FCC TEST REPORT

FCC ID: 2A2C8Q30-I

Product Name	:	Bluetooth Karaoke Microphone
Model Name	:	Q30-I、 Q05、Q7、Q858L、Q858、Q1816、Q1818、Q16、Q17、Q26、Q27、Q25、Q30-I、Q30、Q78、Q103、Q136B、Q156、Q160、BX-01、BX-02、BX-03、BX-04、BX-05、BX-06、BX-07、BX-08、K55、K56、K57、K58
Brand Name	:	N/A
Report No.	:	PTC21041604901E-FC01

Prepared for

DongGuan WanSheng Technology Co., Ltd.

3Floor, No.93 XiHu Road, ShaJiao, HuMen Town, DongGuan

Prepared by

Precise Testing & Certification (Guangdong) Co., Ltd.

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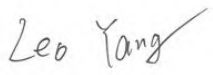
1TEST RESULT CERTIFICATION		
Applicant's name	:	DongGuan WanSheng Technology Co., Ltd.
Address	:	3Floor, No.93 XiHu Road, ShaJiao, HuMen Town, DongGuan
Manufacture's name	:	DongGuan WanSheng Technology Co., Ltd.
Address	:	3Floor, No.93 XiHu Road, ShaJiao, HuMen Town, DongGuan
Product name	:	Bluetooth Karaoke Microphone
Model name	:	Q30-I、 Q05、Q7、Q858L、Q858、Q1816、Q1818、Q16、Q17、Q26、Q27、Q25、Q30-I、Q30、Q78、Q103、Q136B、Q156、Q160、BX-01、BX-02、BX-03、BX-04、BX-05、BX-06、BX-07、BX-08、K55、K56、K57、K58
Standards	:	FCC CFR47 Part 15 Section 15.247
Test procedure	:	ANSI C63.10:2013
Test Date	:	June 04, 2021 to June 10, 2021
Date of Issue	:	June 11, 2021
Test Result	:	Pass
This device described above has been tested by PTC, and the test results show that the equipment under test (EUT) is in compliance with the FCC requirements. And it is applicable only to the tested sample identified in the report. This report shall not be reproduced except in full, without the written approval of PTC, this document may be altered or revised by PTC, personal only, and shall be noted in the revision of the document.		

Test Engineer:



Leo Yang / Engineer

Technical Manager:

Chris Du / Manager

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2 Test Summary

Test Items	Test Requirement	Result
Radiated Spurious Emissions	15.205(a) 15.209 15.247(d)	PASS
Band edge	15.247(d) 15.205(a)	PASS
Conduct Emission	15.207	PASS
20dB Bandwidth	15.247(a)(1)	PASS
Maximum Peak Output Power	15.247(b)(1)	PASS
Frequency Separation	15.247(a)(1)	PASS
Number of Hopping Frequency	15.247(a)(1)(iii)	PASS
Dwell time	15.247(a)(1)(iii)	PASS
Antenna Requirement	15.203	PASS

3 TEST FACILITY

Precise Testing & Certification Co., LTD.

Address: Building 1, No.6 Tongxin Road, Dongcheng Street, Dongguan,China

FCC Registration Number: 790290

A2LA Certificate No.: 4408.01

IC Registration Number: 12191A-1

4 General Information

4.1 General Description of E.U.T.

Product Name	:	Bluetooth Karaoke Microphone
Model Name	:	Q30-I、 Q05、Q7、Q858L、Q858、Q1816、Q1818、Q16、Q17、Q26、Q27、Q25、Q30-I、Q30、Q78、Q103、Q136B、Q156、Q160、BX-01、BX-02、BX-03、BX-04、BX-05、BX-06、BX-07、BX-08、K55、K56、K57、K58
Bluetooth Version	:	BT 5.0
Operating frequency	:	2402-2480MHz
Numbers of Channel	:	79 channels
Antenna Type	:	FPC Antenna
Antenna Gain	:	2 dBi
Power supply	:	DC 3.7V
Type of Modulation	:	GFSK, Π/4-DQPSK, 8DPSK
Hardware Version	:	V1.0
Software Version	:	V1.0

4.2 Test Mode

The EUT has been tested under its typical operating condition. Pre-defined engineering program for regulatory testing used to control the EUT for staying in continuous transmitting. Only the worst case data were reported.

The EUT has been associated with peripherals pursuant to ANSI C63.10-2013 and configuration operated in a manner tended to maximize its emission characteristics in a typical application. Frequency range investigated: radiation (9 KHz to the 10th harmonics of the highest fundamental frequency or to 40 GHz, whichever is lower).

The EUT has been tested under TX operating condition.

This EUT is a FHSS system, were conducted to determine the final configuration from all possible combinations. We use software control the EUT, Let EUT hopping on and transmit with highest power, all the modes GFSK, Π/4-DQPSK, 8DPSK , have been tested. 79 Channels are provided by EUT. The 3 channels of lower, medium and higher were chosen for test.

Pretest Mode	Description
Mode 1	CH00
Mode 2	CH39
Mode 3	CH78
Mode 4	Link BT

For Conducted Emission	
Final Test Mode	Description
Mode 4	Link BT

For Radiated Emission	
Final Test Mode	Description
Mode 1	CH00
Mode 2	CH39
Mode 3	CH78

Note:

(1) The measurements are performed at the highest, middle, lowest available channels.

(2) Measurements are performed according to the Public Notice-DA 00-705.

(3) Test perform on all mode(BDR and EDR), only records worse cases in the test report.

Channel List:

Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
0	2402	1	2403	2	2404	3	2405
4	2406	5	2407	6	2408	7	2409
8	2410	9	2411	10	2412	11	2413
12	2414	13	2415	14	2416	15	2417
16	2418	17	2419	18	2420	19	2421
20	2422	21	2423	22	2424	23	2425
24	2426	25	2427	26	2428	27	2429
28	2430	29	2431	30	2432	31	2433
32	2434	33	2435	34	2436	35	2437
36	2438	37	2439	38	2440	39	2441
40	2442	41	2443	42	2444	43	2445
44	2446	45	2447	46	2448	47	2449
48	2450	49	2451	50	2452	51	2453
52	2454	53	2455	54	2456	55	2457
56	2458	57	2459	58	2460	59	2461
60	2462	61	2463	62	2464	63	2465
64	2466	65	2467	66	2468	67	2469
68	2470	69	2471	70	2472	71	2473
72	2474	73	2475	74	2476	75	2477
76	2478	77	2479	78	2480	-	-

Channel	**Frequency(MHz)**
0	2402
39	2441
78	2480

5 Equipment During Test

5.1 Equipments List

RF Conducted Test

Name of Equipment	Manufacturer	Model	Serial No.	Characteristics	Calibration Due
MXG Signal Analyzer	Agilent	N9020A	MY56070279	10Hz-30GHz	Aug. 21, 2021
Coaxial Cable	CDS	79254	46107086	10Hz-30GHz	Aug. 21, 2021
Antenna Connector	Florida RF Labs	N/A	RF01#	N/A	Aug. 21, 2021
Power Meter	Anritsu	ML2495A	N/A	100k-65GHz	Aug. 21, 2021
Power sensor	Anritsu	MA2411B	N/A	300MHz-40GHz	Aug. 21, 2021

Remark: The temporary antenna connector is soldered on the PCB board in order to perform conducted tests and this temporary antenna connector is listed in the equipment list.

Radiated Emissions

Name of Equipment	Manufacturer	Model	Serial No.	Characteristics	Calibration Due
EMI Test Receiver	Rohde&Schwarz	ESCI	101417	9KHz-3GHz	Aug. 21, 2021
Loop Antenna	Schwarzbeck	FMZB 1519	012	9 KHz -30MHz	Aug. 21, 2021
Bilog Antenna	SCHWARZBECK	VULB9160	9160-3355	25MHz-2GHz	Aug. 21, 2021
Preamplifier (low frequency)	SCHWARZBECK	BBV 9475	9745-0013	1MHz-1GHz	Aug. 21, 2021
Cable	Schwarzbeck	PLF-100	549489	9KHz-3GHz	Aug. 21, 2021
Spectrum Analyzer	Agilent	E4407B	MY45109572	9KHz-40GHz	Aug. 21, 2021
Horn Antenna	SCHWARZBECK	9120D	9120D-1246	1GHz-18GHz	Aug. 21, 2021
Power Amplifier	LUNAR EM	LNA1G18-40	J10100000081	1GHz-26.5GHz	Aug. 21, 2021
Horn Antenna	SCHWARZBECK	BBHA 9170	9170-181	14GHz-40GHz	Aug. 21, 2021
Amplifier	SCHWARZBECK	BBV 9721	9721-205	18GHz-40GHz	Aug. 21, 2021
Cable	H+S	CBL-26	N/A	1GHz-26.5GHz	Aug. 21, 2021
RF Cable	R&S	R204	R21X	1GHz-40GHz	Aug. 21, 2021

Conducted Emissions

Name of Equipment	Manufacturer	Model	Serial No.	Characteristics	Calibration Due
EMI Test Receiver	Rohde&Schwarz	ESCI	101417	9KHz-3GHz	Aug. 21, 2021
Artificial Mains Network	Rohde&Schwarz	L2-16B	000WX31025	9KHz-300MHz	Aug. 21, 2021
Artificial Mains Network	Rohde&Schwarz	ENV216	101342	9KHz-300MHz	Aug. 21, 2021

5.2 Measurement Uncertainty

Parameter	Uncertainty
RF output power, conducted	±1.0dB
Power Spectral Density, conducted	±2.2dB
Radio Frequency	± 1 x 10^{-6}
Bandwidth	± 1.5 x 10^{-6}
Time	±2%
Duty Cycle	±2%
Temperature	±1°C
Humidity	±5%
DC and low frequency voltages	±3%
Conducted Emissions (150kHz~30MHz)	±3.64dB
Radiated Emission(30MHz~1GHz)	±5.03dB
Radiated Emission(1GHz~25GHz)	±4.74dB
Remark: The coverage Factor (k=2), and measurement Uncertainty for a level of Confidence of 95%	

5.3 Description of Support Units

Equipment	Model No.	Series No.
Adapter	Model: PS65B150Y3000S Input: AC100-240V, 50/60Hz, 1.5A Output: DC 5V, 3000mA	N/A

6 Conducted Emission

Test Requirement:	:	FCC CFR 47 Part 15 Section 15.207
Test Method:	:	ANSI C63.10:2013
Test Result:	:	PASS
Frequency Range:	:	150kHz to 30MHz
Class/Severity:	:	Class B
Detector:	:	Peak for pre-scan (9kHz Resolution Bandwidth)

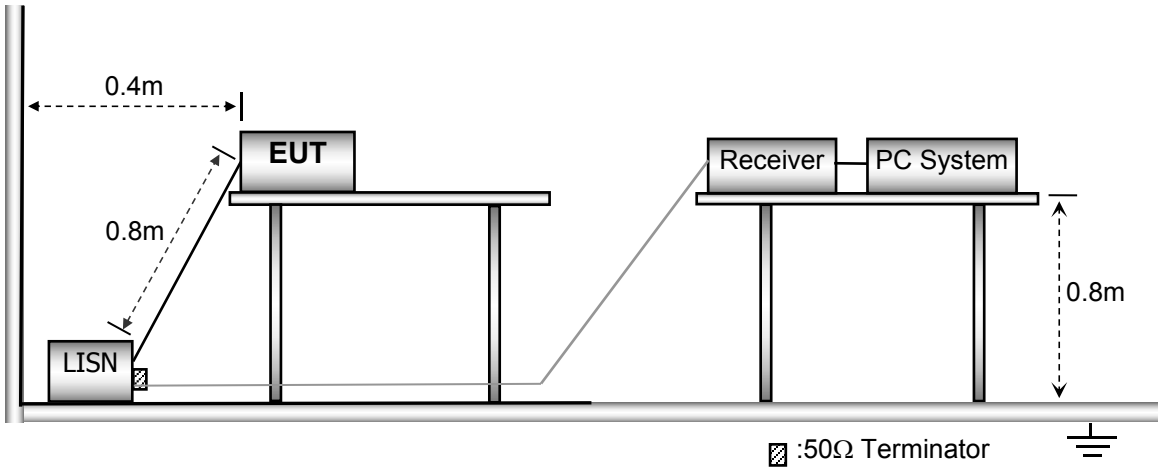
6.1 E.U.T. Operation

Operating Environment **:**

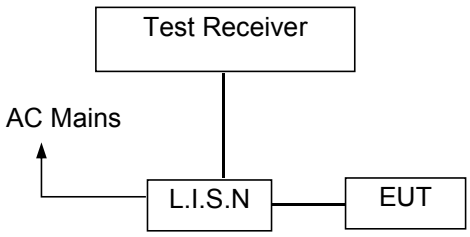
Temperature:	:	25.5 °C
Humidity:	:	51 % RH
Atmospheric Pressure:	:	101.2kPa

6.2 EUT Setup

The conducted emission tests were performed using the setup accordance with the ANSI C63.10: 2013



6.3 Test SET-UP (Block Diagram of Configuration)



6.4 Measurement Procedure:

1. The EUT was placed on a table, which is 0.8m above ground plane.
2. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
3. Repeat above procedures until all frequency measured was complete.

6.5 Conducted Emission Limit

Conducted Emission

Frequency(MHz)	Quasi-peak	Average
0.15-0.5	66-56	56-46
0.5-5.0	56	46
5.0-30.0	60	50

Note:
1. The lower limit shall apply at the transition frequencies
2.The limit decreases in line with the logarithm of the frequency in the range of 0.15 to 0.50MHz.

6.6 Measurement Description

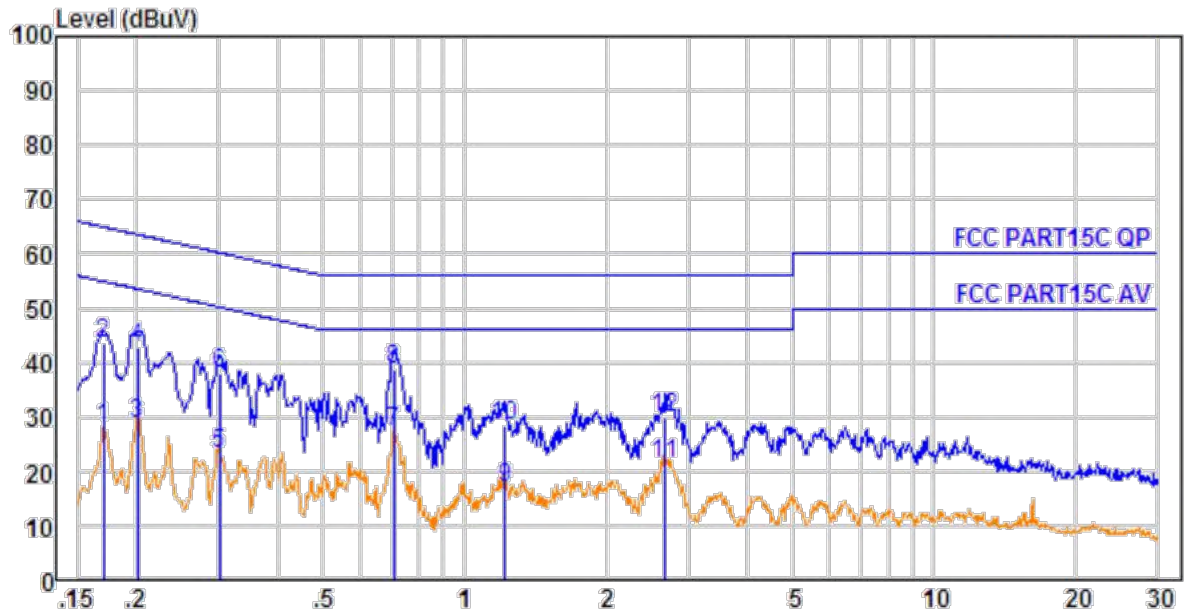
The maximised peak emissions from the EUT was scanned and measured for both the Live and Neutral Lines. Quasi-peak & average measurements were performed if peak emissions were within 6dB of the average limit line.

6.7 Conducted Emission Test Result

Pass.

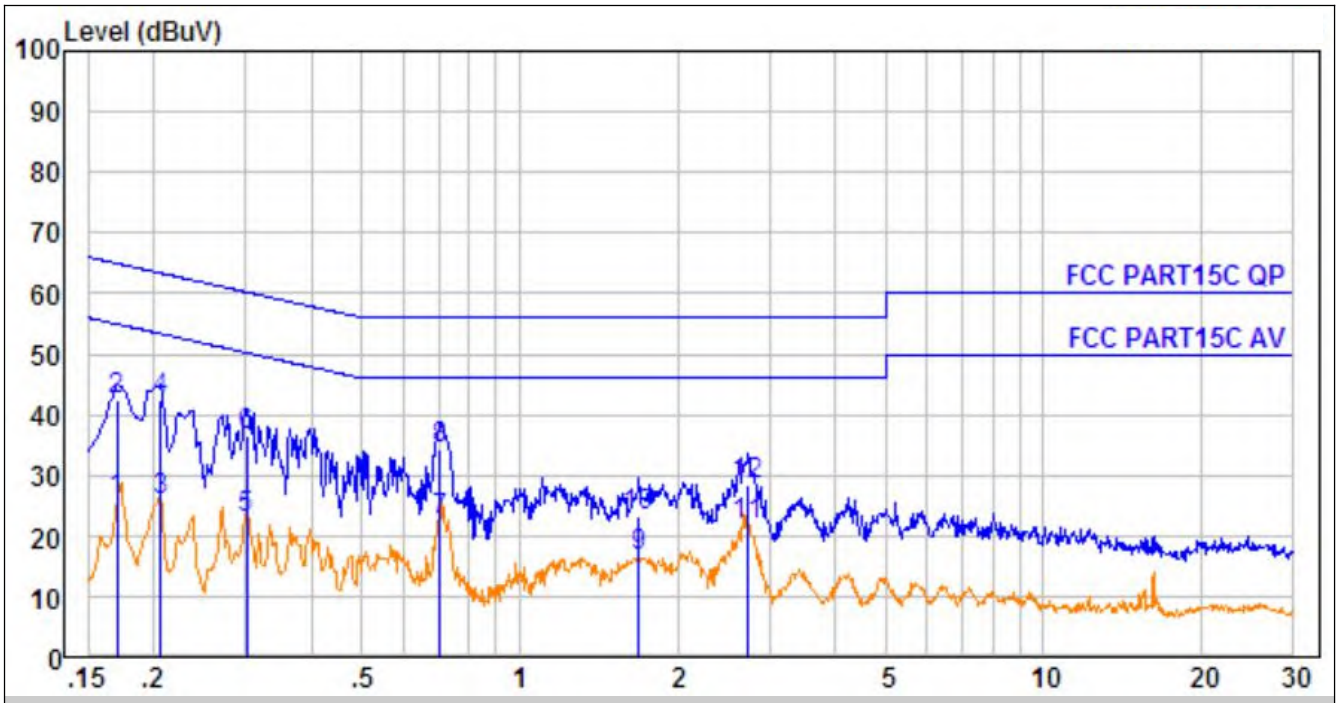
All the modulation modes were tested the data of the worst mode (AC 120V/60Hz, GFSK TX 2402MHz) are recorded in the following pages and the others modulation methods do not exceed the limits.

Line -120V/60Hz:



No.	Freq MHz	Cable Loss dB	AMN Factor dB	Receiver Reading dBµV	Emission Level dBµV	Limit dBµV	Over Limit dB	Remark
1.	0.170	0.24	9.59	18.06	27.89	54.94	-27.05	Average
2.	0.170	0.24	9.59	33.85	43.68	64.94	-21.26	QP
3.	0.202	0.28	9.59	18.90	28.77	53.54	-24.77	Average
4.	0.202	0.28	9.59	32.95	42.82	63.54	-20.72	QP
5.	0.302	0.37	9.60	13.27	23.24	50.19	-26.95	Average
6.	0.302	0.37	9.60	27.96	37.93	60.19	-22.26	QP
7.	0.708	0.44	9.61	17.26	27.31	46.00	-18.69	Average
8.	0.708	0.44	9.61	28.80	38.85	56.00	-17.15	QP
9.	1.223	0.46	9.61	6.77	16.84	46.00	-29.16	Average
10.	1.223	0.46	9.61	18.41	28.48	56.00	-27.52	QP
11.	2.678	0.47	9.62	11.19	21.28	46.00	-24.72	Average
12.	2.678	0.47	9.62	19.85	29.94	56.00	-26.06	QP

Neutral -120V/60Hz:



No.	Freq MHz	Cable Loss dB	AMN Factor dB	Receiver Reading dBµV	Emission Level dBµV	Limit dBµV	Over Limit dB	Remark
1.	0.170	0.24	9.60	16.15	25.99	54.94	-28.95	Average
2.	0.170	0.24	9.60	32.48	42.32	64.94	-22.62	QP
3.	0.206	0.29	9.61	16.05	25.95	53.36	-27.41	Average
4.	0.206	0.29	9.61	32.49	42.39	63.36	-20.97	QP
5.	0.302	0.37	9.62	12.91	22.90	50.19	-27.29	Average
6.	0.302	0.37	9.62	26.69	36.68	60.19	-23.51	QP
7.	0.705	0.44	9.64	12.49	22.57	46.00	-23.43	Average
8.	0.705	0.44	9.64	24.26	34.34	56.00	-21.66	QP
9.	1.689	0.47	9.64	6.57	16.68	46.00	-29.32	Average
10.	1.689	0.47	9.64	13.13	23.24	56.00	-32.76	QP
11.	2.736	0.47	9.65	11.63	21.75	46.00	-24.25	Average
12.	2.736	0.47	9.65	18.23	28.35	56.00	-27.65	QP

7 Radiated Spurious Emissions

Test Requirement : FCC CFR47 Part 15 Section 15.209 & 15.247

Test Method : ANSI C63.10:2013

Test Result : PASS

Measurement Distance : 3m

Limit : See the follow table

Frequency (MHz)	Field Strength		Field Strength Limit at 3m Measurement Dist	
	uV/m	Distance (m)	uV/m	dBuV/m
0.009 ~ 0.490	2400/F(kHz)	300	10000 * 2400/F(kHz)	$20\log^{(2400/F(kHz))} + 80$
0.490 ~ 1.705	24000/F(kHz)	30	100 * 24000/F(kHz)	$20\log^{(24000/F(kHz))} + 40$
1.705 ~ 30	30	30	100 * 30	$20\log^{(30)} + 40$
30 ~ 88	100	3	100	$20\log^{(100)}$
88 ~ 216	150	3	150	$20\log^{(150)}$
216 ~ 960	200	3	200	$20\log^{(200)}$
Above 960	500	3	500	$20\log^{(500)}$

7.1 EUT Operation

Operating Environment :

