0.5m was provided between the EUT and the walls of the laboratory or any other metallic structure.

#### FLOOR STANDING EQUIPMENT

The EUT installed in a representative system as described in section 7 of EN 61000-4-4 and its cables, were isolated from the Ground Reference Plane by an insulating support that is 0.1-meter thick. The GRP consisted of a sheet of aluminum (at least 0.25mm thick and 2.5m square) connected to the protective grounding system.

### 5.5.4 TEST RESULTS

<b>EUT</b>	Wireless AC750 Dual-Band Range Extender		
	WS-WN576A2		
<b>Operation Mode</b>	Mode 1	<b>Test date</b>	2020/03/11
<b>Voltage Supply</b>	230VAC/50Hz	<b>Test Engineer</b>	Li Qin
<b>Environment</b>	Tem:23.8℃ RH:64% 101.1kPa		
<b>Sample NO. in Lab</b>	0001		

Test Point	Polarity	Test Level (kV)	Required Passing Performance	Actual performance	Result
AC port	+/-	1	Criterion A	Criterion A <sup>1)</sup>	PASS
LAN port	+/-	0.5	Criterion A	Criterion A <sup>1)</sup>	PASS

Note:A<sup>1)</sup>: There was no network interruption during the test, and after test, the EUT can work as normal.

<b>EUT</b>	Wireless AC750 Dual-Band Range Extender		
	WS-WN576A2		
<b>Operation Mode</b>	Mode 1	<b>Test date</b>	2020/03/11
<b>Voltage Supply</b>	230VAC/50Hz	<b>Test Engineer</b>	Li Qin
<b>Environment</b>	Tem:23.8℃ RH:64% 101.1kPa		
<b>Sample NO. in Lab</b>	0002		

Test Point	Polarity	Test Level (kV)	Required Passing Performance	Actual performance	Result
AC port	+/-	1	Criterion A	Criterion A <sup>1)</sup>	PASS
LAN port	+/-	0.5	Criterion A	Criterion A <sup>1)</sup>	PASS

Note:A<sup>1)</sup>: There was no network interruption during the test, and after test, the EUT can work as normal.



## 5.6 SURGE IMMUNITY TEST

### 5.6.1 TEST SPECIFICATION

Basic Standard	EN 61000-4-5
Wave-Shape:	1.2/50 us waveform
Test Voltage:	AC Power Port~ line to line: $\pm 1\text{kV}$ , line to ground: $\pm 2\text{kV}$ Signal and Telecommunication Ports ~ Line to line: $\pm 0.5\text{kV}$ ; line to ground: $\pm 1\text{kV}$
Surge Input / Output:	Power Line: L-N / L-PE / N-PE Telecommunication line: T-Ground / R-Ground
Generator Source Impedance:	Power Line: 2 ohm between networks 12 ohm between network and ground Telecommunication line: 42 ohm
Polarity:	Positive/Negative
Phase Angle:	$0^\circ / 90^\circ / 180^\circ / 270^\circ$
Pulse Repetition Rate:	1 time / min. (maximum)
Number of Tests:	5 positive and 5 negative at selected points

### 5.6.2 TEST PROCEDURE

a) For EUT power supply:

The surge is applied to the EUT power supply terminals via the capacitive coupling network. Decoupling networks are required in order to avoid possible adverse effects on equipment not under test that may be powered by the same lines, and to provide sufficient decoupling impedance to the surge wave. The power cord between the EUT and the coupling/decoupling networks was shorter than 2 meters in length.

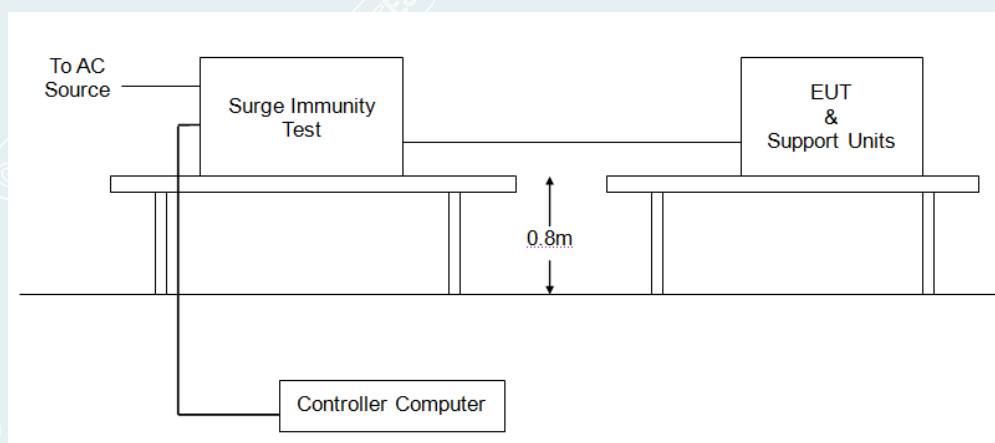
b) For test applied to unshielded un-symmetrically operated interconnection lines of EUT:

The surge was applied to the lines via the capacitive coupling. The coupling / decoupling networks didn't influence the specified functional conditions of the EUT. The interconnection line between the EUT and the coupling/decoupling networks was shorter than 2 meters in length.

c) For test applied to unshielded symmetrically operated interconnection / telecommunication lines of EUT:

The surge was applied to the lines via gas arrestors coupling. Test levels below the ignition point of the coupling arrestor were not specified. The interconnection line between the EUT and the coupling/decoupling networks was shorter than 2 meters in length.

