



**FCC PART 15C
TEST REPORT
No. B17N00006-BT**

for

Huawei Technologies Co., Ltd.

Smart Watch

Model Name: LEO-DLXX

With

Hardware Version: EA1LEOUM

Software Version: sawshark-userdebug7.1.1NFF47

FCC ID: QISLEO-DLXX

Issued Date: 2017-02-14

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.

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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°C

Extreme Temperature: -10/+55°C

Relative Humidity: 20-75%

1.3. Project data

Testing Start Date: 2017-01-04

Testing End Date: 2017-02-09

1.4. Signature

An Ran

(Prepared this test report)

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(Reviewed this test report)

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(Approved this test report)



2. Client Information

2.1. Applicant Information

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

3.1. About EUT

Description	Smart Watch
Model Name	LEO-DLXX
Market Name	/
Frequency Band	2402MHz~2480MHz
Type of Modulation	GFSK/π /4 DQPSK/8DPSK
Number of Channels	79
FCC ID	QISLEO-DLXX

3.2. Internal Identification of EUT

EUT ID*	IMEI	HW Version	SW Version	Receive Date
EUT1	/	EA1LEOUM	sawshark-userdebug7.1.1NFF47	2017-01-04

*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	DONGGUAN PHITEK ELECTRONICS CO.,LTD.

AE2

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

AE3

Model	HW-050100U01
Manufacturer	HUIZHOU BYD 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 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 B** and **ANNEX C** 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	2017-03-21	1 year
2	Bluetooth Tester	CBT32	100584	Rohde & Schwarz	2018-01-05	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 330	Schwarzbeck	2017-04-22	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 -5dBi.

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	Fig.1	15.09	Fig.2	15.66	Fig.3	15.64
π /4 DQPSK	Fig.4	13.31	Fig.5	14.01	Fig.6	14.62
8DPSK	Fig.7	13.85	Fig.8	14.57	Fig.9	15.13

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.10	P
	78	ON	Fig.11	P
$\pi/4$ DQPSK	0	ON	Fig.12	P
	78	ON	Fig.13	P
8DPSK	0	ON	Fig.14	P
	78	ON	Fig.15	P

Mode	Channel	Hopping	Test Results	Conclusion
GFSK	0	OFF	Fig.16	P
	78	OFF	Fig.17	P
$\pi/4$ DQPSK	0	OFF	Fig.18	P
	78	OFF	Fig.19	P
8DPSK	0	OFF	Fig.20	P
	78	OFF	Fig.21	P

See ANNEX C 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.22	P
		30 MHz-3GHz	Fig.23	P
		3GHz-18GHz	Fig.24	P
	39	2.441 GHz	Fig.25	P
		30 MHz-3 GHz	Fig.26	P
		3GHz-18GHz	Fig.27	P
	78	2.480 GHz	Fig.28	P
		30 MHz-3GHz	Fig.29	P
		3GHz-18GHz	Fig.30	P
$\pi/4$ DQPSK	0	2.402 GHz	Fig.31	P
		30 MHz-3 GHz	Fig.32	P
		3GHz-18GHz	Fig.33	P
	39	2.441 GHz	Fig.34	P
		30 MHz-3GHz	Fig.35	P
		3GHz-18Ghz	Fig.36	P
	78	2.480 GHz	Fig.37	P
		30 MHz-3GHz	Fig.38	P
		3GHz-18Ghz	Fig.39	P
8DPSK	0	2.402 GHz	Fig.40	P
		30 MHz-3GHz	Fig.41	P
		3GHz-18GHz	Fig.42	P
	39	2.441 GHz	Fig.43	P
		30 MHz-3GHz	Fig.44	P
		3GHz-18GHz	Fig.45	P
	78	2.480 GHz	Fig.46	P
		30 MHz-3GHz	Fig.47	P
		3GHz-18GHz	Fig.48	P
/	All channel	18GHz-26GHz	Fig.49	P

See ANNEX C 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(μ V/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	
$\pi/4$ 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 (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Corr. (dB)	Pol
13949.500000	54.41	74.00	19.59	10.8	V
14649.000000	55.26	74.00	18.74	11.9	V
15687.500000	56.80	74.00	17.20	12.7	V
16222.500000	57.32	74.00	16.68	13.1	V
16840.000000	57.67	74.00	16.33	13.9	V
17330.000000	57.42	74.00	16.58	14.0	V

Frequency (MHz)	Average (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Corr. (dB)	Pol
14162.500000	42.37	54.00	11.63	11.2	V
15161.500000	43.67	54.00	10.33	12.1	V
15688.000000	45.62	54.00	8.38	12.7	V
16199.000000	45.86	54.00	8.14	13.1	V
16781.000000	46.55	54.00	7.45	13.9	V
17388.000000	46.03	54.00	7.97	14.0	V

GFSK CH39 (1-18GHz)

Frequency (MHz)	MaxPeak (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Corr. (dB)	Pol
13990.500000	54.95	74.00	19.05	10.8	V
15138.500000	55.14	74.00	18.86	12.1	V
15703.500000	57.12	74.00	16.88	12.7	V
16257.000000	57.67	74.00	16.33	13.2	V
16805.000000	57.75	74.00	16.25	13.9	V
17450.000000	59.05	74.00	14.95	14.0	V

Frequency (MHz)	Average (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Corr. (dB)	Pol
14141.000000	42.64	54.00	11.36	11.2	V
15139.500000	43.57	54.00	10.43	12.1	V
15700.000000	45.38	54.00	8.62	12.7	V
16191.500000	45.85	54.00	8.15	13.1	V
16798.500000	46.61	54.00	7.39	13.9	V
17370.000000	46.03	54.00	7.97	14.0	V

GFSK CH78 (1-18GHz)

Frequency (MHz)	MaxPeak (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Corr. (dB)	Pol
14195.500000	54.01	74.00	19.99	11.3	V
14576.500000	55.33	74.00	18.67	11.9	V
15640.500000	56.71	74.00	17.29	12.6	V
16193.000000	57.65	74.00	16.35	13.1	V
16764.000000	57.23	74.00	16.77	13.9	V
17381.500000	57.47	74.00	16.53	14.0	V

Frequency (MHz)	Average (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Corr. (dB)	Pol
14543.500000	43.04	54.00	10.96	11.9	V
15069.000000	43.74	54.00	10.26	12.1	V
15677.000000	45.41	54.00	8.59	12.6	V
16211.000000	45.66	54.00	8.34	13.1	V
16784.500000	46.07	54.00	7.93	13.9	V
17347.000000	45.57	54.00	8.43	14.0	V

$\pi/4$ DQPSK CH0 (1-18GHz)

Frequency (MHz)	MaxPeak (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Corr. (dB)	Pol
14518.000000	54.72	74.00	19.28	11.8	V
15177.500000	55.73	74.00	18.27	12.2	V
15834.000000	56.50	74.00	17.50	12.8	V
16252.500000	57.57	74.00	16.43	13.2	V
16646.000000	57.88	74.00	16.12	13.8	V
17311.500000	57.38	74.00	16.62	13.9	V

Frequency (MHz)	Average (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Corr. (dB)	Pol
14551.000000	43.44	54.00	10.56	11.9	V
15158.000000	44.11	54.00	9.89	12.1	V
15771.500000	45.66	54.00	8.34	12.8	V
16218.500000	45.51	54.00	8.49	13.1	V
16738.000000	46.00	54.00	8.00	13.8	V
17300.500000	45.65	54.00	8.35	13.9	V

π /4 DQPSK CH39 (1-18GHz)

Frequency (MHz)	MaxPeak (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Corr. (dB)	Pol
14282.500000	54.04	74.00	19.96	11.4	V
14626.000000	54.79	74.00	19.21	11.9	V
15769.000000	57.49	74.00	16.51	12.8	V
16246.000000	57.31	74.00	16.69	13.2	V
16762.500000	58.37	74.00	15.63	13.9	V
17290.500000	58.42	74.00	15.58	13.9	V

Frequency (MHz)	Average (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Corr. (dB)	Pol
14159.500000	42.86	54.00	11.14	11.2	V
15182.000000	44.02	54.00	9.98	12.2	V
15685.000000	45.53	54.00	8.47	12.6	V
16219.500000	46.21	54.00	7.79	13.1	V
16794.500000	46.74	54.00	7.26	13.9	V
17306.000000	46.36	54.00	7.64	13.9	V

π /4 DQPSK CH78 (1-18GHz)

Frequency (MHz)	MaxPeak (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Corr. (dB)	Pol
14321.500000	54.18	74.00	19.82	11.4	V
14977.500000	54.39	74.00	19.61	12.0	V
15834.000000	56.36	74.00	17.64	12.8	V
16220.500000	56.23	74.00	17.77	13.1	V
16800.500000	57.69	74.00	16.31	13.9	V
17497.500000	57.66	74.00	16.34	14.0	V

Frequency (MHz)	Average (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Corr. (dB)	Pol
14175.500000	42.48	54.00	11.52	11.2	V
15150.500000	43.14	54.00	10.86	12.1	V
15702.000000	45.40	54.00	8.60	12.7	V
16210.000000	45.70	54.00	8.30	13.1	V
16803.500000	46.38	54.00	7.62	13.9	V
17323.000000	45.93	54.00	8.07	14.0	V

8DPSK CH0 (1-18GHz)

Frequency (MHz)	MaxPeak (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Corr. (dB)	Pol
14550.500000	54.27	74.00	19.73	11.9	V
15179.500000	54.71	74.00	19.29	12.2	V
15653.500000	56.92	74.00	17.08	12.6	V
16218.000000	57.11	74.00	16.89	13.1	V
16762.500000	58.43	74.00	15.57	13.9	V
17299.500000	58.03	74.00	15.97	13.9	V

Frequency (MHz)	Average (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Corr. (dB)	Pol
13999.500000	42.55	54.00	11.45	10.8	V
15150.500000	44.08	54.00	9.92	12.1	V
15766.000000	45.62	54.00	8.38	12.8	V
16197.500000	45.92	54.00	8.08	13.1	V
16781.000000	46.65	54.00	7.35	13.9	V
17395.000000	46.23	54.00	7.77	14.0	V

8DPSK CH39 (1-18GHz)

Frequency (MHz)	MaxPeak (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Corr. (dB)	Pol
14543.000000	54.52	74.00	19.48	11.9	V
15061.000000	56.19	74.00	17.81	12.1	V
15634.500000	56.65	74.00	17.35	12.5	V
16175.500000	57.11	74.00	16.89	13.1	V
17199.000000	57.11	74.00	16.89	13.8	V
17457.500000	57.33	74.00	16.67	14.0	V

Frequency (MHz)	Average (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Corr. (dB)	Pol
14548.500000	43.13	54.00	10.87	11.9	V
15147.000000	43.93	54.00	10.07	12.1	V
15762.000000	45.28	54.00	8.72	12.8	V
16198.500000	45.74	54.00	8.26	13.1	V
16798.000000	46.14	54.00	7.86	13.9	V
17321.500000	45.64	54.00	8.36	14.0	V

8DPSK CH78 (1-18GHz)

Frequency (MHz)	MaxPeak (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Corr. (dB)	Pol
14543.000000	55.00	74.00	19.00	11.9	V
15135.500000	56.25	74.00	17.75	12.1	V
15689.500000	56.64	74.00	17.36	12.7	V
16173.000000	56.45	74.00	17.55	13.1	V
17194.000000	57.10	74.00	16.90	13.8	V
17419.000000	56.76	74.00	17.24	14.0	V

Frequency (MHz)	Average (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Corr. (dB)	Pol
14542.500000	43.31	54.00	10.69	11.9	V
15146.500000	43.89	54.00	10.11	12.1	V
15756.000000	45.23	54.00	8.77	12.8	V
16219.000000	45.32	54.00	8.68	13.1	V
16706.500000	45.99	54.00	8.01	13.8	V
17352.500000	45.40	54.00	8.60	14.0	V

See ANNEX C 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
		Fig.	Value	
GFSK	0	Fig.74	1.127	/
	39	Fig.75	1.131	
	78	Fig.76	1.133	
π /4 DQPSK	0	Fig.77	1.416	/
	39	Fig.78	1.416	
	78	Fig.79	1.416	
8DPSK	0	Fig.80	1.412	/
	39	Fig.81	1.415	
	78	Fig.82	1.414	

See ANNEX C 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	307.9	P
			Fig.84		
π /4 DQPSK	39	2-DH5	Fig.85	308.1	P
			Fig.86		
8DPSK	39	3-DH5	Fig.87	308.4	P
			Fig.88		

See ANNEX C 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	Channel	Packet	Number of hopping channels		Test result	Conclusion
GFSK	39	DH5	Fig.89	Fig.90	79	P
$\pi/4$ DQPSK	39	2-DH5	Fig.91	Fig.92	79	P
8DPSK	39	3-DH5	Fig.93	Fig.94	79	P

See ANNEX C 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
$\pi/4$ DQPSK	39	2-DH5	Fig.96	0.99	P
8DPSK	39	3-DH5	Fig.97	1.03	P

See ANNEX C 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 (dB μ V)	Result (dB μ V)	Conclusion
		Traffic	
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 (dB μ V)	Result (dB μ V)	Conclusion
		Traffic	
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 (dB μ V)	Result (dB μ V)	Conclusion
		Idle	
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 (dB μ V)	Result (dB μ V)	Conclusion
		Idle	
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 (dB μ V)	Result (dB μ V)	Conclusion
		Traffic	
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 (dB μ V)	Result (dB μ V)	Conclusion
		Traffic	
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 (dB μ V)	Result (dB μ V)	Conclusion
		Idle	
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 (dB μ V)	Result (dB μ V)	Conclusion
		Idle	
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 (dB μ V)	Result (dB μ V)	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 (dB μ V)	Result (dB μ V)	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 (dB μ V)	Result (dB μ V)	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 (dB μ V)	Result (dB μ V)	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 (dB μ V)	Result (dB μ V)	Conclusion
		Traffic	
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 (dB μ V)	Result (dB μ V)	Conclusion
		Traffic	
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 (dB μ V)	Result (dB μ V)	Conclusion
		Idle	
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 (dB μ V)	Result (dB μ V)	Conclusion
		Idle	
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 (dB μ V)	Result (dB μ V)	Conclusion
		Traffic	
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 (dB μ V)	Result (dB μ V)	Conclusion
		Traffic	
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 (dB μ V)	Result (dB μ V)	Conclusion
		Idle	
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 (dB μ V)	Result (dB μ V)	Conclusion
		Idle	
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 (dB μ V)	Result (dB μ V)	Conclusion
		Traffic	
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 (dB μ V)	Result (dB μ V)	Conclusion
		Traffic	
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 (dB μ V)	Result (dB μ V)	Conclusion
		Idle	
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 (dB μ V)	Result (dB μ V)	Conclusion
		Idle	
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 C for test graphs.

Conclusion: Pass

ANNEX B: TEST FIGURE LIST

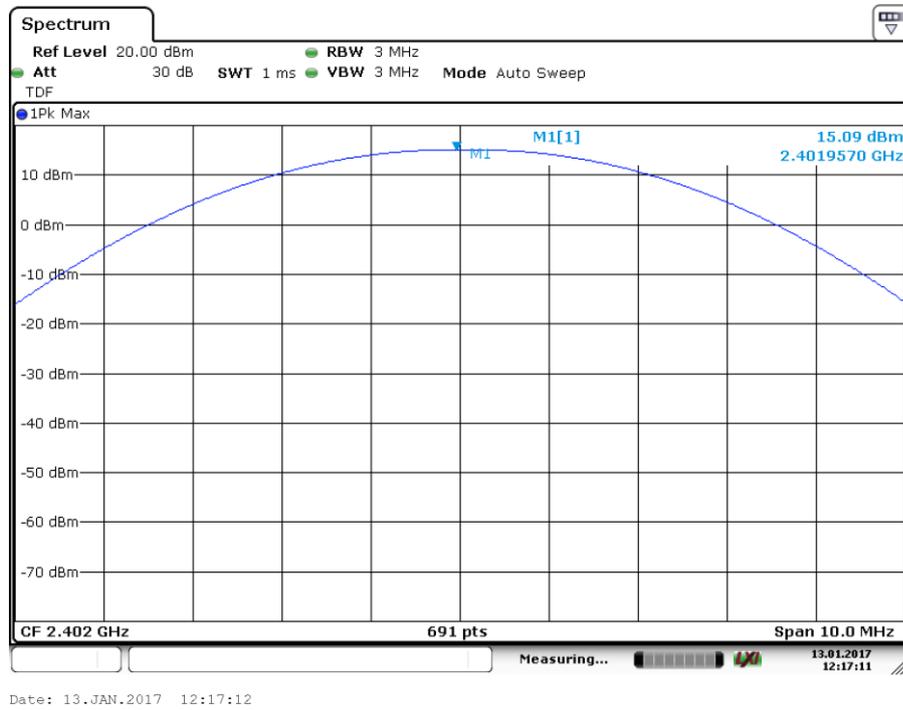


Fig. 1 Maximum Peak Output Power(GFSK, Ch 0)

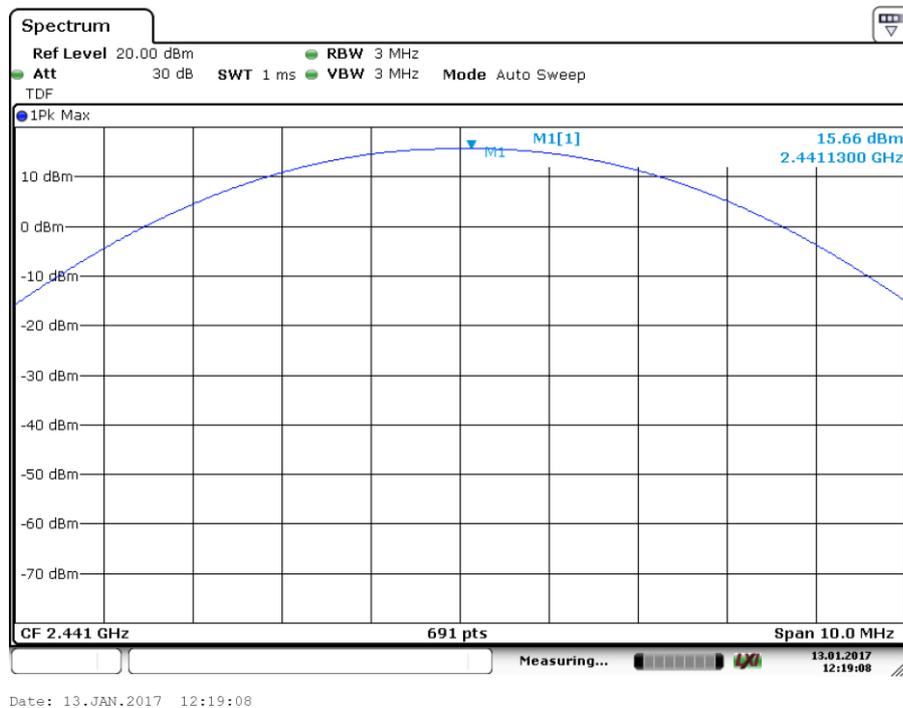


Fig. 2 Maximum Peak Output Power(GFSK, Ch 39)

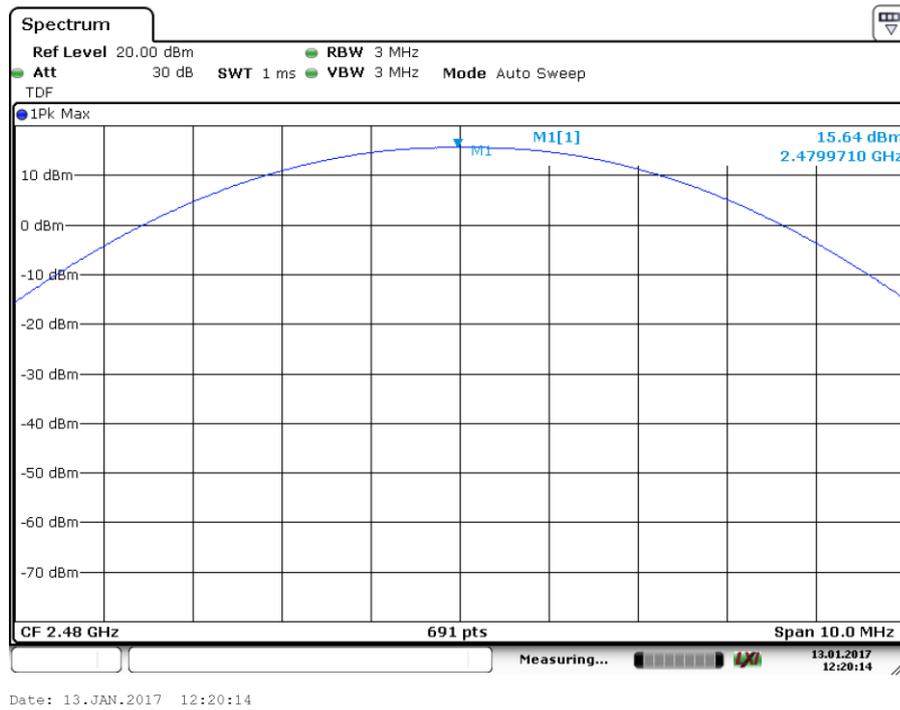


Fig. 3 Maximum Peak Output Power(GFSK, Ch 78)

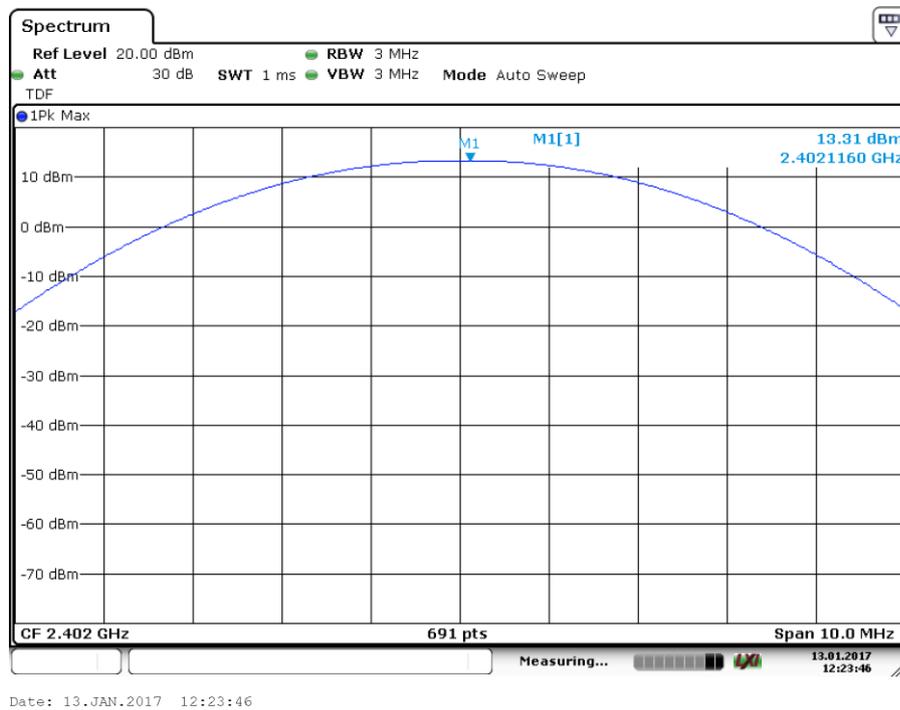


Fig. 4 Maximum Peak Output Power($\pi/4$ DQPSK, Ch 0)

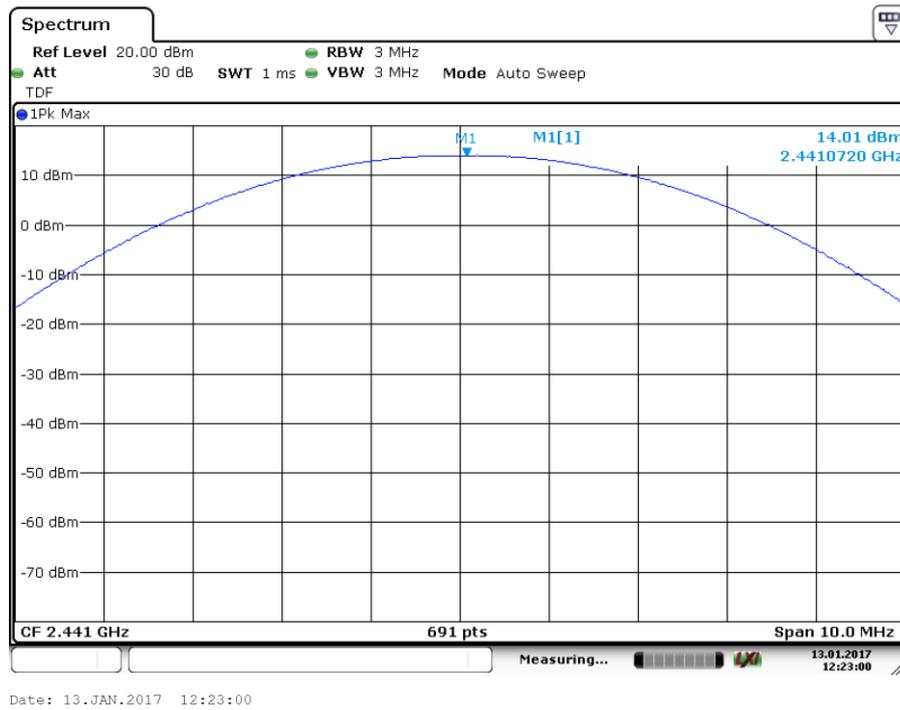


Fig. 5 Maximum Peak Output Power($\pi/4$ DQPSK, Ch 39)

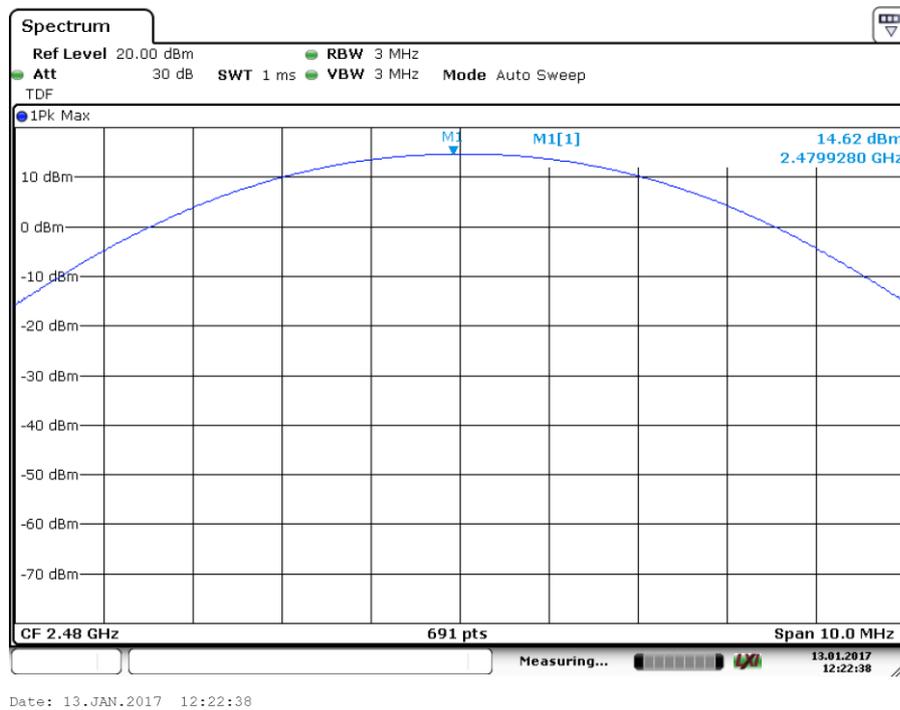


Fig. 6 Maximum Peak Output Power($\pi/4$ DQPSK, Ch 78)

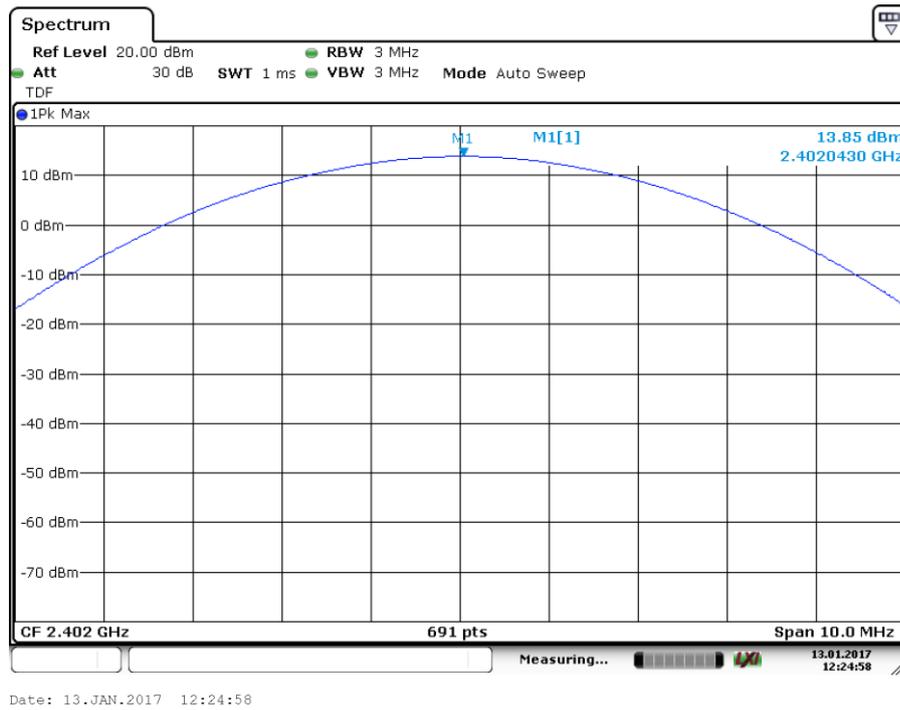


Fig. 7 Maximum Peak Output Power(8DPSK, Ch 0)