Temperature : 23.5 °C

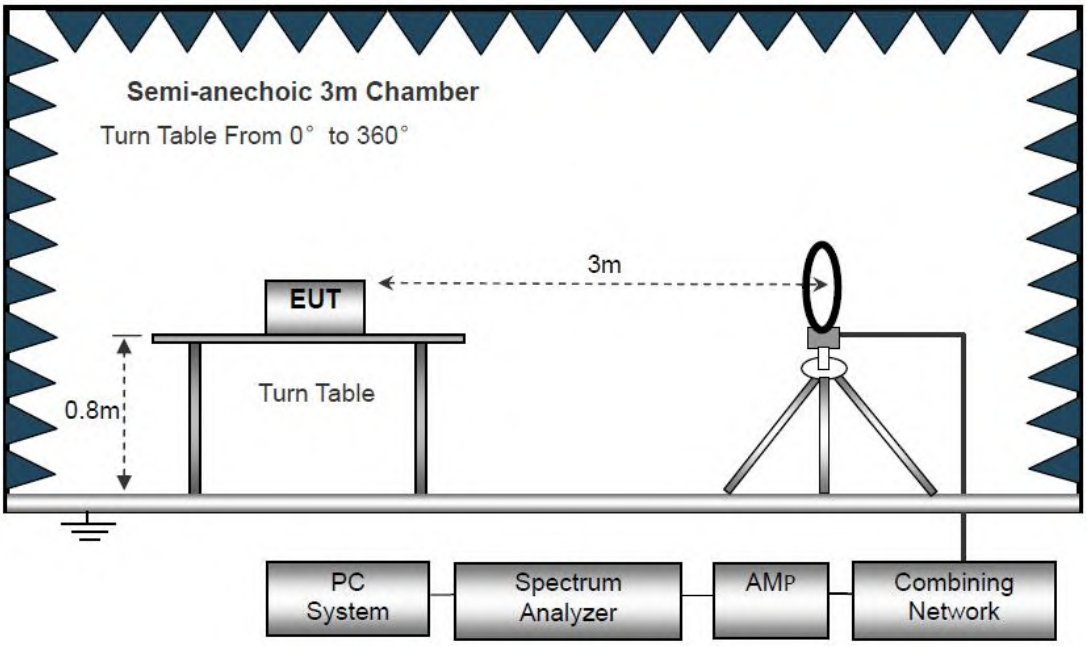
Humidity : 51.1 % RH

Atmospheric Pressure : 101.2kPa

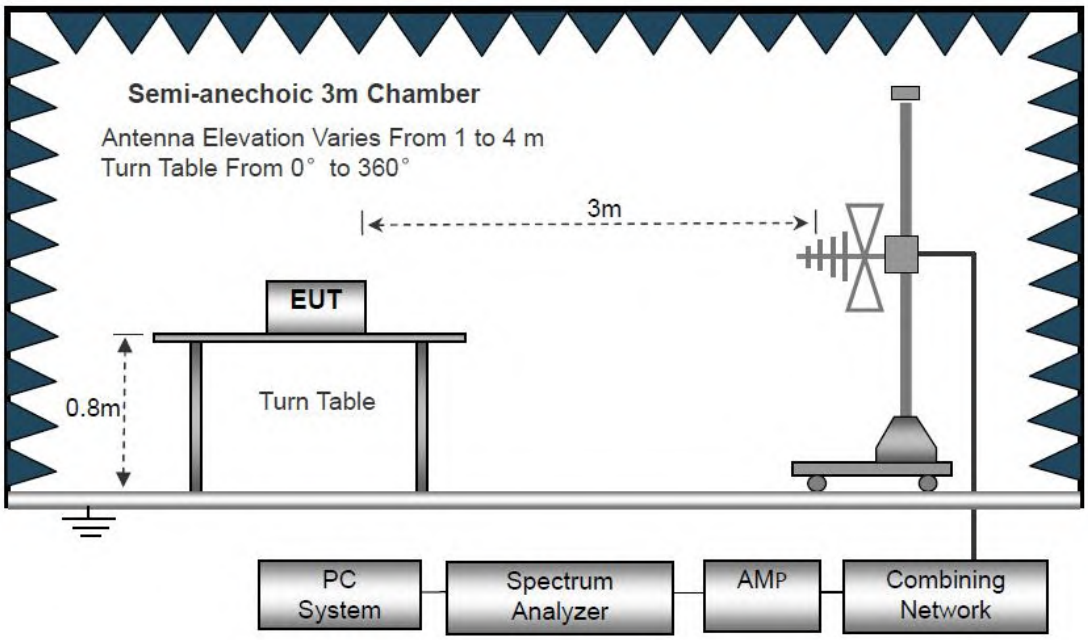
7.2 Test Setup

The radiated emission tests were performed in the 3m Semi- Anechoic Chamber test site

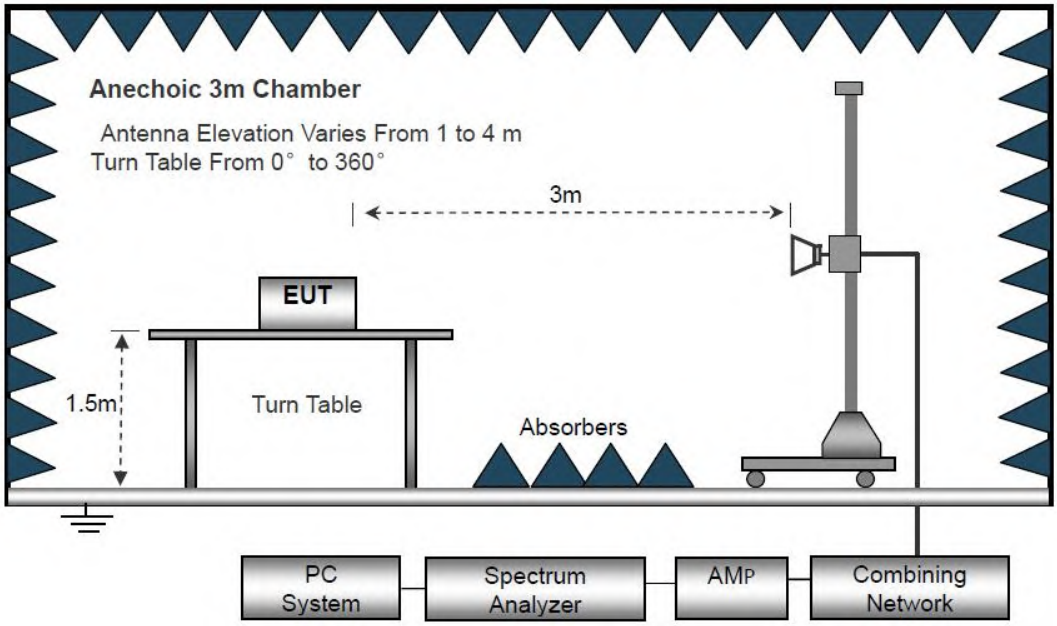
The test setup for emission measurement below 30MHz.



The test setup for emission measurement from 30 MHz to 1 GHz.



The test setup for emission measurement above 1 GHz.



7.3 Spectrum Analyzer Setup

Spectrum Parameter	Setting
Attenuation	Auto
Start Frequency	1000 MHz
Stop Frequency	10th carrier harmonic
RB / VB (emission in restricted band)	1 MHz / 1 MHz for Peak, 1 MHz / *10Hz* for Average

Receiver Parameter	Setting
Attenuation	Auto
Start ~ Stop Frequency	9kHz~150kHz / RB 200Hz for QP
Start ~ Stop Frequency	150kHz~30MHz / RB 9kHz for QP
Start ~ Stop Frequency	30MHz~1000MHz / RB 120kHz for QP

7.4 Test Procedure

1. The testing follows the guidelines in Spurious Radiated Emissions of ANSI C63.10-2013.

2. Below 1000MHz, The EUT was placed on a turn table which is 0.8m above ground plane. And above 1000MHz, The EUT was placed on a styrofoam table which is 1.5m above ground plane.

3. The EUT was set 3 meters from the interference receiving antenna, which was mounted on the top of a variable height antenna tower.

4. For each suspected emission, the EUT was arranged to its worst case and then tune the Antenna tower (From 1m to 4m) and turntable (from 0 degree to 360 degree) to find the maximum reading. A pre-amp and a high pass filter are used for the test in order to get better signal level to comply with the guidelines.

5. Set to the maximum power setting and enable the EUT transmit continuously.

6. Final measurement (Above 1GHz): The frequency range will be divided into different sub ranges depending of the frequency range of the used horn antenna. The EMI Receiver set to peak and average mode and a resolution bandwidth of 1MHz. The measurement will be performed in horizontal and vertical polarization of the measuring antenna and while rotating the EUT in its vertical axis in the range of 0 degree to 360 degree in order to have the antenna inside the cone of radiation.

7. Test Procedure of measurement (For Above 1GHz):

1) Monitor the frequency range at horizontal polarization and move the antenna over all sides of the EUT(if necessary move the EUT to another orthogonal axis).

2) Change the antenna polarization and repeat 1) with vertical polarization.

3) Make a hardcopy of the spectrum.

4) Measure the frequency of the detected emissions with a lower span and resolution bandwidth to increase the accuracy and note the frequency value.

5) Change the analyser mode to Clear/ Write and found the cone of emission.

6) Rotate and move the EUT, so that the measuring distance can be enlarged to 3m and the antenna will be still inside the cone of emission.

7) Measure the level of the detected frequency with the correct resolution bandwidth, with the antenna polarization and azimuth and the peak and average detector, which causes the maximum emission.

8) Repeat steps 1) to 7) for the next antenna spot if the EUT is larger than the antenna beamwidth.

7. The radiation measurements are tested under 3-axes(X,Y,Z) position(X denotes lying on the table, Y denotes side stand and Z denotes vertical stand), After pre-test, It was found that the worse radiation emission was get at the X position. So the data shown was the X position only.

7.5 Summary of Test Results

Test Frequency: 9KHz-30MHz

Freq. (MHz)	Ant.Pol. H/V	Emission Level (dBuV/m)	Limit 3m (dBuV/m)	Over (dB)
--	--	--	--	>20

Note:

The amplitude of spurious emission that is attenuated by more than 20dB below the permissible limit has no need to be reported.

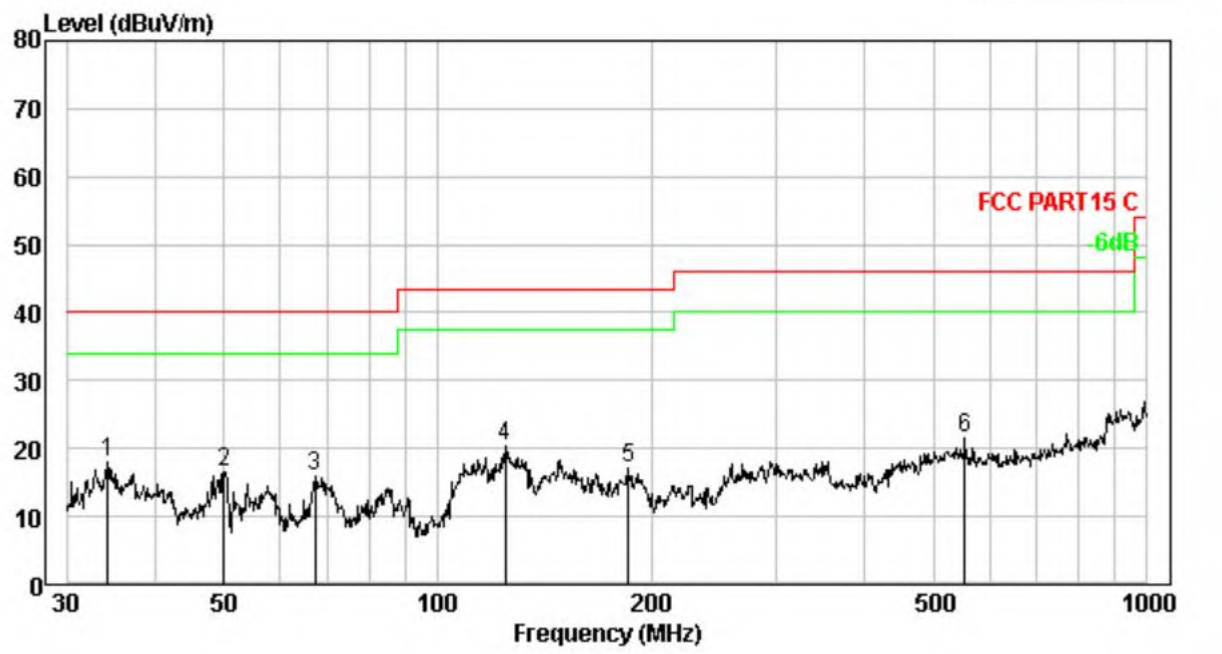
Distance extrapolation factor =40log(Specific distance/ test distance)(dB);
Limit line=Specific limits(dBuV) + distance extrapolation factor.

Test Frequency: 30MHz ~ 1GHz

Please refer to the following test plots:

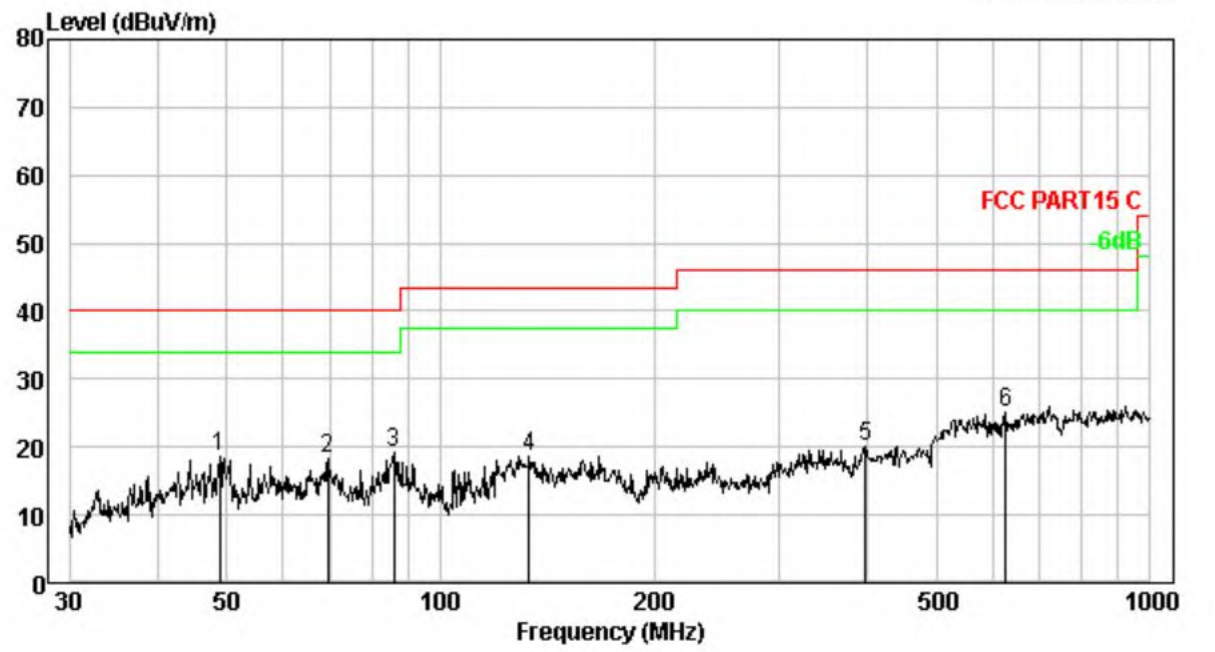
All the modulation modes were tested the data of the worst mode (AC 120V/60Hz, GFSK TX 2402MHz) are recorded in the following pages and the others modulation methods do not exceed the limits.

Test plot for Horizontal: GFSK(2402MHz)



No.	Freq MHz	Cable Loss dB	ANT Factor dB/m	Receiver Reading dBuV	Preamp Factor dB	Emission Level dBuV/m	Limit dBuV/m	Over Limit dB	Remark
1.	34.276	1.43	12.13	34.33	29.90	17.99	40.00	-22.01	QP
2.	49.881	2.08	12.10	32.32	29.92	16.58	40.00	-23.42	QP
3.	67.202	2.59	10.60	32.82	29.95	16.06	40.00	-23.94	QP
4.	124.569	3.65	12.32	34.41	30.01	20.37	43.50	-23.13	QP
5.	185.788	4.33	12.05	30.63	30.03	16.98	43.50	-26.52	QP
6.	552.883	6.21	18.51	27.78	30.96	21.54	46.00	-24.46	QP

Test plot for Vertical: GFSK(2402MHz)



No.	Freq MHz	Cable Loss dB	ANT Factor dB/m	Receiver Reading dBuV	Preamp Factor dB	Emission Level dBuV/m	Limit dBuV/m	Over Limit dB	Remark
1.	48.843	2.04	12.14	34.45	29.92	18.71	40.00	-21.29	QP
2.	69.357	2.64	10.21	35.37	29.95	18.27	40.00	-21.73	QP
3.	85.898	3.01	8.79	37.24	29.97	19.07	40.00	-20.93	QP
4.	133.151	3.77	12.88	32.04	30.01	18.68	43.50	-24.82	QP
5.	397.633	5.65	14.78	30.29	30.69	20.03	46.00	-25.97	QP
6.	627.274	6.43	19.20	30.56	31.03	25.16	46.00	-20.84	QP

Test Frequency 1GHz-25GHz

Frequency	Read Level	Cable loss	Antenna Factor	Preamp Factor	Emission Level	Limits	Margin	Remark	Comment
(MHz)	(dBμV)	(dB)	dB/m	(dB)	(dBμV/m)	(dBμV/m)	(dB)		
Low Channel (2402 MHz)(GFSK)--Above 1G									
4804.03	63.95	5.21	35.59	44.30	60.45	74.00	-13.55	Pk	Vertical
4804.03	41.66	5.21	35.59	44.30	38.16	54.00	-15.84	AV	Vertical
7206.27	61.54	6.48	36.27	44.60	59.69	74.00	-14.31	Pk	Vertical
7206.27	44.81	6.48	36.27	44.60	42.96	54.00	-11.04	AV	Vertical
4804.11	61.94	5.21	35.55	44.30	58.40	74.00	-15.60	Pk	Horizontal
4804.11	42.85	5.21	35.55	44.30	39.31	54.00	-14.69	AV	Horizontal
7206.22	63.58	6.48	36.27	44.52	61.81	74.00	-12.19	Pk	Horizontal
7206.22	47.75	6.48	36.27	44.52	45.98	54.00	-8.02	AV	Horizontal
Mid Channel (2441 MHz)(GFSK)--Above 1G									
4882.4	63.06	5.21	35.66	44.20	59.73	74.00	-14.27	Pk	Vertical
4882.4	42.28	5.21	35.66	44.20	38.95	54.00	-15.05	AV	Vertical
7323.24	60.39	7.10	36.50	44.43	59.56	74.00	-14.44	Pk	Vertical
7323.24	48.48	7.10	36.50	44.43	47.65	54.00	-6.35	AV	Vertical
4882.11	61.21	5.21	35.66	44.20	57.88	74.00	-16.12	Pk	Horizontal
4882.11	47.80	5.21	35.66	44.20	44.47	54.00	-9.53	AV	Horizontal
7323.13	59.86	7.10	36.50	44.43	59.03	74.00	-14.97	Pk	Horizontal
7323.13	42.05	7.10	36.50	44.43	41.22	54.00	-12.78	AV	Horizontal
High Channel (2480 MHz)(GFSK)-- Above 1G									
4960.4	66.15	5.21	35.52	44.21	62.67	74.00	-11.33	Pk	Vertical
4960.4	42.49	5.21	35.52	44.21	39.01	54.00	-14.99	AV	Vertical
7440.2	62.44	7.10	36.53	44.60	61.47	74.00	-12.53	Pk	Vertical
7440.2	45.48	7.10	36.53	44.60	44.51	54.00	-9.49	AV	Vertical
4960.23	67.30	5.21	35.52	44.21	63.82	74.00	-10.18	Pk	Horizontal
4960.23	47.23	5.21	35.52	44.21	43.75	54.00	-10.25	AV	Horizontal
7440.3	61.31	7.10	36.53	44.60	60.34	74.00	-13.66	Pk	Horizontal
7440.3	45.65	7.10	36.53	44.60	44.68	54.00	-9.32	AV	Horizontal

Note: 1. The testing has been conformed to 10*2480MHz=24800MHz.

2. All other emissions more than 30dB below the limit.

3. Emission Level= Antenna Factor + Cable Loss + Read Level - Preamp Factor

Margin=Emission Level-Limit

Spurious Emission in Restricted Band 2310-2390MHz and 2483.5-2500MHz

All the modulation modes have been tested, and the worst result was report as below:

Frequency	Meter Reading	Cable Loss	Antenna Factor	Preamp Factor	Emission Level	Limits	Margin	Detector	Comment
(MHz)	(dBμV)	(dB)	dB/m	(dB)	(dBμV/m)	(dBμV/m)	(dB)	Type	
2Mbps (π/4-DQPSK)-hopping									
2310.00	61.59	2.97	27.80	43.80	48.56	74	-25.44	Pk	Horizontal
2310.00	42.65	2.97	27.80	43.80	29.62	54	-24.38	AV	Horizontal
2310.00	64.99	2.97	27.80	43.80	51.96	74	-22.04	Pk	Vertical
2310.00	43.87	2.97	27.80	43.80	30.84	54	-23.16	AV	Vertical
2390.00	62.99	3.14	27.21	43.80	49.54	74	-24.46	Pk	Vertical
2390.00	41.71	3.14	27.21	43.80	28.26	54	-25.74	AV	Vertical
2390.00	64.66	3.14	27.21	43.80	51.21	74	-22.79	Pk	Horizontal
2390.00	45.69	3.14	27.21	43.80	32.24	54	-21.76	AV	Horizontal
2483.50	65.42	3.58	27.70	44.00	52.70	74	-21.30	Pk	Vertical
2483.50	45.44	3.58	27.70	44.00	32.72	54	-21.28	AV	Vertical
2483.50	65.99	3.58	27.70	44.00	53.27	74	-20.73	Pk	Horizontal
2483.50	47.52	3.58	27.70	44.00	34.80	54	-19.20	AV	Horizontal
2Mbps(π/4-DQPSK)- Non-hopping									
2310.00	64.59	2.97	27.80	43.80	51.56	74	-22.44	Pk	Horizontal
2310.00	42.59	2.97	27.80	43.80	29.56	54	-24.44	AV	Horizontal
2310.00	62.74	2.97	27.80	43.80	49.71	74	-24.29	Pk	Vertical
2310.00	45.61	2.97	27.80	43.80	32.58	54	-21.42	AV	Vertical
2390.00	65.37	3.14	27.21	43.80	51.92	74	-22.08	Pk	Vertical
2390.00	42.61	3.14	27.21	43.80	29.16	54	-24.84	AV	Vertical
2390.00	64.85	3.14	27.21	43.80	51.40	74	-22.60	Pk	Horizontal
2390.00	45.02	3.14	27.21	43.80	31.57	54	-22.43	AV	Horizontal
2483.50	62.63	3.58	27.70	44.00	49.91	74	-24.09	Pk	Vertical
2483.50	44.29	3.58	27.70	44.00	31.57	54	-22.43	AV	Vertical
2483.50	63.91	3.58	27.70	44.00	51.19	74	-22.81	Pk	Horizontal
2483.50	44.52	3.58	27.70	44.00	31.80	54	-22.20	AV	Horizontal

Note: (1) All other emissions more than 20dB below the limit.

8 Conducted Spurious Emission

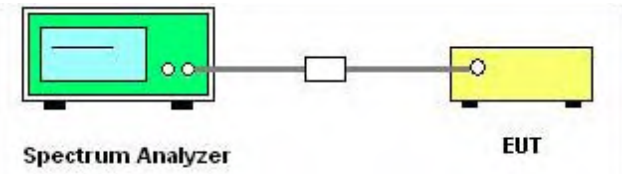
8.1 REQUIREMENT

According to FCC section 15.247(d), in any 100kHz 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 20dB below that in the 100kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement.

8.2 TEST PROCEDURE

The Bluetooth Module of the EUT, which is powered by the Battery, is coupled to the Spectrum Analyzer (SA) and the Bluetooth Service Simulator (SS) with Attenuators through the Power Splitter; the RF load attached to the EUT antenna terminal is 50Ohm; the path loss as the factor is calibrated to correct the reading. During the measurement, the Bluetooth Module of the EUT is activated and controlled by the SS, and is set to operate under test mode transmitting 339 bytes DH5 packages at maximum power.

8.3 TEST SETUP



1. The transmitter output is connected to a spectrum analyzer. The resolution bandwidth is set to 1MHz. The video bandwidth is set to 3MHz.

2. The spectrum from 30MHz to 26 GHz is investigated with the transmitter set to the lowest, middle, and highest channels.

