FCC PART 15C & RSS 247
TEST REPORT
No. I18N01923-BT

for

DAIMLER AG

CTPDIN

CTP2019DTNA

with

Hardware Version: A66-13933-001

Software Version: 127.011.800

FCC ID: 2AKC8CTP13933001

IC: 22221-CTP13933001

Issued Date: 2018-12-28

Designation Number: CN1210

ISED Assigned Code: 23289

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 SAICT.

Test Laboratory:

Shenzhen Academy of Information and Communications Technology

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REPORT HISTORY

Report Number	Revision	Description	Issue Date
I18N01923-BT	Rev.0	1st edition	2018-12-28

CONTENTS

1. Test Laboratory

1.1. Testing Location

Location: Shenzhen Academy of Information and Communications Technology
Address: Building G, Shenzhen International Innovation Center, No.1006 Shennan Road, Futian District, Shenzhen, Guangdong Province ,China
Postal Code: 518026
Telephone: +86(0)755-33322000
Fax: +86(0)755-33322001

1.2. Testing Environment

Normal Temperature: 15-30℃
Relative Humidity: 35-60%

1.3. Project data

Testing Start Date: 2018-09-29
Testing End Date: 2018-10-26

1.4. Signature

An Ran
(Prepared this test report)

Tang Weisheng
(Reviewed this test report)

Zhang Bojun
(Approved this test report)

2. Client Information

2.1. Applicant Information

Company Name:	DAIMLER AG
Address:	Mercedesstraße 137, 70327 Stuttgart, Germany
Contact Person	Jan Waldmann
E-Mail	jan.waldmann@daimler.com
Telephone:	+49-711-17-40099
Fax:	+49-711-3052-148458

2.2. Manufacturer Information

Company Name:	Bosch Car Multimedia Portugal, S.A.
Address:	Rua Max Grundig, 35 – Lomar, 4705-820 Braga, Portugal
Contact Person	Eliseu Vieira
E-Mail	Eliseu.Vieira@pt.bosch.com
Telephone:	+351(253)30-6307
Fax:	/

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

3.1. About EUT

Description	CTPDIN
Model Name	CTP2019DTNA
Market Name	/
Frequency Band	2400MHz~2483.5MHz
Type of Modulation	GFSK/ π /4 DQPSK/8DPSK
Number of Channels	79
Antenna Type	Integrated
Antenna Gain	0 dBi
Power Supply	12V DC
FCC ID	2AKC8CTP13933001
IC number	22221-CTP13933001
Condition of EUT as received	No abnormality in appearance

Note: Components list, please refer to documents of the manufacturer.

3.2. Internal Identification of EUT

EUT ID*	IMEI	HW Version	SW Version	Receive Date
EUT1	/	A66-13933-001	127.011.800	2018-09-05

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

3.3. Internal Identification of AE

AE ID*	Description	Mode	Manufacturer
AE1	/	/	/

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

3.4. General Description

The Equipment Under Test (EUT) are a model of Vehicle Equipment with integrated antenna.
It consists of normal options: travel charger, USB cable.
Manual and specifications of the EUT were provided to fulfil the test.
Samples undergoing test were selected by the client.

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 Part 15	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	2017
ANSI C63.10	American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices	2013
RSS-247	Spectrum Management and Telecommunications Radio Standards Specification Digital Transmission Systems (DTSs), Frequency Hopping Systems (FHSs) and License-Exempt Local Area Network (LE-LAN) Devices	Issue 2 February, 2017
RSS-Gen	Spectrum Management and Telecommunications Radio Standards Specification General Requirements for Compliance of Radio Apparatus	Issue 5 April, 2018

5. Test Results

5.1. Summary of Test Results

No	Test cases	Sub-clause of Part 15C	Sub-clause of IC	Verdict
0	Antenna Requirement	15.203	/	**P**
1	Maximum Peak Output Power	15.247 (b)	RSS-247 section 5.4	**P**
2	Band Edges Compliance	15.247 (d)	RSS-247 section 5.1	**P**
3	Conducted Spurious Emission	15.247 (d)	RSS-247 section 5.5/ RSS-Gen section 6.13	**P**
4	Radiated Spurious Emission	15.247,15.205,15.209	RSS-247 section 5.5/ RSS-Gen section 6.13	**P**
5	Occupied 20dB bandwidth	15.247(a)	RSS-247 section 5.1	**P**
6	Time of Occupancy (Dwell Time)	15.247(a)	RSS-247 section 5.1	**P**
7	Number of Hopping Channel	15.247(a)	RSS-247 section 5.1	**P**
8	Carrier Frequency Separation	15.247(a)	RSS-247 section 5.1	**P**
9	Occupied Bandwidth	/	RSS-Gen section 6.7	**P**

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

5.2. Statements

SAICT 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 ℃, Max. = 35 ℃
Relative humidity	Min. = 15 %, Max. = 75 %
Shielding effectiveness	0.014MHz-1MHz> 60 dB; 1MHz-18000MHz>90 dB
Electrical insulation	> 2MΩ
Ground system resistance	< 4 Ω
Normalised site attenuation (NSA)	< ±4 dB, 3 m distance, from 30 to 1000 MHz

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

Temperature	Min. = 15 ℃, Max. = 35 ℃
Relative humidity	Min. = 15 %, Max. = 75 %
Shielding effectiveness	0.014MHz-1MHz> 60 dB; 1MHz-18000MHz>90 dB
Electrical insulation	> 2MΩ
Ground system resistance	< 4 Ω
Voltage Standing Wave Ratio （VSWR）	≤ 6 dB, from 1 to 18 GHz，3 m distance
Uniformity of field strength	Between 0 and 6 dB, from 80 to 6000 MHz

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	2019.01.17	1 year
2	Bluetooth Tester	CBT32	100584	Rohde & Schwarz	2019.01.03	1 year

Radiated emission test system

NO.	Equipment	Model	Serial Number	Manufacturer	Calibration Due date	Calibration Period
1	Loop Antenna	HLA6120	35779	TESEQ	2019-05-02	3 years
2	BiLog Antenna	3142E	00224831	ETS-Lindgren	2021-05-17	3 years
3	Horn Antenna	3117	00066577	ETS-Lindgren	2019-04-05	3 years
4	Test Receiver	ESR7	101676	Rohde & Schwarz	2018-11-29	1 year
5	Spectrum Analyser	FSV40	101192	Rohde & Schwarz	2019-05-21	1 year
6	Chamber	FACT3-2.0	1285	ETS-Lindgren	2020-07-20	3 years
7	Antenna	QSH-SL-18-26-S-20	17013	Q-par	2020-01-15	3 years
8	Antenna	QSH-SL-26-40-K-20	17014	Q-par	2020-01-11	3 years

Test software

No.	Equipment	Manufacturer	Version
1	TechMgr Software	CAICT	2.1.1
2	EMC32	Rohde & Schwarz	8.53.0
3	EMC32	Rohde & Schwarz	10.01.00

EUT is engineering software provided by the customer to control the transmitting signal.
The EUT was programmed to be in continuously transmitting mode.

Anechoic chamber

Fully anechoic chamber by ETS-Lindgren

7. Measurement Uncertainty

Test Name	Uncertainty	
1. RF Output Power - Conducted	±1.32dB	
2. Time of Occupancy - Conducted	±0.58ms	
3.Occupied channel bandwidth - Conducted	±66Hz	
4 Transmitter Spurious Emission - Conducted	30MHz≤f≤1GHz	±1.41dB
	1GHz≤f≤7GHz	±1.92dB
	7GHz≤f≤13GHz	±2.31dB
	13GHz≤f≤26GHz	±2.61dB
5. Transmitter Spurious Emission - Radiated	9kHz≤f≤30MHz	±1.84dB
	30MHz≤f≤1GHz	±4.90dB
	1GHz≤f≤18GHz	±5.12dB
	18GHz≤f≤40GHz	±4.66dB

ANNEX A: Detailed Test Results

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 0 dBi.
The RF transmitter uses an external antenna with connector.

A.1 Maximum Peak Output Power

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

Use the following spectrum analyzer settings:

a) Set Span = 6 MHz.

b) Set RBW = 3 MHz.

c) Set VBW = 3 MHz.

d) Sweep time = auto.

e) Detector = peak.

f) Trace = max hold.

g) Allow trace to stabilize.

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

I) The indicated level is the peak output power.

Measurement Limit:

Standard	Limit (dBm)
FCC CRF Part 15.247(b)(1) & RSS-247 Section 5.4	< 21

Measurement Results:

Mode	Peak Conducted Output Power（dBm）		
	2402MHz (Ch0)	2441MHz (Ch39)	2480 MHz (Ch78)
GFSK	9.60	9.65	9.45
π/4 DQPSK	0.23	1.17	0.46
8DPSK	0.59	1.51	0.82

See below for test graphs.

Conclusion: Pass

A.2 Band Edges Compliance

Measurement Limit:

Standard	Limit (dBc)
FCC 47 CFR Part 15.247 (d) & RSS-247 Section 5.5	> 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 below for test graphs.

Conclusion: Pass

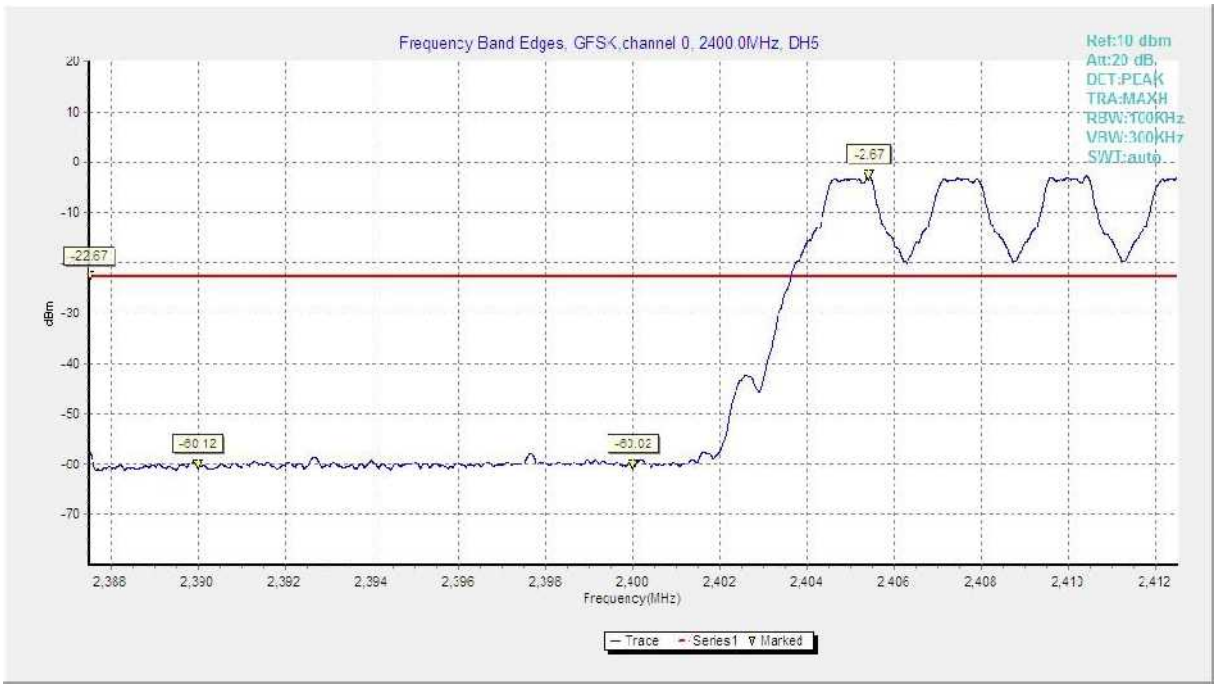

Fig. 1 Band Edges (GFSK, Ch 0, Hopping ON)

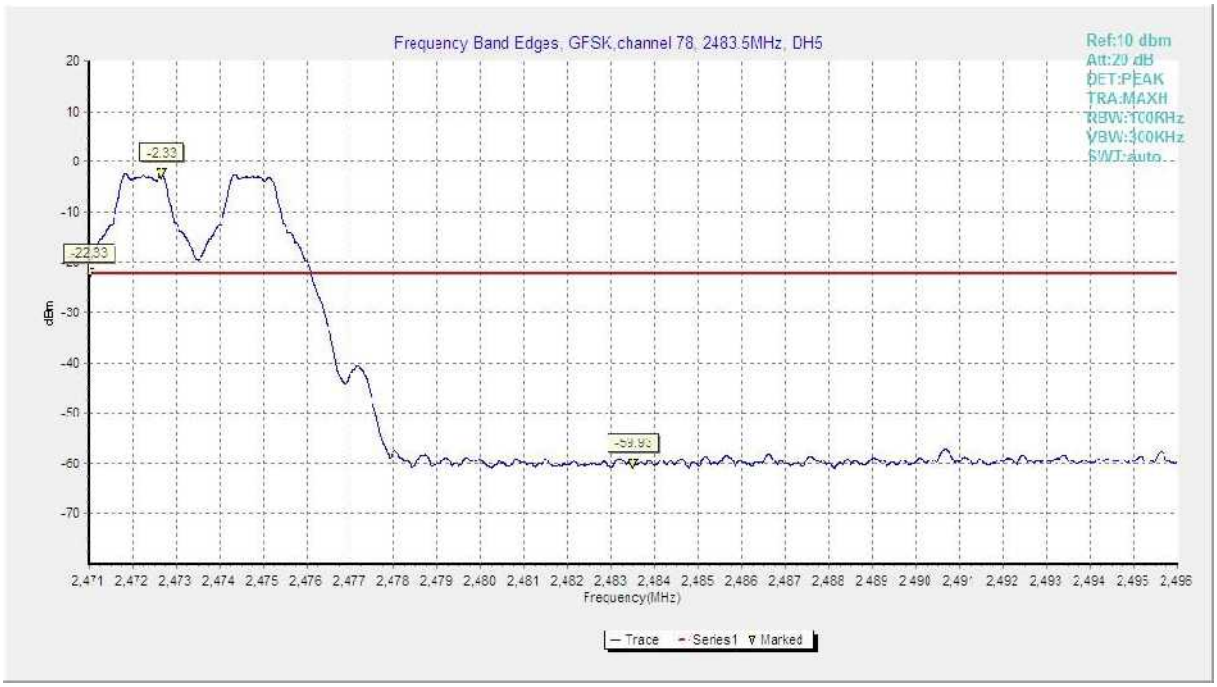

Fig. 2 Band Edges (GFSK, Ch 78, Hopping ON)

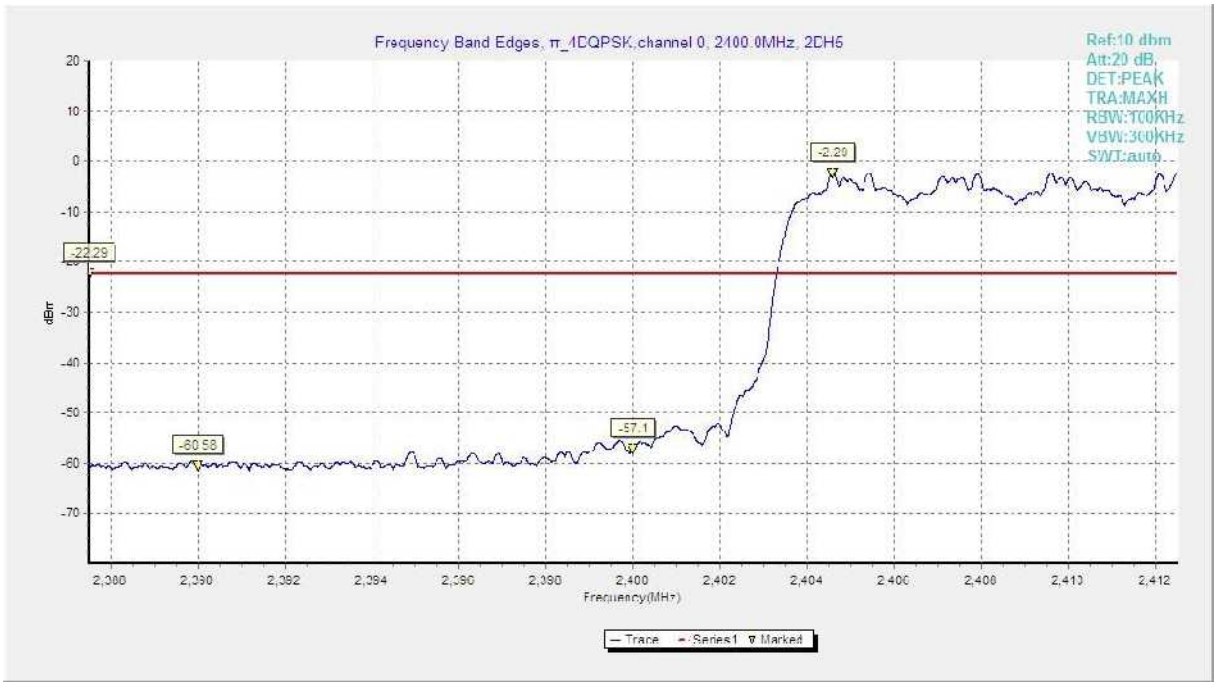

Fig. 3 Band Edges (π/4 DQPSK, Ch 0, Hopping ON)

