



FCC PART 15C TEST REPORT No. I14Z47644-SRD02

for

TCL Communication Ltd.

CDMA 1X/EVDO tri-band mobile phone

Model Name: 4037V

FCC ID: 2ACCJB001

with

Hardware Version: VC

Software Version: V5HT3-5

Issued Date: 2014-09-30



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-1

Note:

The test results in this test report relate only to the devices specified in this report. This report shall not be reproduced except in full without the written approval of TMC Beijing.

Test Laboratory:

TMC Beijing, Telecommunication Metrology Center of Ministry of Industry and Information Technology
Shouxiang Science Building, No 51, Xueyuan Road, Haidian District, Beijing, P.R.China 100191

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

CONTENTS

1. TEST LABORATORY	3
1.1. TESTING LOCATION.....	3
1.2. TESTING ENVIRONMENT	3
1.3. PROJECT DATA	3
1.4. SIGNATURE	3
2. CLIENT INFORMATION.....	4
2.1. APPLICANT INFORMATION	4
2.2. MANUFACTURER INFORMATION.....	4
3. EQUIPMENT UNDER TEST (EUT) AND ANCILLARY EQUIPMENT (AE)	5
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. NORMAL ACCESSORY SETTING	5
3.5. GENERAL DESCRIPTION	5
4. REFERENCE DOCUMENTS	6
4.1. DOCUMENTS SUPPLIED BY APPLICANT	6
4.2. REFERENCE DOCUMENTS FOR TESTING	6
5. LABORATORY ENVIRONMENT	7
6. SUMMARY OF TEST RESULTS.....	8
6.1. SUMMARY OF TEST RESULTS	8
6.2. STATEMENTS.....	8
7. TEST EQUIPMENTS UTILIZED.....	9
ANNEX A: MEASUREMENT RESULTS	10
A.1. MEASUREMENT METHOD	10
A.2. PEAK OUTPUT POWER - CONDUCTED.....	11
A.3. FREQUENCY BAND EDGES - CONDUCTED	12
A.4. CONDUCTED EMISSION.....	19
A.5. RADIATED EMISSION.....	44
A.6. TIME OF OCCUPANCY (DWELL TIME).....	62
A.7. 20dB BANDWIDTH.....	72
A.8. CARRIER FREQUENCY SEPARATION.....	78
A.9. NUMBER OF HOPPING CHANNELS	80
A.10. AC POWERLINE CONDUCTED EMISSION	84

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: 00861062304633-2504

1.2. Testing Environment

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

1.3. Project data

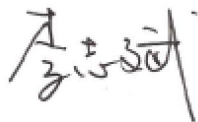
Project Leader: Xu Zhongfei
Testing Start Date: 2014-09-05
Testing End Date: 2014-09-30

1.4. Signature



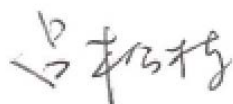
Xu Zhongfei

(Prepared this test report)



Li Zhibin

(Reviewed this test report)



Lv Songdong

(Approved this test report)

2. Client Information

2.1. Applicant Information

Company Name: TCL Communication Ltd.
Address /Post: 12F/B, TCL Tower, Gaoxin Nanyi Road, Nanshan District, Shenzhen,
Guangdong,P.R. China
City: Shenzhen
Postal Code: 518057
Country: China
Contact Person: Lv Meixian
Contact Email: meixian.lv@tcl.com
Telephone: 0086-755 33956929
Fax: 0086-755 36645072

2.2. Manufacturer Information

Company Name: TCL Communication Ltd.
Address /Post: 12F/B, TCL Tower, Gaoxin Nanyi Road, Nanshan District, Shenzhen,
Guangdong,P.R. China
City: Shenzhen
Postal Code: 518057
Country: China
Telephone: 0086-755 33956929
Fax: 0086-755 36645072

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

3.1. About EUT

Description	CDMA 1X/EVDO tri-band mobile phone
Model Name	4037V
FCC ID	2ACCJB001
Frequency Band	ISM 2400MHz~2483.5MHz
Type of Modulation	GFSK/ $\pi/4$ DQPSK/8DPSK
Number of Channels	79
Power Supply	3.7V DC by Battery

3.2. Internal Identification of EUT used during the test

EUT ID*	MEID	HW Version	SW Version
EUT1	A100003BCFECE1	VC	V5HT3-5
EUT2	A100003BCFECEB	VC	V5HT3-5

*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 /
AE1	
Model	TLi014A1
Manufacturer	BYD
Capacitance	1400mAh
Nominal voltage	3.7V

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

3.4. Normal Accessory setting

Fully charged battery should be used during the test.

3.5. General Description

The Equipment Under Test (EUT) is a model of CDMA 1X/EVDO tri-band 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.

4. Reference Documents

4.1. Documents supplied by applicant

EUT feature information is supplied by the applicant or manufacturer, which is the basis of testing.

4.2. Reference Documents for testing

The following documents listed in this section are referred for testing.

Reference	Title	Version
FCC Part15	FCC CFR 47, Part 15, Subpart C:	2013
	15.205 Restricted bands of operation;	
	15.209 Radiated emission limits, general requirements;	
ANSI C63.10	15.247 Operation within the bands 902–928MHz, 2400–2483.5 MHz, and 5725–5850 MHz.	2009
	American National Standard for Testing Unlicensed Wireless Devices	
FCC Part 2	Frequency Allocations and Radio Treaty Matters; General Rules and Regulations	2014

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 X 6.1 meters X 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 X 6.7 meters X 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)	P
Frequency Band Edges	15.247 (d)	P
Conducted Emission	15.247 (d)	P
Radiated Emission	15.247, 15.205, 15.209	P
Time of Occupancy (Dwell Time)	15.247 (a) (1)(iii)	P
20dB Bandwidth	15.247 (a)(1)	NA
Carrier Frequency Separation	15.247 (a)(1)	P
Number of hopping channels	15.247 (a)(b)(iii)	P
AC Powerline Conducted Emission	15.107, 15.207	P

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

The measurement is made according to ANSI C63.10.

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 Period	Calibration Due date
1	Vector Signal Analyzer	FSQ26	200136	Rohde & Schwarz	1 year	2015-01-06
2	Bluetooth Tester	CBT32	100649	Rohde & Schwarz	1 year	2015-02-09

Radiated emission test system

No.	Equipment	Model	Serial Number	Manufacturer	Calibration Period	Calibration Due date
1	Test Receiver	ESU26	100376	Rohde & Schwarz	1 year	2014-11-05
2	EMI Antenna	VULB 9163	9163 175	Schwarzbeck	3 years	2015-07-13
3	EMI Antenna	3117	00119021	ETS-Lindgren	3 years	2015-04-19
4	Dual-Ridge Waveguide Horn Antenna	3116	2663	ETS-Lindgren	3 years	2015-06-30
5	Dual-Ridge Waveguide Horn Antenna	3116	2661	ETS-Lindgren	3 years	2015-06-30
6	Bluetooth Tester	CBT	100153	Rohde & Schwarz	1 year	2015-09-15
7	LISN	ESH2-Z5	829991/01 2	Rohde & Schwarz	1 year	2015-04-14
8	Loop Antenna	HFH2-Z2	829324/00 7	Rohde & Schwarz	3 years	2014-12-12
9	Pre-amplifier(18GHz)	SCU18	1005277	Rohde & Schwarz	/	/
10	Pre-amplifier(26.5 GHz)	SCU26	1006788	Rohde & Schwarz	/	/

Anechoic chamber

Fully anechoic chamber by Frankonia German.

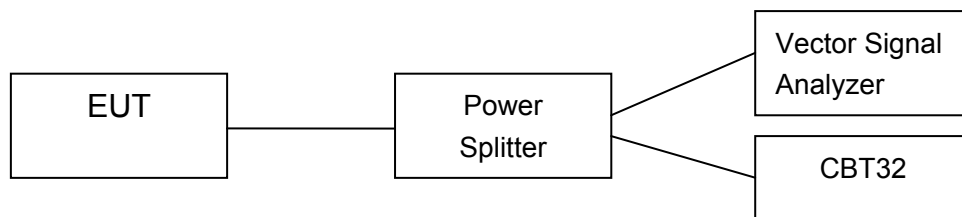
ANNEX A: MEASUREMENT RESULTS

A.1. Measurement Method

A.1.1. Conducted Measurements

The measurement is made according to ANSI C63.10.

- 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

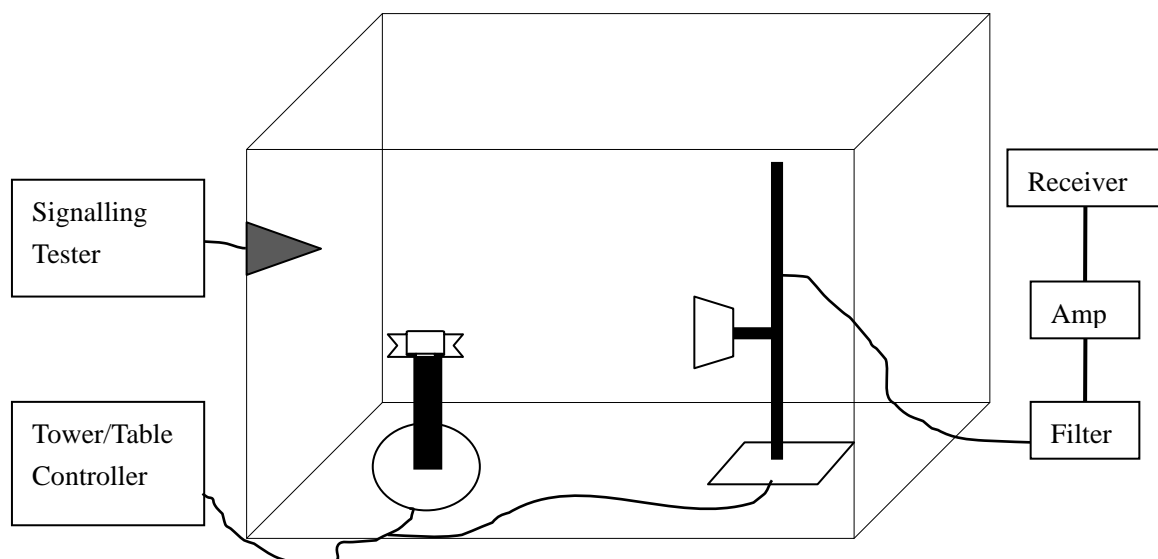
The measurement is made according to ANSI C63.10

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 ANSI C63.10.

Test Condition

Hopping Mode	RBW	VBW	Span	Sweptime	Detector	Trace Mode
Hopping OFF	3MHz	3MHz	5MHz	2.5ms	Peak	Max Hold

Measurement Results:

For GFSK

Channel	Ch 0 2402 MHz	Ch 39 2441 MHz	Ch 78 2480 MHz	Conclusion
Peak Conducted Output Power (dBm)	2.22	2.67	0.98	P

For $\pi/4$ DQPSK

Channel	Ch 0 2402 MHz	Ch 39 2441 MHz	Ch 78 2480 MHz	Conclusion
Peak Conducted Output Power (dBm)	2.37	2.72	1.04	P

For 8DPSK

Channel	Ch 0 2402 MHz	Ch 39 2441 MHz	Ch 78 2480 MHz	Conclusion
Peak Conducted Output Power (dBm)	2.59	2.96	1.27	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 ANSI C63.10.

Test Condition

Hopping Mode	RBW	VBW	Span	SweepTime	Detector	Trace Mode
Hopping OFF/ON	100KHz	300KHz	10MHz	5ms	Peak	Max Hold

Observe the stored trace and measure the amplitude delta between the peak of the fundamental and the peak of the band-edge emission. This is not an absolute field strength measurement; it is only a relative measurement to determine the amount by which the emission drops at the band edge relative to the highest fundamental emission level.

Measurement Result:

For GFSK

Channel	Hopping	Band Edge Power (dBc)		Conclusion
0	Hopping OFF	Fig.1	-56.74	P
	Hopping ON	Fig.2	-56.81	P
78	Hopping OFF	Fig.3	-61.11	P
	Hopping ON	Fig.4	-61.13	P

For $\pi/4$ DQPSK

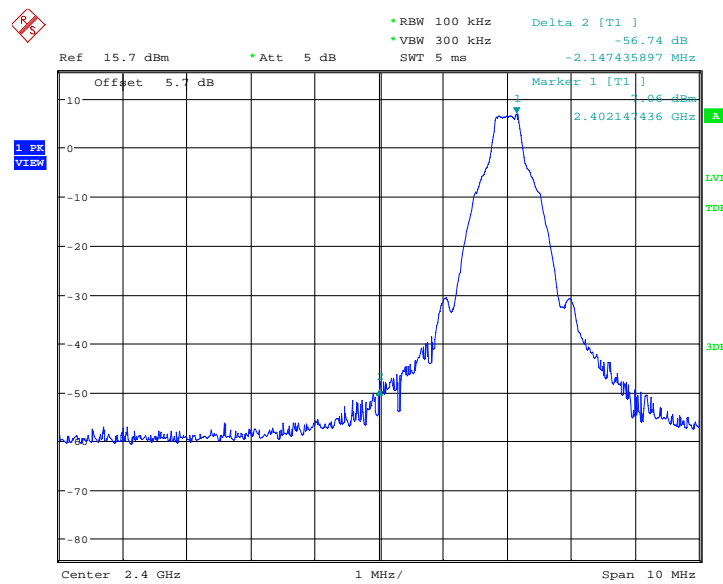
Channel	Hopping	Band Edge Power (dBc)		Conclusion
0	Hopping OFF	Fig.5	-55.30	P
	Hopping ON	Fig.6	-55.13	P
78	Hopping OFF	Fig.7	-59.84	P
	Hopping ON	Fig.8	-58.86	P

For 8DPSK

Channel	Hopping	Band Edge Power (dBc)		Conclusion
0	Hopping OFF	Fig.9	-55.92	P
	Hopping ON	Fig.10	-54.36	P
78	Hopping OFF	Fig.11	-58.70	P
	Hopping ON	Fig.12	-59.03	P

