



# FCC PART 15C TEST REPORT

**No. 2012TAR568**

for

**TCT Mobile Limited**

**HSUPA/HSDPA/UMTS triband/GSM quadband mobile phone**

**Name: Beetle 2SIM US**

**Marketing Name: ONE TOUCH 4030E**

**FCC ID: RAD316**

With

**Hardware Version: Ptoto**

**Software Version: vFA2**

**Issued Date: 2012-12-24**



*DAR accreditation (DIN EN ISO/IEC 17025): No. D-PL-12123-01-01*

*FCC 2.948 Listed: No.733176*

*IC O.A.T.S listed: No.6629B*

**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.

**Test Laboratory:**

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## **CONTENTS**

<b>CONTENTS .....</b>	<b>2</b>
<b>1. TEST LABORATORY .....</b>	<b>3</b>
1.1. TESTING LOCATION .....	3
1.2. TESTING ENVIRONMENT.....	3
1.3. PROJECT DATA .....	3
1.4. SIGNATURE .....	3
<b>2. CLIENT INFORMATION.....</b>	<b>4</b>
2.1. APPLICANT INFORMATION.....	4
2.2. MANUFACTURER INFORMATION .....	4
<b>3. EQUIPMENT UNDER TEST (EUT) AND ANCILLARY EQUIPMENT (AE) .....</b>	<b>5</b>
3.1. ABOUT EUT .....	5
3.2. INTERNAL IDENTIFICATION OF EUT USED DURING THE TEST .....	5
3.3. INTERNAL IDENTIFICATION OF AE USED DURING THE TEST .....	5
3.4. GENERAL DESCRIPTION.....	6
<b>4. REFERENCE DOCUMENTS.....</b>	<b>7</b>
4.1. DOCUMENTS SUPPLIED BY APPLICANT .....	7
4.2. REFERENCE DOCUMENTS FOR TESTING.....	7
<b>5. LABORATORY ENVIRONMENT.....</b>	<b>8</b>
<b>6. SUMMARY OF TEST RESULTS .....</b>	<b>9</b>
6.1. SUMMARY OF TEST RESULTS.....	9
6.2. STATEMENTS.....	9
<b>7. TEST EQUIPMENTS UTILIZED .....</b>	<b>10</b>
<b>ANNEX A: MEASUREMENT RESULTS.....</b>	<b>11</b>
A.1. MEASUREMENT METHOD .....	11
A.2. PEAK OUTPUT POWER - CONDUCTED .....	13
A.3. FREQUENCY BAND EDGES - CONDUCTED.....	14
A.4. CONDUCTED EMISSION.....	21
A.5. RADIATED EMISSION.....	45
A.6. TIME OF OCCUPANCY (DWELL TIME) .....	67
A.7. 20dB BANDWIDTH.....	77
A.8. CARRIER FREQUENCY SEPARATION .....	82
A.9. NUMBER OF HOPPING CHANNELS.....	84
A.10. AC POWERLINE CONDUCTED EMISSION .....	88

## 1. Test Laboratory

### 1.1. Testing Location

Company Name: TMC Beijing, Telecommunication Metrology Center of MIIT  
Address: Shouxiang Science Building, No 51, Xueyuan Road, Haidian District,  
Beijing, P.R.China  
Postal Code: 100191  
Telephone: 00861062304633  
Fax: 00861062304793

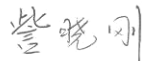
### 1.2. Testing Environment

Normal Temperature: 15-35°C  
Extreme Temperature: -20/+55°C  
Relative Humidity: 20-75%

### 1.3. Project data

Project Leader: Zi Xiaogang  
Testing Start Date: 2012-11-27  
Testing End Date: 2012-12-21

### 1.4. Signature



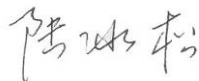
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**Zi Xiaogang**  
**(Prepared this test report)**



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**Sun Xiangqian**  
**(Reviewed this test report)**



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**Lu Bingsong**  
**Deputy Director of the laboratory**  
**(Approved this test report)**

## **2. Client Information**

### **2.1. Applicant Information**

Company Name: TCT Mobile Limited  
Address /Post: 5F, C building, No. 232, Liang Jing Road ZhangJiang High-Tech Park,  
Pudong Area Shanghai, P.R. China. 201203  
City: Shanghai  
Country: China  
Telephone: 0086 21 68897541  
Fax: 0086 21 50801070

### **2.2. Manufacturer Information**

Company Name: TCT Mobile Limited  
Address /Post: 5F, C building, No. 232, Liang Jing Road ZhangJiang High-Tech Park,  
Pudong Area Shanghai, P.R. China. 201203  
City: Shanghai  
Country: China  
Telephone: 0086-21-61460890  
Fax: 0086-21-61460602

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

#### 3.1. About EUT

Description	HSUPA/HSDPA/UMTS triband/GSM quadband mobile phone
Model Name	Beetle 2SIM US
Marketing Name	ONE TOUCH 4030E
FCC ID	RAD316
Frequency Band	ISM 2400MHz~2483.5MHz
Type of Modulation	GFSK/ $\pi/4$ DQPSK/8DPSK
Number of Channels	79
Power Supply	3.8V DC by Battery

Note: The EUT is a variant model of ONE TOUCH 4030A. All the result is coming from the ONE TOUCH 4030A

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

EUT ID*	SN or IMEI	HW Version	SW Version
N01	013460000051475	Ptoto	vFA2
N14	013460000050550	Ptoto	vFA2

\*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
AE1	Battery
AE2	Battery
AE3	Charger
AE4	Charger

##### AE1

Model	CAB60B0000C1
Manufacturer	BYD
Capacitance	1400mAh
Nominal Voltage	3.7V

##### AE2

Model	CAB60B0000C2
Manufacturer	BAK
Capacitance	1400mAh
Nominal Voltage	3.7V

##### AE3

Model	CBA3007AG0C1
-------	--------------

Manufacturer	BYD
Length of DC line	97mm
AE4	
Model	CBA3007AG0C3
Manufacturer	Yingju
Length of DC line	97mm

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

### **3.4. General Description**

The Equipment under Test (EUT) is a model of HSUPA/HSDPA/UMTS triband/GSM quadband mobile phone with integrated antenna. It consists of normal options: lithium battery, charger Manual and specifications of the EUT were provided to fulfil the test. Samples undergoing test were selected by the Client.

## 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.

	FCC CFR 47, Part 15, Subpart C:	
	15.205 Restricted bands of operation;	Oct,10
FCC Part15	15.209 Radiated emission limits, general requirements;	2009
	15.247 Operation within the bands 902–928MHz, 2400–2483.5 MHz, and 5725–5850 MHz.	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	March 2000
KDB412172 D01	Guidelines for Determining the Effective Radiated Power (ERP) and Equivalent Isotropically Radiated Power (EIRP) of a RF Transmitting System	2011

## 5. LABORATORY ENVIRONMENT

**Control room / conducted chamber** did not exceed following limits along the EMC testing:

Temperature	Min. = 15 °C, Max. = 35 °C
Relative humidity	Min. = 20 %, Max. = 80 %
Shielding effectiveness	> 110 dB
Electrical insulation	> 2 MΩ
Ground system resistance	< 0.5 Ω

**Fully-anechoic chamber 2** (8.6 meters × 6.1 meters × 3.85 meters) did not exceed following limits along the EMC testing:

Temperature	Min. = 15 °C, Max. = 30 °C
Relative humidity	Min. = 35 %, Max. = 60 %
Shielding effectiveness	> 110 dB
Electrical insulation	> 2 MΩ
Ground system resistance	< 1 Ω
Site voltage standing-wave ratio ( $S_{VSWR}$ )	Between 0 and 6 dB, from 1GHz to 18GHz
Uniformity of field strength	Between 0 and 6 dB, from 80 to 4000 MHz

**Semi-anechoic chamber 2 / Fully-anechoic chamber 3** (10 meters × 6.7 meters × 6.15 meters) did not exceed following limits along the EMC testing:

Temperature	Min. = 15 °C, Max. = 30 °C
Relative humidity	Min. = 35 %, Max. = 60 %
Shielding effectiveness	> 100 dB
Electrical insulation	> 2 MΩ
Ground system resistance	< 0.5 Ω
Normalised site attenuation (NSA)	< ±3.5 dB, 3 m distance
Site voltage standing-wave ratio ( $S_{VSWR}$ )	Between 0 and 6 dB, from 1GHz to 18GHz
Uniformity of field strength	Between 0 and 6 dB, from 80 to 3000 MHz



## 6. SUMMARY OF TEST RESULTS

### 6.1. Summary of Test Results

Abbreviations used in this clause:

- P** Pass, The EUT complies with the essential requirements in the standard.
- F** Fail, The EUT does not comply with the essential requirements in the standard
- NA** Not Applicable, The test was not applicable
- NP** Not Performed, The test was not performed by TMC

SUMMARY OF MEASUREMENT RESULTS	Sub-clause	Verdict
Peak Output Power - Conducted	15.247 (b)(1)	<b>P</b>
Frequency Band Edges	15.247 (d)	<b>P</b>
Conducted Emission	15.247 (d)	<b>P</b>
Radiated Emission	15.247, 15.205, 15.209	<b>P</b>
Time of Occupancy (Dwell Time)	15.247 (a) (1)(iii)	<b>P</b>
20dB Bandwidth	15.247 (a)(1)	<b>NA</b>
Carrier Frequency Separation	15.247 (a)(1)	<b>P</b>
Number of hopping channels	15.247 (a)(b)(iii)	<b>P</b>
AC Powerline Conducted Emission	15.107, 15.207	<b>P</b>

Please refer to **ANNEX A** for detail.

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

### 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

## 7. Test Equipments Utilized

### Conducted test system

No.	Equipment	Model	Serial Number	Manufacturer	Calibration Due date
1	Vector Signal Analyzer	FSU26	200030	Rohde & Schwarz	2013-12-18
2	Bluetooth Tester	CBT32	100649	Rohde & Schwarz	2013-12-03

### Radiated emission test system

No.	Equipment	Model	Serial Number	Manufacturer	Calibration Due date
1	Test Receiver	ESI40	831564/002	Rohde & Schwarz	2013-06-06
2	EMI Antenna	VULB 9163	9163 301	Schwarzbeck	2013-07-12
3	EMI Antenna	3117	00034610	EMCO	2013-07-05
4	Dual-Ridge Waveguide Horn Antenna	3116	2663	EMCO	2013-07-10
5	Dual-Ridge Waveguide Horn Antenna	3116	2661	EMCO	2013-07-05
6	Universal Radio Communication Tester	CMU200	105948	Rohde & Schwarz	2013-07-20
7	LISN	ESH2-Z5	829991/012	Rohde & Schwarz	2013-03-18
8	Pre-amplifier(18GHz)	/	1005277	Rohde & Schwarz	/
9	Pre-amplifier(26.5GHz)	/	1005277	Rohde & Schwarz	/

### Anechoic chamber

Fully anechoic chamber by Frankonia German.

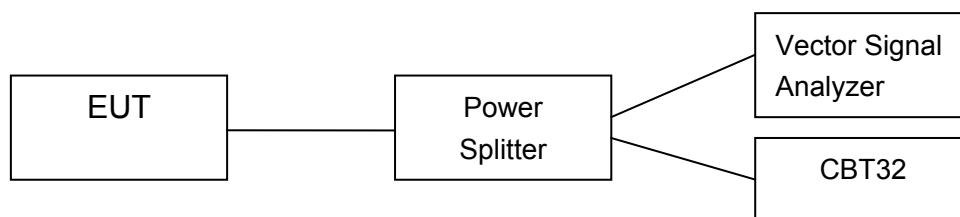
## ANNEX A: MEASUREMENT RESULTS

### A.1. Measurement Method

#### A.1.1. Conducted Measurements

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

- 1). Connect the EUT to the test system correctly.
- 2). Set the EUT to the required work mode (Transmitter, receiver or transmitter & receiver).
- 3). Set the EUT to the required channel.
- 4). Set the EUT hopping mode (hopping or hopping off).
- 5). Set the spectrum analyzer to start measurement.
- 6). Record the values. Vector Signal Analyzer



#### A.1.2. Radiated Emission Measurements

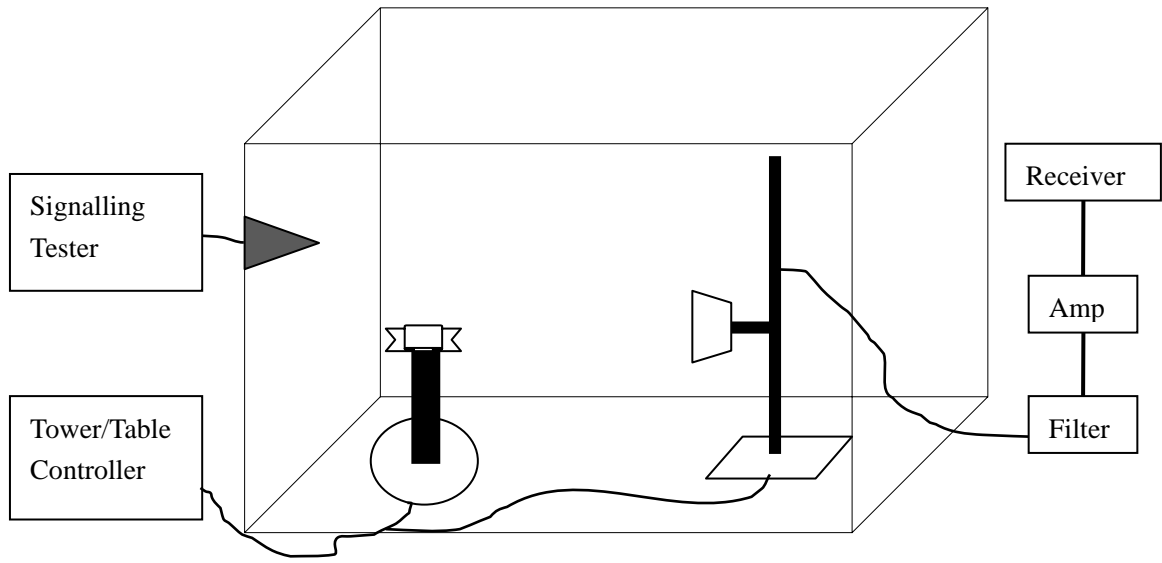
The measurement is made according to Public notice DA 00-705 and ANSI C63.4

The radiated emission test is performed in semi-anechoic chamber. The distance from the EUT to the reference point of measurement antenna is 3m. The test is carried out on both vertical and horizontal polarization and only maximization result of both polarizations is kept. During the test, the turntable is rotated 360° and the measurement antenna is moved from 1m to 4m to get the maximization result.

In the case of radiated emission, the used settings are as follows,

Sweep frequency from 30 MHz to 1GHz, RBW = 100 kHz, VBW = 300 kHz;

Sweep frequency from 1 GHz to 26GHz, RBW = 1MHz, VBW = 1MHz;



## A.2. Peak Output Power - Conducted

### Measurement Limit:

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

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

### Test Condition

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

### Measurement Results:

#### For GFSK

Channel	Ch 0 2402 MHz	Ch 39 2441 MHz	Ch 78 2480 MHz	Conclusion
Peak Conducted Output Power (dBm)	5.12	2.31	4.32	P

#### For $\pi/4$ DQPSK

Channel	Ch 0 2402 MHz	Ch 39 2441 MHz	Ch 78 2480 MHz	Conclusion
Peak Conducted Output Power (dBm)	4.68	1.87	3.89	P

#### For 8DPSK

Channel	Ch 0 2402 MHz	Ch 39 2441 MHz	Ch 78 2480 MHz	Conclusion
Peak Conducted Output Power (dBm)	4.98	2.16	4.15	P

**Conclusion: PASS**

### A.3. Frequency Band Edges - Conducted

**Measurement Limit:**

Standard	Limit (dBc)
FCC 47 CFR Part 15.247 (d)	> 20

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

**Measurement Result:**

**For GFSK**

Channel	Hopping	Band Edge Power ( dBc)		Conclusion
0	Hopping OFF	Fig.1	-40.74	P
	Hopping ON	Fig.2	-55.20	P
78	Hopping OFF	Fig.3	-59.86	P
	Hopping ON	Fig.4	-60.68	P

**For  $\pi/4$  DQPSK**

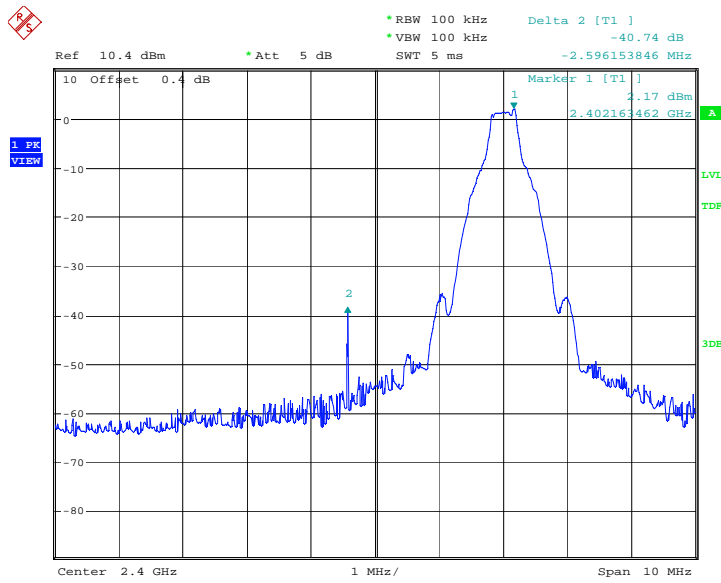
Channel	Hopping	Band Edge Power ( dBc)		Conclusion
0	Hopping OFF	Fig.5	-57.31	P
	Hopping ON	Fig.6	-56.64	P
78	Hopping OFF	Fig.7	-60.40	P
	Hopping ON	Fig.8	-58.02	P

**For 8DPSK**

Channel	Hopping	Band Edge Power ( dBc)		Conclusion
0	Hopping OFF	Fig.9	-56.55	P
	Hopping ON	Fig.10	-57.08	P
78	Hopping OFF	Fig.11	-59.49	P
	Hopping ON	Fig.12	-53.80	P

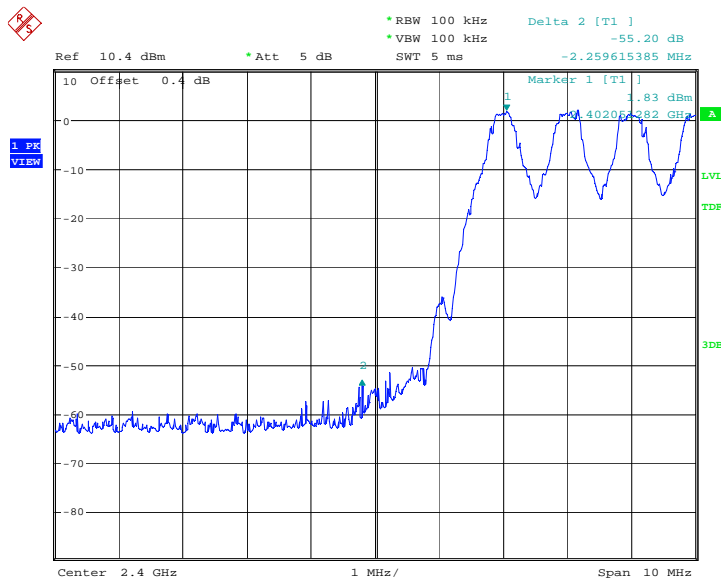
**Conclusion: PASS**

**Test graphs as below**



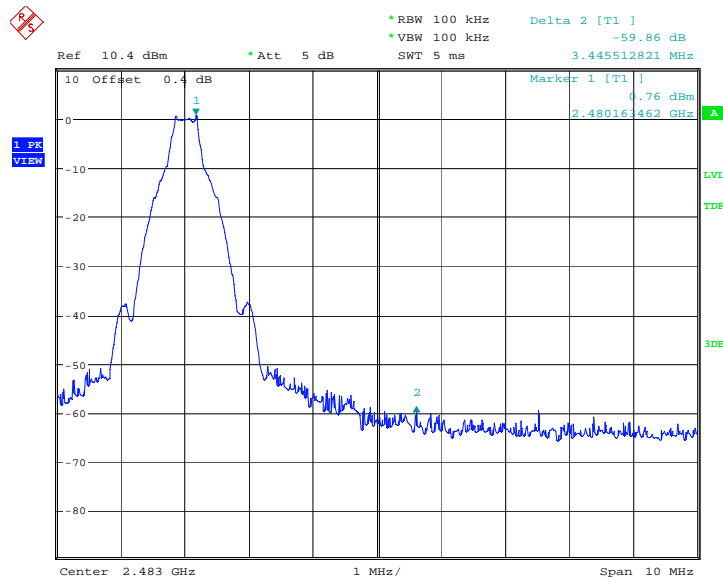
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Fig.1. Frequency Band Edges: GFSK, Channel 0, Hopping Off



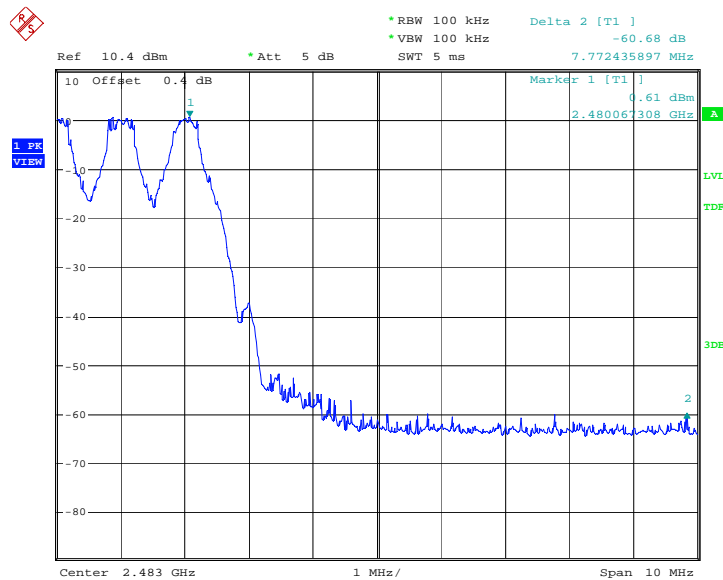
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Fig.2. Frequency Band Edges: GFSK, Channel 0, Hopping On



Date: 27.NOV.2012 01:38:54

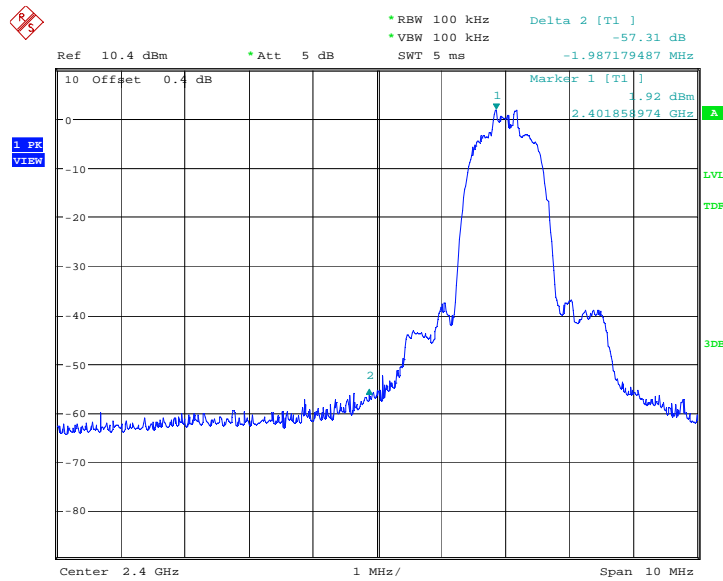
Fig.3. Frequency Band Edges: GFSK, Channel 78, Hopping Off



Date: 27.NOV.2012 01:42:59

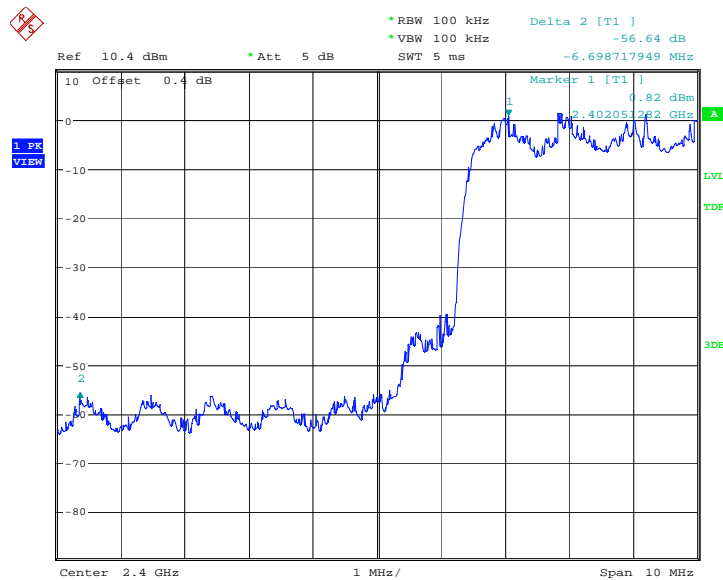
Fig.4. Frequency Band Edges: GFSK, Channel 78, Hopping On





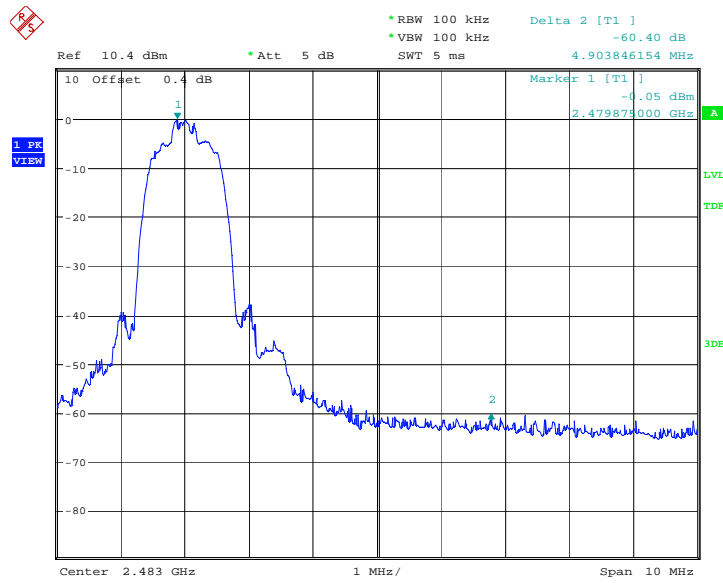
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Fig.5. Frequency Band Edges:  $\pi/4$  DQPSK, Channel 0, Hopping Off



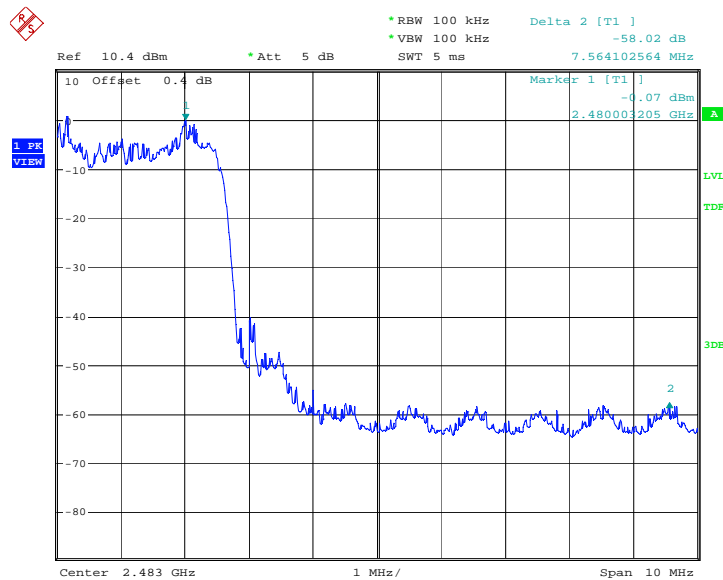
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Fig.6. Frequency Band Edges:  $\pi/4$  DQPSK, Channel 0, Hopping On



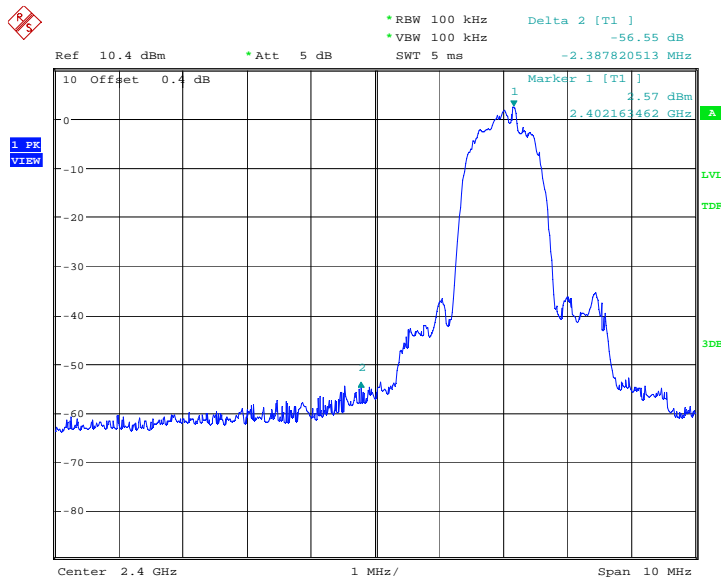
Date: 27.NOV.2012 02:01:02

Fig.7. Frequency Band Edges:  $\pi/4$  DQPSK, Channel 78, Hopping Off



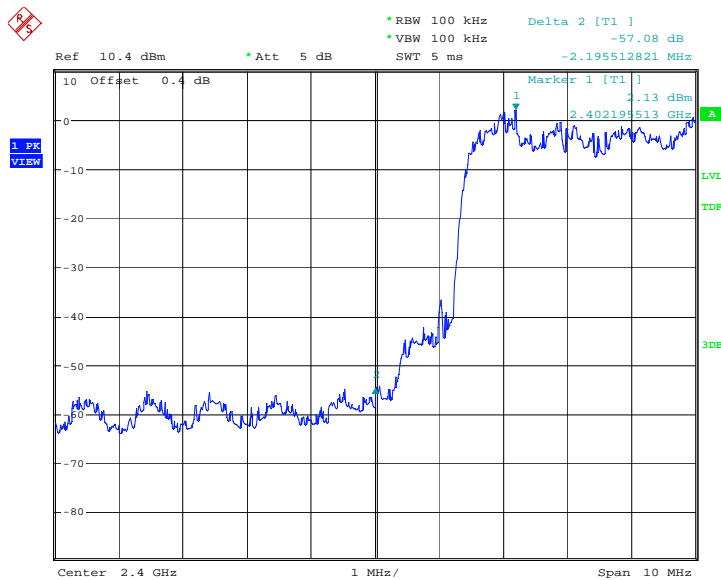
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Fig.8. Frequency Band Edges:  $\pi/4$  DQPSK, Channel 78, Hopping On