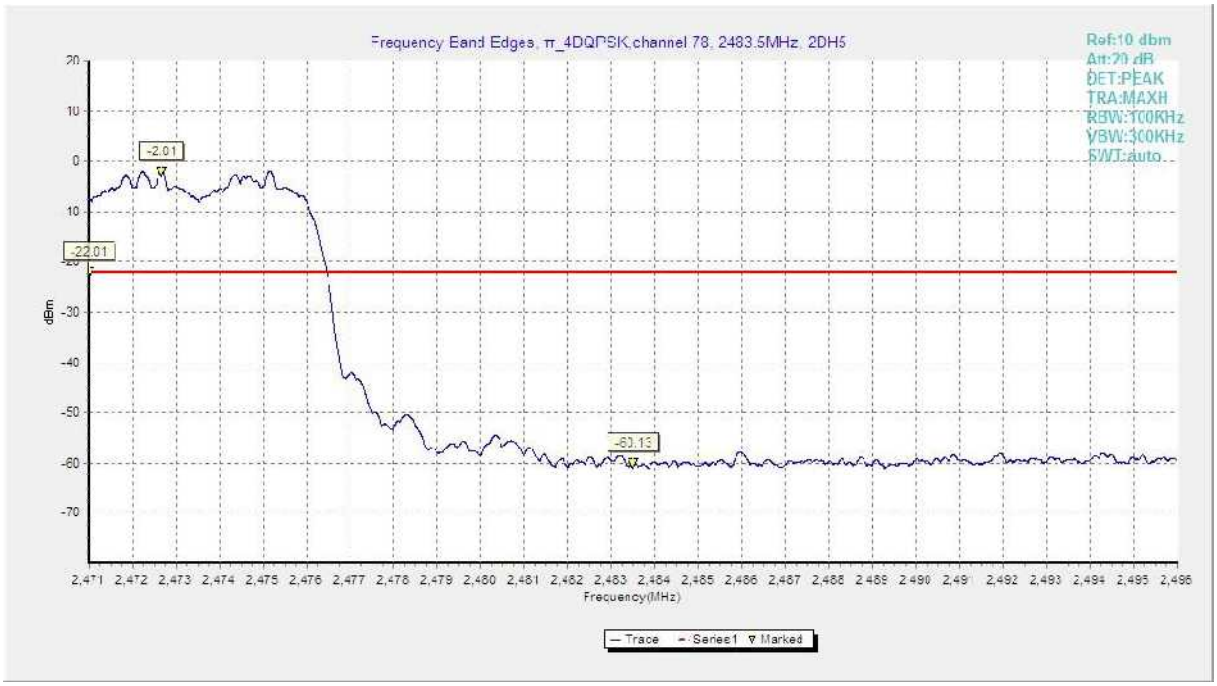

Fig. 4 Band Edges (π/4 DQPSK, Ch 78, Hopping ON)

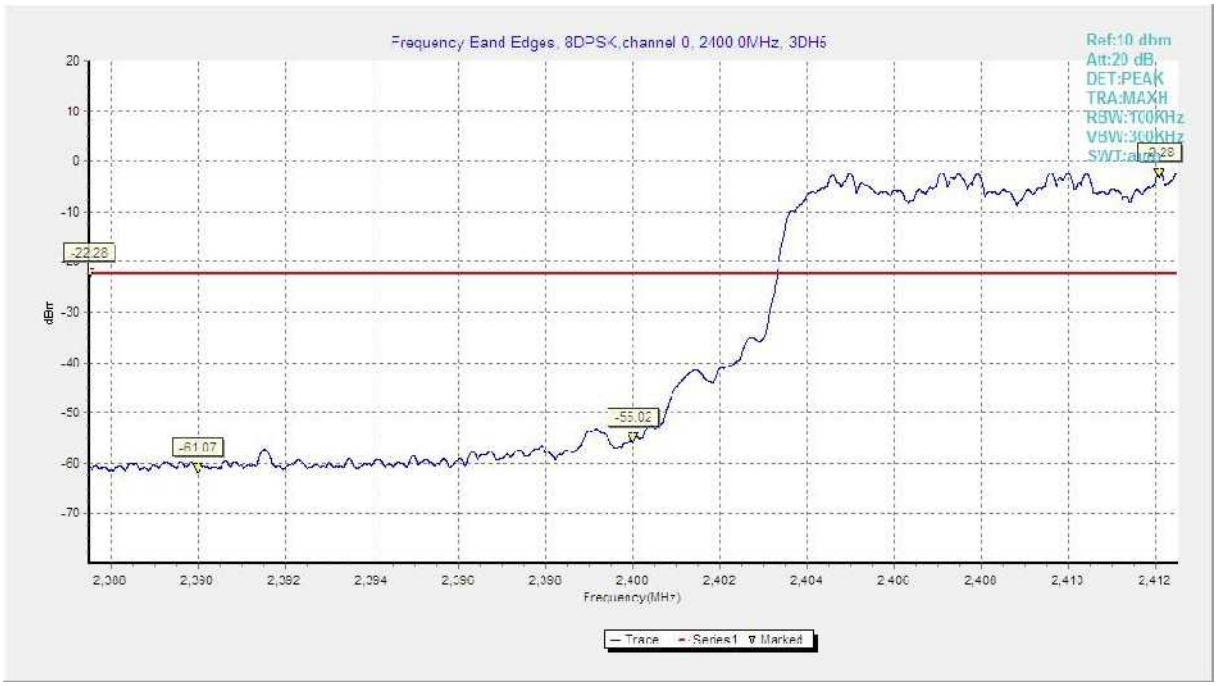

Fig. 5 Band Edges (8DPSK, Ch 0, Hopping ON)

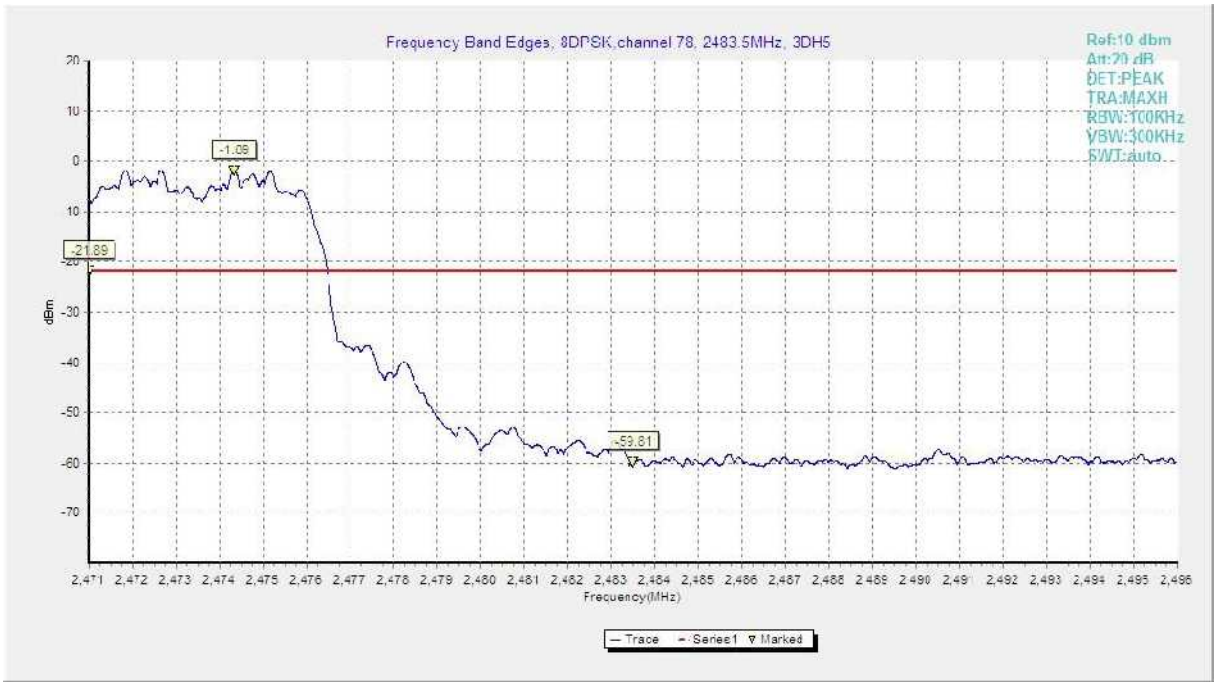

Fig. 6 Band Edges (8DPSK, Ch 78, Hopping ON)

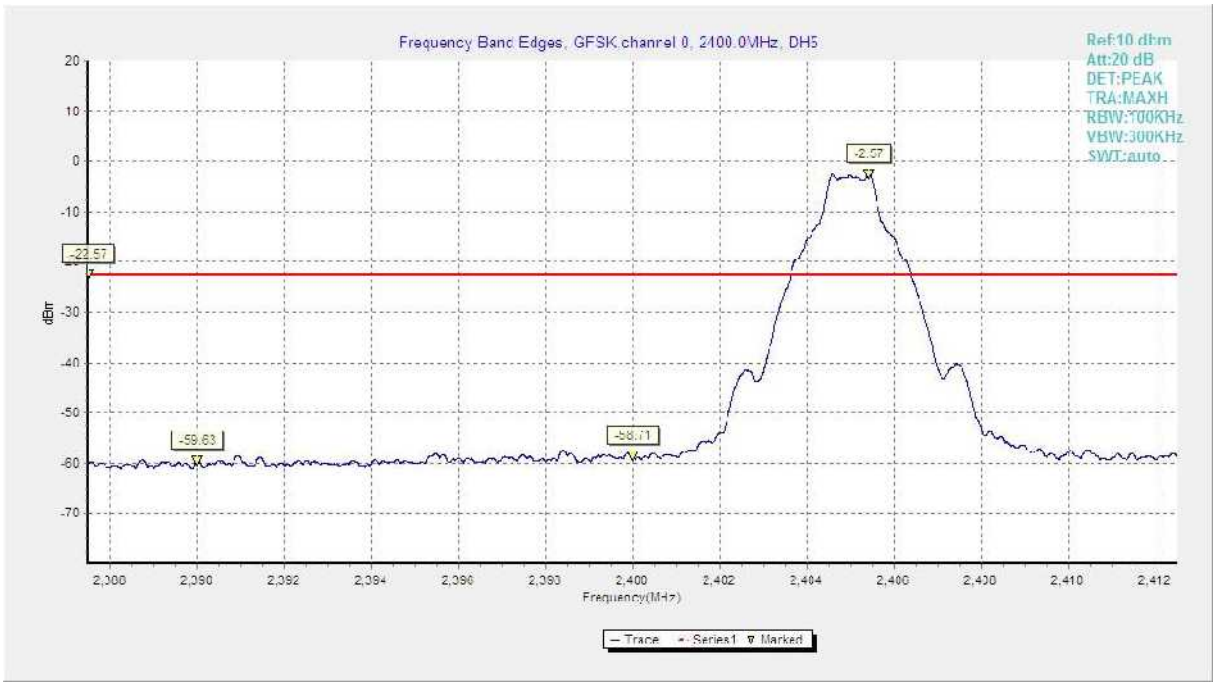

Fig. 7 Band Edges (GFSK, Ch 0, Hopping OFF)

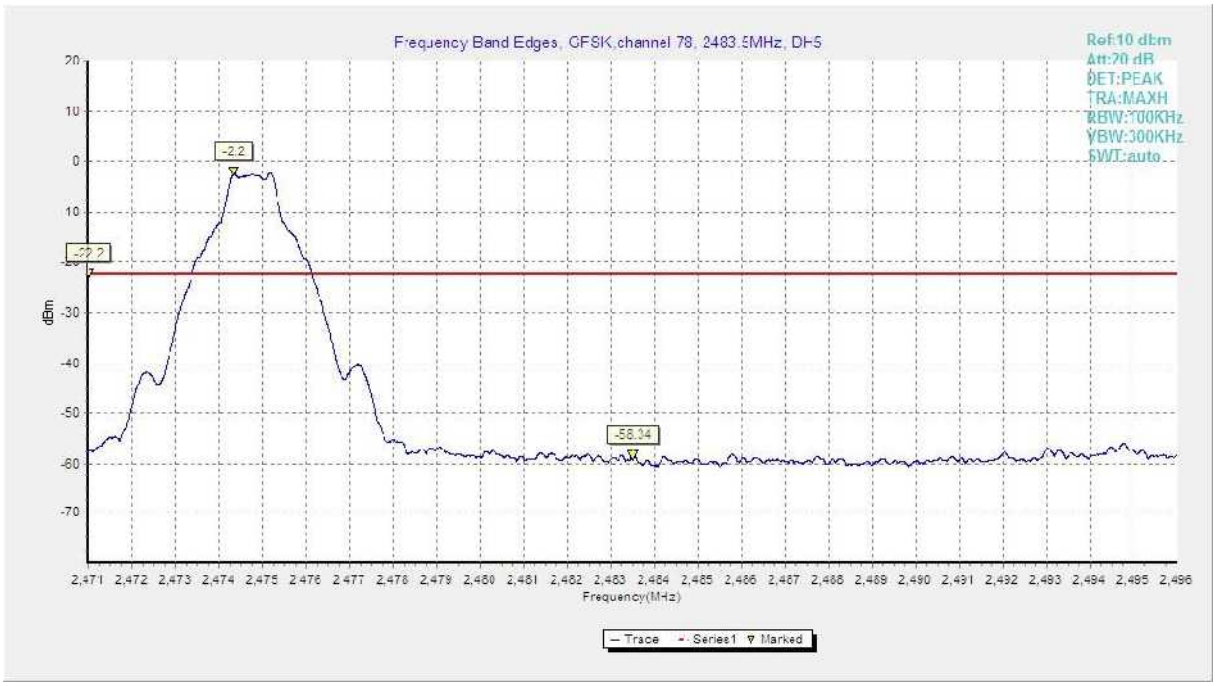

Fig. 8 Band Edges (GFSK, Ch 78, Hopping OFF)

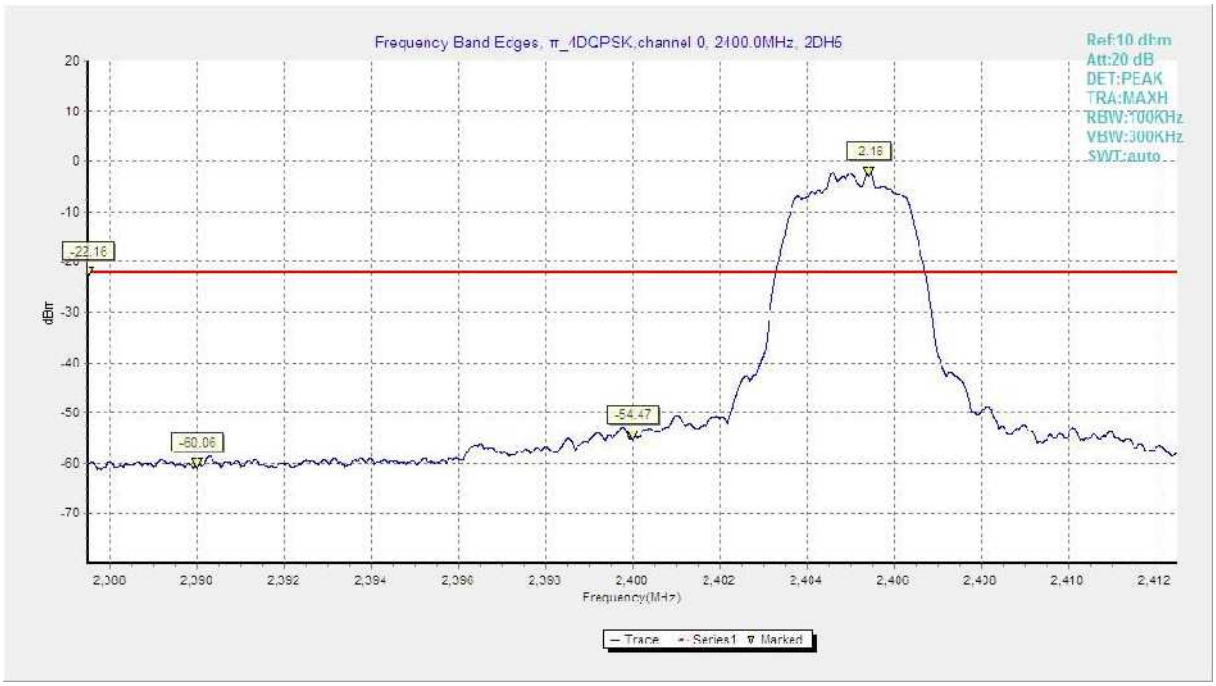

Fig. 9 Band Edges (π/4 DQPSK, Ch 0, Hopping OFF)

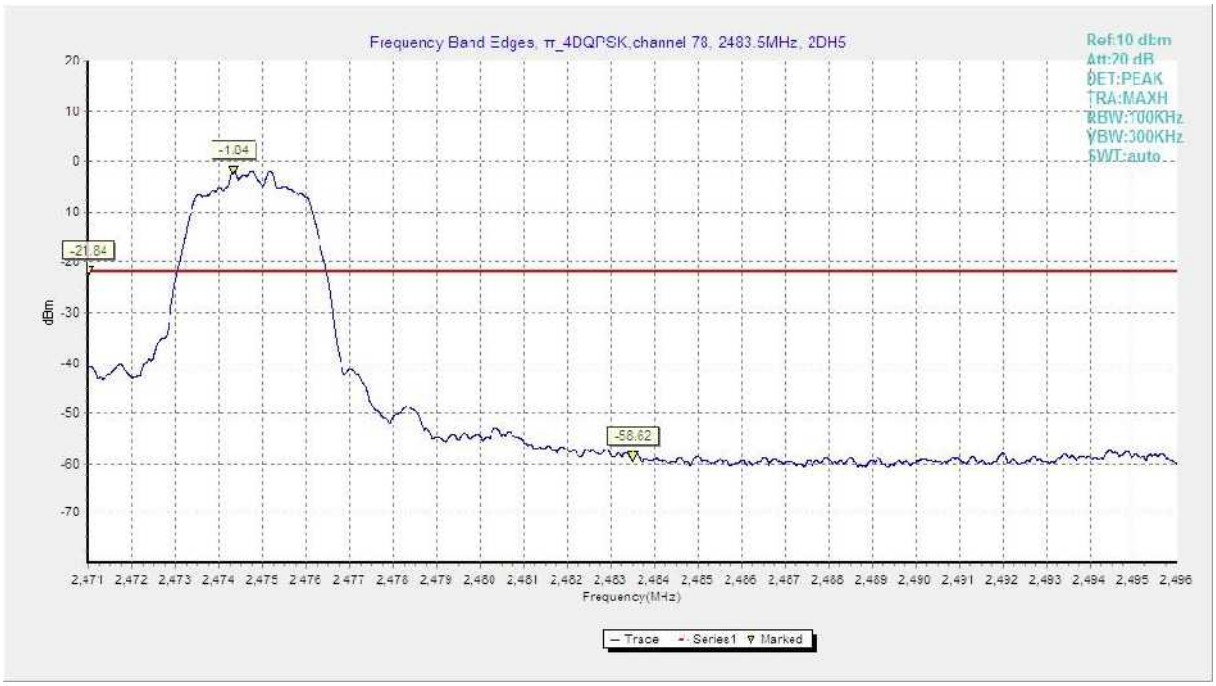

Fig. 10 Band Edges (π/4 DQPSK, Ch 78, Hopping OFF)

