FCC PART 15C
TEST REPORT
No. 2013EEB00553-BT

For

HONG KONG IPRO TECHNOLOGY CO.,LIMITED

Mobile phone

Model Name: i3200

Marketing Name: IPRO

With

Hardware Version: I3183_MB_P2_v01

Software Version: MT6260M_I3200_IPRO_V9_0

FCC ID: PQ4IPROI3200

Issued Date: Jan 3rd, 2014

Test Laboratory:
FCC 2.948 Listed: No.310359
IC O.A.T.S listed: No.6629C-1

Note:

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CONTENTS

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℃-30℃
Extreme Temperature:	-20℃/+55℃
Relative Humidity:	30%-60%

1.3. Project data

Project Leader:	Zhang Bojun
Test Engineer:	Tang Weisheng
Testing Start Date:	Dec 2nd, 2013
Testing End Date:	Jan 2nd, 2014

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:	HONG KONG IPRO TECHNOLOGY CO.,LIMITED
Address /Post:	ROOM C1D,6/F, WING HING INDUSTRIAL BUILDING,14 HING YIP STREET, KWUN TONG, KOWLOON, HONG KONG
City:	Hong Kong
Postal Code:	/
Country:	China
Telephone:	00852-96669759
Fax:	00852- 21100996

2.2. Manufacturer Information

Company Name:	SHENZHEN ZHIKE COMMUNICATION CO., LTD
Address /Post:	1805,Tower A, Phase I, Tianan High-Tech Plaza, Futian District, Shenzhen，R.P. China
City:	Shenzhen
Postal Code:	/
Country:	China
Telephone:	0755-83496450
Fax:	0755-83496050

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

About EUT

Description	Mobile phone
Model Name	i3200
Marketing Name	IPRO
Frequency Band	ISM 2400MHz~2483.5MHz
Type of Modulation	GFSK
Number of Channels	79
FCC ID	PQ4IPROI3200

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

3.1. Internal Identification of EUT used during the test

EUT ID*	SN or IMEI	HW Version	SW Version
EUT1	/	I3183_MB_P2_v01	MT6260M_I3200_IPRO_V9_0

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

3.2. Internal Identification of AE used during the test

AE ID*	Description	Type	SN
AE1	Li-ion Battery	BL-4C	/
AE2	Travel Charger	TC-02	/

*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.

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.	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 ℃, Max. = 30 ℃
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 – 1000MH
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 ℃, Max. = 30 ℃
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 ℃, Max.=30 ℃
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	**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**

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	2014-12-20	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

Test Condition:

Hopping Mode	RBW	VBW	SPAN	Sweeptime
Hopping off	3MHz	3MHz	10MHz	Auto

Measurement Results:

Mode	Test Result (dBm)		
	2402MHz (Ch0)	2441MHz (Ch39)	2480 MHz (Ch78)
GFSK	8.92	8.57	8.64

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.1	P
	78	ON	Fig.2	P

Mode	Channel	Hopping	Test Results	Conclusion
GFSK	0	OFF	Fig.3	P
	78	OFF	Fig.4	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.5	P
		30 MHz-3GHz	Fig.6	P
		3GHz-18GHz	Fig.7	P
	39	2.402 GHz	Fig.8	P
		30 MHz-3 GHz	Fig.9	P
		3GHz-18GHz	Fig.10	P
	78	2.480 GHz	Fig.11	P
		30 MHz-3GHz	Fig.12	P
		3GHz-18GHz	Fig.13	P
/	All channel	18GHz-26GHz	Fig.14	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:

Mode	Channel	Frequency Range	Test Results	Conclusion
GFSK	0	30 MHz ~1 GHz	Fig.15	P
		1 GHz ~ 3 GHz	Fig.16	P
		3 GHz ~ 18 GHz	Fig.17	P
	39	30 MHz ~1 GHz	Fig.18	P
		1 GHz ~ 3 GHz	Fig.19	P
		3 GHz ~ 18 GHz	Fig.20	P
	78	30 MHz ~1 GHz	Fig.21	P
		1 GHz ~ 3 GHz	Fig.22	P
		3 GHz ~ 18 GHz	Fig.23	P
	Power(CH0)	2.38 GHz ~ 2.45 GHz	Fig.24	P
	Power(CH78)	2.45 GHz ~ 2.5 GHz	Fig.25	P
/	All channels	18 GHz ~ 26.5 GHz	Fig.26	P

GFSK CH0 (1-18GHz)-Peak

Frequency (MHz)	Peak (dBμV/m)	Polarization	Corr. (dB)
16768.00	59.09	V	14.27
17332.00	59.01	H	14.40
16808.00	58.57	H	14.28
17354.00	58.54	H	14.44
16851.00	58.50	V	14.30
17190.00	58.40	V	14.23

GFSK CH0 (1-18GHz)-Average

Frequency (MHz)	Average (dBμV/m)	Polarization	Corr. (dB)
16425.00	45.53	H	14.07
16150.00	45.78	H	13.65
16235.00	46.78	V	13.69
15694.00	46.23	V	13.14
16851.00	46.71	V	14.30
17332.00	46.67	H	14.40

GFSK CH39 (1-18GHz)-Peak

Frequency (MHz)	Peak (dBμV/m)	Polarization	Corr. (dB)
15839.00	58.77	V	13.39
17797.00	58.70	H	14.47
17363.00	58.58	V	14.45
17414.00	58.56	H	14.49
16726.00	58.53	V	14.25
17343.00	58.50	V	14.42

GFSK CH39 (1-18GHz)-Average

Frequency (MHz)	Average (dBμV/m)	Polarization	Corr. (dB)
7323.38	49.07	V	6.79
14646.00	48.20	H	12.26
17087.00	48.09	H	14.36
2445.50	47.93	V	1.86
17088.00	47.40	H	14.35
4882.13	47.19	V	5.87

GFSK CH78 (1-18GHz)-Peak

Frequency (MHz)	Peak (dBμV/m)	Polarization	Corr. (dB)
17360.00	58.81	H	14.45
16726.00	58.47	V	14.25
15734.00	58.43	H	13.24
16595.00	58.37	V	14.19
15726.00	58.36	V	13.22
16122.00	58.35	V	13.65

GFSK CH78 (1-18GHz)-Average

Frequency (MHz)	Average (dBμV/m)	Polarization	Corr. (dB)
17360.00	49.83	H	14.45
17361.00	49.16	H	14.45
14880.00	47.03	H	12.29
16756.00	46.91	V	14.26
16764.00	46.86	V	14.27
16826.00	46.82	V	14.29

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.27	1.143	/
	39	Fig.28	1.136	
	78	Fig.29	1.136	

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.30	175.0	**P**
			Fig.31		

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.32	Fig.33	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.34	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 (dBμV)	Result (dBμV) With charger GFSK	Conclusion
0.15 to 0.5	66 o 56	Fig.35	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 (dBμV)	Result (dBμV) With charger GFSK	Conclusion
0.15 to 0.5	56 to 46	Fig.35	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

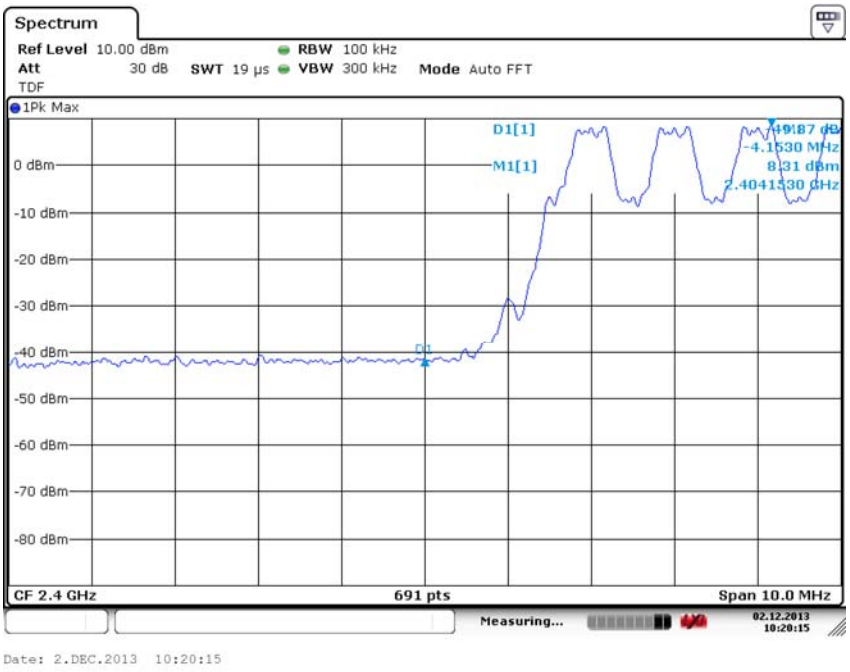


Fig. 1 Band Edges (GFSK, Ch 0, Hopping ON)

