TEST REPORT

No.I23N00692-BT

for

Spectralink Corporation

Wifi/BT Phone

Model Name: Versity 9740

with

Hardware Version: DVT

Software Version: vSL25

FCC ID: IYG97XX

IC: 2128B-97XX

Issued Date: 2023-07-26

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:

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REPORT HISTORY

Report Number	Revision	Description	Issue Date
I23N00642-BT	Rev.0	1st edition	2023-07-26

Note: the latest revision of the test report supersedes all previous versions.

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1. Summary of Test Report

1.1. Test Items

Description	Wifi/BT Phone
Model Name	Versity 9740
Applicant's name	Spectralink Corporation
Manufacturer's Name	Spectralink Corporation

1.2. Test Standards

FCC Part15-2021; ANSI C63.10-2013;RSS-247 Issue 2; RSS-Gen Issue 5 A2.

1.3. Test Result

Pass

Please refer to "5.2.Test Results"

1.4. Testing Location

Address: Building G, Shenzhen International Innovation Center, No.1006 Shennan Road, Futian District, Shenzhen, Guangdong, P. R. China 518000

1.5. Project data

Testing Start Date:	2023-04-21
Testing End Date:	2023-07-04

1.6. Signature

Lin Kanfeng
(Prepared this test report)

An Ran
(Reviewed this test report)

Zhang Bojun
(Approved this test report)

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2. Client Information

2.1. Applicant Information

Company Name:	Spectralink Corporation
Address:	2560 55th Street Boulder CO 80301 USA
Contact Person:	Andrew Jackson
E-Mail:	andrew.jackson@spectralink.com
Telephone:	/
FAX:	+1 (303) 441-7618

2.2. Manufacturer Information

Company Name:	Spectralink Corporation
Address:	2560 55th Street Boulder CO 80301 USA
Contact Person:	Andrew Jackson
E-Mail:	andrew.jackson@spectralink.com
Telephone:	/
FAX:	+1 (303) 441-7618

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

3.1. About EUT

Description	Wifi/BT Phone
Model Name	Versity 9740
Frequency Band	ISM 2400MHz~2483.5MHz
Equipment type	Bluetooth® BR/EDR
Type of Modulation	GFSK/π/4 DQPSK/8DPSK
Number of Channels	79
Antenna Type	Integrated antenna
Antenna Gain	0.43 dBi
Power Supply	3.85V DC by Battery
FCC ID	IYG97XX
IC	2128B-97XX
Condition of EUT as received	No abnormality in appearance

Note: Photographs of EUT are shown in ANNEX A of this test report. Components list, please refer to documents of the manufacturer; it is also included in the original test record of Shenzhen Academy of Information and Communications Technology.

3.2. Internal Identification of EUT used during the test

EUT ID*	SN or IMEI	HW Version	SW Version	Date of Receipt
UT02aa	MHNE03BQKGG000G	DVT	vSL25	2023-04-21
UT14aa	MHNE04BBHHG000S	DVT	vSL25	2023-05-05

*EUT ID: is used to identify the test sample in the lab internally.
UT02aa is used for Conduction test; UT14aa is used for Radiation test and AC Power line Conducted Emission test.

3.3. Internal Identification of AE used during the test

AE No.	Description	AE ID*
AE1	Battery	/
AE2	Charger	Aa01
AE3	USB Cable	Ca01a

AE1-1

Model	BLI0000100
Manufacturer	Ningbo Veken Bat tery Co. , Ltd.
Capacity	3020mAh
Nominal Voltage	3.85V

AE1-2

Model	351038P

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Manufacturer	Chongqing VDL Electronics Co., Ltd.
Capacity	95mAh
Nominal Voltage	3.7V
AE2	
Model	IN-CA-310Q
Manufacturer	Shenzhen Inno Vision Industrial Co., Ltd.

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

3.4. General Description

The Equipment under Test (EUT) is a model of Versity 9740 with integrated antenna and battery.
It consists of normal options: Lithium Battery and Charger.
Manual and specifications of the EUT were provided to fulfil the test.
Samples undergoing test were selected by the client.
According to the customer's description, Versity9740 is a variant product of Versity9753.
The main difference between them is the antenna type and mechanical shell, which does not affect the conduction test. All conduction results were from the initial model, and the radiation part has been retested and updated in this report. The initial model report number is I23N00642-BT.

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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	2021
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 A2 February, 2021

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5. Test Results

5.1. Testing Environment

Normal Temperature: 15~35°C

Relative Humidity: 20~75%

5.2. 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	**/**
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	AC Power line Conducted Emission	15.107,15.207	RSS-Gen section 8.8	**P**
10	99% Occupied Bandwidth	/	RSS-Gen section 6.7	**/**

See **ANNEX A** for details.

5.3. Statements

SAICT has evaluated the test cases requested by the applicant/manufacturer as listed in section 5.2 of this report, for the EUT specified in section 3, according to the standards or reference documents listed in section 4.2.

Disclaimer:

A. After confirmation with the customer, the sample information provided by the customer may affect the validity of the measurement results in this report, and the impact and consequences arising therefrom shall be borne by the customer.

B. The samples in this report are provided by the customer, and the test results are only applicable to the samples received.

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6. Test Equipments Utilized

Conducted test system

No.	Equipment	Model	Serial Number	Manufacturer	Calibration Due date	Calibration Period
1	Vector Signal Analyzer	FSV40	100903	Rohde & Schwarz	2023-12-28	1 year
2	Power Sensor	U2021XA	MY55430013	Keysight	2023-12-28	1 year
3	Data Acquisition	U2531A	TW55443507	Keysight	/	/
4	Bluetooth Tester	CBT32	100584	Rohde & Schwarz	2023-12-28	1 year
5	Shielding Room	S81	CT000986-1344	ETS-Lindgren	2026-09-12	5 years

Radiated emission test system

No.	Equipment	Model	Serial Number	Manufacturer	Calibration Due date	Calibration Period
1	Test Receiver	ESR7	101676	Rohde & Schwarz	2023-11-23	1 year
2	BiLog Antenna	3142E	0224831	ETS-Lindgren	2024-05-27	3 years
3	Horn Antenna	3117	00066577	ETS-Lindgren	2025-04-17	3 years
4	Anechoic Chamber	FACT3-2.0	1285	ETS-Lindgren	2025-05-28	2 years
5	Spectrum Analyzer	FSV40	101192	Rohde & Schwarz	2024-01-11	1 year
6	Loop Antenna	HLA6120	35779	TESEQ	2025-05-12	3 years
7	Horn Antenna	QSH-SL-1 8-26-S-20	17013	Q-par	2026-02-01	3 years
8	Test Receiver	ESCI	100702	Rohde & Schwarz	2024-01-11	1 year
9	LISN	ENV216	102067	Rohde & Schwarz	2023-09-06	1 year

Test software

No.	Equipment	Manufacturer	Version
1	TechMgr Software	CAICT	2.1.1
2	EMC32	Rohde & Schwarz	10.50.40

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

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7. Laboratory Environment

Shielded room

Temperature	Min. = 15 ˚C, Max. = 35 ˚C
Relative humidity	Min. = 20 %, Max. = 75 %
Shielding effectiveness	0.014MHz-1MHz> 60 dB; 1MHz-18000MHz>90 dB
Electrical insulation	> 2MΩ
Ground system resistance	< 4 Ω

Anechoic chamber

Temperature	Min. = 15 ˚C, Max. = 35 ˚C
Relative humidity	Min. = 20 %, 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
Voltage Standing Wave Ratio (VSWR)	≤ 6 dB, from 1 to 18 GHz, 3m distance
Uniformity of field strength	Between 0 and 6 dB, from 80 to 6000 MHz

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8. Measurement Uncertainty

Test Name	Uncertainty (*k*=2)	
1. Maximum Peak Output Power	1.32dB	
2. Band Edges Compliance	1.92dB	
3. Transmitter Spurious Emission - Conducted	30MHz≤f<1GHz	1.41dB
	1GHz≤f<7GHz	1.92dB
	7GHz≤f<13GHz	2.31dB
	13GHz≤f≤26GHz	2.61dB
4.. Transmitter Spurious Emission - Radiated	9kHz≤f<30MHz	1.70dB
	30MHz≤f<1GHz	4.80dB
	1GHz≤f<18GHz	4.62dB
	18GHz≤f≤40GHz	2.36dB
5. 20dB Bandwidth	4.56kHz	
6. Time of Occupancy (Dwell Time) & Number of Hopping Channels	0.58ms	
7. Carrier Frequency Separation	4.56kHz	
8. AC Power line Conducted Emission	150kHz≤f≤30MHz	2.68dB

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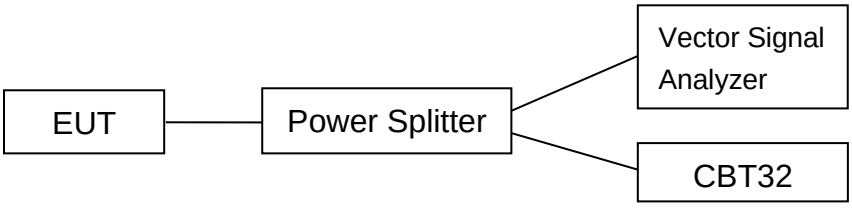
ANNEX A: Detailed Test Results

Test Configuration

The measurement is made according to ANSI C63.10.

1) Conducted Measurements

1. Connect the EUT to the test system correctly.
2. Set the EUT to the required work mode.
3. Set the EUT to the required channel.
4. Set the EUT hopping mode (hopping on or hopping off).
5. Set the spectrum analyzer to start measurement.
6. Record the values.

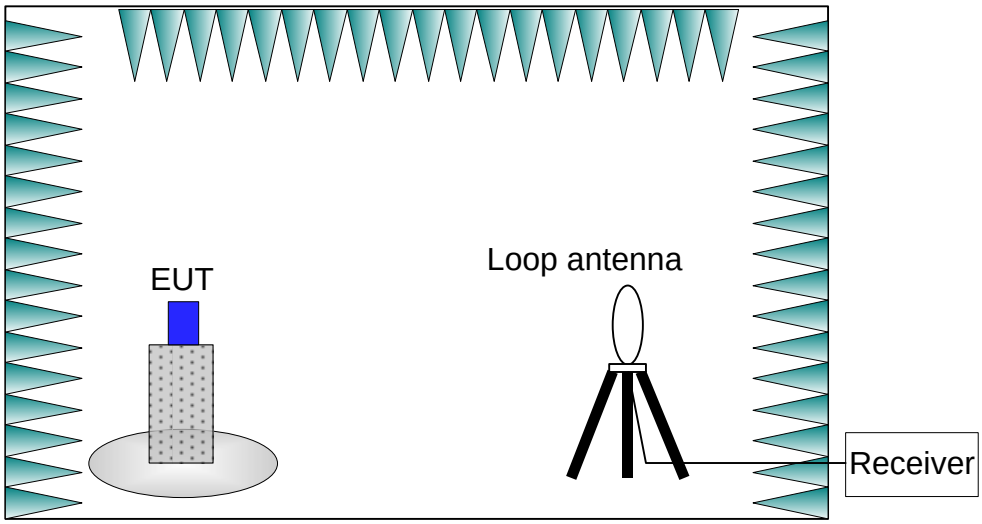


2) Radiated Measurements

Test setup:

9kHz-30MHz:

The EUT are measured in a anechoic chamber. The EUT is placed on a non-conductive stand of 80cm high, and at a measurement distance of 3m from the receiving antenna. The center of the receiving loop antenna is 1.0 meter above the ground. The test setup refers to figure below. Detected emissions were maximized at each frequency by rotating the EUT and adjusting the receiver antenna polarization.



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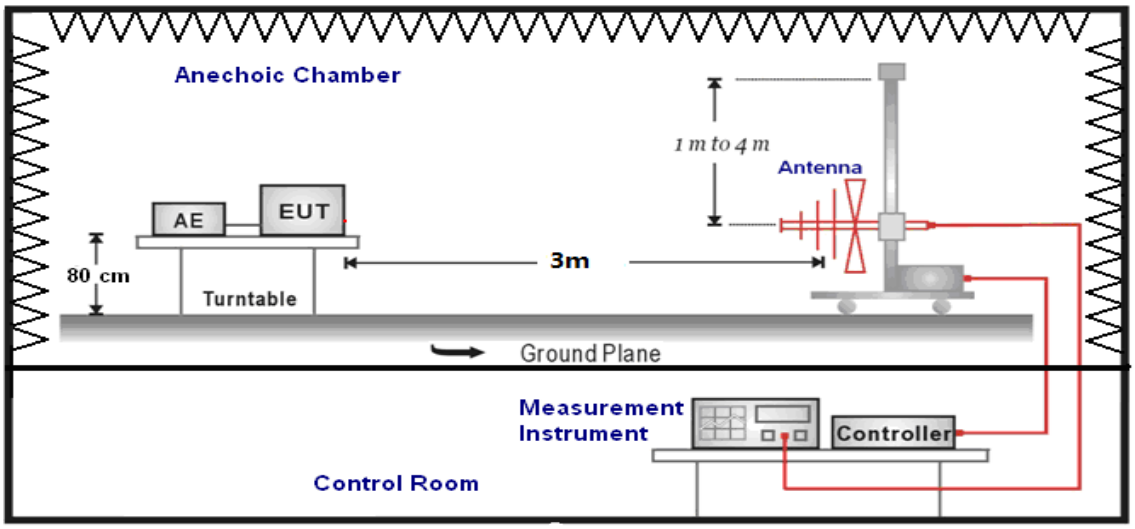
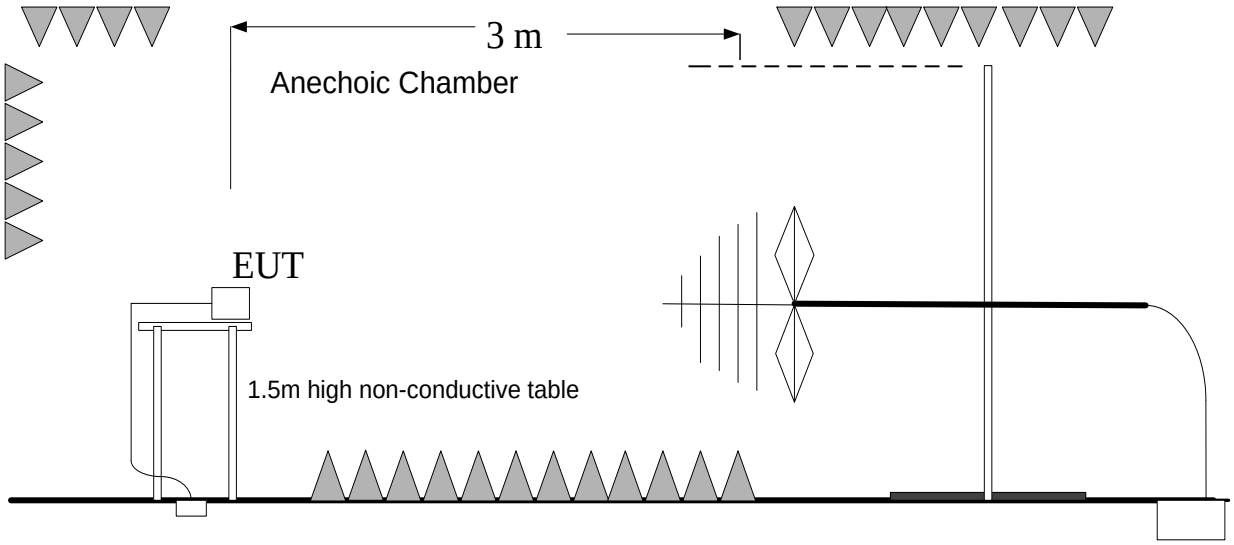
30MHz-26.5GHz:

The EUT are measured in a anechoic chamber. The EUT is placed on a non-conductive stand of 80cm high, and at a measurement distance of 3m from the receiving antenna. The center of the receiving antenna is 1.0 meter to 4.0 meter above the ground. The test setup refers to figure below. Detected emissions were maximized at each frequency by rotating the EUT and adjusting the receiver antenna polarization.

30MHz-1GHz:



1GHz-3GHz:



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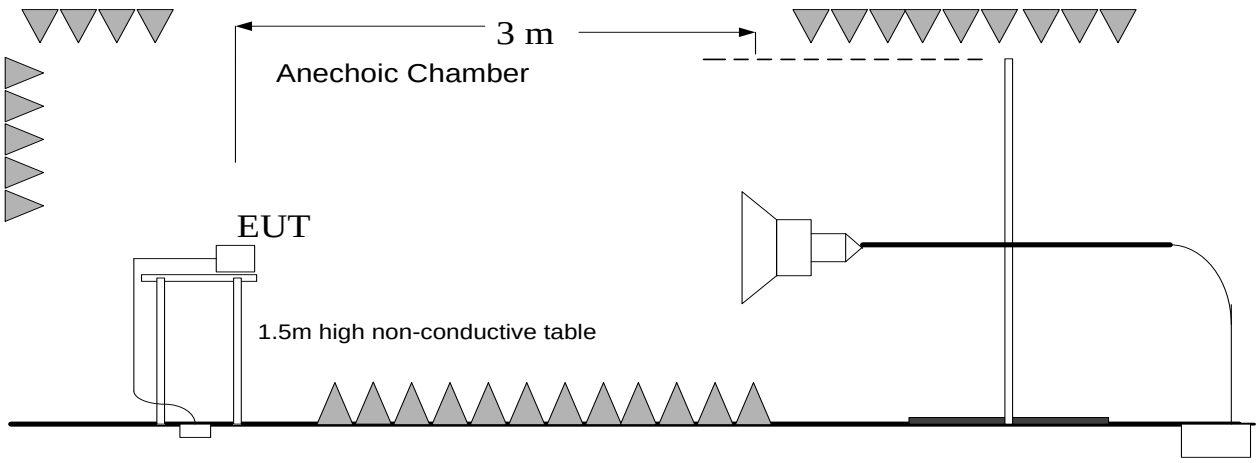
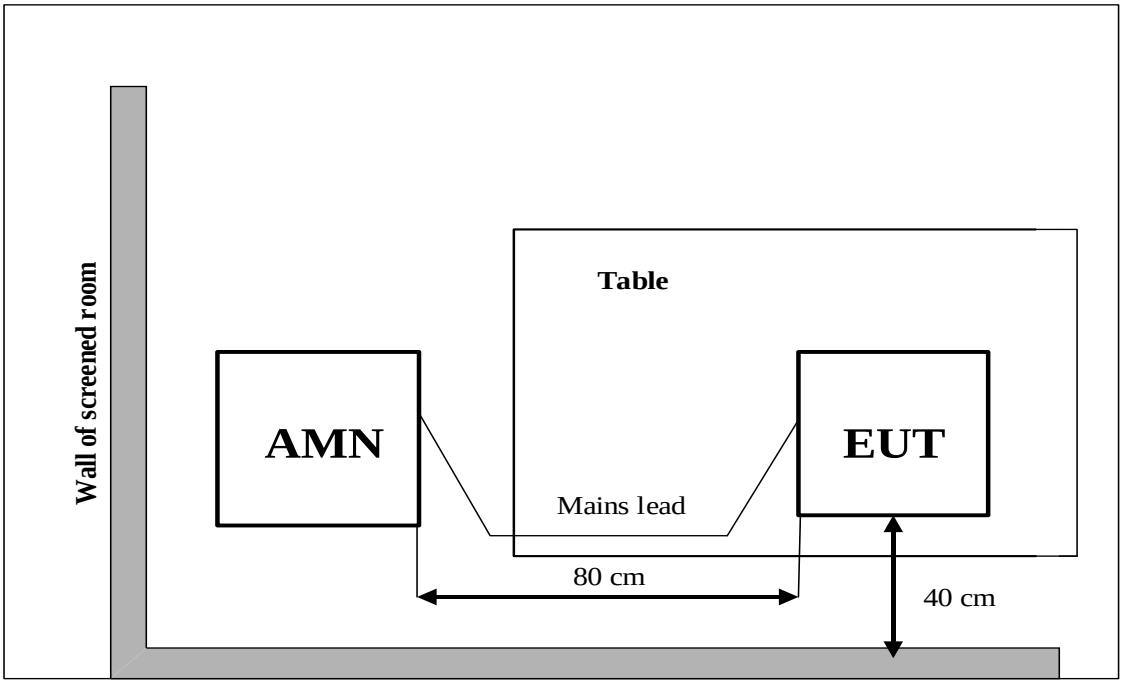
3GHz-26.5GHz:



3) AC Power line Conducted Emission Measurement

The EUT is working as Bluetooth terminal. A communication link of Bluetooth is set up with a System Simulator (SS). The EUT is commanded to operate at maximum transmitting power.



