FCC REPORT

(BLE)

Applicant:	Feld Entertainment, Inc.
Address of Applicant:	8607 Westwood Ctr Dr Vienna, VA 22182, USA
Equipment Under Test (EUT)	
Product Name:	Toys wity Bluetooth PCB board
Model No.:	146csword, 146cgun, 146cstar, 146cscope
FCC ID:	2AIRZ146C
Applicable standards:	FCC CFR Title 47 Part 15 Subpart C Section 15.247
Date of sample receipt:	14 Jun., 2016
Date of Test:	14 Jun., to 17 Jun., 2016
Date of report issued:	20 Jun., 2016
Test Result:	PASS *

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

Authorized Signature:

Bruce Zhang
Laboratory Manager

This report details the results of the testing carried out on one sample. The results contained in this test report do not relate to other samples of the same product and does not permit the use of theCCISproduct certification mark. The manufacturer should ensure that all products in series production are in conformity with the product sample detailed in this report.

This report may only be reproduced and distributed in full. If the product in this report is used in any configuration other than that detailed in the report, the manufacturer must ensure the new system complies with all relevant standards.

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2 Version

Version No.	Date	Description
00	*20 Jun., 2016*	*Original*

Tested by: YT Yang ***Date:*** *20 Jun., 2016*

Test Engineer

Reviewed by: Carey Chen ***Date:*** *20 Jun., 2016*

Project Engineer

3 Contents

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4 Test Summary

Test Item	Section in CFR 47	Result
Antenna requirement	15.203/15.247 (c)	Pass
AC Power Line Conducted Emission	15.207	N/A
Conducted Peak Output Power	15.247 (b)(3)	Pass
6dB Emission Bandwidth	15.247 (a)(2)	Pass
Power Spectral Density	15.247 (e)	Pass
Band Edge	15.247(d)	Pass
Spurious Emission	15.205/15.209	Pass

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

N/A：Not applicable.

5 General Information

5.1 Client Information

Applicant:	Feld Entertainment, Inc.
Address of Applicant:	8607 Westwood Ctr Dr Vienna, VA 22182, USA
Manufacturer：	Windy City Novelties, Inc.
Address of Manufacturer:	300 Lakeview Parkway, Vernon Hills, IL 60061
Factory：	Shantou Chenghai Supreme Toys Factory
Address of Factory:	No. 34 Zhixing Road Xinning Village, Chenghai, Shantou City 515800

5.2 General Description of E.U.T.

Product Name:	Toys wity Bluetooth PCB board
Model No.:	146csword, 146cgun, 146cstar, 146cscope
Operation Frequency:	2402-2480 MHz
Channel numbers:	40
Channel separation:	2 MHz
Modulation technology:	GFSK
Data speed :	1Mbps
Antenna Type:	Internal Antenna
Antenna gain:	0 dBi
Power supply:	1.5V(AA)×3 Battery appropriate for Model No.146cgun and 146csword; 1.5V(AAA)×3 Battery appropriate for Model No.146cscope and 146cstar.
Remark:	The Model No.:146csword, 146cgun, 146cstar, 146cscope were electrically identical at main board part, only appearance of these four items (plastic parts) and LED light part layout are different.

Operation Frequency each of channel							
Channel	Frequency	Channel	Frequency	Channel	Frequency	Channel	Frequency
0	2402MHz	10	2422MHz	20	2442MHz	30	2462MHz
1	2404MHz	11	2424MHz	21	2444MHz	31	2464MHz
2	2406MHz	12	2426MHz	22	2446MHz	32	2466MHz
3	2408MHz	13	2428MHz	23	2448MHz	33	2468MHz
4	2410MHz	14	2430MHz	24	2450MHz	34	2470MHz
5	2412MHz	15	2432MHz	25	2452MHz	35	2472MHz
6	2414MHz	16	2434MHz	26	2454MHz	36	2474MHz
7	2416MHz	17	2436MHz	27	2456MHz	37	2476MHz
8	2418MHz	18	2438MHz	28	2458MHz	38	2478MHz
9	2420MHz	19	2440MHz	29	2460MHz	39	2480MHz

Note:

In section 15.31(m), regards to the operating frequency range over 10 MHz, the Lowest frequency, the middle frequency, and the highest frequency of channel were selected to perform the test, and the selected channel see below:

Channel	Frequency
The lowest channel	2402MHz
The middle channel	2442MHz
The Highest channel	2480MHz

5.3 Test environment andmode

Operating Environment:	
Temperature:	24.0 °C
Humidity:	54 % RH
Atmospheric Pressure:	1010 mbar
Test mode:	
Operation mode	Keep the EUT in continuous transmitting with modulation
The sample was placed 0.8m(below 1GHz)/1.5m(above 1GHz) 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. Duty cycle setting during the transmission is 100% with maximum power setting for all modulations.	

5.4 Measurement Uncertainty

Items	Expanded Uncertainty (Confidence of 95%)
Radiated Emission (9kHz ~ 30MHz)	4.24 dB (k=2)
Radiated Emission (30MHz ~ 1000MHz)	4.35 dB (k=2)
Radiated Emission (1GHz ~ 18GHz)	4.44 dB (k=2)
Radiated Emission (18GHz ~ 26.5GHz)	4.56 dB (k=2)

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	Pre-amplifier (18-26GHz)	Rohde & Schwarz	AFS33-18002 650-30-8P-44	GTS218	04-01-2016	03-31-2017
7	Horn Antenna	ETS-LINDGREN	3160	GTS217	04-01-2016	03-31-2017
8	Spectrum analyzer 9k-30GHz	Rohde & Schwarz	FSP30	CCIS0023	03-28-2016	03-28-2017
9	EMI Test Receiver	Rohde & Schwarz	ESRP7	CCIS0167	03-28-2016	03-28-2017
10	Loop antenna	Laplace instrument	RF300	EMC0701	04-01-2016	03-31-2017
11	EMI Test Software	AUDIX	E3	N/A	N/A	N/A

6 Test results andMeasurement Data

6.1 Antenna requirement:

Standard requirement:	FCC Part15 C Section 15.203 /247(c)

15.203 requirement:

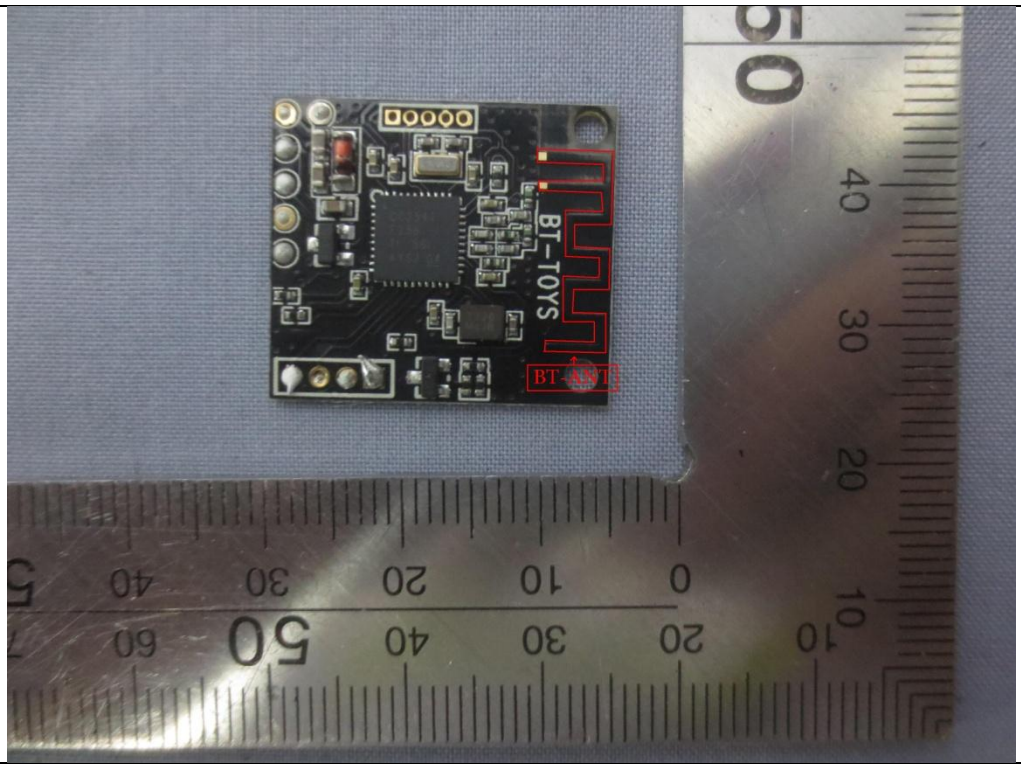
An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator, the manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.

15.247(c) (1)(i) requirement:

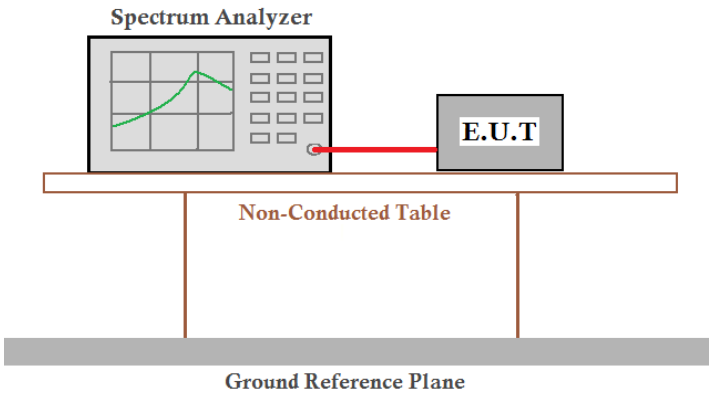
(i) Systems operating in the 2400-2483.5 MHz band that is used exclusively forfixed. Point-to-point operations may employ transmitting antennas with directional gain greater than 6dBiprovided the maximum conducted output power of the intentional radiator is reduced by 1 dB for every 3dB that the directional gain of the antenna exceeds 6dBi.

E.U.T Antenna:	

The BLE antennais aninternal antennawhich cannot replace by end-user, the best case gain of the antennais 0 dBi.