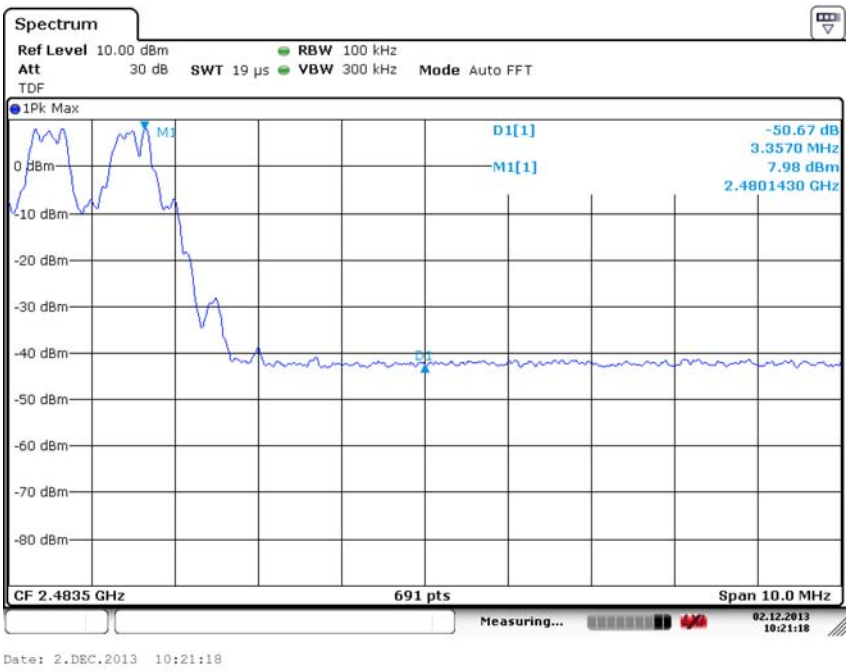


Fig. 2 Band Edges (GFSK, Ch 78, Hopping ON)

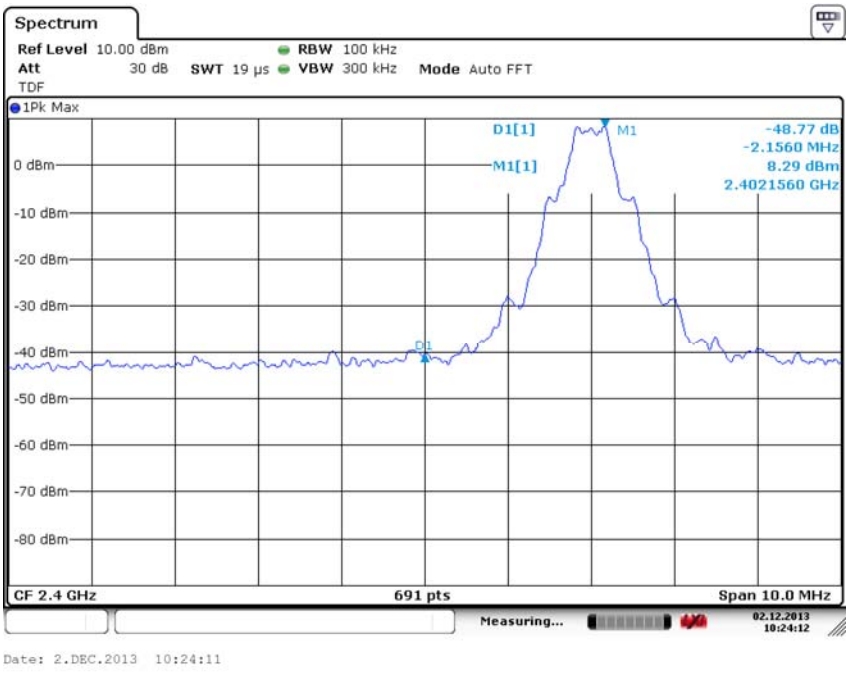


Fig. 3 Band Edges (GFSK, Ch 0, Hopping OFF)

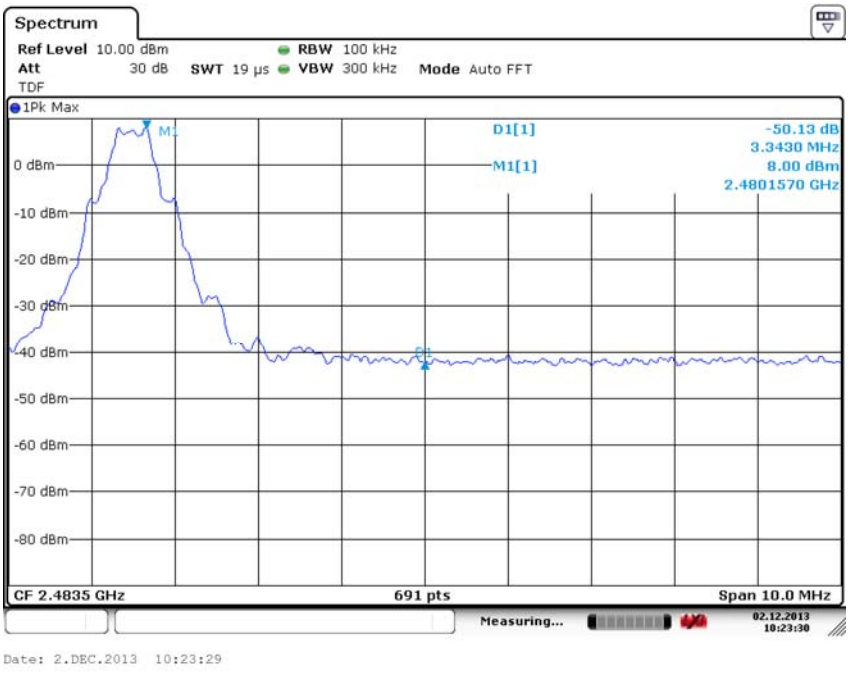


Fig. 4 Band Edges (GFSK, Ch 78, Hopping OFF)

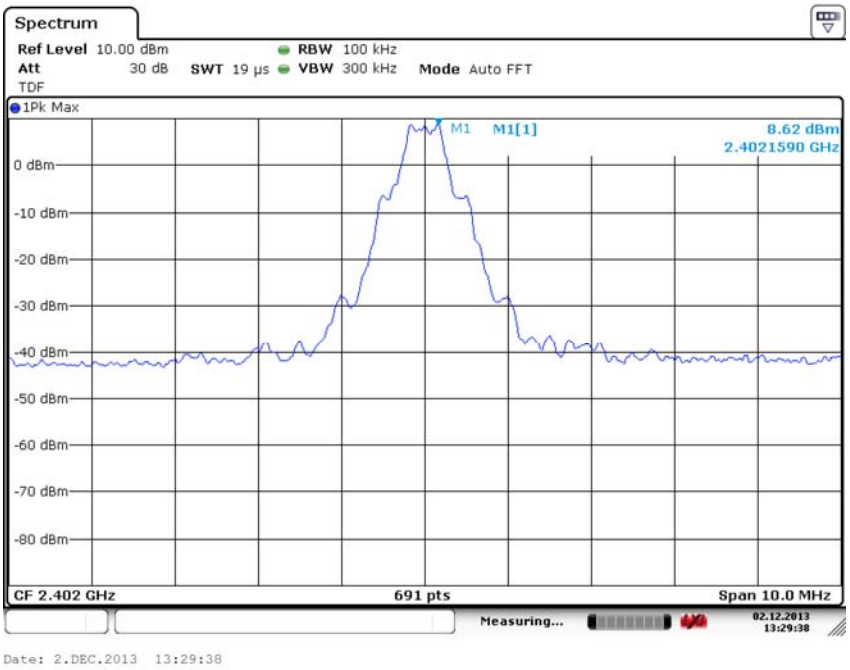


Fig. 5 Conducted Spurious Emission (GFSK, Ch0, 2.402GHz)

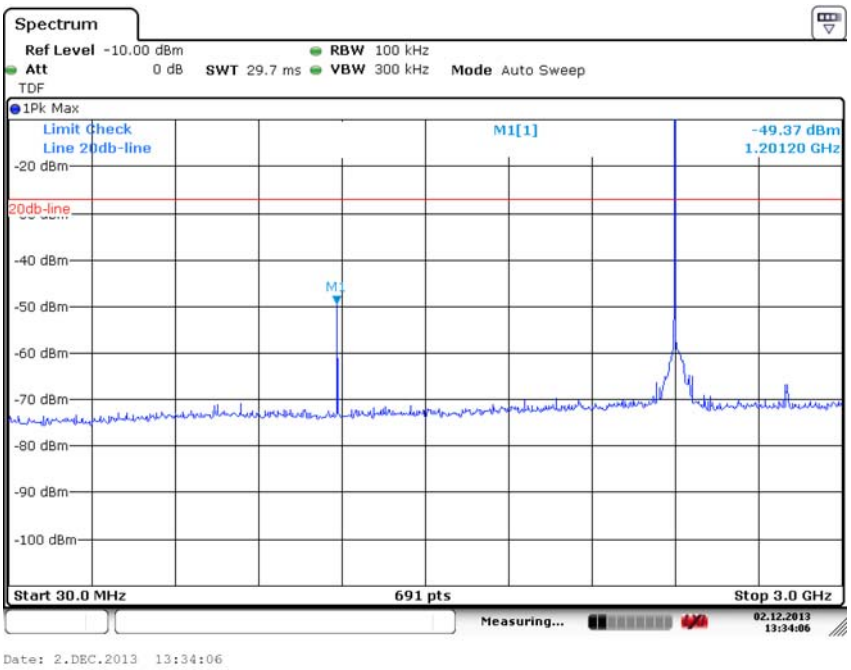


Fig. 6 Conducted Spurious Emission (GFSK, Ch0, 30 MHz-3 GHz)

