



**FCC PART 15C
TEST REPORT
No.I15N00212-BT**

for

Huawei Technologies Co., Ltd

Smart Phone

Model Name: HUAWEI ALE-L21, ALE-L21

With

Hardware Version: HL3ALICEM

Software Version: ALE-L21 V100R001C900B045

FCC ID: QISALE-L21

Issued Date: Apr 1st, 2015

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

Location1: CTTL(South Branch)

Address: No.12, ShangSha Innovation and Technology Park, Futian District,
Shenzhen, Guangdong, P. R. China 518048

Location2: CTTL(huayuan North Road)

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

1.2. Testing Environment

Normal Temperature: 15-35°C

Extreme Temperature: -20/+55°C

Relative Humidity: 20-75%

1.3. Project data

Testing Start Date: 2015-03-09

Testing End Date: 2015-03-25

1.4. Signature

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(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 Phone
Model Name	HUAWEI ALE-L21, ALE-L21
Market Name	/
Frequency Band	2402MHz~2480MHz
Type of Modulation	GFSK/π/4 DQPSK/8DPSK
Number of Channels	79
FCC ID	QISALE-L21

*Note: Photographs of EUT are shown in ANNEX A of this test report.

3.2. Internal Identification of EUT

EUT ID*	IMEI	HW Version	SW Version
EUT1	/	HL3ALICEM	ALE-L21 V100R001C900B045

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

3.3. Internal Identification of AE

AE ID*	Description	Type	SN
AE1	Charger	HW-050100U01_yingju	/
AE2	Charger	HW-050100U01_BYD	/
AE3	Charger	HW-050100U2W_BYD	/
AE4	Charger	HW-050100U2W_hangjia	/
AE5	Charger	HW-050100E01_BYD	/
AE6	Charger	HW-050100E01_dahong	/
AE7	Charger	HW-050100E01_hangjia	/
AE8	Charger	HW-050100E01_yingju	/
AE9	Charger	HW-050100B01_hangjia	/
AE10	Charger	HW-050100B01_dahong	/

*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.	2014
ANSI C63.4	Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz	2009
KDB558074	Measurement of Digital Transmission Systems Operating under Section 15.247	Jun, 2014

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

The hardware of HUAWEI ALE-L21 and HUAWEI ALE-L23 are the same. The only difference between these two models is that HUAWEI ALE-L21 has NFC module but HUAWEI ALE-L23 removes it. The test bases on the model HUAWEI ALE-L23.

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 isotropical 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 (23 meters×17 meters×10 meters) did not exceed following limits:

Temperature	Min. = 15 °C, Max. = 35 °C
Relative humidity	Min. = 15 %, Max. = 75 %
Shielding effectiveness	0.014MHz - 1MHz, >60dB; 1MHz - 1000MHz, >90dB.
Electrical insulation	> 2 M
Ground system resistance	< 4
Normalised site attenuation (NSA)	< ± 4 dB, 3m/10m distance, from 30 to 1000 MHz
Site voltage standing-wave ratio (S_{VSWR})	Between 0 and 6 dB, from 1GHz to 18GHz
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. = 35 °C
Relative humidity	Min. = 20 %, Max. = 75 %
Shielding effectiveness	0.014MHz - 1MHz, >60dB; 1MHz - 1000MHz, >90dB.
Electrical insulation	> 2 M
Ground system resistance	< 4

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	2015-04-22	1 year
2	Bluetooth Tester	CBT32	100584	Rohde & Schwarz	2016-01-10	1 year

Radiated emission test system

No.	Equipment	Model	Serial Number	Manufacturer	Calibration Due date	Calibration Period
1	Chamber	FACT10-3	SAC-1	ETS-Lindgren	2016-03-27	3 years
2	Test Receiver	ESU26	100235	Rohde & Schwarz	2016-03-02	1 year
3	Bluetooth Tester	CBT	R&S	101042	2016-03-02	1 year
4	Bluetooth Tester	CBT	R&S	100153	2015-09-18	1 year
5	Test Receiver	ESCI 7	100948	Rohde & Schwarz	2015-07-16	1 year
6	LISN	ESH2-Z5	100196	Rohde & Schwarz	2015-01-14	1 year
7	Loop Antenna	HFH2-Z2	829324/007	Rohde & Schwarz	2017-12-16	3 years
8	EMI Antenna	VULB9163	9163-234	Schwarzbeck	2016-09-15	3 years
9	EMI Antenna	3115	6914	ETS-Lindgren	2017-12-15	3 years
10	EMI Antenna	3116	2661	ETS-Lindgren	2017-06-17	3 years

Anechoic chamber

Fully anechoic chamber by ETS-Lindgren.

ANNEX A: EUT photograph



Picture A-1: Mobile Phone



Picture A-2: Mobile Phone



Picture A-3: Charger(AE1)



Picture A-4: Charger(AE2)



Picture A-5: Charger(AE3)



Picture A-6: Charger(AE4)



Picture A-7: Charger(AE5)



Picture A-8: Charger(AE6)



Picture A-9: Charger(AE7)



Picture A-10: Charger(AE8)



Picture A-11: Charger(AE9)



Picture A-12: Charger(AE10)

ANNEX B: MEASUREMENT RESULTS FOR RECEIVER

B.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 -2.0 dBi.

The RF transmitter uses an integrate antenna without connector.



B.1 Maximum Peak Output Power

Measurement Limit:

Standard	Limit (dBm)
FCC CRF Part 15.247(b)(1)	< 30

Measurement Results:

Mode	Test Result (dBm)					
	2402MHz (Ch0)		2441MHz (Ch39)		2480 MHz (Ch78)	
GFSK	Fig.1	6.62	Fig.2	7.97	Fig.3	5.48
$\pi/4$ DQPSK	Fig.4	6.54	Fig.5	7.83	Fig.6	5.56
8DPSK	Fig.7	6.49	Fig.8	7.94	Fig.9	5.48

Conclusion: Pass

B.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

B.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

B.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:

GFSK mode

Channel	Frequency Range	AE	Test Results	Conclusion
39	30 MHz ~1 GHz	AE1	Fig.50	P
		AE2	Fig.51	P
		AE3	Fig.52	P
		AE4	Fig.53	P
		AE5	Fig.54	P
		AE6	Fig.55	P
		AE7	Fig.56	P
		AE8	Fig.57	P
		AE9	Fig.58	P
		AE10	Fig.59	P

Note:

The testing shall be performed on middle channel firstly. If there is no emission signal received, the low and high channel could be ignored . Otherwise the testing shall be performed on low , middle and high channel for each frequency ranges and modulations.

Mode	Channel	Frequency Range	Test Results	Conclusion
GFSK	0	1 GHz ~3 GHz	Fig.60	P
		3 GHz ~ 18 GHz	Fig.61	P
	39	1 GHz ~3 GHz	Fig.62	P
		3 GHz ~ 18 GHz	Fig.63	P
	78	1 GHz ~3 GHz	Fig.64	P
		3 GHz ~ 18 GHz	Fig.65	P
	Power(CH0)	2.38 GHz ~ 2.45 GHz	Fig.66	P
	Power(CH78)	2.45 GHz ~ 2.5 GHz	Fig.67	P
$\pi/4$ DQPSK	0	1 GHz ~3 GHz	Fig.68	P
		3 GHz ~ 18 GHz	Fig.69	P
	39	30 MHz ~1 GHz	Fig.70	P
		1 GHz ~3 GHz	Fig.71	P
		3 GHz ~ 18 GHz	Fig.72	P
	78	1 GHz ~3 GHz	Fig.73	P
		3 GHz ~ 18 GHz	Fig.74	P
	Power(CH0)	2.38 GHz ~ 2.45 GHz	Fig.75	P
Power(CH78)	2.45 GHz ~ 2.5 GHz	Fig.76	P	
8DPSK	0	1 GHz ~3 GHz	Fig.77	P
		3 GHz ~ 18 GHz	Fig.78	P
	39	30 MHz ~1 GHz	Fig.79	P
		1 GHz ~3 GHz	Fig.80	P
		3 GHz ~ 18 GHz	Fig.81	P

	78	1 GHz ~3 GHz	Fig.82	P
		3 GHz ~ 18 GHz	Fig.83	P
	Power(CH0)	2.38 GHz ~ 2.45 GHz	Fig.84	P
	Power(CH78)	2.45 GHz ~ 2.5 GHz	Fig.85	P
/	All channels	18 GHz~ 26.5 GHz	Fig.86	P

GFSK CH0 (1-18GHz)

Frequency (MHz)	MaxPeak (dB μ V/m)	Pathloss. (dB)	antenna factor	Receiver (dBm)	Polarization	Limit (dB μ V/m)
2390.000	45.8	-38.8	27.7	56.9	V	74.0
17941.875	58.2	-17.7	45.6	30.3	V	74.0
17910.938	57.9	-18.5	45.6	30.8	V	74.0
17883.750	57.7	-18.5	45.6	30.6	V	74.0
17914.688	57.7	-17.7	45.6	29.8	H	74.0
17993.438	57.5	-17.7	45.6	29.6	V	74.0

GFSK CH0 (1-18GHz)

Frequency (MHz)	Average (dB μ V/m)	Pathloss. (dB)	antenna factor	Receiver (dBm)	Polarization	Limit (dB μ V/m)
2390.000	35.0	-38.8	27.7	46.1	V	54.0
17871.563	46.4	-18.5	45.6	19.3	V	54.0
17860.313	46.4	-18.5	45.6	19.3	V	54.0
17885.625	46.3	-18.5	45.6	19.2	H	54.0
17881.875	46.3	-18.5	45.6	19.2	V	54.0
17878.125	46.2	-18.5	45.6	19.1	V	54.0

GFSK CH39 (1-18GHz)

Frequency (MHz)	MaxPeak (dB μ V/m)	Pathloss. (dB)	antenna factor	Receiver (dBm)	Polarization	Limit (dB μ V/m)
17862.188	57.5	-18.5	45.6	30.4	V	74.0
17877.188	57.4	-18.5	45.6	30.3	V	74.0
17997.188	57.3	-17.7	45.6	29.4	V	74.0
17923.125	57.1	-17.7	45.6	29.2	V	74.0
17878.125	57.0	-18.5	45.6	29.9	V	74.0
17912.813	57.0	-18.5	45.6	29.9	V	74.0

GFSK CH39 (1-18GHz)

Frequency (MHz)	Average (dB μ V/m)	Pathloss. (dB)	antenna factor	Receiver (dBm)	Polarization	Limit (dB μ V/m)
17887.500	46.4	-18.5	45.6	19.300	V	54.0
17898.750	46.4	-18.5	45.6	19.300	V	54.0
17869.688	46.3	-18.5	45.6	19.200	V	54.0
17903.438	46.3	-18.5	45.6	19.200	V	54.0
17908.125	46.3	-18.5	45.6	19.200	H	54.0
17871.563	46.3	-18.5	45.6	19.200	V	54.0

GFSK CH78 (1-18GHz)

Frequency (MHz)	MaxPeak (dB μ V/m)	Pathloss. (dB)	antenna factor	Receiver (dBm)	Polarization	Limit (dB μ V/m)
2483.506	57.0	-38.9	27.7	68.2	V	74.0
17985.938	57.4	-17.7	45.6	29.5	V	74.0
17957.813	57.4	-17.7	45.6	29.5	V	74.0
17876.250	57.3	-18.5	45.6	30.2	H	74.0
17907.188	57.3	-18.5	45.6	30.2	V	74.0
17872.500	57.3	-18.5	45.6	30.2	V	74.0

GFSK CH78 (1-18GHz)

Frequency (MHz)	Average (dB μ V/m)	Pathloss. (dB)	antenna factor	Receiver (dBm)	Polarization	Limit (dB μ V/m)
2483.513	47.6	-38.9	27.7	58.8	V	54.0
17885.625	46.5	-18.5	45.6	19.4	H	54.0
17881.875	46.4	-18.5	45.6	19.3	V	54.0
17886.563	46.3	-18.5	45.6	19.2	V	54.0
17865.000	46.3	-18.5	45.6	19.2	V	54.0
17910.000	46.3	-18.5	45.6	19.2	V	54.0

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

Frequency (MHz)	MaxPeak (dB μ V/m)	Pathloss. (dB)	antenna factor	Receiver (dBm)	Polarization	Limit (dB μ V/m)
2389.725	48.0	-38.8	27.7	59.1	H	74.0
17882.813	58.1	-18.5	45.6	31.0	V	74.0
17888.438	58.0	-18.5	45.6	30.9	V	74.0
17904.375	57.7	-18.5	45.6	30.6	V	74.0
17930.625	57.6	-17.7	45.6	29.7	V	74.0
17877.188	57.4	-18.5	45.6	30.3	V	74.0

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

Frequency (MHz)	Average (dB μ V/m)	Pathloss. (dB)	antenna factor	Receiver (dBm)	Polarization	Limit (dB μ V/m)
2390.000	35.0	-38.8	27.7	46.1	V	54.0
17882.813	46.4	-18.5	45.6	19.3	V	54.0
17886.563	46.3	-18.5	45.6	19.2	H	54.0
17891.250	46.3	-18.5	45.6	19.2	V	54.0
17874.375	46.2	-18.5	45.6	19.1	V	54.0
17872.500	46.2	-18.5	45.6	19.1	H	54.0

$\pi/4$ DQPSK CH39 (1-18GHz)

Frequency (MHz)	MaxPeak (dB μ V/m)	Pathloss. (dB)	antenna factor	Receiver (dBm)	Polarization	Limit (dB μ V/m)
17883.750	58.2	-18.5	45.6	31.1	V	74.0
17882.813	58.1	-18.5	45.6	31.0	V	74.0
17876.250	57.8	-18.5	45.6	30.7	H	74.0
17867.813	57.7	-18.5	45.6	30.6	H	74.0
17942.813	57.5	-17.7	45.6	29.6	V	74.0
17914.688	57.5	-17.7	45.6	29.6	V	74.0

$\pi/4$ DQPSK CH39 (1-18GHz)

Frequency (MHz)	Average (dB μ V/m)	Pathloss. (dB)	antenna factor	Receiver (dBm)	Polarization	Limit (dB μ V/m)
17883.750	46.4	-18.5	45.6	19.3	V	54.0
17885.625	46.3	-18.5	45.6	19.2	V	54.0
17880.000	46.3	-18.5	45.6	19.2	V	54.0
17877.188	46.3	-18.5	45.6	19.2	V	54.0
17864.063	46.2	-18.5	45.6	19.1	V	54.0
17858.438	46.2	-18.5	45.6	19.1	H	54.0

$\pi/4$ DQPSK CH78 (1-18GHz)

Frequency (MHz)	MaxPeak (dB μ V/m)	Pathloss. (dB)	antenna factor	Receiver (dBm)	Polarization	Limit (dB μ V/m)
2483.638	55.3	-38.9	27.7	66.5	V	74.0
17872.500	57.8	-18.5	45.6	30.7	V	74.0
17995.313	57.6	-17.7	45.6	29.7	V	74.0
17896.875	57.5	-18.5	45.6	30.4	V	74.0
17877.188	57.4	-18.5	45.6	30.3	H	74.0
17884.688	57.0	-18.5	45.6	29.9	V	74.0

$\pi/4$ DQPSK CH78 (1-18GHz)

Frequency (MHz)	Average (dB μ V/m)	Pathloss. (dB)	antenna factor	Receiver (dBm)	Polarization	Limit (dB μ V/m)
2483.500	44.1	-38.9	27.7	55.3	H	54.0
17879.063	46.5	-18.5	45.6	19.4	H	54.0
17872.500	46.5	-18.5	45.6	19.4	V	54.0
17891.250	46.4	-18.5	45.6	19.3	H	54.0
17904.375	46.3	-18.5	45.6	19.2	V	54.0
17896.875	46.3	-18.5	45.6	19.2	V	54.0

8DPSK CH0 (1-18GHz)

Frequency (MHz)	MaxPeak (dB μ V/m)	Pathloss. (dB)	antenna factor	Receiver (dBm)	Polarization	Limit (dB μ V/m)
2389.794	48.0	-38.8	27.7	59.1	H	74.0
17920.313	57.3	-17.7	45.6	29.4	V	74.0
17932.500	57.2	-17.7	45.6	29.3	V	74.0
17906.250	57.2	-18.5	45.6	30.1	V	74.0
17868.750	57.1	-18.5	45.6	30.0	V	74.0
17865.000	57.1	-18.5	45.6	30.0	V	74.0

8DPSK CH0 (1-18GHz)

Frequency (MHz)	Average (dB μ V/m)	Pathloss. (dB)	antenna factor	Receiver (dBm)	Polarization	Limit (dB μ V/m)
2390.000	35.1	-38.8	27.7	46.2	V	54.0
17886.563	46.5	-18.5	45.6	19.4	V	54.0
17865.000	46.4	-18.5	45.6	19.3	H	54.0
17885.625	46.4	-18.5	45.6	19.3	V	54.0
17872.500	46.3	-18.5	45.6	19.2	V	54.0
17890.313	46.3	-18.5	45.6	19.2	H	54.0

8DPSK CH39 (1-18GHz)

Frequency (MHz)	MaxPeak (dB μ V/m)	Pathloss. (dB)	antenna factor	Receiver (dBm)	Polarization	Limit (dB μ V/m)
17899.688	57.8	-18.5	45.6	30.7	V	74.0
17956.875	57.4	-17.7	45.6	29.5	V	74.0
17925.000	57.4	-17.7	45.6	29.5	H	74.0
17884.688	57.3	-18.5	45.6	30.2	H	74.0
17936.250	57.2	-17.7	45.6	29.3	V	74.0
17920.313	57.1	-17.7	45.6	29.2	V	74.0

8DPSK CH39 (1-18GHz)

Frequency (MHz)	Average (dB μ V/m)	Pathloss. (dB)	antenna factor	Receiver (dBm)	Polarization	Limit (dB μ V/m)
17873.438	46.6	-18.5	45.6	19.5	V	54.0
17880.938	46.5	-18.5	45.6	19.4	V	54.0
17871.563	46.4	-18.5	45.6	19.3	V	54.0
17906.250	46.3	-18.5	45.6	19.2	V	54.0
17897.813	46.2	-18.5	45.6	19.1	V	54.0
17921.250	46.1	-17.7	45.6	18.2	H	54.0

8DPSK CH78 (1-18GHz)

Frequency (MHz)	MaxPeak (dB μ V/m)	Pathloss. (dB)	antenna factor	Receiver (dBm)	Polarization	Limit (dB μ V/m)
2483.525	56.4	-38.9	27.7	67.6	V	74.0
17918.438	57.4	-17.7	45.6	29.5	V	74.0
17850.000	57.1	-18.5	45.6	30.0	V	74.0
17883.750	57.1	-18.5	45.6	30.0	V	74.0
17880.000	57.1	-18.5	45.6	30.0	H	74.0
17925.938	57.1	-17.7	45.6	29.2	V	74.0

8DPSK CH78 (1-18GHz)

Frequency (MHz)	Average (dB μ V/m)	Pathloss. (dB)	antenna factor	Receiver (dBm)	Polarization	Limit (dB μ V/m)
2483.500	46.4	-38.9	27.7	57.6	H	54.0
17880.000	46.5	-18.5	45.6	19.4	H	54.0
17876.250	46.4	-18.5	45.6	19.3	V	54.0
17880.938	46.3	-18.5	45.6	19.2	H	54.0
17893.125	46.3	-18.5	45.6	19.2	V	54.0
17871.563	46.2	-18.5	45.6	19.1	V	54.0

See ANNEX C for test graphs.

Conclusion: Pass

B.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.87	1.123	/
	39	Fig.88	1.123	
	78	Fig.89	1.129	
$\pi/4$ DQPSK	0	Fig.90	1.346	/
	39	Fig.91	1.346	
	78	Fig.92	1.353	
8DPSK	0	Fig.93	1.303	/
	39	Fig.94	1.303	
	78	Fig.95	1.310	

See ANNEX C for test graphs.

Conclusion: PASS

B.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
			Fig.	Value	
GFSK	39	DH5	Fig.96	197.0	P
			Fig.97		
$\pi/4$ DQPSK	39	2-DH5	Fig.98	152.9	P
			Fig.99		
8DPSK	39	3-DH5	Fig.100	193.2	P
			Fig.101		

See ANNEX C for test graphs.

Conclusion: Pass

B.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.102	Fig.103	79	P
$\pi/4$ DQPSK	39	2-DH5	Fig.104	Fig.105	79	P
8DPSK	39	3-DH5	Fig.106	Fig.107	79	P

See ANNEX C for test graphs.

Conclusion: Pass

B.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.108	1.006	P
$\pi/4$ DQPSK	39	2-DH5	Fig.109	1.006	P
8DPSK	39	3-DH5	Fig.110	1.006	P

See ANNEX C for test graphs.

Conclusion: Pass

B.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.111	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.111	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.112	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.112	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.113	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.113	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)-AE4

Frequency range (MHz)	Quasi-peak Limit (dB μ V)	Result (dB μ V)	Conclusion
		Traffic	
0.15 to 0.5	66 to 56	Fig.114	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)-AE4

Frequency range (MHz)	Average-peak Limit (dB μ V)	Result (dB μ V)	Conclusion
		Traffic	
0.15 to 0.5	56 to 46	Fig.114	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)-AE5

Frequency range (MHz)	Quasi-peak Limit (dB μ V)	Result (dB μ V)	Conclusion
		Traffic	
0.15 to 0.5	66 to 56	Fig.115	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)-AE5

Frequency range (MHz)	Average-peak Limit (dB μ V)	Result (dB μ V)	Conclusion
		Traffic	
0.15 to 0.5	56 to 46	Fig.115	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)-AE6

Frequency range (MHz)	Quasi-peak Limit (dB μ V)	Result (dB μ V)	Conclusion
		Traffic	
0.15 to 0.5	66 to 56	Fig.116	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)-AE6

Frequency range (MHz)	Average-peak Limit (dB μ V)	Result (dB μ V)	Conclusion
		Traffic	
0.15 to 0.5	56 to 46	Fig.116	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)-AE7

Frequency range (MHz)	Quasi-peak Limit (dB μ V)	Result (dB μ V)	Conclusion
		Traffic	
0.15 to 0.5	66 to 56	Fig.117	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)-AE7

Frequency range (MHz)	Average-peak Limit (dB μ V)	Result (dB μ V)	Conclusion
		Traffic	
0.15 to 0.5	56 to 46	Fig.117	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)-AE8

Frequency range (MHz)	Quasi-peak Limit (dB μ V)	Result (dB μ V)	Conclusion
		Traffic	
0.15 to 0.5	66 to 56	Fig.118	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)-AE8

Frequency range (MHz)	Average-peak Limit (dB μ V)	Result (dB μ V)	Conclusion
		Traffic	
0.15 to 0.5	56 to 46	Fig.118	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)-AE9

Frequency range (MHz)	Quasi-peak Limit (dB μ V)	Result (dB μ V)	Conclusion
		Traffic	
0.15 to 0.5	66 to 56	Fig.119	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)-AE9

Frequency range (MHz)	Average-peak Limit (dB μ V)	Result (dB μ V)	Conclusion
		Traffic	
0.15 to 0.5	56 to 46	Fig.119	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)-AE10

Frequency range (MHz)	Quasi-peak Limit (dB μ V)	Result (dB μ V)	Conclusion
		Traffic	
0.15 to 0.5	66 to 56	Fig.120	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)-AE10

Frequency range (MHz)	Average-peak Limit (dB μ V)	Result (dB μ V)	Conclusion
		Traffic	
0.15 to 0.5	56 to 46	Fig.120	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.121	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.121	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 C: TEST FIGURE LIST

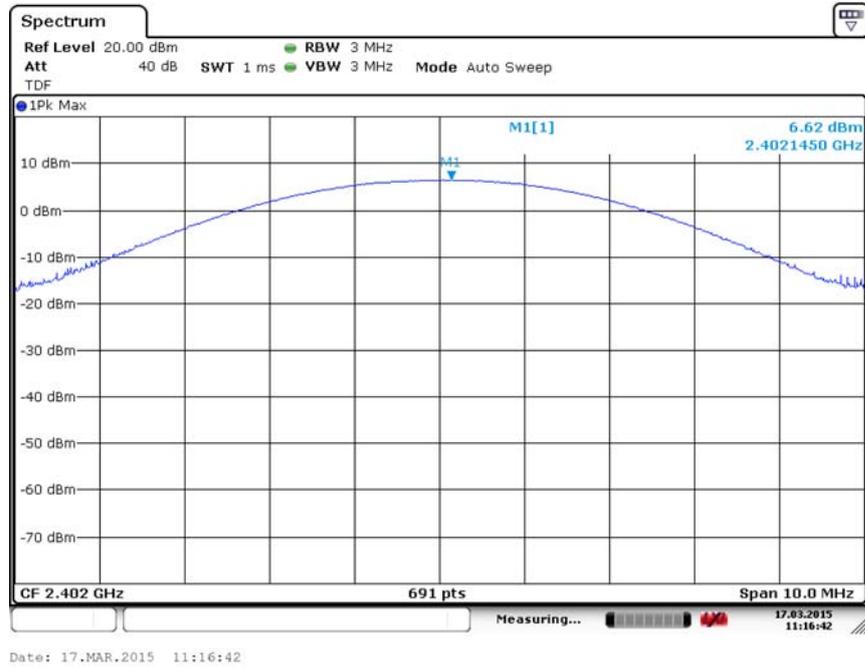


Fig. 1 Maximum Peak Output Power(GFSK, Ch 0)

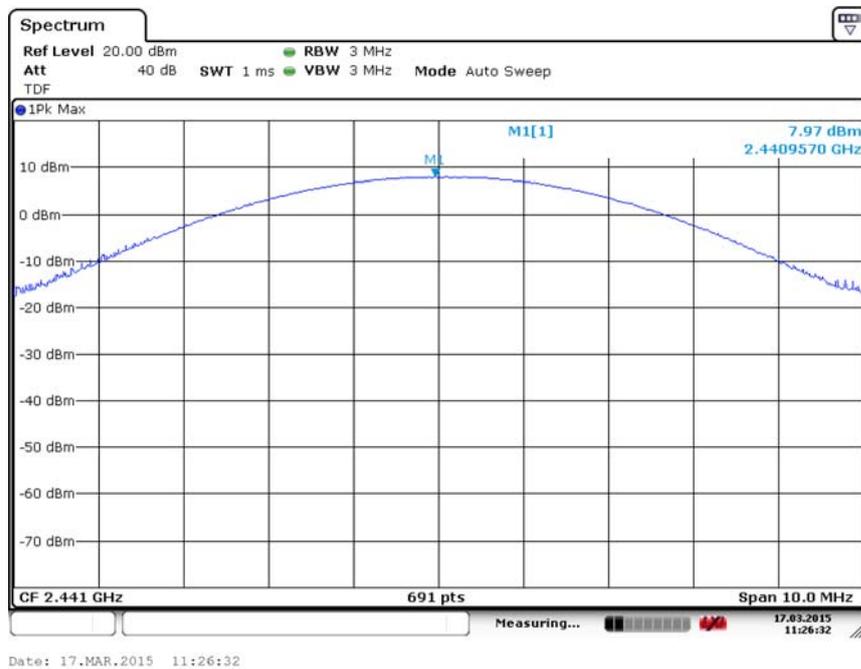
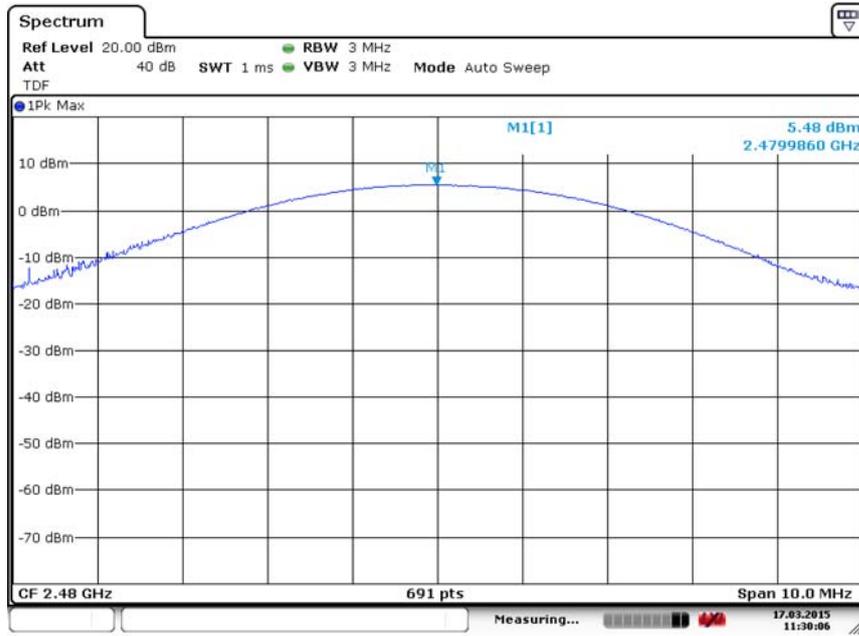
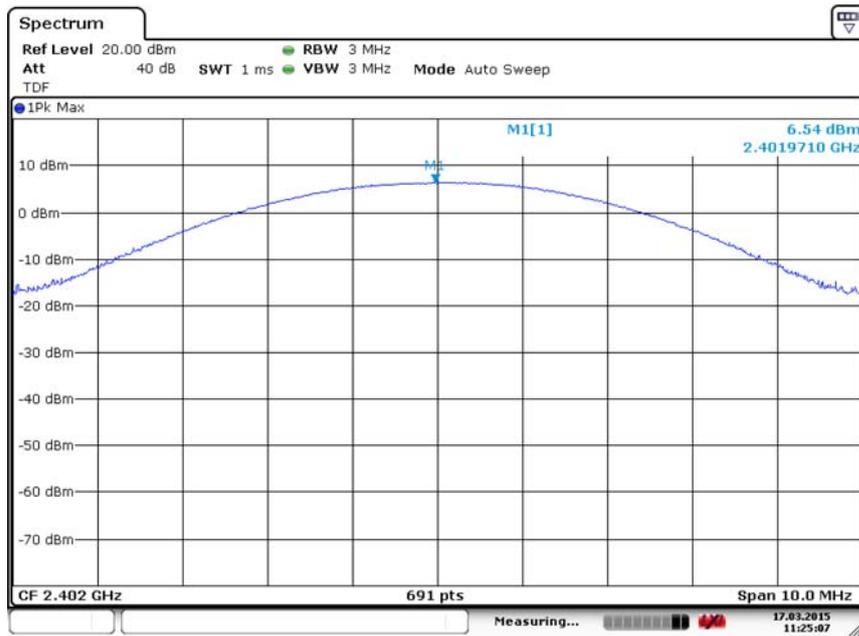


