FCC REPORT
(Bluetooth)

Applicant:	Sun Cupid Technology (HK) Ltd.
Address of Applicant:	16/F, CEO Tower, 77 Wing Hong Street, Cheung Sha Wan, Kowloon, Hong Kong.

Equipment Under Test (EUT)

Product Name:	LTE mobile phone
Model No.:	N5501L, A5L
Trade mark:	NUU
FCC ID:	2ADINN5501L
Applicable standards:	FCC CFR Title 47 Part 15 Subpart C Section 15.247
Date of sample receipt:	20 Jun., 2018
Date of Test:	20 Jun., to 16 Jul., 2018
Date of report issued:	25 Jul., 2018
Test Result:	PASS *

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

Authorized Signature:

Bruce Zhang
Laboratory Manager

2 Version

Version No.	Date	Description
00	*25 Jul., 2018*	*Original*

Tested by: YT Yang ***Date:*** *25 Jul., 2018*

Test Engineer

Reviewed by: Vimer Zhang ***Date:*** *25 Jul., 2018*

Project Engineer

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4 Test Summary

Test Items	Section in CFR 47	Result
Antenna Requirement	15.203 & 15.247 (c)	Pass
AC Power Line Conducted Emission	15.207	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. *N/A: Not Applicable.*		

5 General Information

5.1 Client Information

Applicant:	Sun Cupid Technology (HK) Ltd.
Address:	16/F, CEO Tower, 77 Wing Hong Street, Cheung Sha Wan, Kowloon, Hong Kong.
Manufacturer:	Sun Cupid Technology (HK) Ltd.
Address:	16/F, CEO Tower, 77 Wing Hong Street, Cheung Sha Wan, Kowloon, Hong Kong.
Factory:	SUNCUPID (ShenZhen) Electronic Ltd
Address:	Baolong Industrial City, Longgang District, Shenzhen Hi-Tech Road, Building 1, A 7, China.

5.2 General Description of E.U.T.

Product Name:	LTE mobile phone
Model No.:	N5501L, A5L
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:	-1.0 dBi
Power supply:	Rechargeable Li-ion Battery DC3.8V-2650mAh
AC adapter:	Adapter(1) Model: HNBL050100UX Input: AC100-240V, 50/60Hz, 0.2A Output: DC 5.0V, 1.0A Adapter(2) Model: HJ-0501000E1-US Input: AC100-240V, 50/60Hz, 0.2A Output: DC 5.0V, 1.0A Adapter(3) Model: HJ-0501000B3-EU Input: AC100-240V, 50/60Hz, 0.2A Output: DC 5.0V, 1.0A
Remark:	1. The No.: N5501L, A5L were identical inside, the electrical circuit design, layout, components used and internal wiring, with only difference being model name and trademark. 2. adapter (1) have different pins and the internal structure is the same, so there is no need to do the difference test.

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

5.3 Test environment and test mode

Operating Environment:	
Temperature:	24.0 °C
Humidity:	54 % RH
Atmospheric Pressure:	1010 mbar
Test Modes:	
Non-hopping mode:	Keep the EUT in continuous transmitting mode with worst case data rate.
Hopping mode:	Keep the EUT in hopping mode.
Remark	GFSK (1 Mbps) is the worst case mode.
The sample was placed 0.8m (below 1GHz)/1.5m (above 1GHz) above the ground plane of 3m chamber*. Measurements in both horizontal and vertical polarities were performed. During the test, each emission was maximized by: having the EUT continuously working with a fresh battery, investigated all operating modes, rotated about all 3 axis (X, Y & Z) and considered typical configuration to obtain worst position, manipulating interconnecting cables, rotating the turntable, varying antenna height from 1m to 4m in both horizontal and vertical polarizations. The emissions worst-case are shown in Test Results of the following pages.	

5.4 Description of Support Units

The EUT has been tested as an independent unit.

5.5 Measurement Uncertainty

Parameters	Expanded Uncertainty
Conducted Emission (9kHz ~ 30MHz)	±2.22 dB (k=2)
Radiated Emission (9kHz ~ 30MHz)	±2.76 dB (k=2)
Radiated Emission (30MHz ~ 1000MHz)	±4.28 dB (k=2)
Radiated Emission (1GHz ~ 18GHz)	±5.72 dB (k=2)
Radiated Emission (18GHz ~ 40GHz)	±2.88 dB (k=2)

5.6 Laboratory Facility

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

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

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

- **IC - Registration No.: 10106A-1**

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

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

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

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

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

5.7 Laboratory Location

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

5.8 Test Instruments list

Radiated Emission:					
Test Equipment	**Manufacturer**	**Model No.**	**Serial No.**	**Cal. Date (mm-dd-yy)**	**Cal. Due date (mm-dd-yy)**
3m SAC	SAEMC	9m*6m*6m	966	07-22-2017	07-21-2020
Loop Antenna	SCHWARZBECK	FMZB1519B	00044	03-16-2018	03-15-2019
BiConiLog Antenna	SCHWARZBECK	VULB9163	497	03-16-2018	03-15-2019
Horn Antenna	SCHWARZBECK	BBHA9120D	916	03-16-2018	03-15-2019
EMI Test Software	AUDIX	E3	6.110919b	N/A	N/A
Pre-amplifier	HP	8447D	2944A09358	03-07-2018	03-06-2019
Pre-amplifier	CD	PAP-1G18	11804	03-07-2018	03-06-2019
Spectrum analyzer	Rohde & Schwarz	FSP30	101454	03-07-2018	03-06-2019
EMI Test Receiver	Rohde & Schwarz	ESRP7	101070	03-07-2018	03-06-2019
Cable	ZDECL	Z108-NJ-NJ-81	1608458	03-07-2018	03-06-2019
Cable	MICRO-COAX	MFR64639	K10742-5	03-07-2018	03-06-2019
Cable	SUHNER	SUCOFLEX100	58193/4PE	03-07-2018	03-06-2019

Conducted Emission:					
Test Equipment	**Manufacturer**	**Model No.**	**Serial No.**	**Cal. Date (mm-dd-yy)**	**Cal. Due date (mm-dd-yy)**
EMI Test Receiver	Rohde & Schwarz	ESCI	101189	03-07-2018	03-06-2019
Pulse Limiter	SCHWARZBECK	OSRAM 2306	9731	03-07-2018	03-06-2019
LISN	CHASE	MN2050D	1447	03-19-2018	03-18-2019
LISN	Rohde & Schwarz	ESH3-Z5	8438621/010	07-21-2018	07-20-2019
Cable	HP	10503A	N/A	03-07-2018	03-06-2019
EMI Test Software	AUDIX	E3	6.110919b	N/A	N/A

6 Test results and measurement data

6.1 Antenna Requirement

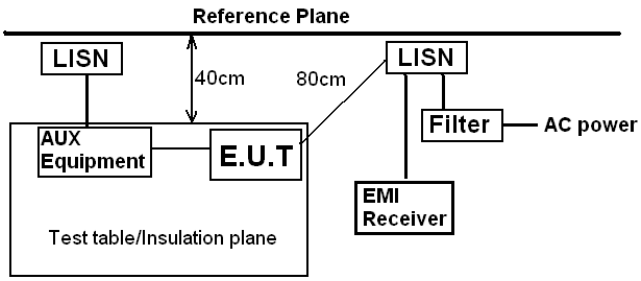
Standard requirement:	FCC Part 15 C Section 15.203 & 247(c)

15.203 requirement:
An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator, the manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.
15.247(c) (1)(i) requirement:
(i) Systems operating in the 2400-2483.5 MHz band that is used exclusively for fixed. Point-to-point operations may employ transmitting antennas with directional gain greater than 6dBi provided the maximum conducted output power of the intentional radiator is reduced by 1 dB for every 3 dB that the directional gain of the antenna exceeds 6dBi.

E.U.T Antenna:	

The Bluetooth antenna is an Internal antenna which permanently attached, and the best case gain of the antenna is -1.0 dBi.