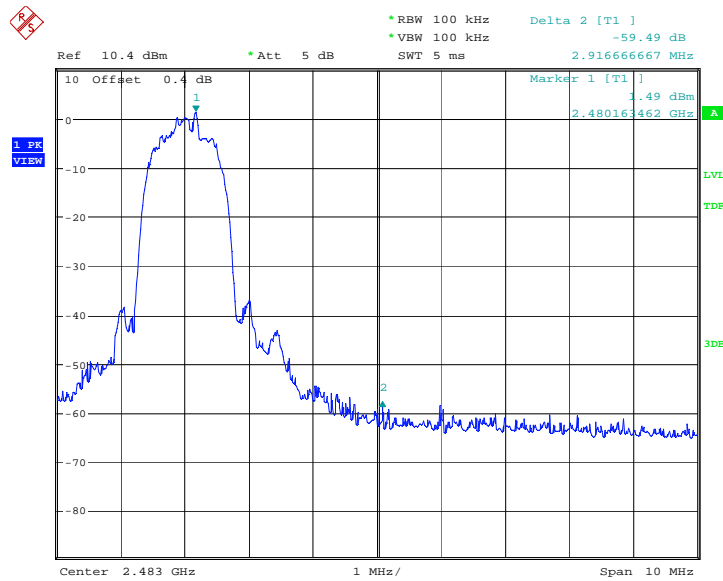
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Fig.9. Frequency Band Edges: 8DPSK, Channel 0, Hopping Off



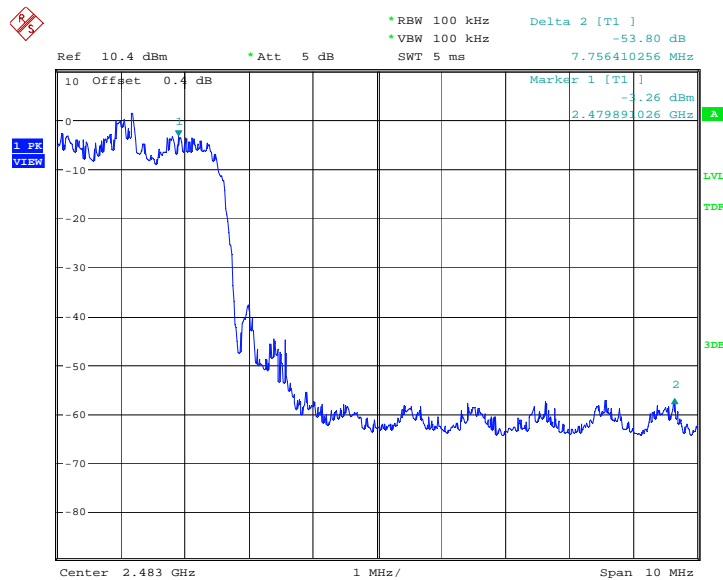
Date: 27.NOV.2012 02:25:06

Fig.10. Frequency Band Edges: 8DPSK, Channel 0, Hopping On



Date: 27.NOV.2012 02:23:04

Fig.11. Frequency Band Edges: 8DPSK, Channel 78, Hopping Off



Date: 27.NOV.2012 02:27:09

Fig.12. Frequency Band Edges: 8DPSK, Channel 78, Hopping On

#### A.4. Conducted Emission

##### Measurement Limit:

Standard	Limit
FCC 47 CFR Part 15.247 (d)	20dB below peak output power in 100 kHz bandwidth

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

##### Measurement Results:

###### For GFSK

Channel	Frequency Range	Test Results	Conclusion
Ch 0 2402 MHz	Center Frequency	Fig.13	P
	30 MHz ~ 1 GHz	Fig.14	P
	1 GHz ~ 3 GHz	Fig.15	P
	3 GHz ~ 10 GHz	Fig.16	P
	10 GHz ~ 26 GHz	Fig.17	P
Ch 39 2441 MHz	Center Frequency	Fig.18	P
	30 MHz ~ 1 GHz	Fig.19	P
	1 GHz ~ 3 GHz	Fig.20	P
	3 GHz ~ 10 GHz	Fig.21	P
	10 GHz ~ 26 GHz	Fig.22	P
Ch 78 2480 MHz	Center Frequency	Fig.23	P
	30 MHz ~ 1 GHz	Fig.24	P
	1 GHz ~ 3 GHz	Fig.25	P
	3 GHz ~ 10 GHz	Fig.26	P
	10 GHz ~ 26 GHz	Fig.27	P

###### For $\pi/4$ DQPSK

Channel	Frequency Range	Test Results	Conclusion
Ch 0 2402 MHz	Center Frequency	Fig.28	P
	30 MHz ~ 1 GHz	Fig.29	P
	1 GHz ~ 3 GHz	Fig.30	P
	3 GHz ~ 10 GHz	Fig.31	P
	10 GHz ~ 26 GHz	Fig.32	P
Ch 39 2441 MHz	Center Frequency	Fig.33	P
	30 MHz ~ 1 GHz	Fig.34	P
	1 GHz ~ 3 GHz	Fig.35	P
	3 GHz ~ 10 GHz	Fig.36	P
	10 GHz ~ 26 GHz	Fig.37	P
Ch 78 2480 MHz	Center Frequency	Fig.38	P
	30 MHz ~ 1 GHz	Fig.39	P

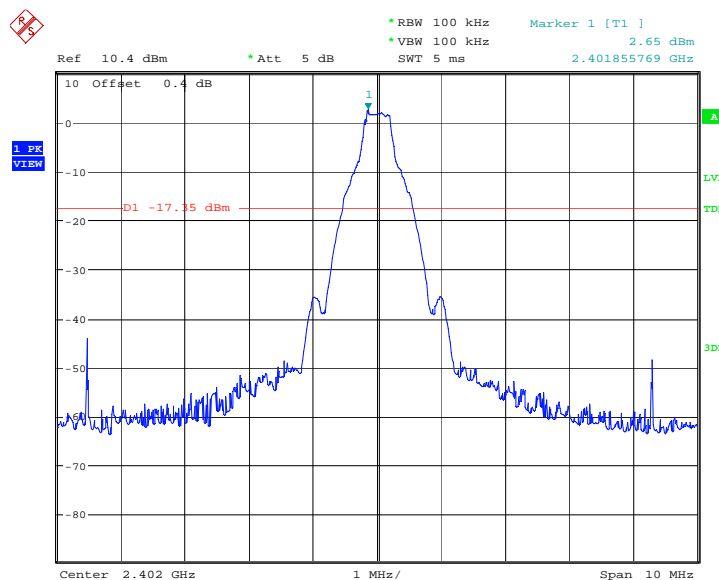
	1 GHz ~ 3 GHz	Fig.40	P
	3 GHz ~ 10 GHz	Fig.41	P
	10 GHz ~ 26 GHz	Fig.42	P

**For 8DPSK**

Channel	Frequency Range	Test Results	Conclusion
Ch 0 2402 MHz	Center Frequency	Fig.43	P
	30 MHz ~ 1 GHz	Fig.44	P
	1 GHz ~ 3 GHz	Fig.45	P
	3 GHz ~ 10 GHz	Fig.46	P
	10 GHz ~ 26 GHz	Fig.47	P
Ch 39 2441 MHz	Center Frequency	Fig.48	P
	30 MHz ~ 1 GHz	Fig.49	P
	1 GHz ~ 3 GHz	Fig.50	P
	3 GHz ~ 10 GHz	Fig.51	P
	10 GHz ~ 26 GHz	Fig.52	P
Ch 78 2480 MHz	Center Frequency	Fig.53	P
	30 MHz ~ 1 GHz	Fig.54	P
	1 GHz ~ 3 GHz	Fig.55	P
	3 GHz ~ 10 GHz	Fig.56	P
	10 GHz ~ 26 GHz	Fig.57	P

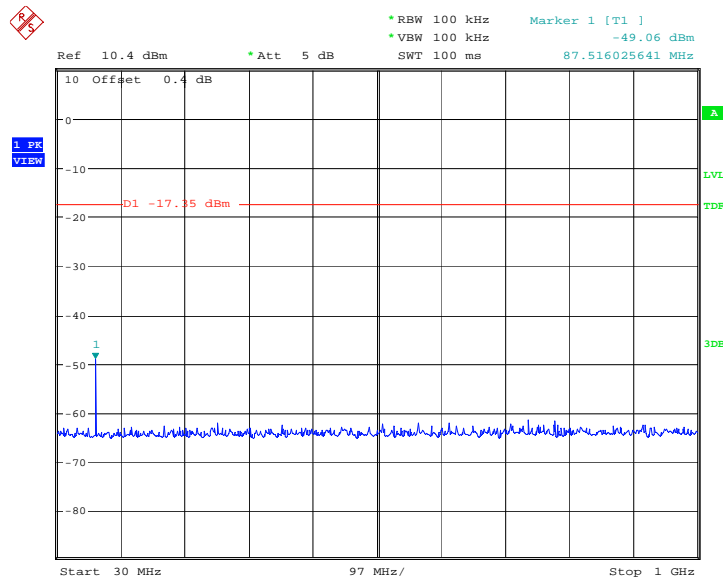
**Conclusion: PASS**

**Test graphs as below**



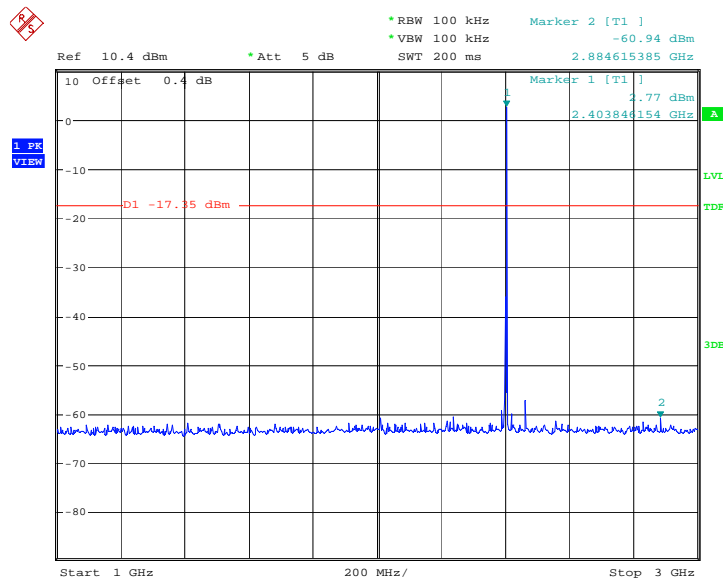
Date: 27.NOV.2012 01:43:18

Fig.13. Conducted spurious emission: GFSK, Channel 0,2402MHz



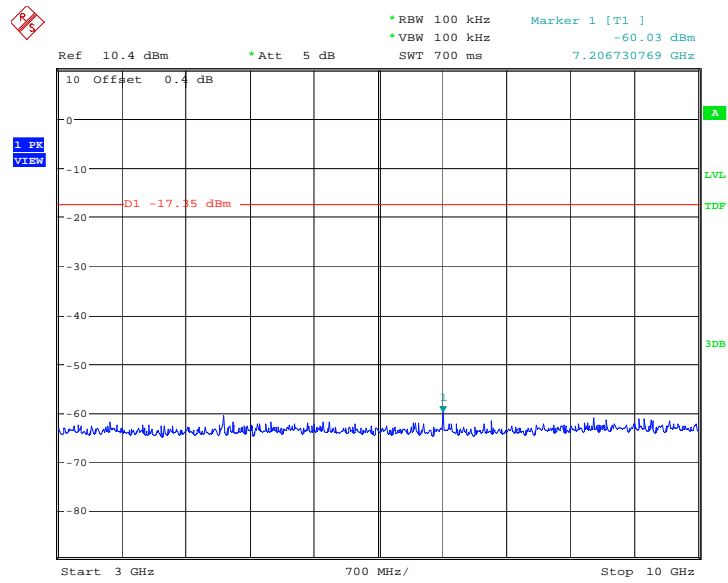
Date: 27.NOV.2012 01:43:35

Fig.14. Conducted spurious emission: GFSK, Channel 0, 30MHz - 1GHz



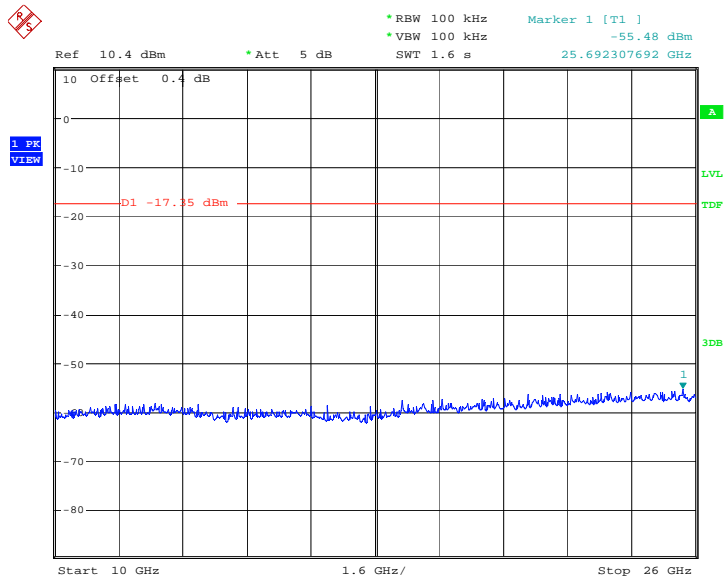
Date: 27.NOV.2012 01:44:07

Fig.15. Conducted spurious emission: GFSK, Channel 0, 1GHz - 3GHz



Date: 27.NOV.2012 01:44:23

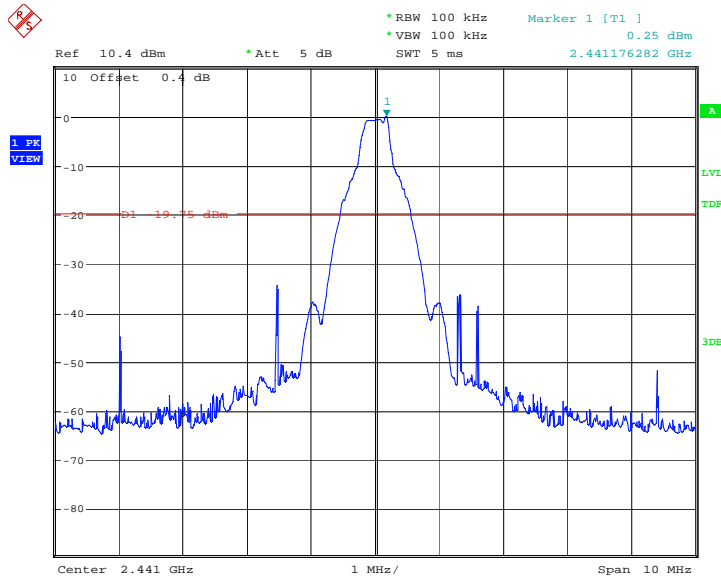
Fig.16. Conducted spurious emission: GFSK, Channel 0, 3GHz - 10GHz



Date: 27.NOV.2012 01:44:40

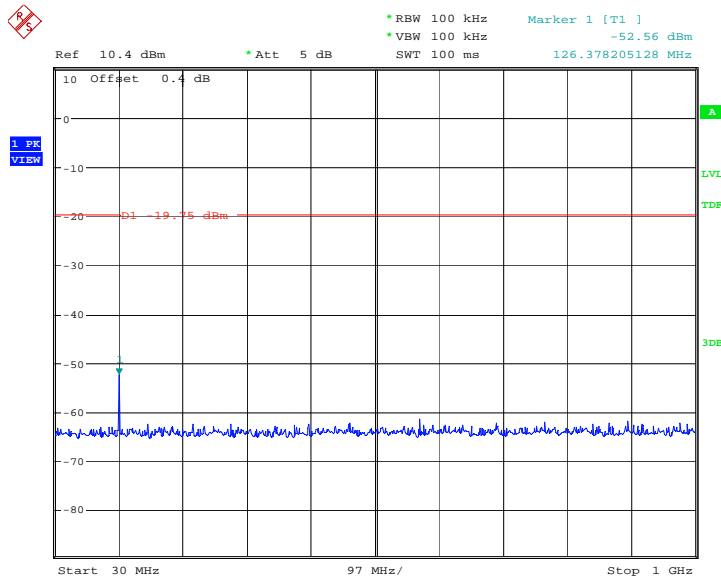
Fig.17. Conducted spurious emission: GFSK, Channel 0, 10GHz - 26GHz





