FCC PART 15C
TEST REPORT

No. I22Z62243-IOT01

for

Honor Device Co., Ltd.

Smart Phone

Model Name: CRT-LX3

FCC ID: 2AYGCCRT-LX3

with

Hardware Version: HL3CRTM

Software Version: 6.1.0.90(C900E21R1P2)

Issued Date: 2022-12-6

Note:

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REPORT HISTORY

Report Number	Revision	Description	Issue Date
I22Z62243-IOT01	Rev.0	1st edition	2022-12-6

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1. Test Laboratory

1.1. Introduction &Accreditation

Telecommunication Technology Labs, CAICT is an ISO/IEC 17025:2017 accredited test laboratory under NATIONAL VOLUNTARY LABORATORY ACCREDITATION PROGRAM (NVLAP) with lab code 600118-0, and is also an FCC accredited test laboratory (CN5017), and ISED accredited test laboratory (ISED#: 24849). The detail accreditation scope can be found on NVLAP website.

1.2. Testing Location

Conducted testing Location: CTTL(huayuan North Road)

Address: No. 52, Huayuan North Road, Haidian District, Beijing, P. R. China100191

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1.3. Testing Environment

Normal Temperature: 20-27℃

Relative Humidity: 20-50%

1.4. Project data

Testing Start Date: 2022-11-21

Testing End Date: 2022-12-6

1.5. Signature

Wu Le

(Prepared this test report)

Sun Zhenyu

(Reviewed this test report)

Hu Xiaoyu

(Approved this test report)

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2. Client Information

2.1. Applicant Information

Company Name:	Honor Device Co., Ltd.
Address /Post:	Suite 3401, Unit A, Building 6, Shum Yip Sky Park, No. 8089, Hongli West Road, Xiangmihu Street, Futian District, Shenzhen, P.R.China
City:	Shenzhen
Postal Code:	/
Country:	China
Telephone:	/
Fax:	/

2.2. Manufacturer Information

Company Name:	Honor Device Co., Ltd.
Address /Post:	Suite 3401, Unit A, Building 6, Shum Yip Sky Park, No. 8089, Hongli West Road, Xiangmihu Street, Futian District, Shenzhen, P.R.China
City:	Shenzhen
Postal Code:	/
Country:	China
Telephone:	/
Fax:	/

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3. Equipment Under Test (EUT) and Ancillary Equipment (AE)

3.1. About EUT

Description	Smart Phone
Model Name	CRT-LX3
FCC ID	2AYGCCRT-LX3
Frequency Band	ISM 2400MHz~2483.5MHz
Type of Modulation	GFSK/π/4 DQPSK/8DPSK
Number of Channels	79
Power Supply	3.89V DC by Battery
Antenna gain	-1.5dBi

3.2. Internal Identification of EUT

EUT ID*	SN or IMEI	HW Version	SW Version	Date of receipt
EUT1	866902060024817/ 866902060025111	HL3CRTM	6.1.0.90(C900E21R1P2)	2022-11-21

*EUT ID: is used to identify the test sample in the lab internally.

3.3. Internal Identification of AE

AE ID*	Description		
AE1	Battery	/	Inbuilt

*AE ID: is used to identify the test sample in the lab internally.

3.4. Normal Accessory setting

Fully charged battery should be used during the test.

3.5. General Description

The Equipment Under Test (EUT) is a model of Smart Phone with integrated antenna. It consists of normal options: lithium battery, charger. Manual and specifications of the EUT were provided to fulfill the test. Samples undergoing test were selected by the Client.

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4. Reference Documents

4.1. Documents supplied by applicant

EUT parameters, referring to Annex A for detailed information, is supplied by the client or manufacturer, which is the basis of testing.

4.2. Reference Documents for testing

The following documents listed in this section are referred for testing.

Reference	Title	Version
FCC Part15	FCC CFR 47, Part 15, Subpart C: 15.205 Restricted bands of operation; 15.209 Radiated emission limits, general requirements; 15.247 Operation within the bands 902–928MHz, 2400–2483.5 MHz, and 5725–5850 MHz.	2021
ANSI C63.10	American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices	June,2013

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5. Test Results

5.1. Summary of Test Results

Abbreviations used in this clause:

P Pass, The EUT complies with the essential requirements in the standard.

F Fail, The EUT does not comply with the essential requirements in the standard

NA Not Applicable, The test was not applicable

NP Not Performed, The test was not performed by CTTL

SUMMARY OF MEASUREMENT RESULTS	Sub-clause	Verdict
Peak Output Power	15.247 (b)(1)	**P**
Frequency Band Edges- Conducted	15.247 (d)	**P**
Transmitter Spurious Emission - Conducted	15.247 (d)	**P**
Time of Occupancy (Dwell Time)	15.247 (a) (1)(iii)	**P**
20dB Bandwidth	15.247 (a)(1)	**NA**
Carrier Frequency Separation	15.247 (a)(1)	**P**
Number of hopping channels	15.247 (a)(iii)	**P**

Please refer to **ANNEX A** for detail.

The measurement is made according to ANSI C63.10.

5.2. Statements

CTTL has evaluated the test cases requested by the applicant /manufacturer as listed in section 5.1 of this report for the EUT specified in section 3 according to the standards or reference documents listed in section 4.2

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6. Test Facilities Utilized

Conducted test system

No.	Equipment	Model	Serial Number	Manufacturer	Calibration Period	Calibration Due date
1	Vector Signal Analyzer	FSQ26	100024	R&S	1 year	2023-03-23
2	Bluetooth Tester	CBT	100315	R&S	1 year	2023-01-22
3	Shielding Room	S81	/	ETS-Lindgren	/	/

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7. Measurement Uncertainty

7.1. Peak Output Power

Measurement Uncertainty:

Measurement Uncertainty (k=2)	0.66dB

7.2. Frequency Band Edges - Conducted

Measurement Uncertainty:

Measurement Uncertainty (k=2)	0.66dB

7.3. Transmitter Spurious Emission - Conducted

Measurement Uncertainty:

Frequency Range	Uncertainty (k=2)
30 MHz ~ 8 GHz	1.22dB
8 GHz ~ 12.75 GHz	1.51dB
12.7GHz ~ 26 GHz	1.51dB

7.4. Time of Occupancy (Dwell Time)

Measurement Uncertainty:

Measurement Uncertainty (k=2)	0.88ms

7.5. 20dB Bandwidth

Measurement Uncertainty:

Measurement Uncertainty (k=2)	61.936Hz

7.6. Carrier Frequency Separation

Measurement Uncertainty:

Measurement Uncertainty (k=2)	61.936Hz

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ANNEX A: EUT parameters

Disclaimer: The antenna gain provided by the client may affect the validity of the measurement results in this report, and the client shall bear the impact and consequences arising therefrom.

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ANNEX B: Detailed Test Results

B.1. Measurement Method

B.1.1. Conducted Measurements

The measurement is made according to ANSI C63.10.

1). Connect the EUT to the test system correctly.

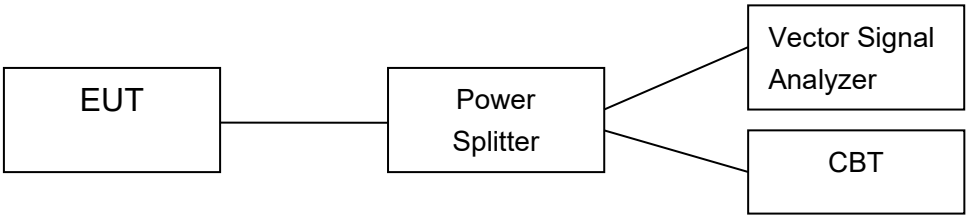
2). Set the EUT to the required work mode (Transmitter, receiver or transmitter & receiver).

3). Set the EUT to the required channel.

4). Set the EUT hopping mode (hopping or hopping off).

5). Set the spectrum analyzer to start measurement.

6). Record the values. Vector Signal Analyzer



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B.2. Peak Output Power

B.2.1. Peak Output Power – Conducted

Method of Measurement: See ANSI C63.10-clause 7.8.5

a) Use the following spectrum analyzer settings:

- Span: 6MHz
- RBW: 3MHz
- VBW: 3MHz
- Sweep time: 2.5ms
- Detector function: peak
- Trace: max hold

b) Allow trace to stabilize.

c) Use the marker-to-peak function to set the marker to the peak of the emission.

d) The indicated level is the peak output power.

Measurement Limit:

Standard	Limits	
FCC Part 15.247 (b)(1)	Bandwidth≤1MHz	30dBm (1W)
	Bandwidth＞1MHz	21dBm (125mW)

Measurement Results:

For GFSK

Channel	Ch 0 2402 MHz	Ch 39 2441 MHz	Ch 78 2480 MHz	Conclusion
Peak Conducted Output Power (dBm)	11.25	11.13	11.25	P

For π/4 DQPSK

Channel	Ch 0 2402 MHz	Ch 39 2441 MHz	Ch 78 2480 MHz	Conclusion
Peak Conducted Output Power (dBm)	10.48	10.85	10.70	P

For 8DPSK

Channel	Ch 0 2402 MHz	Ch 39 2441 MHz	Ch 78 2480 MHz	Conclusion
Peak Conducted Output Power (dBm)	10.58	10.91	10.40	P

Conclusion: PASS

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B.2.2. E.I.R.P.

The radiated E.I.R.P. is listed below:

Antenna gain = -1.5dBi

For GFSK

Channel	Ch 0 2402 MHz	Ch 39 2441 MHz	Ch 78 2480 MHz	Conclusion
E.I.R.P (dBm)	9.75	9.63	9.75	P

Forπ/4 DQPSK

Channel	Ch 0 2402 MHz	Ch 39 2441 MHz	Ch 78 2480 MHz	Conclusion
E.I.R.P (dBm)	8.98	9.35	9.20	P

For 8DPSK

Channel	Ch 0 2402 MHz	Ch 39 2441 MHz	Ch 78 2480 MHz	Conclusion
E.I.R.P (dBm)	9.08	9.41	8.90	P

Note: E.I.R.P. are calculated with the antenna gain.

Conclusion: PASS

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B.3. Frequency Band Edges – Conducted

Method of Measurement: See ANSI C63.10-clause 7.8.6

Connect the spectrum analyzer to the EUT using an appropriate RF cable connected to the EUT output. Configure the spectrum analyzer settings as described below (be sure to enter all losses between the unlicensed wireless device output and the spectrum analyzer).

– Span: 10 MHz
– Resolution Bandwidth: 100 kHz
– Video Bandwidth: 300 kHz
– Sweep Time:Auto
– Detector: Peak
– Trace: max hold

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.

Observe the stored trace and measure the amplitude delta between the peak of the fundamental and the peak of the band-edge emission. This is not an absolute field strength measurement; it is only a relative measurement to determine the amount by which the emission drops at the band edge relative to the highest fundamental emission level.

Measurement Limit:

Standard	Limit (dBc)
FCC 47 CFR Part 15.247 (d)	< -20

Measurement Result:

For GFSK

Channel	Hopping	Band Edge Power (dBc)		Conclusion
0	Hopping OFF	Fig.1	-60.97	P
	Hopping ON	Fig.2	-66.88	P
78	Hopping OFF	Fig.3	-67.08	P
	Hopping ON	Fig.4	-67.03	P

For π/4 DQPSK

Channel	Hopping	Band Edge Power (dBc)		Conclusion
0	Hopping OFF	Fig.5	-59.55	P
	Hopping ON	Fig.6	-60.76	P
78	Hopping OFF	Fig.7	-66.49	P
	Hopping ON	Fig.8	-66.14	P

For 8DPSK

Channel	Hopping	Band Edge Power (dBc)		Conclusion
0	Hopping OFF	Fig.9	-59.06	P
	Hopping ON	Fig.10	-62.93	P

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78	Hopping OFF	Fig.11	-65.98	P
	Hopping ON	Fig.12	-65.63	P

Conclusion: PASS

Test graphs as below

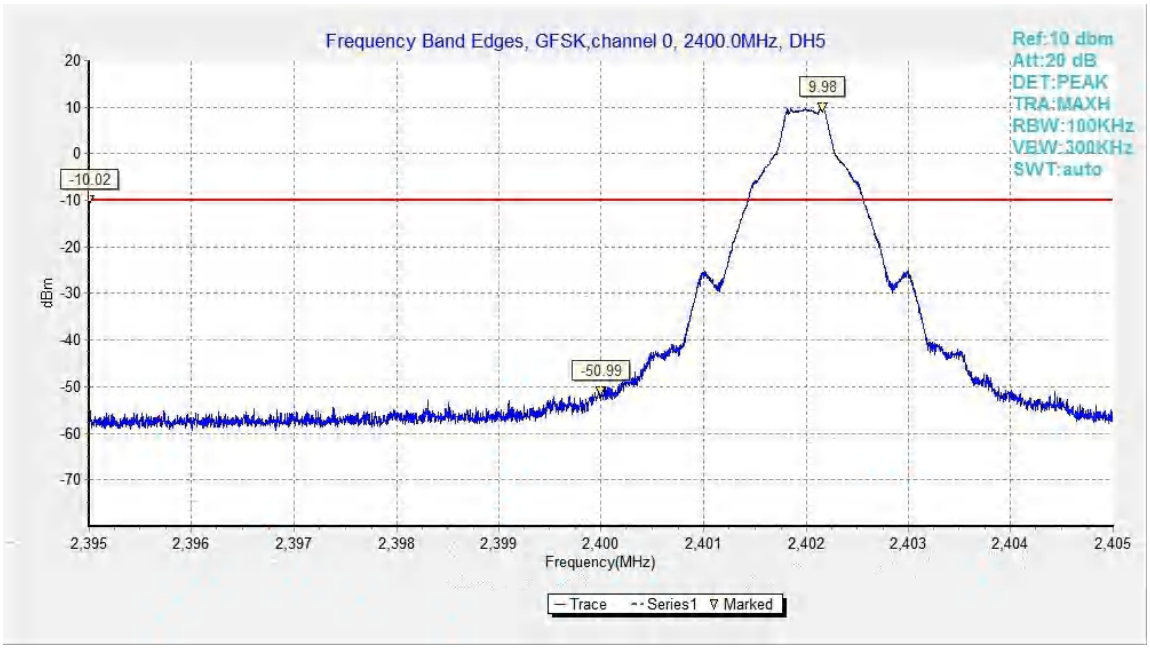

Fig.1. Frequency Band Edges: GFSK, Channel 0, Hopping Off

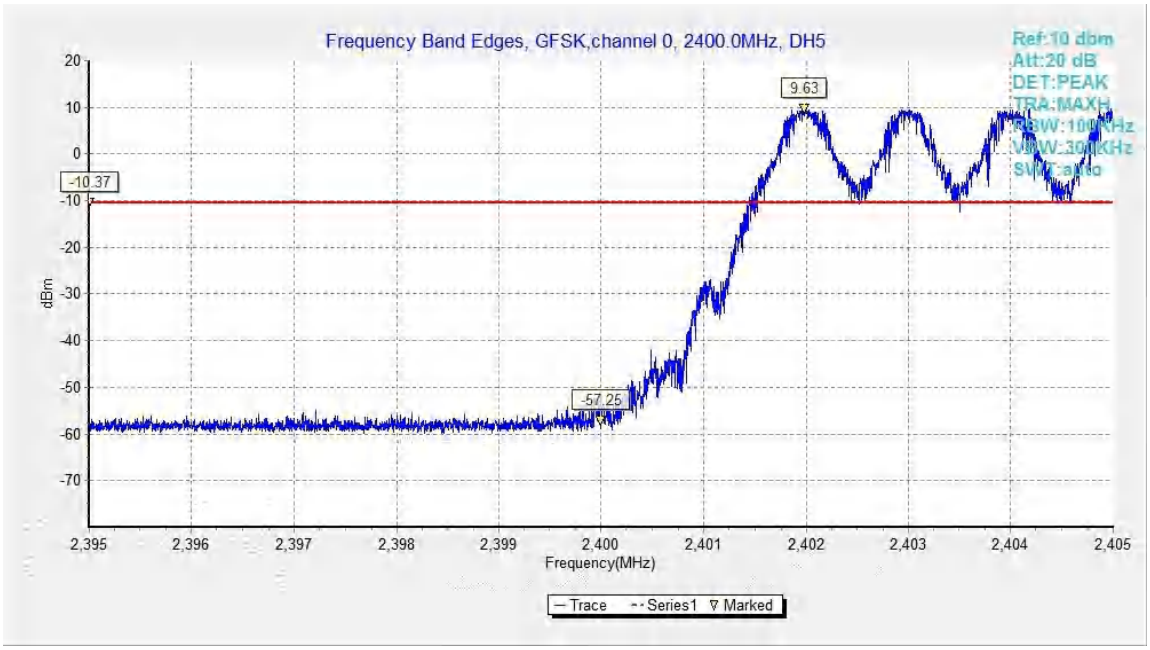

Fig.2. Frequency Band Edges: GFSK, Channel 0, Hopping On

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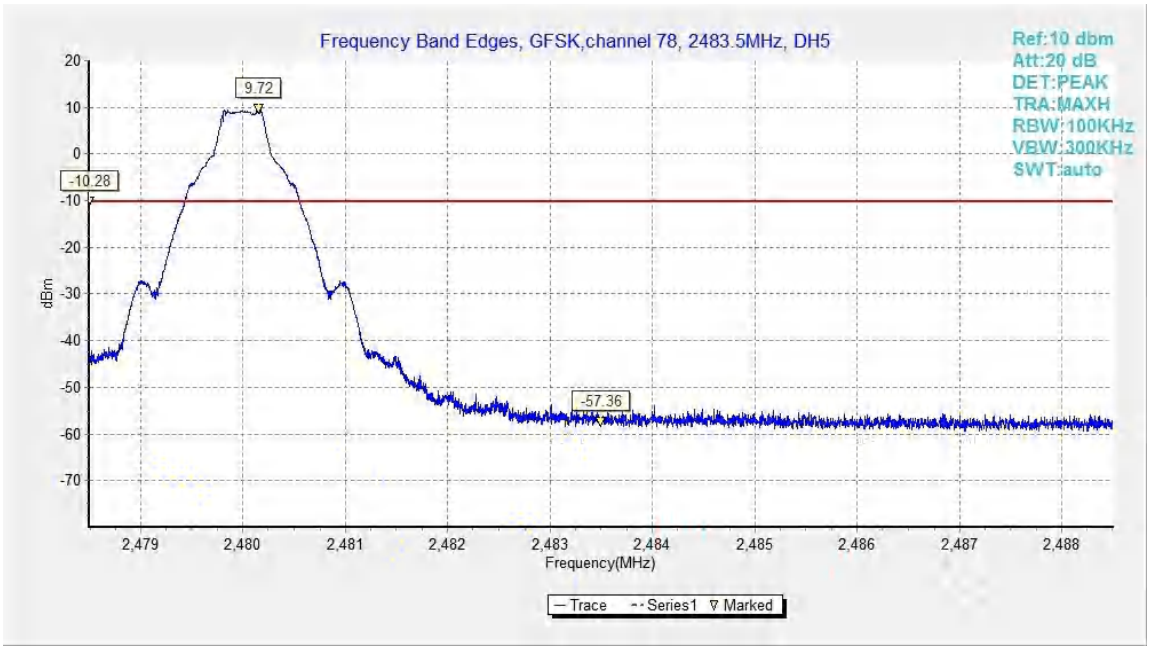

Fig.3. Frequency Band Edges: GFSK, Channel 78, Hopping Off

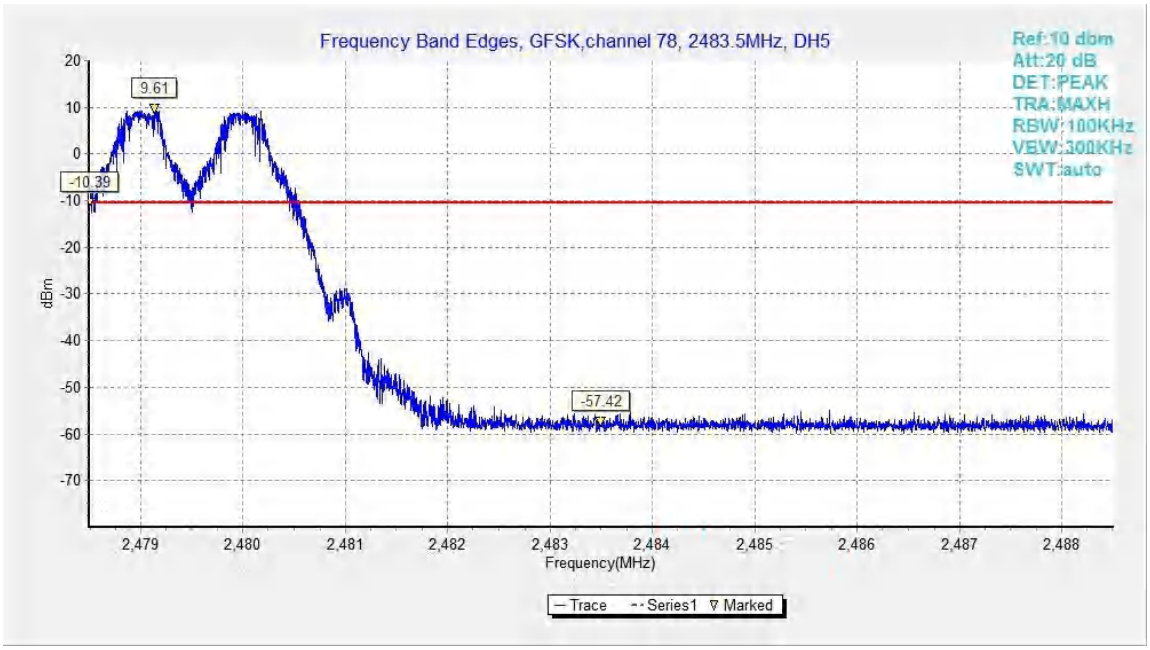

Fig.4. Frequency Band Edges: GFSK, Channel 78, Hopping On

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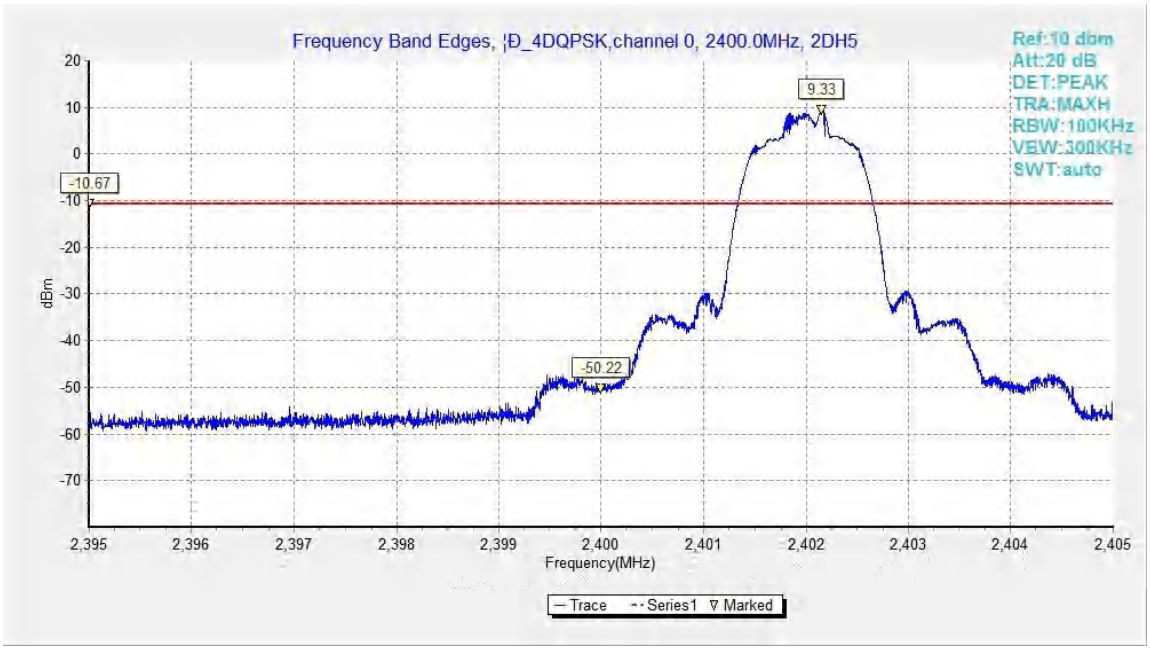

Fig.5. Frequency Band Edges: π/4 DQPSK, Channel 0, Hopping Off

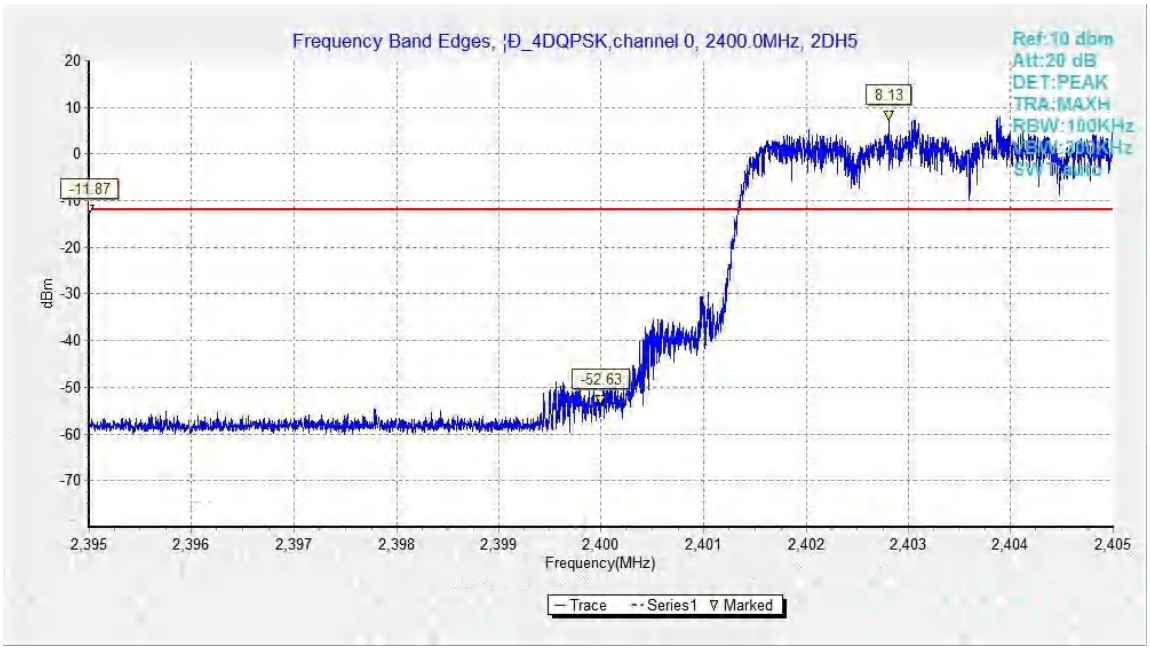

Fig.6. Frequency Band Edges: π/4 DQPSK, Channel 0, Hopping On

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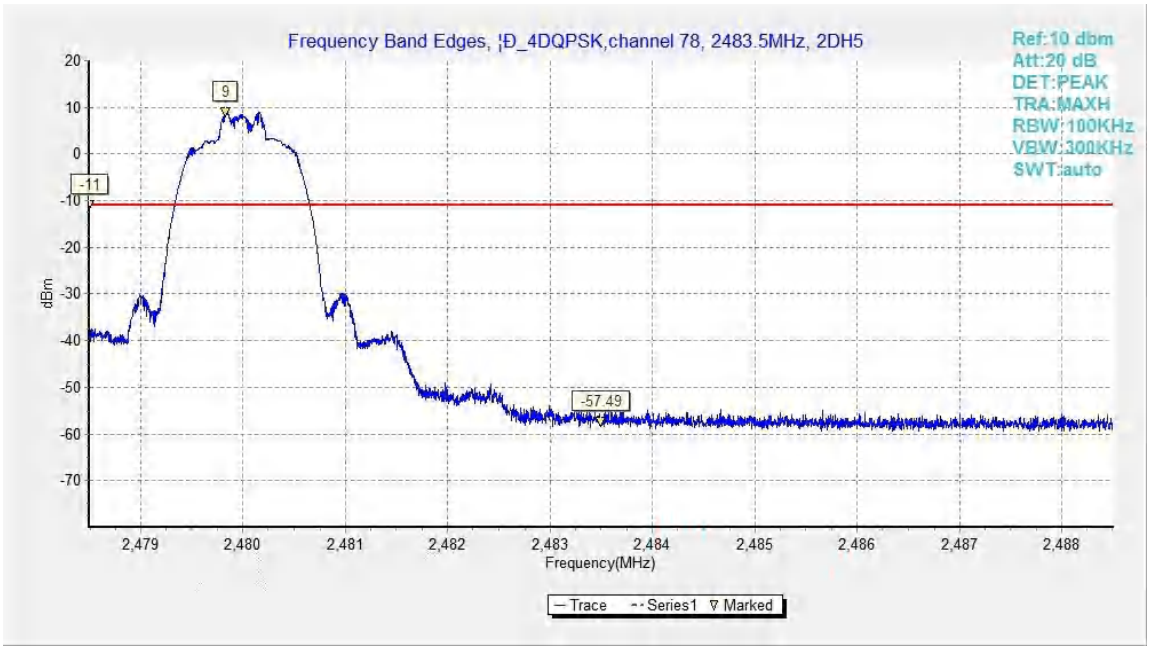

