FCC PART 15C
TEST REPORT
No. I17N00776-BT

For

Huawei Technologies Co., Ltd.

Smart Phone

Model Name: SLA-L03

With

Hardware Version: HL1SLAM

Software Version: SLA-L03C900B044

FCC ID: QISSLA-L03

Issued Date: 2017-07-13

Test Laboratory:

FCC 2.948 Listed: No.342690

Note:

The test results in this test report relate only to the devices specified in this report. This report shall not be reproduced except in full without the written approval of CTTL.

Test Laboratory:

CTTL, Telecommunication Technology Labs, Academy of Telecommunication Research, MIIT.

No. 52, Huayuan North Road, Haidian District, Beijing, P. R. China 100191.

Tel: +86(0)10-62304633-2512, Fax: +86(0)10-62304633-2504

Email: cttl_terminals@catr.cn, website: www.chinattl.com

REPORT HISTORY

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1. Test Laboratory

1.1. Testing Location

Location: CTTL(South Branch)

Address: TCL International E city, No. 1001, Zhongshanyuan Road, Nanshan District, Shenzhen, Guangdong, China 518000

1.2. Testing Environment

Normal Temperature: 15-35℃

Relative Humidity: 20-75%

1.3. Project data

Testing Start Date: 2017-06-16

Testing End Date: 2017-07-10

1.4. Signature

林侃丰

Lin Kanfeng

(Prepared this test report)

唐伟盛

Tang Weisheng

(Reviewed this test report)

张博钧

Zhang Bojun

(Approved this test report)

2. Client Information

2.1. Applicant Information

Company Name:	Huawei Technologies Co., Ltd.
Address:	Huawei Base, Bantian, Longgang District, Shenzhen 518129, P.R. China
City:	Shenzhen
Postal Code:	/
Country:	China
Telephone:	0086-0755-28970299
Fax:	0086-0755-89650226

2.2. Manufacturer Information

Company Name:	Huawei Technologies Co., Ltd.
Address:	Huawei Base, Bantian, Longgang District, Shenzhen 518129, P.R. China
City:	Shenzhen
Postal Code:	/
Country:	China
Telephone:	0086-0755-28970299
Fax:	0086-0755-89650226

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

3.1. About EUT

Description	Smart Phone
Model Name	SLA-L03
Market Name	/
Frequency Band	2402MHz~2480MHz
Type of Modulation	GFSK/π/4 DQPSK/8DPSK
Number of Channels	79
FCC ID	QISSLA-L03

3.2. Internal Identification of EUT

EUT ID*	IMEI	HW Version	SW Version	Receive Date
EUT1	865548030007878	HL1SLAM	SLA-L03C900B044	2017-06-16

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

3.3. Internal Identification of AE

AE ID*	Description	SN
AE1	Charger	/
AE2	Charger	/
AE3	Charger	/

AE1

Model	HW-050100U01
Manufacturer	HUIZHOU BYD ELECTRONIC CO., LTD.

AE2

Model	HW-050100U01
Manufacturer	PHIHONG TECHNOLOGY CO., LTD.

AE3

Model	HW-050100U01
Manufacturer	SHENZHEN HUNTKEY ELECTRONIC CO.,LTD.

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

4. Reference Documents

4.1. Documents supplied by applicant

EUT feature information is supplied by the applicant 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	Nov,2015
ANSI C63.10	American National Standard for Testing Unlicensed Wireless Devices	Jun,2013

5. Test Results

5.1. Summary of Test Results

No	Test cases	Sub-clause of Part15C	Verdict
0	Antenna Requirement	15.203	**P**
1	Maximum Peak Output Power	15.247 (b)	**P**
2	Band Edges Compliance	15.247 (d)	**P**
3	Conducted Spurious Emission	15.247 (d)	**P**
4	Radiated Spurious Emission	15.247,15.205,15.209	**P**
5	Occupied 20dB bandwidth	15.247(a)	**/**
6	Time of Occupancy(Dwell Time)	15.247(a)	**P**
7	Number of Hopping Channel	15.247(a)	**P**
8	Carrier Frequency Separation	15.247(a)	**P**
9	AC Powerline Conducted Emission	15.107,15.207	**P**

See **ANNEX A and ANNEX B** for details.

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.

5.3. Terms used in the result table

Terms used in Verdict column

P	Pass
NA	Not Available
F	Fail

Abbreviations

AC	Alternating Current
AFH	Adaptive Frequency Hopping
BW	Band Width
E.I.R.P.	equivalent isotropic radiated power
ISM	Industrial, Scientific and Medical
R&TTE	Radio and Telecommunications Terminal Equipment
RF	Radio Frequency
Tx	Transmitter

5.4. Laboratory Environment

Semi-anechoic chamber did not exceed following limits along the EMC testing

Temperature	Min. = 15 ˚C, Max. = 30 ˚C
Relative humidity	Min. = 35 %, Max. = 60 %
Shielding effectiveness	0.014MHz - 1MHz, >60dB; 1MHz - 1000MHz, >90dB.
Electrical insulation	> 2 MΩ
Ground system resistance	< 4Ω
Normalised site attenuation (NSA)	< ±4dB, 3m/10m distance, from 30 to 1000 MHz
Uniformity of field strength	Between 0 and 6 dB, from 80 to 3000 MHz

Shielded room did not exceed following limits along the EMC testing

Temperature	Min. = 15 ˚C, Max. = 30 ˚C
Relative humidity	Min. = 35 %, Max. = 60 %
Shielding effectiveness	0.014MHz - 1MHz, >60dB; 1MHz - 1000MHz, >90dB.
Electrical insulation	> 2 MΩ
Ground system resistance	< 4 Ω

Fully-anechoic chamber did not exceed following limits along the EMC testing

Temperature	Min. = 15 ˚C, Max. = 30 ˚C
Relative humidity	Min. = 35 %, Max. = 60 %
Shielding effectiveness	0.014MHz - 1MHz, >60dB; 1MHz - 1000MHz, >90dB.
Electrical insulation	> 2 MΩ
Ground system resistance	< 4Ω
Voltage Standing Wave Ratio (VSWR)	≤6dB, from 1 to 18 GHz,3m distance

6. Test Facilities Utilized

Conducted test system

No.	Equipment	Model	Serial Number	Manufacturer	Calibration Due date	Calibration Period
1	Vector Signal Analyzer	FSV40	100903	Rohde & Schwarz	2018-01-18	1 year
2	Bluetooth Tester	CBT32	100584	Rohde & Schwarz	2018-01-05	1 year
3	Data Acquisition Unit	U2531A	TW55443 507	Agilent	/	/
4	Power Sensor	U2021X A	MY55430 013	Agilent	2018-01-18	1 year

Radiated emission test system

No.	Equipment	Model	Serial Number	Manufacturer	Calibration Due date	Calibration Period
1	LISN	ESH2-Z5	100196	R&S	2018-01-05	1 year
2	Test Receiver	ESCI	100701	R&S	2017-08-09	1 year
3	Loop Antenna	HLA6120	35779	TESEQ	2019-05-02	3 years
4	BiLog Antenna	VULB9163	9163 329	Schwarzbeck	2020-02-17	3 years
5	Horn Antenna	3117	00066585	ETS-Lindgren	2019-03-05	3 years
6	Test Receiver	ESR7	101675	R&S	2017-07-21	1 year
7	Spectrum Analyzer	FSP 40	100378	R&S	2017-12-15	1 year
8	Chamber	FACT5-2.0	4166	ETS-Lindgren	2018-05-13	3 years

Anechoic chamber

Fully anechoic chamber by ETS-Lindgren

ANNEX A: MEASUREMENT RESULTS FOR RECEIVER

A.0 Antenna requirement

Measurement Limit:

Standard	Requirement
FCC CRF Part 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. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section. The manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited. This requirement does not apply to carrier current devices or to devices operated under the provisions of §15.211, §15.213, §15.217, §15.219, or §15.221. Further, this requirement does not apply to intentional radiators that must be professionally installed, such as perimeter protection systems and some field disturbance sensors, or to other intentional radiators which, in accordance with §15.31(d), must be measured at the installation site. However, the installer shall be responsible for ensuring that the proper antenna is employed so that the limits in this part are not exceeded.

Conclusion: The Directional gains of antenna used for transmitting is 1.0dBi.
The RF transmitter uses an integrate antenna without connector.

A.1 Maximum Peak Output Power

Measurement Limit:

Standard	Limit (dBm)
FCC CRF Part 15.247(b)(1)	< 21

Measurement Results:

Mode	Test Result (dBm)		
	2402MHz (Ch0)	2441MHz (Ch39)	2480 MHz (Ch78)
GFSK	7.30	7.43	6.25
π /4 DQPSK	8.19	8.28	7.04
8DPSK	8.37	8.48	7.21

Conclusion: Pass

A.2 Band Edges Compliance

Measurement Limit:

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

Measurement Result:

Mode	Channel	Hopping	Test Results	Conclusion
GFSK	0	ON	Fig.1	P
	78	ON	Fig.2	P
π /4 DQPSK	0	ON	Fig.3	P
	78	ON	Fig.4	P
8DPSK	0	ON	Fig.5	P
	78	ON	Fig.6	P

Mode	Channel	Hopping	Test Results	Conclusion
GFSK	0	OFF	Fig.7	P
	78	OFF	Fig.8	P
π /4 DQPSK	0	OFF	Fig.9	P
	78	OFF	Fig.10	P
8DPSK	0	OFF	Fig.11	P
	78	OFF	Fig.12	P

See ANNEX B for test graphs.

Conclusion: Pass

A.3 Conducted Emission

Measurement Limit:

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

Measurement Results:

MODE	Channel	Frequency Range	Test Results	Conclusion
GFSK	0	2.402 GHz	Fig.13	P
		30 MHz-1GHz	Fig.14	P
		1GHz-3GHz	Fig.15	P
		3GHz-10GHz	Fig.16	P
	39	2.441 GHz	Fig.17	P
		30 MHz-1GHz	Fig.18	P
		1GHz-3GHz	Fig.19	P
		3GHz-10GHz	Fig.20	P
	78	2.480 GHz	Fig.21	P
		30 MHz-1GHz	Fig.22	P
		1GHz-3GHz	Fig.23	P
		3GHz-10GHz	Fig.24	P
π /4 DQPSK	0	2.402 GHz	Fig.25	P
		30 MHz-1GHz	Fig.26	P
		1GHz-3GHz	Fig.27	P
		3GHz-10GHz	Fig.28	P
	39	2.441 GHz	Fig.29	P
		30 MHz-1GHz	Fig.30	P
		1GHz-3GHz	Fig.31	P
		3GHz-10GHz	Fig.32	P
	78	2.480 GHz	Fig.33	P
		30 MHz-1GHz	Fig.34	P
		1GHz-3GHz	Fig.35	P
		3GHz-10GHz	Fig.36	P
8DPSK	0	2.402 GHz	Fig.37	P
		30 MHz-1GHz	Fig.38	P
		1GHz-3GHz	Fig.39	P
		3GHz-10GHz	Fig.40	P
	39	2.441 GHz	Fig.41	P
		30 MHz-1GHz	Fig.42	P
		1GHz-3GHz	Fig.43	P
		3GHz-10GHz	Fig.44	P
	78	2.480 GHz	Fig.45	P
		30 MHz-1GHz	Fig.46	P

		1GHz-3GHz	Fig.47	P
		3GHz-10GHz	Fig.48	P
/	All channel	10GHz-26GHz	Fig.49	P

See ANNEX B for test graphs.

Conclusion: Pass

A.4 Radiated Emission

Measurement Limit:

Standard	Limit
FCC 47 CFR Part 15.247, 15.205, 15.209	20dB below peak output power

In addition, radiated emissions which fall in the restricted bands, as defined in § 15.205(a), must also comply with the radiated emission limits specified in § 15.209(a) (see § 15.205(c)).

Limit in restricted band:

Frequency of emission (MHz)	Field strength(μV/m)	Measurement distance(meters)
0.009-0.490	2400/F(kHz)	300
0.490-1.705	24000/F(kHz)	30
1.705-30.0	30	30
30-88	100	3
88-216	150	3
216-960	200	3
Above 960	500	3

Test Condition:

The EUT was placed on a non-conductive table. The measurement antenna was placed at a distance of 3 meters from the EUT. During the tests, the antenna height and the EUT azimuth were varied in order to identify the maximum level of emissions from the EUT. This maximization process was repeated with the EUT positioned in each of its three orthogonal orientations.

Frequency of emission (MHz)	RBW/VBW	Sweep Time(s)
30-1000	120kHz/300kHz	5
1000-4000	1MHz/3MHz	15
4000-18000	1MHz/3MHz	40
18000-26500	1MHz/3MHz	20

Note: According to the performance evaluation, the radiated emission margin of EUT is over 20dB in the band from 9kHz to 30MHz. Therefore, the measurement starts from 30MHz to tenth harmonic.

The measurement results include the horizontal polarization and vertical polarization measurements.

Measurement Results:

Mode	Channel	Frequency Range	Test Results	Conclusion
GFSK	0	1 GHz ~18 GHz	Fig.50	P
	39	9 kHz ~30 MHz	Fig.51	P
		30 MHz ~1 GHz	Fig.52	P
		1 GHz ~18 GHz	Fig.53	P
		18 GHz ~26.5 GHz	Fig.54	P
	78	1 GHz ~18 GHz	Fig.55	P
	Power(CH0)	2.38 GHz ~ 2.45 GHz	Fig.56	P
	Power(CH78)	2.45 GHz ~ 2.5 GHz	Fig.57	P
π /4 DQPSK	0	1 GHz ~18 GHz	Fig.58	P
	39	9 kHz ~30 MHz	Fig.59	P
		30 MHz ~1 GHz	Fig.60	P
		1 GHz ~18 GHz	Fig.61	P
		18 GHz ~26.5 GHz	Fig.62	P
	78	1 GHz ~18 GHz	Fig.63	P
	Power(CH0)	2.38 GHz ~ 2.45 GHz	Fig.64	P
	Power(CH78)	2.45 GHz ~ 2.5 GHz	Fig.65	P
8DPSK	0	1 GHz ~18 GHz	Fig.66	P
	39	9 kHz ~30 MHz	Fig.67	P
		30 MHz ~1 GHz	Fig.68	P
		1 GHz ~18 GHz	Fig.69	P
		18 GHz ~26.5 GHz	Fig.70	P
	78	1 GHz ~18 GHz	Fig.71	P
	Power(CH0)	2.38 GHz ~ 2.45 GHz	Fig.72	P
	Power(CH78)	2.45 GHz ~ 2.5 GHz	Fig.73	P

GFSK CH0 (1-18GHz)

Frequency (MHz)	MaxPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Pol	Corr. (dB)
13872.500000	56.94	74.00	17.06	V	20.2
14694.500000	57.94	74.00	16.06	V	21.6
15109.500000	60.52	74.00	13.48	H	22.8
15948.000000	61.67	74.00	12.33	V	24.8
16630.500000	62.70	74.00	11.30	H	26.0
17700.500000	62.52	74.00	11.48	H	27.5

Frequency (MHz)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Pol	Corr. (dB)
13909.000000	45.89	54.00	8.11	H	21.1
14693.500000	46.07	54.00	7.93	V	21.6
15576.500000	48.24	54.00	5.76	V	23.8
16079.000000	49.74	54.00	4.26	V	25.5
16586.500000	51.06	54.00	2.94	V	26.3
17708.500000	51.00	54.00	3.00	H	27.6

GFSK CH39 (1-18GHz)

Frequency (MHz)	MaxPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Pol	Corr. (dB)
13906.500000	57.23	74.00	16.77	V	20.9
14574.000000	58.19	74.00	15.81	V	21.1
15112.500000	59.98	74.00	14.02	V	22.7
15937.500000	62.08	74.00	11.92	V	24.9
16591.500000	62.90	74.00	11.10	H	26.3
17165.000000	63.09	74.00	10.91	V	26.0

