



# TEST REPORT

**No. 2014RFB0008**

***For***

**Client : Haier Telecom(Qingdao) Co.,Ltd.**

**Production : WCDMA/GSM Dual-Mode Digital**

**Mobile Phone**

**Model Name : W867**

**Hardware Version: W83\_MB\_B**

**Software Version: Haier\_W867\_W83B\_M00\_S09\_131114**

**FCC ID: SG71401W867**

**Issued date: 2014-02-24**



**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

Add: 7F, G Area, No.668, Beijing East Road, Huangpu District, Shanghai, P. R. China

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## **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 W867 , supporting BT, manufactured by Haier Telecom(Qingdao) Co.,Ltd. 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 Test Laboratory

### 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: 86-21-63843300  
Fax: 86-21-63843301  
FCC Registration NO.: 489729

### 1.3.2. Testing Environment

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

### 1.3.3. Project data

Project Leader: Gong Yajuan  
Testing Start Date: 01-20, 2014  
Testing End Date: 02-20, 2014

### 1.3.4. Signature

Wang Daming

(Prepared this test report)

Liu Jianquan

(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: Haier Telecom(Qingdao) Co.,Ltd.  
Address /Post: No.1, Haier Road,Haier information Property  
Zone,Qingdao,P.R.China  
Tel: (+86)0532-88936599-226  
Country: China

### 1.4.2. Manufacturer Information

Company Name: Haier Telecom(Qingdao) Co.,Ltd.  
Address /Post: No.1,Haier Road,Haier information Property  
Zone,Qingdao,P.R.China  
Tel: (+86)0532-88936599-226  
Country: China

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

### 2.1. About EUT

EUT Description	WCDMA/GSM Dual-Mode Digital Mobile Phone
Model name	W867
Bluetooth Frequency	2402MHz-2480MHz
Bluetooth Channel	Channel0-Channel78
Bluetooth Modulation	GMSK; $\pi/4$ DQPSK;8DPSK
Nominal Voltage	3.8V
Extreme High Voltage	4.2V
Extreme Low Voltage	3.6V

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
N02	863098020002317	W83_MB_B	Haier_W867_W83B_ M00_S09_131114	2014-01-20

\*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	
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.	
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	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

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	3.8V
Humidity	Hnom	32%
Air Pressure	Anom	1010hPa

**Note:**

- All the test data for each data were verified, but only the worst case was reported.
- The GFSK,  $\pi/4$  DQPSK and 8DPSK were set in DH1 for GFSK, 2-DH1 for  $\pi/4$  DQPSK, 3-DH1 for 8DPSK.
- The DC and low frequency voltages' measurement uncertainty is  $\pm 2\%$ .



## 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)	4.091	4.297	3.634	P
	Fig.1	Fig.2	Fig.3	

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

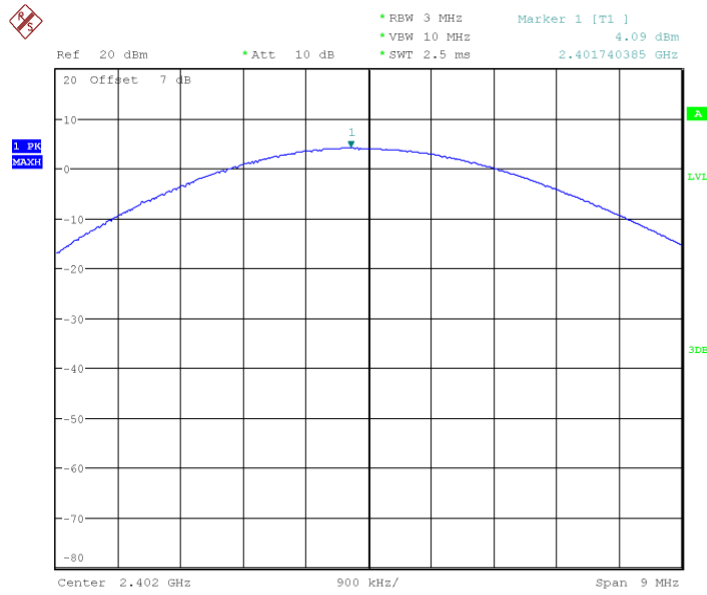
Channel	Ch0 2402 MHz	Ch39 2441 MHz	CH78 2480 MHz	Conclusion
Peak Conducted Output Power (dBm)	3.283	3.428	2.68	P
	Fig.4	Fig.5	Fig.6	

##### For 8DPSK

Channel	Ch0 2402 MHz	Ch39 2441 MHz	CH78 2480 MHz	Conclusion
Peak Conducted Output Power (dBm)	3.283	3.435	2.672	P
	Fig.7	Fig.8	Fig.9	

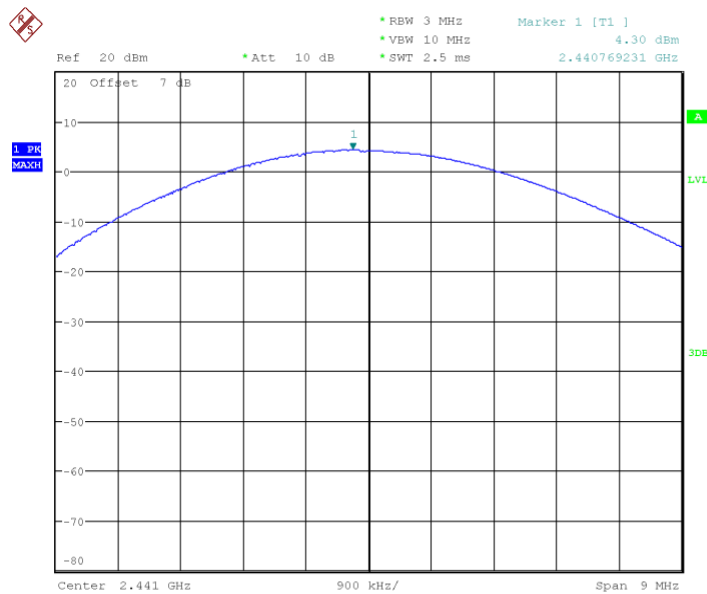
**Conclusion: PASS**

**Test graphs an below**



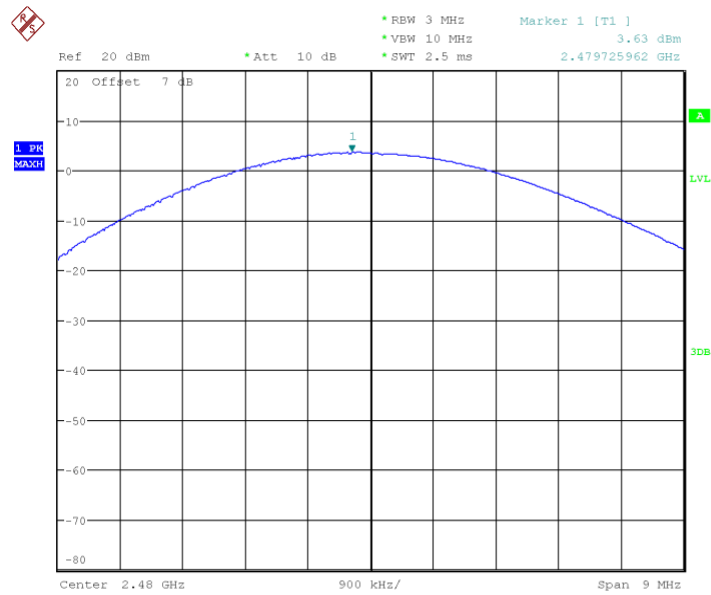
Date: 10.FEB.2014 10:38:54

Fig.1 Peak Conducted Output Power CH0, DH1



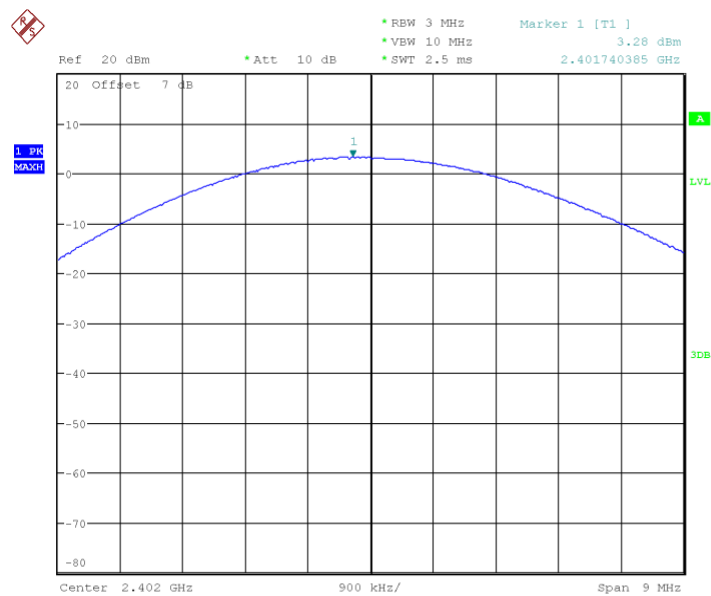
Date: 10.FEB.2014 10:39:06

Fig.2 Peak Conducted Output Power CH39, DH1



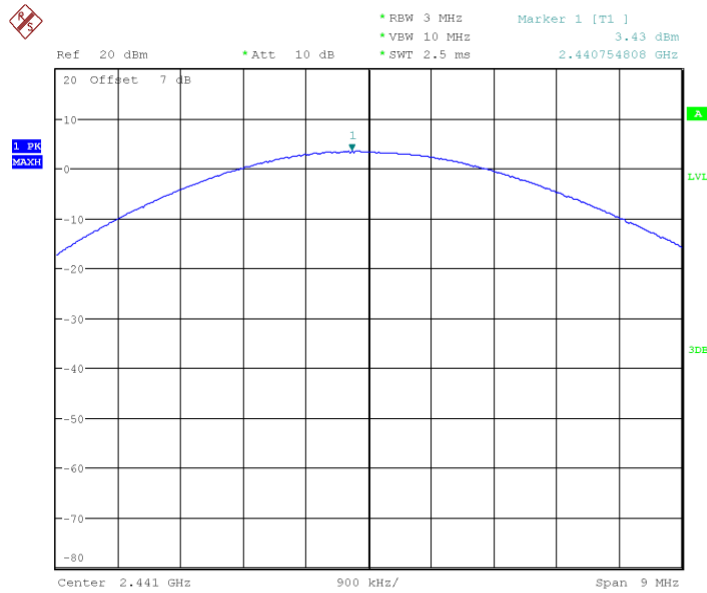
Date: 10.FEB.2014 10:39:18

Fig.3 Peak Conducted Output Power CH78, DH1



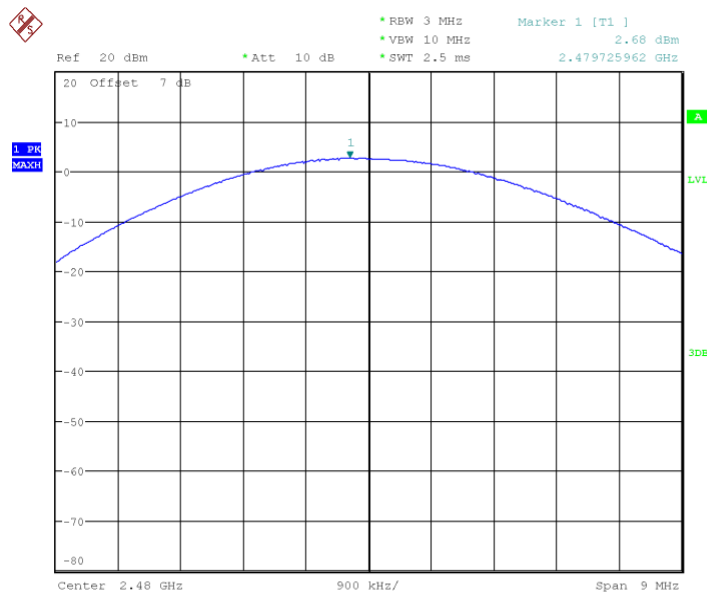
Date: 10.FEB.2014 10:39:29

Fig.4 Peak Conducted Output Power CH0, 2DH1



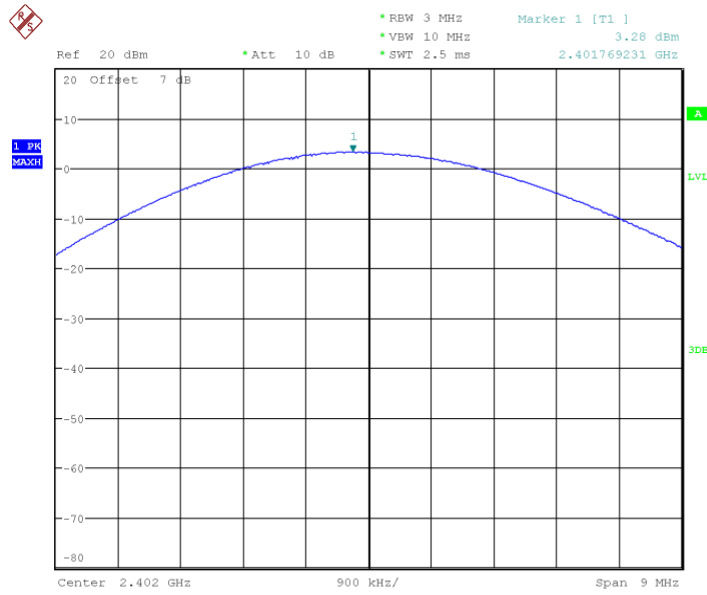
Date: 10.FEB.2014 10:39:41

Fig.5 Peak Conducted Output Power CH39, 2DH1



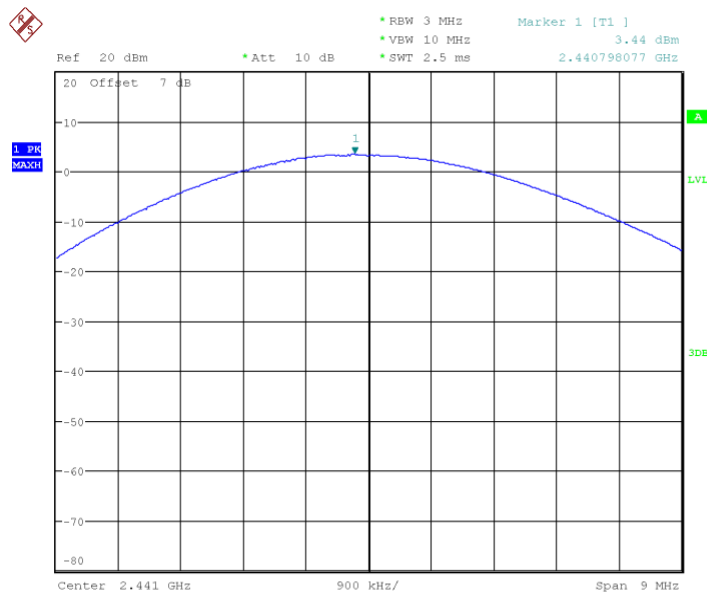
Date: 10.FEB.2014 10:39:53

Fig.6 Peak Conducted Output Power CH78, 2DH1



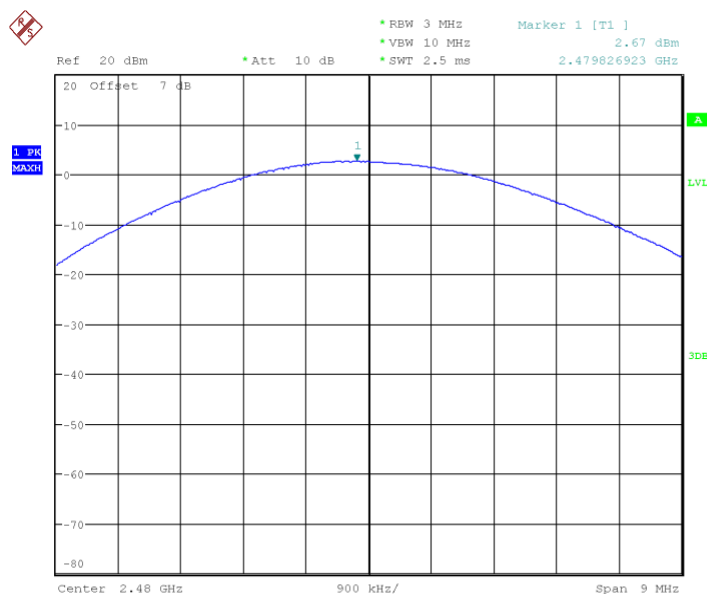
Date: 10.FEB.2014 10:40:04

Fig.7 Peak Conducted Output Power CH0, 3DH1



Date: 10.FEB.2014 10:40:16

Fig.8 Peak Conducted Output Power CH39, 3DH1



Date: 10.FEB.2014 10:40:28

Fig.9 Peak Conducted Output Power CH78, 3DH1

## 5.2. Frequency Band Edges-Conducted

Measurement result:

For GFSK

Channel	Hopping	Band Edge Power (dBc)		Conclusion
0	Hopping OFF	Fig.10	-52.267	P
	Hopping ON	Fig.11	-52.337	P
78	Hopping OFF	Fig.12	-53.062	P
	Hopping ON	Fig.13	-54.274	P

For  $\pi/4$  DQPSK

Channel	Hopping	Band Edge Power (dBc)		Conclusion
0	Hopping OFF	Fig.14	-52.289	P
	Hopping ON	Fig.15	-53.55	P
78	Hopping OFF	Fig.16	-60.603	P
	Hopping ON	Fig.17	-61.301	P

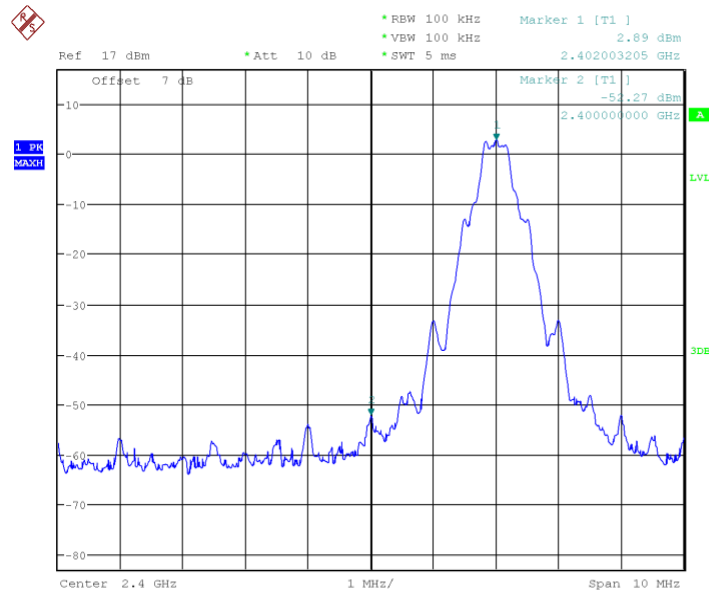
For 8DPSK

Channel	Hopping	Band Edge Power (dBc)		Conclusion
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0	Hopping OFF	Fig.18	-59.957	P
	Hopping ON	Fig.19	-60.945	P
78	Hopping OFF	Fig.20	-59.816	P
	Hopping ON	Fig.21	-61.602	P

