

FCC REPORT

Applicant: Nexpro International Limitada

Address of Applicant: Guadalupe, Barrio Tournon, Frente Al Hotel Villas Oficinas Del Bufete Facio Y Canas,

Equipment Under Test (EUT)

Product Name: T97601T4

Model No.: Bang

FCC ID: ZYPBANG

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

Date of sample receipt: 01 Sep., 2014

Date of Test: 01 Sep., to 02 Sep., 2014

Date of report issued: 03 Sep., 2014

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	03 Sep., 2014	Original

Prepared by:

Luna Gao

Date:

03 Sep., 2014

Report Clerk

Reviewed by:

Abomb Yang

Date:

03 Sep., 2014

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
Radiated 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:	Nexpro International Limitada
Address of Applicant:	Guadalupe, Barrio Tournon, Frente Al Hotel Villas Oficinas Del Bufete Facio Y Canas,

5.2 General Description of E.U.T.

Product Name:	T97601T4
Model No.:	Bang
Operation Frequency:	2402MHz~2480MHz
Transfer rate:	1/2/3 Mbits/s
Number of channel:	79
Modulation type:	GFSK, $\pi/4$ -DQPSK, 8DPSK
Modulation technology:	FHSS
Antenna Type:	Internal Antenna
Antenna gain:	-4.5 dBi
Power supply:	Rechargeable Li-ion Battery DC3.7V-2000mAh
AC adapter:	Model: BANG Input:100-240V AC,50/60Hz 0.2A Output:5.0V DC MAX1000mA

Operation Frequency each of channel for GFSK, $\pi/4$ -DQPSK, 8DPSK							
Channel	Frequency	Channel	Frequency	Channel	Frequency	Channel	Frequency
0	2402MHz	20	2422MHz	40	2442MHz	60	2462MHz
1	2403MHz	21	2423MHz	41	2443MHz	61	2463MHz
2	2404MHz	22	2424MHz	42	2444MHz	62	2464MHz
3	2405MHz	23	2425MHz	43	2445MHz	63	2465MHz
4	2406MHz	24	2426MHz	44	2446MHz	64	2466MHz
5	2407MHz	25	2427MHz	45	2447MHz	65	2467MHz
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, $\pi/4$ -DQPSK and 8DPSK.							

5.3 Test mode

Transmitting mode:	Keep the EUT in transmitting mode with worst case data rate.
Remark	GFSK (1 Mbps) is the worst case mode.
<p>The sample was placed 0.8m above the ground plane of 3m chamber*. Measurements in both horizontal and vertical polarities were performed. During the test, each emission was maximized by: having the EUT continuously working 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.</p>	

5.4 Laboratory Facility

<p>The test facility is recognized, certified, or accredited by the following organizations:</p> <ul style="list-style-type: none"> ● 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.
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5.5 Laboratory Location

<p>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</p>
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5.6 Test Instruments list

Radiated Emission:						
Item	Test Equipment	Manufacturer	Model No.	Inventory No.	Cal. Date (mm-dd-yy)	Cal. Due date (mm-dd-yy)
1	3m Semi- Anechoic Chamber	SAEMC	9(L)*6(W)* 6(H)	CCIS0001	June 09 2014	June 08 2015
2	BiConiLog Antenna	SCHWARZBECK MESS-ELEKTRONIK	VULB9163	CCIS0005	May 25 2014	May 24 2015
3	Double -ridged waveguide horn	SCHWARZBECK MESS-ELEKTRONIK	BBHA9120D	CCIS0006	May 25 2014	May 24 2015
4	EMI Test Software	AUDIX	E3	N/A	N/A	N/A
5	Coaxial Cable	CCIS	N/A	CCIS0016	Apr. 01 2014	Mar. 31 2015
6	Coaxial Cable	CCIS	N/A	CCIS0017	Apr. 01 2014	Mar. 31 2015
7	Coaxial cable	CCIS	N/A	CCIS0018	Apr. 01 2014	Mar. 31 2015
8	Coaxial Cable	CCIS	N/A	CCIS0019	Apr. 01 2014	Mar. 31 2015
9	Coaxial Cable	CCIS	N/A	CCIS0087	Apr. 01 2014	Mar. 31 2015
10	Amplifier(10kHz-1.3GHz)	HP	8447D	CCIS0003	Apr. 01 2014	Mar. 31 2015
11	Amplifier(1GHz-18GHz)	Compliance Direction Systems Inc.	PAP-1G18	CCIS0011	June 09 2014	June 08 2015
12	Pre-amplifier (18-26GHz)	Rohde & Schwarz	AFS33-18002 650-30-8P-44	GTS218	Apr. 01 2014	Mar. 31 2015
13	Horn Antenna	ETS-LINDGREN	3160	GTS217	Mar. 30 2014	Mar. 29 2015
14	Printer	HP	HP LaserJet P1007	N/A	N/A	N/A
15	Positioning Controller	UC	UC3000	CCIS0015	N/A	N/A
16	Spectrum analyzer 9k-30GHz	Rohde & Schwarz	FSP	CCIS0023	May. 25 2014	May. 24 2015
17	EMI Test Receiver	Rohde & Schwarz	ESPI	CCIS0022	Apr 01 2014	Mar. 31 2015
18	Loop antenna	Laplace instrument	RF300	EMC0701	Aug. 12 2014	Aug. 11 2015
19	Universal radio communication tester	Rhode & Schwarz	CMU200	CCIS0069	May. 25 2014	May. 24 2015
20	Signal Analyzer	Rohde & Schwarz	FSIQ3	CCIS0088	May. 25 2014	May. 24 2015

Conducted Emission:						
Item	Test Equipment	Manufacturer	Model No.	Inventory No.	Cal. Date (mm-dd-yy)	Cal. Due date (mm-dd-yy)
1	Shielding Room	ZhongShuo Electron	11.0(L)x4.0(W)x3.0(H)	CCIS0061	June 09 2014	June 08 2015
2	EMI Test Receiver	Rohde & Schwarz	ESCI	CCIS0002	May 25 2014	May 24 2015
3	LISN	CHASE	MN2050D	CCIS0074	Apr 01 2014	Mar. 31 2015
4	Coaxial Cable	CCIS	N/A	CCIS0086	Apr. 01 2014	Mar. 31 2015
5	EMI Test Software	AUDIX	E3	N/A	N/A	N/A

6 Test results and Measurement Data

6.1 Antenna requirement

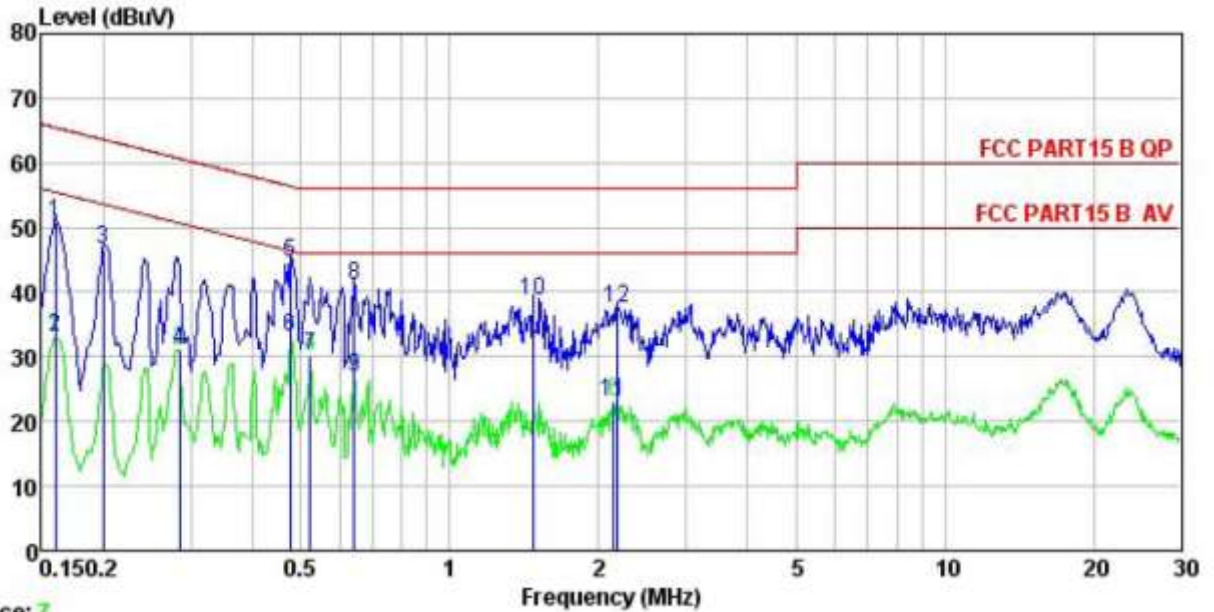
Standard requirement:	FCC Part15 C Section 15.203 /247(c)
<p><i>15.203 requirement:</i> <i>An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that 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></p> <p><i>15.247(c) (1)(i) requirement:</i> <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></p>	
E.U.T Antenna:	
<p><i>The Bluetooth antenna is an integral antenna which permanently attached, and the best case gain of the antenna is -4.5 dBi.</i></p>	
	