Frequency (MHz)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Pol	Corr. (dB)
13909.500000	45.83	54.00	8.17	H	21.1
14688.000000	46.26	54.00	7.74	V	21.6
15576.500000	48.20	54.00	5.80	V	23.8
15932.500000	49.58	54.00	4.42	V	24.8
16589.500000	51.29	54.00	2.71	H	26.3
17708.500000	51.03	54.00	2.97	V	27.6

GFSK CH78 (1-18GHz)

Frequency (MHz)	MaxPeak (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Pol	Corr. (dB)
13901.500000	57.66	74.00	16.34	V	20.6
14690.000000	58.20	74.00	15.80	H	21.6
15576.000000	59.70	74.00	14.30	V	23.8
16058.000000	61.72	74.00	12.28	V	25.4
16588.500000	62.95	74.00	11.05	V	26.3
17725.000000	62.97	74.00	11.03	H	27.5

Frequency (MHz)	Average (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Pol	Corr. (dB)
13909.000000	46.05	54.00	7.95	V	21.1
14693.500000	46.18	54.00	7.82	H	21.6
15576.000000	48.12	54.00	5.88	V	23.8
15918.500000	49.48	54.00	4.52	V	24.6
16590.500000	51.18	54.00	2.82	H	26.3
17707.000000	51.00	54.00	3.00	H	27.6

π /4 DQPSK CH0 (1-18GHz)

Frequency (MHz)	MaxPeak (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Pol	Corr. (dB)
13896.000000	58.30	74.00	15.70	H	20.4
14693.000000	57.79	74.00	16.21	V	21.6
15208.000000	60.66	74.00	13.34	V	22.9
15876.000000	61.41	74.00	12.59	V	24.3
16633.000000	63.91	74.00	10.09	H	25.9
17970.500000	62.19	74.00	11.81	V	27.1

Frequency (MHz)	Average (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Pol	Corr. (dB)
13909.000000	45.73	54.00	8.27	H	21.1
14687.000000	46.09	54.00	7.91	V	21.6
15576.000000	48.27	54.00	5.73	H	23.8
16065.500000	49.62	54.00	4.38	H	25.4
16589.500000	51.27	54.00	2.73	V	26.3
17709.500000	50.79	54.00	3.21	H	27.7

π /4 DQPSK CH39 (1-18GHz)

Frequency (MHz)	MaxPeak (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Pol	Corr. (dB)
13335.000000	57.36	74.00	16.64	H	20.4
14697.500000	57.92	74.00	16.08	V	21.6
15338.000000	60.74	74.00	13.26	V	22.4
15968.500000	61.20	74.00	12.80	V	25.6
16588.000000	63.02	74.00	10.98	H	26.3
17894.500000	62.58	74.00	11.42	V	28.1

Frequency (MHz)	Average (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Pol	Corr. (dB)
13906.500000	45.77	54.00	8.23	V	20.9
14690.000000	46.27	54.00	7.73	V	21.6
15569.000000	48.08	54.00	5.92	V	23.5
15933.000000	49.84	54.00	4.16	V	24.8
17110.000000	51.01	54.00	2.99	V	26.2
17707.000000	51.01	54.00	2.99	H	27.6

π /4 DQPSK CH78 (1-18GHz)

Frequency (MHz)	MaxPeak (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Pol	Corr. (dB)
13899.000000	57.47	74.00	16.53	V	20.5
14671.500000	57.85	74.00	16.15	V	21.3
15127.000000	59.96	74.00	14.04	V	22.3
15720.000000	61.35	74.00	12.65	V	24.0
16590.500000	63.97	74.00	10.03	V	26.3
17896.500000	62.16	74.00	11.84	H	28.0

Frequency (MHz)	Average (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Pol	Corr. (dB)
13910.000000	45.86	54.00	8.14	V	21.2
14687.000000	46.31	54.00	7.69	H	21.6
15575.500000	48.20	54.00	5.80	V	23.8
15919.500000	49.62	54.00	4.38	V	24.7
16593.000000	51.18	54.00	2.82	H	26.3
17705.500000	50.80	54.00	3.20	H	27.6

8DPSK CH0 (1-18GHz)

Frequency (MHz)	MaxPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Pol	Corr. (dB)
13416.500000	56.06	74.00	17.94	V	20.3
14697.000000	58.13	74.00	15.87	V	21.6
15208.000000	59.39	74.00	14.61	V	22.9
15941.500000	61.33	74.00	12.67	V	24.9
16554.000000	62.36	74.00	11.64	V	25.6
17999.000000	63.18	74.00	10.82	H	27.4

Frequency (MHz)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Pol	Corr. (dB)
13910.000000	46.06	54.00	7.94	V	21.2
14683.500000	46.09	54.00	7.91	H	21.5
15577.000000	48.24	54.00	5.76	V	23.8
15929.500000	49.53	54.00	4.47	V	24.8
16587.500000	51.05	54.00	2.95	V	26.3
17704.500000	50.93	54.00	3.07	V	27.6

8DPSK CH39 (1-18GHz)

Frequency (MHz)	MaxPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Pol	Corr. (dB)
13906.000000	57.22	74.00	16.78	V	20.9
14683.000000	58.25	74.00	15.75	V	21.5
15051.500000	60.15	74.00	13.85	V	22.4
15884.000000	61.46	74.00	12.54	H	24.0
16610.000000	63.27	74.00	10.73	H	26.0
17160.000000	62.20	74.00	11.80	H	26.1

Frequency (MHz)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Pol	Corr. (dB)
13906.000000	45.99	54.00	8.01	H	20.9
14689.000000	46.25	54.00	7.75	V	21.6
15576.000000	48.28	54.00	5.72	H	23.8
16068.500000	49.62	54.00	4.38	V	25.4
16591.500000	51.26	54.00	2.74	V	26.3
17998.000000	50.89	54.00	3.11	H	27.4

8DPSK CH78 (1-18GHz)

Frequency (MHz)	MaxPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Pol	Corr. (dB)
13980.000000	57.33	74.00	16.67	H	20.1
14757.000000	57.98	74.00	16.02	H	21.2
15091.500000	59.73	74.00	14.27	H	22.4
15956.000000	61.41	74.00	12.59	H	25.1
17111.000000	62.68	74.00	11.32	H	26.2
17714.500000	62.49	74.00	11.51	H	27.7

Frequency (MHz)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Pol	Corr. (dB)
13417.500000	44.64	54.00	9.36	V	20.4
14683.000000	46.15	54.00	7.85	V	21.5
15576.500000	48.05	54.00	5.95	V	23.8
16076.000000	49.65	54.00	4.35	V	25.5
16584.500000	51.15	54.00	2.85	V	26.4
17707.500000	50.88	54.00	3.12	V	27.6

See ANNEX B for test graphs.

Conclusion: Pass

A.5 Occupied 20dB Bandwidth

Measurement Limit:

Standard	Limit (kHz)
FCC 47 CFR Part 15.247 (a)	/

Measurement Result:

Mode	Channel	Occupied 20dB Bandwidth (MHz)		conclusion
GFSK	0	Fig.74	0.940	/
	39	Fig.75	0.940	
	78	Fig.76	0.942	
π /4 DQPSK	0	Fig.77	1.299	/
	39	Fig.78	1.279	
	78	Fig.79	1.265	
8DPSK	0	Fig.80	1.264	/
	39	Fig.81	1.307	
	78	Fig.82	1.295	

See ANNEX B for test graphs.

Conclusion: PASS

A.6 Time of Occupancy (Dwell Time)

Measurement Limit:

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

Measurement Results:

Mode	Channel	Packet	Dwell Time(ms)			Conclusion
GFSK	39	DH5	Fig.83	Fig.84	307.7	**P**
π /4 DQPSK	39	2-DH5	Fig.85	Fig.86	307.9	**P**
8DPSK	39	3-DH5	Fig.87	Fig.88	308.1	**P**

See ANNEX B for test graphs.

Conclusion: Pass

A.7 Number of Hopping Channels

Measurement Limit:

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

Measurement Results:

Mode	Packet	Number of hopping channels		Test result	Conclusion
GFSK	DH5	Fig.89	Fig.90	79	**P**
π /4 DQPSK	2-DH5	Fig.91	Fig.92	79	**P**
8DPSK	3-DH5	Fig.93	Fig.94	79	**P**

See ANNEX B for test graphs.

Conclusion: Pass

A.8 Carrier Frequency Separation

Measurement Limit:

Standard	Limit
FCC 47 CFR Part 15.247(a)	By a minimum of 25 kHz or two-thirds of the 20 dB bandwidth of the hopping channel, whichever is greater

Measurement Results:

Mode	Channel	Packet	Separation of hopping channels	Test result (MHz)	Conclusion
GFSK	39	DH5	Fig.95	1.01	P
π /4 DQPSK	39	2-DH5	Fig.96	1.00	P
8DPSK	39	3-DH5	Fig.97	1.00	P

See ANNEX B for test graphs.

Conclusion: Pass

A.9 AC Power line Conducted Emission

Test Condition:

Voltage（V）	Frequency（Hz）
120	60

Measurement Result and limit:

BT (Quasi-peak Limit)-AE1

Frequency range (MHz)	Quasi-peak Limit (dBμV)	Result (dBμV) Traffic	Conclusion
0.15 to 0.5	66 to 56	Fig.98	P
0.5 to 5	56		
5 to 30	60		
NOTE: The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.5 MHz.			

BT (Average Limit)-AE1

Frequency range (MHz)	Average-peak Limit (dBμV)	Result (dBμV) Traffic	Conclusion
0.15 to 0.5	56 to 46	Fig.98	P
0.5 to 5	46		
5 to 30	50		
NOTE: The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.5 MHz.			

BT (Quasi-peak Limit)-AE1

Frequency range (MHz)	Quasi-peak Limit (dBμV)	Result (dBμV) Idle	Conclusion
0.15 to 0.5	66 to 56	Fig.99	P
0.5 to 5	56		
5 to 30	60		
NOTE: The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.5 MHz.			

BT (Average Limit)-AE1

Frequency range (MHz)	Average-peak Limit (dBμV)	Result (dBμV) Idle	Conclusion
0.15 to 0.5	56 to 46	Fig.99	P
0.5 to 5	46		
5 to 30	50		
NOTE: The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.5 MHz.			

BT (Quasi-peak Limit)-AE2

Frequency range (MHz)	Quasi-peak Limit (dBμV)	Result (dBμV) Traffic	Conclusion
0.15 to 0.5	66 to 56	Fig.100	P
0.5 to 5	56		
5 to 30	60		
NOTE: The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.5 MHz.			

BT (Average Limit)-AE2

Frequency range (MHz)	Average-peak Limit (dBμV)	Result (dBμV) Traffic	Conclusion
0.15 to 0.5	56 to 46	Fig.100	P
0.5 to 5	46		
5 to 30	50		
NOTE: The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.5 MHz.			

BT (Quasi-peak Limit)-AE2

Frequency range (MHz)	Quasi-peak Limit (dBμV)	Result (dBμV) Idle	Conclusion
0.15 to 0.5	66 to 56	Fig.101	P
0.5 to 5	56		
5 to 30	60		
NOTE: The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.5 MHz.			

BT (Average Limit)-AE2

Frequency range (MHz)	Average-peak Limit (dBμV)	Result (dBμV) Idle	Conclusion
0.15 to 0.5	56 to 46	Fig.101	P
0.5 to 5	46		
5 to 30	50		
NOTE: The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.5 MHz.			

BT (Quasi-peak Limit)-AE3

Frequency range (MHz)	Quasi-peak Limit (dBμV)	Result (dBμV)	Conclusion
		Traffic	
0.15 to 0.5	66 to 56	Fig.102	P
0.5 to 5	56		
5 to 30	60		
NOTE: The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.5 MHz.			

BT (Average Limit)-AE3

Frequency range (MHz)	Average-peak Limit (dBμV)	Result (dBμV)	Conclusion
		Traffic	
0.15 to 0.5	56 to 46	Fig.102	P
0.5 to 5	46		
5 to 30	50		
NOTE: The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.5 MHz.			

BT (Quasi-peak Limit)-AE3

Frequency range (MHz)	Quasi-peak Limit (dBμV)	Result (dBμV)	Conclusion
		Idle	
0.15 to 0.5	66 to 56	Fig.103	P
0.5 to 5	56		
5 to 30	60		
NOTE: The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.5 MHz.			

BT (Average Limit)-AE3

Frequency range (MHz)	Average-peak Limit (dBμV)	Result (dBμV)	Conclusion
		Idle	
0.15 to 0.5	56 to 46	Fig.103	P
0.5 to 5	46		
5 to 30	50		
NOTE: The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.5 MHz.			

Test Condition:

Voltage（V）	Frequency（Hz）
240	60

Measurement Result and limit:

BT (Quasi-peak Limit)-AE1

Frequency range (MHz)	Quasi-peak Limit (dBμV)	Result (dBμV) Traffic	Conclusion
0.15 to 0.5	66 to 56	Fig.104	P
0.5 to 5	56		
5 to 30	60		
NOTE: The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.5 MHz.			

BT (Average Limit)-AE1

Frequency range (MHz)	Average-peak Limit (dBμV)	Result (dBμV) Traffic	Conclusion
0.15 to 0.5	56 to 46	Fig.104	P
0.5 to 5	46		
5 to 30	50		
NOTE: The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.5 MHz.			

BT (Quasi-peak Limit)-AE1

Frequency range (MHz)	Quasi-peak Limit (dBμV)	Result (dBμV) Idle	Conclusion
0.15 to 0.5	66 to 56	Fig.105	P
0.5 to 5	56		
5 to 30	60		
NOTE: The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.5 MHz.			

BT (Average Limit)-AE1

Frequency range (MHz)	Average-peak Limit (dBμV)	Result (dBμV) Idle	Conclusion
0.15 to 0.5	56 to 46	Fig.105	P
0.5 to 5	46		
5 to 30	50		
NOTE: The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.5 MHz.			

BT (Quasi-peak Limit)-AE2

Frequency range (MHz)	Quasi-peak Limit (dBμV)	Result (dBμV) Traffic	Conclusion
0.15 to 0.5	66 to 56	Fig.106	P
0.5 to 5	56		
5 to 30	60		
NOTE: The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.5 MHz.			

BT (Average Limit)-AE2

Frequency range (MHz)	Average-peak Limit (dBμV)	Result (dBμV) Traffic	Conclusion
0.15 to 0.5	56 to 46	Fig.106	P
0.5 to 5	46		
5 to 30	50		
NOTE: The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.5 MHz.			

BT (Quasi-peak Limit)-AE2

Frequency range (MHz)	Quasi-peak Limit (dBμV)	Result (dBμV) Idle	Conclusion
0.15 to 0.5	66 to 56	Fig.107	P
0.5 to 5	56		
5 to 30	60		
NOTE: The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.5 MHz.			

BT (Average Limit)-AE2

Frequency range (MHz)	Average-peak Limit (dBμV)	Result (dBμV) Idle	Conclusion
0.15 to 0.5	56 to 46	Fig.107	P
0.5 to 5	46		
5 to 30	50		
NOTE: The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.5 MHz.			

BT (Quasi-peak Limit)-AE3

Frequency range (MHz)	Quasi-peak Limit (dBμV)	Result (dBμV) Traffic	Conclusion
0.15 to 0.5	66 to 56	Fig.108	P
0.5 to 5	56		
5 to 30	60		
NOTE: The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.5 MHz.			

BT (Average Limit)-AE3

Frequency range (MHz)	Average-peak Limit (dBμV)	Result (dBμV) Traffic	Conclusion
0.15 to 0.5	56 to 46	Fig.108	P
0.5 to 5	46		
5 to 30	50		
NOTE: The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.5 MHz.			