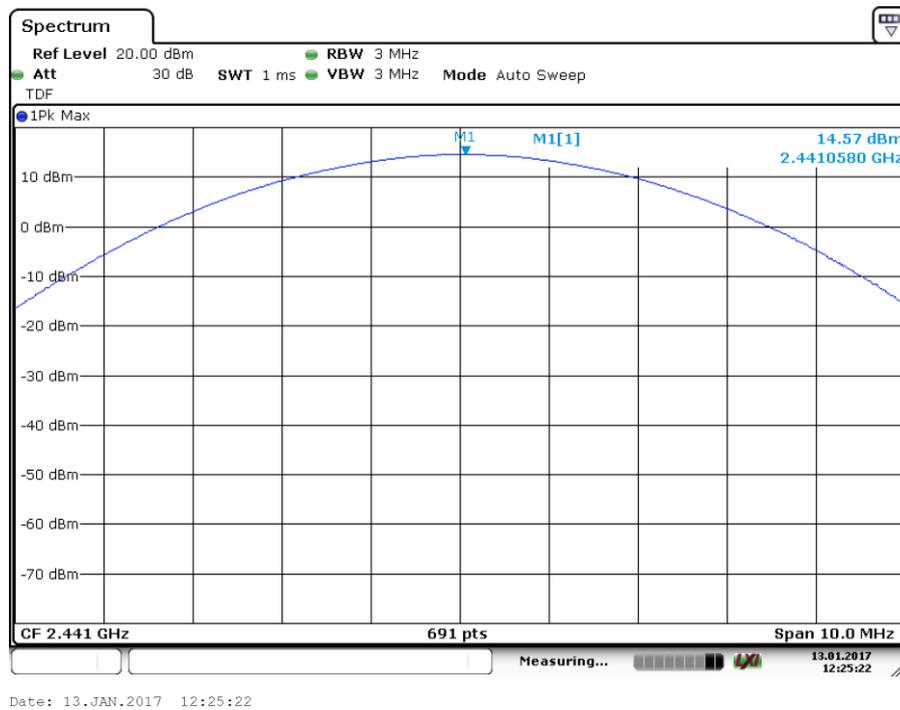


Fig. 8 Maximum Peak Output Power(8DPSK, Ch 39)

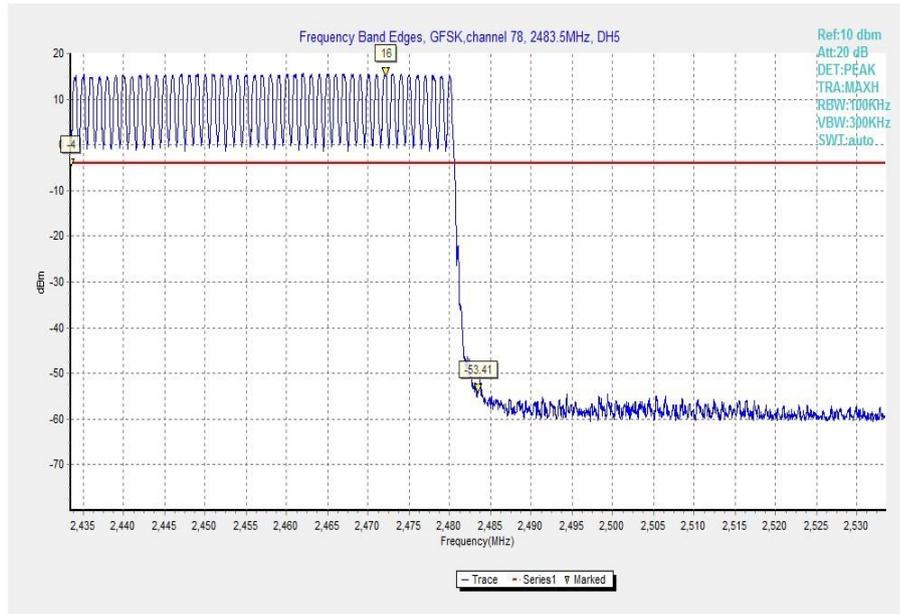


Fig. 11 Band Edges (GFSK, Ch 78, Hopping ON)

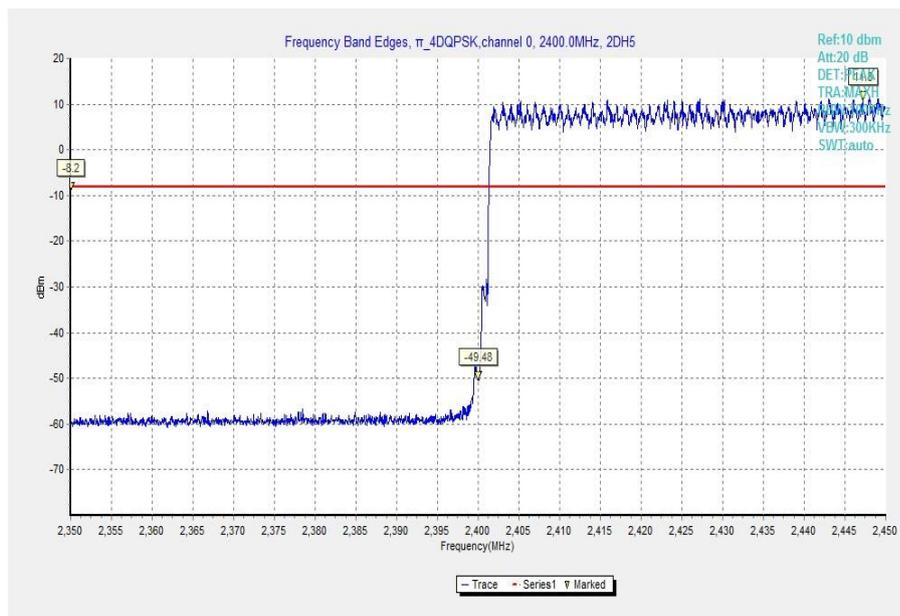


Fig. 12 Band Edges ($\pi/4$ DQPSK, Ch 0, Hopping ON)

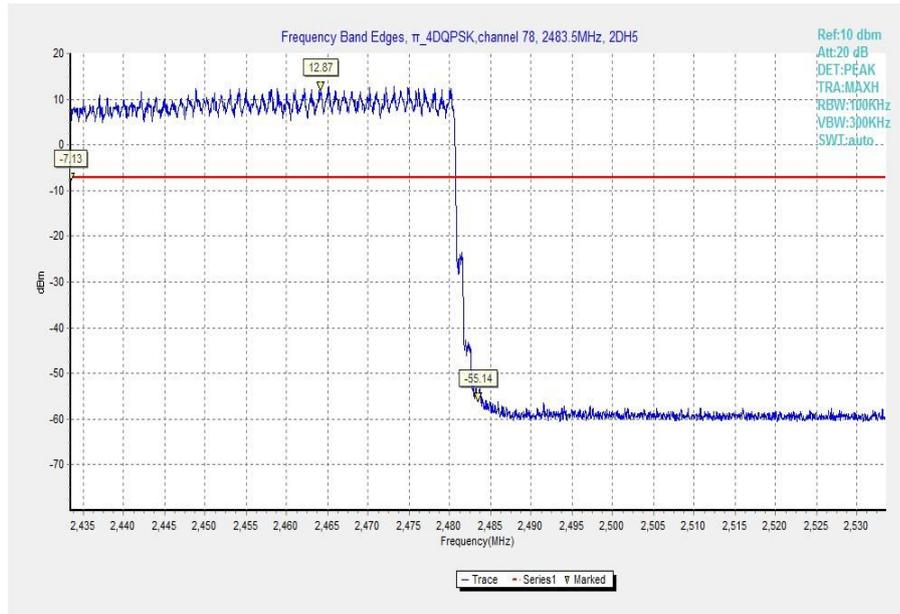


Fig. 13 Band Edges ($\pi/4$ DQPSK, Ch 78, Hopping ON)

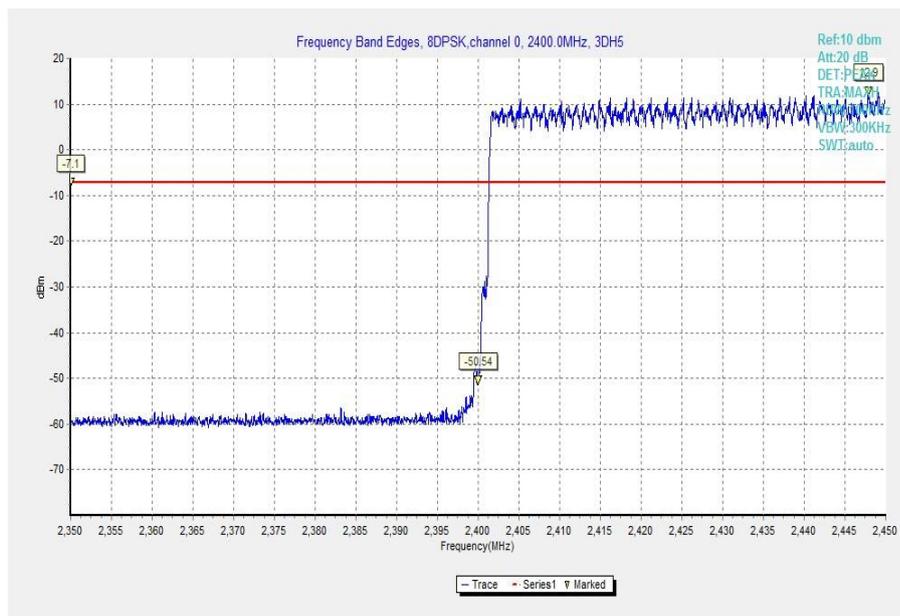


Fig. 14 Band Edges (8DPSK, Ch 0, Hopping ON)

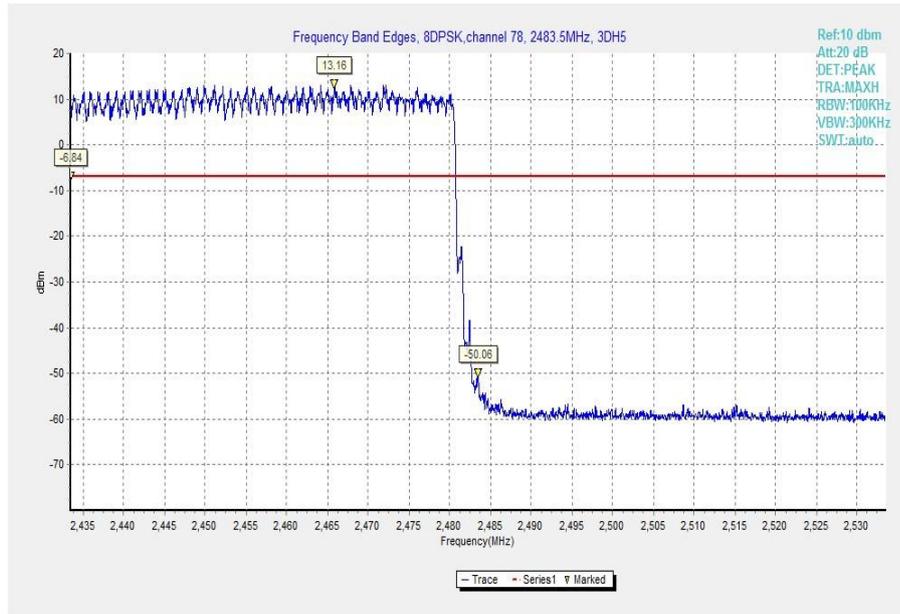


Fig. 15 Band Edges (8DPSK, Ch 78, Hopping ON)

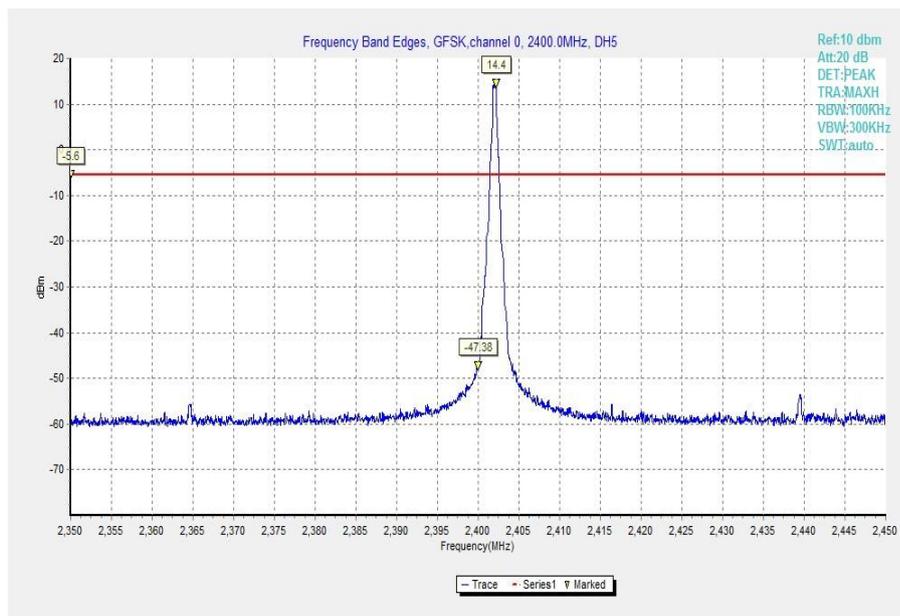


Fig. 16 Band Edges (GFSK, Ch 0, Hopping OFF)

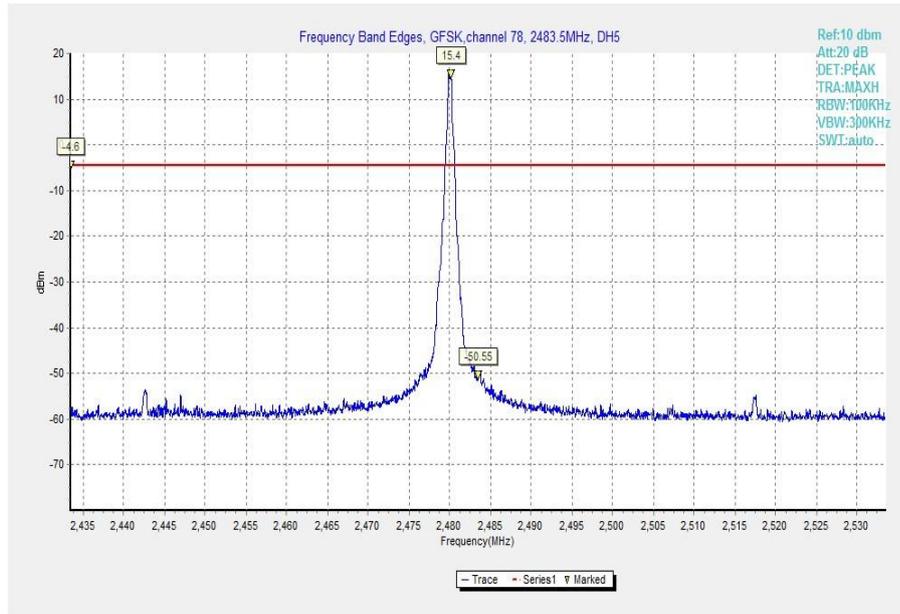


Fig. 17 Band Edges (GFSK, Ch 78, Hopping OFF)

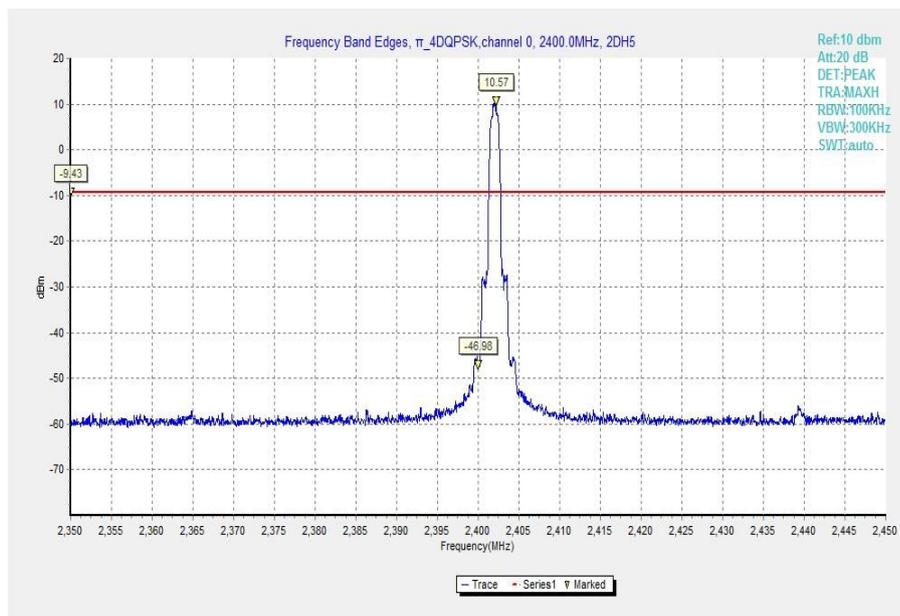


Fig. 18 Band Edges (π /4 DQPSK, Ch 0, Hopping OFF)

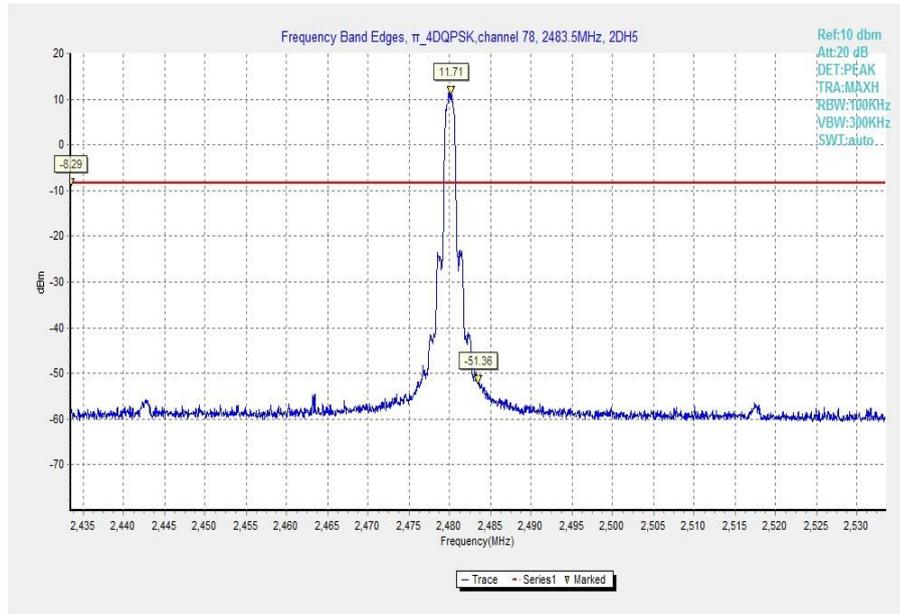


Fig. 19 Band Edges ($\pi/4$ DQPSK, Ch 78, Hopping OFF)

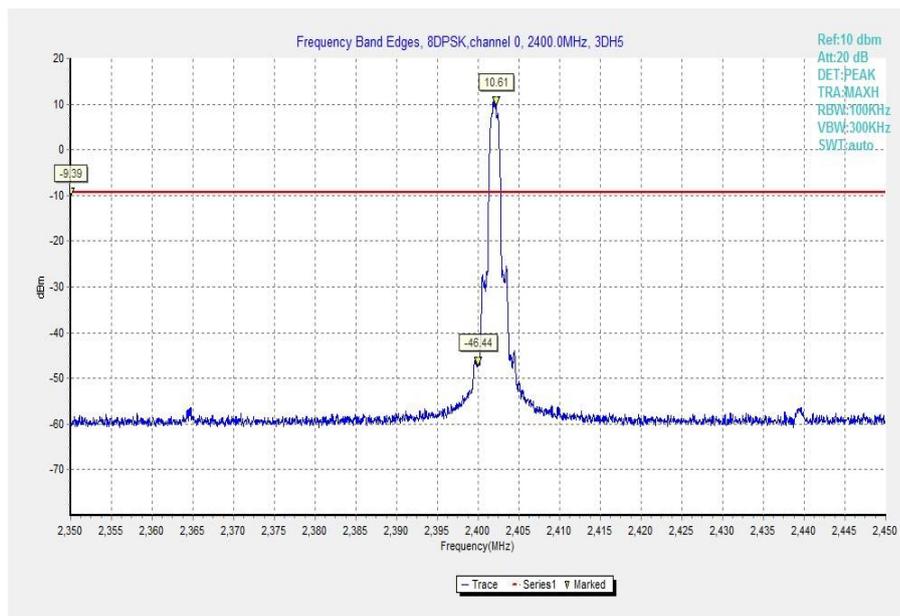


Fig. 20 Band Edges (8DPSK, Ch 0, Hopping OFF)

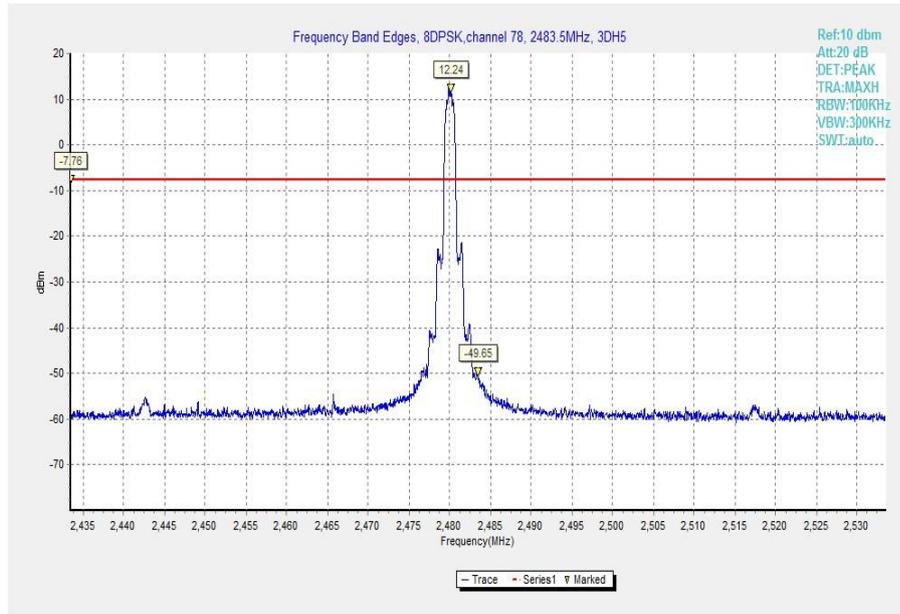


Fig. 21 Band Edges (8DPSK, Ch 78, Hopping OFF)

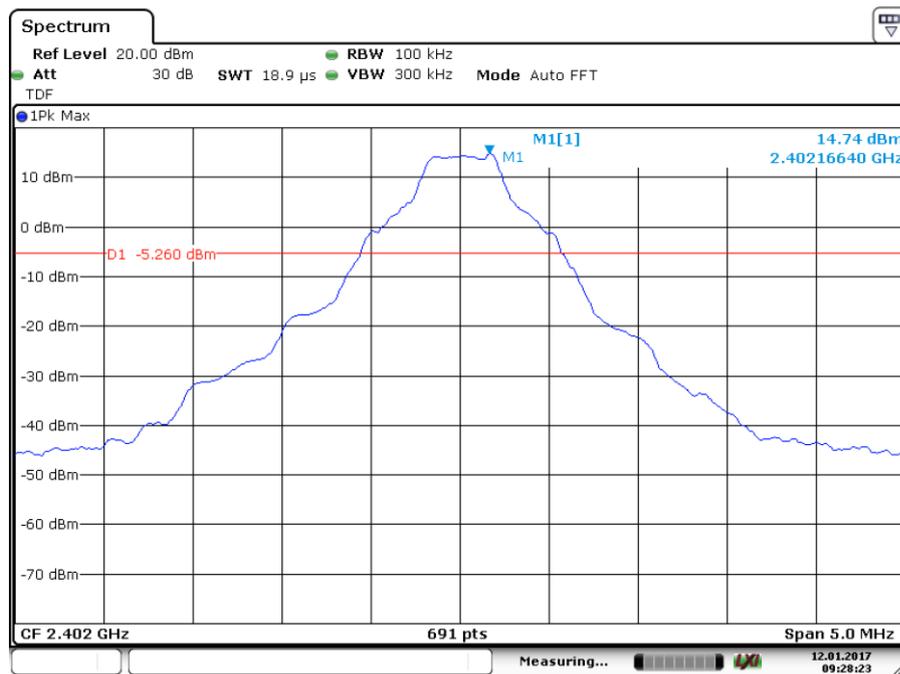


Fig. 22 Conducted Spurious Emission (GFSK, Ch0, 2.402GHz)

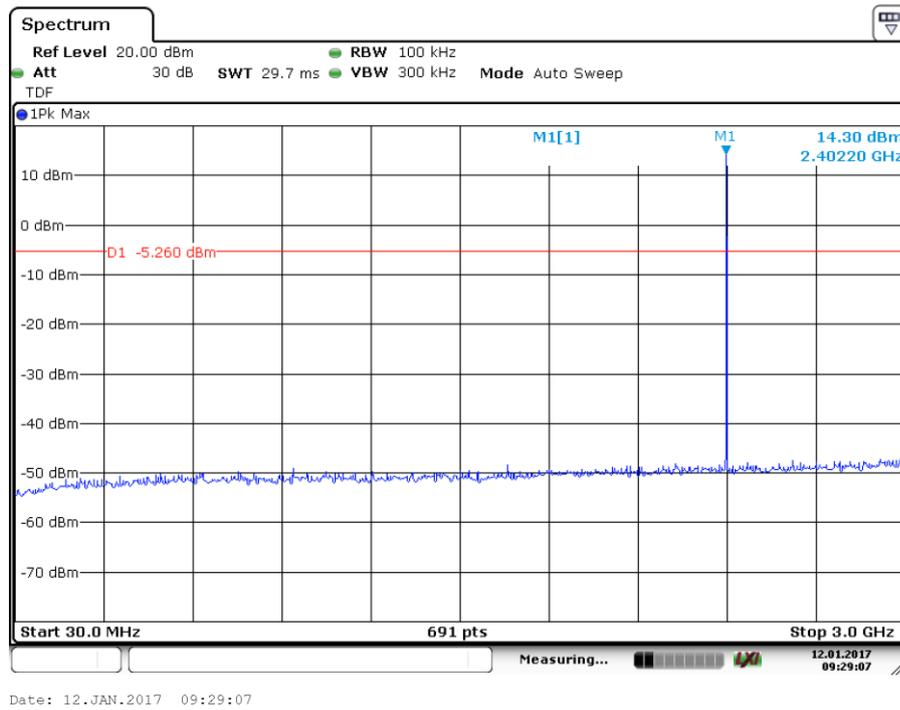


Fig. 23 Conducted Spurious Emission (GFSK, Ch0, 30 MHz-3 GHz)

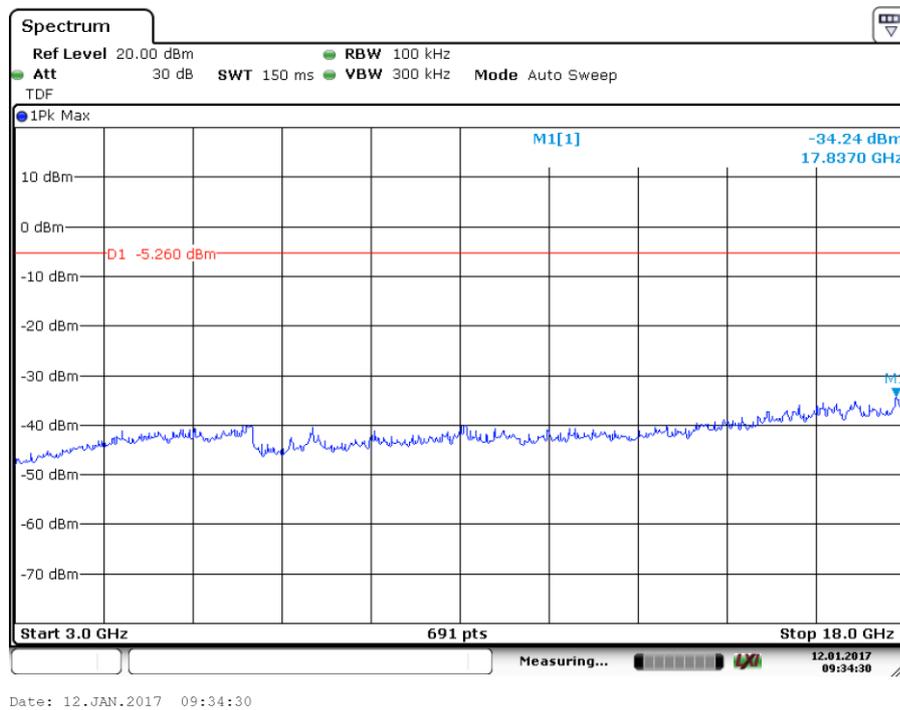


Fig. 24 Conducted Spurious Emission (GFSK, Ch0, 3GHz-18 GHz)

