



FCC PART 15C TEST REPORT

No. 2013TAR307

for

TCT Mobile Limited

HSUPA/HSDPA/UMTS triband/GSM quadband mobile phone

Model Name: Megane 1SIM AWS TMO

FCC ID : RAD393

IC ID : 9238A-0024

with

Hardware Version: PIO4

Software Version: SWL27

Issued Date: 2013-08-15



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

FCC 2.948 Listed: No.733176

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

Note:

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

Test Laboratory:

TMC Beijing, Telecommunication Metrology Center of Ministry of Industry and Information Technology

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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

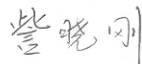
1.2. Testing Environment

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


1.3. Project data

Project Leader: Zi Xiaogang
Testing Start Date: 2013-04-08
Testing End Date: 2013-08-14

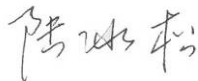
1.4. Signature



Zi Xiaogang
(Prepared this test report)



Sun Xiangqian
(Reviewed this test report)



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

2. Client Information

2.1. Applicant Information

Company Name: TCT Mobile Limited
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2.2. Manufacturer Information

Company Name: TCT Mobile Limited
Address /Post: 12F/B, TCL Tower, Gaoxin Nanyi Road, Nanshan District, Shenzhen,
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Email: meixian.lv@tcl.com
Telephone: 0086-755-33956929
Fax: 0086-755-36645072

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

3.1. About EUT

Description	HSUPA/HSDPA/UMTS triband/GSM quadband mobile phone
Model Name	Megane 1SIM AWS TMO
FCC ID	RAD393
IC ID	9238A-0024
Frequency Band	ISM 2400MHz~2483.5MHz
Type of Modulation	GFSK/ $\pi/4$ DQPSK/8DPSK
Number of Channels	79
Power Supply	3.8V DC by Battery

Note: The EUT is a variant model of ONE TOUCH 5020A. Only RSE have been retested, the other result is coming from ONE TOUCH 5020A.

3.2. Internal Identification of EUT used during the test

EUT ID*	SN or IMEI	HW Version	SW Version
N53	013778000256624	PIO4	SWL27
N39	013778000000436	PIO4	SWL27

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

3.3. Internal Identification of AE used during the test

AE ID*	Description
AE1	Battery /
AE2	Battery /
AE3	Travel charger /

AE1

Model	CAB60BA000C1
Manufacturer	SCUD
Capacitance	1400mAh
Nominal voltage	3.7V

AE2

Model	CAB1400002C1
Manufacturer	BYD
Capacitance	1400mAh
Nominal voltage	3.7V

AE3

Model	CBA3007AG0C1
Manufacturer	BYD
Length of cable	/

*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 HSUPA/HSDPA/UMTS triband/GSM quadband mobile phone with integrated antenna. It consists of normal options: lithium battery, charger. Manual and specifications of the EUT were provided to fulfil the test. Samples undergoing test were selected by the Client.

4. Reference Documents

4.1. Documents supplied by applicant

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

4.2. Reference Documents for testing

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

	FCC CFR 47, Part 15, Subpart C:	
	15.205 Restricted bands of operation;	Oct,10
FCC Part15	15.209 Radiated emission limits, general requirements;	2009
	15.247 Operation within the bands 902–928MHz, 2400–2483.5 MHz, and 5725–5850 MHz.	Edition
	Spectrum Management and Telecommunications - Radio Standards Specification	
RSS - Gen Issue3	General Requirements and Information for the Certification of Radiocommunication Equipment	2010-12
RSS -210 Issue8	Licence-exempt Radio Apparatus (All Frequency Bands): Category I Equipment	2010-12
ANSI C63.4	Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz	2009
FCC Public Notice DA 00-705	Filing and Measurement Guidelines for Frequency Hopping Spread Spectrum Systems	March 2000
KDB412172 D01	Guidelines for Determining the Effective Radiated Power (ERP) and Equivalent Isotropically Radiated Power (EIRP) of a RF Transmitting System	2011

5. LABORATORY ENVIRONMENT

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

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

Fully-anechoic chamber 2 (8.6 meters 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	IC	Verdict
Peak Output Power - Conducted	15.247 (b)(1)	RSS-210 A8.4(2)	P
Frequency Band Edges	15.247 (d)	RSS-210 A8.5RSS-210 A8.4(2)	P
Conducted Emission	15.247 (d)	RSS-210 A8.5	P
Radiated Emission	15.247, 15.205, 15.209	RSS-210 A8.5	P
Time of Occupancy (Dwell Time)	15.247 (a) (1)(iii)	RSS-210 A8.1(4)	P
20dB Bandwidth	15.247 (a)(1)	RSS-210 A8.1(1)	NA
Carrier Frequency Separation	15.247 (a)(1)	RSS-210 A8.1(2)	P
Number of hopping channels	15.247 (a)(b)(iii)	RSS-210 A8.1(4)	P
AC Powerline Conducted Emission	15.107, 15.207	RSS-Gen 7.2.2	P

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

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

6.2. Statements

TMC has evaluated the test cases requested by the applicant /manufacturer as listed in section 6.1 of this report for the EUT specified in section 3 according to the standards or reference documents listed in section 4.2

7. Test Equipments Utilized

Conducted test system

No.	Equipment	Model	Serial Number	Manufacturer	Calibration Due date
1	Vector Signal Analyzer	FSU26	200030	Rohde & Schwarz	2014-06-12
2	Bluetooth Tester	CBT32	100649	Rohde & Schwarz	2014-02-03

Radiated emission test system

No.	Equipment	Model	Serial Number	Manufacturer	Calibration Due date
1	Test Receiver	ESU26	100376	Rohde & Schwarz	2013-11-07
2	EMI Antenna	VULB 9163	9163482	Schwarzbeck	2014-02-17
3	EMI Antenna	3117	00119024	EMCO	2014-02-03
4	Dual-Ridge Waveguide Horn Antenna	3116	2663	ETS-Lindgren	2014-06-30
5	Dual-Ridge Waveguide Horn Antenna	3116	2661	ETS-Lindgren	2014-06-30
6	Bluetooth Tester	CBT	100153	Rohde & Schwarz	2013-09-13
7	LISN	ESH2-Z5	829991/012	Rohde & Schwarz	2014-03-17
8	Pre-amplifier(18GHz)	SCU18	1005277	Rohde & Schwarz	/
9	Pre-amplifier(26.5GHz)	SCU26	1006788	Rohde & Schwarz	/
10	Loop Antenna	HFH2-Z2	829324/007	Rohde & Schwarz	2014-12-20

Anechoic chamber

Fully anechoic chamber by Frankonia German.

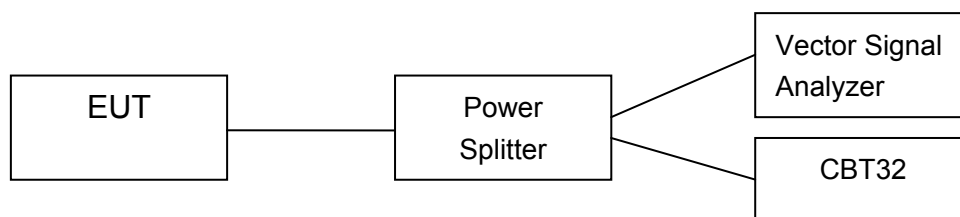
ANNEX A: MEASUREMENT RESULTS

A.1. Measurement Method

A.1.1. Conducted Measurements

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

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



A.1.2. Radiated Emission Measurements

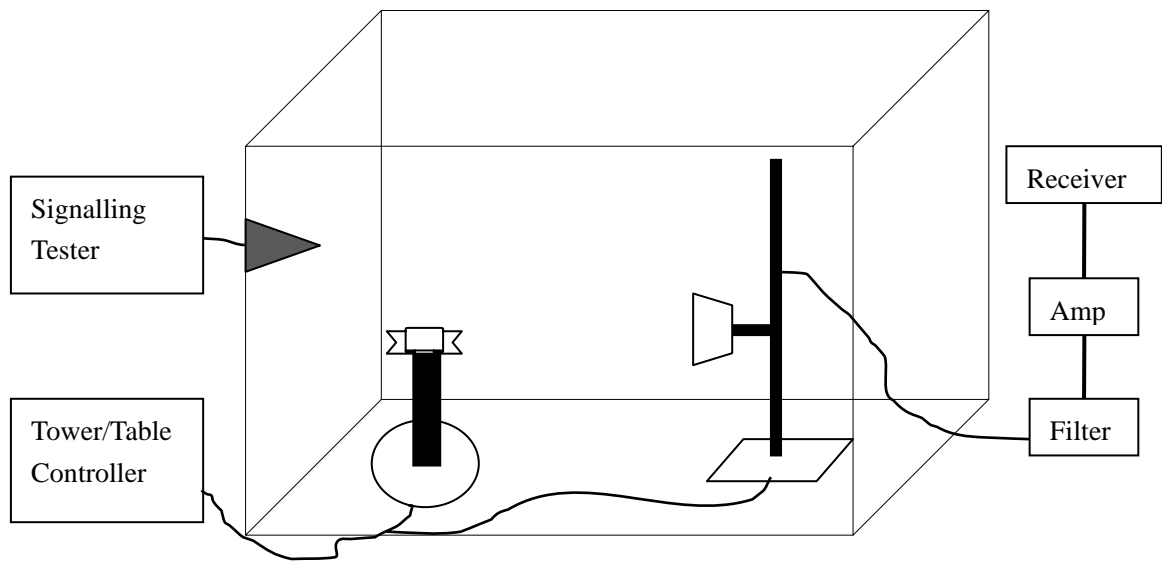
The measurement is made according to Public notice DA 00-705 and ANSI C63.4

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

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

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

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



A.2. Peak Output Power - Conducted

Measurement Limit:

Standard	Limit (dBm)
FCC Part 15.247(b)(1) / RSS-210 A8.4 (2)	< 30

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

Test Condition

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

Measurement Results:

For GFSK

Channel	Ch 0 2402 MHz	Ch 39 2441 MHz	Ch 78 2480 MHz	Conclusion
Peak Conducted Output Power (dBm)	5.48	4.34	3.80	P

For $\pi/4$ DQPSK

Channel	Ch 0 2402 MHz	Ch 39 2441 MHz	Ch 78 2480 MHz	Conclusion
Peak Conducted Output Power (dBm)	4.34	3.33	2.61	P

For 8DPSK

Channel	Ch 0 2402 MHz	Ch 39 2441 MHz	Ch 78 2480 MHz	Conclusion
Peak Conducted Output Power (dBm)	4.37	4.34	2.72	P

Conclusion: PASS

A.3. Frequency Band Edges - Conducted

Measurement Limit:

Standard	Limit (dBc)
FCC 47 CFR Part 15.247 (d) RSS-210 A8.4(2)	> 20

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

Measurement Result:

For GFSK

Channel	Hopping	Band Edge Power (dBc)		Conclusion
0	Hopping OFF	Fig.1	-54.85	P
	Hopping ON	Fig.2	-56.72	P
78	Hopping OFF	Fig.3	-60.33	P
	Hopping ON	Fig.4	-58.89	P

For $\pi/4$ DQPSK

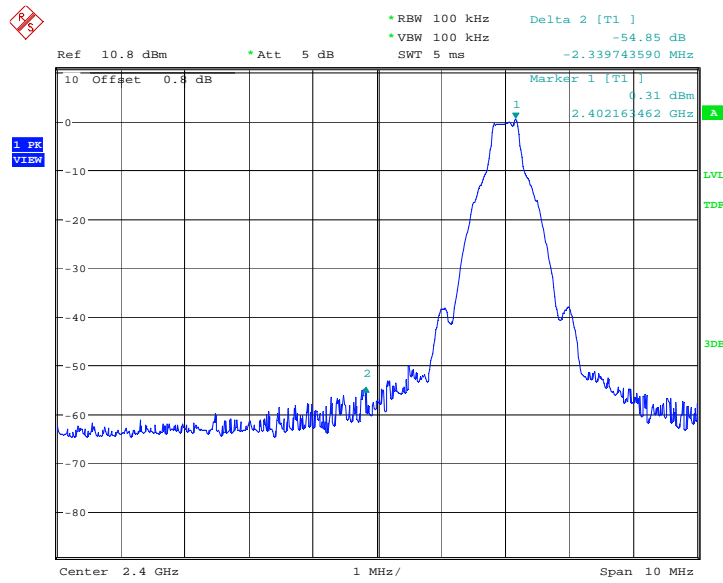
Channel	Hopping	Band Edge Power (dBc)		Conclusion
0	Hopping OFF	Fig.5	-57.36	P
	Hopping ON	Fig.6	-57.40	P
78	Hopping OFF	Fig.7	-61.93	P
	Hopping ON	Fig.8	-56.86	P

For 8DPSK

Channel	Hopping	Band Edge Power (dBc)		Conclusion
0	Hopping OFF	Fig.9	-54.44	P
	Hopping ON	Fig.10	-54.09	P
78	Hopping OFF	Fig.11	-60.22	P
	Hopping ON	Fig.12	-54.92	P

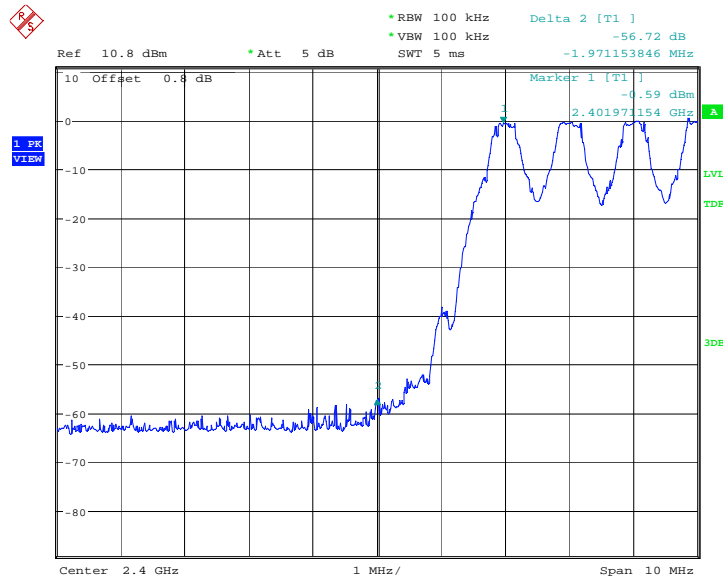
Conclusion: PASS

Test graphs as below



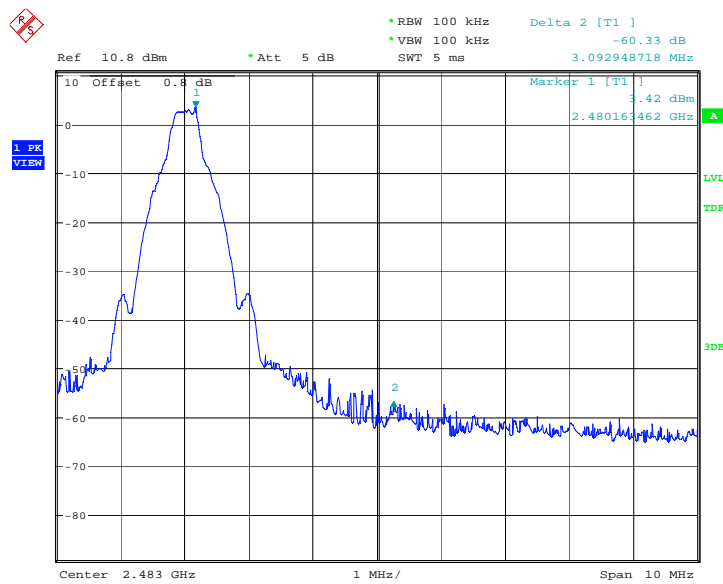
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Fig.1. Frequency Band Edges: GFSK, Channel 0, Hopping Off



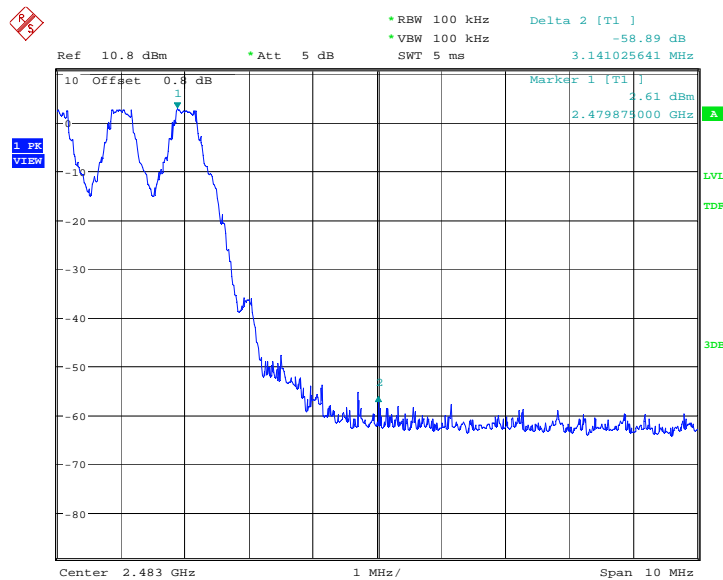
Date: 25.JAN.2013 04:28:46

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



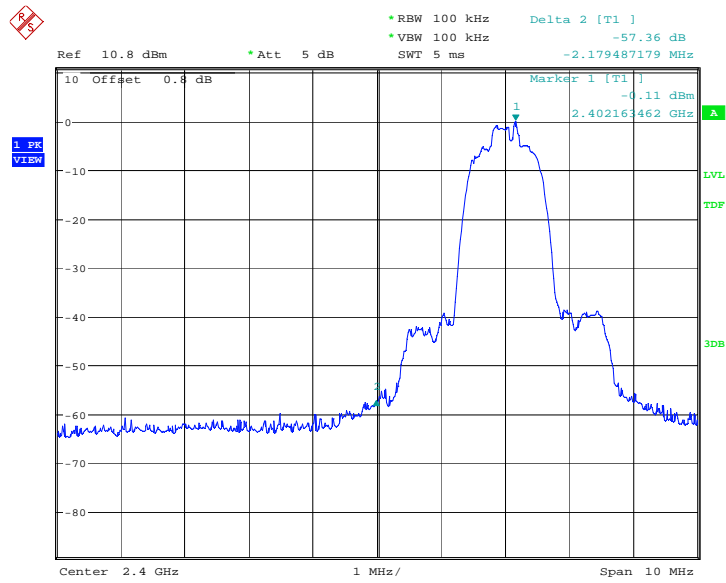
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Fig.3. Frequency Band Edges: GFSK, Channel 78, Hopping Off



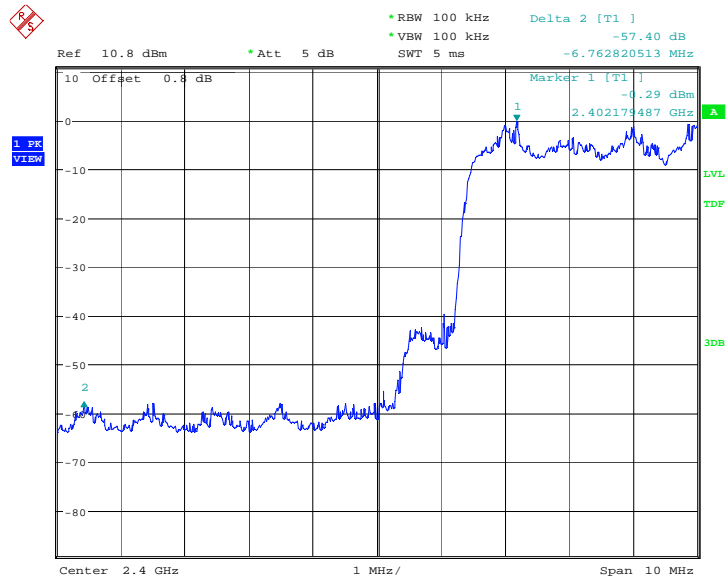
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Fig.4. Frequency Band Edges: GFSK, Channel 78, Hopping On



