



**FCC PART 15C  
TEST REPORT  
No. 2013EEB00528-BT**

**For**

**XOX Technology Limited**

**GSM dual mobile phone**

**Model Name: Wave XX**

**Market Name: XOX**

**With**

**Hardware Version: S40M98EC1-2**

**Software Version: S266\_TJZ\_018\_XOX\_WAVE2\_V04\_130809**

**FCC ID: 2ABBT-XOX-WAVEXX**

**Issued Date: Nov 28<sup>th</sup>, 2013**

**Test Laboratory:**

**FCC 2.948 Listed: No.310359**

**IC O.A.T.S listed: No.6629C-1**

**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 TMC Beijing.

TMC Beijing, Telecommunication Metrology Center of Ministry of Industry and Information Technology  
No. 52, Huayuan Bei Road, Haidian District, Beijing, P. R. China 100191

Tel:+86(0)10-62304633-2678 , Fax:+86(0)10-62304633-2504 Email:welcome@emcite.com. www.emcite.com

## **CONTENTS**

<b>1. TEST LABORATORY .....</b>	<b>6</b>
1.1. TESTING LOCATION.....	6
1.2. TESTING ENVIRONMENT.....	6
1.3. PROJECT DATA .....	6
1.4. SIGNATURE .....	6
<b>2. CLIENT INFORMATION.....</b>	<b>7</b>
2.1. APPLICANT INFORMATION .....	7
2.2. MANUFACTURER INFORMATION.....	7
<b>3. EQUIPMENT UNDER TEST (EUT) AND ANCILLARY EQUIPMENT (AE) .....</b>	<b>8</b>
3.1. ABOUT EUT .....	8
3.2. INTERNAL IDENTIFICATION OF EUT USED DURING THE TEST .....	8
3.3. INTERNAL IDENTIFICATION OF AE USED DURING THE TEST .....	8
<b>4. REFERENCE DOCUMENTS.....</b>	<b>9</b>
4.1. DOCUMENTS SUPPLIED BY APPLICANT.....	9
4.2. REFERENCE DOCUMENTS FOR TESTING.....	9
<b>5. LABORATORY ENVIRONMENT .....</b>	<b>10</b>
<b>6. SUMMARY OF TEST RESULTS .....</b>	<b>11</b>
6.1. SUMMARY OF TEST RESULTS .....	11
6.2. STATEMENTS .....	11
6.3. TERMS USED IN THE RESULT TABLE .....	11
<b>7. TEST EQUIPMENTS UTILIZED .....</b>	<b>12</b>
<b>CONDUCTED TEST SYSTEM .....</b>	<b>12</b>
<b>ANNEX A: EUT PHOTOGRAPH .....</b>	<b>13</b>
<b>ANNEX B: MEASUREMENT RESULTS.....</b>	<b>15</b>
B.0 ANTENNA REQUIREMENT.....	15
B.1 MAXIMUM PEAK OUTPUT POWER.....	16
B.2 BAND EDGES COMPLIANCE.....	16
B.3 CONDUCTED EMISSION .....	17
B.4 RADIATED EMISSION.....	18
B.5 OCCUPIED 20DB BANDWIDTH .....	23
B.6 TIME OF OCCUPANCY (DWELL TIME).....	23
B.7 NUMBER OF HOPPING CHANNELS .....	24
B.8 CARRIER FREQUENCY SEPARATION.....	24
B.9 AC POWER LINE CONDUCTED EMISSION .....	25
<b>ANNEX C: TEST FIGURE LIST .....</b>	<b>26</b>

FIG. 1 MAXIMUM PEAK OUTPUT POWER (GFSK, CH 0, HOPPING OFF).....	26
FIG. 2 MAXIMUM PEAK OUTPUT POWER (GFSK, CH 39, HOPPING OFF).....	26
FIG. 3 MAXIMUM PEAK OUTPUT POWER (GFSK, CH 78, HOPPING OFF).....	27
FIG. 4 MAXIMUM PEAK OUTPUT POWER ( $\pi/4$ DQPSK, CH 0, HOPPING OFF) .....	27
FIG. 5 MAXIMUM PEAK OUTPUT POWER ( $\pi/4$ DQPSK, CH 39, HOPPING OFF) .....	28
FIG. 6 MAXIMUM PEAK OUTPUT POWER ( $\pi/4$ DQPSK, CH 78, HOPPING OFF) .....	28
FIG. 7 MAXIMUM PEAK OUTPUT POWER (8DPSK, CH0, HOPPING OFF).....	29
FIG. 8 MAXIMUM PEAK OUTPUT POWER (8DPSK, CH39, HOPPING OFF).....	29
FIG. 9 MAXIMUM PEAK OUTPUT POWER (8DPSK, CH78, HOPPING OFF).....	30
FIG. 10BAND EDGES (GFSK, CH 0, HOPPING ON) .....	30
FIG. 11BAND EDGES (GFSK, CH 78, HOPPING ON) .....	31
FIG. 12BAND EDGES ( $\pi/4$ DQPSK, CH 0, HOPPING ON).....	31
FIG. 13BAND EDGES ( $\pi/4$ DQPSK, CH 78, HOPPING ON).....	32
FIG. 14BAND EDGES (8DPSK, CH 0, HOPPING ON) .....	32
FIG. 15BAND EDGES (8DPSK, CH 78, HOPPING ON).....	33
FIG. 16BAND EDGES (GFSK, CH 0, HOPPING OFF).....	33
FIG. 17BAND EDGES (GFSK, CH 78, HOPPING OFF).....	34
FIG. 18BAND EDGES ( $\pi/4$ DQPSK, CH 0, HOPPING OFF) .....	34
FIG. 19BAND EDGES ( $\pi/4$ DQPSK, CH 78, HOPPING OFF) .....	35
FIG. 20BAND EDGES (8DPSK, CH 0, HOPPING OFF).....	35
FIG. 21BAND EDGES (8DPSK, CH 78, HOPPING OFF).....	36
FIG. 22CONDUCTED SPURIOUS EMISSION (GFSK, CH0, 2.402GHz) .....	36
FIG. 23CONDUCTED SPURIOUS EMISSION (GFSK, CH0, 30 MHz-3 GHz) .....	37
FIG. 24CONDUCTED SPURIOUS EMISSION (GFSK, CH0, 3GHz-18 GHz) .....	37
FIG. 25CONDUCTED SPURIOUS EMISSION (GFSK, CH39, 2.441GHz) .....	38
FIG. 26CONDUCTED SPURIOUS EMISSION (GFSK, CH39, 30 MHz-3 GHz) .....	39
FIG. 27CONDUCTED SPURIOUS EMISSION (GFSK, CH39, 3GHz-18 GHz) .....	39
FIG. 28CONDUCTED SPURIOUS EMISSION (GFSK, CH78, 2.480GHz) .....	40
FIG. 29CONDUCTED SPURIOUS EMISSION (GFSK, CH78, 30 MHz-3 GHz) .....	40
FIG. 30CONDUCTED SPURIOUS EMISSION (GFSK, CH78, 3GHz-18 GHz) .....	41
FIG. 31CONDUCTED SPURIOUS EMISSION ( $\pi/4$ DQPSK, CH0, 2.402GHz).....	41
FIG. 32CONDUCTED SPURIOUS EMISSION ( $\pi/4$ DQPSK, CH0, 30 MHz-3 GHz).....	42
FIG. 33CONDUCTED SPURIOUS EMISSION ( $\pi/4$ DQPSK, CH0, 3GHz-18 GHz).....	42
FIG. 34CONDUCTED SPURIOUS EMISSION ( $\pi/4$ DQPSK, CH39, 2.441GHz).....	43
FIG. 35CONDUCTED SPURIOUS EMISSION ( $\pi/4$ DQPSK, CH39, 30 MHz-3 GHz).....	43
FIG. 36CONDUCTED SPURIOUS EMISSION ( $\pi/4$ DQPSK, CH39, 3GHz-18 GHz).....	44
FIG. 37CONDUCTED SPURIOUS EMISSION ( $\pi/4$ DQPSK, CH78, 2.480GHz).....	44
FIG. 38CONDUCTED SPURIOUS EMISSION ( $\pi/4$ DQPSK, CH78, 30 MHz-3 GHz).....	45
FIG. 39CONDUCTED SPURIOUS EMISSION ( $\pi/4$ DQPSK, CH78, 3GHz-18 GHz).....	45
FIG. 40CONDUCTED SPURIOUS EMISSION (8DPSK, CH0, 2.402GHz) .....	46
FIG. 41CONDUCTED SPURIOUS EMISSION (8DPSK, CH0, 30 MHz-3 GHz) .....	46
FIG. 42CONDUCTED SPURIOUS EMISSION (8DPSK, CH0, 3GHz-18 GHz) .....	47
FIG. 43CONDUCTED SPURIOUS EMISSION (8DPSK, CH39, 2.441GHz) .....	47

FIG. 44 CONDUCTED SPURIOUS EMISSION (8DPSK, CH39, 30 MHz-3 GHz) .....	48
FIG. 45 CONDUCTED SPURIOUS EMISSION (8DPSK, CH39, 3GHz-18 GHz) .....	48
FIG. 46 CONDUCTED SPURIOUS EMISSION (8DPSK, CH78, 2.480GHz) .....	49
FIG. 47 CONDUCTED SPURIOUS EMISSION (8DPSK, CH78, 30 MHz-3 GHz) .....	49
FIG. 48 CONDUCTED SPURIOUS EMISSION (8DPSK, CH78, 3GHz-18 GHz) .....	50
FIG. 49 CONDUCTED SPURIOUS EMISSION (ALL CHANNEL, 18 GHz-26 GHz) .....	50
FIG. 50 RADIATED SPURIOUS EMISSION (GFSK, CH0, 30MHz ~1 GHz) .....	51
FIG. 51 RADIATED SPURIOUS EMISSION (GFSK, CH0, 1 GHz ~3 GHz) .....	51
FIG. 52 RADIATED SPURIOUS EMISSION (GFSK, CH0, 3 GHz ~18 GHz) .....	52
FIG. 53 RADIATED SPURIOUS EMISSION (GFSK, CH39, 30MHz ~1 GHz) .....	52
FIG. 54 RADIATED SPURIOUS EMISSION (GFSK, CH39, 1 GHz ~3 GHz) .....	53
FIG. 55 RADIATED SPURIOUS EMISSION (GFSK, CH39, 3 GHz ~18 GHz) .....	53
FIG. 56 RADIATED SPURIOUS EMISSION (GFSK, CH78, 30MHz ~1 GHz) .....	54
FIG. 57 RADIATED SPURIOUS EMISSION (GFSK, CH78, 1 GHz ~3 GHz) .....	54
FIG. 58 RADIATED SPURIOUS EMISSION (GFSK, CH78, 3 GHz ~18 GHz) .....	55
FIG. 59 RADIATED SPURIOUS EMISSION ( $\pi/4$ DQPSK, CH0, 30MHz ~1 GHz) .....	55
FIG. 60 RADIATED SPURIOUS EMISSION ( $\pi/4$ DQPSK, CH0, 1 GHz ~3 GHz) .....	56
FIG. 61 RADIATED SPURIOUS EMISSION ( $\pi/4$ DQPSK, CH0, 3 GHz ~18 GHz) .....	56
FIG. 62 RADIATED SPURIOUS EMISSION ( $\pi/4$ DQPSK, CH39, 30MHz ~1 GHz) .....	57
FIG. 63 RADIATED SPURIOUS EMISSION ( $\pi/4$ DQPSK, CH39, 1 GHz ~3 GHz) .....	57
FIG. 64 RADIATED SPURIOUS EMISSION ( $\pi/4$ DQPSK, CH39, 3 GHz ~18 GHz) .....	58
FIG. 65 RADIATED SPURIOUS EMISSION ( $\pi/4$ DQPSK, CH78, 30MHz ~1 GHz) .....	58
FIG. 66 RADIATED SPURIOUS EMISSION ( $\pi/4$ DQPSK, CH78, 1 GHz ~3 GHz) .....	59
FIG. 67 RADIATED SPURIOUS EMISSION ( $\pi/4$ DQPSK, CH78, 3 GHz ~18 GHz) .....	59
FIG. 68 RADIATED SPURIOUS EMISSION (8DPSK, CH0, 30MHz ~1 GHz) .....	60
FIG. 69 RADIATED SPURIOUS EMISSION (8DPSK, CH0, 1 GHz ~3 GHz) .....	60
FIG. 70 RADIATED SPURIOUS EMISSION (8DPSK, CH0, 3 GHz ~18 GHz) .....	61
FIG. 71 RADIATED SPURIOUS EMISSION (8DPSK, CH39, 30MHz ~1 GHz) .....	61
FIG. 72 RADIATED SPURIOUS EMISSION (8DPSK, CH39, 1 GHz ~3 GHz) .....	62
FIG. 73 RADIATED SPURIOUS EMISSION (8DPSK, CH39, 3 GHz ~18 GHz) .....	62
FIG. 74 RADIATED SPURIOUS EMISSION (8DPSK, CH78, 30MHz ~1 GHz) .....	63
FIG. 75 RADIATED SPURIOUS EMISSION (8DPSK, CH78, 1 GHz ~3 GHz) .....	63
FIG. 76 RADIATED SPURIOUS EMISSION (8DPSK, CH78, 3 GHz ~18 GHz) .....	64
FIG. 77 RADIATED SPURIOUS EMISSION (ALL CHANNEL, 18 GHz ~26 GHz) .....	64
FIG. 78 OCCUPIED 20DB BANDWIDTH (GFSK, CH 0) .....	65
FIG. 79 OCCUPIED 20DB BANDWIDTH (GFSK, CH 39) .....	65
FIG. 80 OCCUPIED 20DB BANDWIDTH (GFSK, CH 78) .....	66
FIG. 81 OCCUPIED 20DB BANDWIDTH ( $\pi/4$ DQPSK, CH 0) .....	66
FIG. 82 OCCUPIED 20DB BANDWIDTH ( $\pi/4$ DQPSK, CH 39) .....	67
FIG. 83 OCCUPIED 20DB BANDWIDTH ( $\pi/4$ DQPSK, CH 78) .....	67
FIG. 84 OCCUPIED 20DB BANDWIDTH (8DPSK, CH 0) .....	68
FIG. 85 OCCUPIED 20DB BANDWIDTH (8DPSK, CH 39) .....	68
FIG. 86 OCCUPIED 20DB BANDWIDTH (8DPSK, CH 78) .....	69

FIG. 87 TIME OF OCCUPANCY(DWELL TIME) (GFSK, CH39) .....	69
FIG. 88 NUMBER OF TRANSMISSIONS (GFSK, CH39) .....	70
FIG. 89 TIME OF OCCUPANCY(DWELL TIME) ( $\pi/4$ DQPSK, CH39).....	70
FIG. 90 NUMBER OF TRANSMISSIONS ( $\pi/4$ DQPSK, CH39) .....	71
FIG. 91 TIME OF OCCUPANCY(DWELL TIME) (8DPSK, CH39) .....	71
FIG. 92 NUMBER OF TRANSMISSIONS (8DPSK, CH39) .....	72
FIG. 93 HOPPING CHANNEL CH0~39 (GFSK, CH39).....	72
FIG. 94 HOPPING CHANNEL CH39~78 (GFSK, CH39).....	73
FIG. 95 HOPPING CHANNEL CH0~39 ( $\pi/4$ DQPSK, CH39).....	73
FIG. 96 HOPPING CHANNEL CH39~78 ( $\pi/4$ DQPSK, CH39).....	74
FIG. 97 HOPPING CHANNEL CH0~39 (8DPSK, CH39).....	74
FIG. 98 HOPPING CHANNEL CH39~78 (8DPSK, CH39).....	75
FIG. 99 CARRIER FREQUENCY SEPARATION (GFSK, CH39).....	75
FIG. 100 CARRIER FREQUENCY SEPARATION ( $\pi/4$ DQPSK, CH39).....	76
FIG. 101 CARRIER FREQUENCY SEPARATION (8DPSK, CH39).....	76
FIG. 102 AC POWER LINE CONDUCTED EMISSION (GFSK, CH39) .....	77
FIG. 103 AC POWER LINE CONDUCTED EMISSION ( $\pi/4$ DQPSK, CH39).....	78
FIG. 104 AC POWER LINE CONDUCTED EMISSION (8DPSK, CH39) .....	79

## 1. Test Laboratory

### 1.1. Testing Location

Company Name: TMC Shenzhen, Telecommunication Metrology Center of MIIT  
Address: No. 12 Building, Shangsha Innovation and Technology Park, Futian District, Shenzhen, P. R. China  
Postal Code: 518048  
Telephone: +86(0)755-33322000  
Fax: +86(0)755-33322001

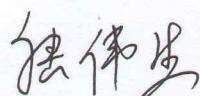
### 1.2. Testing Environment

Normal Temperature: 15°C-30°C  
Extreme Temperature: -20°C/+55°C  
Relative Humidity: 30%-60%

### 1.3. Project data

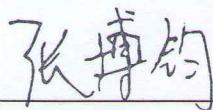
Project Leader: Zhang Bojun  
Test Engineer: Tang Weisheng  
Testing Start Date: Nov 12<sup>th</sup>, 2013  
Testing End Date: Nov 19<sup>th</sup>, 2013

### 1.4. Signature



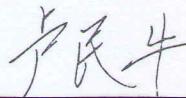
Tang Weisheng

(Prepared this test report)



Zhang Bojun

(Reviewed this test report)



Lu Minniu

Director of the laboratory

(Approved this test report)

## **2. Client Information**

### **2.1. Applicant Information**

Company Name: XOX Technology Limited  
Address /Post: 20/F, York House, The Landmark 15 Queen's Road Central, Hong Kong  
City: Hong Kong  
Postal Code: /  
Country: China  
Telephone: (852) 69522170  
Fax: (852) 25301677

### **2.2. Manufacturer Information**

Company Name: Matsunichi Digital Technology (Shen zhen) Limited  
Address /Post: 21/F, No.9996, Shen Nan Boulevard, Nan Shan District, Shenzhen, China  
City: Shenzhen  
Postal Code: /  
Country: China  
Telephone: 150 0755 6476  
Fax: (86) 755 86561526

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

#### **3.1. About EUT**

Description	GSM dual mobile phone
Model Name	Wave XX
Market Name	XOX
Frequency Band	ISM 2400MHz~2483.5MHz
Type of Modulation	GFSK/ $\pi/4$ DQPSK/8DPSK
Number of Channels	79
FCC ID	2ABBT-XOX-WAVEXX

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

#### **3.2. Internal Identification of EUT used during the test**

EUT	SN or IMEI	HW Version	SW Version
ID*	/	S40M98EC1-2	S266_TJZ_018_XOX_WAVE2_V04_130809

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

#### **3.3. Internal Identification of AE used during the test**

AE ID*	Description	Type	SN
AE1	Li-ion Battery	XB-100A	/
AE2	Travel Charger	TN0500500D-08	/

\*AE ID: is used to identify the test accessory 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.

<b>Reference</b>	<b>Title</b>	<b>Version</b>
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.	Oct, 2012 Edition
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
FCC Public Notice DA 00-705	Filing and Measurement Guidelines for Frequency Hopping Spread Spectrum Systems	Mar, 2000

## 5. Laboratory Environment

**Half-anechoic chamber** (11.20 meters×6.10 meters×5.60 meters) did not exceed following limits:

Temperature	Min. = 15 °C, Max. = 30 °C
Relative humidity	Min. = 30 %, Max. = 60 %
Shielding effectiveness	> 110 dB
Electrical insulation	> 2M Ω
Ground system resistance	< 0.5 Ω
Normalized Site Attenuation (NSA)	< ±3.5dB, with 3m of Measuring distance, 30MHz 1000MHz
Uniformity of field strength	Between 0 and 6 dB, from 80MHz to 3000 MHz

**Fully-anechoic chamber** (11.20 meters×6.10 meters×6.60 meters) did not exceed following limits:

Temperature	Min. = 15 °C, Max. = 30 °C
Relative humidity	Min. = 30 %, Max. = 60 %
Shielding effectiveness	> 110 dB
Electrical insulation	> 2M Ω
Ground system resistance	< 0.5 Ω
VSWR	Between 0 and 6 dB, from 30MHz to 18 000 MHz

**Conduction Lab** did not exceed following limits:

Temperature	Min.=15 °C, Max.=30 °C
Relative humidity	Min.=30 %, Max.= 60 %
Shielding effectiveness	> 80 dB
Electrical insulation	> 2M Ω
Ground system resistance	< 0.5 Ω

## **6. Summary of Test Results**

### **6.1. 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)	NA
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

### **6.2. Statements**

TMC has evaluated the test cases requested by the applicant/manufacturer as listed in section 6.1 of this report, for the EUT specified in section 3, according to the standards or reference documents listed in section 4.2

### **6.3. Terms used in the result table**

Terms used in Verdict column

P	Pass
NA	Not Available
F	Fail

Abbreviations

AC	Alternating Current
BW	Band Width
ISM	Industrial, Scientific and Medical
RF	Radio Frequency

## **7. Test Equipments Utilized**

### **Conducted test system**

No.	Equipment	Model	Serial Number	Manufacturer	Calibration Due date	Calibration Period
1	Vector Signal Analyzer	FSV40	100903	Rohde & Schwarz	2014-04-23	1 year
2	Bluetooth Tester	CBT32	100584	Rohde & Schwarz	2014-01-12	1 year

### **Radiated emission test system**

No.	Equipment	Model	Serial Number	Manufacturer	Calibration Due date	Calibration Period
1	Chamber	FACT5-2.0	4166	ETS-Lindgren	2016-05-29	3 years
2	Test Receiver	ESCI	100701	Rohde & Schwarz	2014-07-31	1 year
3	Spectrum Analyzer	FSP40	100378	Rohde & Schwarz	2013-12-21	1 year
4	BiLog Antenna	VULB9163	9163-330	Schwarzbeck	2014-02-24	3 years
5	Dual-Ridge Waveguide Horn Antenna	3164-05	00085724	ETS-Lindgren	2014-02-17	3 years
6	Test Receiver	ESCI	100702	Rohde & Schwarz	2014-07-31	1 year
7	LISN	ESH2-Z5	100196	Rohde & Schwarz	2014-01-23	1 year
8	Signal Generator	SMR40	100541	Rohde & Schwarz	2014-01-10	1 year
9	Dual-Ridge Waveguide Horn Antenna	3117	00066577	ETS-Lindgren	2016-04-01	3 years
10	Loop Antenna	HLA6120	35779	TESEQ	2016-02-25	3 years
11	EMI Antenna	3160-09	00118383	ETS-Lindgren	2015-09-05	3 years

### **Anechoic chamber**

Fully anechoic chamber by ETS-Lindgren.

**ANNEX A: EUT photograph****Pic A-1 Mobile phone****Pic A-2 Mobile phone**

**Pic A-3 Battery****Pic A-4 Charger**

## ANNEX B: MEASUREMENT RESULTS

### 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 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	1.43	Fig.2	0.62	Fig.3	0.55
$\pi/4$ DQPSK	Fig.4	1.47	Fig.5	0.28	Fig.6	0.47
8DPSK	Fig.7	1.22	Fig.8	0.38	Fig.9	0.44

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	2.402 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	2.480 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	2.402 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(µV/m)	Measurement distance(meters)
0.009-0.490	2400/F(kHz)	300
0.490-1.705	24000/F(kHz)	30
1.705-30.0	30	30
30-88	100	3
88-216	150	3
216-960	200	3
Above 960	500	3

**Test Condition**

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

Frequency of emission (MHz)	RBW/VBW	Sweep Time(s)
30-1000	100KHz/300KHz	5
1000-4000	1MHz/1MHz	15
4000-18000	1MHz/1MHz	40
18000-26500	1MHz/1MHz	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:**

<b>Mode</b>	<b>Channel</b>	<b>Frequency Range</b>	<b>Test Results</b>	<b>Conclusion</b>
GFSK	0	30 MHz ~1 GHz	Fig.50	P
		1 GHz ~ 3 GHz	Fig.51	P
		3 GHz ~ 18 GHz	Fig.52	P
	39	30 MHz ~1 GHz	Fig.53	P
		1 GHz ~ 3 GHz	Fig.54	P
		3 GHz ~ 18 GHz	Fig.55	P
	78	30 MHz ~1 GHz	Fig.56	P
		1 GHz ~ 3 GHz	Fig.57	P
		3 GHz ~ 18 GHz	Fig.58	P
$\pi/4$ DQPSK	0	30 MHz ~1 GHz	Fig.59	P
		1 GHz ~ 3 GHz	Fig.60	P
		3 GHz ~ 18 GHz	Fig.61	P
	39	30 MHz ~1 GHz	Fig.62	P
		1 GHz ~ 3 GHz	Fig.63	P
		3 GHz ~ 18 GHz	Fig.64	P
	78	30 MHz ~1 GHz	Fig.65	P
		1 GHz ~ 3 GHz	Fig.66	P
		3 GHz ~ 18 GHz	Fig.67	P
8DPSK	0	30 MHz ~1 GHz	Fig.68	P
		1 GHz ~ 3 GHz	Fig.69	P
		3 GHz ~ 18 GHz	Fig.70	P
	39	30 MHz ~1 GHz	Fig.71	P
		1 GHz ~ 3 GHz	Fig.72	P
		3 GHz ~ 18 GHz	Fig.73	P
	78	30 MHz ~1 GHz	Fig.74	P
		1 GHz ~ 3 GHz	Fig.75	P
		3 GHz ~ 18 GHz	Fig.76	P
/	All channels	18 GHz~ 26.5 GHz	Fig.77	P

**GFSK CH0 (1-18GHz)**

<b>Frequency (MHz)</b>	<b>Peak (dB<math>\mu</math>V/m)</b>	<b>Polarization</b>	<b>Azimuth (deg)</b>	<b>Corr. (dB)</b>	<b>Margin (dB)</b>	<b>Limit (dB<math>\mu</math>V/m)</b>
2357.000000	35.8	V	90.0	1.7	18.1	53.9
4801.625000	39.4	H	90.0	5.7	14.5	53.9
7206.125000	42.5	V	90.0	6.8	11.4	53.9
9608.000000	48.3	H	90.0	9.1	5.6	53.9
13453.000000	41.7	H	90.0	11.4	12.2	53.9
16750.000000	47.3	V	0.0	14.3	6.6	53.9

**GFSK CH39 (1-18GHz)**

<b>Frequency (MHz)</b>	<b>Peak (dB<math>\mu</math>V/m)</b>	<b>Polarization</b>	<b>Azimuth (deg)</b>	<b>Corr. (dB)</b>	<b>Margin (dB)</b>	<b>Limit (dB<math>\mu</math>V/m)</b>
2357.000000	35.7	V	90.0	1.7	18.2	53.9
4879.500000	40.7	V	90.0	5.9	13.2	53.9
7323.375000	40.6	V	90.0	6.8	13.3	53.9
9764.625000	49.6	V	0.0	9.2	4.3	53.9
13445.000000	41.5	H	90.0	11.4	12.4	53.9
16742.000000	47.2	V	0.0	14.3	6.7	53.9

**GFSK CH78 (1-18GHz)**

<b>Frequency (MHz)</b>	<b>Peak (dB<math>\mu</math>V/m)</b>	<b>Polarization</b>	<b>Azimuth (deg)</b>	<b>Corr. (dB)</b>	<b>Margin (dB)</b>	<b>Limit (dB<math>\mu</math>V/m)</b>
2357.000000	35.7	V	90.0	1.7	18.2	53.9
4958.250000	38.2	V	90.0	5.9	15.7	53.9
7440.625000	38.3	V	90.0	6.8	15.6	53.9
9920.375000	48.4	V	0.0	9.3	5.5	53.9
13448.000000	41.5	V	90.0	11.4	12.4	53.9
16781.000000	47.2	V	0.0	14.3	6.7	53.9

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

Frequency (MHz)	Peak (dB $\mu$ V/m)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dB $\mu$ V/m)
2357.000000	35.6	V	0.0	1.7	18.3	53.9
4801.625000	41.9	V	90.0	5.7	12.0	53.9
7480.875000	40.1	V	90.0	6.9	13.8	53.9
9608.875000	49.0	H	90.0	9.1	4.9	53.9
12659.000000	41.5	V	0.0	11.2	12.4	53.9
16768.000000	47.1	H	0.0	14.3	6.8	53.9

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

Frequency (MHz)	Peak (dB $\mu$ V/m)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dB $\mu$ V/m)
2357.000000	35.7	V	90.0	1.7	18.2	53.9
4879.500000	40.4	V	90.0	5.9	13.5	53.9
7323.375000	37.7	V	90.0	6.8	16.2	53.9
9764.625000	48.0	V	90.0	9.2	5.9	53.9
13180.000000	41.5	H	0.0	11.5	12.4	53.9
16760.000000	47.1	V	0.0	14.3	6.8	53.9