### 5.6.3 TEST SETUP



### 5.6.4 TEST RESULTS

<b>EUT</b>	Wireless AC750 Dual-Band Range Extender		
	WS-WN576A2		
<b>Operation Mode</b>	Mode 1	<b>Test date</b>	2020/03/18
<b>Voltage Supply</b>	230VAC/50Hz	<b>Test Engineer</b>	Li Qin
<b>Environment</b>	Tem:23.8℃ RH:64% 101.1kPa		
<b>Sample NO. in Lab</b>	0001		

Test Point	Polarity	Test Level (kV)	Required Passing Performance	Actual performance	Result
AC port (L – N)	+/-	1	Criterion B	Criterion A <sup>1)</sup>	PASS
AC port (L – Pe)	+/-	2	Criterion B	Criterion A <sup>1)</sup>	PASS
AC port (N – Pe)	+/-	2	Criterion B	Criterion A <sup>1)</sup>	PASS
RJ45 cable	+/-	0.5	Criterion B	Criterion A <sup>1)</sup>	PASS

Note: A<sup>1)</sup>: There was no network interruption during the test, and after test, the EUT can work as normal.

<b>EUT</b>	Wireless AC750 Dual-Band Range Extender		
	WS-WN576A2		
<b>Operation Mode</b>	Mode 1	<b>Test date</b>	2020/03/18
<b>Voltage Supply</b>	230VAC/50Hz	<b>Test Engineer</b>	Li Qin
<b>Environment</b>	Tem:23.8℃ RH:64% 101.1kPa		
<b>Sample NO. in Lab</b>	0002		

Test Point	Polarity	Test Level (kV)	Required Passing Performance	Actual performance	Result
AC port (L – N)	+/-	1	Criterion B	Criterion A <sup>1)</sup>	PASS
AC port (L – Pe)	+/-	2	Criterion B	Criterion A <sup>1)</sup>	PASS
AC port (N – Pe)	+/-	2	Criterion B	Criterion A <sup>1)</sup>	PASS
RJ45 cable	+/-	0.5	Criterion B	Criterion A <sup>1)</sup>	PASS

Note: A<sup>1)</sup>: There was no network interruption during the test, and after test, the EUT can work as normal.