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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 0.43dBi.
The RF transmitter uses an integrate antenna without connector.

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A.1 Maximum Peak Output Power

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

A peak responding power meter may be used, where the power meter and sensor system video bandwidth is greater than the occupied bandwidth of the unlicensed wireless device, rather than a spectrum analyzer.

Measurement Limit:

Standard	Limit (dBm)	E.I.R.P Limit (dBm)
FCC CRF Part 15.247(b)& RSS-247 Section 5.4	< 30	< 36

Measurement Results:

Mode	Peak Conducted Output Power (dBm)			Conclusion
	2402MHz (CH0)	2441MHz (CH39)	2480MHz (CH78)	
GFSK	5.78	6.57	5.50	**P**
π/4 DQPSK	5.05	5.85	4.84	**P**
8DPSK	5.53	6.35	5.35	**P**

The E.I.R.P Results are listed below:

Mode	Peak Conducted Output Power (dBm)			Conclusion
	2402MHz (CH0)	2441MHz (CH39)	2480MHz (CH78)	
GFSK	6.21	7.00	5.93	**P**
π/4 DQPSK	5.48	6.28	5.27	**P**
8DPSK	5.96	6.78	5.78	**P**

Note: E.I.R.P value = Conducted values (with conducted samples) + Antenna Gain.

Conclusion: Pass

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A.2 Band Edges Compliance

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

Measurement Limit:

Standard	Limit (dBc)
FCC 47 CFR Part 15.247 (d) & RSS-247 Section 5.1	> 20

Measurement Result:

Mode	Frequency (MHz)	Hopping	Test Results	Conclusion
GFSK	2402(CH0)	ON	63.01	**P**
	2480(CH78)	ON	61.22	**P**
π/4 DQPSK	2402(CH0)	ON	60.18	**P**
	2480(CH78)	ON	59.98	**P**
8DPSK	2402(CH0)	ON	60.51	**P**
	2480(CH78)	ON	60.00	**P**

Mode	Frequency (MHz)	Hopping	Test Results	Conclusion
GFSK	2402(CH0)	OFF	62.38	**P**
	2480(CH78)	OFF	63.40	**P**
π/4 DQPSK	2402(CH0)	OFF	60.37	**P**
	2480(CH78)	OFF	59.52	**P**
8DPSK	2402(CH0)	OFF	59.47	**P**
	2480(CH78)	OFF	59.19	**P**

See below for test graphs.

Conclusion: Pass

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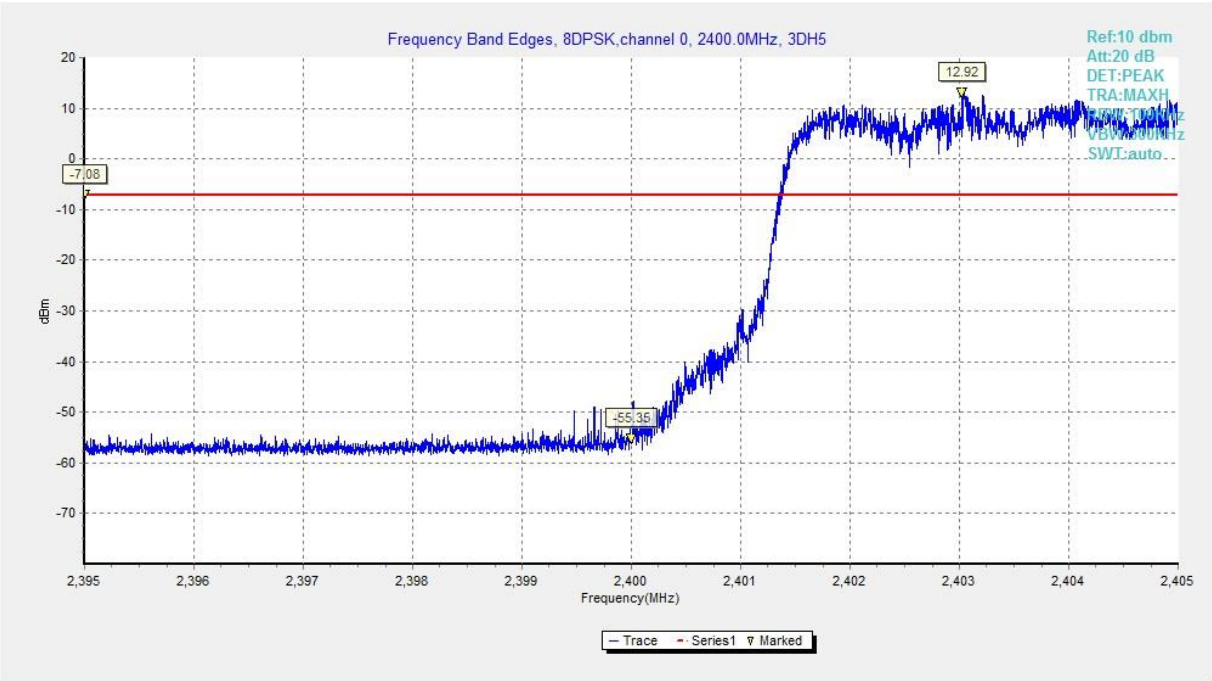

Fig. 1 Band Edges (8DPSK, CH0, Hopping ON)

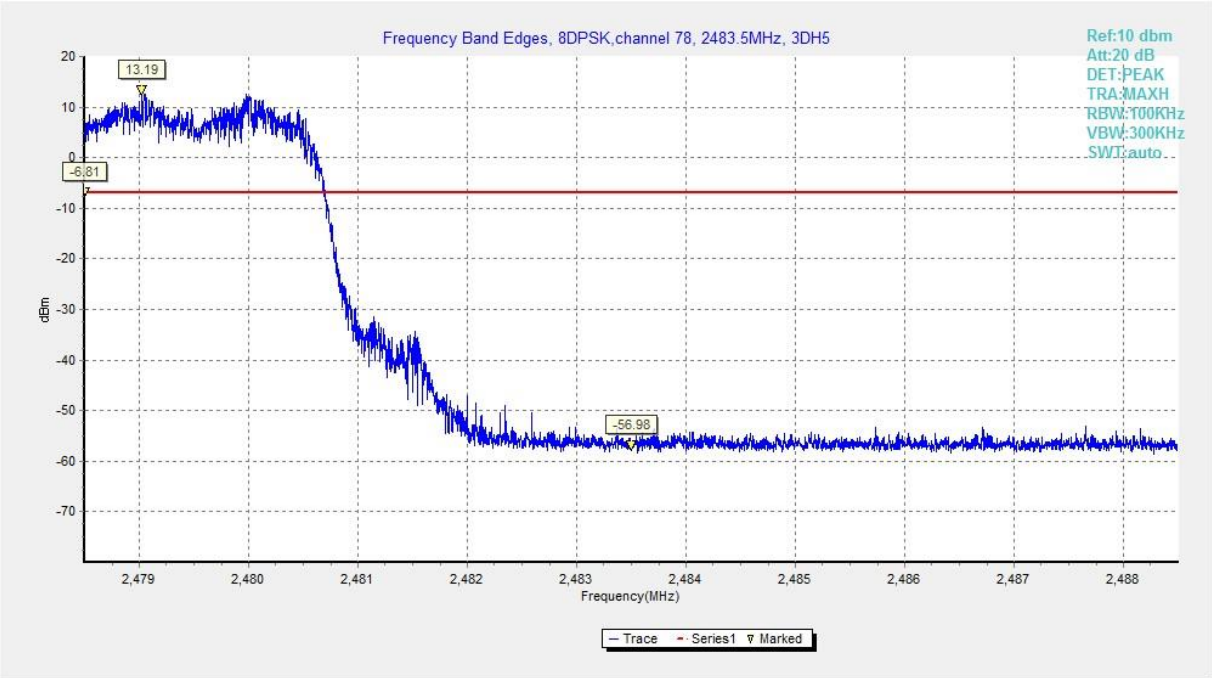

Fig. 2 Band Edges (8DPSK, CH78, Hopping ON)

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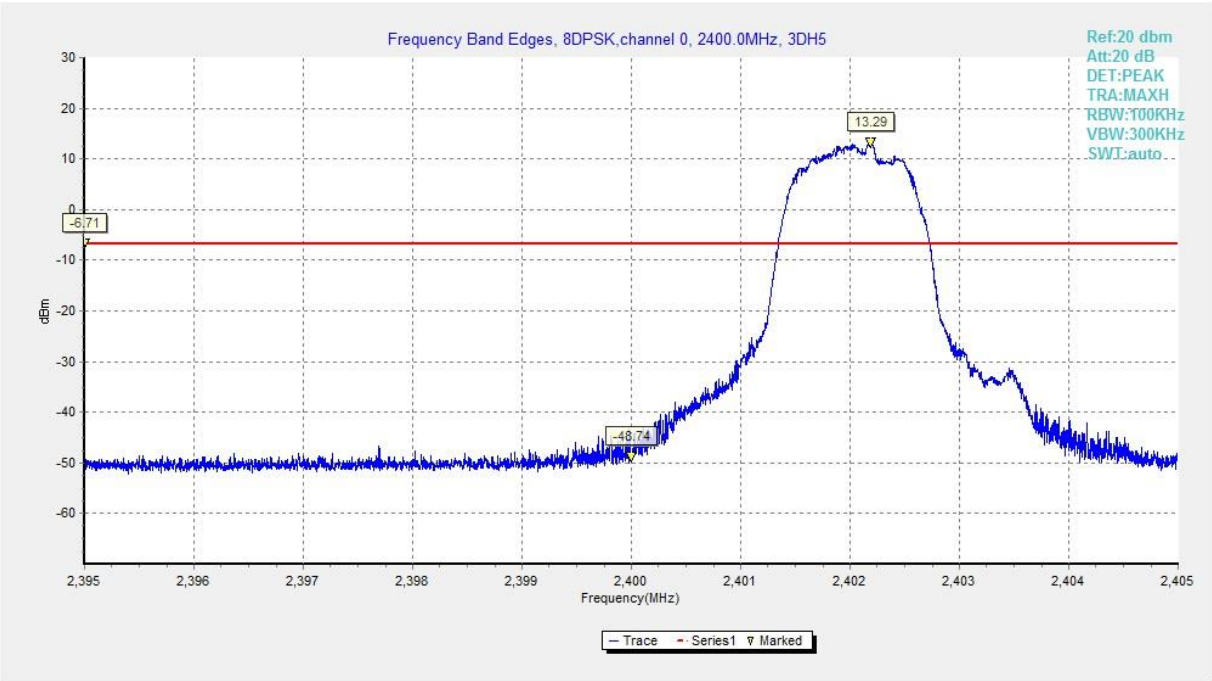

Fig. 3 Band Edges (8DPSK, CH0, Hopping OFF)

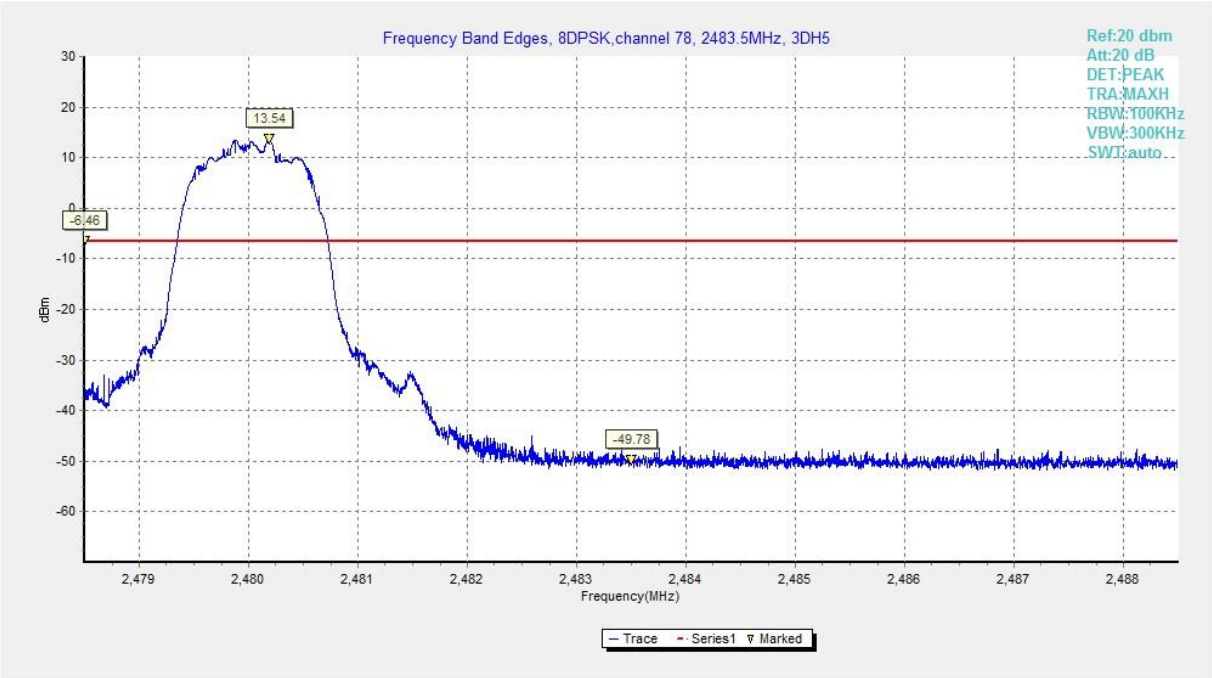

Fig. 4 Band Edges (8DPSK, CH78, Hopping OFF)

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A.3 Conducted Emission

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

Measurement Limit:

Standard	Limit
FCC 47 CFR Part 15.247 (d) & RSS-247 section 5.5/RSS-Gen section 6.13	20dB below peak output power in 100 kHz bandwidth

Measurement Results:

Mode	Frequency (MHz)	Frequency Range	Test Results	Conclusion
GFSK	2402(CH0)	1GHz-3GHz	Fig.1	**P**
		3GHz-10GHz	Fig.2	**P**
	2441(CH39)	1GHz-3GHz	Fig.3	**P**
		3GHz-10GHz	Fig.4	**P**
	2480(CH78)	1GHz-3GHz	Fig.5	**P**
		3GHz-10GHz	Fig.6	**P**
π/4 DQPSK	2402(CH0)	1GHz-3GHz	Fig.7	**P**
		3GHz-10GHz	Fig.8	**P**
	2441(CH39)	1GHz-3Ghz	Fig.9	**P**
		3GHz-10GHz	Fig.10	**P**
	2480(CH78)	1GHz-3Ghz	Fig.11	**P**
		3GHz-10GHz	Fig.12	**P**
8DPSK	2402(CH0)	1GHz-3GHz	Fig.13	**P**
		3GHz-10GHz	Fig.14	**P**
	2441(CH39)	1GHz-3GHz	Fig.15	**P**
		3GHz-10GHz	Fig.16	**P**
	2480(CH78)	1GHz-3GHz	Fig.17	**P**
		3GHz-10GHz	Fig.18	**P**
/	All channels	30 MHz-1GHz	Fig.19	**P**
		10GHz-26GHz	Fig.20	**P**

See below for test graphs.

Conclusion: Pass

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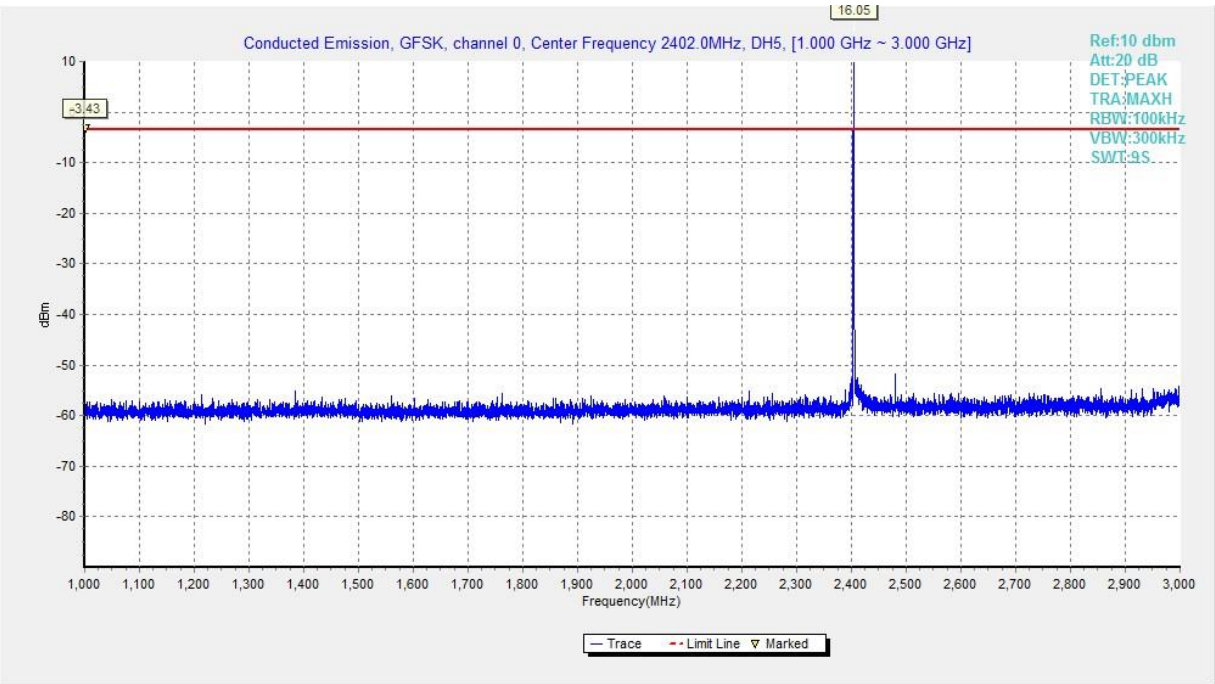

Fig. 1 Conducted Spurious Emission (GFSK, CH0, 1GHz-3GHz)

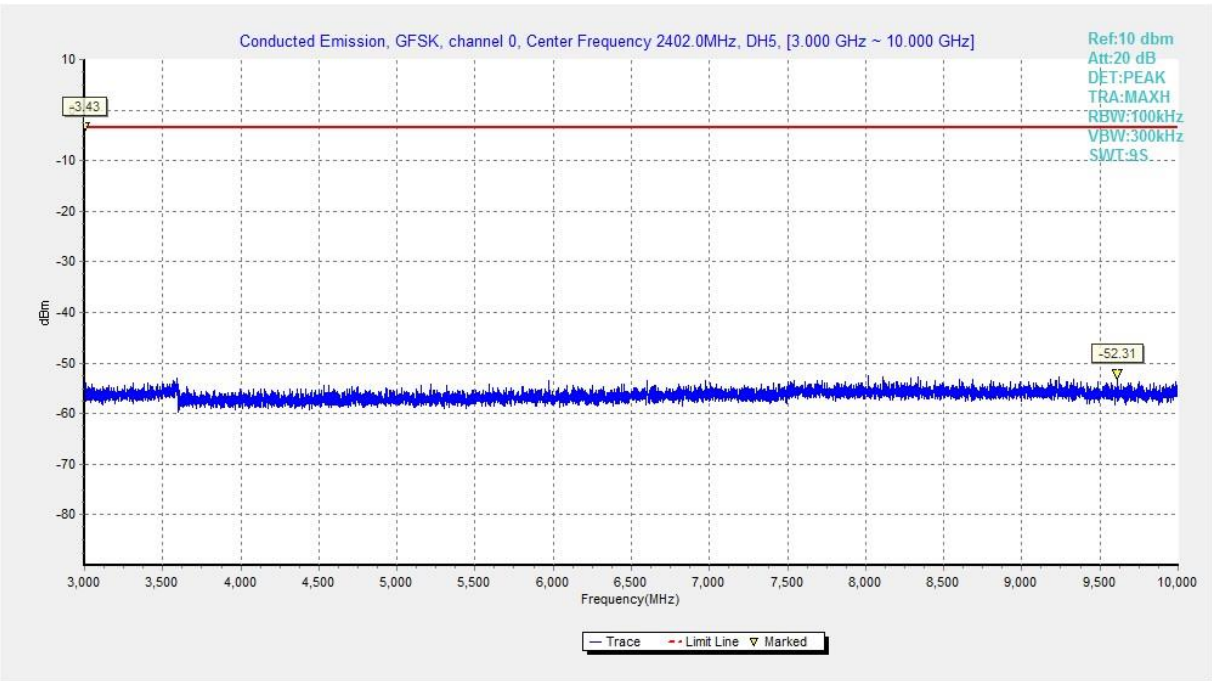

Fig. 2 Conducted Spurious Emission (GFSK, CH0, 3GHz-10GHz)

