



## RF TEST REPORT

### No. 160602051SHA-001

Applicant : THE BUBBLES COMPANY  
11 cite Vaneau 75007 PARIS FRANCE  
Manufacturer : THE BUBBLES COMPANY  
11 cite Vaneau 75007 PARIS FRANCE  
Product Name : Smart USB Charger  
Type/Model : BUBBLETWO  
**TEST RESULT : PASS**

#### SUMMARY

The equipment complies with the requirements according to the following standard(s):

**47CFR Part 15 (2015):** Radio Frequency Devices

**ANSI C63.10 (2013):** American National Standard for Testing Unlicensed Wireless Devices

**RSS-210 Issue 8 (December 2010):** Licence-exempt Radio Apparatus (All Frequency Bands): Category I Equipment

**RSS-Gen Issue 4 (November 2014):** General Requirements for Compliance of Radio Apparatus

Date of issue: August 1, 2016

Prepared by:

Wade Zhang (*Project Engineer*)

Reviewed by:

Daniel Zhao (*Reviewer*)



**FCC ID: 2AIOL-BUBBLETWO**  
**IC: 21580-BUBBLETWO**

## **Description of Test Facility**

Name: Intertek Testing Services Limited Shanghai  
Address: Building 86, No. 1198 Qinzhou Rd., North, Shanghai 200233, P.R. China

FCC Registration Number: 236597  
IC Assigned Code: 2042B-1

Name of contact: Jonny Jing  
Tel: +86 21 61278271  
Fax: +86 21 54262353

## Content

<b>SUMMARY .....</b>	<b>1</b>
<b>DESCRIPTION OF TEST FACILITY .....</b>	<b>2</b>
<b>1. GENERAL INFORMATION .....</b>	<b>4</b>
1.1 Applicant Information.....	4
1.2 Identification of the EUT .....	4
1.3 Mode of operation during the test / Test peripherals used.....	5
<b>2. TEST SPECIFICATION .....</b>	<b>6</b>
2.1 Instrument list .....	6
2.2 Test Standard .....	6
2.3 Test Summary .....	7
<b>3. RADIATED EMISSION &amp; BAND EDGE.....</b>	<b>8</b>
3.1 Test limit .....	8
3.2 Test Configuration .....	8
3.3 Test procedure and test setup .....	9
3.4 Test protocol .....	10
<b>4. ASSIGNED BANDWIDTH (20dB BANDWIDTH) .....</b>	<b>13</b>
4.1 Limit.....	13
4.2 Test Configuration .....	13
4.3 Test procedure and test setup .....	13
4.4 Test protocol .....	14
<b>5. POWER LINE CONDUCTED EMISSION .....</b>	<b>16</b>
5.1 Limit.....	16
5.2 Test configuration .....	16
5.3 Test procedure and test set up .....	17
5.4 Test protocol .....	18

## **1. General Information**

### **1.1 Applicant Information**

Applicant : THE BUBBLES COMPANY  
11 cite Vaneau 75007 PARIS FRANCE

Name of contact : Julien CASEL

Tel : +33 6 68 67 29 12

Fax : /

Manufacturer : THE BUBBLES COMPANY  
11 cite Vaneau 75007 PARIS FRANCE

Factory : Technochina Industries(ShangHai) Co., Ltd  
152/1421 Zhuan Xin Dong Lu, Minhang Industrial Park  
201108 Shanghai, China

### **1.2 Identification of the EUT**

Product description : Smart USB Charger

Type/model : BUBBLETWO

Operation Frequency : 2400-2483.5MHz

Band

EUT Modes of : Bluetooth 4.0 Low Energy

Modulation

Type of Modulation : GFSK

Channel Description : 40 channels (0-39)

Antenna Type : 1.6dBi Internal PCB antenna

Port identification : USB \* 4

Rating : Input: 120-230V AC 1.35A 50-60Hz  
Output: 4 x 5V DC 1.7A

Category of EUT : Class B

EUT type : ☒ Table top ☐ Floor standing

Sample received date : 2016.06.15

Sample Identification : /

No

Date of test : 2016.06.16 ~ 2016.07.11

### **1.3 Mode of operation during the test / Test peripherals used**

Within this test report, EUT was tested with modulation and tested under its rating voltage and frequency.

The EUT was set to work normal and as receiving and transmitting mode during test. No standby function.