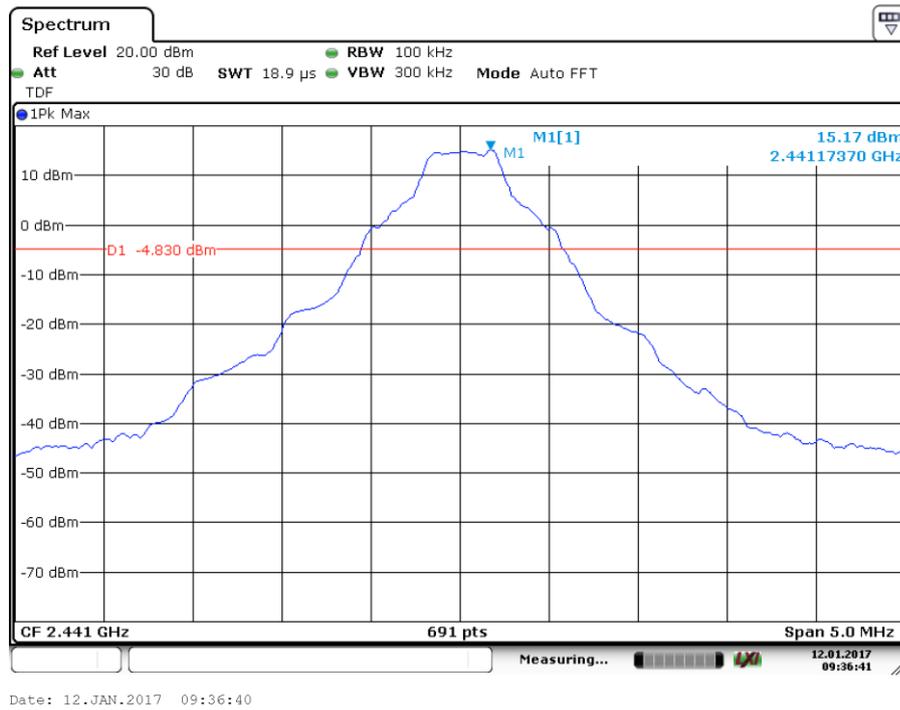


Fig. 25 Conducted Spurious Emission (GFSK, Ch39, 2.441GHz)

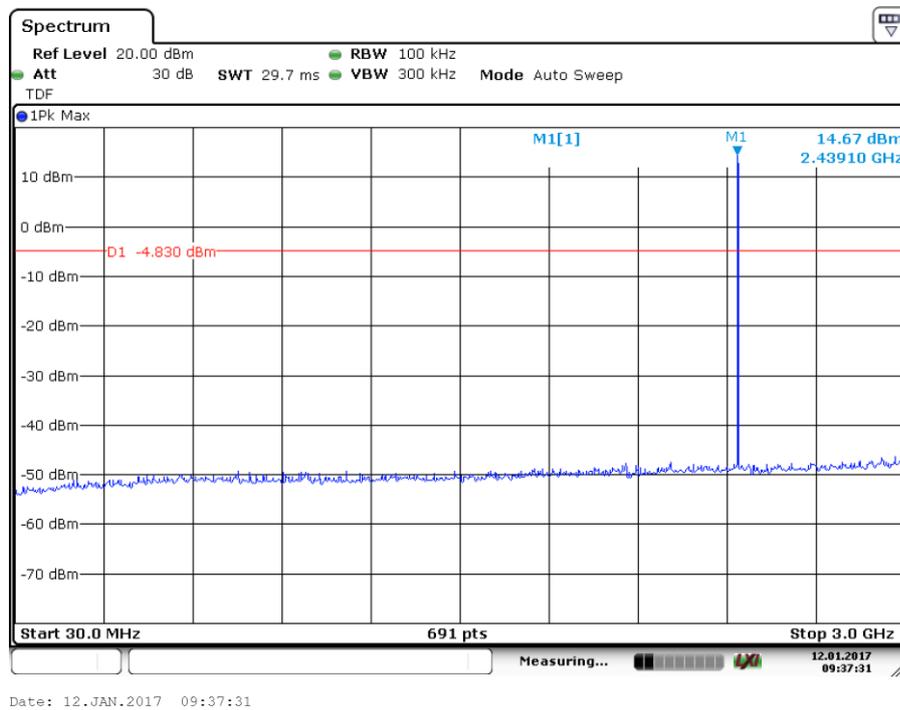


Fig. 26 Conducted Spurious Emission (GFSK, Ch39, 30 MHz-3 GHz)

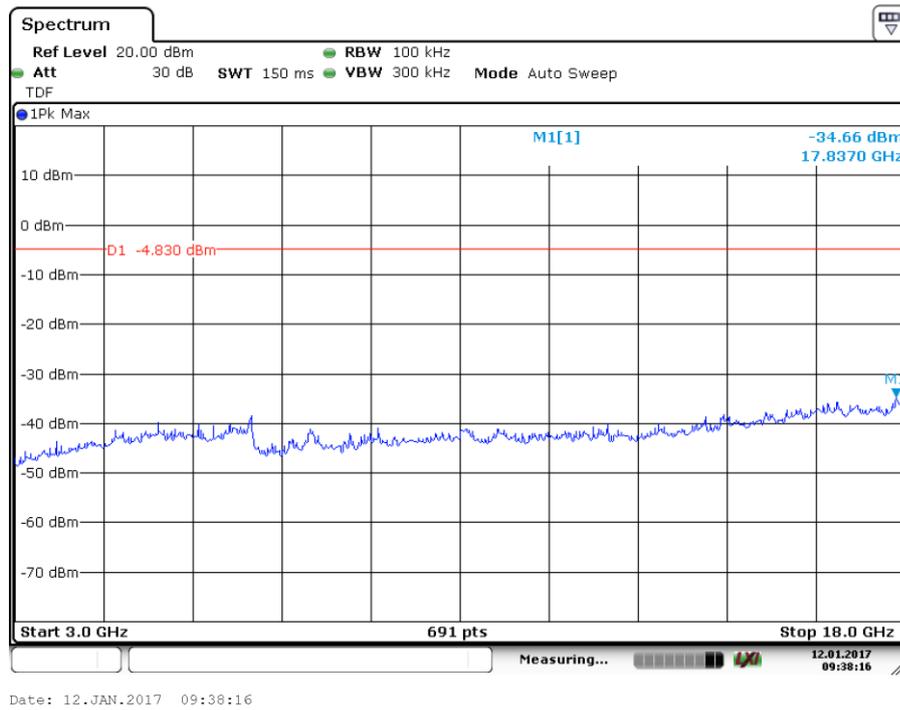


Fig. 27 Conducted Spurious Emission (GFSK, Ch39, 3GHz-18 GHz)

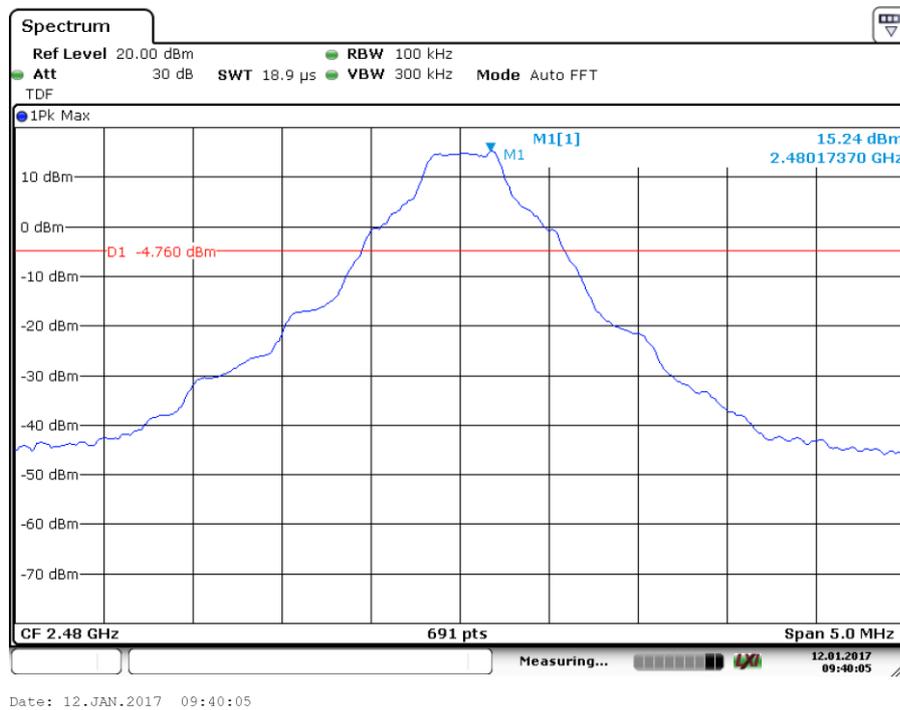


Fig. 28 Conducted Spurious Emission (GFSK, Ch78, 2.480GHz)

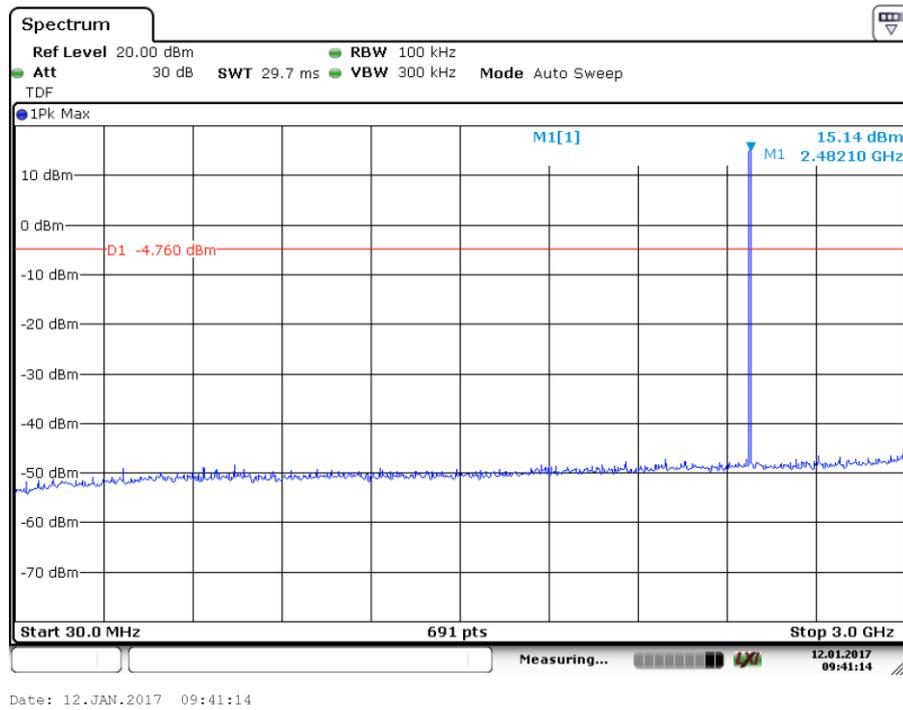


Fig. 29 Conducted Spurious Emission (GFSK, Ch78, 30 MHz-3 GHz)

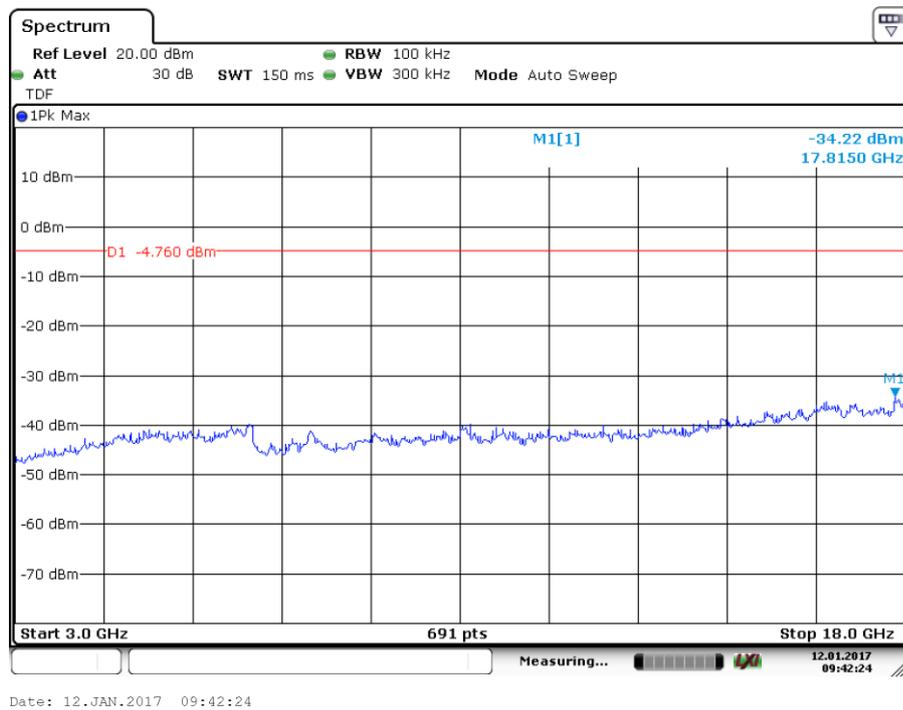


Fig. 30 Conducted Spurious Emission (GFSK, Ch78, 3GHz-18 GHz)

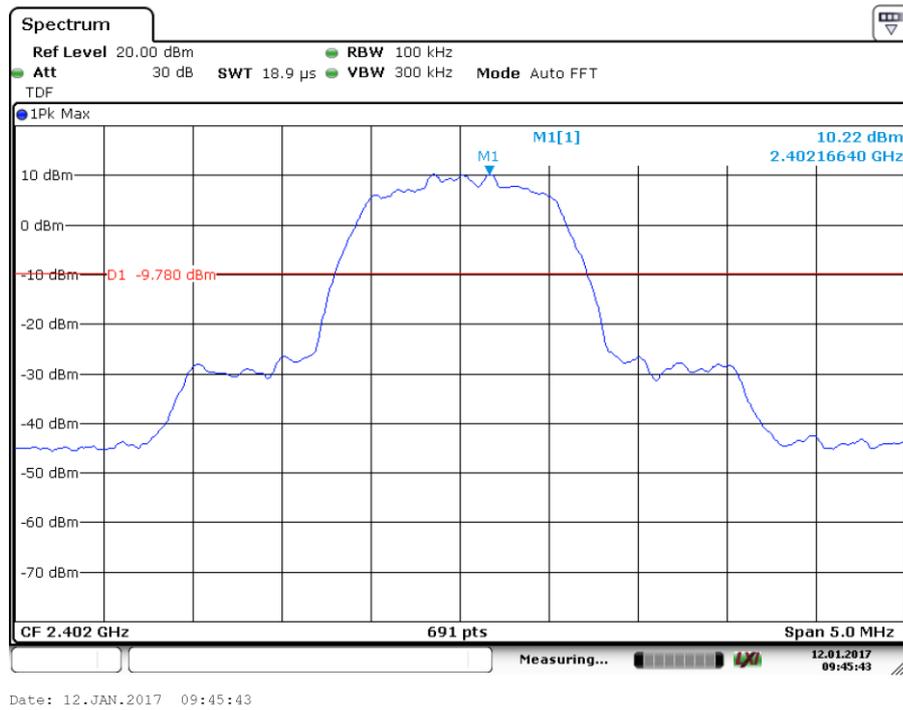


Fig. 31 Conducted Spurious Emission ($\pi/4$ DQPSK, Ch0, 2.402GHz)

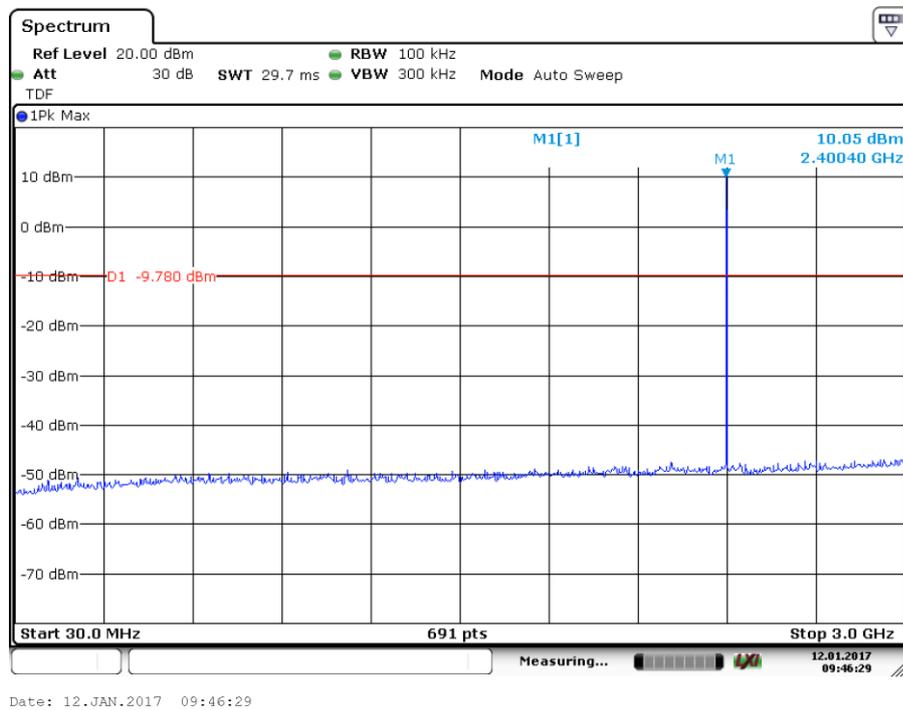


Fig. 32 Conducted Spurious Emission ($\pi/4$ DQPSK, Ch0, 30 MHz-3 GHz)

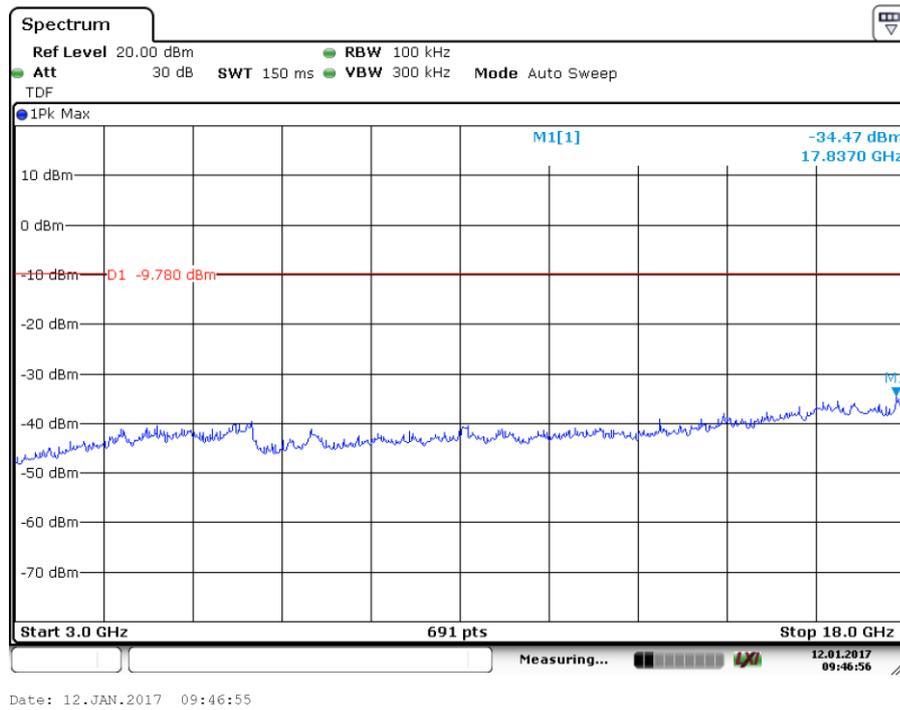


Fig. 33 Conducted Spurious Emission ($\pi/4$ DQPSK, Ch0, 3GHz-18 GHz)

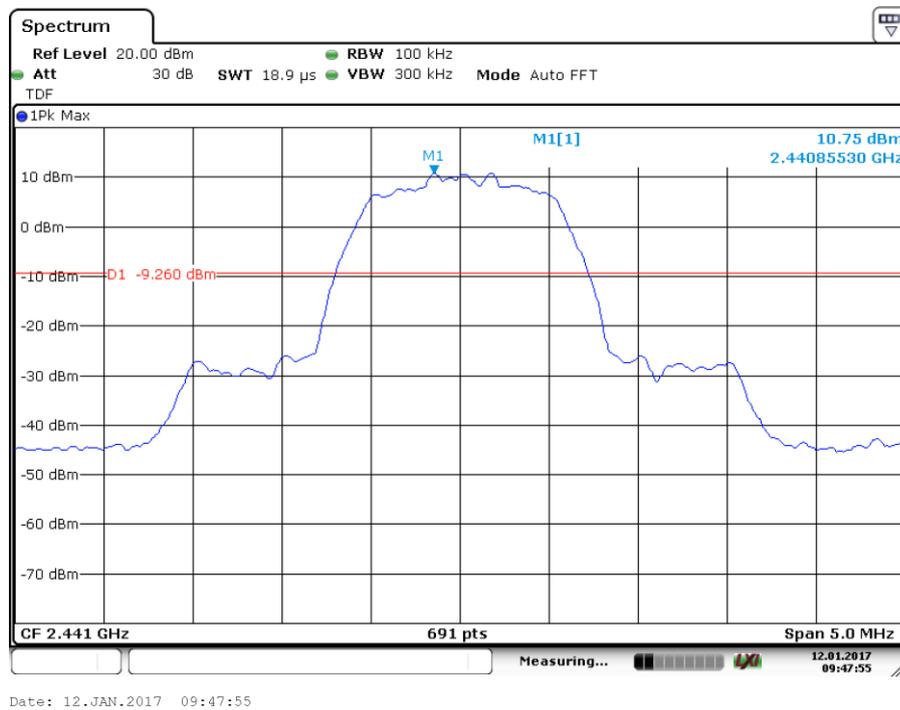


Fig. 34 Conducted Spurious Emission ($\pi/4$ DQPSK, Ch39, 2.441GHz)

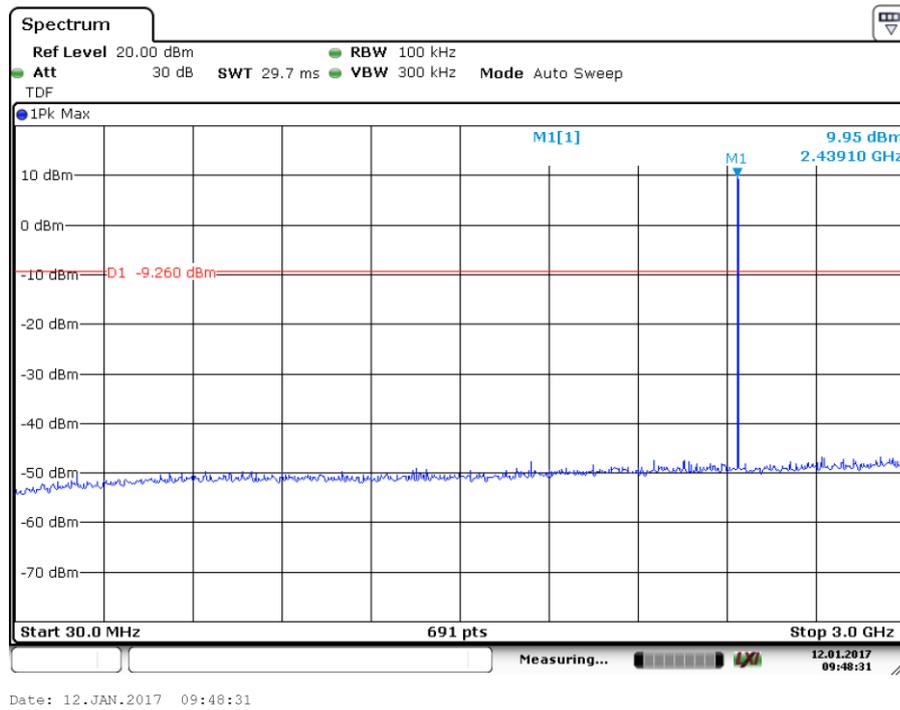


Fig. 35 Conducted Spurious Emission ($\pi/4$ DQPSK, Ch39, 30 MHz-3 GHz)

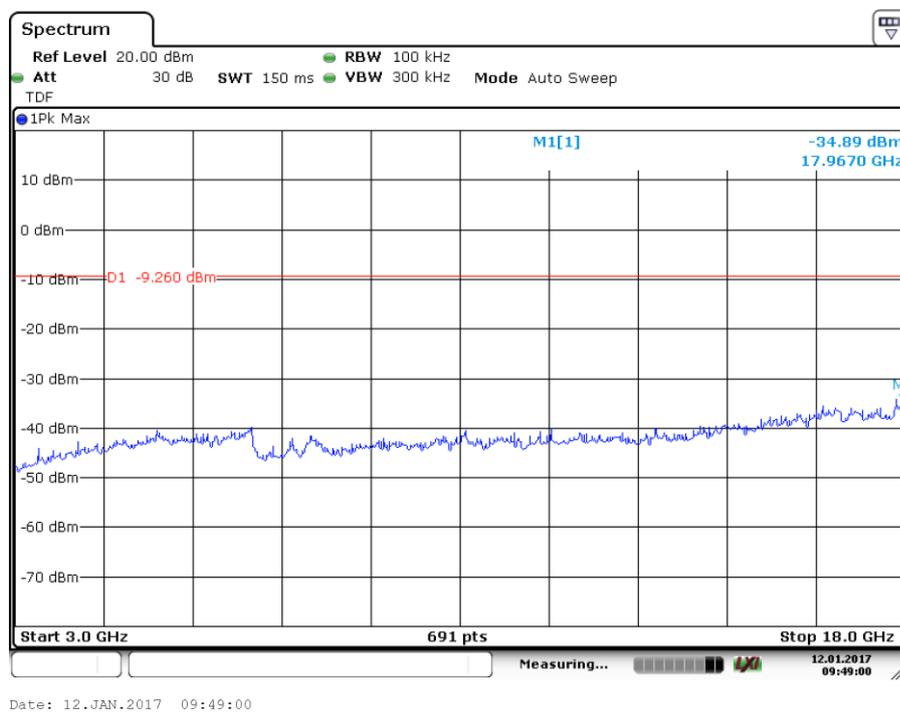


Fig. 36 Conducted Spurious Emission ($\pi/4$ DQPSK, Ch39, 3GHz-18 GHz)

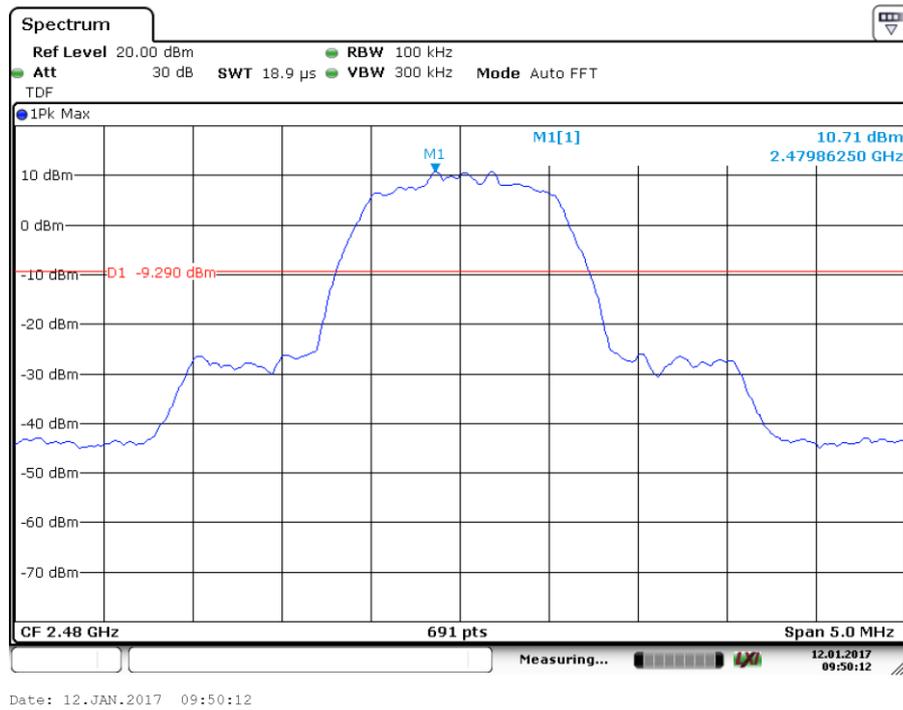


Fig. 37 Conducted Spurious Emission ($\pi/4$ DQPSK, Ch78, 2.480GHz)