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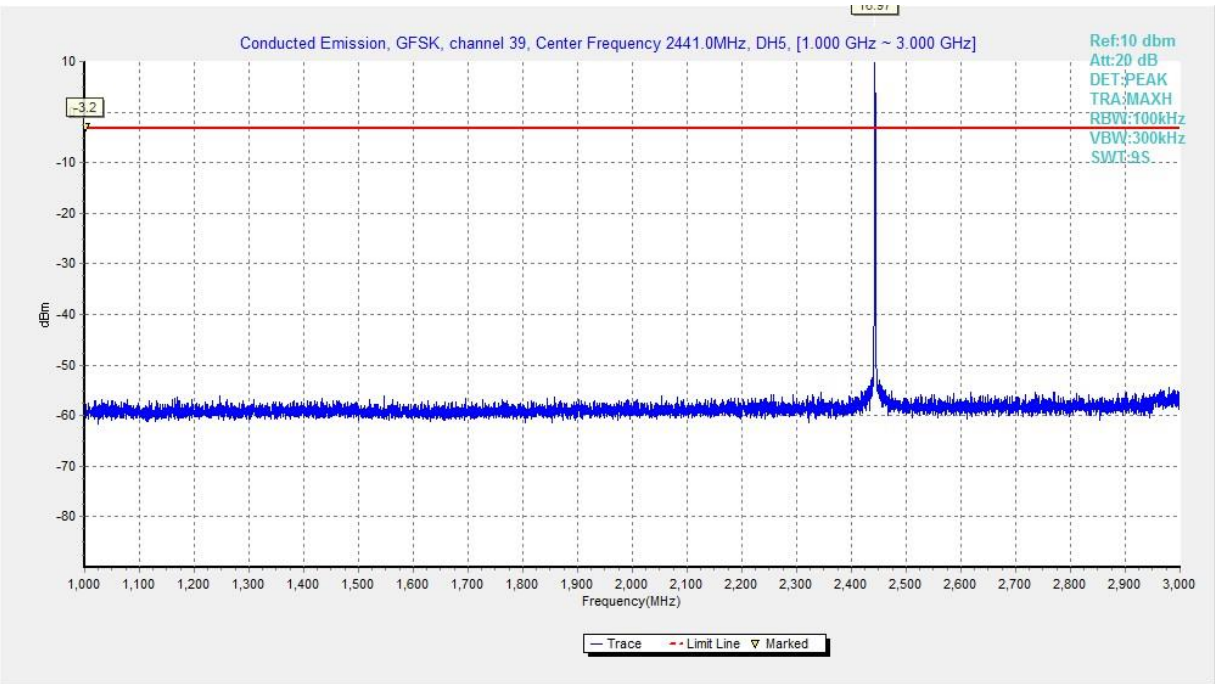

Fig. 3 Conducted Spurious Emission (GFSK, CH39, 1GHz-3GHz)

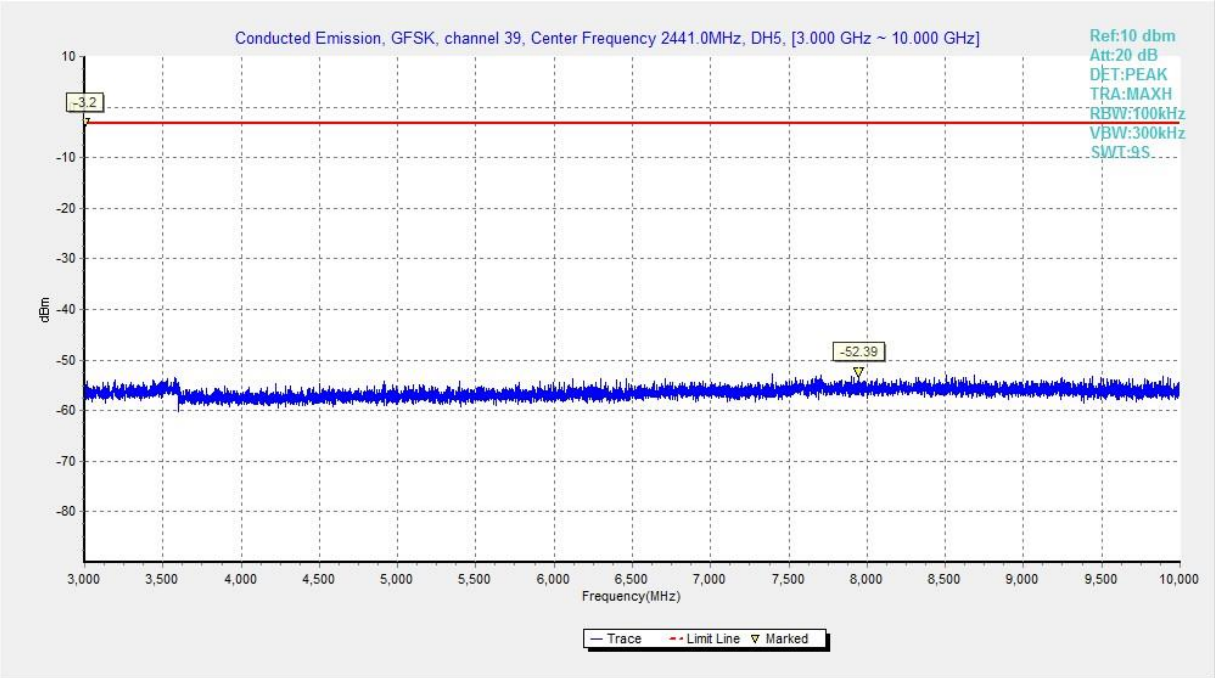

Fig. 4 Conducted Spurious Emission (GFSK, CH39, 3GHz-10GHz)

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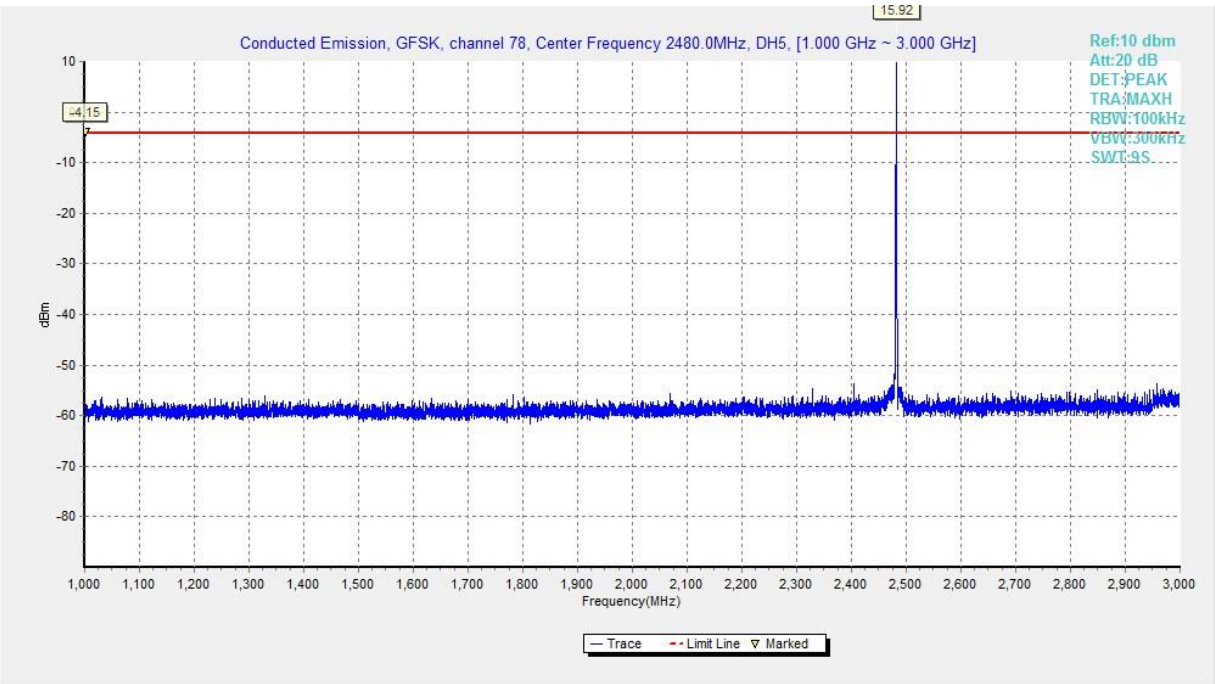

Fig. 5 Conducted Spurious Emission (GFSK, CH78, 1GHz-3GHz)

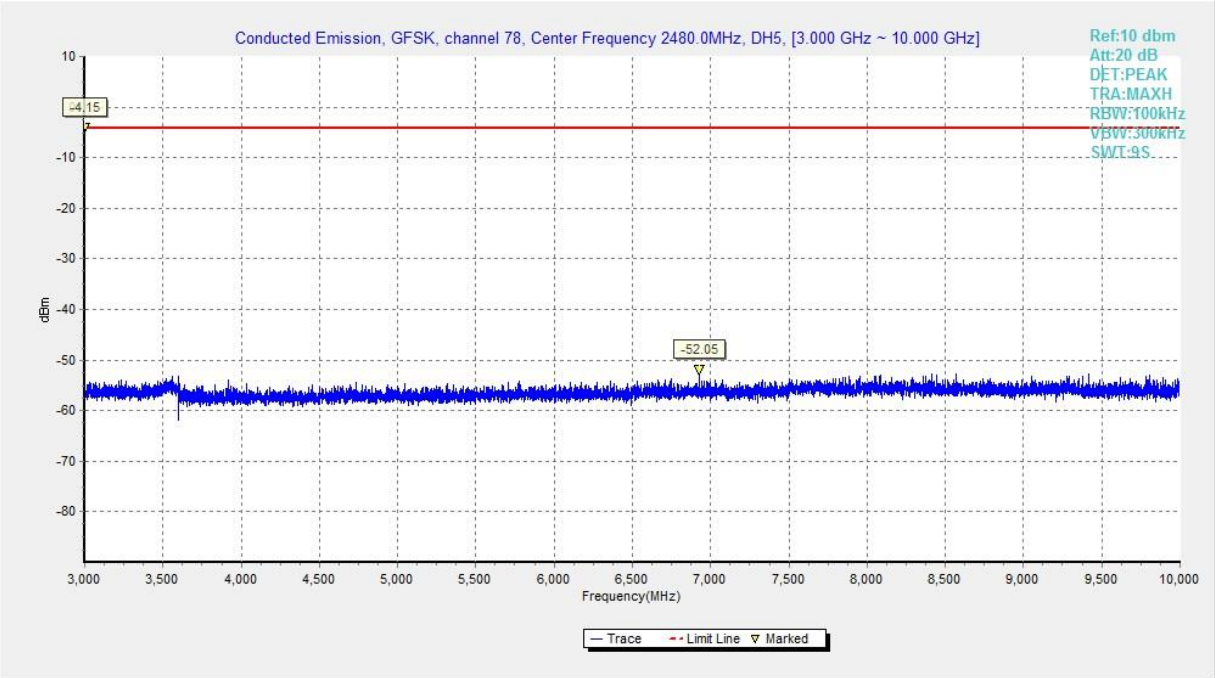

Fig. 6 Conducted Spurious Emission (GFSK, CH78, 3GHz-10GHz)

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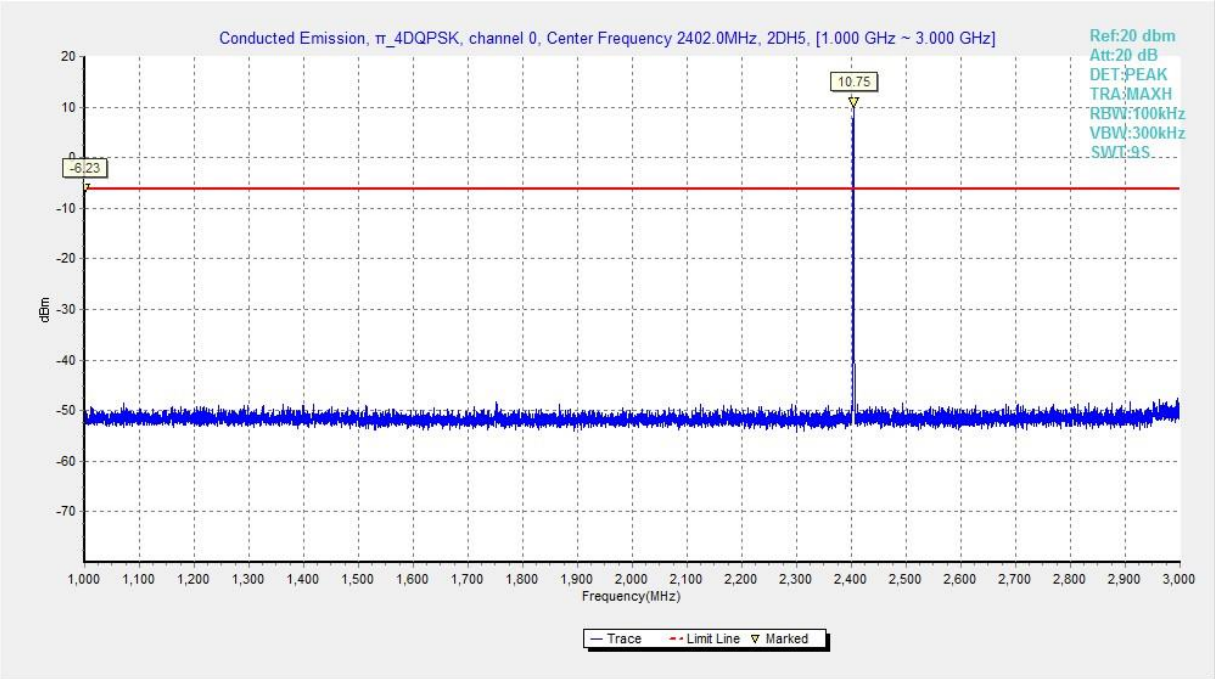

Fig. 7 Conducted Spurious Emission (π/4 DQPSK, CH0, 1GHz-3GHz)

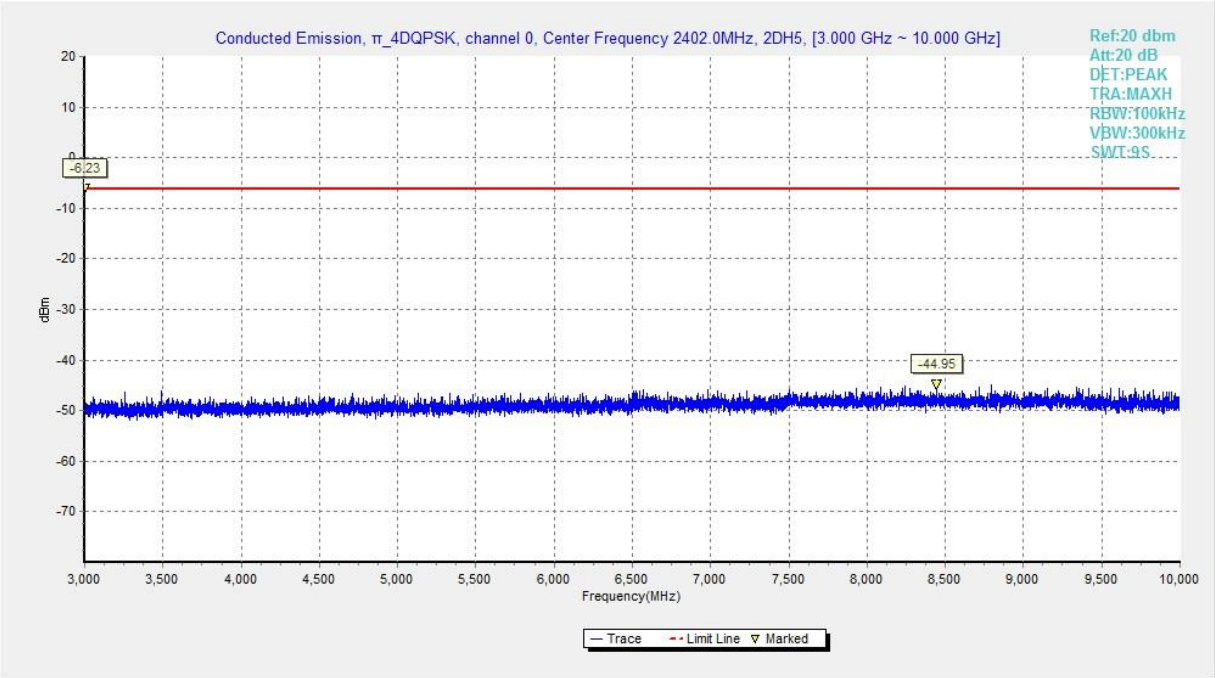

Fig. 8 Conducted Spurious Emission (π/4 DQPSK, CH0, 3GHz-10GHz)

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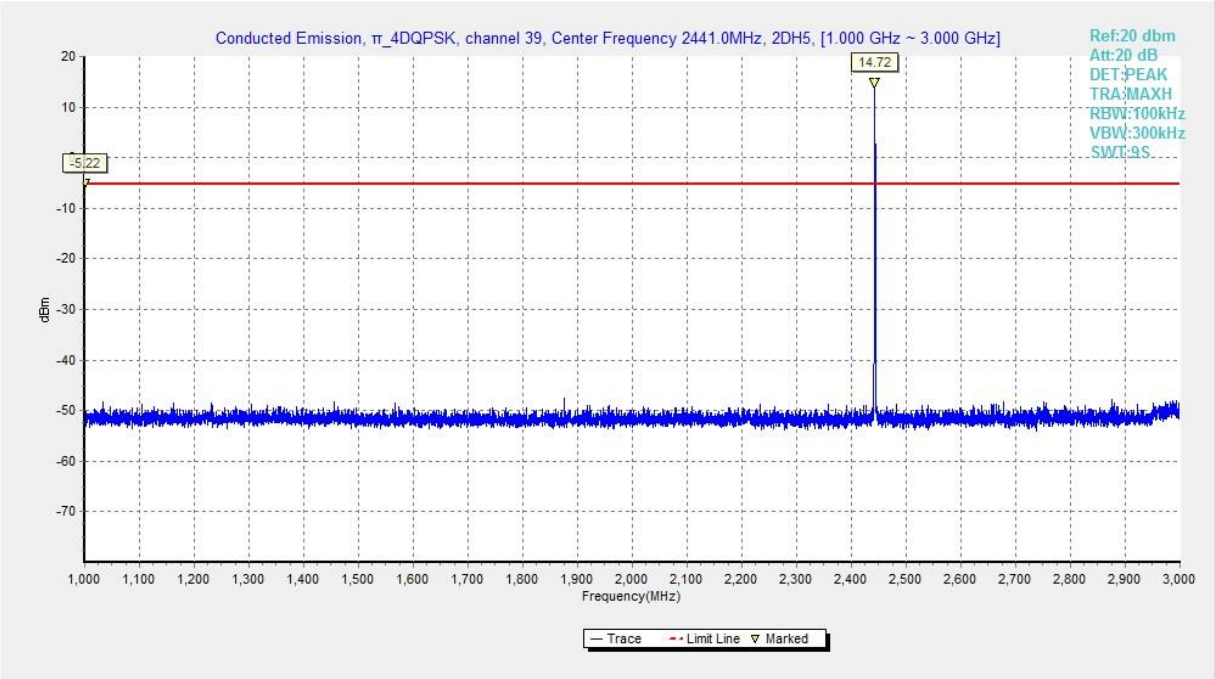

Fig. 9 Conducted Spurious Emission (π/4 DQPSK, CH39, 1GHz-3GHz)