## 5.7 CONTINUOUS INDUCED RF DISTURBANCE

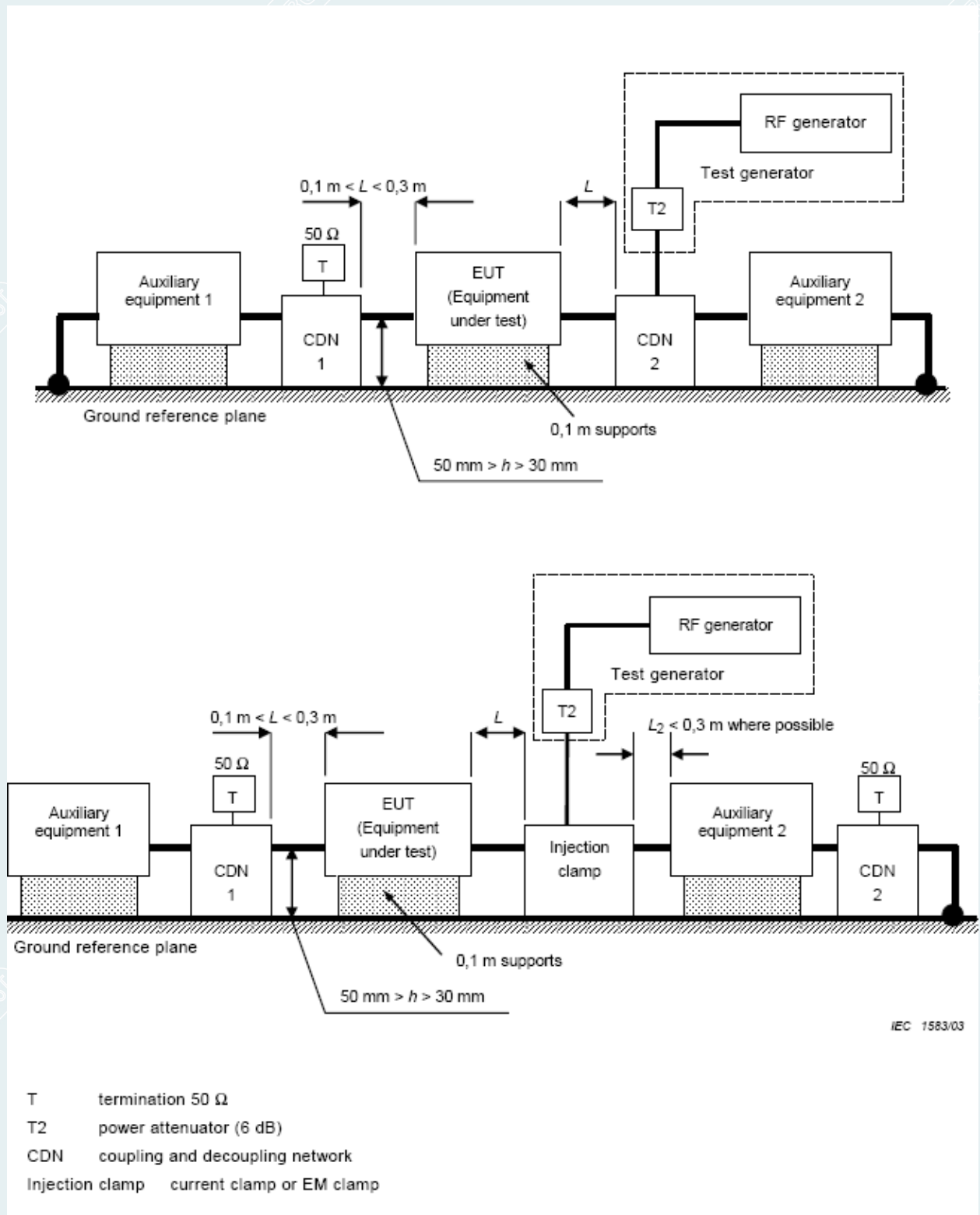
### 5.7.1 TEST SPECIFICATION

Basic Standard	EN 61000-4-6
Frequency Range	0.15 MHz-80 MHz
Field Strength	3 V
Modulation	1 kHz,80% AM
Frequency Step	1%
Dwell time	1s

### 5.7.2 TEST PROCEDURE

- 1) Set up the EUT, CDN as shown on Section 5.7.4
- 2) Let the EUT work in test mode and measure it.
- 3) The EUT are placed on an insulating support 0.1m high above a ground reference plane. CDN (coupling and decoupling device) is placed on the ground plane about 0.3m from EUT. Cables between CDN and EUT are as short as possible, and their height above the ground reference plane shall be between 30 and 50 mm (where possible).
- 4) The disturbance signal described below is injected to EUT through CDN.
- 5) The EUT operates within its operational mode(s) under intended climatic conditions after power on.
- 6) The frequency range is swept from 150 kHz to 80MHz using 3V signal level, and with the disturbance signal 80% amplitude modulated with a 1 kHz sine wave.
- 7) The rate of sweep shall not exceed  $1.5 \times 10^{-3}$  decades/s. Where the frequency is swept incrementally, the step size shall not exceed 1% of the start and thereafter 1% of the preceding frequency value.
- 8) Recording the EUT operating situation during compliance testing and decide the EUT immunity criterion.

### 5.7.3 TEST SETUP





### 5.7.4 TEST RESULTS

<b>EUT</b>	Wireless AC750 Dual-Band Range Extender		
	WS-WN576A2		
<b>Operation Mode</b>	Mode 1	<b>Test date</b>	2020/03/13
<b>Voltage Supply</b>	230VAC/50Hz	<b>Test Engineer</b>	Li Qin
<b>environment</b>	Tem:23.8℃ RH:69% 101.1kPa		
<b>Sample NO. in Lab</b>	0001		

Frequency Band (MHz)	Field Strength (Vrms)	Cable	Injection Method	Required Passing Performance	Actual performance	Result
0.15-80	3	AC port	CDN	Criterion A	Criterion A <sup>1)</sup>	PASS
0.15-80	3	LAN port	CDN	Criterion A	Criterion A <sup>1)</sup>	PASS

Note: A<sup>1)</sup>: There was no network interruption during the test, and after test, the EUT can work as normal.

<b>EUT</b>	Wireless AC750 Dual-Band Range Extender		
	WS-WN576A2		
<b>Operation Mode</b>	Mode 1	<b>Test date</b>	2020/03/13
<b>Voltage Supply</b>	230VAC/50Hz	<b>Test Engineer</b>	Li Qin
<b>environment</b>	Tem:23.8℃ RH:69% 101.1kPa		
<b>Sample NO. in Lab</b>	0002		

Frequency Band (MHz)	Field Strength (Vrms)	Cable	Injection Method	Required Passing Performance	Actual performance	Result
0.15-80	3	AC port	CDN	Criterion A	Criterion A <sup>1)</sup>	PASS
0.15-80	3	LAN port	CDN	Criterion A	Criterion A <sup>1)</sup>	PASS

Note: A<sup>1)</sup>: There was no network interruption during the test, and after test, the EUT can work as normal.