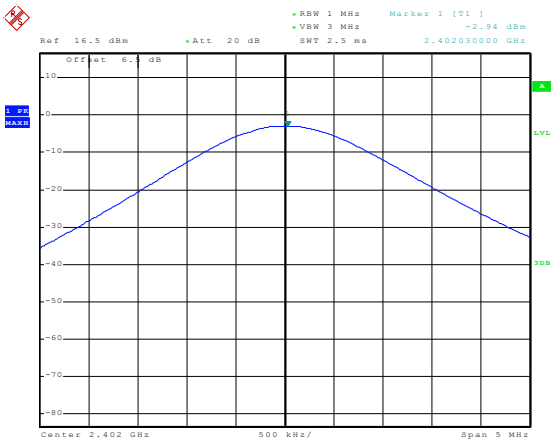
6.2 Conducted Output Power

Test Requirement:	FCC Part15 C Section 15.247 (b)(3)
Test Method:	ANSI C63.10:2013 and KDB558074v03r05 section 9.1.1
Limit:	30dBm
Test setup:	
Test Instruments:	Refer to section 5.7 for details
Test mode:	Refer to section 5.3 for details
Test results:	Passed

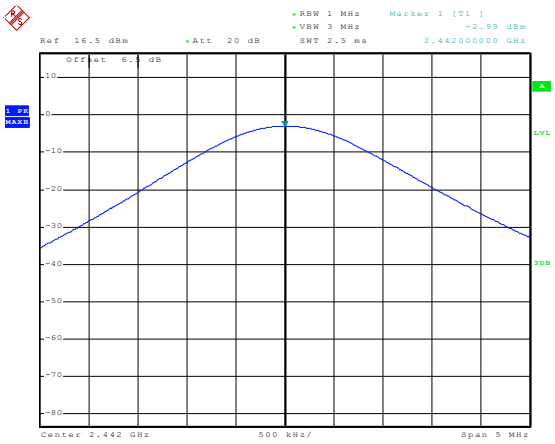
Measurement Data:

Test CH	Maximum Conducted Output Power (dBm)	Limit(dBm)	Result
Lowest	-2.94	30.00	Pass
Middle	-2.99		
Highest	-3.30		

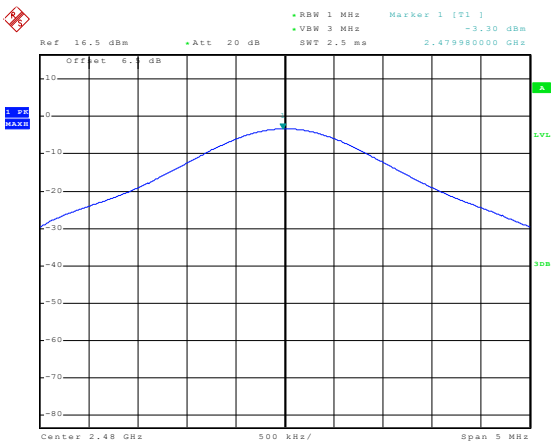
Test plot as follows:



Lowest channel

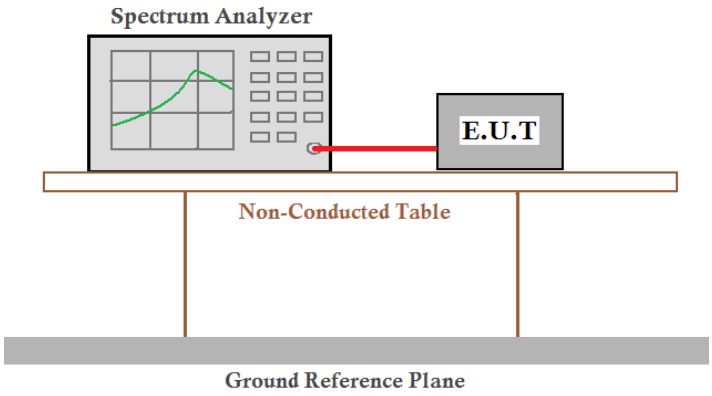


Middle channel



Highest channel

6.3 Occupy Bandwidth

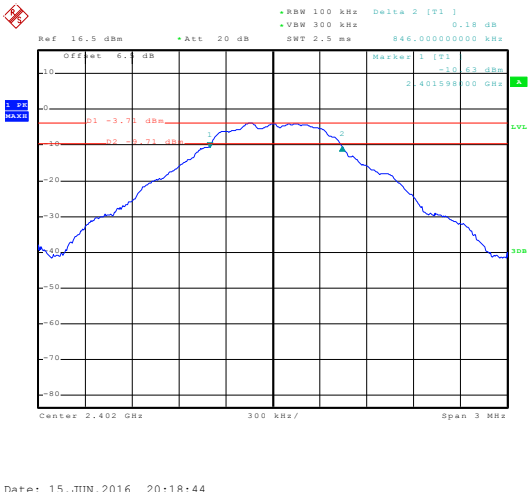
Test Requirement:	FCC Part15 C Section 15.247 (a)(2)
Test Method:	ANSI C63.10:2013 and KDB558074v03r05 section 8.1
Limit:	>500kHz
Test setup:	
Test Instruments:	Refer to section 5.7 for details
Test mode:	Refer to section 5.3 for details
Test results:	Passed

Measurement Data:

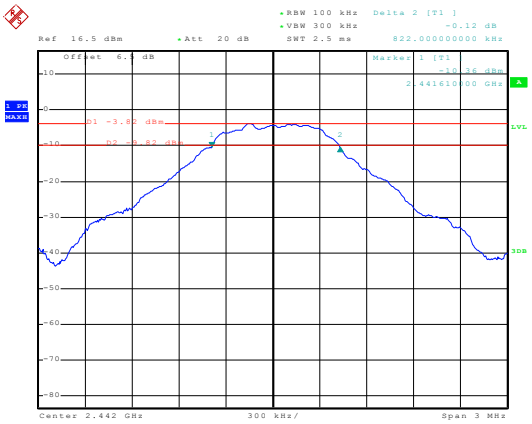
Test CH	6dB Emission Bandwidth (MHz)	Limit(kHz)	Result
Lowest	0.846	>500	Pass
Middle	0.822		
Highest	0.822		
Test CH	99% Occupy Bandwidth (MHz)	Limit(kHz)	Result
Lowest	1.524	N/A	N/A
Middle	1.416		
Highest	1.308		

Test plot as follows:

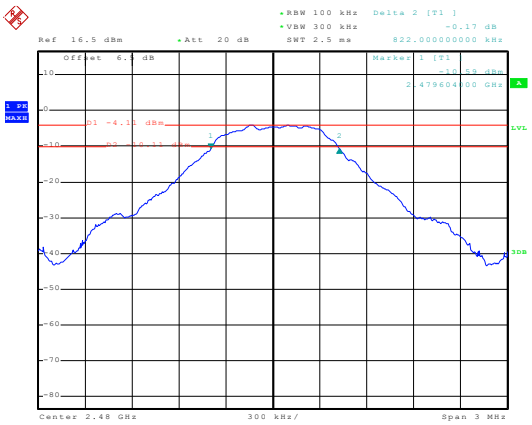
6dB EBW



Lowest channel

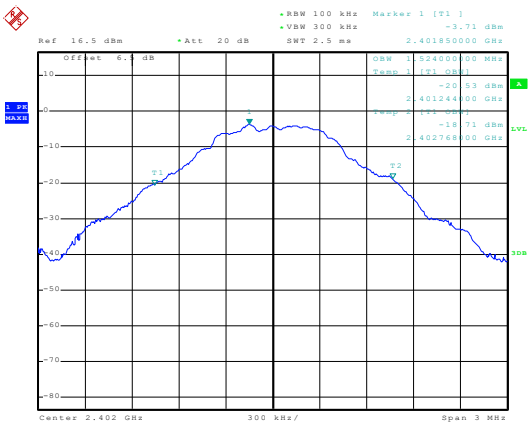


Middle channel

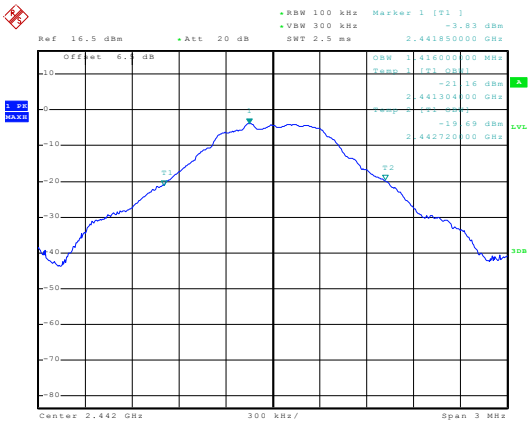


Highest channel

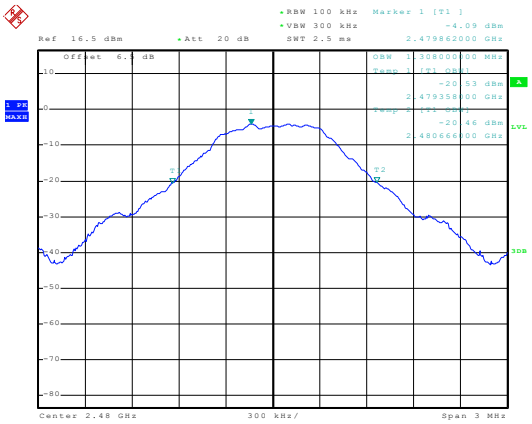
99% OBW



Lowest channel

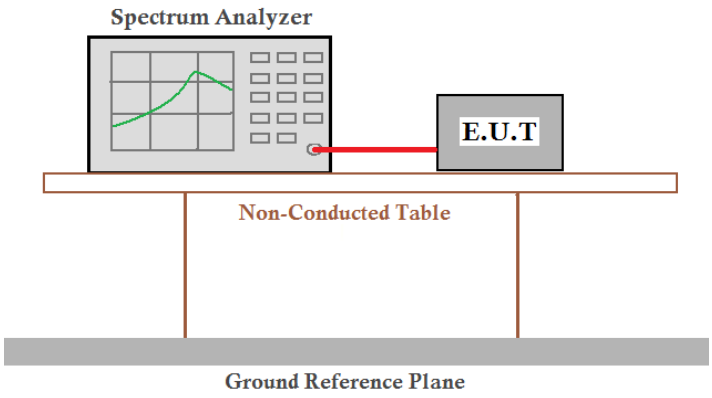


Middle channel



Highest channel

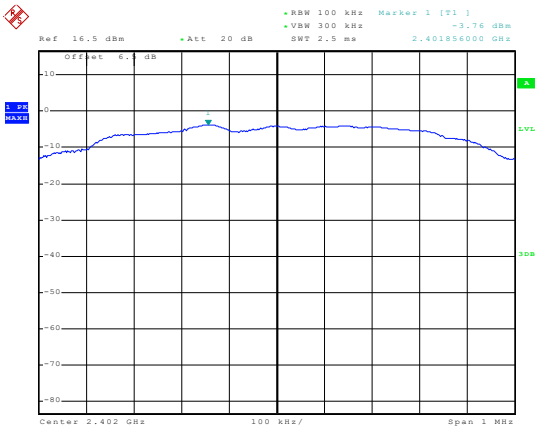
6.4 Power Spectral Density

Test Requirement:	FCC Part15 C Section 15.247 (e)
Test Method:	ANSI C63.10:2013 and KDB558074v03r05 section 10.2
Limit:	8dBm
Test setup:	
Test Instruments:	Refer to section 5.7 for details
Test mode:	Refer to section 5.3 for details
Test results:	Passed

Measurement Data:

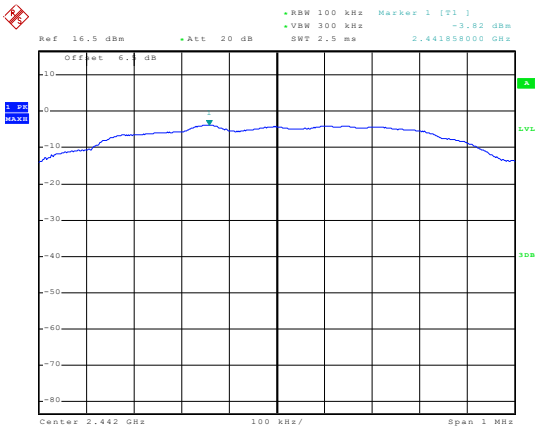
Test CH	Power Spectral Density (dBm)	Limit(dBm)	Result
Lowest	-3.76	8.00	Pass
Middle	-3.82		
Highest	-4.04		

Test plots as follow:



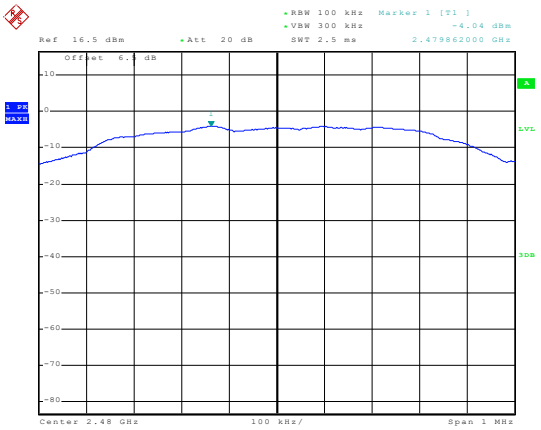
Date: 15.JUN.2016 20:28:07

Lowest channel



Date: 15.JUN.2016 20:27:43

Middle channel

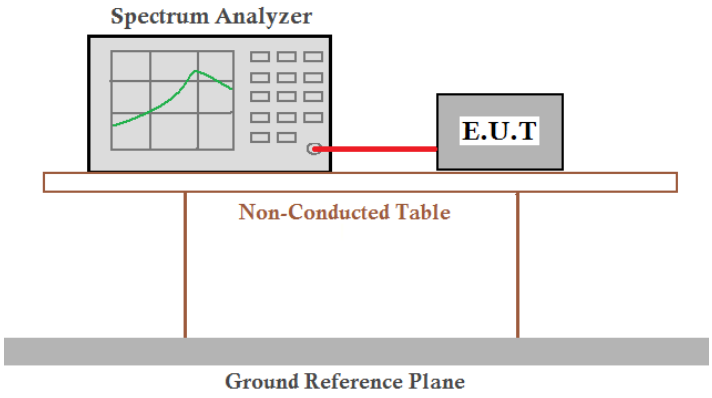


Date: 15.JUN.2016 20:27:19

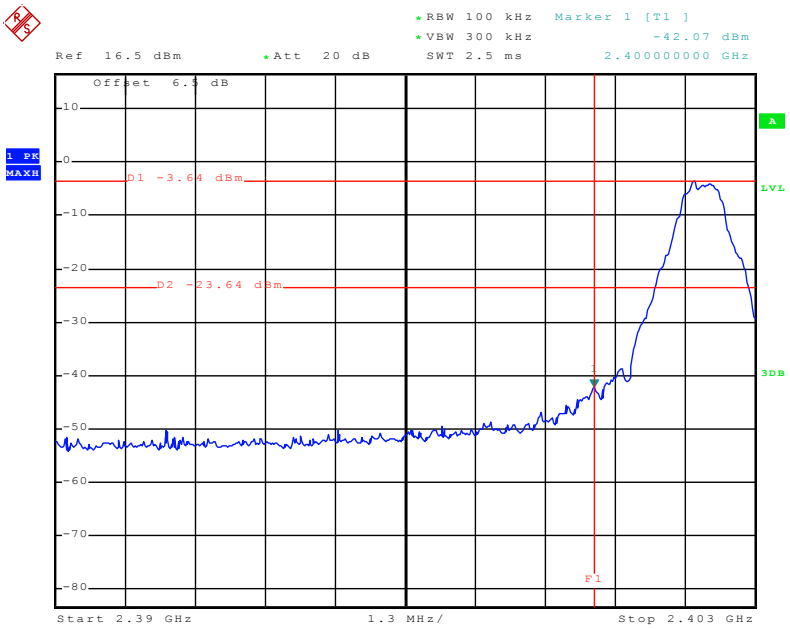
Highest channel

6.5 Band Edge

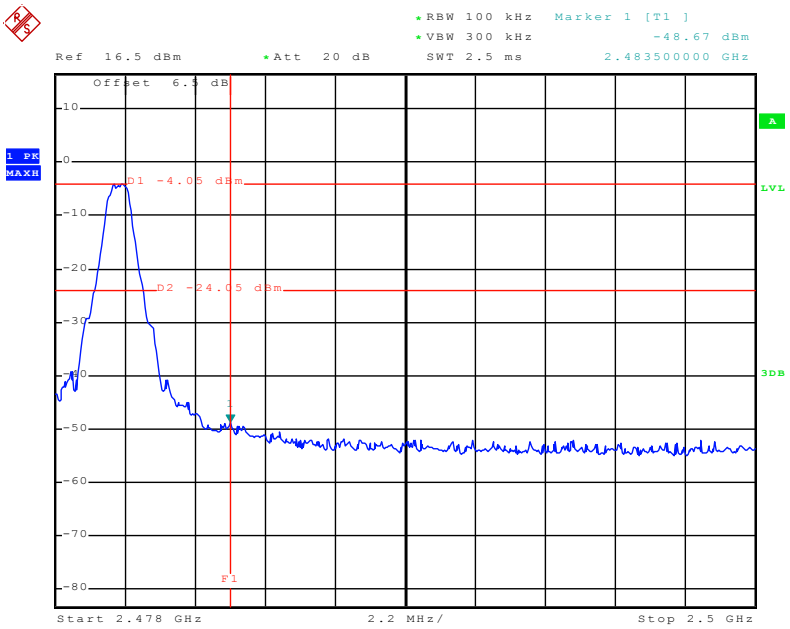
6.5.1 Conducted Emission Method

Test Requirement:	FCC Part15 C Section 15.247 (d)
Test Method:	ANSI C63.10:2013 and KDB558074v03r05 section 13
Limit:	In any 100 kHz bandwidth outside the frequency band in which the spreadspectrum intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement.
Test setup:	
Test Instruments:	Refer to section 5.7 for details
Test mode:	Refer to section 5.3 for details
Test results:	Passed

Test plots as follow:

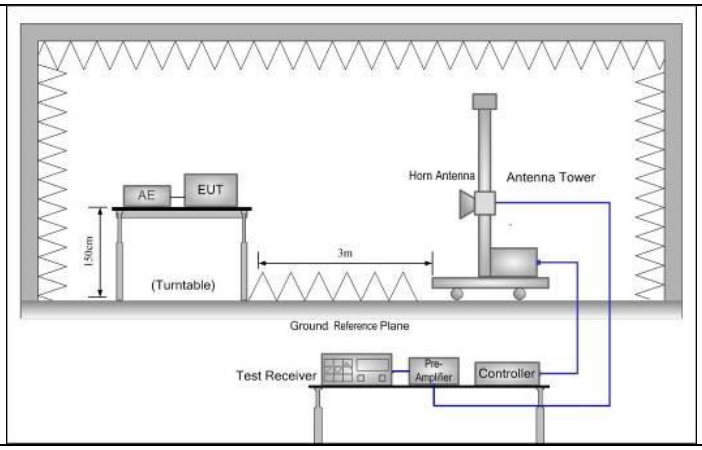


Lowest channel



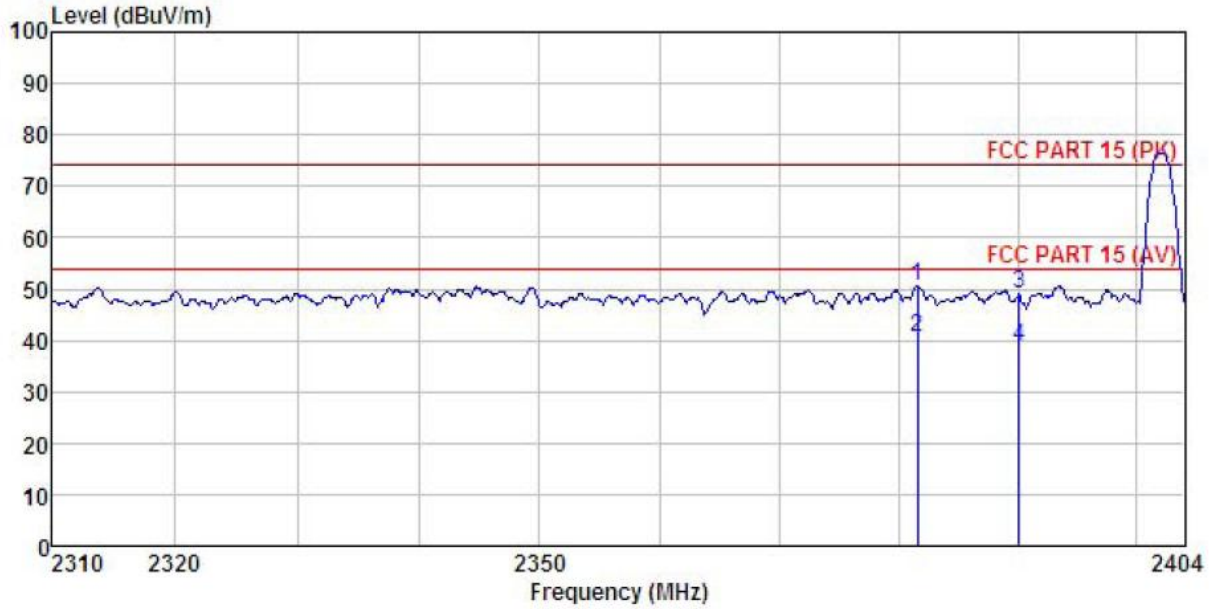
Highest channel

6.5.2 Radiated Emission Method

<table>
<tr><td>Test Requirement:</td><td colspan="5">FCC Part15 C Section 15.209 and 15.205</td></tr>
<tr><td>Test Method:</td><td colspan="5">ANSI C63.10: 2013and KDB 558074v03r05 section 12.1</td></tr>
<tr><td>TestFrequencyRange:</td><td colspan="5">2.3GHz to 2.5GHz</td></tr>
<tr><td>Test site:</td><td colspan="5">Measurement Distance: 3m</td></tr>
<tr><td rowspan="3">Receiver setup:</td><td>Frequency</td><td>Detector</td><td>RBW</td><td>VBW</td><td>Remark</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="3">Limit:</td><td colspan="2">Frequency</td><td colspan="2">Limit (dBuV/m @3m)</td><td>Remark</td></tr>
<tr><td colspan="2" rowspan="2">Above 1GHz</td><td colspan="2">54.00</td><td>Average Value</td></tr>
<tr><td colspan="2">74.00</td><td>Peak Value</td></tr>
<tr><td>Test Procedure:</td><td colspan="5">1. The EUT was placed on the top of a rotating table 1.5 meters above the groundat a 3 meter camber. The table was rotated 360 degrees todetermine the position of the highest radiation.
2. The EUT was set 3 meters away from the interference-receiving antenna, whichwas 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 thenthe antenna was tuned to heights from 1 meter to 4 meters and the rotatablewas turned from 0 degrees to 360 degrees to find the maximum reading.
5. The test-receiver system was set to Peak Detect Function and SpecifiedBandwidth with Maximum Hold Mode.
6. If the emission level of the EUT in peak mode was 10dB lower than the limitspecified, then testing could be stopped and the peak values of the EUT wouldbe reported. Otherwise the emissions that did not have 10dB margin would bere-tested one by one using peak, quasi-peak or average method as specified andthen reported in a data sheet.</td></tr>
<tr><td>Test setup:</td><td colspan="5"> 
</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">Passed</td></tr>
<tr><td>Remak:</td><td colspan="5">During the test, pre-scan the model: 146csword, 146cgun, 146cstar and 146cscope, and found the model: 146csword is the worst case, so only shows the model: 146csword in this report.</td></tr>
</table>