Fig. 2 Maximum Peak Output Power(GFSK, Ch 39)



Date: 17.MAR.2015 11:30:06

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



Date: 17.MAR.2015 11:25:07

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



Date: 17.MAR.2015 11:27:17

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



Date: 17.MAR.2015 11:28:37

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

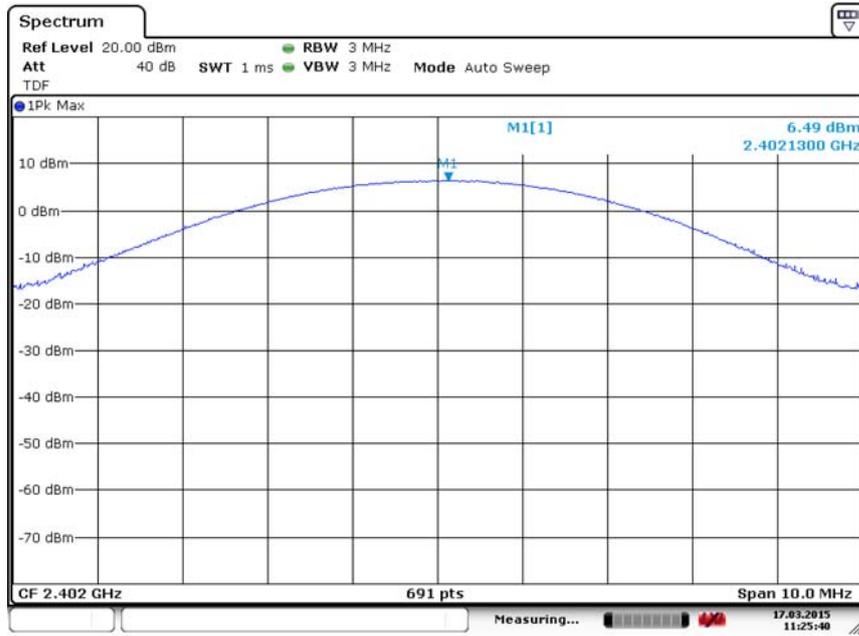


Fig. 7 Maximum Peak Output Power(8DPSK, Ch 0)



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

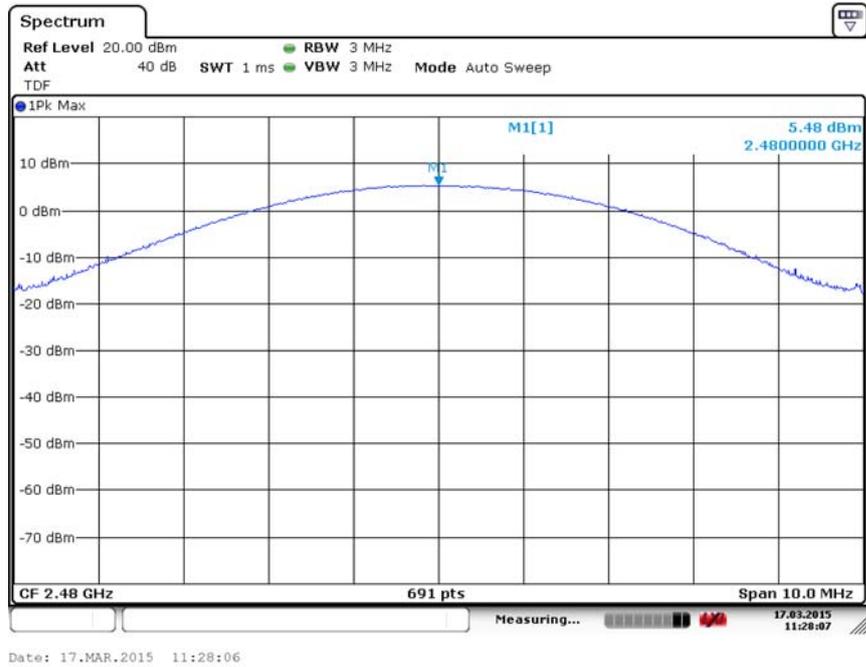


Fig. 9 Maximum Peak Output Power(8DPSK, Ch 78)

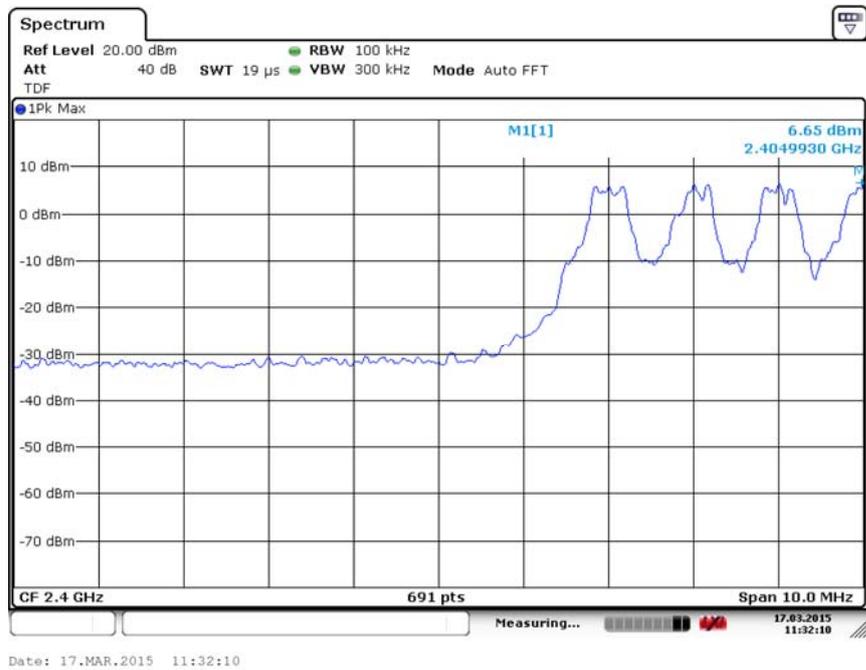


Fig. 10 Band Edges (GFSK, Ch 0, Hopping ON)



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

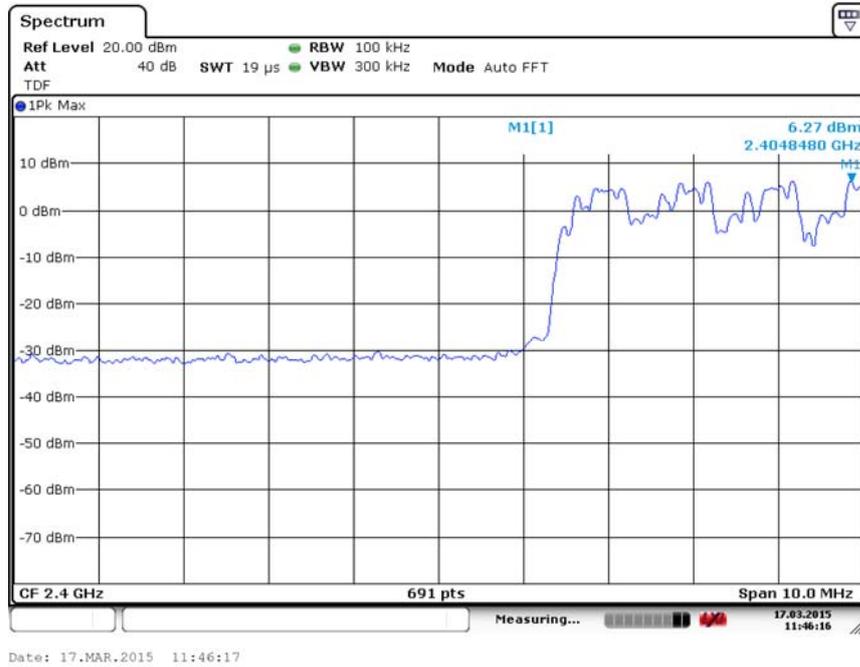


Fig. 12 Band Edges ($\pi/4$ DQPSK, Ch 0, Hopping ON)



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

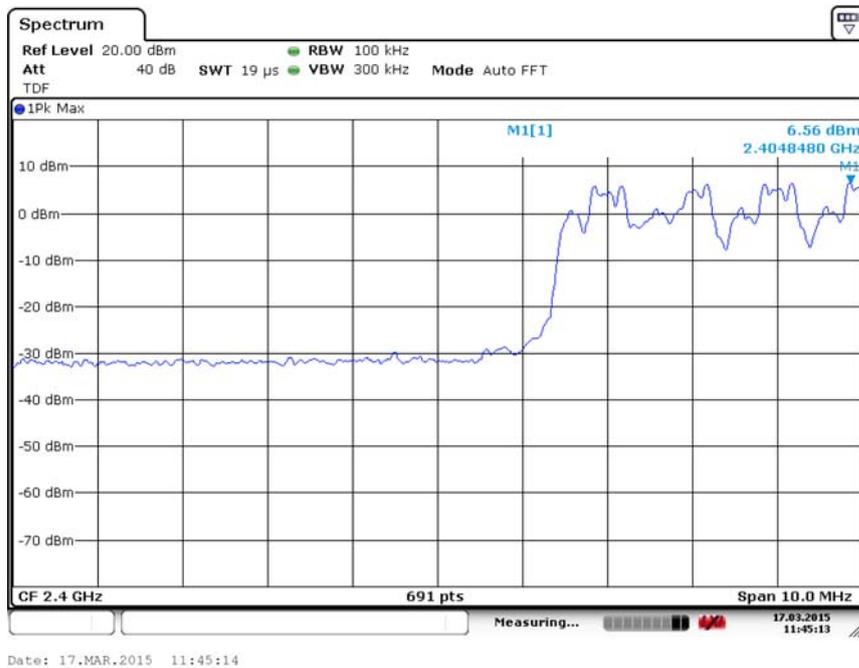


Fig. 14 Band Edges (8DPSK, Ch 0, Hopping ON)

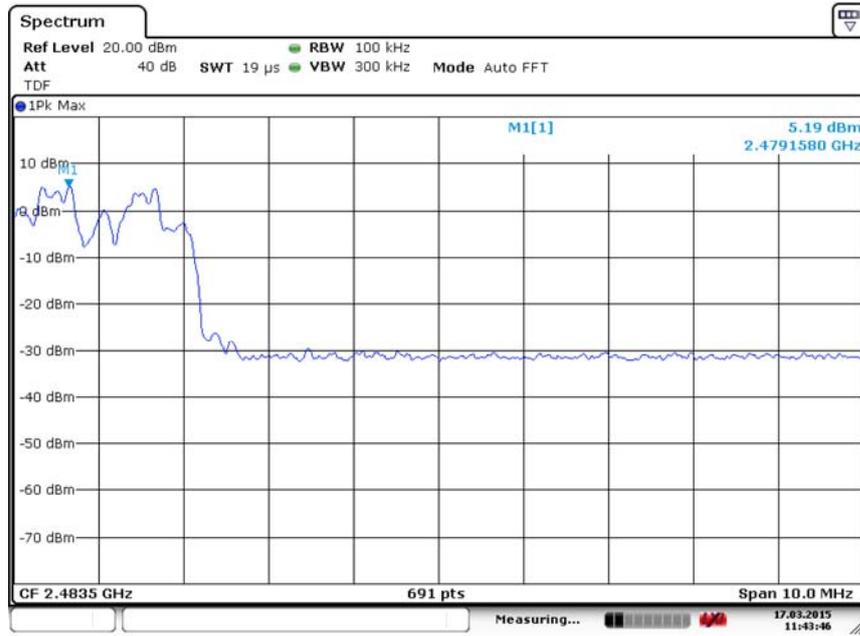


Fig. 15 Band Edges (8DPSK, Ch 78, Hopping ON)

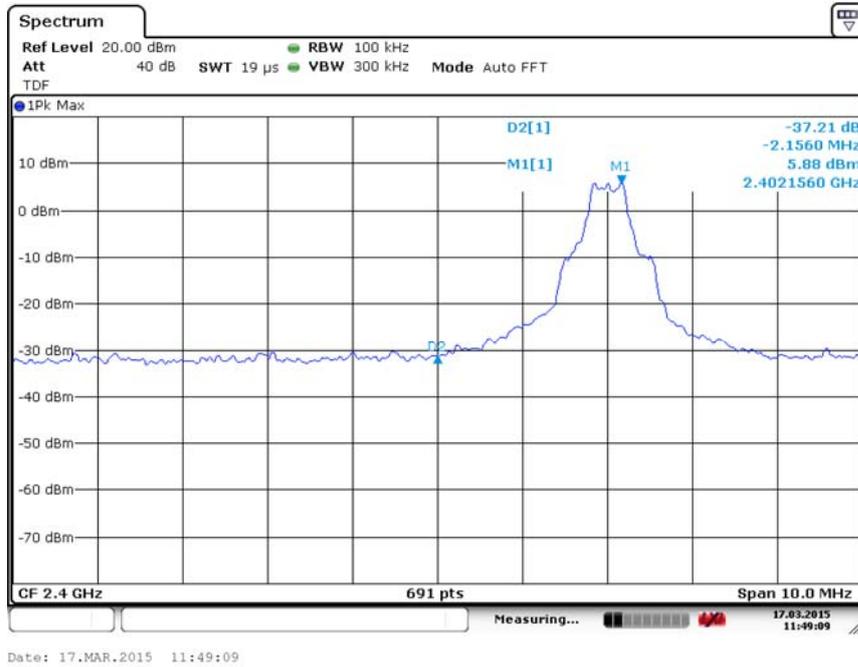
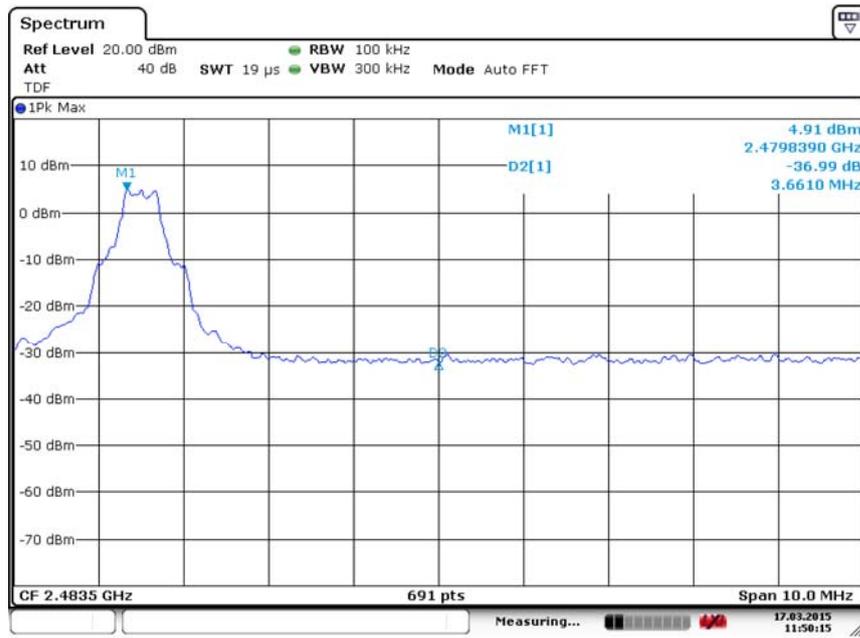


Fig. 16 Band Edges (GFSK, Ch 0, Hopping OFF)



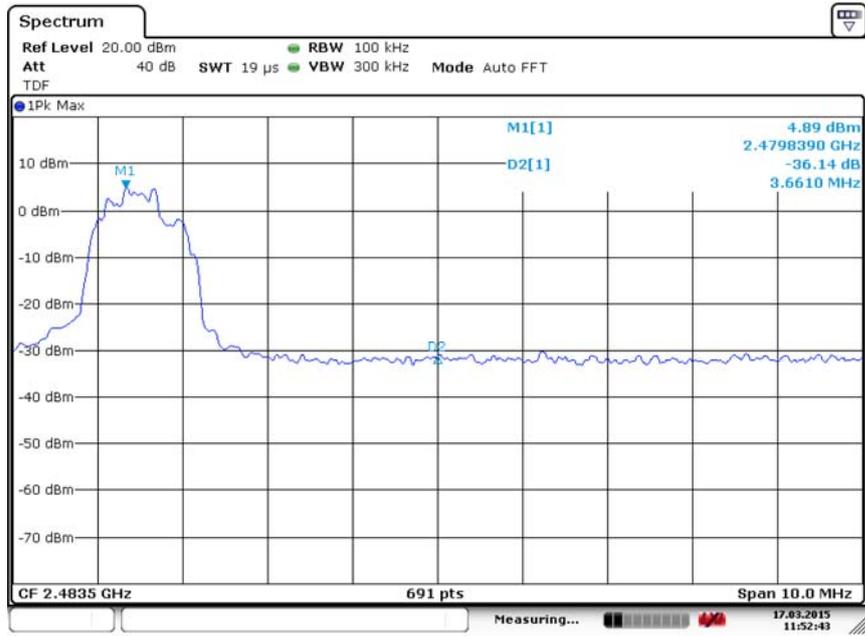
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Fig. 17 Band Edges (GFSK, Ch 78, Hopping OFF)



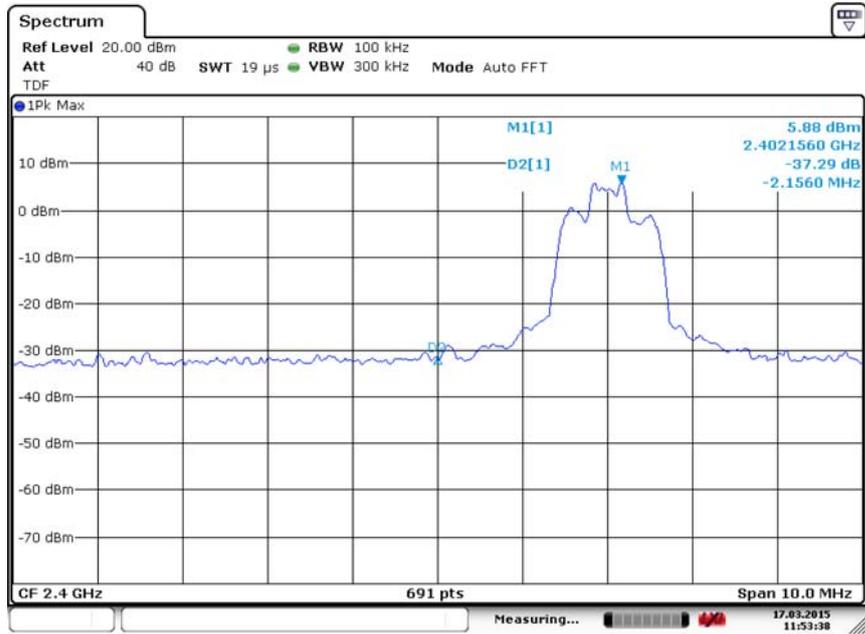
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Fig. 18 Band Edges ($\pi/4$ DQPSK, Ch 0, Hopping OFF)



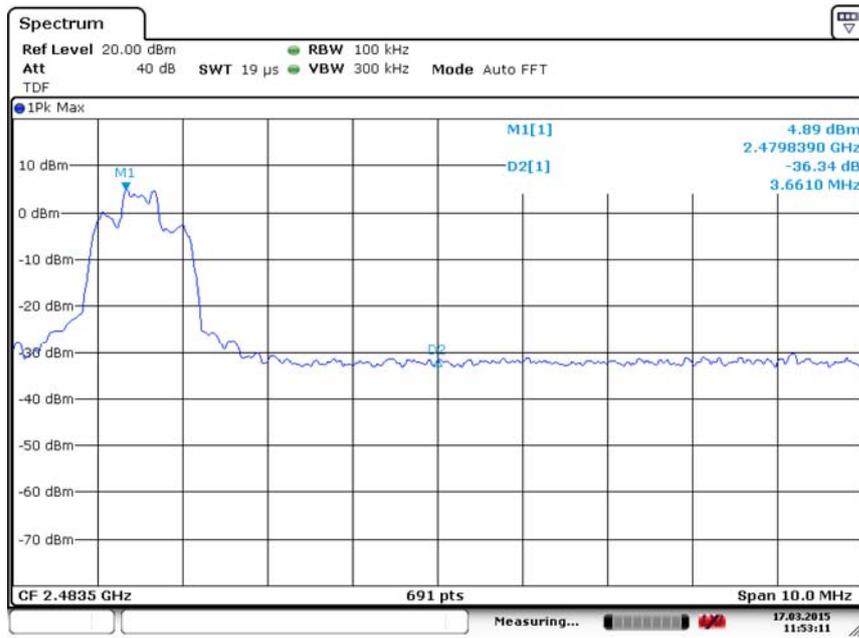
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Fig. 19 Band Edges ($\pi/4$ DQPSK, Ch 78, Hopping OFF)



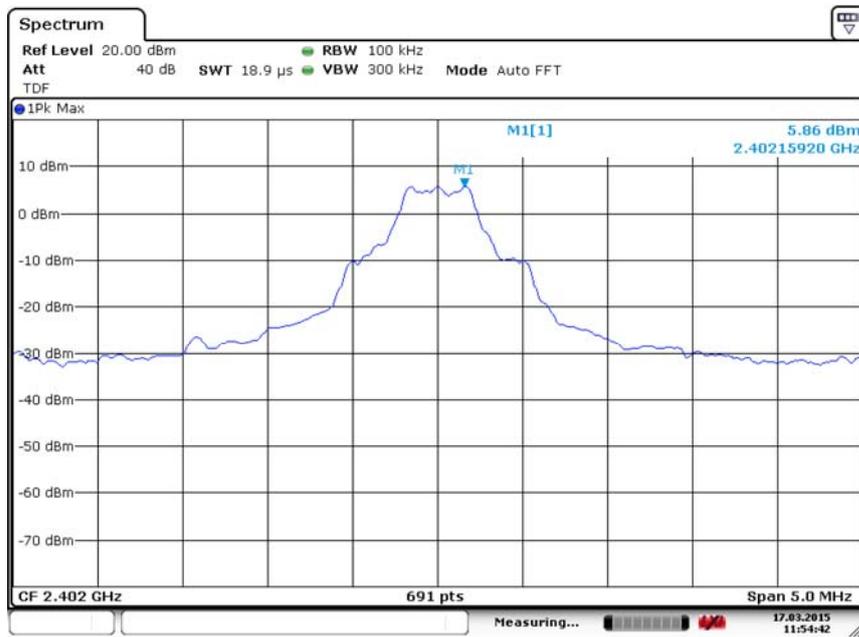
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Fig. 20 Band Edges (8DPSK, Ch 0, Hopping OFF)



Date: 17.MAR.2015 11:53:11

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



Date: 17.MAR.2015 11:54:43

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

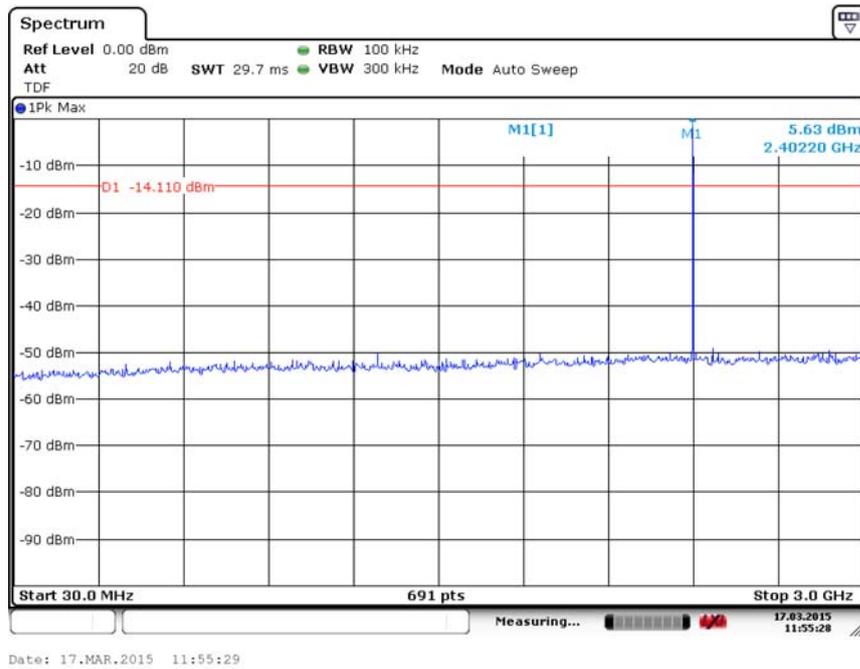


Fig. 23 Conducted Spurious Emission (GFSK, Ch0, 30 MHz-3 GHz)

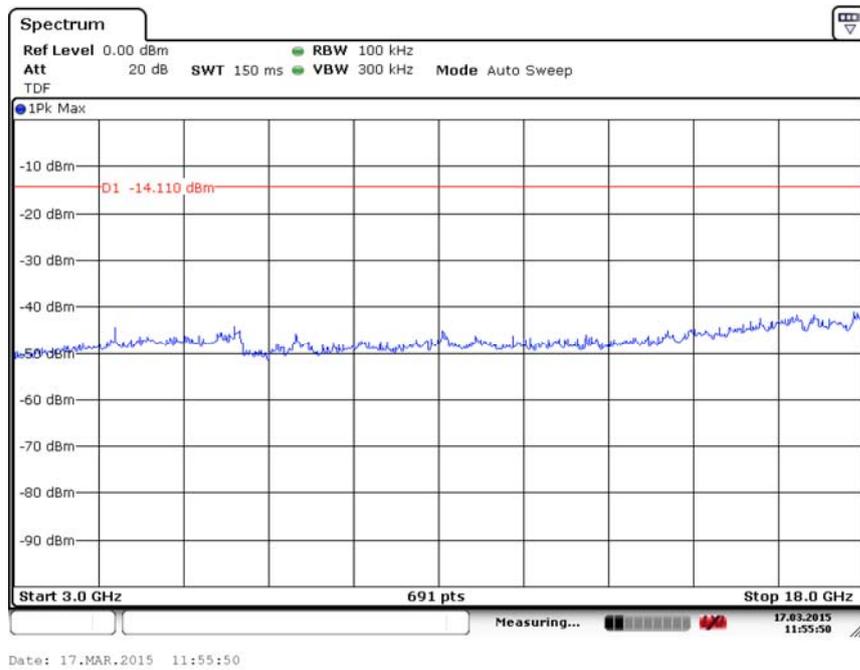


Fig. 24 Conducted Spurious Emission (GFSK, Ch0, 3GHz-18 GHz)

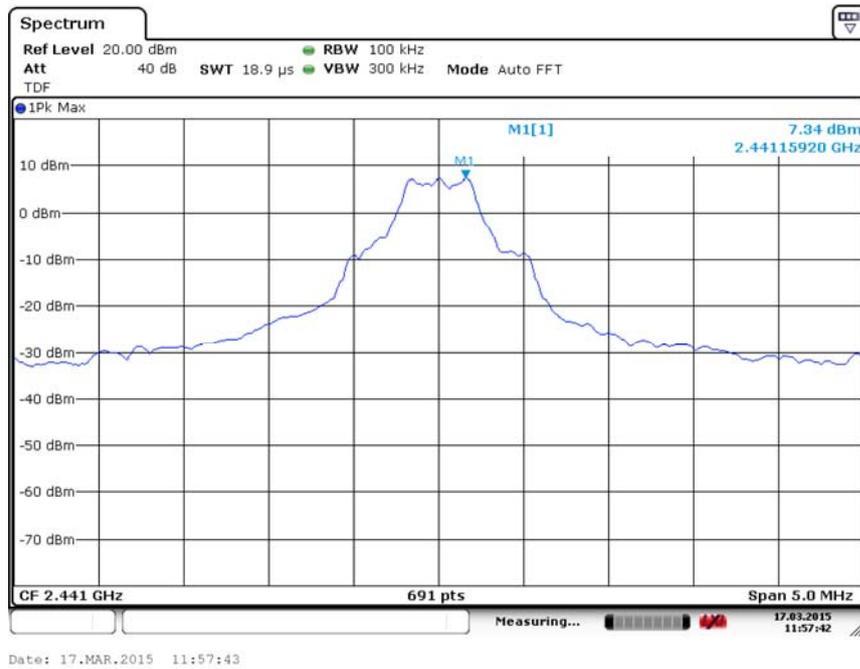


Fig. 25 Conducted Spurious Emission (GFSK, Ch39, 2.441GHz)

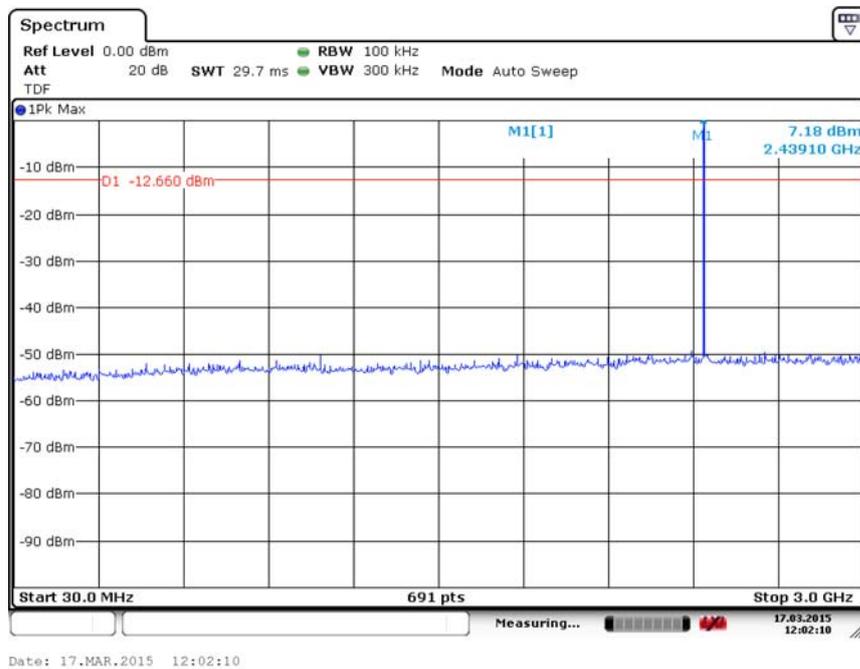


Fig. 26 Conducted Spurious Emission (GFSK, Ch39, 30 MHz-3 GHz)