BT (Quasi-peak Limit)-AE3

Frequency range (MHz)	Quasi-peak Limit (dBμV)	Result (dBμV) Idle	Conclusion
0.15 to 0.5	66 to 56	Fig.109	P
0.5 to 5	56		
5 to 30	60		
NOTE: The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.5 MHz.			

BT (Average Limit)-AE3

Frequency range (MHz)	Average-peak Limit (dBμV)	Result (dBμV) Idle	Conclusion
0.15 to 0.5	56 to 46	Fig.109	P
0.5 to 5	46		
5 to 30	50		
NOTE: The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.5 MHz.			

Note: The measurement results include the L1 and N measurements.

See ANNEX B for test graphs.

Conclusion: Pass

ANNEX B: TEST FIGURE LIST

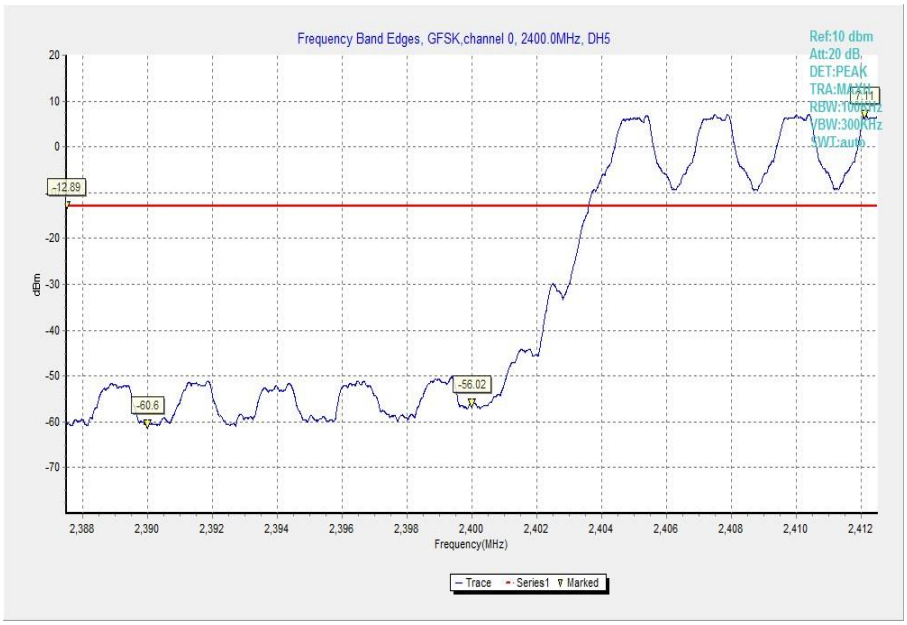

Fig. 1 Band Edges (GFSK, Ch 0, Hopping ON)

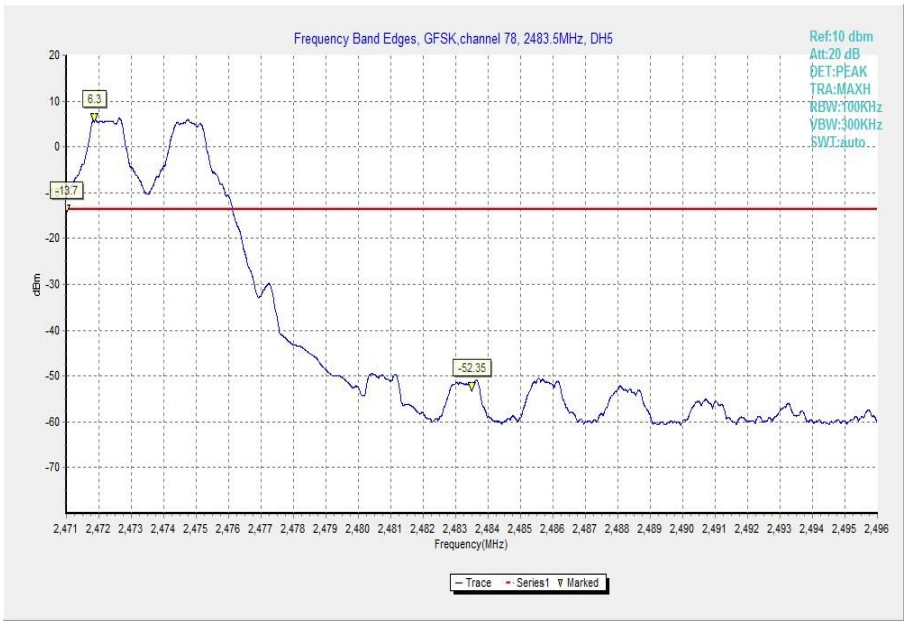

Fig. 2 Band Edges (GFSK, Ch 78, Hopping ON)

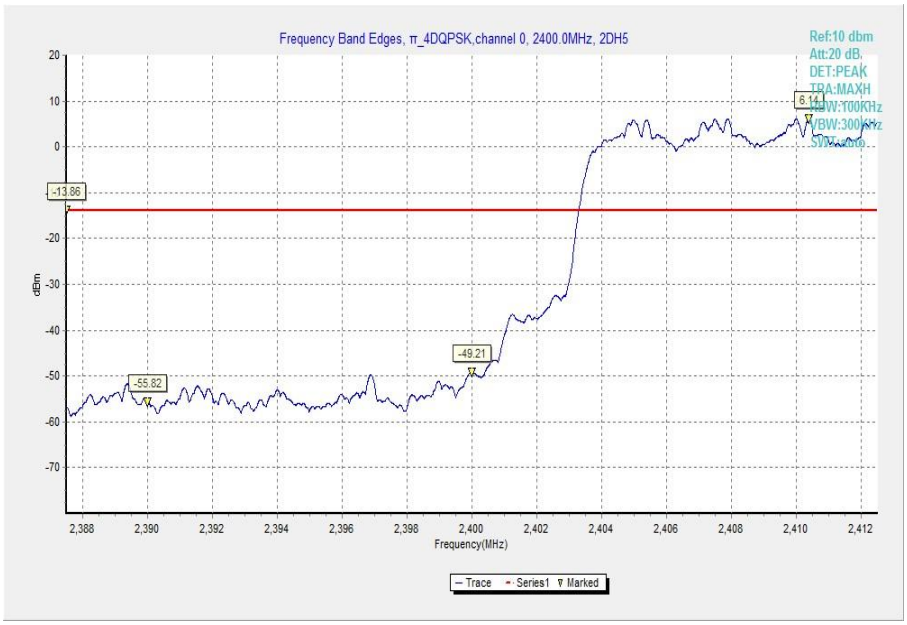

Fig. 3 Band Edges (π /4 DQPSK, Ch 0, Hopping ON)

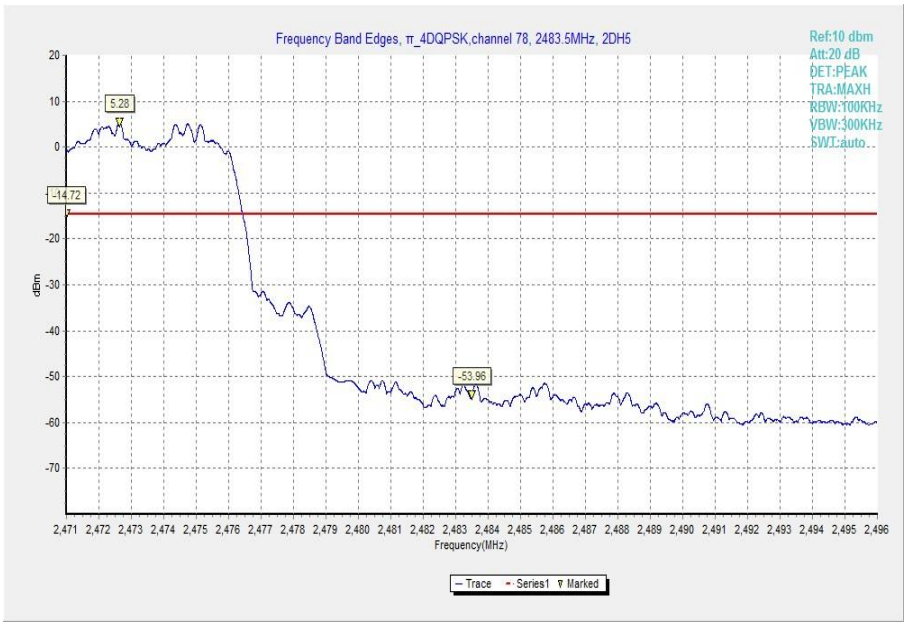

Fig. 4 Band Edges (π /4 DQPSK, Ch 78, Hopping ON)

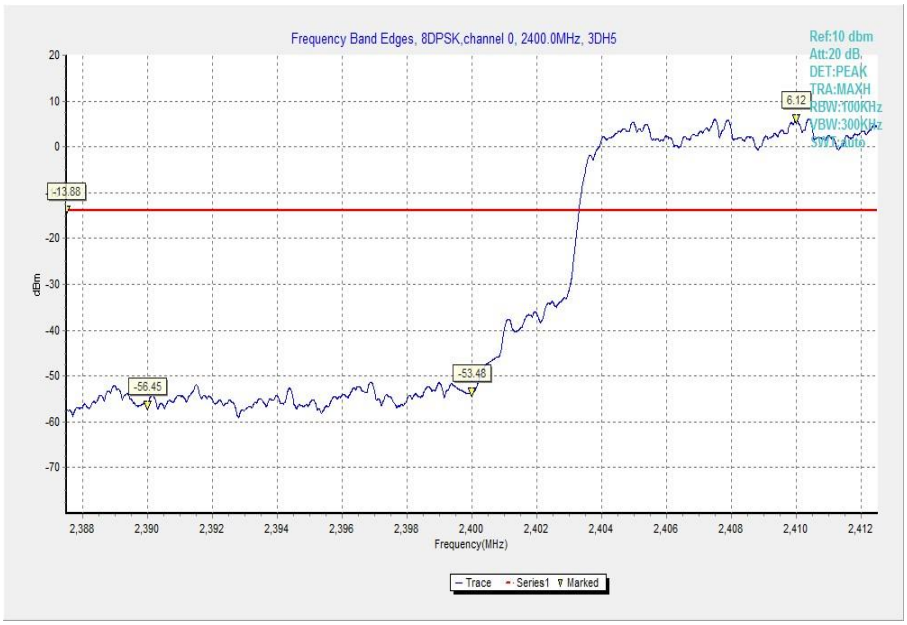

Fig. 5 Band Edges (8DPSK, Ch 0, Hopping ON)

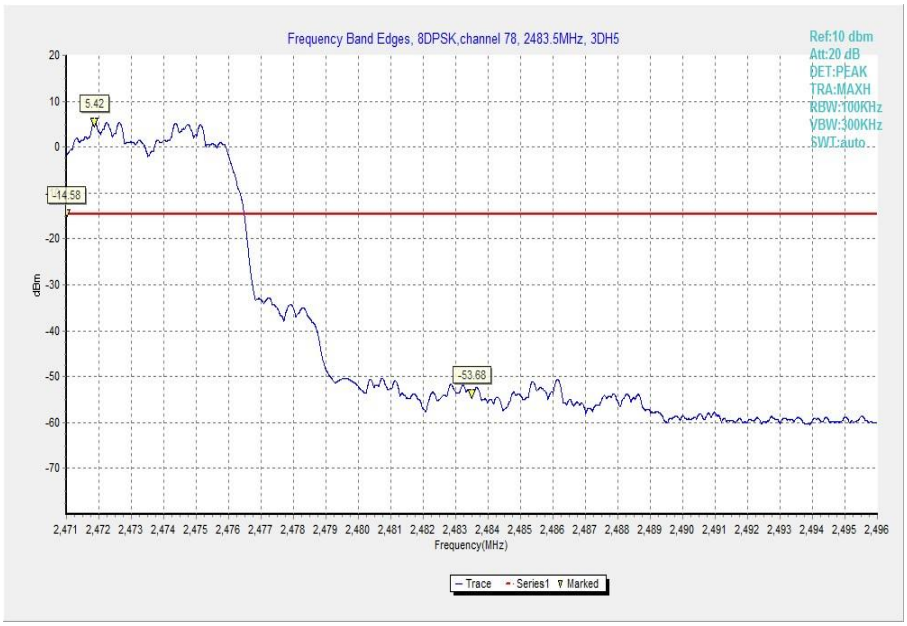

Fig. 6 Band Edges (8DPSK, Ch 78, Hopping ON)

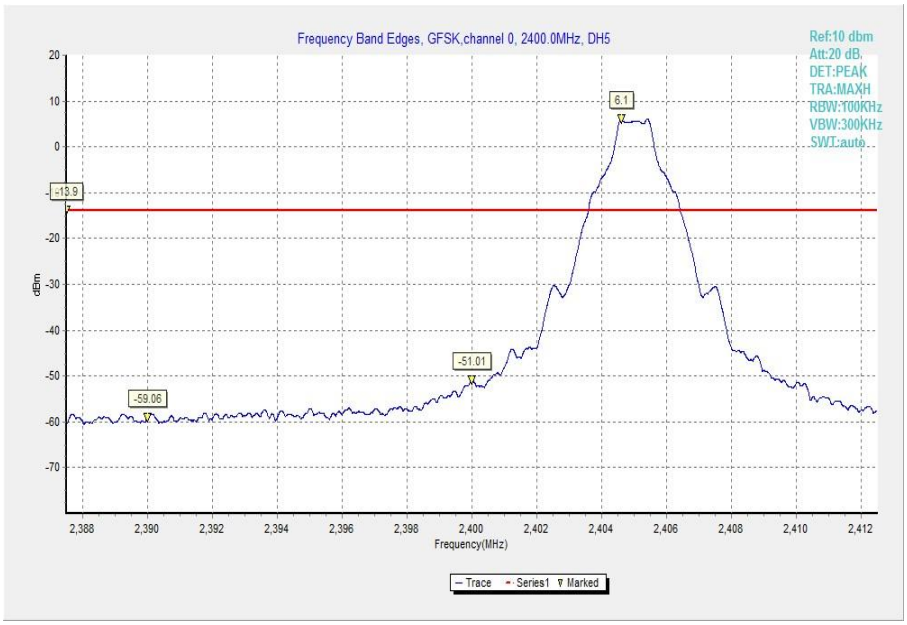

Fig. 7 Band Edges (GFSK, Ch 0, Hopping OFF)

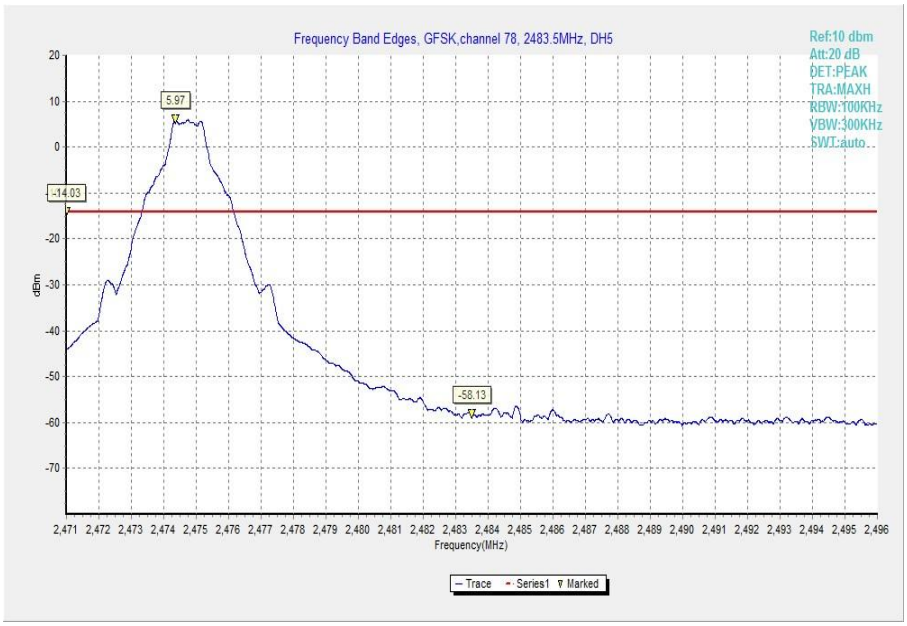

Fig. 8 Band Edges (GFSK, Ch 78, Hopping OFF)