Fig.7. Frequency Band Edges: π/4 DQPSK, Channel 78, Hopping Off

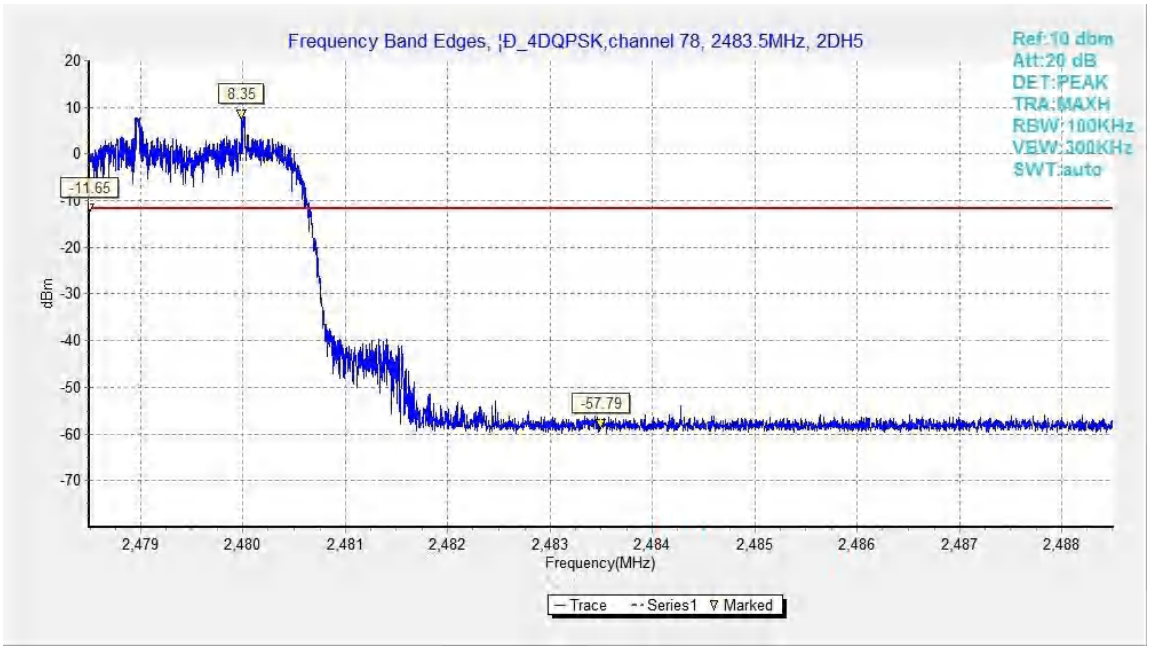

Fig.8. Frequency Band Edges: π/4 DQPSK, Channel 78, Hopping On

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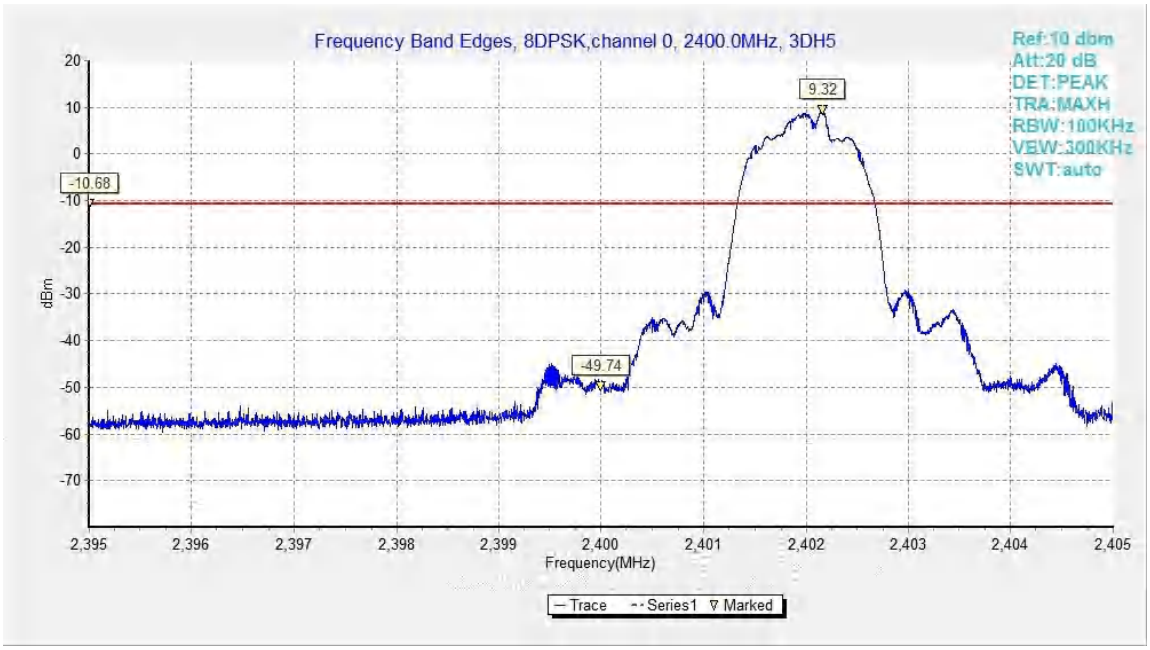

Fig.9. Frequency Band Edges: 8DPSK, Channel 0, Hopping Off

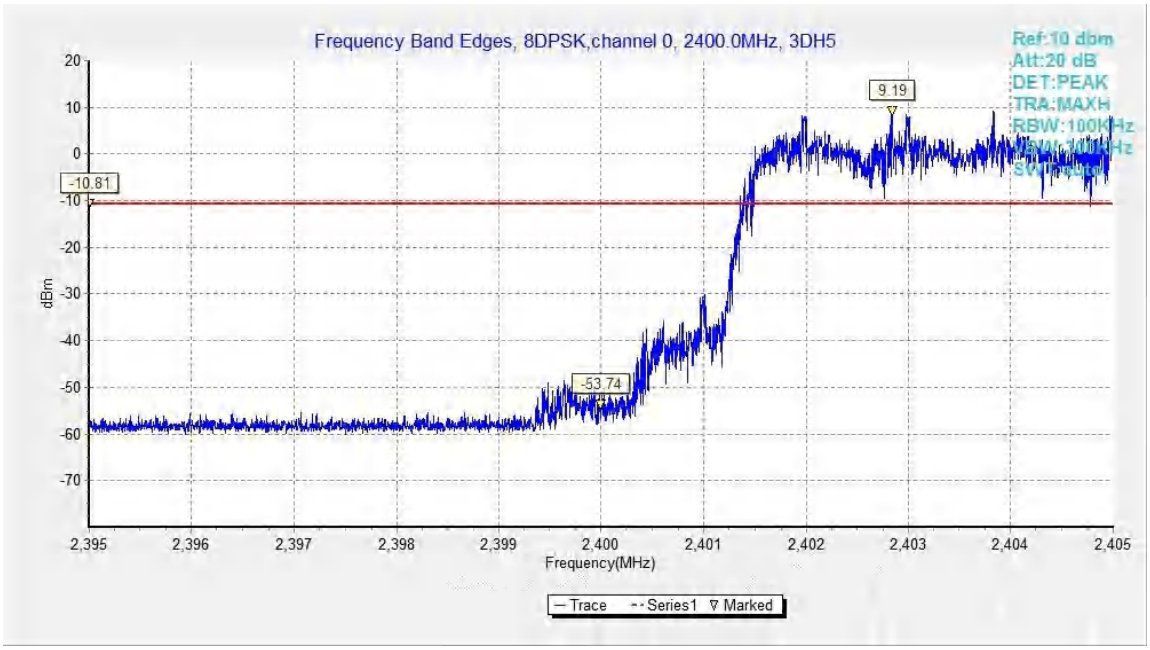

Fig.10. Frequency Band Edges: 8DPSK, Channel 0, Hopping On

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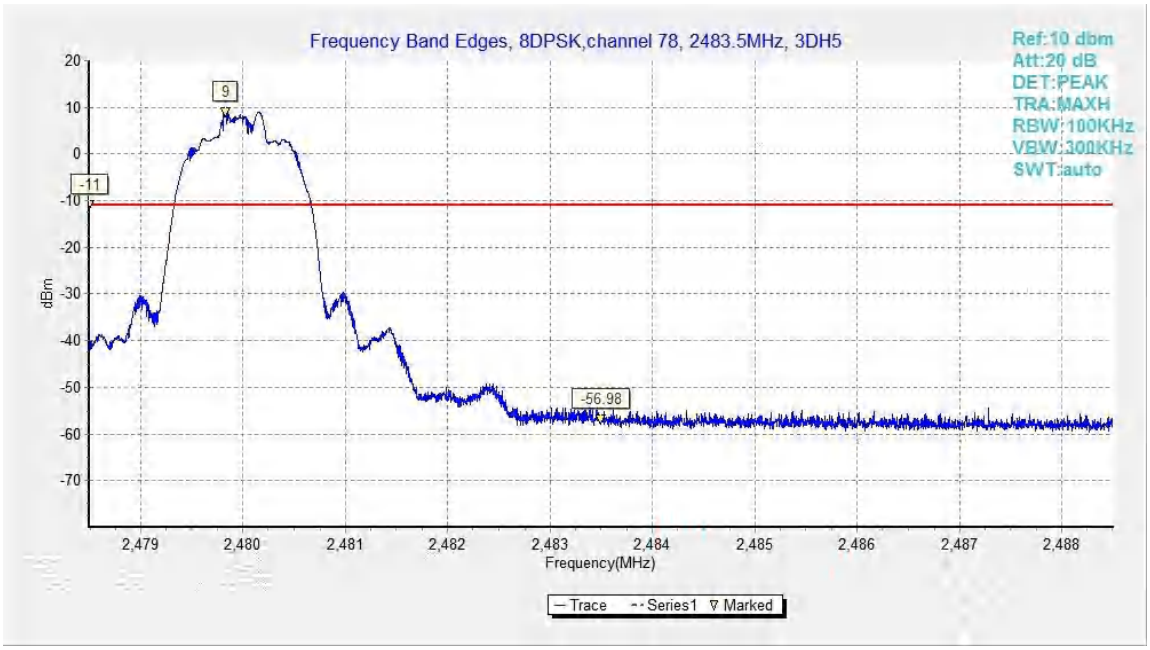

Fig.11. Frequency Band Edges: 8DPSK, Channel 78, Hopping Off

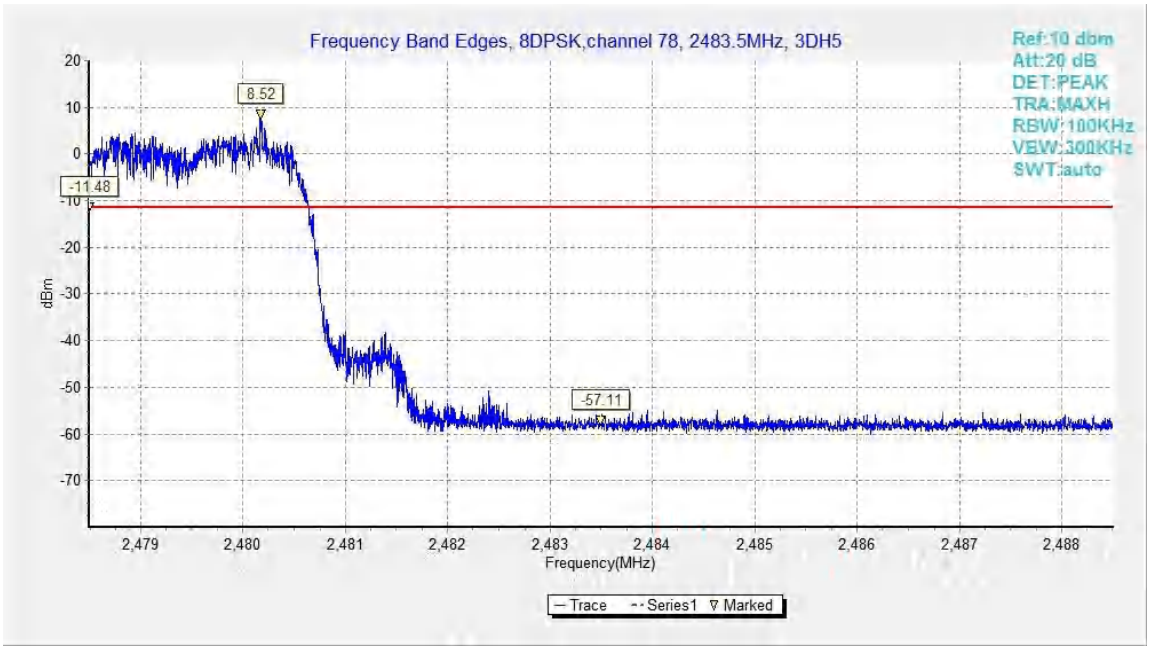

Fig.12. Frequency Band Edges: 8DPSK, Channel 78, Hopping On

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B.4. Transmitter Spurious Emission - Conducted

Method of Measurement: See ANSI C63.10-clause 7.8.8

Measurement Procedure – Reference Level

1. Set the RBW = 100 kHz.

2. Set the VBW = 300 kHz.

3. Set the span to 5-30 % greater than the EBW.

4. Detector = peak.

5. Sweep time = auto couple.

6. Trace mode = max hold.

7. Allow trace to fully stabilize.

8. Use the peak marker function to determine the maximum power level in any 100 kHz band segment within the fundamental EBW. Next, determine the power in 100 kHz band segments outside of the authorized frequency band using the following measurement:

Measurement Procedure - Unwanted Emissions

1. Set RBW = 100 kHz.

2. Set VBW = 300 kHz.

3. Set span to encompass the spectrum to be examined.

4. Detector = peak.

5. Trace Mode = max hold.

6. Sweep = auto couple.

7. Allow the trace to stabilize (this may take some time, depending on the extent of the span).

Ensure that the amplitude of all unwanted emissions outside of the authorized frequency band (excluding restricted frequency bands) is attenuated by at least the minimum requirements specified above.

Measurement Limit:

Standard	Limit
FCC 47 CFR Part 15.247 (d)	20dB below peak output power in 100 kHz bandwidth

Measurement Results:

For GFSK

Channel	Frequency Range	Test Results	Conclusion
Ch 0	Center Frequency	Fig.13	P

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2402 MHz	30 MHz ~ 1 GHz	Fig.14	P
	1 GHz ~ 3 GHz	Fig.15	P
	3 GHz ~ 10 GHz	Fig.16	P
	10 GHz ~ 26 GHz	Fig.17	P
Ch 39 2441 MHz	Center Frequency	Fig.18	P
	30 MHz ~ 1 GHz	Fig.19	P
	1 GHz ~ 3 GHz	Fig.20	P
	3 GHz ~ 10 GHz	Fig.21	P
	10 GHz ~ 26 GHz	Fig.22	P
Ch 78 2480 MHz	Center Frequency	Fig.23	P
	30 MHz ~ 1 GHz	Fig.24	P
	1 GHz ~ 3 GHz	Fig.25	P
	3 GHz ~ 10 GHz	Fig.26	P
	10 GHz ~ 26 GHz	Fig.27	P

For π/4 DQPSK

Channel	Frequency Range	Test Results	Conclusion
Ch 0 2402 MHz	Center Frequency	Fig.28	P
	30 MHz ~ 1 GHz	Fig.29	P
	1 GHz ~ 3 GHz	Fig.30	P
	3 GHz ~ 10 GHz	Fig.31	P
	10 GHz ~ 26 GHz	Fig.32	P
Ch 39 2441 MHz	Center Frequency	Fig.33	P
	30 MHz ~ 1 GHz	Fig.34	P
	1 GHz ~ 3 GHz	Fig.35	P
	3 GHz ~ 10 GHz	Fig.36	P
	10 GHz ~ 26 GHz	Fig.37	P
Ch 78 2480 MHz	Center Frequency	Fig.38	P
	30 MHz ~ 1 GHz	Fig.39	P
	1 GHz ~ 3 GHz	Fig.40	P
	3 GHz ~ 10 GHz	Fig.41	P
	10 GHz ~ 26 GHz	Fig.42	P

For 8DPSK

Channel	Frequency Range	Test Results	Conclusion
Ch 0 2402 MHz	Center Frequency	Fig.43	P
	30 MHz ~ 1 GHz	Fig.44	P
	1 GHz ~ 3 GHz	Fig.45	P
	3 GHz ~ 10 GHz	Fig.46	P
	10 GHz ~ 26 GHz	Fig.47	P

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Ch 39 2441 MHz	Center Frequency	Fig.48	P
	30 MHz ~ 1 GHz	Fig.49	P
	1 GHz ~ 3 GHz	Fig.50	P
	3 GHz ~ 10 GHz	Fig.51	P
	10 GHz ~ 26 GHz	Fig.52	P
Ch 78 2480 MHz	Center Frequency	Fig.53	P
	30 MHz ~ 1 GHz	Fig.54	P
	1 GHz ~ 3 GHz	Fig.55	P
	3 GHz ~ 10 GHz	Fig.56	P
	10 GHz ~ 26 GHz	Fig.57	P

Conclusion: PASS

Test graphs as below

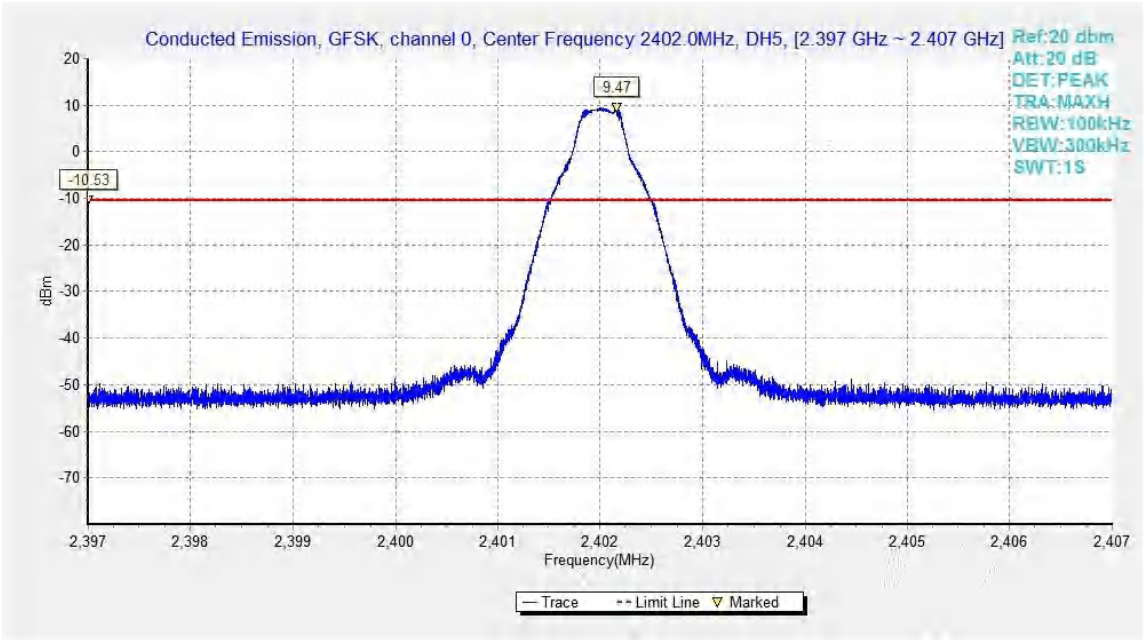

Fig.13. Conducted spurious emission: GFSK, Channel 0,2402MHz

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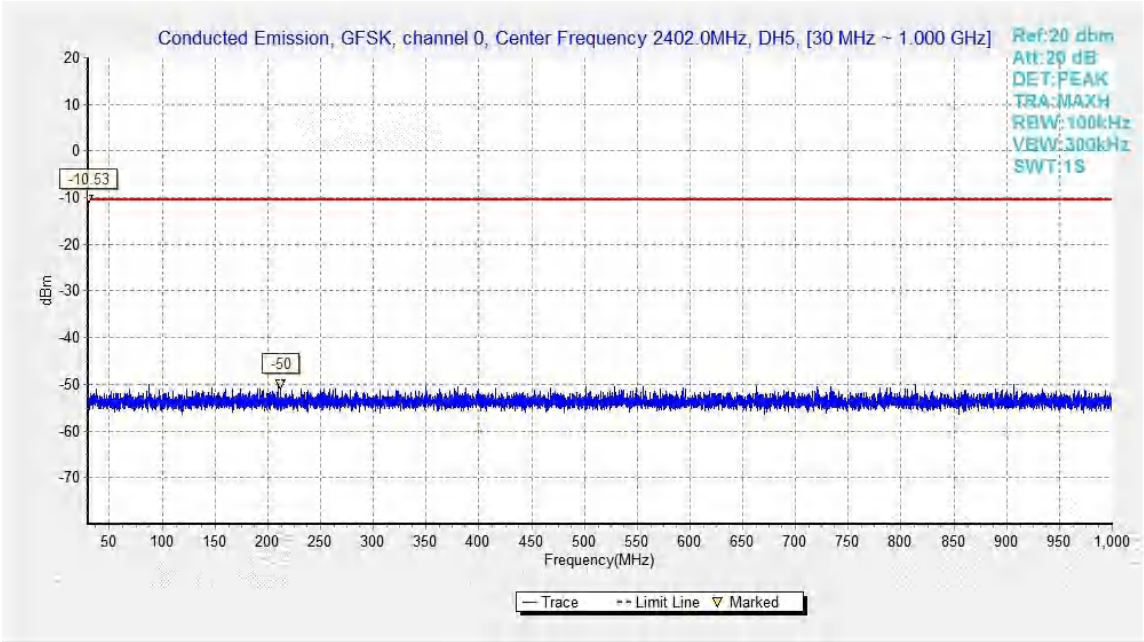

Fig.14. Conducted spurious emission: GFSK, Channel 0, 30MHz - 1GHz

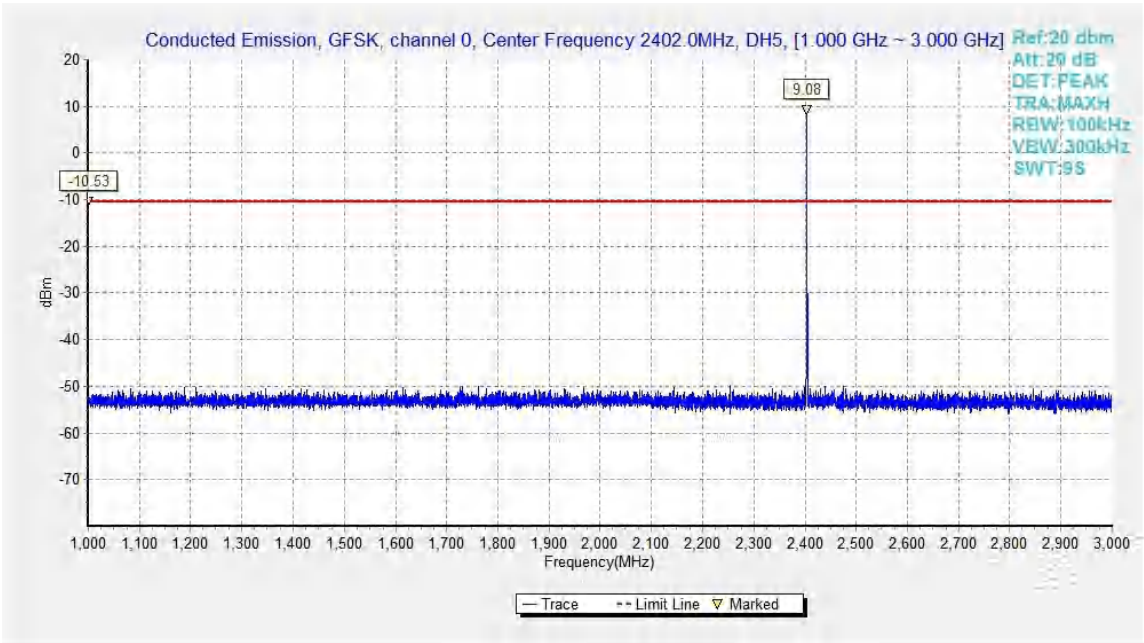

Fig.15. Conducted spurious emission: GFSK, Channel 0, 1GHz - 3GHz

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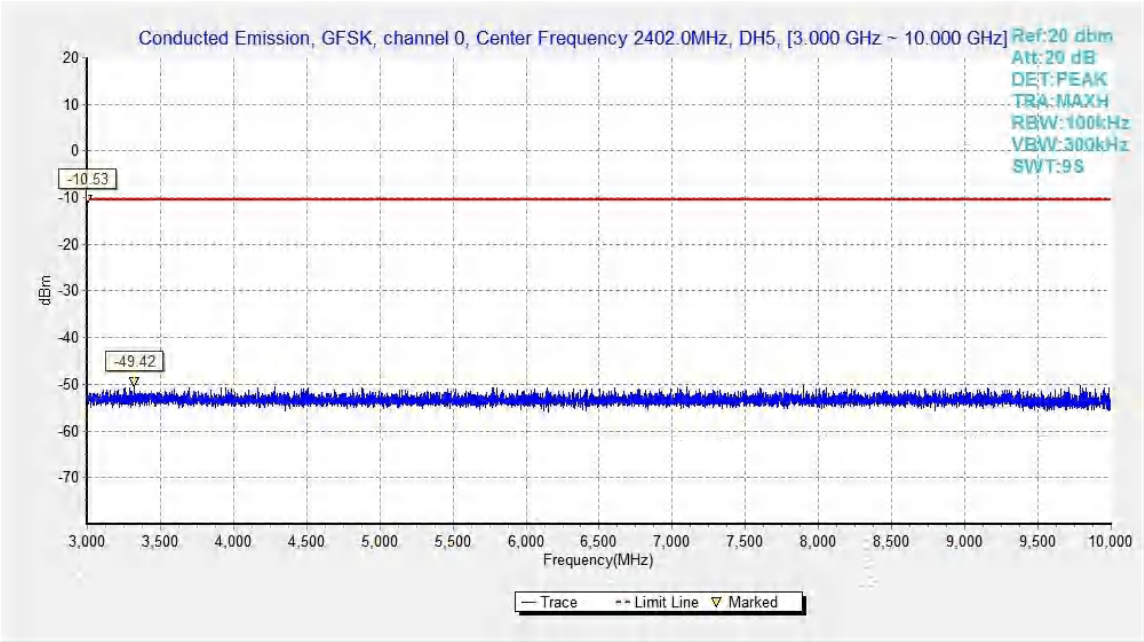

Fig.16. Conducted spurious emission: GFSK, Channel 0, 3GHz - 10GHz

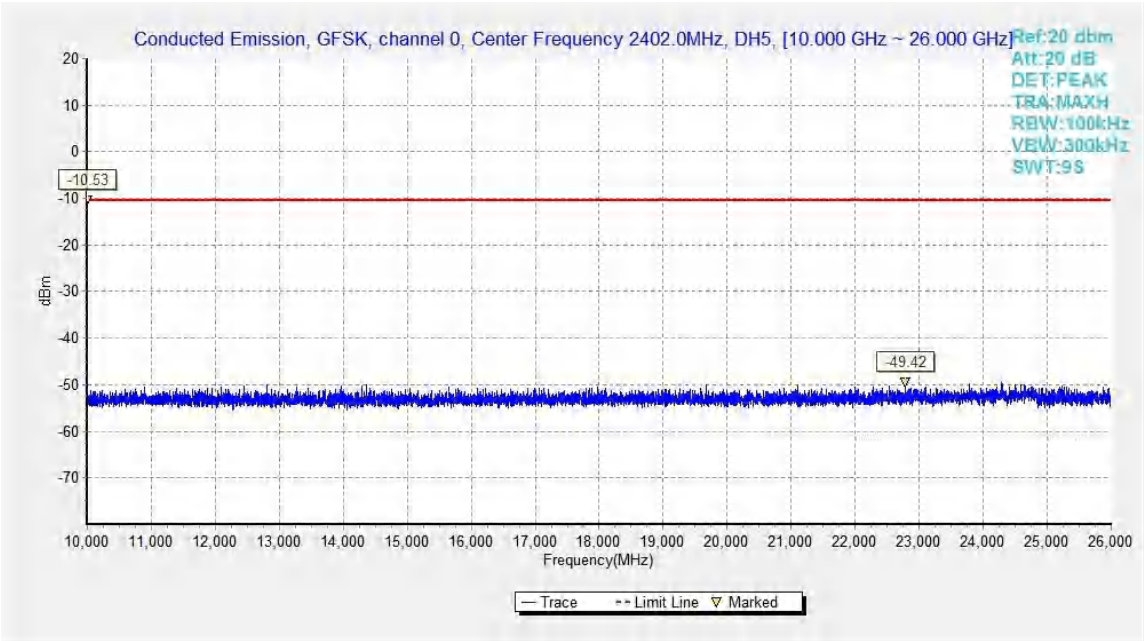

Fig.17. Conducted spurious emission: GFSK, Channel 0,10GHz - 26GHz

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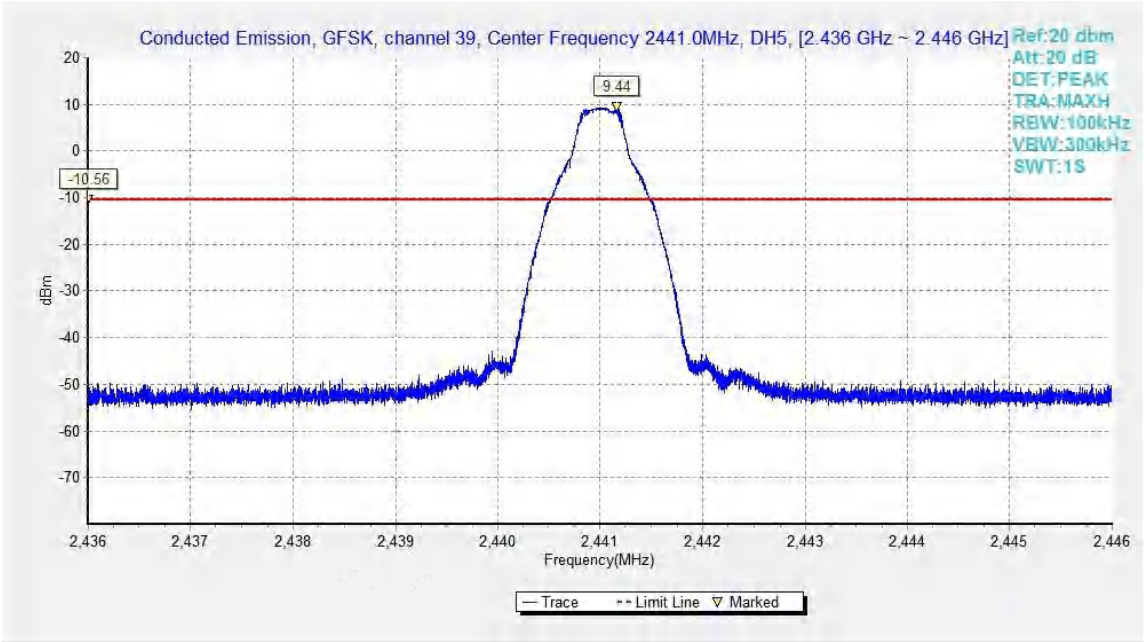