## 5.8 VOLTAGE DIP & VOLTAGE INTERRUPTIONS

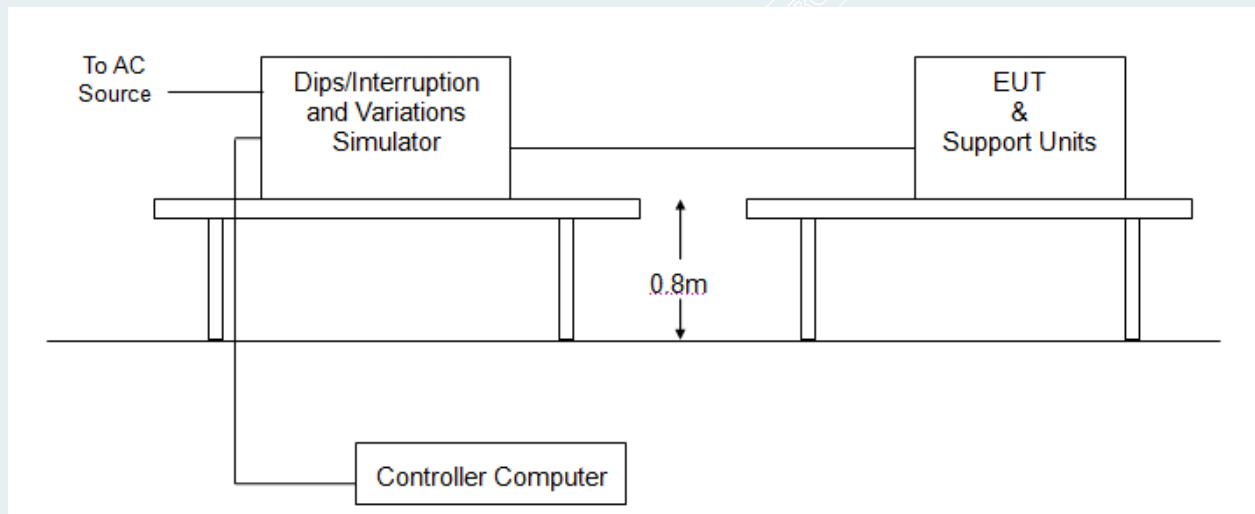
### 5.8.1 TEST SPECIFICATION

Basic Standard	EN 61000-4-11
Test duration time:	Minimum three test events in sequence
Interval between event:	Minimum 10 seconds
Phase Angle:	$0^{\circ} / 45^{\circ} / 90^{\circ} / 135^{\circ} / 180^{\circ} / 225^{\circ} / 270^{\circ} / 315^{\circ}$
Test cycle:	3 times

### 5.8.2 TEST PROCEDURE

- The EUT and support units were located on a wooden table, 0.8 m away from ground floor.
- Setting the parameter of tests and then perform the test software of test simulator.
- Conditions changes to occur at 0 degree crossover point of the voltage waveform.
- Recording the test result in test record form

### 5.8.3 TEST SETUP



**5.8.4 TEST RESULTS**

<b>EUT</b>	Wireless AC750 Dual-Band Range Extender		
	WS-WN576A2		
<b>Operation Mode</b>	Mode 1	<b>Test date</b>	2020/03/12
<b>Voltage Supply</b>	230VAC/50Hz	<b>Test Engineer</b>	Li Qin
<b>Environment</b>	Tem:24.2℃ RH:71% 101.1kPa		
<b>Sample NO. in Lab</b>	0001		

Voltage (% Reduction)	Duration (Period)	Required Passing Performance	Actual performance	Result
0	0.5	Criterion B	Criterion A <sup>1)</sup>	PASS
0	1	Criterion B	Criterion A <sup>1)</sup>	PASS
70	25	Criterion B	Criterion A <sup>1)</sup>	PASS
0	250	Criterion C	Criterion C <sup>2)</sup>	PASS

<b>EUT</b>	Wireless AC750 Dual-Band Range Extender		
	WS-WN576A2		
<b>Operation Mode</b>	Mode 1	<b>Test date</b>	2020/03/12
<b>Voltage Supply</b>	230VAC/50Hz	<b>Test Engineer</b>	Li Qin
<b>Environment</b>	Tem:24.2℃ RH:71% 101.1kPa		
<b>Sample NO. in Lab</b>	0002		

Voltage (% Reduction)	Duration (Period)	Required Passing Performance	Actual performance	Result
0	0.5	Criterion B	Criterion A <sup>1)</sup>	PASS
0	1	Criterion B	Criterion A <sup>1)</sup>	PASS
70	25	Criterion B	Criterion A <sup>1)</sup>	PASS
0	250	Criterion C	Criterion C <sup>2)</sup>	PASS