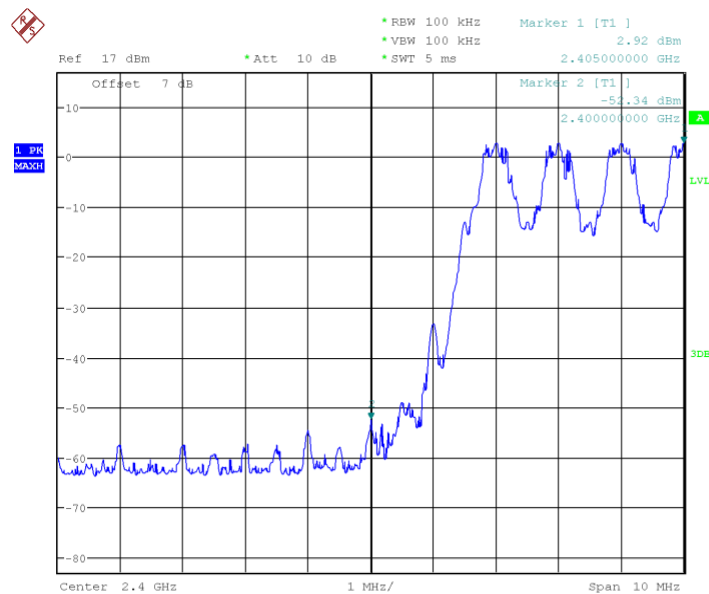
Conclusion: PASS

Test graphs an below



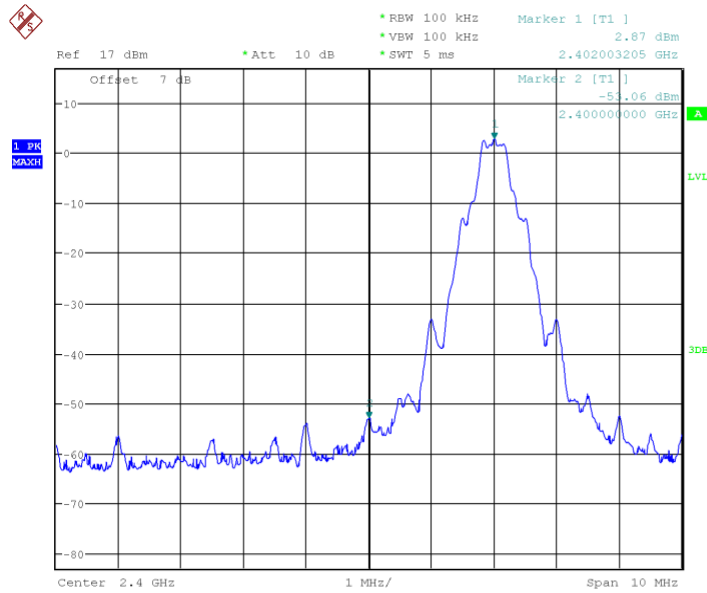
Date: 10.FEB.2014 10:41:33

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



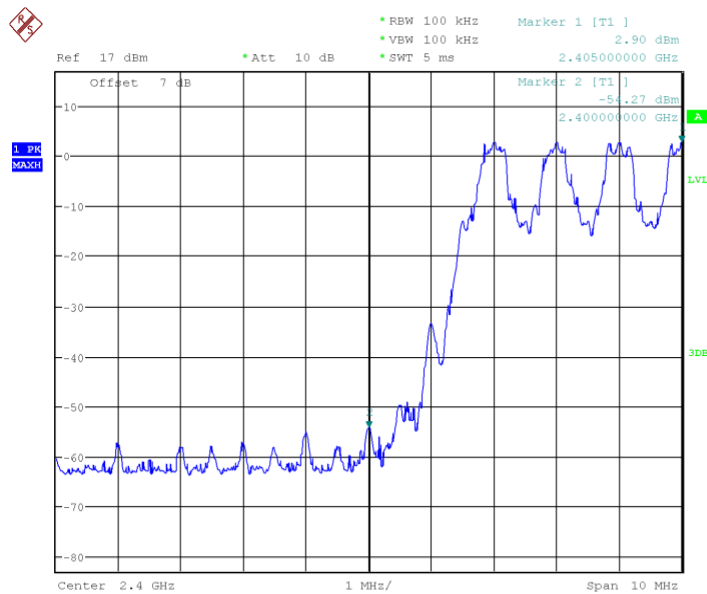
Date: 10.FEB.2014 10:43:37

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



Date: 10.FEB.2014 10:44:11

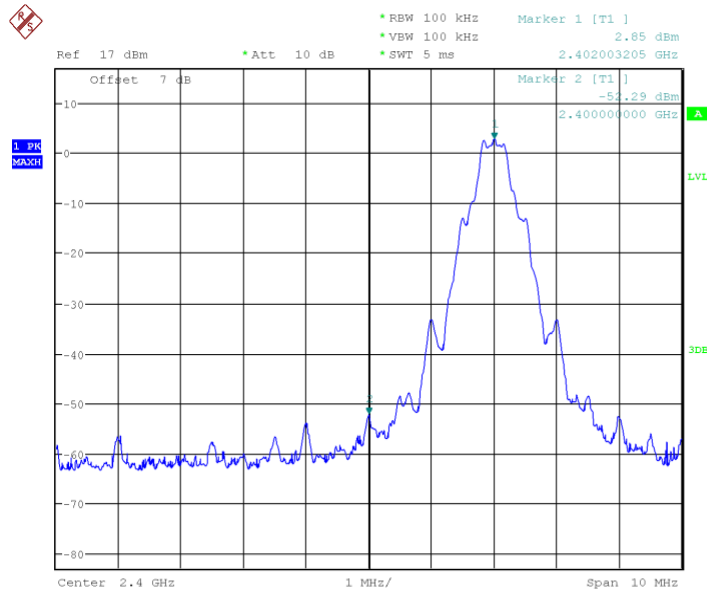
Fig.12 Frequency Band Edge: GFSK, Ch78, Hopping OFF



Date: 10.FEB.2014 10:46:15

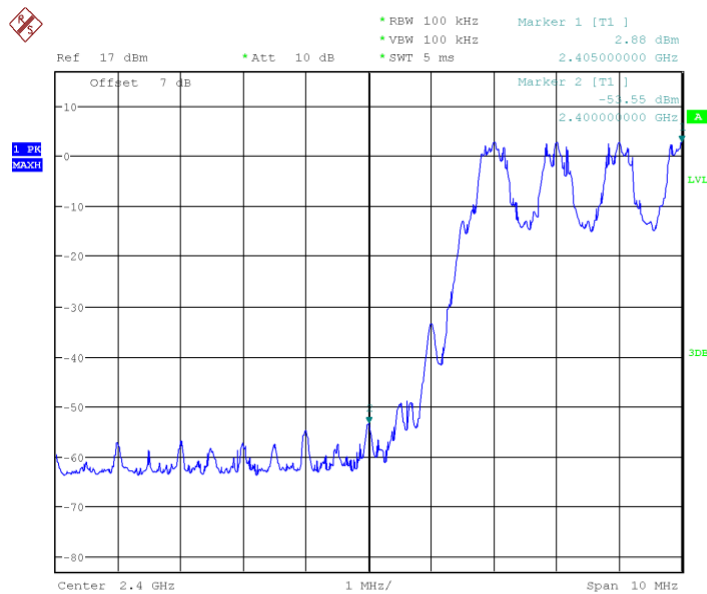
Fig.13 Frequency Band Edge: GFSK, Ch78, Hopping ON





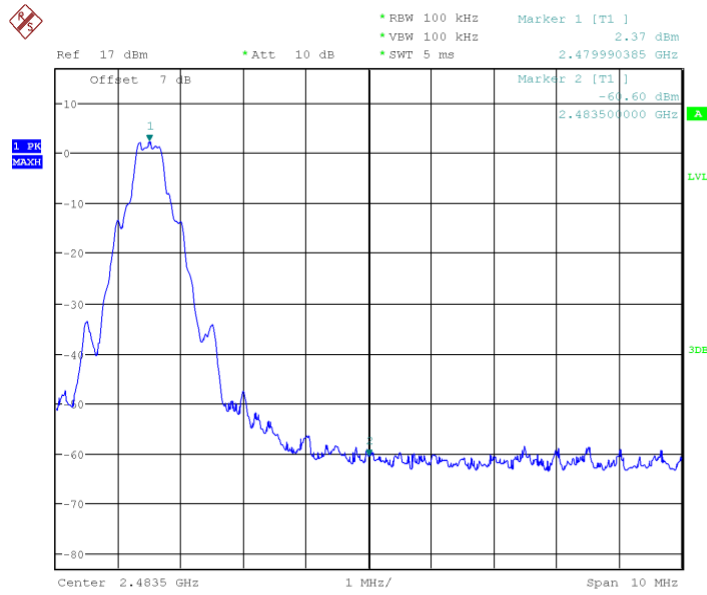
Date: 10.FEB.2014 10:46:49

Fig.14 Frequency Band Edge:  $\pi/4$  DQPSK, Ch0, Hopping OFF



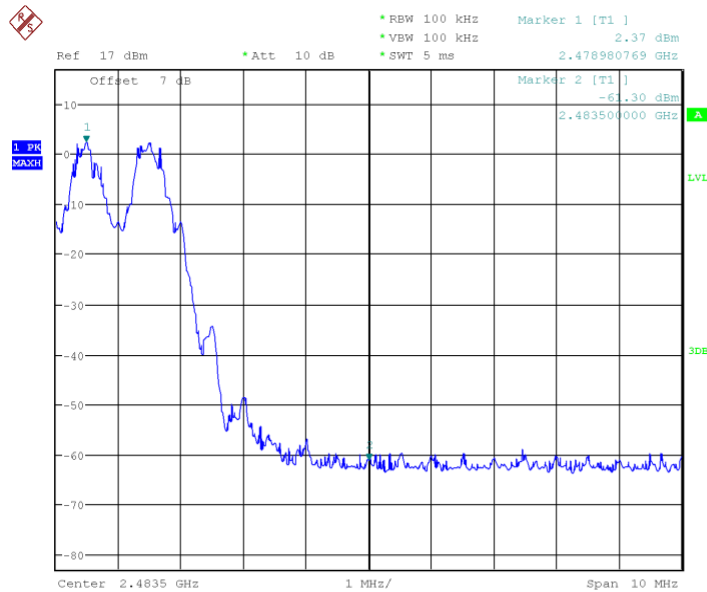
Date: 10.FEB.2014 10:48:53

Fig.15 Frequency Band Edge:  $\pi/4$  DQPSK, Ch0, Hopping ON



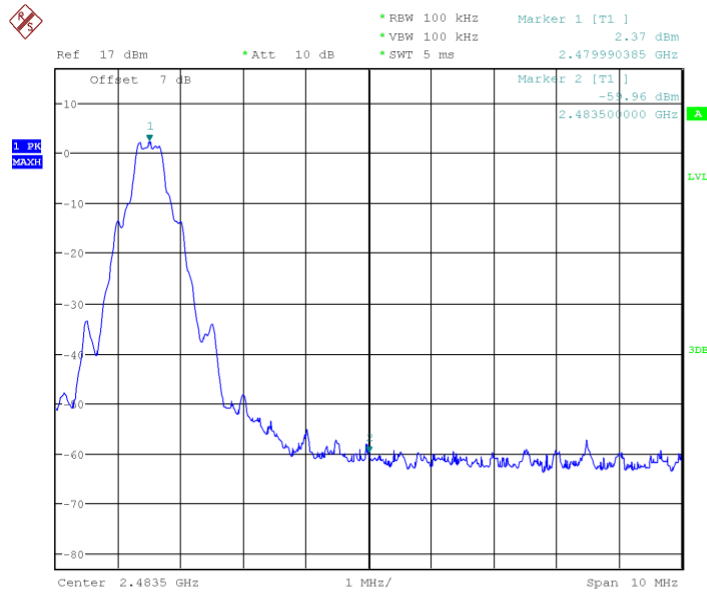
Date: 10.FEB.2014 10:49:28

Fig.16 Frequency Band Edge:  $\pi/4$  DQPSK, Ch78, Hopping OFF



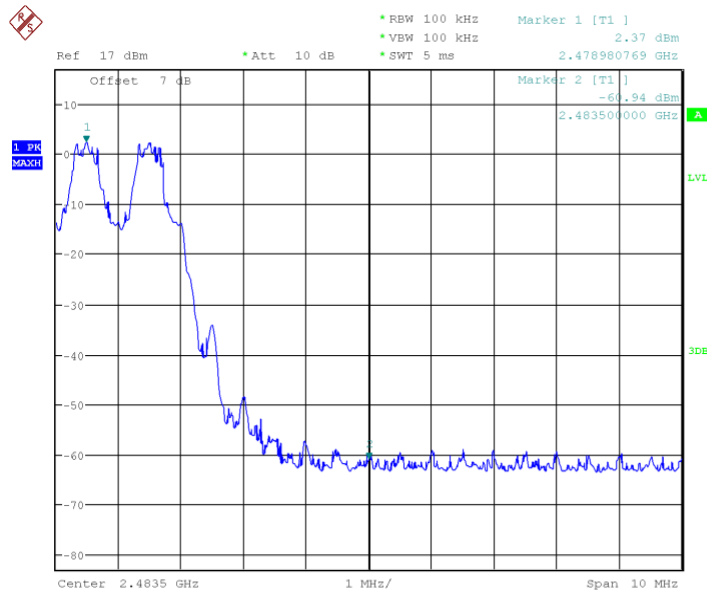
Date: 10.FEB.2014 10:51:32

Fig.17 Frequency Band Edge:  $\pi/4$  DQPSK, Ch78, Hopping ON



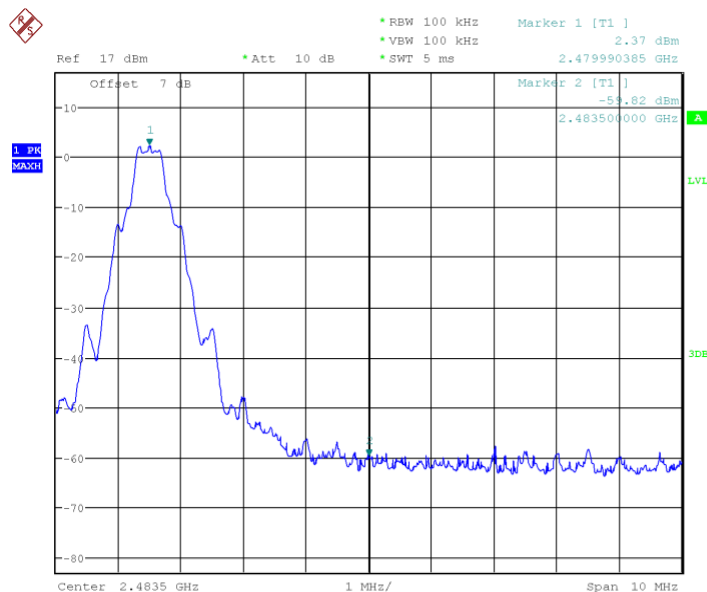
Date: 10.FEB.2014 10:52:06

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



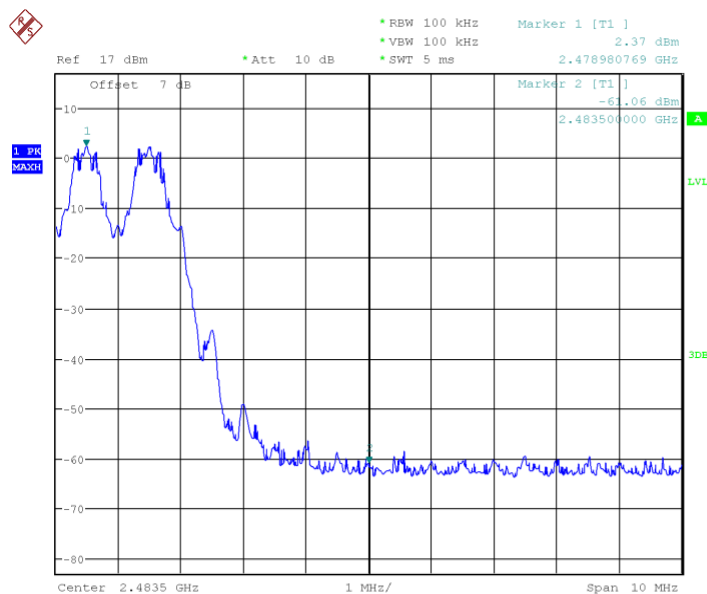
Date: 10.FEB.2014 10:54:10

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



Date: 10.FEB.2014 10:54:45

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



Date: 10.FEB.2014 10:56:48

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
<b>Ch0 2402MHz</b>	Center Freq.	Fig.22	P
	30MHz~26GHz	Fig.23	P
<b>Ch39 2441MHz</b>	Center Freq.	Fig.24	P
	30MHz~26GHz	Fig.25	P
<b>Ch78 2480MHz</b>	Center Freq.	Fig.26	P
	30MHz~26GHz	Fig.27	P

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

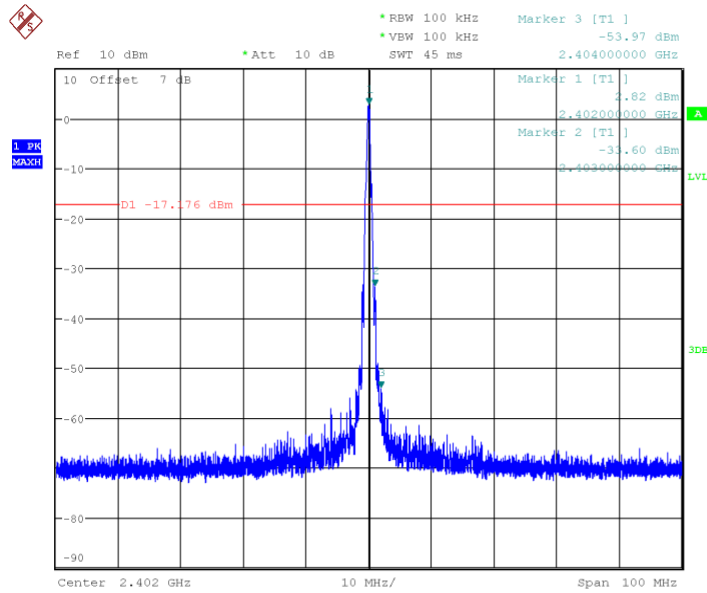
Channel	Frequency Range	Test Results	Conclusion
<b>Ch0 2402MHz</b>	Center Freq.	Fig.28	P
	30MHz~26GHz	Fig.29	P
<b>Ch39 2441MHz</b>	Center Freq.	Fig.30	P
	30MHz~26GHz	Fig.31	P
<b>Ch78 2480MHz</b>	Center Freq.	Fig.32	P
	30MHz~26GHz	Fig.33	P

**For 8DPSK**

Channel	Frequency Range	Test Results	Conclusion
<b>Ch0 2402MHz</b>	Center Freq.	Fig.34	P
	30MHz~26GHz	Fig.35	P
<b>Ch39 2441MHz</b>	Center Freq.	Fig.36	P
	30MHz~26GHz	Fig.37	P
<b>Ch78 2480MHz</b>	Center Freq.	Fig.38	P
	30MHz~26GHz	Fig.39	P