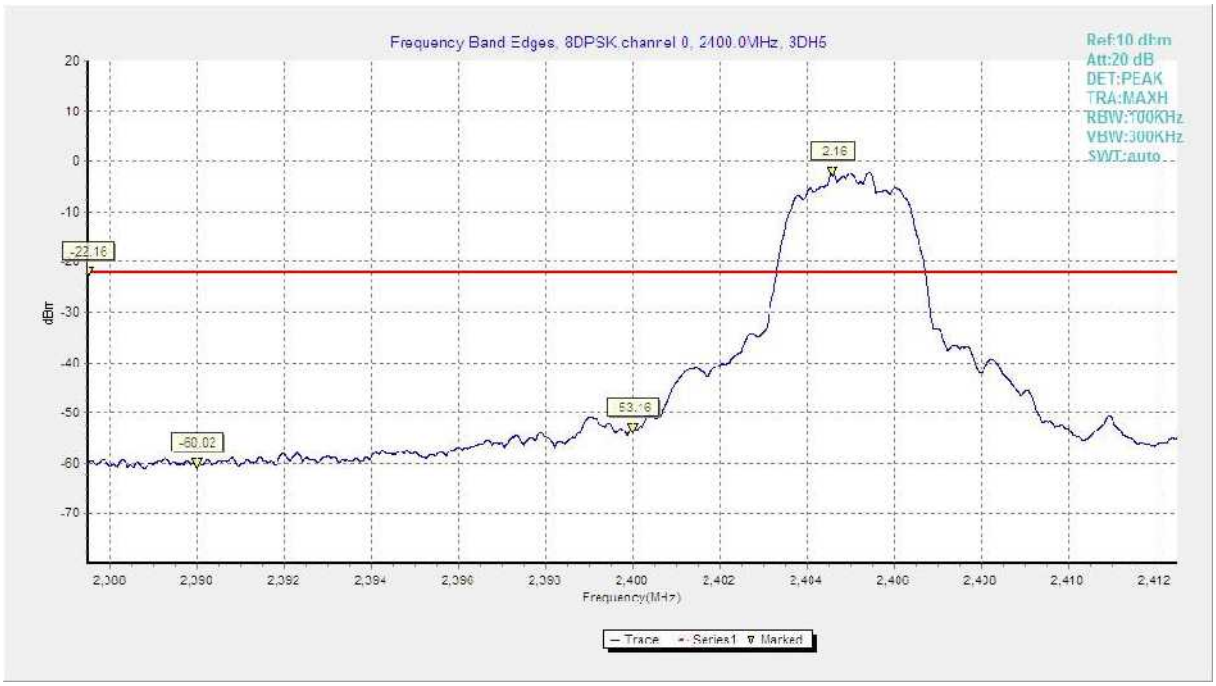

Fig. 11 Band Edges (8DPSK, Ch 0, Hopping OFF)

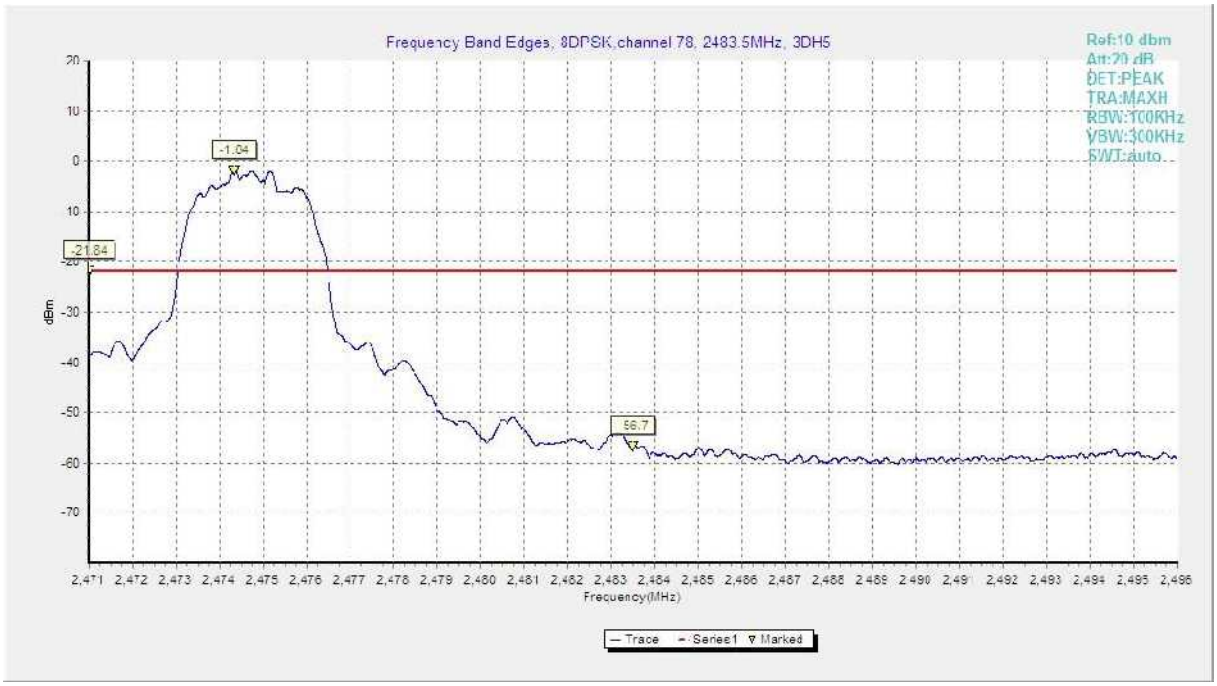

Fig. 12 Band Edges (8DPSK, Ch 78, Hopping OFF)

A.3 Conducted Emission

Measurement Limit:

Standard	Limit
FCC 47 CFR Part 15.247 (d) & RSS-247 Section 5.5	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**
		1GHz-3GHz	Fig.14	**P**
		3GHz-10GHz	Fig.15	**P**
	39	2.441 GHz	Fig.16	**P**
		1GHz-3GHz	Fig.17	**P**
		3GHz-10GHz	Fig.18	**P**
	78	2.480 GHz	Fig.19	**P**
		1GHz-3GHz	Fig.20	**P**
		3GHz-10GHz	Fig.21	**P**
π /4 DQPSK	0	2.402 GHz	Fig.22	**P**
		1GHz-3GHz	Fig.23	**P**
		3GHz-10GHz	Fig.24	**P**
	39	2.441 GHz	Fig.25	**P**
		1GHz-3Ghz	Fig.26	**P**
		3GHz-10GHz	Fig.27	**P**
	78	2.480 GHz	Fig.28	**P**
		1GHz-3Ghz	Fig.29	**P**
		3GHz-10GHz	Fig.30	**P**
8DPSK	0	2.402 GHz	Fig.31	**P**
		1GHz-3GHz	Fig.32	**P**
		3GHz-10GHz	Fig.33	**P**
	39	2.441 GHz	Fig.34	**P**
		1GHz-3GHz	Fig.35	**P**
		3GHz-10GHz	Fig.36	**P**
	78	2.480 GHz	Fig.37	**P**
		1GHz-3GHz	Fig.38	**P**
		3GHz-10GHz	Fig.39	**P**
/	All channels	30 MHz-1GHz	Fig.40	**P**
		10GHz-26GHz	Fig.41	**P**

See below for test graphs.

Conclusion: Pass

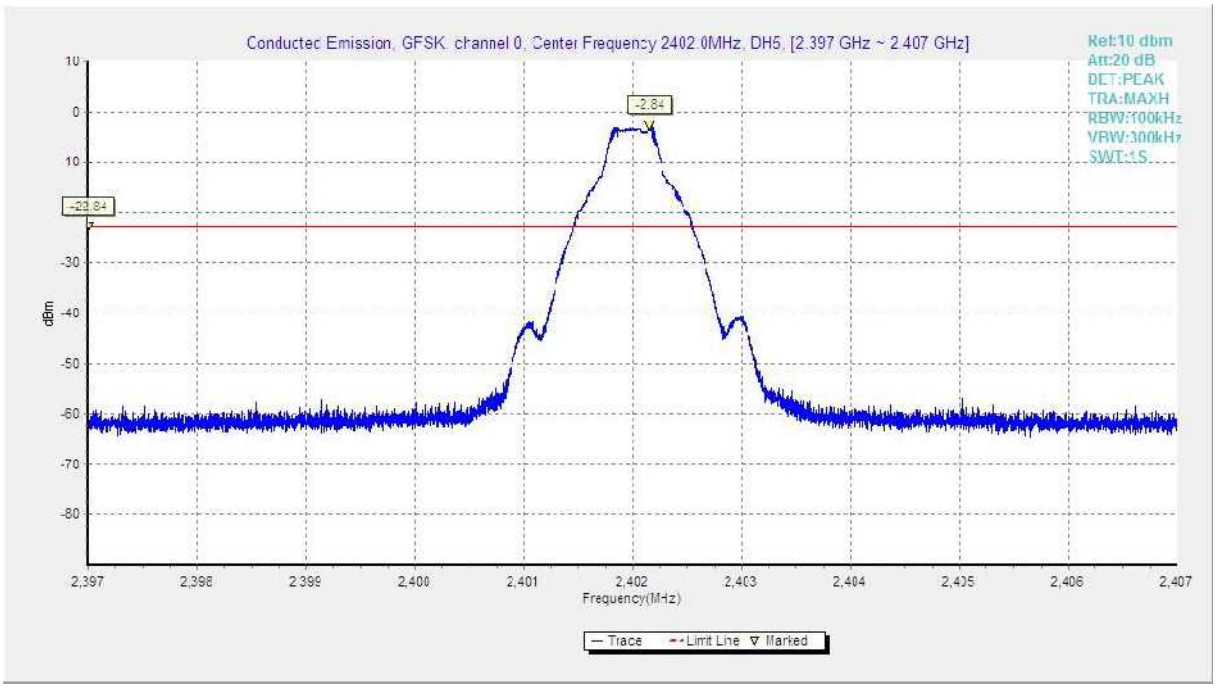

Fig. 13 Conducted Spurious Emission (GFSK, Ch0, 2.402GHz)

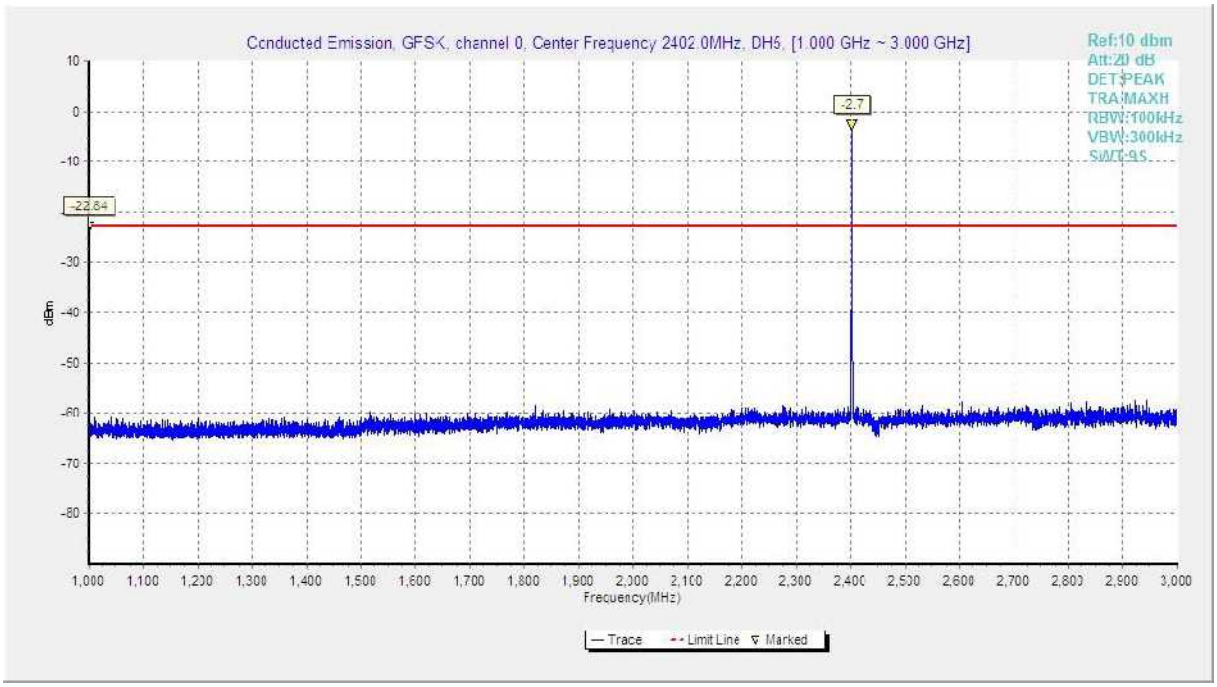

Fig. 14 Conducted Spurious Emission (GFSK, Ch0, 1 GHz-3 GHz)

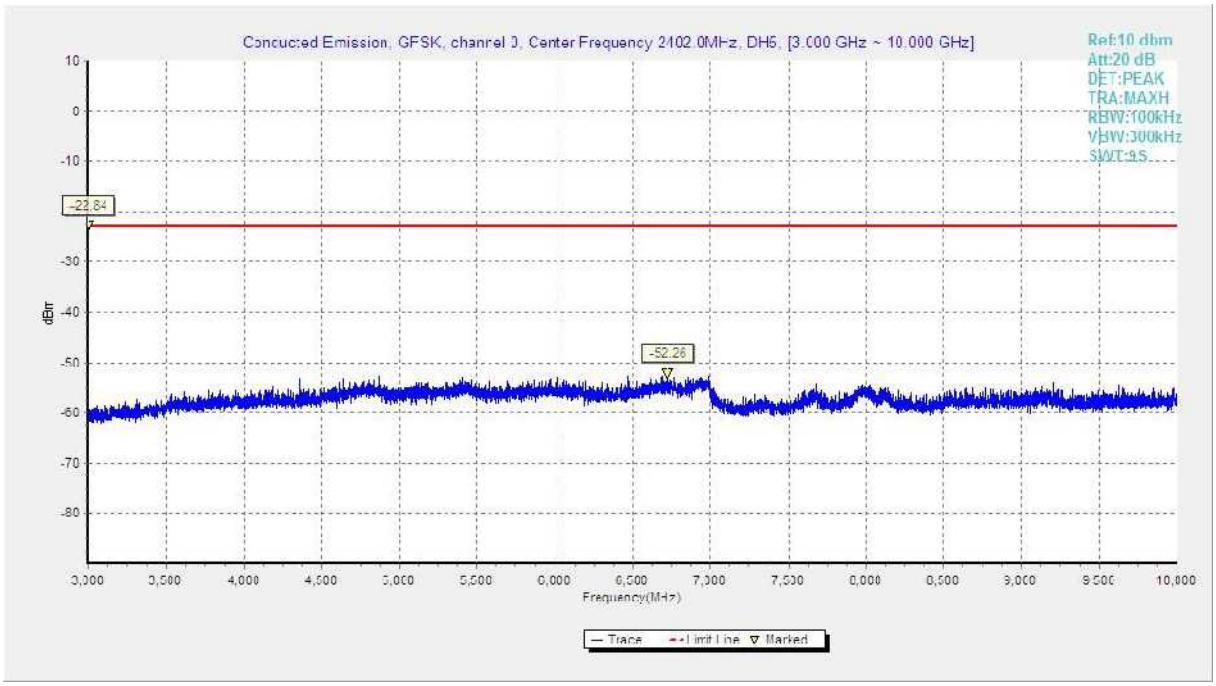

Fig. 15 Conducted Spurious Emission (GFSK, Ch0, 3GHz-10 GHz)

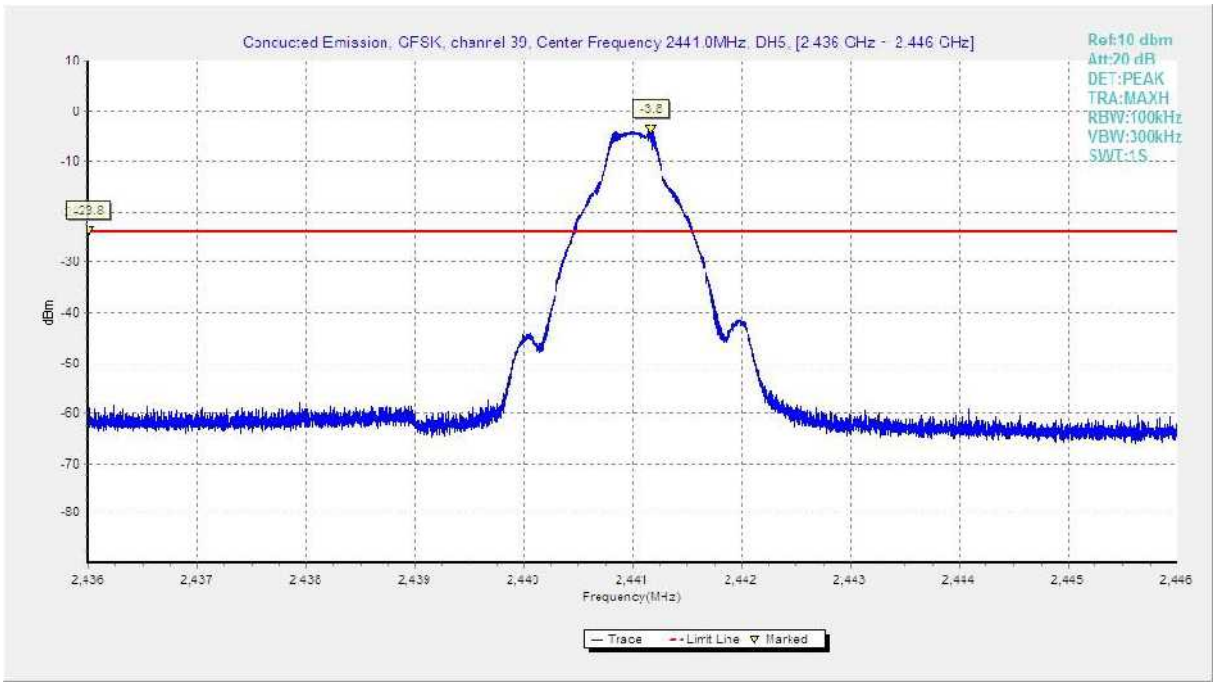

Fig. 16 Conducted Spurious Emission (GFSK, Ch39, 2.441GHz)