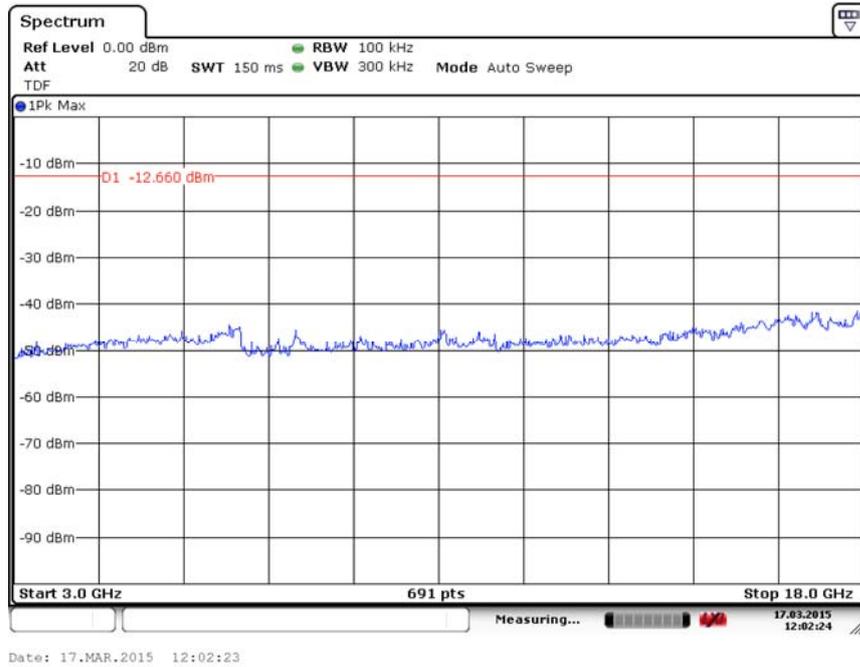


Fig. 27 Conducted Spurious Emission (GFSK, Ch39, 3GHz-18 GHz)

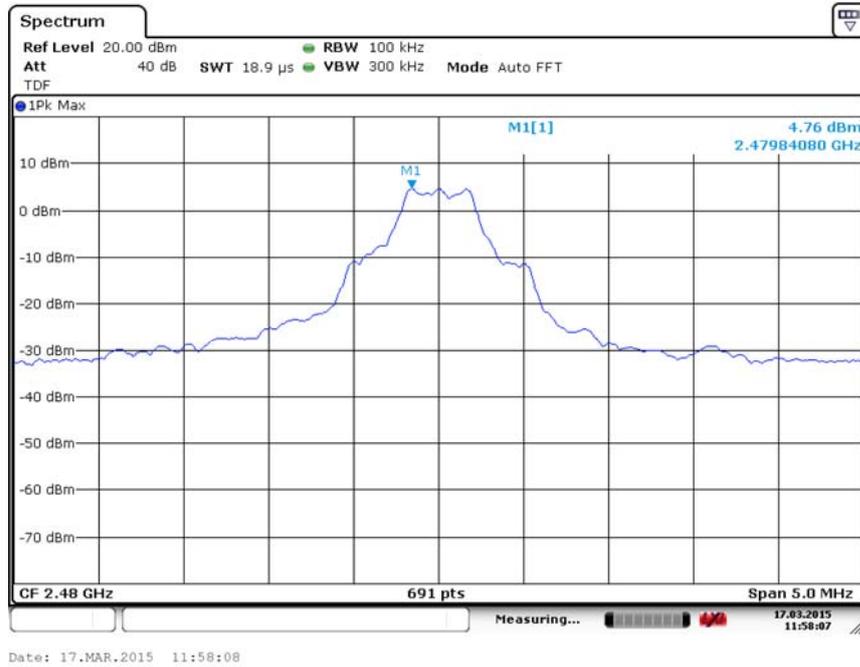


Fig. 28 Conducted Spurious Emission (GFSK, Ch78, 2.480GHz)

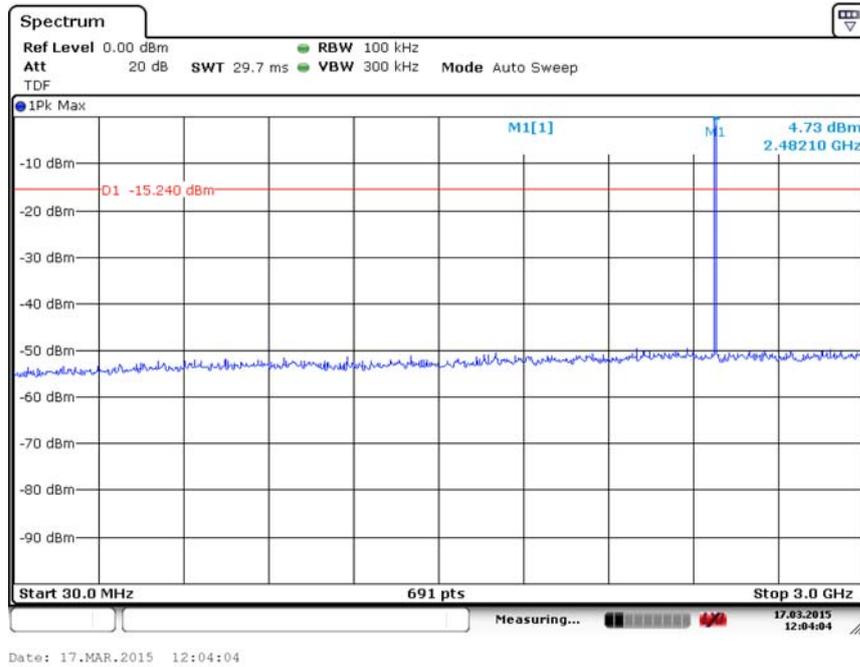


Fig. 29 Conducted Spurious Emission (GFSK, Ch78, 30 MHz-3 GHz)

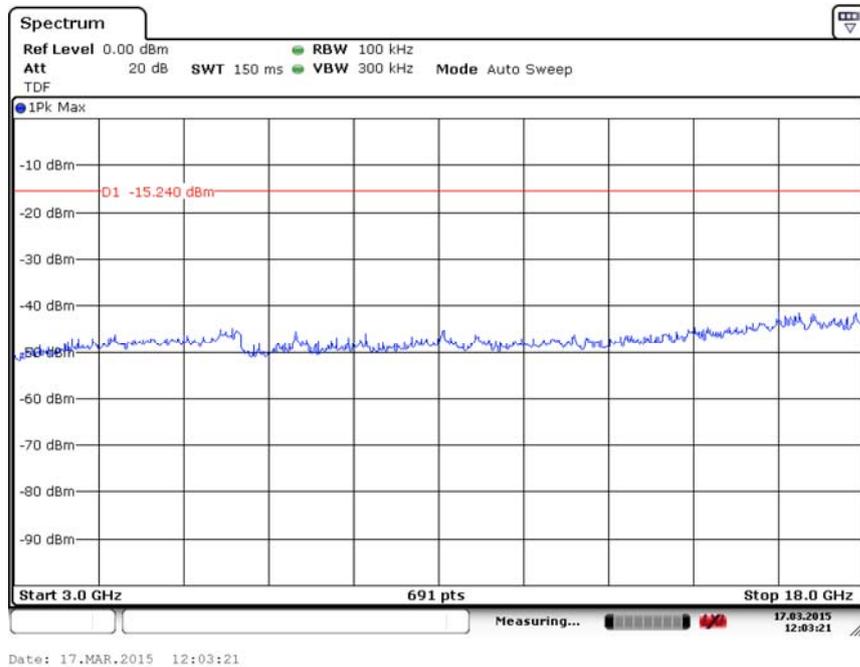


Fig. 30 Conducted Spurious Emission (GFSK, Ch78, 3GHz-18 GHz)



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

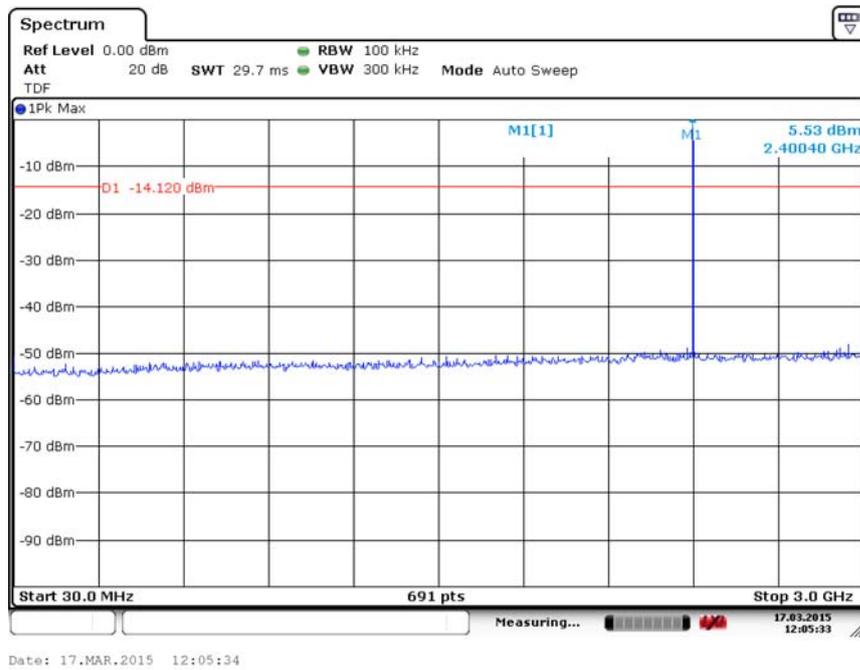


Fig. 32 Conducted Spurious Emission ($\pi/4$ DQPSK, Ch0, 30 MHz-3 GHz)

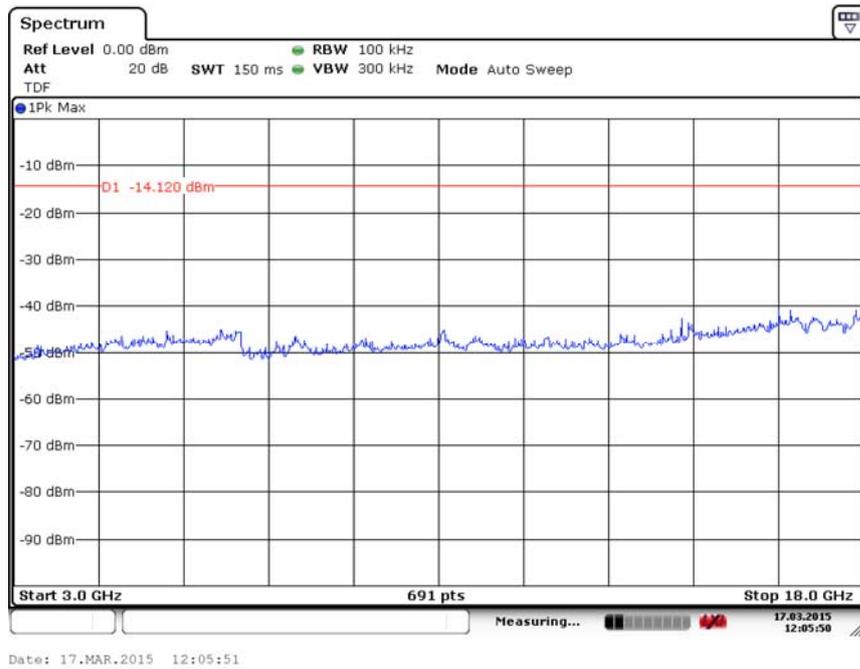


Fig. 33 Conducted Spurious Emission ($\pi/4$ DQPSK, Ch0, 3GHz-18 GHz)

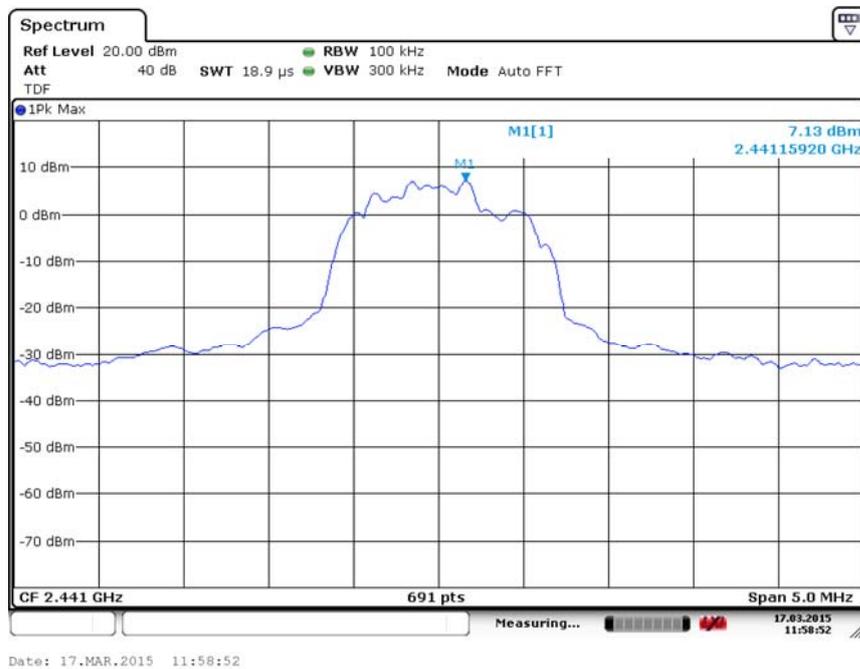


Fig. 34 Conducted Spurious Emission ($\pi/4$ DQPSK, Ch39, 2.441GHz)

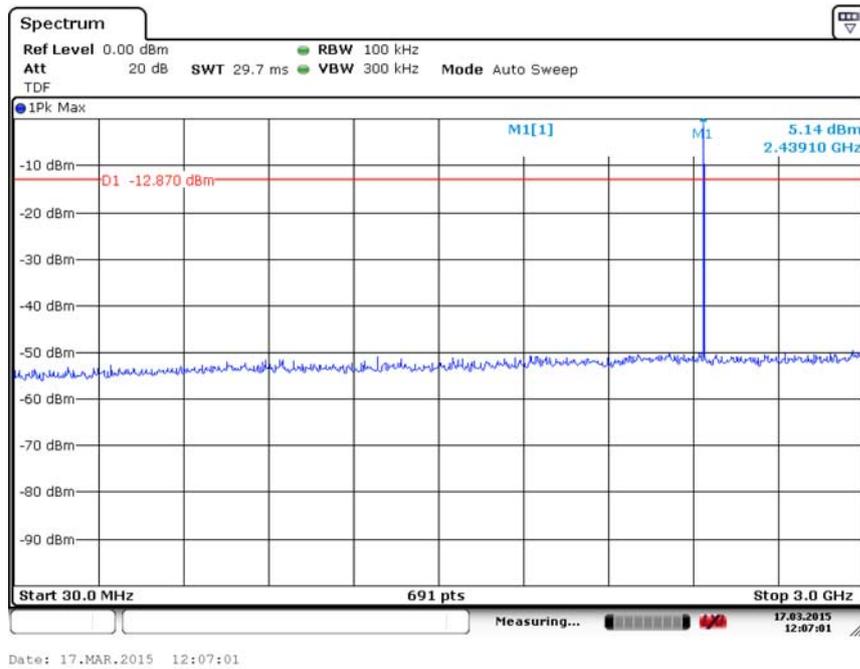


Fig. 35 Conducted Spurious Emission ($\pi/4$ DQPSK, Ch39, 30 MHz-3 GHz)

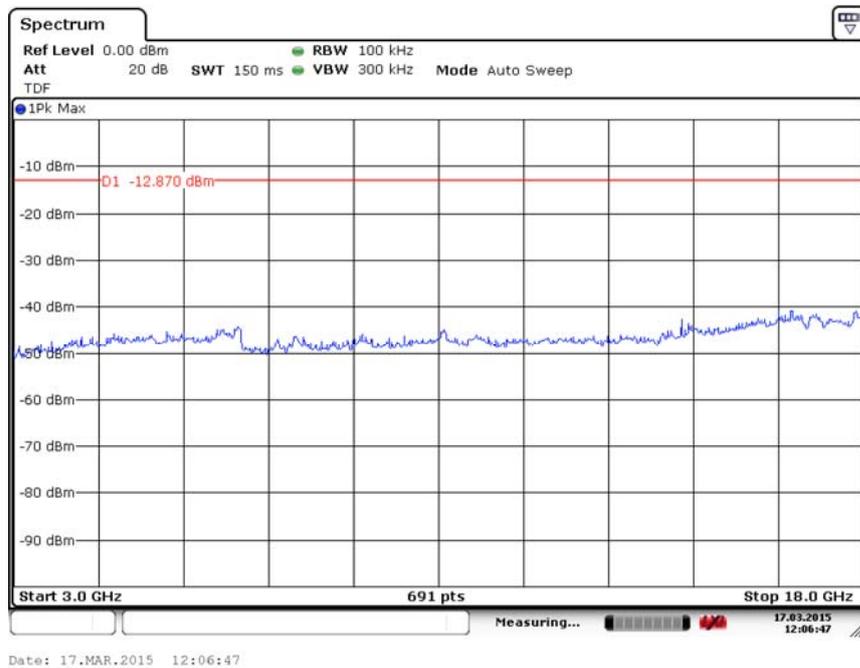


Fig. 36 Conducted Spurious Emission ($\pi/4$ DQPSK, Ch39, 3GHz-18 GHz)

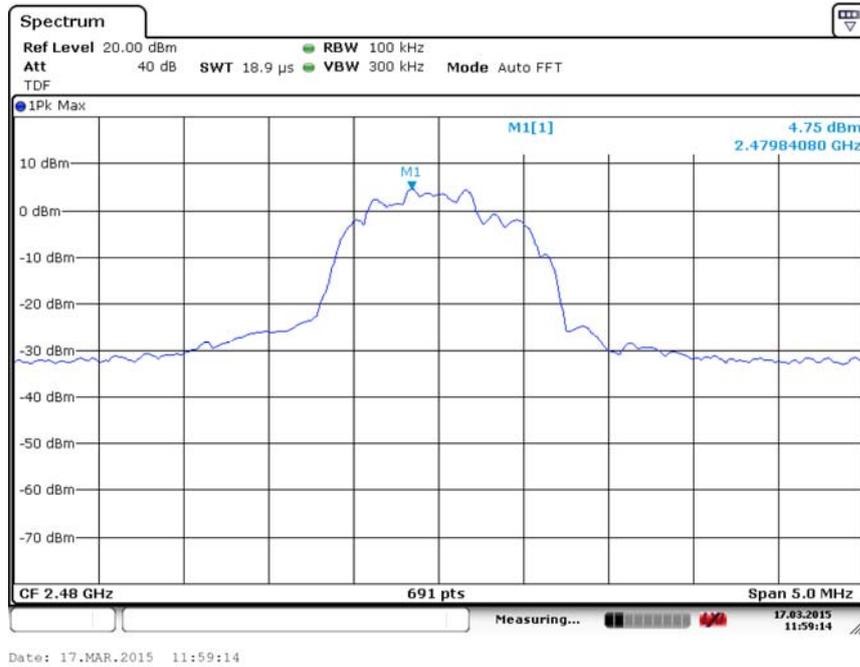


Fig. 37 Conducted Spurious Emission ($\pi/4$ DQPSK, Ch78, 2.480GHz)

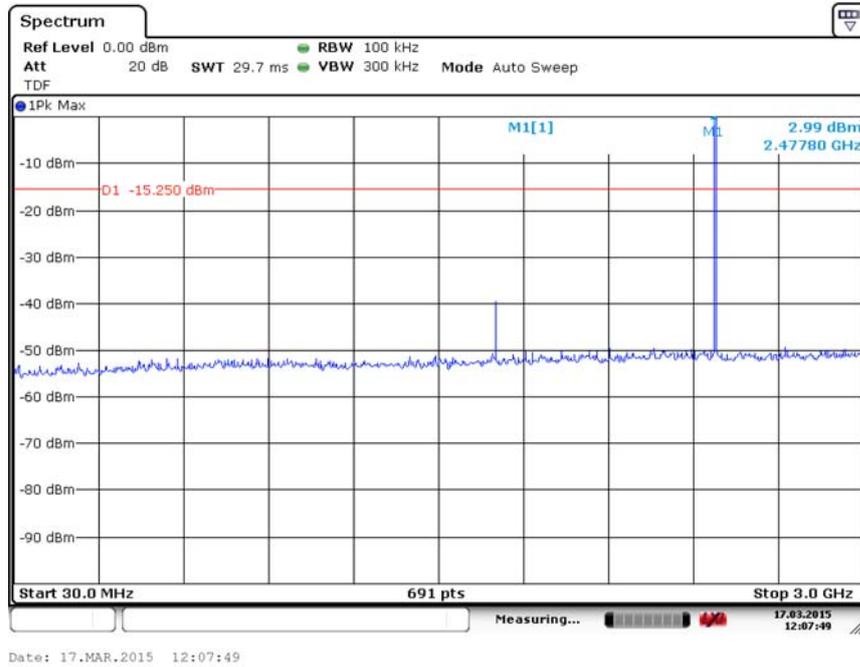


Fig. 38 Conducted Spurious Emission ($\pi/4$ DQPSK, Ch78, 30 MHz-3 GHz)

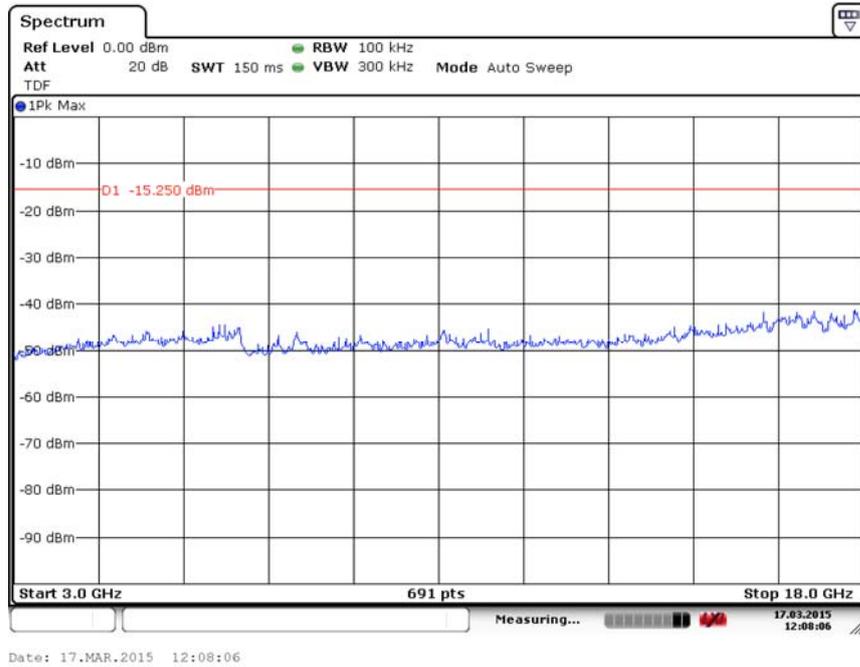


Fig. 39 Conducted Spurious Emission ($\pi/4$ DQPSK, Ch78, 3GHz-18 GHz)

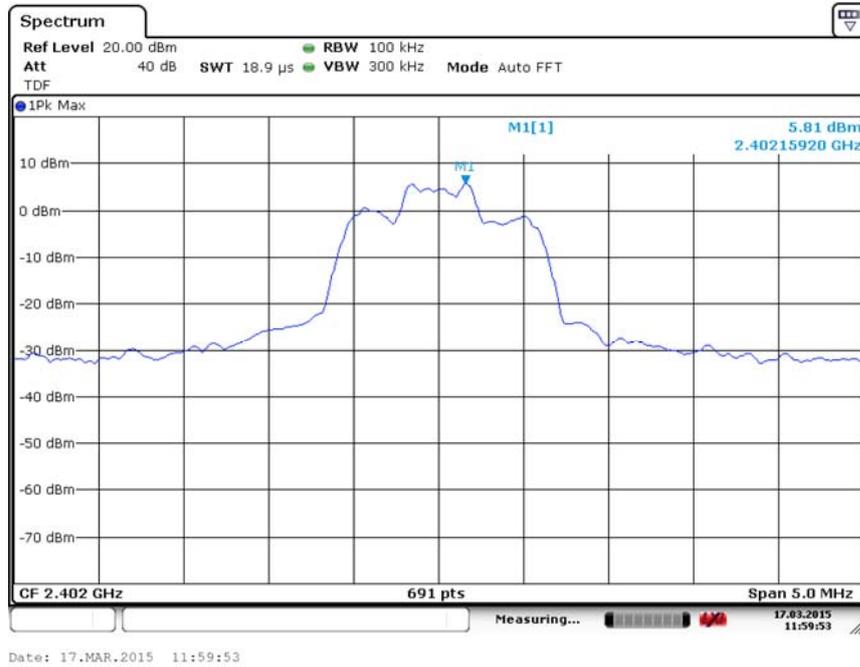


Fig. 40 Conducted Spurious Emission (8DPSK, Ch0, 2.402GHz)

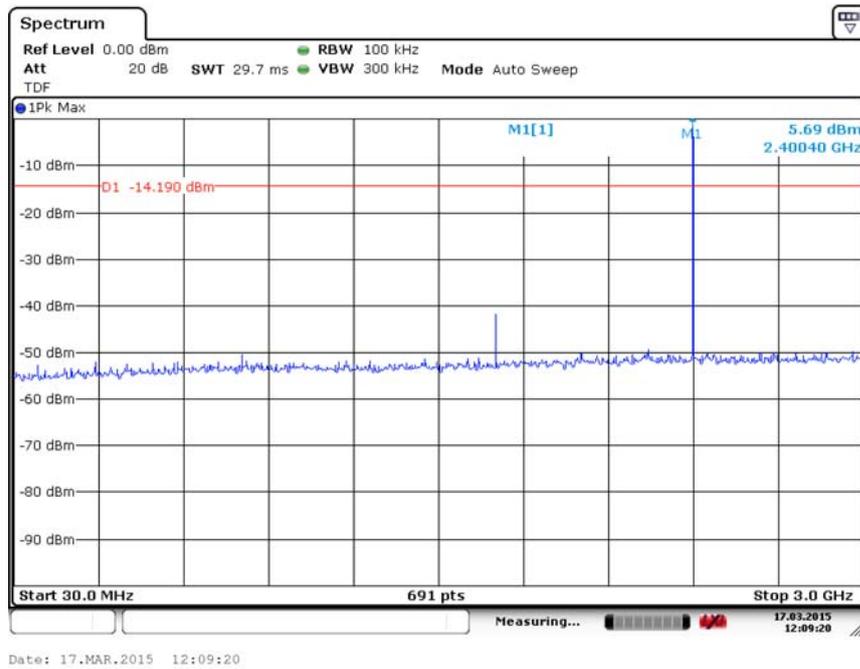


Fig. 41 Conducted Spurious Emission (8DPSK, Ch0, 30 MHz-3 GHz)

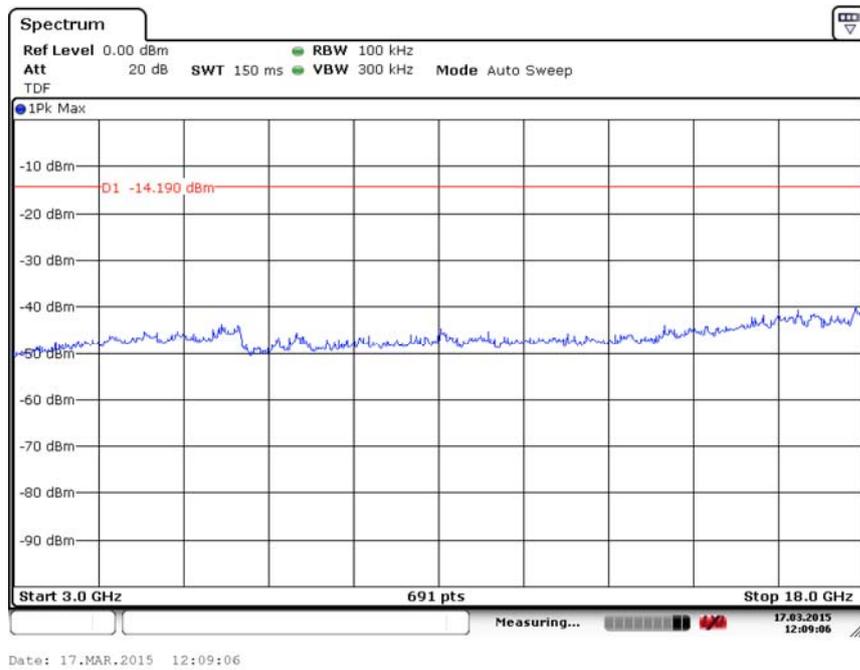


Fig. 42 Conducted Spurious Emission (8DPSK, Ch0, 3GHz-18 GHz)