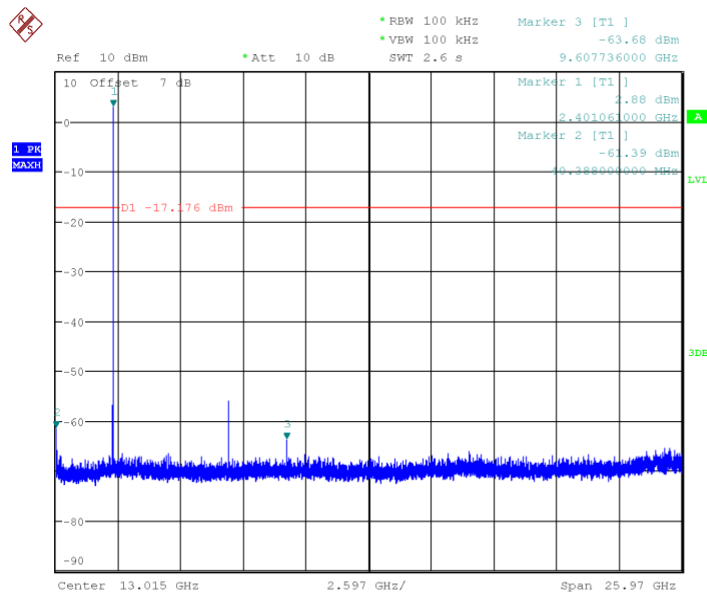
**Conclusion: PASS**

Test graphs as below



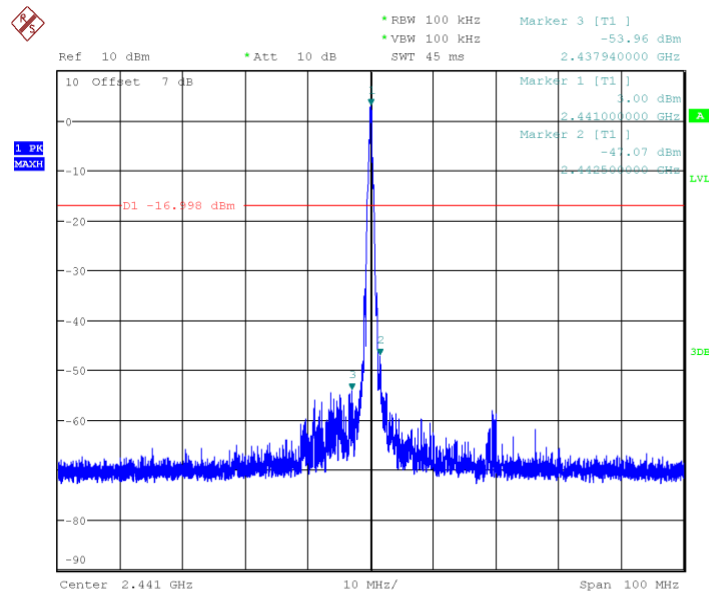
Date: 10.FEB.2014 10:57:40

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



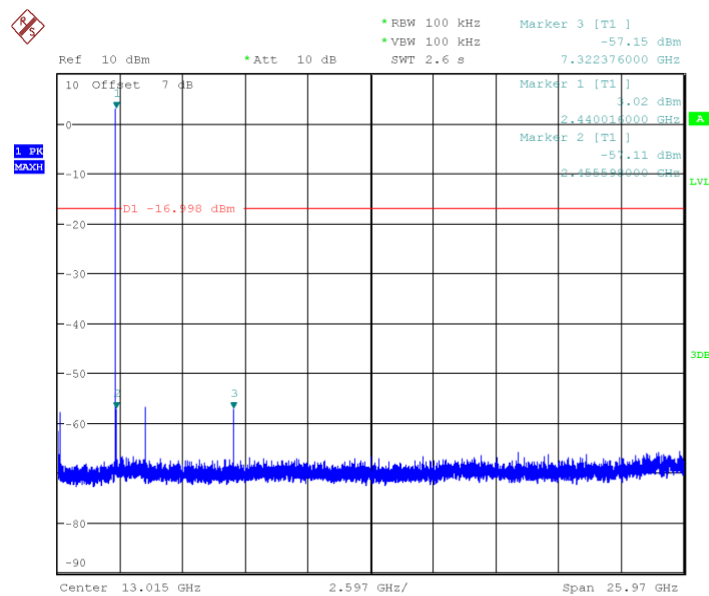
Date: 10.FEB.2014 10:58:02

Fig.23 Conducted spurious emission: GFSK, Ch0, 30MHz~26GHz



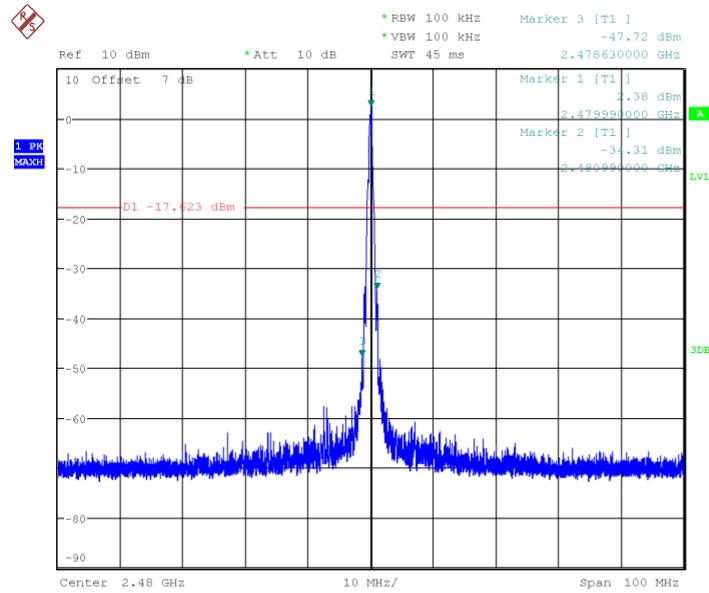
Date: 10.FEB.2014 10:58:26

Fig.24 Conducted spurious emission: GFSK, Ch39, 2441MHz



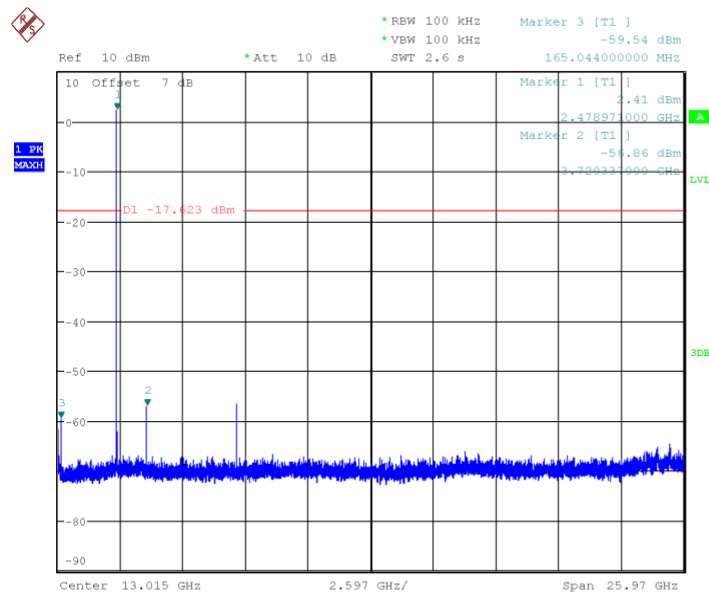
Date: 10.FEB.2014 10:58:49

Fig.25 Conducted spurious emission: GFSK, Ch39, 30MHz~26GHz



Date: 10.FEB.2014 10:59:13

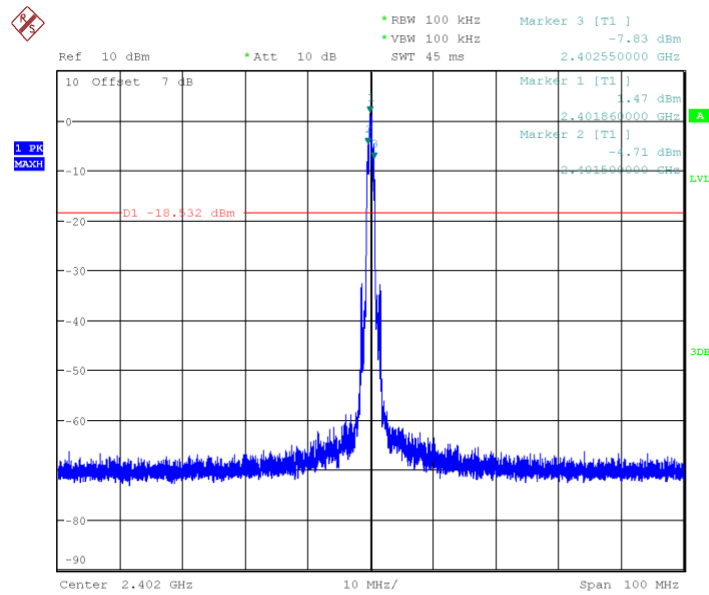
Fig.26 Conducted spurious emission: GFSK, Ch78, 2480MHz



Date: 10.FEB.2014 10:59:35

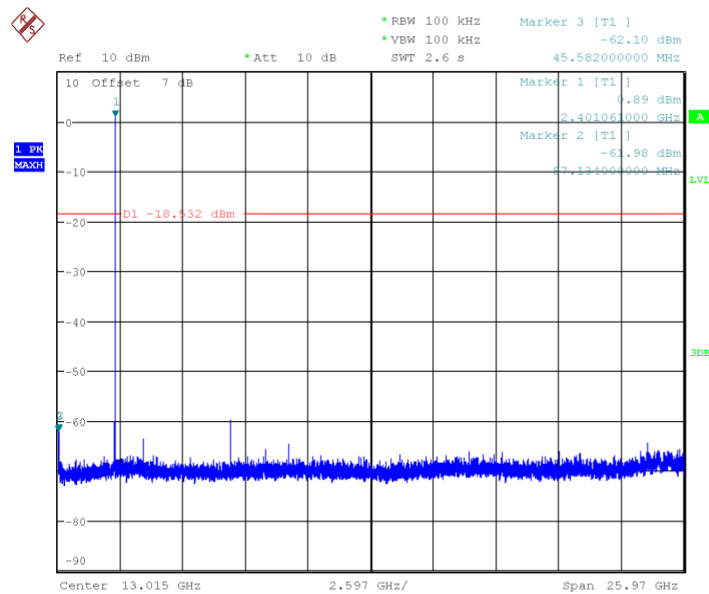
Fig.27 Conducted spurious emission: GFSK, Ch78, 30MHz~26GHz