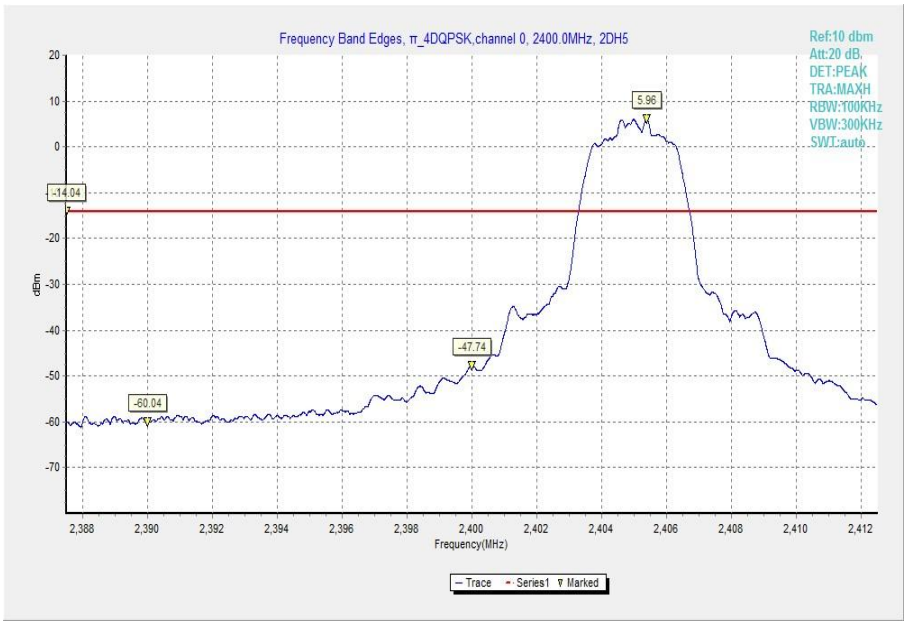

Fig. 9 Band Edges (π /4 DQPSK, Ch 0, Hopping OFF)

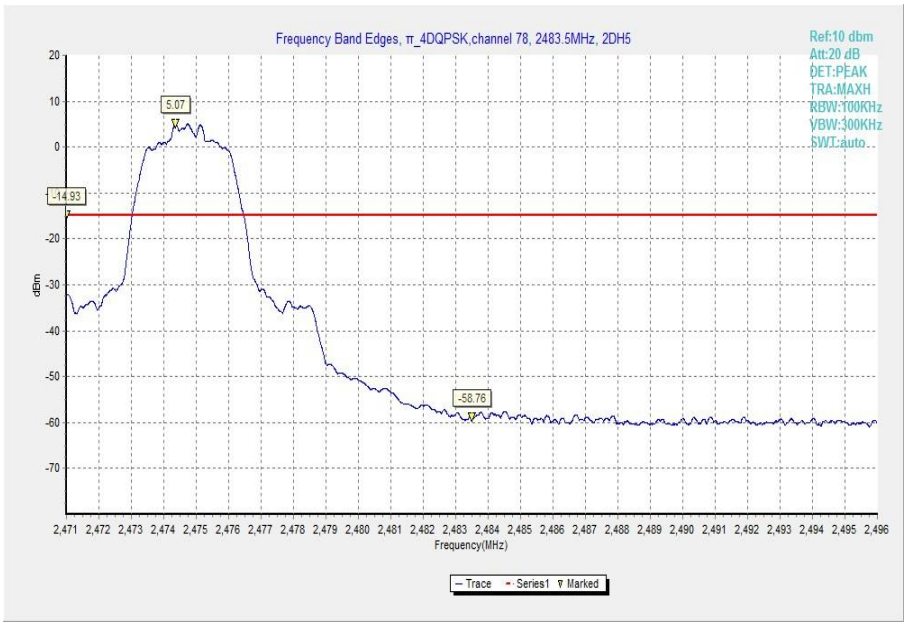

Fig. 10 Band Edges (π /4 DQPSK, Ch 78, Hopping OFF)

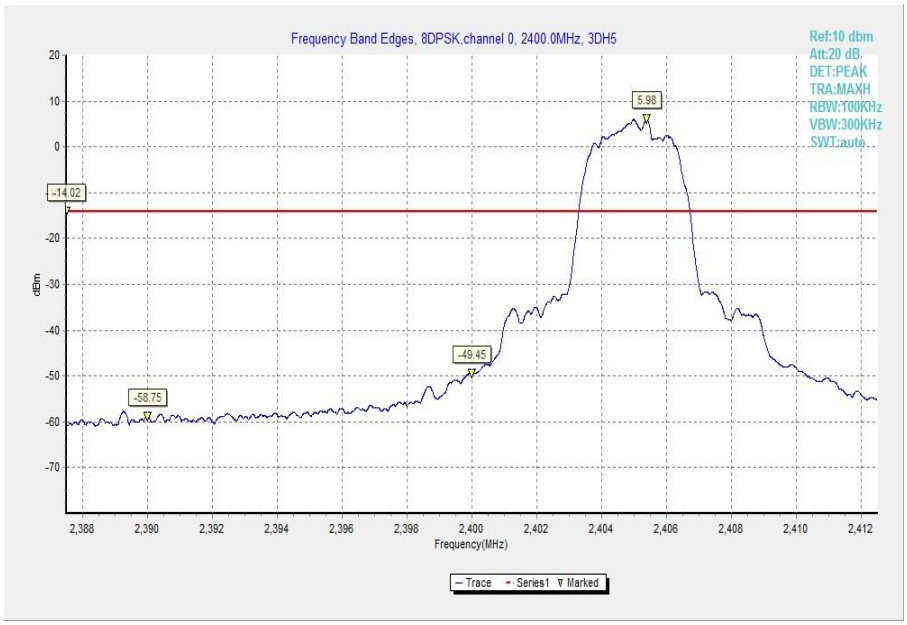

Fig. 11 Band Edges (8DPSK, Ch 0, Hopping OFF)

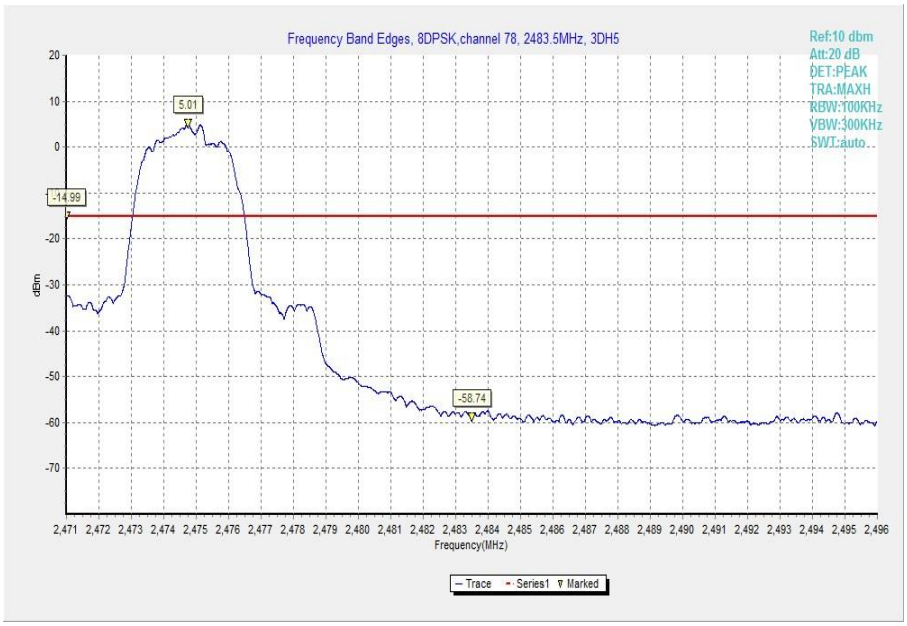

Fig. 12 Band Edges (8DPSK, Ch 78, Hopping OFF)

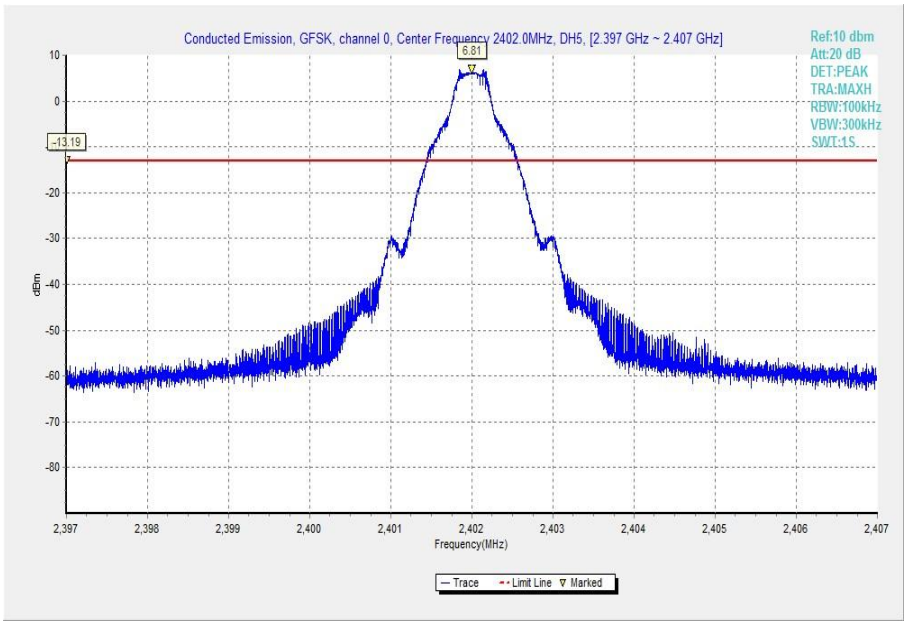

Fig. 13 Conducted Spurious Emission (GFSK, Ch0, 2.402GHz)

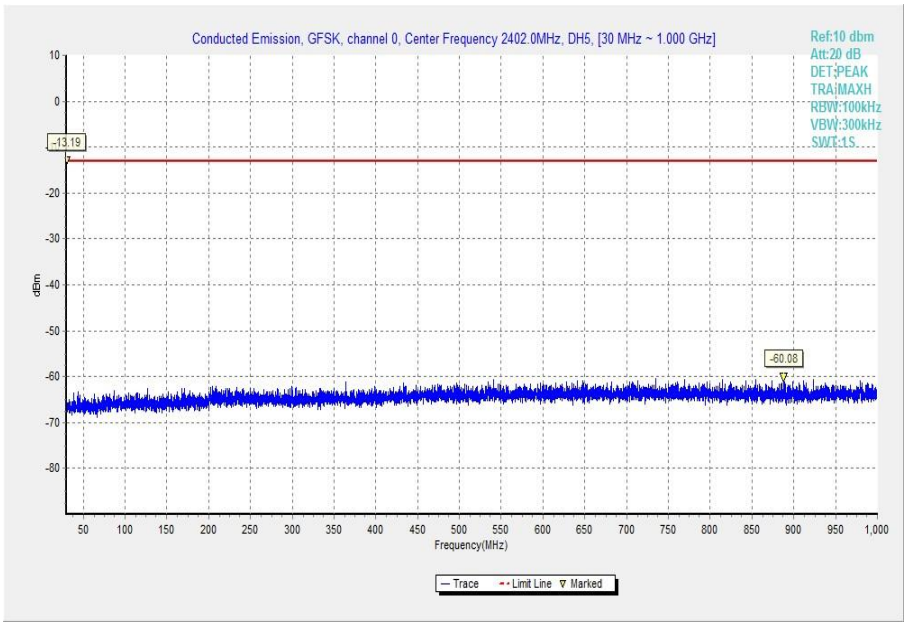

Fig. 14 Conducted Spurious Emission (GFSK, Ch0, 30 MHz-1 GHz)

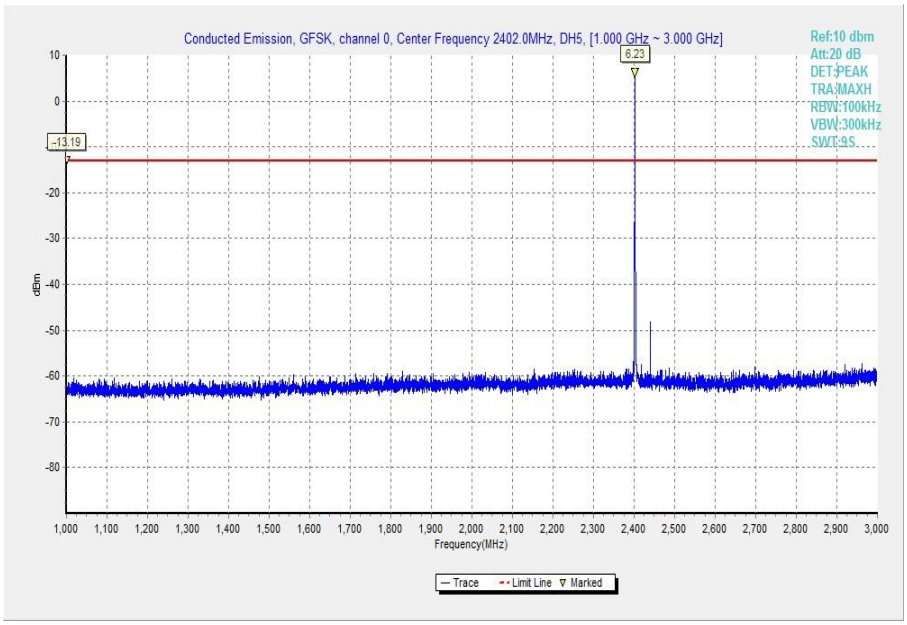

Fig. 15 Conducted Spurious Emission (GFSK, Ch0, 1GHz-3 GHz)

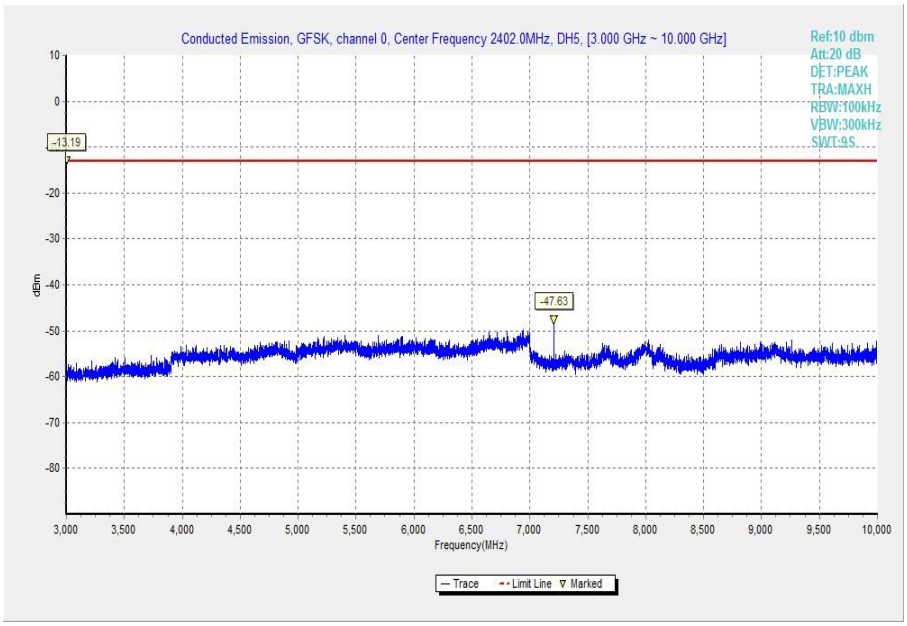

Fig. 16 Conducted Spurious Emission (GFSK, Ch0, 3GHz-10 GHz)