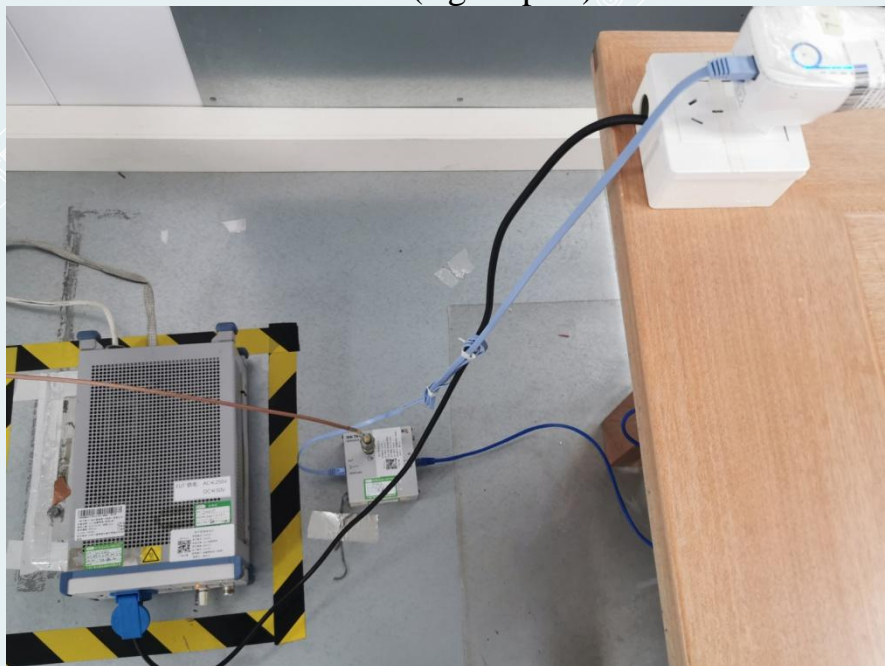
Note: A<sup>1)</sup>: There was no network interruption during the test, and after test, the EUT can work as normal.  
C<sup>2)</sup>: There was stopped during the test, but can be recoverable manually after the test.

## APPENDIX A: PHOTOGRAPH OF THE TEST CONFIGURATION

CE (power port)

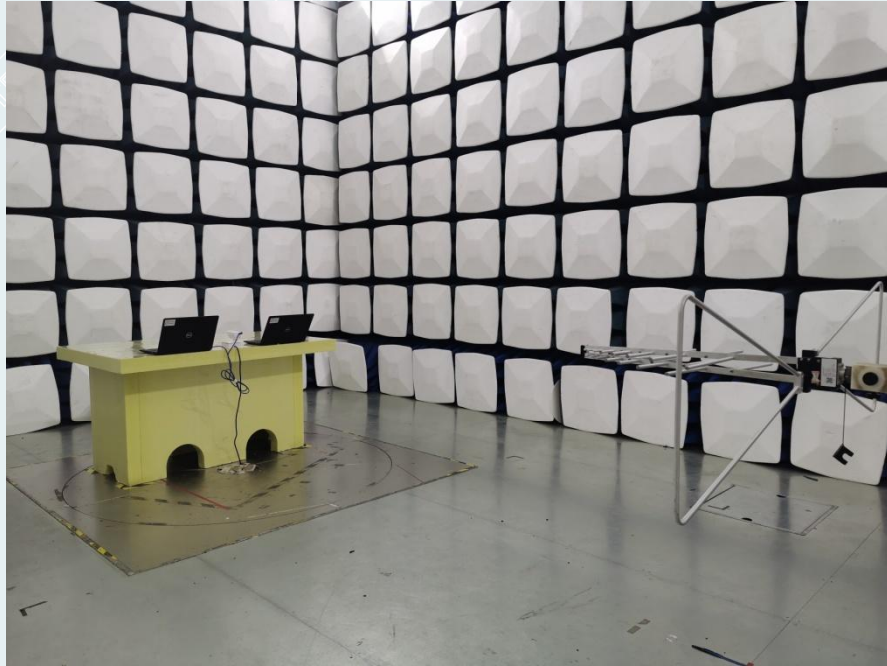


CE (signal port)

