

# FCC REPORT

## (Bluetooth)

**Applicant:** Libre Wireless Technologies Inc.

**Address of Applicant:** 2100 Geng Road, Suite 210 Palo Alto, CA 94303, USA

### Equipment Under Test (EUT)

**Product Name:** WiFi Media Streaming Module

**Model No.:** LS9AD-AC11DBT, LS9AD-AC11DBT-V, LS9AD-AC11DBT-GV

**Trade mark:**



**FCC ID:** 2ADBM-LS9ADAC11DBT

**Applicable standards:** FCC CFR Title 47 Part 15 Subpart C Section 15.247

**Date of sample receipt:** 29 Jun., 2017

**Date of Test:** 29 Jun., to 07 Jul., 2017

**Date of report issued:** 07 Jul., 2017

**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 the CCIS product 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	07 Jul., 2017	Original

**Tested by:****Date:**

07 Jul., 2017

**Test Engineer****Reviewed by:****Date:**

07 Jul., 2017

**Project Engineer**

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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	Pass
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:	Libre Wireless Technologies Inc.
Address of Applicant:	2100 Geng Road, Suite 210 Palo Alto, CA 94303, USA
Manufacturer:	Shenzhen Zowee Technology Co., Ltd.
Address of Manufacturer:	NO.5 Zowee technology building, Science & Technology industrial park of privately owned enterprises, Pingshan, Xili, Nanshan district, Shenzhen
Factory:	Shenzhen Zowee Technology Co., Ltd.
Address of Factory:	No 149, Tongfuyu Industrial Zone Songgang, Baoan District Shenzhen Guangdong 518105 China

### 5.2 General Description of E.U.T.

Product Name:	WiFi Media Streaming Module
Model No.:	LS9AD-AC11DBT, LS9AD-AC11DBT-V, LS9AD-AC11DBT-GV
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:	Internal Antenna
Antenna gain:	3.5 dBi
Power supply:	DC 3.3V
Remark:	<p>The No.: LS9AD-AC11DBT, LS9AD-AC11DBT-V, LS9AD-AC11DBT-GV were identical inside, the electrical circuit design, layout, components used and internal wiring, with only difference being model name ,DDR3, Flash for different customer</p> <p>LS9AD-AC11DBT: this is the standard LS9AD, and this is the variant used for testing at the BTL laboratory. Memory Configuration - 256MB Flash/ 256MB DDR3.</p> <p>LS9AD-AC11DBT-V: this variant is the same as the standard except for the memory configuration. Memory Configuration - 256MB Flash / 512MB DDR3. LS9AD-AC11DBT-V with different shield design.</p> <p>LS9AD-AC11DBT-GV: this variant is the same as the standard except for the memory configuration. Memory Configuration - 512MB Flash / 512MB DDR3.</p> <p>Base on the differences description, We chose LS9AD-AC11DB model No. as the main test, Conducted Emission and Spurious Emission was re-tested for LS9AD-AC11DBT-V and LS9AD-AC11DBT-GV.</p>

<b>Operation Frequency each of channel for GFSK, π/4-DQPSK, 8DPSK</b>							
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
6	2408MHz	26	2428MHz	46	2448MHz	66	2468MHz
7	2409MHz	27	2429MHz	47	2449MHz	67	2469MHz
8	2410MHz	28	2430MHz	48	2450MHz	68	2470MHz
9	2411MHz	29	2431MHz	49	2451MHz	69	2471MHz
10	2412MHz	30	2432MHz	50	2452MHz	70	2472MHz
11	2413MHz	31	2433MHz	51	2453MHz	71	2473MHz
12	2414MHz	32	2434MHz	52	2454MHz	72	2474MHz
13	2415MHz	33	2435MHz	53	2455MHz	73	2475MHz
14	2416MHz	34	2436MHz	54	2456MHz	74	2476MHz
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 mode

Non-hopping mode:	Keep the EUT in transmitting mode with worst case data rate.
Hopping mode:	Keep the EUT in hopping mode.
Remark:	<ol style="list-style-type: none"> <li>1. GFSK (1 Mbps) is the worst-case mode.</li> <li>2. The EUT have two chains, but cannot transmit Simultaneously, so all test items performed on each chain respectively.</li> </ol>

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 Measurement Uncertainty

Items	Expanded Uncertainty (Confidence of 95%)
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)

### 5.5 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

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

## 5.7 Test Instruments list

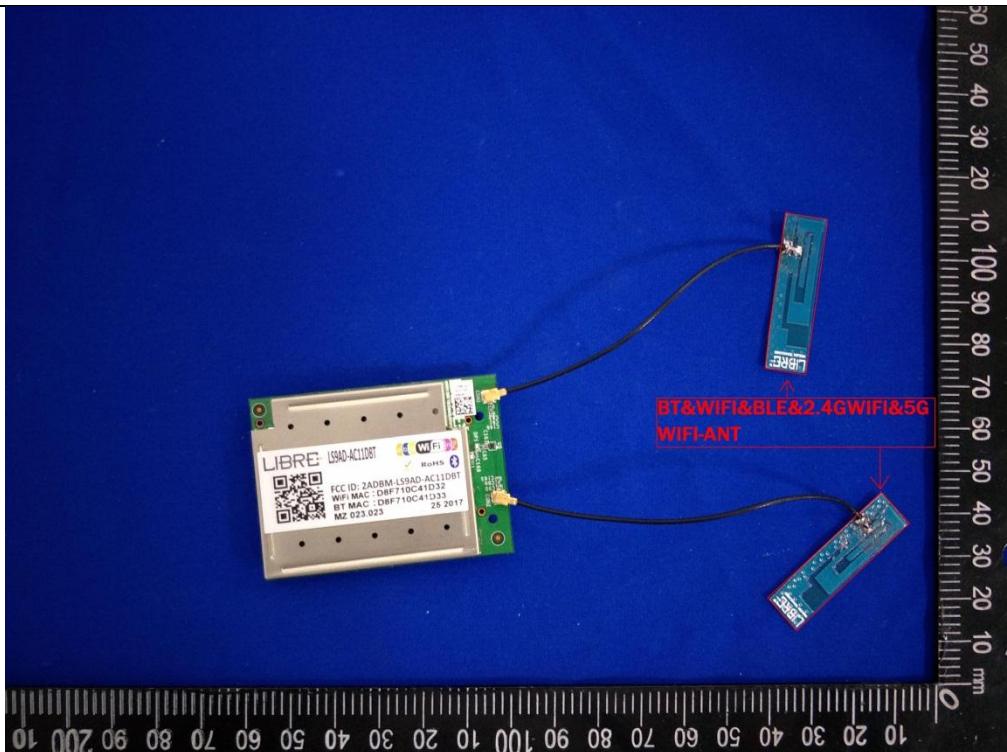
<b>Radiated Emission:</b>						
<b>Item</b>	<b>Test Equipment</b>	<b>Manufacturer</b>	<b>Model No.</b>	<b>Inventory No.</b>	<b>Cal. Date (mm-dd-yy)</b>	<b>Cal. Due date (mm-dd-yy)</b>
1	3m SAC	SAEMC	9(L)*6(W)* 6(H)	CCIS0001	08-23-2014	08-22-2017
2	BiConiLog Antenna	SCHWARZBECK	VULB9163	CCIS0005	02-25-2017	02-24-2018
3	Horn Antenna	SCHWARZBECK	BBHA9120D	CCIS0006	02-25-2017	02-24-2018
4	Pre-amplifier (10kHz-1.3GHz)	HP	8447D	CCIS0003	02-25-2017	02-24-2018
5	Pre-amplifier (1GHz-18GHz)	Compliance Direction Systems Inc.	PAP-1G18	CCIS0011	02-25-2017	02-24-2018
6	Pre-amplifier (18-26GHz)	Rohde & Schwarz	AFS33-18002 650-30-8P-44	GTS218	02-25-2017	02-24-2018
7	Horn Antenna	ETS-LINDGREN	3160	GTS217	02-25-2017	02-24-2018
8	Spectrum analyzer 9k-30GHz	Rohde & Schwarz	FSP30	CCIS0023	02-25-2017	02-24-2018
9	EMI Test Receiver	Rohde & Schwarz	ESRP7	CCIS0167	02-25-2017	02-24-2018
10	Loop antenna	Laplace instrument	RF300	EMC0701	02-25-2017	02-24-2018
11	EMI Test Software	AUDIX	E3	N/A	N/A	N/A
12	Coaxial Cable	N/A	N/A	CCIS0018	02-25-2017	02-24-2018
13	Coaxial Cable	N/A	N/A	CCIS0020	02-25-2017	02-24-2018

<b>Conducted Emission:</b>						
<b>Item</b>	<b>Test Equipment</b>	<b>Manufacturer</b>	<b>Model No.</b>	<b>Inventory No.</b>	<b>Cal. Date (mm-dd-yy)</b>	<b>Cal. Due date (mm-dd-yy)</b>
1	Shielding Room	ZhongShuo Electron	11.0(L)x4.0(W)x3.0(H)	CCIS0061	08-23-2014	08-22-2017
2	EMI Test Receiver	Rohde & Schwarz	ESCI	CCIS0002	02-25-2017	02-24-2018
3	LISN	CHASE	MN2050D	CCIS0074	02-25-2017	02-24-2018
4	Coaxial Cable	CCIS	N/A	CCIS0086	02-25-2017	02-24-2018
5	EMI Test Software	AUDIX	E3	N/A	N/A	N/A

## 6 Test results and Measurement Data

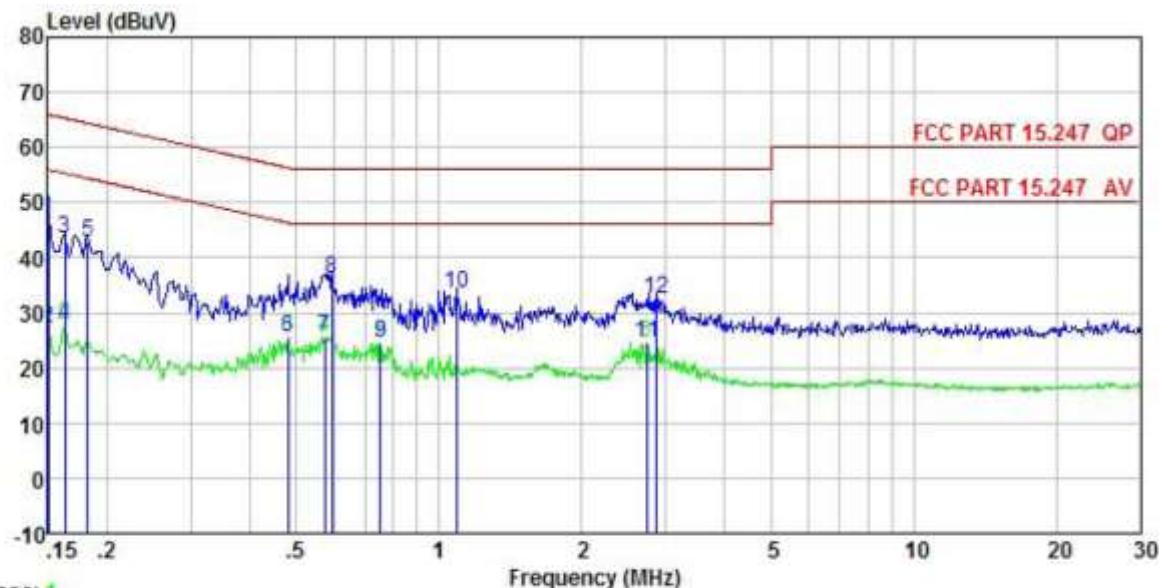
### 6.1 Antenna requirement

Standard requirement:	FCC Part 15 C Section 15.203 /247(c)
15.203 requirement: <i>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.</i>	
15.247(c) (1)(i) requirement: <i>(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.</i>	
E.U.T Antenna:	The Bluetooth antenna is an integral antenna which permanently attached, and the best case gain of the antenna is 3.5 dBi.

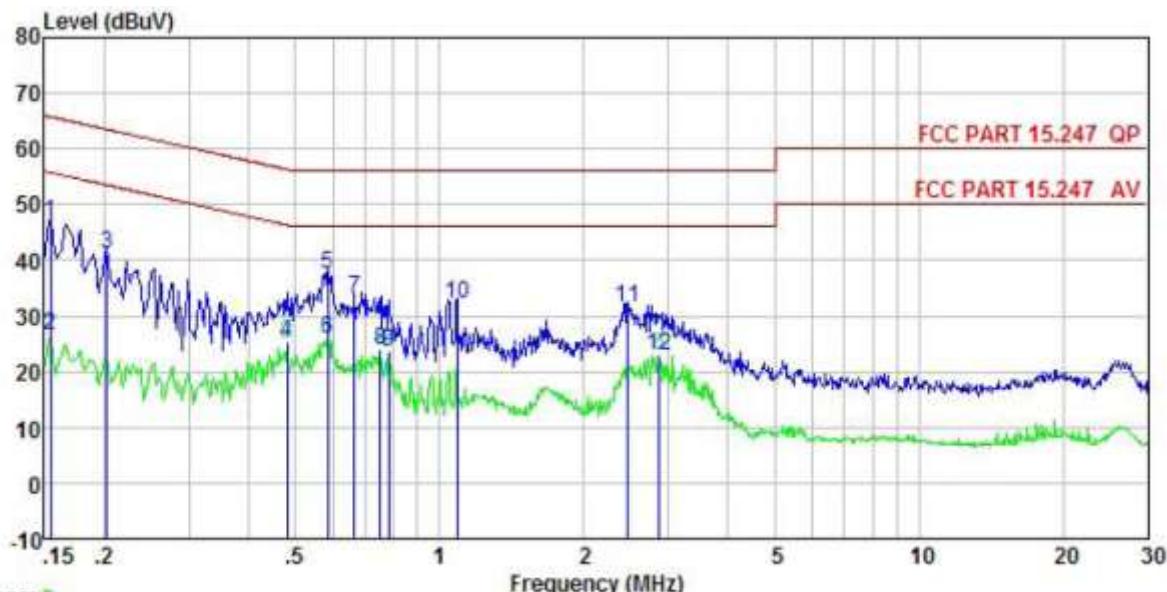


## 6.2 Conducted Emissions

Test Requirement:	FCC Part 15 C Section 15.207		
Test Method:	ANSI C63.4:2014		
Test Frequency Range:	150 kHz to 30 MHz		
Class / Severity:	Class B		
Receiver setup:	RBW=9 kHz, VBW=30 kHz, Sweep time=auto		
Limit:	Frequency range (MHz)	Limit (dBuV)	
		Quasi-peak	Average
	0.15-0.5	66 to 56*	56 to 46*
	0.5-5	56	46
	5-30	60	50
	* Decreases with the logarithm of the frequency.		
Test setup:	<p>Reference Plane</p> <p>LISN</p> <p>AUX Equipment</p> <p>E.U.T</p> <p>Test table/Insulation plane</p> <p>80cm</p> <p>EMI Receiver</p> <p>Filter</p> <p>AC power</p> <p>Remark: E.U.T: Equipment Under Test LISN: Line Impedance Stabilization Network Test table height=0.8m</p>		
Test procedure:	<ol style="list-style-type: none"> <li>The E.U.T and simulators are connected to the main power through a line impedance stabilization network (L.I.S.N.). This provides a 50ohm/50uH coupling impedance for the measuring equipment.</li> <li>The peripheral devices are also connected to the main power through a LISN that provides a 50ohm/50uH coupling impedance with 50ohm termination. (Please refer to the block diagram of the test setup and photographs).</li> <li>Both sides of A.C. line are checked for maximum conducted interference. In order to find the maximum emission, the relative positions of equipment and all of the interface cables must be changed according to ANSI C63.4: 2014 on conducted measurement.</li> </ol>		
Test Instruments:	Refer to section 5.7 for details		
Test mode:	Hopping mode		
Test results:	Pass		

**Measurement Data:****Model No. LS9AD-AC11DBT test data:****Line:****Notes:**

1. An initial pre-scan was performed on the line and neutral lines with peak detector.
2. Quasi-Peak and Average measurement were performed at the frequencies with maximized peak emission.
3. Final Level = Receiver Read level + LISN Factor + Cable Loss.

**Neutral:**

Trace: 3

Site : CCIS Shielding Room  
 Condition : FCC PART 15.247 QP LISN NEUTRAL  
 EUT : WiFi Media Streaming Module  
 Model : LS9AD-AC11DBT  
 Test Mode : BT mode  
 Power Rating : AC 120V/60Hz  
 Environment : Temp: 23 °C Humi:56% Atmos:101KPa  
 Test Engineer: YT  
 Remark :

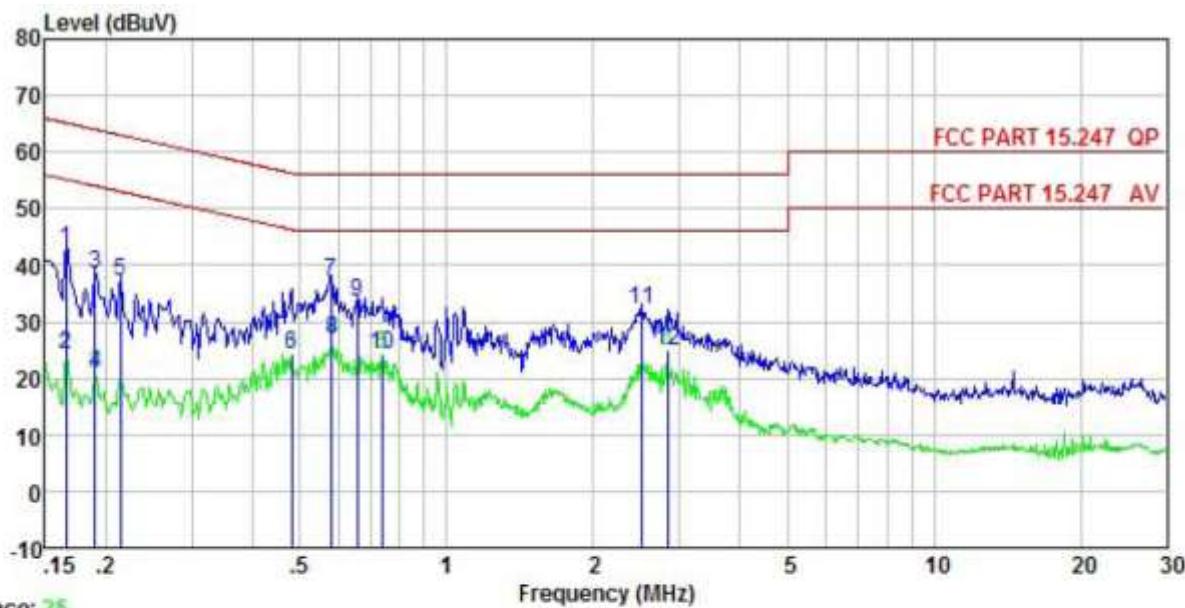
Freq	Read	LISN	Cable	Limit	Over	Remark	
	Freq	Level	Factor				
MHz	dBuV		dB	dBuV	dBuV		dB
1	0.154	36.50	-0.38	10.78	46.90	65.78	-18.88 QP
2	0.154	16.06	-0.38	10.78	26.46	55.78	-29.32 Average
3	0.202	30.61	-0.34	10.76	41.03	63.54	-22.51 QP
4	0.481	14.65	-0.30	10.75	25.10	46.32	-21.22 Average
5	0.585	26.87	-0.30	10.76	37.33	56.00	-18.67 QP
6	0.585	15.25	-0.30	10.76	25.71	46.00	-20.29 Average
7	0.665	22.86	-0.30	10.77	33.33	56.00	-22.67 QP
8	0.751	13.38	-0.30	10.79	23.87	46.00	-22.13 Average
9	0.783	12.91	-0.30	10.81	23.42	46.00	-22.58 Average
10	1.088	21.47	-0.29	10.88	32.06	56.00	-23.94 QP
11	2.474	20.72	-0.23	10.94	31.43	56.00	-24.57 QP
12	2.869	12.23	-0.21	10.92	22.94	46.00	-23.06 Average

**Notes:**

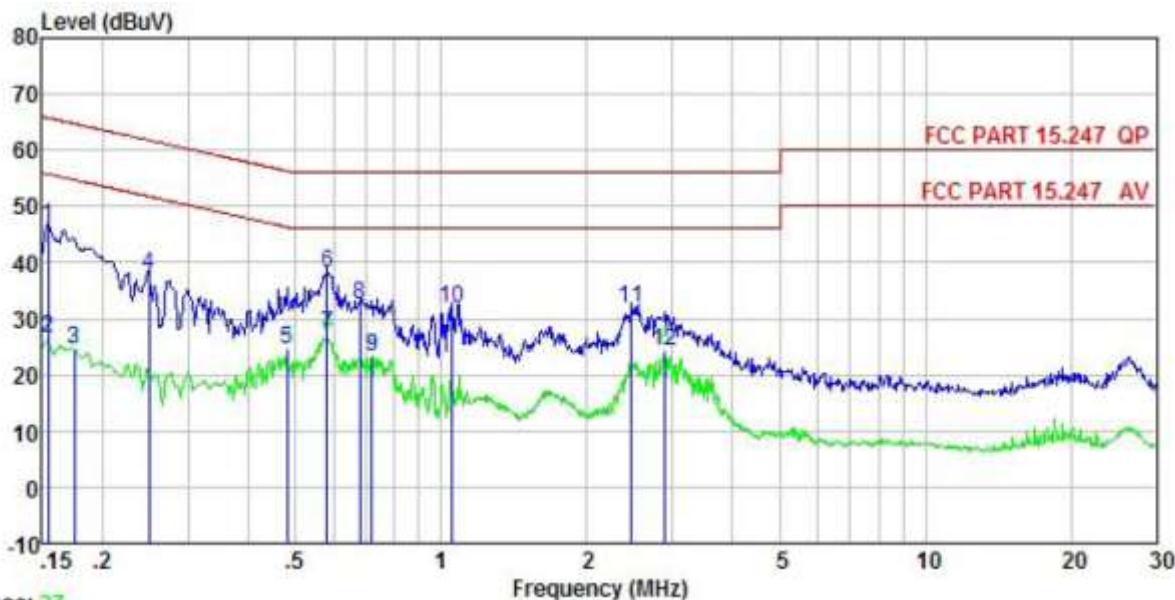
- An initial pre-scan was performed on the line and neutral lines with peak detector.
- Quasi-Peak and Average measurement were performed at the frequencies with maximized peak emission.
- Final Level =Receiver Read level + LISN Factor + Cable Loss.

**Model No. LS9AD-AC11DBT-V test data:**

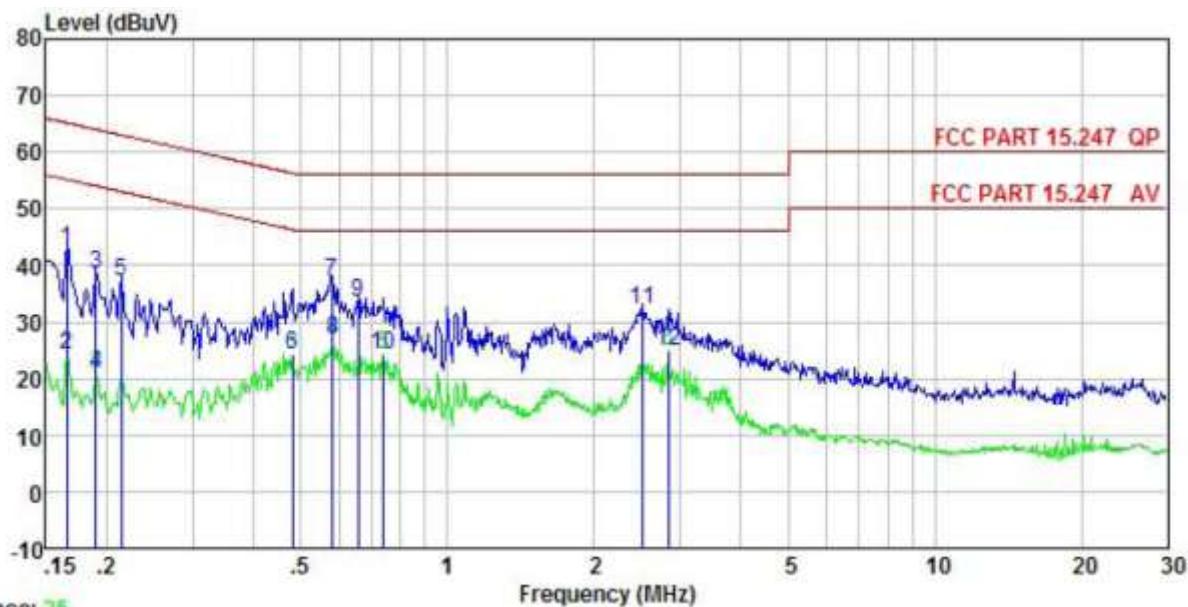
Line:

**Notes:**

1. An initial pre-scan was performed on the line and neutral lines with peak detector.
2. Quasi-Peak and Average measurement were performed at the frequencies with maximized peak emission.
3. Final Level = Receiver Read level + LISN Factor + Cable Loss.

**Neutral:****Notes:**

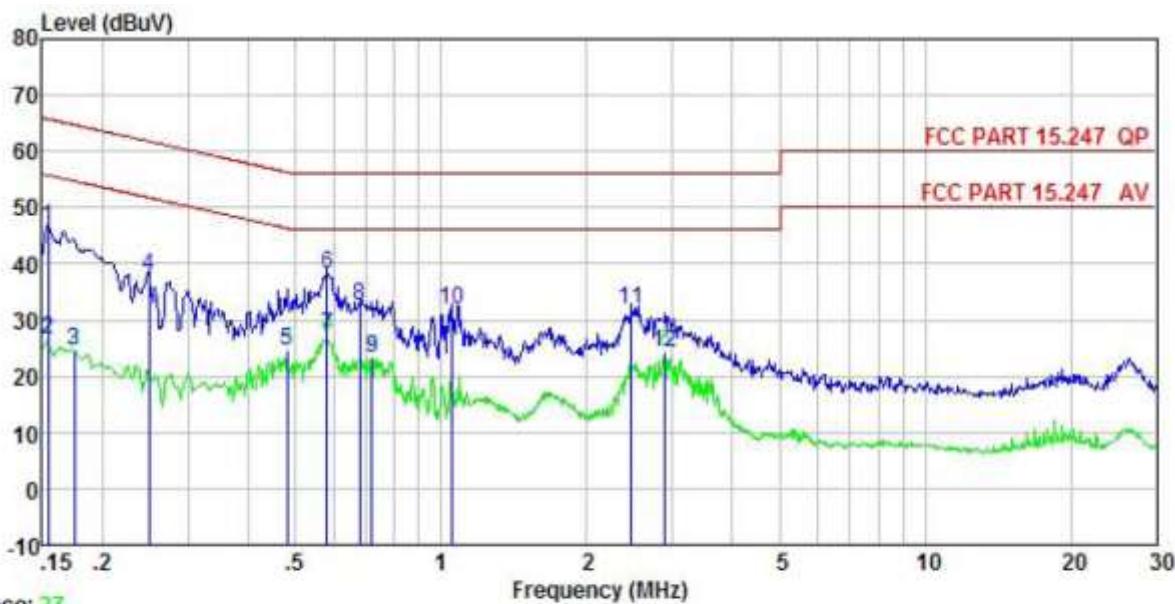
1. An initial pre-scan was performed on the line and neutral lines with peak detector.
2. Quasi-Peak and Average measurement were performed at the frequencies with maximized peak emission.
3. Final Level = Receiver Read level + LISN Factor + Cable Loss.

**Model No. LS9AD-AC11DBT-GV test data:****Line:**

Freq	Read	LISN	Cable	Limit	Over	Remark
	MHz	dBuV	Factor	Loss	Level	
1	0.166	32.71	-0.55	10.77	42.93	65.16 -22.23 QP
2	0.166	13.95	-0.55	10.77	24.17	55.16 -30.99 Average
3	0.190	28.37	-0.53	10.76	38.60	64.02 -25.42 QP
4	0.190	10.81	-0.53	10.76	21.04	54.02 -32.98 Average
5	0.214	26.98	-0.52	10.76	37.22	63.05 -25.83 QP
6	0.481	13.93	-0.49	10.75	24.19	46.32 -22.13 Average
7	0.579	27.03	-0.49	10.76	37.30	56.00 -18.70 QP
8	0.582	16.61	-0.49	10.76	26.88	46.00 -19.12 Average
9	0.654	23.27	-0.48	10.77	33.56	56.00 -22.44 QP
10	0.739	14.05	-0.48	10.79	24.36	46.00 -21.64 Average
11	2.500	21.59	-0.44	10.94	32.09	56.00 -23.91 QP
12	2.839	14.31	-0.44	10.93	24.80	46.00 -21.20 Average

**Notes:**

1. An initial pre-scan was performed on the line and neutral lines with peak detector.
2. Quasi-Peak and Average measurement were performed at the frequencies with maximized peak emission.
3. Final Level = Receiver Read level + LISN Factor + Cable Loss.

**Neutral:**

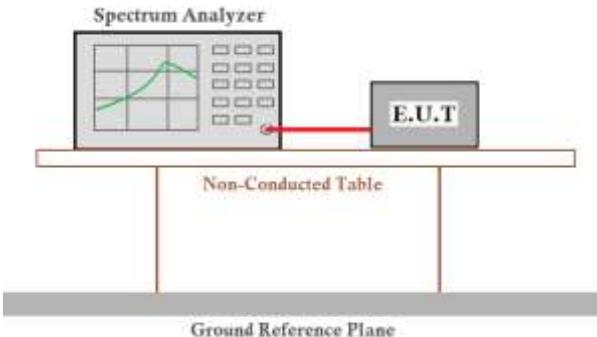
Site : CCIS Shielding Room  
 Condition : FCC PART 15.247 QP LISN NEUTRAL  
 EUT : WiFi Media Streaming Module  
 Model : LS9AD-AC11DBT-GV  
 Test Mode : BT mode  
 Power Rating : AC 120V/60Hz  
 Environment : Temp: 23 °C Humi:56% Atmos:101KPa  
 Test Engineer: YT  
 Remark :

Freq	Read	LISN	Cable	Limit	Over	Remark
	Level	Factor	Loss			
MHz	dBuV	dB	dB	dBuV	dB	
1	0.154	35.98	-0.38	10.78	46.38	65.78 -19.40 QP
2	0.154	16.13	-0.38	10.78	26.53	55.78 -29.25 Average
3	0.175	14.08	-0.36	10.77	24.49	54.72 -30.23 Average
4	0.249	27.35	-0.33	10.75	37.77	61.78 -24.01 QP
5	0.481	14.00	-0.30	10.75	24.45	46.32 -21.87 Average
6	0.582	27.82	-0.30	10.76	38.28	56.00 -17.72 QP
7	0.582	16.62	-0.30	10.76	27.08	46.00 -18.92 Average
8	0.679	22.16	-0.30	10.77	32.63	56.00 -23.37 QP
9	0.720	12.63	-0.30	10.78	23.11	46.00 -22.89 Average
10	1.054	21.29	-0.29	10.88	31.88	56.00 -24.12 QP
11	2.474	21.18	-0.23	10.94	31.89	56.00 -24.11 QP
12	2.900	13.42	-0.20	10.92	24.14	46.00 -21.86 Average

**Notes:**

- An initial pre-scan was performed on the line and neutral lines with peak detector.
- Quasi-Peak and Average measurement were performed at the frequencies with maximized peak emission.
- Final Level = Receiver Read level + LISN Factor + Cable Loss.

