Full

TEST REPORT

No. ECIT-2013-0104-RF-BT

For

Client : ZTE Corporation

Production : GSM（GPRS）Dual-Band Digital Mobile Phone

Model Name : ZTE S522

FCC ID: SRQ-ZTES522

Hardware Version: GMBD

Software Version: ZTE-CN-QS-P126A30V1.0.0

Issued d te: 2013-08-15

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 ECIT Shanghai.

Test Laboratory:

ECIT Shanghai, East China Institute of Telecommunications

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CONTENTS

1. General Information

1.1 Notes

All reported tests were carried out on a sample equipment to demonstrate limited compliance with the section 3.

The test results of this test report relate exclusively to the item(s) tested as specified in section 5.

The following deviation from, additions to, or exclusions from the test specifications have been made. See section 3.

1.2 Statements

The product ZTE S522 , supporting WCDMA/HSPA/HSUPA/GPRS/GSM, manufactured by ZTE Corporation is a new product for testing.

ECIT has verified that the compliance of the tested device specified in section 5 of this test report is successfully evaluated according to the procedure and test methods as defined in type certification requirement listed in section 5 of this test report.

1.3 Testing Laboratory information

1.3.1. Testing Location

Company Name:	ECIT Shanghai, East China Institute of Telecommunications
Address:	7F, G Area,No. 668, Beijing East Road, Huangpu District, Shanghai, P. R. China
Postal Code:	200001
Telephone:	00862163843300
Fax:	00862163843301
FCC Registration NO.:	489729

1.3.2. Testing Environment

Normal Temperature:	15-35℃
Extreme Temperature:	N/A
Relative Humidity:	20-75%

1.3.3. Project data

Project Leader:	Liu Jianquan
Testing Start Date:	07,16,2013
Testing End Date:	08,15,2013

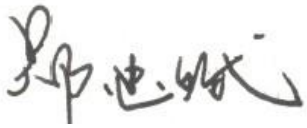
1.3.4. Signature

Wang daming

(Testing Engineer)

Yu naiping

(Reviewed this test report)



Zheng Zhongbin

Director of the laboratory

(Approved this test report)

1.4 Details of applicant or manufacturer

1.4.1. Applicant Information

Company Name:	ZTE Corporation
Address /Post:	ZTE Plaza, Keji Road South, Hi-Tech, Industrial Park, Nanshan District,Shenzhen, Guangdong, 518057, P.R.China
Country:	China

1.4.2. Manufacturer Information

Company Name:	ZTE Corporation
Address /Post:	ZTE Plaza, Keji Road South, Hi-Tech, Industrial Park, Nanshan District,Shenzhen, Guangdong, 518057, P.R.China
Country:	China

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

2.1. About EUT

EUT Description	GSM（GPRS）Dual-Band Digital Mobile Phone
Model name	ZTE S522
Bluetooth Frequency	2402MHz-2480MHz
Bluetooth Channel	Channel0-Channel78
Bluetooth Modulation	GMSK;π/4 DQPSK;8DPSK
Extreme Temperature	N/A
Nominal Voltage	3.7V
Extreme High Voltage	4.2V
Extreme Low Voltage	3.5V

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

2.2. Internal Identification of EUT used during the test

EUT ID*	SN or IMEI	HW Version	SW Version	Date of receipt
No.1	357244040003512	GMBD	ZTE-CN-QS-P126A3 0V1.0.0	2013-07-16

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

2.3. Internal Identification of AE used during the test

AE ID*	Description	SN
AE1	RF cable	---
AE2	---	---

3. Reference Documents

3.1. 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, 2400-2483.5MHz, and 5725-5850MHz.	Oct,2009 Edition
ANSI C63.4	Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9KHz to 40GHz	2009
DA 00-705	Filing and Measurement Guidelines for Frequency Hopping Spread Spectrum Systems	March 30,2000

4. Summary of Test Results

A brief summary of the tests carried out is shown as following.

Measurement Items	Sub-clause of Part15C	Sub-clause of IC	Verdict
Maximum Peak Output Power	15.247(a)	/	P
Peak Power Spectral Density	15.247(d)	/	P
Occupied 6dB Bandwidth	15.247(d)	/	P
Band Edges Compliance	15.247(b)	/	P
Transmitter Spurious Emission-Conducted	15.247	/	P
Transmitter Spurious Emission-Radiated	15.247,15.209,	/	P
AC Powerline Conducted Emission	15.107,15.207	/	P

Please refer to part 5 for detail.

The measurements are according to Public notice DA 00-705 and ANSI C63.4.

Terms used in Verdict column

P	Pass, the EUT complies with the essential requirements in the standard.
NP	Not Perform, the test was not performed by ECIT.
NA	Not Applicable, the test was not applicable.
F	Fail, the EUT does not comply with the essential requirements in the standard.

Test Conditions

Tnom	Normal temperature
Tmin	Low Temperature
Tmax	High Temperature
Vnom	Normal Voltage
Vmin	Low Voltage
Vmax	High Voltage
Hnom	Norm Humidity
Anom	Norm Air Pressure

For this report, all the test case listed above are tested under Normal Temperature and Normal Voltage, and also under norm humidity, the specific conditions as following:

Temperature	Tnom	22℃
Voltage	Vnom	3.7V
Humidity	Hnom	32%
Air Pressure	Anom	1010hPa

Note:

a. All the test data for each data were verified, but only the worst case was reported.

b.The GFSK, π/4 DQPSK and 8DPSK were set in DH1 for GFSK, 2-DH1 for π/4 DQPSK, 3-DH1 for 8DPSK.

c.The DC and low frequency voltages' measurement uncertainty is ±2%.

5. Test result

5.1. Peak Output Power-Conducted

Measurement Limit

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

The measurement is according to Public notice DA 00-705 and ANSI C63.4.

Test Condition:

Hopping Mode	RBW	VBW	Span	Sweeptime
Hopping OFF	3MHz	10MHz	5MHz	2.5ms

Measurement Results:

For GFSK

Channel	Ch0 2402 MHz	Ch39 2441 MHz	CH78 2480 MHz	Conclusion
Peak Conducted Output Power (dBm)	7.09	7.44	6.83	P
	Fig.1	Fig.2	Fig.3	

For π/4 DQPSK

Channel	Ch0 2402 MHz	Ch39 2441 MHz	CH78 2480 MHz	Conclusion
Peak Conducted Output Power (dBm)	6.82	6.22	5.64	P
	Fig.4	Fig.5	Fig.6	

For 8DPSK

Channel	Ch0 2402 MHz	Ch39 2441 MHz	CH78 2480 MHz	Conclusion
Peak Conducted Output Power (dBm)	6.86	6.22	5.61	P
	Fig.7	Fig.8	Fig.9	

Conclusion: PASS

Test graphs an below

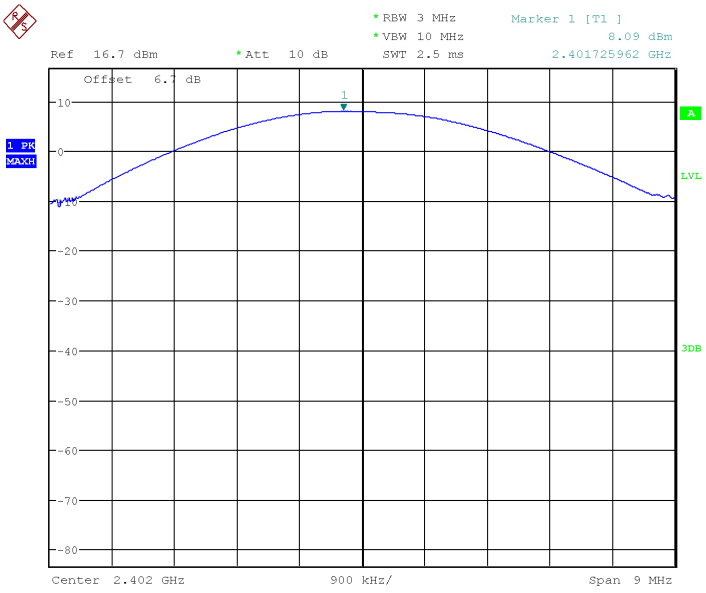


Fig.1 Peak Conducted Output Power CH0, DH1

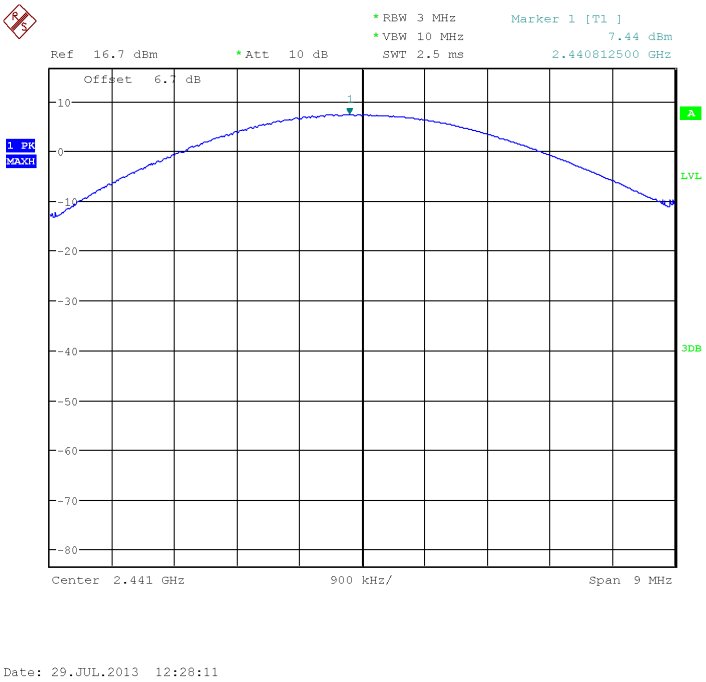


Fig.2 Peak Conducted Output Power CH39, DH1

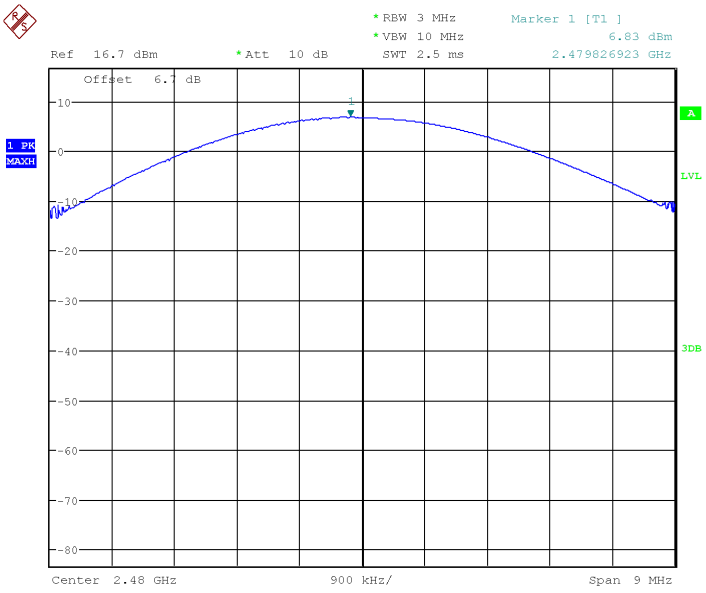


Fig.3 Peak Conducted Output Power CH78, DH1

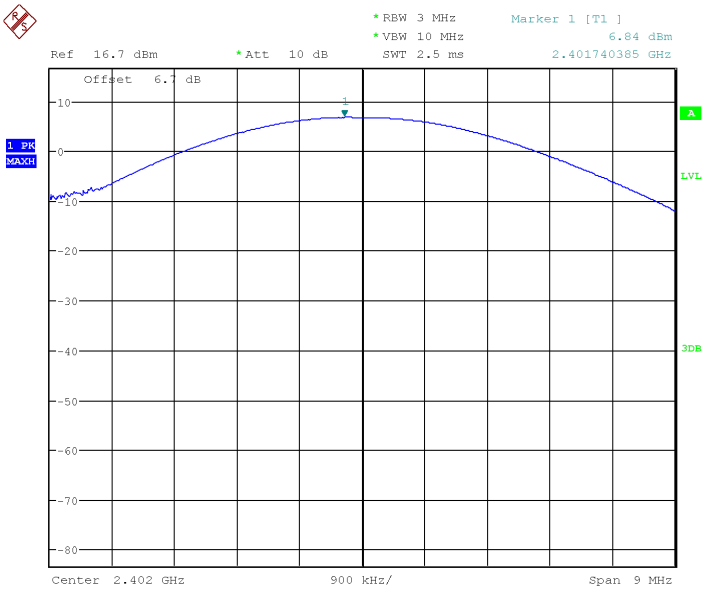


Fig.4 Peak Conducted Output Power CH0, 2DH1

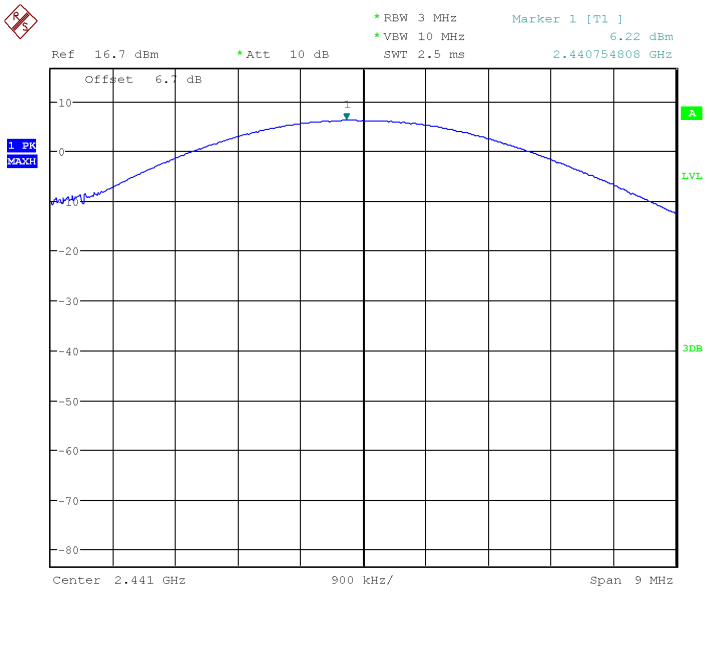


Fig.5 Peak Conducted Output Power CH39, 2DH1

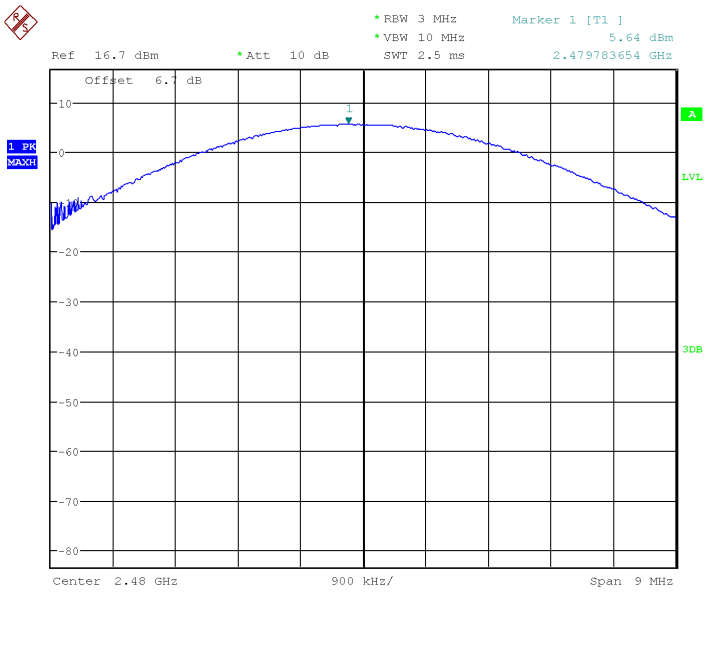


Fig.6 Peak Conducted Output Power CH78, 2DH1

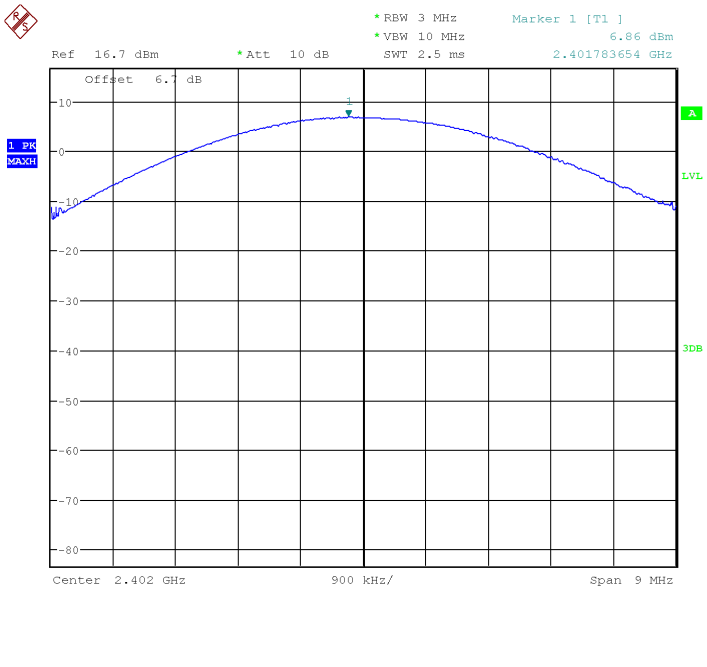


Fig.7 Peak Conducted Output Power CH0, 3DH1

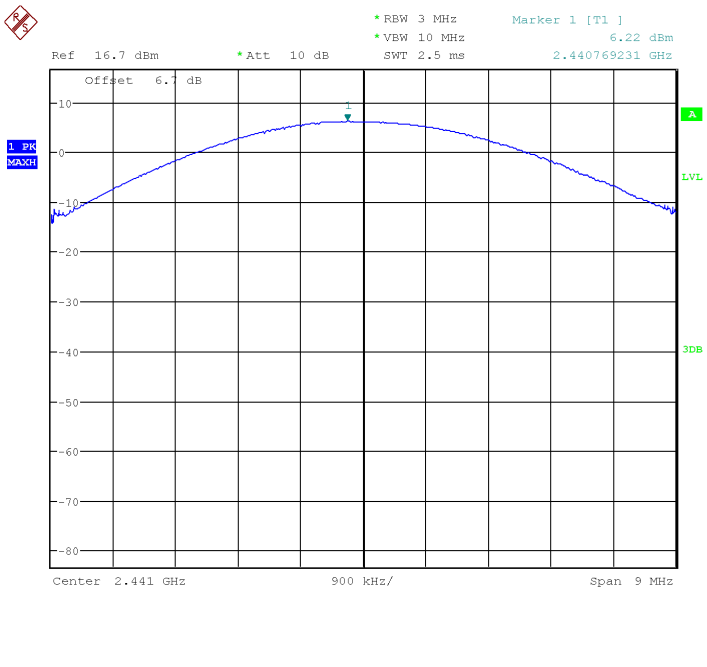


Fig.8 Peak Conducted Output Power CH39, 3DH1

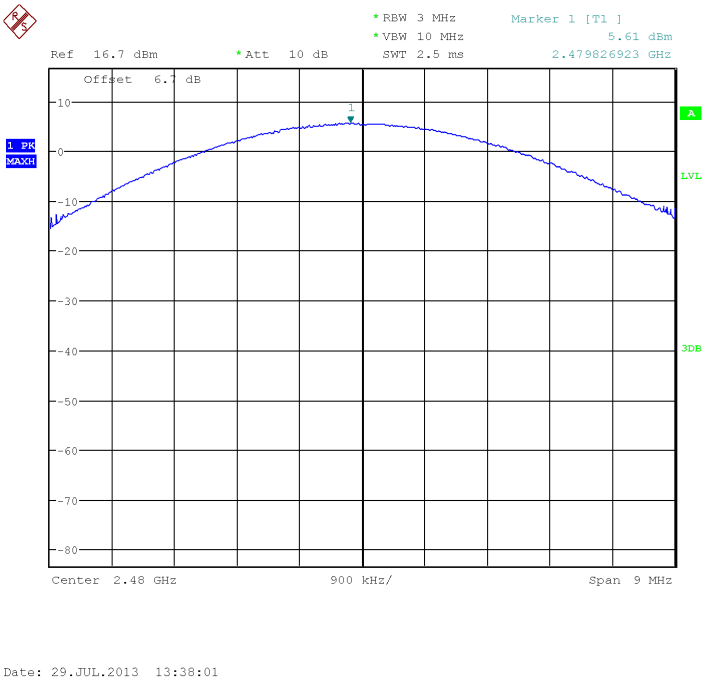


Fig.9 Peak Conducted Output Power CH78, 3DH1

5.2. Frequency Band Edges-Conducted

Measurement Limit:

For GFSK

Channel	Hopping	Band Edge Power (dBc)		Conclusion
0	Hopping OFF	Fig.10	-35.26	P
	Hopping ON	Fig.11	-35.26	P
78	Hopping OFF	Fig.12	-42.78	P
	Hopping ON	Fig.13	-42.78	P

For π/4 DQPSK

Channel	Hopping	Band Edge Power (dBc)		Conclusion
0	Hopping OFF	Fig.14	-33.19	P
	Hopping ON	Fig.15	-33.19	P
78	Hopping OFF	Fig.16	-41.37	P
	Hopping ON	Fig.17	-41.37	P

For 8DPSK

Channel	Hopping	Band Edge Power (dBc)		Conclusion
0	Hopping OFF	Fig.18	-36.70	P
	Hopping ON	Fig.19	-36.70	P
78	Hopping OFF	Fig.20	-40.89	P
	Hopping ON	Fig.21	-40.89	P