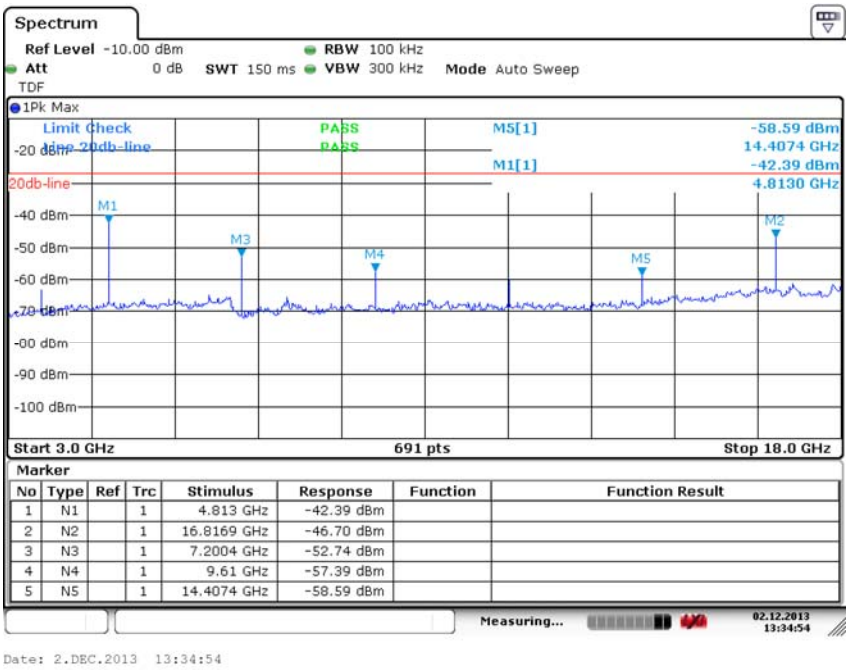


Fig. 7 Conducted Spurious Emission (GFSK, Ch0, 3GHz-18 GHz)

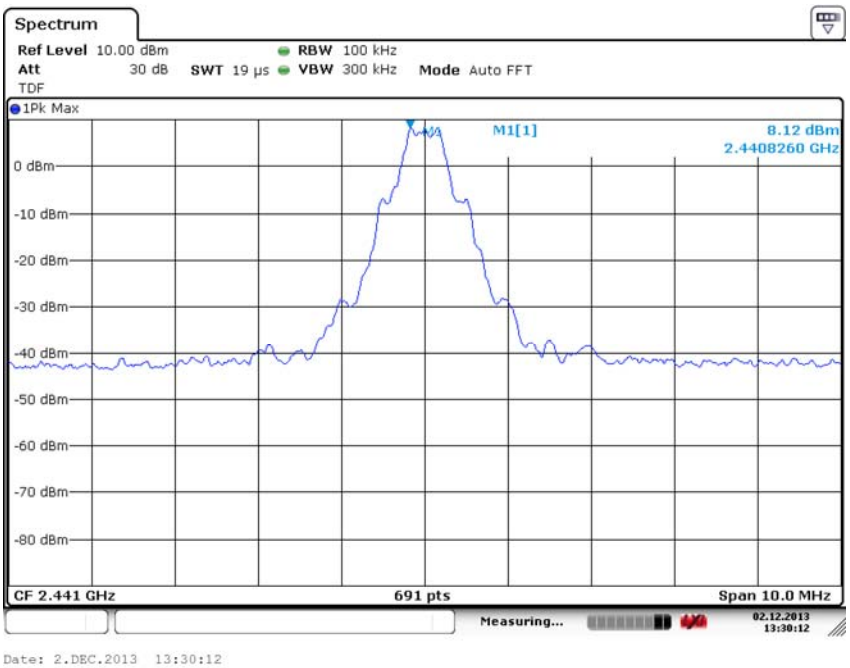


Fig. 8 Conducted Spurious Emission (GFSK, Ch39, 2.441GHz)

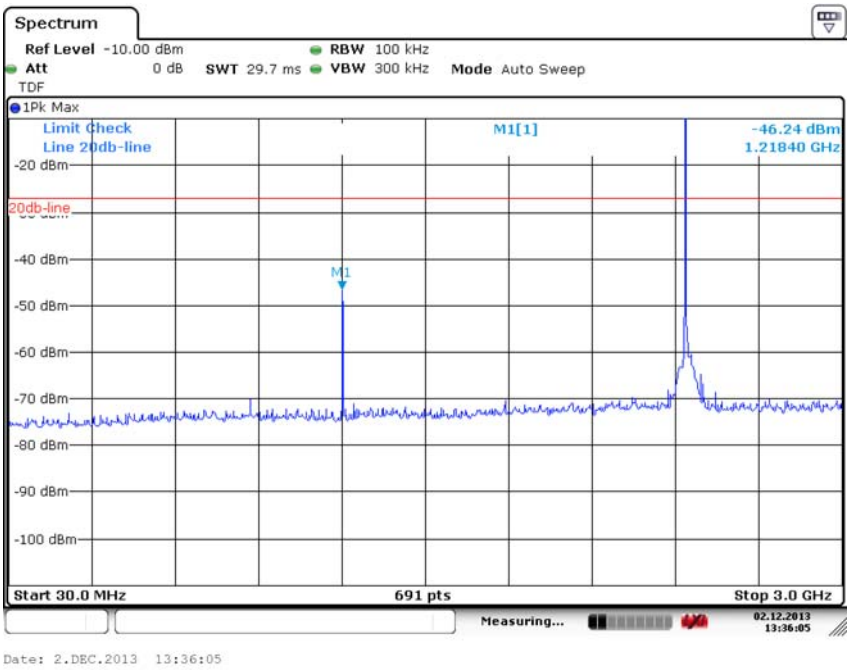
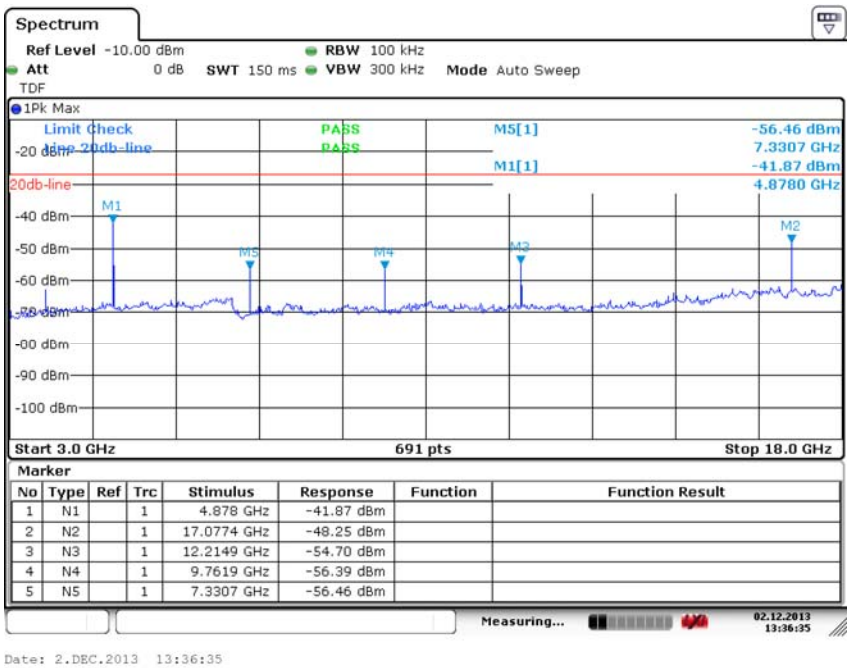


Fig. 9 Conducted Spurious Emission (GFSK, Ch39, 30 MHz-3 GHz)



Marker

No	Type	Ref	Trc	Stimulus	Response	Function	Function Result
1	N1		1	4.878 GHz	-41.87 dBm		
2	N2		1	17.0774 GHz	-48.25 dBm		
3	N3		1	12.2149 GHz	-54.70 dBm		
4	N4		1	9.7619 GHz	-56.39 dBm		
5	N5		1	7.3307 GHz	-56.46 dBm		

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

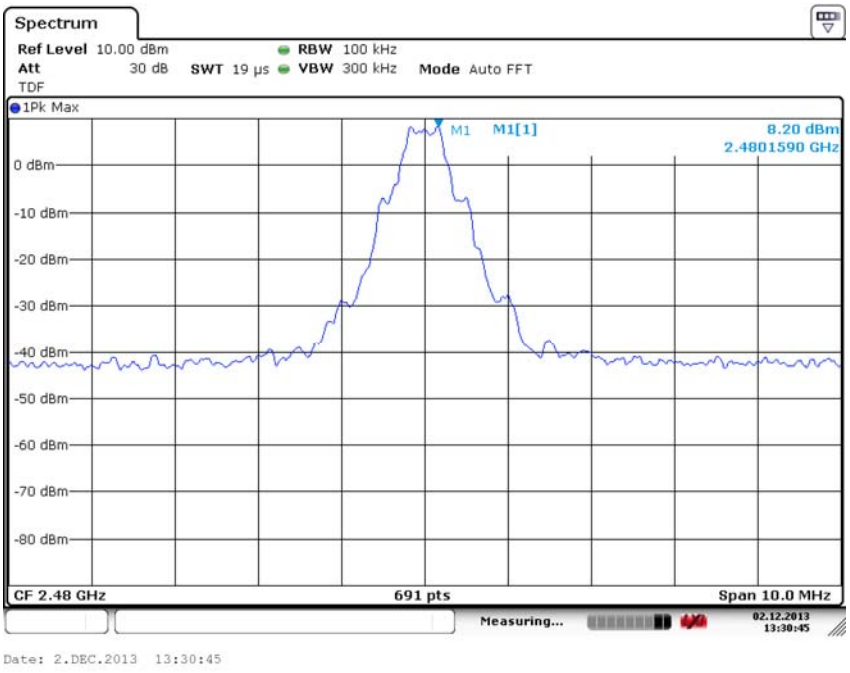


Fig. 11 Conducted Spurious Emission (GFSK, Ch78, 2.480GHz)