6.2 Conducted Emissions

Test Requirement:	FCC Part15 C Section 15.207														
Test Method:	ANSI C63.4:2003														
Test Frequency Range:	150 kHz to 30 MHz														
Class / Severity:	Class B														
Receiver setup:	RBW=9 kHz, VBW=30 kHz, Sweep time=auto														
Limit:	<table border="1"> <thead> <tr> <th rowspan="2">Frequency range (MHz)</th> <th colspan="2">Limit (dBuV)</th> </tr> <tr> <th>Quasi-peak</th> <th>Average</th> </tr> </thead> <tbody> <tr> <td>0.15-0.5</td> <td>66 to 56*</td> <td>56 to 46*</td> </tr> <tr> <td>0.5-5</td> <td>56</td> <td>46</td> </tr> <tr> <td>5-30</td> <td>60</td> <td>50</td> </tr> </tbody> </table> <p>* Decreases with the logarithm of the frequency.</p>	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
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													
Test setup:	<p><i>Remark: E.U.T: Equipment Under Test LISN: Line Impedance Stabilization Network Test table height=0.8m</i></p>														
Test procedure:	<ol style="list-style-type: none"> 1. 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. 2. The peripheral devices are also connected to the main power through a LISN that provides a 50ohm/50uH coupling impedance with 50ohm termination. (Please refer to the block diagram of the test setup and photographs). 3. Both sides of A.C. line are checked for maximum conducted interference. In order to find the maximum emission, the relative positions of equipment and all of the interface cables must be changed according to ANSI C63.4: 2003 on conducted measurement. 														
Test Instruments:	Refer to section 5.7 for details														
Test mode:	Bluetooth (Continuous transmitting) mode														
Test results:	Pass														

Measurement Data

Line:

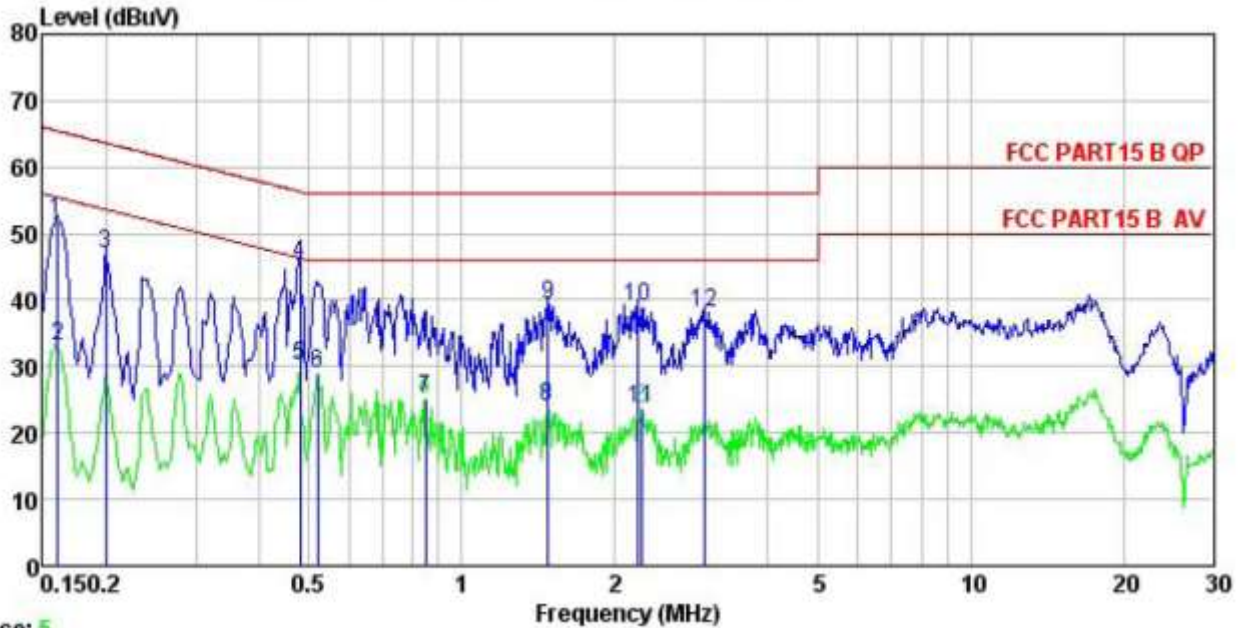


Trace: 7

Site : CCIS Shielding Room
 Condition : FCC PART15 B QP LISN LINE
 Job No. : 736RF
 EUT : T97601T4
 Model : Bang
 Test Mode : BT mode
 Power Rating : AC 120V/60Hz
 Environment : Temp: 23 °C Humi:56% Atmos:101KPa
 Test Engineer: Wendell
 Remark :

	Freq	Read Level	LISN Factor	Cable Loss	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB	dB	dBuV	dBuV	dB	
1	0.160	39.78	0.27	10.78	50.83	65.47	-14.64	QP
2	0.160	22.11	0.27	10.78	33.16	55.47	-22.31	Average
3	0.200	35.69	0.28	10.76	46.73	63.62	-16.89	QP
4	0.285	20.10	0.26	10.74	31.10	50.68	-19.58	Average
5	0.476	33.65	0.29	10.75	44.69	56.41	-11.72	QP
6	0.476	22.00	0.29	10.75	33.04	46.41	-13.37	Average
7	0.524	19.09	0.28	10.76	30.13	46.00	-15.87	Average
8	0.641	30.12	0.24	10.77	41.13	56.00	-14.87	QP
9	0.641	15.80	0.24	10.77	26.81	46.00	-19.19	Average
10	1.472	27.37	0.26	10.92	38.55	56.00	-17.45	QP
11	2.144	11.96	0.26	10.95	23.17	46.00	-22.83	Average
12	2.178	26.23	0.26	10.95	37.44	56.00	-18.56	QP

Neutral:



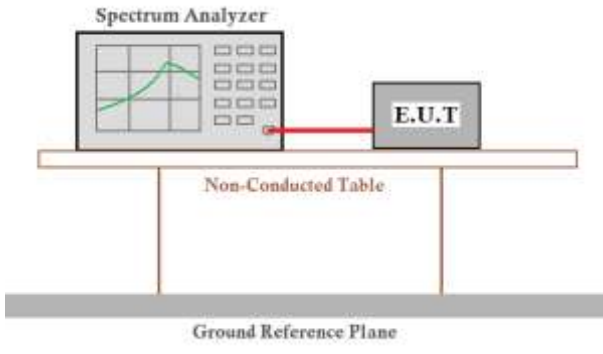
Trace: 5
 Site : CCIS Shielding Room
 Condition : FCC PART15 B QP LISN NEUTRAL
 Job No. : 736RF
 EUT : T97601T4
 Model : Bang
 Test Mode : BT mode
 Power Rating : AC 120V/60Hz
 Environment : Temp: 23 °C Humi:56% Atmos:101KPa
 Test Engineer: Wendell
 Remark :

	Read	LISN	Cable	Level	Limit	Over	
Freq	Level	Factor	Loss	Level	Line	Limit	Remark
MHz	dBuV	dB	dB	dBuV	dBuV	dB	
1	0.160	40.84	0.25	10.78	51.87	65.47	-13.60 QP
2	0.161	22.11	0.25	10.78	33.14	55.43	-22.29 Average
3	0.200	35.80	0.25	10.76	46.81	63.62	-16.81 QP
4	0.481	34.48	0.28	10.75	45.51	56.32	-10.81 QP
5	0.481	19.18	0.28	10.75	30.21	46.32	-16.11 Average
6	0.521	17.91	0.28	10.76	28.95	46.00	-17.05 Average
7	0.848	14.03	0.20	10.82	25.05	46.00	-20.95 Average
8	1.472	12.77	0.26	10.92	23.95	46.00	-22.05 Average
9	1.480	28.14	0.26	10.92	39.32	56.00	-16.68 QP
10	2.213	27.83	0.29	10.95	39.07	56.00	-16.93 QP
11	2.261	12.43	0.29	10.95	23.67	46.00	-22.33 Average
12	2.993	26.88	0.29	10.92	38.09	56.00	-17.91 QP

Notes:

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

6.3 Conducted Output Power

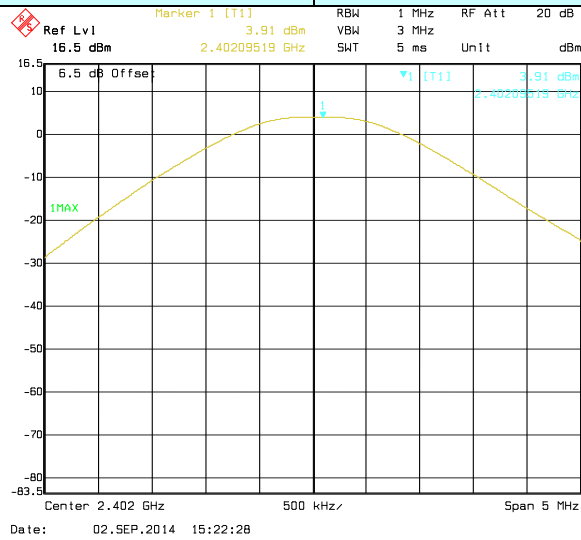
Test Requirement:	FCC Part15 C Section 15.247 (b)(3)
Test Method:	ANSI C63.4:2003 and DA00-705
Receiver setup:	RBW=1MHz, VBW=3MHz, Detector=Peak (If 20dB BW ≤1 MHz) RBW=3MHz, VBW=10MHz, Detector=Peak (If 20dB BW > 1 MHz and < 3MHz)
Limit:	125 mW(21 dBm)
Test setup:	
Test Instruments:	Refer to section 5.7 for details
Test mode:	Non-hopping mode
Test results:	Pass

Measurement Data

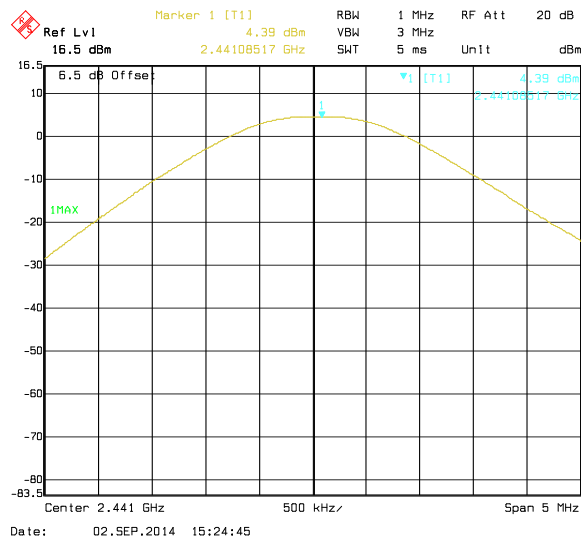
GFSK mode			
Test channel	Peak Output Power (dBm)	Limit (dBm)	Result
Lowest	3.91	21.00	Pass
Middle	4.39	21.00	Pass
Highest	4.41	21.00	Pass
π/4-DQPSK mode			
Test channel	Peak Output Power (dBm)	Limit (dBm)	Result
Lowest	3.10	21.00	Pass
Middle	3.71	21.00	Pass
Highest	3.71	21.00	Pass
8DPSK mode			
Test channel	Peak Output Power (dBm)	Limit (dBm)	Result
Lowest	3.21	21.00	Pass
Middle	3.86	21.00	Pass
Highest	3.71	21.00	Pass

Test plot as follows:

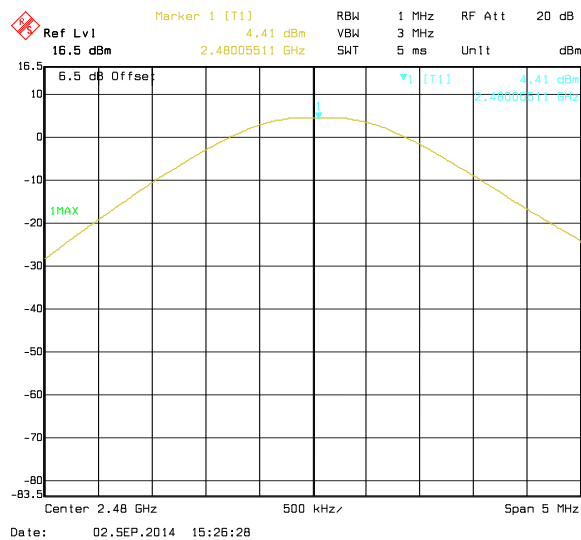
Modulation mode:	GFSK
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Lowest channel