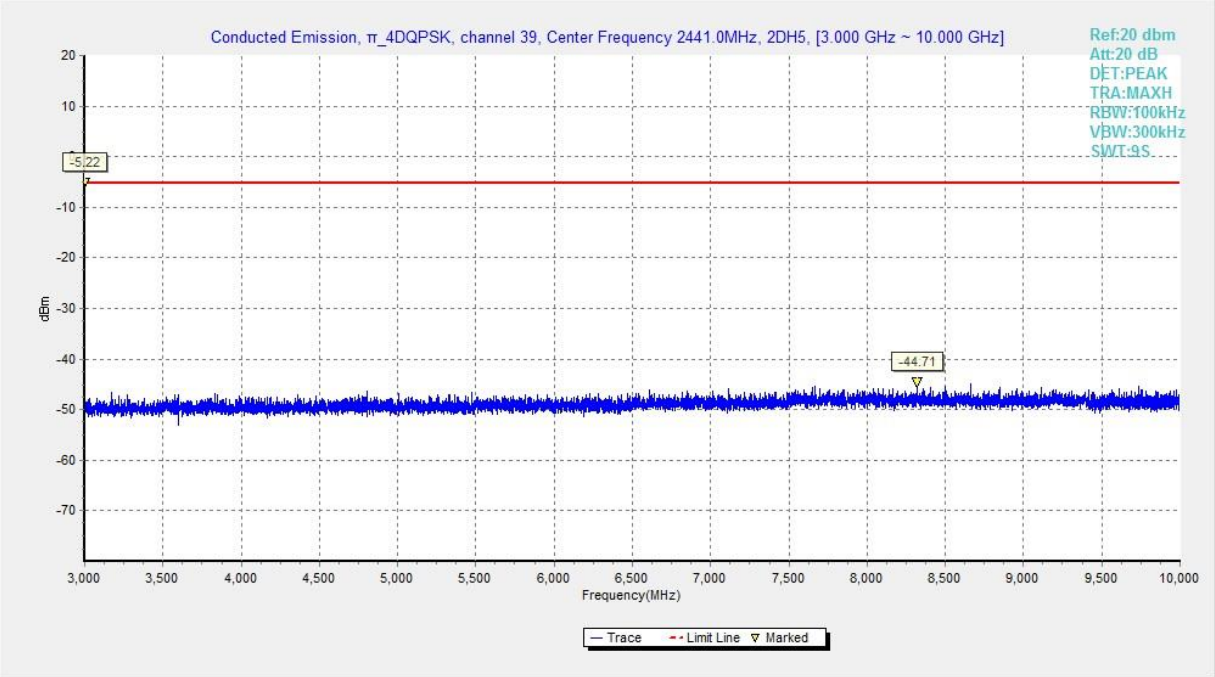

Fig. 10 Conducted Spurious Emission (π/4 DQPSK, CH39, 3GHz-10GHz)

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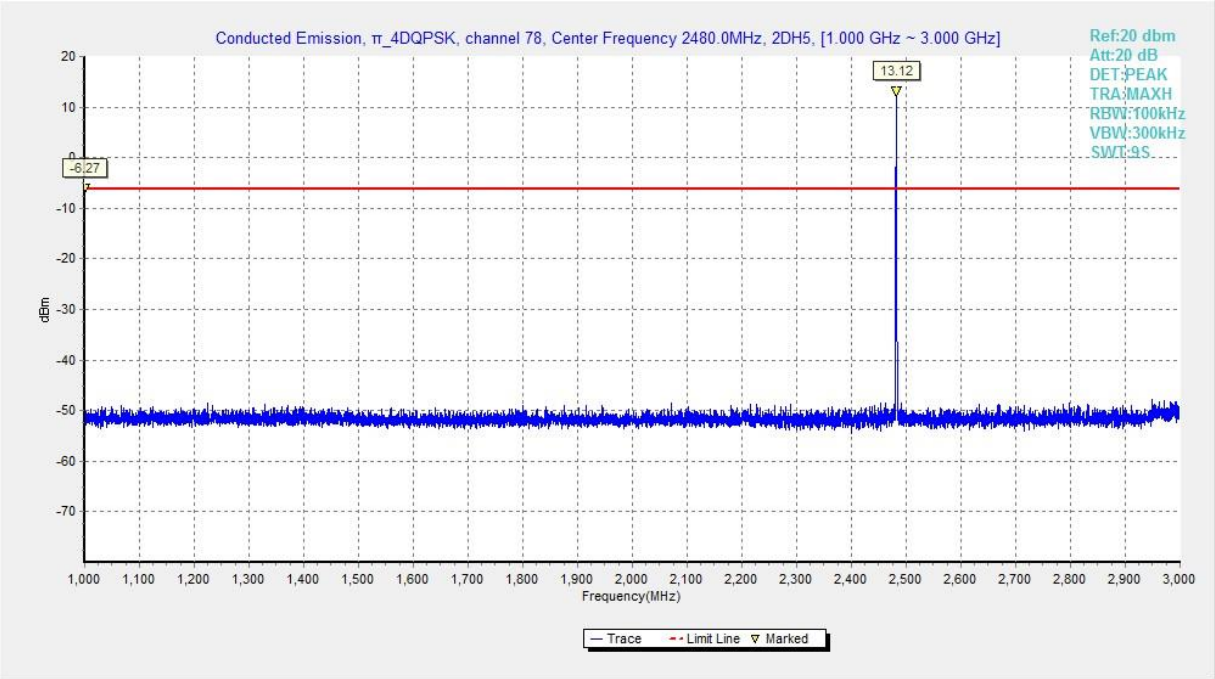

Fig. 11 Conducted Spurious Emission (π/4 DQPSK, CH78, 1GHz-3GHz)

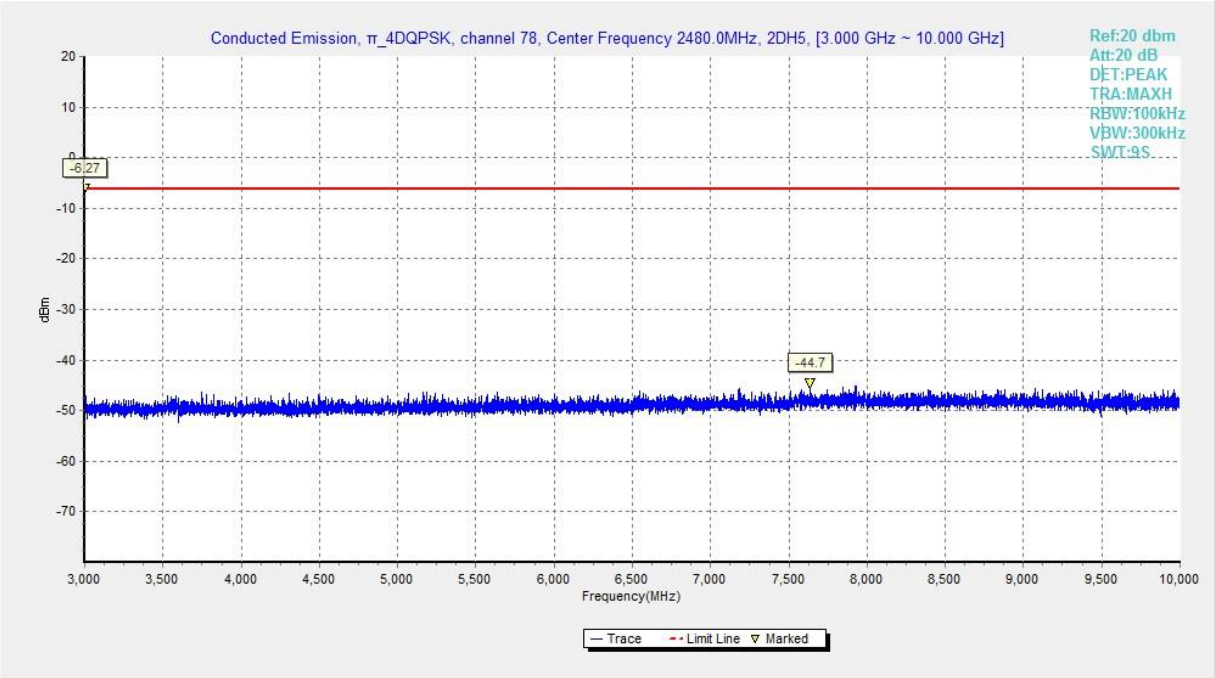

Fig. 12 Conducted Spurious Emission (π/4 DQPSK, CH78, 3GHz-10GHz)

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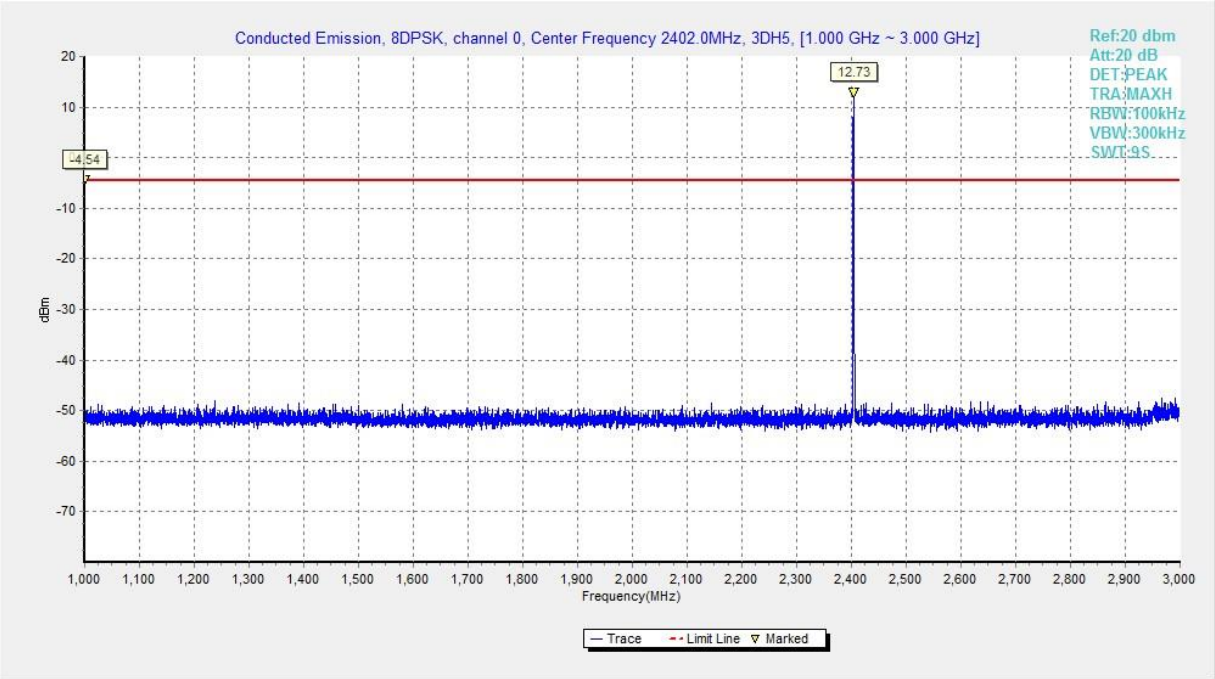

Fig. 13 Conducted Spurious Emission (8DPSK, CH0, 1GHz-3GHz)

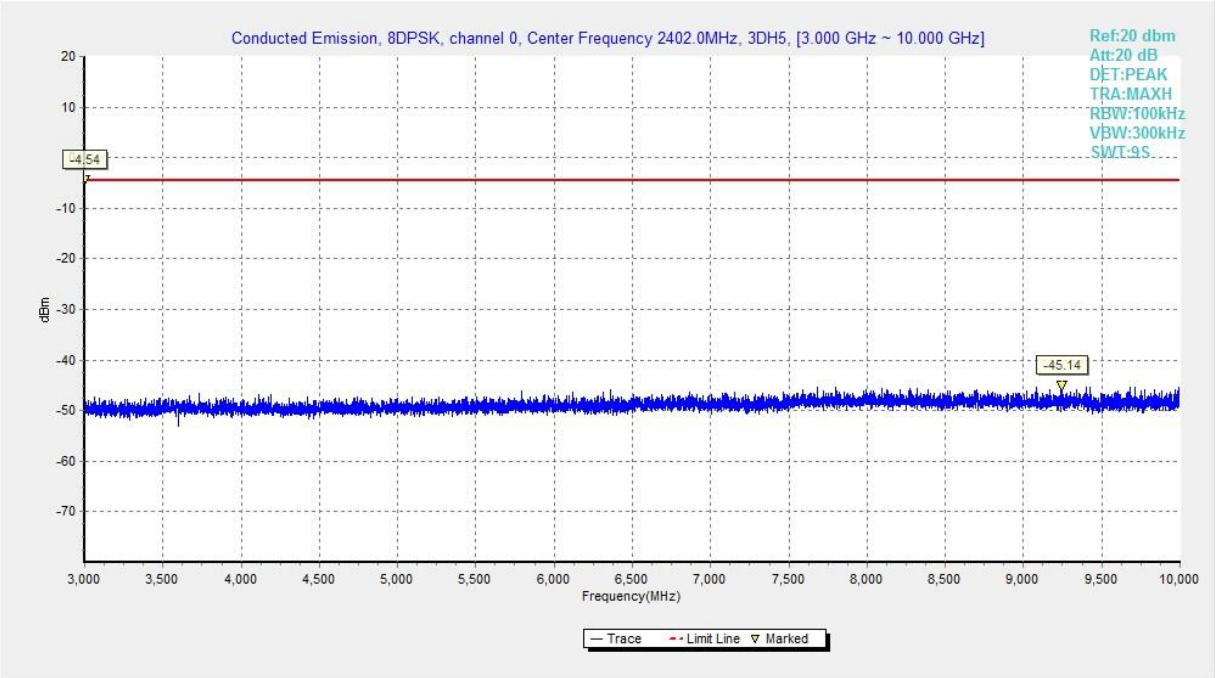

Fig. 14 Conducted Spurious Emission (8DPSK, CH0, 3GHz-10GHz)

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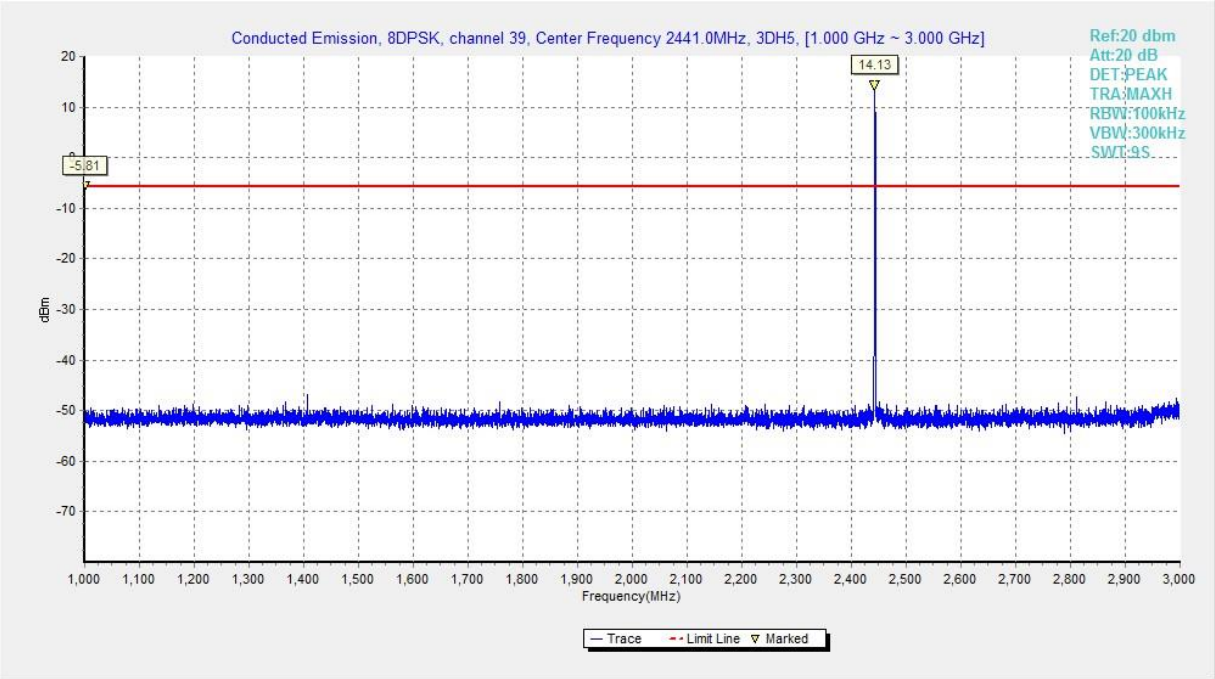

Fig. 15 Conducted Spurious Emission (8DPSK, CH39, 1GHz-3GHz)

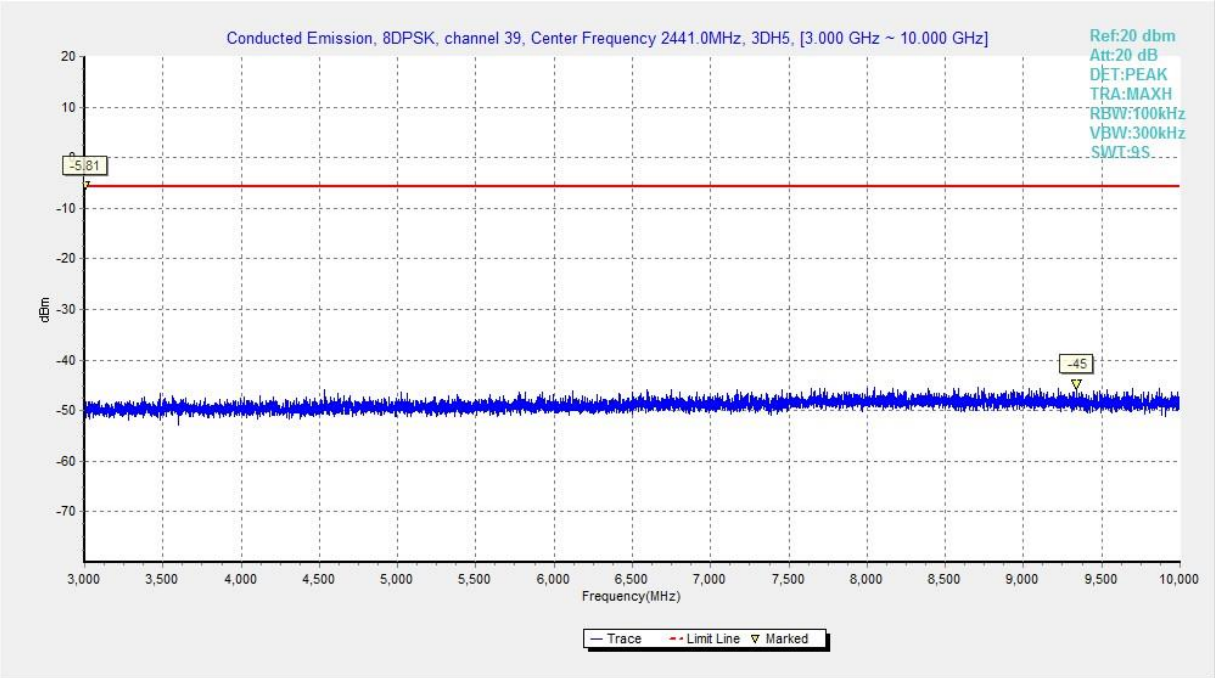

Fig. 16 Conducted Spurious Emission (8DPSK, CH39, 3GHz-10GHz)

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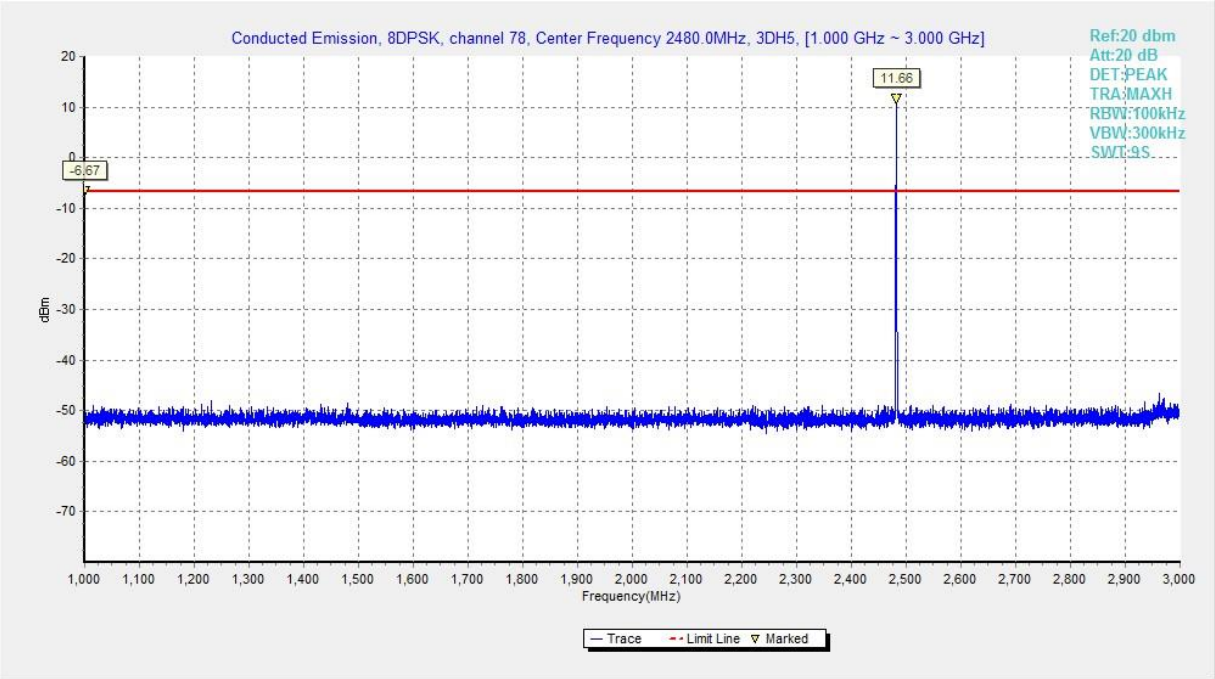