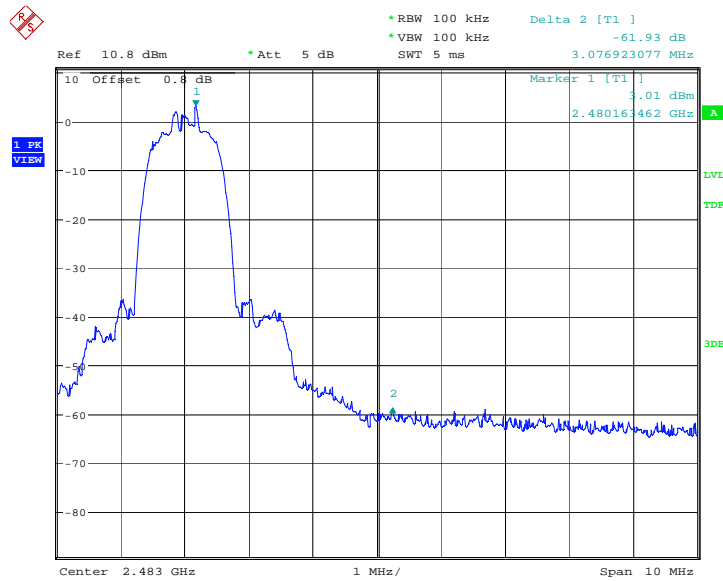
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Fig.5. Frequency Band Edges: $\pi/4$ DQPSK, Channel 0, Hopping Off



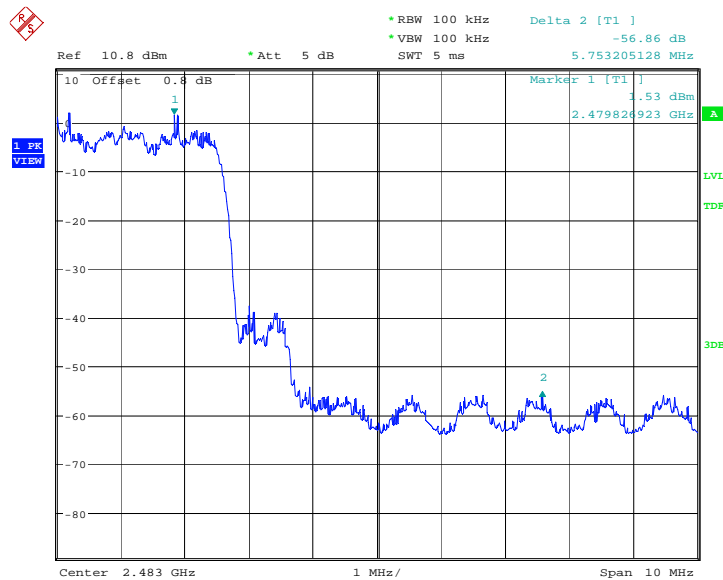
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Fig.6. Frequency Band Edges: $\pi/4$ DQPSK, Channel 0, Hopping On



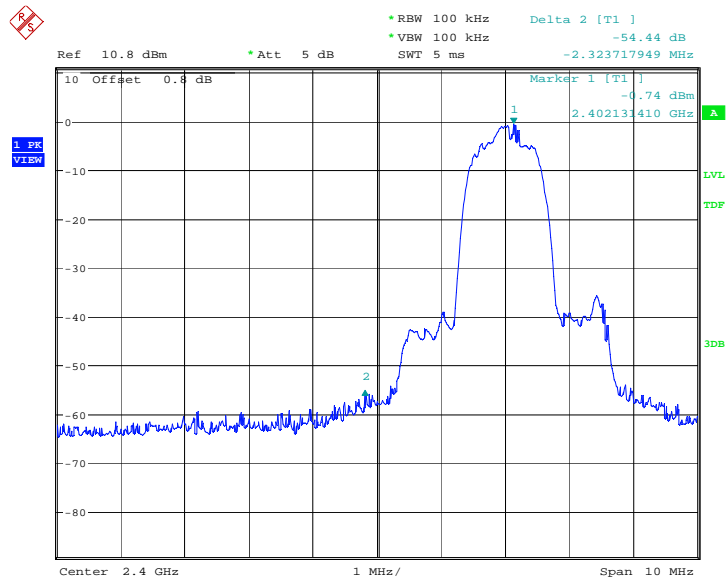
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Fig.7. Frequency Band Edges: $\pi/4$ DQPSK, Channel 78, Hopping Off



Date: 25.JAN.2013 04:52:15

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



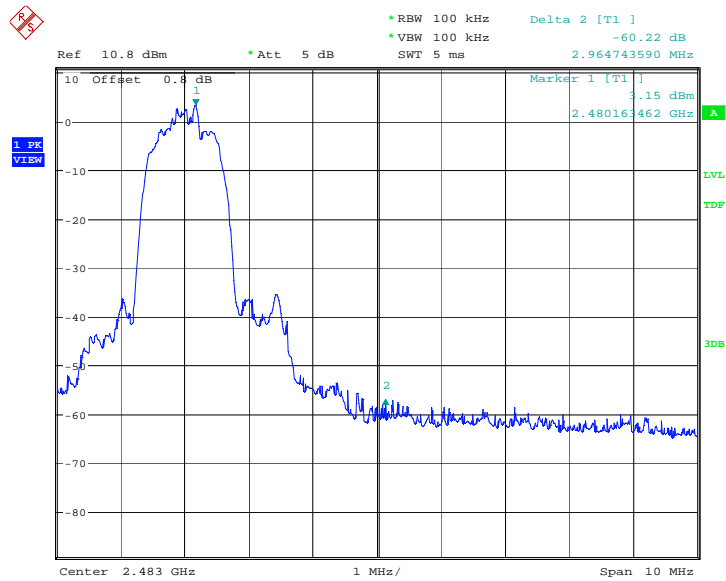
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Fig.9. Frequency Band Edges: 8DPSK, Channel 0, Hopping Off



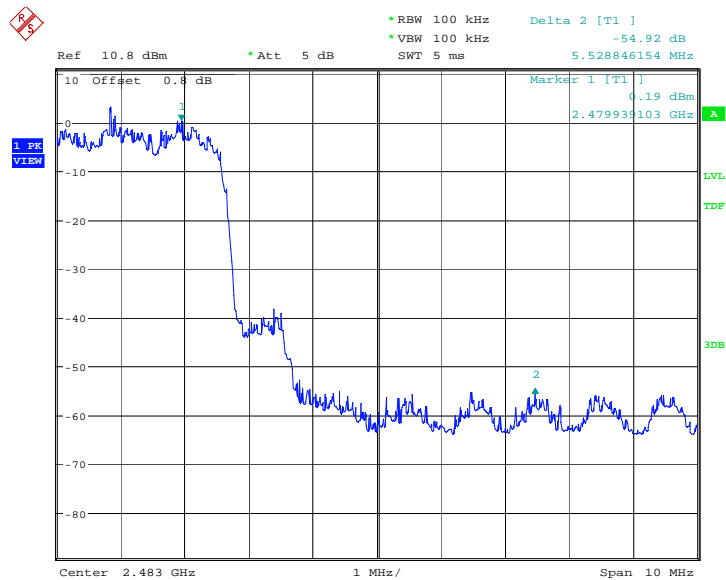
Date: 25.JAN.2013 05:11:41

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



Date: 25.JAN.2013 05:09:38

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



Date: 25.JAN.2013 05:13:43

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

A.4. Conducted Emission

Measurement Limit:

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

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

Measurement Results:

For GFSK

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

For $\pi/4$ DQPSK

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

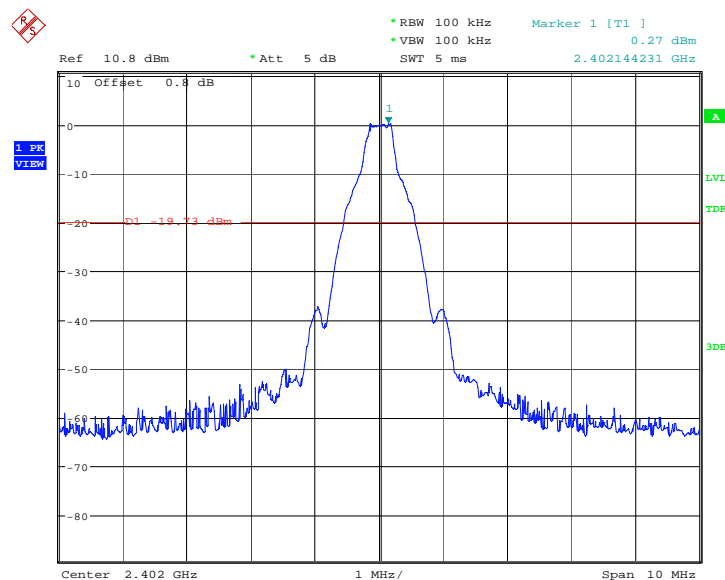
	1 GHz ~ 3 GHz	Fig.40	P
	3 GHz ~ 10 GHz	Fig.41	P
	10 GHz ~ 26 GHz	Fig.42	P