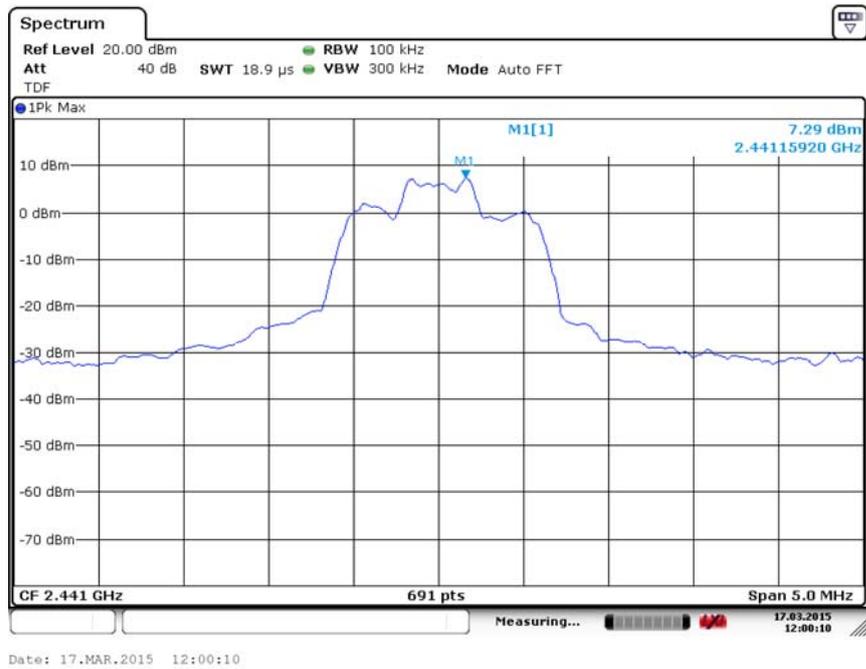


Fig. 43 Conducted Spurious Emission (8DPSK, Ch39, 2.441GHz)

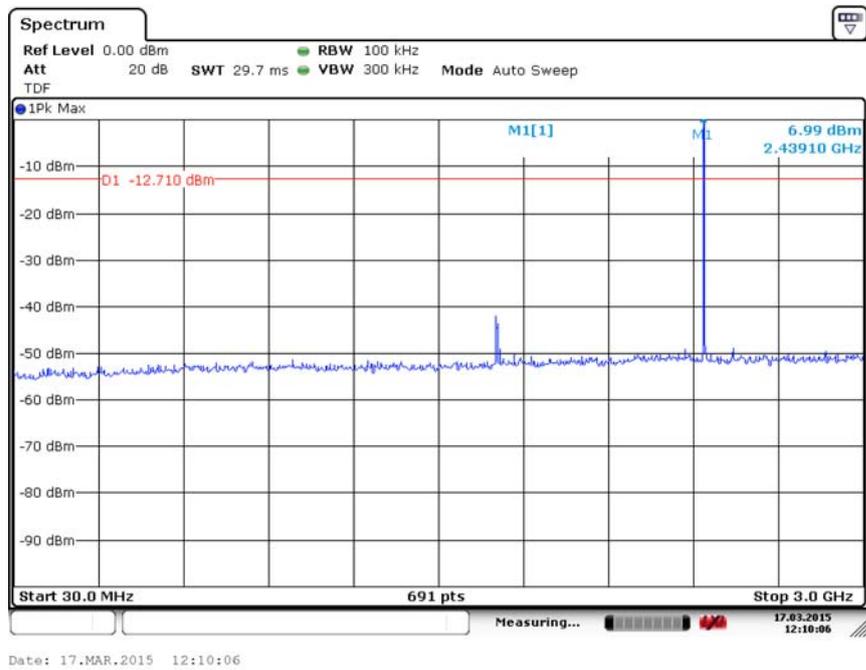


Fig. 44 Conducted Spurious Emission (8DPSK, Ch39, 30 MHz-3 GHz)

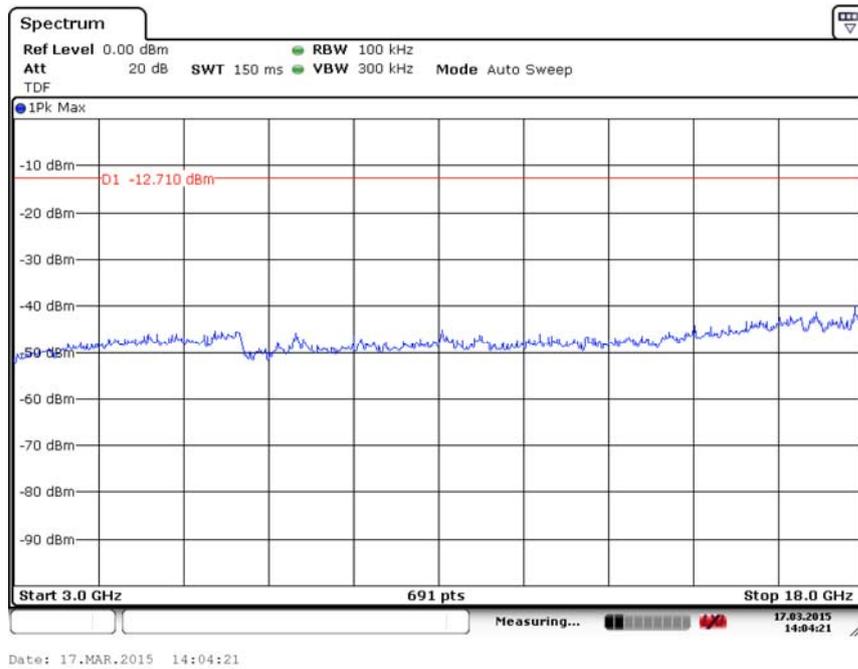


Fig. 45 Conducted Spurious Emission (8DPSK, Ch39, 3GHz-18 GHz)



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

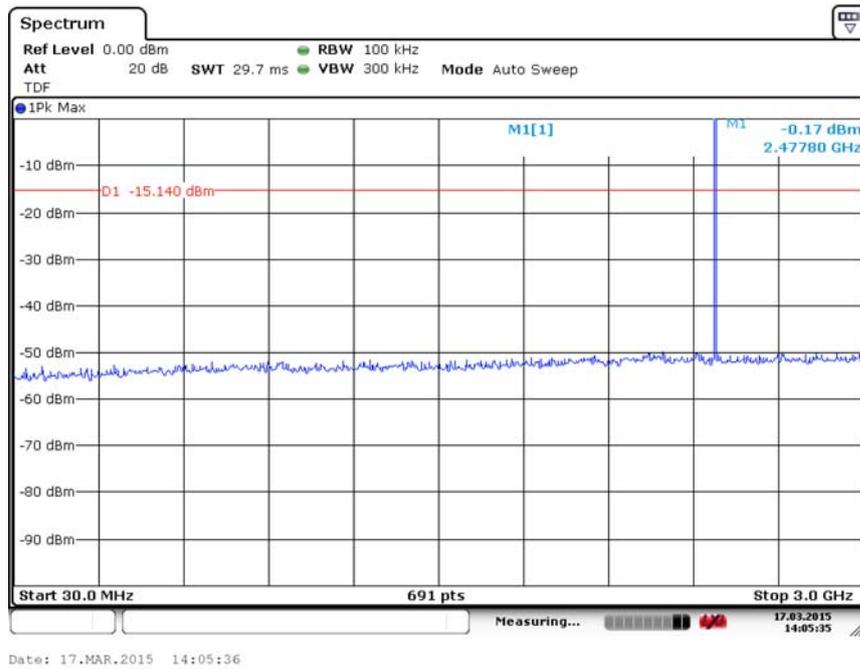


Fig. 47 Conducted Spurious Emission (8DPSK, Ch78, 30 MHz-3 GHz)

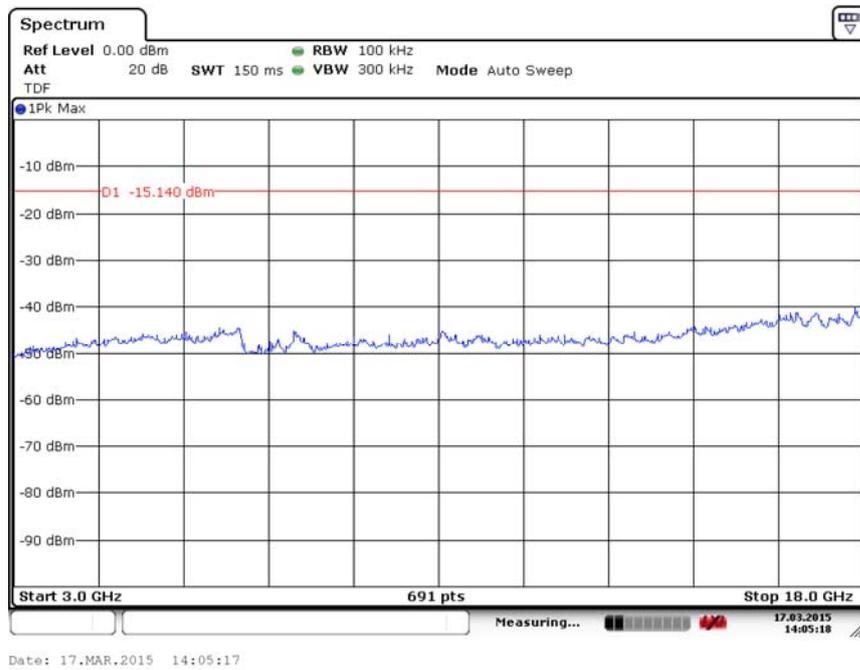


Fig. 48 Conducted Spurious Emission (8DPSK, Ch78, 3GHz-18 GHz)

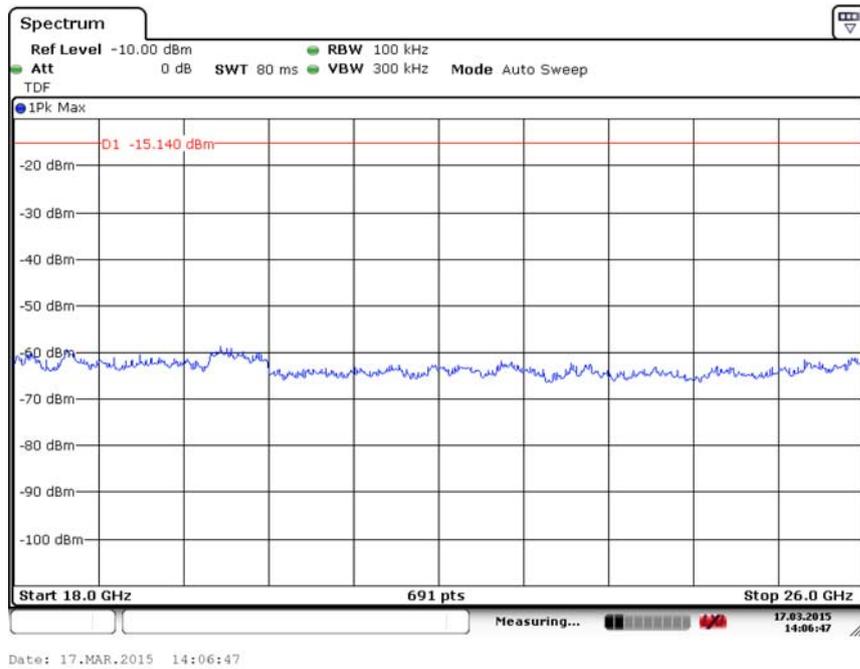


Fig. 49 Conducted Spurious Emission (All channel, 18 GHz-26 GHz)

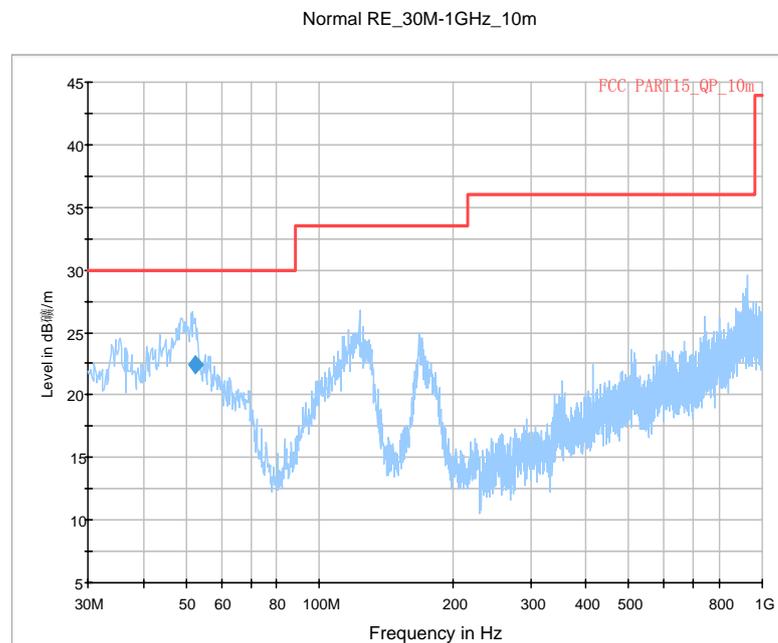


Fig. 50 Radiated Spurious Emission (GFSK, Ch0, 30 MHz ~1 GHz,AE1)

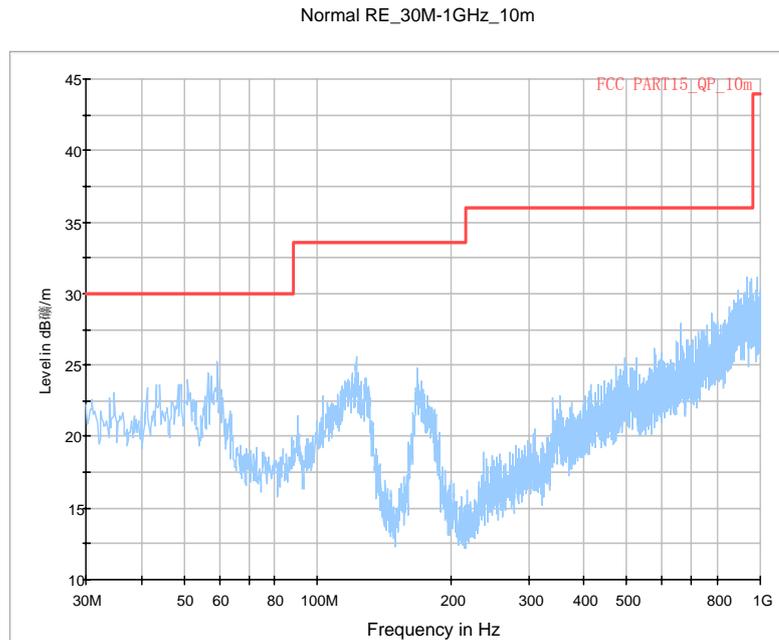


Fig. 51 Radiated Spurious Emission (GFSK, Ch0, 30 MHz ~1 GHz,AE2)

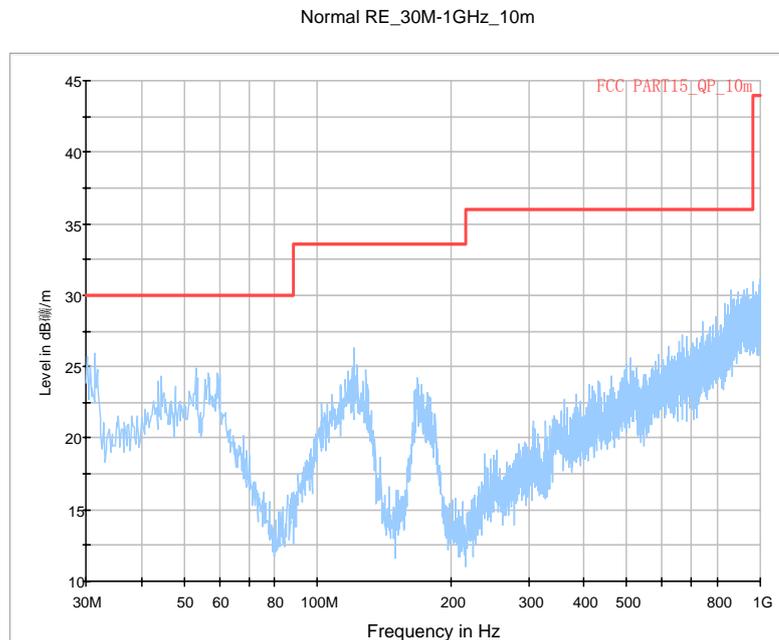


Fig. 52 Radiated Spurious Emission (GFSK, Ch0, 30 MHz ~1 GHz,AE3)

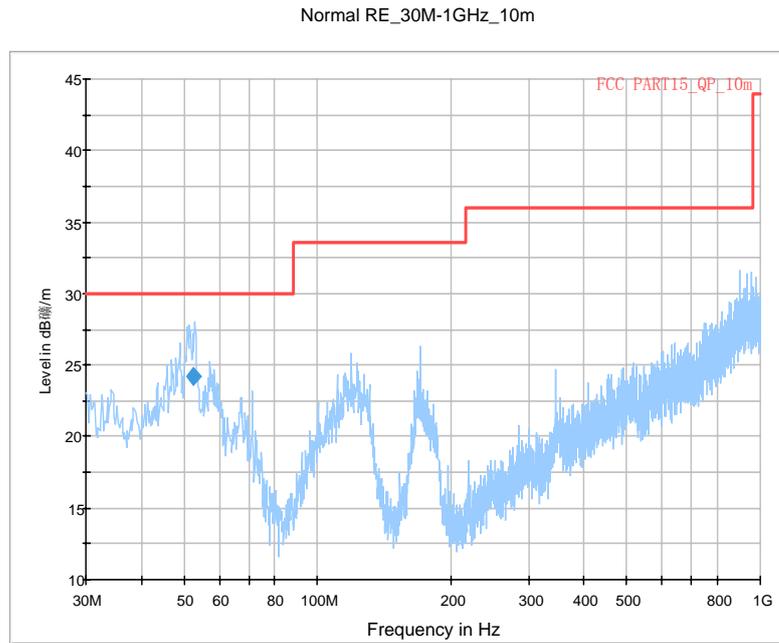


Fig. 53 Radiated Spurious Emission (GFSK, Ch0, 30 MHz ~1 GHz,AE4)

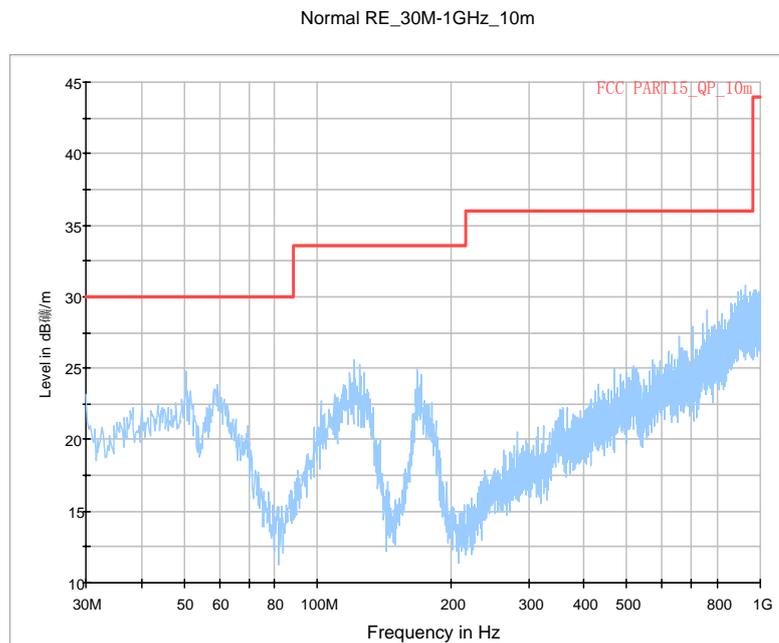


Fig. 54 Radiated Spurious Emission (GFSK, Ch0, 30 MHz ~1 GHz,AE5)

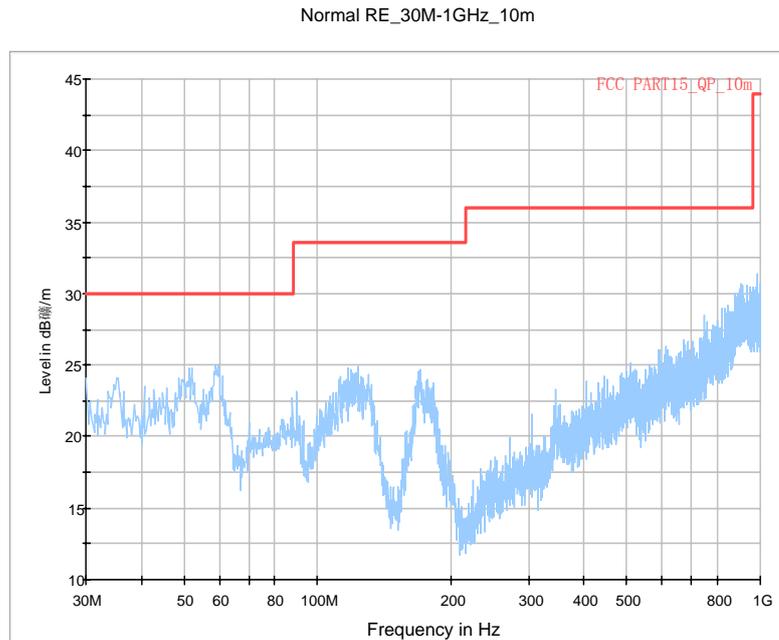


Fig. 55 Radiated Spurious Emission (GFSK, Ch0, 30 MHz ~1 GHz,AE6)

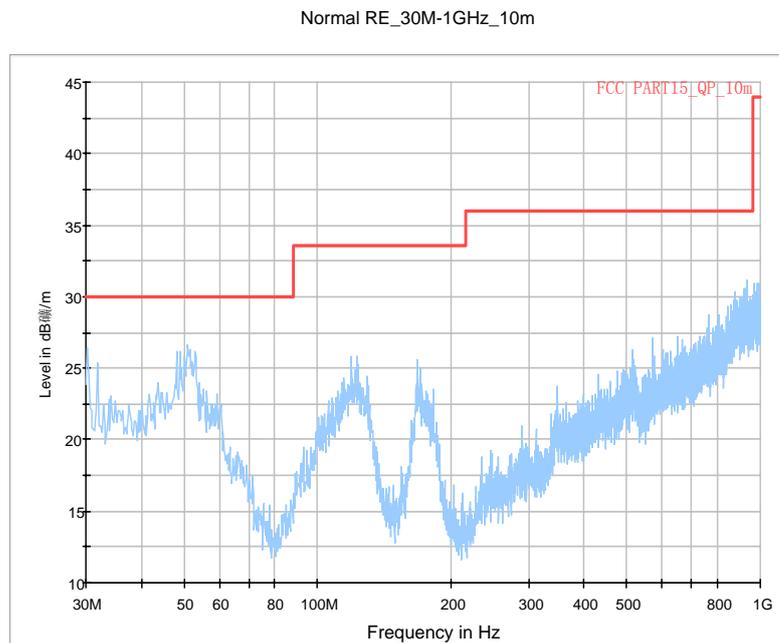


Fig. 56 Radiated Spurious Emission (GFSK, Ch0, 30 MHz ~1 GHz,AE7)

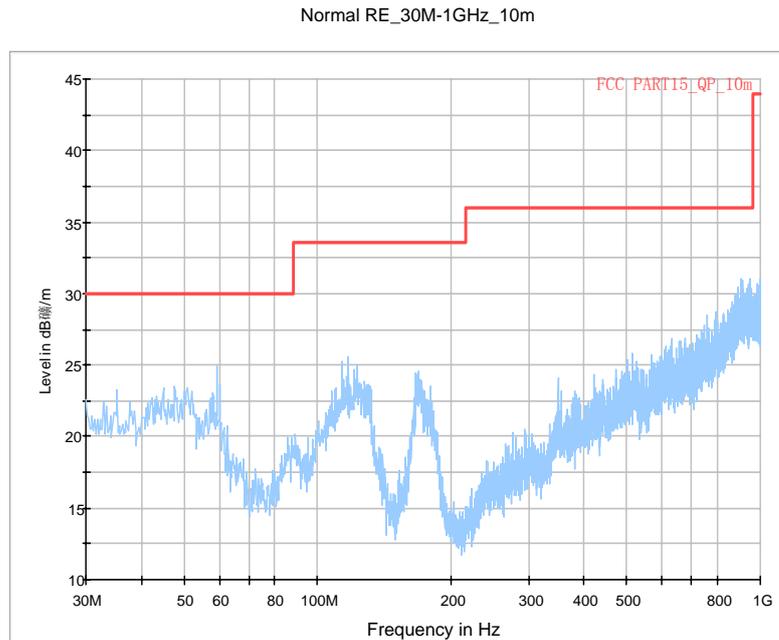


Fig. 57 Radiated Spurious Emission (GFSK, Ch0, 30 MHz ~1 GHz,AE8)

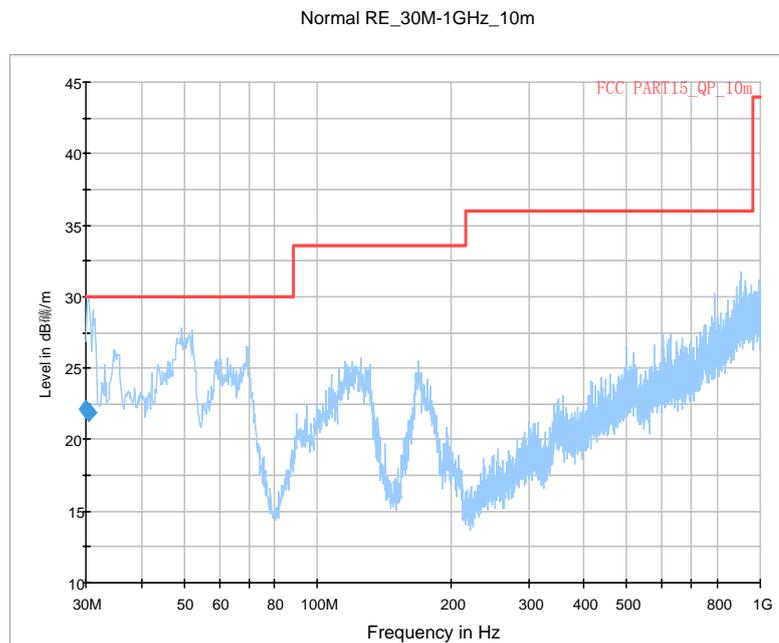


Fig. 58 Radiated Spurious Emission (GFSK, Ch0, 30 MHz ~1 GHz,AE9)

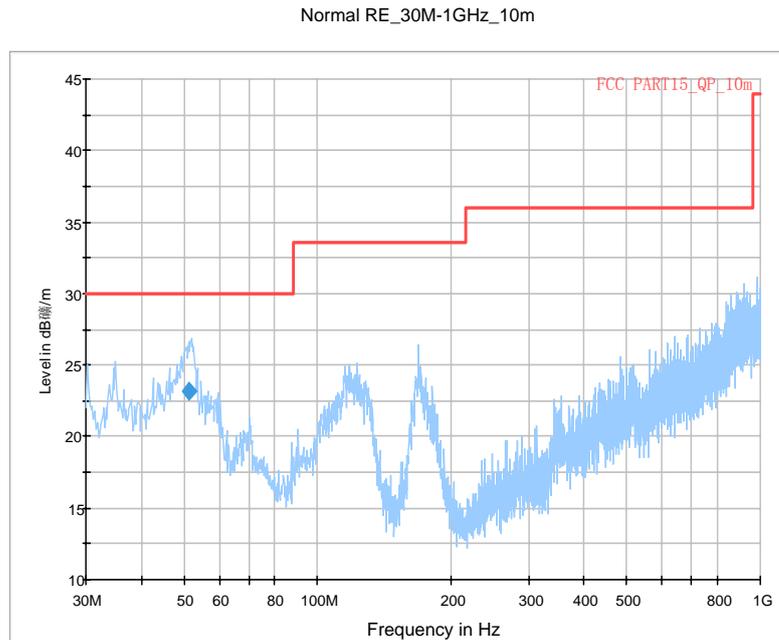


Fig. 59 Radiated Spurious Emission (GFSK, Ch0, 30 MHz ~1 GHz,AE10)

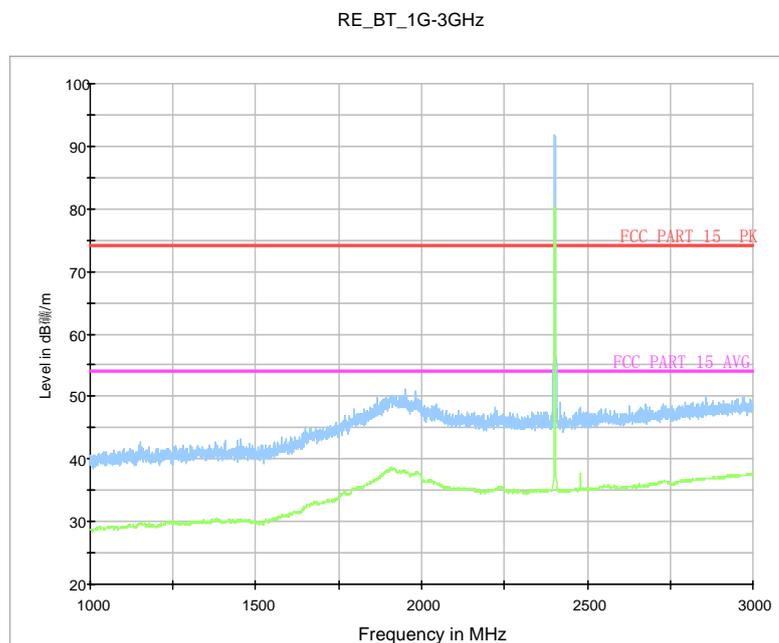


Fig. 60 Radiated Spurious Emission (GFSK, Ch0, 1 GHz ~3 GHz)