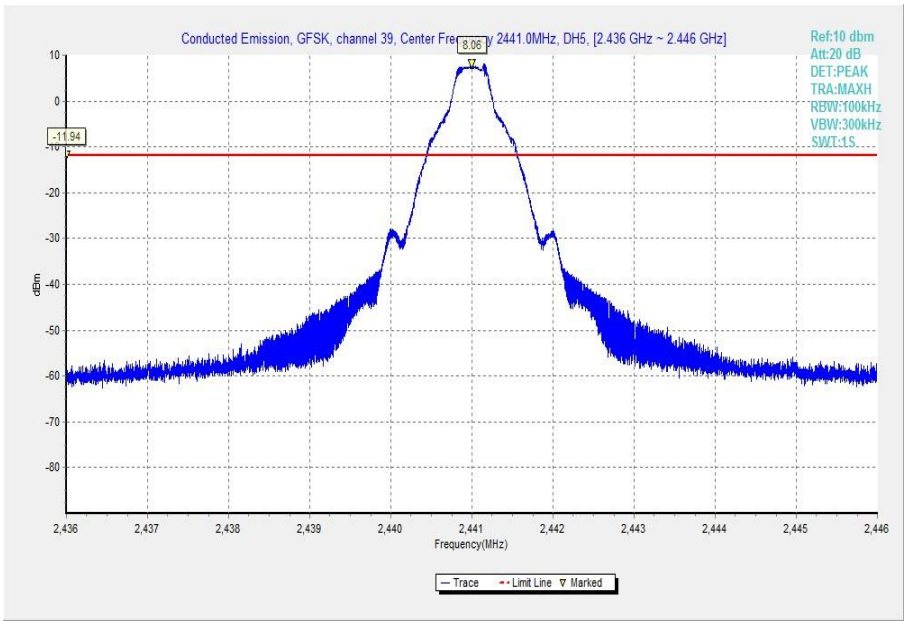

Fig. 17 Conducted Spurious Emission (GFSK, Ch39, 2.441GHz)

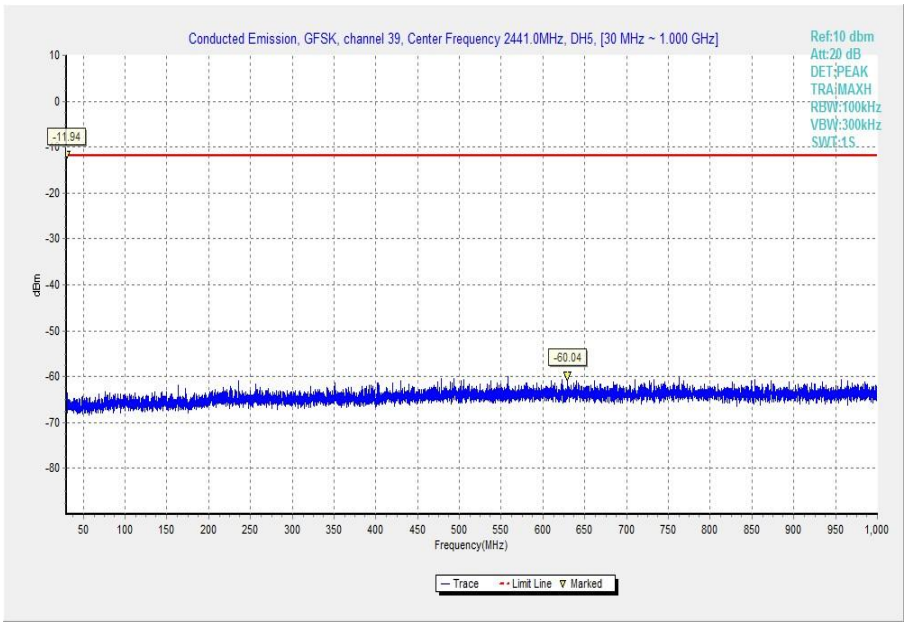

Fig. 18 Conducted Spurious Emission (GFSK, Ch39, 30 MHz-1 GHz)

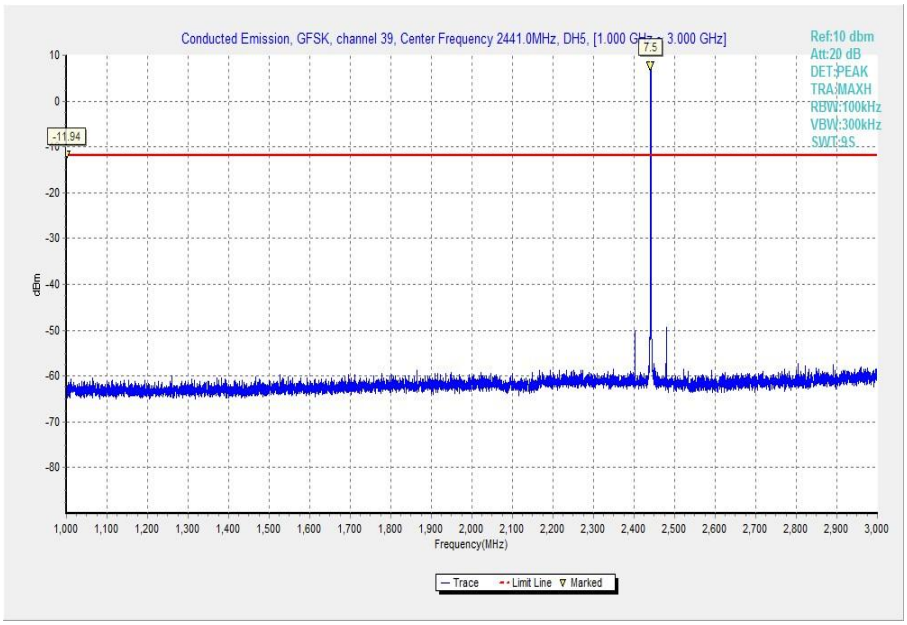

Fig. 19 Conducted Spurious Emission (GFSK, Ch39, 1GHz-3 GHz)

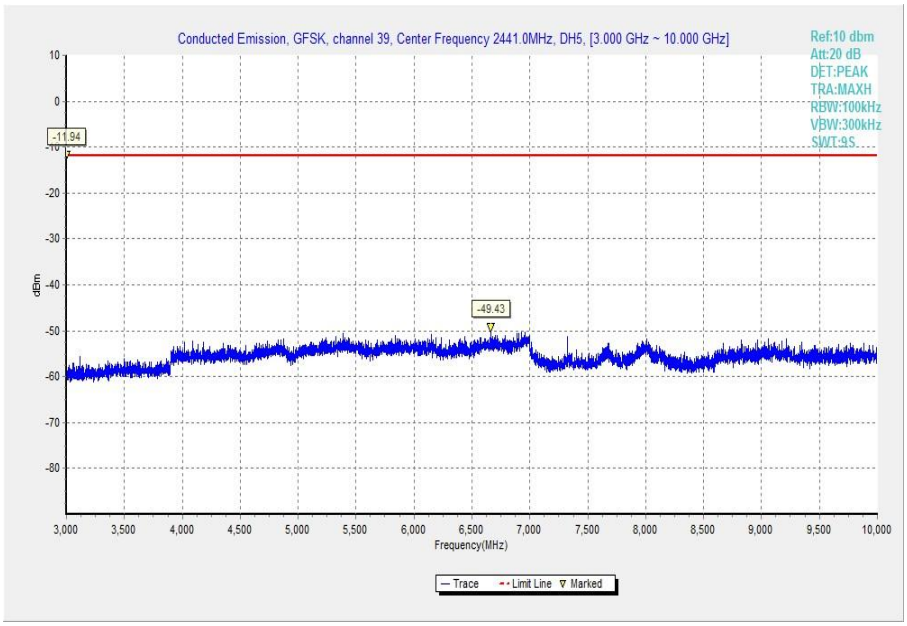

Fig. 20 Conducted Spurious Emission (GFSK, Ch39, 3GHz-10 GHz)

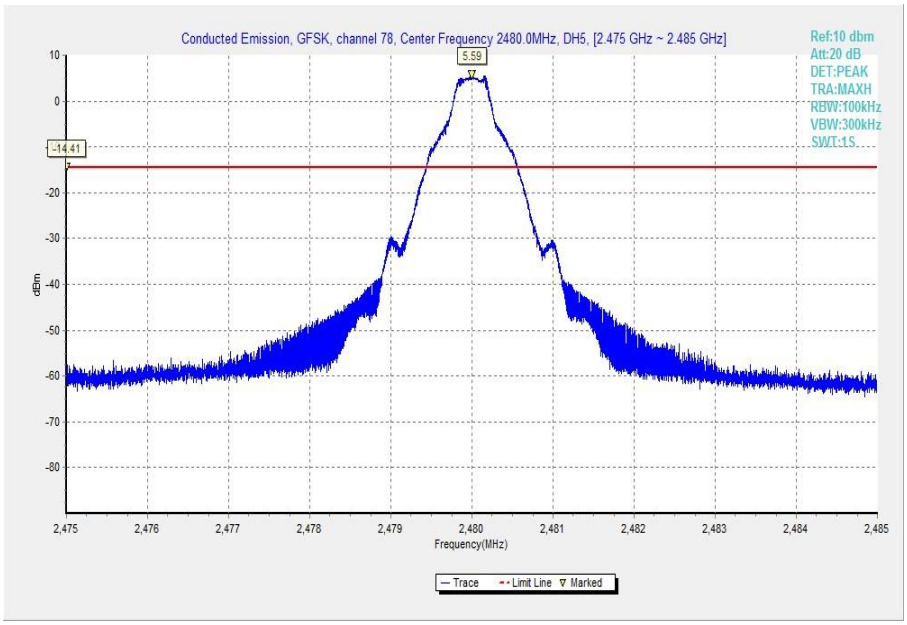

Fig. 21 Conducted Spurious Emission (GFSK, Ch78, 2.480GHz)

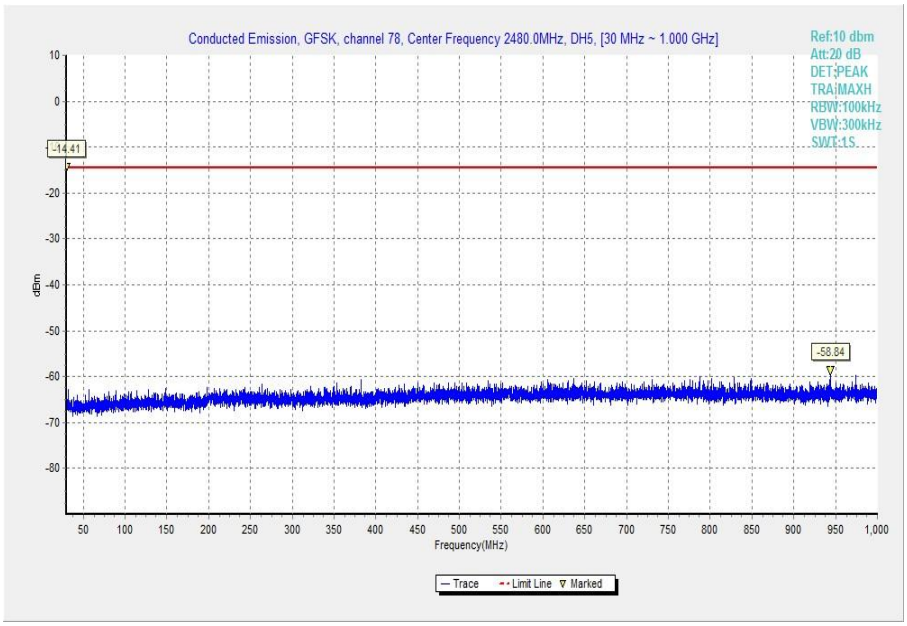

Fig. 22 Conducted Spurious Emission (GFSK, Ch78, 30 MHz-1 GHz)

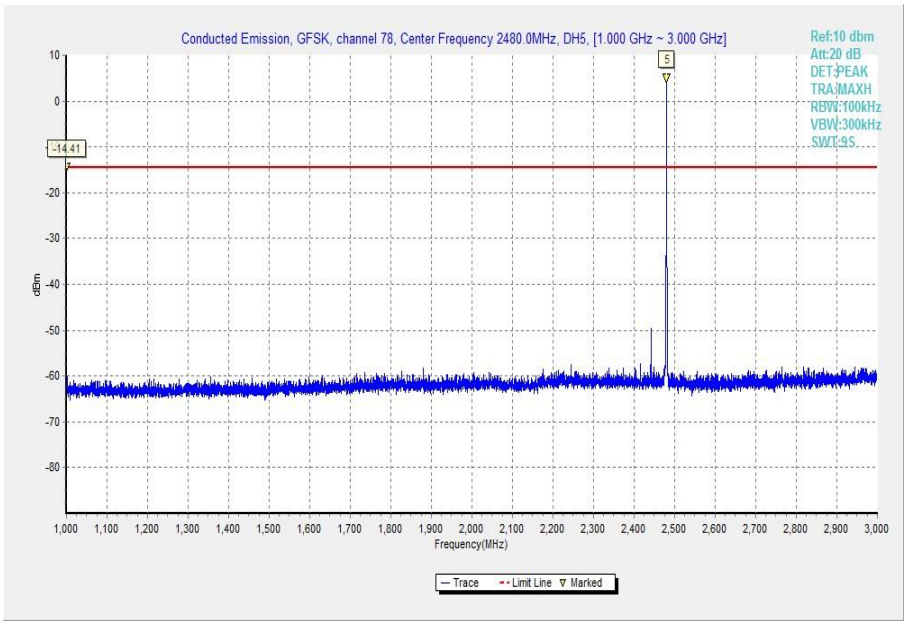

Fig. 23 Conducted Spurious Emission (GFSK, Ch78, 1GHz-3 GHz)

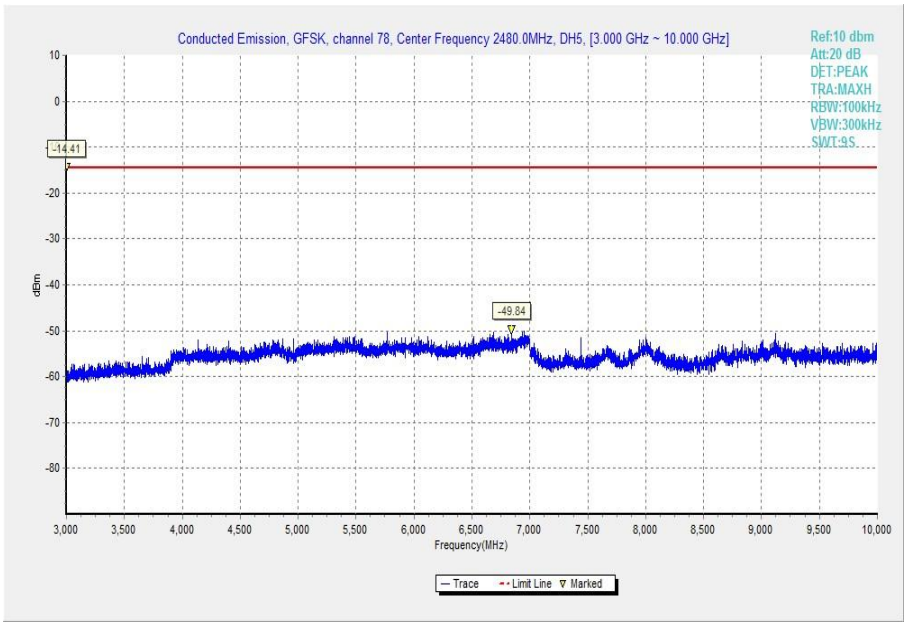

Fig. 24 Conducted Spurious Emission (GFSK, Ch78, 3GHz-10 GHz)

