SGS-CSTC Standards Technical Services Ltd.
Shenzhen Branch

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FCC REPORT

Application No:	SZEM1804002458CR
Applicant:	NGSTB Company Limited
Address of Applicant:	F11,BLOCK B,ZhiYuan Bldg,No. 89 Industry 8th Road Nanshan District, Shenzhen, 518067, China
Manufacturer:	ABOX42 GmbH
Address of Manufacturer:	76227 Karlsruhe Germany
Factory:	Aztech Communication Device (DG) Ltd
Address of Factory:	Jiu Jiang Shui Village,Chang Ping Town,Dong Guan City,GUangdong Province
Product Name:	Set Top Box for **Smart** TV/OTT/Hybrid
Model No.(EUT):	M30WL.11
Trade Mark:	ABOX42 GmbH
FCC ID:	2APK9-M30WL11
Standards:	47 CFR Part 15, Subpart C 15.247
Date of Receipt:	2016-12-26
Date of Test:	2016-12-26 to 2017-03-03
Date of Issue:	2018-04-08
Test Result :	**PASS ***

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

Authorized Signature:

Keny Xu
EMC Laboratory Manager

The manufacturer should ensure that all products in series production are in conformity with the product sample detailed in this report. 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. Any mention of SGS International Electrical Approvals or testing done by SGS International Electrical Approvals in connection with, distribution or use of the product described in this report must be approved by SGS International Electrical Approvals in writing.

2 Version

Revision Record				
Version	**Chapter**	**Date**	**Modifier**	**Remark**
01		*2018-04-08*		Original

Authorized for issue by:				
		Moon.Zhang **(Moon Zhang) /Project Engineer**		
		Eric Fu **(Eric Fu) /Reviewer**		

3 Test Summary

Test Item	Test Requirement	Test method	Result
Antenna Requirement	47 CFR Part 15, Subpart C 15.247	47 CFR Part 15, Subpart C 15.203 & 15.247(c)	PASS
Conducted Emission	47 CFR Part 15, Subpart C 15.247	ANSI C63.10 (2013) Section 7.8.8	PASS
Maximum Peak Output Power	47 CFR Part 15, Subpart C 15.247	ANSI C63.10 (2013) Section 7.8.5	PASS
20Db Occupied Bandwidth	47 CFR Part 15, Subpart C 15.247	ANSI C63.10 (2013) Section 6.9	PASS
Carrier Frequencies Separated	47 CFR Part 15, Subpart C 15.247	ANSI C63.10 (2013) Section 7.8.2	PASS
Hopping Channel Number	47 CFR Part 15, Subpart C 15.247	ANSI C63.10 (2013) Section 7.8.3	PASS
Dwell Time	47 CFR Part 15, Subpart C 15.247	ANSI C63.10 (2013) Section 7.8.4	PASS
Band-edge for RF Transmit Conducted Emissions	47 CFR Part 15, Subpart C 15.247	ANSI C63.10 (2013) Section 7.8.6	PASS
Spurious RF Transmit Conducted Emissions	47 CFR Part 15, Subpart C 15.247	ANSI C63.10 (2013) Section 7.8.8	PASS
Pseudorandom Frequency Hopping Sequence	47 CFR Part 15, Subpart C 15.247	N/A	PASS
Radiated Transmit Spurious Emissions	47 CFR Part 15, Subpart C 15.247	ANSI C63.10 (2013) Section 6.10.4	PASS
Restricted bands around fundamental frequency (Radiated Emission)	47 CFR Part 15, Subpart C 15.247	ANSI C63.10 (2013) Section 6.10.5	PASS

4 Contents

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5 General Information

5.1 General Description of EUT

Bluetooth Version:	Bluetooth 4.0 dual mode
	This test report is for classic mode.
Modulation Technique:	Frequency Hopping Spread Spectrum(FHSS)
Modulation Type:	GFSK, π/4DQPSK, 8DPSK
Number of Channels:	79
Hopping Channel Type:	Adaptive Frequency Hopping systems
Sample Type:	Mobile production
Antenna Type:	Embedded Antenna
Antenna Gain:	5dBi
Power Supply:	AC/DC Adapter: MODEL: F18W6-050250SPAU INPUT:AC100-240V, 50/60Hz, 0.6A OUTPUT:DC 5V, 2.5A
Cable:	HDMI Cable: 150cm unsheilded LAN Cable: 200cm unsheilded

Operation Frequency each of channel							
Channel	Frequency	Channel	Frequency	Channel	Frequency	Channel	Frequency
1	2402MHz	21	2422MHz	41	2442MHz	61	2462MHz
2	2403MHz	22	2423MHz	42	2443MHz	62	2463MHz
3	2404MHz	23	2424MHz	43	2444MHz	63	2464MHz
4	2405MHz	24	2425MHz	44	2445MHz	64	2465MHz
5	2406MHz	25	2426MHz	45	2446MHz	65	2466MHz
6	2407MHz	26	2427MHz	46	2447MHz	66	2467MHz
7	2408MHz	27	2428MHz	47	2448MHz	67	2468MHz
8	2409MHz	28	2429MHz	48	2449MHz	68	2469MHz
9	2410MHz	29	2430MHz	49	2450MHz	69	2470MHz
10	2411MHz	30	2431MHz	50	2451MHz	70	2471MHz
11	2412MHz	31	2432MHz	51	2452MHz	71	2472MHz
12	2413MHz	32	2433MHz	52	2453MHz	72	2473MHz
13	2414MHz	33	2434MHz	53	2454MHz	73	2474MHz
14	2415MHz	34	2435MHz	54	2455MHz	74	2475MHz
15	2416MHz	35	2436MHz	55	2456MHz	75	2476MHz
16	2417MHz	36	2437MHz	56	2457MHz	76	2477MHz
17	2418MHz	37	2438MHz	57	2458MHz	77	2478MHz
18	2419MHz	38	2439MHz	58	2459MHz	78	2479MHz
19	2420MHz	39	2440MHz	59	2460MHz	79	2480MHz
20	2421MHz	40	2441MHz	60	2461MHz		

Channel	Frequency
The Lowest channel	2402MHz
The Middle channel	2441MHz
The Highest channel	2480MHz

5.2 Test Environment

Operating Environment:	
Temperature:	25.0 °C
Humidity:	55 % RH
Atmospheric Pressure:	1010 mbar

5.3 Description of Support Units

The EUT has been tested independent unit.

5.4 Test Location

All tests were performed at:

SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen Branch ,
No. 1 Workshop, M-10, Middle Section, Science & Technology Park, Shenzhen, Guangdong, China. 518057.
Tel: +86 755 2601 2053 Fax: +86 755 2671 0594
No tests were sub-contracted.

5.5 Measurement Uncertainty (95% confidence levels, k=2)

No.	Item	Measurement Uncertainty
1	Duty cycle	0.37%
2	Total RF power, conducted	0.75dB
3	RF power density, conducted	2.84dB
4	Spurious emissions, conducted	0.75dB
5	Radiated Spurious emission test	4.5dB (30MHz-1GHz)
		4.8dB (1GHz-25GHz)
6	Temperature test	1℃
7	Humidity test	3%
8	DC and low frequency voltages	0.5%

5.6 Test Facility

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

• **CNAS (No. CNAS L2929)**

CNAS has accredited SGS-CSTC Standards Technical Services Co., Ltd. Shenzhen Branch EMC Lab to ISO/IEC 17025:2005 General Requirements for the Competence of Testing and Calibration Laboratories (CNAS-CL01 Accreditation Criteria for the Competence of Testing and Calibration Laboratories) for the competence in the field of testing.

• **A2LA (Certificate No. 3816.01)**

SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen EMC Laboratory is accredited by the American Association for Laboratory Accreditation(A2LA). Certificate No. 3816.01.

• **VCCI**

The 3m Fully-anechoic chamber for above 1GHz, 10m Semi-anechoic chamber for below 1GHz, Shielded Room for Mains Port Conducted Interference Measurement and Telecommunication Port Conducted Interference Measurement of SGS-CSTC Standards Technical Services Co., Ltd. have been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: G-20026, R-14188, C-12383 and T-11153 respectively.

• **FCC –Designation Number: CN1178**

SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen EMC Laboratory has been recognized as an accredited testing laboratory.

Designation Number: CN1178. Test Firm Registration Number: 406779.

• **Industry Canada (IC)**

Two 3m Semi-anechoic chambers and the 10m Semi-anechoic chamber of SGS-CSTC Standards Technical Services Co., Ltd. Shenzhen Branch EMC Lab have been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 4620C-1, 4620C-2, 4620C-3.

5.7 Deviation from Standards

None.

5.8 Abnormalities from Standard Conditions

None.

5.9 Other Information Requested by the Customer

None.

5.10 Equipment List

Conducted Emission						
Item	**Test Equipment**	**Manufacturer**	**Model No.**	**Inventory No.**	**Cal. Date (yyyy-mm-dd)**	**Cal. Due date (yyyy-mm-dd)**
1	Shielding Room	ZhongYu Electron	GB-88	SEM001-06	2016-05-13	2017-05-13
2	LISN	Rohde & Schwarz	ENV216	SEM007-01	2016-10-09	2017-10-09
3	LISN	ETS-LINDGREN	3816/2	SEM007-02	2016-04-25	2017-04-25
4	8 Line ISN	Fischer Custom Communications Inc.	FCC-TLISN-T8-02	EMC0120	2016-09-28	2017-09-28
5	4 Line ISN	Fischer Custom Communications Inc.	FCC-TLISN-T4-02	EMC0121	2016-09-28	2017-09-28
6	2 Line ISN	Fischer Custom Communications Inc.	FCC-TLISN-T2-02	EMC0122	2016-09-28	2017-09-28
7	EMI Test Receiver	Rohde & Schwarz	ESCI	SEM004-02	2016-04-25	2017-04-25
8	DC Power Supply	Zhao Xin	RXN-305D	SEM011-02	2016-10-09	2017-10-09
9	Coaxial Cable	SGS	N/A	SEM024-01	2016-07-13	2017-07-12

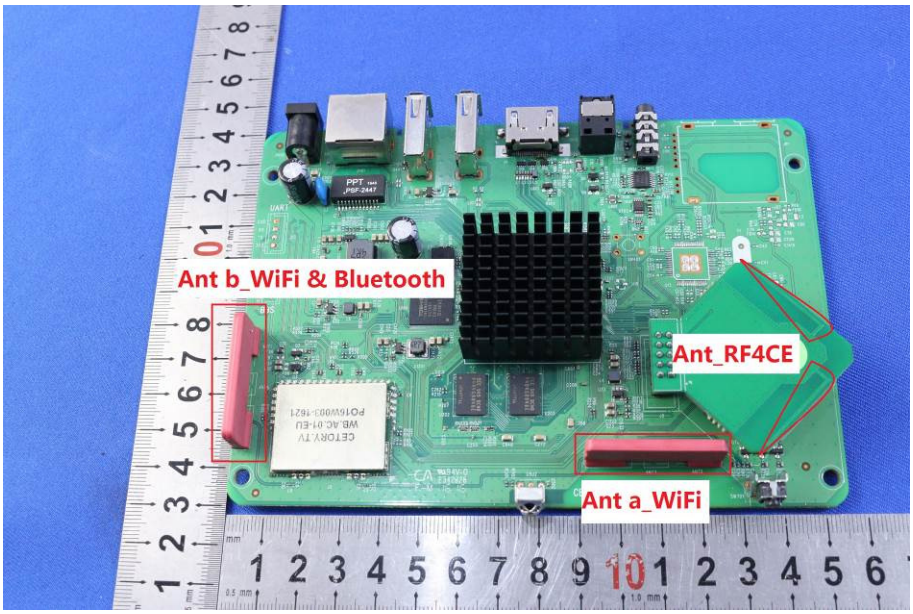
RF connected test						
Item	**Test Equipment**	**Manufacturer**	**Model No.**	**Inventory No.**	**Cal. Date (yyyy-mm-dd)**	**Cal. Due date (yyyy-mm-dd)**
1	DC Power Supply	ZhaoXin	RXN-305D	SEM011-02	2016-10-09	2017-10-09
2	Spectrum Analyzer	Rohde & Schwarz	FSP	SEM004-06	2016-10-09	2017-10-09
3	Signal Generator	Rohde & Schwarz	SML03	SEM006-02	2016-04-25	2017-04-25
4	Power Meter	Rohde & Schwarz	NRVS	SEM014-02	2016-10-09	2017-10-09
5	Coaxial Cable	SGS	N/A	SEM031-02	2016-07-13	2017-07-12

RE in Chamber						
Item	**Test Equipment**	**Manufacturer**	**Model No.**	**Inventory No.**	**Cal. Date (yyyy-mm-dd)**	**Cal. Due date (yyyy-mm-dd)**
1	3m Chamber	AUDIX	N/A	SEM001-02	2016-05-13	2017-05-13
2	EXA Spectrum Analyzer	Agilent Technologies Inc	N9010A	SEM004-09	2016-07-19	2017-07-19
3	BiConiLog Antenna (26-3000MHz)	ETS-Lindgren	3142C	SEM003-02	2014-11-15	2017-11-15
4	Amplifier (0.1-1300MHz)	HP	8447D	SEM005-02	2016-10-09	2017-10-09
5	Horn Antenna (1-18GHz)	Rohde & Schwarz	HF907	SEM003-07	2015-06-14	2018-06-14
6	Horn Antenna (18-26GHz)	ETS-Lindgren	3160	SEM003-12	2014-11-24	2017-11-24
7	Horn Antenna(26GHz-40GHz)	A.H.Systems, inc.	SAS-573	SEM003-13	2015-02-12	2018-02-12
8	Low Noise Amplifier	Black Diamond Series	BDLNA-0118-352810	SEM005-05	2016-10-09	2017-10-09
9	Band filter	Amindeon	Asi 3314	SEM023-01	N/A	N/A
10	Coaxial Cable	SGS	N/A	SEM026-01	2016-07-13	2017-07-12

Note: The calibration interval is one year, all the instruments are valid.

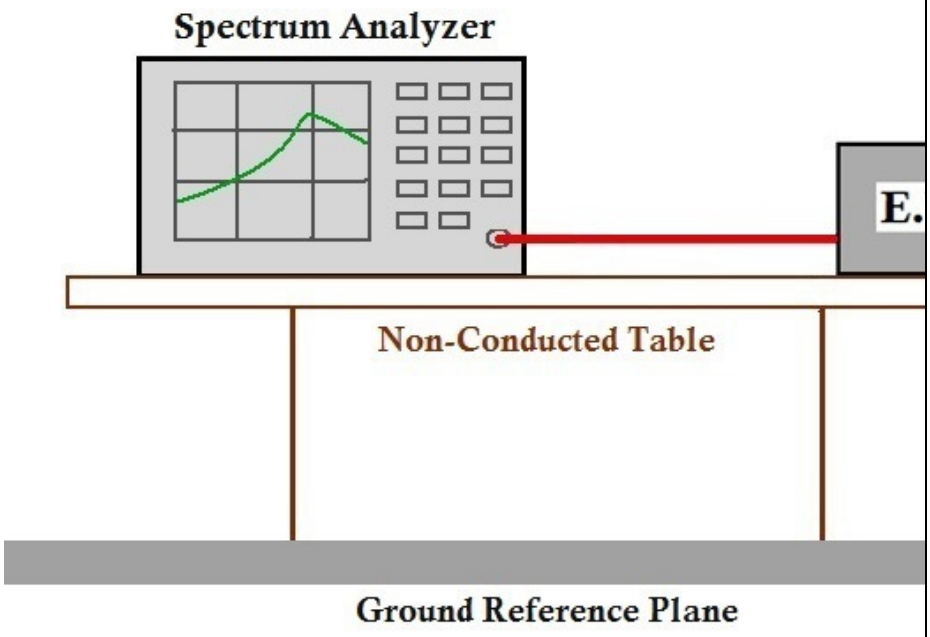
6 Test Results and Measurement Data

6.1 Antenna Requirement

Standard Requirement:	47 CFR Part 15, Subpart C 15.203 & 15.247(c)
EUT Antenna:	
The antenna is integrated on the main PCB and no consideration of replacement. The best case gain of the antenna is 5dBi.	

6.2 Conducted Emissions

Test Requirement:	47 CFR Part 15, Subpart C 15.247(d)
Test Method:	ANSI C63.10 (2013) Section 7.8.8
Test Frequency Range:	150kHz to 30MHz
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 Procedure:	1) The mains terminal disturbance voltage test was conducted in a shielded room. 2) The EUT was connected to AC power source through a LISN 1 (Line Impedance Stabilization Network) which provides a 50Ω/50μH + 5Ω linear impedance. The power cables of all other units of the EUT were connected to a second LISN 2, which was bonded to the ground reference plane in the same way as the LISN 1 for the unit being measured. A multiple socket outlet strip was used to connect multiple power cables to a single LISN provided the rating of the LISN was not exceeded. 3) The tabletop EUT was placed upon a non-metallic table 0.8m above the ground reference plane. And for floor-standing arrangement, the EUT was placed on the horizontal ground reference plane. 4) The test was performed with a vertical ground reference plane. The rear of the EUT shall be 0.4 m from the vertical ground reference plane. The vertical ground reference plane was bonded to the horizontal ground reference plane. The LISN 1 was placed 0.8 m from the boundary of the unit under test and bonded to a ground reference plane for LISNs mounted on top of the ground reference plane. This distance was between the closest points of the LISN 1 and the EUT. All other units of the EUT and associated equipment was at least 0.8 m from the LISN 2. 5) In order to find the maximum emission, the relative positions of equipment and all of the interface cables must be changed according to ANSI C63.10: 2013 on conducted measurement.

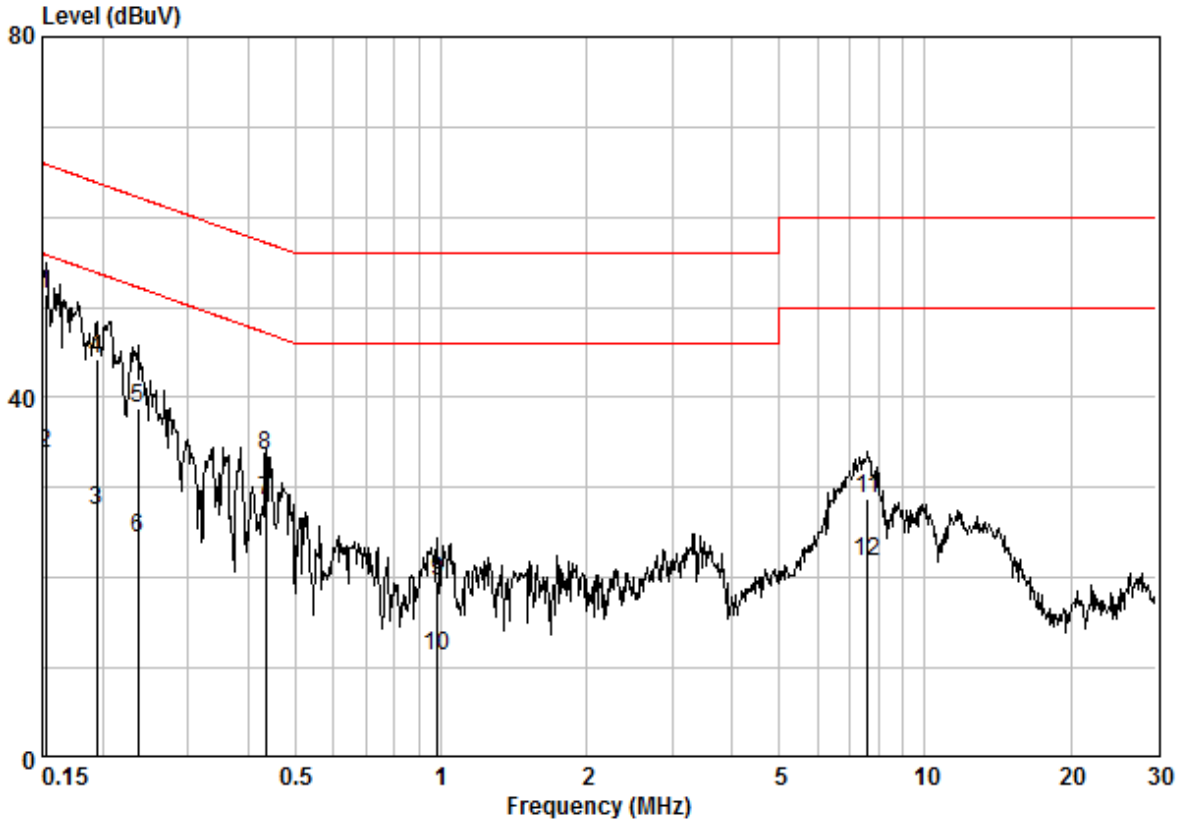
Test Setup:	
Instruments Used:	Refer to section 5.10 for details
Exploratory Test Mode:	Non-hopping transmitting mode with all kind of modulation and all kind of data type Transmitting mode.
Final Test Mode:	Through Pre-scan, find the DH1 of data type and GFSK modulation is the worst case. Transmitting mode Only the worst case is recorded in the report.
Test Results:	Pass

Measurement Data

An initial pre-scan was performed on the live and neutral lines with peak detector.

Quasi-Peak and Average measurement were performed at the frequencies with maximized peak emission were detected.

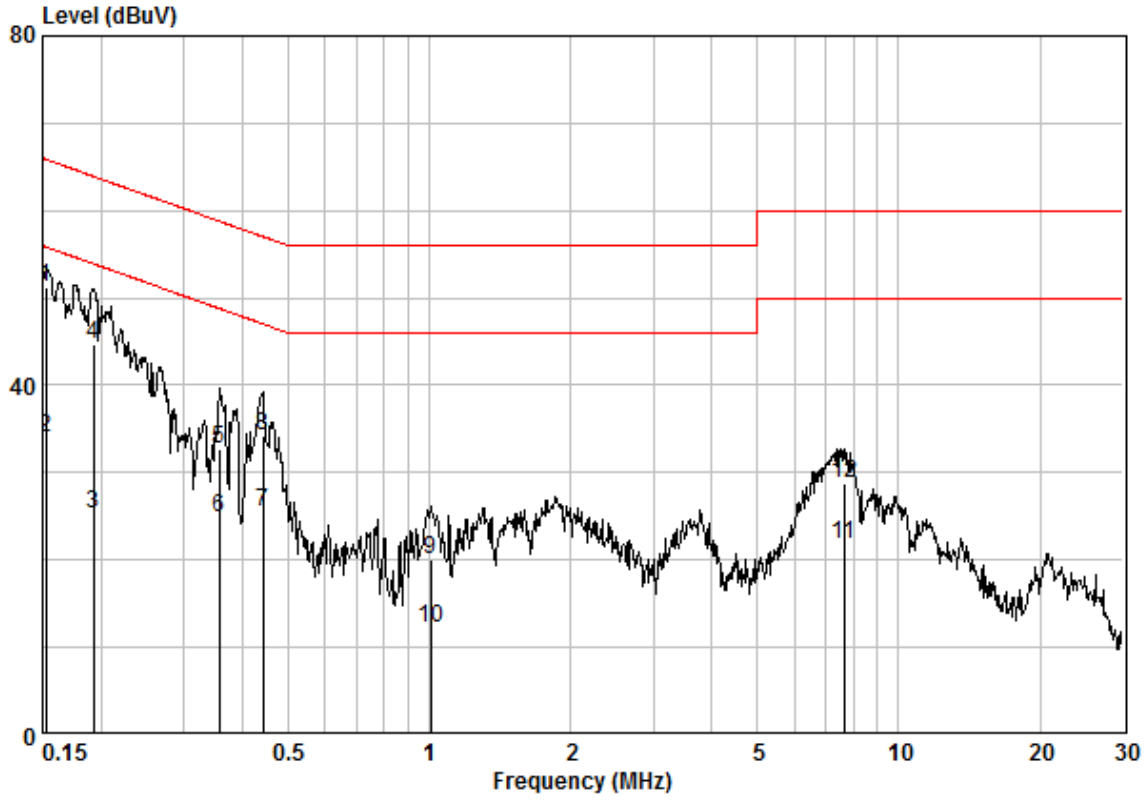
Live Line:



Site : Shielding Room
Condition : CE LINE
Job No. : 11090CR
Test Mode : TX mode

	Freq	Cable Loss	LISN Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB	dB	dBuV	dBuV	dBuV	dB	
1	0.15240	0.02	9.64	41.80	51.46	65.87	-14.41	QP
2	0.15240	0.02	9.64	24.02	33.68	55.87	-22.19	AVERAGE
3	0.19447	0.02	9.64	17.87	27.53	53.84	-26.31	AVERAGE
4	0.19447	0.02	9.64	34.60	44.26	63.84	-19.59	QP
5	0.23658	0.02	9.64	29.20	38.86	62.22	-23.35	QP
6	0.23658	0.02	9.64	14.67	24.33	52.22	-27.89	AVERAGE
7	0.43511	0.02	9.64	18.95	28.61	47.15	-18.54	AVERAGE
8	0.43511	0.02	9.64	24.01	33.67	57.15	-23.48	QP
9	0.98391	0.03	9.65	9.99	19.67	56.00	-36.33	QP
10	0.98391	0.03	9.65	1.75	11.43	46.00	-34.57	AVERAGE
11	7.606	0.09	9.80	18.99	28.88	60.00	-31.12	QP
12	7.606	0.09	9.80	11.83	21.73	50.00	-28.27	AVERAGE

Neutral Line:



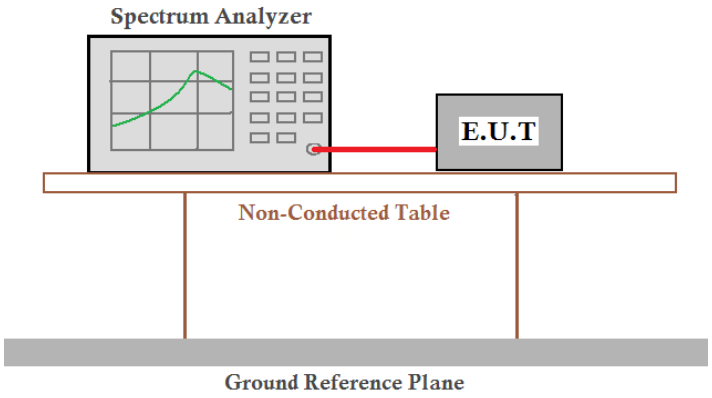
Site : Shielding Room
Condition : CE NEUTRAL
Job No. : 11090CR
Test Mode : TX mode

	Freq	Cable Loss	LISN Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB	dB	dBuV	dBuV	dBuV	dB	
1	0.15240	0.02	9.64	41.67	51.33	65.87	-14.54	QP
2	0.15240	0.02	9.64	24.33	33.99	55.87	-21.88	AVERAGE
3	0.19242	0.02	9.63	15.62	25.27	53.93	-28.66	AVERAGE
4	0.19242	0.02	9.63	35.13	44.78	63.93	-19.15	QP
5	0.35765	0.02	9.63	23.06	32.71	58.78	-26.07	QP
6	0.35765	0.02	9.63	15.21	24.86	48.78	-23.92	AVERAGE
7	0.44208	0.02	9.63	15.93	25.58	47.02	-21.45	AVERAGE
8	0.44208	0.02	9.63	24.49	34.14	57.02	-22.89	QP
9	1.005	0.03	9.64	10.49	20.16	56.00	-35.84	QP
10	1.005	0.03	9.64	2.56	12.23	46.00	-33.77	AVERAGE
11	7.646	0.09	9.79	11.93	21.81	50.00	-28.19	AVERAGE
12	7.646	0.09	9.79	18.95	28.83	60.00	-31.17	QP

