FCC REPORT

Applicant: 8devices

Address of Applicant: Gedimino 47, Kaunas, LT-44242, Lithuania

Equipment Under Test (EUT)

Product Name: Broadband Digital Transmission System

Model No.: Rambutan

Applicable standards: FCC CFR Title 47 Part 15 Subpart B

Date of sample receipt: 10 May, 2016

Date of Test: 10 May, to 01 Jun., 2016

Date of report issued: 02 Jun., 2016

Test Result: Pass *

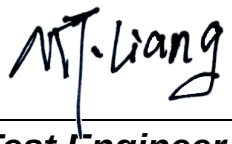
* In the configuration tested, the EUT complied with the standards specified above.

Authorized Signature:

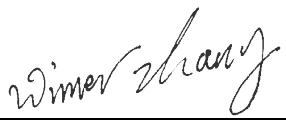
Bruce Zhang
Laboratory Manager

2 Version

Version No.	Date	Description
00	*02 Jun., 2016*	*Original*

Tested by:  ***Date:*** *02 Jun., 2016*

Test Engineer

Reviewed by:  ***Date:*** *02 Jun., 2016*

Project Engineer

3 Contents

Page

4 Test Summary

Test Item	Section in CFR 47	Result
Conducted Emission	Part 15.107	Pass
Radiated Emission	Part 15.109	Pass

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

5 General Information

5.1 Client Information

Applicant:	8devices
Address of Applicant:	Gedimino 47, Kaunas, LT-44242, Lithuania
Manufacturer/Factory:	8devices
Address of Manufacturer/Factory:	Gedimino 47, Kaunas, LT-44242, Lithuania

5.2 General Description of E.U.T.

Product Name:	Broadband Digital Transmission System
Model No.:	Rambutan
Power supply:	DC 5V

5.3 Test Mode

Operating mode	Detail description
On mode	Keep the EUT in On mode
The sample was placed 0.8m above the ground plane of 3m chamber. Measurements in both horizontal and vertical polarities were performed. During the test, each emission was maximized by: having the EUT continuously working, investigated all operating modes, rotated about all 3 axis (X, Y & Z) and considered typical configuration to obtain worst position, manipulating interconnecting cables, rotating the turntable, varying antenna height from 1m to 4m in both horizontal and vertical polarizations. The emissions worst-case are shown in Test Results of the following pages.	

5.4 Description of Support Units

Manufacturer	Description	Model	Serial Number	FCC ID/DoC
DELL	PC	OPTIPLEX745	N/A	DoC
DELL	MONITOR	E178FPC	N/A	DoC
DELL	KEYBOARD	SK-8115	N/A	DoC
DELL	MOUSE	MOC5UO	N/A	DoC

5.5 Laboratory Facility

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

● **FCC - Registration No.: 817957**

Shenzhen Zhongjian Nanfang Testing Co., Ltd. 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 out files. Registration 817957, February 27, 2012.

● **IC - Registration No.: 10106A-1**

The 3m Semi-anechoic chamber of Shenzhen Zhongjian Nanfang Testing Co., Ltd. has been Registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 10106A-1.

● **CNAS - Registration No.: CNAS L6048**

Shenzhen Zhongjian Nanfang Testing Co., Ltd. is accredited to ISO/IEC 17025:2005 General Requirements for the Competence of Testing and Calibration laboratories for the competence of testing.The Registration No. is CNAS L6048.

5.6 Laboratory Location

Shenzhen Zhongjian Nanfang Testing Co., Ltd.
Address: No. B-C, 1/F., Building 2, Laodong No.2 Industrial Park, Xixiang Road,
Bao'an District,Shenzhen, Guangdong,China
Tel: +86-755-23118282
Fax: +86-755-23116366