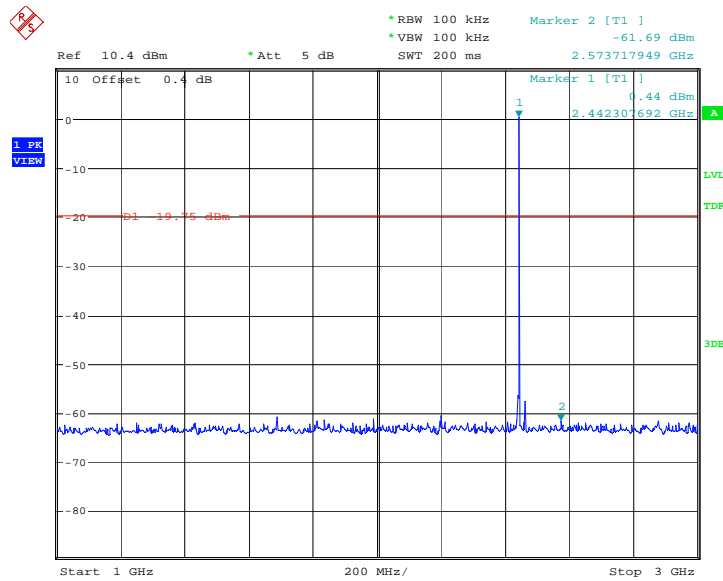
Date: 27.NOV.2012 01:44:57

Fig.18. Conducted spurious emission: GFSK, Channel 39, 2441MHz



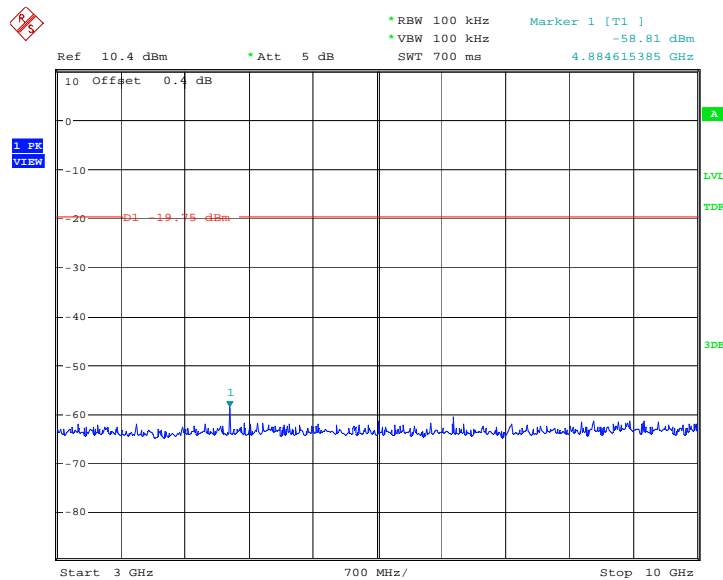
Date: 27.NOV.2012 01:45:13

Fig.19. Conducted spurious emission: GFSK, Channel 39, 30MHz - 1GHz



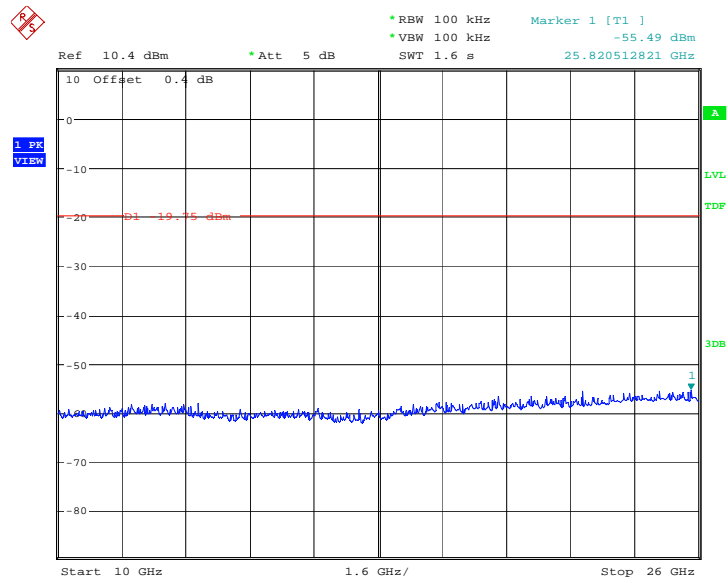
Date: 27.NOV.2012 01:45:45

Fig.20. Conducted spurious emission: GFSK, Channel 39, 1GHz – 3GHz



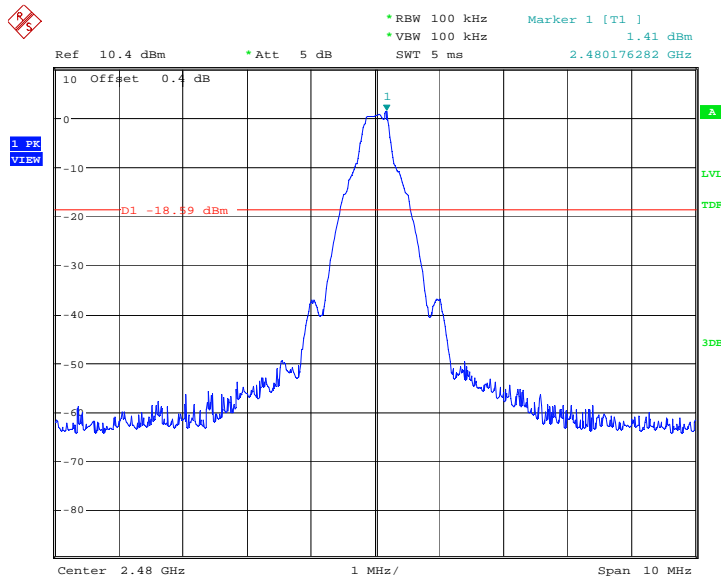
Date: 27.NOV.2012 01:46:02

Fig.21. Conducted spurious emission: GFSK, Channel 39, 3GHz – 10GHz



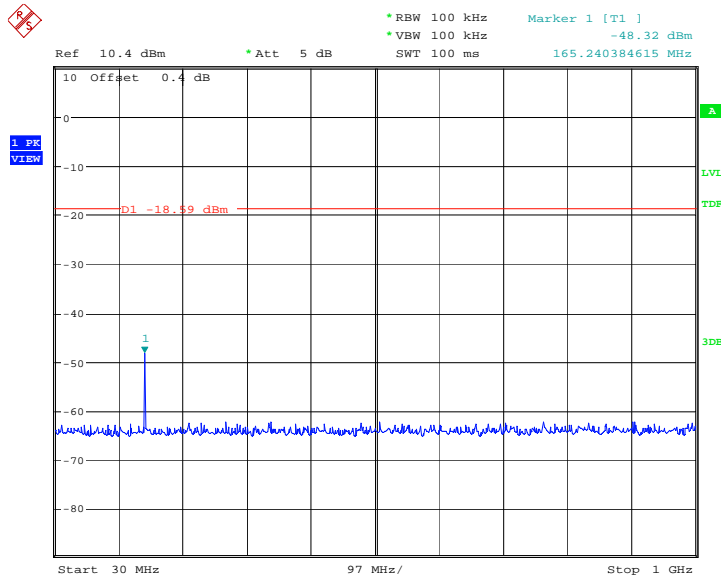
Date: 27.NOV.2012 01:46:18

Fig.22. Conducted spurious emission: GFSK, Channel 39, 10GHz – 26GHz



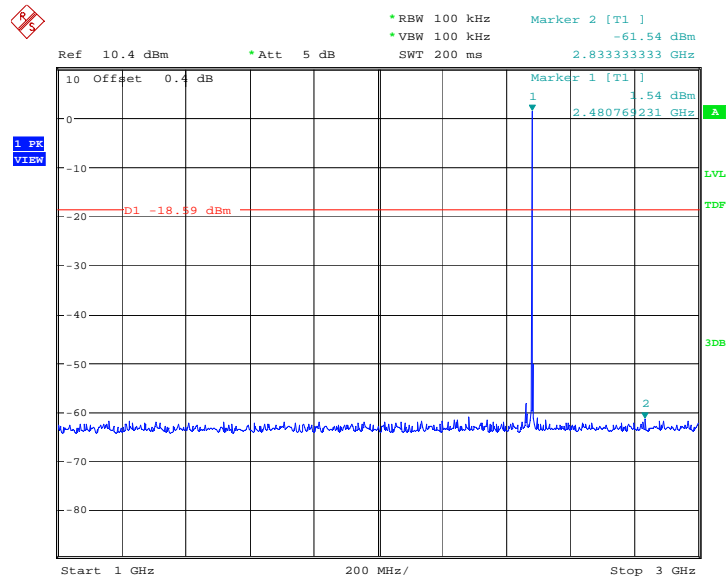
Date: 27.NOV.2012 01:46:35

Fig.23. Conducted spurious emission: GFSK, Channel 78, 2480MHz



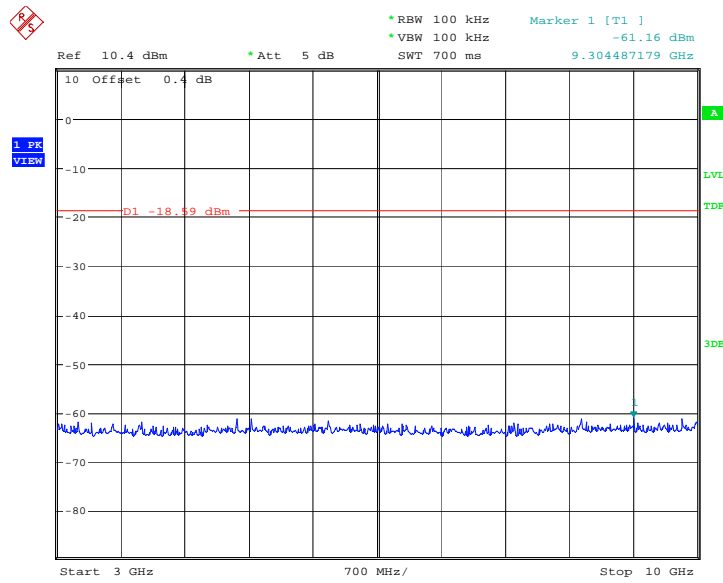
Date: 27.NOV.2012 01:46:52

Fig.24. Conducted spurious emission: GFSK, Channel 78, 30MHz - 1GHz



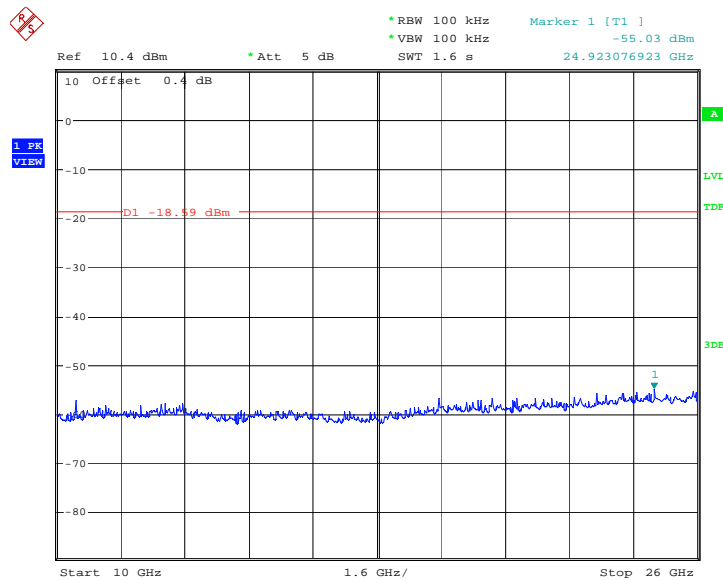
Date: 27.NOV.2012 01:47:23

Fig.25. Conducted spurious emission: GFSK, Channel 78, 1GHz - 3GHz



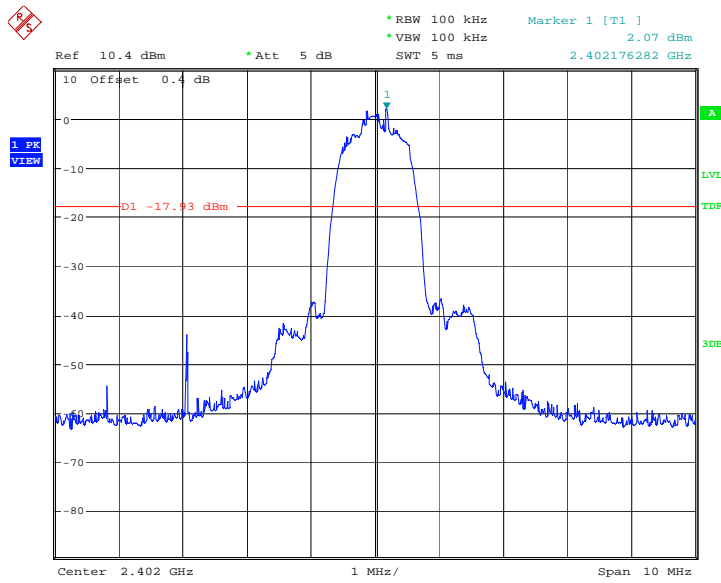
Date: 27.NOV.2012 01:47:40

Fig.26. Conducted spurious emission: GFSK, Channel 78, 3GHz - 10GHz



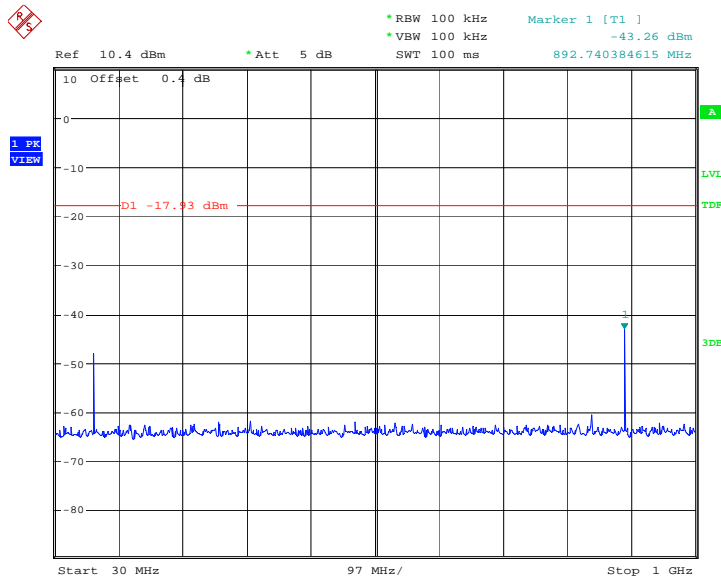
Date: 27.NOV.2012 01:47:57

Fig.27. Conducted spurious emission: GFSK, Channel 78, 10GHz - 26GHz



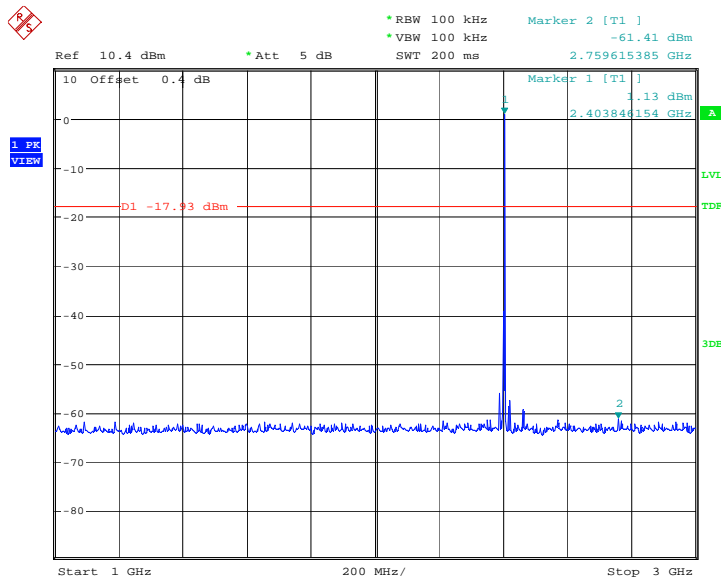
Date: 27.NOV.2012 02:05:26

Fig.28. Conducted spurious emission:  $\pi/4$  DQPSK, Channel 0,2402MHz



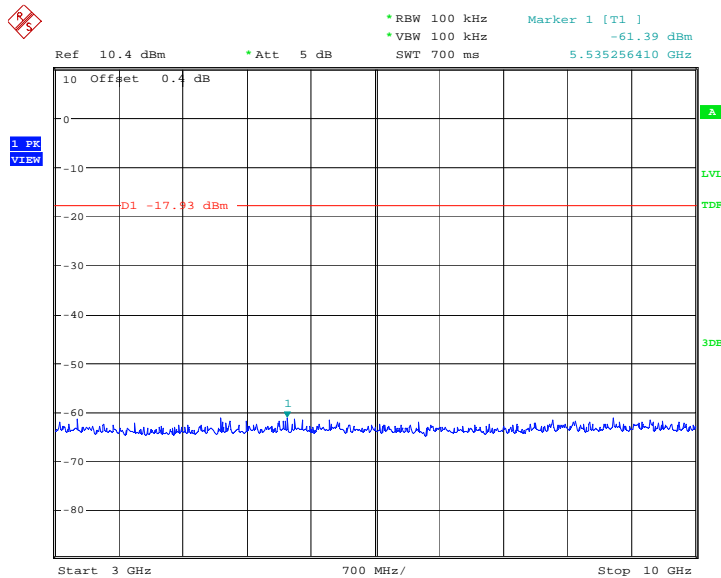
Date: 27.NOV.2012 02:05:43

Fig.29. Conducted spurious emission:  $\pi/4$  DQPSK, Channel 0, 30MHz - 1GHz



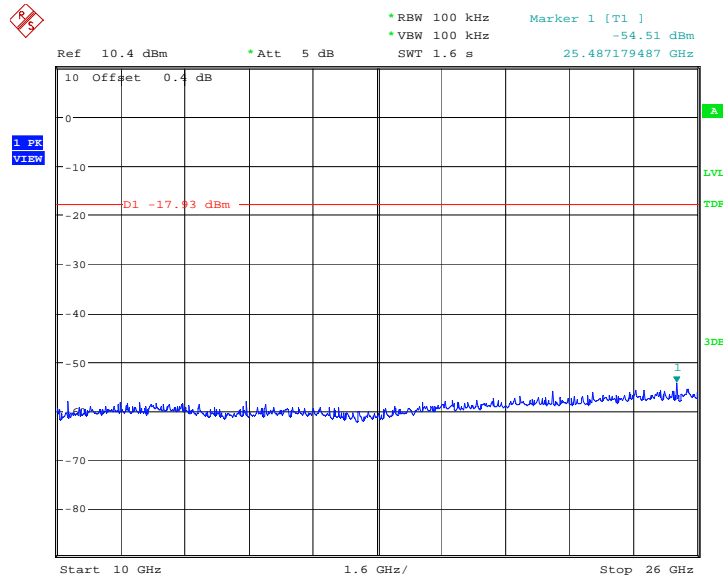
Date: 27.NOV.2012 02:06:14

Fig.30. Conducted spurious emission:  $\pi/4$  DQPSK, Channel 0, 1GHz - 3GHz



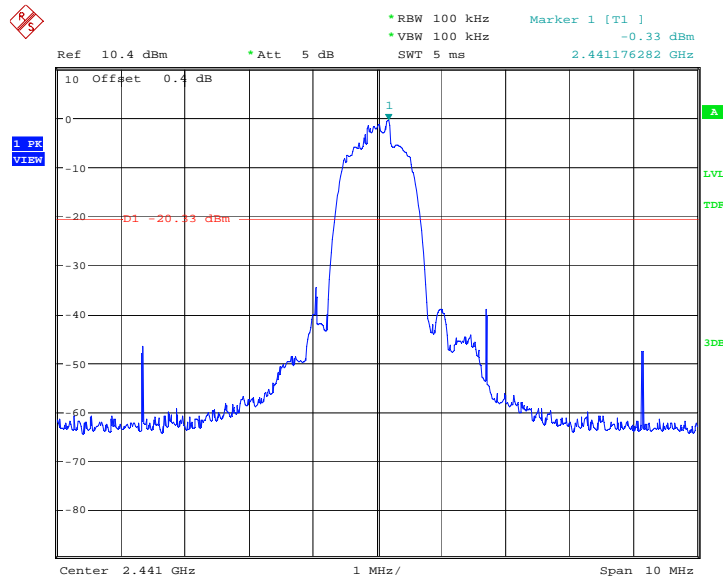
Date: 27.NOV.2012 02:06:31

Fig.31. Conducted spurious emission:  $\pi/4$  DQPSK, Channel 0, 3GHz - 10GHz



Date: 27.NOV.2012 02:06:48

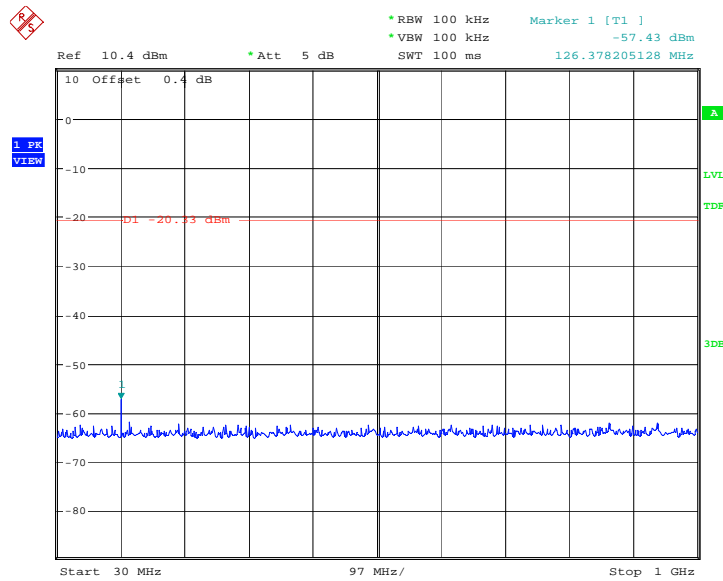
Fig.32. Conducted spurious emission:  $\pi/4$  DQPSK, Channel 0, 10GHz - 26GHz



Date: 27.NOV.2012 02:07:04

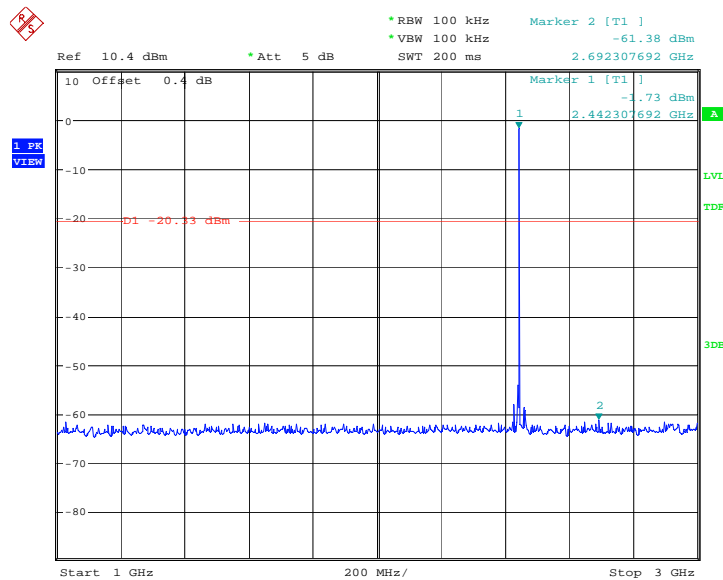
Fig.33. Conducted spurious emission:  $\pi/4$  DQPSK, Channel 39, 2441MHz





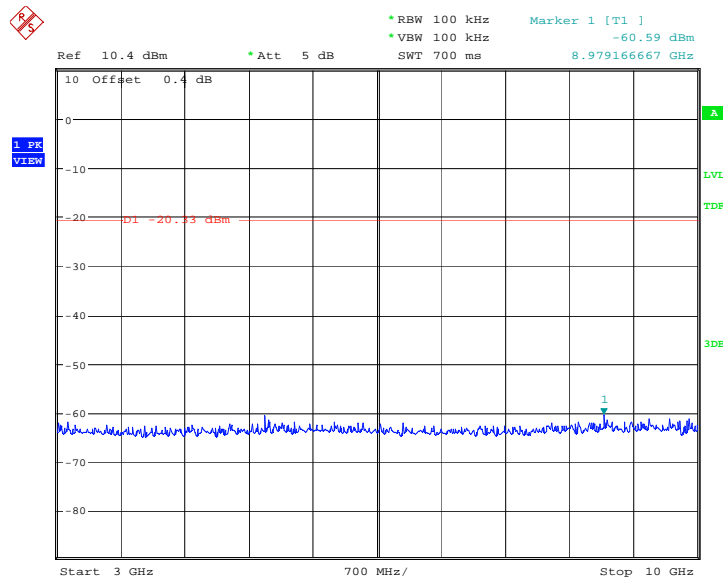
Date: 27.NOV.2012 02:07:21

Fig.34. Conducted spurious emission:  $\pi/4$  DQPSK, Channel 39, 30MHz - 1GHz



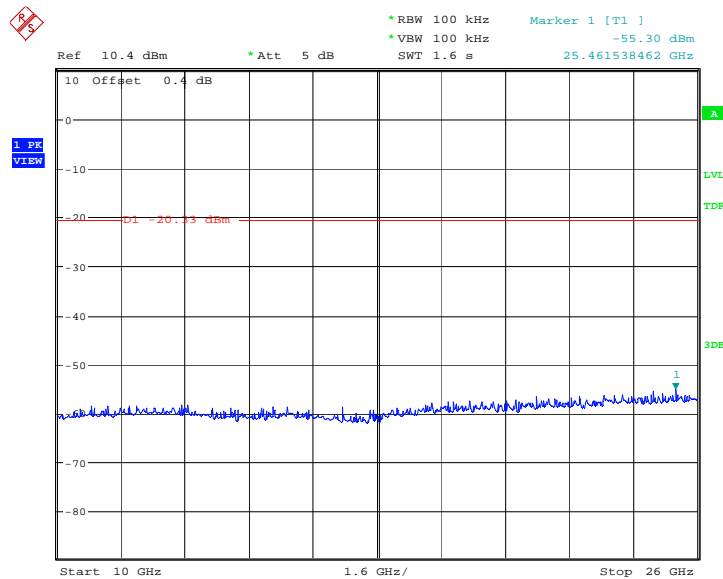
Date: 27.NOV.2012 02:07:53

Fig.35. Conducted spurious emission:  $\pi/4$  DQPSK, Channel 39, 1GHz - 3GHz



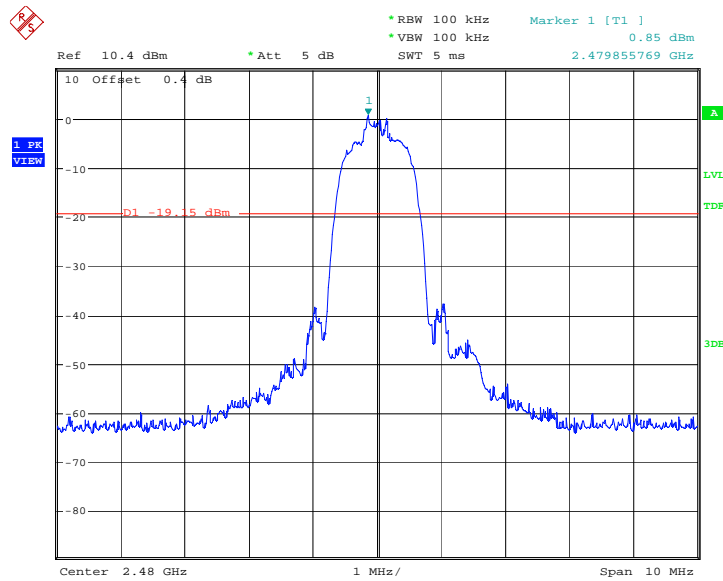
Date: 27.NOV.2012 02:08:09

Fig.36. Conducted spurious emission:  $\pi/4$  DQPSK, Channel 39, 3GHz - 10GHz



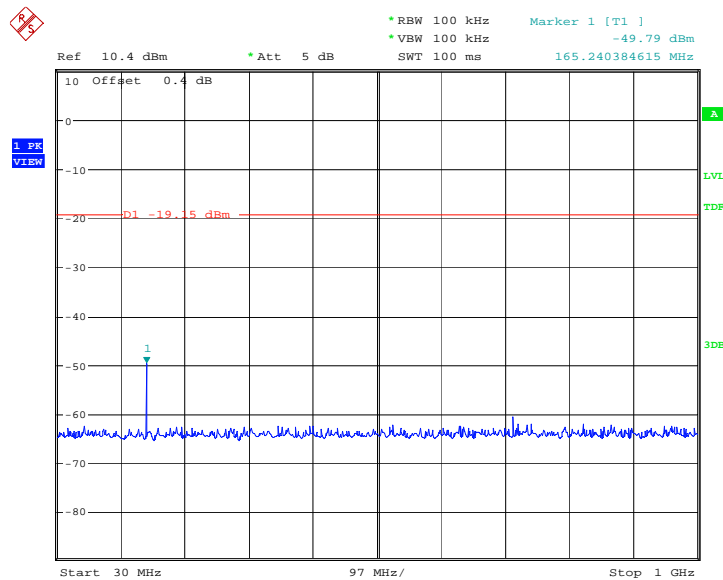
Date: 27.NOV.2012 02:08:26

Fig.37. Conducted spurious emission:  $\pi/4$  DQPSK, Channel 39, 10GHz – 26GHz



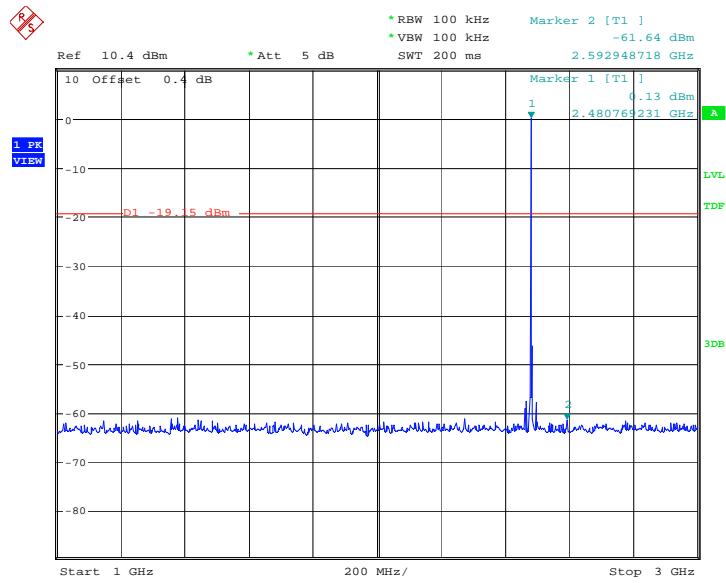
Date: 27.NOV.2012 02:08:42

Fig.38. Conducted spurious emission:  $\pi/4$  DQPSK, Channel 78, 2480MHz



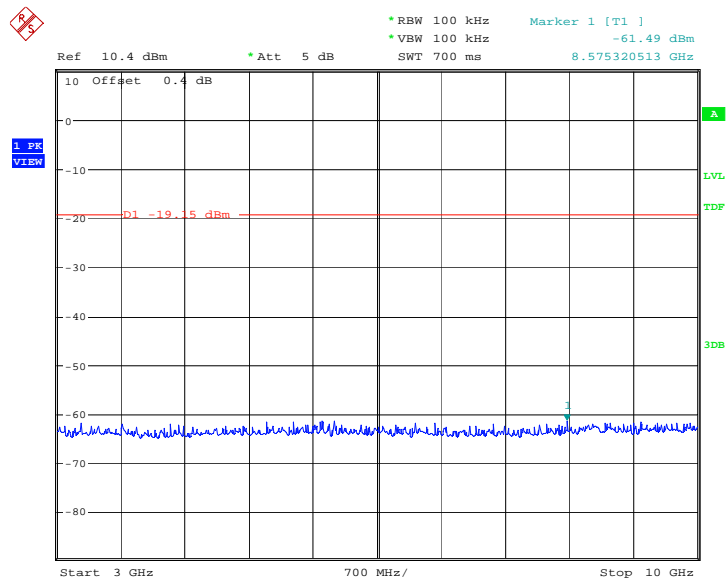
Date: 27.NOV.2012 02:08:59

Fig.39. Conducted spurious emission:  $\pi/4$  DQPSK, Channel 78, 30MHz - 1GHz



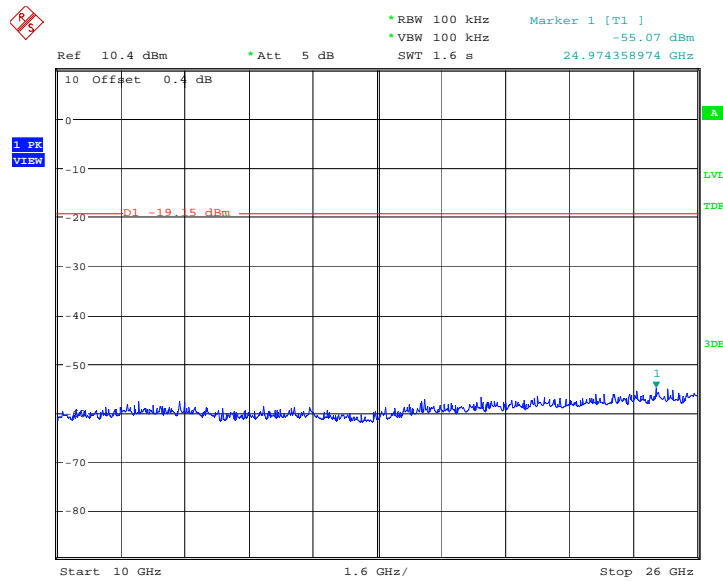
Date: 27.NOV.2012 02:09:31

Fig.40. Conducted spurious emission:  $\pi/4$  DQPSK, Channel 78, 1GHz - 3GHz



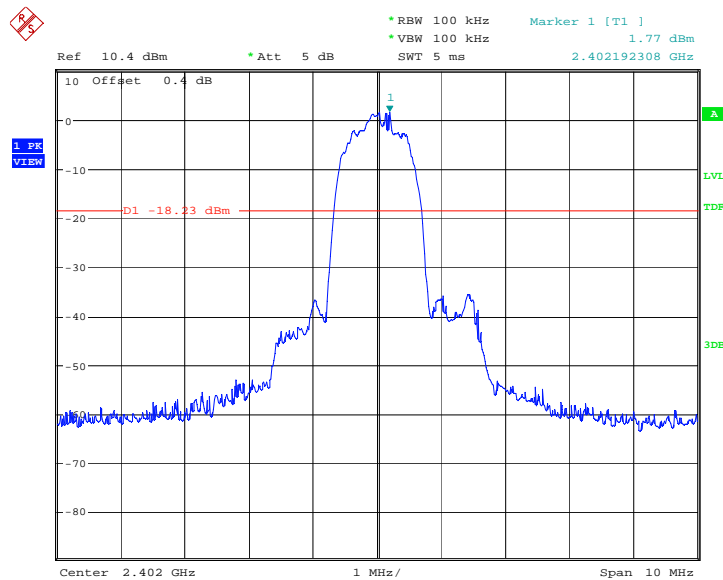
Date: 27.NOV.2012 02:09:47

Fig.41. Conducted spurious emission:  $\pi/4$  DQPSK, Channel 78, 3GHz - 10GHz



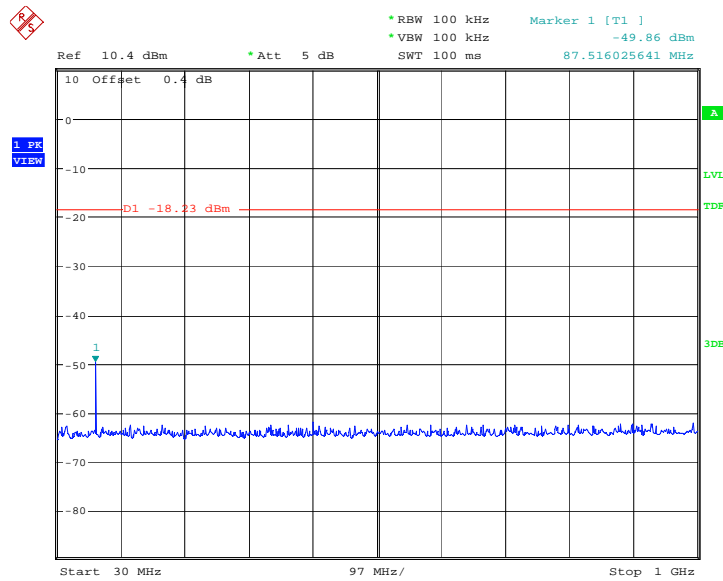
Date: 27.NOV.2012 02:10:04

Fig.42. Fig.30 Conducted spurious emission:  $\pi/4$  DQPSK, Channel 78, 10GHz - 26GHz



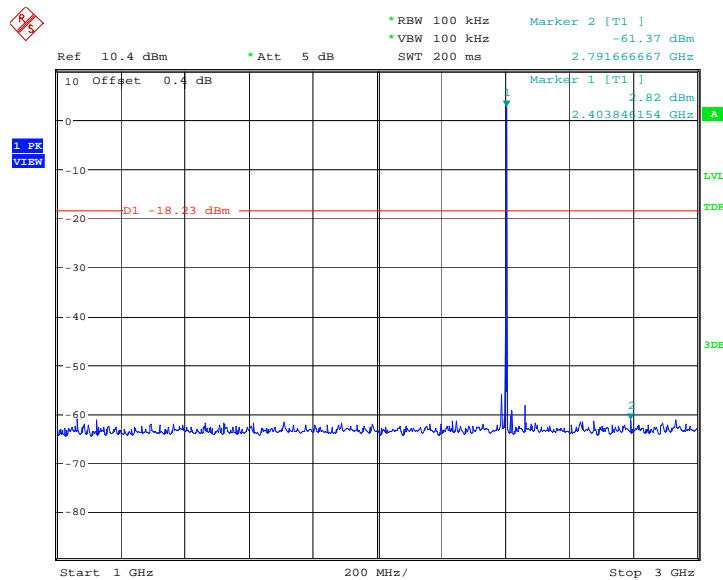
Date: 27.NOV.2012 02:27:28

Fig.43. Conducted spurious emission: 8DPSK, Channel 0,2402MHz



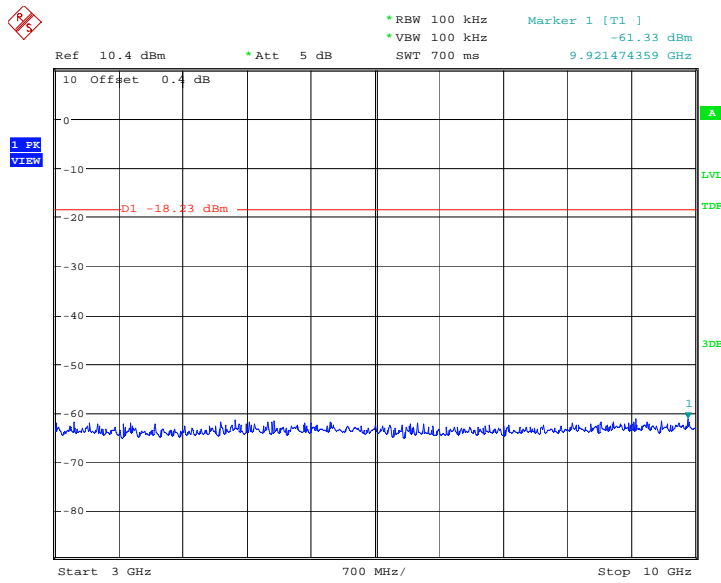
Date: 27.NOV.2012 02:27:45

Fig.44. Conducted spurious emission: 8DPSK, Channel 0, 30MHz - 1GHz



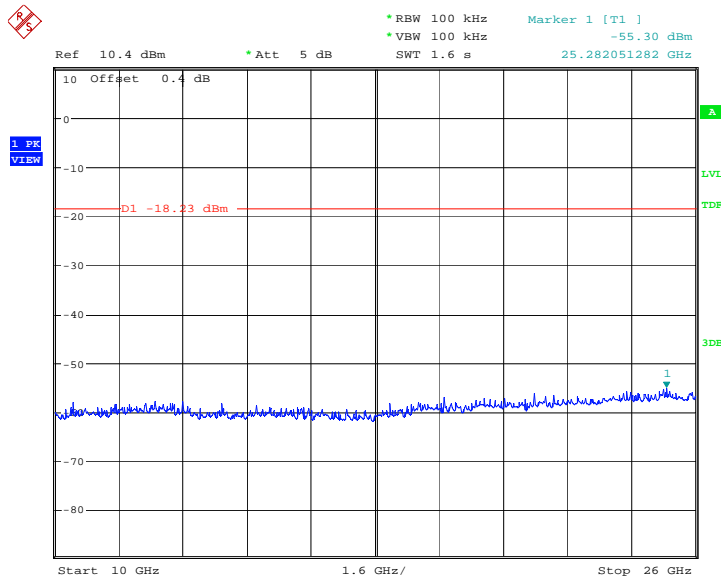
Date: 27.NOV.2012 02:28:16

Fig.45. Conducted spurious emission: 8DPSK, Channel 0, 1GHz - 3GHz



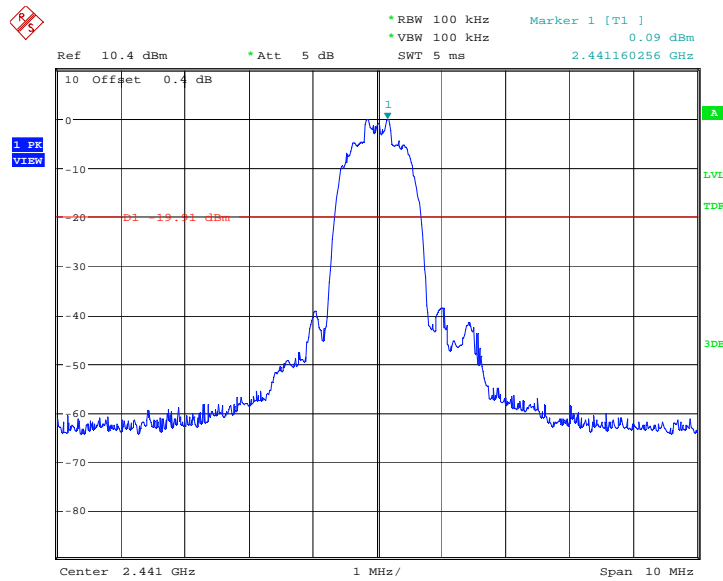
Date: 27.NOV.2012 02:28:33

Fig.46. Conducted spurious emission: 8DPSK, Channel 0, 3GHz - 10GHz



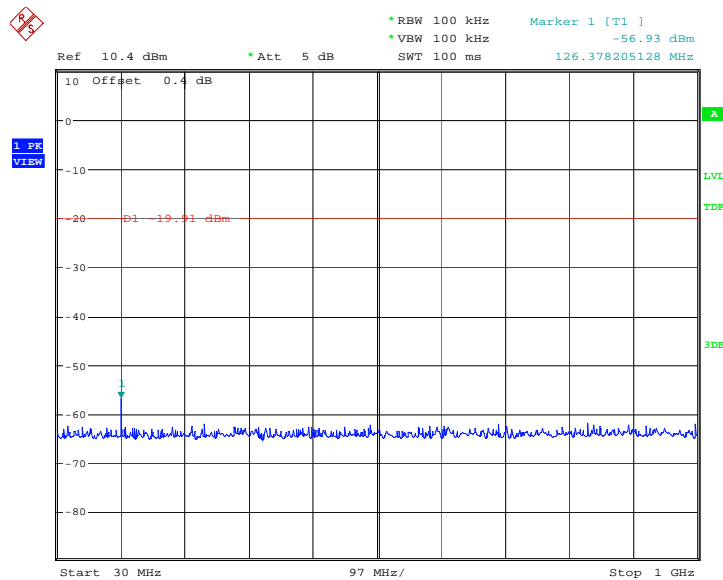
Date: 27.NOV.2012 02:28:49

Fig.47. Conducted spurious emission: 8DPSK, Channel 0, 10GHz - 26GHz



Date: 27.NOV.2012 02:29:06

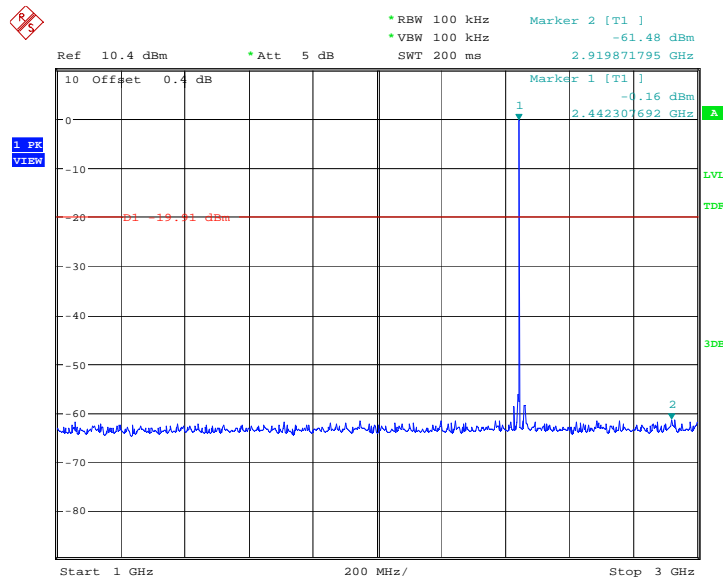
Fig.48. Conducted spurious emission: 8DPSK, Channel 39, 2441MHz