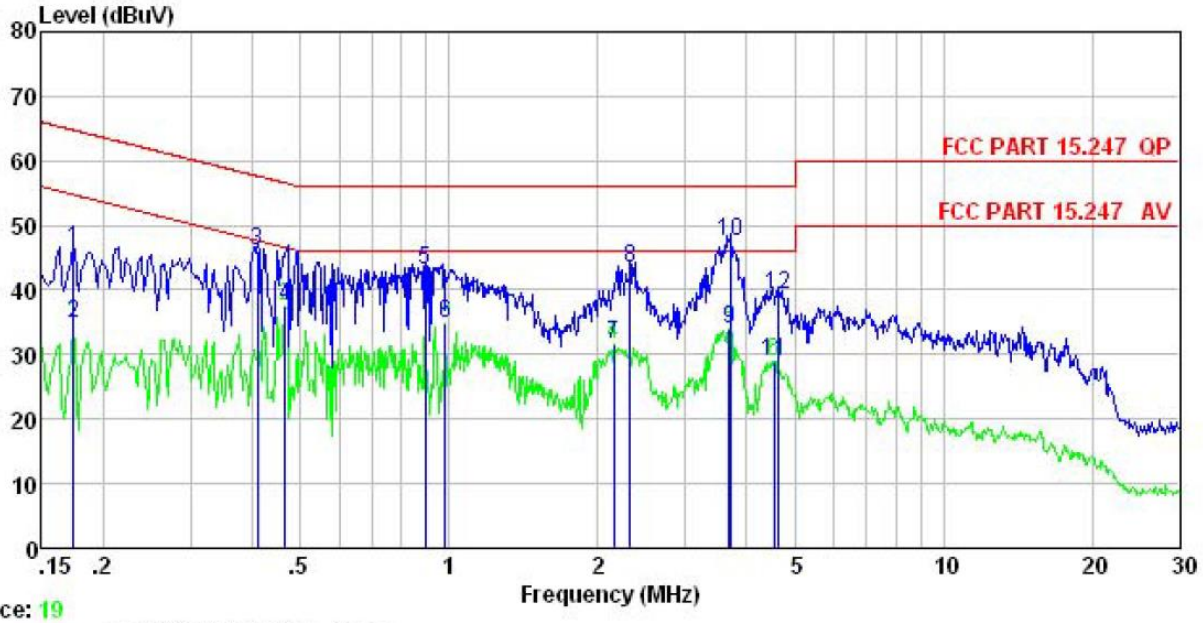
6.2 Conducted Emissions

Test Requirement:	FCC Part 15 C Section 15.207		
Test Method:	ANSI C63.10:2013		
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:	 *Remark:* *E.U.T: Equipment Under Test* *LISN: Line Impedence Stabilization Network* *Test table height=0.8m*		
Test procedure:	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: 2014 on conducted measurement.		
Test Instruments:	Refer to section 5.8 for details		
Test mode:	Hopping mode		
Test results:	Pass		

Adapter（1）

Measurement Data:

Test Phase: Line



Trace: 19

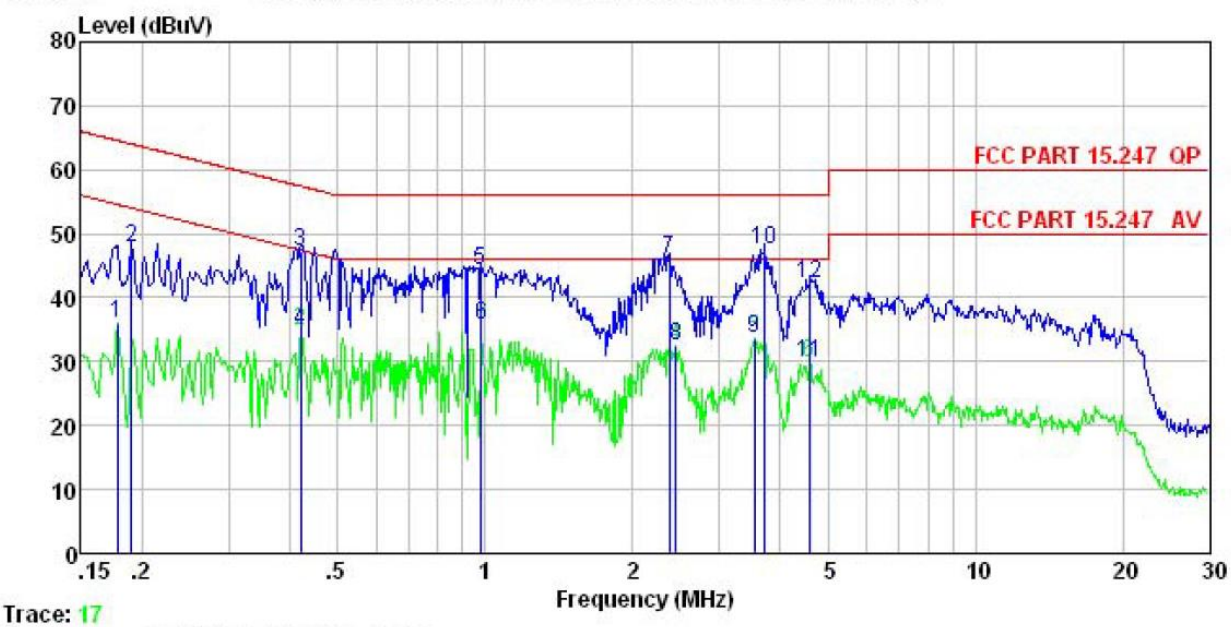
Site : CCIS Shielding Room
Condition : FCC PART 15.247 QP LISN LINE
EUT : LTE mobile phone
Model : N5501L
Test Mode : BT mode
Power Rating : AC 120V/60Hz
Environment : Temp: 23 'C Huni:56% Atmos:101KPa
Test Engineer: YT
Remark :

	Freq	Read Level	LISN Factor	Cable Loss	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB	dB	dBuV	dBuV	dB	
1	0.174	35.47	0.16	10.77	46.40	64.77	-18.37	QP
2	0.174	24.04	0.16	10.77	34.97	64.77	-29.80	Average
3	0.410	35.15	0.12	10.72	45.99	57.64	-11.65	QP
4	0.466	26.67	0.12	10.75	37.54	56.58	-19.04	Average
5	0.894	32.16	0.13	10.84	43.13	56.00	-12.87	QP
6	0.984	23.84	0.13	10.87	34.84	56.00	-21.16	Average
7	2.155	20.56	0.14	10.95	31.65	56.00	-24.35	Average
8	2.321	32.37	0.15	10.94	43.46	56.00	-12.54	QP
9	3.681	22.87	0.17	10.90	33.94	56.00	-22.06	Average
10	3.720	36.50	0.18	10.90	47.58	56.00	-8.42	QP
11	4.549	17.98	0.20	10.87	29.05	56.00	-26.95	Average
12	4.647	28.33	0.20	10.86	39.39	56.00	-16.61	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.*

Test Phase: Neutral



Trace: 17

Site : CCIS Shielding Room
Condition : FCC PART 15.247 QP LISN NEUTRAL
EUT : LTE mobile phone
Model : N5501L
Test Mode : BT mode
Power Rating : AC 120V/60Hz
Environment : Temp: 23 'C Huni:56% Atmos:101KPa
Test Engineer: YT
Remark :

	Freq	Read Level	LISN Factor	Cable Loss	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB	dB	dBuV	dBuV	dB	
1	0.178	24.22	0.95	10.77	35.94	64.59	-28.65	Average
2	0.190	36.01	0.93	10.76	47.70	64.02	-16.32	QP
3	0.421	35.61	0.97	10.73	47.31	57.42	-10.11	QP
4	0.421	23.12	0.97	10.73	34.82	57.42	-22.60	Average
5	0.979	32.44	0.97	10.86	44.27	56.00	-11.73	QP
6	0.984	23.97	0.97	10.87	35.81	56.00	-20.19	Average
7	2.371	34.13	0.98	10.94	46.05	56.00	-9.95	QP
8	2.448	20.49	0.99	10.94	32.42	56.00	-23.58	Average
9	3.547	21.78	1.00	10.90	33.68	56.00	-22.32	Average
10	3.720	35.55	1.00	10.90	47.45	56.00	-8.55	QP
11	4.574	17.97	1.00	10.87	29.84	56.00	-26.16	Average
12	4.598	30.43	1.00	10.86	42.29	56.00	-13.71	QP

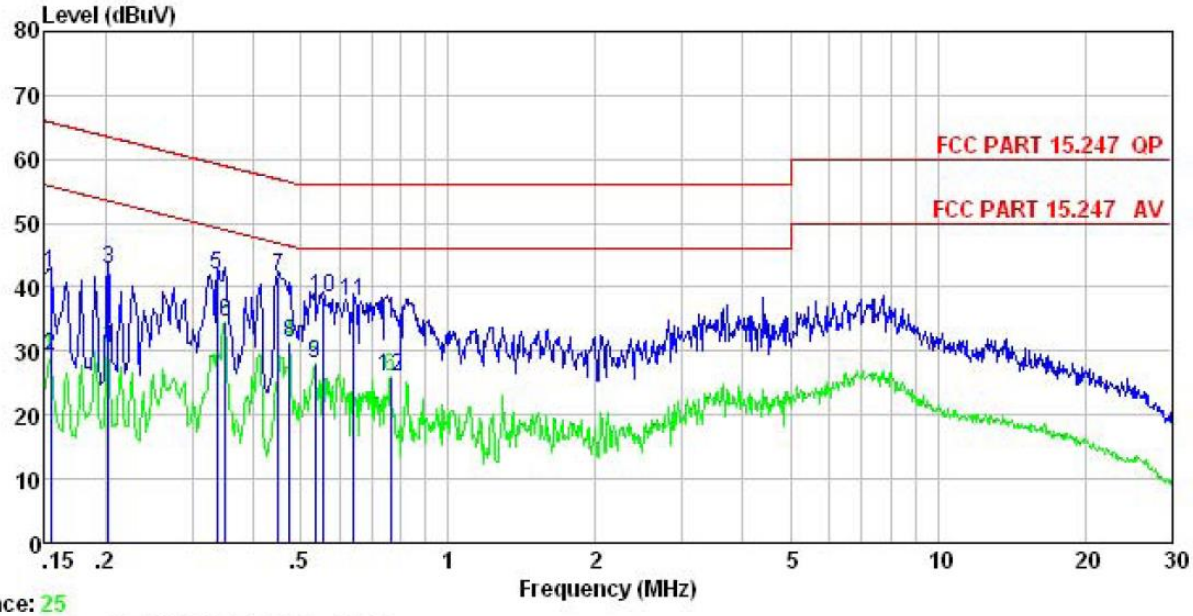
Notes:

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.*

Adapter（2）

Measurement Data:

Test Phase: Line



Trace: 25

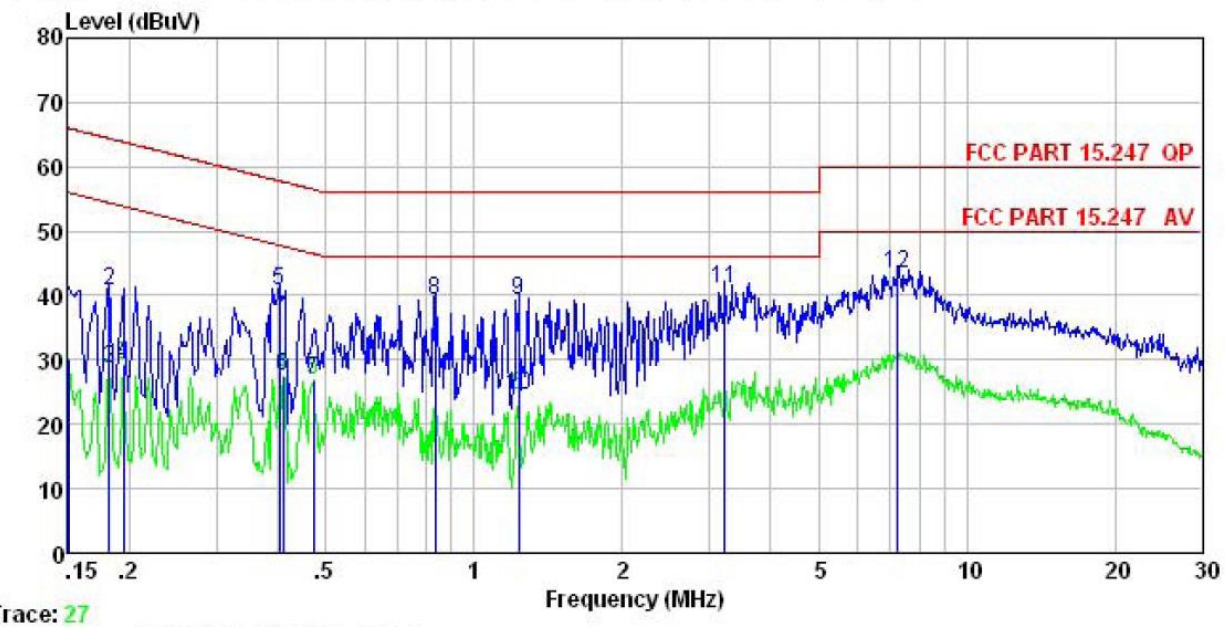
Site : CCIS Shielding Room
Condition : FCC PART 15.247 QP LISN LINE
EUT : LTE mobile phone
Model : N5501L
Test Mode : BLE mode
Power Rating : AC 120V/60Hz
Environment : Temp: 23 ℃ Huni:56% Atmos:101KPa
Test Engineer: YT
Remark : HJ-0501000E1-US

	Freq	Read Level	LISN Factor	Cable Loss	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB	dB	dBuV	dBuV	dB	
1	0.154	31.14	0.18	10.78	42.10	65.78	-23.68	QP
2	0.154	18.30	0.18	10.78	29.26	65.78	-36.52	Average
3	0.202	31.98	0.15	10.76	42.89	63.54	-20.65	QP
4	0.202	19.49	0.15	10.76	30.40	63.54	-33.14	Average
5	0.337	31.19	0.13	10.73	42.05	59.27	-17.22	QP
6	0.350	23.66	0.12	10.73	34.51	58.96	-24.45	Average
7	0.449	30.70	0.12	10.74	41.56	56.89	-15.33	QP
8	0.474	20.51	0.12	10.75	31.38	56.45	-25.07	Average
9	0.535	17.17	0.12	10.76	28.05	56.00	-27.95	Average
10	0.555	27.53	0.12	10.76	38.41	56.00	-17.59	QP
11	0.641	26.94	0.13	10.77	37.84	56.00	-18.16	QP
12	0.763	14.97	0.13	10.80	25.90	56.00	-30.10	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.*

Test Phase: Neutral



Trace: 27

Site : CCIS Shielding Room
Condition : FCC PART 15.247 QP LISN NEUTRAL
EUT : LTE mobile phone
Model : N5501L
Test Mode : BLE mode
Power Rating : AC 120V/60Hz
Environment : Temp: 23 'C Huni:56% Atmos:101KPa
Test Engineer: YT
Remark : HJ-0501000E1-US

	Freq	Read Level	LISN Factor	Cable Loss	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB	dB	dBuV	dBuV	dB	
1	0.150	18.21	0.99	10.78	29.98	66.00	-36.02	Average
2	0.182	28.93	0.94	10.77	40.64	64.42	-23.78	QP
3	0.182	16.97	0.94	10.77	28.68	64.42	-35.74	Average
4	0.194	17.60	0.93	10.76	29.29	63.84	-34.55	Average
5	0.402	29.17	0.97	10.72	40.86	57.81	-16.95	QP
6	0.410	15.64	0.97	10.72	27.33	57.64	-30.31	Average
7	0.471	15.06	0.97	10.75	26.78	56.49	-29.71	Average
8	0.835	27.33	0.97	10.82	39.12	56.00	-16.88	QP
9	1.229	27.40	0.97	10.90	39.27	56.00	-16.73	QP
10	1.229	12.65	0.97	10.90	24.52	56.00	-31.48	Average
11	3.224	29.22	0.99	10.91	41.12	56.00	-14.88	QP
12	7.252	31.66	1.02	10.81	43.49	60.00	-16.51	QP

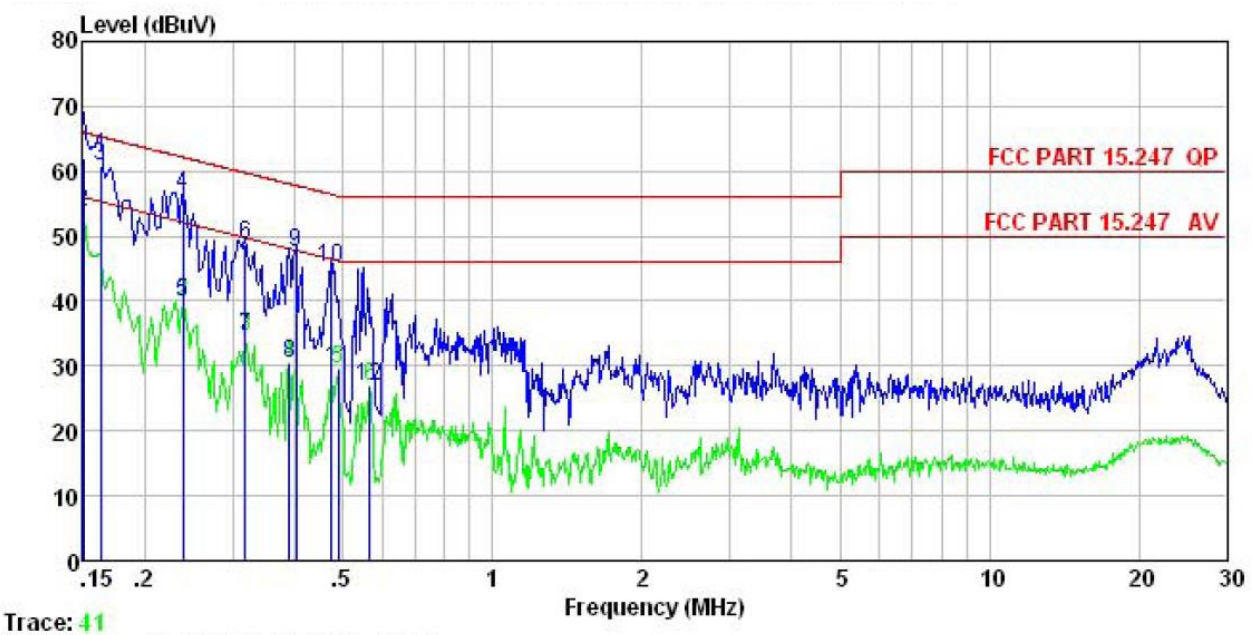
Notes:

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.*

Adapter（3）

Measurement Data:

Test Phase: Line



Trace: 41

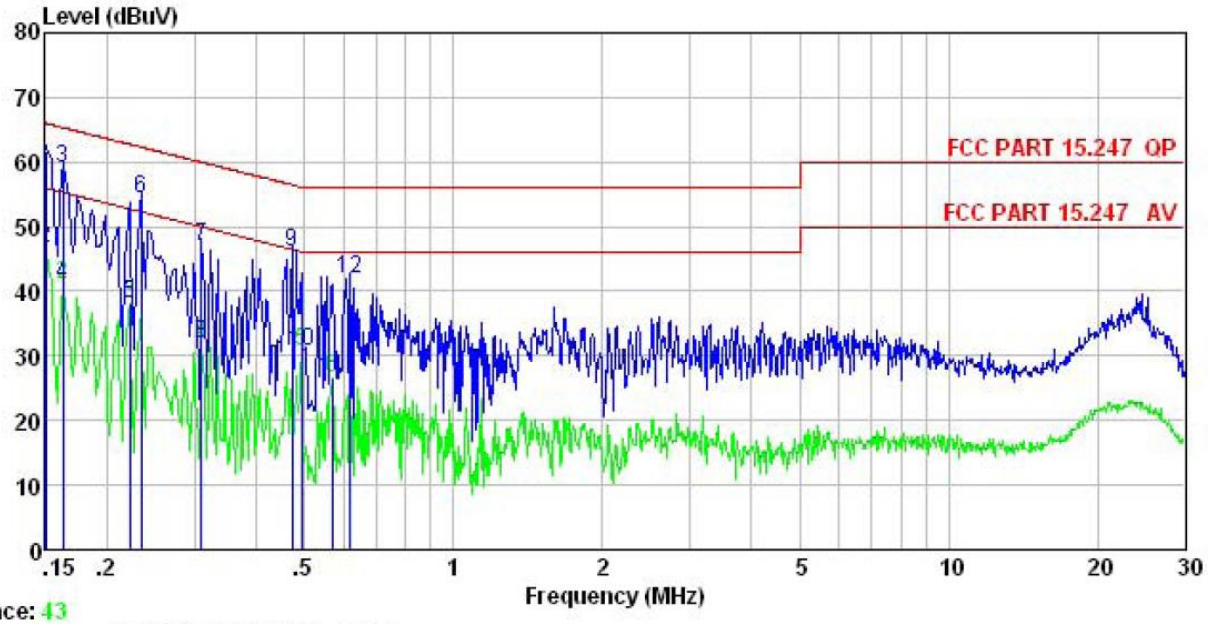
Site : CCIS Shielding Room
Condition : FCC PART 15.247 QP LISN LINE
EUT : LTE mobile phone
Model : N5501L
Test Mode : BT mode
Power Rating : AC 120V/60Hz
Environment : Temp: 23 'C Huni:56% Atmos:101KPa
Test Engineer: YT
Remark : HJ-0501000B3-EU

	Freq	Read Level	LISN Factor	Cable Loss	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB	dB	dBuV	dBuV	dB	
1	0.150	51.00	0.18	10.78	61.96	66.00	-4.04	QP
2	0.150	42.85	0.18	10.78	53.81	66.00	-12.19	Average
3	0.162	49.92	0.17	10.77	60.86	65.34	-4.48	QP
4	0.238	45.38	0.14	10.75	56.27	62.17	-5.90	QP
5	0.238	28.92	0.14	10.75	39.81	62.17	-22.36	Average
6	0.318	37.92	0.13	10.74	48.79	59.75	-10.96	QP
7	0.318	23.66	0.13	10.74	34.53	59.75	-25.22	Average
8	0.389	19.65	0.12	10.72	30.49	58.08	-27.59	Average
9	0.402	36.64	0.12	10.72	47.48	57.81	-10.33	QP
10	0.471	34.28	0.12	10.75	45.15	56.49	-11.34	QP
11	0.489	18.78	0.12	10.76	29.66	56.19	-26.53	Average
12	0.567	16.11	0.12	10.76	26.99	56.00	-29.01	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.*

Test Phase: Neutral



Trace: 43

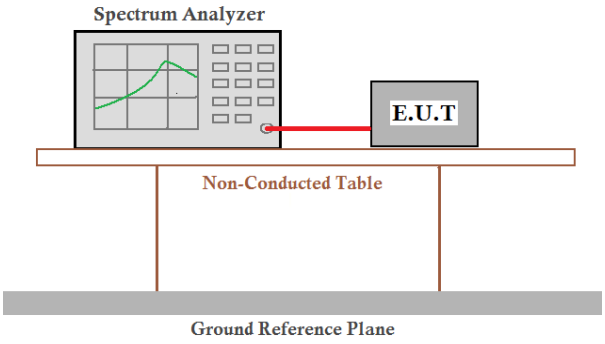
Site : CCIS Shielding Room
Condition : FCC PART 15.247 QP LISN NEUTRAL
EUT : LTE mobile phone
Model : N5501L
Test Mode : BT mode
Power Rating : AC 120V/60Hz
Environment : Temp: 23 'C Huni:56% Atmos:101KPa
Test Engineer: YT
Remark : HJ-0501000B3-EU

	Freq	Read Level	LISN Factor	Cable Loss	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB	dB	dBuV	dBuV	dB	
1	0.150	49.83	0.99	10.78	61.60	66.00	-4.40	QP
2	0.150	34.94	0.99	10.78	46.71	66.00	-19.29	Average
3	0.162	47.37	0.97	10.77	59.11	65.34	-6.23	QP
4	0.162	29.44	0.97	10.77	41.18	65.34	-24.16	Average
5	0.222	26.37	0.93	10.76	38.06	62.74	-24.68	Average
6	0.234	42.55	0.94	10.75	54.24	62.30	-8.06	QP
7	0.310	35.26	0.97	10.74	46.97	59.97	-13.00	QP
8	0.310	20.26	0.97	10.74	31.97	59.97	-28.00	Average
9	0.471	34.37	0.97	10.75	46.09	56.49	-10.40	QP
10	0.494	18.99	0.97	10.76	30.72	56.10	-25.38	Average
11	0.570	14.82	0.97	10.76	26.55	56.00	-29.45	Average
12	0.617	30.05	0.97	10.77	41.79	56.00	-14.21	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.*

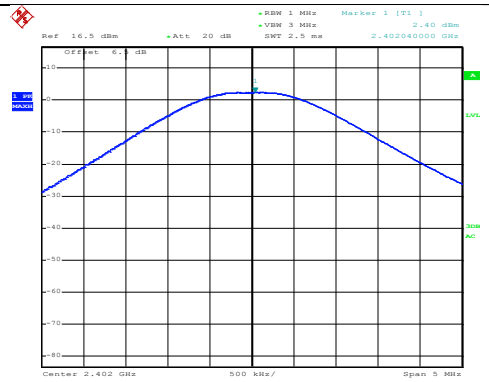
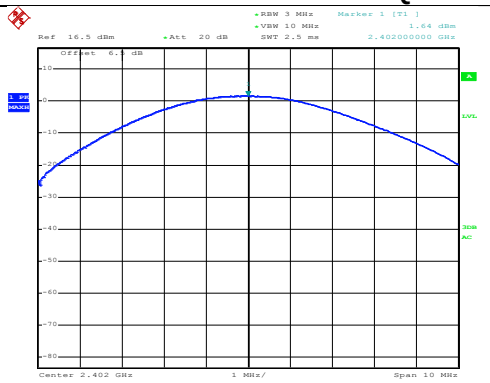
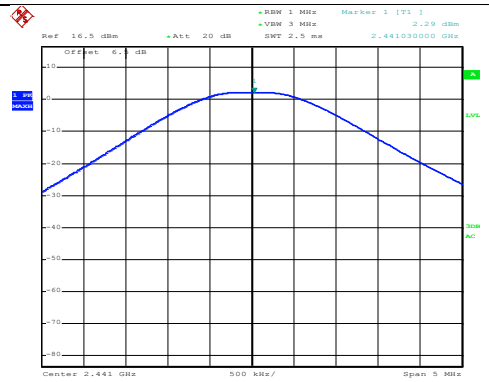
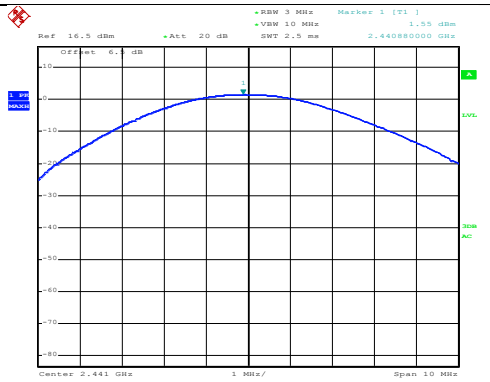
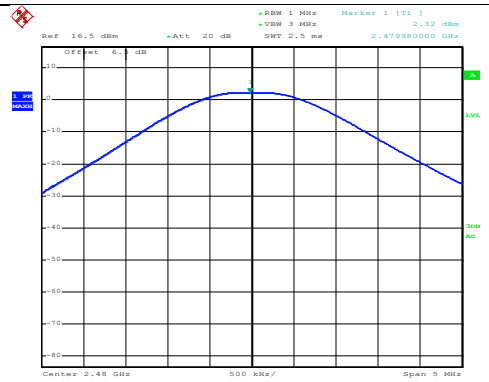
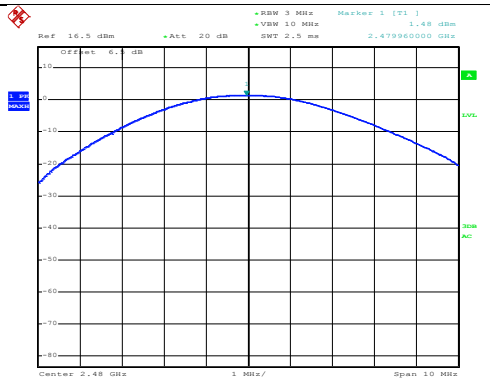
6.3 Conducted Output Power