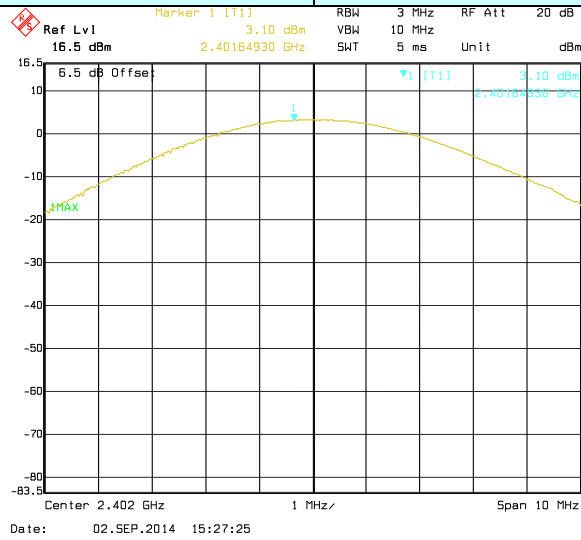


Middle channel

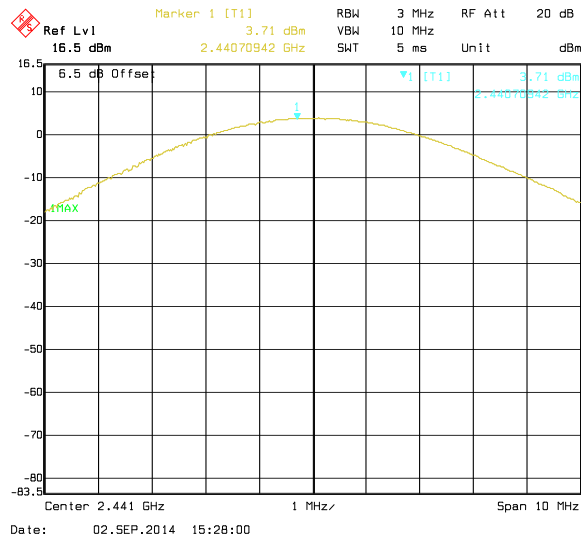


Highest channel

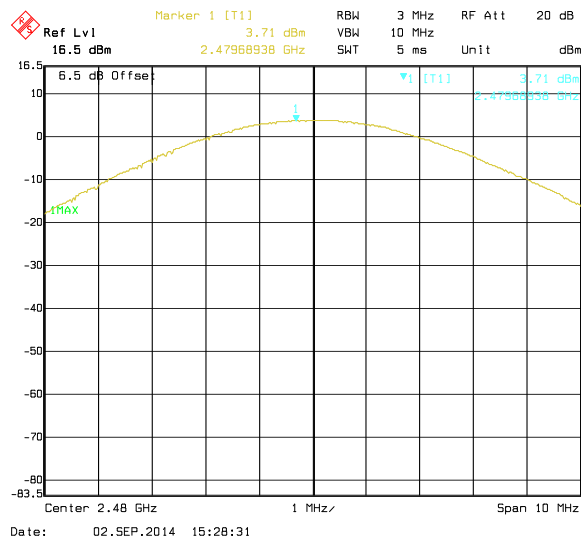
Modulation mode: π/4-DQPSK



Lowest channel

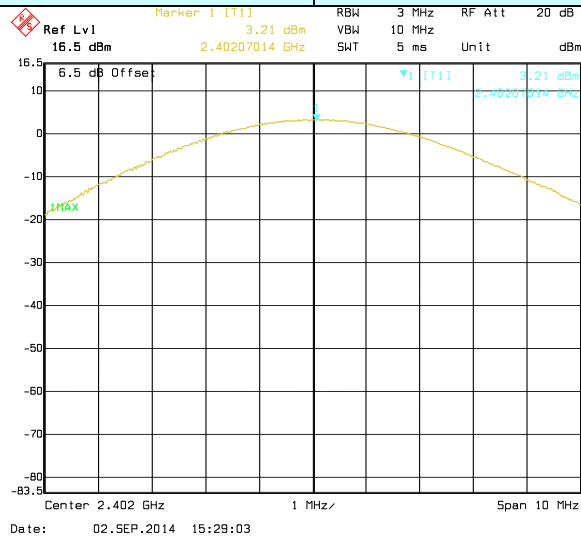


Middle channel

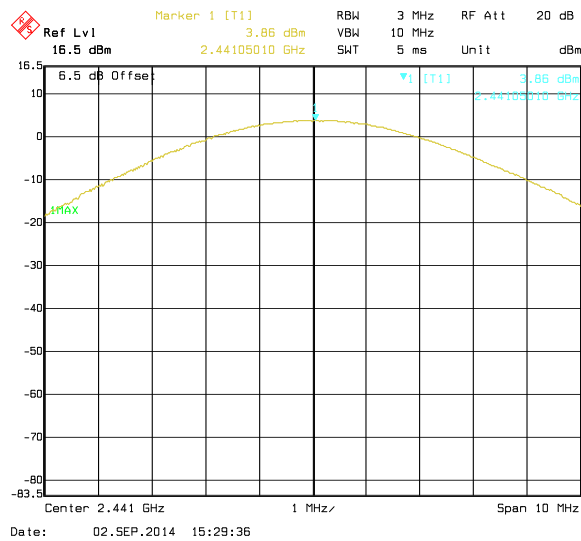


Highest channel

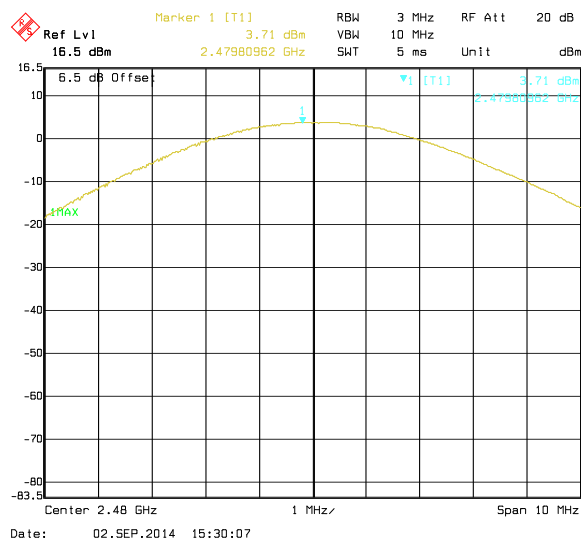
Modulation mode: 8DPSK



Lowest channel

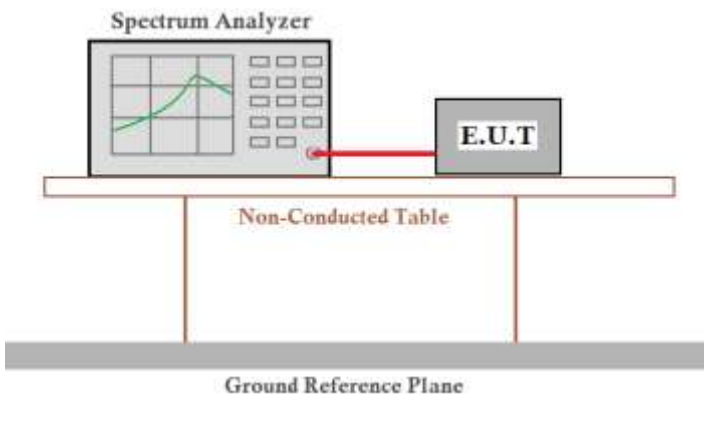


Middle channel



Highest channel

6.4 20dB Occupy Bandwidth

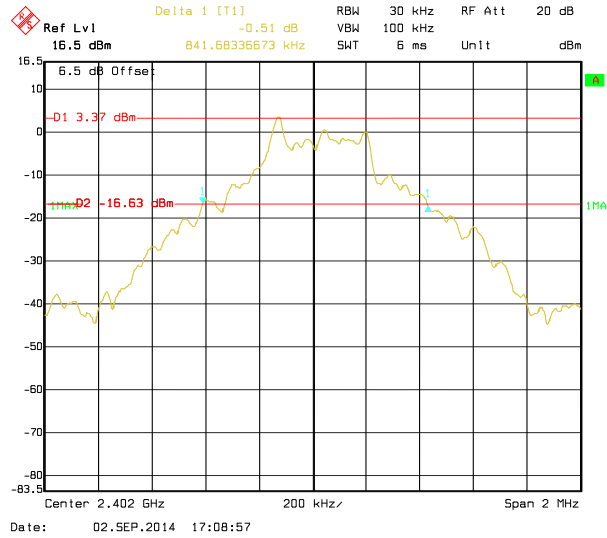
Test Requirement:	FCC Part15 C Section 15.247 (a)(1)
Test Method:	ANSI C63.4:2003 and DA00-705
Receiver setup:	RBW=30 kHz, VBW=100 kHz, detector=Peak
Limit:	NA
Test setup:	 <p>The diagram illustrates the test setup. A Spectrum Analyzer is connected via a red cable to an E.U.T. (Equipment Under Test). Both are placed on a Non-Conducted Table. Below the table is a Ground Reference Plane.</p>
Test Instruments:	Refer to section 5.7 for details
Test mode:	Non-hopping mode
Test results:	Pass

Measurement Data

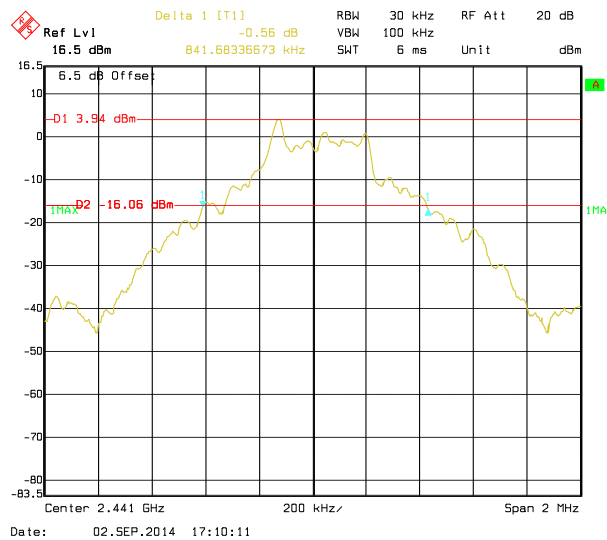
Test channel	20dB Occupy Bandwidth (kHz)		
	GFSK	$\pi/4$ -DQPSK	8DPSK
Lowest	841.68	1146.29	1174.35
Middle	841.68	1138.28	1174.35
Highest	841.68	1142.28	1174.35

Test plot as follows:

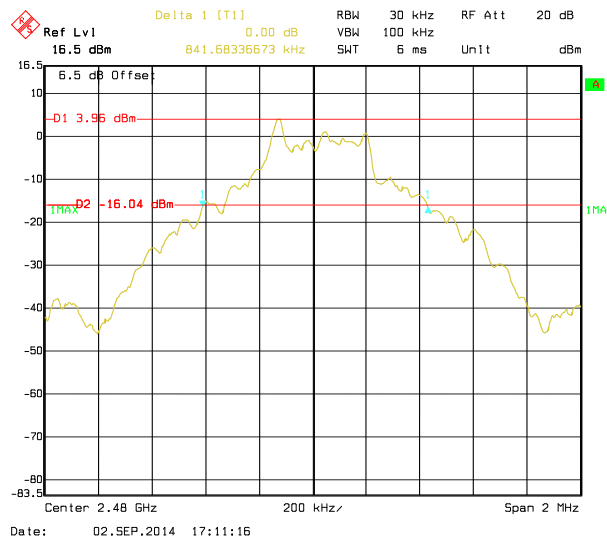
Modulation mode: **GFSK**



Lowest channel

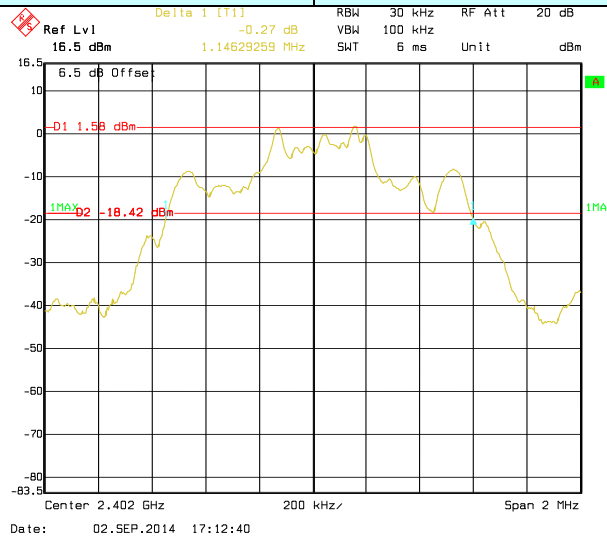


Middle channel

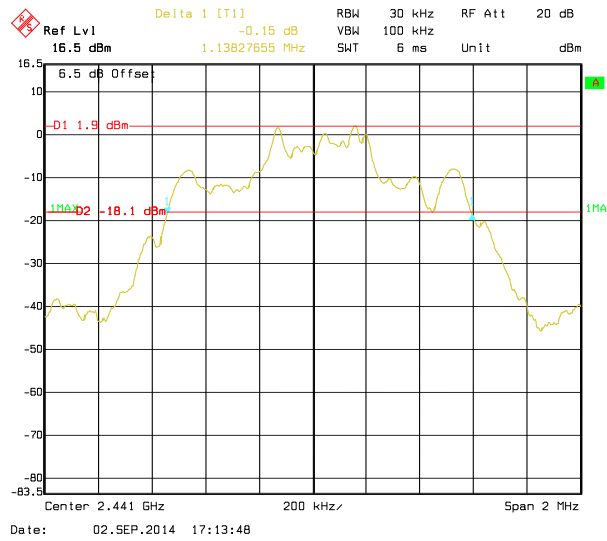


Highest channel

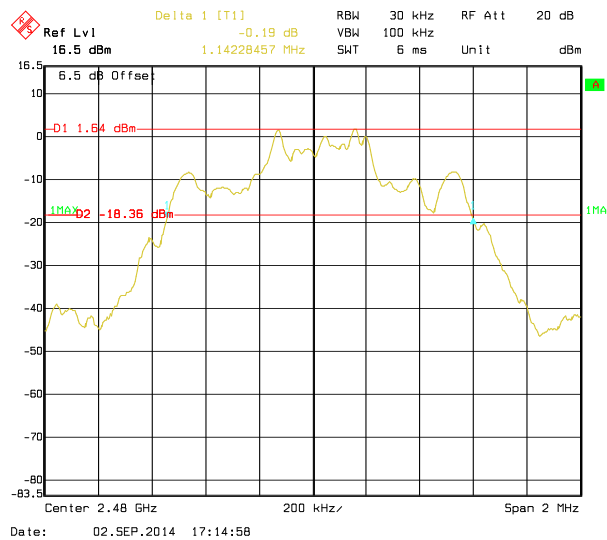
Modulation mode: $\pi/4$ -DQPSK



Lowest channel

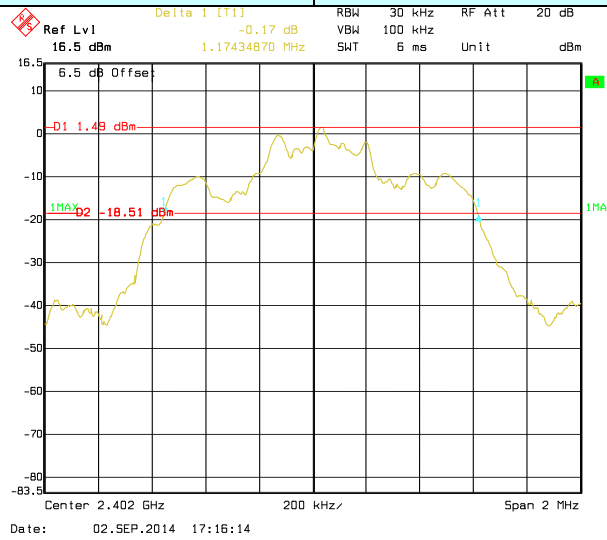


Middle channel

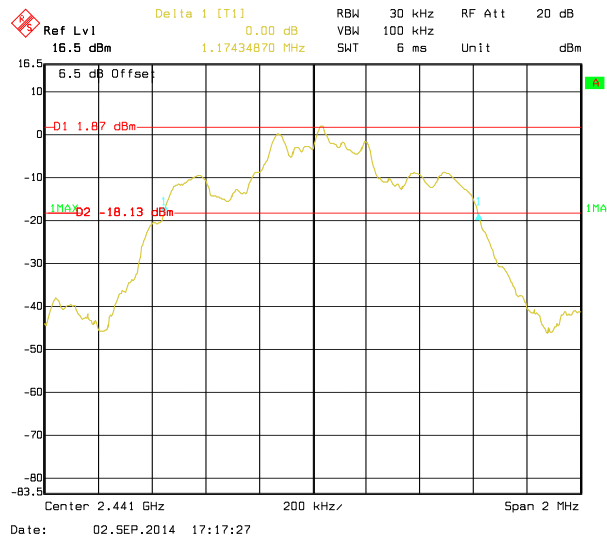


Highest channel

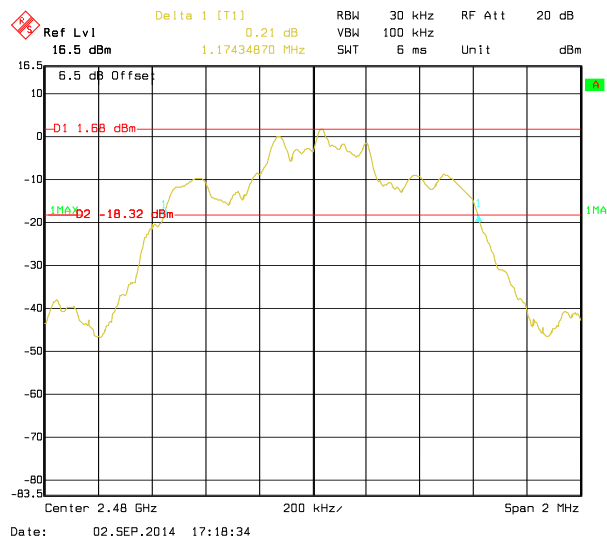
Modulation mode: **8DPSK**



Lowest channel

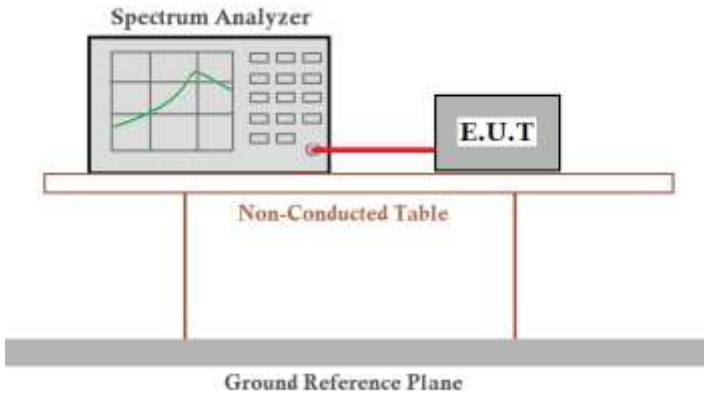


Middle channel



Highest channel

6.5 Carrier Frequencies Separation

Test Requirement:	FCC Part15 C Section 15.247 (a)(1)
Test Method:	ANSI C63.4:2003 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:	 <p>The diagram illustrates the test setup. A Spectrum Analyzer is connected to an E.U.T. (Equipment Under Test) via a red cable. Both are placed on a Non-Conducted Table, which is supported by two vertical legs. Below the table is a Ground Reference Plane.</p>
Test Instruments:	Refer to section 5.7 for details
Test mode:	Hopping mode
Test results:	Pass

Measurement Data

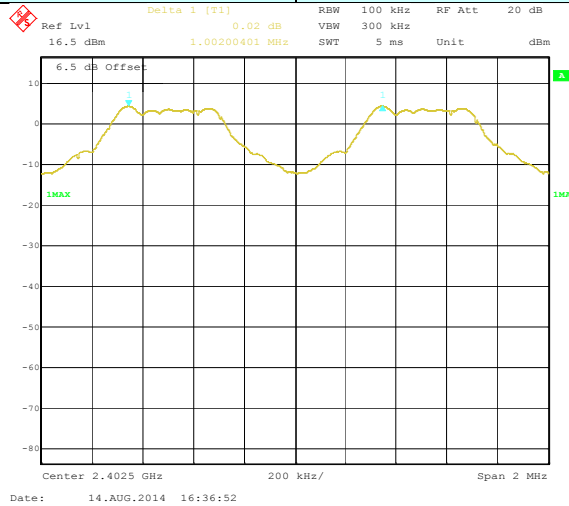
GFSK mode			
Test channel	Carrier Frequencies Separation (kHz)	Limit (kHz)	Result
Lowest	1002	561.12	Pass
Middle	1002	561.12	Pass
Highest	1002	561.12	Pass
$\pi/4$ -DQPSK mode			
Test channel	Carrier Frequencies Separation (kHz)	Limit (kHz)	Result
Lowest	1002	764.19	Pass
Middle	1002	764.19	Pass
Highest	1002	764.19	Pass
8DPSK mode			
Test channel	Carrier Frequencies Separation (kHz)	Limit (kHz)	Result
Lowest	1002	782.90	Pass
Middle	1002	782.90	Pass
Highest	1002	782.90	Pass

Note: According to section 6.4

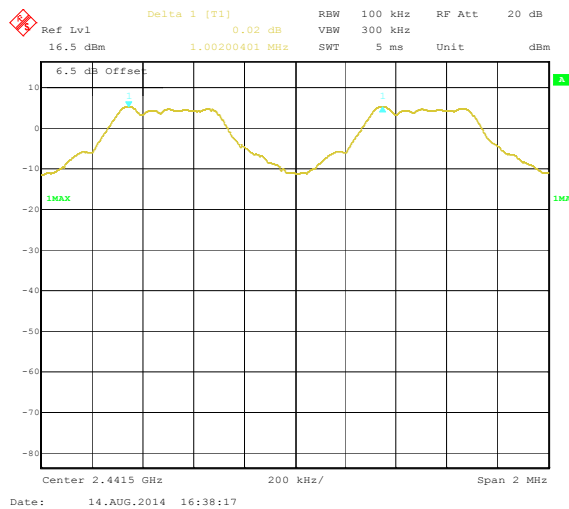
Mode	20dB bandwidth (kHz) (worse case)	Limit (kHz) (Carrier Frequencies Separation)
GFSK	841.68	561.12
$\pi/4$ -DQPSK	1146.29	764.19
8DPSK	1174.35	782.90

