

TEST REPORT

Applicant: NINGBO UNIVERSAL DRAGON I/E CORP.

Address of Applicant: 9/f Kirin Mansion, Tiantong North Road 1539#, Ningbo, China

Manufacturer/Factory: NINGBO UNIVERSAL DRAGON I/E CORP.

Address of Manufacturer/Factory: 9/f Kirin Mansion, Tiantong North Road 1539#, Ningbo, China

Equipment Under Test (EUT)

Product Name: wireless charging notebook

Model No.: KP2238S

FCC ID: 2AUVH-KP2238S

Applicable standards: FCC CFR Title 47 Part 15 Subpart C

Date of sample receipt: May 31, 2022

Date of Test: June 01-08, 2022

Date of report issued: June 08, 2022

Test Result : PASS *

* In the configuration tested, the EUT complied with the standards specified above.

Authorized Signature:



Robinson Luo
Laboratory Manager

This results shown in this test report refer only to the sample(s) tested, this test report cannot be reproduced, except in full, without prior written permission of the company. The report would be invalid without specific stamp of test institute and the signatures of compiler and approver.

2 Version

Version No.	Date	Description
00	June 08, 2022	Original

Prepared By:



Date:

June 08, 2022

Project Engineer

Check By:



Date:

June 08, 2022

Reviewer

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4 Test Summary

Test Item	Section in CFR 47	Result
Antenna requirement	15.203	Pass
AC Power Line Conducted Emission	15.207	Pass
Radiated Emission	15.209	Pass
20dB Bandwidth	15.215	Pass

Pass: The EUT complies with the essential requirements in the standard.

4.1 Measurement Uncertainty

Test Item	Frequency Range	Measurement Uncertainty	Notes
Radiated Emission	30MHz-200MHz	3.8039dB	(1)
Radiated Emission	200MHz-1GHz	3.9679dB	(1)
AC Power Line Conducted Emission	0.15MHz ~ 30MHz	3.44dB	(1)

Note (1): The measurement uncertainty is for coverage factor of k=2 and a level of confidence of 95%.

5 General Information

5.1 General Description of EUT

Product Name:	wireless charging notebook
Model No.:	KP2238S
Serial No.:	N/A
Test sample(s) ID:	GTS202205000308-1
Sample(s) Status	Engineer sample
Operation Frequency:	112kHz~205kHz
Modulation type:	FSK
Antenna Type:	Coil Antenna
Antenna gain:	0dBi (Max)
Power supply:	Input: DC 5V, 2A Output: DC 5V, 1A, 5W

5.2 Test mode

Wireless charging mode	Keep the EUT in wireless charging status. Wireless output 5W mode is worse case and reported.
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5.3 Description of Support Units

Manufacturer	Description	Model	S/N
YBZ	Intelligent wireless charging full function test module	001	N/A
XIAOMI	USB Charger	MDY-10-EH	N/A

5.4 Deviation from Standards

None.

5.5 Abnormalities from Standard Conditions

None.

5.6 Test Facility

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

- **FCC—Registration No.: 381383**

Designation Number: CN5029

Global United Technology Services Co., Ltd., Shenzhen EMC Laboratory has been registered and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in files.

- **IC —Registration No.: 9079A**

CAB identifier: CN0091

The 3m Semi-anechoic chamber of Global United Technology Services Co., Ltd. has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing

- **NVLAP (LAB CODE:600179-0)**

Global United Technology Services Co., Ltd., is accredited by the National Voluntary Laboratory Accreditation Program (NVLAP).

5.7 Test Location

All tests were performed at:

Global United Technology Services Co., Ltd.

No. 123-128, Tower A, Jinyuan Business Building, No.2, Laodong Industrial Zone, Xixiang Road, Baoan District, Shenzhen, Guangdong, China 518102

Tel: 0755-27798480

Fax: 0755-27798960

5.8 Other Information Requested by the Customer

None.

6 Test Instruments list

Radiated Emission:						
Item	Test Equipment	Manufacturer	Model No.	Inventory No.	Cal.Date (mm-dd-yy)	Cal.Due date (mm-dd-yy)
1	3m Semi- Anechoic Chamber	ZhongYu Electron	9.2(L)*6.2(W)* 6.4(H)	GTS250	July 02, 2020	July 01, 2025
2	Control Room	ZhongYu Electron	6.2(L)*2.5(W)* 2.4(H)	GTS251	N/A	N/A
	EMI Test Software	AUDIX	E3	N/A	N/A	N/A
3	EMI Test Receiver	Rohde & Schwarz	ESU26	GTS203	April 22, 2022	April 21, 2023
4	Loop Antenna	ZHINAN	ZN30900A	GTS534	Nov. 30, 2021	Nov. 29, 2022
5	BiConiLog Antenna	SCHWARZBECK MESS-ELEKTRONIK	VULB9168	GTS640	March 21, 2022	March 20, 2023
6	Amplifier(100kHz-3GHz)	HP	8347A	GTS204	April 22, 2022	April 21, 2023
7	Coaxial Cable	GTS	N/A	GTS213	April 22, 2022	April 21, 2023
8	Coaxial Cable	GTS	N/A	GTS211	April 22, 2022	April 21, 2023
9	Coaxial cable	GTS	N/A	GTS210	April 22, 2022	April 21, 2023