For 8DPSK

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

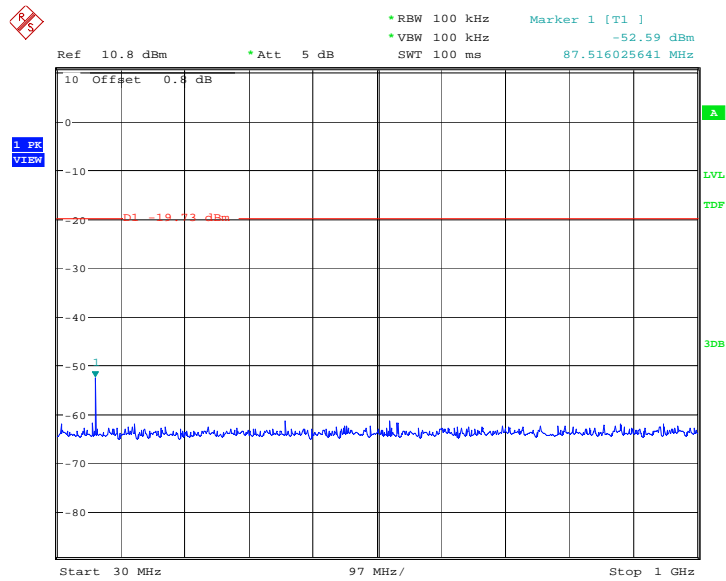
Conclusion: PASS

Test graphs as below



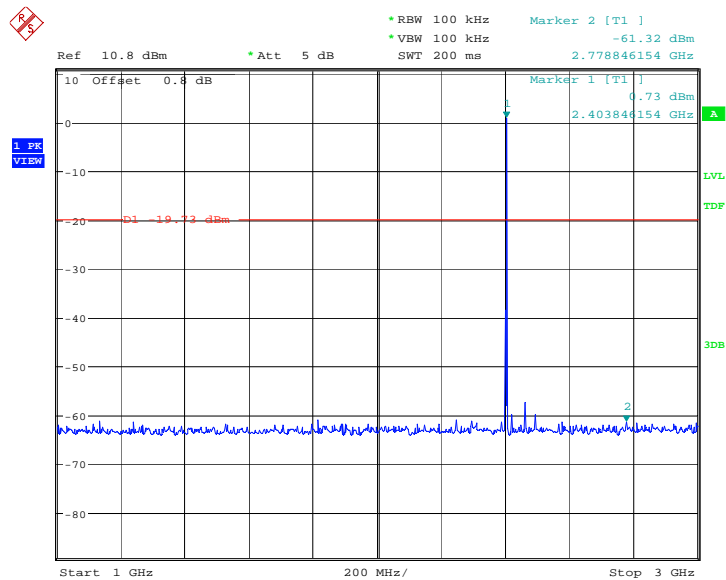
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Fig.13. Conducted spurious emission: GFSK, Channel 0,2402MHz



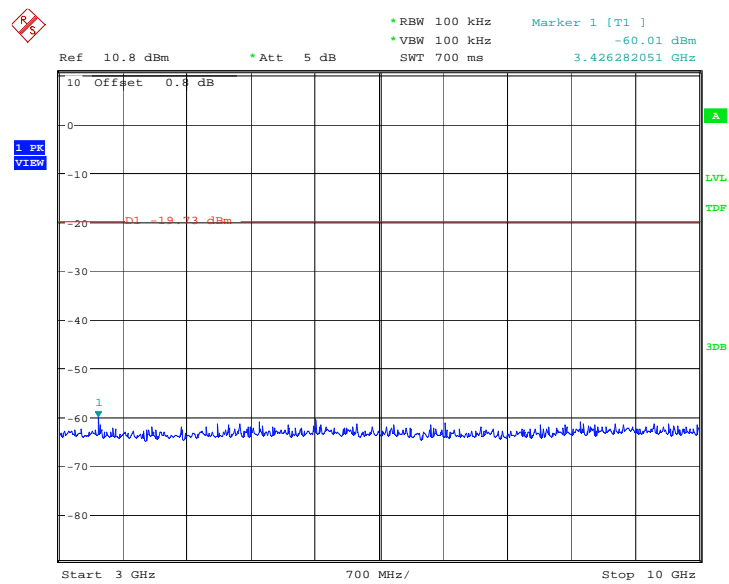
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Fig.14. Conducted spurious emission: GFSK, Channel 0, 30MHz - 1GHz



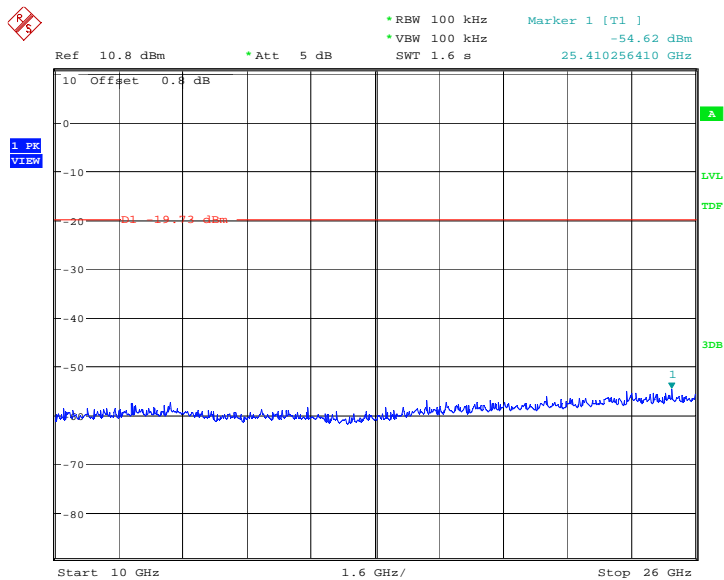
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Fig.15. Conducted spurious emission: GFSK, Channel 0, 1GHz - 3GHz



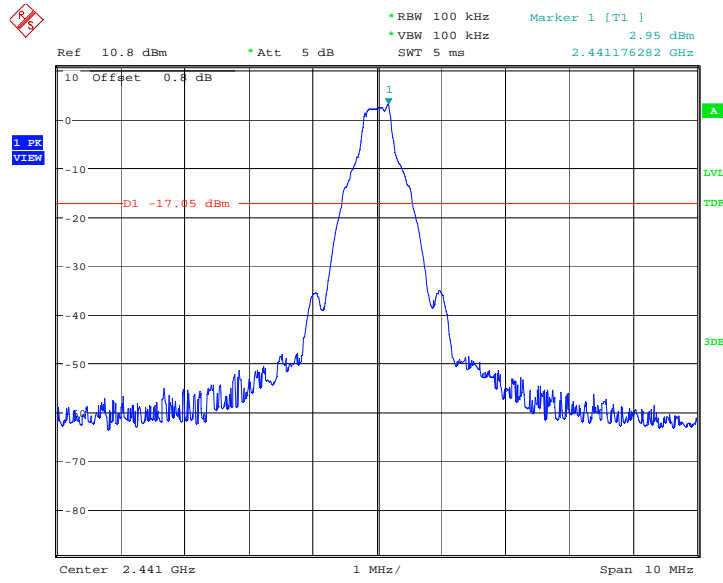
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Fig.16. Conducted spurious emission: GFSK, Channel 0, 3GHz - 10GHz



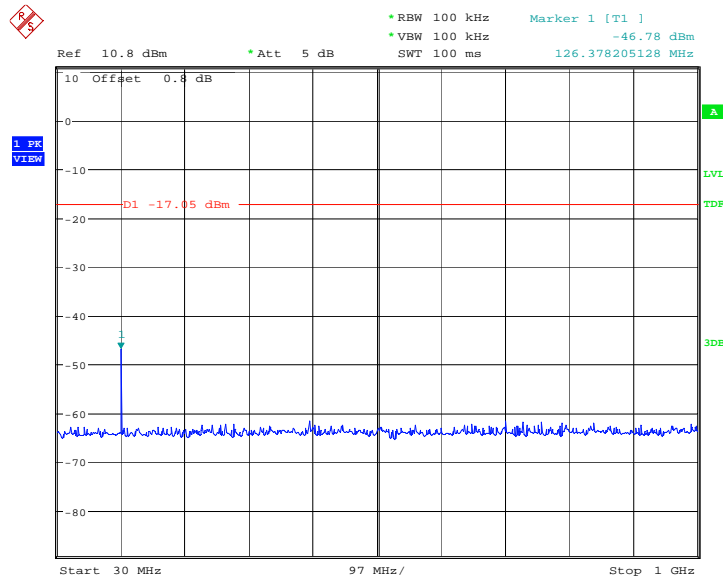
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Fig.17. Conducted spurious emission: GFSK, Channel 0, 10GHz - 26GHz



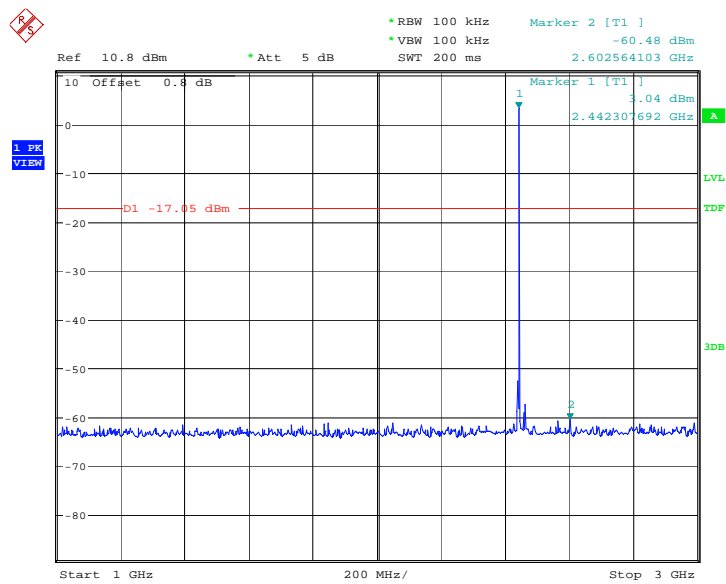
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Fig.18. Conducted spurious emission: GFSK, Channel 39, 2441MHz