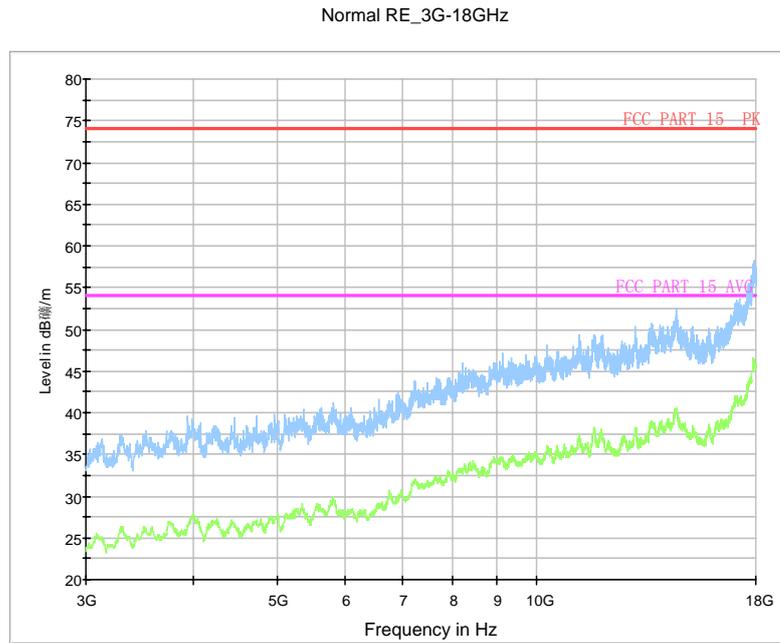


Fig. 61 Radiated Spurious Emission (GFSK, Ch39, 3 GHz ~18 GHz)

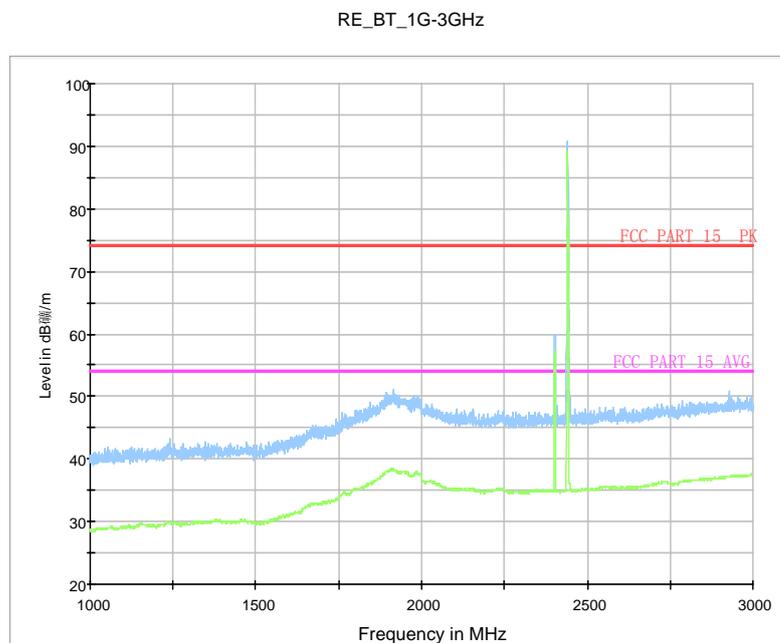


Fig. 62 Radiated Spurious Emission (GFSK, Ch39, 1 GHz ~3 GHz)

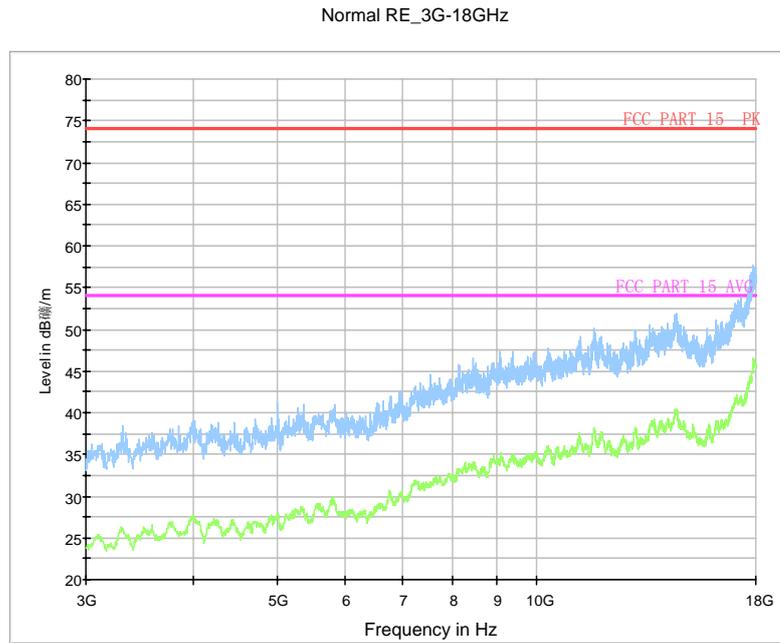


Fig. 63 Radiated Spurious Emission (GFSK, Ch39, 3 GHz ~18 GHz)

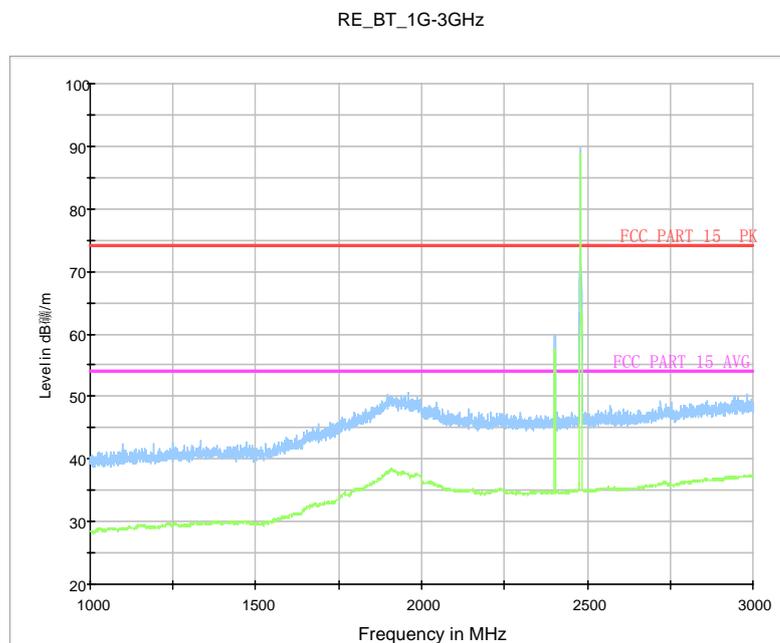


Fig. 64 Radiated Spurious Emission (GFSK, Ch78, 1 GHz ~3 GHz)

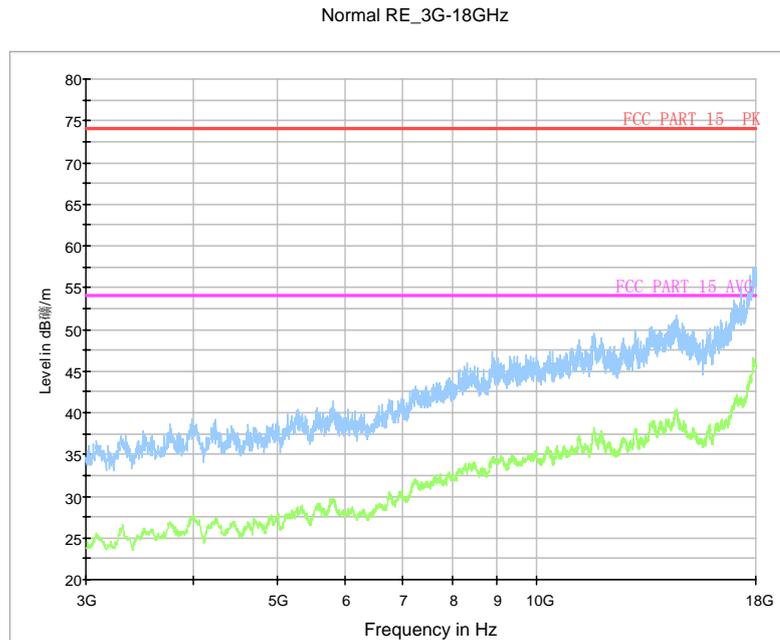


Fig. 65 Radiated Spurious Emission (GFSK, Ch78, 3 GHz ~18 GHz)

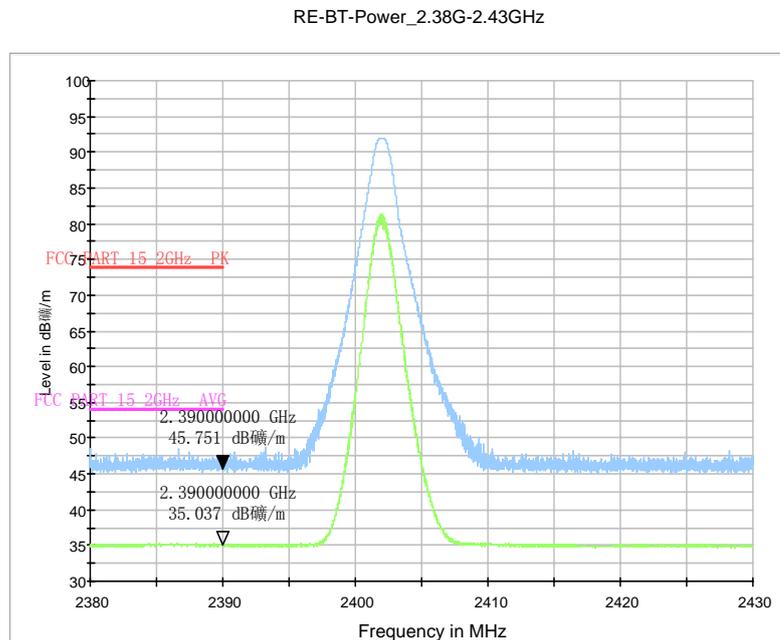


Fig. 66 Radiated Emission Power (GFSK, Ch0, 2380GHz~2450GHz)

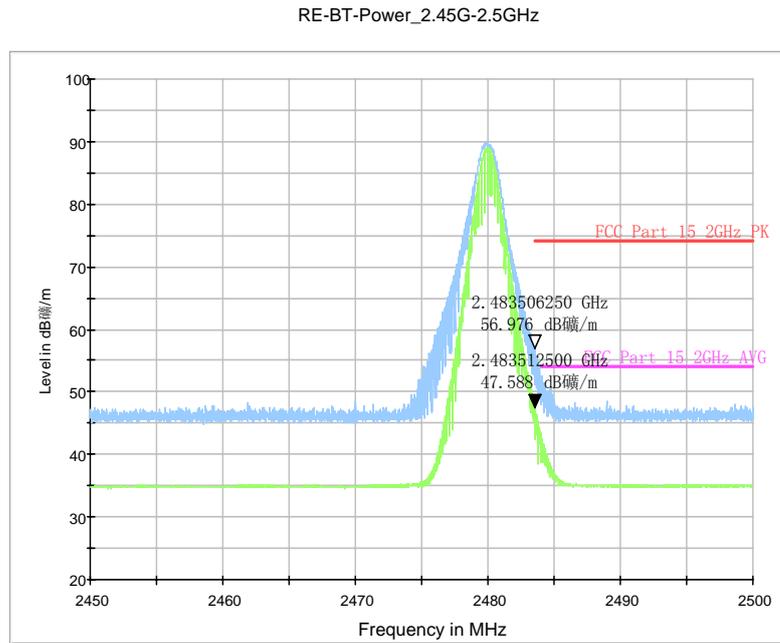


Fig. 67 Radiated Emission Power (GFSK, Ch78, 2450GHz~2500GHz)

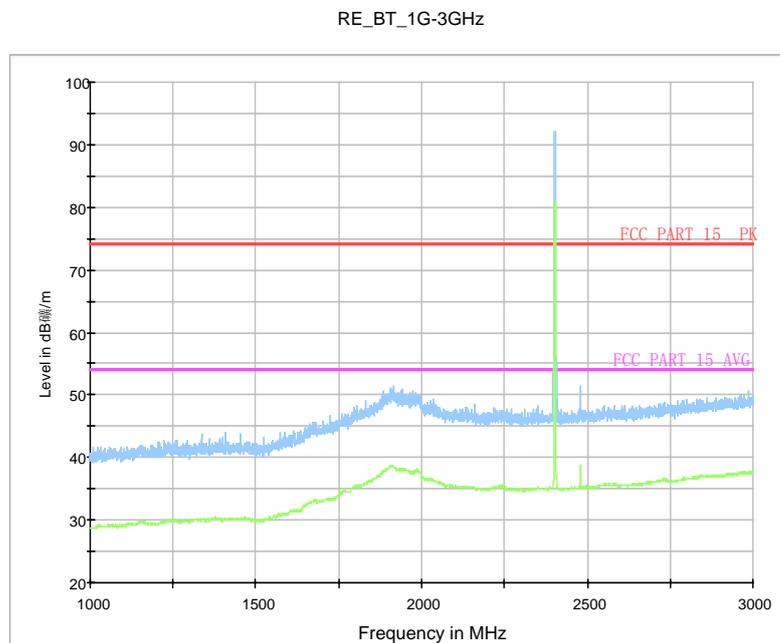


Fig. 68 Radiated Spurious Emission ($\pi/4$ DQPSK, Ch0, 1 GHz ~3 GHz)

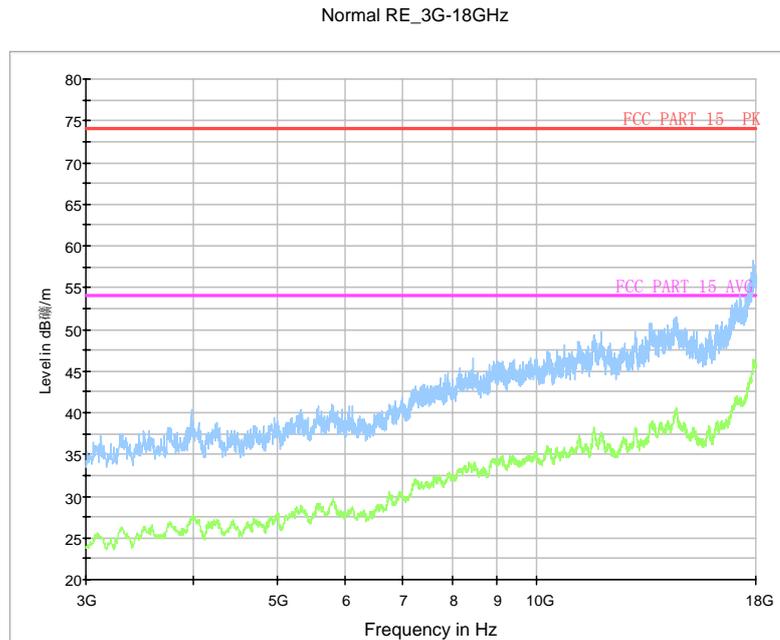


Fig. 69 Radiated Spurious Emission ($\pi/4$ DQPSK, Ch0, 3 GHz ~18 GHz)

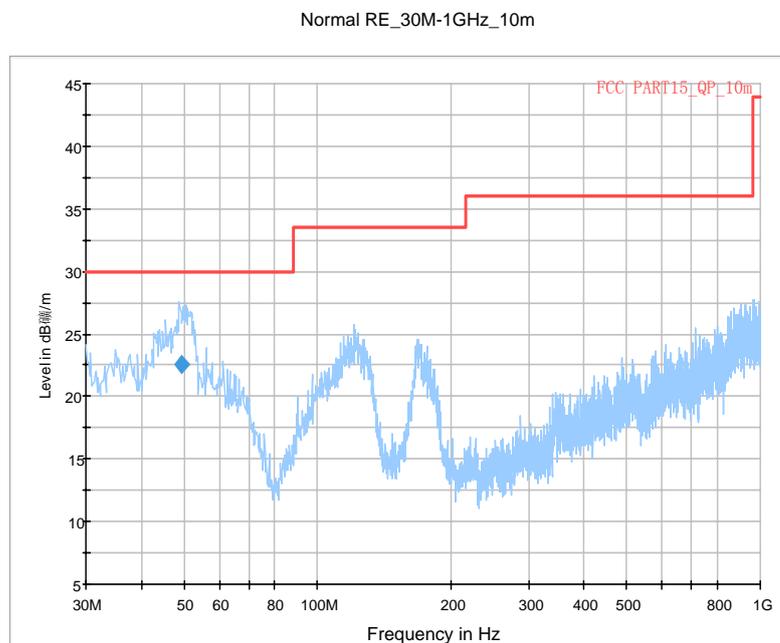


Fig. 70 Radiated Spurious Emission ($\pi/4$ DQPSK, Ch39, 30 MHz ~1 GHz)

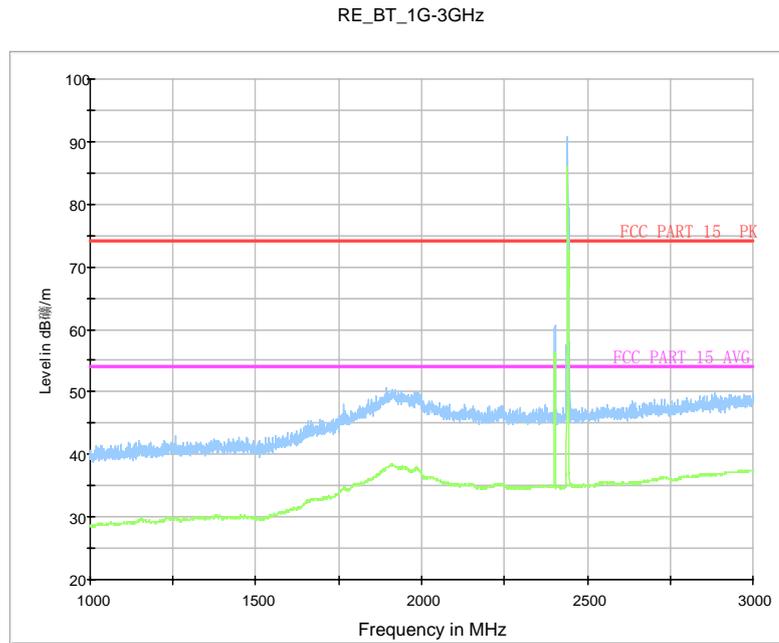


Fig. 71 Radiated Spurious Emission ($\pi/4$ DQPSK, Ch39, 1 GHz ~3 GHz)

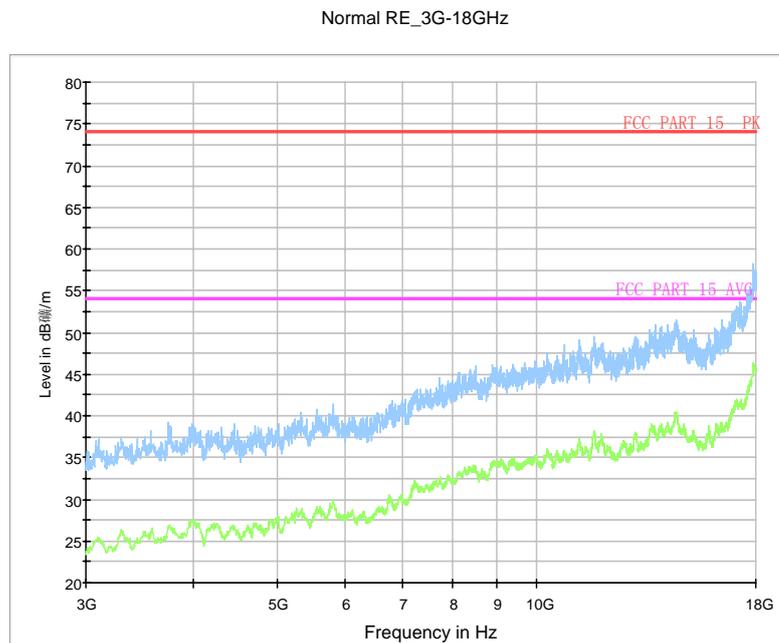


Fig. 72 Radiated Spurious Emission ($\pi/4$ DQPSK, Ch39, 3 GHz ~18 GHz)

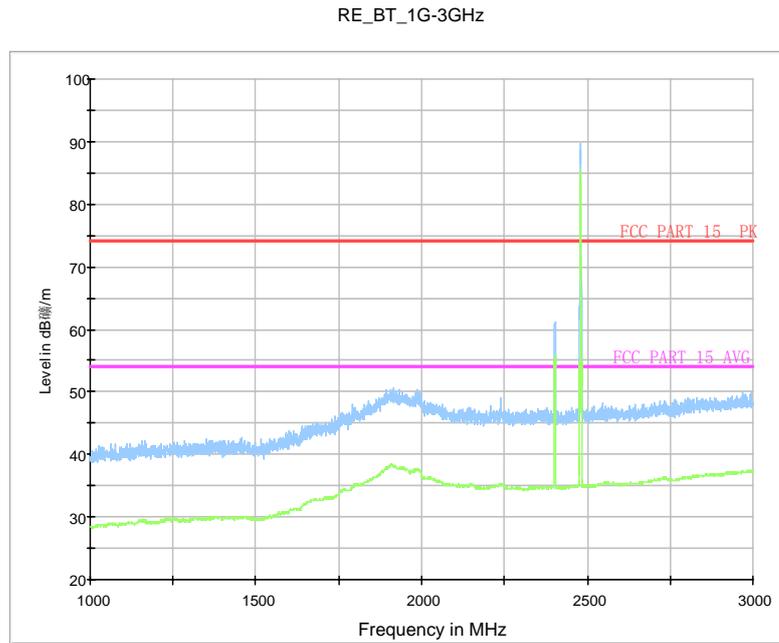


Fig. 73 Radiated Spurious Emission ($\pi/4$ DQPSK, Ch78, 1 GHz ~3 GHz)

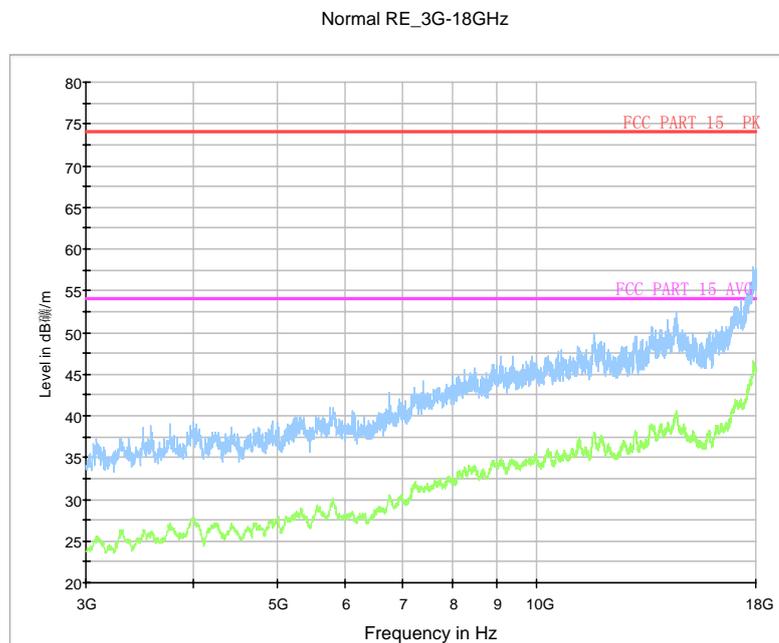


Fig. 74 Radiated Spurious Emission ($\pi/4$ DQPSK, Ch78, 3 GHz ~18 GHz)

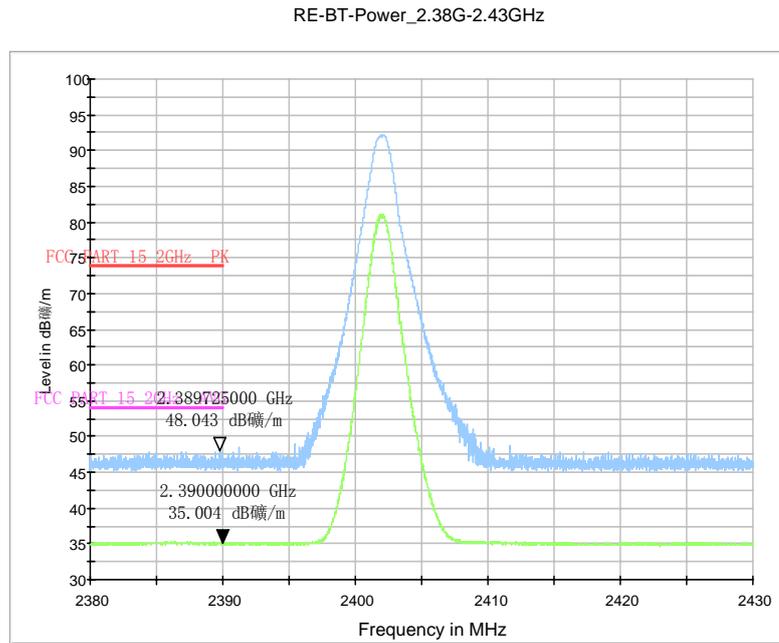


Fig. 75 Radiated Emission Power ($\pi/4$ DQPSK, Ch0, 2380GHz~2450GHz)

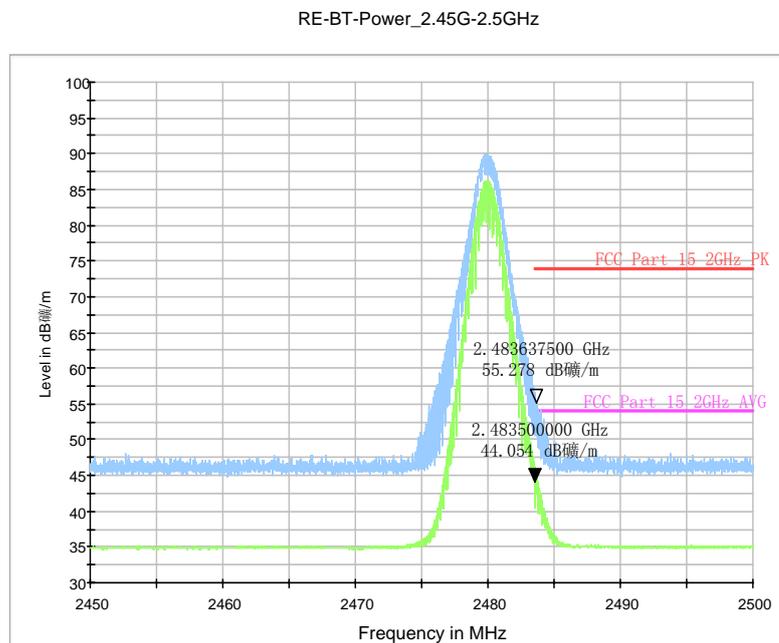


Fig. 76 Radiated Emission Power ($\pi/4$ DQPSK, Ch78, 2450GHz~2500GHz)

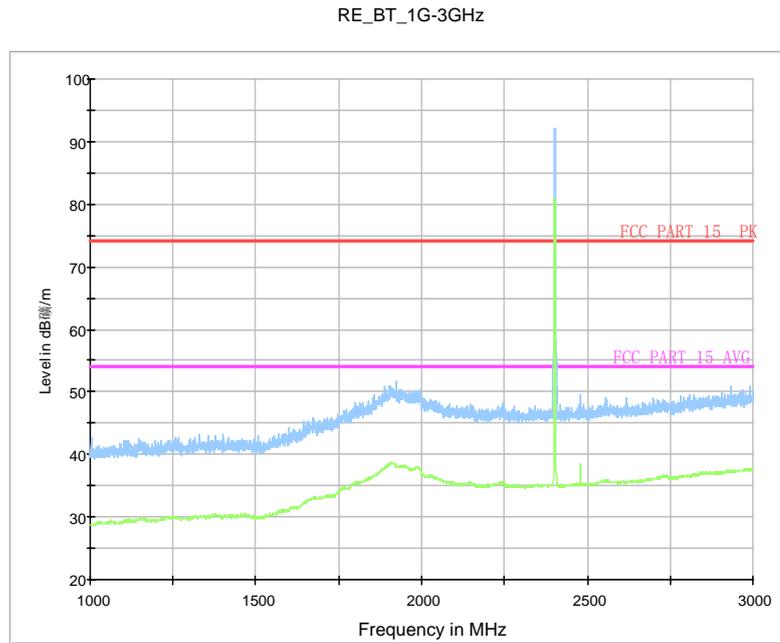


Fig. 77 Radiated Spurious Emission (8DPSK, Ch0, 1 MHz ~3 GHz)

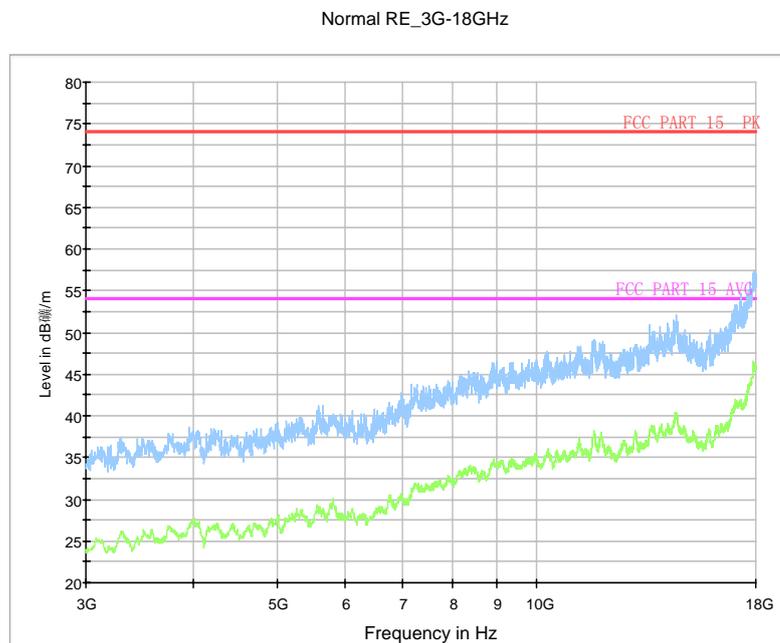


Fig. 78 Radiated Spurious Emission (8DPSK, Ch0, 3 GHz ~18 GHz)