Conducted Emission						
Item	Test Equipment	Manufacturer	Model No.	Inventory No.	Cal.Date (mm-dd-yy)	Cal.Due date (mm-dd-yy)
1	Shielding Room	ZhongYu Electron	7.3(L)x3.1(W)x2.9(H)	GTS252	May.14 2022	May.13 2025
2	EMI Test Receiver	R&S	ESCI 7	GTS552	June. 24 2021	June. 23 2022
3	ENV216 2-L-V- NETZNACHB.DE	ROHDE&SCHWARZ	ENV216	GTS226	June. 24 2021	June. 23 2022
4	Coaxial Cable	GTS	N/A	GTS227	N/A	N/A
5	EMI Test Software	AUDIX	E3	N/A	N/A	N/A

RF Conducted Test:						
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Cal.Date (mm-dd-yy)	Cal.Due date (mm-dd-yy)
1	Spectrum Analyzer	Agilent	E4440A	GTS533	June. 24 2021	June. 23 2022

General used equipment:						
Item	Test Equipment	Manufacturer	Model No.	Inventory No.	Cal.Date (mm-dd-yy)	Cal.Due date (mm-dd-yy)
1	Humidity/ Temperature Indicator	KTJ	TA328	GTS243	June. 24 2021	June. 23 2022
2	Barometer	KUMAO	SF132	GTS647	July 26, 2022	July 25, 2023