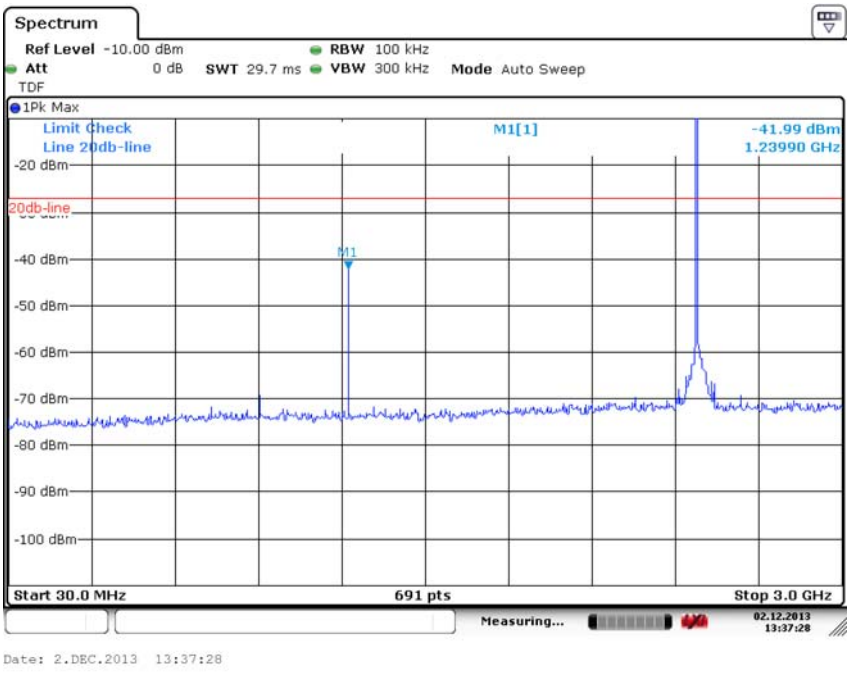


Fig. 12 Conducted Spurious Emission (GFSK, Ch78, 30 MHz-3 GHz)

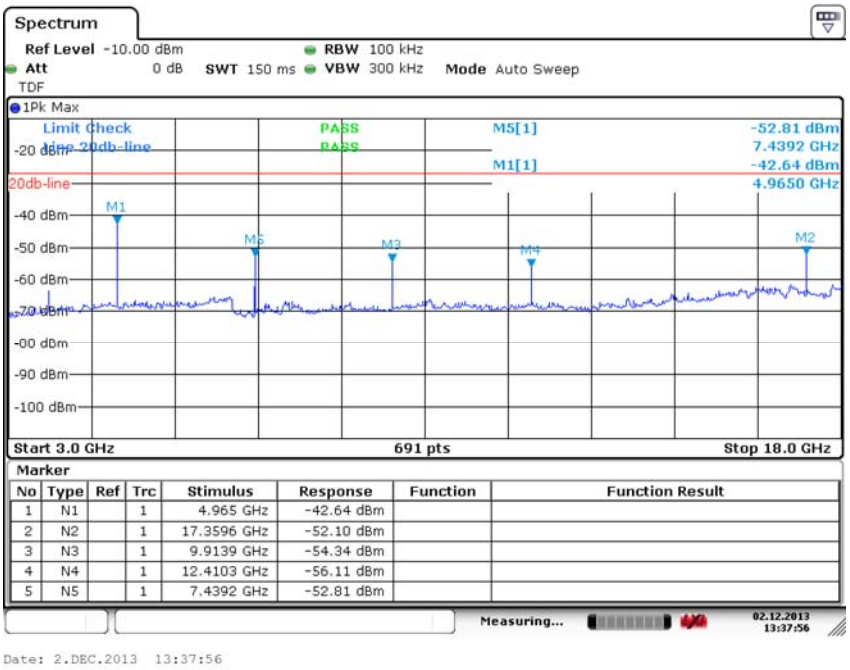


Fig. 13 Conducted Spurious Emission (GFSK, Ch78, 3GHz-18 GHz)

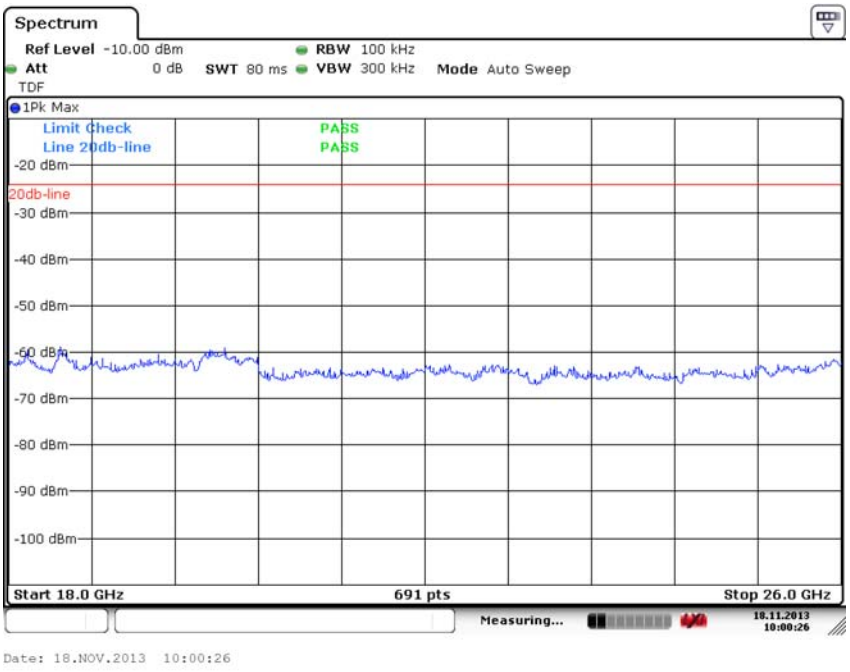


Fig. 14 Conducted Spurious Emission (All channel, 18 GHz-26 GHz)

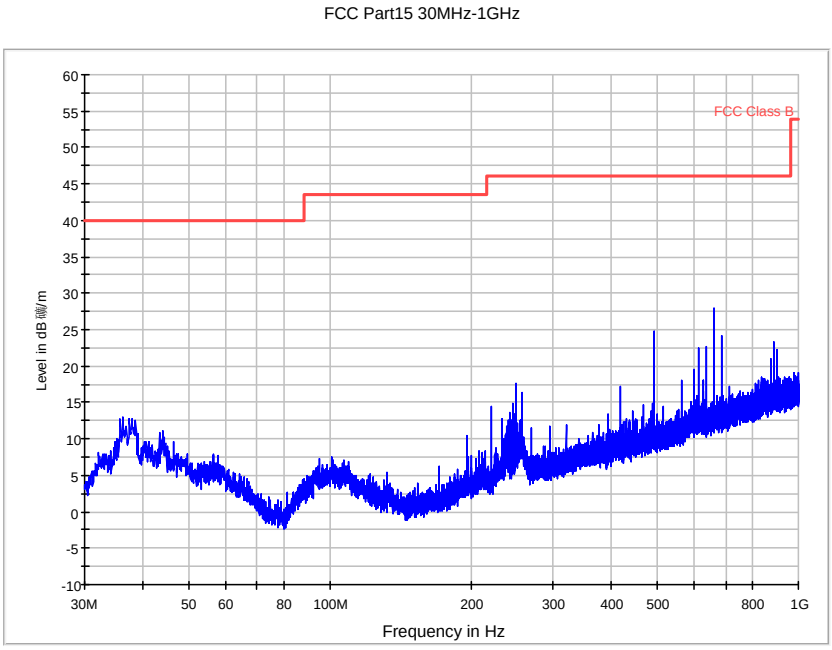


Fig. 15 Radiated Spurious Emission (GFSK, Ch0, 30 MHz ~1 GHz)

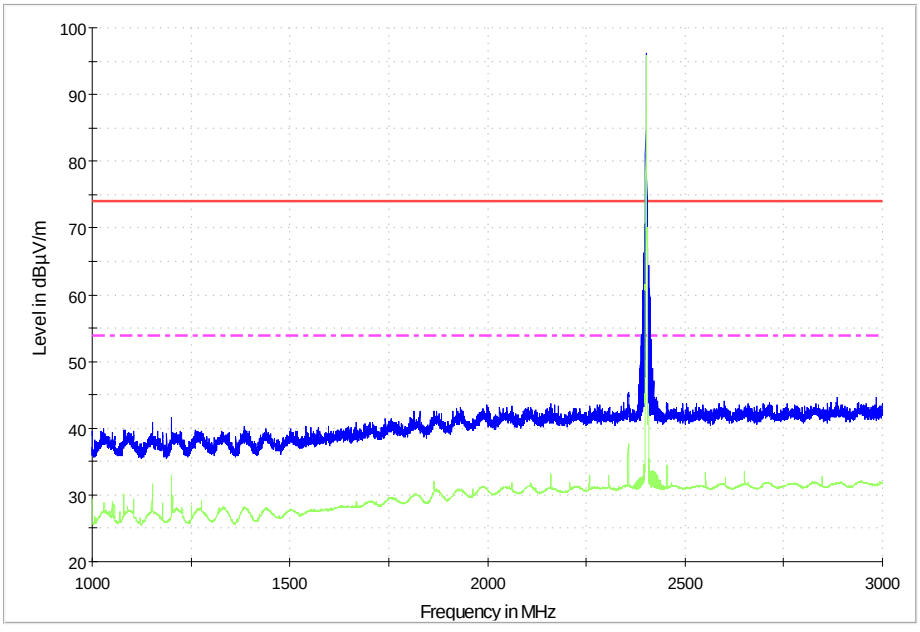


Fig. 16 Radiated Spurious Emission (GFSK, Ch0, 1 GHz ~3 GHz)