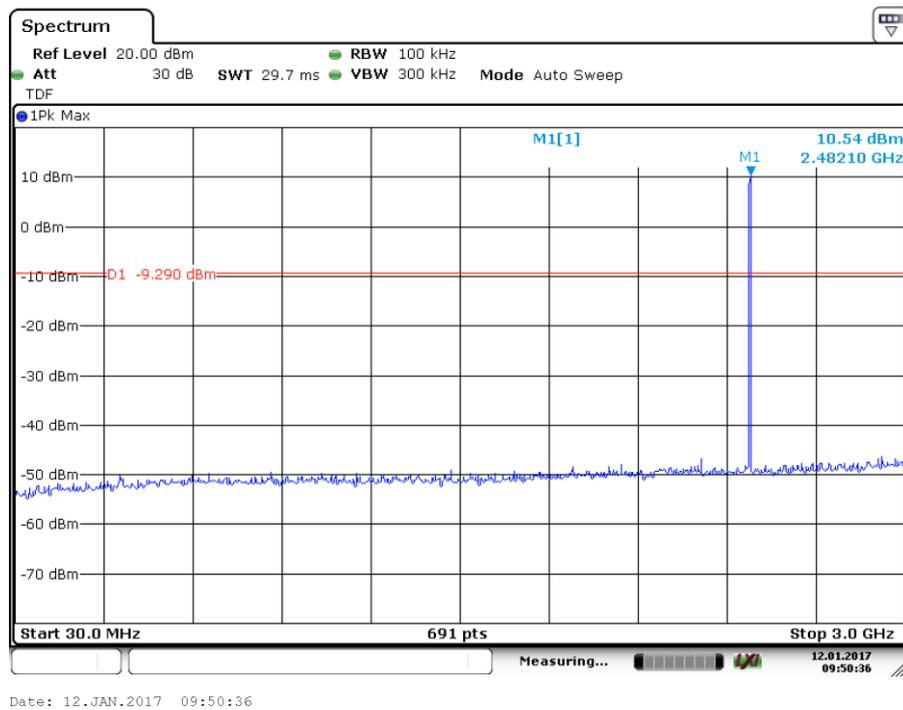


Fig. 38 Conducted Spurious Emission ($\pi/4$ DQPSK, Ch78, 30 MHz-3 GHz)

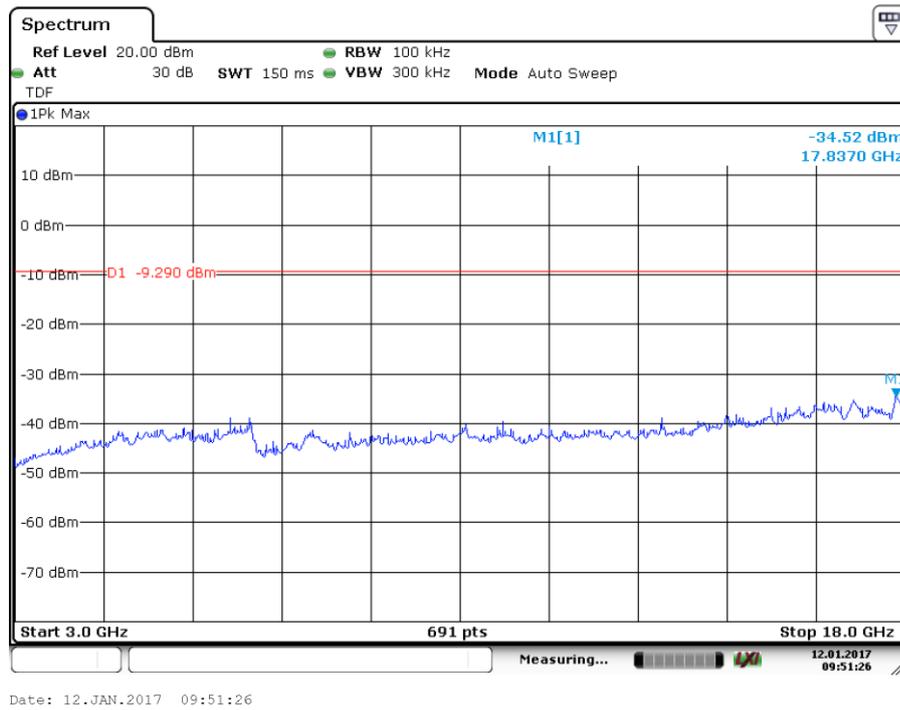


Fig. 39 Conducted Spurious Emission ($\pi/4$ DQPSK, Ch78, 3GHz-18 GHz)

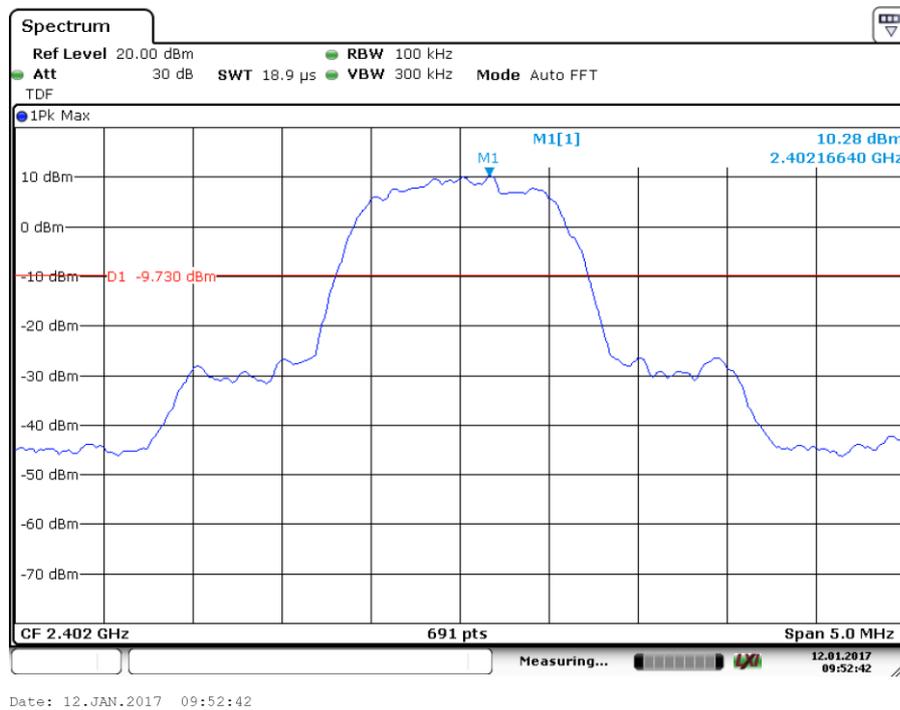


Fig. 40 Conducted Spurious Emission (8DPSK, Ch0, 2.402GHz)

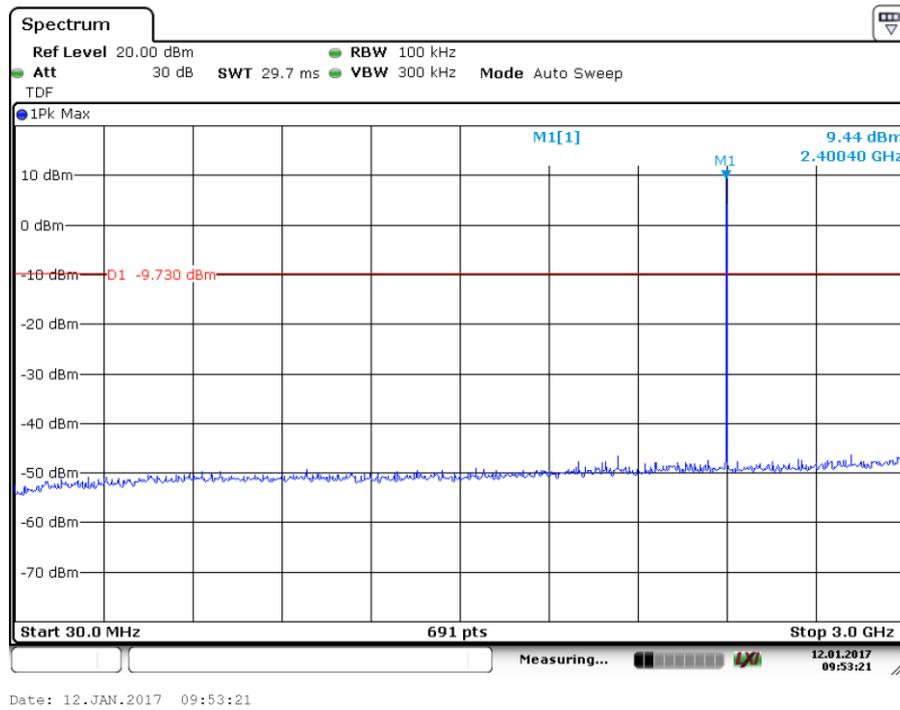


Fig. 41 Conducted Spurious Emission (8DPSK, Ch0, 30 MHz-3 GHz)

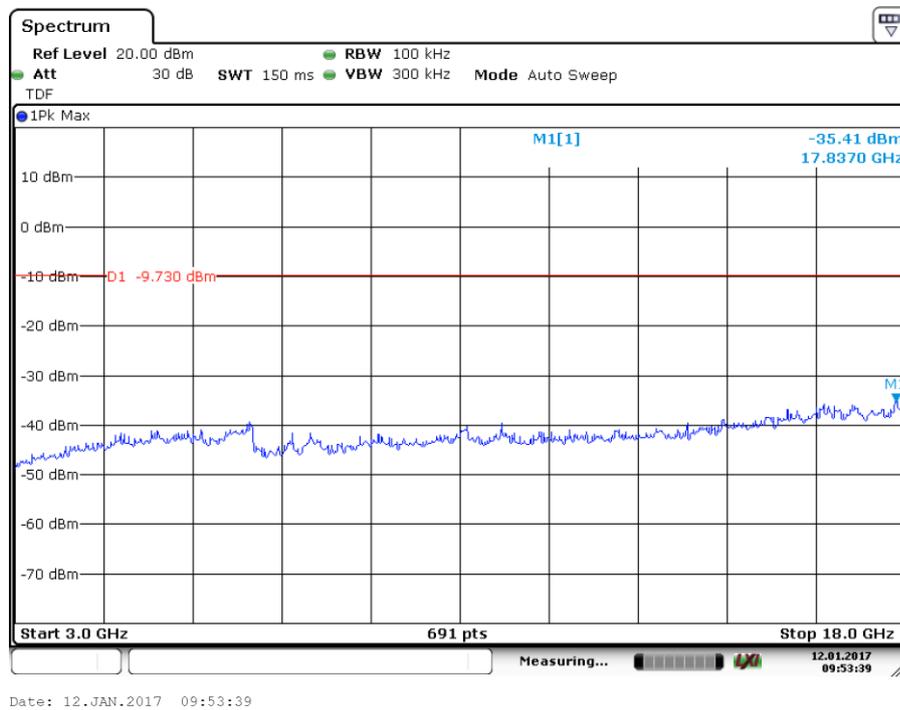


Fig. 42 Conducted Spurious Emission (8DPSK, Ch0, 3GHz-18 GHz)

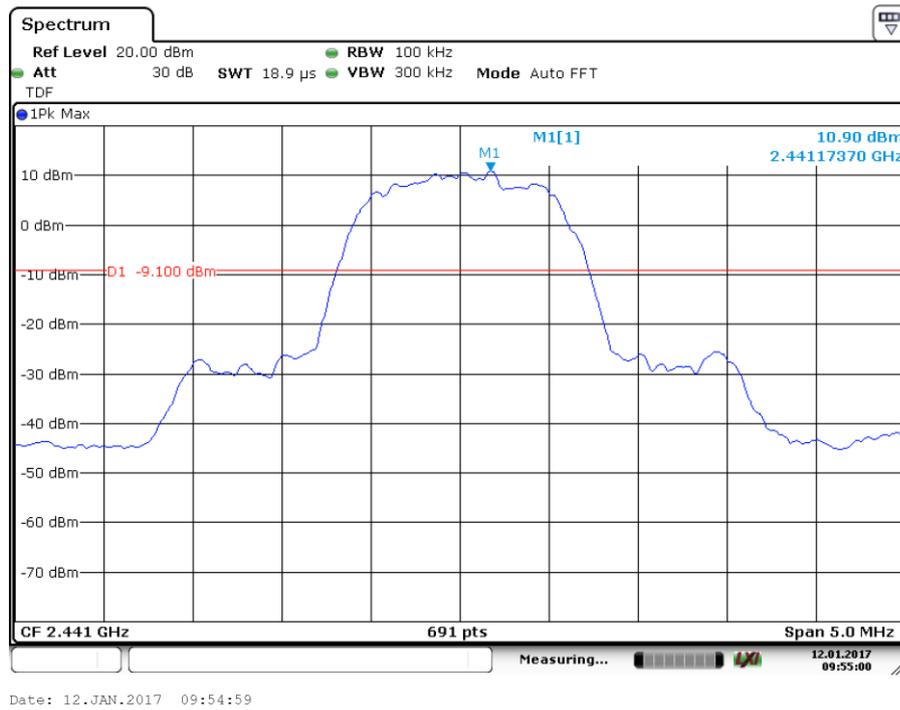


Fig. 43 Conducted Spurious Emission (8DPSK, Ch39, 2.441GHz)

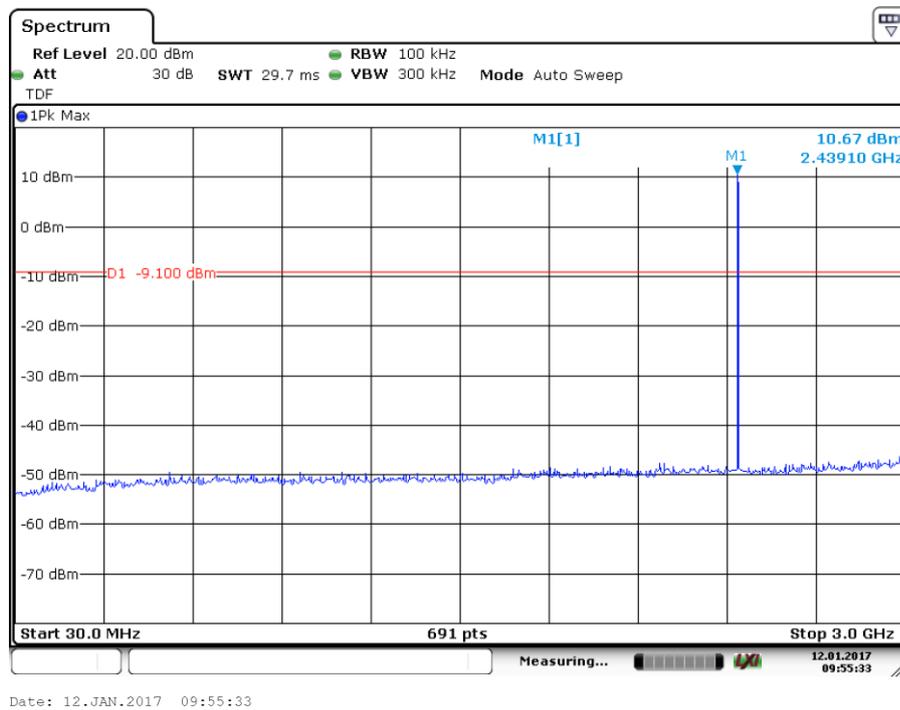


Fig. 44 Conducted Spurious Emission (8DPSK, Ch39, 30 MHz-3 GHz)

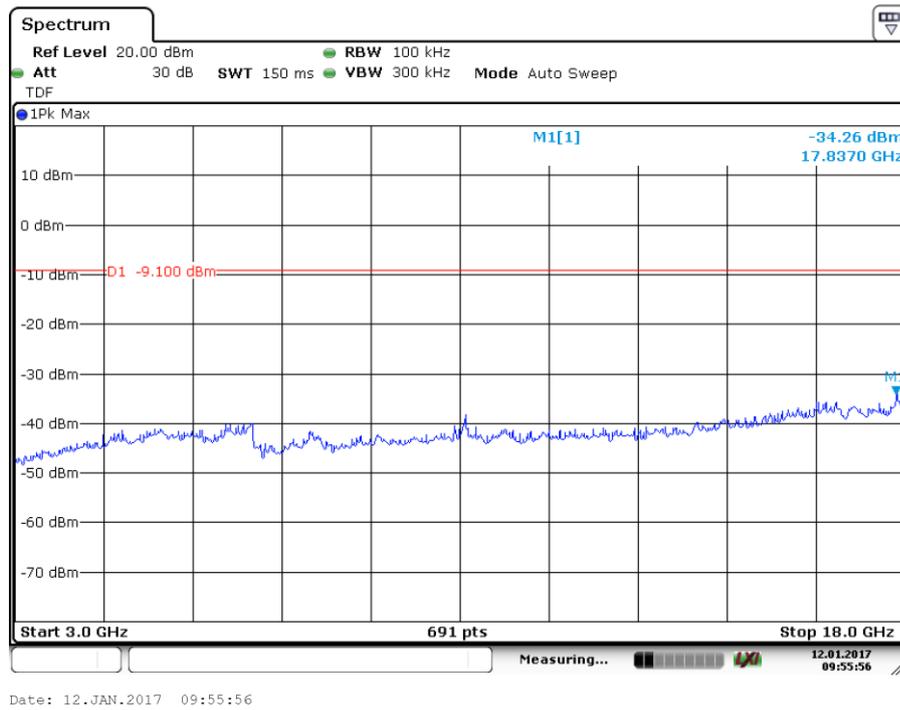


Fig. 45 Conducted Spurious Emission (8DPSK, Ch39, 3GHz-18 GHz)

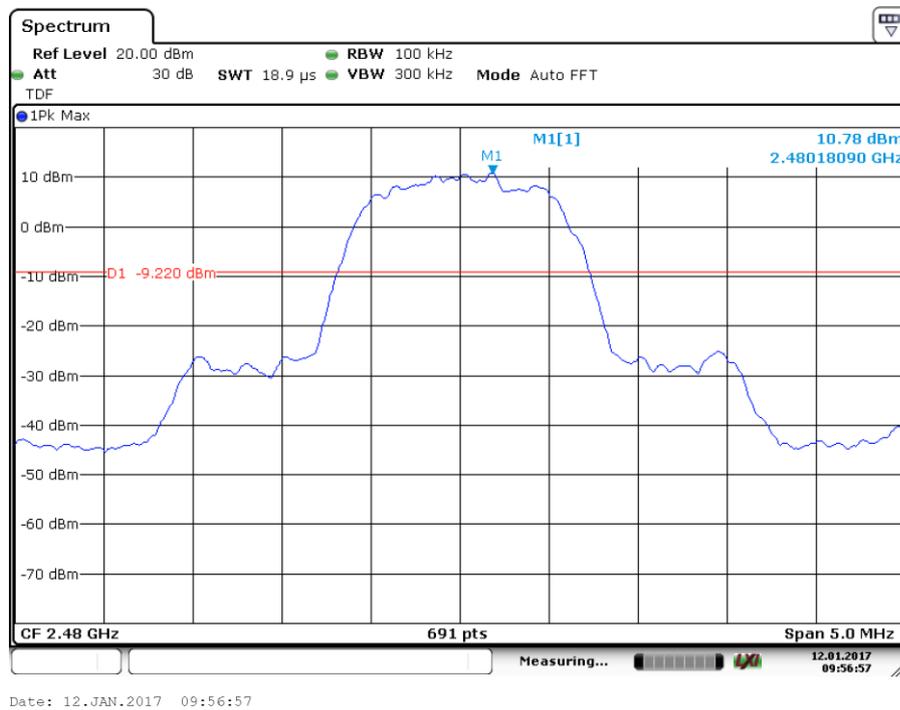


Fig. 46 Conducted Spurious Emission (8DPSK, Ch78, 2.480GHz)

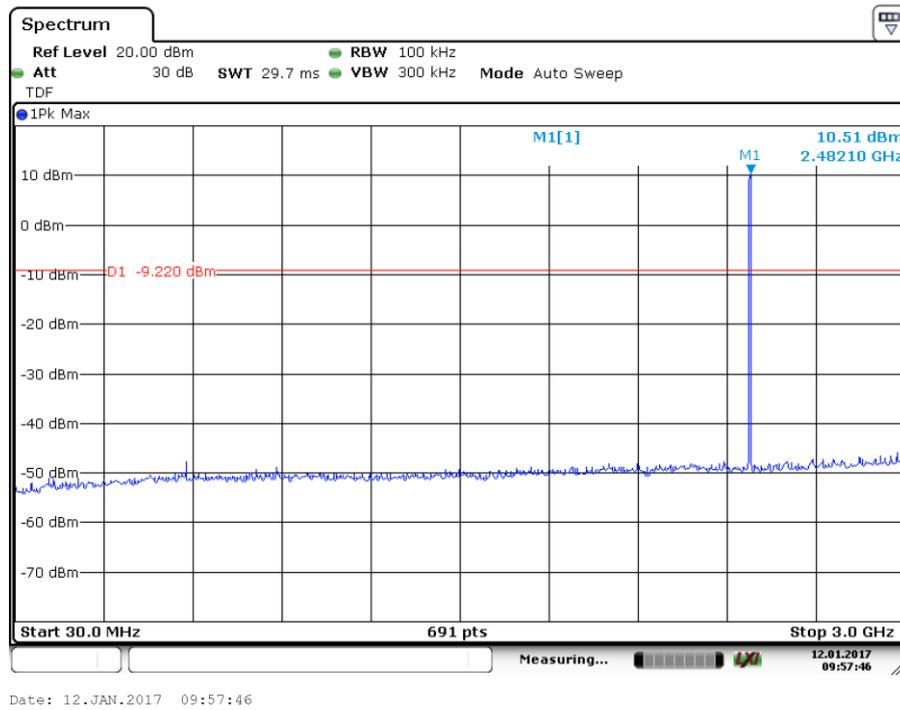


Fig. 47 Conducted Spurious Emission (8DPSK, Ch78, 30 MHz-3 GHz)

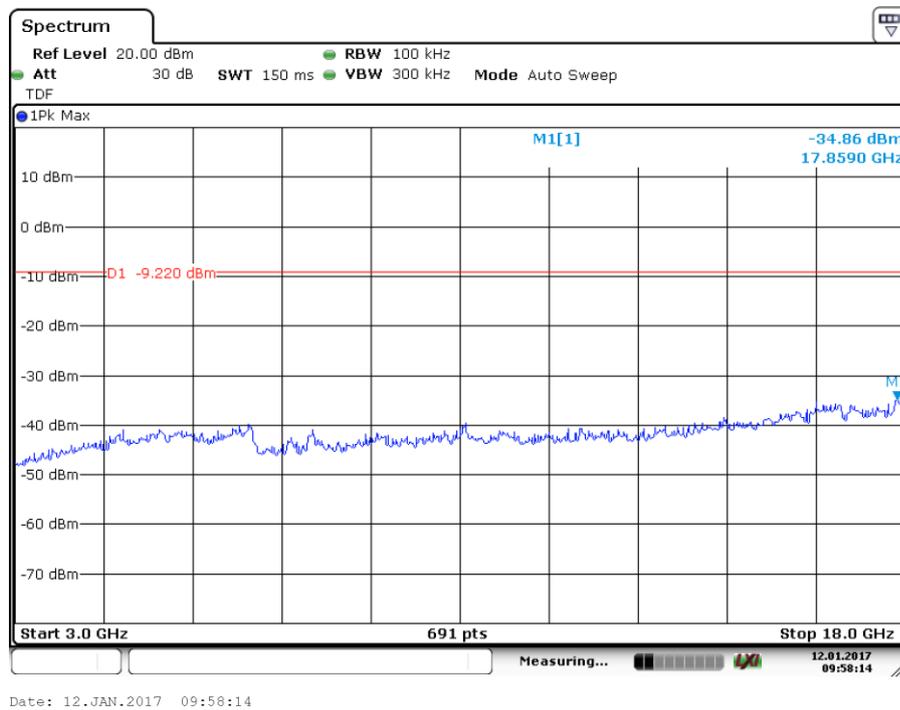


Fig. 48 Conducted Spurious Emission (8DPSK, Ch78, 3GHz-18 GHz)

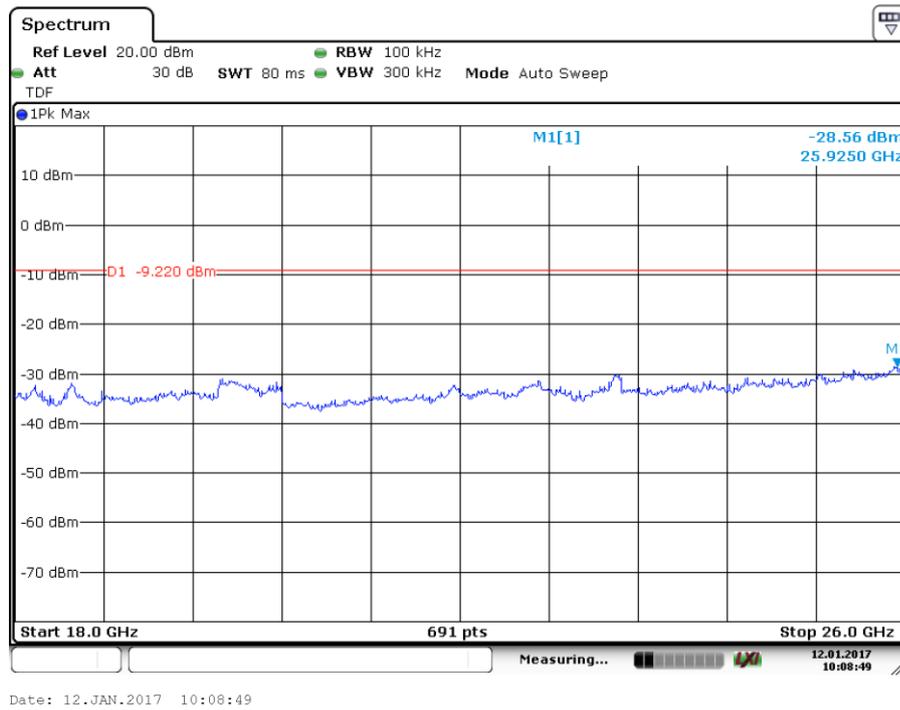


Fig. 49 Conducted Spurious Emission (All channel, 18 GHz-26 GHz)

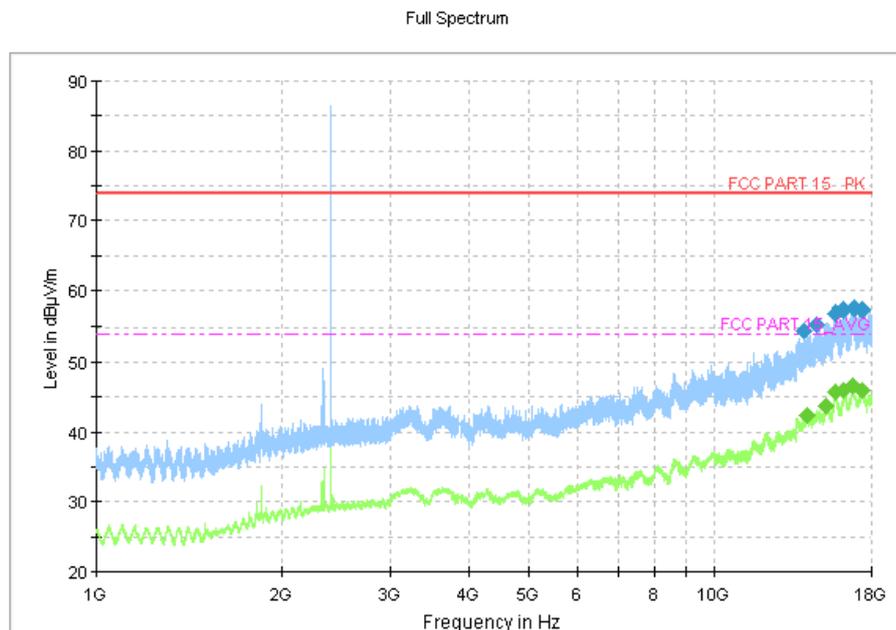


Fig. 50 Radiated Spurious Emission (GFSK, Ch0, 1 GHz ~18 GHz)

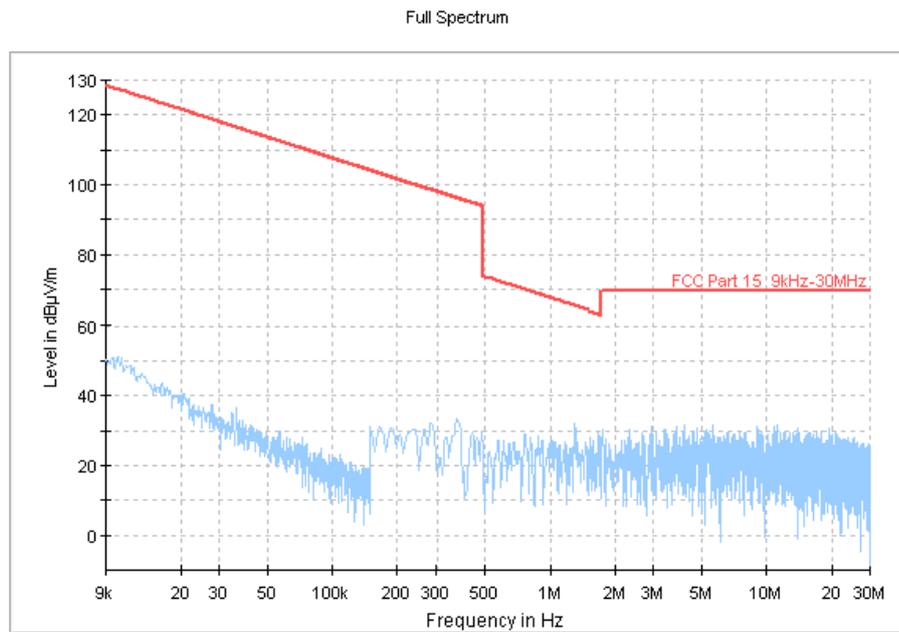


Fig. 51 Radiated Spurious Emission (GFSK, Ch39, 9 kHz ~30 MHz)