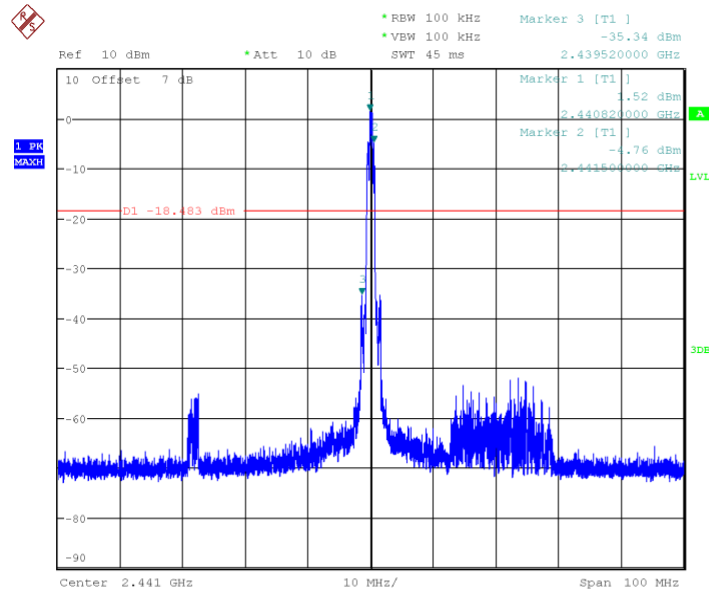
Date: 10.FEB.2014 10:59:59

Fig.28 Conducted spurious emission:  $\pi/4$  DQPSK, Ch0, 2402MHz



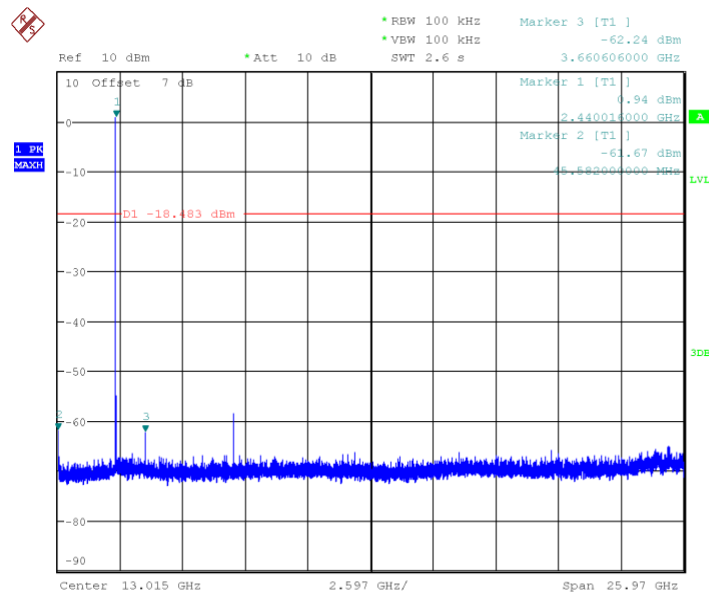
Date: 10.FEB.2014 11:00:22

Fig.29 Conducted spurious emission:  $\pi/4$  DQPSK, Ch0, 30MHz~26GHz



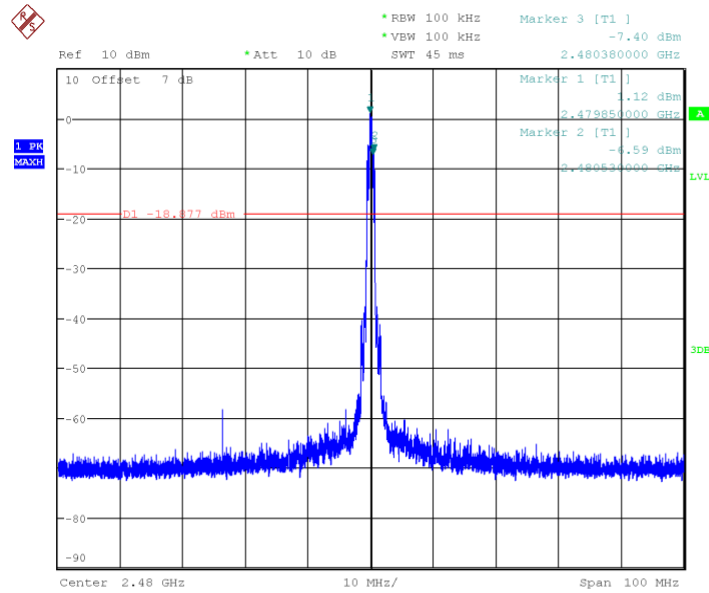
Date: 10.FEB.2014 11:00:46

Fig.30 Conducted spurious emission:  $\pi/4$  DQPSK, Ch39, 2441MHz



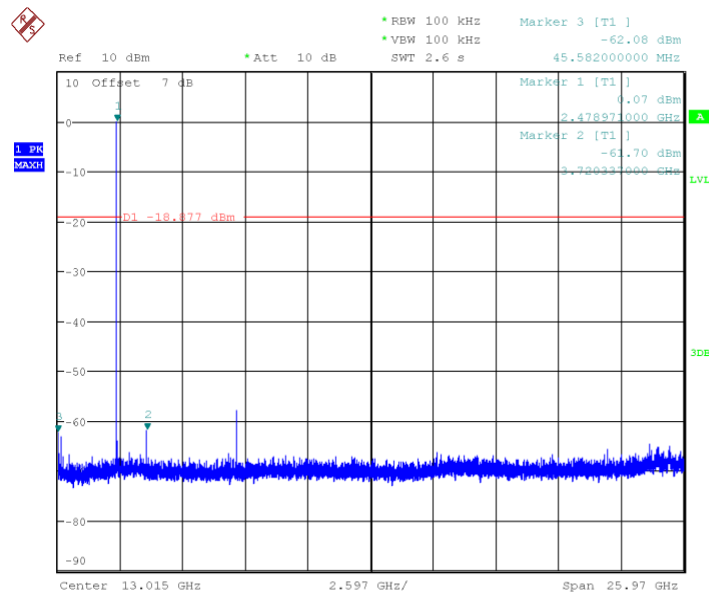
Date: 10.FEB.2014 11:01:08

Fig.31 Conducted spurious emission:  $\pi/4$  DQPSK, Ch39, 30MHz~26GHz



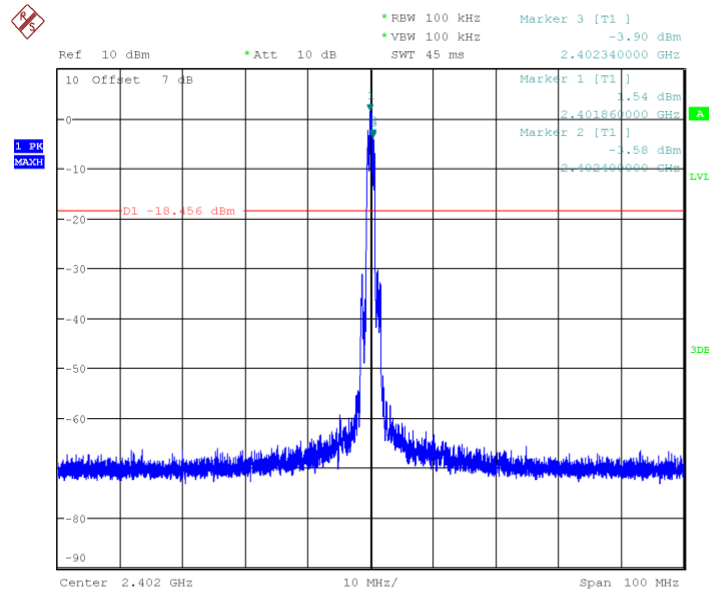
Date: 10.FEB.2014 11:01:32

Fig.32 Conducted spurious emission:  $\pi/4$  DQPSK, Ch78, 2480MHz



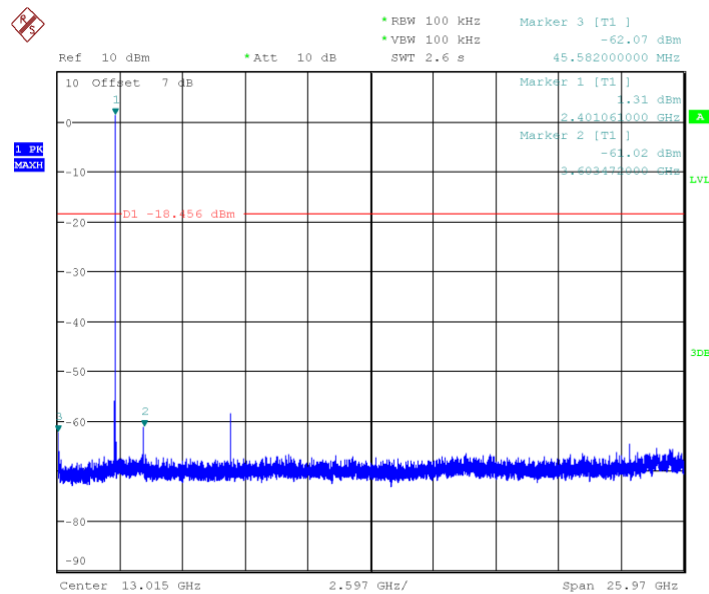
Date: 10.FEB.2014 11:01:54

Fig.33 Conducted spurious emission:  $\pi/4$  DQPSK, Ch78, 30MHz~26GHz



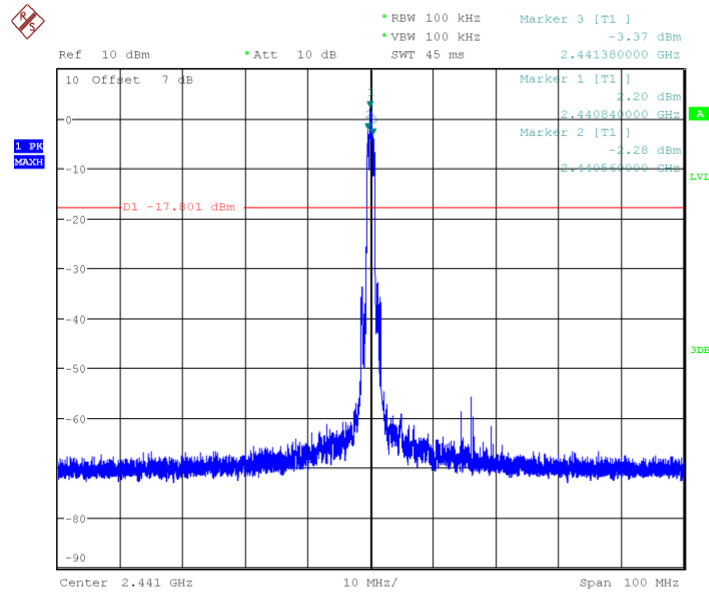
Date: 10.FEB.2014 11:02:19

Fig.34 Conducted spurious emission: 8DPSK, Ch0, 2402MHz



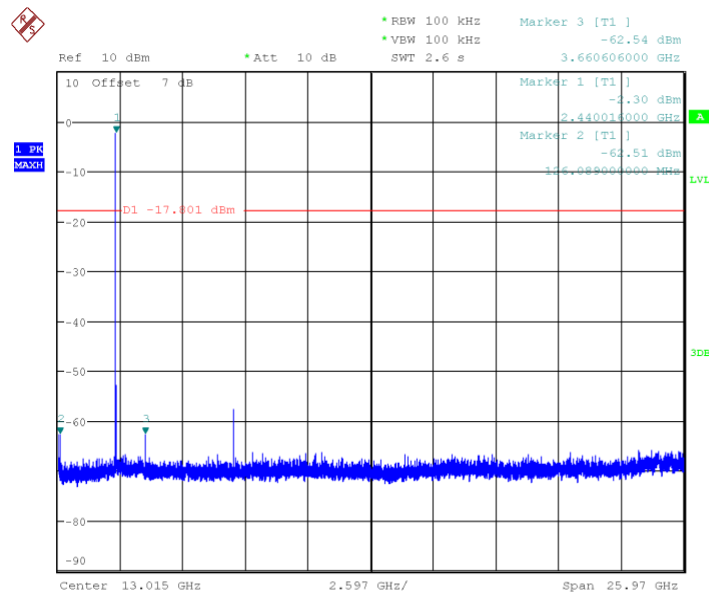
Date: 10.FEB.2014 11:02:41

Fig.35 Conducted spurious emission: 8DPSK, Ch0, 30MHz~26GHz



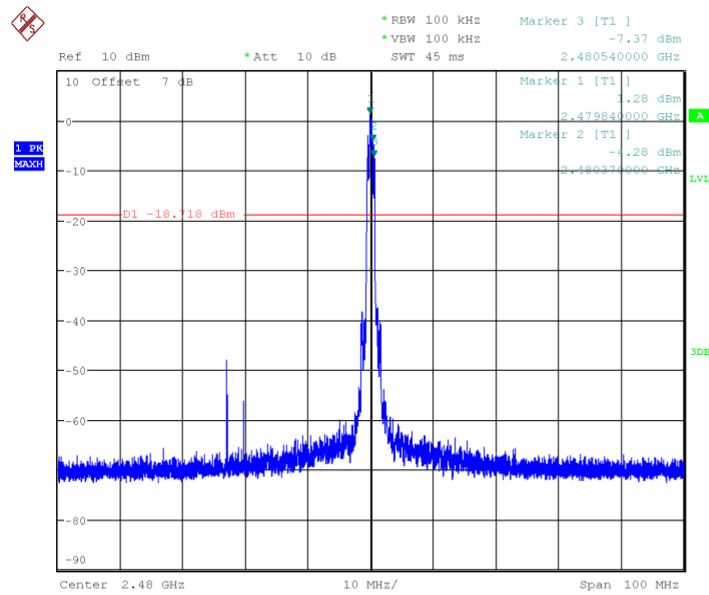
Date: 10.FEB.2014 11:03:05

Fig.36 Conducted spurious emission: 8DPSK, Ch39, 2441MHz



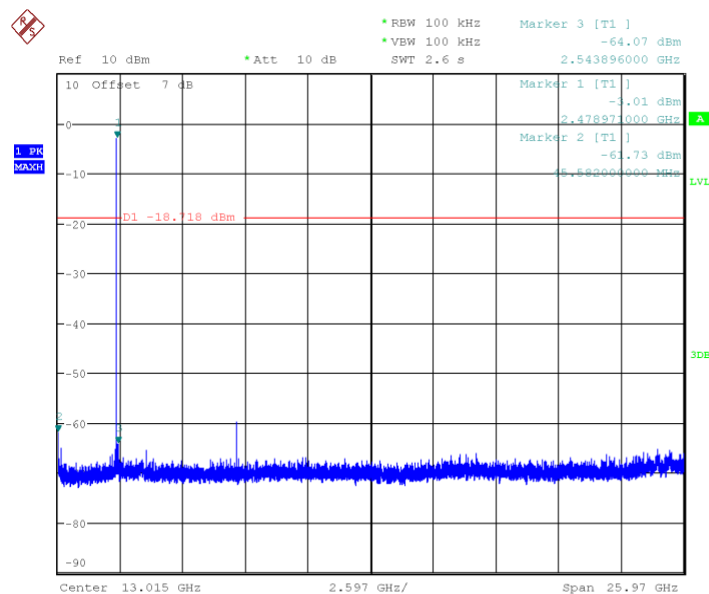
Date: 10.FEB.2014 11:03:27

Fig.37 Conducted spurious emission: 8DPSK, Ch39, 30MHz~26GHz



Date: 10.FEB.2014 11:03:51

Fig.38 Conducted spurious emission: 8DPSK, Ch78, 2480MHz



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Fig.39 Conducted spurious emission: 8DPSK, Ch78, 30MHz~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:

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

**For GFSK**

Channel	Frequency Range	Test Results	Conclusion
Ch0 2402MHz	30MH~1GHz	Fig.40	P
	1GHz~3GHz	Fig.41	P
	3GHz~18GHz	Fig.42	P
Power	2.38GHz~2.4GHz	Fig.43	P
Power	2.45GHz~2.5GHz	Fig.44	P
All channels	18GHz~26GHz	Fig.45	P

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

Channel	Frequency Range	Test Results	Conclusion
Ch0 2402MHz	30MH~1GHz	Fig.46	P
	1GHz~3GHz	Fig.47	P
	3GHz~18GHz	Fig.48	P
Power	2.38GHz~2.4GHz	Fig.49	P
Power	2.45GHz~2.5GHz	Fig.50	P
All channels	18GHz~26GHz	Fig.51	P

**For 8DPSK**

Channel	Frequency Range	Test Results	Conclusion
Ch0 2402MHz	30MH~1GHz	Fig.52	P
	1GHz~3GHz	Fig.53	P
	3GHz~18GHz	Fig.54	P
Power	2.38GHz~2.4GHz	Fig.55	P
Power	2.45GHz~2.5GHz	Fig.56	P
All channels	18GHz~26GHz	Fig.57	P

**GFSK Ch0 30MHz-1GHz**

Frequency(MHz)	Result(dBuV/m)	ARpl (dB)	PMea(dBuV/m)	Polarity
43.799964	29.4	0.61	28.79	V
47.11112	33.7	0.86	32.84	V





50.89618	29.1	1.11	27.99	V
59.249916	27.6	1.36	26.24	V

**GFSK Ch0 1GHz-3GHz**

Frequency(MHz)	Result(dBuV/m)	ARpl (dB)	PMea(dBuV/m)	Polarity
2104.2252	48.8	12.82	35.98	H
2357.05	52.8	12.64	40.16	V

**GFSK Ch0 3GHz-18GHz**

Frequency(MHz)	Result(dBuV/m)	ARpl (dB)	PMea(dBuV/m)	Polarity
16756.10013	48.7	7.1	41.6	V
17551.3438	50.6	11.93	38.67	V

 **$\pi/4$  DQPSK Ch0 30MHz-1GHz**

Frequency(MHz)	Result(dBuV/m)	ARpl (dB)	PMea(dBuV/m)	Polarity
42.476088	27.1	0.61	26.49	V
46.870836	32.7	1.61	31.09	V

 **$\pi/4$  DQPSK Ch0 1GHz-3GHz**

Frequency(MHz)	Result(dBuV/m)	ARpl (dB)	PMea(dBuV/m)	Polarity
2544.5872	52.1	12.82	39.28	H
2817.8494	54.3	12.64	41.66	V

 **$\pi/4$  DQPSK Ch0 3GHz-18GHz**

Frequency(MHz)	Result(dBuV/m)	ARpl (dB)	PMea(dBuV/m)	Polarity
16678.03113	48.9	7.1	41.8	V
17193.339	50.3	10.73	39.57	V

**8DPSK 30MHz-1GHz**

Frequency(MHz)	Result(dBuV/m)	ARpl (dB)	PMea(dBuV/m)	Polarity
43.37854	25.6	0.61	24.99	V



44.227168	27	0.86	26.14	V
46.564432	29.5	1.11	28.39	V

**8DPSK 1GHz-3GHz**

Frequency(MHz)	Result(dBuV/m)	ARpl (dB)	PMea(dBuV/m)	Polarity
2175.8136	49.5	12.82	36.68	H
2346.3844	51.6	12.64	38.96	V

**8DPSK 3GHz-18GHz**

Frequency(MHz)	Result(dBuV/m)	ARpl (dB)	PMea(dBuV/m)	Polarity
16069.5574	51.1	7.1	44	V
16637.27547	48.7	8.72	39.98	H