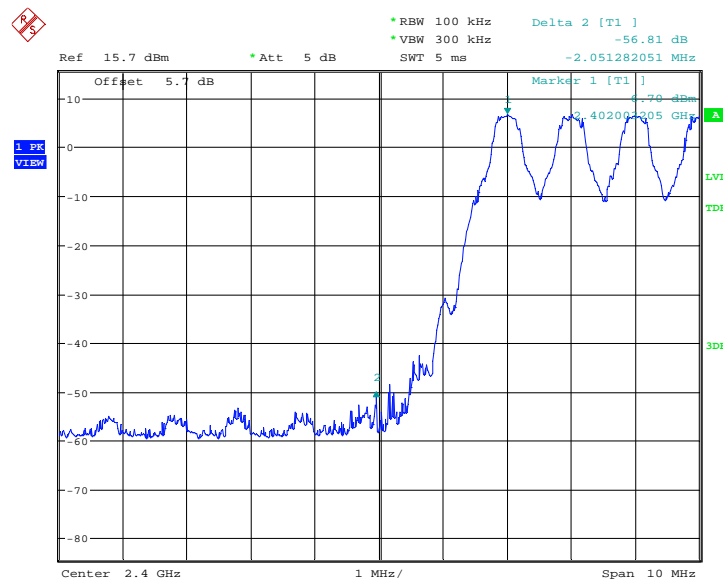
Conclusion: PASS

Test graphs as below



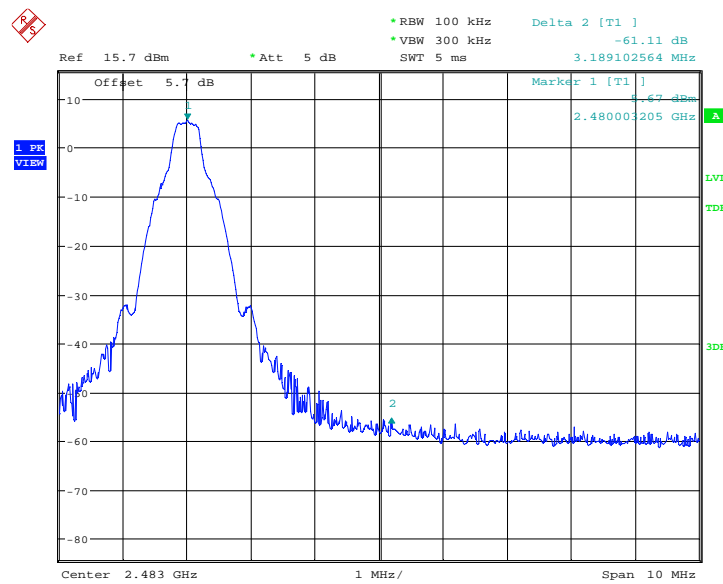
Date: 23.SEP.2014 20:27:48

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



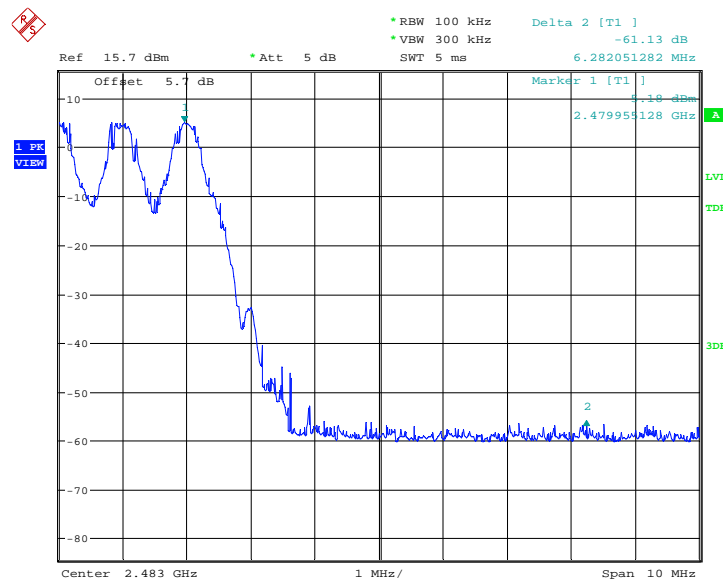
Date: 23.SEP.2014 20:30:08

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



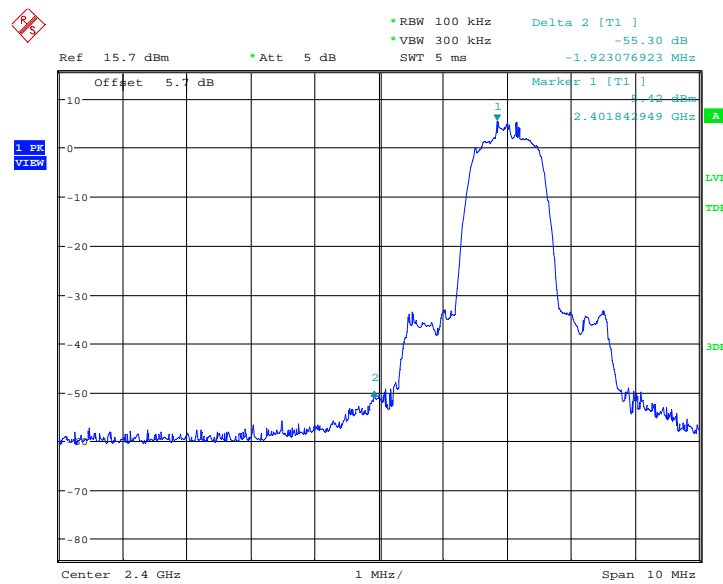
Date: 23.SEP.2014 20:28:05

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



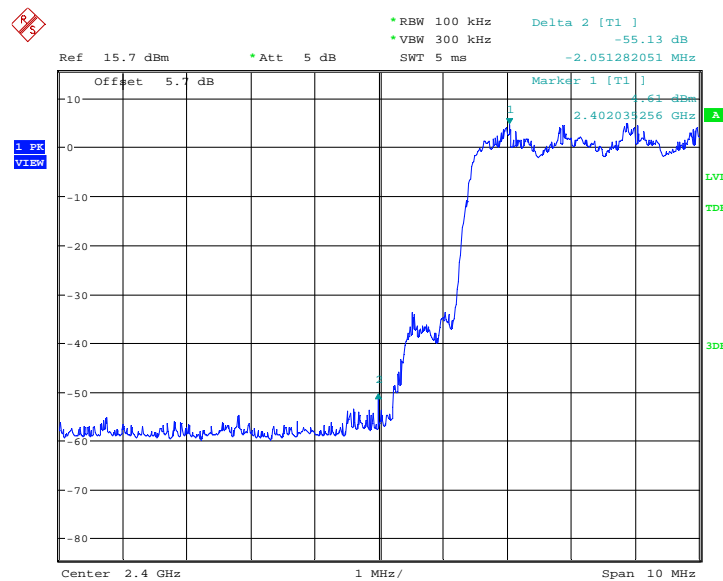
Date: 23.SEP.2014 20:32:11

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



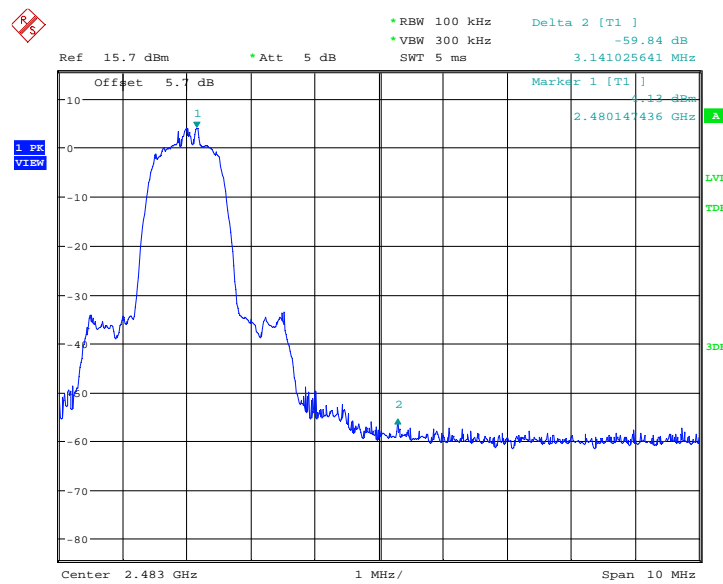
Date: 23.SEP.2014 19:32:33

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



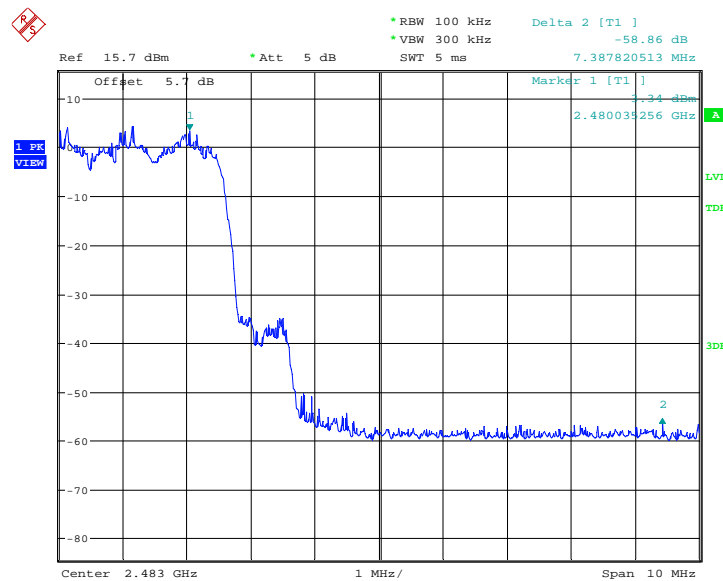
Date: 23.SEP.2014 19:34:53

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



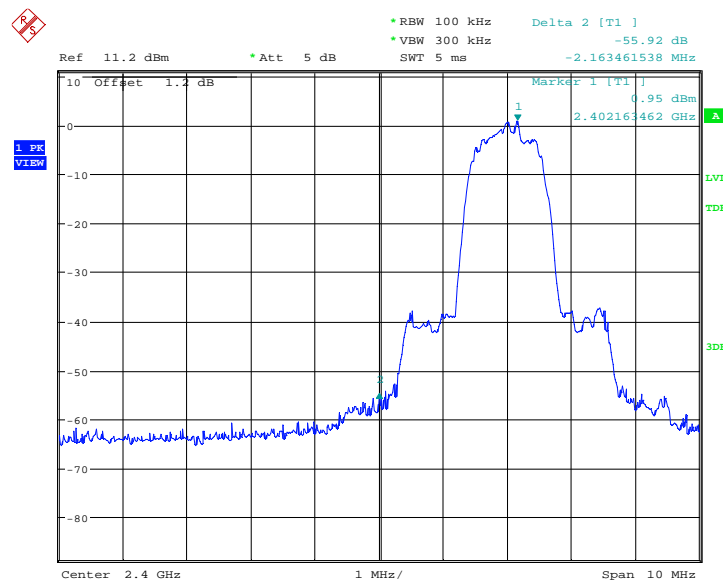
Date: 23.SEP.2014 19:32:50

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



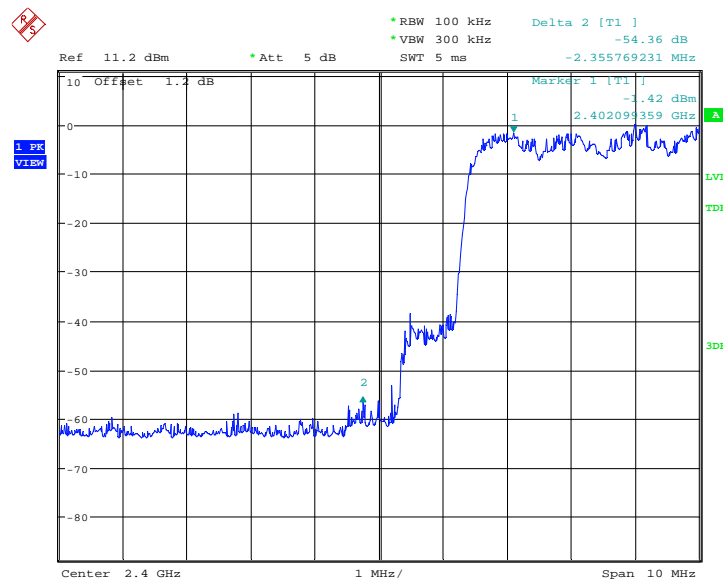
Date: 23.SEP.2014 19:36:55

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



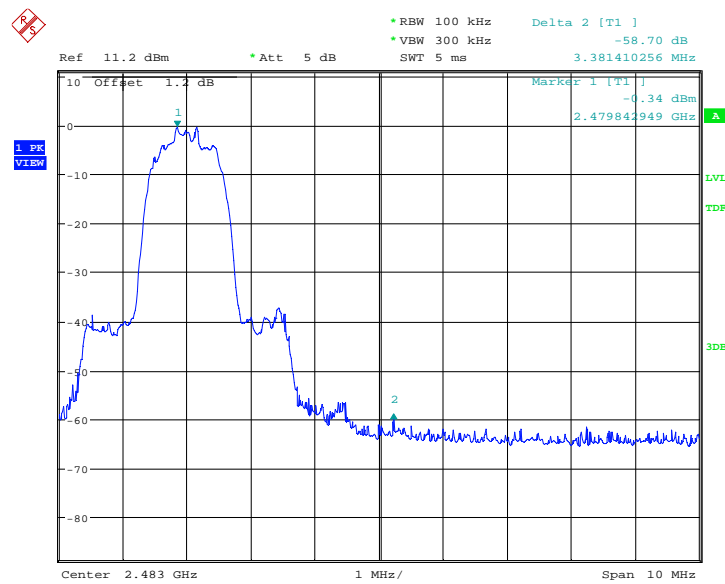
Date: 24.SEP.2014 17:01:33

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



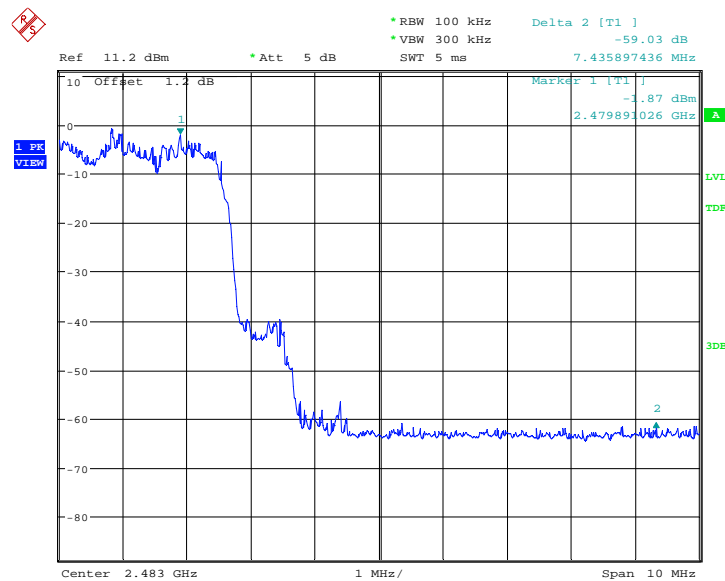
Date: 24.SEP.2014 17:03:53

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



Date: 24.SEP.2014 17:01:51

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



Date: 24.SEP.2014 17:05:56

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 ANSI C63.10

Test Condition

Hopping Mode	RBW	VBW	Sweeptime	Detector	Trace Mode
Hopping OFF	100KHz	300KHz	Auto	Peak	Max Hold

Measurement Procedure – Reference Level

1. Set the RBW = 100 kHz.
2. Set the VBW \geq 300 kHz.
3. Set the span to 5-30 % greater than the EBW.
4. Detector = peak.
5. Sweep time = auto couple.
6. Trace mode = max hold.
7. Allow trace to fully stabilize.
8. Use the peak marker function to determine the maximum power level in any 100 kHz band segment within the fundamental EBW. Next, determine the power in 100 kHz band segments outside of the authorized frequency band using the following measurement:

Measurement Procedure - Unwanted Emissions

1. Set RBW = 100 kHz.
2. Set VBW \geq 300 kHz.
3. Set span to encompass the spectrum to be examined.
4. Detector = peak.
5. Trace Mode = max hold.
6. Sweep = auto couple.
7. Allow the trace to stabilize (this may take some time, depending on the extent of the span).

Ensure that the amplitude of all unwanted emissions outside of the authorized frequency band (excluding restricted frequency bands) is attenuated by at least the minimum requirements specified above.