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

Frequency (MHz)	Peak (dB $\mu$ V/m)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dB $\mu$ V/m)
2357.000000	35.6	V	90.0	1.7	18.3	53.9
4960.000000	39.0	V	90.0	5.9	14.9	53.9
7440.625000	36.5	V	90.0	6.8	17.4	53.9
9920.375000	49.4	H	0.0	9.3	4.5	53.9
13448.000000	41.5	V	0.0	11.4	12.4	53.9
16750.000000	47.1	V	0.0	14.3	6.8	53.9

**8DPSK CH0 (1-18GHz)**

Frequency (MHz)	Peak (dB $\mu$ V/m)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dB $\mu$ V/m)
3883.750000	36.9	V	0.0	4.4	17.0	53.9
4801.625000	42.1	V	90.0	5.7	11.8	53.9
7545.625000	36.4	V	90.0	6.9	17.5	53.9
9608.000000	50.5	H	0.0	9.1	3.4	53.9
13453.000000	41.5	H	90.0	11.4	12.4	53.9
16742.000000	47.2	V	90.0	14.3	6.7	53.9

**8DPSK CH39 (1-18GHz)**

Frequency (MHz)	Peak (dB $\mu$ V/m)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dB $\mu$ V/m)
2357.000000	35.9	V	90.0	1.7	18.0	53.9
4880.375000	39.8	V	90.0	5.9	14.1	53.9
7550.875000	36.4	V	90.0	6.9	17.5	53.9
9764.625000	52.3	H	0.0	9.2	1.6	53.9
13162.000000	41.5	H	90.0	11.5	12.4	53.9
16755.000000	47.3	V	0.0	14.3	6.6	53.9

**8DPSK CH78 (1-18GHz)**

Frequency (MHz)	Peak (dB $\mu$ V/m)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dB $\mu$ V/m)
2357.000000	35.8	V	0.0	1.7	18.1	53.9
4960.000000	39.2	V	90.0	5.9	14.7	53.9
7558.750000	36.5	H	0.0	6.9	17.4	53.9
9920.375000	51.7	V	90.0	9.3	2.2	53.9
13453.000000	41.7	H	90.0	11.4	12.2	53.9
16747.000000	47.5	V	0.0	14.3	6.4	53.9

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
GFSK	0	Fig.78	1.158	/
	39	Fig.79	1.122	
	78	Fig.80	1.114	
$\pi/4$ DQPSK	0	Fig.81	1.303	/
	39	Fig.82	1.324	
	78	Fig.83	1.317	
8DPSK	0	Fig.84	1.317	/
	39	Fig.85	1.324	
	78	Fig.86	1.324	

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
GFSK	39	DH5	Fig.87	192.3	P
			Fig.88		
$\pi/4$ DQPSK	39	2-DH5	Fig.89	174.8	P
			Fig.90		
8DPSK	39	3-DH5	Fig.91	189.3	P
			Fig.92		

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.93	Fig.94	79
$\pi/4$ DQPSK	39	2-DH5	Fig.95	Fig.96	79
8DPSK	39	3-DH5	Fig.97	Fig.98	79

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.99	1.006	P
$\pi/4$ DQPSK	39	2-DH5	Fig.100	1.006	P
8DPSK	39	3-DH5	Fig.101	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)

Frequency range (MHz)	Quasi-peak Limit (dB $\mu$ V)	Result (dB $\mu$ V)			Conclusion	
		With charger				
		GFSK	$\pi/4$ DQPSK	8DPSK		
0.15 to 0.5	66 o 56	Fig.102	Fig.103	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)

Frequency range (MHz)	Average Limit (dB $\mu$ V)	Result (dB $\mu$ V)			Conclusion	
		With charger				
		GFSK	$\pi/4$ DQPSK	8DPSK		
0.15 to 0.5	56 to 46	Fig.102	Fig.103	Fig.104	P	
0.5 to 5	46					
5 to 30	50					

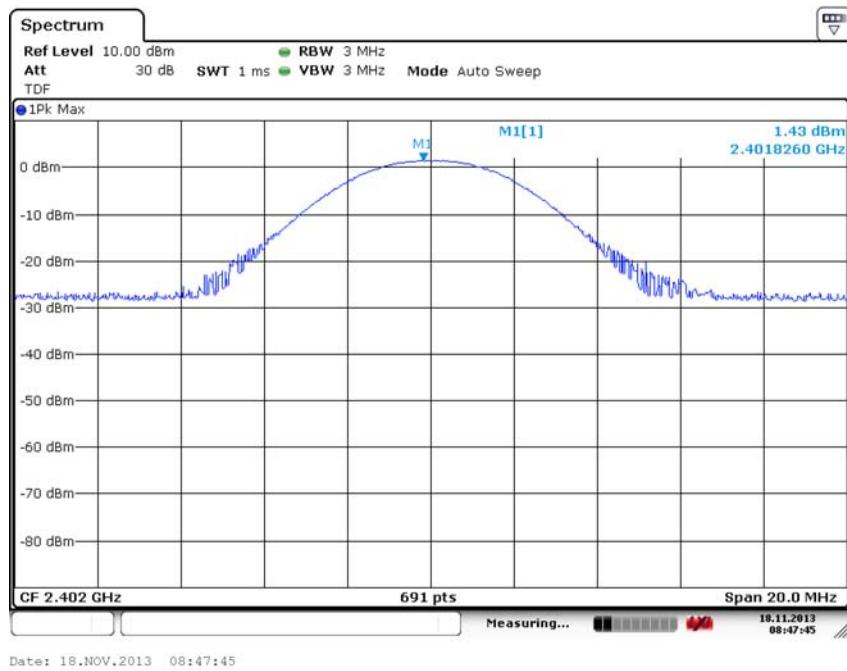
NOTE: The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.5 MHz.

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

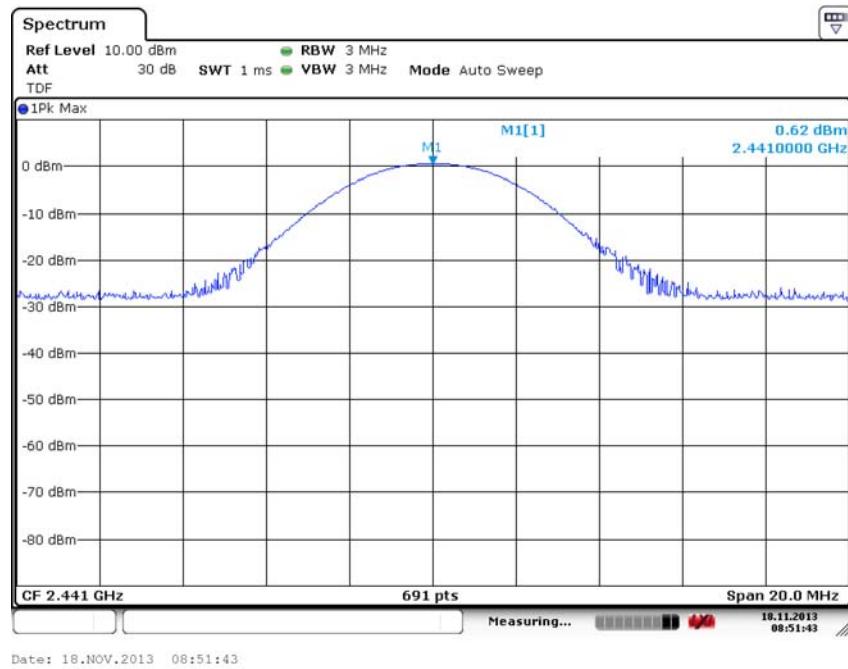
See ANNEX C for test graphs.

Conclusion: Pass

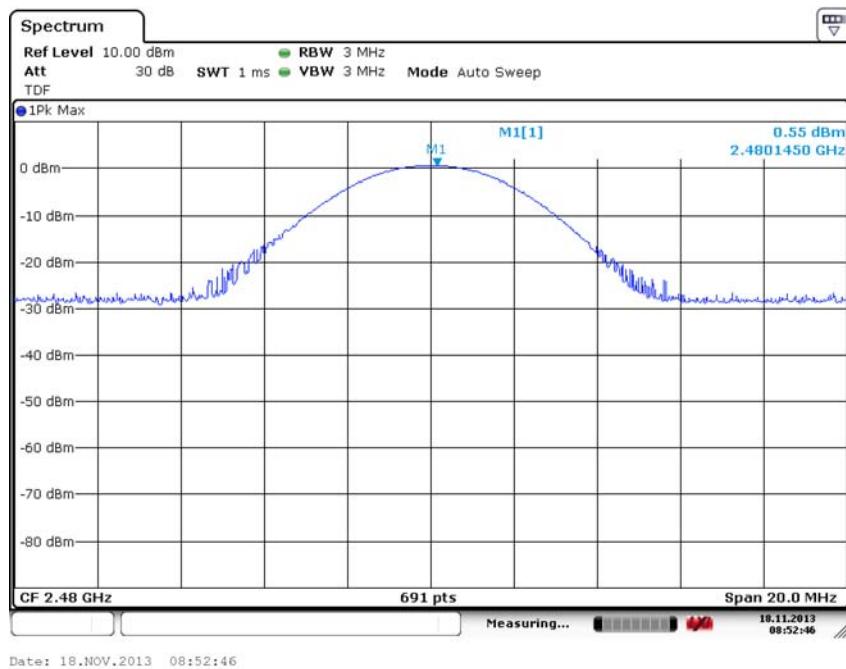
## ANNEX C: TEST FIGURE LIST



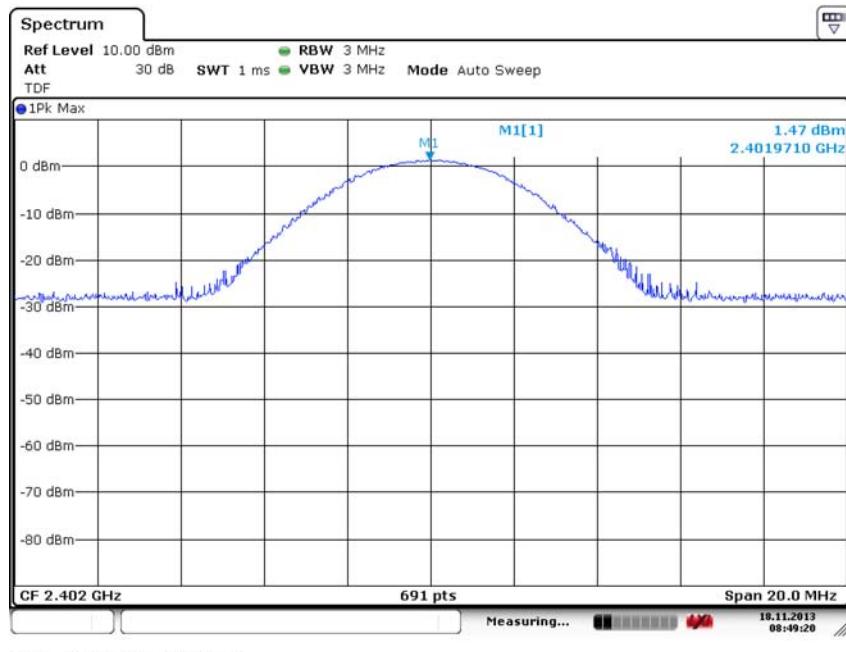
**Fig. 1 Maximum Peak Output Power (GFSK, Ch 0, Hopping OFF)**



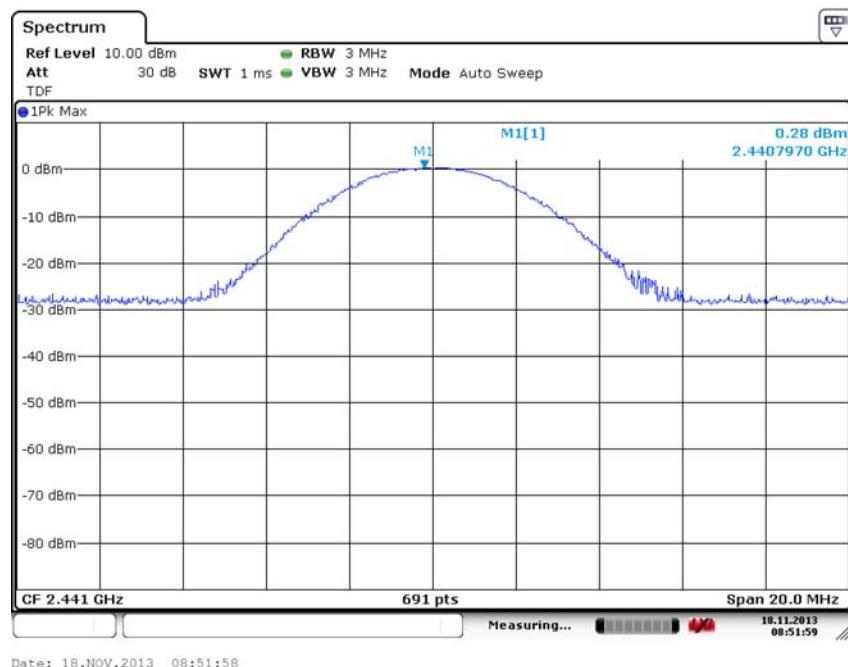
**Fig. 2 Maximum Peak Output Power (GFSK, Ch 39, Hopping OFF)**



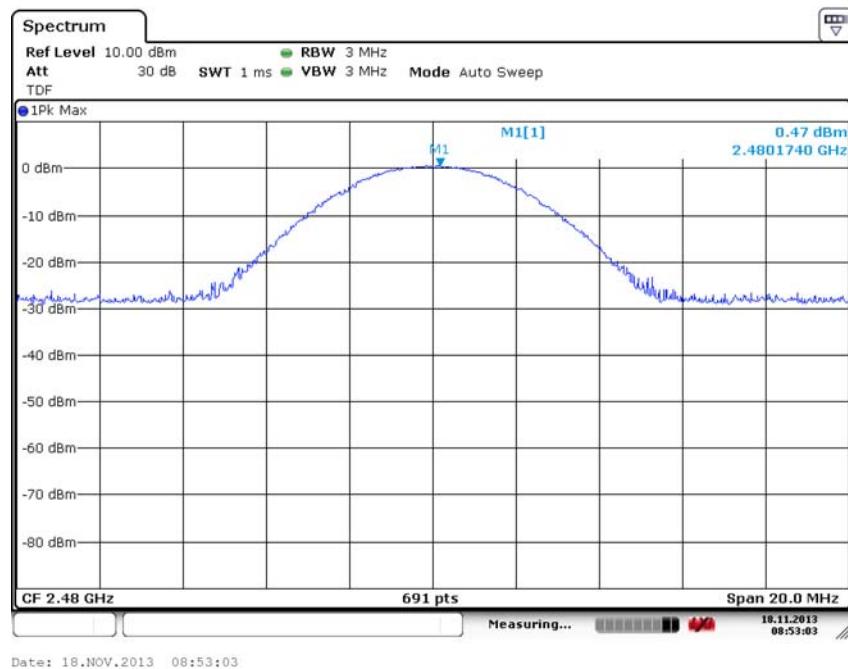
**Fig. 3 Maximum Peak Output Power (GFSK, Ch 78, Hopping OFF)**



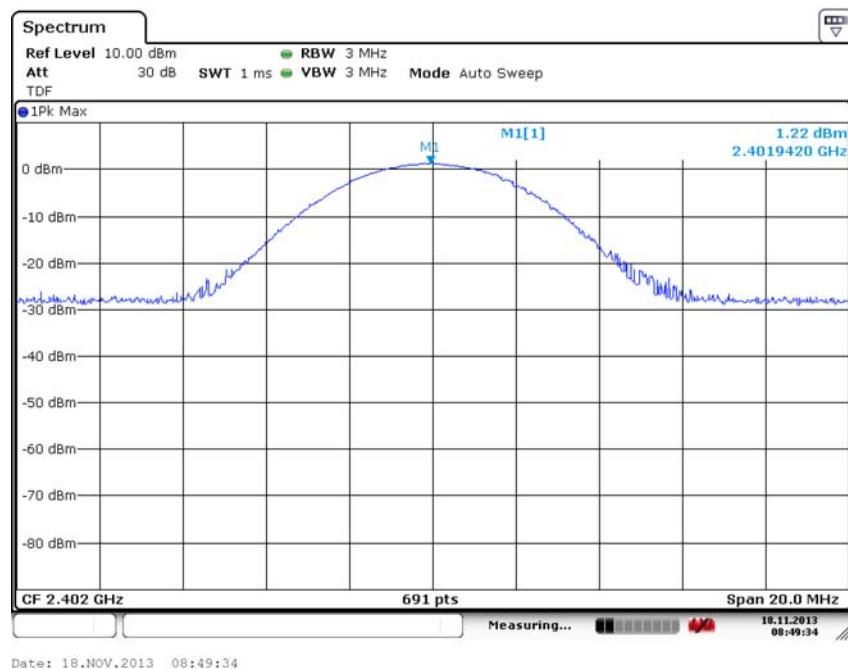
**Fig. 4 Maximum Peak Output Power ( $\pi/4$  DQPSK, Ch 0, Hopping OFF)**



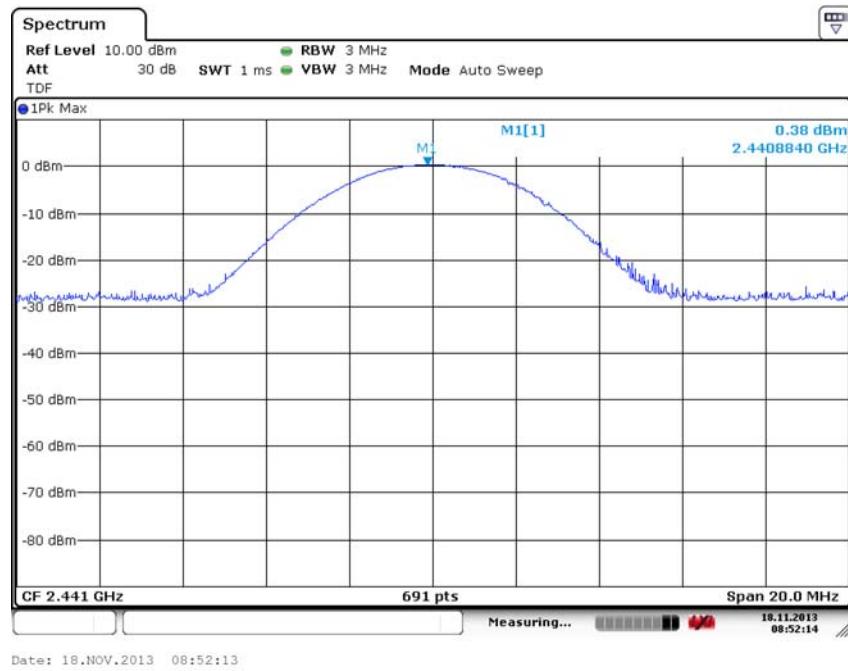
**Fig. 5 Maximum Peak Output Power (  $\pi/4$  DQPSK, Ch 39, Hopping OFF)**



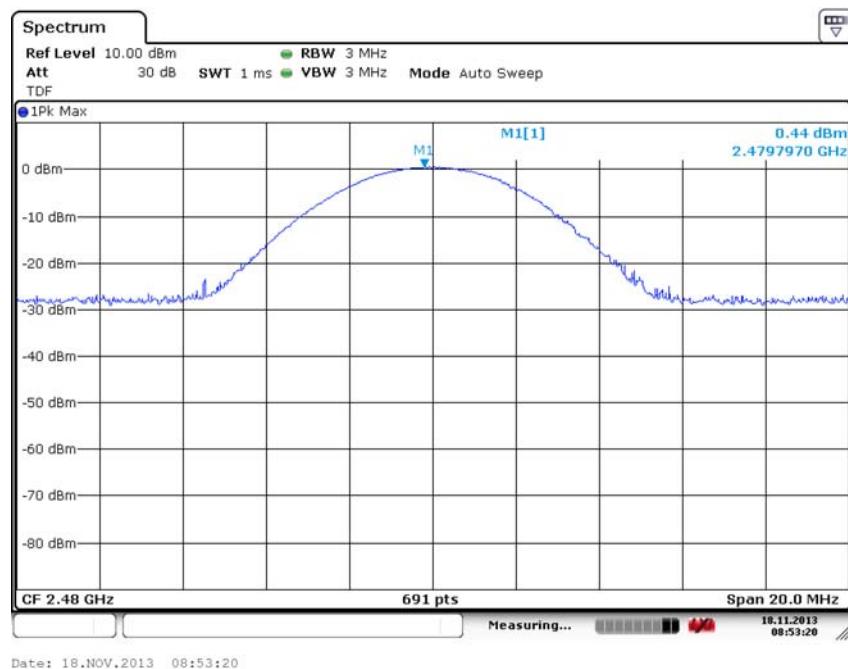
**Fig. 6 Maximum Peak Output Power (  $\pi/4$  DQPSK, Ch 78, Hopping OFF)**



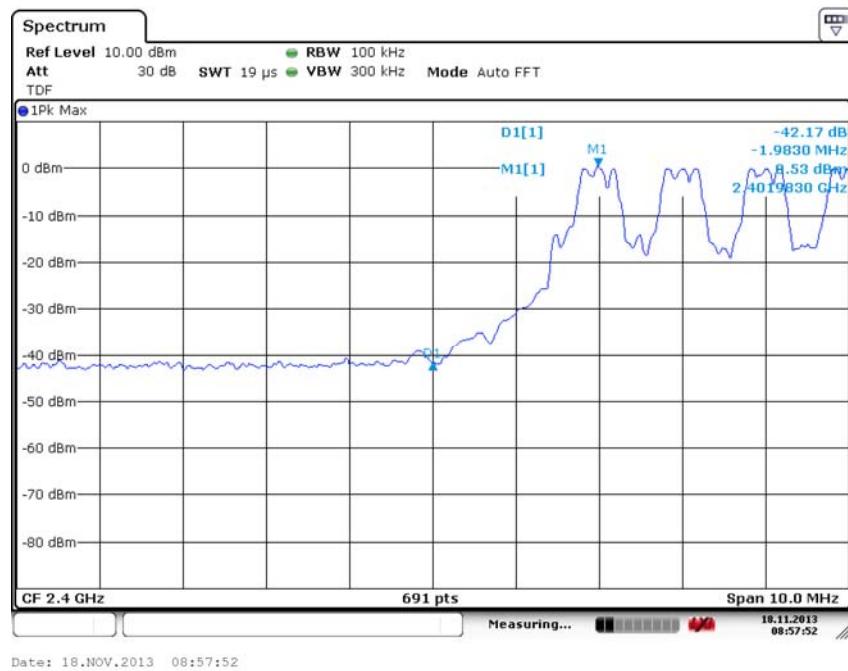
**Fig. 7 Maximum Peak Output Power (8DPSK, Ch0, Hopping OFF)**



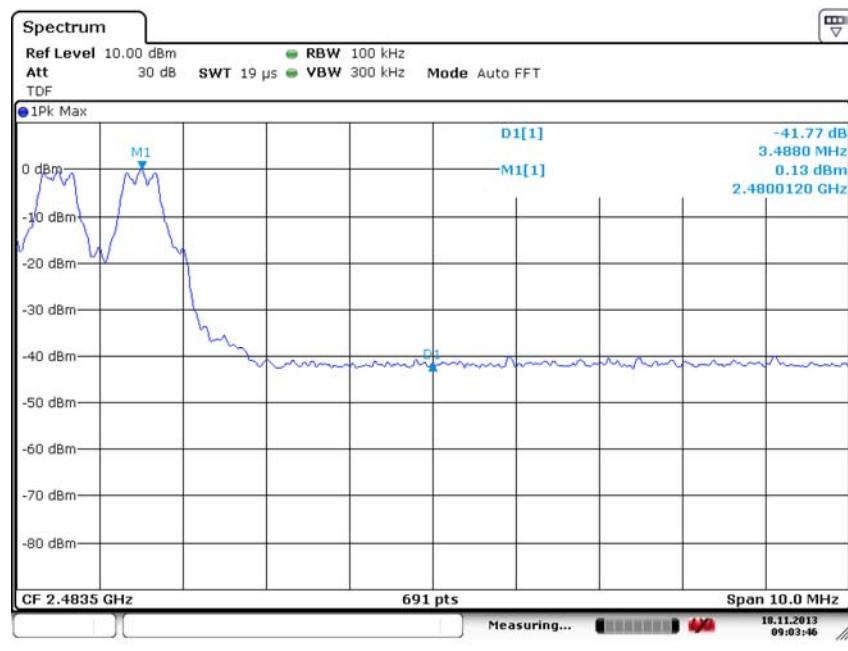
**Fig. 8 Maximum Peak Output Power (8DPSK, Ch39, Hopping OFF)**



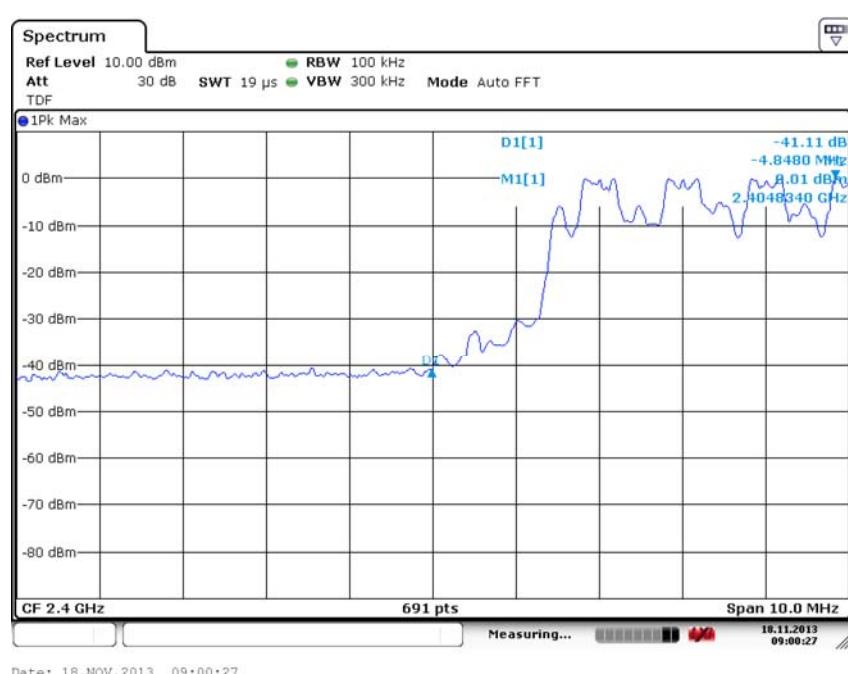
**Fig. 9 Maximum Peak Output Power (8DPSK, Ch78, Hopping OFF)**



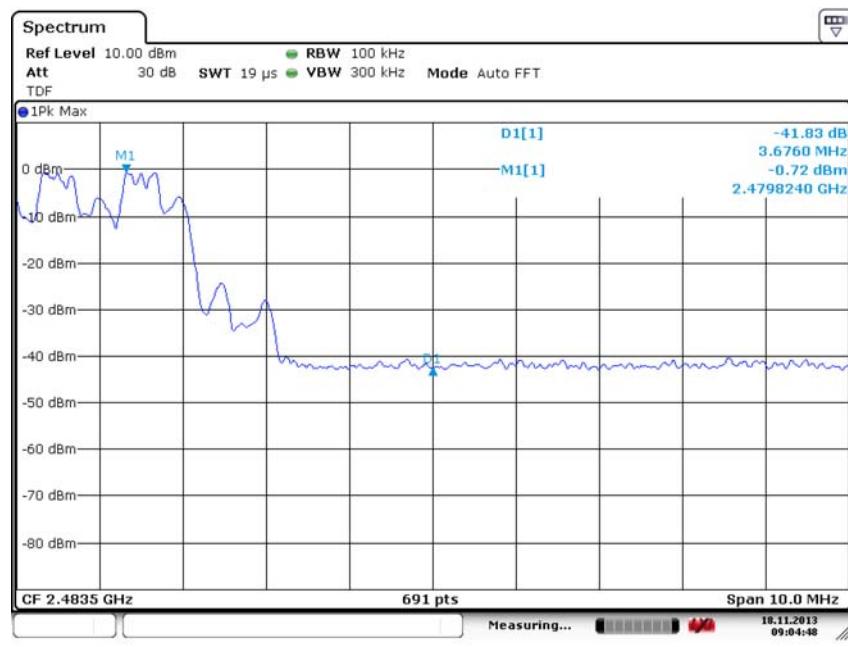
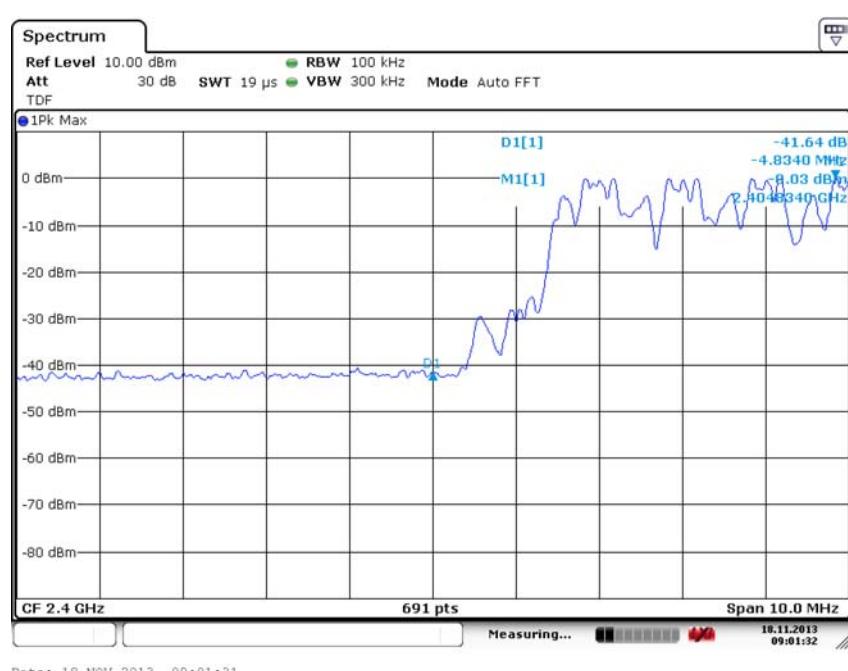
**Fig. 10 Band Edges (GFSK, Ch 0, Hopping ON)**