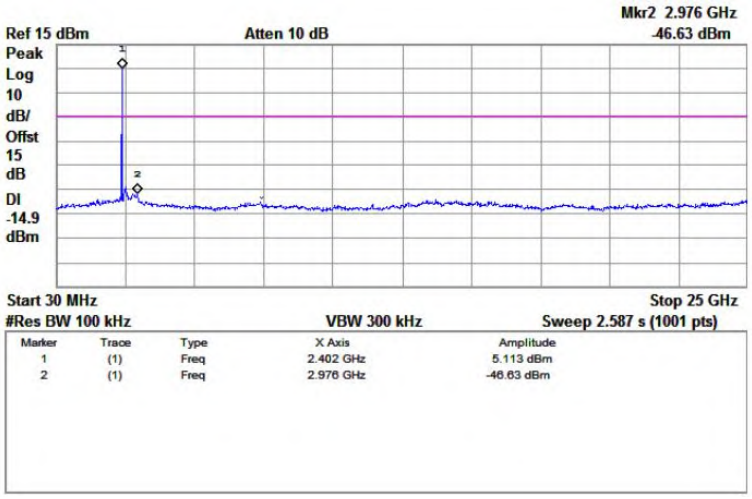
8.4 EUT OPERATION CONDITIONS

The EUT tested system was configured as the statements of 2.3 Unless otherwise a special operating condition is specified in the follows during the testing.

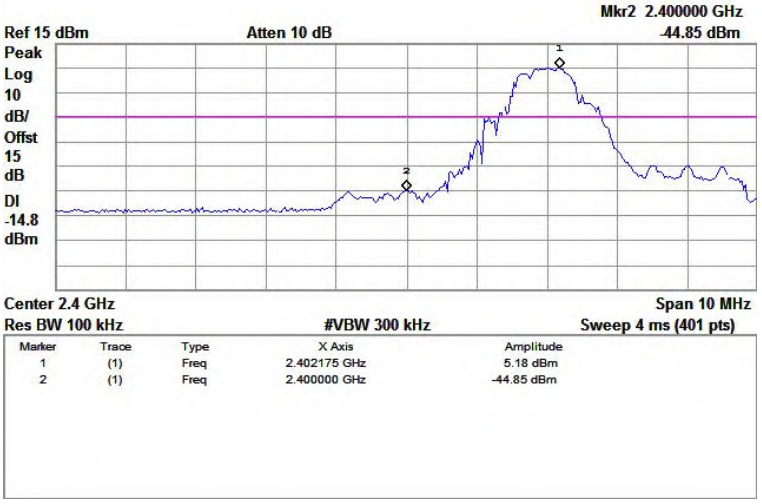
8.5 TEST RESULTS

Channel	Frequency (MHz)	Measured Max. Out of Band Emission dBm)	Refer to Plot	Limit (dBm)		Verdict
				Carrier Level	Calculated -20dBc Limit	
0	2402	-46.63	Plot A.1	5.113	-14.9	PASS

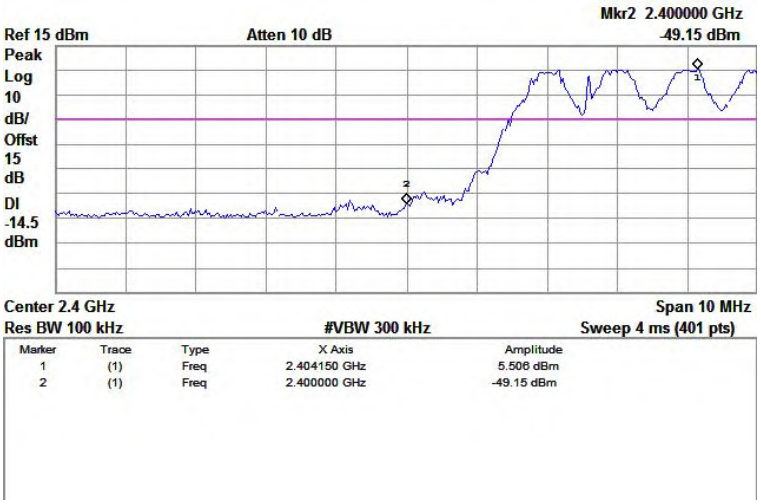
39	2441	-45.64	Plot B.1	5.325	-14.7	PASS
78	2480	-45.68	Plot C.1	6.430	-13.6	PASS



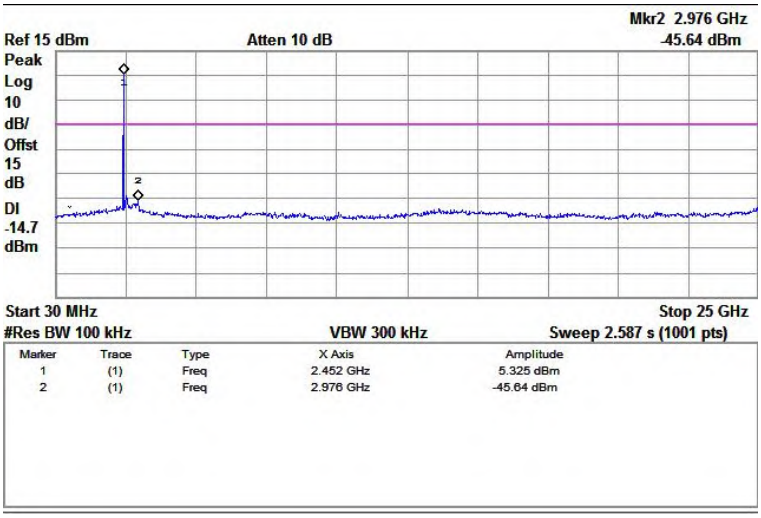
(Plot A.1: Channel = 0, 30MHz to 25GHz @ GFSK Mode)



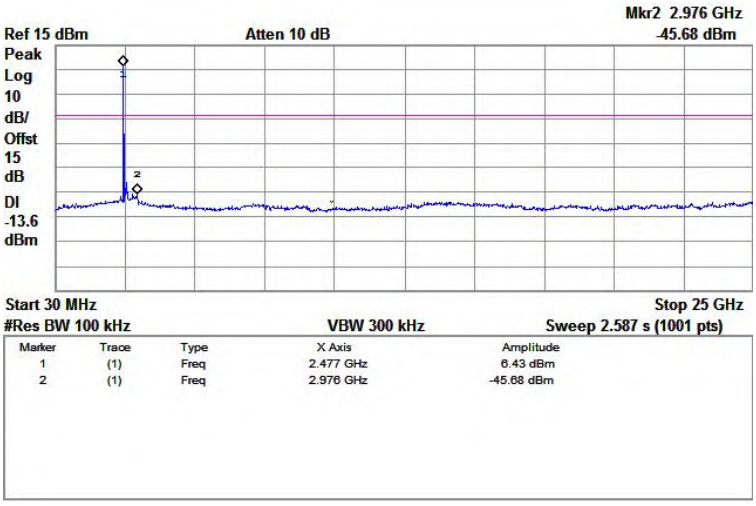
(Channel = 0, Bandedge @ GFSK Mode)



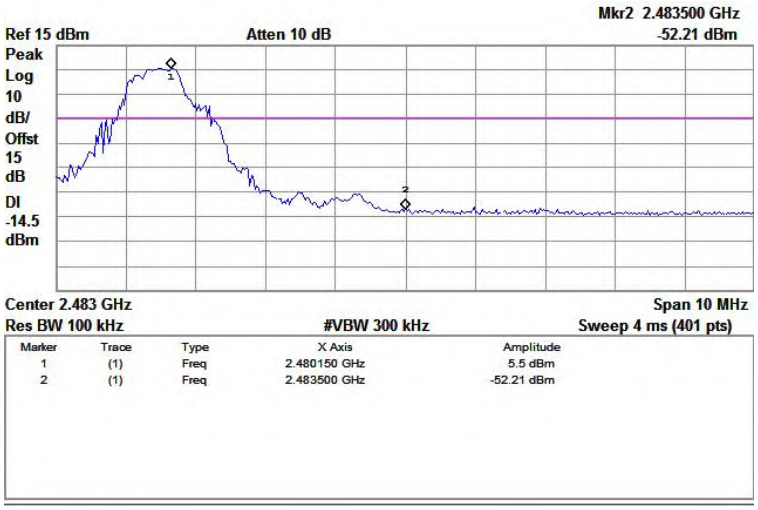
(Channel = 0, Bandedge with hopping on @ GFSK Mode)



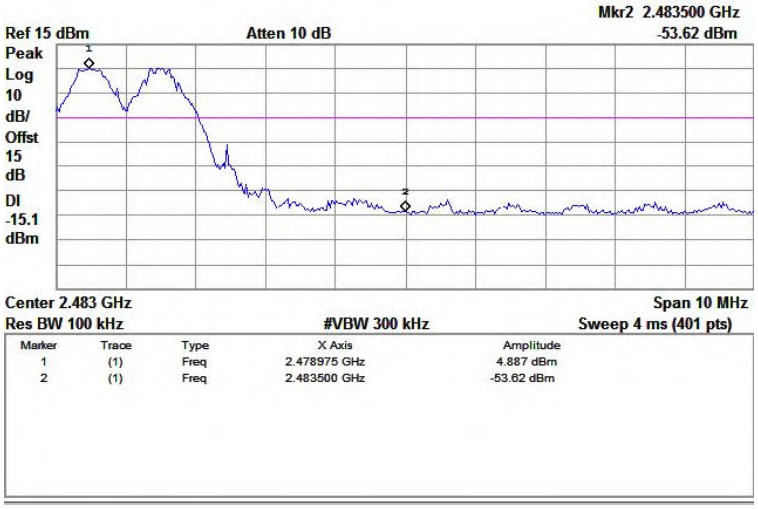
(Plot B.1: Channel = 39, 30MHz to 25GHz @ GFSK Mode)



(Plot C.1: Channel = 78, 30MHz to 25GHz @ GFSK Mode)

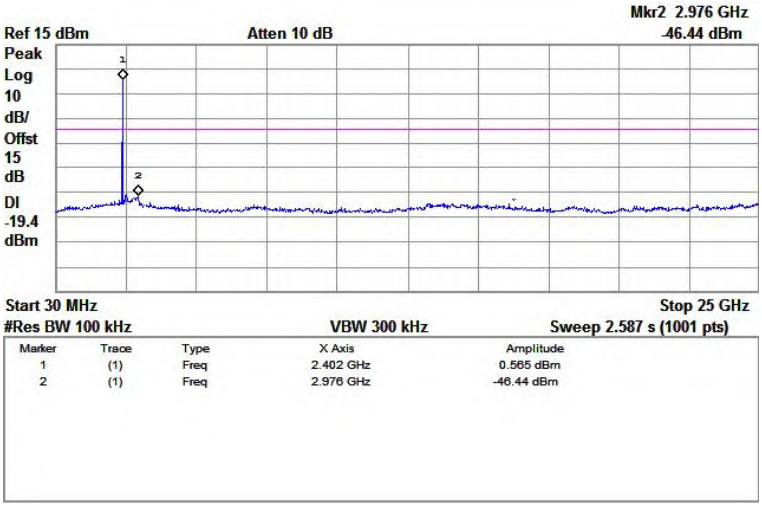


(Channel = 78, Bandedge @ GFSK Mode)

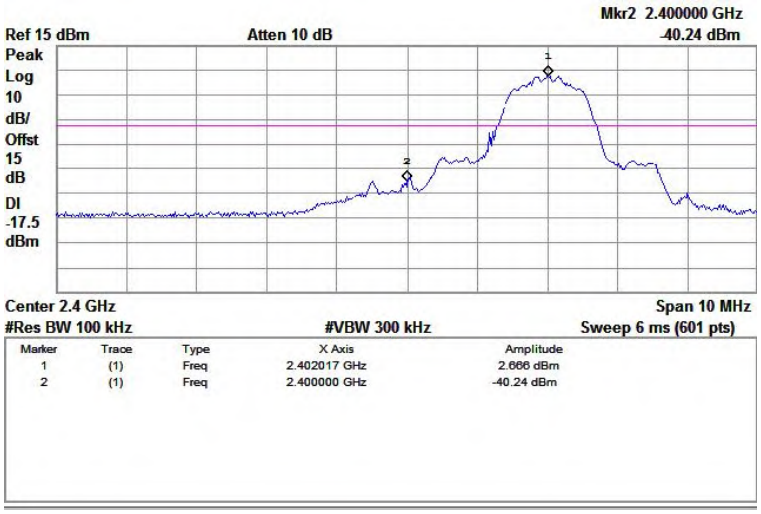


(Channel = 78, Bandedge with hopping on @ GFSK Mode)

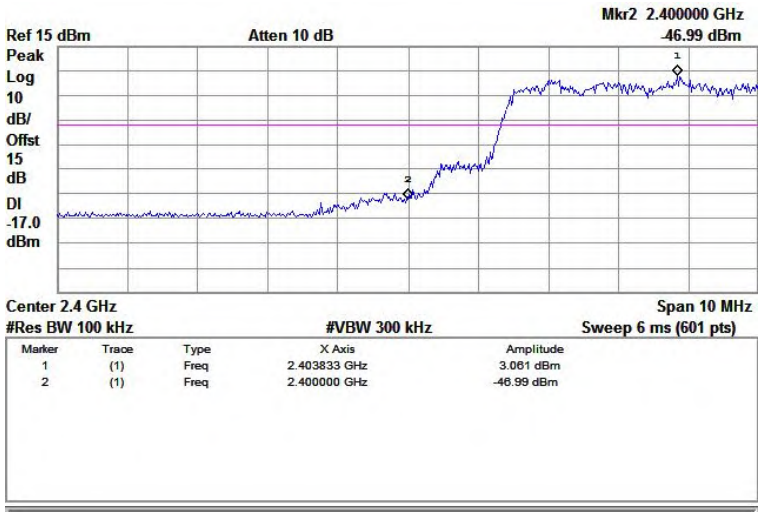
Channel	Frequency (MHz)	Measured Max. Out of Band Emission (dBm)	Refer to Plot	Limit (dBm)		Verdict
				Carrier Level	Calculated -20dBc Limit	
0	2402	-46.44	Plot D.1	0.565	-19.4	PASS
39	2441	-46.57	Plot E.1	0.265	-19.7	PASS
78	2480	-45.96	Plot F.1	1.885	-18.1	PASS



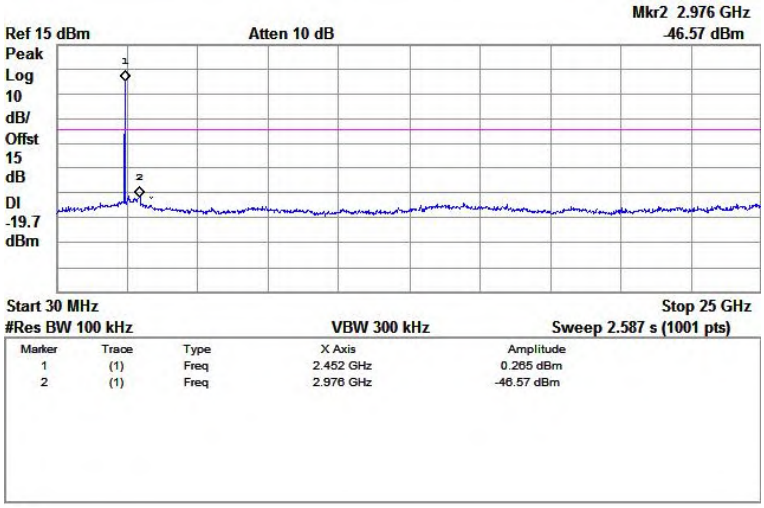
(Plot D.1: Channel = 0, 30MHz to 25GHz @ Π/4-DQPSK)



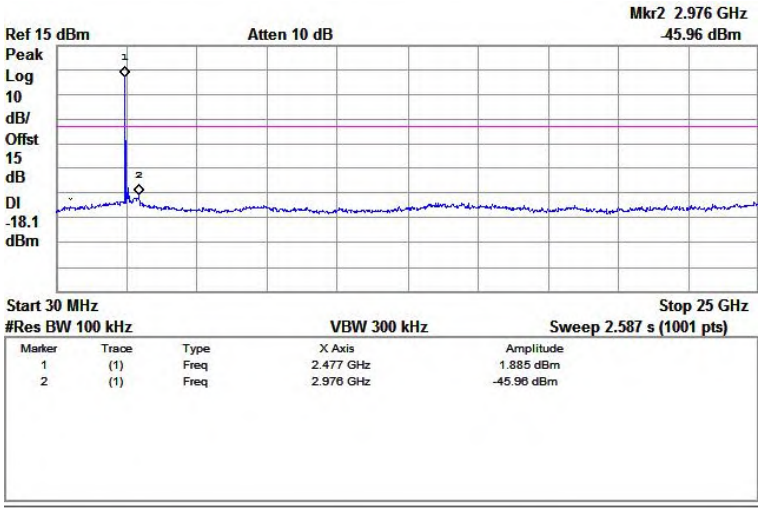
(Channel = 0, Bandedge @ Π/4-DQPSK)



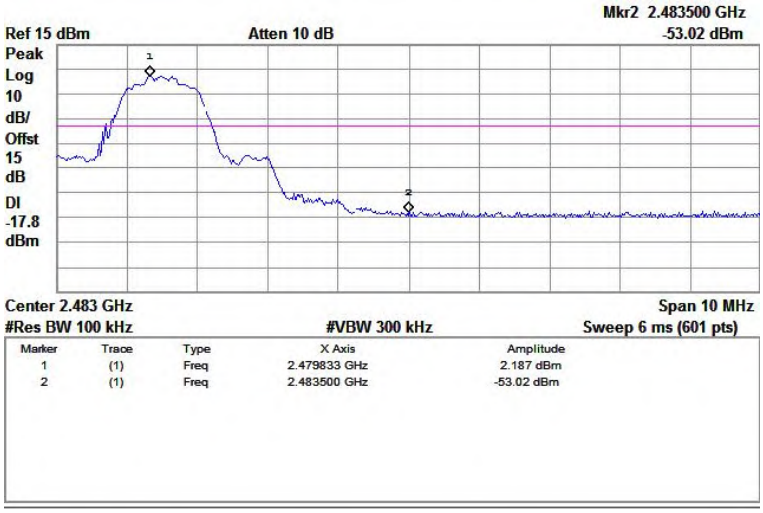
(Channel = 0, Bandedge with hopping on @ Π/4-DQPSK)



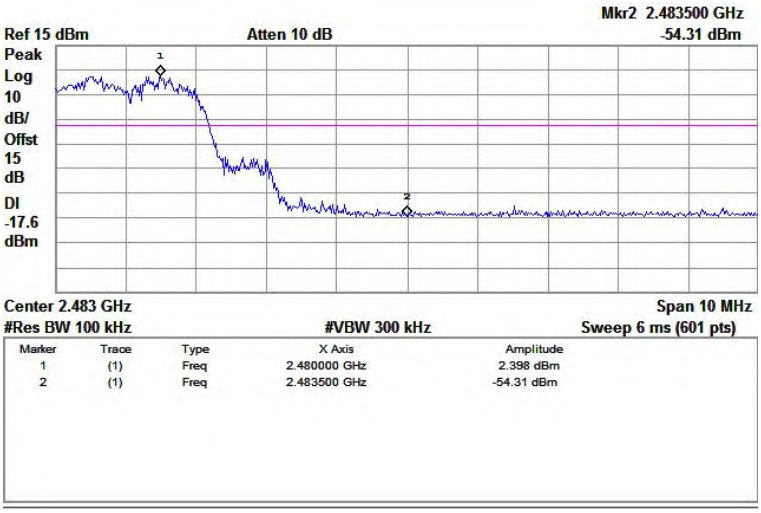
(Plot E.1: Channel = 39, 30MHz to 25GHz @ ∏/4-DQPSK)



(Plot F.1:Channel = 78, 30MHz to 25GHz @ ∏/4-DQPSK)

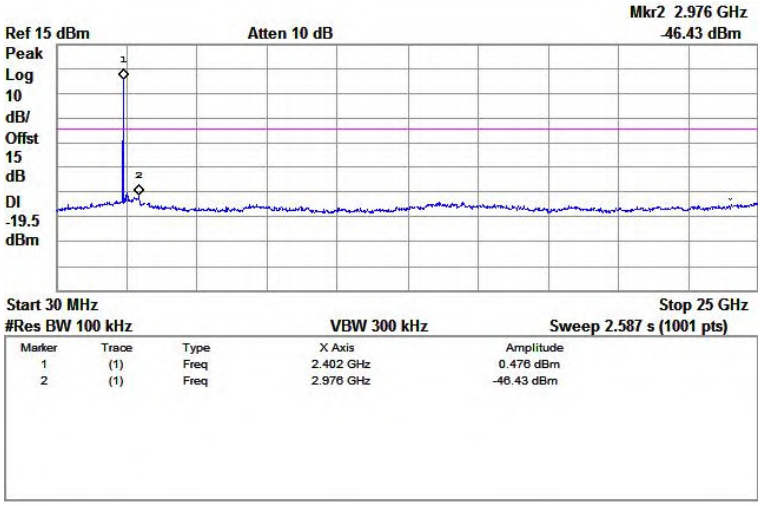


(Channel = 78, Bandedge @ ∏/4-DQPSK)

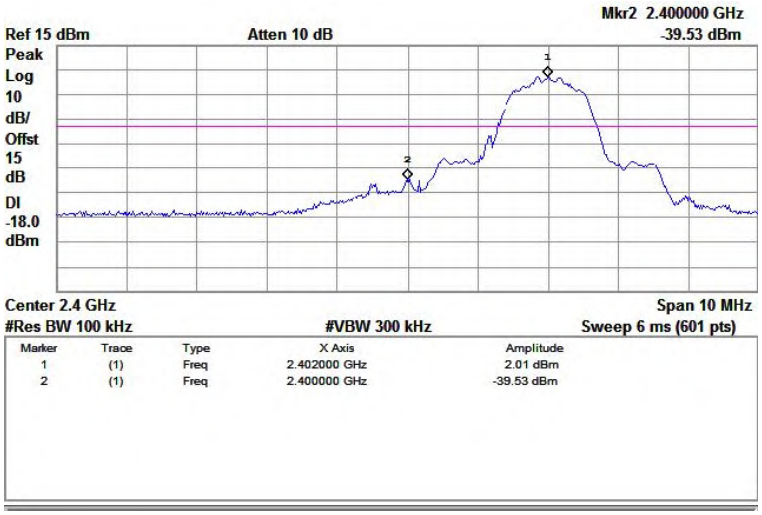


(Channel = 78, Bandedge with hopping on @ ∏/4-DQPSK

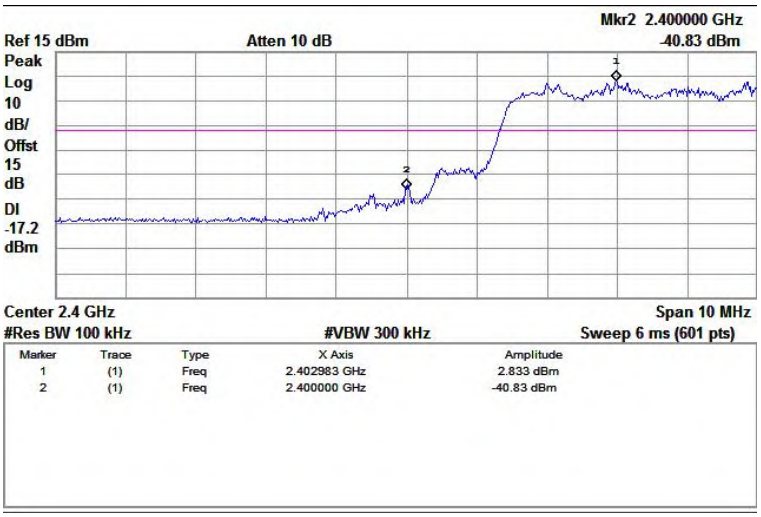
Channel	Frequency (MHz)	Measured Max. Out of Band Emission (dBm)	Refer to Plot	Limit (dBm)		Verdict
				Carrier Level	Calculated -20dBc Limit	
0	2402	-46.43	Plot G.1	0.476	-19.5	PASS
39	2441	-46.65	Plot H.1	0.653	-19.3	PASS
78	2480	-46.87	Plot I.1	0.333	-19.7	PASS