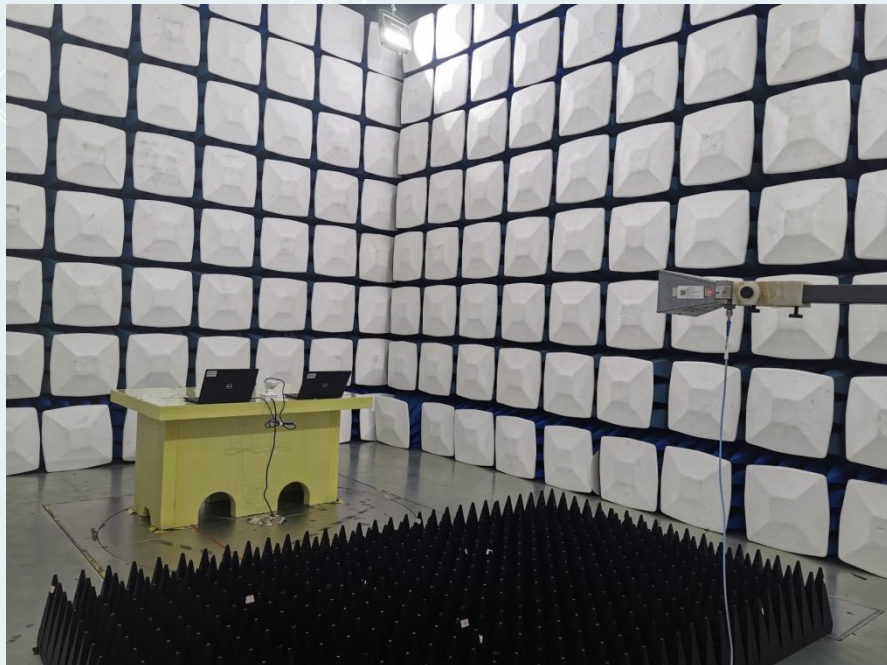




RE  
Below 1GHz



RE  
Above 1GHz

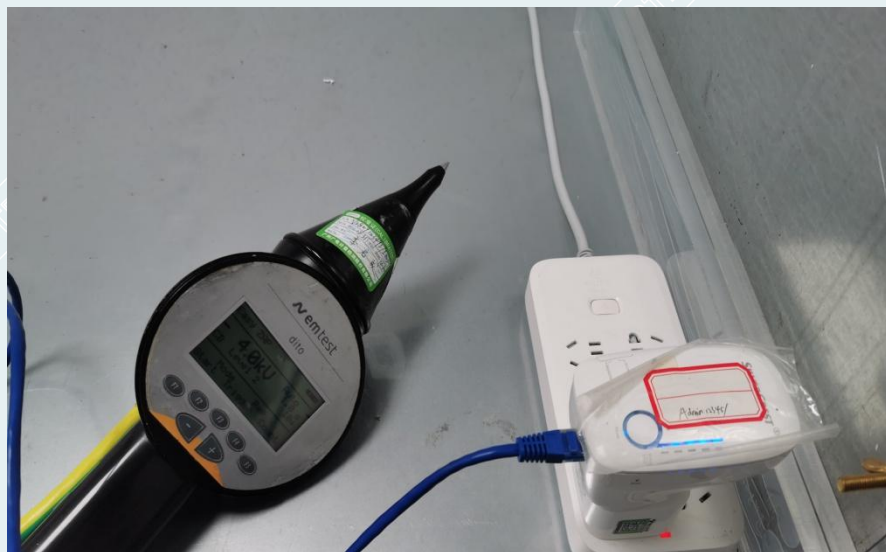




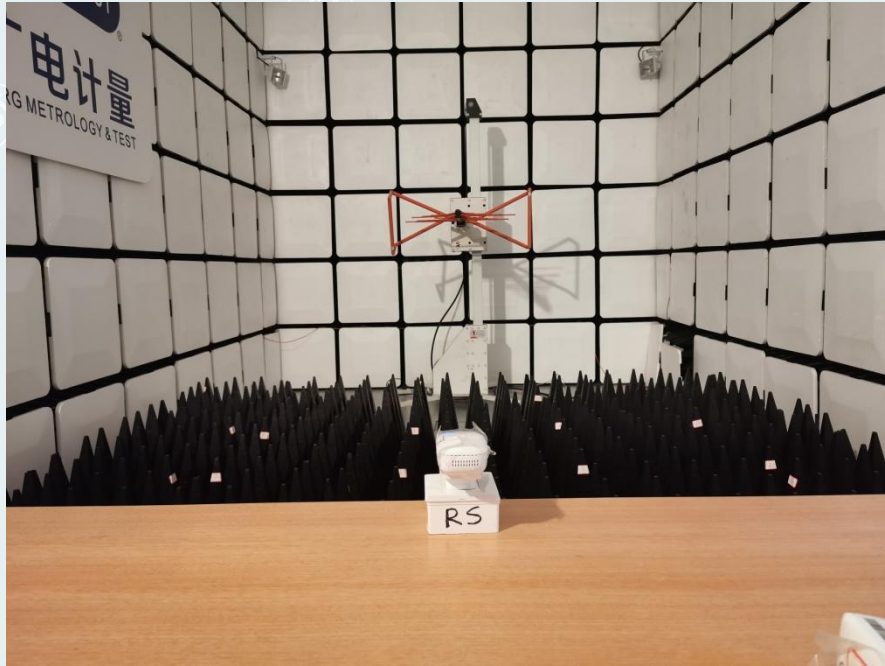