Test channel: Lowest

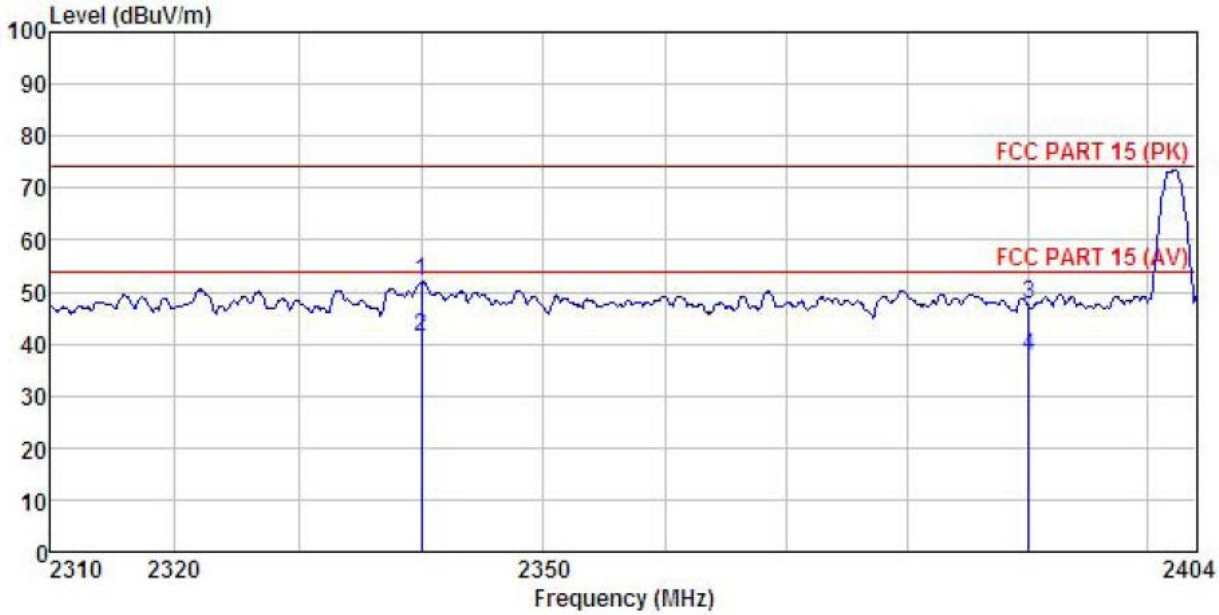
Horizontal:



Site : 3m chamber
Condition : FCC PART 15 (PK) 3m BBHA9120(1G18) HORIZONTAL
EUT : Toys wity Bluetooth PCB board
Model : 146csword
Test mode : BLE-L mode
Power Rating : DC 4.5V
Environment : Temp:25.5'C Huni:55% 101KPa
Test Engineer: YT
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	2381.477	20.17	23.68	6.62	0.00	50.47	74.00	-23.53	Peak
2	2381.477	10.36	23.68	6.62	0.00	40.66	54.00	-13.34	Average
3	2390.000	18.67	23.68	6.63	0.00	48.98	74.00	-25.02	Peak
4	2390.000	8.36	23.68	6.63	0.00	38.67	54.00	-15.33	Average

Vertical:

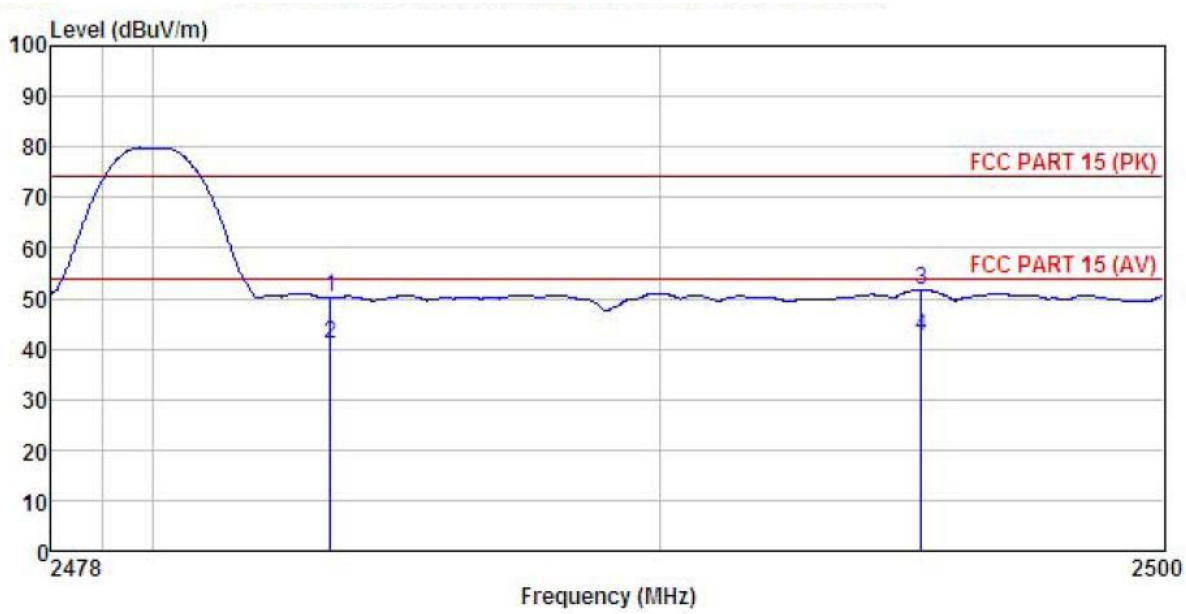


Site : 3m chamber
Condition : FCC PART 15 (PK) 3m BBHA9120(1G18) VERTICAL
EUT : Toys wity Bluetooth PCB board
Model : 146csword
Test mode : BLE-L mode
Power Rating : DC 4.5V
Environment : Temp:25.5℃ Huni:55% 101KPa
Test Engineer: YT
REMARK :

	Freq	Read 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	2340.046	21.70	23.67	6.53	0.00	51.90	74.00	-22.10	Peak
2	2340.046	11.24	23.67	6.53	0.00	41.44	54.00	-12.56	Average
3	2390.000	17.14	23.68	6.63	0.00	47.45	74.00	-26.55	Peak
4	2390.000	7.21	23.68	6.63	0.00	37.52	54.00	-16.48	Average

Test channel: Highest

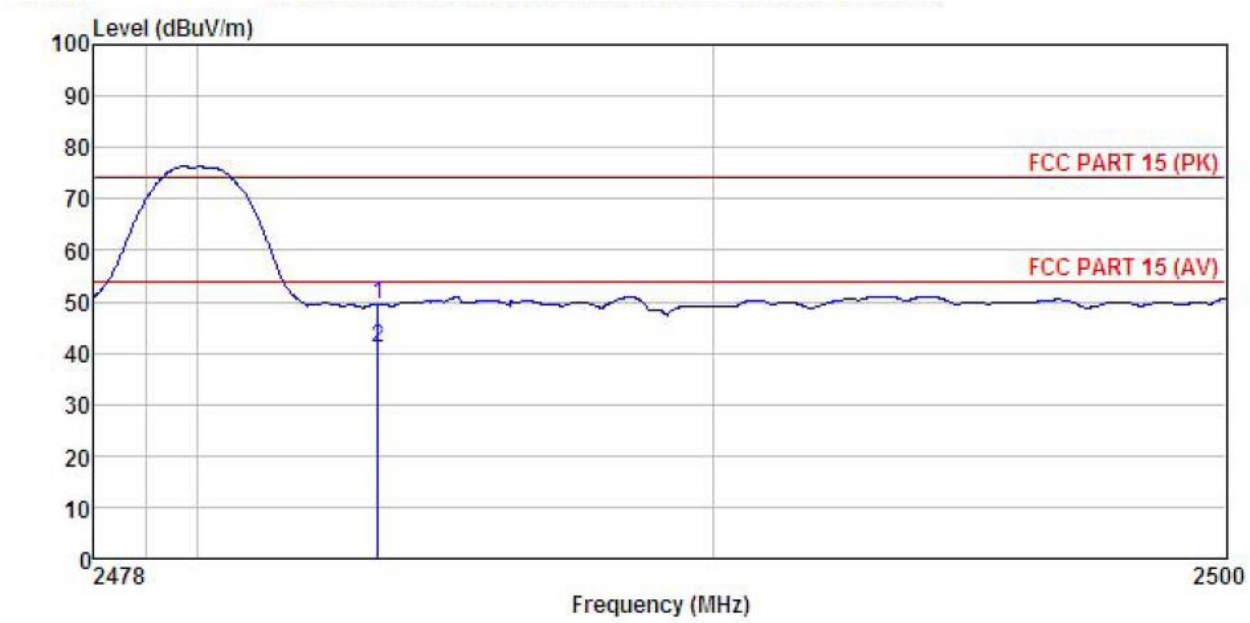
Horizontal:



Site : 3m chamber
Condition : FCC PART 15 (PK) 3m BBHA9120(1G18) HORIZONTAL
EUT : Toys wity Bluetooth PCB board
Model : 146csword
Test mode : BLE-H mode
Power Rating : DC 4.5V
Environment : Temp:25.5'C Huni:55% 101KPa
Test Engineer: YT
REMARK :

	Freq	Read 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	2483.500	19.72	23.70	6.85	0.00	50.27	74.00	-23.73	Peak
2	2483.500	10.38	23.70	6.85	0.00	40.93	54.00	-13.07	Average
3	2495.188	21.15	23.70	6.86	0.00	51.71	74.00	-22.29	Peak
4	2495.188	11.74	23.70	6.86	0.00	42.30	54.00	-11.70	Average

Vertical:

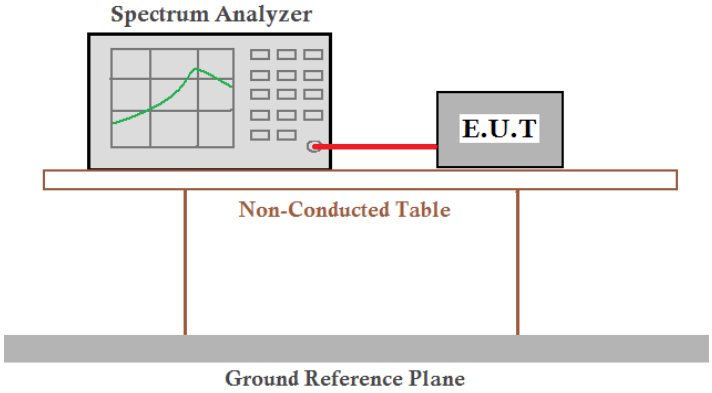


Site : 3m chamber
Condition : FCC PART 15 (PK) 3m BBHA9120(1G18) VERTICAL
EUT : Toys wity Bluetooth PCB board
Model : 146csword
Test mode : BLE-H mode
Power Rating : DC 4.5V
Environment : Temp:25.5'C Huni:55% 101KPa
Test Engineer: YT
REMARK :

	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	2483.500	18.96	23.70	6.85	0.00	49.51	74.00	-24.49	Peak
2	2483.500	10.23	23.70	6.85	0.00	40.78	54.00	-13.22	Average

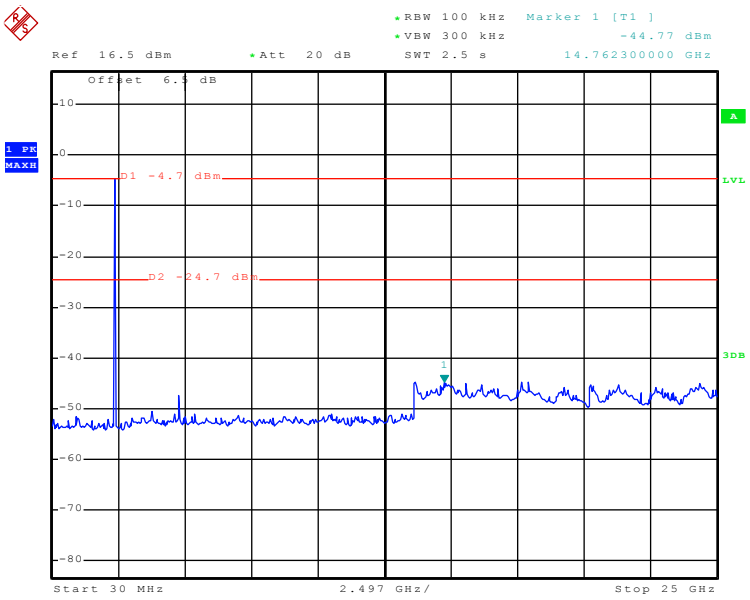
6.6 Spurious Emission

6.6.1 Conducted Emission Method

Test Requirement:	FCC Part15 C Section 15.247 (d)
Test Method:	ANSI C63.10:2013 and KDB558074v03r05 section 11
Limit:	In any 100 kHz bandwidth outside the frequency band in which the spreadspectrum intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement.
Test setup:	
Test Instruments:	Refer to section 5.7 for details
Test mode:	Refer to section 5.3 for details
Test results:	Passed

Test plot as follows:

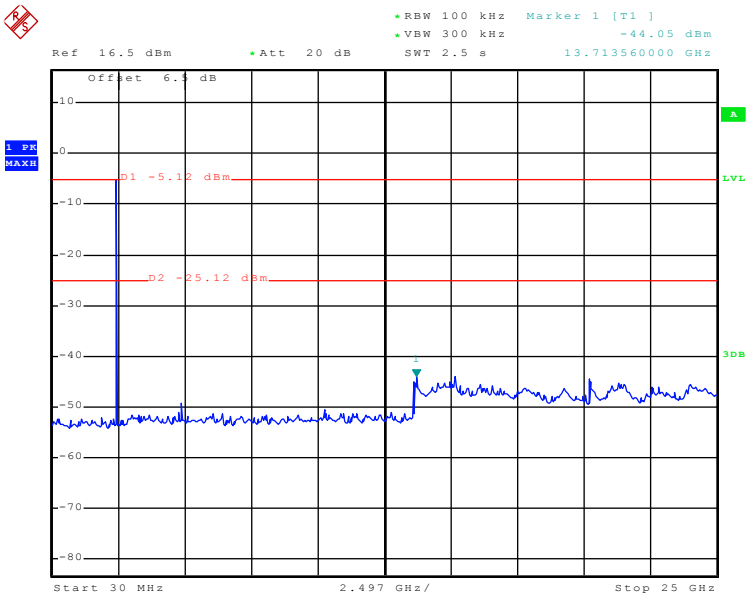
Lowest channel



Date: 15.JUN.2016 20:29:13

30MHz~25GHz

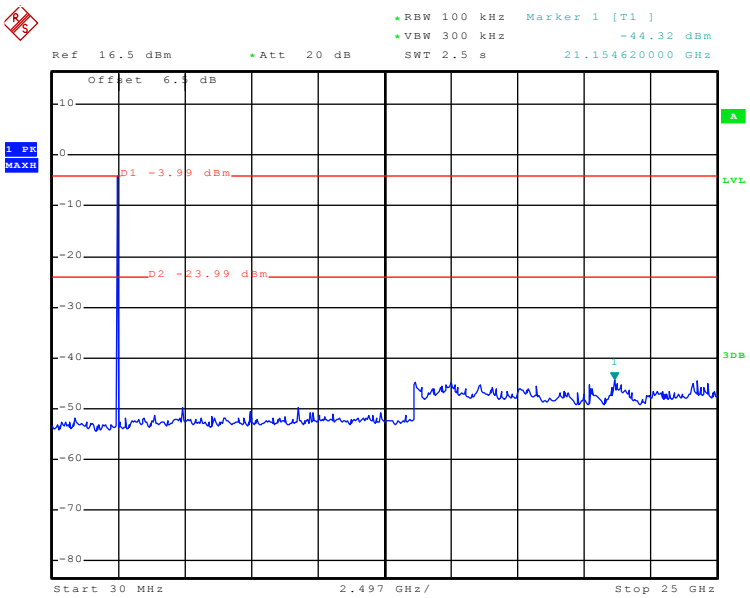
Middle channel



Date: 15.JUN.2016 20:30:12

30MHz~25GHz

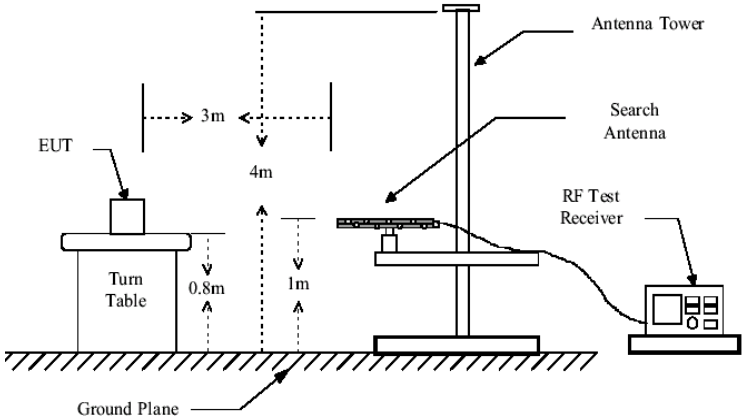
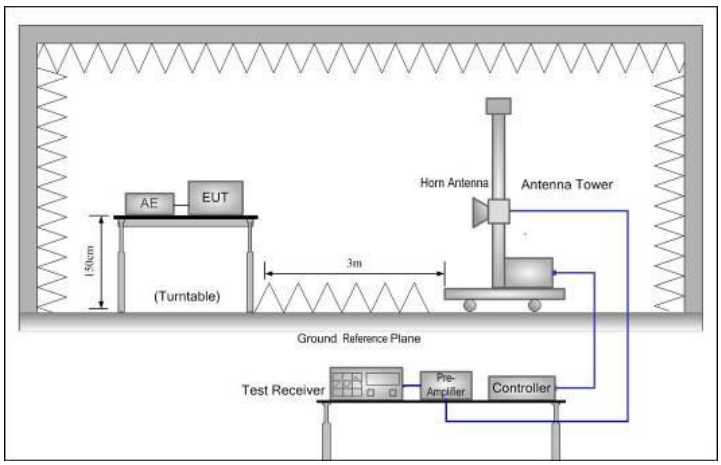
Highest channel



30MHz~25GHz

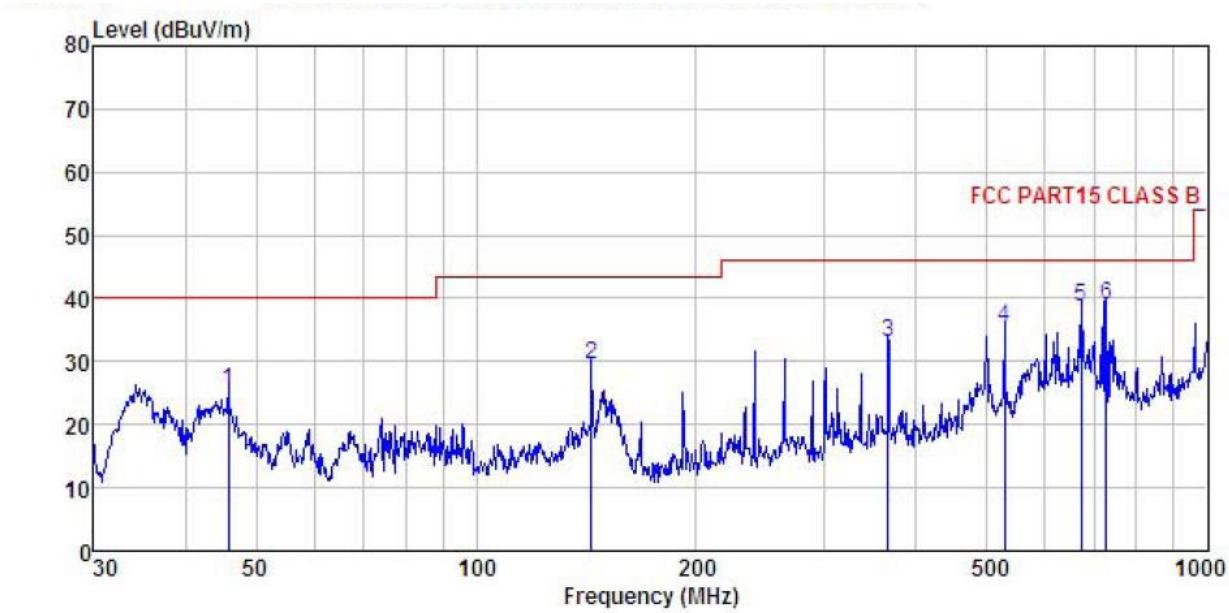
6.6.2 Radiated Emission Method

<table>
<tr><td>Test Requirement:</td><td colspan="5">FCC Part15 C Section 15.209 and 15.205</td></tr>
<tr><td>Test Method:</td><td colspan="5">ANSI C63.10:2013</td></tr>
<tr><td>TestFrequencyRange:</td><td colspan="5">9KHz to 25GHz</td></tr>
<tr><td>Test site:</td><td colspan="5">Measurement Distance: 3m</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 Procedure:</td><td colspan="5">1. The EUT was placed on the top of a rotating table 0.8m(below 1GHz)/1.5m(above 1GHz) above the groundat a 3 meter camber. The table was rotated 360 degrees todetermine the position of the highest radiation.
2. The EUT was set 3 meters away from the interference-receiving antenna, whichwas 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 thenthe antenna was tuned to heights from 1 meter to 4 meters and the rotatablewas turned from 0 degrees to 360 degrees to find the maximum reading.
5. The test-receiver system was set to Peak Detect Function and SpecifiedBandwidth with Maximum Hold Mode.
6. If the emission level of the EUT in peak mode was 10dB lower than the limitspecified, then testing could be stopped and the peak values of the EUT wouldbe reported. Otherwise the emissions that did not have 10dB margin would bere-tested one by one using peak, quasi-peak or average method as specified andthen reported in a data sheet.</td></tr>
</table>