Fig.18. Conducted spurious emission: GFSK, Channel 39, 2441MHz

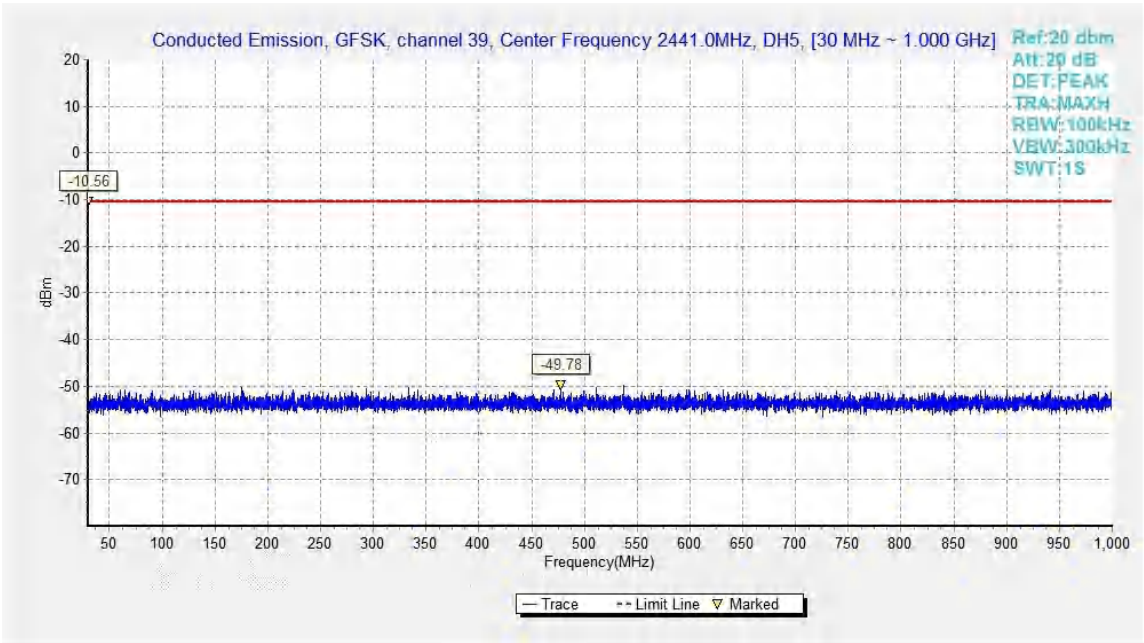

Fig.19. Conducted spurious emission: GFSK, Channel 39, 30MHz - 1GHz

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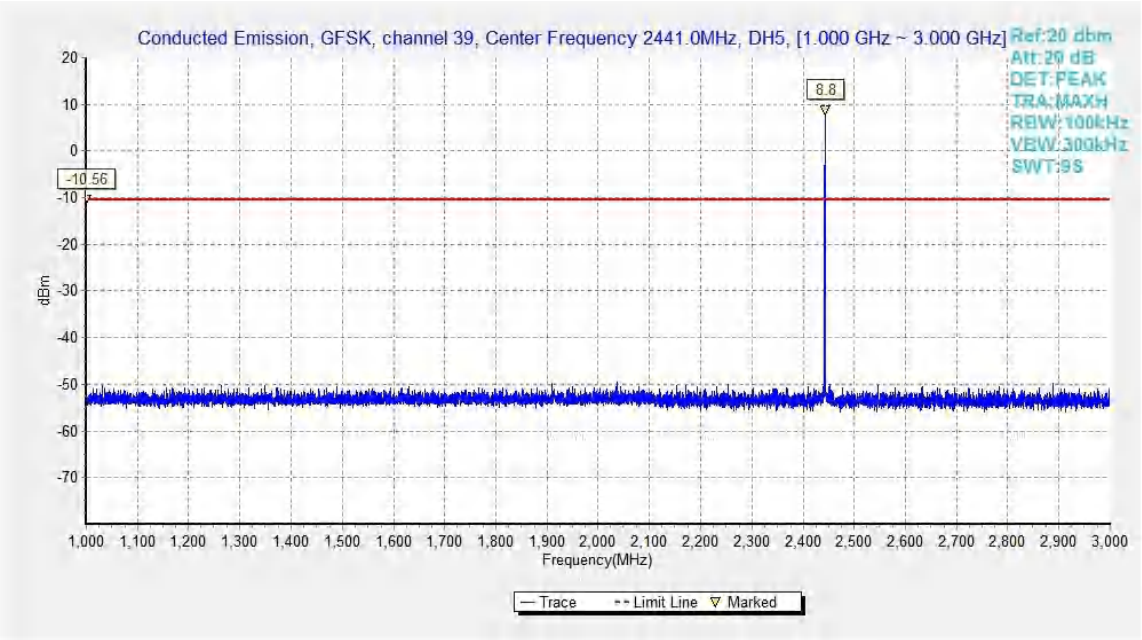

Fig.20. Conducted spurious emission: GFSK, Channel 39, 1GHz – 3GHz

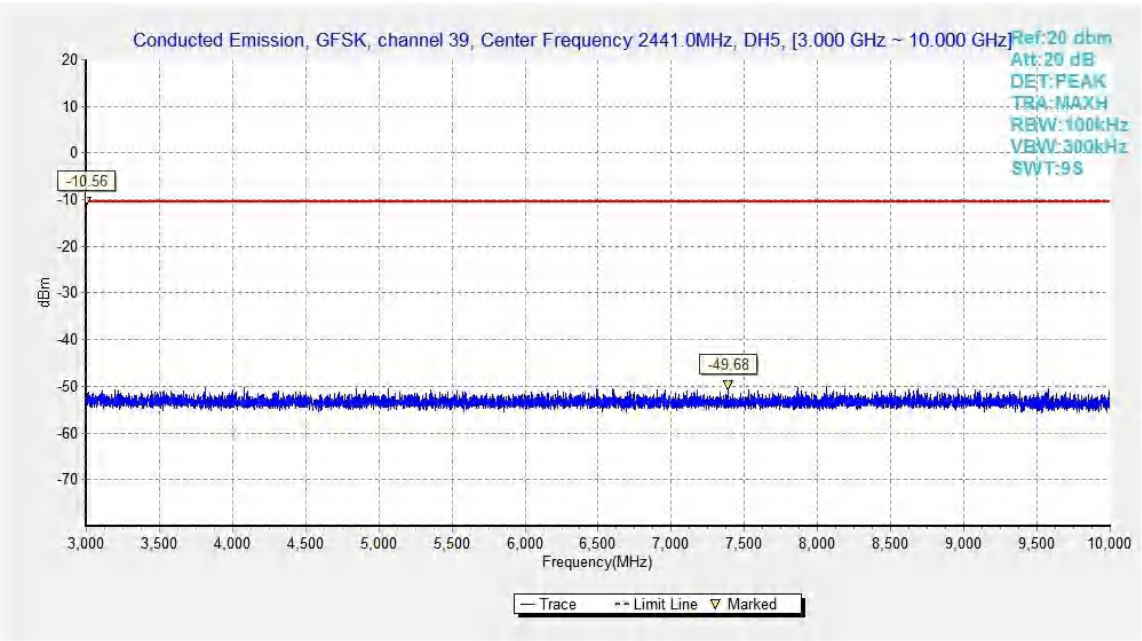

Fig.21. Conducted spurious emission: GFSK, Channel 39, 3GHz – 10GHz

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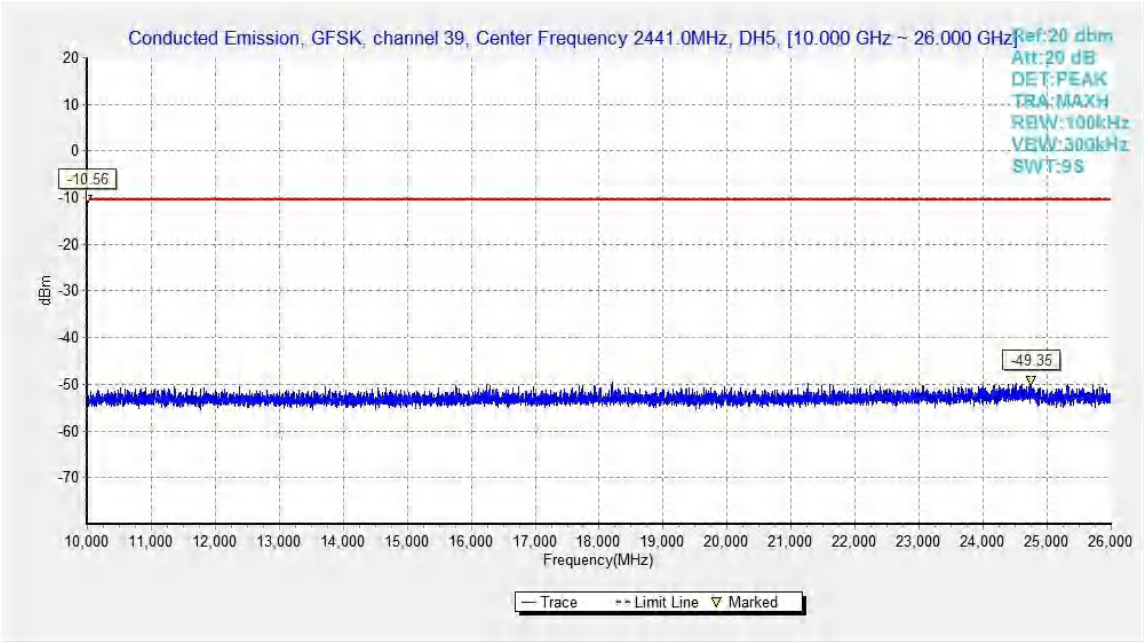

Fig.22. Conducted spurious emission: GFSK, Channel 39, 10GHz – 26GHz

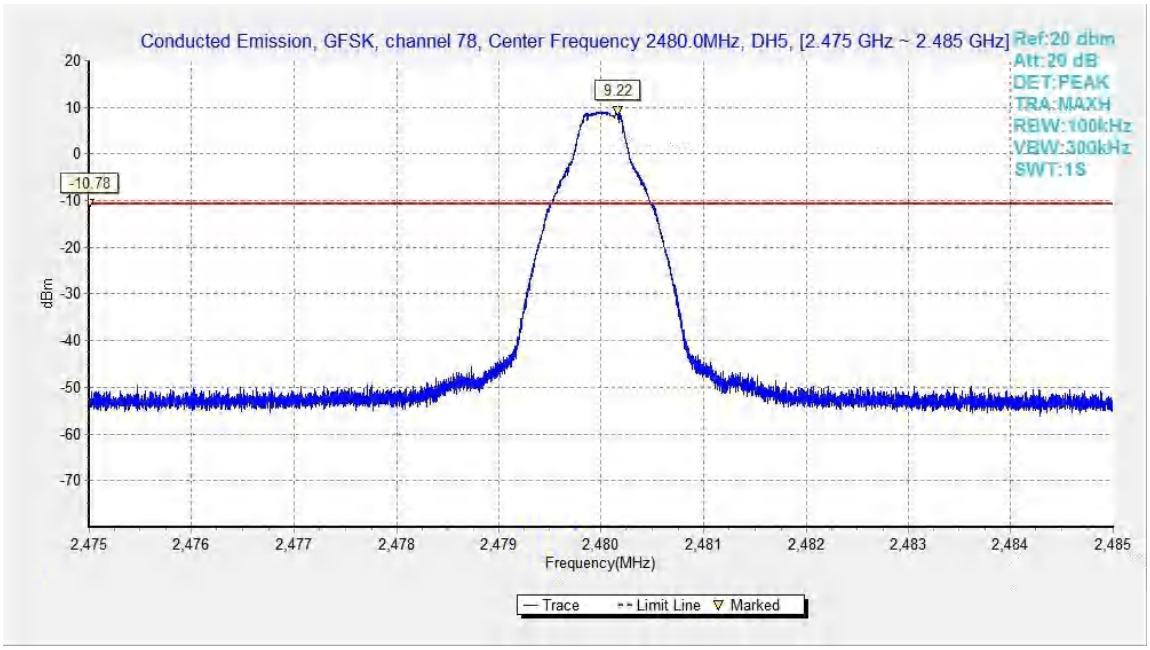

Fig.23. Conducted spurious emission: GFSK, Channel 78, 2480MHz

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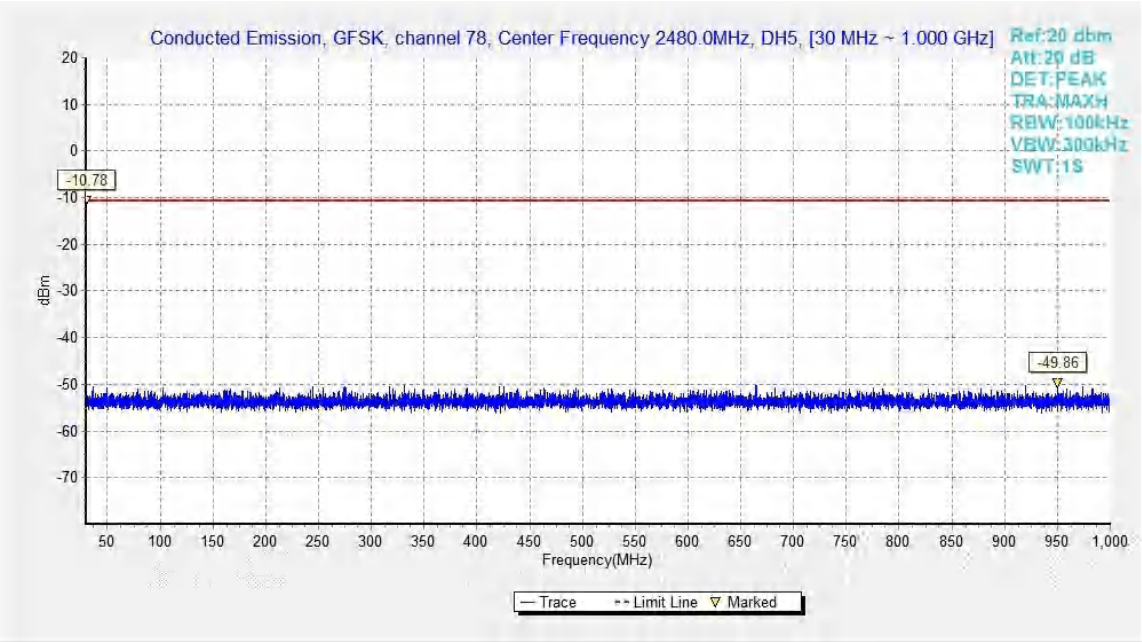

Fig.24. Conducted spurious emission: GFSK, Channel 78, 30MHz - 1GHz

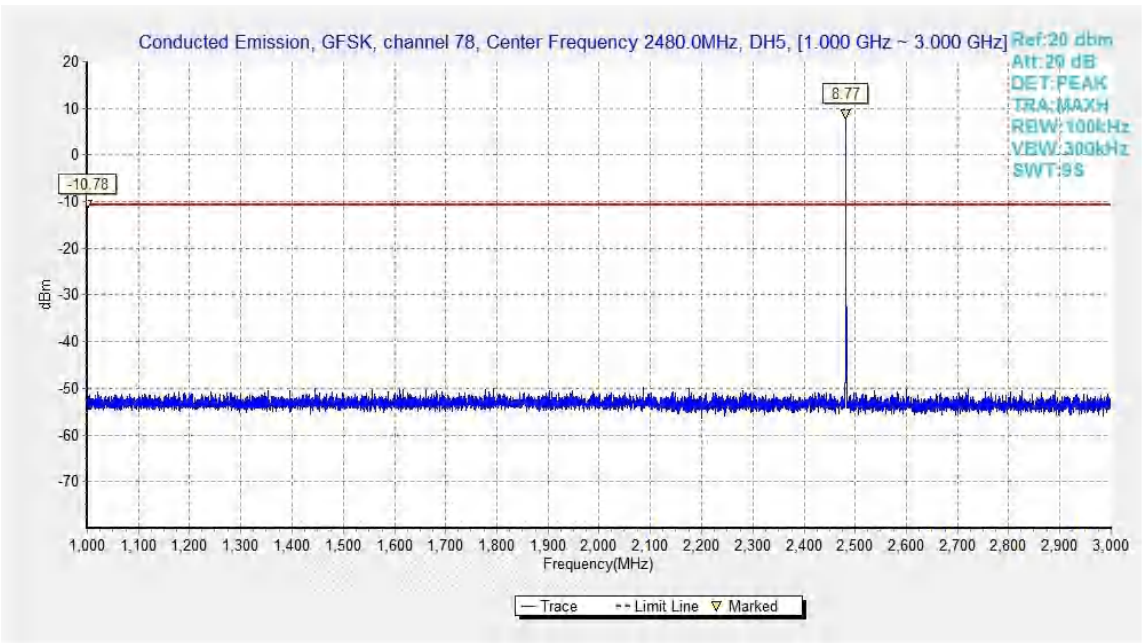

Fig.25. Conducted spurious emission: GFSK, Channel 78, 1GHz - 3GHz

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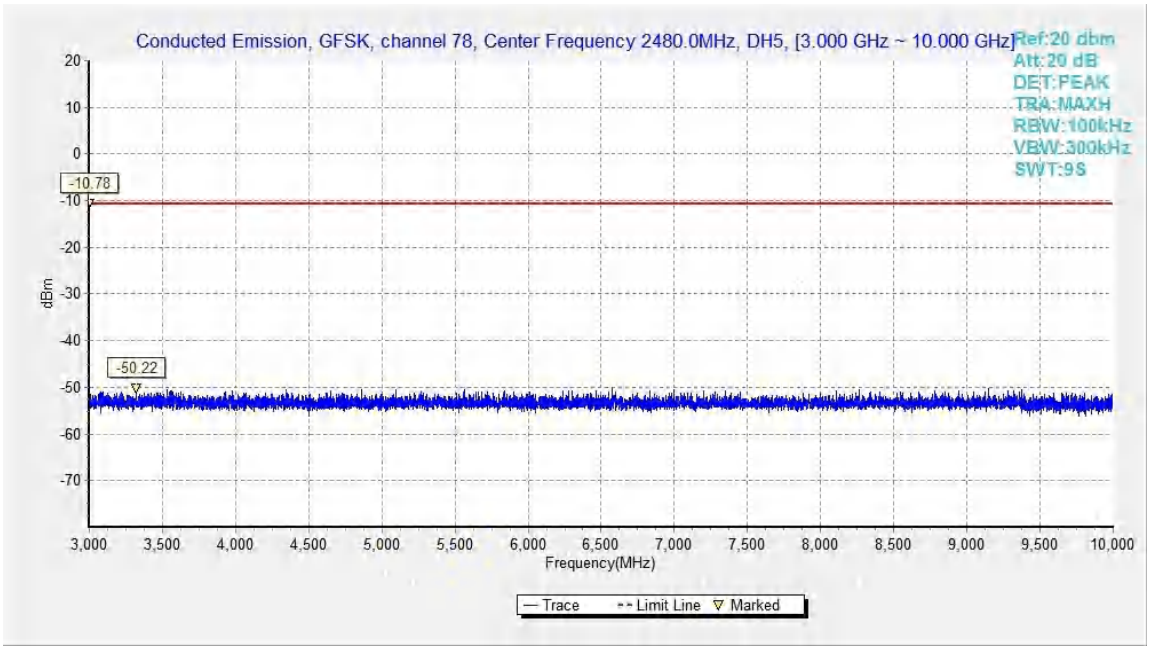

Fig.26. Conducted spurious emission: GFSK, Channel 78, 3GHz - 10GHz

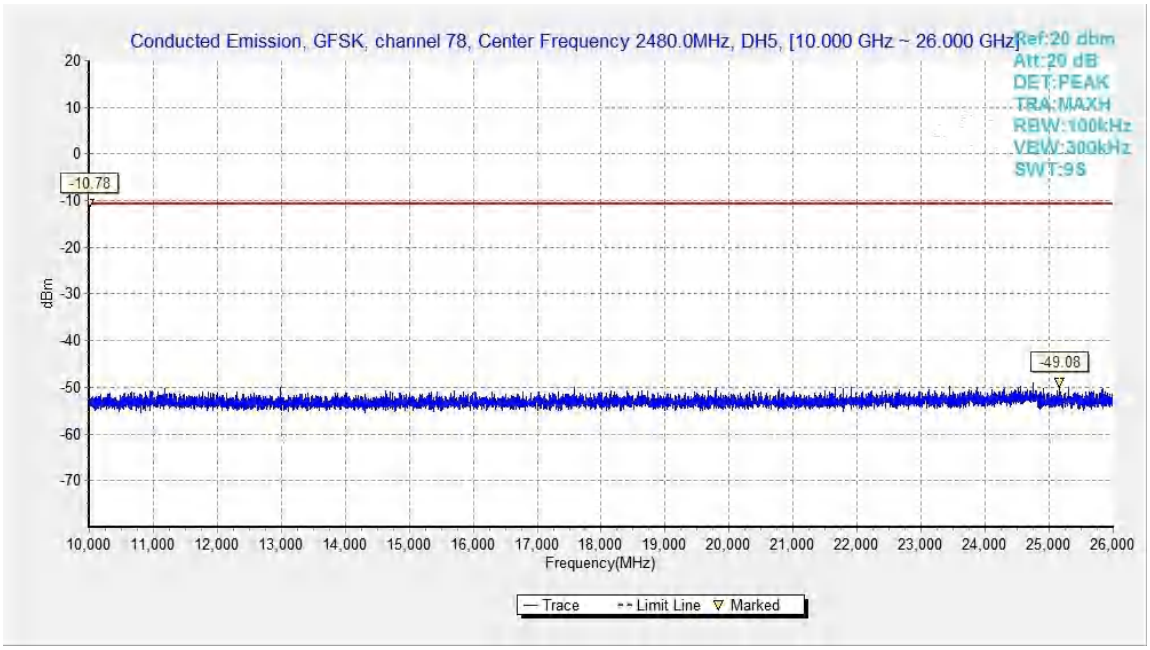

Fig.27. Conducted spurious emission: GFSK, Channel 78, 10GHz - 26GHz

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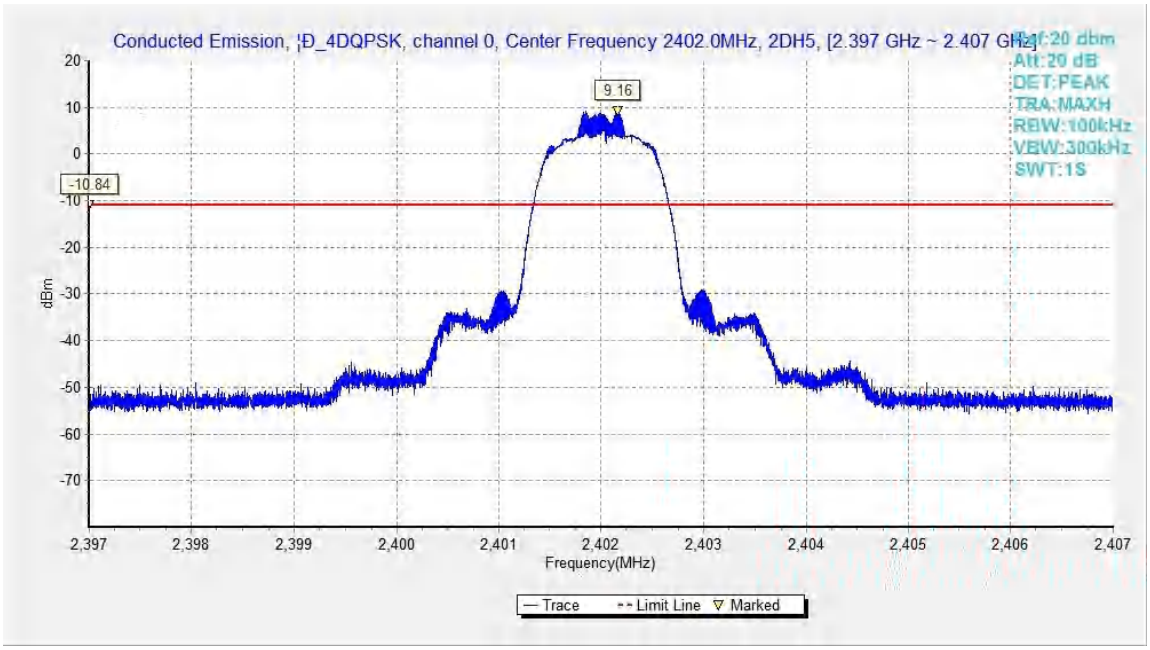

Fig.28. Conducted spurious emission: π/4 DQPSK, Channel 0,2402MHz

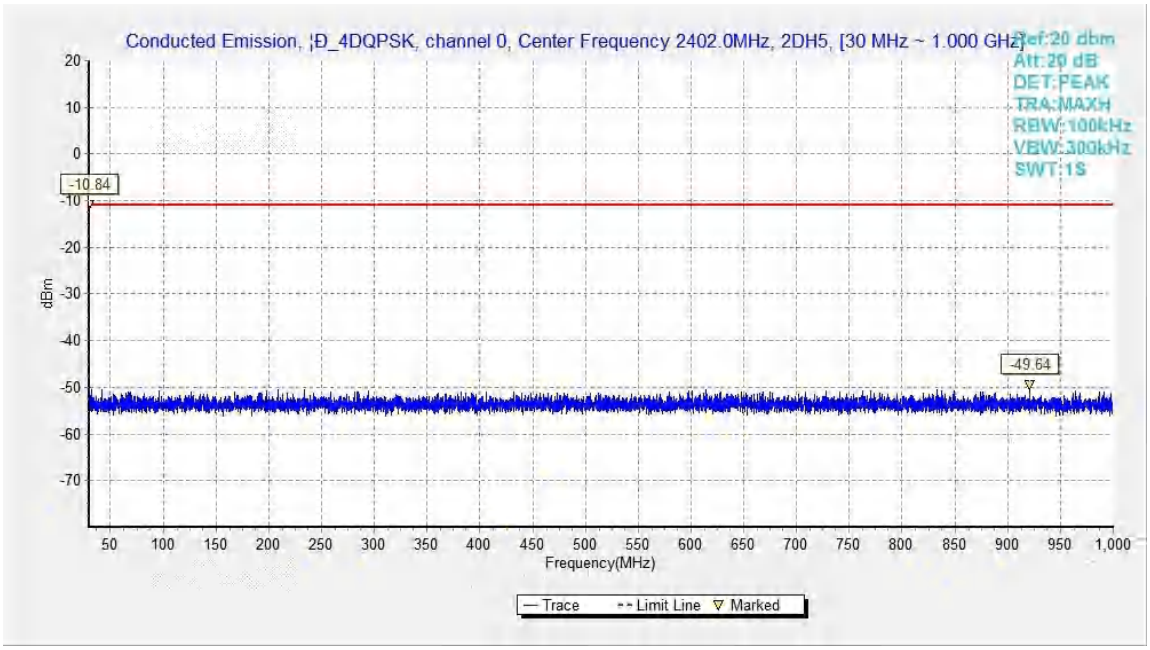

Fig.29. Conducted spurious emission: π/4 DQPSK, Channel 0, 30MHz - 1GHz

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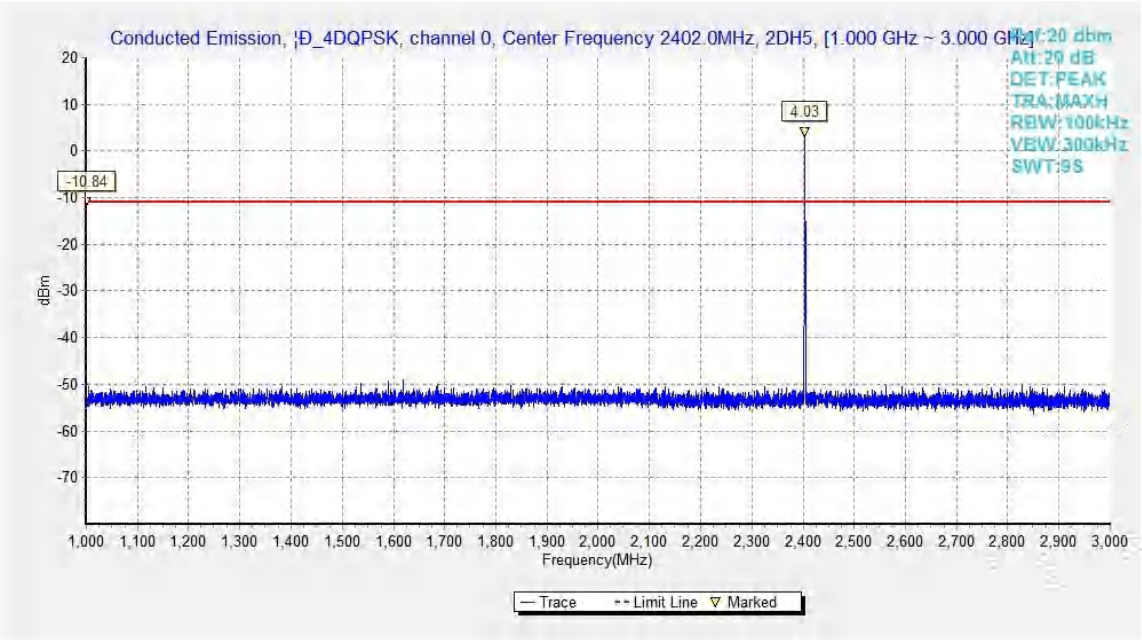

Fig.30. Conducted spurious emission: π/4 DQPSK, Channel 0, 1GHz - 3GHz

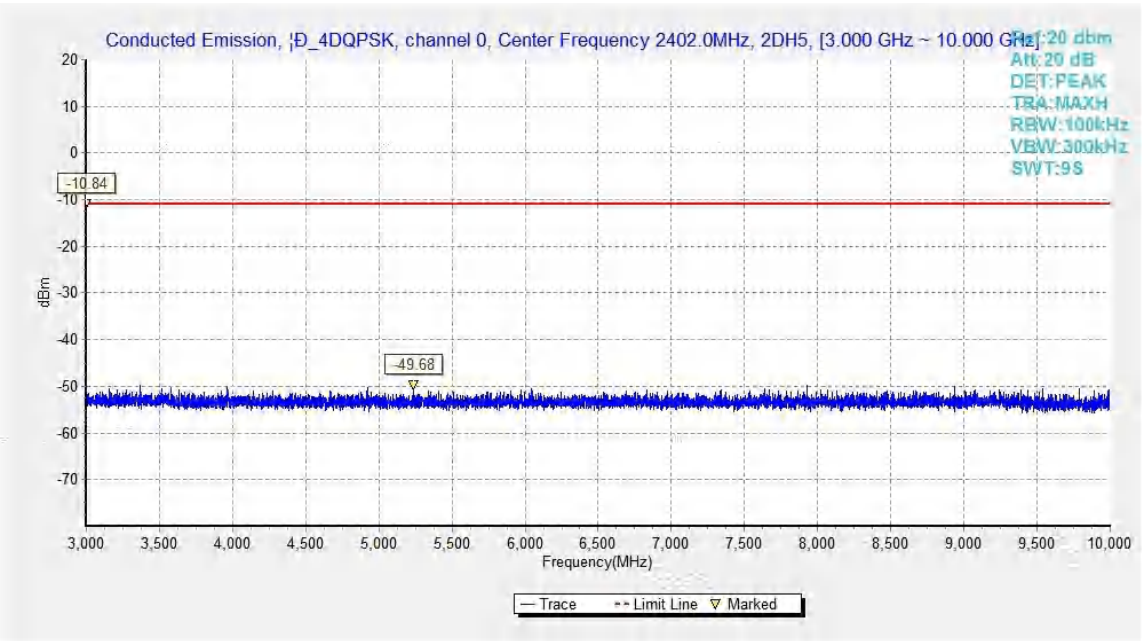

Fig.31. Conducted spurious emission: π/4 DQPSK, Channel 0, 3GHz - 10GHz

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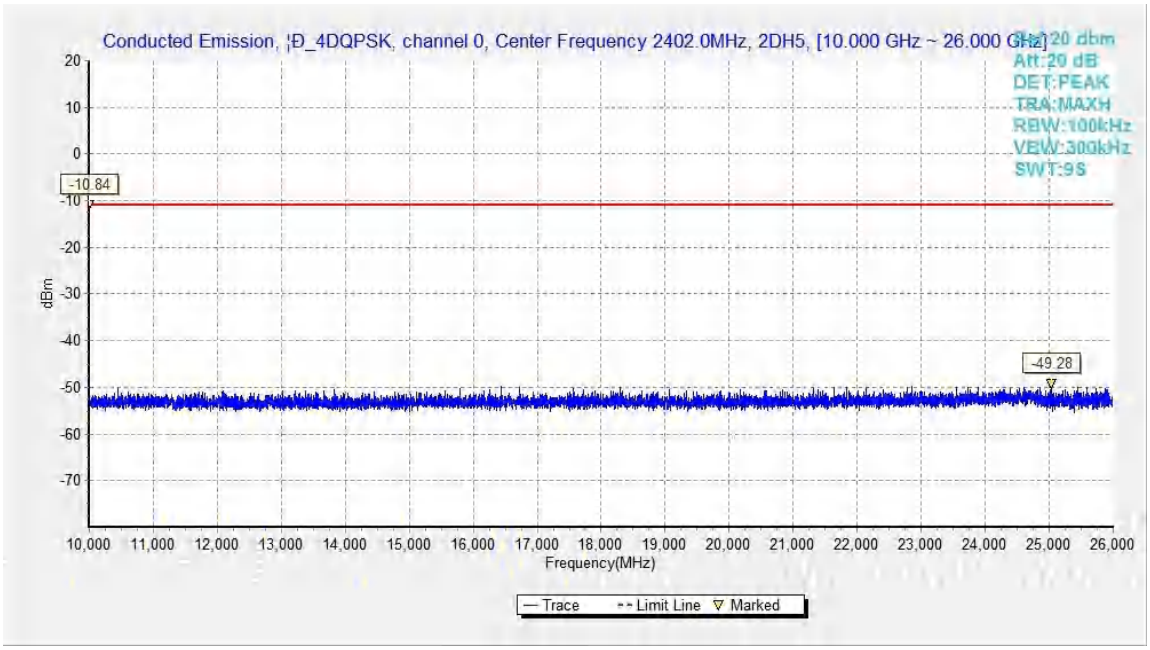