Notes:

1. *The following Quasi-Peak and Average measurements were performed on the EUT:*
2. *Final Test Level =Receiver Reading + LISN Factor + Cable Loss*

6.3 Conducted Peak Output Power

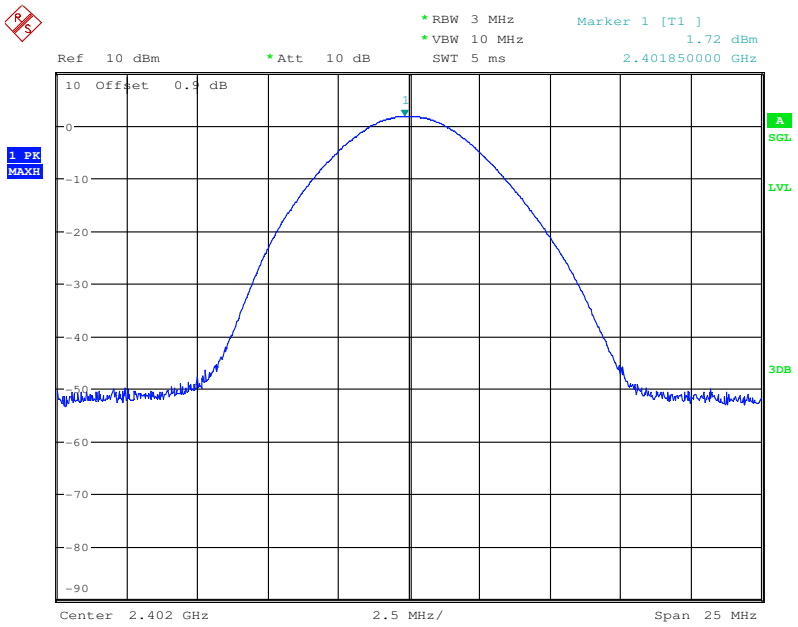
Test Requirement:	47 CFR Part 15, Subpart C 15.247(b)(1)
Test Method:	ANSI C63.10 (2013) Section 7.8.5
Limit:	20.97dBm
Test Setup:	
Instruments Used:	Refer to section 5.10 for details
Exploratory Test Mode:	Non-hopping transmitting with all kind of modulation and all kind of data type.
Final Test Mode:	Through Pre-scan, find the DH1 of data type is the worst case of GFSK modulation type, 2-DH1 of data type is the worst case of π/4DQPSK modulation type, 3-DH1 of data type is the worst case of 8DPSK modulation type.
Test Results:	Pass

Measurement Data

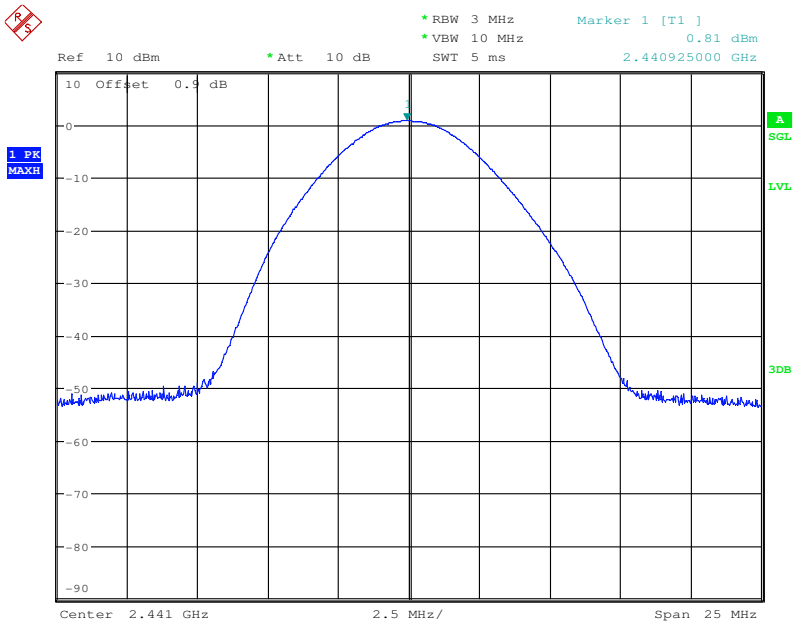
GFSK mode			
Test channel	Peak Output Power (dBm)	Limit (dBm)	Result
Lowest	1.72	20.97	Pass
Middle	0.81	20.97	Pass
Highest	-0.15	20.97	Pass
π/4DQPSK mode			
Test channel	Peak Output Power (dBm)	Limit (dBm)	Result
Lowest	3.01	20.97	Pass
Middle	2.04	20.97	Pass
Highest	1.00	20.97	Pass
8DPSK mode			
Test channel	Peak Output Power (dBm)	Limit (dBm)	Result
Lowest	3.15	20.97	Pass
Middle	2.22	20.97	Pass
Highest	1.23	20.97	Pass

Test plot as follows:

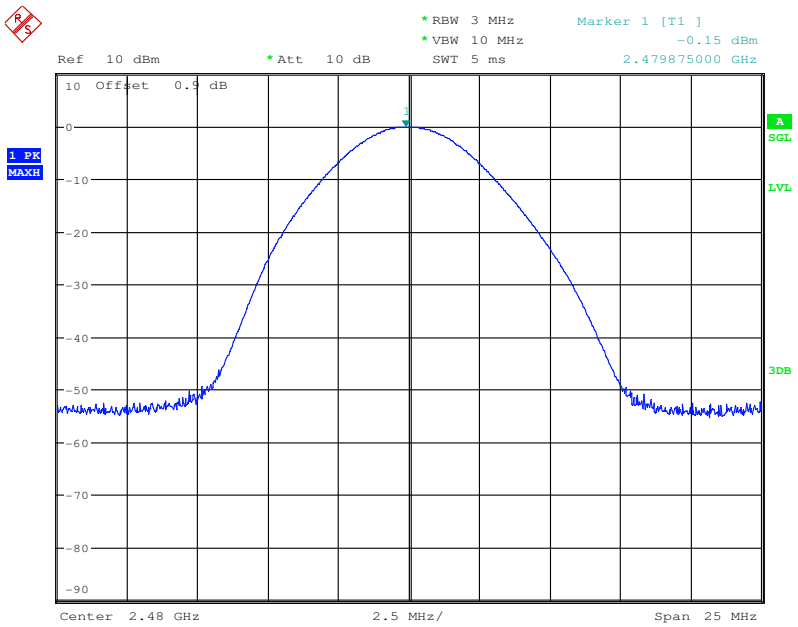
Test mode:	GFSK	Test channel:	Lowest



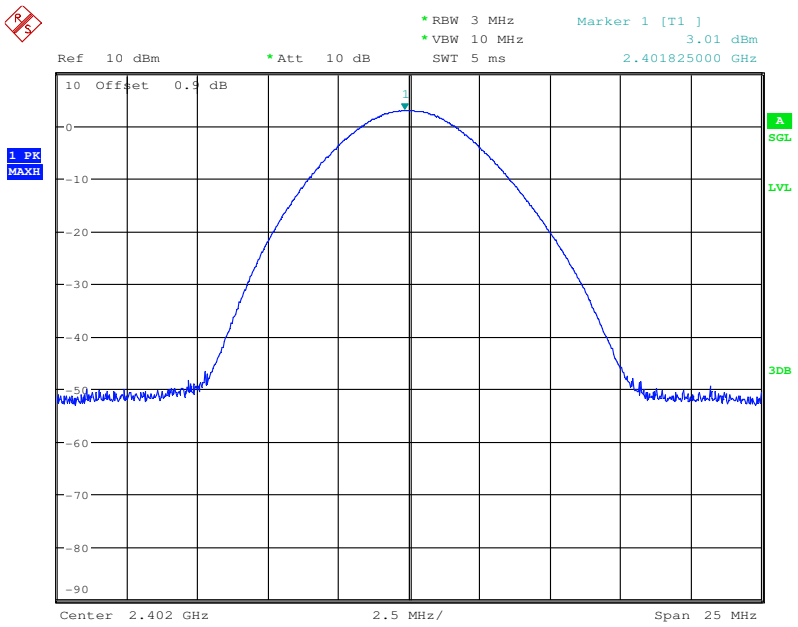
Test mode:	GFSK	Test channel:	Middle



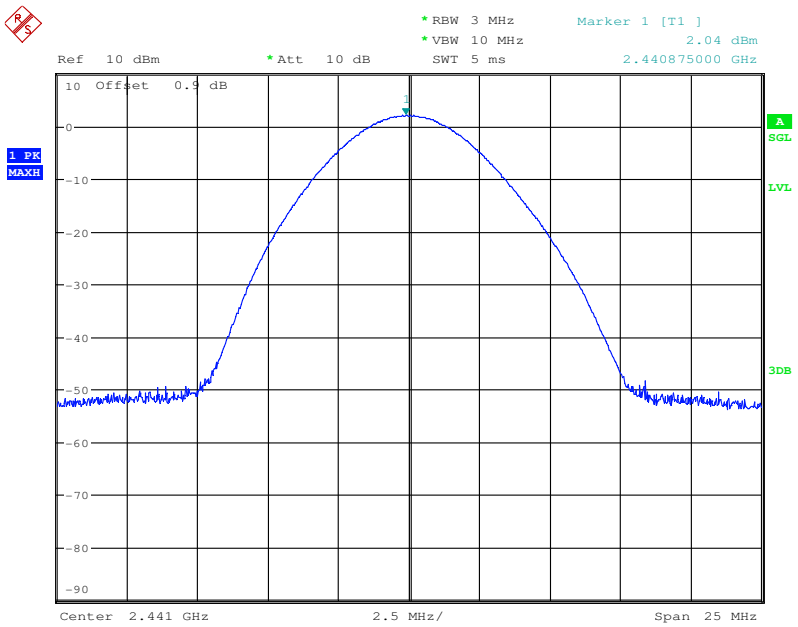
Test mode:	GFSK	Test channel:	Highest



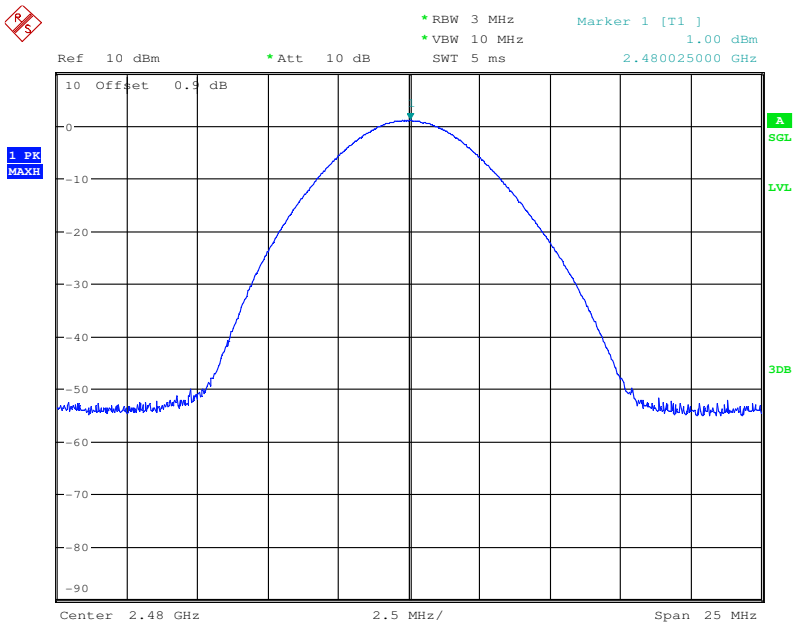
Test mode:	π/4DQPSK	Test channel:	Lowest



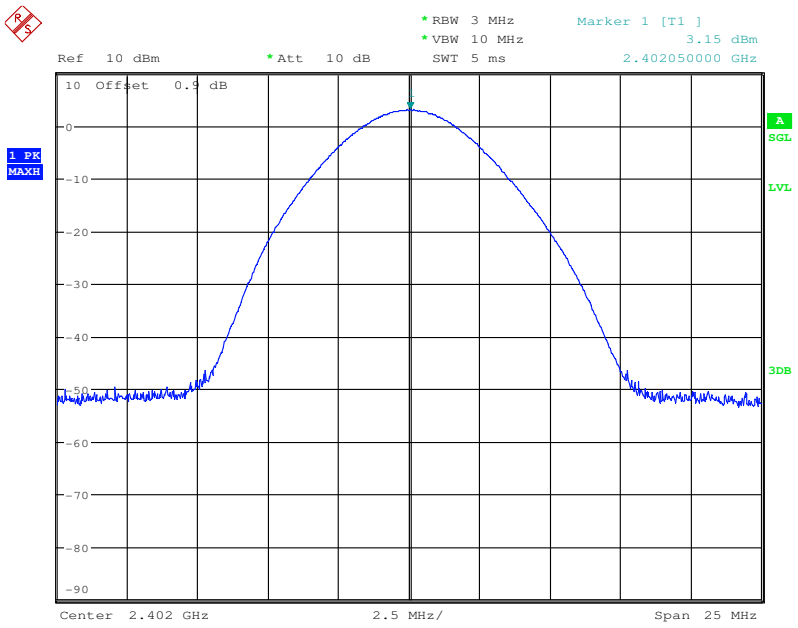
Test mode:	π/4DQPSK	Test channel:	Middle



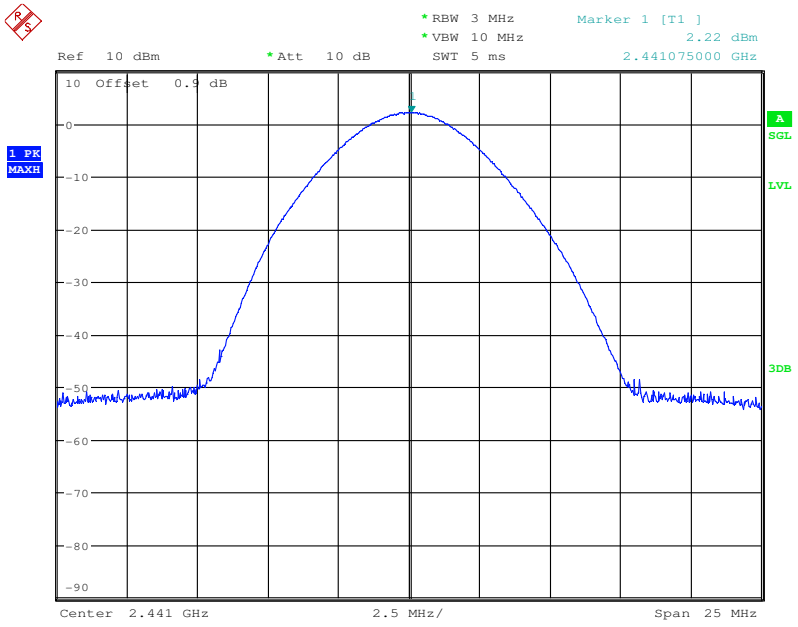
Test mode:	π/4DQPSK	Test channel:	Highest



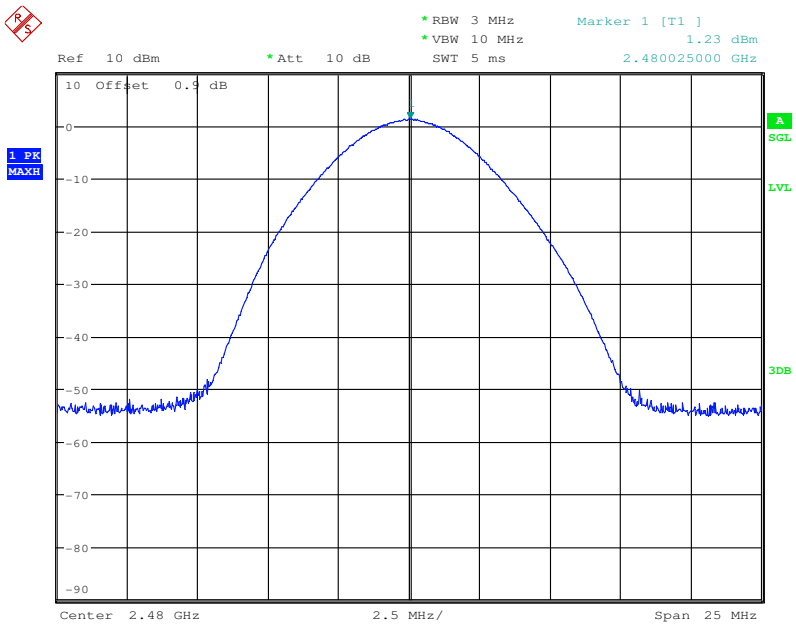
Test mode:	8DPSK	Test channel:	Lowest



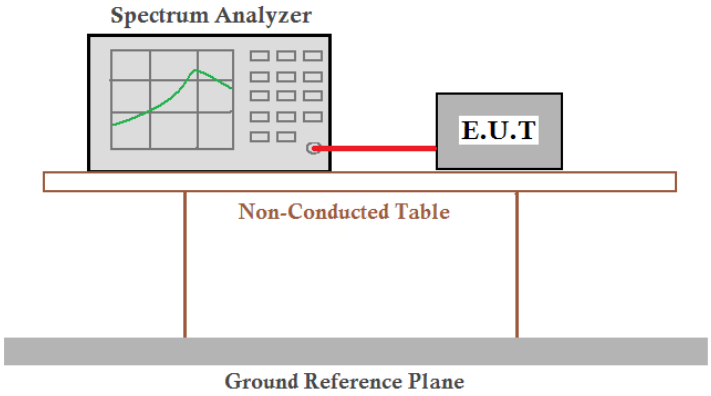
Test mode:	8DPSK	Test channel:	Middle



Test mode:	8DPSK	Test channel:	Highest



6.4 20dB Occupy Bandwidth

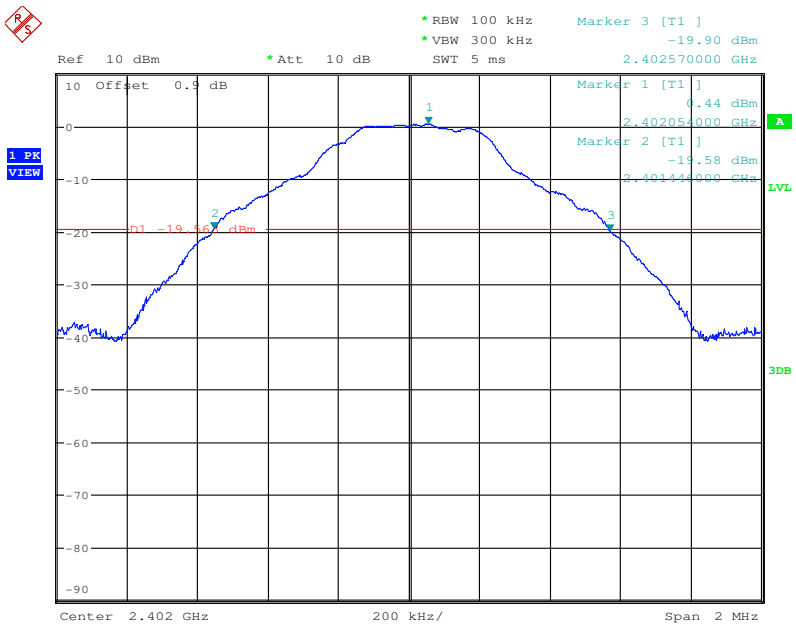
Test Requirement:	47 CFR Part 15, Subpart C 15.247(a)(1)
Test Method:	ANSI C63.10 (2013) Section 6.9
Test Setup:	
Instruments Used:	Refer to section 5.10 for details
Limit:	NA
Exploratory Test Mode:	Non-hopping transmitting with all kind of modulation and all kind of data type.
Final Test Mode:	Through Pre-scan, find the DH1 of data type is the worst case of GFSK modulation type, 2-DH1 of data type is the worst case of π/4DQPSK modulation type, 3-DH1 of data type is the worst case of 8DPSK modulation type.
Test Results:	Pass

Measurement Data

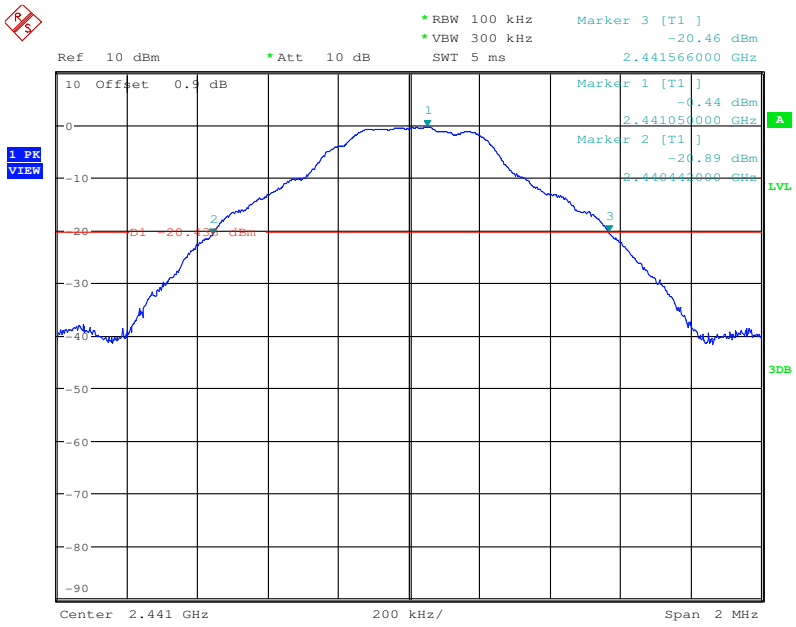
Test channel	20dB Occupy Bandwidth (kHz)		
	GFSK	π/4DQPSK	8DPSK
Lowest	1124	1400	1428
Middle	1124	1402	1440
Highest	1128	1400	1432

Test plot as follows:

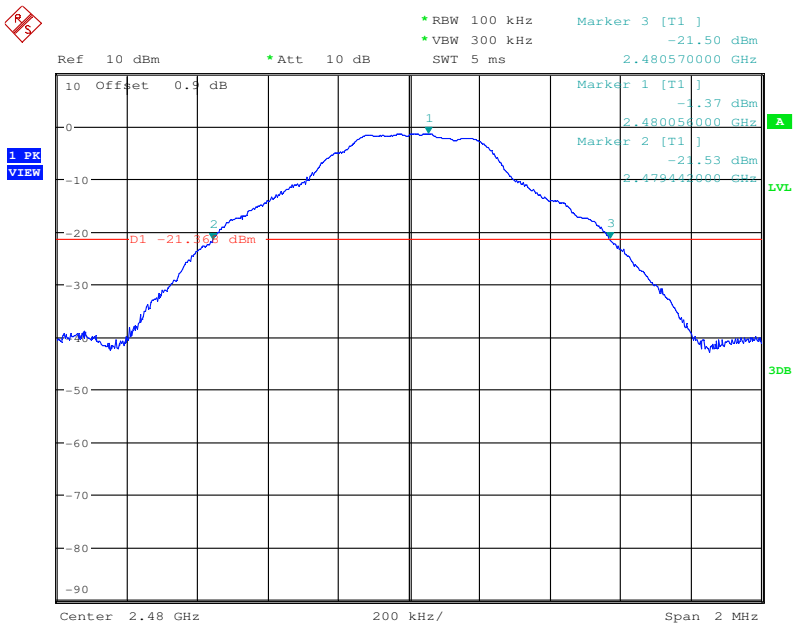
Test mode:	GFSK	Test channel:	Lowest



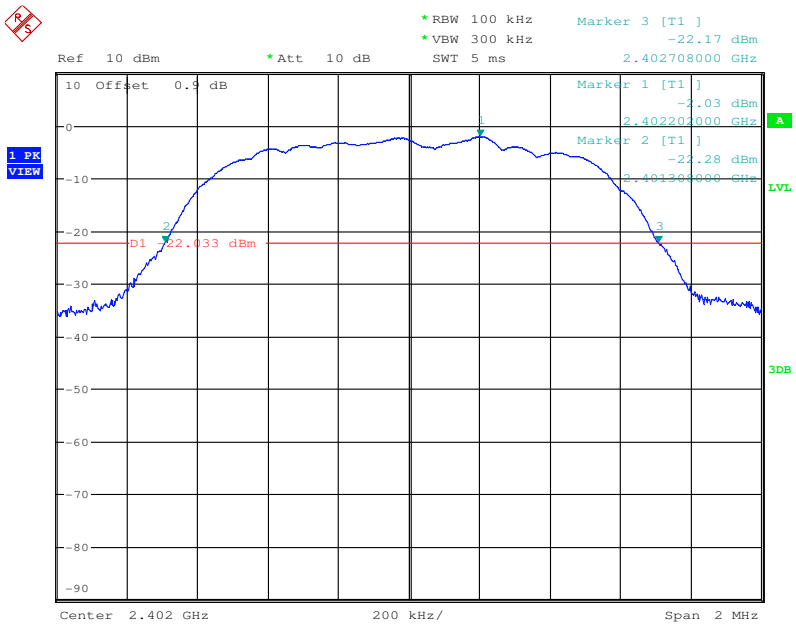
Test mode:	GFSK	Test channel:	Middle



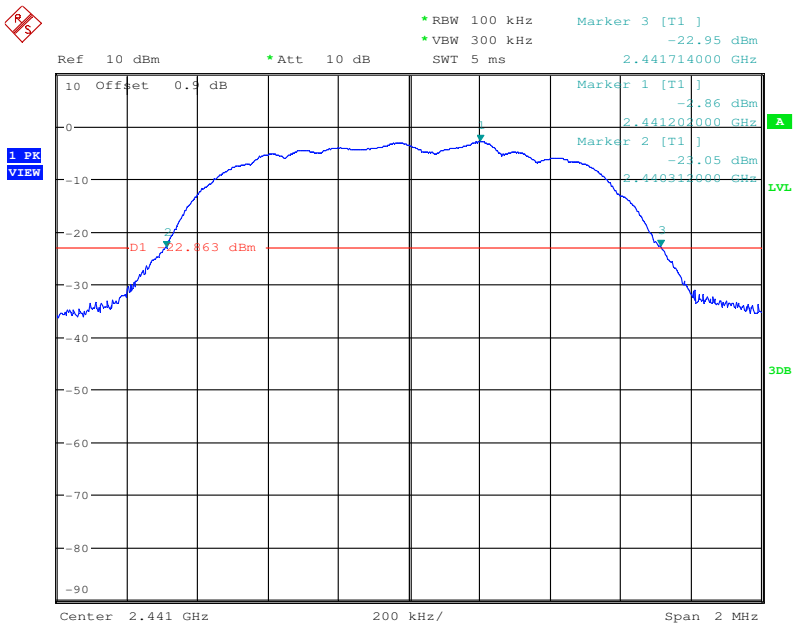
Test mode:	GFSK	Test channel:	Highest



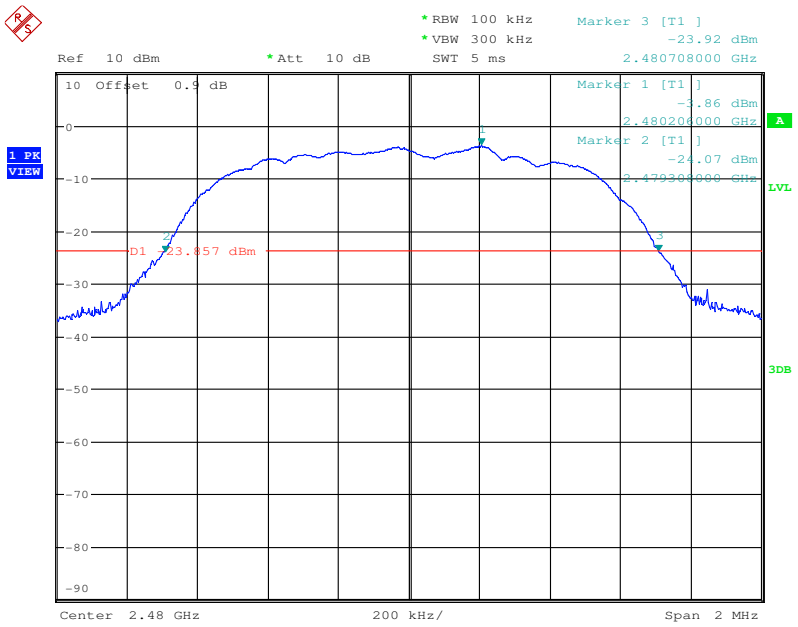
Test mode:	π/4DQPSK	Test channel:	Lowest