Test plot as follows:

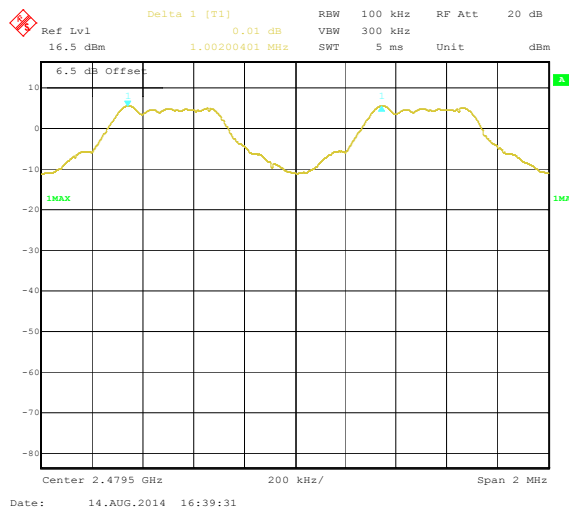
Modulation mode: GFSK



Lowest channel

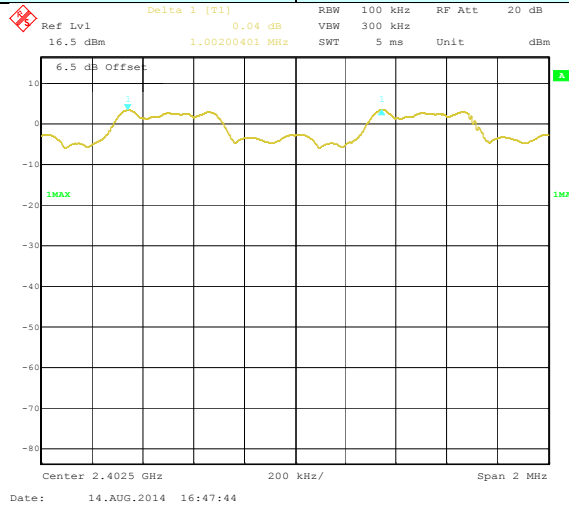


Middle channel

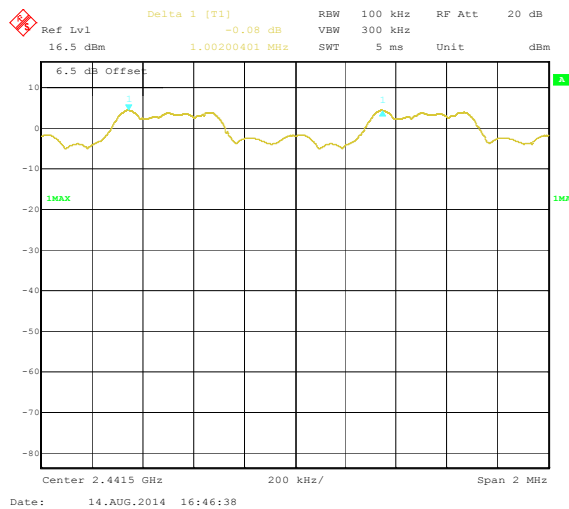


Highest channel

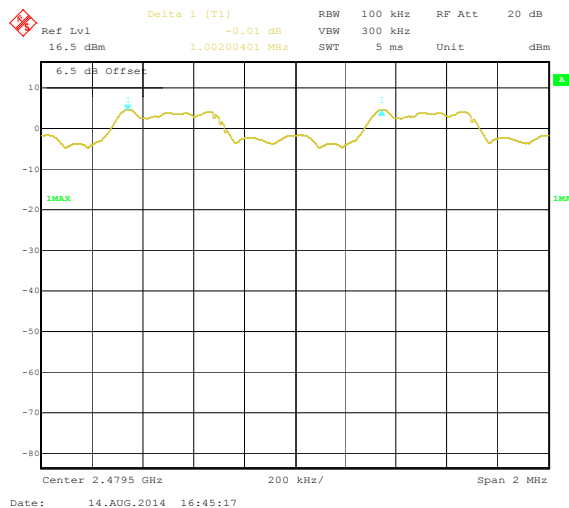
Modulation mode: π/4-DQPSK



Lowest channel

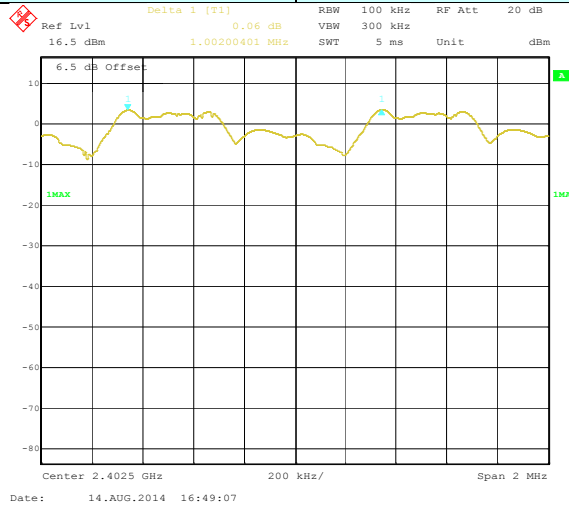


Middle channel

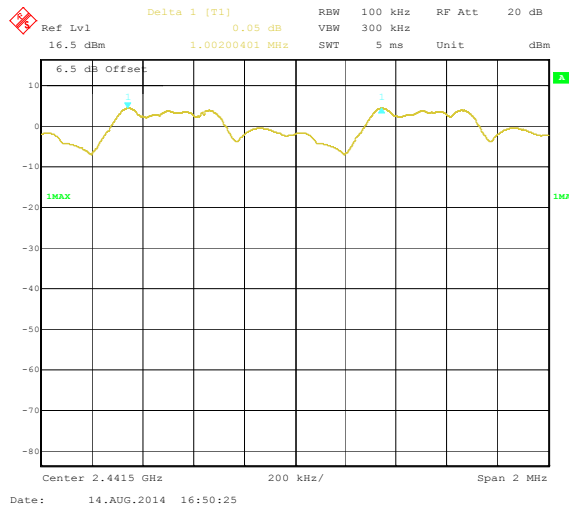


Highest channel

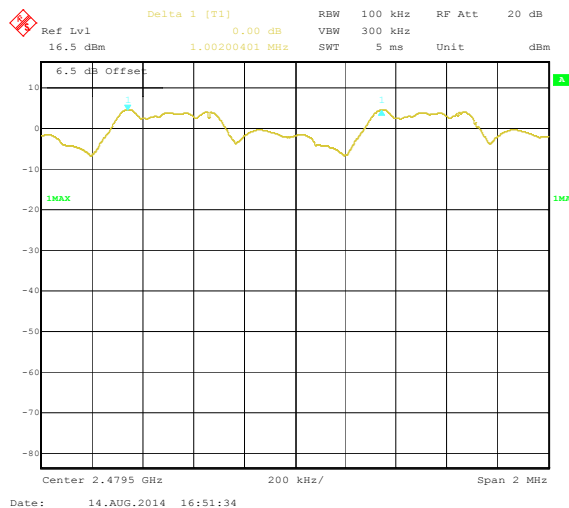
Modulation mode: **8DPSK**



Lowest channel

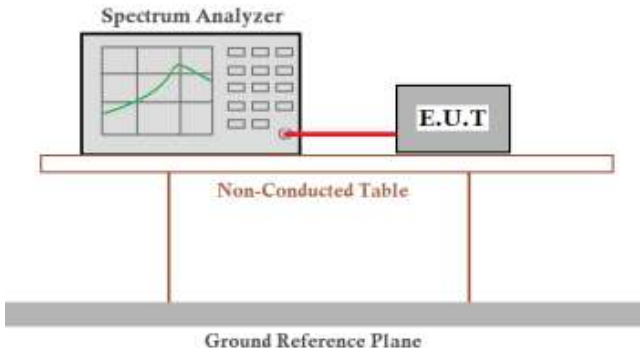


Middle channel



Highest channel

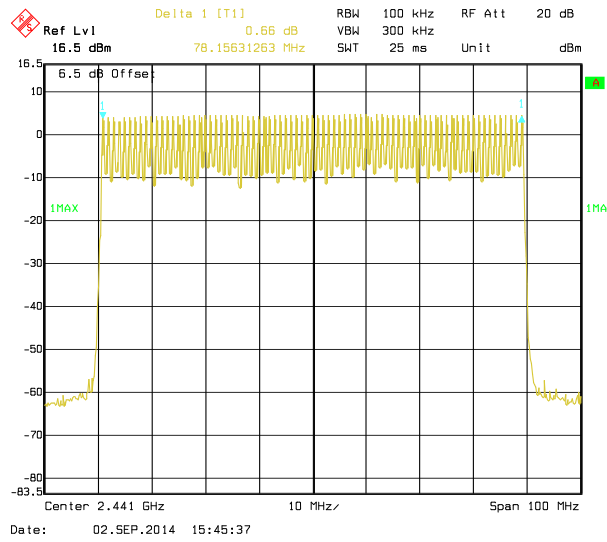
6.6 Hopping Channel Number

Test Requirement:	FCC Part15 C Section 15.247 (a)(1)
Test Method:	ANSI C63.4:2003 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 and an E.U.T. (Equipment Under Test) are placed on a Non-Conducted Table. The table is supported by two vertical legs. Below the table is a Ground Reference Plane, represented by a thick grey bar. A red line connects the Spectrum Analyzer to the E.U.T.</p>
Test Instruments:	Refer to section 5.7 for details
Test mode:	Hopping mode
Test results:	Pass