## HARMONIC AND FLICKER



## ESD



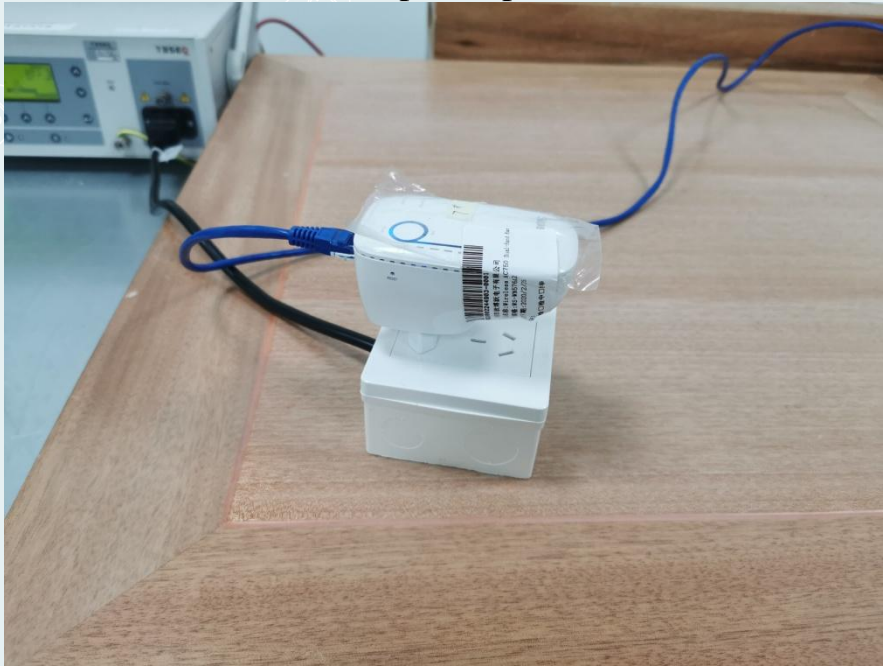
RS- Below 1GHz



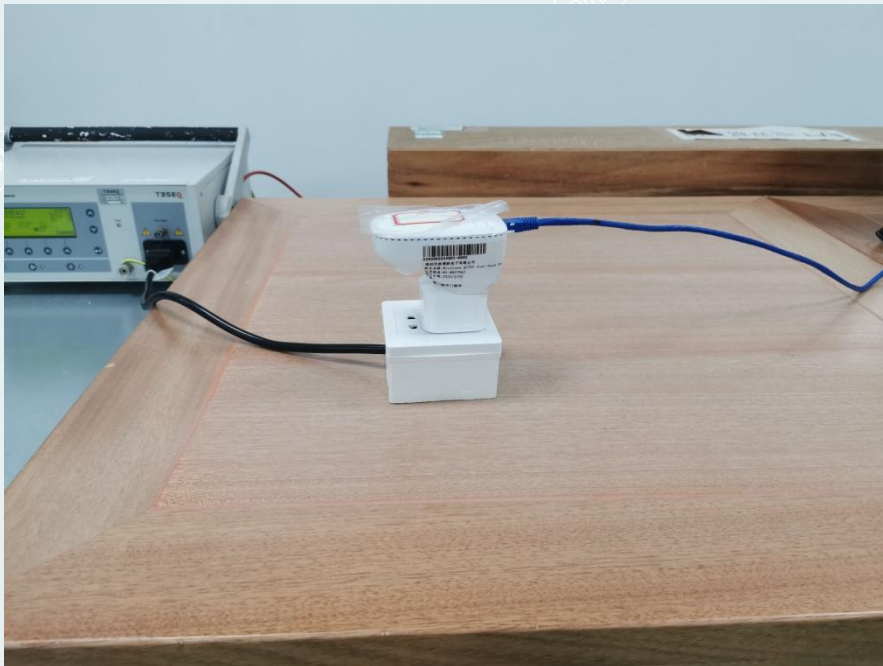
RS- Above 1GHz



EFT (power port)



EFT (signal port)