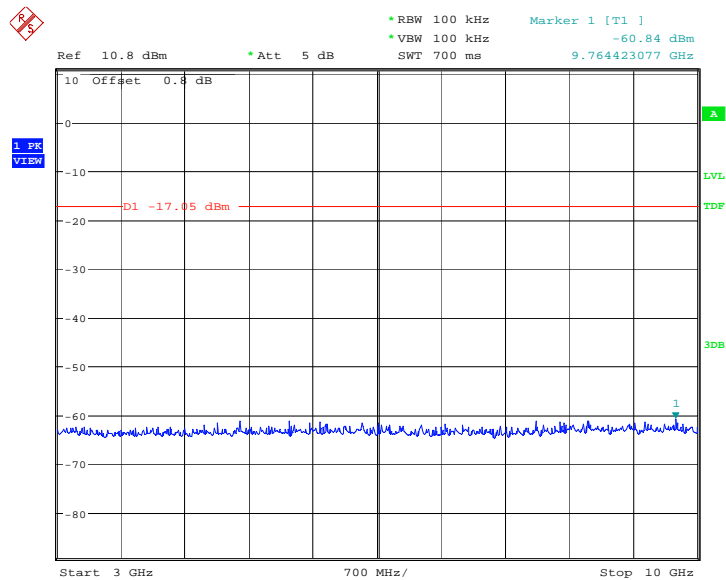
Date: 25.JAN.2013 04:33:02

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



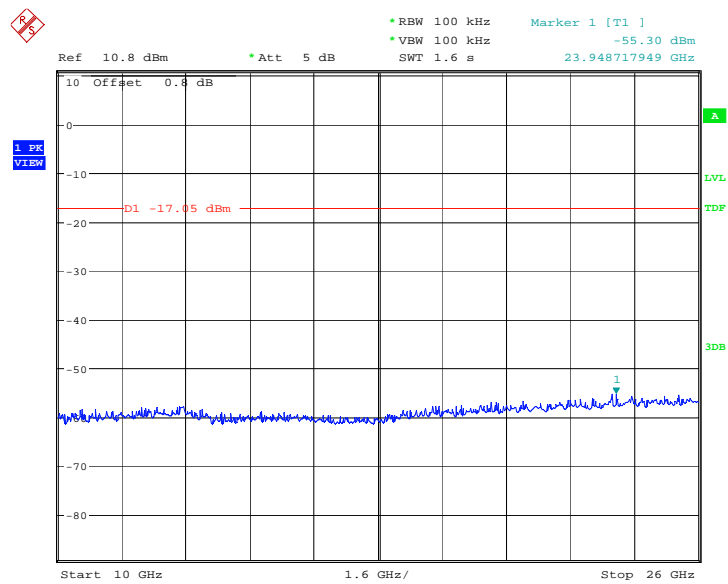
Date: 25.JAN.2013 04:33:34

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



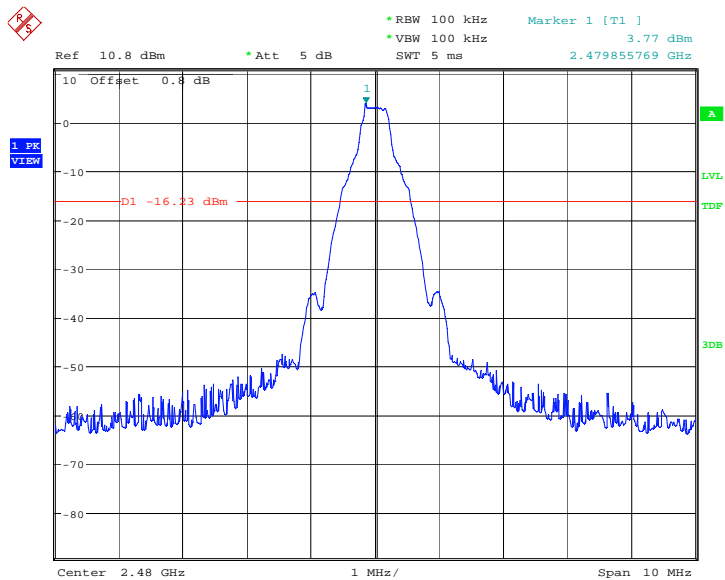
Date: 25.JAN.2013 04:33:50

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



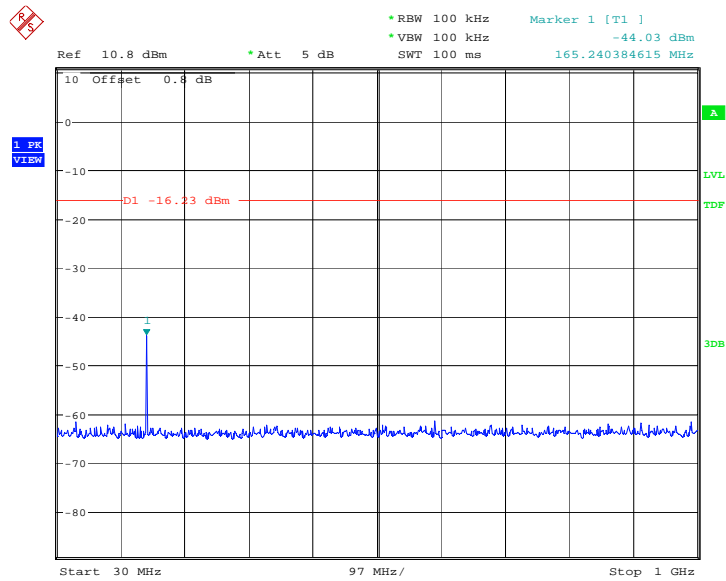
Date: 25.JAN.2013 04:34:07

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



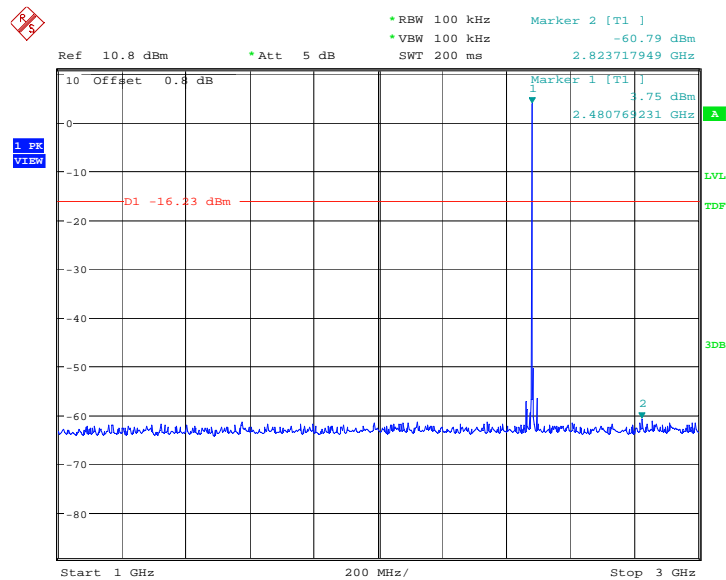
Date: 25.JAN.2013 04:34:24

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



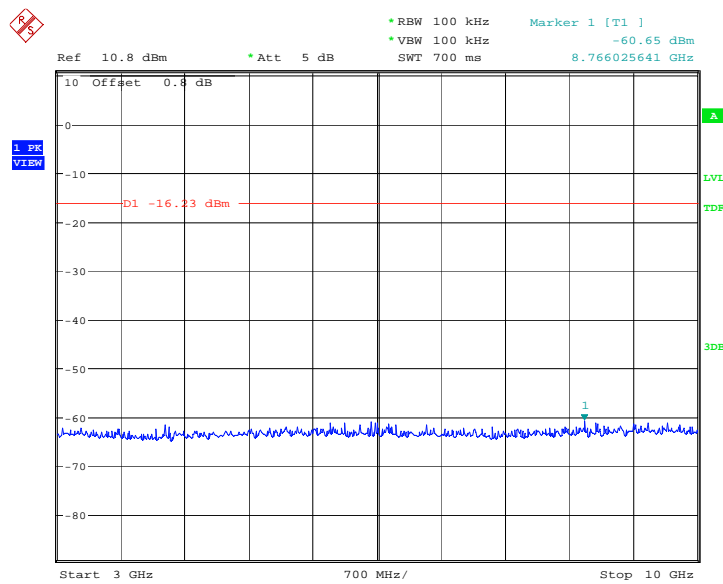
Date: 25.JAN.2013 04:34:40

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



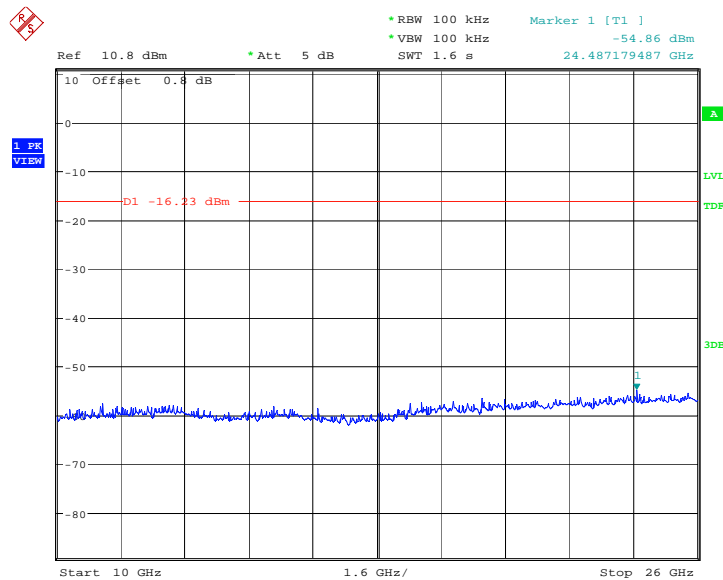
Date: 25.JAN.2013 04:35:12

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