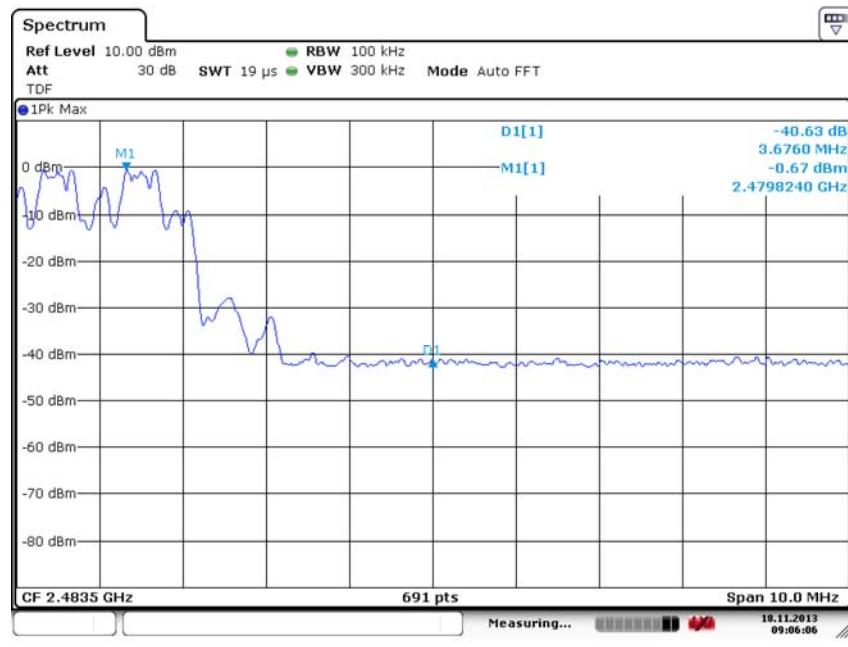
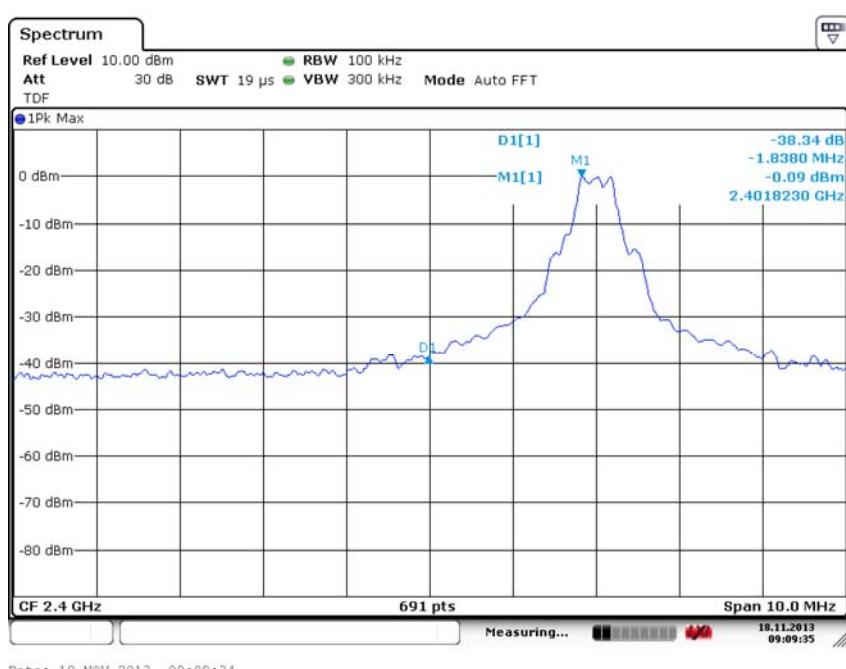


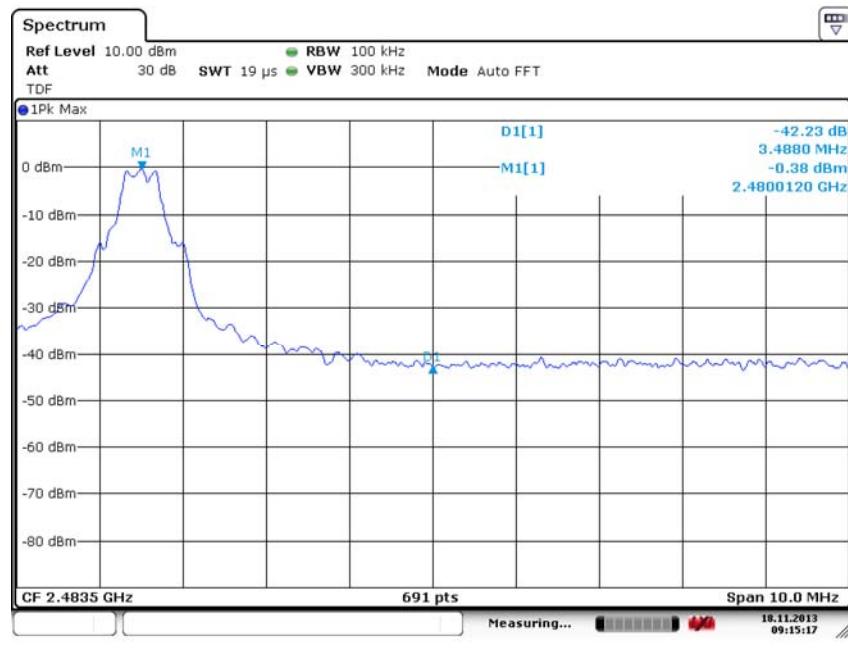
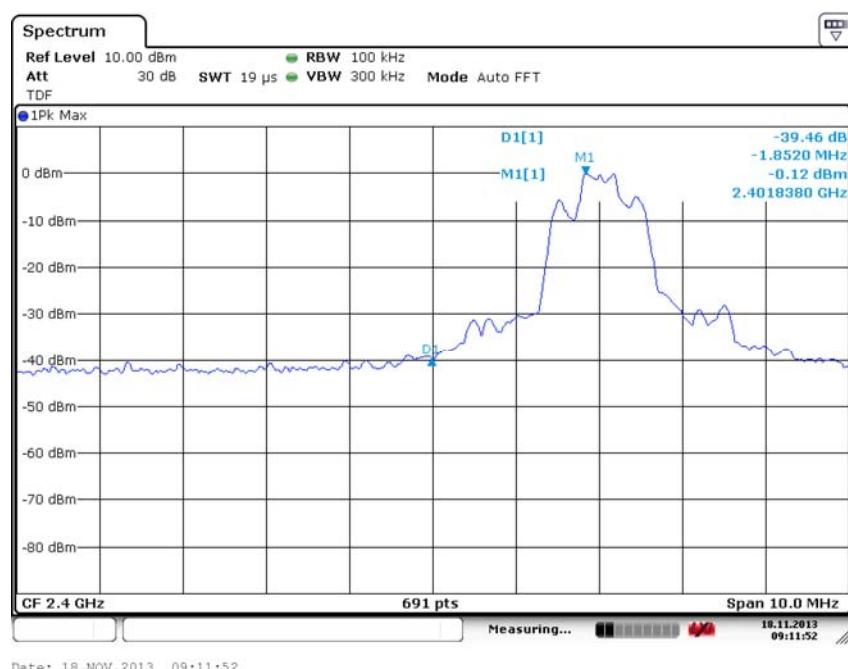
**Fig. 11 Band Edges (GFSK, Ch 78, Hopping ON)**

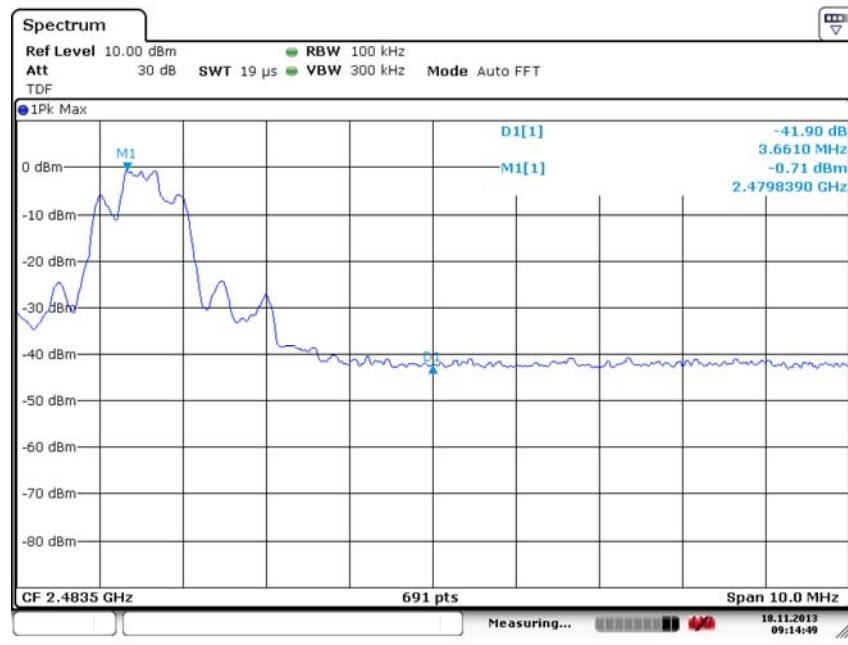


**Fig. 12 Band Edges (π/4 DQPSK, Ch 0, Hopping ON)**

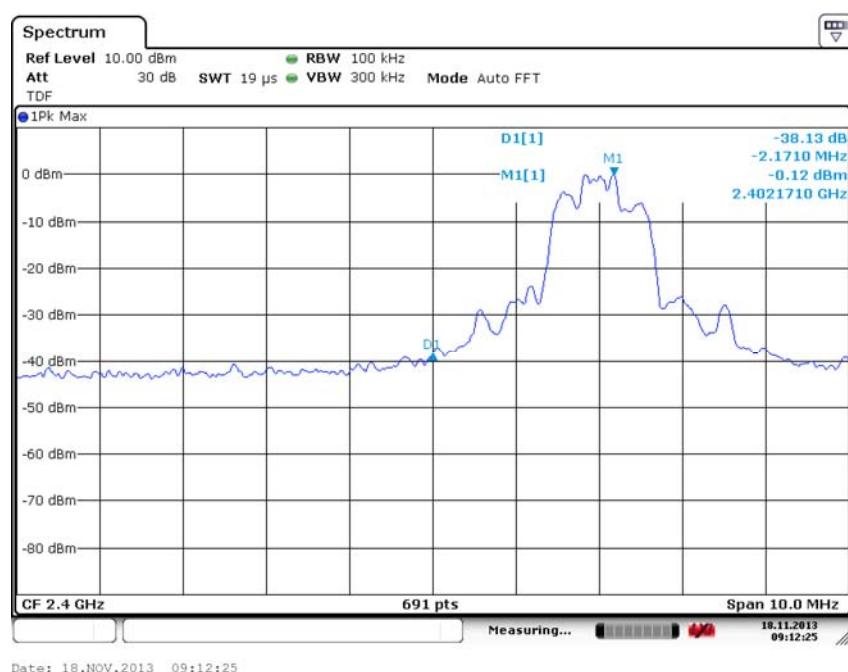

**Fig. 13 Band Edges ( $\pi/4$  DQPSK, Ch 78, Hopping ON)**

**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)**

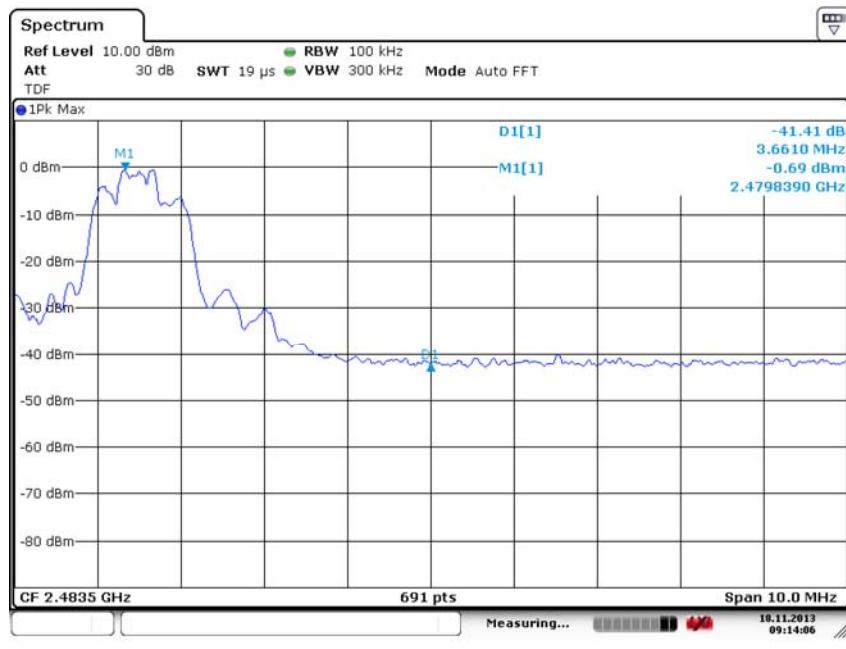

**Fig. 17 Band Edges (GFSK, Ch 78, Hopping OFF)**

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



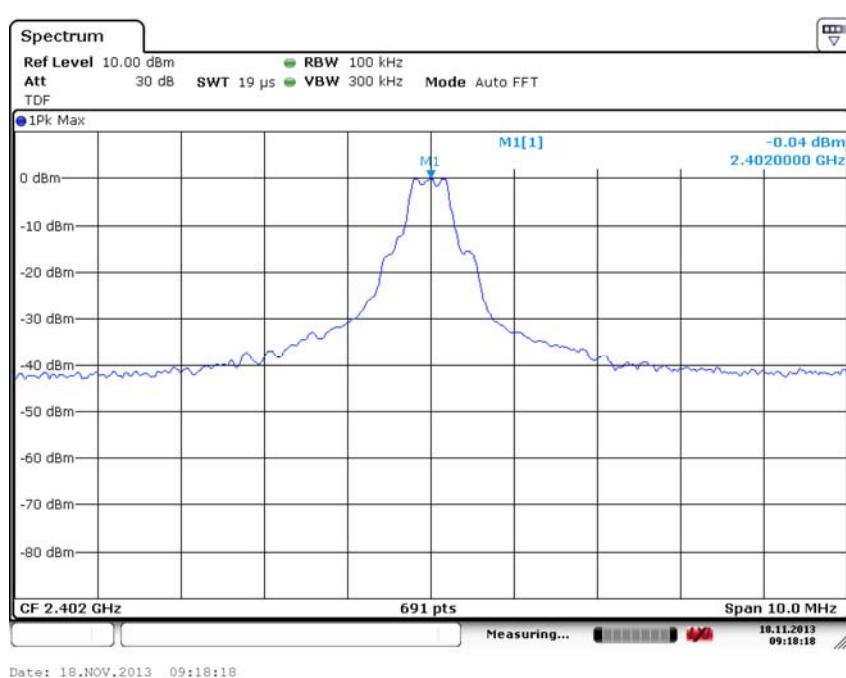
**Fig. 19 Band Edges ( $\pi/4$  DQPSK, Ch 78, Hopping OFF)**



**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)**

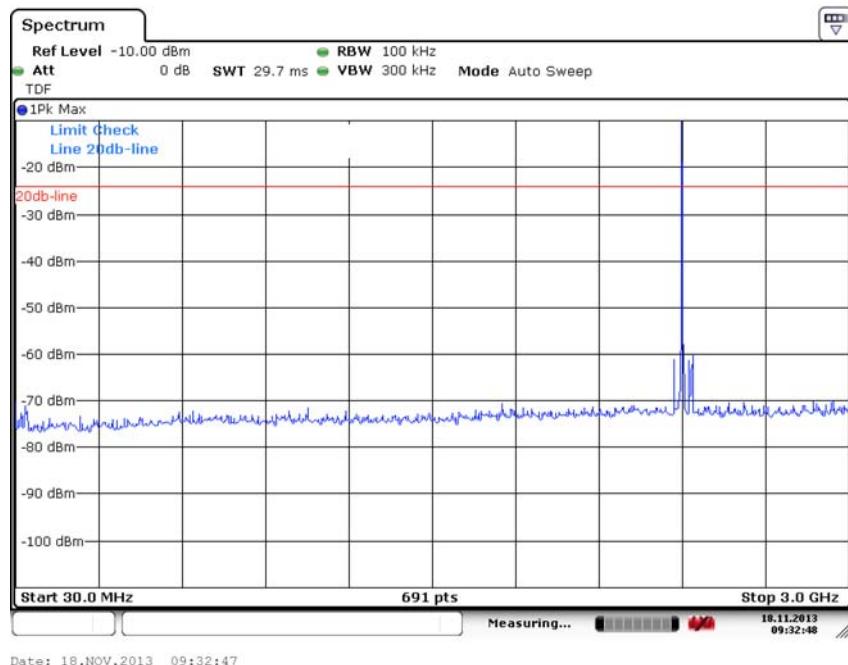


Fig. 23 Conducted Spurious Emission (GFSK, Ch0, 30 MHz-3 GHz)

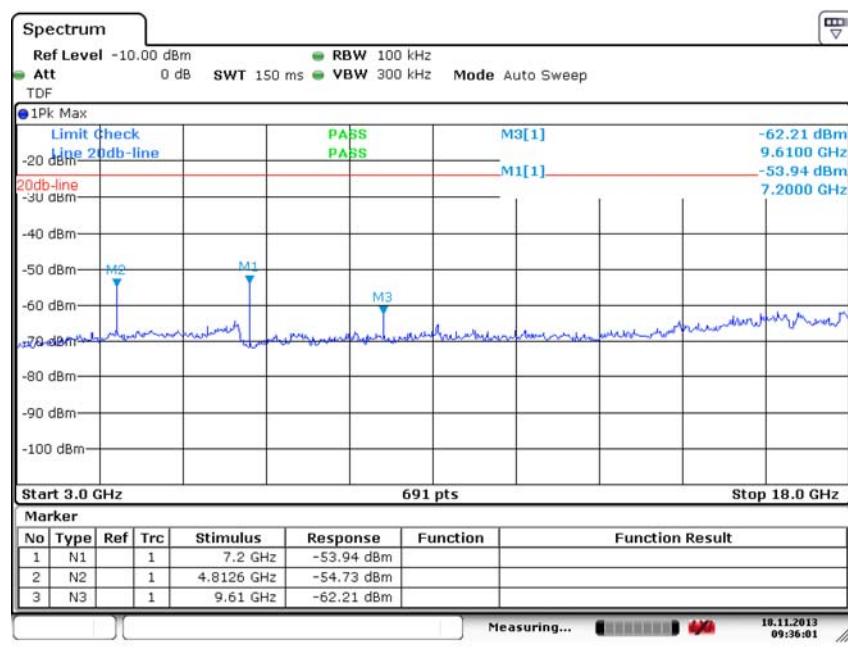
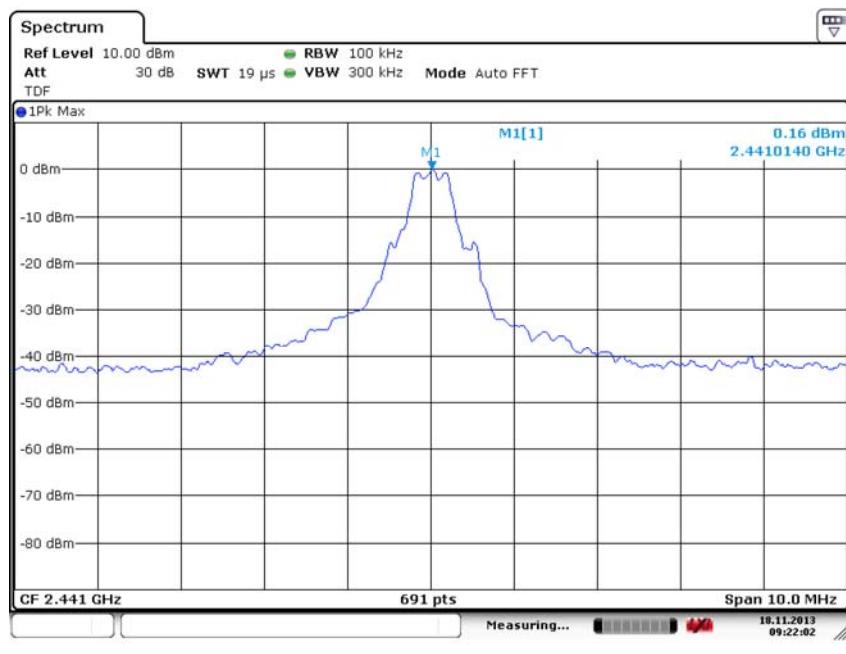
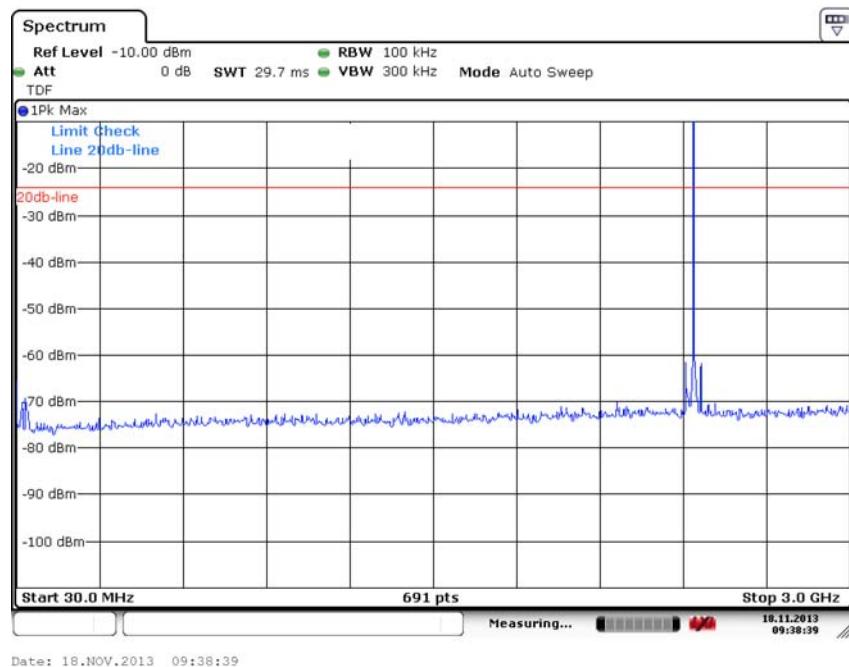
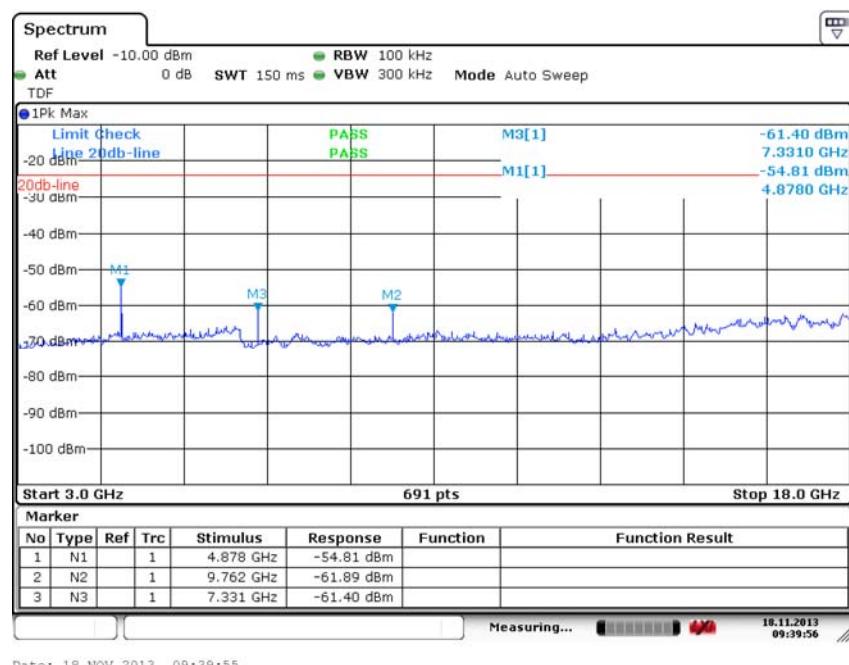
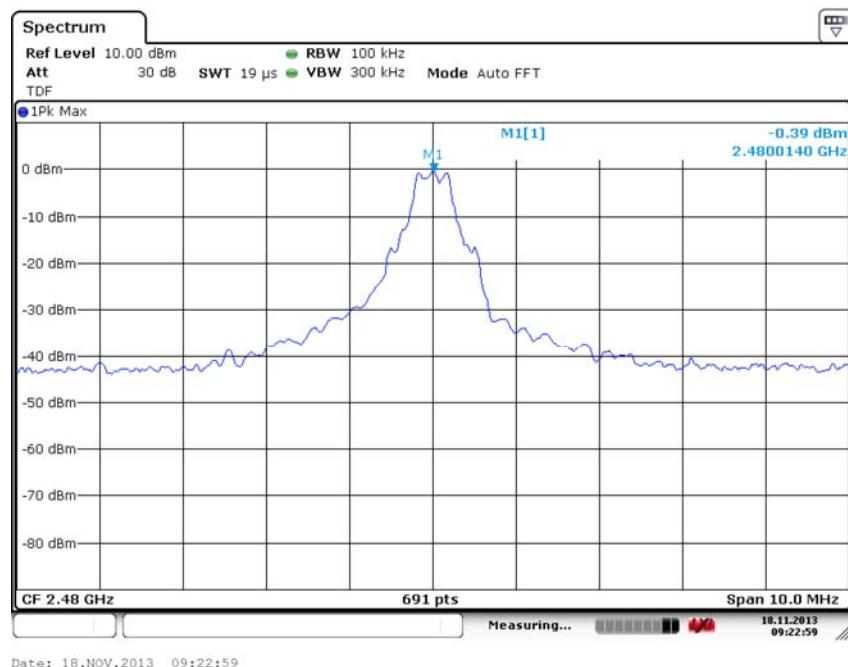
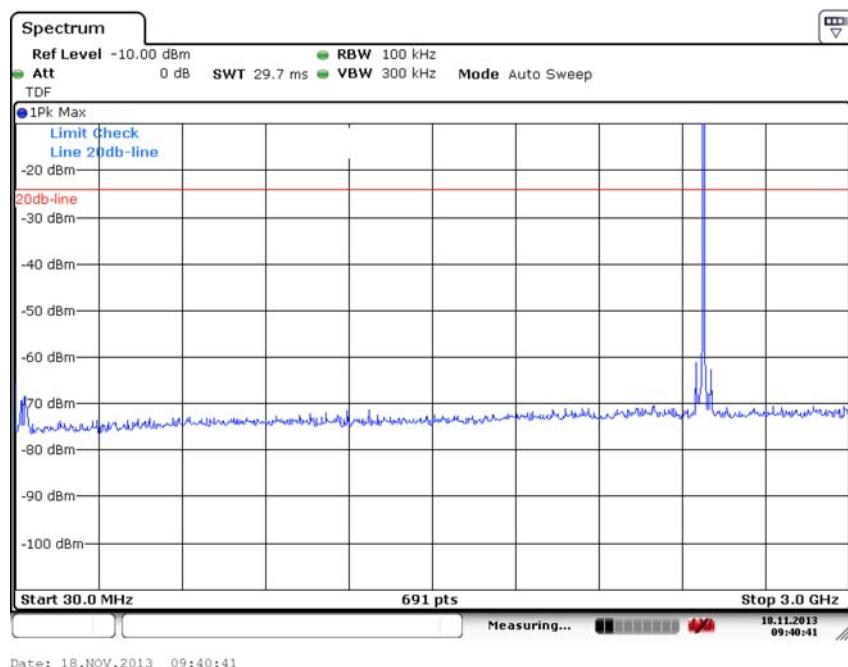