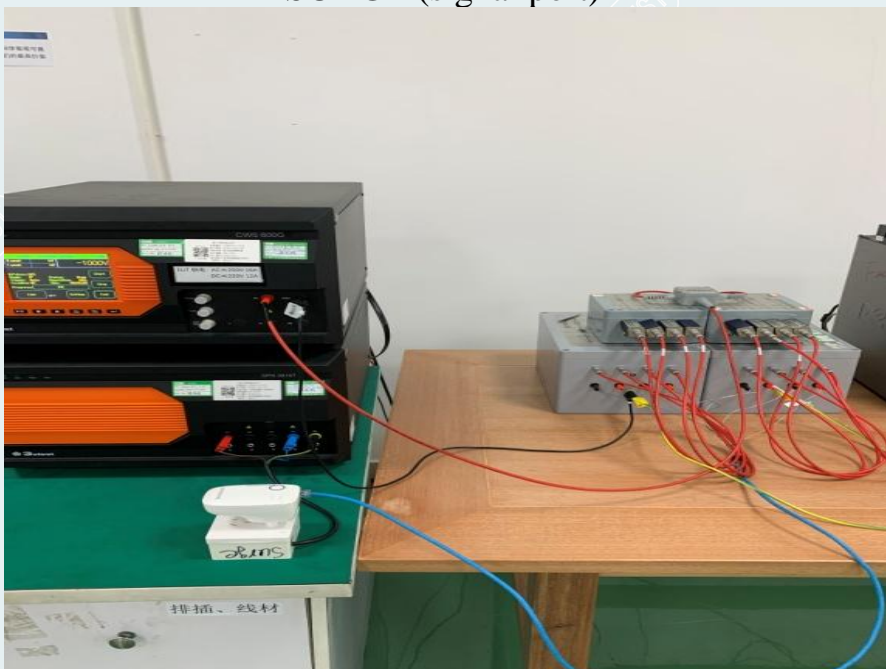




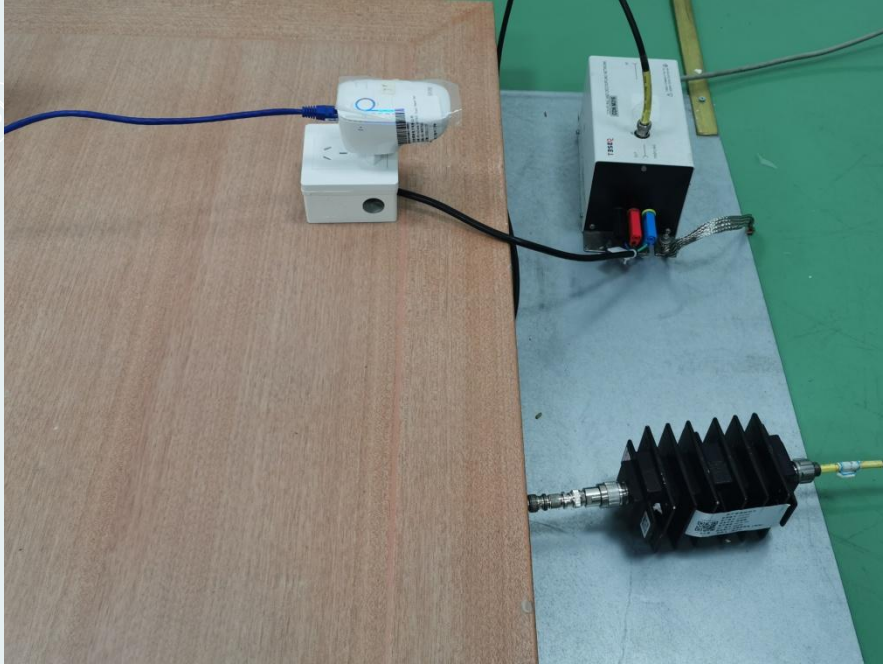
### SURGE (power port)



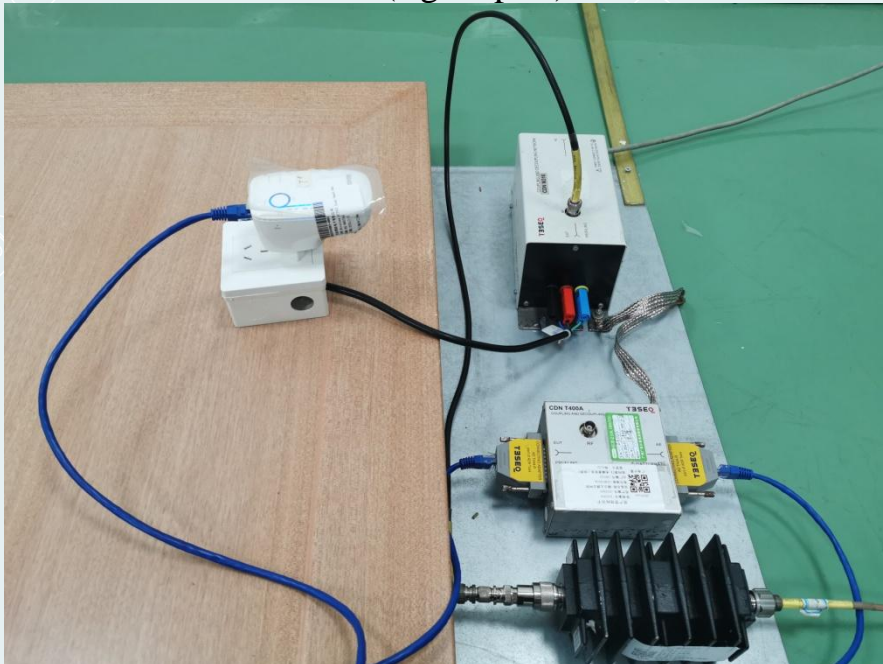
### SURGE (signal port)



CS (power Port)

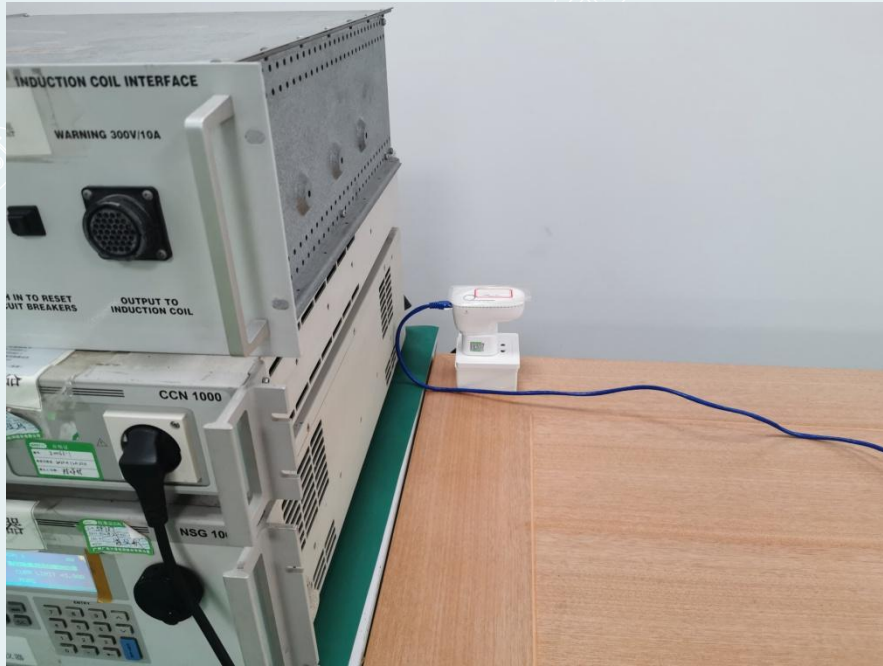


CS (signal port)



VOLTAGE DIPS





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