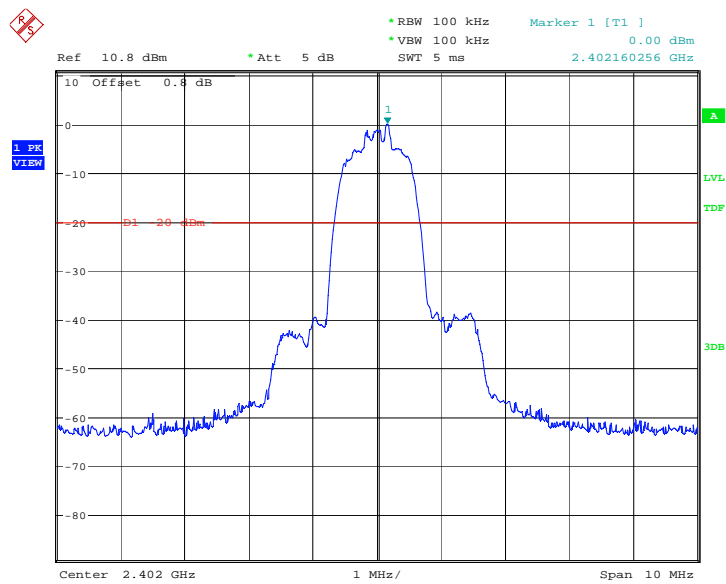
Date: 25.JAN.2013 04:35:28

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



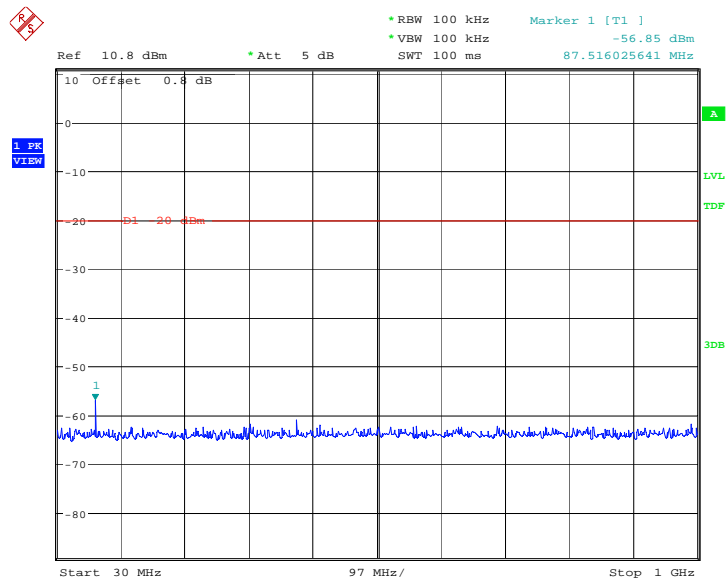
Date: 25.JAN.2013 04:35:45

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



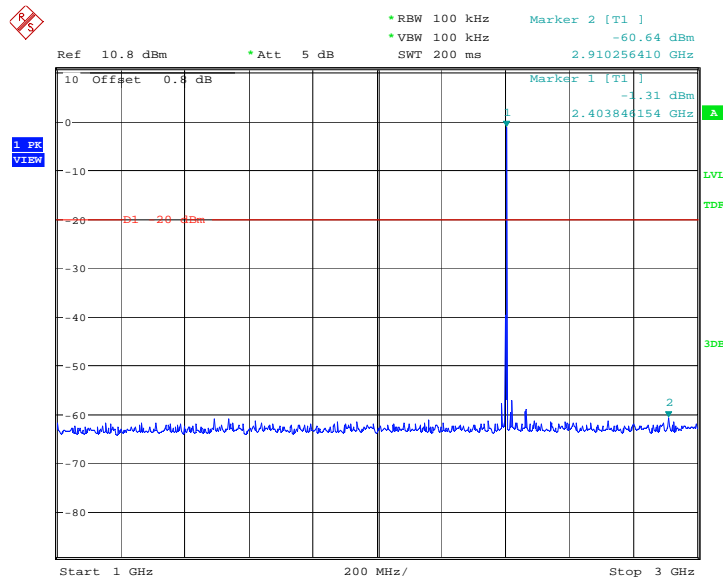
Date: 25.JAN.2013 04:52:33

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



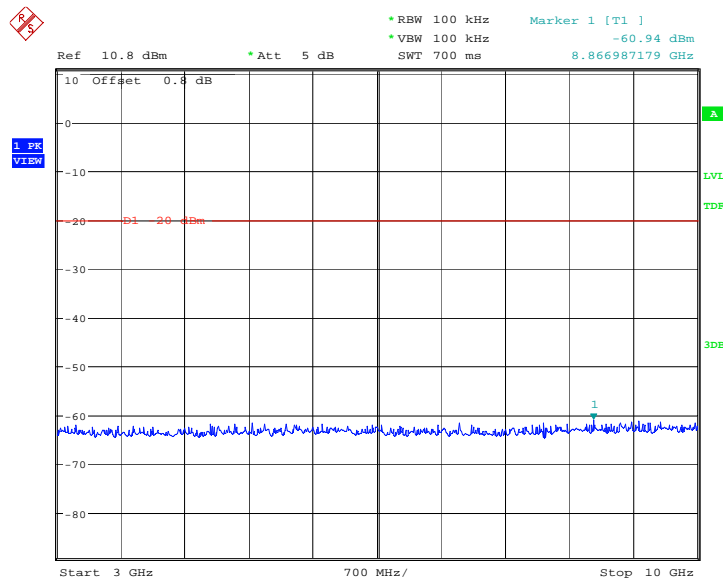
Date: 25.JAN.2013 04:52:50

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



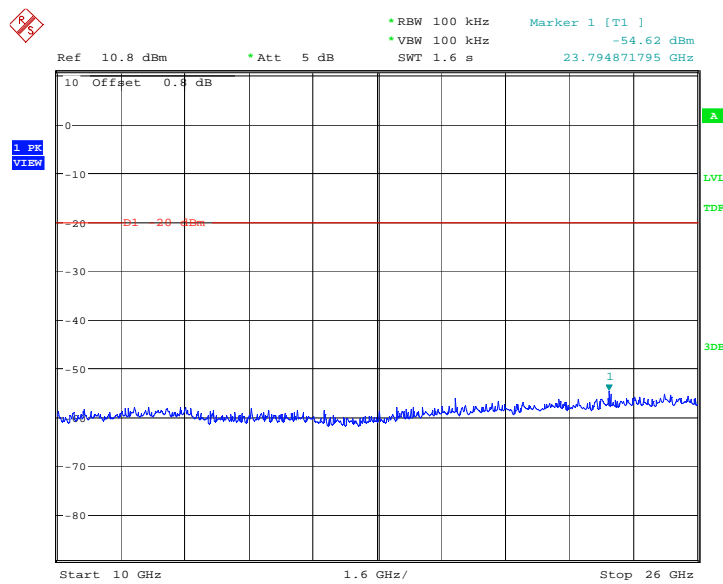
Date: 25.JAN.2013 04:53:22

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



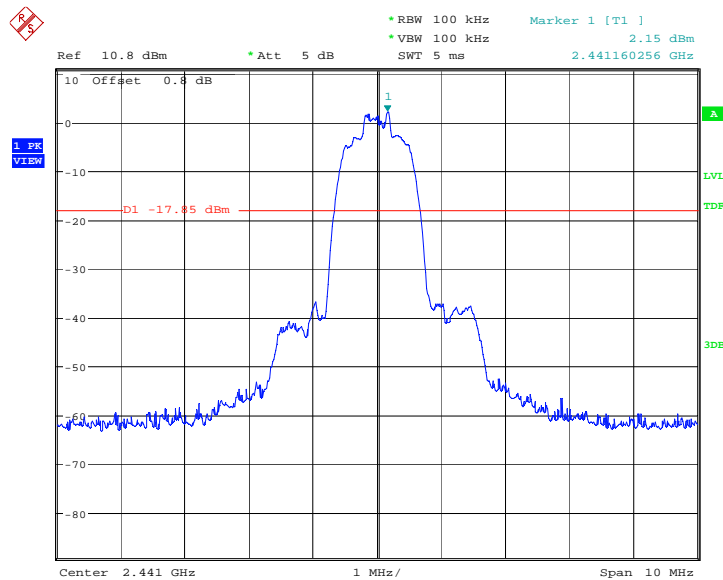
Date: 25.JAN.2013 04:53:38

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



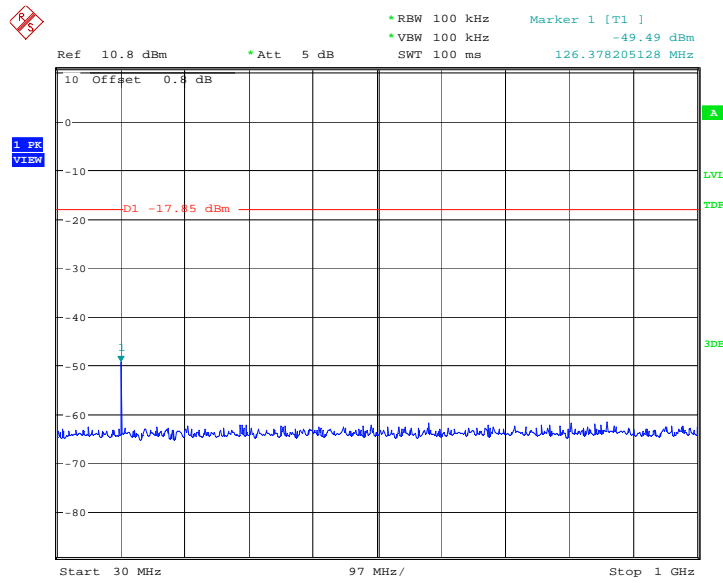
Date: 25.JAN.2013 04:53:55

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