Fig.32. Conducted spurious emission: π/4 DQPSK, Channel 0,10GHz - 26GHz

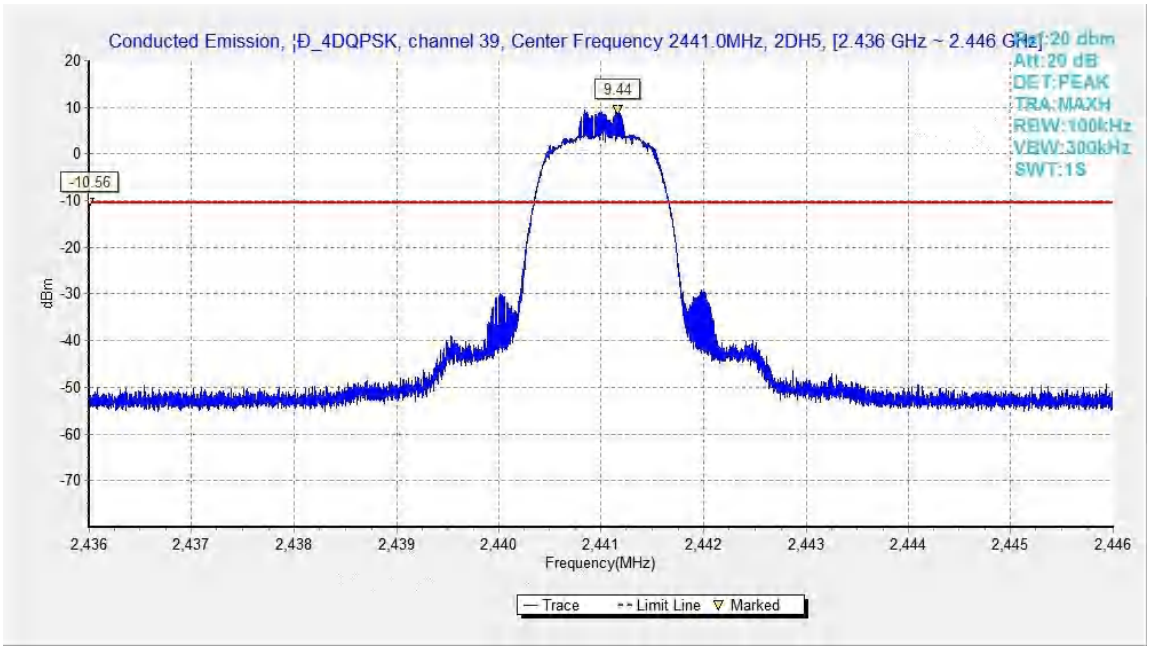

Fig.33. Conducted spurious emission: π/4 DQPSK, Channel 39, 2441MHz

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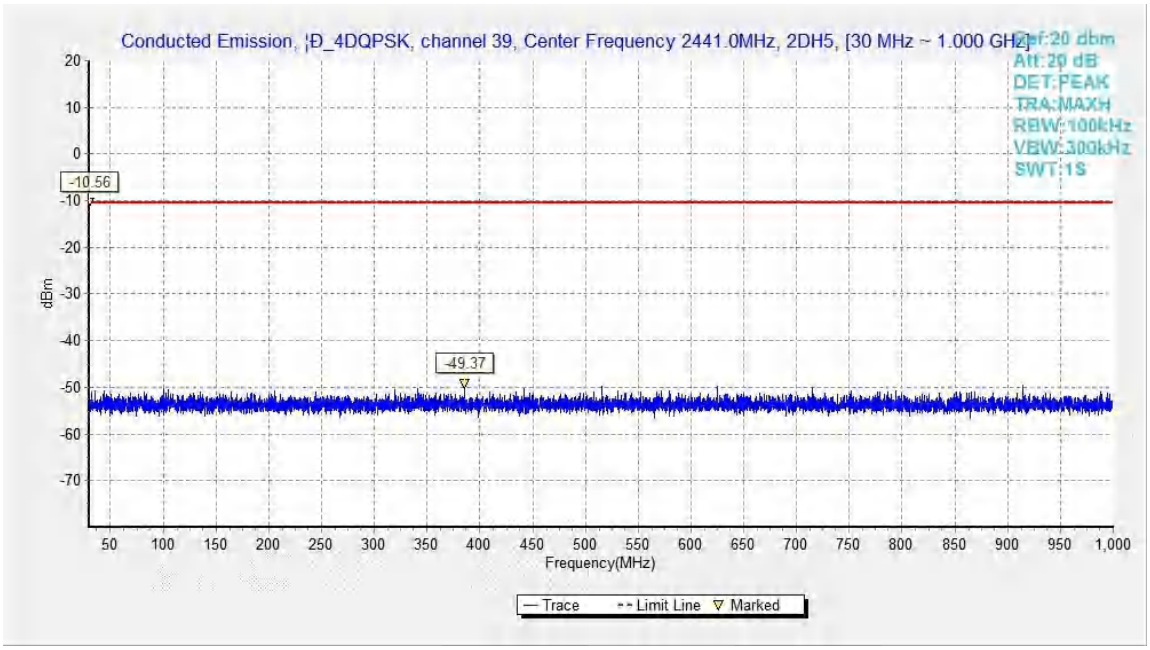

Fig.34. Conducted spurious emission: π/4 DQPSK, Channel 39, 30MHz - 1GHz

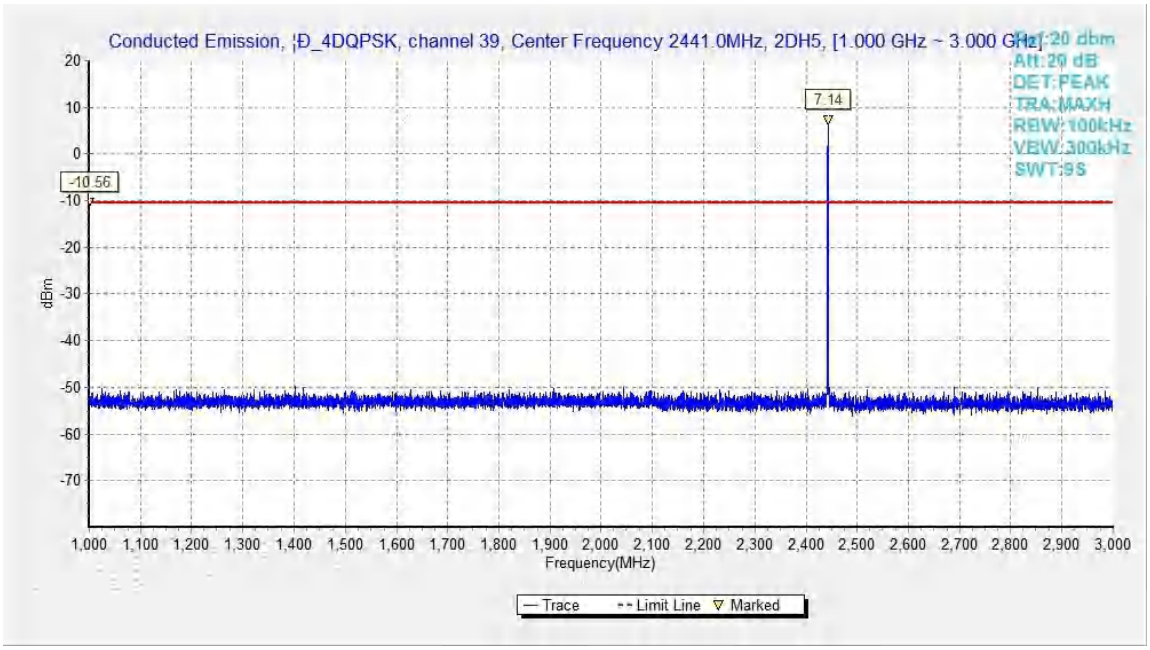

Fig.35. Conducted spurious emission: π/4 DQPSK, Channel 39, 1GHz - 3GHz

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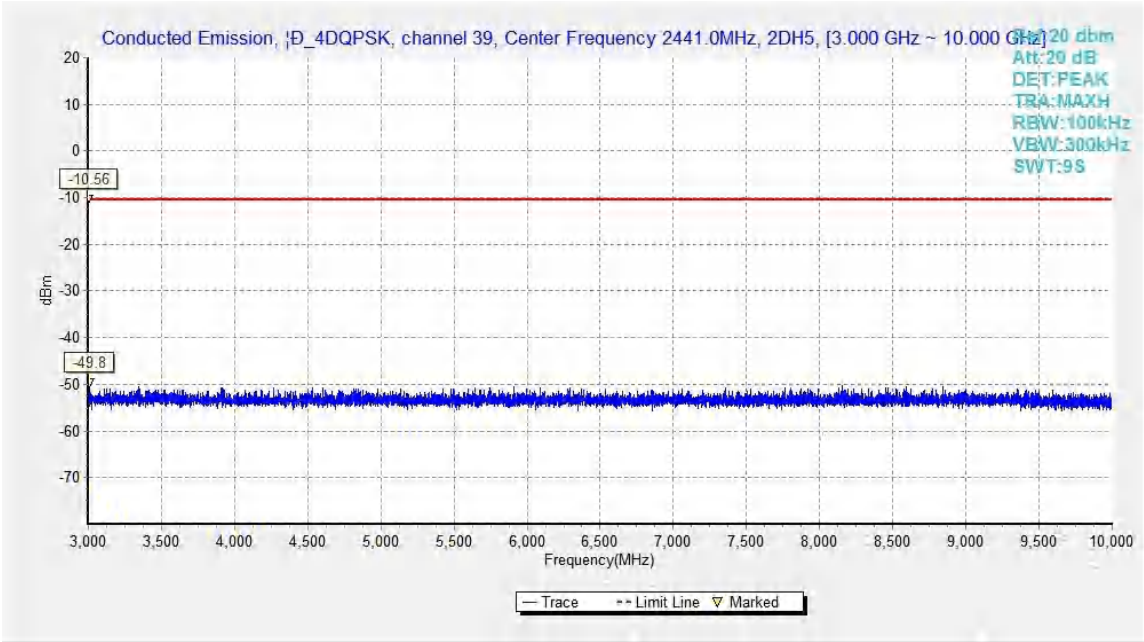

Fig.36. Conducted spurious emission: π/4 DQPSK, Channel 39, 3GHz - 10GHz

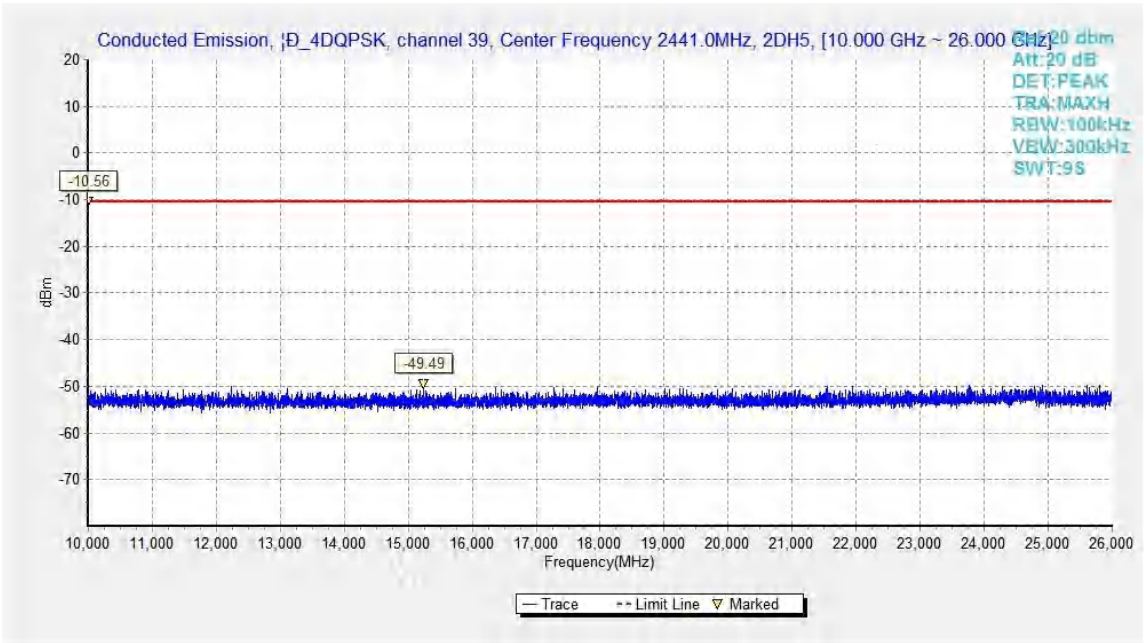

Fig.37. Conducted spurious emission: π/4 DQPSK, Channel 39, 10GHz – 26GHz

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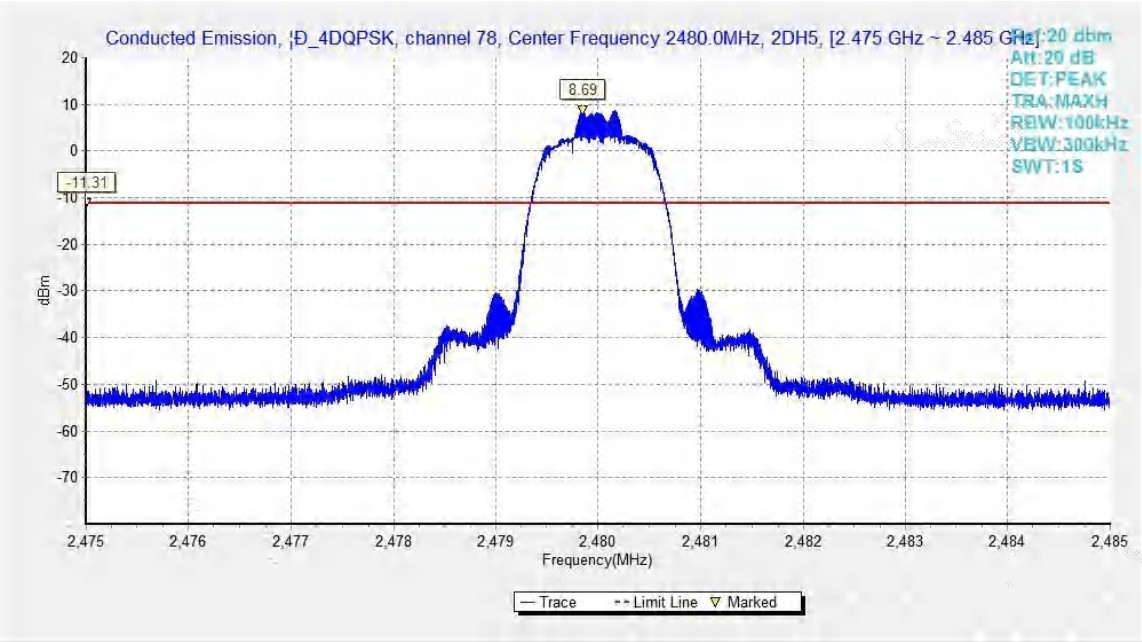

Fig.38. Conducted spurious emission: π/4 DQPSK, Channel 78, 2480MHz

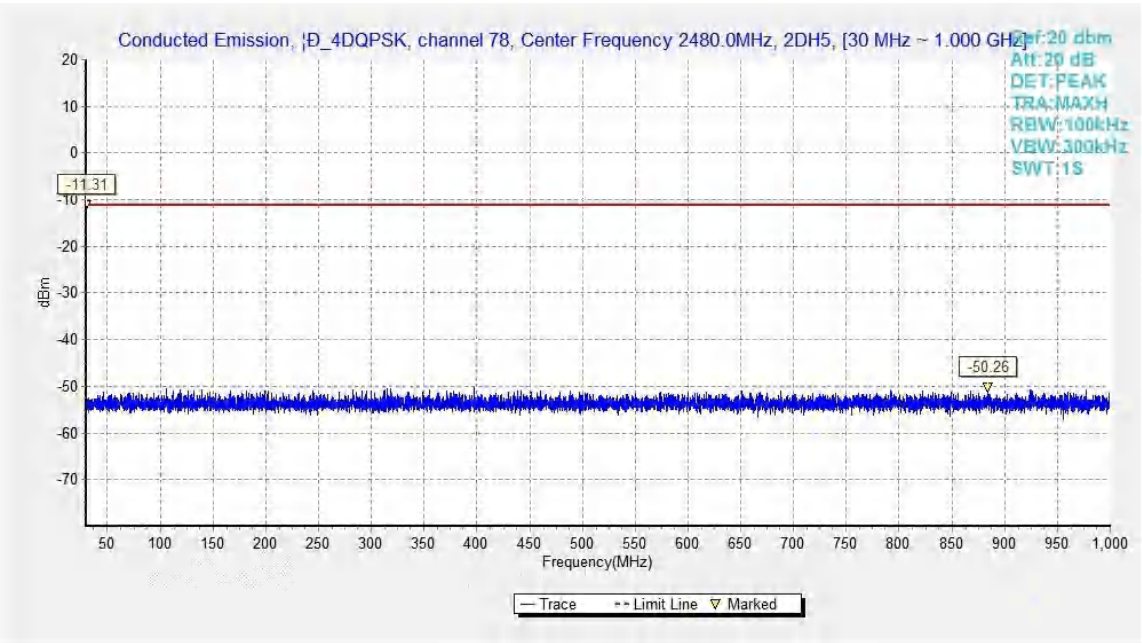

Fig.39. Conducted spurious emission: π/4 DQPSK, Channel 78, 30MHz - 1GHz

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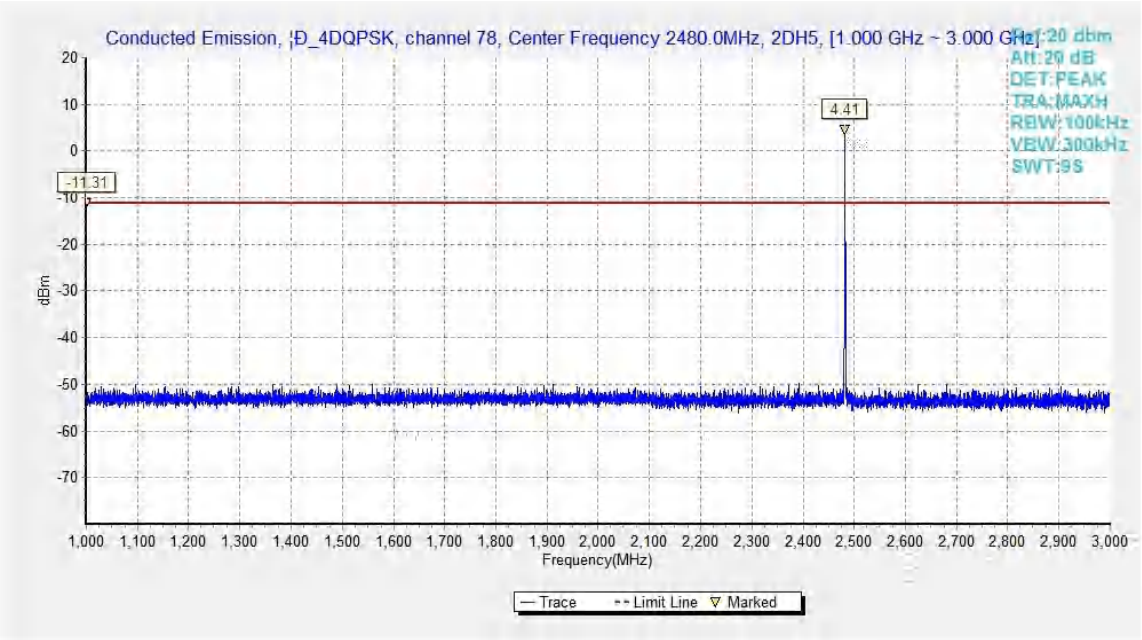

Fig.40. Conducted spurious emission: π/4 DQPSK, Channel 78, 1GHz - 3GHz

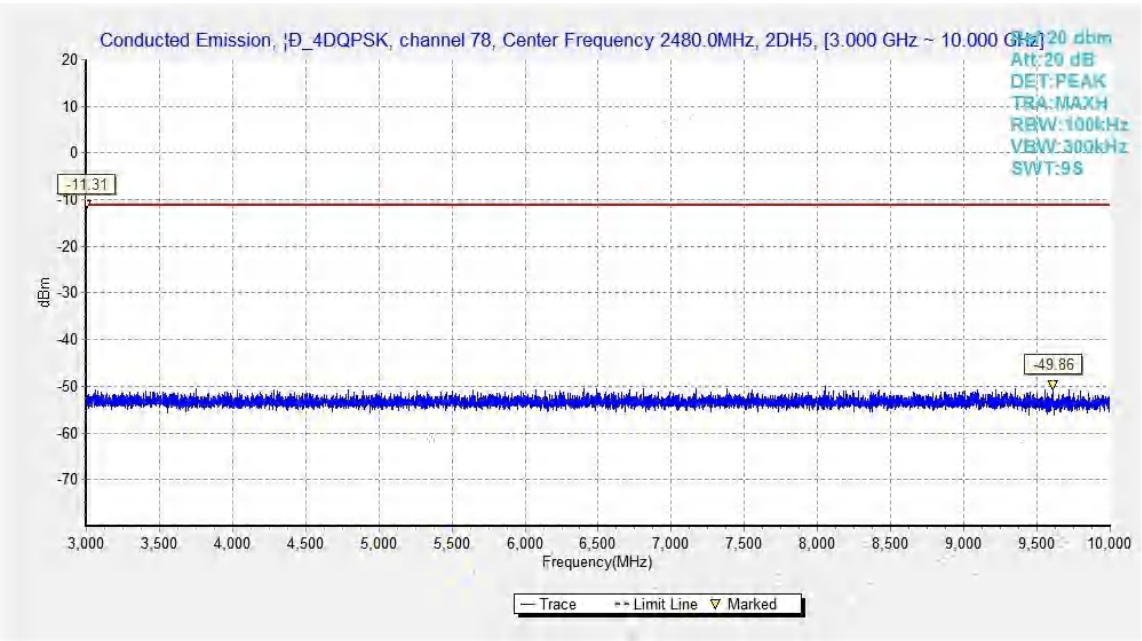

Fig.41. Conducted spurious emission: π/4 DQPSK, Channel 78, 3GHz - 10GHz

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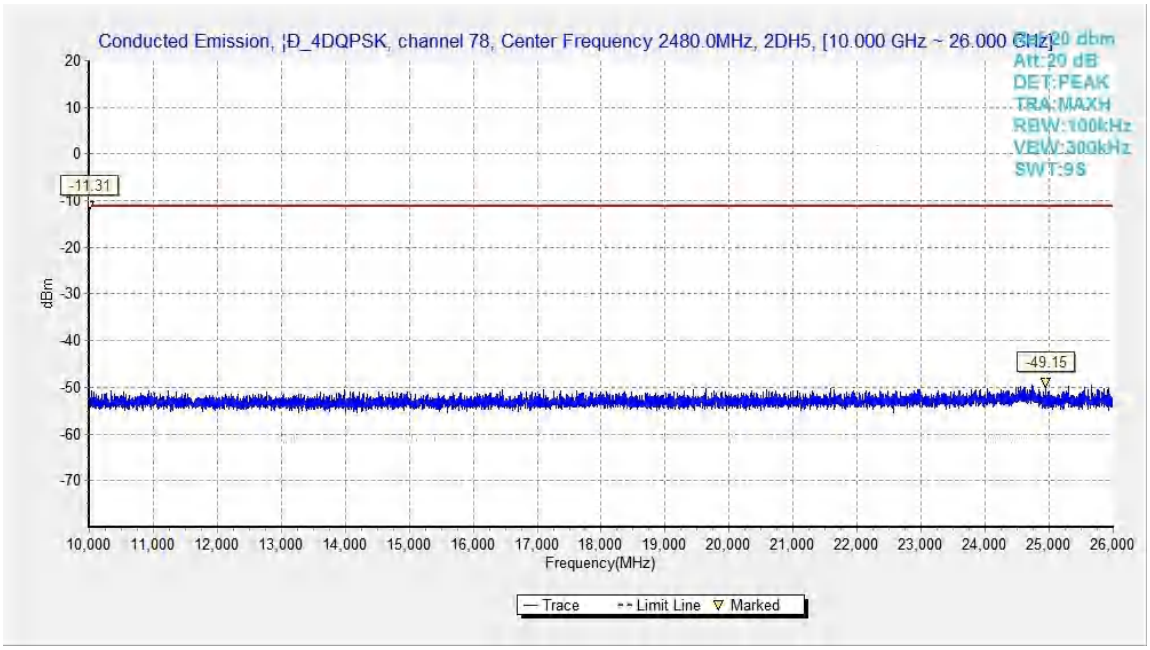

Fig.42. Conducted spurious emission: π/4 DQPSK, Channel 78, 10GHz - 26GHz

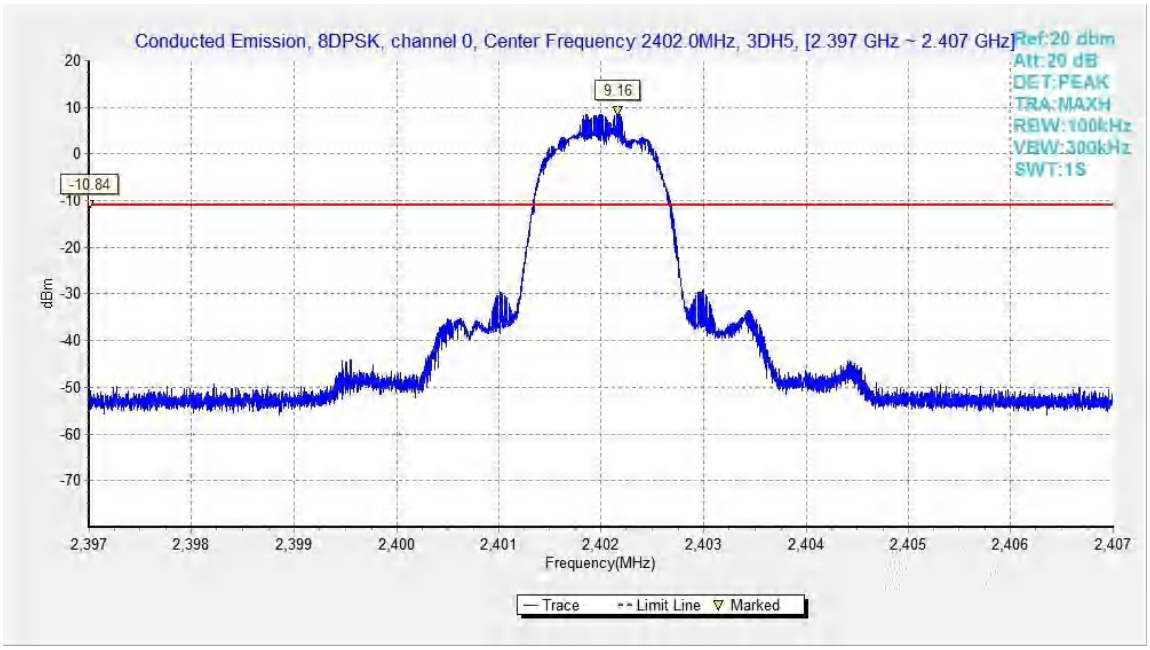

Fig.43. Conducted spurious emission: 8DPSK, Channel 0,2402MHz

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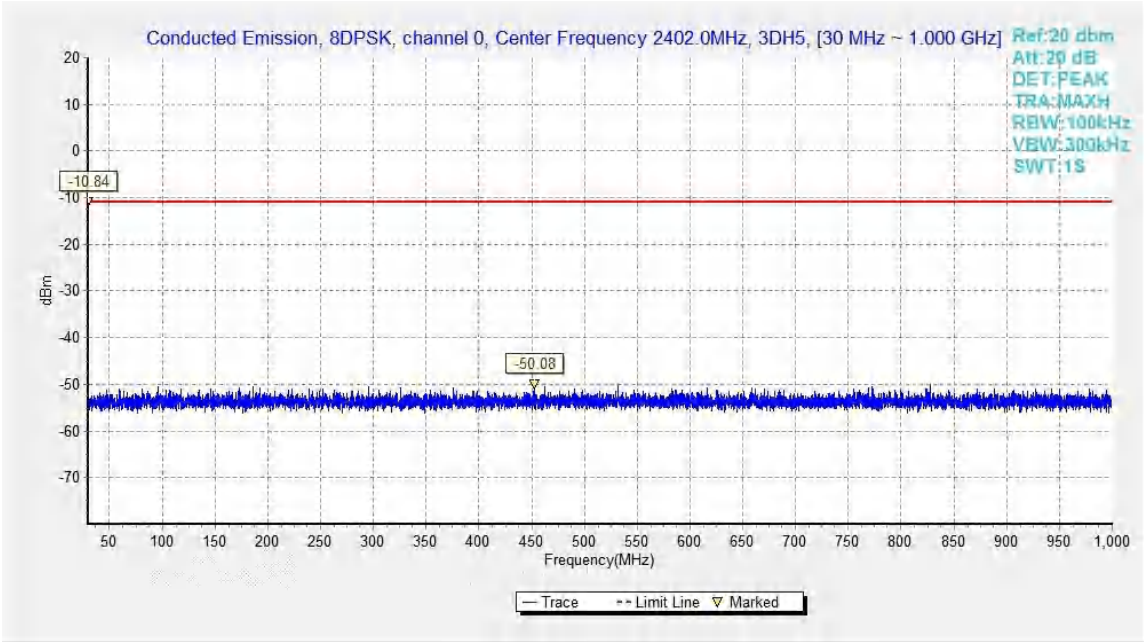