**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:**

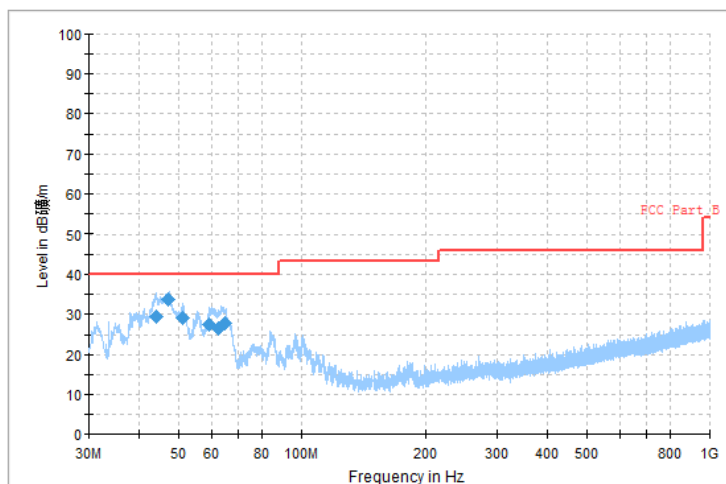


Fig.40 Radiated emission: GFSK, Ch0, 30MHz~1GHz

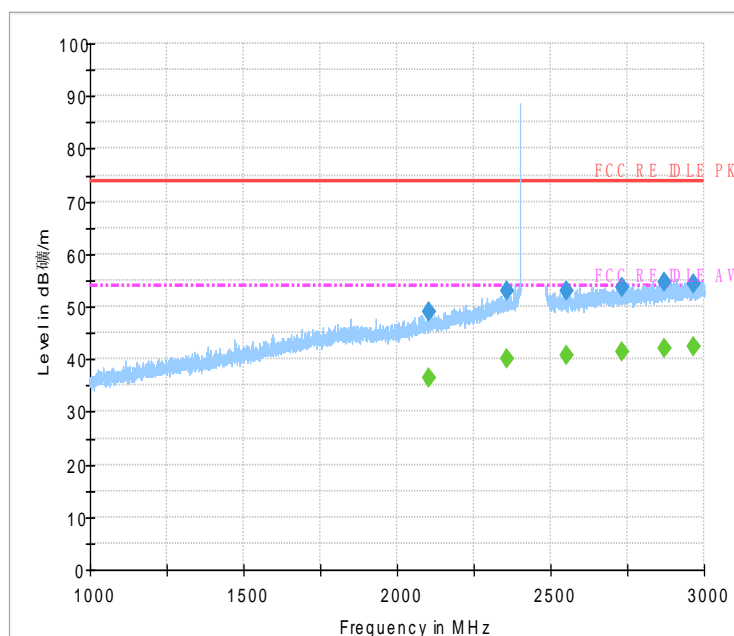


Fig.41 Radiated emission: GFSK, Ch0, 1GHz~3GHz

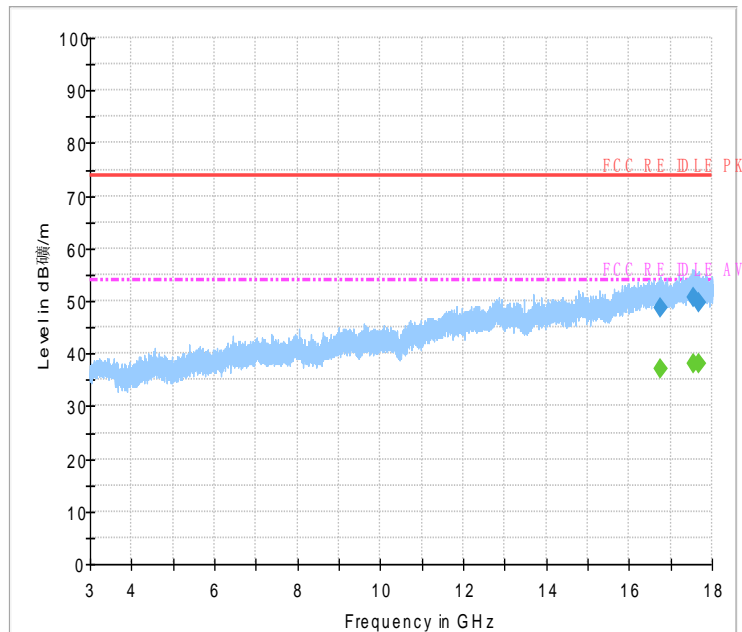


Fig.42 Radiated emission: GFSK, Ch0, 3GHz~18GHz

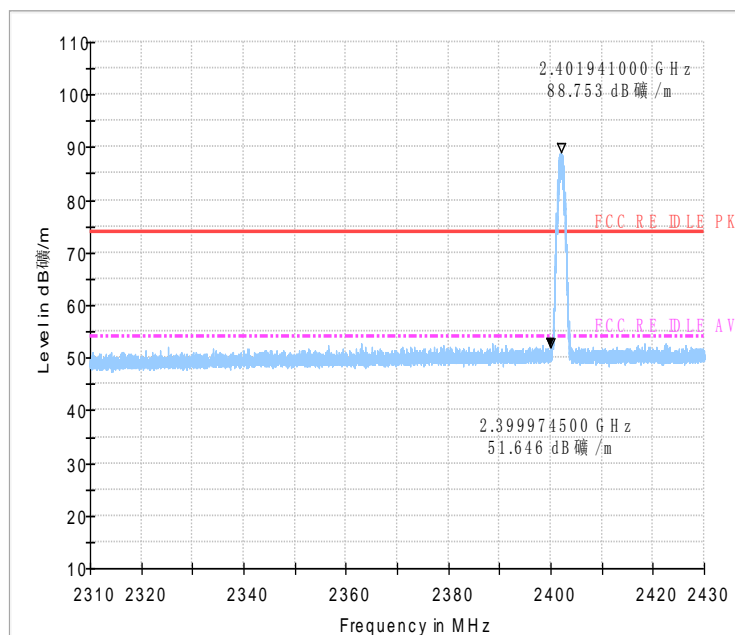


Fig.43 Radiated emission (Power): GFSK, low channel

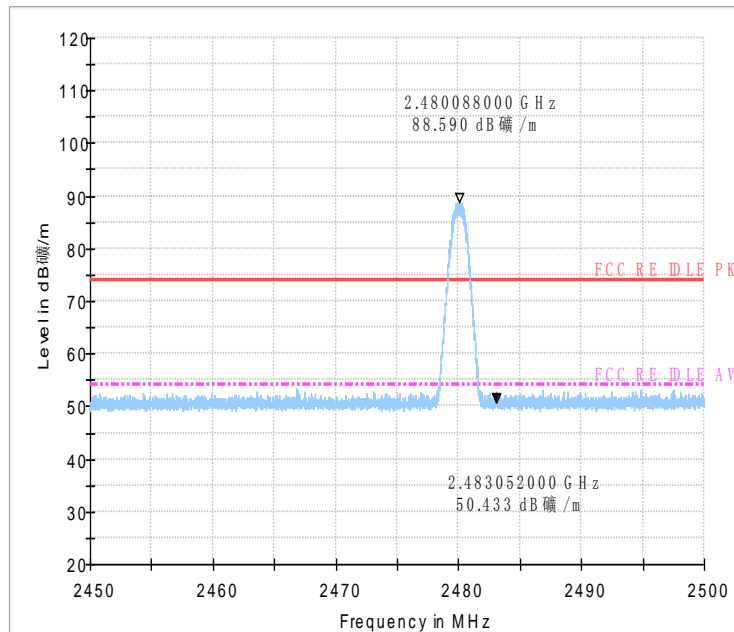


Fig.44 Radiated emission (Power): GFSK, high channel

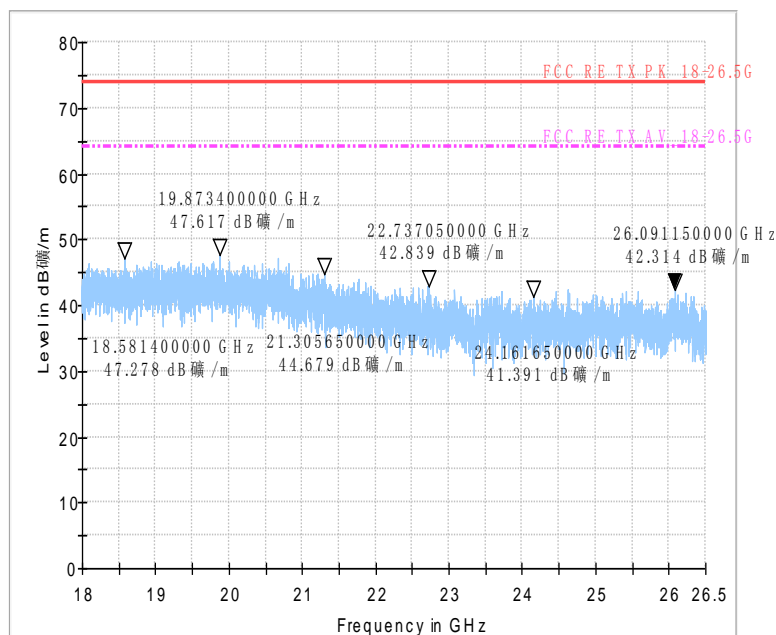


Fig.45 Radiated emission: GFSK, 18 GHz - 26 GHz

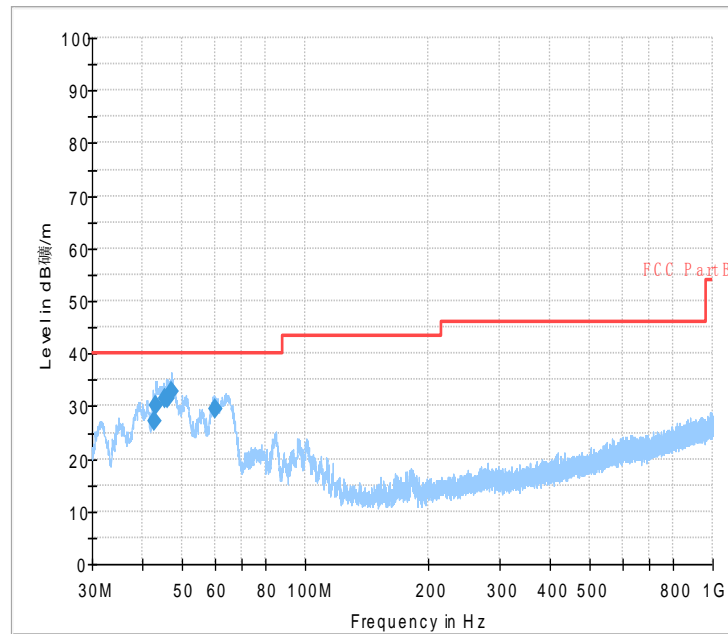


Fig.46 Radiated emission:  $\pi/4$  DQPSK, Ch0, 30MHz~1GHz

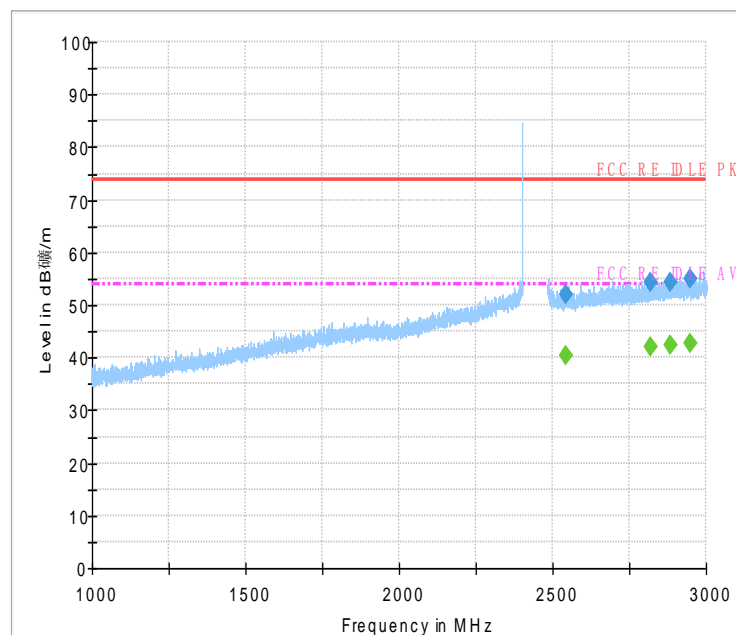


Fig.47 Radiated emission:  $\pi/4$  DQPSK, Ch0, 1GHz~3GHz

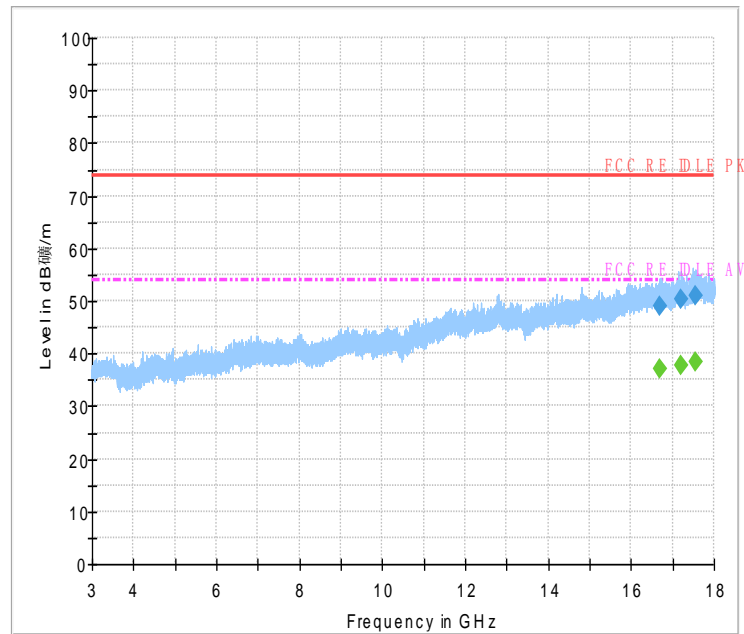


Fig.48 Radiated emission:  $\pi/4$  DQPSK, Ch0, 3GHz~18GHz

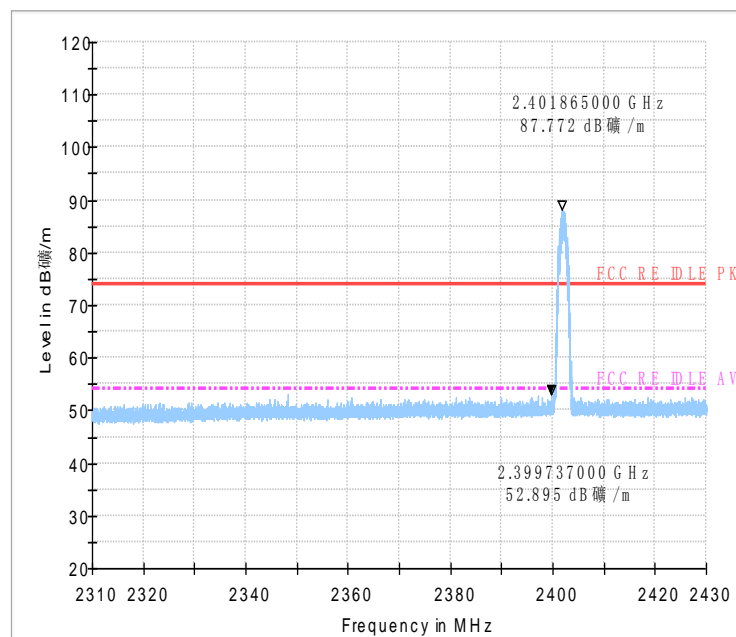


Fig.49 Radiated emission (Power): GFSK, low channel

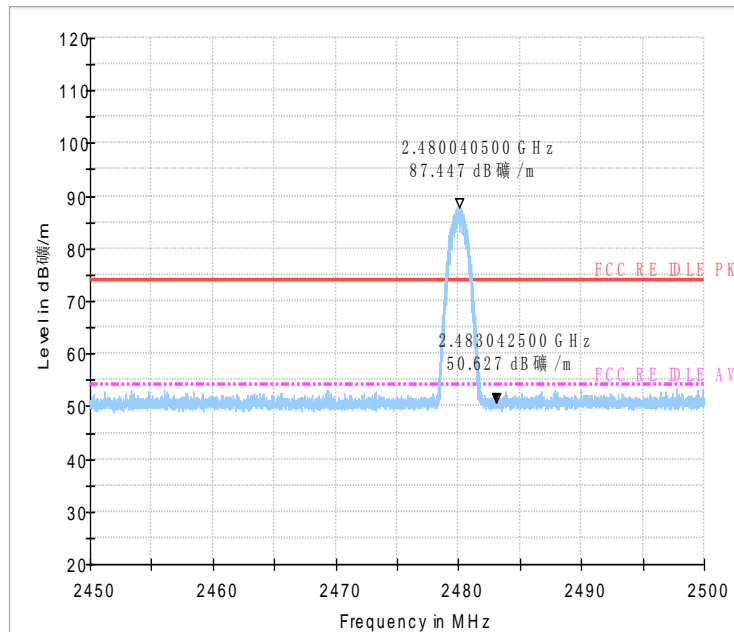


Fig.50 Radiated emission (Power): GFSK, high channel

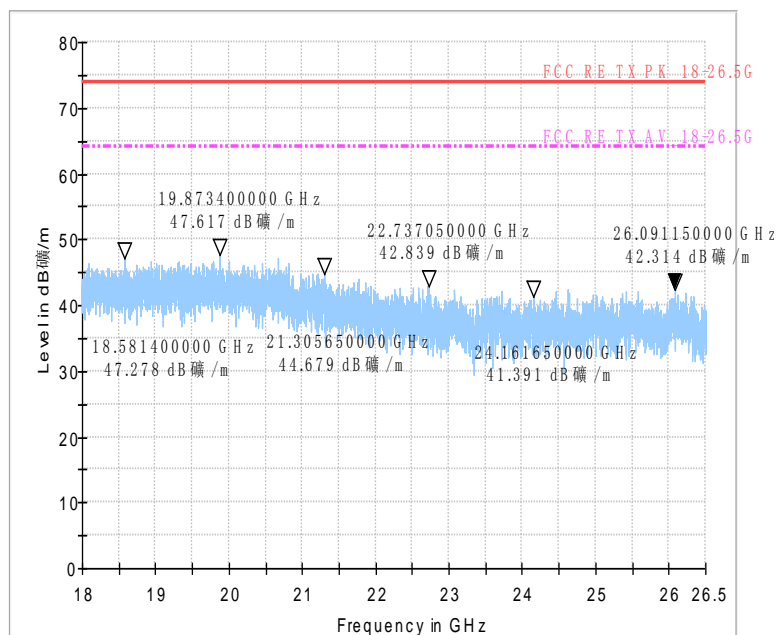


Fig.51 Radiated emission: GFSK, 18 GHz - 26 GHz



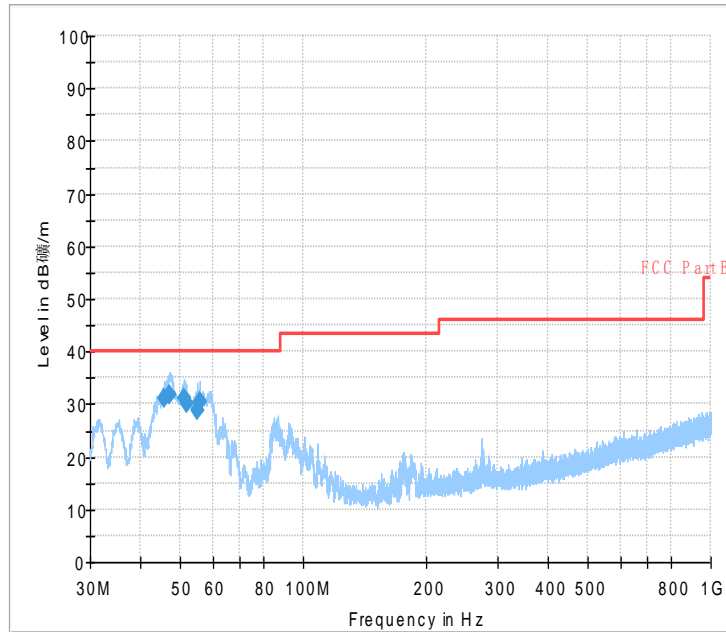


Fig.52 Radiated emission: 8DPSK, Ch0, 30MHz~1GHz

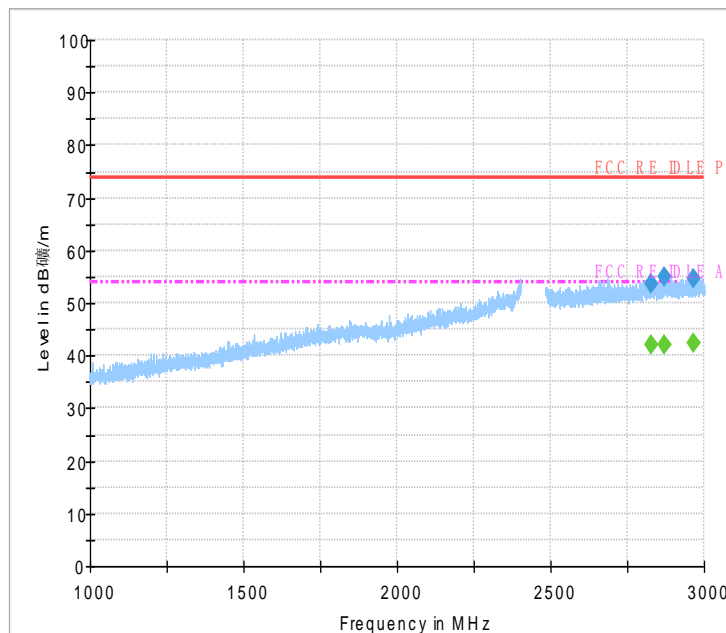


Fig.53 Radiated emission: 8DPSK, Ch0, 1GHz~3GHz

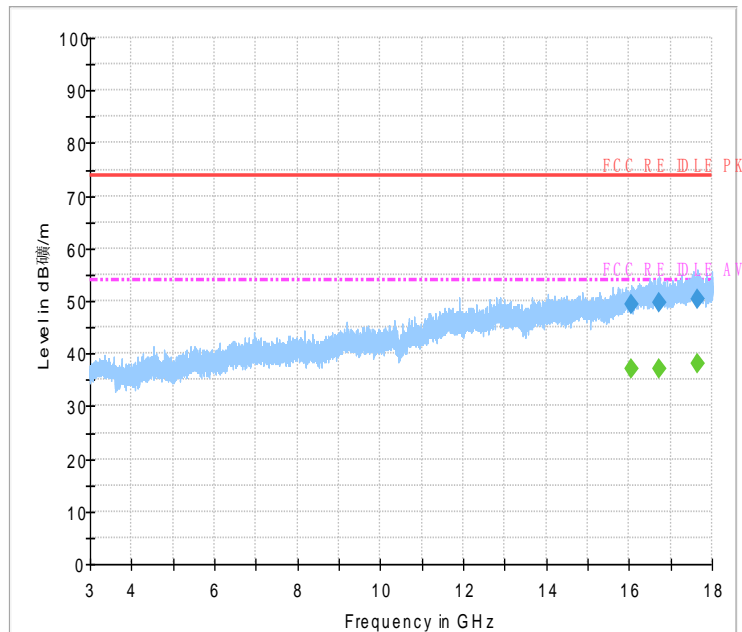


Fig.54 Radiated emission: 8DPSK, Ch0, 3GHz~18GHz

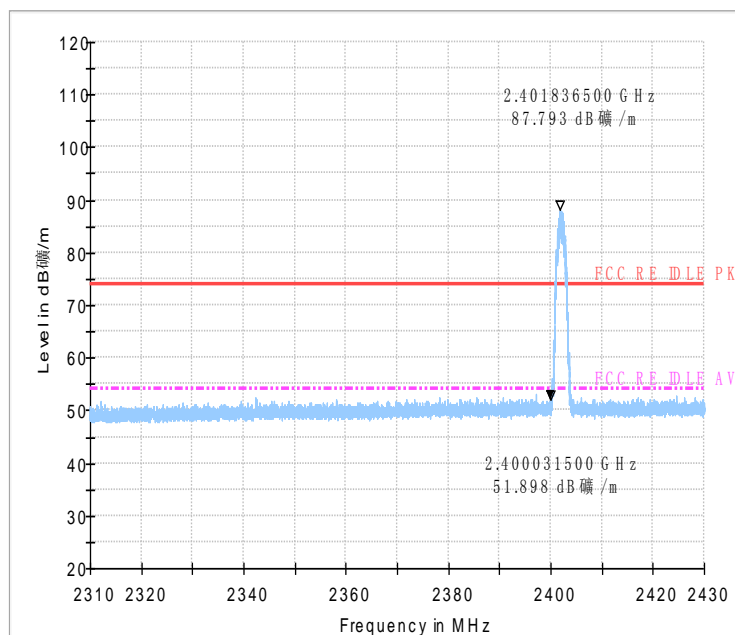


Fig.55 Radiated emission (Power): GFSK, low channel

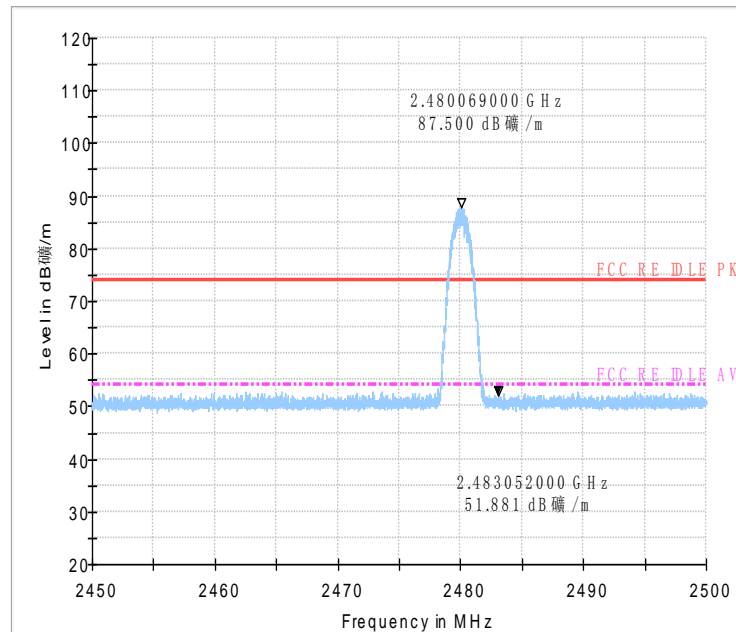


Fig.56 Radiated emission (Power): GFSK, high channel

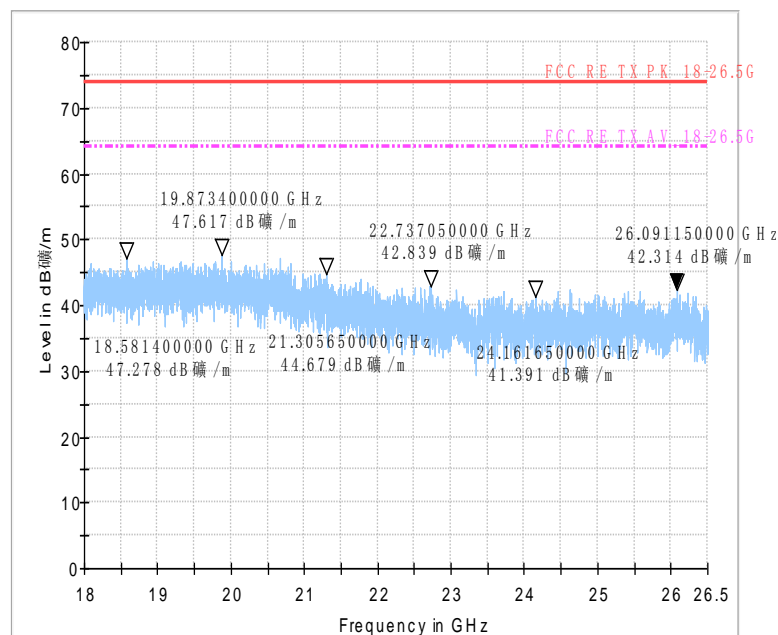


Fig.57 Radiated emission: GFSK, 18 GHz - 26 GHz

## 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.58	50.992	P
		Fig.59		
	DH3	Fig.60	178.067	P
		Fig.61		
	DH5	Fig.62	303.524	P
		Fig.63		

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

Channel	Packet	Dwell Time (ms)		Conclusion
39	2DH1	Fig.64	51.801	P
		Fig.65		
	2DH3	Fig.66	178.067	P
		Fig.67		
	2DH5	Fig.68	304.333	P
		Fig.69		

**For 8DPSK**

Channel	Packet	Dwell Time (ms)		Conclusion
39	3DH1	Fig.70	52.611	P
		Fig.71		
	3DH3	Fig.72	178.067	P
		Fig.73		
	3DH5	Fig.74	304.333	P
		Fig.75		

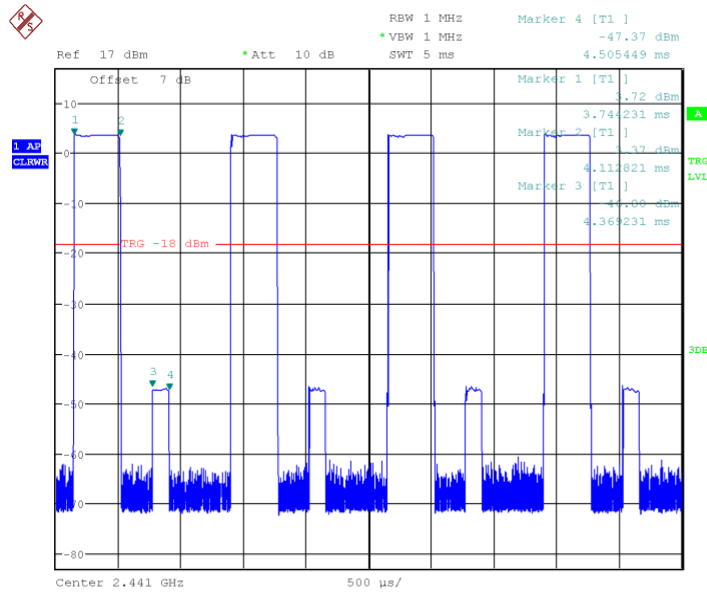
**Note:** the dwell time is Calculated of the sum of test time about 31.5 seconds.