Test Peripherals: NA

## 2. Test Specification

### 2.1 Instrument list

Selected	Equipment	Type	Manu.	Internal no.	Cal. Date	Due date
<input checked="" type="checkbox"/>	PXA Analyzer	N9030A	Agilent	EC5338	2016/3/4	2017/3/3
<input checked="" type="checkbox"/>	Vector SG	N5182B	Agilent	EC5175	2016/3/4	2017/3/3
<input checked="" type="checkbox"/>	Power sensor	U2021XA	Agilent	EC5338-1	2016/3/4	2017/3/3
<input checked="" type="checkbox"/>	MXG Analog SG	N5181A	Agilent	EC5338-2	2016/3/4	2017/3/3
<input checked="" type="checkbox"/>	Power meter	N1911A/N1921A	Agilent	EC4318	2016/4/10	2017/4/9
<input checked="" type="checkbox"/>	EMI Receiver	ESCS 30	R&S	EC 2107	2015/10/20	2016/10/19
<input checked="" type="checkbox"/>	A.M.N.	ESH2-Z5	R&S	EC 3119	2015/12/16	2017/12/15
<input checked="" type="checkbox"/>	I.S.N.	FCC-TLISN-T8-02	FCC	EC3756	2016/2/16	2017/2/15
<input checked="" type="checkbox"/>	EMI chamber	3m	Albatross	EC 3048	2016/5/5	2017/5/4
<input checked="" type="checkbox"/>	Test Receiver	ESIB 26	R&S	EC 3045	2015/10/20	2016/10/19
<input checked="" type="checkbox"/>	Test Receiver	ESCI 7	R&S	EC4501	2016/2/24	2017/2/23
<input checked="" type="checkbox"/>	Bilog Antenna	CBL 6112D	TESEQ	EC 4206	2016/5/30	2017/5/29
<input checked="" type="checkbox"/>	Horn antenna	HF 906	R&S	EC 3049	2015/9/12	2016/9/11
<input checked="" type="checkbox"/>	Horn antenna	HAP18-26W	TOYO	EC 4792-3	2014/6/12	2017/6/11
<input checked="" type="checkbox"/>	Pre-amplifier	Pre-amp 18	R&S	EC 5262	2016/5/24	2017/5/23
<input checked="" type="checkbox"/>	Pre-amplifier	Tpa0118-40	R&S	EC 4792-2	2016/4/11	2017/4/10
<input checked="" type="checkbox"/>	Shielded room	-	Zhongyu	EC 2838	2016/1/9	2017/1/8

### 2.2 Test Standard

47CFR Part 15 (2015)  
 ANSI C63.10 (2013)  
 RSS-210 Issue 8 (December 2010)  
 RSS-Gen Issue 4 (November 2014)

## 2.3 Test Summary

**This report applies to tested sample only. This report shall not be reproduced in part without written approval of Intertek Testing Service Shanghai Limited.**

TEST ITEM	FCC REFERENCE	IC Reference	RESULT
Radiated emission	15.249 & 15.209	RSS 210 Issue 8 A2.9	Pass
Assigned bandwidth (20dB bandwidth)	15.215(c)	-	Pass
Power line conducted emission	15.207	RSS-Gen Issue 4 Clause 8.8	Pass

*Note: This report is for the exclusive use of Intertek's Client and is provided pursuant to the agreement between Intertek and its Client. Intertek's responsibility and liability are limited to the terms and conditions of the agreement. Intertek assumes no liability to any party, other than to the Client in accordance with the agreement, for any loss, expense or damage occasioned by the use of this report. Only the Client is authorized to permit copying or distribution of this report and then only in its entirety. Any use of the Intertek name or one of its marks for the sale or advertisement of the tested material, product or service must first be approved in writing by Intertek. The observations and test results in this report are relevant only to the sample tested. This report by itself does not imply that the material, product, or service is or has ever been under an Intertek certification program.*