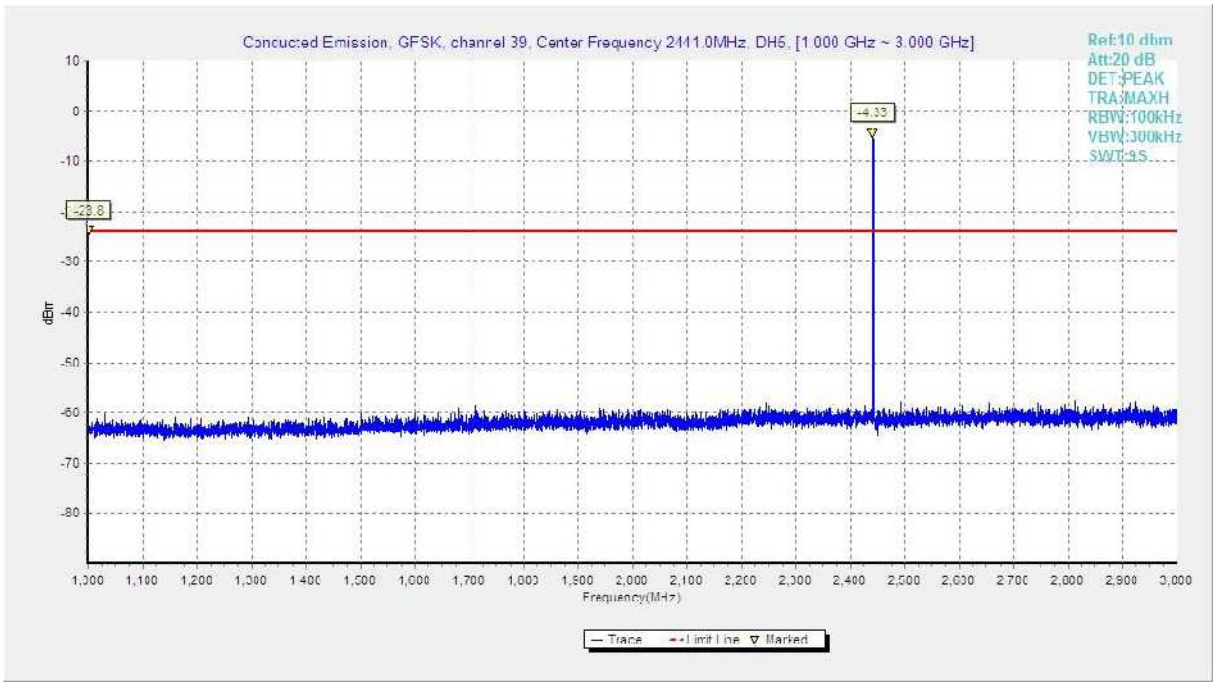

Fig. 17 Conducted Spurious Emission (GFSK, Ch39, 1GHz-3 GHz)

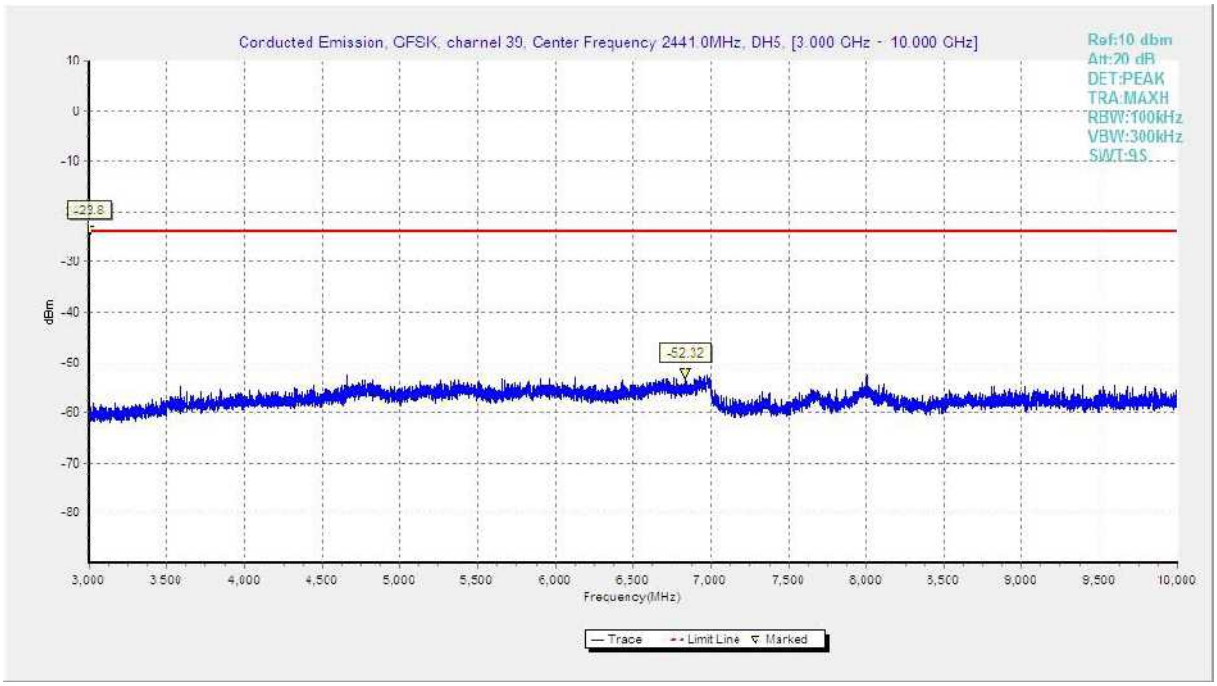

Fig. 18 Conducted Spurious Emission (GFSK, Ch39, 3GHz-10 GHz)

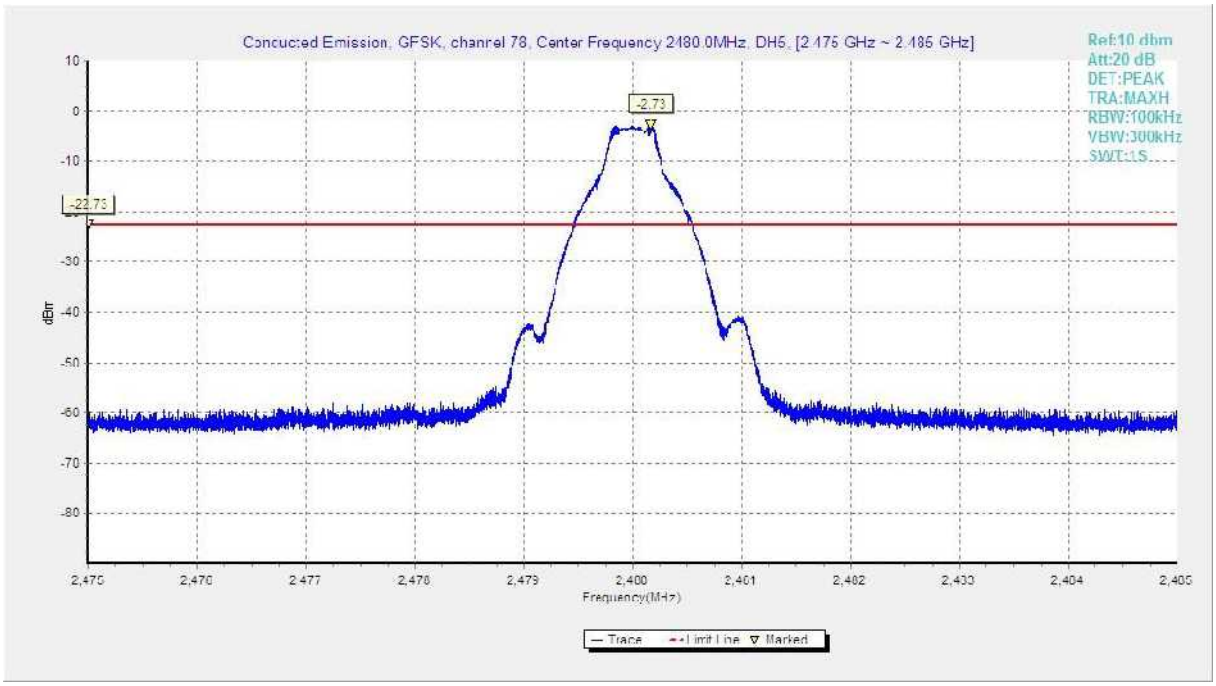

Fig. 19 Conducted Spurious Emission (GFSK, Ch78, 2.480GHz)

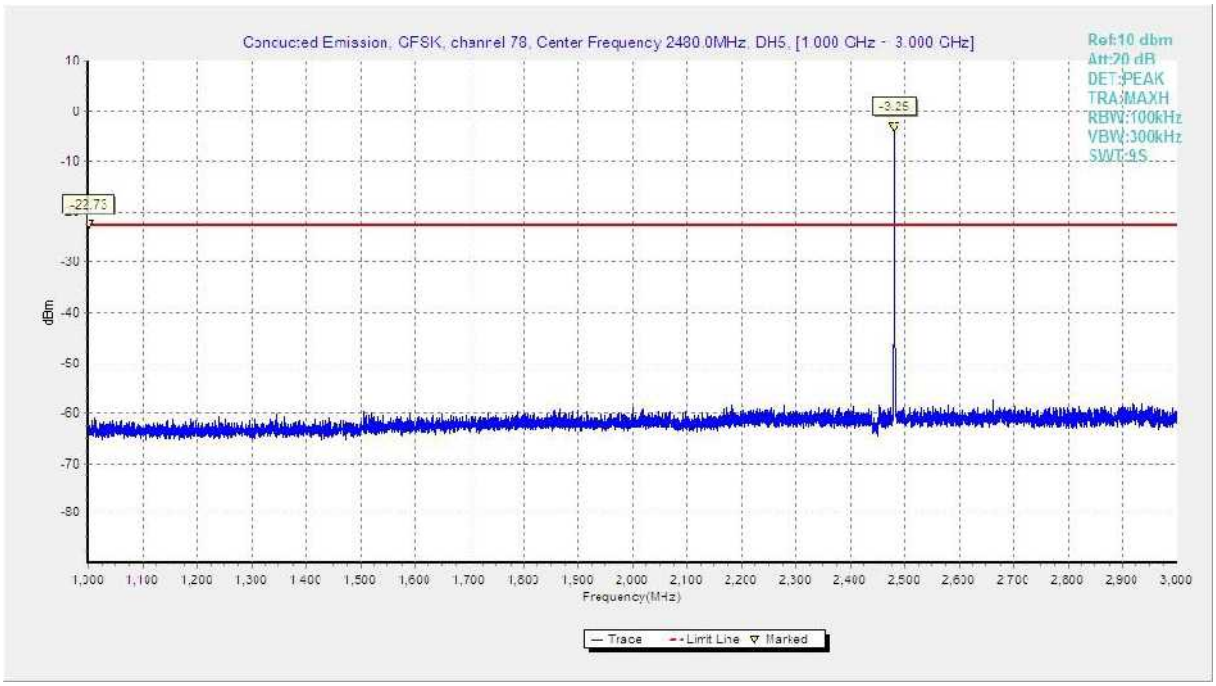

Fig. 20 Conducted Spurious Emission (GFSK, Ch78, 1GHz-3 GHz)

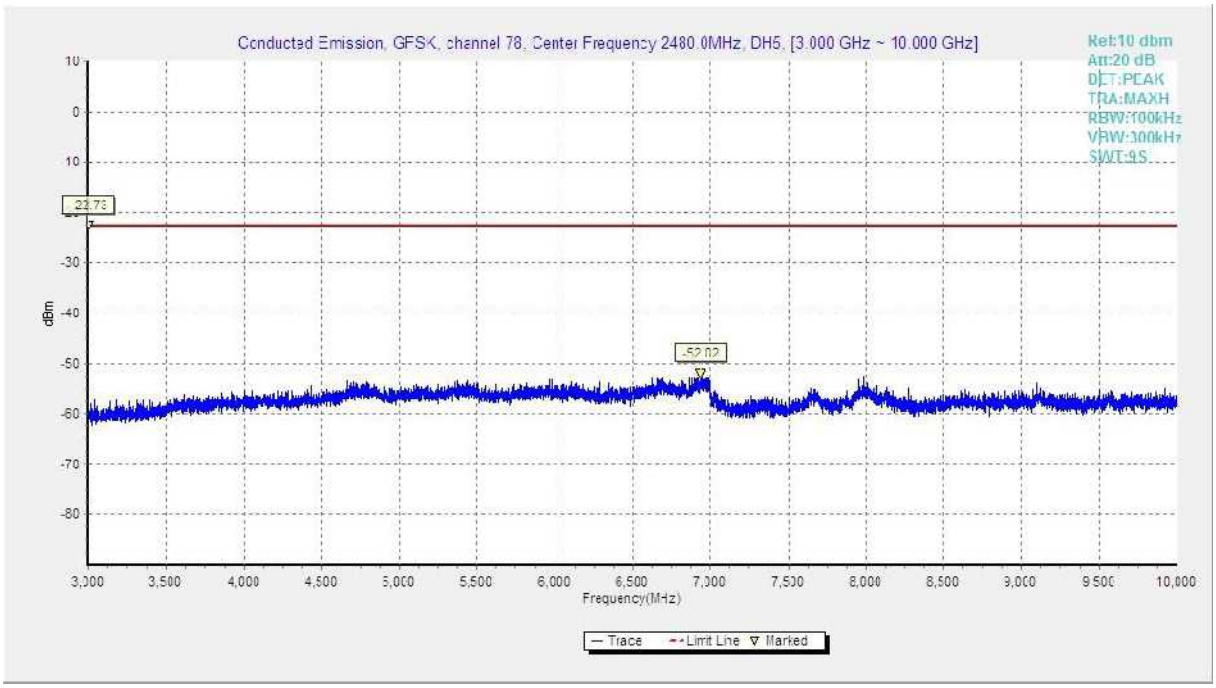

Fig. 21 Conducted Spurious Emission (GFSK, Ch78, 3GHz-10 GHz)

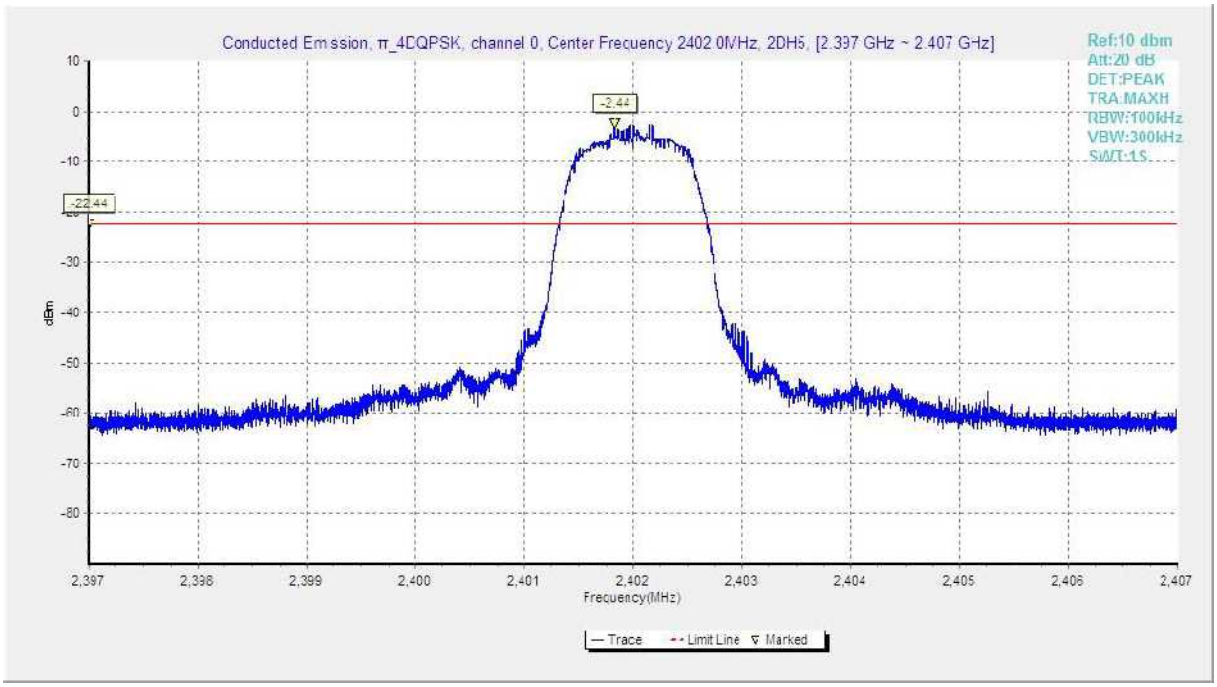

Fig. 22 Conducted Spurious Emission (π /4 DQPSK, Ch0, 2.402GHz)

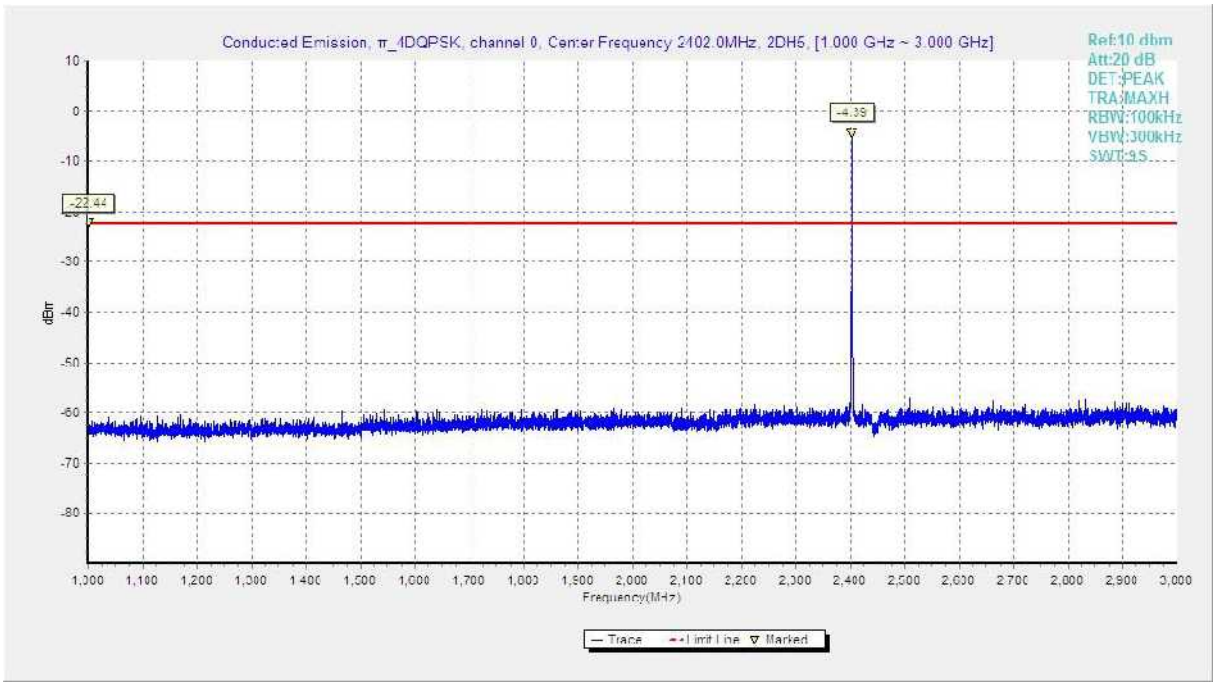

Fig. 23 Conducted Spurious Emission (π /4 DQPSK, Ch0, 1GHz-3 GHz)