### 6.3 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:	GFSK mode:1000 mW(30 dBm) $\pi/4$ -DQPSK /8DPSK mode: 125 mW(21 dBm)
Test setup:	
Test Instruments:	Refer to section 5.7 for details
Test mode:	Non-hopping mode
Test results:	Pass

#### Measurement Data:

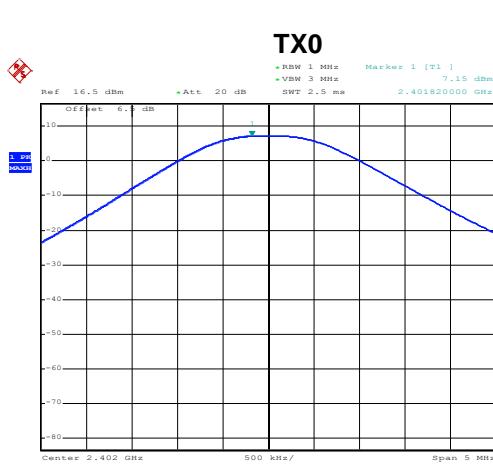
**TX0**

GFSK mode			
Test channel	Peak Output Power (dBm)	Limit (dBm)	Result
Lowest	7.15	30.00	Pass
Middle	7.59	30.00	Pass
Highest	7.77	30.00	Pass
$\pi/4$ -DQPSK mode			
Test channel	Peak Output Power (dBm)	Limit (dBm)	Result
Lowest	2.61	21.00	Pass
Middle	3.10	21.00	Pass
Highest	3.28	21.00	Pass
8DPSK mode			
Test channel	Peak Output Power (dBm)	Limit (dBm)	Result
Lowest	3.01	21.00	Pass
Middle	3.47	21.00	Pass
Highest	3.68	21.00	Pass

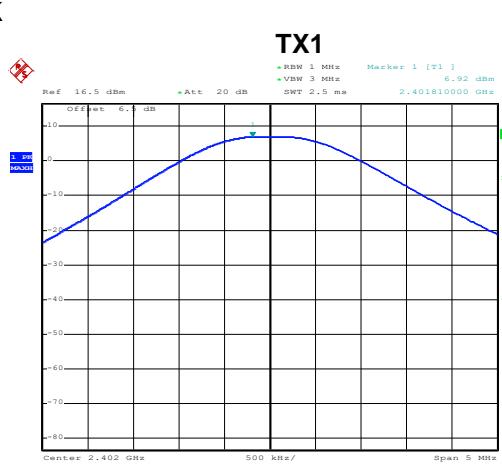
**TX1**

GFSK mode			
Test channel	Peak Output Power (dBm)	Limit (dBm)	Result
Lowest	6.92	30.00	Pass
Middle	7.22	30.00	Pass
Highest	7.17	30.00	Pass
$\pi/4$ -DQPSK mode			
Test channel	Peak Output Power (dBm)	Limit (dBm)	Result
Lowest	2.49	21.00	Pass
Middle	2.67	21.00	Pass
Highest	2.77	21.00	Pass
8DPSK mode			
Test channel	Peak Output Power (dBm)	Limit (dBm)	Result
Lowest	2.80	21.00	Pass
Middle	3.07	21.00	Pass
Highest	2.98	21.00	Pass

Test plot as follows:

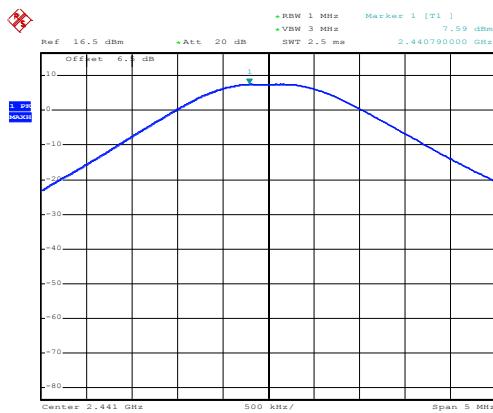


**GFSK**



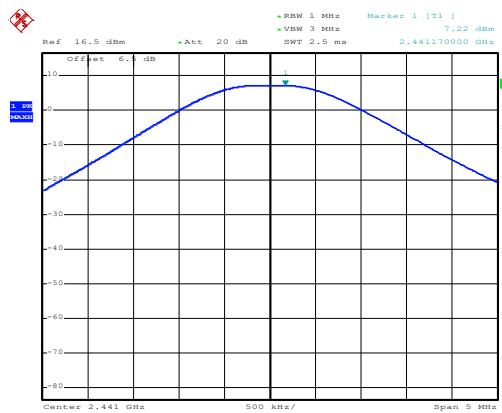
Date: 6.JUL.2017 21:23:15

Lowest channel



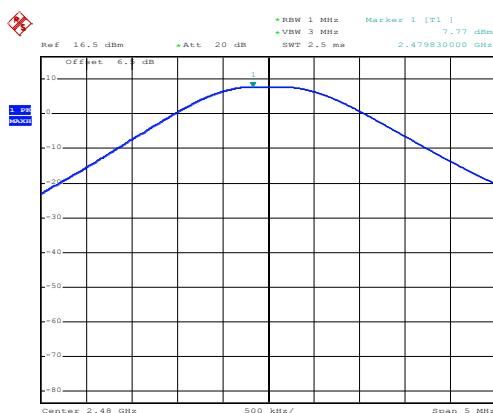
Date: 2.JUL.2017 13:58:37

Lowest channel



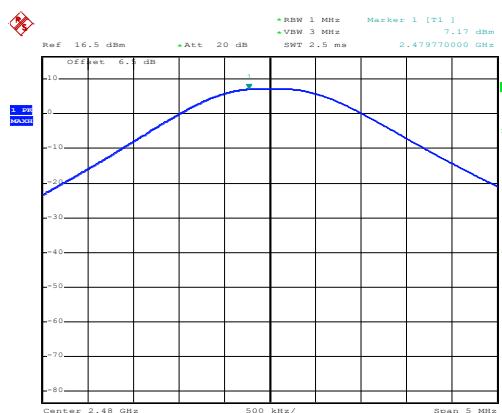
Date: 6.JUL.2017 21:23:37

Middle channel



Date: 2.JUL.2017 13:41:22

Middle channel



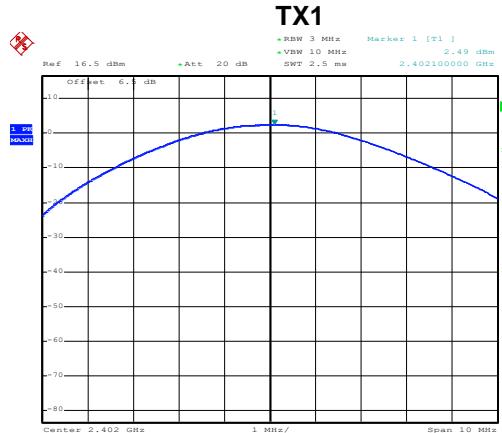
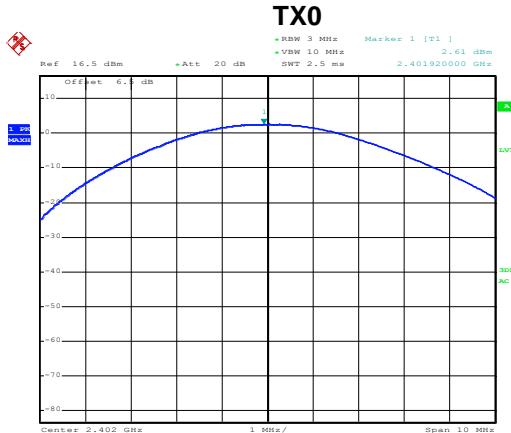
Date: 6.JUL.2017 21:23:55

Highest channel

Date: 2.JUL.2017 13:42:02

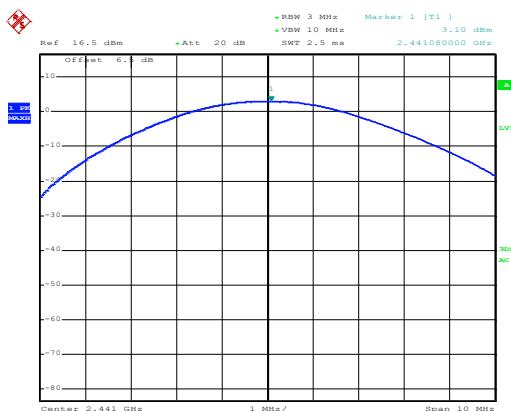
Highest channel

## $\pi/4$ -DQPSK



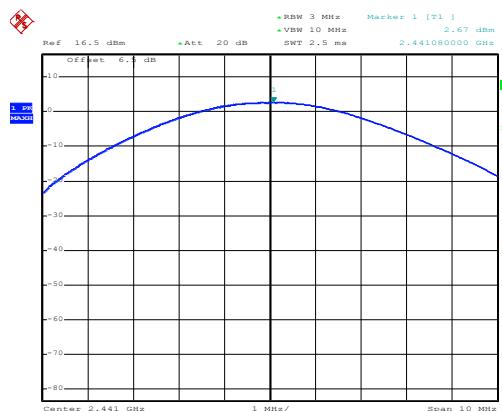
Date: 6.JUL.2017 21:25:53

### Lowest channel



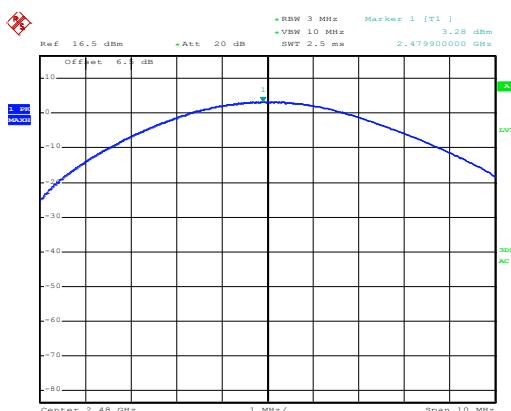
Date: 2.JUL.2017 13:43:21

### Lowest channel



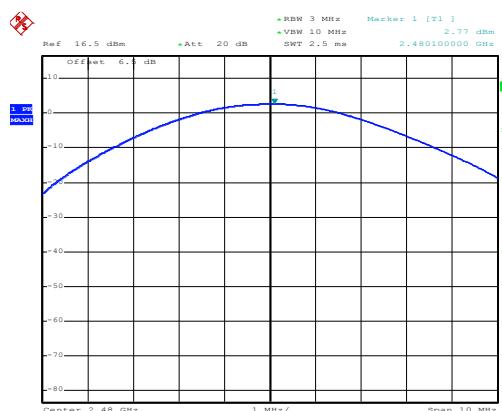
Date: 6.JUL.2017 21:26:19

### Middle channel



Date: 2.JUL.2017 13:44:02

### Middle channel



Date: 6.JUL.2017 21:26:38

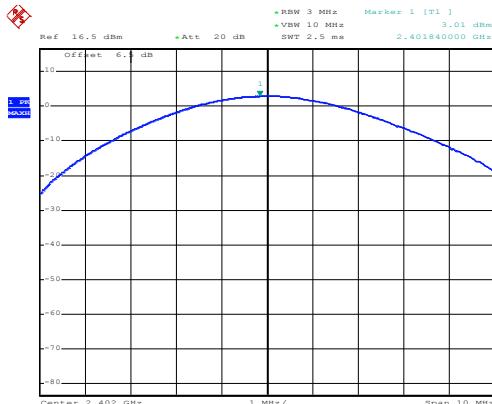
### Highest channel

Date: 2.JUL.2017 13:45:51

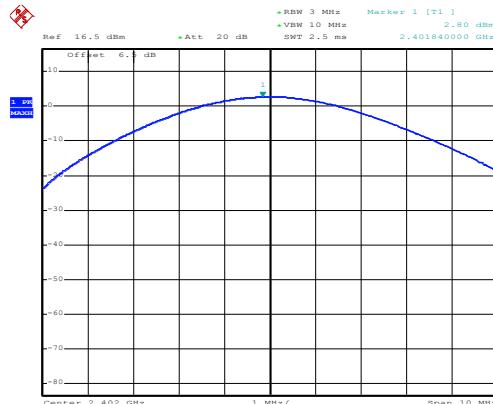
### Highest channel

## 8DPSK

**TX0**

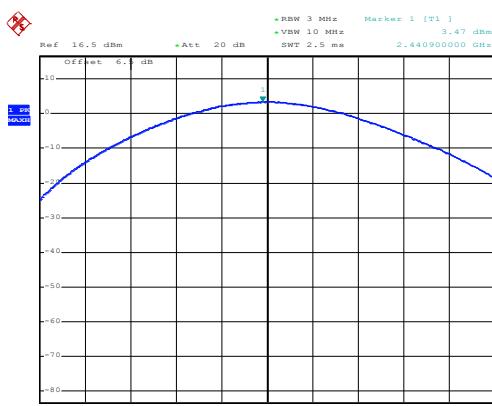


**TX1**



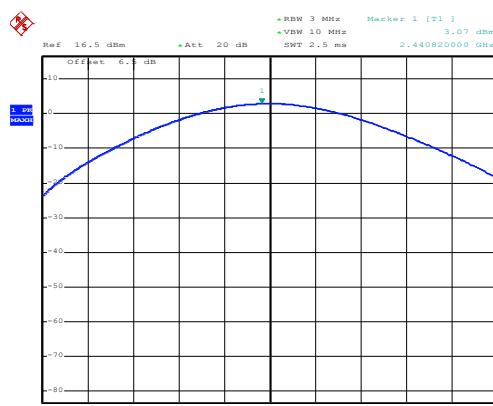
Date: 6.JUL.2017 21:27:08

Lowest channel



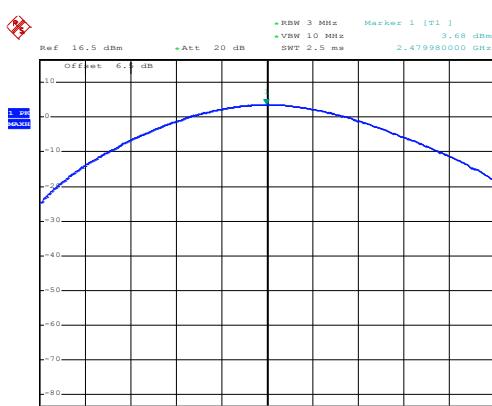
Date: 2.JUL.2017 13:46:49

Lowest channel



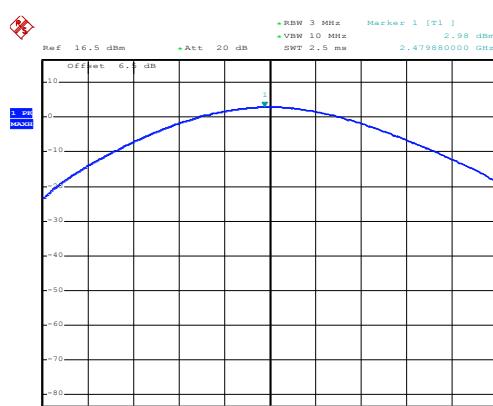
Date: 6.JUL.2017 21:27:28

Middle channel



Date: 2.JUL.2017 13:47:25

Middle channel



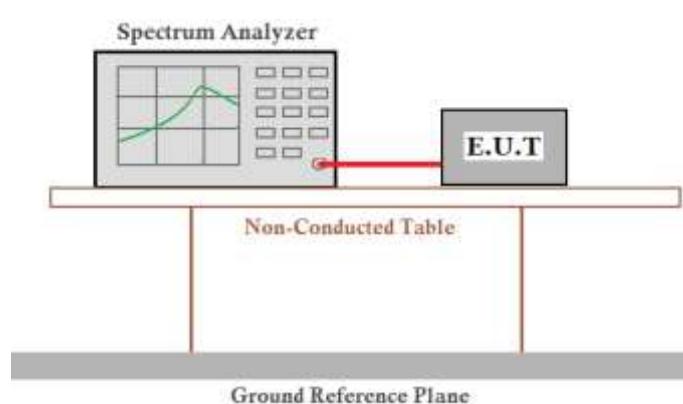
Date: 6.JUL.2017 21:27:49

Highest channel

Date: 2.JUL.2017 13:47:57

Highest channel

#### 6.4 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:	N/A
Test setup:	 <p>The diagram illustrates the test setup. A Spectrum Analyzer is positioned at the top left, displaying a signal spectrum. A red cable connects it to a rectangular box labeled 'E.U.T' (Equipment Under Test) located to its right. This entire assembly rests on a light-colored rectangular table labeled 'Non-Conducted Table'. Below the table is a thick grey horizontal bar labeled 'Ground Reference Plane'.</p>
Test Instruments:	Refer to section 5.7 for details
Test mode:	Non-hopping mode
Test results:	Pass

#### Measurement Data:

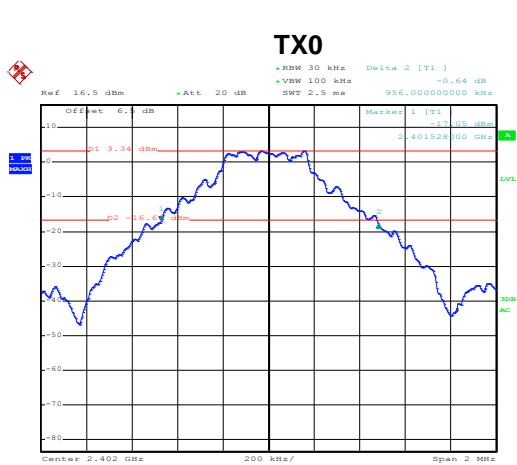
##### TX0

Test channel	20dB Occupy Bandwidth (kHz)		
	GFSK	$\pi/4$ -DQPSK	8DPSK
Lowest	956	1326	1290
Middle	956	1332	1290
Highest	956	1326	1296

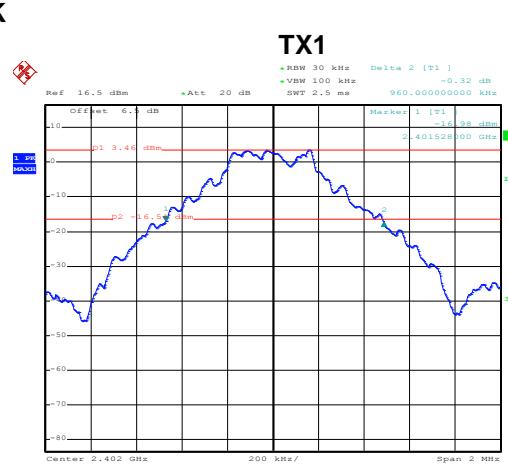
##### TX1

Test channel	20dB Occupy Bandwidth (kHz)		
	GFSK	$\pi/4$ -DQPSK	8DPSK
Lowest	960	1320	1290
Middle	956	1326	1290
Highest	956	1326	1290

Test plot as follows:

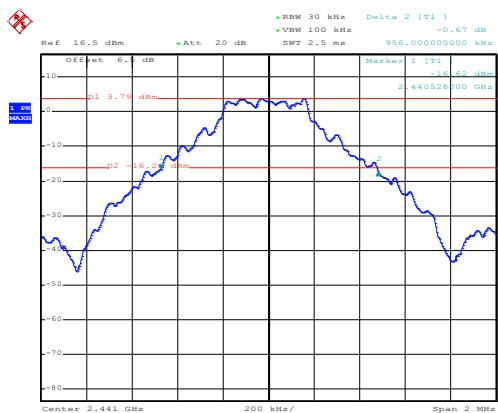


GFSK



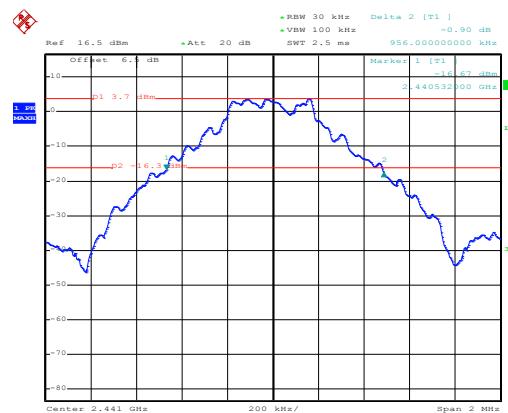
Date: 6.JUL.2017 21:31:14

Lowest channel



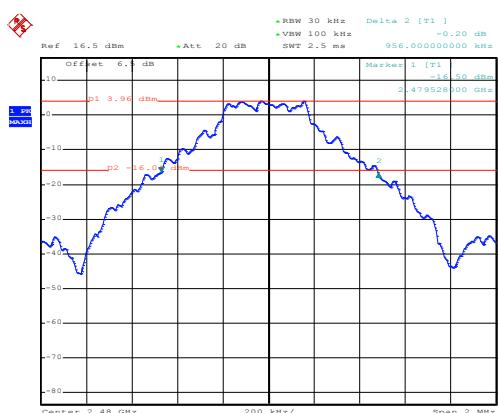
Date: 2.JUL.2017 14:00:27

Lowest channel



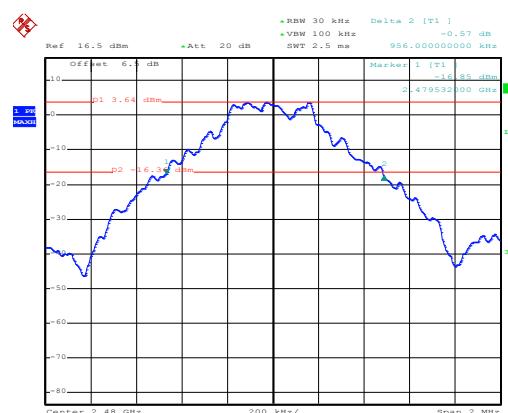
Date: 6.JUL.2017 21:32:38

Middle channel



Date: 2.JUL.2017 14:02:06

Middle channel



Date: 6.JUL.2017 21:33:40

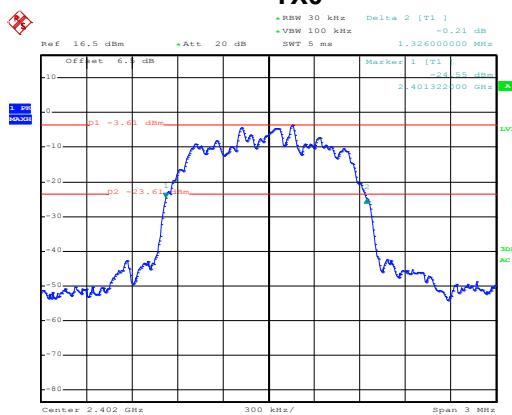
Highest channel

Date: 2.JUL.2017 14:03:13

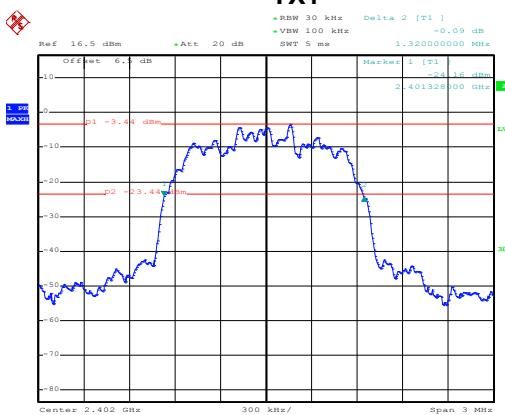
Highest channel

## π/4-DQPSK

**TX0**

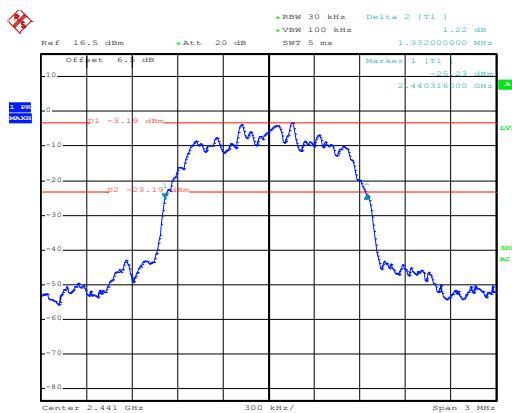


**TX1**



Date: 6.JUL.2017 21:35:12

Lowest channel



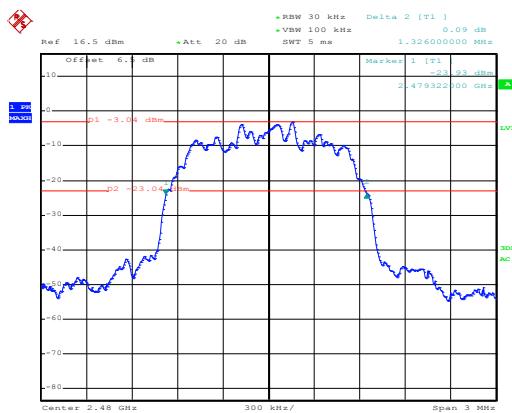
Date: 2.JUL.2017 14:54:56

Lowest channel



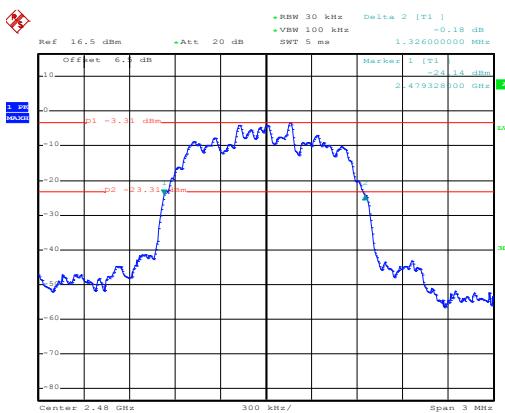
Date: 6.JUL.2017 21:36:07

Middle channel



Date: 2.JUL.2017 14:55:47

Middle channel



Date: 6.JUL.2017 21:37:09

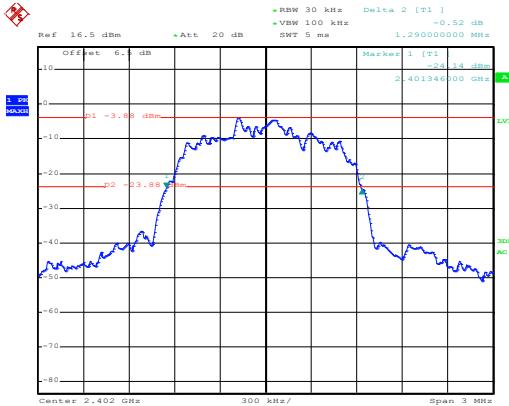
Highest channel

Date: 2.JUL.2017 14:56:32

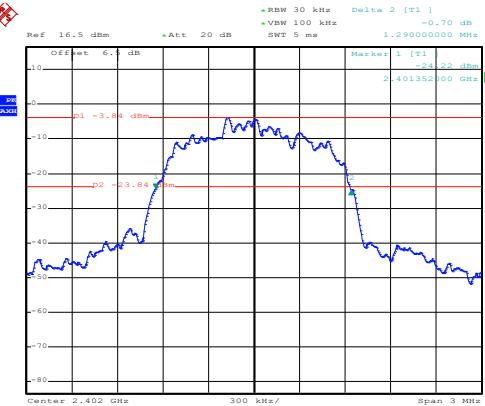
Highest channel

## 8DPSK

**TX0**

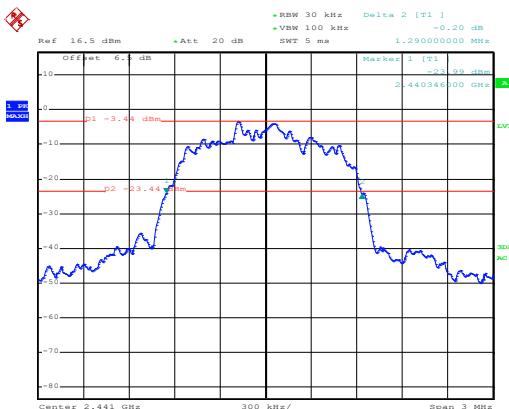


**TX1**



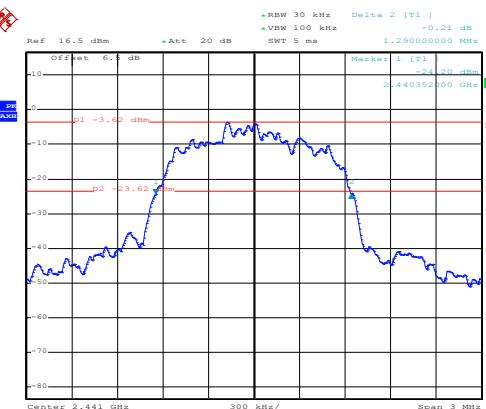
Date: 6.JUL.2017 21:38:31

Lowest channel



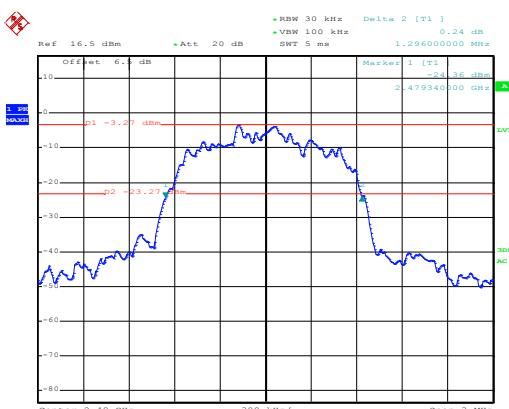
Date: 2.JUL.2017 14:51:44

Lowest channel



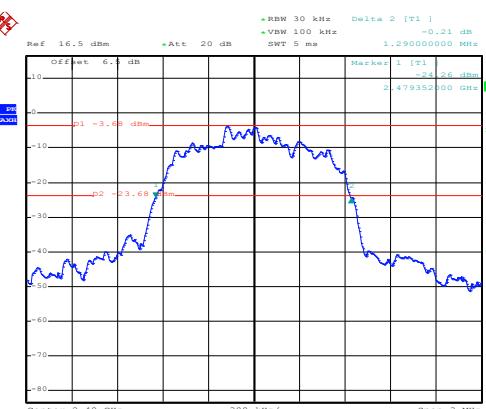
Date: 6.JUL.2017 21:39:46

Middle channel



Date: 2.JUL.2017 14:52:59

Middle channel



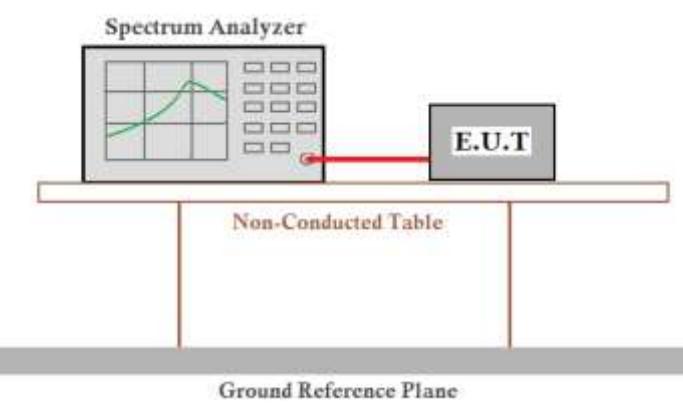
Date: 6.JUL.2017 21:40:53

Highest channel

Date: 2.JUL.2017 14:53:56

Highest channel

## 6.5 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 5.7 for details
Test mode:	Hopping mode
Test results:	Pass

**Measurement Data:****TX0**

GFSK mode			
Test channel	Carrier Frequencies Separation (kHz)	Limit (kHz)	Result
Lowest	1000	956.00	Pass
Middle	1004	956.00	Pass
Highest	1000	956.00	Pass
$\pi/4$ -DQPSK mode			
Test channel	Carrier Frequencies Separation (kHz)	Limit (kHz)	Result
Lowest	1004	888.00	Pass
Middle	1004	888.00	Pass
Highest	1004	888.00	Pass
8DPSK mode			
Test channel	Carrier Frequencies Separation (kHz)	Limit (kHz)	Result
Lowest	1000	860.00	Pass
Middle	1004	860.00	Pass
Highest	1004	860.00	Pass

Note: According to section 6.4

Mode	20dB bandwidth (kHz) (worse case)	Limit (kHz) (Carrier Frequencies Separation)
GFSK	956	956.00
$\pi/4$ -DQPSK	1332	888.00
8DPSK	1290	860.00