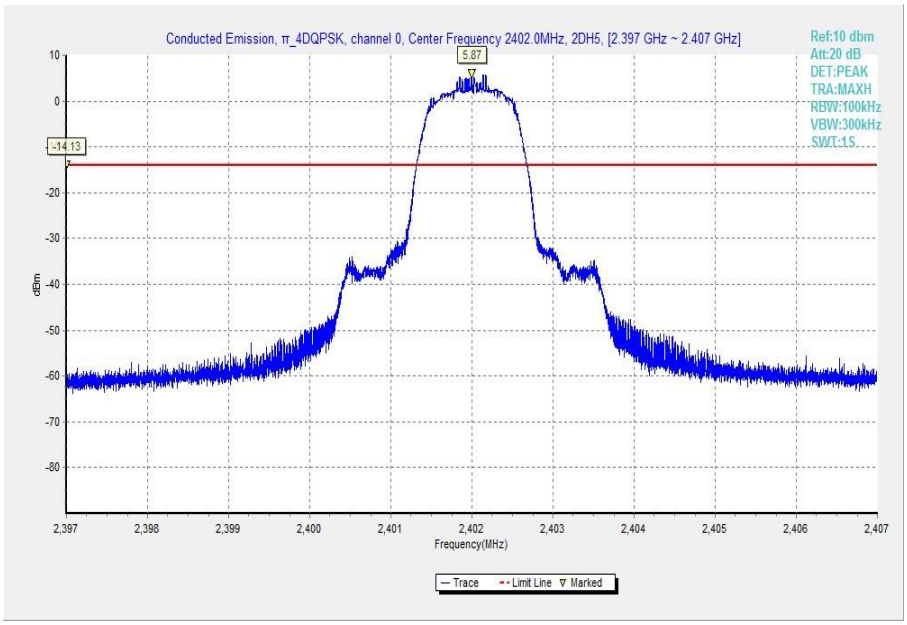

Fig. 25 Conducted Spurious Emission (π /4 DQPSK, Ch0, 2.402GHz)

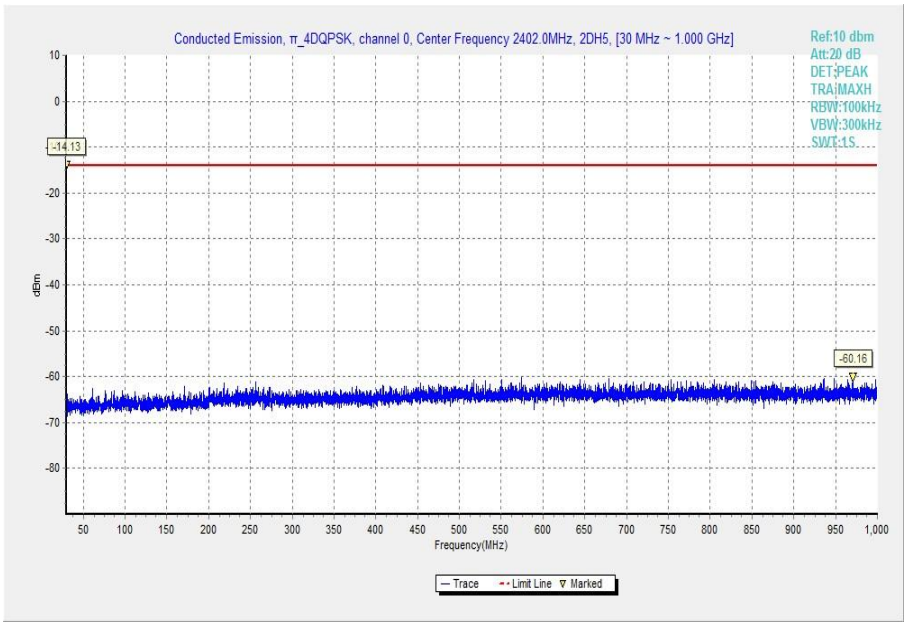

Fig. 26 Conducted Spurious Emission (π /4 DQPSK, Ch0, 30 MHz-1 GHz)

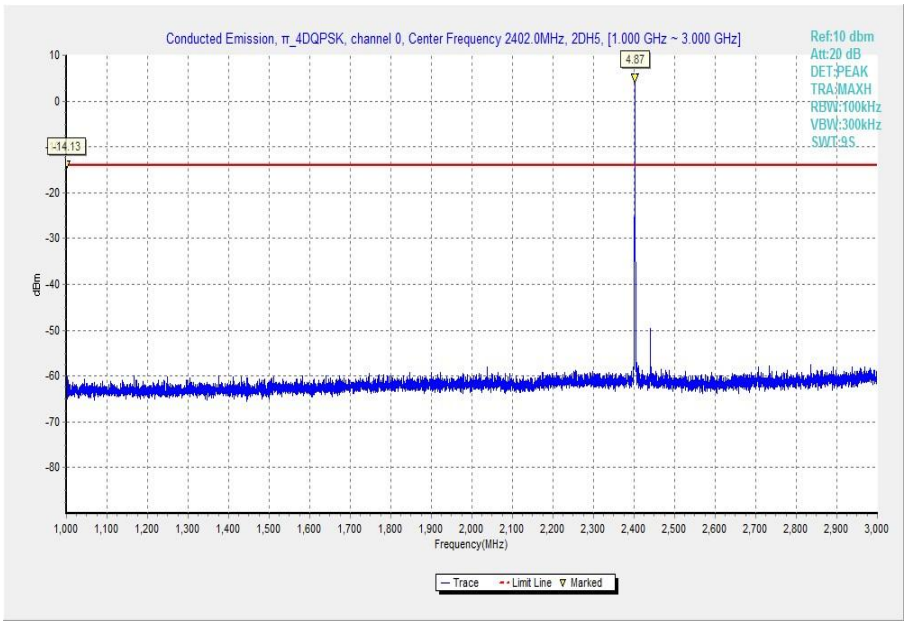

Fig. 27 Conducted Spurious Emission (π /4 DQPSK, Ch0, 1GHz-3 GHz)

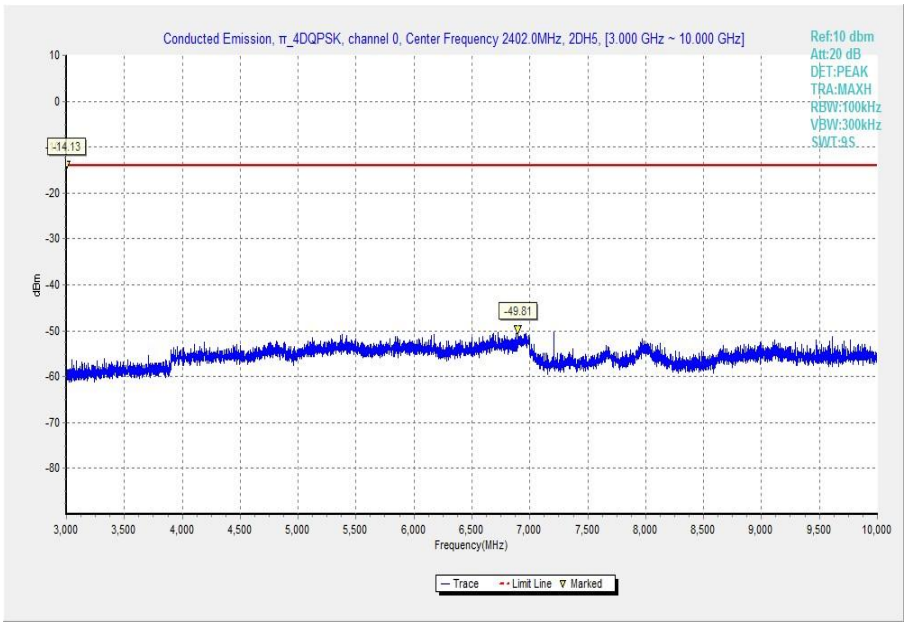

Fig. 28 Conducted Spurious Emission (π /4 DQPSK, Ch0, 3GHz-10 GHz)

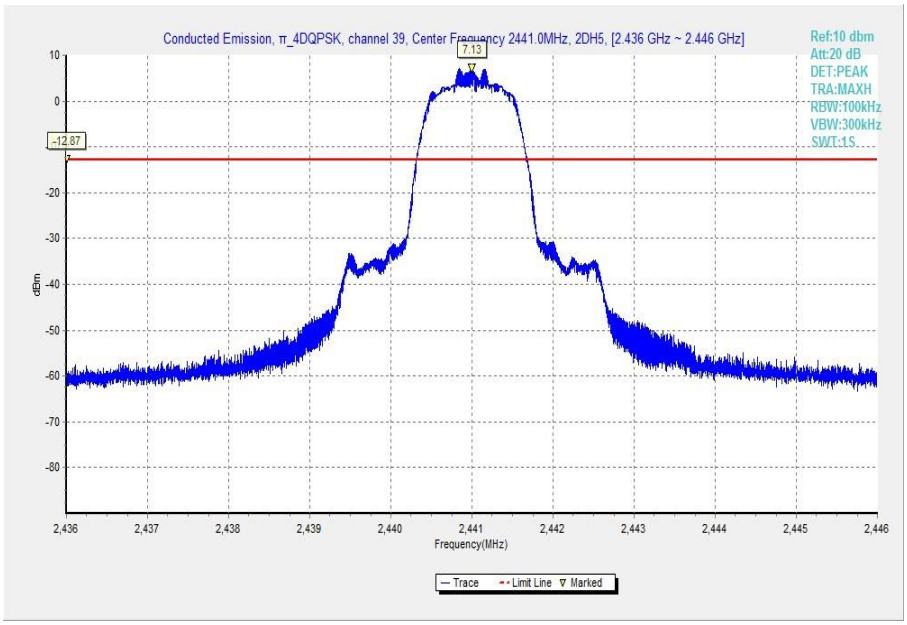

Fig. 29 Conducted Spurious Emission (π /4 DQPSK, Ch39, 2.441GHz)

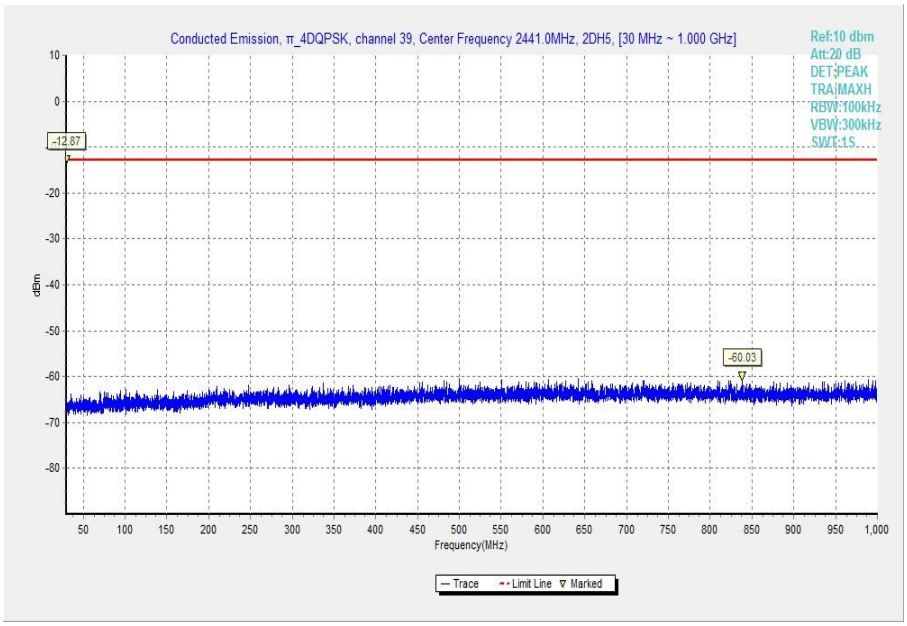

Fig. 30 Conducted Spurious Emission (π /4 DQPSK, Ch39, 30 MHz-1 GHz)

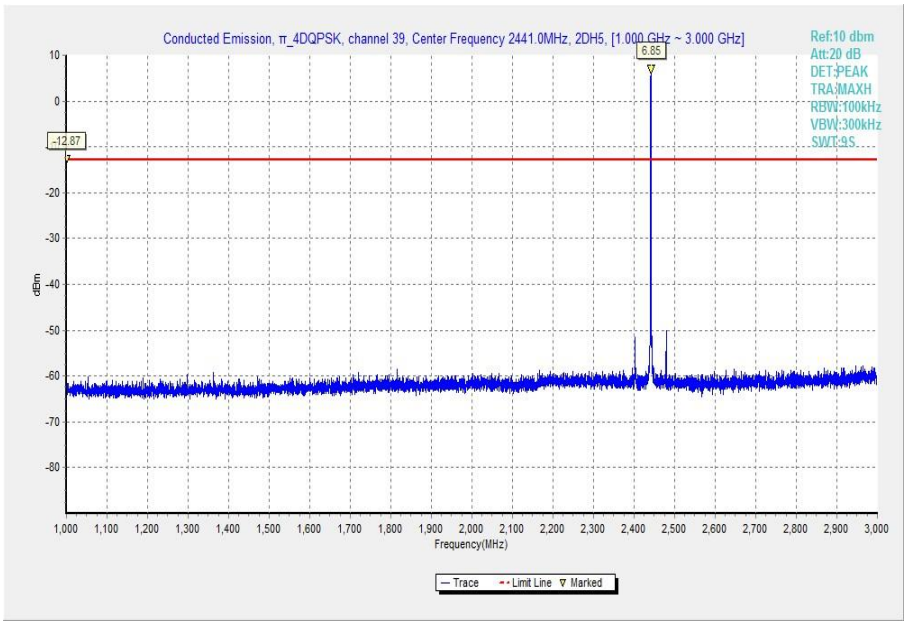

Fig. 31 Conducted Spurious Emission (π /4 DQPSK, Ch39, 1 GHz-3 GHz)

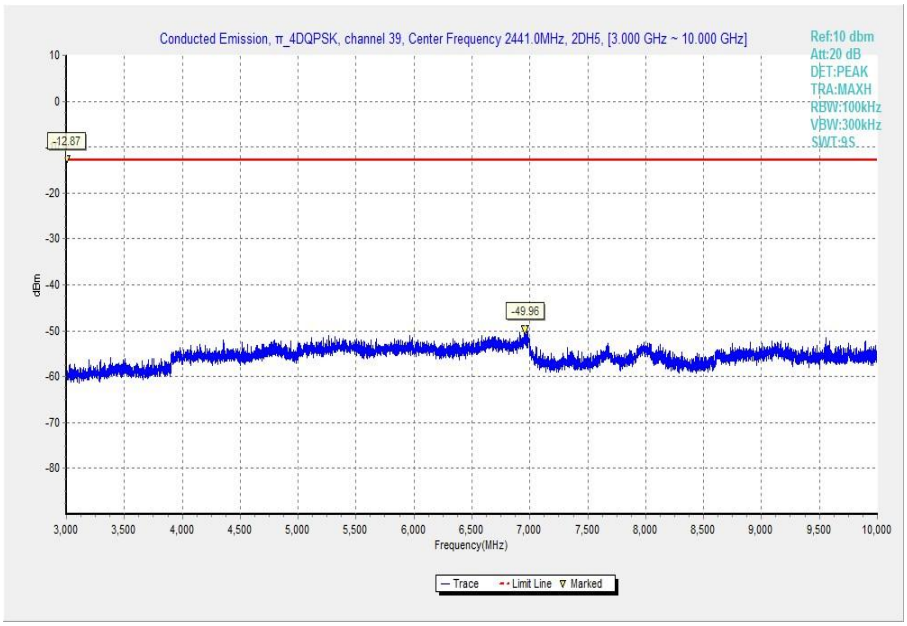

Fig. 32 Conducted Spurious Emission (π /4 DQPSK, Ch39, 3GHz-10 GHz)