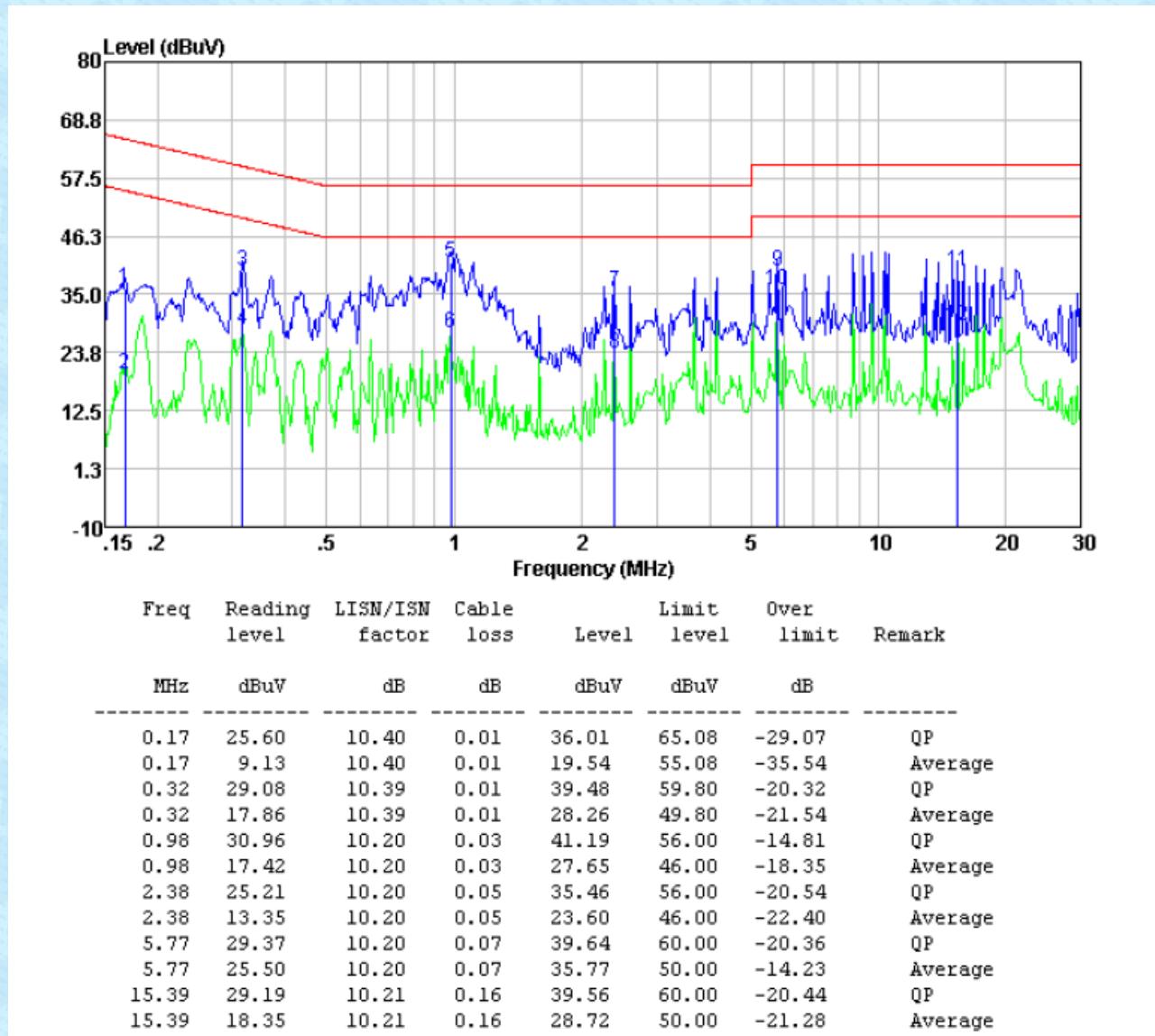
7 Test results and Measurement Data

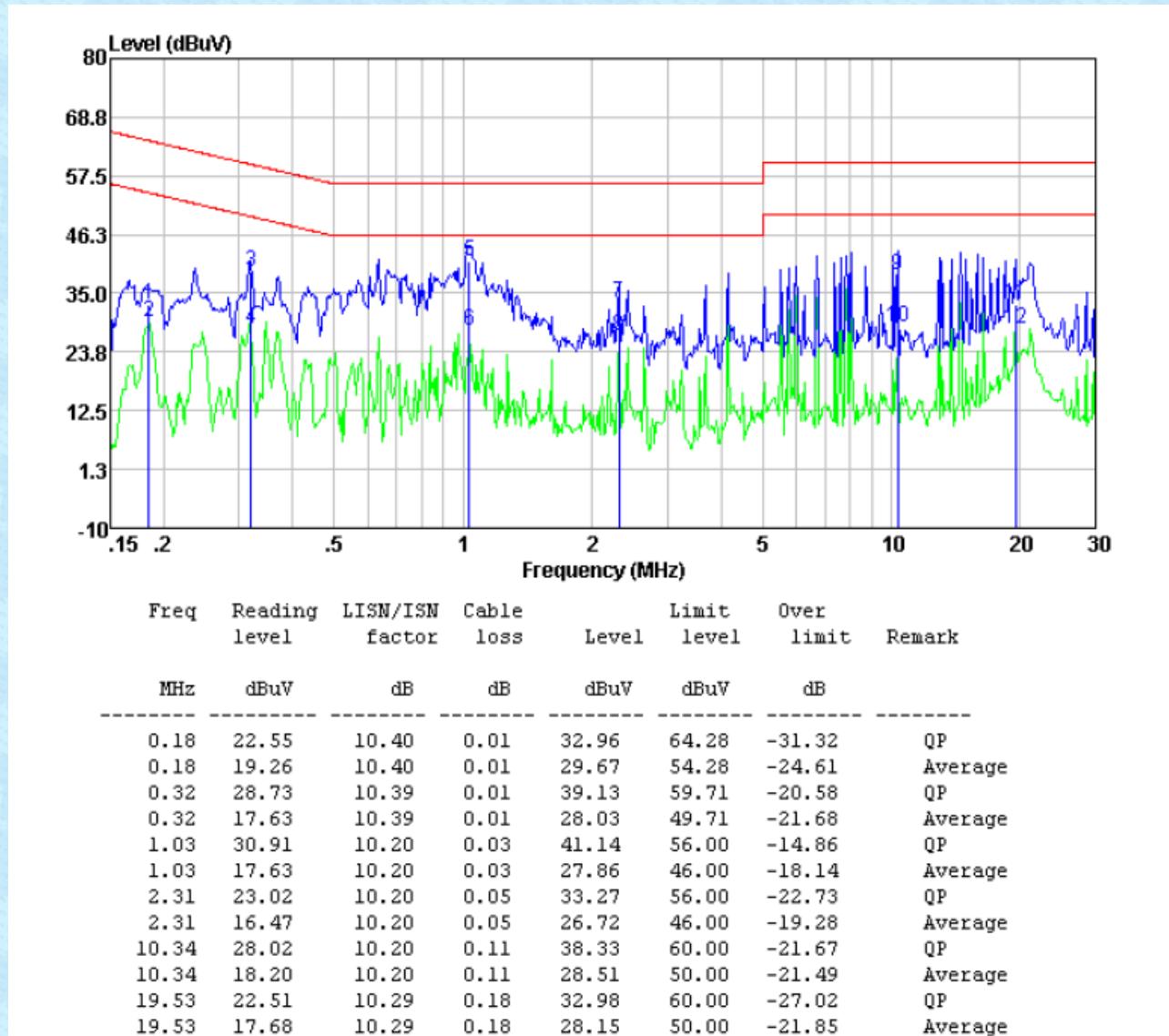
7.1 Antenna requirement:

Standard requirement:	FCC Part15 C Section 15.203
15.203 requirement:	
An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator, the manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.	
EUT Antenna:	
<i>The Ant is coil antenna, the best case gain of the antenna is 0dBi, reference to the appendix II for details.</i>	

7.2 Conducted Emissions

Test Requirement:	FCC Part15 C Section 15.207																
Test Method:	ANSI C63.10																
Test Frequency Range:	150KHz to 30MHz																
Class / Severity:	Class B																
Receiver setup:	RBW=9KHz, VBW=30KHz, Sweep time=auto																
Limit:	<table border="1"> <thead> <tr> <th rowspan="2">Frequency range (MHz)</th> <th colspan="2">Limit (dBuV)</th> </tr> <tr> <th>Quasi-peak</th> <th>Average</th> </tr> </thead> <tbody> <tr> <td>0.15-0.5</td> <td>66 to 56*</td> <td>56 to 46*</td> </tr> <tr> <td>0.5-5</td> <td>56</td> <td>46</td> </tr> <tr> <td>5-30</td> <td>60</td> <td>50</td> </tr> </tbody> </table>			Frequency range (MHz)	Limit (dBuV)		Quasi-peak	Average	0.15-0.5	66 to 56*	56 to 46*	0.5-5	56	46	5-30	60	50
Frequency range (MHz)	Limit (dBuV)																
	Quasi-peak	Average															
0.15-0.5	66 to 56*	56 to 46*															
0.5-5	56	46															
5-30	60	50															
	<small>* Decreases with the logarithm of the frequency.</small>																
Test setup:	<p><i>Remark</i> <i>E.U.T: Equipment Under Test</i> <i>LISN: Line Impedance Stabilization Network</i> <i>Test table height=0.8m</i></p>																
Test procedure:	<ol style="list-style-type: none"> 1. The E.U.T and simulators are connected to the main power through a line impedance stabilization network (L.I.S.N.). This provides a 50ohm/50uH coupling impedance for the measuring equipment. 2. The peripheral devices are also connected to the main power through a LISN that provides a 50ohm/50uH coupling impedance with 50ohm termination. (Please refer to the block diagram of the test setup and photographs). 3. Both sides of A.C. line are checked for maximum conducted interference. In order to find the maximum emission, the relative positions of equipment and all of the interface cables must be changed according to ANSI C63.10 on conducted measurement. 																
Test Instruments:	Refer to section 6.0 for details																
Test mode:	Refer to section 5.2 for details. Only show the worst cas (Charging with 5W wireless charging load).																
Test environment:	Temp.:	25 °C	Humid.:	52%	Press.:	1012mbar											
Test voltage:	AC 120V, 60Hz																
Test results:	Pass																

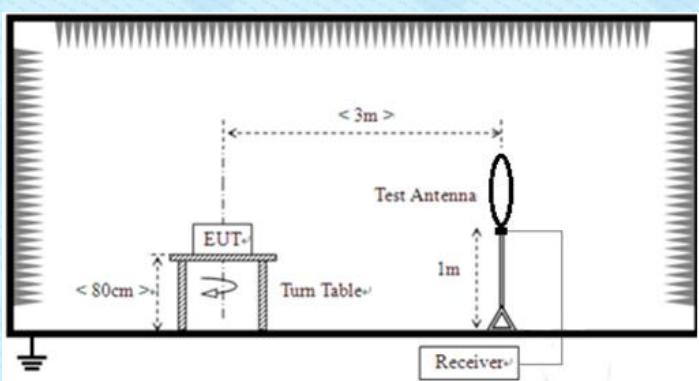
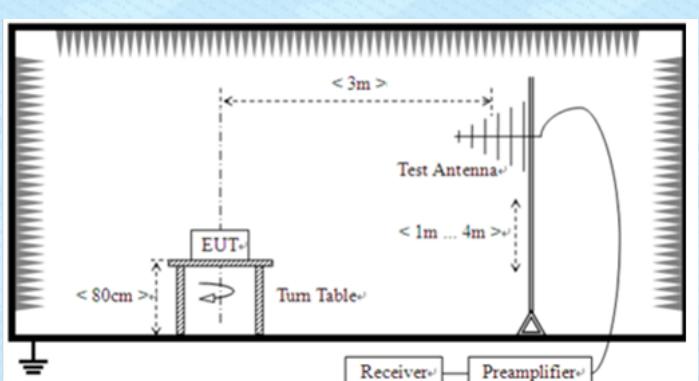
Measurement data:
Line:


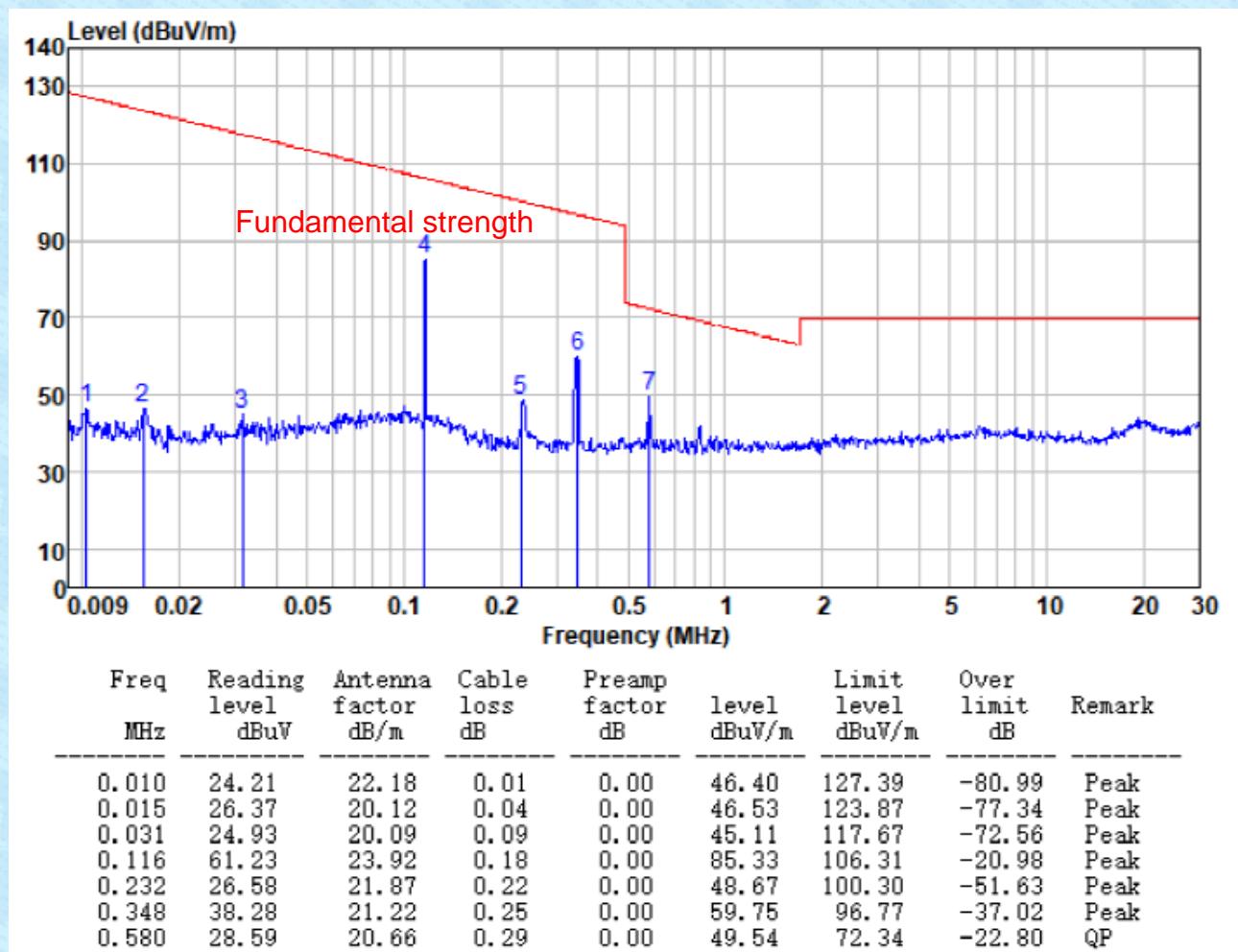
Neutral:

Notes:

1. An initial pre-scan was performed on the line and neutral lines with peak detector.
2. Quasi-Peak and Average measurement were performed at the frequencies with maximized peak emission.
3. Final Level =Receiver Read level + LISN Factor + Cable Loss
4. If the average limit is met when using a quasi-peak detector receiver, the EUT shall be deemed to meet both limits and measurement with the average detector receiver is unnecessary.