Fig. 17 Conducted Spurious Emission (8DPSK, CH78, 1GHz-3GHz)

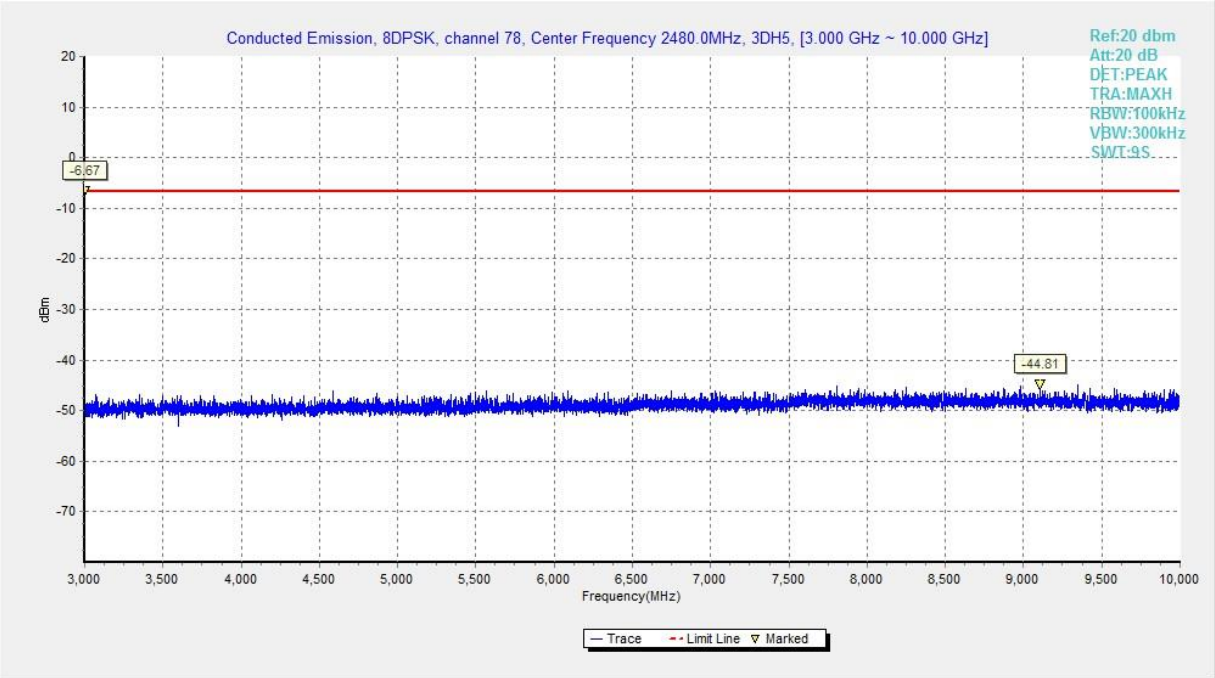

Fig. 18 Conducted Spurious Emission (8DPSK, Ch78, 3GHz-10GHz)

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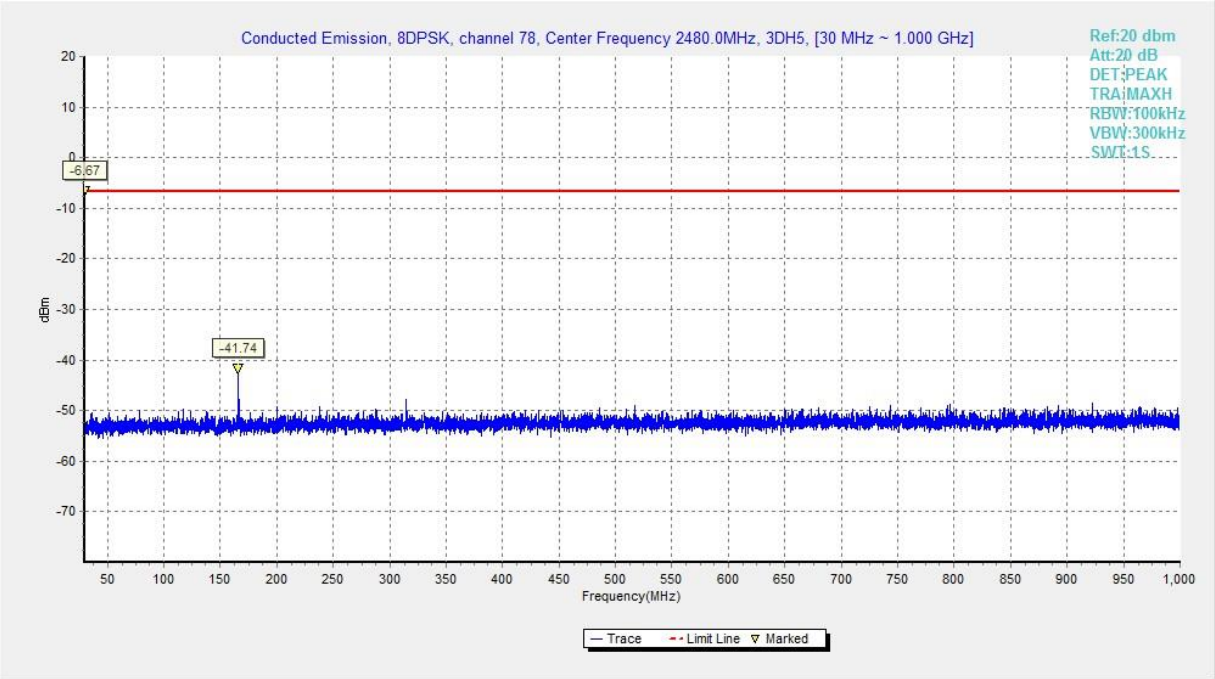

Fig. 19 Conducted Spurious Emission (All channel, 30MHz-1GHz)

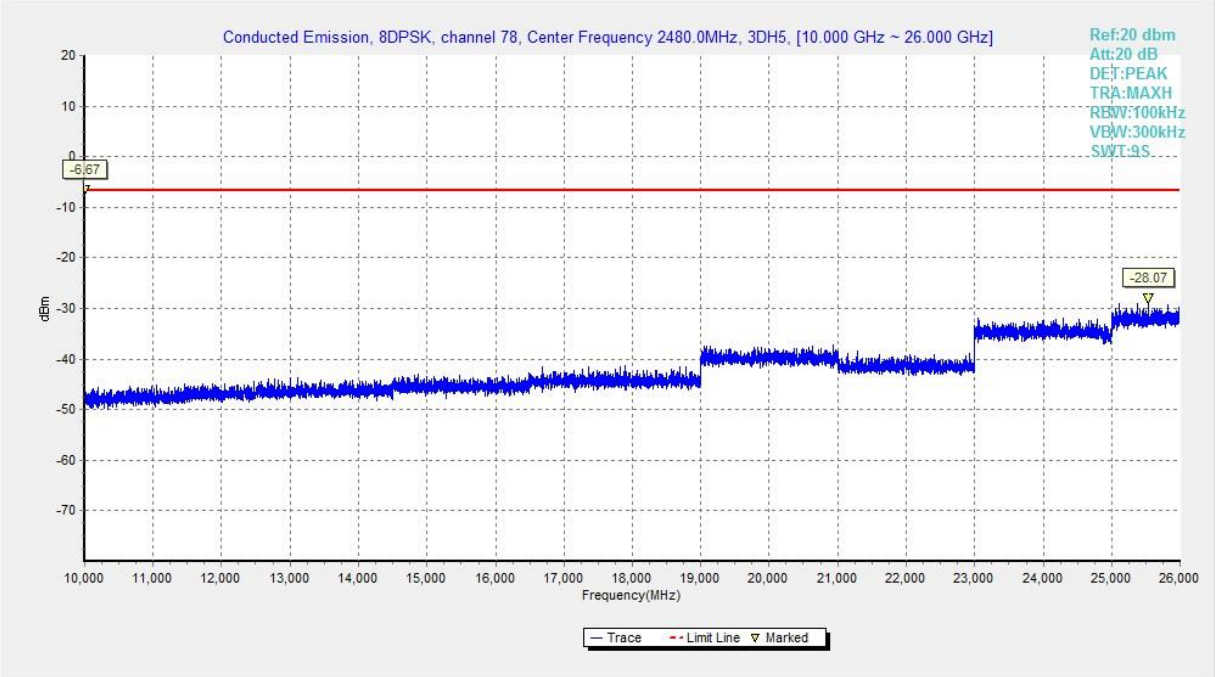

Fig. 20 Conducted Spurious Emission (All channel, 10GHz-26GHz)

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A.4 Radiated Emission

Method of Measurement: See ANSI C63.10-clause 6.3&6.4&6.5&6.6.

Measurement Limit:

Standard	Limit (dBm)
FCC 47 CFR Part 15.247, 15.205, 15.209 & RSS-247 section 5.5/RSS-Gen section 6.13	20dBm 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. For radiated measurement, pre-scanned in three orthogonal panels, X, Y, Z. The worst cases (Y plane) were recorded in this report.

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Measurement Results:

Mode	Frequency (MHz)	Frequency Range	Test Results	Conclusion
GFSK	2402(CH0)	1 GHz ~18 GHz	Fig.1	**P**
	2441(CH39)	1 GHz ~18 GHz	Fig.2	**P**
	2480(CH78)	1 GHz ~18 GHz	Fig.3	**P**
	Restricted Band (CH0)	2.38 GHz ~ 2.45 GHz	Fig.4	**P**
	Restricted Band (CH78)	2.45 GHz ~ 2.50GHz	Fig.5	**P**
π/4 DQPSK	2402(CH0)	1 GHz ~18 GHz	Fig.6	**P**
	2441(CH39)	1 GHz ~18 GHz	Fig.7	**P**
	2480(CH78)	1 GHz ~18 GHz	Fig.8	**P**
	Restricted Band (CH0)	2.38 GHz ~ 2.45 GHz	Fig.9	**P**
	Restricted Band (CH78)	2.45 GHz ~ 2.50 GHz	Fig.10	**P**
8DPSK	2402(CH0)	1 GHz ~18 GHz	Fig.11	**P**
	2441(CH39)	1 GHz ~18 GHz	Fig.12	**P**
	2480(CH78)	1 GHz ~18 GHz	Fig.13	**P**
	Restricted Band (CH0)	2.38 GHz ~ 2.45 GHz	Fig.14	**P**
	Restricted Band (CH78)	2.45 GHz ~ 2.50 GHz	Fig.15	**P**
/	All channels	9 kHz ~30 MHz	Fig.16	**P**
		30 MHz ~1 GHz	Fig.17	**P**
		18 GHz ~26.5 GHz	Fig.18	**P**

Worst Case Result

GFSK CH39 (1-18GHz)

Frequency (MHz)	MaxPeak (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Pol	Corr. (dB/m)
5576.700000	47.31	74.00	26.69	H	3.8
7059.857143	44.05	74.00	29.95	H	5.2
8991.428572	44.57	74.00	29.43	V	6.5
11625.428572	47.84	74.00	26.16	V	9.9
16587.428571	52.89	74.00	21.11	H	16.8
17896.714286	54.20	74.00	19.80	H	18.8

Frequency (MHz)	Average (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Pol	Corr. (dB/m)
5576.700000	35.07	54.00	18.93	H	3.8
7059.857143	31.99	54.00	22.01	H	5.2
8991.428572	32.43	54.00	21.57	V	6.5
11625.428572	35.29	54.00	18.71	V	9.9
16587.428571	40.81	54.00	13.19	H	16.8
17896.714286	41.78	54.00	12.22	H	18.8

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π/4 DQPSK CH39 (1-18GHz)

Frequency (MHz)	MaxPeak (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Pol	Corr. (dB/m)
4194.300000	45.39	74.00	28.61	V	2.5
6593.142857	45.38	74.00	28.62	H	6.0
8991.428572	48.34	74.00	25.66	V	6.5
10452.857143	47.29	74.00	26.71	V	9.0
16995.428571	53.66	74.00	20.34	V	18.4
17913.428571	54.49	74.00	19.51	H	18.9

Frequency (MHz)	Average (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Pol	Corr. (dB/m)
4194.300000	33.40	54.00	20.60	V	2.5
6593.142857	31.86	54.00	22.14	H	6.0
8991.428572	33.64	54.00	20.36	V	6.5
10452.857143	35.08	54.00	18.92	V	9.0
16995.428571	41.72	54.00	12.28	V	18.4
17913.428571	42.34	54.00	11.66	H	18.9

8DPSK CH39 (1-18GHz)

Frequency (MHz)	MaxPeak (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Pol	Corr. (dB/m)
4651.200000	46.62	74.00	27.38	V	4.6
5810.100000	47.46	74.00	26.54	V	4.5
8984.142857	48.46	74.00	25.54	V	6.5
11197.285714	46.98	74.00	27.02	V	9.7
16983.000000	53.54	74.00	20.46	H	18.3
17939.142857	54.19	74.00	19.81	H	19.0

Frequency (MHz)	Average (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Pol	Corr. (dB/m)
4651.200000	34.28	54.00	19.72	V	4.6
5810.100000	35.47	54.00	18.53	V	4.5
8984.142857	33.50	54.00	20.50	V	6.5
11197.285714	34.49	54.00	19.51	V	9.7
16983.000000	41.39	54.00	12.61	H	18.3
17939.142857	42.54	54.00	11.46	H	19.0

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

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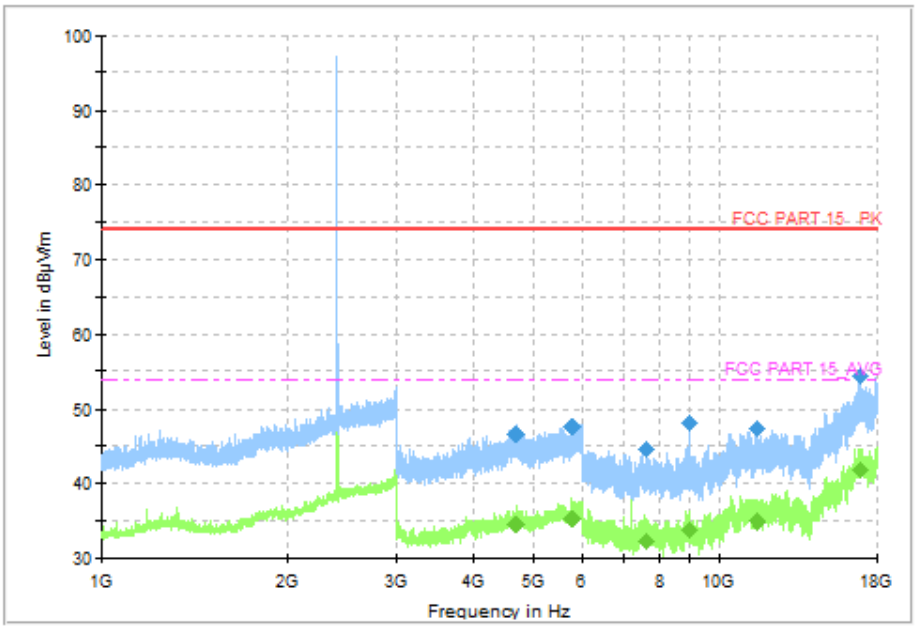

Fig. 1 Radiated Spurious Emission (GFSK, CH0, 1GHz ~18GHz)

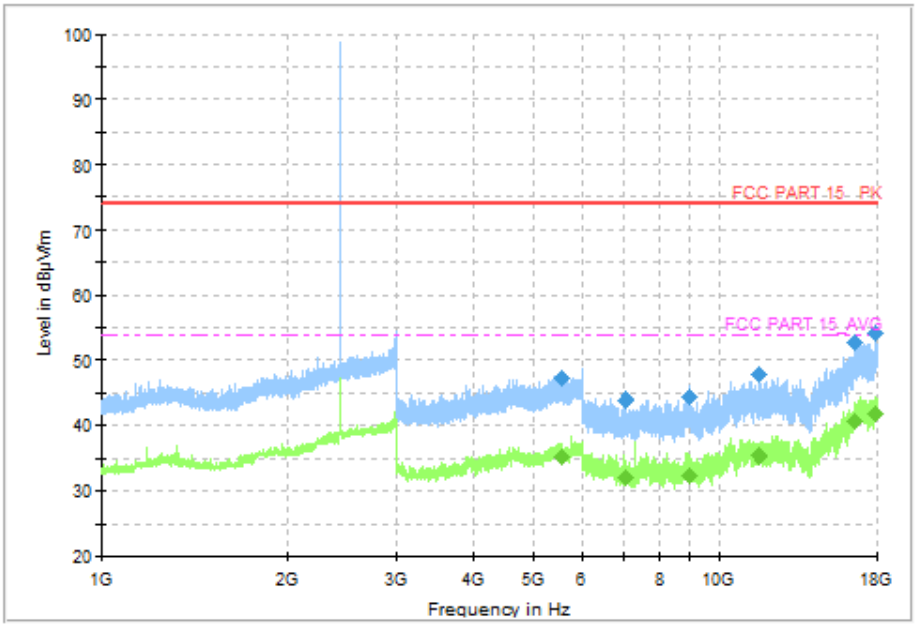

Fig. 2 Radiated Spurious Emission (GFSK, CH39, 1GHz ~18GHz)

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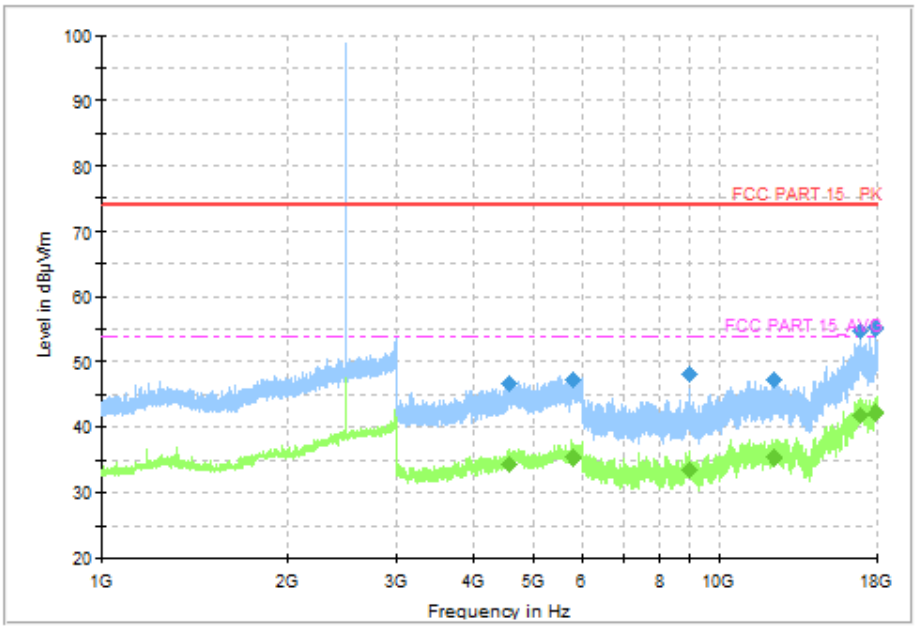

Fig. 3 Radiated Spurious Emission (GFSK, CH78, 1GHz ~18GHz)

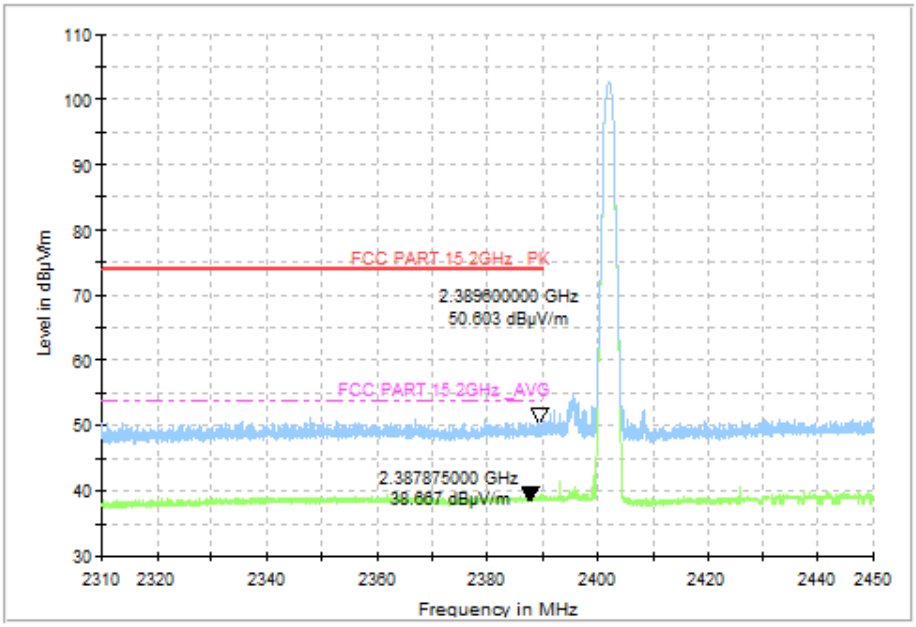

Fig. 4 Radiated Band Edges (GFSK, CH0, 2.38GHz~2.45GHz)