Conclusion: PASS

Test graphs an below

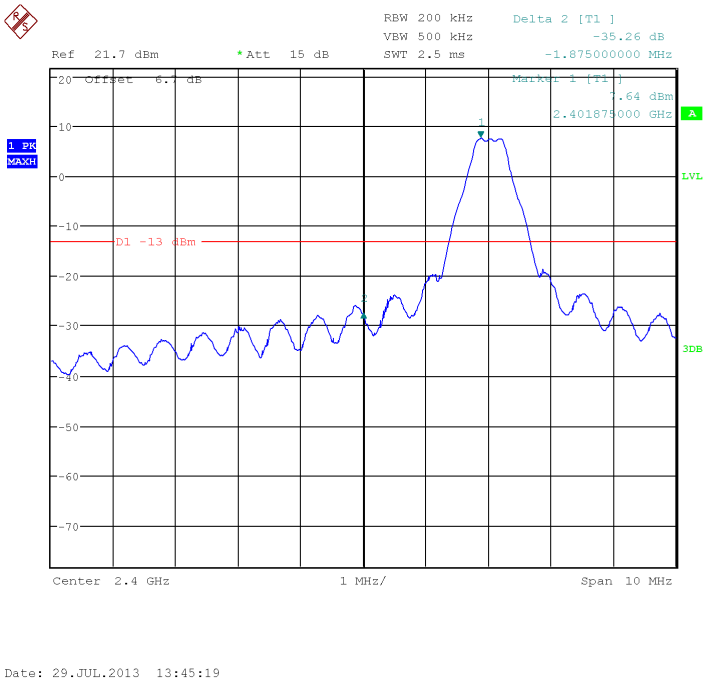


Fig.10 Frequency Band Edge: GFSK, Ch0, Hopping OFF

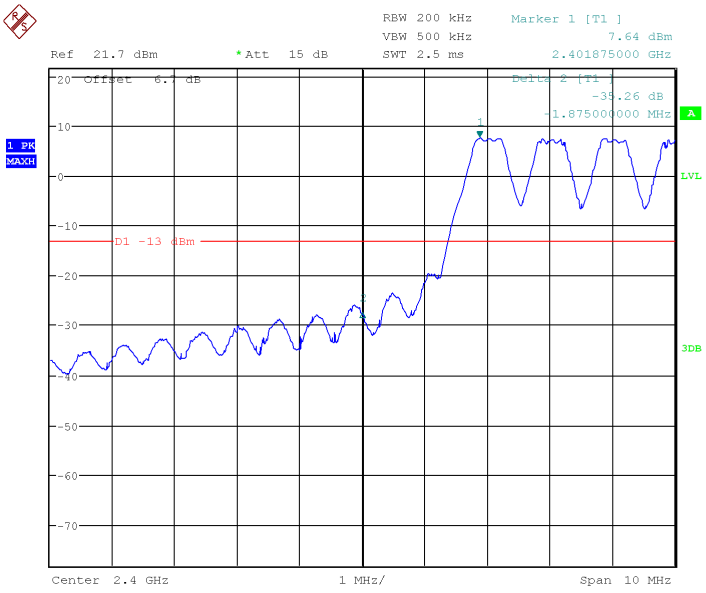


Fig.11 Frequency Band Edge: GFSK, Ch0, Hopping ON

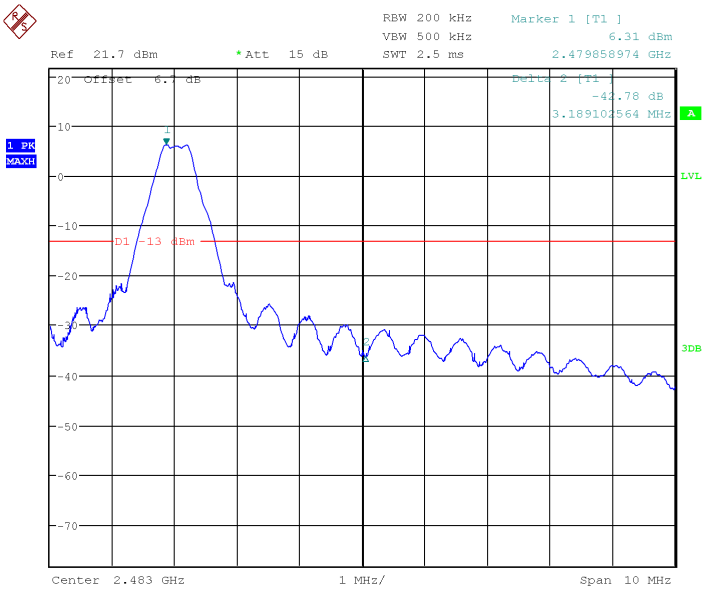


Fig.12 Frequency Band Edge: GFSK, Ch78, Hopping OFF

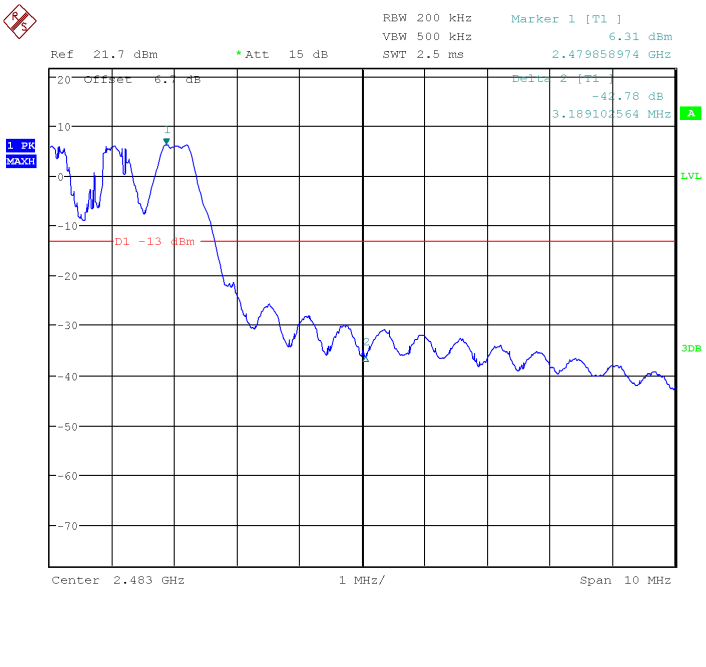


Fig.13 Frequency Band Edge: GFSK, Ch78, Hopping ON

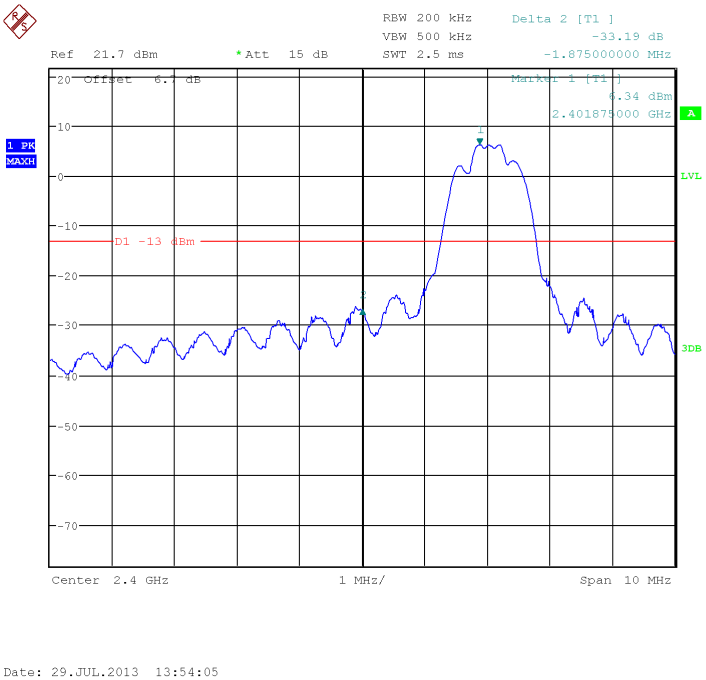


Fig.14 Frequency Band Edge: π/4 DQPSK, Ch0, Hopping OFF

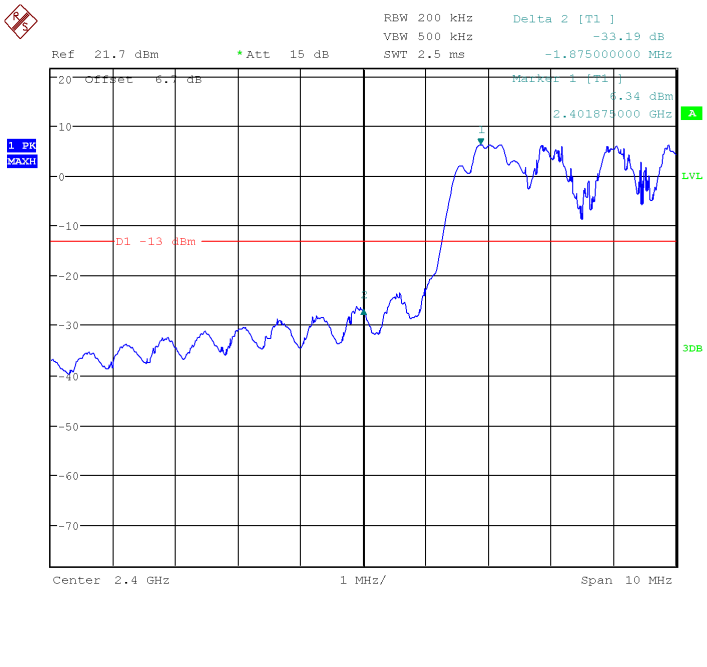


Fig.15 Frequency Band Edge: π/4 DQPSK, Ch0, Hopping ON

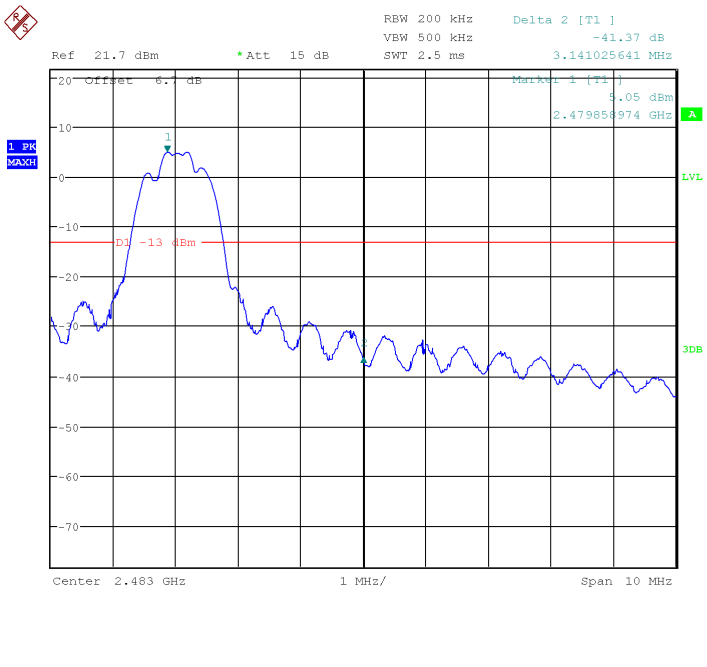


Fig.16 Frequency Band Edge: π/4 DQPSK, Ch78, Hopping OFF

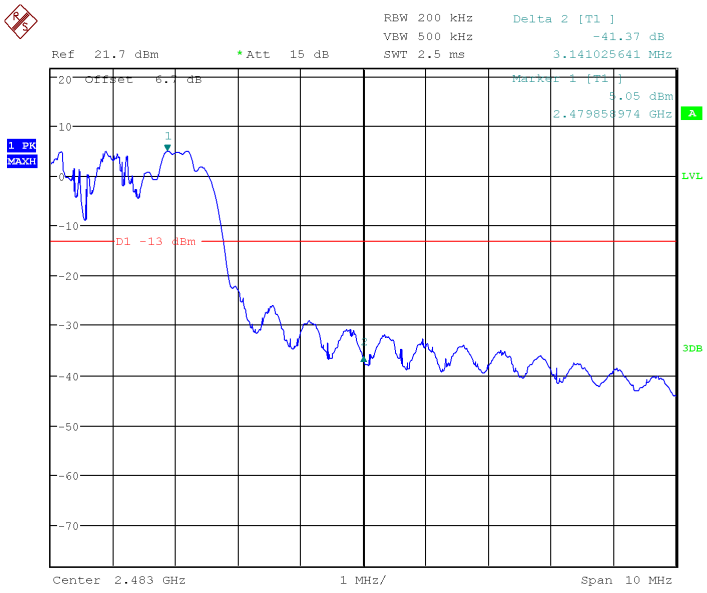


Fig.17 Frequency Band Edge: π/4 DQPSK, Ch78, Hopping ON

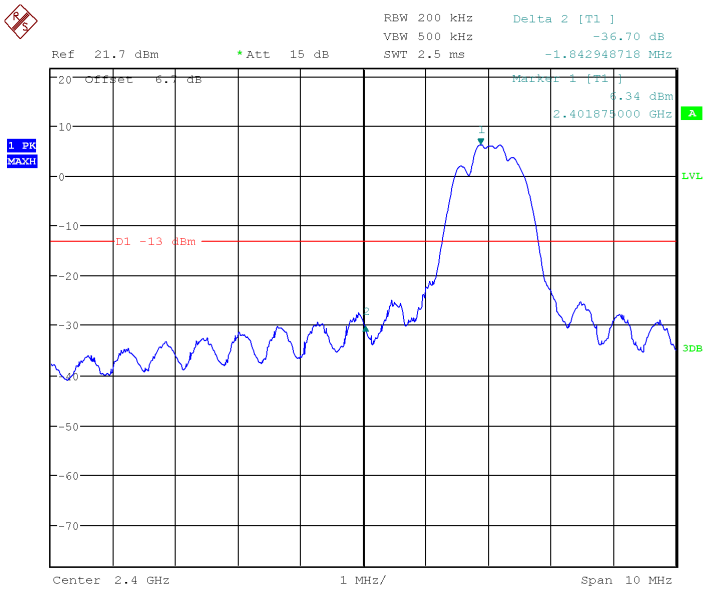


Fig.18 Frequency Band Edge: 8DPSK, Ch0, Hopping OFF

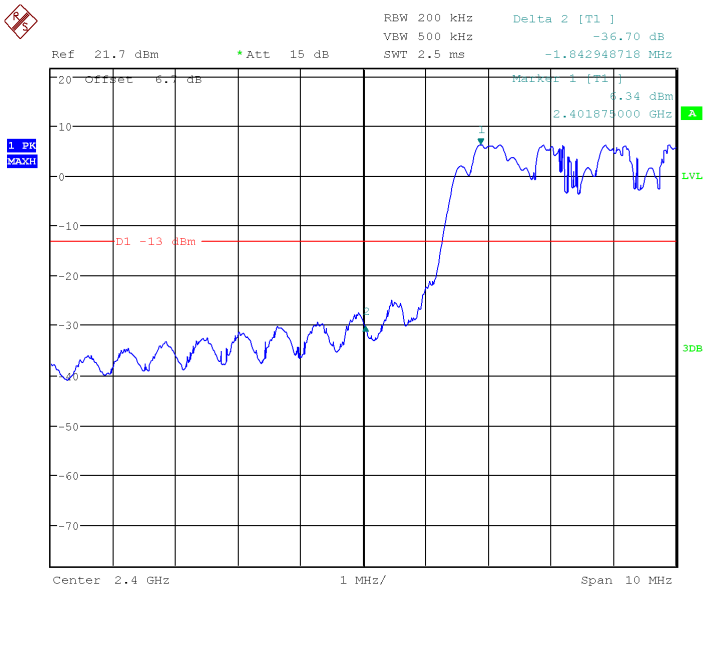


Fig.19 Frequency Band Edge: 8DPSK, Ch0, Hopping ON

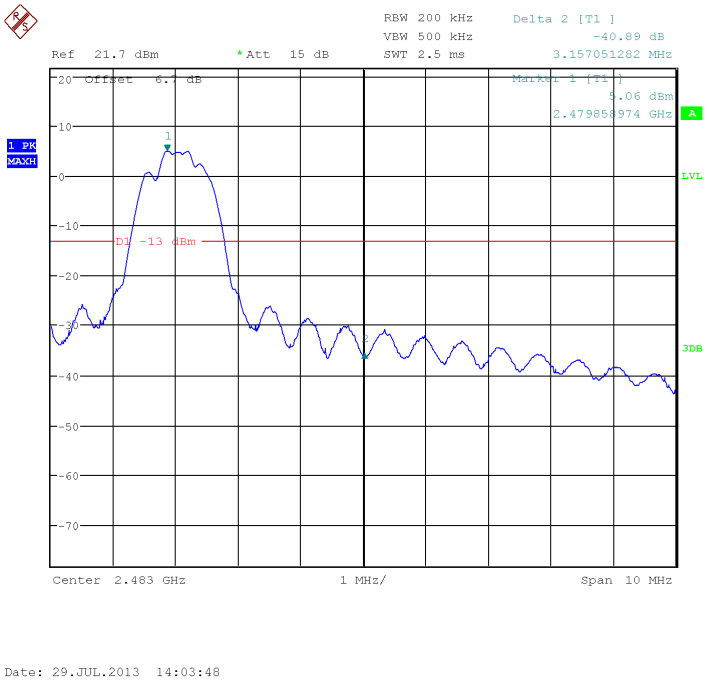


Fig.20 Frequency Band Edge: 8DPSK, Ch78, Hopping OFF

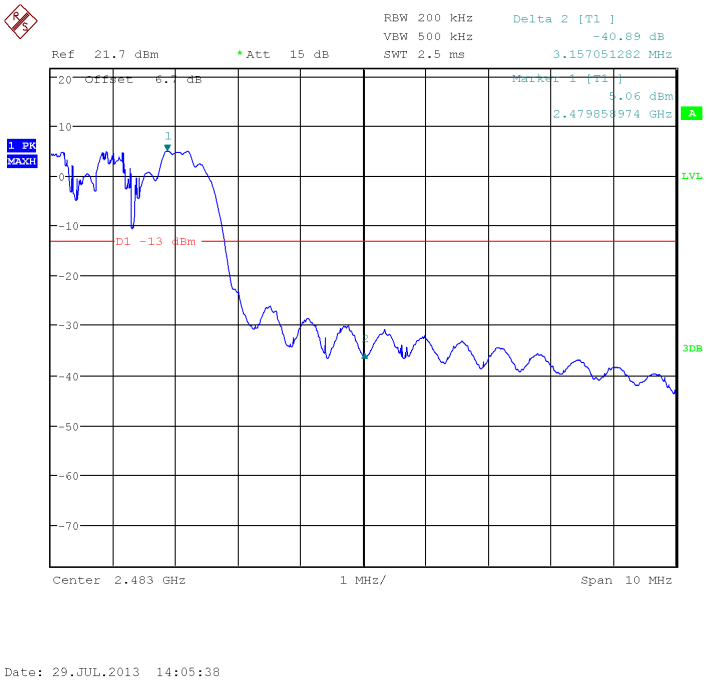


Fig.21 Frequency Band Edge: 8DPSK, Ch78, Hopping ON

5.3. Conducted Emission

Measurement Limit:

Standard	Limit
FCC 47 CFR Part15.247 (d)	20dB below peak output power in 100KHz bandwidth

The measurement is according to Public notice DA 00-705 and ANSI C63.4

Measurement Results:

For GFSK

Channel	Frequency Range	Test Results	Conclusion
Ch0 2402MHz	Center Freq.	Fig.22	P
	30MHz~1GHz	Fig.23	P
	1GHz~3GHz	Fig.24	P
	3GHz~10GHz	Fig.25	P
	10GHz~26GHz	Fig.26	P
Ch39 2441MHz	Center Freq.	Fig.27	P
	30MHz~1GHz	Fig.28	P
	1GHz~3GHz	Fig.29	P
	3GHz~10GHz	Fig.30	P

	10GHz~26GHz	Fig.31	P
Ch78 2480MHz	Center Freq.	Fig.32	P
	30MHz~1GHz	Fig.33	P
	1GHz~3GHz	Fig.34	P
	3GHz~10GHz	Fig.35	P
	10GHz~26GHz	Fig.36	P

For π/4 DQPSK

Channel	Frequency Range	Test Results	Conclusion
Ch0 2402MHz	Center Freq.	Fig.37	P
	30MHz~1GHz	Fig.38	P
	1GHz~3GHz	Fig.39	P
	3GHz~10GHz	Fig.40	P
	10GHz~26GHz	Fig.41	P
Ch39 2441MHz	Center Freq.	Fig.42	P
	30MHz~1GHz	Fig.43	P
	1GHz~3GHz	Fig.44	P
	3GHz~10GHz	Fig.45	P
	10GHz~26GHz	Fig.46	P
Ch78 2480MHz	Center Freq.	Fig.47	P
	30MHz~1GHz	Fig.48	P
	1GHz~3GHz	Fig.49	P
	3GHz~10GHz	Fig.50	P
	10GHz~26GHz	Fig.51	P

For 8DPSK

Channel	Frequency Range	Test Results	Conclusion
Ch0 2402MHz	Center Freq.	Fig.52	P
	30MHz~1GHz	Fig.53	P
	1GHz~3GHz	Fig.54	P

	3GHz~10GHz	Fig.55	P
	10GHz~26GHz	Fig.56	P
Ch39 2441MHz	Center Freq.	Fig.57	P
	30MHz~1GHz	Fig.58	P
	1GHz~3GHz	Fig.59	P
	3GHz~10GHz	Fig.60	P
	10GHz~26GHz	Fig.61	P
Ch78 2480MHz	Center Freq.	Fig.62	P
	30MHz~1GHz	Fig.63	P
	1GHz~3GHz	Fig.64	P
	3GHz~10GHz	Fig.65	P
	10GHz~26GHz	Fig.66	P