### 3. Radiated emission & Band Edge

Test result: **PASS**

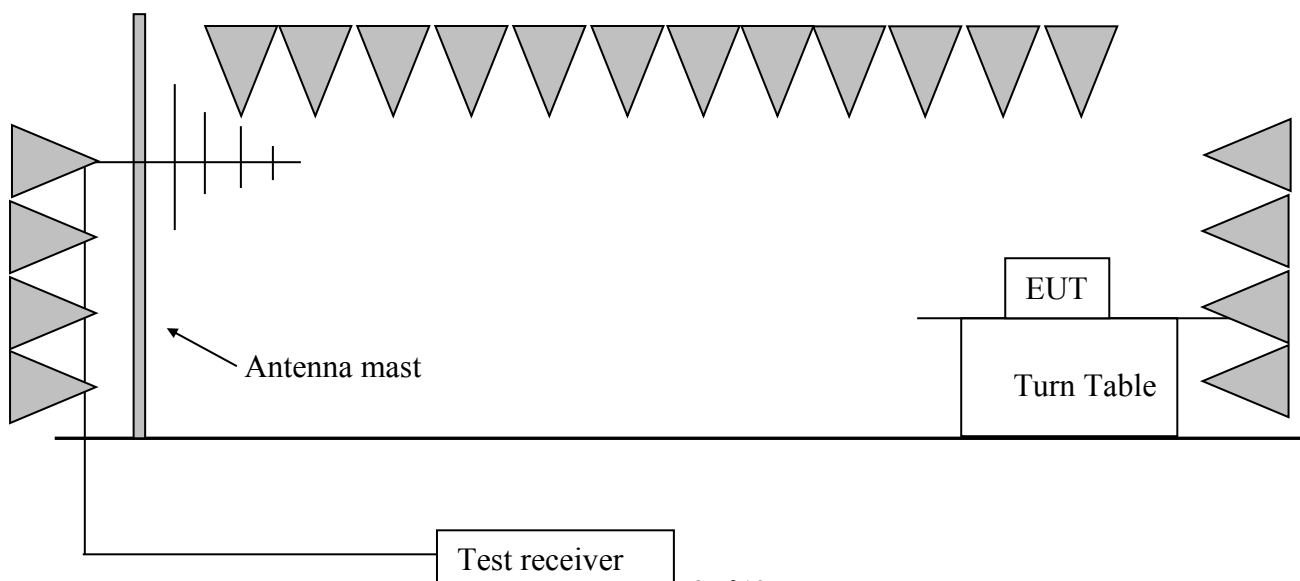
#### 3.1 Test limit

Fundamental Frequency (MHz)	Fundamental limit (dBuV/m)	Harmonic limit (dBuV/m)
<input type="checkbox"/> 902 - 928	94	54
<input checked="" type="checkbox"/> 2400 - 2483.5	94	54
<input type="checkbox"/> 5725 - 5875	94	54
<input type="checkbox"/> 24000 - 24250	108	68

The radiated emissions which fall outside allocated band, must also comply with the radiated emission limits specified in § 15.209(a) and Band edge emissions radiated outside of the specified frequency bands shall be attenuated by at least 50 dB below the level of the fundamental or comply with the radiated emissions limits specified in section 15.209(a) limit in the table below has to be followed.

Frequency (MHz)	Field Strength (dBuV/m)	Measurement Distance (m)
30 - 88	40.0	3
88 - 216	43.5	3
216 - 960	46.0	3
Above 960	54.0	3

#### 3.2 Test Configuration





### **3.3 Test procedure and test setup**

The measurement was applied in a semi-anechoic chamber. While testing for spurious emission higher than 1GHz, if applied, the pre-amplifier would be equipped just at the output terminal of the antenna.

Tabletop devices shall be placed on a non-conducting platform with nominal top surface dimensions 1 m by 1.5 m. For emissions testing at or below 1 GHz, the table height shall be 80 cm above the reference ground plane. For emission measurements above 1 GHz, the table height shall be 1.5 m.

The turn table rotated 360 degrees to determine the position of the maximum emission level. The EUT was set 3 meters away from the receiving antenna which was mounted on an antenna mast. The antenna moved up and down between from 1meter to 4 meters to find out the maximum emission level.

The radiated emission was measured using the Spectrum Analyzer with the resolutions bandwidth set as:

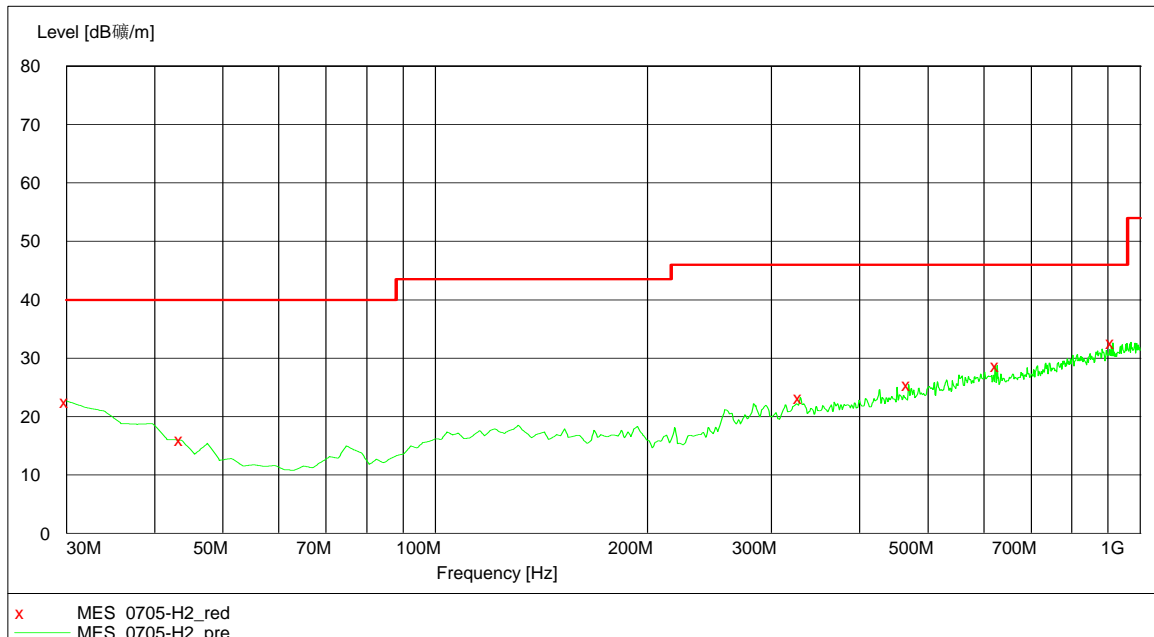
RBW = 300 Hz, VBW = 1 kHz (9 kHz~150 kHz);  
RBW = 10 kHz, VBW = 30 kHz (150 kHz~30MHz);  
RBW = 100 kHz, VBW = 300 kHz (30MHz~1GHz for PK)  
RBW = 1MHz, VBW = 3MHz (>1GHz for PK);