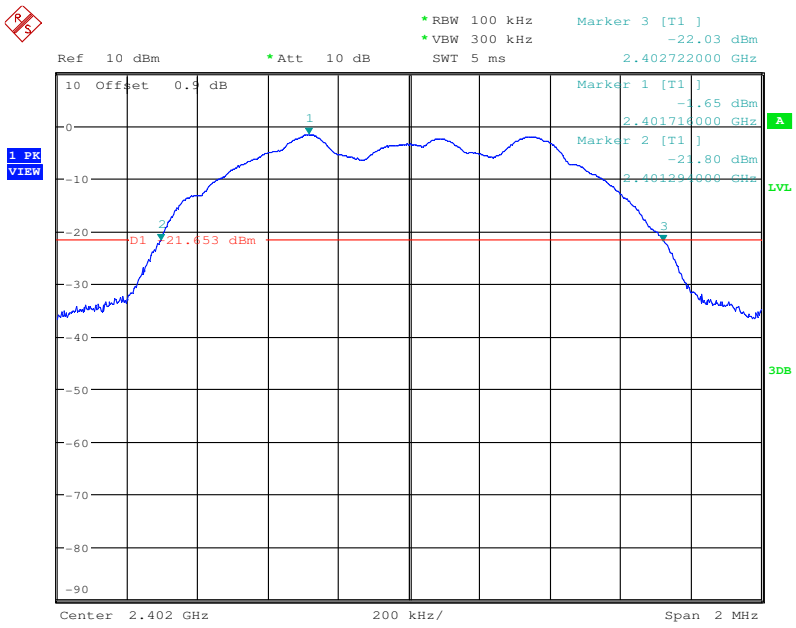
Test mode:	π/4DQPSK	Test channel:	Middle



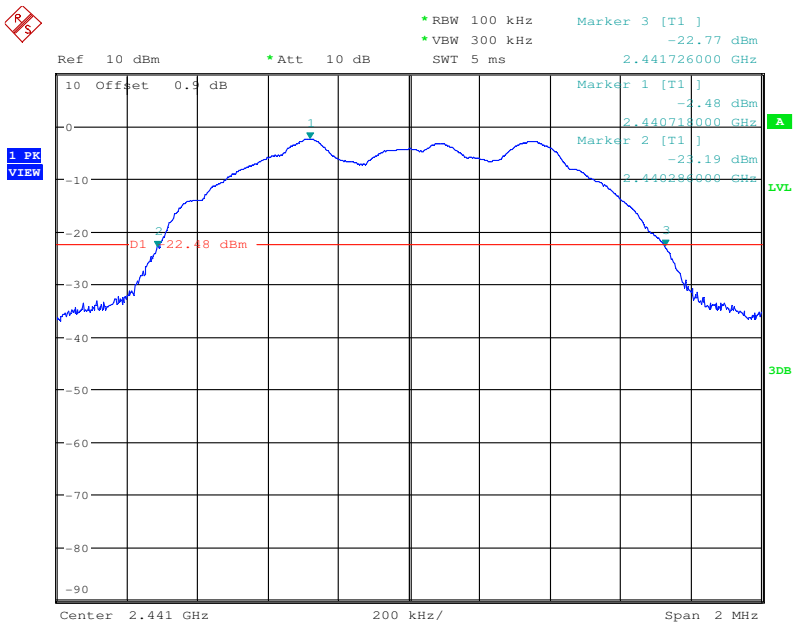
Test mode:	π/4DQPSK	Test channel:	Highest



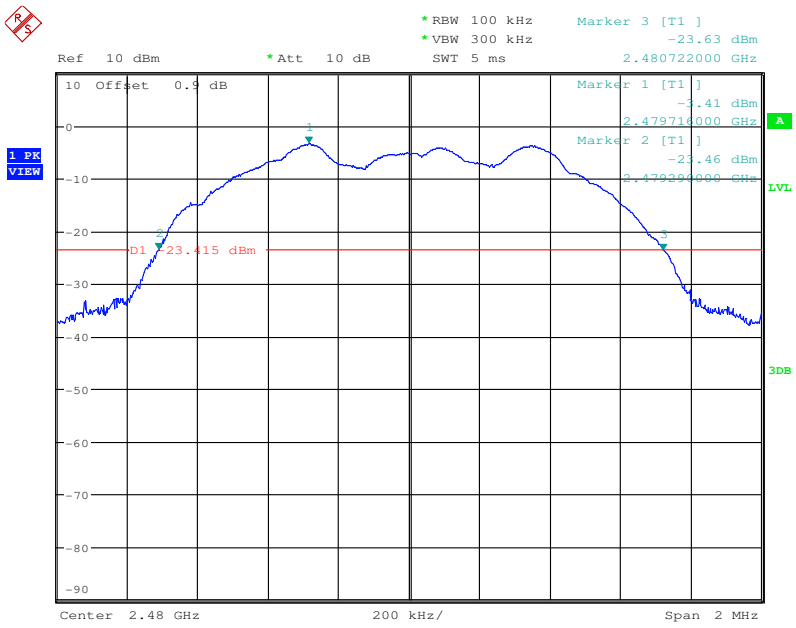
Test mode:	8DPSK	Test channel:	Lowest



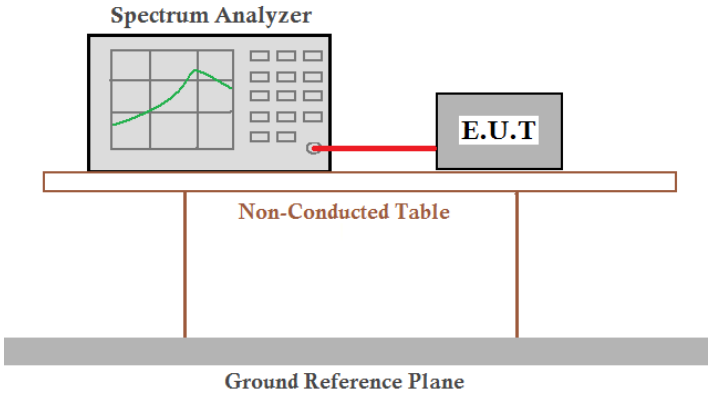
Test mode:	8DPSK	Test channel:	Middle



Test mode:	8DPSK	Test channel:	Highest



6.5 99% Occupy Bandwidth

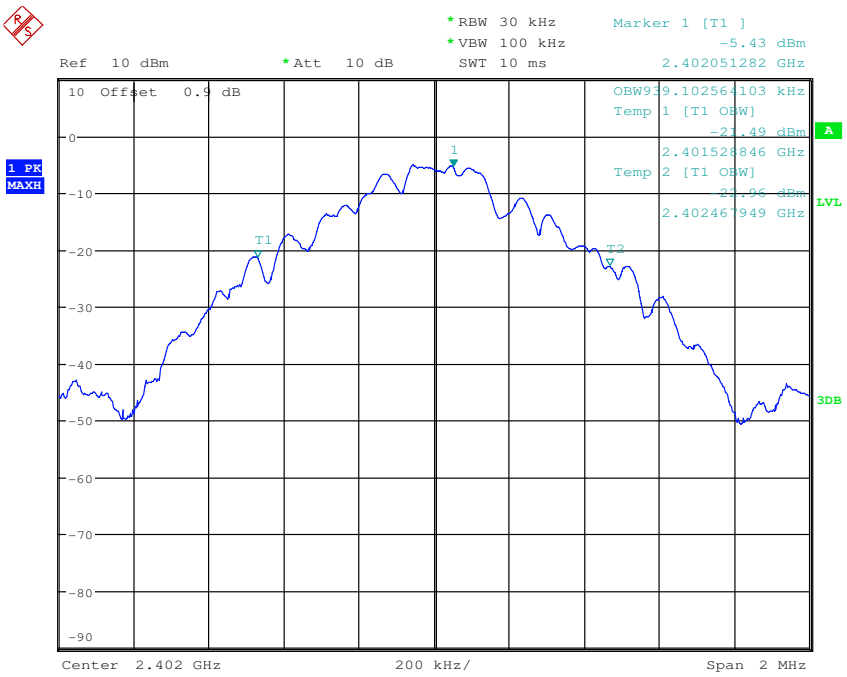
Test Requirement:	47 CFR Part 15, Subpart C 15.247(a)(1)
Test Method:	ANSI C63.10 (2013)
Test Setup:	
Instruments Used:	Refer to section 5.10 for details
Limit:	NA
Exploratory Test Mode:	Non-hopping transmitting with all kind of modulation and all kind of data type.
Final Test Mode:	Through Pre-scan, find the DH1 of data type is the worst case of GFSK modulation type, 2-DH1 of data type is the worst case of π/4DQPSK modulation type, 3-DH1 of data type is the worst case of 8DPSK modulation type.
Test Results:	Pass

Measurement Data

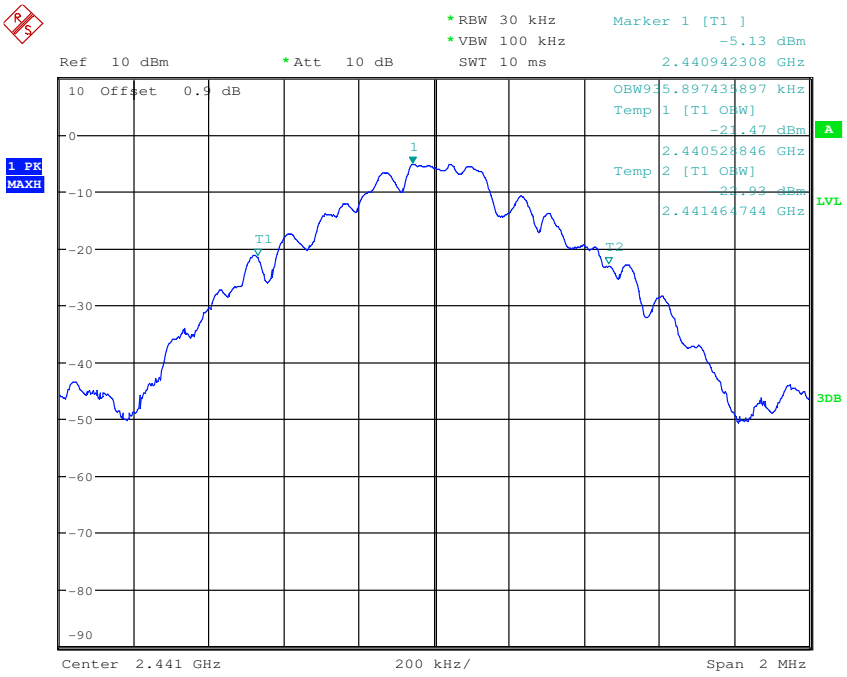
Test channel	99% Occupy Bandwidth (kHz)		
	GFSK	π/4DQPSK	8DPSK
Lowest	939	1208	1192
Middle	936	1208	1192
Highest	939	1215	1202

Test plot as follows:

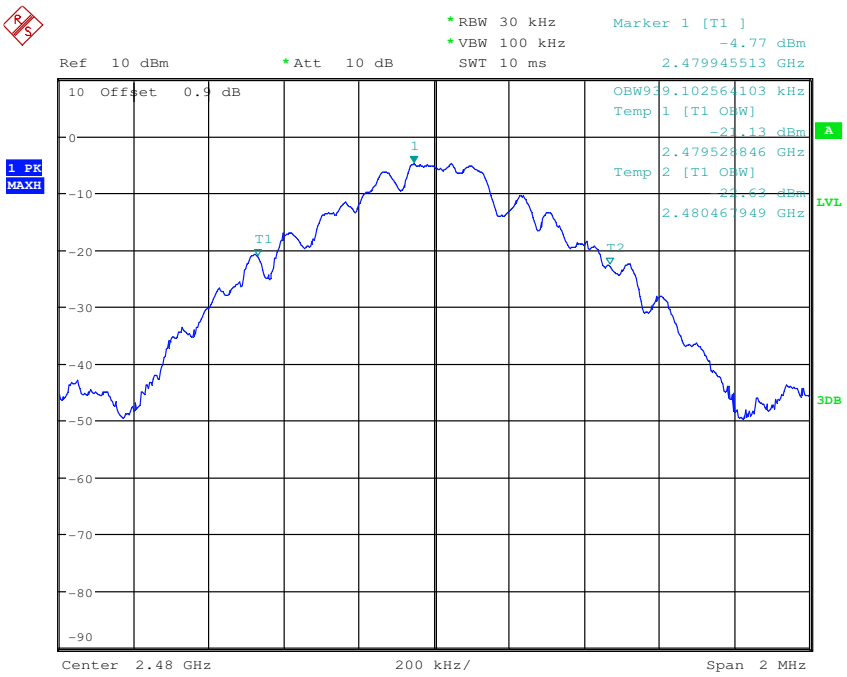
Test mode:	GFSK	Test channel:	Lowest



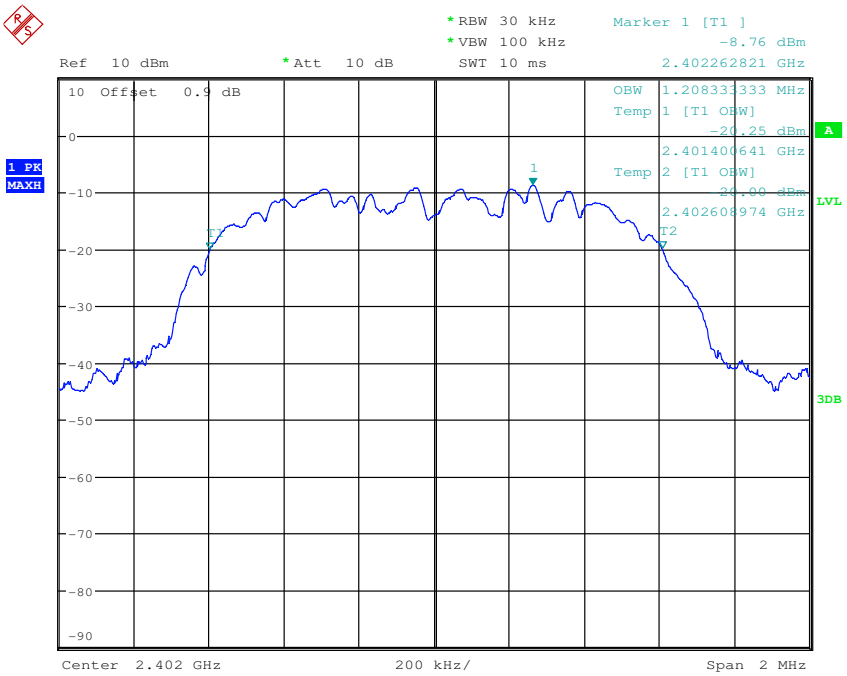
Test mode:	GFSK	Test channel:	Middle



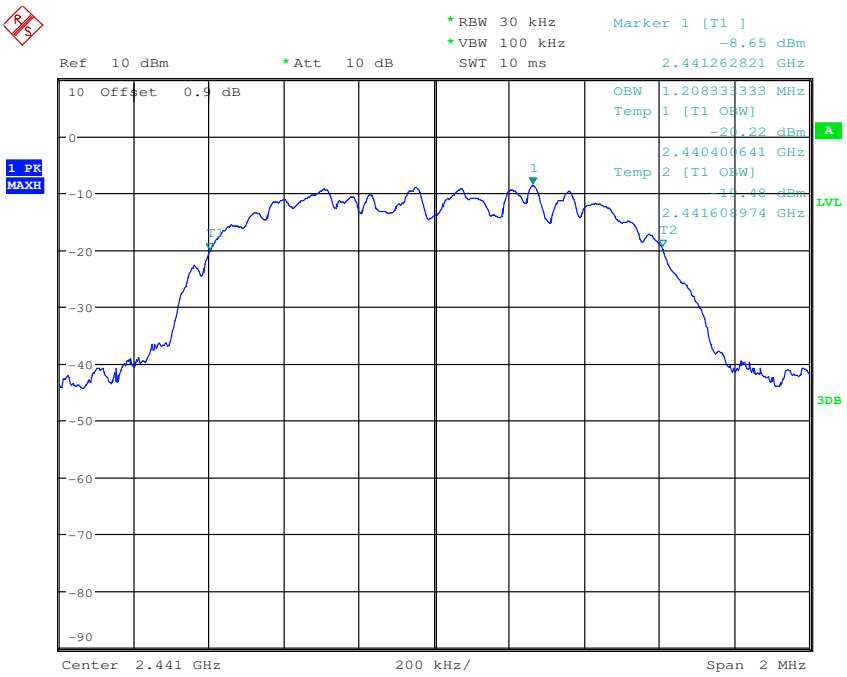
Test mode:	GFSK	Test channel:	Highest



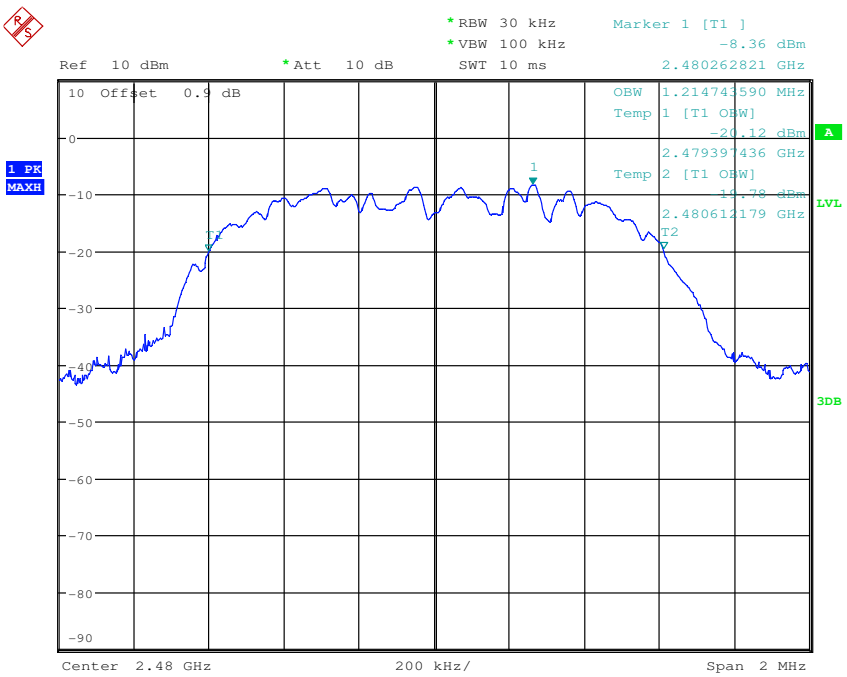
Test mode:	π/4DQPSK	Test channel:	Lowest



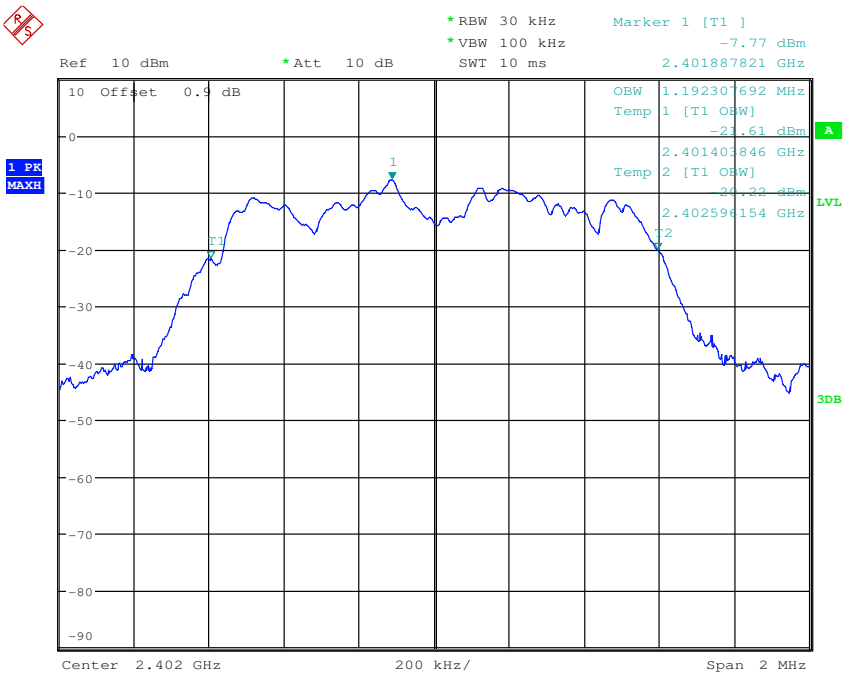
Test mode:	π/4DQPSK	Test channel:	Middle



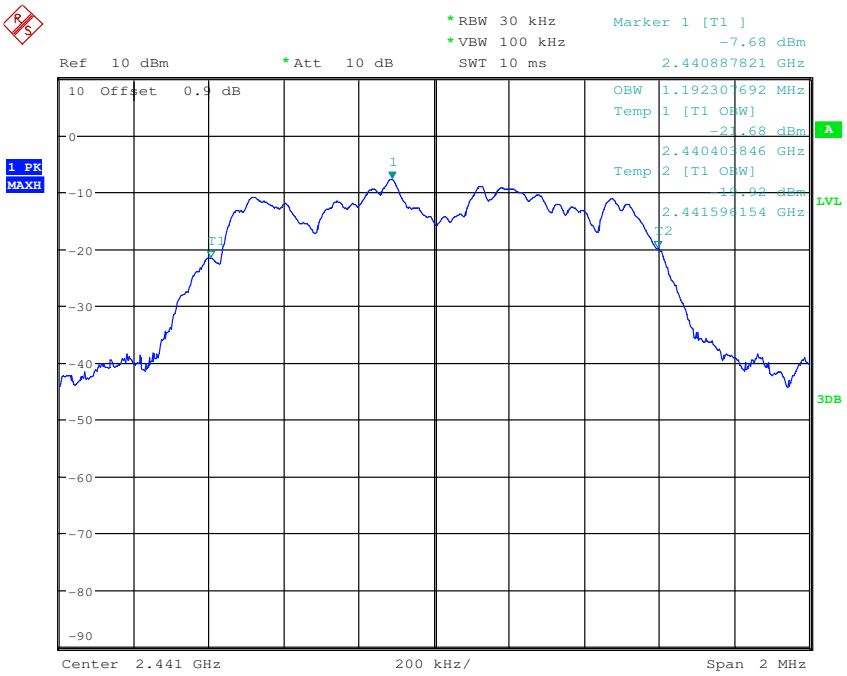
Test mode:	π/4DQPSK	Test channel:	Highest



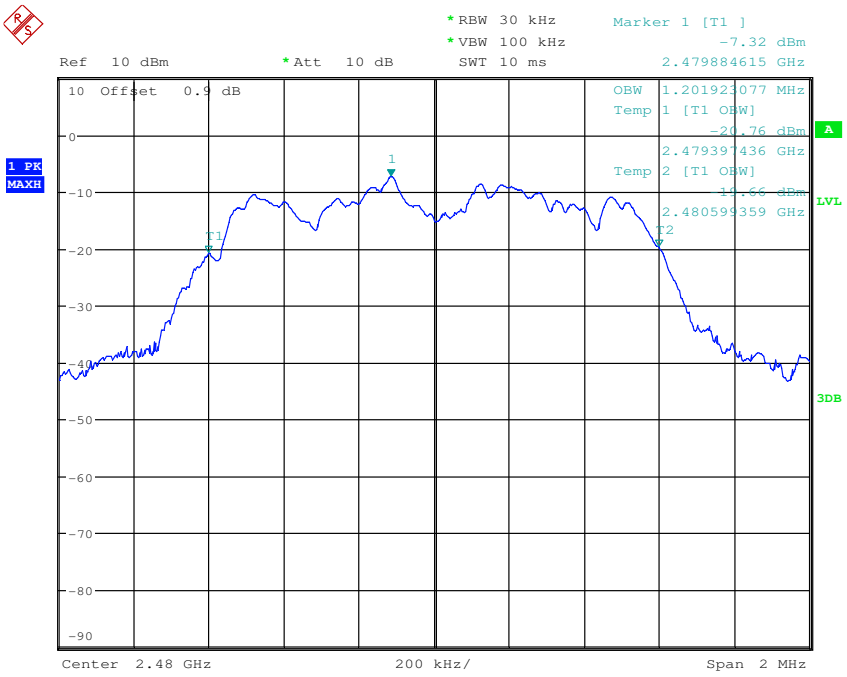
Test mode:	8DPSK	Test channel:	Lowest



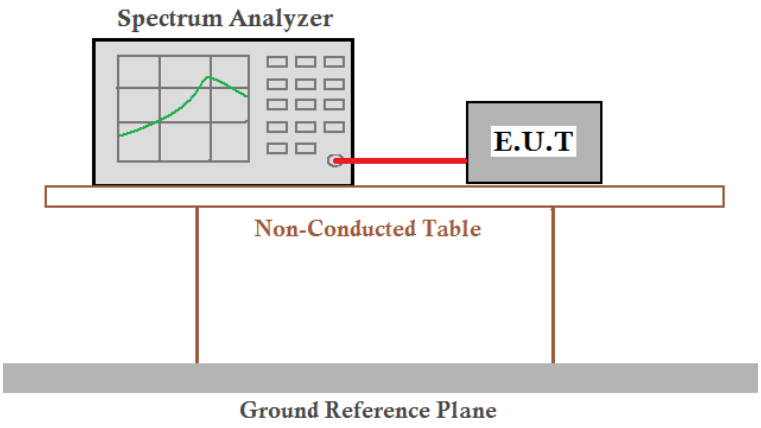
Test mode:	8DPSK	Test channel:	Middle



Test mode:	8DPSK	Test channel:	Highest



6.6 Carrier Frequencies Separation

Test Requirement:	47 CFR Part 15, Subpart C 15.247a(1)
Test Method:	ANSI C63.10 (2013) Section 7.8.2
Test Setup:	
Instruments Used:	Refer to section 5.10 for details
Exploratory Test Mode:	Hopping transmitting with all kind of modulation and all kind of data type.
Final Test Mode:	Through Pre-scan, find the DH1 of data type is the worst case of GFSK modulation type, 2-DH1 of data type is the worst case of π/4DQPSK modulation type, 3-DH1 of data type is the worst case of 8DPSK modulation type.
Limit:	0.025MHz or 2/3 of the 20dB bandwidth (whichever is greater)
Test Results:	Pass