Conclusion: PASS

Test graphs as below

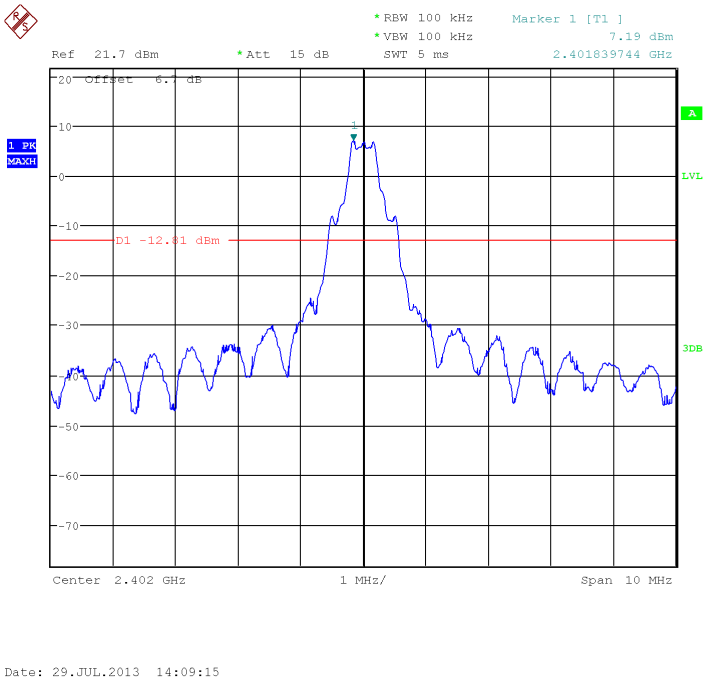


Fig.22 Conducted spurious emission: GFSK, Ch0, 2402MHz

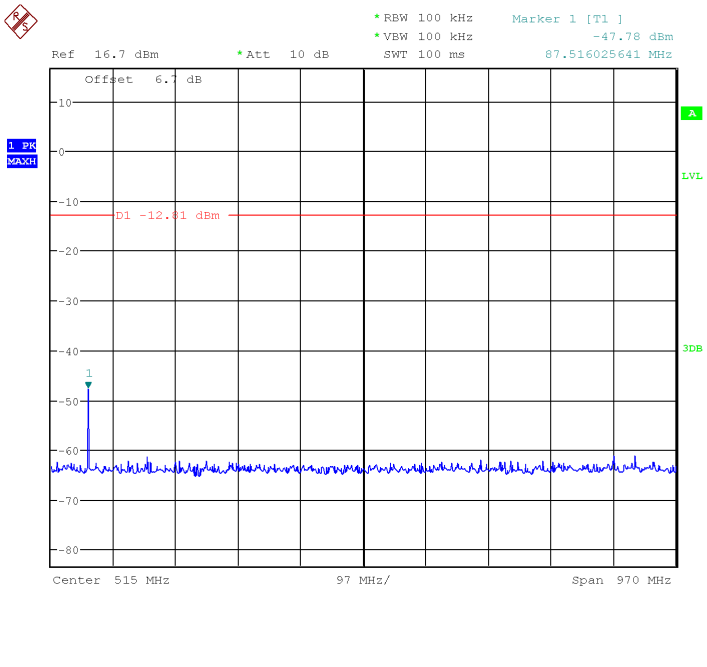


Fig.23 Conducted spurious emission: GFSK, Ch0, 30MHz~1GHz

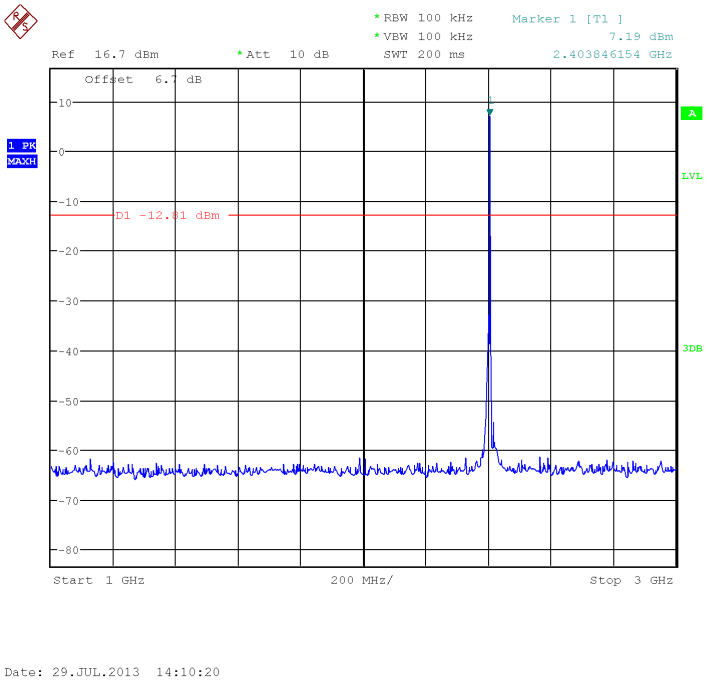


Fig.24 Conducted spurious emission: GFSK, Ch0, 1GHz~3GHz

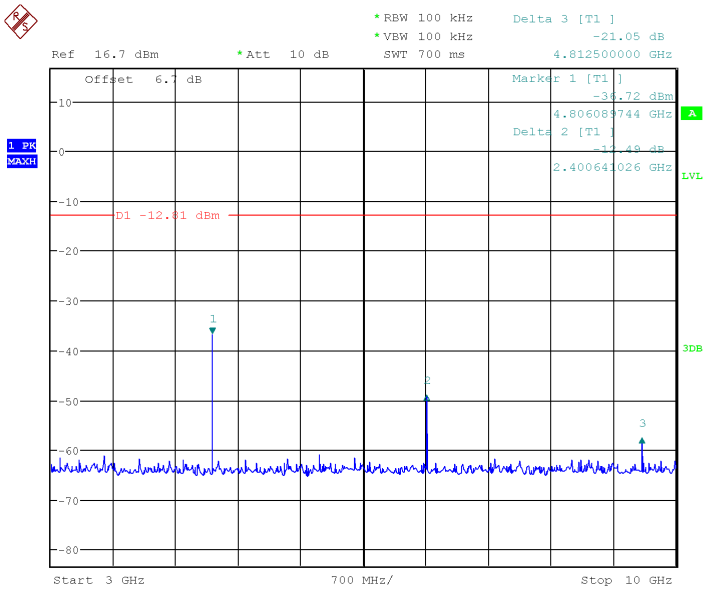


Fig.25 Conducted spurious emission: GFSK, Ch0, 3GHz~10GHz

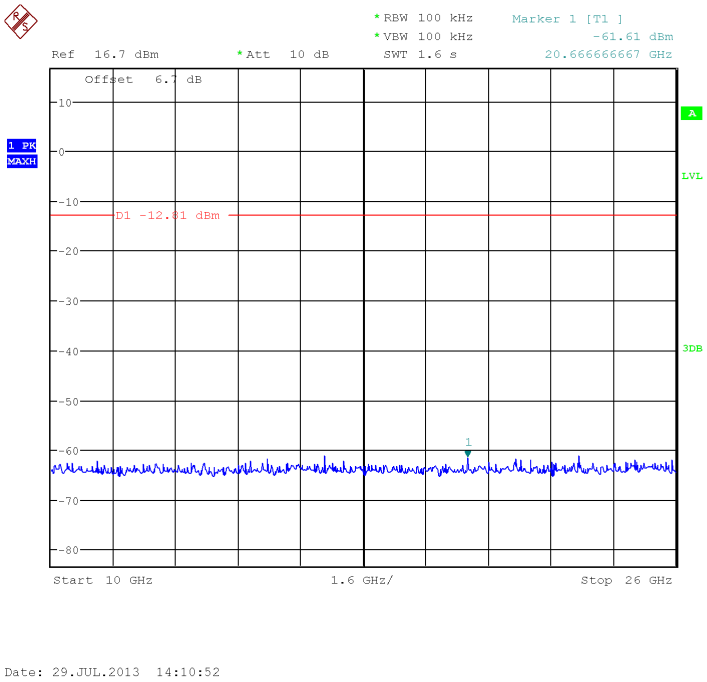


Fig.26 Conducted spurious emission: GFSK, Ch0, 10GHz~26GHz

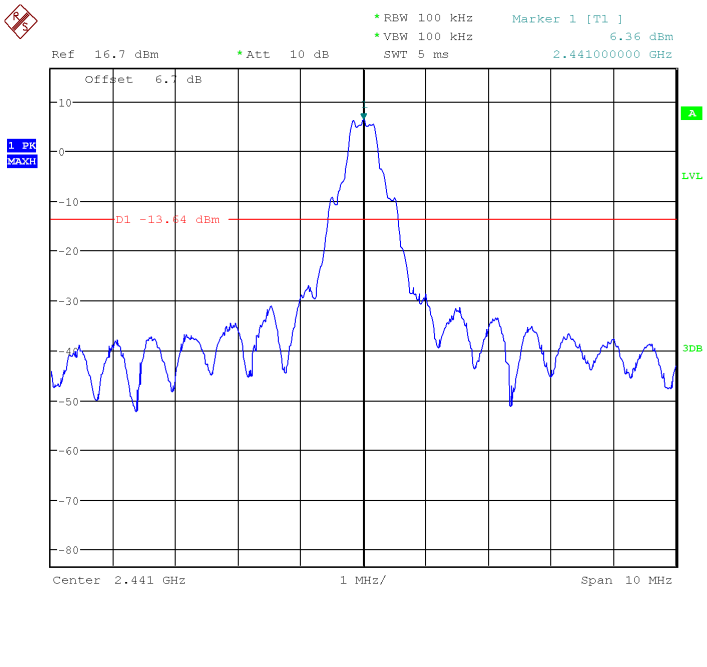


Fig.27 Conducted spurious emission: GFSK, Ch39, 2441MHz

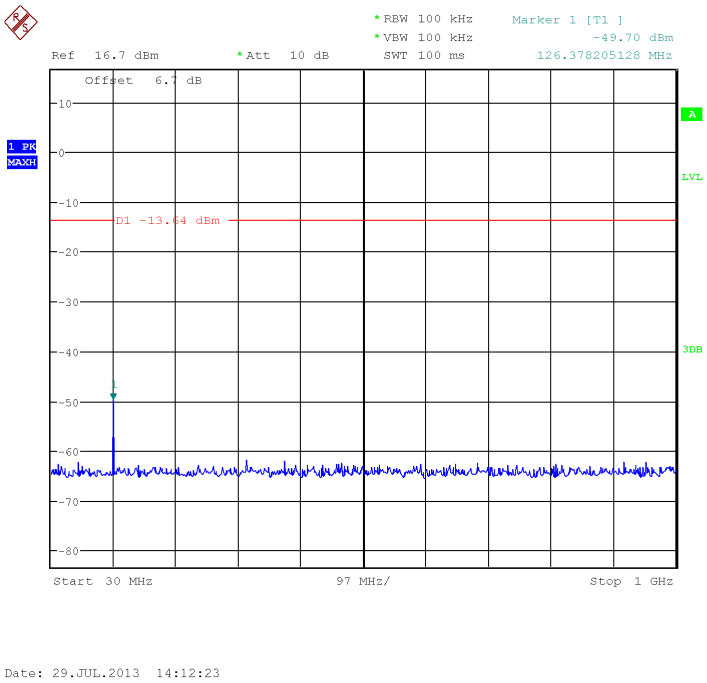


Fig.28 Conducted spurious emission: GFSK, Ch39, 30MHz~1GHz

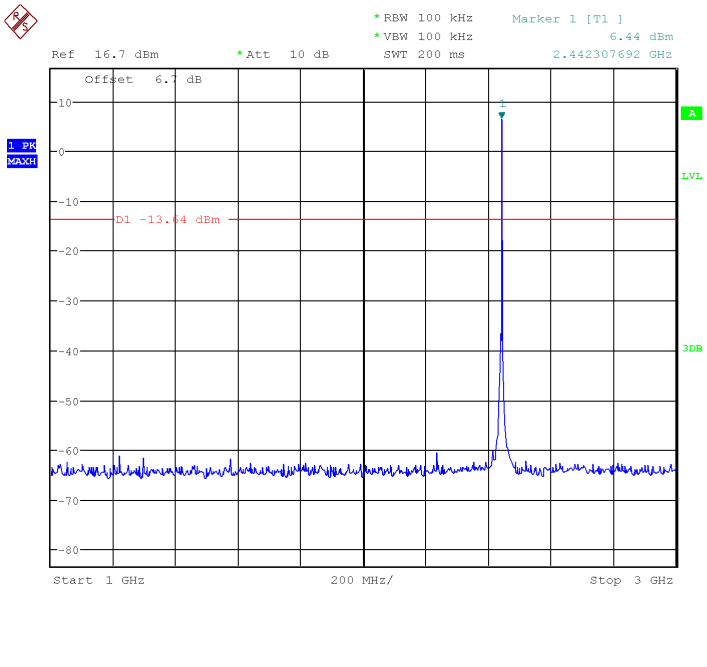


Fig.29 Conducted spurious emission: GFSK, Ch39, 1GHz~3GHz

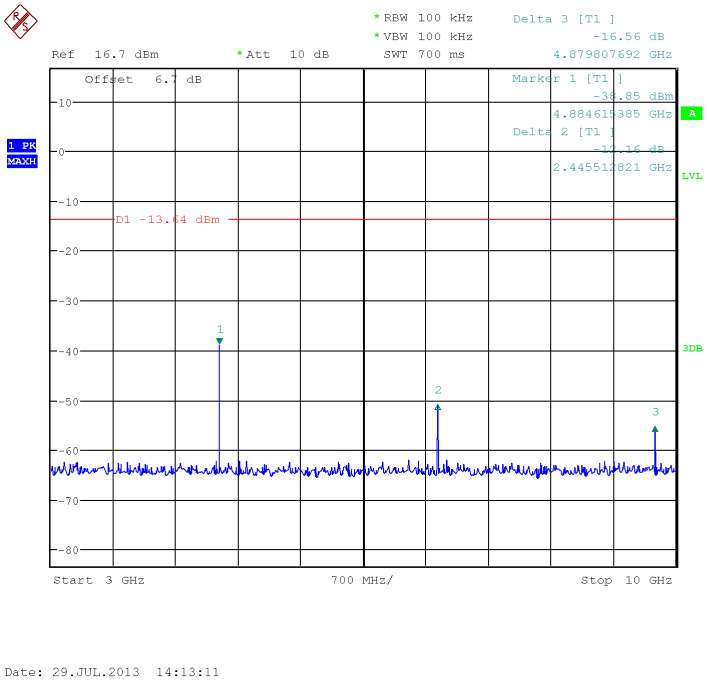


Fig.30 Conducted spurious emission: GFSK, Ch39, 3GHz~10GHz

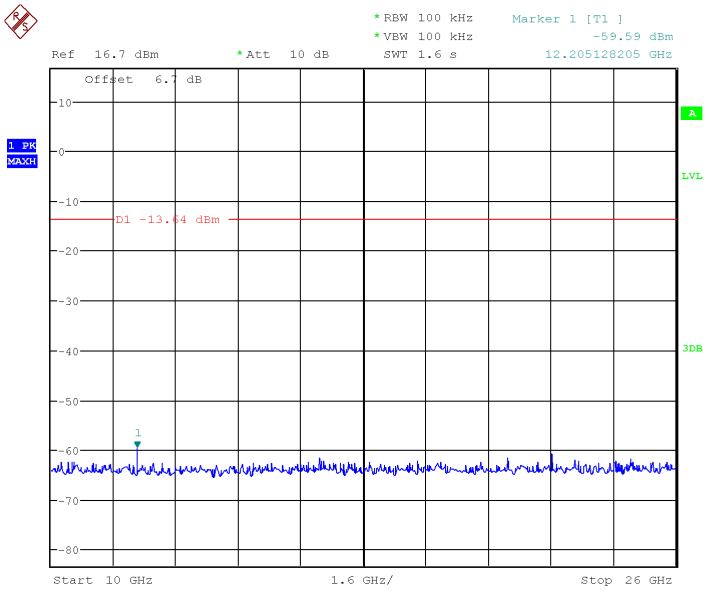


Fig.31 Conducted spurious emission: GFSK, Ch39, 10GHz~26GHz

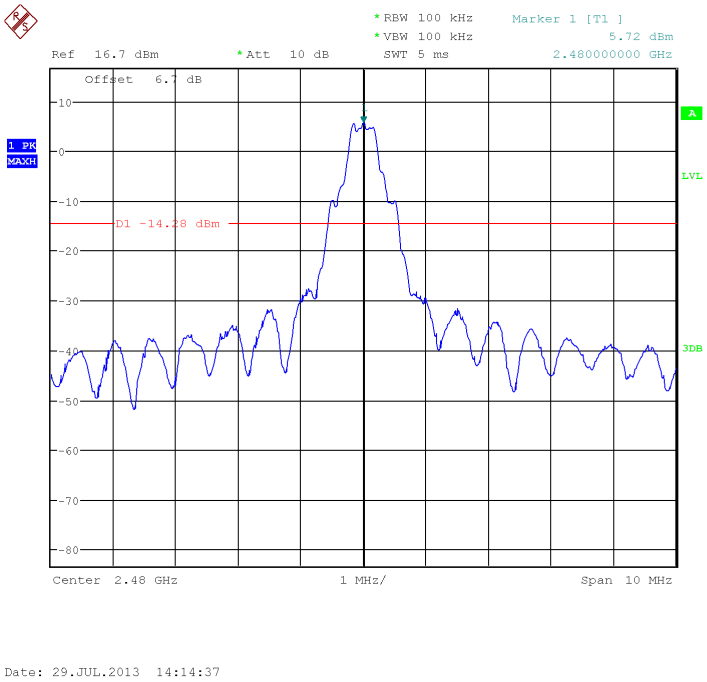


Fig.32 Conducted spurious emission: GFSK, Ch78, 2480MHz

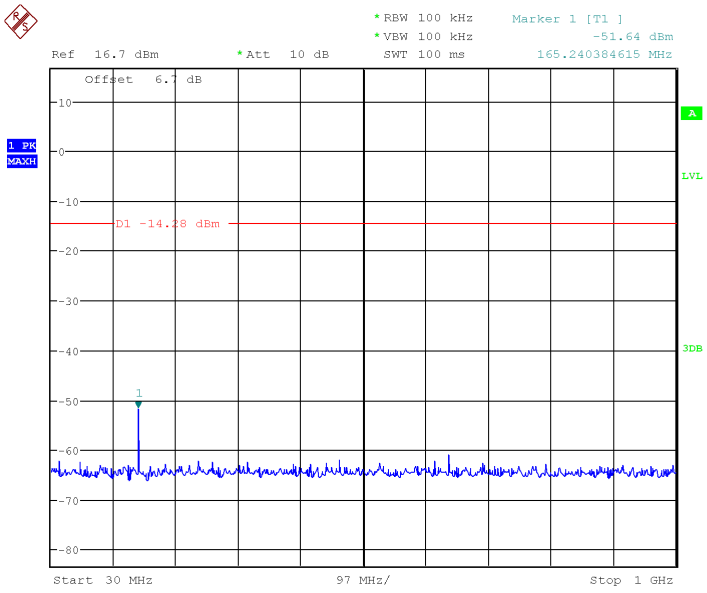


Fig.33 Conducted spurious emission: GFSK, Ch78, 30MHz~1GHz

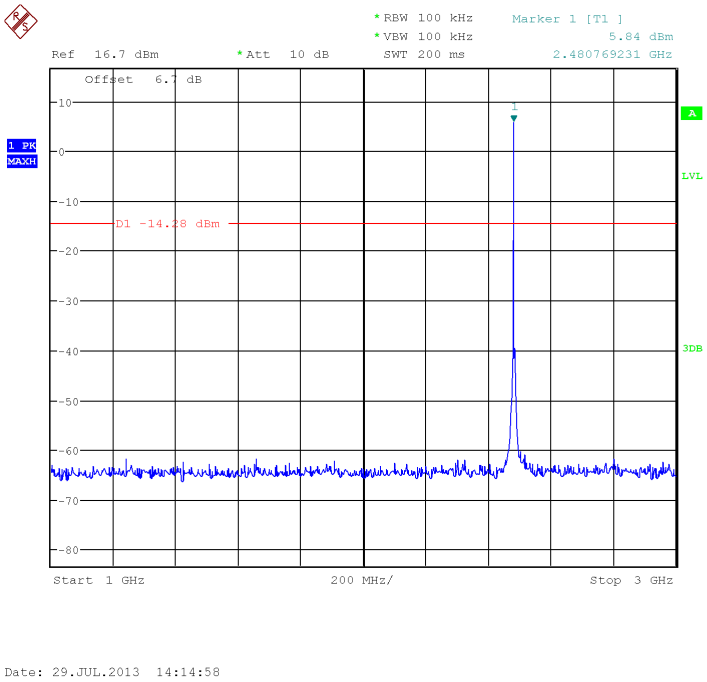


Fig.34 Conducted spurious emission: GFSK, Ch78, 1GHz~3GHz

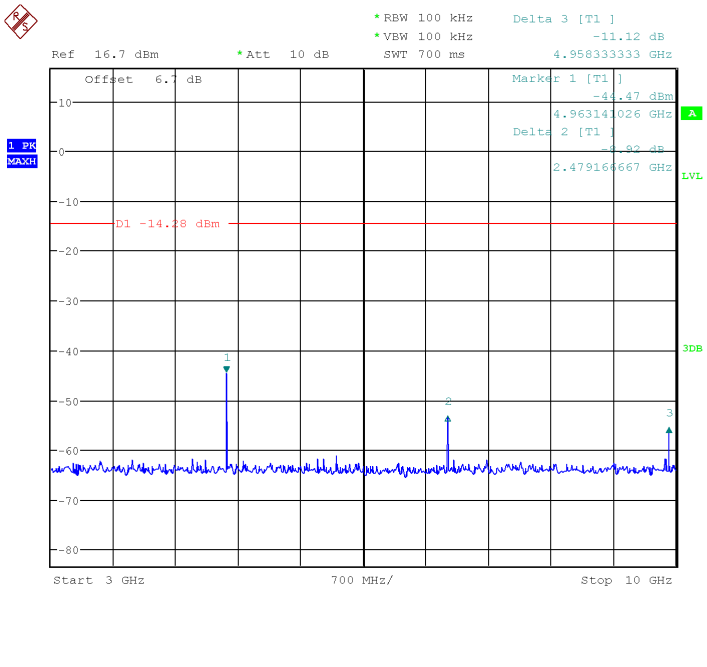


Fig.35 Conducted spurious emission: GFSK, Ch78, 3GHz~10GHz

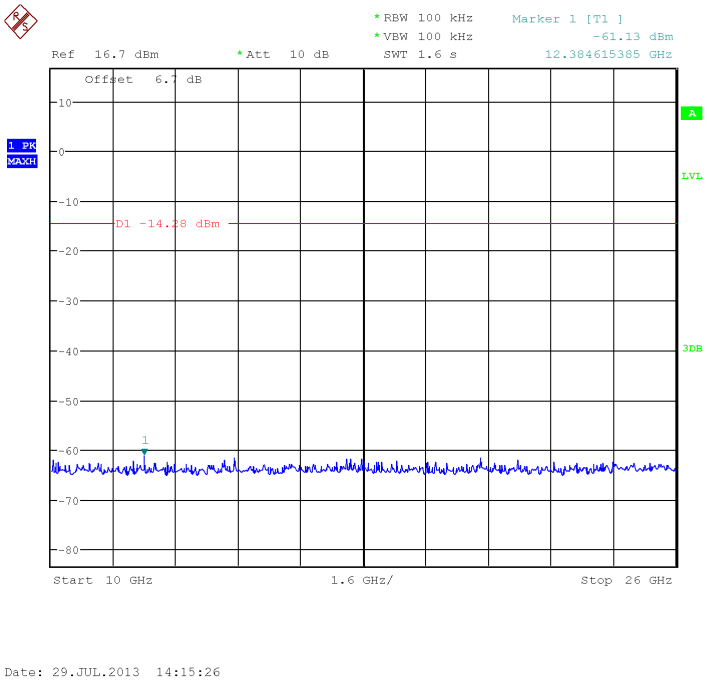


Fig.36 Conducted spurious emission: GFSK, Ch78, 10GHz~26GHz

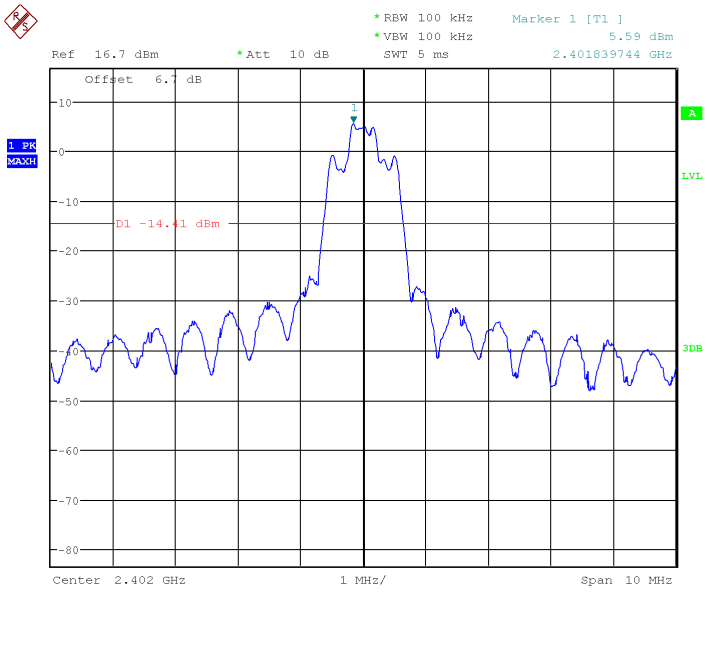


Fig.37 Conducted spurious emission: π/4 DQPSK, Ch0, 2402MHz

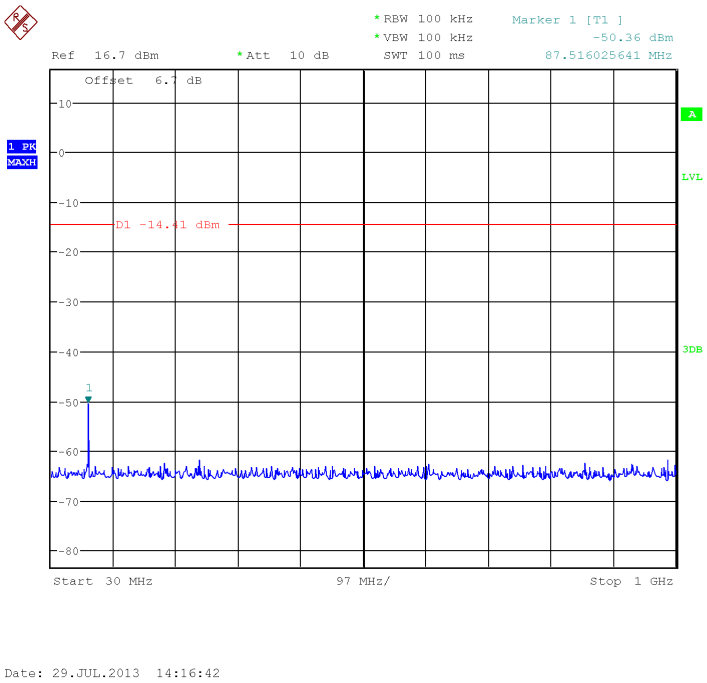


Fig.38 Conducted spurious emission: π/4 DQPSK, Ch0, 30MHz~1GHz

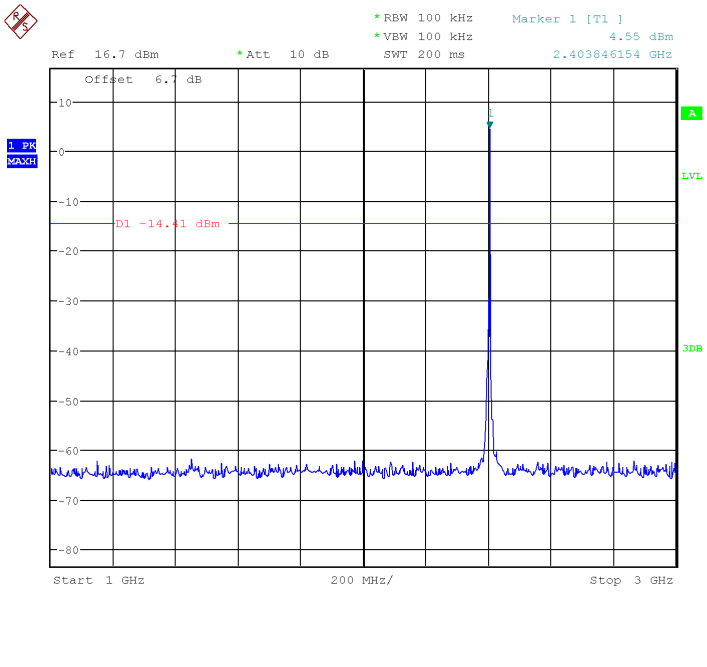


Fig.39 Conducted spurious emission: π/4 DQPSK, Ch0, 1GHz~3GHz

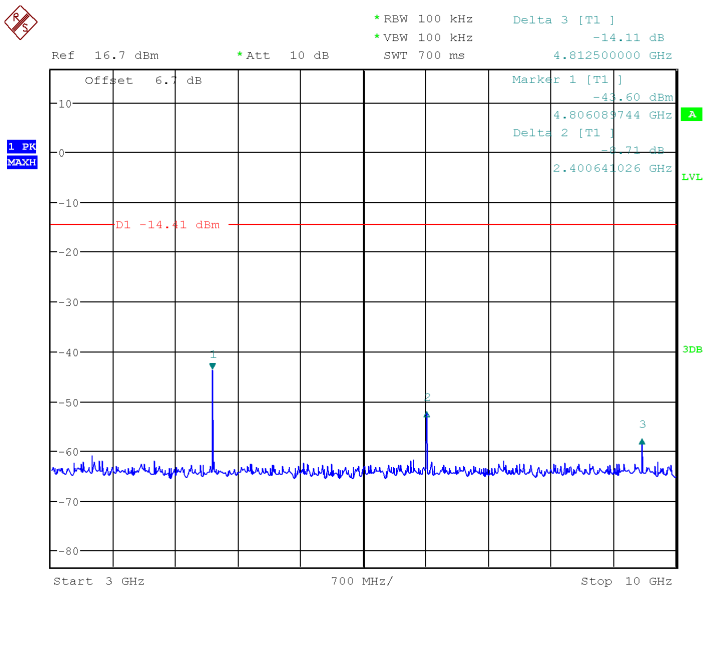


Fig.40 Conducted spurious emission: π/4 DQPSK, Ch0, 3GHz~10GHz

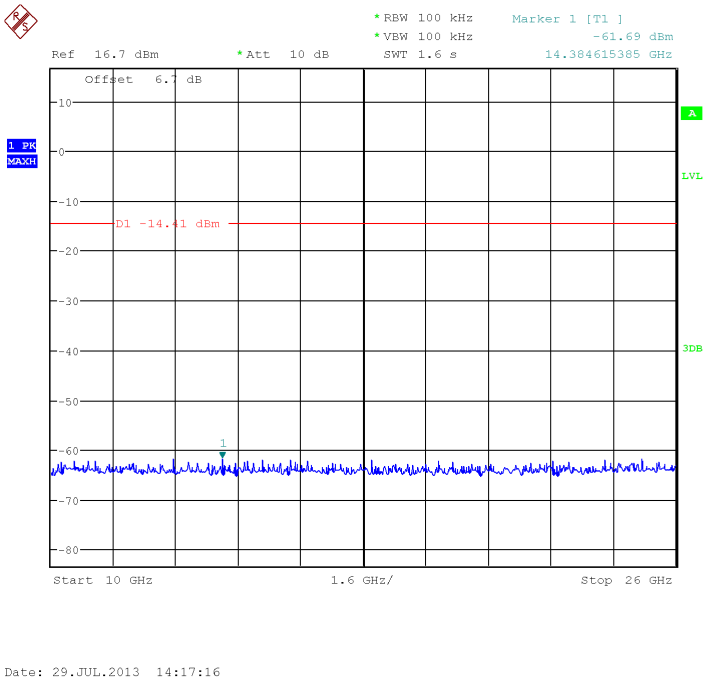


Fig.41 Conducted spurious emission: π/4 DQPSK, Ch0, 10GHz~26GHz

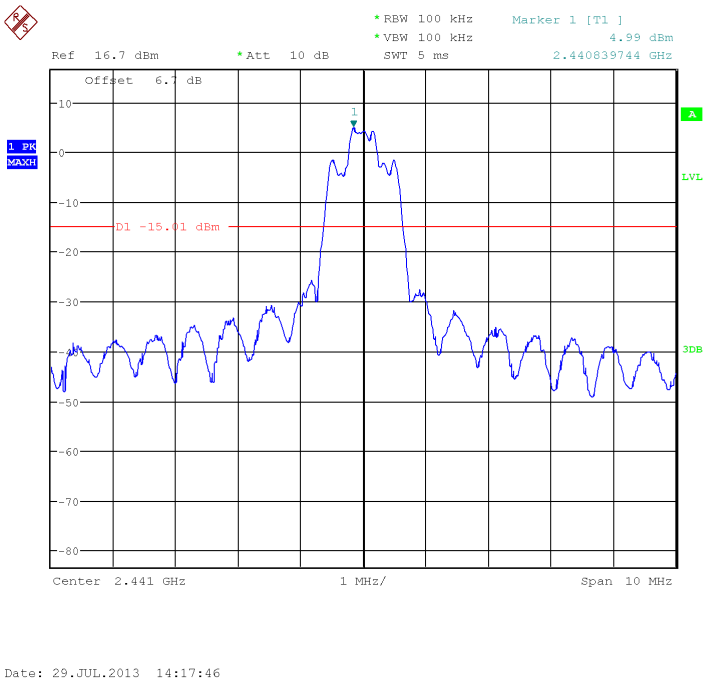


Fig.42 Conducted spurious emission: π/4 DQPSK, Ch39, 2441MHz

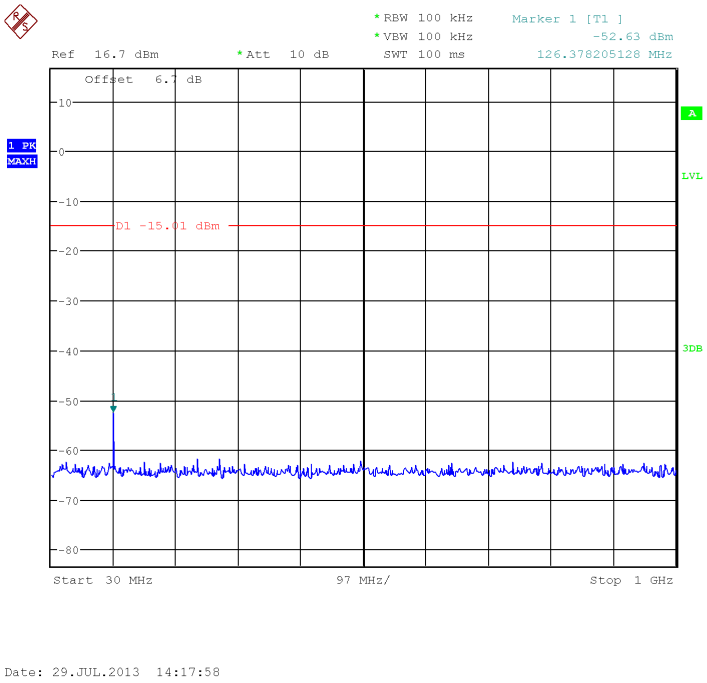


Fig.43 Conducted spurious emission: π/4 DQPSK, Ch39, 30MHz~1GHz

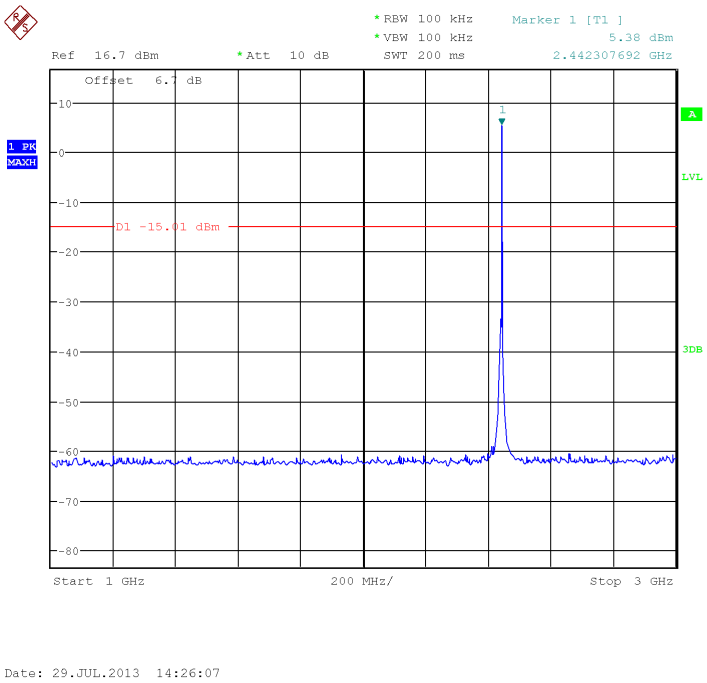


Fig.44 Conducted spurious emission: π/4 DQPSK, Ch39, 1GHz~3GHz