## TX1

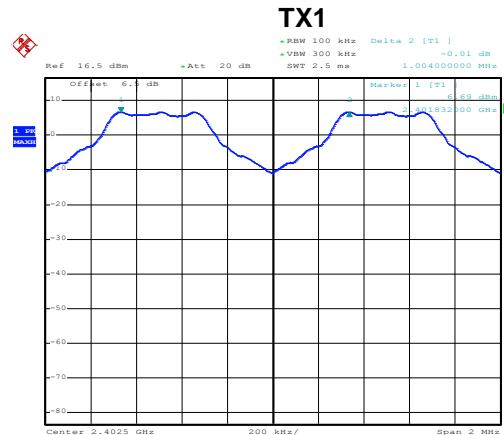
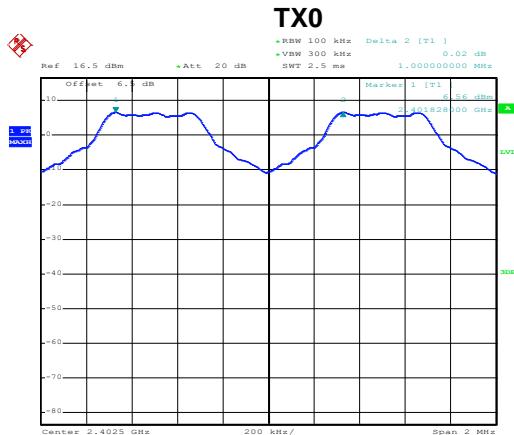
GFSK mode			
Test channel	Carrier Frequencies Separation (kHz)	Limit (kHz)	Result
Lowest	1004	960.00	Pass
Middle	1004	960.00	Pass
Highest	1004	960.00	Pass
$\pi/4$ -DQPSK mode			
Test channel	Carrier Frequencies Separation (kHz)	Limit (kHz)	Result
Lowest	1004	884.00	Pass
Middle	1004	884.00	Pass
Highest	1004	884.00	Pass
8DPSK mode			
Test channel	Carrier Frequencies Separation (kHz)	Limit (kHz)	Result
Lowest	1004	860.00	Pass
Middle	1004	860.00	Pass
Highest	1004	860.00	Pass

Note: According to section 6.4

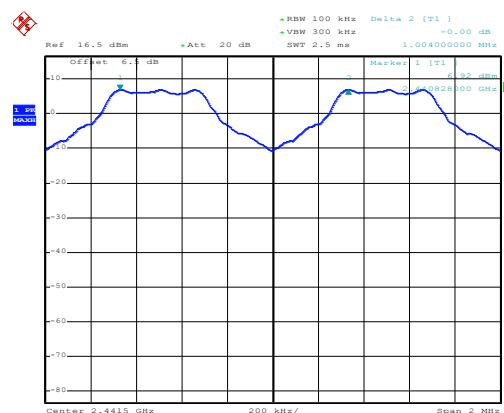
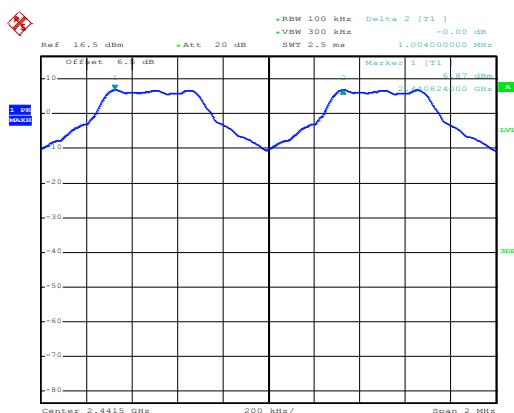
Mode	20dB bandwidth (kHz) (worse case)	Limit (kHz) (Carrier Frequencies Separation)
GFSK	960	960.00
$\pi/4$ -DQPSK	1326	884.00
8DPSK	1290	860.00

Test plot as follows:

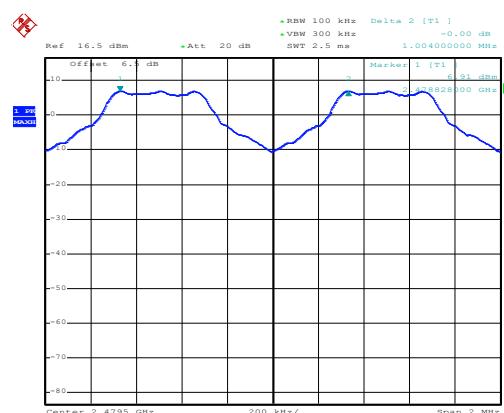
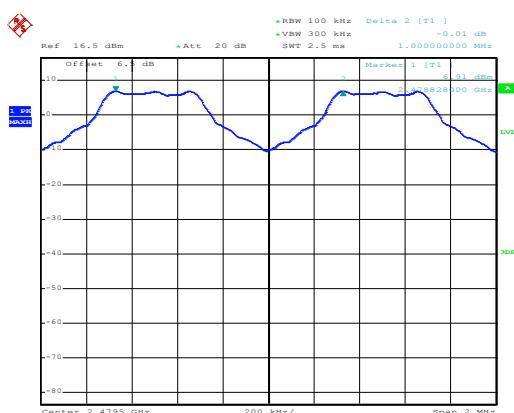
## GFSK



## Lowest channel



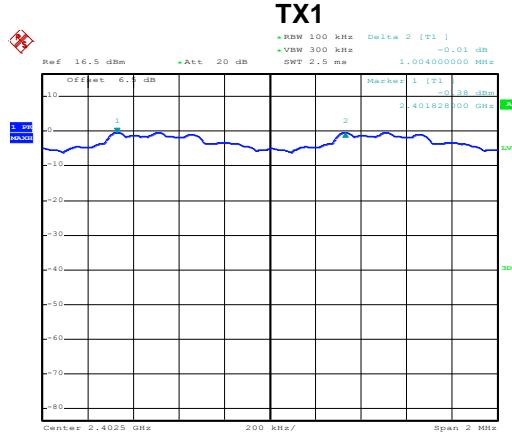
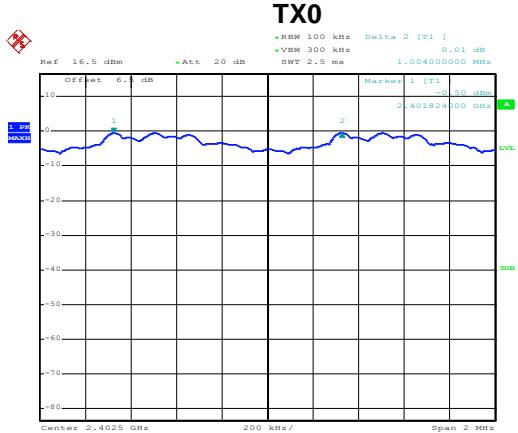
## Middle channel



## Highest channel

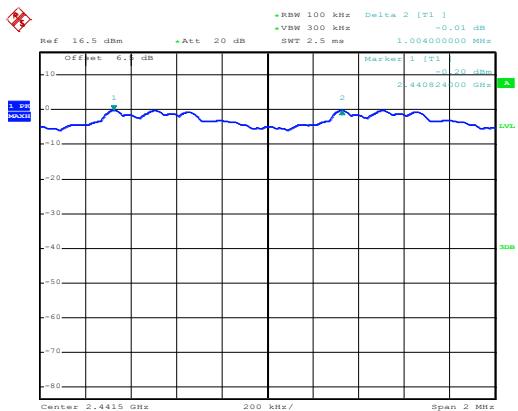
## Highest channel

## $\pi/4$ -DQPSK



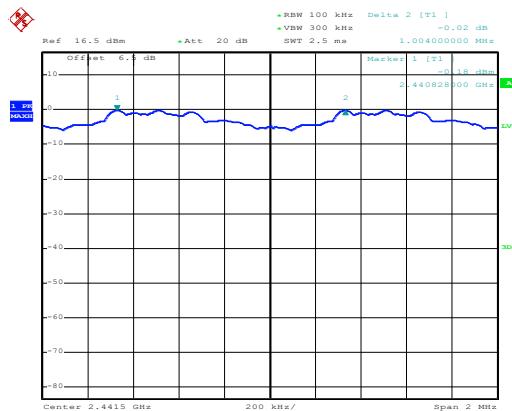
Date: 7.JUL.2017 08:47:06

### Lowest channel



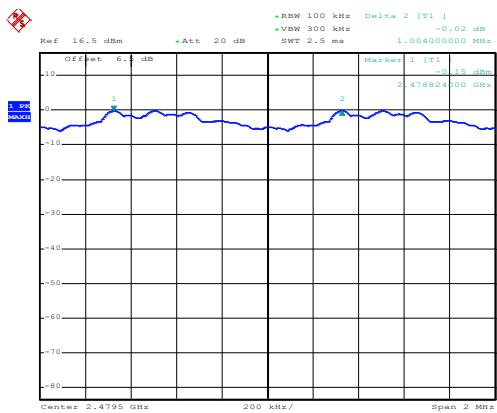
Date: 2.JUL.2017 15:38:43

### Lowest channel



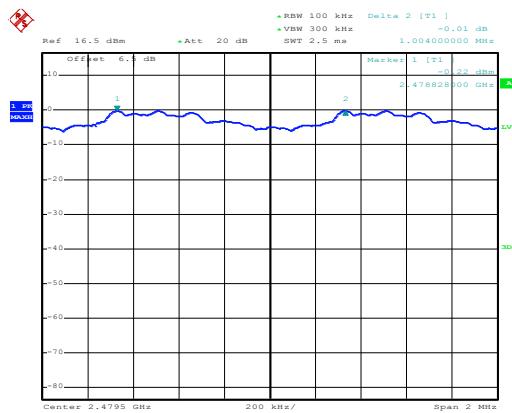
Date: 7.JUL.2017 08:48:25

### Middle channel



Date: 2.JUL.2017 15:40:16

### Middle channel



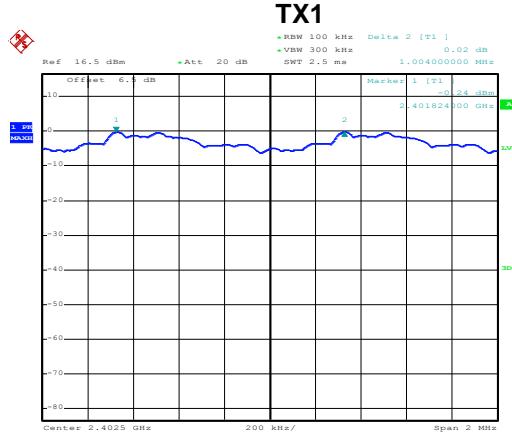
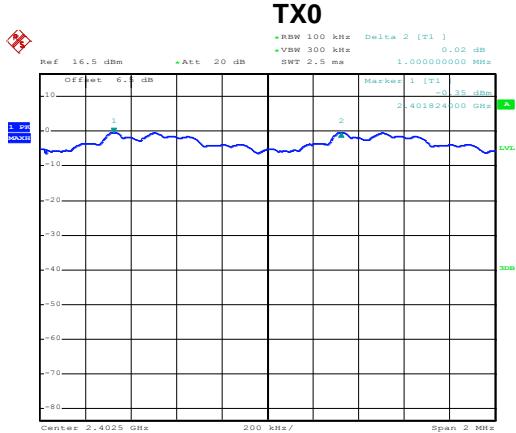
Date: 7.JUL.2017 08:49:32

### Highest channel

Date: 2.JUL.2017 15:41:21

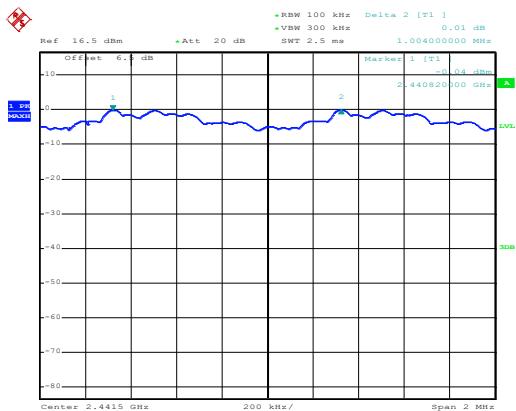
### Highest channel

## 8DPSK



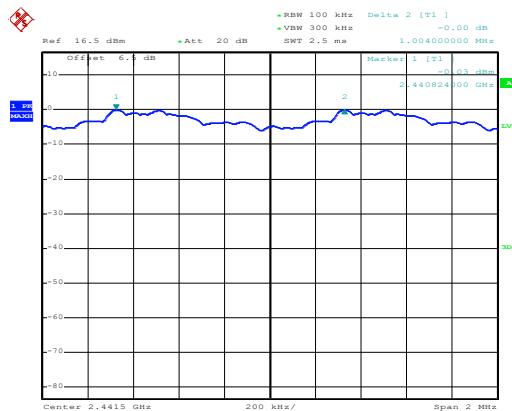
Date: 7.JUL.2017 08:50:45

### Lowest channel



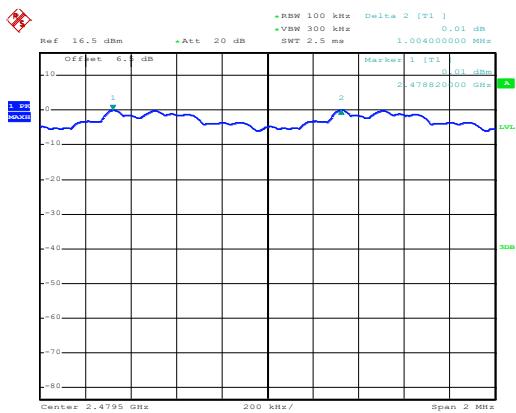
Date: 2.JUL.2017 15:42:31

### Lowest channel



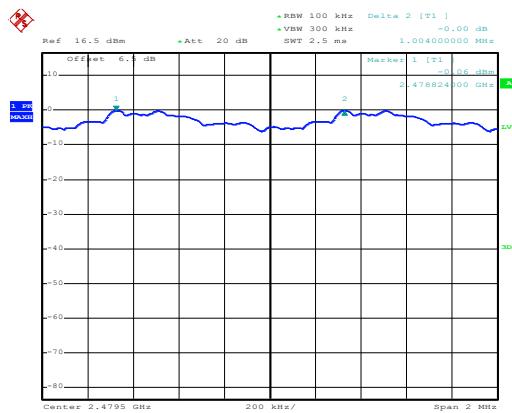
Date: 7.JUL.2017 08:51:44

### Middle channel



Date: 2.JUL.2017 15:43:57

### Middle channel



Date: 7.JUL.2017 08:53:03

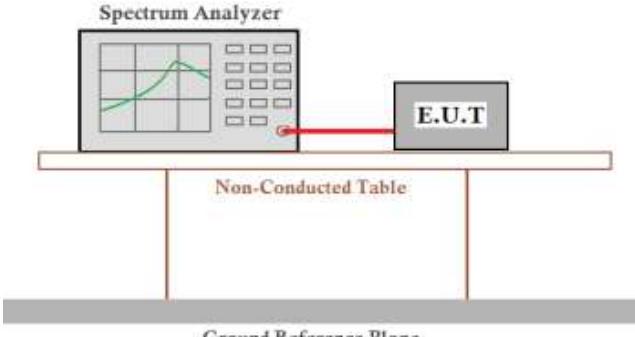
### Highest channel



Date: 2.JUL.2017 15:45:06

### Highest channel

## 6.6 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:	 <p>The diagram illustrates the test setup. A Spectrum Analyzer is positioned at the top left, displaying a signal spectrum. A red line connects its output to the Equipment Under Test (E.U.T), which is represented by a gray rectangular box. The E.U.T is placed on a white rectangular table labeled "Non-Conducted Table". This table is situated above a thick gray horizontal bar labeled "Ground Reference Plane".</p>
Test Instruments:	Refer to section 5.7 for details
Test mode:	Hopping mode
Test results:	Pass

### Measurement Data:

#### TX0

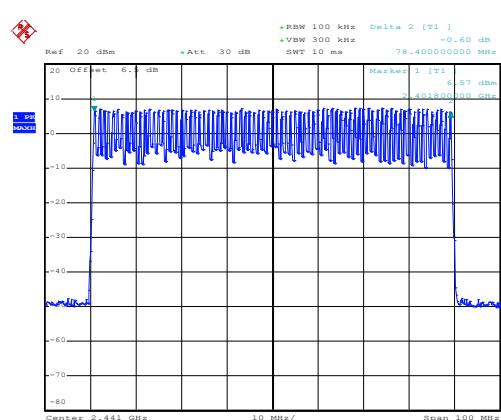
Mode	Hopping channel numbers	Limit	Result
GFSK, π/4-DQPSK, 8DPSK	79	15	Pass

#### TX1

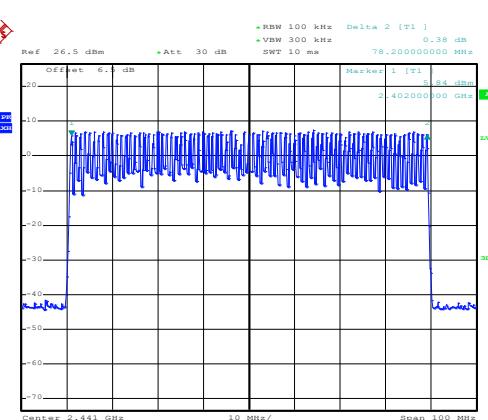
Mode	Hopping channel numbers	Limit	Result
GFSK, π/4-DQPSK, 8DPSK	79	15	Pass

Test plot as follows:

**TX0**



**GFSK**

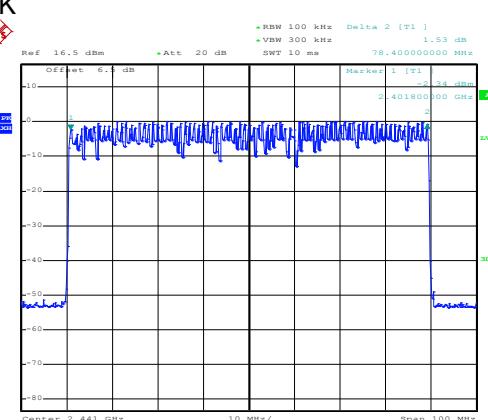
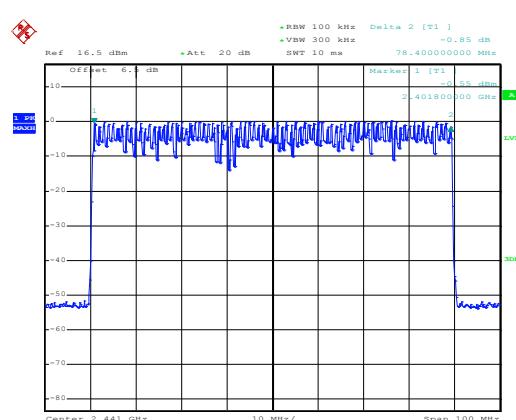


**TX1**

Date: 7.JUL.2017 09:05:36

Date: 2.JUL.2017 14:35:44

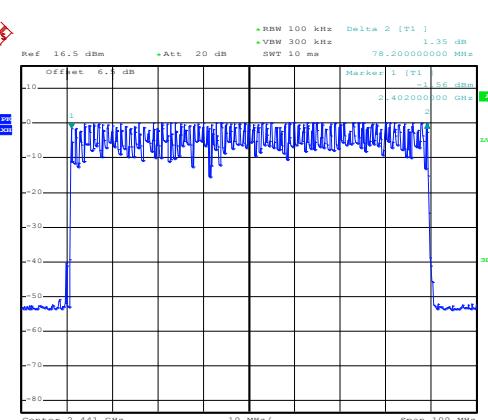
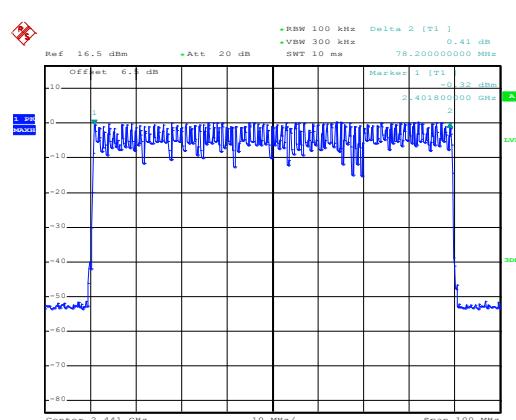
**π/4-DQPSK**



Date: 7.JUL.2017 10:32:30

Date: 7.JUL.2017 10:26:16

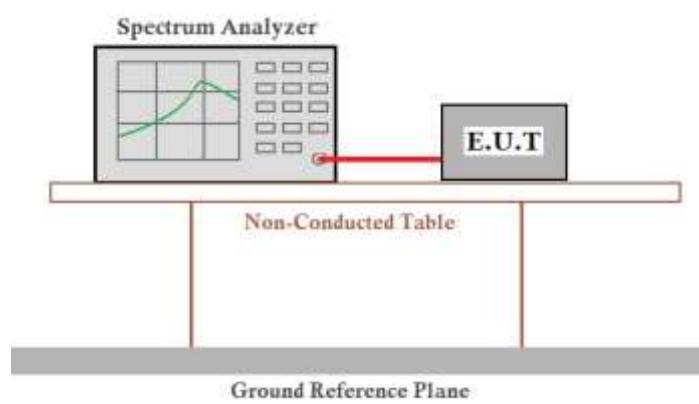
**8DPSK**



Date: 7.JUL.2017 10:43:56

Date: 7.JUL.2017 10:38:10

## 6.7 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 5.7 for details
Test mode:	Hopping mode
Test results:	Pass

### Measurement Data (Worse case):

TX0

Mode	Packet	Dwell time (second)	Limit (second)	Result
GFSK	DH1	0.13440	0.4	Pass
	DH3	0.27456		
	DH5	0.31488		
$\pi/4$ -DQPSK	2-DH1	0.13312	0.4	Pass
	2-DH3	0.27264		
	2-DH5	0.31488		
8DPSK	3-DH1	0.13376	0.4	Pass
	3-DH3	0.26976		
	3-DH5	0.31573		

For GFSK,  $\pi/4$ -DQPSK and 8DPSK:

The test period:  $T = 0.4 \text{ Second}/\text{Channel} \times 79 \text{ Channel} = 31.6 \text{ s}$

$$\text{DH1 time slot} = 0.420 * (1600 / (2 * 79)) * 31.6 = 134.40\text{ms}$$

$$\text{DH3 time slot} = 1.716 * (1600 / (4 * 79)) * 31.6 = 274.56\text{ms}$$

$$\text{DH5 time slot} = 2.952 * (1600 / (6 * 79)) * 31.6 = 314.88\text{ms}$$

$$2-\text{DH1 time slot} = 0.416 * (1600 / (2 * 79)) * 31.6 = 133.12\text{ms}$$

$$2-\text{DH3 time slot} = 1.704 * (1600 / (4 * 79)) * 31.6 = 272.64\text{ms}$$

$$2-\text{DH5 time slot} = 2.952 * (1600 / (6 * 79)) * 31.6 = 314.88\text{ms}$$

$$3-\text{DH1 time slot} = 0.418 * (1600 / (2 * 79)) * 31.6 = 133.76\text{ms}$$

$$3-\text{DH3 time slot} = 1.686 * (1600 / (4 * 79)) * 31.6 = 269.76\text{ms}$$

$$3-\text{DH5 time slot} = 2.960 * (1600 / (6 * 79)) * 31.6 = 315.73\text{ms}$$

## TX1

Mode	Packet	Dwell time (second)	Limit (second)	Result
GFSK	DH1	0.13312	0.4	Pass
	DH3	0.27360		
	DH5	0.31403		
$\pi/4$ -DQPSK	2-DH1	0.13248	0.4	Pass
	2-DH3	0.27072		
	2-DH5	0.31659		
8DPSK	3-DH1	0.13376	0.4	Pass
	3-DH3	0.27072		
	3-DH5	0.31403		

For GFSK,  $\pi/4$ -DQPSK and 8DPSK:

The test period: T= 0.4 Second/Channel x 79 Channel = 31.6 s

$$\text{DH1 time slot} = 0.416 * (1600 / (2 * 79)) * 31.6 = 133.12\text{ms}$$

$$\text{DH3 time slot} = 1.710 * (1600 / (4 * 79)) * 31.6 = 273.60\text{ms}$$

$$\text{DH5 time slot} = 2.944 * (1600 / (6 * 79)) * 31.6 = 314.03\text{ms}$$

$$\text{2-DH1 time slot} = 0.414 * (1600 / (2 * 79)) * 31.6 = 132.48\text{ms}$$

$$\text{2-DH3 time slot} = 1.692 * (1600 / (4 * 79)) * 31.6 = 270.72\text{ms}$$

$$\text{2-DH5 time slot} = 2.968 * (1600 / (6 * 79)) * 31.6 = 316.59\text{ms}$$

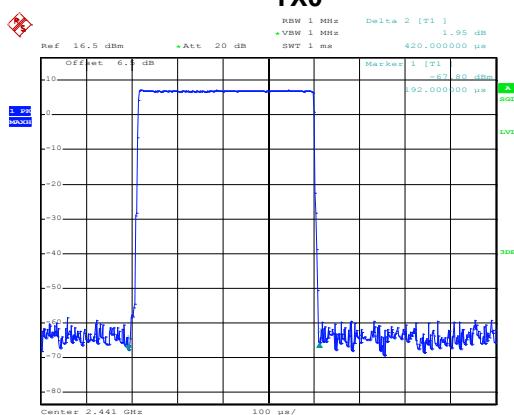
$$\text{3-DH1 time slot} = 0.418 * (1600 / (2 * 79)) * 31.6 = 133.76\text{ms}$$

$$\text{3-DH3 time slot} = 1.692 * (1600 / (4 * 79)) * 31.6 = 270.72\text{ms}$$

$$\text{3-DH5 time slot} = 2.944 * (1600 / (6 * 79)) * 31.6 = 314.03\text{ms}$$

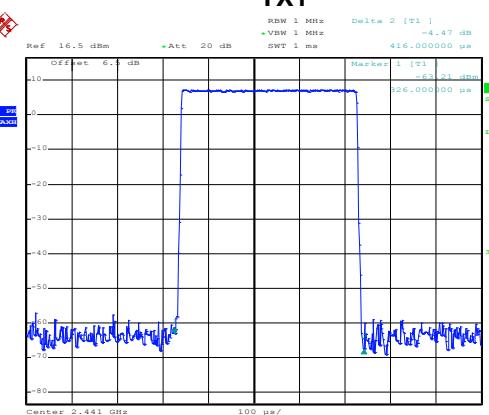
Test plot as follows:

**TX0**



**GFSK**

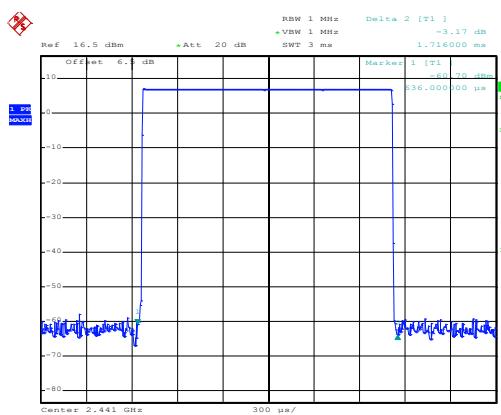
**TX1**



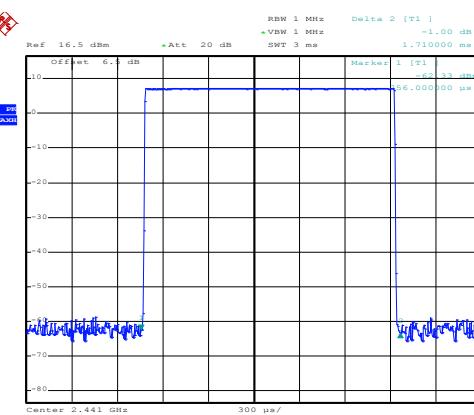
Date: 7.JUL.2017 08:54:19

Date: 2.JUL.2017 14:30:05

**DH1**



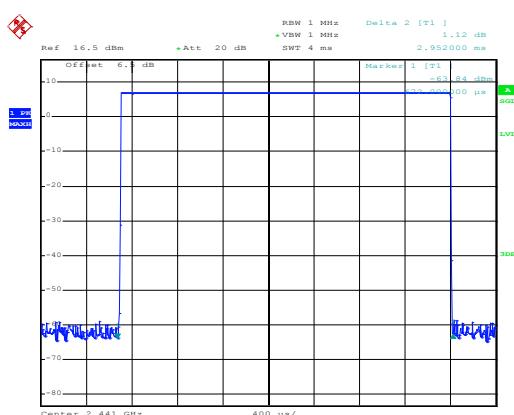
**DH1**



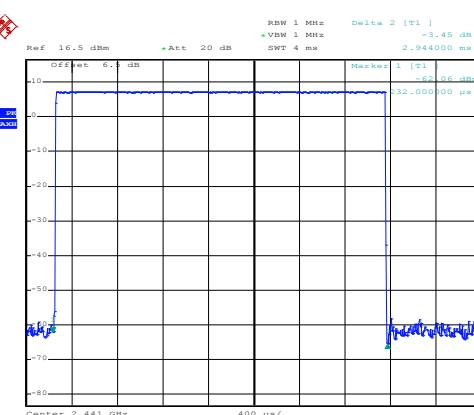
Date: 7.JUL.2017 08:55:01

Date: 2.JUL.2017 14:31:07

**DH3**



**DH3**



Date: 7.JUL.2017 08:55:43

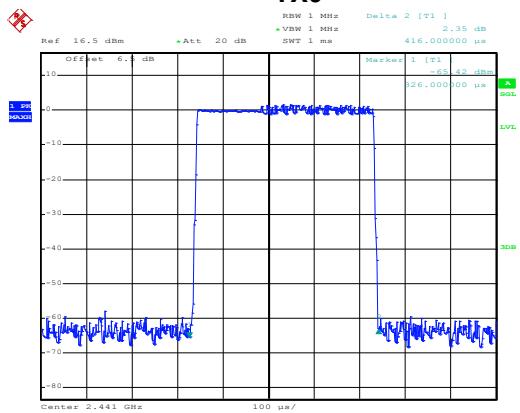
Date: 2.JUL.2017 14:32:04

**DH5**

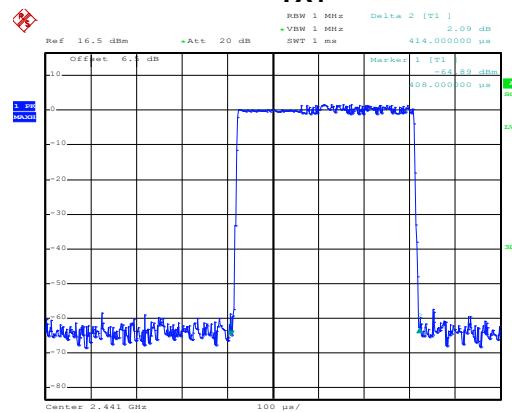
**DH5**

## $\pi/4$ -DQPSK

**TX0**



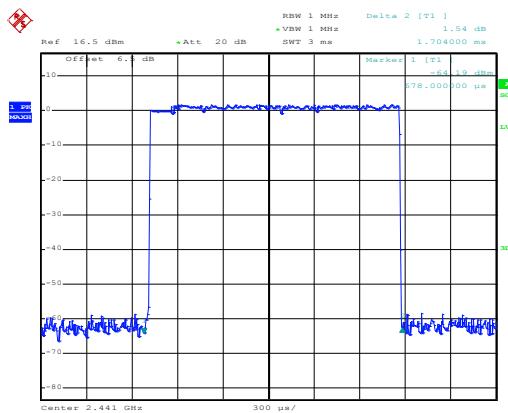
**TX1**



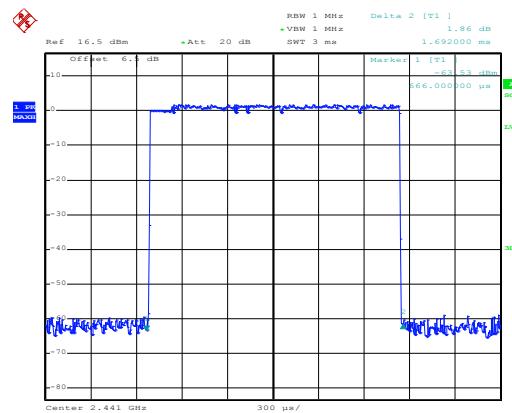
Date: 7.JUL.2017 08:56:42

Date: 2.JUL.2017 15:46:45

**2-DH1**



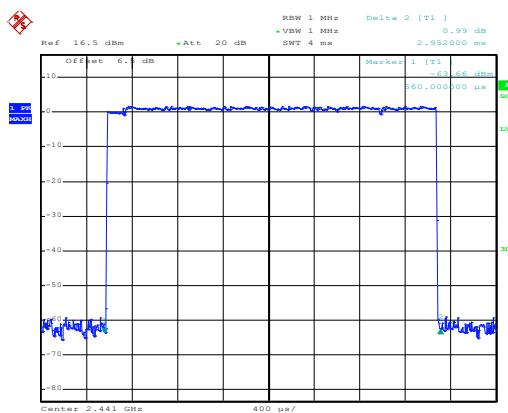
**2-DH1**



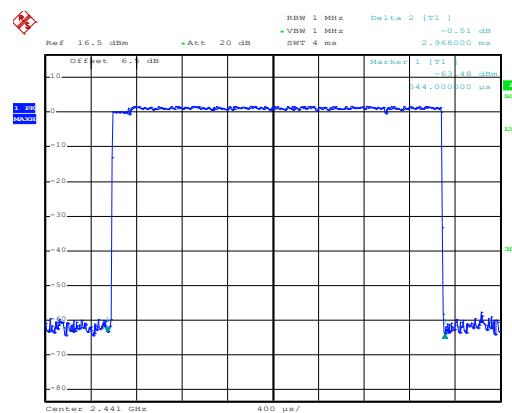
Date: 7.JUL.2017 08:57:19

Date: 2.JUL.2017 15:47:16

**2-DH3**



**2-DH3**



Date: 7.JUL.2017 08:57:59

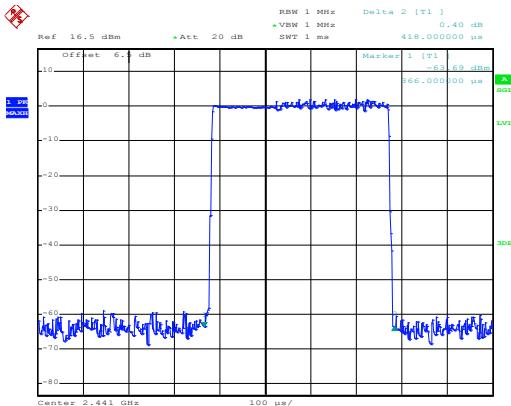
Date: 2.JUL.2017 15:48:07

**2-DH5**

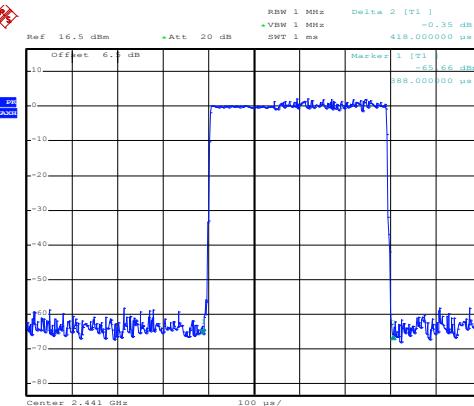
**2-DH5**

## 8DPSK

### TX0

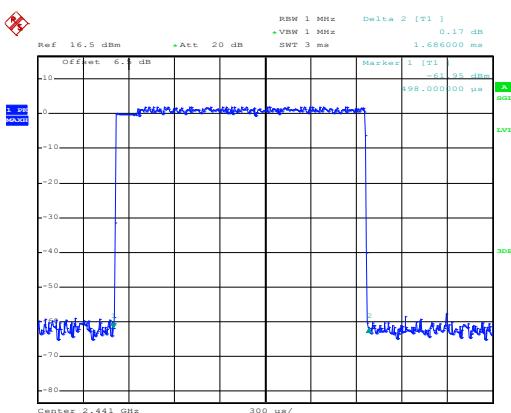


### TX1



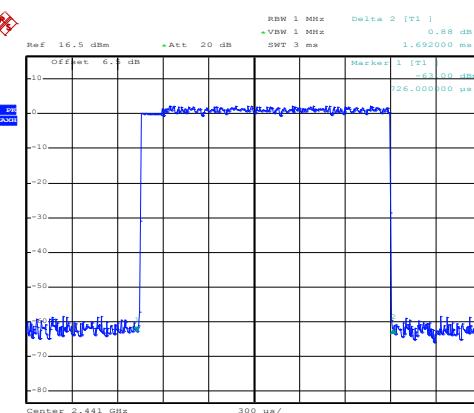
Date: 7.JUL.2017 08:58:48

### 3-DH1



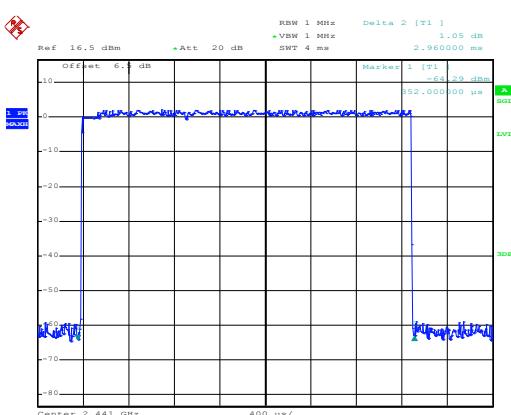
Date: 2.JUL.2017 15:48:59

### 3-DH1



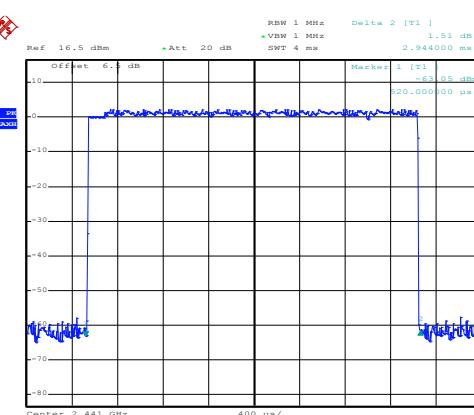
Date: 7.JUL.2017 08:59:37

### 3-DH3



Date: 2.JUL.2017 15:49:48

### 3-DH3



Date: 7.JUL.2017 09:00:38

### 3-DH5

Date: 2.JUL.2017 15:50:25

### 3-DH5

## 6.8 Pseudorandom Frequency Hopping Sequence

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

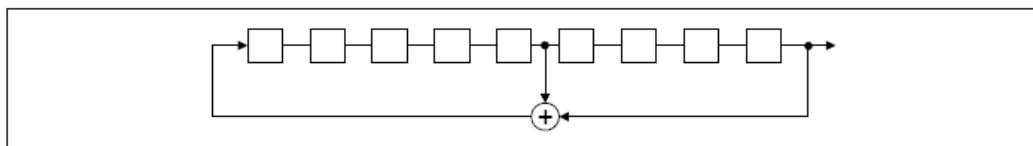
*Frequency hopping systems shall have hopping channel carrier frequencies separated by a minimum of 25 kHz or the 20 dB bandwidth of the hopping channel, whichever is greater.*

*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**

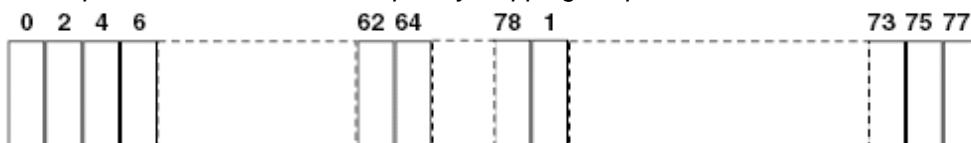
*The pseudorandom sequence may be generated in a nine-stage shift register whose 5th and 9th stage outputs are added in a modulo-two addition stage. And the result is fed back to the input of the first stage. The sequence begins with the first ONE of 9 consecutive ONEs; i.e. the shift register is initialized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

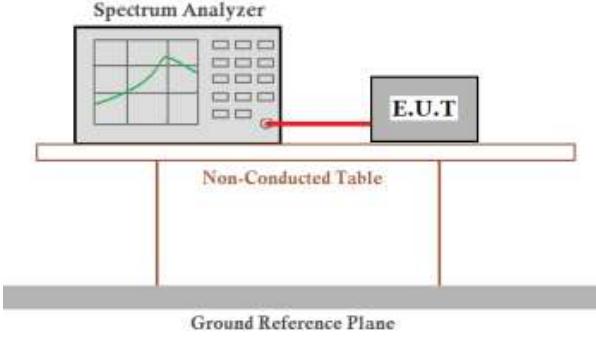


*Each frequency used equally on the average by each transmitter.*

*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.*

## 6.9 Band Edge

### 6.9.1 Conducted Emission Method

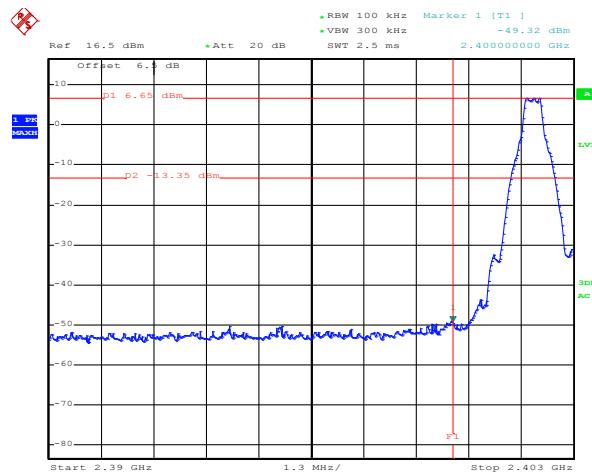
Test Requirement:	FCC Part 15 C Section 15.247 (d)
Test Method:	ANSI C63.10:2013 and DA00-705
Receiver setup:	RBW=100 kHz, VBW=300 kHz, Detector=Peak
Limit:	In any 100 kHz bandwidth outside the frequency band in which the spread spectrum intentional radiator is operating, the radio frequency power that 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 5.7 for details
Test mode:	Non-hopping mode and hopping mode
Test results:	Pass

Test plot as follows:

**TX0**

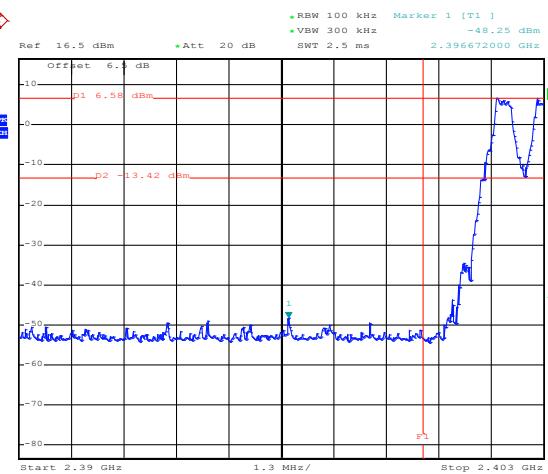
### GFSK

#### Lowest Channel



Date: 6.JUL.2017 21:43:08

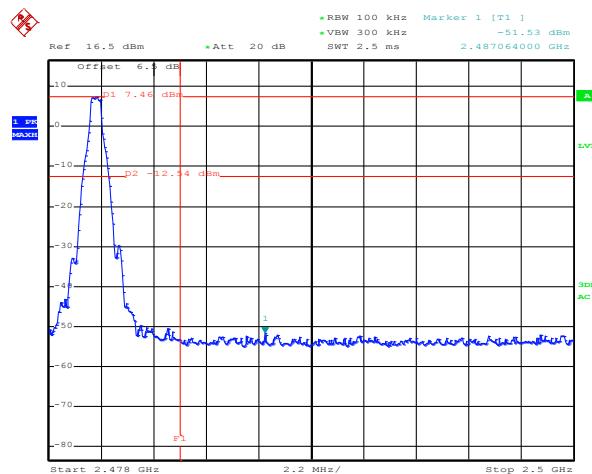
No-hopping mode



Date: 6.JUL.2017 21:44:50

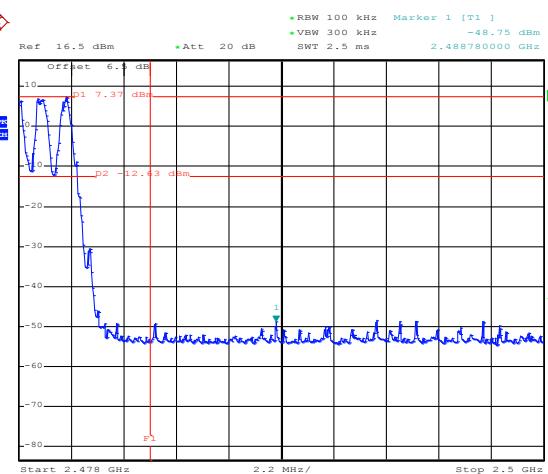
Hopping mode

#### Highest Channel



Date: 6.JUL.2017 21:52:08

No-hopping mode

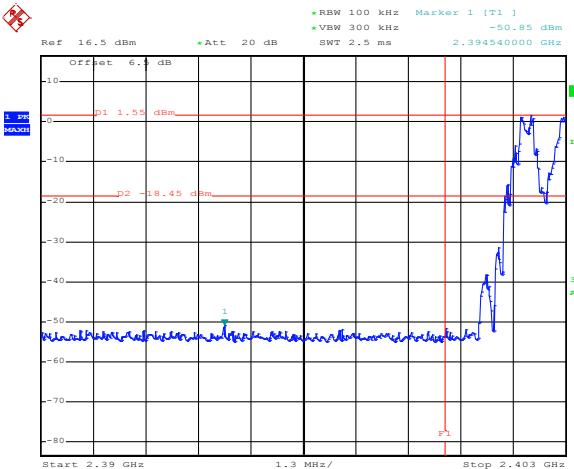
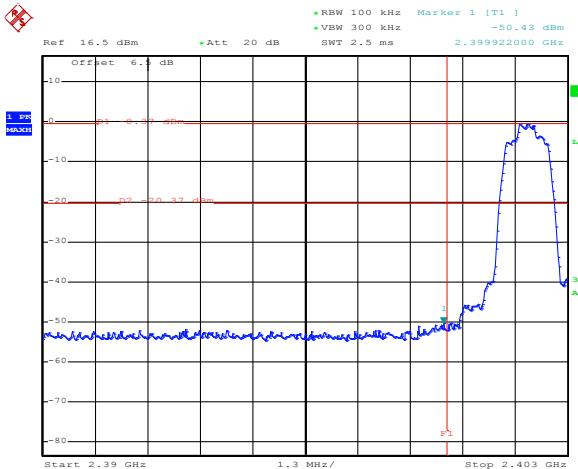


Date: 6.JUL.2017 21:53:45

Hopping mode

## $\pi/4$ -DQPSK

### Lowest Channel



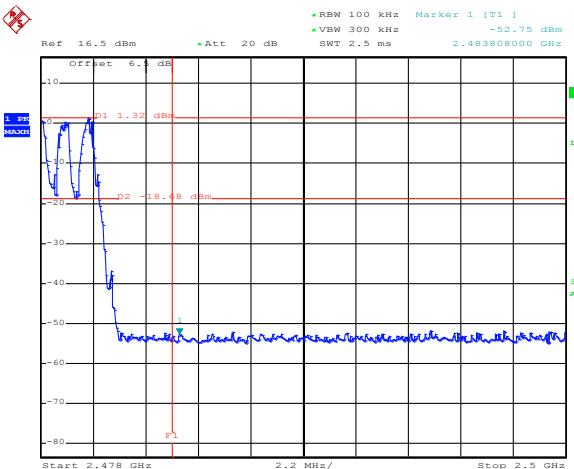
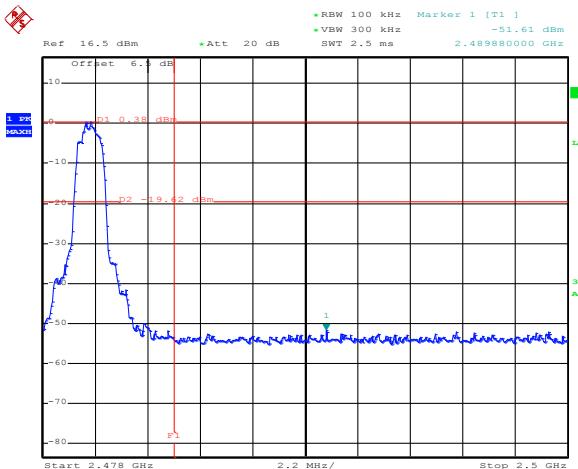
Date: 6.JUL.2017 21:46:04

No-hopping mode

Date: 6.JUL.2017 21:47:10

Hopping mode

### Highest Channel



Date: 6.JUL.2017 21:54:47

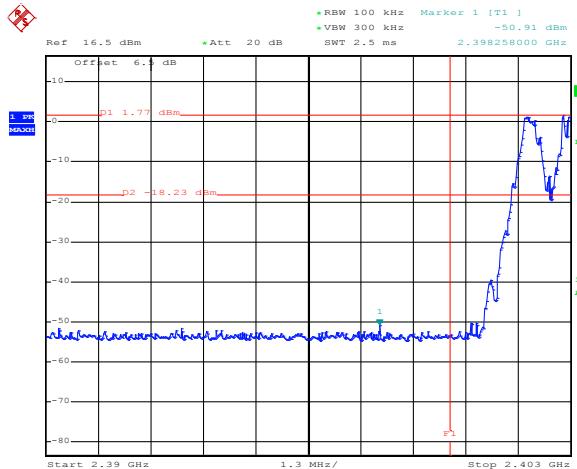
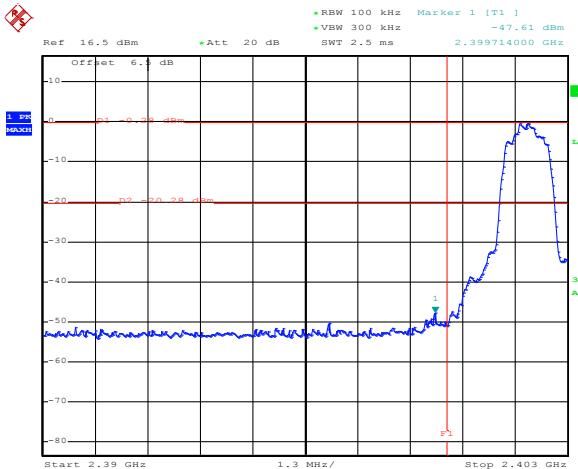
No-hopping mode

Date: 6.JUL.2017 21:56:40

Hopping mode

## 8DPSK

### Lowest Channel



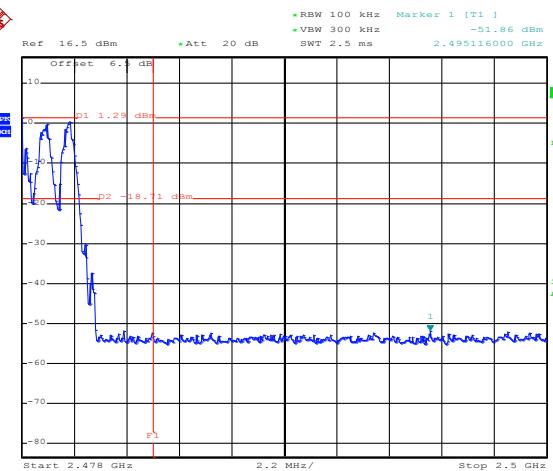
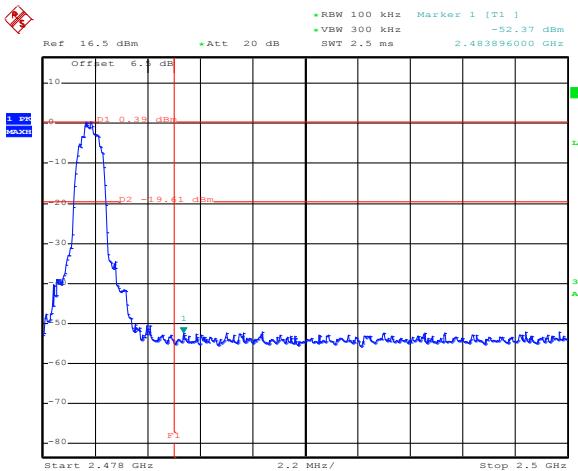
Date: 6.JUL.2017 21:49:44

No-hopping mode

Date: 6.JUL.2017 21:50:57

Hopping mode

### Highest Channel



Date: 6.JUL.2017 21:57:55

No-hopping mode

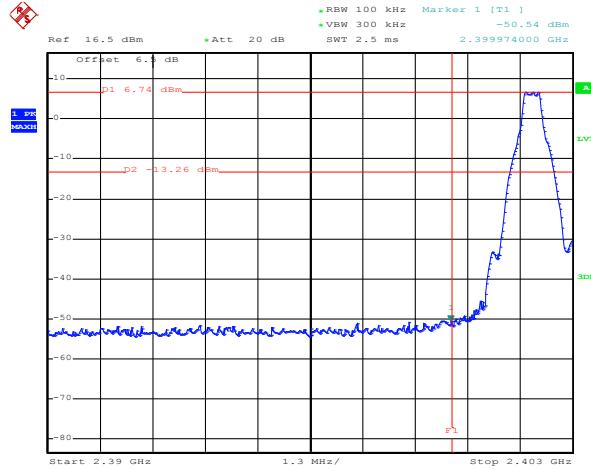
Date: 6.JUL.2017 21:59:33

Hopping mode

TX1

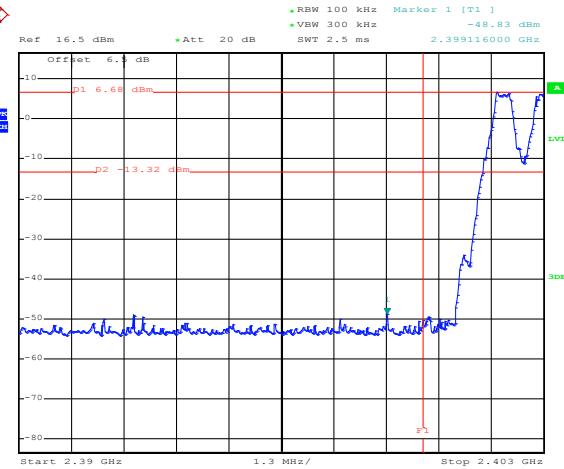
## GFSK

### Lowest Channel



Date: 2.JUL.2017 14:16:45

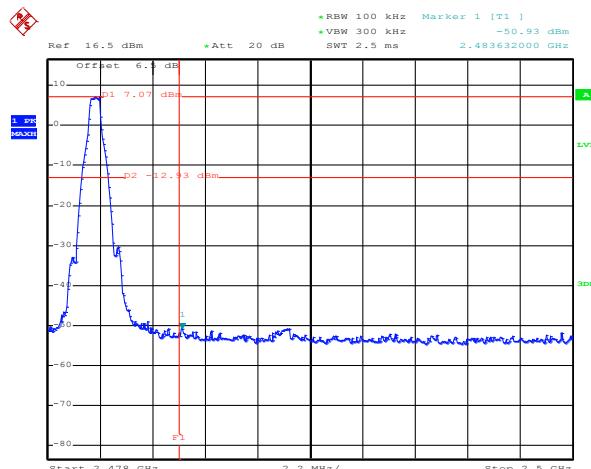
No-hopping mode



Date: 2.JUL.2017 14:18:58

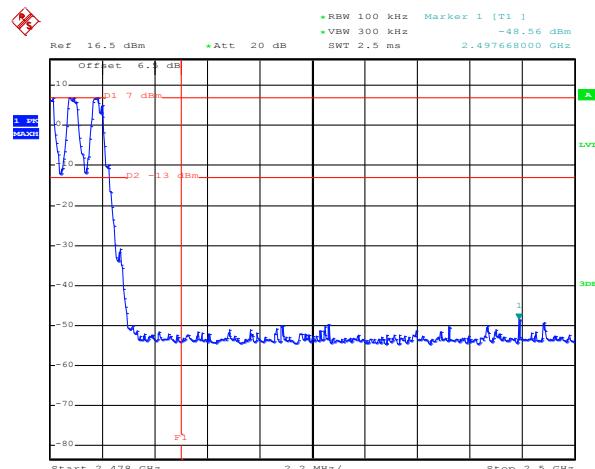
Hopping mode

### Highest Channel



Date: 2.JUL.2017 14:13:52

No-hopping mode

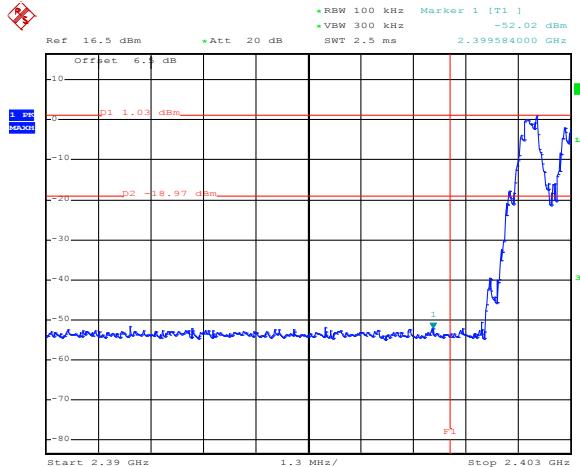
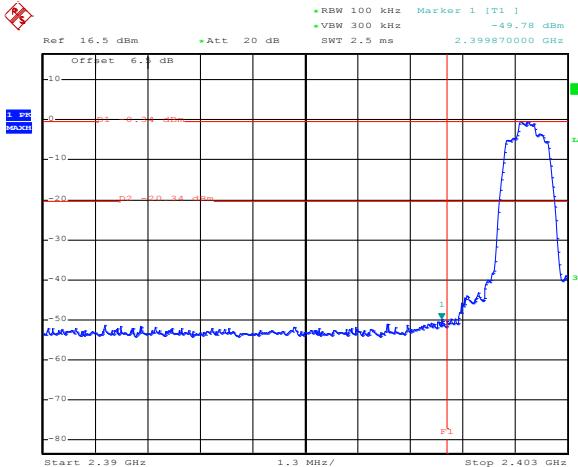


Date: 2.JUL.2017 14:15:30

Hopping mode

## $\pi/4$ -DQPSK

### Lowest Channel



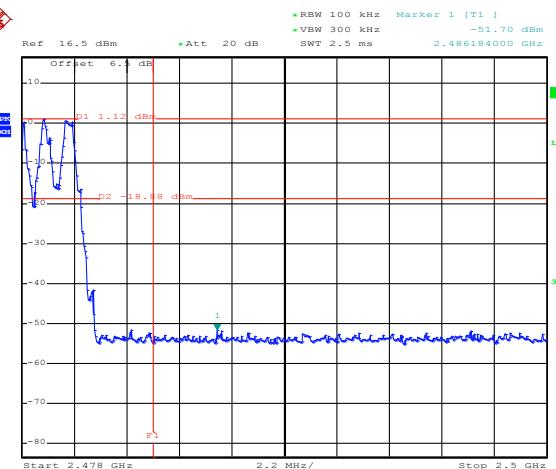
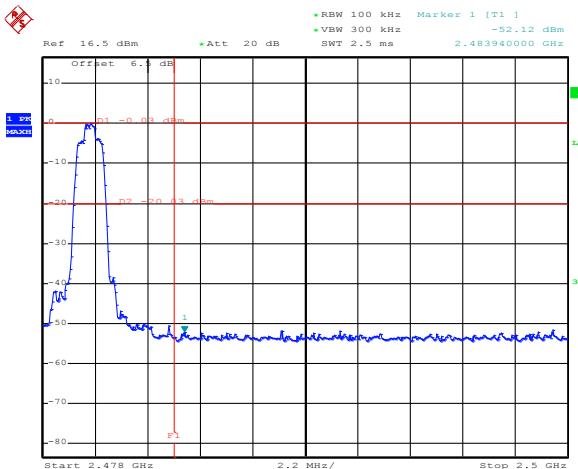
Date: 2.JUL.2017 14:59:37

No-hopping mode

Date: 2.JUL.2017 15:22:04

Hopping mode

### Highest Channel



Date: 2.JUL.2017 15:24:43

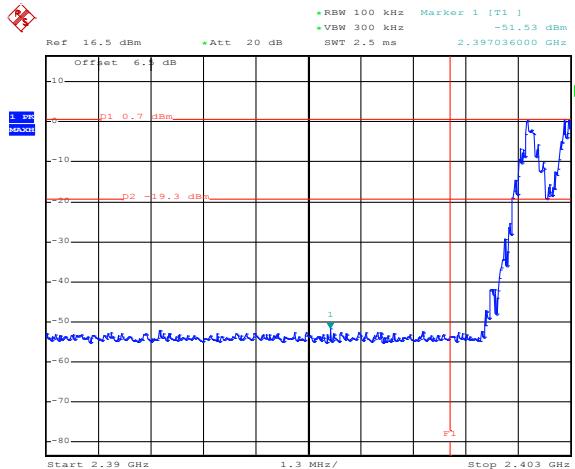
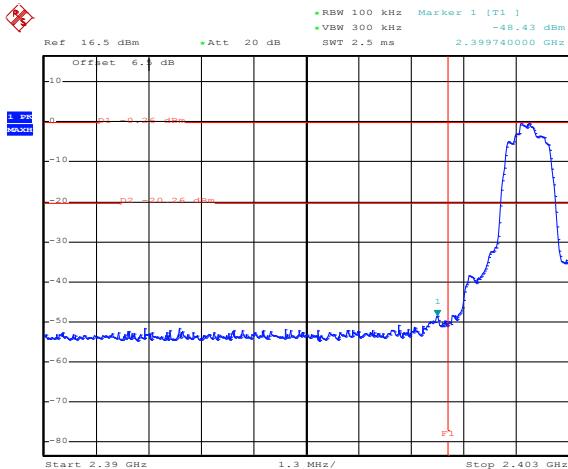
No-hopping mode

Date: 2.JUL.2017 15:26:28

Hopping mode

## 8DPSK

### Lowest Channel



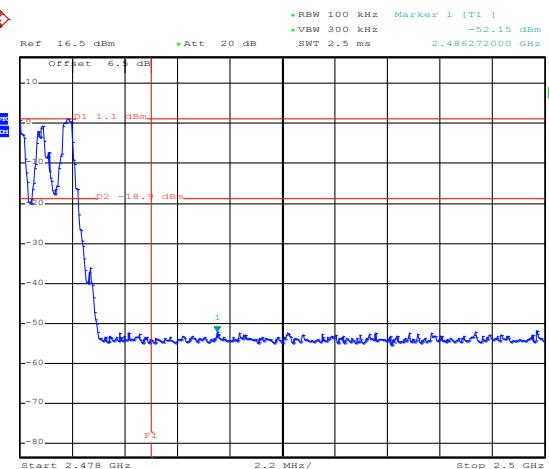
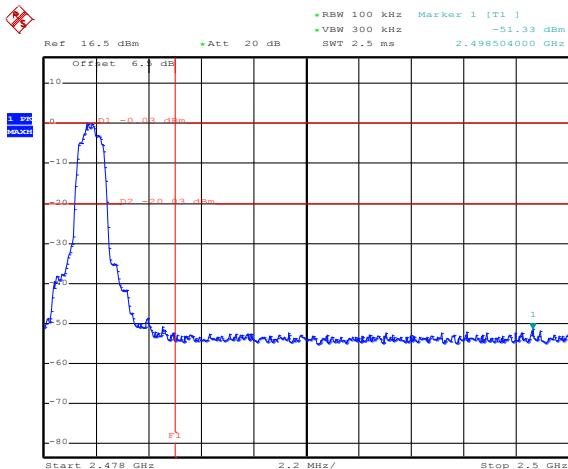
Date: 2.JUL.2017 15:28:04

No-hopping mode

Date: 2.JUL.2017 15:29:01

Hopping mode

### Highest Channel



Date: 2.JUL.2017 15:30:14

No-hopping mode

Date: 2.JUL.2017 15:32:08

Hopping mode

### 6.9.2 Radiated Emission Method

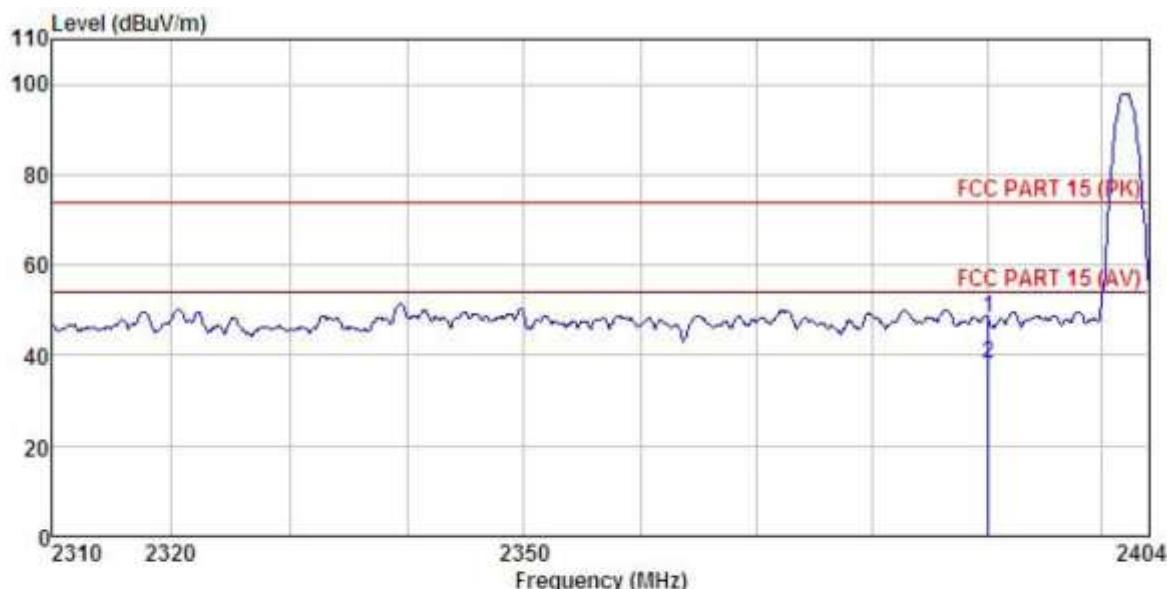
Test Requirement:	FCC Part 15 C Section 15.209 and 15.205								
Test Method:	ANSI C63.10: 2013								
Test Frequency Range:	2.3GHz to 2.5GHz								
Test site:	Measurement Distance: 3m								
Receiver setup:	Frequency	Detector	RBW	VBW	Remark				
	Above 1GHz	Peak	1MHz	3MHz	Peak Value				
		RMS	1MHz	3MHz	Average Value				
Limit:	Frequency	Limit (dBuV/m @ 3m)		Remark					
	Above 1GHz	54.00		Average Value					
		74.00		Peak Value					
Test setup:									
Test Procedure:	<ol style="list-style-type: none"> <li>The EUT was placed on the top of a rotating table 1.5 meters above the ground at a 3 meter camber. The table was rotated 360 degrees to determine the position of the highest radiation.</li> <li>The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.</li> <li>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.</li> <li>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.</li> <li>The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.</li> <li>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.</li> </ol>								
Test Instruments:	Refer to section 5.7 for details								
Test mode:	Non-hopping mode								
Test results:	Passed								

#### Remark:

- During the test, pre-scan the GFSK, π/4-DQPSK, 8DPSK, and all data were shown in report.
- Pre-scan all kind of the place mode (X-axis, Y-axis, Z-axis), and found the Y-axis is the worst case.