Date: 27.NOV.2012 02:29:23

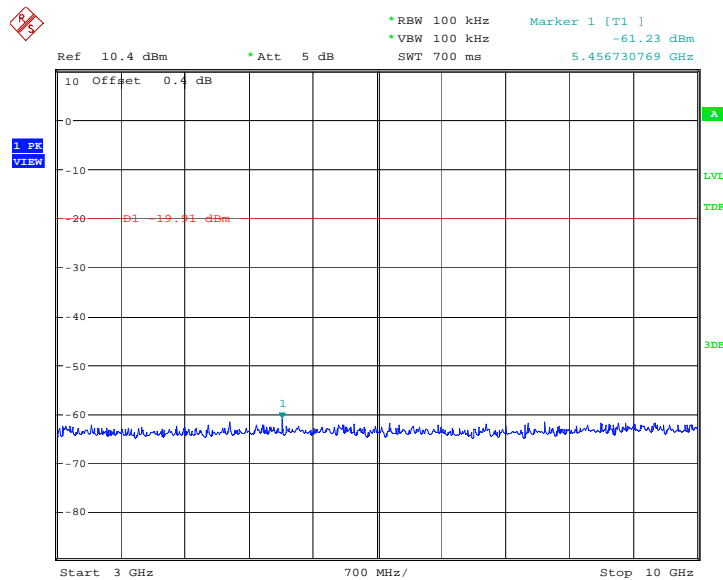
Fig.49. Conducted spurious emission: 8DPSK, Channel 39, 30MHz - 1GHz





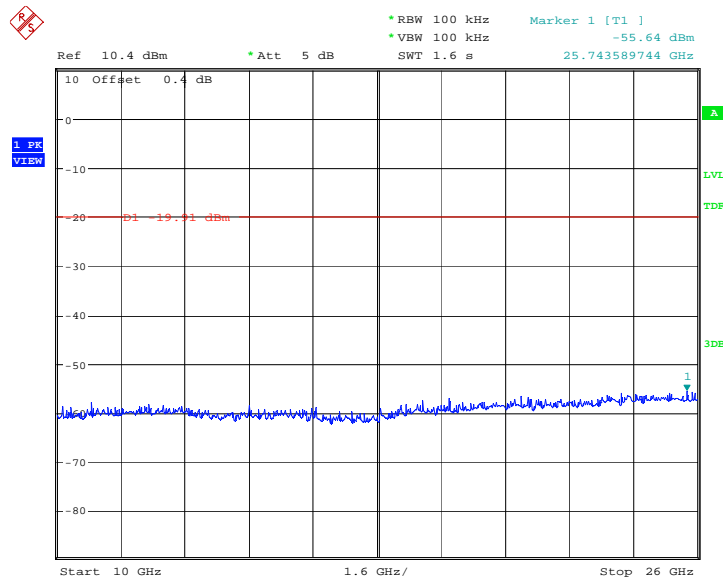
Date: 27.NOV.2012 02:29:54

Fig.50. Conducted spurious emission: 8DPSK, Channel 39, 1GHz - 3GHz



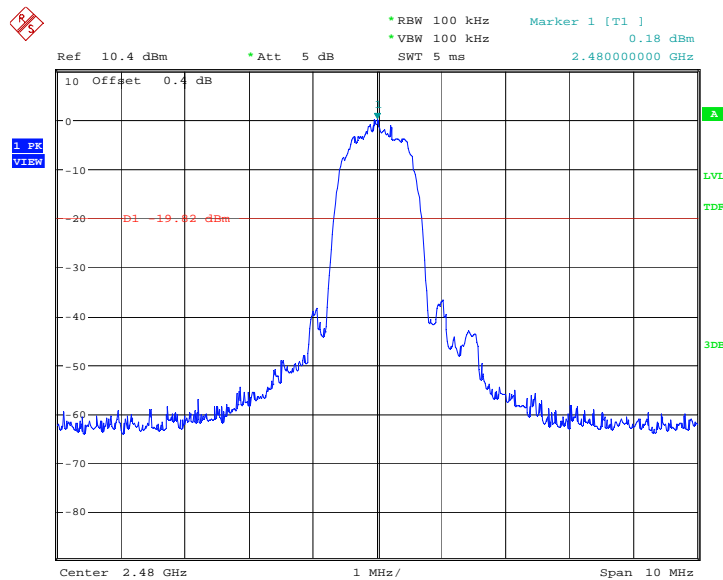
Date: 27.NOV.2012 02:30:11

Fig.51. Conducted spurious emission: 8DPSK, Channel 39, 3GHz - 10GHz



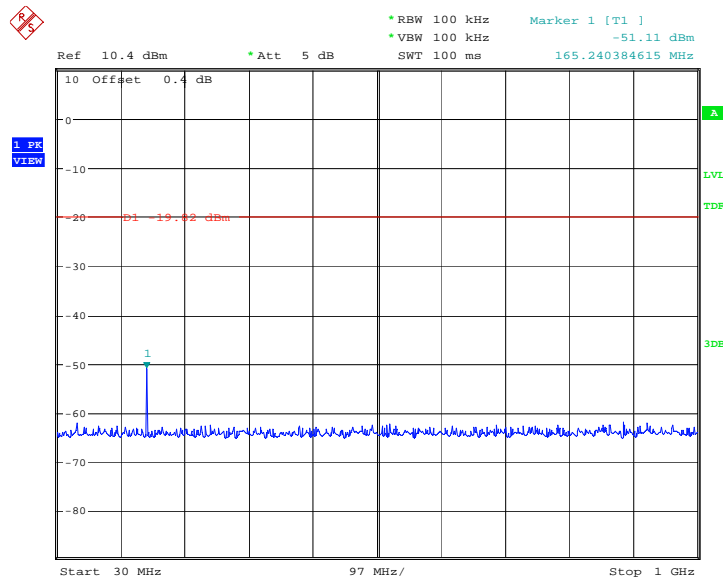
Date: 27.NOV.2012 02:30:27

Fig.52. Conducted spurious emission: 8DPSK, Channel 39, 10GHz – 26GHz



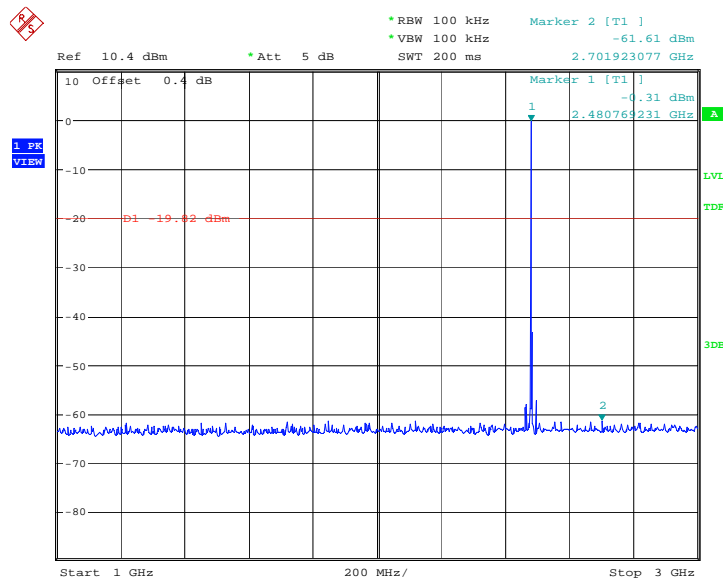
Date: 27.NOV.2012 02:30:44

Fig.53. Conducted spurious emission: 8DPSK, Channel 78, 2480MHz



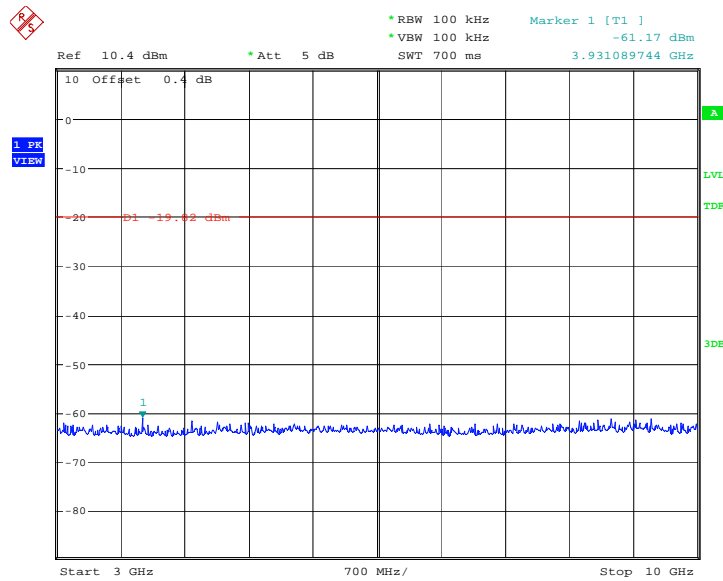
Date: 27.NOV.2012 02:31:01

Fig.54. Conducted spurious emission: 8DPSK, Channel 78, 30MHz - 1GHz



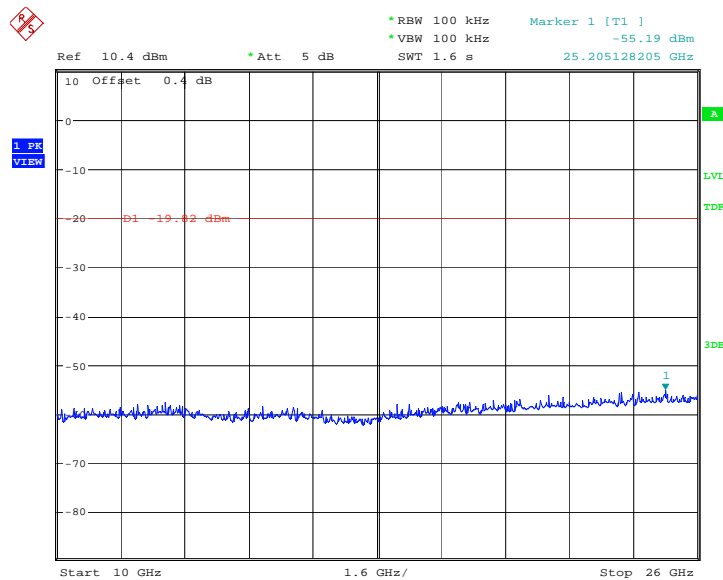
Date: 27.NOV.2012 02:31:32

Fig.55. Conducted spurious emission: 8DPSK, Channel 78, 1GHz - 3GHz



Date: 27.NOV.2012 02:31:49

Fig.56. Conducted spurious emission: 8DPSK, Channel 78, 3GHz - 10GHz



Date: 27.NOV.2012 02:32:06

Fig.57. Conducted spurious emission: 8DPSK, Channel 78, 1GHz - 26GHz

## A.5. 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 made 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

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 the  $A_{Rpl}$  is the attenuation of "reference path loss", and including the gain of receive antenna, the gain of the preamplifier, the cable los.

The measurement results are obtained as described below:

$$\text{Result} = P_{\text{Mea}} + A_{\text{Rpl}}$$

### For GFSK

Channel	Frequency Range	Test Results	Conclusion
Ch 0 2402 MHz	30 MHz ~ 1 GHz	Fig.58	P
	1 GHz ~ 3 GHz	Fig.59	P
	3 GHz ~ 18 GHz	Fig.60	P
Ch 39 2441 MHz	30 MHz ~ 1 GHz	Fig.61	P
	1 GHz ~ 3 GHz	Fig.62	P
	3 GHz ~ 18 GHz	Fig.63	P

Ch 78 2480 MHz	30 MHz ~ 1 GHz	Fig.64	P
	1 GHz ~ 3 GHz	Fig.65	P
	3 GHz ~ 18 GHz	Fig.66	P
Power	2.38GHz~2.4GHz---L	Fig.67	P
Power	2.45GHz~2.5GHz---H	Fig.68	P
For all channels	18 GHz ~ 26 GHz	Fig.69	P

**Forπ/4 DQPSK**

Channel	Frequency Range	Test Results	Conclusion
Ch 0 2402 MHz	30 MHz ~ 1 GHz	Fig.70	P
	1 GHz ~ 3 GHz	Fig.71	P
	3 GHz ~ 18 GHz	Fig.72	P
Ch 39 2441 MHz	30 MHz ~ 1 GHz	Fig.73	P
	1 GHz ~ 3 GHz	Fig.74	P
	3 GHz ~ 18 GHz	Fig.75	P
Ch 78 2480 MHz	30 MHz ~ 1 GHz	Fig.76	P
	1 GHz ~ 3 GHz	Fig.77	P
	3 GHz ~ 18 GHz	Fig.78	P
Power	2.38GHz~2.4GHz---L	Fig.79	P
Power	2.45GHz~2.5GHz---H	Fig.80	P
For all channels	18 GHz ~ 26 GHz	Fig.81	P

**For 8DPSK**

Channel	Frequency Range	Test Results	Conclusion
Ch 0 2402 MHz	30 MHz ~ 1 GHz	Fig.82	P
	1 GHz ~ 3 GHz	Fig.83	P
	3 GHz ~ 18 GHz	Fig.84	P
Ch 39 2441 MHz	30 MHz ~ 1 GHz	Fig.85	P
	1 GHz ~ 3 GHz	Fig.86	P
	3 GHz ~ 18 GHz	Fig.87	P
Ch 78 2480 MHz	30 MHz ~ 1 GHz	Fig.88	P
	1 GHz ~ 3 GHz	Fig.89	P
	3 GHz ~ 18 GHz	Fig.90	P
Power	2.38GHz~2.4GHz---L	Fig.91	P
Power	2.45GHz~2.5GHz---H	Fig.92	P
For all channels	18 GHz ~ 26 GHz	Fig.93	P

**GFSK Ch 0**

Frequency(MHz)	Result(dBuV/m)	ARpl (dB)	PMea(dBuV/m)	Polarity
2399.600	46.8	0.5	46.327	V
2441.600	46.4	2.9	43.499	H
2400.400	46.3	2.3	44.027	H
2399.800	44.9	0.5	44.427	V

2440.800	44.5	2.9	41.599	H
2761.400	44.3	6.2	38.085	H

**GFSK Ch 39**

Frequency(MHz)	Result(dBuV/m)	ARpl (dB)	PMea(dBuV/m)	Polarity
2443.000	50.2	2.9	47.299	V
2402.000	49.4	2.3	47.127	H
2402.200	49.1	2.3	46.827	H
2439.000	48.9	2.9	45.999	V
2402.400	47.2	2.3	44.927	H
2401.800	46.6	2.3	44.327	H

**GFSK Ch 78**

Frequency(MHz)	Result(dBuV/m)	ARpl (dB)	PMea(dBuV/m)	Polarity
2401.600	50.4	2.3	48.127	V
2401.800	49.9	2.3	47.627	H
2478.200	49.3	2.3	46.973	H
2438.600	49.0	2.5	46.453	V
2478.000	47.6	2.3	45.273	H
2401.400	46.3	2.3	44.027	H

**$\pi/4$  DQPSK Ch 0**

Frequency(MHz)	Result(dBuV/m)	ARpl (dB)	PMea(dBuV/m)	Polarity
2440.800	46.3	2.9	43.399	V
2453.600	44.8	2.9	41.899	H
2441.000	44.6	2.9	41.699	H
2440.600	44.5	2.9	41.599	V
2787.200	44.3	7.0	37.338	H
2767.000	44.3	6.2	38.085	H

**$\pi/4$  DQPSK Ch 39**

Frequency(MHz)	Result(dBuV/m)	ARpl (dB)	PMea(dBuV/m)	Polarity
2402.000	50.6	2.3	48.327	V
2401.400	49.6	2.3	47.327	H
2401.600	48.6	2.3	46.327	H
2459.600	47.9	2.9	44.999	V
2793.600	46.2	7.0	39.238	H
2439.000	46.2	2.9	43.299	H

**$\pi/4$  DQPSK Ch 78**

Frequency(MHz)	Result(dBuV/m)	ARpl (dB)	PMea(dBuV/m)	Polarity
2402.400	50.8	2.3	48.527	V
2459.800	49.2	2.9	46.299	H
2432.800	48.7	2.5	46.153	H
2401.800	48.6	2.3	46.327	V
2478.400	46.9	2.3	44.573	H
2401.600	46.8	2.3	44.527	H

**8DPSK Ch 0**

Frequency(MHz)	Result(dBuV/m)	ARpl (dB)	PMea(dBuV/m)	Polarity
2440.600	50.9	2.9	47.999	V
2440.800	50.8	2.9	47.899	H
2399.800	49.8	0.5	49.327	H
2440.400	49.5	2.9	46.599	V
2404.000	47.3	2.3	45.027	H
2441.000	45.3	2.9	42.399	H

**8DPSK Ch 39**

Frequency(MHz)	Result(dBuV/m)	ARpl (dB)	PMea(dBuV/m)	Polarity
2401.400	50.6	2.3	48.327	V
2401.800	50.5	2.3	48.227	H
2442.800	50.0	2.9	47.099	H
2401.600	49.0	2.3	46.727	V
2401.200	48.8	2.3	46.527	H
2439.200	48.8	2.9	45.899	H

**8DPSK Ch 78**

Frequency(MHz)	Result(dBuV/m)	ARpl (dB)	PMea(dBuV/m)	Polarity
2402.200	51.9	2.3	49.627	V
2402.400	50.7	2.3	48.427	H
2482.000	50.4	2.3	48.073	H
2402.000	50.3	2.3	48.027	V
2402.600	49.4	2.3	47.127	H
2478.200	48.5	2.3	46.173	H