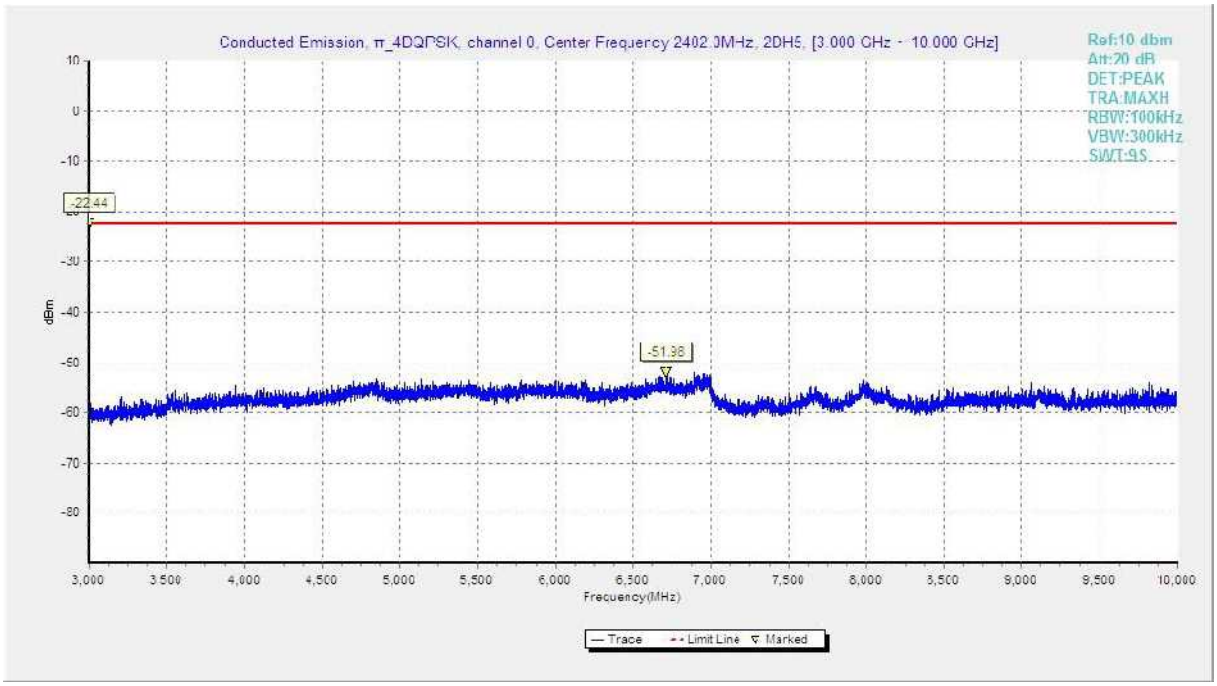

Fig. 24 Conducted Spurious Emission (π /4 DQPSK, Ch0, 3GHz-10 GHz)

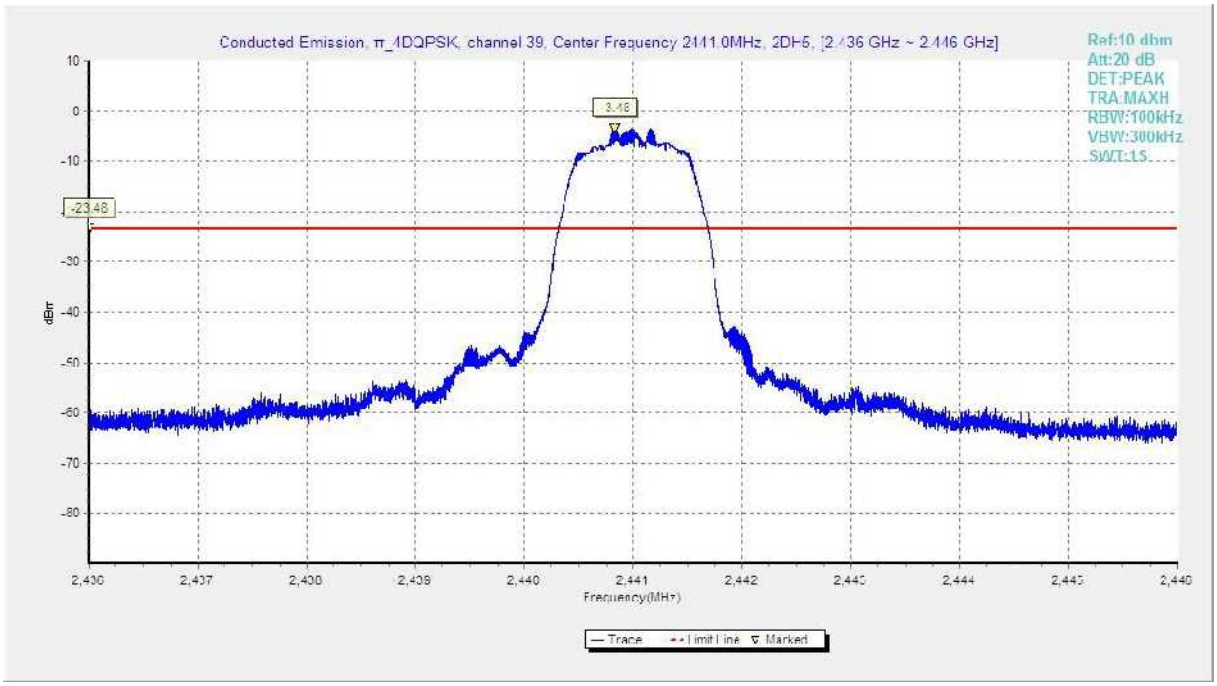

Fig. 25 Conducted Spurious Emission (π/4 DQPSK, Ch39, 2.441GHz)

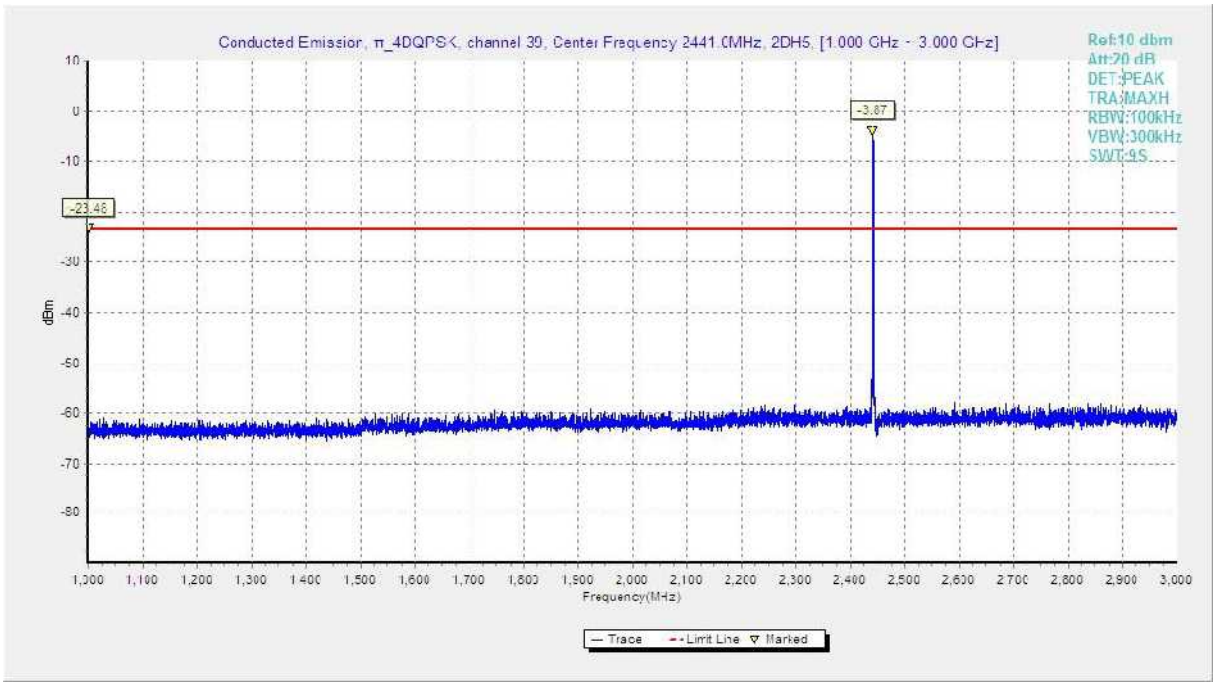

Fig. 26 Conducted Spurious Emission (π/4 DQPSK, Ch39, 1GHz-3 GHz)

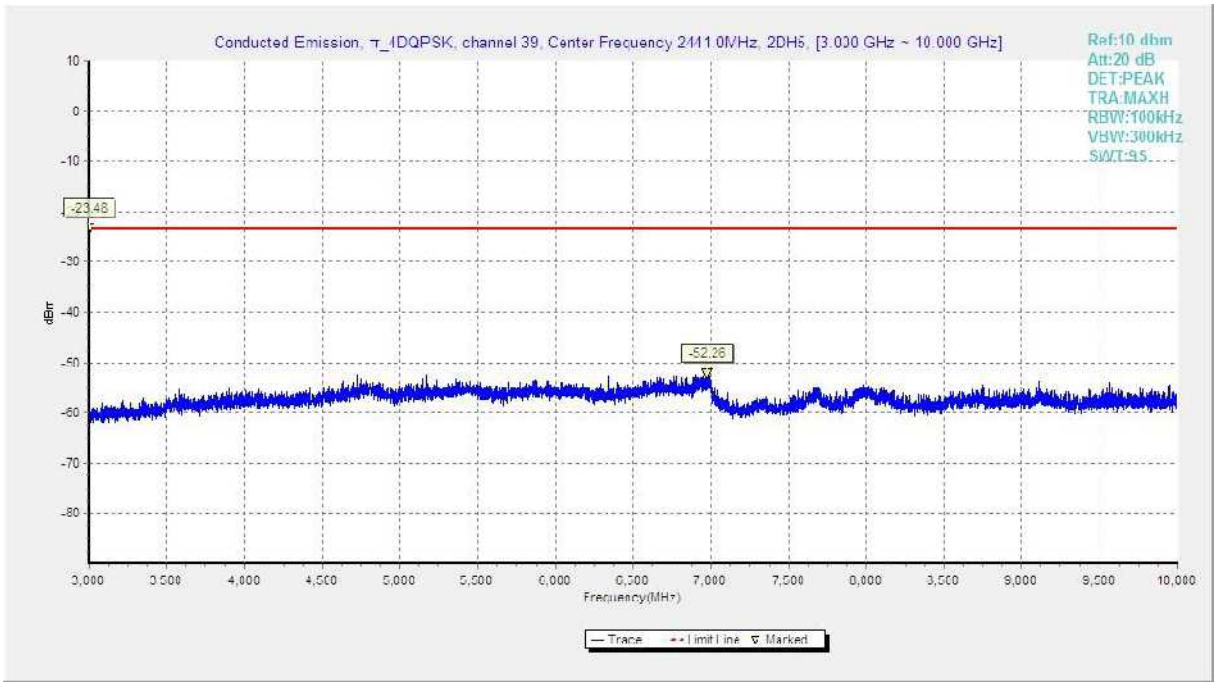

Fig. 27 Conducted Spurious Emission (π/4 DQPSK, Ch39, 3GHz-10 GHz)

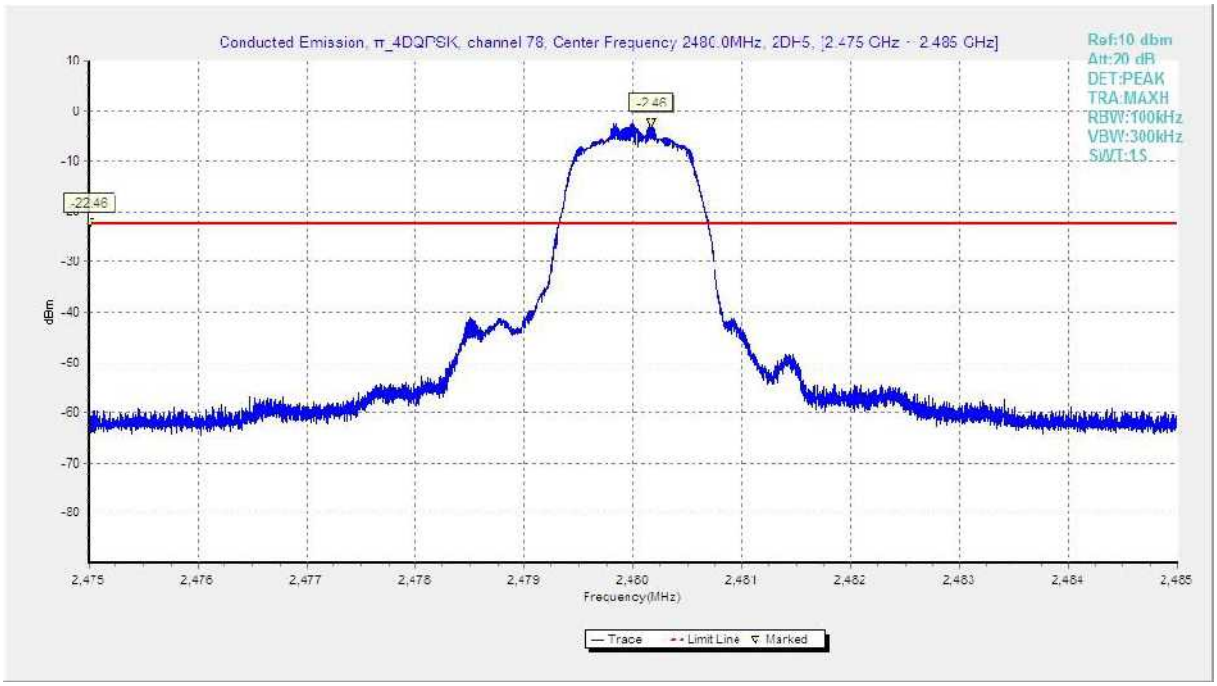

Fig. 28 Conducted Spurious Emission (π/4 DQPSK, Ch78, 2.480GHz)

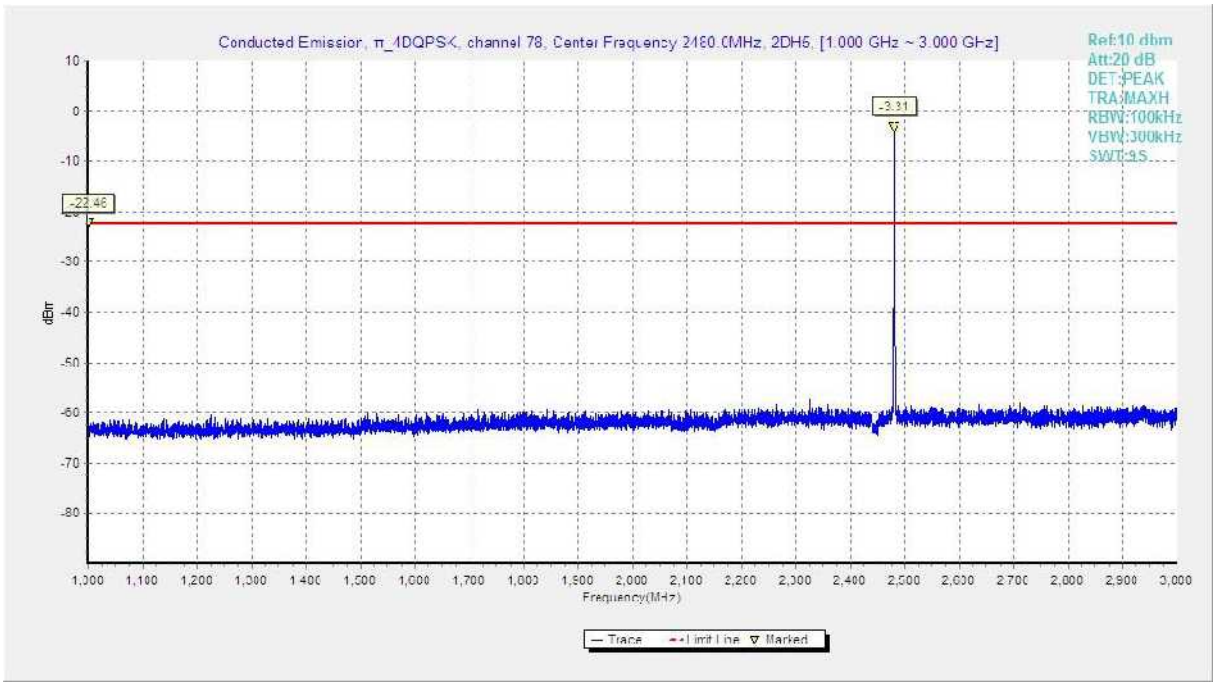

Fig. 29 Conducted Spurious Emission (π/4 DQPSK, Ch78, 1GHz-3 GHz)