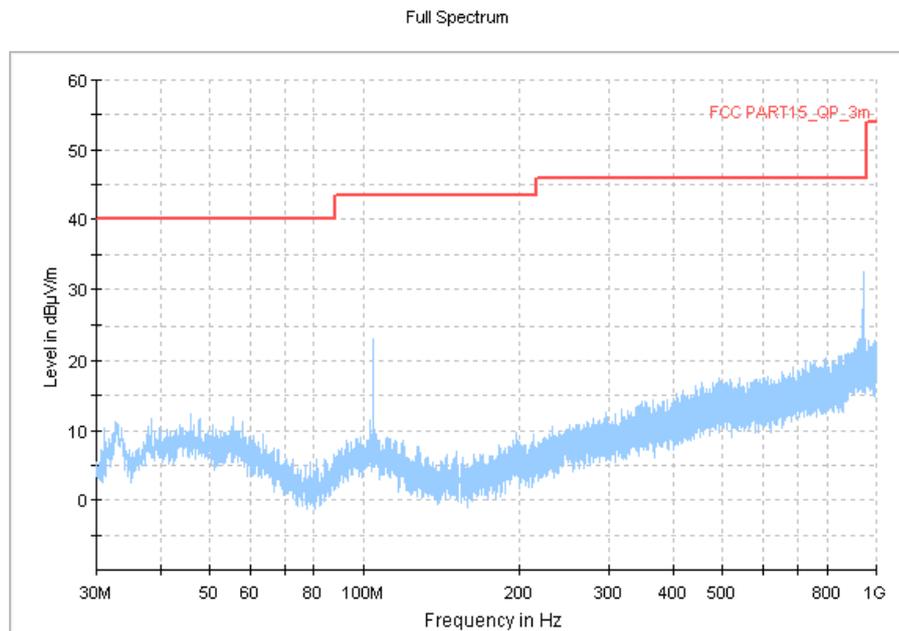


Fig. 52 Radiated Spurious Emission (GFSK, Ch39, 30 MHz ~1 GHz)

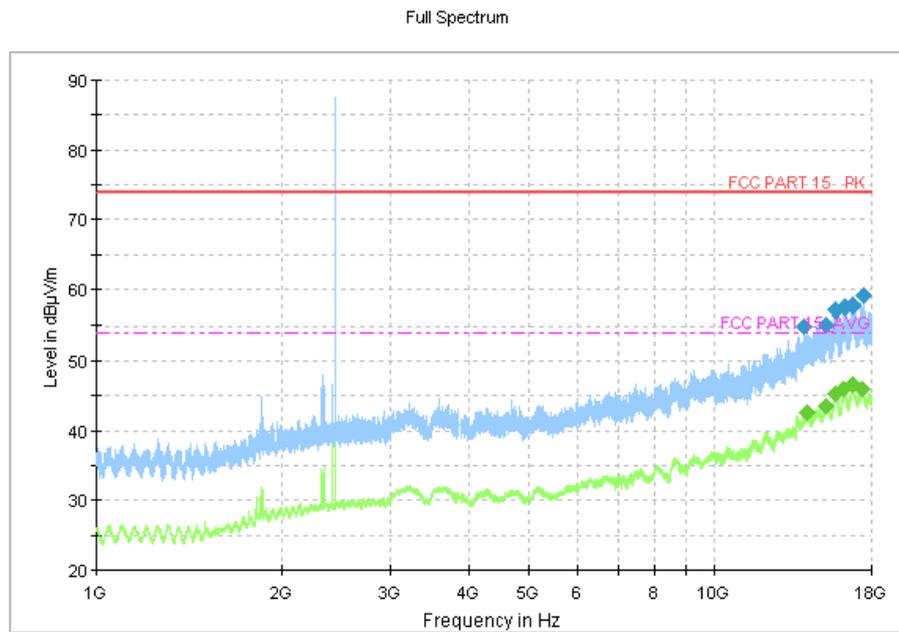


Fig. 53 Radiated Spurious Emission (GFSK, Ch39, 1 GHz ~18 GHz)

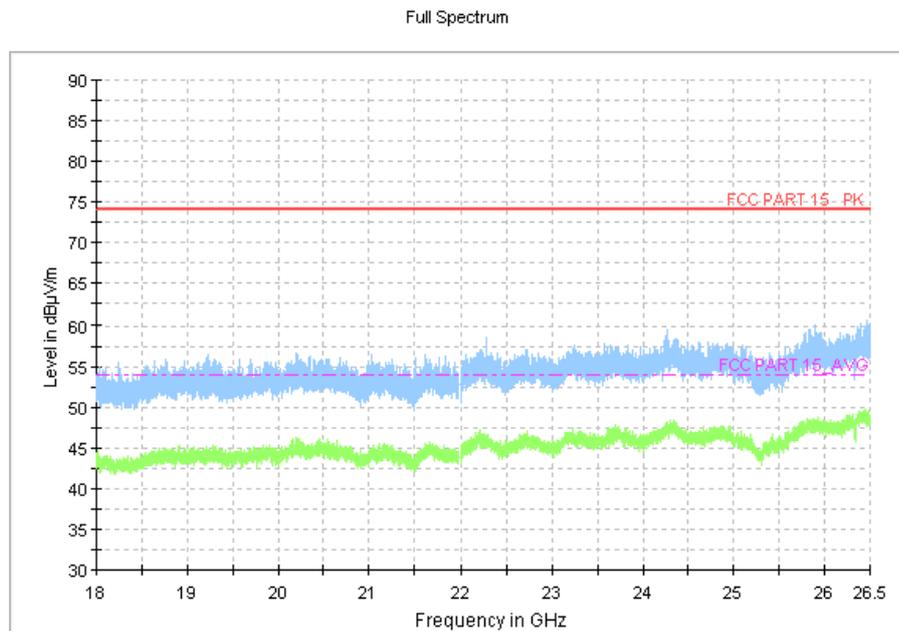


Fig. 54 Radiated Spurious Emission (GFSK, Ch39, 18 GHz ~26.5 GHz)

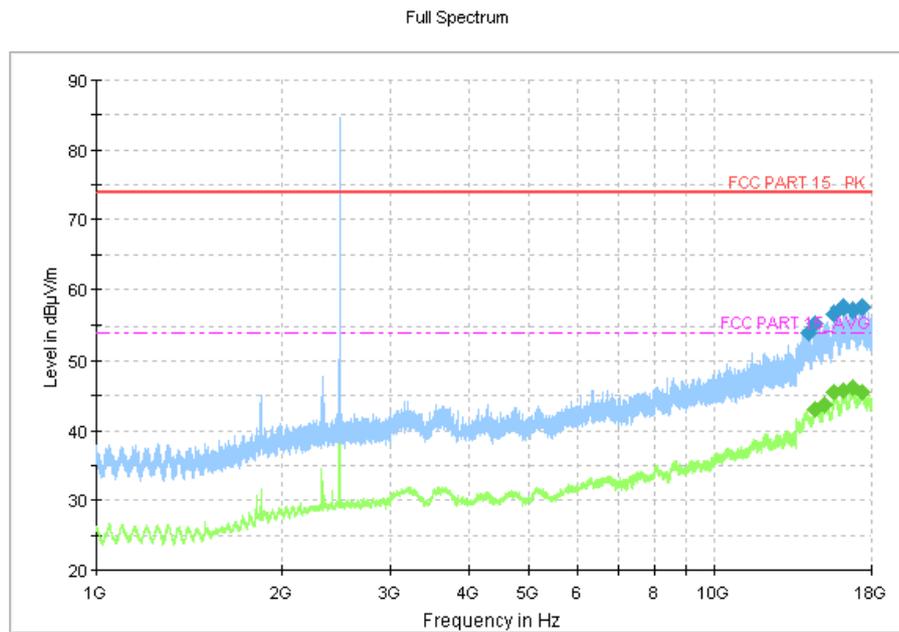


Fig. 55 Radiated Spurious Emission (GFSK, Ch78, 1 GHz ~18 GHz)

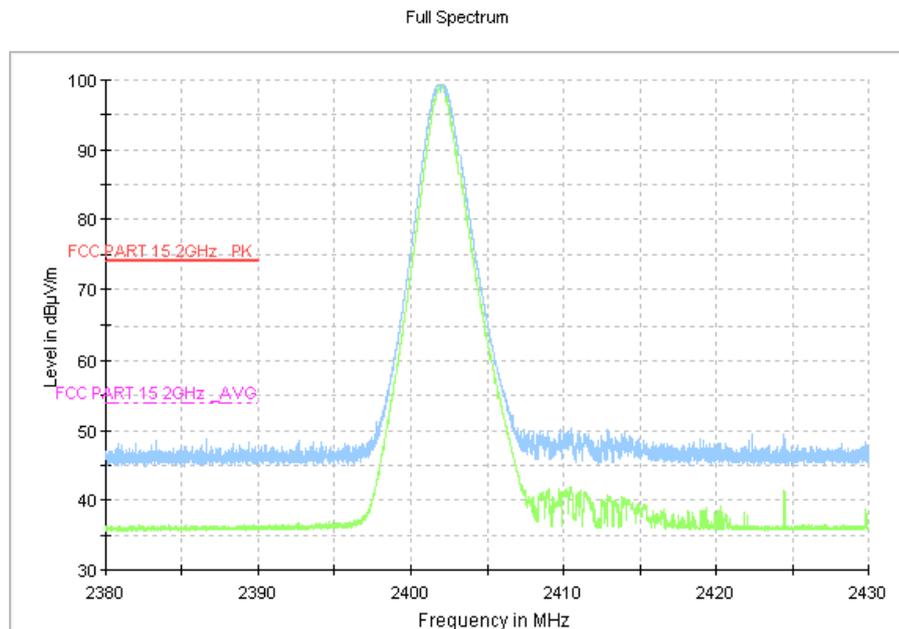


Fig. 56 Radiated Emission Power (GFSK, Ch0, 2380GHz~2450GHz)

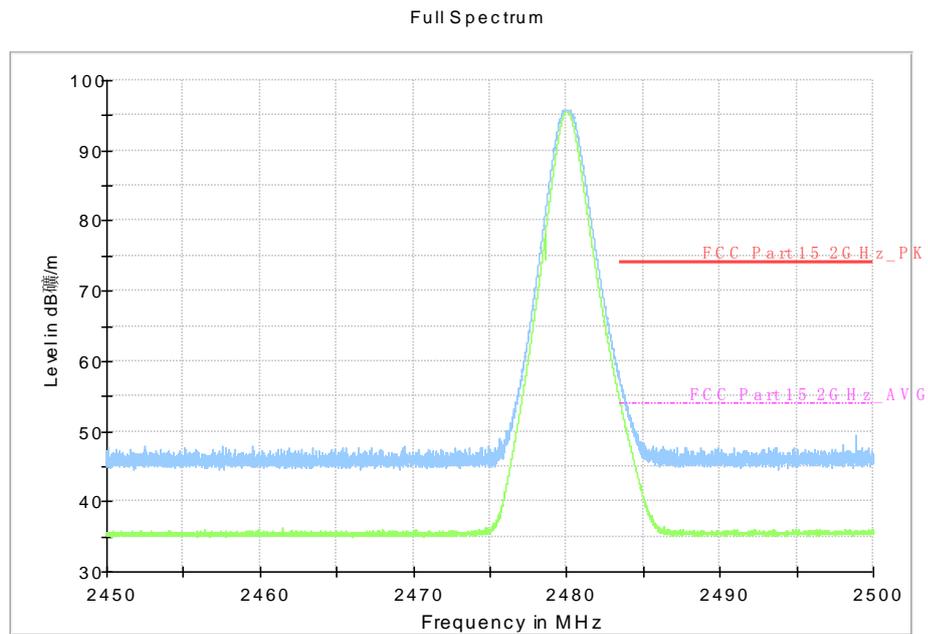


Fig. 57 Radiated Emission Power (GFSK, Ch78, 2450GHz~2500GHz)

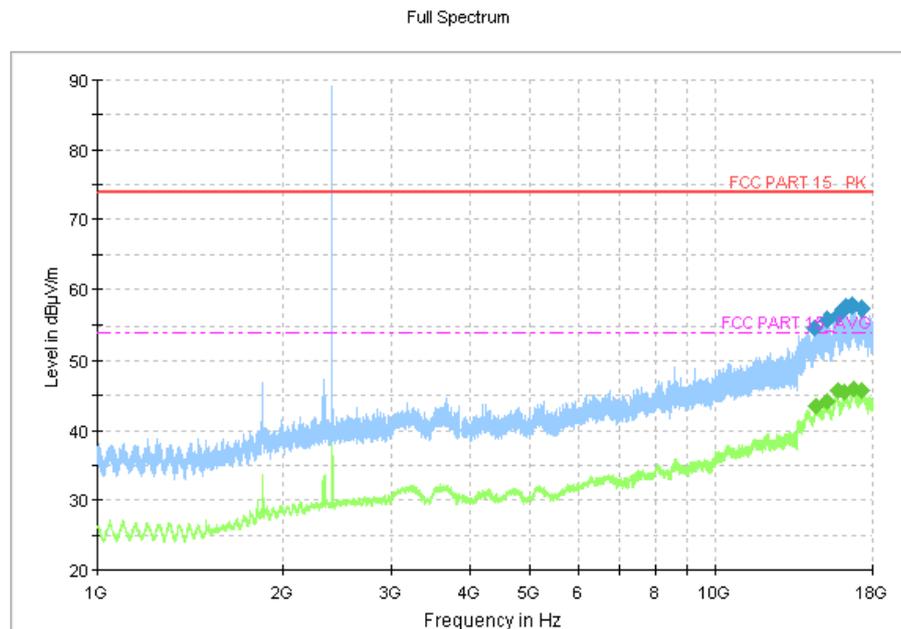


Fig. 58 Radiated Spurious Emission ($\pi/4$ DQPSK, Ch0, 1 GHz ~18 GHz)

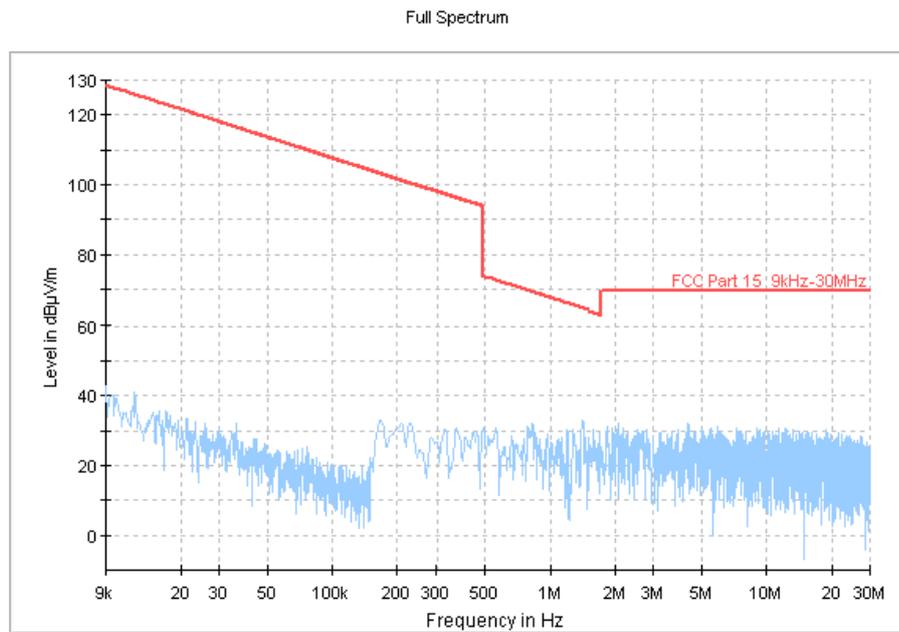


Fig. 59 Radiated Spurious Emission ($\pi/4$ DQPSK, Ch39, 9 kHz ~30 MHz)

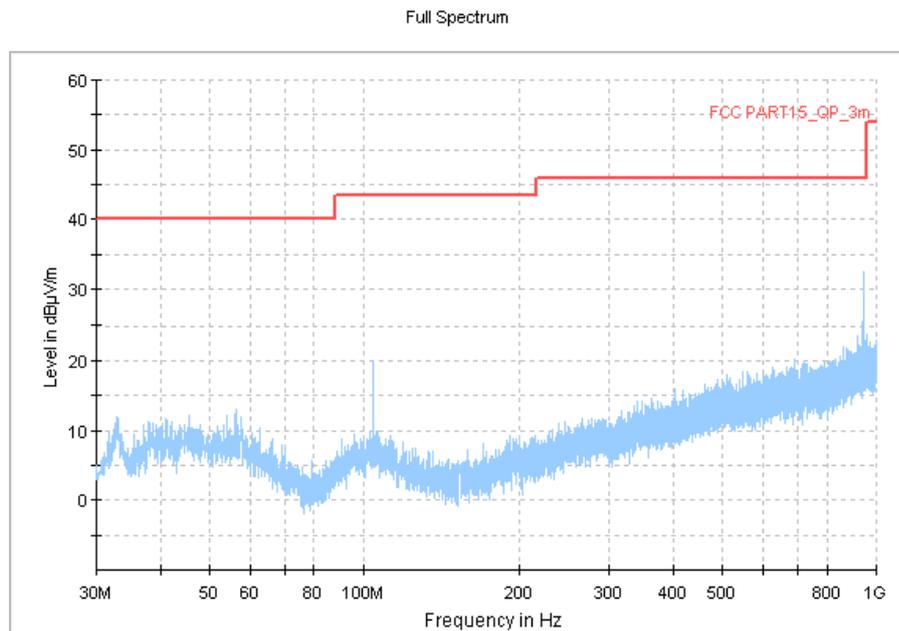


Fig. 60 Radiated Spurious Emission ($\pi/4$ DQPSK, Ch39, 30 MHz ~1 GHz)

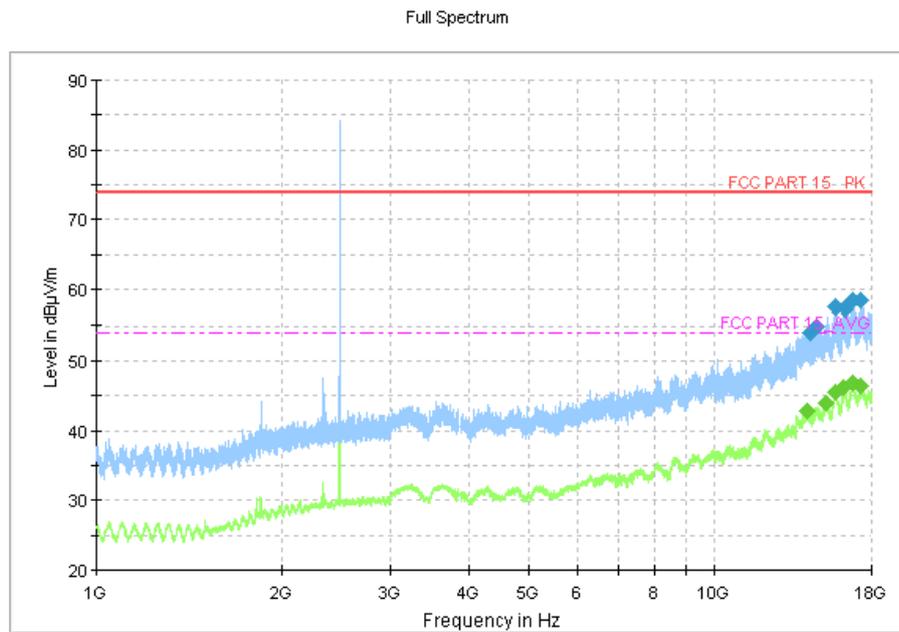


Fig. 61 Radiated Spurious Emission ($\pi/4$ DQPSK, Ch39, 1 GHz ~18 GHz)

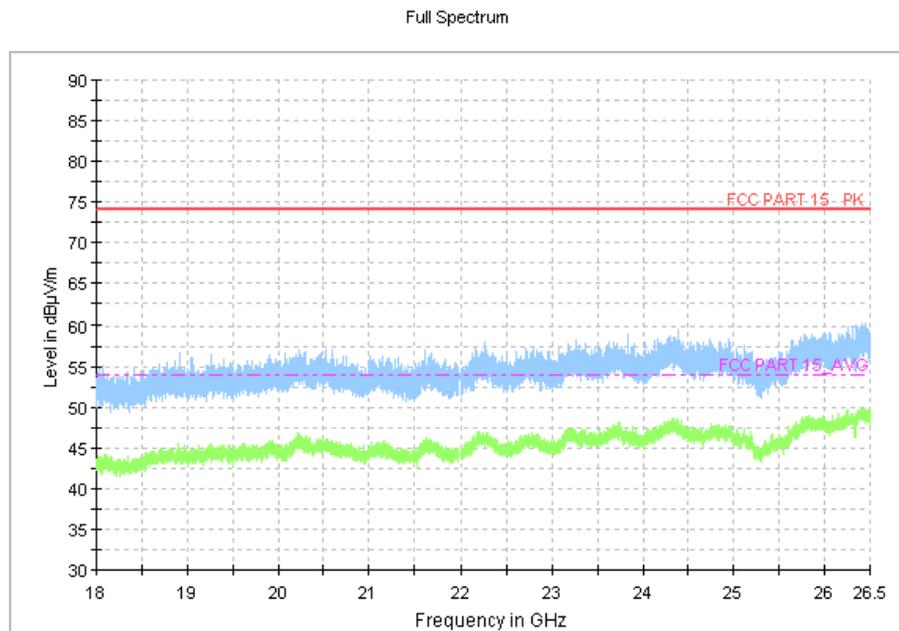


Fig. 62 Radiated Spurious Emission ($\pi/4$ DQPSK, Ch39, 18 GHz ~26.5 GHz)

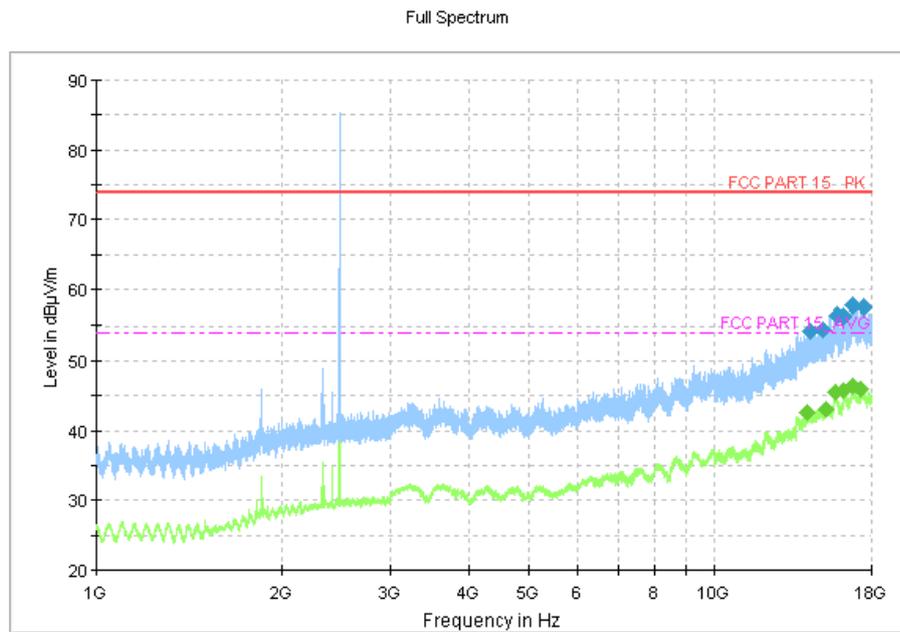


Fig. 63 Radiated Spurious Emission ($\pi/4$ DQPSK, Ch78, 1 GHz ~18 GHz)

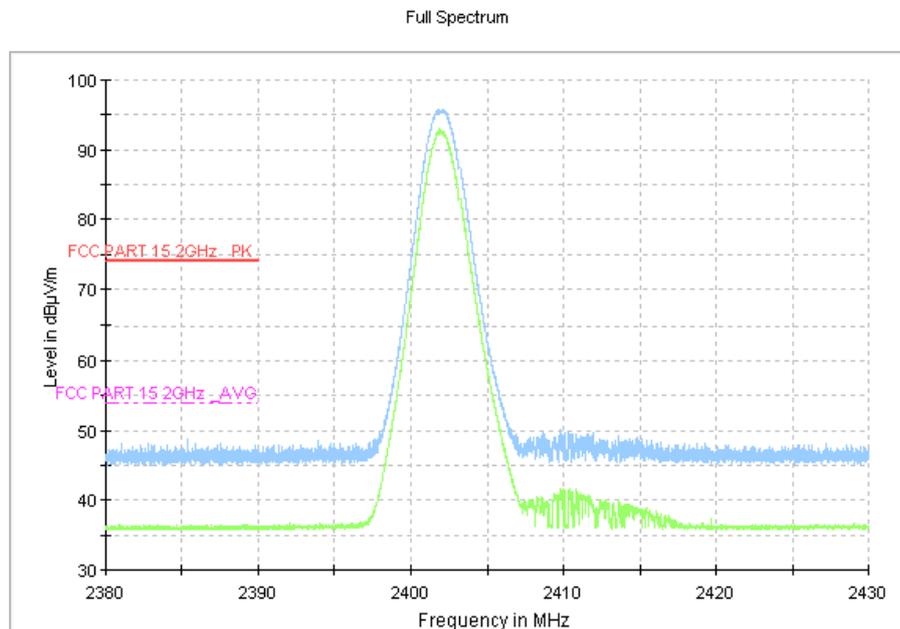


Fig. 64 Radiated Emission Power ($\pi/4$ DQPSK, Ch0, 2380GHz~2450GHz)

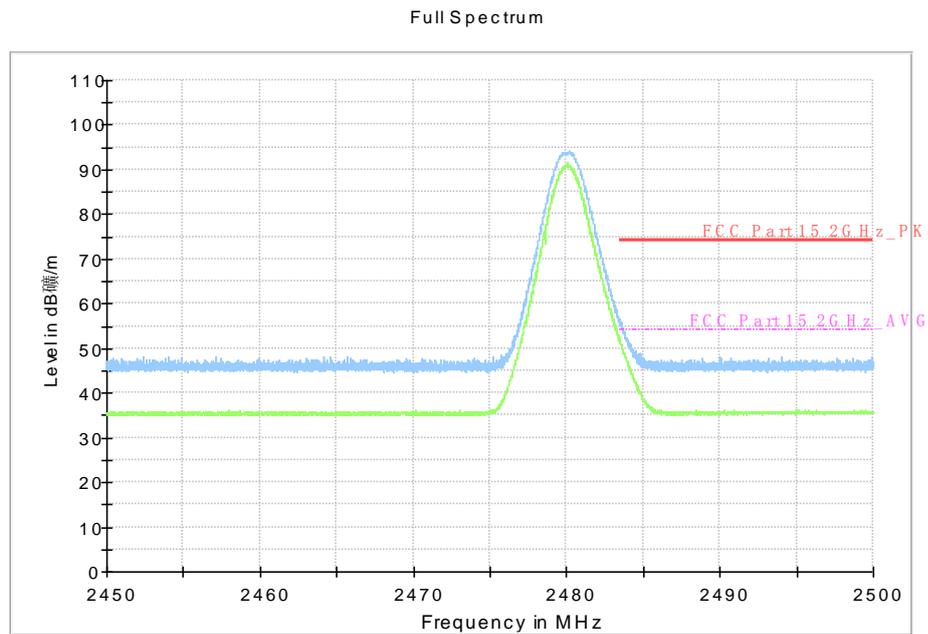


Fig. 65 Radiated Emission Power ($\pi/4$ DQPSK, Ch78, 2450GHz~2500GHz)

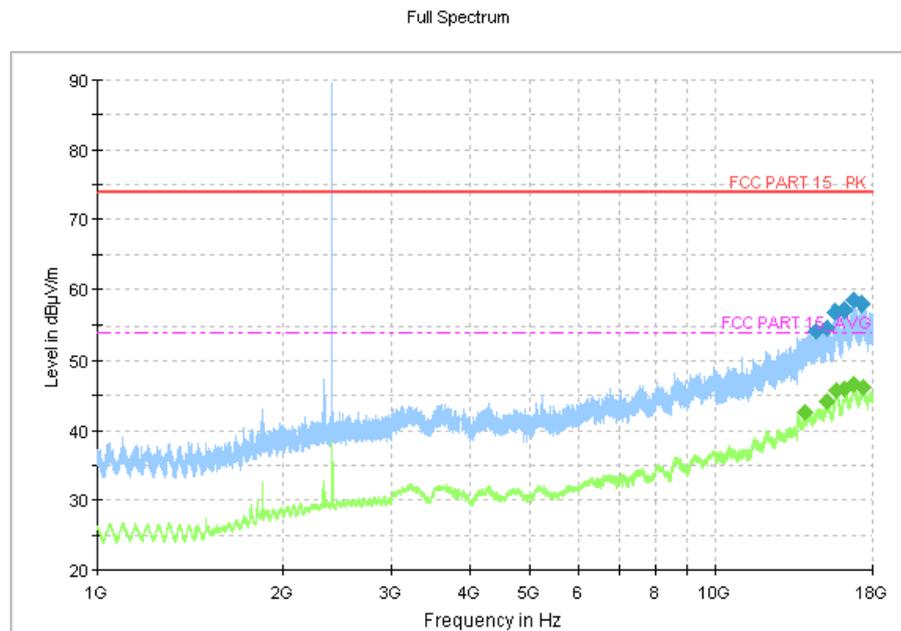


Fig. 66 Radiated Spurious Emission (8DPSK, Ch0, 1 GHz ~18 GHz)