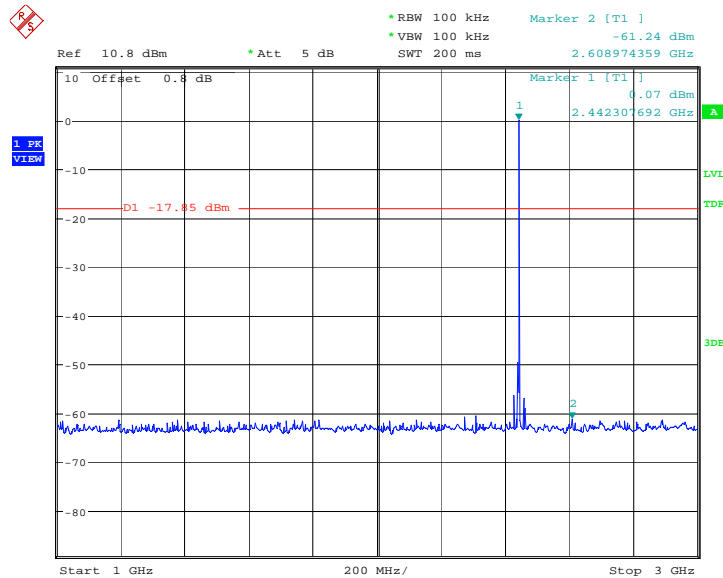
Date: 25.JAN.2013 04:54:12

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



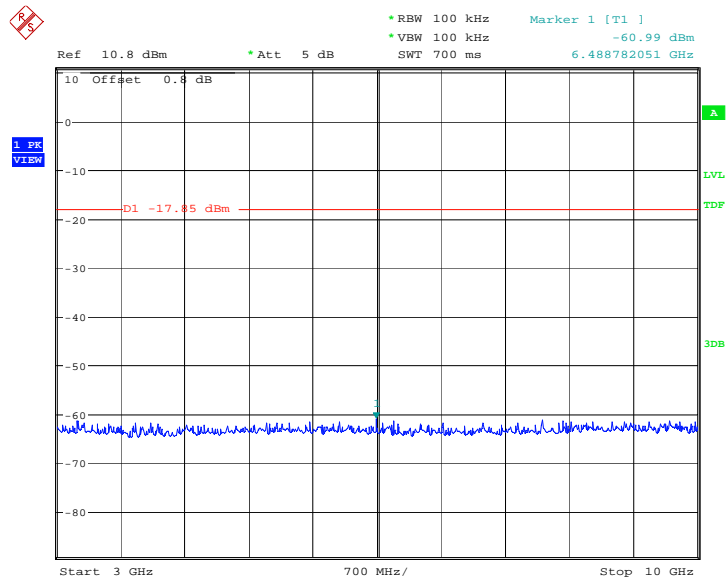
Date: 25.JAN.2013 04:54:28

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



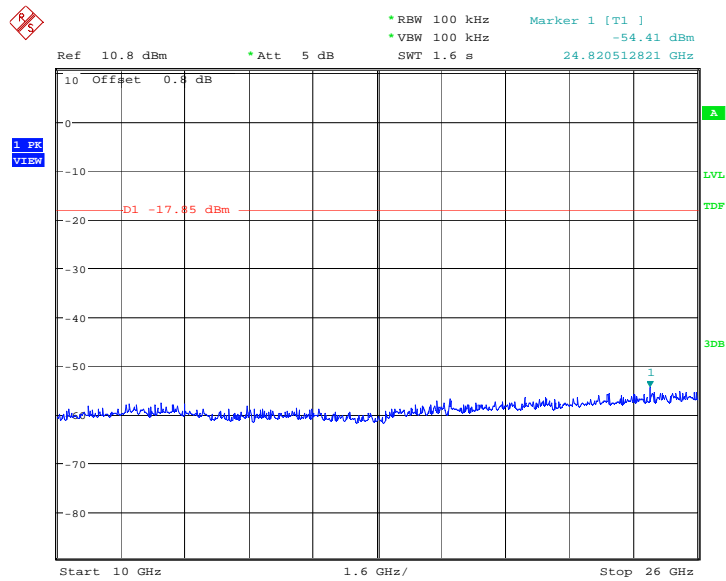
Date: 25.JAN.2013 04:55:00

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



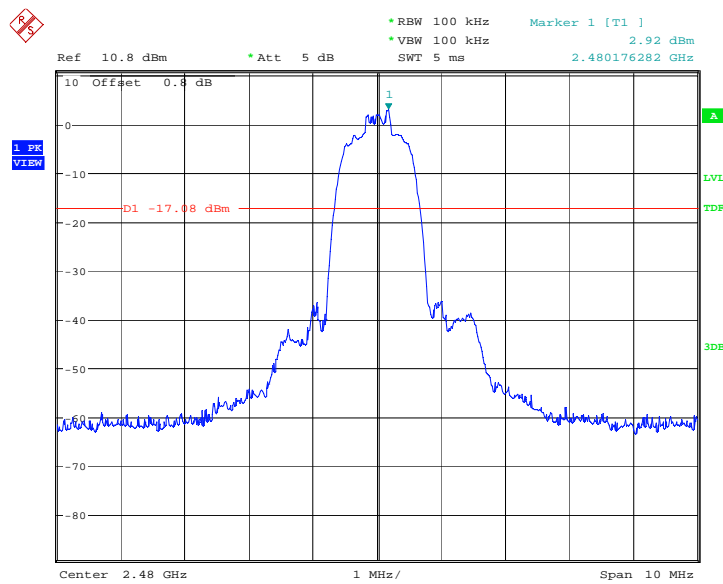
Date: 25.JAN.2013 04:55:16

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



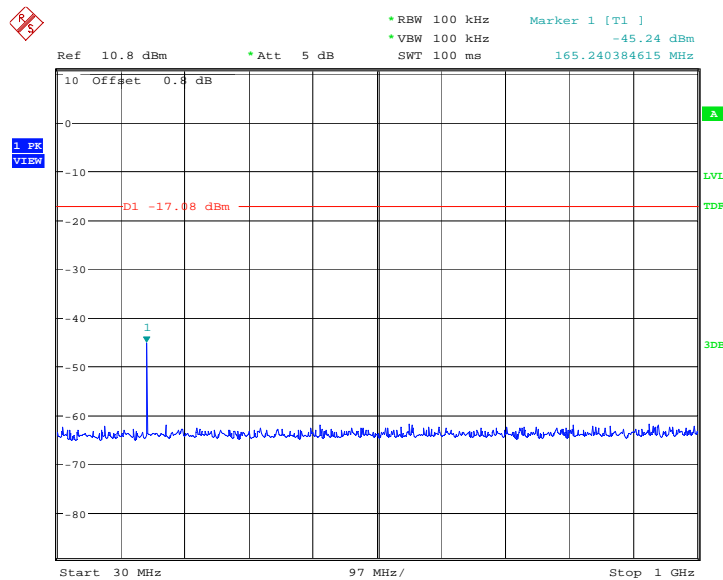
Date: 25.JAN.2013 04:55:33

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



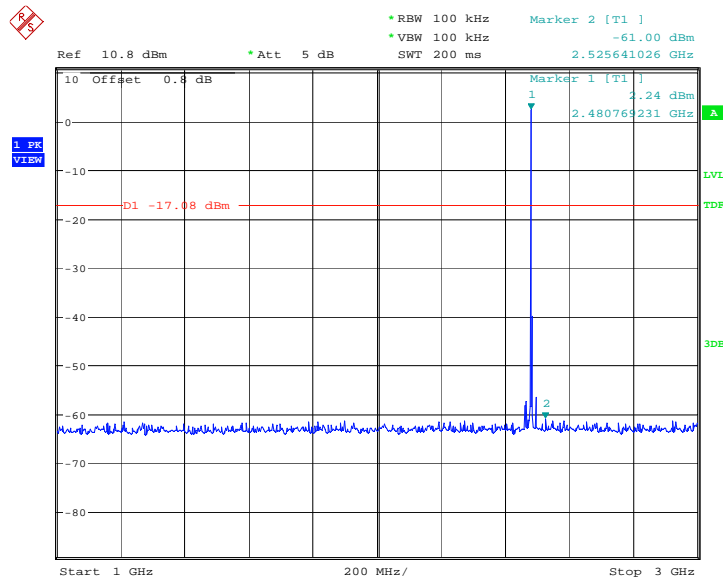
Date: 25.JAN.2013 04:55:50

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



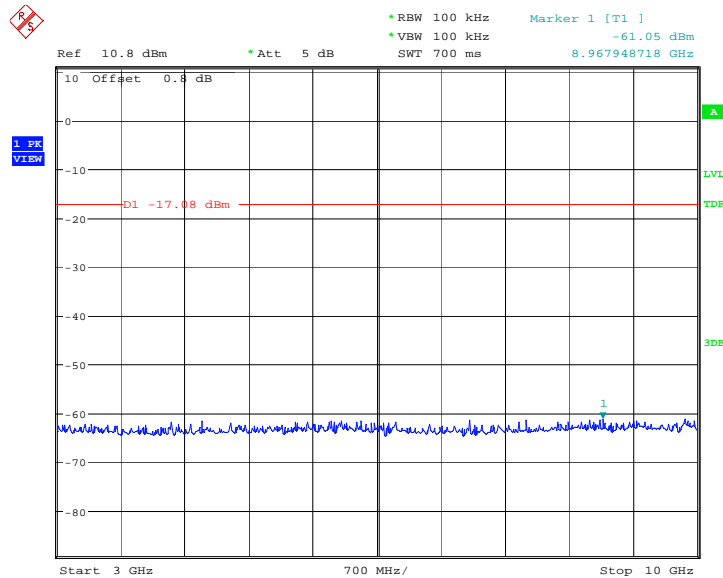
Date: 25.JAN.2013 04:56:06

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