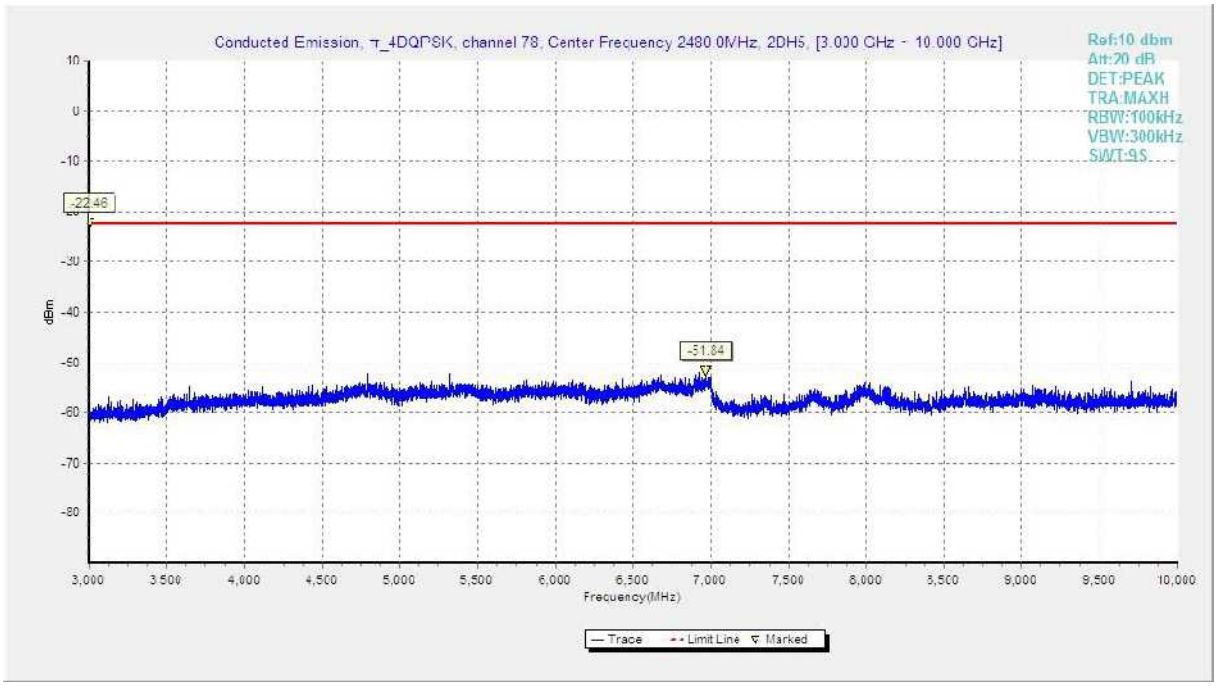

Fig. 30 Conducted Spurious Emission (π/4 DQPSK, Ch78, 3GHz-10 GHz)

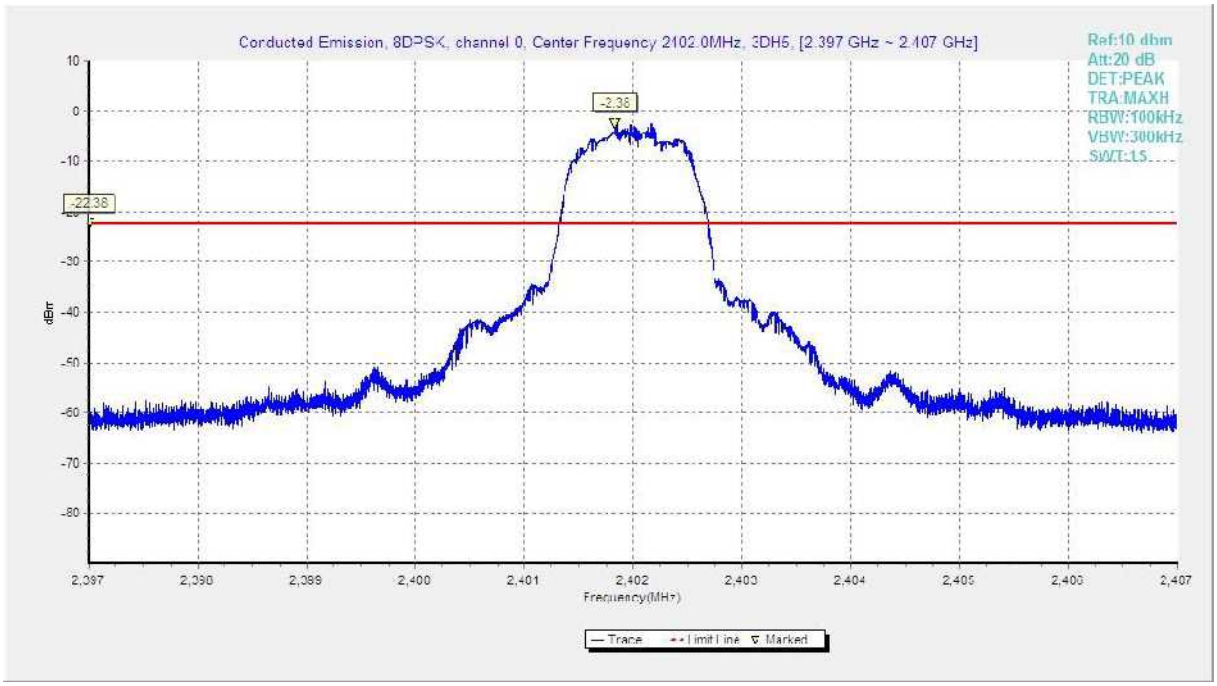

Fig. 31 Conducted Spurious Emission (8DPSK, Ch0, 2.402GHz)

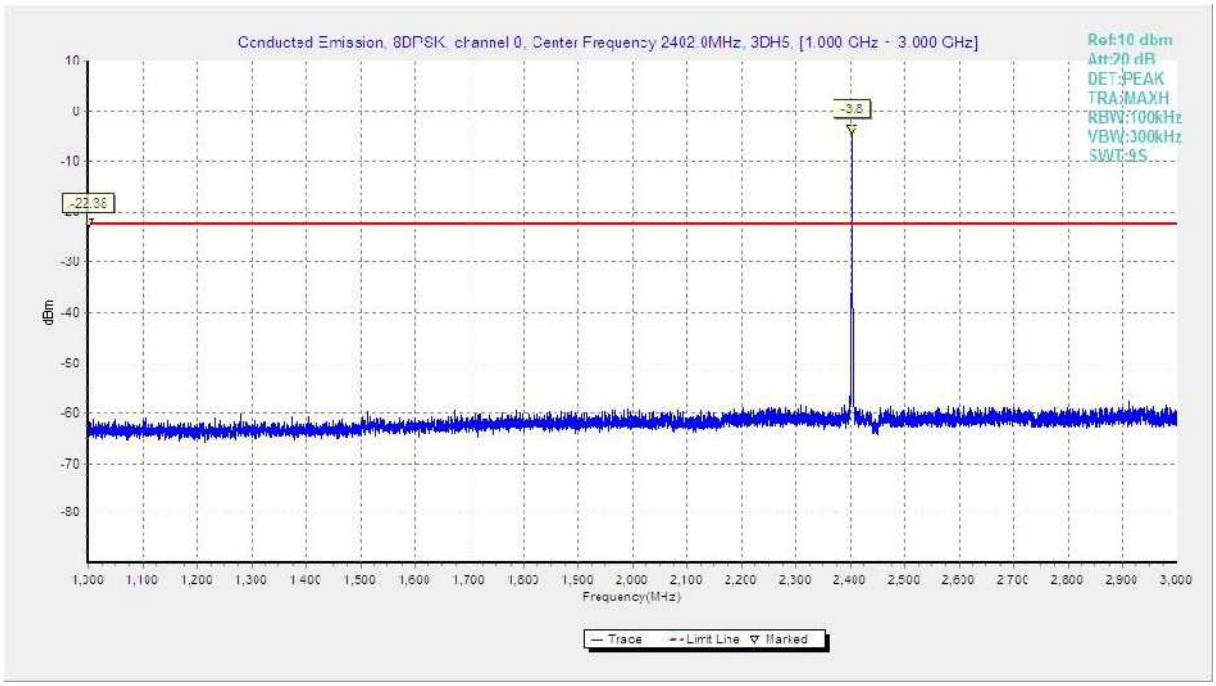

Fig. 32 Conducted Spurious Emission (8DPSK, Ch0, 1GHz-3 GHz)

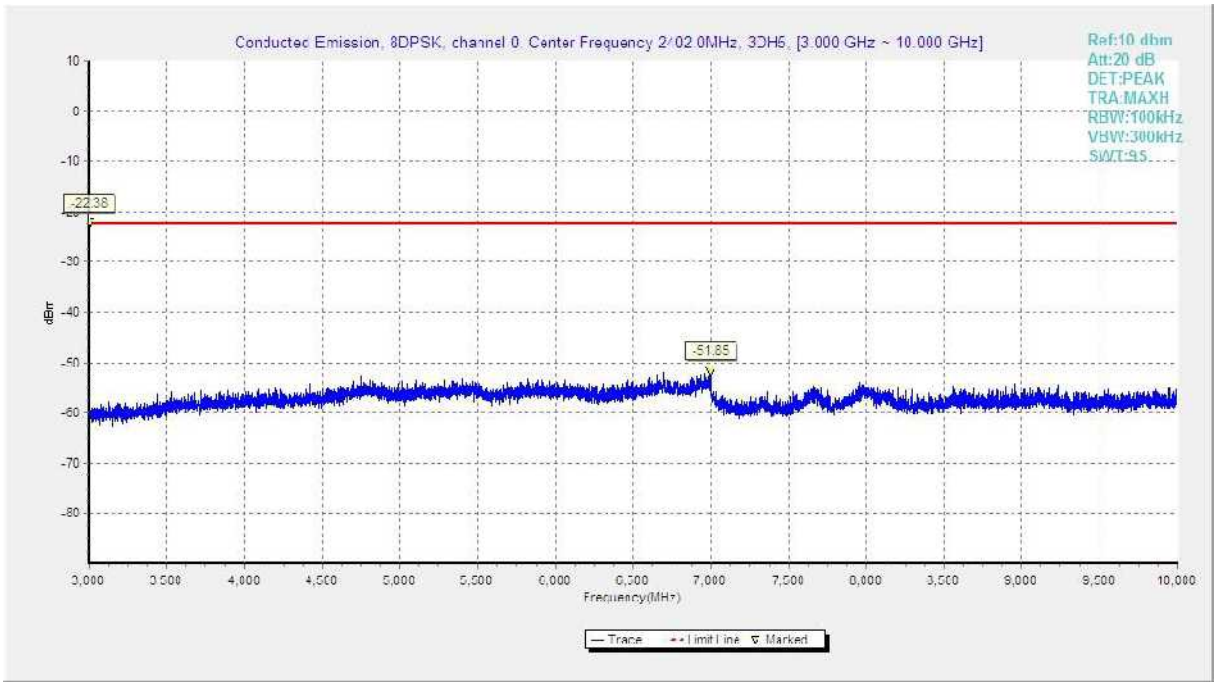

Fig. 33 Conducted Spurious Emission (8DPSK, Ch0, 3GHz-10 GHz)

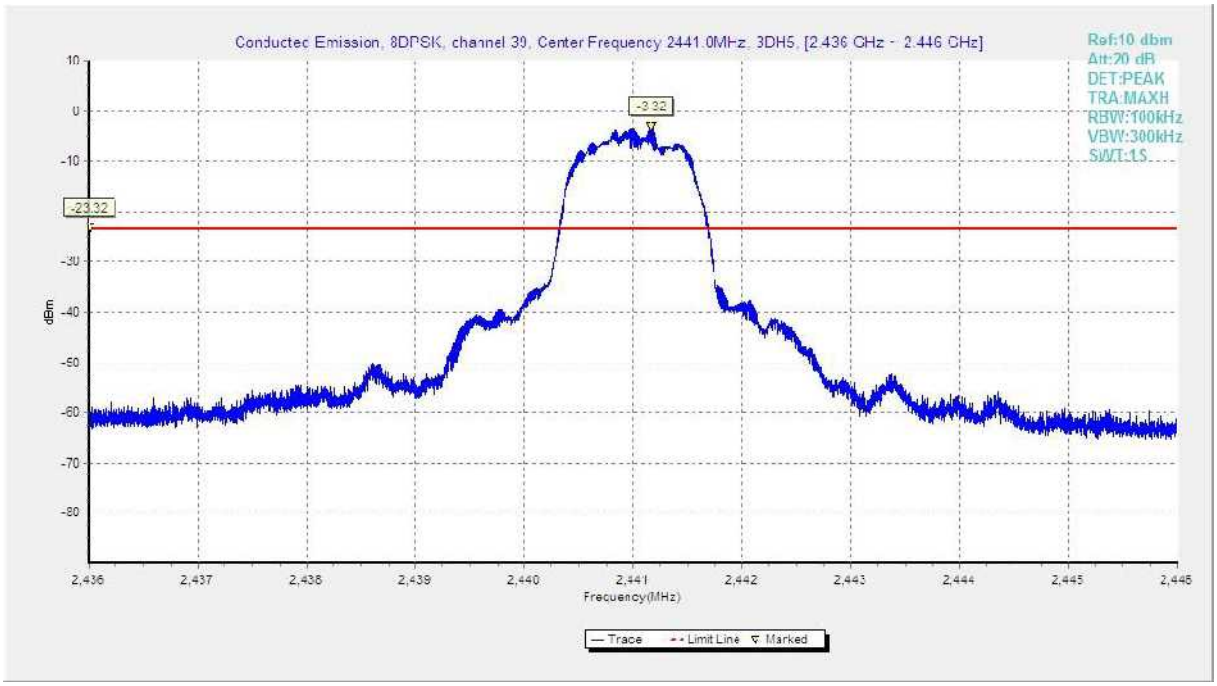

Fig. 34 Conducted Spurious Emission (8DPSK, Ch39, 2.441GHz)

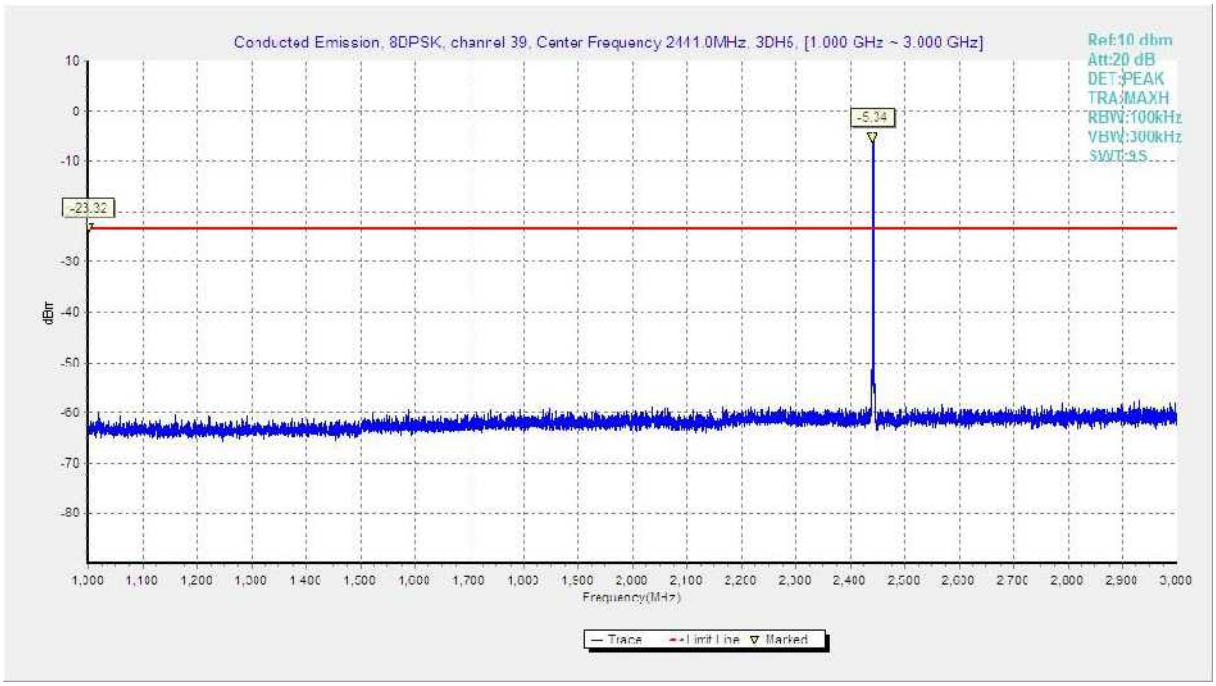

Fig. 35 Conducted Spurious Emission (8DPSK, Ch39, 1GHz-3 GHz)

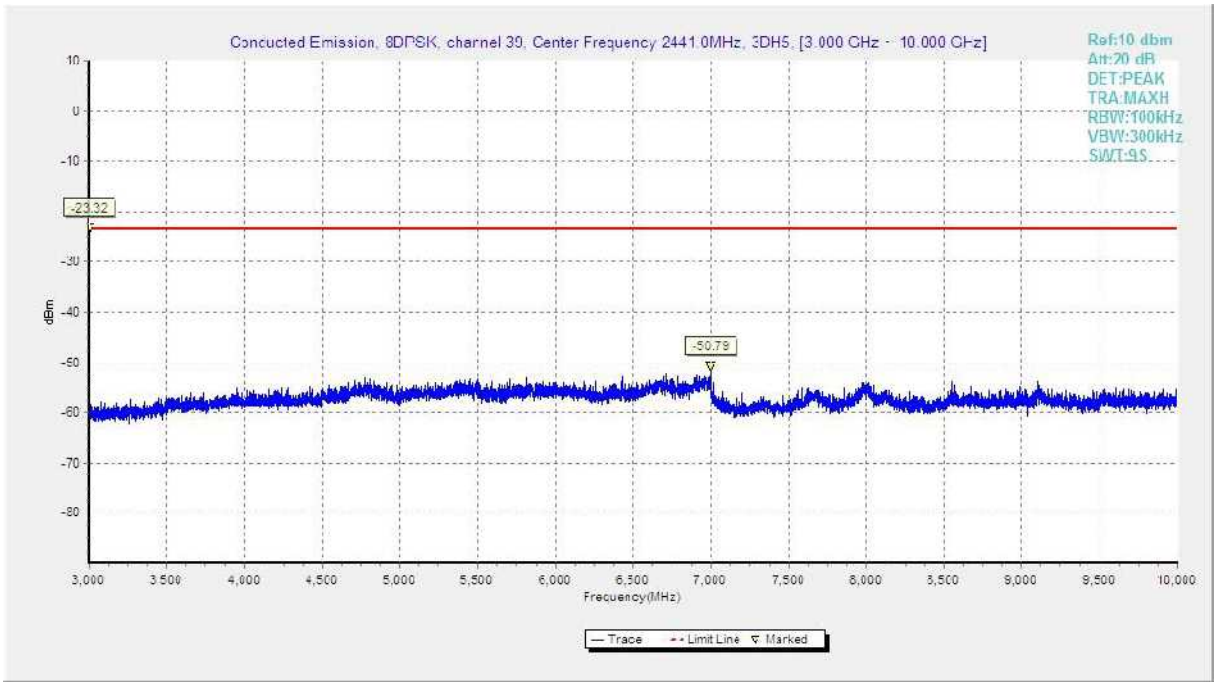

Fig. 36 Conducted Spurious Emission (8DPSK, Ch39, 3GHz-10 GHz)