7.3 Radiated Emission Method

Test Requirement:	FCC Part15 C Section 15.209									
Test Method:	ANSI C63.10									
Test Frequency Range:	9kHz to 1GHz									
Test site:	Measurement Distance: 3m									
Receiver setup:	Frequency	Detector	RBW	VBW	Remark					
	9kHz - 30MHz	Quasi-peak	10kHz	30kHz	Quasi-peak Value					
	30MHz-1GHz	Quasi-peak	120kHz	300kHz	Quasi-peak Value					
	Above 1GHz	Peak	1MHz	3MHz	Peak Value					
AV					Average Value					
Remark: For the frequency bands 9-90 kHz, 110-490 kHz and above 1000 MHz. Radiated emission test in these three bands are based on measurements employing an average detector.										
Limit: (Spurious Emissions)	Limits for frequency below 30MHz									
	Frequency	Limit (uV/m)	Measurement Distance(m)	Remark						
	0.009-0.490	2400/F(kHz)	300	Quasi-peak Value						
	0.490-1.705	24000/F(kHz)	30	Quasi-peak Value						
	1.705-30	30	30	Quasi-peak Value						
	Limits for frequency Above 30MHz									
	Frequency	Limit (dBuV/m @3m)	Remark							
	30MHz-88MHz	40.00	Quasi-peak Value							
	88MHz-216MHz	43.50	Quasi-peak Value							
Test Procedure:	216MHz-960MHz	46.00	Quasi-peak Value							
	960MHz-1GHz	54.00	Quasi-peak Value							
	Above 1GHz	54.00	Average Value							
		74.00	Peak Value							
	Remark: The emission limits shown in the above table are based on measurements employing a CISPR quasi-peak detector except for the frequency bands 9-90 kHz, 110-490 kHz and above 1000 MHz. Radiated emission limits in these three bands are based on measurements employing an average detector.									
	1. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter camber. The table was rotated 360 degrees to determine the position of the highest radiation.									
	2. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.									
	3. The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.									
	4. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rota table was turned from 0 degrees to 360 degrees to find the maximum reading.									
	5. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.									
	6. If the emission level of the EUT in peak mode was 10dB lower than the									

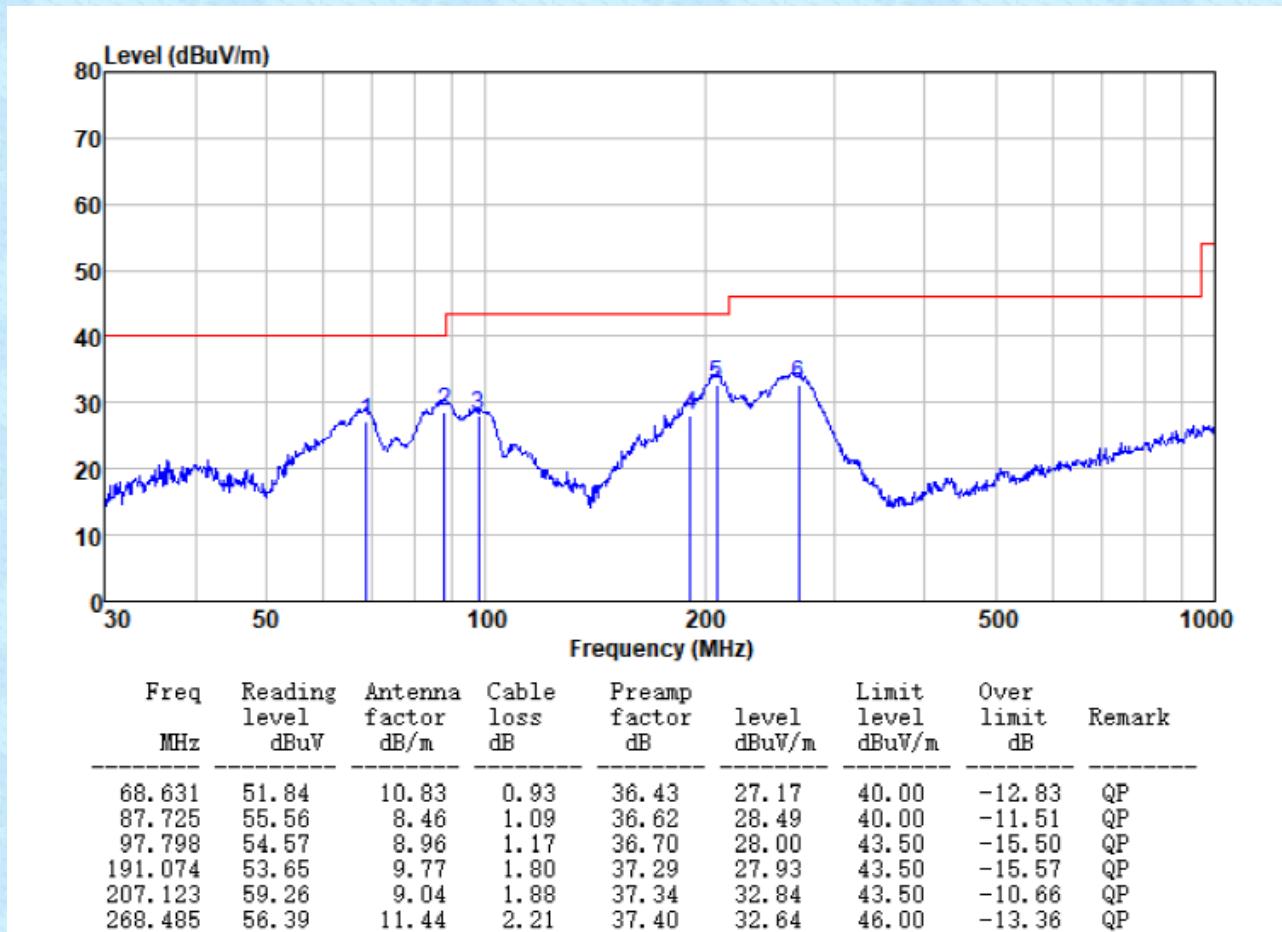
	<p>limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.</p> <p>7. The radiation measurements are performed in X, Y, Z axis positioning. And found the Y axis positioning which it is worse case, only the test worst case mode is recorded in the report.</p>
Test setup:	<p>Below 30MHz</p>  <p>30MHz ~ 1000MHz</p> 
Test Instruments:	Refer to section 6.0 for details
Test mode:	Refer to section 5.2 for details. Only show the worst cas (Charging with 5W wireless charging load).
Test environment:	Temp.: 25 °C Humid.: 52% Press.: 1012mbar
Test voltage:	AC 120V, 60Hz
Test results:	Pass