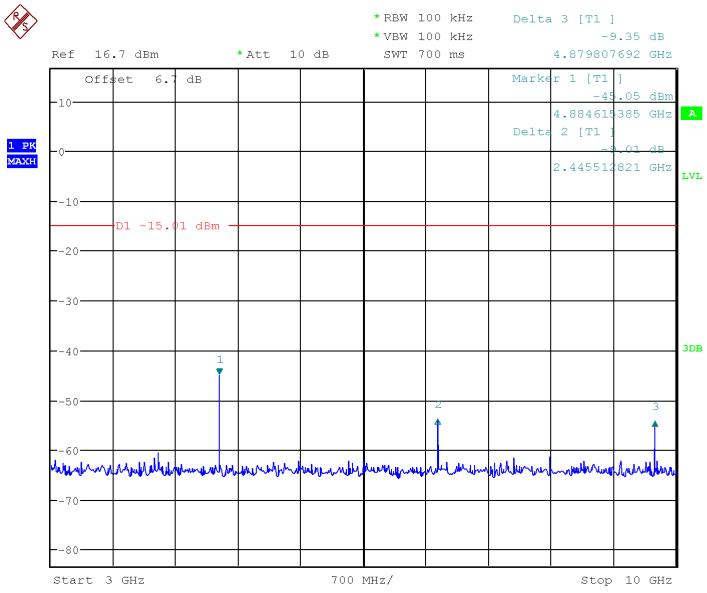


Fig.45 Conducted spurious emission: π/4 DQPSK, Ch39, 3GHz~10GHz

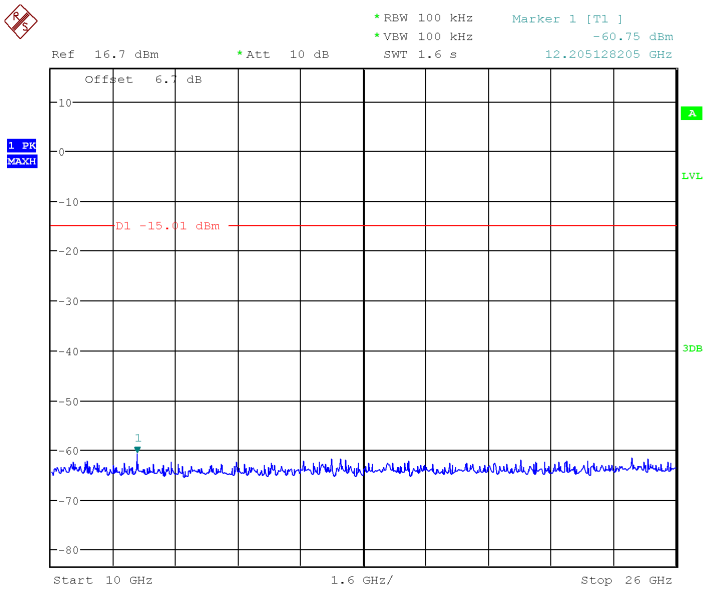


Fig.46 Conducted spurious emission: π/4 DQPSK, Ch39, 10GHz~26GHz

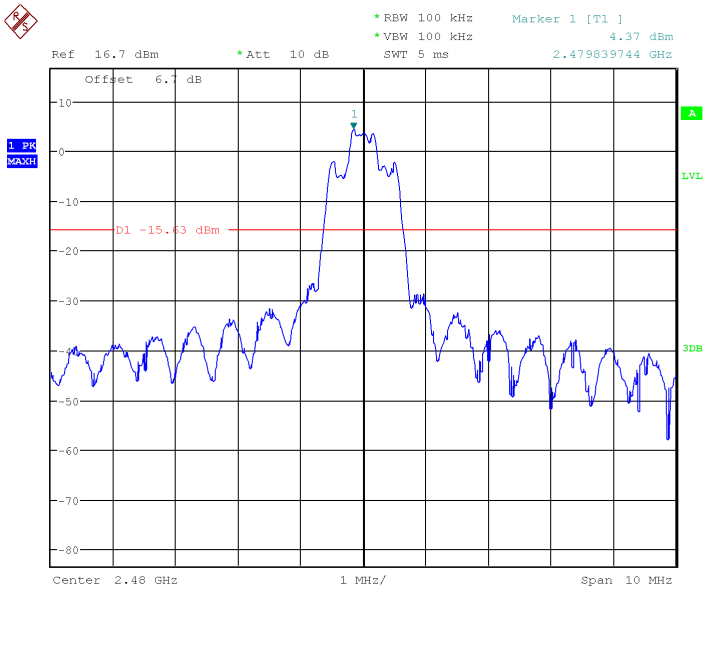


Fig.47 Conducted spurious emission: π/4 DQPSK, Ch78, 2480MHz

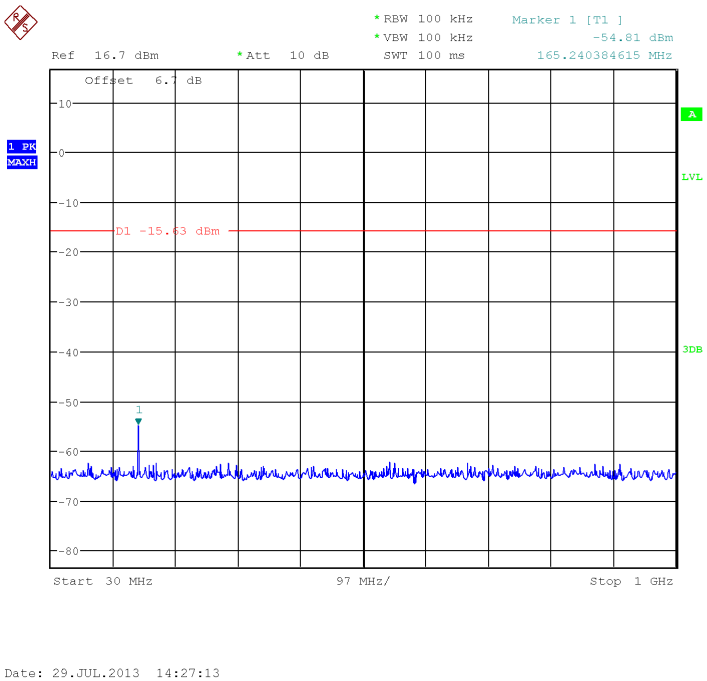


Fig.48 Conducted spurious emission: π/4 DQPSK, Ch78, 30MHz~1GHz

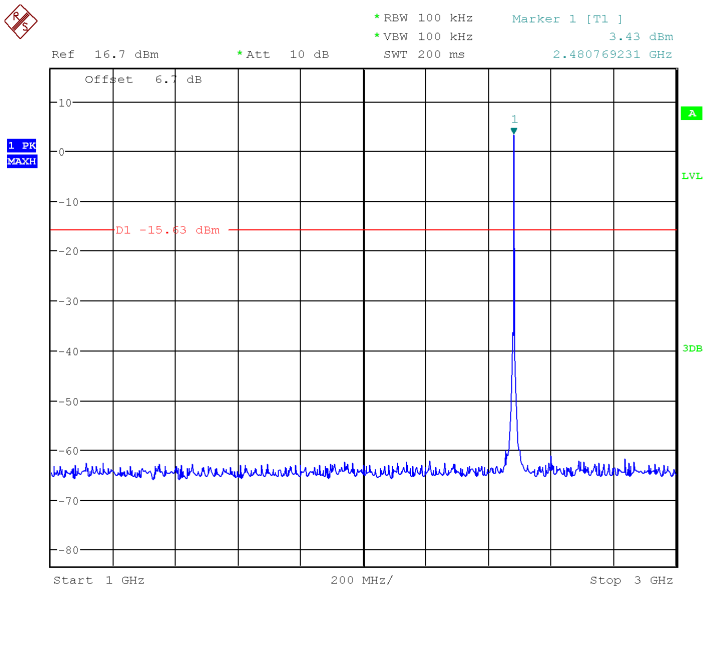


Fig.49 Conducted spurious emission: π/4 DQPSK, Ch78, 1GHz~3GHz

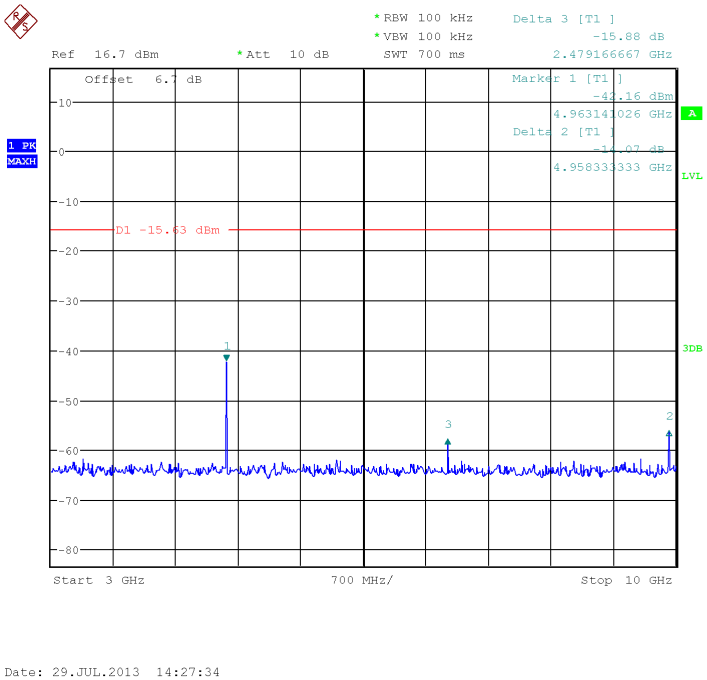


Fig.50 Conducted spurious emission: π/4 DQPSK, Ch78, 3GHz~10GHz

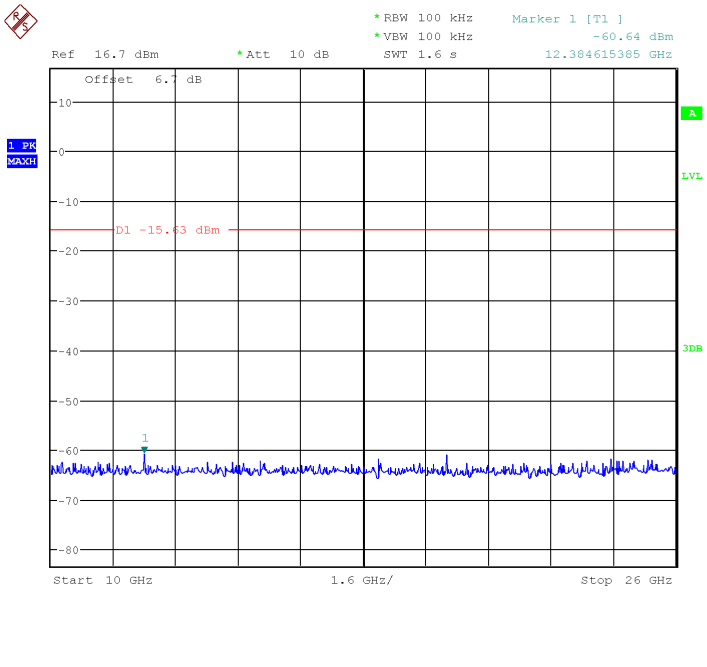


Fig.51 Conducted spurious emission: π/4 DQPSK, Ch78, 10GHz~26GHz

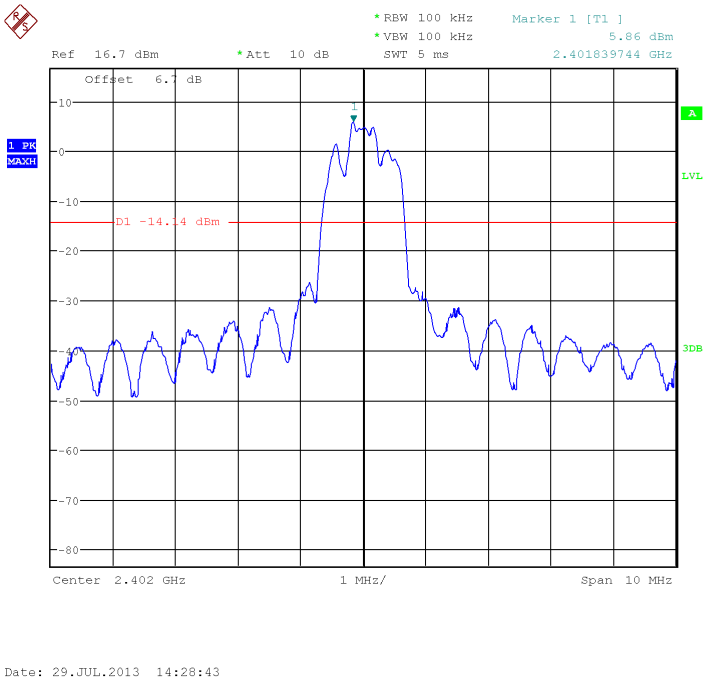


Fig.52 Conducted spurious emission: 8DPSK, Ch0, 2402MHz

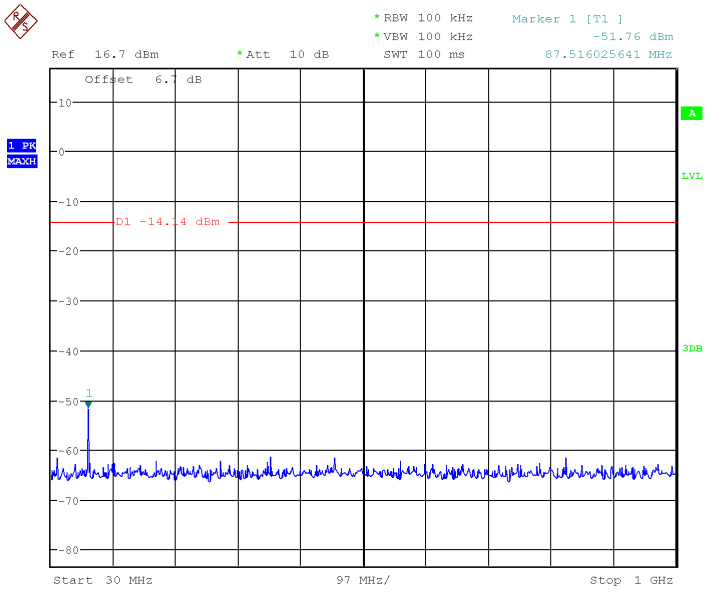


Fig.53 Conducted spurious emission: 8DPSK, Ch0, 30MHz~1GHz

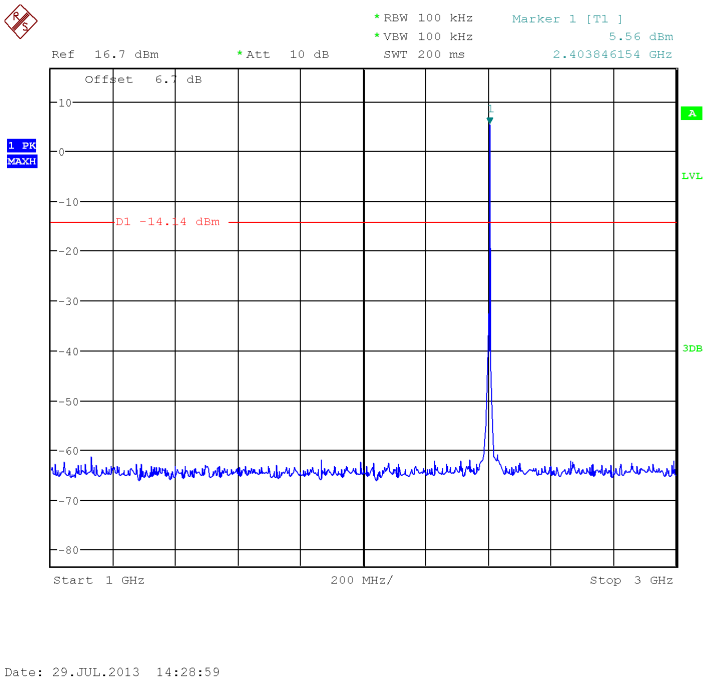


Fig.54 Conducted spurious emission: 8DPSK, Ch0, 1GHz~3GHz

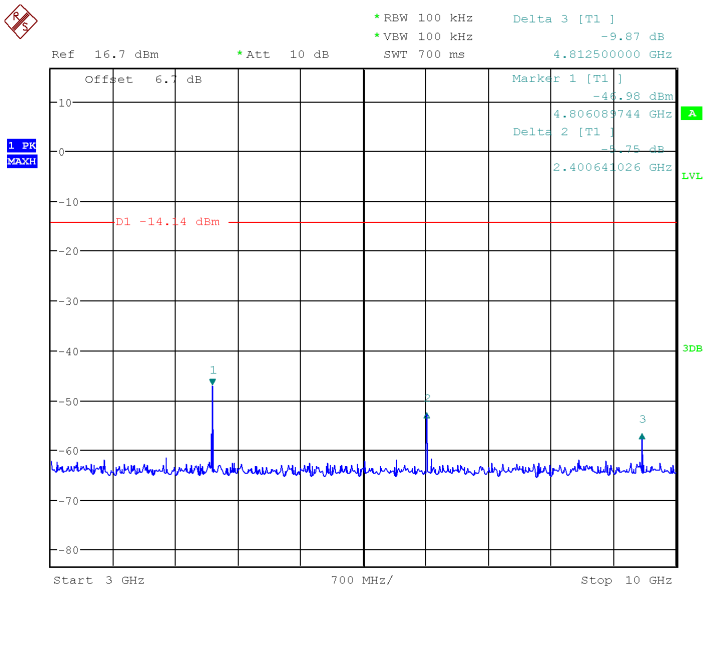


Fig.55 Conducted spurious emission: 8DPSK, Ch0, 3GHz~10GHz

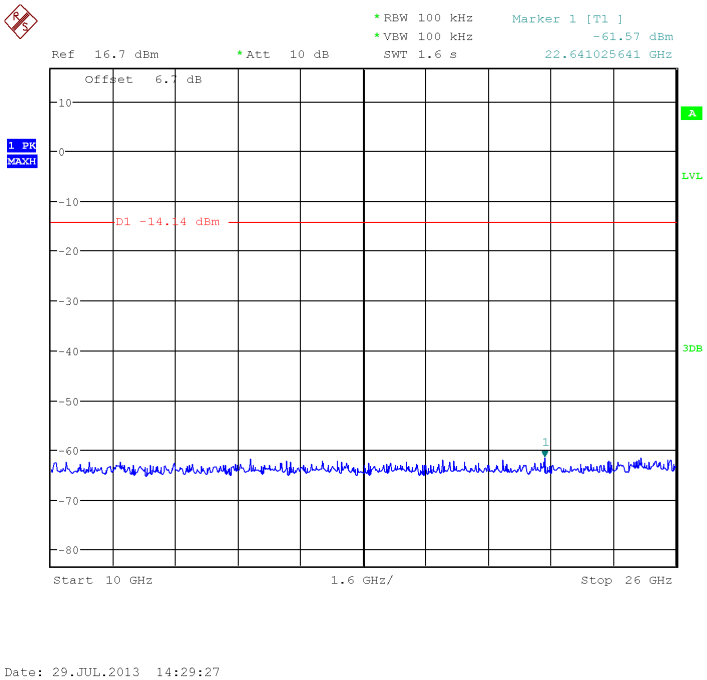


Fig.56 Conducted spurious emission: 8DPSK, Ch0, 10GHz~26GHz

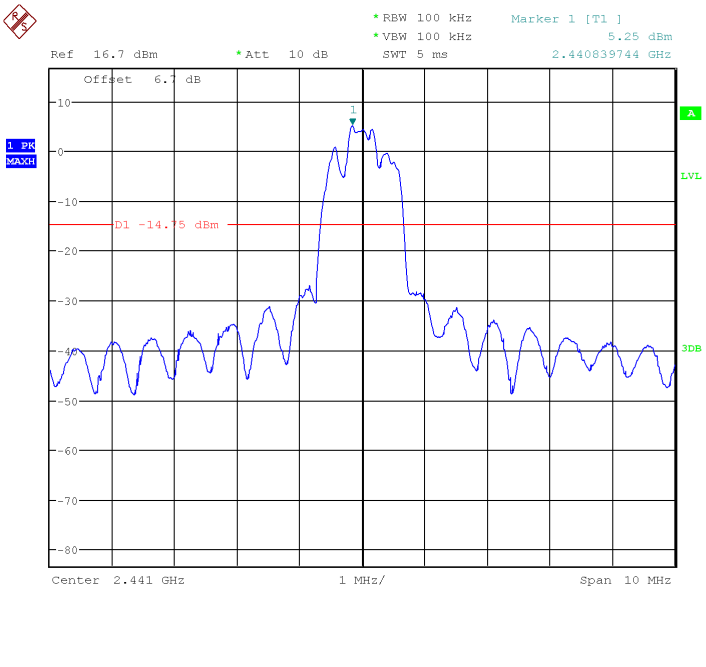


Fig.57 Conducted spurious emission: 8DPSK, Ch39, 2441MHz

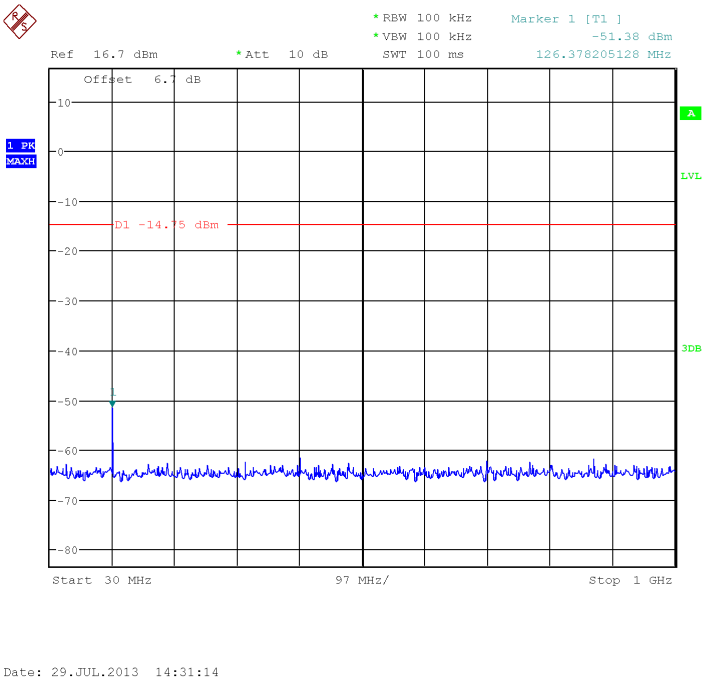


Fig.58 Conducted spurious emission: 8DPSK, Ch39, 30MHz~1GHz

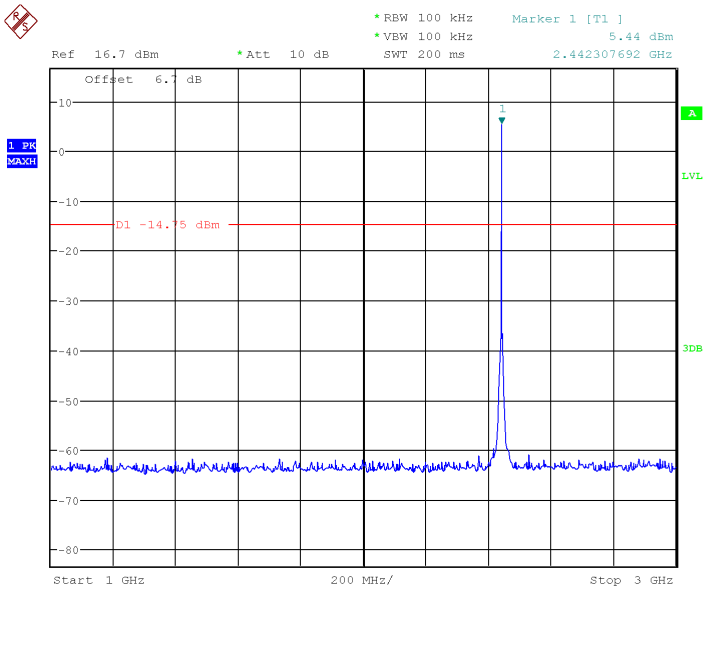


Fig.59 Conducted spurious emission: 8DPSK, Ch39, 1GHz~3GHz

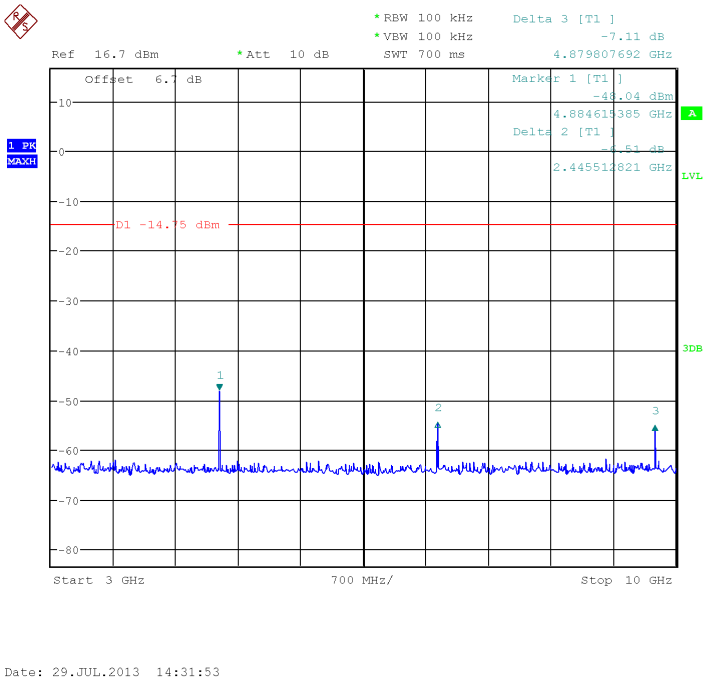


Fig.60 Conducted spurious emission: 8DPSK, Ch39, 3GHz~10GHz

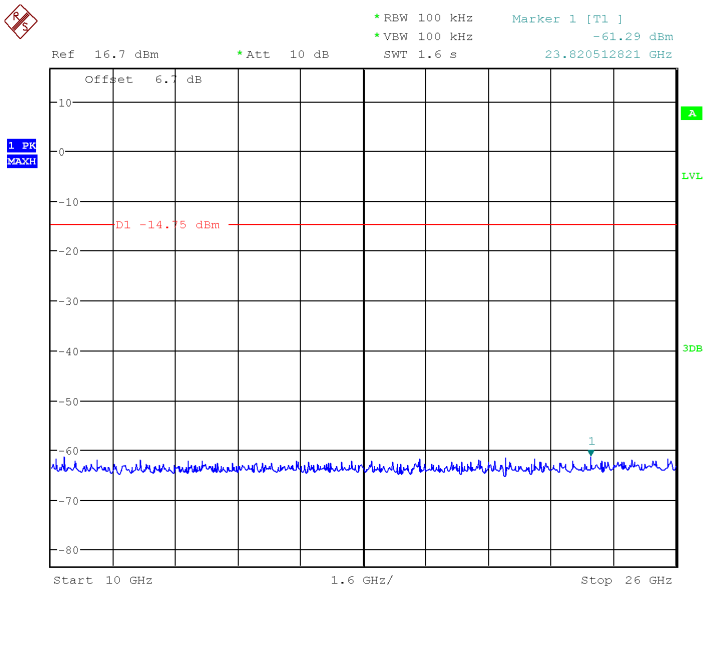


Fig.61 Conducted spurious emission: 8DPSK, Ch39, 10GHz~26GHz

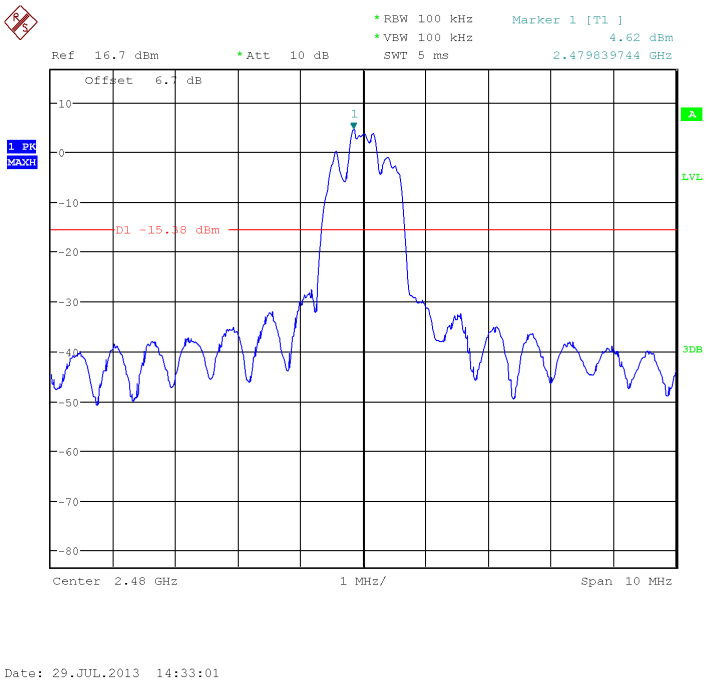


Fig.62 Conducted spurious emission: 8DPSK, Ch78, 2480MHz

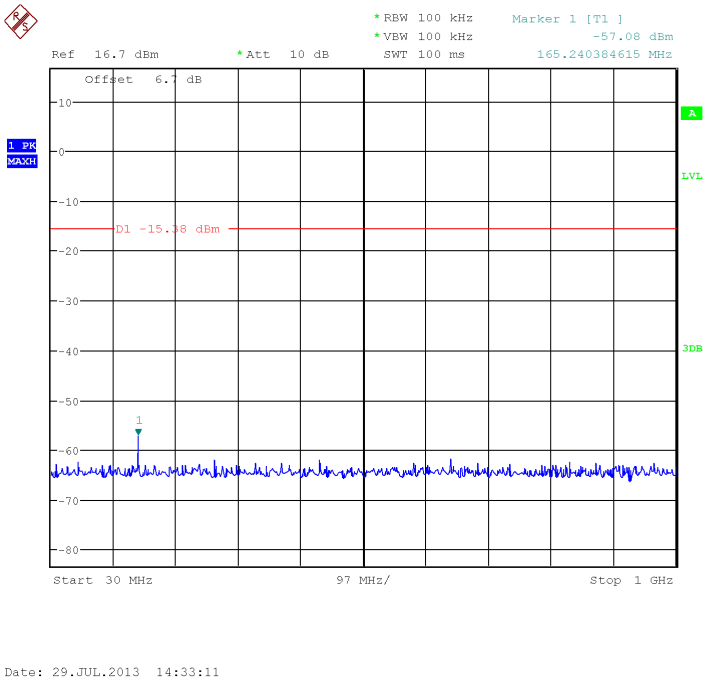


Fig.63 Conducted spurious emission: 8DPSK, Ch78, 30MHz~1GHz

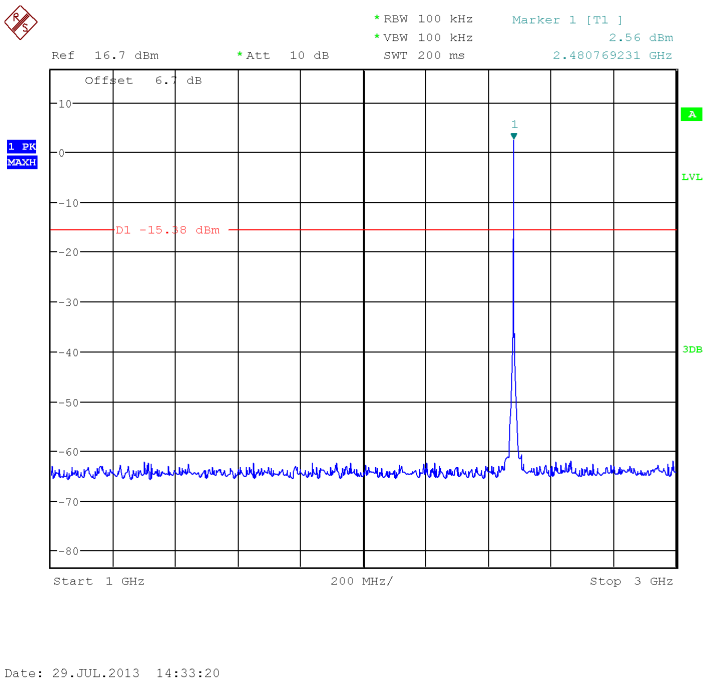


Fig.64 Conducted spurious emission: 8DPSK, Ch78, 1GHz~3GHz

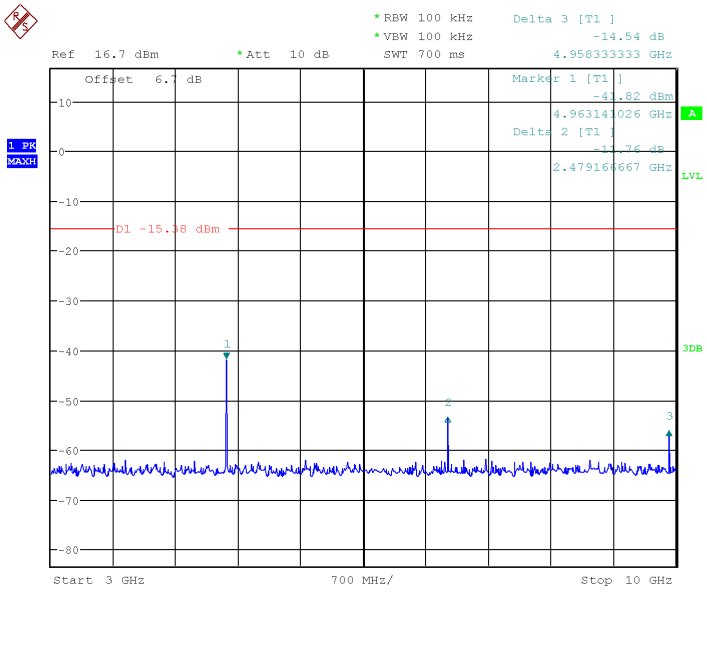


Fig.65 Conducted spurious emission: 8DPSK, Ch78, 3GHz~10GHz

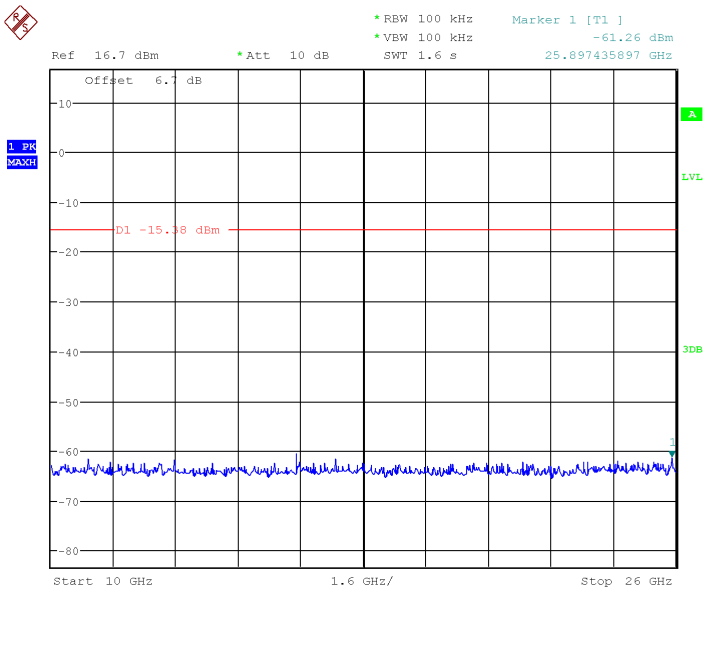


Fig.66 Conducted spurious emission: 8DPSK, Ch78, 10GHz~26GHz

5.4. 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)).