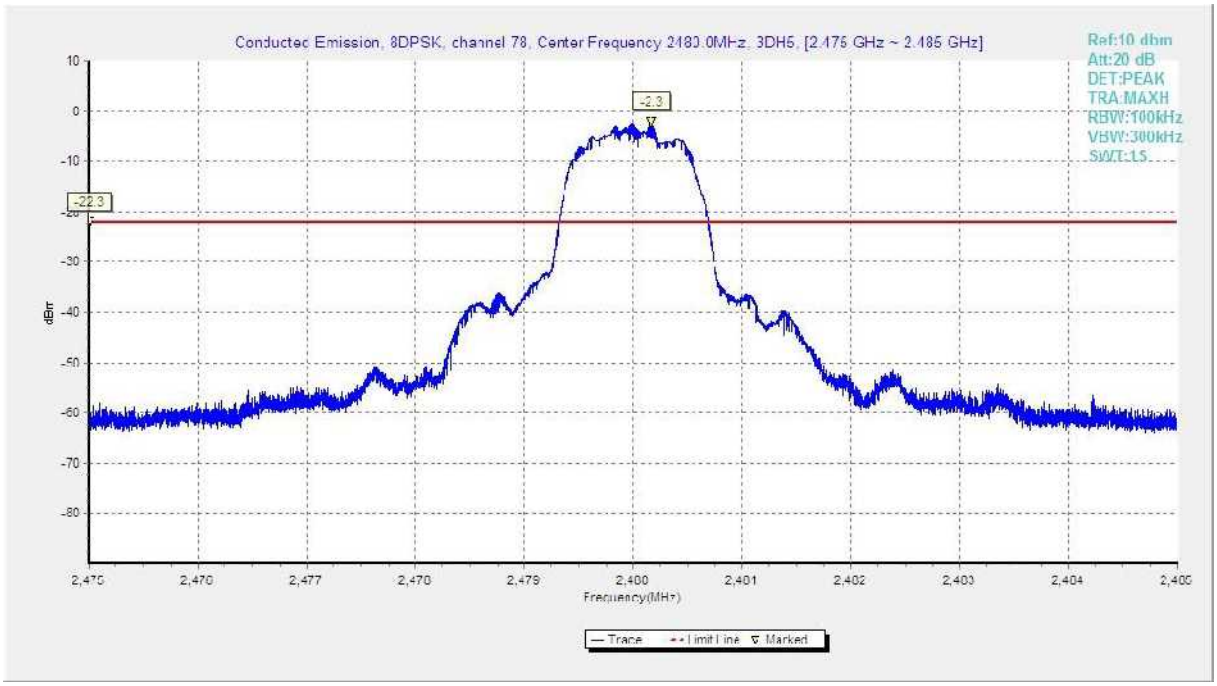

Fig. 37 Conducted Spurious Emission (8DPSK, Ch78, 2.480GHz)

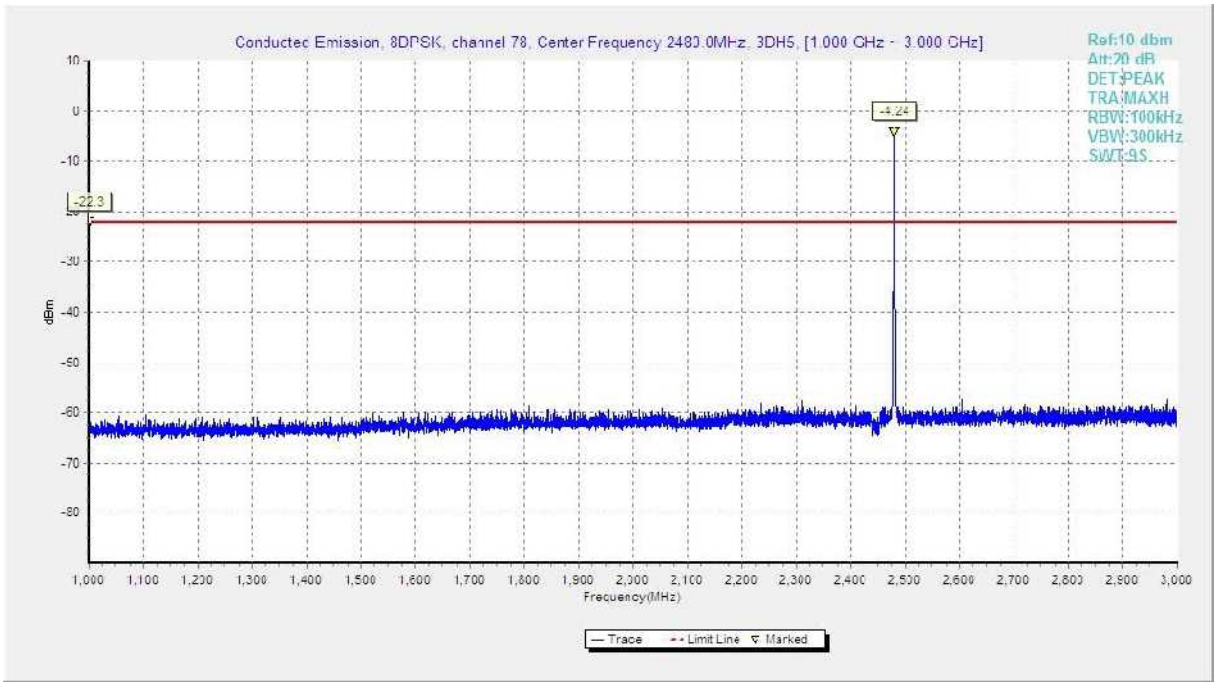

Fig. 38 Conducted Spurious Emission (8DPSK, Ch78, 1GHz-3 GHz)

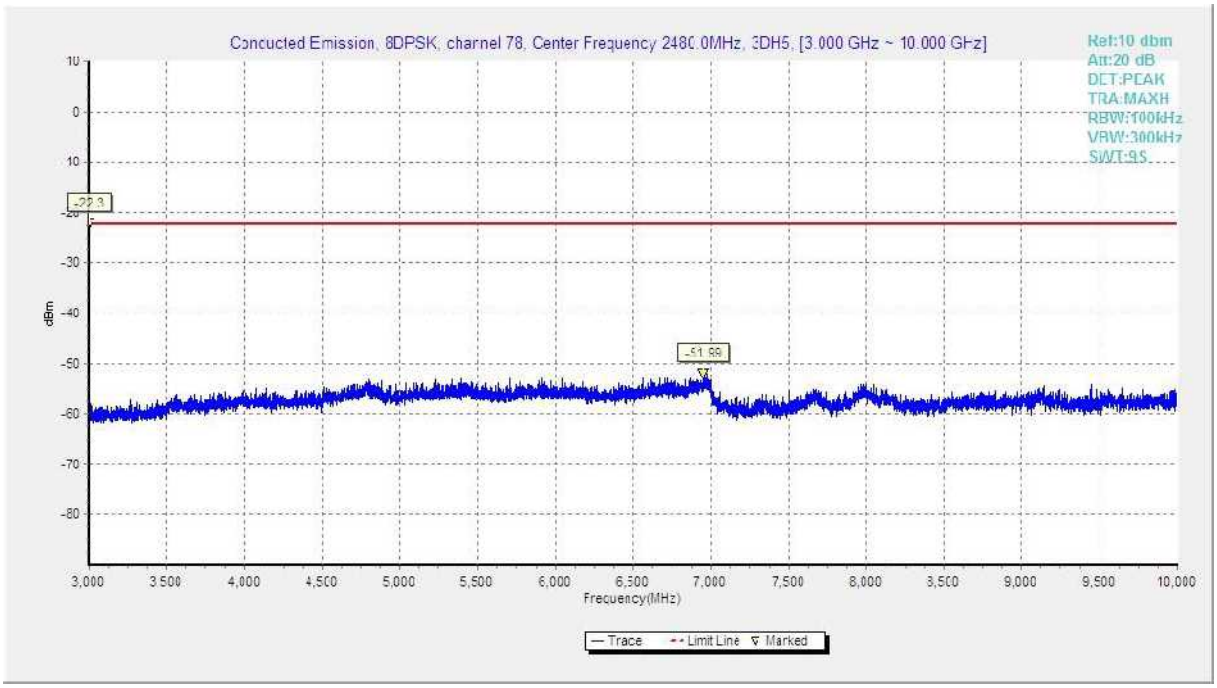

Fig. 39 Conducted Spurious Emission (8DPSK, Ch78, 3GHz-10 GHz)

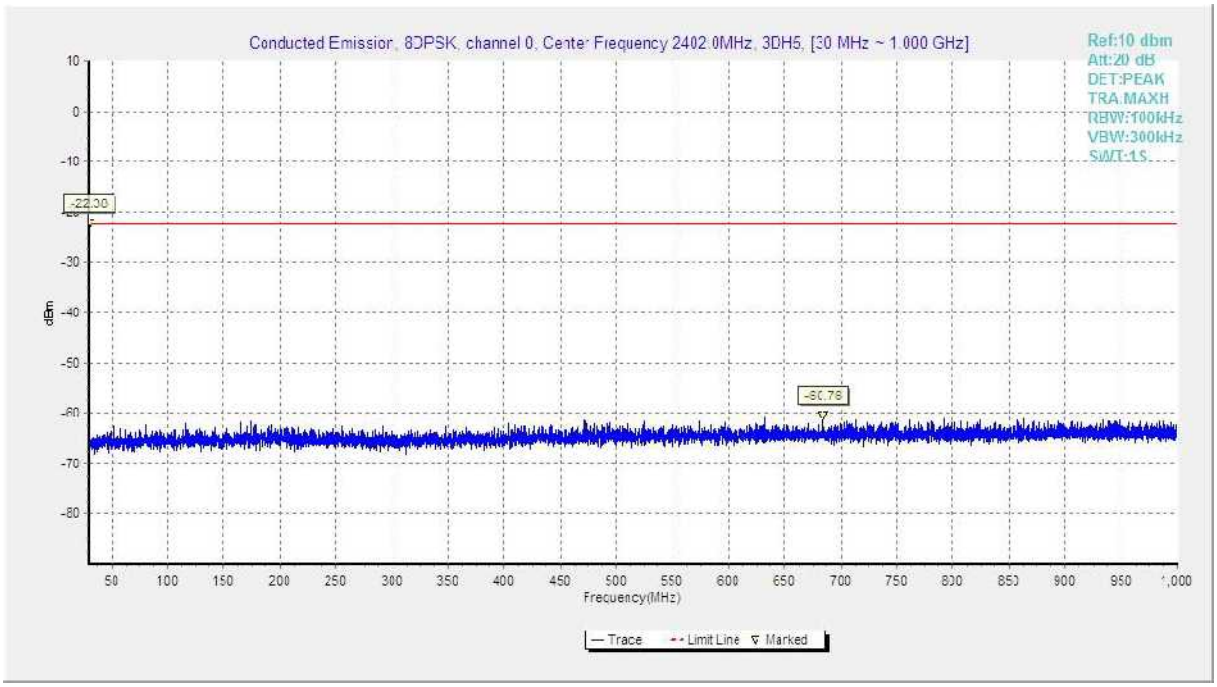

Fig. 40 Conducted Spurious Emission (All channel, 30 MHz-1 GHz)

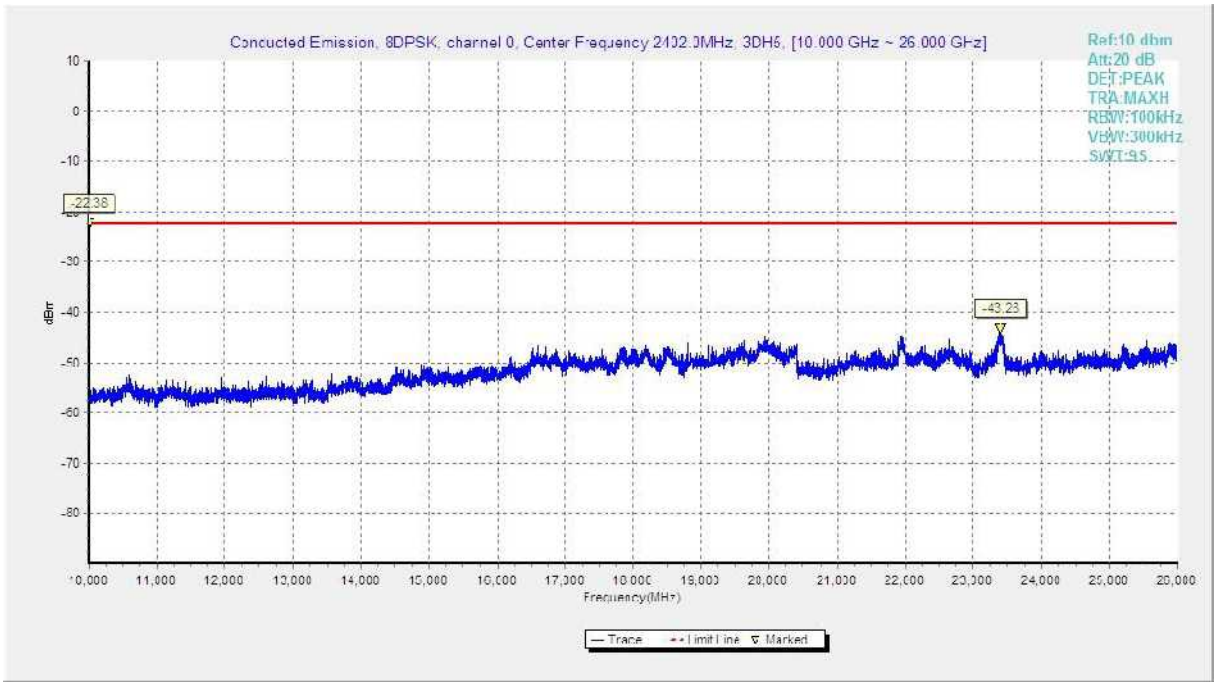

Fig. 41 Conducted Spurious Emission All channel, 10 GHz-26 GHz,)

A.4 Radiated Emission

Measurement Limit:

Standard	Limit
FCC 47 CFR Part 15.247, 15.205, 15.209 & RSS-247 Section 5.5	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 two states of EUT: horizontal polarization and vertical polarization measurements.

ALL Channels: The data presented in report is the worst case.

Measurement Results:

Mode	Direction	Channel	Frequency Range	Test Results	Conclusion
GFSK	Horizontal	0	1 GHz ~3 GHz	Fig.42	P
			3 GHz ~18 GHz	Fig.43	P
		39	1 GHz ~3 GHz	Fig.44	P
			3 GHz ~18 GHz	Fig.45	P
		78	1 GHz ~3GHz	Fig.46	P
			3 GHz ~18 GHz	Fig.47	P
		Restricted Band(CH0)	2.38 GHz ~ 2.45 GHz	Fig.48	P
		Restricted Band(CH78)	2.45 GHz ~ 2.5 GHz	Fig.49	P
	Vertical	0	1 GHz ~3 GHz	Fig.50	P
			3 GHz ~18 GHz	Fig.51	P
		39	1 GHz ~3 GHz	Fig.52	P
			3 GHz ~18 GHz	Fig.53	P
		78	1 GHz ~3GHz	Fig.54	P
			3 GHz ~18 GHz	Fig.55	P
		Restricted Band(CH0)	2.38 GHz ~ 2.45 GHz	Fig.56	P
		Restricted Band(CH78)	2.45 GHz ~ 2.5 GHz	Fig.57	P
	/	All channels	9 kHz ~30 MHz	Fig.58	P
			30 MHz ~1 GHz	Fig.59	P
			18 GHz ~26.5 GHz	Fig.60	P

Mode	Direction	Channel	Frequency Range	Test Results	Conclusion
π/4 DQPSK	Horizontal	0	1 GHz ~3 GHz	Fig.61	P
			3 GHz ~18 GHz	Fig.62	P
		39	1 GHz ~3 GHz	Fig.63	P
			3 GHz ~18 GHz	Fig.64	P
		78	1 GHz ~3GHz	Fig.65	P
			3 GHz ~18 GHz	Fig.66	P
		Restricted Band(CH0)	2.38 GHz ~ 2.45 GHz	Fig.67	P
		Restricted Band(CH78)	2.45 GHz ~ 2.5 GHz	Fig.68	P
	Vertical	0	1 GHz ~3 GHz	Fig.69	P
			3 GHz ~18 GHz	Fig.70	P
		39	1 GHz ~3 GHz	Fig.71	P
			3 GHz ~18 GHz	Fig.72	P
		78	1 GHz ~3GHz	Fig.73	P
			3 GHz ~18 GHz	Fig.74	P
		Restricted Band(CH0)	2.38 GHz ~ 2.45 GHz	Fig.75	P
		Restricted Band(CH78)	2.45 GHz ~ 2.5 GHz	Fig.76	P
	/	All channels	9 kHz ~30 MHz	Fig.77	P
			30 MHz ~1 GHz	Fig.78	P
			18 GHz ~26.5 GHz	Fig.79	P

Mode	Direction	Channel	Frequency Range	Test Results	Conclusion
8DPSK	Horizontal	0	1 GHz ~3 GHz	Fig.80	**P**
			3 GHz ~18 GHz	Fig.81	**P**
		39	1 GHz ~3 GHz	Fig.82	**P**
			3 GHz ~18 GHz	Fig.83	**P**
		78	1 GHz ~3GHz	Fig.84	**P**
			3 GHz ~18 GHz	Fig.85	**P**
		Restricted Band(CH0)	2.38 GHz ~ 2.45 GHz	Fig.86	**P**
		Restricted Band(CH78)	2.45 GHz ~ 2.5 GHz	Fig.87	**P**
	Vertical	0	1 GHz ~3 GHz	Fig.88	**P**
			3 GHz ~18 GHz	Fig.89	**P**
		39	1 GHz ~3 GHz	Fig.90	**P**
			3 GHz ~18 GHz	Fig.91	**P**
		78	1 GHz ~3GHz	Fig.92	**P**
			3 GHz ~18 GHz	Fig.93	**P**
		Restricted Band(CH0)	2.38 GHz ~ 2.45 GHz	Fig.94	**P**
		Restricted Band(CH78)	2.45 GHz ~ 2.5 GHz	Fig.95	**P**
	/	All channels	9 kHz ~30 MHz	Fig.96	**P**
			30 MHz ~1 GHz	Fig.97	**P**
			18 GHz ~26.5 GHz	Fig.98	**P**