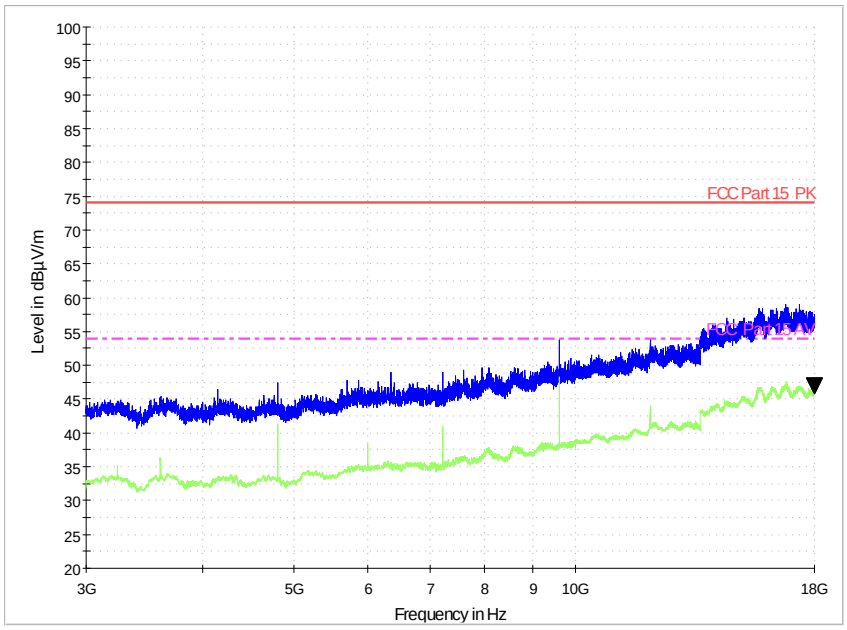


Fig. 17 Radiated Spurious Emission (GFSK, Ch0, 3 GHz ~18 GHz)

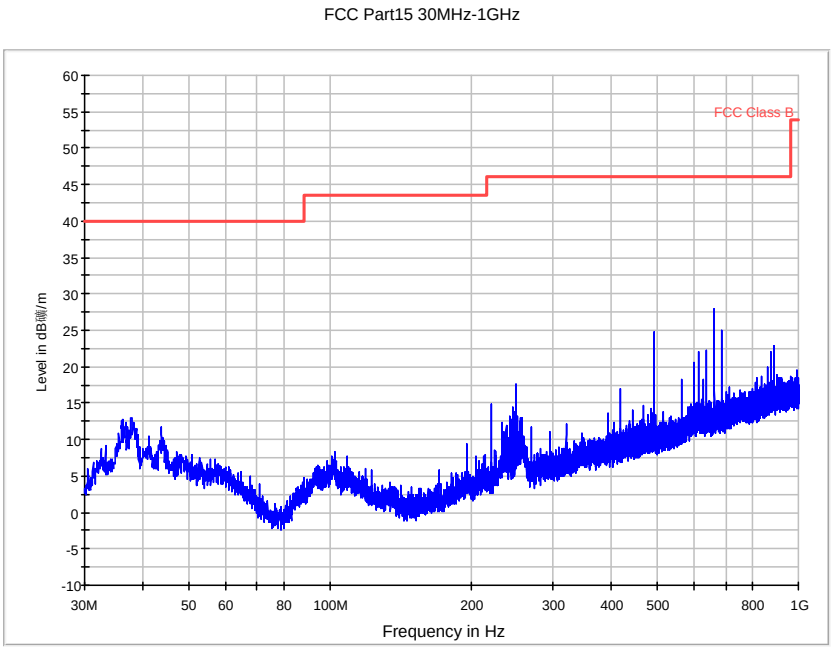


Fig. 18 Radiated Spurious Emission (GFSK, Ch39, 30 MHz ~1 GHz)

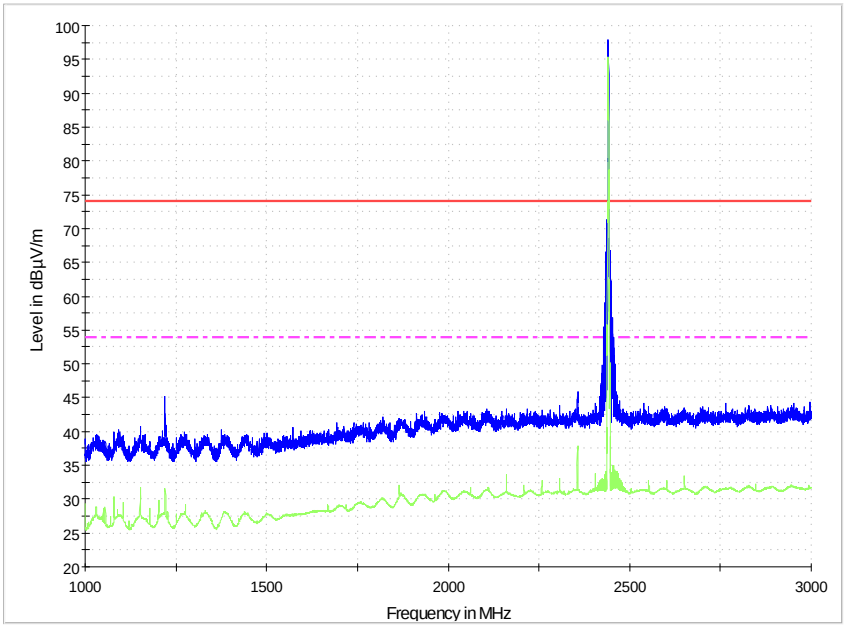


Fig. 19 Radiated Spurious Emission (GFSK, Ch39, 1 GHz ~3 GHz)

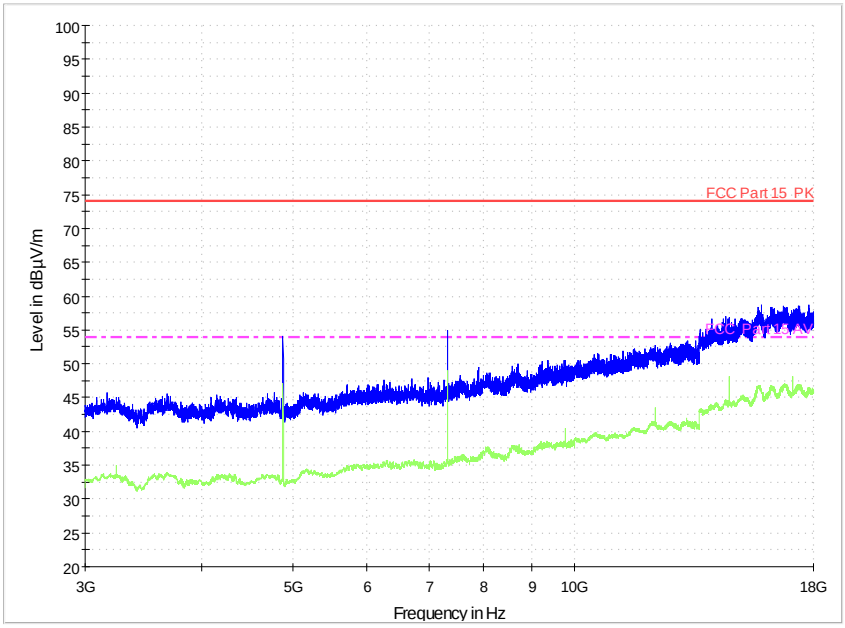


Fig. 20 Radiated Spurious Emission (GFSK, Ch39, 3 GHz ~18 GHz)

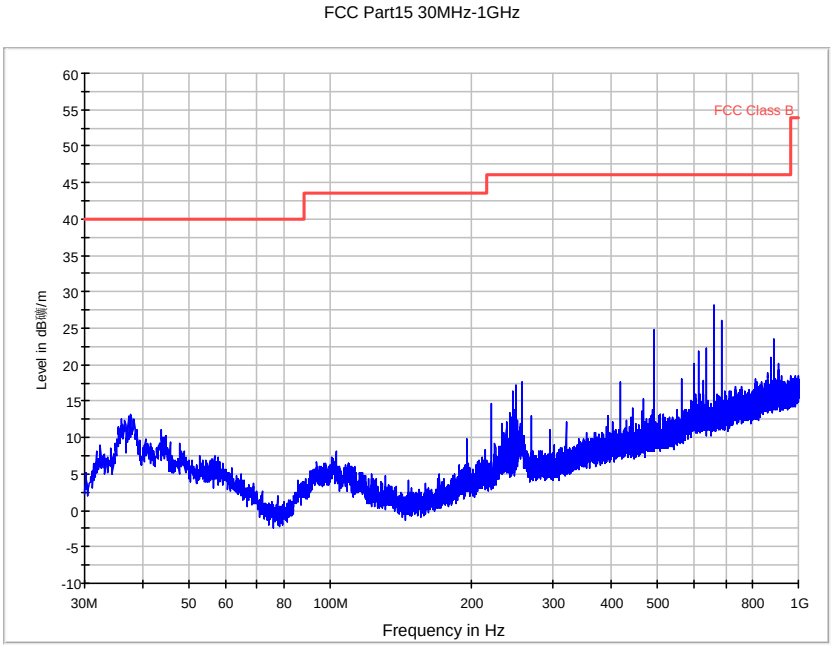


Fig. 21 Radiated Spurious Emission (GFSK, Ch78, 30 MHz ~1 GHz)