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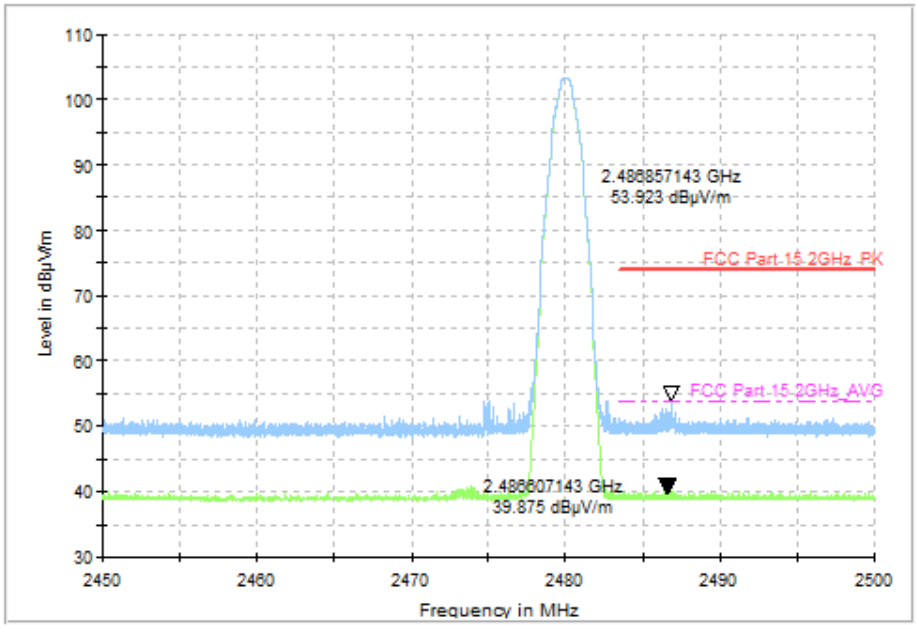

Fig. 5 Radiated Band Edges (GFSK, CH78, 2.45GHz~2.50GHz)

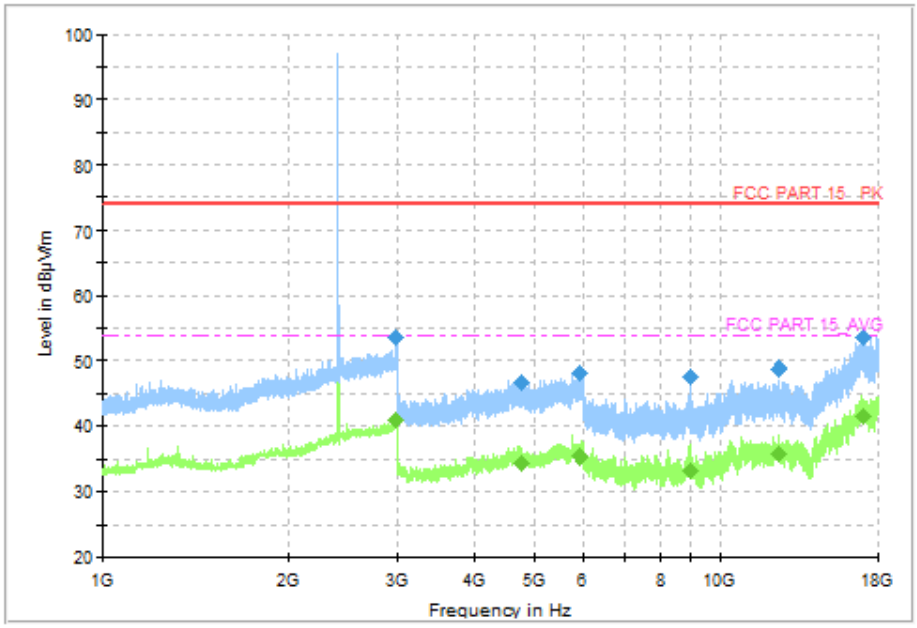

Fig. 6 Radiated Spurious Emission (π/4 DQPSK, CH0, 1GHz ~18GHz)

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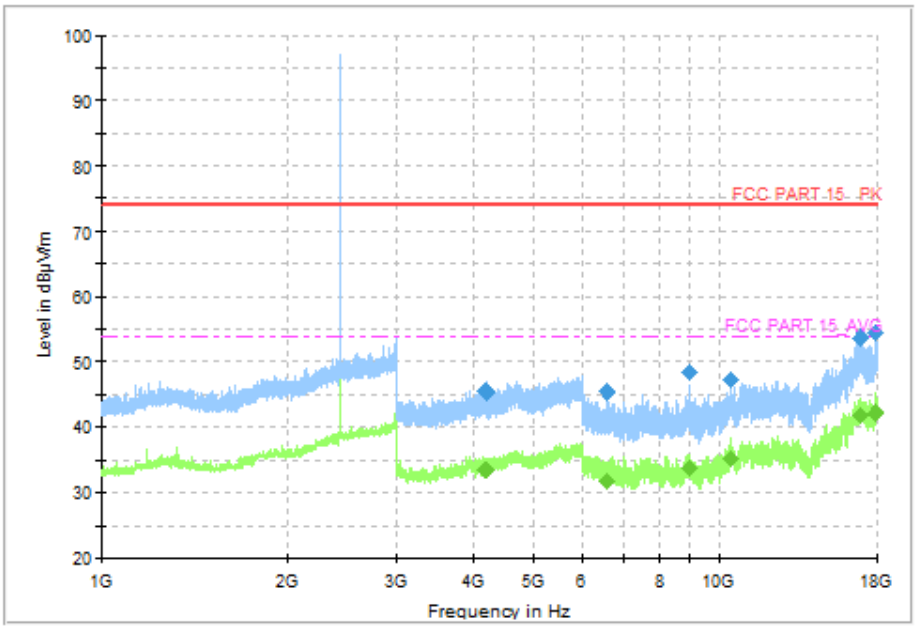

Fig. 7 Radiated Spurious Emission (π/4 DQPSK, CH39, 1GHz ~18GHz)

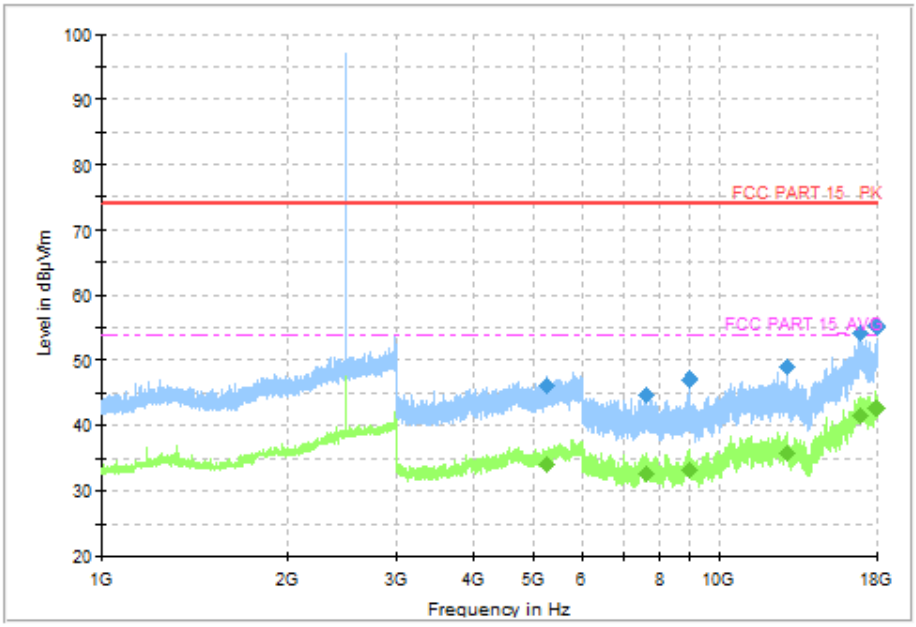

Fig. 8 Radiated Spurious Emission (π/4 DQPSK, CH78, 1GHz ~18GHz)

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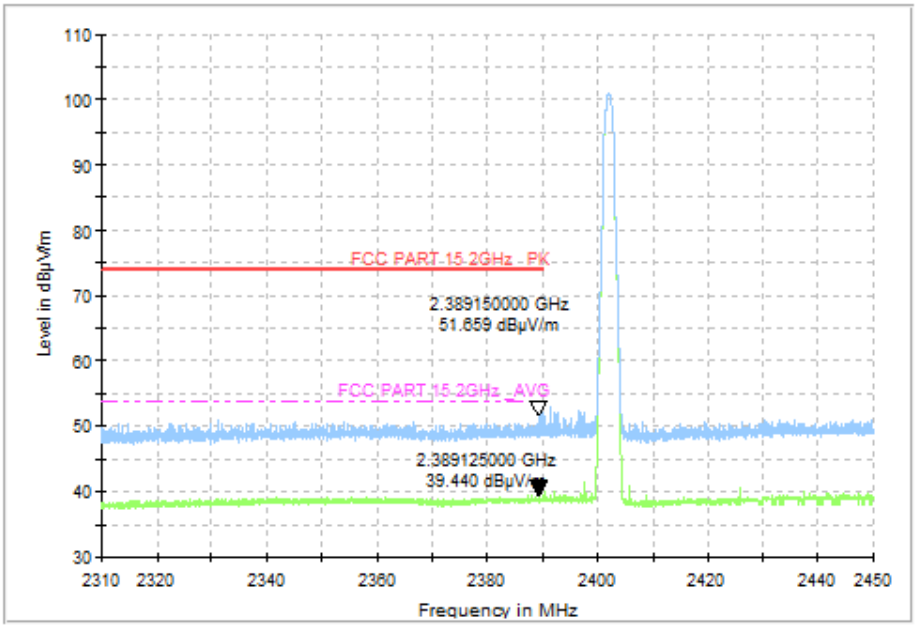

Fig. 9 Radiated Band Edges (π/4 DQPSK, CH0, 2.38GHz~2.45GHz)

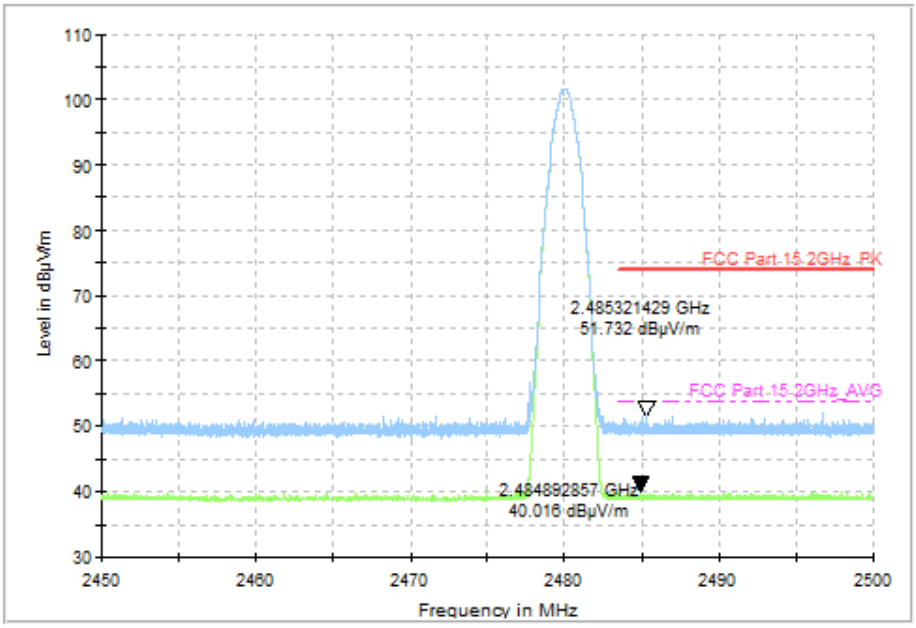

Fig. 10 Radiated Band Edges (π/4 DQPSK, CH78, 2.45GHz~2.50GHz)

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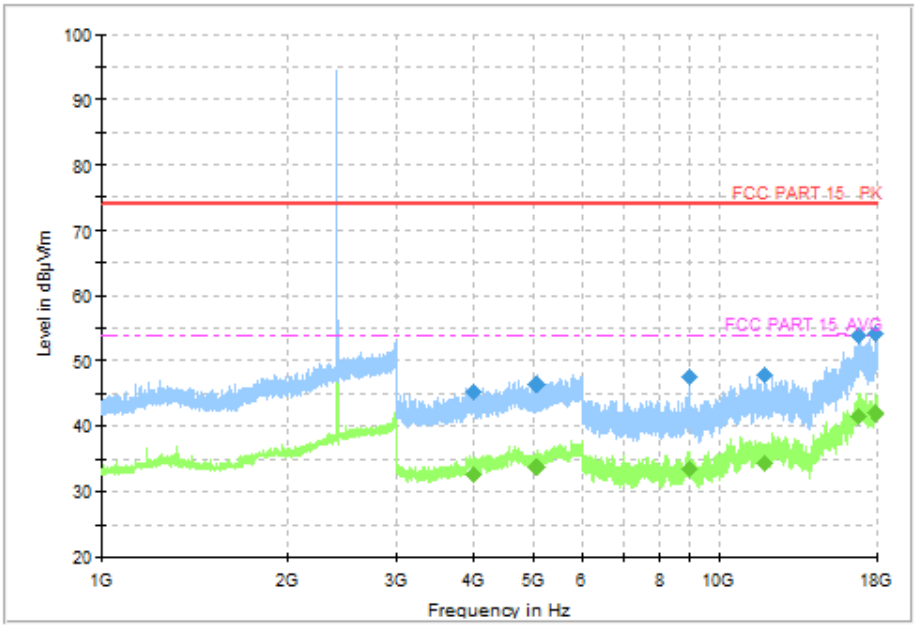

Fig. 11 Radiated Spurious Emission (8DPSK, CH0, 1GHz ~18GHz)

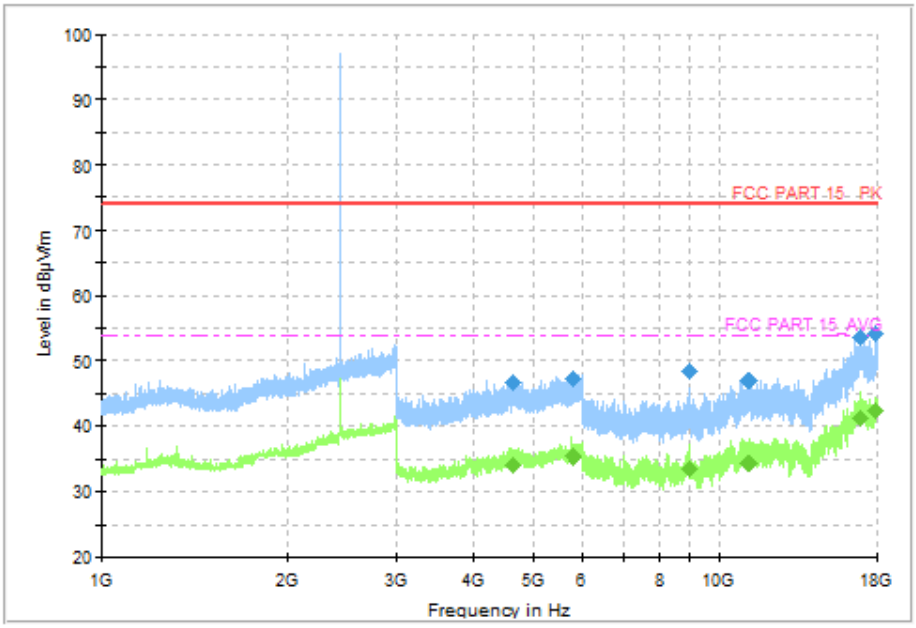

Fig. 12 Radiated Spurious Emission (8DPSK, CH39, 1GHz ~18GHz)

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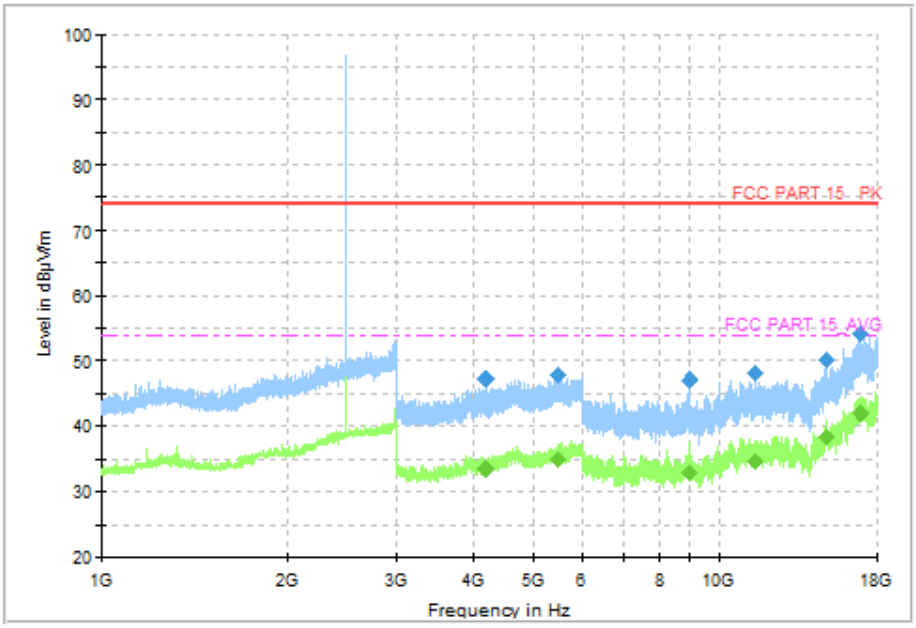

Fig. 13 Radiated Spurious Emission (8DPSK, CH78, 1GHz ~18GHz)

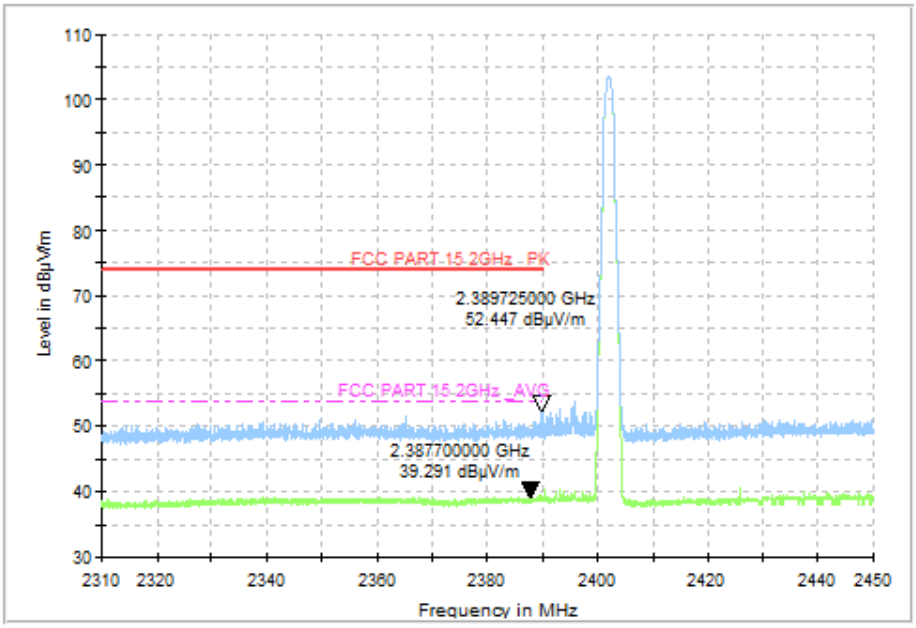

Fig. 14 Radiated Band Edges (8DPSK, CH0, 2.38GHz~2.45GHz)