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

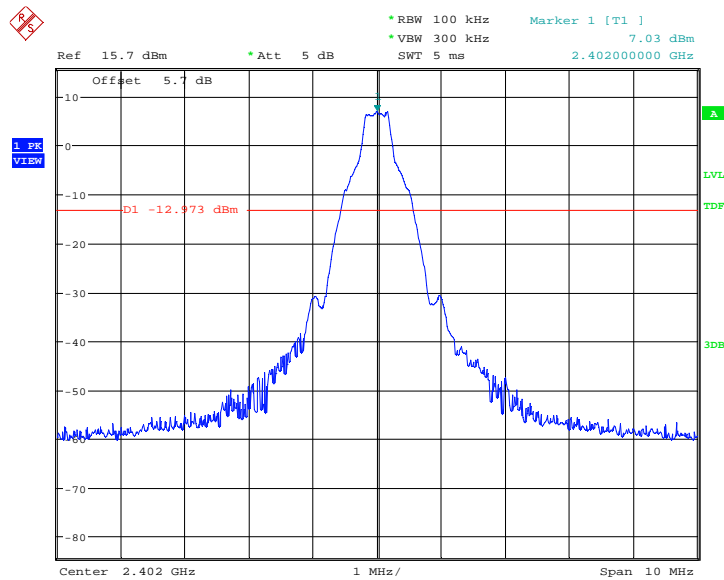
For 8DPSK

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

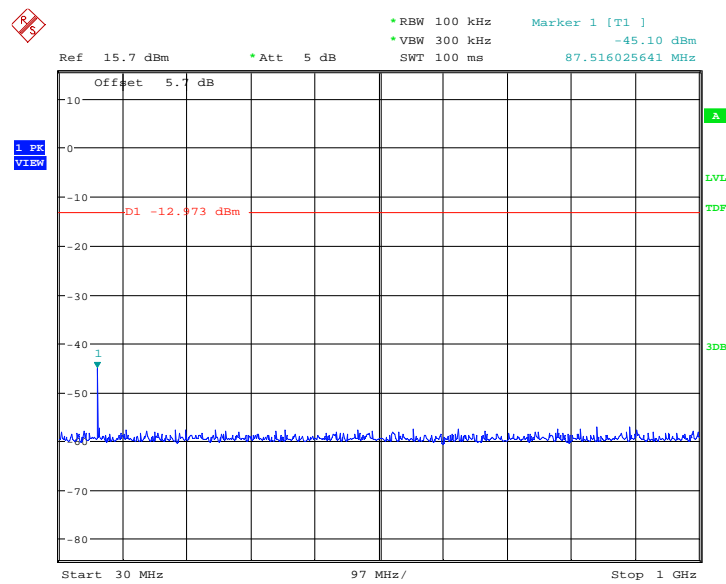
Conclusion: PASS

Test graphs as below



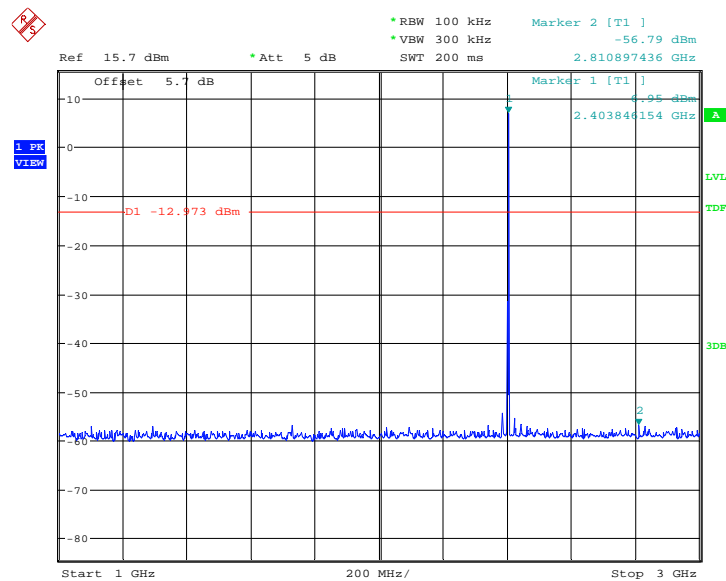
Date: 23.SEP.2014 17:58:48

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



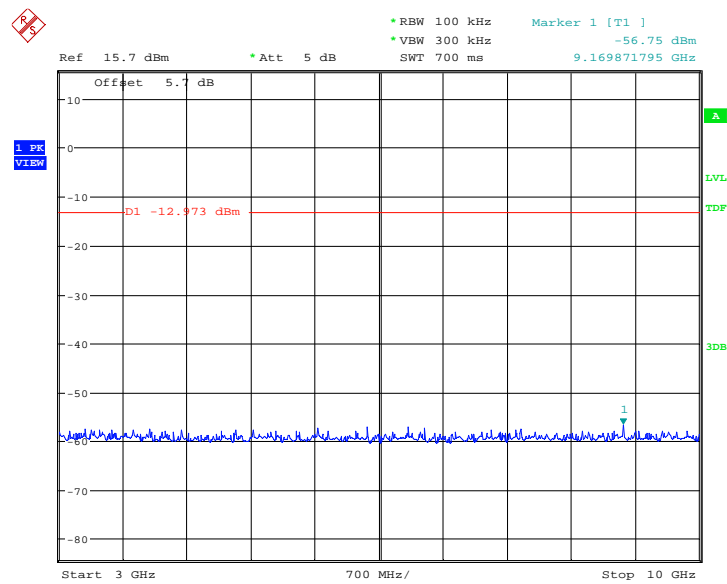
Date: 23.SEP.2014 17:59:05

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



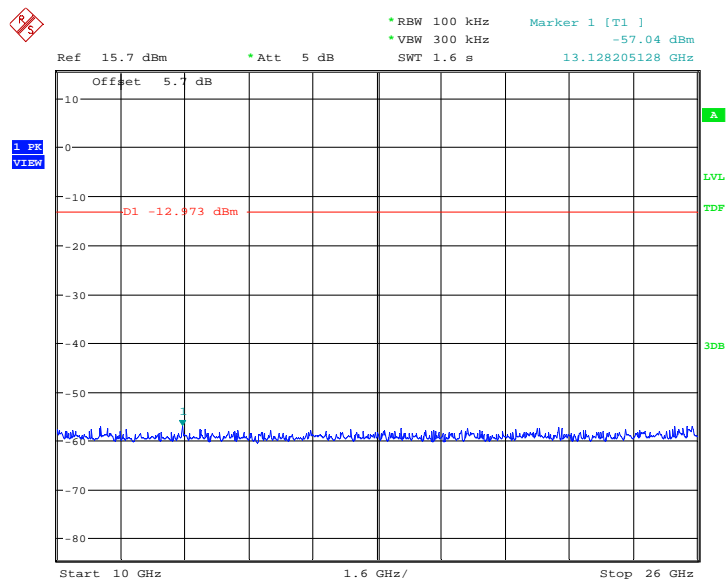
Date: 23.SEP.2014 17:59:36

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



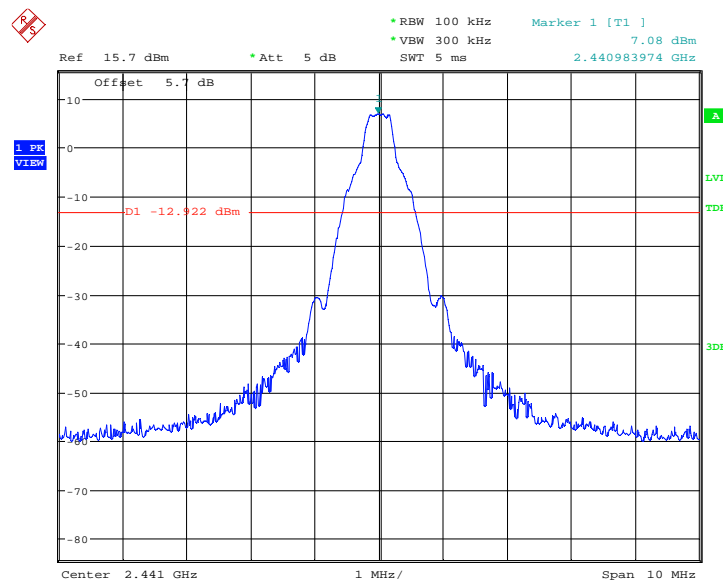
Date: 23.SEP.2014 17:59:53

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



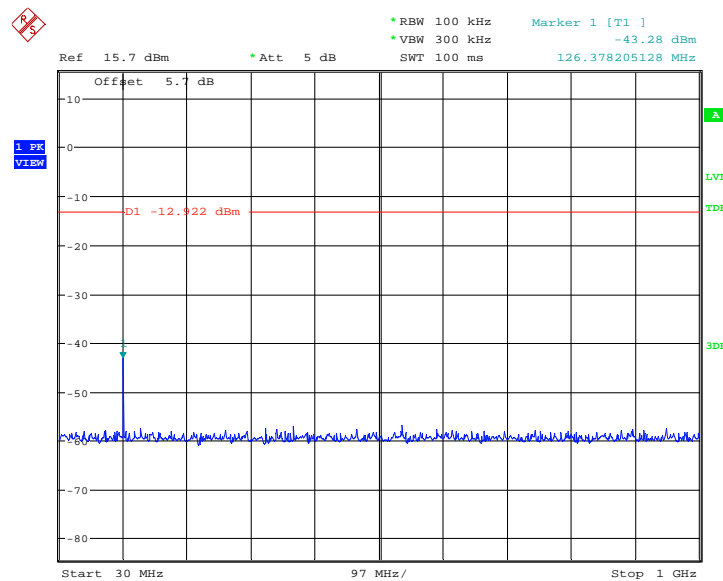
Date: 23.SEP.2014 18:00:09

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



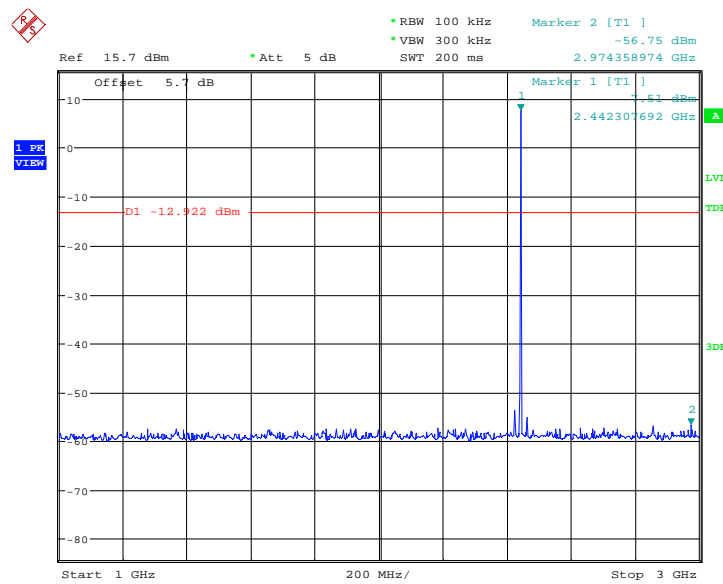
Date: 23.SEP.2014 18:00:26

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



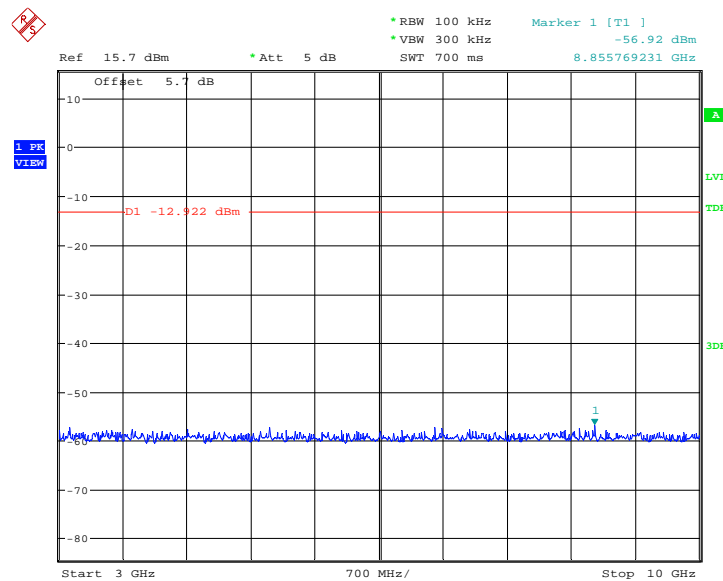
Date: 23.SEP.2014 18:00:42

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



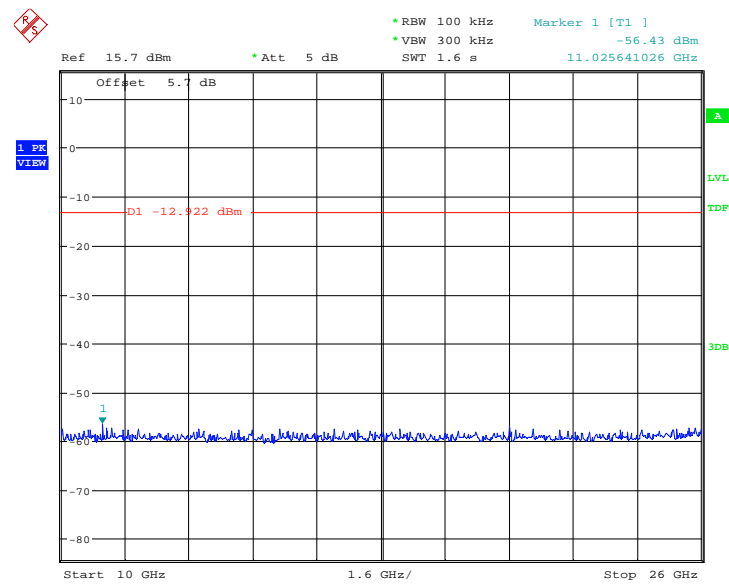
Date: 23.SEP.2014 18:01:14

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



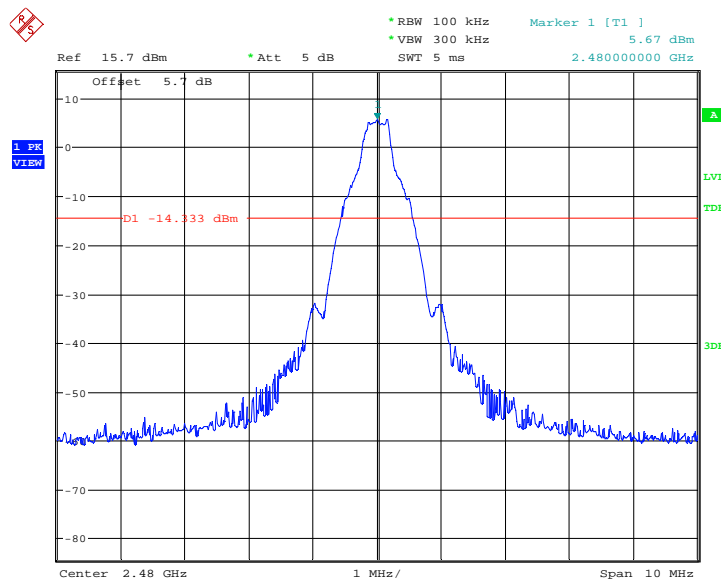
Date: 23.SEP.2014 18:01:31

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



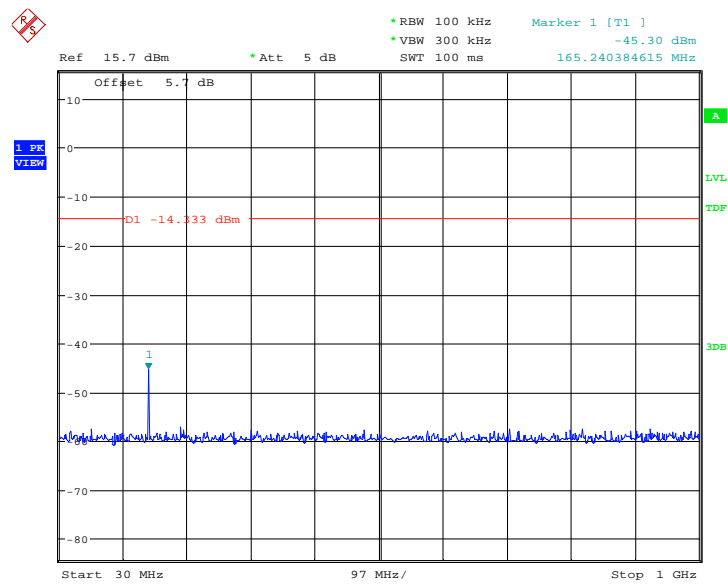
Date: 23.SEP.2014 18:01:47

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



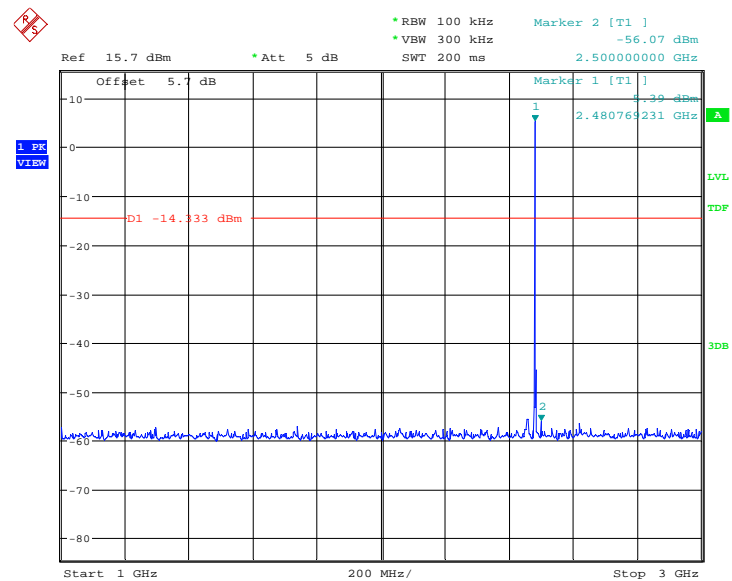
Date: 23.SEP.2014 18:02:04

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



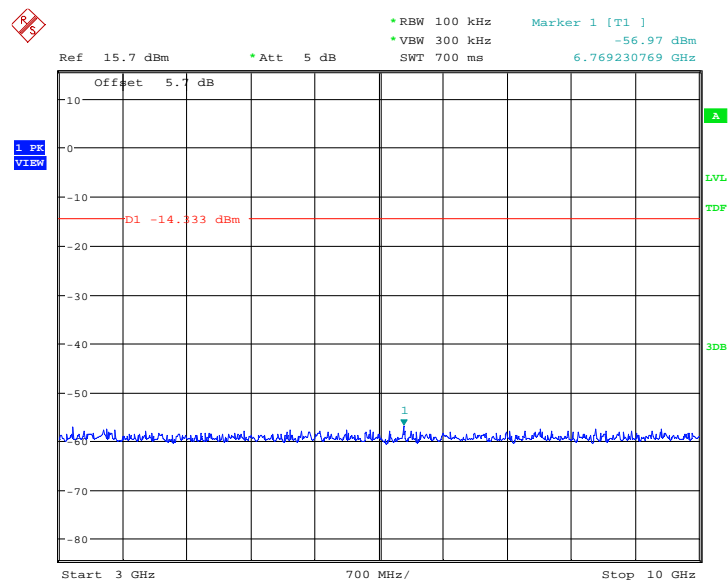
Date: 23.SEP.2014 18:02:20

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



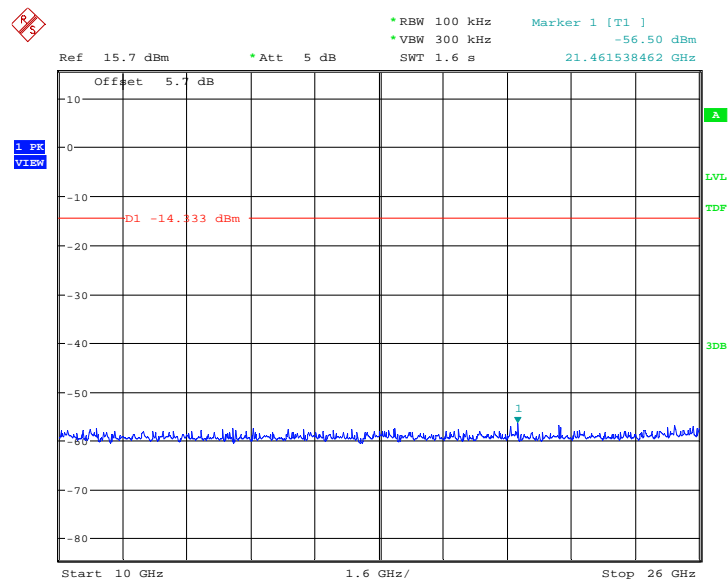
Date: 23.SEP.2014 18:02:52

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



Date: 23.SEP.2014 18:03:08

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



Date: 23.SEP.2014 18:03:25

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

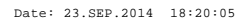


Fig.28. Conducted spurious emission: $\pi/4$ DQPSK, Channel 0,2402MHz

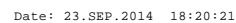
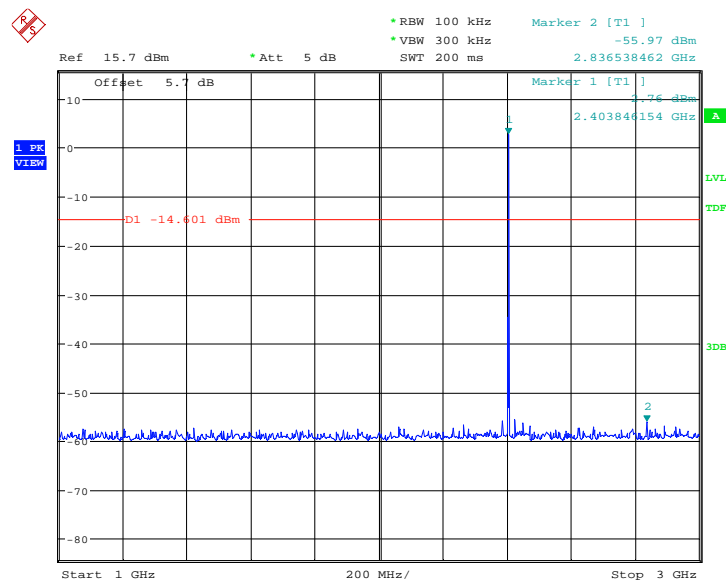
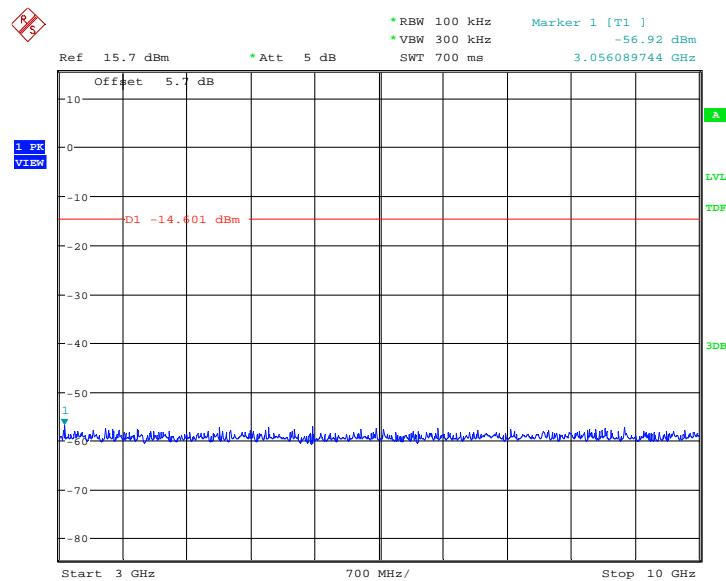


Fig.29. Conducted spurious emission: $\pi/4$ DQPSK, Channel 0, 30MHz - 1GHz



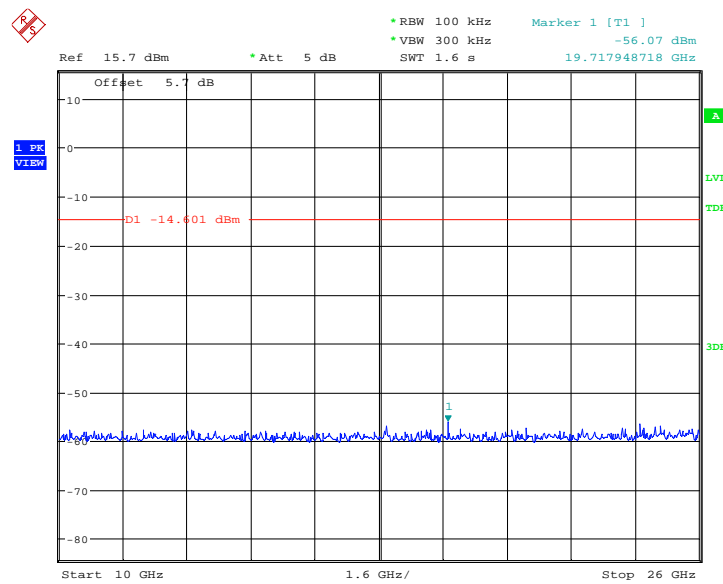
Date: 23.SEP.2014 18:20:53

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



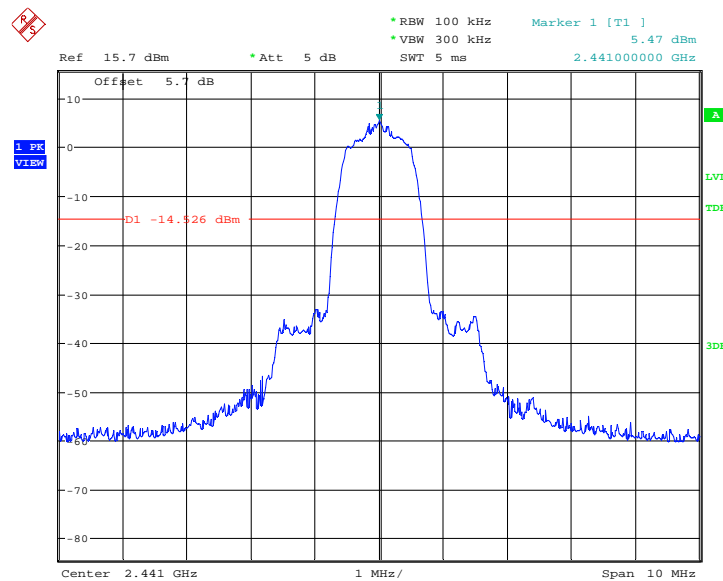
Date: 23.SEP.2014 18:21:09

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



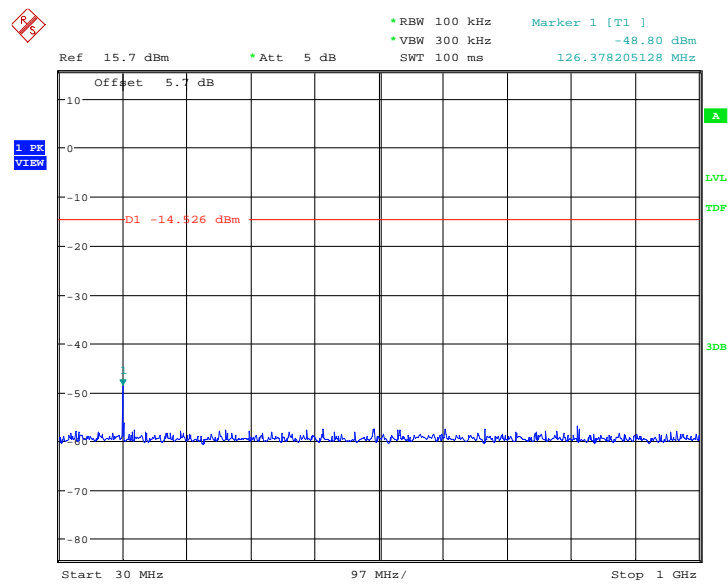
Date: 23.SEP.2014 18:21:26

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



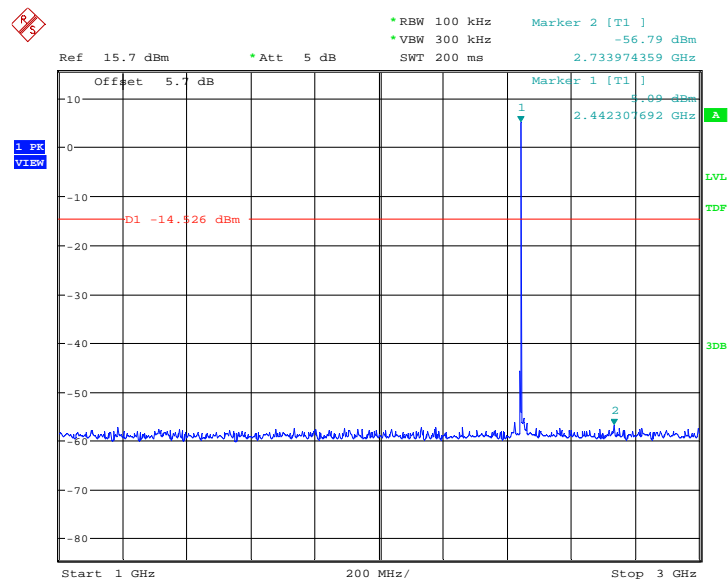
Date: 23.SEP.2014 18:21:43

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



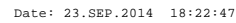
Date: 23.SEP.2014 18:21:59

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



Date: 23.SEP.2014 18:22:31

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



Ref 15.7 dBm * Att 5 dB * RBW 100 kHz Marker 1 [T1] -56.33 dBm
 * VBW 300 kHz SWT 1.6 s 17.820512821 GHz

Offset 5.7 dB

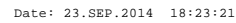
1 PK VIEW

D1 -14.526 dBm

1

Start 10 GHz 1.6 GHz/ Stop 26 GHz

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



Offset 5.7 dB

Ref 15.7 dBm Att 5 dB RBW 100 kHz VBW 300 kHz SWT 100 ms Marker 1 [T1] -50.52 dBm 165.240384615 MHz

1 PK VIEW

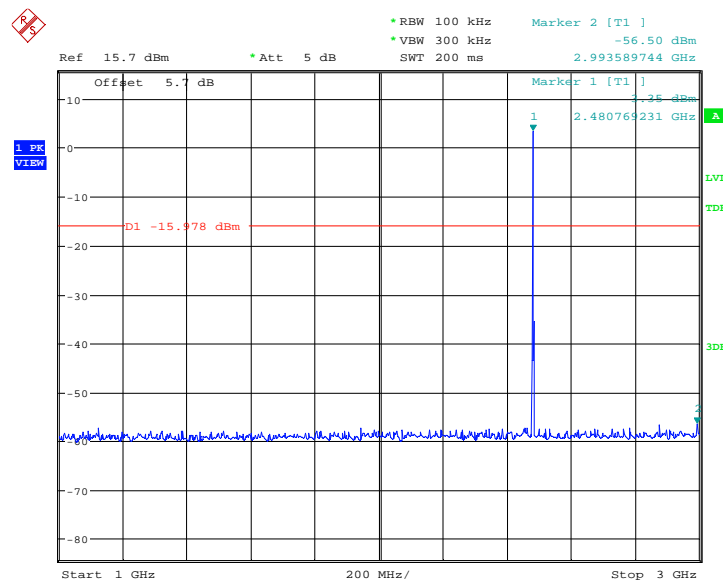
D1 -15.978 dBm

1

Start 30 MHz 97 MHz/ Stop 1 GHz

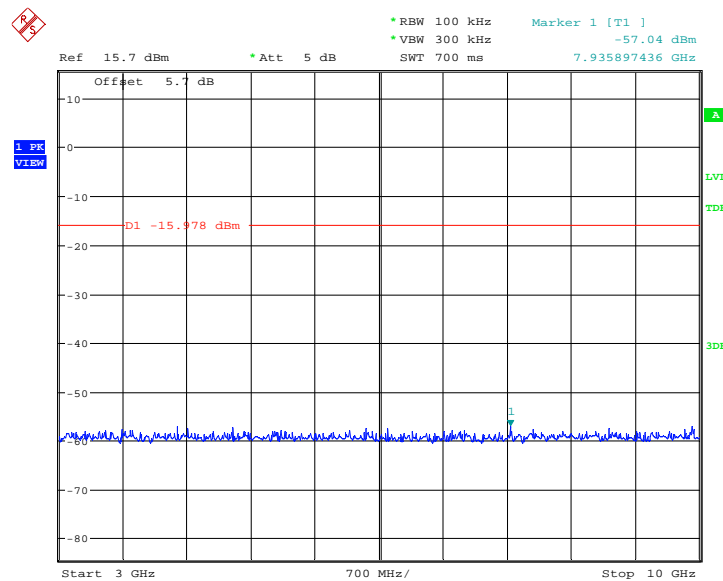
Date: 23.SEP.2014 18:23:37

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



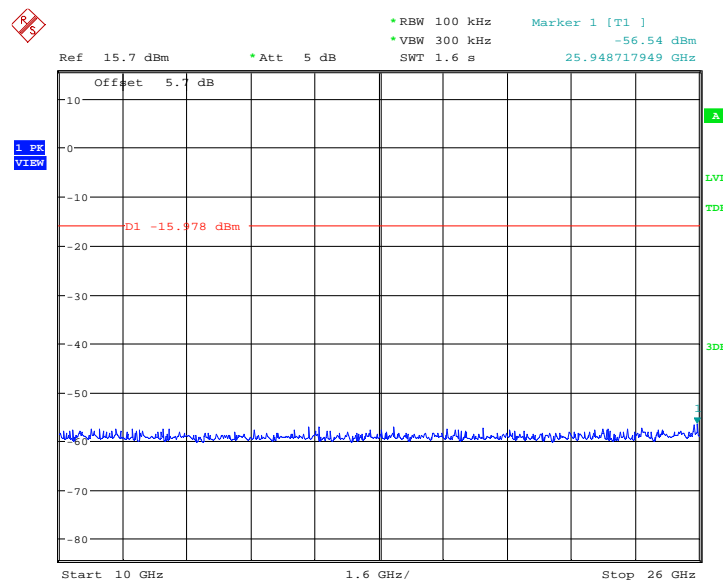
Date: 23.SEP.2014 18:24:09

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



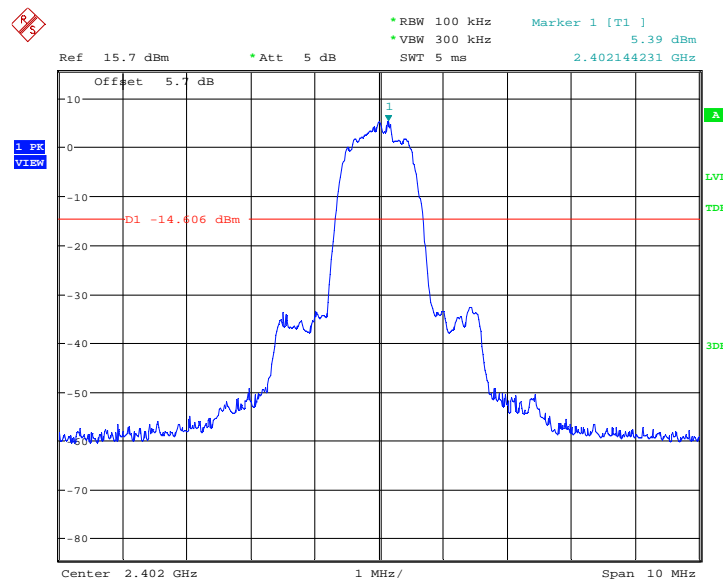
Date: 23.SEP.2014 18:24:25

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



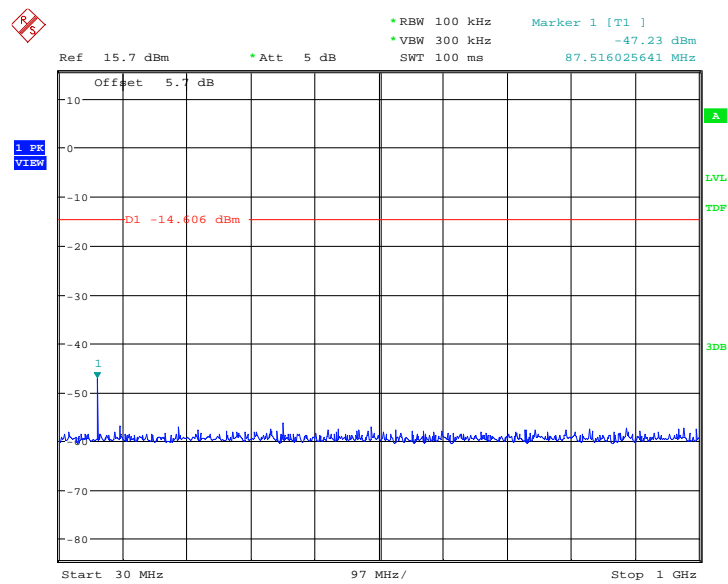
Date: 23.SEP.2014 18:24:42

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



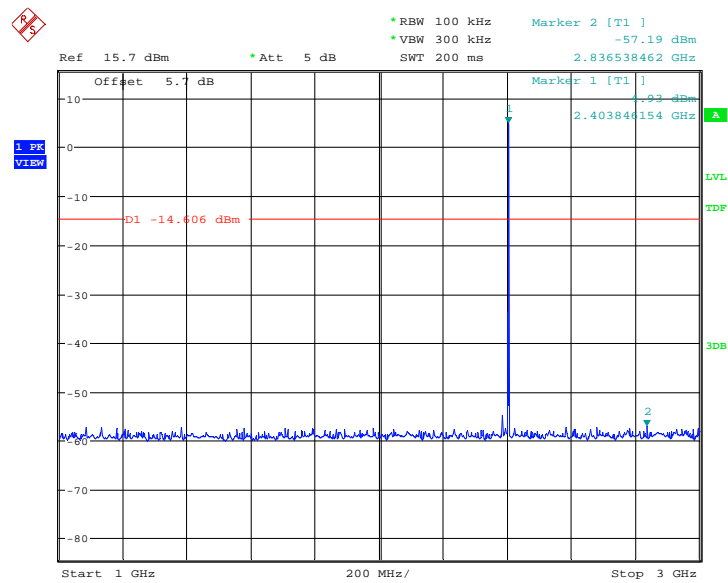
Date: 23.SEP.2014 20:15:30

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



Date: 23.SEP.2014 20:15:47

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



Date: 23.SEP.2014 20:16:19

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

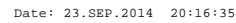


Fig.46. Conducted spurious emission: 8DPSK, Channel 0, 3GHz - 10GHz

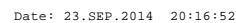
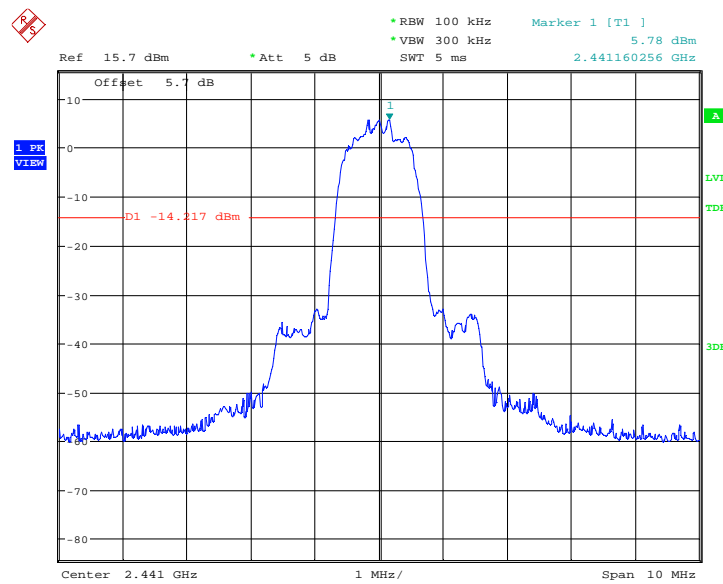
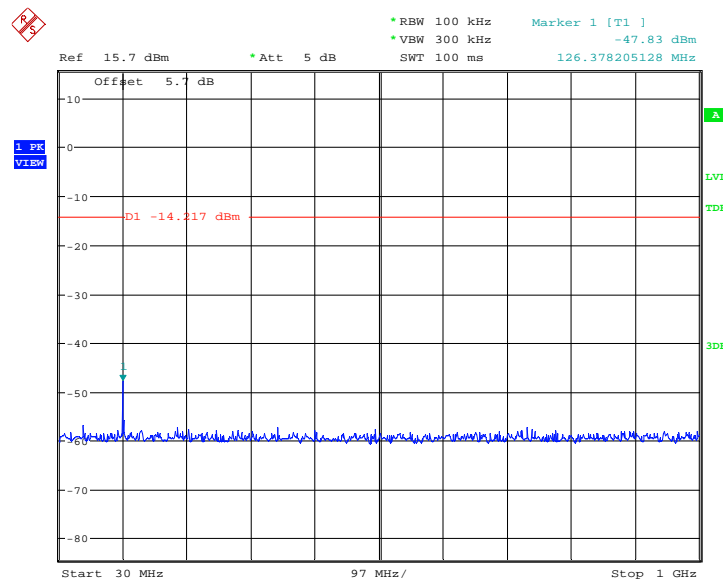


Fig.47. Conducted spurious emission: 8DPSK, Channel 0, 10GHz - 26GHz



Date: 23.SEP.2014 20:17:09

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



Date: 23.SEP.2014 20:17:26

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

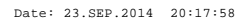


Fig.50. Conducted spurious emission: 8DPSK, Channel 39, 1GHz - 3GHz

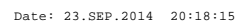
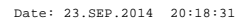


Fig.51. Conducted spurious emission: 8DPSK, Channel 39, 3GHz - 10GHz



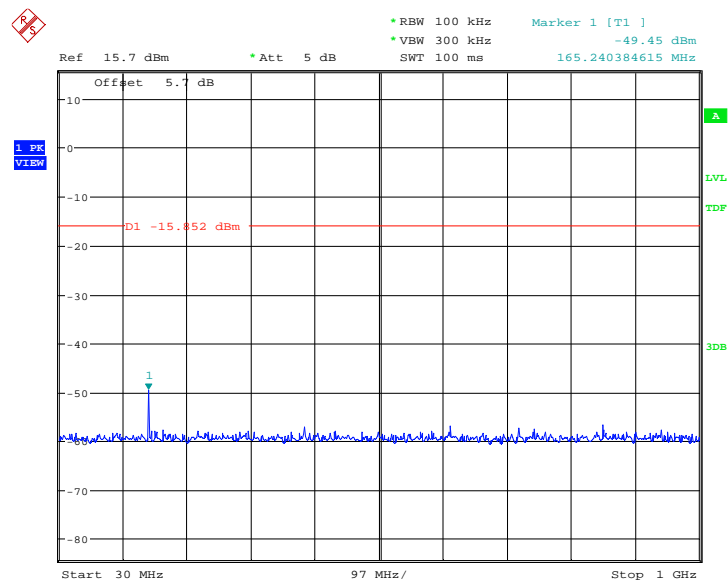
Ref 15.7 dBm Att 5 dB RBW 100 kHz VBW 300 kHz Marker 1 [T1] 4.15 dBm
 Offset 5.7 dB SWT 5 ms 2.480160256 GHz