Worst Case Result

Horizontal Direction:

GFSK CH0 (1-18GHz)

Frequency (MHz)	MaxPeak (dBuV/m)	Average (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Pol	Corr. (dB)
15480.500000	48.98	---	74.00	25.02	H	13.7
15965.000000	---	36.75	54.00	17.25	V	15.1
16171.000000	49.55	---	74.00	24.45	H	15.4
16610.500000	49.86	---	74.00	24.14	H	16.1
16695.000000	---	37.76	54.00	16.24	V	16.3
16778.000000	49.96	---	74.00	24.04	V	16.2
17045.000000	---	37.35	54.00	16.65	H	16.1
17152.500000	50.12	---	74.00	23.88	H	16.3
17288.500000	---	37.67	54.00	16.33	V	16.5
17570.000000	---	37.92	54.00	16.08	H	16.9
17864.000000	---	38.32	54.00	15.68	V	17.6
17894.500000	51.29	---	74.00	22.71	H	17.7

Vertical Direction:

GFSK CH0 (1-18GHz)

Frequency (MHz)	MaxPeak (dBuV/m)	Average (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Pol	Corr. (dB)
16220.000000	49.41	---	74.00	24.59	H	15.4
16495.500000	50.27	---	74.00	23.73	H	15.7
16556.000000	---	37.42	54.00	16.58	V	16.0
16792.000000	---	37.63	54.00	16.37	H	16.2
16799.500000	50.43	---	74.00	23.57	H	16.0
16994.500000	---	37.65	54.00	16.35	H	16.5
17123.000000	50.53	---	74.00	23.47	V	16.3
17293.000000	---	37.55	54.00	16.45	V	16.4
17498.000000	50.67	---	74.00	23.33	H	16.6
17577.000000	---	38.09	54.00	15.91	V	17.0
17860.500000	---	38.35	54.00	15.65	V	17.6
17984.000000	51.46	---	74.00	22.54	V	17.4

Horizontal Direction:

π /4 DQPSK CH0 (1-18GHz)

Frequency (MHz)	MaxPeak (dBuV/m)	Average (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Pol	Corr. (dB)
15903.000000	49.39	---	74.00	24.61	V	14.8
16123.500000	---	36.65	54.00	17.35	H	15.3
16339.500000	50.14	---	74.00	23.86	H	15.5
16633.000000	---	37.58	54.00	16.42	H	16.2
16708.000000	50.72	---	74.00	23.28	H	16.4
17012.000000	---	37.62	54.00	16.38	V	16.5
17143.000000	49.76	---	74.00	24.24	H	16.2
17339.500000	---	37.59	54.00	16.41	H	16.3
17410.500000	49.91	---	74.00	24.09	V	16.4
17509.000000	---	37.98	54.00	16.02	H	16.6
17920.000000	---	38.55	54.00	15.45	H	17.6
17941.000000	51.59	---	74.00	22.41	H	17.6

Vertical Direction:

π /4 DQPSK CH0 (1-18GHz)

Frequency (MHz)	MaxPeak (dBuV/m)	Average (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Pol	Corr. (dB)
15466.500000	49.18	---	74.00	24.82	V	14.0
15534.000000	---	36.13	54.00	17.87	H	14.1
15956.500000	49.54	---	74.00	24.46	H	14.9
16037.500000	---	36.69	54.00	17.31	V	15.3
16308.000000	49.42	---	74.00	24.58	V	15.3
16422.500000	---	36.96	54.00	17.04	H	15.6
17119.500000	50.67	---	74.00	23.33	H	16.3
17158.500000	---	37.61	54.00	16.39	H	16.2
17590.500000	---	37.81	54.00	16.19	H	16.7
17679.500000	50.58	---	74.00	23.42	H	16.9
17862.500000	51.39	---	74.00	22.61	V	17.6
17931.000000	---	38.81	54.00	15.19	H	17.6

Horizontal Direction:

8DPSK CH0 (1-18GHz)

Frequency (MHz)	MaxPeak (dBuV/m)	Average (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Pol	Corr. (dB)
15916.000000	48.74	---	74.00	25.26	V	14.9
15965.000000	---	36.88	54.00	17.12	V	15.1
16255.500000	49.45	---	74.00	24.55	H	15.3
16465.000000	---	37.01	54.00	16.99	H	15.8
16635.000000	---	37.52	54.00	16.48	V	16.2
16636.000000	50.58	---	74.00	23.42	H	16.2
17125.500000	---	37.65	54.00	16.35	H	16.3
17184.500000	49.89	---	74.00	24.11	V	16.0
17493.500000	51.30	---	74.00	22.70	H	16.6
17549.000000	---	37.72	54.00	16.28	V	16.5
17889.500000	---	38.64	54.00	15.36	V	17.7
17927.000000	50.97	---	74.00	23.03	V	17.5

Vertical Direction:

8DPSK CH0 (1-18GHz)

Frequency (MHz)	MaxPeak (dBuV/m)	Average (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Pol	Corr. (dB)
15900.000000	50.06	---	74.00	23.94	H	14.8
16201.000000	---	36.68	54.00	17.32	H	15.4
16332.000000	49.62	---	74.00	24.38	H	15.3
16570.000000	---	37.23	54.00	16.77	H	15.9
16635.000000	50.82	---	74.00	23.18	V	16.2
17062.000000	50.63	---	74.00	23.37	H	16.3
17072.000000	---	37.60	54.00	16.40	H	16.3
17460.500000	---	37.72	54.00	16.28	H	16.5
17535.500000	51.34	---	74.00	22.66	V	16.5
17824.000000	---	38.02	54.00	15.98	H	17.4
17900.000000	51.79	---	74.00	22.21	H	17.6
17936.000000	---	38.81	54.00	15.19	H	17.6

Note:

A "reference path loss" is established and the A_{Rpl} is the attenuation of “reference path loss”, and Antenna Factor, the gain of the preamplifier, the cable loss. P_{Mea} is the field strength recorded from the instrument.

The measurement results are obtained as described below:
Result= P_{Mea} +Cable Loss +Antenna Factor-Gain of the preamplifier.

See below for test graphs.

Conclusion: Pass

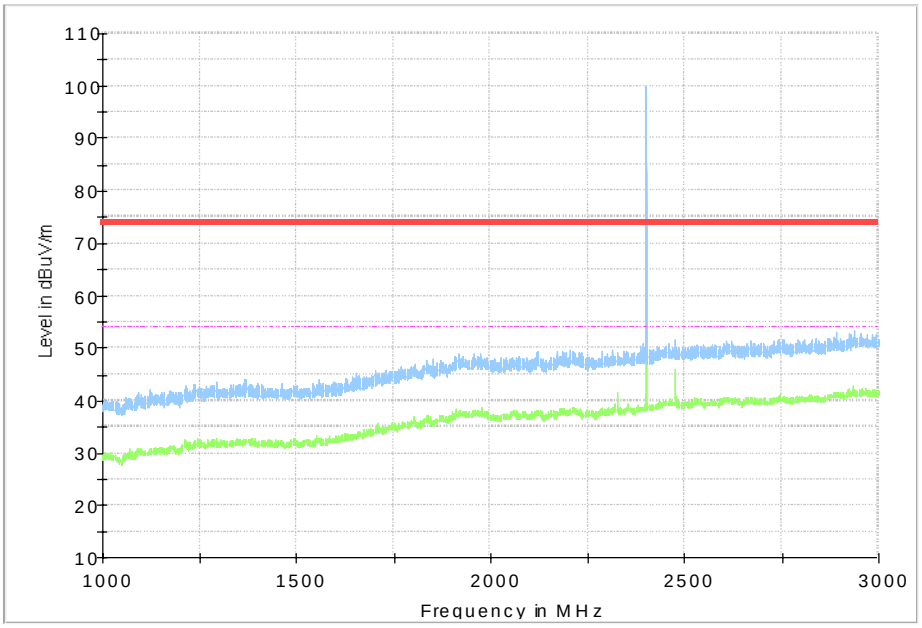

Fig.42 Radiated Spurious Emission (GFSK, Ch0, 1 GHz ~3 GHz, Horizontal Direction)

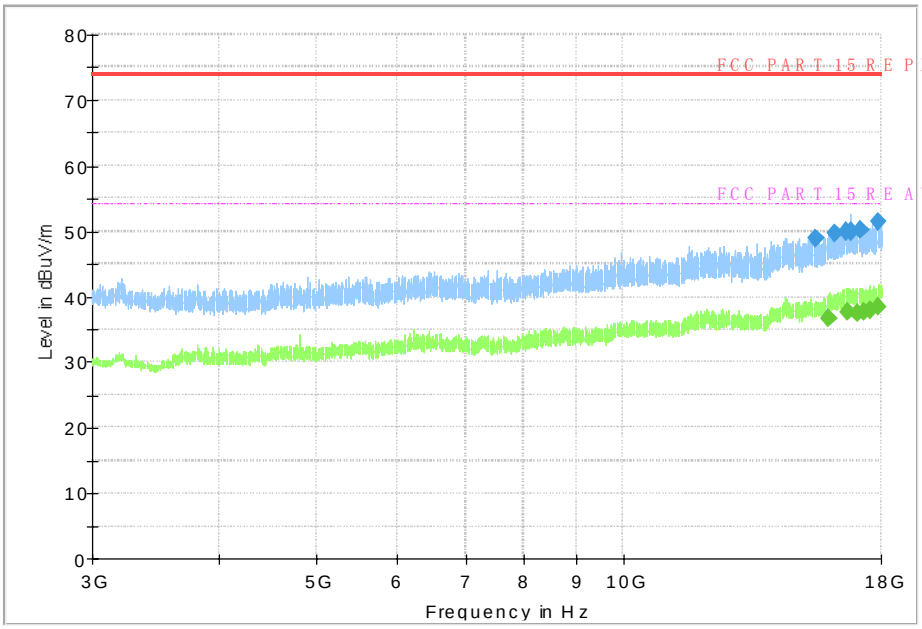

Fig.43 Radiated Spurious Emission (GFSK, Ch0, 3GHz ~18 GHz,Horizontal Direction)

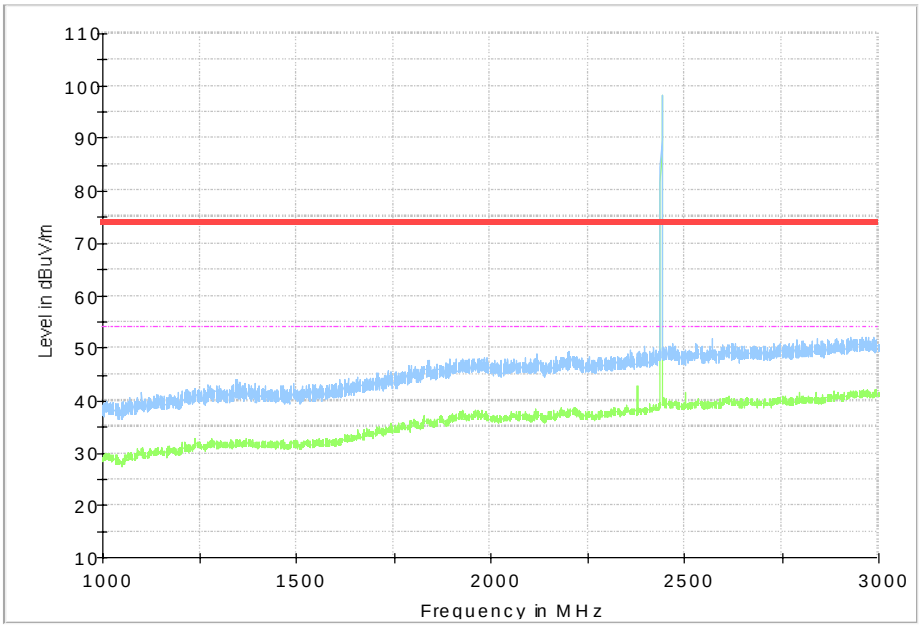

Fig.44 Radiated Spurious Emission (GFSK, Ch39, 1GHz ~3 GHz ,Horizontal Direction)

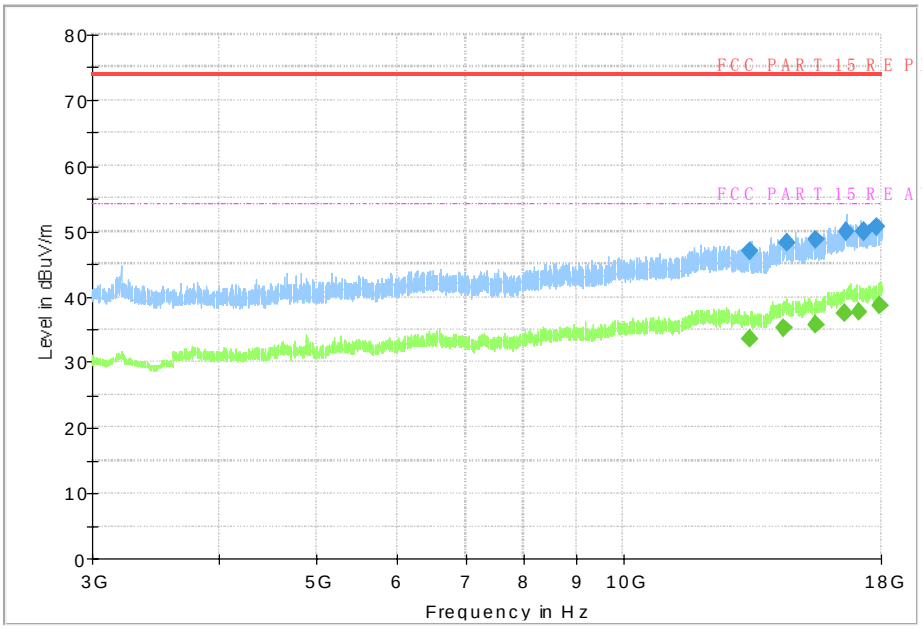

Fig.45 Radiated Spurious Emission (GFSK, Ch39, 3GHz ~18 GHz ,Horizontal Direction)

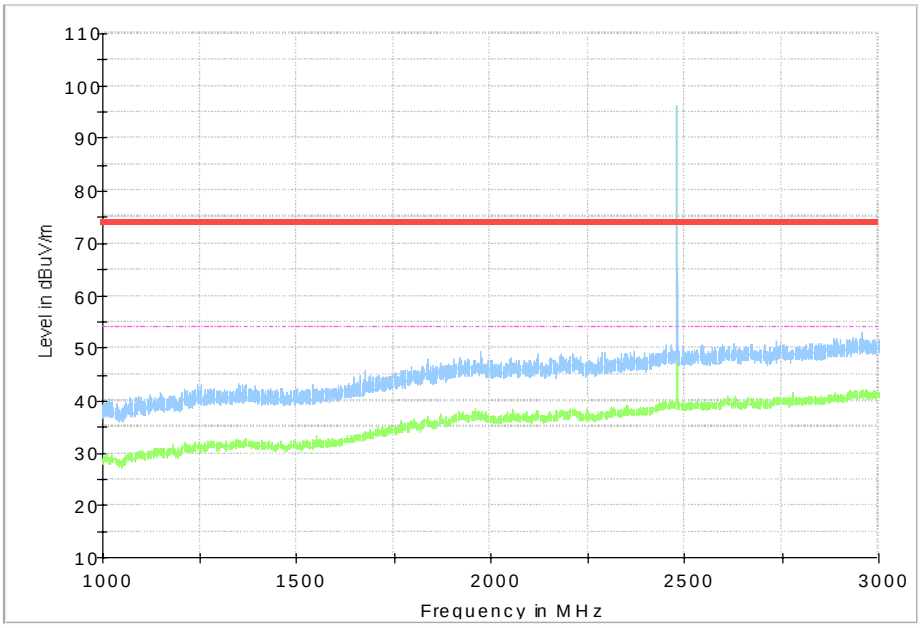

Fig.46 Radiated Spurious Emission (GFSK, Ch78, 1GHz ~3 GHz ,Horizontal Direction)

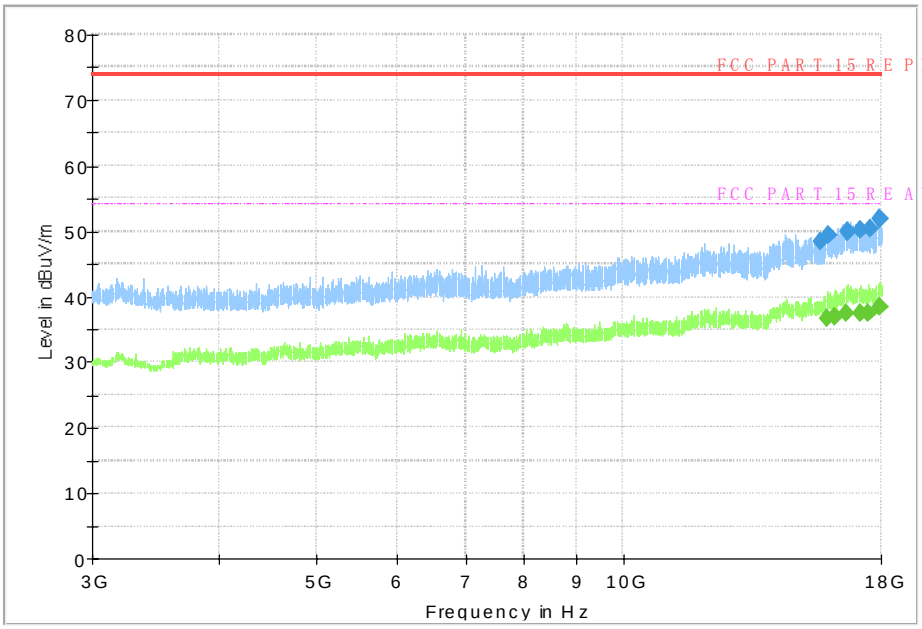

Fig.47 Radiated Spurious Emission (GFSK, Ch78, 3GHz ~18GHz , Horizontal Direction)