Test setup:	Below 1GHz  Above 1GHz 
Test Uncertainty:	±4.88 dB
Test Instruments:	Refer to section 5.7 for details
Test mode:	Refer to section 5.3 for details
Test results:	Passed
Remark:	1. Pre-scan all kind of the place mode (X-axis, Y-axis, Z-axis), and found the Y-axis is the worst case. 2. 9 kHz to 30MHz is too low, so only shows the data of above 30MHz in this report. 3. The below 1GHz test, pre-scan the model: 146csword, 146cgun, 146cstar and 146cscope, and found the model: 146csword is the worst case, so only shows the model: 146csword in this report

Below 1GHz:

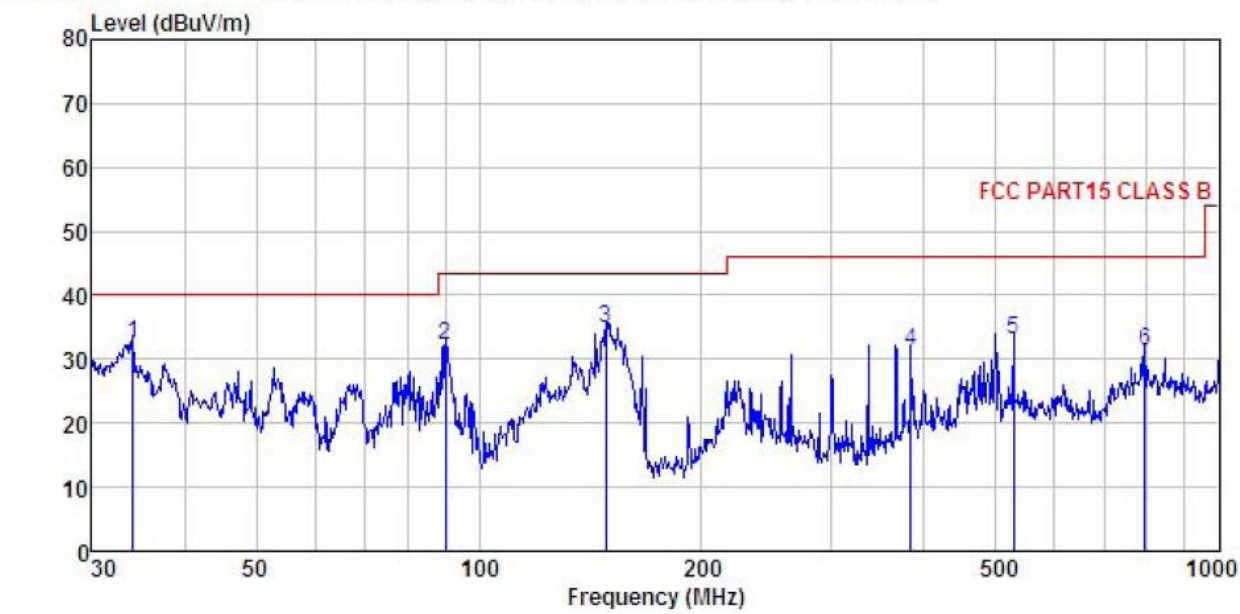
Horizontal:



Site : 3m chamber
Condition : FCC PART15 CLASS B 3m VULB9163(30M3G) HORIZONTAL
EUT : Toys wity Bluetooth PCB board
Model : 146csword
Test mode : BLE mode
Power Rating : DC 4.5V
Environment : Temp:25.5℃ Huni:55% 101KPa
Test Engineer: YT
REMARK :

	Freq	Read 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	45.855	36.84	17.24	1.29	29.85	25.52	40.00	-14.48	QP
2	143.830	45.10	11.34	2.44	29.25	29.63	43.50	-13.87	QP
3	365.539	43.76	14.72	3.09	28.63	32.94	46.00	-13.06	QP
4	528.246	43.05	17.54	3.77	29.04	35.32	46.00	-10.68	QP
5	672.845	44.54	18.98	4.00	28.73	38.79	46.00	-7.21	QP
6	726.805	43.42	19.84	4.28	28.57	38.97	46.00	-7.03	QP

Vertical:

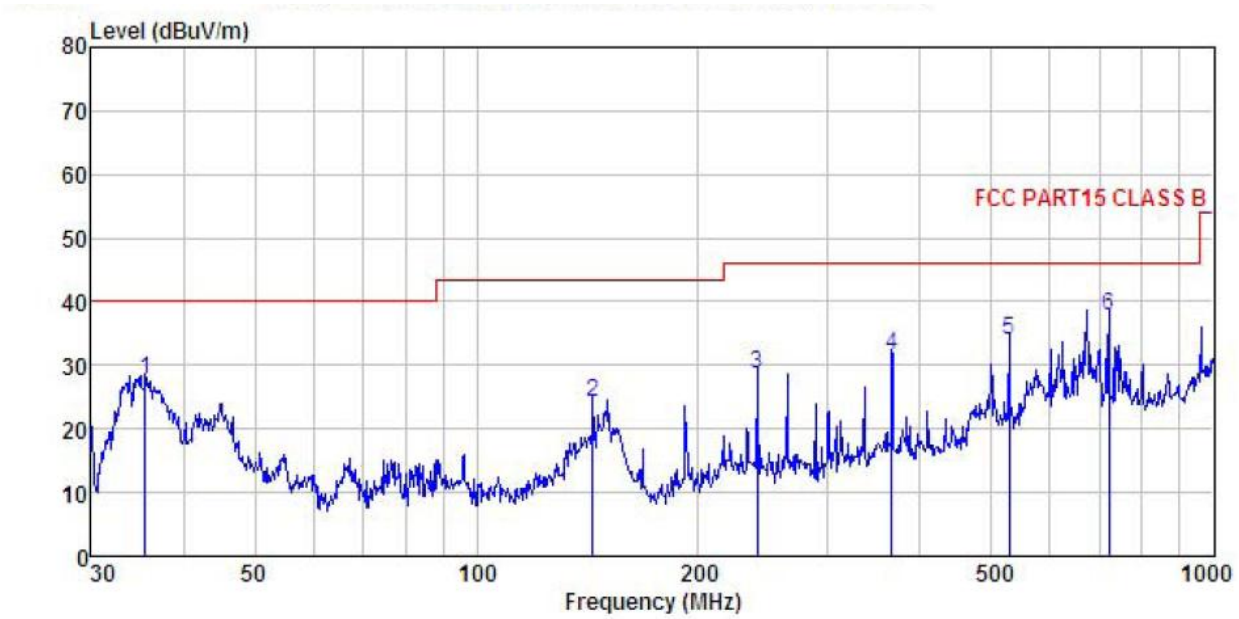


Site : 3m chamber
Condition : FCC PART15 CLASS B 3m VULB9163(30M3G) VERTICAL
EUT : Toys wity Bluetooth PCB board
Model : 146csword
Test mode : BLE mode
Power Rating : DC 4.5V
Environment : Temp:25.5℃ Huni:55% 101KPa
Test Engineer: YT
REMARK :

	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	34.037	47.29	14.20	0.98	29.96	32.51	40.00	-7.49	QP
2	90.220	51.57	8.20	2.03	29.57	32.23	43.50	-11.27	QP
3	148.441	50.68	10.84	2.50	29.23	34.79	43.50	-8.71	QP
4	383.932	41.39	15.40	3.09	28.71	31.17	46.00	-14.83	QP
5	528.246	40.88	17.54	3.77	29.04	33.15	46.00	-12.85	QP
6	793.396	34.75	20.57	4.35	28.23	31.44	46.00	-14.56	QP

Model: 146cgun

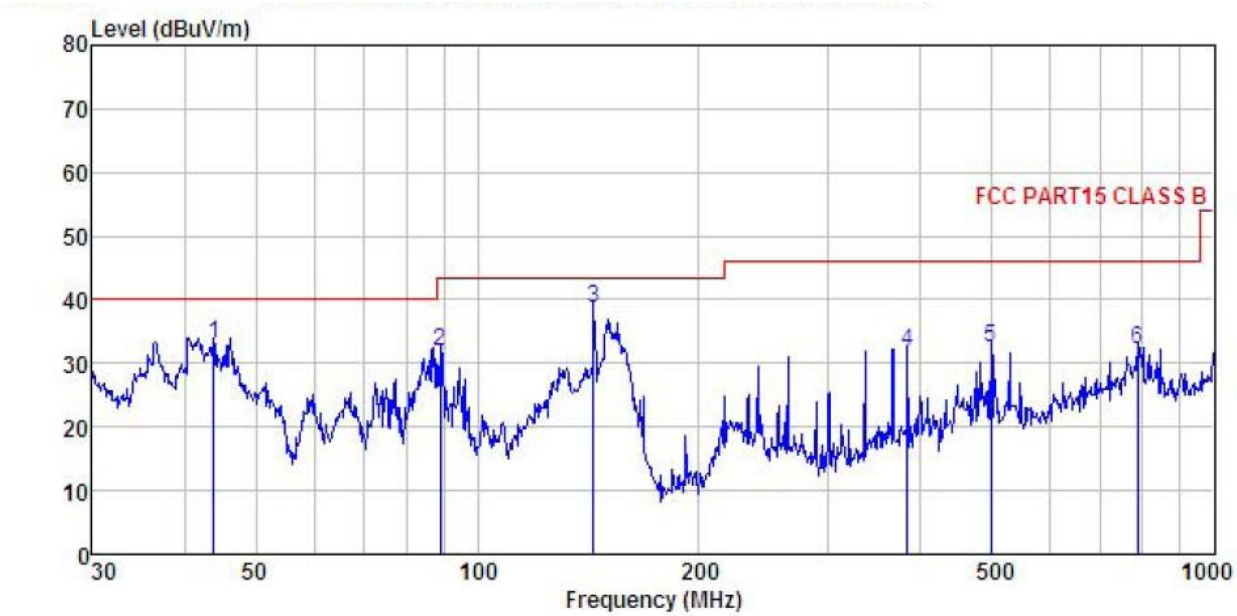
Horizontal:



Site : 3m chamber
Condition : FCC PART15 CLASS B 3m VULB9163(30M3G) HORIZONTAL
EUT : Toys wity Bluetooth PCB board
Model : 146cgun
Test mode : BLE mode
Power Rating : DC 4.5V
Environment : Temp:25.5℃ Huni:55% 101KPa
Test Engineer: YT
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	35.499	41.46	15.05	1.07	29.94	27.64	40.00	-12.36	QP
2	143.830	39.80	11.34	2.44	29.25	24.33	43.50	-19.17	QP
3	239.987	42.46	11.80	2.82	28.59	28.49	46.00	-17.51	QP
4	365.539	42.31	14.72	3.09	28.63	31.49	46.00	-14.51	QP
5	528.246	41.77	17.54	3.77	29.04	34.04	46.00	-11.96	QP
6	721.726	42.32	19.76	4.26	28.58	37.76	46.00	-8.24	QP

Vertical:

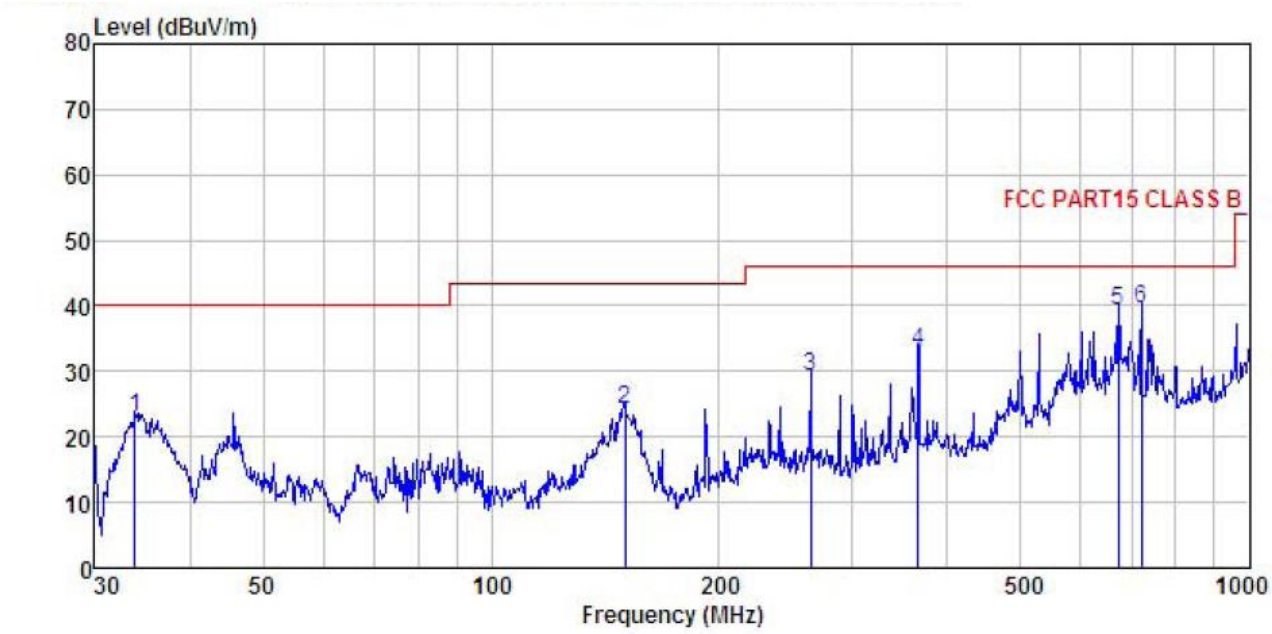


Site : 3m chamber
Condition : FCC PART15 CLASS B 3m VULB9163(30M3G) VERTICAL
EUT : Toys wity Bluetooth PCB board
Model : 146cgun
Test mode : BLE mode
Power Rating : DC 4.5V
Environment : Temp:25.5℃ Huni:55% 101KPa
Test Engineer: YT
REMARK :

	Freq	Read 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	44.14	17.56	1.26	29.87	33.09	40.00	-6.91	QP
2	88.964	51.43	8.04	2.00	29.58	31.89	43.50	-11.61	QP
3	143.830	54.07	11.34	2.44	29.25	38.60	43.50	-4.90	QP
4	383.932	42.07	15.40	3.09	28.71	31.85	46.00	-14.15	QP
5	497.677	40.96	16.77	3.60	28.95	32.38	46.00	-13.62	QP
6	787.851	35.61	20.56	4.35	28.26	32.26	46.00	-13.74	QP

Model: 146cstar

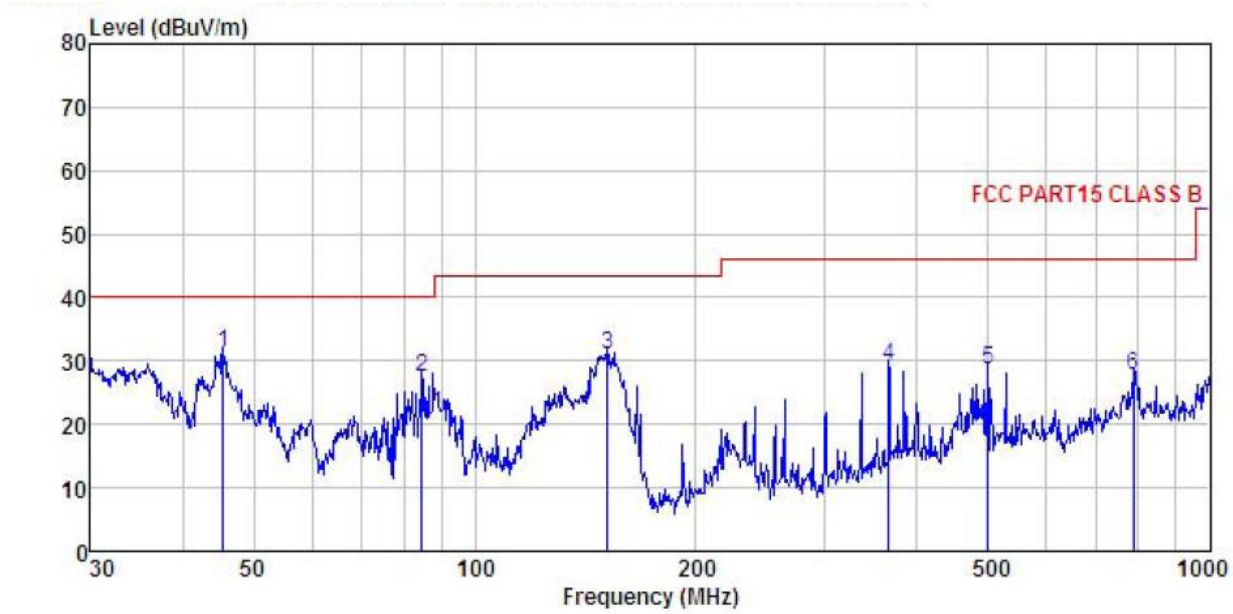
Horizontal:



Site : 3m chamber
Condition : FCC PART15 CLASS B 3m VULB9163(30M3G) HORIZONTAL
EUT : Toys wity Bluetooth PCB board
Model : 146cstar
Test mode : BLE mode
Power Rating : DC 4.5V
Environment : Temp:25.5℃ Huni:55% 101KPa
Test Engineer: YT
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	33.917	37.72	14.20	0.98	29.96	22.94	40.00	-17.06	QP
2	150.011	40.36	10.64	2.52	29.22	24.30	43.50	-19.20	QP
3	263.819	42.94	11.85	2.85	28.51	29.13	46.00	-16.87	QP
4	365.539	44.01	14.72	3.09	28.63	33.19	46.00	-12.81	QP
5	672.845	44.96	18.98	4.00	28.73	39.21	46.00	-6.79	QP
6	721.726	44.13	19.76	4.26	28.58	39.57	46.00	-6.43	QP

Vertical:

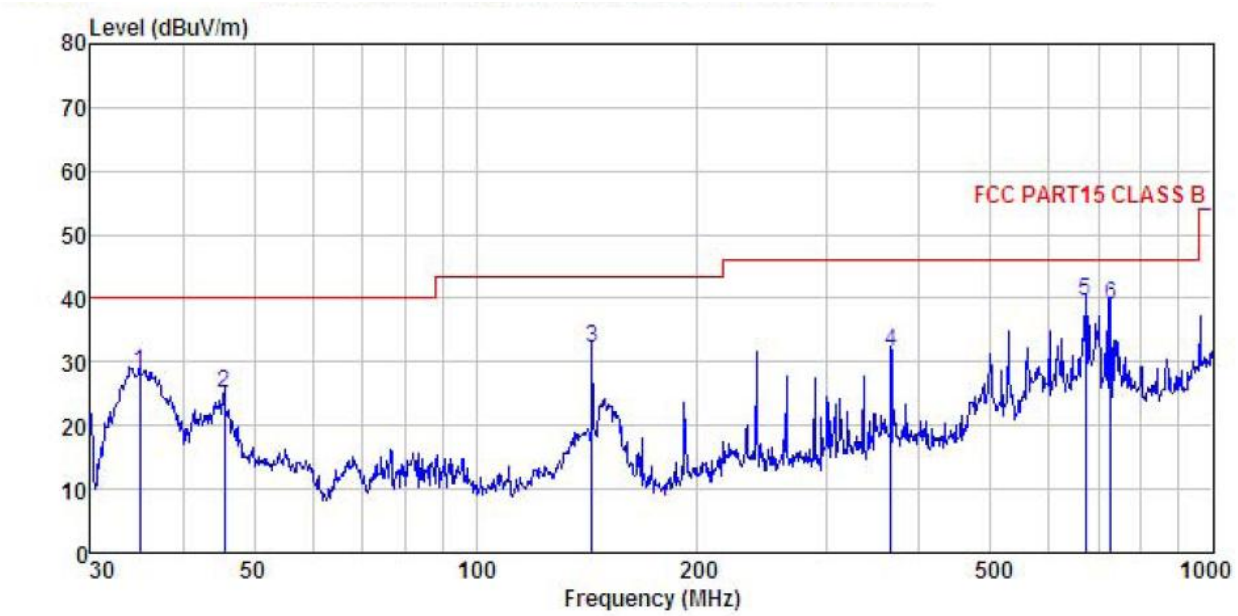


Site : 3m chamber
Condition : FCC PART15 CLASS B 3m VULB9163(30M3G) VERTICAL
EUT : Toys wity Bluetooth PCB board
Model : 146cstar
Test mode : BLE mode
Power Rating : DC 4.5V
Environment : Temp:25.5'C Huni:55% 101KPa
Test Engineer: YT
REMARK :

	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	45.375	42.48	17.32	1.29	29.86	31.23	40.00	-8.77	QP
2	84.702	47.71	7.42	1.83	29.60	27.36	40.00	-12.64	QP
3	151.597	47.23	10.53	2.53	29.21	31.08	43.50	-12.42	QP
4	365.539	39.96	14.72	3.09	28.63	29.14	46.00	-16.86	QP
5	499.425	37.20	16.80	3.61	28.95	28.66	46.00	-17.34	QP
6	787.851	31.18	20.56	4.35	28.26	27.83	46.00	-18.17	QP