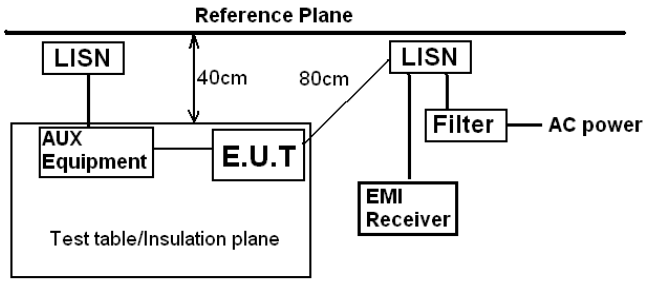
5.7 Test Instruments list

Radiated Emission:						
Item	**Test Equipment**	**Manufacturer**	**Model No.**	**Inventory No.**	**Cal. Date (mm-dd-yy)**	**Cal. Due date (mm-dd-yy)**
1	3m SAC	SAEMC	9(L)*6(W)* 6(H)	CCIS0001	08-23-2014	08-22-2017
2	BiConiLog Antenna	SCHWARZBECK	VULB9163	CCIS0005	03-25-2016	03-25-2017
3	Horn Antenna	SCHWARZBECK	BBHA9120D	CCIS0006	03-25-2016	03-25-2017
4	Pre-amplifier (10kHz-1.3GHz)	HP	8447D	CCIS0003	04-01-2016	03-31-2017
5	Pre-amplifier (1GHz-18GHz)	Compliance Direction Systems Inc.	PAP-1G18	CCIS0011	04-01-2016	03-31-2017
6	Spectrum analyzer 9k-30GHz	Rohde & Schwarz	FSP30	CCIS0023	03-28-2016	03-28-2017
7	EMI Test Receiver	Rohde & Schwarz	ESRP7	CCIS0167	03-28-2016	03-28-2017

Conducted Emission:						
Item	**Test Equipment**	**Manufacturer**	**Model No.**	**Inventory No.**	**Cal.Date (mm-dd-yy)**	**Cal.Due date (mm-dd-yy)**
1	Shielding Room	ZhongShuo Electron	11.0(L)x4.0(W)x3.0(H)	CCIS0061	08-23-2014	08-22-2017
2	EMI Test Receiver	Rohde & Schwarz	ESCI	CCIS0002	03-24-2016	03-24-2017
3	LISN	CHASE	MN2050D	CCIS0074	03-26-2016	03-26-2017
4	Coaxial Cable	CCIS	N/A	CCIS0086	04-01-2016	03-31-2017

6 Test results and Measurement Data

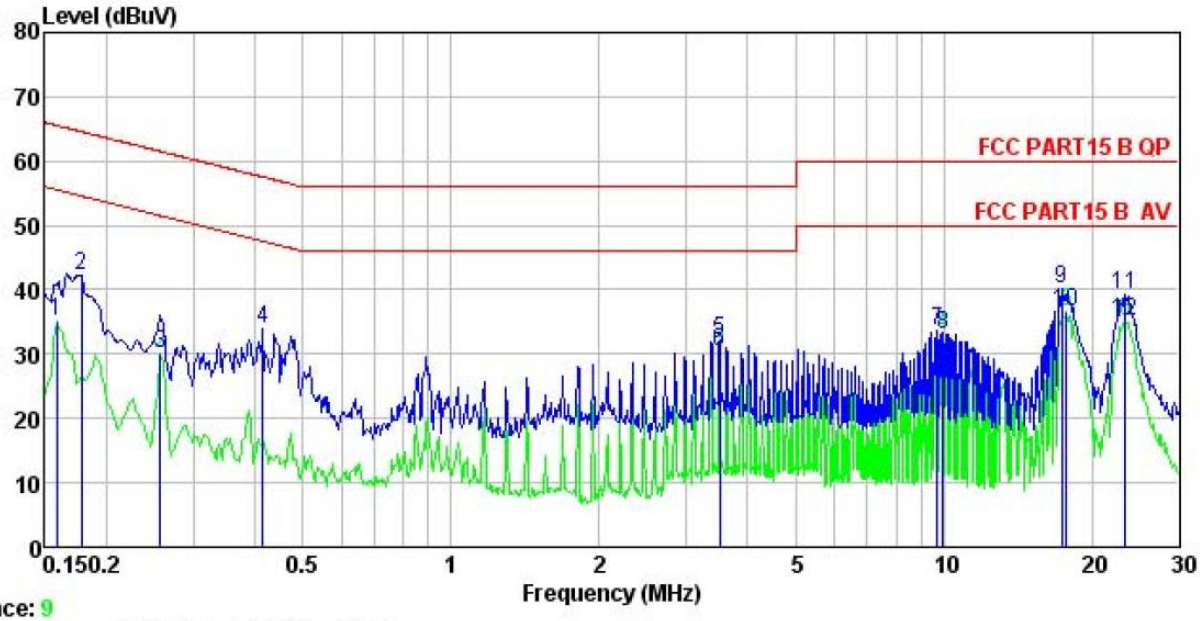
6.1 Conducted Emission

<table>
<tr><td>Test Requirement:</td><td colspan="5">FCC Part 15 B Section 15.107</td></tr>
<tr><td>Test Method:</td><td colspan="5">ANSI C63.4:2014</td></tr>
<tr><td>Test Frequency Range:</td><td colspan="5">150kHz to 30MHz</td></tr>
<tr><td>Class / Severity:</td><td colspan="5">Class B</td></tr>
<tr><td>Receiver setup:</td><td colspan="5">RBW=9kHz, VBW=30kHz</td></tr>
<tr><td>Limit:</td><td colspan="5"><table>
<tr><td rowspan="2">Frequency range (MHz)</td><td colspan="2">Limit (dBµV)</td></tr>
<tr><td>Quasi-peak</td><td>Average</td></tr>
<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>0.5-30</td><td>60</td><td>50</td></tr>
<tr><td colspan="3">* Decreases with the logarithm of the frequency.</td></tr>
</table></td></tr>
<tr><td>Test setup:</td><td colspan="5"> 