**Conclusion: PASS**

**Test graphs as below:**



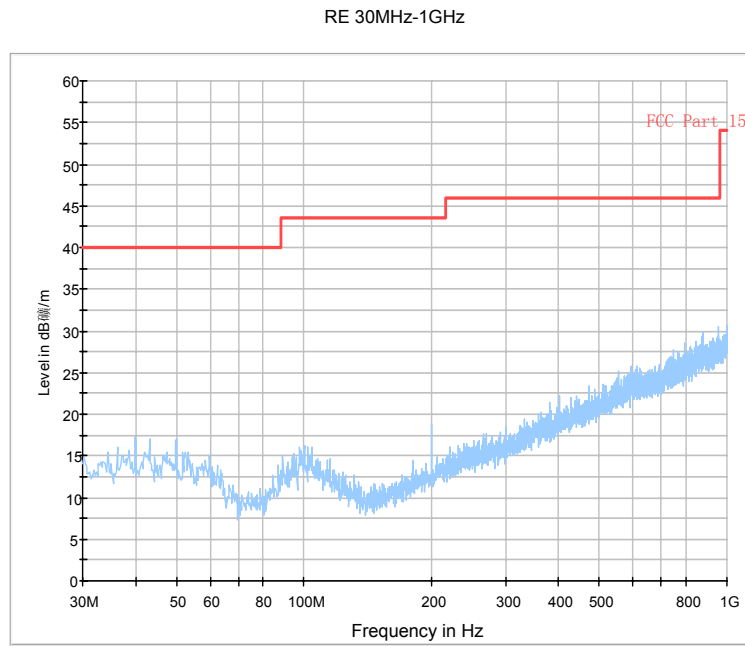


Fig.58. Radiated emission: GFSK, Channel 0, 30 MHz - 1 GHz

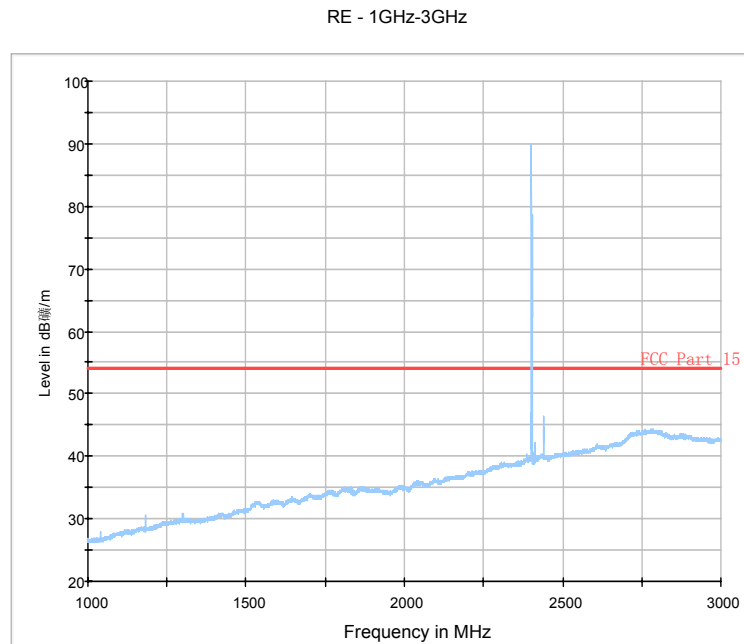


Fig.59. Radiated emission: GFSK, Channel 0, 1 GHz - 3 GHz

RE - 3GHz-18GHz

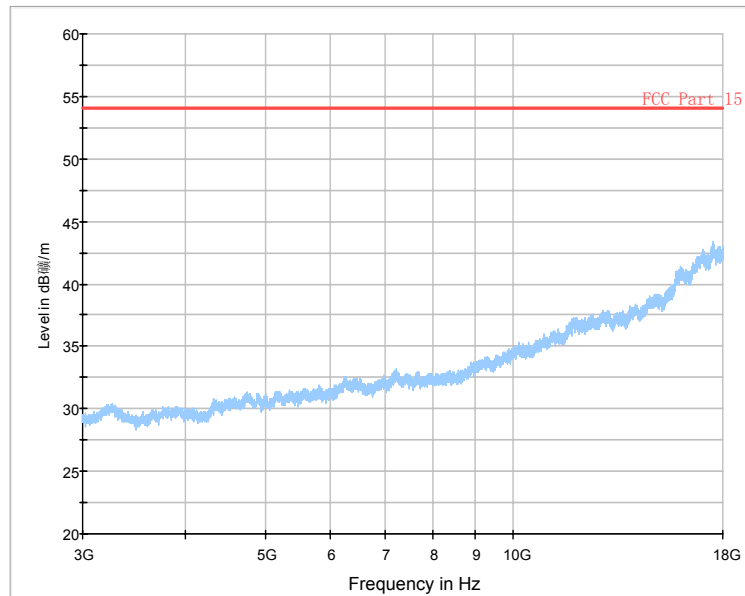


Fig.60. Radiated emission: GFSK, Channel 0, 3 GHz - 18 GHz

RE 30MHz-1GHz

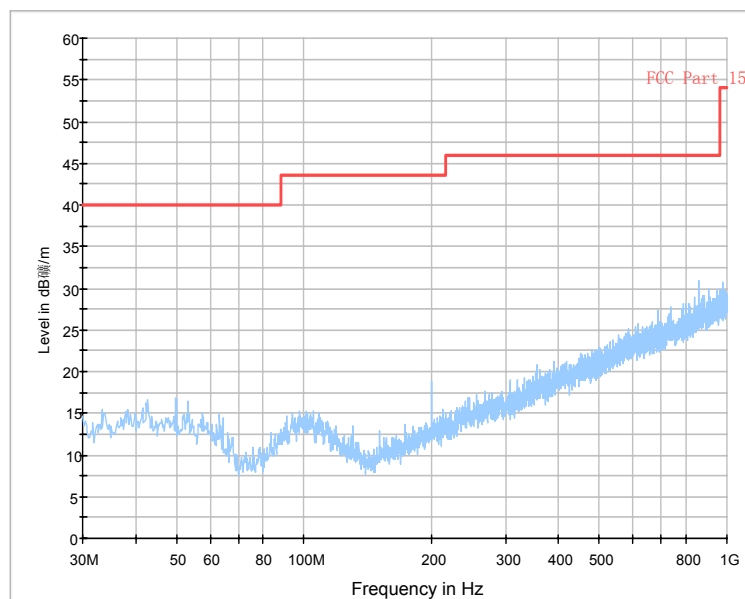


Fig.61. Radiated emission: GFSK, Channel 39, 30 MHz - 1 GHz

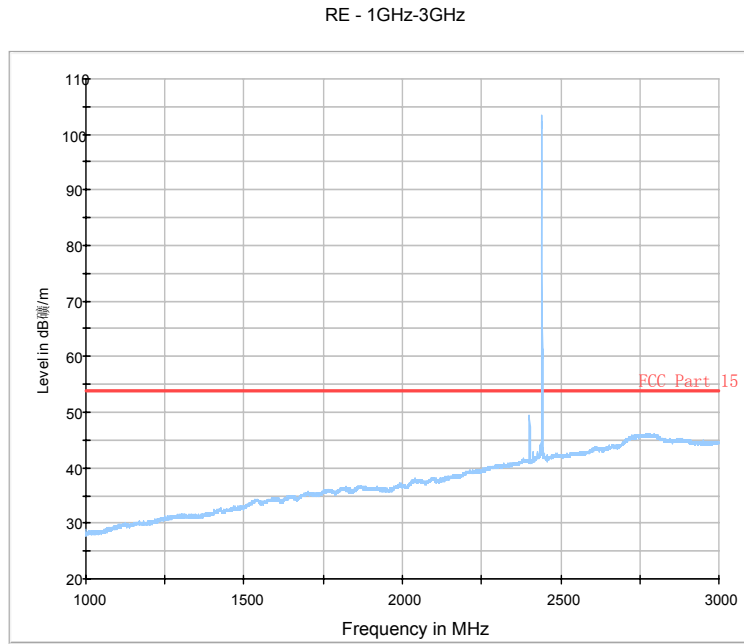


Fig.62. Radiated emission: GFSK, Channel 39, 1 GHz - 3 GHz

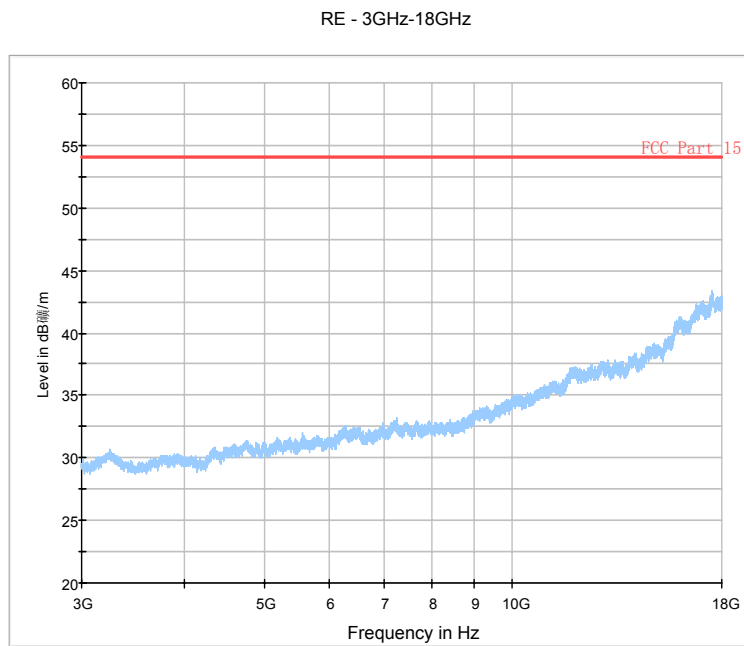


Fig.63. Radiated emission: GFSK, Channel 39, 3 GHz - 18 GHz

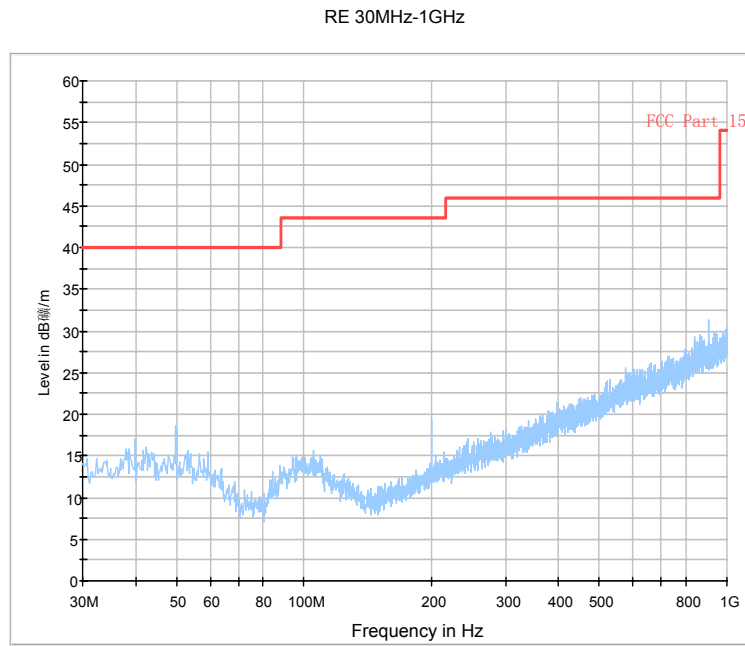


Fig.64. Radiated emission: GFSK, Channel 78, 30 MHz - 1 GHz

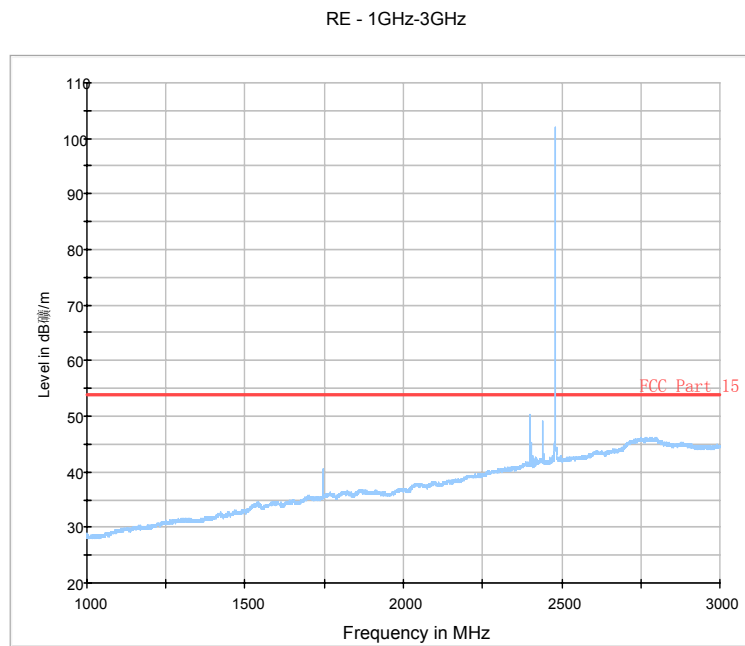


Fig.65. Fig.47 Radiated emission: GFSK, Channel 78, 1 GHz - 3 GHz

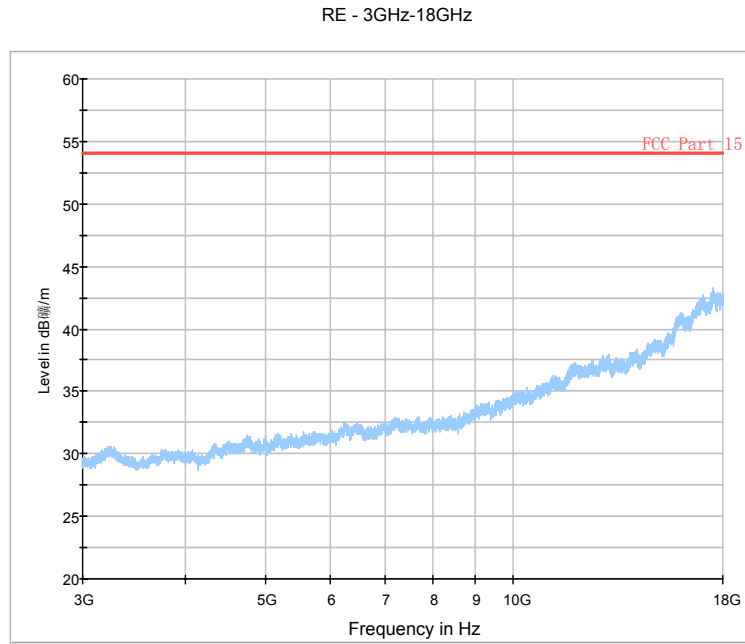


Fig.66. Radiated emission: GFSK, Channel 78, 3 GHz - 18 GHz

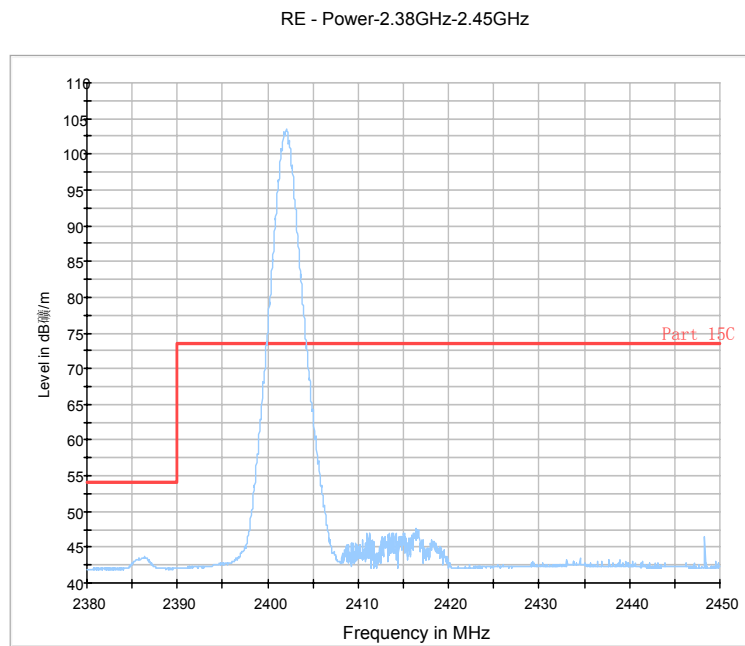


Fig.67. Radiated emission (Power): GFSK, low channel

RE - Power-2.45GHz-2.5GHz

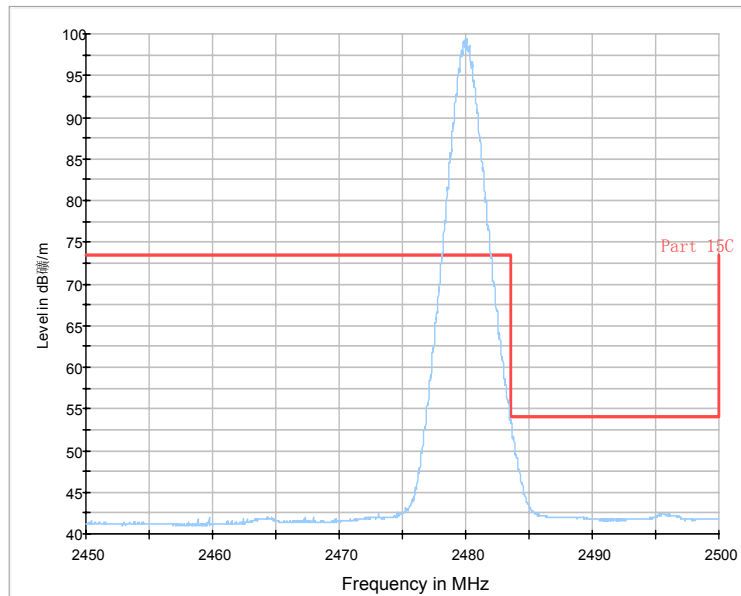


Fig.68. Radiated emission (Power) GFSK, high channel

EMI 18GHz-26.5GHz

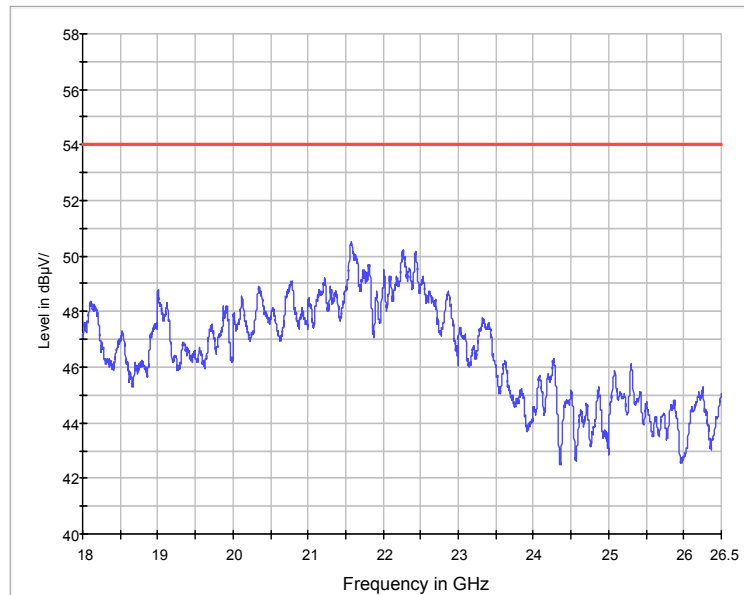


Fig.69. Radiated emission: GFSK, 18 GHz - 26 GHz

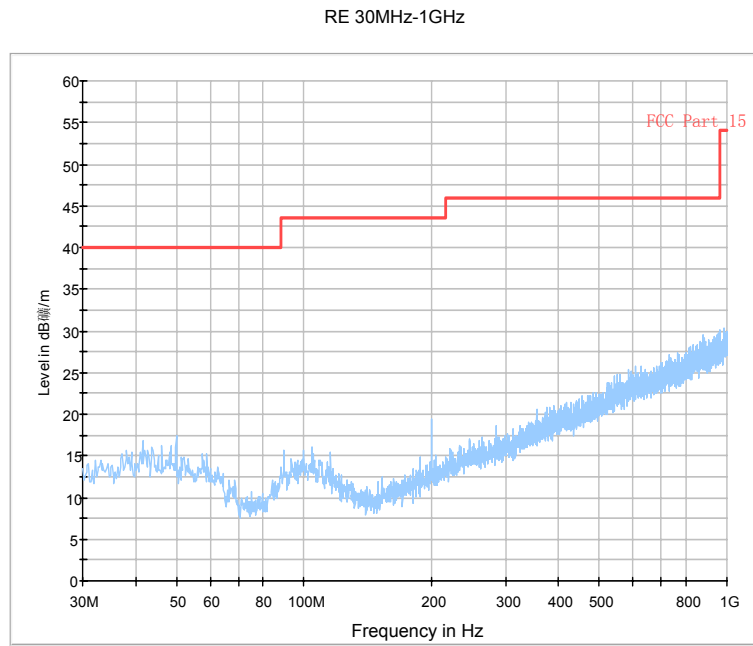


Fig.70. Radiated emission:  $\pi/4$  DQPSK, Channel 0, 30 MHz - 1 GHz

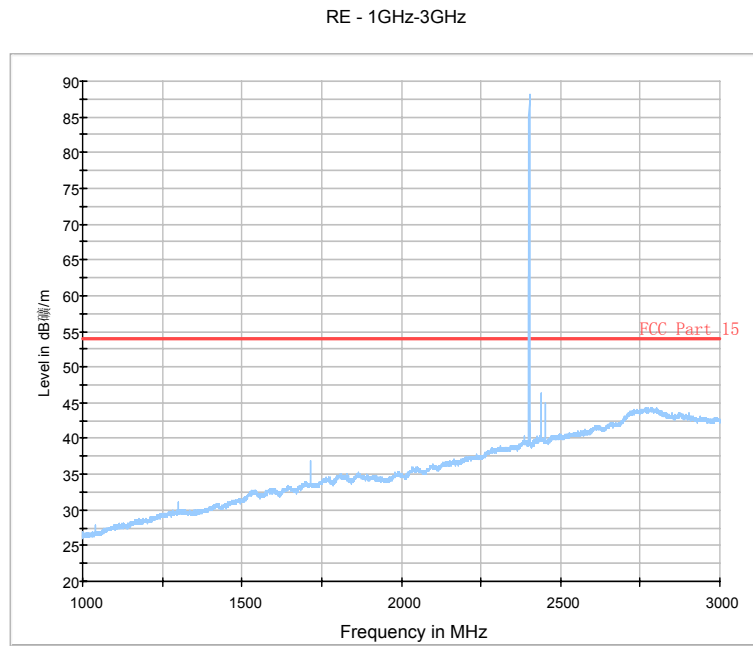


Fig.71. Radiated emission:  $\pi/4$  DQPSK, Channel 0, 1 GHz - 3 GHz

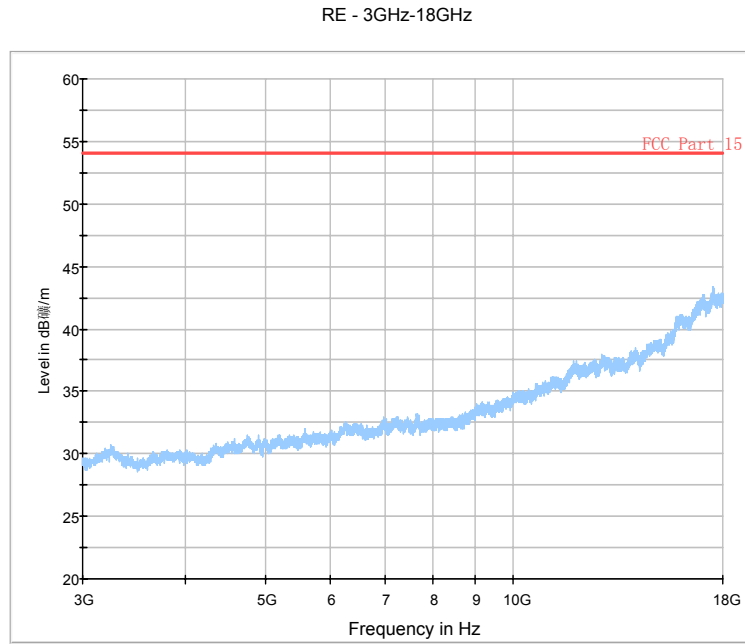


Fig.72. Radiated emission:  $\pi/4$  DQPSK, Channel 0, 3 GHz - 18 GHz

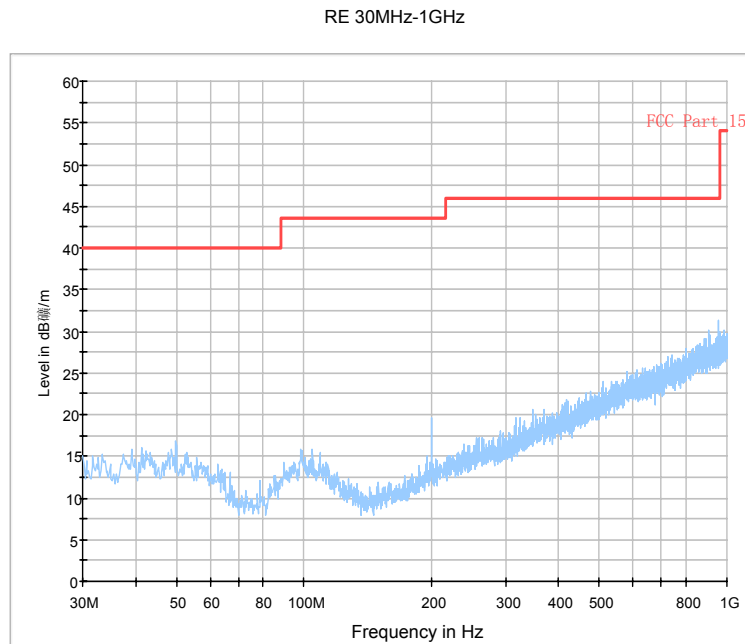


Fig.73. Radiated emission:  $\pi/4$  DQPSK, Channel 39, 30 MHz - 1 GHz



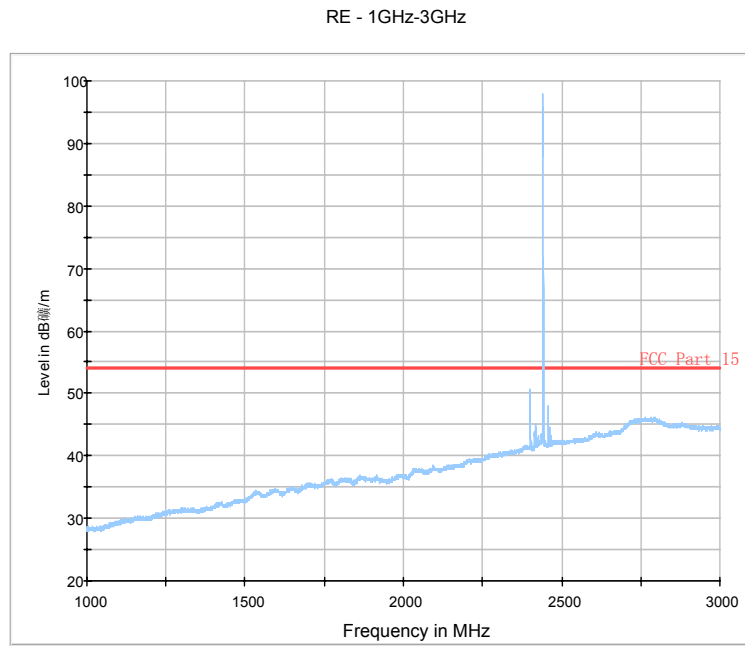


Fig.74. Radiated emission:  $\pi/4$  DQPSK, Channel 39, 1 GHz - 3 GHz

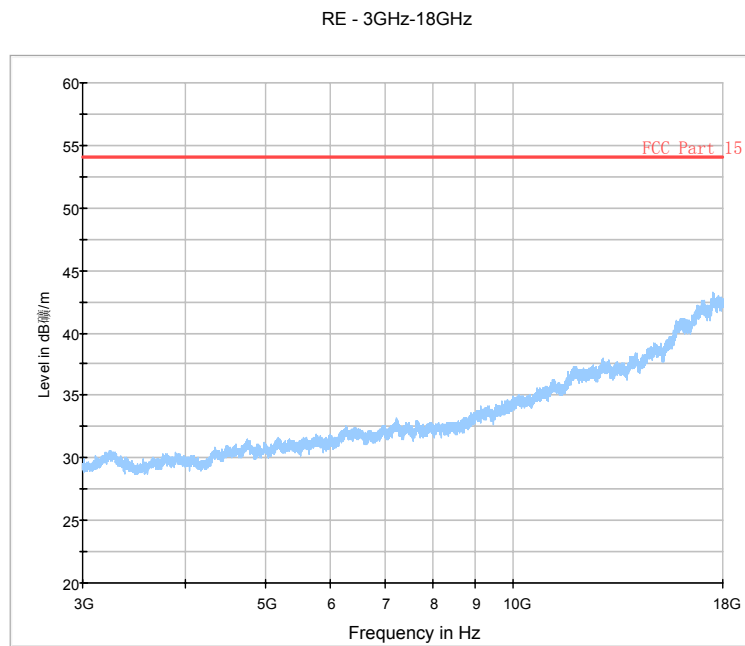


Fig.75. Radiated emission:  $\pi/4$  DQPSK, Channel 39, 3 GHz - 18 GHz

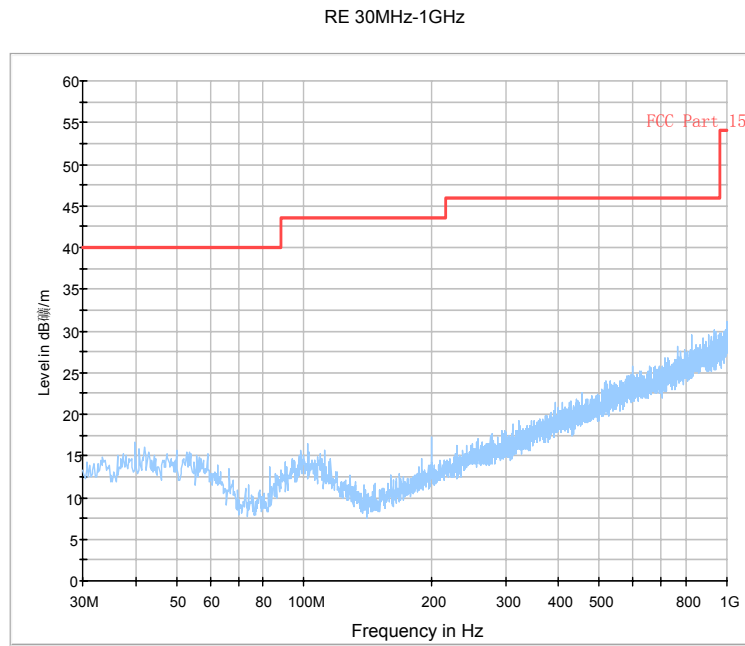


Fig.76. Radiated emission:  $\pi/4$  DQPSK, Channel 78, 30 MHz - 1 GHz

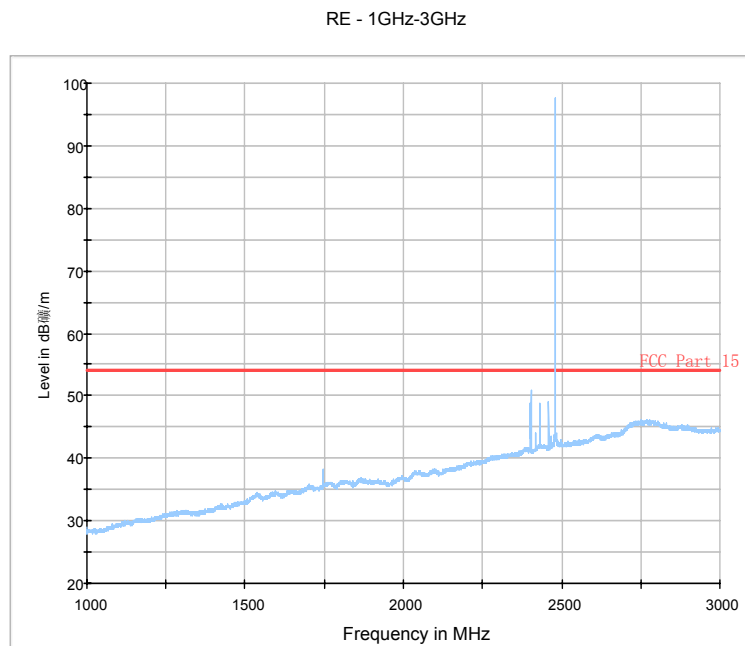


Fig.77. Radiated emission:  $\pi/4$  DQPSK, Channel 78, 1 GHz - 3 GHz

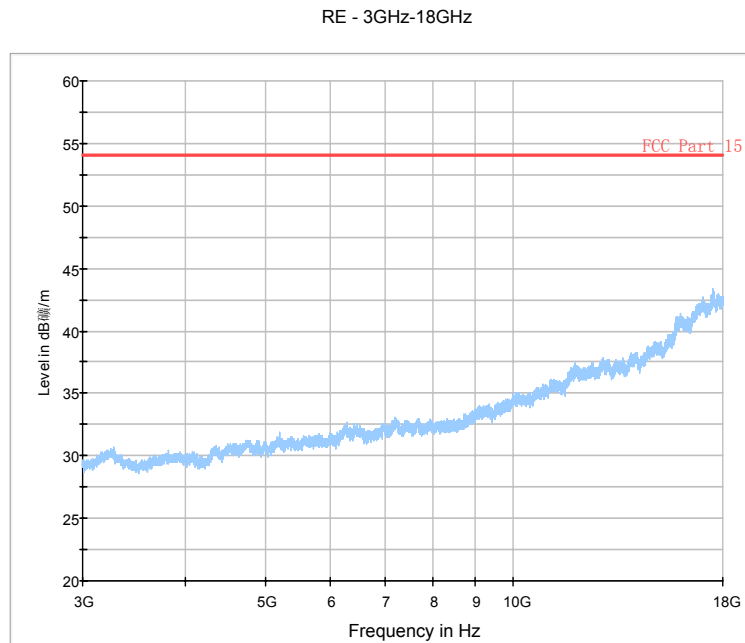


Fig.78. Radiated emission:  $\pi/4$  DQPSK, Channel 78, 3 GHz - 18 GHz

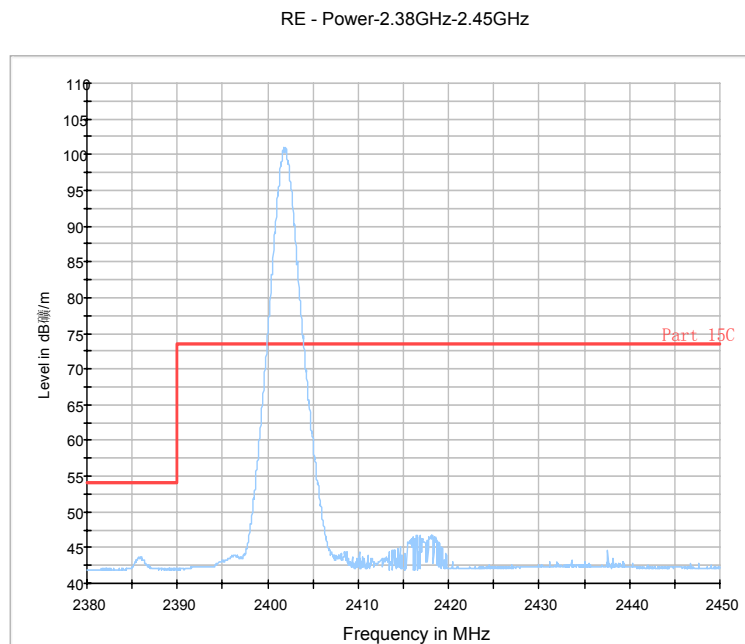