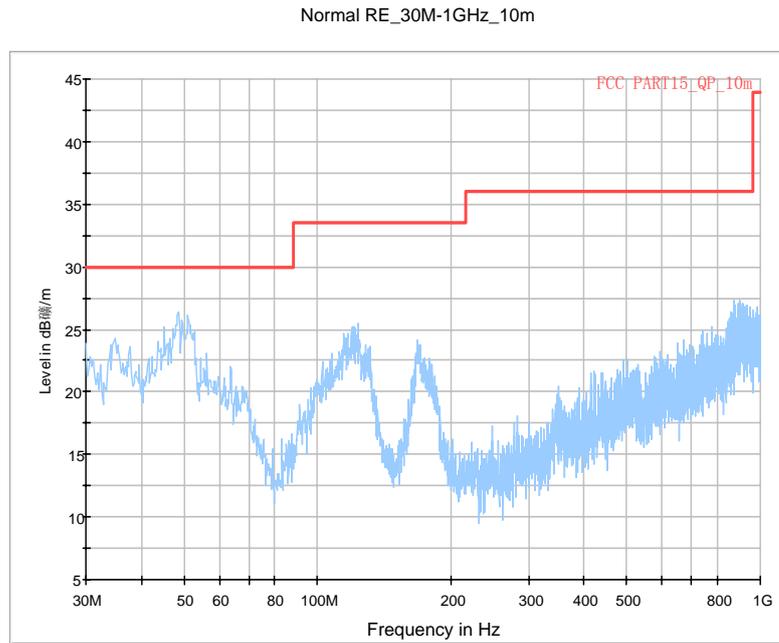


Fig. 79 Radiated Spurious Emission (8DPSK, Ch39, 30 MHz ~1 GHz)

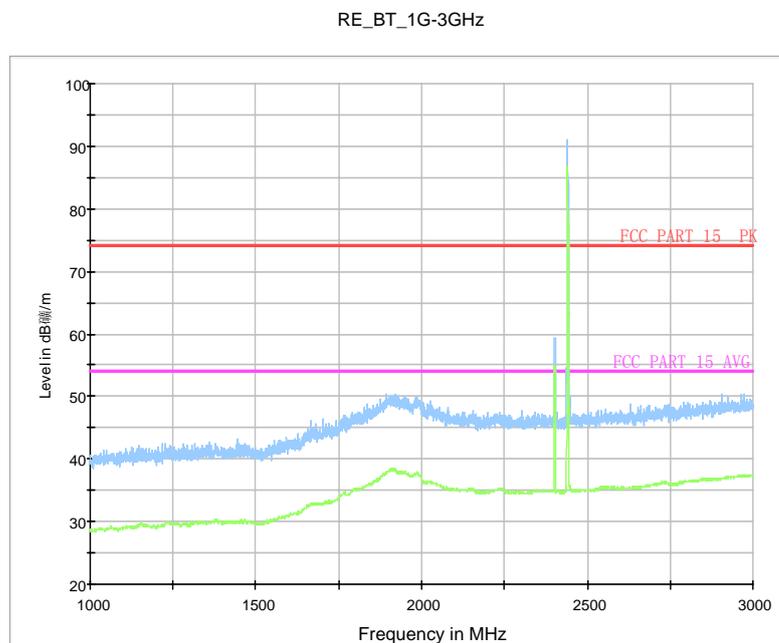


Fig. 80 Radiated Spurious Emission (8DPSK, Ch39, 1 GHz ~3 GHz)

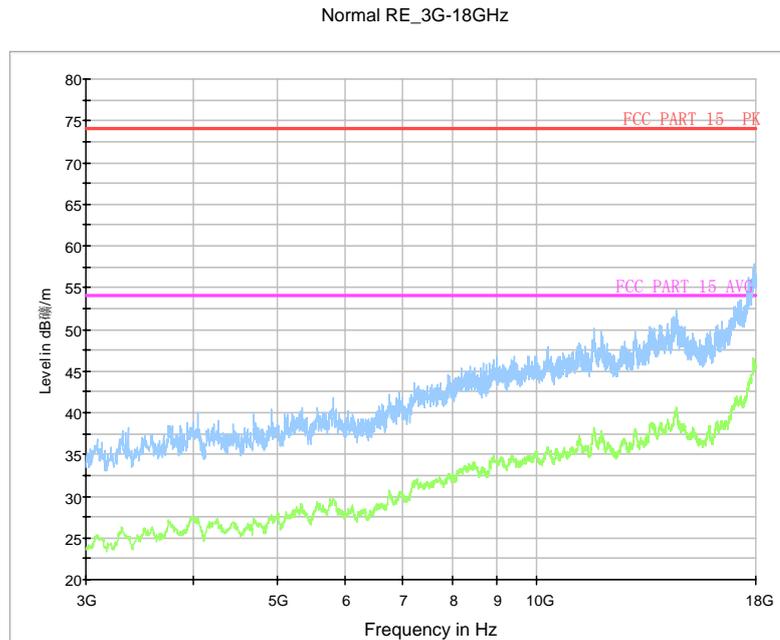


Fig. 81 Radiated Spurious Emission (8DPSK, Ch39, 3 MHz ~18 GHz)

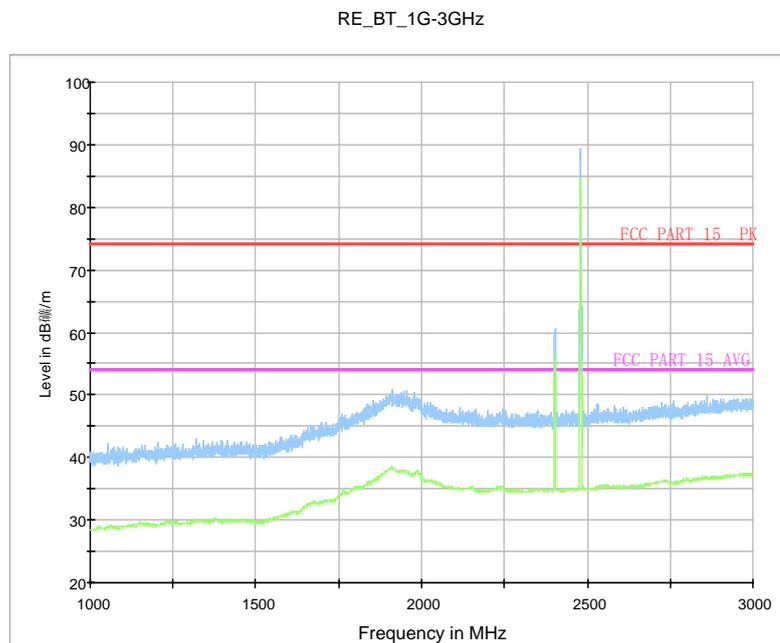


Fig. 82 Radiated Spurious Emission (8DPSK, Ch78, 1 GHz ~3 GHz)

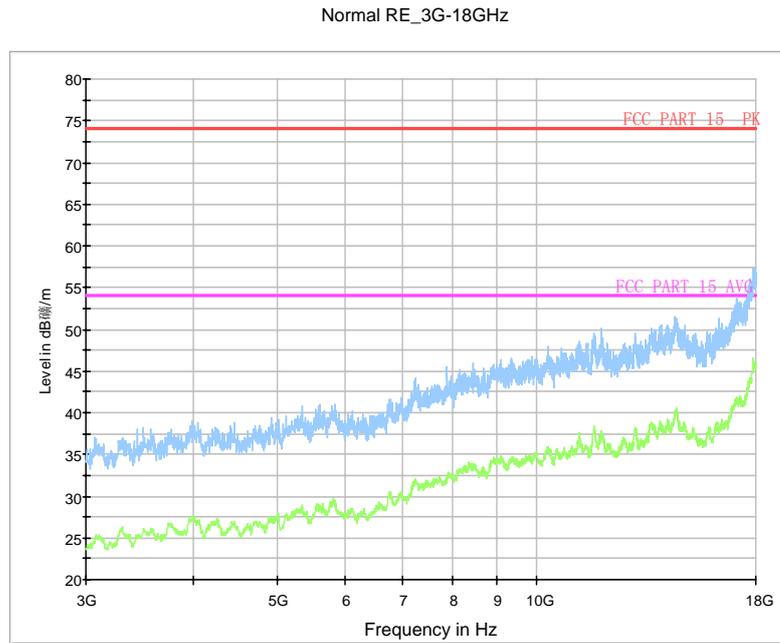


Fig. 83 Radiated Spurious Emission (8DPSK, Ch78, 3 GHz ~18 GHz)

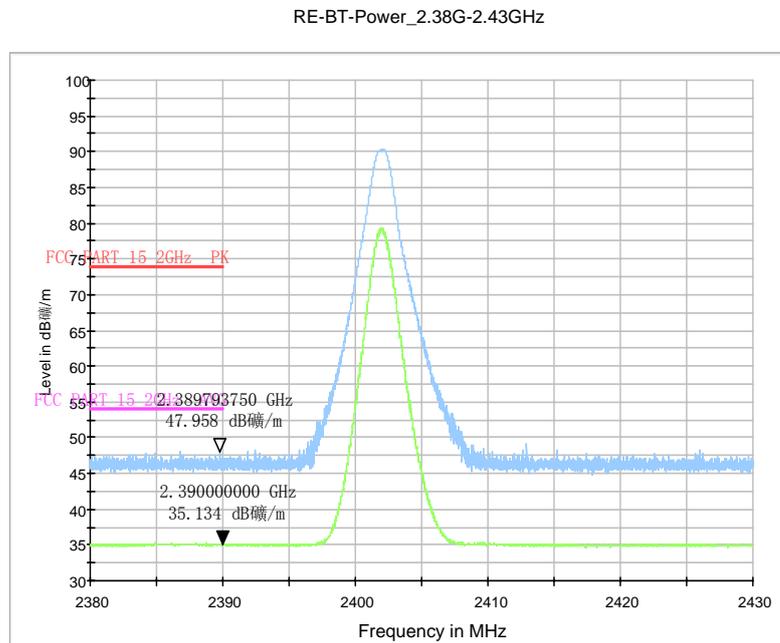


Fig. 84 Radiated Emission Power (8DPSK, Ch0, 2380GHz~2450GHz)

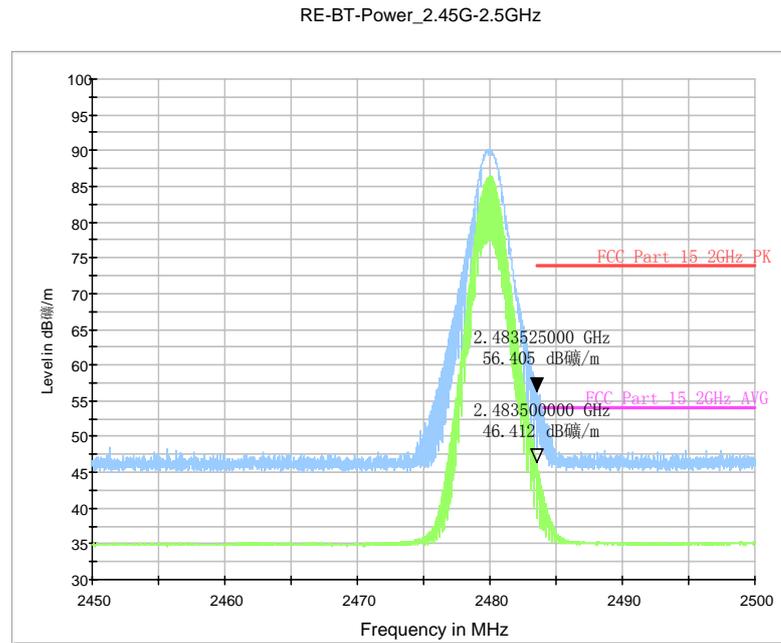


Fig. 85 Radiated Emission Power (8DPSK, Ch78, 2450GHz~2500GHz)

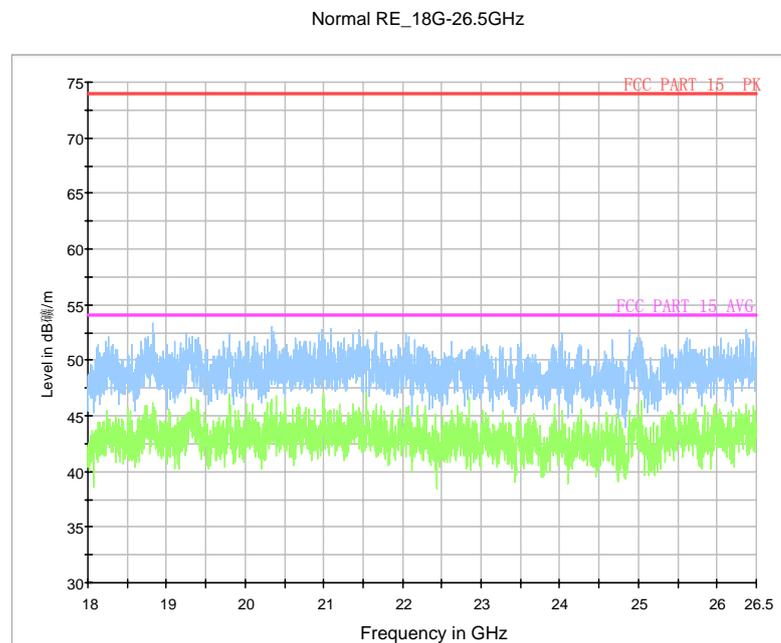
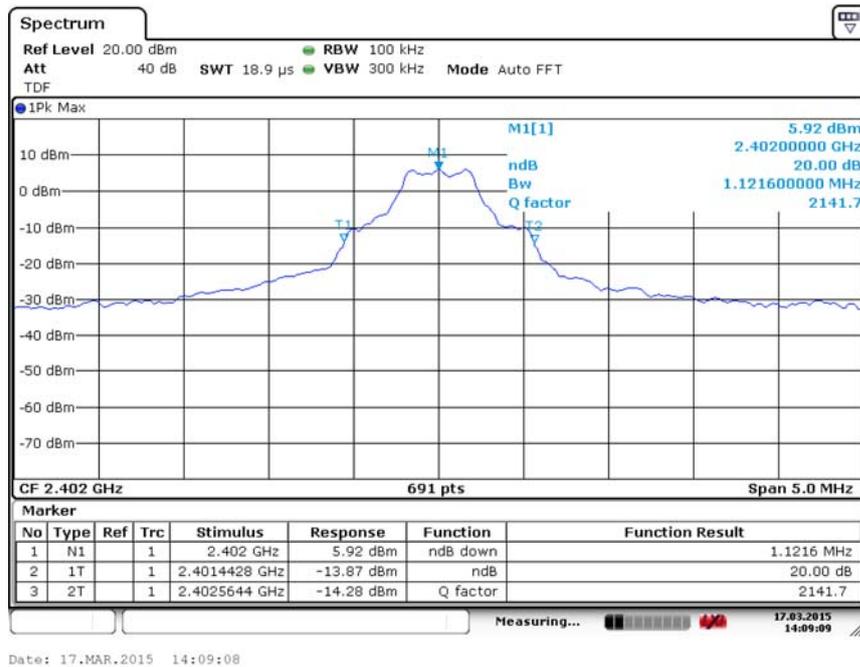
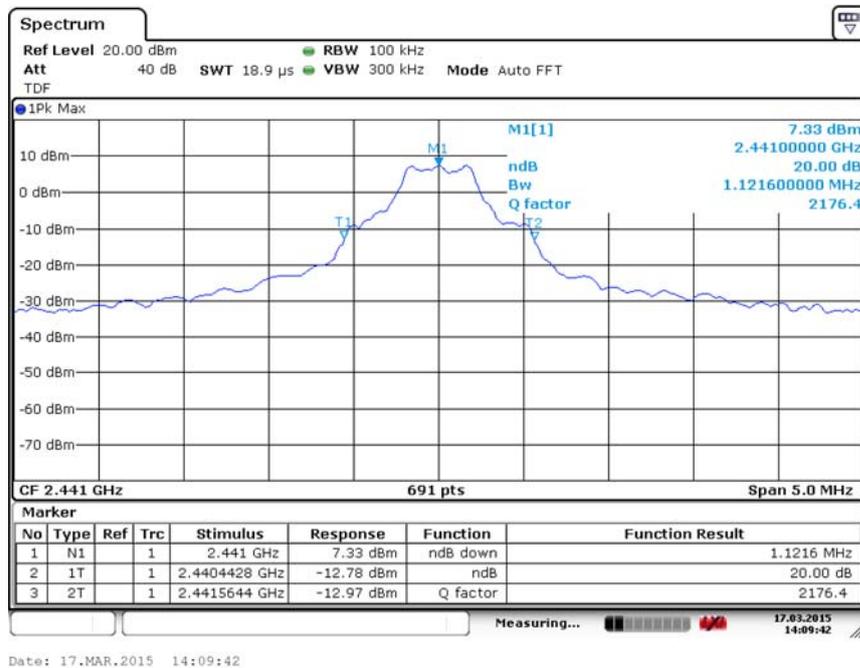


Fig. 86 Radiated Spurious Emission (All channel, 18 GHz ~26.5 GHz)



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Fig. 87 Occupied 20dB Bandwidth (GFSK, Ch 0)



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Fig. 88 Occupied 20dB Bandwidth (GFSK, Ch 39)

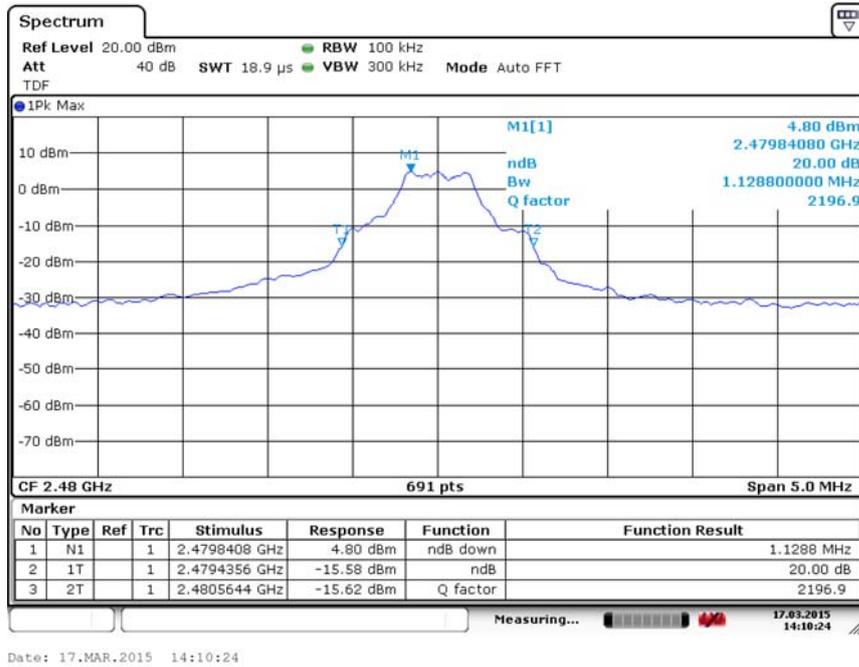


Fig. 89 Occupied 20dB Bandwidth (GFSK, Ch 78)

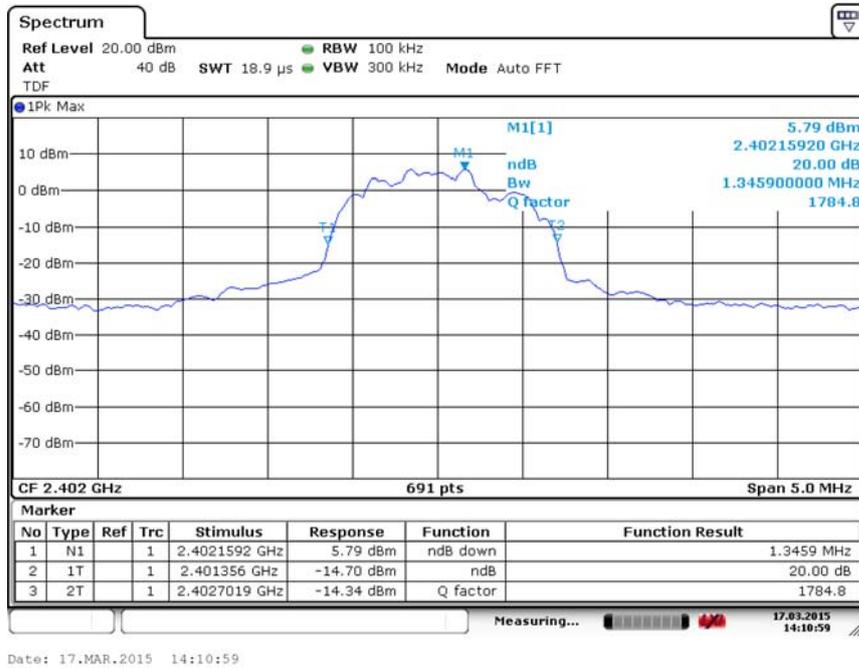


Fig. 90 Occupied 20dB Bandwidth ($\pi/4$ DQPSK, Ch 0)

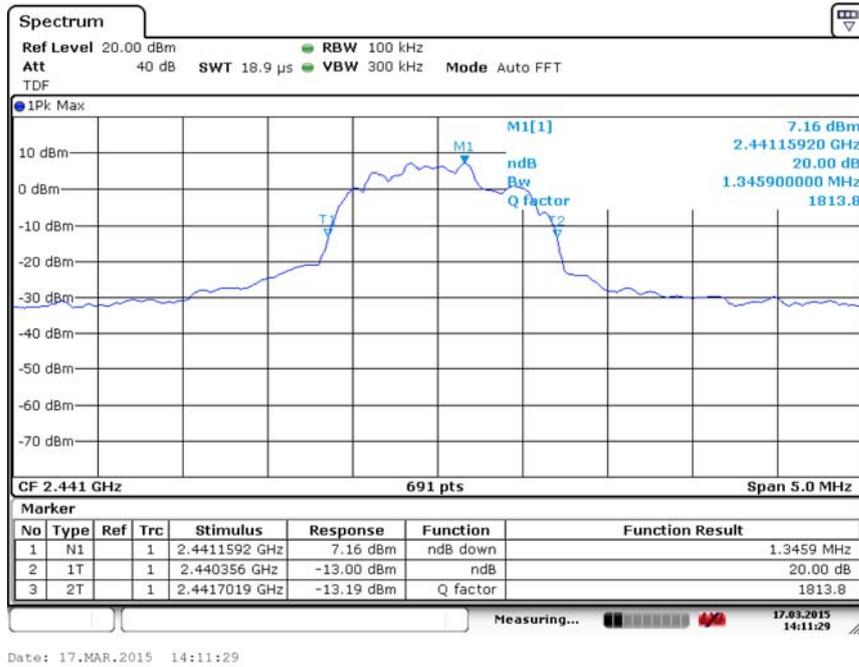


Fig. 91 Occupied 20dB Bandwidth ($\pi/4$ DQPSK, Ch 39)

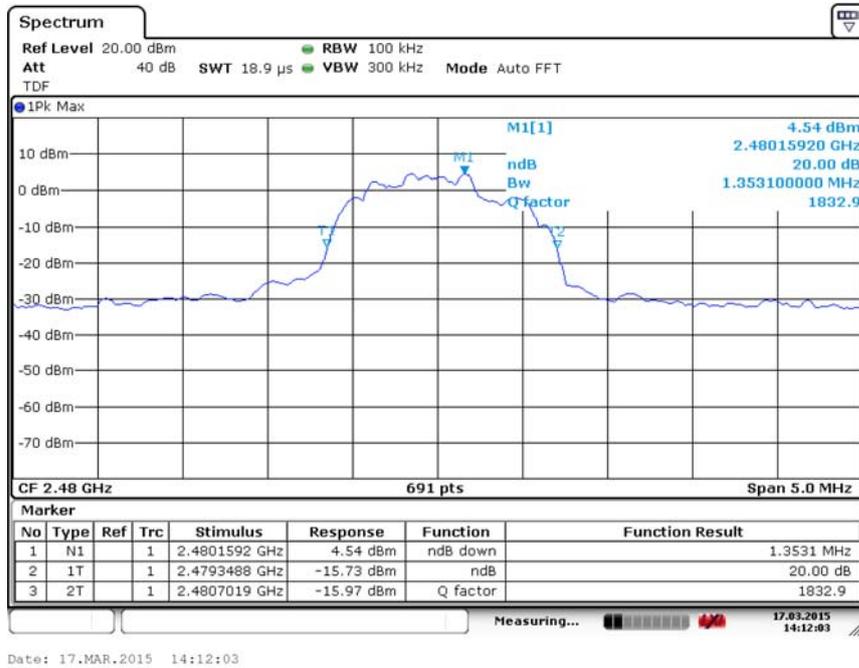
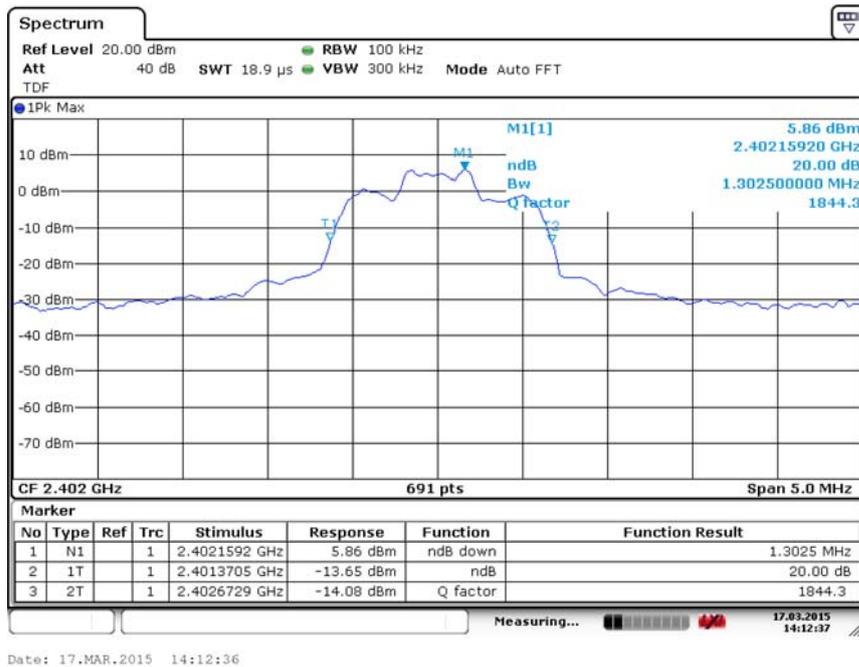
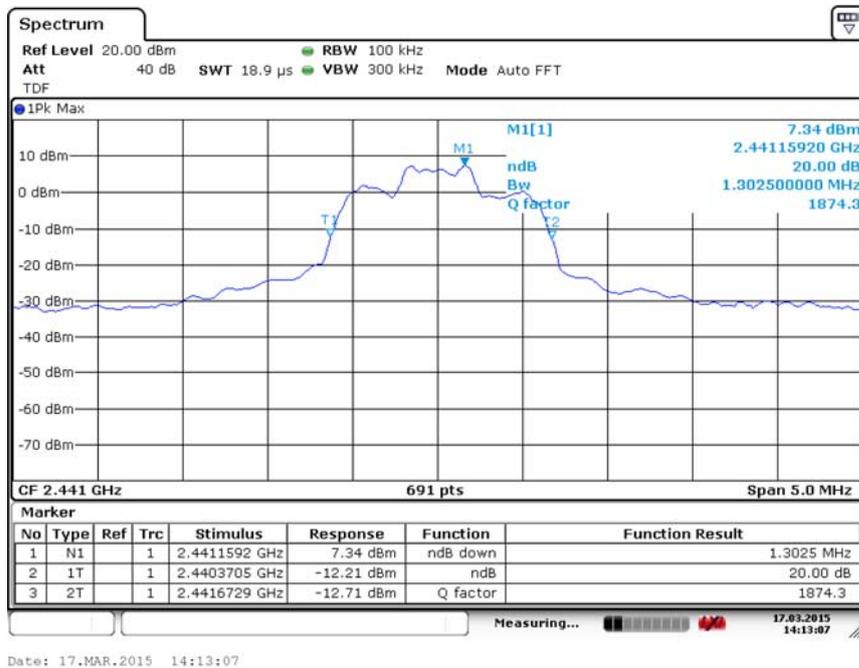


Fig. 92 Occupied 20dB Bandwidth ($\pi/4$ DQPSK, Ch 78)



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Fig. 93 Occupied 20dB Bandwidth (8DPSK, Ch 0)



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Fig. 94 Occupied 20dB Bandwidth (8DPSK, Ch 39)

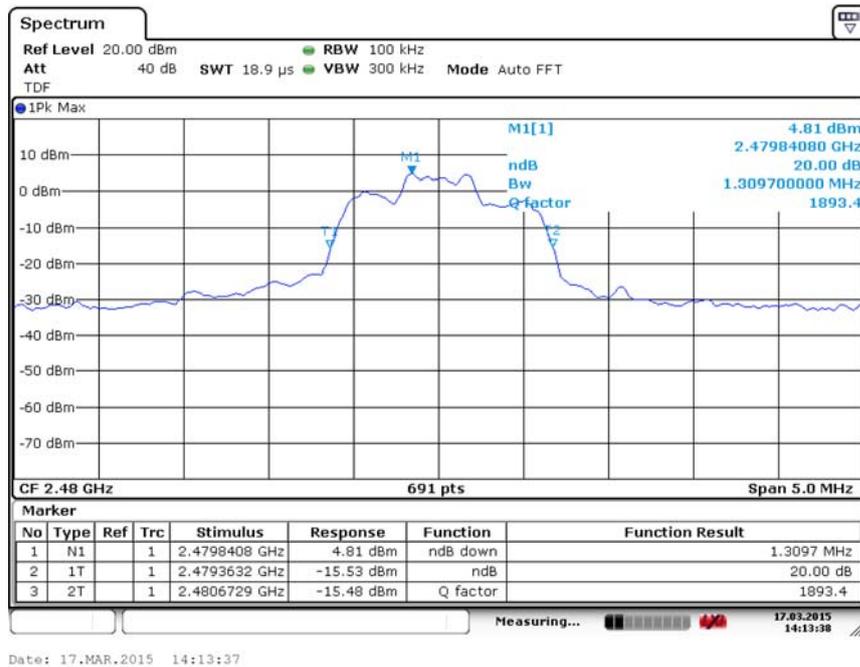


Fig. 95 Occupied 20dB Bandwidth (8DPSK, Ch 78)