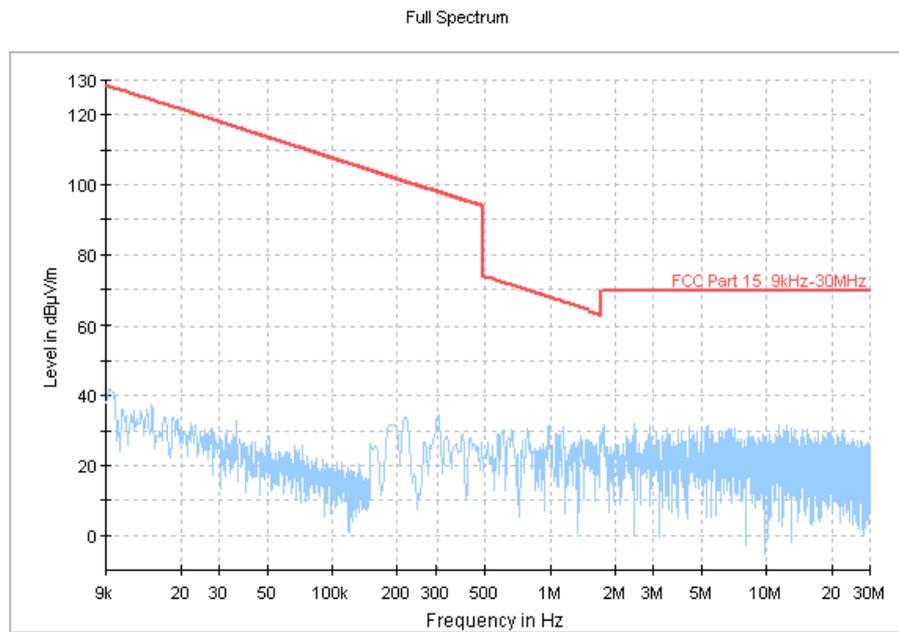


Fig. 67 Radiated Spurious Emission (8DPSK, Ch39, 9 kHz ~30 MHz)

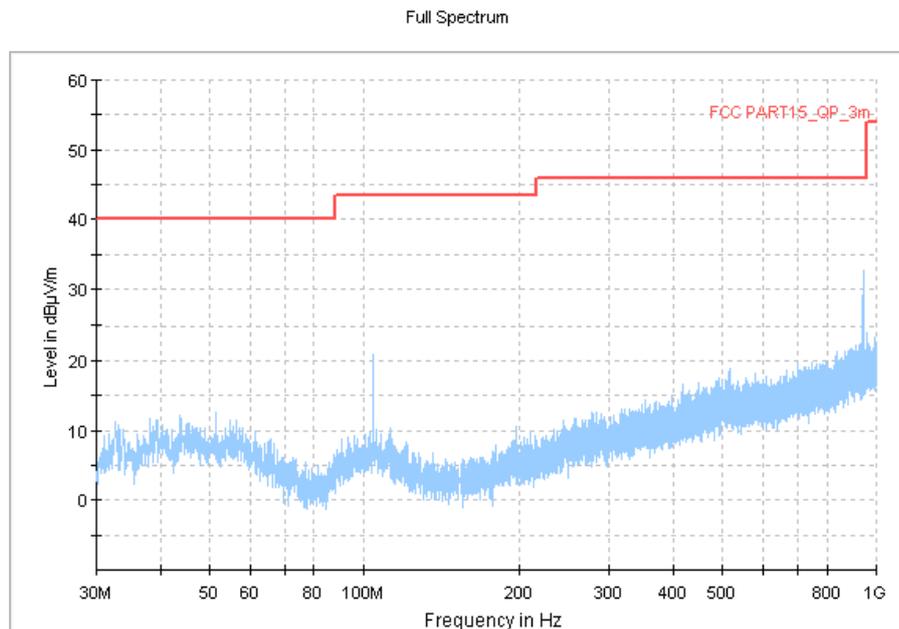


Fig. 68 Radiated Spurious Emission (8DPSK, Ch39, 30 MHz ~1 GHz)

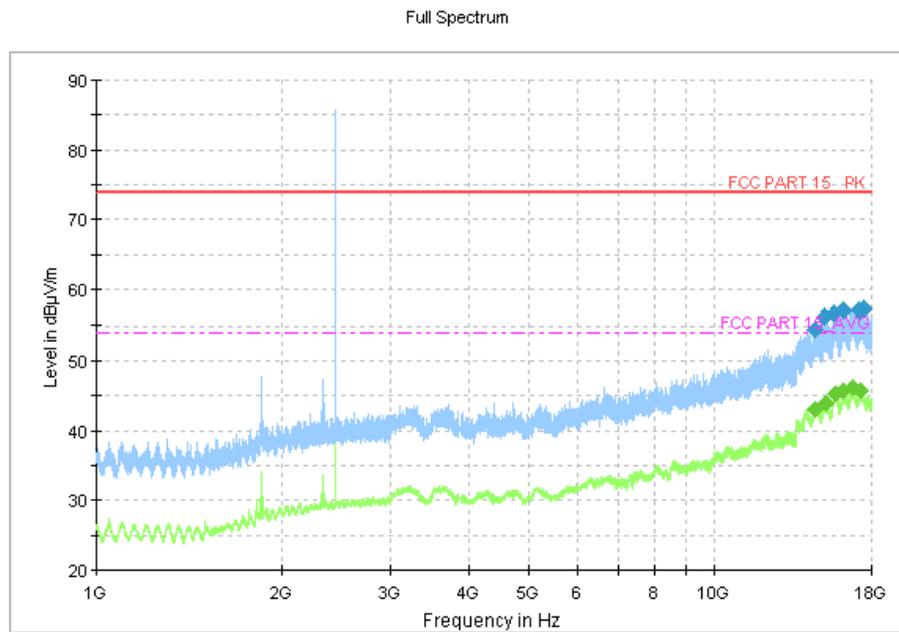


Fig. 69 Radiated Spurious Emission (8DPSK, Ch39, 1 GHz ~18 GHz)

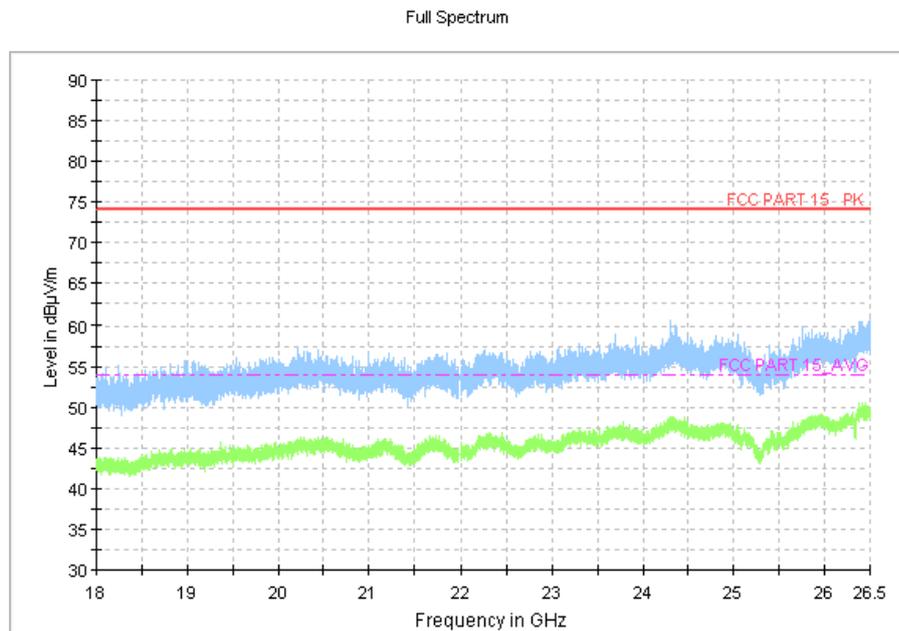


Fig. 70 Radiated Spurious Emission (8DPSK, Ch39, 18 GHz ~26.5 GHz)

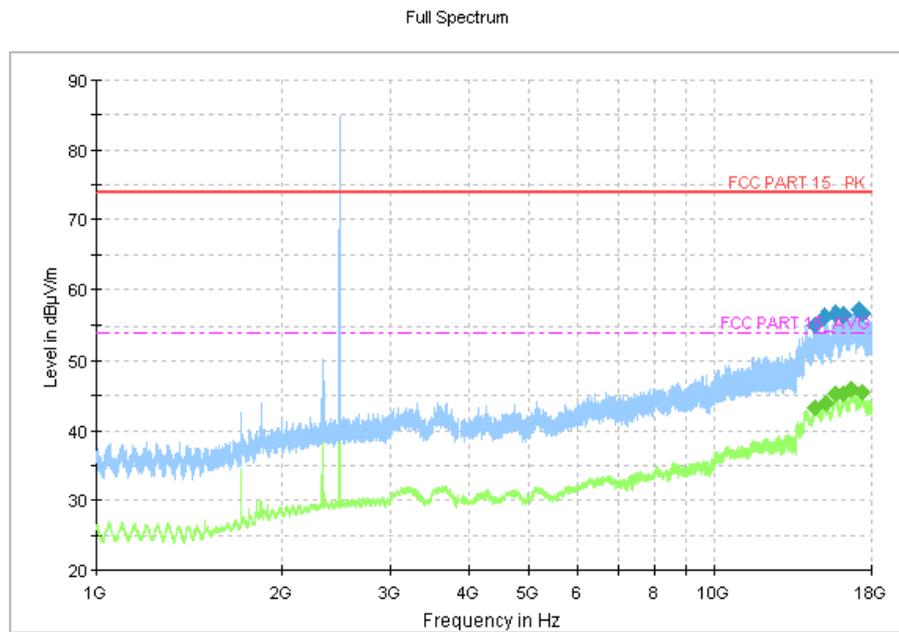


Fig. 71 Radiated Spurious Emission (8DPSK, Ch78, 1 GHz ~18 GHz)

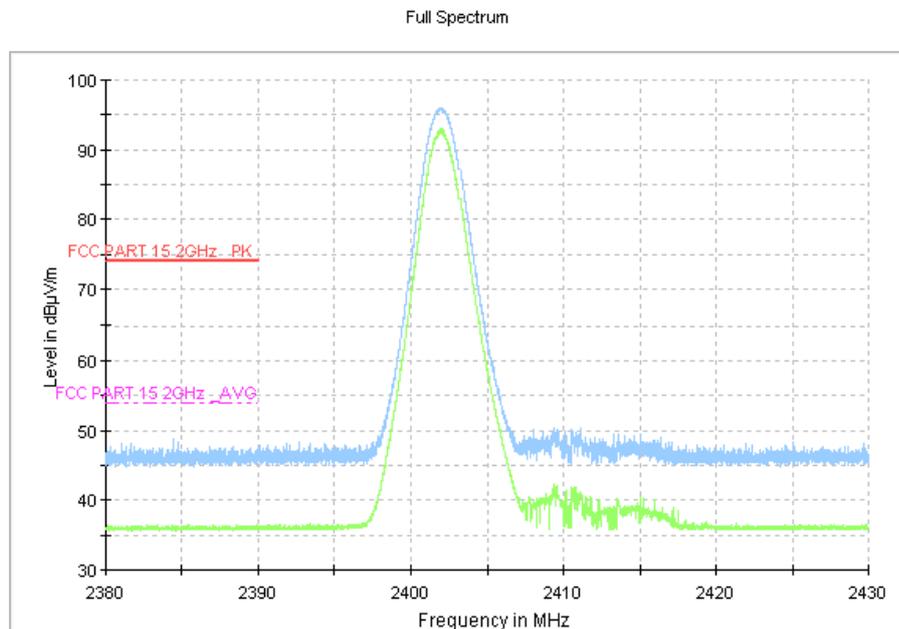


Fig. 72 Radiated Emission Power (8DPSK, Ch0, 2380GHz~2450GHz)

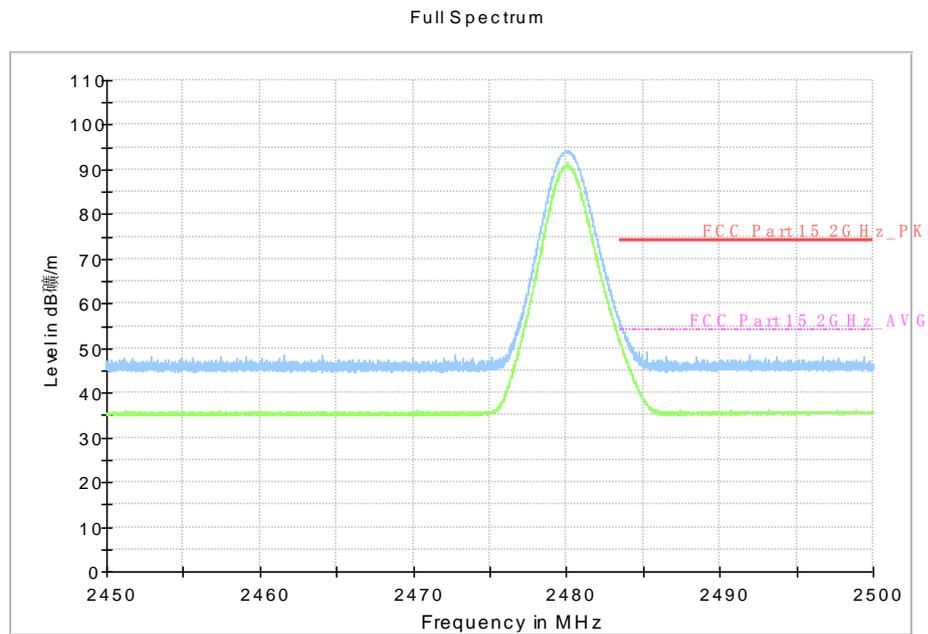


Fig. 73 Radiated Emission Power (8DPSK, Ch78, 2450GHz~2500GHz)

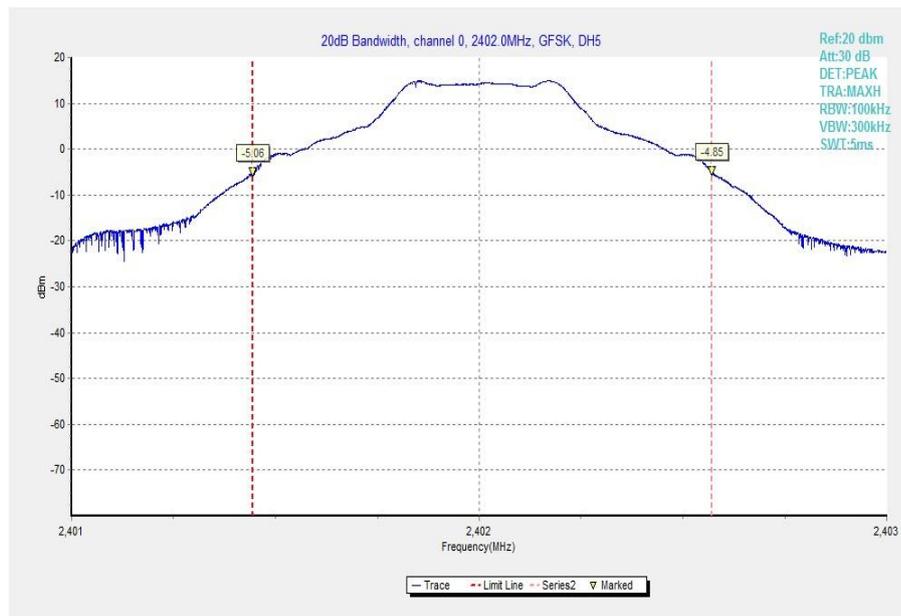


Fig. 74 Occupied 20dB Bandwidth (GFSK, Ch 0)

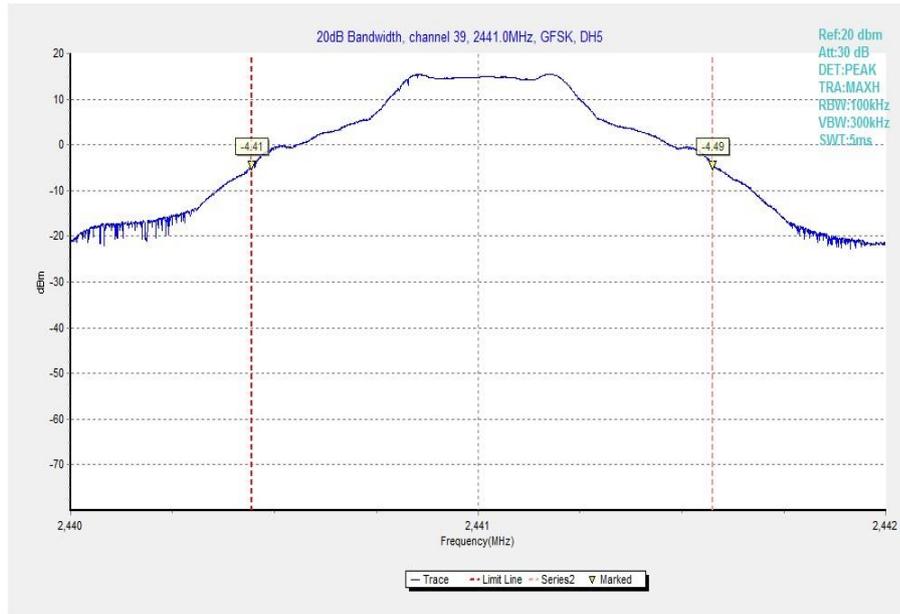


Fig. 75 Occupied 20dB Bandwidth (GFSK, Ch 39)

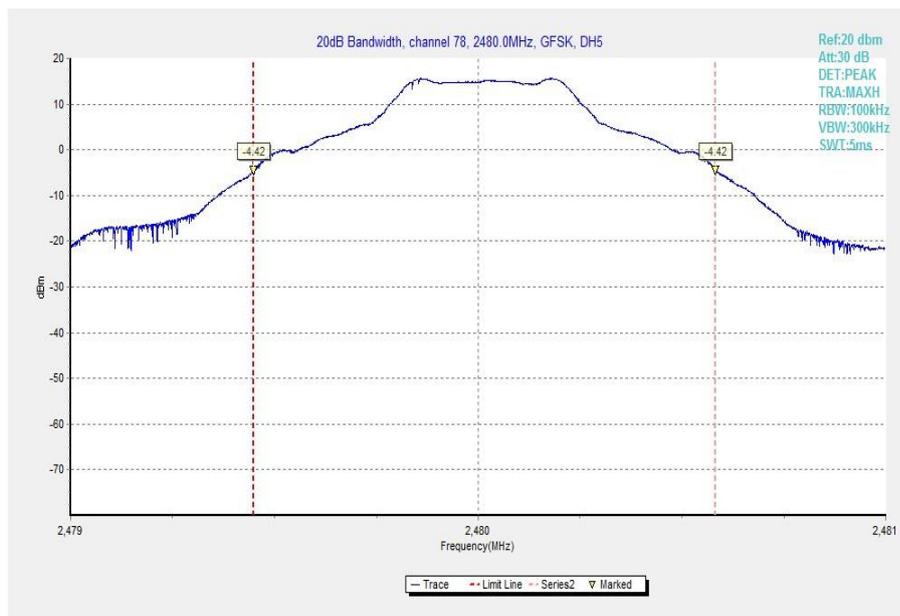


Fig. 76 Occupied 20dB Bandwidth (GFSK, Ch 78)

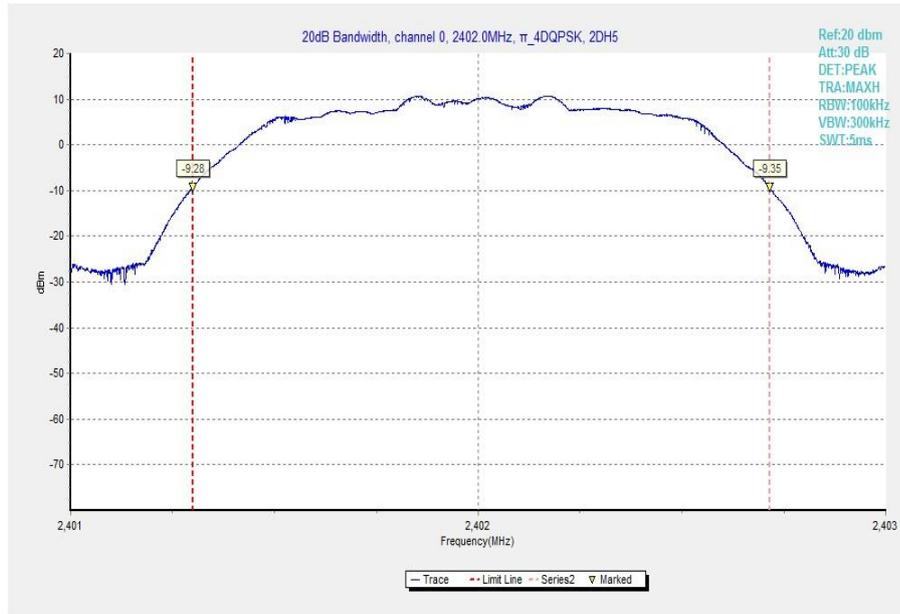


Fig. 77 Occupied 20dB Bandwidth (π /4 DQPSK, Ch 0)

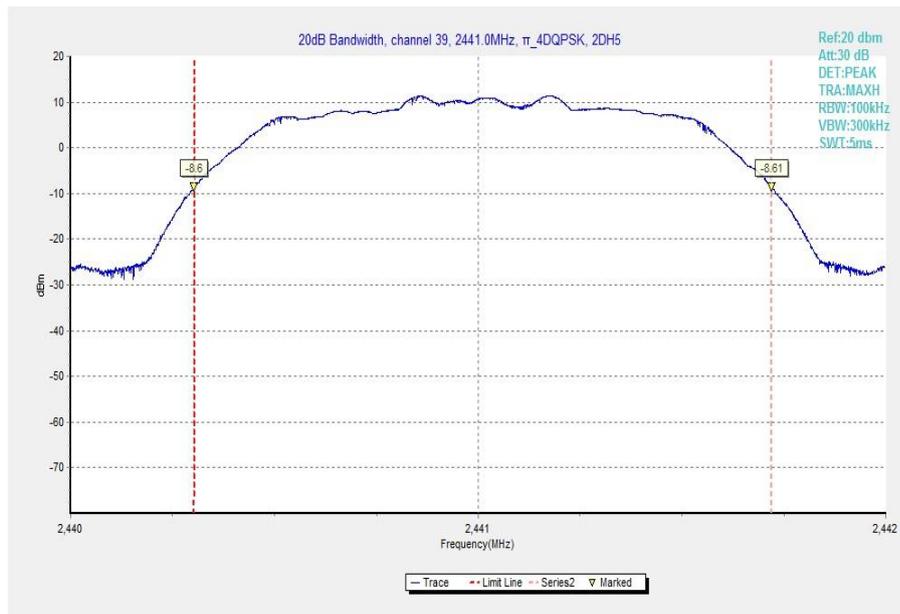


Fig. 78 Occupied 20dB Bandwidth (π /4 DQPSK, Ch 39)

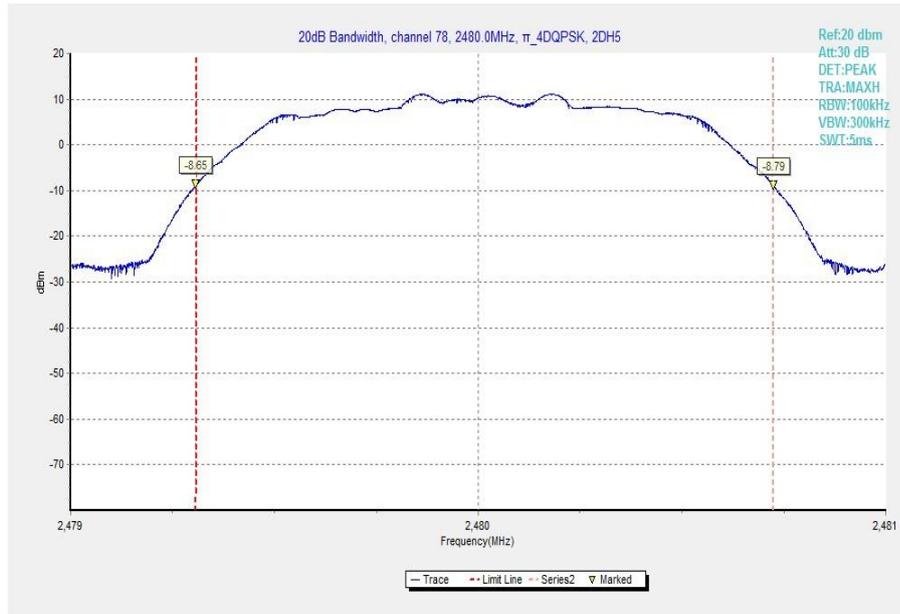


Fig. 79 Occupied 20dB Bandwidth ($\pi/4$ DQPSK, Ch 78)

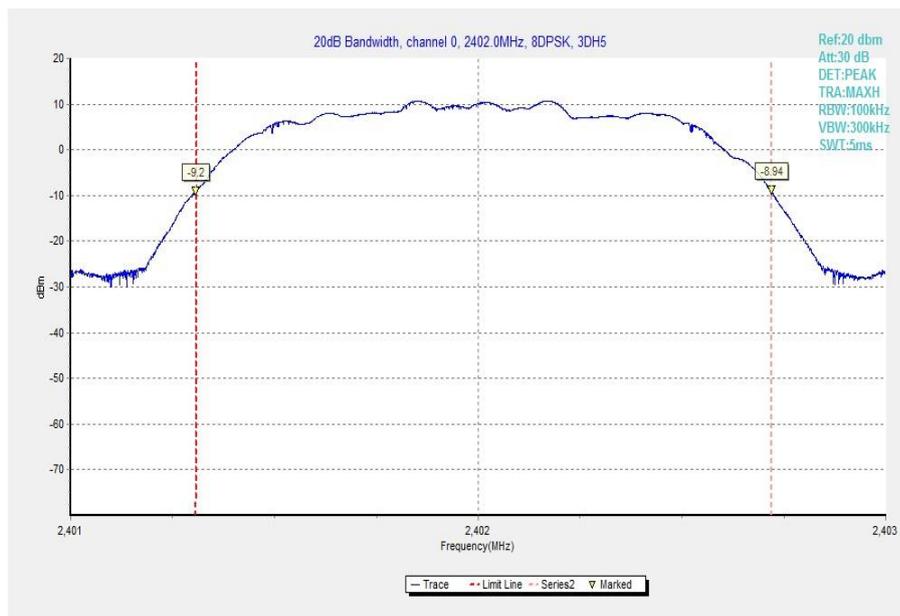


Fig. 80 Occupied 20dB Bandwidth (8DPSK, Ch 0)

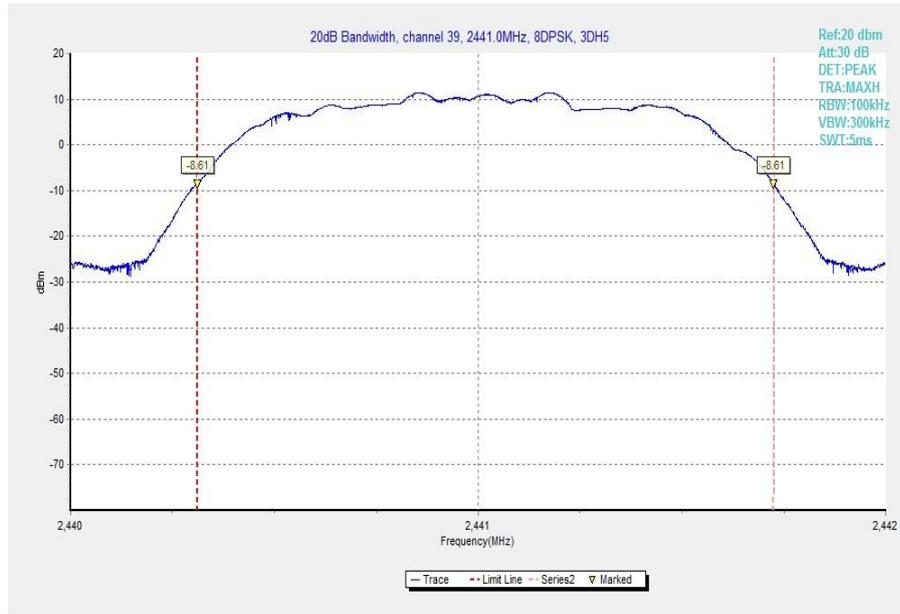


Fig. 81 Occupied 20dB Bandwidth (8DPSK, Ch 39)

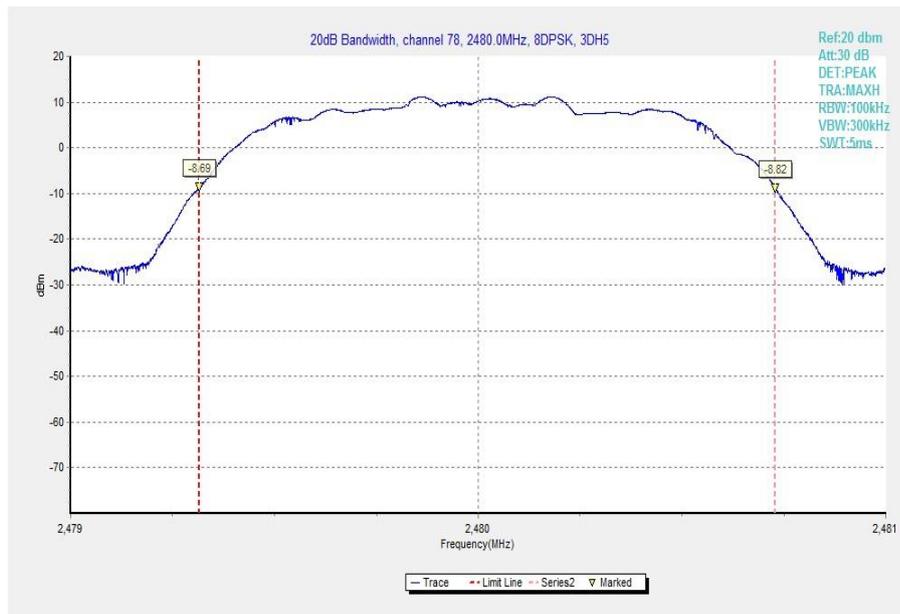


Fig. 82 Occupied 20dB Bandwidth (8DPSK, Ch 78)