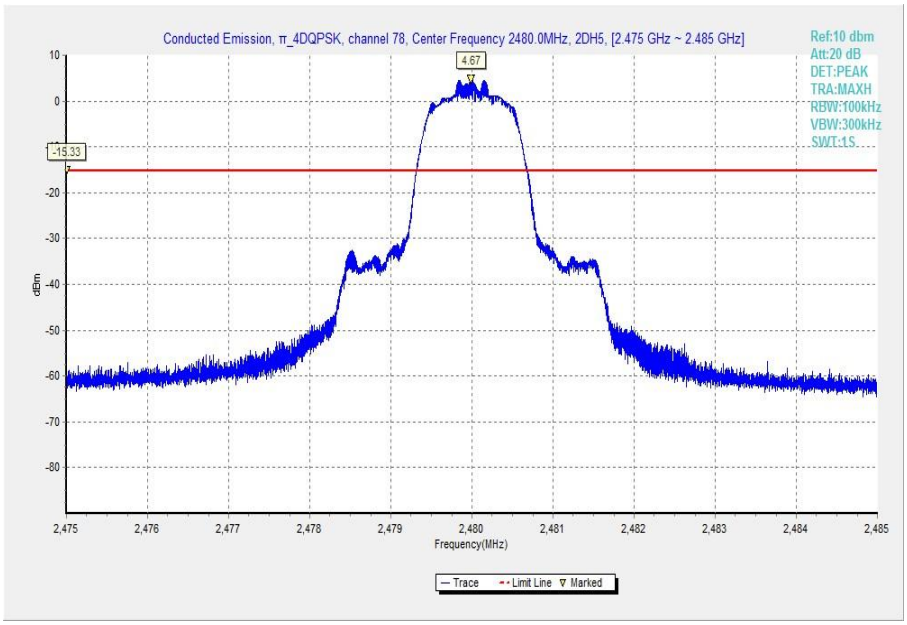

Fig. 33 Conducted Spurious Emission (π /4 DQPSK, Ch78, 2.480GHz)

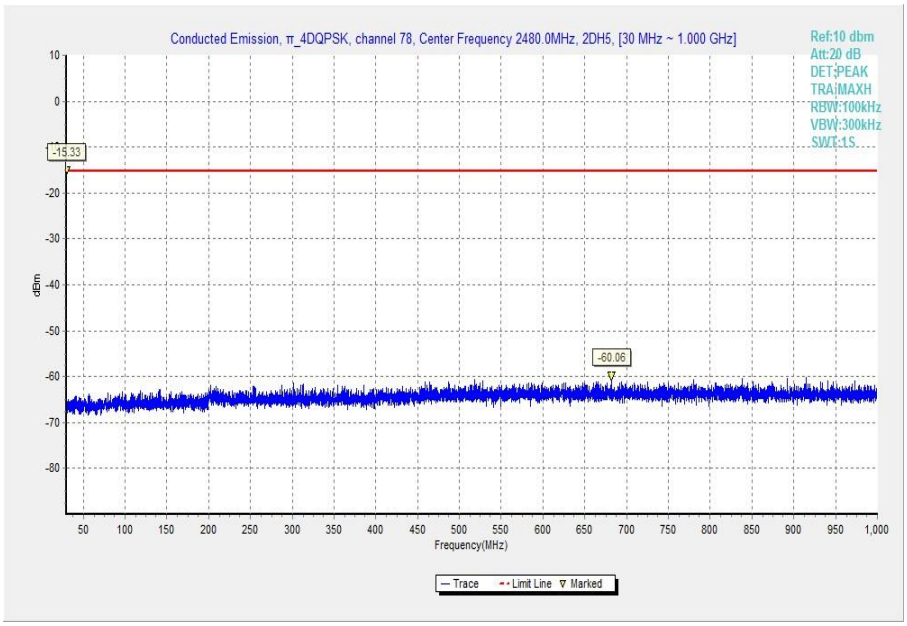

Fig. 34 Conducted Spurious Emission (π /4 DQPSK, Ch78, 30 MHz-1 GHz)

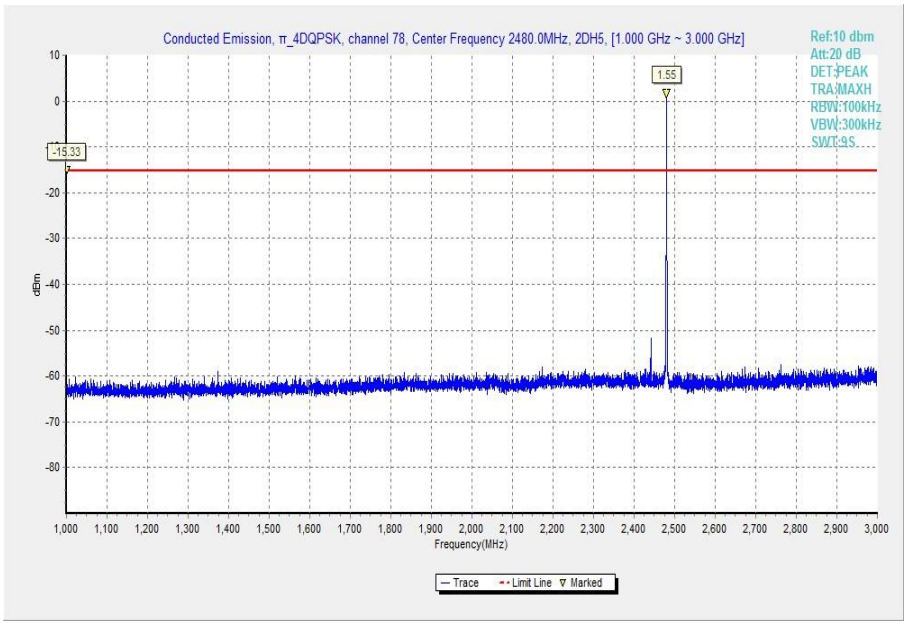

Fig. 35 Conducted Spurious Emission (π /4 DQPSK, Ch78, 1GHz-3 GHz)

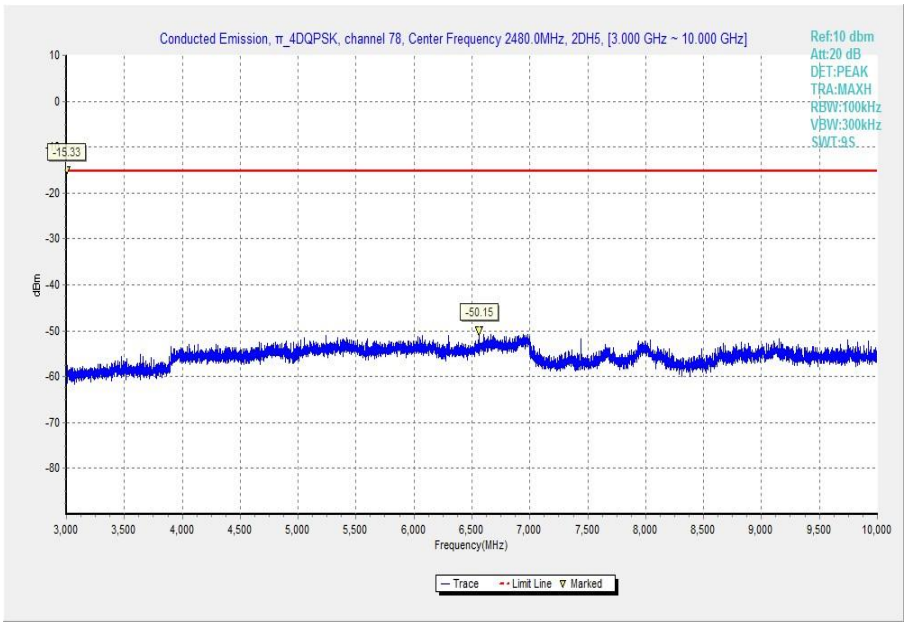

Fig. 36 Conducted Spurious Emission (π /4 DQPSK, Ch78, 3GHz-10 GHz)

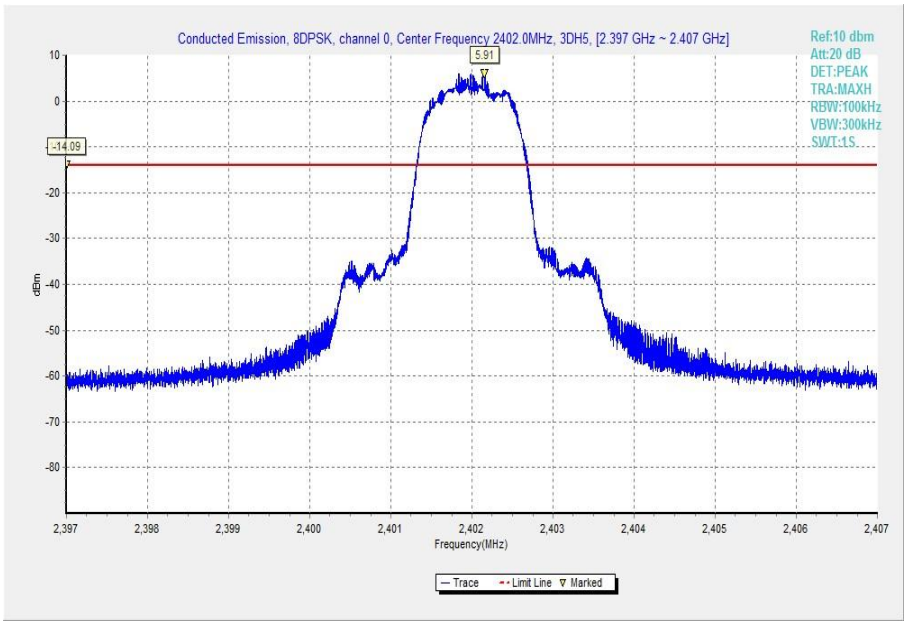

Fig. 37 Conducted Spurious Emission (8DPSK, Ch0, 2.402GHz)

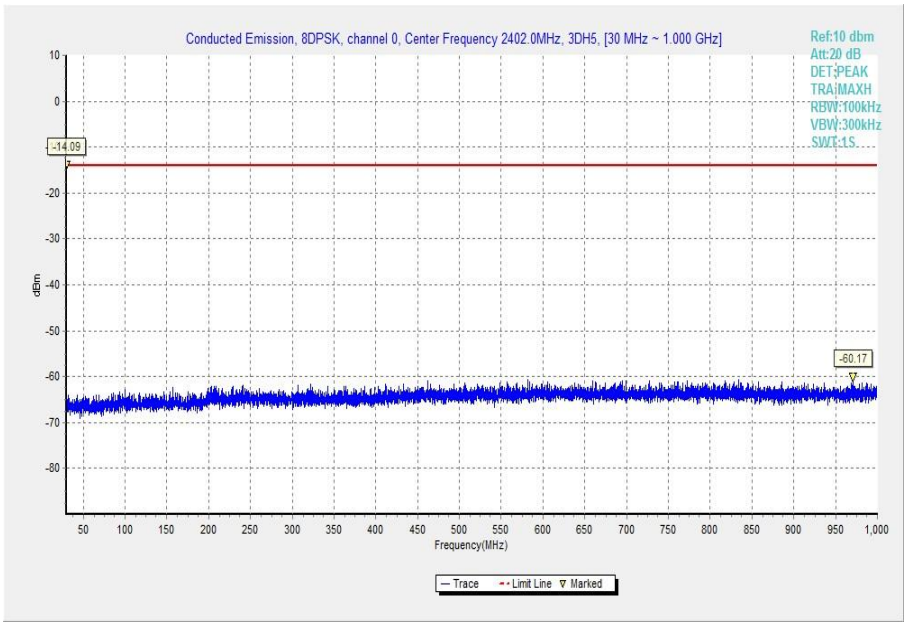

Fig. 38 Conducted Spurious Emission (8DPSK, Ch0, 30 MHz-1 GHz)

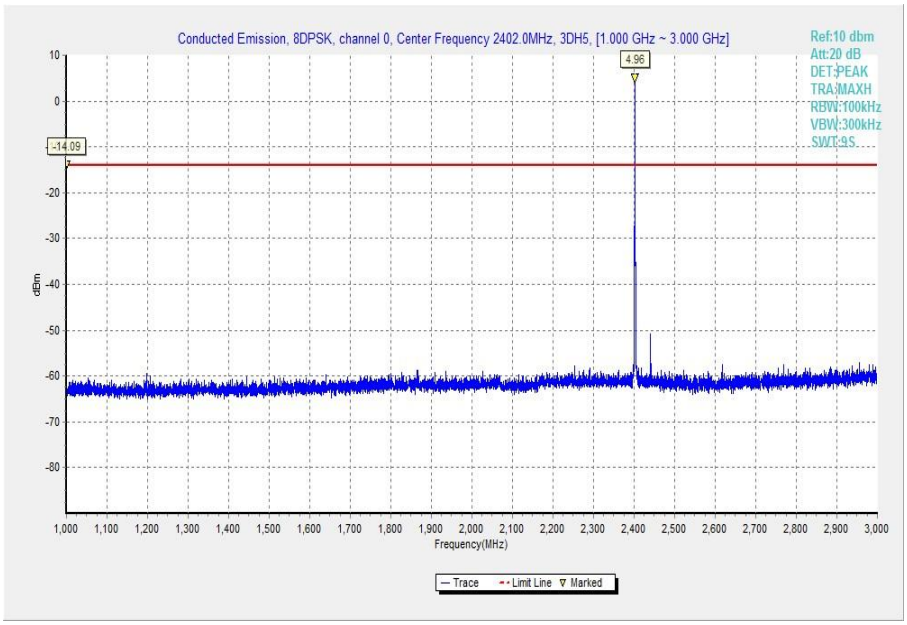

Fig. 39 Conducted Spurious Emission (8DPSK, Ch0, 1GHz-3 GHz)

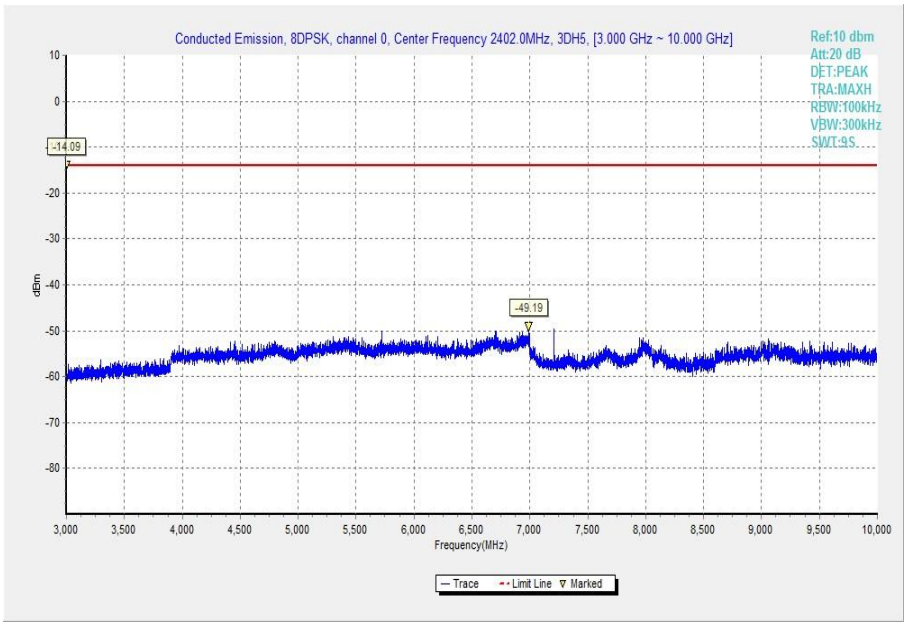

Fig. 40 Conducted Spurious Emission (8DPSK, Ch0, 3GHz-10 GHz)