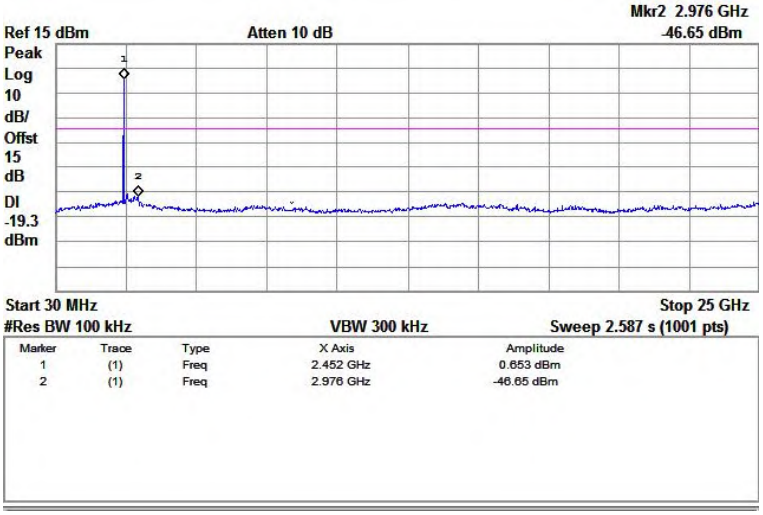
(Plot G.1: Channel = 0, 30MHz to 25GHz @ 8-DPSK)



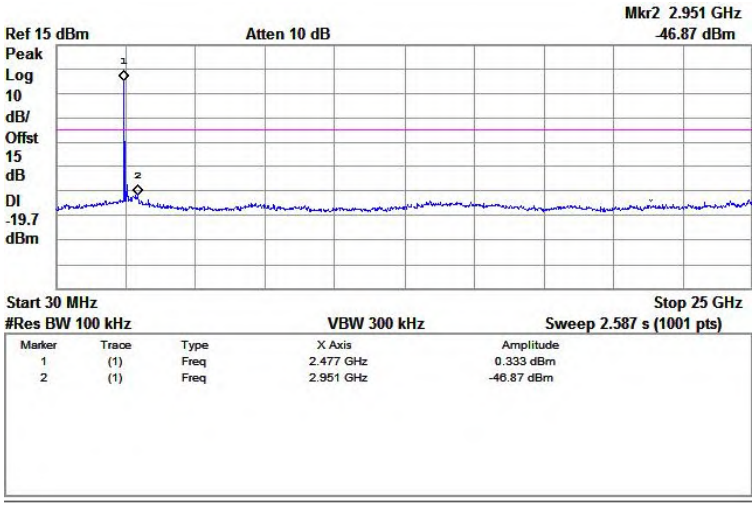
(Channel = 0, Bandedge @ 8-DPSK)



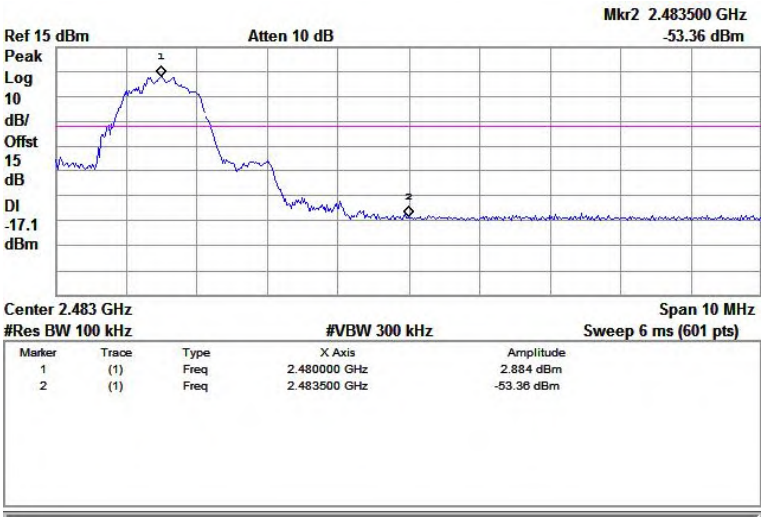
(Channel = 0, Bandedge with hopping on @ 8-DPSK)



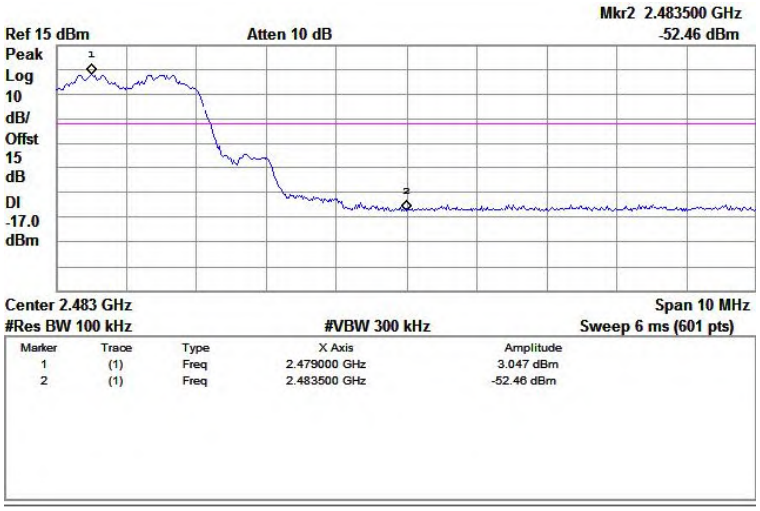
(Plot H.1: Channel = 39, 30MHz to 25GHz @ 8-DPSK)



(Plot I.1: Channel = 78, 30MHz to 25GHz @ 8-DPSK)



(Plot I.1: Channel = 78, Bandedge @ 8-DPSK)



(Plot I.1: Channel = 78, Bandedge with hopping on @ 8-DPSK)

9 100 KHZ BANDWIDTH OF FREQUENCY BAND EDGE

9.1 REQUIREMENT

According to FCC section 15.247(d), in any 100kHz 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 20dB below that in the 100kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement.

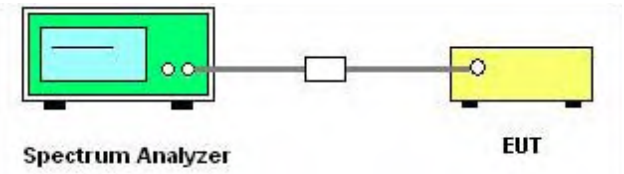
9.2 TEST PROCEDURE

Spectrum Parameter	Setting
Detector	Peak
Start/Stop Frequency	30 MHz to 10th carrier harmonic
RB / VB (emission in restricted band)	100 KHz/300 KHz
Trace-Mode:	Max hold

. For Band edge

Spectrum Parameter	Setting
Detector	Peak
Start/Stop Frequency	Lower Band Edge: 2300 – 2403 MHz Upper Band Edge: 2479 – 2500 MHz
RB / VB (emission in restricted band)	1MHz/3MHz
Trace-Mode:	Max hold

9.3 TEST SETUP



1. The transmitter output is connected to a spectrum analyzer. The resolution bandwidth is set to 1MHz. The video bandwidth is set to 3MHz.

2. The spectrum from 30MHz to 26 GHz is investigated with the transmitter set to the lowest, middle, and highest channels.

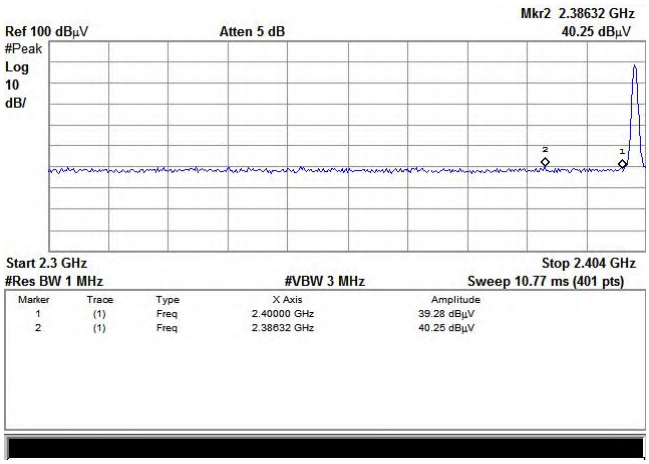
9.4 EUT OPERATION CONDITIONS

The EUT tested system was configured as the statements of 2.3 Unless otherwise a special operating condition is specified in the follows during the testing.GFSK , was tested and record.

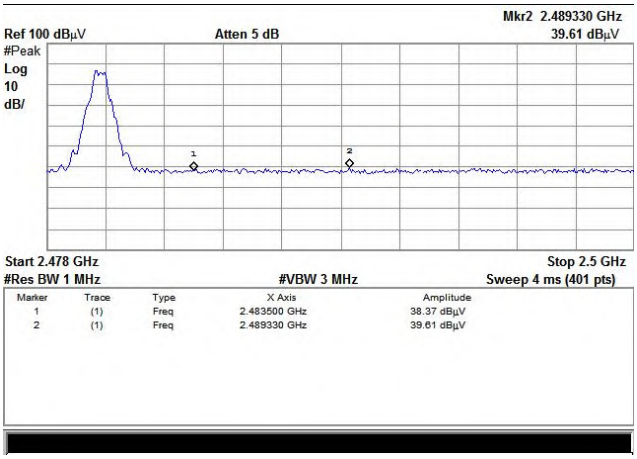
9.5 TEST RESULTS

Test Plot

GFSK: Band Edge-Low Channel

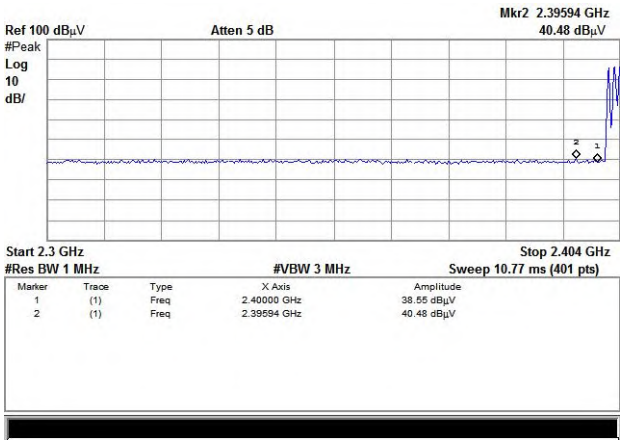


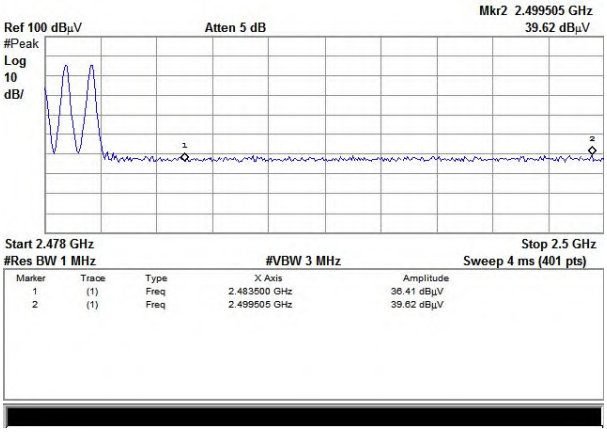
GFSK: Band Edge-High Channel



GFSK: Band Edge-Low Channel (Hopping Mode)

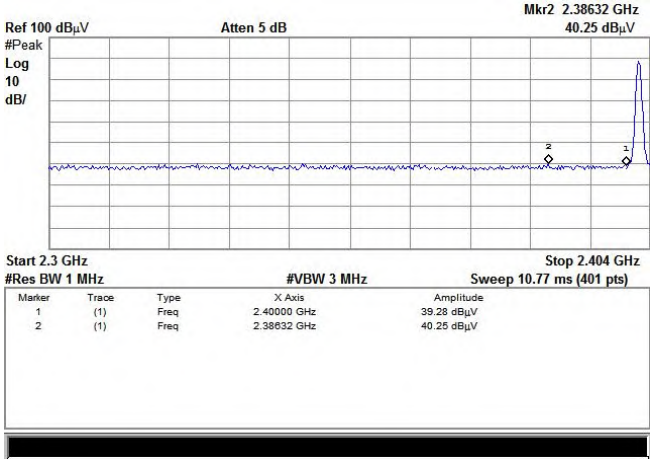
GFSK: Band Edge-High Channel (Hopping Mode)



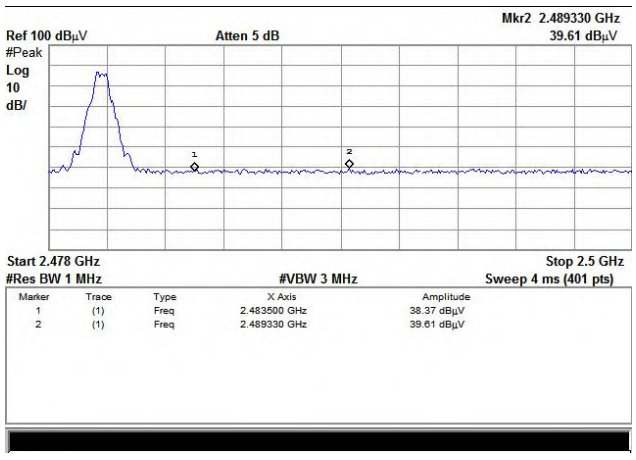


Test Plot

π /4-DQPSK: Band Edge-Low Channel



π /4-DQPSK: Band Edge-High Channel

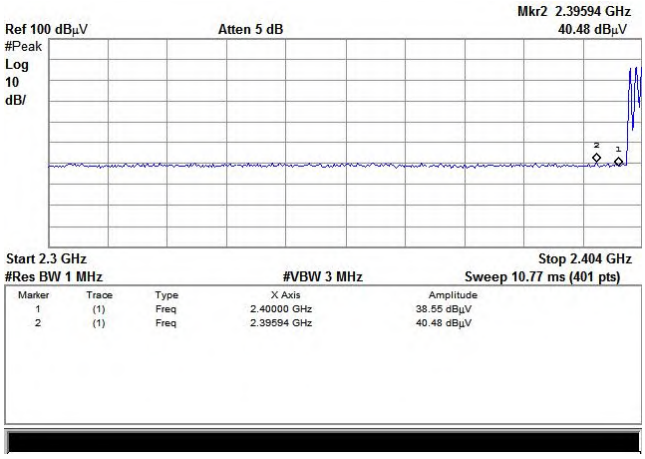


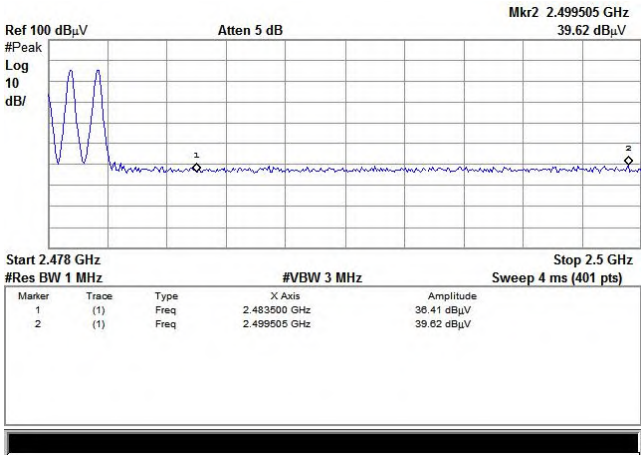
π /4-DQPSK: Band Edge-Low Channel

(Hopping Mode)

π /4-DQPSK: Band Edge-High Channel

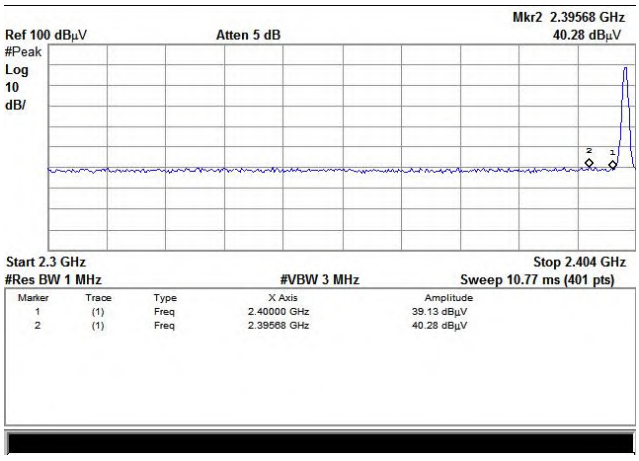
(Hopping Mode)



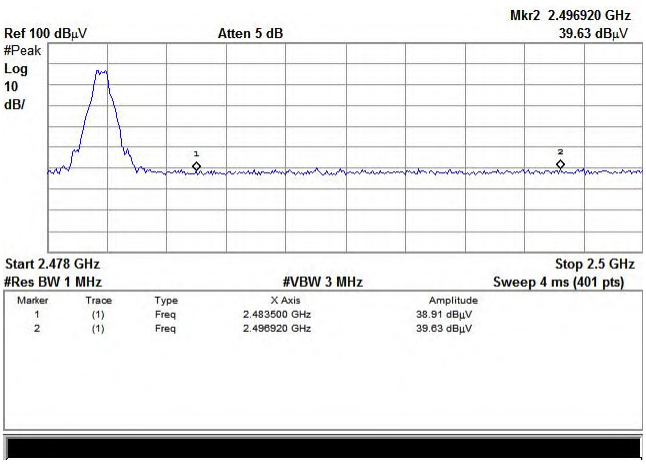


Test Plot

8DQPSK: Band Edge-Low Channel



8DQPSK: Band Edge-High Channel

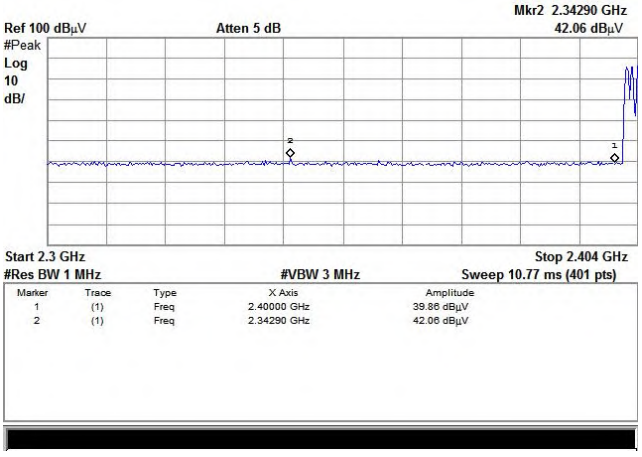


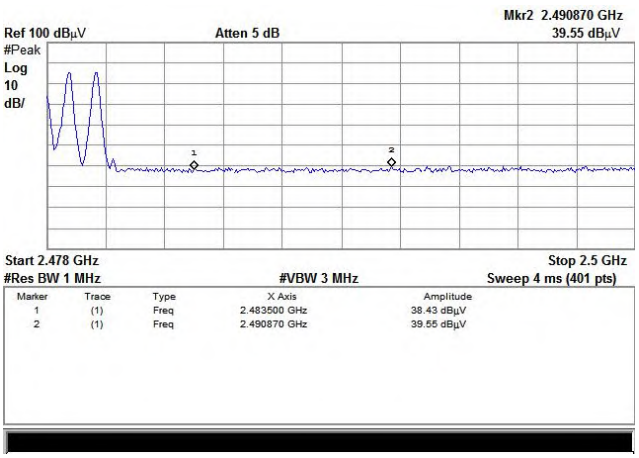
8DQPSK: Band Edge-Low Channel

(Hopping Mode)

8DQPSK: Band Edge-High Channel

(Hopping Mode)


Mkr2 2.34290 GHz
42.06 dBµV
Ref 100 dBµV
Atten 5 dB
#Peak
Log
10
dB/
Start 2.3 GHz
#Res BW 1 MHz
#VBW 3 MHz
Stop 2.404 GHz
Sweep 10.77 ms (401 pts)
Marker Trace Type X Axis Amplitude
1 (1) Freq 2.40000 GHz 39.86 dBµV
2 (1) Freq 2.34290 GHz 42.06 dBµV


Mkr2 2.490870 GHz
39.55 dBµV
Ref 100 dBµV
Atten 5 dB
#Peak
Log
10
dB/
Start 2.478 GHz
#Res BW 1 MHz
#VBW 3 MHz
Stop 2.5 GHz
Sweep 4 ms (401 pts)
Marker Trace Type X Axis Amplitude
1 (1) Freq 2.483500 GHz 38.43 dBµV
2 (1) Freq 2.490870 GHz 39.55 dBµV

10 20 dB Bandwidth Measurement

Test Requirement : FCC CFR47 Part 15 Section 15.247

Test Method : ANSI C63.10:2013

10.1 Test Procedure

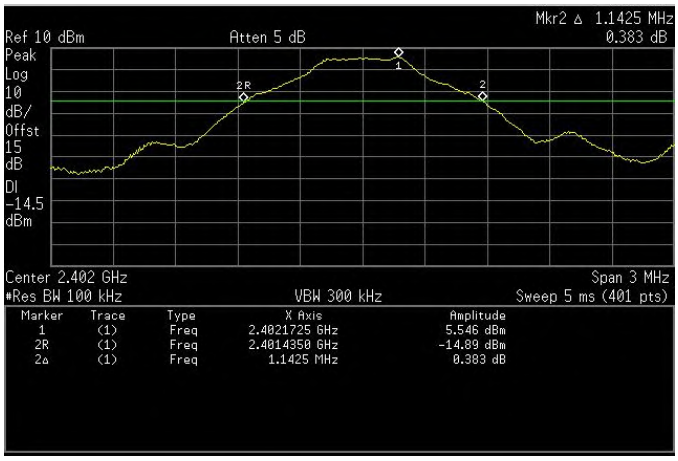
1. Remove the antenna from the EUT and then connect a low RF cable from the antenna port to the spectrum;

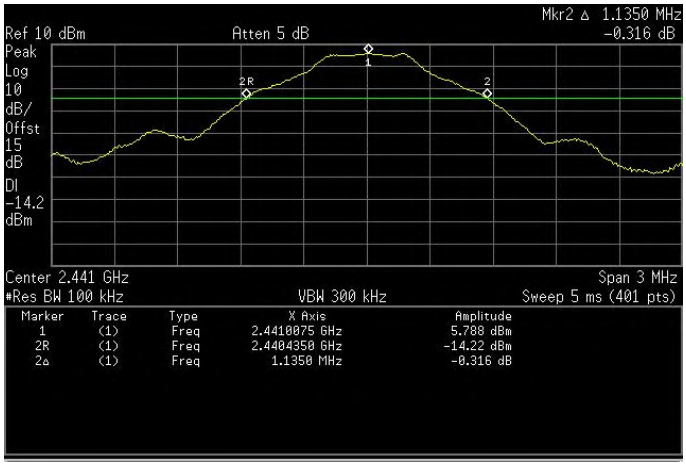
2. Set the spectrum analyzer: RBW =100kHz, VBW = 300kHz

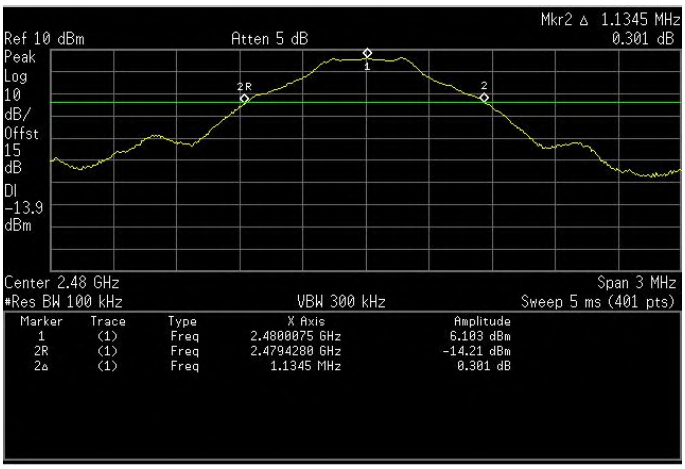
10.2 Test Result

Test Channel	Frequency (MHz)	Measured Bandwidth (MHz)	Limit (kHz)	Verdict
GFSK				
0	2402	1.1425	N/A	PASS
39	2441	1.1350	N/A	PASS
78	2480	1.1345	N/A	PASS
Æ/4DQPSK				
0	2402	1.4050	N/A	PASS
39	2441	1.4195	N/A	PASS
78	2480	1.4120	N/A	PASS
8DPSK				
0	2402	1.4120	N/A	PASS
39	2441	1.4195	N/A	PASS
78	2480	1.4120	N/A	PASS