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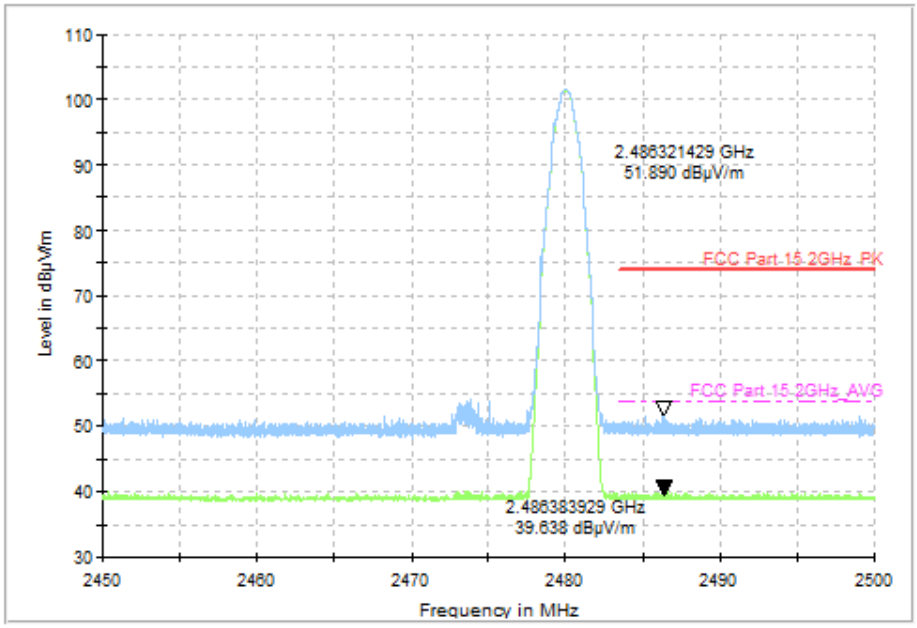

Fig. 15 Radiated Band Edges (8DPSK, CH78, 2.45GHz~2.50GHz)

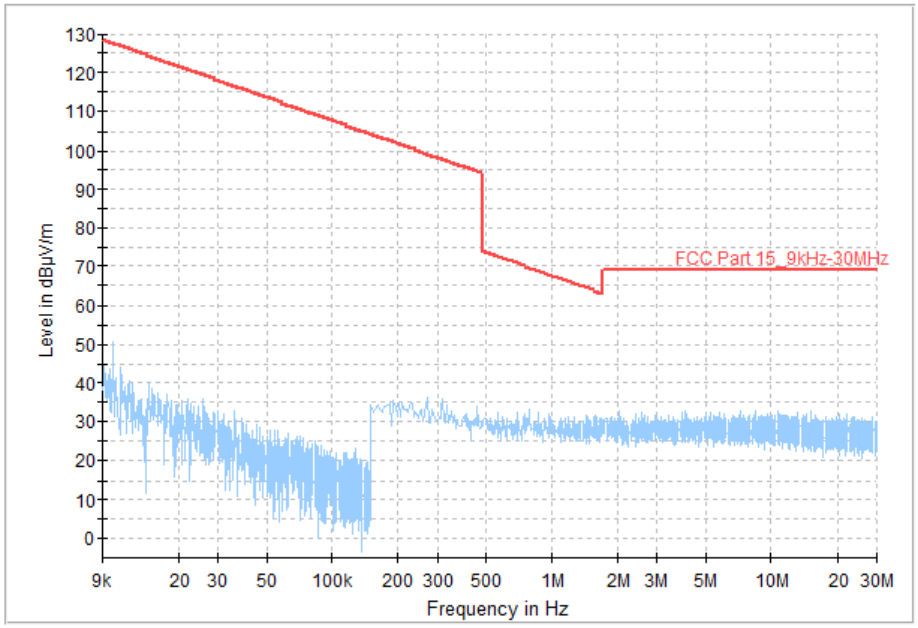

Fig. 16 Radiated Spurious Emission (All Channels, 9kHz ~30MHz)

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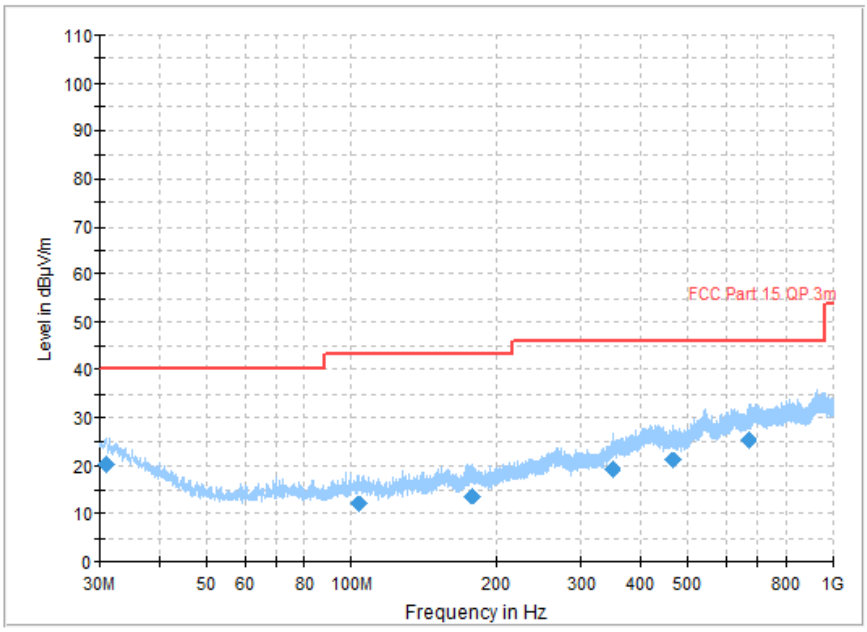

Fig. 17 Radiated Spurious Emission (All Channels, 30MHz ~1GHz)

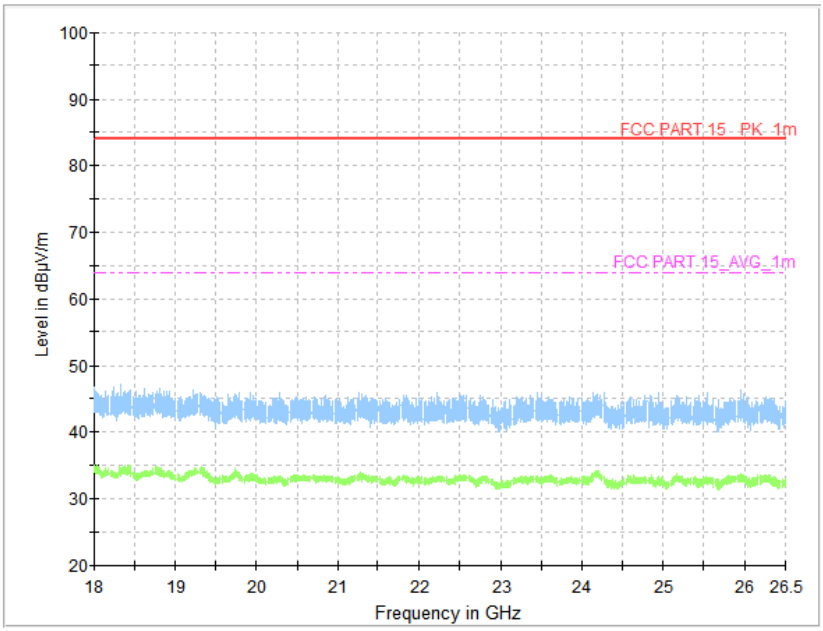

Fig. 18 Radiated Spurious Emission (All Channels, 18GHz ~26.5GHz)

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A.5 20dB Bandwidth

Method of Measurement: See ANSI C63.10-clause 7.8.7.

Measurement Limit:

Standard	Limit (kHz)
FCC 47 CFR Part 15.247 (a) & RSS-247 Section 5.1	/

Measurement Result:

Mode	Frequency (MHz)	20dB Bandwidth (kHz)	Conclusion
GFSK	2402(CH0)	881.25	**P**
	2441(CH39)	903.75	
	2480(CH78)	880.50	
π/4 DQPSK	2402(CH0)	1317.75	**P**
	2441(CH39)	1317.00	
	2480(CH78)	1318.50	
8DPSK	2402(CH0)	1283.25	**P**
	2441(CH39)	1284.00	
	2480(CH78)	1300.50	

See below for test graphs.

Conclusion: PASS

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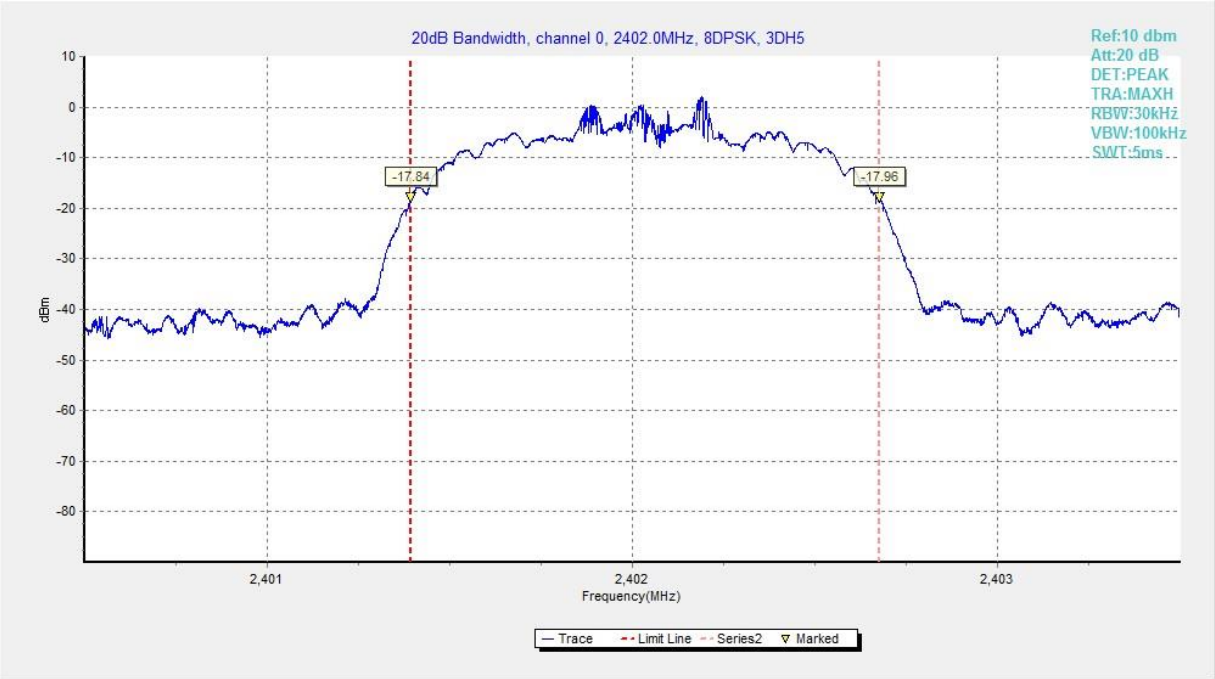

Fig. 1 20dB Bandwidth (8DPSK, CH0)

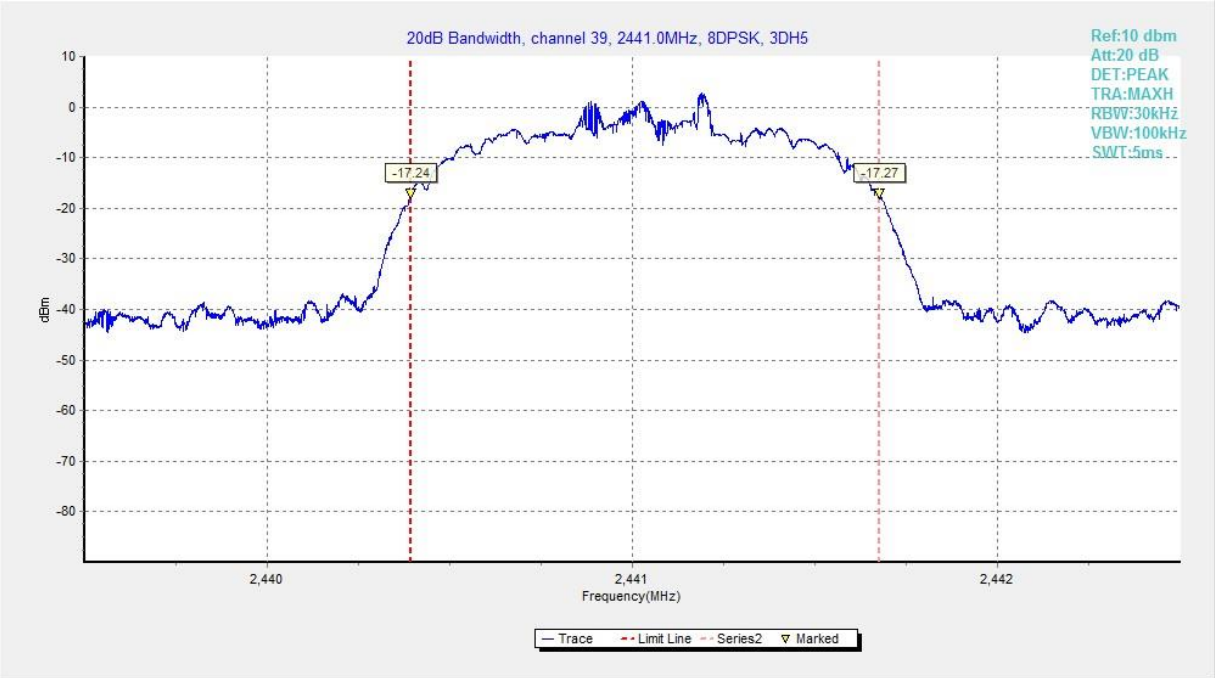

Fig. 2 20dB Bandwidth (8DPSK, CH39)

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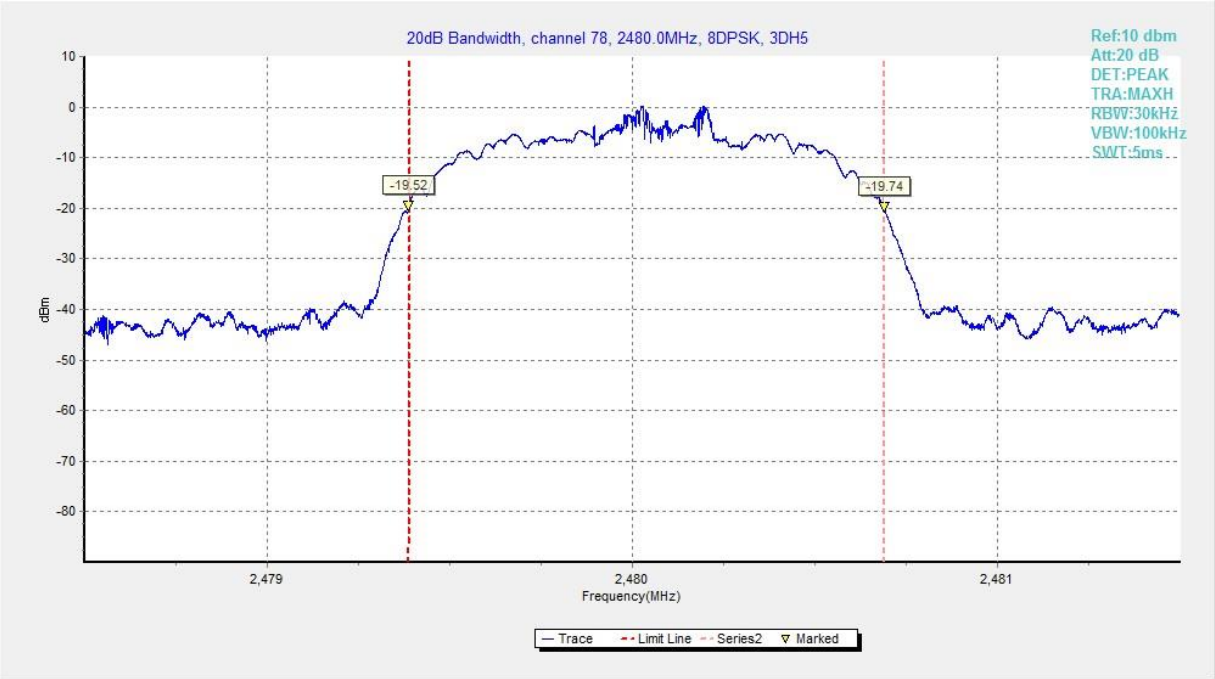

Fig. 3 20dB Bandwidth (8DPSK, CH78)

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A.6 Time of Occupancy (Dwell Time)

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

Measurement Limit:

Standard	Limit
FCC 47 CFR Part 15.247 (a) & RSS-247 Section 5.1	< 400 ms

Measurement Results:

Mode	Frequency (MHz)	Packet	Dwell Time(ms)	Conclusion
GFSK	2441(CH39)	DH5	190.16	**P**
π/4 DQPSK	2441(CH39)	2-DH5	193.27	**P**
8DPSK	2441(CH39)	3-DH5	372.68	**P**

See below for test graphs.

Conclusion: Pass

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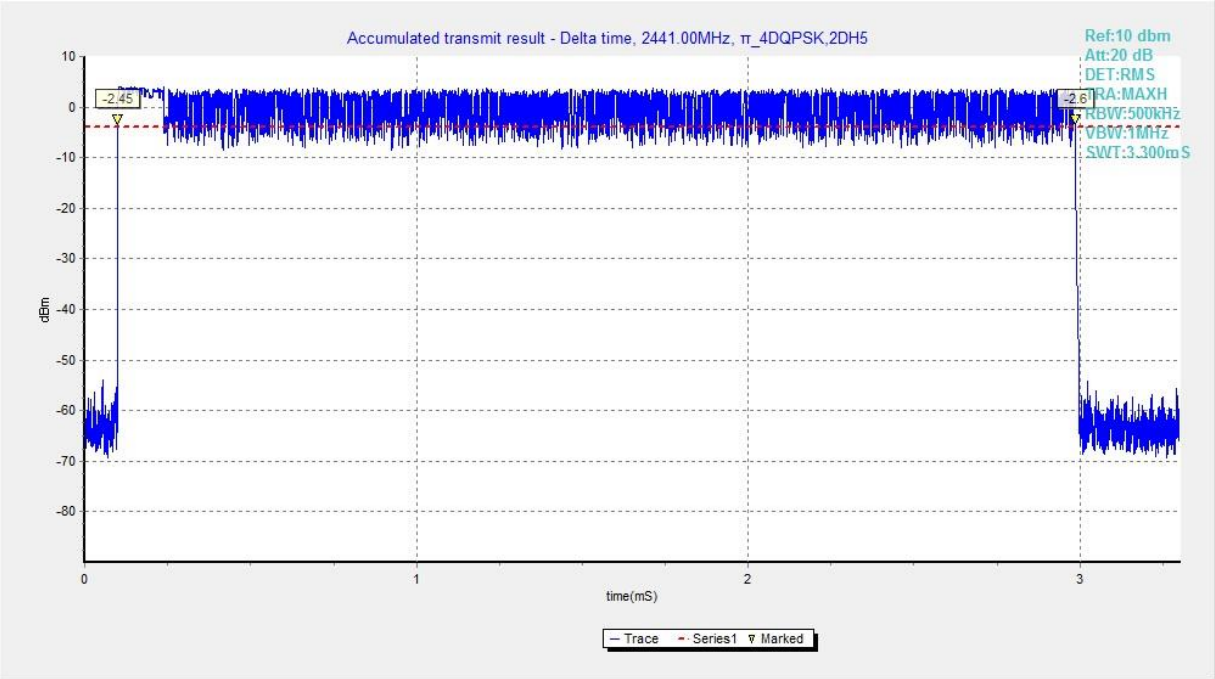

Fig. 1 Time of Occupancy (Dwell Time) (8DPSK, CH39)

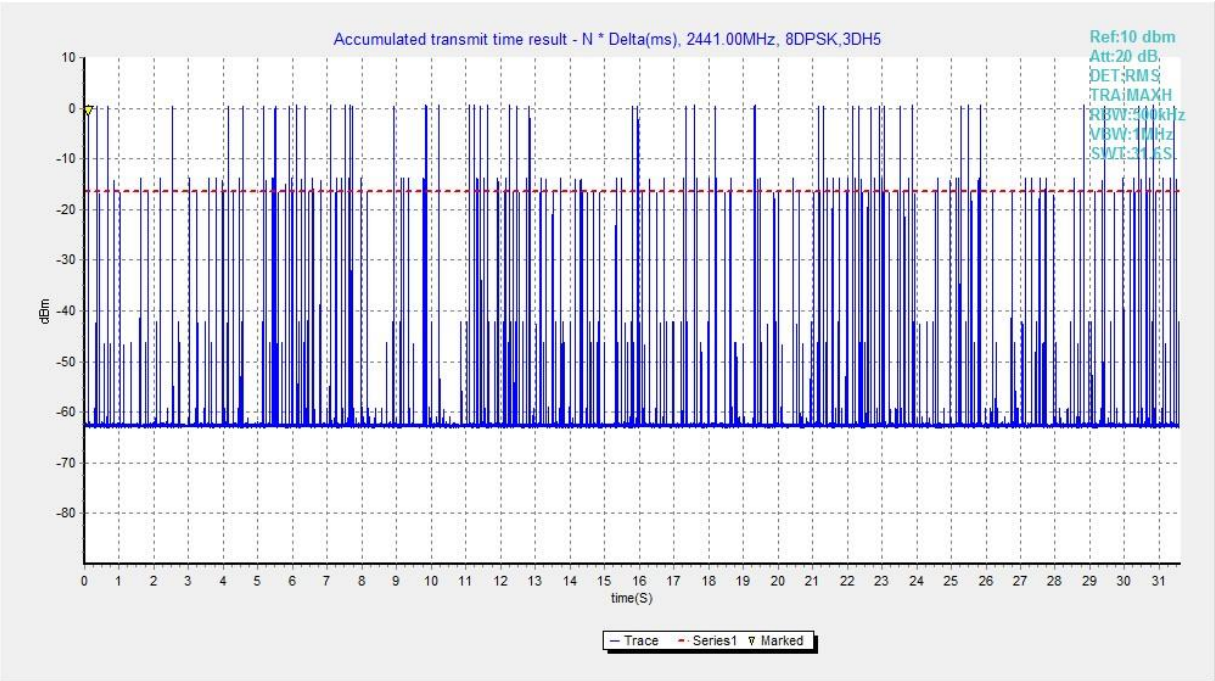

Fig. 2 Time of Occupancy (Dwell Time) (8DPSK, CH39)

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A.7 Number of Hopping Channels

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

Measurement Limit:

Standard	Limit
FCC 47 CFR Part 15.247(a) & RSS-247 Section 5.1	At least 15 non-overlapping channels

Measurement Results:

Mode	Packet	Number of hopping channels	Conclusion
GFSK	DH5	79	**P**
π/4 DQPSK	2-DH5	79	**P**
8DPSK	3-DH5	79	**P**

See below for test graphs.