Remark:
E.U.T: Equipment Under Test
LISN: Line Impedence Stabilization Network
Test table height=0.8m</td></tr>
<tr><td>Test procedure</td><td colspan="5">1. The E.U.T and simulators are connected to the main power through a line impedance stabilization network(L.I.S.N.). The provide 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 refers 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 C63.4: 2014 on conducted measurement.</td></tr>
<tr><td>Test environment:</td><td>Temp.:</td><td>23 °C</td><td>Humid.:</td><td>56%</td><td>Press.:</td><td>101kPa</td></tr>
<tr><td>Measurement Record:</td><td colspan="5">Uncertainty: ±3.28dB</td></tr>
<tr><td>Test Instruments:</td><td colspan="5">Refer to section 5.7 for details</td></tr>
<tr><td>Test mode:</td><td colspan="5">Refer to section 5.3 for details</td></tr>
<tr><td>Test results:</td><td colspan="5">Pass</td></tr>
</table>

Measurement data:

Line:



Trace: 9

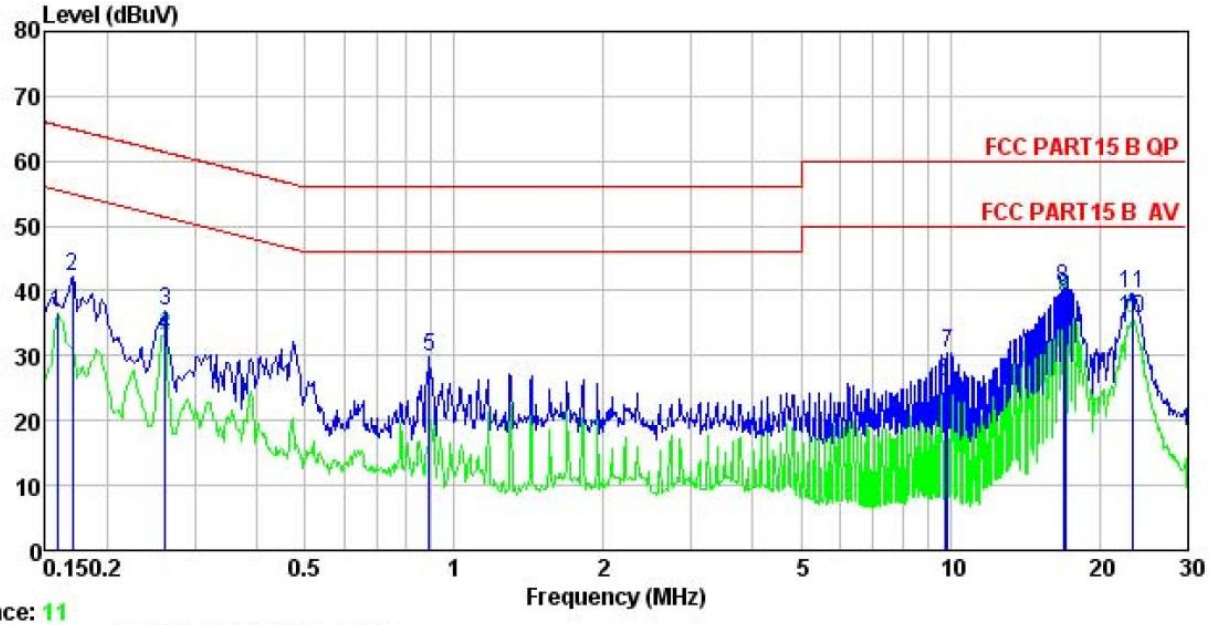
```
Site          : CCIS Shielding Room
Condition     : FCC PART15 B QP LISN LINE
EUT           : Broadband Digital Transmission System
Model         : Rambutan
Test Mode     : On mode
Power Rating  : AC 120/60Hz
Environment   : Temp: 23 'C Huni:56%  Atmos:101KPa
Test Engineer: MT
Remark        :
```

	Freq	Read Level	LISN Factor	Cable Loss	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB	dB	dBuV	dBuV	dB	
1	0.158	24.12	0.14	10.78	35.04	55.56	-20.52	Average
2	0.178	31.26	0.15	10.77	42.18	64.59	-22.41	QP
3	0.258	19.24	0.16	10.75	30.15	51.51	-21.36	Average
4	0.415	22.97	0.24	10.73	33.94	57.55	-23.61	QP
5	3.509	20.91	0.34	10.90	32.15	56.00	-23.85	QP
6	3.509	19.02	0.34	10.90	30.26	46.00	-15.74	Average
7	9.705	22.43	0.31	10.93	33.67	60.00	-26.33	QP
8	9.966	21.70	0.30	10.94	32.94	50.00	-17.06	Average
9	17.383	28.88	0.30	10.91	40.09	60.00	-19.91	QP
10	17.755	25.52	0.30	10.90	36.72	50.00	-13.28	Average
11	23.263	27.90	0.35	10.89	39.14	60.00	-20.86	QP
12	23.387	24.02	0.35	10.89	35.26	50.00	-14.74	Average