The measurement is according to Public notice DA 00-705 and ANSI C63.4

Limit in restricted band:

Frequency of emission (MHz)	Field strength (uV/m)	Field strength (dBuV/m)
30~88	100	40
88~216	150	43.5
216~960	200	46
Above 960	500	54

Test condition:

Portable, small, lightweight, or modular devices that may be handheld, worn on the body, or placed on a table during operation shall be positioned on a nonconducting platform, the top of which is 80 cm above the reference ground plane. The preferred area occupied by the EUT arrangement is 1 m by 1.5 m, but it may be larger or smaller to accommodate various sized EUTs. For testing purposes, ceiling- and wall-mounted devices also shall be positioned on a tabletop (see also ANSI C63.4-2009 section 6.3.4 and 6.3.5). In making any tests involving handheld, body-worn, or ceiling-mounted equipment, it is essential to recognize that the measured levels may be dependent on the orientation (attitude) of the three orthogonal axes of the EUT. Thus, exploratory tests as specified in 8.3.1 shall be carried out for various axes orientations to determine the attitude having maximum or near-maximum emission level.

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

Measurement Results:

A ”reference path loss” is established and A_{Rpi} is the attenuation of “reference path loss”, and including the gain of receive antenna , the gain of the preamplifier, the cable loss.

The measurement results are obtained as described below:

Result=P_{Mea} + A_{Rpi}

For GFSK

Channel	Frequency Range	Test Results	Conclusion
Ch0 2402MHz	30MH~1GHz	Fig.67	P
	1GHz~3GHz	Fig.68	P
	3GHz~18GHz	Fig.69	P
Power	2.38GHz~2.4GHz	Fig.70	P
Power	2.45GHz~2.5GHz	Fig.71	P
All channels	18GHz~26GHz	Fig.72	P

For π/4 DQPSK

Channel	Frequency Range	Test Results	Conclusion
Ch0 2402MHz	30MH~1GHz	Fig.73	P
	1GHz~3GHz	Fig.74	P
	3GHz~18GHz	Fig.75	P
Power	2.38GHz~2.4GHz	Fig.76	P
Power	2.45GHz~2.5GHz	Fig.77	P
All channels	18GHz~26GHz	Fig.78	P

For 8DPSK

Channel	Frequency Range	Test Results	Conclusion
Ch0 2402MHz	30MH~1GHz	Fig.79	P
	1GHz~3GHz	Fig.80	P
	3GHz~18GHz	Fig.81	P
Power	2.38GHz~2.4GHz	Fig.82	P
Power	2.45GHz~2.5GHz	Fig.83	P
All channels	18GHz~26GHz	Fig.84	P

GFSK Ch0 30MHz-1GHz

Frequency(MHz)	Result(dBuV/m)	ARpl (dB)	PMea(dBuV/m)	Polarity
33.68972	34.3	0.61	33.69	V
62.9443	34.2	1.26	34.2	V

160.41616	36.5	2.28	36.5	H

GFSK Ch0 1GHz-3GHz

Frequency(MHz)	Result(dBuV/m)	ARpl (dB)	PMea(dBuV/m)	Polarity
1815.13	45.5	13.45	32.05	V
2942.34	53.6	16.96	36.64	H

GFSK Ch0 3GHz-18GHz

Frequency(MHz)	Result(dBuV/m)	ARpl (dB)	PMea(dBuV/m)	Polarity
4881.5	41.7	7.57	34.13	H
7323	47.5	8.71	38.79	H
9764	47.7	10.01	37.69	H
12894	50.8	11.27	39.53	V
16605	53.3	14.32	38.98	V

π/4 DQPSK Ch0 30MHz-1GHz

Frequency(MHz)	Result(dBuV/m)	ARpl (dB)	PMea(dBuV/m)	Polarity
33.589	33.8	0.61	33.19	V
62.398	30.1	1.26	28.84	V
160.853	23.6	2.28	21.32	H

π/4 DQPSK Ch0 1GHz-3GHz

Frequency(MHz)	Result(dBuV/m)	ARpl (dB)	PMea(dBuV/m)	Polarity
2148.28	48.6	13.45	35.15	V
2741.32	53.3	16.96	36.34	H

π/4 DQPSK Ch0 3GHz-18GHz

Frequency(MHz)	Result(dBuV/m)	ARpl (dB)	PMea(dBuV/m)	Polarity
3103	41.9	7.57	34.33	H
5880.5	42.1	8.71	33.39	V
7323	46.2	10.01	36.19	H

9764	46.8	11.27	35.53	V
12354	50.4	13.5	36.9	V
14865.5	52.6	14.1	38.5	V

8DPSK 30MHz-1GHz

Frequency(MHz)	Result(dBuV/m)	ARpl (dB)	PMea(dBuV/m)	Polarity
33.432	32.18	0.61	31.57	V
62.785	29.95	1.26	28.69	V
165.268	28.32	2.28	26.04	H

8DPSK 1GHz-3GHz

Frequency(MHz)	Result(dBuV/m)	ARpl (dB)	PMea(dBuV/m)	Polarity
1633.89	43.2	13.45	29.75	V
2899.66	54.7	16.96	37.74	H

8DPSK 3GHz-18GHz

Frequency(MHz)	Result(dBuV/m)	ARpl (dB)	PMea(dBuV/m)	Polarity
3121.5	42	7.52	34.48	V
4249	39.7	8.65	31.05	V
5726.5	42.1	10.02	32.08	H
7323	44.2	11.32	32.88	H
12078.5	50.2	12.89	37.31	V
14787.5	52.4	14.24	38.16	V

All Ch 18GHz~26.5GHz

Frequency(MHz)	Result(dBuV/m)	ARpl (dB)	PMea(dBuV/m)	Polarity
19525.786000	49.0	6.97	42.03	V
20684.980000	47.7	6.97	40.73	H
22119.789000	45.3	3.05	42.05	V
23627.899000	43.8	3.05	40.75	H

24606.319000	43.4	3.05	40.35	V
25244.558000	43.6	3.05	40.55	H

Conclusion: PASS

Test graphs as below:

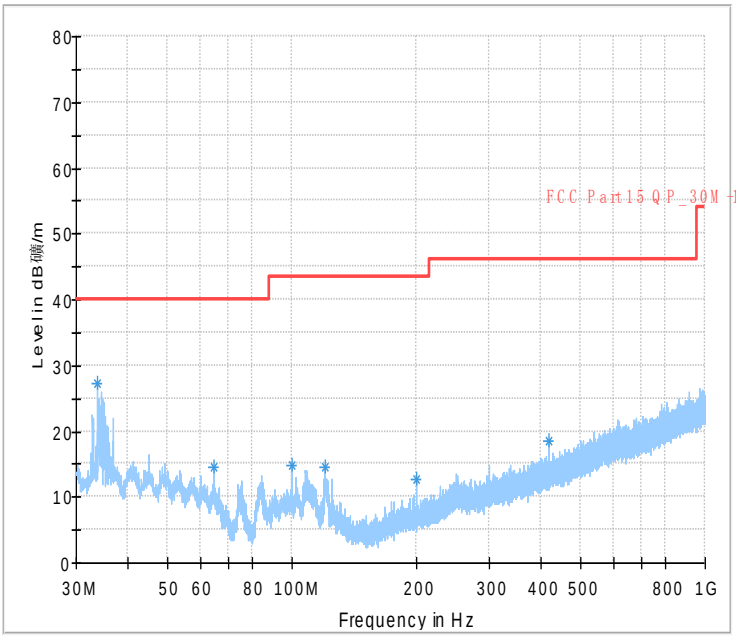


Fig.67 Radiated emission: GFSK, Ch0, 30MHz~1GHz

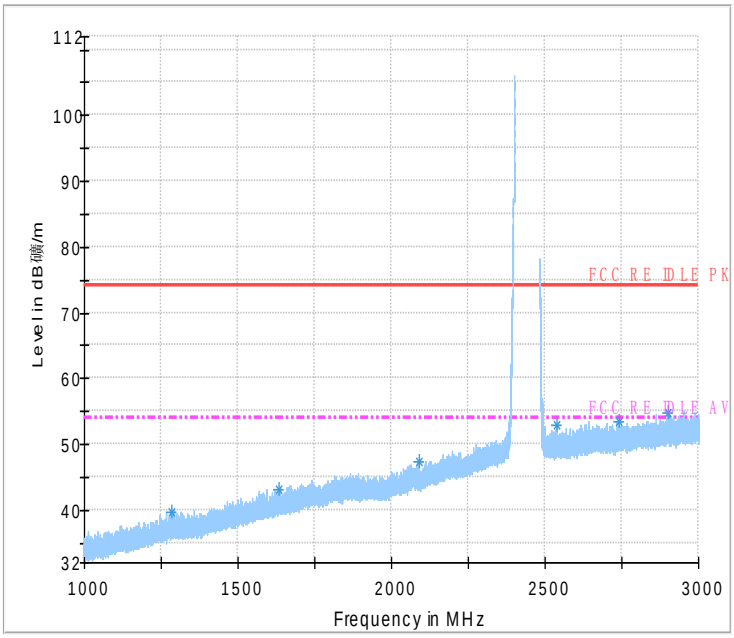


Fig.68 Radiated emission: GFSK, Ch0, 1GHz~3GHz

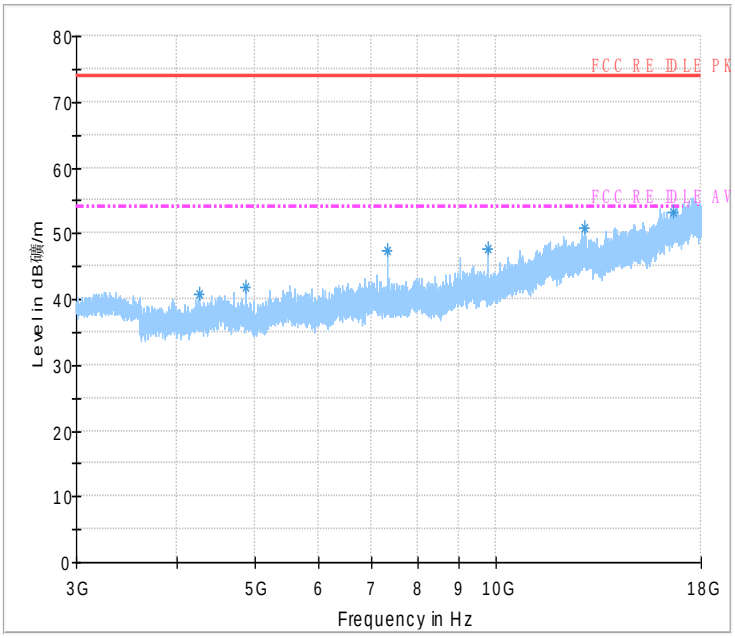


Fig.69 Radiated emission: GFSK, Ch0, 3GHz~18GHz

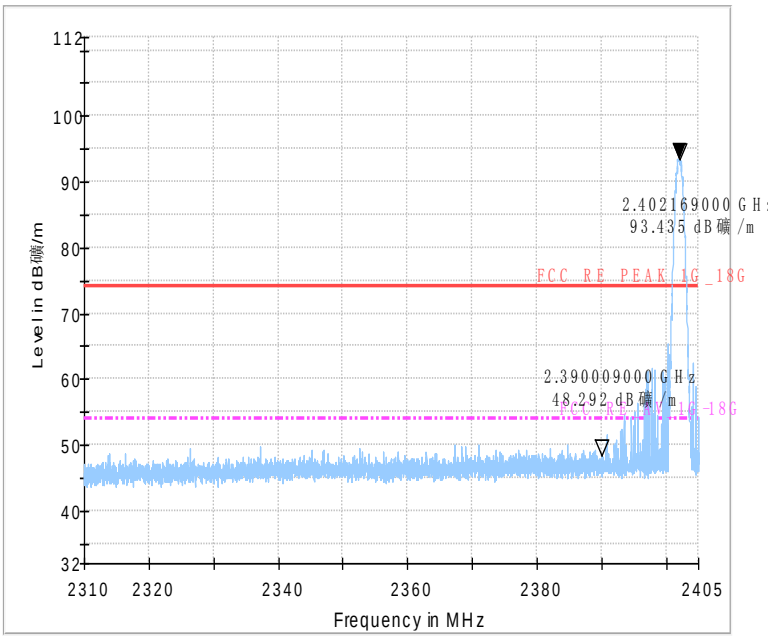
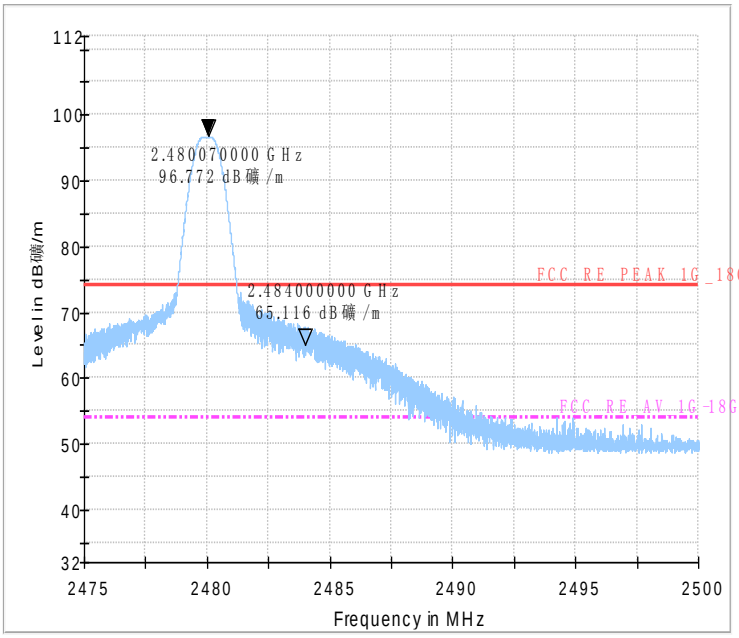


Fig.70 Radiated emission (Power): GFSK, low channel



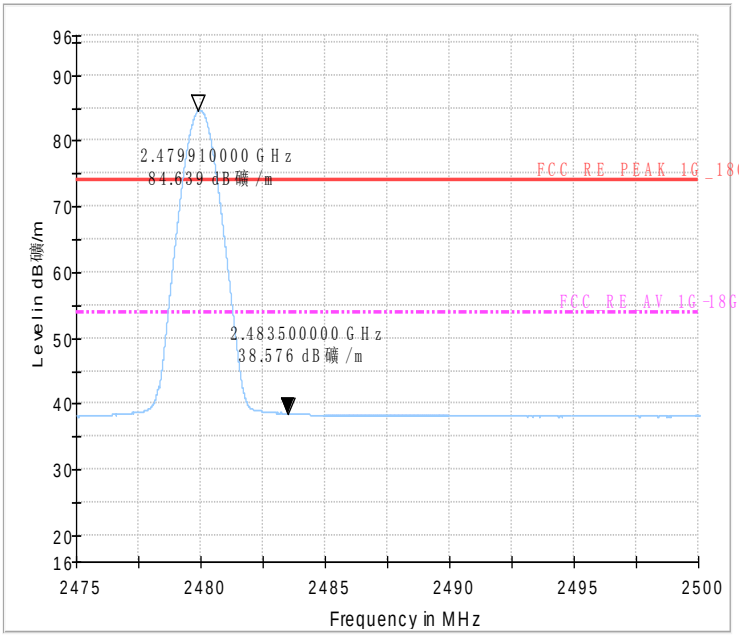


Fig.71 Radiated emission (Power): GFSK, high channel

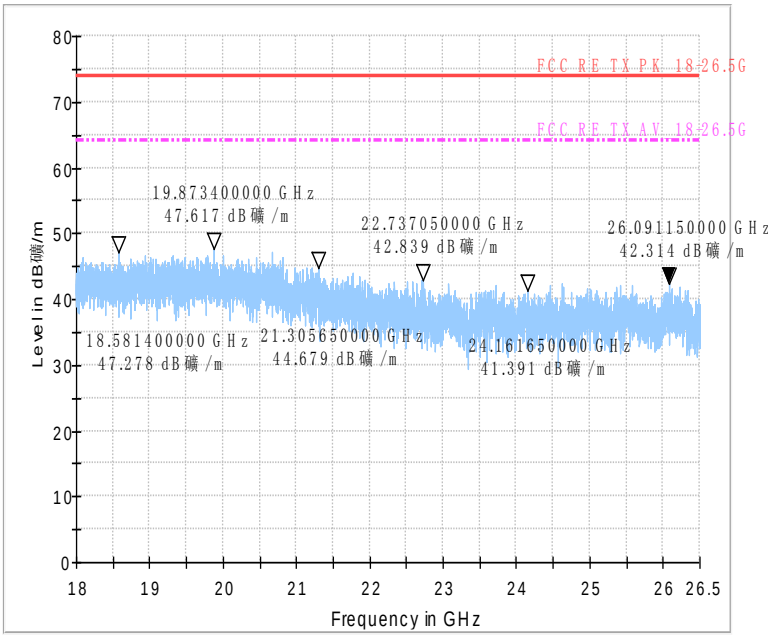


Fig.72 Radiated emission: GFSK, 18 GHz - 26 GHz

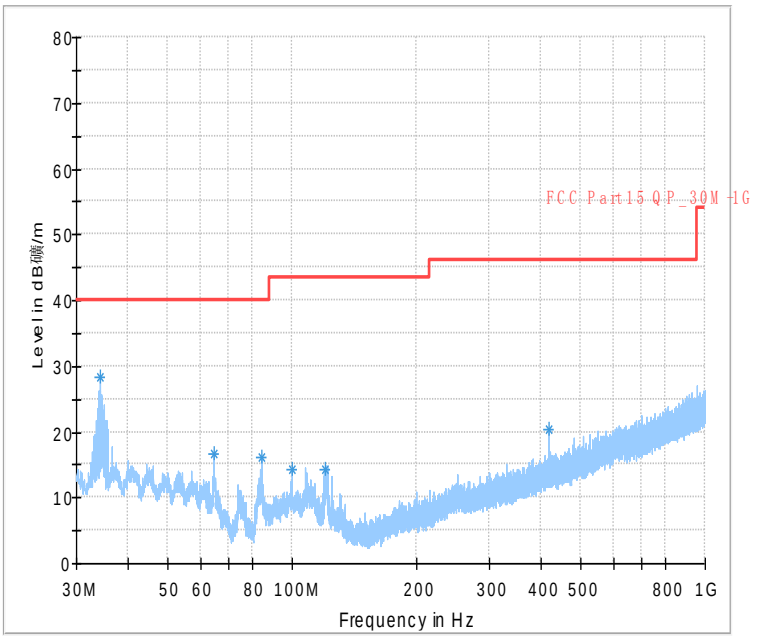


Fig.73 Radiated emission: π/4 DQPSK, Ch0, 30MHz~1GHz

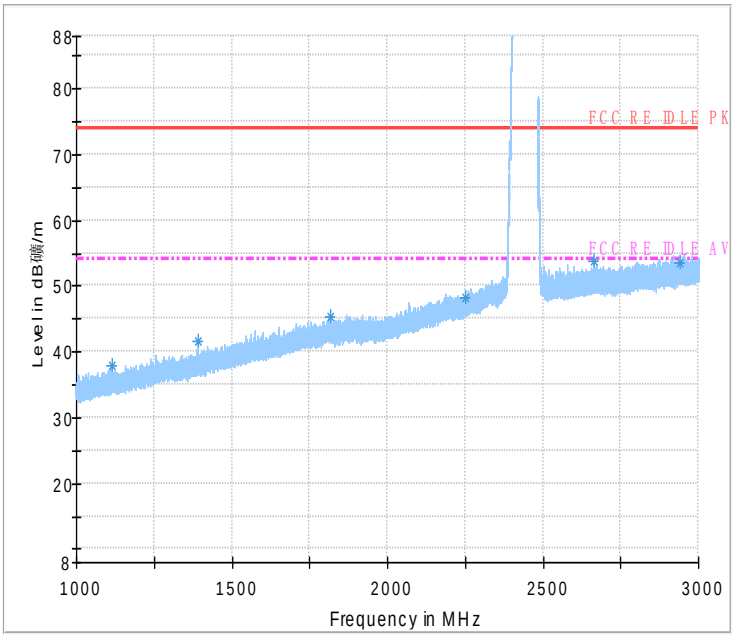


Fig.74 Radiated emission: π/4 DQPSK, Ch0, 1GHz~3GHz

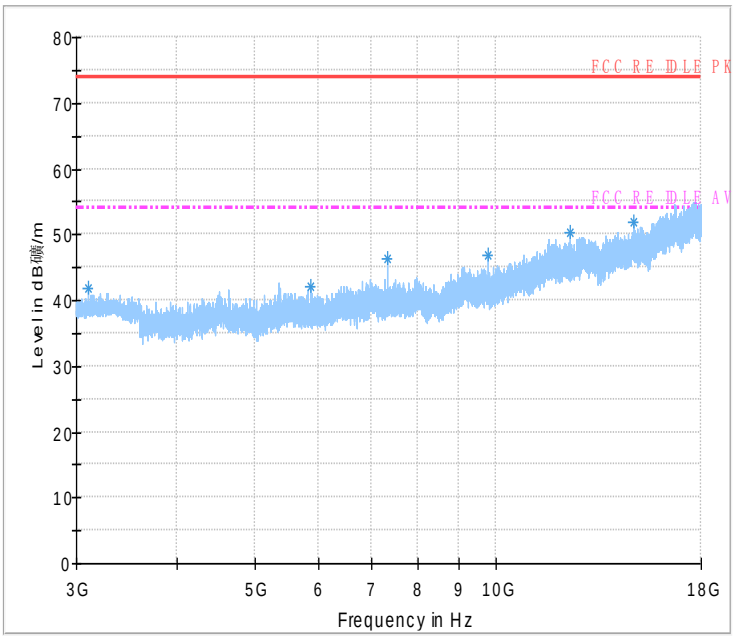


Fig.75 Radiated emission: π/4 DQPSK, Ch0, 3GHz~18GHz

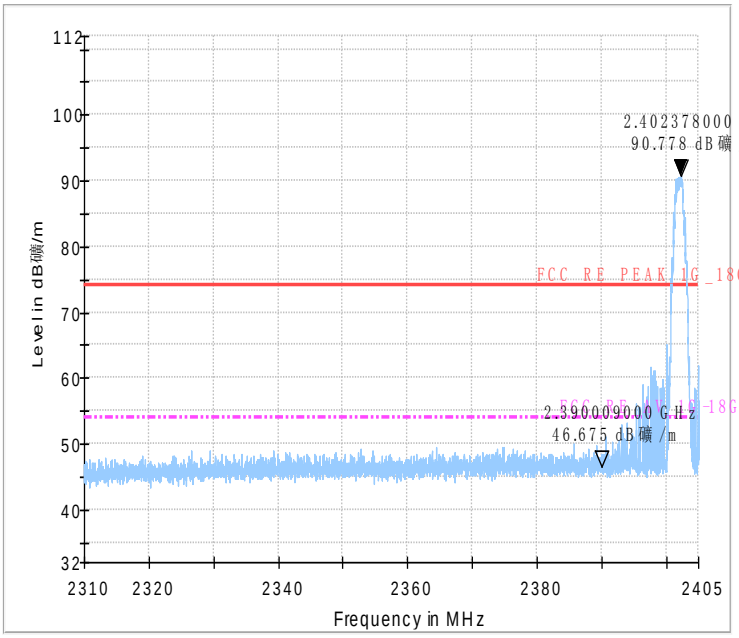
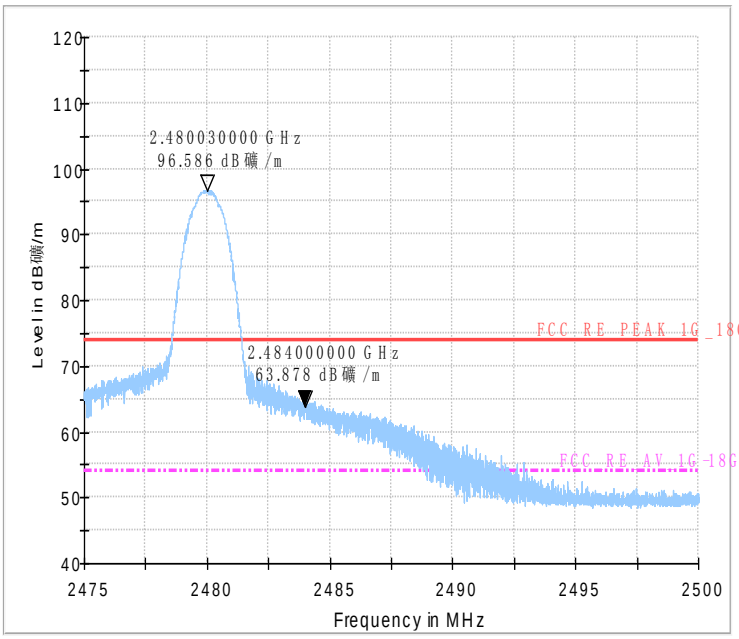