**TX0****GFSK mode****Test channel: Lowest**

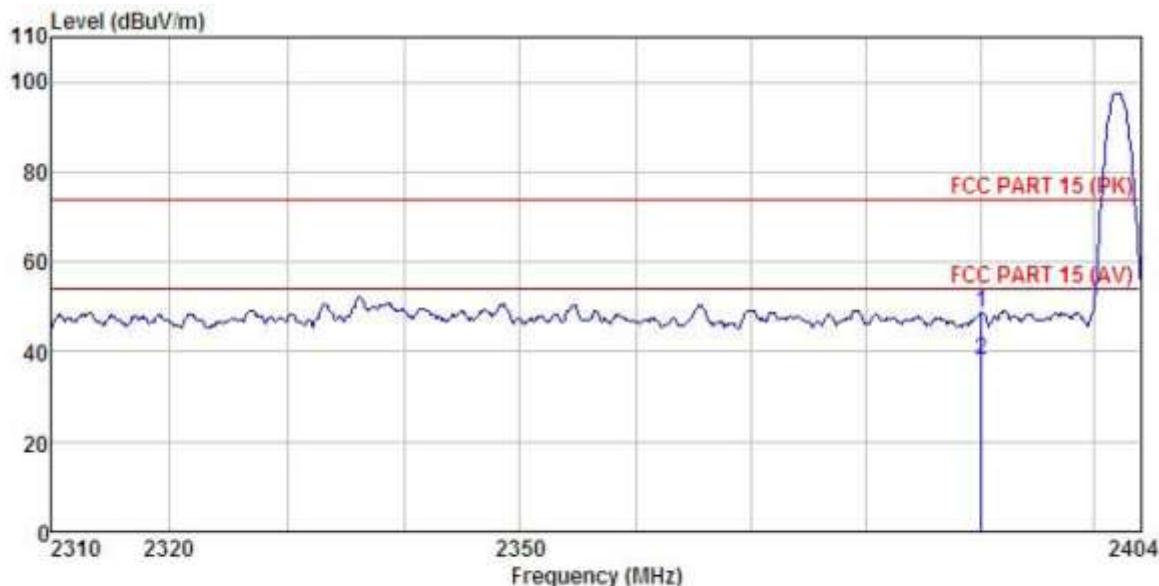
Horizontal:



Site : 3m chamber  
Condition : FCC PART 15 (PK) 3m BBHA9120(1G18G) HORIZONTAL  
EUT : WiFi Media Streaming Module  
Model : LS9AD-AC11DBT  
Test mode : DH1-L Mode  
Power Rating : AC 120V/60Hz  
Environment : Temp:25.5°C Huni:55%  
Test Engineer: YT  
REMARK : CON-1

Freq	ReadAntenna		Cable		Preamp	Limit	Over	Remark
	Level	Factor	Loss	Factor				
MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
1 2390.000	18.20	25.45	4.69	0.00	48.34	74.00	-25.66	Peak
2 2390.000	7.85	25.45	4.69	0.00	37.99	54.00	-16.01	Average

Vertical:

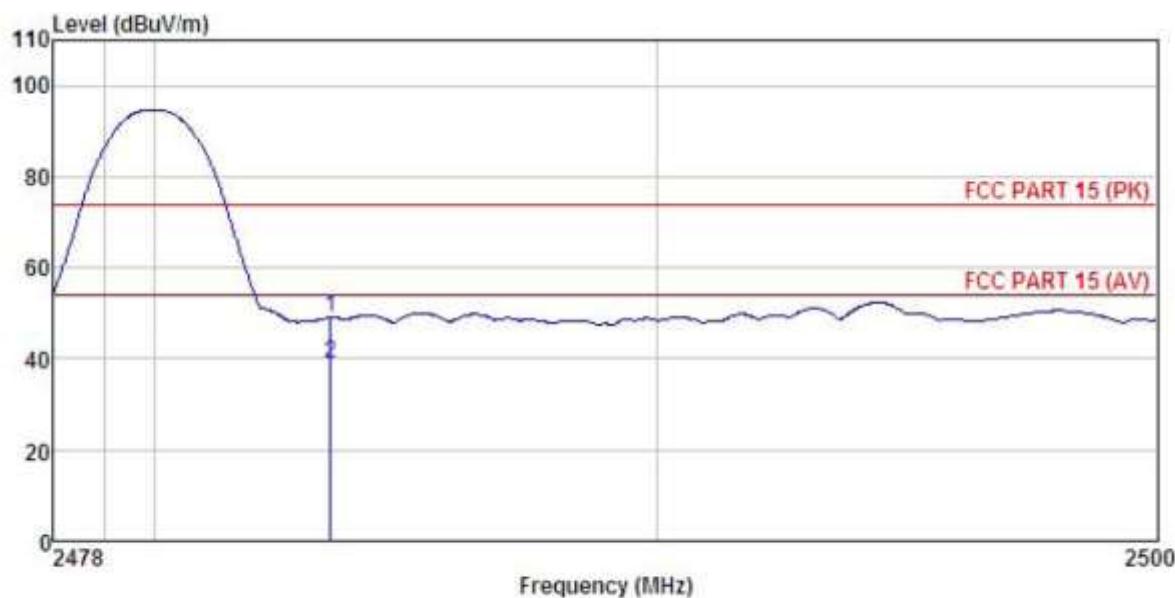


Site : 3m chamber  
Condition : FCC PART 15 (PK) 3m BBHA9120(1G18G) VERTICAL  
EUT : WiFi Media Streaming Module  
Model : LS9AD-AC11DBT  
Test mode : DH1-L Mode  
Power Rating : AC 120V/60Hz  
Environment : Temp:25.5°C Huni:55%  
Test Engineer: YT  
REMARK : CON 1

Freq	ReadAntenna		Cable	Preamp	Limit Level	Over Line Limit	Remark
	Level	Factor	Loss	Factor			
MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB
1 2390.000	18.59	25.45	4.69	0.00	48.73	74.00	-25.27 Peak
2 2390.000	7.82	25.45	4.69	0.00	37.96	54.00	-16.04 Average

**Test channel: Highest**

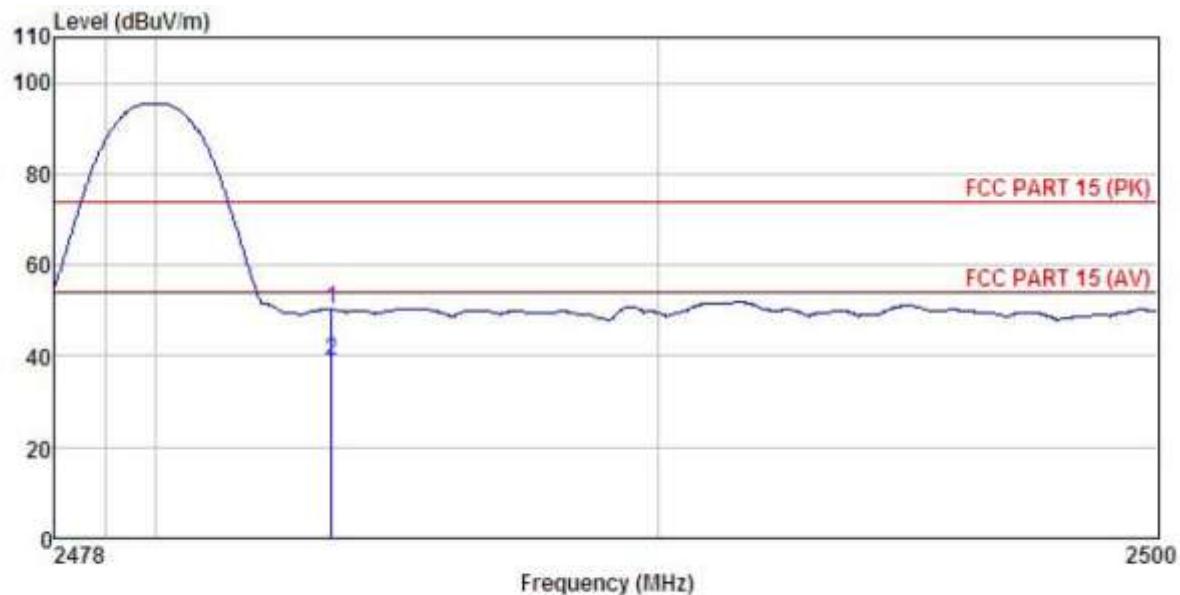
Horizontal:



Site : 3m chamber  
Condition : FCC PART 15 (PK) 3m BBHA9120(1G18G) HORIZONTAL  
EUT : WiFi Media Streaming Module  
Model : LS9AD-AC11DBT  
Test mode : DH1-H Mode  
Power Rating : AC 120V/60Hz  
Environment : Temp:25.5°C Huni:55%  
Test Engineer: YT  
REMARK : CON 1

	ReadAntenna	Cable	Preamp	Limit	Over	
Freq	Level	Factor	Loss	Level	Line	Limit
MHz	dBuV	dB/m	dB	dB	dBuV/m	dB
1	2483.500	18.54	25.66	4.81	0.00	49.01
2	2483.500	8.35	25.66	4.81	0.00	38.82
					74.00	-24.99 Peak
					54.00	-15.18 Average

Vertical:



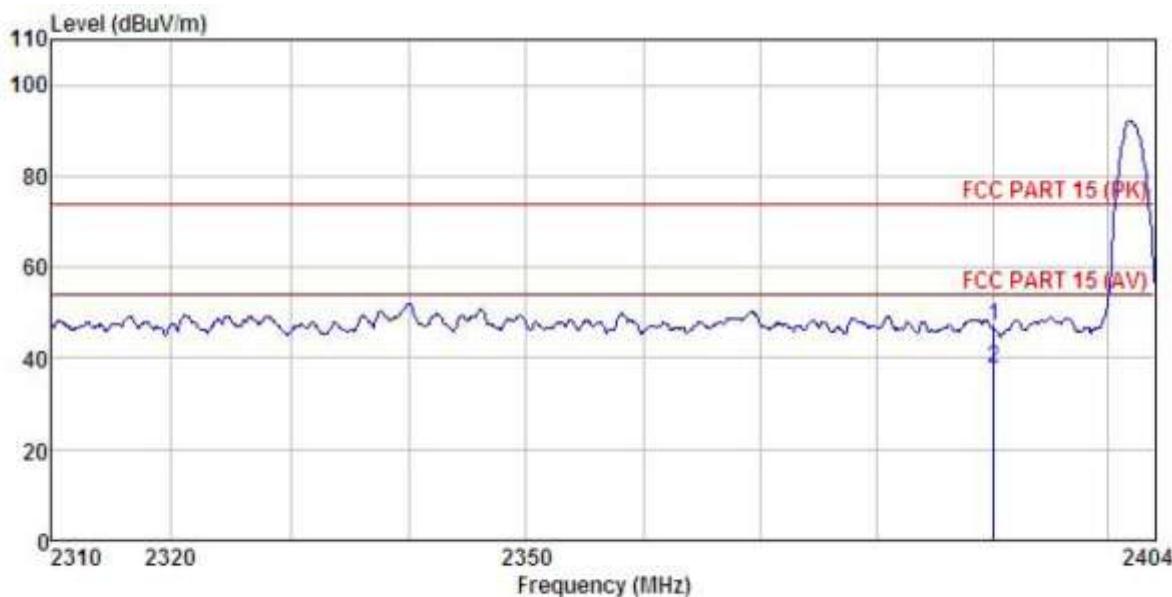
Site : 3m chamber  
Condition : FCC PART 15 (PK) 3m BBHA9120(1G18G) VERTICAL  
EUT : WiFi Media Streaming Module  
Model : LS9AD-AC11DBT  
Test mode : DH1-H Mode  
Power Rating : AC 120V/60Hz  
Environment : Temp:25.5°C Huni:55%  
Test Engineer: YT  
REMARK : CON 1

Freq	ReadAntenna		Cable	Preamp	Limit Level	Limit Line	Over	Remark
	Level	Factor	Loss	Factor				
MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
1 2483.500	19.74	25.66	4.81	0.00	50.21	74.00	-23.79	Peak
2 2483.500	8.59	25.66	4.81	0.00	39.06	54.00	-14.94	Average

$\pi/4$ -DQPSK mode

Test channel: Lowest

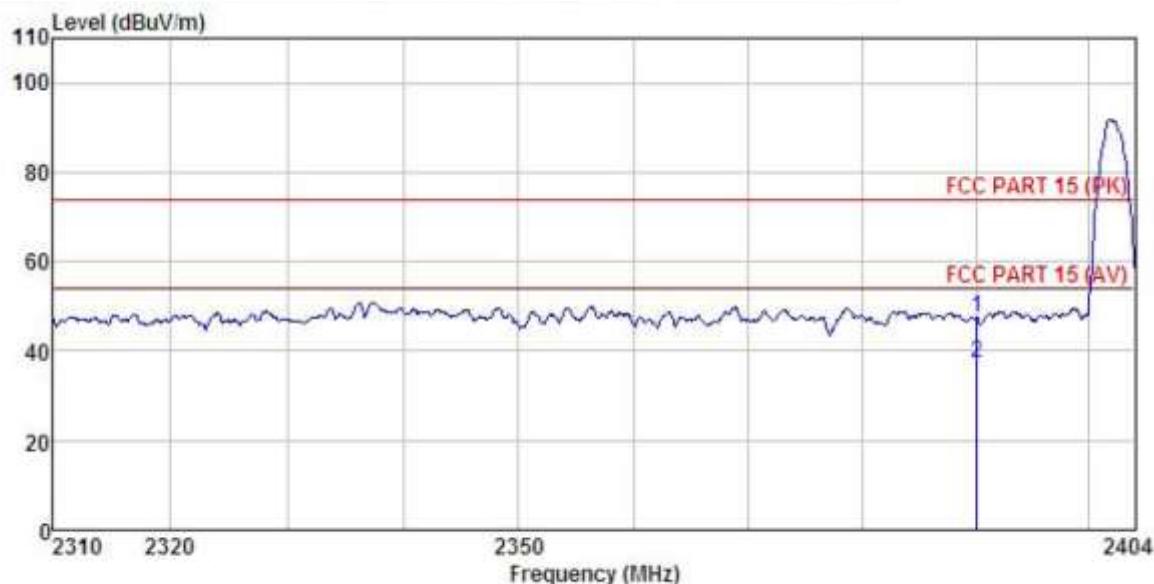
Horizontal:



Site : 3m chamber  
Condition : FCC PART 15 (PK) 3m BBHA9120(1G18G) HORIZONTAL  
EUT : WiFi Media Streaming Module  
Model : LS9AD-AC11DBT  
Test mode : 2DH1-L Mode  
Power Rating : AC 120V/60Hz  
Environment : Temp:25.5'C Humi:55%  
Test Engineer: YT  
REMARK : CON 1

	ReadAntenna	Cable	Preamp	Limit	Over			
Freq	Level	Factor	Loss	Factor	Level	Line	Limit	Remark
MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
1	2390.000	16.86	25.45	4.69	0.00	47.00	74.00	-27.00 Peak
2	2390.000	7.41	25.45	4.69	0.00	37.55	54.00	-16.45 Average

Vertical:

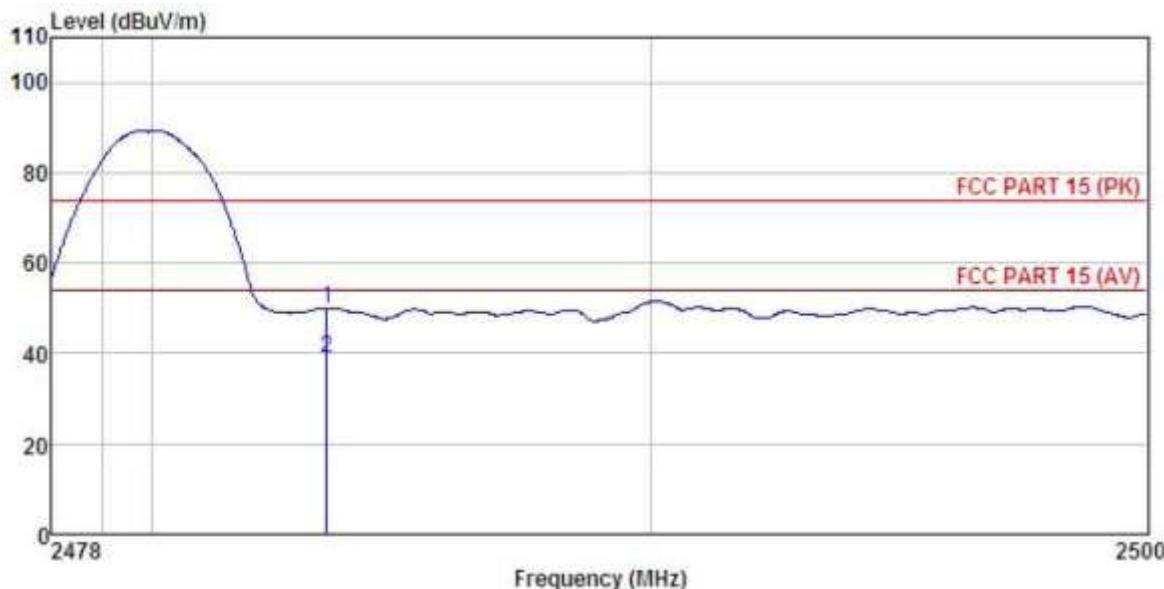


Site : 3m chamber  
Condition : FCC PART 15 (PK) 3m BBHA9120(1G18G) VERTICAL  
EUT : WiFi Media Streaming Module  
Model : LS9AD-AC11DBT  
Test mode : 2DH1-L Mode  
Power Rating : AC 120V/60Hz  
Environment : Temp:25.5°C Humi:55%  
Test Engineer: YT  
REMARK : CON 1

	Read	Antenna	Cable	Preamp	Limit	Over		
Freq	Level	Factor	Loss	Factor	Level	Line	Limit	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB
1	2390.000	17.47	25.45	4.69	0.00	47.61	74.00	-26.39 Peak
2	2390.000	7.26	25.45	4.69	0.00	37.40	54.00	-16.60 Average

**Test channel: Highest**

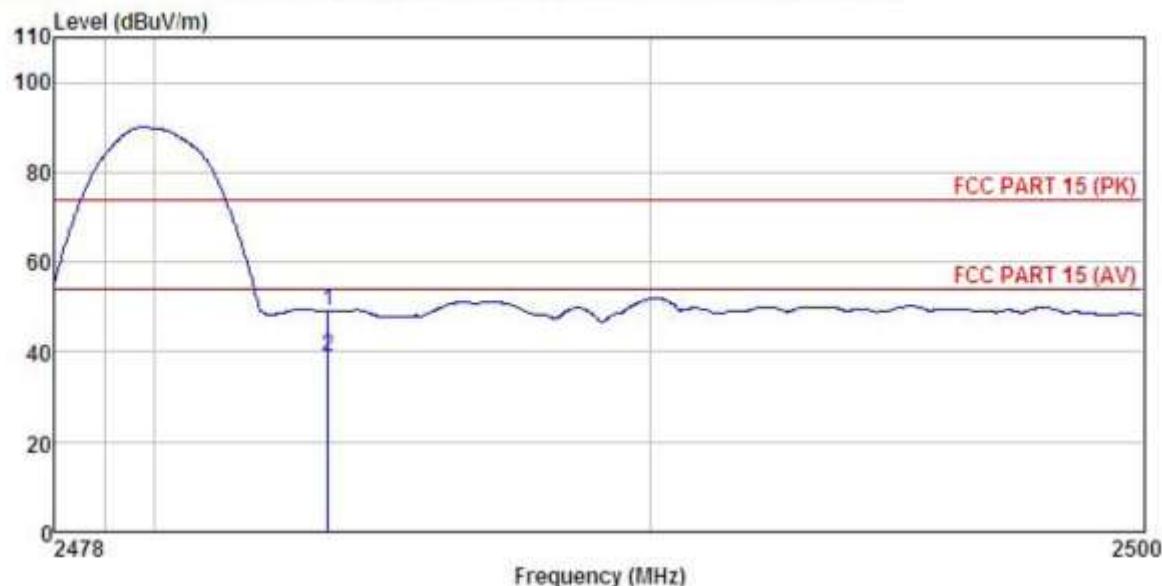
Horizontal:



Site : 3m chamber  
Condition : FCC PART 15 (PK) 3m BBHA9120(1G18G) HORIZONTAL  
EUT : WiFi Media Streaming Module  
Model : LS9AD-AC11DBT  
Test mode : 2DH1-H Mode  
Power Rating : AC 120V/60Hz  
Environment : Temp:25.5'C Huni:55%  
Test Engineer: YT  
REMARK : CON 1

	Read	Antenna	Cable	Preamp	Limit	Over		
Freq	Level	Factor	Loss	Factor	Level	Line	Limit	
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB
1	2483.500	19.29	25.66	4.81	0.00	49.76	74.00	-24.24 Peak
2	2483.500	8.65	25.66	4.81	0.00	39.12	54.00	-14.88 Average

Vertical:

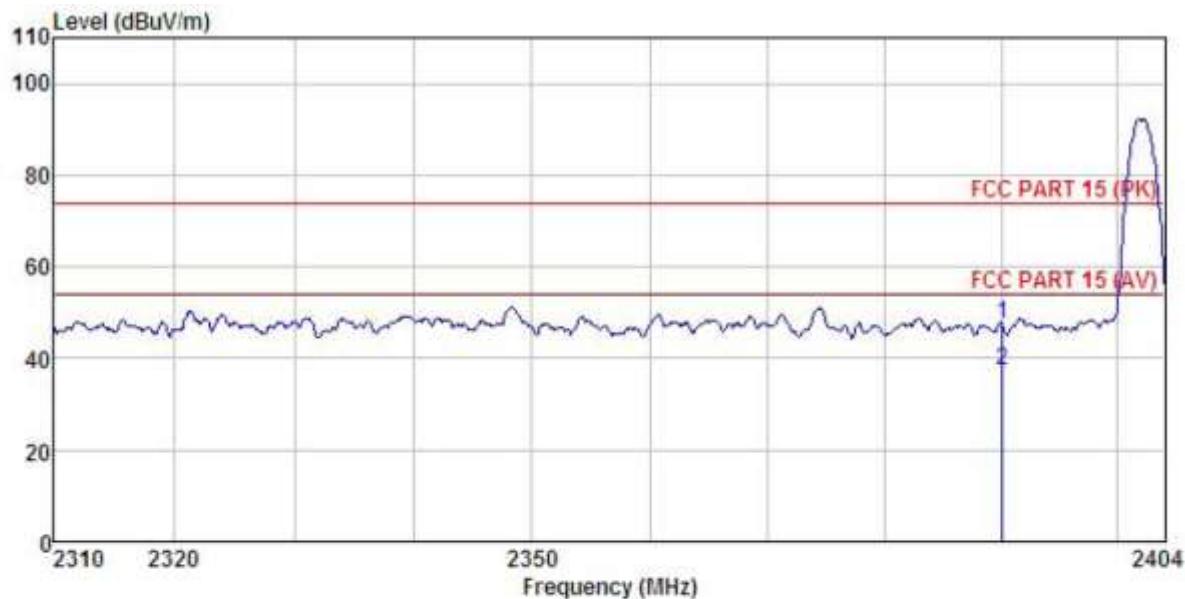


Site : 3m chamber  
Condition : FCC PART 15 (PK) 3m BBHA9120(1G18G) VERTICAL  
EUT : WiFi Media Streaming Module  
Model : LS9AD-AC11DBT  
Test mode : 2DH1-H Mode  
Power Rating : AC 120V/60Hz  
Environment : Temp:25.5°C Huni:55%  
Test Engineer: YT  
REMARK : CON 1

Freq	Read	Antenna	Cable	Preamp	Limit	Over	Remark
	Level	Factor	Loss	Factor			
MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB
1	2483.500	18.58	25.66	4.81	0.00	49.05	74.00 -24.95 Peak
2	2483.500	8.63	25.66	4.81	0.00	39.10	54.00 -14.90 Average

**8DPSK mode****Test channel: Lowest**

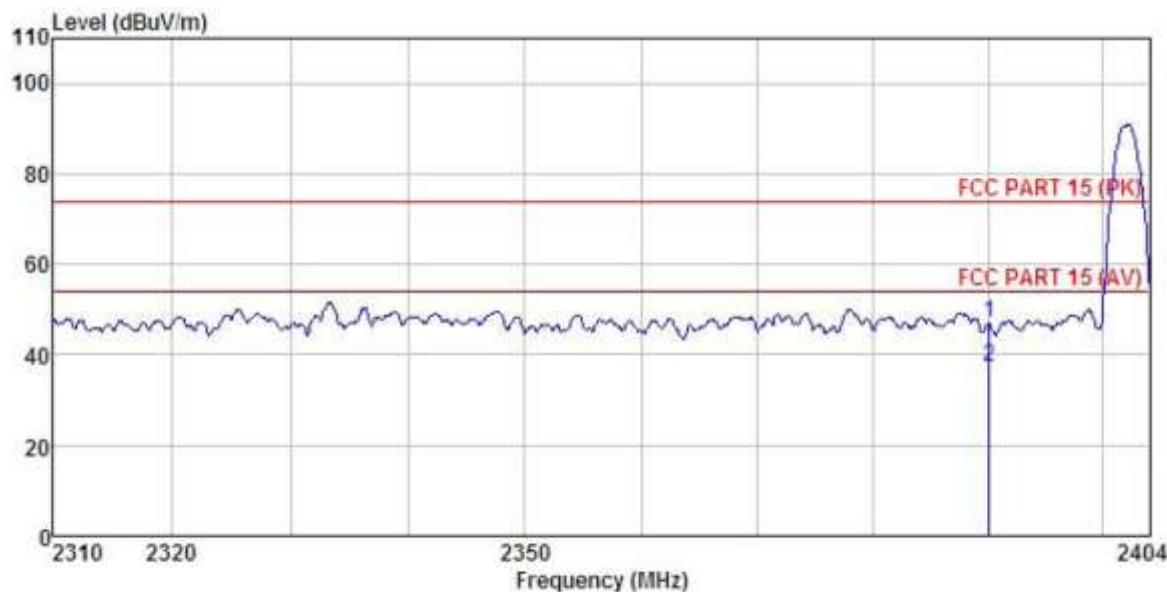
Horizontal:



Site : 3m chamber  
Condition : FCC PART 15 (PK) 3m BBHA9120(1G18G) HORIZONTAL  
EUT : WiFi Media Streaming Module  
Model : LS9AD-AC11DBT  
Test mode : 3DH1-L Mode  
Power Rating : AC 120V/60Hz  
Environment : Temp:25.5°C Huni:55%  
Test Engineer: YT  
REMARK : CON 1

Freq	ReadAntenna		Cable	Preamp	Limit	Over	Remark
	Level	Factor	Loss	Factor			
MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB
1	2390.000	17.52	25.45	4.69	0.00	47.66	74.00 -26.34 Peak
2	2390.000	7.36	25.45	4.69	0.00	37.50	54.00 -16.50 Average

Vertical:

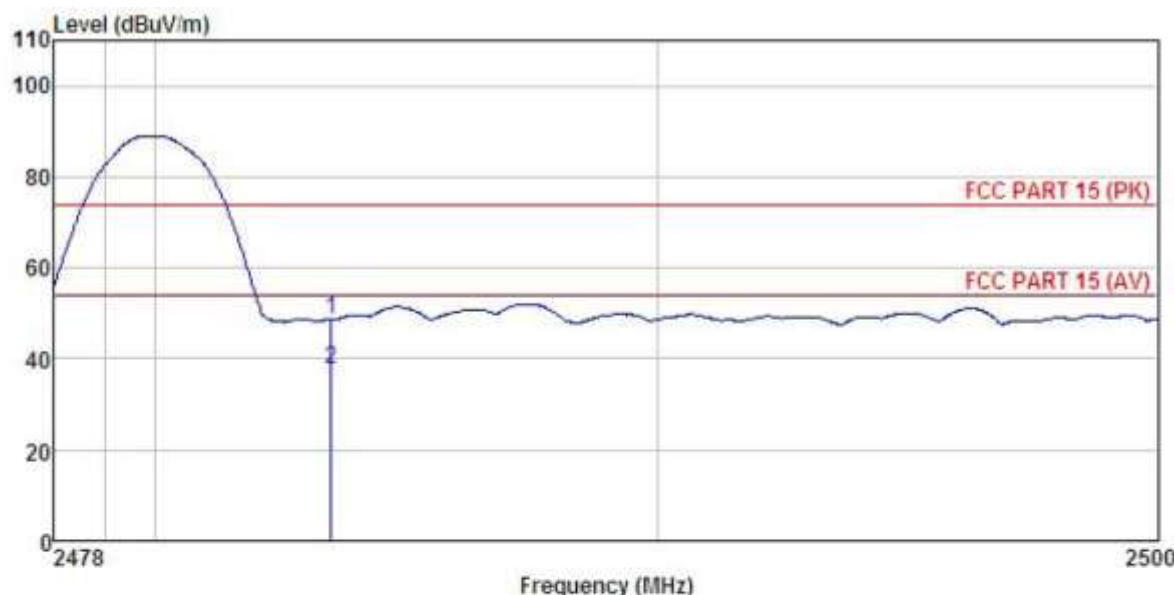


Site : 3m chamber  
Condition : FCC PART 15 (PK) 3m BBHA9120(1G18G) VERTICAL  
EUT : WiFi Media Streaming Module  
Model : LS9AD-AC11DBT  
Test mode : 3DH1-L Mode  
Power Rating : AC 120V/60Hz  
Environment : Temp:25.5°C Huni:55%  
Test Engineer: YT  
REMARK : CON 1

Freq	Read	Antenna	Cable	Preamp	Level	Limit	Over	Remark
	MHz	dBuV	dB/m	dB		dBuV/m	dBuV/m	
1	2390.000	17.00	25.45	4.69	0.00	47.14	74.00	-26.86 Peak
2	2390.000	7.26	25.45	4.69	0.00	37.40	54.00	-16.60 Average