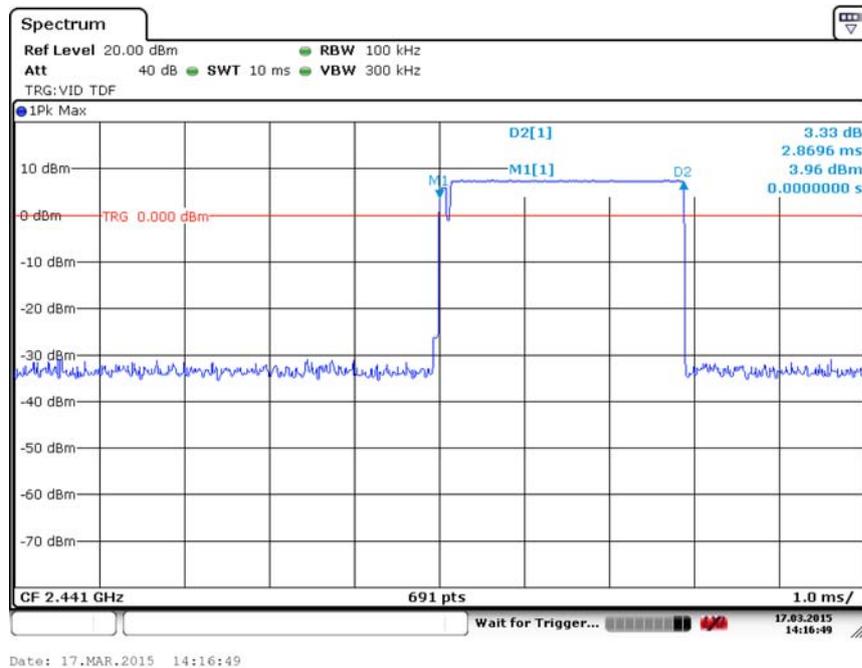


Fig. 96 Time of Occupancy(Dwell Time) (GFSK, Ch39)

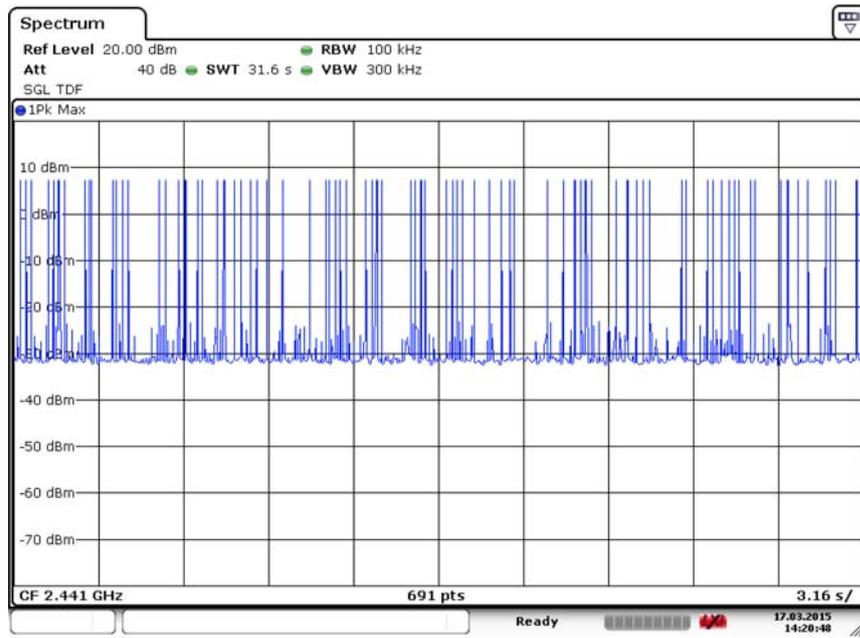


Fig. 97 Number of Transmissions (GFSK, Ch39)

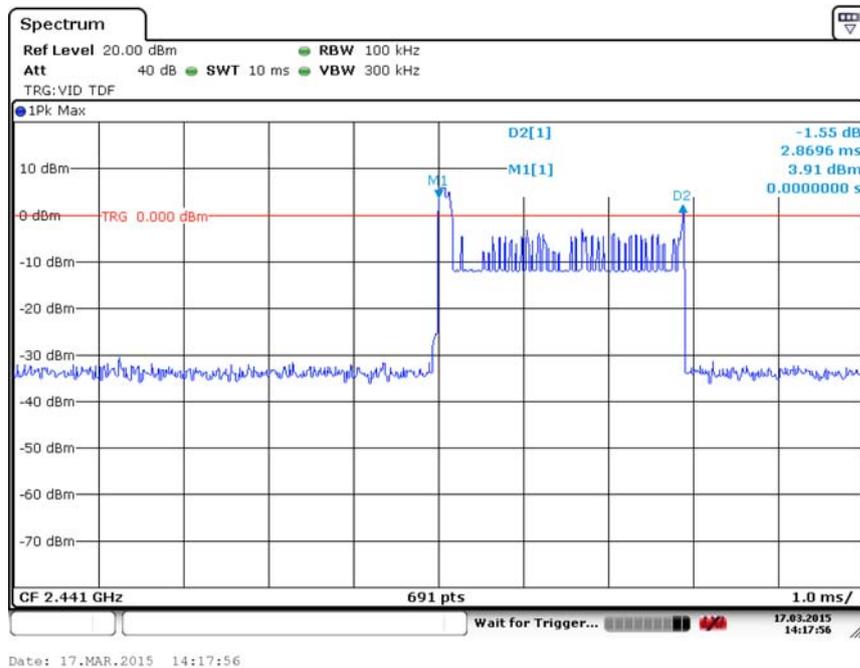


Fig. 98 Time of Occupancy(Dwell Time) ($\pi/4$ DQPSK, Ch39)

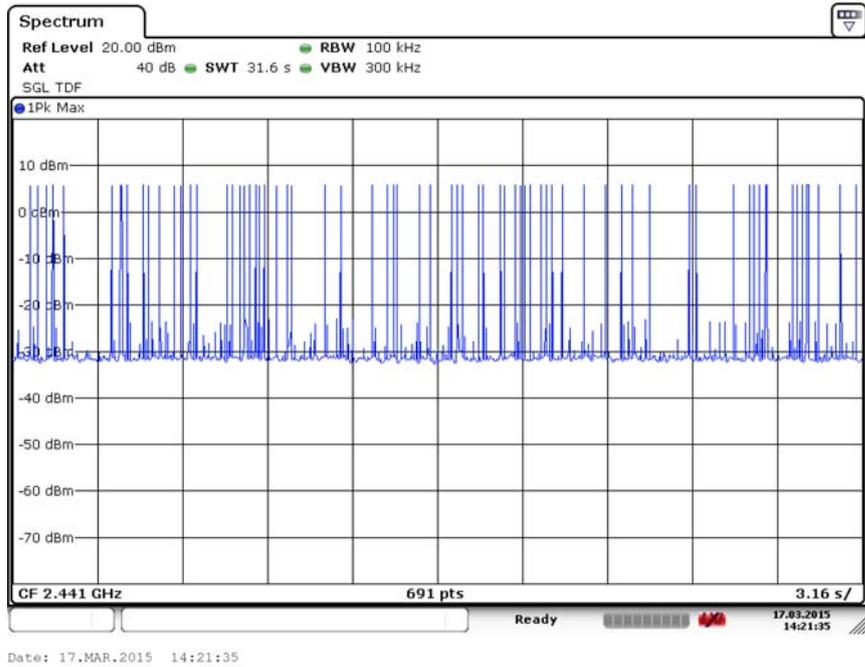


Fig. 99 Number of Transmissions ($\pi/4$ DQPSK, Ch39)

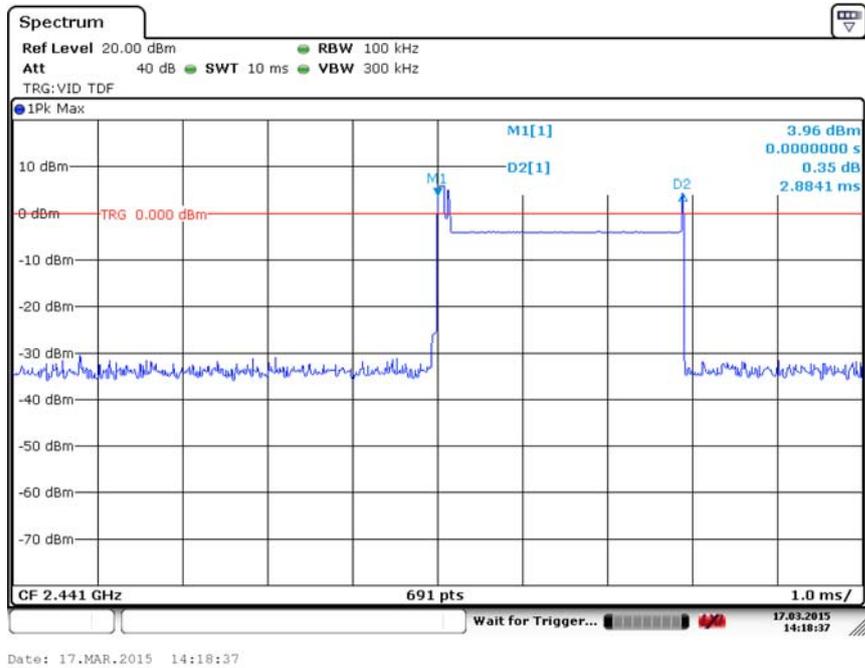


Fig. 100 Time of Occupancy(Dwell Time) (8DPSK, Ch39)

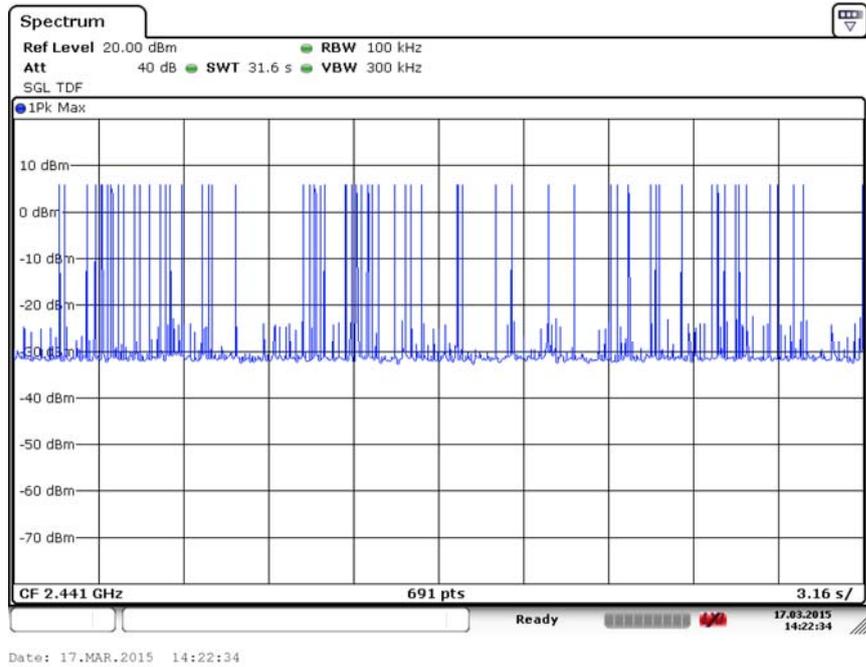


Fig. 101 Number of Transmissions (8DPSK, Ch39)

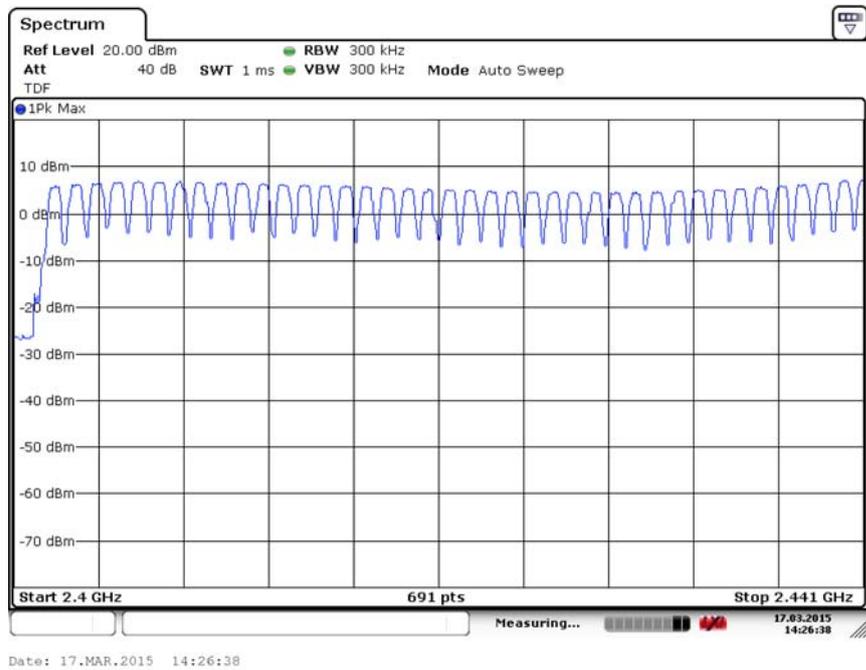


Fig. 102 Hopping channel ch0~39 (GFSK, Ch39)

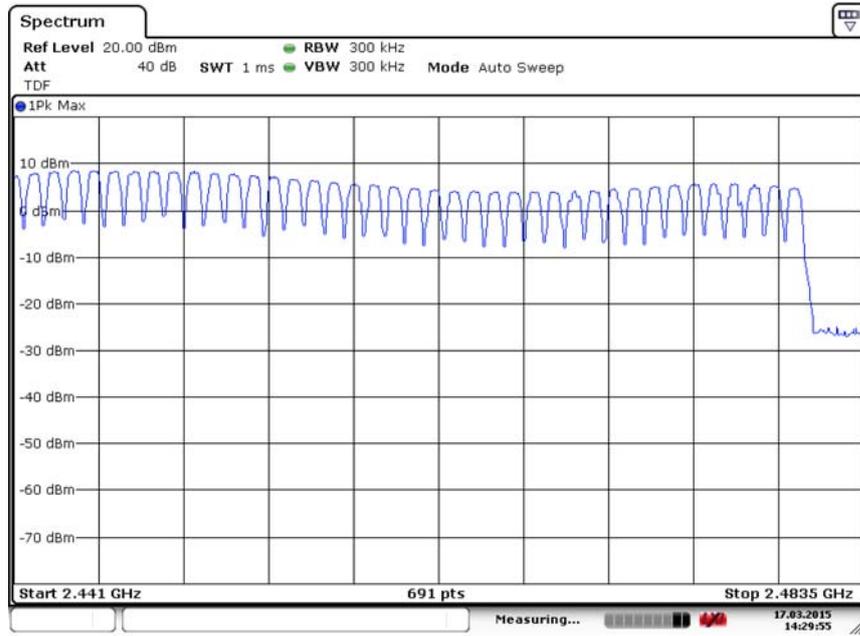


Fig. 103 Hopping channel ch39~78 (GFSK, Ch39)

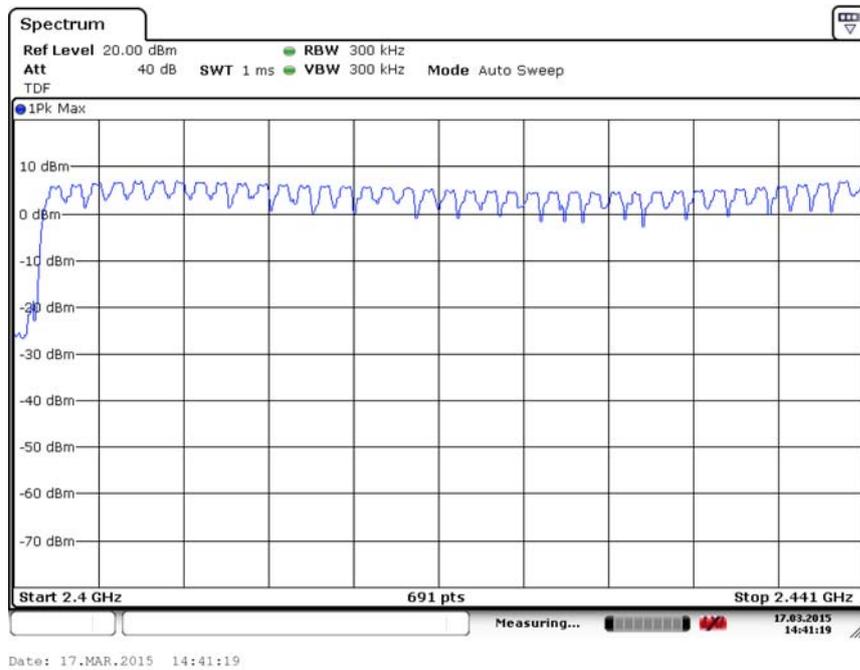


Fig. 104 Hopping channel ch0~39 ($\pi/4$ DQPSK, Ch39)

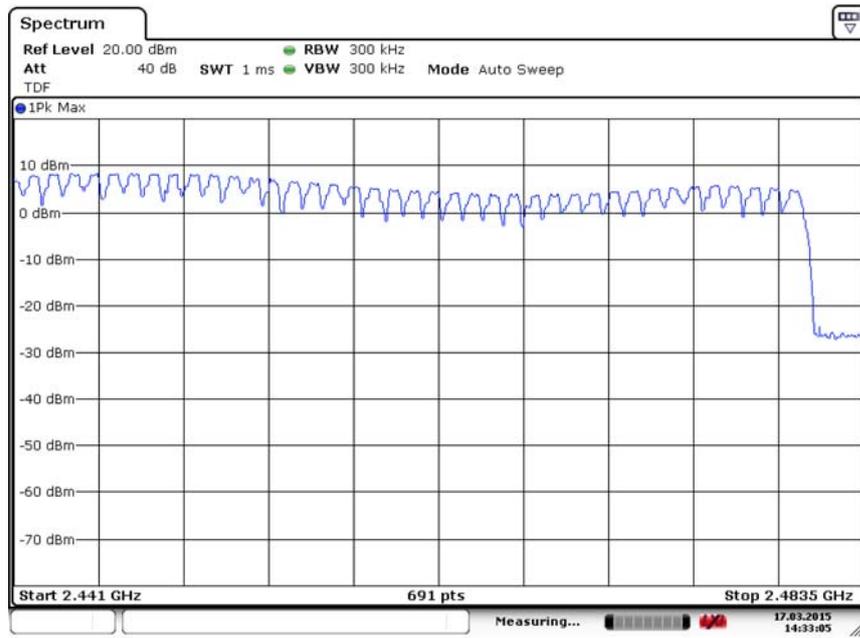


Fig. 105 Hopping channel ch39~78 ($\pi/4$ DQPSK, Ch39)

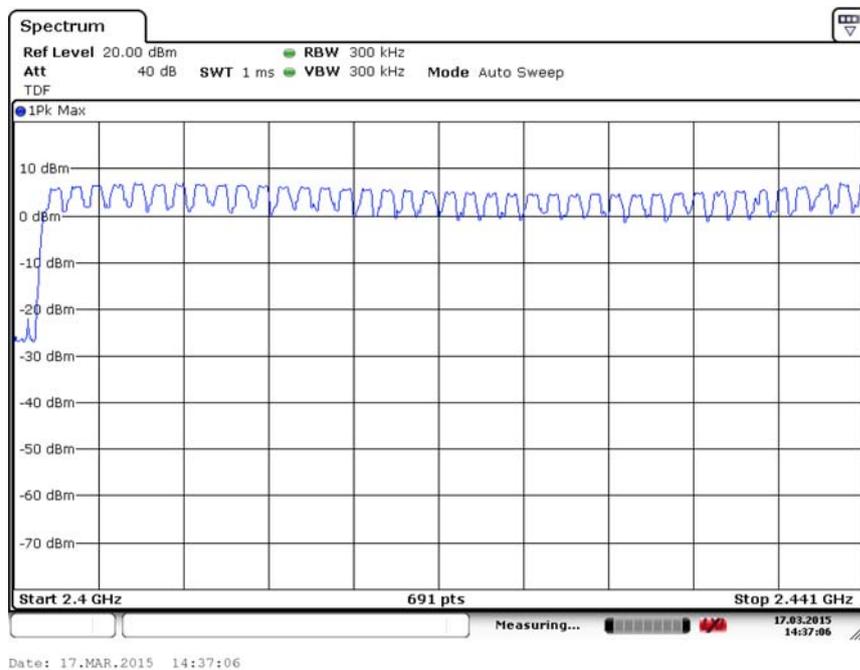


Fig. 106 Hopping channel ch0~39 (8DPSK, Ch39)

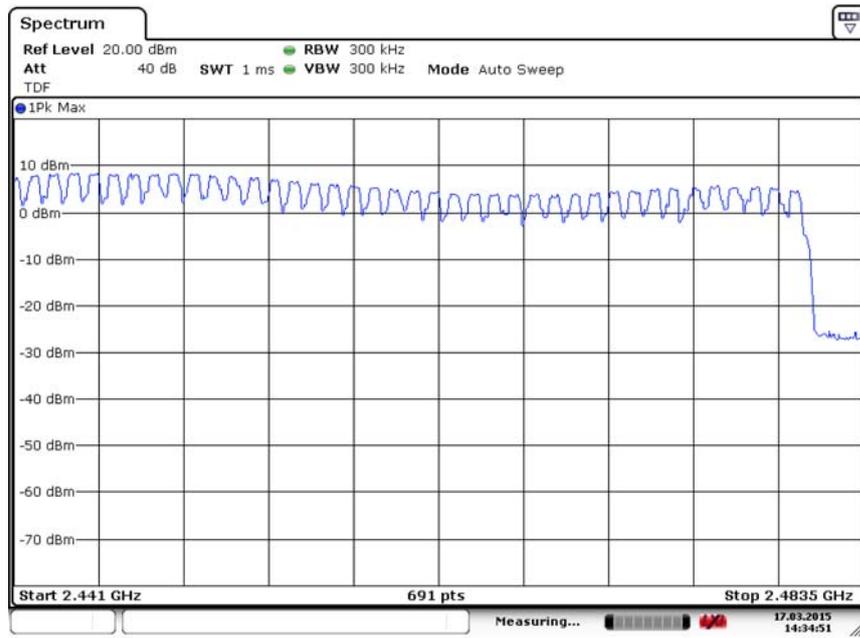


Fig. 107 Hopping channel ch39~78 (8DPSK, Ch39)

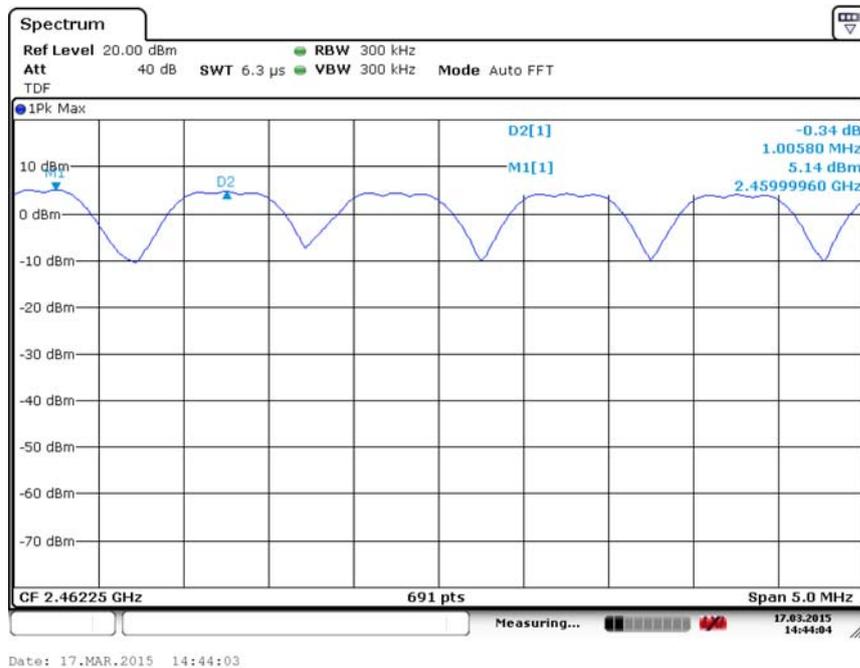
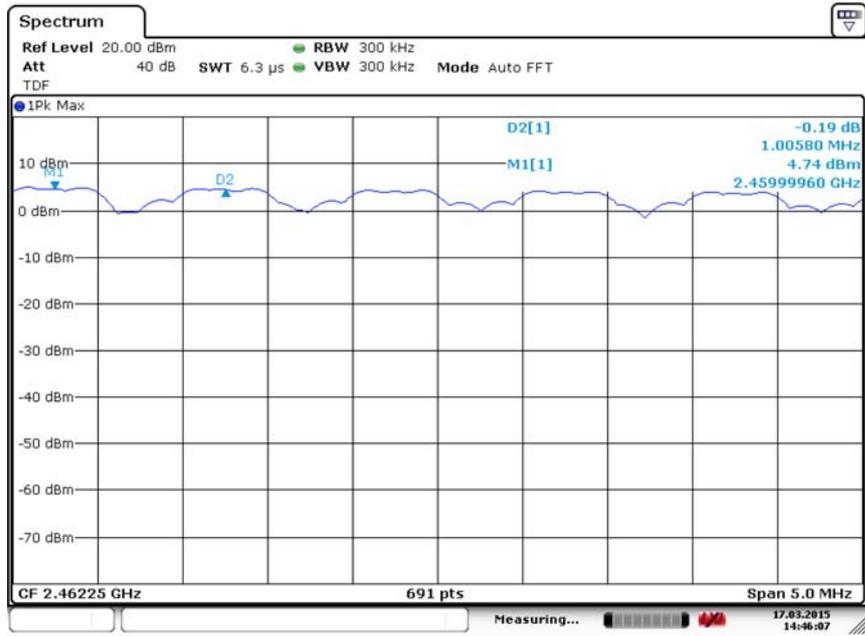
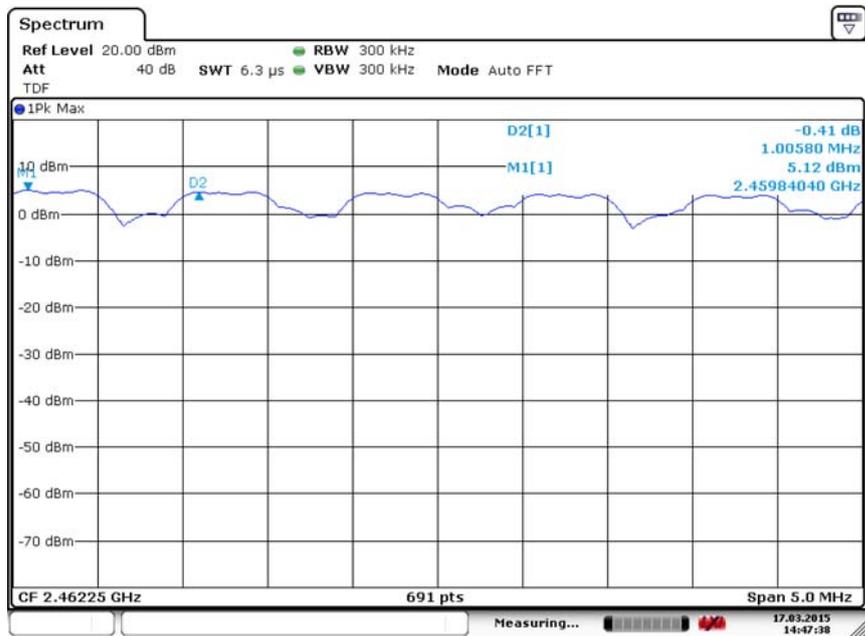


Fig. 108 Carrier Frequency Separation (GFSK, Ch39)



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Fig. 109 Carrier Frequency Separation ($\pi/4$ DQPSK, Ch39)



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Fig. 110 Carrier Frequency Separation (8DPSK, Ch39)

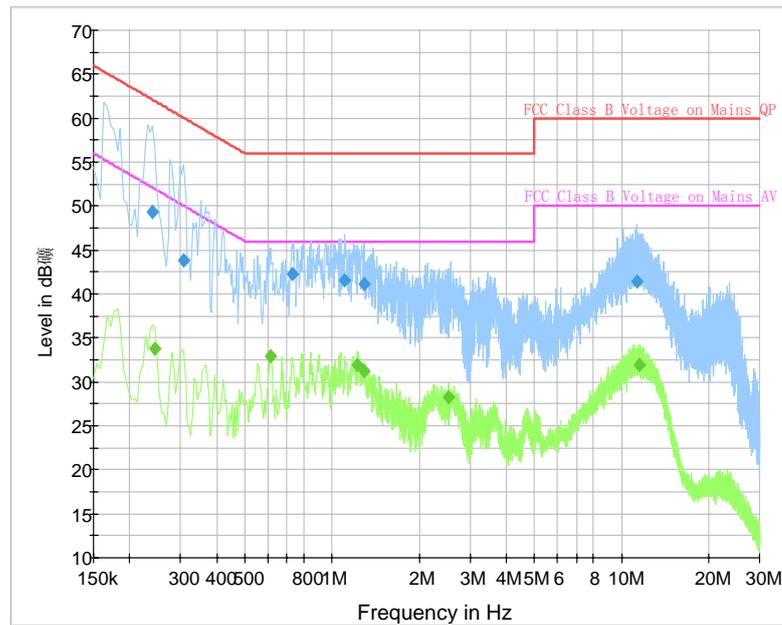


Fig. 111 AC Power line Conducted Emission (Traffic, AE1)

MEASUREMENT RESULT: " QuasiPeak "