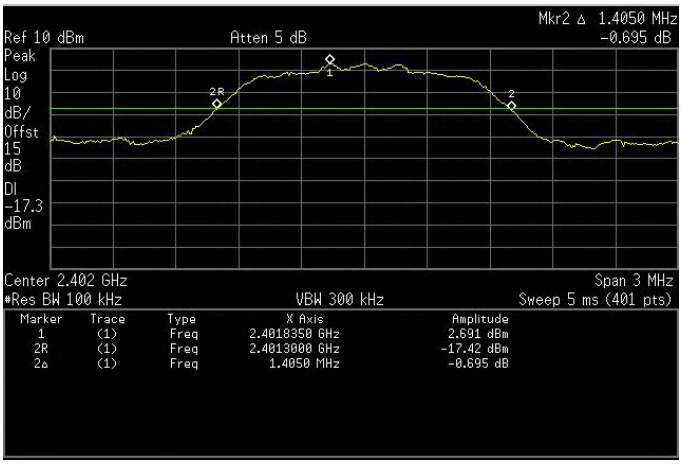
Test Mode: CH00 / CH39 / CH78 (GFSK Mode)

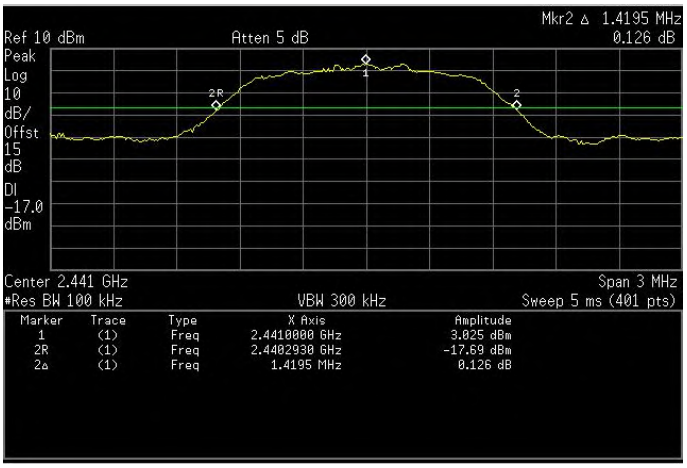


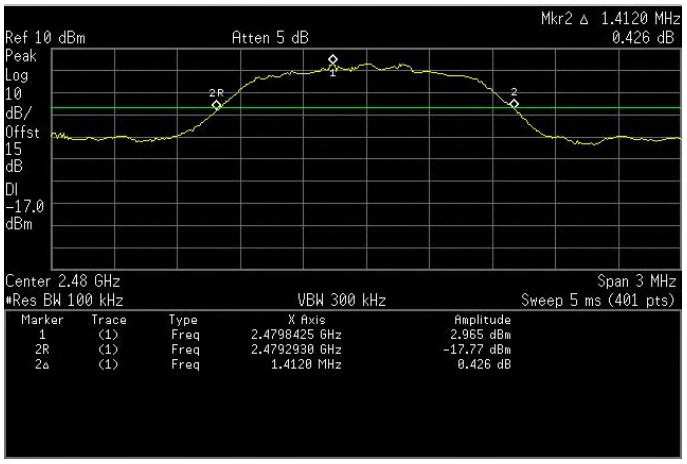




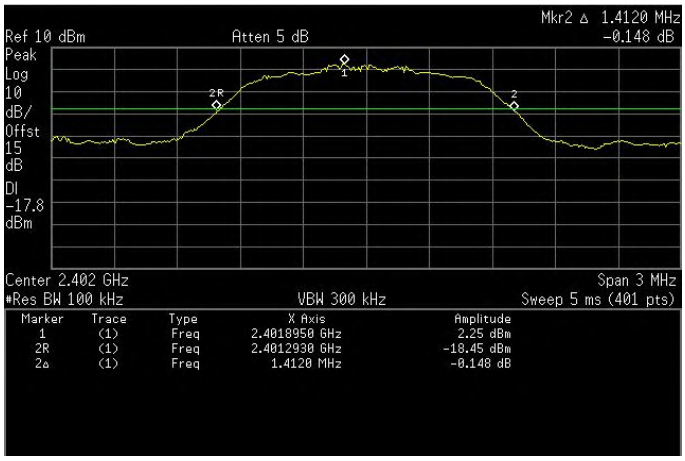
Test Mode: CH00 / CH39 / CH78 (Æ/4DQPSK Mode)

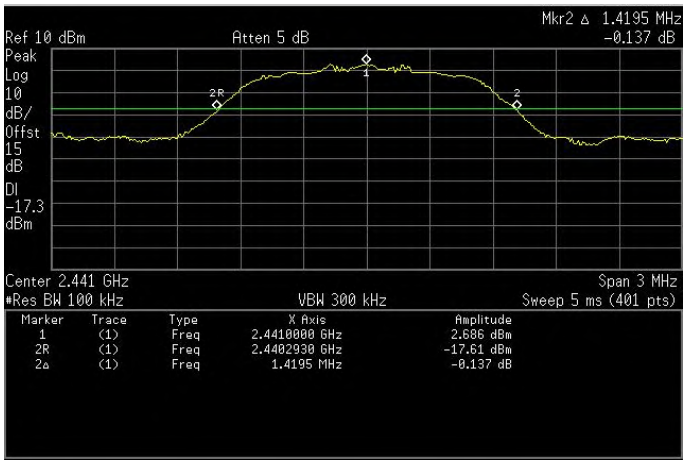


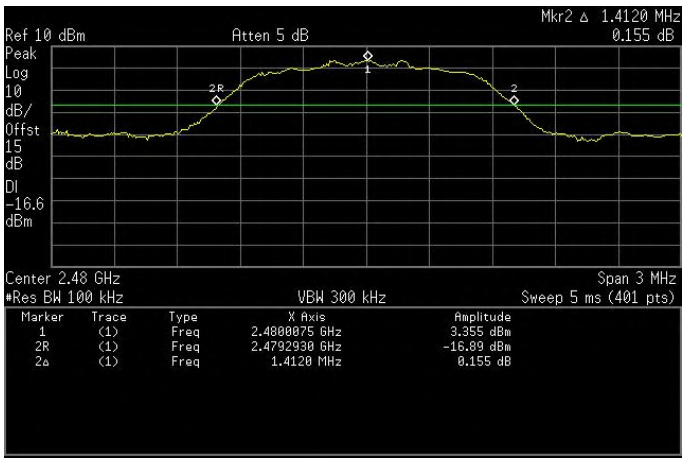




Test Mode: CH00 / CH39 / CH78 (8DPSK Mode)







11 Maximum Peak Output Power

Test Requirement : FCC CFR47 Part 15 Section 15.247

Test Method : ANSI C63.10:2013

Test Limit : Regulation 15.247 (b)(1), For frequency hopping systems operating in the 2400-2483.5 MHz band eploying at least 75 non-overlapping hopping channels, and all frequency hopping systems in the 5725-5850 MHz band: 1 watt (30dBm). For all other frequency hopping systems in the 2400-2483.5 MHz band: 0.125 watts.
Refer to the result “Number of Hopping Frequency” of this document. The 0.125watts (20.97 dBm) limit applies.

11.1Test Procedure

1. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the Power Meter.GFSK, was tested and record.

11.2Test Result

Test Channel	Frequenc y (MHz)	Power Setting	Peak Output Power (dBm)	LIMIT (dBm)	Verdict
1Mbps					
0	2402	Default	5.679	30	PASS
39	2441	Default	5.876	30	PASS
78	2480	Default	6.255	30	PASS
2Mbps					
0	2402	Default	3.466	30	PASS
39	2441	Default	3.649	30	PASS
78	2480	Default	3.595	30	PASS
3Mbps					

0	2402	Default	2.895	30	PASS
39	2441	Default	3.474	30	PASS
78	2480	Default	3.999	30	PASS

12 Hopping Channel Separation

Test Requirement	:	FCC CFR47 Part 15 Section 15.247
Test Method	:	ANSI C63.10:2013
Test Limit	:	Regulation 15.247(a)(1) Frequency hopping systems shall have hopping channel carrier frequencies separated by a minimum of 25 kHz or the 20 dB bandwidth of the hopping channel, whichever is greater. Alternatively, frequency hopping systems operating in the 2400-2483.5MHz band may have hopping channel carrier frequencies that are separated by 25 kHz or two-thirds of the 20 dB bandwidth of the hopping channel, whichever is greater, provided the systems operate with an output power no greater than 1W.
Test Mode	:	Hopping

12.1 Test Procedure

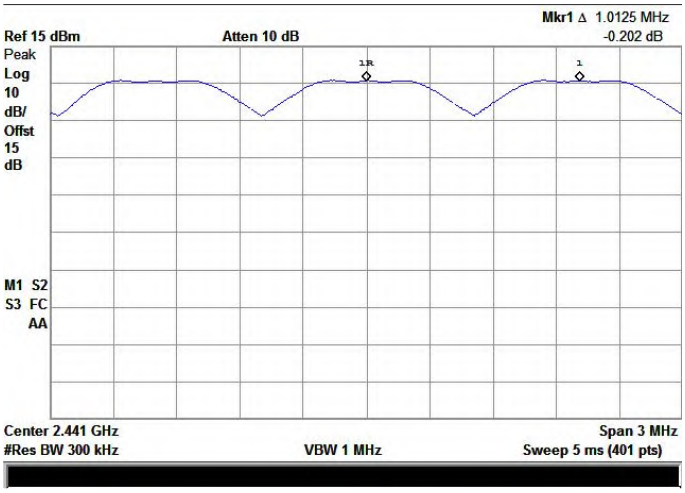
1. Remove the antenna from the EUT and then connect a low RF cable from the antenna port to the spectrum.

2. Set the spectrum analyzer: RBW =300KHz. VBW =1MHz, Span = 3.0MHz. Sweep = auto; Detector Function = Peak. Trace = Max hold.

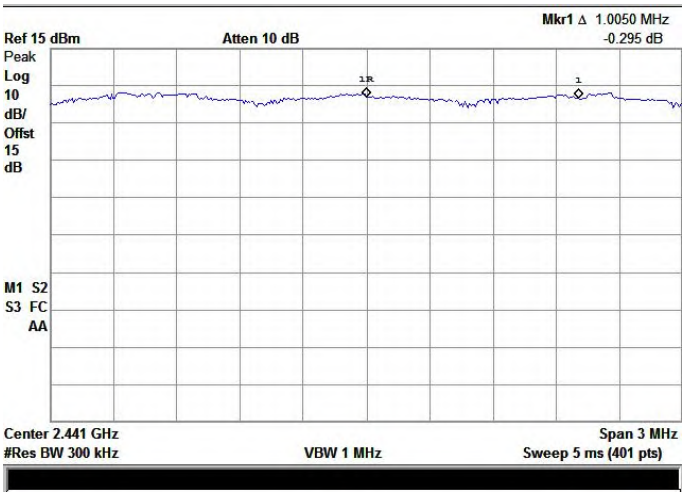
3. Allow the trace to stabilize. Use the marker-delta function to determine the separation between the peaks of the adjacent channels. The limit is specified in one of the subparagraphs of this Section Submit this plot.

12.2 Test Result

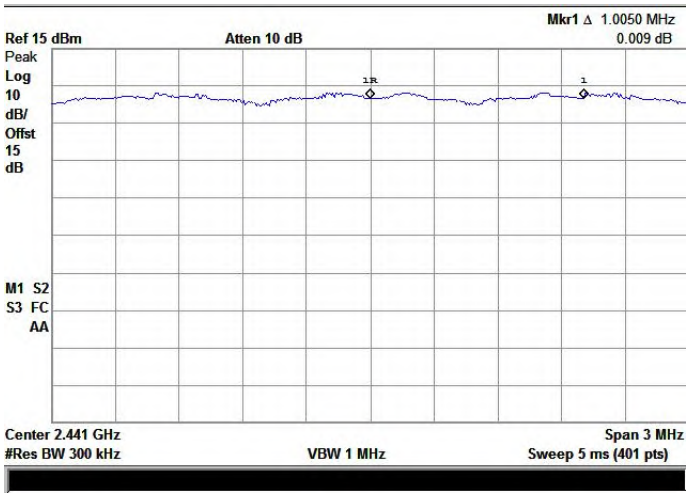
(GFSK) Channel Separation plot



(Æ/4DQPSK) Channel Separation plot



(8DPSK) Channel Separation plot



13 Number of Hopping Frequency

Test Requirement	:	FCC CFR47 Part 15 Section 15.247
Test Method	:	ANSI C63.10:2013
Test Limit	:	Regulation 15.247 (a)(1)(iii) Frequency hopping systems in the 2400-2483.5 MHz band shall use at least 15 channels.
Test Mode	:	Hopping(GFSK)

13.1 Test Procedure

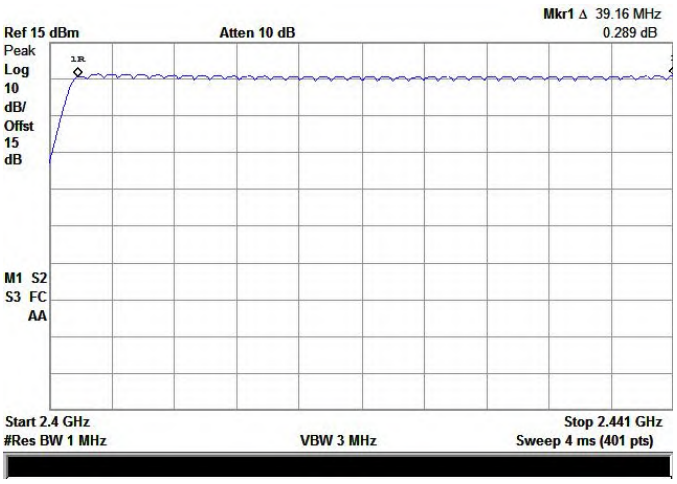
1. Remove the antenna from the EUT and then connect a low RF cable from the antenna port to the spectrum.
2. Set the spectrum analyzer: RBW = 1MHz. VBW = 3MHz. Sweep = auto; Detector Function = Peak. Trace = Max hold.
3. Allow the trace to stabilize. It may prove necessary to break the span up to sections. in order to clearly show all of the hopping frequencies. The limit is specified in one of the subparagraphs of this Section.
4. Set the spectrum analyzer: Start Frequency = 2.4GHz, Stop Frequency = 2.483GHz. Sweep=auto;

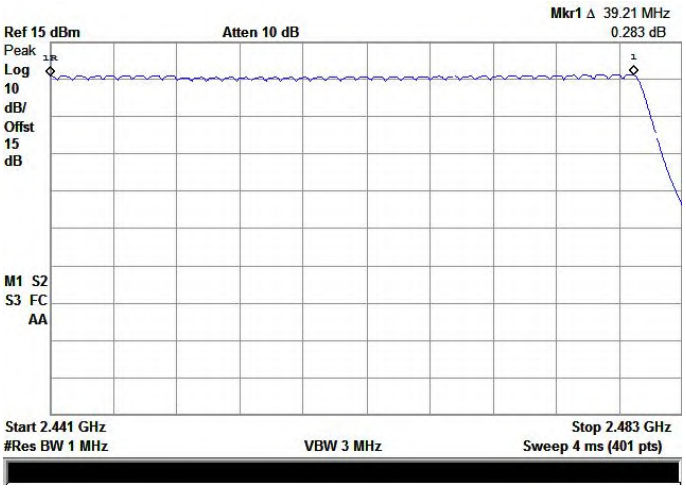
13.2 Test Result

Quantity of Hopping Channel	Limit	Results
79	>15	Pass

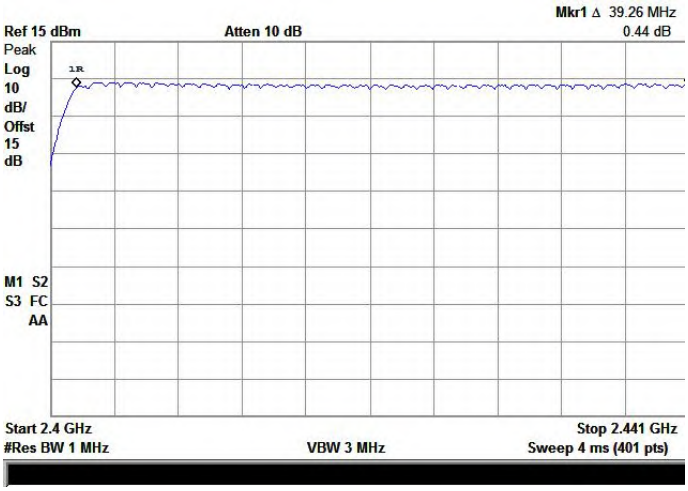
Test plots

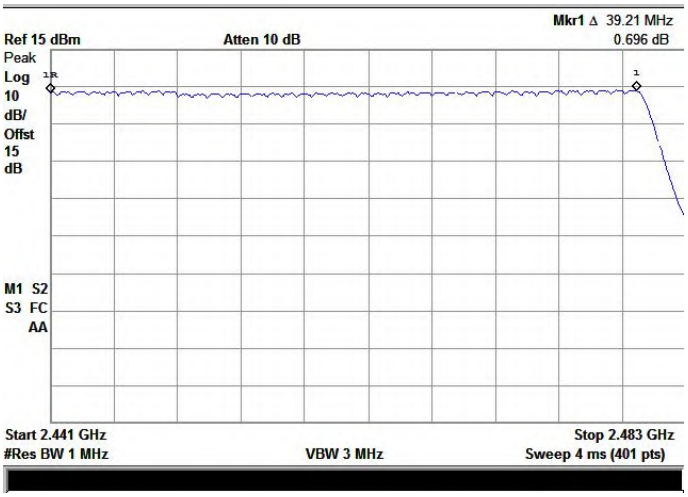
GFSK



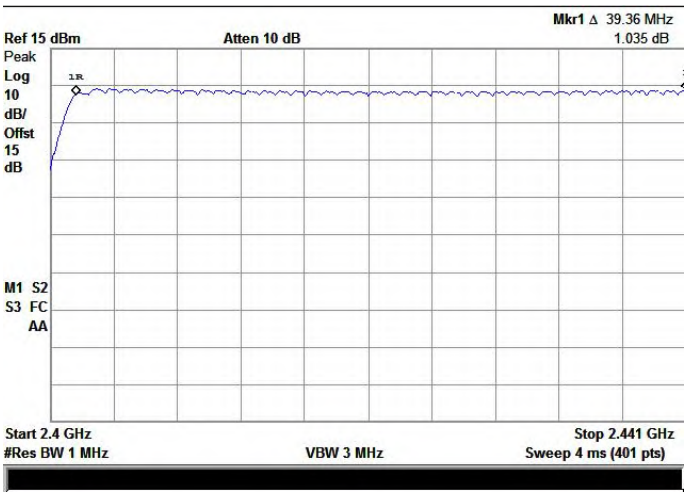


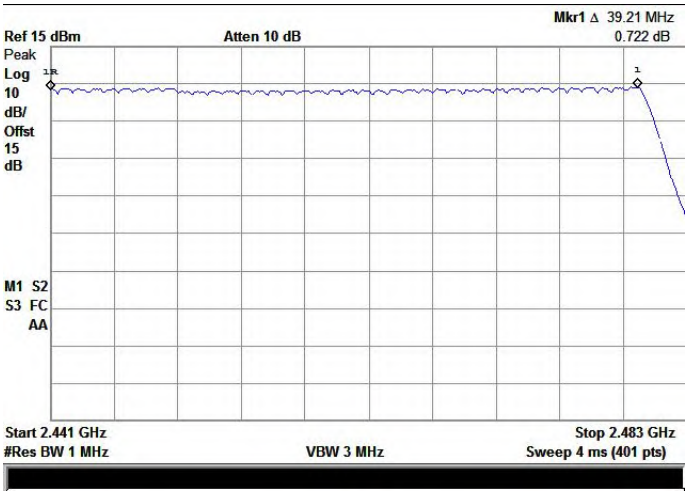
Test plots
Æ/4DQPSK





Test plots
8DPSK





14 Dwell Time

Test Requirement	:	FCC CFR47 Part 15 Section 15.247
Test Method	:	ANSI C63.10:2013
Test Limit	:	Regulation 15.247(a)(1)(iii) Frequency hopping systems in the 2400-2483.5 MHz band shall use at least 15 channels. The average time of occupancy on any channel shall not be greater than 0.4 seconds within a period of 0.4 seconds multiplied by the number of hopping channels employed.
Test Mode	:	The test model GFSK and was recorded.

14.1 Test Procedure

1. Remove the antenna from the EUT and then connect a low RF cable from the antenna port to the spectrum.

2. Set spectrum analyzer span = 0. Centred on a hopping channel;

3. Set RBW = 300KHz and VBW = 300KHz.Sweep = as necessary to capture the entire dwell time per hopping channel. Set the EUT for DH5, DH3 and DH1 packet transmitting.

4. Use the marker-delta function to determine the dwell time. If this value varies with different modes of operation (e.g.. data rate. modulation format. etc.). repeat this test for each variation. The limit is specified in one of the subparagraphs of this Section. Submit this plot(s).DH5 was worse case.