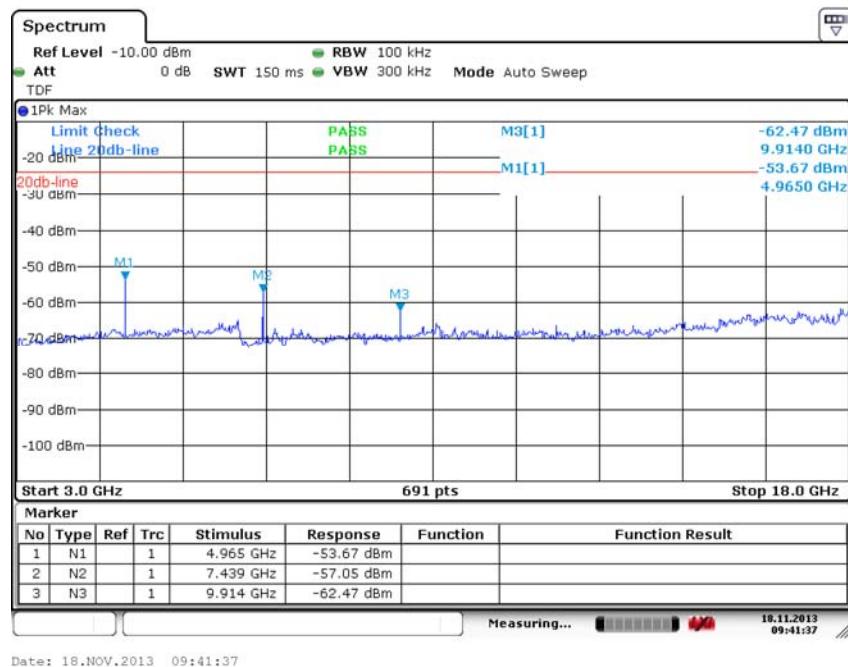
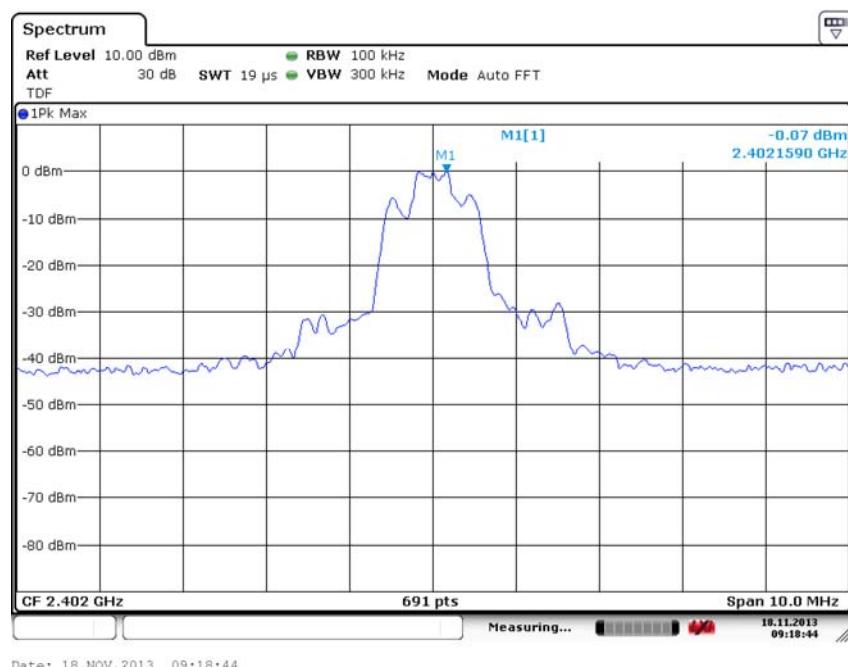
Fig. 24 Conducted Spurious Emission (GFSK, Ch0, 3GHz-18 GHz)

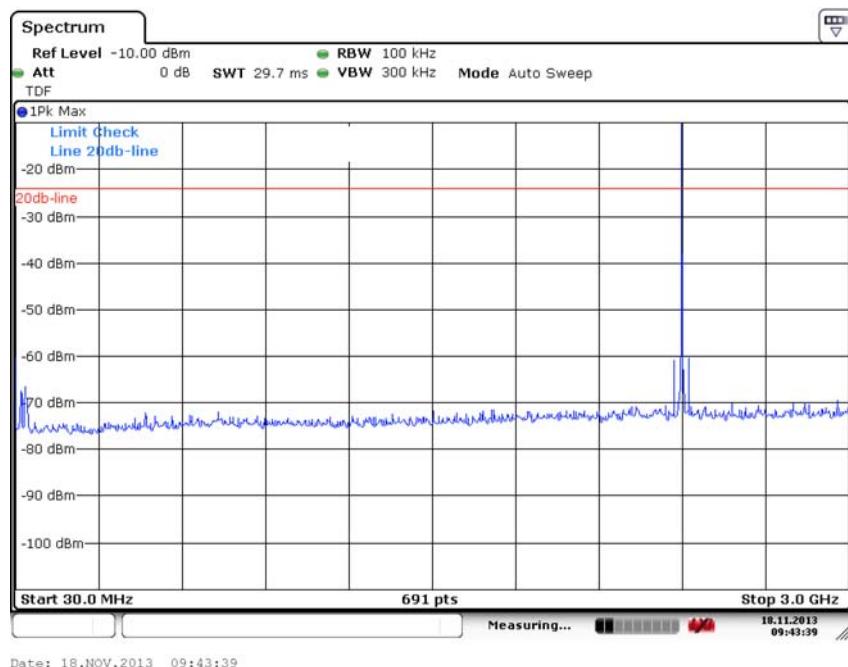


**Fig. 25 Conducted Spurious Emission (GFSK, Ch39, 2.441GHz)**

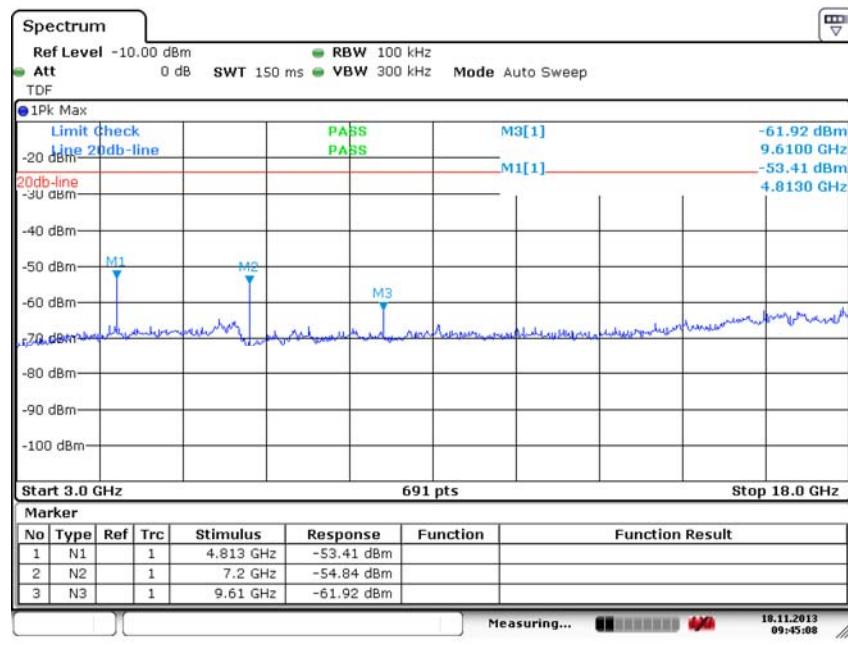

**Fig. 26 Conducted Spurious Emission (GFSK, Ch39, 30 MHz-3 GHz)**

**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 (π/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)**

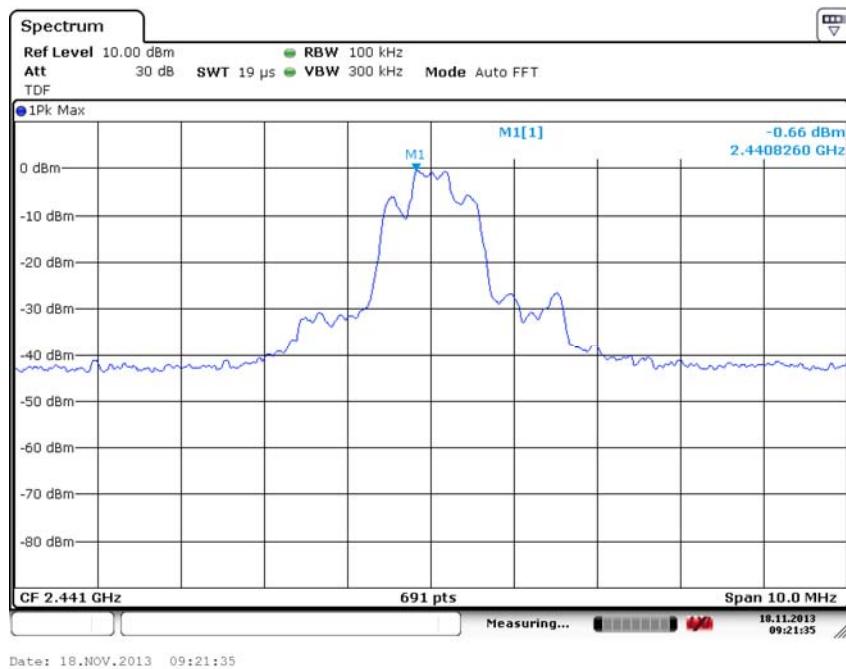


Fig. 34 Conducted Spurious Emission ( $\pi/4$  DQPSK, Ch39, 2.441GHz)

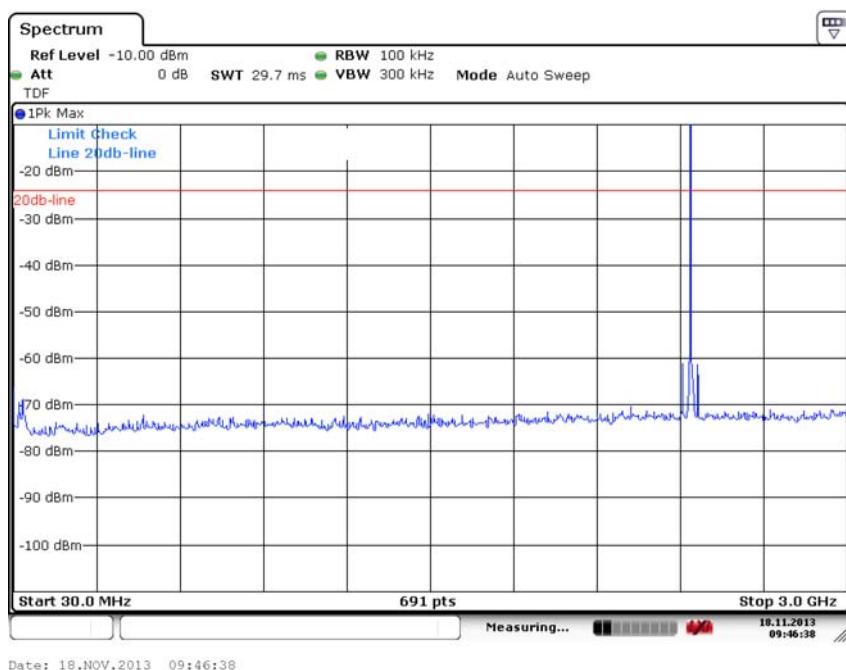
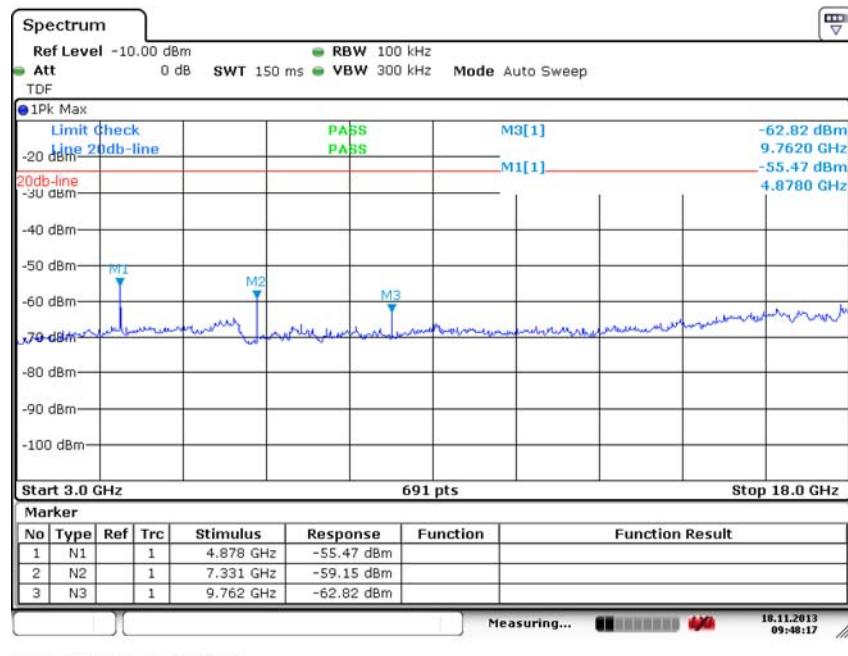
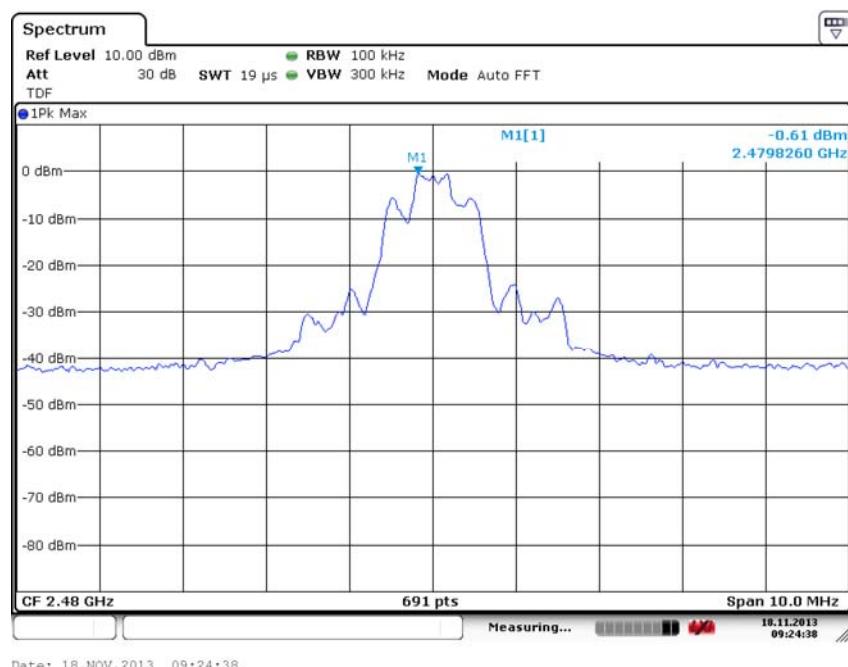


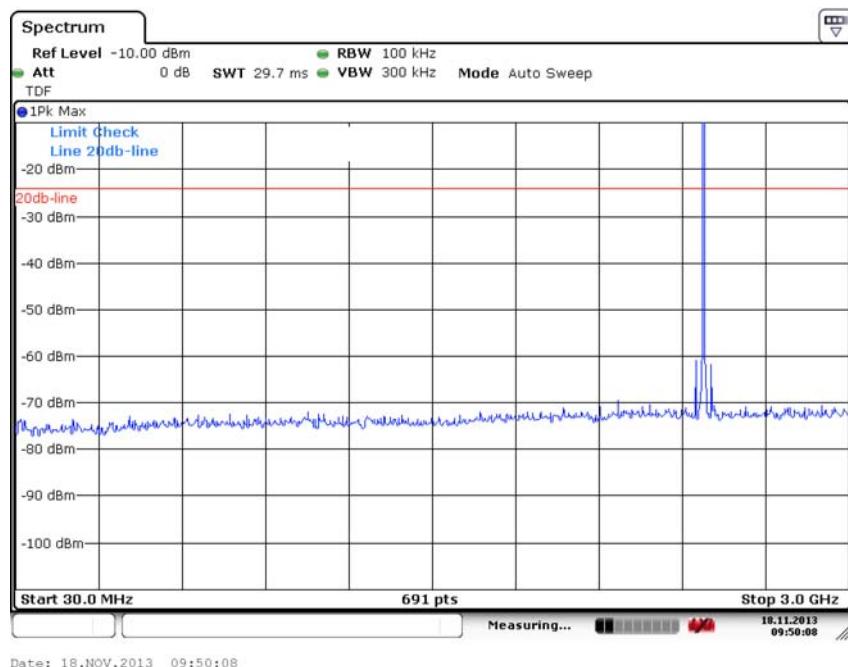
Fig. 35 Conducted Spurious Emission ( $\pi/4$  DQPSK, Ch39, 30 MHz-3 GHz)



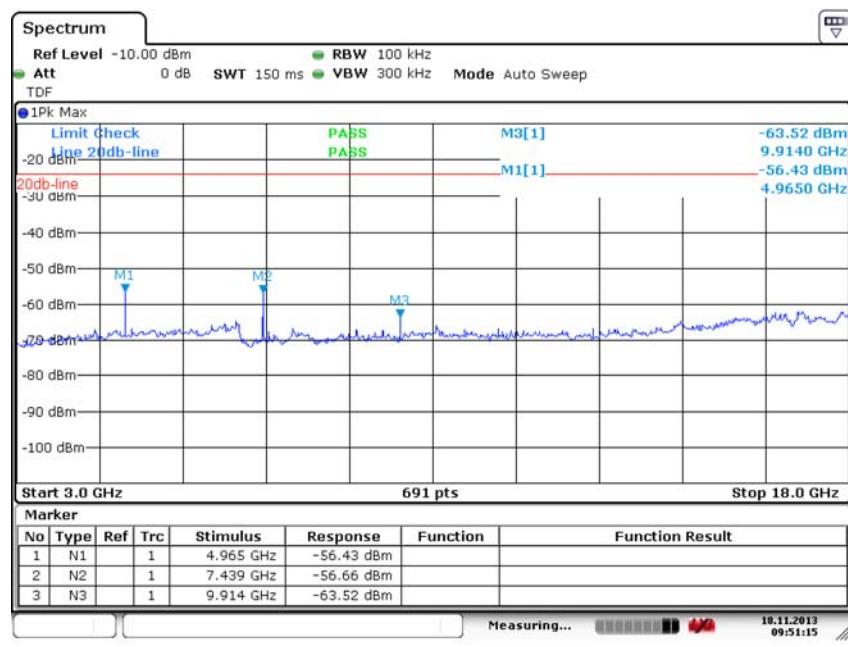
**Fig. 36 Conducted Spurious Emission (  $\pi/4$  DQPSK, Ch39, 3GHz-18 GHz)**



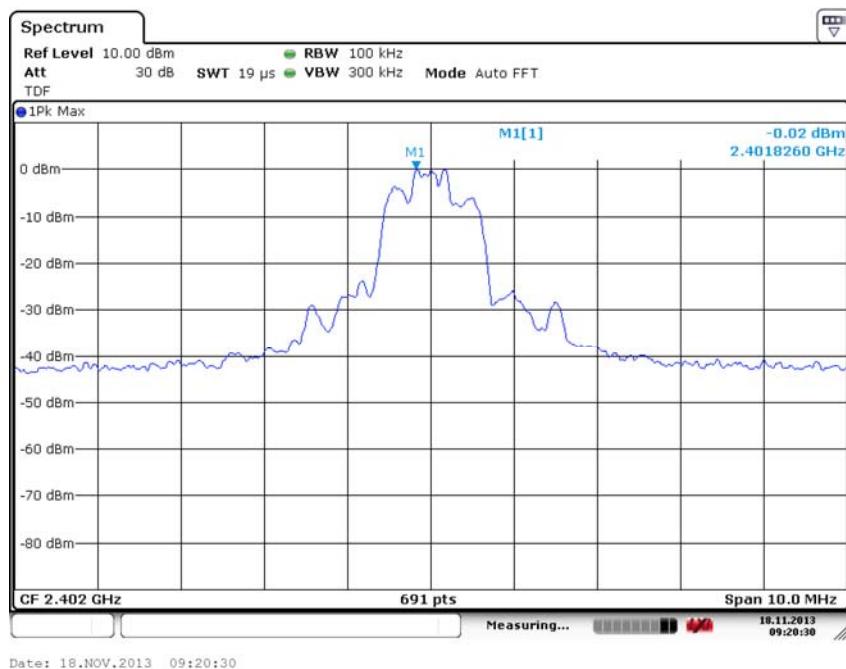
**Fig. 37 Conducted Spurious Emission (  $\pi/4$  DQPSK, Ch78, 2.480GHz)**



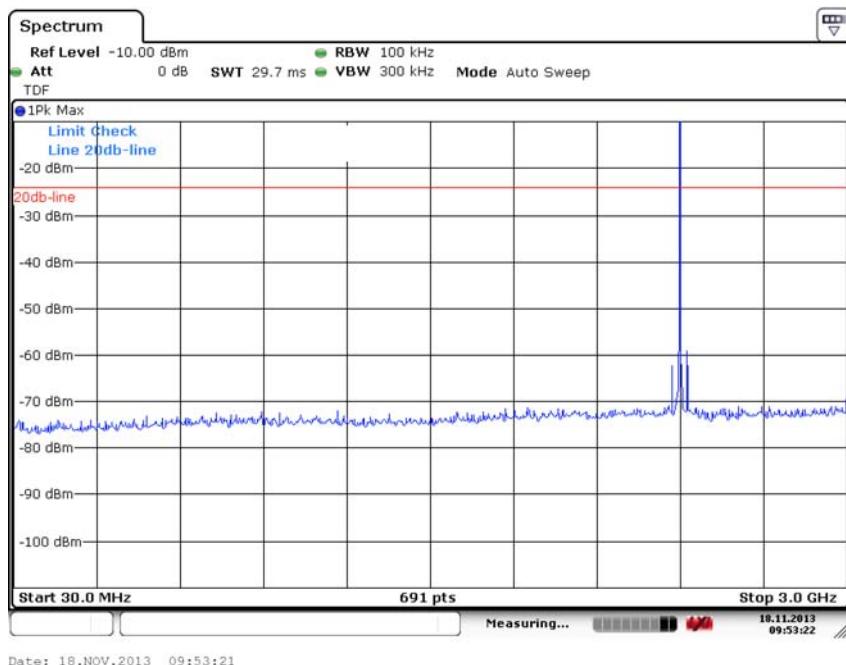
**Fig. 38 Conducted Spurious Emission (  $\pi/4$  DQPSK, Ch78, 30 MHz-3 GHz)**



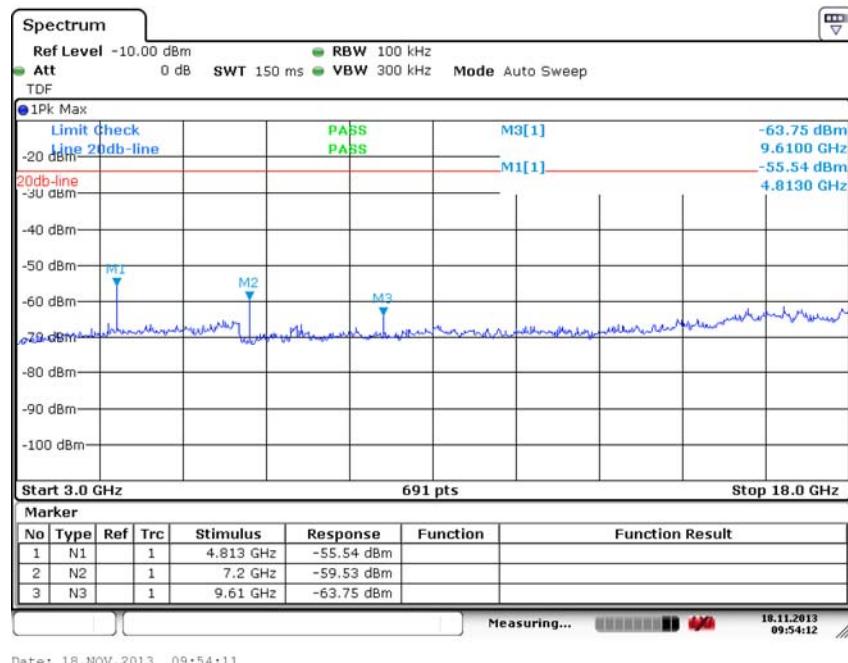
**Fig. 39 Conducted Spurious Emission (  $\pi/4$  DQPSK, Ch78, 3GHz-18 GHz)**



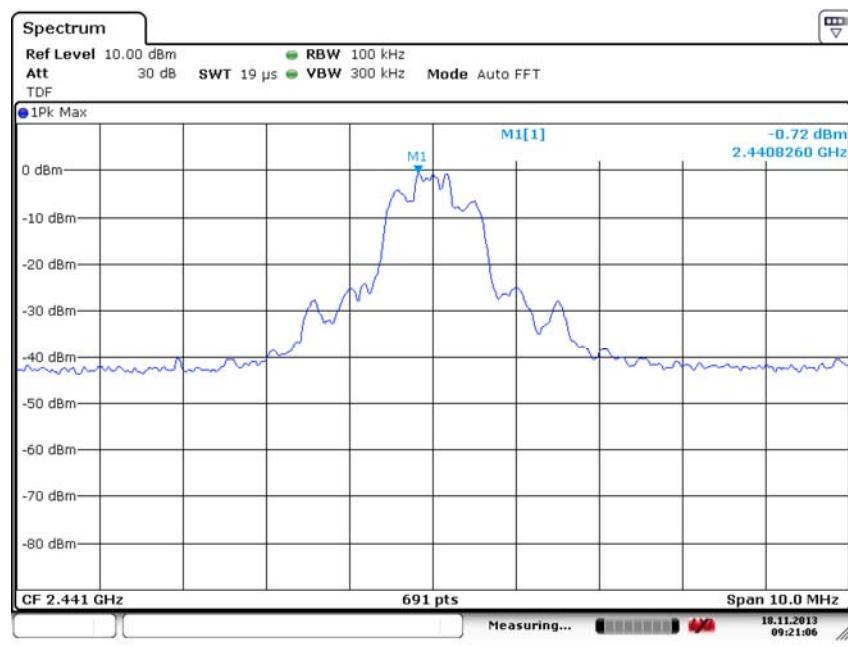
**Fig. 40 Conducted Spurious Emission (8DPSK, Ch0, 2.402GHz)**