Conclusion: Pass

Fig. 1 Hopping channel CH0~78 (GFSK)

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A.8 Carrier Frequency Separation

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

Measurement Limit:

Standard	Limit
FCC 47 CFR Part 15.247(a) & RSS-247 Section 5.1	By a minimum of 25 kHz or two-thirds of the 20 dB bandwidth of the hopping channel, whichever is greater

Measurement Results:

Mode	Frequency (MHz)	Packet	Carrier Frequency Separation (MHz)	Conclusion
GFSK	2441(CH39)	DH5	1.01	**P**
π/4 DQPSK	2441(CH39)	2-DH5	1.01	**P**
8DPSK	2441(CH39)	3-DH5	1.00	**P**

See below for test graphs.

Conclusion: Pass

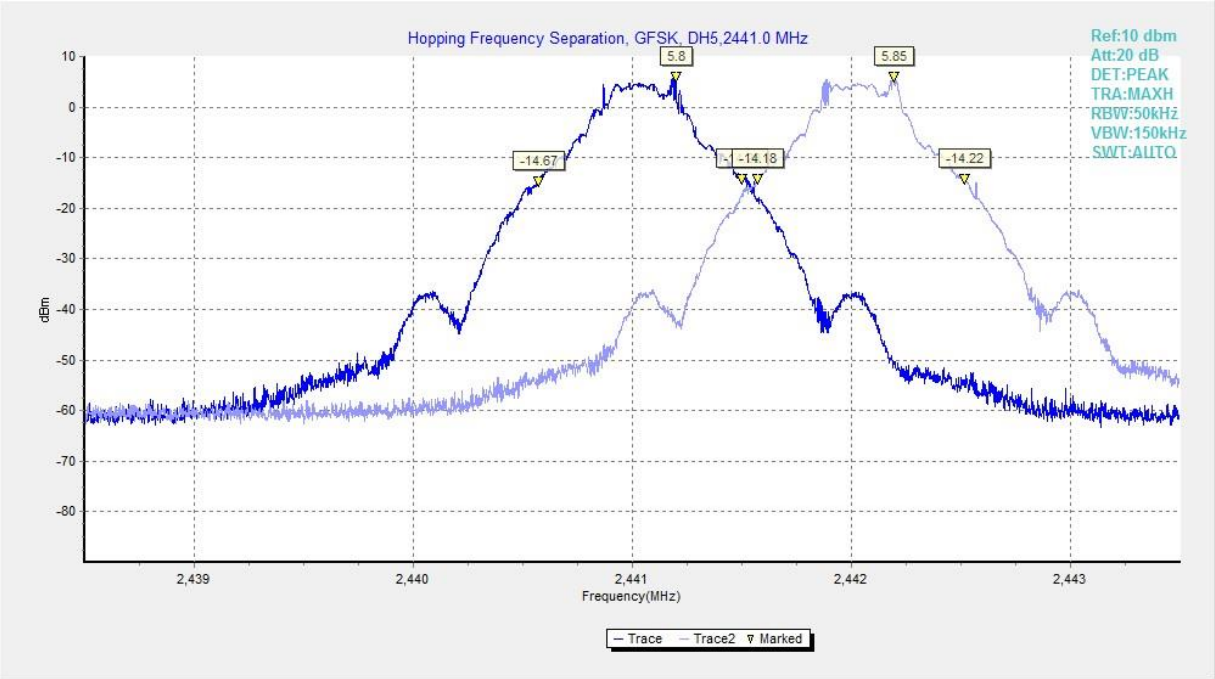

Fig. 1 Carrier Frequency Separation (GFSK, CH39)

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A.9 AC Power line Conducted Emission

Method of Measurement: See ANSI C63.10-clause 6.2.

Test Condition:

Voltage (V)	Frequency (Hz)
120	60

Measurement Result and limit:

Frequency range (MHz)	Quasi-peak Limit (dBμV)	Average-peak Limit (dBμV)	Result (dBμV)		Conclusion
			Traffic	Idle	
0.15 to 0.5	66 to 56	56 to 46	Fig.1	Fig.2	**P**
0.5 to 5	56	46			
5 to 30	60	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 below for test graphs.

Conclusion: Pass

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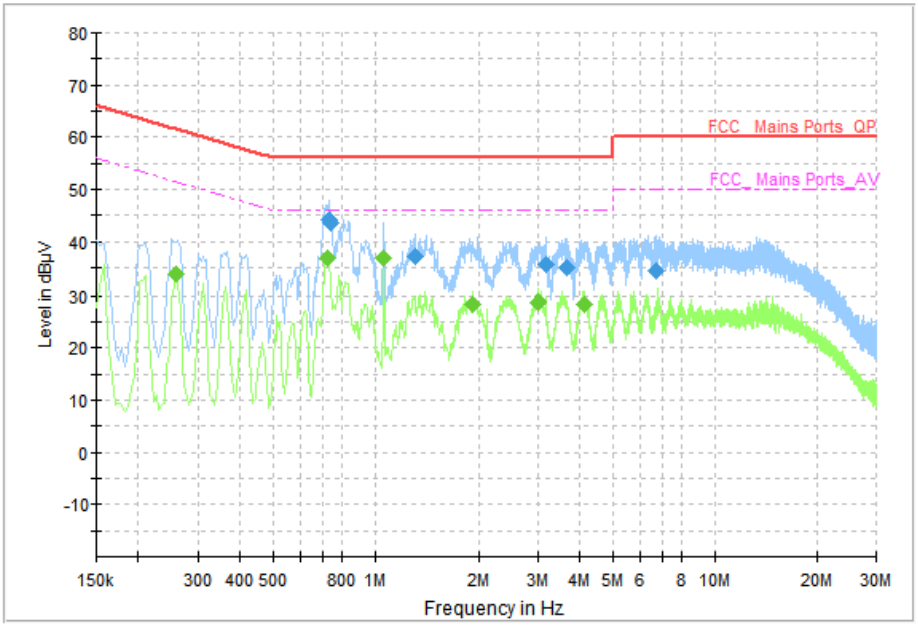

Fig. 1 AC Powerline Conducted Emission (Traffic)

Measurement Results: Quasi Peak

Frequency (MHz)	Quasi Peak (dBµV)	Limit (dBµV)	Margin (dB)	Line	Filter	Corr. (dB)
0.730000	44.20	56.00	11.80	N	ON	10
0.738000	43.49	56.00	12.51	N	ON	10
1.310000	37.32	56.00	18.68	N	ON	10
3.174000	35.76	56.00	20.24	N	ON	10
3.642000	34.90	56.00	21.10	N	ON	10
6.714000	34.37	60.00	25.63	N	ON	10

Measurement Results: Average

Frequency (MHz)	Average (dBµV)	Limit (dBµV)	Margin (dB)	Line	Filter	Corr. (dB)
0.258000	33.74	51.50	17.76	N	ON	10
0.722000	36.90	46.00	9.10	L1	ON	10
1.058000	36.89	46.00	9.11	L1	ON	10
1.922000	28.42	46.00	17.58	N	ON	10
3.010000	28.63	46.00	17.37	N	ON	10
4.110000	28.24	46.00	17.76	N	ON	10

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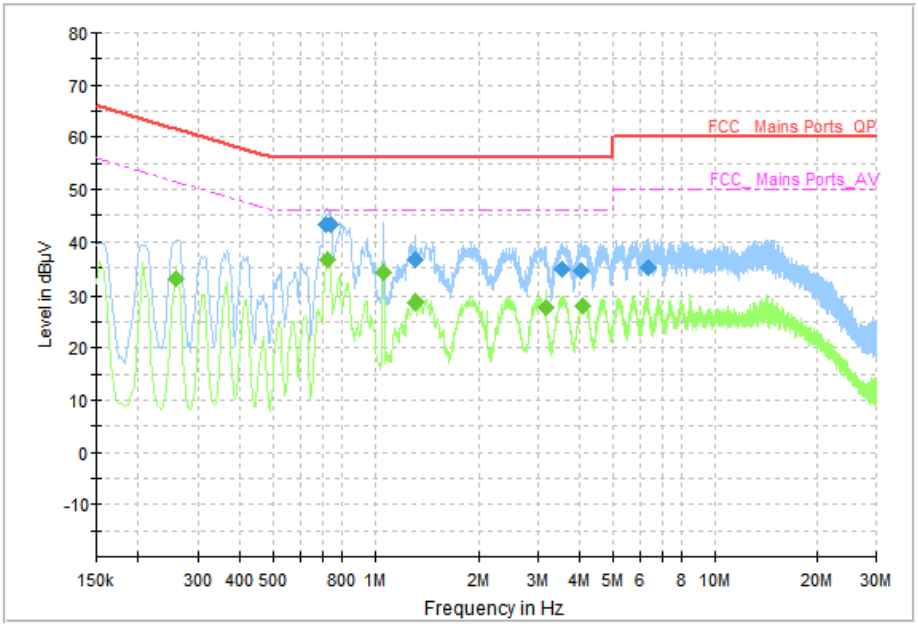

Fig. 2 AC Power line Conducted Emission (Idle)

Measurement Results: Quasi Peak

Frequency (MHz)	Quasi Peak (dBµV)	Limit (dBµV)	Margin (dB)	Line	Filter	Corr. (dB)
0.714000	43.32	56.00	12.68	N	ON	10
0.738000	43.37	56.00	12.63	N	ON	10
1.314000	36.66	56.00	19.34	N	ON	10
3.526000	34.78	56.00	21.22	N	ON	10
4.046000	34.58	56.00	21.42	N	ON	10
6.338000	34.92	60.00	25.08	N	ON	10

Measurement Results: Average

Frequency (MHz)	Average (dBµV)	Limit (dBµV)	Margin (dB)	Line	Filter	Corr. (dB)
0.258000	32.89	51.50	18.61	L1	ON	10
0.726000	36.64	46.00	9.36	N	ON	10
1.054000	34.04	46.00	11.96	N	ON	10
1.314000	28.51	46.00	17.49	N	ON	10
3.174000	27.72	46.00	18.28	L1	ON	10
4.074000	28.02	46.00	17.98	N	ON	10

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A.10 99% Occupied Bandwidth

Measurement Limit:

Standard	Limit
RSS-Gen section 6.7	/

Measurement Result:

Mode	Channel	Occupied Bandwidth (kHz)	Conclusion
GFSK	0	829.50	/
	39	838.50	
	78	836.50	
π /4 DQPSK	0	1182.50	/
	39	1196.00	
	78	1181.00	
8DPSK	0	1195.00	/
	39	1208.50	
	78	1199.00	

See below for test graphs.

Conclusion: PASS

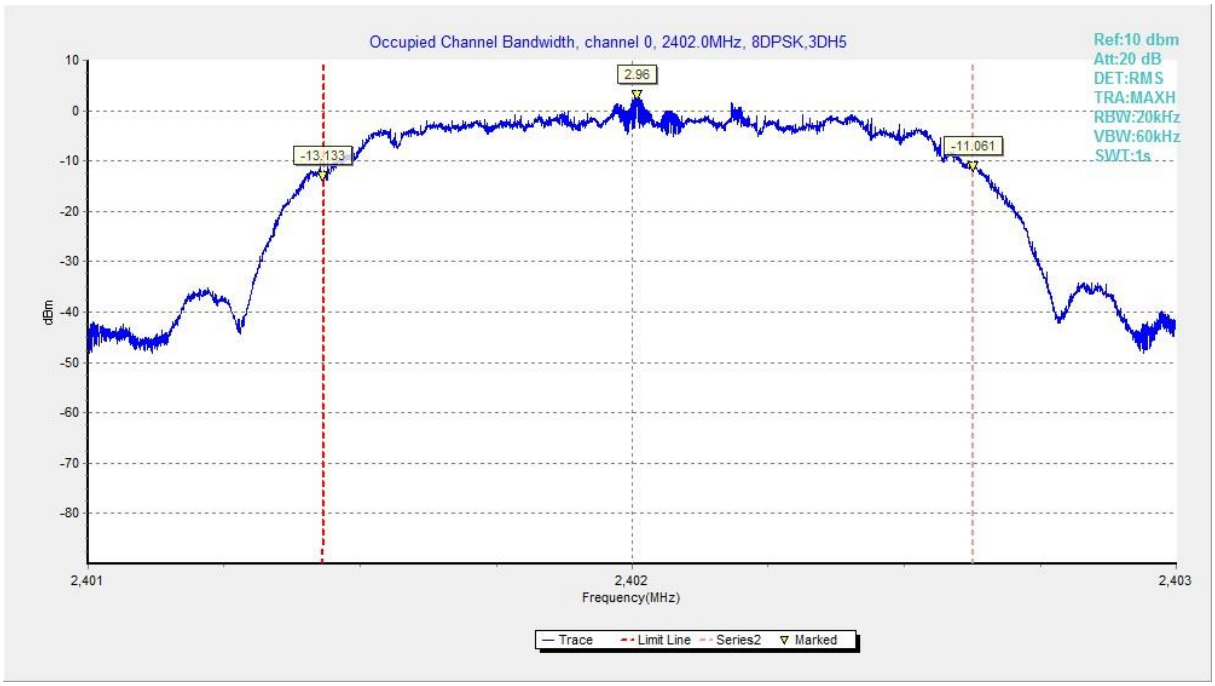

Fig. 1 99% Occupied Bandwidth (8DPSK, Ch 0)

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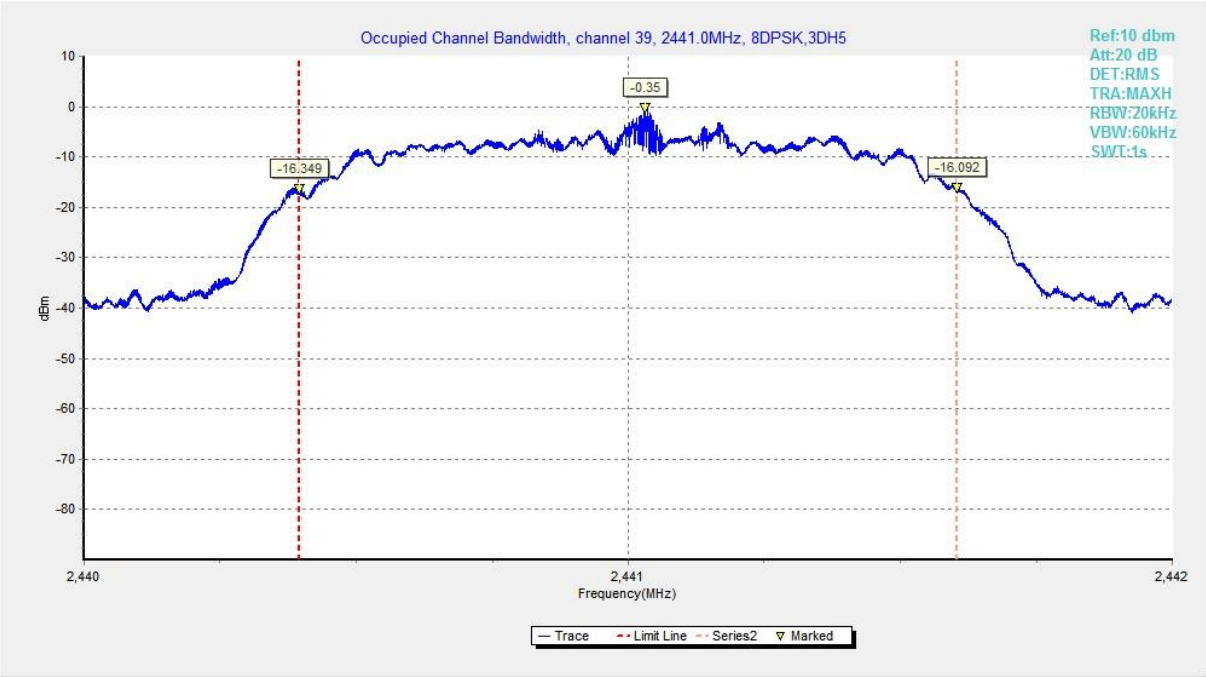

Fig. 2 99% Occupied Bandwidth (8DPSK, Ch 39)

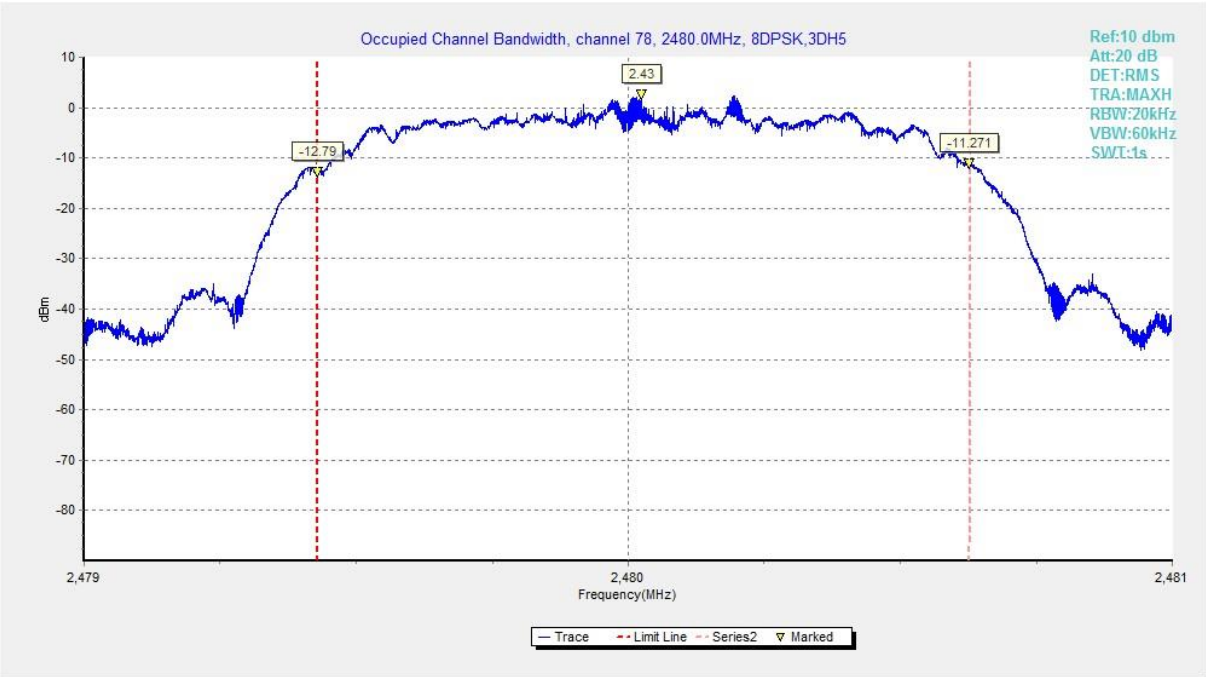

Fig. 3 99% Occupied Bandwidth (8DPSK, Ch 78)

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

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