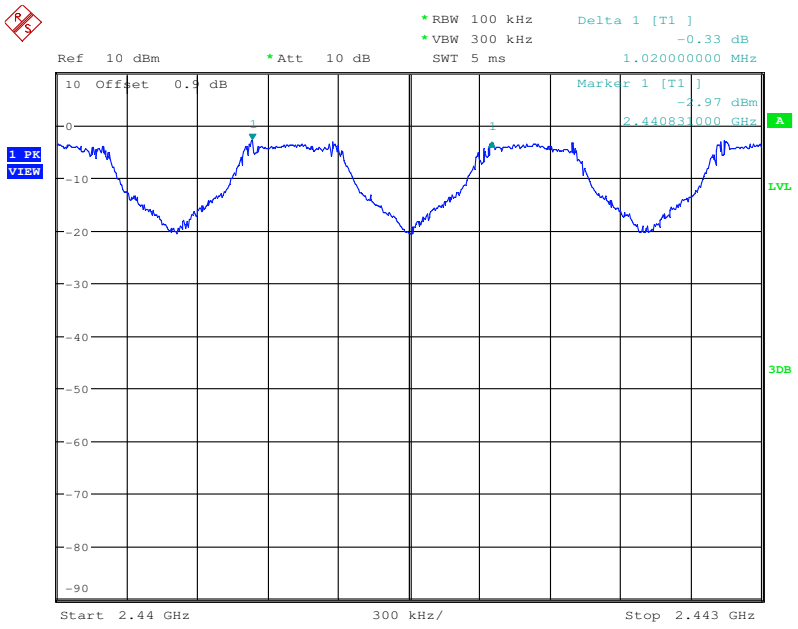
GFSK mode			
Test channel	Carrier Frequencies Separation (kHz)	Limit (kHz)	Result
Middle	1020	752	Pass
π/4DQPSK mode			
Test channel	Carrier Frequencies Separation (kHz)	Limit (kHz)	Result
Middle	993	934.67	Pass
8DPSK mode			
Test channel	Carrier Frequencies Separation (kHz)	Limit (kHz)	Result
Middle	1005	960	Pass

Note: According to section 6.4,

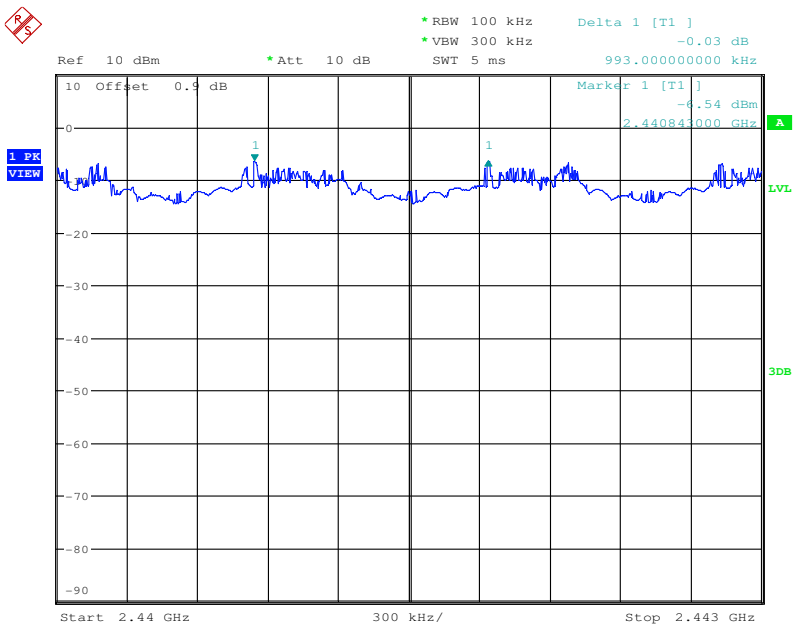
Mode	20dB bandwidth (kHz) (worse case)	Limit (kHz) (Carrier Frequencies Separation)
GFSK	1128	752
π/4DQPSK	1402	934.67
8DPSK	1440	960

Test plot as follows:

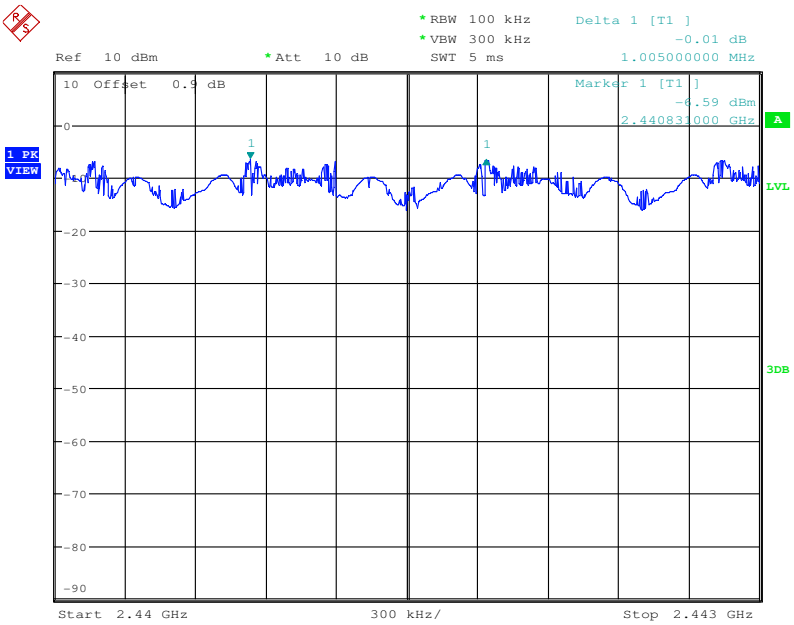
Test mode:	GFSK	Test channel:	Middle



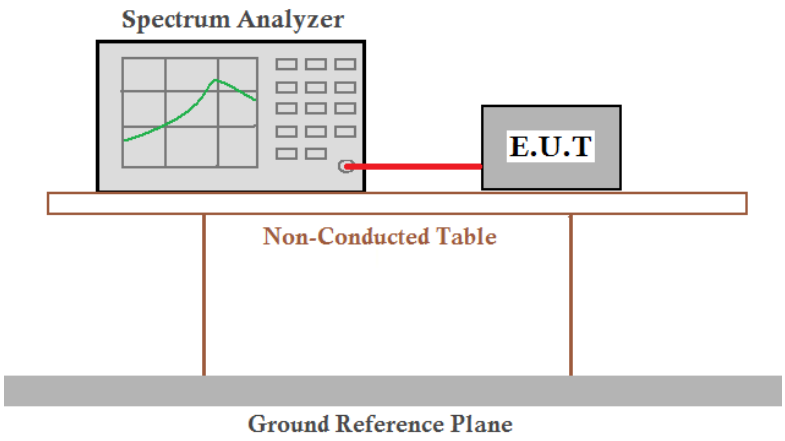
Test mode:	π/4DQPSK	Test channel:	Middle



Test mode:	8DPSK	Test channel:	Middle



6.7 Hopping Channel Number

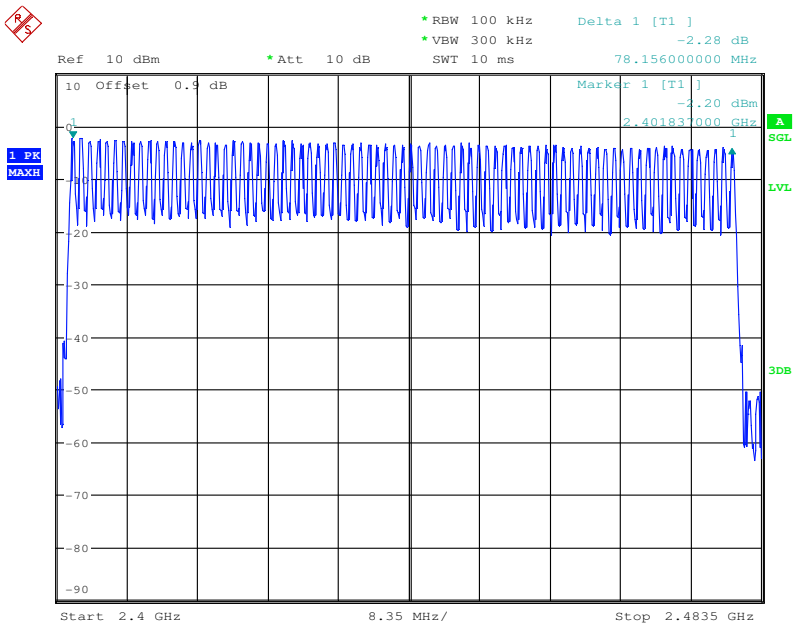
Test Requirement:	47 CFR Part 15, Subpart C 15.247a(1)(iii)
Test Method:	ANSI C63.10 (2013) Section 7.8.3
Test Setup:	
Instruments Used:	Refer to section 5.10 for details
Limit:	At least 15 channels
Test Mode:	Hopping transmitting with all kind of modulation.
Test Results:	Pass

Measurement Data

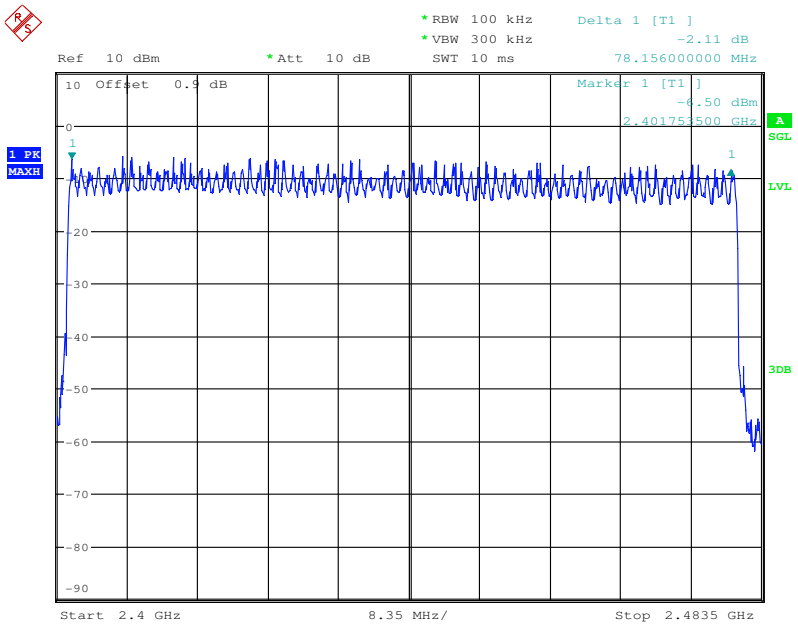
Test mode	Hopping channel numbers	Limit	Results
GFSK	79	15	Pass
π/4DQPSK	79	15	Pass
8DPSK	79	15	Pass

Test plot as follows

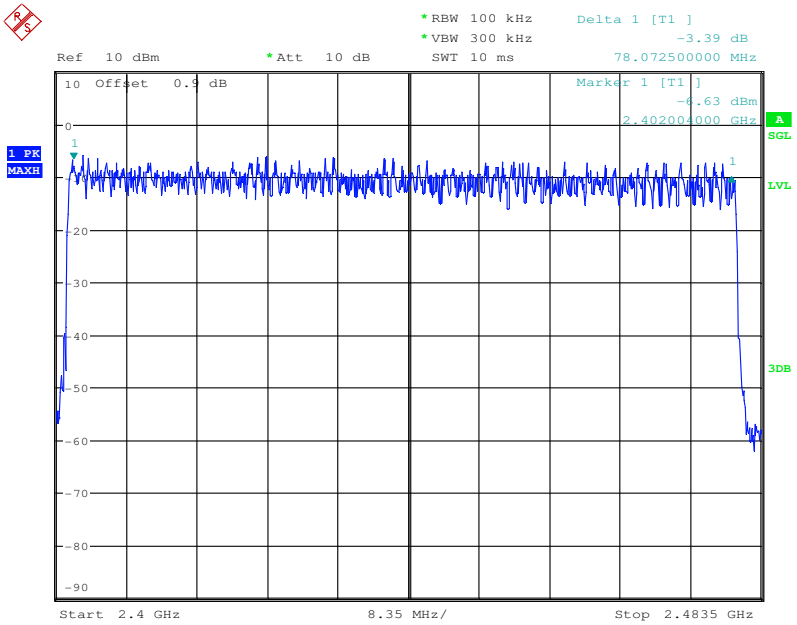
Test mode:	GFSK



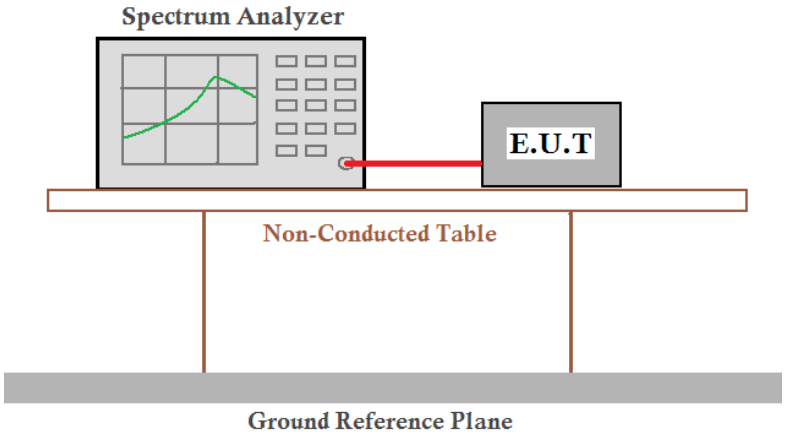
Test mode:	π/4DQPSK



Test mode:	8DPSK



6.8 Dwell Time

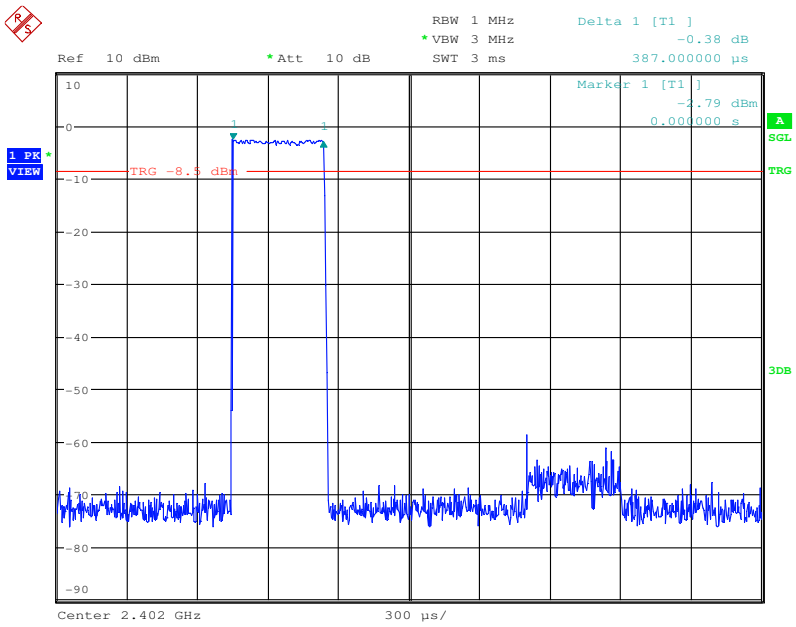
Test Requirement:	47 CFR Part 15, Subpart C 15.247a(1)(iii)
Test Method:	ANSI C63.10 (2013) Section 7.8.4
Test Setup:	
Instruments Used:	Refer to section 5.10 for details
Limit:	≤0.4 Second
Test Mode:	Hopping transmitting with all kind of modulation and all kind of data type
Test Results:	Pass

Measurement Data

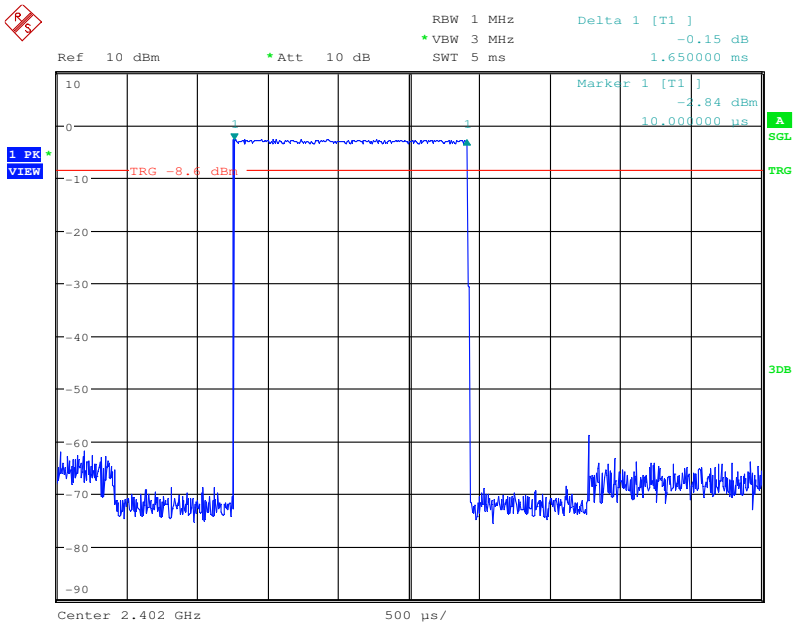
Test Mode	Test Channel	Burst Width[ms/hop/ch]	Total Hops[hop*ch]	Dwell Time[s]	Limit[s]	Verdict
DH1	2402	0.39	320	0.125	<0.4	PASS
DH3	2402	1.65	150	0.248	<0.4	PASS
DH5	2402	2.9	90	0.261	<0.4	PASS
2DH1	2402	0.4	320	0.128	<0.4	PASS
2DH3	2402	1.66	160	0.266	<0.4	PASS
2DH5	2402	2.9	110	0.319	<0.4	PASS
3DH1	2402	0.4	320	0.128	<0.4	PASS
3DH3	2402	1.66	160	0.266	<0.4	PASS
3DH5	2402	2.9	90	0.261	<0.4	PASS

Test plot as follows:

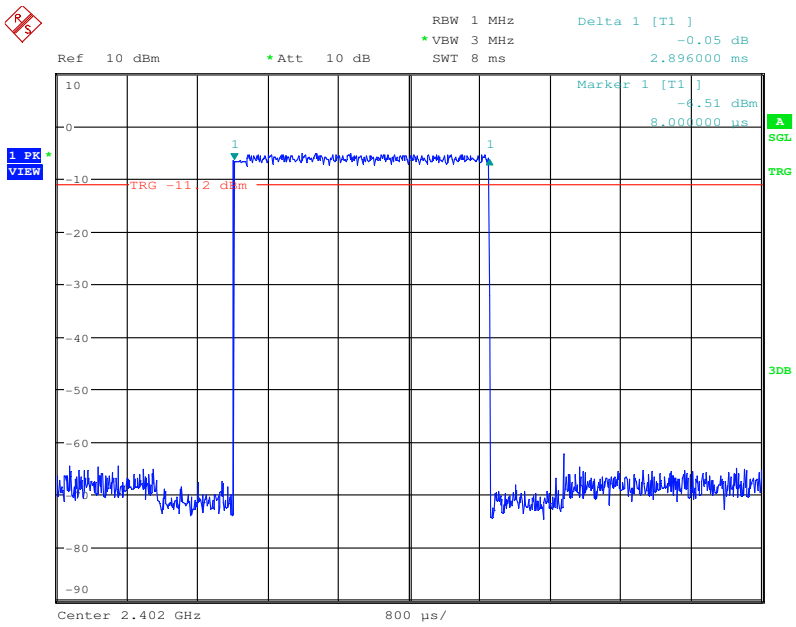
Test Packet:	DH1



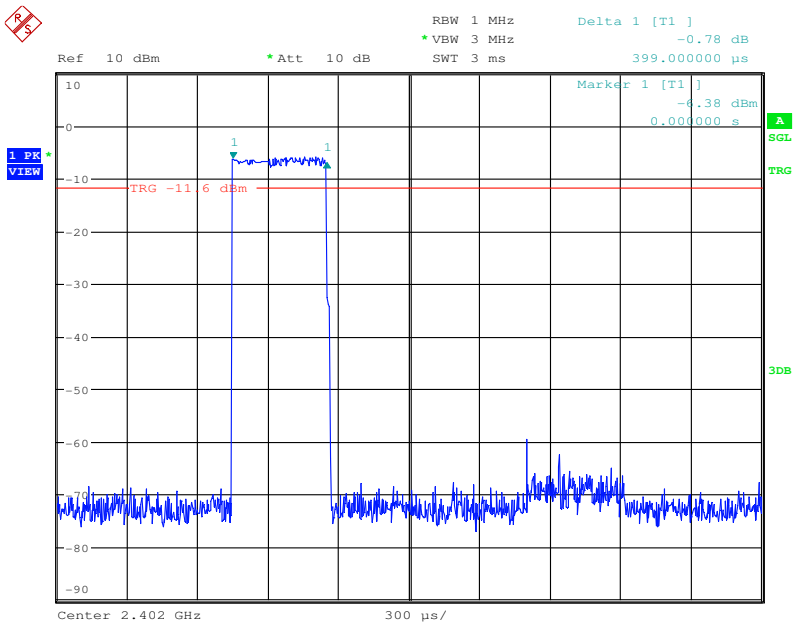
Test Packet:	DH3



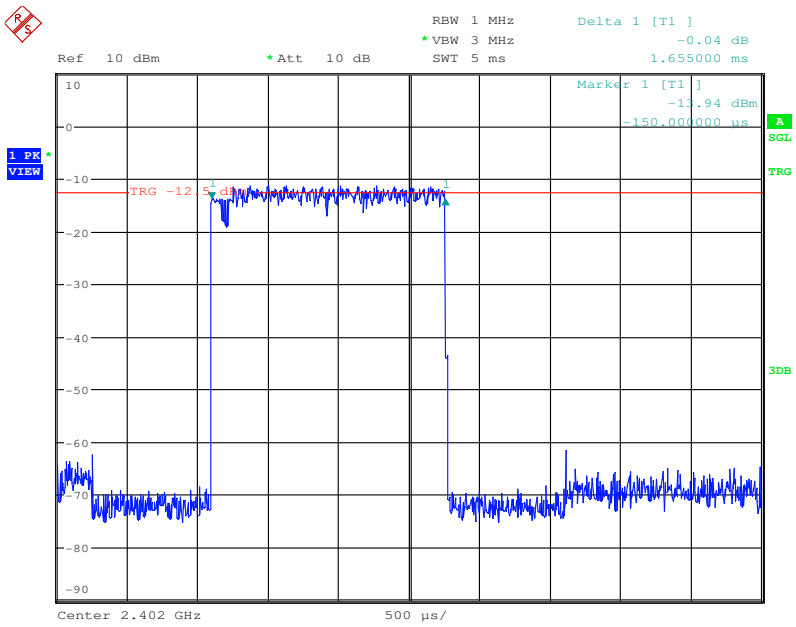
Test Packet:	DH5



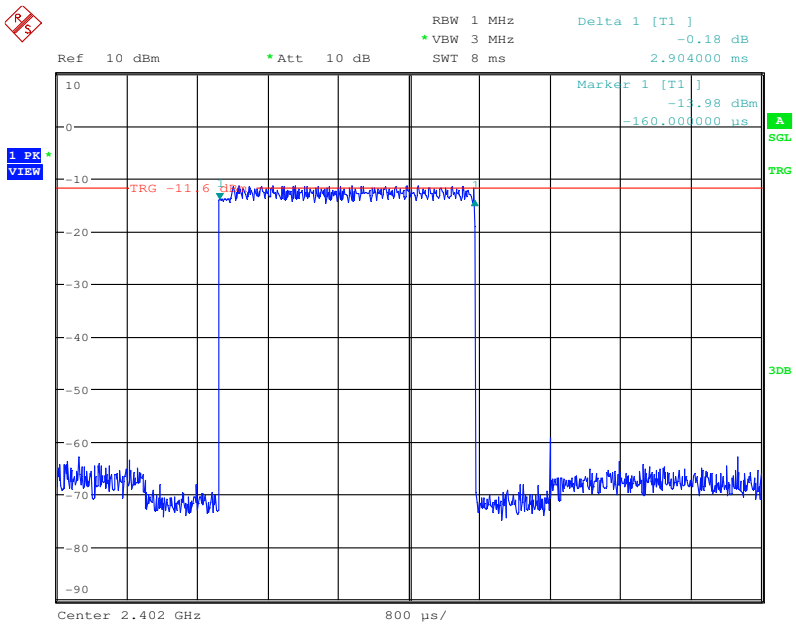
Test Packet:	2-DH1



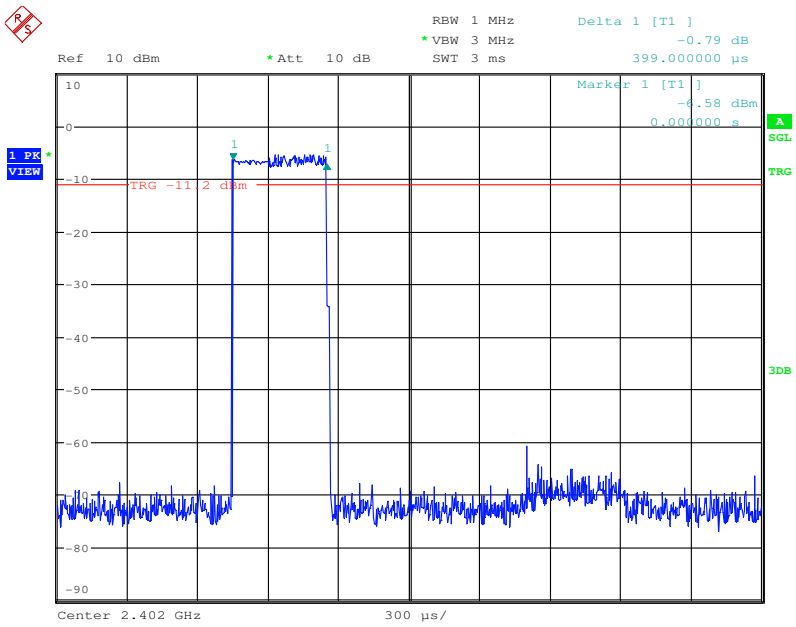
Test Packet:	2-DH3



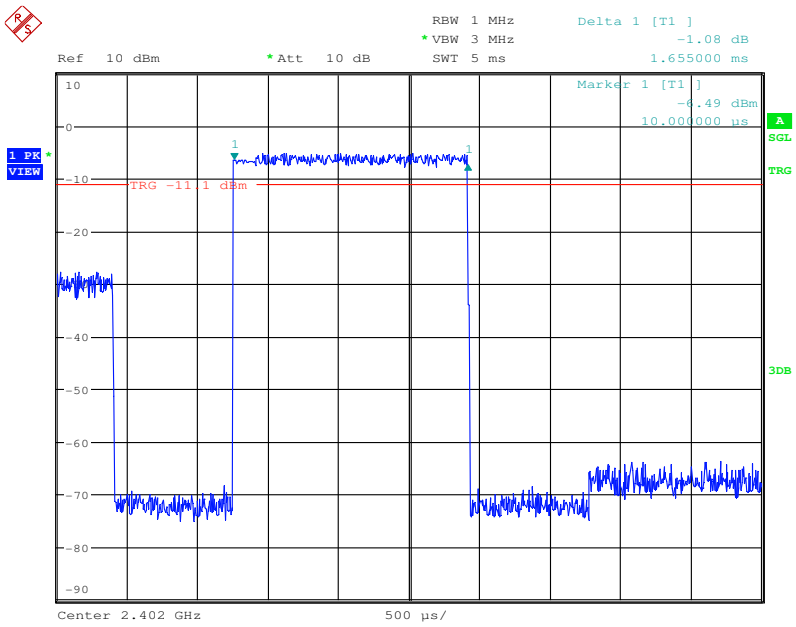
Test Packet:	2-DH5



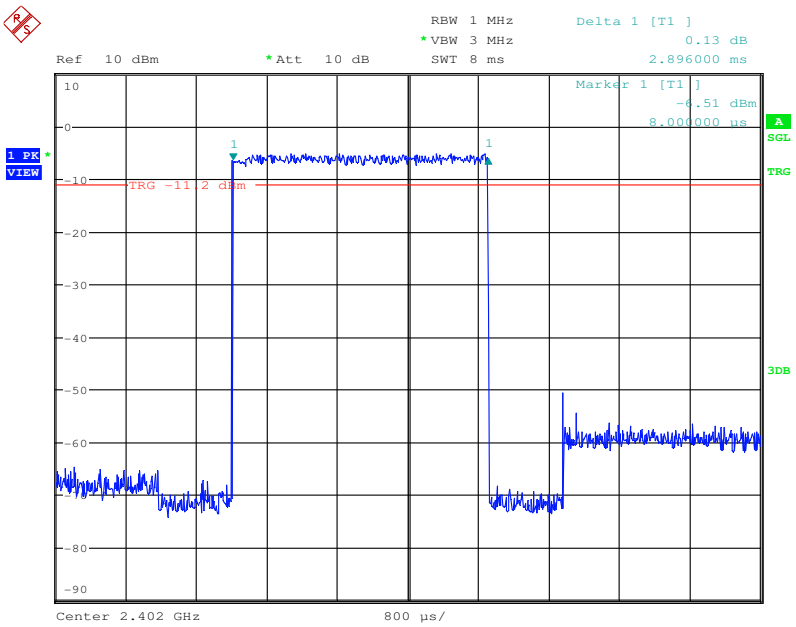
Test Packet:	3-DH1



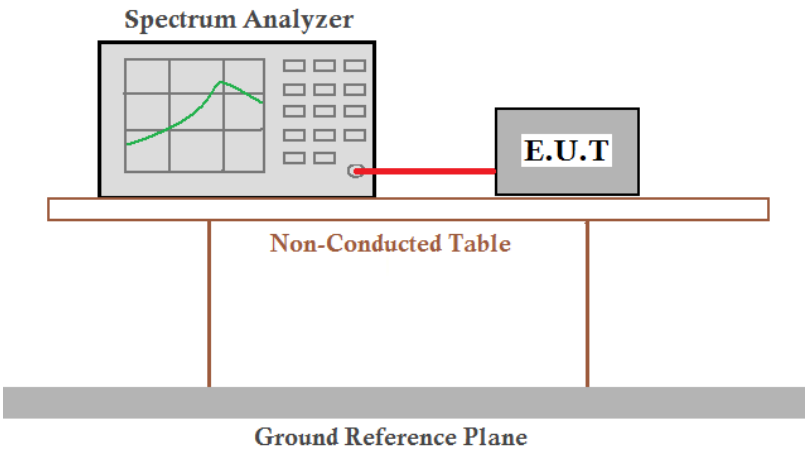
Test Packet:	3-DH3



Test Packet:	3-DH5

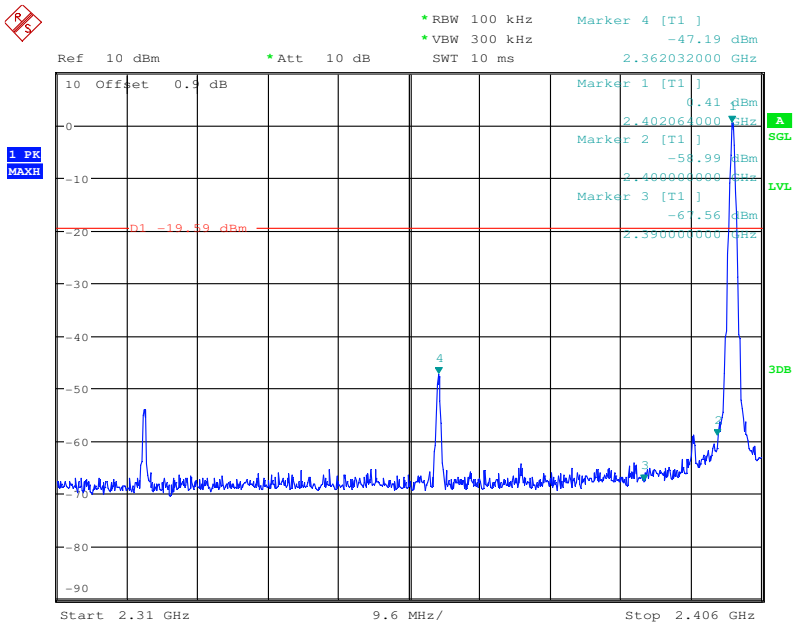


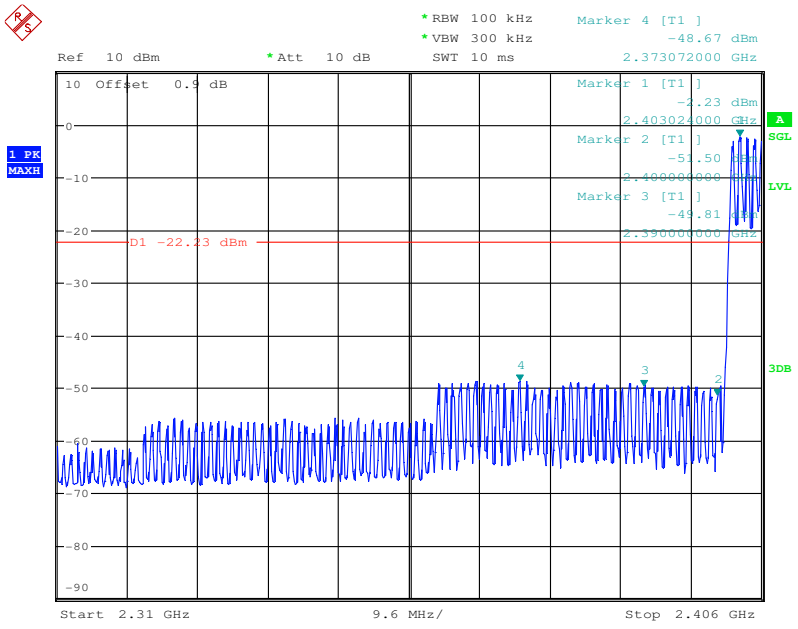
6.9 Band Edge for RF Conducted Emissions

Test Requirement:	47 CFR Part 15, Subpart C 15.247(d)
Test Method:	ANSI C63.10 (2013) Section 7.8.6
Test Setup:	
Instruments Used:	Refer to section 5.10 for details
Limit:	In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated 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.
Exploratory Test Mode:	Hopping and Non-hopping transmitting with all kind of modulation and all kind of data type
Final Test Mode:	Through Pre-scan, find the DH1 of data type is the worst case of GFSK modulation type, 2-DH1 of data type is the worst case of π/4DQPSK modulation type, 3-DH1 of data type is the worst case of 8DPSK modulation type.
Test Results:	Pass

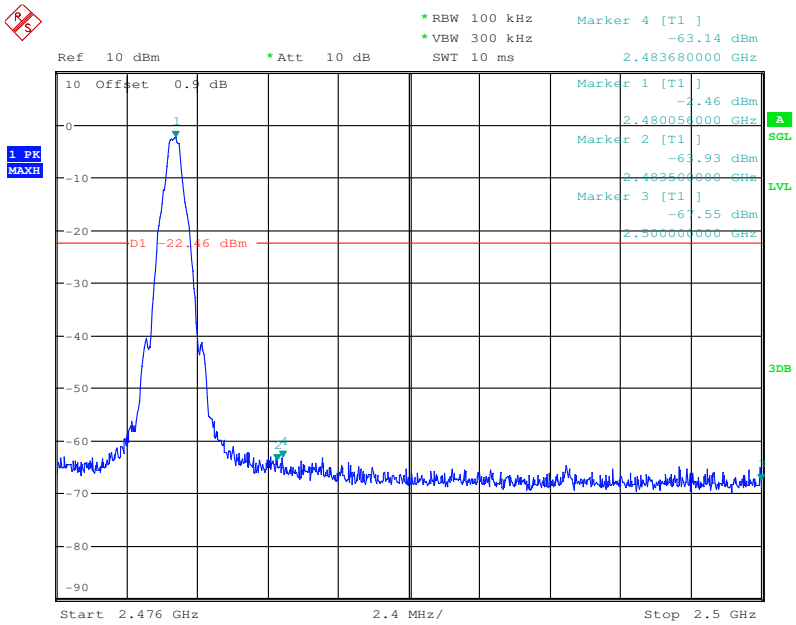
Test plot as follows:

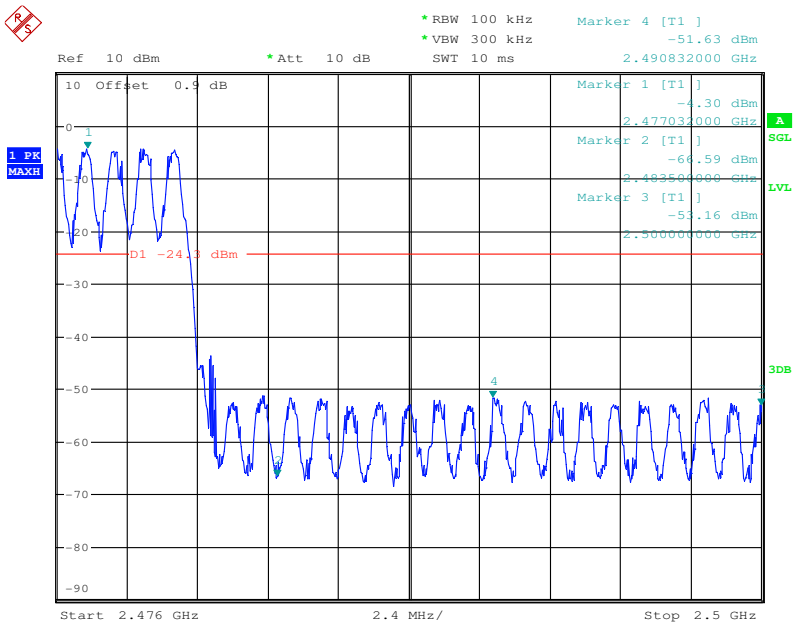
Test mode:	GFSK	Test channel:	Lowest



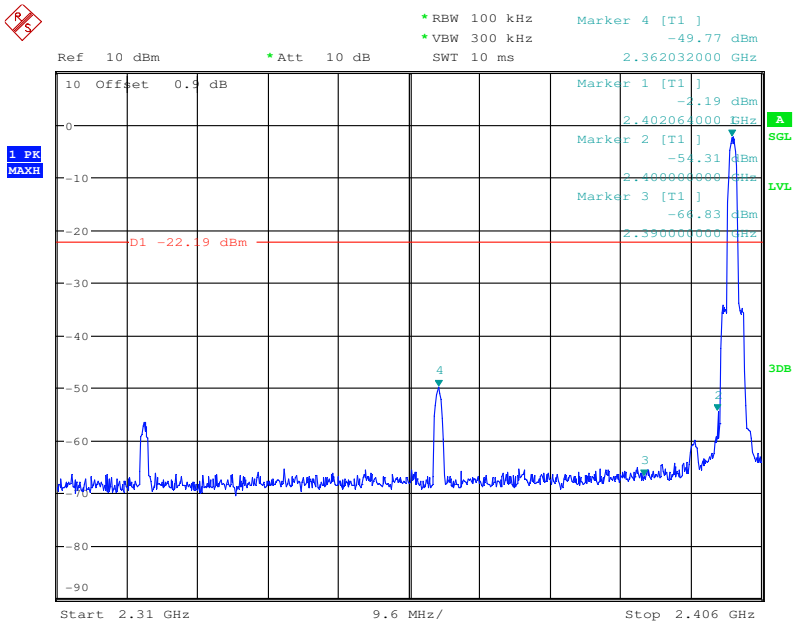


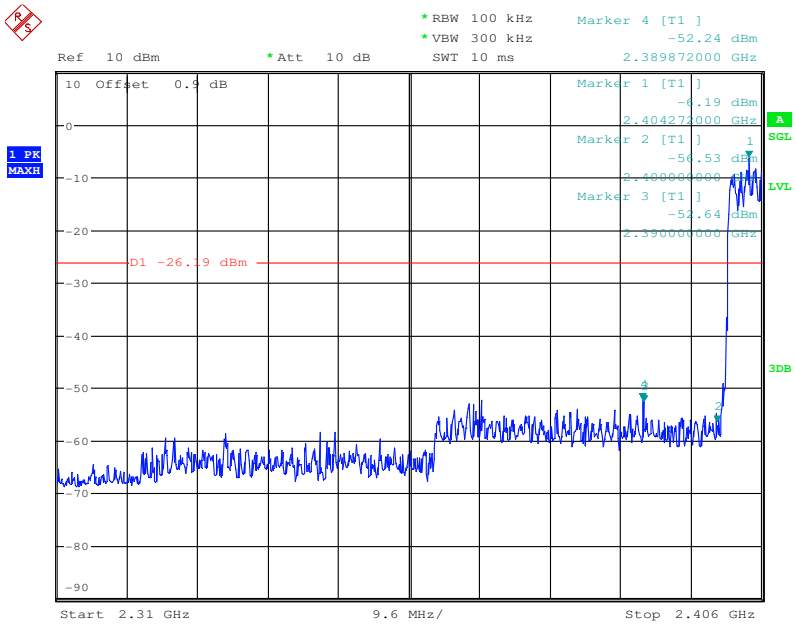
Test mode:	GFSK	Test channel:	Highest



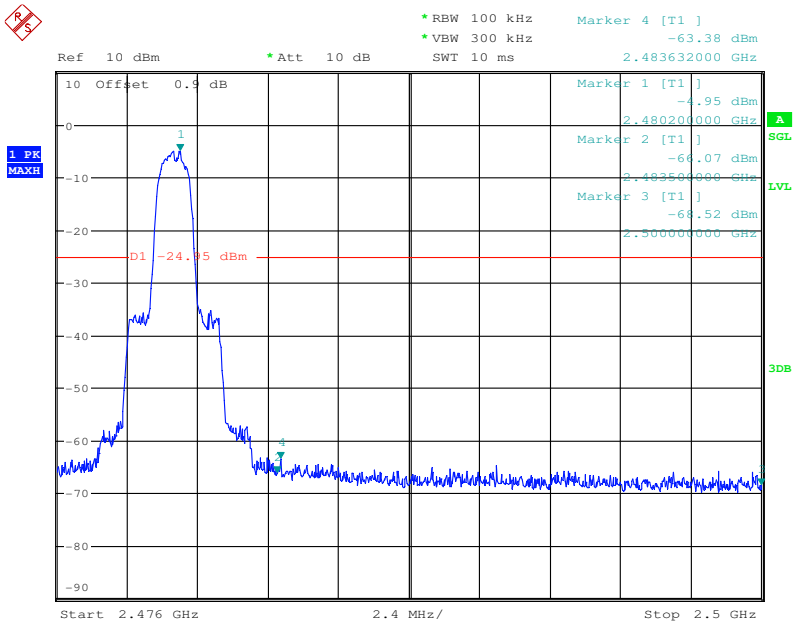


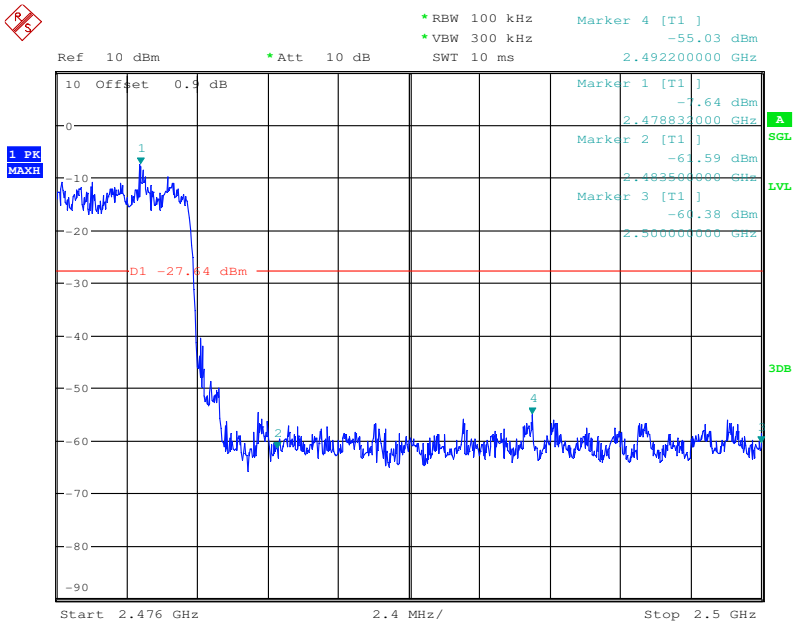
Test mode:	π/4DQPSK	Test channel:	Lowest



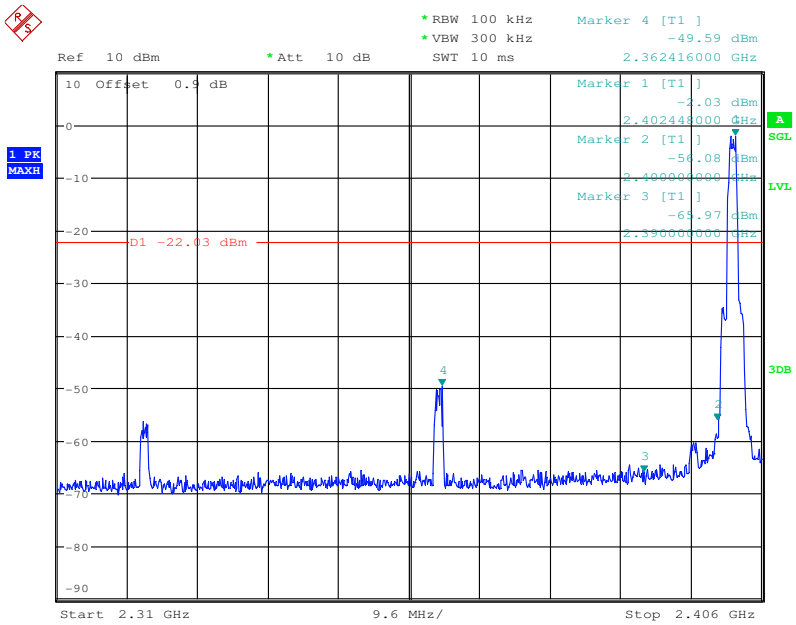


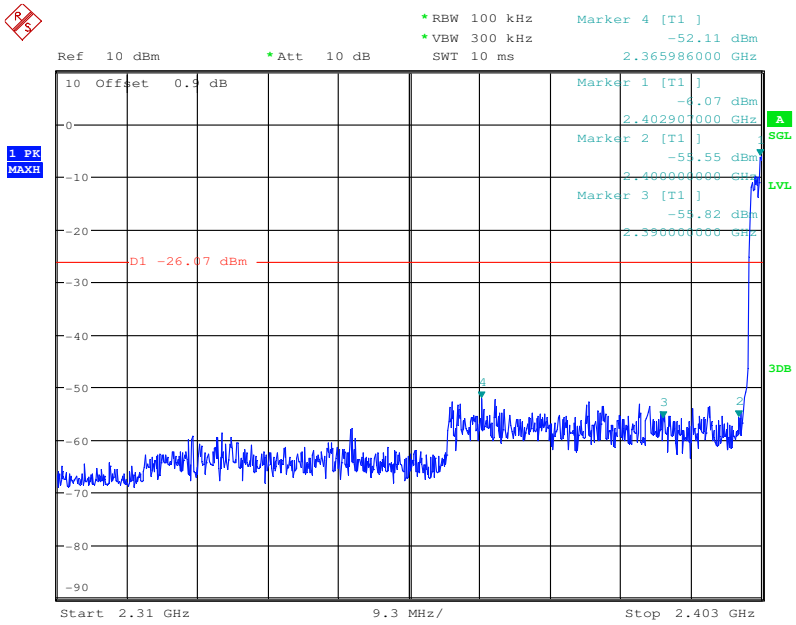
Test mode:	π/4DQPSK	Test channel:	Highest



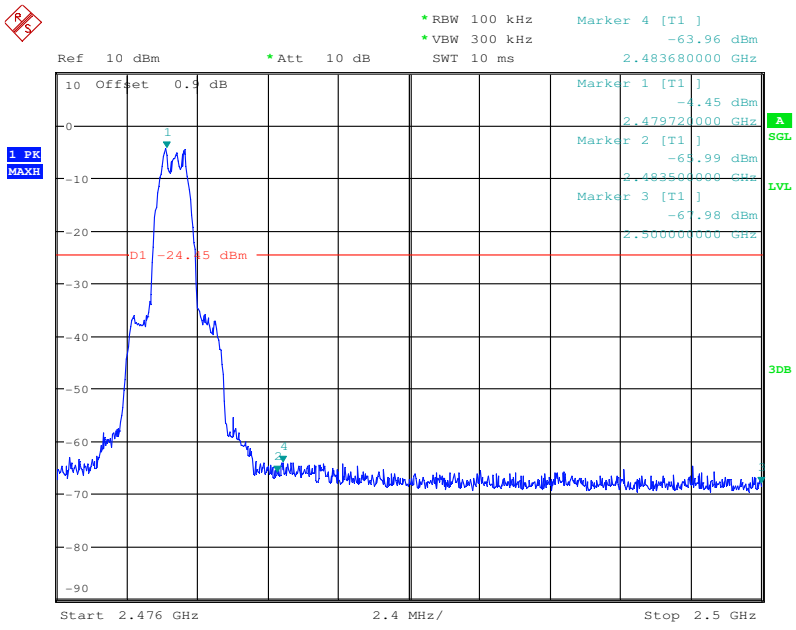


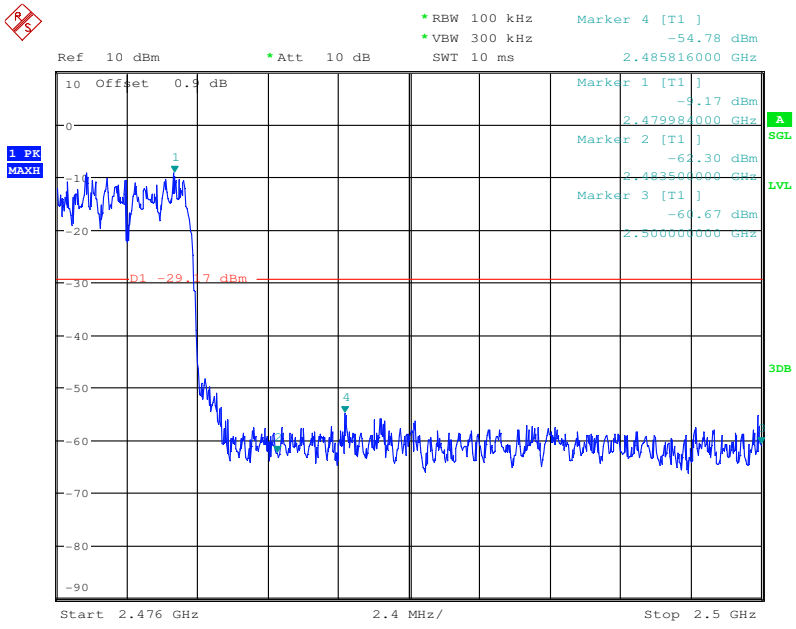
Test mode:	8DPSK	Test channel:	Lowest



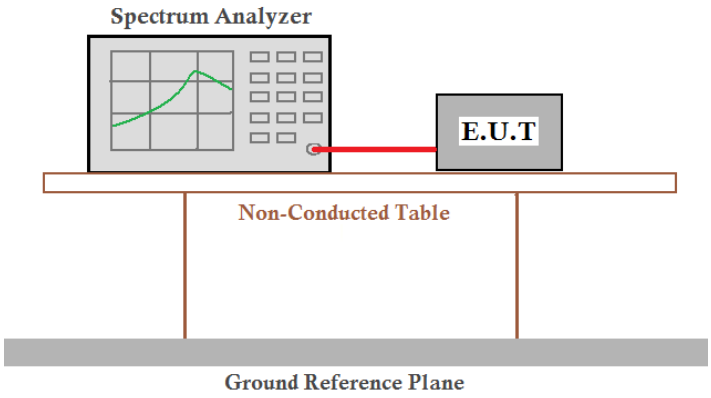


Test mode:	8DPSK	Test channel:	Highest

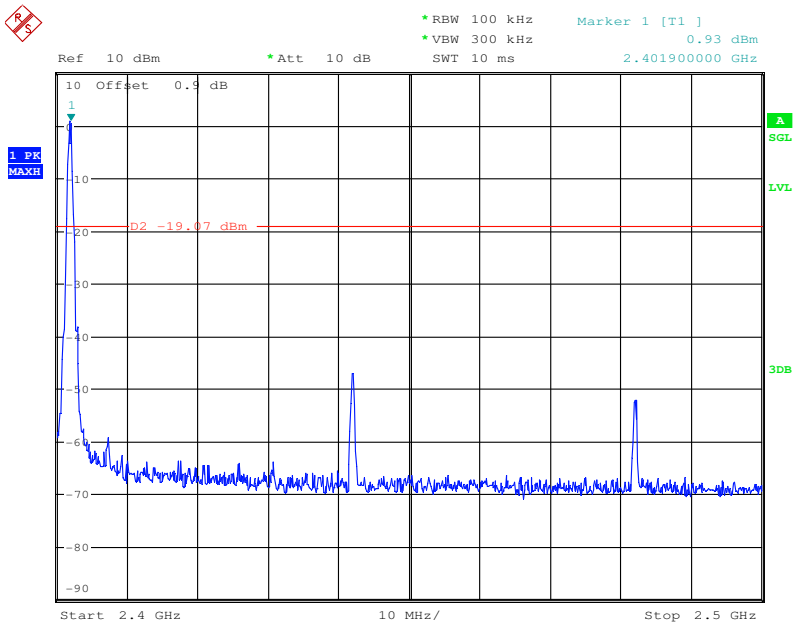
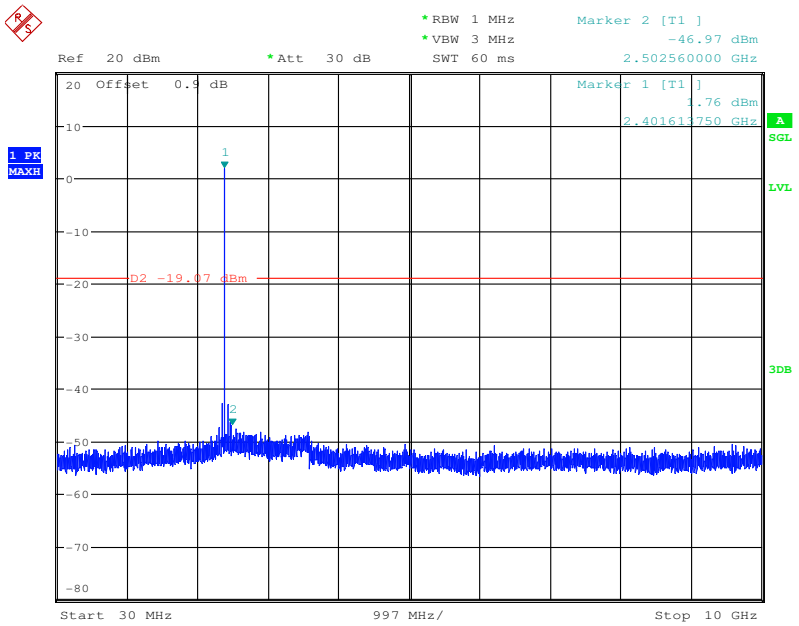