1 SPK
 V/DW

D1 -15.452 dBm

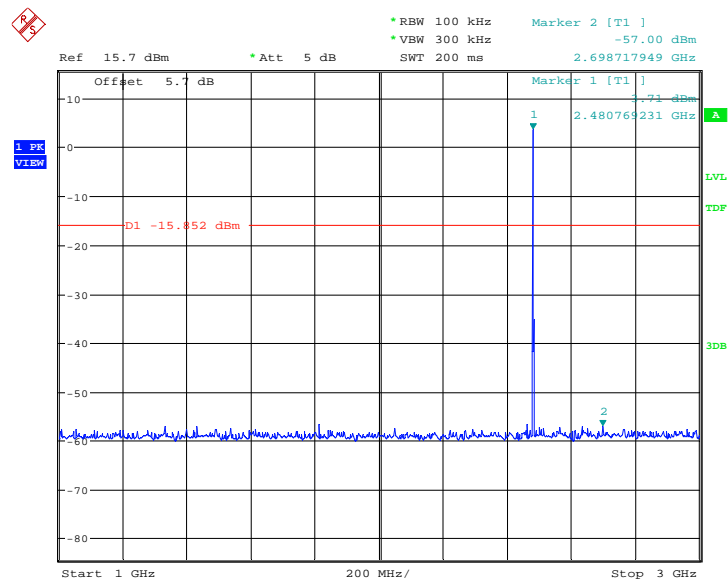
Center 2.48 GHz 1 MHz/ Span 10 MHz

Date: 23.SEP.2014 20:18:48



Date: 23.SEP.2014 20:19:05

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



Date: 23.SEP.2014 20:19:37

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

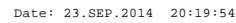


Fig.56. Conducted spurious emission: 8DPSK, Channel 78, 3GHz - 10GHz

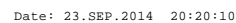


Fig.57. Conducted spurious emission: 8DPSK, Channel 78, 10GHz - 26GHz

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 ANSI C63.10

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:

Result= P_{Mea} +ARPL

For GFSK

Channel	Frequency Range	Test Results	Conclusion
Ch 0 2402 MHz	1 GHz ~ 3 GHz	Fig.58	P
	3 GHz ~ 18 GHz	Fig.59	P
Ch 39 2441 MHz	9 kHz ~ 30 MHz	Fig.60	P
	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	1 GHz ~ 3 GHz	Fig.64	P
	3 GHz ~ 18 GHz	Fig.65	P
Power	2.38GHz~2.4GHz---L	Fig.66	P

Power	2.45GHz~2.5GHz---H	Fig.67	P
For all channels	18 GHz ~ 26 GHz	Fig.68	P

For $\pi/4$ DQPSK

Channel	Frequency Range	Test Results	Conclusion
Ch 0 2402 MHz	1 GHz ~ 3 GHz	Fig.69	P
	3 GHz ~ 18 GHz	Fig.70	P
Ch 39 2441 MHz	30 MHz ~ 1 GHz	Fig.71	P
	1 GHz ~ 3 GHz	Fig.72	P
	3 GHz ~ 18 GHz	Fig.73	P
Ch 78 2480 MHz	1 GHz ~ 3 GHz	Fig.74	P
	3 GHz ~ 18 GHz	Fig.75	P
Power	2.38GHz~2.4GHz---L	Fig.76	P
Power	2.45GHz~2.5GHz---H	Fig.77	P

For 8DPSK

Channel	Frequency Range	Test Results	Conclusion
Ch 0 2402 MHz	1 GHz ~ 3 GHz	Fig.78	P
	3 GHz ~ 18 GHz	Fig.79	P
Ch 39 2441 MHz	30 MHz ~ 1 GHz	Fig.80	P
	1 GHz ~ 3 GHz	Fig.81	P
	3 GHz ~ 18 GHz	Fig.82	P
Ch 78 2480 MHz	1 GHz ~ 3 GHz	Fig.83	P
	3 GHz ~ 18 GHz	Fig.84	P
Power	2.38GHz~2.4GHz---L	Fig.85	P
Power	2.45GHz~2.5GHz---H	Fig.86	P

GFSK Ch 0 - Average

Frequency(MHz)	Result(dBuv/m)	ARPL (dB)	PMea(dBuv/m)	Polarization
14453	44.9	13.1	31.8	V
15060	45.5	13.2	32.3	H
15781	47.3	14.2	33.1	H
16337	47.5	15.1	32.4	H
16824	48.3	15.5	32.8	V
17419	47.8	15.6	32.2	V

GFSK Ch 39 - Average

Frequency(MHz)	Result(dBuv/m)	ARPL (dB)	Pmea(dBuv/m)	Polarization
14462	45.1	13	32.1	H
15178	45.9	13.1	32.8	H
15786	47.6	14.2	33.4	H
16204	47.9	14.4	33.5	H
16783	48.6	15.3	33.3	H
17434	48.3	15.6	32.7	H

GFSK Ch 78 - Average

Frequency(MHz)	Result(dBuv/m)	ARPL (dB)	Pmea(dBuv/m)	Polarization
14550	45.1	12.6	32.5	H
15156	45.8	13	32.8	H
15665	47.6	13.8	33.8	H
16205	48.3	14.4	33.9	H
16821	48.9	15.5	33.4	H
17330	48.6	15.5	33.1	H

 $\pi/4$ DQPSK Ch 0 - Average

Frequency(MHz)	Result(dBuv/m)	ARPL (dB)	Pmea(dBuv/m)	Polarization
14454	45	13.1	31.9	V
15051	45.6	13.3	32.3	V
15685	47.3	13.9	33.4	V
16202	47.9	14.4	33.5	H
16819	48.7	15.5	33.2	H
17285	48.5	15.4	33.1	V

 $\pi/4$ DQPSK Ch 39 - Average

Frequency(MHz)	Result(dBuv/m)	ARPL (dB)	Pmea(dBuv/m)	Polarization
14448	44.9	13.1	31.8	H
15001	45.4	13.6	31.8	H
15779	47.1	14.2	32.9	V
16319	47.3	15	32.3	V
16829	48.3	15.5	32.8	H
17401	47.8	15.6	32.2	H

 $\pi/4$ DQPSK Ch 78 - Average

Frequency(MHz)	Result(dBuv/m)	ARPL (dB)	Pmea(dBuv/m)	Polarization
14399	44.7	13.4	31.3	H
14974	45.3	13.8	31.5	H
15776	47.1	14.2	32.9	H
16291	47.2	14.8	32.4	H
16832	48	15.5	32.5	H
17424	47.6	15.6	32	H

8DPSK Ch 0 - Average

Frequency(MHz)	Result(dBuv/m)	ARPL (dB)	Pmea(dBuv/m)	Polarization
14154	44.9	12.4	32.5	V
15181	45.4	13.1	32.3	V
15686	47.4	13.9	33.5	H
16201	47.9	14.4	33.5	V
16840	48.7	15.6	33.1	H
17367	48.3	15.5	32.8	V

8DPSK Ch 39 - Average

Frequency(MHz)	Result(dBuv/m)	ARPL (dB)	Pmea(dBuv/m)	Polarization
14455	44.9	13.1	31.8	V
14986	45.6	13.7	31.9	H
15736	47.3	14	33.3	H
16209	47.7	14.4	33.3	H
16826	48.5	15.5	33	V
17419	48.2	15.6	32.6	H

8DPSK Ch 78 - Average

Frequency(MHz)	Result(dBuv/m)	ARPL (dB)	Pmea(dBuv/m)	Polarization
14398	44.9	13.4	31.5	V
15048	45.4	13.3	32.1	H
15776	47.2	14.2	33	H
16314	47.5	14.9	32.6	H
16793	48.2	15.3	32.9	V
17311	47.9	15.4	32.5	V

Conclusion: PASS

Test graphs as below:

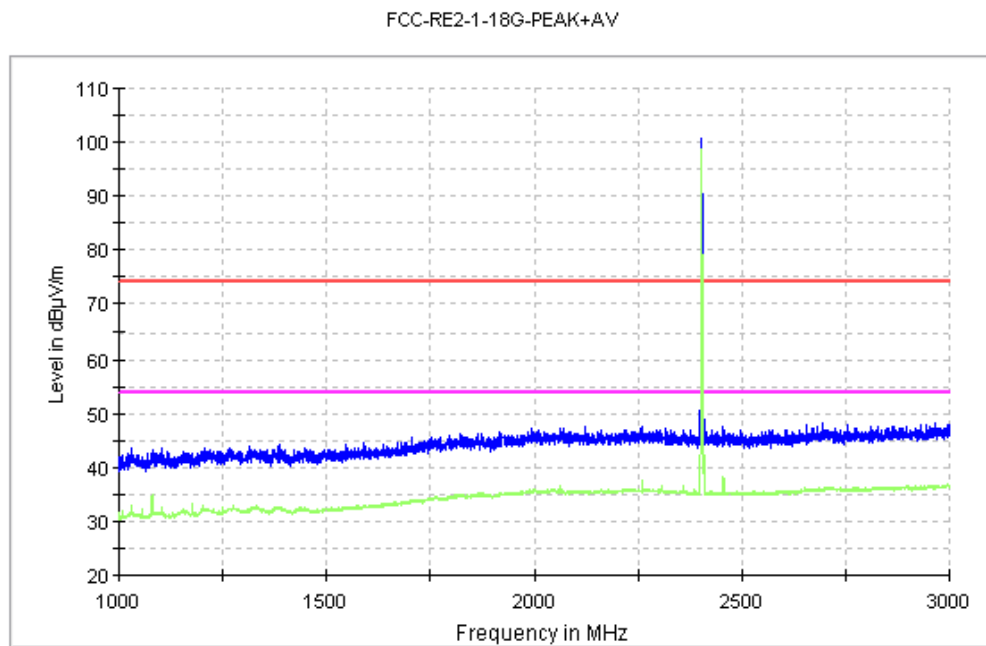


Fig.58. Radiated emission: GFSK, Channel 0, 1 GHz - 3 GHz

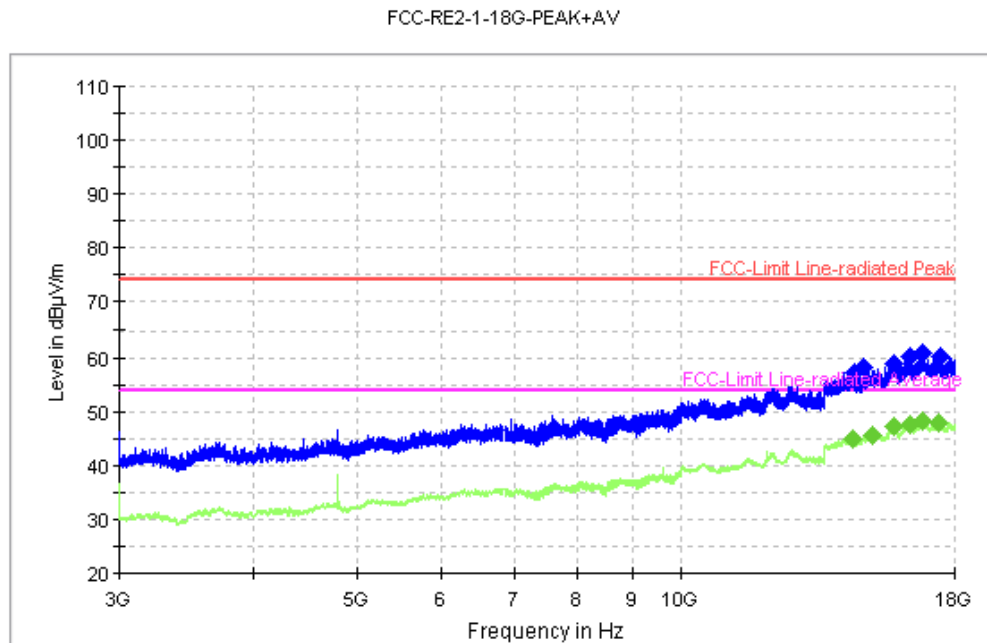


Fig.59. Radiated emission: GFSK, Channel 0, 3 GHz - 18 GHz

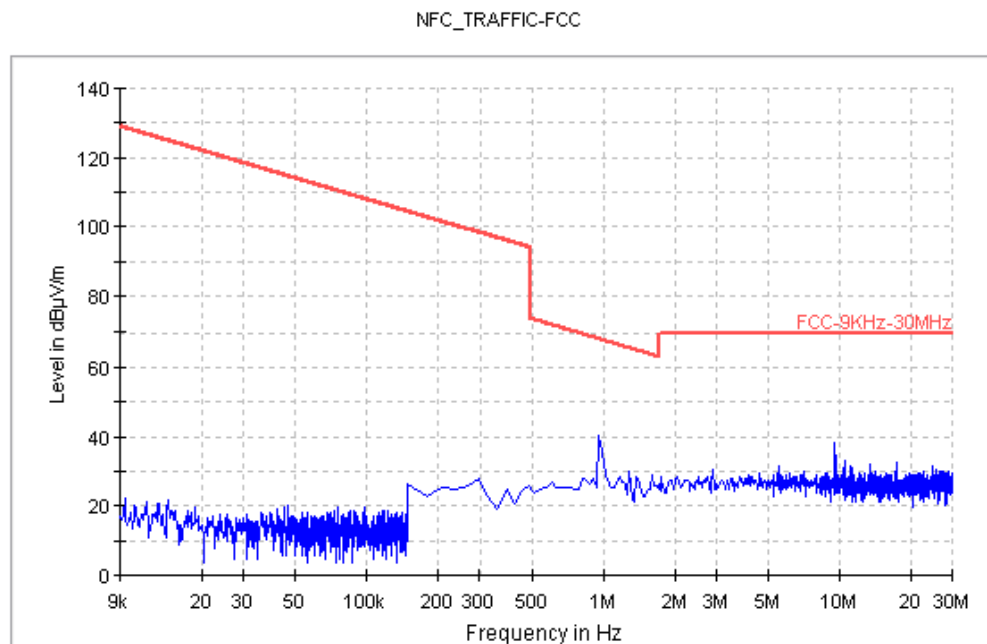


Fig.60. Radiated emission: GFSK, Channel 39, 9 kHz - 30 MHz

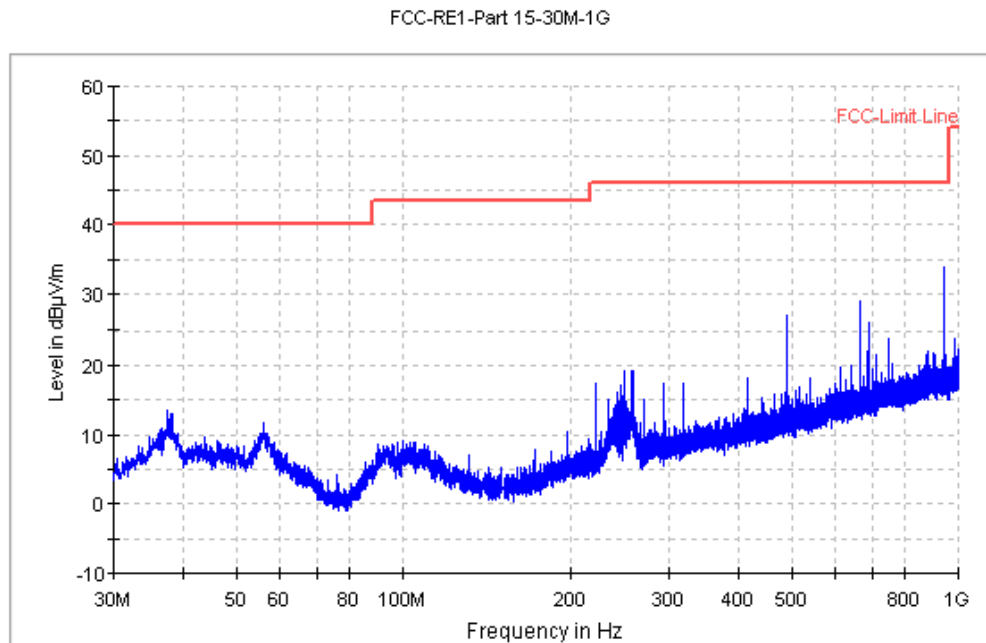


Fig.61. Radiated emission: GFSK, Channel 39, 30 MHz - 1 GHz

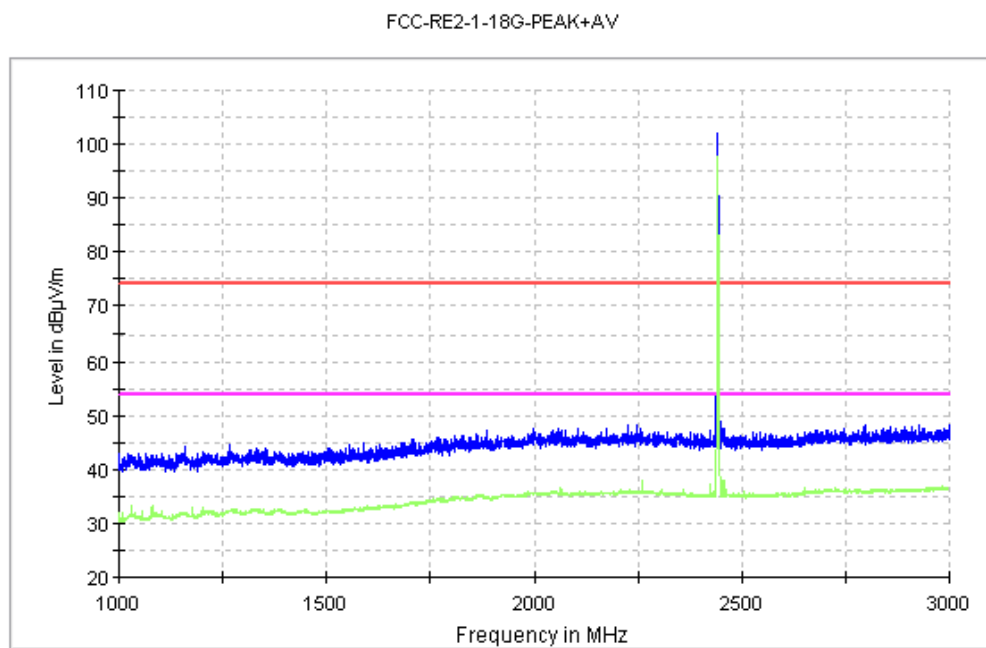


Fig.62. Radiated emission: GFSK, Channel 39, 1 GHz - 3 GHz

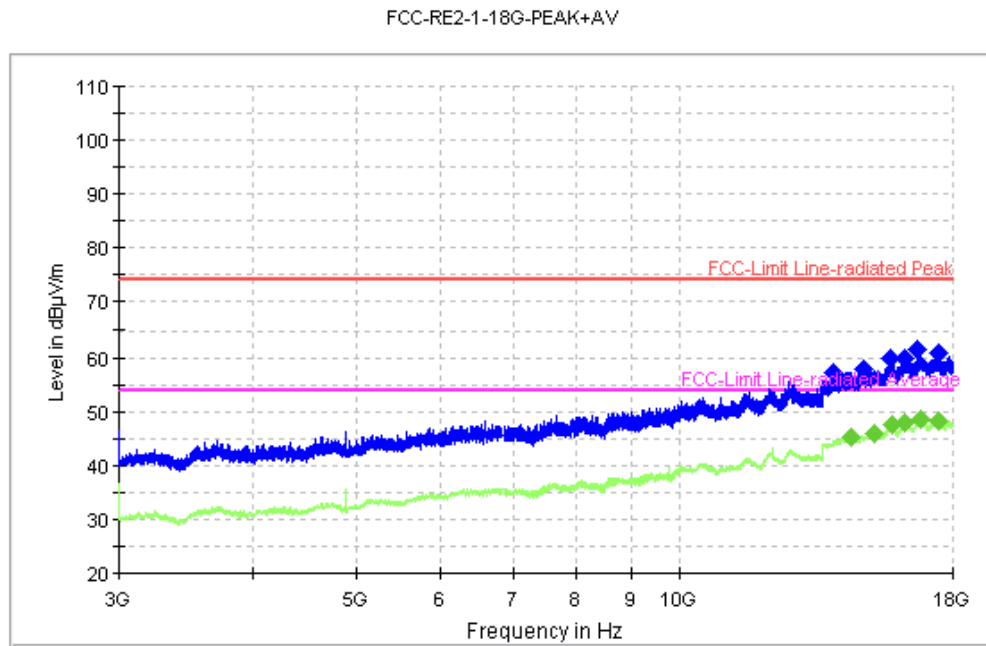


Fig.63. Radiated emission: GFSK, Channel 39, 3 GHz - 18 GHz

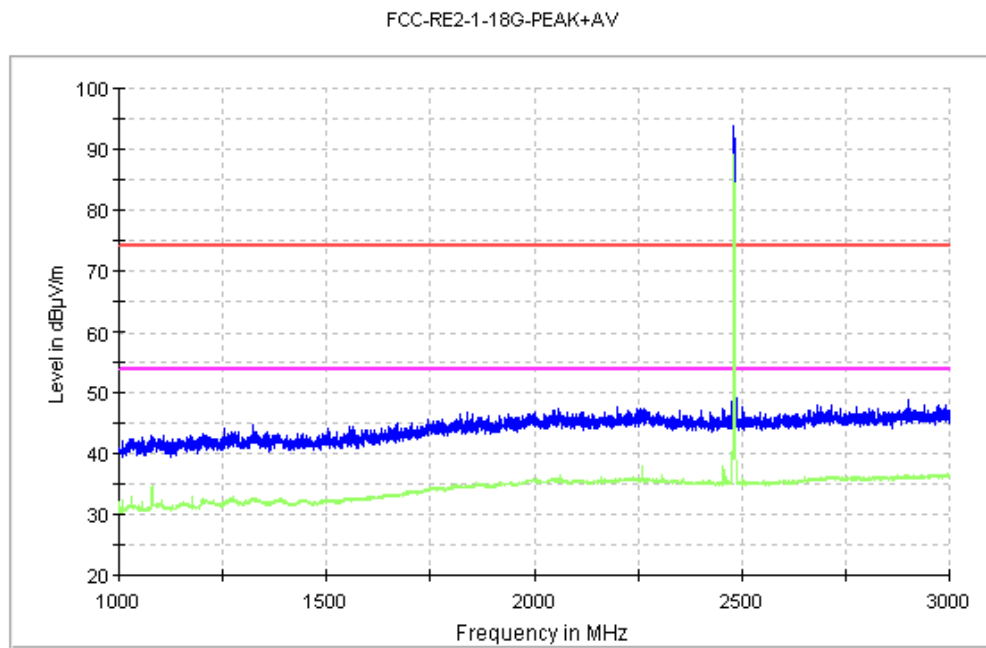


Fig.64. Radiated emission: GFSK, Channel 78, 1 GHz - 3 GHz

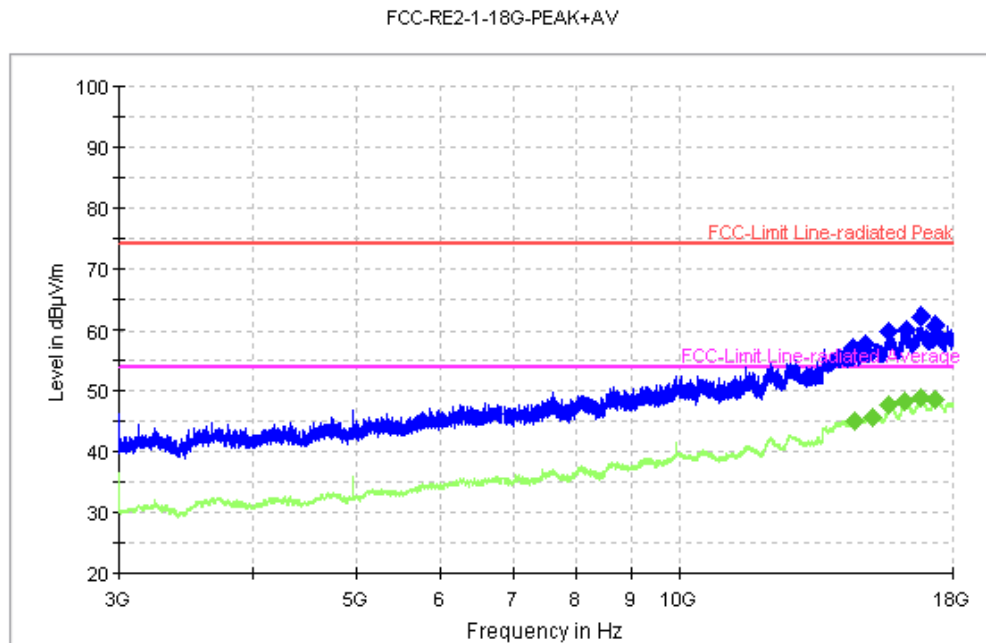


Fig.65. Radiated emission: GFSK, Channel 78, 3 GHz - 18 GHz

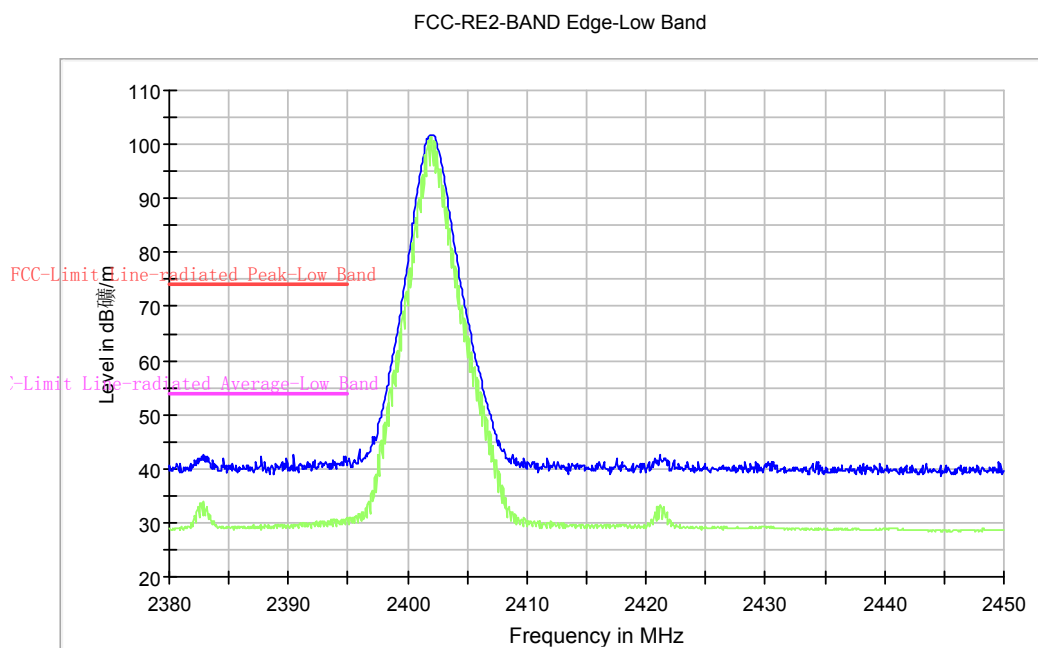


Fig.66. Radiated emission (Power): GFSK, low channel

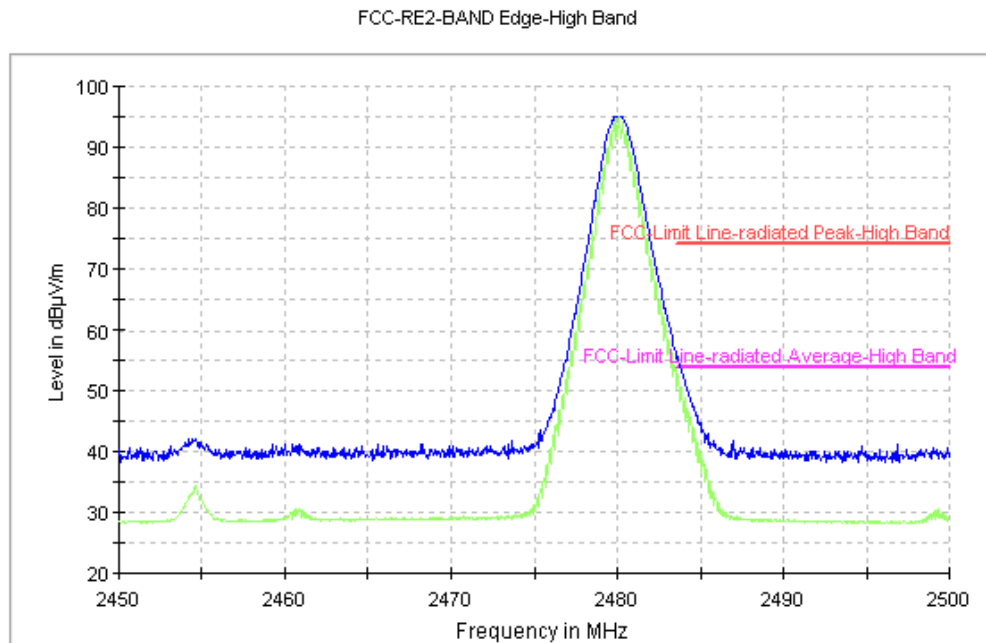


Fig.67. Radiated emission (Power) GFSK, high channel

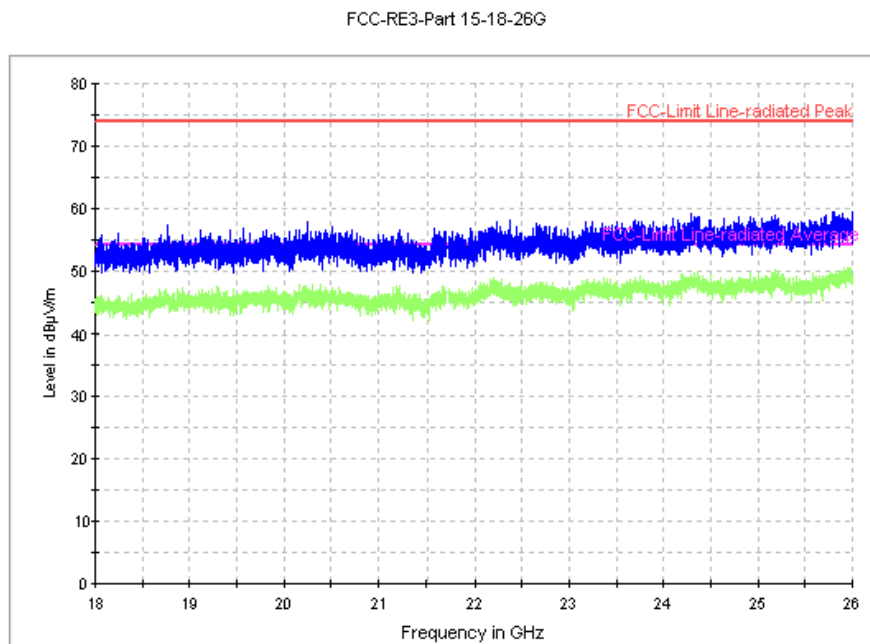


Fig.68. Radiated emission: GFSK, 18 GHz - 26 GHz

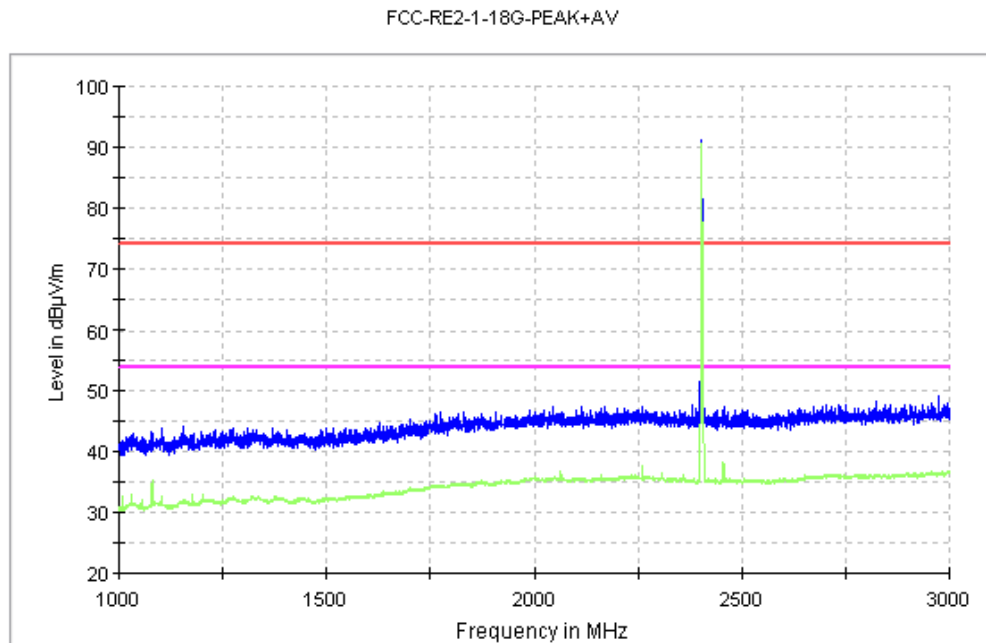


Fig.69. Radiated emission: $\pi/4$ DQPSK, Channel 0, 1 GHz - 3 GHz

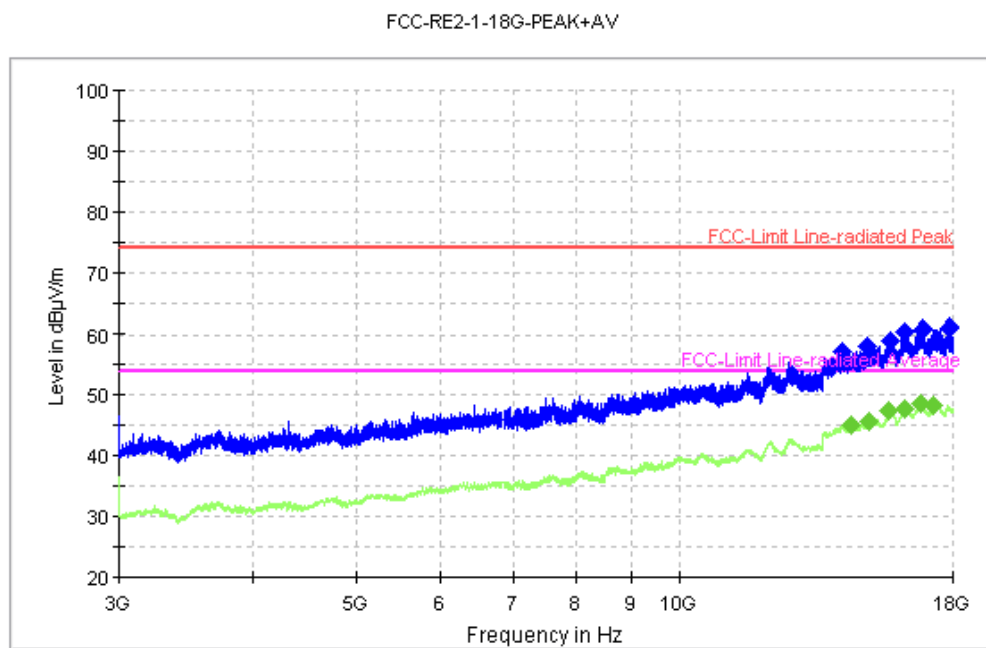


Fig.70. Radiated emission: $\pi/4$ DQPSK, Channel 0, 3 GHz - 18 GHz

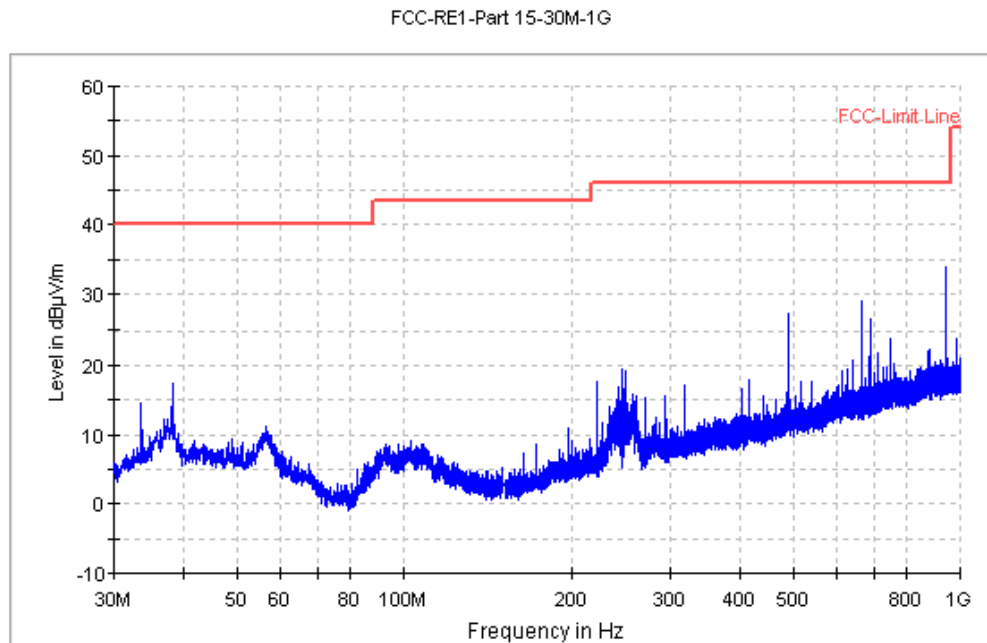


Fig.71. Radiated emission: $\pi/4$ DQPSK, Channel 39, 30 MHz - 1 GHz

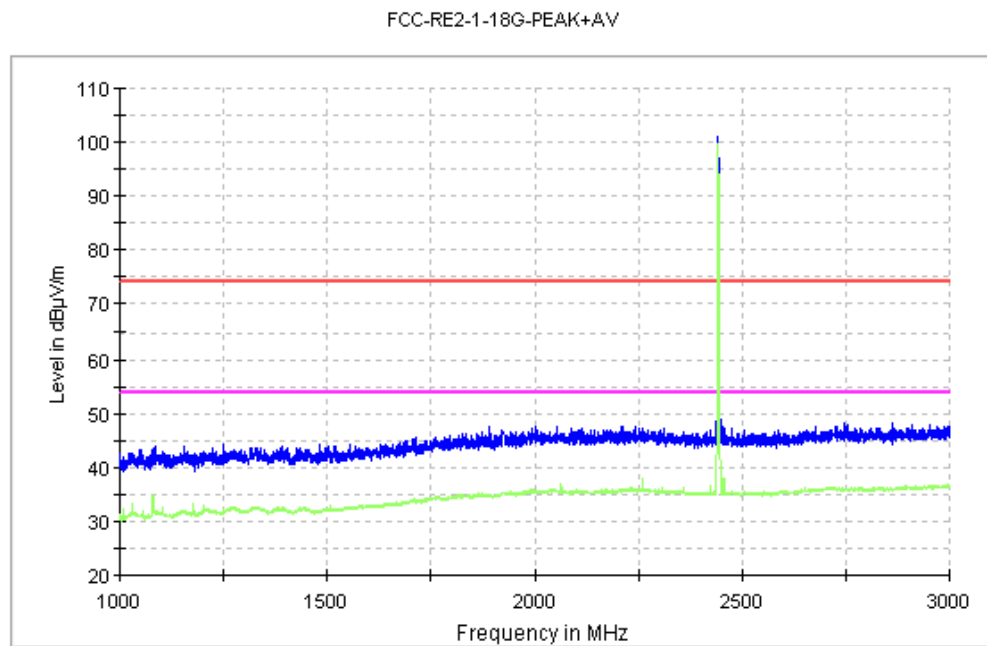


Fig.72. Radiated emission: $\pi/4$ DQPSK, Channel 39, 1 GHz - 3 GHz

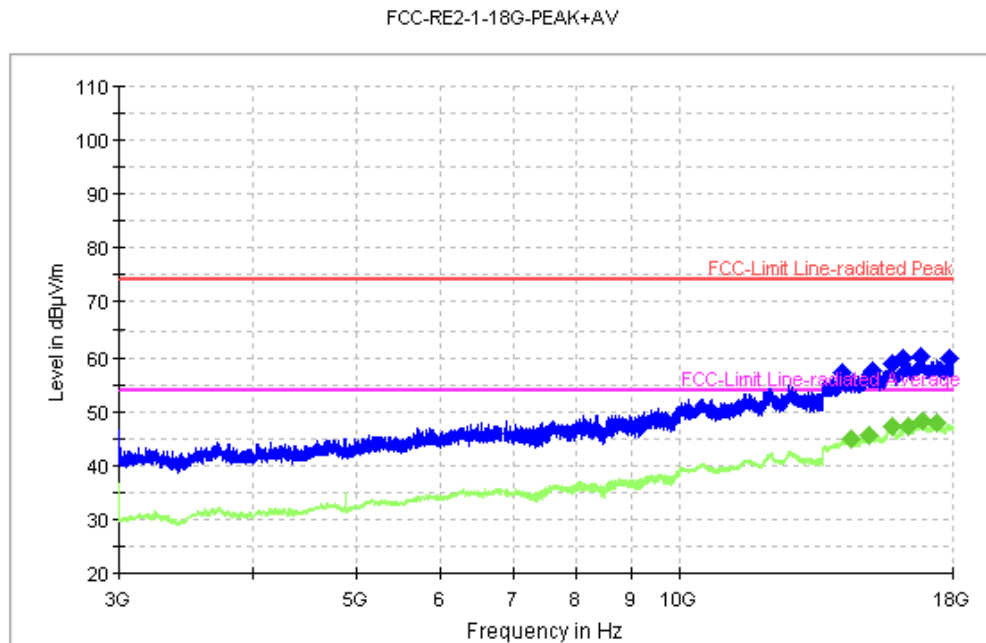


Fig.73. Radiated emission: $\pi/4$ DQPSK, Channel 39, 3 GHz - 18 GHz