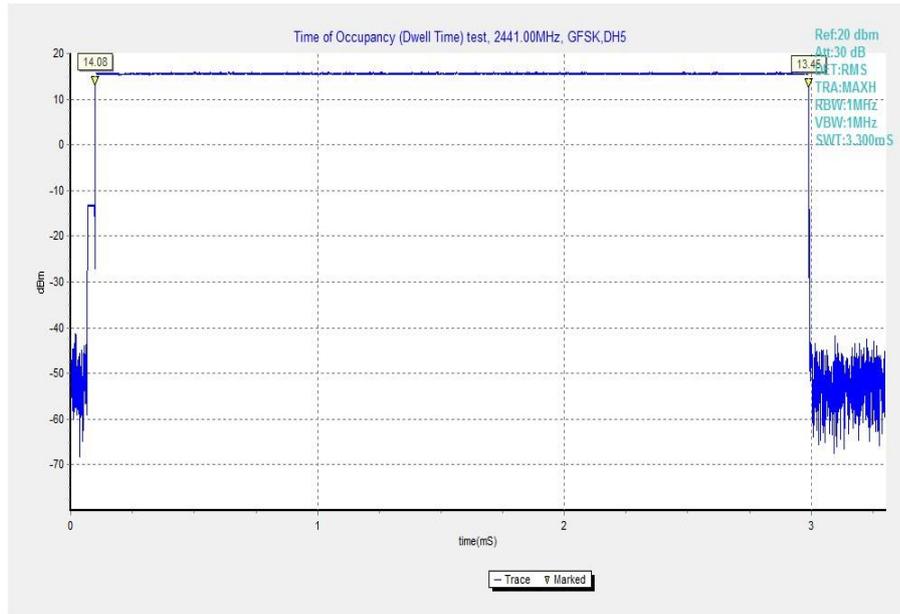
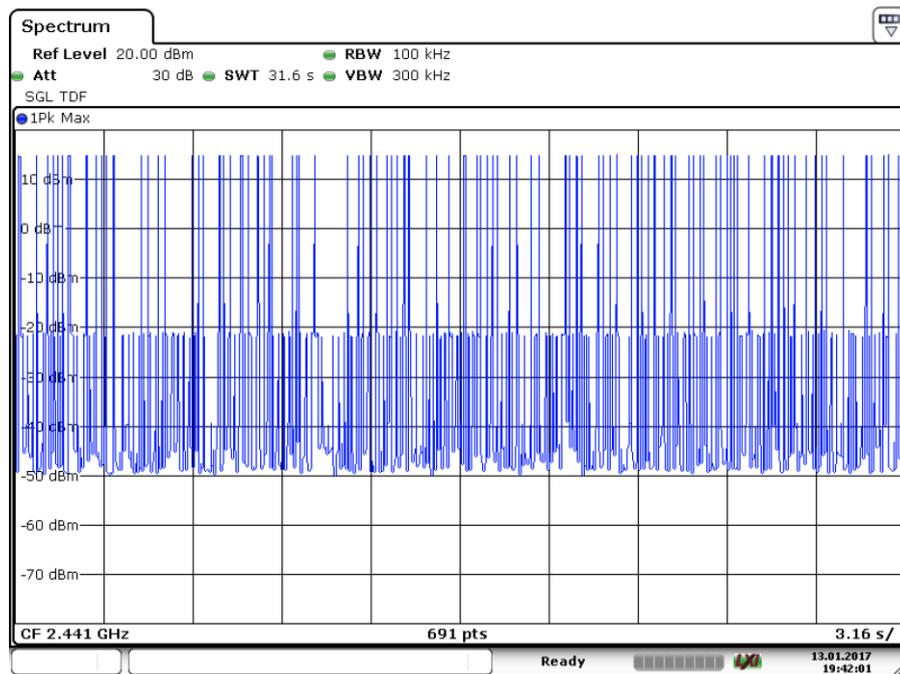


Fig. 83 Time of Occupancy(Dwell Time) (GFSK, Ch39)



Date: 13.JAN.2017 19:42:01

Fig. 84 Number of Transmissions (GFSK, Ch39)

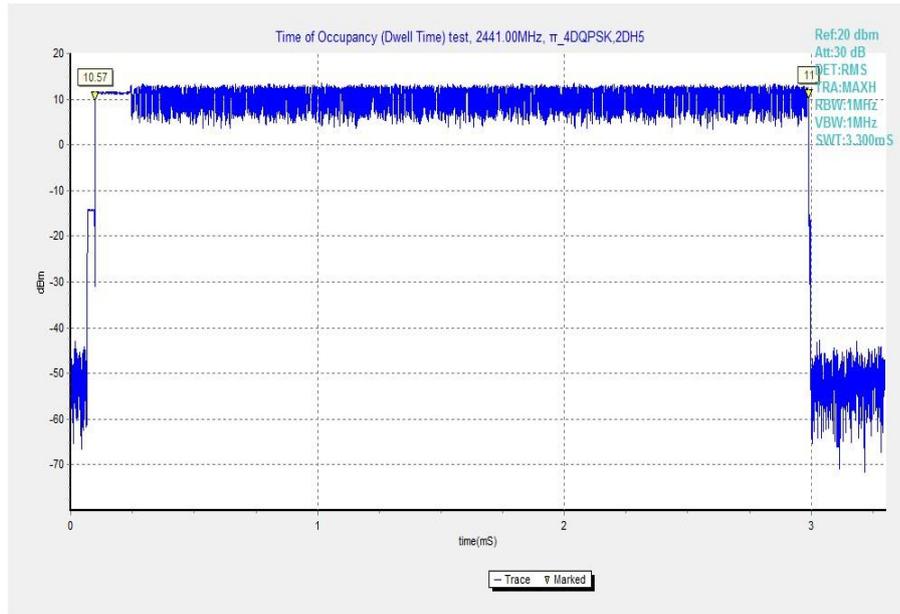
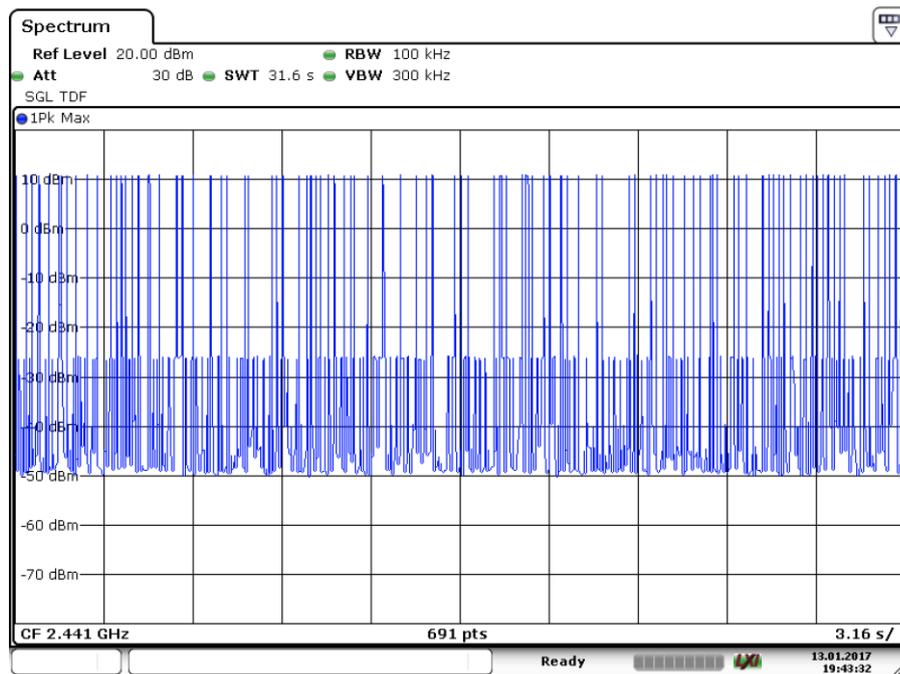


Fig. 85 Time of Occupancy(Dwell Time) ($\pi/4$ DQPSK, Ch39)



Date: 13.JAN.2017 19:43:32

Fig. 86 Number of Transmissions ($\pi/4$ DQPSK, Ch39)

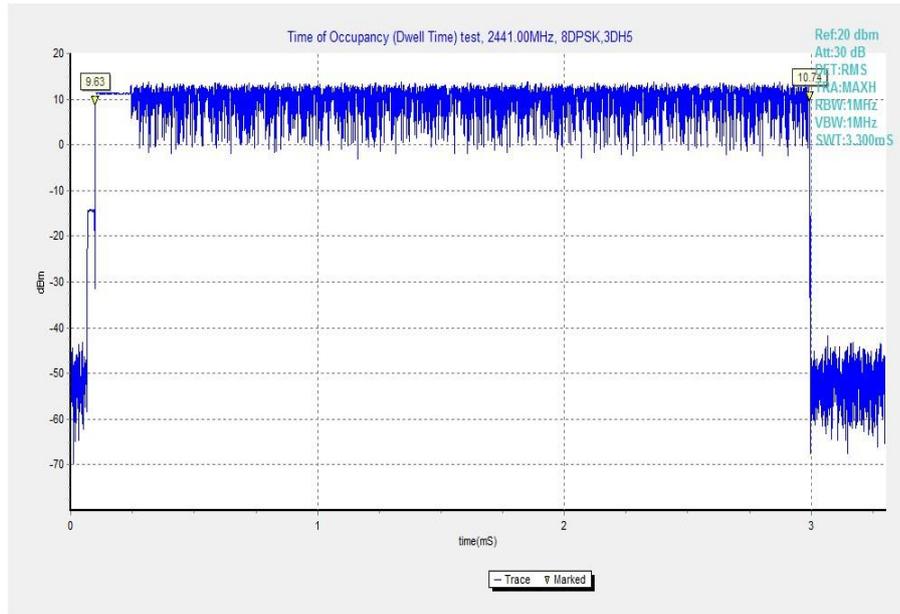


Fig. 87 Time of Occupancy(Dwell Time) (8DPSK, Ch39)

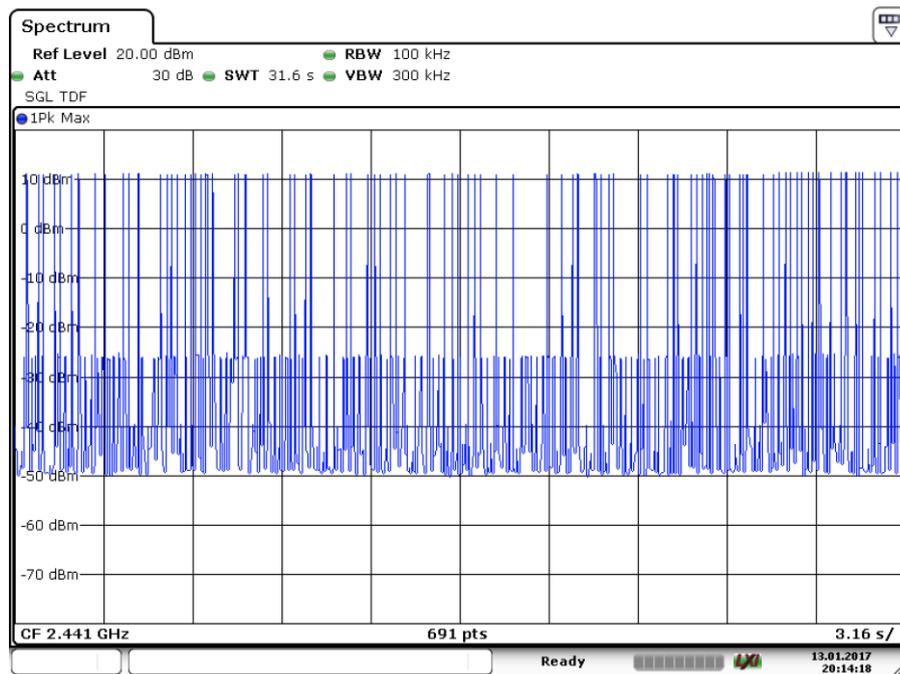


Fig. 88 Number of Transmissions (8DPSK, Ch39)

Date: 13.JAN.2017 20:14:18

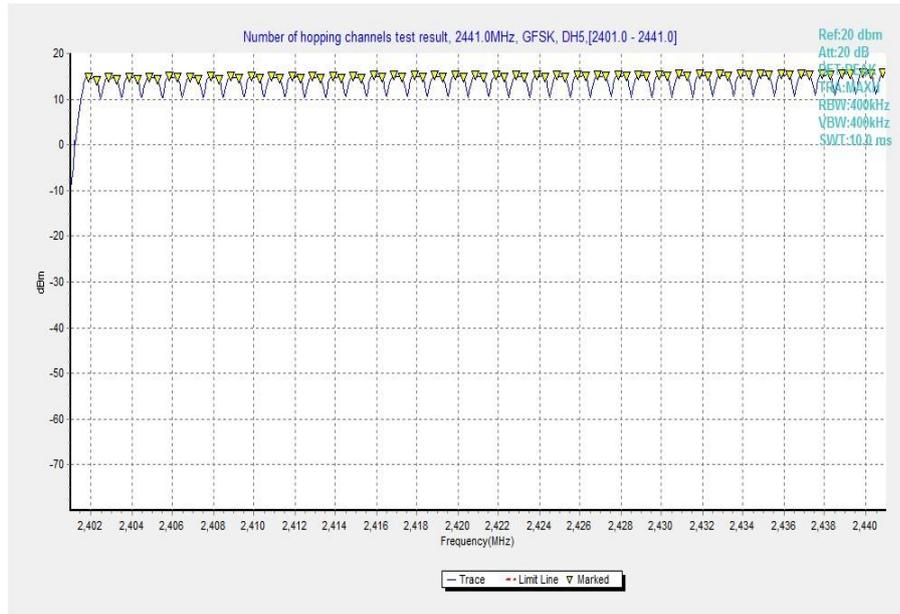


Fig. 89 Hopping channel ch0~39 (GFSK, Ch39)

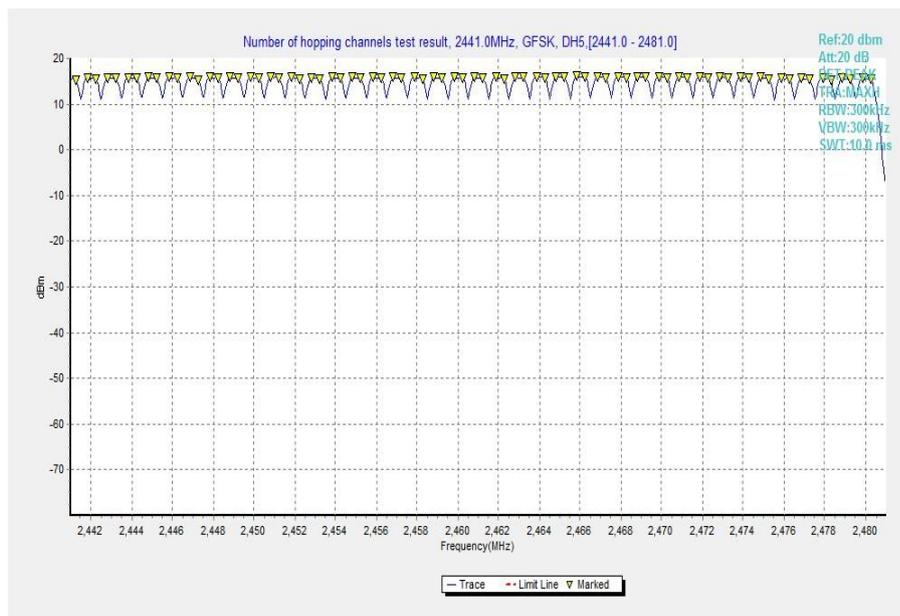


Fig. 90 Hopping channel ch39~78 (GFSK, Ch39)

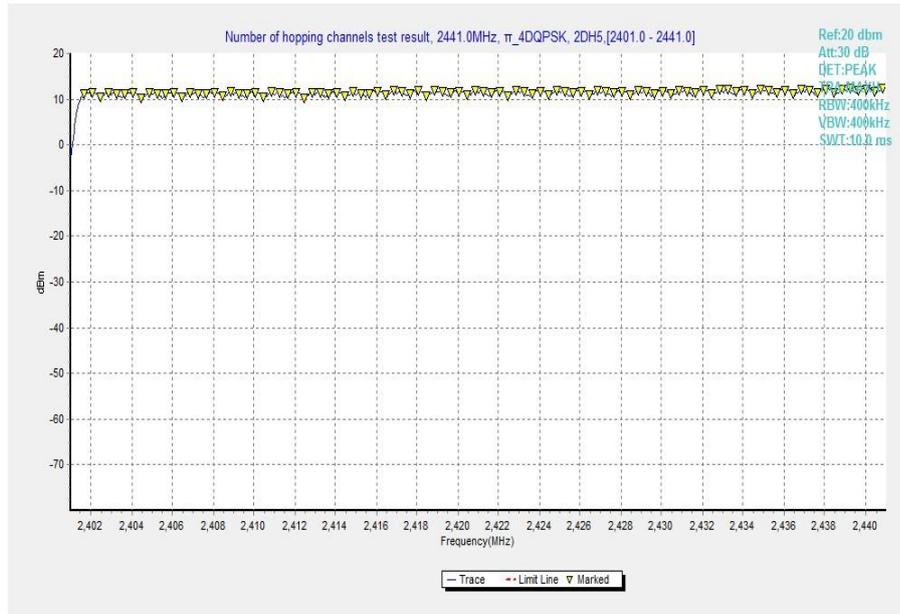


Fig. 91 Hopping channel ch0~39 ($\pi/4$ DQPSK, Ch39)

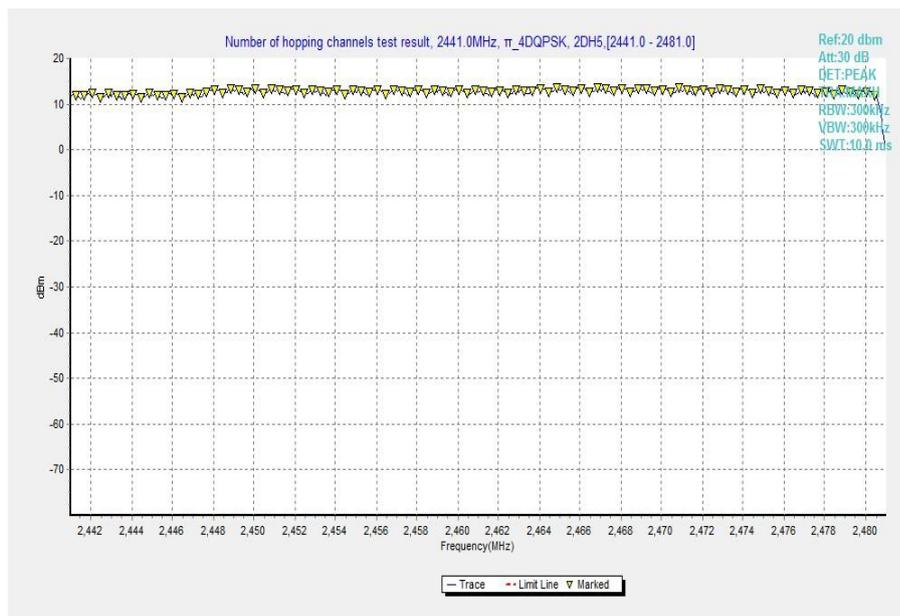


Fig. 92 Hopping channel ch39~78 ($\pi/4$ DQPSK, Ch39)

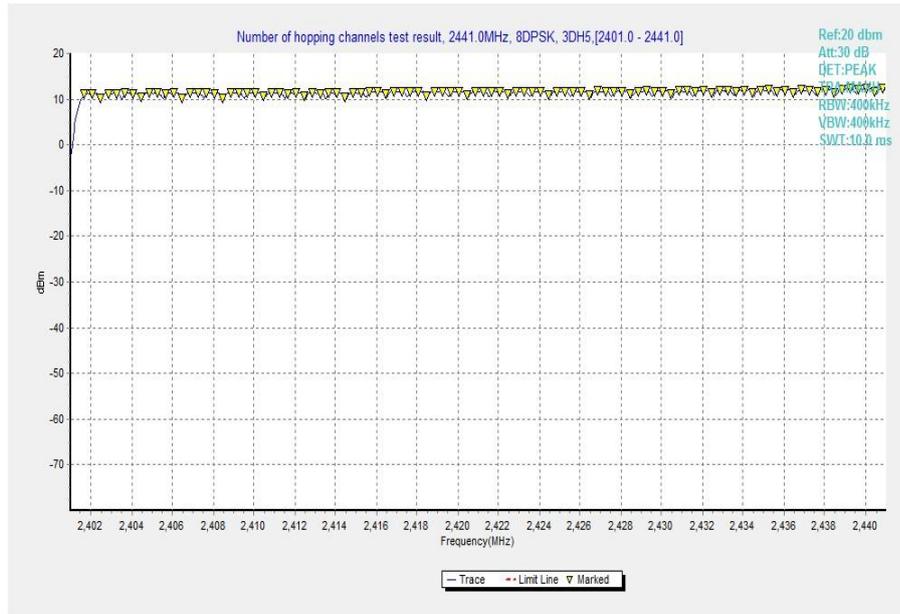


Fig. 93 Hopping channel ch0~39 (8DPSK, Ch39)



Fig. 94 Hopping channel ch39~78 (8DPSK, Ch39)

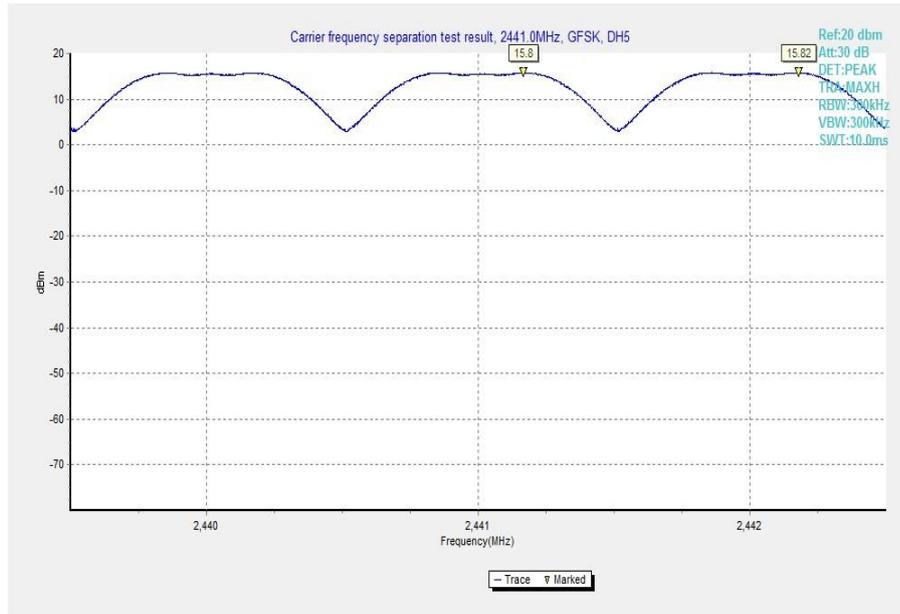


Fig. 95 Carrier Frequency Separation (GFSK, Ch39)

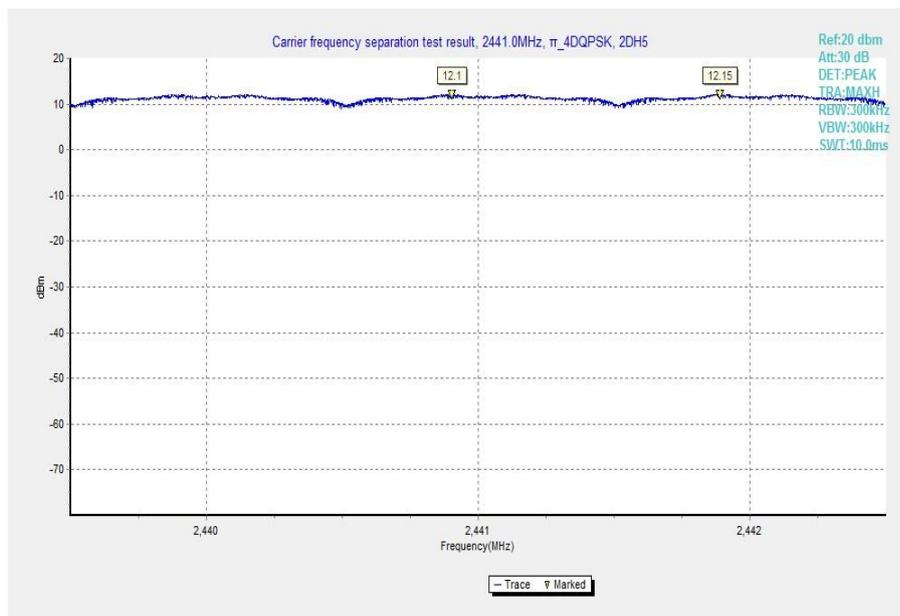


Fig. 96 Carrier Frequency Separation ($\pi/4$ DQPSK, Ch39)

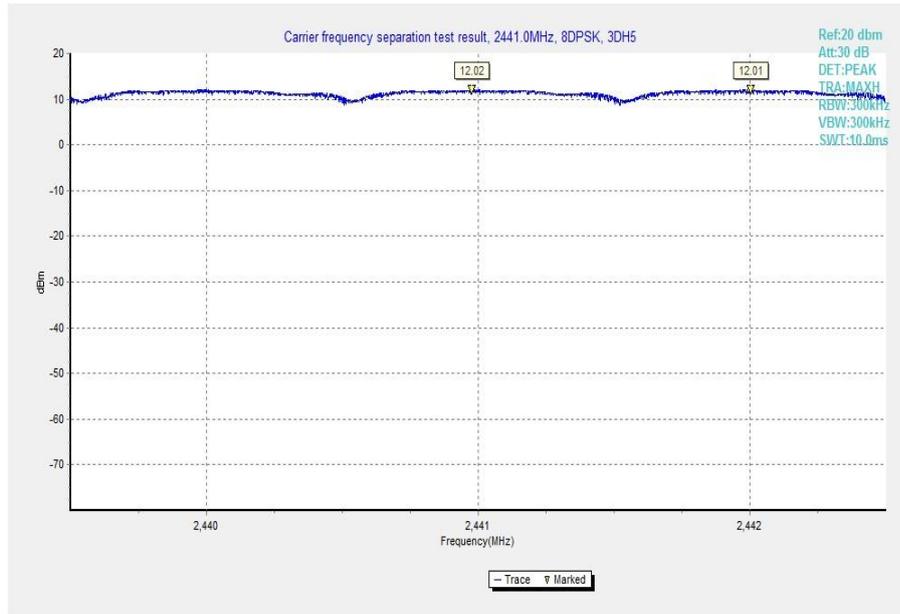


Fig. 97 Carrier Frequency Separation (8DPSK, Ch39)

ESH2-Z5 Scan-FCC

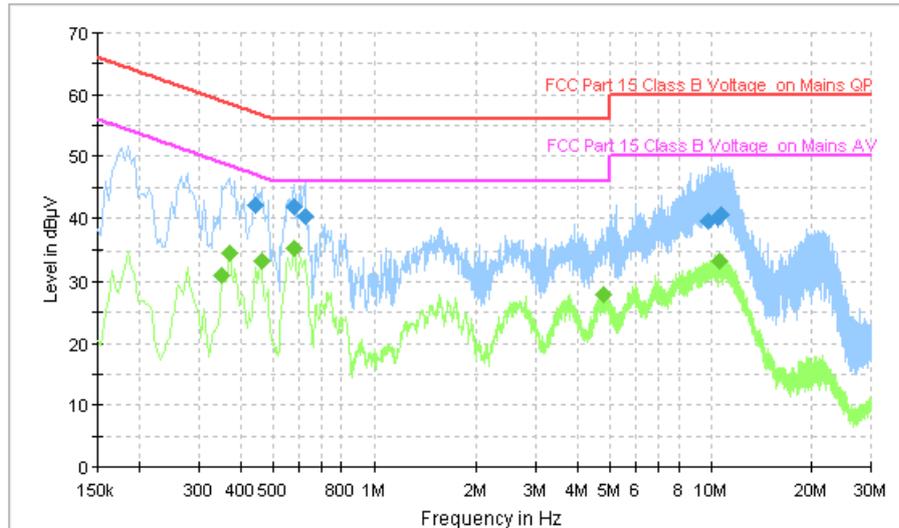


Fig. 98 AC Powerline Conducted Emission (Traffic, AE1)

MEASUREMENT RESULT: "QuasiPeak"

Frequency (MHz)	QuasiPeak (dBµV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.442000	42.0	GND	N	9.7	15.0	57.0
0.578000	41.9	GND	N	9.6	14.2	56.0
0.622000	40.2	GND	N	9.6	15.8	56.0
9.818000	39.6	GND	N	9.9	20.4	60.0
10.454000	40.1	GND	N	9.9	19.9	60.0
10.746000	40.4	GND	N	9.9	19.6	60.0

MEASUREMENT RESULT: "Average"