Measurement data:
Below 30MHz


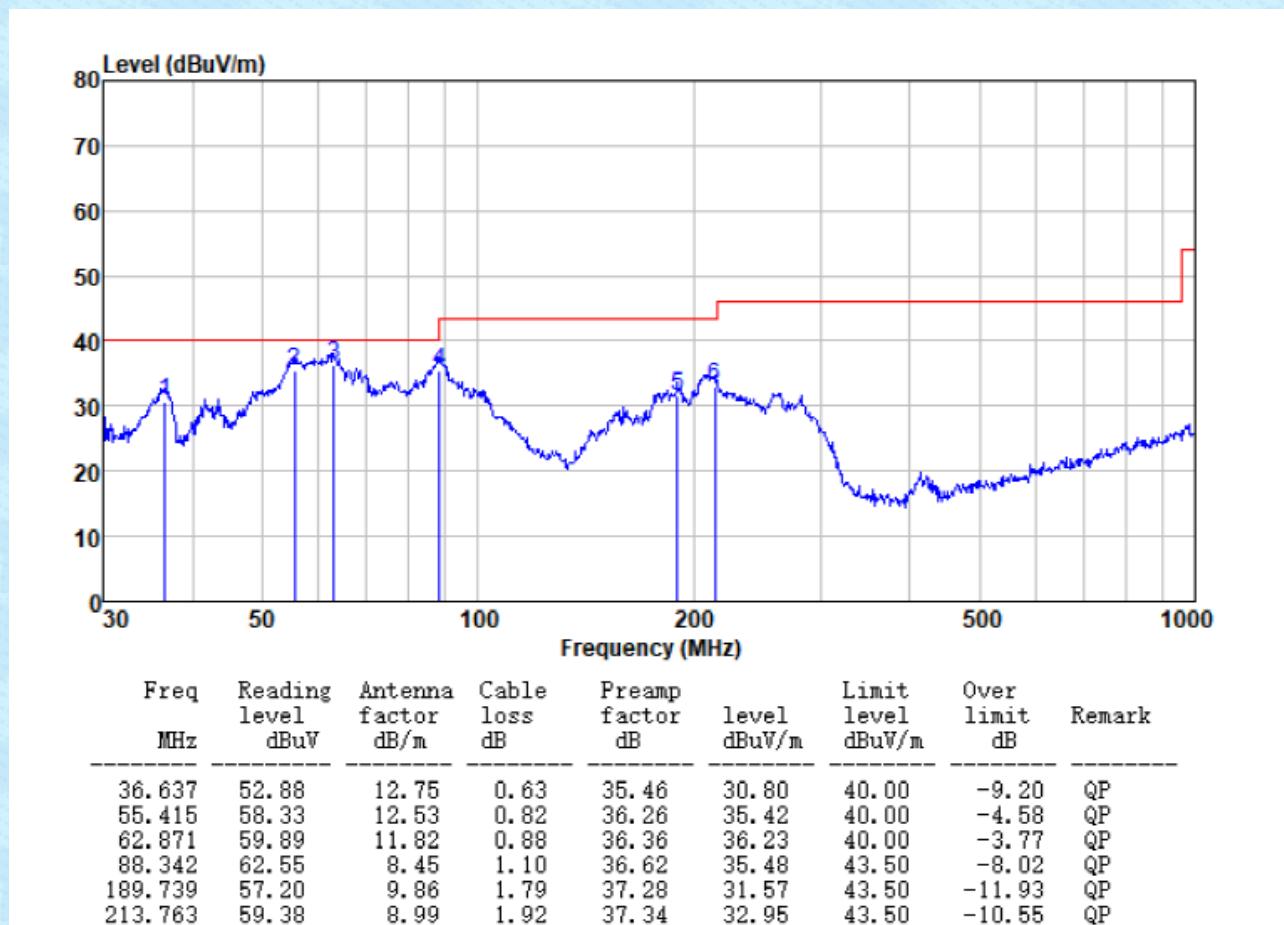
Note: Coplaner and Coaxial polarity all have been tested , only worse case is reported .