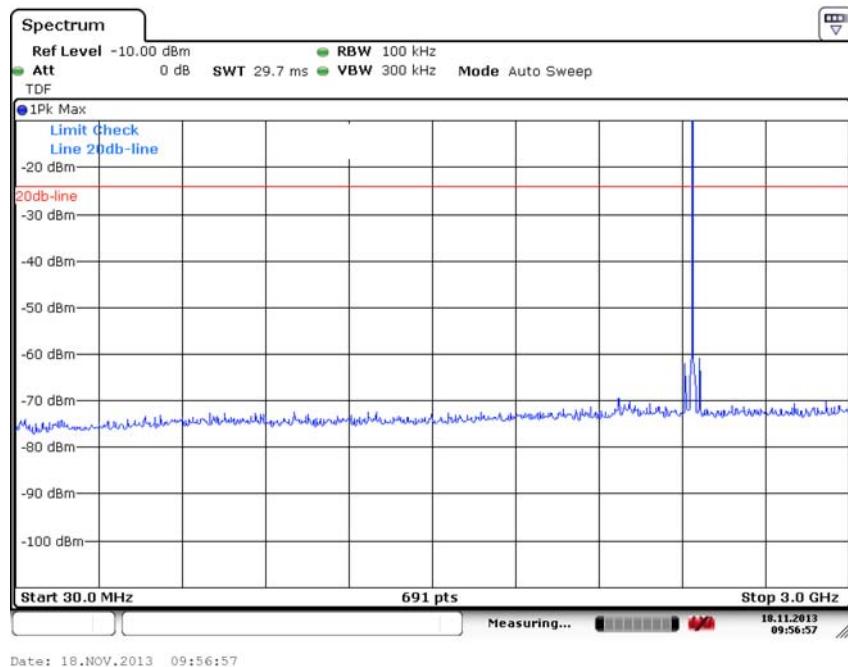
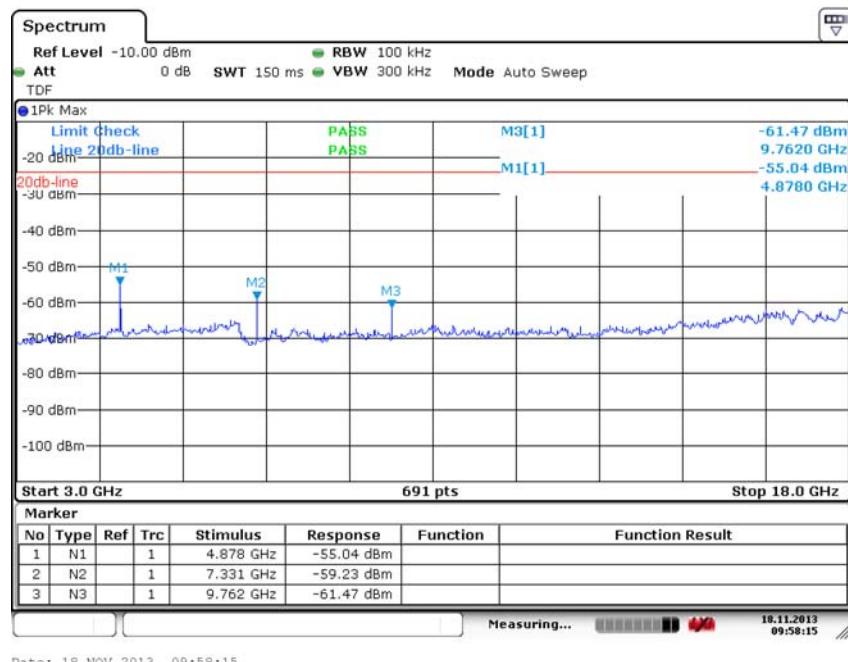
**Fig. 41 Conducted Spurious Emission (8DPSK, Ch0, 30 MHz-3 GHz)**

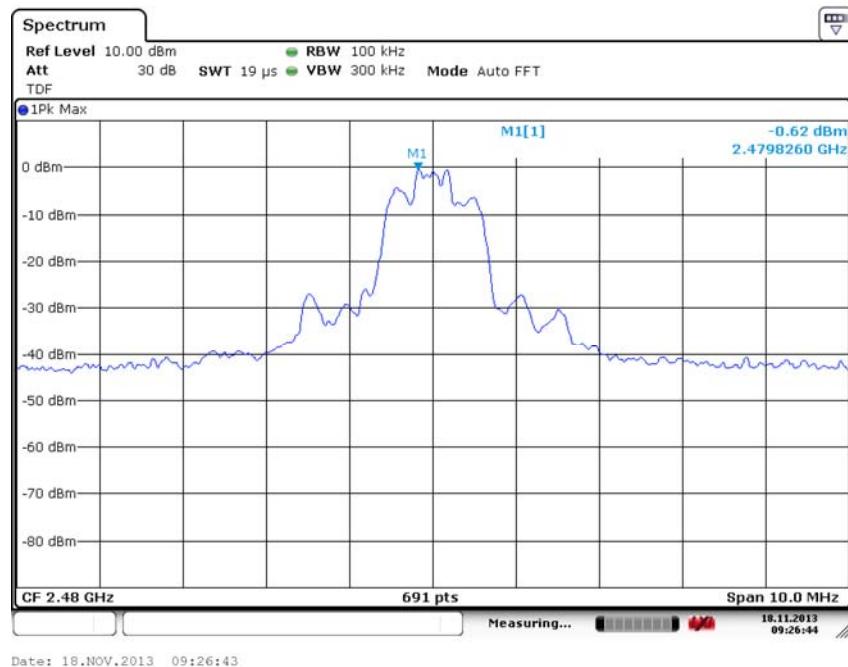


**Fig. 42 Conducted Spurious Emission (8DPSK, Ch0, 3GHz-18 GHz)**

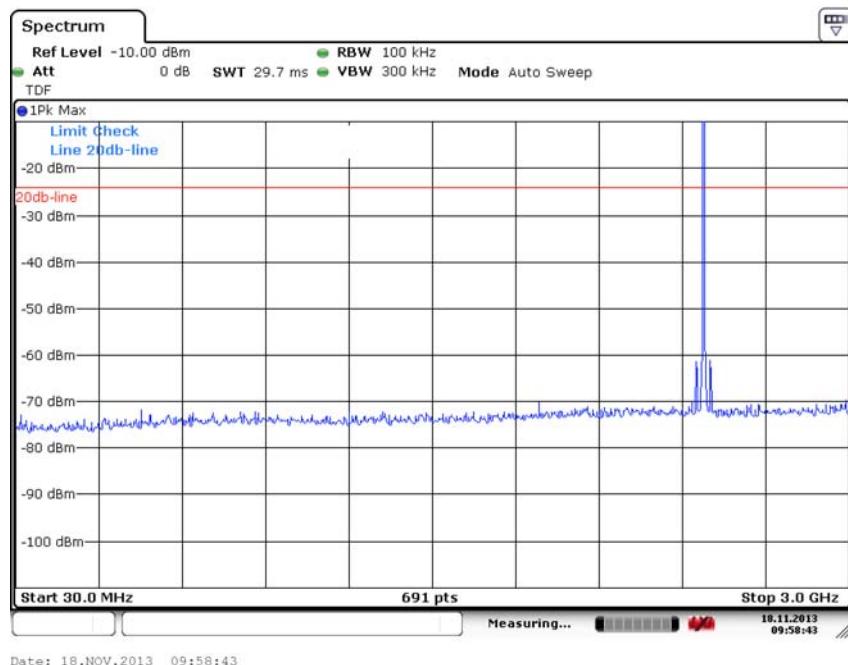


**Fig. 43 Conducted Spurious Emission (8DPSK, Ch39, 2.441GHz)**

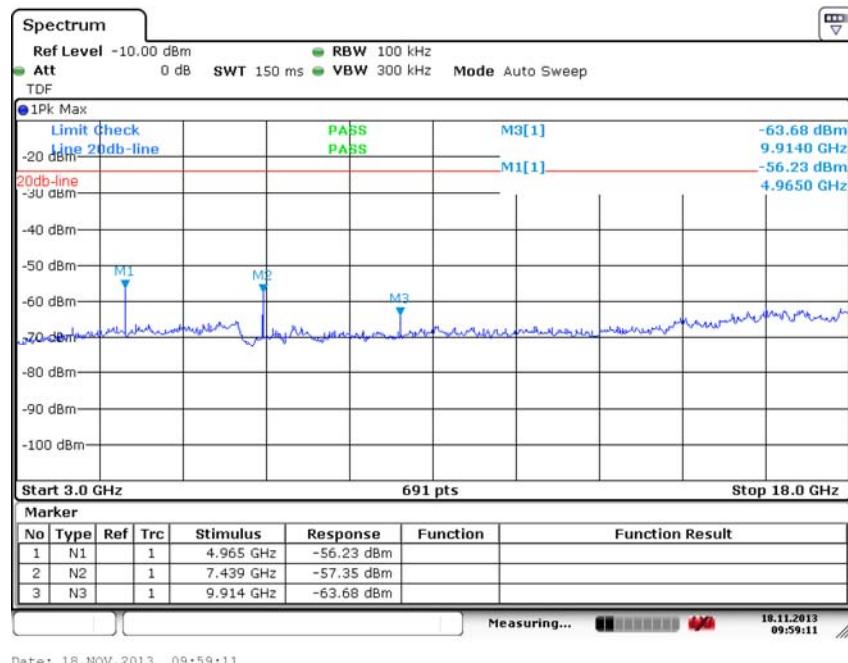
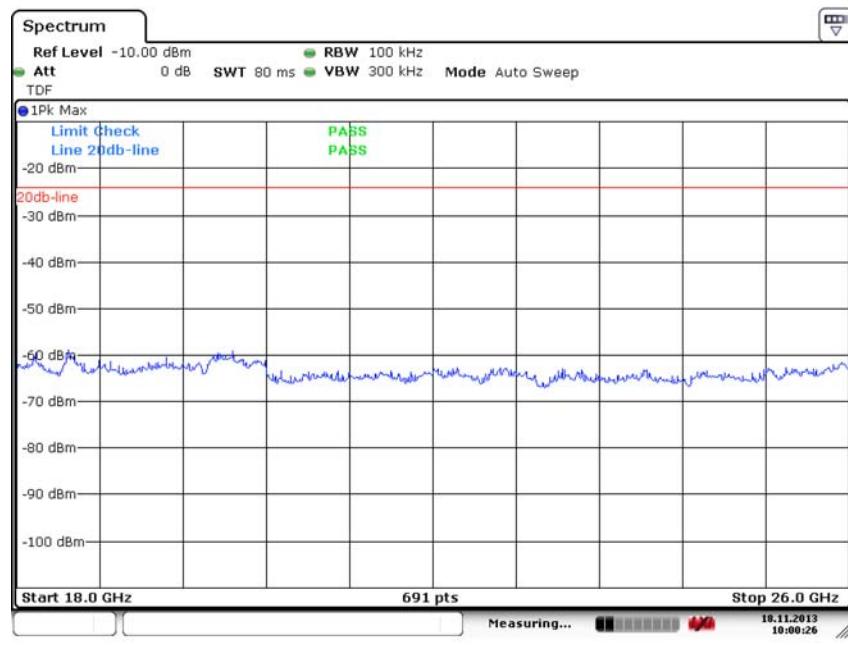

**Fig. 44 Conducted Spurious Emission (8DPSK, Ch39, 30 MHz-3 GHz)**

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

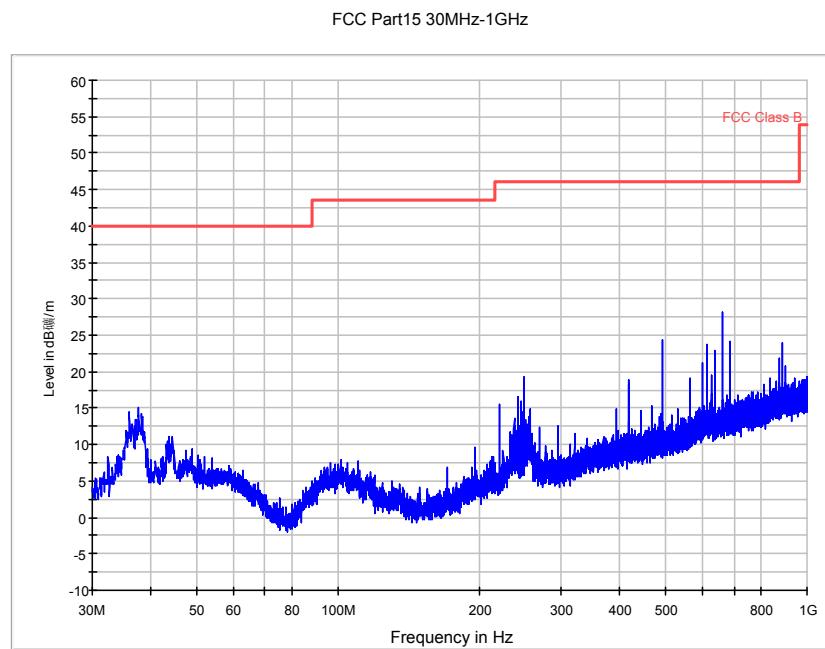


**Fig. 46 Conducted Spurious Emission (8DPSK, Ch78, 2.480GHz)**

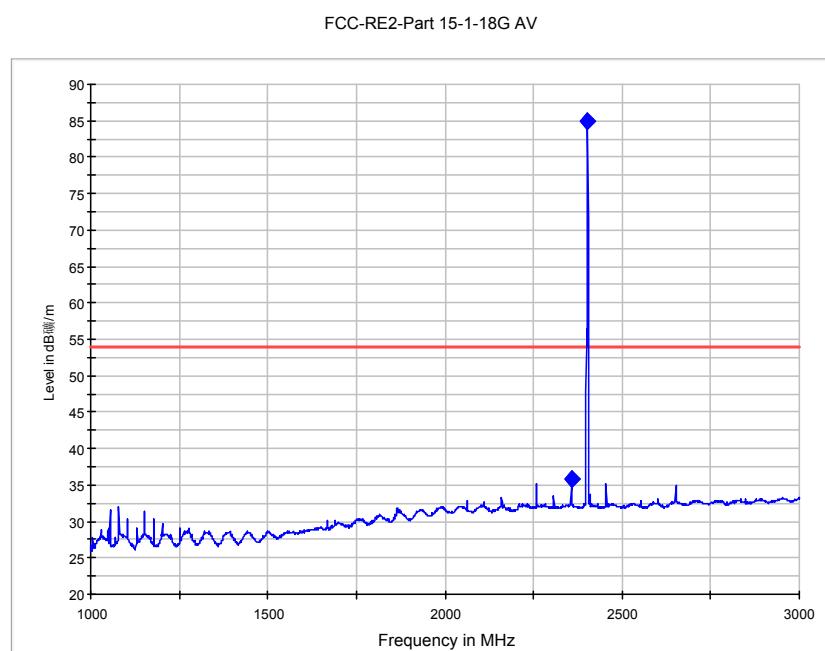


**Fig. 47 Conducted Spurious Emission (8DPSK, Ch78, 30 MHz-3 GHz)**

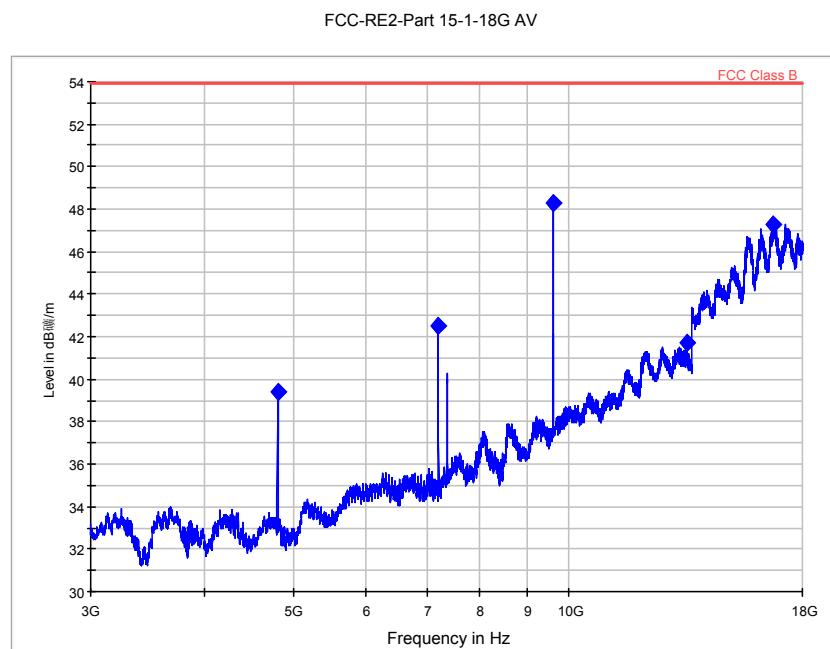
**Fig. 48 Conducted Spurious Emission (8DPSK, Ch78, 3GHz-18 GHz)****Fig. 49 Conducted Spurious Emission (All channel, 18 GHz-26 GHz)**



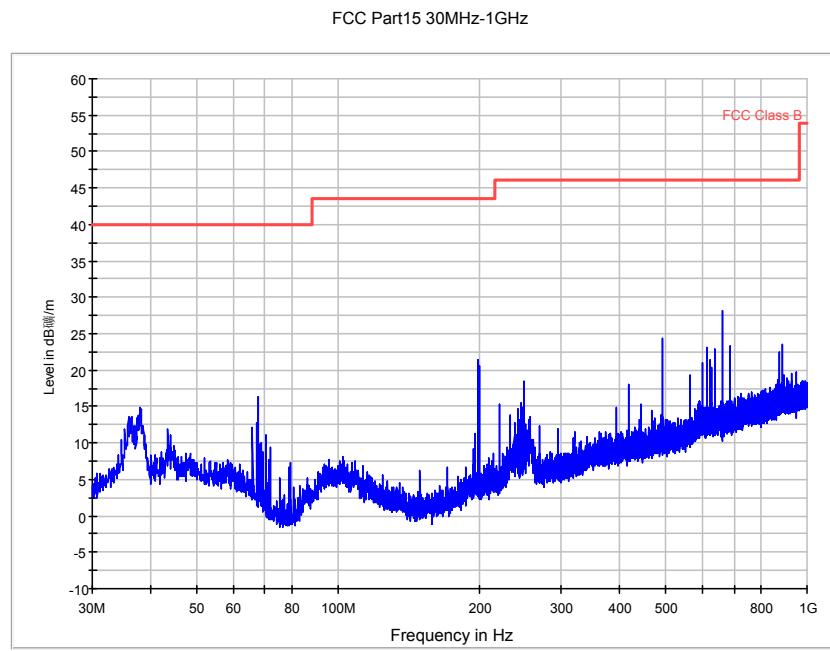
**Fig. 50 Radiated Spurious Emission (GFSK, Ch0, 30MHz ~1 GHz)**



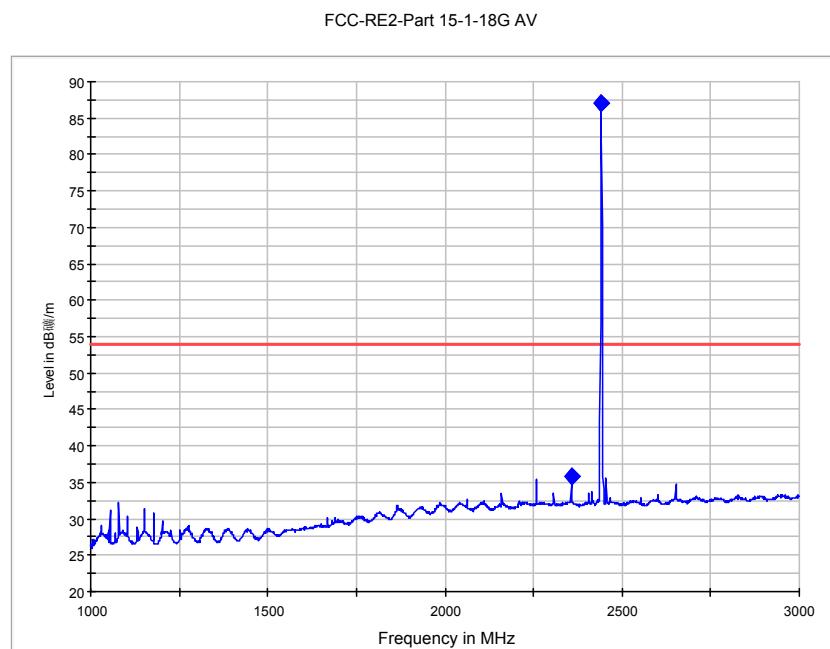
**Fig. 51 Radiated Spurious Emission (GFSK, Ch0, 1 GHz ~3 GHz)**



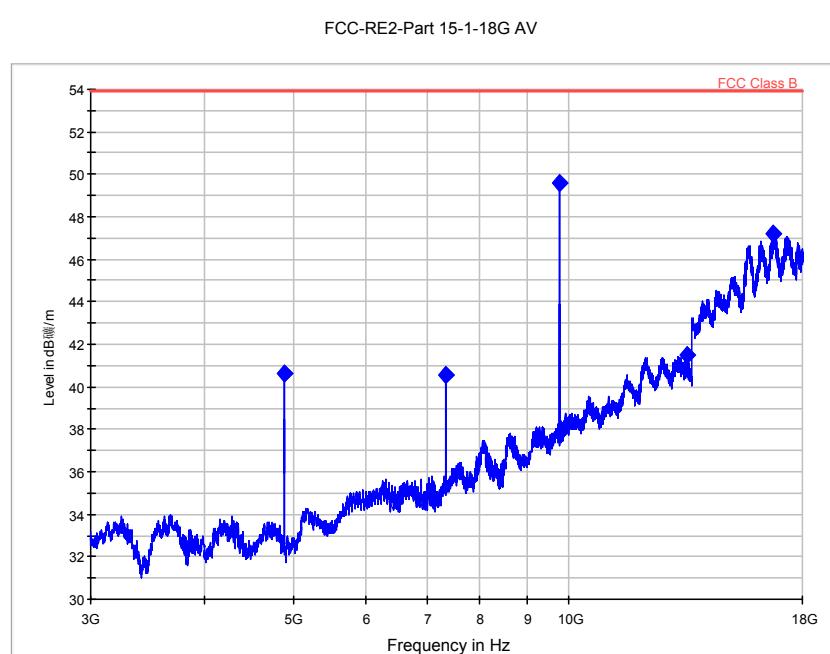
**Fig. 52 Radiated Spurious Emission (GFSK, Ch0, 3 GHz ~18 GHz)**



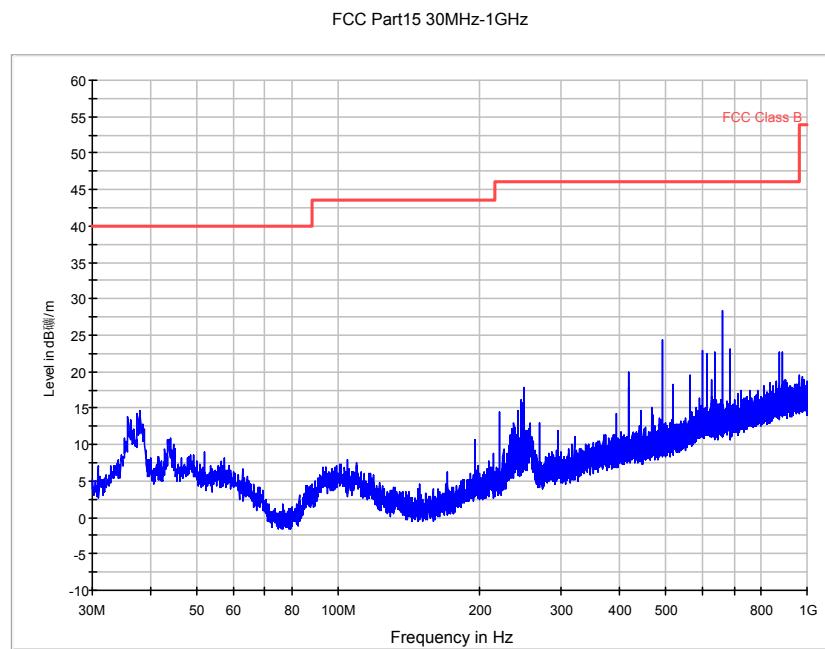
**Fig. 53 Radiated Spurious Emission (GFSK, Ch39, 30MHz ~1 GHz)**



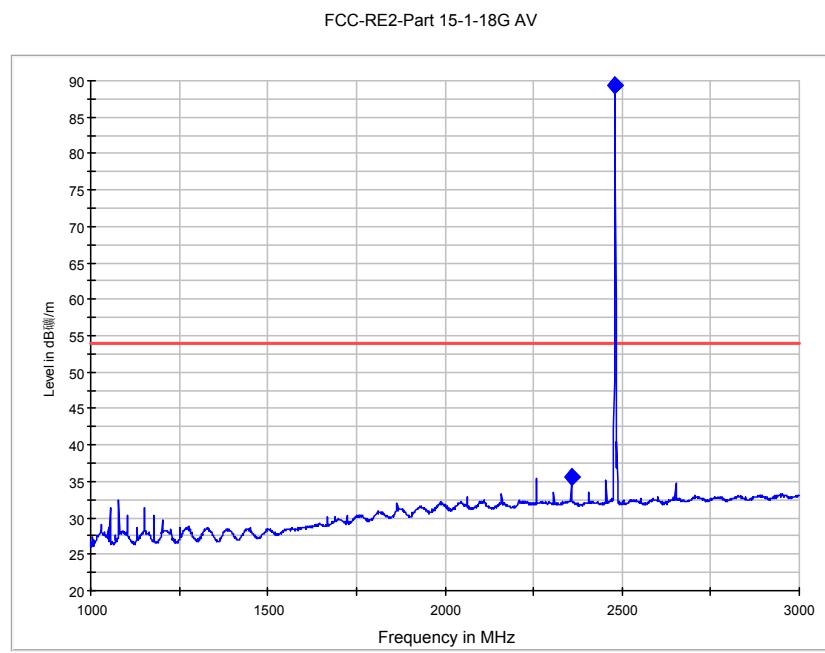
**Fig. 54 Radiated Spurious Emission (GFSK, Ch39, 1 GHz ~3 GHz)**



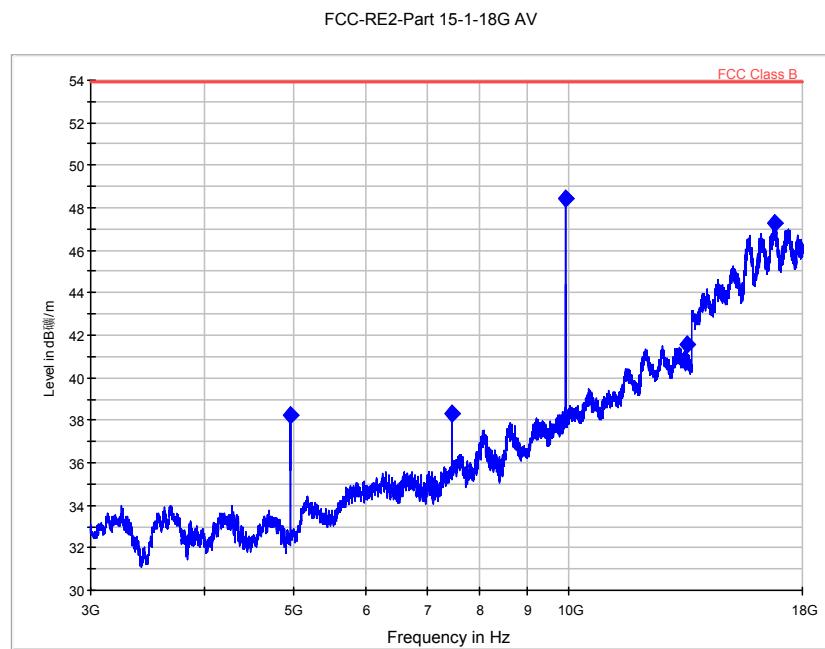
**Fig. 55 Radiated Spurious Emission (GFSK, Ch39, 3 GHz ~18 GHz)**



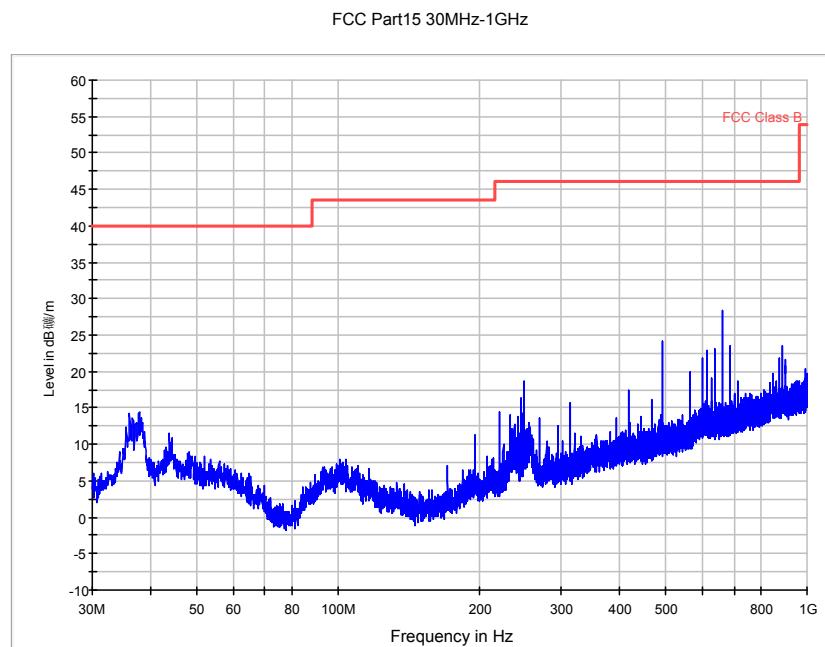
**Fig. 56 Radiated Spurious Emission (GFSK, Ch78, 30MHz ~1 GHz)**