Fig.44. Conducted spurious emission: 8DPSK, Channel 0, 30MHz - 1GHz

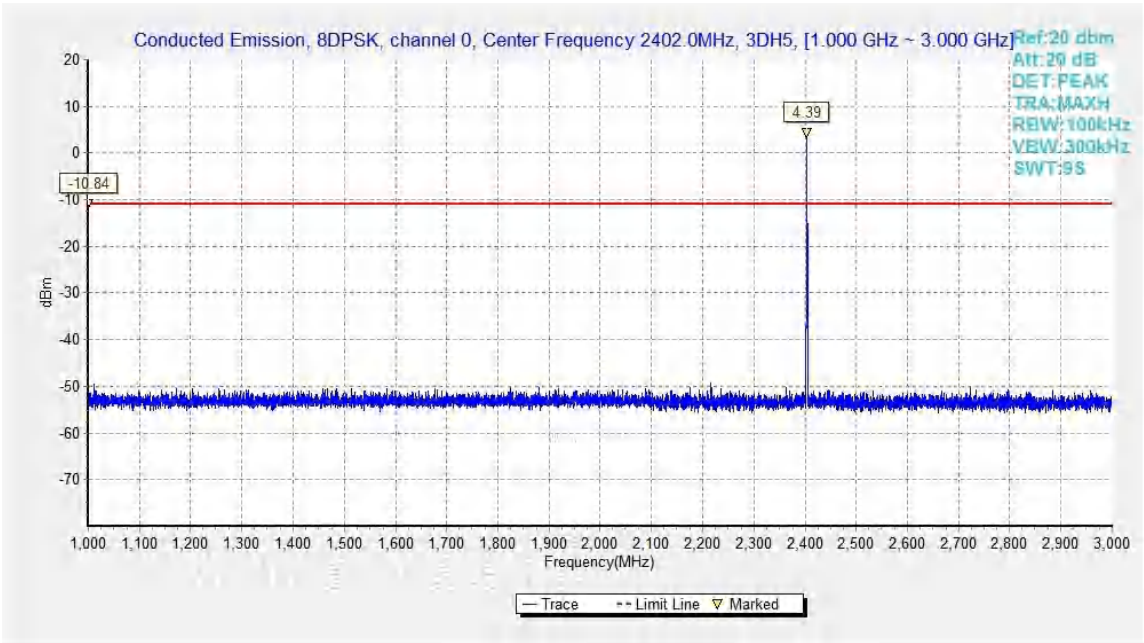

Fig.45. Conducted spurious emission: 8DPSK, Channel 0, 1GHz - 3GHz

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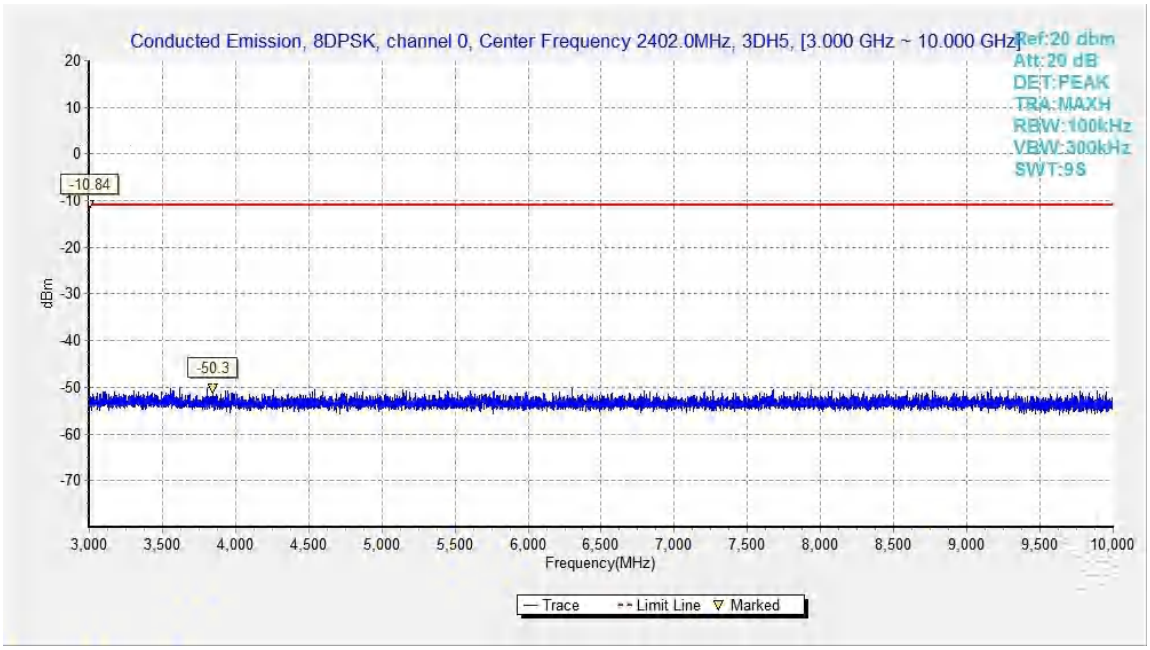

Fig.46. Conducted spurious emission: 8DPSK, Channel 0, 3GHz - 10GHz

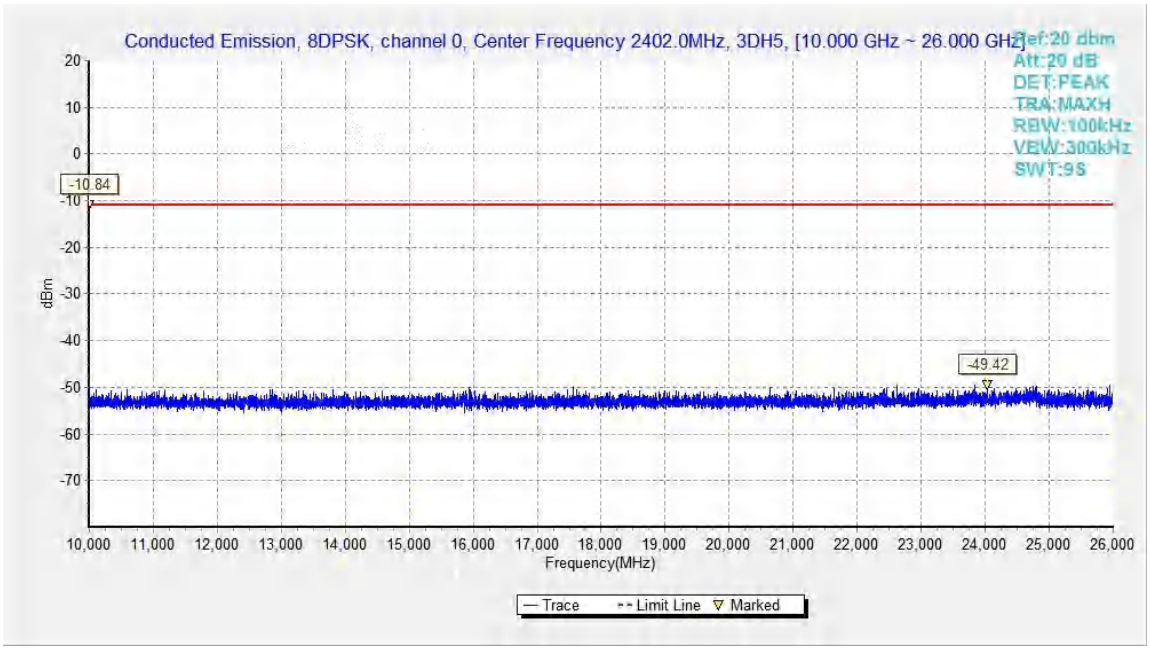

Fig.47. Conducted spurious emission: 8DPSK, Channel 0,10GHz - 26GHz

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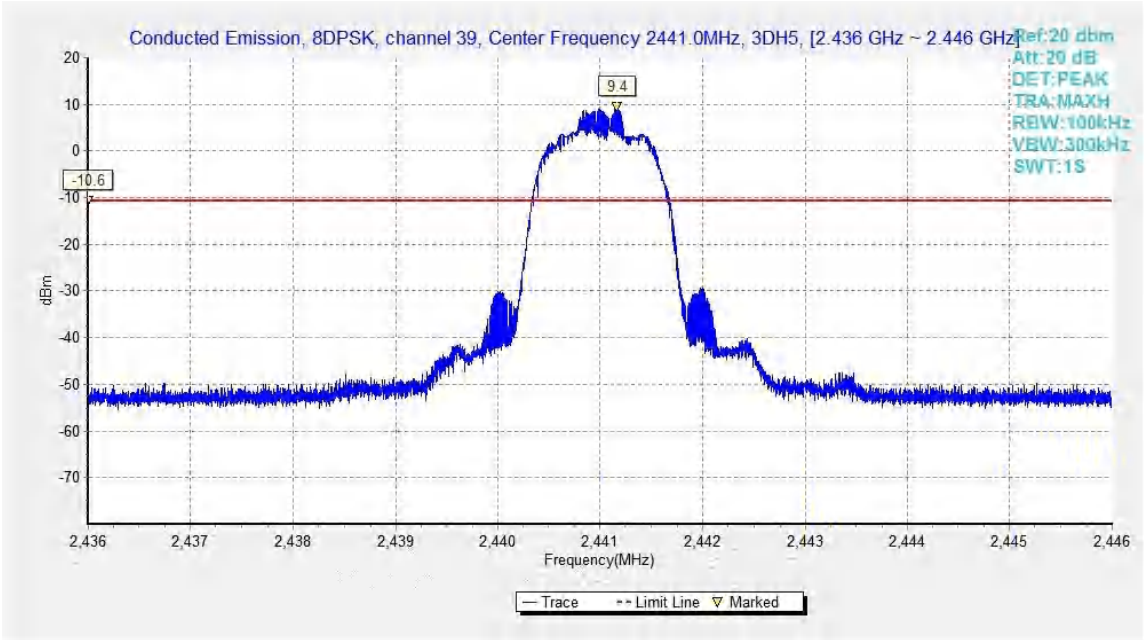

Fig.48. Conducted spurious emission: 8DPSK, Channel 39, 2441MHz

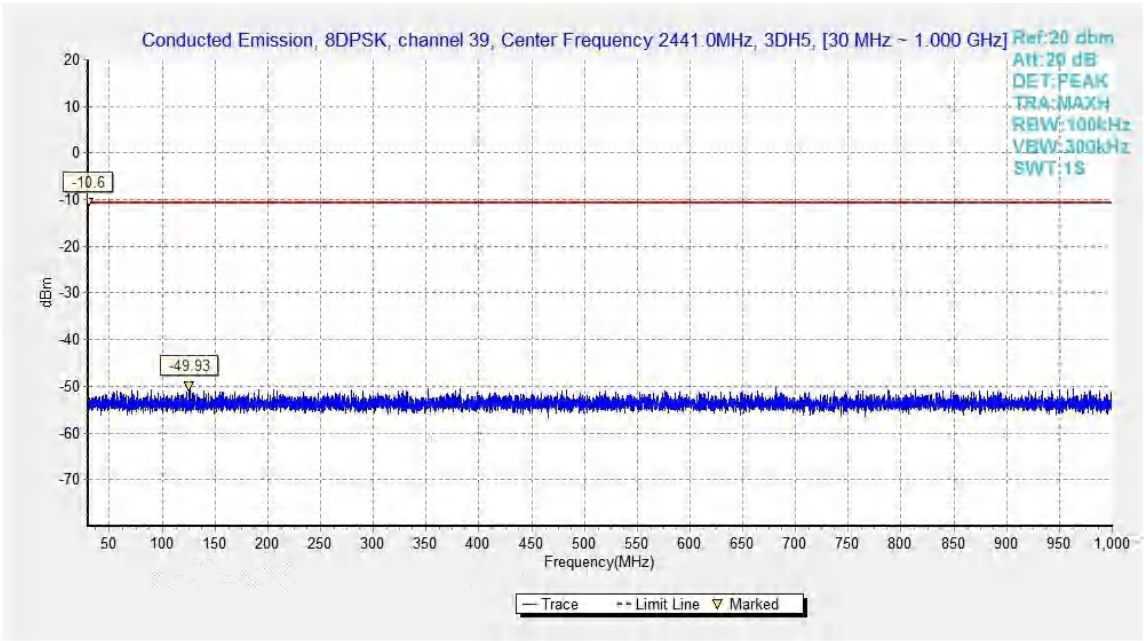

Fig.49. Conducted spurious emission: 8DPSK, Channel 39, 30MHz - 1GHz

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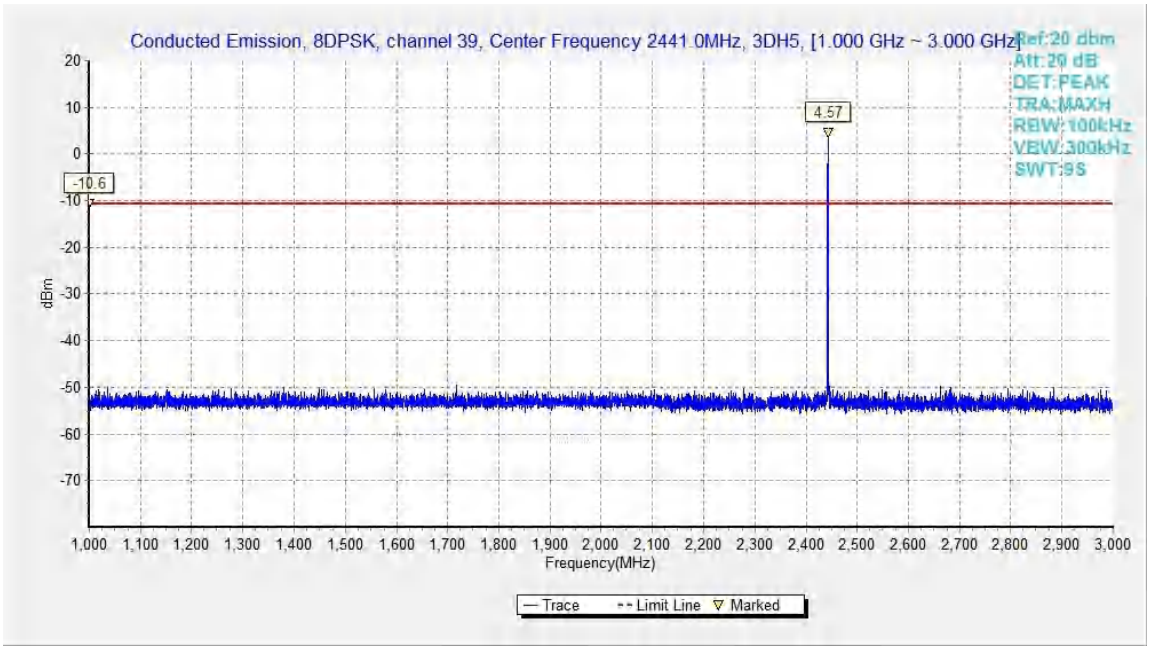

Fig.50. Conducted spurious emission: 8DPSK, Channel 39, 1GHz - 3GHz

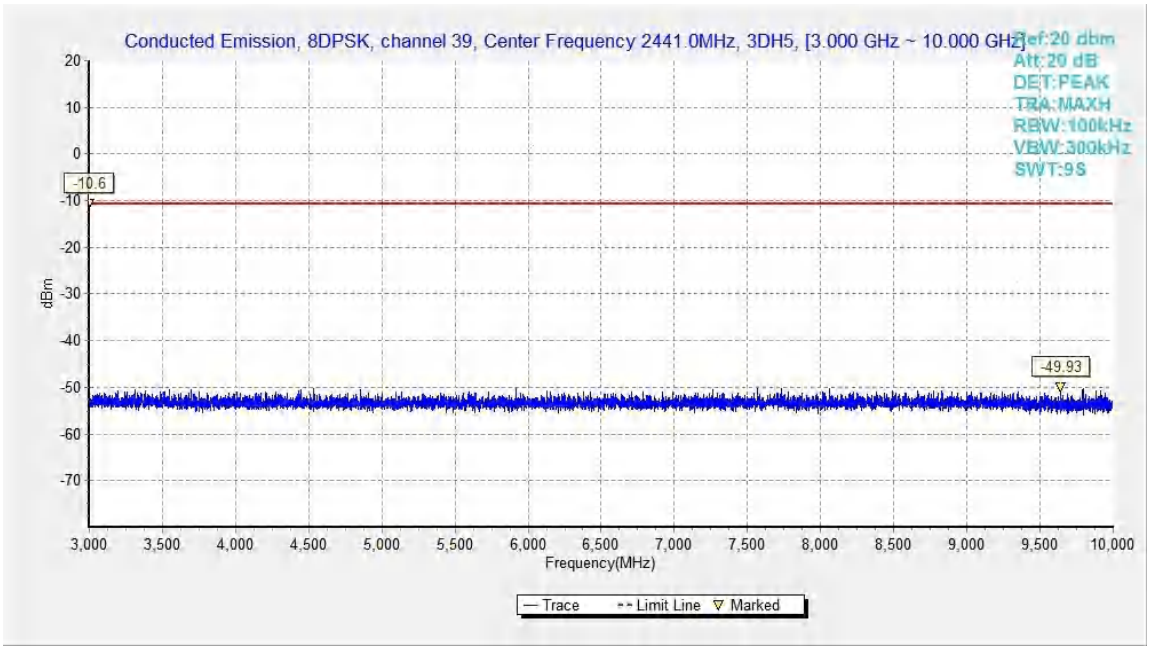

Fig.51. Conducted spurious emission: 8DPSK, Channel 39, 3GHz - 10GHz

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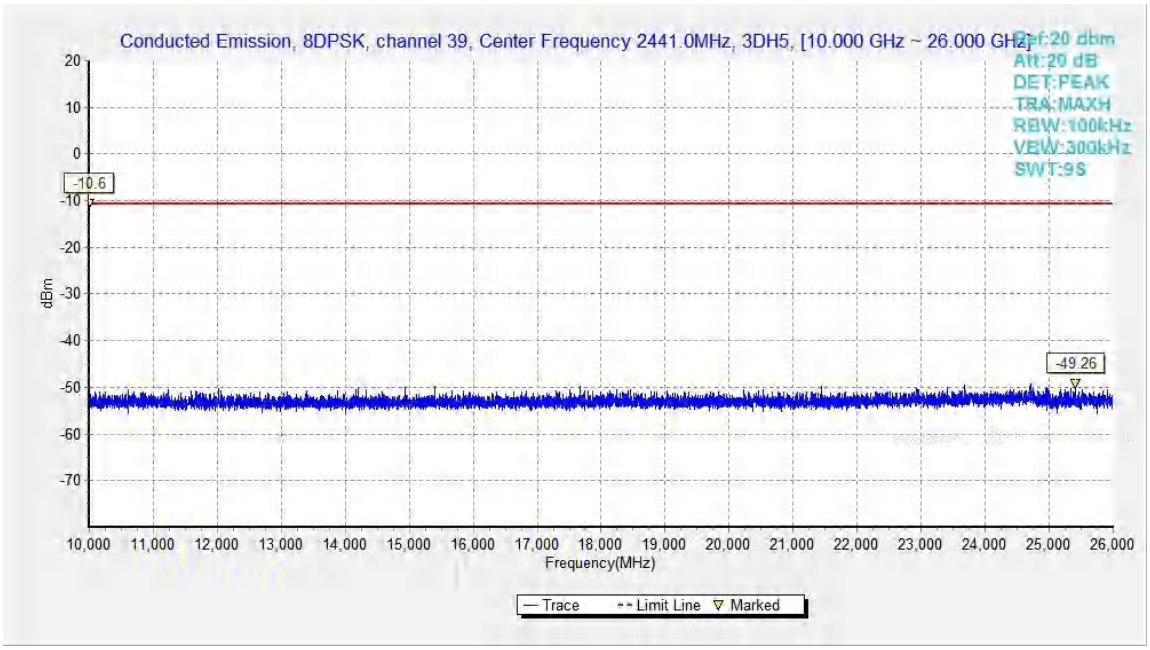

Fig.52. Conducted spurious emission: 8DPSK, Channel 39, 10GHz – 26GHz

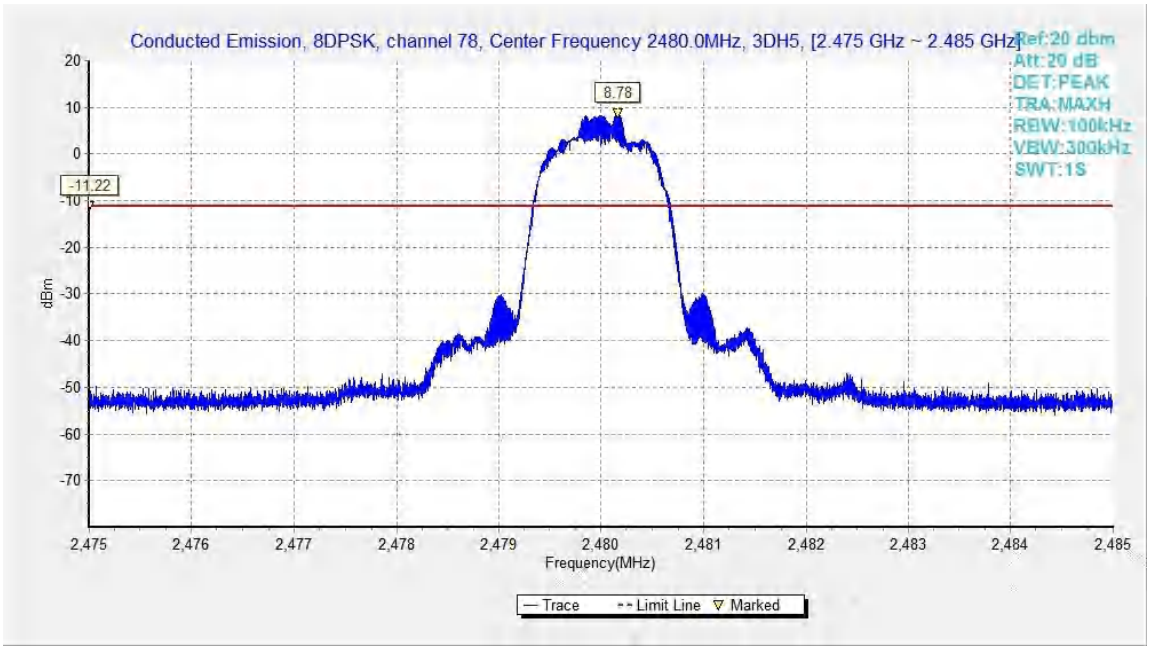

Fig.53. Conducted spurious emission: 8DPSK, Channel 78, 2480MHz

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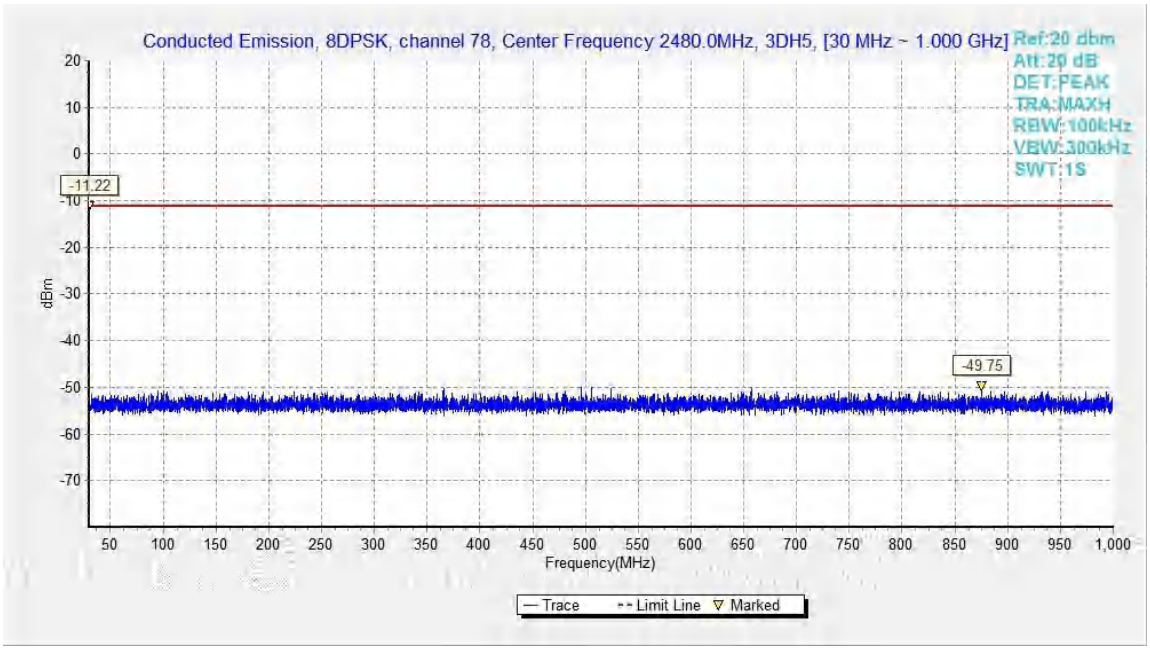

Fig.54. Conducted spurious emission: 8DPSK, Channel 78, 30MHz - 1GHz

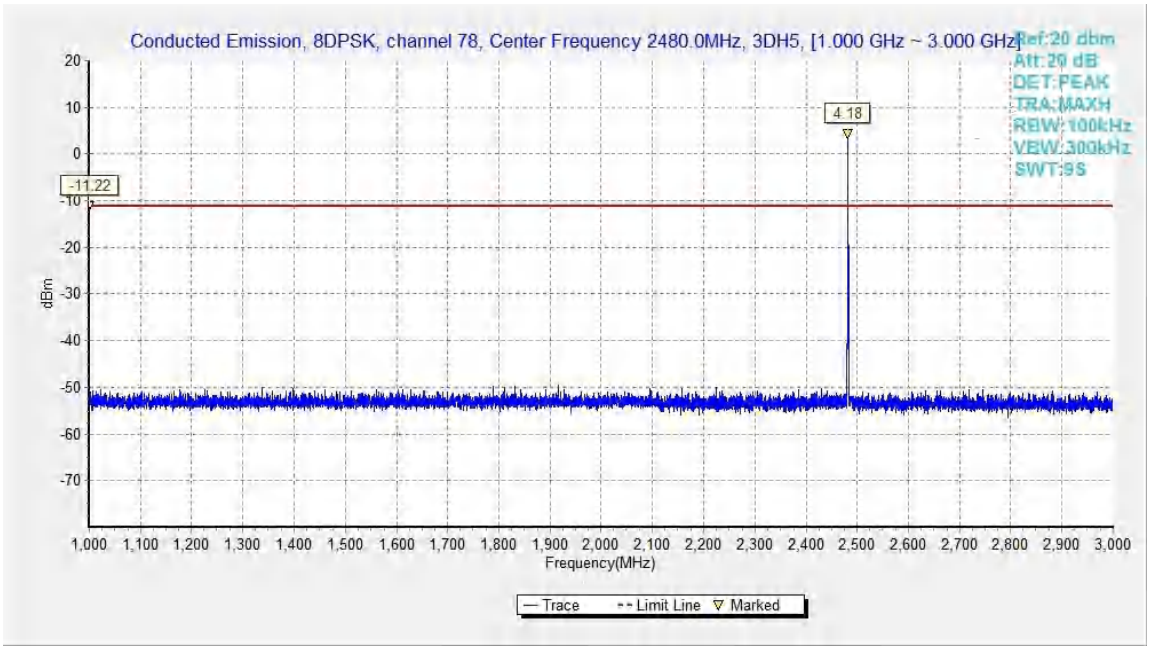

Fig.55. Conducted spurious emission: 8DPSK, Channel 78, 1GHz - 3GHz

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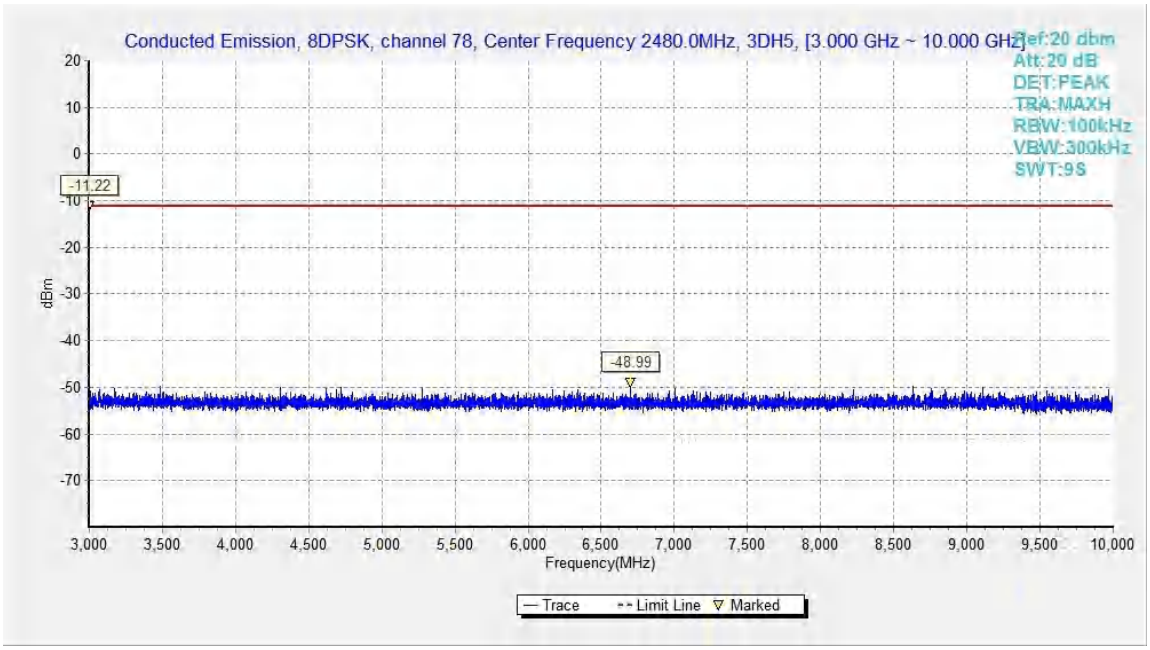

Fig.56. Conducted spurious emission: 8DPSK, Channel 78, 3GHz - 10GHz

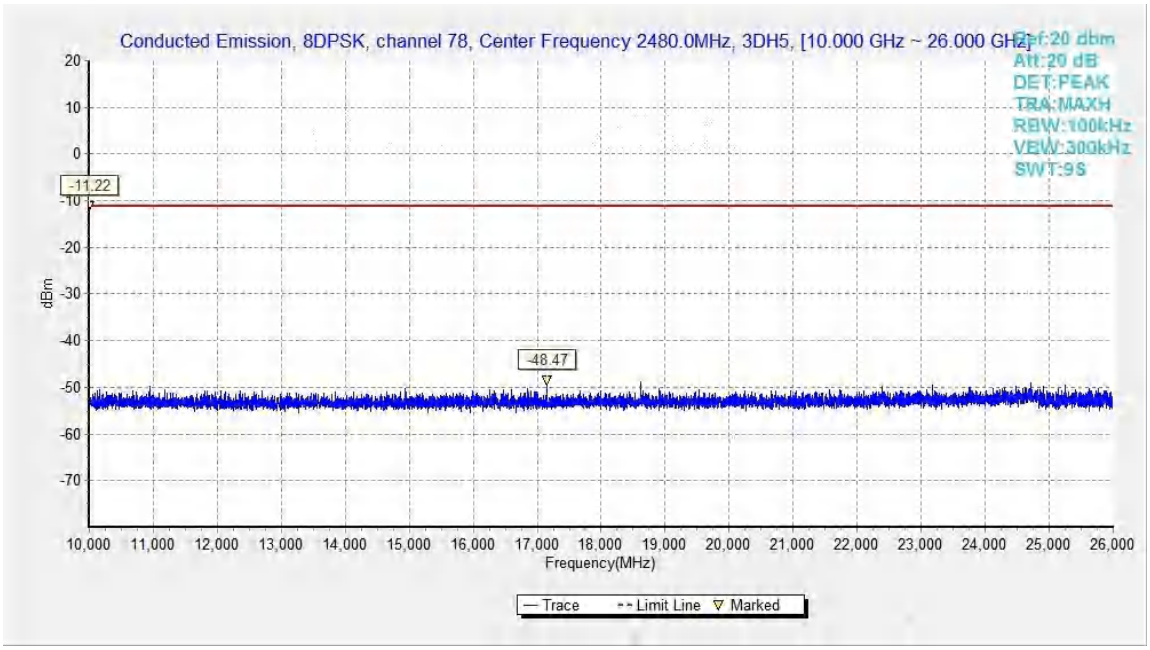

Fig.57. Conducted spurious emission: 8DPSK, Channel 78, 10GHz - 26GHz

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B.5. Time of Occupancy (Dwell Time)

Method of Measurement: See ANSI C63.10-clause 7.8.4

The EUT must have its hopping function enabled. Use the following spectrum analyzer settings:

- Span = zero span, centered on a hopping channel
- RBW = 1 MHz
- VBW ≥ RBW
- Sweep = as necessary to capture the entire dwell time per hopping channel
- Detector function = peak
- Trace = max hold

Measure a pulse time in time domain at middle frequency and then count the hopping number in 31.6s(which equals with 0.4 multiply 79) of middle frequency ,then multiply the pulse time and hopping number and record them.