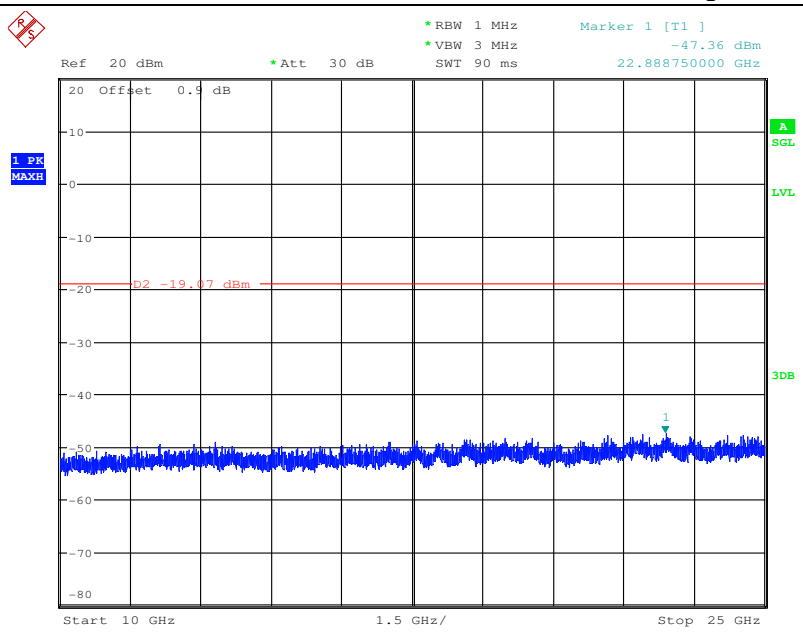


6.10 RF Antenna Conducted Spurious Emissions

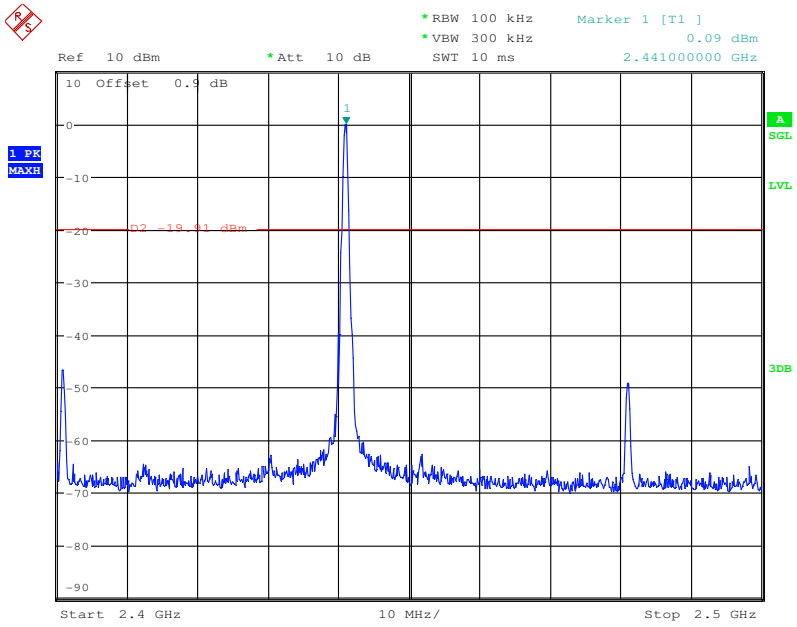
Test Requirement:	47 CFR Part 15, Subpart C 15.247(d)
Test Method:	ANSI C63.10 (2013) Section 7.8.8
Test Setup:	
Instruments Used:	Refer to section 5.10 for details
Limit:	In any 100 kHz bandwidth outside the frequency band in which the spread spectrum intentional radiator is operating, the radio frequency 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.
Exploratory Test Mode:	Non-hopping transmitting with all kind of modulation and all kind of data type
Final Test Mode:	Through Pre-scan, find the DH1 of data type is the worst case of GFSK modulation type, 2-DH1 of data type is the worst case of π/4DQPSK modulation type, 3-DH1 of data type is the worst case of 8DPSK modulation type.
Test Results:	Pass

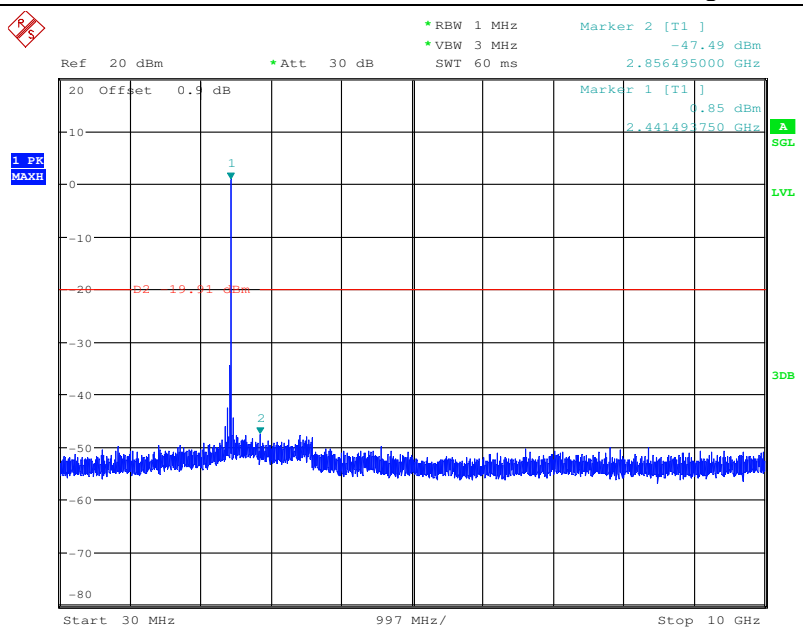
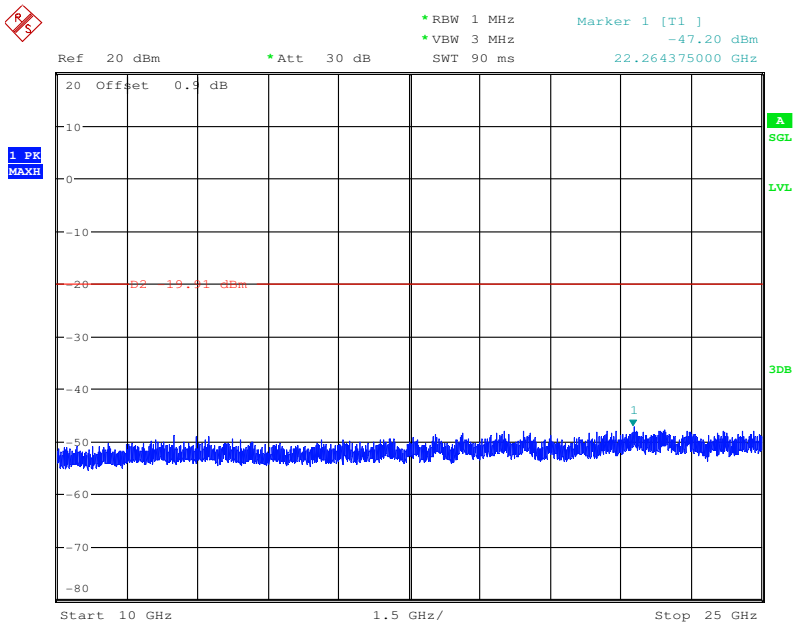
Test plot as follows:

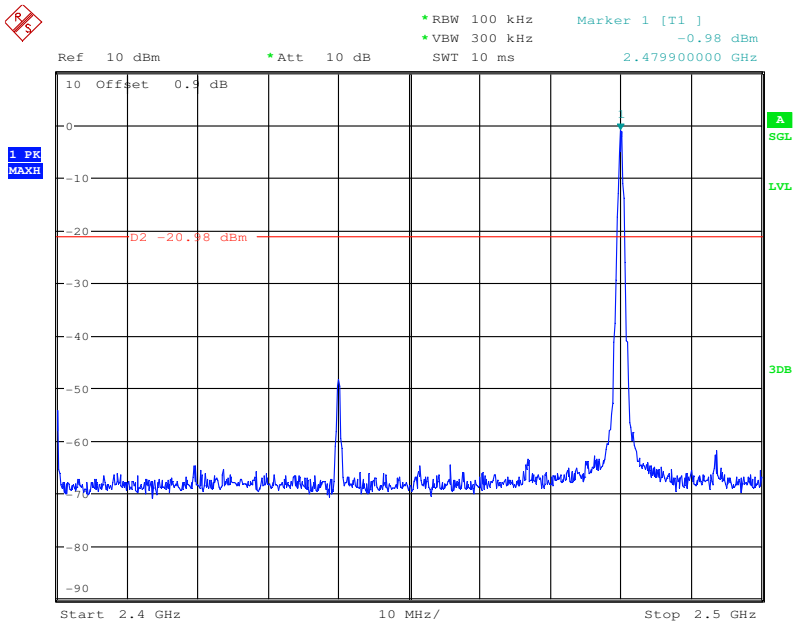
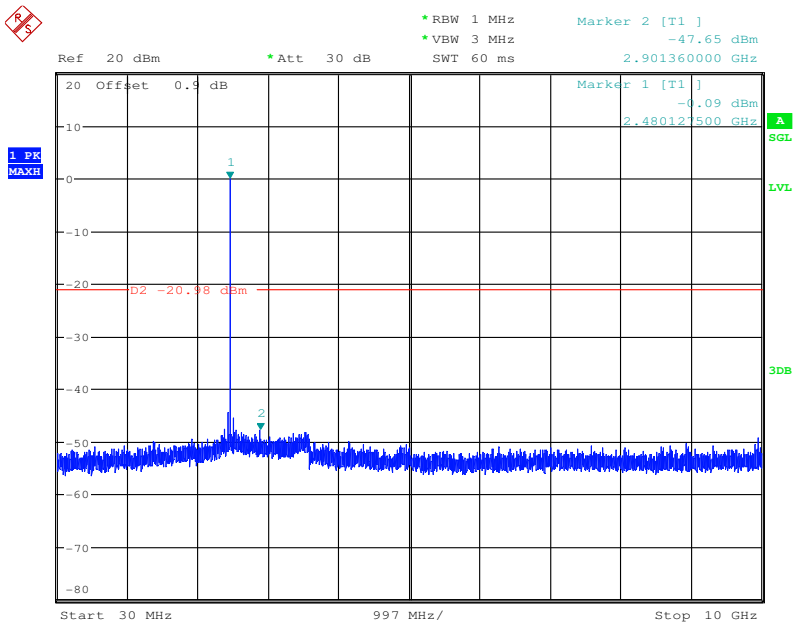
TEST PLOT	
RF Conducted Spurious Emissions_DH5_2402	
Pref	
CSE_1	

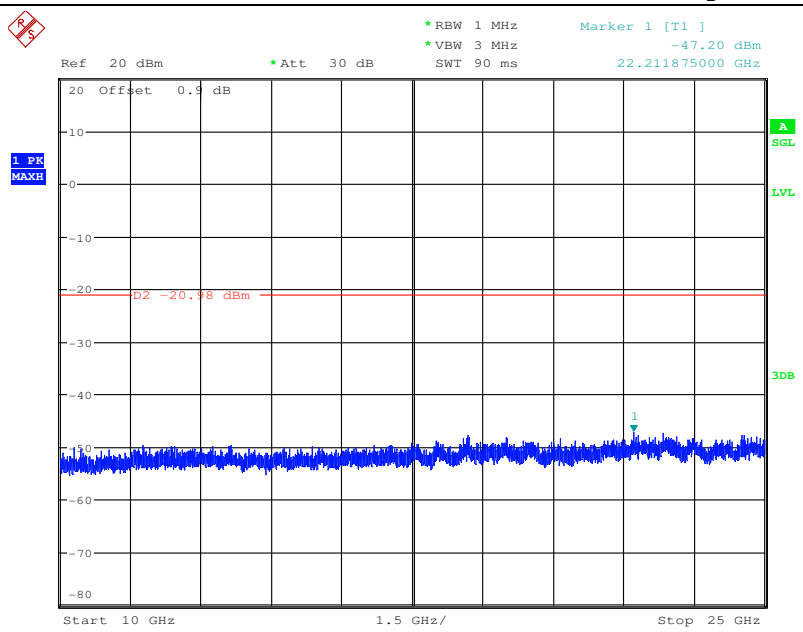
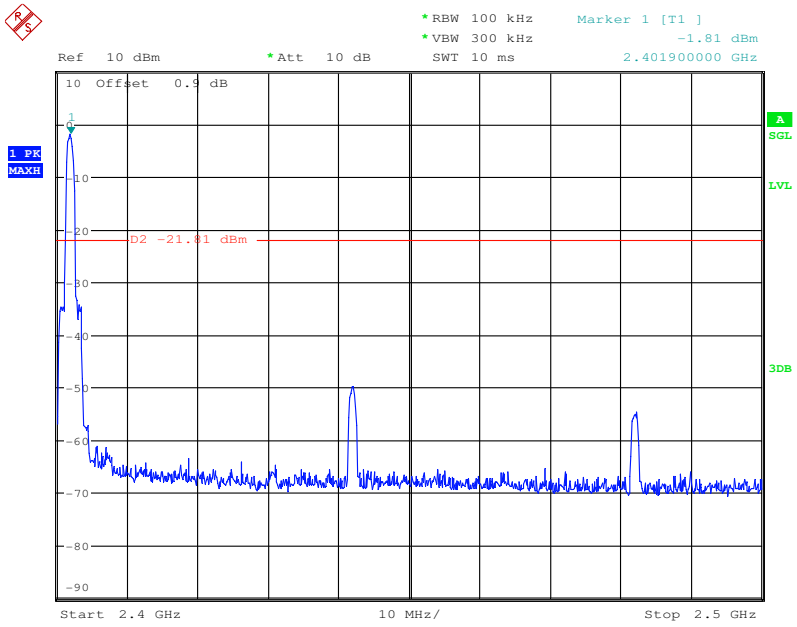
CSE_2	

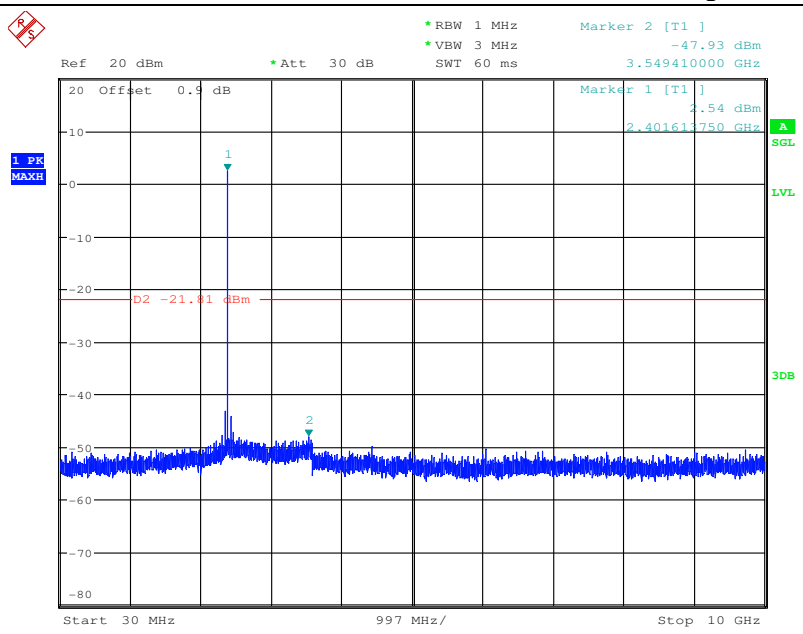
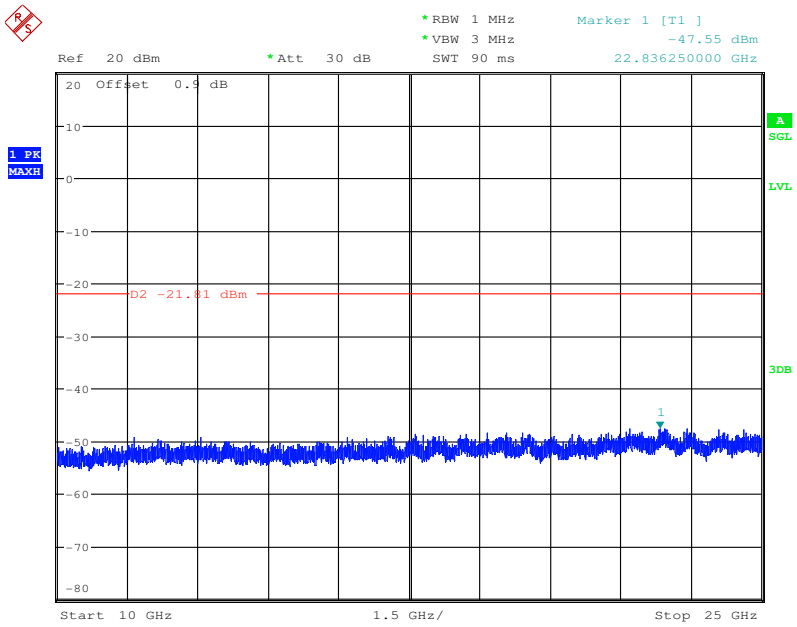
RF Conducted Spurious Emissions_DH5_2441

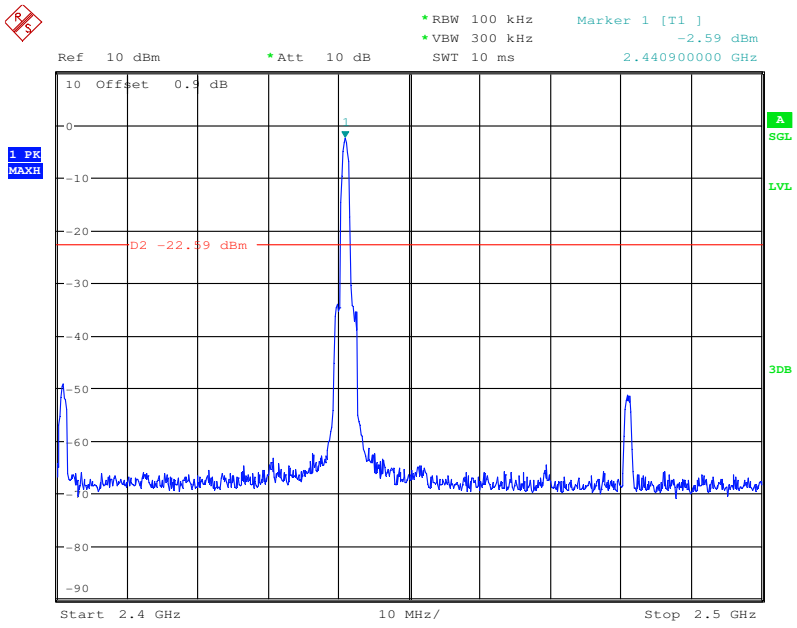
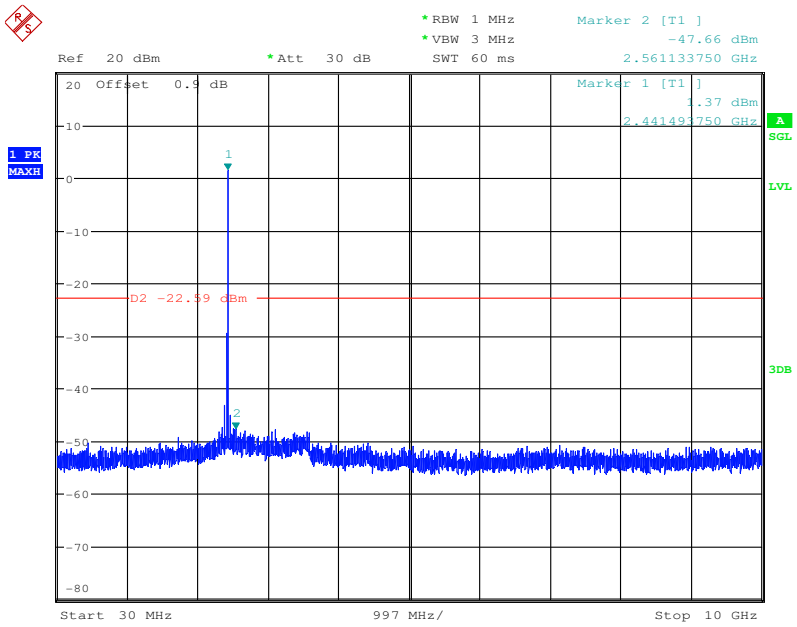
Pref	

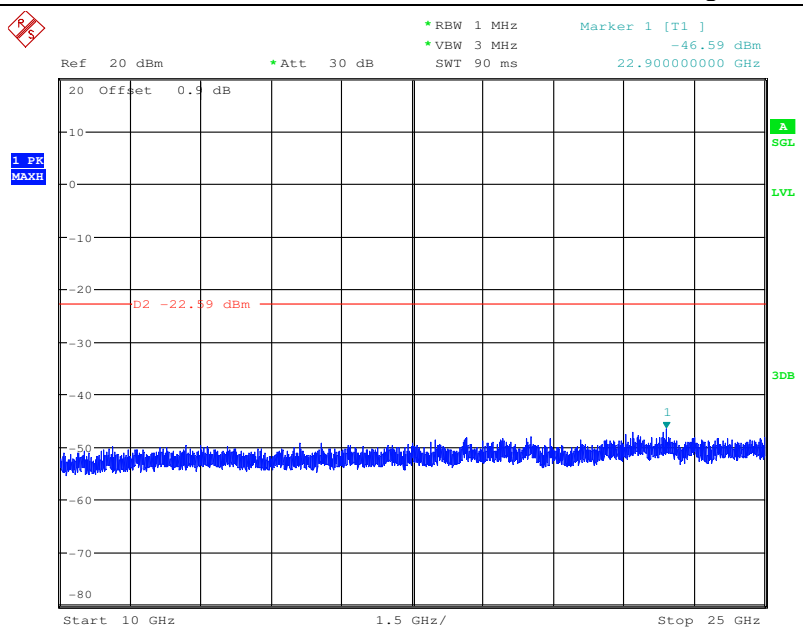
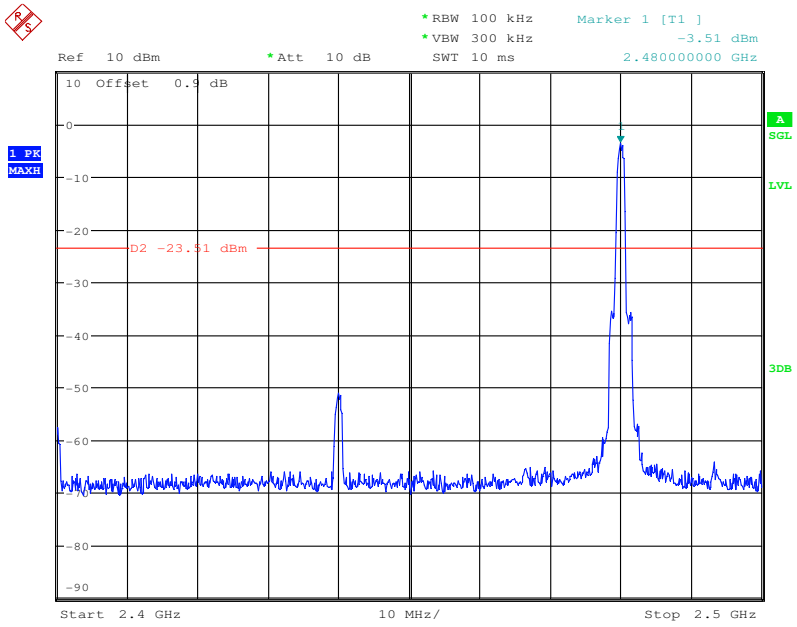
CSE_1	
CSE_2	

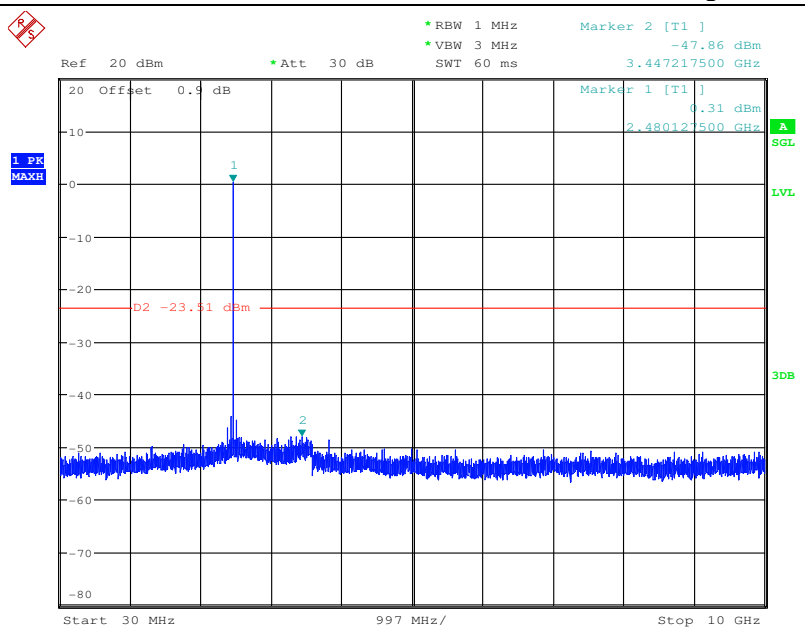
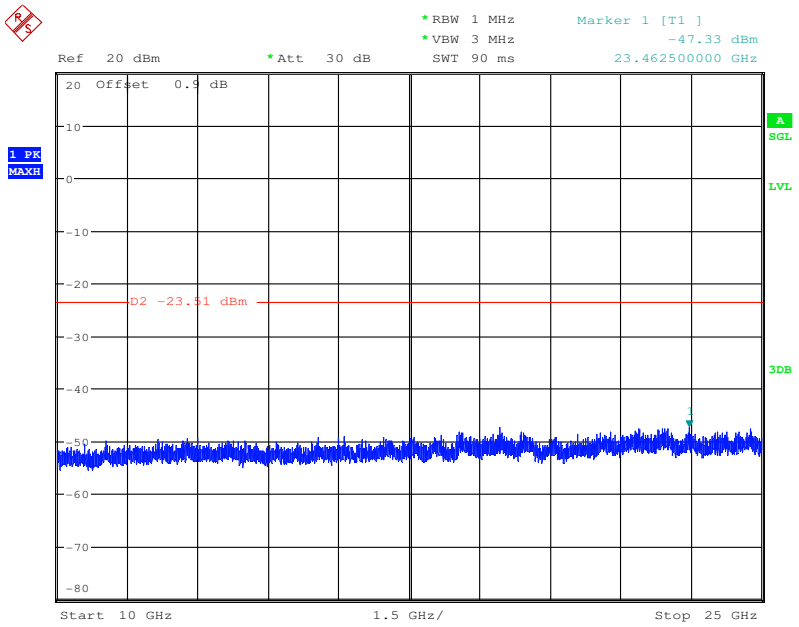
RF Conducted Spurious Emissions_DH5_2480	
Pref	
CSE_1	

