FCC REPORT
(Bluetooth)

Applicant:	Light wave Technology
Address of Applicant:	400 Wright Street St-Laurent QC H4N 1M6 Canada

Equipment Under Test (EUT)

Product Name:	Lookit
Model No.:	RVC2000-BT
FCC ID:	2ABSL2000
Applicable standards:	FCC CFR Title 47 Part 15 Subpart C Section 15.247
Date of sample receipt:	16 Oct., 2017
Date of Test:	17 Oct., to 25 Oct., 2017
Date of report issued:	26 Oct., 2017
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	26 Oct., 2017	Original

Tested by:  ***Date:*** 26 Oct., 2017

Test Engineer

Reviewed by:  ***Date:*** 26 Oct., 2017

Project Engineer

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4 Test Summary

Test Items	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)(1)	Pass
20dB Occupied Bandwidth	15.247 (a)(1)	Pass
Carrier Frequencies Separation	15.247 (a)(1)	Pass
Hopping Channel Number	15.247 (a)(1)	Pass
Dwell Time	15.247 (a)(1)	Pass
Spurious Emission	15.205/15.209	Pass
Band Edge	15.247(d)	Pass
Pass: The EUT complies with the essential requirements in the standard.		

5 General Information

5.1 Client Information

Applicant:	Light wave Technology
Address:	400 Wright Street St-Laurent QC H4N 1M6 Canada
Manufacturer/Factory:	DONGGUAN PORTMAN ELECTRONIC SCIENCE AND TECHNOLOGY CO., LTD
Address:	NO.10, LUYI 2 ROAD, TANGXIA TOWN, DONGGUAN CITY, GUANGDONG PROVINCE CHINA

5.2 General Description of E.U.T.

Product Name:	Lookit
Model No.:	RVC2000-BT
Operation Frequency:	2402MHz~2480MHz
Transfer rate:	1/2/3 Mbits/s
Number of channel:	79
Modulation type:	GFSK, π/4-DQPSK, 8DPSK
Modulation technology:	FHSS
Antenna Type:	PCB Antenna
Antenna gain:	-3 dBi
Power supply:	Rechargeable Li-ion Battery DC3.6V/8Ah*3 and SPC1550*1

Operation Frequency each of channel for GFSK, π/4-DQPSK, 8DPSK							
Channel	Frequency	Channel	Frequency	Channel	Frequency	Channel	Frequency
0	2402MHz	20	2422MHz	40	2442MHz	60	2462MHz
1	2403MHz	21	2423MHz	41	2443MHz	61	2463MHz
2	2404MHz	22	2424MHz	42	2444MHz	62	2464MHz
3	2405MHz	23	2425MHz	43	2445MHz	63	2465MHz
4	2406MHz	24	2426MHz	44	2446MHz	64	2466MHz
5	2407MHz	25	2427MHz	45	2447MHz	65	2467MHz
…	…	…	…	…	…	…	…
15	2417MHz	35	2437MHz	55	2457MHz	75	2477MHz
16	2418MHz	36	2438MHz	56	2458MHz	76	2478MHz
17	2419MHz	37	2439MHz	57	2459MHz	77	2479MHz
18	2420MHz	38	2440MHz	58	2460MHz	78	2480MHz
19	2421MHz	39	2441MHz	59	2461MHz		
Remark: Channel 0, 39 &78 selected for GFSK, π/4-DQPSK and 8DPSK.							

5.3 Test environment and test mode

Operating Environment:	
Temperature:	24.0 °C
Humidity:	54 % RH
Atmospheric Pressure:	1010 mbar
Test Modes:	
Non-hopping mode:	Keep the EUT in continuous transmitting mode with worst case data rate.
Hopping mode:	Keep the EUT in hopping mode.
Remark	GFSK (1 Mbps) is the worst case mode.
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 with a fresh battery, 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

The EUT has been tested as an independent unit. New battery is used during all test.

5.5 Measurement Uncertainty

Parameters	Expanded Uncertainty
Conducted Emission (9kHz ~ 30MHz)	2.14 dB (k=2)
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)

5.6 Laboratory Facility

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

- **FCC - Registration No.: 727551**

Shenzhen Zhongjian Nanfang Testing Co., Ltd. has been accredited as a testing laboratory by FCC (Federal Communications Commission). The Registration No. is 727551.

- **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.

- **A2LA - Registration No.: 4346.01**

This laboratory is accredited in accordance with the recognized International Standard ISO/IEC 17025:2005 General requirements for the competence of testing and calibration laboratories. The test scope can be found as below link: https://portal.a2la.org/scopepdf/4346-01.pdf

5.7 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
Email: info@ccis-cb.com, Website: http://www.ccis-cb.com

5.8 Test Instruments list

Radiated Emission:					
Test Equipment	**Manufacturer**	**Model No.**	**Serial No.**	**Cal. Date (mm-dd-yy)**	**Cal. Due date (mm-dd-yy)**
3m SAC	SAEMC	9m*6m*6m	966	07-22-2017	07-21-2020
Loop Antenna	SCHWARZBECK	FMZB1519B	00044	02-25-2017	02-24-2018
BiConiLog Antenna	SCHWARZBECK	VULB9163	497	02-25-2017	02-24-2018
Horn Antenna	SCHWARZBECK	BBHA9120D	916	02-25-2017	02-24-2018
EMI Test Software	AUDIX	E3	6.110919b	N/A	N/A
Pre-amplifier	HP	8447D	2944A09358	02-25-2017	02-24-2018
Pre-amplifier	CD	PAP-1G18	11804	02-25-2017	02-24-2018
Spectrum analyzer	Rohde & Schwarz	FSP30	101454	02-25-2017	02-24-2018
EMI Test Receiver	Rohde & Schwarz	ESRP7	101070	02-25-2017	02-24-2018
Cable	ZDECL	Z108-NJ-NJ-81	1608458	02-25-2017	02-24-2018
Cable	MICRO-COAX	MFR64639	K10742-5	02-25-2017	02-24-2018
Cable	SUHNER	SUCOFLEX100	58193/4PE	02-25-2017	02-24-2018

6 Test results and measurement data

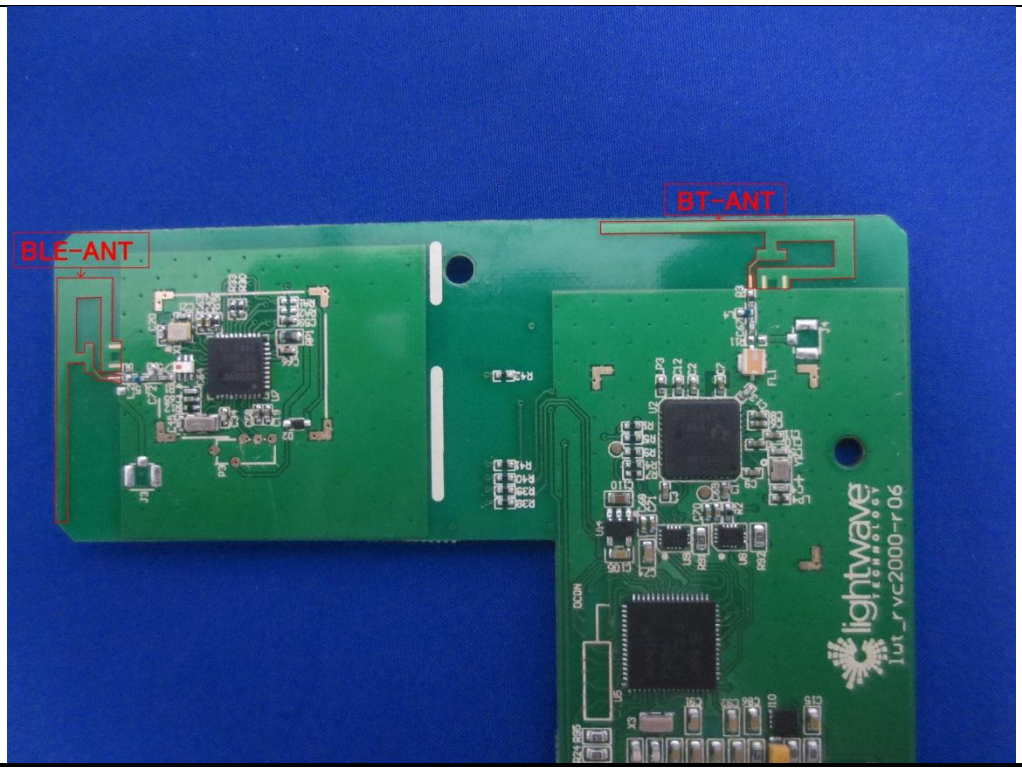
6.1 Antenna Requirement

Standard requirement:	FCC Part 15 C Section 15.203 /247(c)

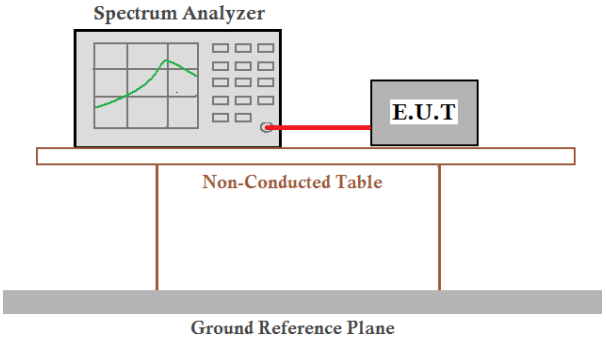
15.203 requirement:
An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator, the manufacturer 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 for fixed. Point-to-point operations may employ transmitting antennas with directional gain greater than 6dBi provided the maximum conducted output power of the intentional radiator is reduced by 1 dB for every 3 dB that the directional gain of the antenna exceeds 6dBi.

E.U.T Antenna:	

The Bluetooth antenna is integral antenna , the best-case gain of the antenna is -3 dBi.



6.2 Conducted Output Power

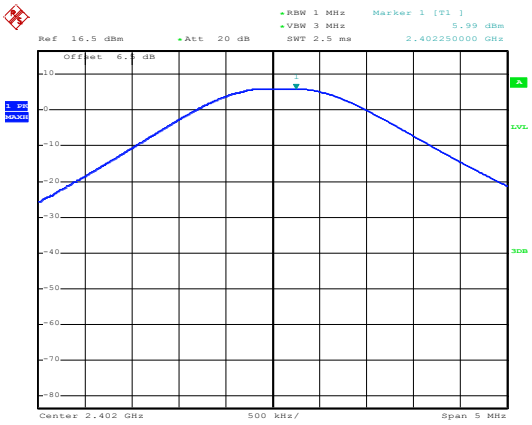
Test Requirement:	FCC Part 15 C Section 15.247 (b)(1)
Test Method:	ANSI C63.10:2013 and DA00-705
Receiver setup:	RBW=1MHz, VBW=3MHz, Detector=Peak (If 20dB BW ≤1 MHz) RBW=3MHz, VBW=10MHz, Detector=Peak (If 20dB BW > 1 MHz and < 3MHz)
Limit:	125 mW(21 dBm)
Test setup:	
Test Instruments:	Refer to section 5.8 for details
Test mode:	Non-hopping mode
Test results:	Pass

Measurement Data:

Test channel	Peak Output Power (dBm)	Limit (dBm)	Result
GFSK mode			
Lowest	5.99	30.00	Pass
Middle	5.89	30.00	Pass
Highest	5.82	30.00	Pass
π/4-DQPSK mode			
Lowest	2.09	21.00	Pass
Middle	2.03	21.00	Pass
Highest	1.97	21.00	Pass
8DPSK mode			
Lowest	2.70	21.00	Pass
Middle	2.67	21.00	Pass
Highest	2.55	21.00	Pass

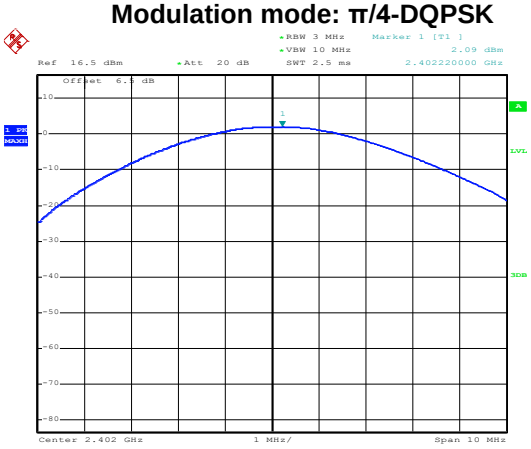
Test plot as follows:

Modulation mode: GFSK



Date: 20.OCT.2017 13:44:38

Modulation mode: π/4-DQPSK



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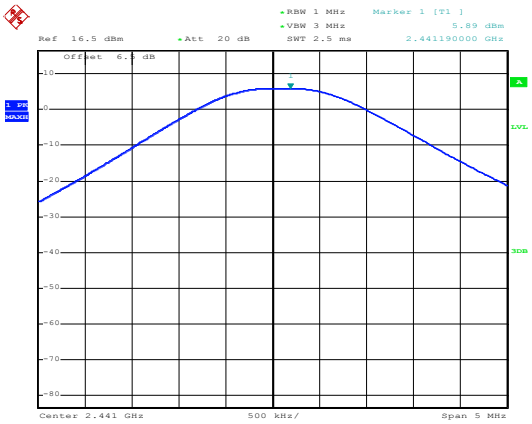
Lowest channel



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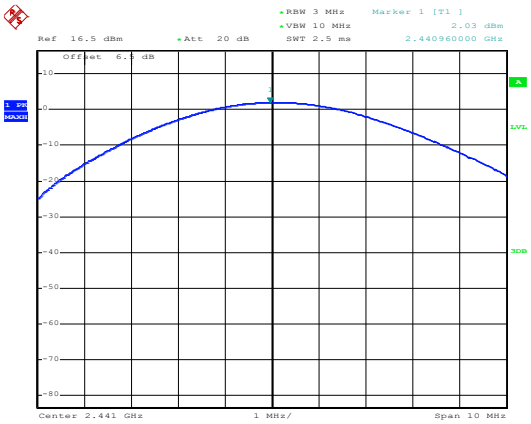
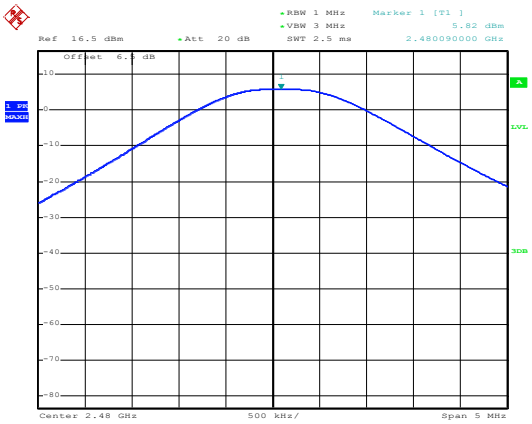
Lowest channel



Date: 20.OCT.2017 13:49:12

Middle channel



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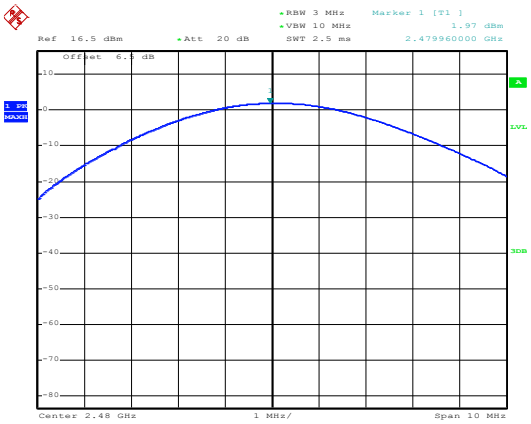
Middle channel