### 3.4 Test protocol

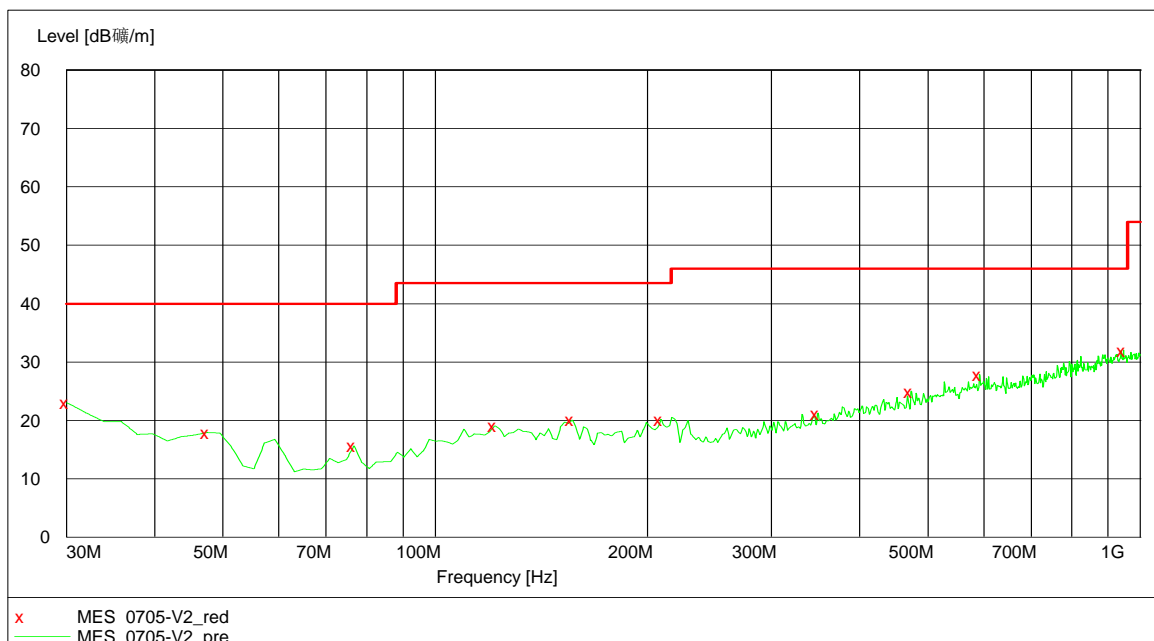
Temperature : 25 °C  
 Relative Humidity : 55 %

The worst waveform from 30MHz to 1000MHz is listed as below:

Horizontal



Vertical



**Test result below 1GHz:**

Polarization	Frequency (MHz)	Measured level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
H	30.00	22.6	40.0	17.4	PK
	43.61	16.0	40.0	24.0	PK
	329.36	23.3	46.0	22.7	PK
	469.32	25.5	46.0	20.5	PK
	626.77	28.7	46.0	17.3	PK
	914.47	32.6	46.0	13.4	PK
V	30.00	23.0	40.0	17.0	PK
	47.49	17.9	40.0	22.1	PK
	76.65	15.6	40.0	24.4	PK
	121.36	19.1	43.5	24.4	PK
	156.35	20.1	43.5	23.4	PK
	208.84	20.2	43.5	23.3	PK
	348.80	21.2	46.0	24.8	PK
	473.21	24.9	46.0	21.1	PK
	591.78	27.9	46.0	18.1	PK
	947.52	32.0	46.0	14.0	PK

Note: The low frequency, which started from 9 kHz to 30MHz, was pre-scanned and the result which was 20dB lower than the limit line per 15.31(o) was not reported.

**Test result above 1GHz:**

CH	Antenna	Frequency (MHz)	Correct Factor (dB/m)	Corrected Reading (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
L	H	2402.20	34.34	92.12	114.00	21.88	PK
	H	2400.00	34.29	50.63	74.00	23.37	PK
	H	7206.65	2.30	48.72	74.00	25.28	PK
	V	7206.21	2.30	44.26	74.00	29.74	PK
M	H	2440.18	34.48	91.87	114.00	22.13	PK
	H	7320.68	2.30	46.63	74.00	27.37	PK
	V	7320.21	2.30	42.32	74.00	31.68	PK
H	H	2480.16	34.62	91.77	114.00	22.23	PK
	H	2483.52	34.63	49.52	74.00	24.48	PK
	H	7328.66	2.30	47.75	74.00	26.25	PK
	V	7327.24	2.30	43.32	74.00	30.68	PK

Remark:

1. For fundamental emission test, no pre-amplifier is employed;
2. Correct Factor = Antenna Factor + Cable Loss (-Amplifier, is employed);
3. Corrected Reading = Original Receiver Reading + Correct Factor;
4. Margin = limit – Corrected Reading;
5. If the PK reading is lower than AV limit, the AV test can be elided;
6. The shaded data is the fundamental emission;
7. Both emissions on “horizontal” and “vertical” axes were assessed and the worse test data was listed in this report;