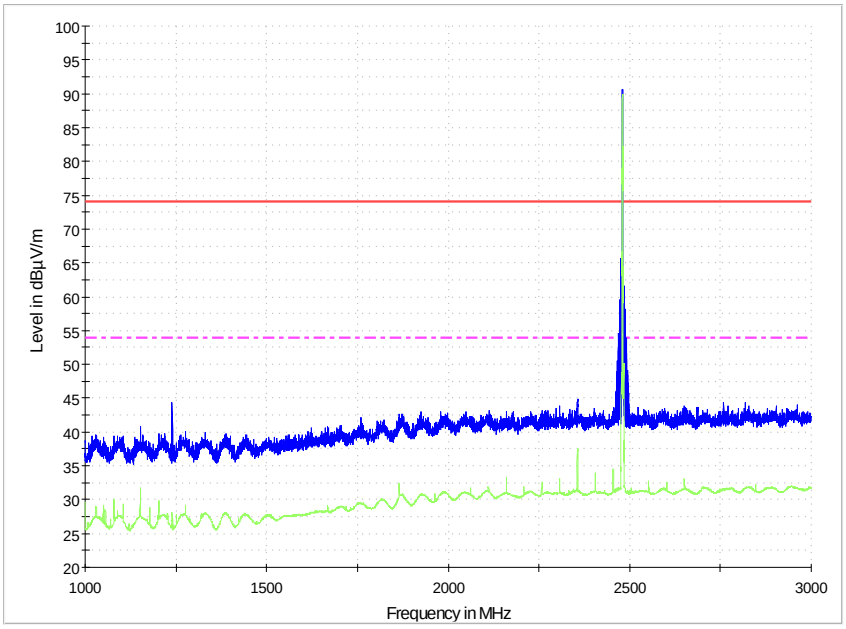


Fig. 22 Radiated Spurious Emission (GFSK, Ch78, 1 GHz ~3 GHz)

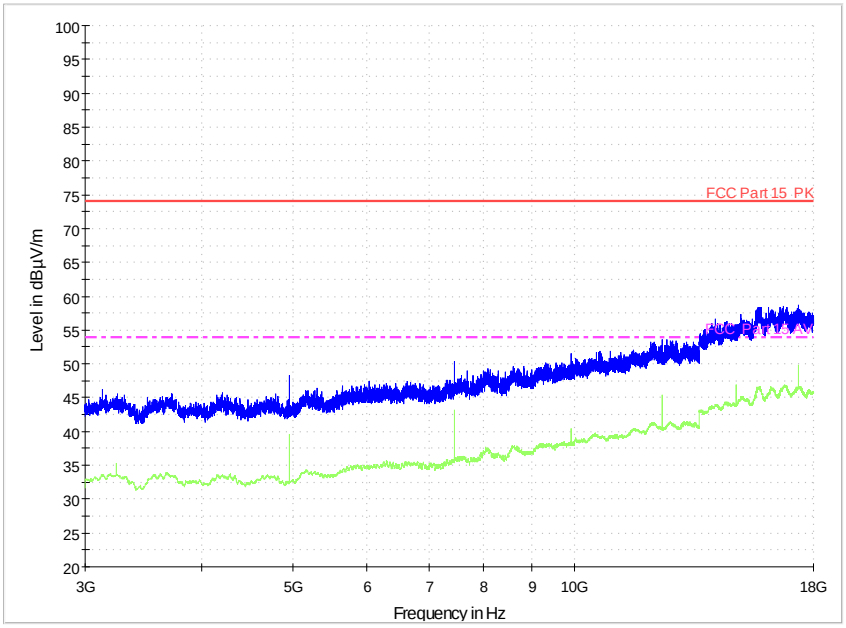


Fig. 23 Radiated Spurious Emission (GFSK, Ch78, 3 GHz ~18 GHz)

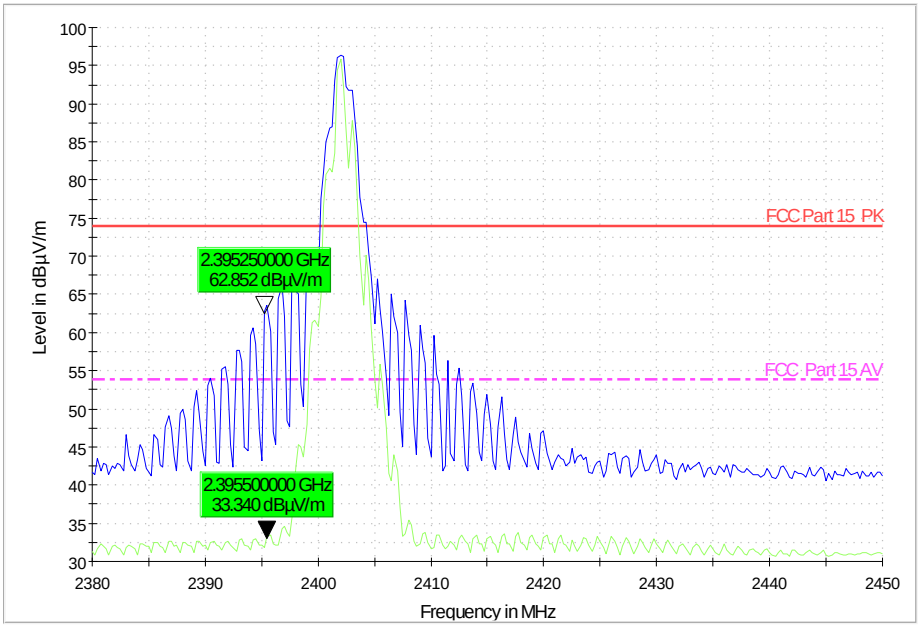


Fig. 24 Radiated Emission Power (GFSK, Ch0, 2380GHz~2450GHz)

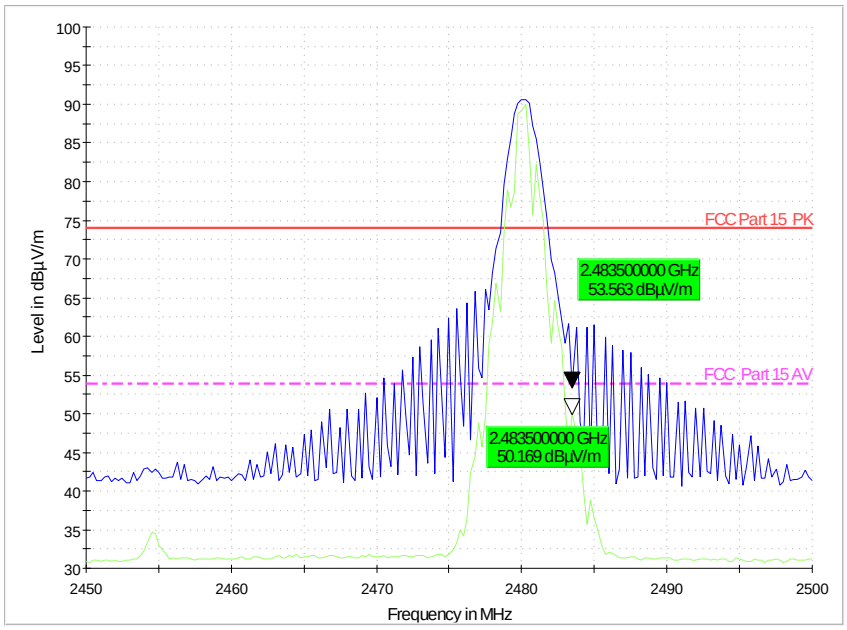


Fig. 25 Radiated Emission Power (GFSK, Ch78, 2450GHz~2500GHz)

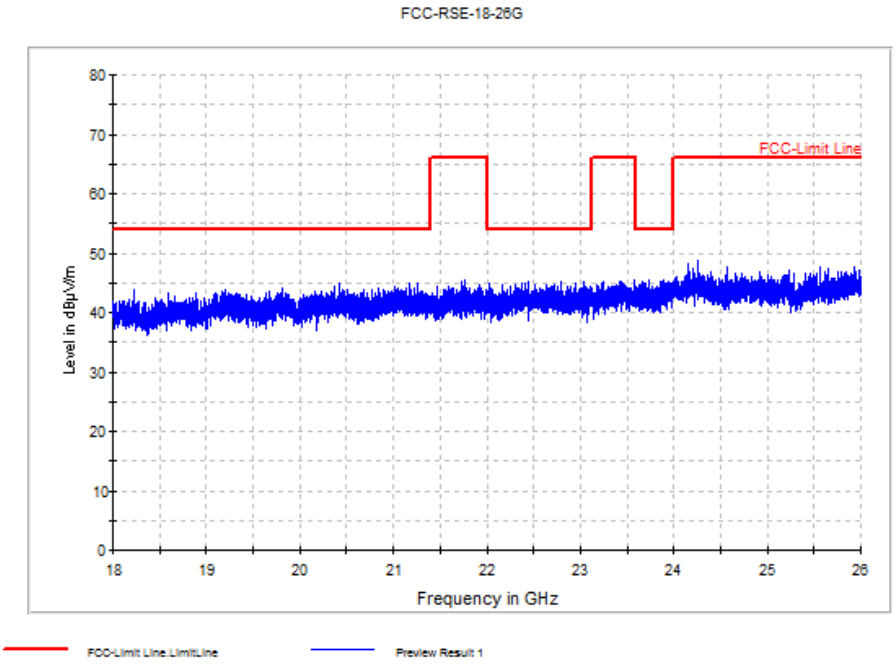


Fig. 26 Radiated Spurious Emission (All channel, 18 GHz ~26 GHz)