Fig.76 Radiated emission (Power): π/4 DQPSK, low channel



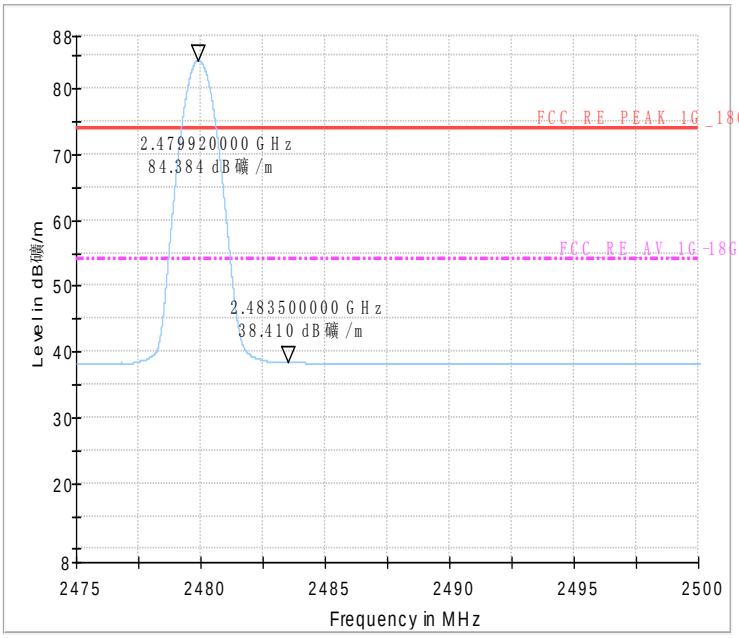


Fig.77 Radiated emission (Power): π/4 DQPSK, high channel

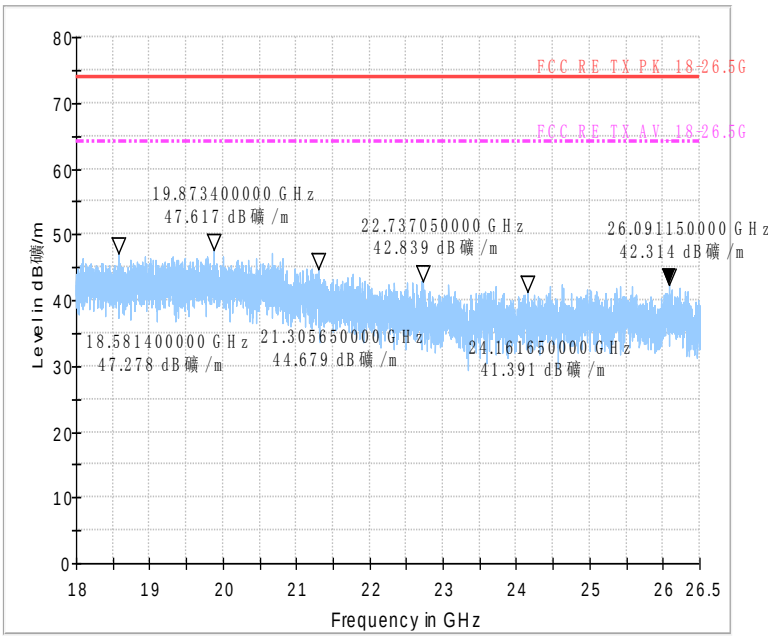


Fig.78 Radiated emission: π/4 DQPSK, 18 GHz - 26 GHz

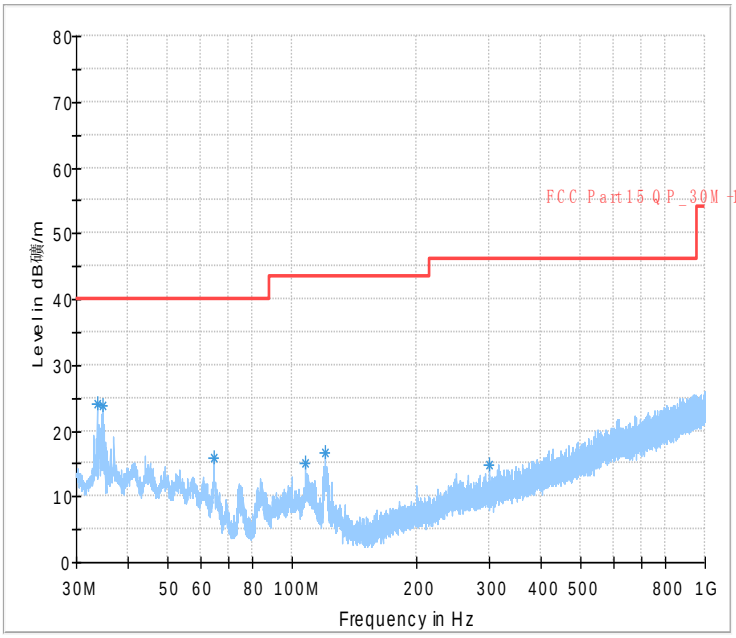


Fig.79 Radiated emission: 8DPSK, Ch0, 30MHz~1GHz

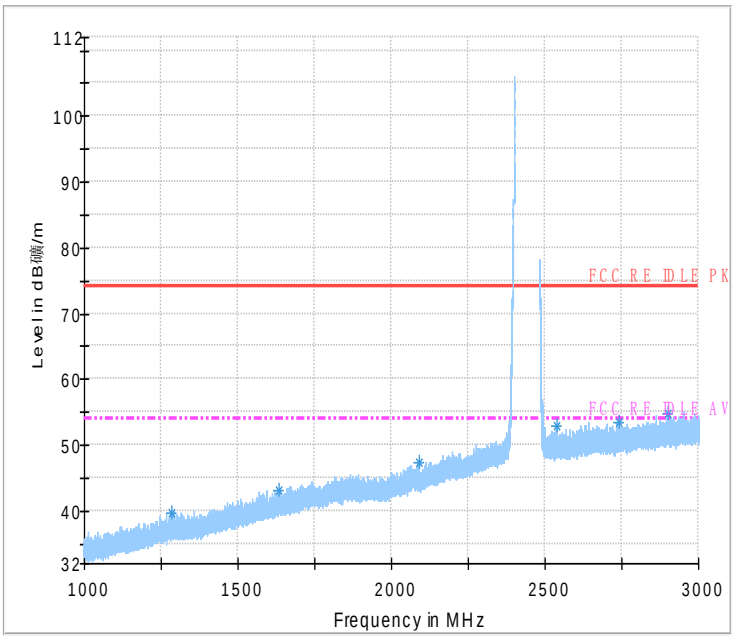


Fig.80 Radiated emission: 8DPSK, Ch0, 1GHz~3GHz

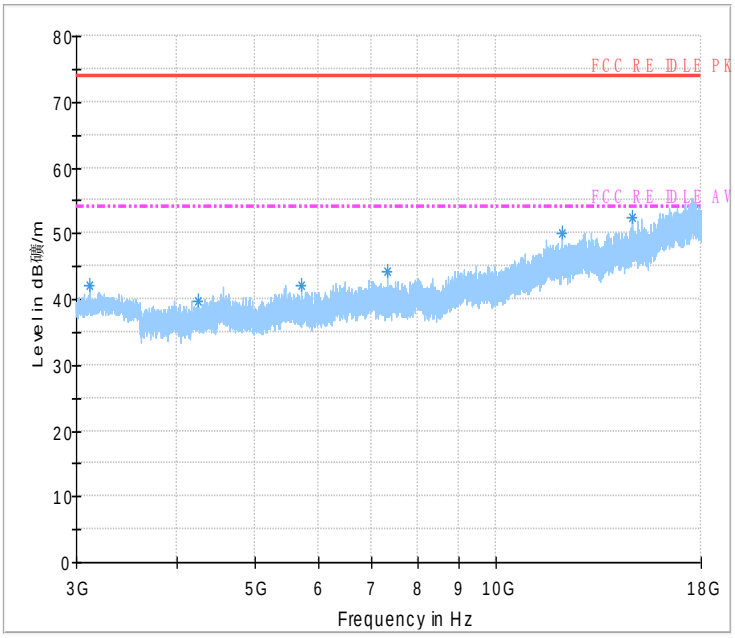


Fig.81 Radiated emission: 8DPSK, Ch0, 3GHz~18GHz

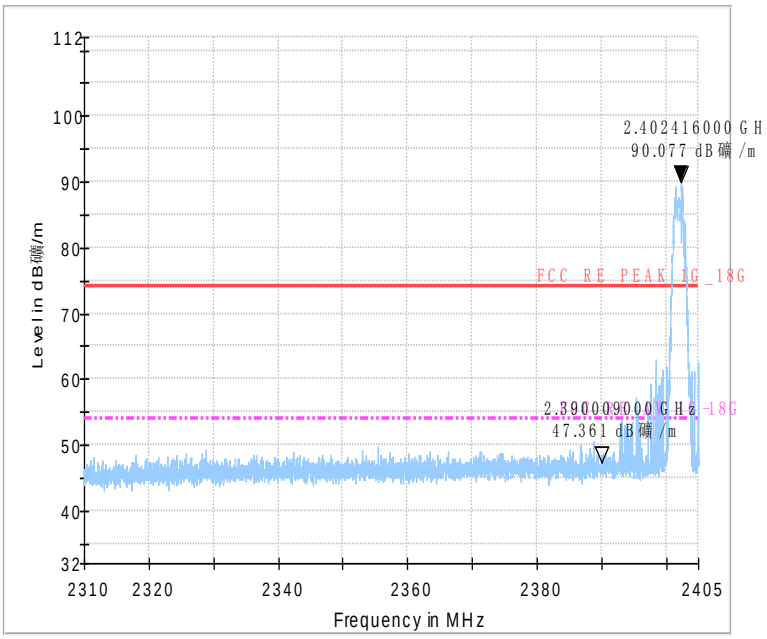
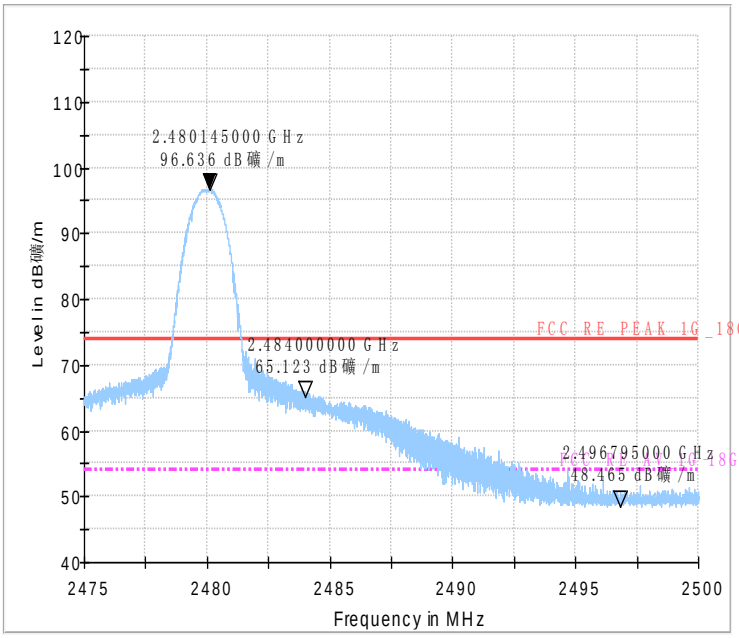


Fig.82 Radiated emission (Power): 8DPSK, low channel



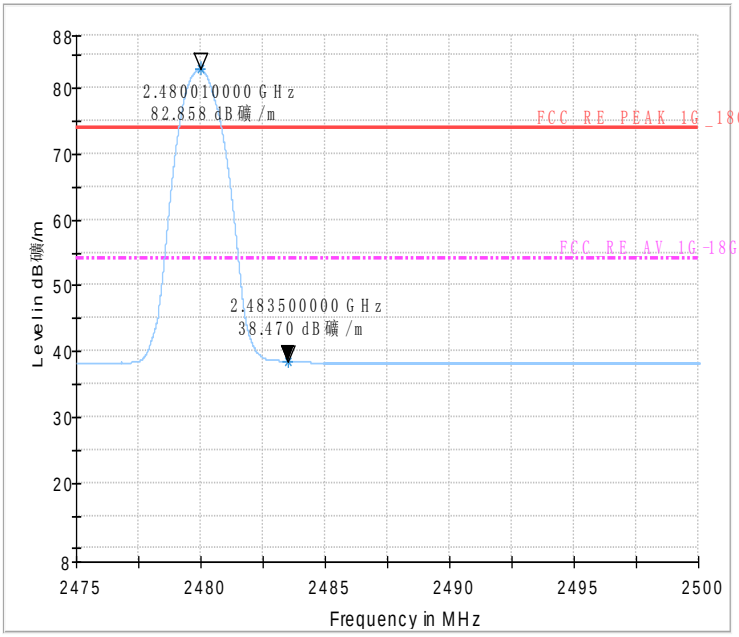


Fig.83 Radiated emission (Power): 8DPSK, high channel

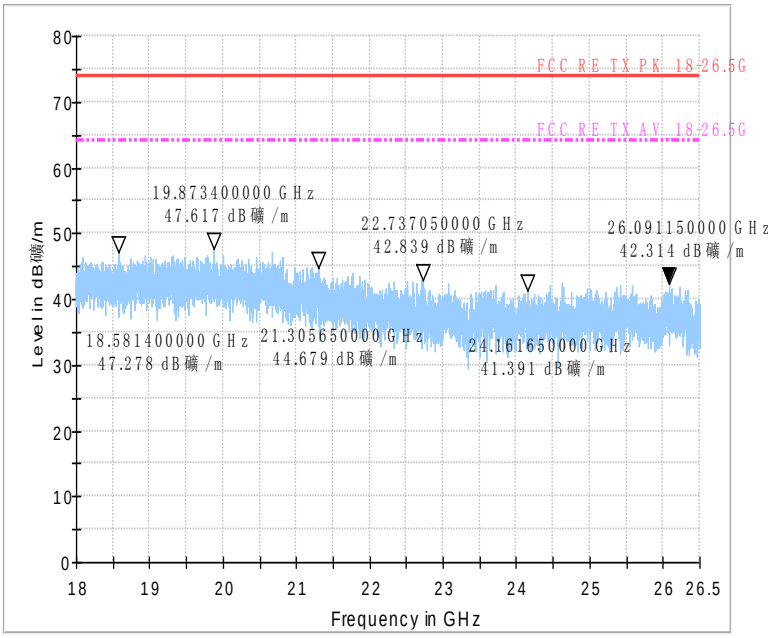


Fig.84 Radiated emission: 8DPSK, 18 GHz - 26 GHz

5.5. Time Of Occupancy (Dwell Time)

Measurement Limit:

Standard	Limit (ms)
FCC 47CFR Part 15.247 (a) (1) (iii)	< 400

The measurement is according to Public notice DA 00-705 and ANSI C63.4

Measurement Result:

For GFSK

Channel	Packet	Dwell Time (ms)		Conclusion
39	DH1	Fig.85	121.6	P
		Fig.86		
	DH3	Fig.87	264.1	P
		Fig.88		
	DH5	Fig.89	308.3	P
		Fig.90		

For π/4 DQPSK

Channel	Packet	Dwell Time (ms)		Conclusion
39	2DH1	Fig.91	124.7	P

		Fig.92		
	2DH3	Fig.93	264.0	P
		Fig.94		
	2DH5	Fig.95	308.3	P
		Fig.96		

For 8DPSK

Channel	Packet	Dwell Time (ms)		Conclusion
39	3DH1	Fig.97	125.2	P
		Fig.98		
	3DH3	Fig.99	264.2	P
		Fig.100		
	3DH5	Fig.101	308.4	P
		Fig.102		

Note: the dwell time is Calculated of the sum of test time about 31.5 seconds.
Equation: dwell time = pusletime *(1600/N)/79*T . N is the number of timeslot; T is the time about 31.5s.
The time of DH5=2.9*(1600/6)/79*31.5=308.3ms.
Conclusion: PASS
Test graphs as below:

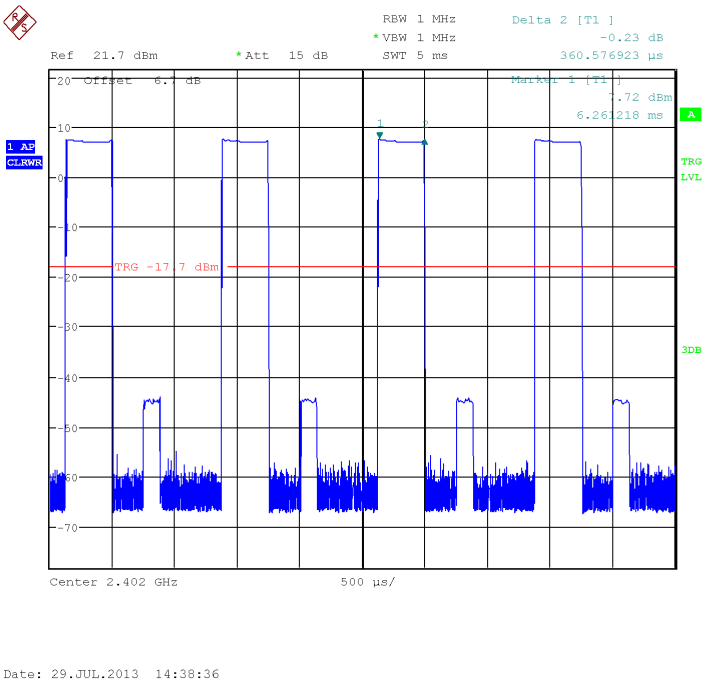


Fig.85 Time of occupancy (Dwell Time): Ch39, Packet DH1

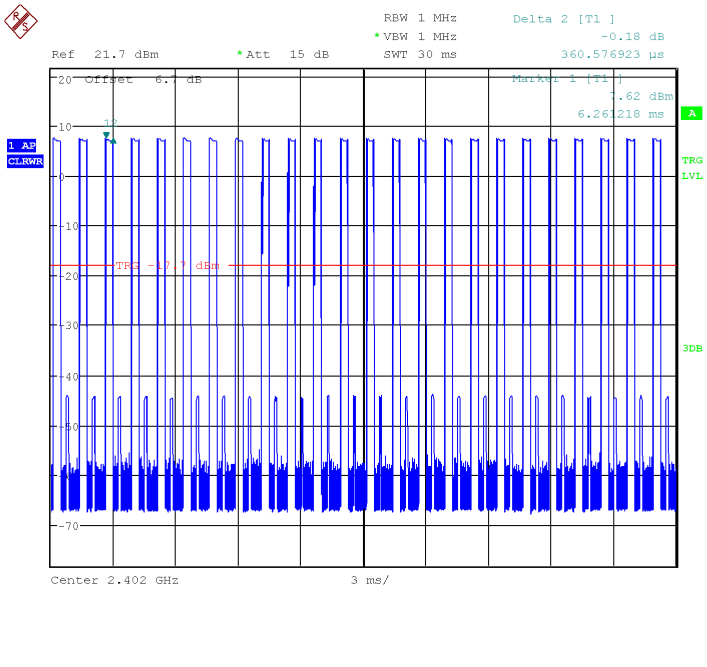


Fig.86 Number of Transmissions Measurement: Ch39, Packet DH1

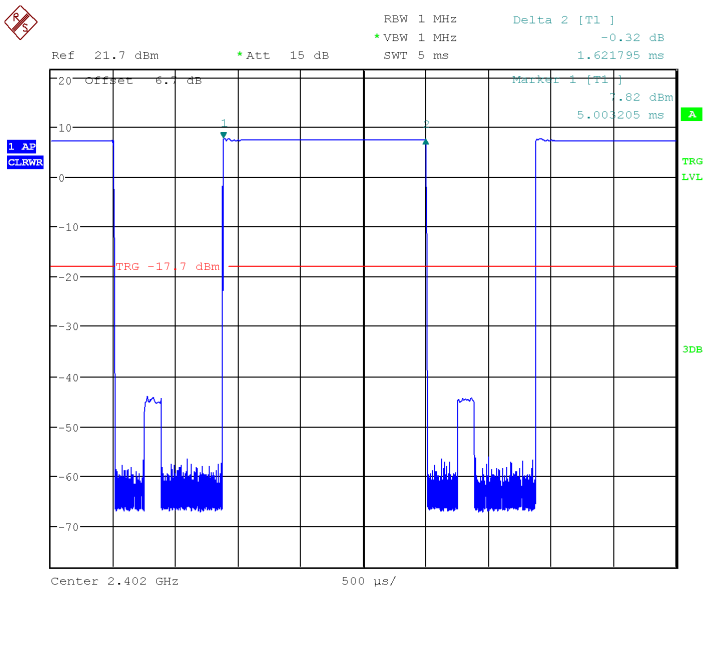


Fig.87 Time of occupancy (Dwell Time): Ch39, Packet DH3

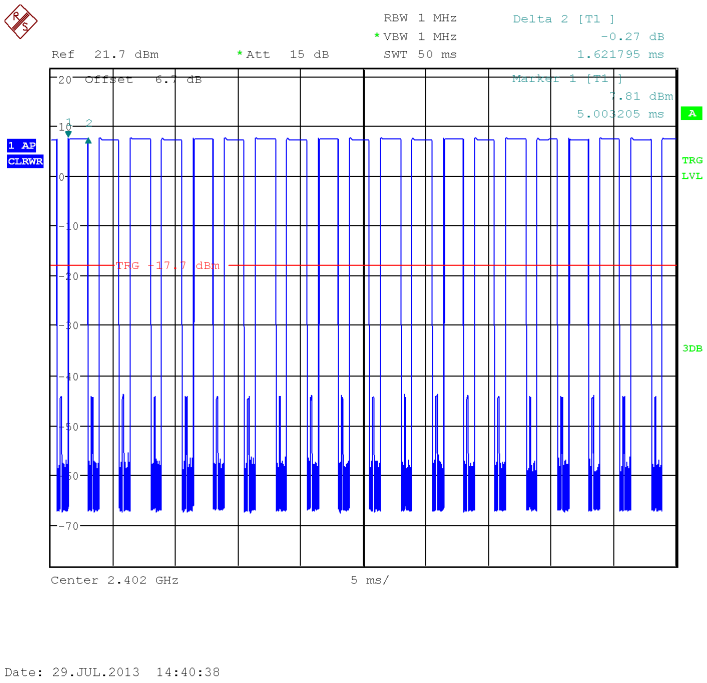


Fig.88 Number of Transmissions Measurement: Ch39, Packet DH3

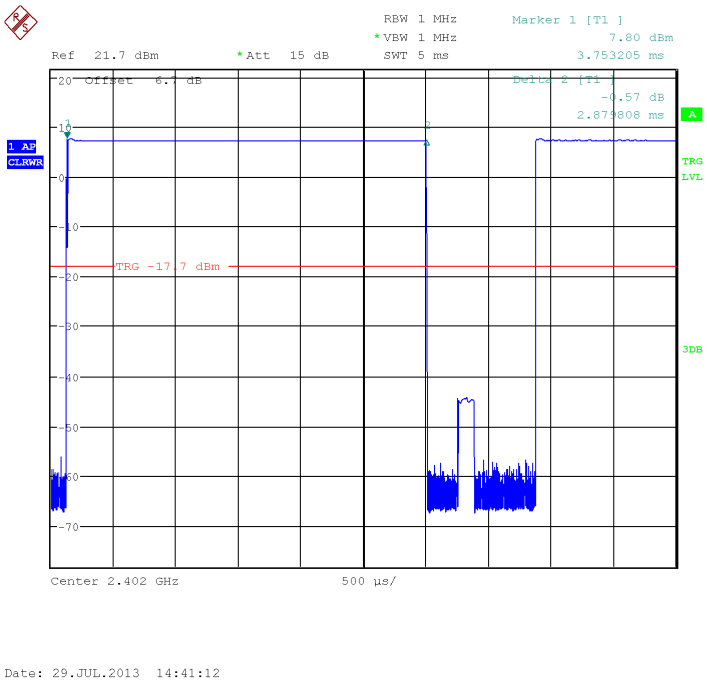


Fig.89 Time of occupancy (Dwell Time): Ch39,Packet DH5

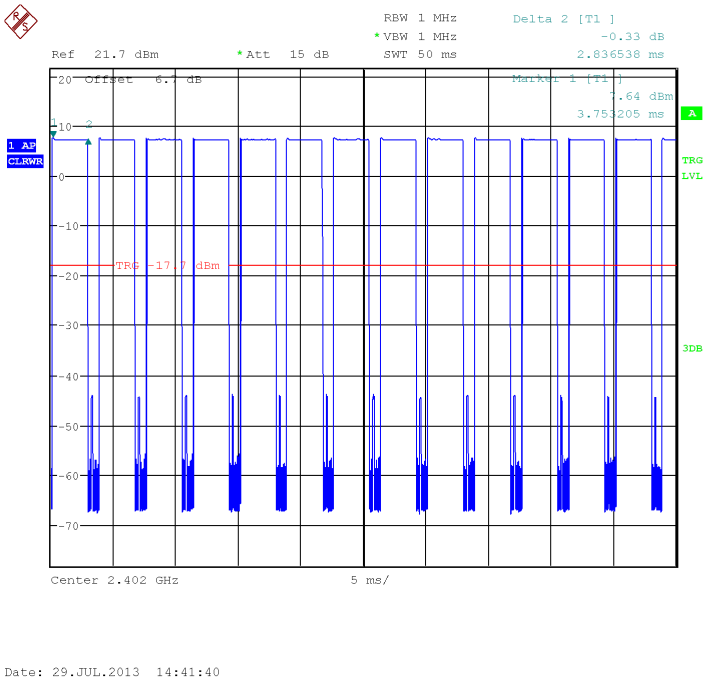


Fig.90 Number of Transmissions Measurement: Ch39, Packet DH5

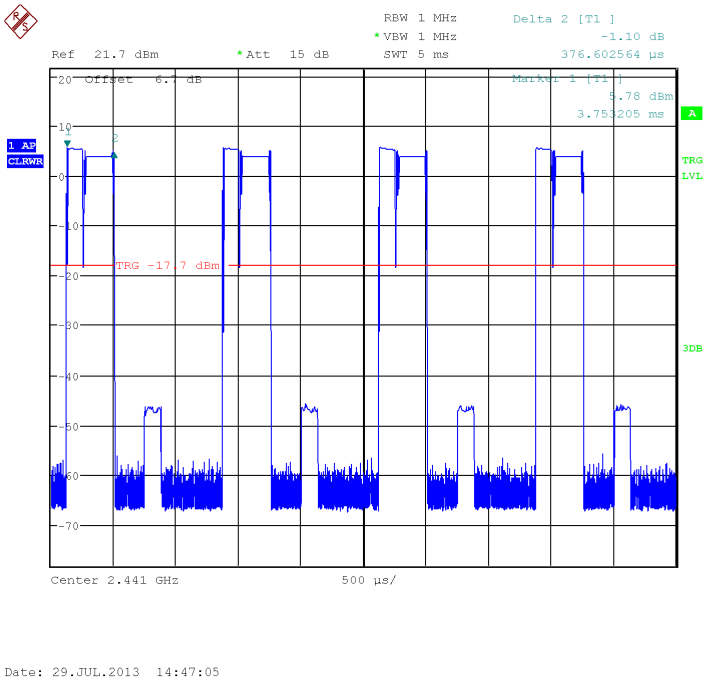


Fig.91 Time of occupancy (Dwell Time): Ch39,Packet 2-DH1

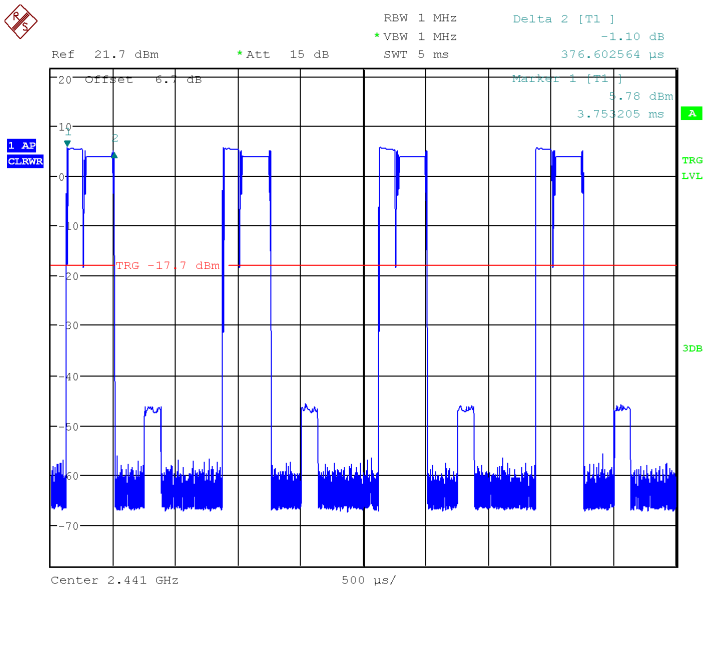


Fig.92 Number of Transmissions Measurement: Ch39, Packet 2-DH1

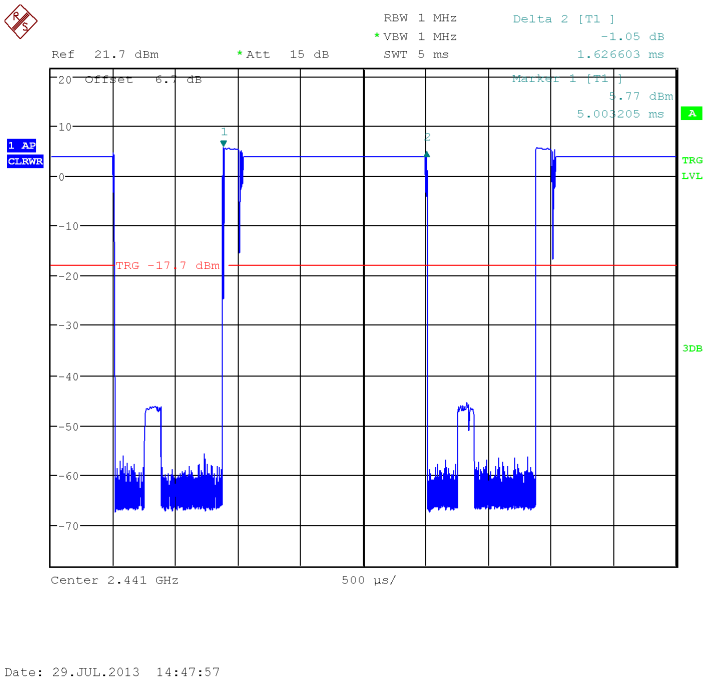


Fig.93 Time of occupancy (Dwell Time): Ch39,Packet 2-DH3

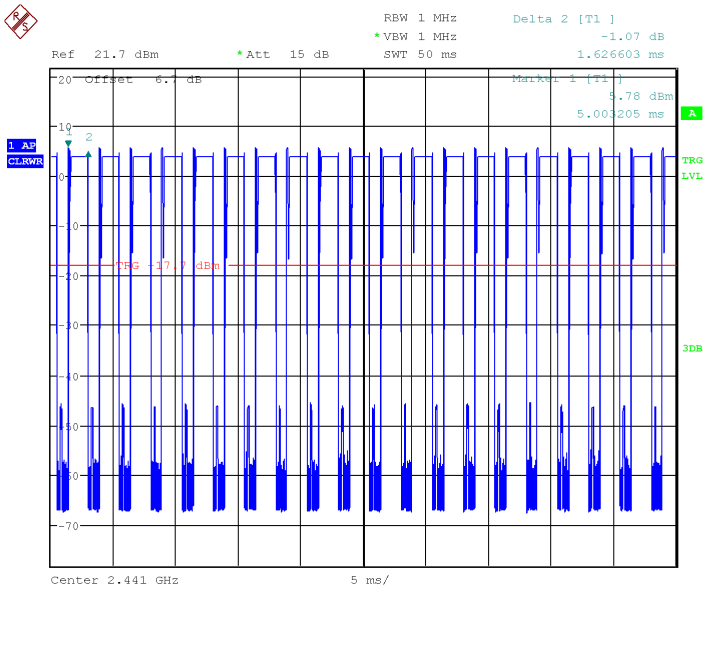


Fig.94 Number of Transmissions Measurement: Ch39, Packet 2-DH3

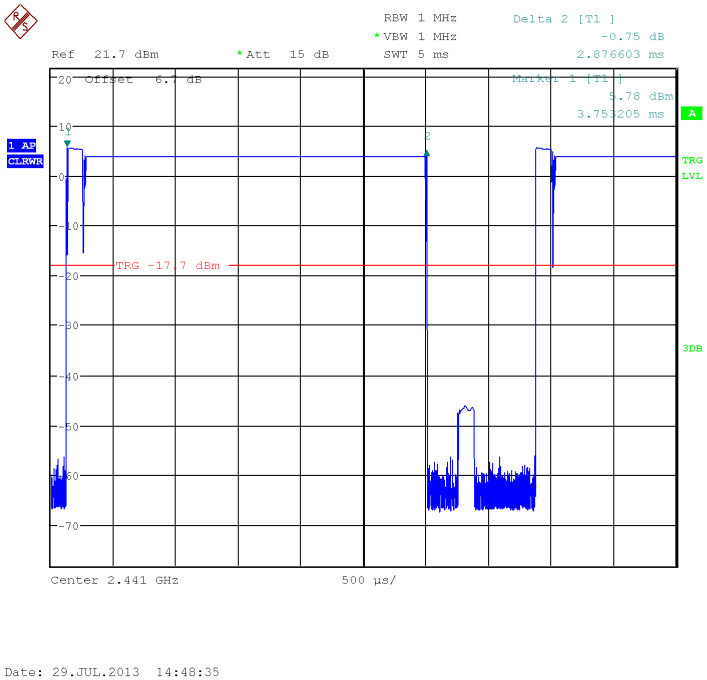


Fig.95 Time of occupancy (Dwell Time): Ch39,Packet 2-DH5

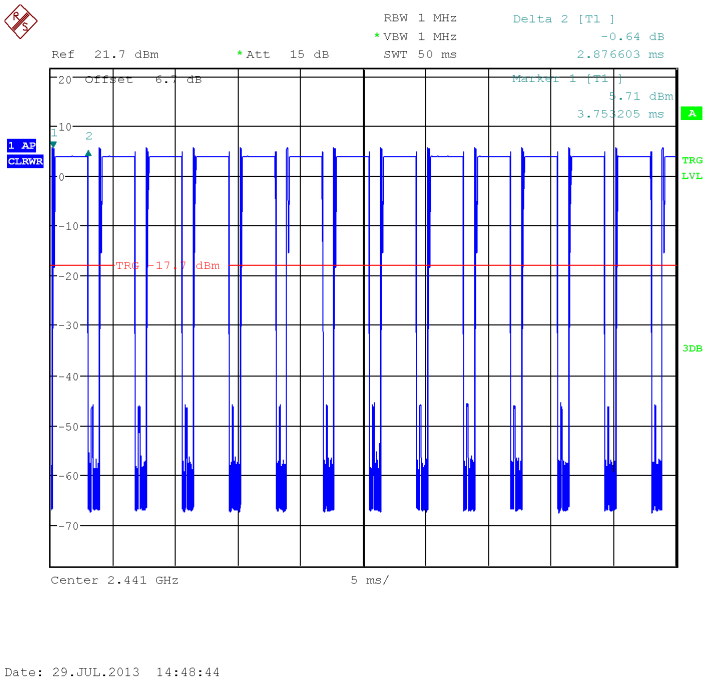


Fig.96 Number of Transmissions Measurement: Ch39, Packet 2-DH5

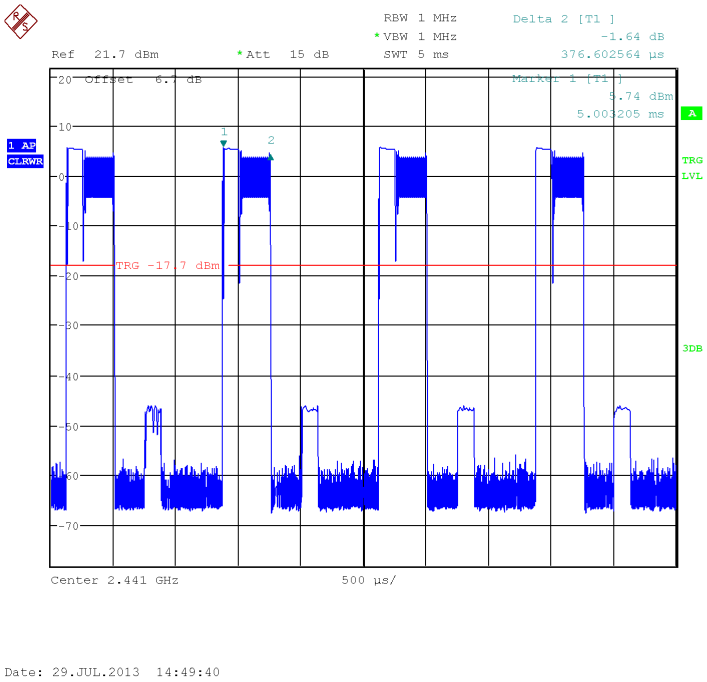


Fig.97 Time of occupancy (Dwell Time): Ch39,Packet 3-DH1

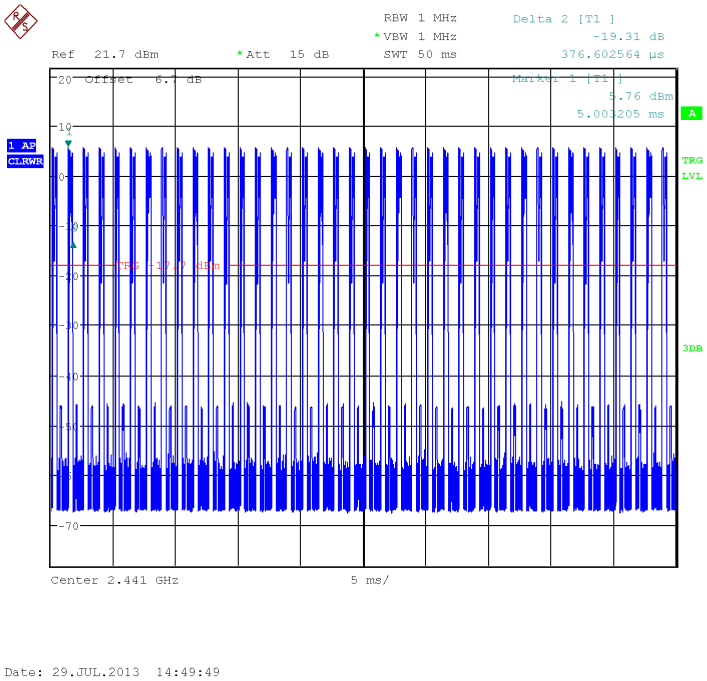


Fig.98 Number of Transmissions Measurement: Ch39, Packet 3-DH1

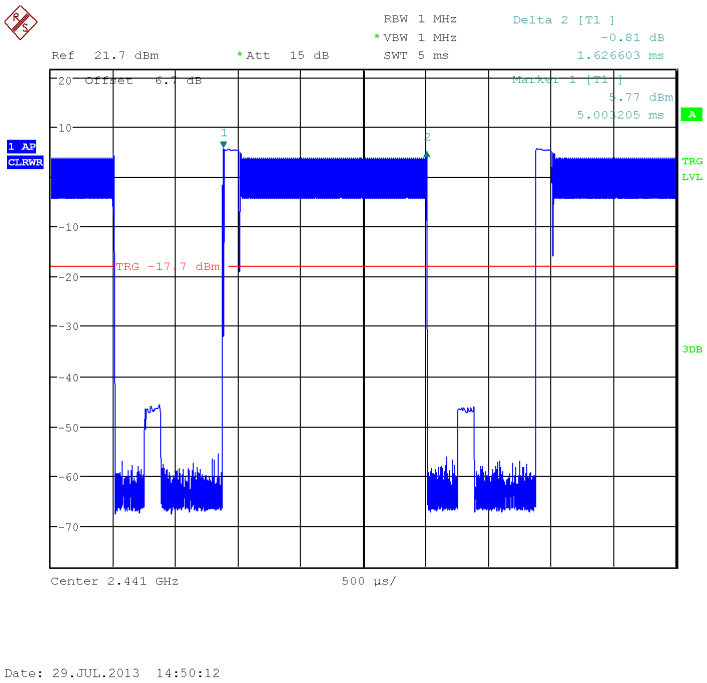


Fig.99 Time of occupancy (Dwell Time): Ch39,Packet 3-DH3

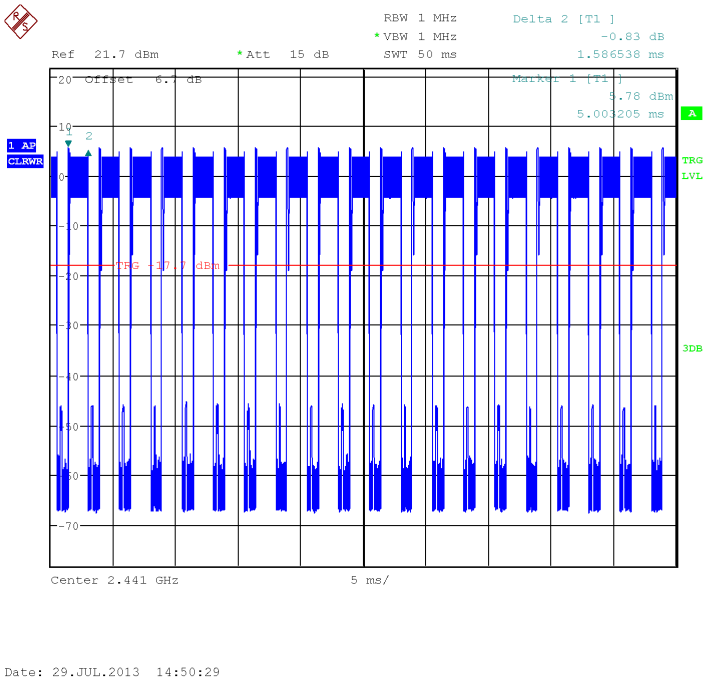


Fig.100 Number of Transmissions Measurement: Ch39, Packet 3-DH3

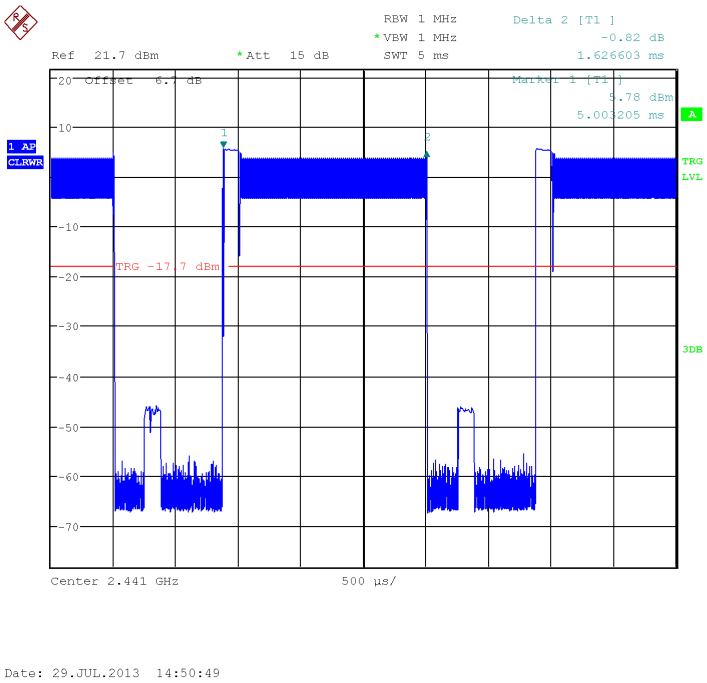


Fig.101 Time of occupancy (Dwell Time): Ch39,Packet 3-DH5

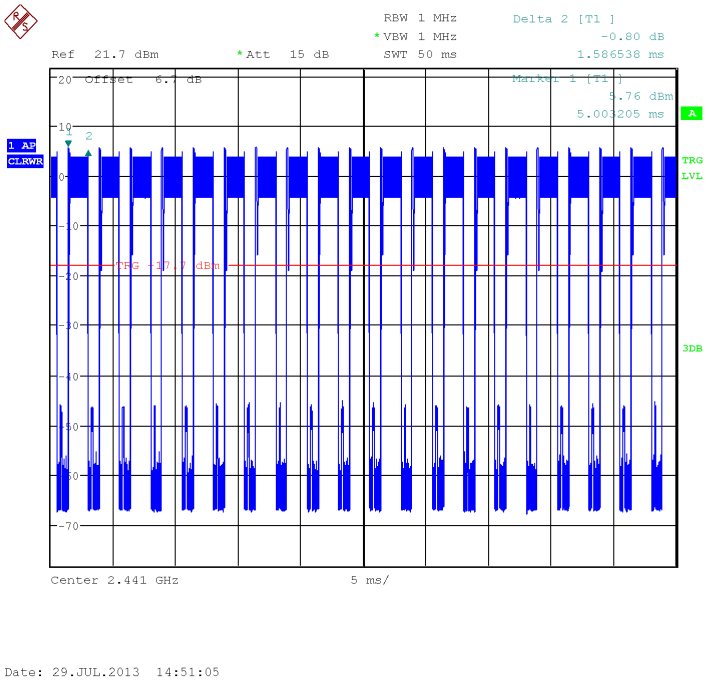


Fig.102 Number of Transmissions Measurement: Ch39, Packet 3-DH5

5.6. 20dB Bandwidth

Measurement Limit:

Standard	Limit
FCC 47 CFR Part 15.247 (a) (1)	N/A

The measurement is according to Public notice DA 00-705 and ANSI C63.4.

Measurement Result:

For GFSK

Channel	20dB Bandwidth (KHz)		Conclusion
0	Fig.103	1038.46	P
39	Fig.104	1028.84	P
78	Fig.105	1033.66	P

For π/4 DQPSK

Channel	20dB Bandwidth (KHz)		Conclusion
0	Fig.106	1096.15	P
39	Fig.107	1096.15	P
78	Fig.108	1096.15	P

For 8DPSK

Channel	20dB Bandwidth (KHz)	Conclusion

0	Fig.109	1197.12	P
39	Fig.110	1192.31	P
78	Fig.111	1197.12	P

Conclusion: PASS

Test graphs as below:

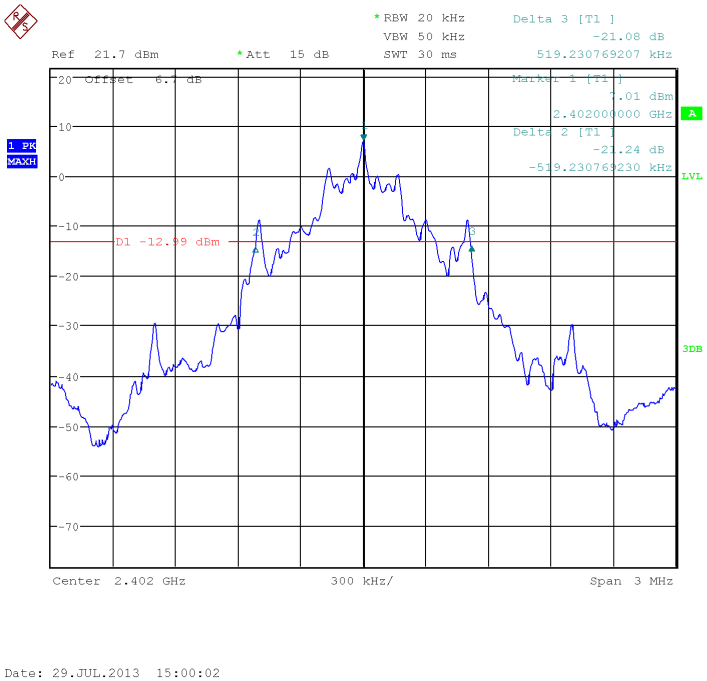


Fig.103 20dB Bandwidth: GFSK, Ch0

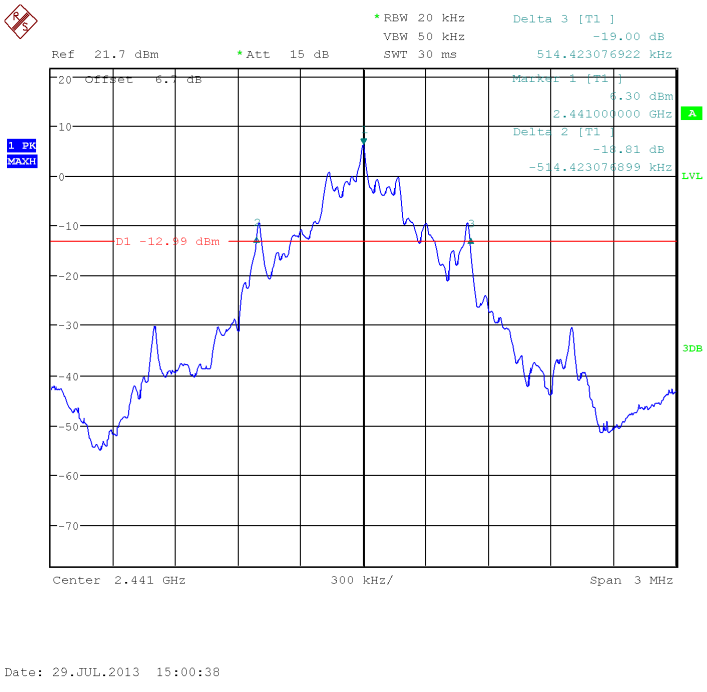


Fig.104 20dB Bandwidth: GFSK, Ch39

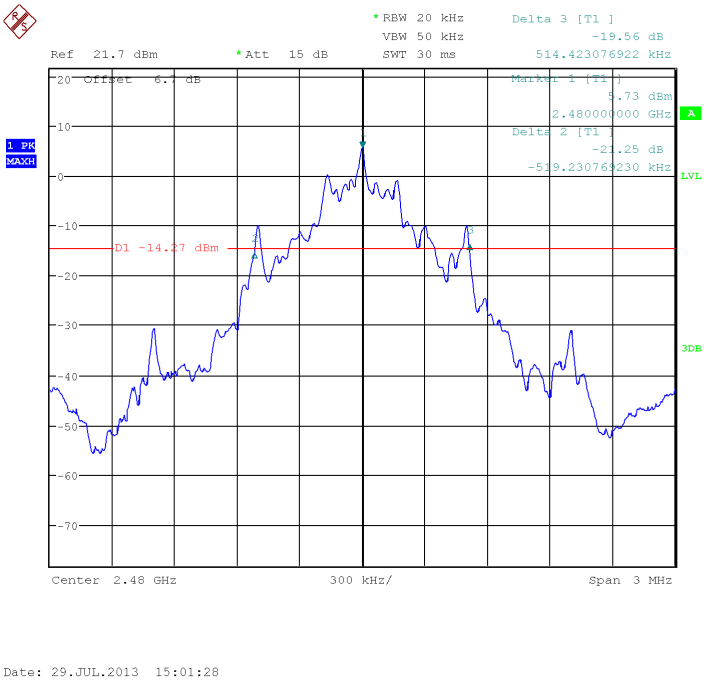


Fig.105 20dB Bandwidth: GFSK, Ch78

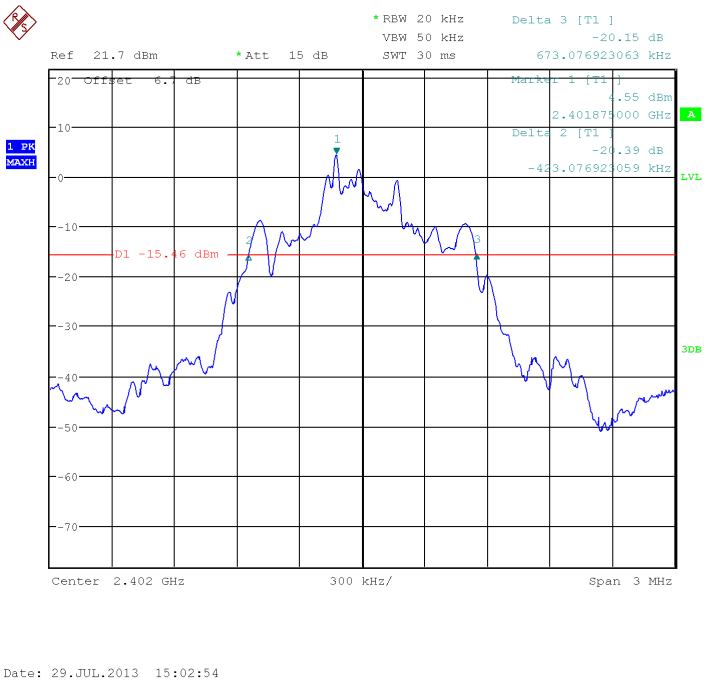


Fig.106 20dB Bandwidth: π/4 DQPSK, Ch0

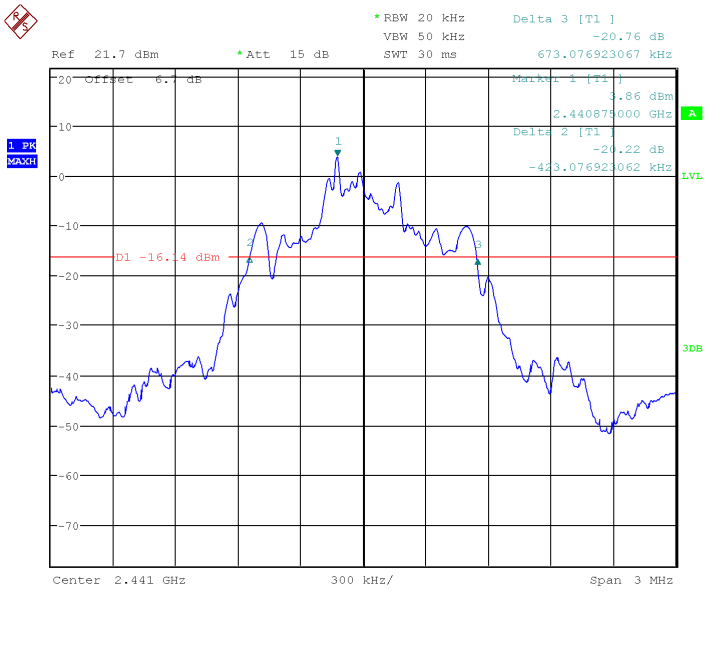


Fig.107 20dB Bandwidth: π/4 DQPSK, Ch39

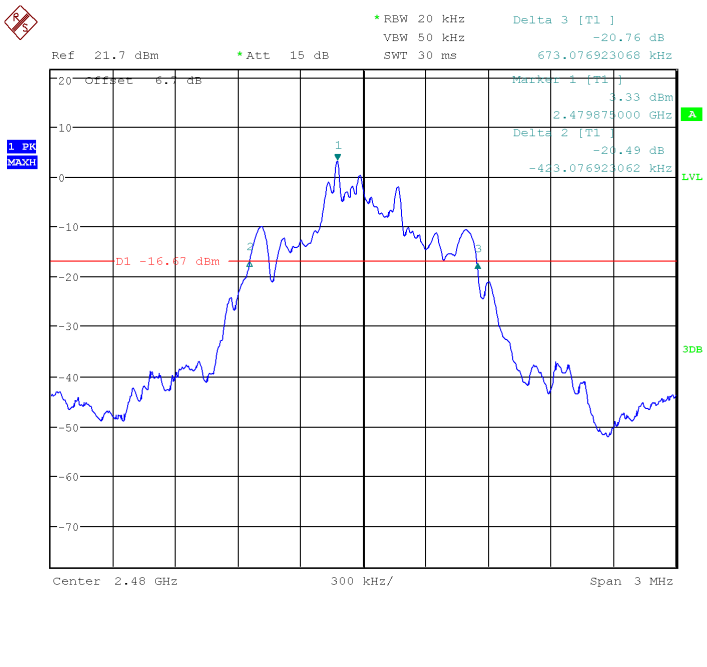


Fig.108 20dB Bandwidth: π/4 DQPSK, Ch78

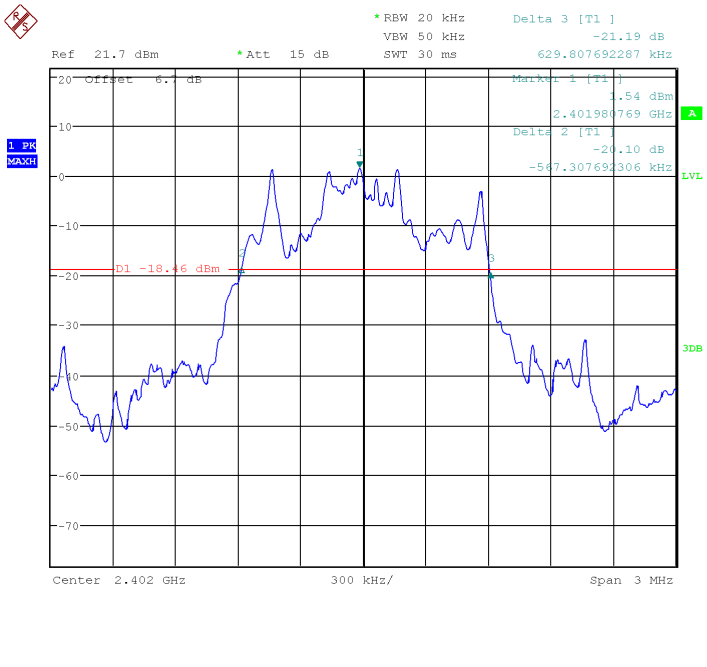


Fig.109 20dB Bandwidth: 8DPSK, Ch0

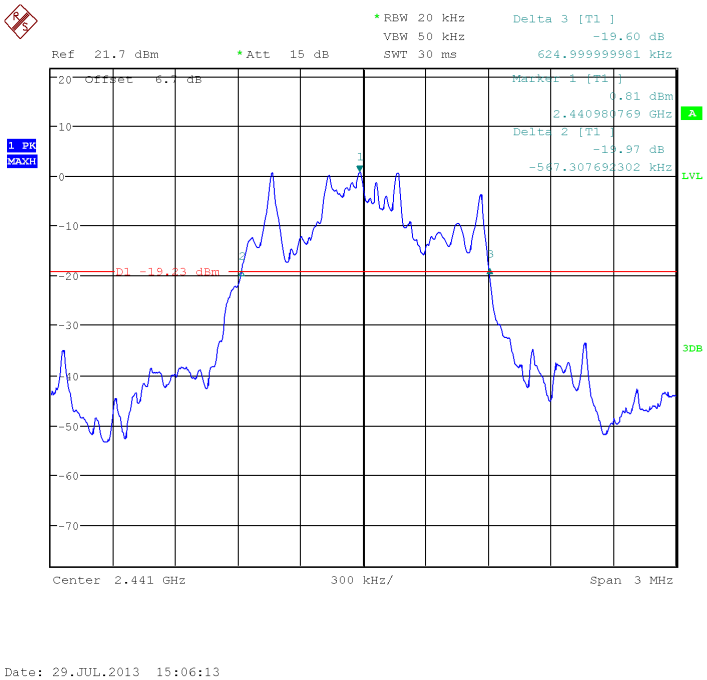


Fig.110 20dB Bandwidth: 8DPSK, Ch39

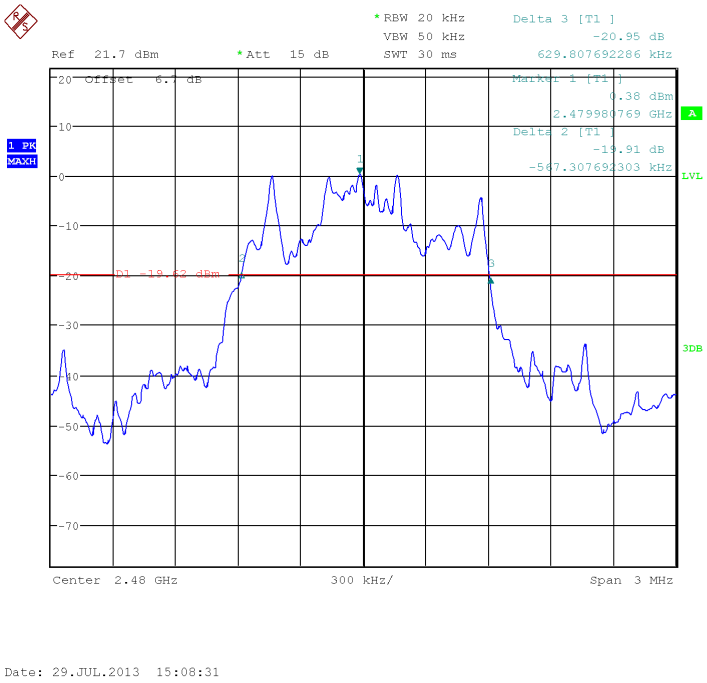


Fig.111 20dB Bandwidth: 8DPSK, Ch78

5.7. Carrier Frequency Separation

Measurement Limit:

Standard	Limit (KHz)
FCC 47 CFR Part 15.247 (a) (1)	Over 25KHz or (2/3)*20dB bandwidth

The measurement is according to Public notice DA 00-705 and ANSI C63.4.