Fig.79. Radiated emission (Power):  $\pi/4$  DQPSK, low channel

RE - Power-2.45GHz-2.5GHz

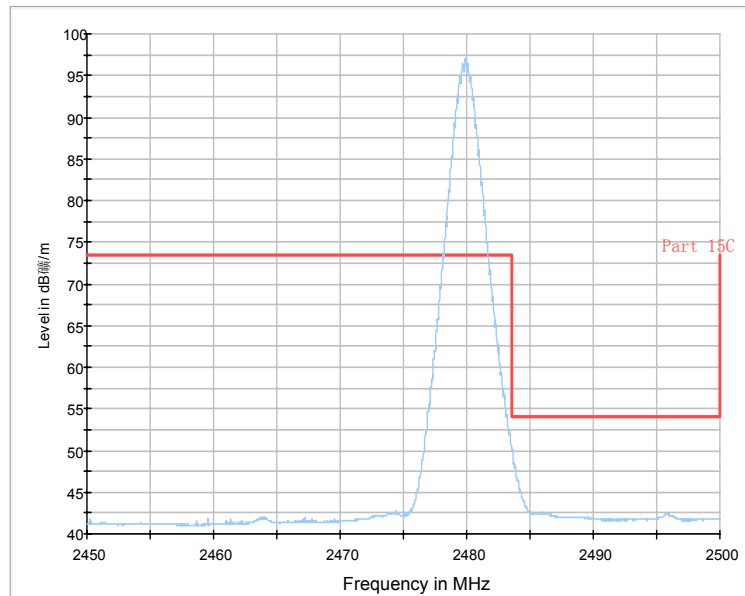


Fig.80. Radiated emission (Power):  $\pi/4$  DQPSK, high channel

EMI 18GHz-26.5GHz

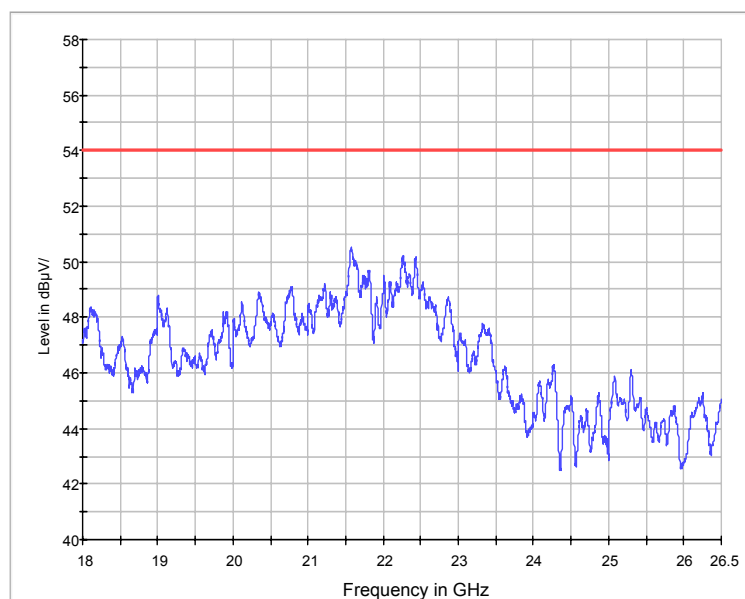


Fig.81. Radiated emission:  $\pi/4$  DQPSK, 18 GHz - 26 GHz

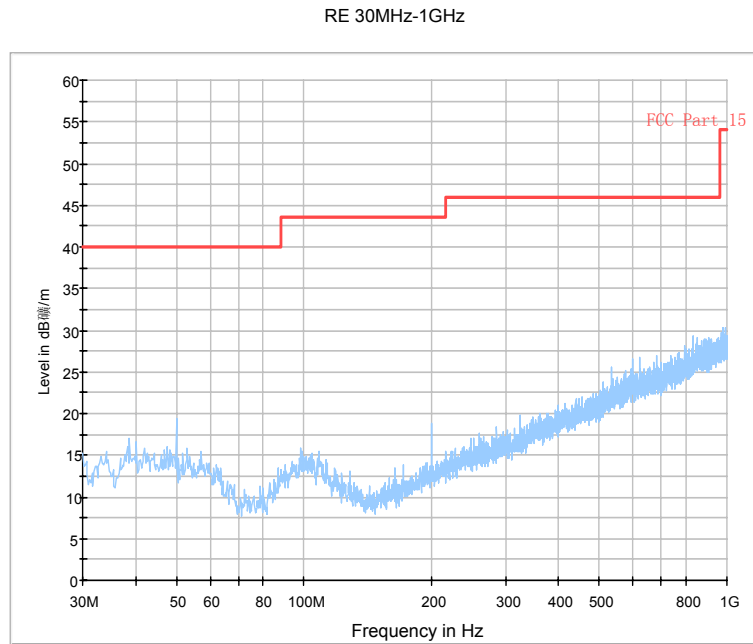


Fig.82. Radiated emission: 8DPSK, Channel 0, 30 MHz - 1 GHz

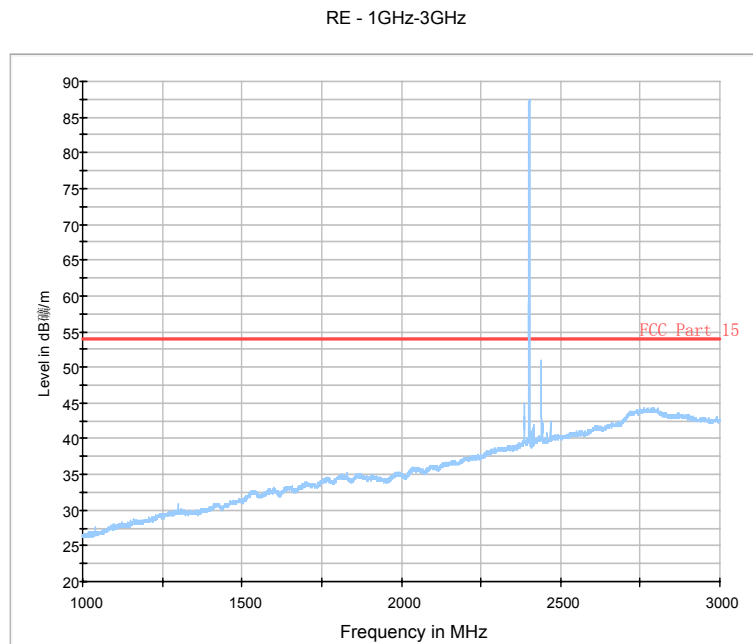


Fig.83. Radiated emission: 8DPSK, Channel 0, 1 GHz - 3 GHz

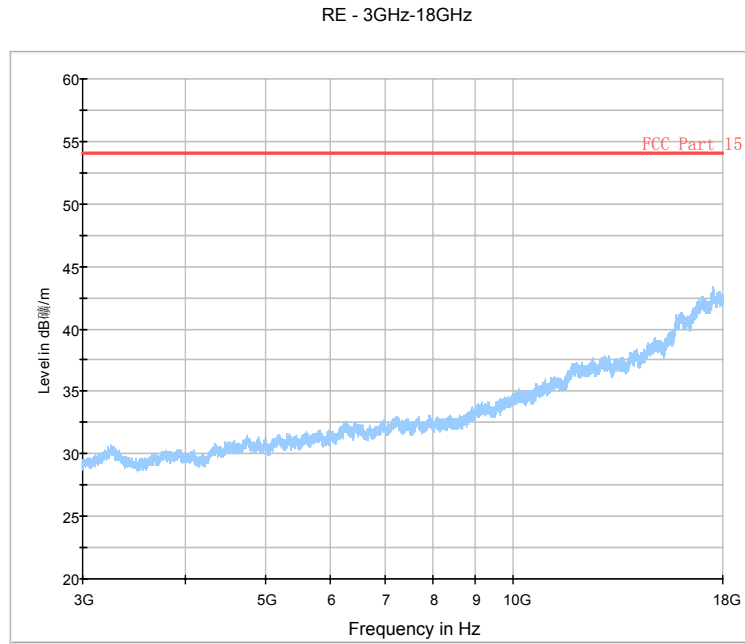


Fig.84. Radiated emission: 8DPSK, Channel 0, 3 GHz - 18 GHz

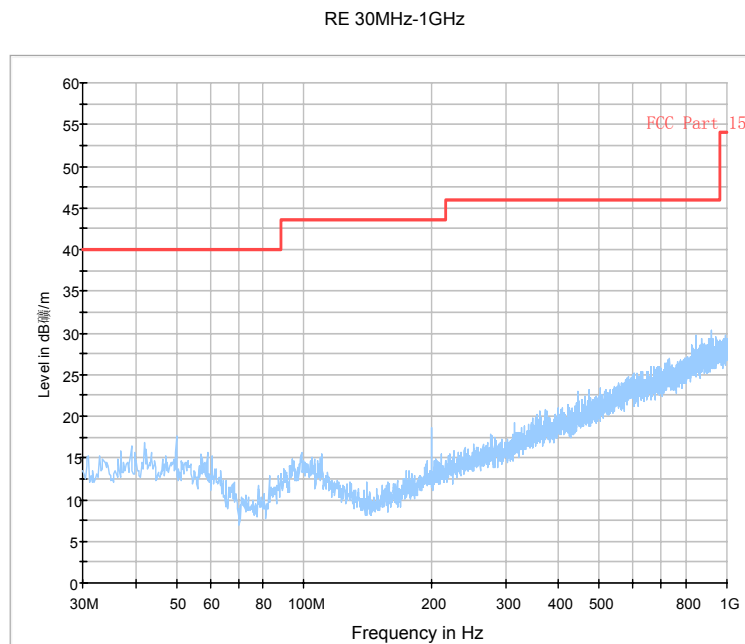


Fig.85. Radiated emission: 8DPSK, Channel 39, 30 MHz - 1 GHz

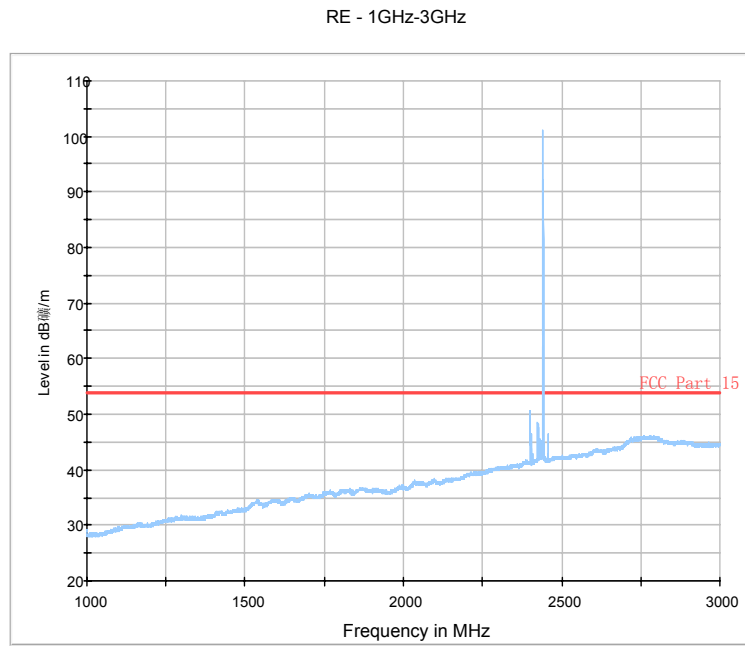


Fig.86. Radiated emission: 8DPSK, Channel 39, 1 GHz - 3 GHz

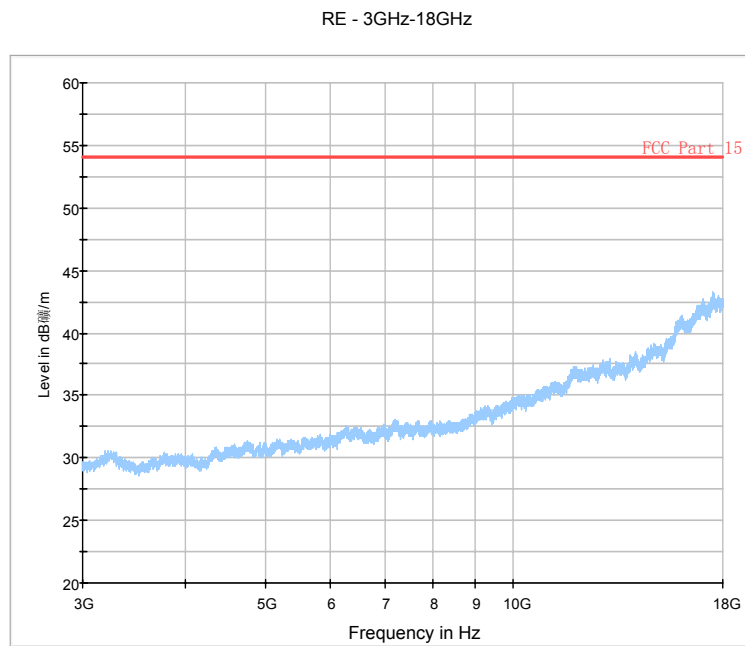


Fig.87. Radiated emission: 8DPSK, Channel 39, 3 GHz - 18 GHz

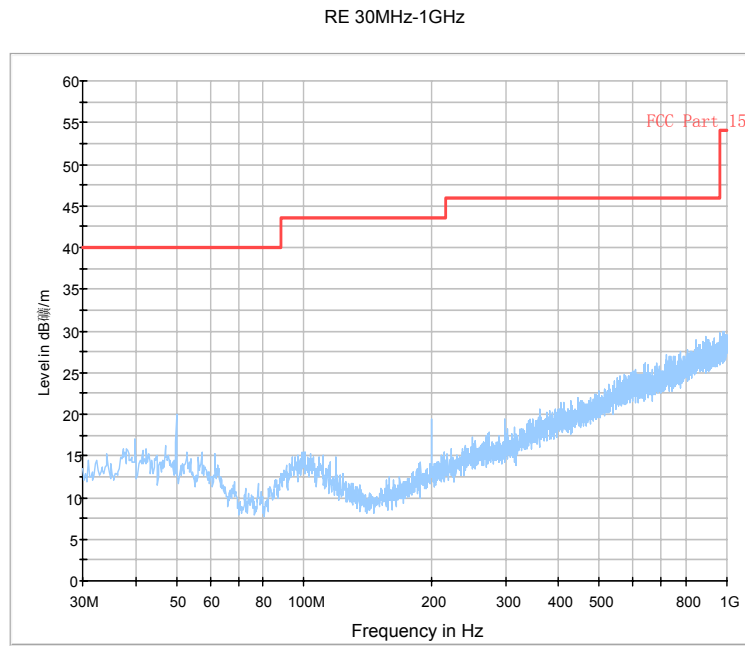


Fig.88. Radiated emission: 8DPSK, Channel 78, 30 MHz - 1 GHz

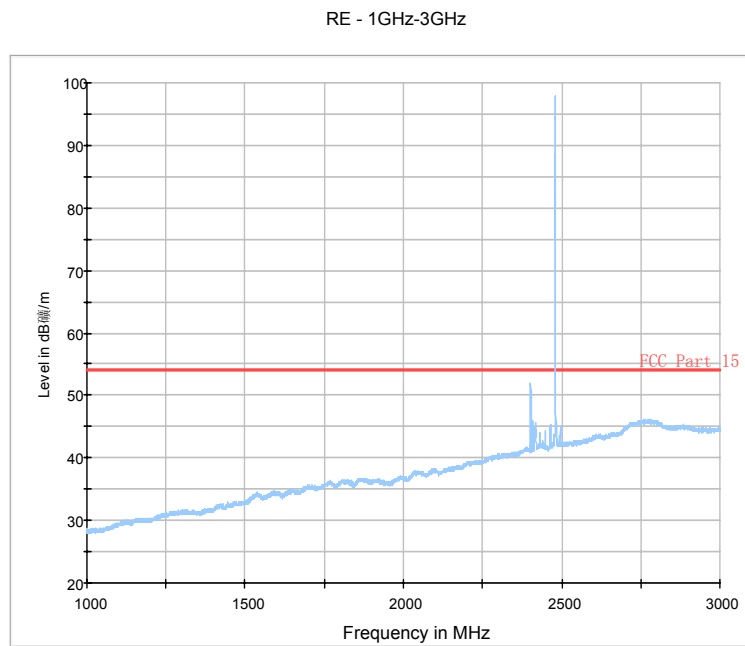


Fig.89. Radiated emission: 8DPSK, Channel 78, 1 GHz - 3 GHz



RE - 3GHz-18GHz

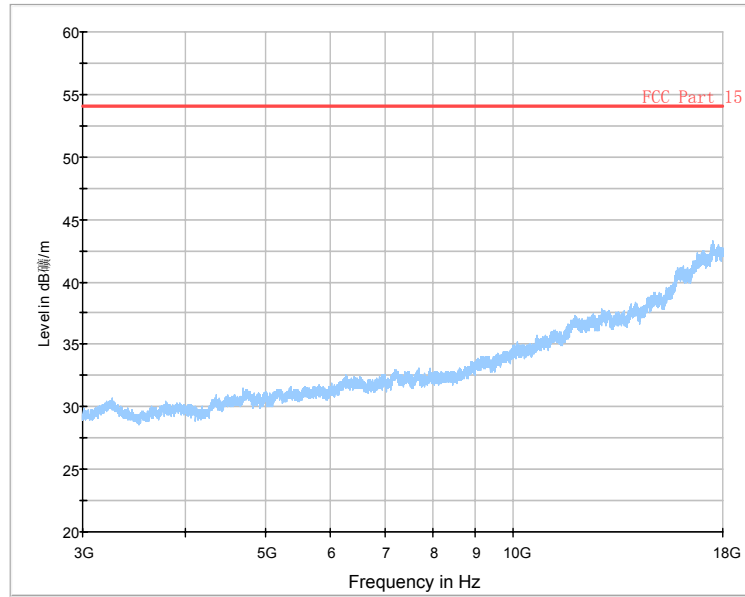


Fig.90. Radiated emission: 8DPSK, Channel 78, 3 GHz - 18 GHz

RE - Power-2.38GHz-2.45GHz

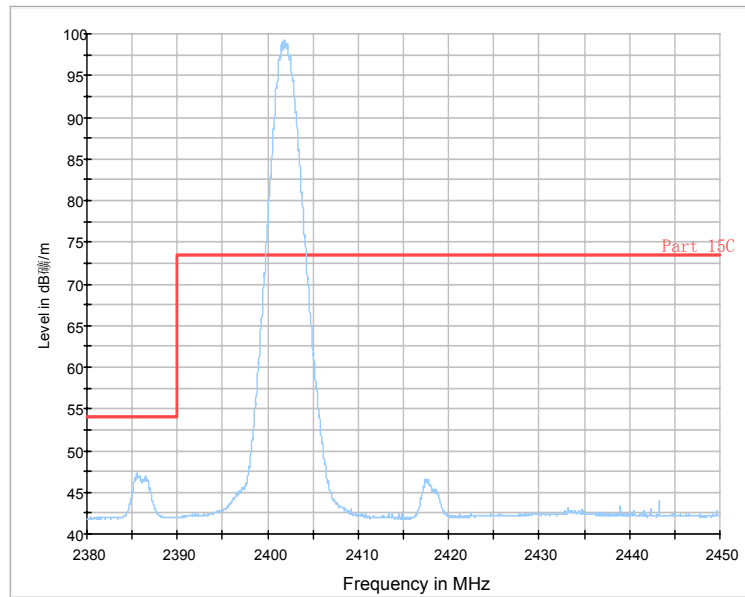


Fig.91. Radiated emission (Power): 8DPSK, low channel

RE - Power-2.45GHz-2.5GHz

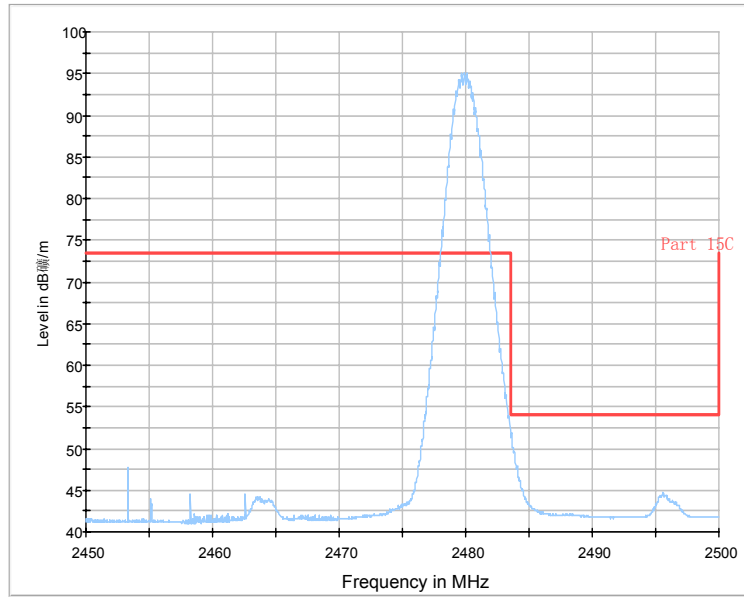


Fig.92. Radiated emission (Power): 8DPSK, high channel

EMI 18GHz-26.5GHz

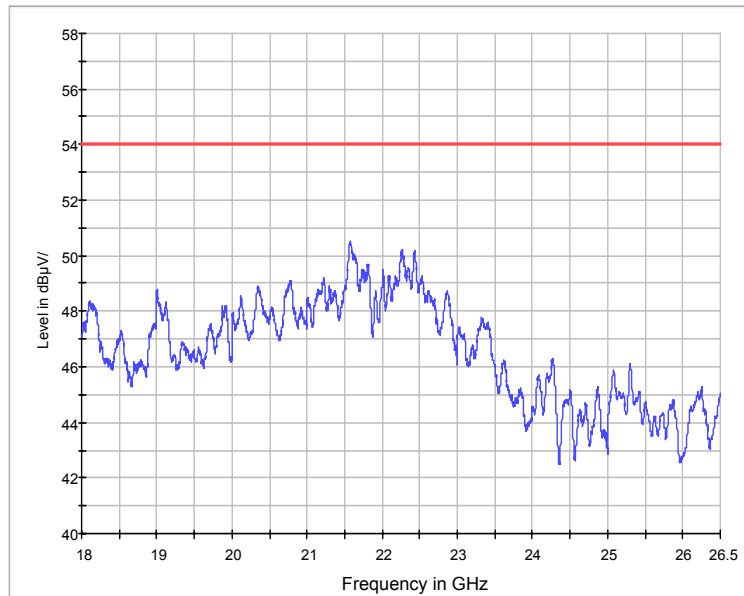


Fig.93. Radiated emission: 8DPSK, 18 GHz - 26 GHz

### A.6. Time of Occupancy (Dwell Time)

#### Measurement Limit:

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

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

#### Measurement Result:

##### For GFSK

Channel	Packet	Dwell Time (ms)		Conclusion
39	DH1	Fig.94	108.51	P
		Fig.95		
	DH3	Fig.96	180.34	P
		Fig.97		
	DH5	Fig.98	194.53	P
		Fig.99		

##### For $\pi/4$ DQPSK

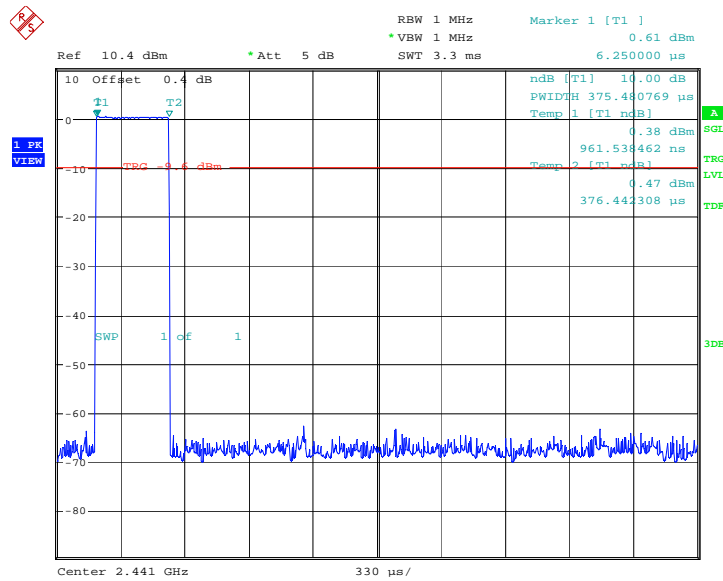
Channel	Packet	Dwell Time (ms)		Conclusion
39	DH1	Fig.100	109.25	P
		Fig.101		
	DH3	Fig.102	190.79	P
		Fig.103		
	DH5	Fig.104	217.75	P
		Fig.105		

##### For 8DPSK

Channel	Packet	Dwell Time (ms)		Conclusion
39	DH1	Fig.106	106.05	P
		Fig.107		
	DH3	Fig.108	175.98	P
		Fig.109		
	DH5	Fig.110	180.34	P
		Fig.111		

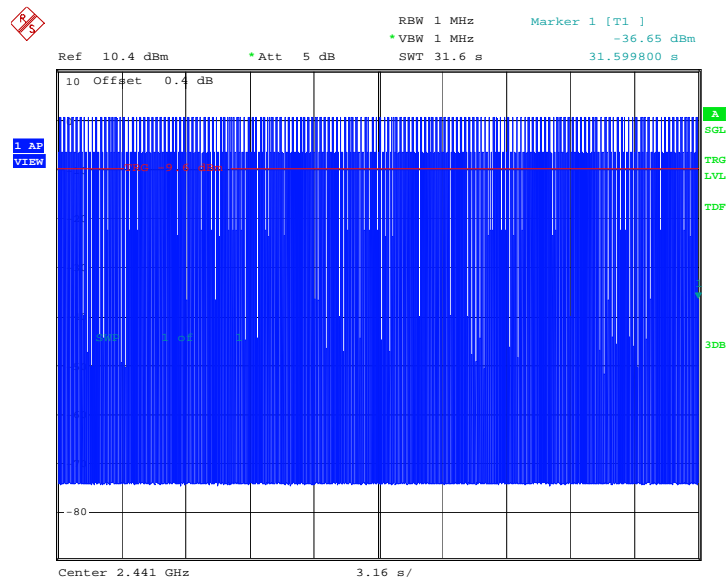
**Conclusion: PASS**

Test graphs as below:



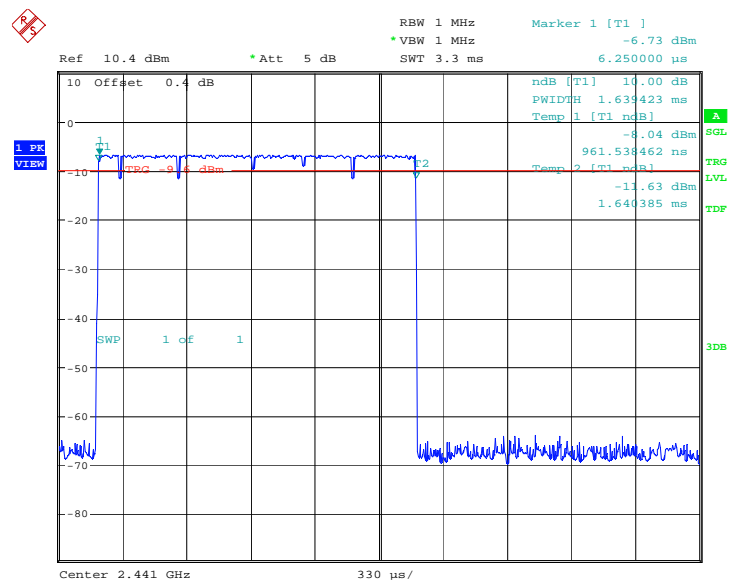
Date: 27.NOV.2012 01:49:23

Fig.94. Time of occupancy (Dwell Time): Channel 39, Packet DH1



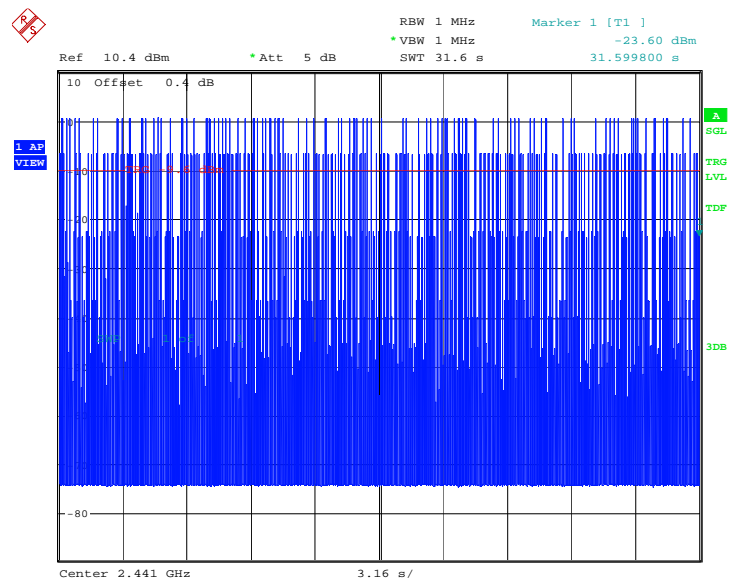
Date: 27.NOV.2012 01:49:11

Fig.95. Number of Transmissions Measurement: Channel 39, Packet DH1



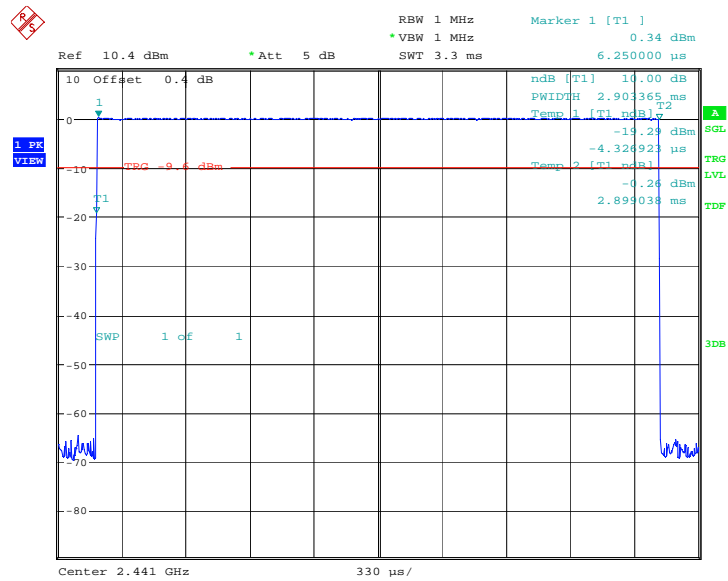
Date: 27.NOV.2012 01:50:41

Fig.96. Time of occupancy (Dwell Time): Channel 39, Packet DH3



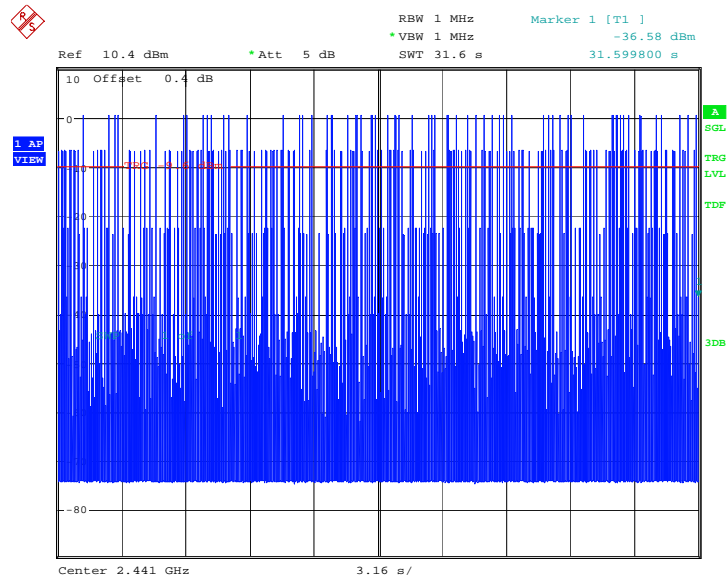
Date: 27.NOV.2012 01:50:29

Fig.97. Number of Transmissions Measurement:Channel 39,Packet DH3



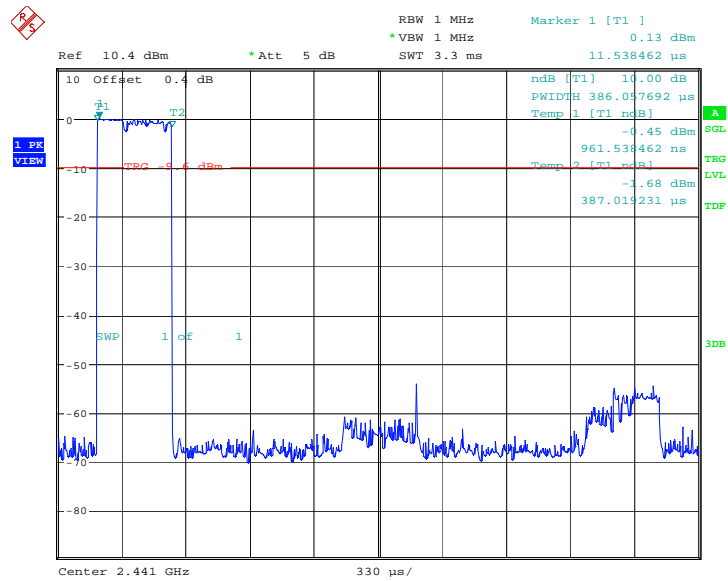
Date: 27.NOV.2012 01:51:59

Fig.98. Time of occupancy (Dwell Time): Channel 39, Packet DH5



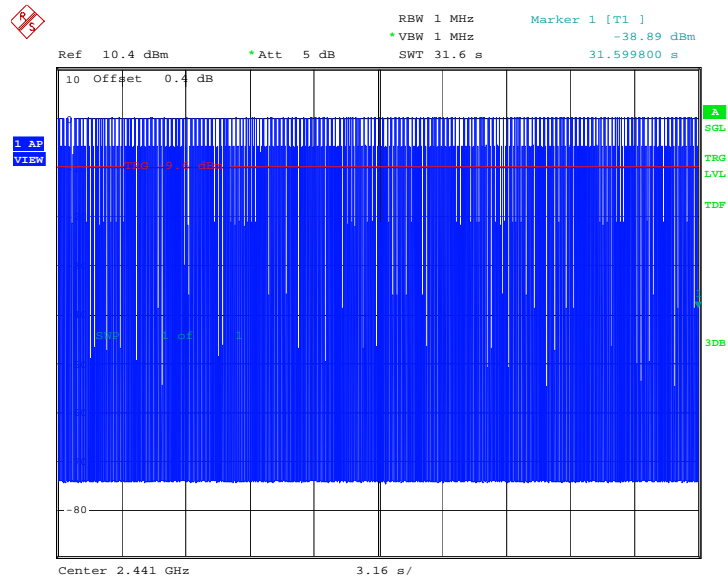
Date: 27.NOV.2012 01:51:47

Fig.99. Number of Transmissions Measurement:Channel 39,Packet DH5



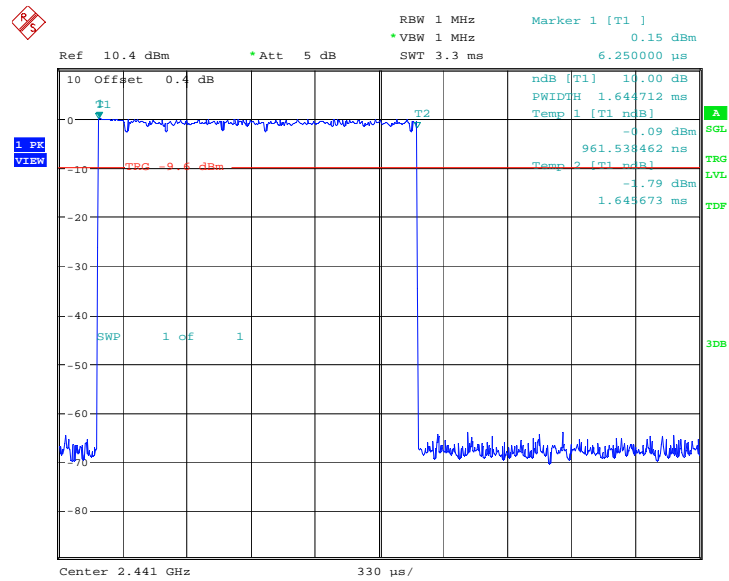
Date: 27.NOV.2012 02:11:29

Fig.100. Time of occupancy (Dwell Time): Channel 39, Packet 2-DH1



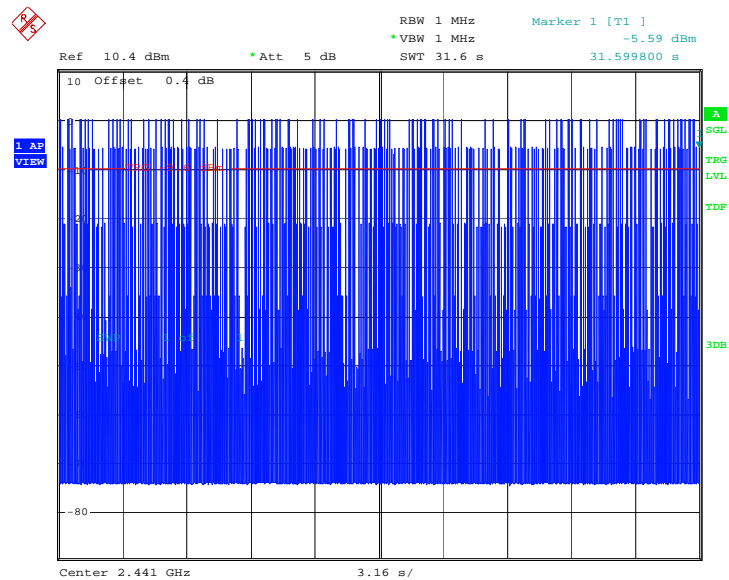
Date: 27.NOV.2012 02:11:17

Fig.101. Number of Transmissions Measurement:Channel 39,Packet 2-DH1



Date: 27.NOV.2012 02:12:46

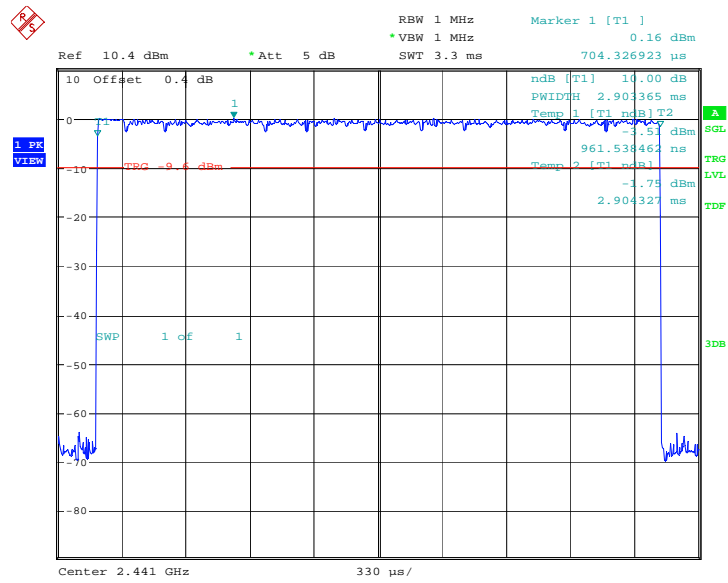
Fig.102. Time of occupancy (Dwell Time): Channel 39, Packet 2-DH3



Date: 27.NOV.2012 02:12:34

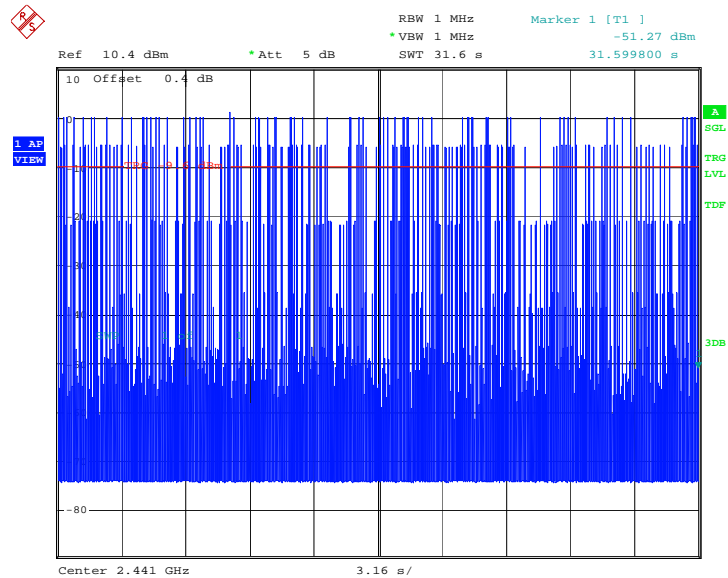
Fig.103. Number of Transmissions Measurement:Channel 39,Packet 2-DH3





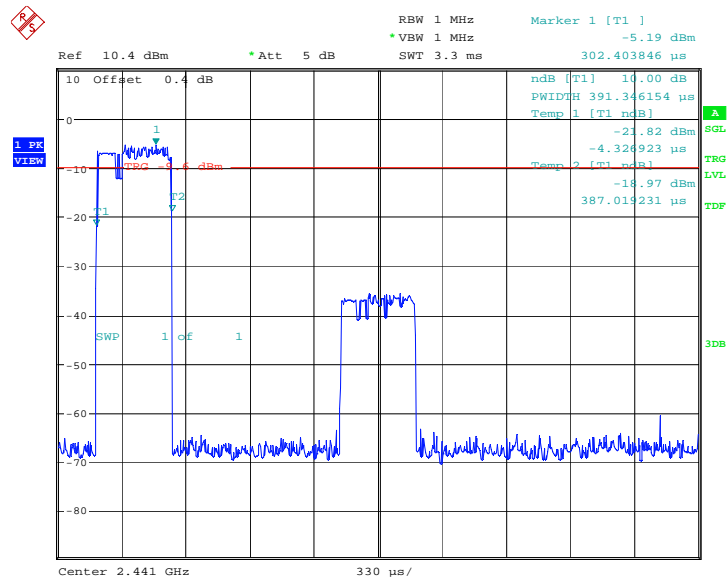
Date: 27.NOV.2012 02:14:01

Fig.104. Time of occupancy (Dwell Time): Channel 39, Packet 2-DH5



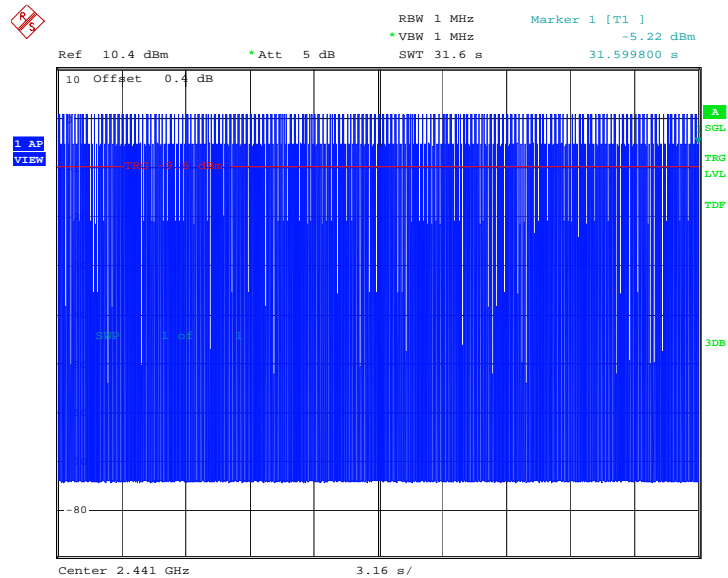
Date: 27.NOV.2012 02:13:49

Fig.105. Number of Transmissions Measurement: Channel 39, Packet 2-DH5



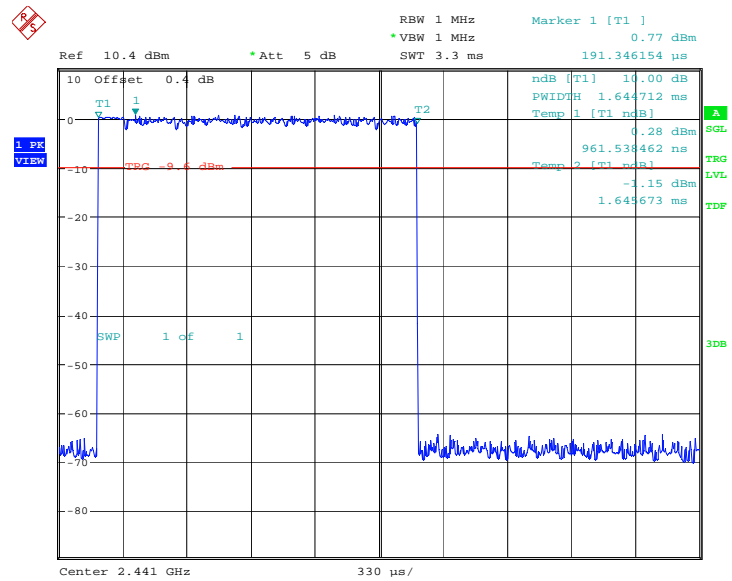
Date: 27.NOV.2012 02:33:31

Fig.106. Time of occupancy (Dwell Time): Channel 39, Packet 3-DH1



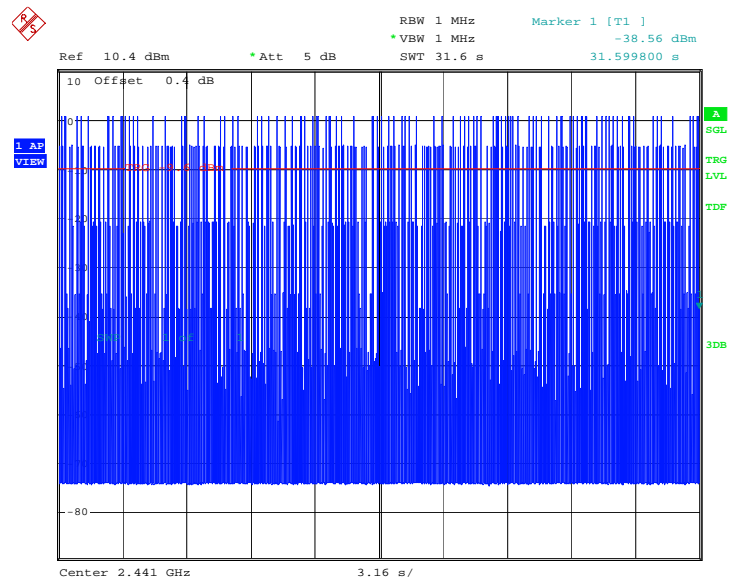
Date: 27.NOV.2012 02:33:19

Fig.107. Number of Transmissions Measurement:Channel 39,Packet 3-DH1



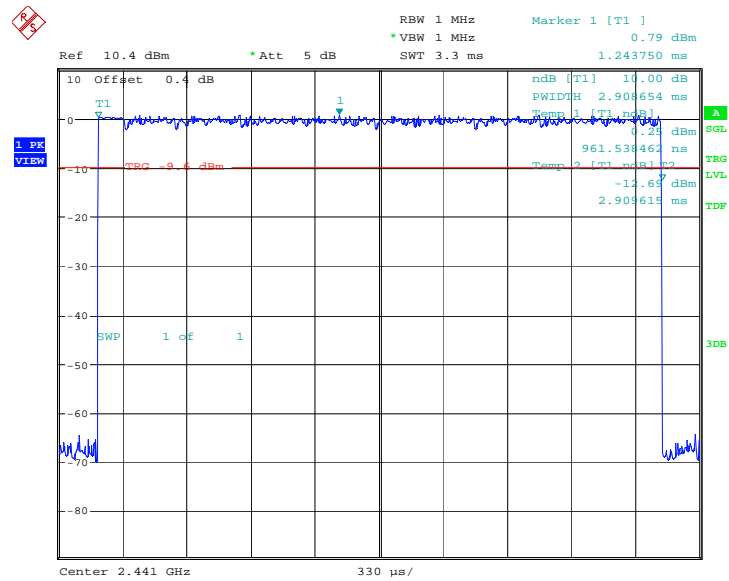
Date: 27.NOV.2012 02:34:51

Fig.108. Time of occupancy (Dwell Time): Channel 39, Packet 3-DH3



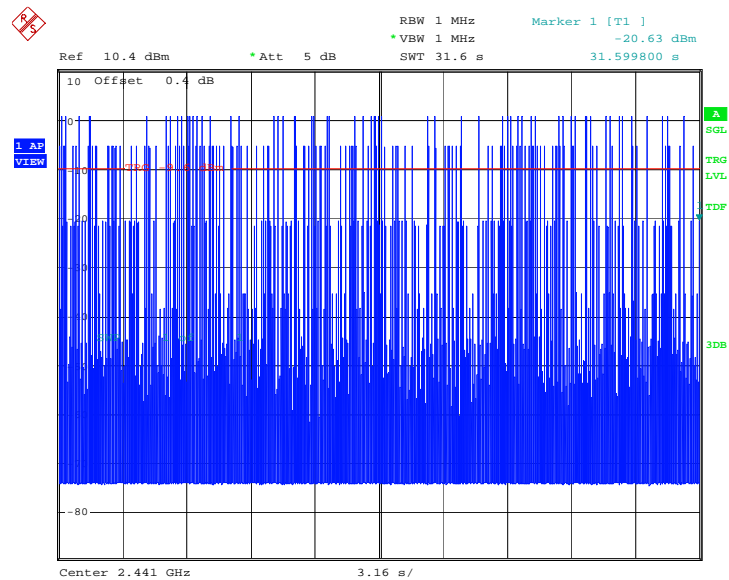
Date: 27.NOV.2012 02:34:39

Fig.109. Number of Transmissions Measurement:Channel 39,Packet 3-DH3



Date: 27.NOV.2012 02:36:08

Fig.110. Time of occupancy (Dwell Time): Channel 39, Packet 3-DH5



Date: 27.NOV.2012 02:35:56

Fig.111. Number of Transmissions Measurement: Channel 39, Packet 3-DH5

### A.7. 20dB Bandwidth

#### Measurement Limit:

Standard	Limit
FCC 47 CFR Part 15.247(a)(1)	NA *

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

\* Comment: This test case is not required according to the latest FCC 47 CFR Part 15.247. But the test results are necessary for “carrier frequency separation” test case, in Annex A.8.

#### Measurement Results:

##### For GFSK

Channel	20dB Bandwidth (kHz)		Conclusion
0	Fig.112	730.77	NA
39	Fig.113	860.58	NA
78	Fig.114	865.38	NA

##### For $\pi/4$ DQPSK

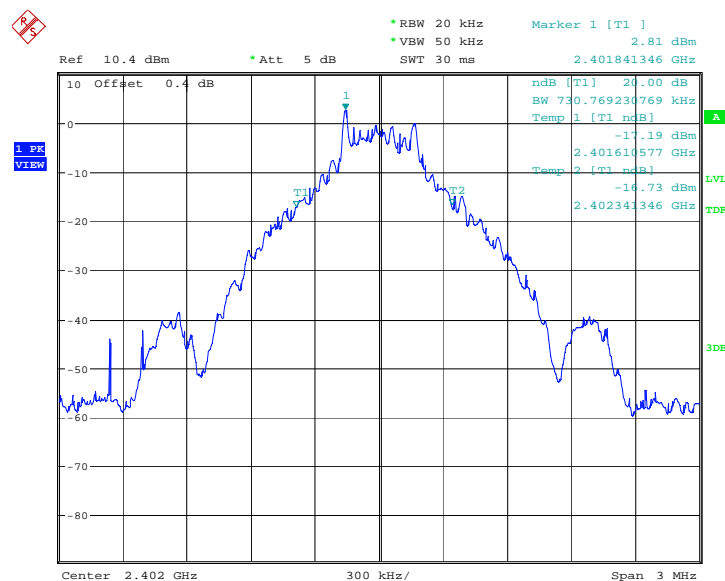
Channel	20dB Bandwidth (kHz)		Conclusion
0	Fig.115	1264.42	NA
39	Fig.116	1250.00	NA
78	Fig.117	1274.04	NA

##### For 8DPSK

Channel	20dB Bandwidth (kHz)		Conclusion
0	Fig.118	1278.85	NA
39	Fig.119	1254.81	NA
78	Fig.120	1274.04	NA

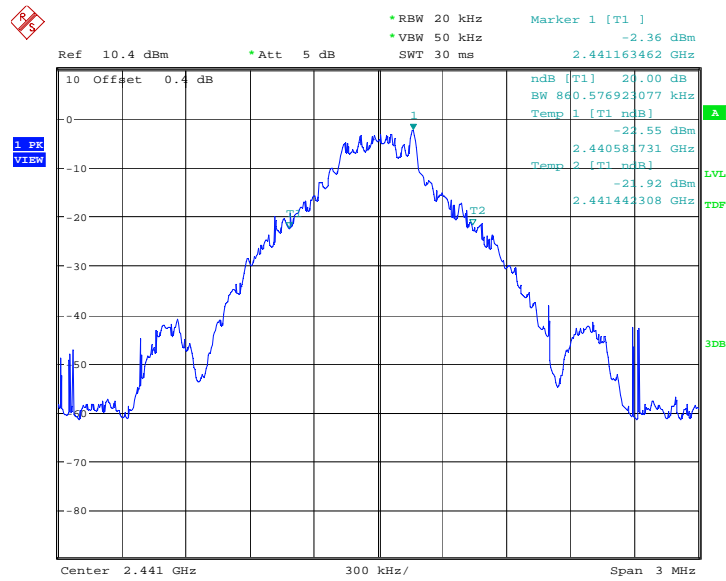
**Conclusion: NA**

Test graphs as below:



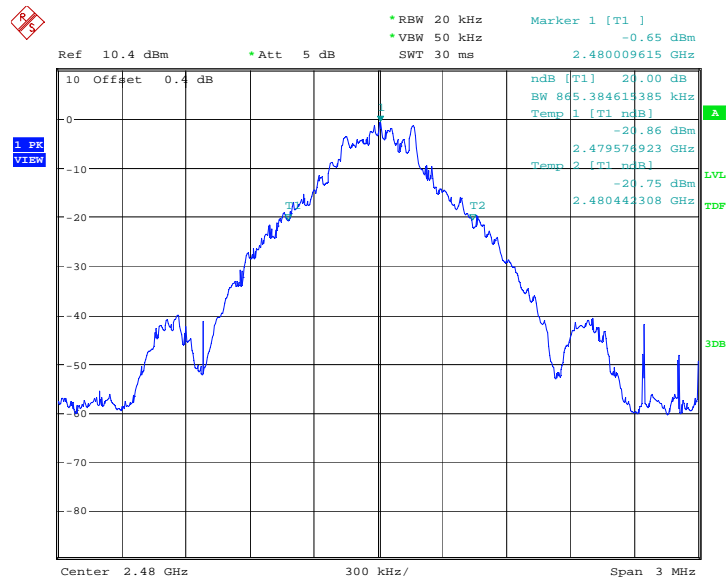
Date: 27.NOV.2012 01:52:33

Fig.112. 20dB Bandwidth: GFSK, Channel 0



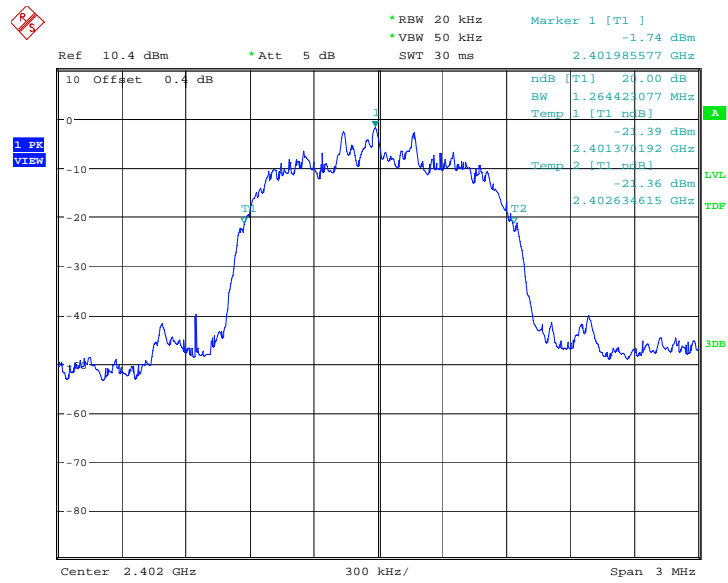
Date: 27.NOV.2012 01:53:05

Fig.113. 20dB Bandwidth: GFSK, Channel 39



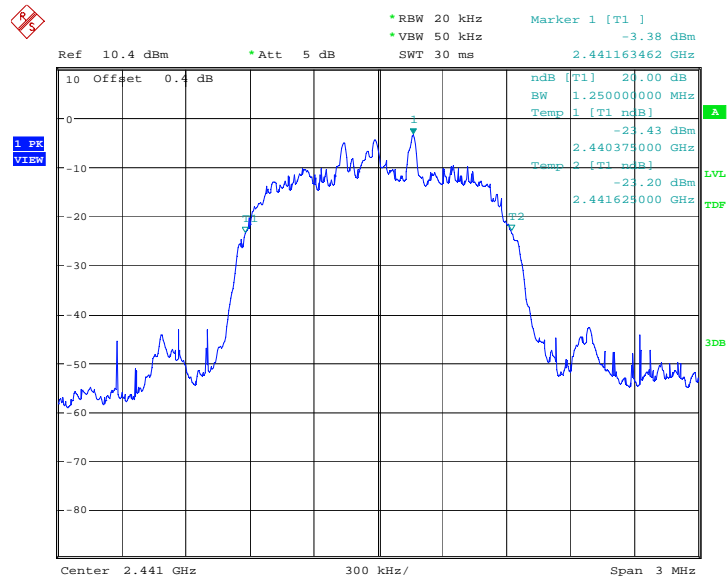
Date: 27.NOV.2012 01:53:37

Fig.114. 20dB Bandwidth: GFSK, Channel 78



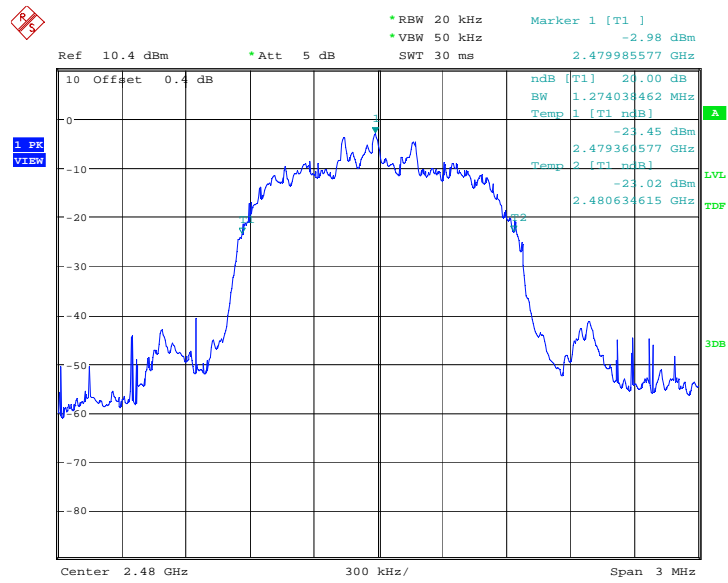
Date: 27.NOV.2012 02:14:35

Fig.115. 20dB Bandwidth:  $\pi/4$  DQPSK, Channel 0



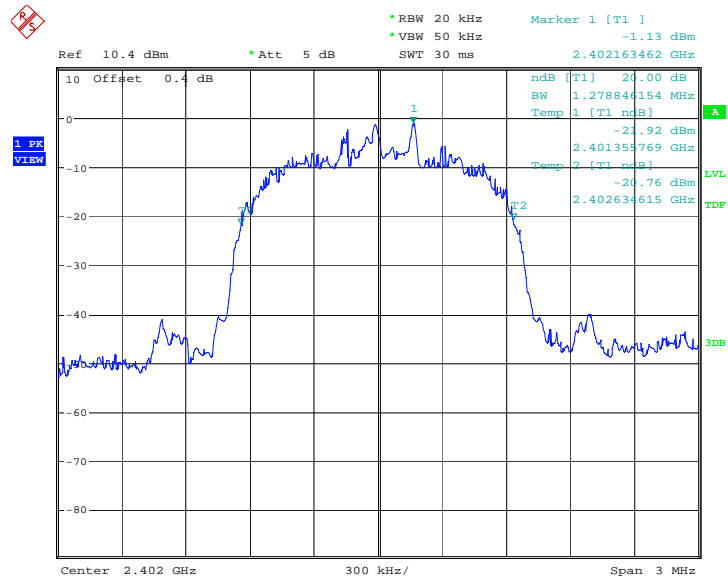
Date: 27.NOV.2012 02:15:07

Fig.116. 20dB Bandwidth:  $\pi/4$  DQPSK, Channel 39



Date: 27.NOV.2012 02:15:39

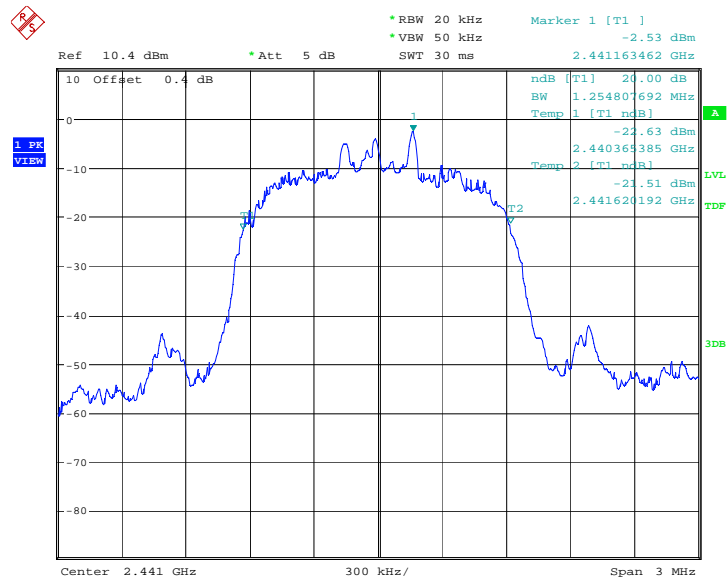
Fig.117. 20dB Bandwidth:  $\pi/4$  DQPSK, Channel 78



Date: 27.NOV.2012 02:36:42

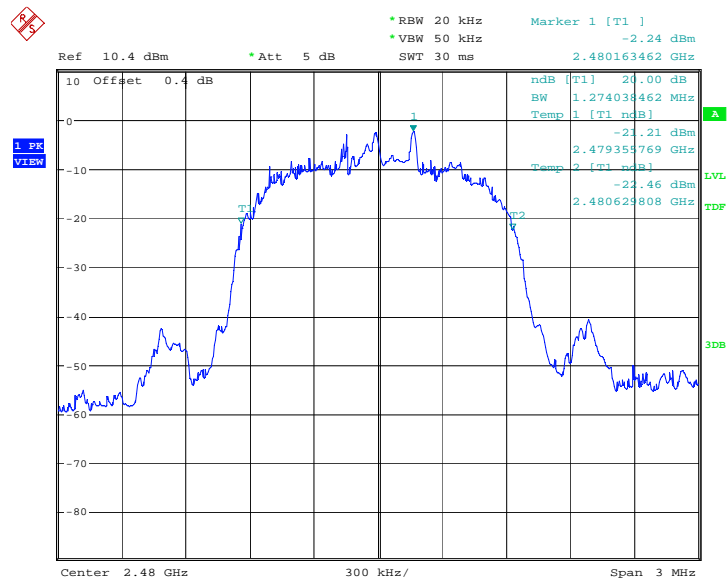
Fig.118. 20dB Bandwidth: 8DPSK, Channel 0





Date: 27.NOV.2012 02:37:14

Fig.119. 20dB Bandwidth: 8DPSK, Channel 39



Date: 27.NOV.2012 02:37:46

Fig.120. 20dB Bandwidth: 8DPSK, Channel 78

### A.8. Carrier Frequency Separation

#### Measurement Limit:

Standard	Limit(kHz)
FCC 47 CFR Part 15.247(a)(1)	over 25 kHz or $(2/3) * 20\text{dB bandwidth}$

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

\* Comment: This limit should be over 25 kHz or  $(2/3) * 20\text{dB bandwidth}$ , whichever is greater.