Measurement Limit:

Standard	Limit (ms)
FCC 47 CFR Part 15.247(a) (1)(iii)	< 400

Measurement Result:

For GFSK

Channel	Packet	Pulse time (ms)		Number of Transmissions		Dwell Time (ms)	Conclusion
39	DH1	Fig.58	0.38	Fig.59	320	121.6	P
	DH3	Fig.60	1.63	Fig.61	119	193.97	P
	DH5	Fig.62	2.88	Fig.63	58	167.04	P

For π/4 DQPSK

Channel	Packet	Pulse time (ms)		Number of Transmissions		Dwell Time (ms)	Conclusion
39	2DH1	Fig.64	0.38	Fig.65	320	121.6	P
	2DH3	Fig.66	1.63	Fig.67	105	171.15	P
	2DH5	Fig.68	2.88	Fig.69	55	158.4	P

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For 8DPSK

Channel	Packet	Pulse time (ms)		Number of Transmissions		Dwell Time (ms)	Conclusion
39	3DH1	Fig.70	0.38	Fig.71	318	120.84	P
	3DH3	Fig.72	1.63	Fig.73	92	149.96	P
	3DH5	Fig.74	2.89	Fig.75	58	167.62	P

Conclusion: PASS

Test graphs as below:

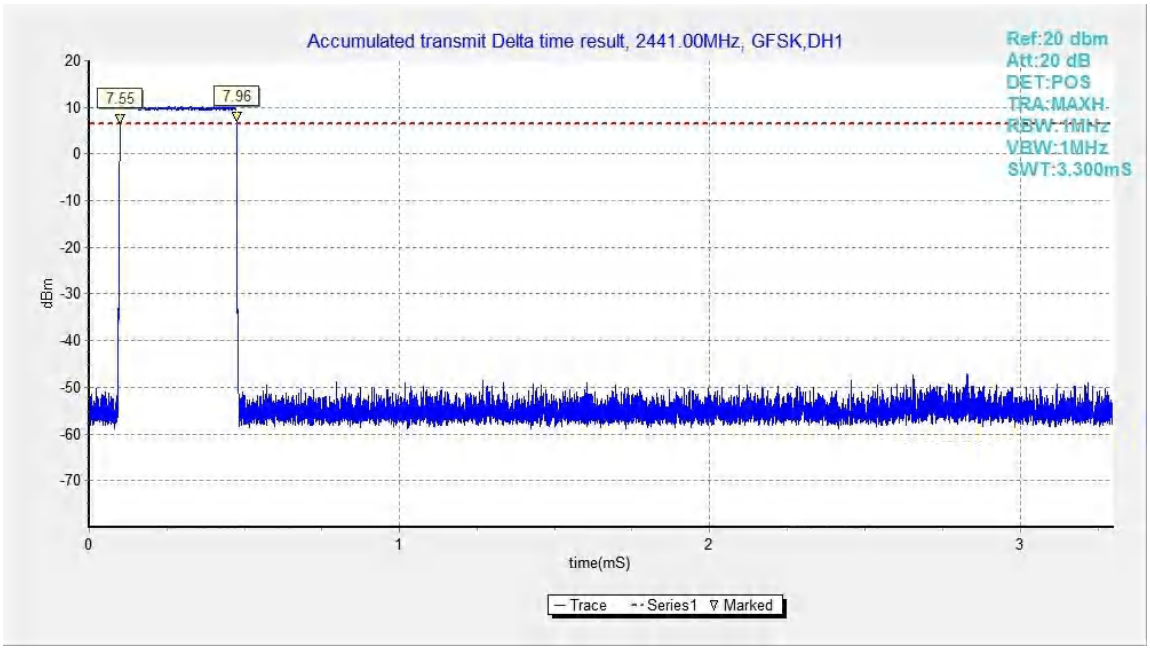

Fig.58. Time of occupancy (Dwell Time): Channel 39, Packet DH1

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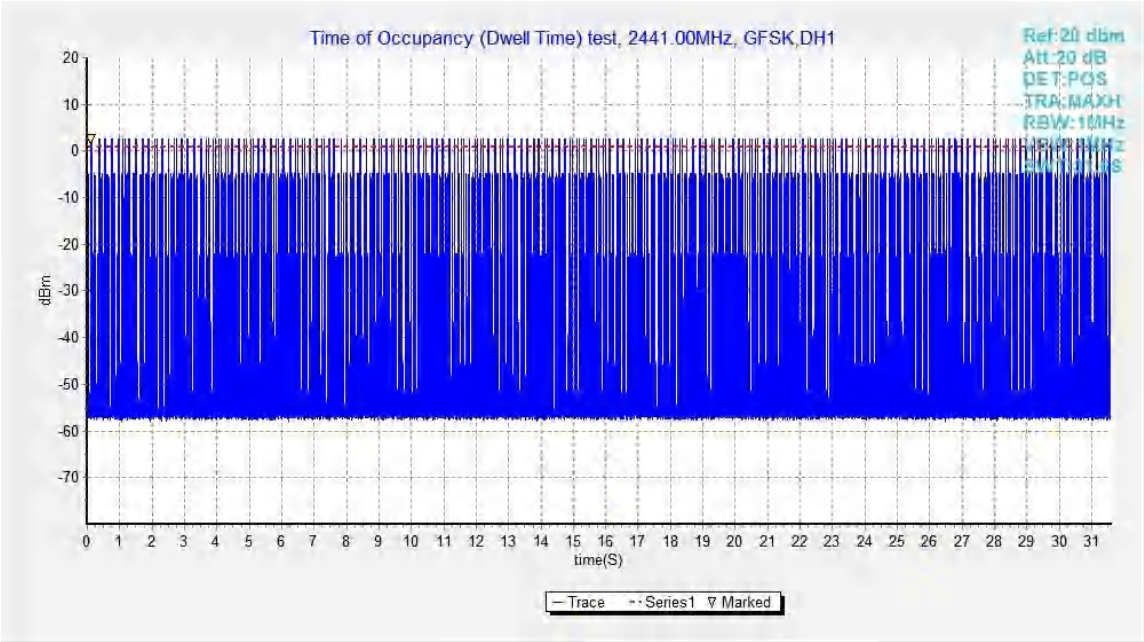

Fig.59. Number of Transmissions Measurement: Channel 39,Packet DH1

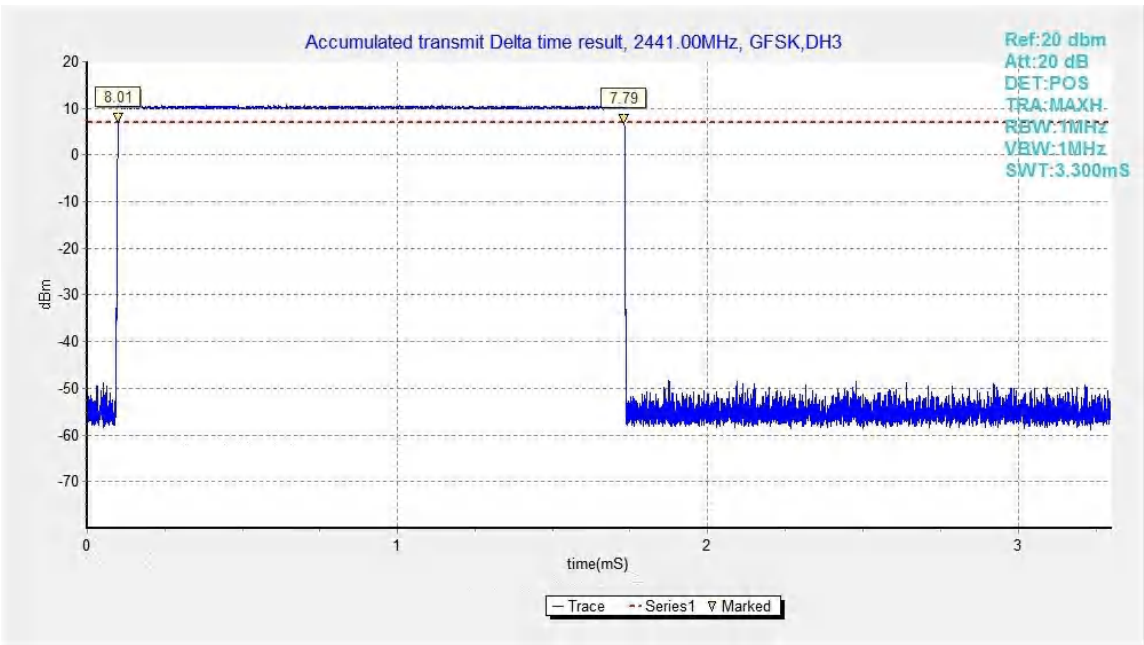

Fig.60. Time of occupancy (Dwell Time): Channel 39, Packet DH3

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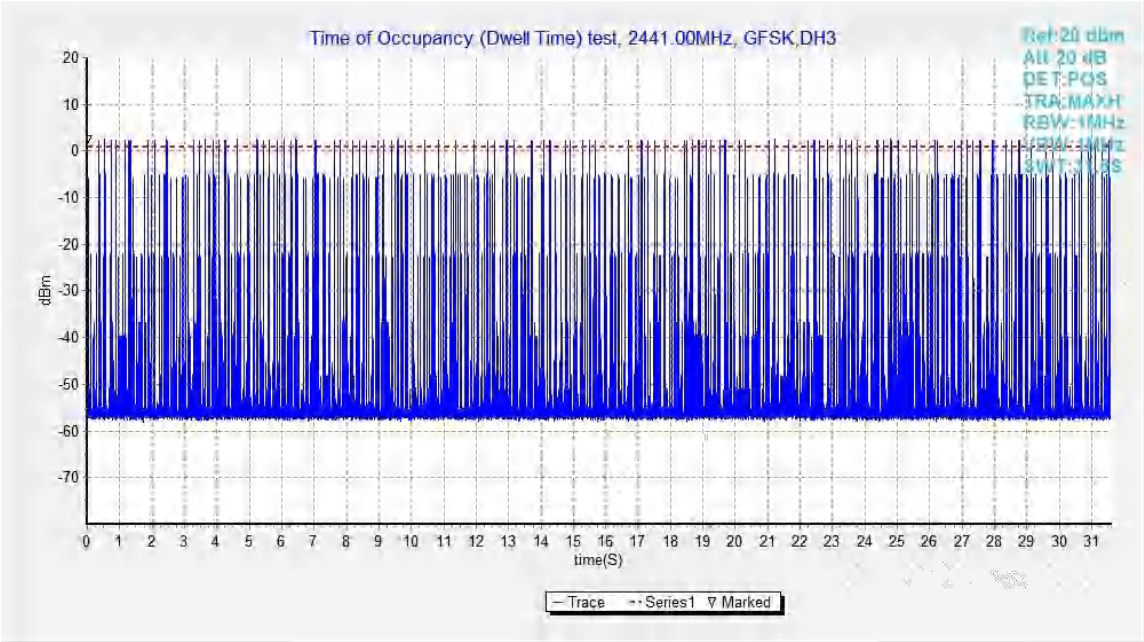

Fig.61. Number of Transmissions Measurement: Channel 39,Packet DH3

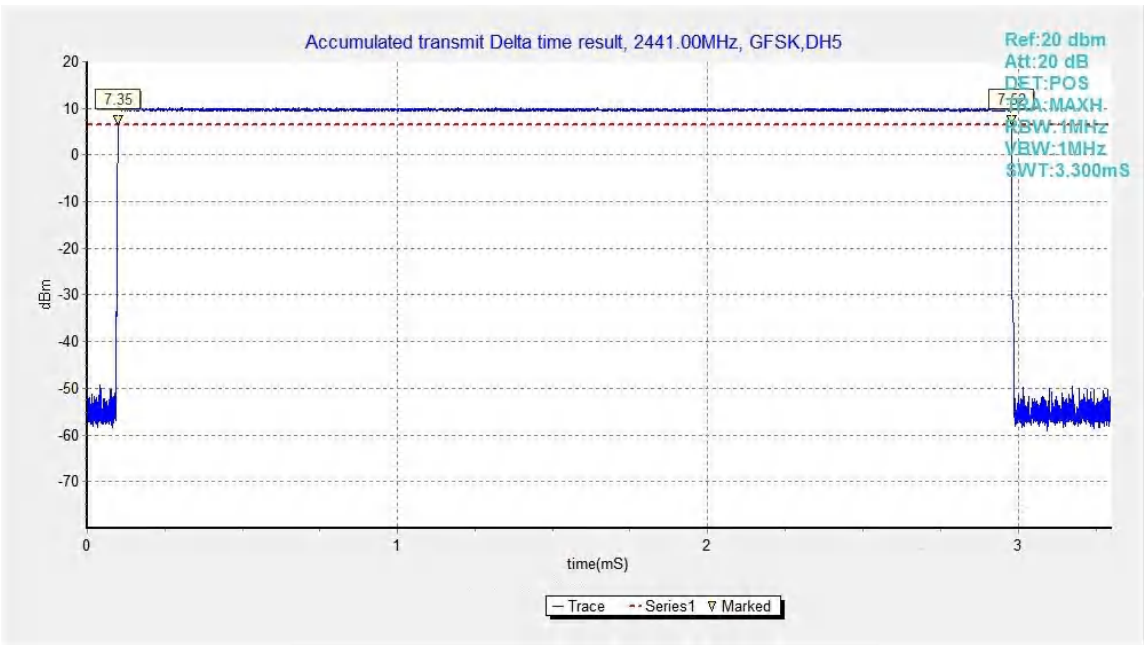

Fig.62. Time of occupancy (Dwell Time): Channel 39, Packet DH5

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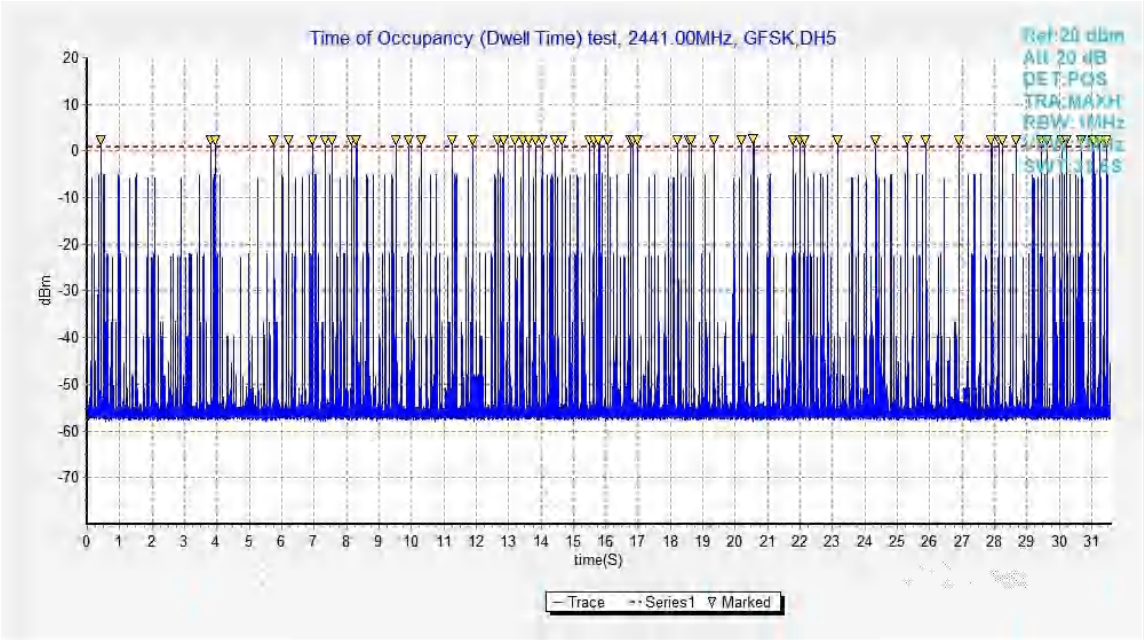

Fig.63. Number of Transmissions Measurement: Channel 39,Packet DH5

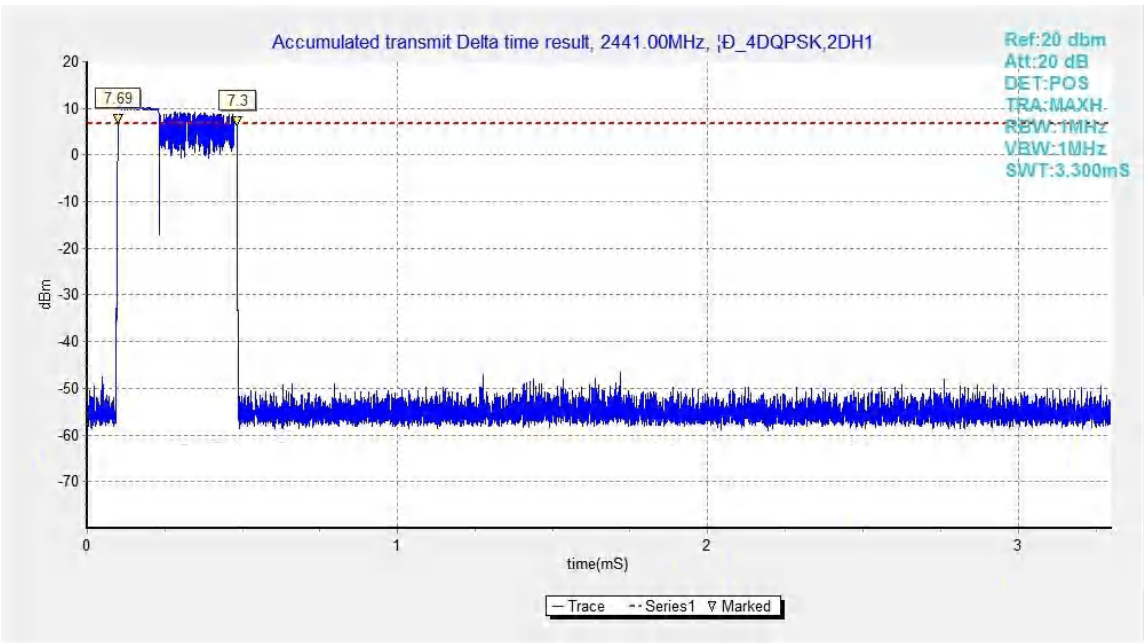

Fig.64. Time of occupancy (Dwell Time): Channel 39, Packet 2-DH1

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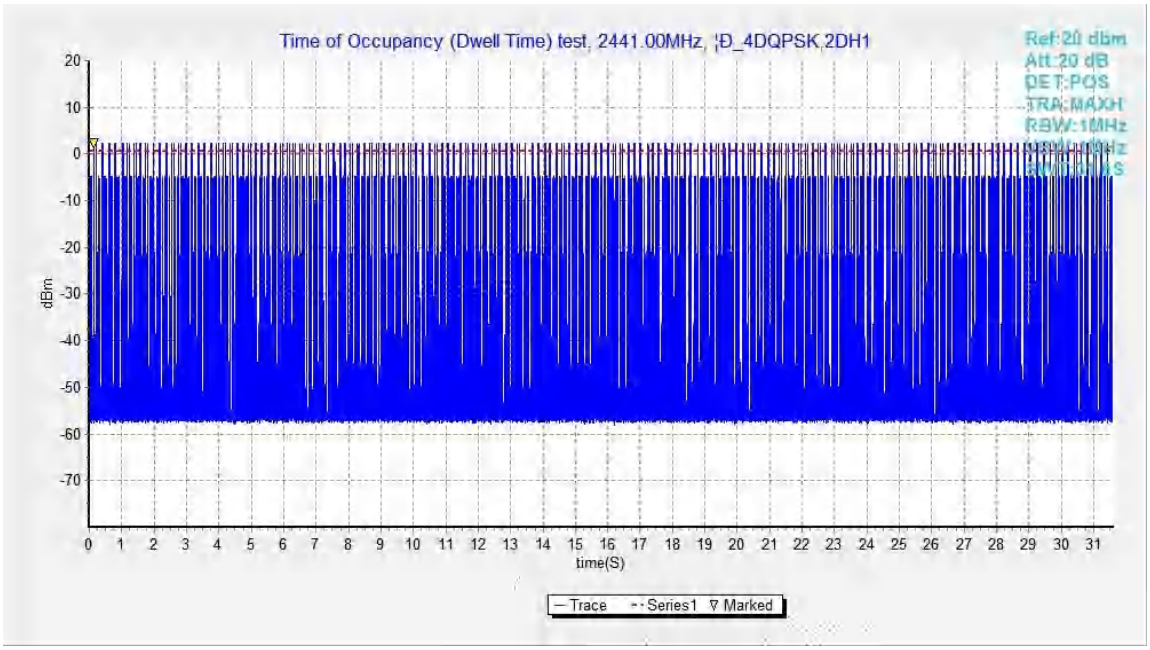

Fig.65. Number of Transmissions Measurement: Channel 39,Packet 2-DH1

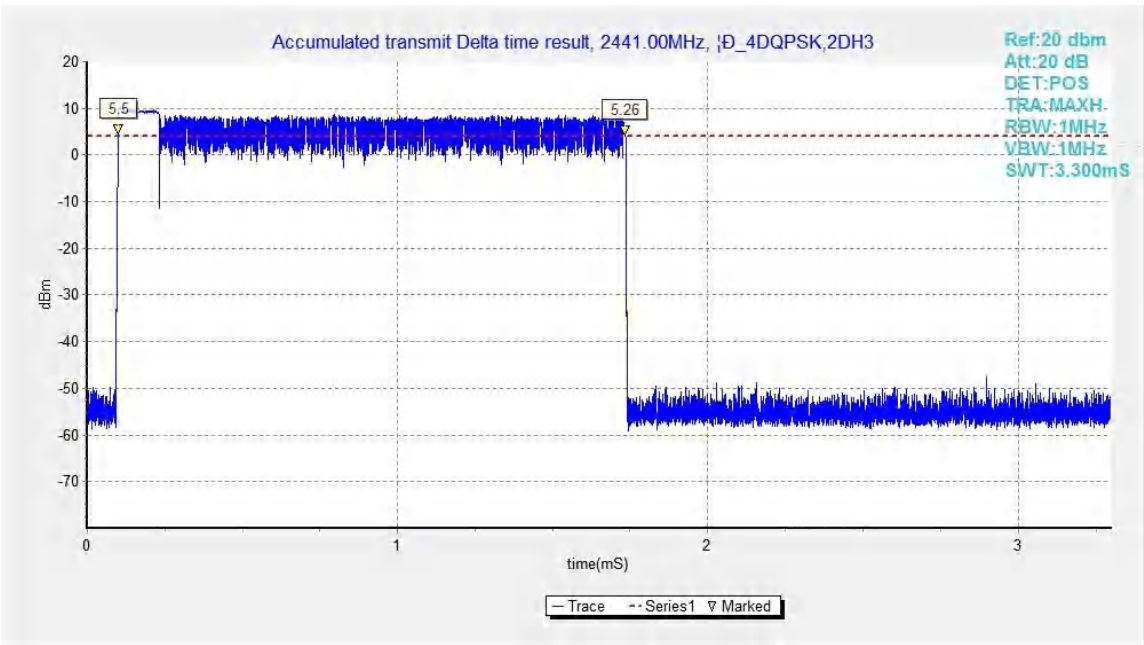

Fig.66. Time of occupancy (Dwell Time): Channel 39, Packet 2-DH3

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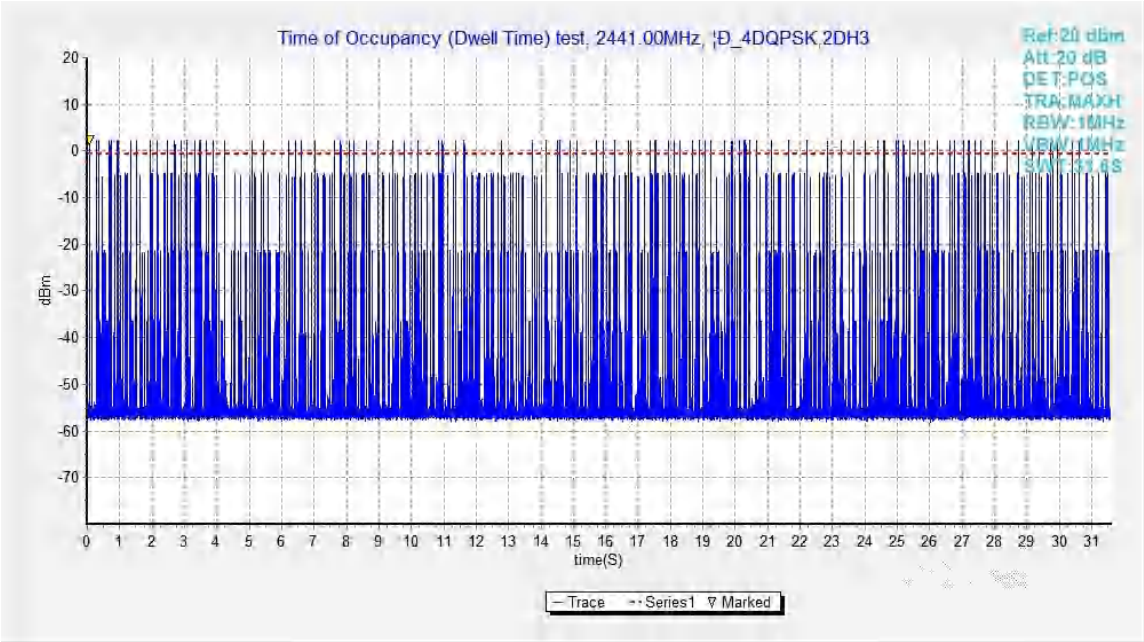

Fig.67. Number of Transmissions Measurement: Channel 39,Packet 2-DH3

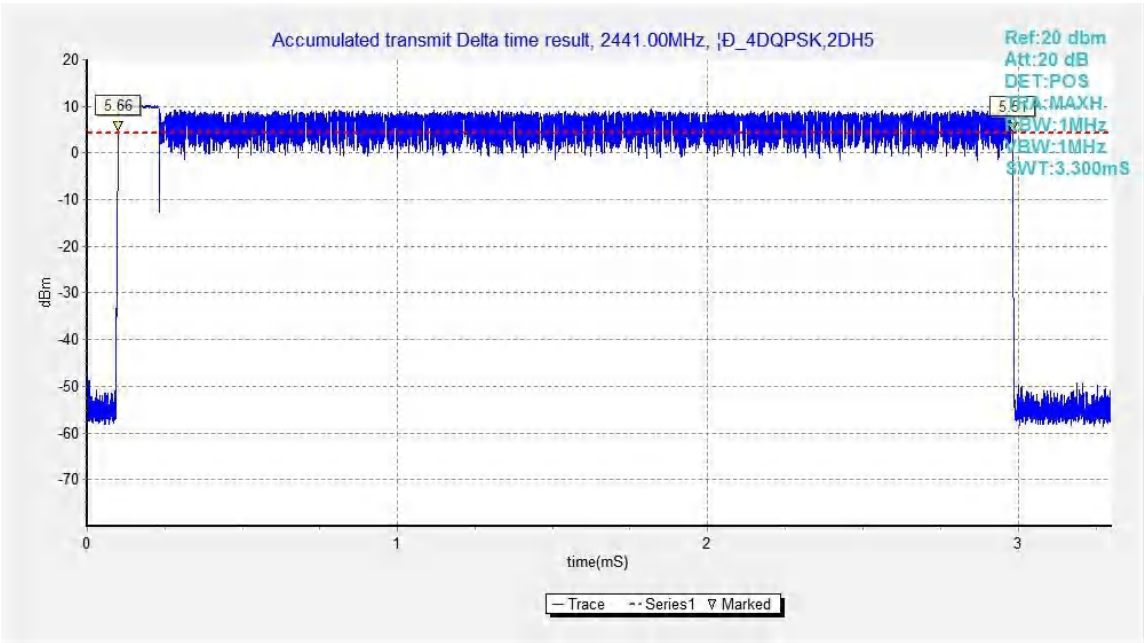

Fig.68. Time of occupancy (Dwell Time): Channel 39, Packet 2-DH5

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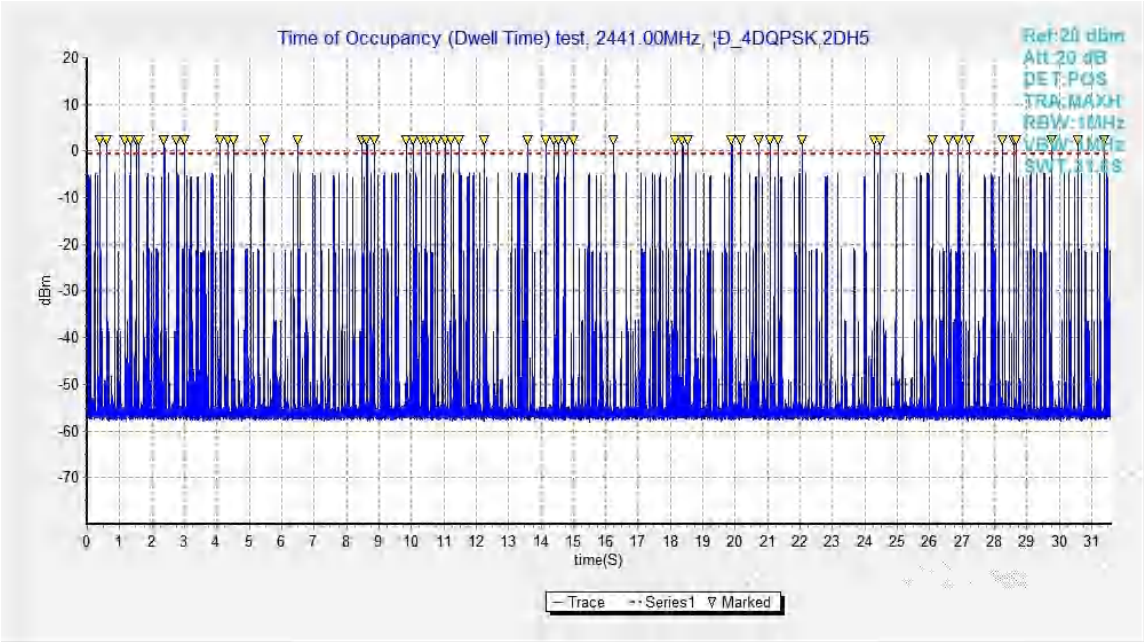