Example:

Assuming Antenna Factor = 30.20dB/m, Cable Loss = 2.00dB,  
Gain of Preamplifier = 32.00dB, Original Receiver Reading = 10dBuV,  
Then Correct Factor = 30.20 + 2.00 – 32.00 = 0.20dB/m,  
Corrected Reading = 10dBuV + 0.20dB/m = 10.20dBuV/m,  
Assuming limit = 54dBuV/m, Corrected Reading = 10.20dBuV/m,  
Then Margin = 54 -10.20 = 43.80dBuV/m.

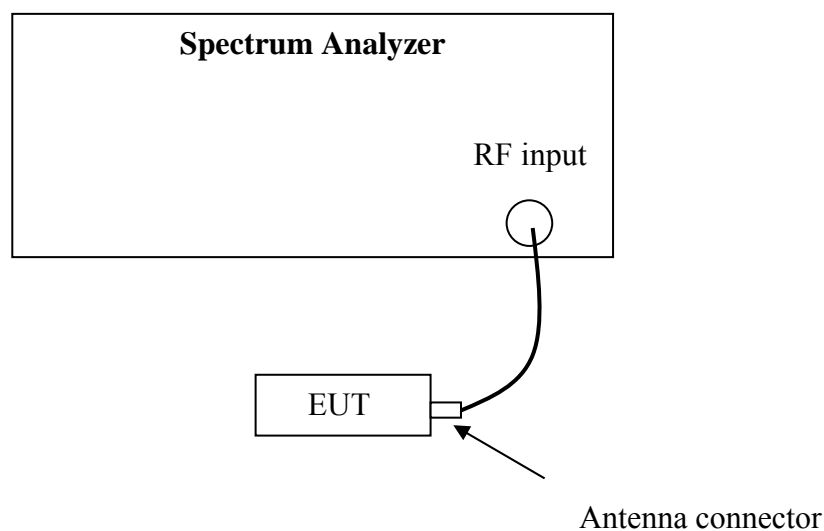
#### **4. Assigned bandwidth (20dB bandwidth)**

**Test result: PASS**

##### **4.1 Limit**

Intentional radiators must be designed to ensure that the 20 dB bandwidth of the emission is contained within the allocated frequency band as clause 3.1 shows.

##### **4.2 Test Configuration**



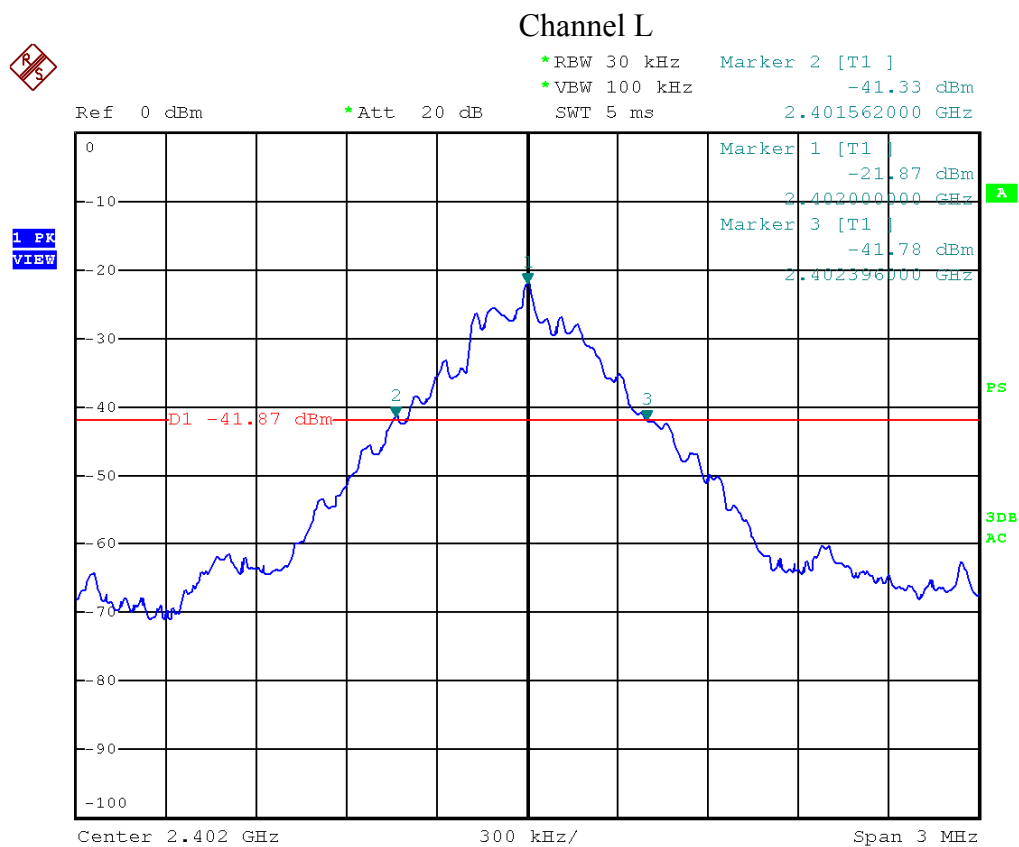
##### **4.3 Test procedure and test setup**