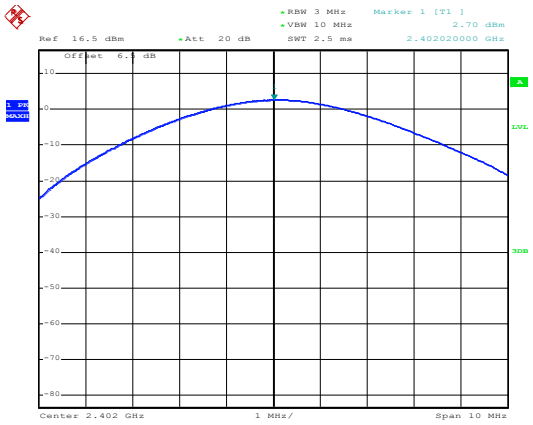


Date: 20.OCT.2017 13:48:58

Highest channel

Highest channel

Modulation mode: 8DPSK



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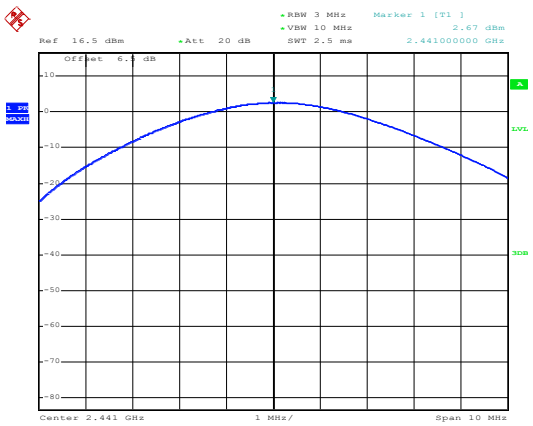
Lowest channel



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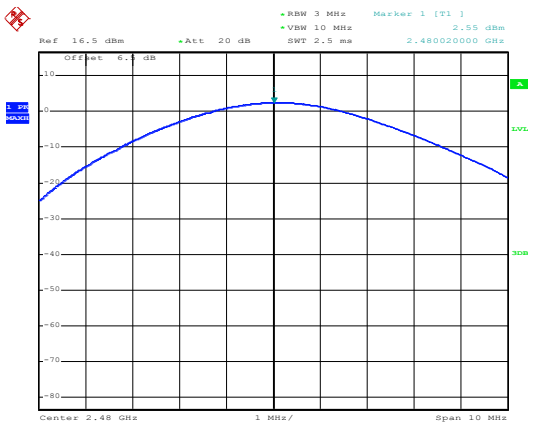
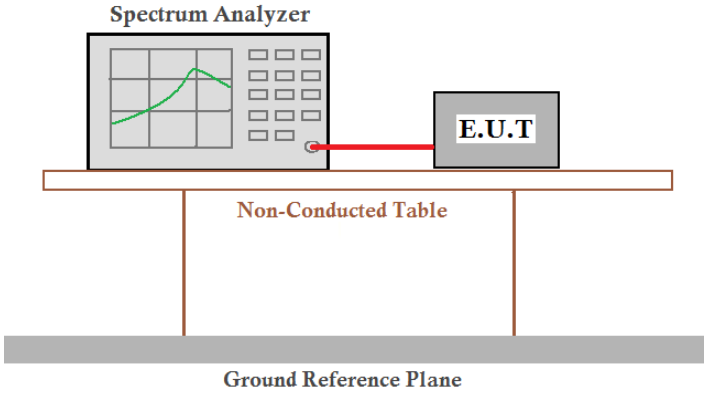
Middle channel



Date: 20.OCT.2017 13:50:07

Highest channel

6.3 20dB Occupy Bandwidth

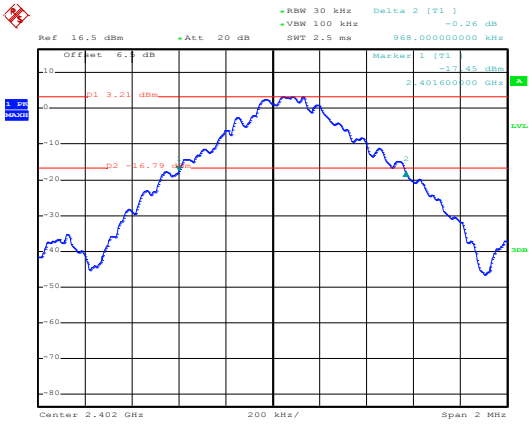
Test Requirement:	FCC Part 15 C Section 15.247 (a)(1)
Test Method:	ANSI C63.10:2013 and DA00-705
Receiver setup:	RBW=30 kHz, VBW=100 kHz, detector=Peak
Limit:	NA
Test setup:	
Test Instruments:	Refer to section 5.8 for details
Test mode:	Non-hopping mode
Test results:	Pass

Measurement Data:

Test channel	20dB Occupy Bandwidth (kHz)		
	GFSK	π/4-DQPSK	8DPSK
Lowest	968	1392	1374
Middle	960	1386	1368
Highest	964	1386	1380

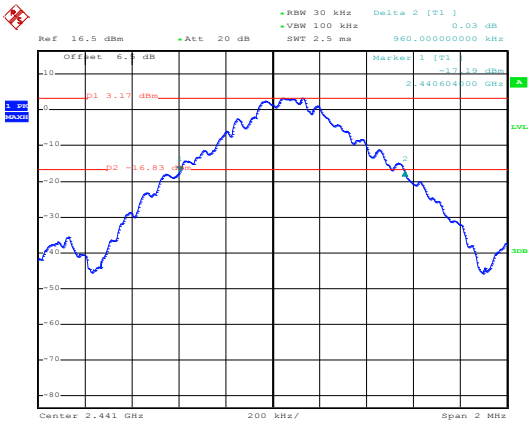
Test plot as follows:

Modulation mode: GFSK



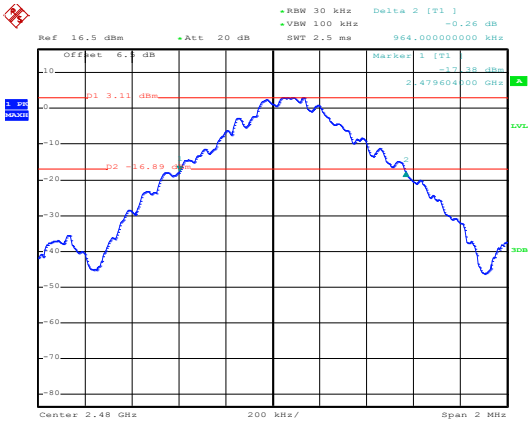
Date: 20.OCT.2017 13:51:39

Lowest channel



Date: 20.OCT.2017 13:52:44

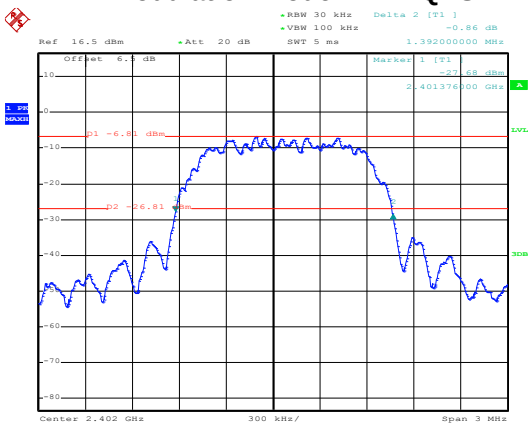
Middle channel



Date: 20.OCT.2017 13:53:53

Highest channel

Modulation mode: π/4-DQPSK



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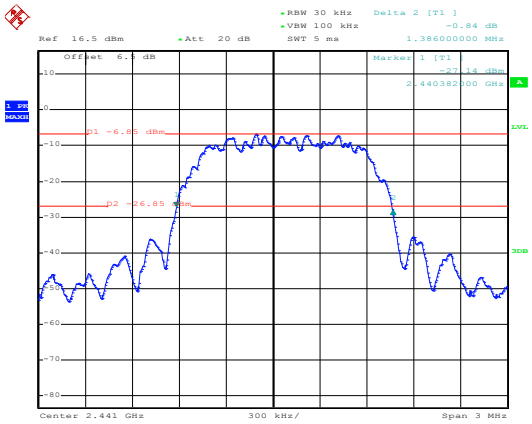
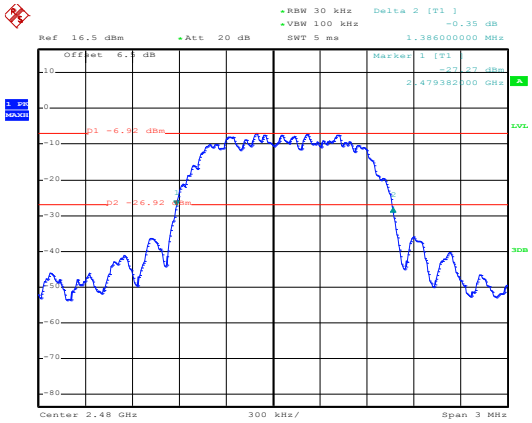
Lowest channel



Date: 20.OCT.2017 13:56:42

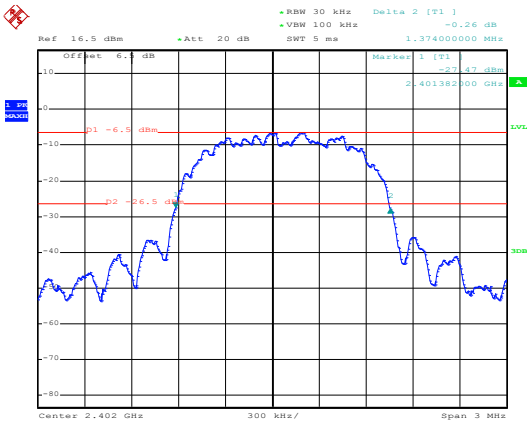
Middle channel



Date: 20.OCT.2017 13:57:39

Highest channel

Modulation mode: 8DPSK



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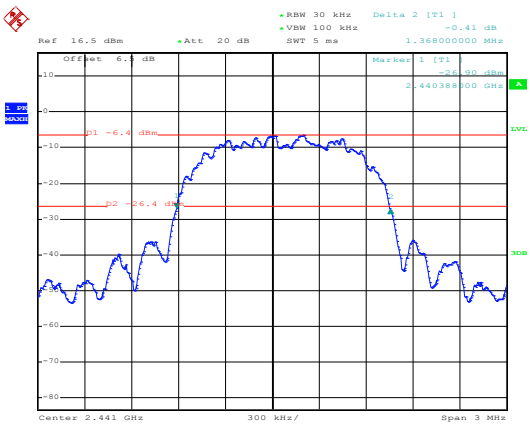
Lowest channel



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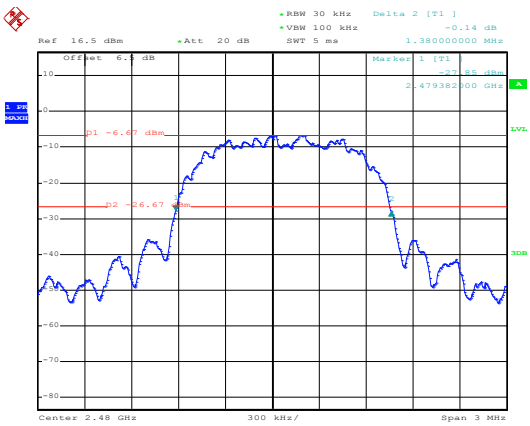
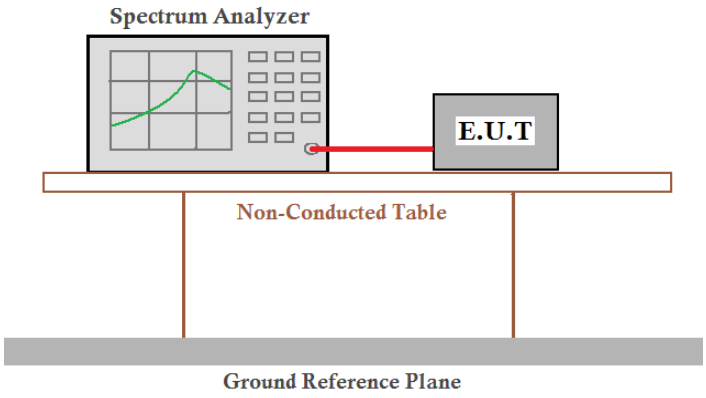
Middle channel



Date: 20.OCT.2017 14:01:02

Highest channel

6.4 Carrier Frequencies Separation

Test Requirement:	FCC Part 15 C Section 15.247 (a)(1)
Test Method:	ANSI C63.10:2013 and DA00-705
Receiver setup:	RBW=100 kHz, VBW=300 kHz, detector=Peak
Limit:	0.025MHz or 2/3 of the 20dB bandwidth (whichever is greater)
Test setup:	
Test Instruments:	Refer to section 5.8 for details
Test mode:	Hopping mode
Test results:	Pass

Measurement Data:

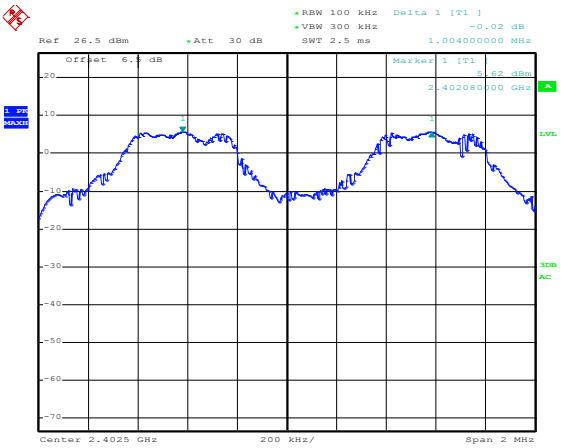
Test channel	Carrier Frequencies Separation (kHz)	Limit (kHz)	Result
GFSK			
Lowest	1004	645.33	Pass
Middle	1004	645.33	Pass
Highest	1004	645.33	Pass
π/4-DQPSK mode			
Lowest	1008	928.00	Pass
Middle	1004	928.00	Pass
Highest	1008	928.00	Pass
8DPSK mode			
Lowest	1004	920.00	Pass
Middle	1004	920.00	Pass
Highest	1004	920.00	Pass

Note: According to section 6.4

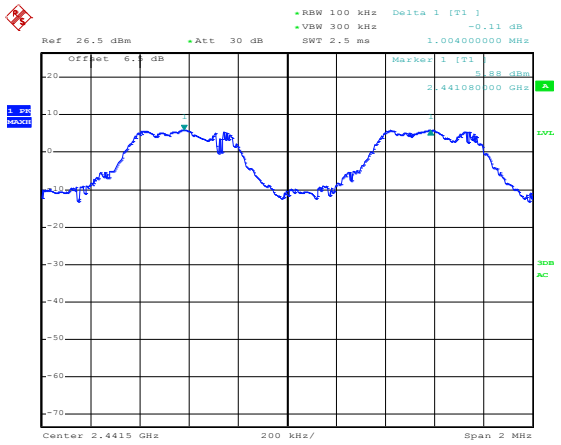
Mode	20dB bandwidth (kHz) (worse case)	Limit (kHz) (Carrier Frequencies Separation)
GFSK	968	645.33
π/4-DQPSK	1392	928.00
8DPSK	1380	920.00