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.*

Neutral:



Trace: 11

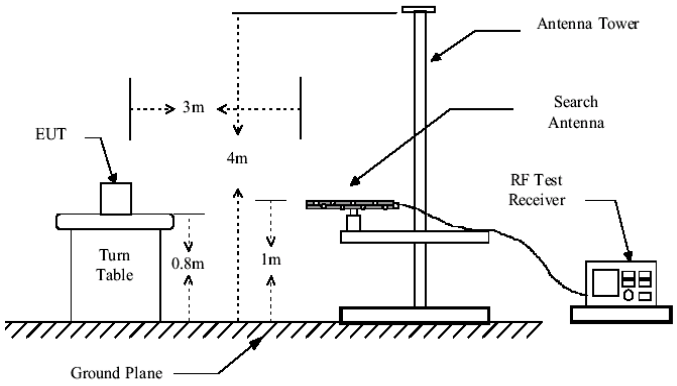
```
Site          : CCIS Shielding Room
Condition     : FCC PART15 B QP LISN NEUTRAL
EUT           : Broadband Digital Transmission System
Model         : Rambutan
Test Mode     : On mode
Power Rating  : AC 120/60Hz
Environment   : Temp: 23 'C Huni:56%  Atmos:101KPa
Test Engineer: MT
Remark        : 5G WiFi
```

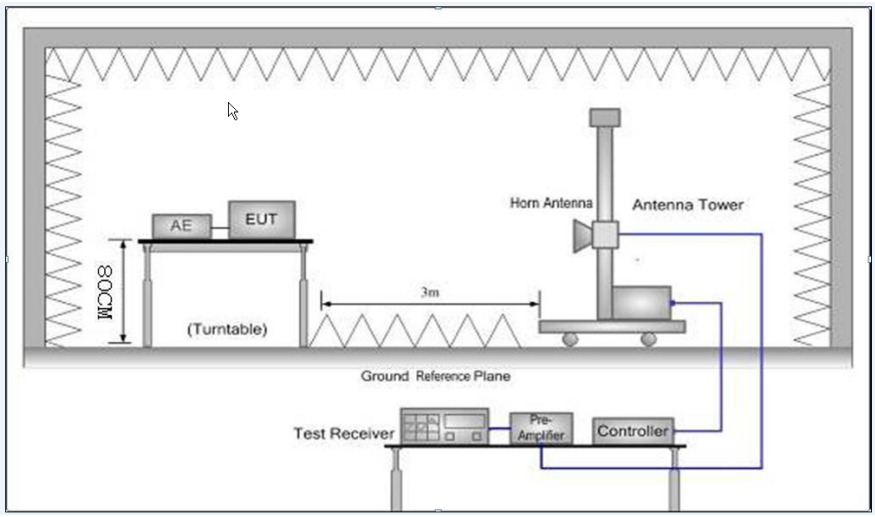
	Freq	Read Level	LISN Factor	Cable Loss	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB	dB	dBuV	dBuV	dB	
1	0.158	25.58	0.13	10.78	36.49	55.56	-19.07	Average
2	0.170	31.35	0.13	10.77	42.25	64.94	-22.69	QP
3	0.262	26.07	0.18	10.75	37.00	61.38	-24.38	QP
4	0.262	22.16	0.18	10.75	33.09	51.38	-18.29	Average
5	0.890	18.68	0.28	10.84	29.80	56.00	-26.20	QP
6	9.757	14.87	0.25	10.93	26.05	50.00	-23.95	Average
7	9.861	19.25	0.24	10.93	30.42	60.00	-29.58	QP
8	16.928	29.14	0.27	10.91	40.32	60.00	-19.68	QP
9	17.018	27.65	0.27	10.91	38.83	50.00	-11.17	Average
10	23.263	24.63	0.25	10.89	35.77	50.00	-14.23	Average
11	23.387	28.32	0.25	10.89	39.46	60.00	-20.54	QP