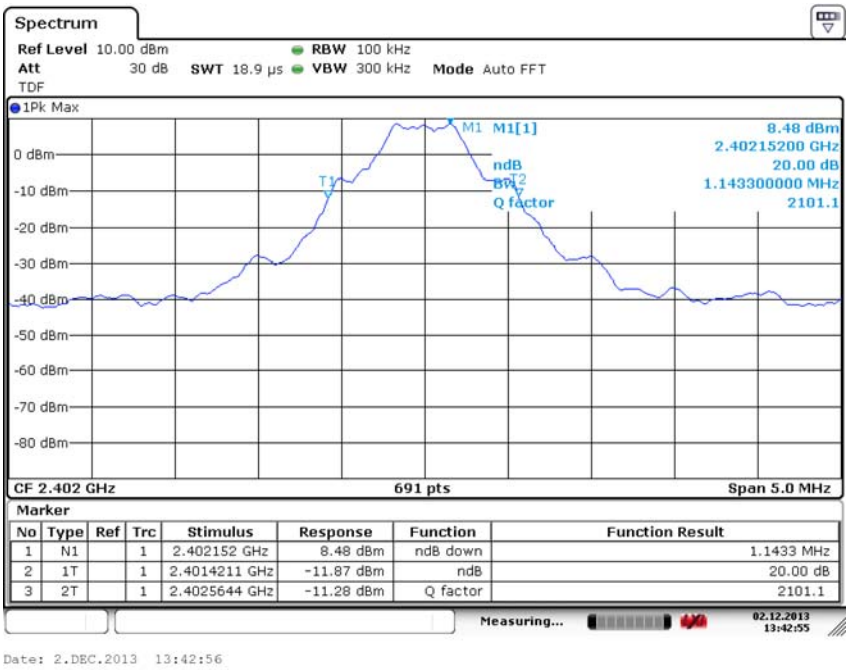


Fig. 27 Occupied 20dB Bandwidth (GFSK, Ch 0)

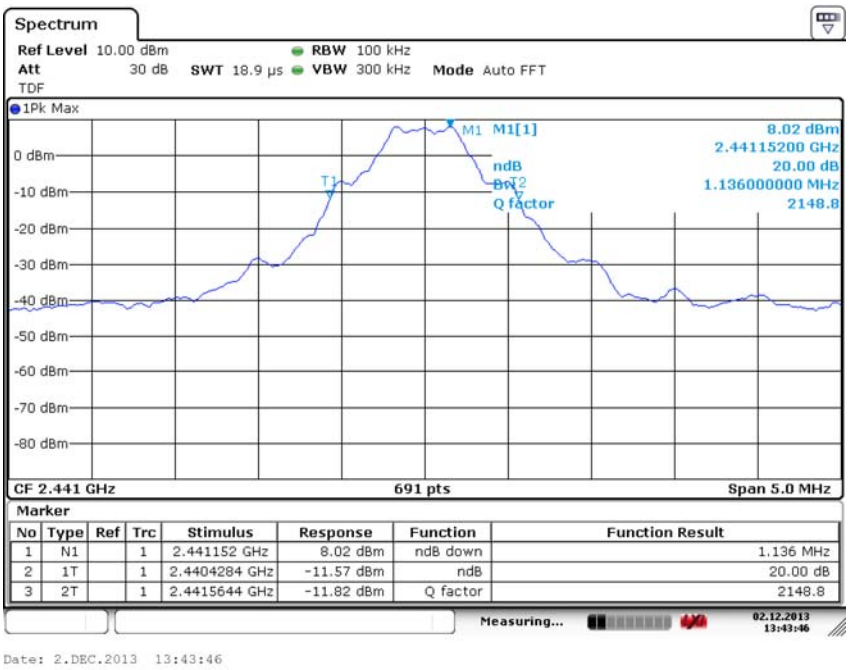


Fig. 28 Occupied 20dB Bandwidth (GFSK, Ch 39)

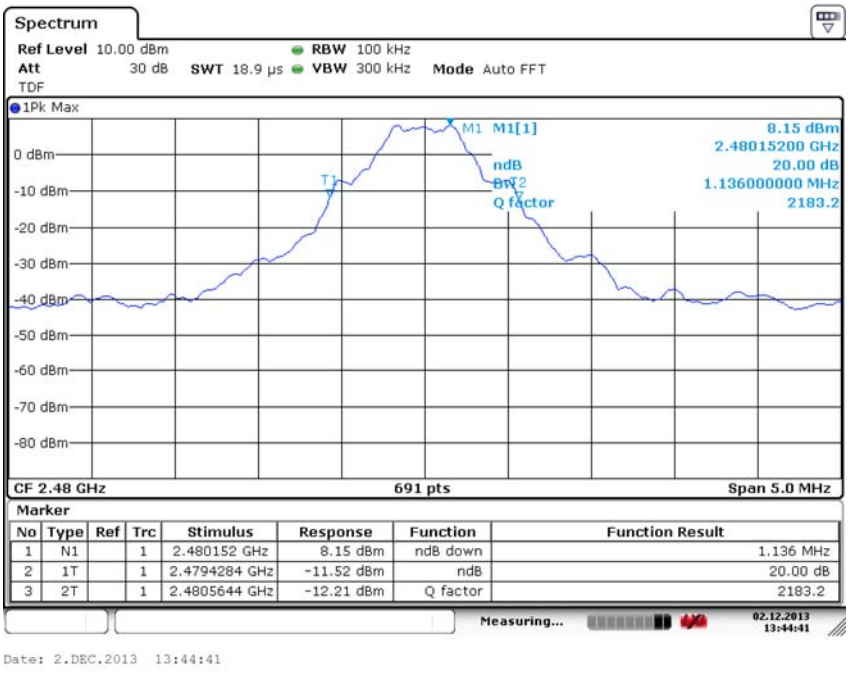


Fig. 29 Occupied 20dB Bandwidth (GFSK, Ch 78)

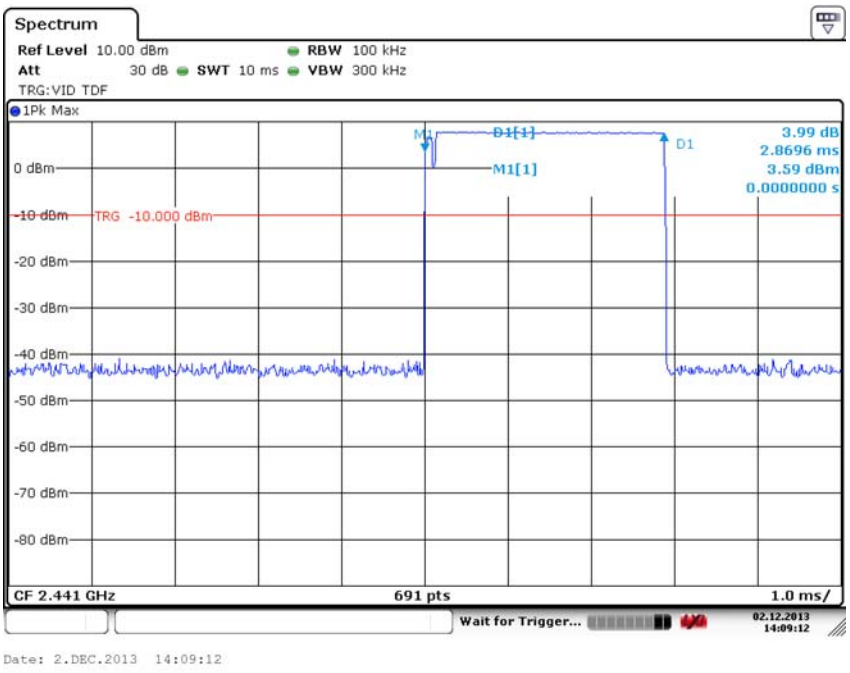


Fig. 30 Time of Occupancy(Dwell Time) (GFSK, Ch39)

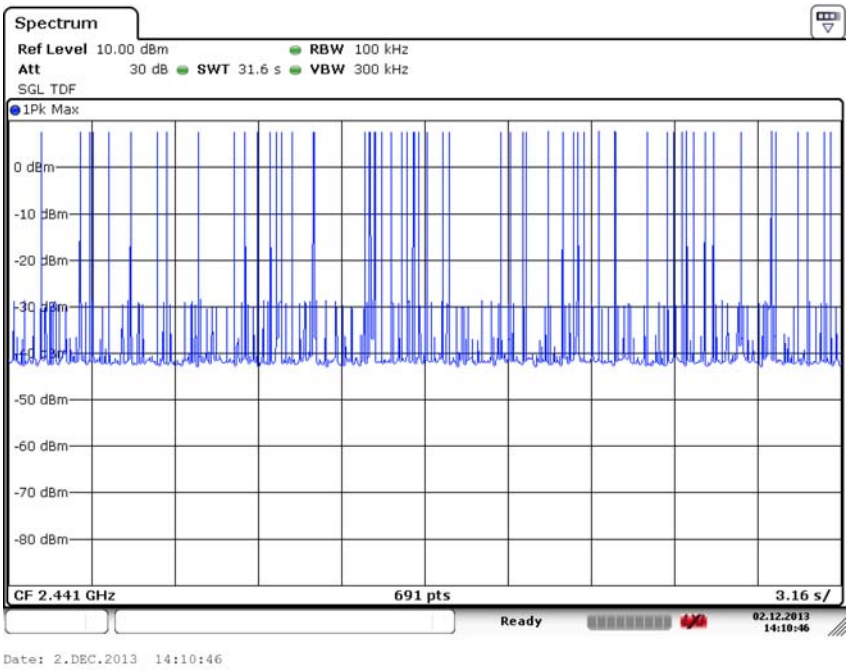


Fig. 31 Number of Transmissions (GFSK, Ch39)