Test plot as follows:

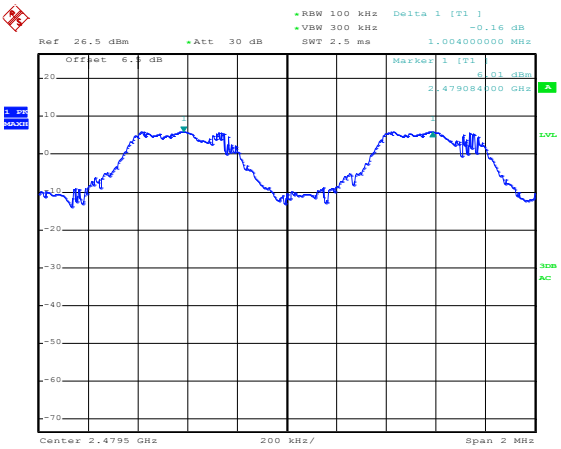
Modulation mode: GFSK



Lowest channel

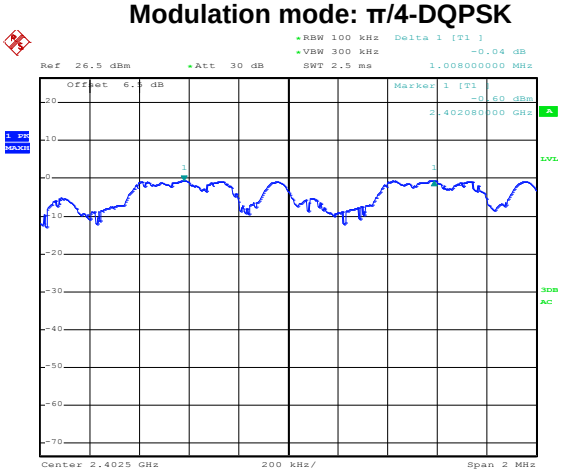


Middle channel

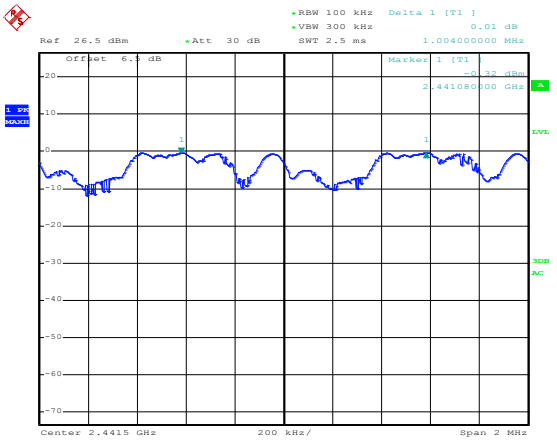


Highest channel

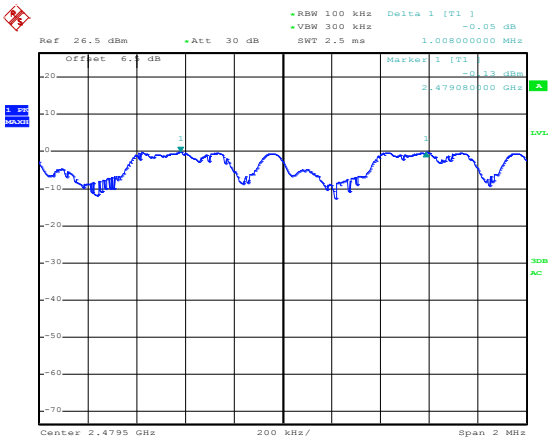
Modulation mode: π/4-DQPSK



Lowest channel

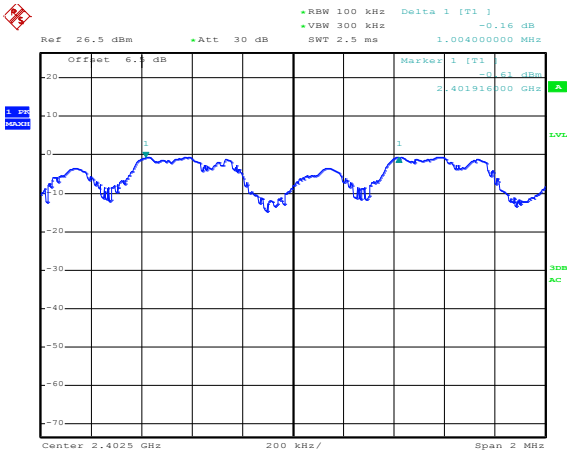


Middle channel

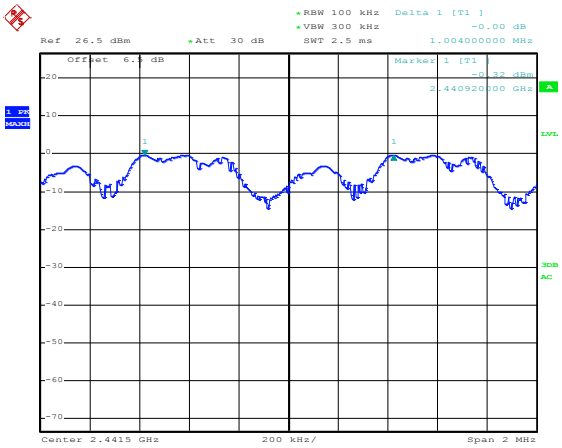


Highest channel

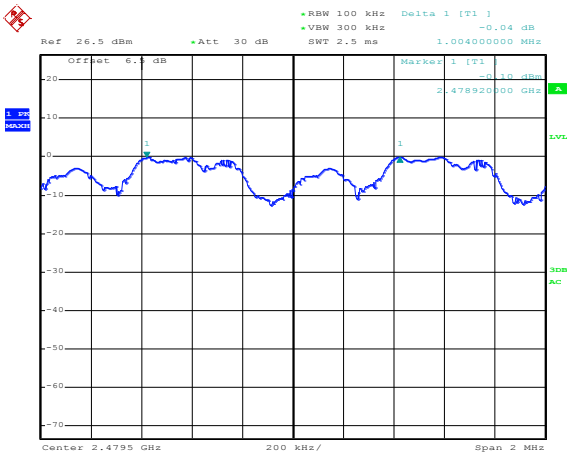
Modulation mode: 8DPSK



Lowest channel

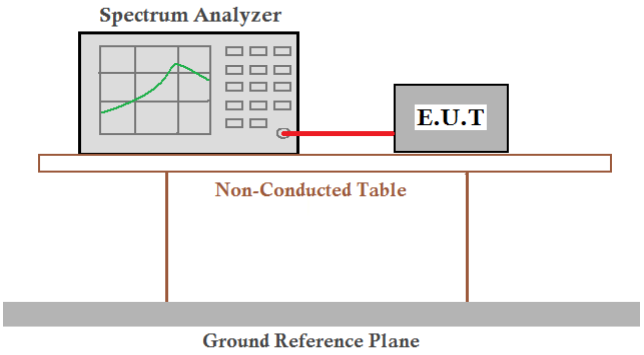


Middle channel



Highest channel

6.5 Hopping Channel Number

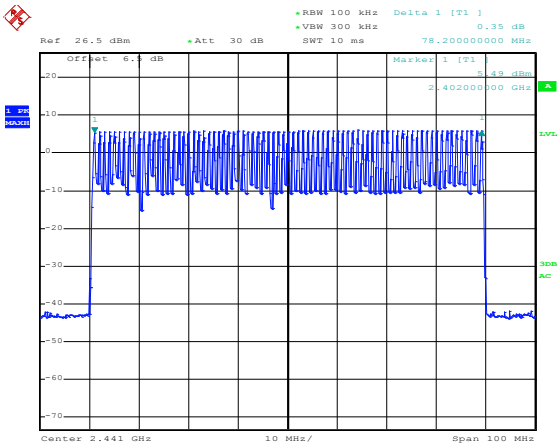
Test Requirement:	FCC Part 15 C Section 15.247 (a)(1)
Test Method:	ANSI C63.10:2013 and DA00-705
Receiver setup:	RBW=100 kHz, VBW=300 kHz, Frequency range=2400MHz-2483.5MHz, Detector=Peak
Limit:	15 channels
Test setup:	
Test Instruments:	Refer to section 5.8 for details
Test mode:	Hopping mode
Test results:	Pass

Measurement Data:

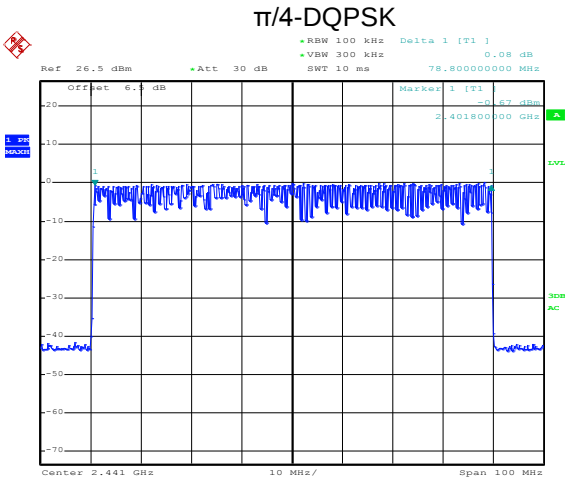
Mode	Hopping channel numbers	Limit	Result
GFSK, π/4-DQPSK, 8DPSK	79	15	Pass

Test plot as follows:

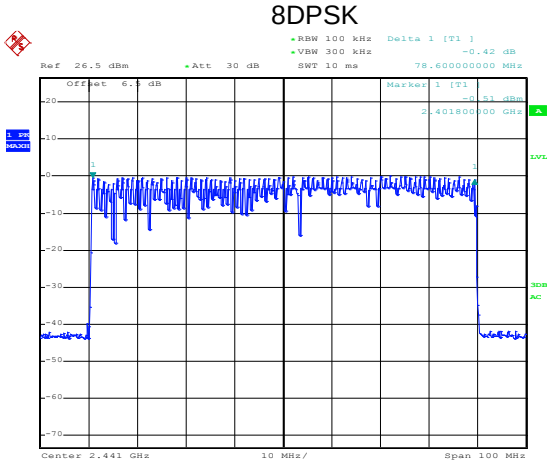
GFSK



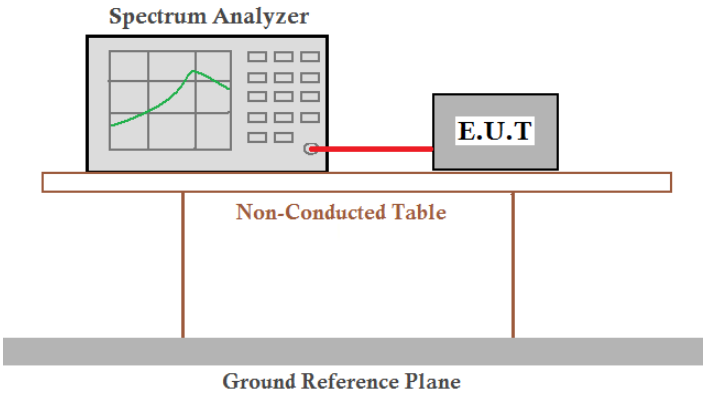
π/4-DQPSK



8DPSK



6.6 Dwell Time

Test Requirement:	FCC Part 15 C Section 15.247 (a)(1)
Test Method:	ANSI C63.10:2013 and KDB DA00-705
Receiver setup:	RBW=1 MHz, VBW=1 MHz, Span=0 Hz, Detector=Peak
Limit:	0.4 Second
Test setup:	
Test Instruments:	Refer to section 5.8 for details
Test mode:	Hopping mode
Test results:	Pass

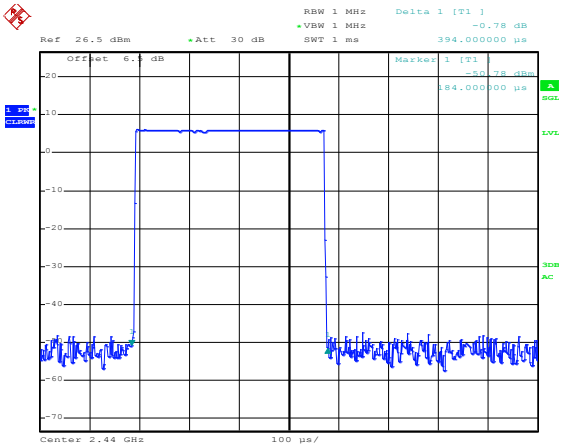
Measurement Data (Worse case):

Mode	Packet	Dwell time (second)	Limit (second)	Result
GFSK	DH1	0.12608	0.4	Pass
	DH3	0.26592		
	DH5	0.31147		
π/4-DQPSK	2-DH1	0.13696	0.4	Pass
	2-DH3	0.27264		
	2-DH5	0.31488		
8DPSK	3-DH1	0.13696	0.4	Pass
	3-DH3	0.27168		
	3-DH5	0.31573		

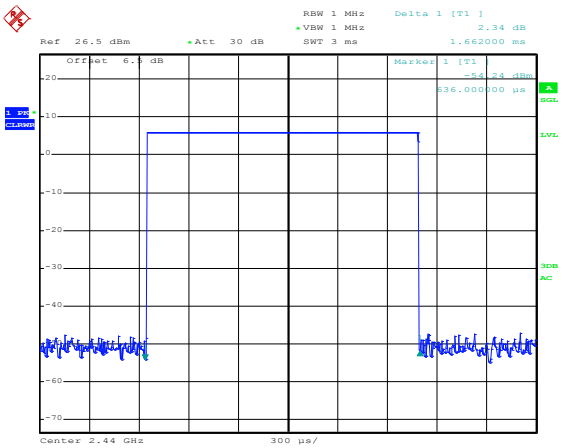
Note:
The test period = 0.4 Second/Channel x 79 Channel = 31.6 s
Calculation Formula: Dwell time = Ton time per hop * Hopping numbers * Period
For example:
DH1 time slot=0.394*(1600/ (2*79)) * 31.6=126.08ms
DH3 time slot=1.662*(1600/ (4*79)) * 31.6=265.92ms
DH5 time slot=2.920*(1600/ (6*79)) * 31.6=311.47ms

Test plot as follows:

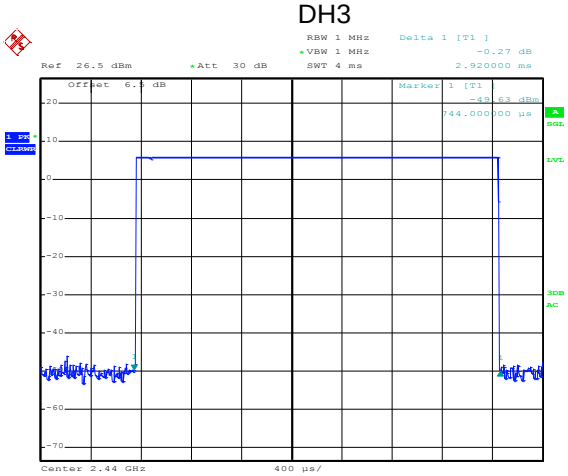
Modulation mode: GFSK



DH1

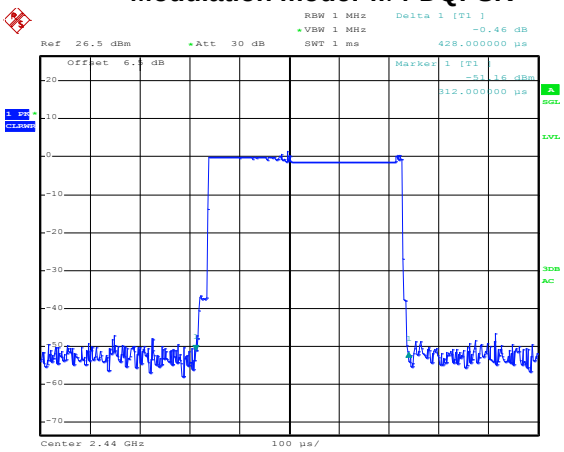


DH3

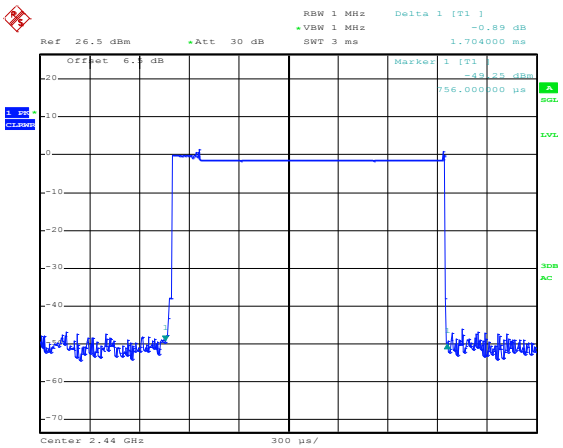


DH5

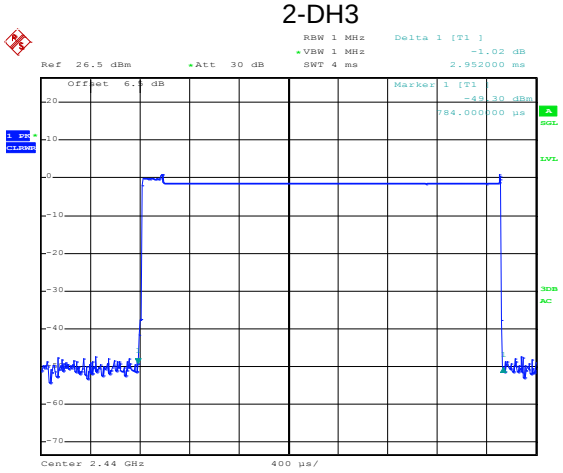
Modulation mode: π/4-DQPSK



2-DH1

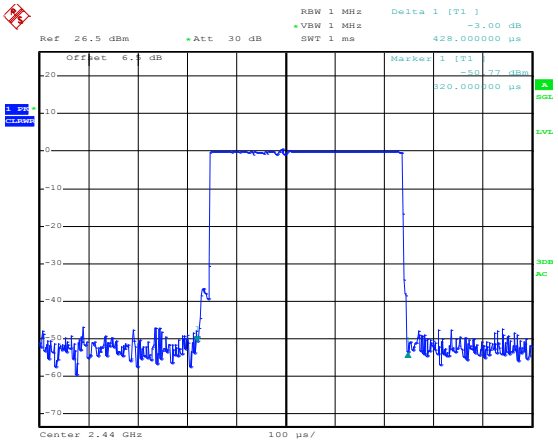


2-DH3

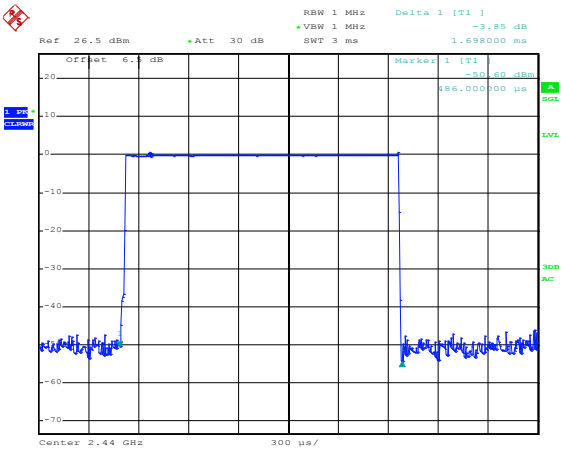


2-DH5

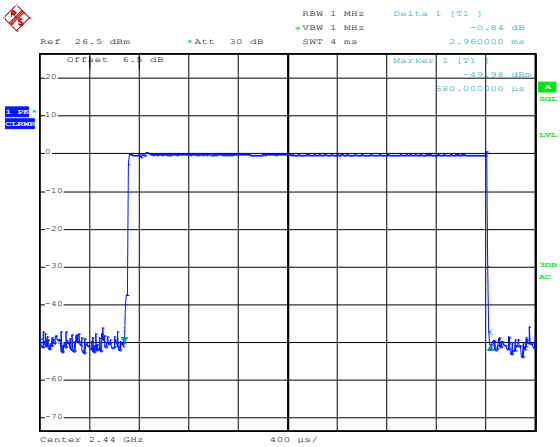
Modulation mode: 8DPSK



3-DH1



3-DH3



3-DH5

6.7 Pseudorandom Frequency Hopping Sequence

Test Requirement:	FCC Part 15 C Section 15.247 (a)(1) requirement:

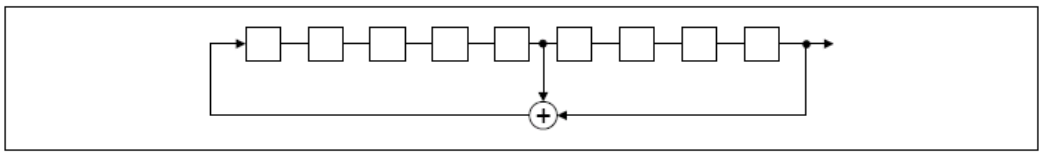
Frequency hopping systems shall have hopping channel carrier frequencies separated by a minimum of 25 kHz or the 20 dB bandwidth of the hopping channel, whichever is greater.

Alternatively. Frequency hopping systems operating in the 2400-2483.5 MHz band may have hopping channel carrier frequencies that are separated by 25 kHz or two-thirds of the 20 dB bandwidth of the hopping channel, whichever is greater, provided the systems operate with an output power no greater than 125 mW. The system shall hop to channel frequencies that are selected at the system hopping rate from a Pseudorandom ordered list of hopping frequencies. Each frequency must be used equally on the average by each transmitter. The system receivers shall have input bandwidths that match the hopping channel bandwidths of their corresponding transmitters and shall shift frequencies in synchronization with the transmitted signals.

EUT Pseudorandom Frequency Hopping Sequence

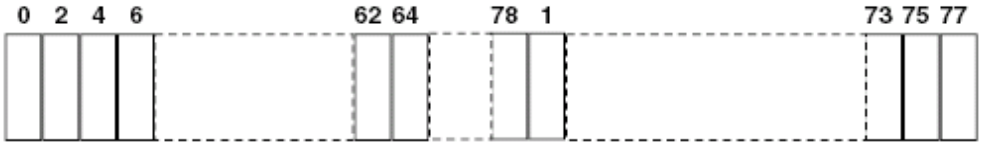
The pseudorandom sequence may be generated in a nine-stage shift register whose 5th and 9th stage outputs are added in a modulo-two addition stage. And the result is fed back to the input of the first stage. The sequence begins with the first ONE of 9 consecutive ONEs; i.e. the shift register is initialized with nine ones.

• Number of shift register stages: 9
• Length of pseudo-random sequence: 2^9 -1 = 511 bits
• Longest sequence of zeros: 8 (non-inverted signal)



Linear Feedback Shift Register for Generation of the PRBS sequence

An example of Pseudorandom Frequency Hopping Sequence as follow:

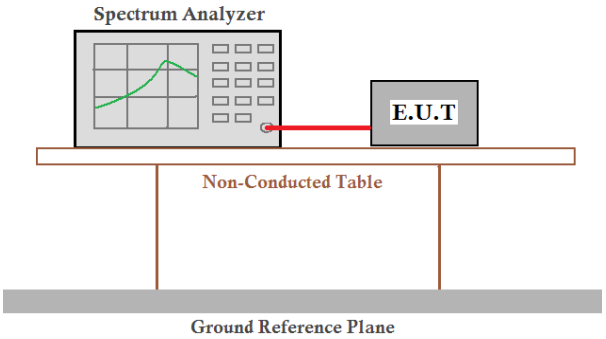


Each frequency used equally on the average by each transmitter.

The system receivers have input bandwidths that match the hopping channel bandwidths of their corresponding transmitters and shift frequencies in synchronization with the transmitted signals.

6.8 Band Edge

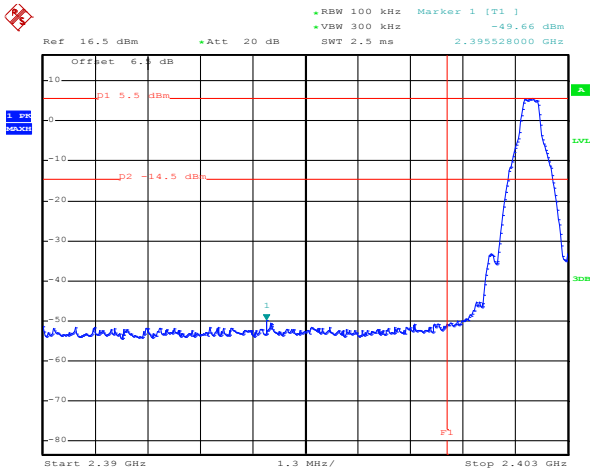
6.8.1 Conducted Emission Method

Test Requirement:	FCC Part 15 C Section 15.247 (d)
Test Method:	ANSI C63.10:2013 and DA00-705
Receiver setup:	RBW=100 kHz, VBW=300 kHz, Detector=Peak
Limit:	In any 100 kHz bandwidth outside the frequency band in which the spread spectrum 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 5.8 for details
Test mode:	Non-hopping mode and hopping mode
Test results:	Pass

Test plot as follows:

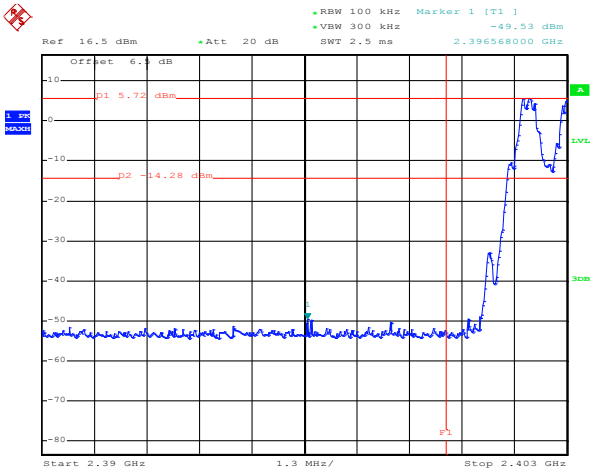
GFSK

Lowest Channel



Date: 20.OCT.2017 14:06:17

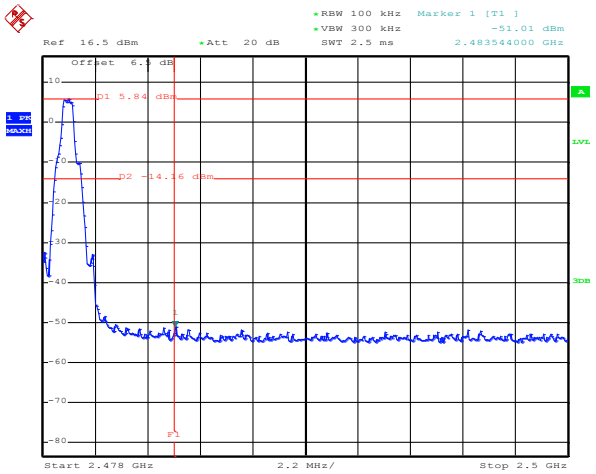
No-hopping mode



Date: 20.OCT.2017 14:07:57

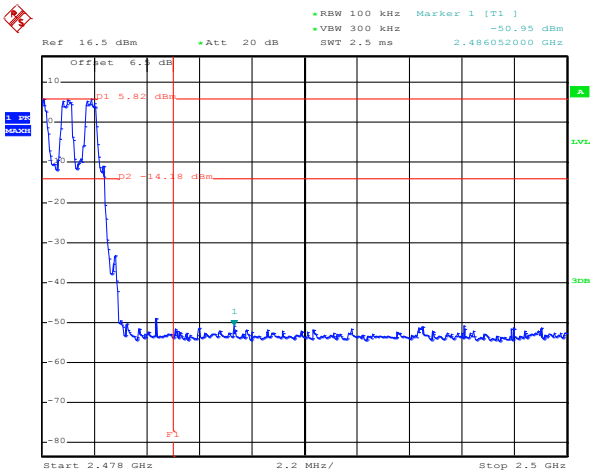
Hopping mode

Highest Channel



Date: 20.OCT.2017 14:16:56

No-hopping mode

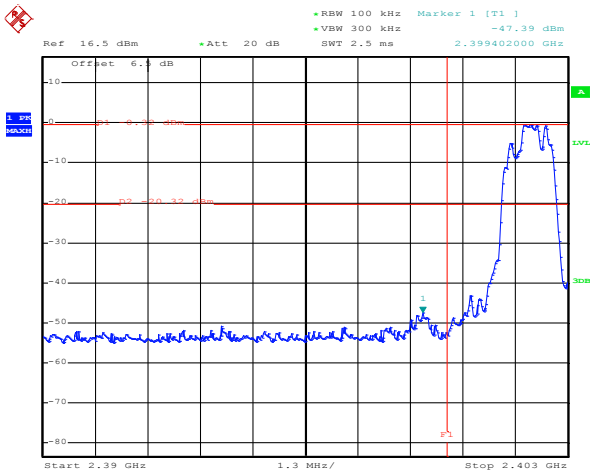


Date: 20.OCT.2017 14:19:06

Hopping mode

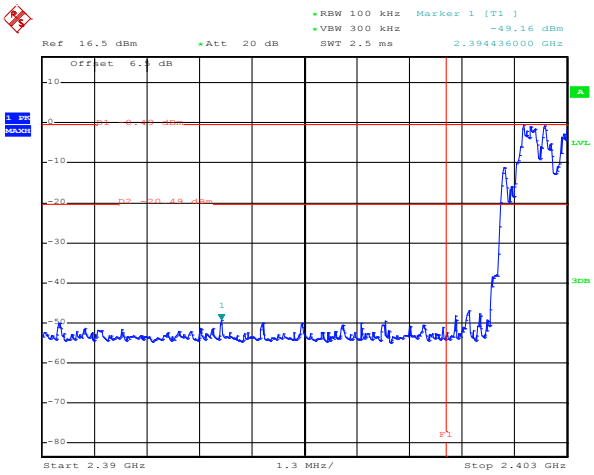
π/4-DQPSK

Lowest Channel



Date: 20.OCT.2017 14:11:56

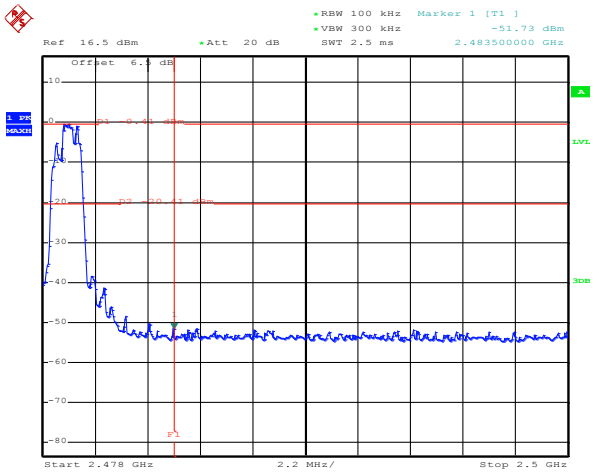
No-hopping mode



Date: 20.OCT.2017 14:12:57

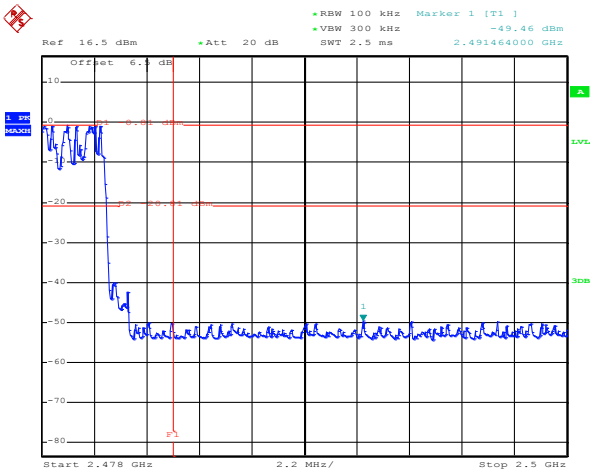
Hopping mode

Highest Channel



Date: 20.OCT.2017 14:22:05

No-hopping mode

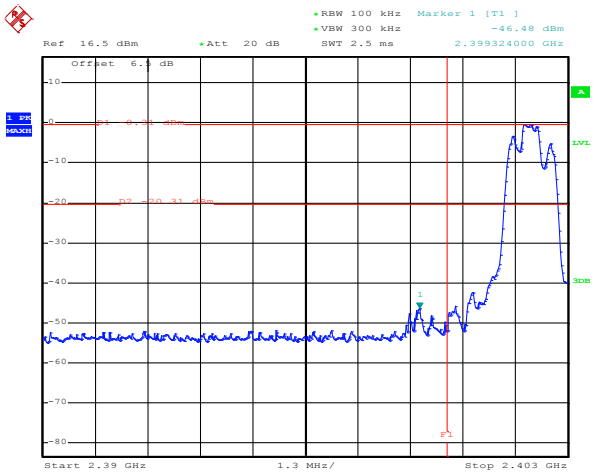


Date: 20.OCT.2017 14:26:05

Hopping mode

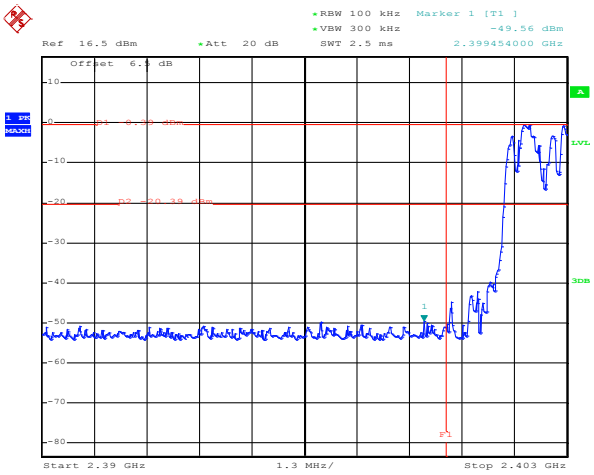
8DPSK

Lowest Channel



Date: 20.OCT.2017 14:13:54

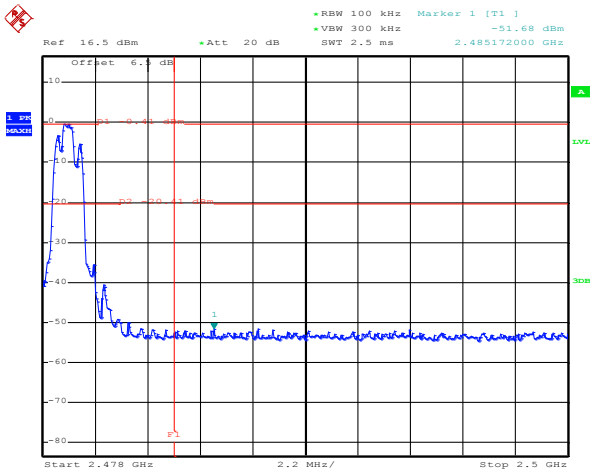
No-hopping mode



Date: 20.OCT.2017 14:15:47

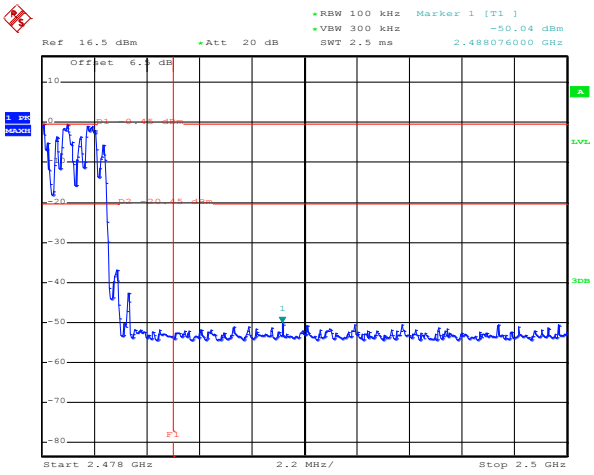
Hopping mode

Highest Channel



Date: 20.OCT.2017 14:28:01

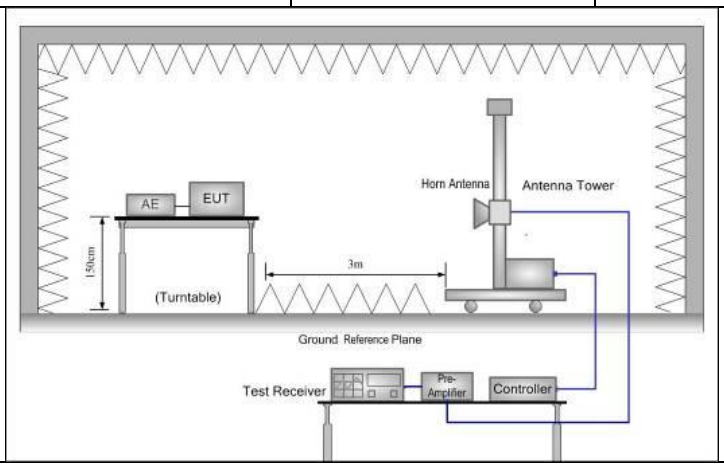
No-hopping mode



Date: 20.OCT.2017 14:29:37

Hopping mode

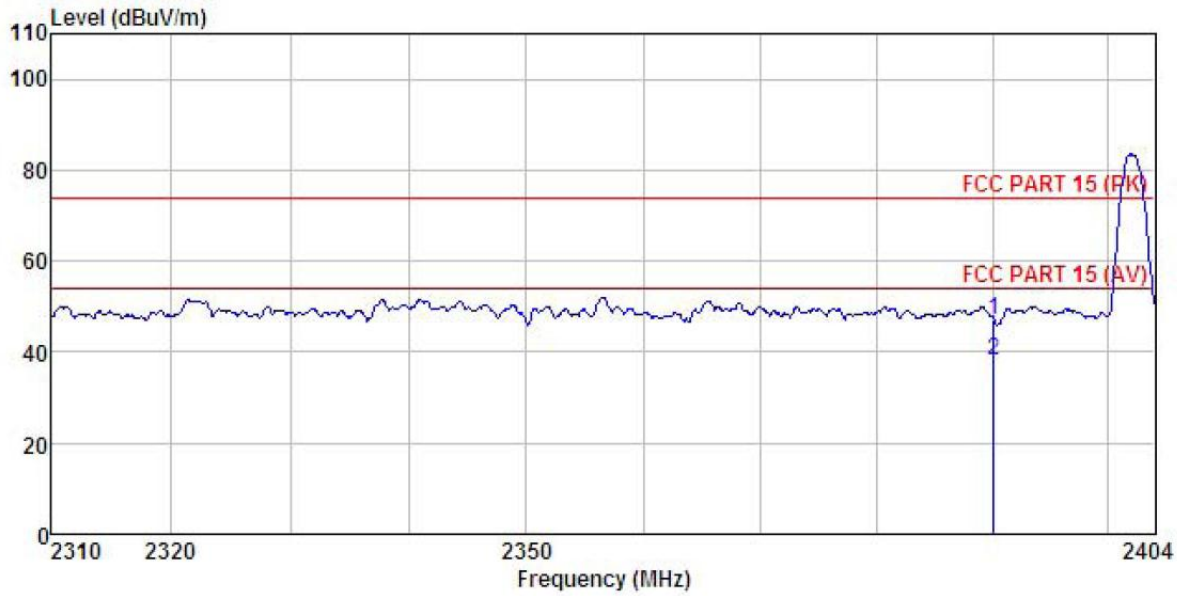
6.8.2 Radiated Emission Method

<table>
<tr><td>Test Requirement:</td><td colspan="5">FCC Part 15 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>Test Frequency Range:</td><td colspan="5">2.3GHz to 2.5GHz</td></tr>
<tr><td>Test Distance:</td><td colspan="5">3m</td></tr>
<tr><td>Receiver setup:</td><td>Frequency</td><td>Detector</td><td>RBW</td><td>VBW</td><td>Remark</td></tr>
<tr><td rowspan="2"></td><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>Limit:</td><td colspan="2">Frequency</td><td colspan="2">Limit (dBuV/m @3m)</td><td>Remark</td></tr>
<tr><td rowspan="2"></td><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 setup:</td><td colspan="5"> 
</td></tr>
<tr><td>Test Procedure:</td><td colspan="5">1. The EUT was placed on the top of a rotating table 1.5meters 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 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.</td></tr>
<tr><td>Test Instruments:</td><td colspan="5">Refer to section 5.8 for details</td></tr>
<tr><td>Test mode:</td><td colspan="5">Non-hopping mode</td></tr>
<tr><td>Test results:</td><td colspan="5">Passed</td></tr>
</table>

GFSK mode

Test channel: Lowest

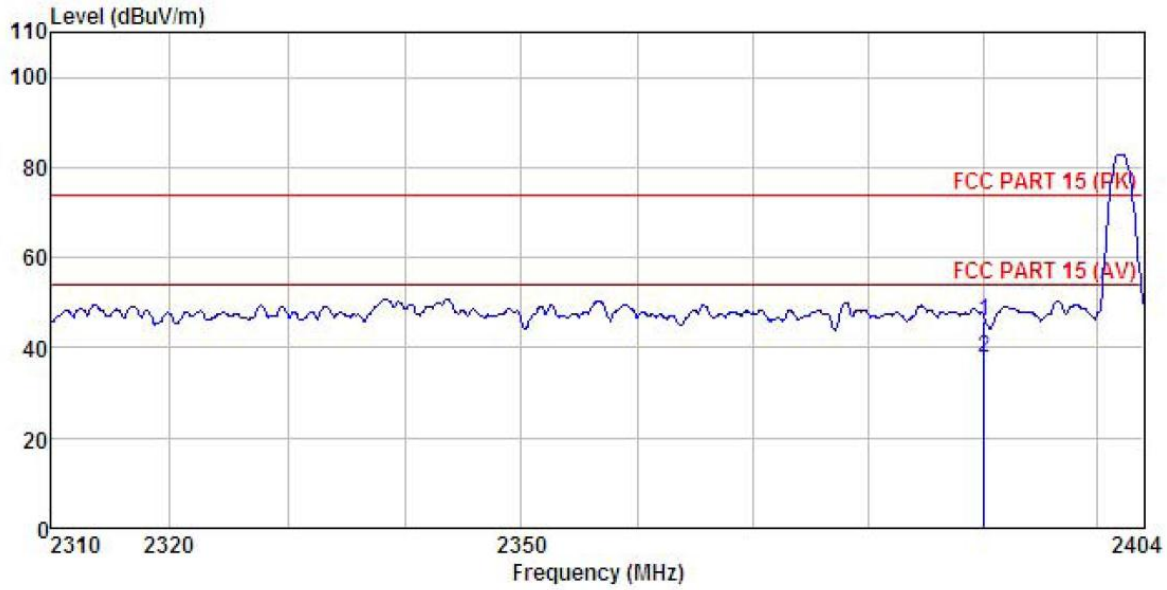
Horizontal:



Site : 3m chamber
Condition : FCC PART 15 (PK) 3m BBHA9120(1G18G) HORIZONTAL
EUT : Lookit
Model : RVC2000
Test mode : DH1-L mode
Power Rating : DC 3.6V
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	2390.000	16.93	25.45	4.69	0.00	47.07	74.00	-26.93	Peak
2	2390.000	7.89	25.45	4.69	0.00	38.03	54.00	-15.97	Average

Vertical:

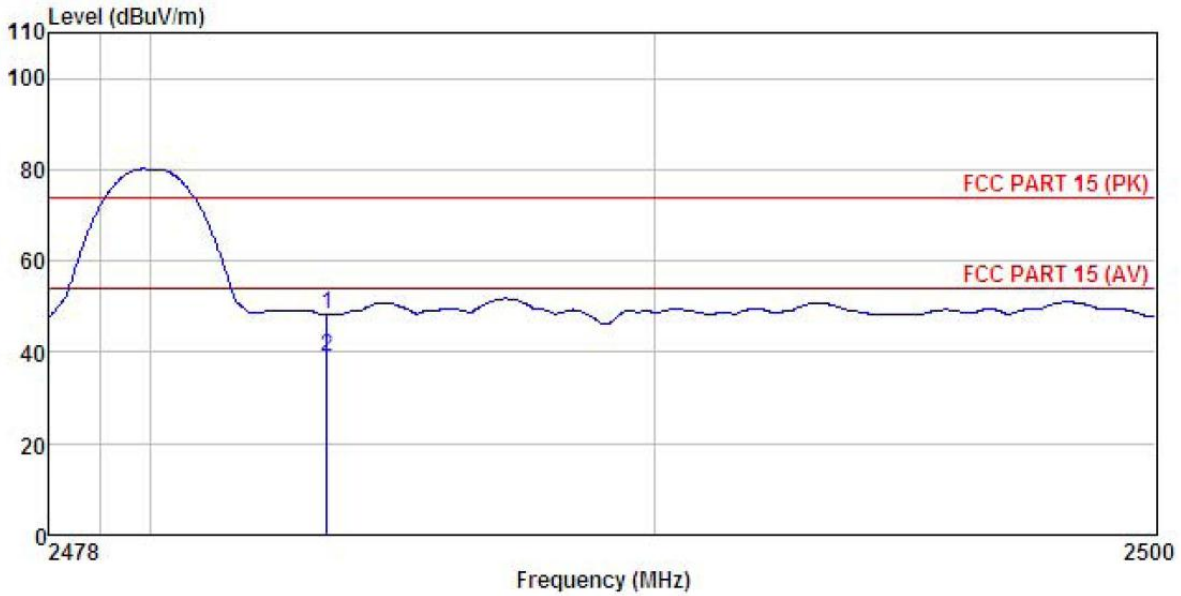


Site : 3m chamber
Condition : FCC PART 15 (PK) 3m BBHA9120(1G18G) VERTICAL
EUT : Lookit
Model : RVC2000
Test mode : DH1-L mode
Power Rating : DC 3.6V
Environment : Temp:25.5℃ Huni:55% 101KPa
Test Engineer: YT
REMARK :