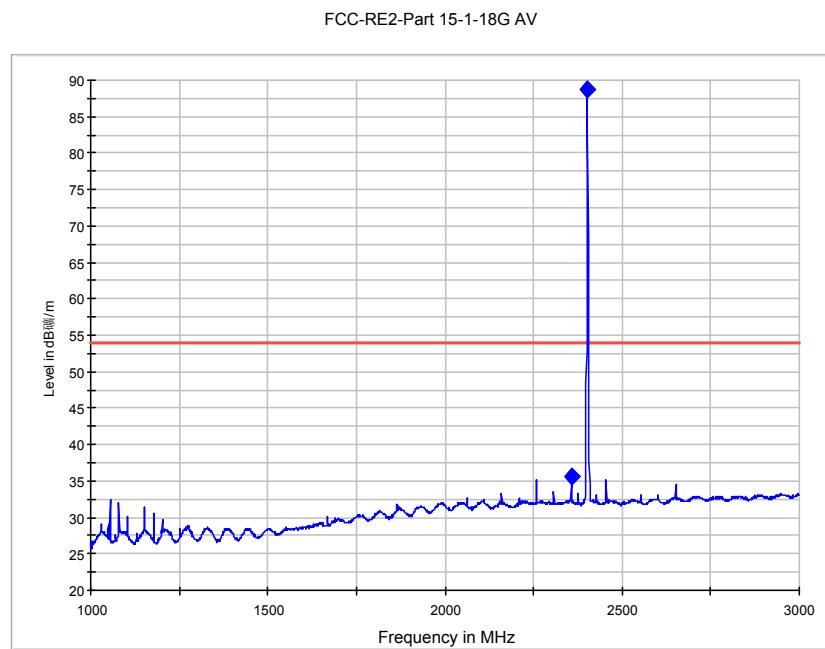
**Fig. 57 Radiated Spurious Emission (GFSK, Ch78, 1 GHz ~3 GHz)**



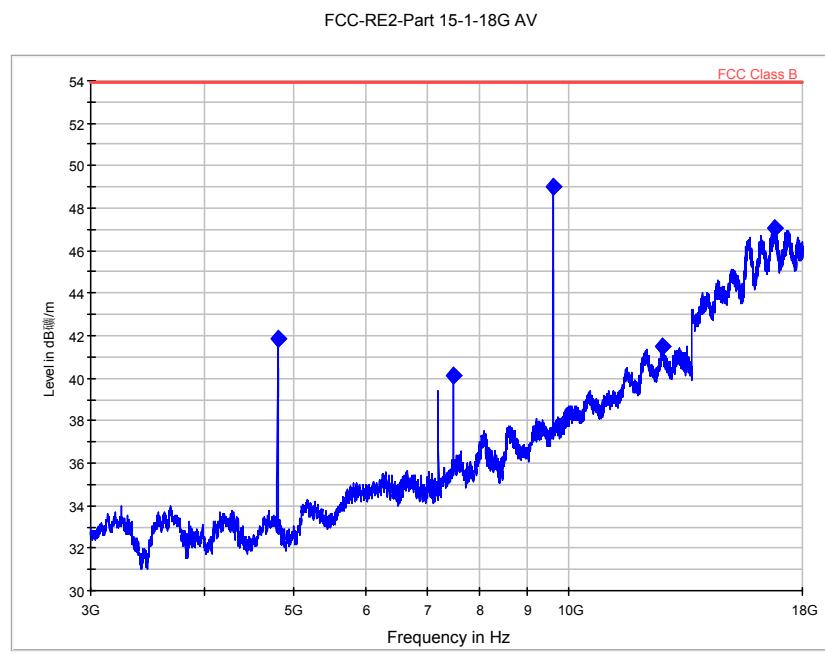
**Fig. 58 Radiated Spurious Emission (GFSK, Ch78, 3 GHz ~18 GHz)**



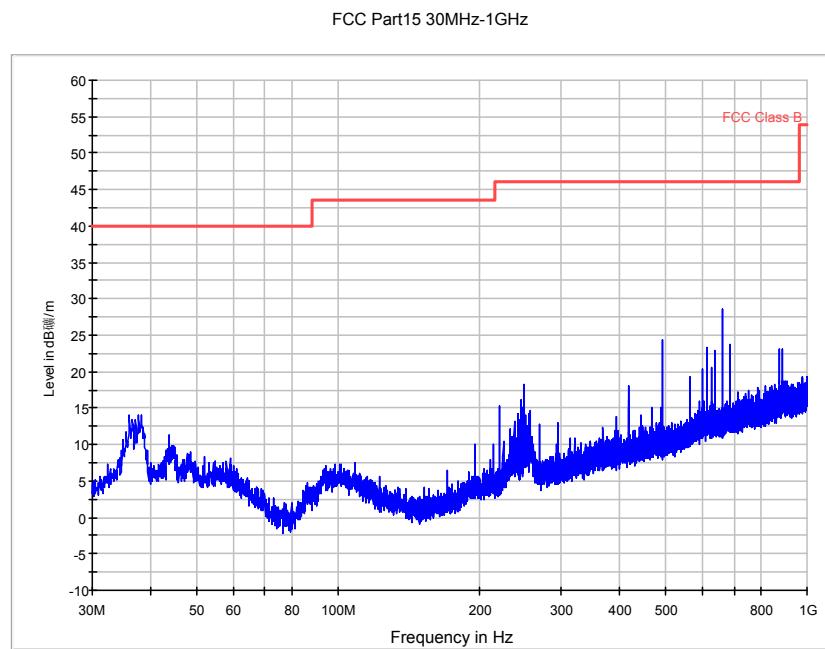
**Fig. 59 Radiated Spurious Emission ( $\pi/4$  DQPSK, Ch0, 30MHz ~1 GHz)**



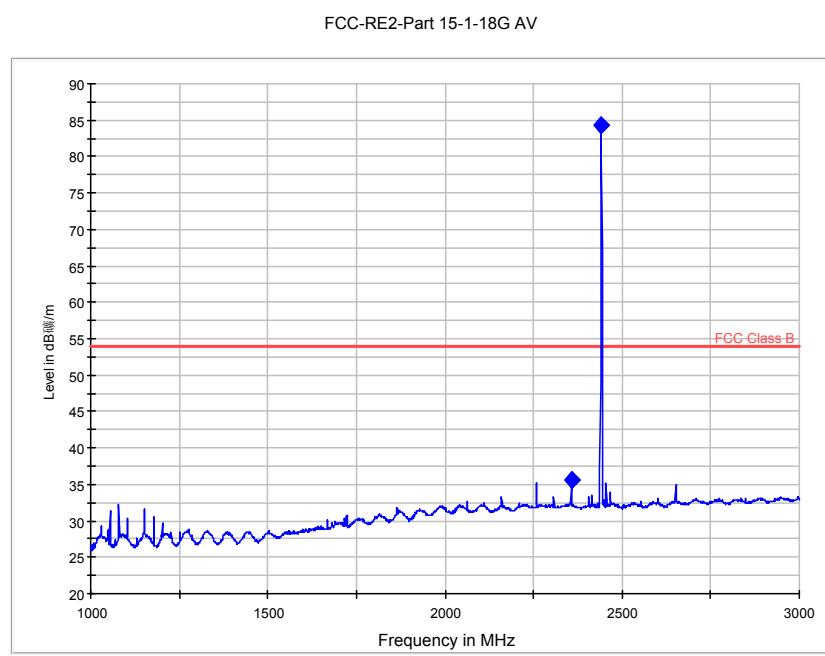
**Fig. 60 Radiated Spurious Emission ( $\pi/4$  DQPSK, Ch0, 1 GHz ~3 GHz)**



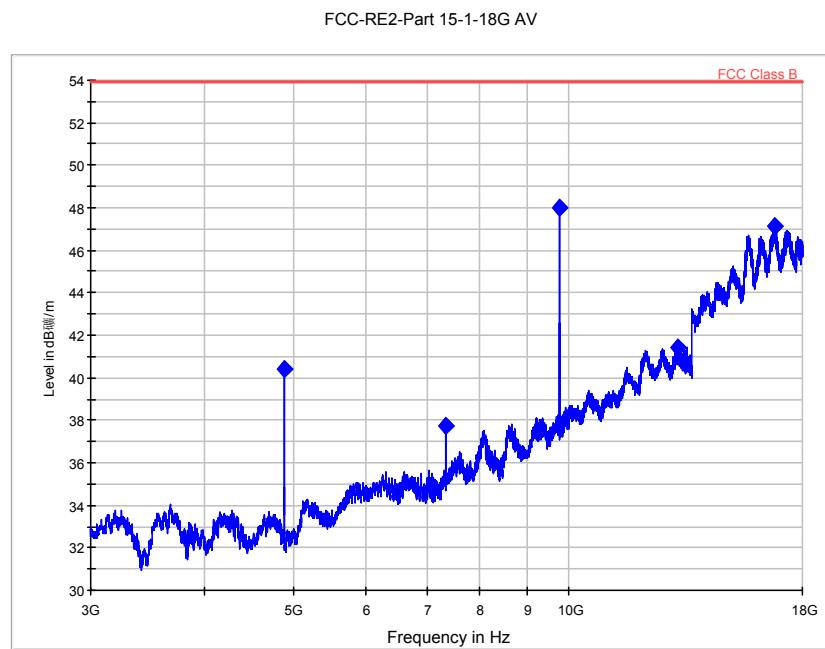
**Fig. 61 Radiated Spurious Emission ( $\pi/4$  DQPSK, Ch0, 3 GHz ~18 GHz)**



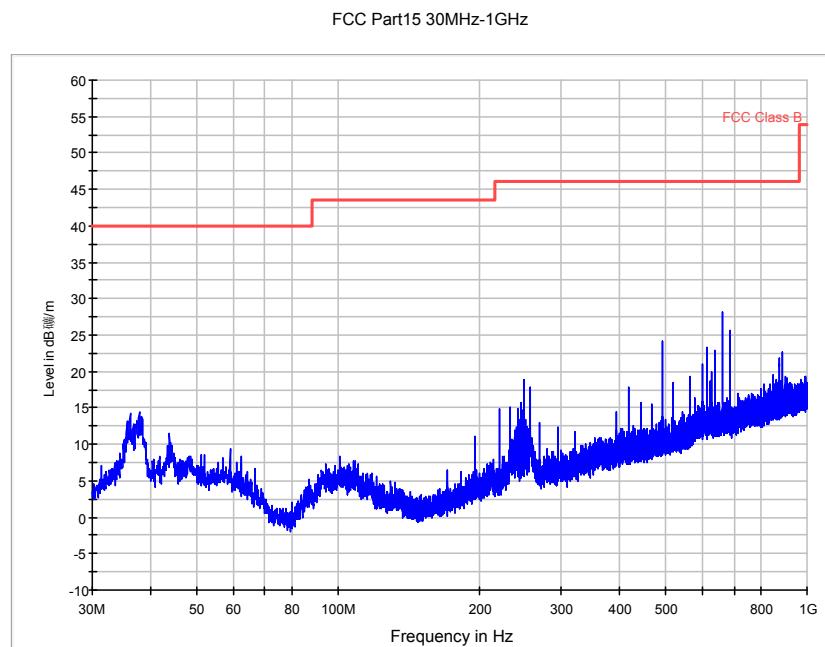
**Fig. 62 Radiated Spurious Emission (  $\pi/4$  DQPSK, Ch39, 30MHz ~1 GHz)**



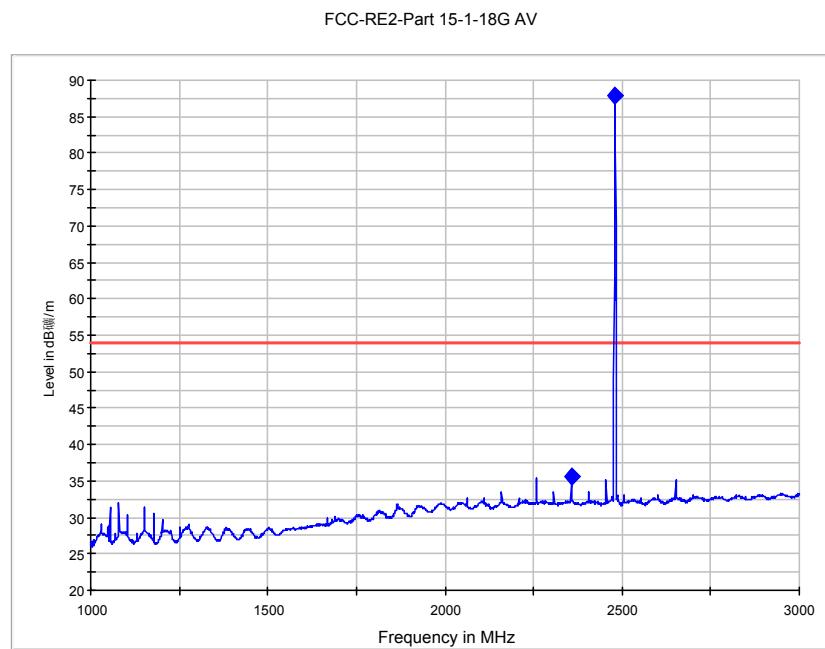
**Fig. 63 Radiated Spurious Emission (  $\pi/4$  DQPSK, Ch39, 1 GHz ~3 GHz)**



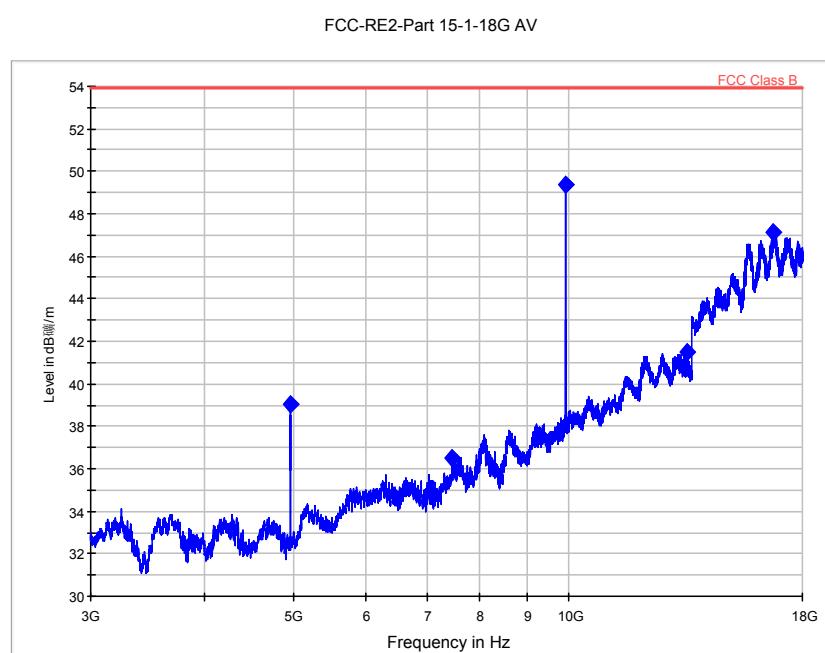
**Fig. 64 Radiated Spurious Emission (  $\pi/4$  DQPSK, Ch39, 3 GHz ~18 GHz)**



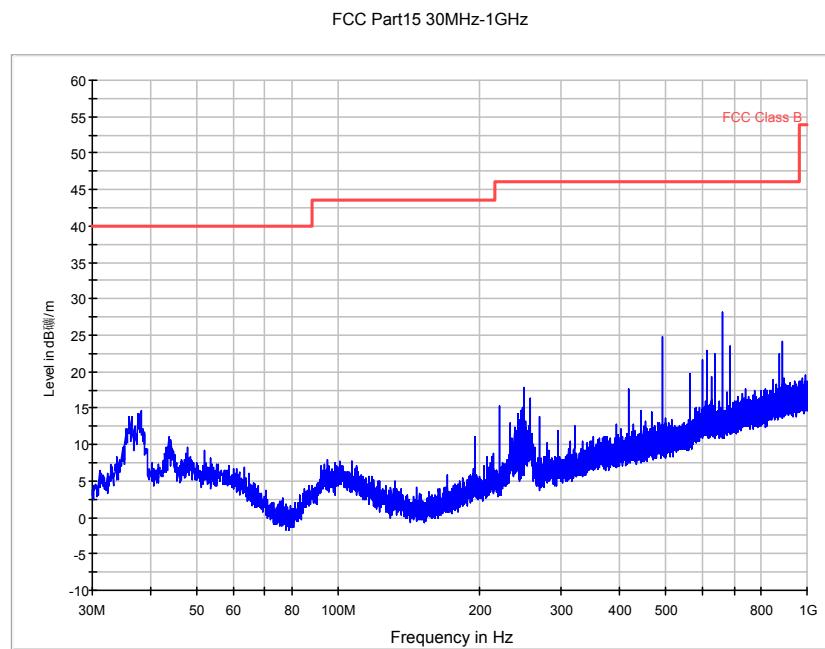
**Fig. 65 Radiated Spurious Emission (  $\pi/4$  DQPSK, Ch78, 30MHz ~1 GHz)**



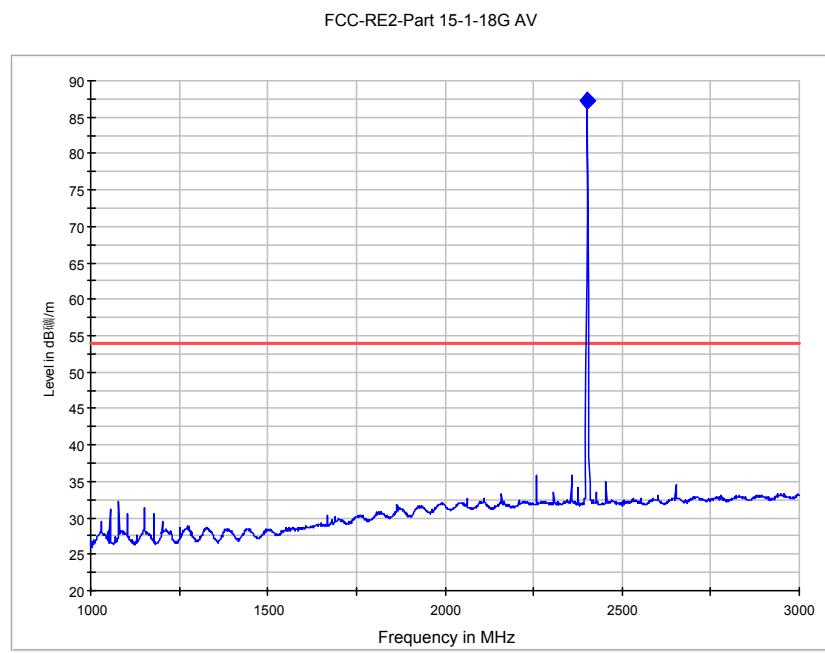
**Fig. 66 Radiated Spurious Emission ( $\pi/4$  DQPSK, Ch78, 1 GHz ~3 GHz)**



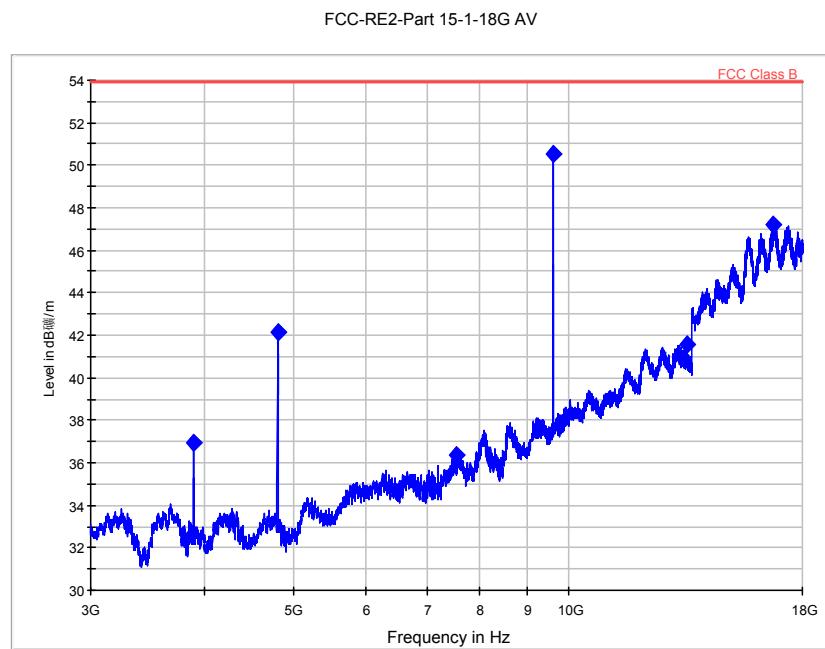
**Fig. 67 Radiated Spurious Emission ( $\pi/4$  DQPSK, Ch78, 3 GHz ~18 GHz)**



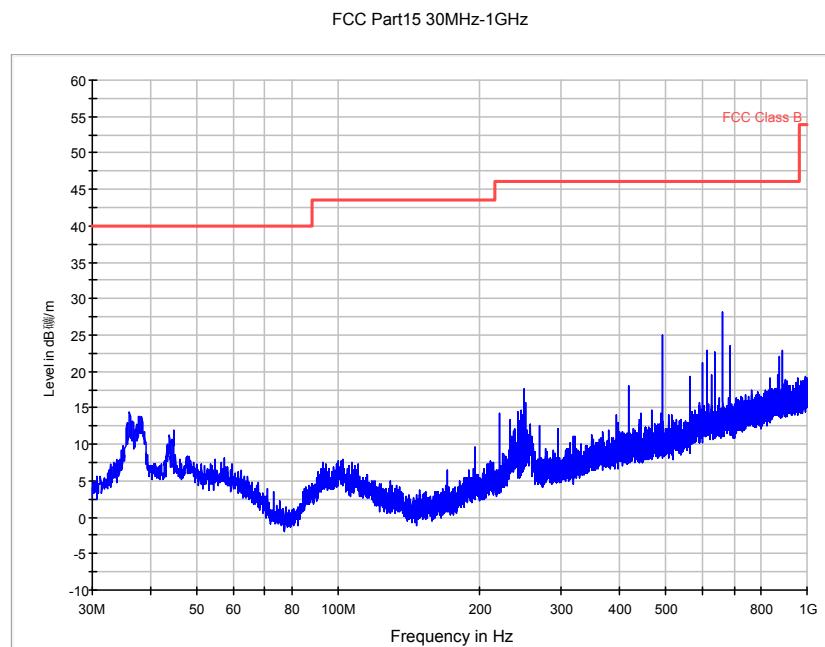
**Fig. 68 Radiated Spurious Emission (8DPSK, Ch0, 30MHz ~1 GHz)**



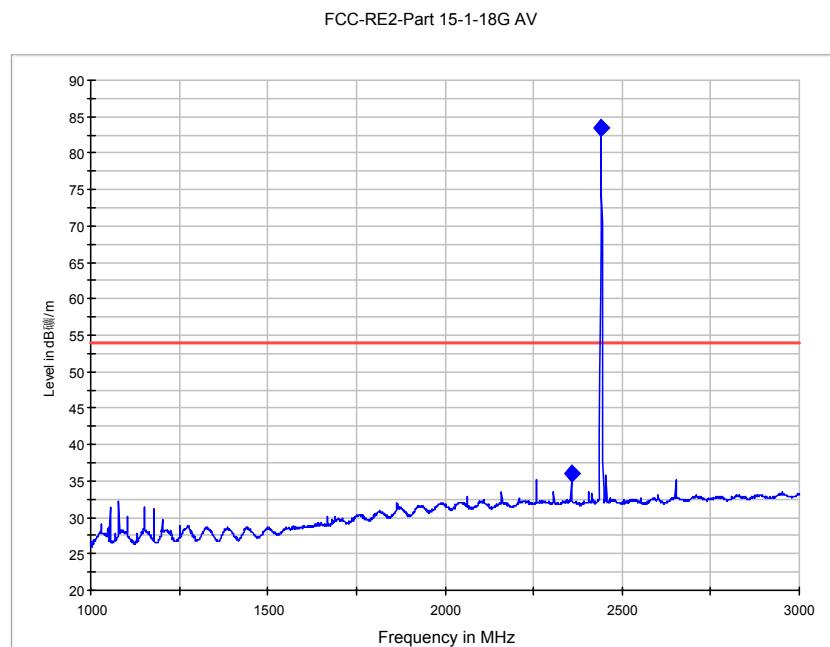
**Fig. 69 Radiated Spurious Emission (8DPSK, Ch0, 1 GHz ~3 GHz)**



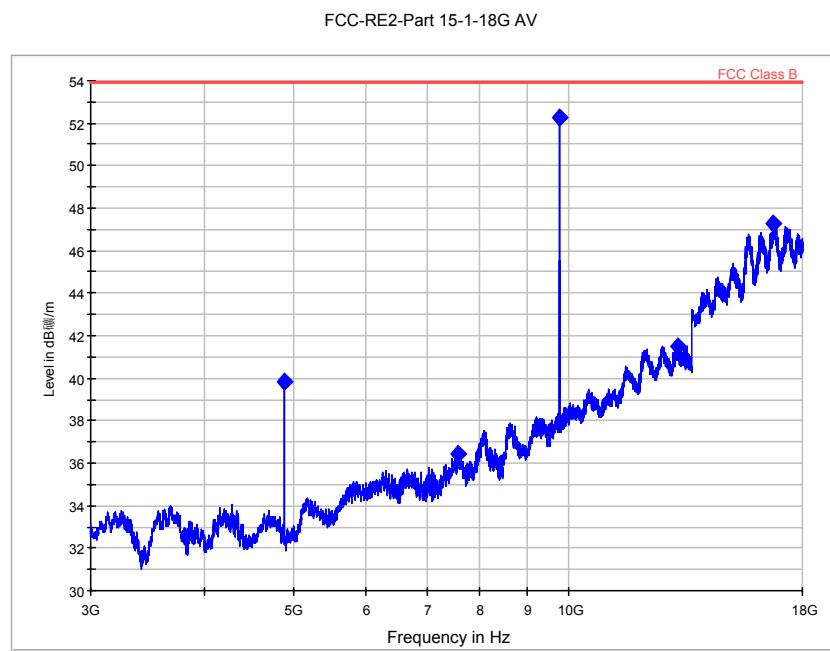
**Fig. 70 Radiated Spurious Emission (8DPSK, Ch0, 3 GHz ~18 GHz)**



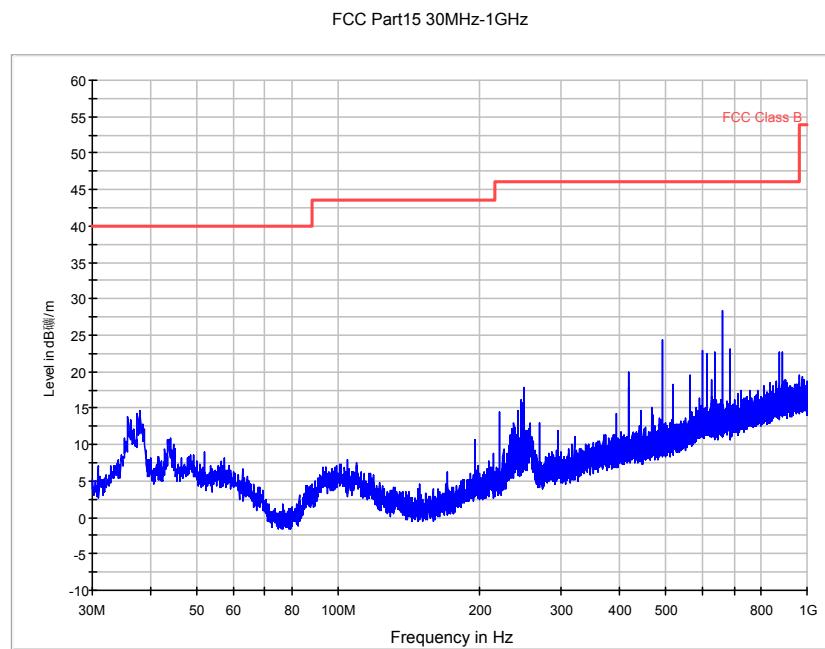
**Fig. 71 Radiated Spurious Emission (8DPSK, Ch39, 30MHz ~1 GHz)**