Frequency (MHz)	QuasiPeak (dBµV)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.240000	49.4	2000.0	9.000	On	L1	19.8	12.7	62.1
0.307500	43.9	2000.0	9.000	On	L1	19.8	16.2	60.0
0.730500	42.2	2000.0	9.000	On	L1	19.8	13.8	56.0
1.108500	41.6	2000.0	9.000	On	L1	19.7	14.4	56.0
1.293000	41.2	2000.0	9.000	On	L1	19.6	14.8	56.0
11.310000	41.4	2000.0	9.000	On	L1	19.9	18.6	60.0

MEASUREMENT RESULT: " Average "

Frequency (MHz)	CAverage (dBµV)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.244500	33.7	2000.0	9.000	On	L1	19.8	18.2	51.9
0.613500	32.9	2000.0	9.000	On	L1	19.8	13.1	46.0
1.225500	32.0	2000.0	9.000	On	L1	19.7	14.0	46.0
1.293000	31.3	2000.0	9.000	On	L1	19.6	14.7	46.0
2.526000	28.2	2000.0	9.000	On	L1	19.6	17.8	46.0
11.557500	32.0	2000.0	9.000	On	L1	19.9	18.0	50.0

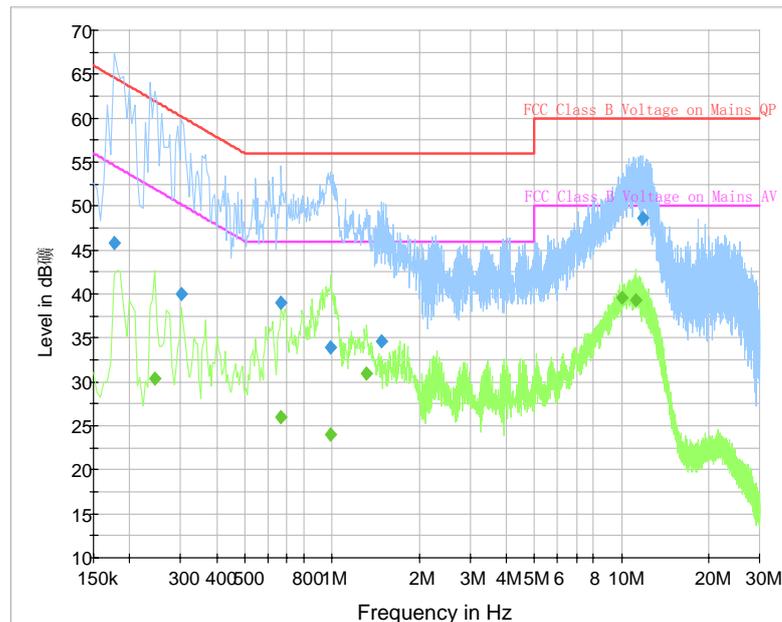


Fig. 112 AC Power line Conducted Emission (Traffic, AE2)

MEASUREMENT RESULT: " QuasiPeak "

Frequency (MHz)	QuasiPeak (dBµV)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.177000	45.8	2000.0	9.000	On	L1	19.7	18.8	64.6
0.303000	39.9	2000.0	9.000	On	L1	19.8	20.2	60.2
0.667500	39.0	2000.0	9.000	On	L1	19.8	17.0	56.0
0.991500	33.9	2000.0	9.000	On	L1	19.7	22.1	56.0
1.486500	34.6	2000.0	9.000	On	N	19.6	21.4	56.0
11.854500	48.6	2000.0	9.000	On	L1	19.8	11.4	60.0

MEASUREMENT RESULT: " Average "

Frequency (MHz)	CAverage (dBµV)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.244500	30.3	2000.0	9.000	On	L1	19.8	21.6	51.9
0.667500	26.1	2000.0	9.000	On	L1	19.8	20.0	46.0
0.991500	24.0	2000.0	9.000	On	L1	19.7	22.0	46.0
1.320000	31.0	2000.0	9.000	On	L1	19.6	15.0	46.0
10.077000	39.6	2000.0	9.000	On	L1	19.8	10.4	50.0
11.256000	39.2	2000.0	9.000	On	L1	19.9	10.8	50.0

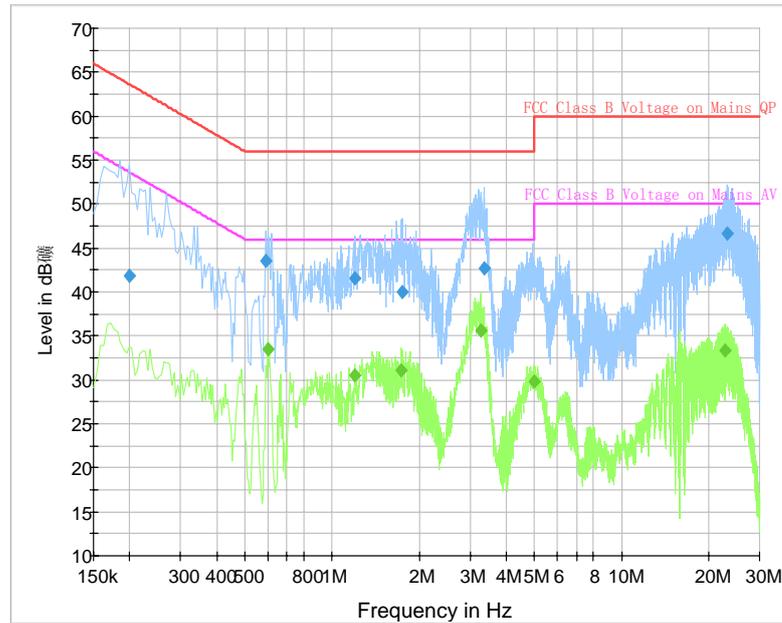


Fig. 113 AC Power line Conducted Emission (Traffic, AE3)

MEASUREMENT RESULT: " QuasiPeak "

Frequency (MHz)	QuasiPeak (dBµV)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.199500	41.9	2000.0	9.000	On	L1	19.8	21.8	63.6
0.591000	43.5	2000.0	9.000	On	L1	19.8	12.5	56.0
1.203000	41.5	2000.0	9.000	On	L1	19.7	14.5	56.0
1.747500	40.0	2000.0	9.000	On	L1	19.7	16.0	56.0
3.345000	42.7	2000.0	9.000	On	L1	19.7	13.3	56.0
23.217000	46.6	2000.0	9.000	On	L1	20.0	13.4	60.0

MEASUREMENT RESULT: " Average "

Frequency (MHz)	CAverage (dBµV)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.600000	33.5	2000.0	9.000	On	L1	19.8	12.5	46.0
1.194000	30.5	2000.0	9.000	On	L1	19.7	15.5	46.0
1.738500	31.0	2000.0	9.000	On	L1	19.7	15.0	46.0
3.255000	35.7	2000.0	9.000	On	L1	19.6	10.3	46.0
4.992000	29.8	2000.0	9.000	On	L1	19.6	16.2	46.0
22.717500	33.3	2000.0	9.000	On	L1	20.1	16.7	50.0

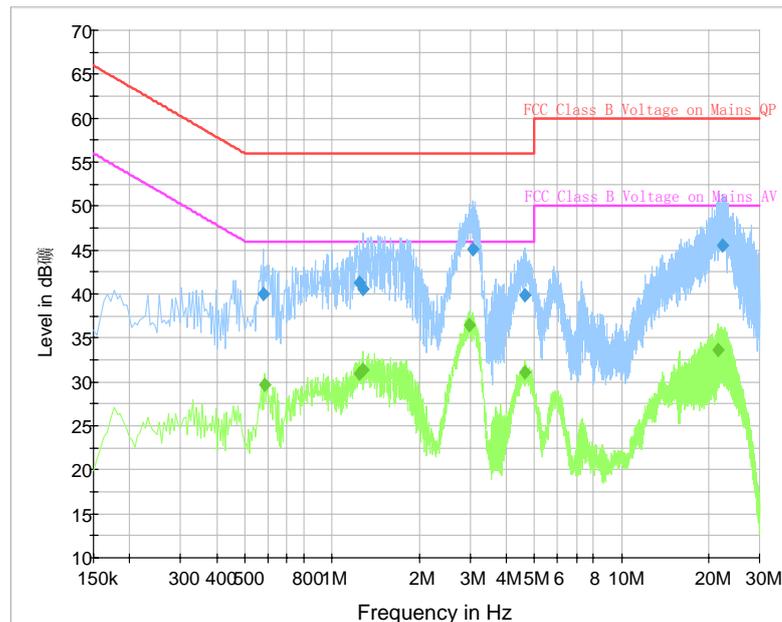


Fig. 114 AC Power line Conducted Emission (Traffic, AE4)

MEASUREMENT RESULT: " QuasiPeak "

Frequency (MHz)	QuasiPeak (dBµV)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.577500	40.0	2000.0	9.000	On	L1	19.8	16.0	56.0
1.248000	41.3	2000.0	9.000	On	L1	19.7	14.7	56.0
1.284000	40.6	2000.0	9.000	On	L1	19.6	15.4	56.0
3.075000	45.1	2000.0	9.000	On	L1	19.7	10.9	56.0
4.623000	39.8	2000.0	9.000	On	L1	19.6	16.2	56.0
22.267500	45.6	2000.0	9.000	On	L1	20.1	14.4	60.0

MEASUREMENT RESULT: " Average "

Frequency (MHz)	CAverage (dBµV)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.586500	29.7	2000.0	9.000	On	L1	19.8	16.3	46.0
1.239000	31.0	2000.0	9.000	On	L1	19.7	15.0	46.0
1.284000	31.3	2000.0	9.000	On	L1	19.6	14.7	46.0
2.994000	36.4	2000.0	9.000	On	L1	19.7	9.6	46.0
4.623000	31.1	2000.0	9.000	On	L1	19.6	14.9	46.0
21.574500	33.6	2000.0	9.000	On	L1	20.1	16.4	50.0

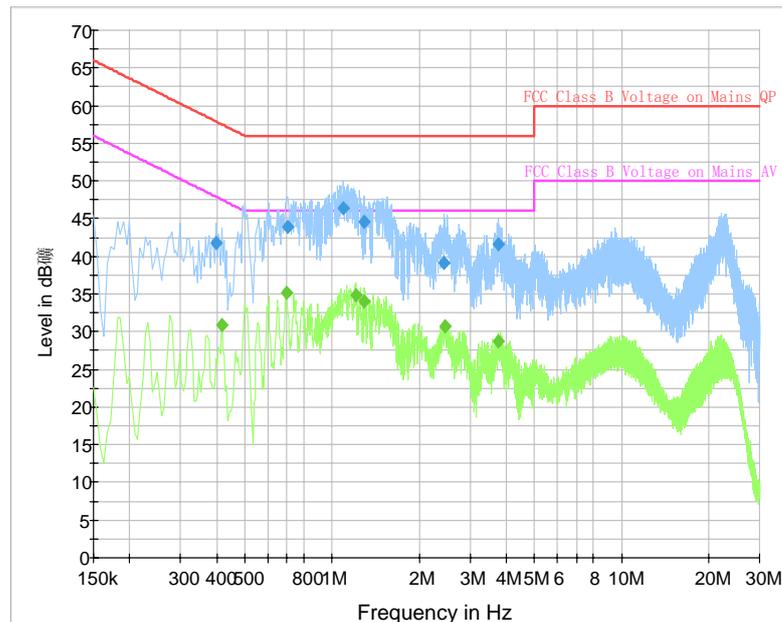


Fig. 115 AC Power line Conducted Emission (Traffic, AE5)

MEASUREMENT RESULT: " QuasiPeak "

Frequency (MHz)	QuasiPeak (dBµV)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.397500	41.8	2000.0	9.000	On	L1	19.8	16.1	57.9
0.703500	43.9	2000.0	9.000	On	L1	19.8	12.1	56.0
1.095000	46.5	2000.0	9.000	On	L1	19.7	9.5	56.0
1.293000	44.7	2000.0	9.000	On	L1	19.6	11.3	56.0
2.445000	39.1	2000.0	9.000	On	L1	19.6	16.9	56.0
3.768000	41.6	2000.0	9.000	On	L1	19.7	14.4	56.0

MEASUREMENT RESULT: " Average "

Frequency (MHz)	CAverage (dBµV)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.415500	30.8	2000.0	9.000	On	L1	19.8	16.7	47.5
0.699000	35.2	2000.0	9.000	On	L1	19.8	10.9	46.0
1.207500	34.8	2000.0	9.000	On	L1	19.7	11.2	46.0
1.293000	34.0	2000.0	9.000	On	L1	19.6	12.0	46.0
2.458500	30.8	2000.0	9.000	On	L1	19.6	15.2	46.0
3.763500	28.7	2000.0	9.000	On	L1	19.7	17.3	46.0

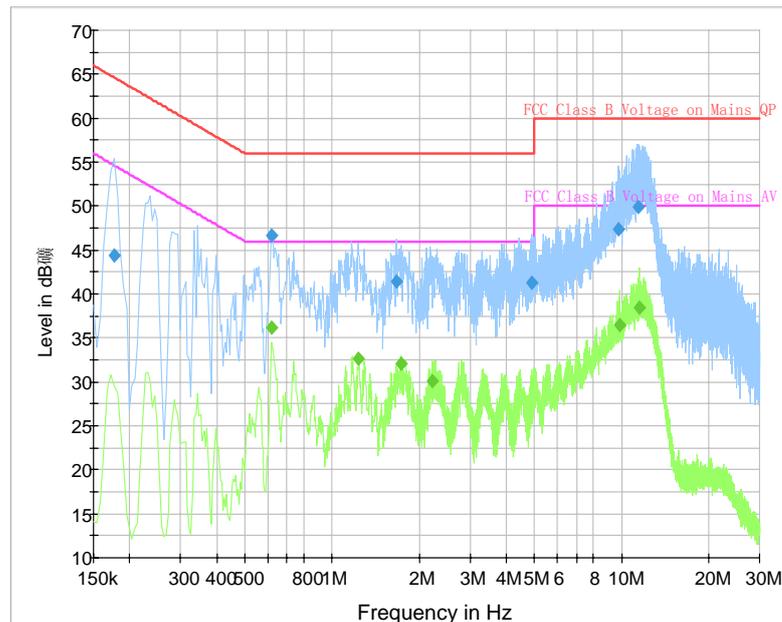


Fig. 116 AC Power line Conducted Emission (Traffic, AE6)

MEASUREMENT RESULT: " QuasiPeak "

Frequency (MHz)	QuasiPeak (dBµV)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.177000	44.4	2000.0	9.000	On	L1	19.7	20.2	64.6
0.618000	46.6	2000.0	9.000	On	L1	19.8	9.4	56.0
1.666500	41.4	2000.0	9.000	On	L1	19.6	14.6	56.0
4.911000	41.2	2000.0	9.000	On	L1	19.7	14.8	56.0
9.726000	47.3	2000.0	9.000	On	L1	19.8	12.7	60.0
11.467500	49.9	2000.0	9.000	On	L1	19.9	10.1	60.0

MEASUREMENT RESULT: " Average "

Frequency (MHz)	CAverage (dBµV)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.618000	36.2	2000.0	9.000	On	L1	19.8	9.8	46.0
1.234500	32.6	2000.0	9.000	On	L1	19.7	13.4	46.0
1.734000	32.1	2000.0	9.000	On	L1	19.7	13.9	46.0
2.229000	30.2	2000.0	9.000	On	L1	19.6	15.8	46.0
9.861000	36.5	2000.0	9.000	On	L1	19.8	13.5	50.0
11.476500	38.5	2000.0	9.000	On	L1	19.9	11.5	50.0

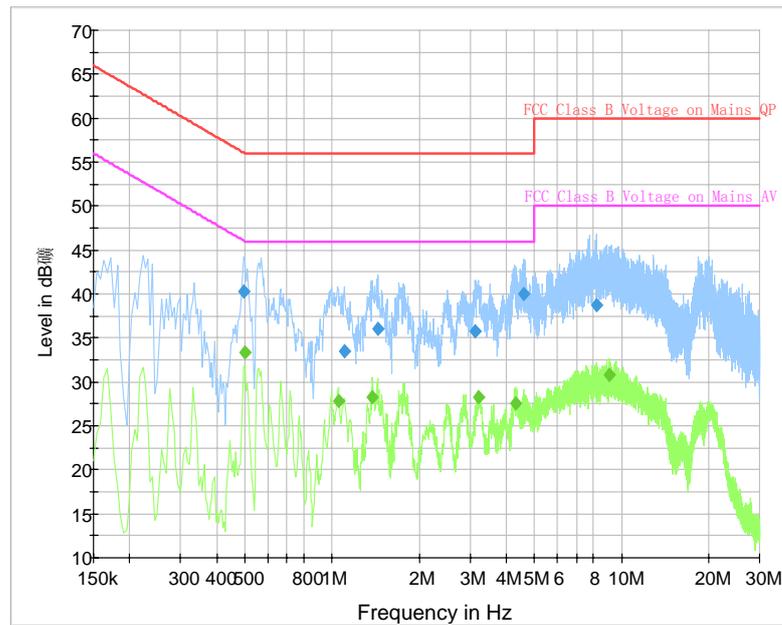


Fig. 117 AC Power line Conducted Emission (Traffic, AE7)

MEASUREMENT RESULT: " QuasiPeak "

Frequency (MHz)	QuasiPeak (dBµV)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.496500	40.3	2000.0	9.000	On	L1	19.8	15.8	56.1
1.099500	33.4	2000.0	9.000	On	L1	19.7	22.6	56.0
1.441500	36.0	2000.0	9.000	On	L1	19.7	20.0	56.0
3.115500	35.8	2000.0	9.000	On	L1	19.6	20.2	56.0
4.600500	40.1	2000.0	9.000	On	L1	19.6	15.9	56.0
8.227500	38.7	2000.0	9.000	On	L1	19.7	21.3	60.0

MEASUREMENT RESULT: " Average "

Frequency (MHz)	CAverage (dBµV)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.501000	33.3	2000.0	9.000	On	L1	19.8	12.7	46.0
1.050000	27.8	2000.0	9.000	On	L1	19.7	18.2	46.0
1.383000	28.3	2000.0	9.000	On	L1	19.7	17.7	46.0
3.205500	28.3	2000.0	9.000	On	L1	19.7	17.7	46.0
4.312500	27.5	2000.0	9.000	On	L1	19.6	18.5	46.0
9.105000	30.8	2000.0	9.000	On	L1	19.8	19.2	50.0

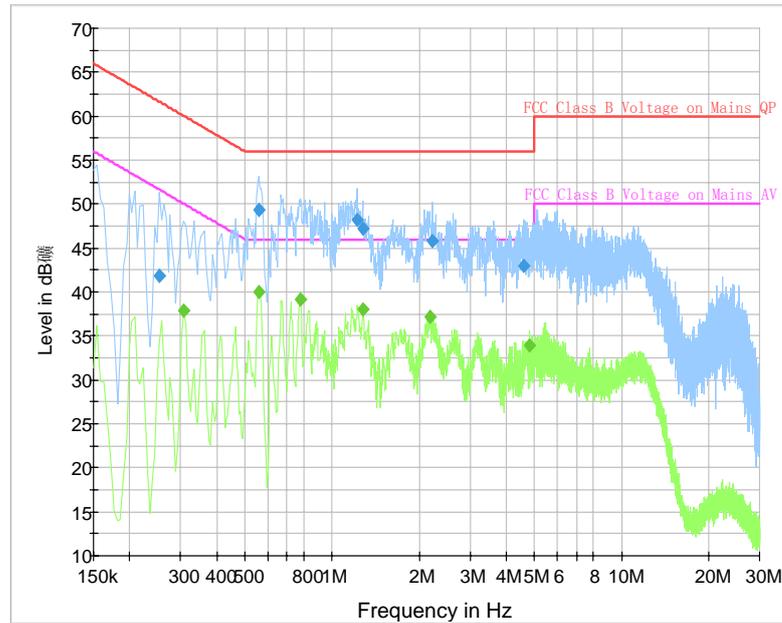


Fig. 118 AC Power line Conducted Emission (Traffic, AE8)

MEASUREMENT RESULT: " QuasiPeak "

Frequency (MHz)	QuasiPeak (dBµV)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.253500	41.8	2000.0	9.000	On	N	19.8	19.8	61.6
0.559500	49.3	2000.0	9.000	On	L1	19.8	6.7	56.0
1.221000	48.2	2000.0	9.000	On	L1	19.7	7.8	56.0
1.275000	47.2	2000.0	9.000	On	L1	19.7	8.8	56.0
2.224500	45.8	2000.0	9.000	On	L1	19.6	10.2	56.0
4.587000	43.0	2000.0	9.000	On	L1	19.6	13.0	56.0

MEASUREMENT RESULT: " Average "

Frequency (MHz)	CAverage (dBµV)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.307500	37.9	2000.0	9.000	On	L1	19.8	12.1	50.0
0.559500	40.0	2000.0	9.000	On	L1	19.8	6.0	46.0
0.780000	39.1	2000.0	9.000	On	L1	19.8	6.9	46.0
1.275000	38.0	2000.0	9.000	On	L1	19.7	8.0	46.0
2.184000	37.1	2000.0	9.000	On	L1	19.6	8.9	46.0
4.812000	33.9	2000.0	9.000	On	L1	19.7	12.1	46.0

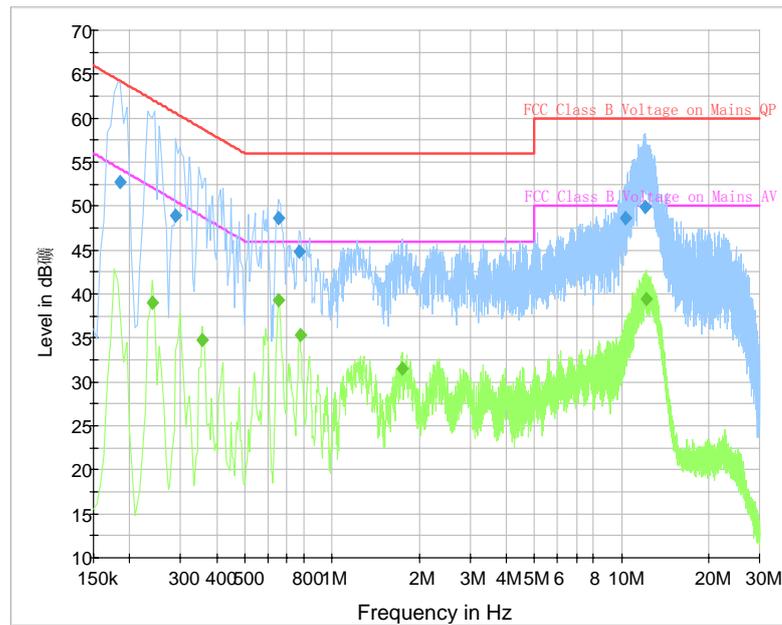


Fig. 119 AC Power line Conducted Emission (Traffic, AE9)

MEASUREMENT RESULT: " QuasiPeak "

Frequency (MHz)	QuasiPeak (dBµV)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.186000	52.8	2000.0	9.000	On	L1	19.8	11.4	64.2
0.289500	48.9	2000.0	9.000	On	L1	19.8	11.7	60.5
0.654000	48.7	2000.0	9.000	On	L1	19.8	7.3	56.0
0.771000	44.8	2000.0	9.000	On	L1	19.8	11.2	56.0
10.351500	48.7	2000.0	9.000	On	L1	19.8	11.3	60.0
12.111000	50.0	2000.0	9.000	On	L1	19.9	10.0	60.0

MEASUREMENT RESULT: " Average "

Frequency (MHz)	CAverage (dBµV)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.240000	39.0	2000.0	9.000	On	L1	19.8	13.1	52.1
0.357000	34.8	2000.0	9.000	On	L1	19.8	14.0	48.8
0.654000	39.3	2000.0	9.000	On	L1	19.8	6.7	46.0
0.775500	35.3	2000.0	9.000	On	L1	19.8	10.7	46.0
1.747500	31.5	2000.0	9.000	On	L1	19.7	14.5	46.0
12.196500	39.5	2000.0	9.000	On	L1	19.9	10.5	50.0

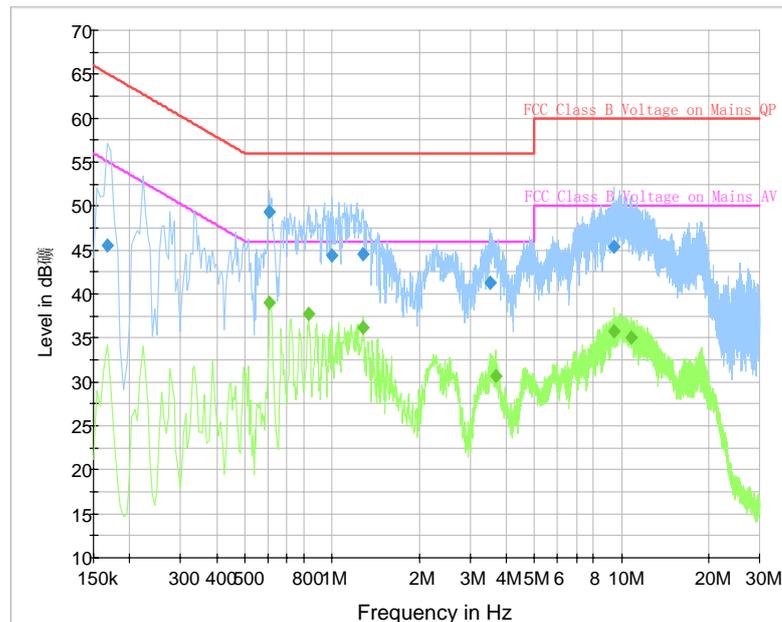


Fig. 120 AC Power line Conducted Emission (Traffic, AE10)

MEASUREMENT RESULT: " QuasiPeak "

Frequency (MHz)	QuasiPeak (dBµV)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.168000	45.5	2000.0	9.000	On	L1	19.7	19.6	65.1
0.609000	49.4	2000.0	9.000	On	L1	19.8	6.6	56.0
1.000500	44.4	2000.0	9.000	On	N	19.7	11.6	56.0
1.275000	44.5	2000.0	9.000	On	N	19.7	11.5	56.0
3.516000	41.3	2000.0	9.000	On	L1	19.7	14.7	56.0
9.388500	45.4	2000.0	9.000	On	L1	19.8	14.6	60.0

MEASUREMENT RESULT: " Average "

Frequency (MHz)	CAverage (dBµV)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.609000	39.0	2000.0	9.000	On	N	19.8	7.0	46.0
0.829500	37.7	2000.0	9.000	On	L1	19.8	8.3	46.0
1.279500	36.2	2000.0	9.000	On	L1	19.7	9.8	46.0
3.669000	30.7	2000.0	9.000	On	N	19.7	15.3	46.0
9.447000	35.8	2000.0	9.000	On	L1	19.8	14.2	50.0
10.833000	35.0	2000.0	9.000	On	L1	19.8	15.0	50.0

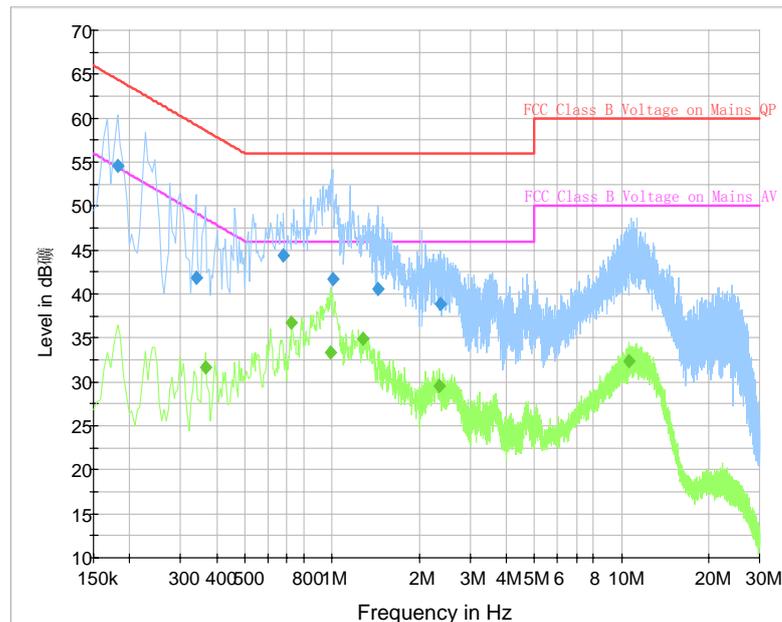


Fig. 121 AC Power line Conducted Emission (Idle, AE1)

MEASUREMENT RESULT: " QuasiPeak "

Frequency (MHz)	QuasiPeak (dBµV)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.181500	54.6	2000.0	9.000	On	L1	19.7	9.9	64.4
0.339000	41.9	2000.0	9.000	On	L1	19.8	17.4	59.2
0.681000	44.4	2000.0	9.000	On	N	19.8	11.6	56.0
1.005000	41.7	2000.0	9.000	On	L1	19.7	14.3	56.0
1.446000	40.6	2000.0	9.000	On	N	19.7	15.4	56.0
2.364000	38.9	2000.0	9.000	On	L1	19.6	17.1	56.0

MEASUREMENT RESULT: " Average "

Frequency (MHz)	CAverage (dBµV)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.366000	31.7	2000.0	9.000	On	L1	19.8	16.9	48.6
0.726000	36.8	2000.0	9.000	On	L1	19.8	9.2	46.0
0.987000	33.4	2000.0	9.000	On	L1	19.7	12.6	46.0
1.275000	34.9	2000.0	9.000	On	L1	19.7	11.1	46.0
2.355000	29.5	2000.0	9.000	On	L1	19.6	16.5	46.0
10.630500	32.4	2000.0	9.000	On	L1	19.8	17.6	50.0

ANNEX D: Persons involved in this testing

Test Name	Tester
Maximum Peak Output Power	Xu Ye, Tang Weisheng
Peak Power Spectral Density	Xu Ye, Tang Weisheng
Occupied 6dB Bandwidth	Xu Ye, Tang Weisheng
Band Edges Compliance	Xu Ye, Tang Weisheng
Transmitter Spurious Emission - Conducted	Xu Ye, Tang Weisheng
Transmitter Spurious Emission - Radiated	Xu Ye, Tang Weisheng
AC Powerline Conducted Emission	Xu Ye, Tang Weisheng

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