	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	2390.000	15.84	25.45	4.69	0.00	45.98	74.00	-28.02	Peak
2	2390.000	7.75	25.45	4.69	0.00	37.89	54.00	-16.11	Average

Test channel: Highest

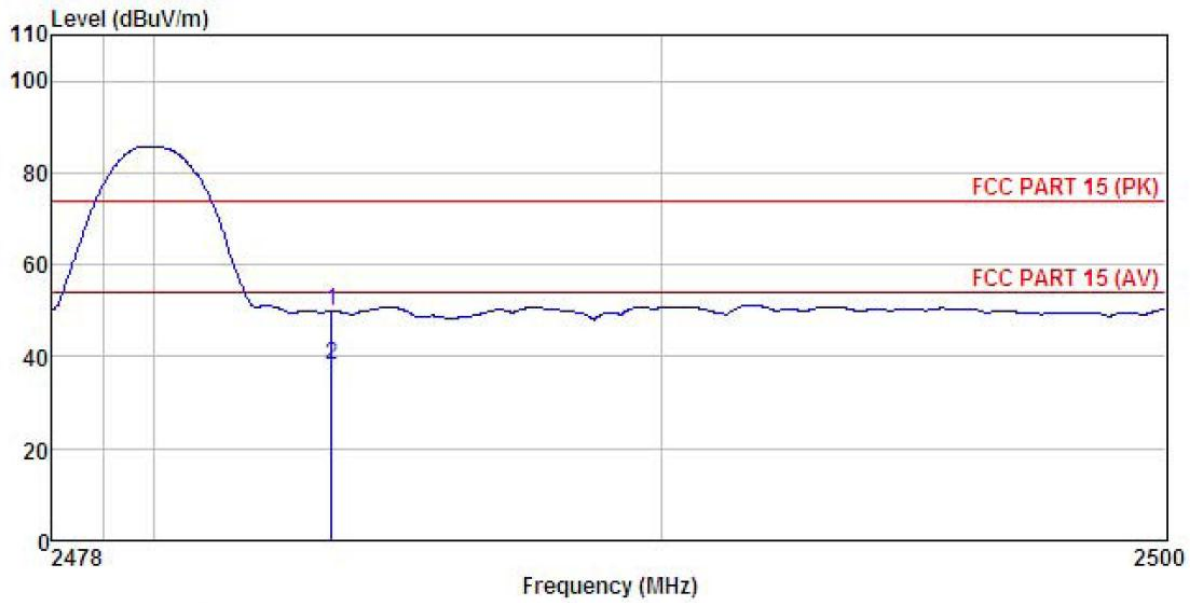
Horizontal:



Site : 3m chamber
Condition : FCC PART 15 (PK) 3m BBHA9120(1G18G) HORIZONTAL
EUT : Lookit
Model : RVC2000
Test mode : DH1-H mode
Power Rating : DC 3.6V
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	2483.500	17.76	25.66	4.81	0.00	48.23	74.00	-25.77	Peak
2	2483.500	8.65	25.66	4.81	0.00	39.12	54.00	-14.88	Average

Vertical:



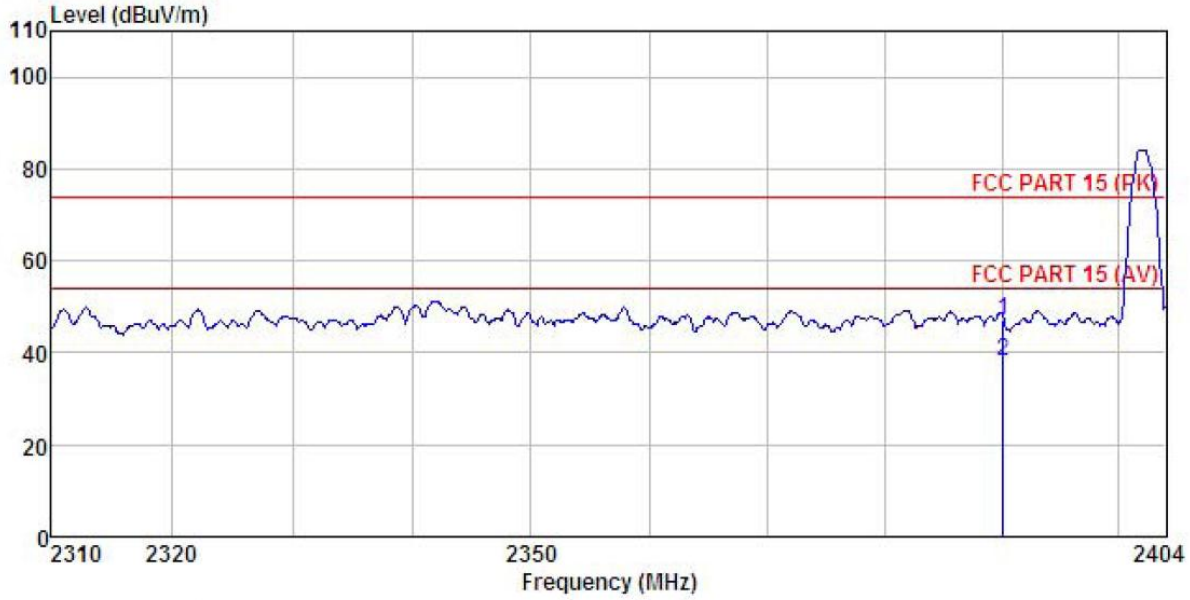
Site : 3m chamber
Condition : FCC PART 15 (PK) 3m BBHA9120(1G18G) VERTICAL
EUT : Lookit
Model : RVC2000
Test mode : DH1-H mode
Power Rating : DC 3.6V
Environment : Temp:25.5℃ Huni:55% 101KPa
Test Engineer: YT
REMARK :

	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	2483.500	19.45	25.66	4.81	0.00	49.92	74.00	-24.08	Peak
2	2483.500	7.88	25.66	4.81	0.00	38.35	54.00	-15.65	Average

π/4-DQPSK mode

Test channel: Lowest

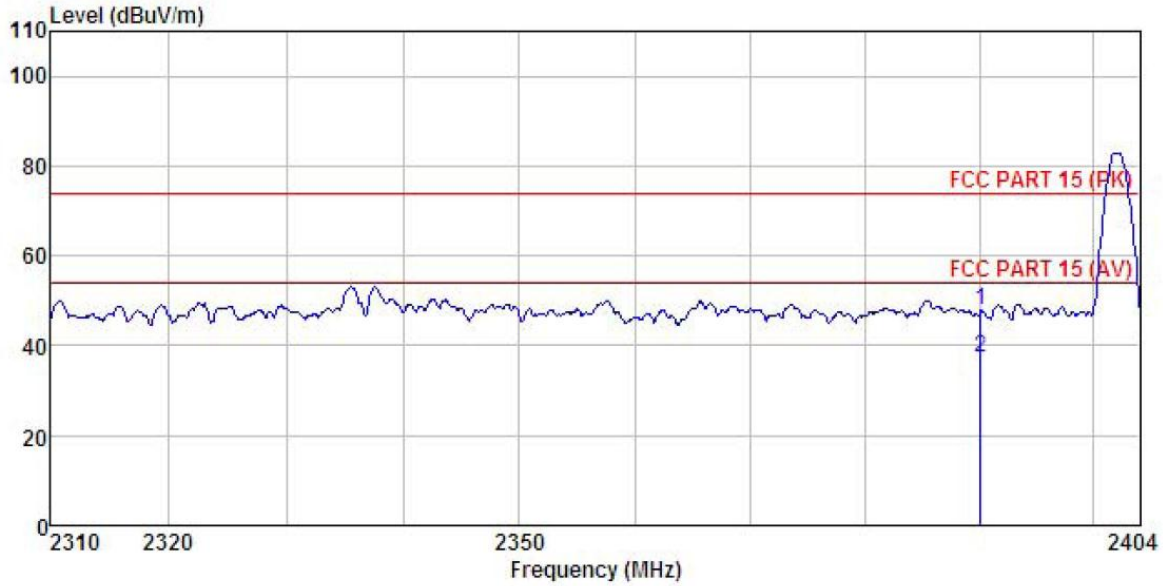
Horizontal:



Site : 3m chamber
Condition : FCC PART 15 (PK) 3m BBHA9120(1G18G) HORIZONTAL
EUT : Lookit
Model : RVC2000
Test mode : 2DH1-L mode
Power Rating : DC 3.6V
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	2390.000	16.83	25.45	4.69	0.00	46.97	74.00	-27.03	Peak
2	2390.000	7.89	25.45	4.69	0.00	38.03	54.00	-15.97	Average

Vertical:

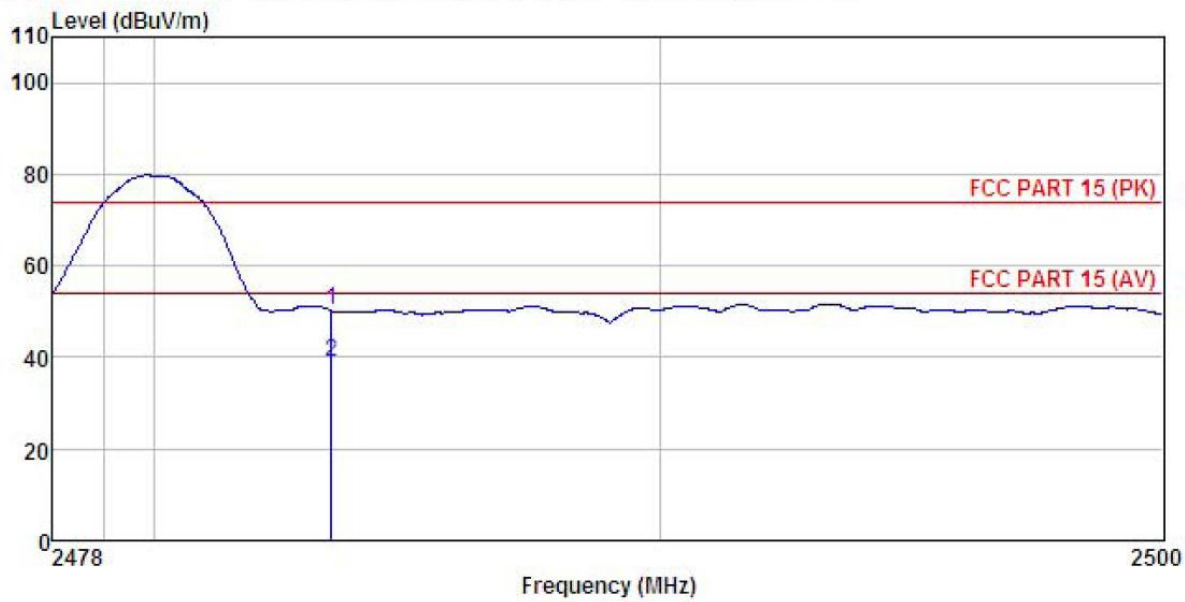


Site : 3m chamber
Condition : FCC PART 15 (PK) 3m BBHA9120(1G18G) VERTICAL
EUT : Lookit
Model : RVC2000
Test mode : 2DH1-L mode
Power Rating : DC 3.6V
Environment : Temp:25.5℃ Huni:55% 101KPa
Test Engineer: YT
REMARK :

	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	2390.000	17.64	25.45	4.69	0.00	47.78	74.00	-26.22	Peak
2	2390.000	7.34	25.45	4.69	0.00	37.48	54.00	-16.52	Average

Test channel: Highest

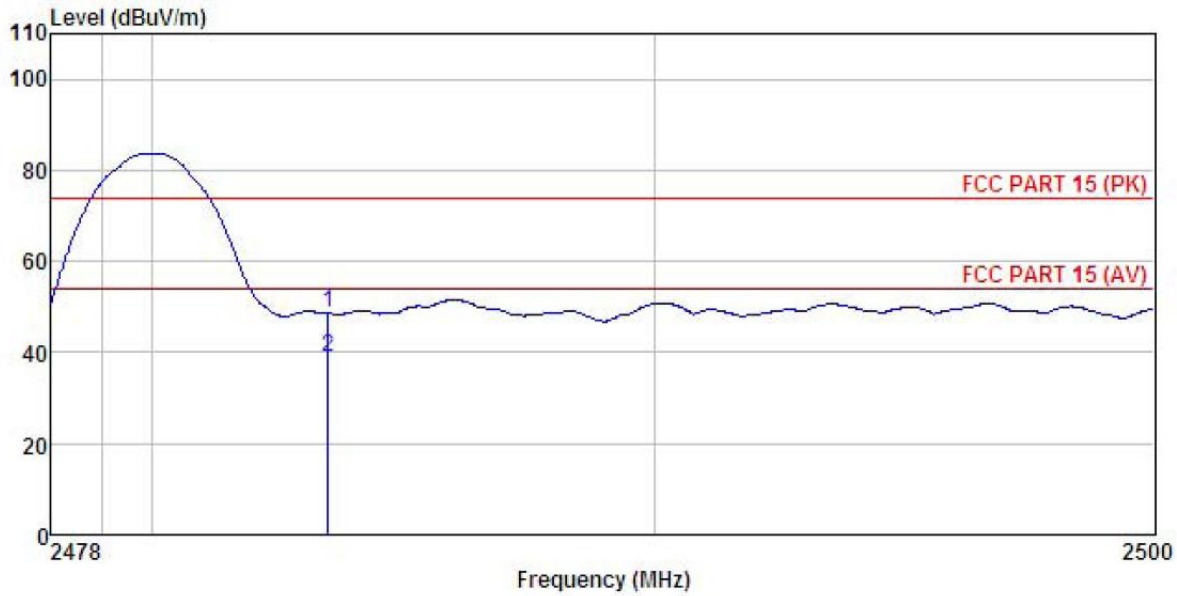
Horizontal:



Site : 3m chamber
Condition : FCC PART 15 (PK) 3m BBHA9120(1G18G) HORIZONTAL
EUT : Lookit
Model : RVC2000
Test mode : 2DH1-H mode
Power Rating : DC 3.6V
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	2483.500	19.71	25.66	4.81	0.00	50.18	74.00	-23.82	Peak
2	2483.500	8.36	25.66	4.81	0.00	38.83	54.00	-15.17	Average

Vertical:



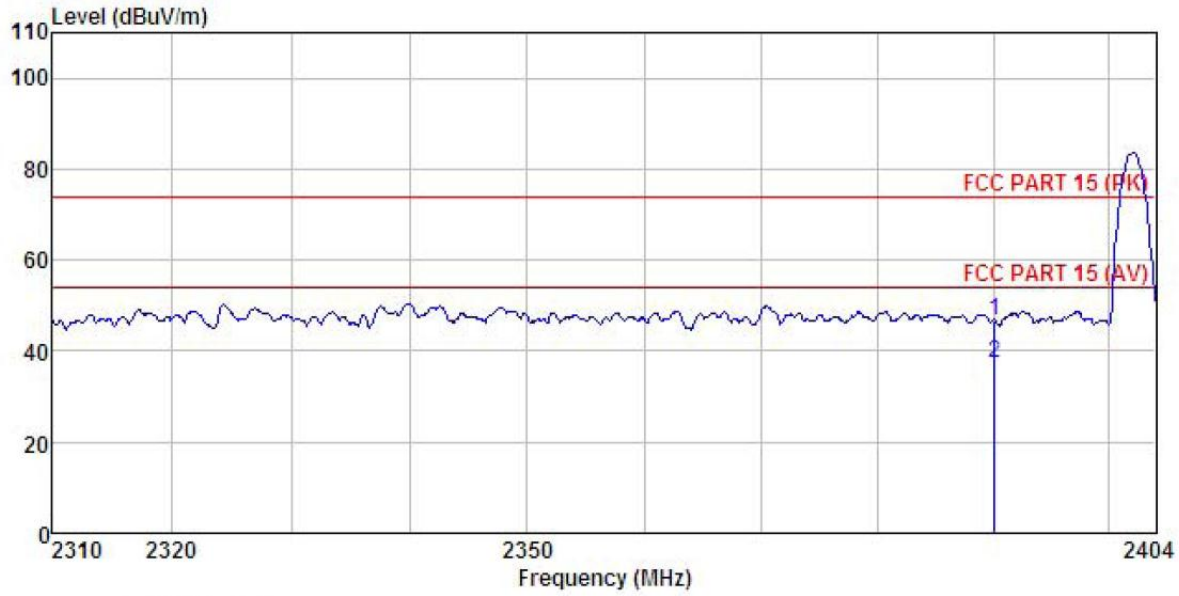
Site : 3m chamber
Condition : FCC PART 15 (PK) 3m BBHA9120(1G18G) VERTICAL
EUT : Lookit
Model : RVC2000
Test mode : 2DH1-H mode
Power Rating : DC 3.6V
Environment : Temp:25.5℃ Huni:55% 101KPa
Test Engineer: YT
REMARK :

	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	2483.500	18.33	25.66	4.81	0.00	48.80	74.00	-25.20	Peak
2	2483.500	8.55	25.66	4.81	0.00	39.02	54.00	-14.98	Average