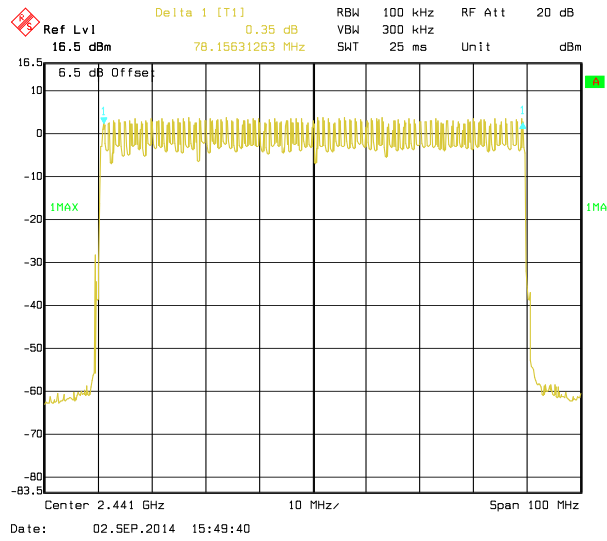
Measurement Data:

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

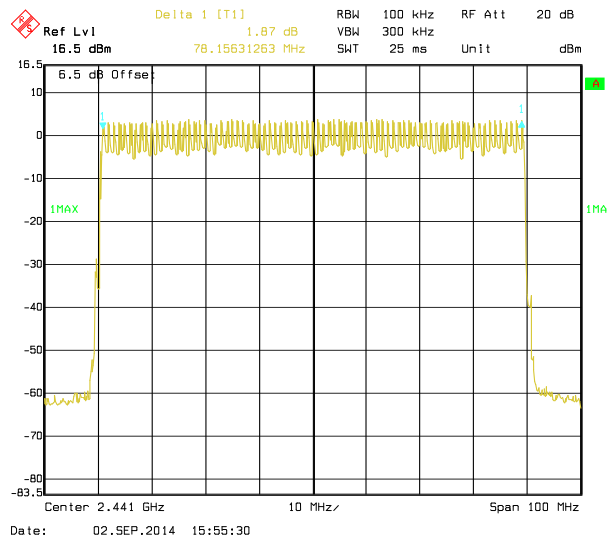
GFSK



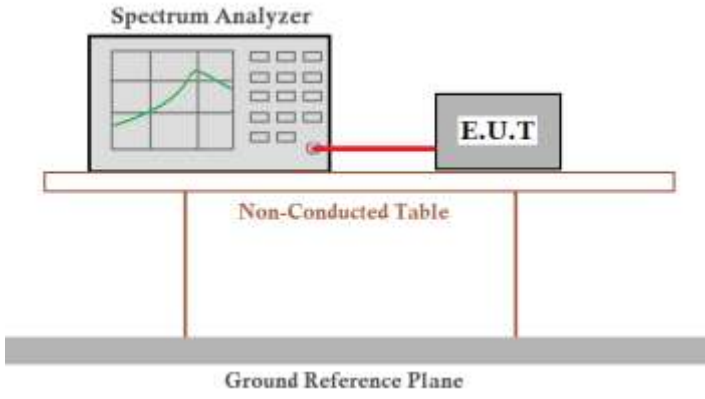
$\pi/4$ -DQPSK



8DPSK



6.7 Dwell Time

Test Requirement:	FCC Part15 C Section 15.247 (a)(1)
Test Method:	ANSI C63.4:2003 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)

Mode	Packet	Dwell time (second)	Limit (second)	Result
GFSK	DH1	0.12704	0.4	Pass
	DH3	0.26736		
	DH5	0.31296		
π /4-DQPSK	2-DH1	0.12960	0.4	Pass
	2-DH3	0.26640		
	2-DH5	0.31296		
8DPSK	3-DH1	0.12704	0.4	Pass
	3-DH3	0.26544		
	3-DH5	0.31211		

For GFSK, π/4-DQPSK and 8DPSK:

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

DH1 time slot = $0.397 \times (1600 / (2 \times 79)) \times 31.6 = 127.04 \text{ ms}$

DH3 time slot = $1.671 \times (1600 / (4 \times 79)) \times 31.6 = 267.36 \text{ ms}$

DH5 time slot = $2.934 \times (1600 / (6 \times 79)) \times 31.6 = 312.96 \text{ ms}$

2-DH1 time slot = $0.405 \times (1600 / (2 \times 79)) \times 31.6 = 129.60 \text{ ms}$

2-DH3 time slot = $1.665 \times (1600 / (4 \times 79)) \times 31.6 = 266.40 \text{ ms}$

2-DH5 time slot = $2.9346 \times (1600 / (6 \times 79)) \times 31.6 = 312.96 \text{ ms}$

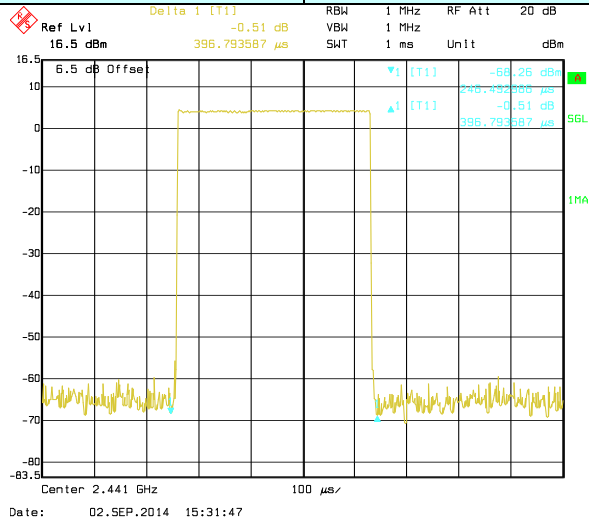
3-DH1 time slot = $0.397 \times (1600 / (2 \times 79)) \times 31.6 = 127.04 \text{ ms}$

3-DH3 time slot = $1.659 \times (1600 / (4 \times 79)) \times 31.6 = 265.44 \text{ ms}$

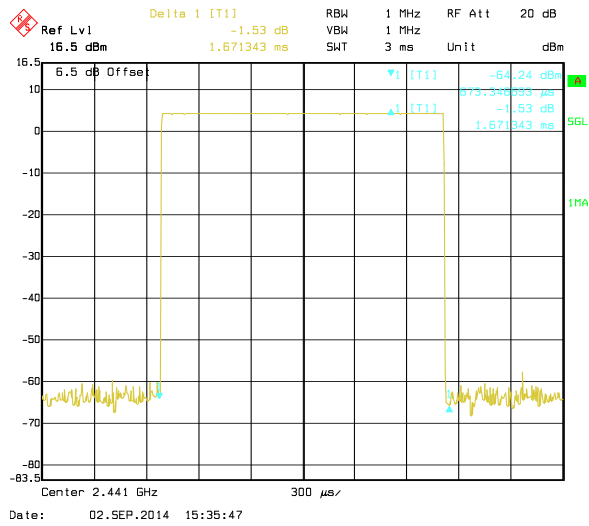
3-DH5 time slot = $2.926 \times (1600 / (6 \times 79)) \times 31.6 = 312.11 \text{ ms}$

Test plot as follows:

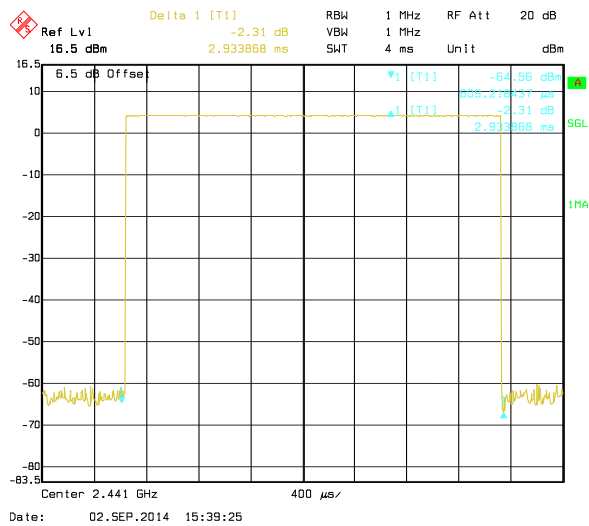
Modulation mode:	GFSK
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DH1

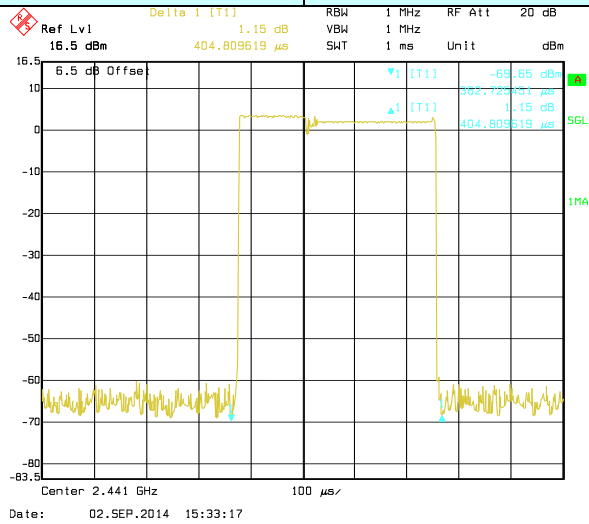


DH3

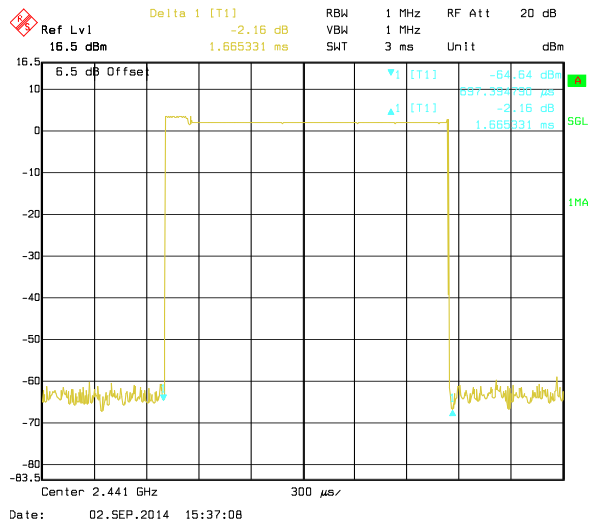


DH5

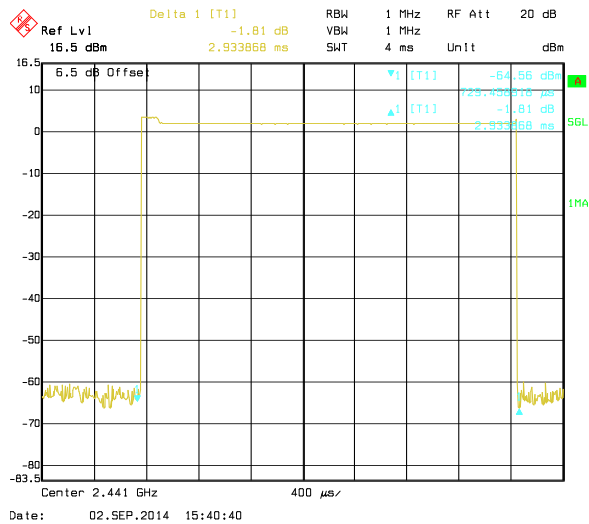
Modulation mode: $\pi/4$ -DQPSK



2-DH1

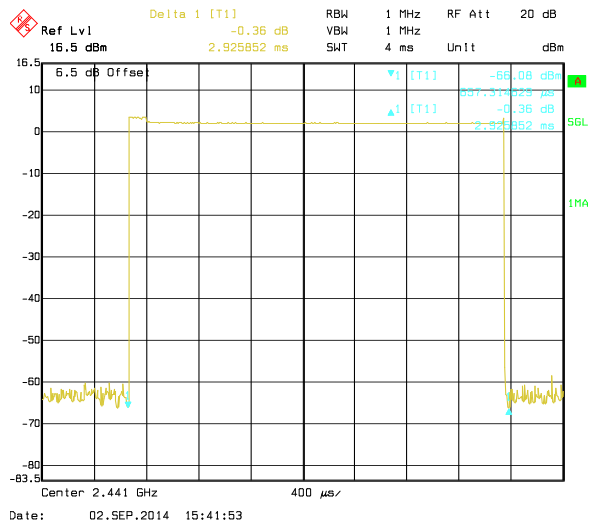
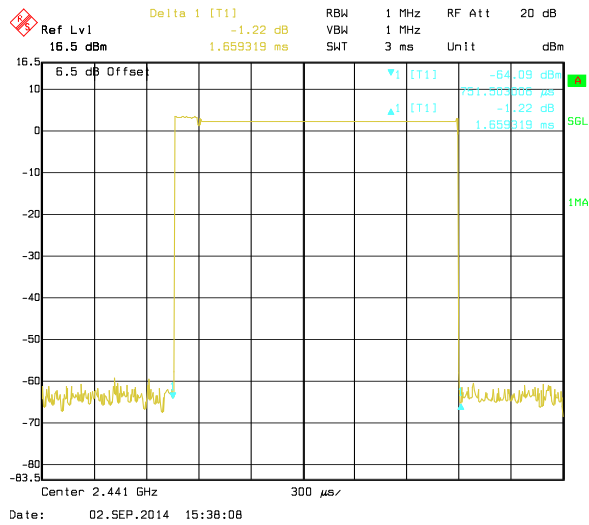
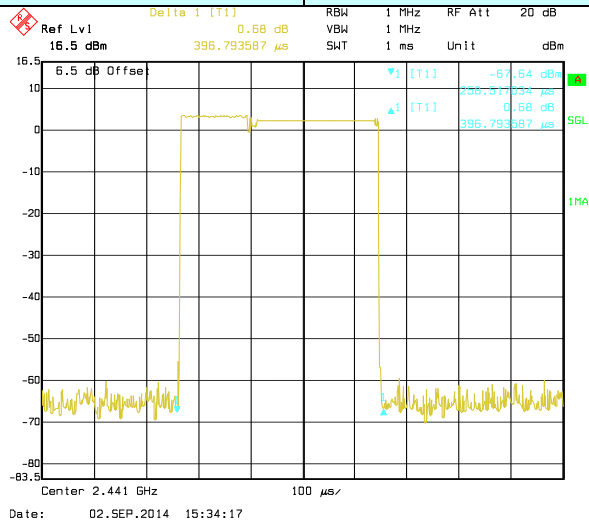


2-DH3

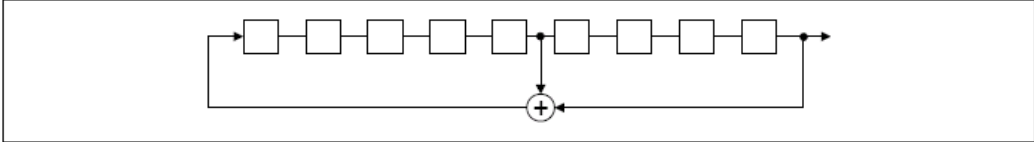
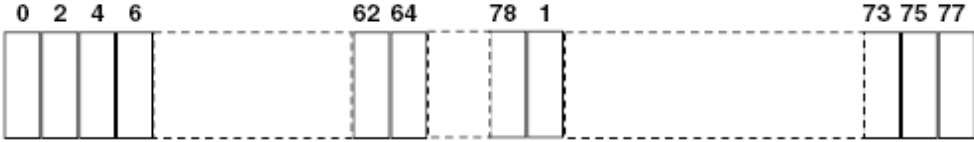


2-DH5

Modulation mode: **8DPSK**



6.8 Pseudorandom Frequency Hopping Sequence

Test Requirement:	FCC Part15 C Section 15.247 (a)(1) requirement:
<p>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.</p> <p>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.</p>	
EUT Pseudorandom Frequency Hopping Sequence	
<p>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.</p> <ul style="list-style-type: none"> • Number of shift register stages: 9 • Length of pseudo-random sequence: $2^9 - 1 = 511$ bits • Longest sequence of zeros: 8 (non-inverted signal) 	
	
<p><i>Linear Feedback Shift Register for Generation of the PRBS sequence</i></p>	
<p>An example of Pseudorandom Frequency Hopping Sequence as follow:</p>	
	
<p>Each frequency used equally on the average by each transmitter.</p> <p>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.</p>	