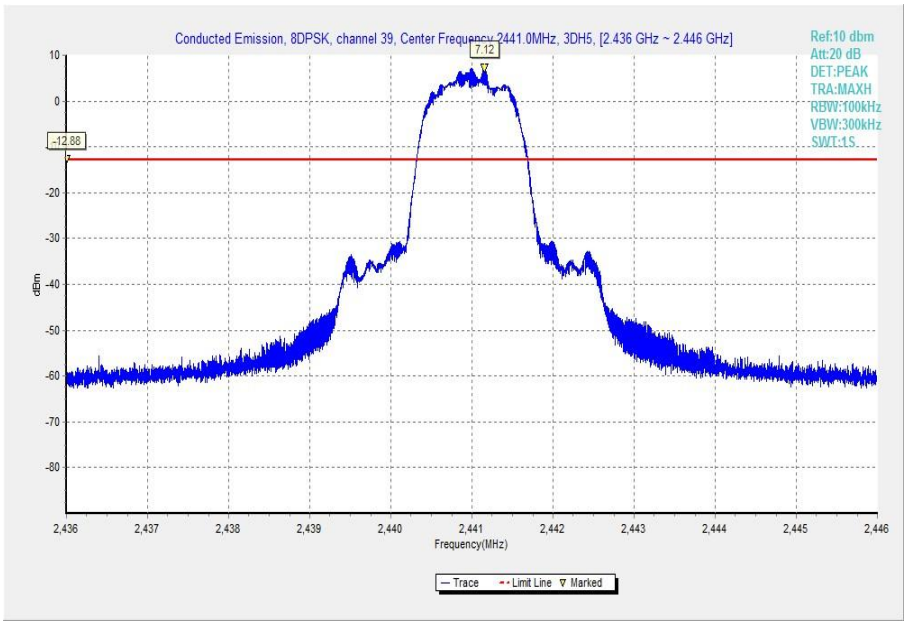

Fig. 41 Conducted Spurious Emission (8DPSK, Ch39, 2.441GHz)

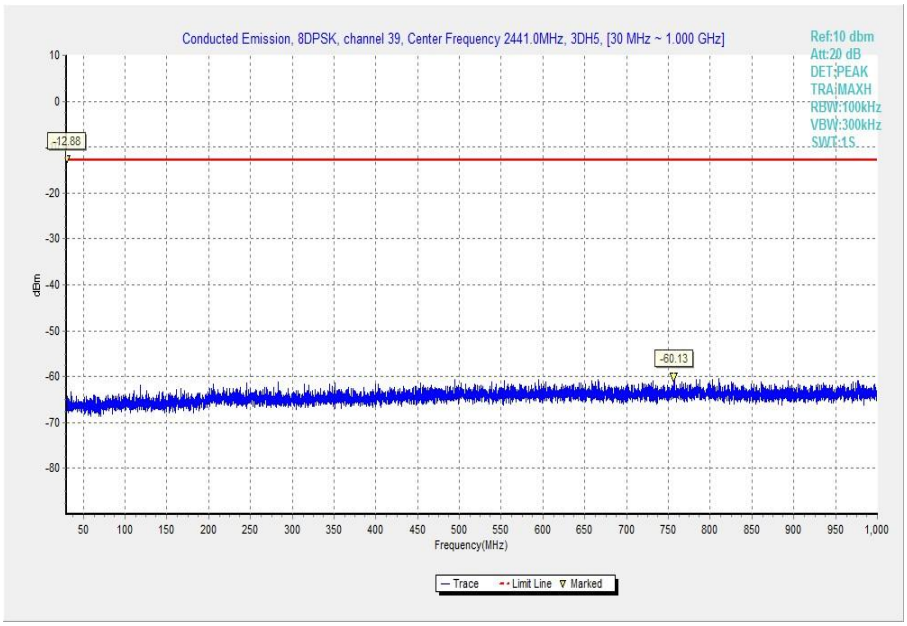

Fig. 42 Conducted Spurious Emission (8DPSK, Ch39, 30 MHz-1 GHz)

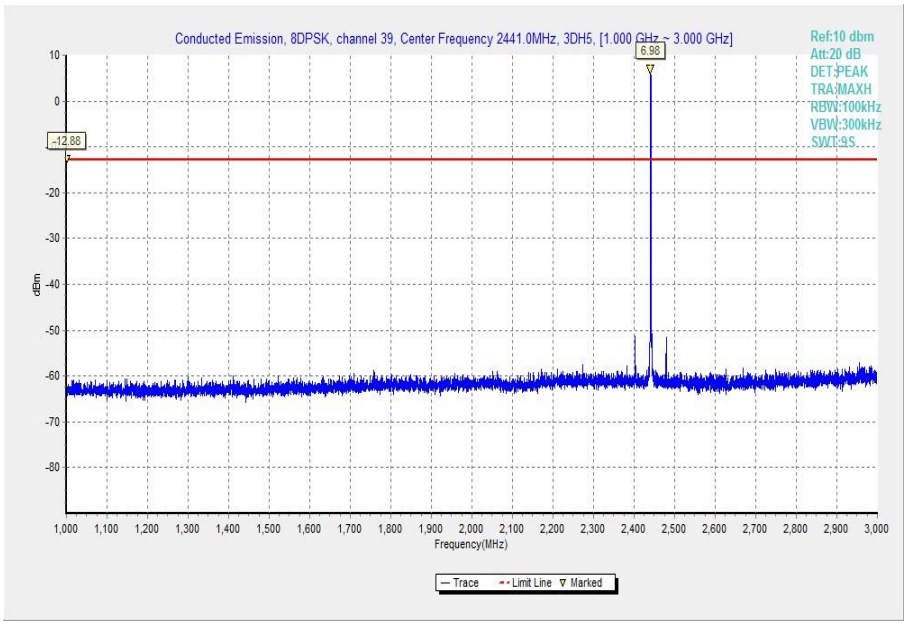

Fig. 43 Conducted Spurious Emission (8DPSK, Ch39, 1GHz-3 GHz)

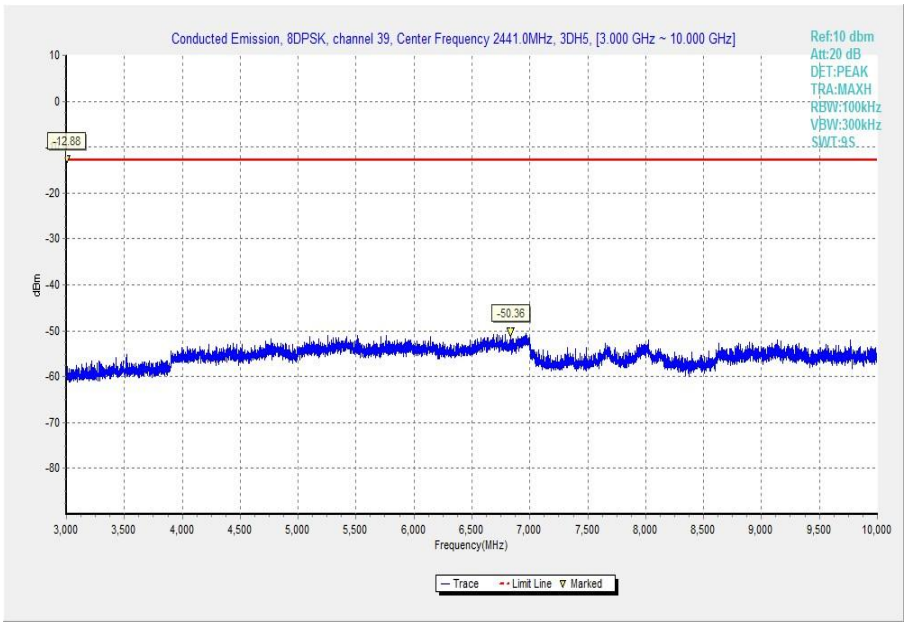

Fig. 44 Conducted Spurious Emission (8DPSK, Ch39, 3GHz-10 GHz)

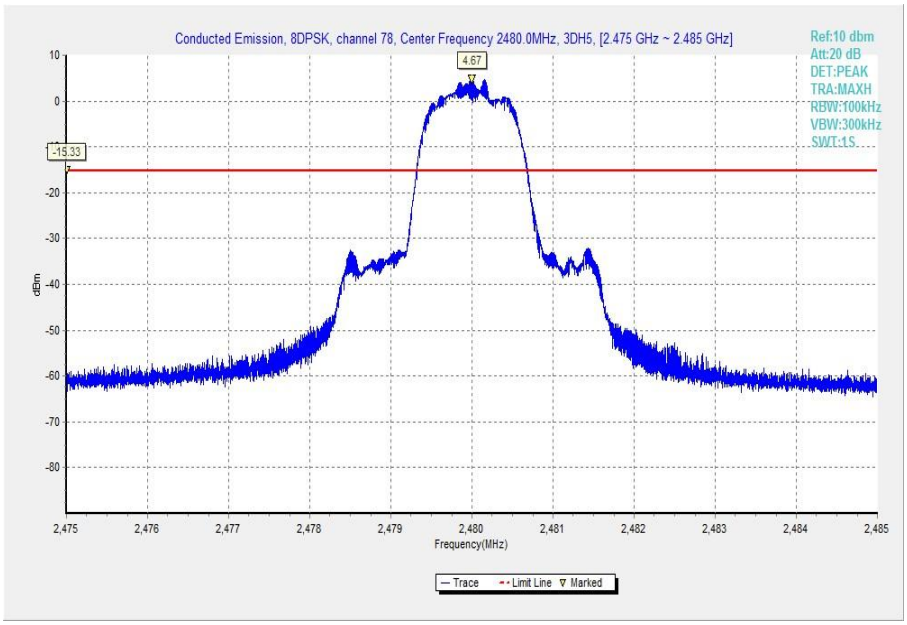

Fig. 45 Conducted Spurious Emission (8DPSK, Ch78, 2.480GHz)

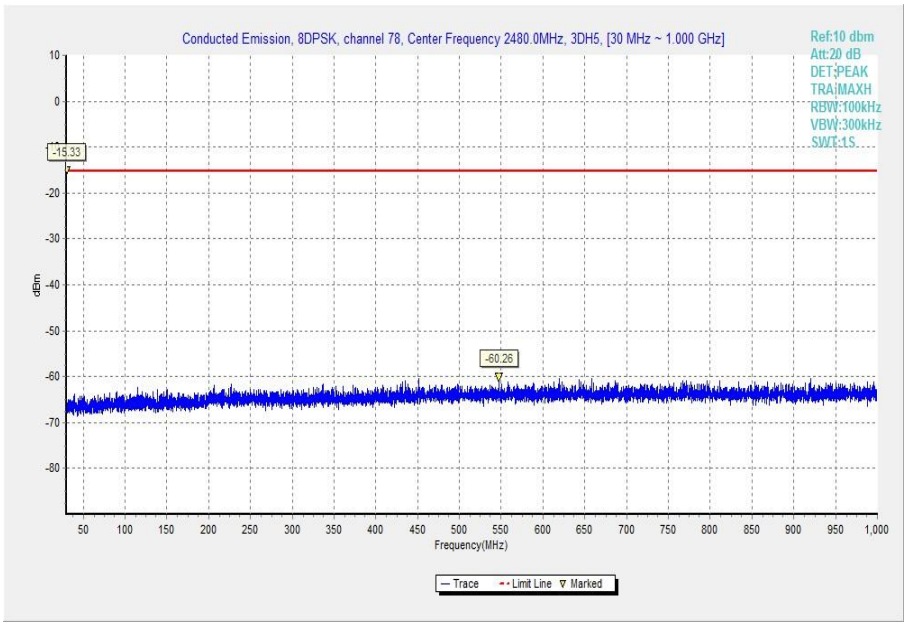

Fig. 46 Conducted Spurious Emission (8DPSK, Ch78, 30 MHz-1 GHz)

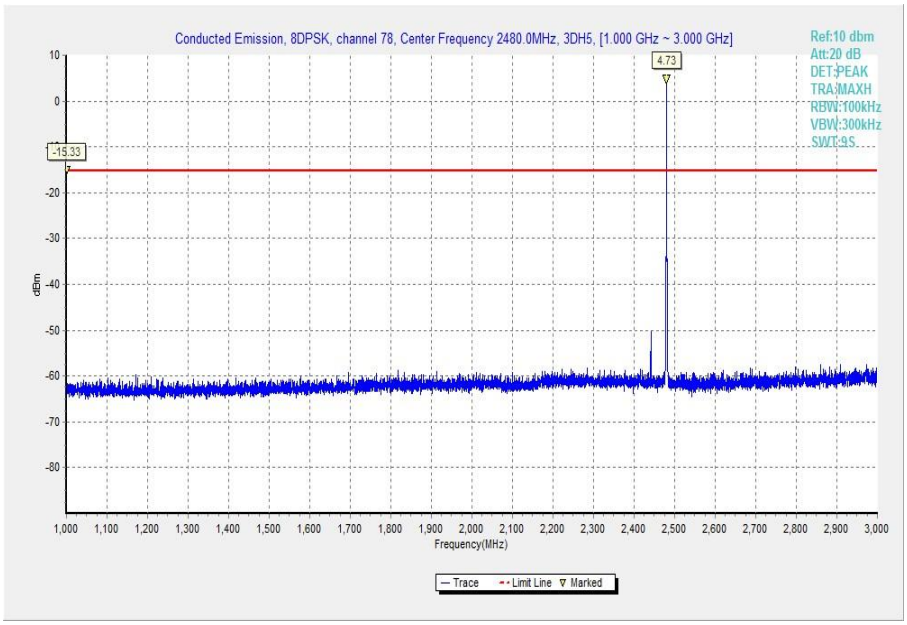

Fig. 47 Conducted Spurious Emission (8DPSK, Ch78, 1GHz-3 GHz)

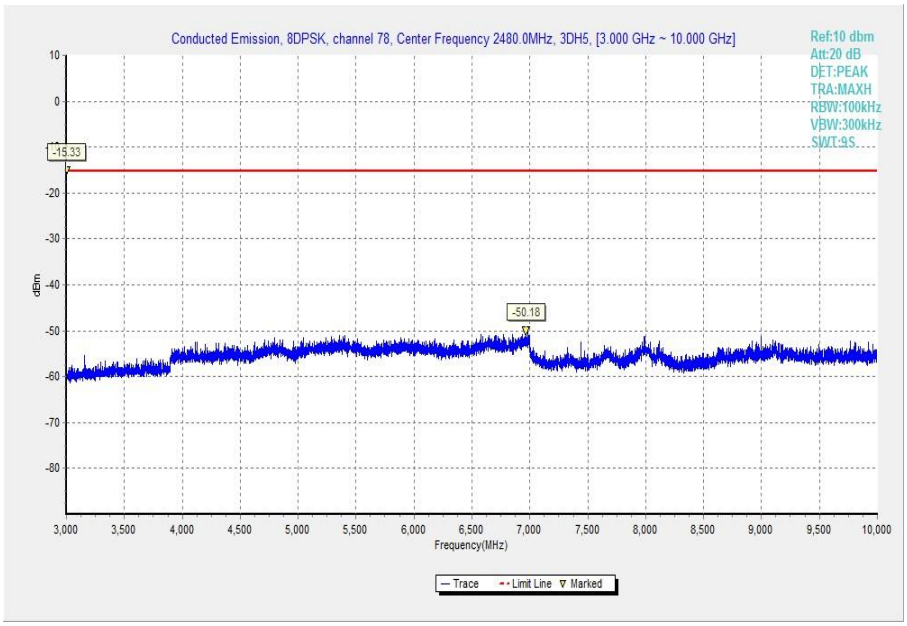

Fig. 48 Conducted Spurious Emission (8DPSK, Ch78, 3GHz-10 GHz)