#### Measurement Result:

##### For GFSK

Channel	Carrier frequency separation (kHz)	Conclusion
39	Fig.121	P

##### For $\pi/4$ DQPSK

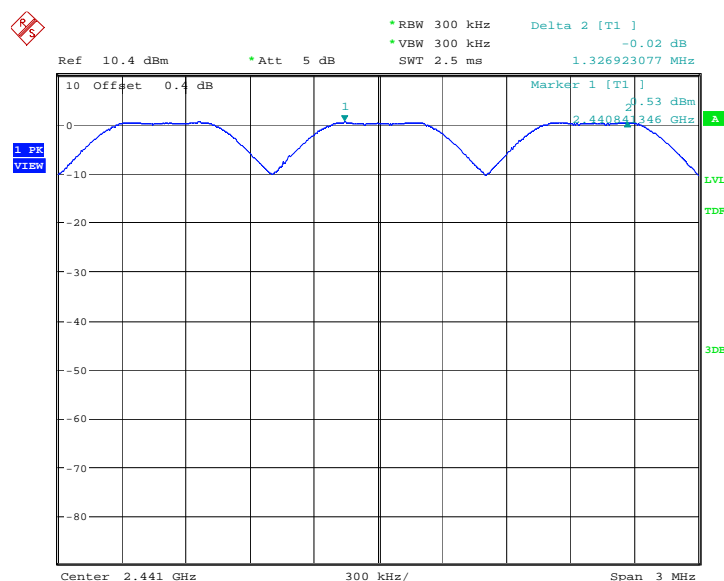
Channel	Carrier frequency separation (kHz)	Conclusion
39	Fig.122	P

##### For 8DPSK

Channel	Carrier frequency separation (kHz)	Conclusion
39	Fig.123	P

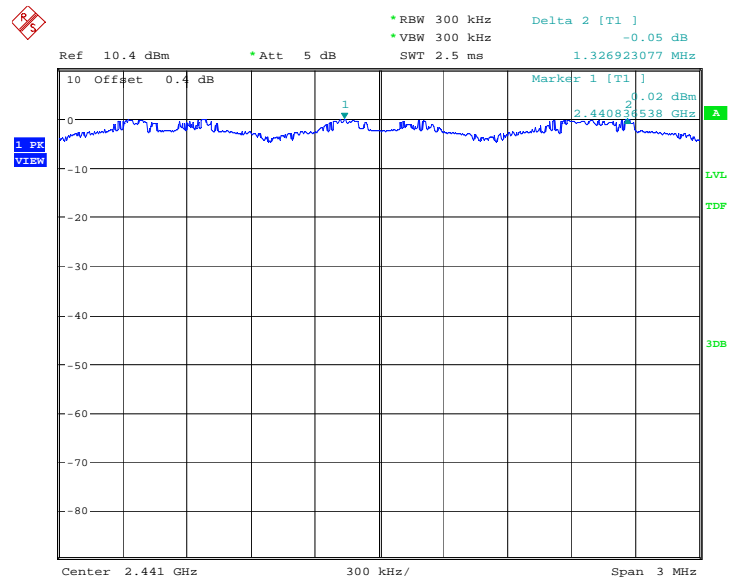
**Conclusion: PASS**

Test graphs as below:



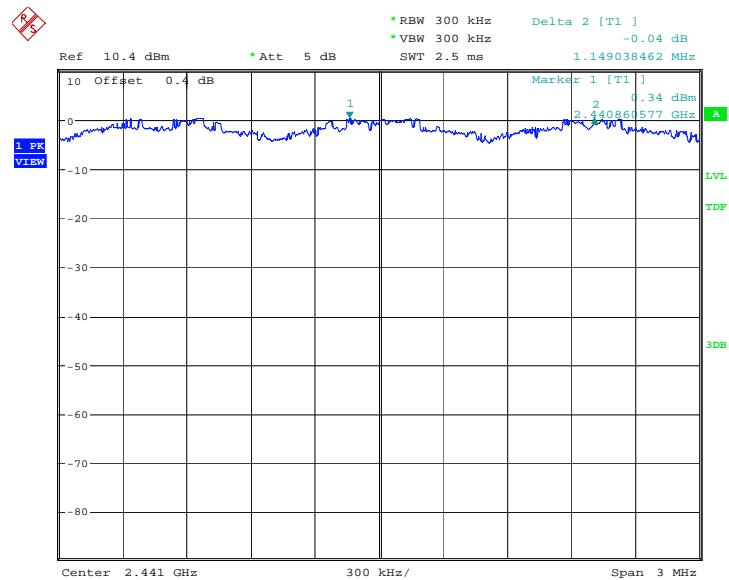
Date: 27.NOV.2012 01:55:42

Fig.121. Carrier frequency separation measurement: GFSK, Channel 39



Date: 27.NOV.2012 02:17:43

Fig.122. Carrier frequency separation measurement:  $\pi/4$  DQPSK, Channel 39



Date: 27.NOV.2012 02:39:50

Fig.123. Carrier frequency separation measurement: 8DPSK, Channel 39

### A.9. 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 made according to Public notice DA 00-705 and ANSI C63.4

**Measurement Result:**

**For GFSK**

Channel	Number of hopping channels	Conclusion
0~39	Fig.124	79 P
40~78	Fig.125	

**For  $\pi/4$  DQPSK**

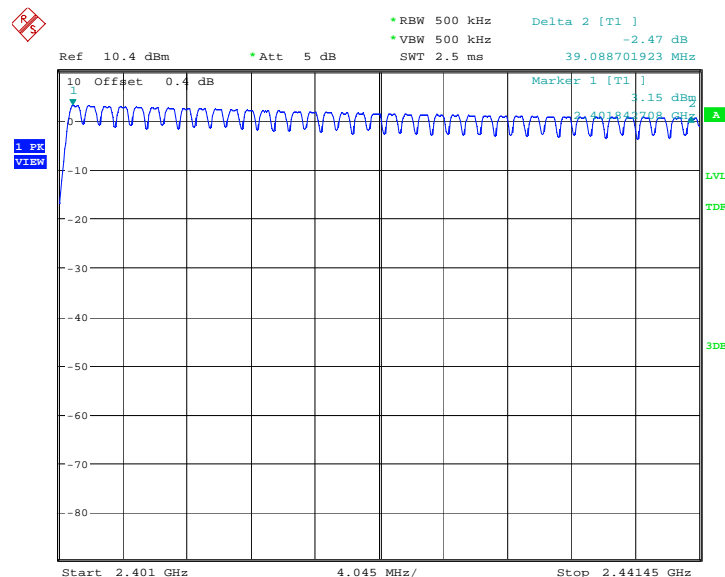
Channel	Number of hopping channels	Conclusion
0~39	Fig.126	79 P
40~78	Fig.127	

**For 8DPSK**

Channel	Number of hopping channels	Conclusion
0~39	Fig.128	79 P
40~78	Fig.129	

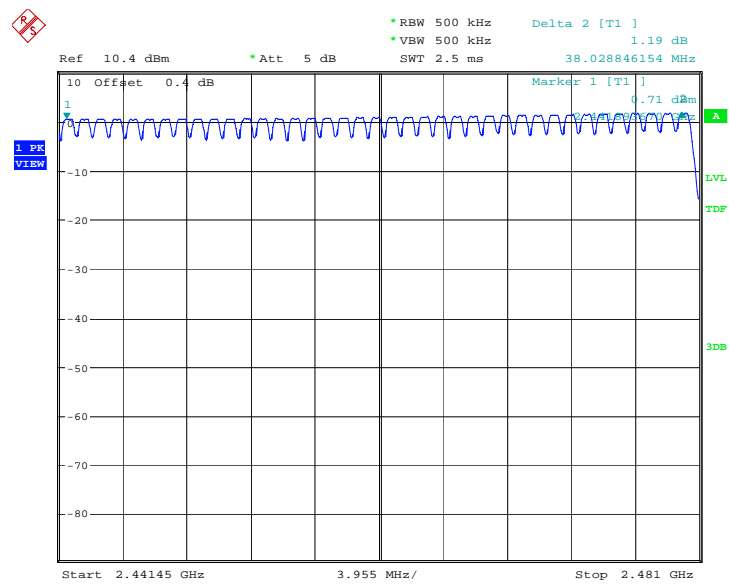
**Conclusion: PASS**

**Test graphs as below:**



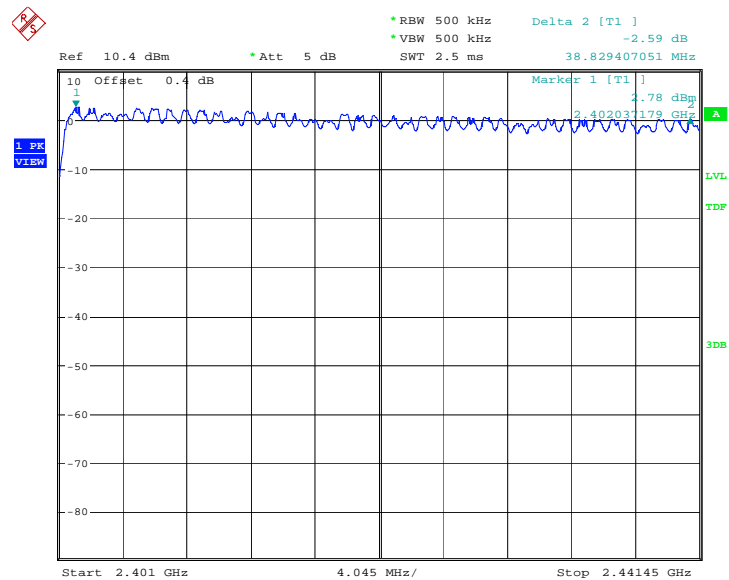
Date: 27.NOV.2012 01:57:46

Fig.124. Number of hopping frequencies: GFSK, Channel 0 - 39



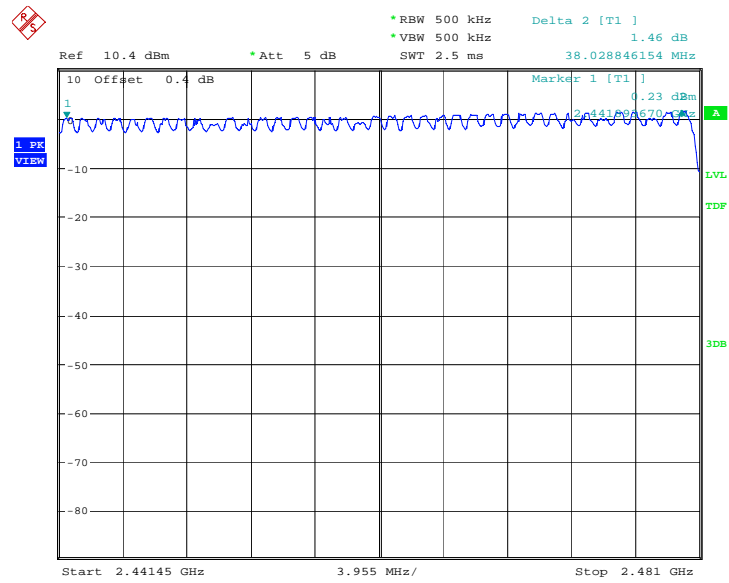
Date: 27.NOV.2012 01:59:48

Fig.125. Number of hopping frequencies: GFSK, Channel 40 - 78



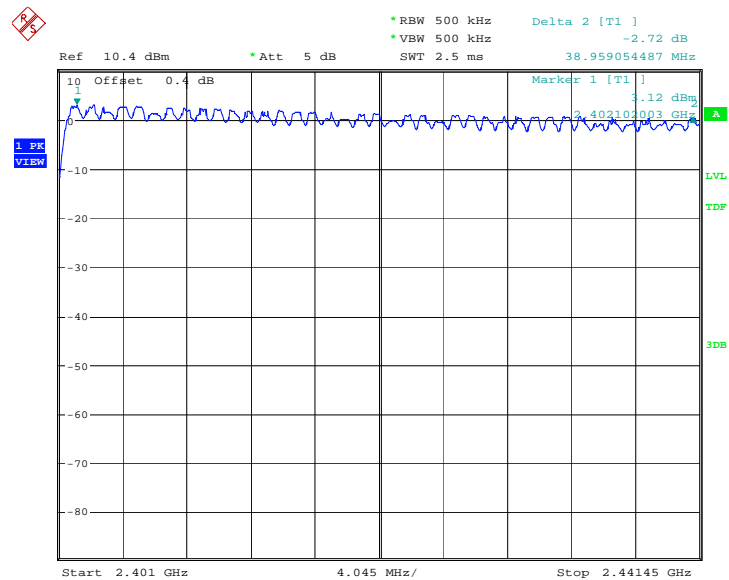
Date: 27.NOV.2012 02:19:47

Fig.126. Number of hopping frequencies:  $\pi/4$  DQPSK, Channel 0 - 39



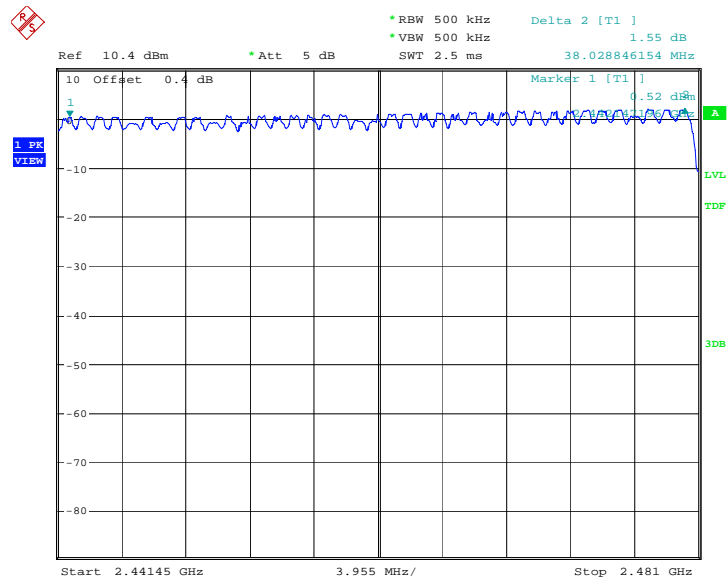
Date: 27.NOV.2012 02:21:50

Fig.127. Number of hopping frequencies:  $\pi/4$  DQPSK, Channel 40 - 78



Date: 27.NOV.2012 02:41:54

Fig.128. Number of hopping frequencies: 8DPSK, Channel 0 - 39



Date: 27.NOV.2012 02:43:57

Fig.129. Number of hopping frequencies: 8DPSK, Channel 40 - 78

### A.10. AC Powerline Conducted Emission

#### Test Condition

Voltage (V)	Frequency (Hz)
120	60

#### Measurement Result and limit:

##### Bluetooth (Quasi-peak Limit)

Frequency range (MHz)	Quasi-peak Limit (dB $\mu$ V)	Conclusion
0.15 to 0.5	66 o 56	P
0.5 to 5	56	
5 to 30	60	

##### Bluetooth (Average Limit)

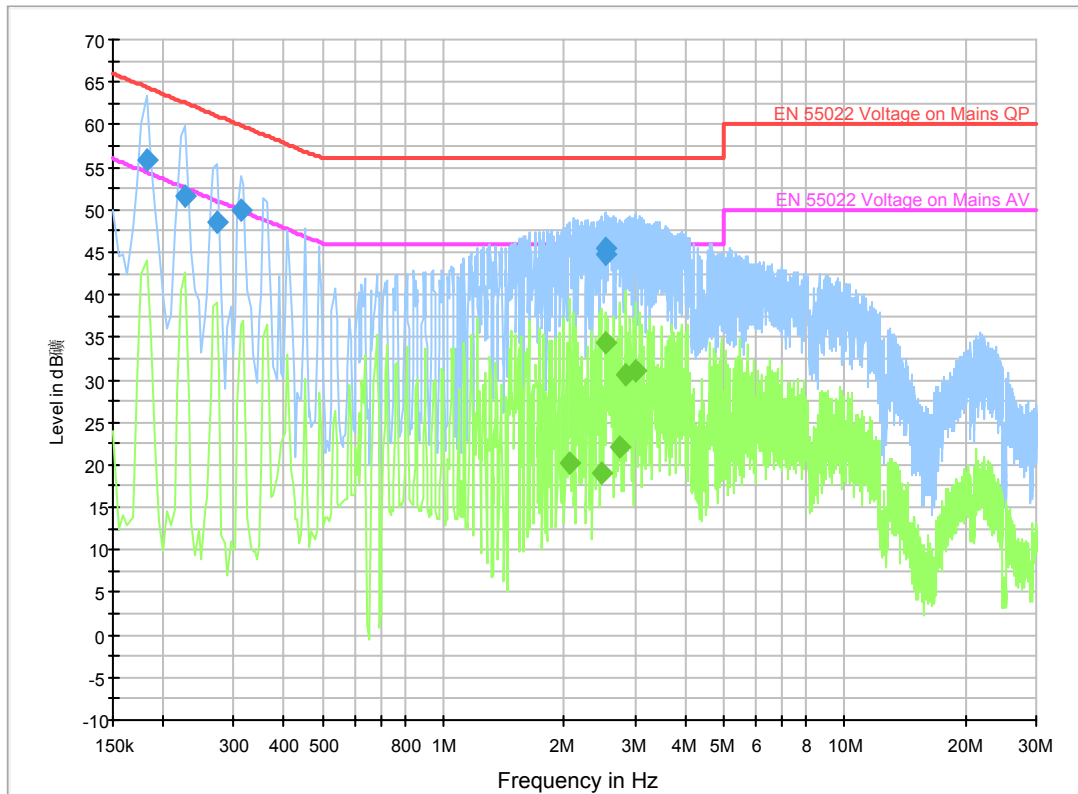
Frequency range (MHz)	Average Limit (dB $\mu$ V)	Conclusion
0.15 to 0.5	56 to 46	P
0.5 to 5	46	
5 to 30	50	

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

**Conclusion: PASS**

**Test graphs as below:**



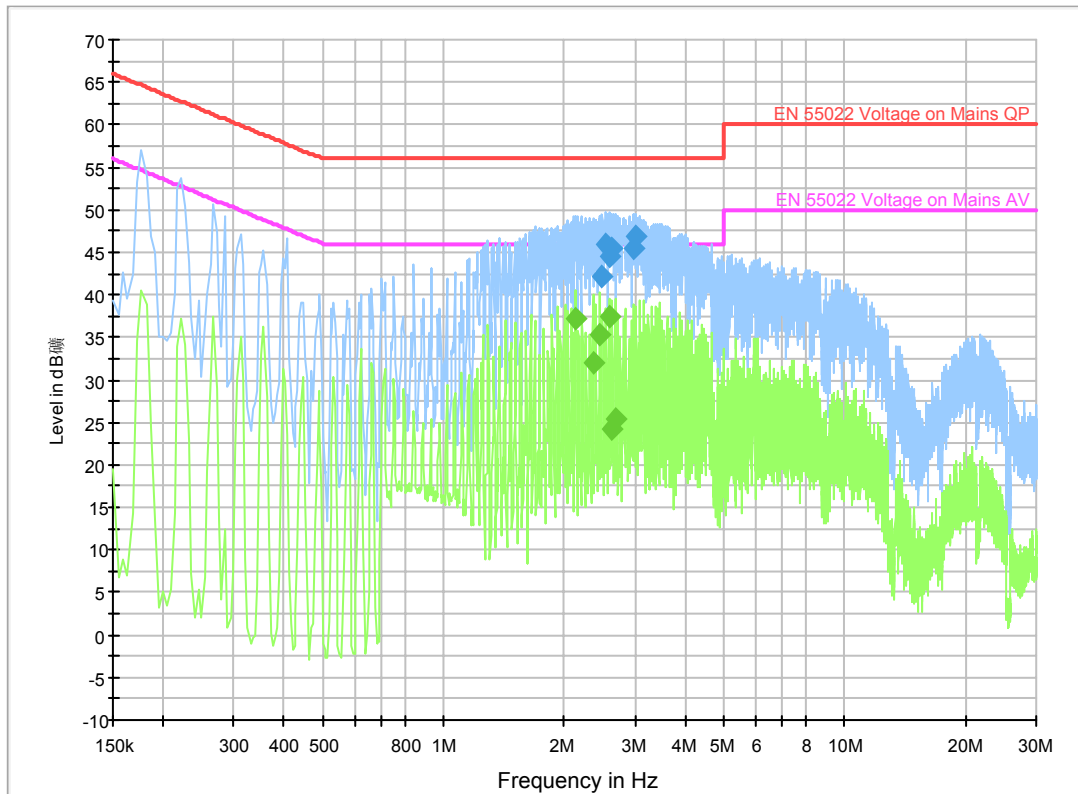


### Final Result 1

Frequency (MHz)	QuasiPeak (dBµV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.181500	55.9	GND	N	10.0	8.5	64.4
0.226500	51.7	GND	N	10.0	10.9	62.6
0.271500	48.4	GND	N	10.0	12.6	61.1
0.312000	49.8	GND	N	10.0	10.1	59.9
2.521500	44.7	GND	L1	10.0	11.3	56.0
2.539500	45.4	GND	L1	10.0	10.6	56.0

### Final Result 2

Frequency (MHz)	Average (dBµV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
2.071500	20.2	GND	L1	10.0	25.8	46.0
2.467500	19.1	GND	L1	10.0	26.9	46.0
2.539500	34.4	GND	L1	10.0	11.6	46.0
2.746500	22.2	GND	L1	10.0	23.8	46.0
2.845500	30.5	GND	L1	10.0	15.5	46.0
3.021000	31.2	GND	L1	10.0	14.8	46.0

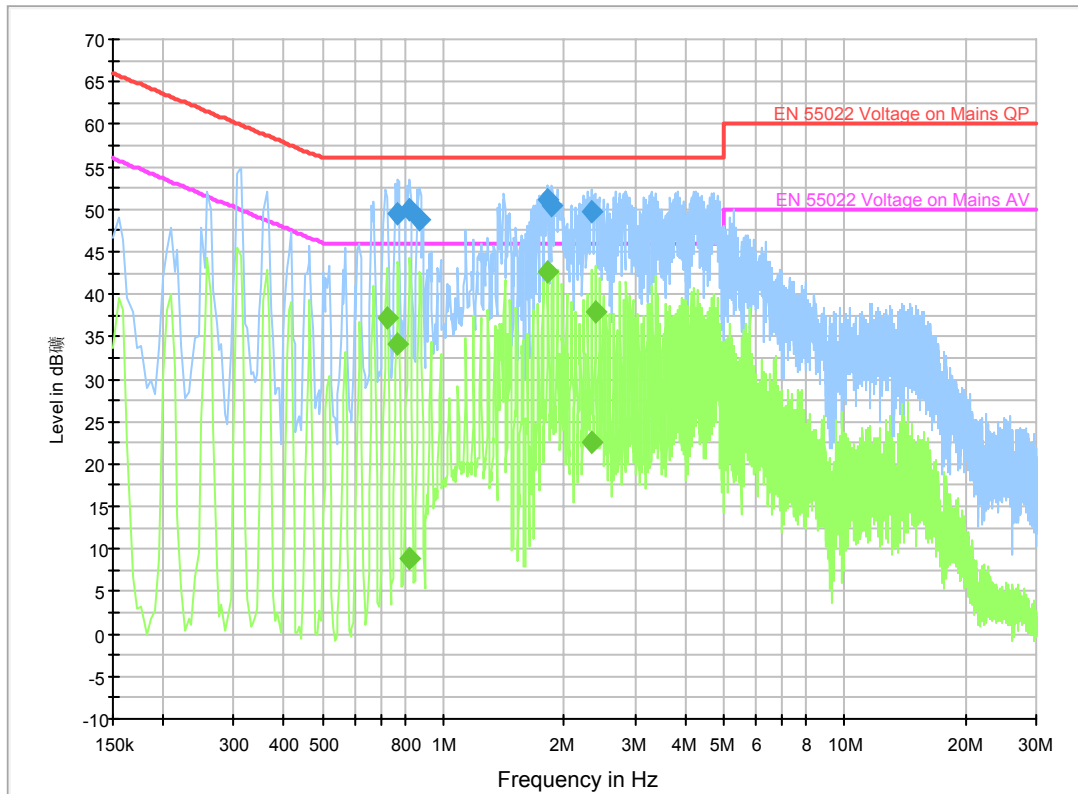


### Final Result 1

Frequency (MHz)	QuasiPeak (dBµV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
2.490000	42.1	GND	L1	10.0	13.9	56.0
2.530500	45.8	GND	L1	10.0	10.2	56.0
2.580000	44.6	GND	L1	10.0	11.4	56.0
2.629500	45.5	GND	L1	10.0	10.5	56.0
2.980500	45.5	GND	L1	10.0	10.5	56.0
3.021000	46.9	GND	L1	10.0	9.1	56.0

### Final Result 2

Frequency (MHz)	Average (dBµV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
2.130000	37.1	GND	L1	10.0	8.9	46.0
2.355000	32.0	GND	L1	10.0	14.0	46.0
2.445000	35.3	GND	L1	10.0	10.7	46.0
2.580000	37.5	GND	L1	10.0	8.5	46.0
2.629500	24.2	GND	L1	10.0	21.8	46.0
2.670000	25.3	GND	L1	10.0	20.7	46.0

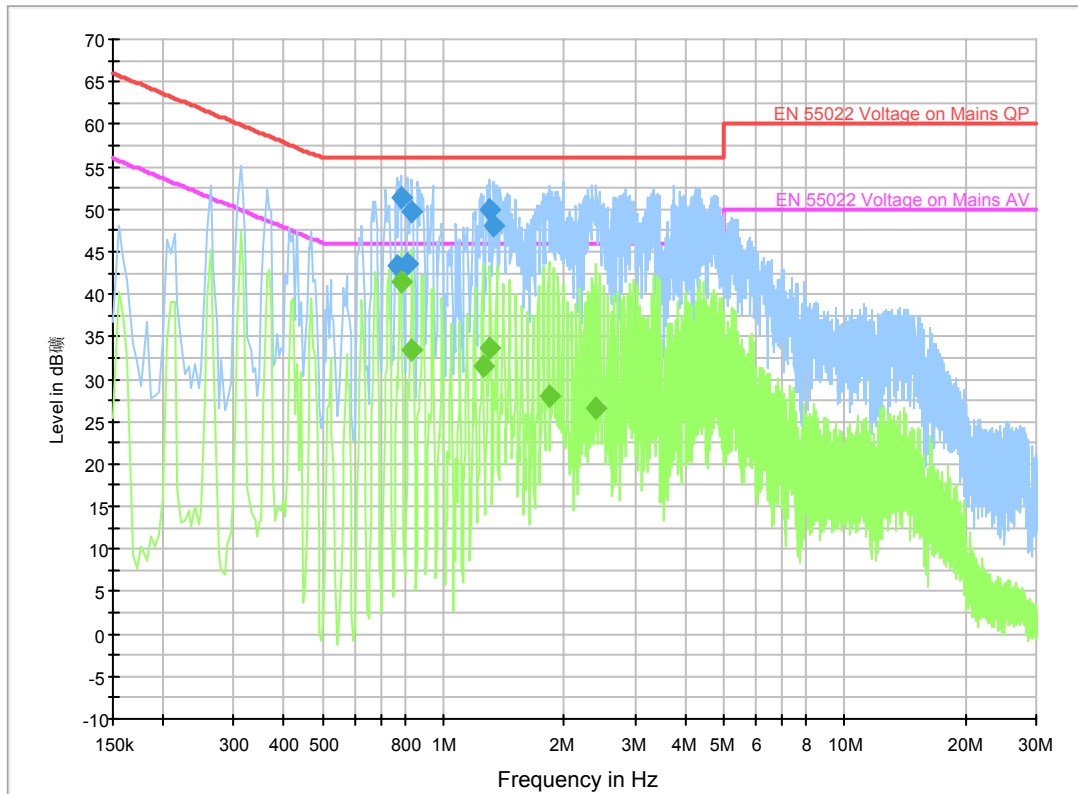


### Final Result 1

Frequency (MHz)	QuasiPeak (dBµV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.771000	49.6	GND	L1	10.0	6.4	56.0
0.825000	49.9	GND	L1	10.0	6.1	56.0
0.874500	48.7	GND	L1	10.0	7.3	56.0
1.819500	51.0	GND	L1	10.0	5.0	56.0
1.869000	50.5	GND	L1	10.0	5.5	56.0
2.337000	49.6	GND	L1	10.0	6.4	56.0

### Final Result 2

Frequency (MHz)	Average (dBµV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.721500	37.2	GND	L1	10.0	8.8	46.0
0.771000	34.1	GND	L1	10.0	11.9	46.0
0.825000	8.9	GND	L1	10.0	37.1	46.0
1.819500	42.6	GND	L1	10.0	3.4	46.0
2.341500	22.6	GND	L1	10.0	23.4	46.0
2.391000	37.9	GND	L1	10.0	8.1	46.0



### Final Result 1

Frequency (MHz)	QuasiPeak (dBµV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.766500	43.4	GND	L1	10.0	12.6	56.0
0.784500	51.4	GND	L1	10.0	4.6	56.0
0.816000	43.6	GND	L1	10.0	12.4	56.0
0.834000	49.8	GND	L1	10.0	6.2	56.0
1.306500	49.9	GND	L1	10.0	6.1	56.0
1.338000	48.2	GND	L1	10.0	7.8	56.0

### Final Result 2

Frequency (MHz)	Average (dBµV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.784500	41.5	GND	L1	10.0	4.5	46.0
0.834000	33.5	GND	L1	10.0	12.5	46.0
1.252500	31.5	GND	L1	10.0	14.5	46.0
1.306500	33.8	GND	L1	10.0	12.2	46.0
1.828500	28.1	GND	L1	10.0	17.9	46.0
2.404500	26.7	GND	L1	10.0	19.3	46.0

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