Model: 146cscope

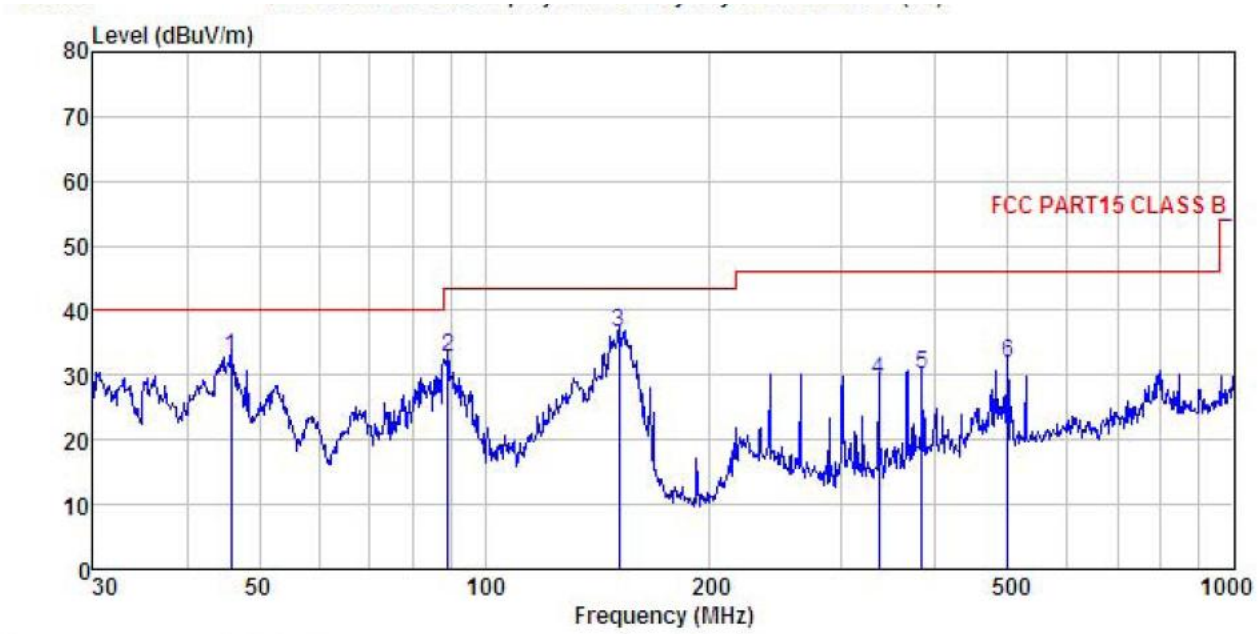
Horizontal:



Site : 3m chamber
Condition : FCC PART15 CLASS B 3m VULB9163(30M3G) HORIZONTAL
EUT : Toys wity Bluetooth PCB board
Model : 146cscope
Test mode : BLE mode
Power Rating : DC 4.5V
Environment : Temp:25.5℃ Huni:55% 101KPa
Test Engineer: YT
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	35.005	42.37	14.79	1.04	29.95	28.25	40.00	-11.75	QP
2	45.535	36.32	17.28	1.29	29.86	25.03	40.00	-14.97	QP
3	143.830	47.59	11.34	2.44	29.25	32.12	43.50	-11.38	QP
4	365.539	42.28	14.72	3.09	28.63	31.46	46.00	-14.54	QP
5	672.845	45.24	18.98	4.00	28.73	39.49	46.00	-6.51	QP
6	726.805	43.51	19.84	4.28	28.57	39.06	46.00	-6.94	QP

Vertical:



Site : 3m chamber
Condition : FCC PART15 CLASS B 3m VULB9163(30M3G) VERTICAL
EUT : Toys wity Bluetooth PCB board
Model : 146cscope
Test mode : BLE mode
Power Rating : DC 4.5V
Environment : Temp:25.5'C Huni:55% 101KPa
Test Engineer: YT
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	45.855	44.20	17.24	1.29	29.85	32.88	40.00	-7.12	QP
2	89.276	52.22	8.09	2.04	29.57	32.78	43.50	-10.72	QP
3	151.067	52.55	10.59	2.53	29.21	36.46	43.50	-7.04	QP
4	336.035	41.08	13.76	3.05	28.53	29.36	46.00	-16.64	QP
5	383.932	40.37	15.40	3.09	28.71	30.15	46.00	-15.85	QP
6	499.425	40.46	16.80	3.61	28.95	31.92	46.00	-14.08	QP

Above 1GHz

Model: 146csword

Test channel:			Lowest		Level:		Peak	
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
4804.00	45.38	35.99	10.57	40.24	51.70	74.00	-22.30	Vertical
4804.00	44.62	35.99	10.57	40.24	50.94	74.00	-23.06	Horizontal
Test channel:			Lowest		Level:		Average	
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
4804.00	35.24	35.99	10.57	40.24	41.56	54.00	-12.44	Vertical
4804.00	34.68	35.99	10.57	40.24	41.00	54.00	-13.00	Horizontal

Test channel:			Middle		Level:		Peak	
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
4884.00	44.23	36.38	10.66	40.15	51.12	74.00	-22.88	Vertical
4884.00	45.15	36.38	10.66	40.15	52.04	74.00	-21.96	Horizontal
Test channel:			Middle		Level:		Average	
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
4884.00	34.67	36.38	10.66	40.15	41.56	54.00	-12.44	Vertical
4884.00	35.27	36.38	10.66	40.15	42.16	54.00	-11.84	Horizontal

Test channel:			Highest		Level:		Peak	
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
4960.00	44.81	36.71	10.73	40.03	52.22	74.00	-21.78	Vertical
4960.00	44.37	36.71	10.73	40.03	51.78	74.00	-22.22	Horizontal
Test channel:			Highest		Level:		Average	
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
4960.00	34.21	36.71	10.73	40.03	41.62	54.00	-12.38	Vertical
4960.00	34.69	36.71	10.73	40.03	42.10	54.00	-11.90	Horizontal

Remark:

1. *Final Level =Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor*
2. *The emission levels of other frequencies are very lower than the limit and not show in test report.*

Model: 146cgun

Test channel:			Lowest		Level:		Peak	
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
4804.00	45.84	35.99	10.57	40.24	52.16	74.00	-21.84	Vertical
4804.00	44.16	35.99	10.57	40.24	50.48	74.00	-23.52	Horizontal
Test channel:			Lowest		Level:		Average	
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
4804.00	35.92	35.99	10.57	40.24	42.24	54.00	-11.76	Vertical
4804.00	34.87	35.99	10.57	40.24	41.19	54.00	-12.81	Horizontal

Test channel:			Middle		Level:		Peak	
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
4884.00	45.78	36.38	10.66	40.15	52.67	74.00	-21.33	Vertical
4884.00	44.61	36.38	10.66	40.15	51.50	74.00	-22.50	Horizontal
Test channel:			Middle		Level:		Average	
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
4884.00	35.68	36.38	10.66	40.15	42.57	54.00	-11.43	Vertical
4884.00	34.21	36.38	10.66	40.15	41.10	54.00	-12.90	Horizontal

Test channel:			Highest		Level:		Peak	
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
4960.00	45.87	36.71	10.73	40.03	53.28	74.00	-20.72	Vertical
4960.00	44.96	36.71	10.73	40.03	52.37	74.00	-21.63	Horizontal
Test channel:			Highest		Level:		Average	
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
4960.00	35.67	36.71	10.73	40.03	43.08	54.00	-10.92	Vertical
4960.00	34.21	36.71	10.73	40.03	41.62	54.00	-12.38	Horizontal

Remark:

3. Final Level =Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor
The emission levels of other frequencies are very lower than the limit and not show in test report

Model: 146cstar

Test channel:			Lowest		Level:		Peak	
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
4804.00	44.21	35.99	10.57	40.24	50.53	74.00	-23.47	Vertical
4804.00	45.35	35.99	10.57	40.24	51.67	74.00	-22.33	Horizontal
Test channel:			Lowest		Level:		Average	
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
4804.00	33.25	35.99	10.57	40.24	39.57	54.00	-14.43	Vertical
4804.00	34.87	35.99	10.57	40.24	41.19	54.00	-12.81	Horizontal

Test channel:			Middle		Level:		Peak	
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
4884.00	45.61	36.38	10.66	40.15	52.50	74.00	-21.50	Vertical
4884.00	44.87	36.38	10.66	40.15	51.76	74.00	-22.24	Horizontal
Test channel:			Middle		Level:		Average	
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
4884.00	34.71	36.38	10.66	40.15	41.60	54.00	-12.40	Vertical
4884.00	34.63	36.38	10.66	40.15	41.52	54.00	-12.48	Horizontal

Test channel:			Highest		Level:		Peak	
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
4960.00	44.12	36.71	10.73	40.03	51.53	74.00	-22.47	Vertical
4960.00	45.87	36.71	10.73	40.03	53.28	74.00	-20.72	Horizontal
Test channel:			Highest		Level:		Average	
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
4960.00	34.65	36.71	10.73	40.03	42.06	54.00	-11.94	Vertical
4960.00	35.74	36.71	10.73	40.03	43.15	54.00	-10.85	Horizontal

Remark:

4. Final Level =Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor

The emission levels of other frequencies are very lower than the limit and not show in test report

Model: 146cscope

Test channel:			Lowest		Level:		Peak	
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
4804.00	44.81	35.99	10.57	40.24	51.13	74.00	-22.87	Vertical
4804.00	45.63	35.99	10.57	40.24	51.95	74.00	-22.05	Horizontal
Test channel:			Lowest		Level:		Average	
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
4804.00	34.58	35.99	10.57	40.24	40.90	54.00	-13.10	Vertical
4804.00	35.62	35.99	10.57	40.24	41.94	54.00	-12.06	Horizontal

Test channel:			Middle		Level:		Peak	
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
4884.00	45.19	36.38	10.66	40.15	52.08	74.00	-21.92	Vertical
4884.00	44.67	36.38	10.66	40.15	51.56	74.00	-22.44	Horizontal
Test channel:			Middle		Level:		Average	
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
4884.00	35.26	36.38	10.66	40.15	42.15	54.00	-11.85	Vertical
4884.00	34.87	36.38	10.66	40.15	41.76	54.00	-12.24	Horizontal

Test channel:			Highest		Level:		Peak	
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
4960.00	45.13	36.71	10.73	40.03	52.54	74.00	-21.46	Vertical
4960.00	44.78	36.71	10.73	40.03	52.19	74.00	-21.81	Horizontal
Test channel:			Highest		Level:		Average	
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
4960.00	35.69	36.71	10.73	40.03	43.10	54.00	-10.90	Vertical
4960.00	33.54	36.71	10.73	40.03	40.95	54.00	-13.05	Horizontal

Remark:

5. Final Level =Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor

The emission levels of other frequencies are very lower than the limit and not show in test report