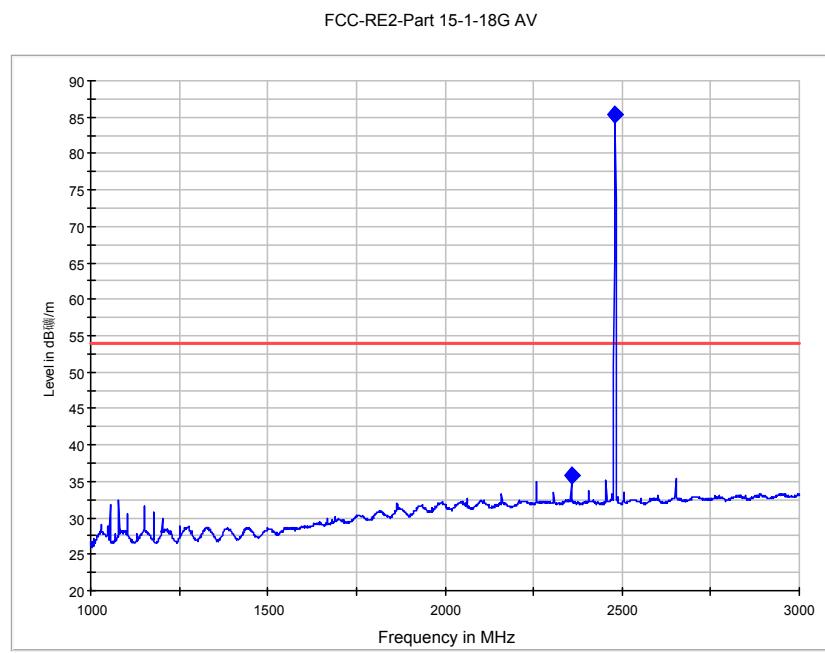
**Fig. 72 Radiated Spurious Emission (8DPSK, Ch39, 1 GHz ~3 GHz)**



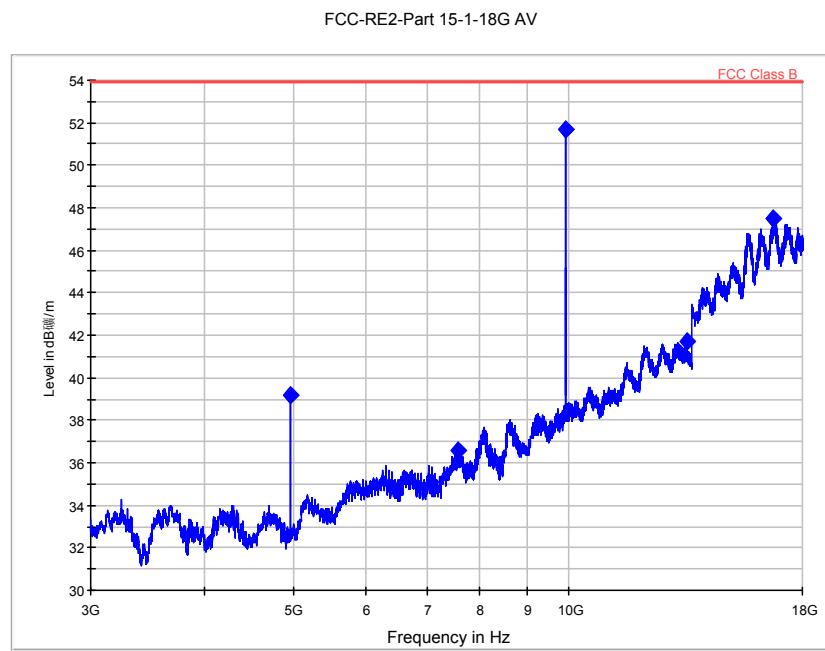
**Fig. 73 Radiated Spurious Emission (8DPSK, Ch39, 3 GHz ~18 GHz)**



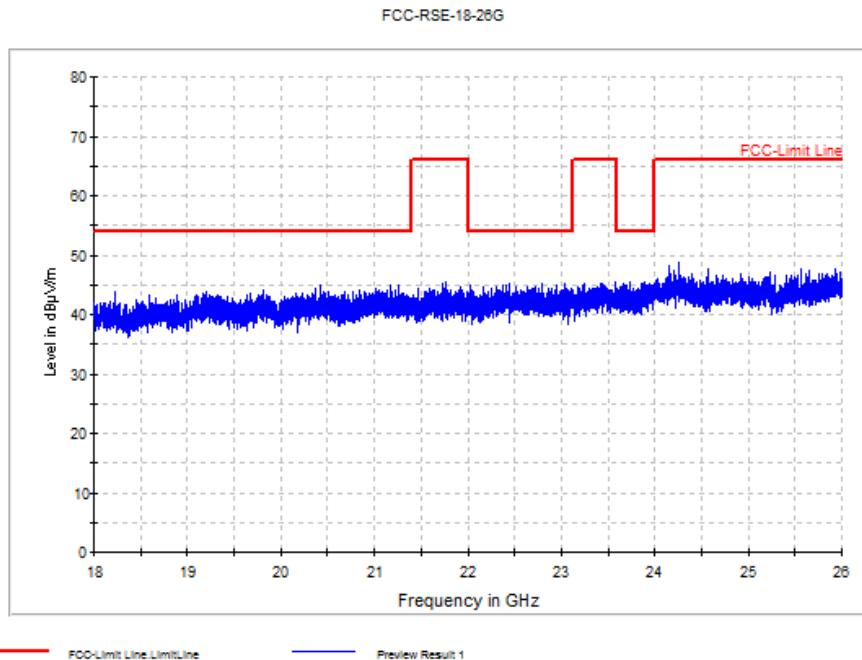
**Fig. 74 Radiated Spurious Emission (8DPSK, Ch78, 30MHz ~1 GHz)**



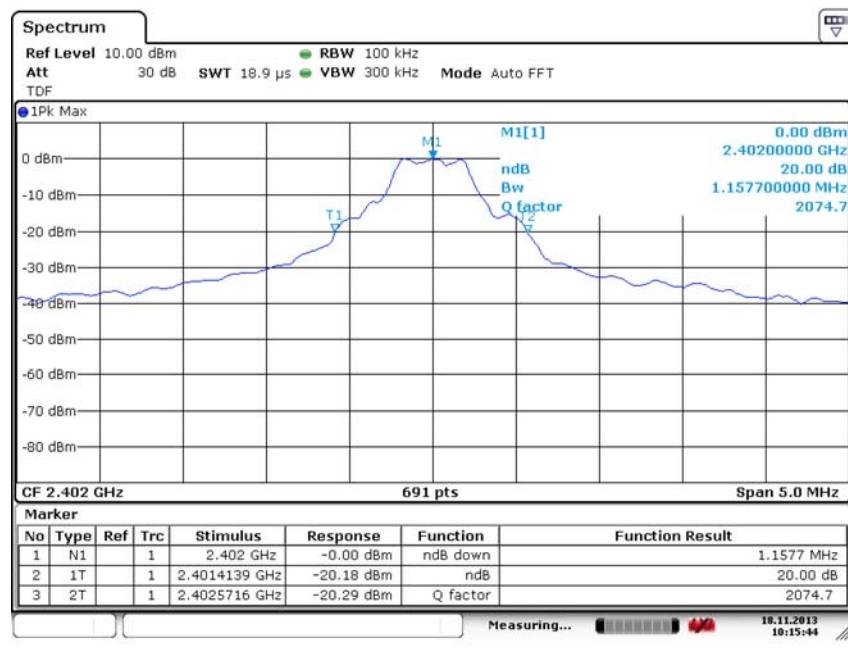
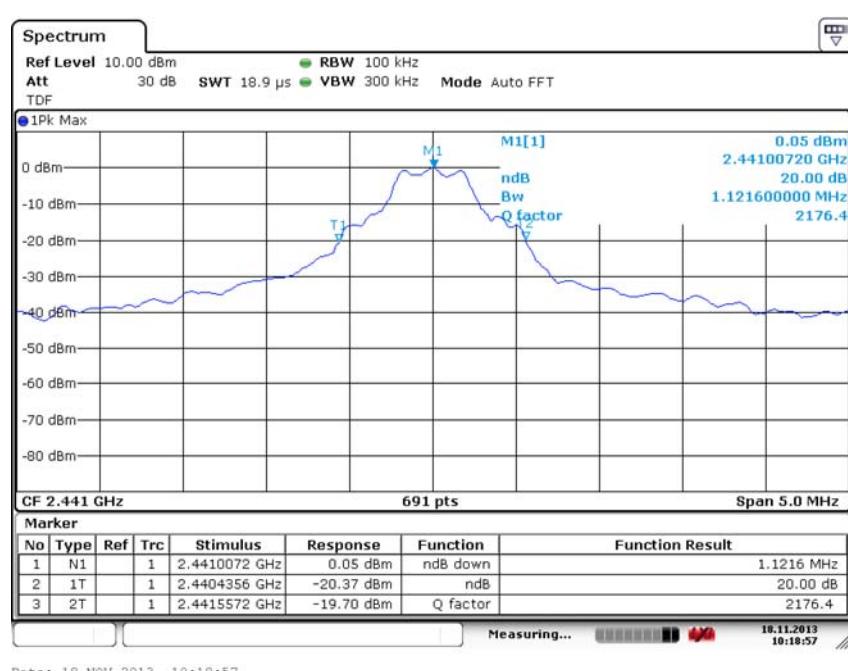
**Fig. 75 Radiated Spurious Emission (8DPSK, Ch78, 1 GHz ~3 GHz)**

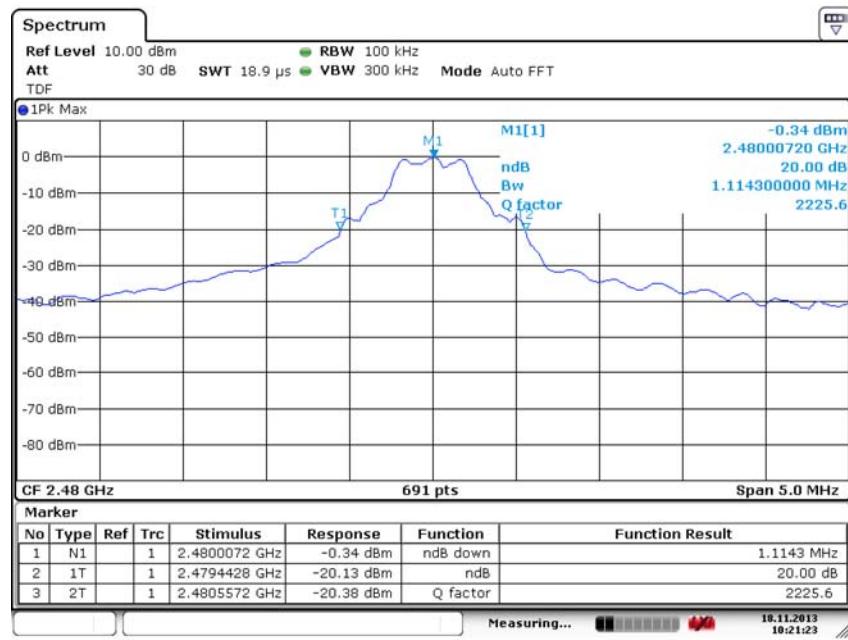
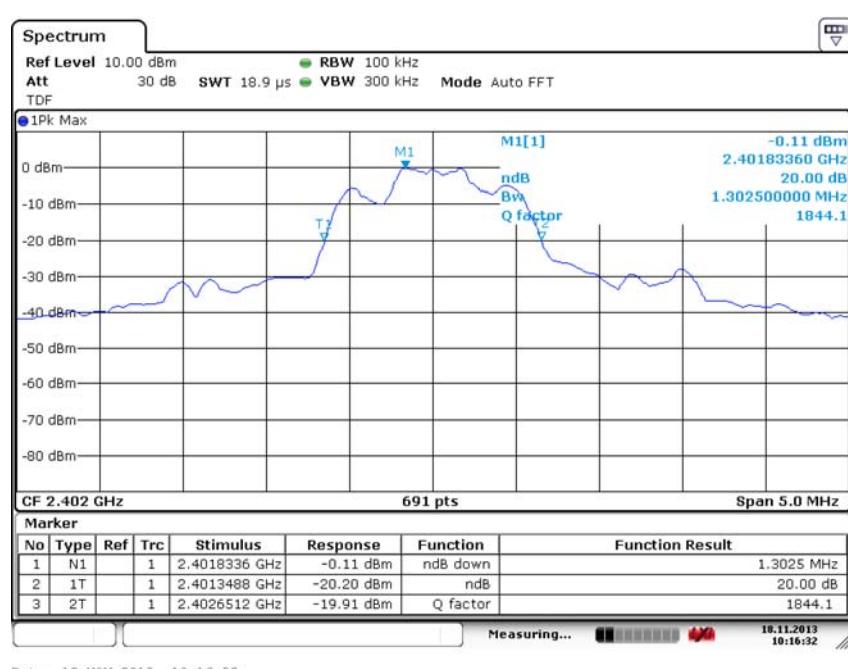


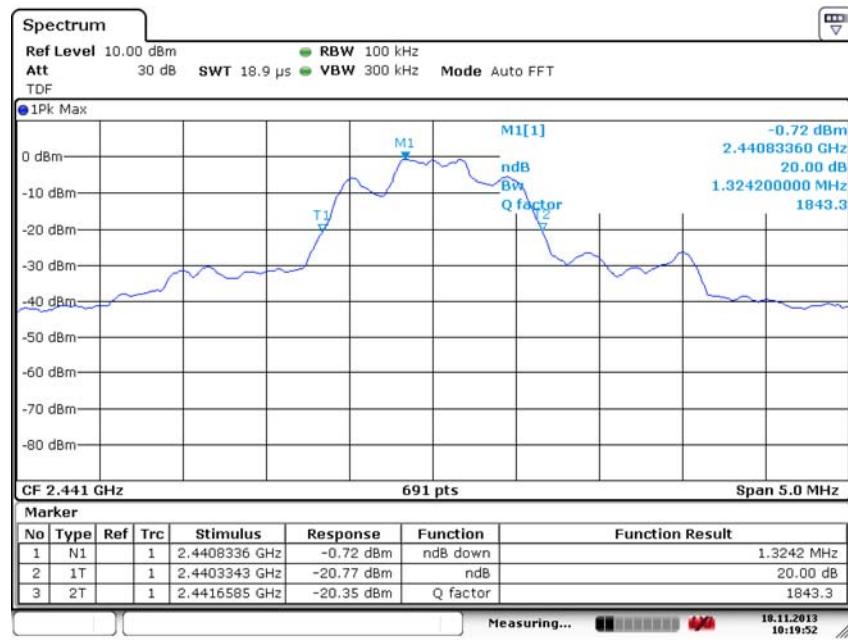
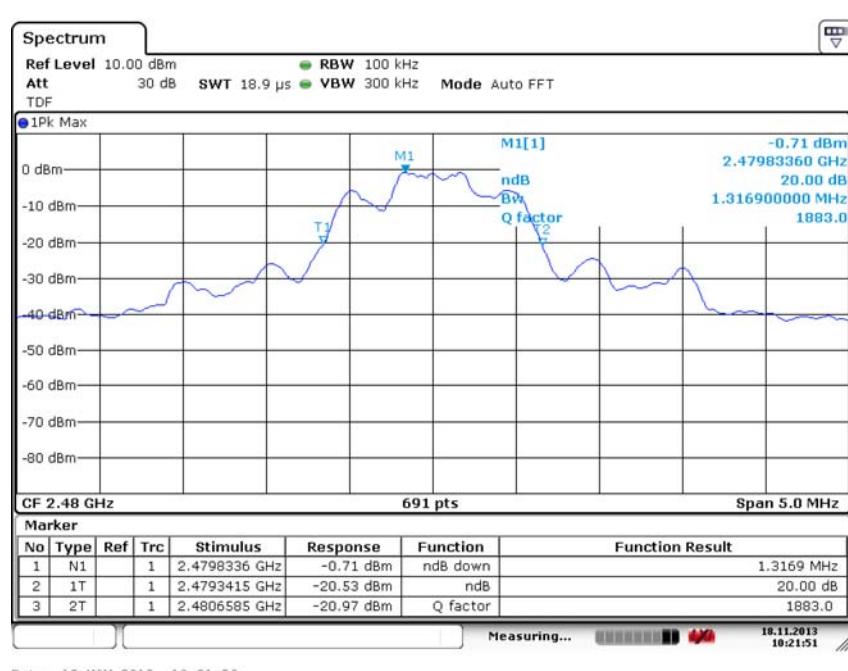
**Fig. 76 Radiated Spurious Emission (8DPSK, Ch78, 3 GHz ~18 GHz)**

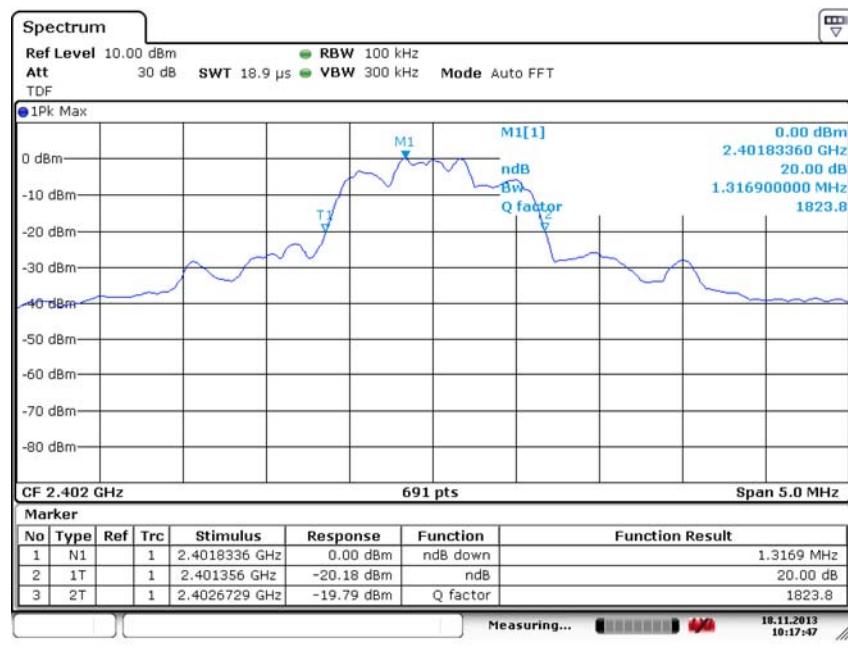
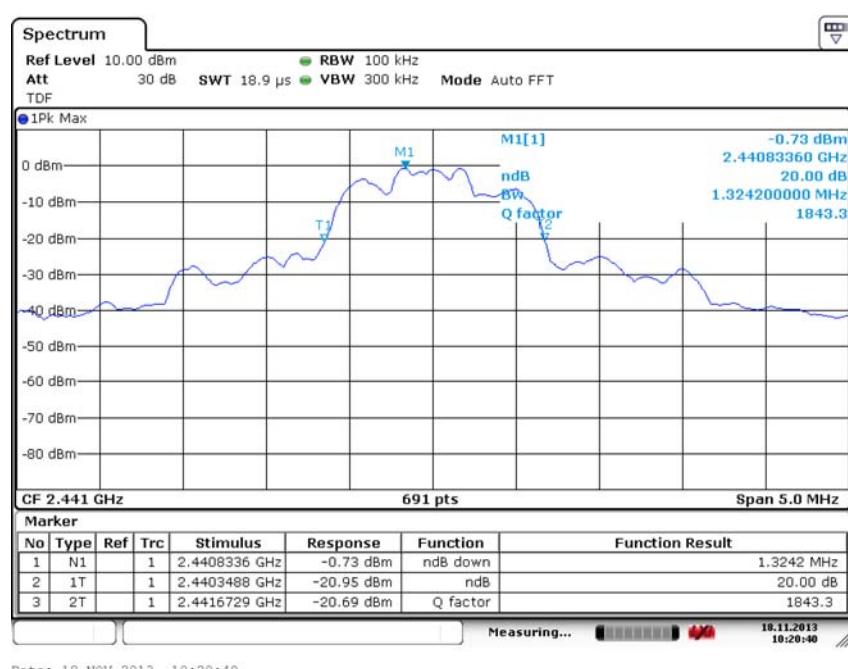


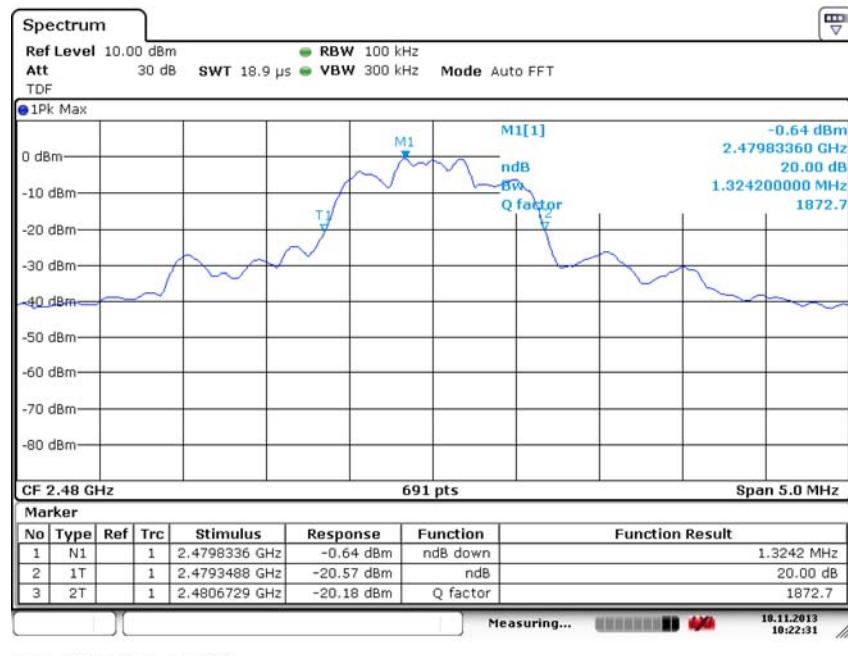
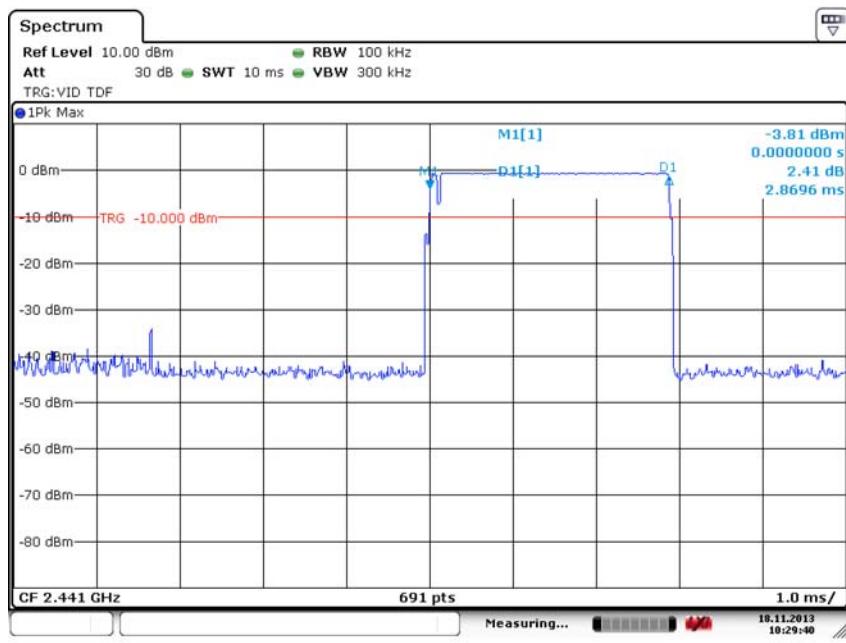
**Fig. 77 Radiated Spurious Emission (All channel, 18 GHz ~26 GHz)**

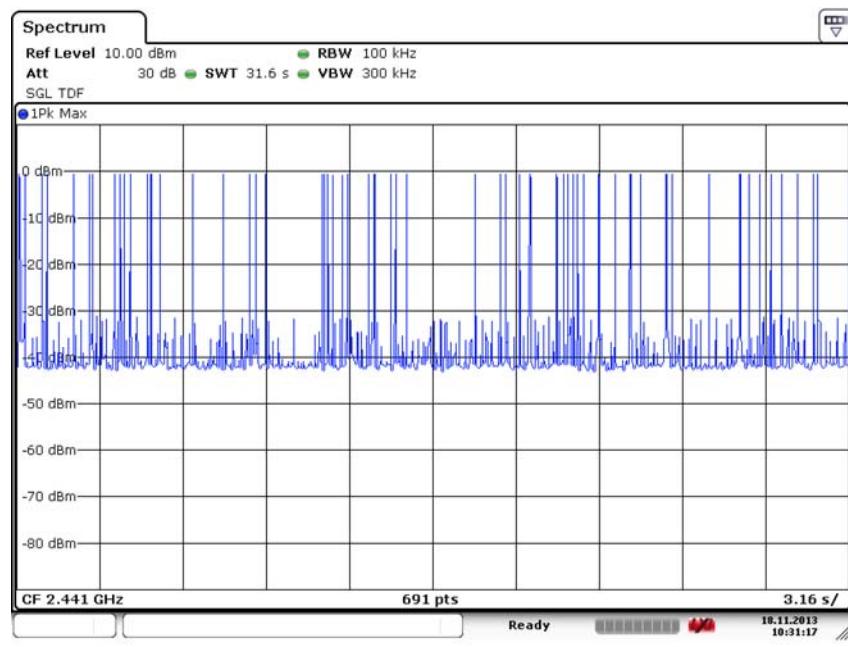
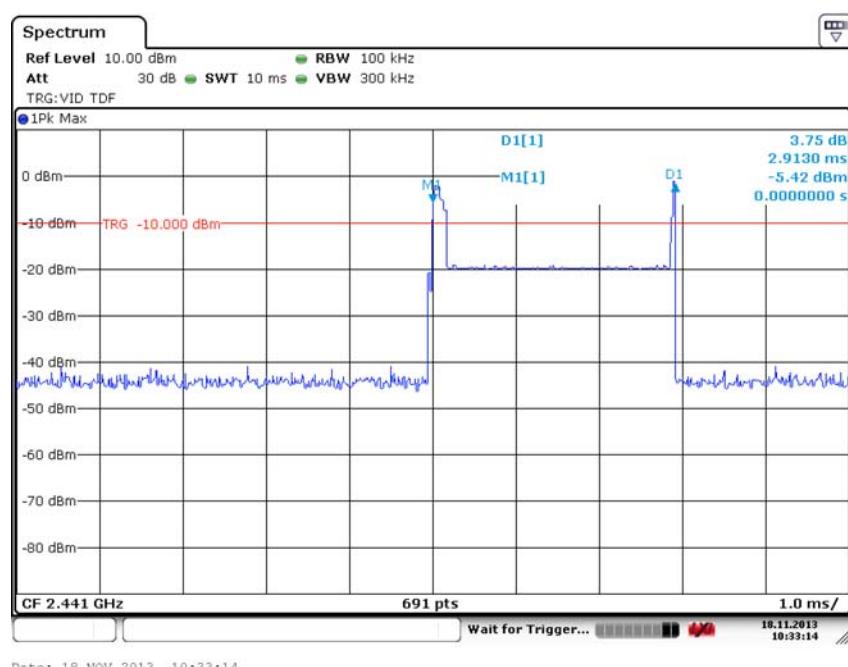