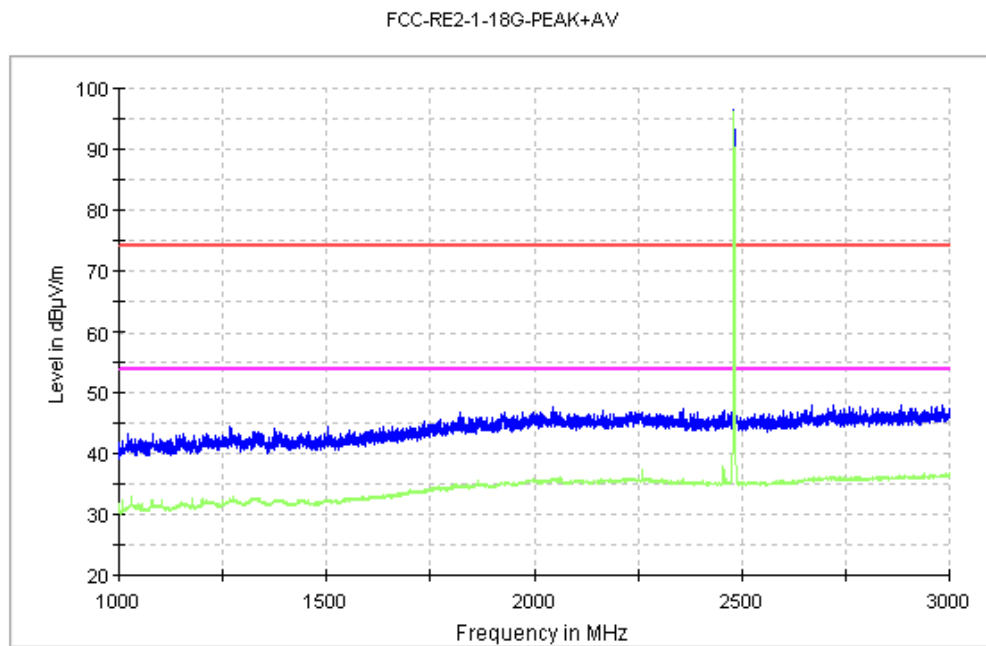


Fig.74. Radiated emission: $\pi/4$ DQPSK, Channel 78, 1 GHz - 3 GHz

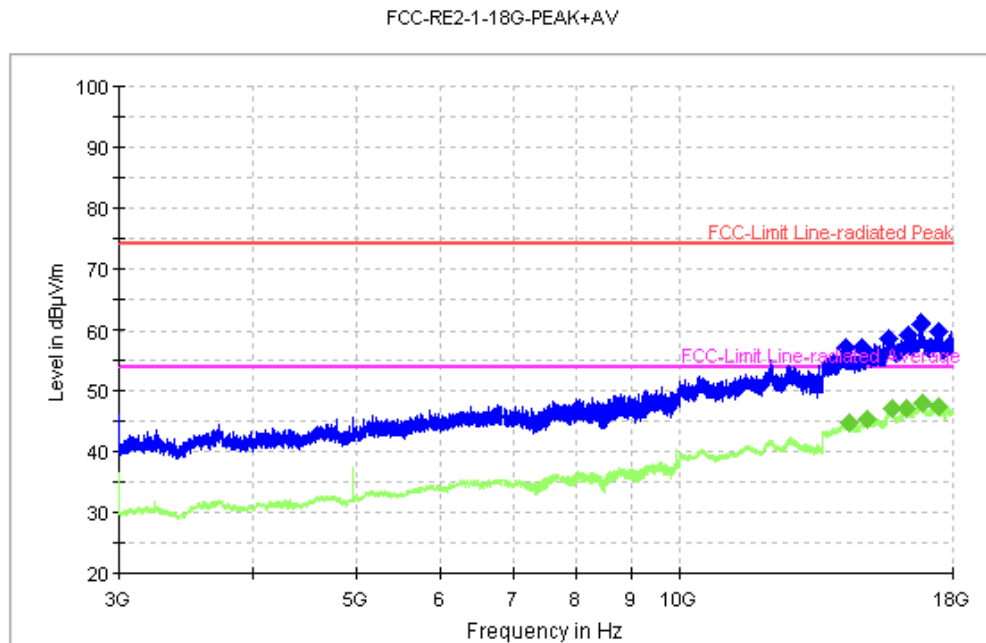


Fig.75. Radiated emission: $\pi/4$ DQPSK, Channel 78, 3 GHz - 18 GHz

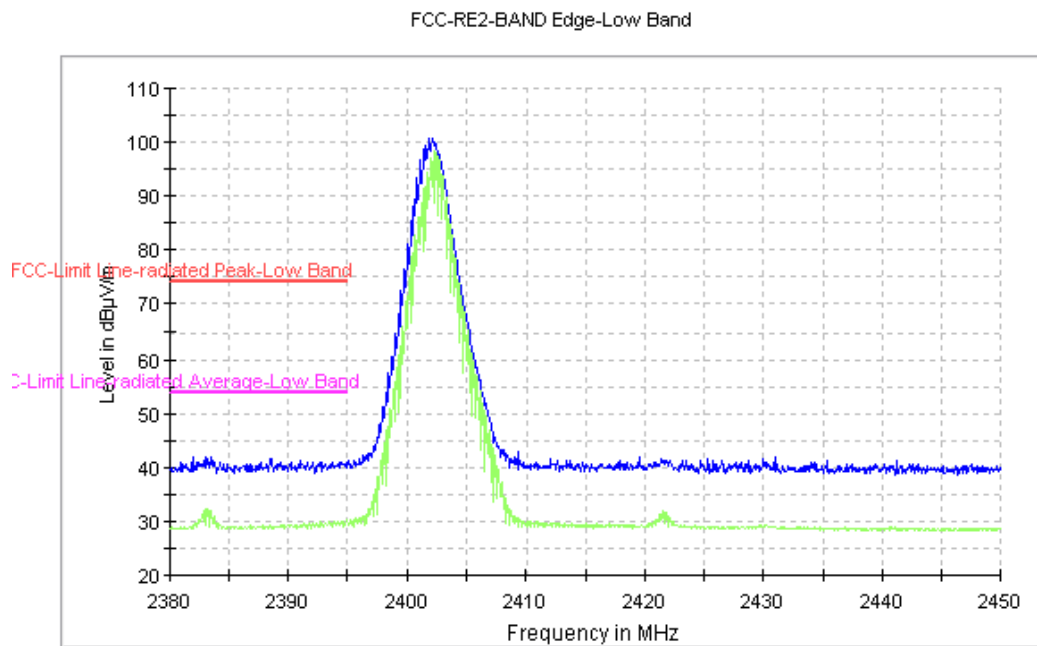


Fig.76. Radiated emission (Power): $\pi/4$ DQPSK, low channel

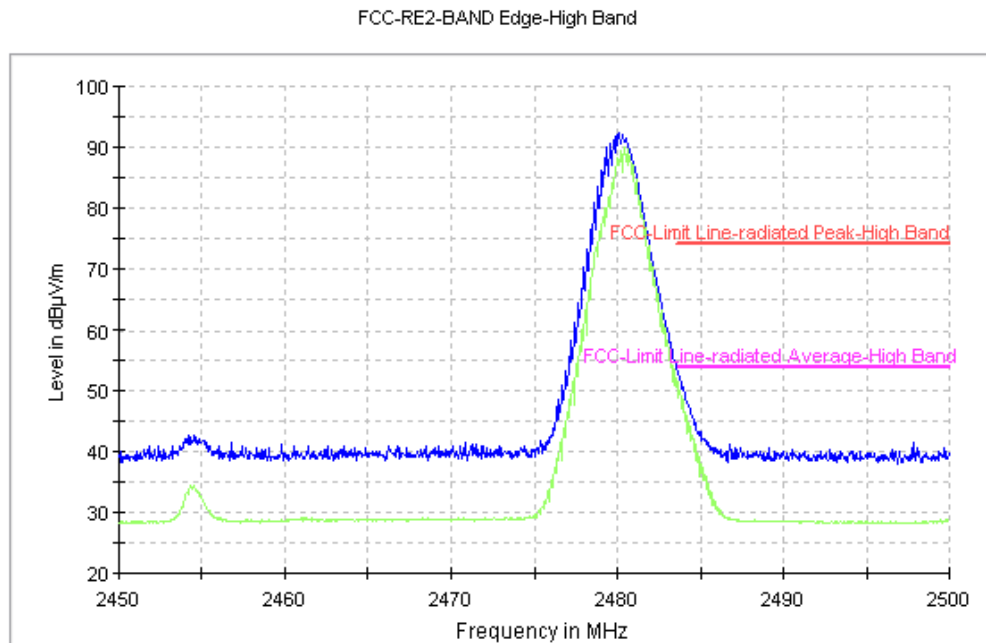


Fig.77. Radiated emission (Power): $\pi/4$ DQPSK, high channel

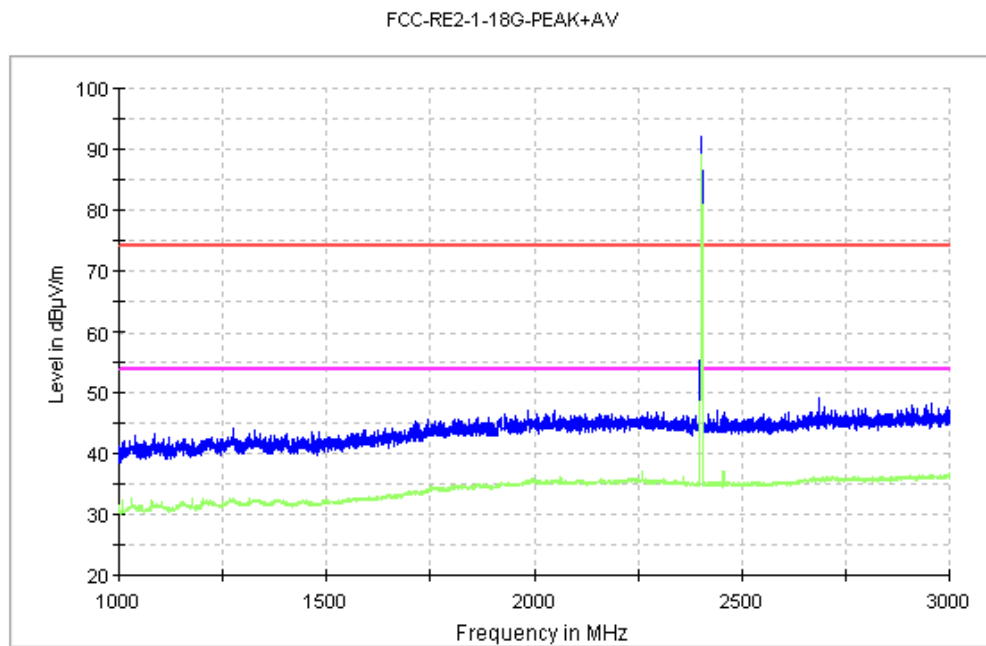


Fig.78. Radiated emission: 8DPSK, Channel 0, 1 GHz - 3 GHz

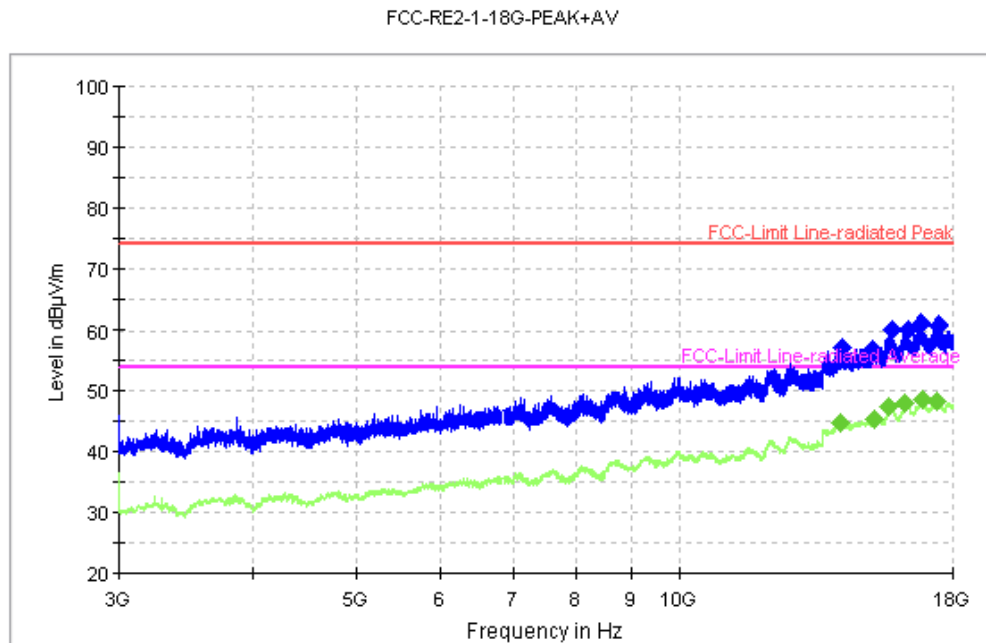


Fig.79. Radiated emission: 8DPSK, Channel 0, 3 GHz - 18 GHz

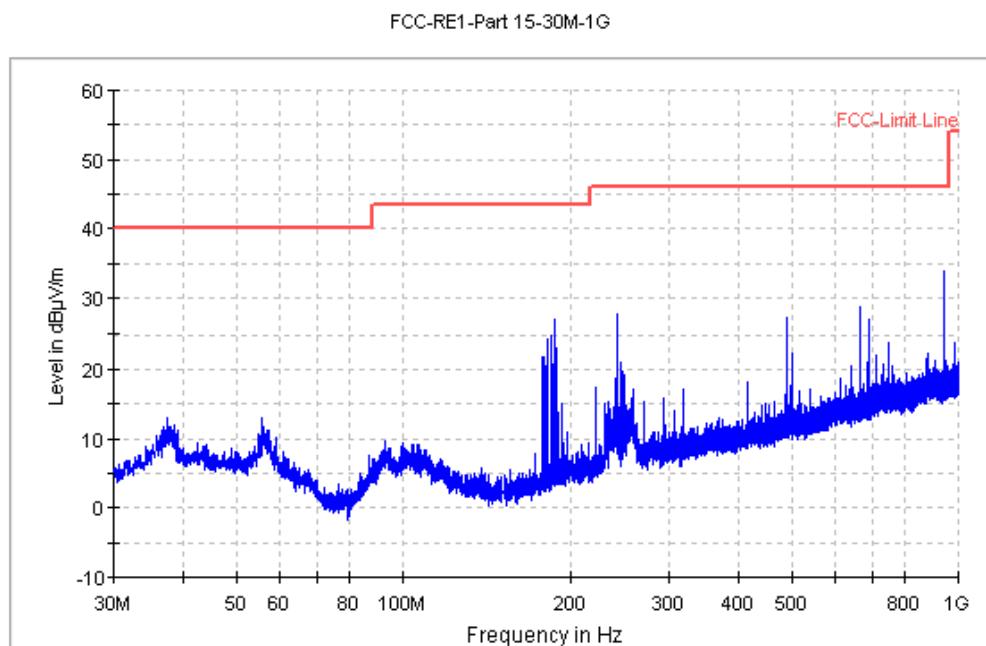


Fig.80. Radiated emission: 8DPSK, Channel 39, 30 MHz - 1 GHz

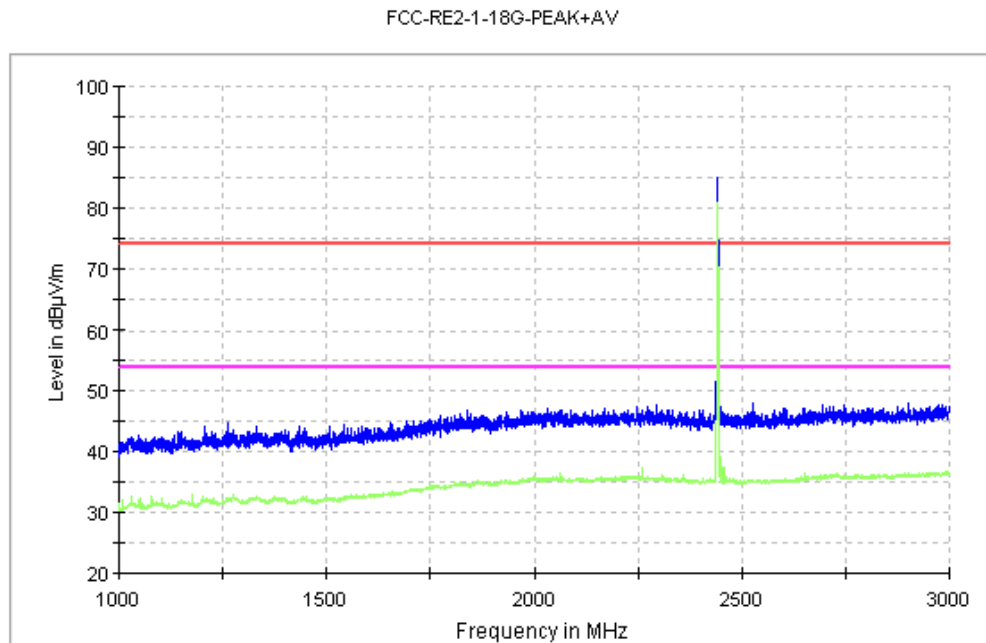


Fig.81. Radiated emission: 8DPSK, Channel 39, 1 GHz - 3 GHz

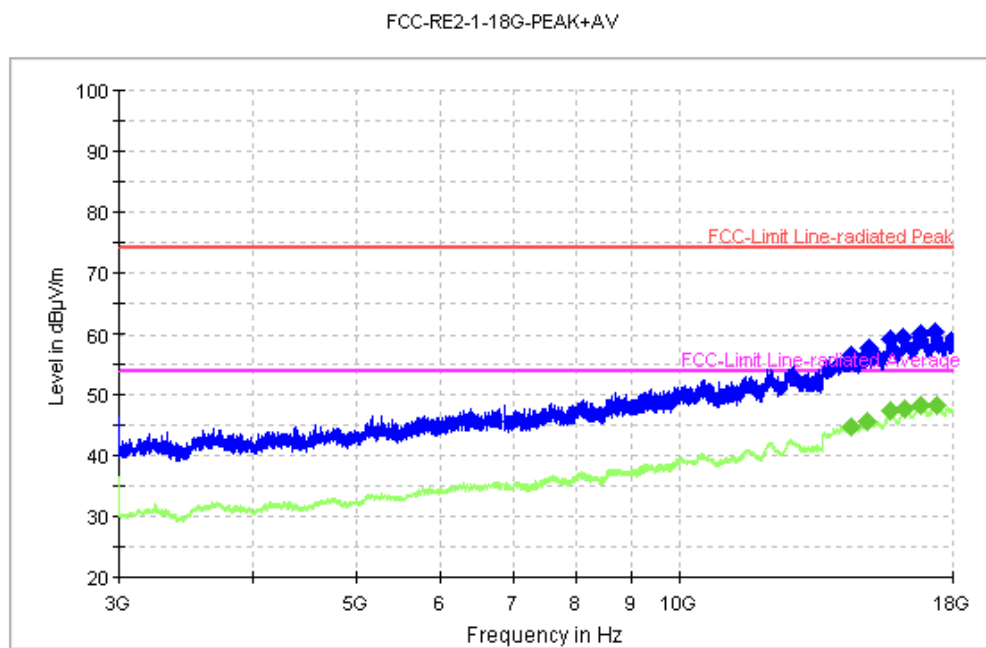


Fig.82. Radiated emission: 8DPSK, Channel 39, 3 GHz - 18 GHz

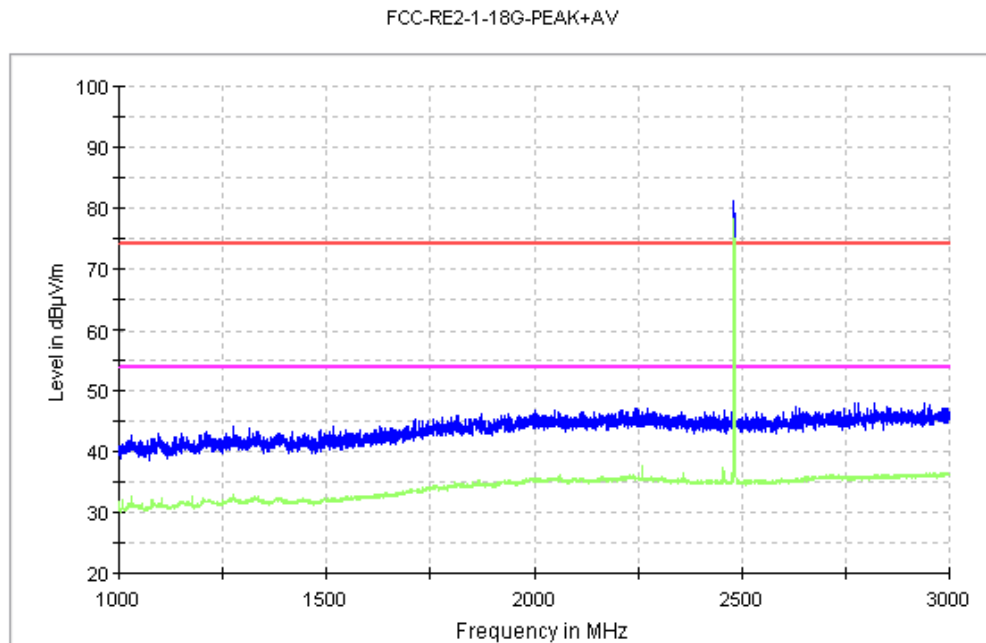


Fig.83. Radiated emission: 8DPSK, Channel 78, 1 GHz - 3 GHz

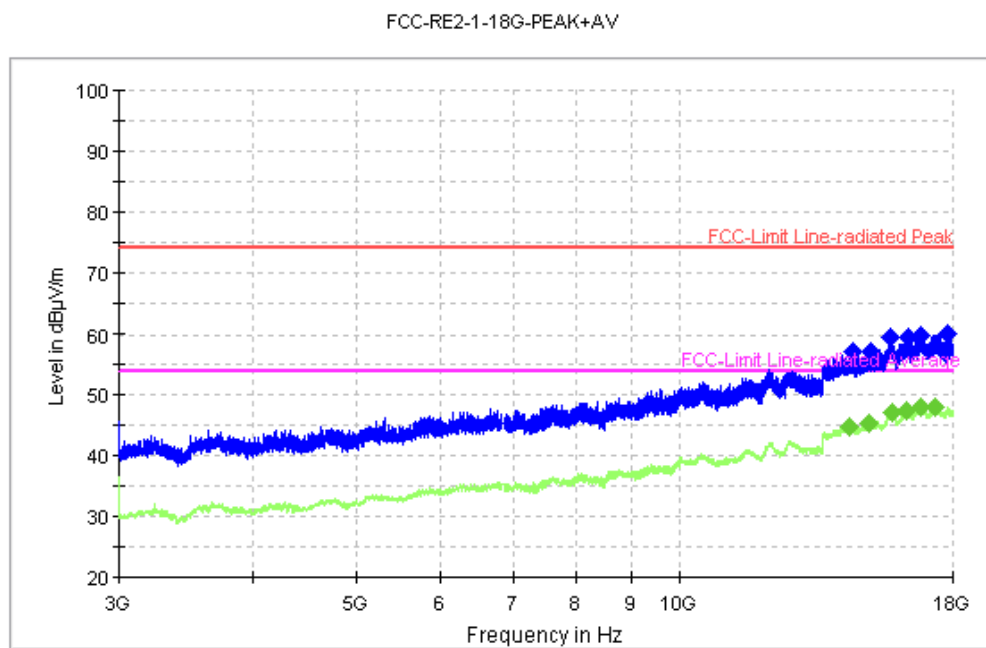


Fig.84. Radiated emission: 8DPSK, Channel 78, 3 GHz - 18 GHz

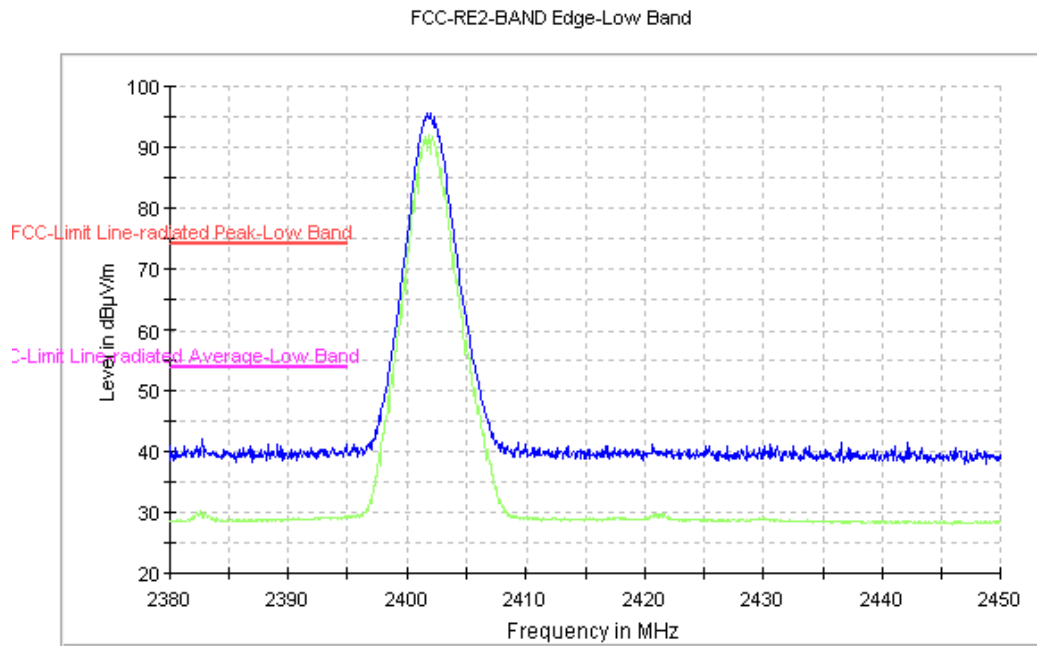


Fig.85. Radiated emission (Power): 8DPSK, low channel

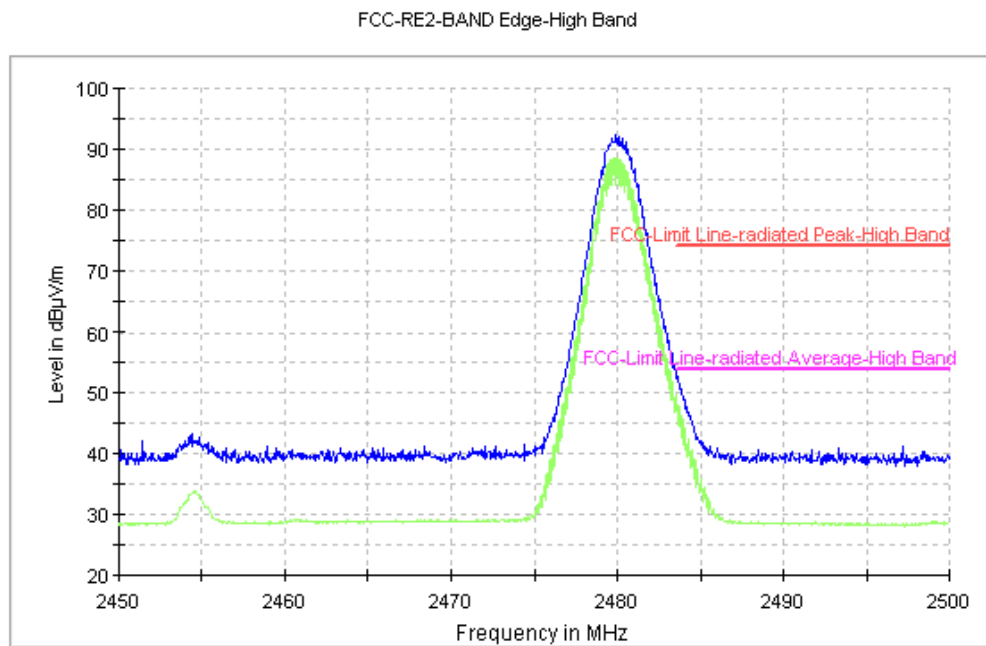


Fig.86. Radiated emission (Power): 8DPSK, high channel

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 ANSI C63.10

Measure a pulse time in time domain at middle frequency and then count the hopping number in 31.6s(which equals with 0.4 multiply 79) of middle frequency ,then multiply the pulse time and hopping number and record them.