Frequency (MHz)	Average (dBµV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.350000	31.0	GND	N	9.6	17.9	49.0
0.370000	34.6	GND	N	9.6	13.9	48.5
0.462000	33.5	GND	N	9.7	13.2	46.7
0.578000	35.4	GND	N	9.6	10.6	46.0
4.782000	27.8	GND	N	9.6	18.2	46.0
10.554000	33.4	GND	N	9.9	16.6	50.0

ESH2-Z5 Scan-FCC

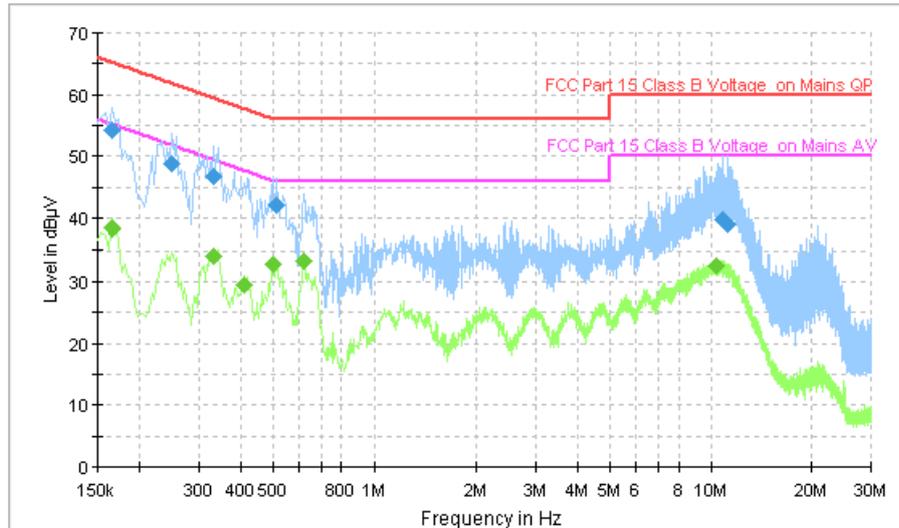


Fig. 99 AC Power line Conducted Emission (Idle, AE1)

MEASUREMENT RESULT: "QuasiPeak"

Frequency (MHz)	QuasiPeak (dBµV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.166000	54.2	GND	N	9.6	11.0	65.2
0.250000	48.8	GND	N	9.6	12.9	61.8
0.334000	46.8	GND	N	9.6	12.5	59.4
0.510000	42.1	GND	N	9.7	13.9	56.0
10.858000	39.7	GND	N	9.9	20.3	60.0
11.206000	38.9	GND	N	9.9	21.1	60.0

MEASUREMENT RESULT: "Average"

Frequency (MHz)	Average (dBµV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.166000	38.6	GND	N	9.6	16.6	55.2
0.334000	34.2	GND	N	9.6	15.1	49.4
0.410000	29.3	GND	N	9.7	18.3	47.6
0.502000	32.7	GND	N	9.7	13.3	46.0
0.618000	33.4	GND	N	9.6	12.6	46.0
10.378000	32.4	GND	N	9.9	17.6	50.0

ESH2-Z5 Scan-FCC

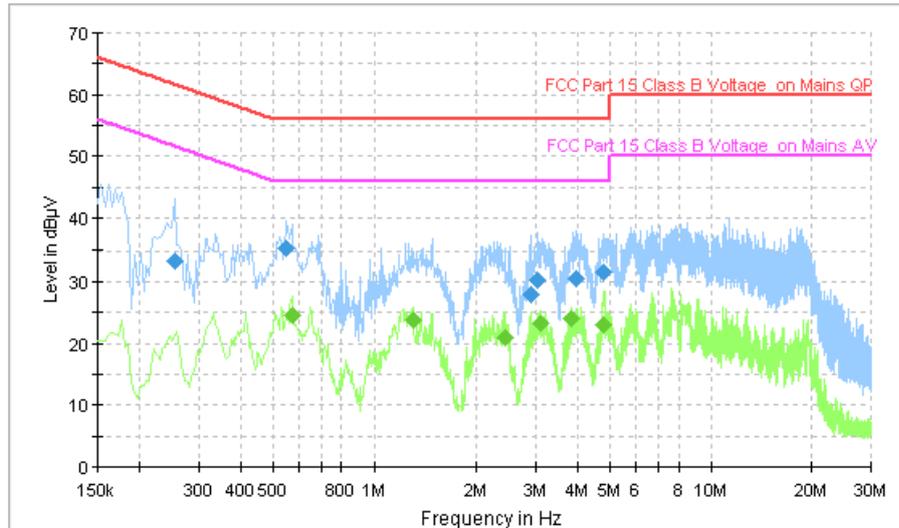


Fig. 100 AC Powerline Conducted Emission (Traffic, AE2)

MEASUREMENT RESULT: "QuasiPeak"

Frequency (MHz)	QuasiPeak (dBµV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.254000	33.2	GND	N	9.6	28.4	61.6
0.546000	35.3	GND	N	9.7	20.7	56.0
2.894000	27.9	GND	N	9.6	28.1	56.0
3.046000	30.2	GND	N	9.6	25.8	56.0
3.942000	30.6	GND	N	9.6	25.4	56.0
4.790000	31.4	GND	N	9.6	24.6	56.0

MEASUREMENT RESULT: "Average"

Frequency (MHz)	Average (dBµV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.570000	24.4	GND	N	9.7	21.6	46.0
1.306000	23.7	GND	N	9.6	22.3	46.0
2.430000	21.0	GND	N	9.6	25.0	46.0
3.122000	23.4	GND	N	9.6	22.6	46.0
3.838000	24.2	GND	N	9.6	21.8	46.0
4.794000	22.9	GND	N	9.6	23.1	46.0

ESH2-Z5 Scan-FCC

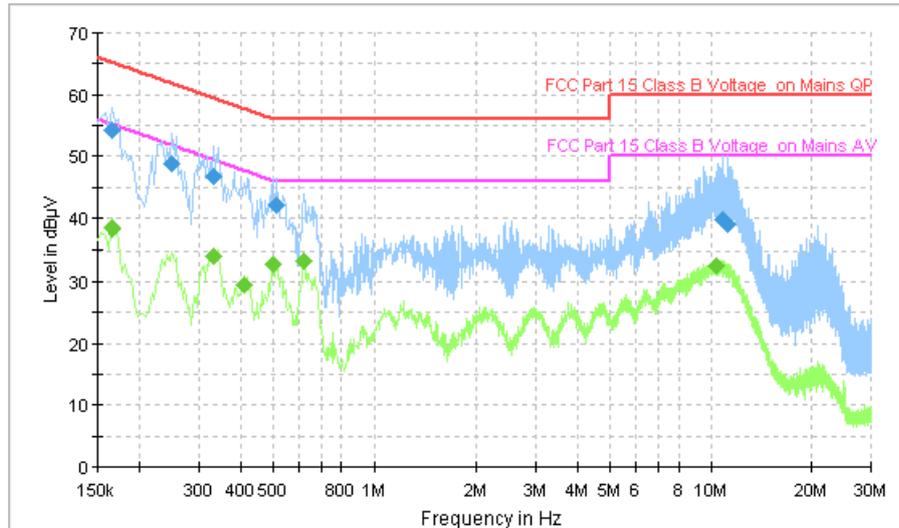


Fig. 101 AC Power line Conducted Emission (Idle, AE2)

MEASUREMENT RESULT: "QuasiPeak"

Frequency (MHz)	QuasiPeak (dBµV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.166000	54.2	GND	N	9.6	11.0	65.2
0.250000	48.8	GND	N	9.6	12.9	61.8
0.334000	46.8	GND	N	9.6	12.5	59.4
0.510000	42.1	GND	N	9.7	13.9	56.0
10.858000	39.7	GND	N	9.9	20.3	60.0
11.206000	38.9	GND	N	9.9	21.1	60.0

MEASUREMENT RESULT: "Average"

Frequency (MHz)	Average (dBµV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.166000	38.6	GND	N	9.6	16.6	55.2
0.334000	34.2	GND	N	9.6	15.1	49.4
0.410000	29.3	GND	N	9.7	18.3	47.6
0.502000	32.7	GND	N	9.7	13.3	46.0
0.618000	33.4	GND	N	9.6	12.6	46.0
10.378000	32.4	GND	N	9.9	17.6	50.0

ESH2-Z5 Scan-FCC

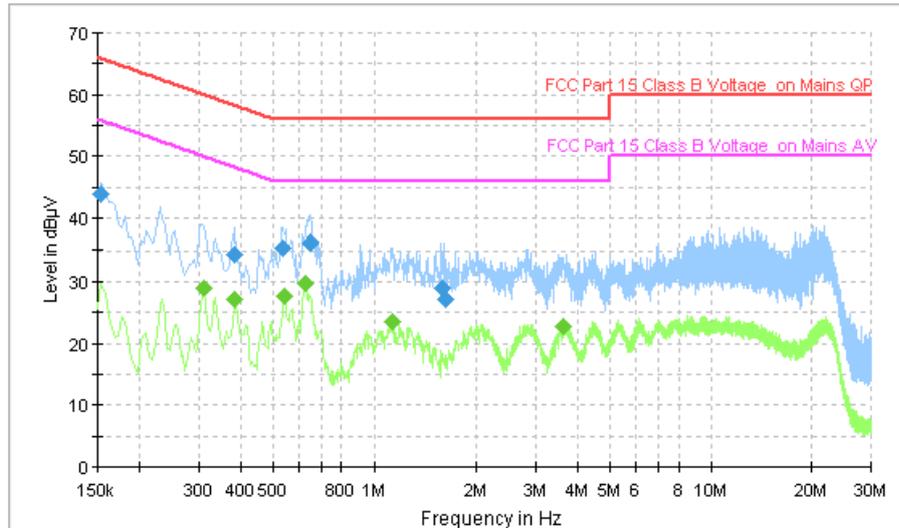


Fig. 102 AC Powerline Conducted Emission (Traffic, AE3)

MEASUREMENT RESULT: "QuasiPeak"

Frequency (MHz)	QuasiPeak (dBµV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.154000	43.9	GND	N	9.6	21.9	65.8
0.382000	34.3	GND	N	9.6	23.9	58.2
0.538000	35.3	GND	N	9.7	20.7	56.0
0.646000	36.1	GND	N	9.6	19.9	56.0
1.586000	29.0	GND	N	9.6	27.0	56.0
1.618000	27.1	GND	N	9.6	28.9	56.0

MEASUREMENT RESULT: "Average"

Frequency (MHz)	Average (dBµV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.310000	29.0	GND	N	9.6	21.0	50.0
0.386000	27.2	GND	N	9.6	20.9	48.1
0.542000	27.7	GND	N	9.7	18.3	46.0
0.622000	29.6	GND	N	9.6	16.4	46.0
1.130000	23.4	GND	N	9.6	22.6	46.0
3.618000	22.6	GND	N	9.6	23.4	46.0

ESH2-Z5 Scan-FCC

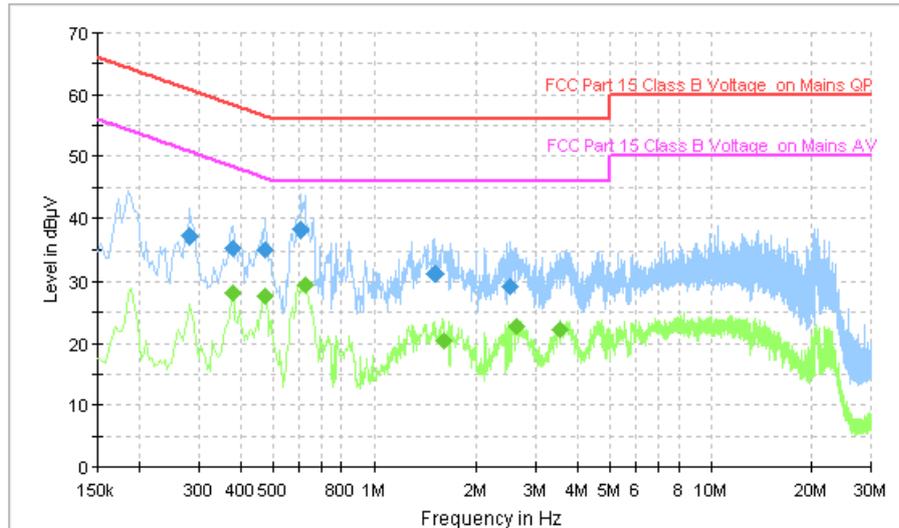


Fig. 103 AC Power line Conducted Emission (Idle, AE3)

MEASUREMENT RESULT: "QuasiPeak"

Frequency (MHz)	QuasiPeak (dBµV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.282000	37.3	GND	N	9.6	23.4	60.8
0.378000	35.5	GND	N	9.6	22.8	58.3
0.474000	35.1	GND	N	9.7	21.3	56.4
0.606000	38.2	GND	N	9.6	17.8	56.0
1.522000	31.1	GND	N	9.6	24.9	56.0
2.510000	29.2	GND	N	9.6	26.8	56.0

MEASUREMENT RESULT: "Average"

Frequency (MHz)	Average (dBµV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.378000	28.1	GND	N	9.6	20.2	48.3
0.474000	27.6	GND	N	9.7	18.9	46.4
0.622000	29.5	GND	N	9.6	16.5	46.0
1.602000	20.5	GND	N	9.6	25.5	46.0
2.630000	22.8	GND	N	9.6	23.2	46.0
3.566000	22.3	GND	N	9.6	23.7	46.0

ESH2-Z5 Scan-FCC

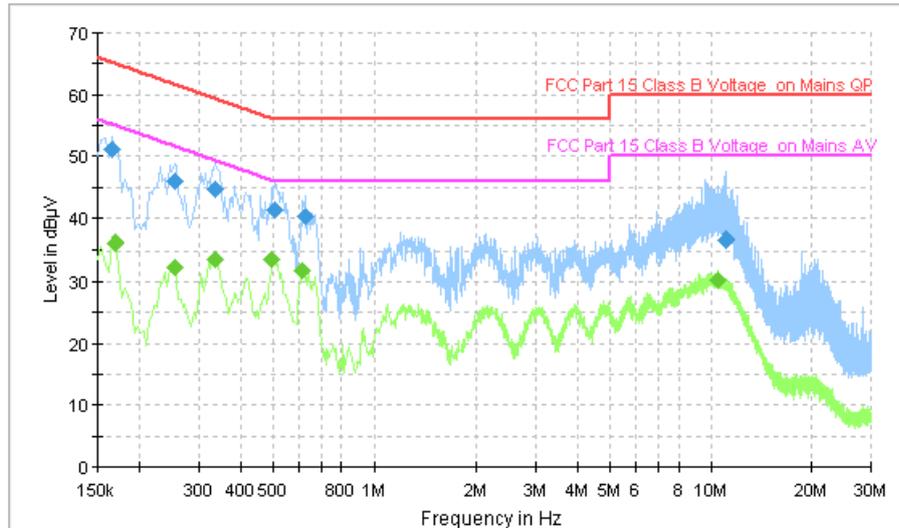


Fig. 104 AC Powerline Conducted Emission (Traffic, AE1)

MEASUREMENT RESULT: "QuasiPeak"

Frequency (MHz)	QuasiPeak (dBµV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.166000	51.1	GND	N	9.6	14.0	65.2
0.254000	46.0	GND	N	9.6	15.6	61.6
0.338000	44.8	GND	N	9.6	14.5	59.3
0.506000	41.3	GND	N	9.7	14.7	56.0
0.622000	40.4	GND	N	9.6	15.6	56.0
11.074000	36.6	GND	N	9.9	23.4	60.0

MEASUREMENT RESULT: "Average"

Frequency (MHz)	Average (dBµV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.170000	36.1	GND	N	9.6	18.9	55.0
0.254000	32.4	GND	N	9.6	19.2	51.6
0.338000	33.6	GND	N	9.6	15.7	49.3
0.498000	33.5	GND	N	9.7	12.6	46.0
0.614000	31.8	GND	N	9.6	14.2	46.0
10.498000	30.3	GND	N	9.9	19.7	50.0

ESH2-Z5 Scan-FCC

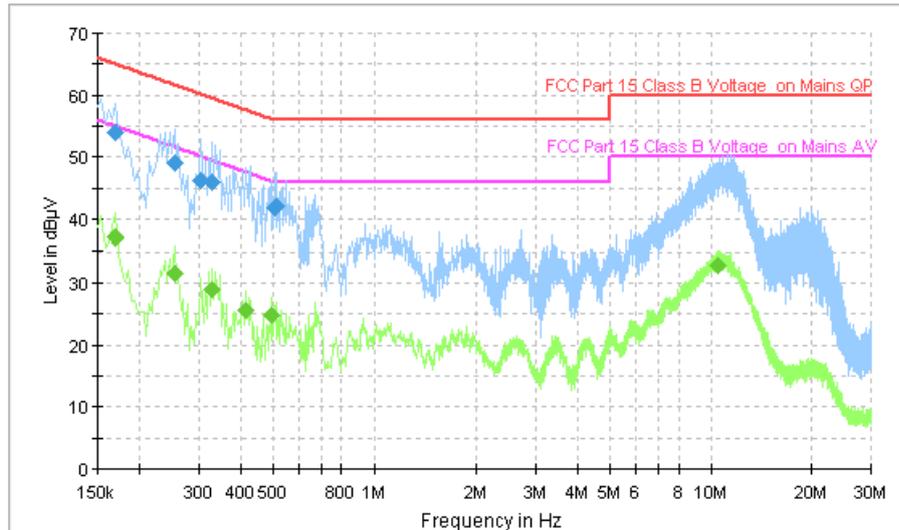


Fig. 105 AC Power line Conducted Emission (Idle, AE1)

MEASUREMENT RESULT: " QuasiPeak "

Frequency (MHz)	QuasiPeak (dBµV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.170000	53.9	GND	N	9.6	11.0	65.0
0.254000	49.0	GND	N	9.6	12.6	61.6
0.306000	46.3	GND	N	9.6	13.8	60.1
0.330000	46.1	GND	N	9.6	13.4	59.5
0.506000	41.8	GND	N	9.7	14.2	56.0
0.514000	42.1	GND	N	9.7	13.9	56.0

MEASUREMENT RESULT: " Average "

Frequency (MHz)	Average (dBµV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.170000	37.3	GND	N	9.6	17.6	55.0
0.254000	31.4	GND	N	9.6	20.2	51.6
0.330000	28.9	GND	N	9.6	20.6	49.5
0.414000	25.7	GND	N	9.7	21.9	47.6
0.498000	24.7	GND	N	9.7	21.3	46.0
10.498000	32.9	GND	N	9.9	17.1	50.0

ESH2-Z5 Scan-FCC

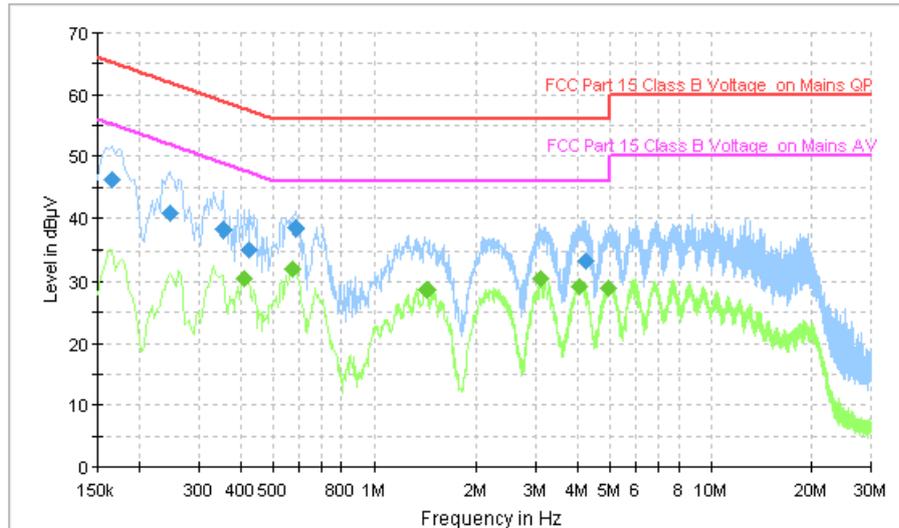


Fig. 106 AC Powerline Conducted Emission (Traffic, AE2)

MEASUREMENT RESULT: "QuasiPeak"

Frequency (MHz)	QuasiPeak (dBµV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.166000	46.1	GND	N	9.6	19.0	65.2
0.246000	40.8	GND	N	9.6	21.1	61.9
0.354000	38.1	GND	N	9.6	20.8	58.9
0.426000	35.2	GND	N	9.7	22.2	57.3
0.586000	38.5	GND	N	9.6	17.5	56.0
4.242000	33.4	GND	N	9.6	22.6	56.0

MEASUREMENT RESULT: "Average"

Frequency (MHz)	Average (dBµV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.410000	30.4	GND	N	9.7	17.3	47.6
0.570000	32.0	GND	N	9.7	14.0	46.0
1.426000	28.8	GND	N	9.5	17.2	46.0
3.118000	30.4	GND	N	9.6	15.6	46.0
4.038000	29.2	GND	N	9.6	16.8	46.0
4.926000	28.9	GND	N	9.6	17.1	46.0

ESH2-Z5 Scan-FCC

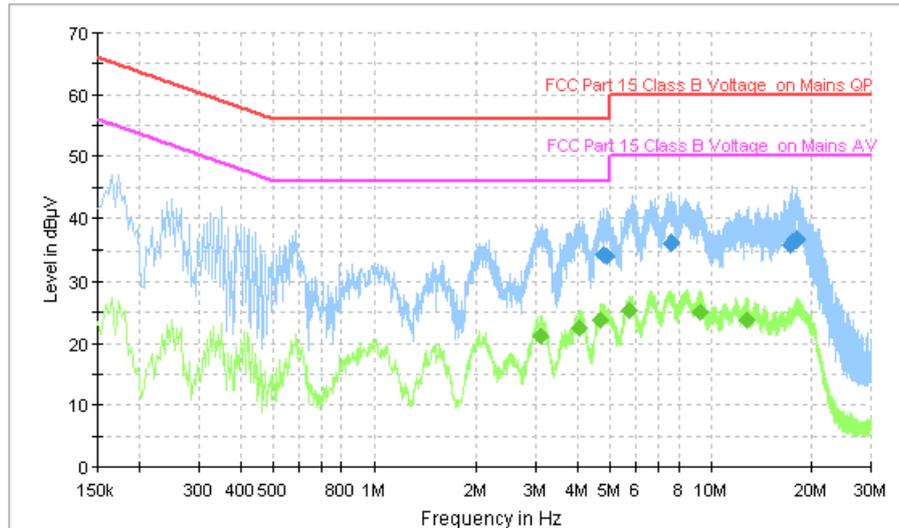


Fig. 107 AC Power line Conducted Emission (Idle, AE2)

MEASUREMENT RESULT: " QuasiPeak "

Frequency (MHz)	QuasiPeak (dBµV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
4.778000	34.4	GND	N	9.6	21.6	56.0
4.910000	34.0	GND	N	9.6	22.0	56.0
7.606000	36.1	GND	N	9.8	23.9	60.0
17.302000	35.9	GND	N	9.9	24.1	60.0
17.458000	36.2	GND	N	9.9	23.8	60.0
18.102000	36.6	GND	N	9.9	23.4	60.0

MEASUREMENT RESULT: " Average "

Frequency (MHz)	Average (dBµV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
3.106000	21.2	GND	N	9.6	24.8	46.0
4.054000	22.5	GND	N	9.6	23.5	46.0
4.682000	23.8	GND	N	9.6	22.2	46.0
5.694000	25.4	GND	N	9.7	24.6	50.0
9.314000	25.0	GND	N	9.8	25.0	50.0
12.858000	23.8	GND	N	9.9	26.2	50.0

ESH2-Z5 Scan-FCC

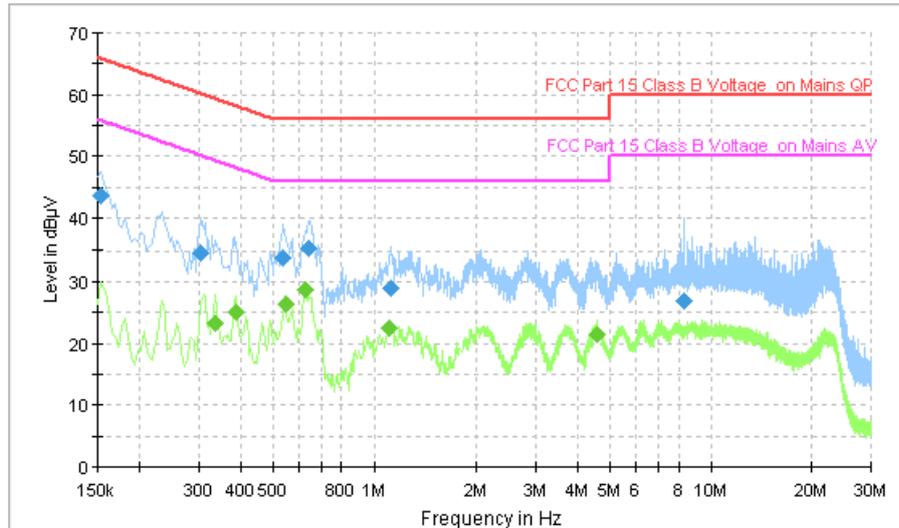


Fig. 108 AC Powerline Conducted Emission (Traffic, AE3)

MEASUREMENT RESULT: "QuasiPeak"

Frequency (MHz)	QuasiPeak (dBµV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.154000	43.7	GND	N	9.6	22.1	65.8
0.306000	34.6	GND	N	9.6	25.5	60.1
0.538000	33.9	GND	N	9.7	22.1	56.0
0.642000	35.5	GND	N	9.6	20.5	56.0
1.122000	28.8	GND	N	9.6	27.2	56.0
8.302000	26.8	GND	N	9.8	33.2	60.0

MEASUREMENT RESULT: "Average"

Frequency (MHz)	Average (dBµV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.338000	23.3	GND	N	9.6	26.0	49.3
0.390000	25.0	GND	N	9.6	23.1	48.1
0.546000	26.3	GND	N	9.7	19.7	46.0
0.622000	28.7	GND	N	9.6	17.3	46.0
1.110000	22.4	GND	N	9.6	23.6	46.0
4.578000	21.5	GND	N	9.6	24.5	46.0

ESH2-Z5 Scan-FCC

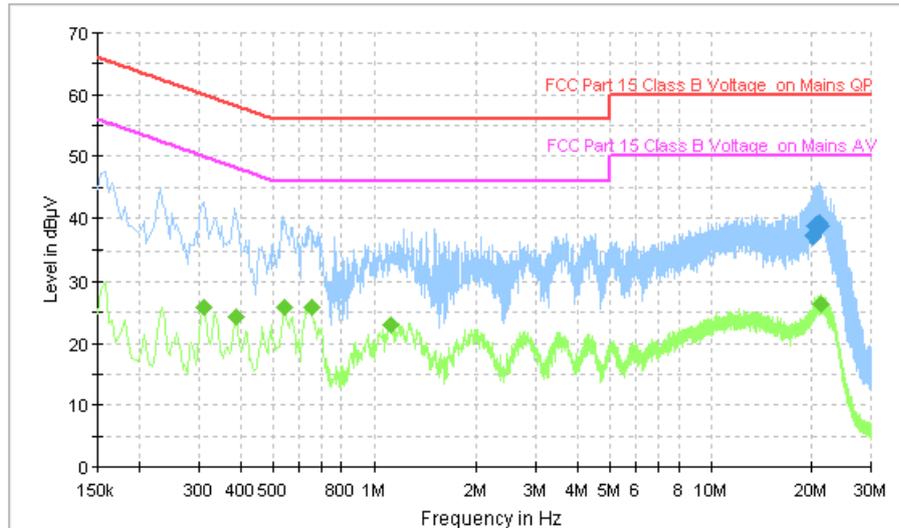


Fig. 109 AC Power line Conducted Emission (Idle, AE3)

MEASUREMENT RESULT: " QuasiPeak "

Frequency (MHz)	QuasiPeak (dBµV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
20.074000	37.2	GND	N	10.0	22.8	60.0
20.374000	38.7	GND	N	10.0	21.3	60.0
20.674000	38.9	GND	N	10.0	21.1	60.0
20.870000	38.9	GND	N	10.0	21.1	60.0
21.026000	39.3	GND	N	10.0	20.7	60.0
21.226000	38.7	GND	N	10.0	21.3	60.0

MEASUREMENT RESULT: " Average "

Frequency (MHz)	Average (dBµV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.310000	25.8	GND	N	9.6	24.2	50.0
0.390000	24.3	GND	N	9.6	23.8	48.1
0.542000	25.8	GND	N	9.7	20.2	46.0
0.650000	25.7	GND	N	9.6	20.3	46.0
1.118000	23.0	GND	N	9.6	23.0	46.0
21.306000	26.4	GND	N	10.0	23.6	50.0



ANNEX C: Persons involved in this testing

Test Name	Tester
Maximum Peak Output Power	An Ran, Tang Weisheng
Band Edges Compliance	An Ran, Tang Weisheng
Conducted Spurious Emission	An Ran, Tang Weisheng
Radiated Spurious Emission	An Ran, Tang Weisheng
Occupied 20dB bandwidth	An Ran, Tang Weisheng
Time of Occupancy(Dwell Time)	An Ran, Tang Weisheng
Number of Hopping Channel	An Ran, Tang Weisheng
Carrier Frequency Separation	An Ran, Tang Weisheng
AC Powerline Conducted Emission	An Ran, Tang Weisheng

END OF REPORT