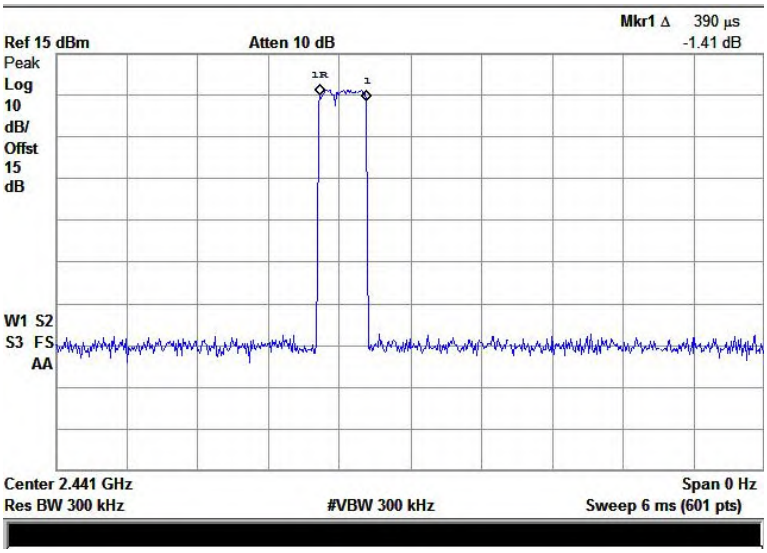
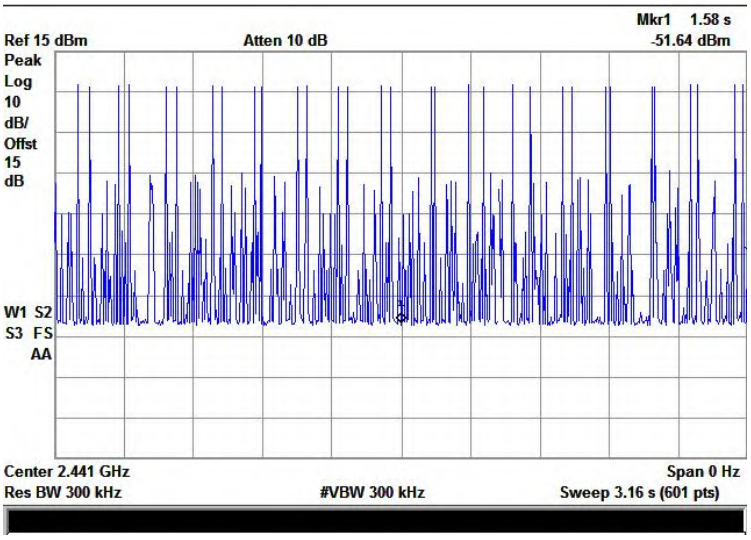
14.2 Test Result

GFSK

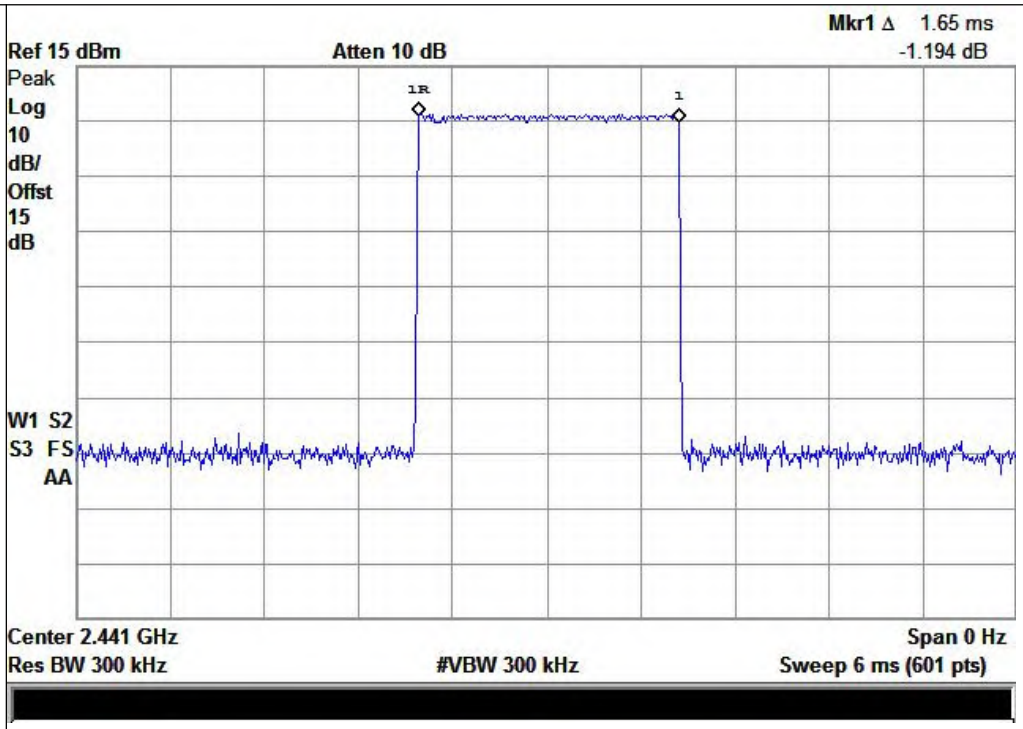
DH Packet	Pulse Width (msec)	Number of pulse in 3.16 seconds	Refer to Plot	Average Time of Occupancy (sec)	Limit (sec)	Verdict
DH1	0.390	32	Plot A	0.125	0.4	PASS
DH3	1.650	12	Plot B	0.198		PASS
DH5	2.880	10	Plot C	0.288		PASS

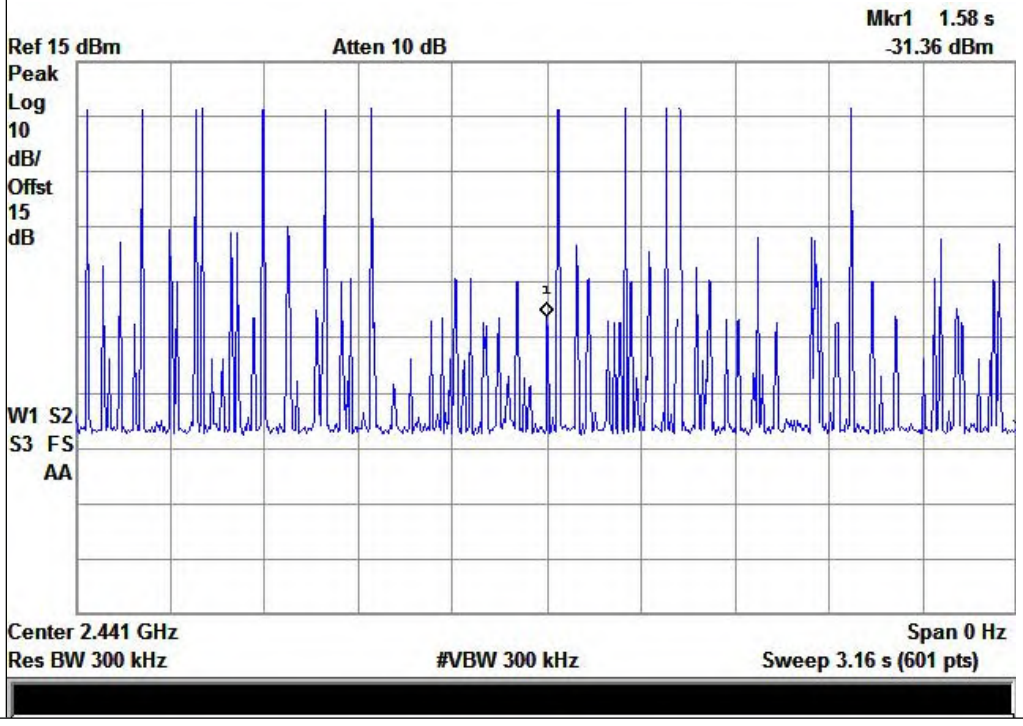
The transmitter output is connected to a spectrum analyzer. The span is set to 0 Hz, centered on a single, selected hopping channel. The width of a single pulse is measured in a fast scan. The number of pulses is measured in a 3.16 second scan, to enable resolution of each occurrence.

The average time of occupancy in the specified 31.6 second period (79 channel * 0.4 s) is equal to 10 * (# of pulses in 3.16 s) * pulse width.

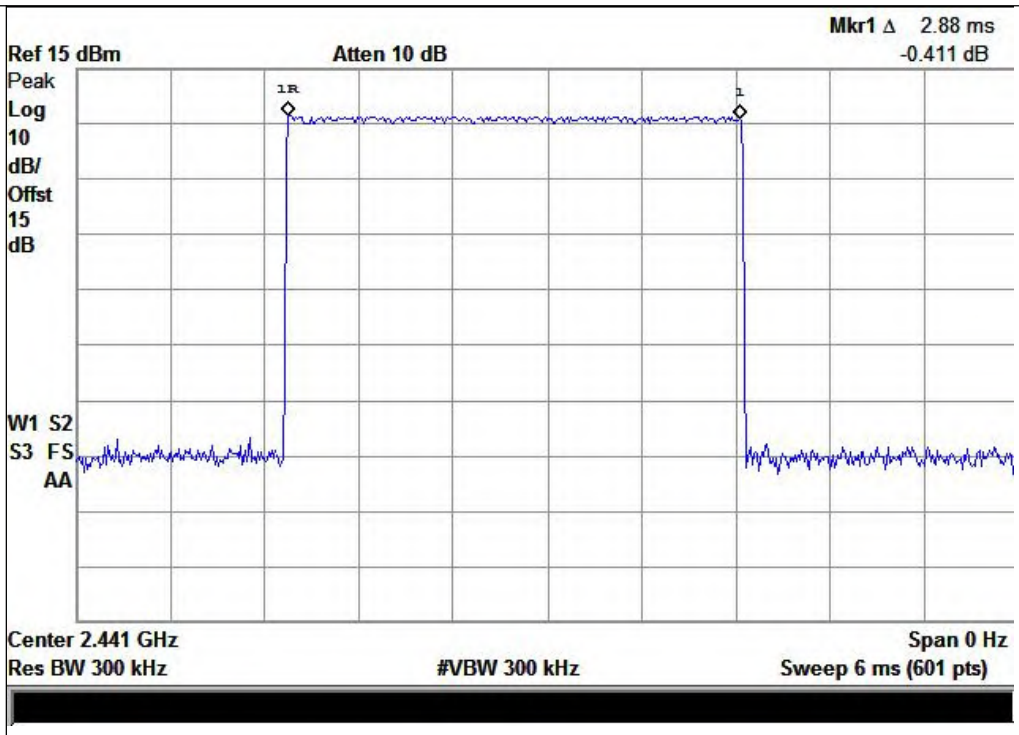
Modulation mode	GFSK mode
Plot A: DH1	 

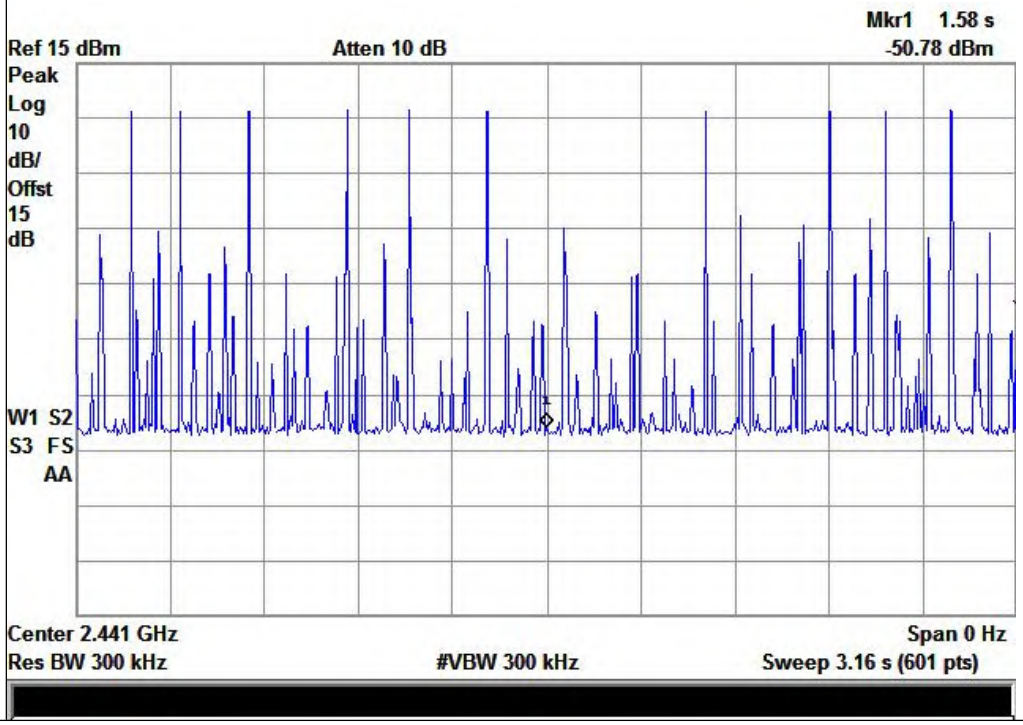
Plot B:
DH3


Mkr1 Δ 1.65 ms
-1.194 dB
Ref 15 dBm
Atten 10 dB
Peak
Log
10
dB/
Offst
15
dB
1R
1
W1 S2
S3 FS
AA
Center 2.441 GHz
Res BW 300 kHz
#VBW 300 kHz
Span 0 Hz
Sweep 6 ms (601 pts)


Mkr1 1.58 s
-31.36 dBm
Ref 15 dBm
Atten 10 dB
Peak
Log
10
dB/
Offst
15
dB
1
W1 S2
S3 FS
AA
Center 2.441 GHz
Res BW 300 kHz
#VBW 300 kHz
Span 0 Hz
Sweep 3.16 s (601 pts)

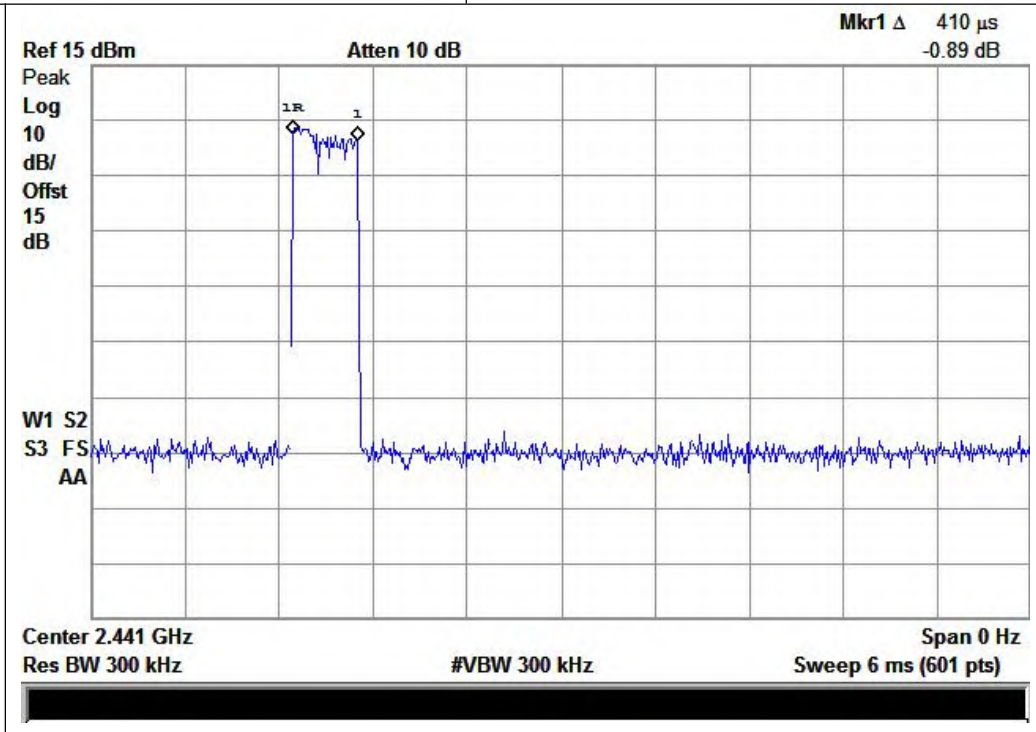
Plot C:
DH5

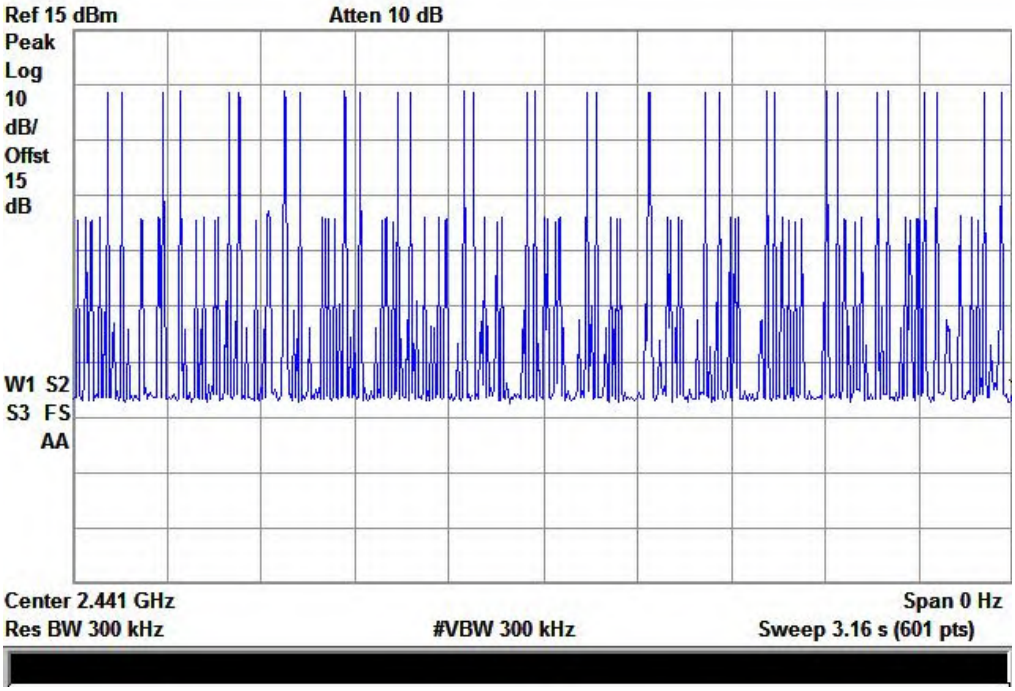

Mkr1 Δ 2.88 ms
-0.411 dB
Ref 15 dBm
Atten 10 dB
Peak
Log
10
dB/
Offst
15
dB
1R
1
W1 S2
S3 FS
AA
Center 2.441 GHz
Res BW 300 kHz
#VBW 300 kHz
Span 0 Hz
Sweep 6 ms (601 pts)


Mkr1 1.58 s
-50.78 dBm
Ref 15 dBm
Atten 10 dB
Peak
Log
10
dB/
Offst
15
dB
W1 S2
S3 FS
AA
Center 2.441 GHz
Res BW 300 kHz
#VBW 300 kHz
Span 0 Hz
Sweep 3.16 s (601 pts)

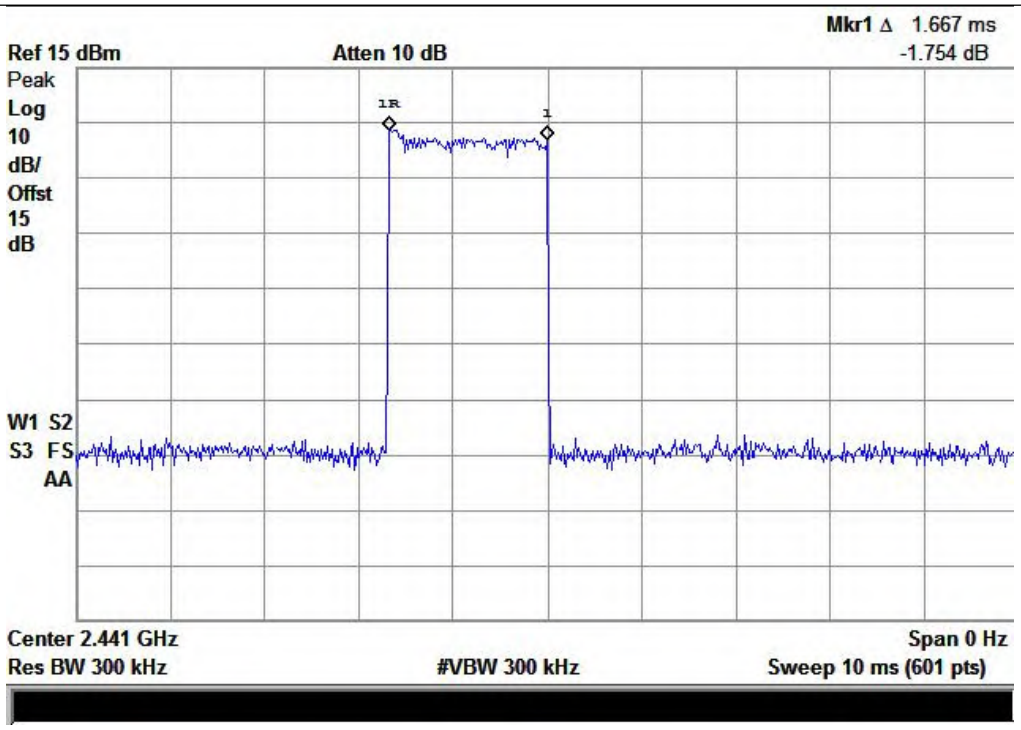
Type of Modulation: Æ/4DQPSK

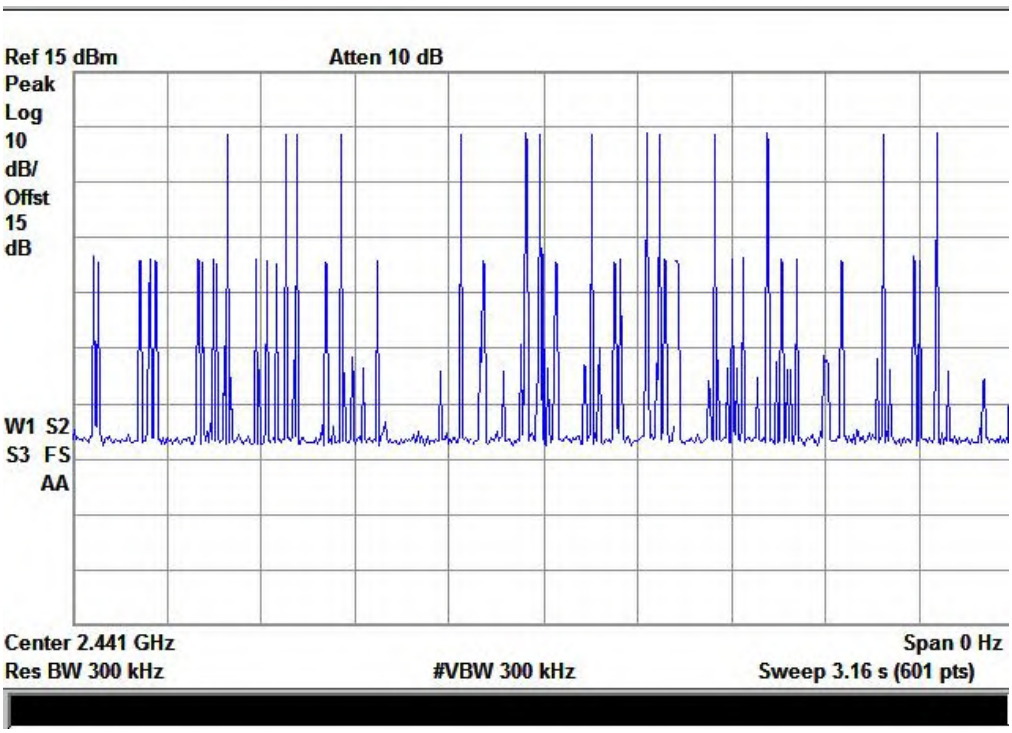
DH Packet	Pulse Width (msec)	Number of pulse in 3.16 seconds	Refer to Plot	Average Time of Occupancy (sec)	Limit (sec)	Verdict
DH1	0.410	31	Plot D	0.127	0.4	PASS
DH3	1.667	14	Plot E	0.233		PASS
DH5	2.900	13	Plot F	0.377		PASS

Modulation mode	Æ/4DQPSK
Plot D: DH1	

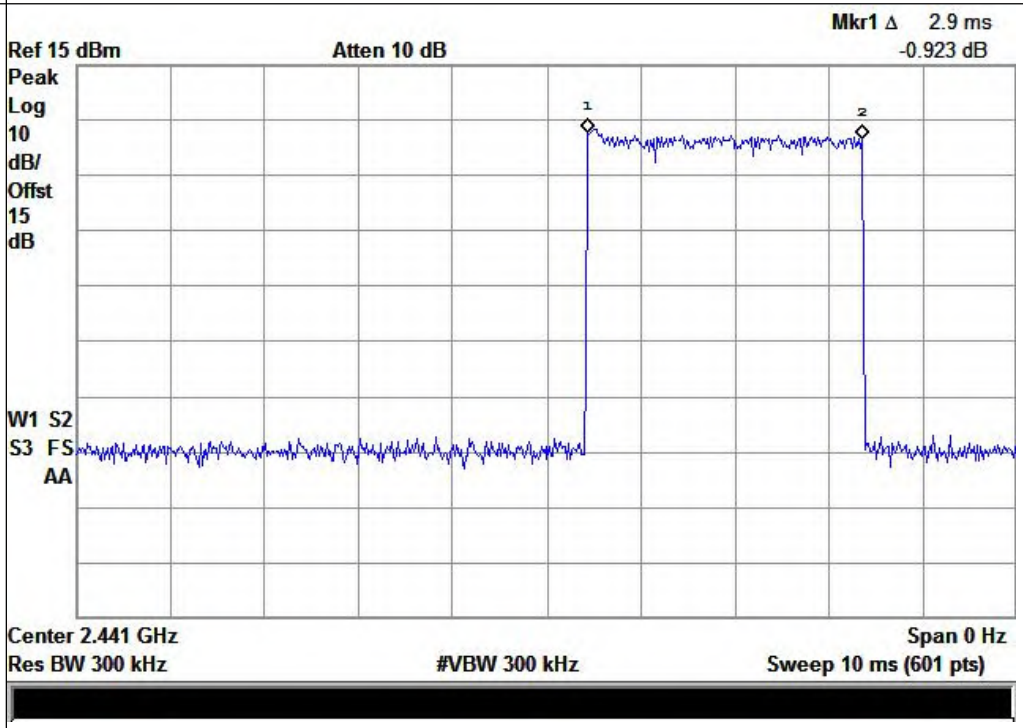

Ref 15 dBm
Atten 10 dB
Peak
Log
10
dB/
Offst
15
dB
W1 S2
S3 FS
AA
Center 2.441 GHz
Span 0 Hz
Res BW 300 kHz
#VBW 300 kHz
Sweep 3.16 s (601 pts)