The 20dB Bandwidth per FCC § 15.215(c) is measured using the Spectrum Analyzer. Set Span = 2 to 3 times the 20 dB bandwidth,  $RBW \geq 1\%$  of the 20 dB bandwidth,  $VBW \geq RBW$ , Sweep = auto, Detector = peak, Trace = max hold. The test was performed at 3 channels (lowest, middle and highest channel).

#### 4.4 Test protocol

Temperature : 25°C  
 Relative Humidity : 55 %

Mode	20dB Bandwidth		Permitted Bandwidth (MHz)	Result
	F <sub>L</sub> (MHz)	F <sub>H</sub> (MHz)		
BLE	2401.562	2480.414	2400-2483.5	Pass



# Channel H

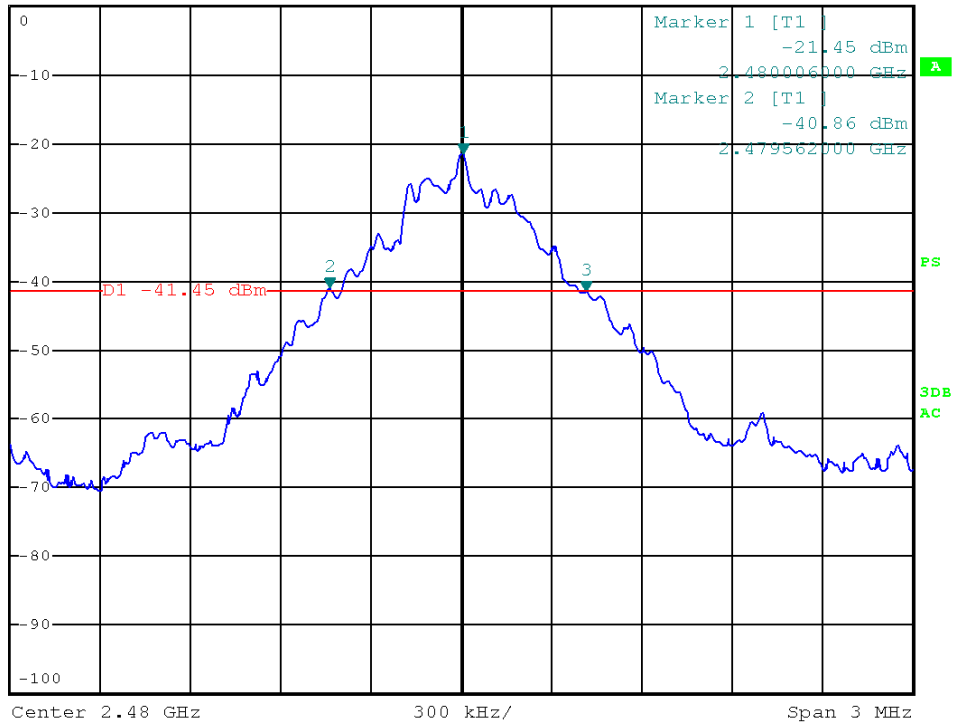


\*RBW 30 kHz    Marker 3 [T1 ]  
\*VBW 100 kHz    -41.44 dBm  
SWT 5 ms    2.480414000 GHz

Ref 0 dBm

\*Att 20 dB

1 PK  
VIEW



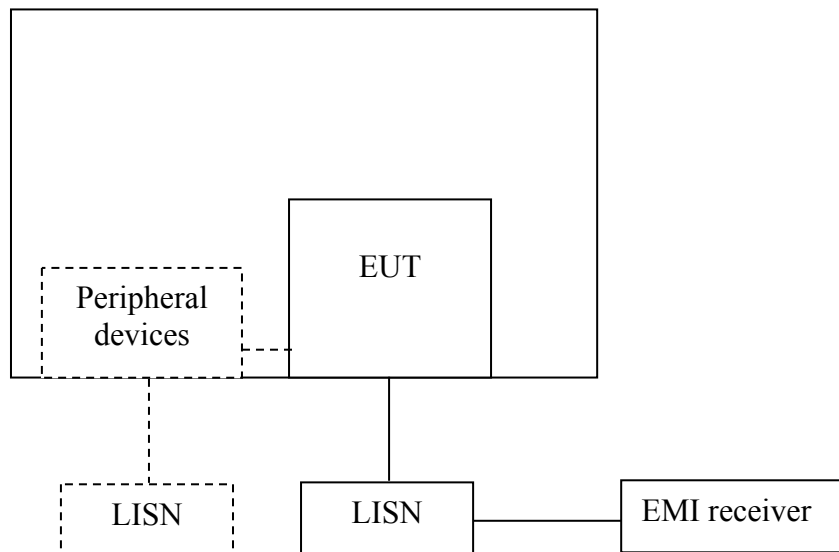
## 5. Power line conducted emission

**Test result: PASS**

### 5.1 Limit

Frequency of Emission (MHz)	Conducted Limit (dBuV)	
	QP	AV
0.15-0.5	66 to 56*	56 to 46 *
0.5-5	56	46
5-30	60	50
* Decreases with the logarithm of the frequency.		