**Test channel: Highest**

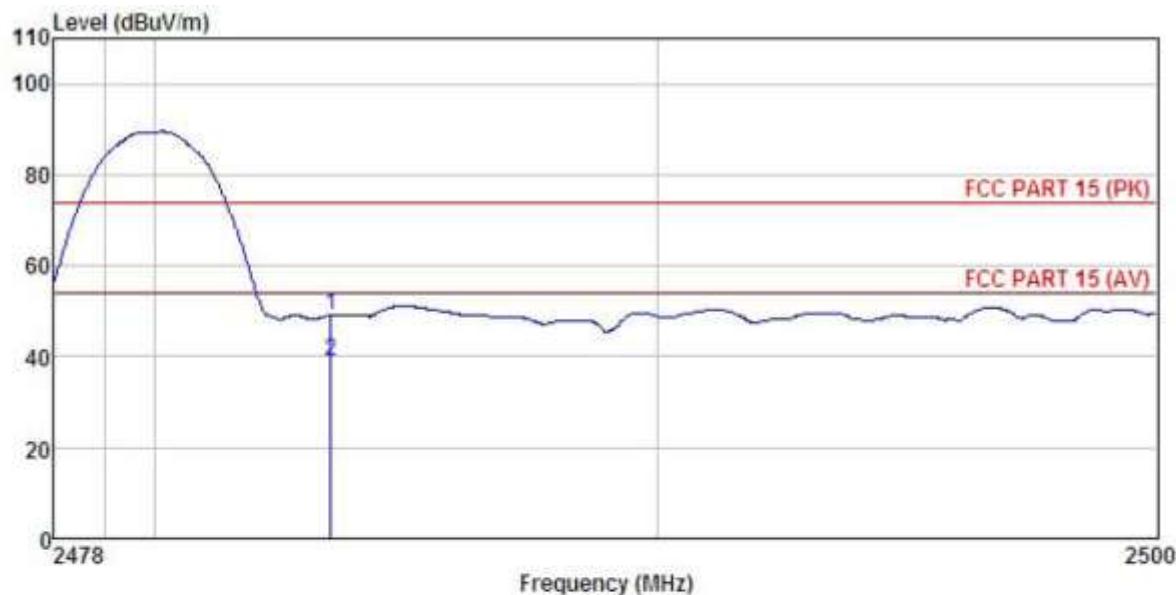
Horizontal:



Site : 3m chamber  
Condition : FCC PART 15 (PK) 3m BBHA9120(1G18G) HORIZONTAL  
EUT : WiFi Media Streaming Module  
Model : LS9AD-AC11DBT  
Test mode : 3DH1-H Mode  
Power Rating : AC 120V/60Hz  
Environment : Temp:25.5°C Huni:55%  
Test Engineer: YI  
REMARK : CON 1

	Read	Antenna	Cable	Preamp	Limit	Over		
Freq	Level	Factor	Loss	Factor	Level	Line	Limit	Remark
MHz	dBuV	dB/a	dB	dB	dBuV/m	dBuV/m	dB	
1	2483.500	18.18	25.66	4.81	0.00	48.65	74.00	-25.35 Peak
2	2483.500	7.34	25.66	4.81	0.00	37.81	54.00	-16.19 Average

Vertical:



Site : 3m chamber  
Condition : FCC PART 15 (PK) 3m BBHA9120(1G18G) VERTICAL  
EUT : WiFi Media Streaming Module  
Model : LS9AD-AC11DBI  
Test mode : 3DH1-H Mode  
Power Rating : AC 120V/60Hz  
Environment : Temp:25.5°C Huni:55%  
Test Engineer: YT  
REMARK : CON 1

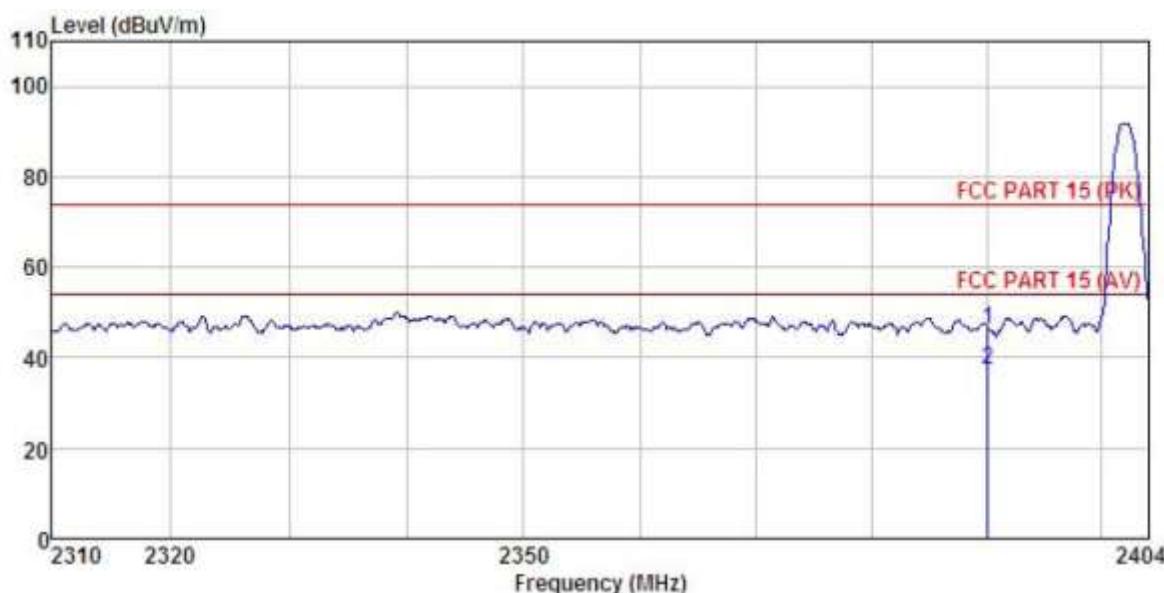
	Read	Antenna	Cable	Preamp	Limit	Over		
Freq	Level	Factor	Loss	Factor	Level	Line	Limit	Remark
MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
1 2483.500	18.61	25.66	4.81	0.00	49.08	74.00	-24.92	Peak
2 2483.500	8.32	25.66	4.81	0.00	38.79	54.00	-15.21	Average

TX1

GFSK mode

Test channel: Lowest

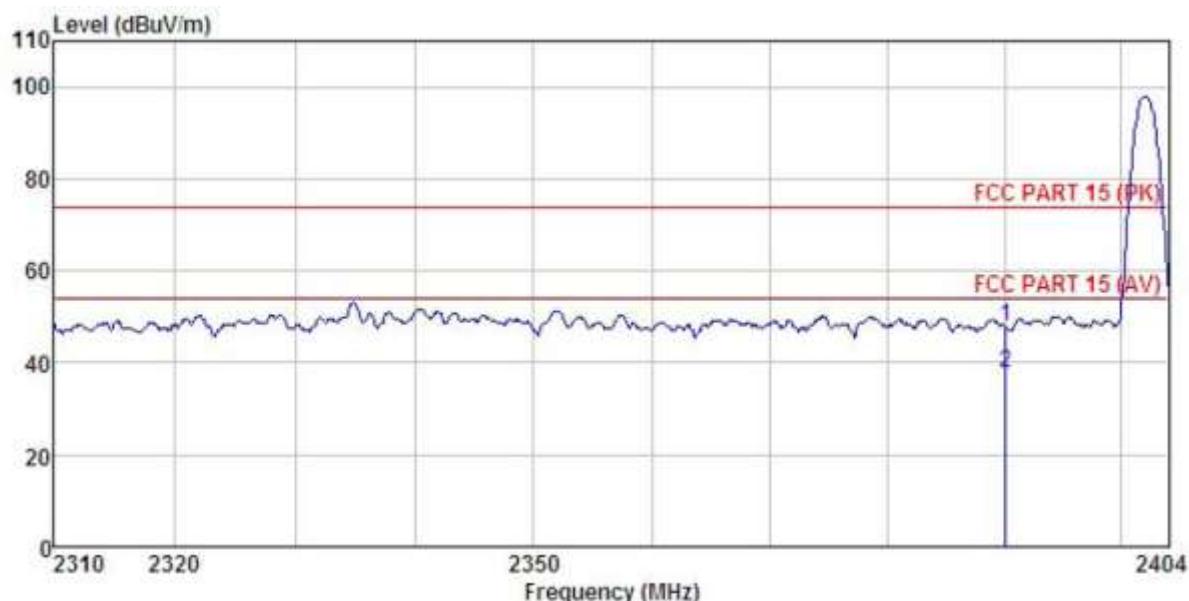
Horizontal:



Site : 3m chamber  
Condition : FCC PART 15 (PK) 3m BBHA9120(1G18G) HORIZONTAL  
EUT : WiFi Media Streaming Module  
Model : LS9AD-AC11DBT  
Test mode : DH1-L Mode  
Power Rating : AC 120V/60Hz  
Environment : Temp:25.5°C Huni:55%  
Test Engineer: YT  
REMARK : CON 2

Freq	Read	Antenna	Cable	Preamp	Limit	Over	Remark
	MHz	Level	Factor	Loss	Factor	Line	
1	2390.000	16.33	25.45	4.69	0.00	46.47	74.00 -27.53 Peak
2	2390.000	7.34	25.45	4.69	0.00	37.48	54.00 -16.52 Average

Vertical:

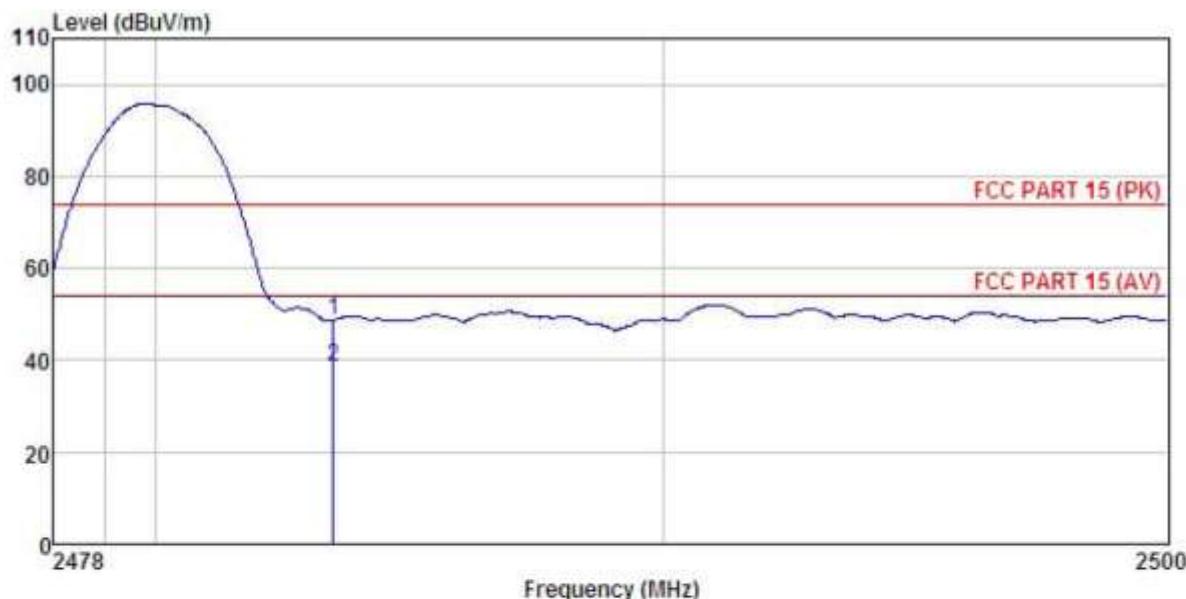


Site : 3m chamber  
Condition : FCC PART 15 (PK) 3m BBHA9120(1G18G) VERTICAL  
EUT : WiFi Media Streaming Module  
Model : LS9AD-AC11DBT  
Test mode : DH1-L Mode  
Power Rating : AC 120V/60Hz  
Environment : Temp:25.5°C Huni:55%  
Test Engineer: YT  
REMARK : CON 2

	Read	Antenna	Cable	Preamp	Limit	Over		
Freq	Level	Factor	Loss	Factor	Level	Line	Limit Remark	
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB
1	2390.000	17.73	25.45	4.69	0.00	47.87	74.00	-26.13 Peak
2	2390.000	7.45	25.45	4.69	0.00	37.59	54.00	-16.41 Average

**Test channel: Highest**

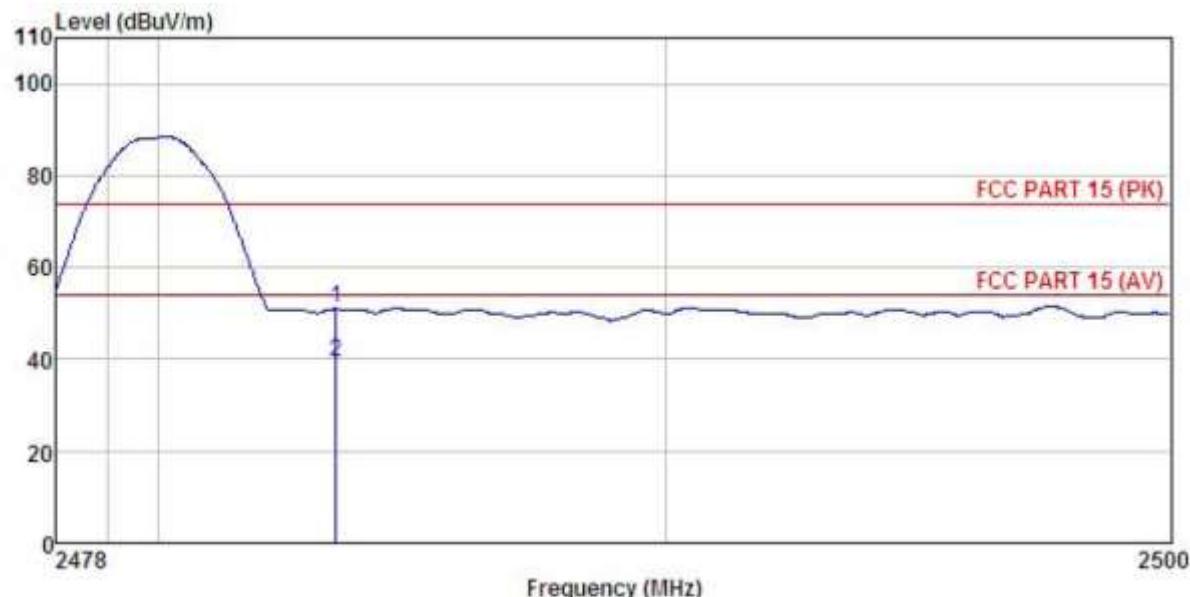
Horizontal:



Site : 3m chamber  
Condition : FCC PART 15 (PK) 3m BBHA9120(1G18G) HORIZONTAL  
EUT : WiFi Media Streaming Module  
Model : LS9AD-AC11DBT  
Test mode : 2DH1-H Mode  
Power Rating : AC 120V/60Hz  
Environment : Temp:25.5°C Huni:55%  
Test Engineer: YT  
REMARK : CON 2

Freq	ReadAntenna		Cable		Preamp Loss Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB/m	dB					
1	2483.500	18.34	25.66	4.81	0.00	48.81	74.00	-25.19	Peak
2	2483.500	8.25	25.66	4.81	0.00	38.72	54.00	-15.28	Average

Vertical:



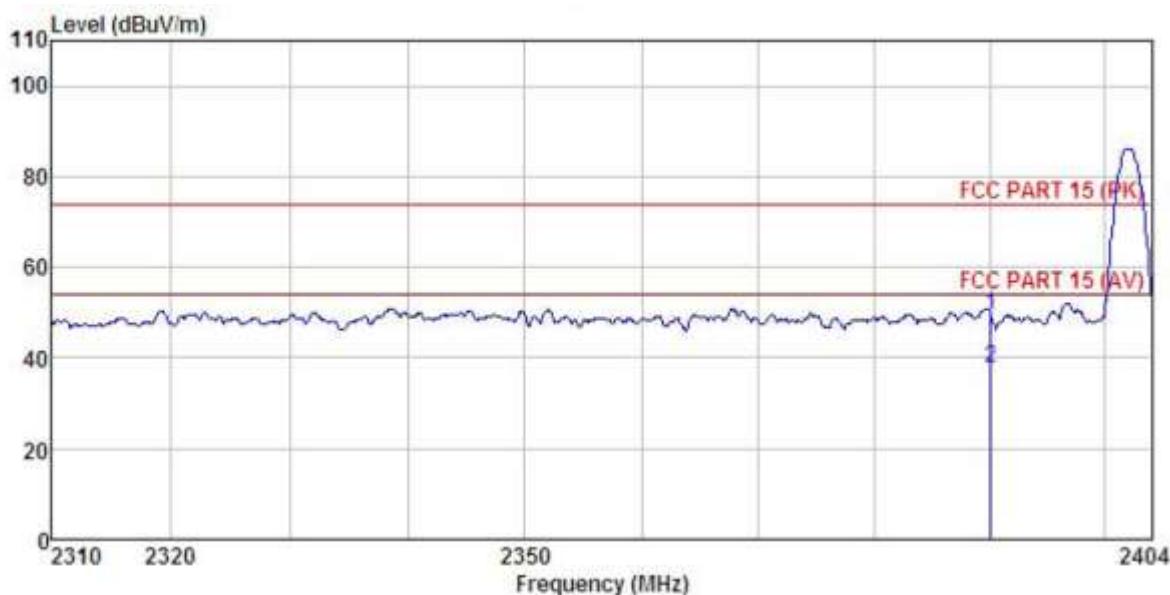
Site : 3m chamber  
Condition : FCC PART 15 (PK) 3m BBHA9120(1G18G) VERTICAL  
EUT : WiFi Media Streaming Module  
Model : LS9AD-AC11DBT  
Test mode : 2DHI-H Mode  
Power Rating : AC 120V/60Hz  
Environment : Temp:25.5°C Huni:55%  
Test Engineer: YT  
REMARK : CON 2

Freq	Read	Antenna	Cable	Preamp	Limit	Over	Remark	
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB
1	2483.500	20.48	25.66	4.81	0.00	50.95	74.00	-23.05 Peak
2	2483.500	8.95	25.66	4.81	0.00	39.42	54.00	-14.58 Average

$\pi/4$ -DQPSK mode

Test channel: Lowest

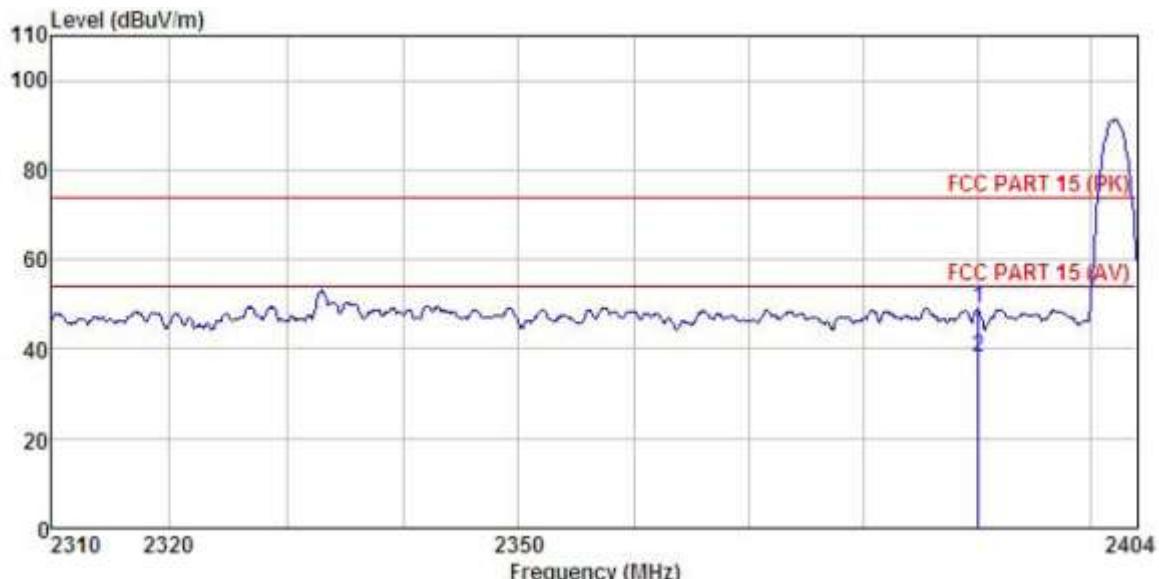
Horizontal:



Site : 3m chamber  
Condition : FCC PART 15 (PK) 3m BBHA9120(1G18G) HORIZONTAL  
EUT : WiFi Media Streaming Module  
Model : LS9AD-AC11DBT  
Test mode : 2DH1-L Mode  
Power Rating : AC 120V/60Hz  
Environment : Temp:25.5°C Huni:55%  
Test Engineer: YT  
REMARK : CON 2

	Read	Antenna	Cable	Preamp	Limit	Over	
Freq	Level	Factor	Loss	Factor	Level	Line	Limit
MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB
1	2390.000	19.50	25.45	4.69	0.00	49.64	74.00 -24.36 Peak
2	2390.000	7.63	25.45	4.69	0.00	37.77	54.00 -16.23 Average

Vertical:

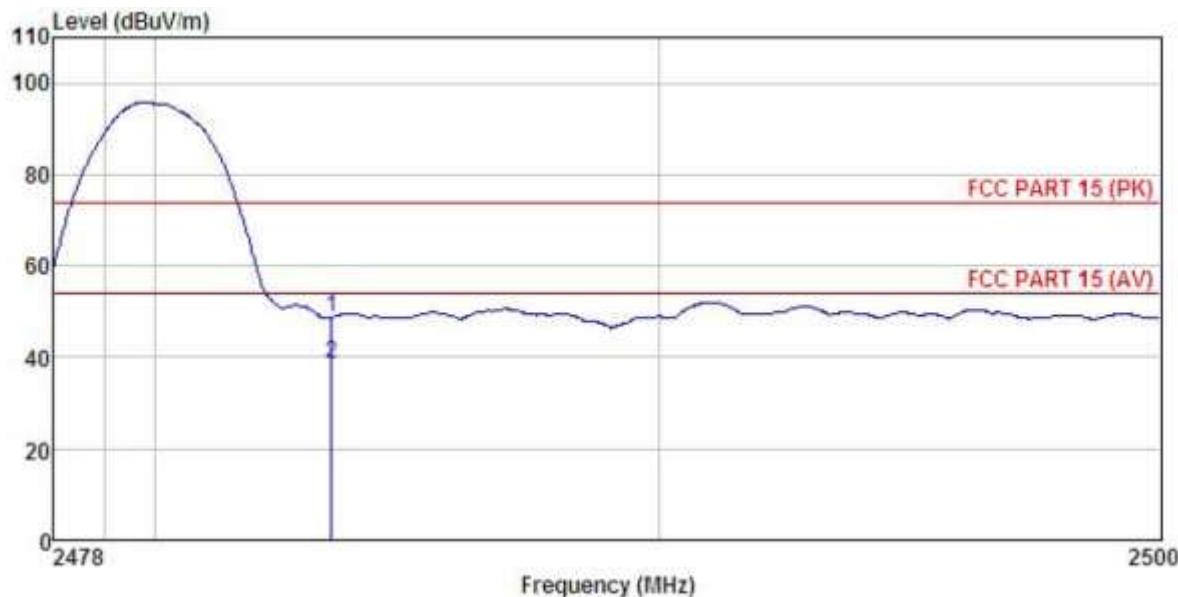


Site : 3m chamber  
Condition : FCC PART 15 (PK) 3m BBHA9120(1G18G) VERTICAL  
EUT : WiFi Media Streaming Module  
Model : LS9AD-AC11DBT  
Test mode : 2DH1-L Mode  
Power Rating : AC 120V/60Hz  
Environment : Temp:25.5°C Humi:55%  
Test Engineer: YT  
REMARK : CON 2

Freq	ReadAntenna		Cable	Preamp	Limit		Over	Remark
	Level	Factor	Loss	Factor	Level	Line	Limit	
MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
1 2390.000	18.88	25.45	4.69	0.00	49.02	74.00	-24.98	Peak
2 2390.000	7.83	25.45	4.69	0.00	37.97	54.00	-16.03	Average

**Test channel: Highest**

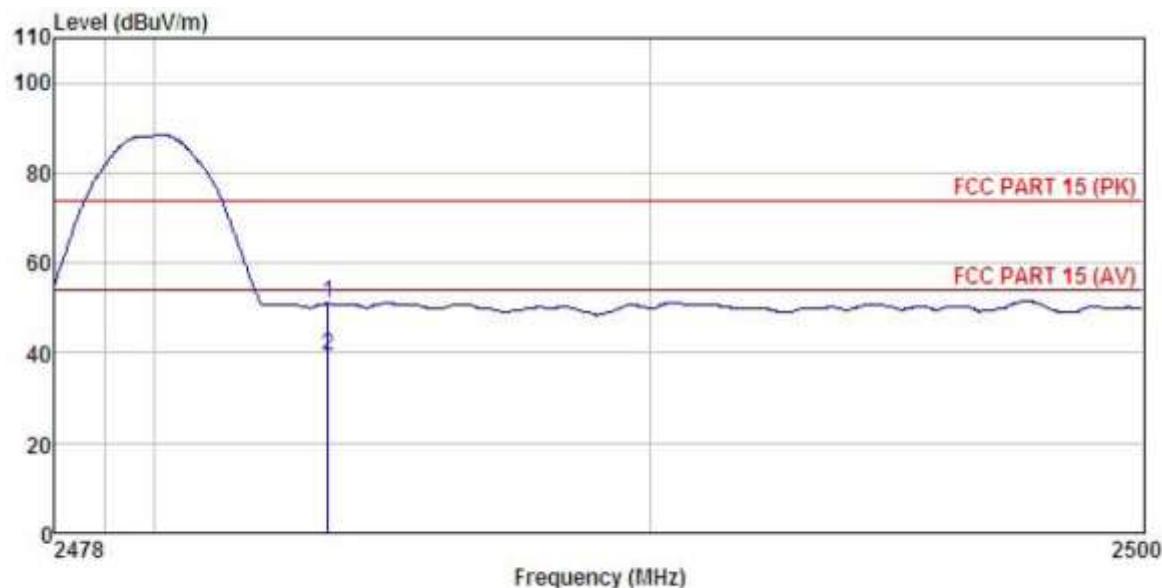
Horizontal:



Site : 3m chamber  
Condition : FCC PART 15 (PK) 3m BBHA9120(1G18G) HORIZONTAL  
EUT : WiFi Media Streaming Module  
Model : LS9AD-AC11DBT  
Test mode : 2DH1-H Mode  
Power Rating : AC 120V/60Hz  
Environment : Temp:25.5°C Humi:55%  
Test Engineer: YI  
REMARK : CON 2

Freq	ReadAntenna		Cable	Preamp	Limit	Over	Remark
	Level	Factor	Loss	Factor			
MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB
1	2483.500	18.34	25.66	4.81	0.00	48.81	74.00 -25.19 Peak
2	2483.500	8.25	25.66	4.81	0.00	38.72	54.00 -15.28 Average

Vertical:

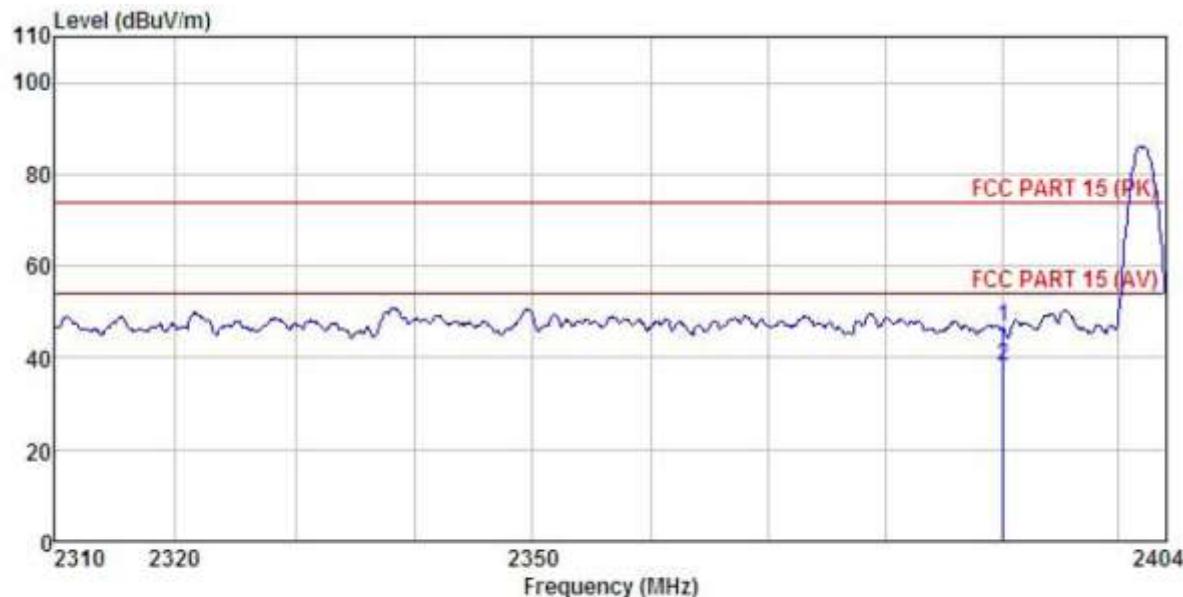


Site : 3m chamber  
Condition : FCC PART 15 (PK) 3m BBHA9120(1G18G) VERTICAL  
EUT : WiFi Media Streaming Module  
Model : LS9AD-AC11DBT  
Test mode : 2DH1-H Mode  
Power Rating : AC 120V/60Hz  
Environment : Temp:25.5°C Huni:55%  
Test Engineer: YT  
REMARK : CON 2

Freq	ReadAntenna		Cable		Preamp		Limit	Over	Remark
	Level	Factor	Loss	Factor	Level	Line			
MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB		
1	2483.500	20.48	25.66	4.81	0.00	50.95	74.00	-23.05	Peak
2	2483.500	8.95	25.66	4.81	0.00	39.42	54.00	-14.58	Average

**8DPSK mode****Test channel: Lowest**

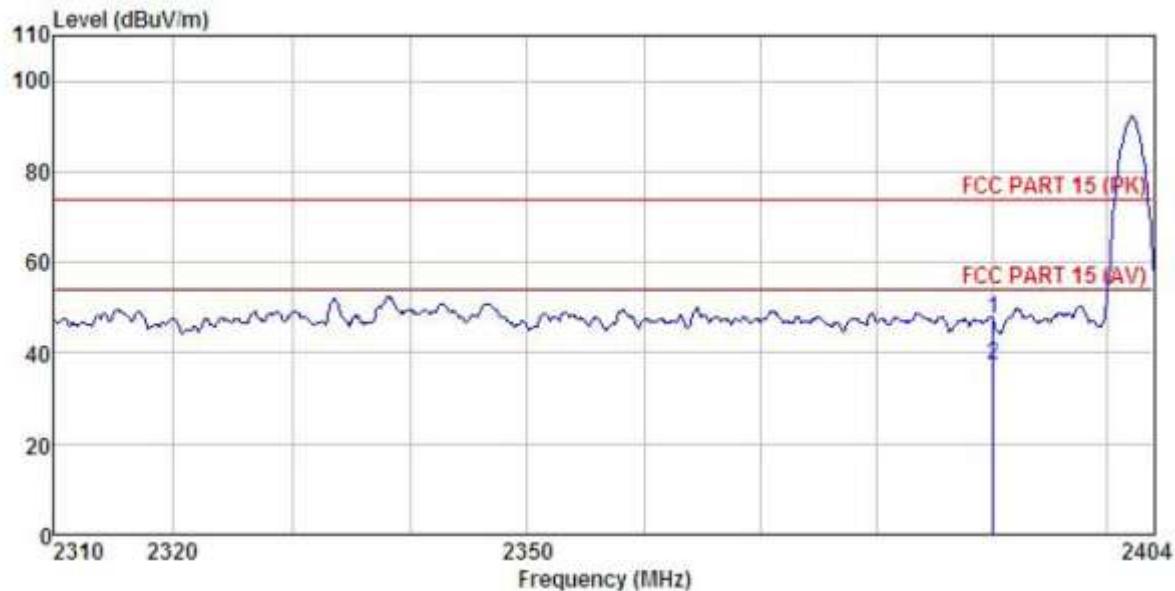
Horizontal:



Site : 3m chamber  
Condition : FCC PART 15 (PK) 3m BBHA9120(1G18G) HORIZONTAL  
EUT : WiFi Media Streaming Module  
Model : LS9AD-AC11DBT  
Test mode : 3DH1-L Mode  
Power Rating : AC 120V/60Hz  
Environment : Temp:25.5°C Huni:55%  
Test Engineer: YT  
REMARK : CON 2

	Read	Antenna	Cable	Preamp	Limit	Over	
Freq	Level	Factor	Loss	Factor	Level	Line	Limit
MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB
1	2390.000	16.72	25.45	4.69	0.00	46.86	74.00 -27.14 Peak
2	2390.000	7.86	25.45	4.69	0.00	38.00	54.00 -16.00 Average

Vertical:

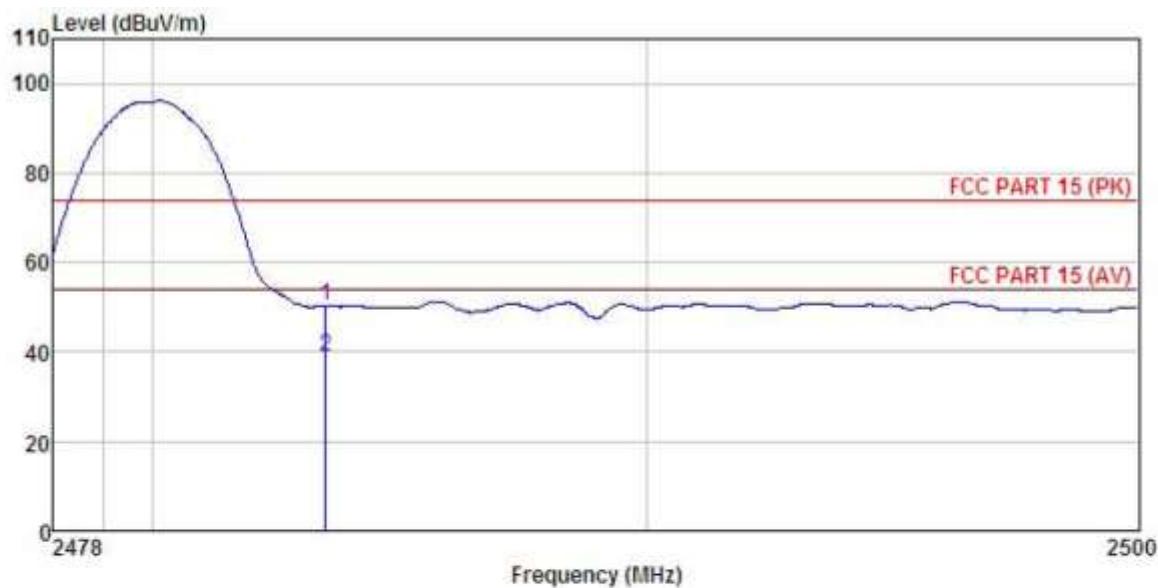


Site : 3m chamber  
Condition : FCC PART 15 (PK) 3m BBHA9120(1G18G) VERTICAL  
EUT : WiFi Media Streaming Module  
Model : LS9AD-AC11DBT  
Test mode : 3DH1-L Mode  
Power Rating : AC 120V/60Hz  
Environment : Temp:25.5°C Huni:55%  
Test Engineer: YT  
REMARK : CON 2

Freq	Read	Antenna	Cable	Preamp	Limit	Over	Remark	
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB
1	2390.000	17.55	25.45	4.69	0.00	47.69	74.00	-26.31 Peak
2	2390.000	7.26	25.45	4.69	0.00	37.40	54.00	-16.60 Average

**Test channel: Highest**

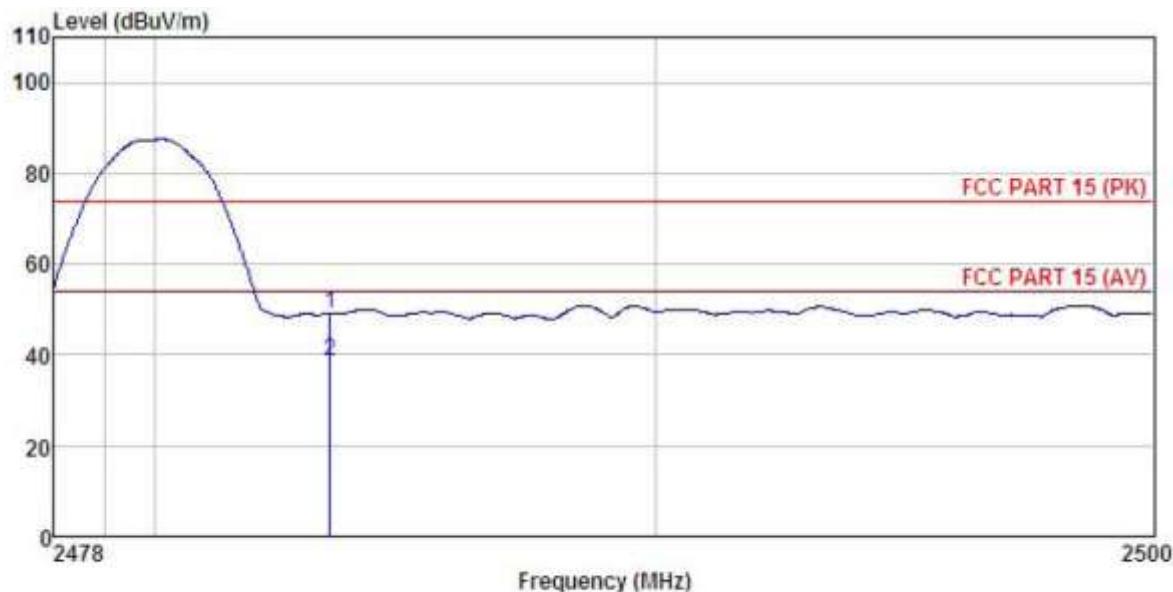
Horizontal:



Site : 3m chamber  
Condition : FCC PART 15 (PK) 3m BBHA9120(1G18G) HORIZONTAL  
EUT : WiFi Media Streaming Module  
Model : LS9AD-AC11DBT  
Test mode : 3DH1-H Mode  
Power Rating : AC 120V/60Hz  
Environment : Temp:25.5°C Huni:55%  
Test Engineer: YT  
REMARK : CON 2

	Read	Antenna	Cable	Preamp	Limit	Over		
Freq	Level	Factor	Loss	Factor	Level	Line	Limit	Remark
MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
1	2483.500	19.85	25.66	4.81	0.00	50.32	74.00	-23.68 Peak
2	2483.500	8.36	25.66	4.81	0.00	38.83	54.00	-15.17 Average

Vertical:

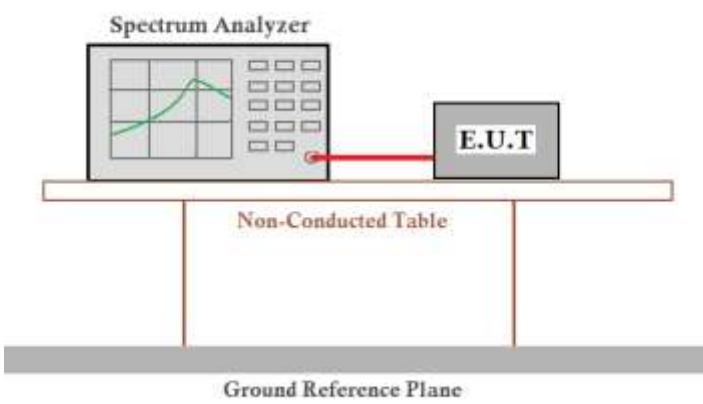


Site : 3m chamber  
Condition : FCC PART 15 (PK) 3m BBHA9120(1G18G) VERTICAL  
EUT : WiFi Media Streaming Module  
Model : LS9AD-AC11DBT  
Test mode : 3DH1-H Mode  
Power Rating : AC 120V/60Hz  
Environment : Temp:25.5°C Huni:55%  
Test Engineer: YT  
REMARK : CON 2

Freq	ReadAntenna		Cable Preamp		Limit Level	Line	Over Limit	Remark
	MHz	dBuV	Level Factor	Cable Loss Factor	dB	dB	dBuV/m	dBuV/m
1	2483.500	18.72	25.66	4.81	0.00	49.19	74.00	-24.81 Peak
2	2483.500	8.25	25.66	4.81	0.00	38.72	54.00	-15.28 Average

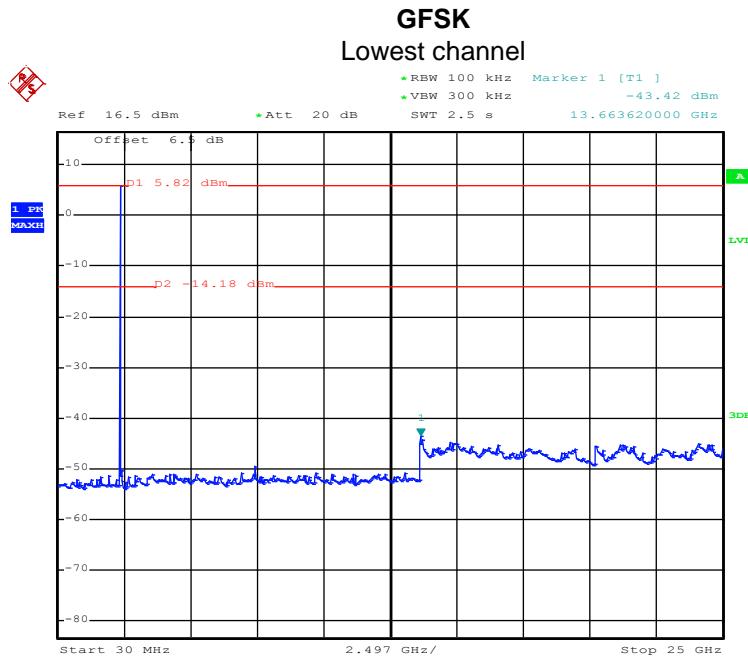
## 6.10 Spurious Emission

### 6.10.1 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 5.7 for details
Test mode:	Non-hopping mode
Test results:	Pass

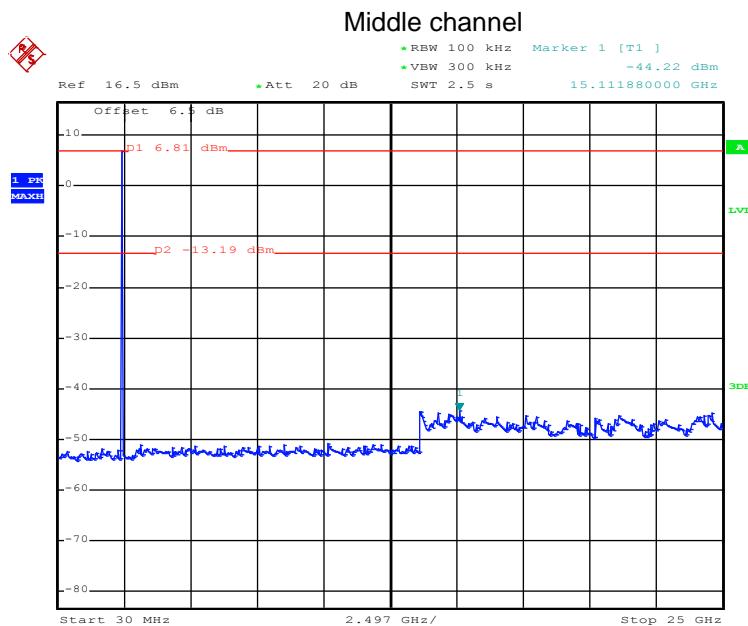
Test plot as follows:

TX0



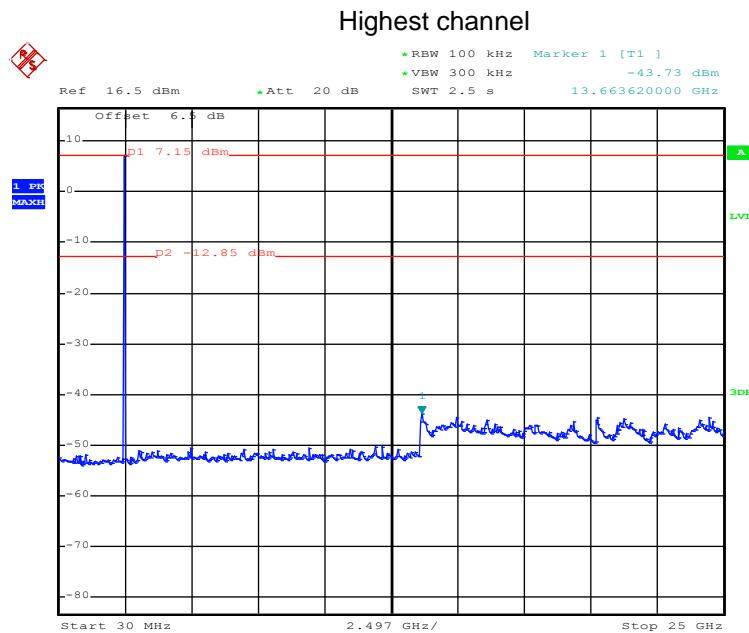
Date: 7.JUL.2017 09:13:09

30MHz~25GHz



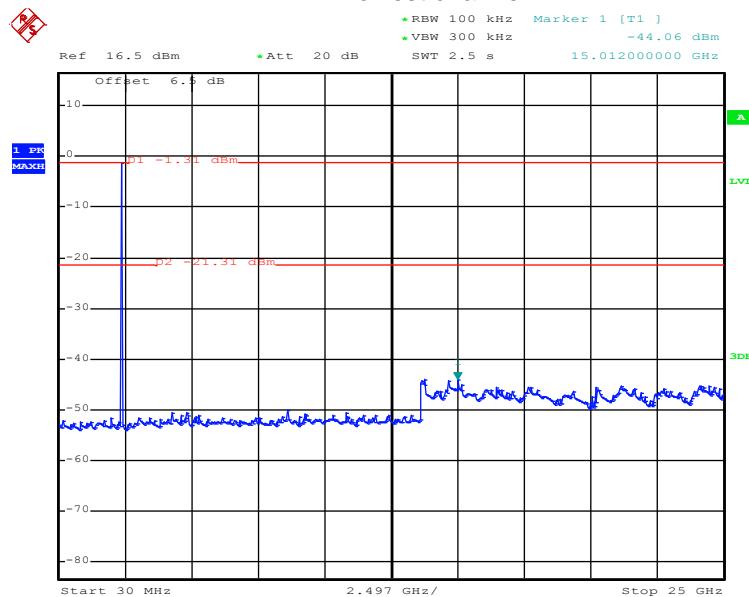
Date: 7.JUL.2017 09:14:26

30MHz~25GHz



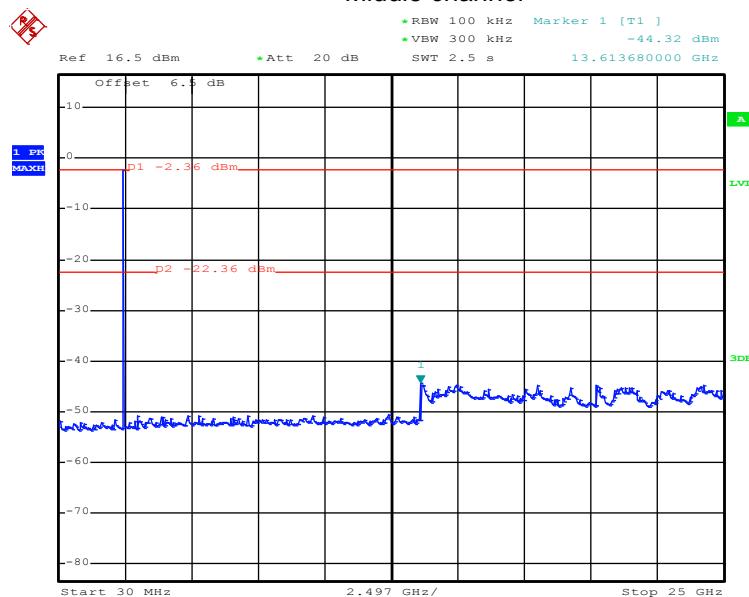
Date: 7.JUL.2017 09:15:58

30MHz~25GHz

**$\pi/4$ -DQPSK****Lowest channel**

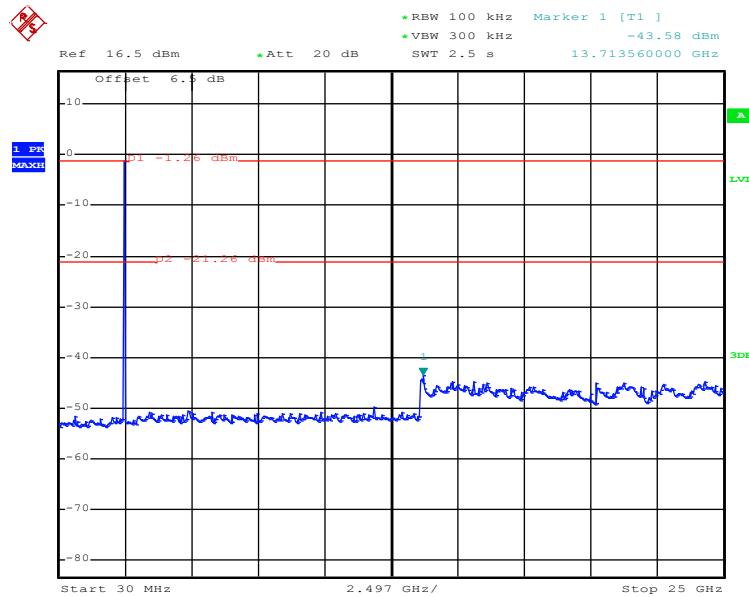
Date: 7.JUL.2017 09:19:47

30MHz~25GHz

**Middle channel**

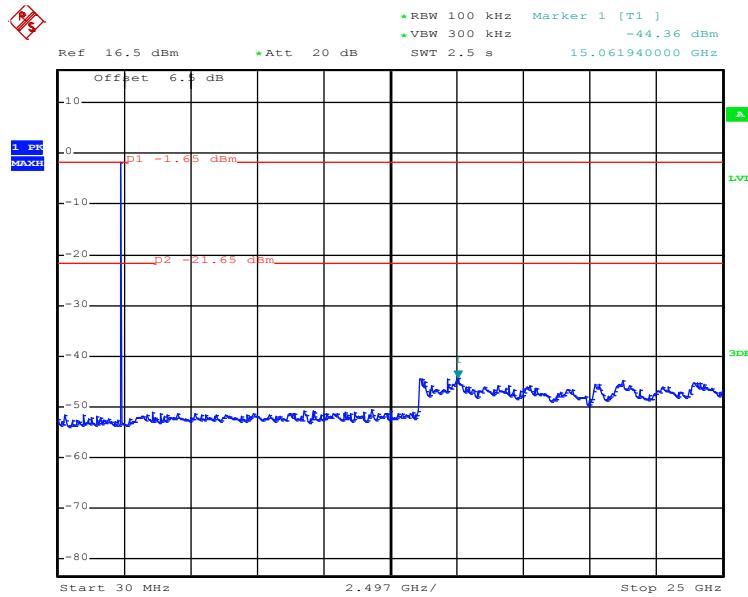
Date: 7.JUL.2017 09:21:53

30MHz~25GHz

**Highest channel**

Date: 7.JUL.2017 09:25:24

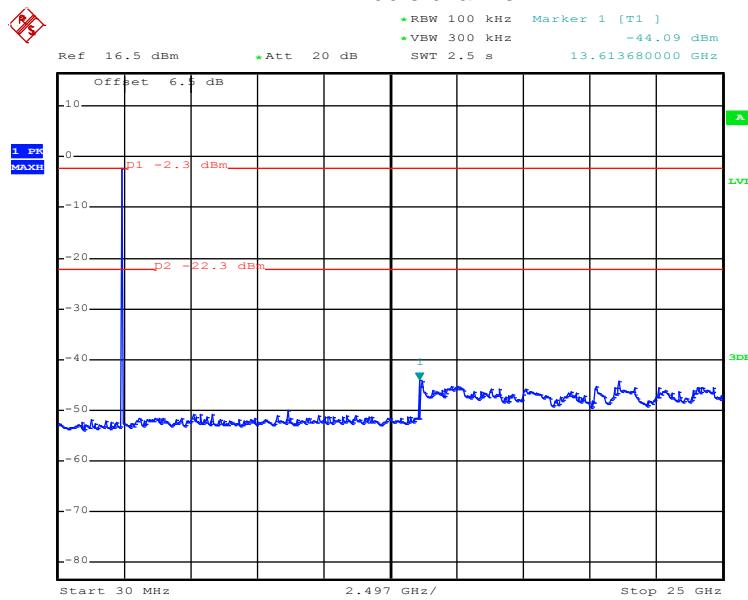
30MHz~25GHz

**8DPSK**  
Lowest channel

Date: 7.JUL.2017 09:27:09

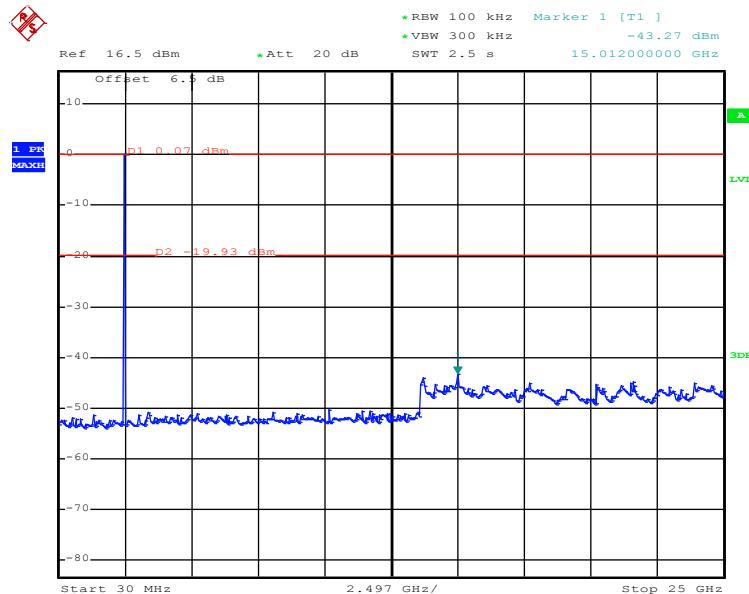
## 30MHz~25GHz

## Middle channel



Date: 7.JUL.2017 09:28:52

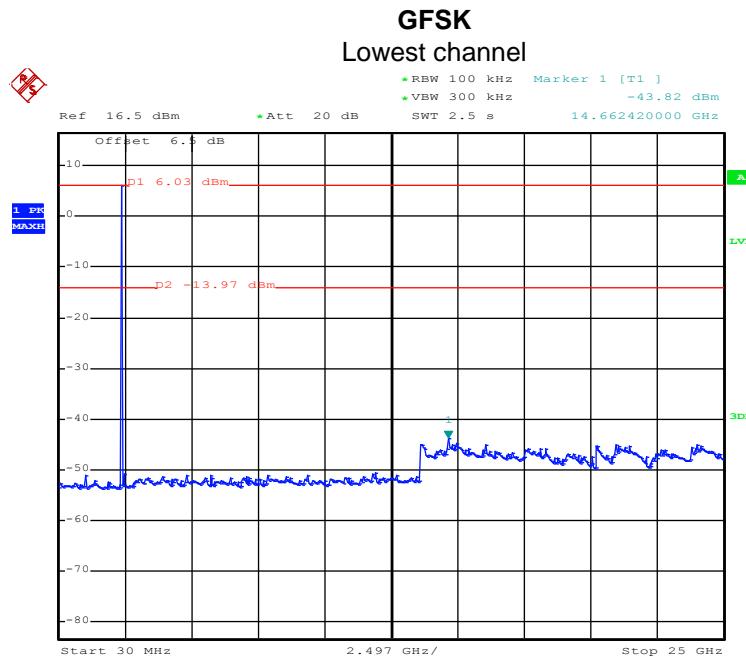
## 30MHz~25GHz

**Highest channel**

Date: 7.JUL.2017 09:30:35

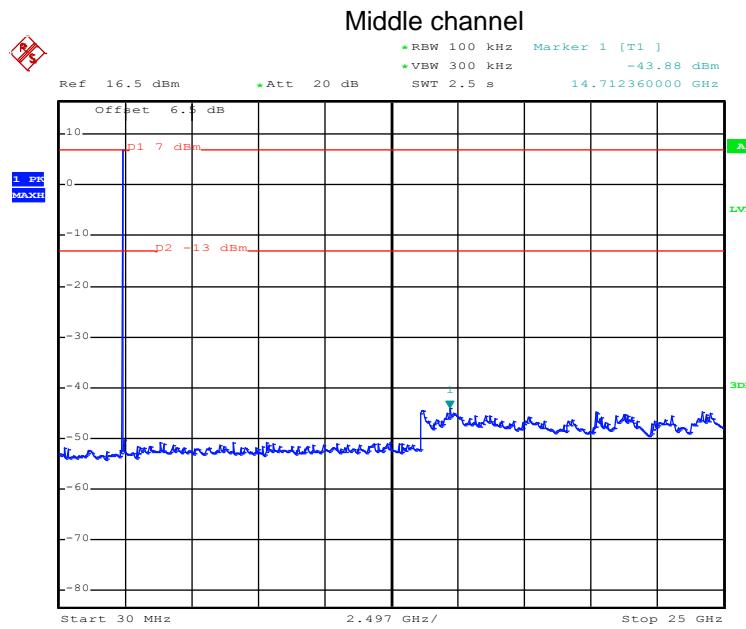
30MHz~25GHz

TX1



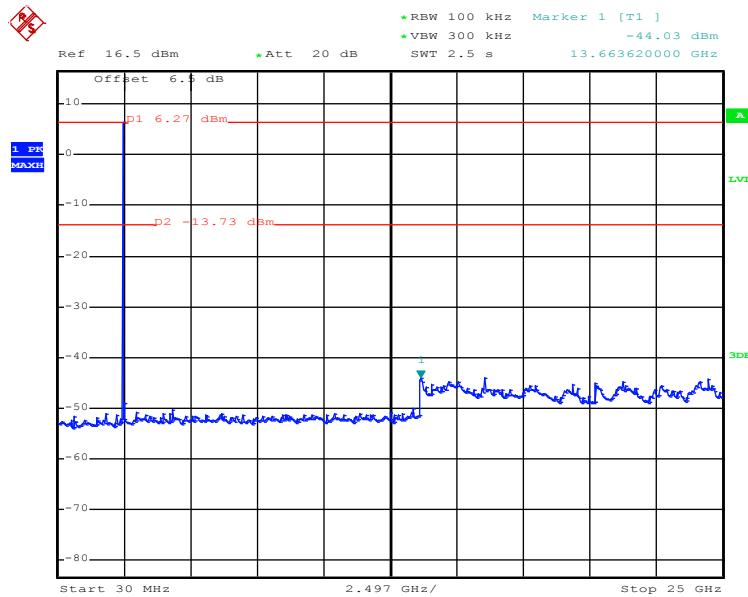
Date: 2.JUL.2017 14:38:31

30MHz~25GHz



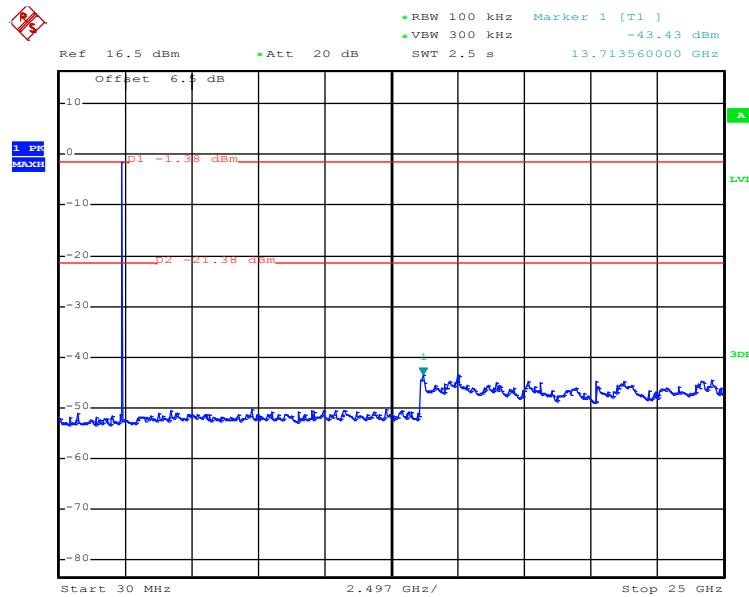
Date: 2.JUL.2017 14:39:48

30MHz~25GHz

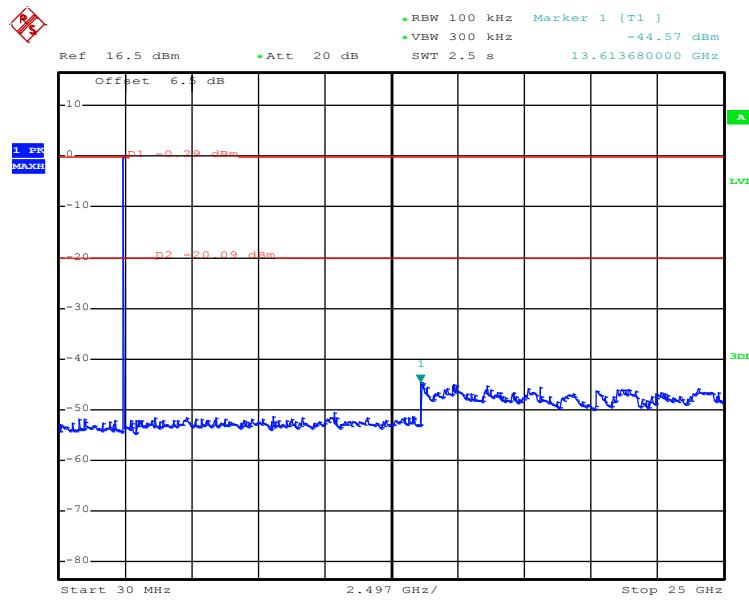
**Highest channel**

Date: 2.JUL.2017 14:44:10

30MHz~25GHz

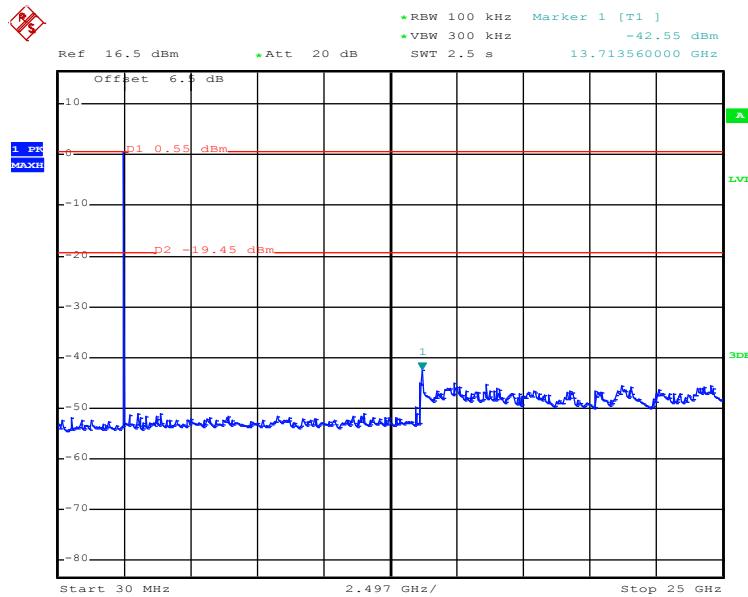
**$\pi/4$ -DQPSK****Lowest channel**

Date: 2.JUL.2017 15:59:06

**30MHz~25GHz****Middle channel**

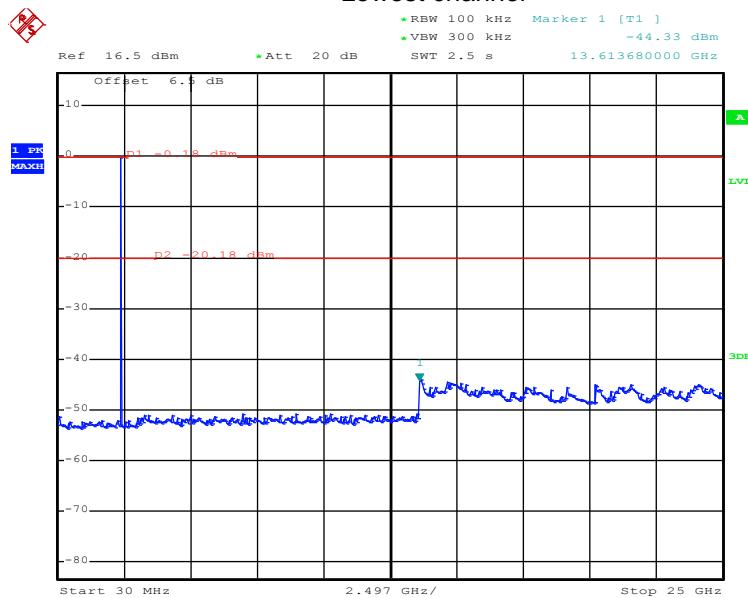
Date: 2.JUL.2017 15:59:39

**30MHz~25GHz**

**Highest channel**

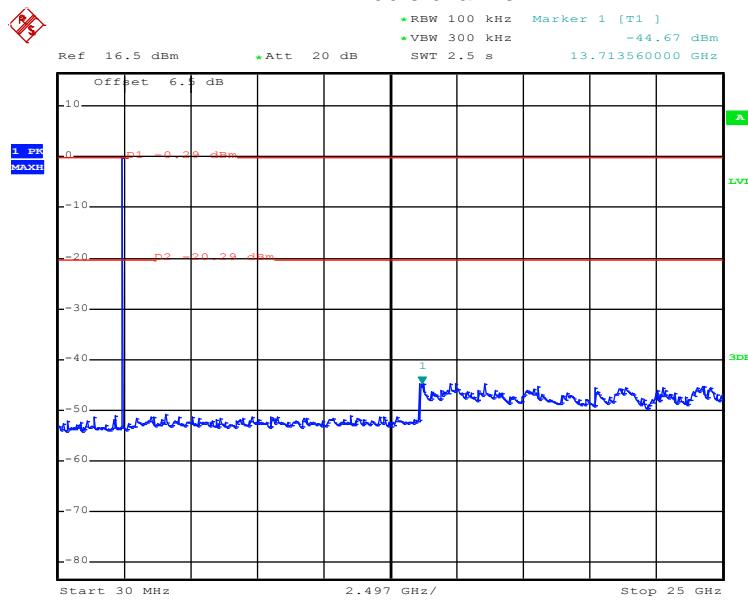
Date: 2.JUL.2017 16:00:09

30MHz~25GHz

**8DPSK**  
Lowest channel

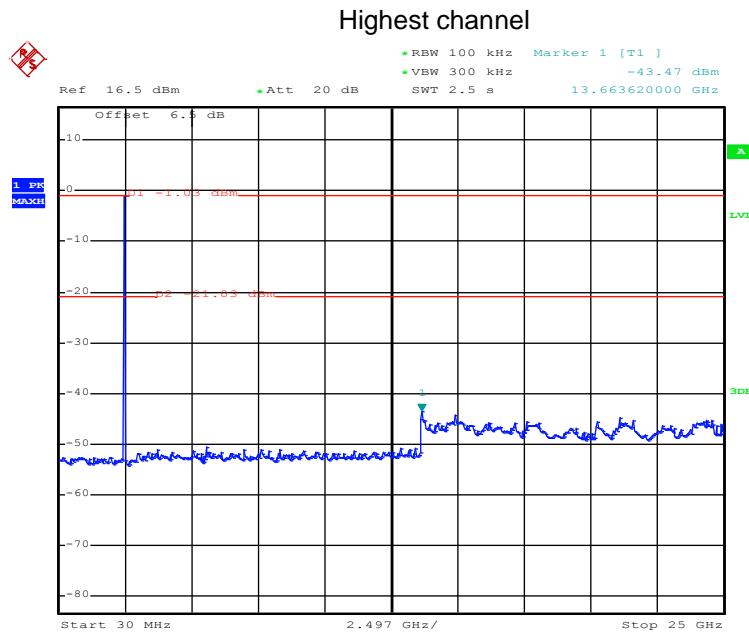
Date: 2.JUL.2017 16:03:04

30MHz~25GHz

**Middle channel**

Date: 2.JUL.2017 16:04:53

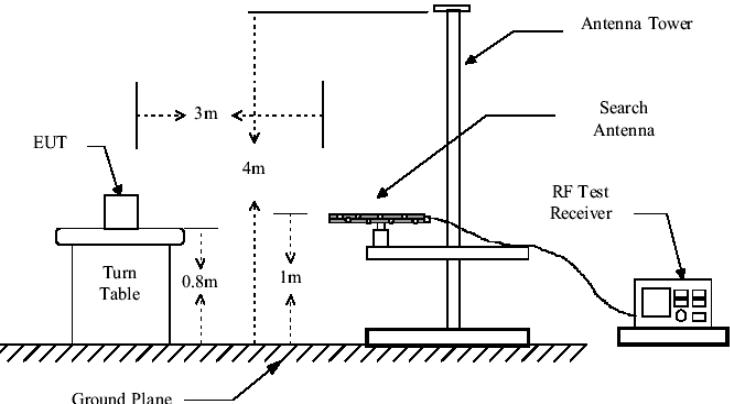
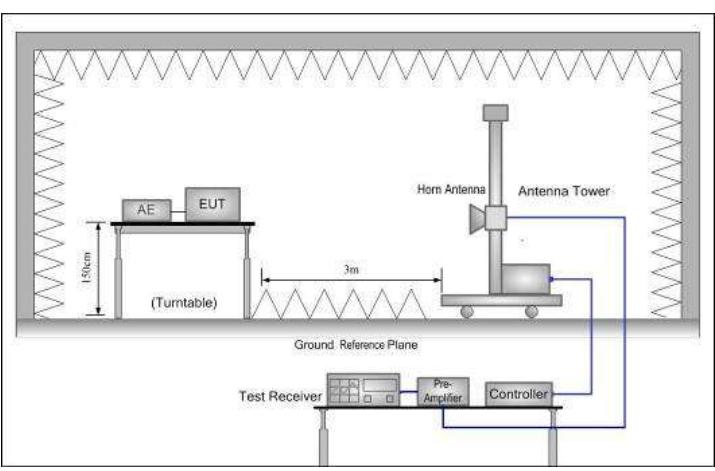
30MHz~25GHz



Date: 2.JUL.2017 16:07:02

30MHz~25GHz

### 6.10.2 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 site:	Measurement 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 				

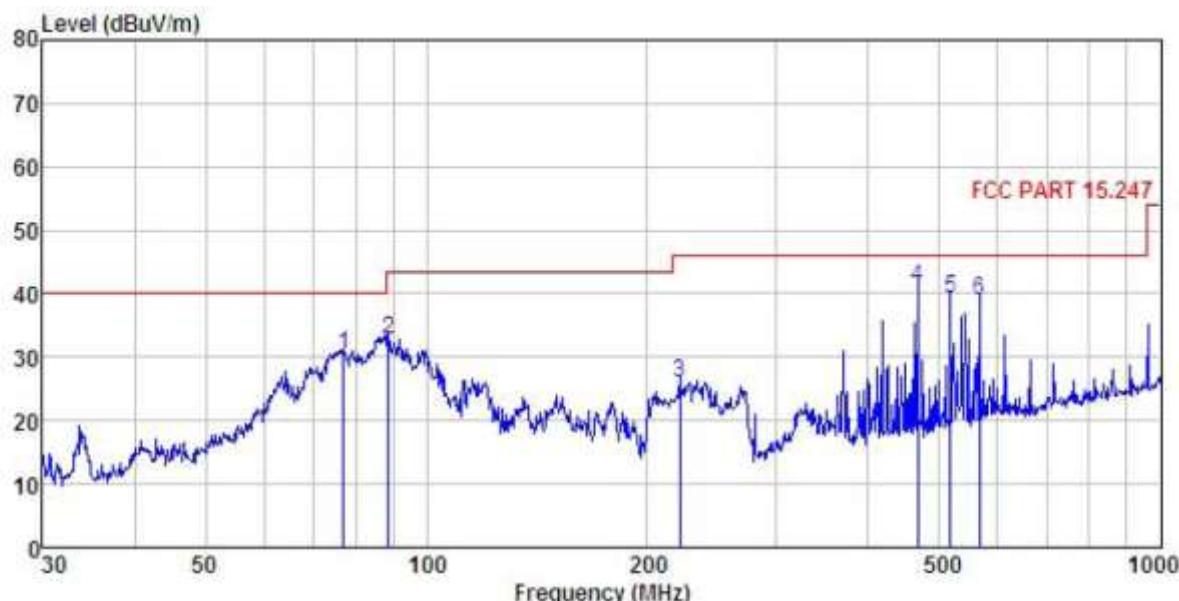
Test Procedure:	<ol style="list-style-type: none"> <li>1. The EUT was placed on the top of a rotating table 0.8m(below 1GHz) /1.5m(above 1GHz) above the ground at a 3 meter chamber. The table was rotated 360 degrees to determine the position of the highest radiation.</li> <li>2. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.</li> <li>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.</li> <li>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.</li> <li>5. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.</li> <li>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.</li> </ol>
Test Instruments:	Refer to section 5.7 for details
Test mode:	Non-hopping mode
Test results:	Pass

**Remark:**

1. During the test, pre-scan the GFSK,  $\pi/4$ -DQPSK, 8DPSK modulation, and found the GFSK modulation is the worst case.
2. Pre-scan all kind of the place mode (X-axis, Y-axis, Z-axis), and found the Y-axis is the worst case.
3. 9 kHz to 30 MHz is noise floor, so only shows the data of above 30MHz in this report.

**Measurement data:****Model No. LS9AD-AC11DBT-Vtest data:****Below 1GHz**

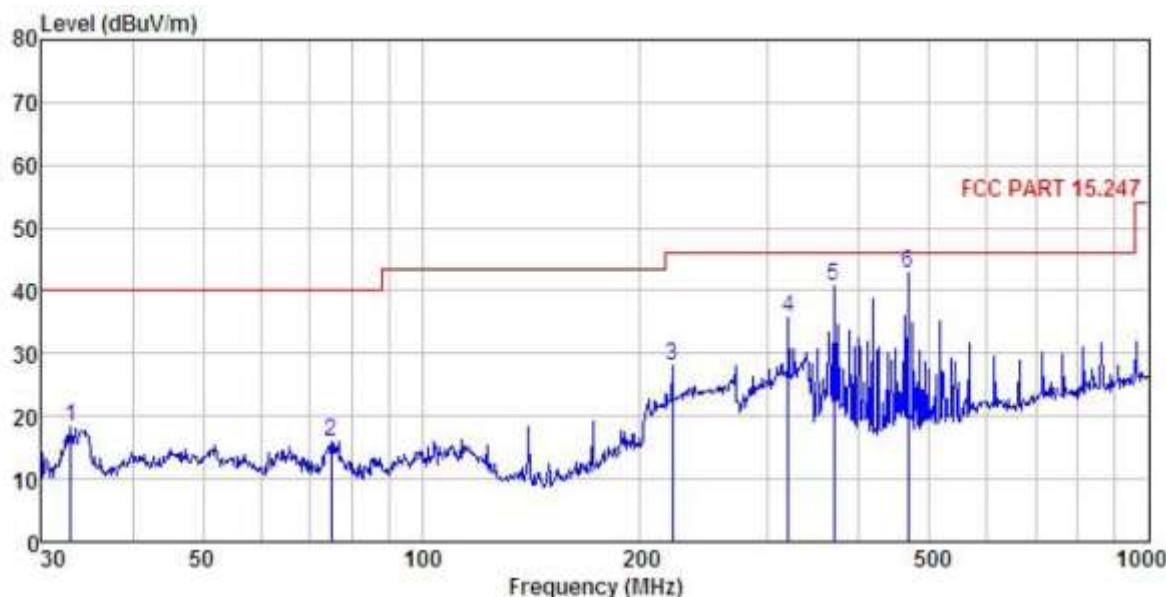
Vertical:



Site : 3m chamber  
Condition : FCC PART 15.247 3m VULB9163(30M2G) VERTICAL  
EUT : WiFi Media Streaming Module  
Model : LS9AD-AC11DBT  
Test mode : BT Mode  
Power Rating : AC 120V/60Hz  
Environment : Temp:25.5°C Huni:55%  
Test Engineer: YI  
REMARK :

Freq	Read	Antenna	Cable	Preamp	Limit	Over	Remark
	Freq	Level	Factor	Loss			
MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB
1	77.051	49.60	8.84	1.64	29.66	30.42	40.00 -9.58 QP
2	88.652	49.67	10.60	2.00	29.58	32.69	43.50 -10.81 QP
3	221.392	40.42	11.30	2.84	28.70	25.86	46.00 -20.14 QP
4	467.235	51.20	15.53	3.34	28.90	41.17	46.00 -4.83 QP
5	517.248	47.94	16.70	3.71	29.00	39.35	46.00 -6.65 QP
6	566.622	46.60	17.65	3.91	29.05	39.11	46.00 -6.89 QP

Horizontal:

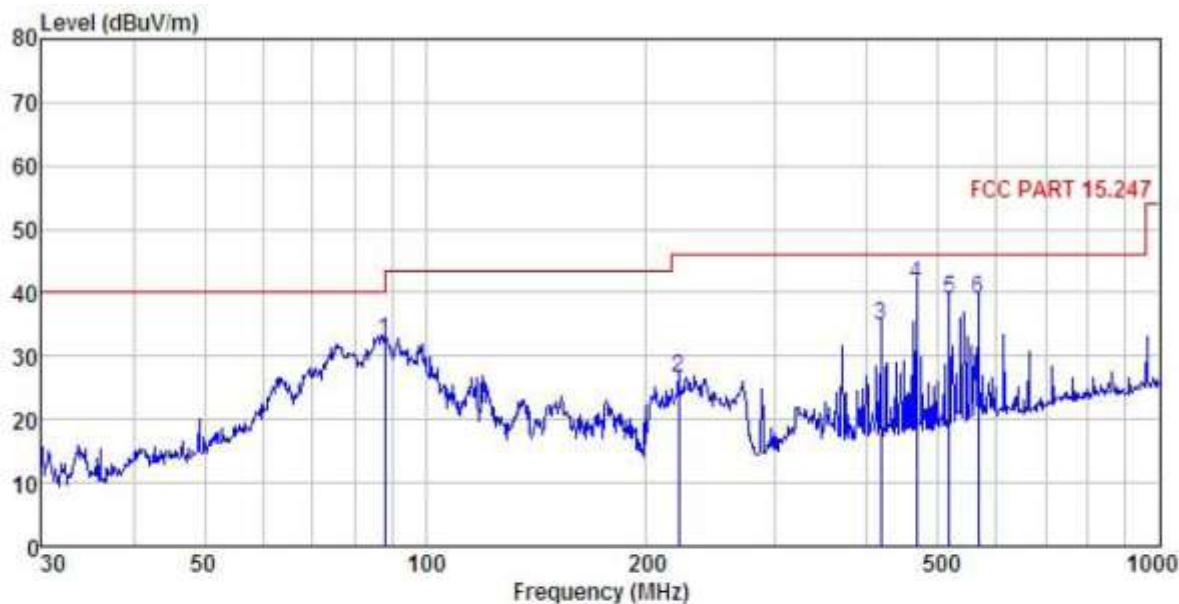


Site : 3m chamber  
 Condition : FCC PART 15.247 3m VULB9163(30M2G) HORIZONTAL  
 EUT : WiFi Media Streaming Module  
 Model : LS9AD-AC11DBT  
 Test mode : BT Mode  
 Power Rating : AC 120V/60Hz  
 Environment : Temp:25.5°C Huni:55%  
 Test Engineer: YT  
 REMARK :

Freq	Read	Antenna	Cable	Preamp	Limit	Over	Remark
	Freq	Level	Factor	Loss			
MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB
1 32.864	35.93	11.43	0.91	29.96	18.31	40.00	-21.69 QP
2 75.182	34.89	9.18	1.63	29.68	16.02	40.00	-23.98 QP
3 221.392	42.71	11.30	2.84	28.70	28.15	46.00	-17.85 QP
4 319.937	47.72	13.55	3.00	28.50	35.77	46.00	-10.23 QP
5 369.405	51.86	14.53	3.09	28.65	40.83	46.00	-5.17 QP
6 467.235	52.70	15.53	3.34	28.90	42.67	46.00	-3.33 QP

**Model No. LS9AD-AC11DBT-V test data:****Below 1GHz**

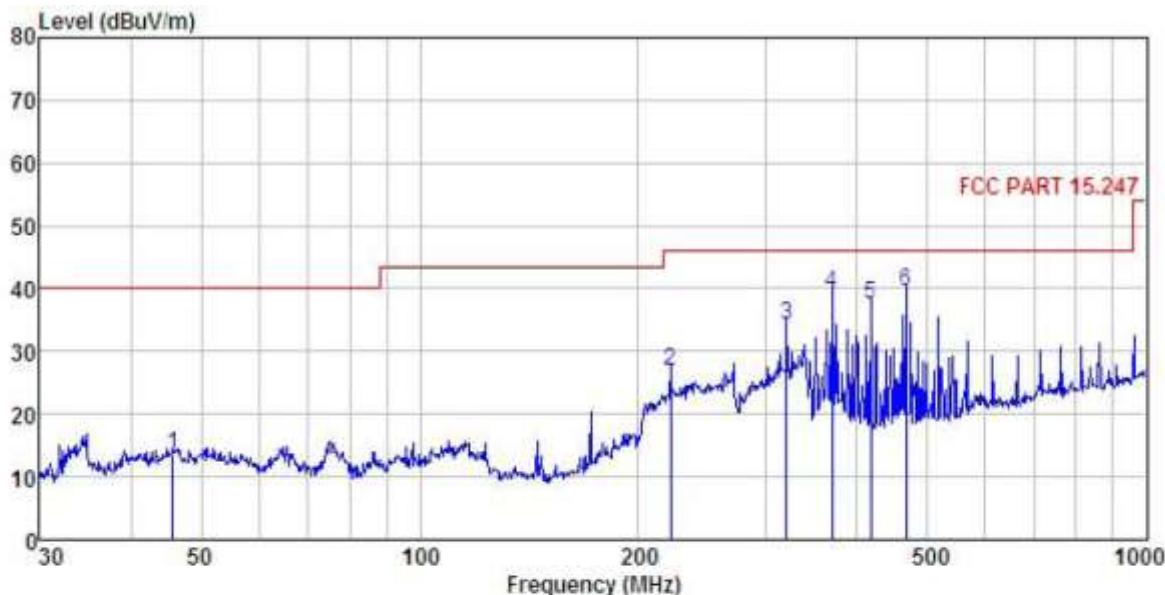
Vertical:



Site : 3m chamber  
 Condition : FCC PART 15.247 3m VULB9163(30M2G) VERTICAL  
 EUT : WiFi Media Streaming Module  
 Model : LS9AD-AC11DBT-V  
 Test mode : BT Mode  
 Power Rating : AC 120V/60Hz  
 Environment : Temp:25.5°C Huni:55%  
 Test Engineer: YT  
 REMARK :

Freq	ReadAntenna		Cable Preamp		Limit Line	Over Limit	Remark
	Freq	Level Factor	Cable Loss	Preamp Factor			
MHz	dBuV	dB/m	dB	dBuV/m	dBuV/m	dB	
1	88.033	49.94	10.18	1.96	29.58	32.50	43.50 -11.00 QP
2	221.392	41.24	11.30	2.84	28.70	26.68	46.00 -19.32 QP
3	417.641	45.12	15.35	3.12	28.81	34.78	46.00 -11.22 QP
4	467.235	51.36	15.53	3.34	28.90	41.33	46.00 -4.67 QP
5	517.248	47.41	16.70	3.71	29.00	38.82	46.00 -7.18 QP
6	566.622	46.51	17.65	3.91	29.05	39.02	46.00 -6.98 QP

Horizontal:

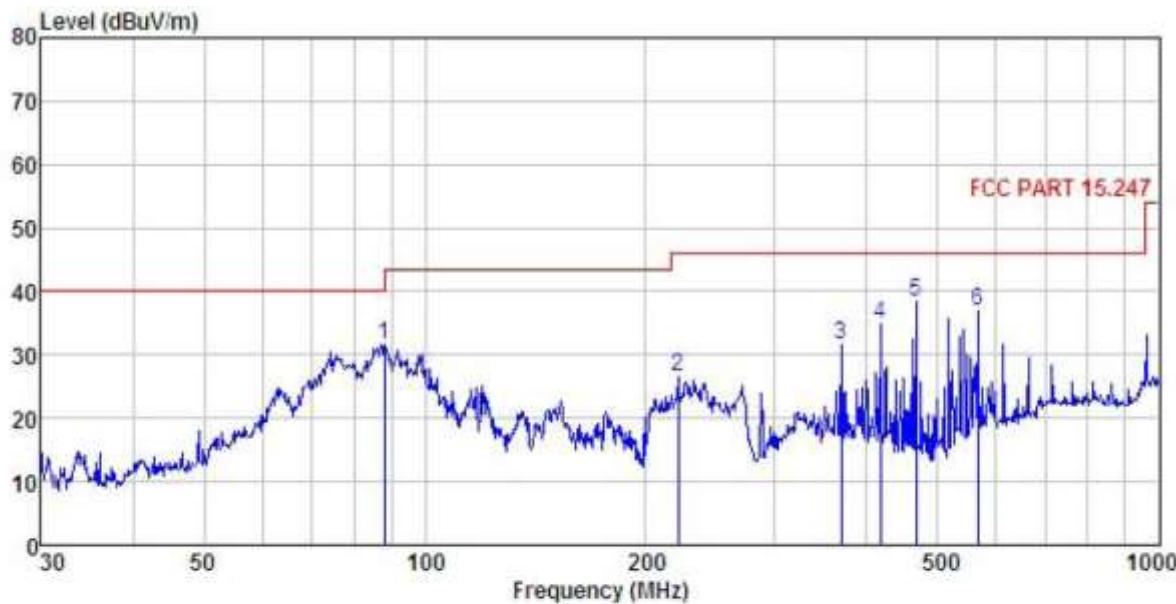


Site : 3m chamber  
Condition : FCC PART 15.247 3m VULB9163(30M2G) HORIZONTAL  
EUT : WiFi Media Streaming Module  
Model : LS9AD-AC11DBT-V  
Test mode : BT Mode  
Power Rating : AC 120V/60Hz  
Environment : Temp:25.5°C Huni:55%  
Test Engineer: YT  
REMARK :

Freq	ReadAntenna		Cable Preamp		Limit Level	Over Line	Over Limit	Remark
	MHz	dBuV	dB/m	dB				
1	45.695	27.75	14.40	1.29	29.85	13.59	40.00	-26.41 QP
2	221.392	41.55	11.30	2.84	28.70	26.99	46.00	-19.01 QP
3	319.937	46.16	13.55	3.00	28.50	34.21	46.00	-11.79 QP
4	369.405	50.38	14.53	3.09	28.65	39.35	46.00	-6.65 QP
5	417.641	47.80	15.35	3.12	28.81	37.46	46.00	-8.54 QP
6	467.235	49.67	15.53	3.34	28.90	39.64	46.00	-6.36 QP

**Model No. LS9AD-AC11DBT-GV test data:****Below 1GHz**

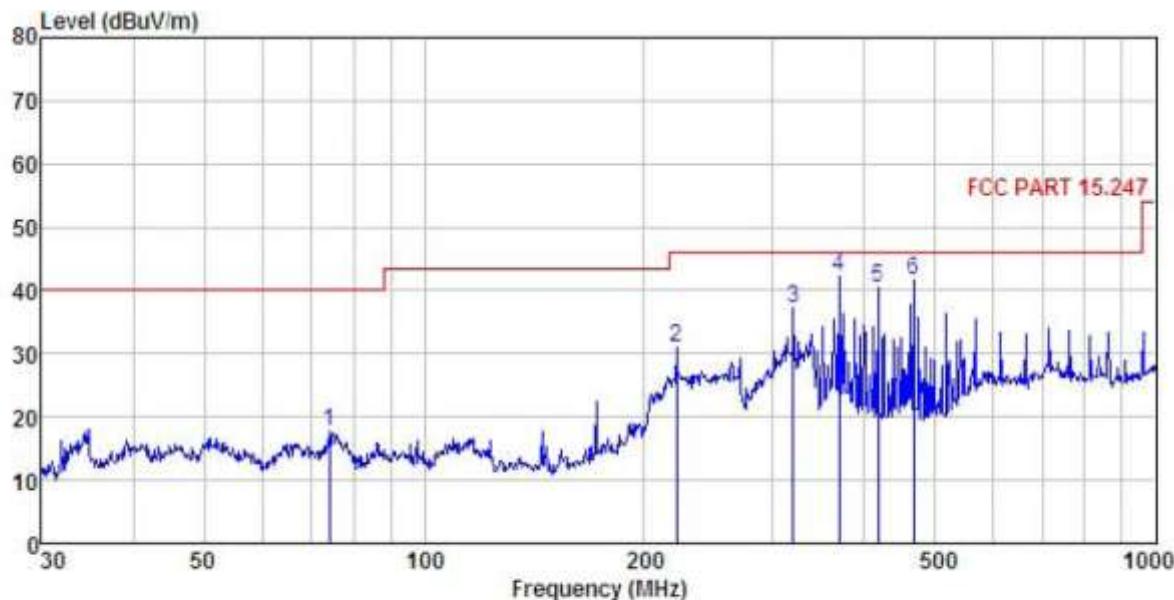
Vertical:



Site : 3m chamber  
 Condition : FCC PART 15.247 3m VULB9163(30M2G) VERTICAL  
 EUT : WiFi Media Streaming Module  
 Model : LS9AD-AC11DBT-GV  
 Test mode : BT Mode  
 Power Rating : AC 120V/60Hz  
 Environment : Temp:25.5°C Huni:55%  
 Test Engineer: YT  
 REMARK :

Freq	ReadAntenna		Cable	Preamp	Limit	Over	Remark
	Level	Factor	Loss	Factor			
MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB
1 88.033	48.94	10.18	1.96	29.58	31.50	43.50	-12.00 QP
2 221.392	41.24	11.30	2.84	28.70	26.68	46.00	-19.32 QP
3 369.405	42.51	14.53	3.09	28.65	31.48	46.00	-14.52 QP
4 417.641	45.12	15.35	3.12	28.81	34.78	46.00	-11.22 QP
5 467.235	48.36	15.53	3.34	28.90	38.33	46.00	-7.67 QP
6 566.622	44.51	17.65	3.91	29.05	37.02	46.00	-8.98 QP

Horizontal:



Site : 3m chamber  
Condition : FCC PART 15.247 3m VULB9163(30M2G) HORIZONTAL  
EUT : WiFi Media Streaming Module  
Model : LS9AD-AC11DBT-GV  
Test mode : BT Mode  
Power Rating : AC 120V/60Hz  
Environment : Temp:25.5°C Huni:55%  
Test Engineer: YT  
REMARK :

Freq	Read	Antenna	Cable	Preamp	Limit	Over	Remark
	Level	Factor	Loss	Factor			
1	74.135	36.17	9.52	1.61	29.69	17.61	40.00 -22.39 QP
2	221.392	45.55	11.30	2.84	28.70	30.99	46.00 -15.01 QP
3	319.937	49.16	13.55	3.00	28.50	37.21	46.00 -8.79 QP
4	369.405	53.38	14.53	3.09	28.65	42.35	46.00 -3.65 QP
5	417.641	50.80	15.35	3.12	28.81	40.46	46.00 -5.54 QP
6	467.235	51.67	15.53	3.34	28.90	41.64	46.00 -4.36 QP

**Above 1GHz:****Model No. LS9AD-AC11DBT test data:****TX0**

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	49.58	35.99	6.80	41.81	50.56	74.00	-23.44	Vertical
4804.00	49.26	35.99	6.80	41.81	50.24	74.00	-23.76	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	40.27	35.99	6.80	41.81	41.25	54.00	-12.75	Vertical
4804.00	39.25	35.99	6.80	41.81	40.23	54.00	-13.77	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	49.87	36.38	6.86	41.84	51.27	74.00	-22.73	Vertical
4882.00	49.26	36.38	6.86	41.84	50.66	74.00	-23.34	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	39.23	36.38	6.86	41.84	40.63	54.00	-13.37	Vertical
4882.00	40.74	36.38	6.86	41.84	42.14	54.00	-11.86	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	49.82	36.71	6.91	41.87	51.57	74.00	-22.43	Vertical
4960.00	50.16	36.71	6.91	41.87	51.91	74.00	-22.09	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	39.56	36.71	6.91	41.87	41.31	54.00	-12.69	Vertical
4960.00	40.72	36.71	6.91	41.87	42.47	54.00	-11.53	Horizontal

**Remark:**

- 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.

## TX1

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	49.85	35.99	6.80	41.81	50.83	74.00	-23.17	Vertical
4804.00	50.77	35.99	6.80	41.81	51.75	74.00	-22.25	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	39.64	35.99	6.80	41.81	40.62	54.00	-13.38	Vertical
4804.00	40.19	35.99	6.80	41.81	41.17	54.00	-12.83	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	49.62	36.38	6.86	41.84	51.02	74.00	-22.98	Vertical
4882.00	48.11	36.38	6.86	41.84	49.51	74.00	-24.49	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	39.47	36.38	6.86	41.84	40.87	54.00	-13.13	Vertical
4882.00	38.25	36.38	6.86	41.84	39.65	54.00	-14.35	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	49.58	36.71	6.91	41.87	51.33	74.00	-22.67	Vertical
4960.00	48.77	36.71	6.91	41.87	50.52	74.00	-23.48	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	38.62	36.71	6.91	41.87	40.37	54.00	-13.63	Vertical
4960.00	39.44	36.71	6.91	41.87	41.19	54.00	-12.81	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 No. LS9AD-AC11DBT-V test data:****TX0**

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	50.16	35.99	6.80	41.81	51.14	74.00	-22.86	Vertical
4804.00	51.43	35.99	6.80	41.81	52.41	74.00	-21.59	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	39.65	35.99	6.80	41.81	40.63	54.00	-13.37	Vertical
4804.00	41.72	35.99	6.80	41.81	42.70	54.00	-11.30	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	49.65	36.38	6.86	41.84	51.05	74.00	-22.95	Vertical
4882.00	48.11	36.38	6.86	41.84	49.51	74.00	-24.49	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	39.65	36.38	6.86	41.84	41.05	54.00	-12.95	Vertical
4882.00	38.97	36.38	6.86	41.84	40.37	54.00	-13.63	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	50.24	36.71	6.91	41.87	51.99	74.00	-22.01	Vertical
4960.00	49.77	36.71	6.91	41.87	51.52	74.00	-22.48	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	39.64	36.71	6.91	41.87	41.39	54.00	-12.61	Vertical
4960.00	38.52	36.71	6.91	41.87	40.27	54.00	-13.73	Horizontal

**Remark:**

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

## TX1

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	50.23	35.99	6.80	41.81	51.21	74.00	-22.79	Vertical
4804.00	50.69	35.99	6.80	41.81	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	39.23	35.99	6.80	41.81	40.21	54.00	-13.79	Vertical
4804.00	40.25	35.99	6.80	41.81	41.23	54.00	-12.77	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	49.61	36.38	6.86	41.84	51.01	74.00	-22.99	Vertical
4882.00	48.59	36.38	6.86	41.84	49.99	74.00	-24.01	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	39.62	36.38	6.86	41.84	41.02	54.00	-12.98	Vertical
4882.00	38.72	36.38	6.86	41.84	40.12	54.00	-13.88	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	49.85	36.71	6.91	41.87	51.60	74.00	-22.40	Vertical
4960.00	48.17	36.71	6.91	41.87	49.92	74.00	-24.08	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	38.62	36.71	6.91	41.87	40.37	54.00	-13.63	Vertical
4960.00	39.44	36.71	6.91	41.87	41.19	54.00	-12.81	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.