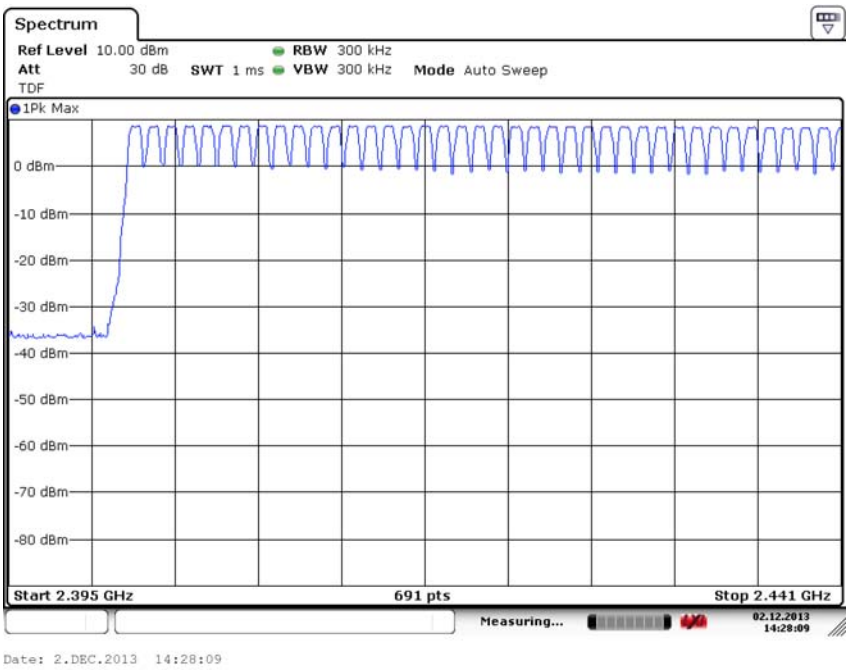


Fig. 32 Hopping channel ch0~39 (GFSK, Ch39)

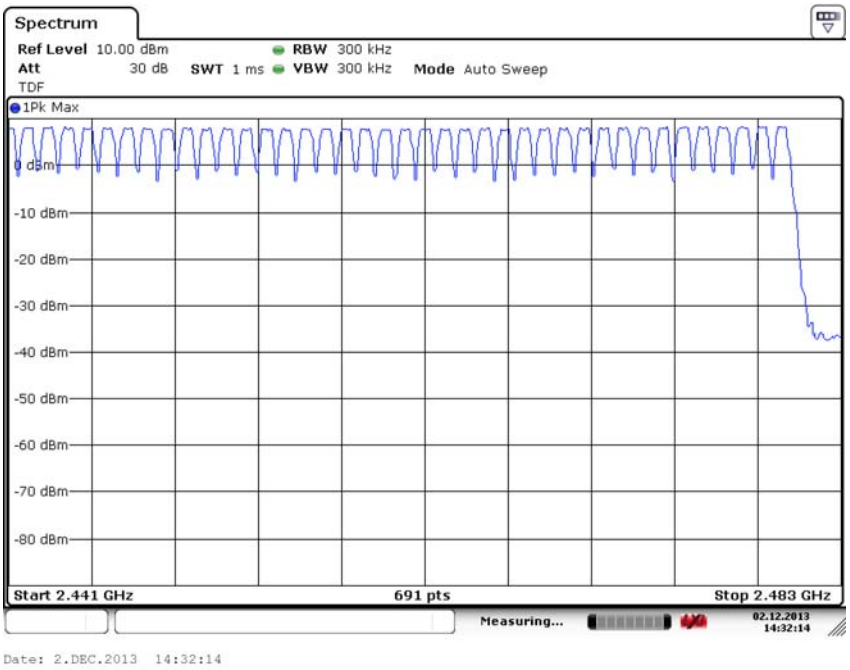


Fig. 33 Hopping channel ch39~78 (GFSK, Ch39)

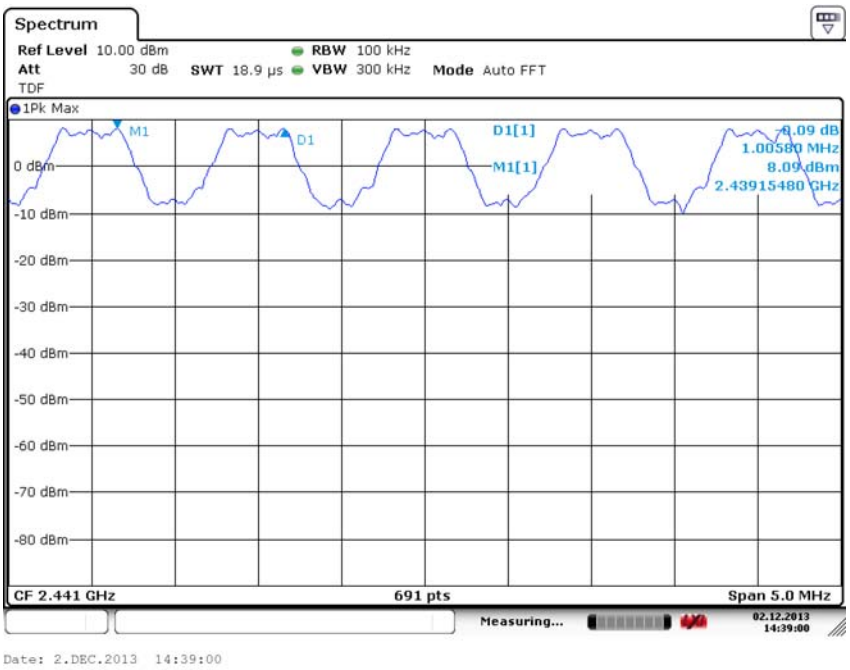


Fig. 34 Carrier Frequency Separation (GFSK, Ch39)

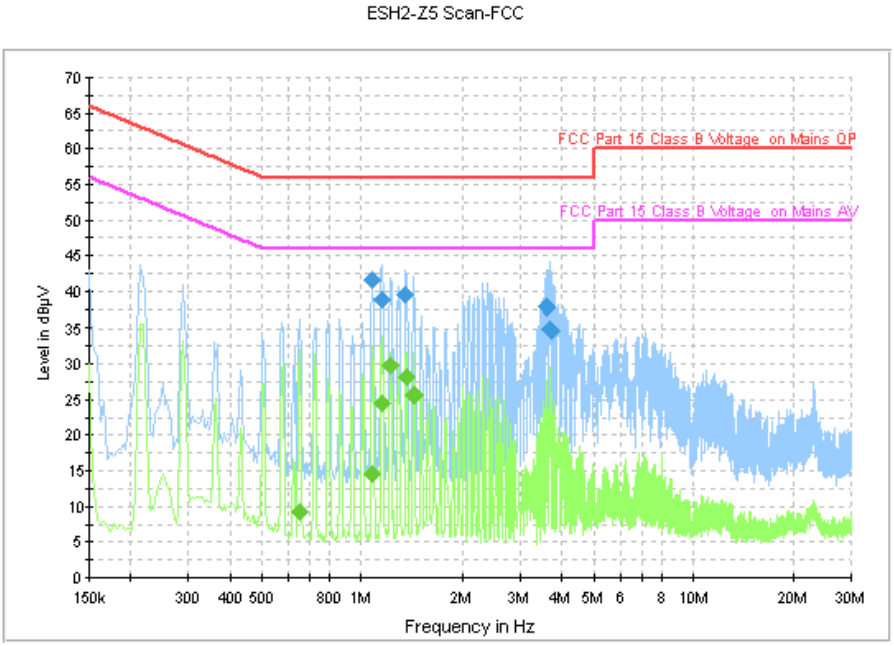


Fig. 35 AC Power line Conducted Emission (GFSK, Ch39)

MEASUREMENT RESULT: " QuasiPeak "

Frequency (MHz)	QuasiPeak (dBµV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
1.078000	41.5	FLO	L1	10.1	14.5	56.0
1.150000	38.8	FLO	L1	10.1	17.2	56.0
1.362000	39.6	FLO	L1	10.1	16.4	56.0
3.586000	37.9	FLO	L1	10.2	18.1	56.0
3.658000	34.9	FLO	L1	10.2	21.1	56.0
3.742000	34.6	FLO	L1	10.2	21.4	56.0

MEASUREMENT RESULT: " Average "

Frequency (MHz)	CAverage (dBµV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.650000	9.3	FLO	N	10.0	36.7	46.0
1.078000	14.6	FLO	L1	10.1	31.4	46.0
1.150000	24.5	FLO	L1	10.1	21.5	46.0
1.222000	29.8	FLO	L1	10.1	16.2	46.0
1.366000	28.2	FLO	L1	10.1	17.8	46.0
1.438000	25.7	FLO	L1	10.1	20.3	46.0

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