Fig.69. Number of Transmissions Measurement: Channel 39,Packet 2-DH5

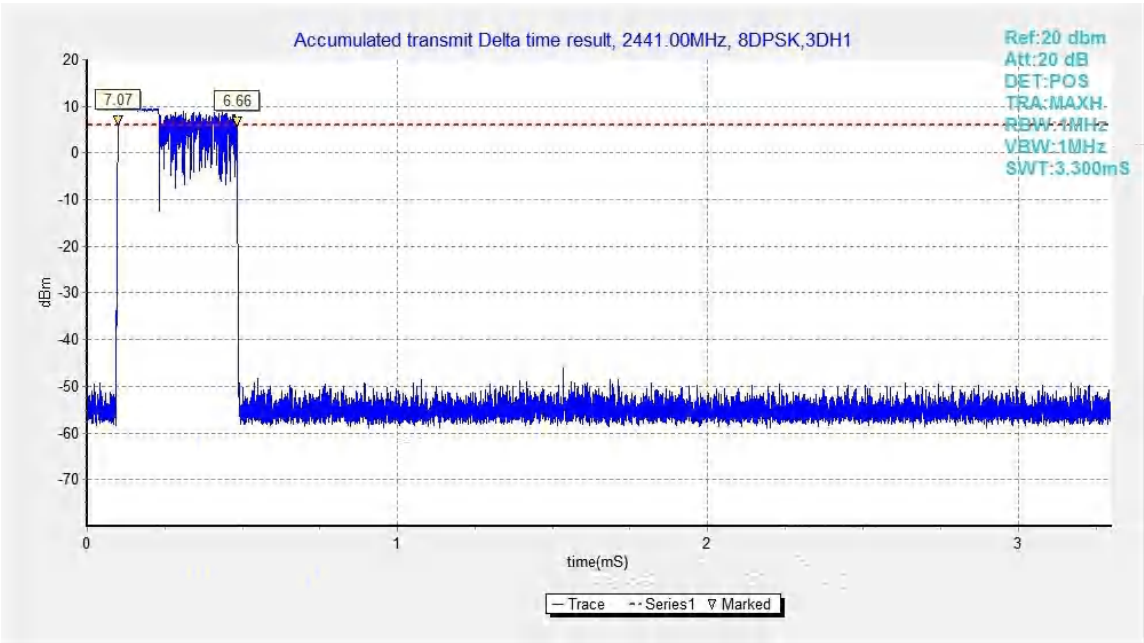

Fig.70. Time of occupancy (Dwell Time): Channel 39, Packet 3-DH1

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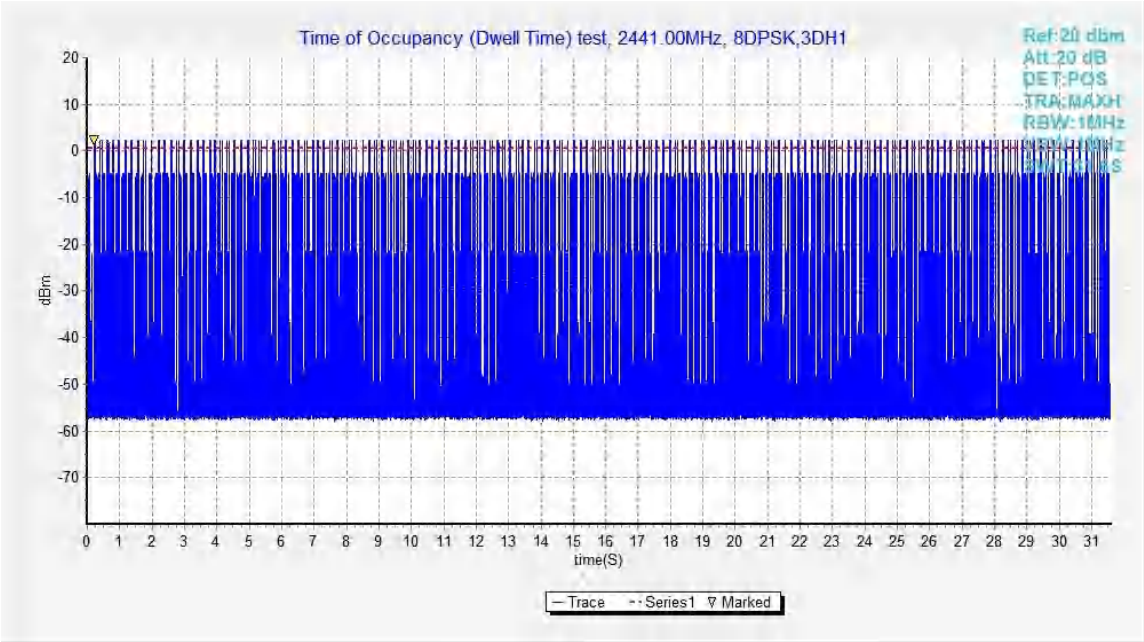

Fig.71. Number of Transmissions Measurement: Channel 39,Packet 3-DH1

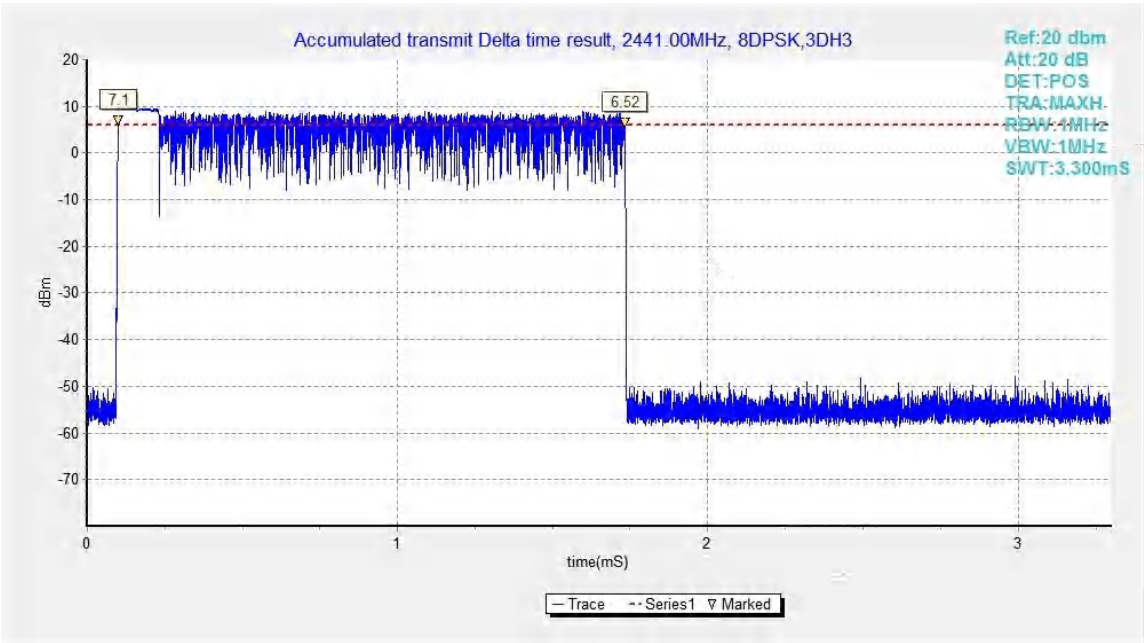

Fig.72. Time of occupancy (Dwell Time): Channel 39, Packet 3-DH3

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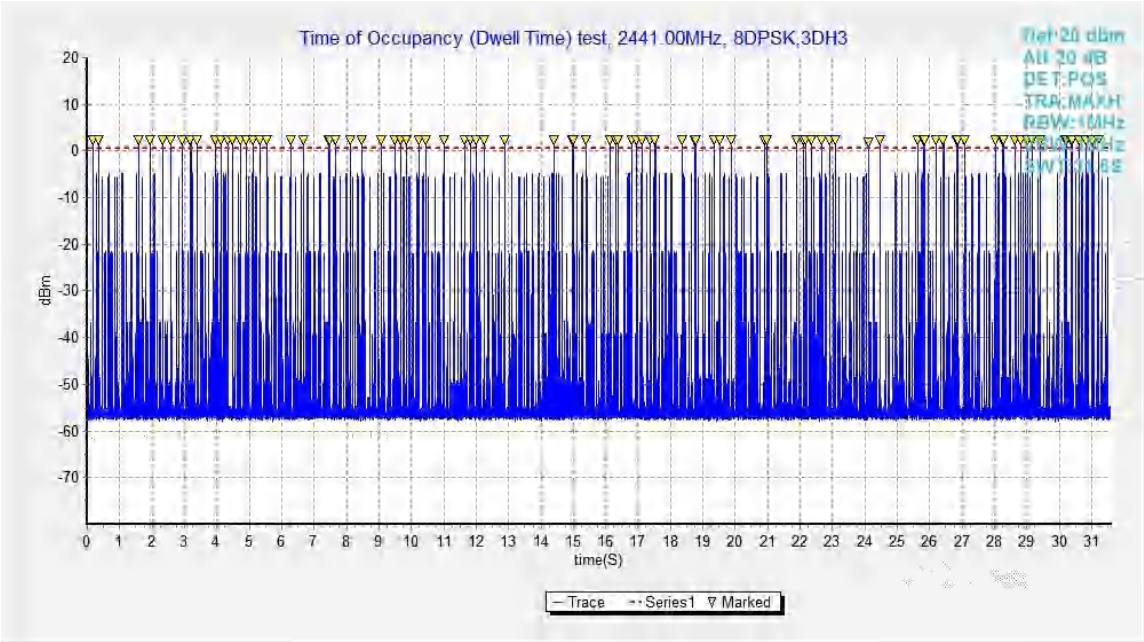

Fig.73. Number of Transmissions Measurement: Channel 39,Packet 3-DH3

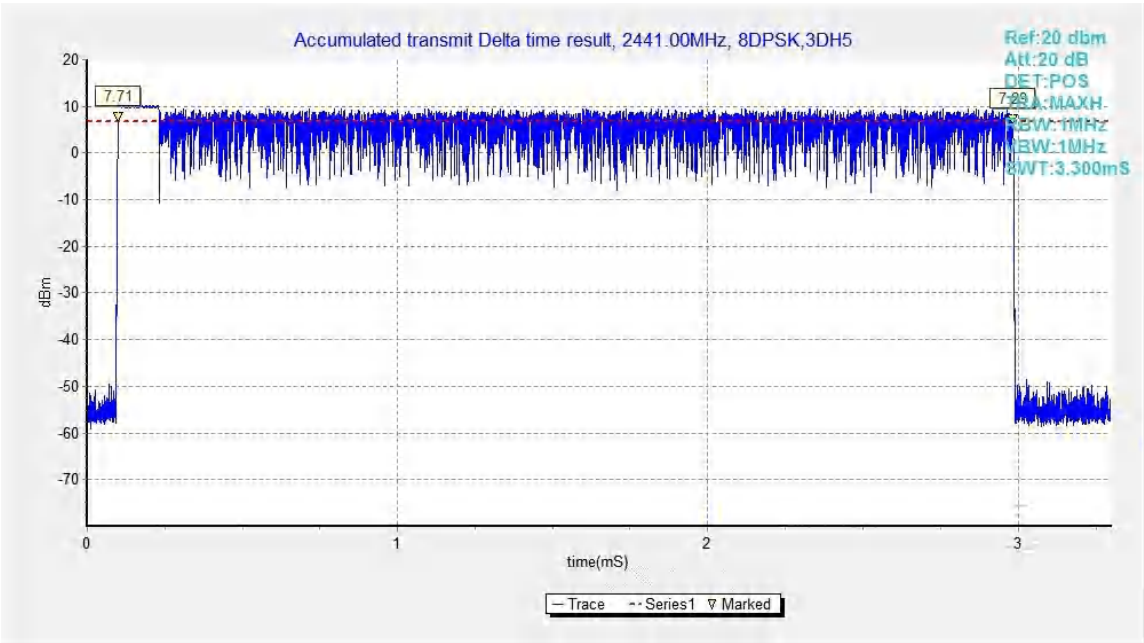

Fig.74. Time of occupancy (Dwell Time): Channel 39, Packet 3-DH5

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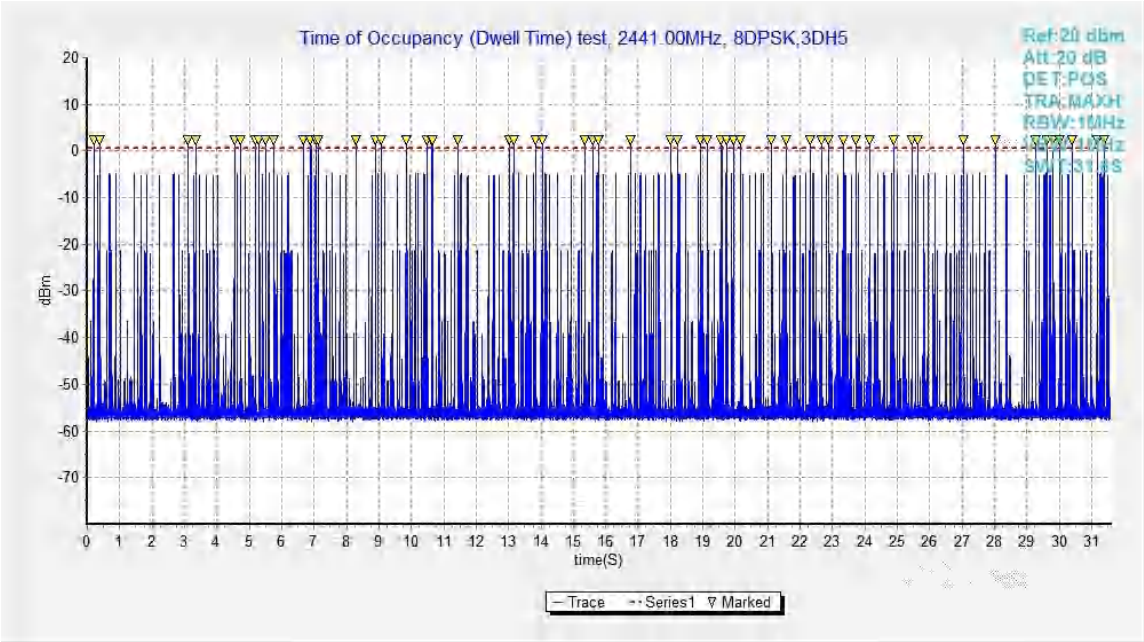

Fig.75. Number of Transmissions Measurement: Channel 39,Packet 3-DH5

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B.6. 20dB Bandwidth

Method of Measurement: See ANSI C63.10-clause 6.9.2

Measurement Procedure - Unwanted Emissions

1. Set RBW = 30kHz.

2. Set VBW = 100 kHz.

3. Set span to 3MHz

4. Detector = peak.

5. Trace Mode = max hold.

6. Sweep = auto couple.

7. Allow the trace to stabilize (this may take some time, depending on the extent of the span).

Measurement Limit:

Standard	Limit
FCC 47 CFR Part 15.247(a)(1)	NA *

Use NdB Down function of the SA to measure the 20dB Bandwidth

* Comment: This test case is not required according to the latest FCC 47 CFR Part 15.247. But the test results are necessary for “carrier frequency separation” test case, in Annex A.8.

Measurement Results:

For GFSK

Channel	20dB Bandwidth (kHz)		Conclusion
0	Fig.76	950.25	NA
39	Fig.77	939.00	NA
78	Fig.78	945.00	NA

For π/4 DQPSK

Channel	20dB Bandwidth (kHz)		Conclusion
0	Fig.79	1261.50	NA
39	Fig.80	1222.50	NA
78	Fig.81	1229.25	NA

For 8DPSK

Channel	20dB Bandwidth (kHz)		Conclusion
0	Fig.82	1242.75	NA
39	Fig.83	1204.50	NA
78	Fig.84	1262.25	NA

Conclusion: NA

Test graphs as below:

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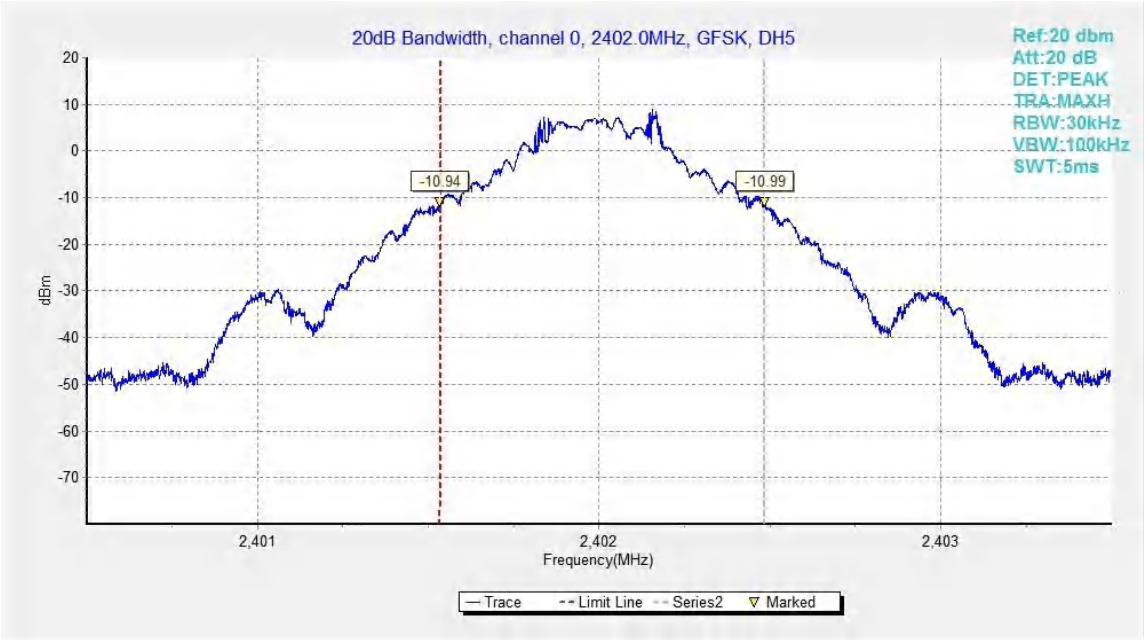

Fig.76. 20dB Bandwidth: GFSK, Channel 0

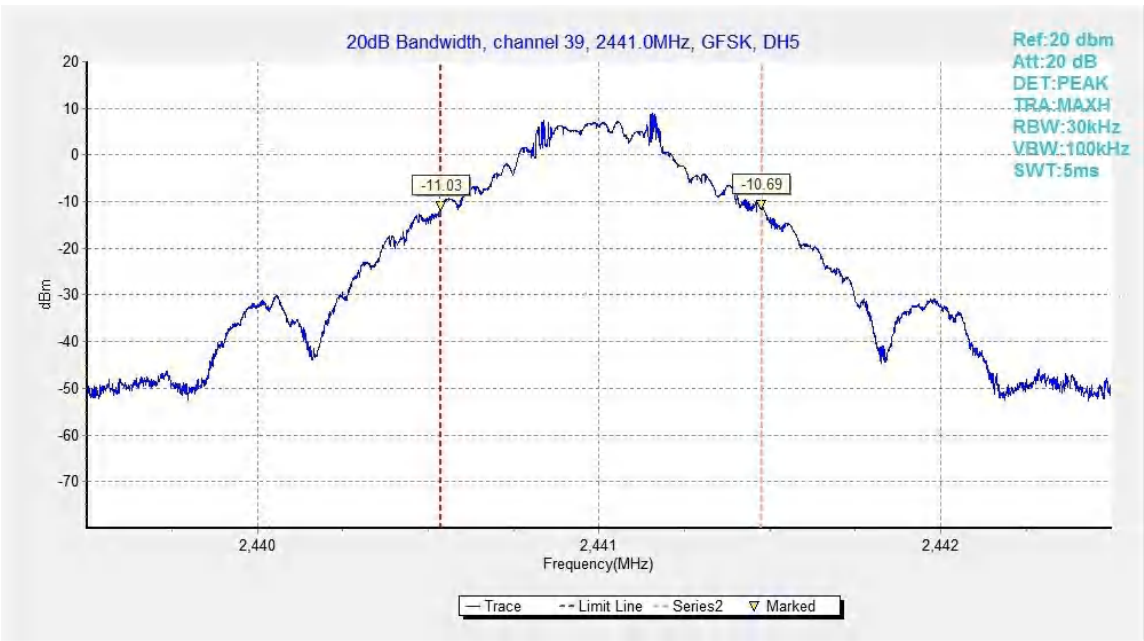

Fig.77. 20dB Bandwidth: GFSK, Channel 39

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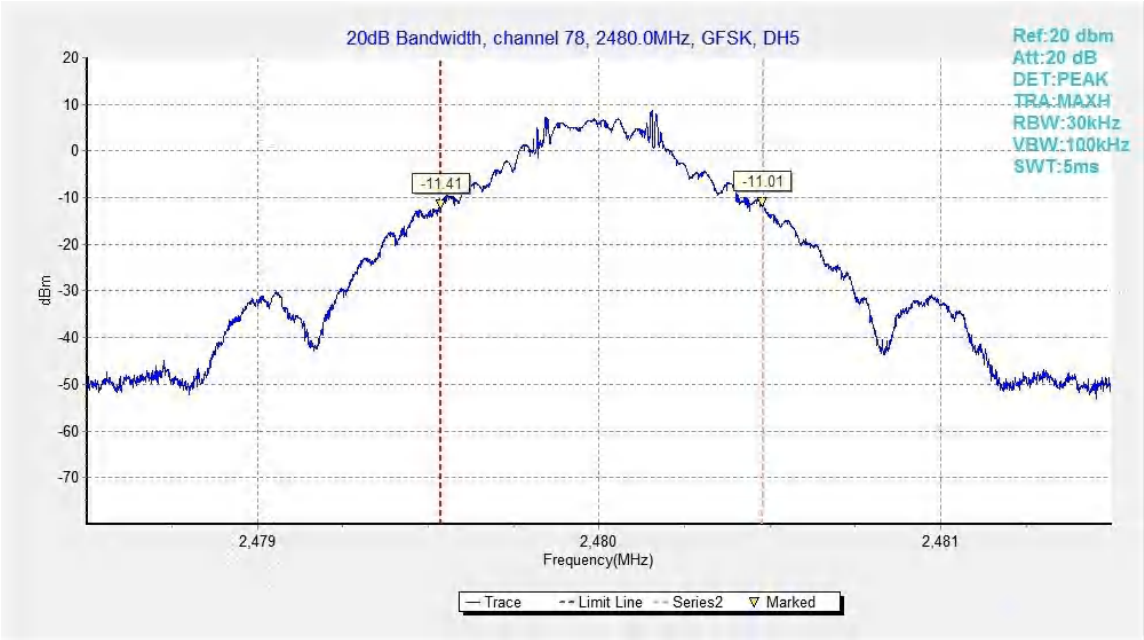

Fig.78. 20dB Bandwidth: GFSK, Channel 78

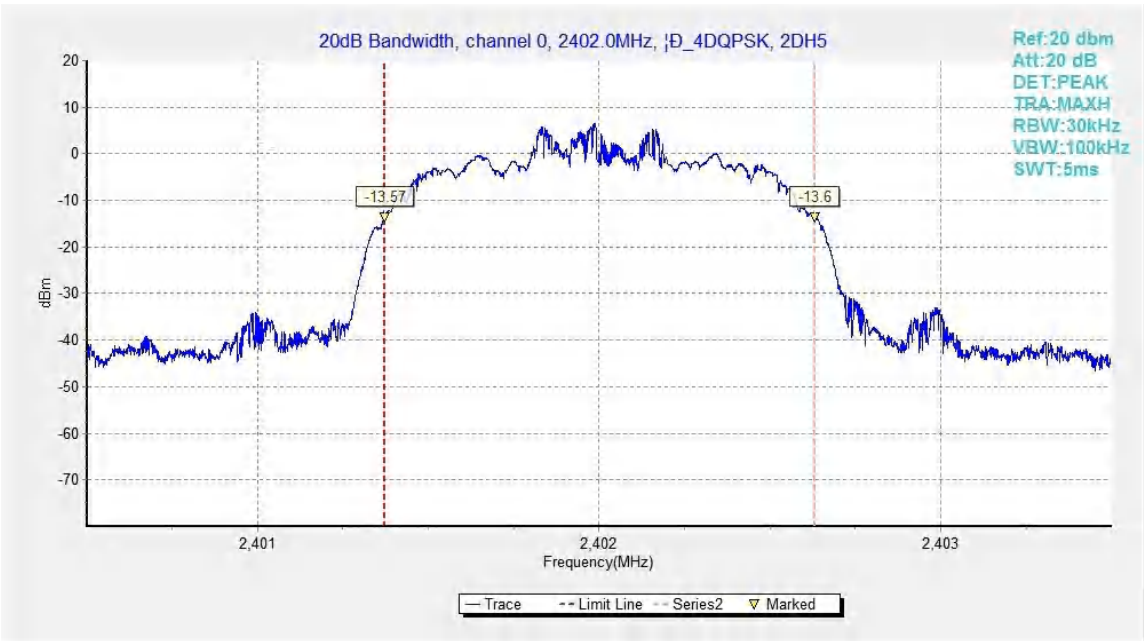

Fig.79. 20dB Bandwidth: π/4 DQPSK, Channel 0

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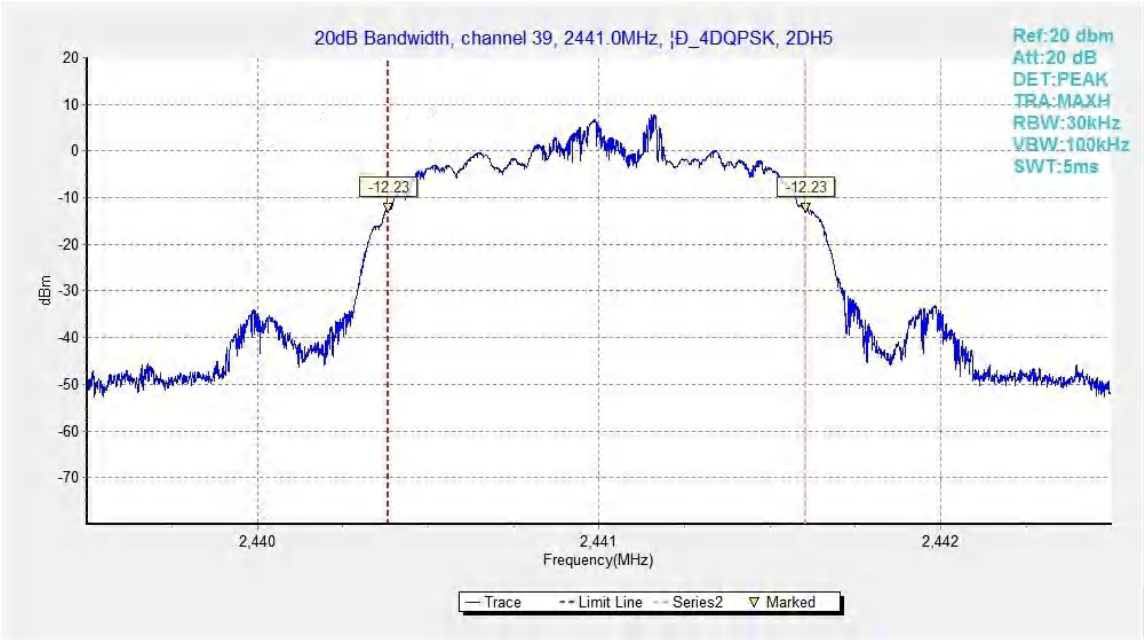

Fig.80. 20dB Bandwidth: π/4 DQPSK, Channel 39

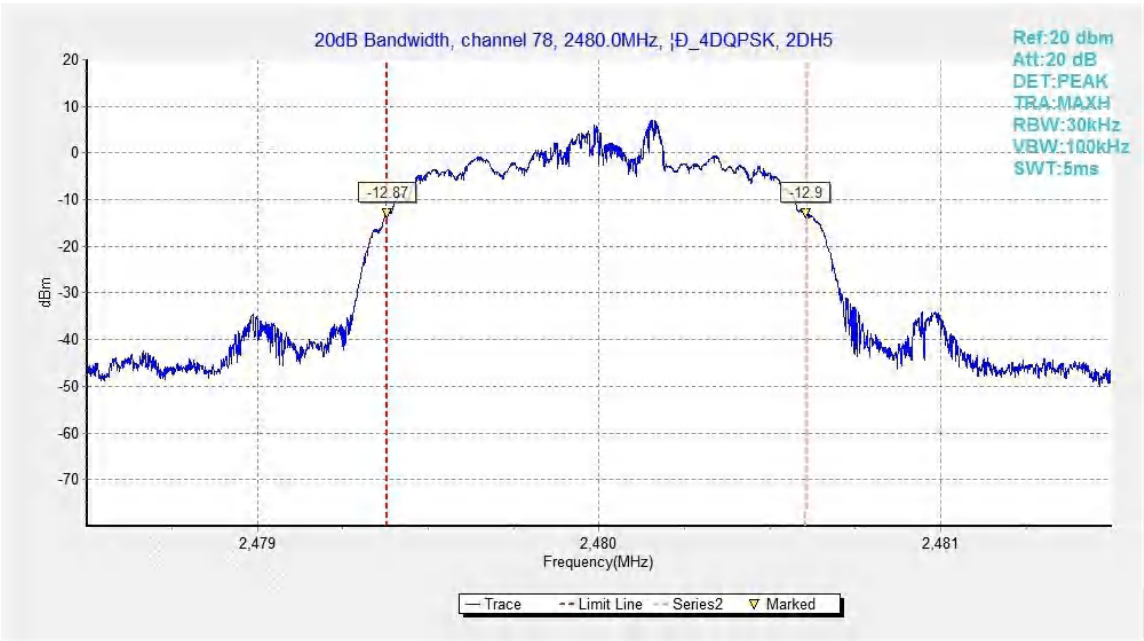

Fig.81. 20dB Bandwidth: π/4 DQPSK, Channel 78

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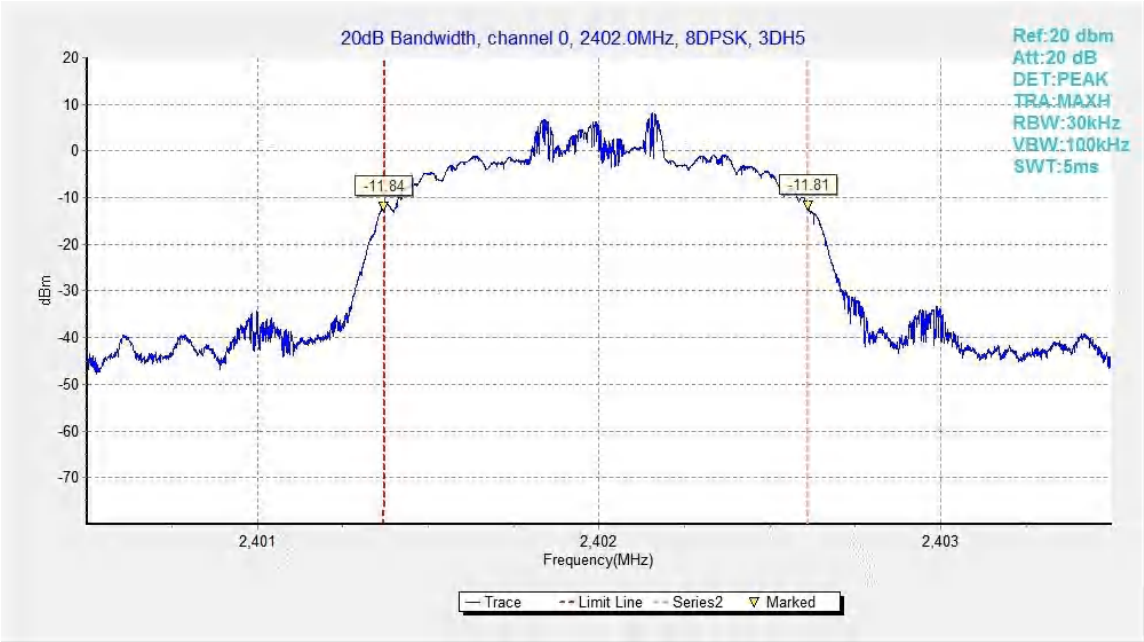