**Equation:** dwell time = pusletime  $\times$  (1600/N)/79 $\times$ T . N is the number of timeslot; T is the time about 31.5s.

The time of DH5=2.9 $\times$ (1600/6)/79 $\times$ 31.5=308.3ms.

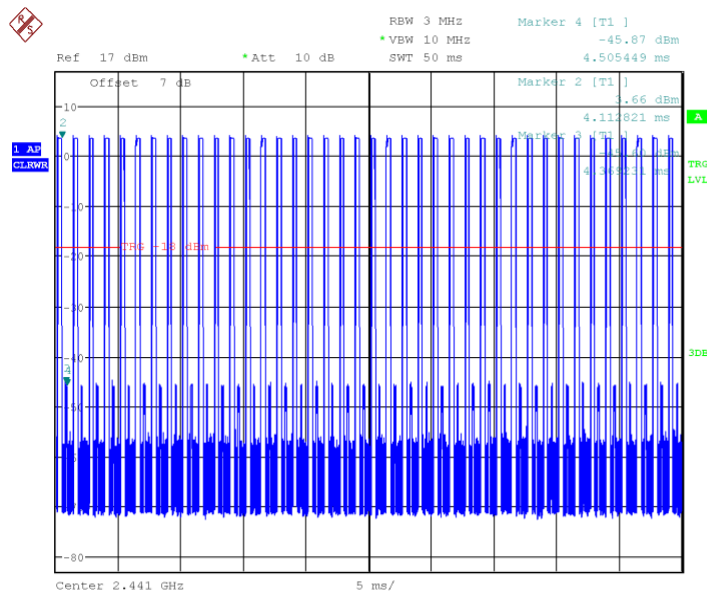
**Conclusion:** PASS

**Test graphs as below:**



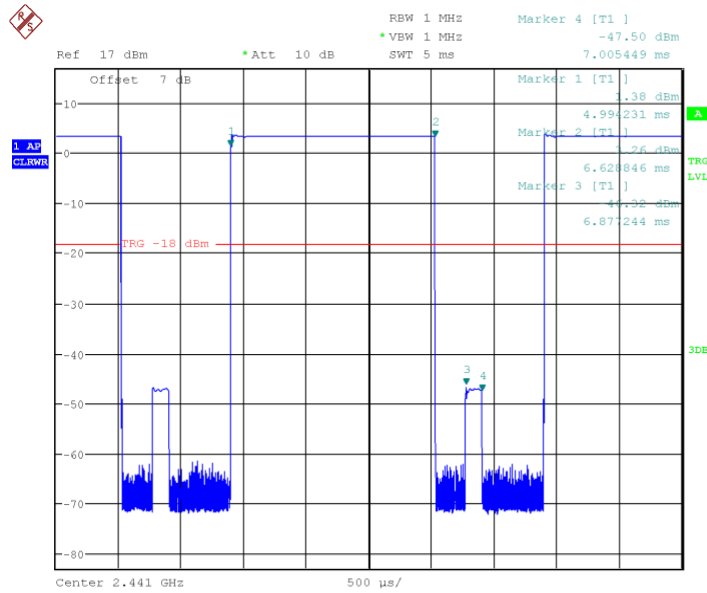
Date: 10.FEB.2014 11:04:54

Fig.58 Time of occupancy (Dwell Time): Ch39, Packet DH1



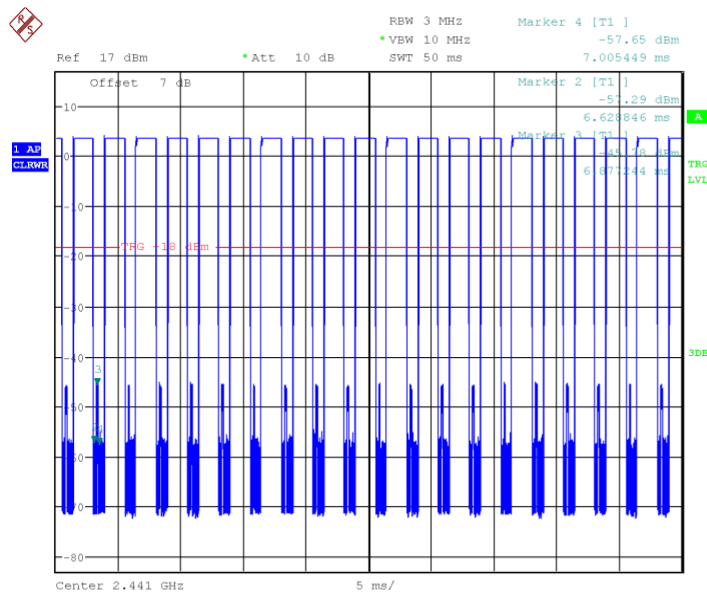
Date: 10.FEB.2014 11:05:01

Fig.59 Number of Transmissions Measurement: Ch39, Packet DH1



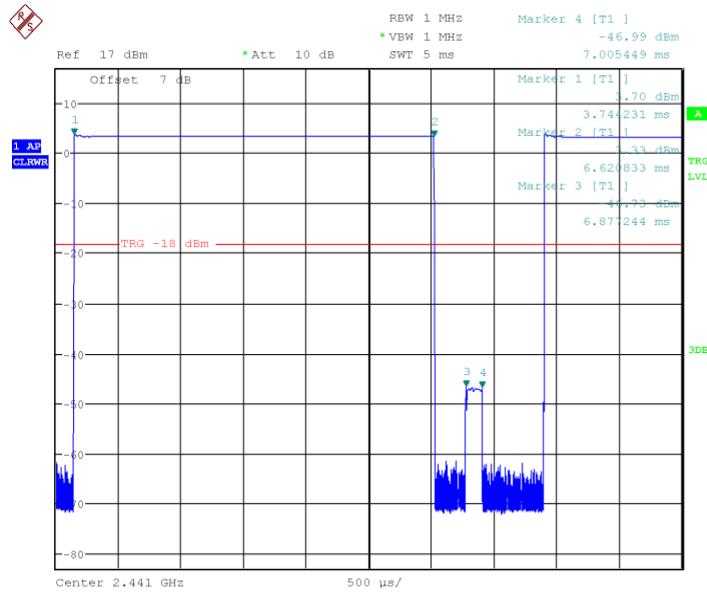
Date: 10.FEB.2014 11:05:10

Fig.60 Time of occupancy (Dwell Time): Ch39, Packet DH3



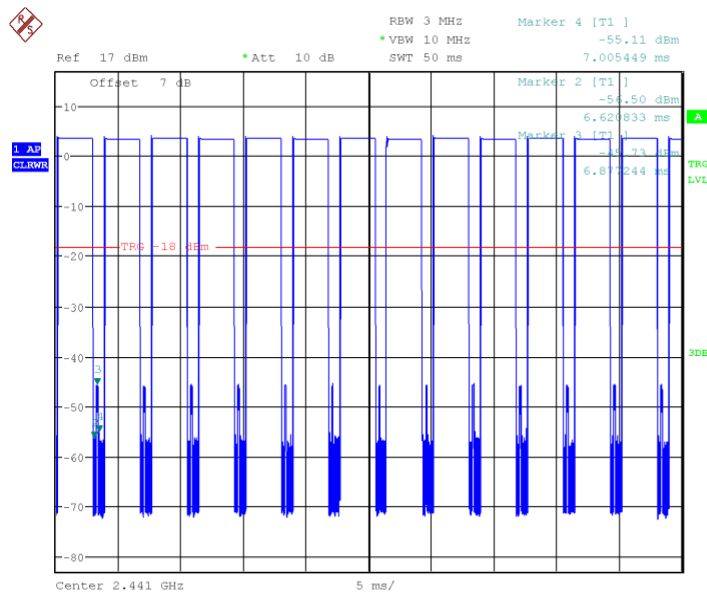
Date: 10.FEB.2014 11:05:17

Fig.61 Number of Transmissions Measurement: Ch39, Packet DH3



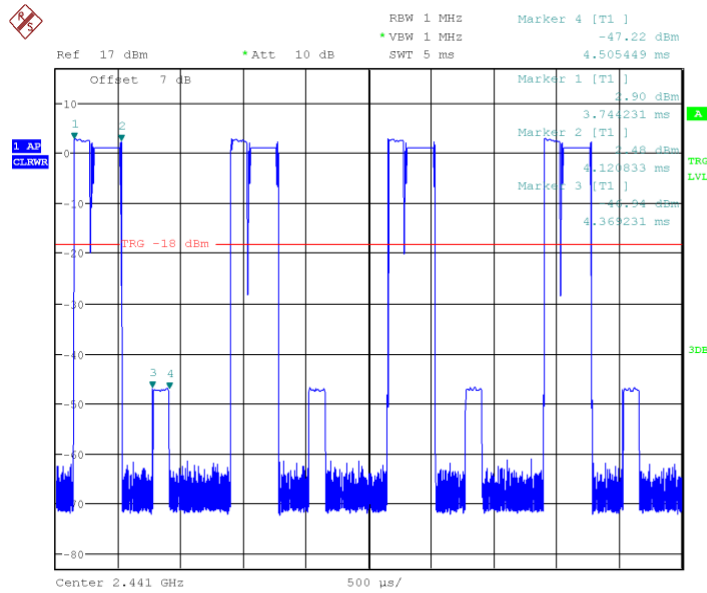
Date: 10.FEB.2014 11:05:25

Fig.62 Time of occupancy (Dwell Time): Ch39,Packet DH5



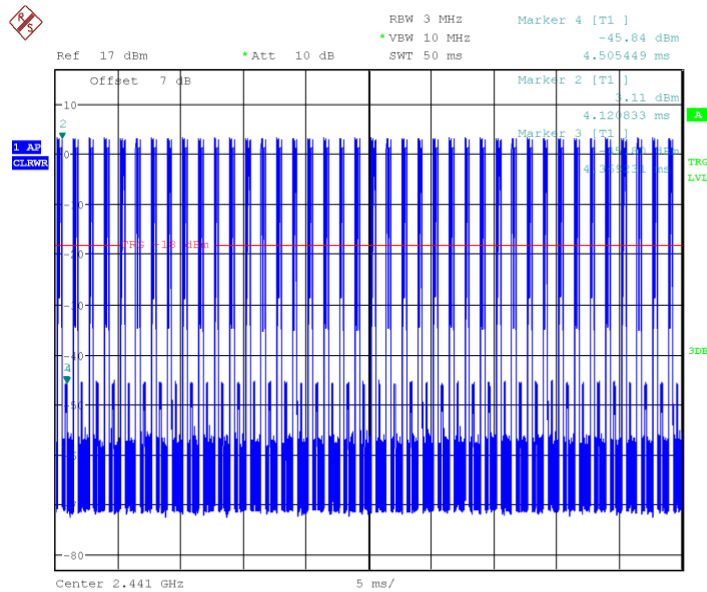
Date: 10.FEB.2014 11:05:32

Fig.63 Number of Transmissions Measurement: Ch39, Packet DH5



Date: 10.FEB.2014 11:05:40

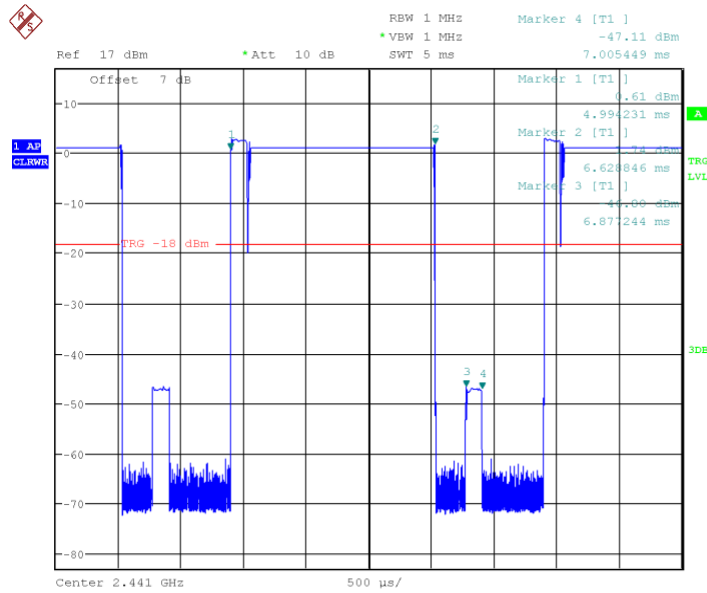
Fig.64 Time of occupancy (Dwell Time): Ch39,Packet 2-DH1



Date: 10.FEB.2014 11:05:47

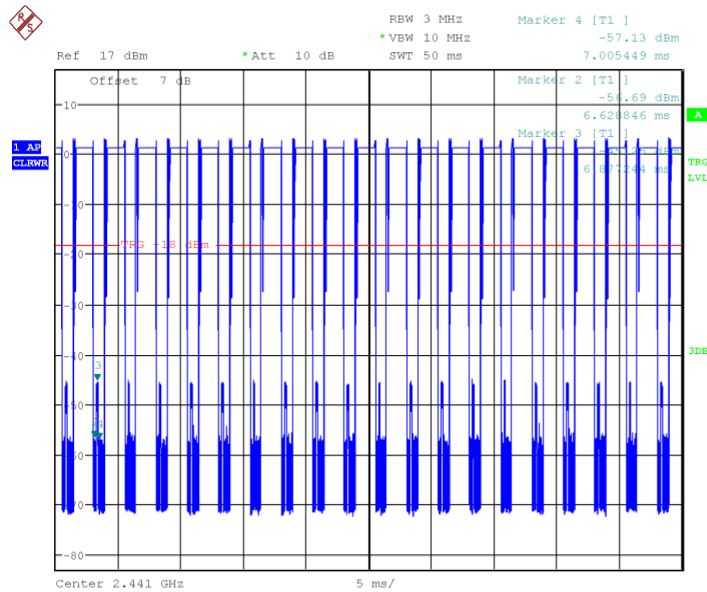
Fig.65 Number of Transmissions Measurement: Ch39, Packet 2-DH1