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.*

6.2 Radiated Emission

<table>
<tr><td>Test Requirement:</td><td colspan="5">FCC Part 15 B Section 15.109</td></tr>
<tr><td>Test Method:</td><td colspan="5">ANSI C63.4:2014</td></tr>
<tr><td>Test Frequency Range:</td><td colspan="5">30MHz to 6000MHz</td></tr>
<tr><td>Test site:</td><td colspan="5">Measurement Distance: 3m (Semi-Anechoic Chamber)</td></tr>
<tr><td rowspan="4">Receiver setup:</td><td>Frequency</td><td>Detector</td><td>RBW</td><td>VBW</td><td>Remark</td></tr>
<tr><td>30MHz-1GHz</td><td>Quasi-peak</td><td>120kHz</td><td>300kHz</td><td>Quasi-peak Value</td></tr>
<tr><td rowspan="2">Above 1GHz</td><td>Peak</td><td>1MHz</td><td>3MHz</td><td>Peak Value</td></tr>
<tr><td>RMS</td><td>1MHz</td><td>3MHz</td><td>Average Value</td></tr>
<tr><td rowspan="7">Limit:</td><td colspan="2">Frequency</td><td colspan="2">Limit (dBuV/m @3m)</td><td>Remark</td></tr>
<tr><td colspan="2">30MHz-88MHz</td><td colspan="2">40.0</td><td>Quasi-peak Value</td></tr>
<tr><td colspan="2">88MHz-216MHz</td><td colspan="2">43.5</td><td>Quasi-peak Value</td></tr>
<tr><td colspan="2">216MHz-960MHz</td><td colspan="2">46.0</td><td>Quasi-peak Value</td></tr>
<tr><td colspan="2">960MHz-1GHz</td><td colspan="2">54.0</td><td>Quasi-peak Value</td></tr>
<tr><td colspan="2" rowspan="2">Above 1GHz</td><td colspan="2">54.0</td><td>Average Value</td></tr>
<tr><td colspan="2">74.0</td><td>Peak Value</td></tr>
<tr><td>Test setup:</td><td colspan="5">Below 1GHz
 

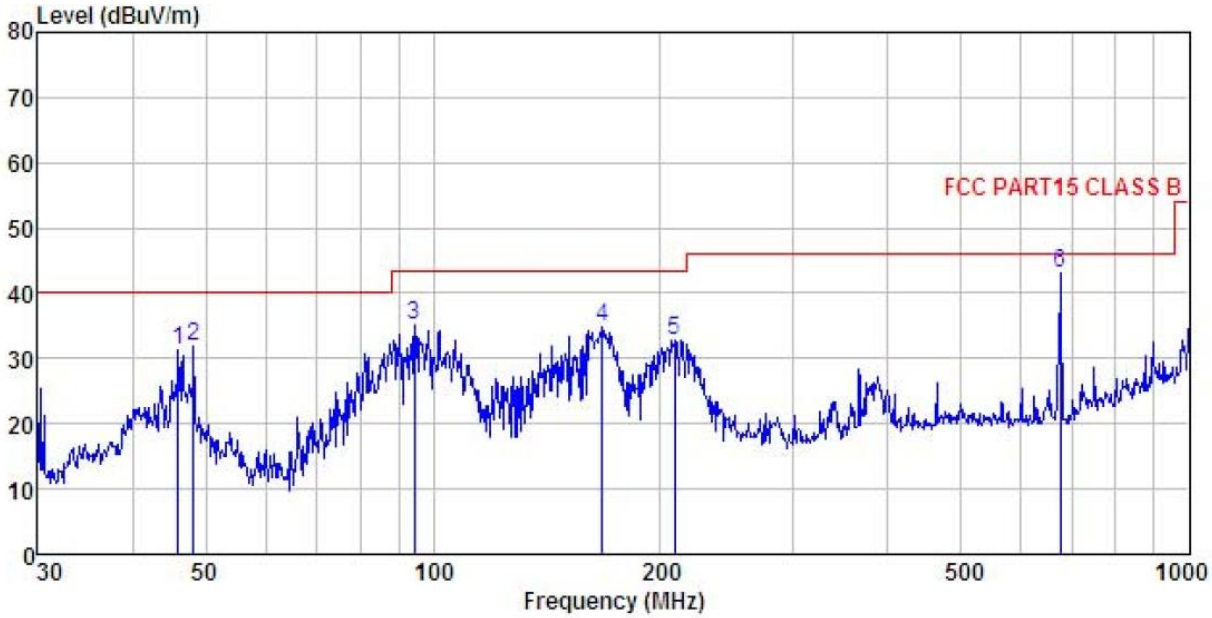
Above 1GHz
 
</td></tr>
</table>

Test Procedure:	1. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter semi-anechoic 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 rotatable 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 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.					
Test environment:	Temp.:	25 °C	Humid.:	55%	Press.:	1 01kPa
Measurement Record:	Uncertainty: ±4.88dB					
Test Instruments:	Refer to section 5.7 for details					
Test mode:	Refer to section 5.3 for details					
Test results:	Passed					

Measurement Data:

Below 1GHz

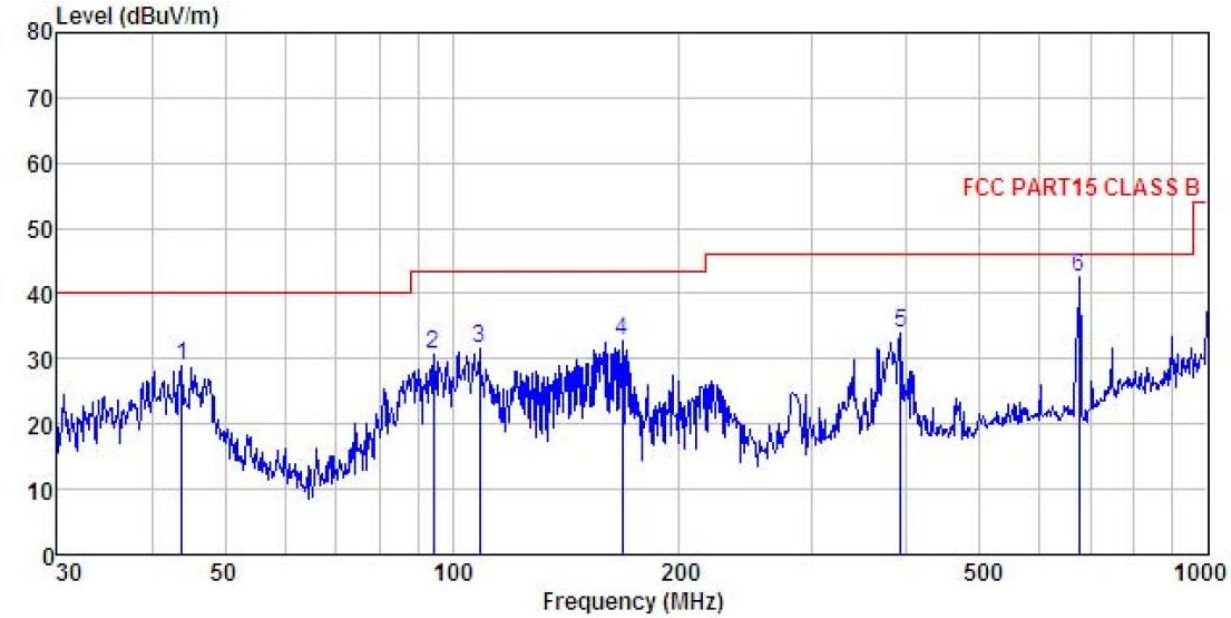
Horizontal:



Site : 3m chamber
Condition : FCC PART15 CLASS B 3m VULB9163(30M3G) HORIZONTAL
Pro : 5011
EUT : Broadband Digital Transmission System
Model : Rambutan
Test mode : On mode
Power Rating : AC120V/60Hz
Environment : Temp:25.5'C Huni:55%
Test Engineer: MT
REMARK :

	Freq	ReadAntenna Level	Antenna Factor	Cable Loss	Preamp Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
1	46.016	42.63	17.20	1.28	29.85	31.26	40.00	-8.74	QP
2	48.163	44.53	16.00	1.27	29.83	31.97	40.00	-8.03	QP
3	94.428	54.04	8.56	2.01	29.55	35.06	43.50	-8.44	QP
4	167.237	51.32	9.83	2.64	29.07	34.72	43.50	-8.78	QP
5	208.580	48.18	10.61	2.86	28.78	32.87	43.50	-10.63	QP
6	675.208	48.81	19.00	4.02	28.72	43.11	46.00	-2.89	QP

Vertical:

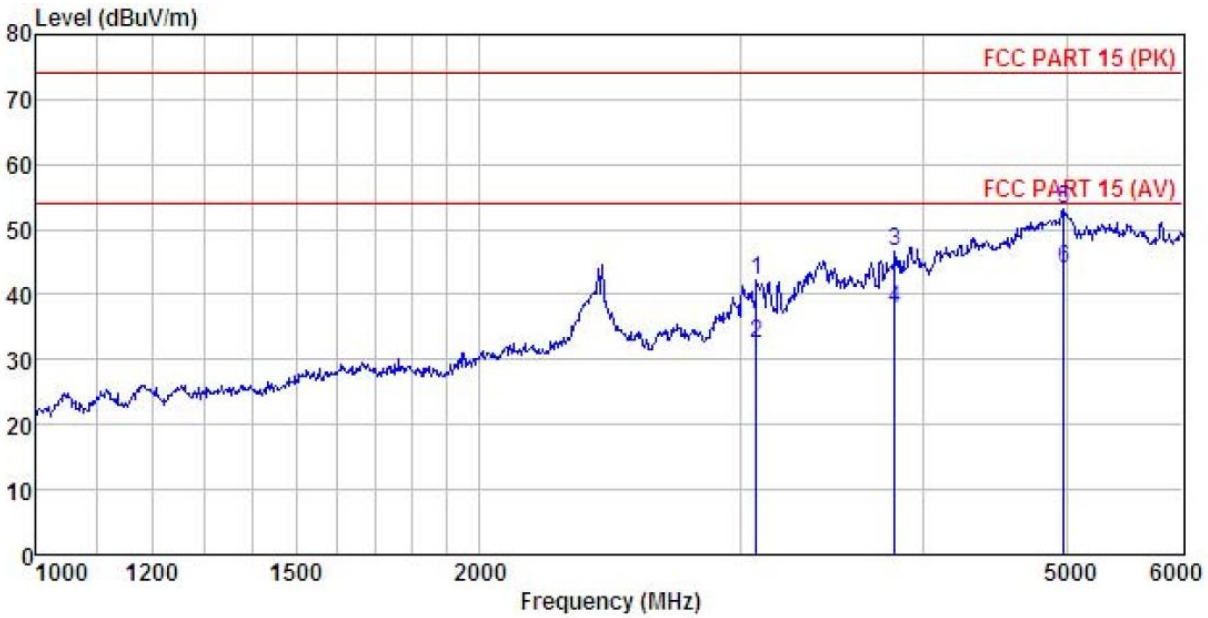


Site : 3m chamber
Condition : FCC PART15 CLASS B 3m VULB9163(30M3G) VERTICAL
Pro : 5011
EUT : Broadband Digital Transmission System
Model : Rambutan
Test mode : On mode
Power Rating : AC120V/60Hz
Environment : Temp:25.5℃ Huni:55%
Test Engineer: MT
REMARK :

	Freq	ReadAntenna Level	Antenna Factor	Cable Loss	Preamp Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
1	43.812	39.86	17.56	1.26	29.87	28.81	40.00	-11.19	QP
2	94.428	49.57	8.56	2.01	29.55	30.59	43.50	-12.91	QP
3	108.647	48.56	10.42	2.03	29.47	31.54	43.50	-11.96	QP
4	167.824	49.51	9.82	2.64	29.07	32.90	43.50	-10.60	QP
5	392.095	44.08	15.65	3.08	28.75	34.06	46.00	-11.94	QP
6	675.208	48.27	19.00	4.02	28.72	42.57	46.00	-3.43	QP

Above 1GHz

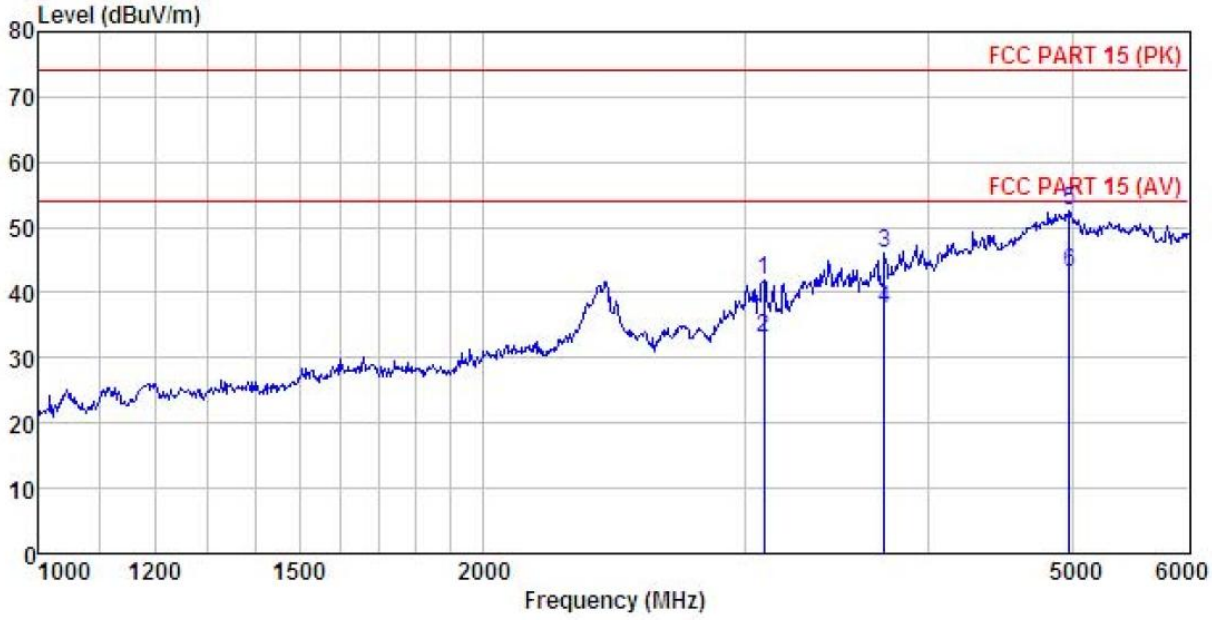
Horizontal:



Site : 3m chamber
Condition : FCC PART 15 (PK) 3m BBHA9120(1G18) HORIZONTAL
Pro : 5011
EUT : Broadband Digital Transmission System
Model : Rambutan
Test mode : On mode
Power Rating : AC120V/60Hz
Environment : Temp:25.5°C Huni:55%
Test Engineer: MT
REMARK :

	Freq	ReadAntenna Level	Factor	Cable Loss	Preamp Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
1	3079.404	48.87	25.97	7.98	40.59	42.23	74.00	-31.77	Peak
2	3079.404	39.13	25.97	7.98	40.59	32.49	54.00	-21.51	Average
3	3821.840	47.05	30.77	9.33	40.63	46.52	74.00	-27.48	Peak
4	3821.840	38.36	30.77	9.33	40.63	37.83	54.00	-16.17	Average
5	4979.731	45.52	36.77	10.75	40.00	53.04	74.00	-20.96	Peak
6	4979.731	36.58	36.77	10.75	40.00	44.10	54.00	-9.90	Average

Vertical:

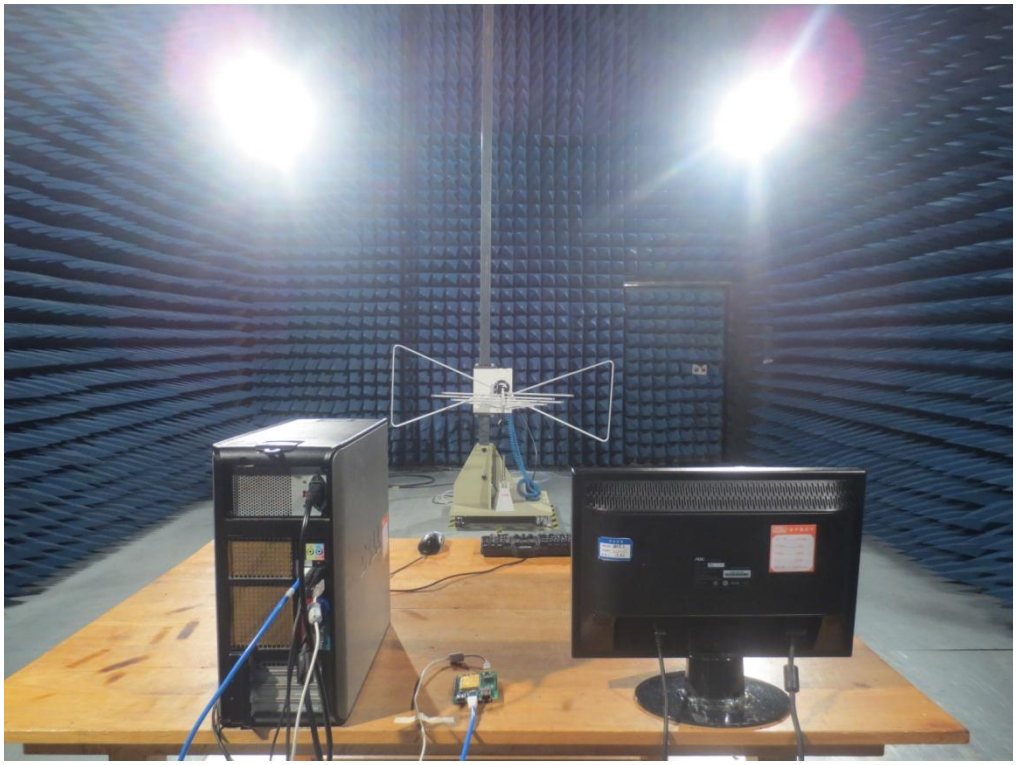


Site : 3m chamber
Condition : FCC PART 15 (PK) 3m BBHA9120(1G18) VERTICAL
Pro : 5011
EUT : Broadband Digital Transmission System
Model : Rambutan
Test mode : On mode
Power Rating : AC120V/60Hz
Environment : Temp:25.5℃ Huni:55%
Test Engineer: MT
REMARK :

	Freq	ReadAntenna Level	Factor	Cable Loss	Preamp Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
1	3091.412	48.46	26.02	8.00	40.61	41.87	74.00	-32.13	Peak
2	3091.412	39.64	26.02	8.00	40.61	33.05	54.00	-20.95	Average
3	3733.631	47.30	30.00	9.19	40.50	45.99	74.00	-28.01	Peak
4	3733.631	38.84	30.00	9.19	40.50	37.53	54.00	-16.47	Average
5	4979.731	44.96	36.77	10.75	40.00	52.48	74.00	-21.52	Peak
6	4979.731	35.71	36.77	10.75	40.00	43.23	54.00	-10.77	Average

7 Test Setup Photo

Radiated Emission



Conducted Emission

8 EUT Constructional Details

Reference to the test report No. CCISE160501101

------End of report------