Fig.82. 20dB Bandwidth: 8DPSK, Channel 0

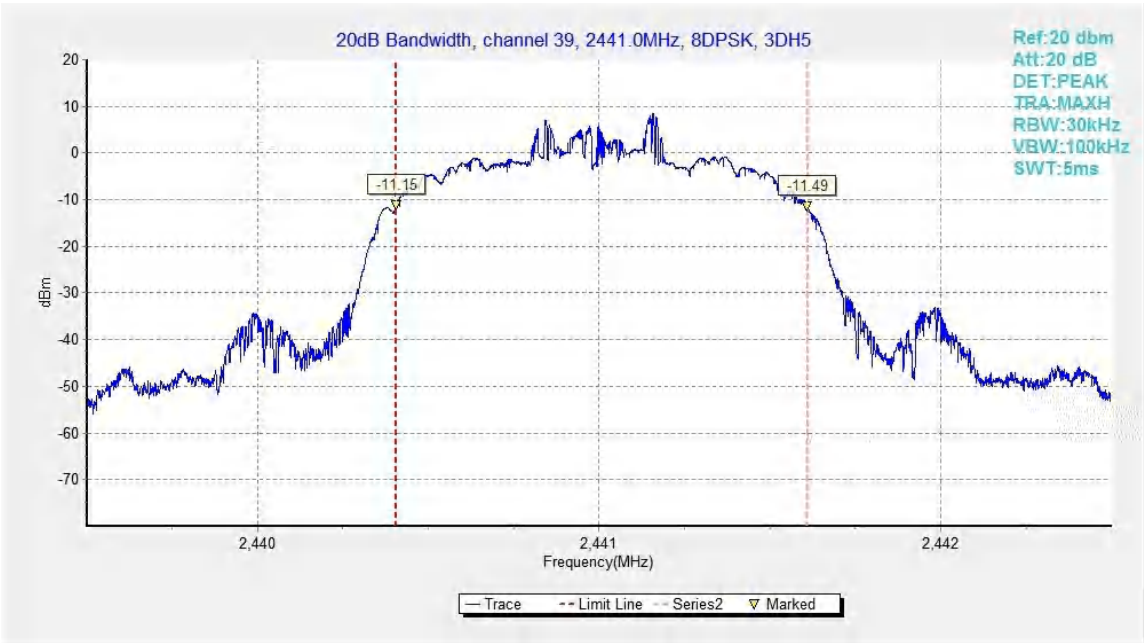

Fig.83. 20dB Bandwidth: 8DPSK, Channel 39

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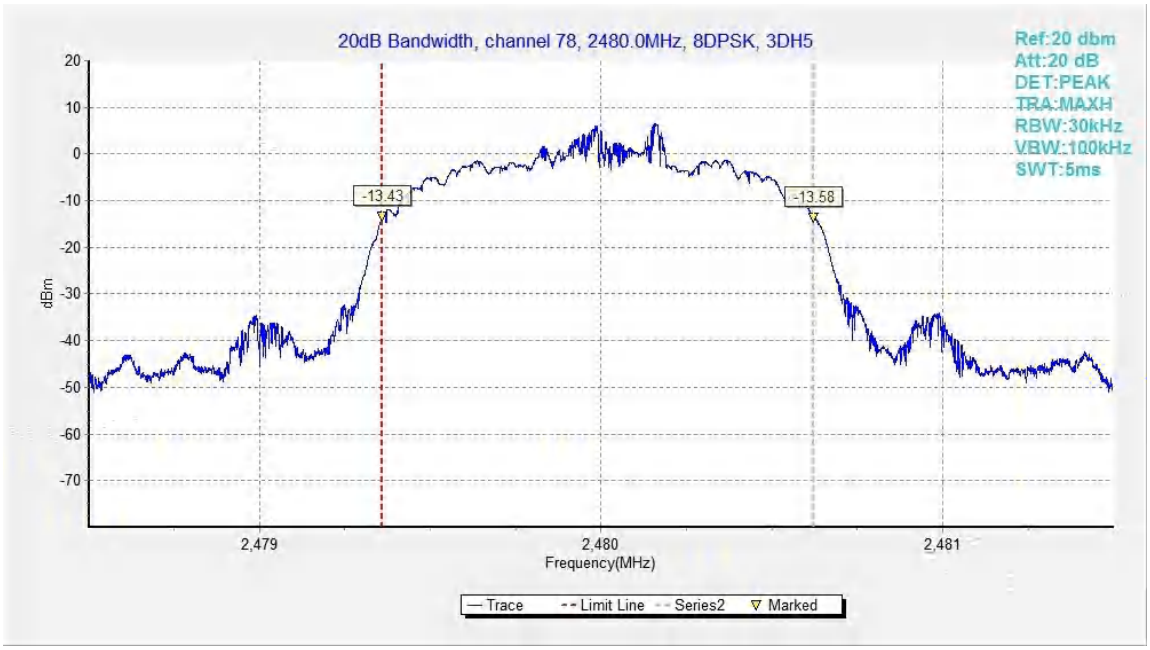

Fig.84. 20dB Bandwidth: 8DPSK, Channel 78

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B.7. Carrier Frequency Separation

Method of Measurement: See ANSI C63.10-clause 7.8.2

The EUT must have its hopping function enabled. Use the following spectrum analyzer settings:

- Span = 3MHz
- RBW=300kHz
- VBW=300kHz
- Sweep = auto
- Detector function = peak
- Trace = max hold
- Allow the trace to stabilize

Search the peak marks of the middle frequency and adjacent channel, then record the separation between them.

* Comment: This limit should be over 25 kHz or (2/3) * 20dB bandwidth, whichever is greater.

Measurement Limit:

Standard	Limit(kHz)
FCC 47 CFR Part 15.247(a)(1)	over 25 kHz or (2/3) * 20dB bandwidth

Measurement Result:

For GFSK

Channel	Carrier frequency separation (kHz)		Conclusion
39	Fig.85	1160.25	P

For π/4 DQPSK

Channel	Carrier frequency separation (kHz)		Conclusion
39	Fig.86	1128.75	P

For 8DPSK

Channel	Carrier frequency separation (kHz)		Conclusion
39	Fig.87	1124.25	P

Conclusion: PASS

Test graphs as below:

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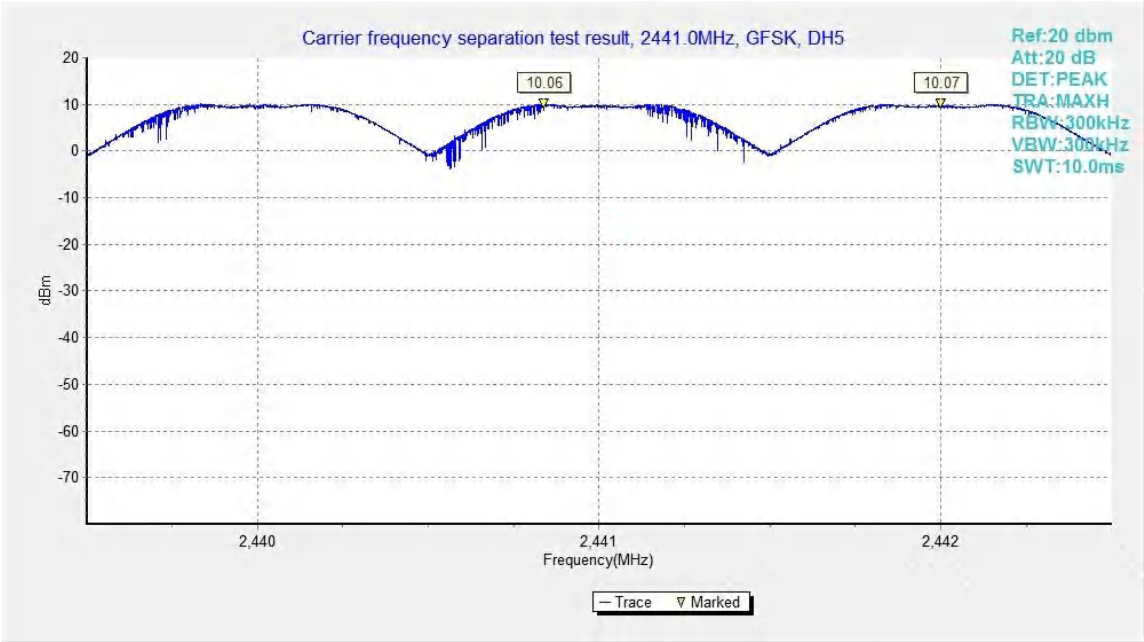

Fig.85. Carrier frequency separation measurement: GFSK, Channel 39

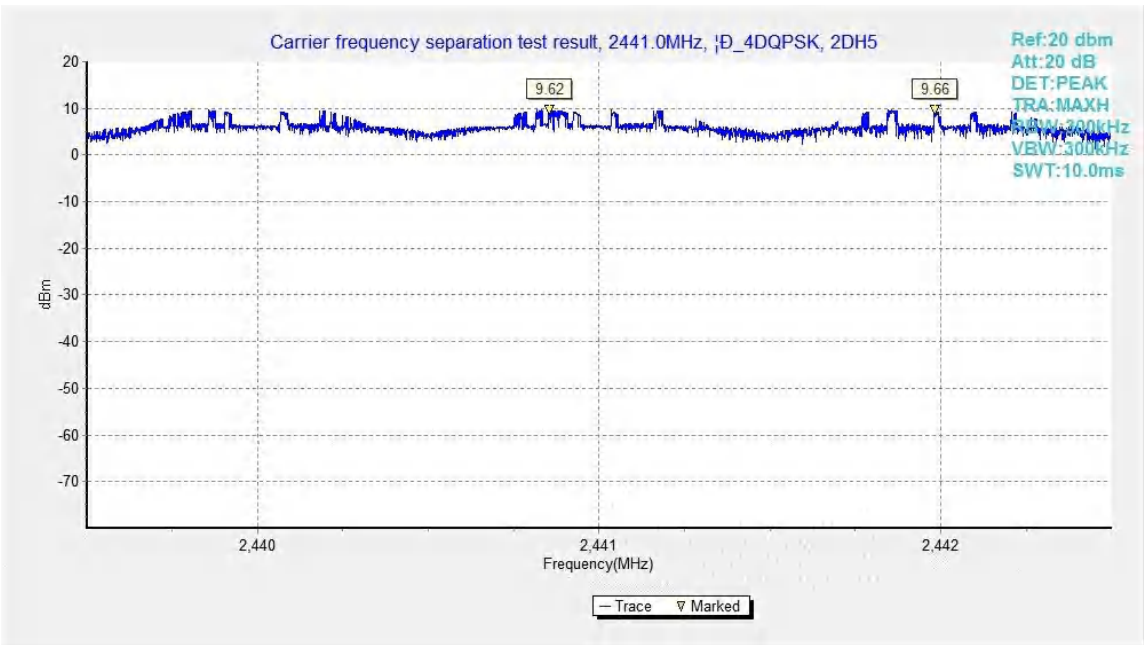

Fig.86. Carrier frequency separation measurement: π/4 DQPSK, Channel 39

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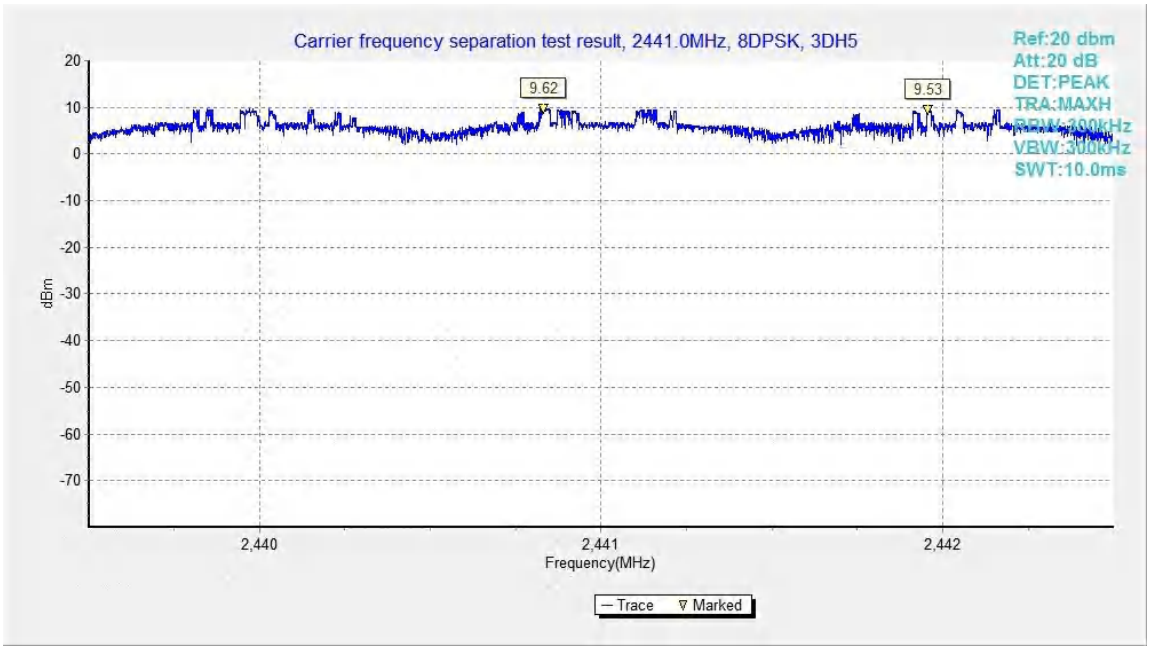

Fig.87. Carrier frequency separation measurement: 8DPSK, Channel 39

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B.8. Number of Hopping Channels

Method of Measurement: See ANSI C63.10-clause 7.8.3

The EUT must have its hopping function enabled. Use the following spectrum analyzer settings:

- Span = the frequency band of operation
- RBW = 500kHz
- VBW = 500kHz
- Sweep = auto
- Detector function = peak
- Trace = max hold
- Allow the trace to stabilize

It might prove necessary to break the span up into subranges to show clearly all of the hopping frequencies. Compliance of an EUT with the appropriate regulatory limit shall be determined for the number of hopping channels. A plot of the data shall be included in the test report.

Measurement Limit:

Standard	Limit
FCC 47 CFR Part 15.247(a) (1)(iii)	At least 15 non-overlapping channels

Measurement Result:

For GFSK

Channel	Number of hopping channels		Conclusion
0~39	Fig.88	79	P
40~78	Fig.89		

Forπ/4 DQPSK

Channel	Number of hopping channels		Conclusion
0~39	Fig.90	79	P
40~78	Fig.91		

For 8DPSK

Channel	Number of hopping channels		Conclusion
0~39	Fig.92	79	P
40~78	Fig.93		

Conclusion: PASS

Test graphs as below:

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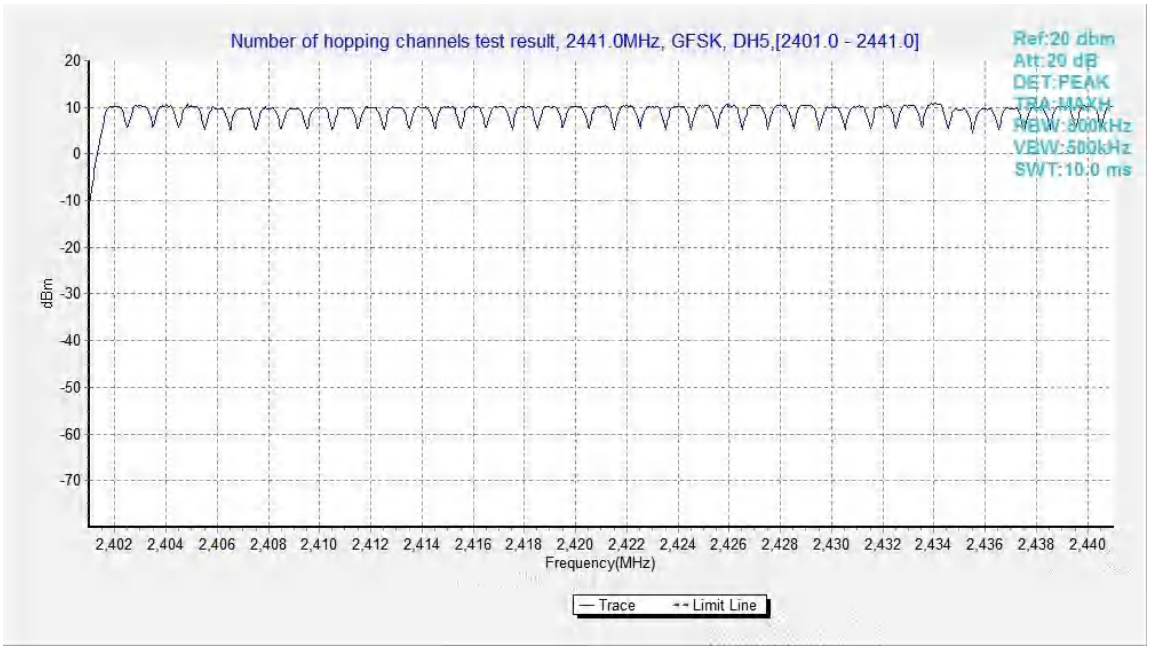

Fig.88. Number of hopping frequencies: GFSK, Channel 0 - 39

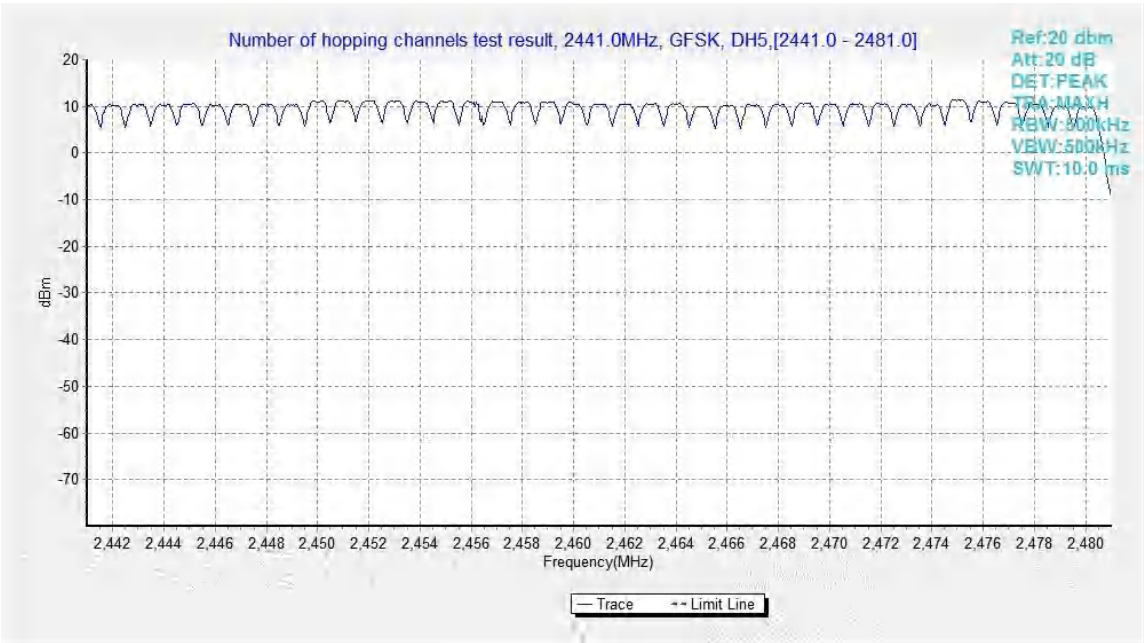

Fig.89. Number of hopping frequencies: GFSK, Channel 40 - 78

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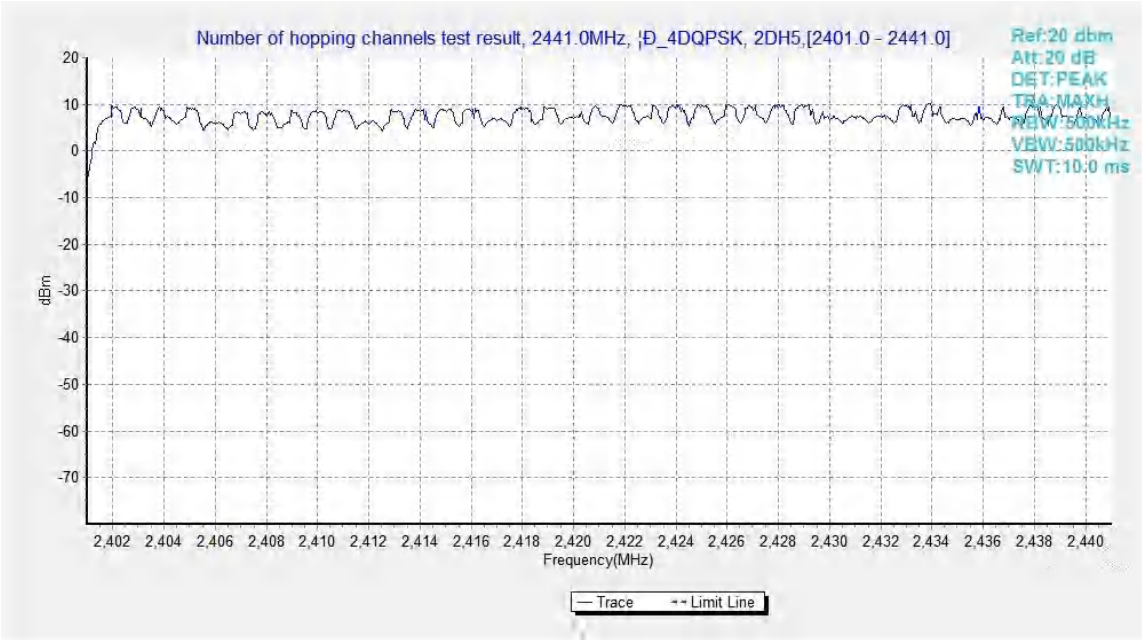

Fig.90. Number of hopping frequencies: π/4 DQPSK, Channel 0 - 39

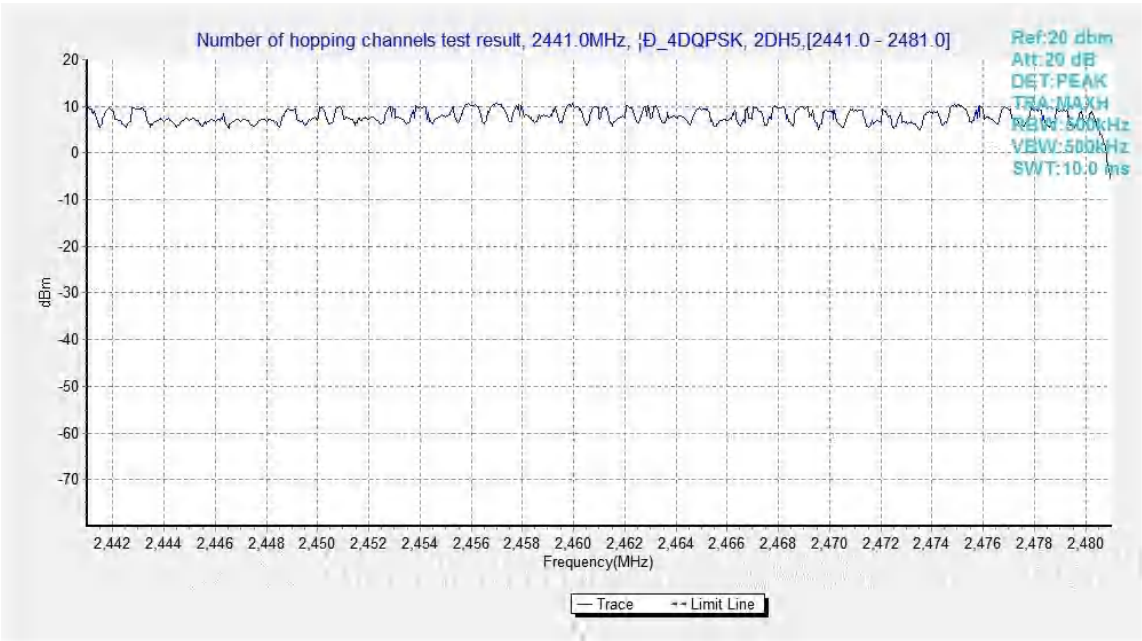

Fig.91. Number of hopping frequencies: π/4 DQPSK, Channel 40 - 78

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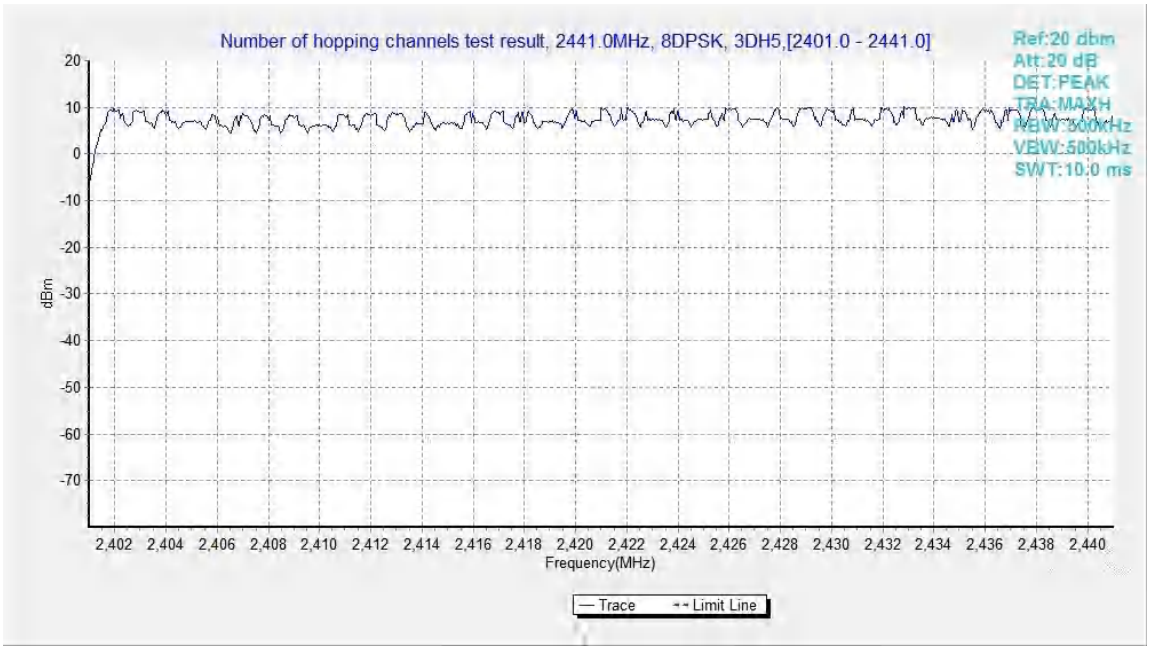

Fig.92. Number of hopping frequencies: 8DPSK, Channel 0 - 39

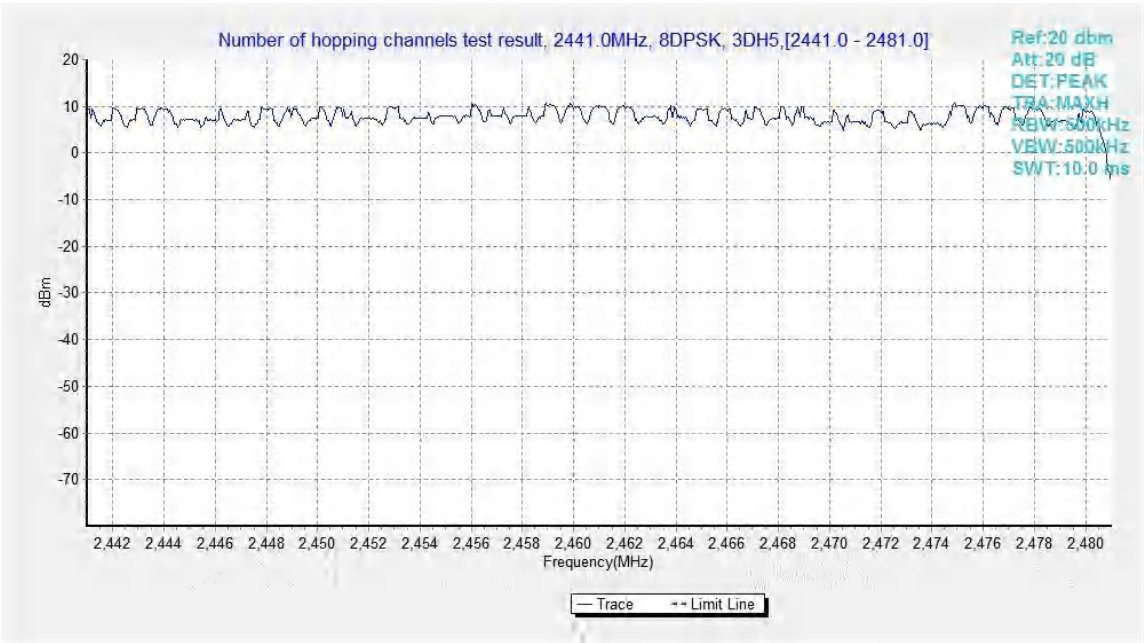

Fig.93. Number of hopping frequencies: 8DPSK, Channel 40 - 78

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ANNEX C: Accreditation Certificate

United States Department of Commerce
National Institute of Standards and Technology

NVLAP® ilac-MRA

Certificate of Accreditation to ISO/IEC 17025:2017

NVLAP LAB CODE: 600118-0

Telecommunication Technology Labs, CAICT
Beijing
China

is accredited by the National Voluntary Laboratory Accreditation Program for specific services, listed on the Scope of Accreditation, for:

Electromagnetic Compatibility & Telecommunications

This laboratory is accredited in accordance with the recognized International Standard ISO/IEC 17025:2017. This accreditation demonstrates technical competence for a defined scope and the operation of a laboratory quality management system (refer to joint ISO-ILAC-IAF Communique dated January 2009).

2022-10-01 through 2023-09-30
Effective Dates

DEPARTMENT OF COMMERCE · UNITED STATES OF AMERICA

For the National Voluntary Laboratory Accreditation Program

*****END OF REPORT*****

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