Measurement Result:

For GFSK

Channel	Packet	Dwell Time (ms)		Conclusion
39	DH1	Fig.87	110.04	P
		Fig.88		
	DH3	Fig.89	183.15	P
		Fig.90		
	DH5	Fig.91	171.61	P
		Fig.92		

For $\pi/4$ DQPSK

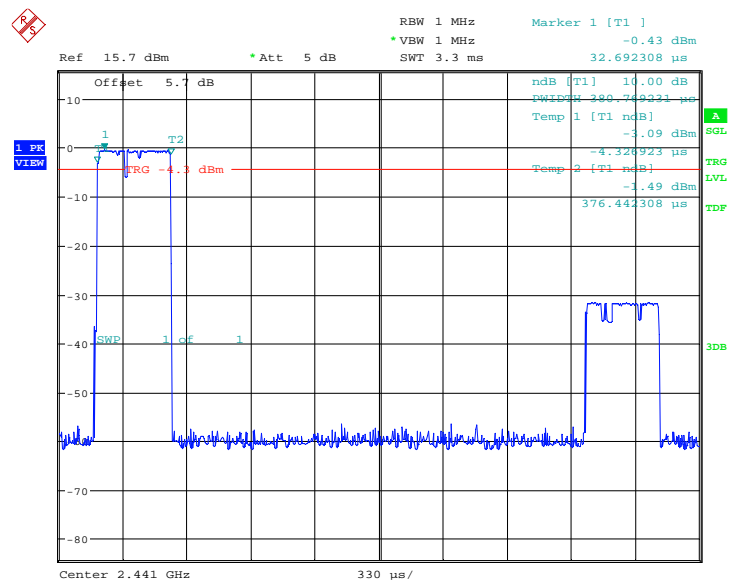
Channel	Packet	Dwell Time (ms)		Conclusion
39	DH1	Fig.93	111.14	P
		Fig.94		
	DH3	Fig.95	174.90	P
		Fig.96		
	DH5	Fig.97	197.79	P
		Fig.98		

For 8DPSK

Channel	Packet	Dwell Time (ms)		Conclusion
39	DH1	Fig.99	113.88	P
		Fig.100		
	DH3	Fig.101	183.15	P
		Fig.102		
	DH5	Fig.103	177.43	P
		Fig.104		

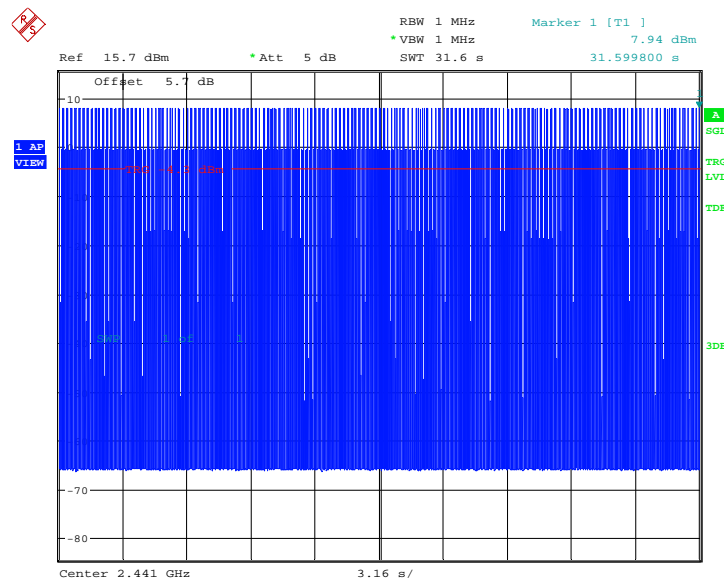
Conclusion: PASS

Test graphs as below:



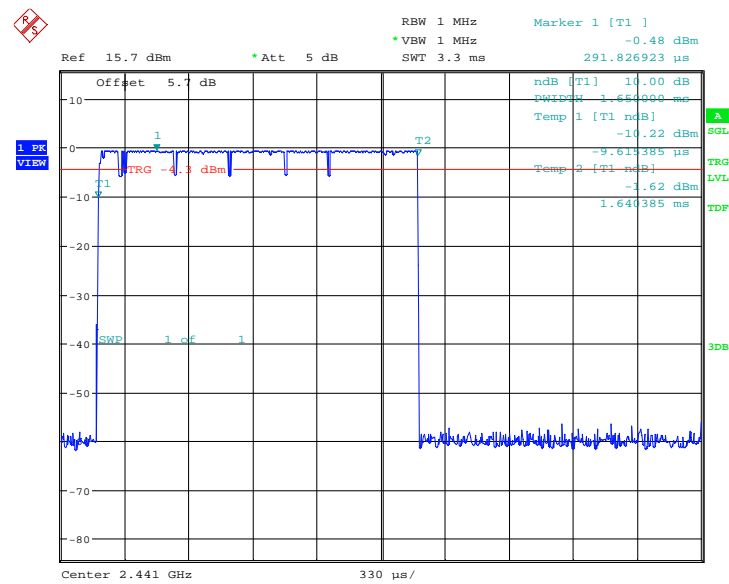
Date: 23.SEP.2014 20:23:28

Fig.87. Time of occupancy (Dwell Time): Channel 39, Packet DH1



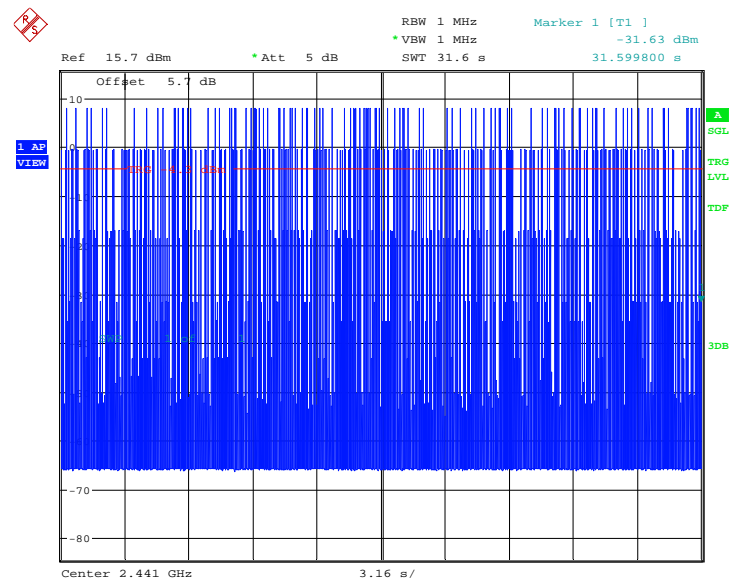
Date: 23.SEP.2014 20:23:16

Fig.88. Number of Transmissions Measurement:Channel 39,Packet DH1



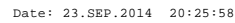
Date: 23.SEP.2014 20:24:45

Fig.89. Time of occupancy (Dwell Time): Channel 39, Packet DH3



Date: 23.SEP.2014 20:24:34

Fig.90. Number of Transmissions Measurement:Channel 39,Packet DH3



RBW 1 MHz VBW 1 MHz SWT 31.6 s

Marker 1 [T1] -47.16 dBm

Ref 15.7 dBm Att 5 dB

Offset 5.7 dB

Center 2.441 GHz 3.16 s/

31.599800 s

1 AP VIEW

A SGL TRG LVL TDP 3DB

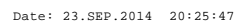
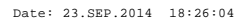


Fig.92. Number of Transmissions Measurement:Channel 39,Packet DH5



RBW 1 MHz Marker 1 [T1] 1.02 dBm
 VBW 1 MHz
 SWT 31.6 s 31.599800 s
 Ref 15.7 dBm Att 5 dB
 Offset 5.7 dB

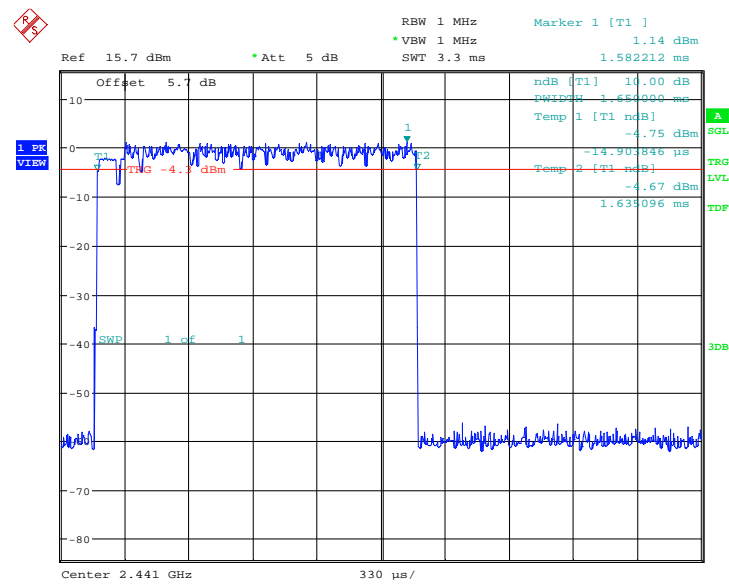
10
 -10
 -20
 -30
 -40
 -50
 -60
 -70
 -80

Center 2.441 GHz 3.16 s/

A
 SGL
 TRG
 LVL
 TDP
 3DB

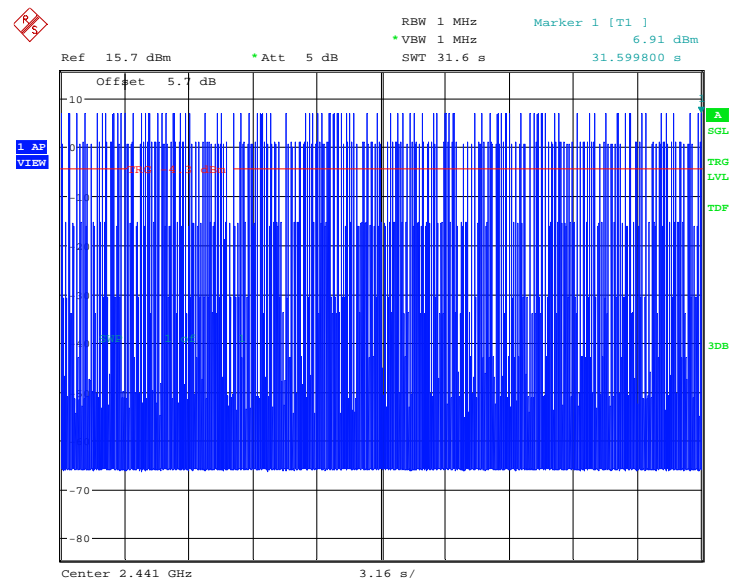
Date: 23.SEP.2014 18:25:52

Fig.94. Number of Transmissions Measurement:Channel 39,Packet 2-DH1



Date: 23.SEP.2014 18:27:22

Fig.95. Time of occupancy (Dwell Time): Channel 39, Packet 2-DH3



Date: 23.SEP.2014 18:27:10

Fig.96. Number of Transmissions Measurement:Channel 39,Packet 2-DH3

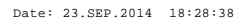


Fig.97. Time of occupancy (Dwell Time): Channel 39, Packet 2-DH5

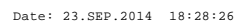
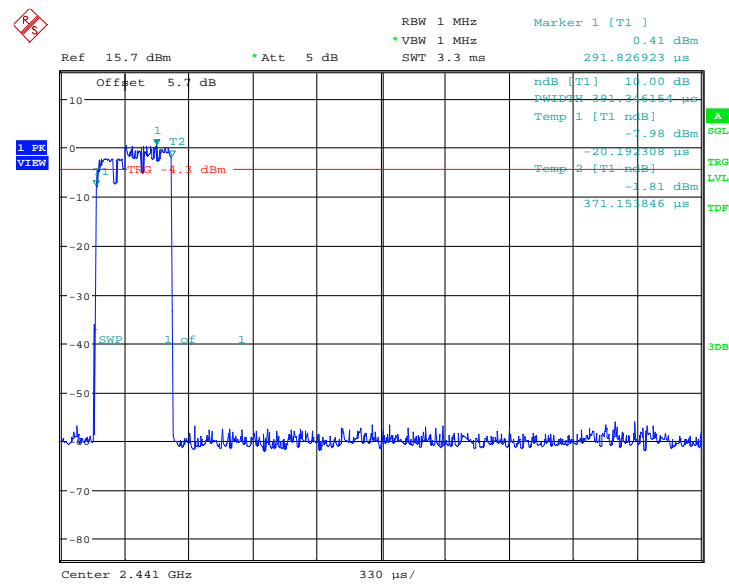
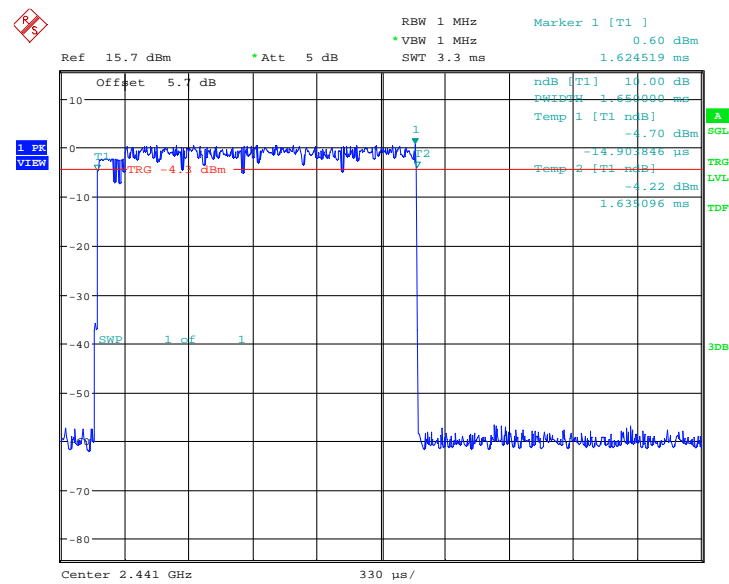


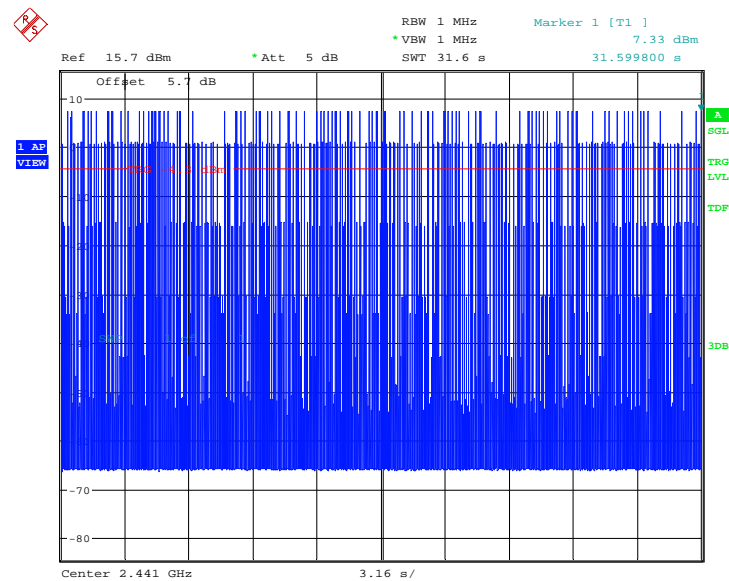
Fig.98. Number of Transmissions Measurement:Channel 39,Packet 2-DH5





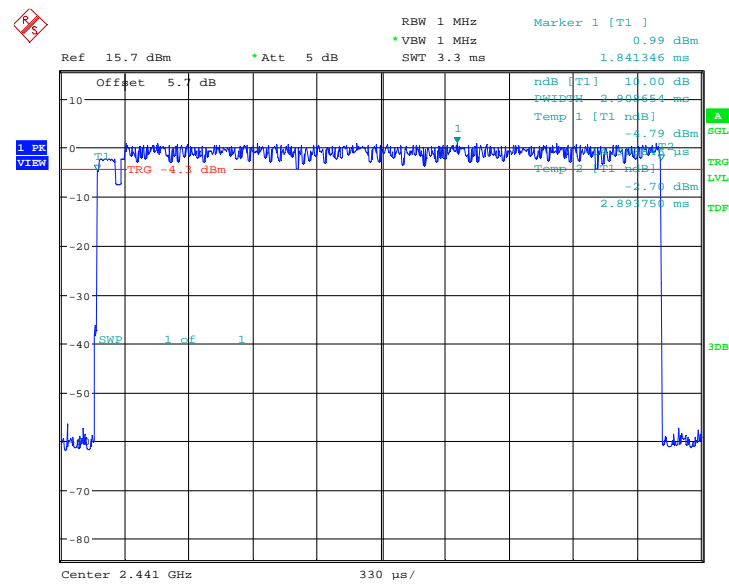
Date: 23.SEP.2014 18:48:44

Fig.101. Time of occupancy (Dwell Time): Channel 39, Packet 3-DH3



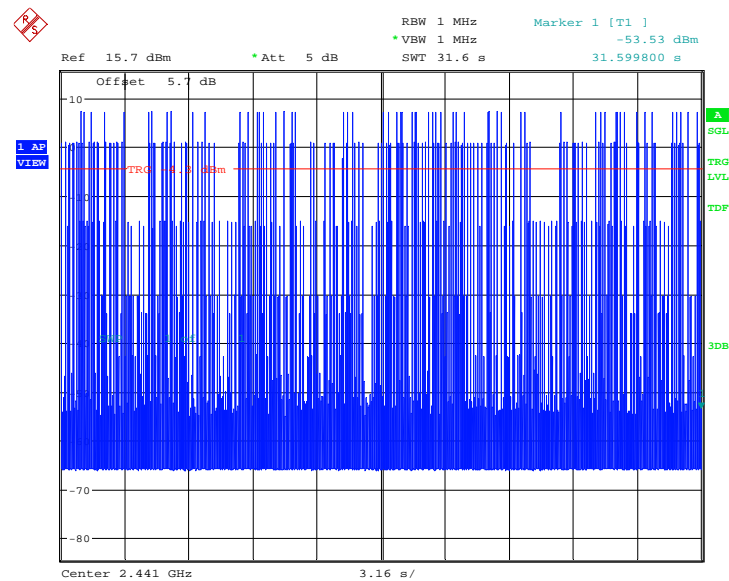
Date: 23.SEP.2014 18:48:32

Fig.102. Number of Transmissions Measurement:Channel 39,Packet 3-DH3



Date: 23.SEP.2014 18:49:57

Fig.103. Time of occupancy (Dwell Time): Channel 39, Packet 3-DH5



Date: 23.SEP.2014 18:49:45

Fig.104. 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 ANSI C63.10

Test Condition

Hopping Mode	RBW	VBW	SPAN	Sweptime	Detector	Trace Mode
Hopping OFF	20KHz	100KHz	3MHz	Auto	Peak	Max Hold

Use NdB Down function of the SA to measure the 20dB Bandwidth

* 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.105	865.38	NA
39	Fig.106	865.38	NA
78	Fig.107	865.38	NA

For $\pi/4$ DQPSK

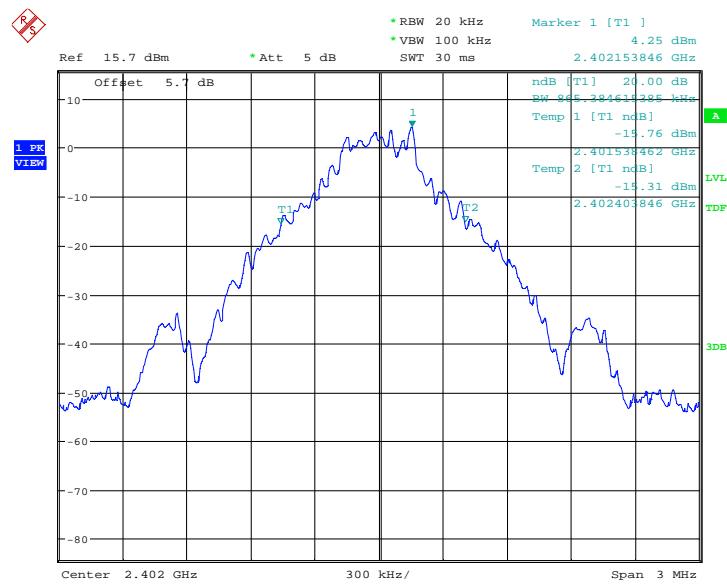
Channel	20dB Bandwidth (kHz)		Conclusion
0	Fig.108	1264.42	NA
39	Fig.109	1274.04	NA
78	Fig.110	1264.42	NA

For 8DPSK

Channel	20dB Bandwidth (kHz)		Conclusion
0	Fig.111	1274.04	NA
39	Fig.112	1264.42	NA
78	Fig.113	1283.65	NA

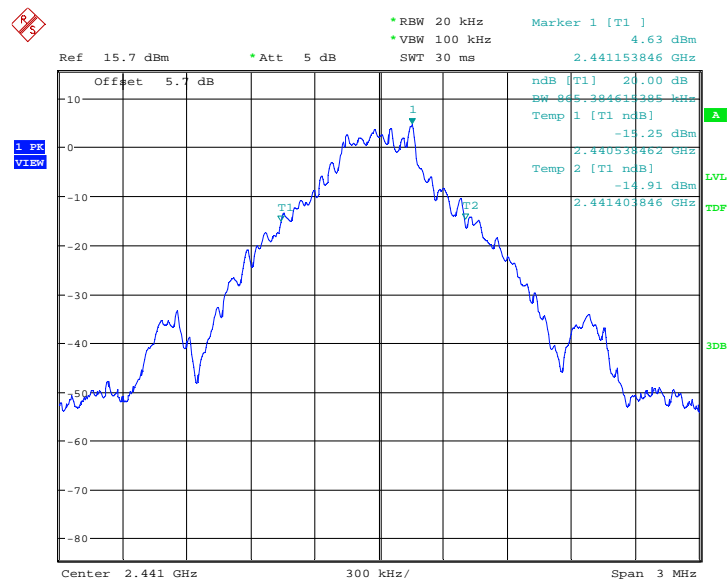
Conclusion: NA

Test graphs as below:



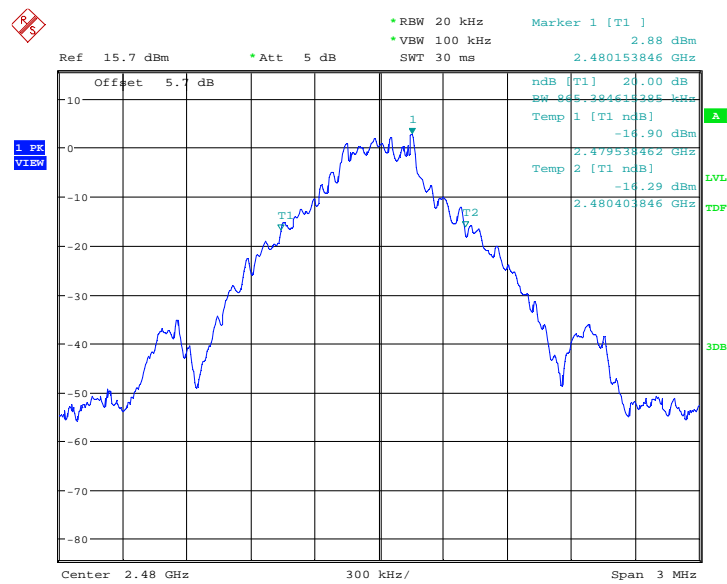
Date: 23.SEP.2014 18:07:50

Fig.105. 20dB Bandwidth: GFSK, Channel 0



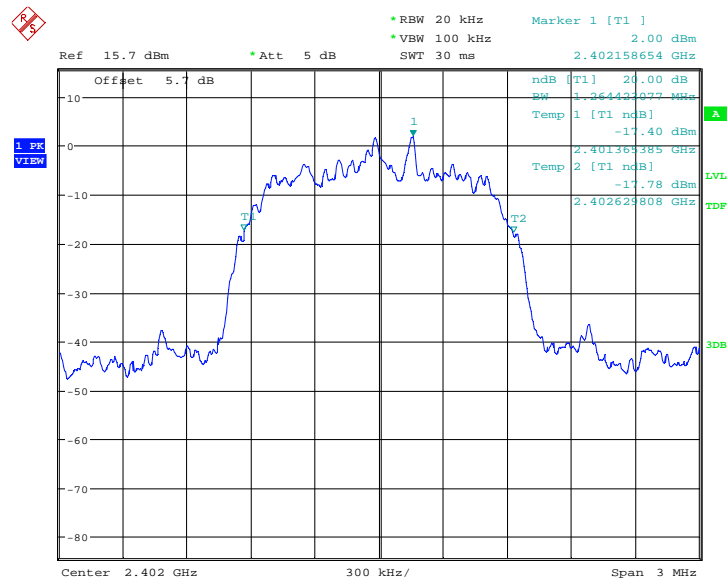
Date: 23.SEP.2014 18:08:22

Fig.106. 20dB Bandwidth: GFSK, Channel 39



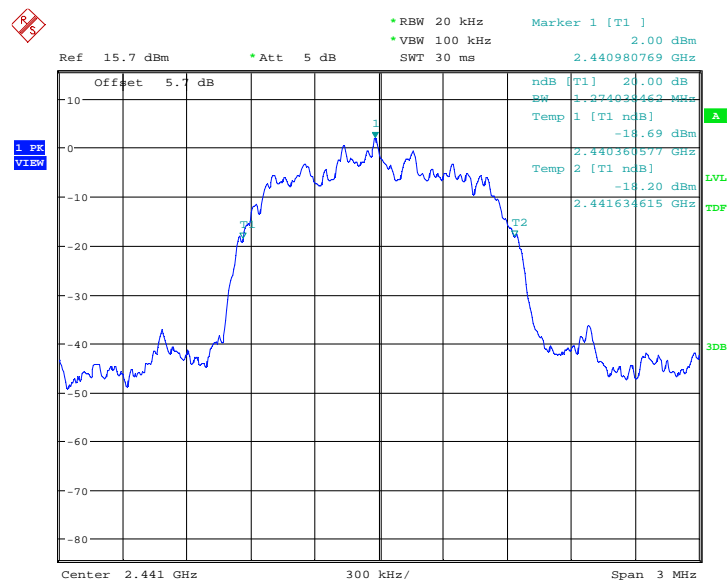
Date: 23.SEP.2014 18:08:54

Fig.107. 20dB Bandwidth: GFSK, Channel 78



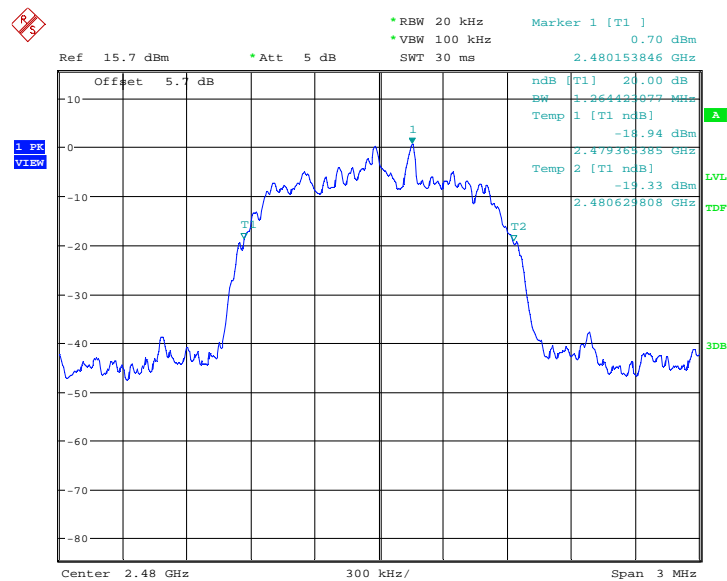
Date: 23.SEP.2014 18:29:12

Fig.108. 20dB Bandwidth: $\pi/4$ DQPSK, Channel 0



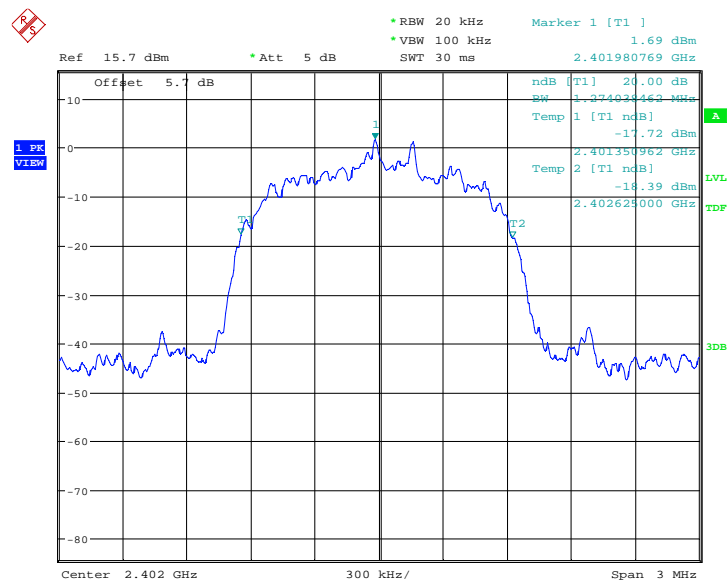
Date: 23.SEP.2014 18:29:44

Fig.109. 20dB Bandwidth: $\pi/4$ DQPSK, Channel 39



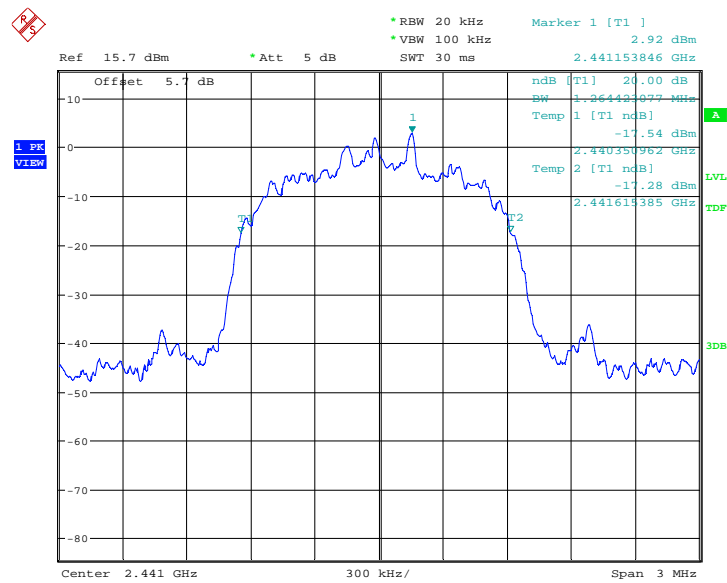
Date: 23.SEP.2014 18:30:15

Fig.110. 20dB Bandwidth: $\pi/4$ DQPSK, Channel 78



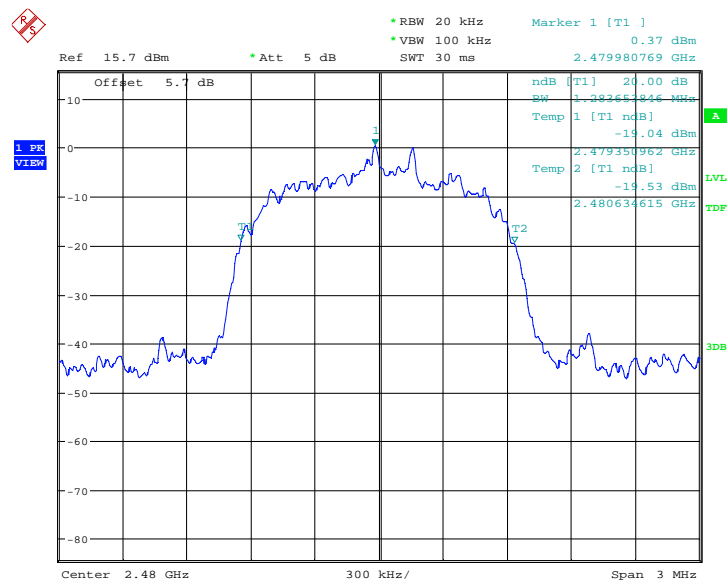
Date: 23.SEP.2014 18:50:31

Fig.111. 20dB Bandwidth: 8DPSK, Channel 0



Date: 23.SEP.2014 18:51:03

Fig.112. 20dB Bandwidth: 8DPSK, Channel 39



Date: 23.SEP.2014 18:51:34

Fig.113. 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 ANSI C63.10

Test Condition

Hopping Mode	RBW	VBW	SPAN	SweepTime	Detector	Trace Mode
Hopping ON	300KHz	1MHz	3MHz	Auto	Peak	Max Hold

Search the peak marks of the middle frequency and adjacent channel, the record the separation between them.

* 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.114	P

For $\pi/4$ DQPSK

Channel	Carrier frequency separation (kHz)	Conclusion
39	Fig.115	P

For 8DPSK

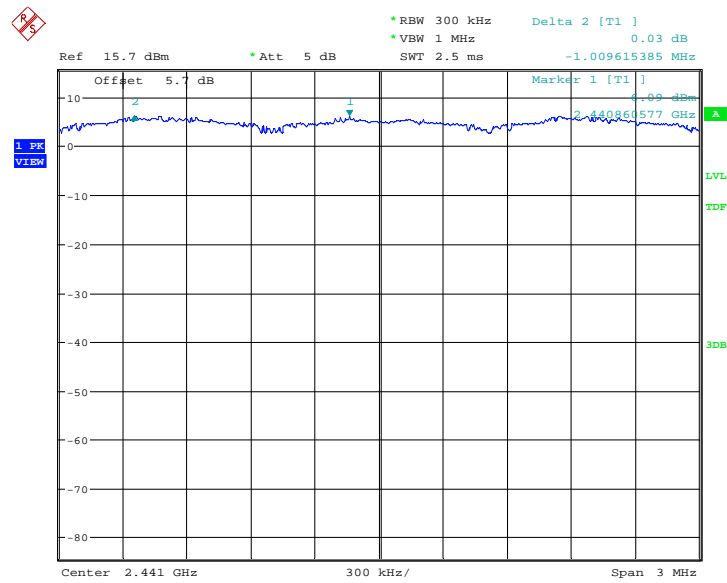
Channel	Carrier frequency separation (kHz)	Conclusion
39	Fig.116	P

Conclusion: PASS

Test graphs as below:

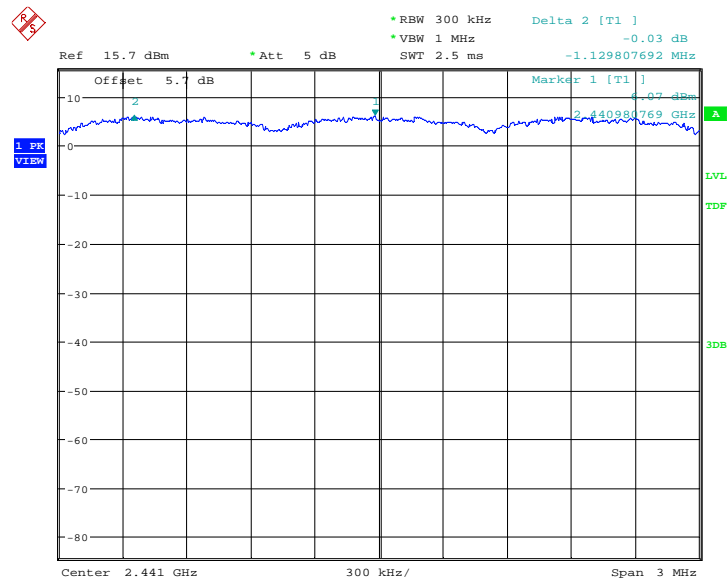
Date: 23.SEP.2014 18:10:58

Fig.114. Carrier frequency separation measurement: GFSK, Channel 39



Date: 23.SEP.2014 19:21:12

Fig.115. Carrier frequency separation measurement: $\pi/4$ DQPSK, Channel 39



Date: 23.SEP.2014 18:53:39

Fig.116. 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 ANSI C63.10

Test Condition

Hopping Mode	RBW	VBW	Sweeptime	Detector	Trace Mode
Hopping ON	500KHz	500KHz	Auto	Peak	Max Hold

Measurement Result:

For GFSK

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

For $\pi/4$ DQPSK

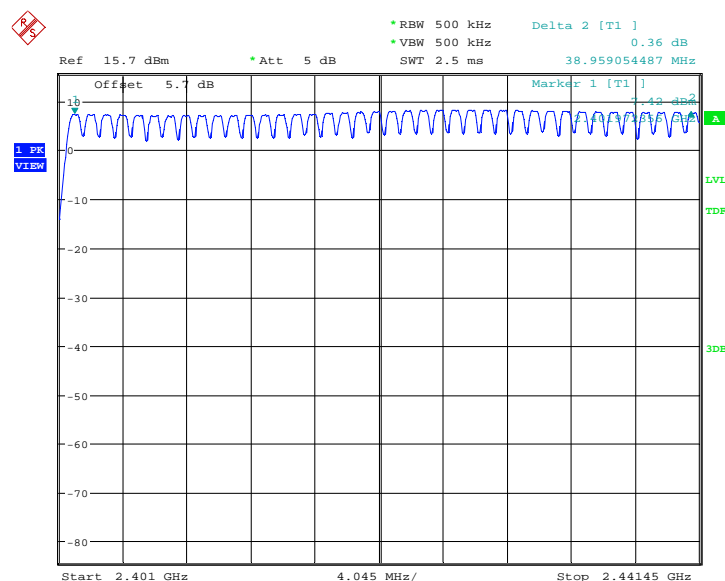
Channel	Number of hopping channels	Conclusion
0~39	Fig.119	P
40~78	Fig.120	

For 8DPSK

Channel	Number of hopping channels	Conclusion
0~39	Fig.121	P
40~78	Fig.122	

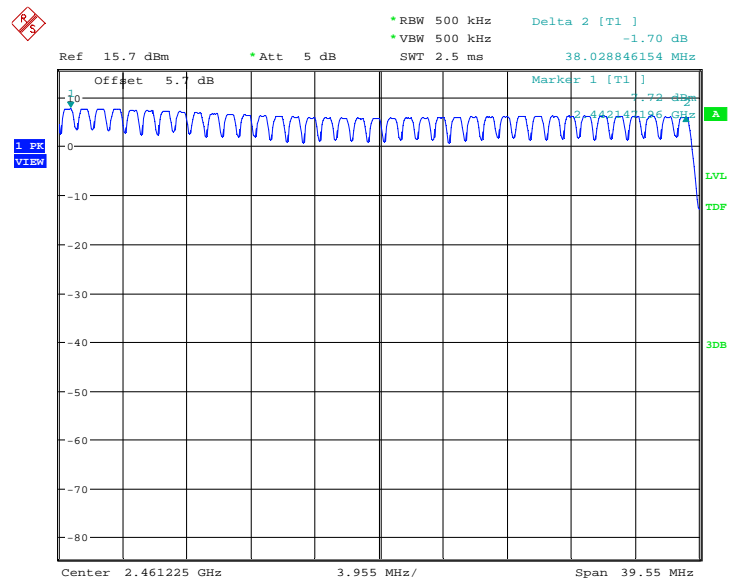
Conclusion: PASS

Test graphs as below:



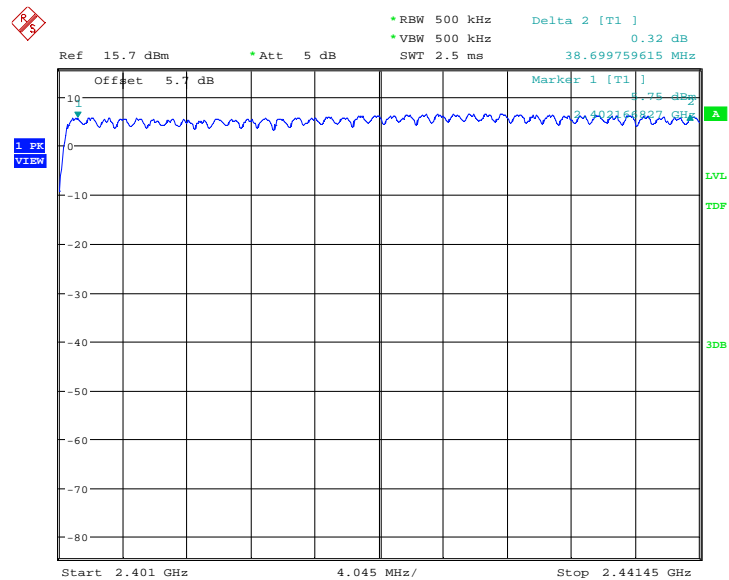
Date: 23.SEP.2014 20:01:41

Fig.117. Number of hopping frequencies: GFSK, Channel 0 - 39



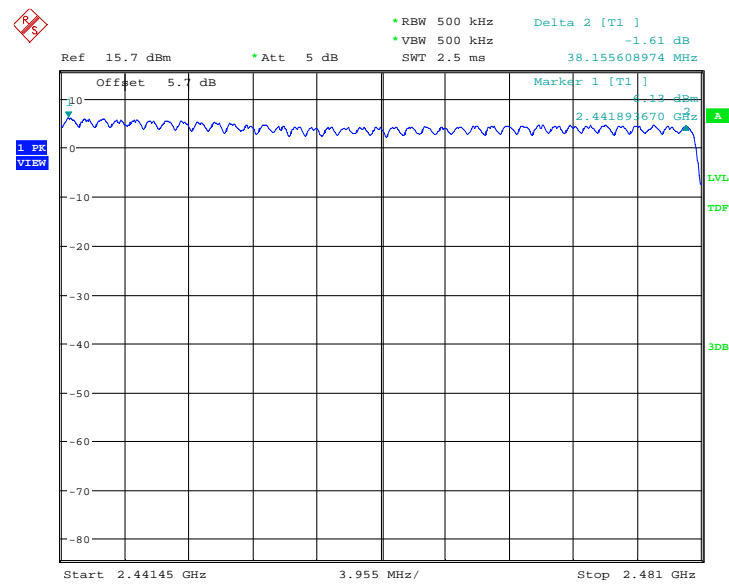
Date: 23.SEP.2014 20:03:44

Fig.118. Number of hopping frequencies: GFSK, Channel 40 - 78



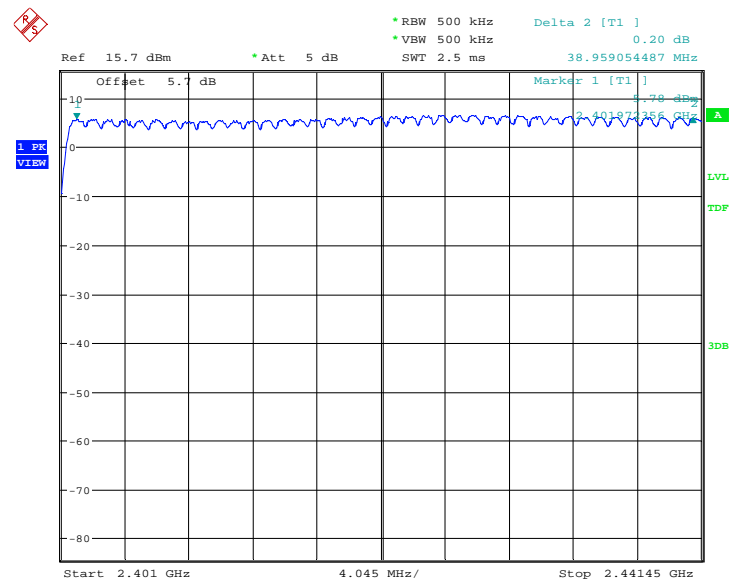
Date: 23.SEP.2014 19:46:18

Fig.119. Number of hopping frequencies: $\pi/4$ DQPSK, Channel 0 - 39



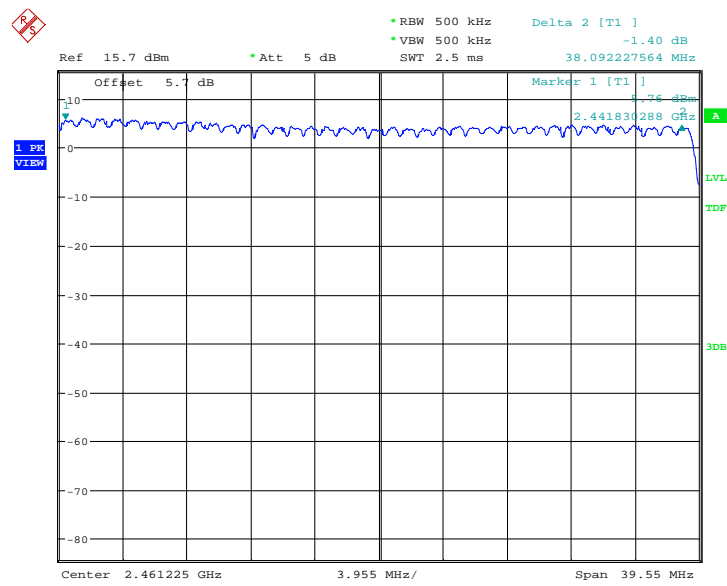
Date: 23.SEP.2014 19:48:21

Fig.120. Number of hopping frequencies: $\pi/4$ DQPSK, Channel 40 - 78



Date: 23.SEP.2014 20:05:49

Fig.121. Number of hopping frequencies: 8DPSK, Channel 0 - 39



Date: 23.SEP.2014 20:07:52

Fig.122. 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 μ V)	Conclusion
0.15 to 0.5	66 to 56	P
0.5 to 5	56	
5 to 30	60	

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

Bluetooth (Average Limit)

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

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

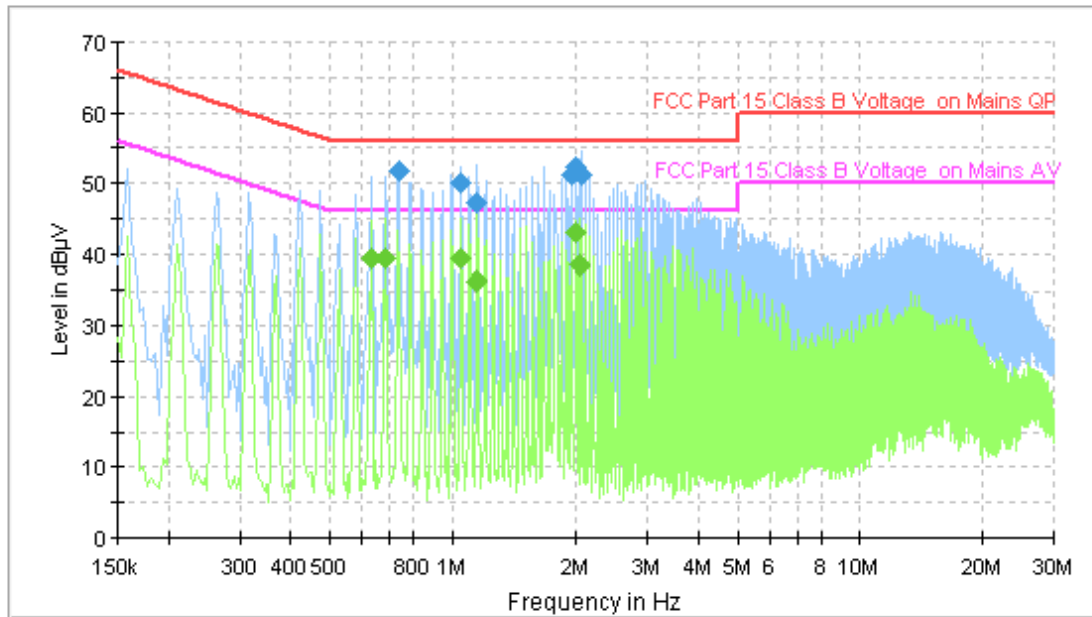
The measurement is made according to ANSI C63.10

Conclusion: PASS

Test graphs as below:

Traffic:

ESH2-Z5 Scan-FCC



Final Result 1

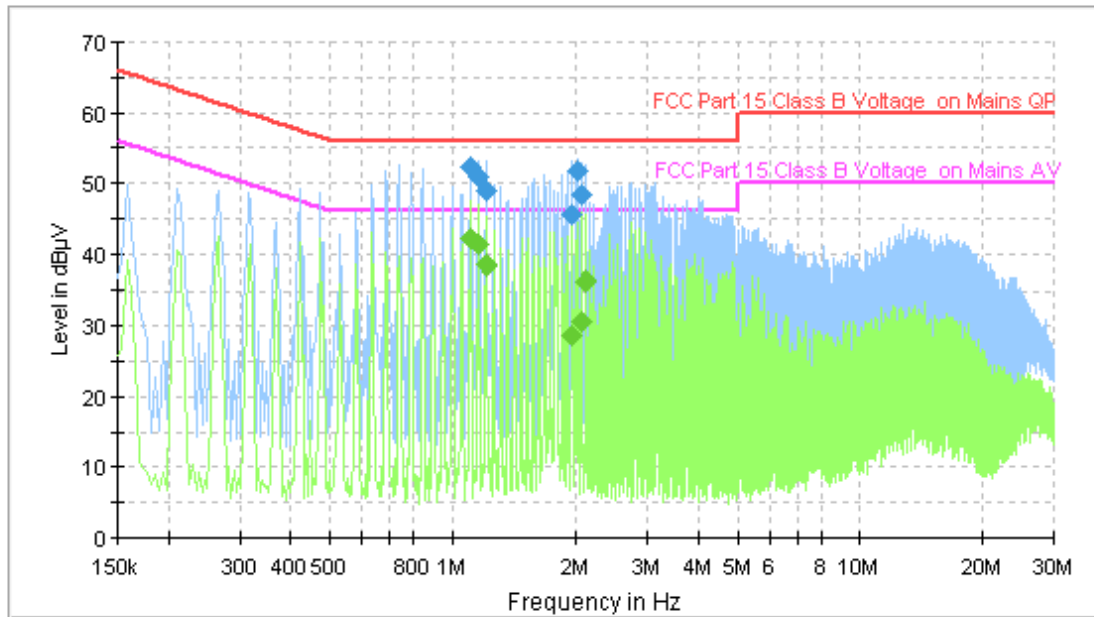
Frequency (MHz)	QuasiPeak (dBµV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.738000	51.8	FLO	L1	10.0	4.2	56.0
1.050000	50.1	FLO	L1	10.1	5.9	56.0
1.154000	47.2	FLO	L1	10.1	8.8	56.0
1.946000	51.3	FLO	L1	10.1	4.7	56.0
2.002000	52.3	FLO	L1	10.1	3.7	56.0
2.054000	51.3	FLO	L1	10.1	4.7	56.0

Final Result 2

Frequency (MHz)	CAverage (dBµV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.630000	39.5	FLO	L1	10.0	6.5	46.0
0.682000	39.3	FLO	L1	10.0	6.7	46.0
1.050000	39.3	FLO	L1	10.1	6.7	46.0
1.154000	36.2	FLO	L1	10.1	9.8	46.0
2.002000	43.1	FLO	L1	10.1	2.9	46.0
2.050000	38.6	FLO	L1	10.1	7.4	46.0

Idle:

ESH2-Z5 Scan-FCC



Final Result 1

Frequency (MHz)	QuasiPeak (dBµV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
1.110000	52.4	FLO	L1	10.1	3.6	56.0
1.162000	50.8	FLO	L1	10.1	5.2	56.0
1.214000	48.9	FLO	L1	10.1	7.1	56.0
1.950000	45.5	FLO	L1	10.1	10.5	56.0
2.010000	51.9	FLO	L1	10.1	4.1	56.0
2.058000	48.4	FLO	L1	10.1	7.6	56.0

Final Result 2

Frequency (MHz)	CAverage (dBµV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
1.110000	42.1	FLO	L1	10.1	3.9	46.0
1.162000	41.4	FLO	L1	10.1	4.6	46.0
1.214000	38.6	FLO	L1	10.1	7.4	46.0
1.950000	28.6	FLO	L1	10.1	17.4	46.0
2.058000	30.5	FLO	L1	10.1	15.5	46.0
2.114000	36.4	FLO	L1	10.1	9.6	46.0

*** END OF REPORT BODY ***