30MHz ~ 1GHz

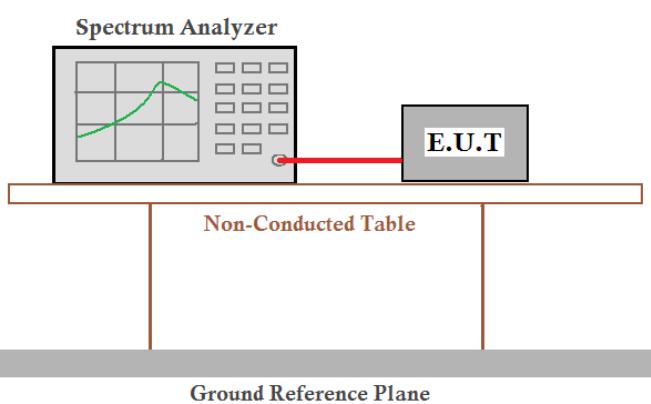
Horizontal



Vertical



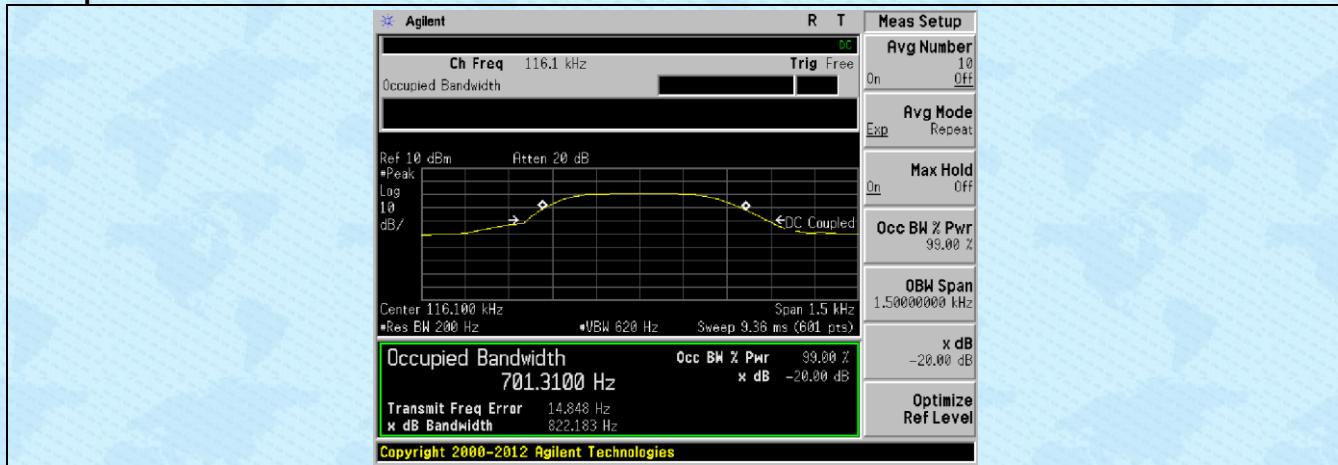
7.4 20dB Occupy Bandwidth

Test Requirement:	FCC Part15 C Section 15.215	
Test Method:	ANSI C63.10	
Test setup:		
Test Instruments:	Refer to section 6.0 for details	
Test mode:	Refer to section 5.2 for details	
Test results:	Pass	

Measurement Data

Test frequency(KHz)	20dB bandwidth(Hz)	Result
116.1	822.183	Pass

Test plot as follows:



8 Test Setup Photo

Reference to the **appendix I** for details.

9 EUT Constructional Details

Reference to the **appendix II** for details.

-----End-----