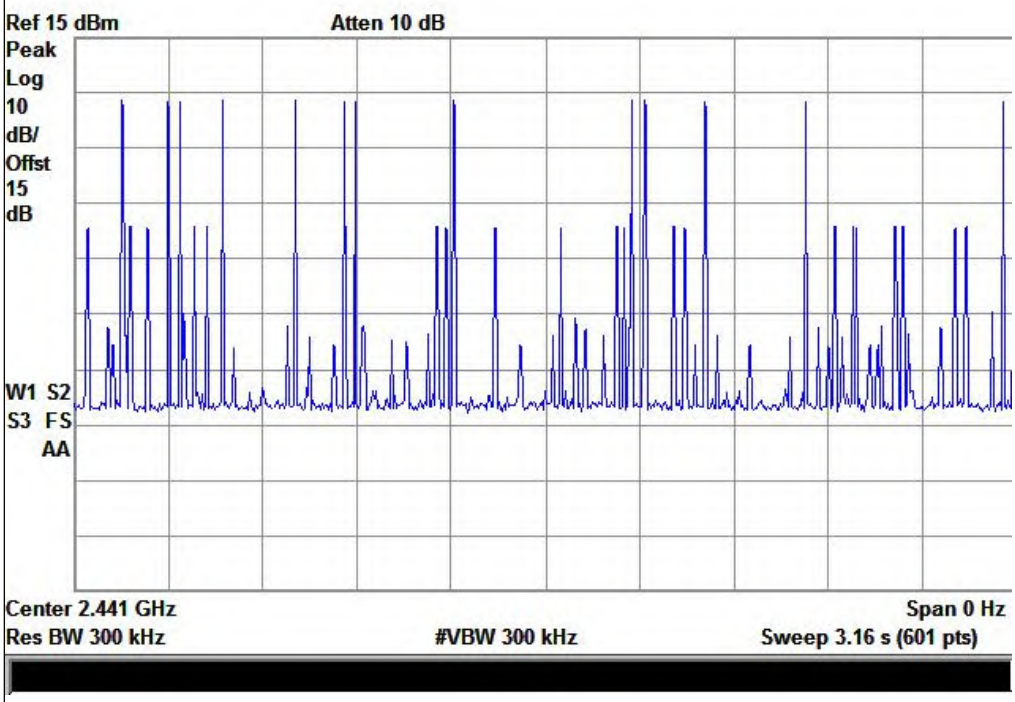
Plot E: DH3


Mkr1 Δ 1.667 ms
-1.754 dB
Ref 15 dBm
Atten 10 dB
Peak
Log
10
dB/
Offst
15
dB
1R
1
W1 S2
S3 FS
AA
Center 2.441 GHz
Span 0 Hz
Res BW 300 kHz
#VBW 300 kHz
Sweep 10 ms (601 pts)


Ref 15 dBm
Atten 10 dB
Peak
Log
10
dB/
Offst
15
dB
W1 S2
S3 FS
AA
Center 2.441 GHz
Res BW 300 kHz
#VBW 300 kHz
Span 0 Hz
Sweep 3.16 s (601 pts)

Plot F: DH5

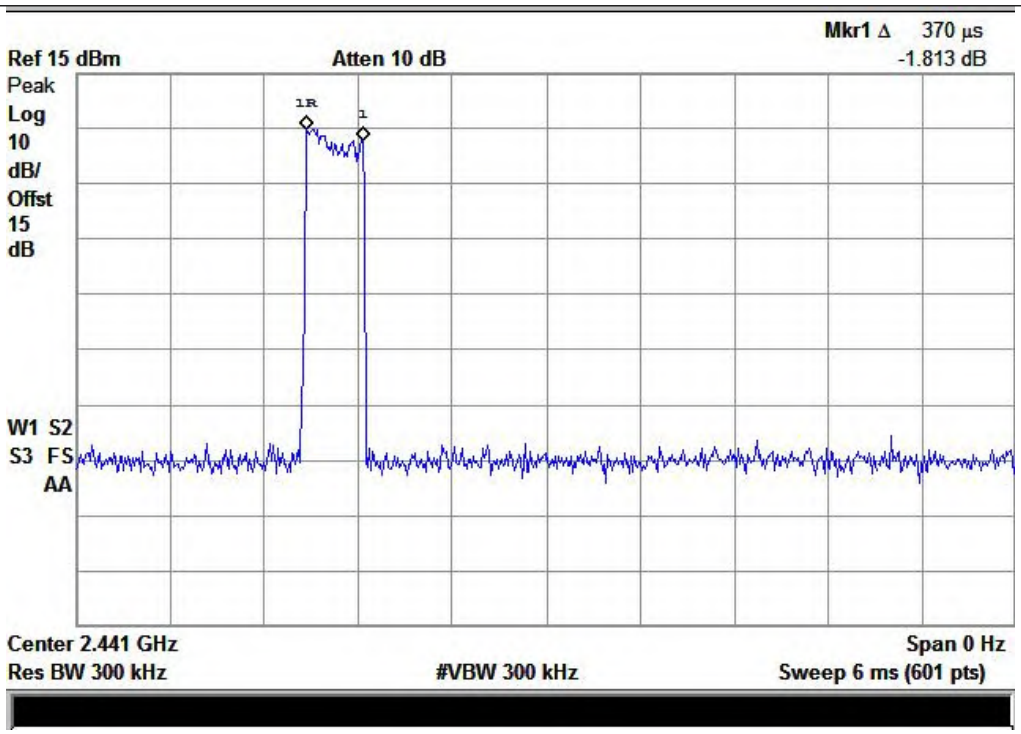
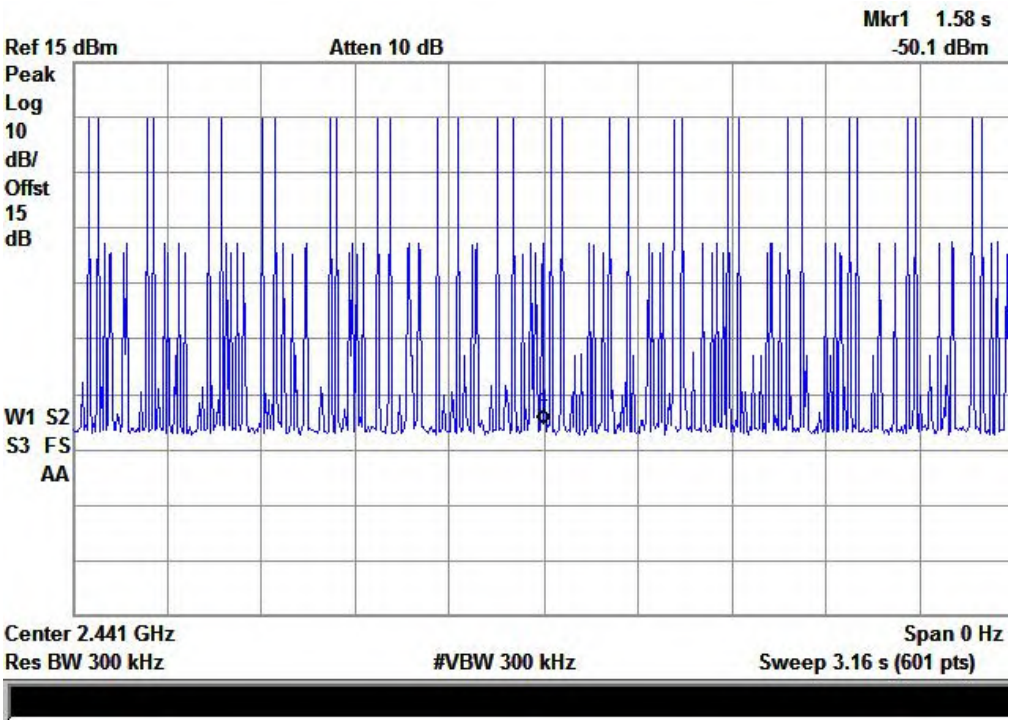

Mkr1 Δ 2.9 ms
-0.923 dB
Ref 15 dBm
Atten 10 dB
Peak
Log
10
dB/
Offst
15
dB
1
2
W1 S2
S3 FS
AA
Center 2.441 GHz
Res BW 300 kHz
#VBW 300 kHz
Span 0 Hz
Sweep 10 ms (601 pts)

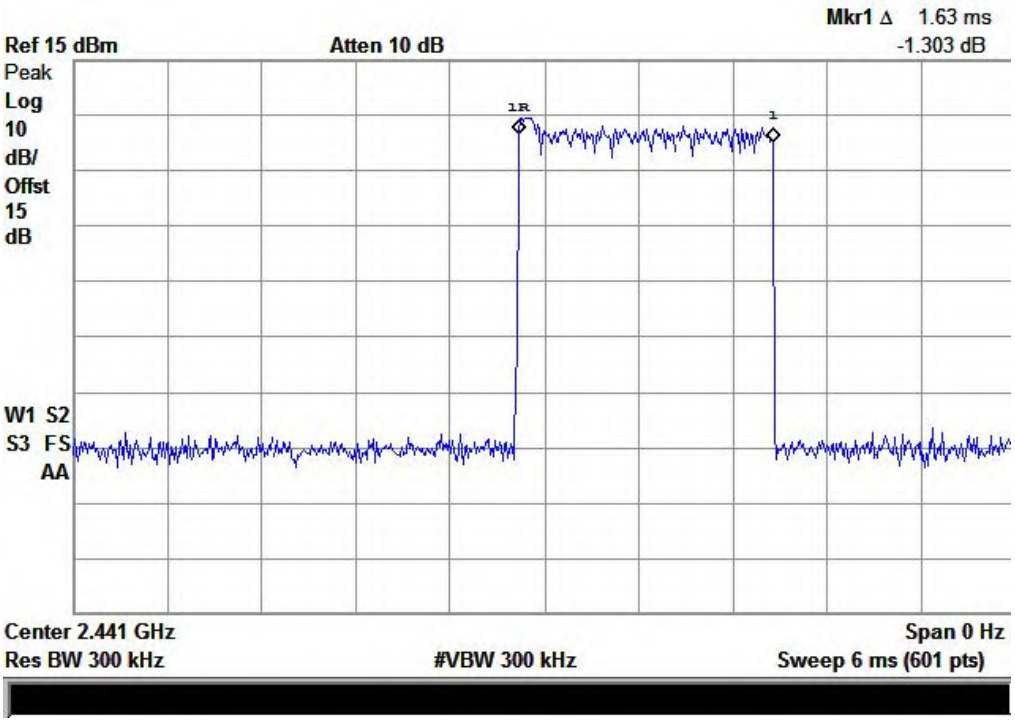
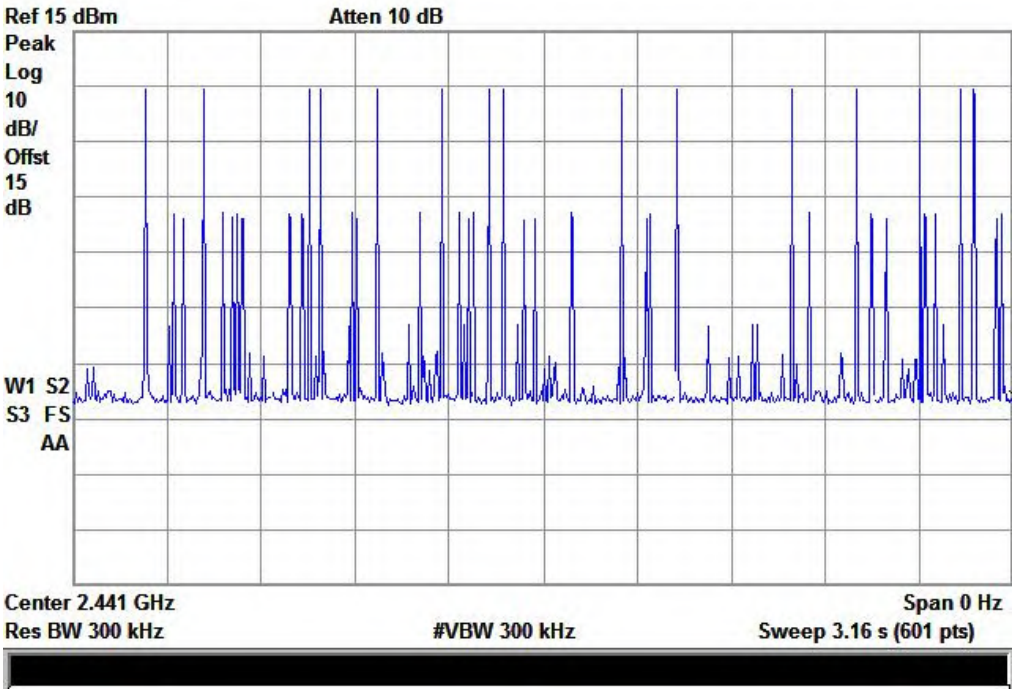


Type of Modulation: 8DPSK

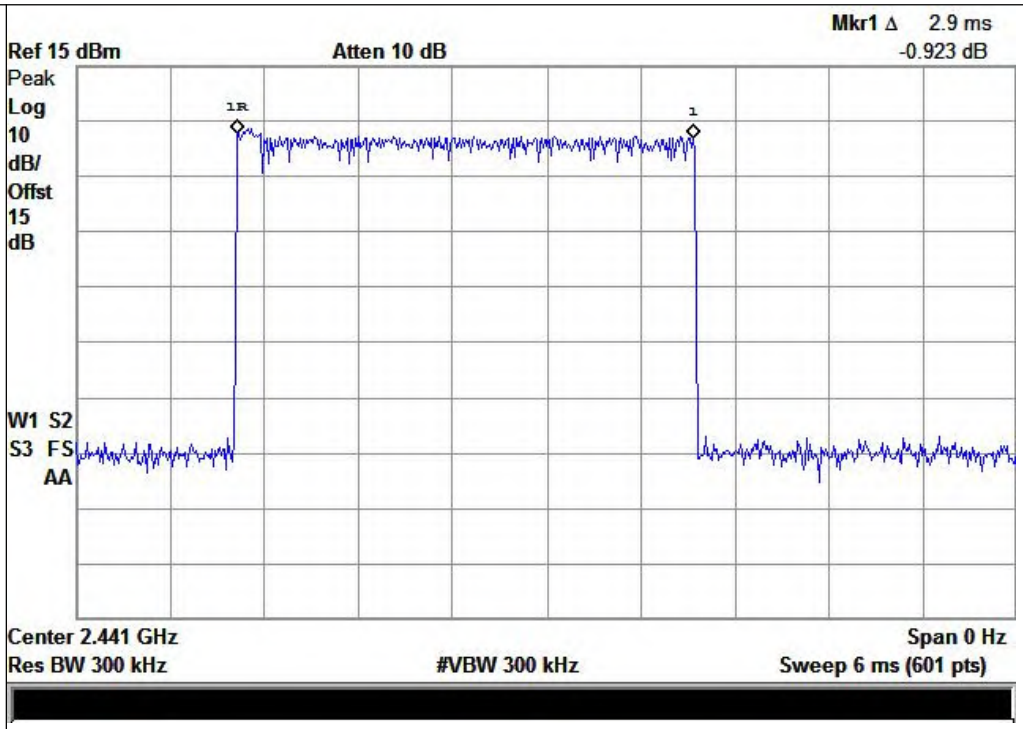
DH Packet	Pulse Width (msec)	Number of pulse in 3.16 seconds	Refer to Plot	Average Time of Occupancy (sec)	Limit (sec)	Verdict
DH1	0.370	32	Plot G	0.118	0.4	PASS
DH3	1.630	15	Plot H	0.245		PASS
DH5	2.900	11	Plot I	0.319		PASS

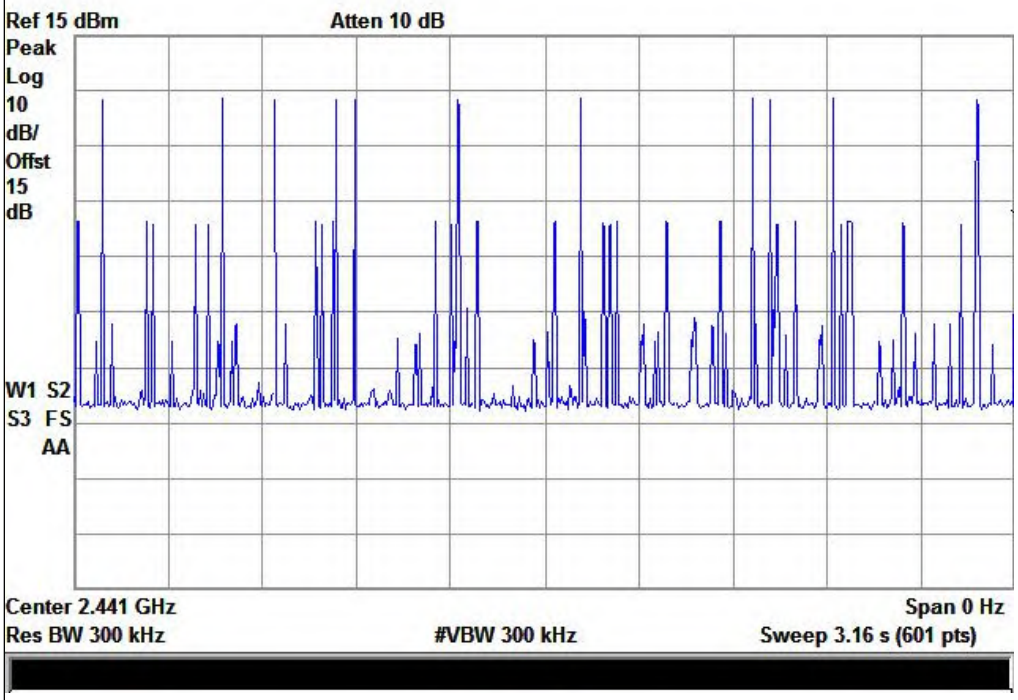
Modulation mode	8DPSK

Plot G: DH1	 Mkr1 Δ 370 µs -1.813 dB Ref 15 dBm Atten 10 dB Peak Log 10 dB/ Offst 15 dB 1R 1 W1 S2 S3 FS AA Center 2.441 GHz Span 0 Hz Res BW 300 kHz #VBW 300 kHz Sweep 6 ms (601 pts)  Mkr1 1.58 s -50.1 dBm Ref 15 dBm Atten 10 dB Peak Log 10 dB/ Offst 15 dB W1 S2 S3 FS AA Center 2.441 GHz Span 0 Hz Res BW 300 kHz #VBW 300 kHz Sweep 3.16 s (601 pts)

Plot H: DH3	 Mkr1 Δ 1.63 ms -1.303 dB Ref 15 dBm Atten 10 dB Peak Log 10 dB/ Offst 15 dB 1R 1 W1 S2 S3 FS AA Center 2.441 GHz Res BW 300 kHz #VBW 300 kHz Span 0 Hz Sweep 6 ms (601 pts)  Ref 15 dBm Atten 10 dB Peak Log 10 dB/ Offst 15 dB W1 S2 S3 FS AA Center 2.441 GHz Res BW 300 kHz #VBW 300 kHz Span 0 Hz Sweep 3.16 s (601 pts)

Plot I:
DH5


Mkr1 Δ 2.9 ms
-0.923 dB
Ref 15 dBm
Atten 10 dB
Peak
Log
10
dB/
Offst
15
dB
1R
1
W1 S2
S3 FS
AA
Center 2.441 GHz
Res BW 300 kHz
#VBW 300 kHz
Span 0 Hz
Sweep 6 ms (601 pts)


Ref 15 dBm
Atten 10 dB
Peak
Log
10
dB/
Offst
15
dB
W1 S2
S3 FS
AA
Center 2.441 GHz
Res BW 300 kHz
#VBW 300 kHz
Span 0 Hz
Sweep 3.16 s (601 pts)

15 Antenna Requirement

15.1 Antenna Requirement

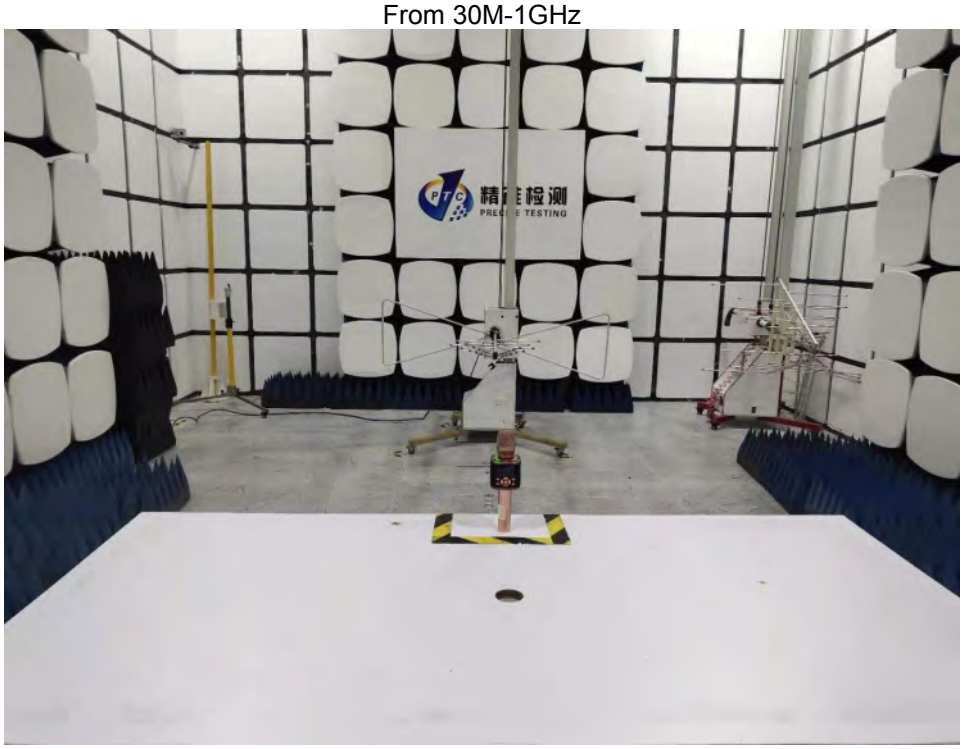
For intentional device, according to FCC 47 CFR Section 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. And according to FCC 47 CFR Section 15.247 (b), if transmitting antennas of directional gain greater than 6dBi are used, the power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6dBi.