Measurement Result:

For GFSK

Channel	Carrier separation (KHz)		Conclusion
39	Fig.112	990.385	P

For π/4 DQPSK

Channel	Carrier separation (KHz)		Conclusion
39	Fig.113	1019.2	P

For 8DPSK

Channel	Carrier separation (KHz)		Conclusion
39	Fig.114	1019.2	P

Conclusion: PASS

Test graphs as below:

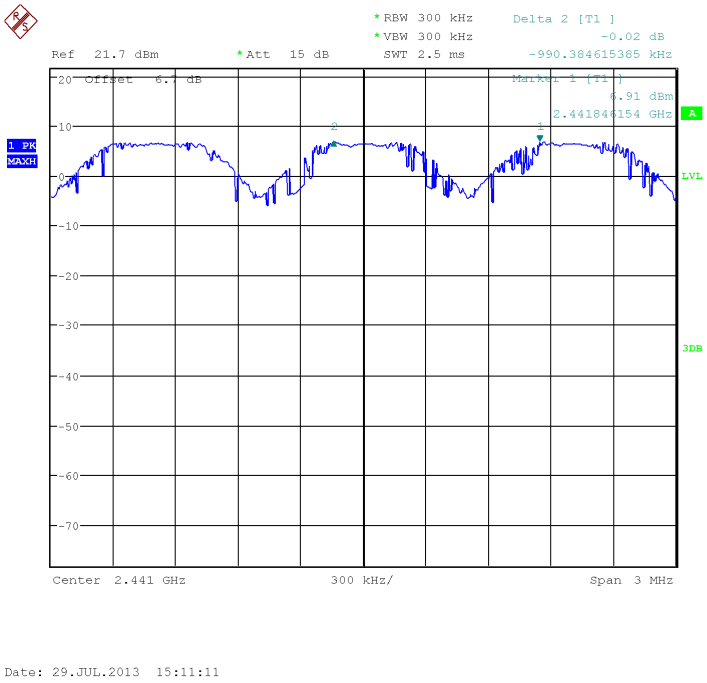


Fig.112 Carrier separation measurement: GFSK, Ch39

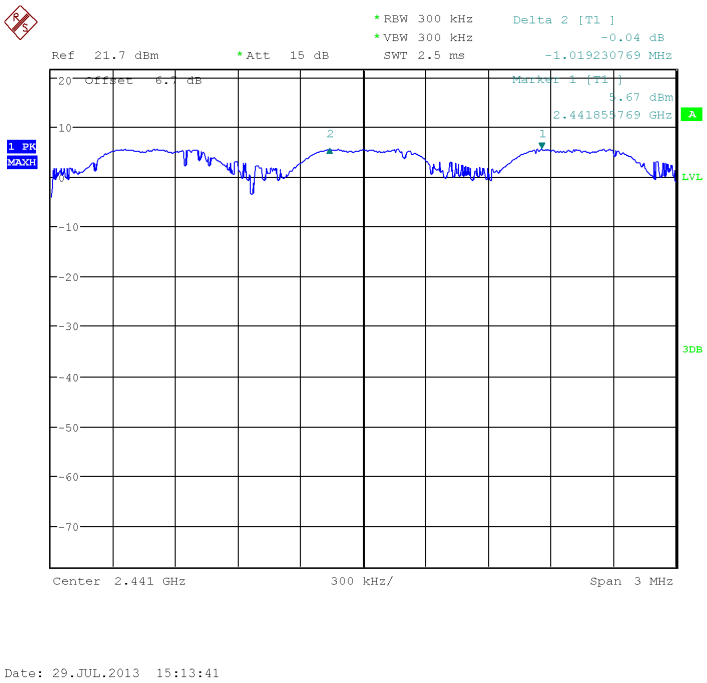


Fig.113 Carrier separation measurement: π/4 DQPSK, Ch39

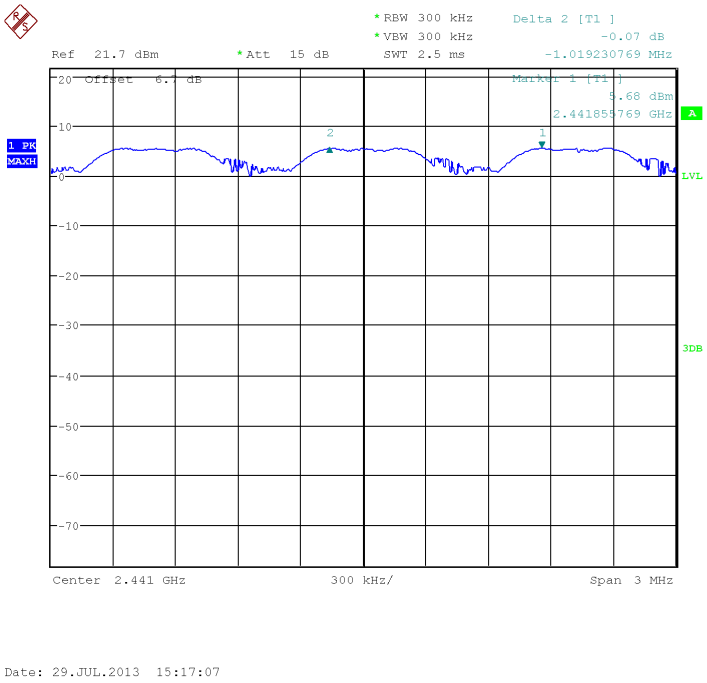


Fig.114 Carrier separation measurement: 8DPSK, Ch39

5.8. Number Of Hopping Channels

Measurement Limit:

Standard	Limit
FCC 47 CFR Part 15.247 (a)(1)(iii)	At least 15 non-overlapping channels

The measurement is according to Public notice DA 00-705 and ANSI C63.4.

Measurement Result:

For GFSK

Channel	Number of hopping channels		Conclusion
0~39	Fig.115	79	P
40~78	Fig.116		P

For π/4 DQPSK

Channel	Number of hopping channels		Conclusion
0~39	Fig.117	79	P
40~78	Fig.118		P

For 8DPSK

Channel	Number of hopping channels		Conclusion
0~39	Fig.119	79	P
40~78	Fig.120		P

Conclusion: PASS

Test graphs as below:

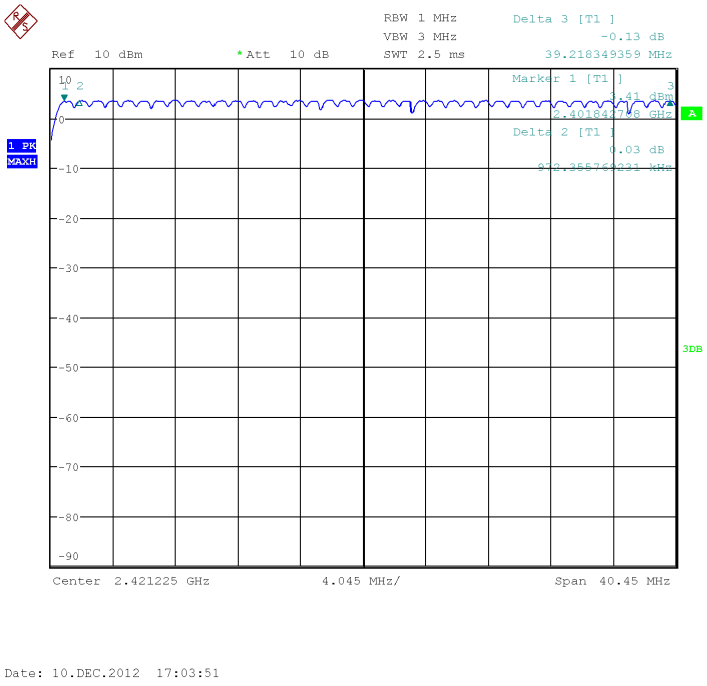


Fig.115 Number of hopping frequency: GFSK, Ch0~39

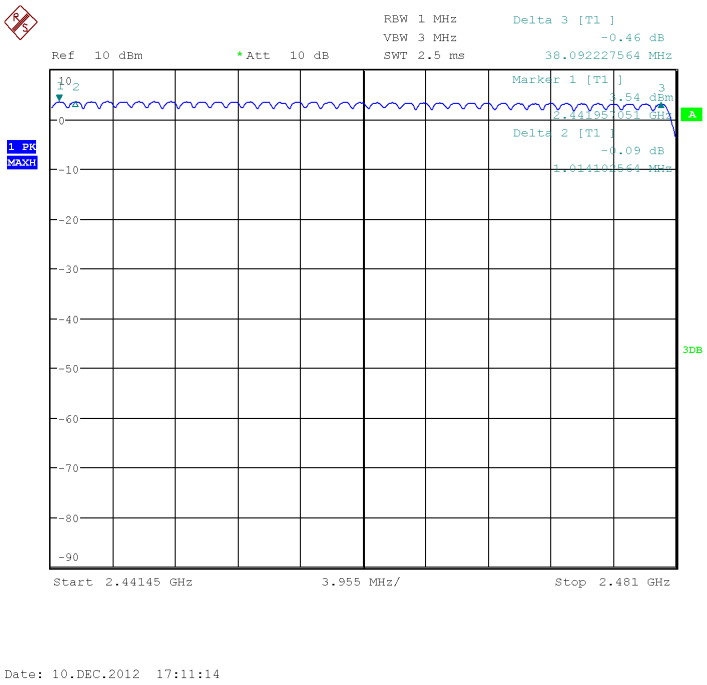


Fig.116 Number of hopping frequency: GFSK, Ch40~78

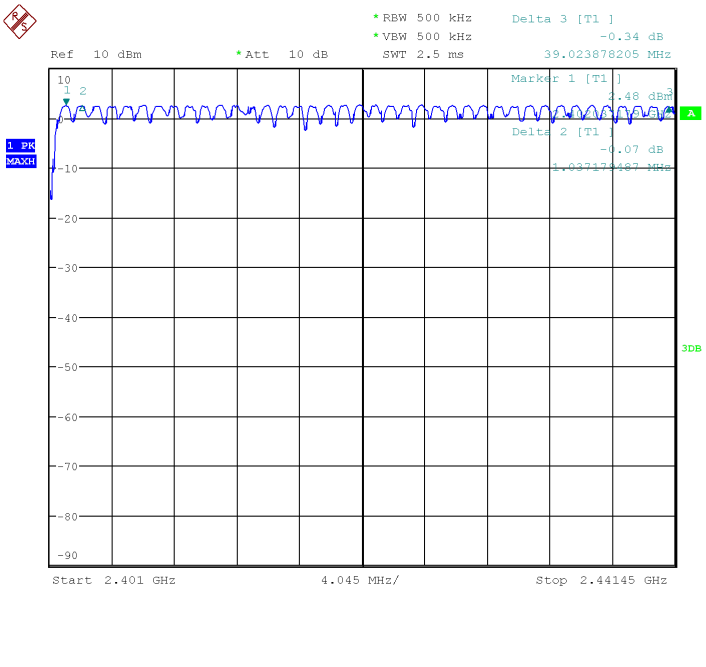


Fig.117 Number of hopping frequency: π/4 DQPSK, Ch0~39

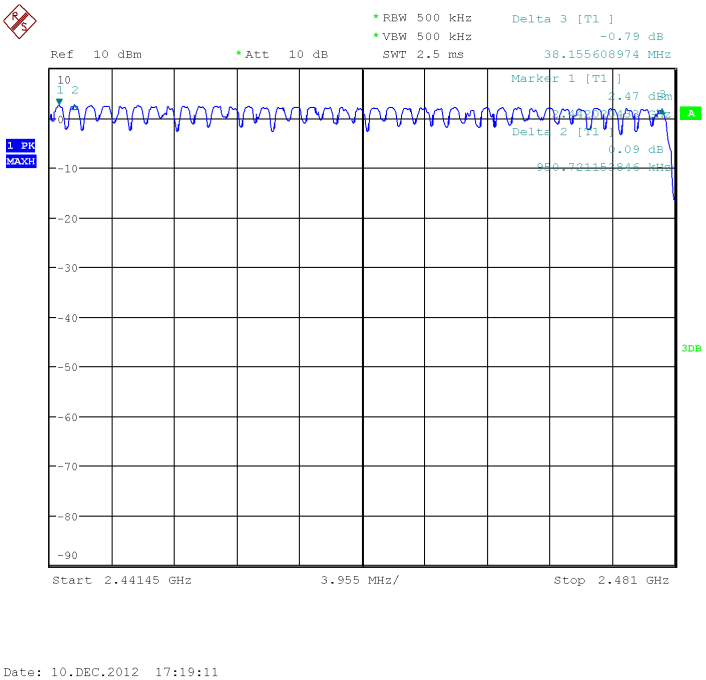


Fig.118 Number of hopping frequency: π/4 DQPSK, Ch40~78

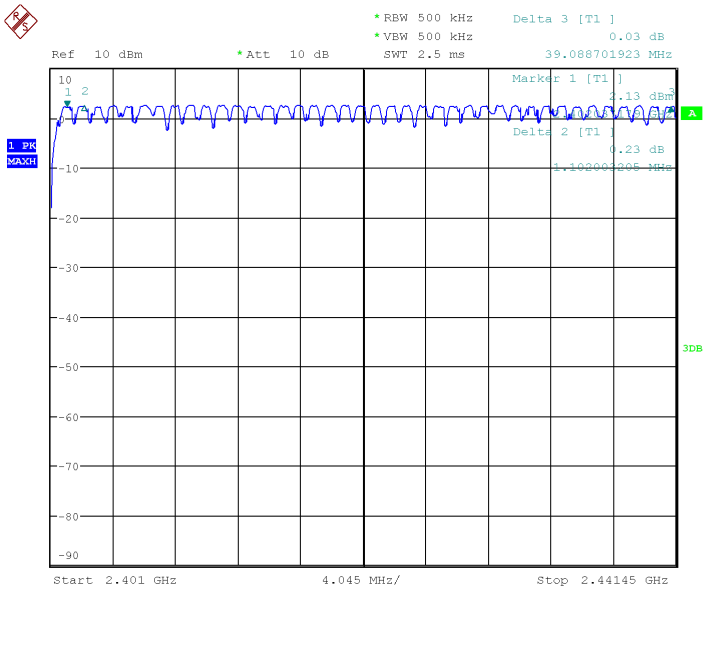


Fig.119 Number of hopping frequency: 8DPSK, Ch0~39

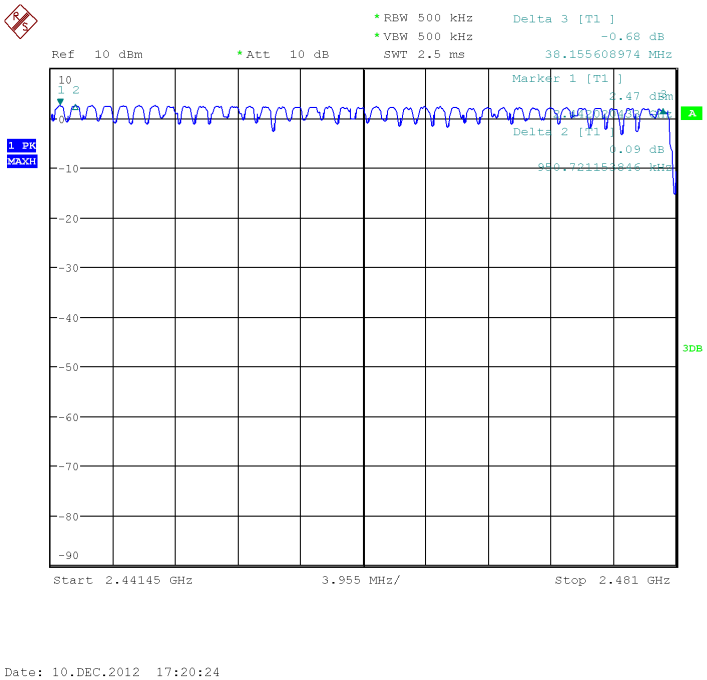


Fig.120 Number of hopping frequency: 8DPSK, Ch40~78

5.9. AC Powerline Conducted Emission

Test Condition

Voltage (V)	Frequency (Hz)
120V	60

Measurement Result and Limit:

Bluetooth (Quasi-peak Limit)

Frequency range (MHz)	Quasi-peak Limit (dBuV)	Result (dBuV)	Conclusion
0.15 to 0.5	66 to 56	With Charger	
0.5 to 5	56	Fig.121	P
5 to 30	60		
NOTE: The limit decrease linearly with the logarithm of the frequency in the range 0.15 MHz to 0.5MHz.			

Bluetooth (Average Limit)

Frequency range (MHz)	Average Limit (dBuV)	Result (dBuV)	Conclusion
0.15 to 0.5	66 to 56	With Charger	
0.5 to 5	56	Fig.122	P
5 to 30	60		
NOTE: The limit decrease linearly with the logarithm of the frequency in the range 0.15 MHz to 0.5MHz.			

The measurement is according to Public notice DA 00-705 and ANSI C63.4.

Conclusion: PASS

Test graphs as below:

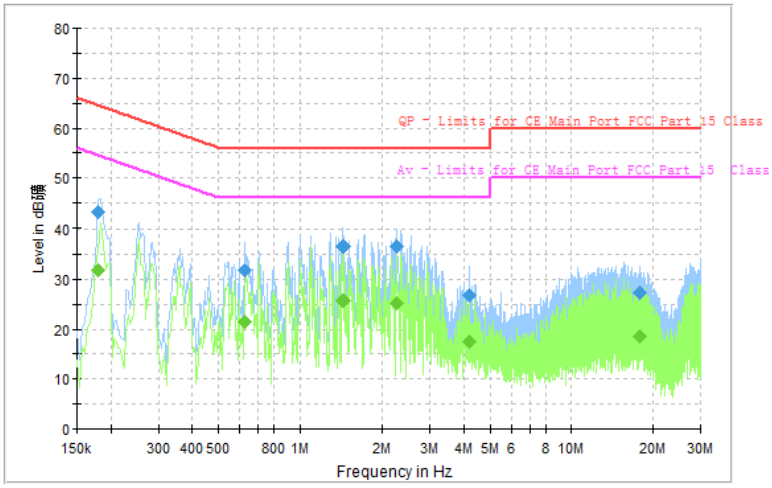


Fig.121 AC powerline Conducted Emission

Final Result1

Frequency (MHz)	QuasiPeak (dBuV)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit(dBuV)
0.179850	43.1	1000.0	9.000	On	L1	10.2	21.4	64.5
0.623869	31.8	1000.0	9.000	On	L1	10.1	24.2	56.0
1.444744	36.6	1000.0	9.000	On	L1	9.9	19.4	56.0
2.254425	36.6	1000.0	9.000	On	L1	9.8	19.4	56.0
4.183481	26.8	1000.0	9.000	On	L1	9.8	29.2	56.0
17.892094	27.3	1000.0	9.000	On	L1	9.9	32.7	60.0

Final Result2

Frequency (MHz)	Average (dBuV)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit(dBuV)
0.179850	31.8	1000.0	9.000	On	L1	10.2	22.7	54.5
0.623869	21.5	1000.0	9.000	On	L1	10.1	24.5	46.0
1.444744	25.8	1000.0	9.000	On	L1	9.9	20.2	46.0
2.254425	25.1	1000.0	9.000	On	L1	9.8	20.9	46.0
4.183481	17.4	1000.0	9.000	On	L1	9.8	28.6	46.0
17.892094	18.6	1000.0	9.000	On	L1	9.9	31.4	50.0

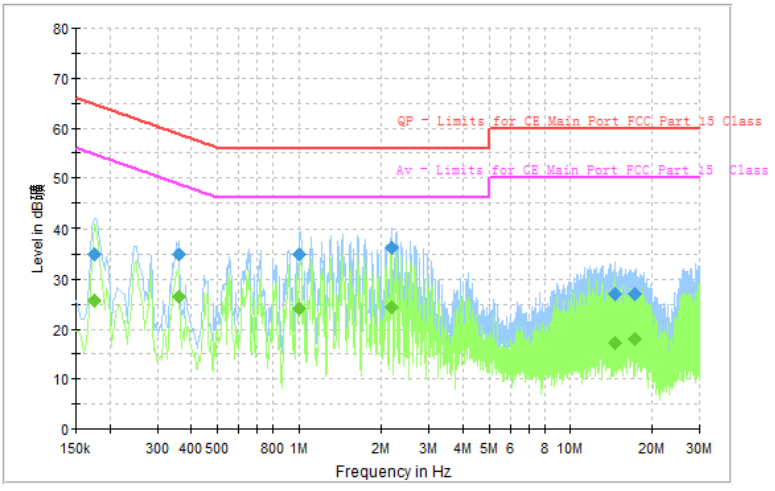


Fig.122 AC powerline Conducted Emission

Final Result1

Frequency (MHz)	QuasiPeak (dBuV)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBuV)
0.176119	35.0	1000.0	9.000	On	N	10.2	29.7	64.7
0.358950	34.9	1000.0	9.000	On	L1	10.1	23.9	58.8
1.008188	35.0	1000.0	9.000	On	L1	9.9	21.0	56.0
2.179800	36.3	1000.0	9.000	On	L1	9.8	19.7	56.0
14.556356	26.9	1000.0	9.000	On	L1	9.9	33.1	60.0
17.242856	27.0	1000.0	9.000	On	L1	9.9	33.0	60.0

Final Result2

Frequency (MHz)	Average (dBuV)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit(dBuV)
0.176119	25.6	1000.0	9.000	On	N	10.2	29.1	54.7
0.358950	26.5	1000.0	9.000	On	L1	10.1	22.3	48.8
1.008188	24.2	1000.0	9.000	On	L1	9.9	21.8	46.0
2.179800	24.4	1000.0	9.000	On	L1	9.8	21.6	46.0
14.556356	17.3	1000.0	9.000	On	L1	9.9	32.7	50.0
17.242856	17.9	1000.0	9.000	On	L1	9.9	32.1	50.0

6. Test Equipments and Ancillaries Used For Tests

The test equipments and ancillaries used are as follows.

Conducted test system

No.	Equipment	Model	Serial Number	Manufacturer	Calibration Due date
1	Vector Signal Analyzer	FSQ26	101096	Rohde&Schwarz	2013-10-17
2	DC Power Supply	ZUP60-14	LOC-220Z006	TDL-Lambda	2013-11-30
3	Bluetooth Tester	CBT32	100785	Rohde&Schwarz	2013-10-16

Radiated emission test system

No.	Equipment	Model	Serial Number	Manufacturer	Calibration Due date
1	Universal Radio Communication Tester	CMU200	123102	R&S	2013-09-10
2	Test Receiver	ESU40	100307	R&S	2013-11-07
3	Trilog Antenna	VULB9163	19-162515	Schwarzbeck	2014-11-11
4	Double Ridged Guide Antenna	ETS-3117	00135885	ETS	2014-04-29
5	Double Ridged Guide Antenna	ETS-3117	00135890	ETS	2014-04-28
6	Test receiver	ESCI	101235	R&S	2013-11-07

7	2-Line V-Network	ENV216	101380	R&S	2013-11-07
8	Biconical VHF-UHF broad band antenna	SWB-VUBA9117	9117-266	SCHWARZBECK	2013/11/11
9	Horn antenna(18.0-26.5GHz)	3160_09	LM6321	ETS-LINDGREN	2013/11/22
10	Signal conditioning unit(0.1-18GHz)	SCU18	10155	R/S	2013/11/03
11	Signal conditioning unit(0.1-18GHz)	SCU18	10146	R/S	2013/11/03
12	Horn antenna(18.0-26.5GHz)	3160_09	00086671	ETS-LINDGREN	2013/06/15
13	Amplifier	AFS4-00102650-42-8P-4	1405286	MITEQ	2013/06/09
14	Amplifier	SCV26	10025	R&S	2013/11/09

Anechoic chamber

Fully anechoic chamber by Frankonia German.

7. Test Environment

Shielding Room1 (6.0 meters×3.0 meters×2.7 meters) did not exceed following limits along the conducted RF performance testing:

Temperature	Min. = 15 ℃, Max. = 30 ℃

Relative humidity	Min. = 30 %, Max. = 60 %
Shielding effectiveness	> 110 dB
Ground system resistance	< 0.5 Ω
Uniformity of field strength	Between 0 and 6 dB, from 80MHz to 3000 MHz

Control room did not exceed following limits along the EMC testing:

Temperature	Min. = 15 ℃, Max. = 35 ℃
Relative humidity	Min. =30 %, Max. = 60 %
Shielding effectiveness	> 110 dB
Electrical insulation	> 10 kΩ
Ground system resistance	< 0.5 Ω

Fully-anechoic chamber1 (6.8 meters×3.08 meters×3.53 meters) did not exceed following limits along the EMC testing:

Temperature	Min. = 15 ℃, Max. = 30 ℃
Relative humidity	Min. = 30 %, Max. = 60 %
Shielding effectiveness	> 110 dB
Electrical insulation	> 10 kΩ
Ground system resistance	< 0.5 Ω
Uniformity of field strength	Between 0 and 6 dB, from 80MHz to 3000 MHz

Fully-anechoic chamber2 (Tapered Section: 8.75 meters×3.66 meters×3.66 meters, Rectangular Section: 7.32 meters×3.97 meters×3.66 meters) did not exceed following limits along the EMC testing:

Temperature	Min. = 15 ℃, Max. = 30 ℃
Relative humidity	Min. = 35 %, Max. = 60 %
Shielding effectiveness	> 110 dB
Electrical insulation	> 10 kΩ
Ground system resistance	< 0.5 Ω
Uniformity of field strength	Between 0 and 6 dB, from 30MHz to 40000MHz

ANNEX A Deviations from Prescribed Test Methods

No deviation from Prescribed Test Methods.

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