Test Requirement:	FCC 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:	For frequency hopping systems operating in the 2400-2483.5 MHz band employing at least 75 non-overlapping hopping channels: 1 watt. For all other frequency hopping systems in the 2400-2483.5 MHz band: 0.125 watts.
Test setup:	
Test Instruments:	Refer to section 5.8 for details
Test mode:	Non-hopping mode
Test results:	Pass

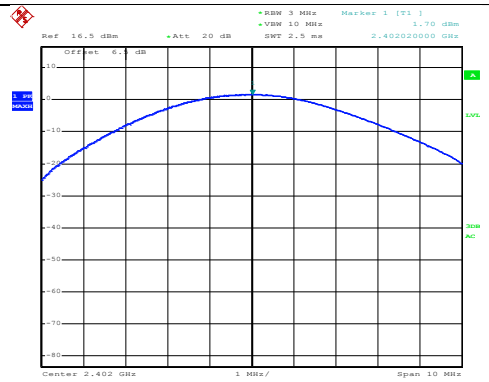
Measurement Data:

Test channel	Peak Output Power (dBm)	Limit (dBm)	Result
GFSK mode			
Lowest channel	2.40	30.00	Pass
Middle channel	2.29	30.00	Pass
Highest channel	2.32	30.00	Pass
π/4-DQPSK mode			
Lowest channel	1.64	21.00	Pass
Middle channel	1.55	21.00	Pass
Highest channel	1.48	21.00	Pass
8DPSK mode			
Lowest channel	1.70	21.00	Pass
Middle channel	1.67	21.00	Pass
Highest channel	1.61	21.00	Pass

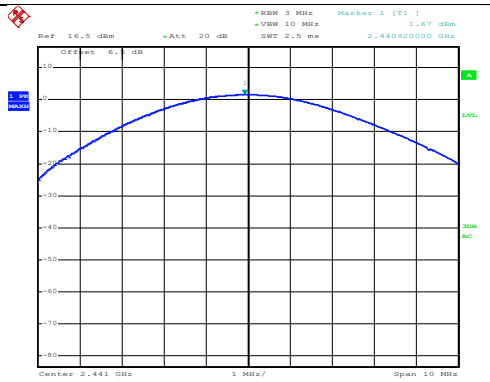
Test plot as follows:

Modulation mode: GFSK	Modulation mode: π/4-DQPSK
	
Lowest channel	Lowest channel
	
Middle channel	Middle channel
	
Highest channel	Highest channel

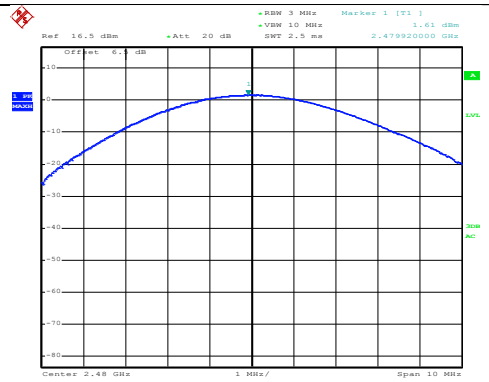
Modulation mode: 8DPSK



Lowest channel

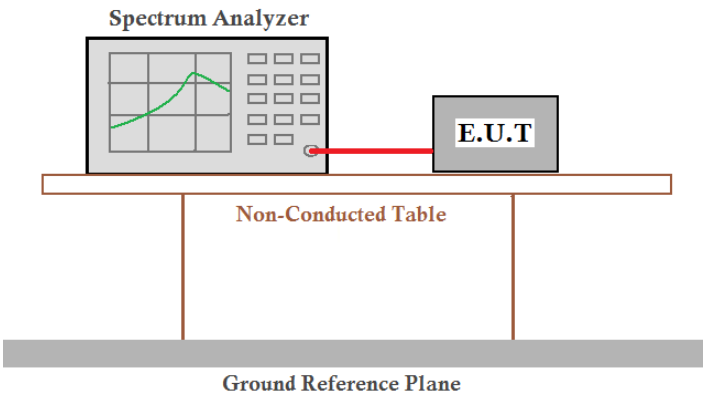


Middle channel



Highest channel

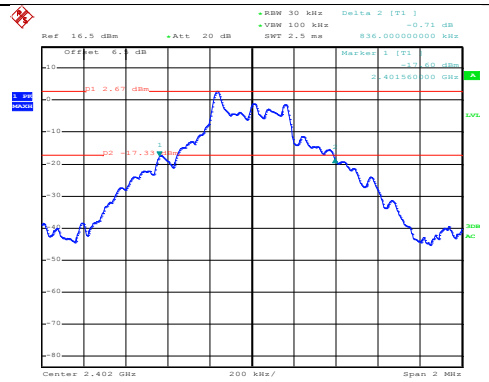
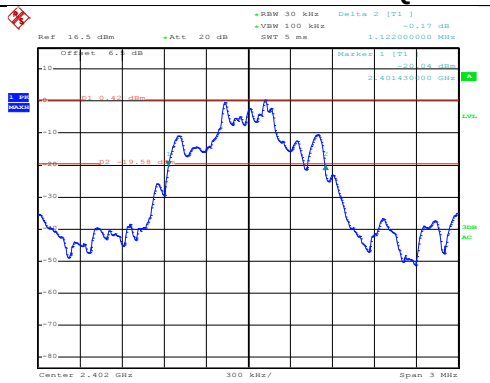
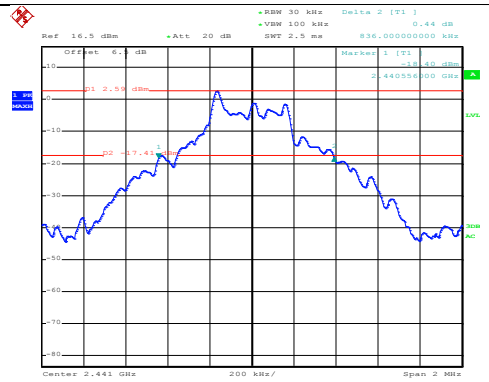
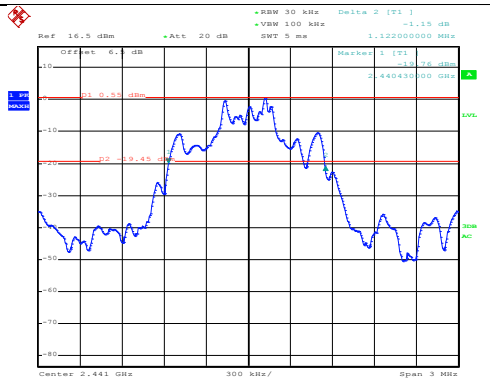
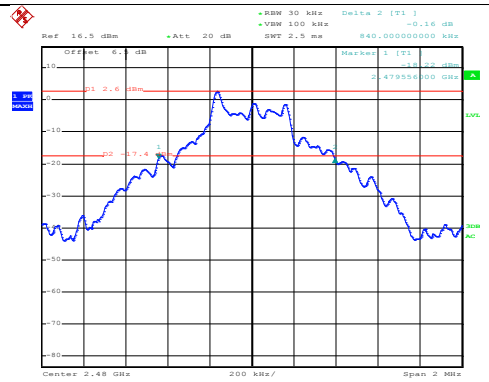
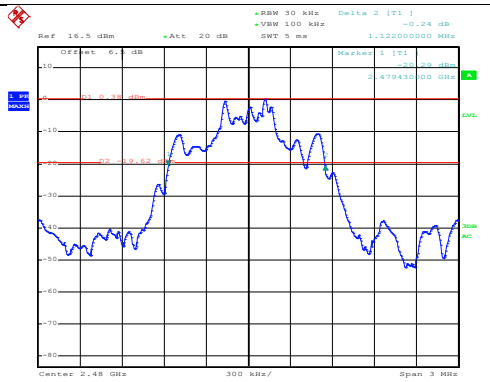
6.4 20dB Occupy Bandwidth