**Fig. 78 Occupied 20dB Bandwidth (GFSK, Ch 0)**

**Fig. 79 Occupied 20dB Bandwidth (GFSK, Ch 39)**

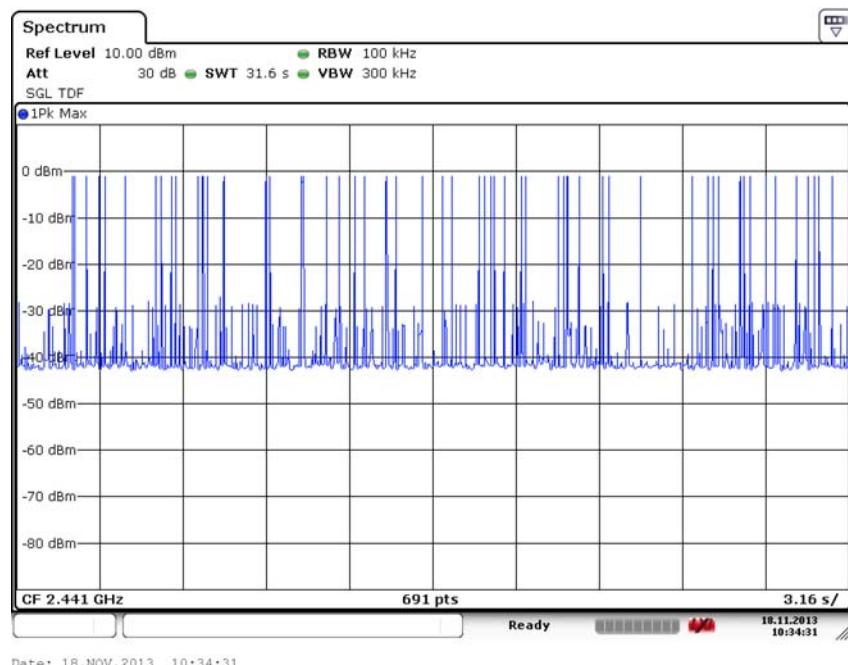

**Fig. 80 Occupied 20dB Bandwidth (GFSK, Ch 78)**

**Fig. 81 Occupied 20dB Bandwidth ( π /4 DQPSK, Ch 0)**


**Fig. 82 Occupied 20dB Bandwidth ( $\pi/4$  DQPSK, Ch 39)**

**Fig. 83 Occupied 20dB Bandwidth ( $\pi/4$  DQPSK, Ch 78)**

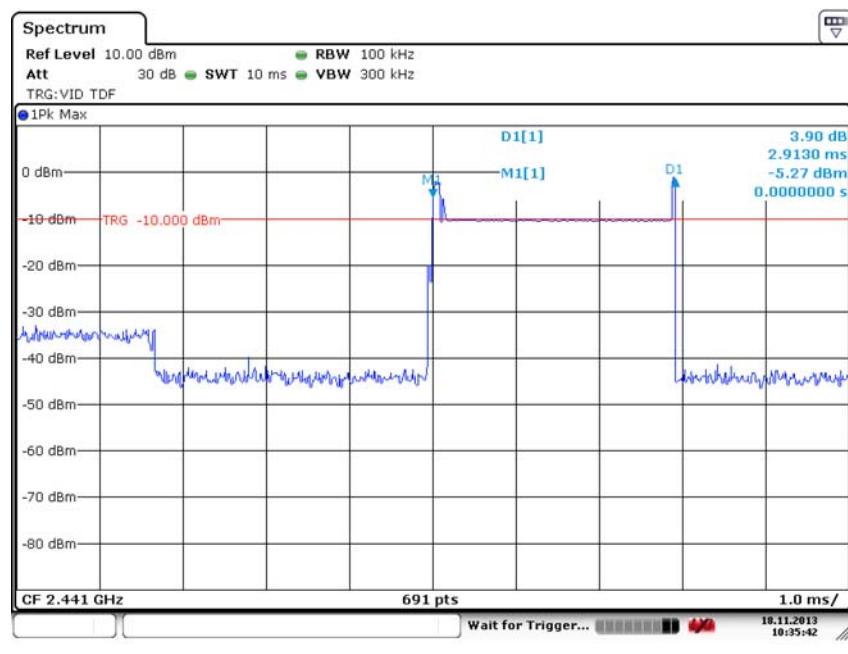

**Fig. 84 Occupied 20dB Bandwidth (8DPSK, Ch 0)**

**Fig. 85 Occupied 20dB Bandwidth (8DPSK, Ch 39)**


**Fig. 86 Occupied 20dB Bandwidth (8DPSK, Ch 78)**

**Fig. 87 Time of Occupancy(Dwell Time) (GFSK, Ch39)**

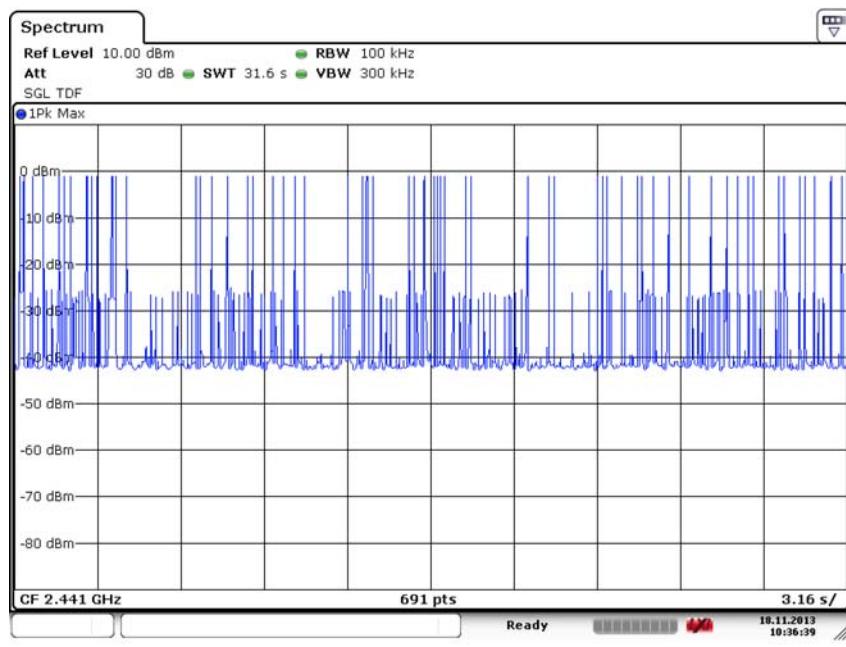
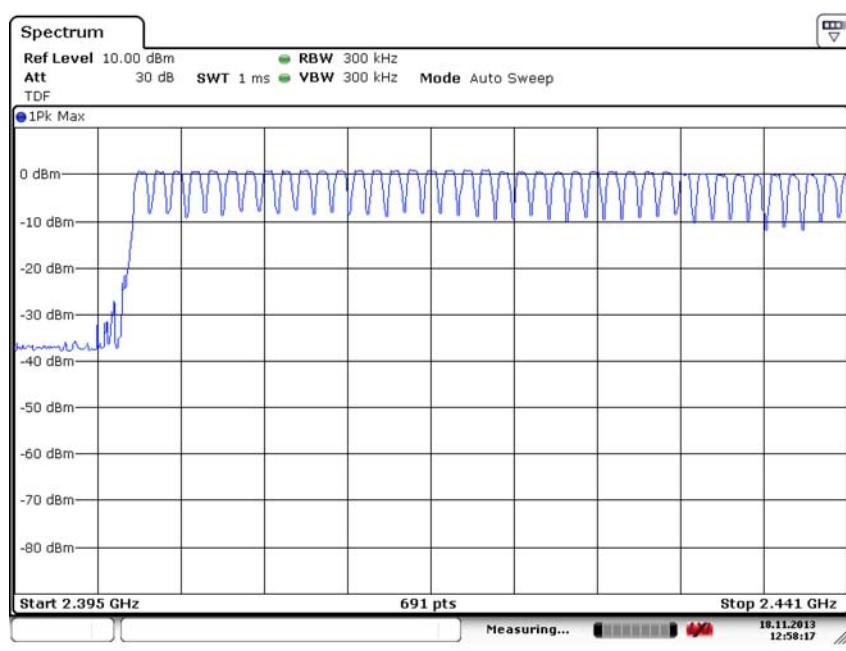

**Fig. 88 Number of Transmissions (GFSK, Ch39)**

**Fig. 89 Time of Occupancy(Dwell Time) (  $\pi/4$  DQPSK, Ch39)**

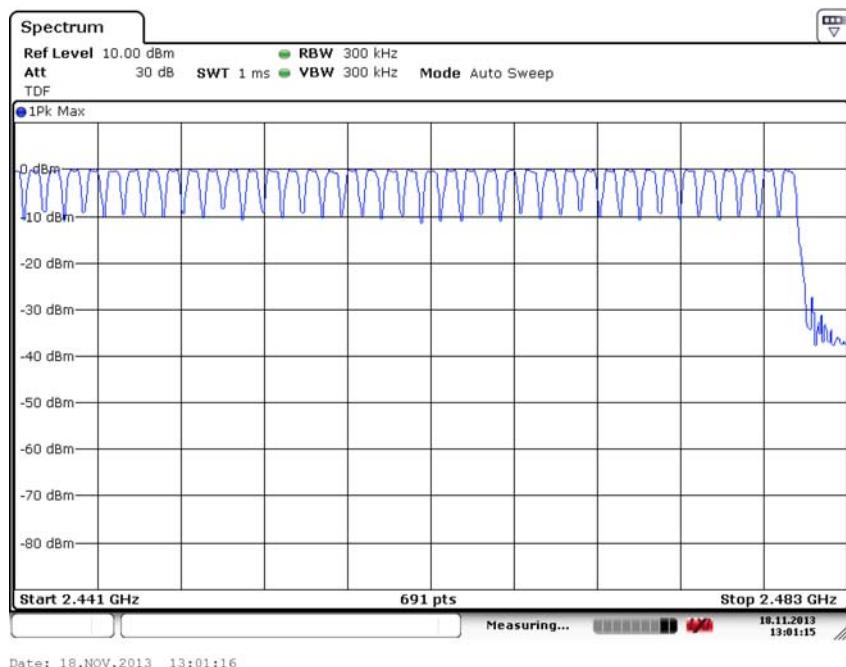
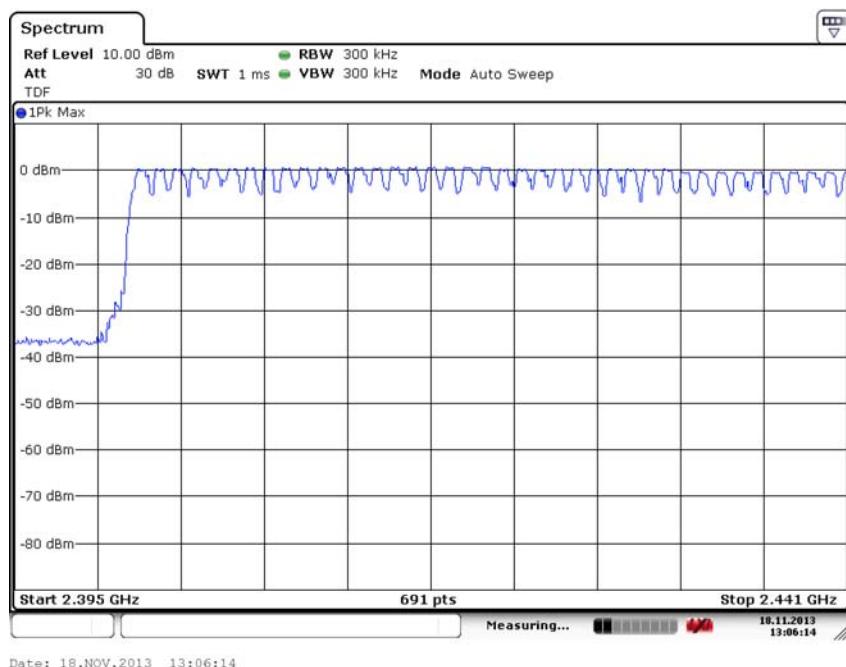


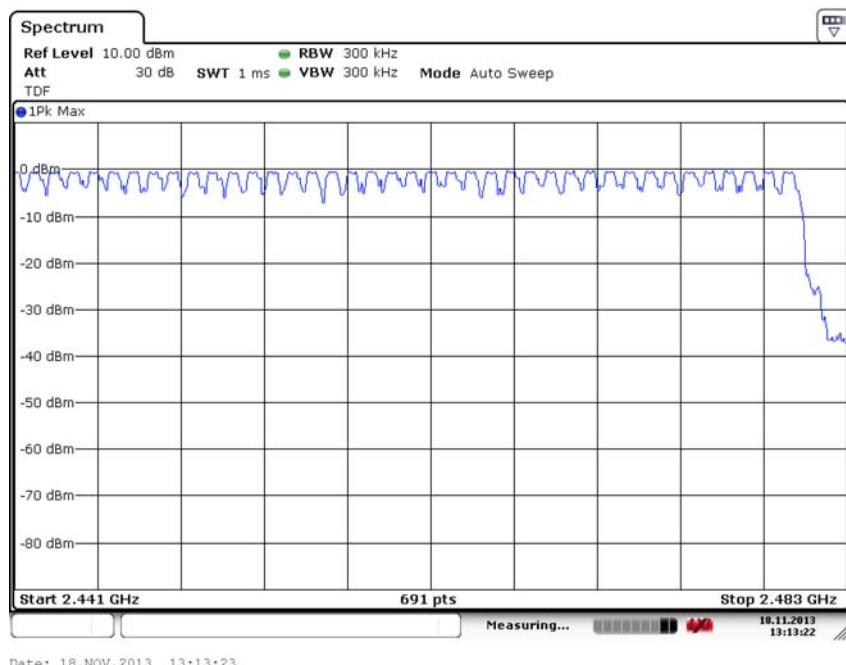
**Fig. 90 Number of Transmissions ( $\pi/4$  DQPSK, Ch39)**



**Fig. 91 Time of Occupancy(Dwell Time) (8DPSK, Ch39)**


**Fig. 92 Number of Transmissions (8DPSK, Ch39)**

**Fig. 93 Hopping channel ch0~39 (GFSK, Ch39)**

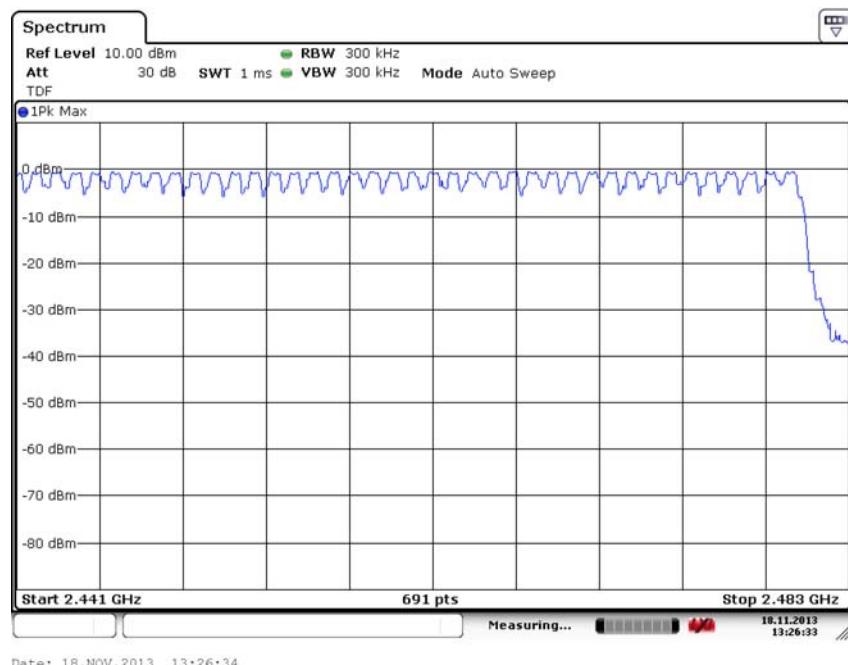
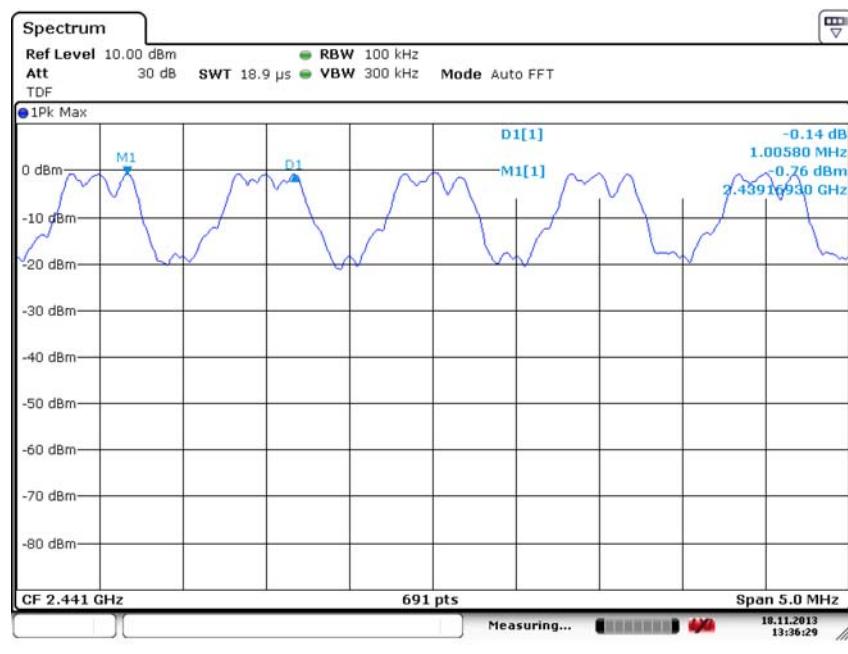

**Fig. 94 Hopping channel ch39~78 (GFSK, Ch39)**

**Fig. 95 Hopping channel ch0~39 ( $\pi/4$  DQPSK, Ch39)**



**Fig. 96 Hopping channel ch39~78 ( $\pi/4$  DQPSK, Ch39)**



**Fig. 97 Hopping channel ch0~39 (8DPSK, Ch39)**


**Fig. 98 Hopping channel ch39~78 (8DPSK, Ch39)**

**Fig. 99 Carrier Frequency Separation (GFSK, Ch39)**

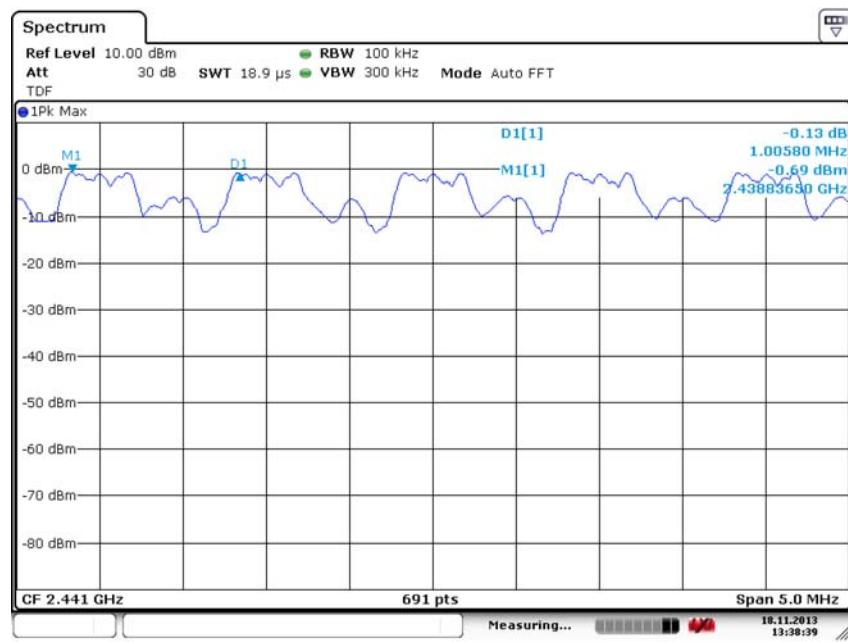


Fig. 100 Carrier Frequency Separation ( $\pi/4$  DQPSK, Ch39)

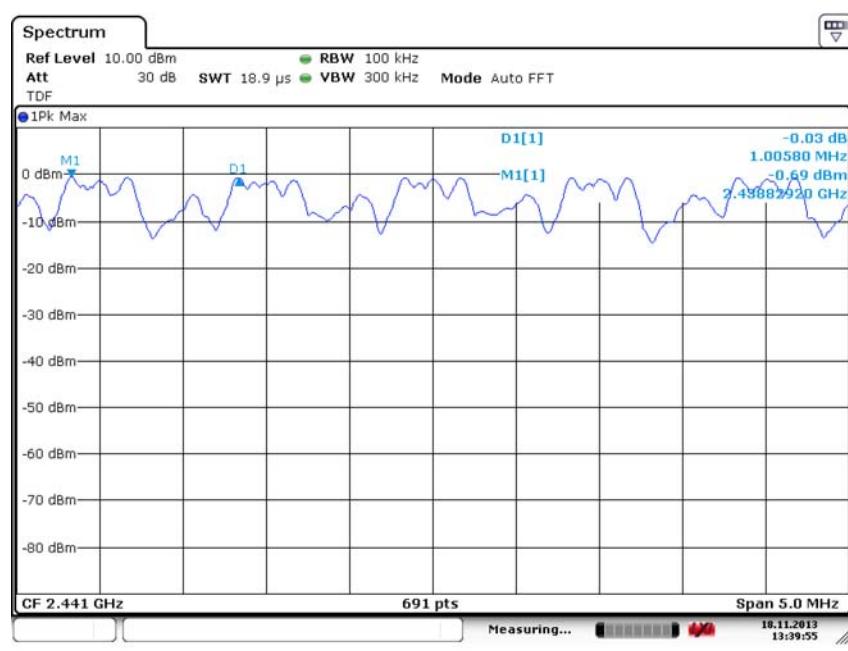
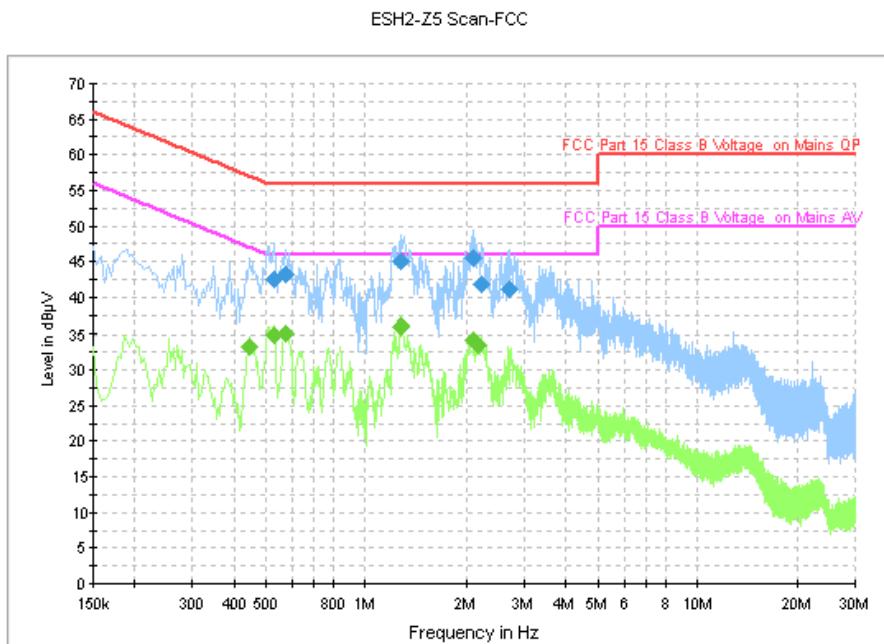


Fig. 101 Carrier Frequency Separation (8DPSK, Ch39)



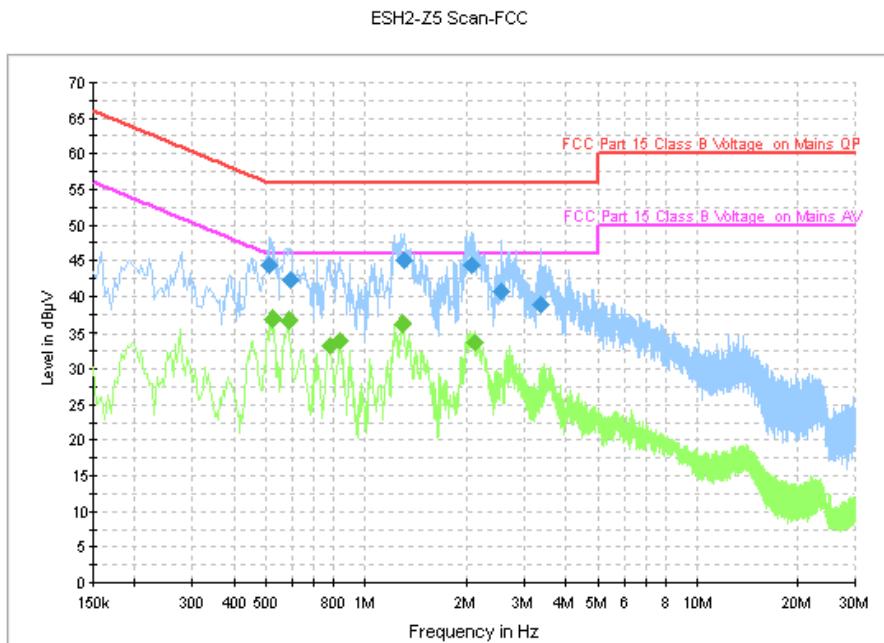
**Fig. 102 AC Power line Conducted Emission (GFSK, Ch39)**

MEASUREMENT RESULT: " QuasiPeak "

Frequency (MHz)	QuasiPeak (dBµV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.530000	42.5	FLO	L1	10.0	13.5	56.0
0.574000	43.1	FLO	L1	10.1	12.9	56.0
1.282000	45.1	FLO	L1	10.1	10.9	56.0
2.086000	45.6	FLO	N	10.2	10.4	56.0
2.226000	41.8	FLO	L1	10.1	14.2	56.0
2.686000	41.2	FLO	L1	10.2	14.8	56.0

MEASUREMENT RESULT: " Average "

Frequency (MHz)	CAverage (dBµV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.446000	33.4	FLO	L1	10.0	13.6	46.9
0.530000	35.0	FLO	L1	10.0	11.0	46.0
0.574000	35.0	FLO	L1	10.1	11.0	46.0
1.282000	36.1	FLO	L1	10.1	9.9	46.0
2.086000	34.1	FLO	N	10.2	11.9	46.0
2.166000	33.5	FLO	L1	10.1	12.5	46.0



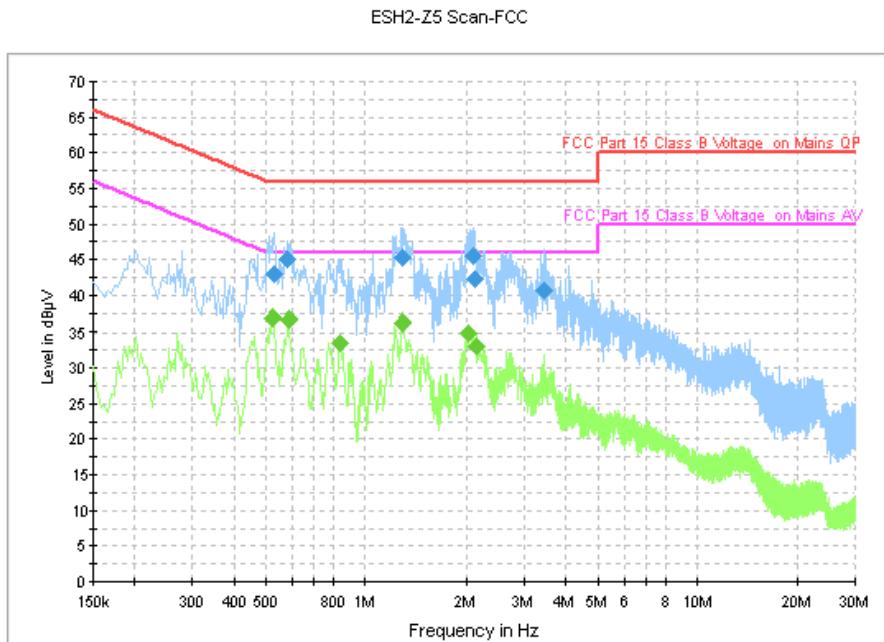
**Fig. 103 AC Power line Conducted Emission (  $\pi/4$  DQPSK, Ch39)**

MEASUREMENT RESULT: " QuasiPeak "

Frequency (MHz)	QuasiPeak (dB $\mu$ V)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dB $\mu$ V)
0.510000	44.3	FLO	L1	10.0	11.7	56.0
0.594000	42.4	FLO	N	10.1	13.6	56.0
1.306000	45.1	FLO	N	10.1	10.9	56.0
2.082000	44.3	FLO	N	10.2	11.7	56.0
2.562000	40.6	FLO	N	10.2	15.4	56.0
3.338000	38.9	FLO	L1	10.2	17.1	56.0

MEASUREMENT RESULT: " Average "

Frequency (MHz)	CAverage (dB $\mu$ V)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dB $\mu$ V)
0.526000	37.0	FLO	L1	10.0	9.0	46.0
0.586000	36.8	FLO	L1	10.1	9.2	46.0
0.778000	33.2	FLO	L1	10.1	12.8	46.0
0.834000	34.0	FLO	L1	10.0	12.0	46.0
1.294000	36.3	FLO	L1	10.1	9.7	46.0
2.110000	33.7	FLO	L1	10.1	12.3	46.0



**Fig. 104 AC Power line Conducted Emission (8DPSK, Ch39)**

MEASUREMENT RESULT: " QuasiPeak "

Frequency (MHz)	QuasiPeak (dB $\mu$ V)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dB $\mu$ V)
0.530000	43.1	FLO	L1	10.0	12.9	56.0
0.582000	45.1	FLO	L1	10.1	10.9	56.0
1.290000	45.2	FLO	L1	10.1	10.8	56.0
2.106000	45.5	FLO	N	10.2	10.5	56.0
2.126000	42.4	FLO	N	10.2	13.6	56.0
3.418000	40.7	FLO	L1	10.2	15.3	56.0

MEASUREMENT RESULT: " Average "

Frequency (MHz)	CAverage (dB $\mu$ V)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dB $\mu$ V)
0.522000	36.9	FLO	L1	10.0	9.1	46.0
0.586000	36.8	FLO	L1	10.1	9.2	46.0
0.838000	33.5	FLO	L1	10.0	12.5	46.0
1.298000	36.2	FLO	L1	10.1	9.8	46.0
2.018000	34.8	FLO	L1	10.1	11.2	46.0
2.134000	32.9	FLO	L1	10.1	13.1	46.0

\*\*\* END OF REPORT BODY \*\*\*