15.2 Result

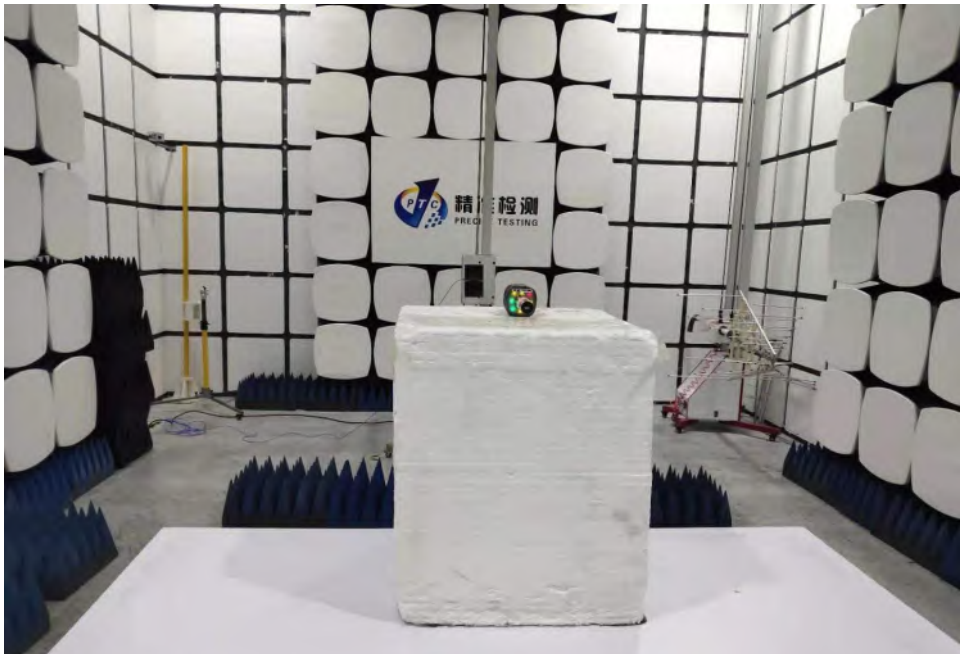
The EUT’S antenna, permanent attached antenna, is Internal FPC Antenna. The antenna’s gain is 2dBi and meets the requirement.

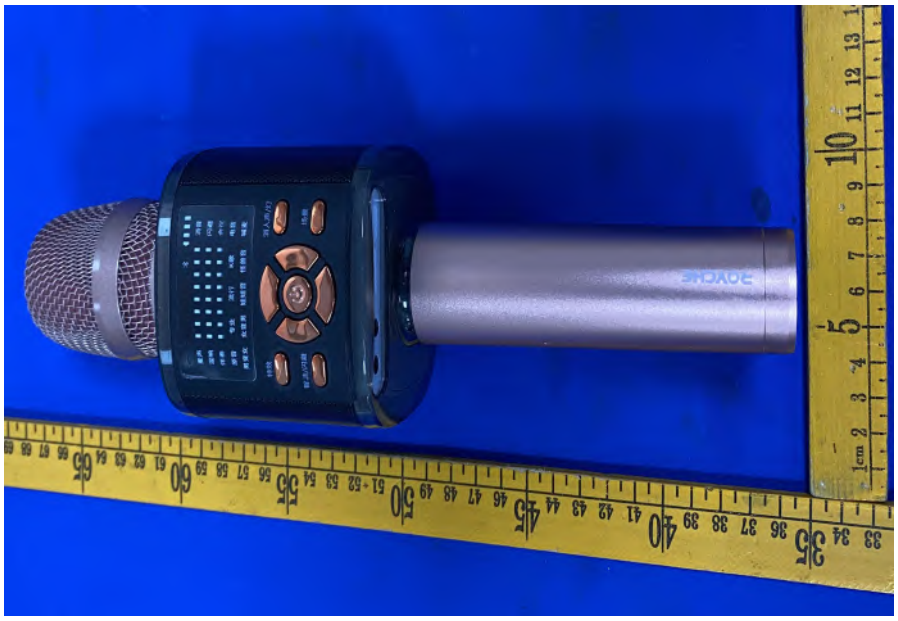
16 SET UP PHOTOS AND EUT PHOTOS

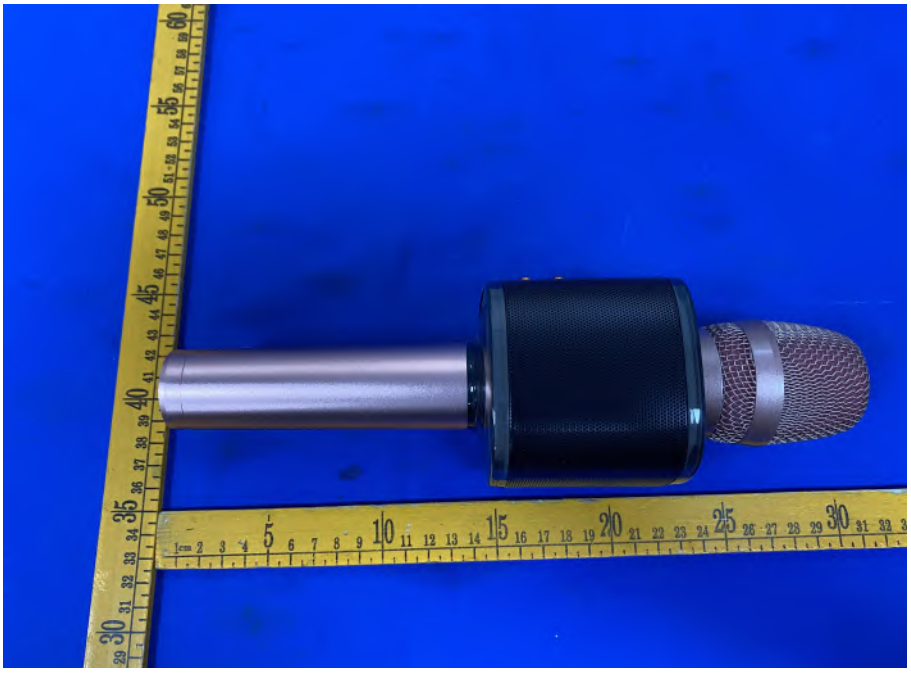
Radiated Emissions
From 30M-1GHz



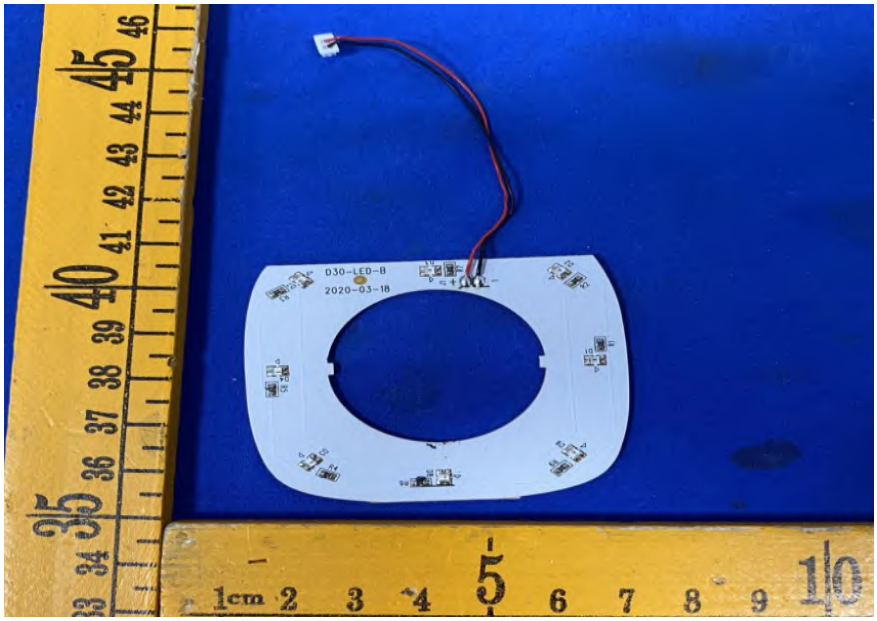
Above 1GHz

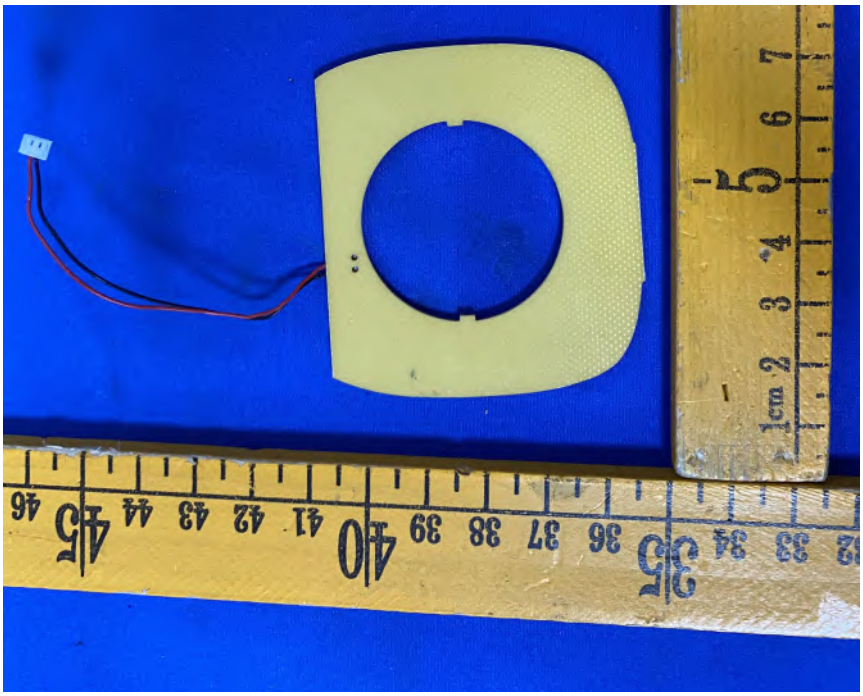


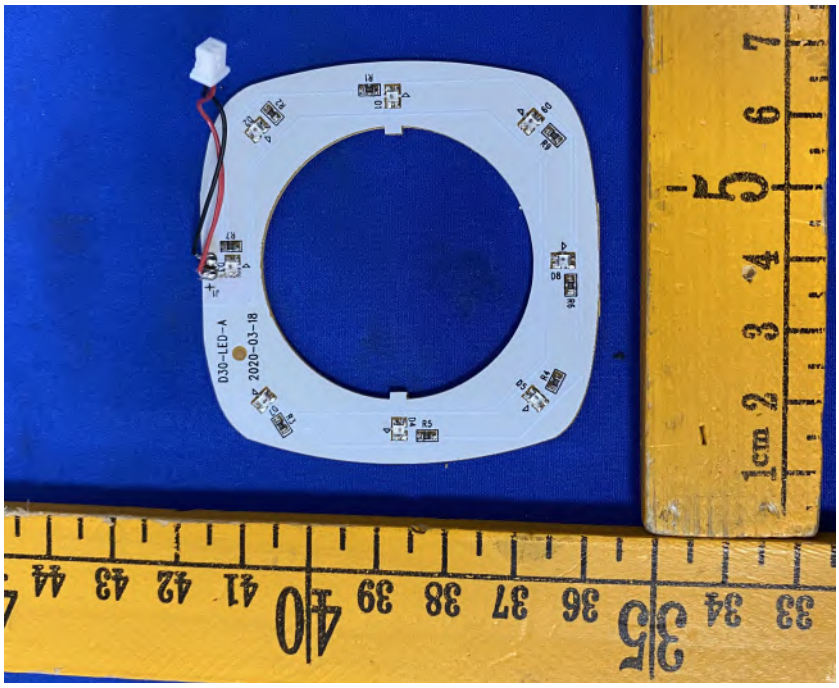


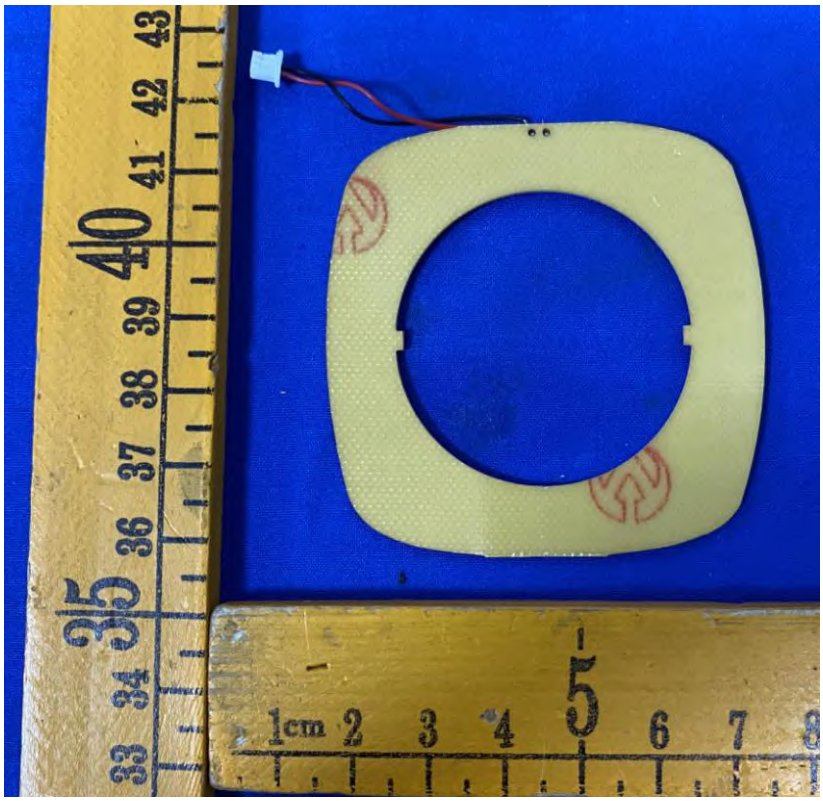


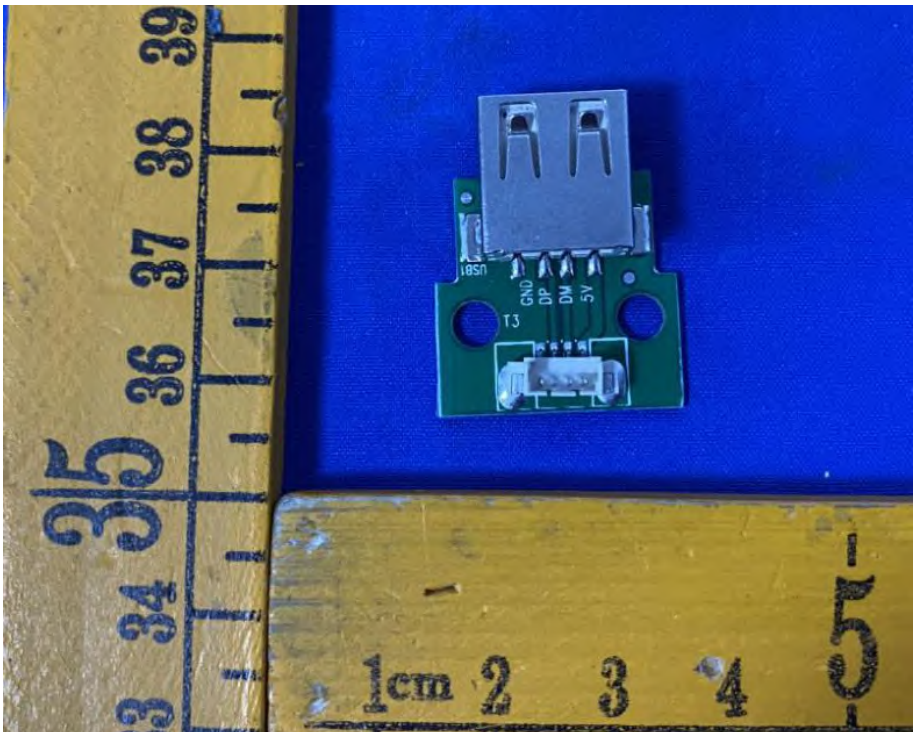

+ JXY 18650 2000MAh 3.7V 210506 -

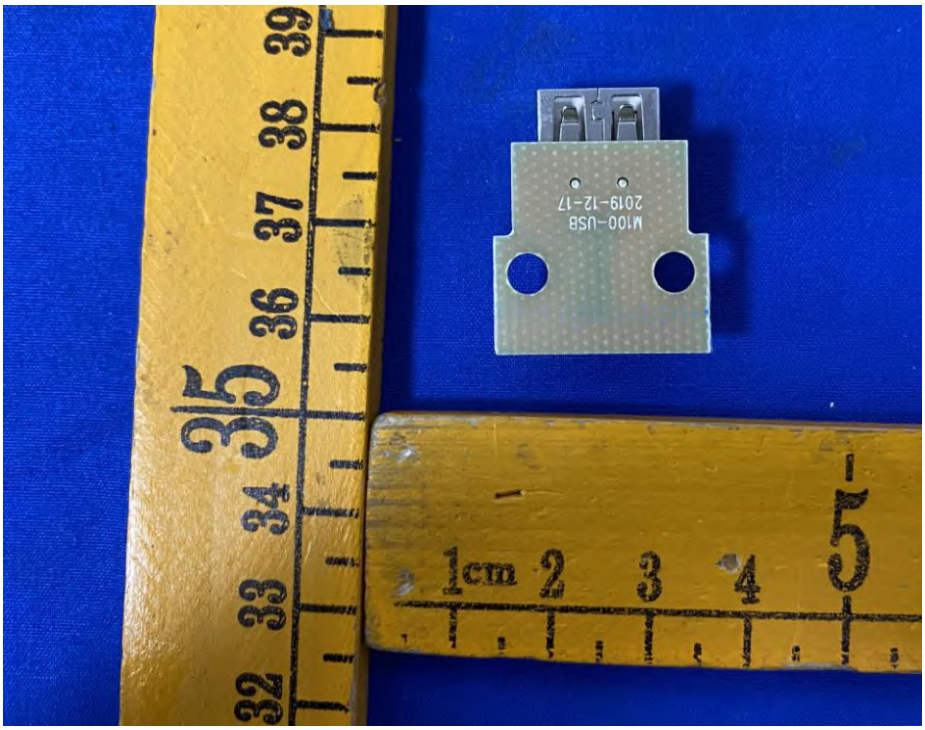

D30-LED-B
2020-03-18

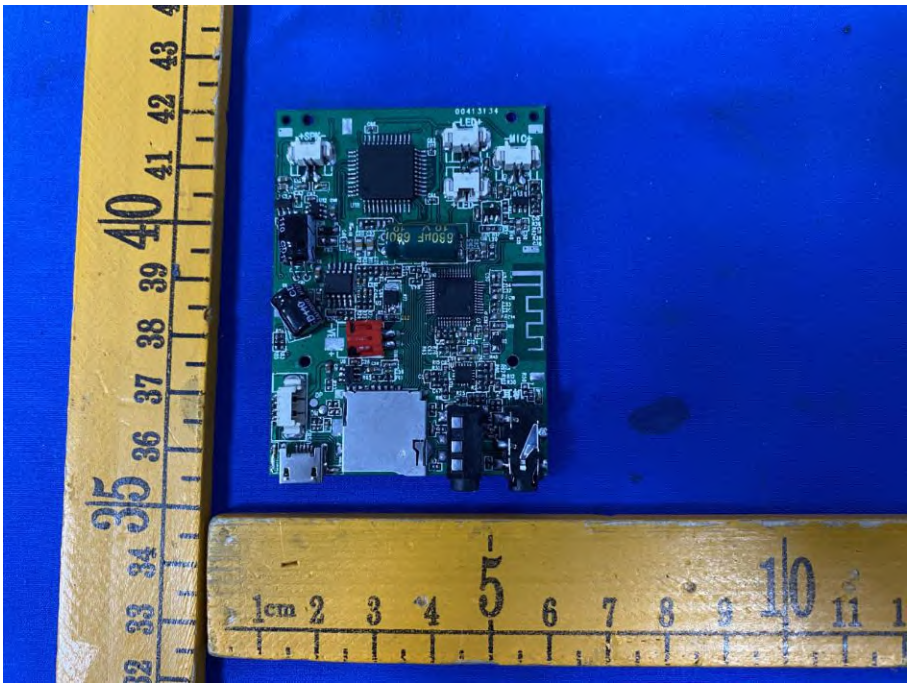


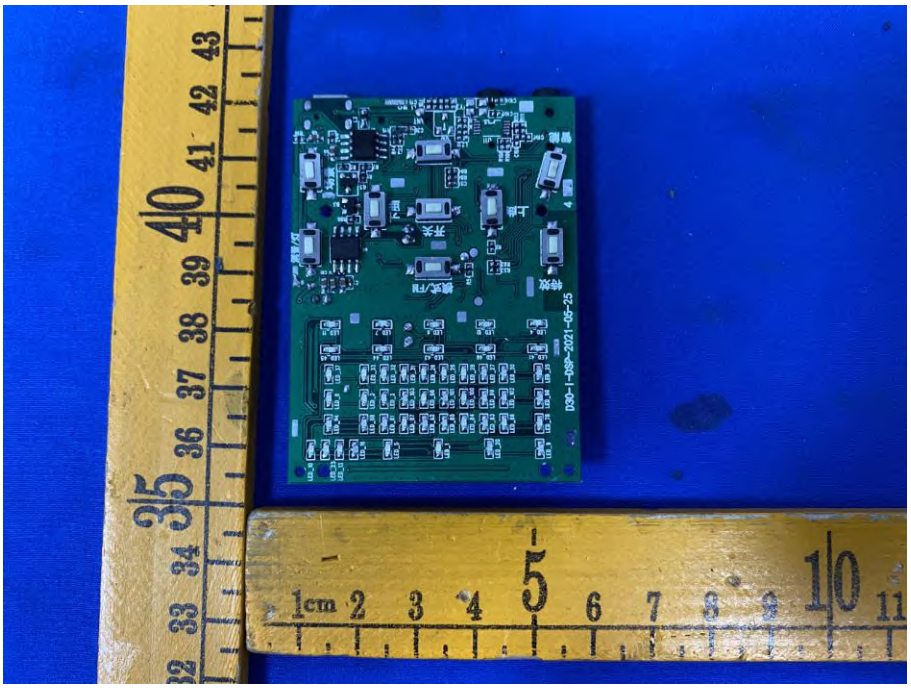

DJ0-LED-A
2020-03-18

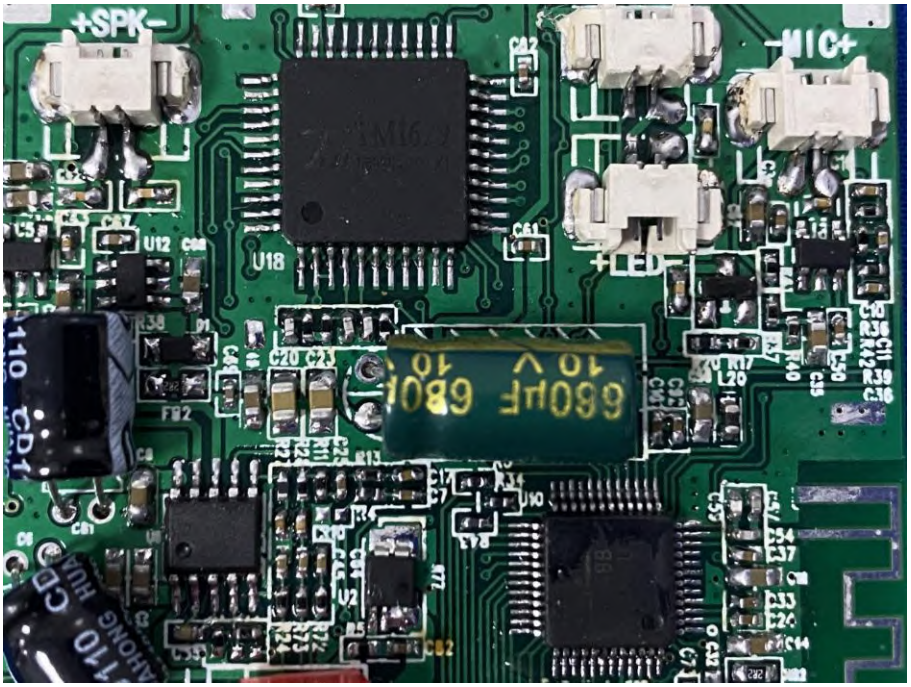



USB1
GND
DP
DM
5V
TJ


M100-USB
2019-12-17
1cm


1cm





******THE END REPORT******