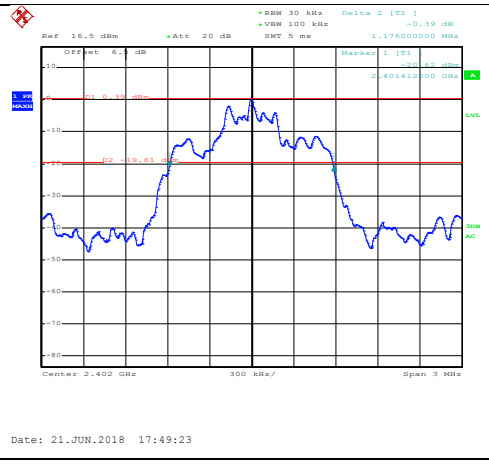
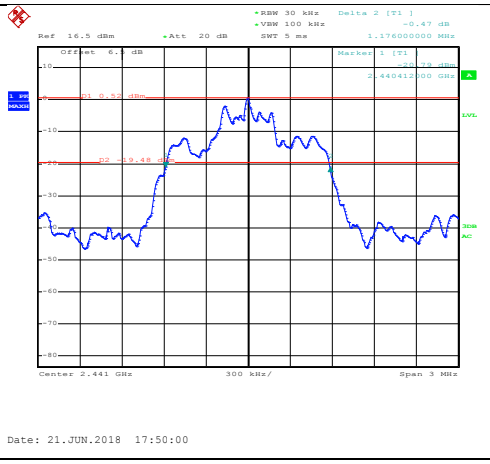
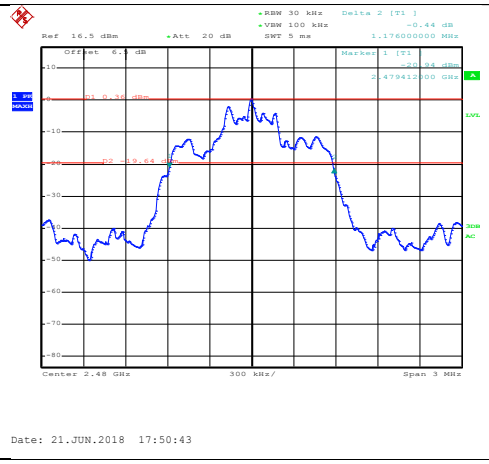
Test Requirement:	FCC Part 15 C Section 15.247 (a)(1)
Test Method:	ANSI C63.10:2013 and DA00-705
Receiver setup:	RBW=30 kHz, VBW=100 kHz, detector=Peak
Limit:	NA
Test setup:	
Test Instruments:	Refer to section 5.8 for details
Test mode:	Non-hopping mode
Test results:	Pass

Measurement Data:

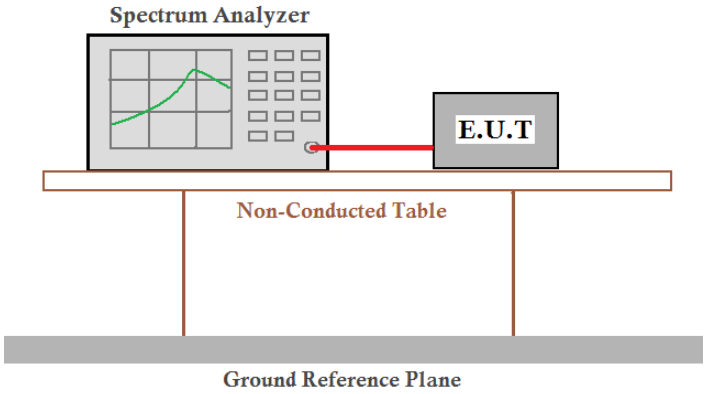
Test channel	20dB Occupy Bandwidth (kHz)		
	GFSK	π/4-DQPSK	8DPSK
Lowest	836	1122	1176
Middle	836	1122	1176
Highest	840	1122	1176

Test plot as follows:

Modulation mode: GFSK	Modulation mode: π/4-DQPSK
	
Lowest channel	Lowest channel
	
Middle channel	Middle channel
	
Highest channel	Highest channel

Modulation mode: 8DPSK	
 Date: 21.JUN.2018 17:49:23	 Date: 21.JUN.2018 17:50:00
Lowest channel	Middle channel
 Date: 21.JUN.2018 17:50:43	
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:	a) 0.025MHz or the 20dB bandwidth (whichever is greater) b) 0.025MHz or 2/3 of the 20dB bandwidth (whichever is greater)
Test setup:	
Test Instruments:	Refer to section 5.8 for details
Test mode:	Hopping mode
Test results:	Pass

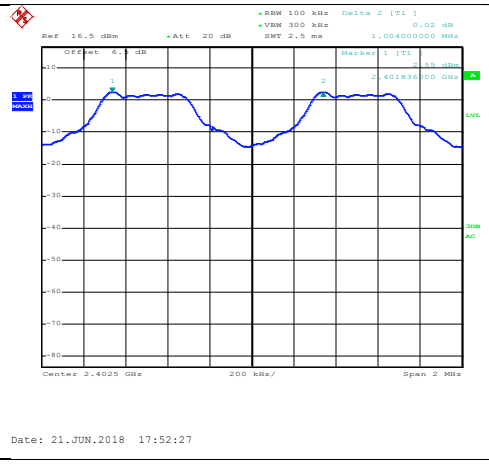
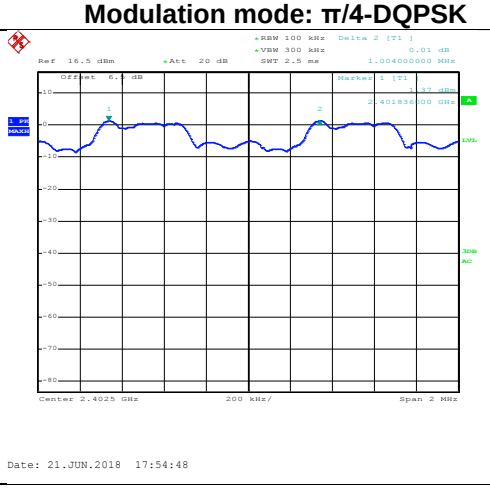
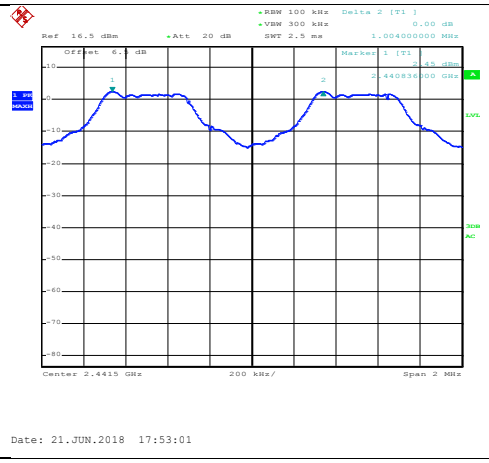
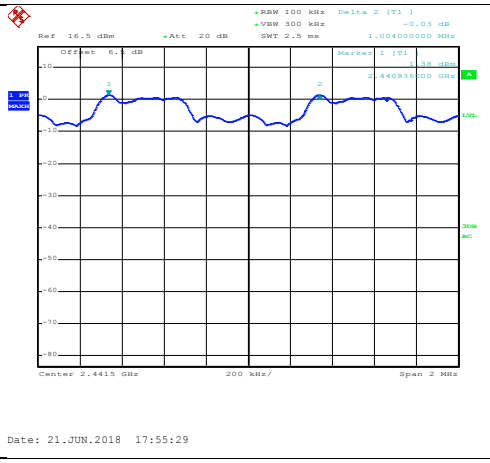
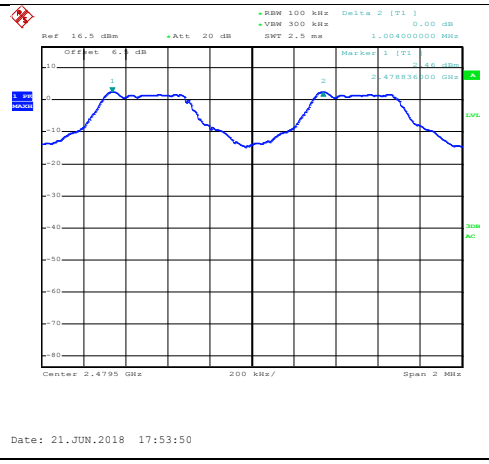
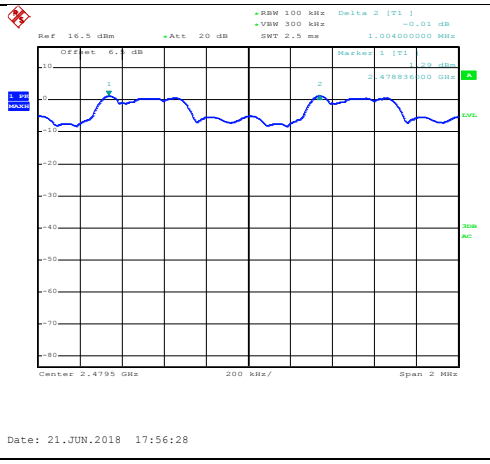
Measurement Data:

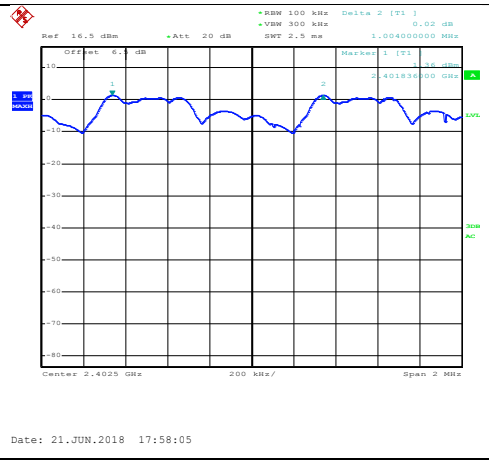
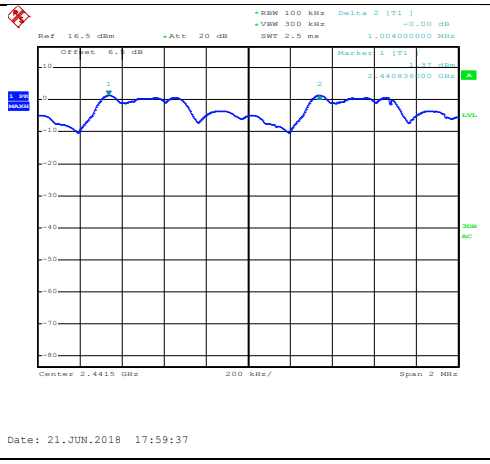
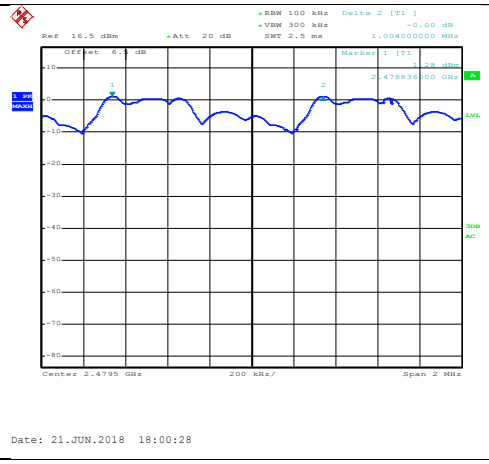
Test channel	Carrier Frequencies Separation (kHz)	Limit (kHz)	Result
GFSK			
Lowest	1004	840.00	Pass
Middle	1004	840.00	Pass
Highest	1004	840.00	Pass
π/4-DQPSK mode			
Lowest	1004	748.00	Pass
Middle	1004	748.00	Pass
Highest	1004	748.00	Pass
8DPSK mode			
Lowest	1004	784.00	Pass
Middle	1004	784.00	Pass
Highest	1004	784.00	Pass

Note: According to section 6.4

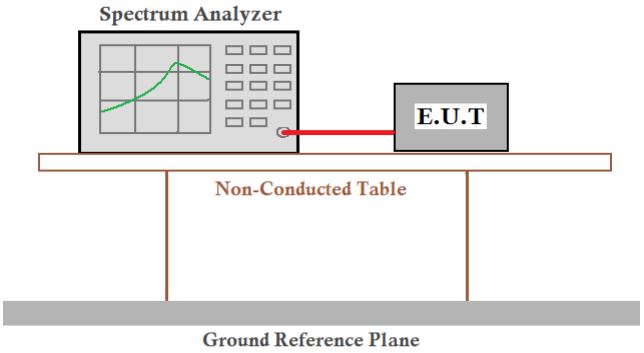
Mode	20dB bandwidth (kHz) (worse case)	Limit (kHz) (Carrier Frequencies Separation)
GFSK	840	840.00
π/4-DQPSK	1122	748.00
8DPSK	1176	784.00

Test plot as follows:

Modulation mode: GFSK	Modulation mode: π/4-DQPSK
	
Lowest channel	Lowest channel
	
Middle channel	Middle channel
	
Highest channel	Highest channel

Modulation mode: 8DPSK	
 Date: 21.JUN.2018 17:58:05	 Date: 21.JUN.2018 17:59:37
Lowest channel	Middle channel
 Date: 21.JUN.2018 18:00:28	
Highest channel	

6.6 Hopping Channel Number

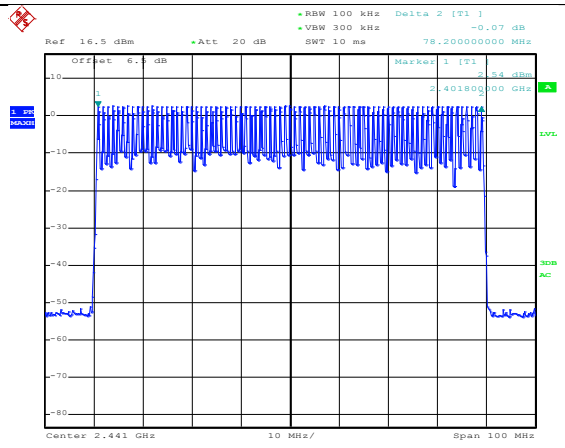
Test Requirement:	FCC Part 15 C Section 15.247 (a)(1)
Test Method:	ANSI C63.10:2013 and DA00-705
Receiver setup:	RBW=100 kHz, VBW=300 kHz, Frequency range=2400MHz-2483.5MHz, Detector=Peak
Limit:	15 channels
Test setup:	
Test Instruments:	Refer to section 5.8 for details
Test mode:	Hopping mode
Test results: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

Measurement Data:

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

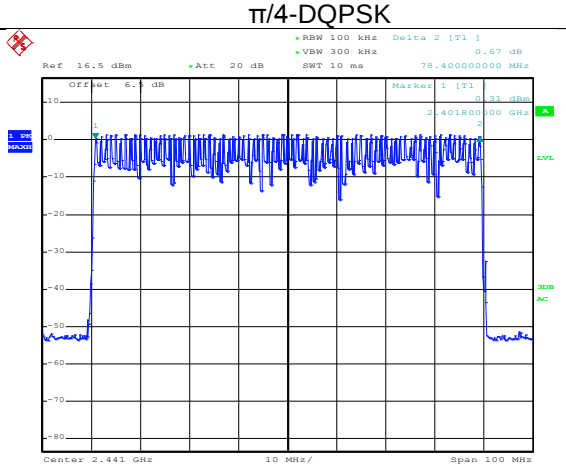
Test plot as follows:

GFSK



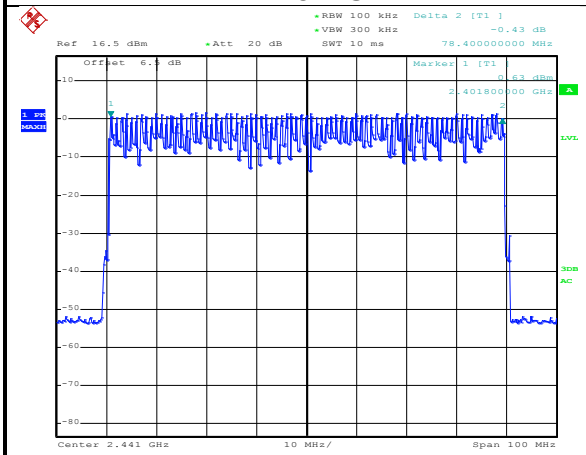
Date: 21.JUN.2018 18:11:26

π/4-DQPSK



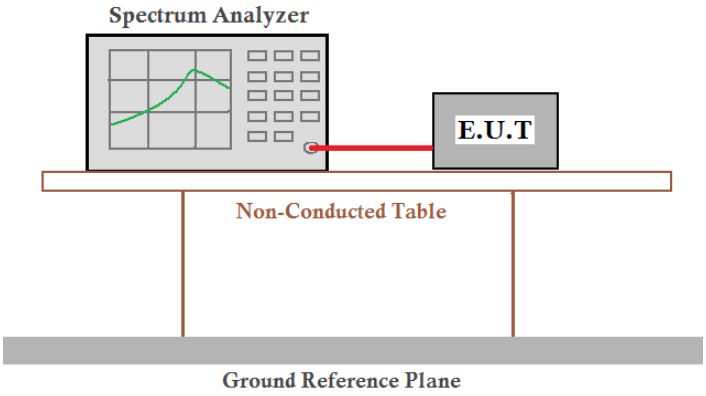
Date: 21.JUN.2018 18:14:03

8DPSK



Date: 21.JUN.2018 18:17:06

6.7 Dwell Time

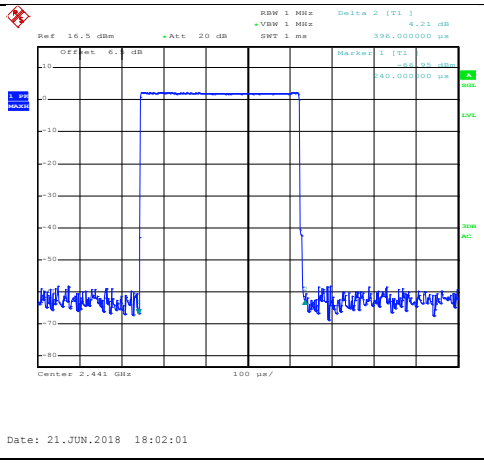
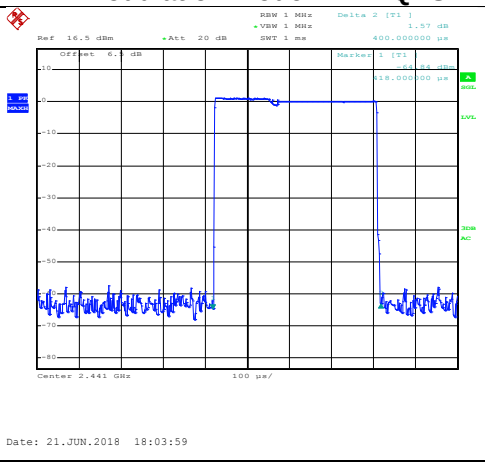
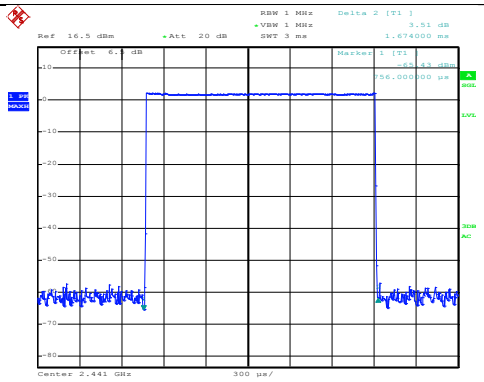
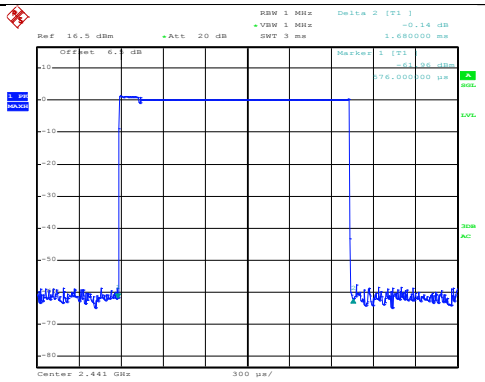
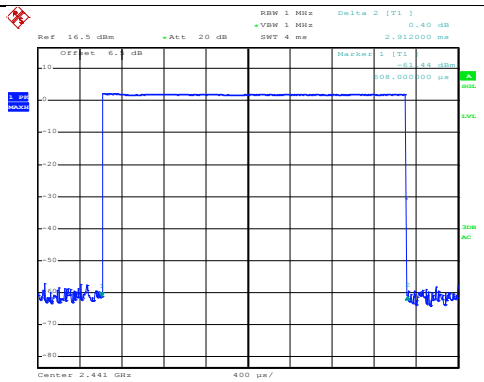
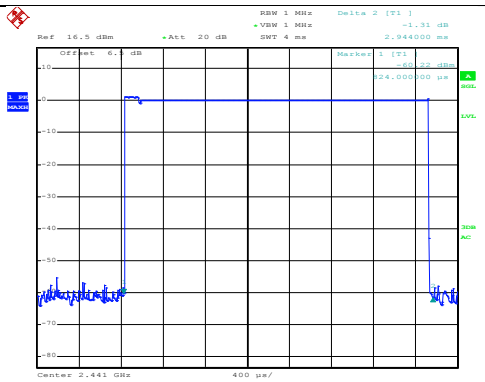
Test Requirement:	FCC Part 15 C Section 15.247 (a)(1)
Test Method:	ANSI C63.10:2013 and KDB DA00-705
Receiver setup:	RBW=1 MHz, VBW=1 MHz, Span=0 Hz, Detector=Peak
Limit:	0.4 Second
Test setup:	
Test Instruments:	Refer to section 5.8 for details
Test mode:	Hopping mode
Test results:	Pass

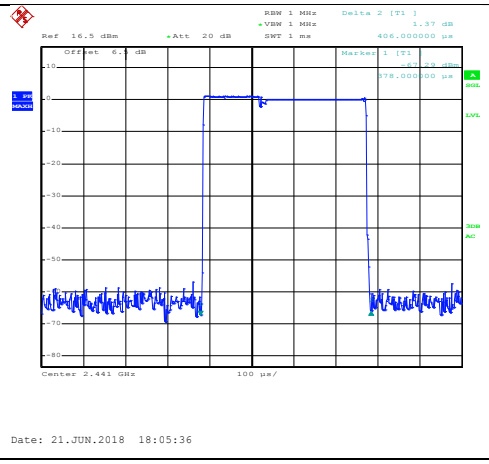
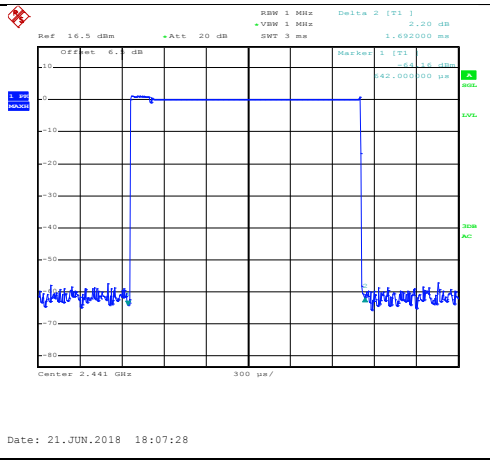
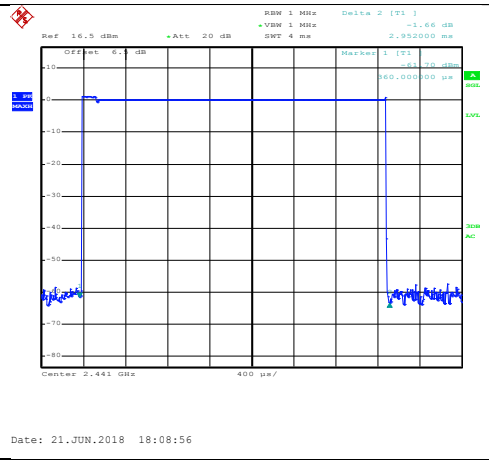
Measurement Data (Worse case):

Mode	Packet	Dwell time (second)	Limit (second)	Result
GFSK	DH1	0.12672	0.4	Pass
	DH3	0.26784		
	DH5	0.31061		
π/4-DQPSK	2-DH1	0.12800	0.4	Pass
	2-DH3	0.26880		
	2-DH5	0.31403		
8DPSK	3-DH1	0.12992	0.4	Pass
	3-DH3	0.27072		
	3-DH5	0.31488		

Note:
The test period = 0.4 Second/Channel x 79 Channel = 31.6 s
Calculation Formula: Dwell time = Ton time per hop * Hopping numbers * Period
For example:
DH1 time slot=0.396*(1600/ (2*79)) * 31.6=126.72ms
DH3 time slot=1.674*(1600/ (4*79)) * 31.6=267.84ms
DH5 time slot=2.912*(1600/ (6*79)) * 31.6=310.61ms

Test plot as follows:

Modulation mode: GFSK	Modulation mode: π/4-DQPSK
	
DH1	2-DH1
	
DH3	2-DH3
	
DH5	2-DH5

Modulation mode: 8DPSK	
	
3-DH1	3-DH3
	
3-DH5	