### 5.2 Test configuration



☒ For table top equipment, wooden support is 0.8m height table

☐ For floor standing equipment, wooden support is 0.1m height rack.



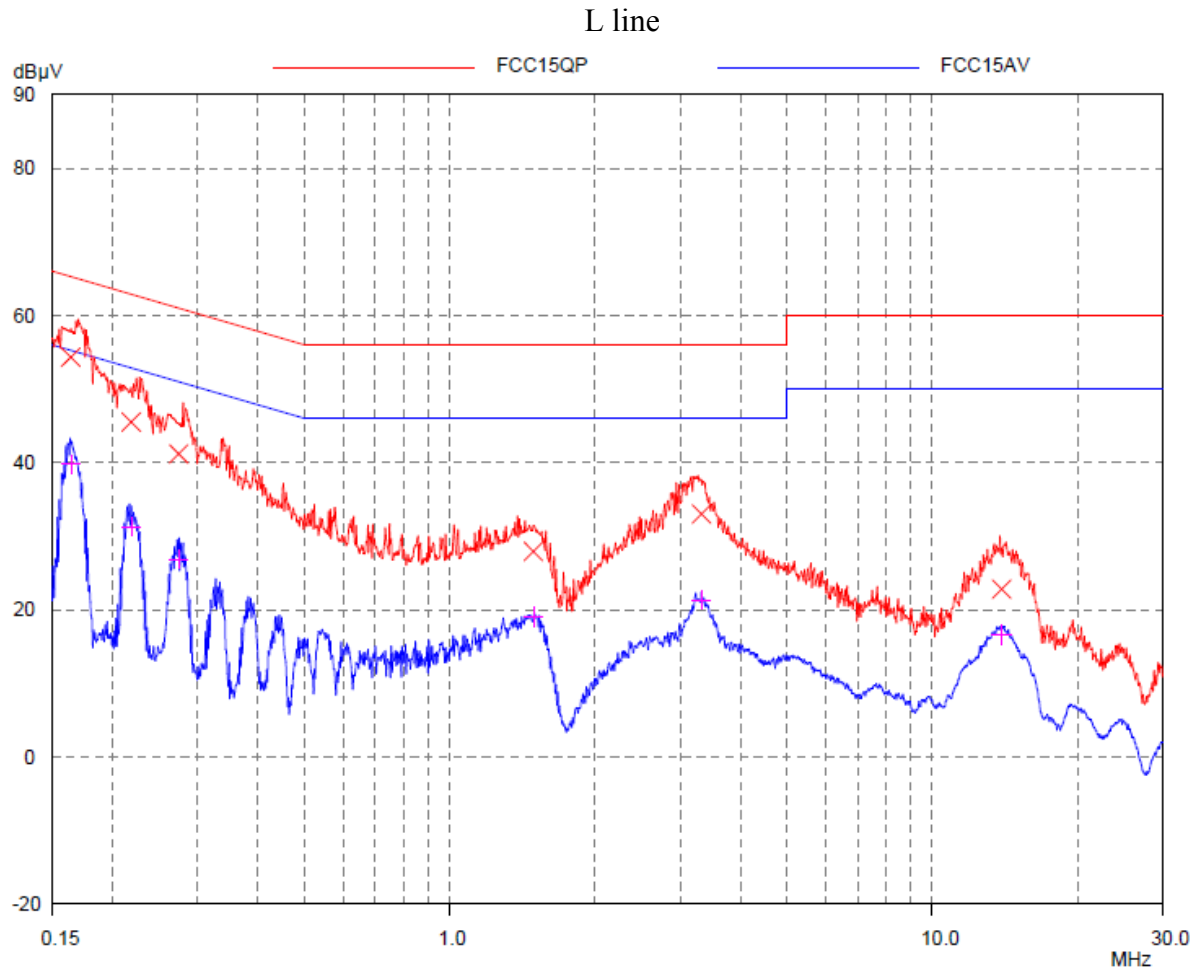
### **5.3 Test procedure and test set up**

The EUT are connected to the main power through a line impedance stabilization network (LISN). This provides a  $50\Omega/50\mu\text{H}$  coupling impedance for the measuring equipment. The peripheral devices are also connected to the main power through a LISN that provides a  $50\Omega/50\mu\text{H}$  coupling impedance with  $50\Omega$  termination.

Both sides (Line and Neutral) of AC 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 C63.4 on conducted measurement. The bandwidth of the test receiver is set at 9 kHz.