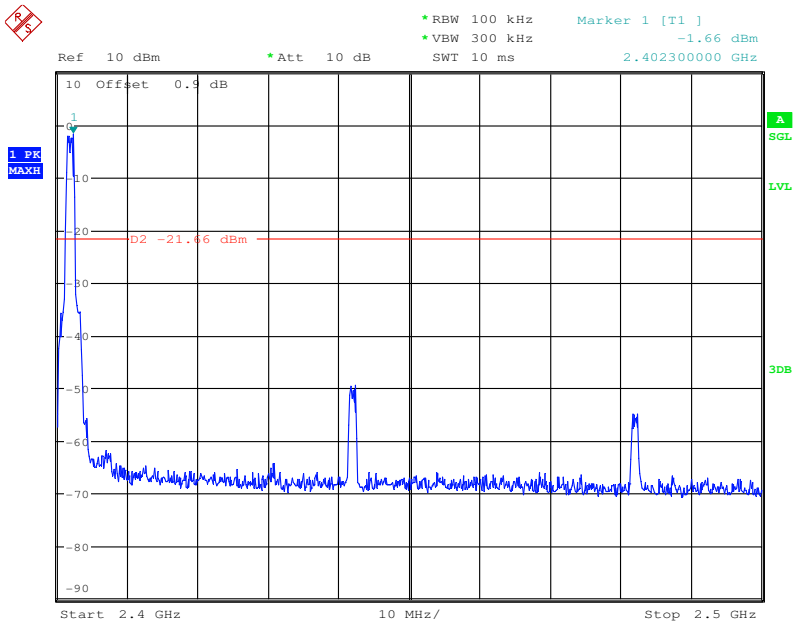
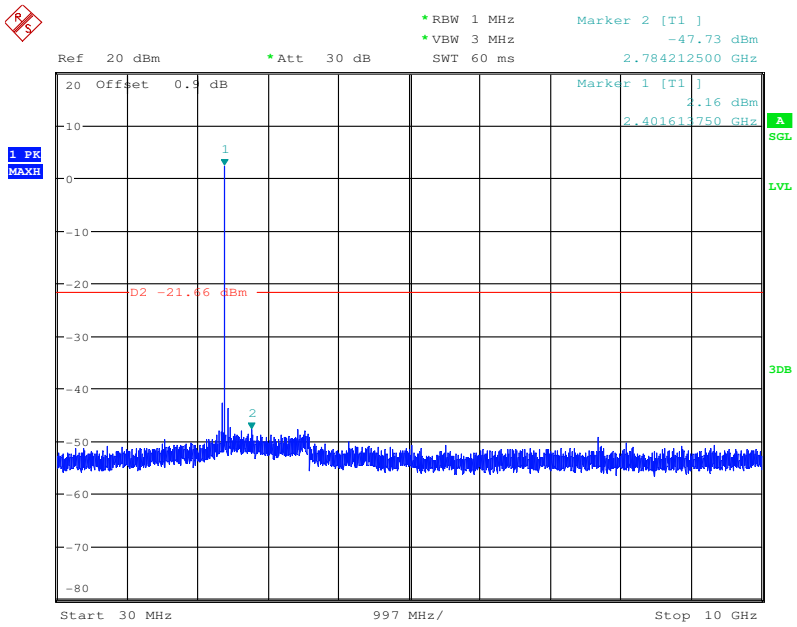
CSE_2	
RF Conducted Spurious Emissions_2DH5_2402	
Pref	

CSE_1	
CSE_2	

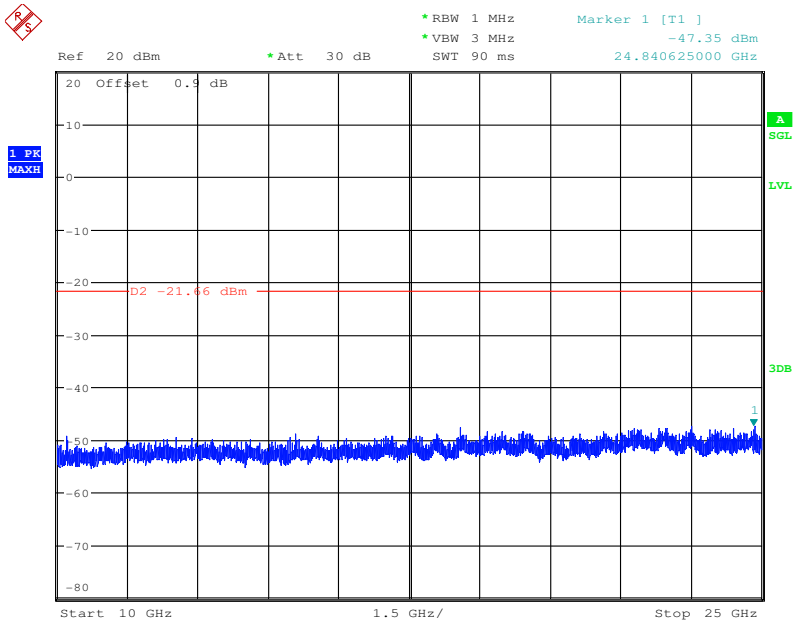
RF Conducted Spurious Emissions_2DH5_2441	
Pref	
CSE_1	

CSE_2	
RF Conducted Spurious Emissions_2DH5_2480	
Pref	

CSE_1	
CSE_2	

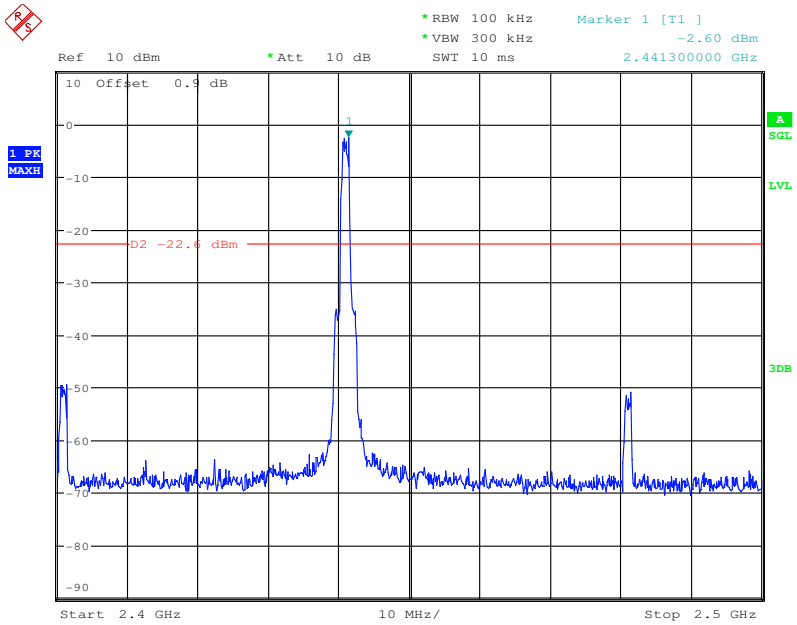
RF Conducted Spurious Emissions_3DH5_2402	
Pref	
CSE_1	

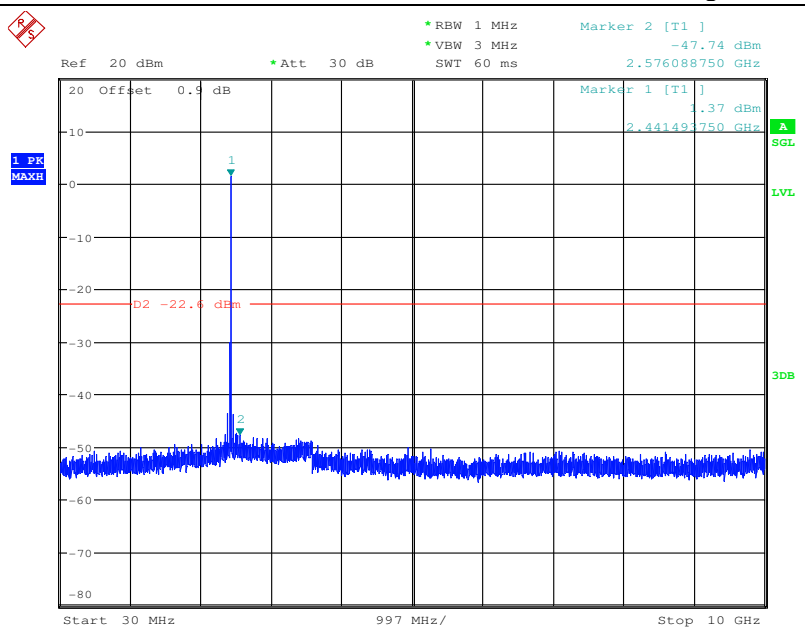
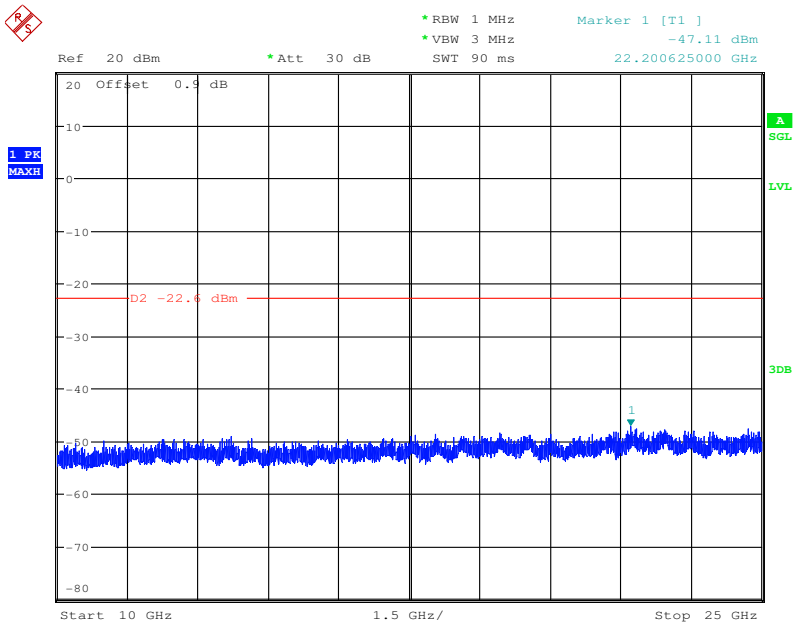
CSE_2

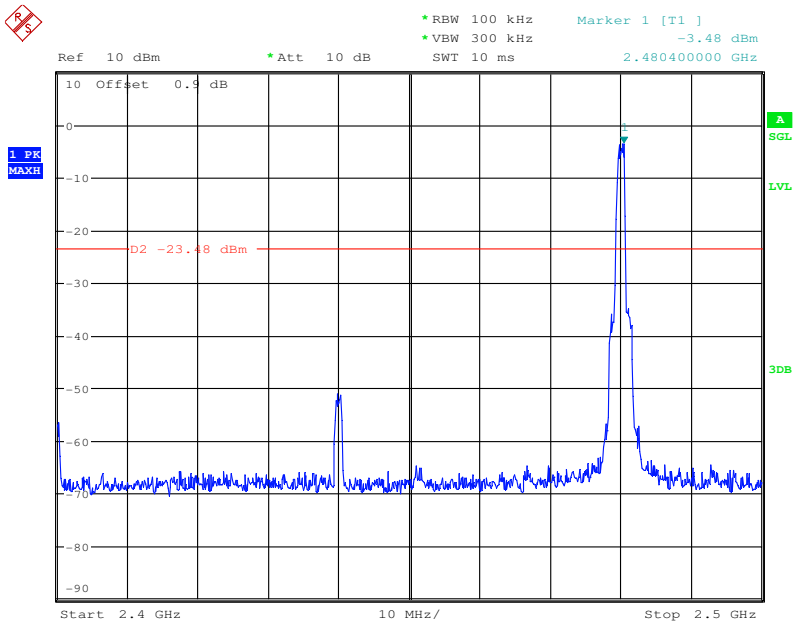
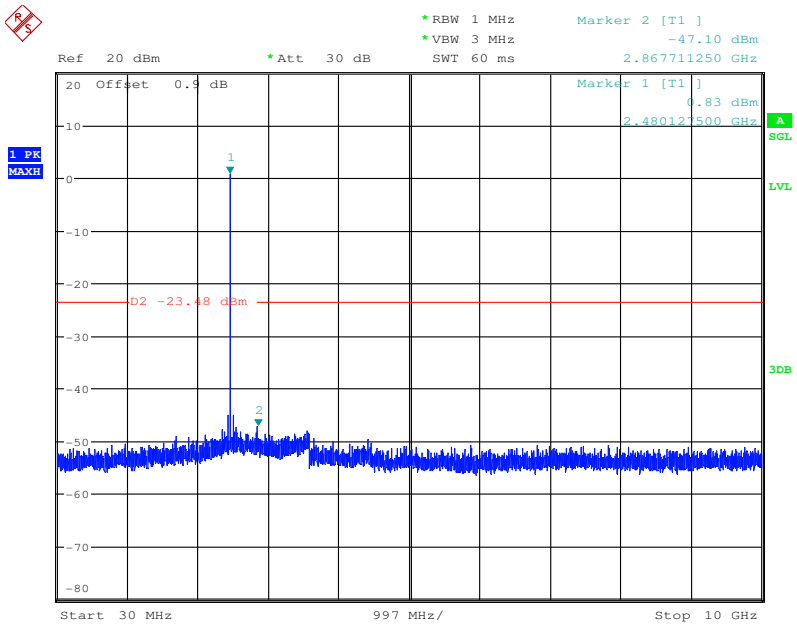


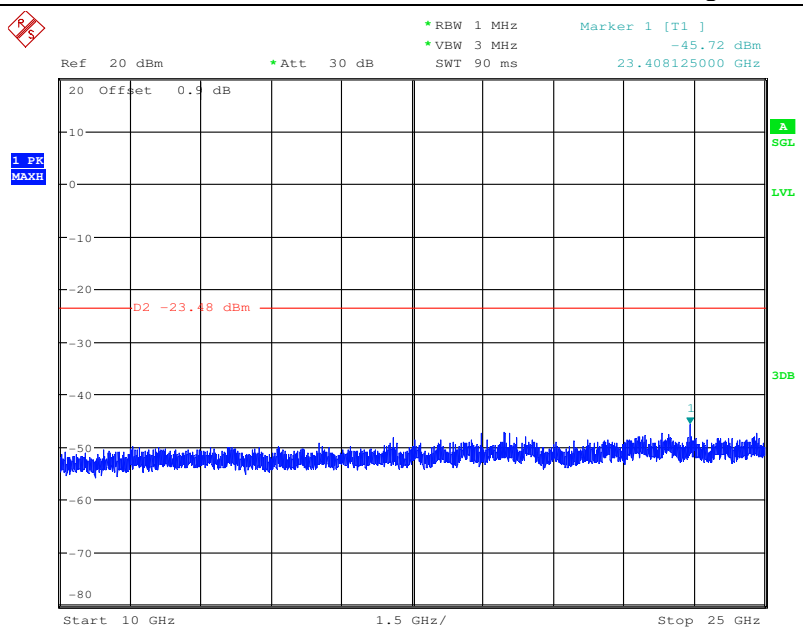
RF Conducted Spurious Emissions_3DH5_2441

Pref



CSE_1	
CSE_2	

RF Conducted Spurious Emissions_3DH5_2480	
Pref	
CSE_1	

CSE_2	

Remark:

Use 100kHz RBW to determine the relative limit in the band 2.4GHz to 2.5GHz, and Use 1MHz RBW to measure spurious emissions in the band 30MHz to 10GHz and 10GHz to 25GHz. The sweep points set to 30001.

6.11 Pseudorandom Frequency Hopping Sequence

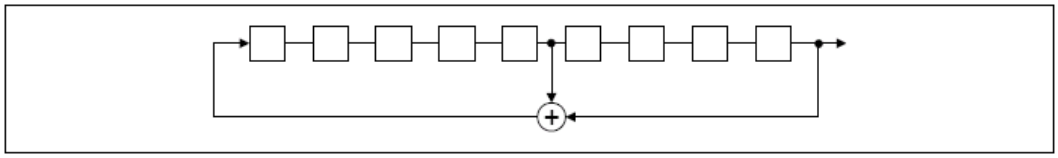
Test Requirement:	47 CFR Part 15, Subpart C 15.247(a)(1),(g),(h)

FHSs 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, FHSs operating in the band 2400-2483.5 MHz 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 that the systems operate with an output power no greater than 0.125 W. 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

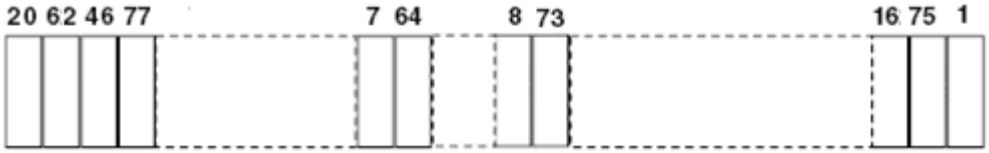
The pseudorandom sequence may be generated in a nine-stage shift register whose 5th and 9th stage outputs are added in a modulo-two addition stage. And the result is fed back to the input of the first stage. The sequence begins with the first ONE of 9 consecutive ONEs; i.e. the shift register is initialized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

According to Bluetooth Core Specification, Bluetooth receivers are designed to have input and IF bandwidths that match the hopping channel bandwidths of any Bluetooth transmitters and shift frequencies in synchronization with the transmitted signals.

According to Bluetooth Core Specification, the Bluetooth system transmits the packet with the pseudorandom hopping frequency with a continuous data and the short burst transmission from the Bluetooth system is also transmitted under the frequency hopping system with the pseudorandom hopping frequency system.

According to Bluetooth Core specification, the Bluetooth system incorporates with an adaptive system to detect other user within the spectrum band so that it individually and independently to avoid hopping on the occupied channels.

According to the Bluetooth Core specification, the Bluetooth system is designed not have the ability to coordinated with other FHSS System in an effort to avoid the simultaneous occupancy of individual hopping frequencies by multiple transmitter.

6.12 Radiated Spurious Emission

Test Requirement:	47 CFR Part 15, Subpart C 15.205 & 15.209
Test Method:	ANSI C63.10 (2013) Section 6.10.4
Test Site:	Measurement Distance: 3m

Receiver Setup:

Frequency	Detector	RBW	VBW	Remark
0.009MHz-0.015MHz	Quasi-peak	200Hz	1kHz	Quasi-peak
0.015MHz-30MHz	Quasi-peak	9kHz	30kHz	Quasi-peak
30MHz-1GHz	Quasi-peak	120 kHz	300kHz	Quasi-peak
Above 1GHz	Peak	1MHz	3MHz	Peak
	Peak	1MHz	10Hz	Average

Limit:

Frequency	Field strength (microvolt/meter)	Limit (dBuV/m)	Remark	Measurement distance (m)
0.009MHz-0.490MHz	2400/F(kHz)	-	Quasi-peak	300
0.490MHz-1.705MHz	24000/F(kHz)	-	Quasi-peak	30
1.705MHz-30MHz	30	-	Quasi-peak	30
30MHz-88MHz	100	40.0	Quasi-peak	3
88MHz-216MHz	150	43.5	Quasi-peak	3
216MHz-960MHz	200	46.0	Quasi-peak	3
960MHz-1GHz	500	54.0	Quasi-peak	3
Above 1GHz	500	54.0	Average	3
		74.0	Peak	3

Test Setup:

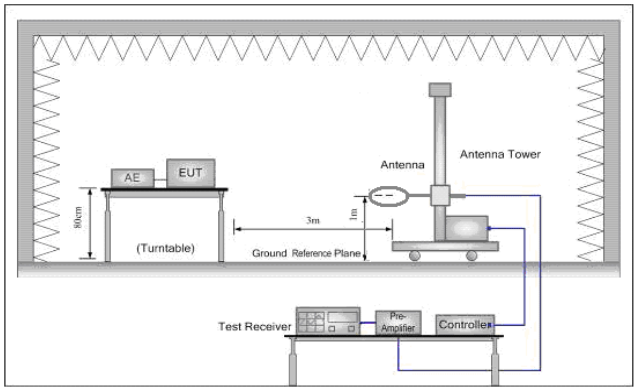


Figure 1. Below 30MHz

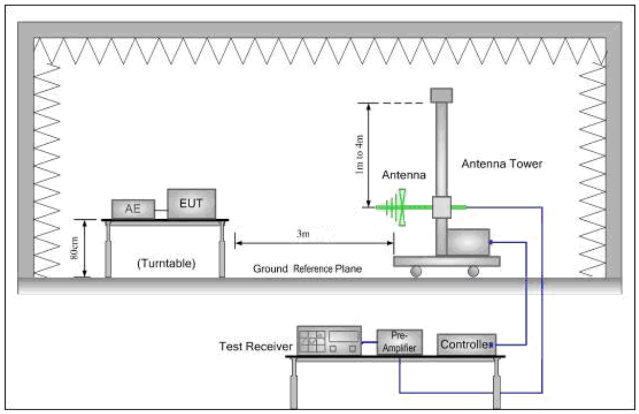


Figure 2. 30MHz to 1GHz

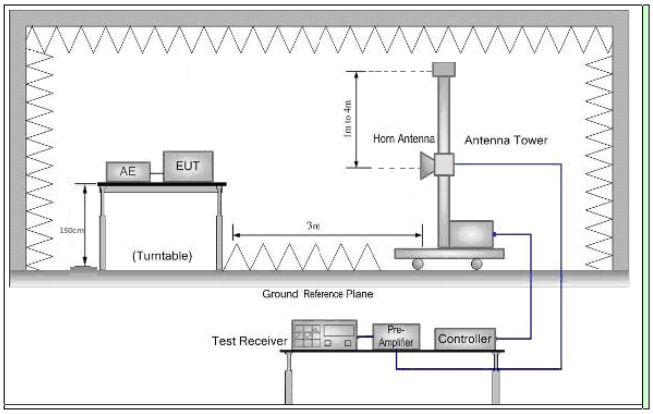


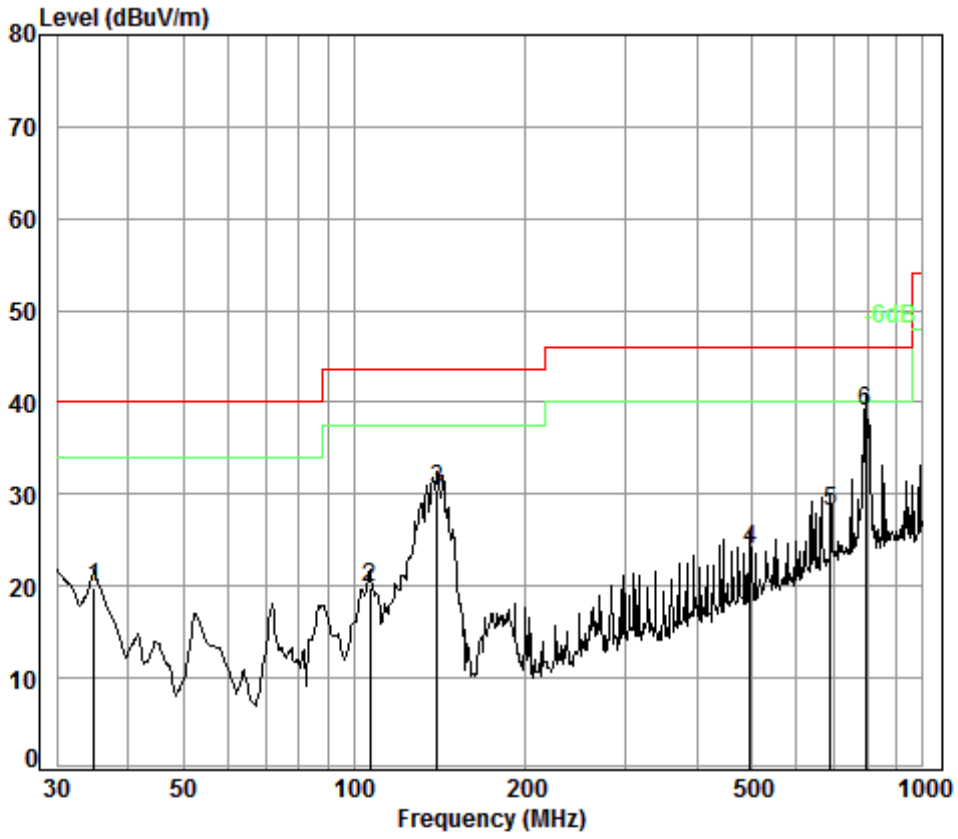
Figure 3. Above 1 GHz

Test Procedure:	a. For below 1GHz test, the EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter semi-anechoic camber. The table was rotated 360 degrees to determine the position of the highest radiation. b. For above 1GHz test, the EUT was placed on the top of a rotating table 1.5 meters above the ground at a 3 meter full-anechoic camber. The table was rotated 360 degrees to determine the position of the highest radiation. c. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower. d. 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. e. 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 (for the test frequency of below 30MHz, the antenna was tuned to height 1 meter) and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading. f. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode. g. 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. h. Test the EUT in the lowest channel (2402MHz),the middle channel (2441MHz),the Highest channel (2480MHz) i. The radiation measurements are performed in X, Y, Z axis positioning for Transmitting mode, and found the X axis positioning which it is the worst case. j. Repeat above procedures until all frequencies measured was complete.
Instruments Used:	Refer to section 5.10 for details
Exploratory Test Mode:	Non-hopping transmitting mode with all kind of modulation and all kind of data type Transmitting mode
Final Test Mode:	Through Pre-scan, find the DH1 of data type and GFSK modulation is the worst case.