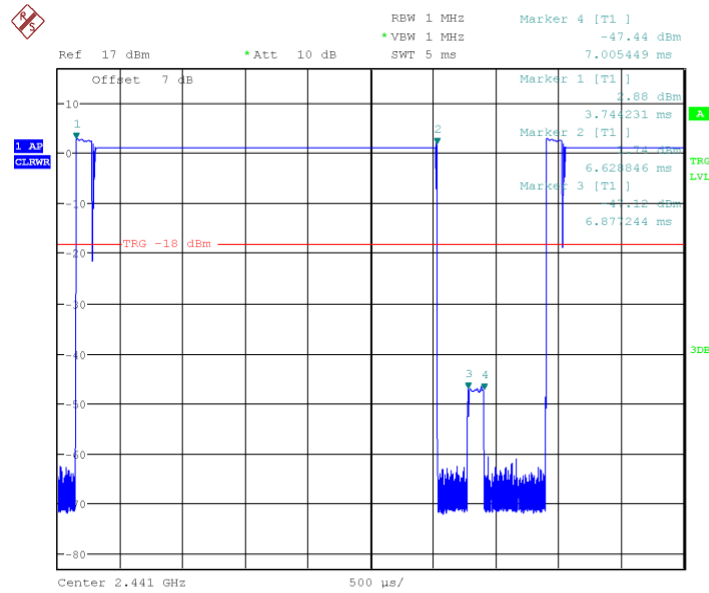
Date: 10.FEB.2014 11:05:56

Fig.66 Time of occupancy (Dwell Time): Ch39,Packet 2-DH3



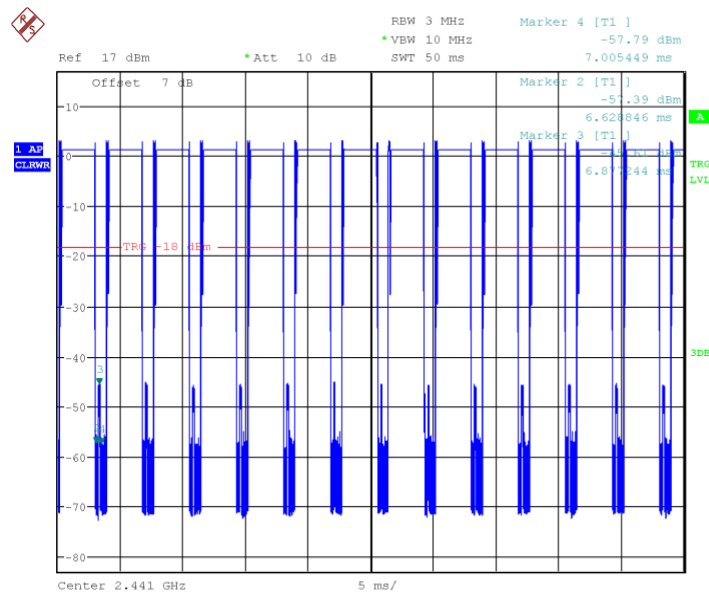
Date: 10.FEB.2014 11:06:03

Fig.67 Number of Transmissions Measurement: Ch39, Packet 2-DH3



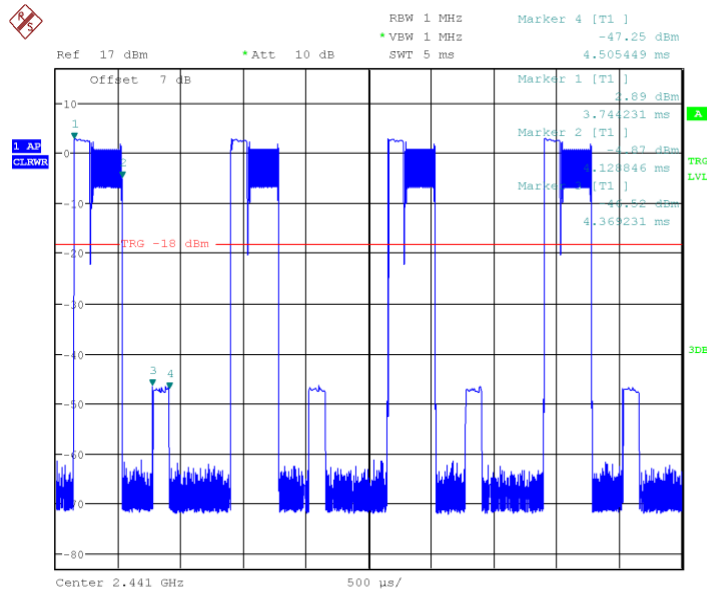
Date: 10.FEB.2014 11:06:11

Fig.68 Time of occupancy (Dwell Time): Ch39,Packet 2-DH5



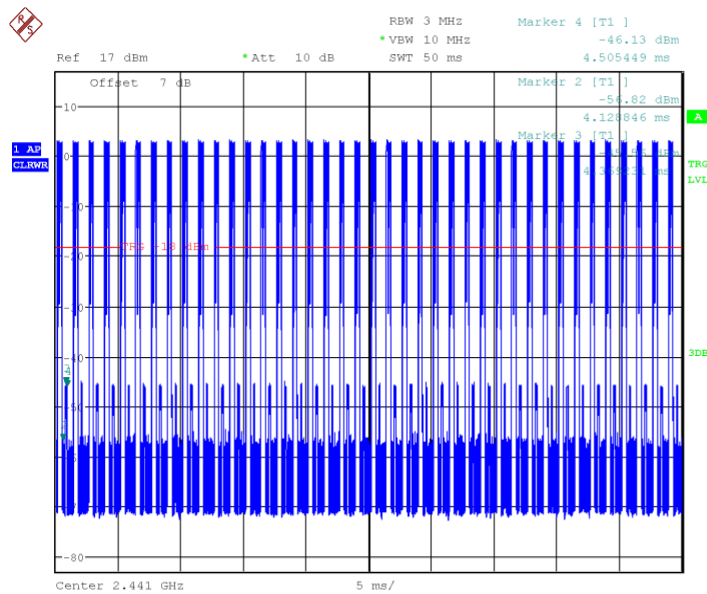
Date: 10.FEB.2014 11:06:18

Fig.69 Number of Transmissions Measurement: Ch39, Packet 2-DH5



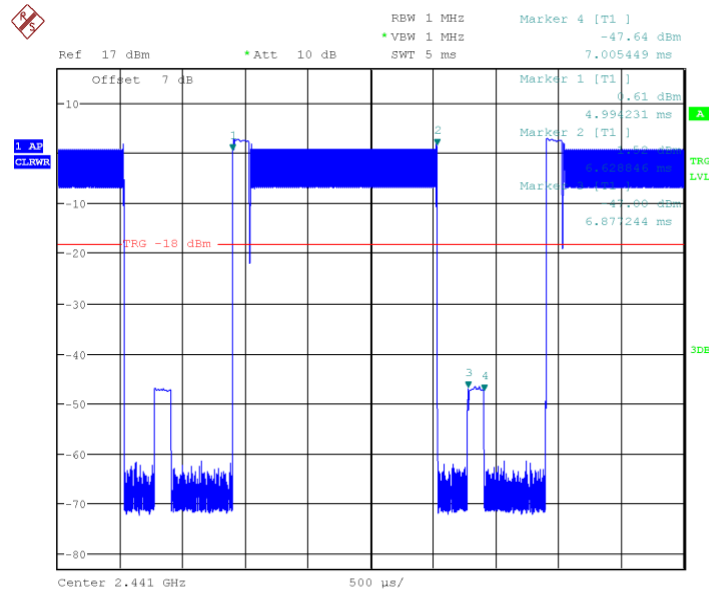
Date: 10.FEB.2014 11:06:27

Fig.70 Time of occupancy (Dwell Time): Ch39,Packet 3-DH1



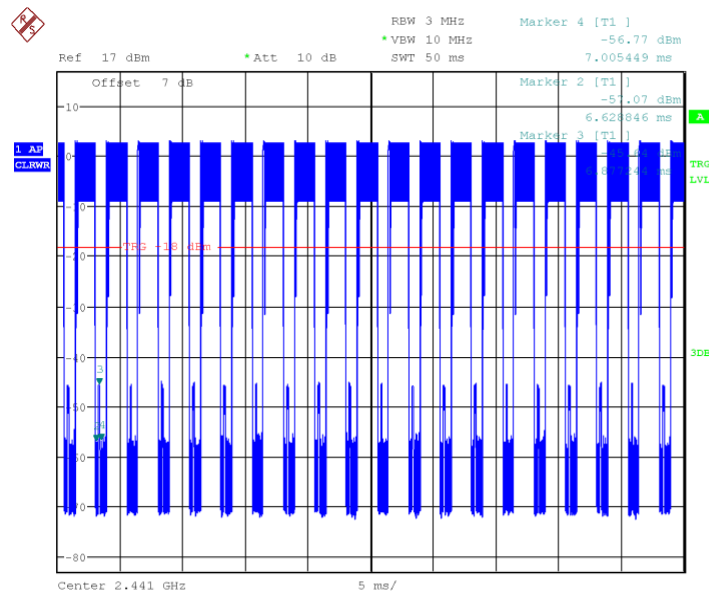
Date: 10.FEB.2014 11:06:34

Fig.71 Number of Transmissions Measurement: Ch39, Packet 3-DH1



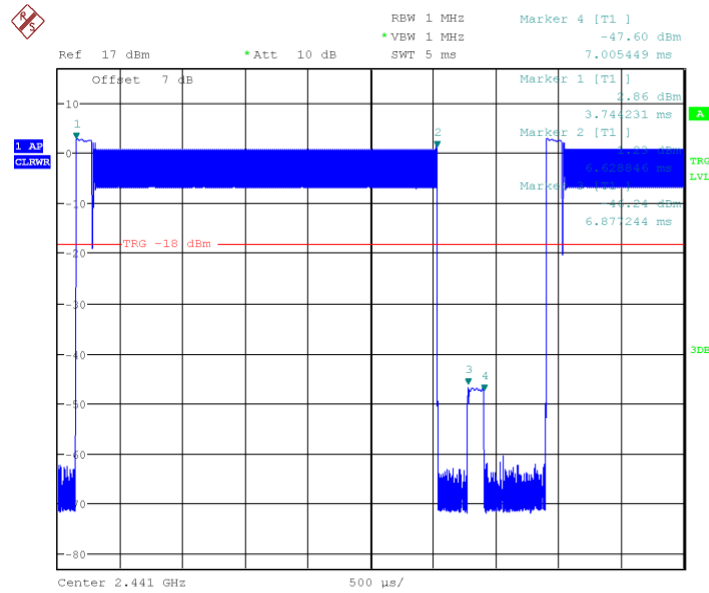
Date: 10.FEB.2014 11:06:42

Fig.72 Time of occupancy (Dwell Time): Ch39,Packet 3-DH3



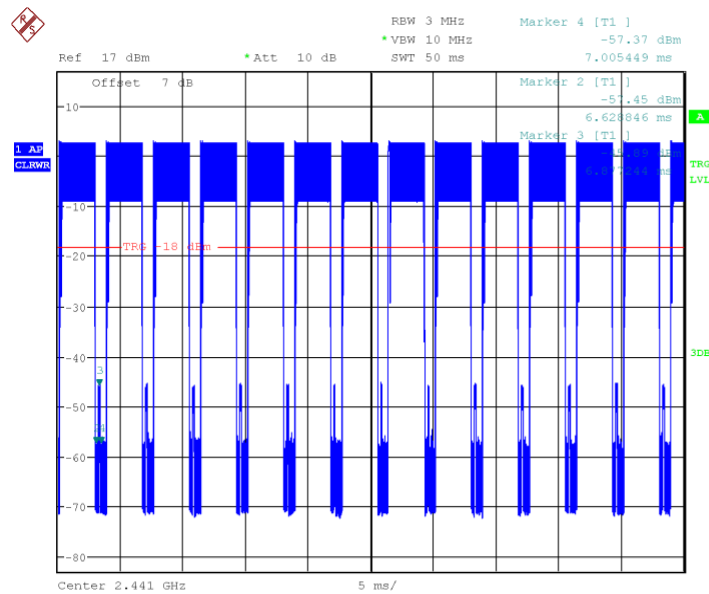
Date: 10.FEB.2014 11:06:49

Fig.73 Number of Transmissions Measurement: Ch39, Packet 3-DH3



Date: 10.FEB.2014 11:06:58

Fig.74 Time of occupancy (Dwell Time): Ch39,Packet 3-DH5



Date: 10.FEB.2014 11:07:05

Fig.75 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.76	1029	P
39	Fig.77	1029	P
78	Fig.78	1029	P

For  $\pi/4$  DQPSK

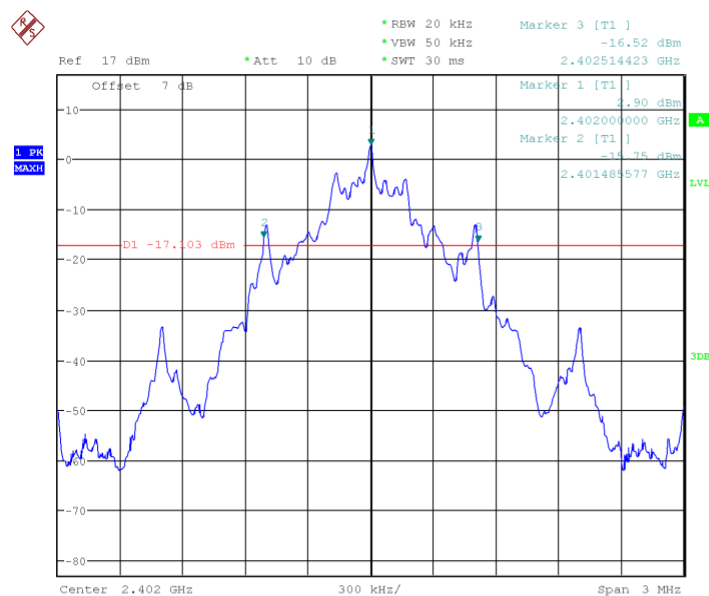
Channel	20dB Bandwidth (KHz)		Conclusion
0	Fig.79	1091	P
39	Fig.80	1091	P
78	Fig.81	1087	P

For 8DPSK

Channel	20dB Bandwidth (KHz)		Conclusion
0	Fig.82	1192	P
39	Fig.83	1192	P
78	Fig.84	1192	P

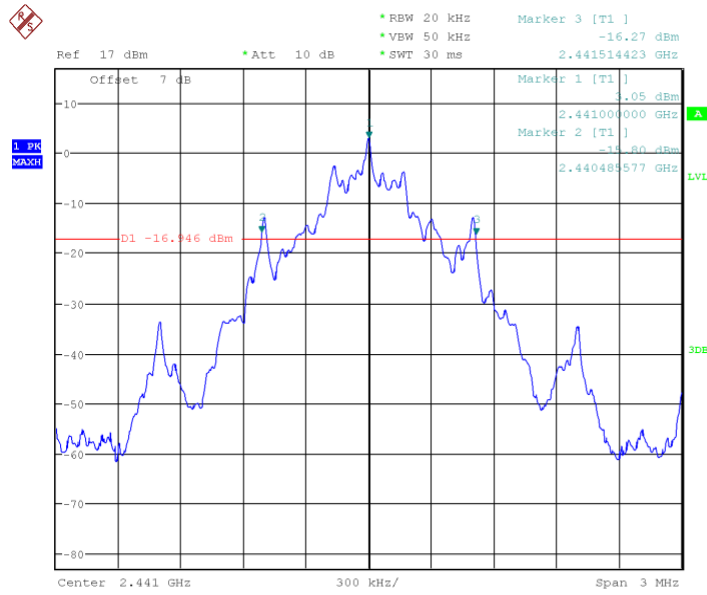
Conclusion: PASS

Test graphs as below:



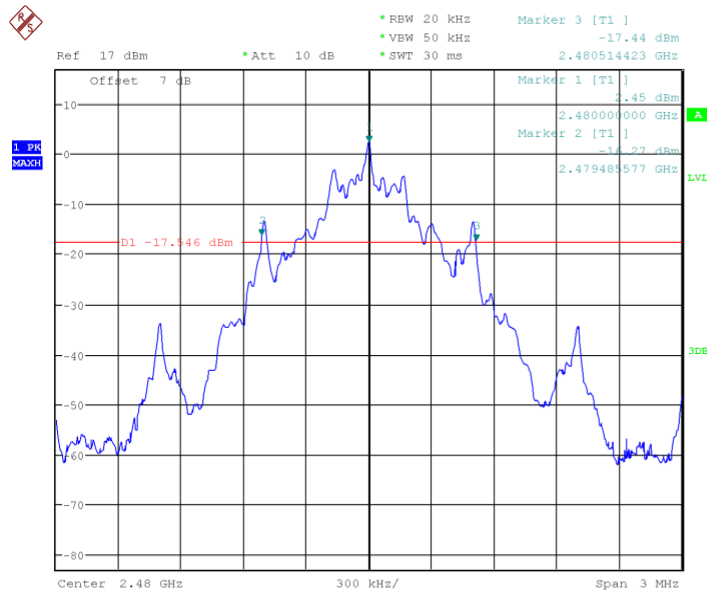
Date: 10.FEB.2014 11:07:47

Fig.76 20dB Bandwidth: GFSK, Ch0



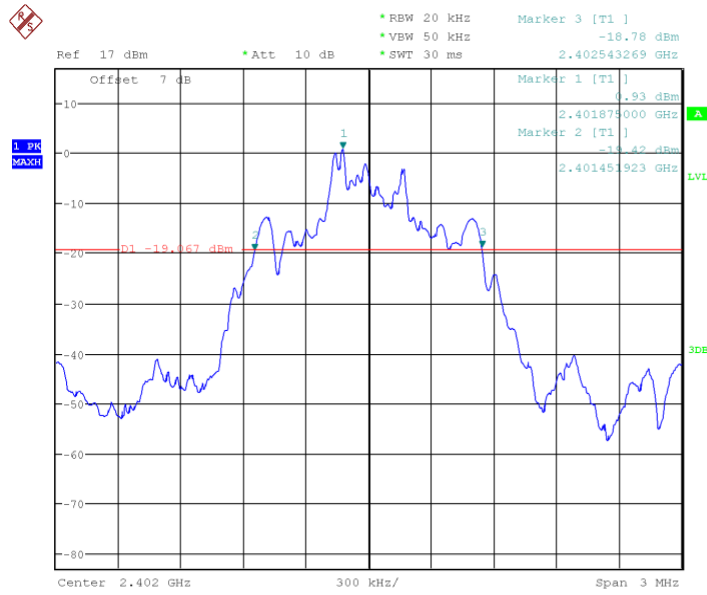
Date: 10.FEB.2014 11:08:00

Fig.77 20dB Bandwidth: GFSK, Ch39



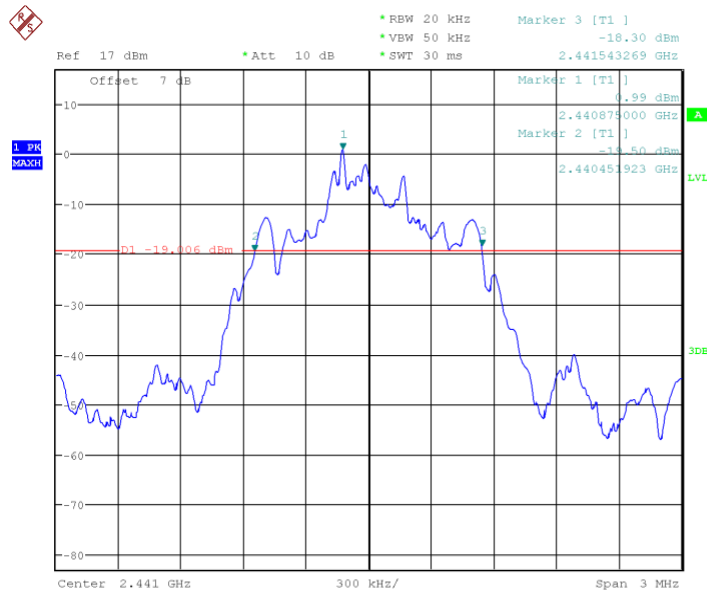
Date: 10.FEB.2014 11:08:14

Fig.78 20dB Bandwidth: GFSK, Ch78



Date: 10.FEB.2014 11:08:27

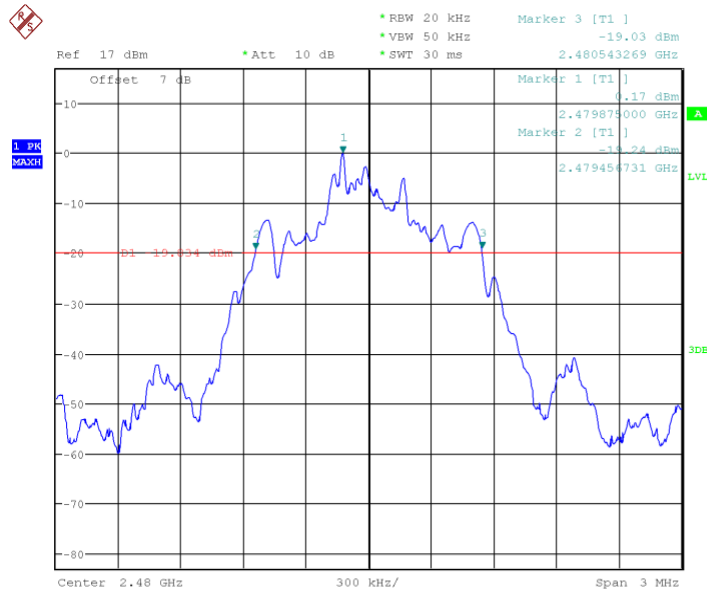
Fig.79 20dB Bandwidth:  $\pi/4$  DQPSK, Ch0



Date: 10.FEB.2014 11:08:40

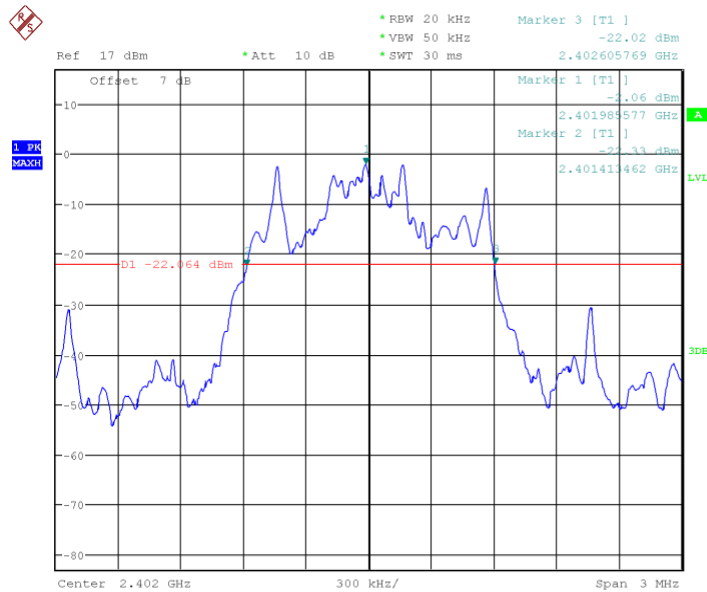
Fig.80 20dB Bandwidth:  $\pi/4$  DQPSK, Ch39