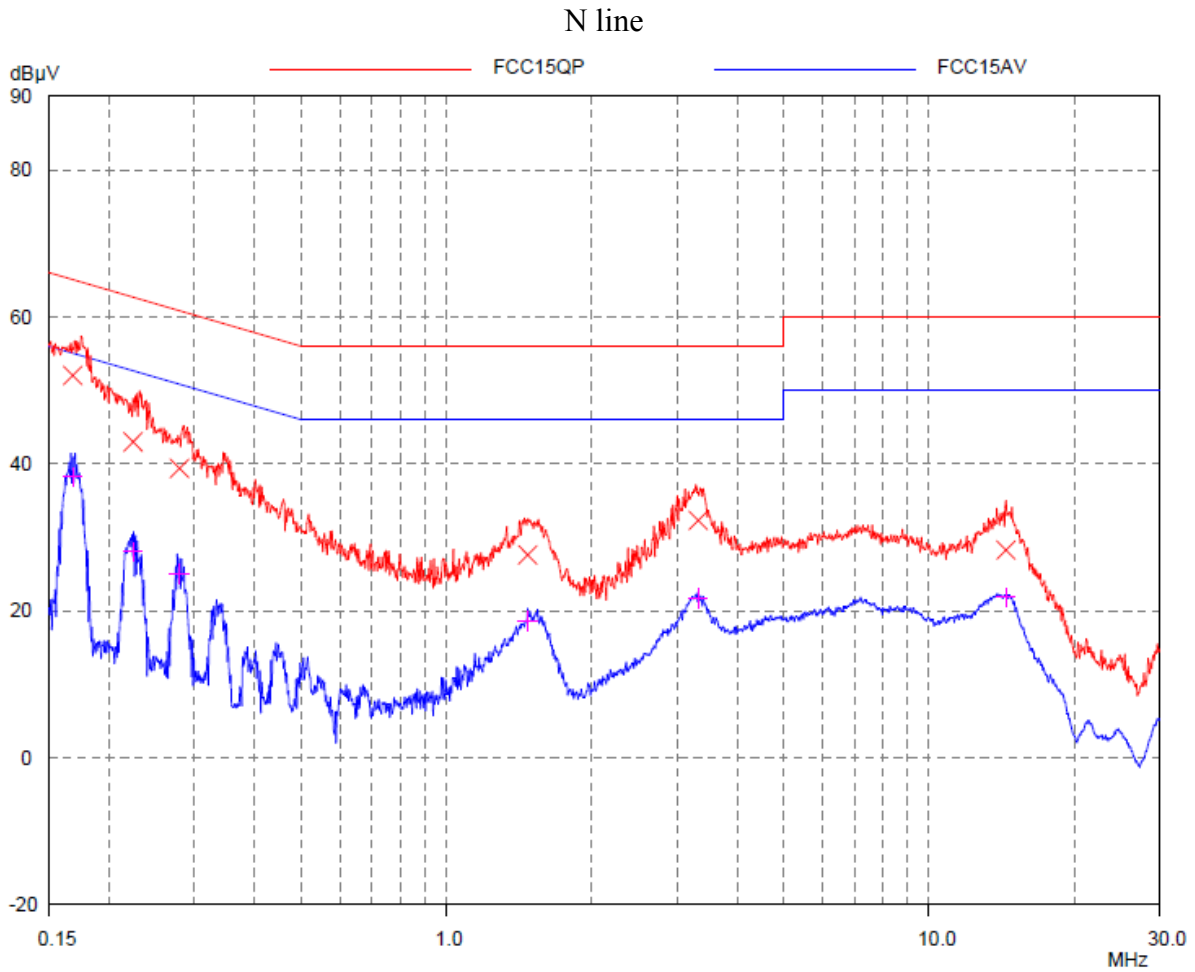
## 5.4 Test protocol

Temperature : 25°C  
Relative Humidity : 55 %



## Test Data:

Frequency (MHz)	Quasi-peak			Average		
	level dB(μV)	Limit dB(μV)	Margin (dB)	level dB(μV)	limit dB(μV)	Margin (dB)
0.164	54.34	65.27	10.93	0.164	39.80	55.27
0.218	45.53	62.88	17.35	0.218	31.27	52.88
0.274	41.19	60.99	19.80	0.274	26.92	50.99
1.489	27.95	56.00	28.05	1.489	19.06	46.00
3.322	33.04	56.00	22.96	3.322	21.34	46.00
13.927	22.80	60.00	37.20	13.927	16.61	50.00



**Test Data:**

Frequency (MHz)	Quasi-peak			Average		
	level dB(μV)	Limit dB(μV)	Margin (dB)	level dB(μV)	limit dB(μV)	Margin (dB)
0.168	52.02	65.07	13.05	38.23	55.07	16.84
0.224	43.00	62.68	19.68	28.04	52.68	24.64
0.280	39.37	60.83	21.46	25.02	50.83	25.81
1.472	27.61	56.00	28.39	18.65	46.00	27.35
3.322	32.31	56.00	23.69	21.69	46.00	24.31
14.436	28.29	60.00	31.71	21.85	50.00	28.15