	For below 1GHz part, through pre-scan, the worst case is the lowest channel. Only the worst case is recorded in the report.
Test Results:	Pass

6.12.1 Radiated Emission below 1GHz

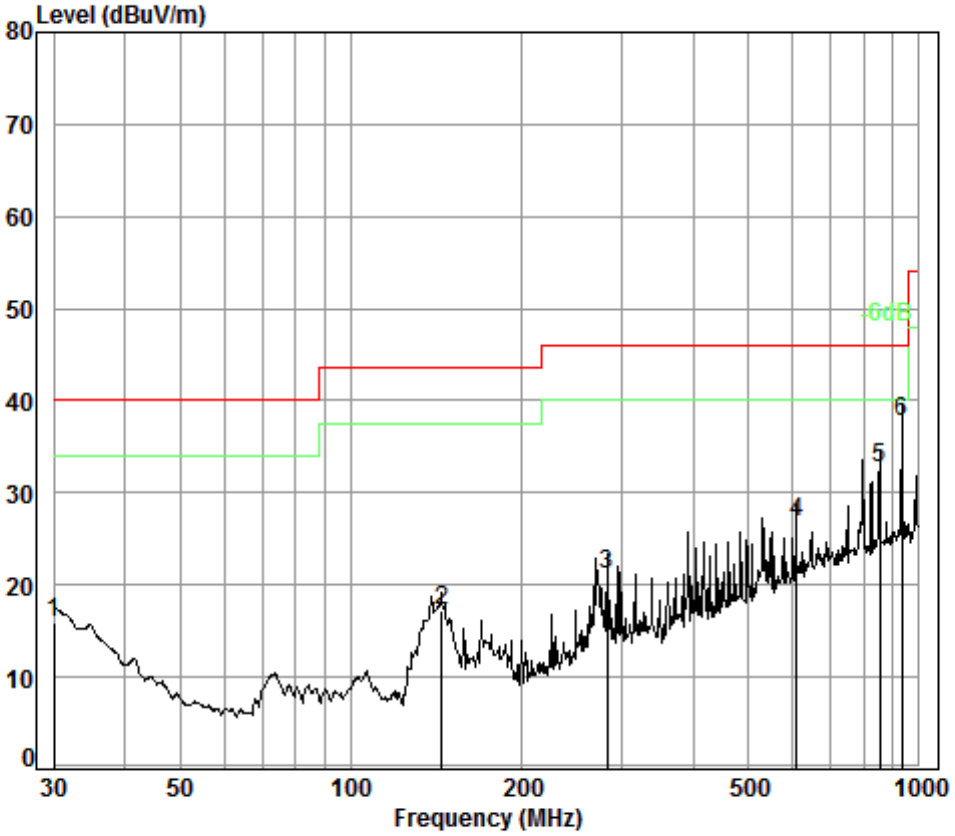
30MHz~1GHz (QP)		
Test mode:	Transmitting	Vertical



Condition: 3m VERTICAL
Job No. : 11090CR
Test mode: TX
: BT

	Freq	Cable Loss	Ant Factor	Preamp Factor	Read Level	Level	Limit Line	Over Limit
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB
1	34.88	0.60	15.97	27.34	30.52	19.75	40.00	-20.25
2	106.76	1.22	8.76	27.15	36.92	19.75	43.50	-23.75
3	139.85	1.30	8.09	26.96	48.04	30.47	43.50	-13.03
4	497.68	2.59	17.80	27.70	31.32	24.01	46.00	-21.99
5	687.15	2.88	21.50	27.43	31.19	28.14	46.00	-17.86
6 pp	793.40	3.18	22.07	27.31	41.06	39.00	46.00	-7.00

Test mode:	Transmitting	Horizontal



Condition: 3m HORIZONTAL
Job No. : 11090CR
Test mode: TX
: BT

	Freq	Cable Loss	Ant Factor	Preamp Factor	Read Level	Level	Limit Line	Over Limit
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB
1	30.00	0.60	18.70	27.36	23.87	15.81	40.00	-24.19
2	144.33	1.31	8.49	26.94	34.31	17.17	43.50	-26.33
3	281.99	1.82	13.11	26.45	32.75	21.23	46.00	-24.77
4	607.79	2.72	20.02	27.53	31.66	26.87	46.00	-19.13
5	851.04	3.41	22.42	27.02	33.88	32.69	46.00	-13.31
6 pp	932.27	3.63	23.30	26.61	37.41	37.73	46.00	-8.27

6.12.2 Transmitter Emission above 1GHz

Test mode:	GFSK(DH1)	Test channel:	Lowest	Remark:	Peak

Frequency (MHz)	Antenna factors (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Read Level (dBuV)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
3711.030	32.81	7.71	37.97	45.93	48.48	74.00	-25.52	Vertical
4804.000	34.16	8.87	38.40	43.29	47.92	74.00	-26.08	Vertical
5939.103	34.66	10.39	38.31	44.67	51.41	74.00	-22.59	Vertical
7206.000	36.42	10.68	37.11	41.81	51.80	74.00	-22.20	Vertical
9608.000	37.52	12.50	35.10	37.80	52.72	74.00	-21.28	Vertical
12137.940	38.68	14.45	35.93	35.97	53.17	74.00	-20.83	Vertical
3711.030	32.81	7.71	37.97	45.04	47.59	74.00	-26.41	Horizontal
4804.000	34.16	8.87	38.40	43.15	47.78	74.00	-26.22	Horizontal
5930.516	34.66	10.37	38.31	43.79	50.51	74.00	-23.49	Horizontal
7206.000	36.42	10.68	37.11	42.07	52.06	74.00	-21.94	Horizontal
9608.000	37.52	12.50	35.10	38.07	52.99	74.00	-21.01	Horizontal
12173.120	38.71	14.42	36.02	36.69	53.80	74.00	-20.20	Horizontal

Test mode:	GFSK(DH1)	Test channel:	Middle	Remark:	Peak

Frequency (MHz)	Antenna factors (dB/m)	Cable Loss (dB)	Cable Loss (dB)	Reading Level (dBµV)	Emission Level (dBµV/m)	Limit (dBµV/m)	Over limit (dB)	Polarization
3497.281	32.20	7.63	37.95	44.78	46.66	74.00	-27.34	Vertical
4882.000	34.30	8.98	38.44	43.43	48.27	74.00	-25.73	Vertical
6069.413	34.76	10.47	38.23	43.41	50.41	74.00	-23.59	Vertical
7323.000	36.37	10.72	37.01	41.31	51.39	74.00	-22.61	Vertical
9764.000	37.55	12.58	35.02	37.02	52.13	74.00	-21.87	Vertical
12279.260	38.77	14.33	36.27	36.51	53.34	74.00	-20.66	Vertical
3781.495	33.01	7.73	37.98	44.03	46.79	74.00	-27.21	Horizontal
4882.000	34.30	8.98	38.44	41.88	46.72	74.00	-27.28	Horizontal
5947.702	34.67	10.42	38.31	43.91	50.69	74.00	-23.31	Horizontal
7323.000	36.37	10.72	37.01	41.08	51.16	74.00	-22.84	Horizontal
9764.000	37.55	12.58	35.02	37.26	52.37	74.00	-21.63	Horizontal
11946.280	38.55	14.50	35.59	35.64	53.10	74.00	-20.90	Horizontal

Test mode:	GFSK(DH1)		Test channel:	Highest		Remark:	Peak
Frequency (MHz)	Antenna factors (dB/m)	Cable Loss (dB)	Preamp factor (dB)	Reading Level (dBμV)	Emission Level (dBμV/m)	Limit (dBμV/m)	Over limit (dB)	Polarization
3842.163	33.18	7.76	37.98	44.77	47.73	74.00	-26.27	Vertical
4960.000	34.43	9.09	38.48	43.35	48.39	74.00	-25.61	Vertical
6140.076	34.82	10.38	38.16	43.81	50.85	74.00	-23.15	Vertical
7440.000	36.32	10.77	36.90	40.64	50.83	74.00	-23.17	Vertical
9920.000	37.58	12.67	34.94	37.02	52.33	74.00	-21.67	Vertical
12050.440	38.63	14.52	35.72	35.79	53.22	74.00	-20.78	Vertical
3836.607	33.16	7.75	37.98	44.54	47.47	74.00	-26.53	Horizontal
4960.000	34.43	9.09	38.48	43.12	48.16	74.00	-25.84	Horizontal
6060.637	34.75	10.48	38.24	45.18	52.17	74.00	-21.83	Horizontal
7440.000	36.32	10.77	36.90	41.44	51.63	74.00	-22.37	Horizontal
9920.000	37.58	12.67	34.94	37.55	52.86	74.00	-21.14	Horizontal
12208.390	38.73	14.39	36.10	36.63	53.65	74.00	-20.35	Horizontal

Remark:

1) The field strength is calculated by adding the Antenna Factor, Cable Factor & Preamplifier. The basic equation with a sample calculation is as follows:
   Final Test Level =Receiver Reading + Antenna Factor + Cable Factor – Preamplifier Factor

2) Scan from 9kHz to 25GHz, the disturbance above 13GHz and below 30MHz was very low, and the above harmonics were the highest point could be found when testing, so only the above harmonics had been displayed. The amplitude of spurious emissions from the radiator which are attenuated more than 20dB below the limit need not be reported.

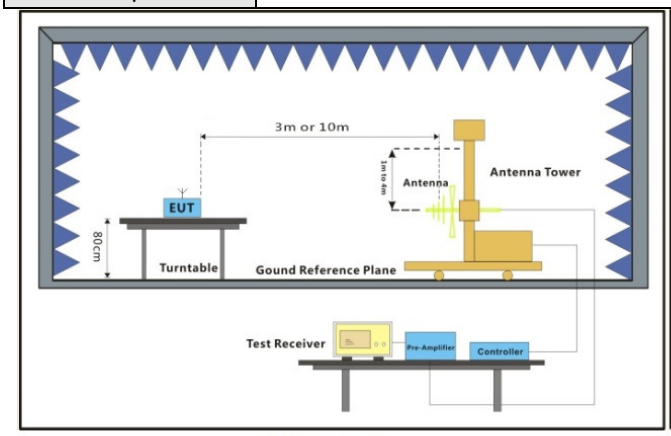
3) As shown in this section, for frequencies above 1GHz, the field strength limits are based on average limits. However, the peak field strength of any emission shall not exceed the maximum permitted average limits specified above by more than 20 dB under any condition of modulation. So, only the peak measurements were shown in the report.

6.13 Restricted bands around fundamental frequency

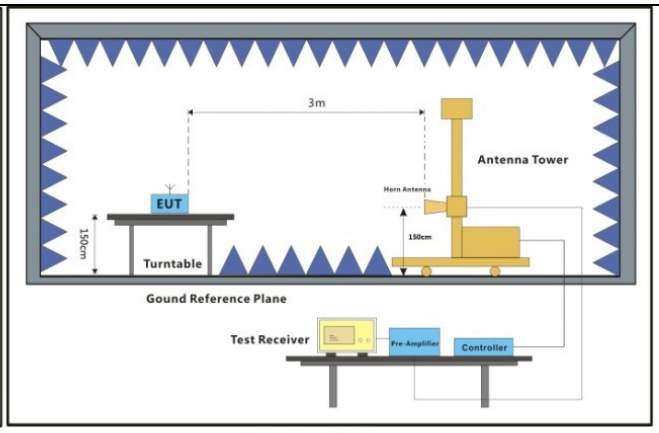
Test Requirement:	47 CFR Part 15, Subpart C 15.247(d)
Test Method:	ANSI C63.10 (2013) Section 7.8.6
Test Site:	Measurement Distance: 3m (Semi-Anechoic Chamber)
Limit:	

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:



30MHz-1GHz

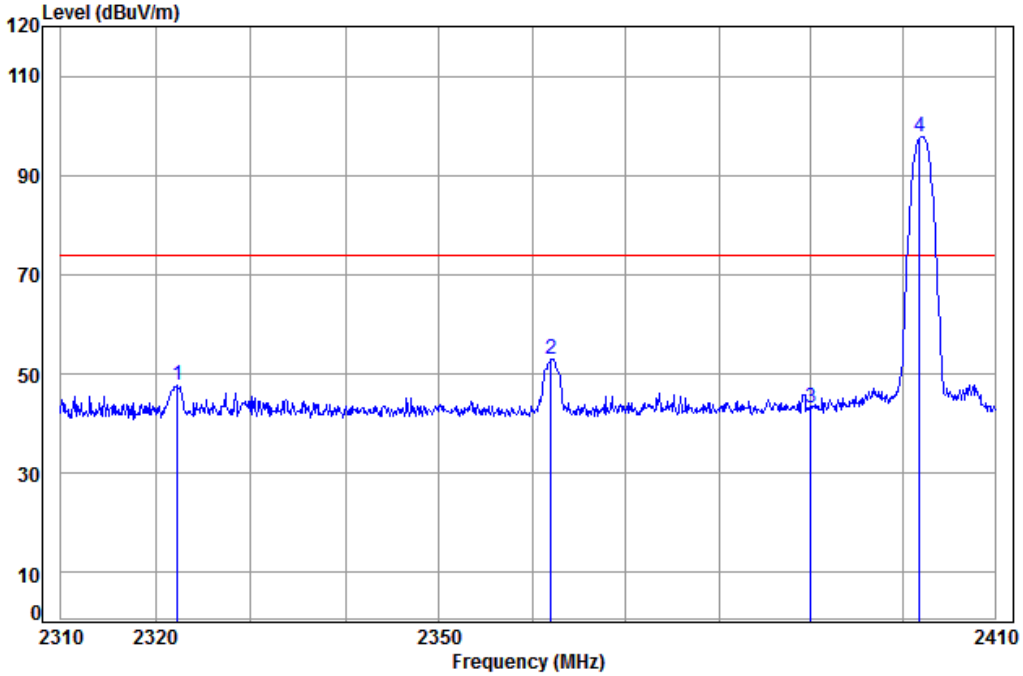


Above 1GHz

Test Procedure:	a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter semi-anechoic camber. The table was rotated 360 degrees to determine the position of the highest radiation. b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower. c. 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. d. 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 rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading. e. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode. f. Place a marker at the end of the restricted band closest to the transmit frequency to show compliance. Also measure any emissions in the restricted bands. Save the spectrum analyzer plot. Repeat for each power and modulation for lowest and highest channel g. Test the EUT in the lowest channel , the Highest channel h. The radiation measurements are performed in X, Y, Z axis positioning for Transmitting mode, and found the X axis positioning which it is the worst case. i. Repeat above procedures until all frequencies measured was complete.
Instruments Used:	Refer to section 5.10 for details
Exploratory Test Mode:	Non-hopping transmitting mode with all kind of modulation and all kind of data type Transmitting mode
Final Test Mode:	Through Pre-scan, find the DH5 of data type and GFSK modulation is the worst case. Only the worst case is recorded in the report.
Test Results:	Pass

Test plot as follows:

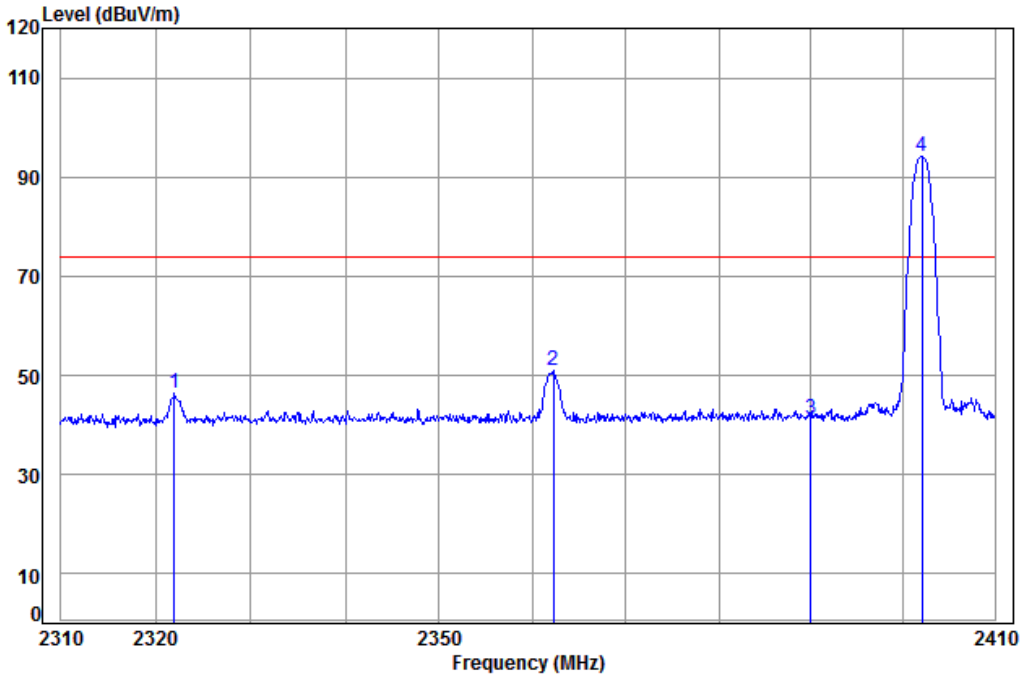
Worse case mode:	GFSK (DH5)	Test channel:	Lowest	Remark:	Peak	Vertical



Condition: 3m VERTICAL
Job No: : 11090CR
Mode: : 2402 Bandedge
: BT

	Freq	Cable Loss	Ant Factor	Preamp Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1	2322.270	5.28	28.87	37.97	51.57	47.75	74.00	-26.25	
2	2361.971	5.32	28.99	37.96	56.65	53.00	74.00	-21.00	
3	2390.000	5.34	29.08	37.96	46.60	43.06	74.00	-30.94	
4 pp	2401.843	5.35	29.11	37.96	101.19	97.69	74.00	23.69	

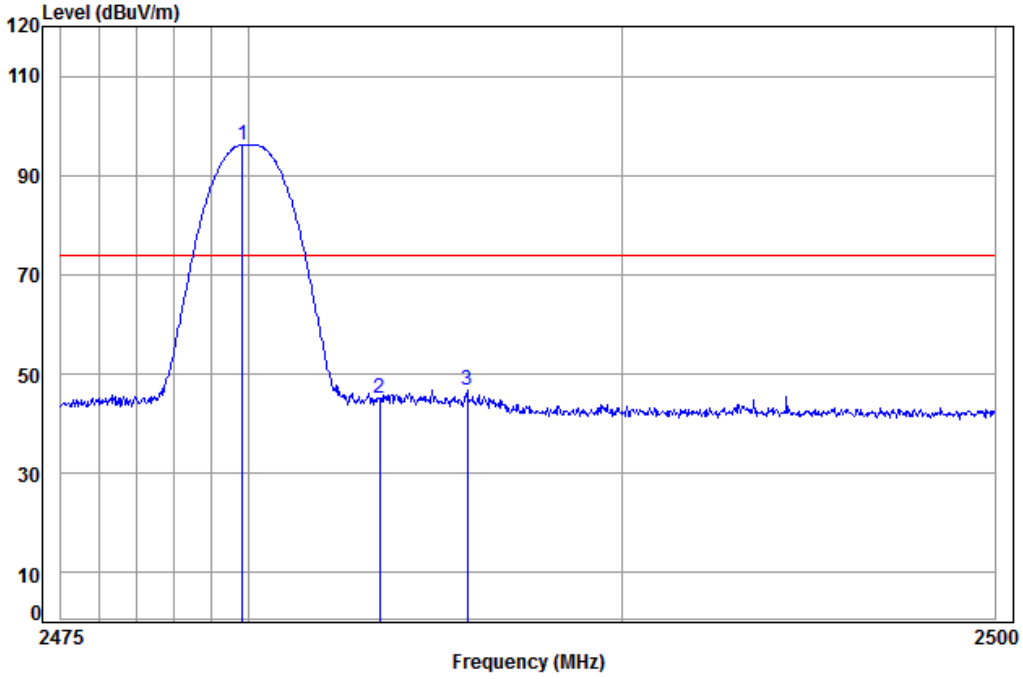
Worse case mode:	GFSK (DH5)	Test channel:	Lowest	Remark:	Peak	Horizontal



Condition: 3m HORIZONTAL
Job No: : 11090CR
Mode: : 2402 Bandedge
: BT

	Freq	Cable Loss	Ant Factor	Preamp Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1	2321.876	5.28	28.87	37.97	50.17	46.35	74.00	-27.65	
2	2362.172	5.32	28.99	37.96	54.74	51.09	74.00	-22.91	
3	2390.000	5.34	29.08	37.96	44.72	41.18	74.00	-32.82	
4 pp	2402.047	5.35	29.11	37.96	97.56	94.06	74.00	20.06	

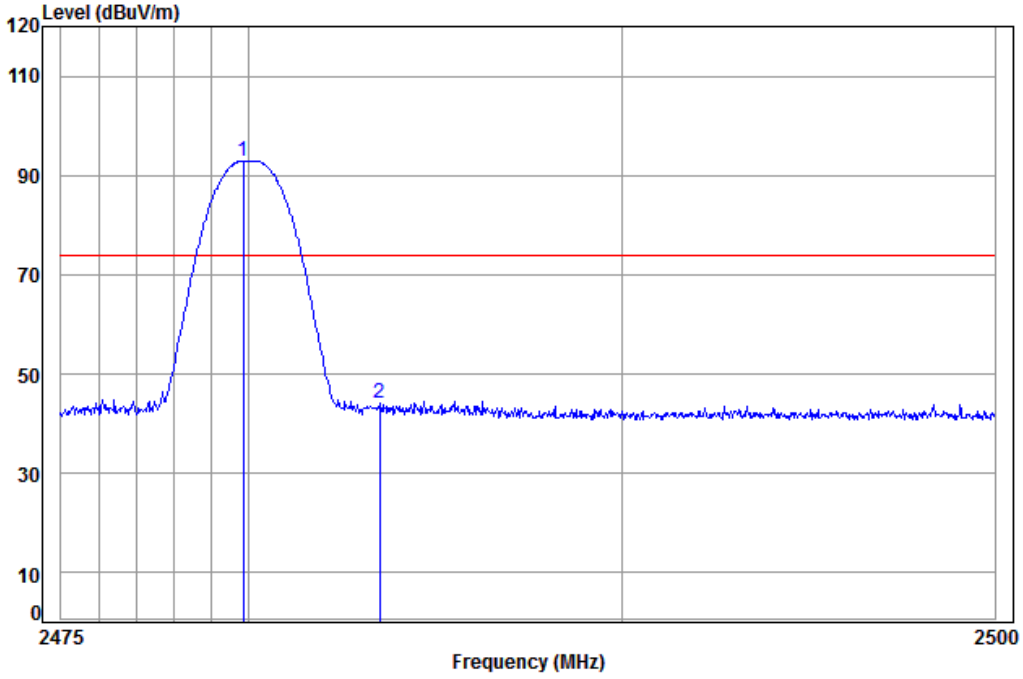
Worse case mode:	GFSK (DH5)	Test channel:	Highest	Remark:	Peak	Vertical



Condition: 3m VERTICAL
Job No: : 11090CR
Mode: : 2480 Bandedge
: BT

	Freq	Cable Loss	Ant Factor	Preamp Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1 pp	2479.830	5.41	29.34	37.95	99.38	96.18	74.00	22.18	
2	2483.500	5.41	29.35	37.95	48.32	45.13	74.00	-28.87	
3	2485.844	5.41	29.36	37.95	49.90	46.72	74.00	-27.28	

Worse case mode:	GFSK(DH5)	Test channel:	Highest	Remark:	Peak	Horizontal



Condition: 3m HORIZONTAL
Job No: : 11090CR
Mode: : 2480 Bandedge
: BT

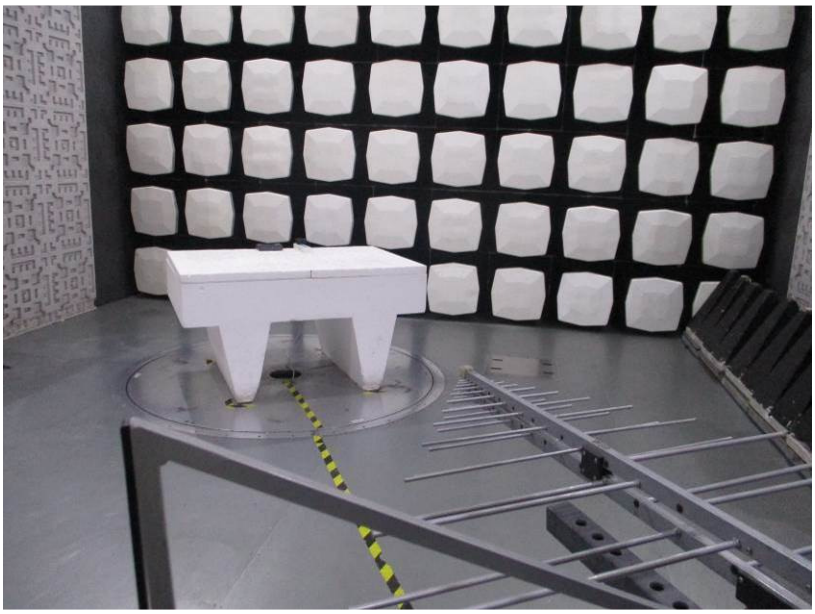
	Freq	Cable Loss	Ant Factor	Preamp Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1	pp 2479.855	5.41	29.34	37.95	96.16	92.96	74.00	18.96	
2	2483.500	5.41	29.35	37.95	47.34	44.15	74.00	-29.85	

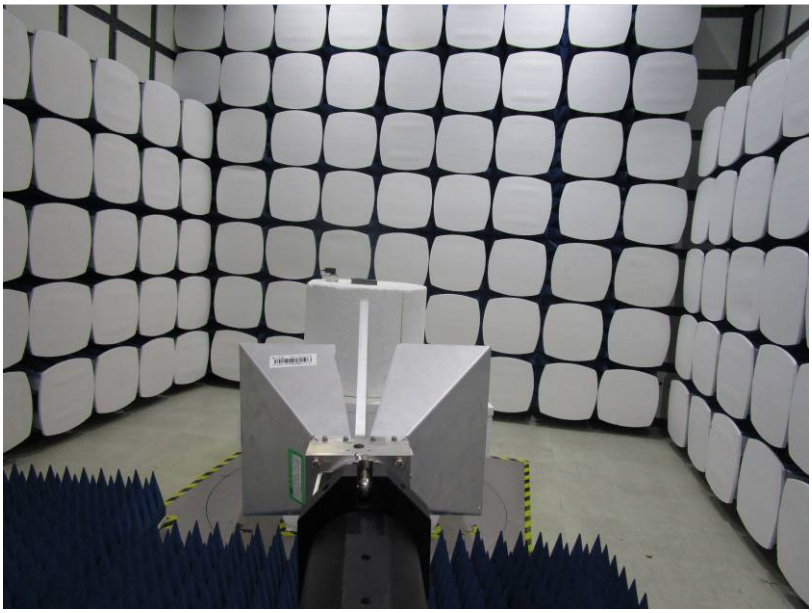
Note:
The field strength is calculated by adding the Antenna Factor, Cable Factor & Preamplifier. The basic equation with a sample calculation is as follows:
Final Test Level =Receiver Reading + Antenna Factor + Cable Factor – Preamplifier Factor

7 Photographs - EUT Test Setup

Test Model No.: M30WL.11

7.1 Radiated Spurious Emission Test Setup





7.2 Conducted Emission Test Setup

8 Photographs - EUT Constructional Details

Refer to Appendix A - Photographs of EUT Constructional Details for SZEM1804002458CR.