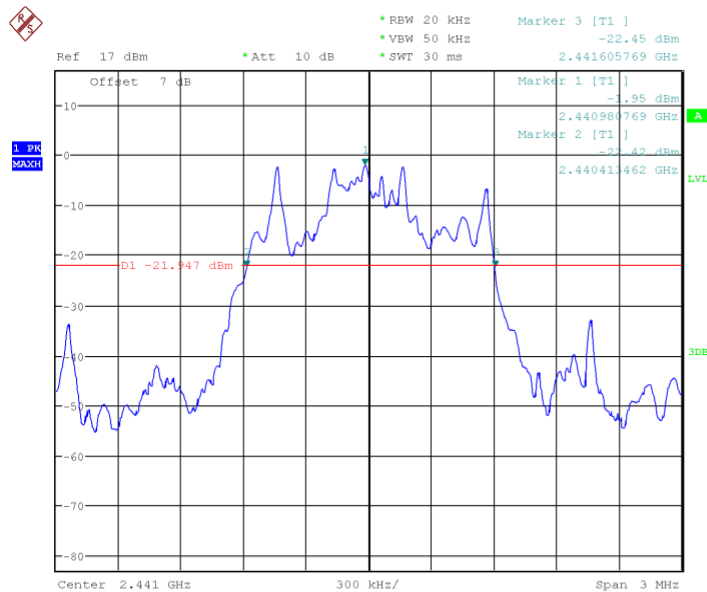
Date: 10.FEB.2014 11:08:54

Fig.81 20dB Bandwidth:  $\pi/4$  DQPSK, Ch78



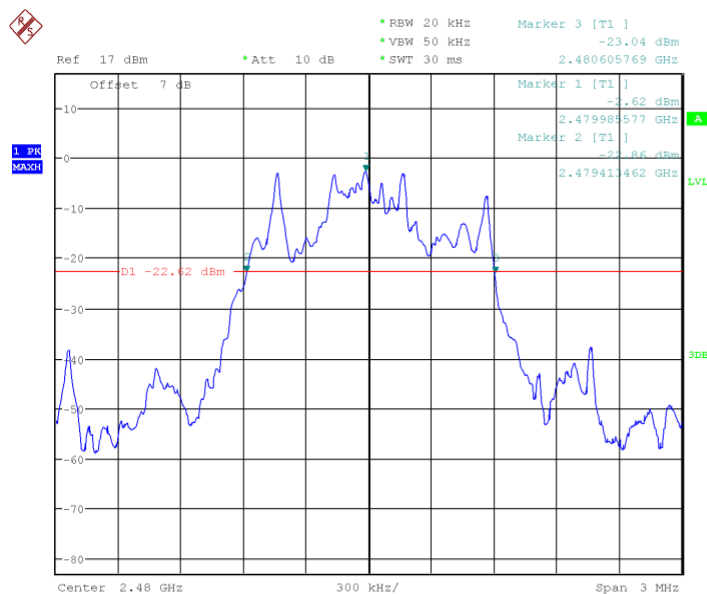
Date: 10.FEB.2014 11:09:08

Fig.82 20dB Bandwidth: 8DPSK, Ch0



Date: 10.FEB.2014 11:09:21

Fig.83 20dB Bandwidth: 8DPSK, Ch39



Date: 10.FEB.2014 11:09:35

Fig.84 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 $(2/3) \times 20\text{dB bandwidth}$

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.85	1019.2308	P

For  $\pi/4$  DQPSK

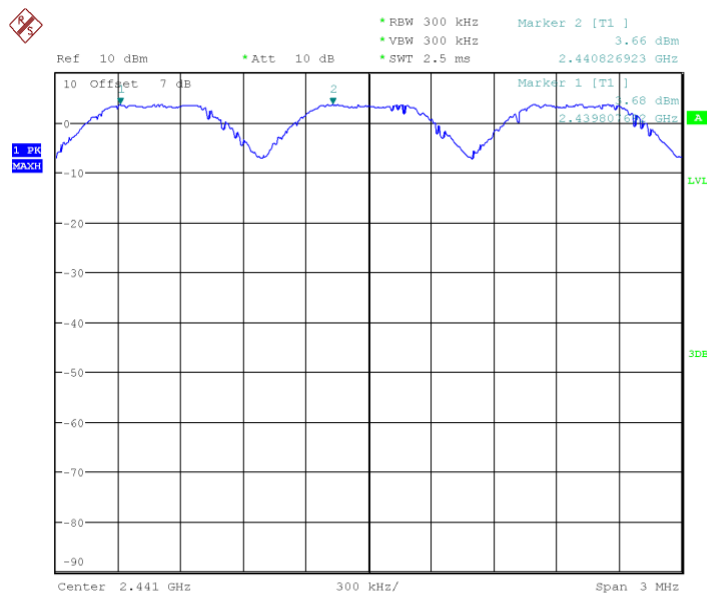
Channel	Carrier separation (KHz)		Conclusion
39	Fig.86	985.5769	P

For 8DPSK

Channel	Carrier separation (KHz)		Conclusion
39	Fig.87	1024.0385	P

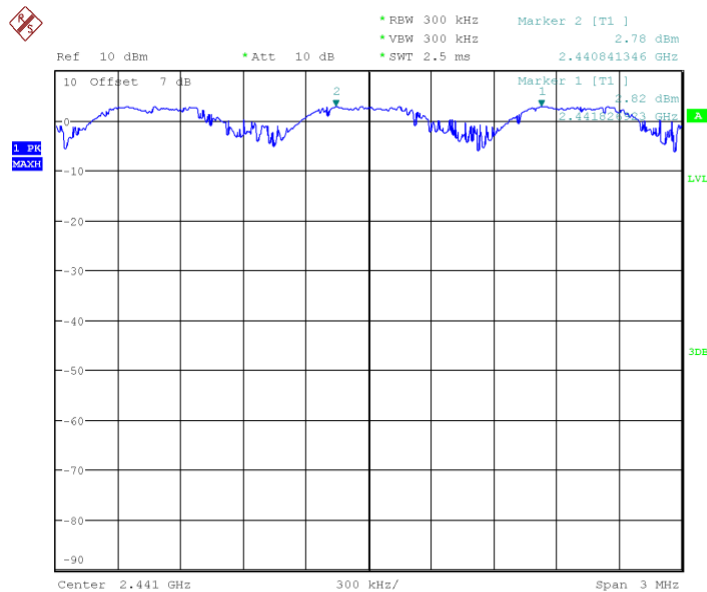
Conclusion: PASS

Test graphs as below:



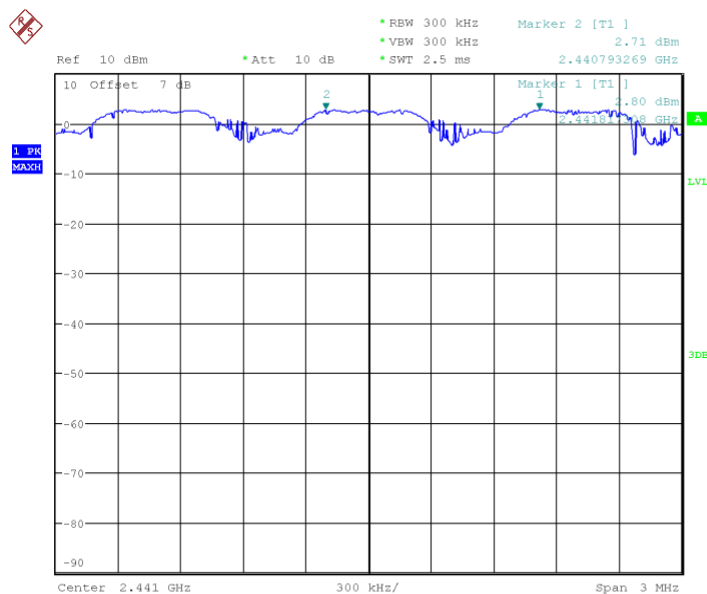
Date: 10.FEB.2014 11:11:14

Fig.85 Carrier separation measurement: GFSK, Ch39



Date: 10.FEB.2014 11:12:24

Fig.86 Carrier separation measurement:  $\pi/4$  DQPSK, Ch39



Date: 10.FEB.2014 11:13:35

Fig.87 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.88	79	P
40~78	Fig.89		P

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

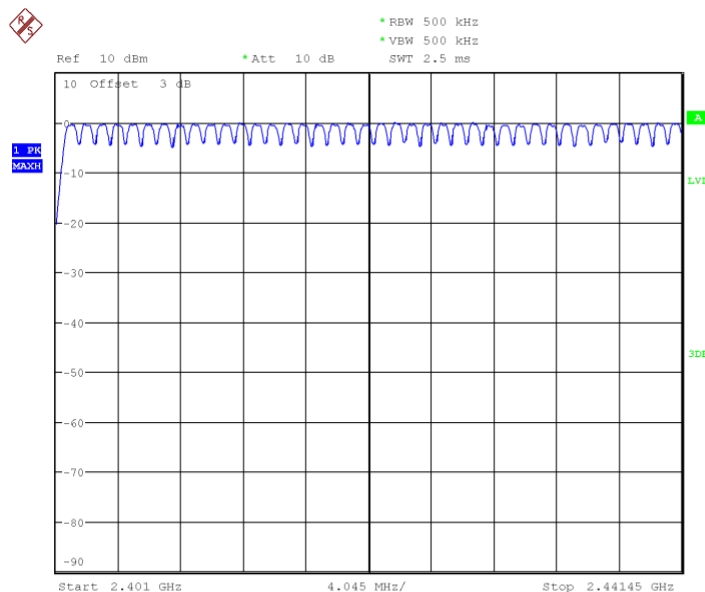
Channel	Number of hopping channels		Conclusion
0~39	Fig.90	79	P
40~78	Fig.91		P

**For 8DPSK**

Channel	Number of hopping channels		Conclusion
0~39	Fig.92	79	P
40~78	Fig.93		P

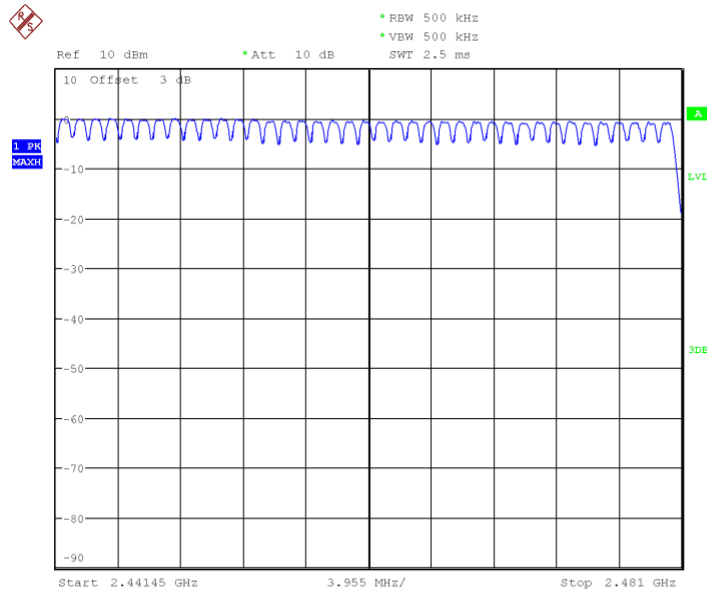
**Conclusion: PASS**

**Test graphs as below:**



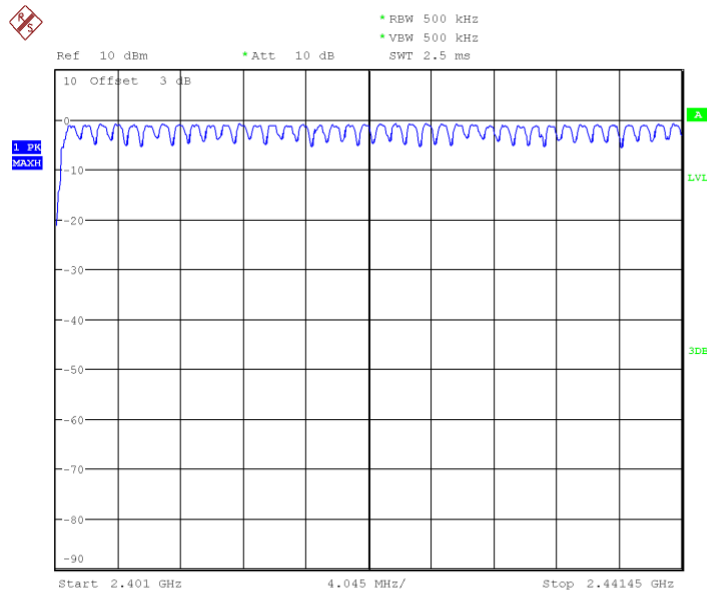
Date: 10.FEB.2014 11:16:07

Fig.88 Number of hopping frequency: GFSK, Ch0~39



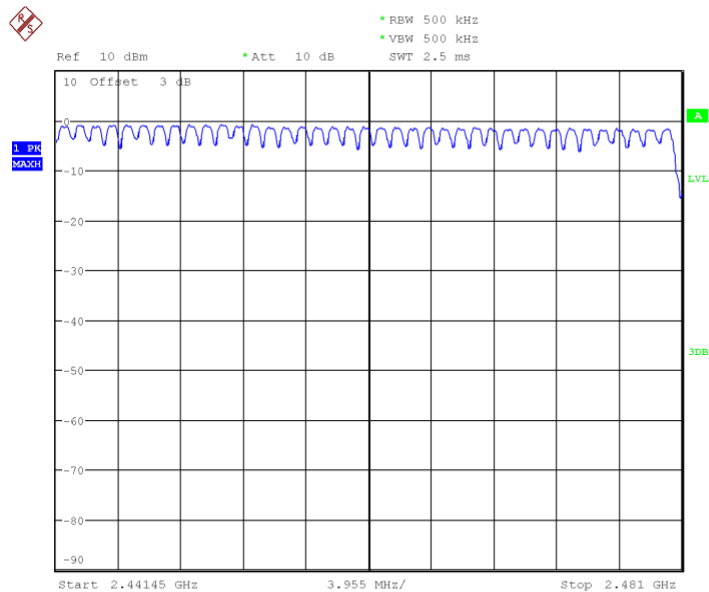
Date: 10.FEB.2014 11:18:11

Fig.89 Number of hopping frequency: GFSK, Ch40~78



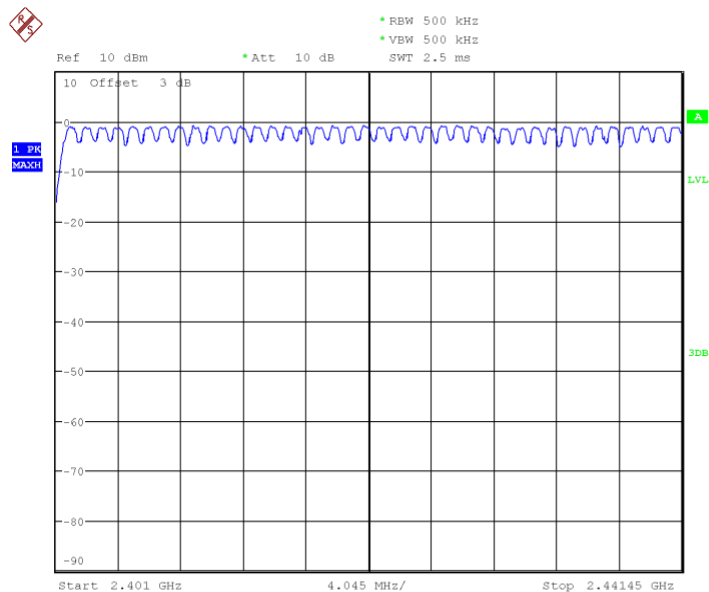
Date: 10.FEB.2014 11:20:16

Fig.90 Number of hopping frequency:  $\pi/4$  DQPSK, Ch0~39



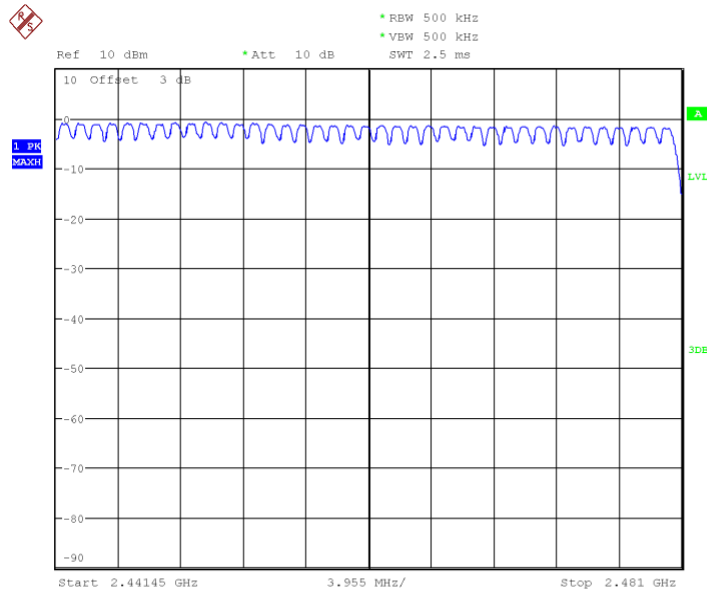
Date: 10.FEB.2014 11:22:20

Fig.91 Number of hopping frequency:  $\pi/4$  DQPSK, Ch40~78



Date: 10.FEB.2014 11:24:25

Fig.92 Number of hopping frequency: 8DPSK, Ch0~39



Date: 10.FEB.2014 11:26:29

Fig.93 Number of hopping frequency: 8DPSK, Ch40~78



## 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	2014-08-30
2	DC Power Supply	ZUP60-14	LOC-220Z006	TDL-Lambda	2014-08-30
3	Bluetooth Tester	CBT32	100785	Rohde&Schwarz	2014-08-30

### Radiated emission test system

No.	Equipment	Model	Serial Number	Manufacturer	Calibration Due date
1	Universal Radio Communication Tester	CMU200	123102	R&S	2014-08-30
2	Test Receiver	ESCI	101235	R&S	2014-08-30
3	Test Receiver	ESU40	100307	R&S	2014-10-29
4	Trilog Antenna	VULB9163	19-162515	Schwarzbeck	2014-11-11
5	Double Ridged Guide Antenna	ETS-3117	135885	ETS	2014-04-28
6	2-Line V-Network	ENV216	101380	R&S	2014-10-30



7	Single Phase Harmonic & Flicker	DPA500N	V112610998 8	EM Test	2014-10-28
8	Multifunction AC/DC Power Source	Netwave7	V112610998 9	EM Test	2014-10-28
9	Ultra Compact Simulator	UCS 500N7	V112610998 3	EM Test	2014-07-22
10	Motorized Variac	MV 2616	V112610998 7	EM Test	2014-07-22
11	Telecom Surge Module	TSurge7	V090210458 2	EM Test	2014-07-22
12	Audio Analyzer	UPV	101950	R&S	2014-08-30
13	Power Meter	NRP2	101804	R&S	2014-08-30
14	Signal Generator	SMB 100A	105563	R&S	2014-08-30
15	ESD Test Simulator	Dito	V112610998 2	EM Test	2014-10-31

**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 °C, Max. = 30 °C
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 °C, Max. = 35 °C
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 °C, Max. = 30 °C
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 °C, Max. = 30 °C
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\*\*\*\*\***