8DPSK mode

Test channel: Lowest

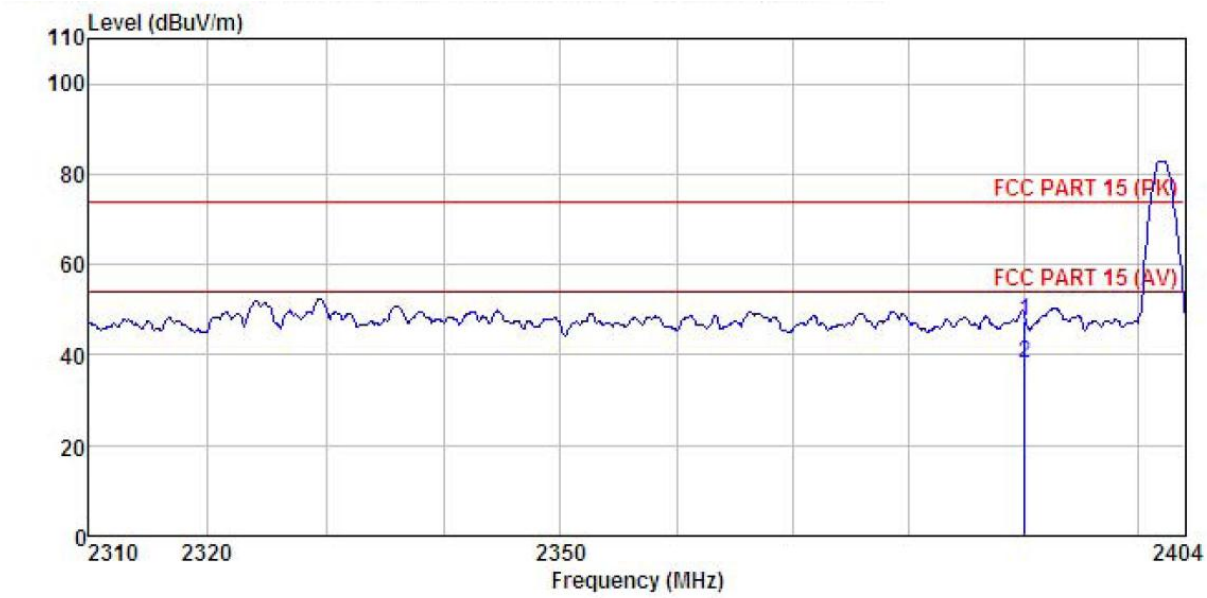
Horizontal:




```
Site          : 3m chamber
Condition     : FCC PART 15 (PK) 3m BBHA9120(1G18G) HORIZONTAL
EUT           : Lookit
Model         : RVC2000
Test mode     : 3DH1-L mode
Power Rating  : DC 3.6V
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	2390.000	16.69	25.45	4.69	0.00	46.83	74.00	-27.17	Peak
2	2390.000	7.22	25.45	4.69	0.00	37.36	54.00	-16.64	Average

Vertical:

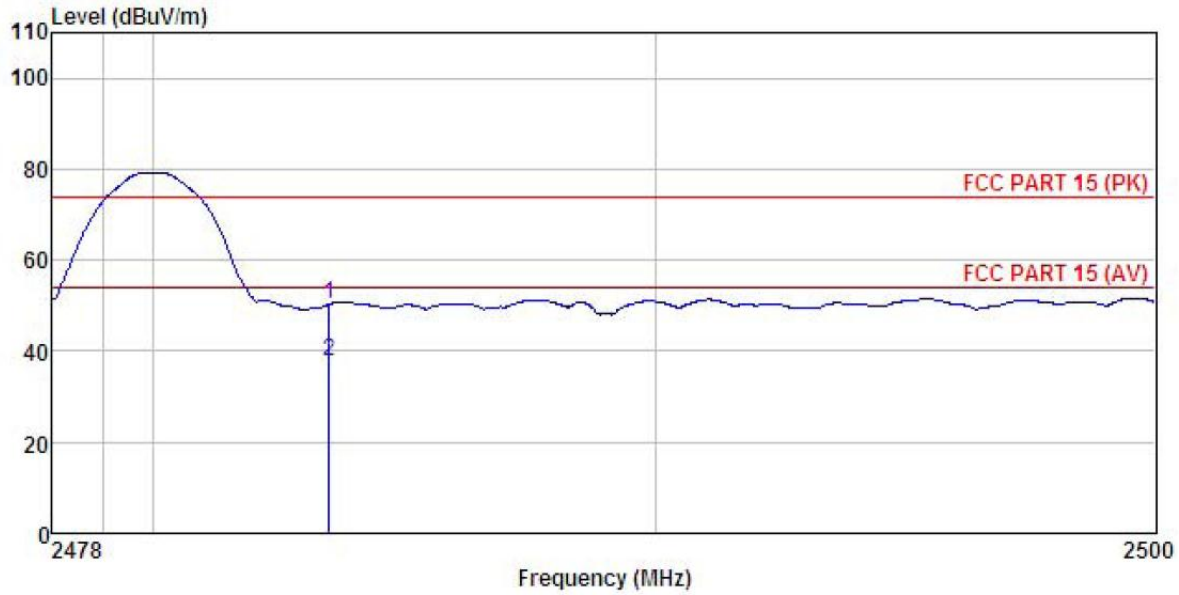


Site : 3m chamber
Condition : FCC PART 15 (PK) 3m BBHA9120(1G18G) VERTICAL
EUT : Lookit
Model : RVC2000
Test mode : 3DH1-L mode
Power Rating : DC 3.6V
Environment : Temp:25.5'C Huni:55% 101KPa
Test Engineer: YT
REMARK :

	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	2390.000	17.49	25.45	4.69	0.00	47.63	74.00	-26.37	Peak
2	2390.000	7.89	25.45	4.69	0.00	38.03	54.00	-15.97	Average

Test channel: Highest

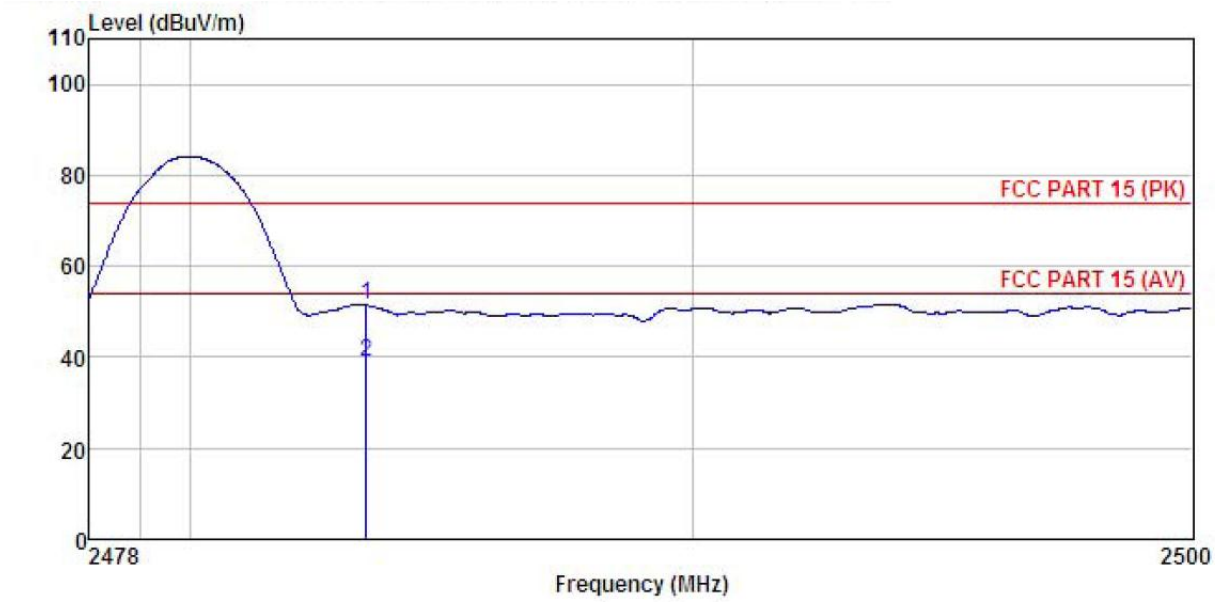
Horizontal:



Site : 3m chamber
Condition : FCC PART 15 (PK) 3m BBHA9120(1G18G) HORIZONTAL
EUT : Lookit
Model : RVC2000
Test mode : 3DH1-H mode
Power Rating : DC 3.6V
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	2483.500	19.91	25.66	4.81	0.00	50.38	74.00	-23.62	Peak
2	2483.500	7.45	25.66	4.81	0.00	37.92	54.00	-16.08	Average

Vertical:

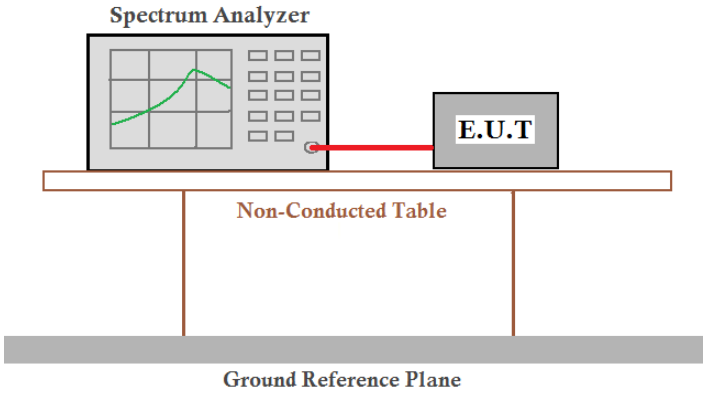


Site : 3m chamber
Condition : FCC PART 15 (PK) 3m BBHA9120(1G18G) VERTICAL
EUT : Lookit
Model : RVC2000
Test mode : 3DH1-H mode
Power Rating : DC 3.6V
Environment : Temp:25.5℃ Huni:55% 101KPa
Test Engineer: YT
REMARK :

	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	2483.500	20.92	25.66	4.81	0.00	51.39	74.00	-22.61	Peak
2	2483.500	8.35	25.66	4.81	0.00	38.82	54.00	-15.18	Average

6.9 Spurious Emission

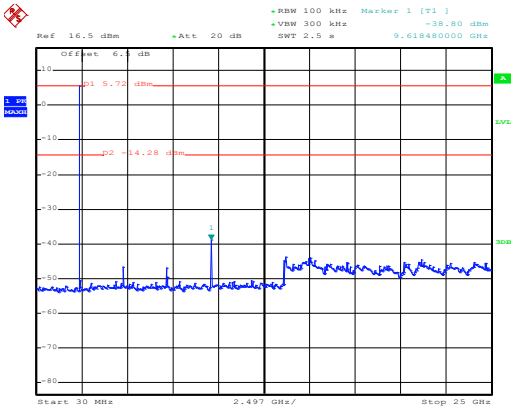
6.9.1 Conducted Emission Method

Test Requirement:	FCC Part 15 C Section 15.247 (d)
Test Method:	ANSI C63.10:2013 and DA00-705
Limit:	In any 100 kHz bandwidth outside the frequency band in which the spread spectrum 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 5.8 for details
Test mode:	Non-hopping mode
Test results:	Pass

Test plot as follows:

GFSK

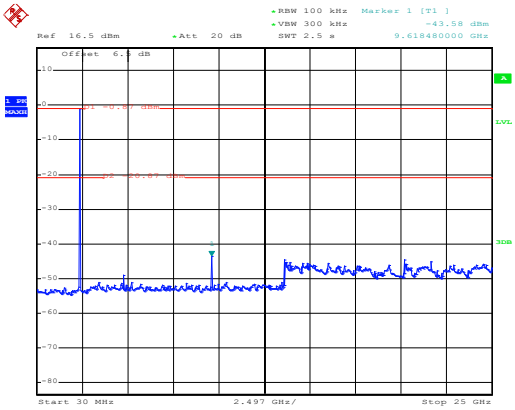
Lowest channel



Date: 20.OCT.2017 14:31:37

π/4-DQPSK

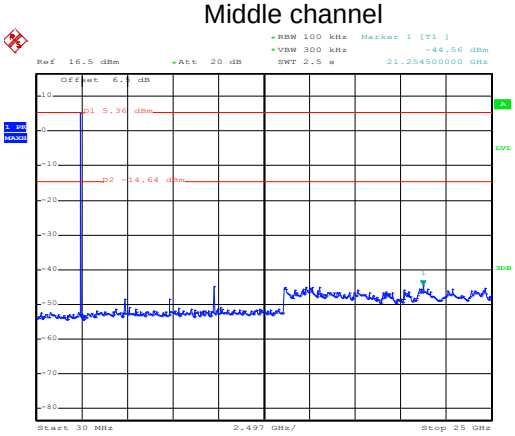
Lowest channel



Date: 20.OCT.2017 14:41:15

30MHz~25GHz

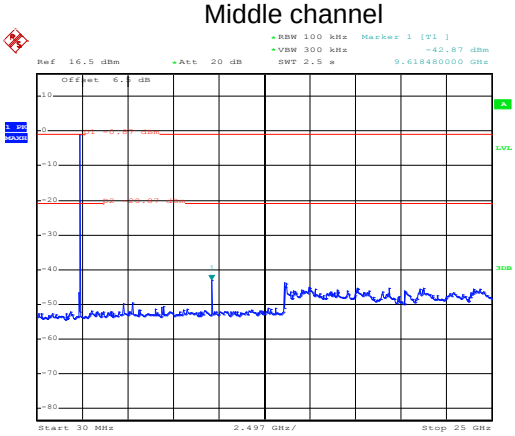
Middle channel



Date: 20.OCT.2017 14:34:40

30MHz~25GHz

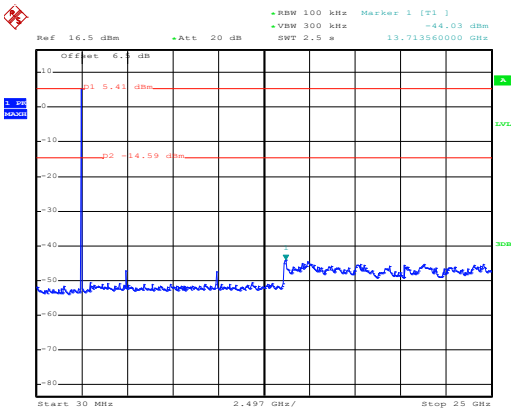
Middle channel



Date: 20.OCT.2017 14:44:21

30MHz~25GHz

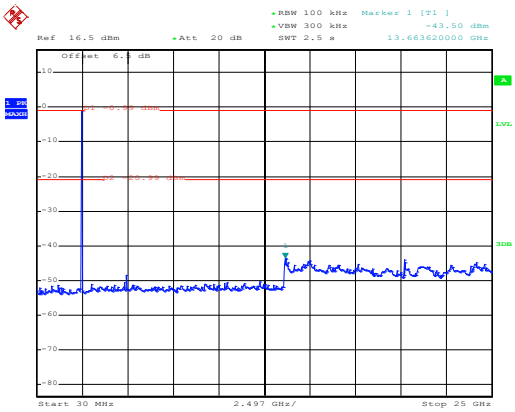
Highest channel



Date: 20.OCT.2017 14:38:56

30MHz~25GHz

Highest channel



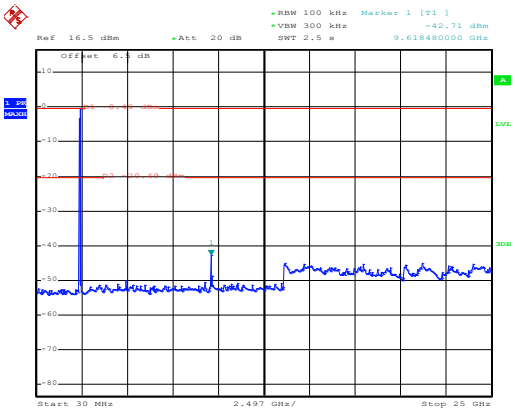
Date: 20.OCT.2017 14:45:59

30MHz~25GHz

30MHz~25GHz

8DPSK

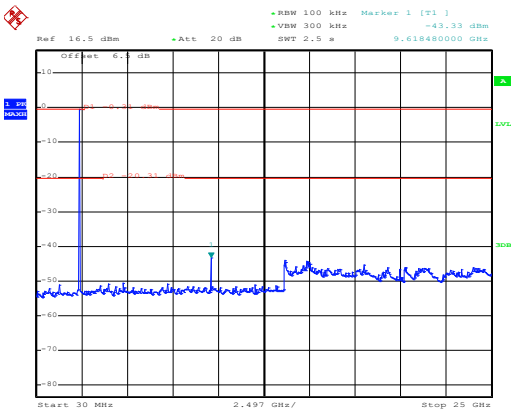
Lowest channel



Date: 20.OCT.2017 14:48:22

30MHz~25GHz

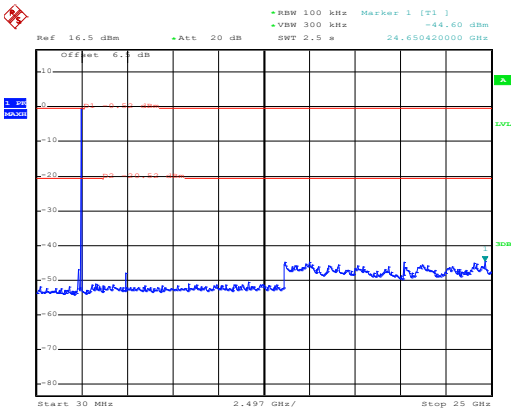
Middle channel



Date: 20.OCT.2017 14:48:58

30MHz~25GHz

Highest channel



Date: 20.OCT.2017 14:50:56

30MHz~25GHz

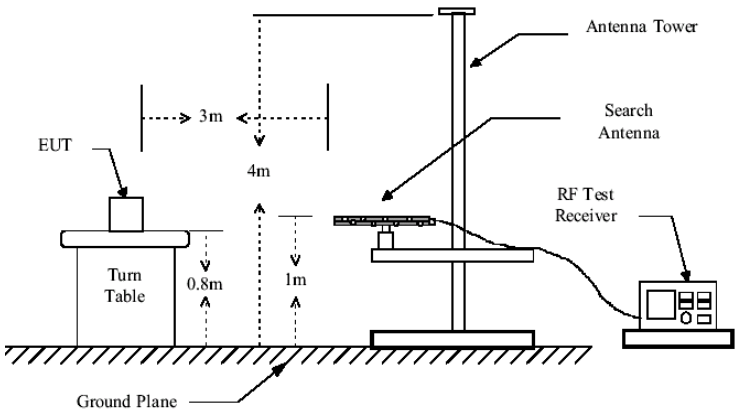
6.9.2 Radiated Emission Method

Test Requirement:	FCC Part 15 C Section 15.209				
Test Method:	ANSI C63.10: 2013				
Test Frequency Range:	9 kHz to 25 GHz				
Test Distance:	3m				
Receiver setup:	Frequency	Detector	RBW	VBW	Remark
	30MHz-1GHz	Quasi-peak	120kHz	300kHz	Quasi-peak Value
	Above 1GHz	Peak	1MHz	3MHz	Peak Value
		RMS	1MHz	3MHz	Average Value

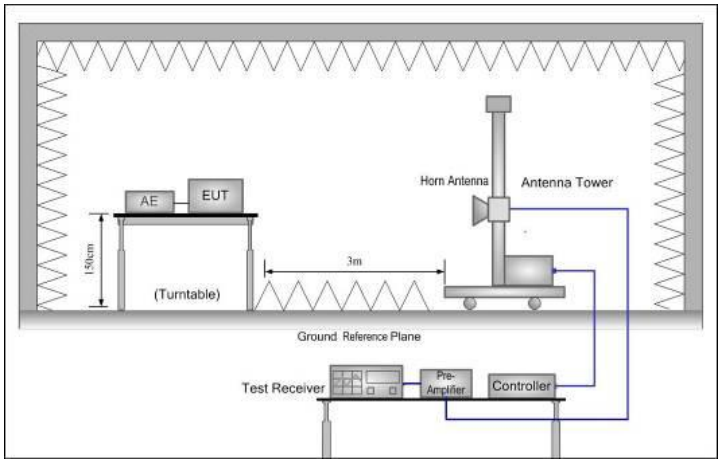
Limit:	Frequency	Limit (dBuV/m @3m)	Remark
	30MHz-88MHz	40.0	Quasi-peak Value
	88MHz-216MHz	43.5	Quasi-peak Value
	216MHz-960MHz	46.0	Quasi-peak Value
	960MHz-1GHz	54.0	Quasi-peak Value
	Above 1GHz	54.0	Average Value
		74.0	Peak Value

Test setup:

Below 1GHz



Above 1GHz

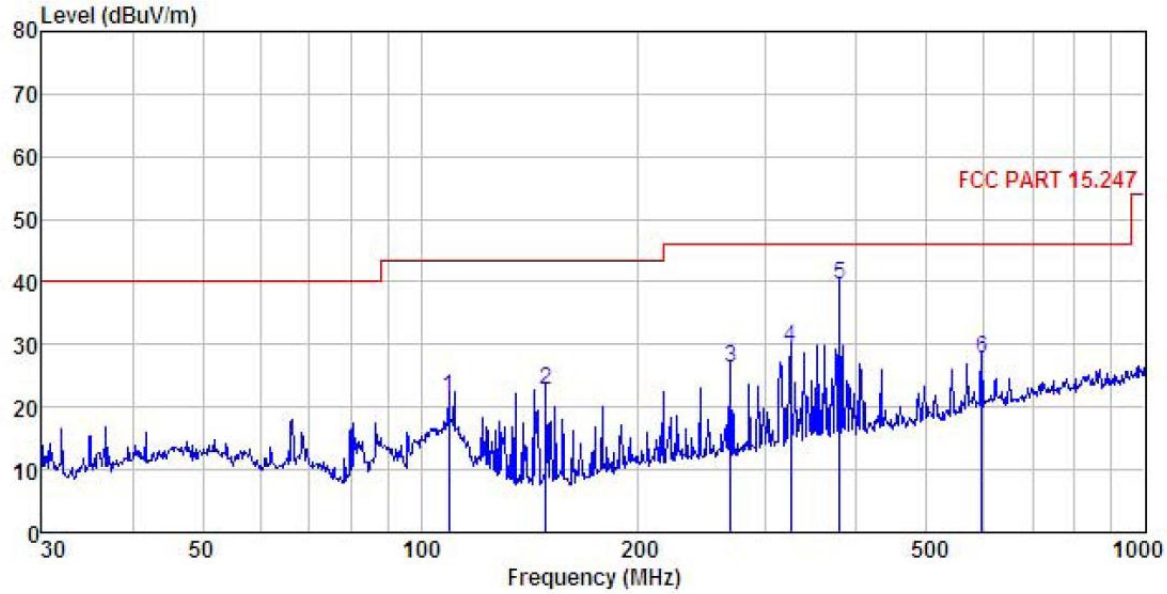


Test Procedure:	1. The EUT was placed on the top of a rotating table 0.8m(below 1GHz) /1.5m(above 1GHz) above the ground at a 3 meter chamber. The table was rotated 360 degrees to determine the position of the highest radiation. 2. The EUT was set 3 meters away from the interference-receiving antenna, 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 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 Instruments:	Refer to section 5.8 for details
Test mode:	Non-hopping mode
Test results:	Pass
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 30 MHz is noise floor, so only shows the data of above 30MHz in this report.

Measurement data:

Below 1GHz

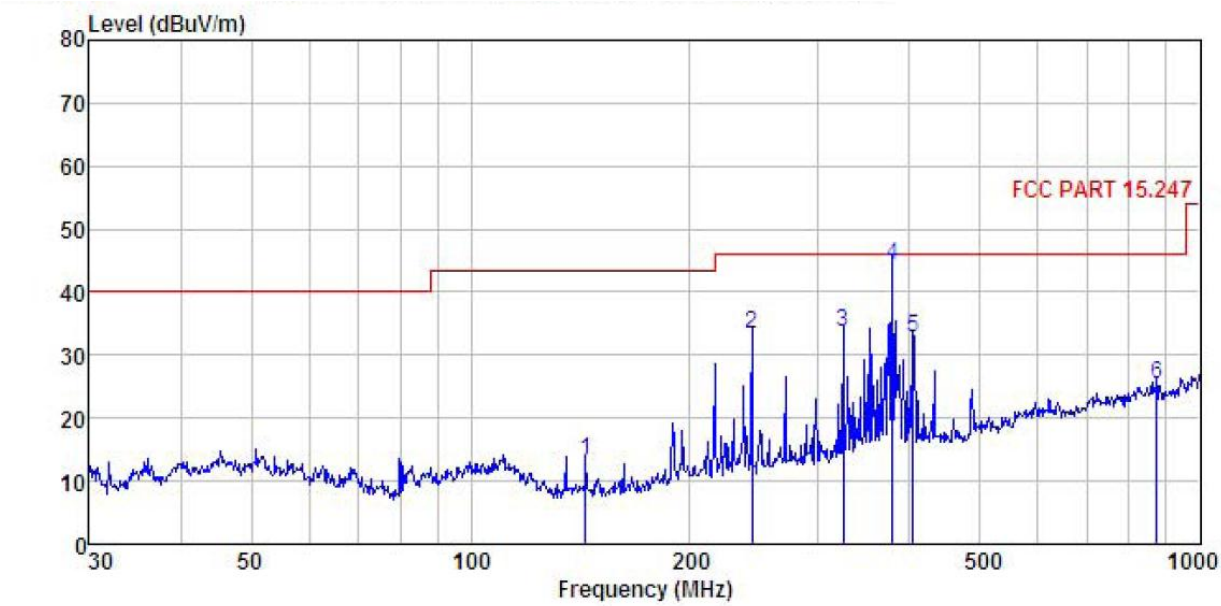
Vertical:



Site : 3m chamber
Condition : FCC PART 15.247 3m VULB9163(30M2G) VERTICAL
EUT : Lookit
Model : RVC2000
Test mode : BT Mode
Power Rating : DC 3.6V
Environment : Temp:25.5'C Huni:55%
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	109.412	36.96	12.04	2.04	29.46	21.58	43.50	-21.92	QP
2	148.963	40.97	8.46	2.51	29.23	22.71	43.50	-20.79	QP
3	267.546	39.45	12.50	2.86	28.51	26.30	46.00	-19.70	QP
4	324.456	41.34	13.58	3.02	28.51	29.43	46.00	-16.57	QP
5	378.584	50.44	14.58	3.09	28.69	39.42	46.00	-6.58	QP
6	595.133	34.28	18.42	3.94	28.95	27.69	46.00	-18.31	QP

Horizontal:



Site : 3m chamber
Condition : FCC PART 15.247 3m VULB9163(30M2G) HORIZONTAL
EUT : Lookit
Model : RVC2000
Test mode : BT Mode
Power Rating : DC 3.6V
Environment : Temp:25.5'C Huni:55%
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	143.830	31.73	8.38	2.44	29.25	13.30	43.50	-30.20	QP
2	243.377	47.11	11.92	2.82	28.58	33.27	46.00	-12.73	QP
3	324.456	45.42	13.58	3.02	28.51	33.51	46.00	-12.49	QP
4	378.584	55.19	14.58	3.09	28.69	44.17	46.00	-1.83	QP
5	404.667	43.65	14.92	3.09	28.79	32.87	46.00	-13.13	QP
6	872.183	28.63	20.60	3.97	27.95	25.25	46.00	-20.75	QP

Above 1GHz:

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	57.82	30.85	6.80	41.81	53.66	74.00	-20.34	Vertical
4804.00	56.86	30.85	6.80	41.81	52.70	74.00	-21.30	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	56.22	30.85	6.80	41.81	52.06	54.00	-1.94	Vertical
4804.00	56.69	30.85	6.80	41.81	52.53	54.00	-1.47	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
4882.00	57.49	31.20	6.86	41.84	53.71	74.00	-20.29	Vertical
4882.00	59.45	31.20	6.86	41.84	55.67	74.00	-18.33	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
4882.00	56.23	31.20	6.86	41.84	52.45	54.00	-1.55	Vertical
4882.00	57.02	31.20	6.86	41.84	53.24	54.00	-0.76	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	58.26	31.63	6.91	41.87	54.93	74.00	-19.07	Vertical
4960.00	57.91	31.63	6.91	41.87	54.58	74.00	-19.42	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	55.20	31.63	6.91	41.87	51.87	54.00	-2.13	Vertical
4960.00	56.17	31.63	6.91	41.87	52.84	54.00	-1.16	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.