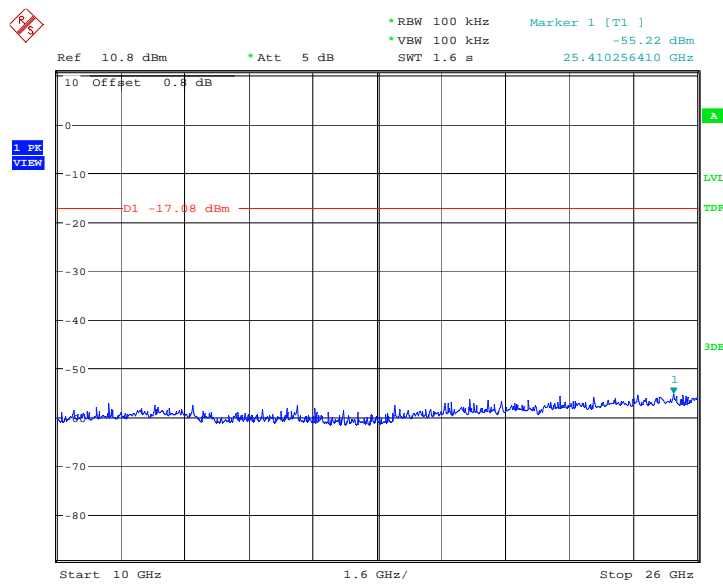
Date: 25.JAN.2013 04:56:38

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



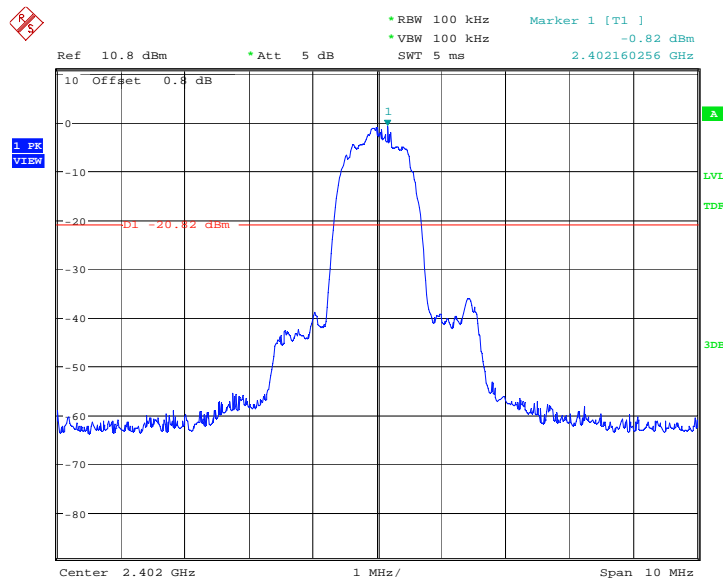
Date: 25.JAN.2013 04:56:55

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



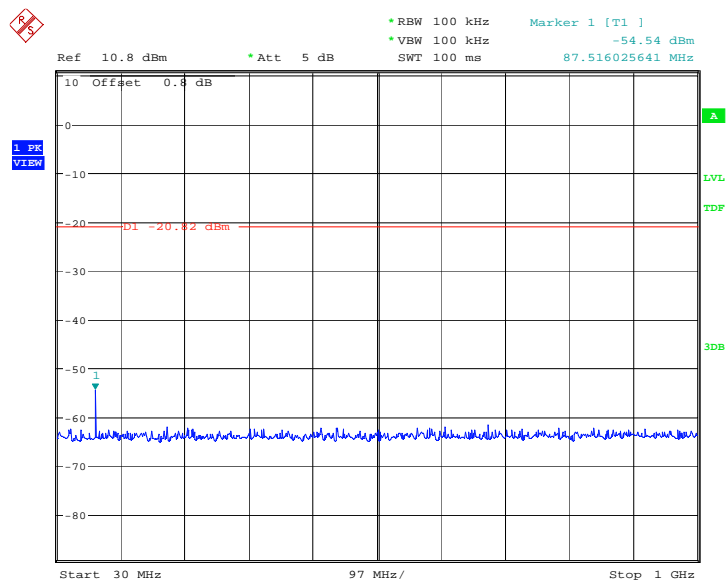
Date: 25.JAN.2013 04:57:11

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



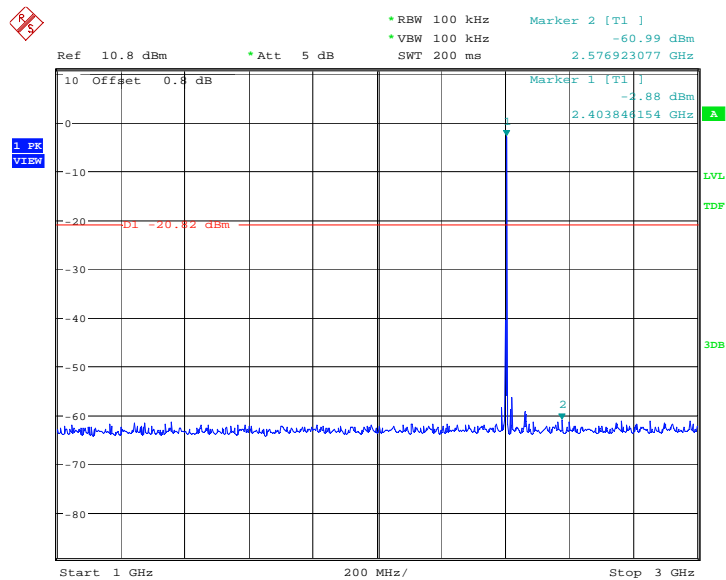
Date: 25.JAN.2013 05:14:02

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



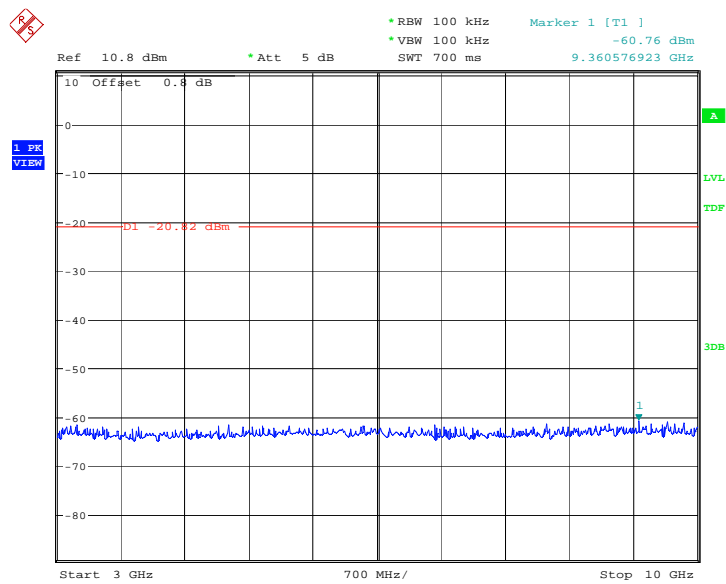
Date: 25.JAN.2013 05:14:19

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



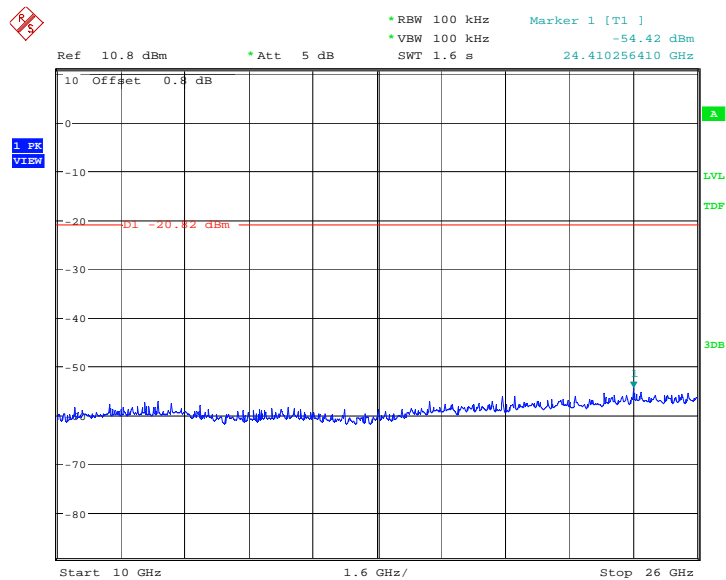
Date: 25.JAN.2013 05:14:50

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



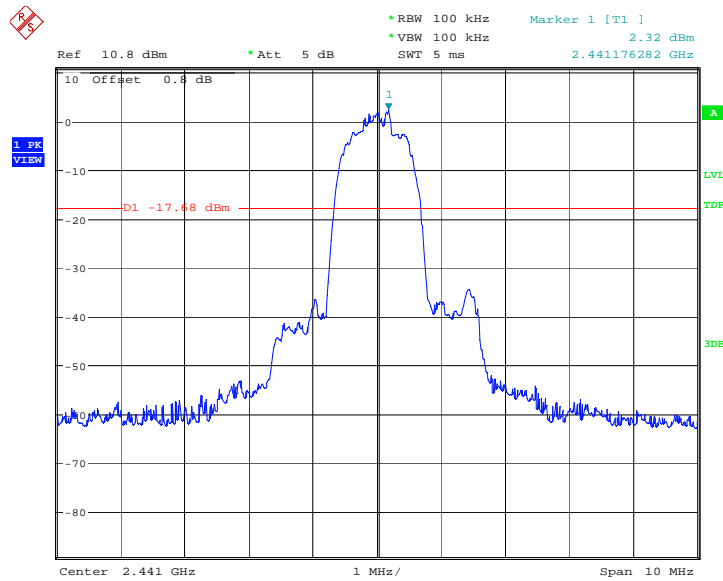
Date: 25.JAN.2013 05:15:07

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



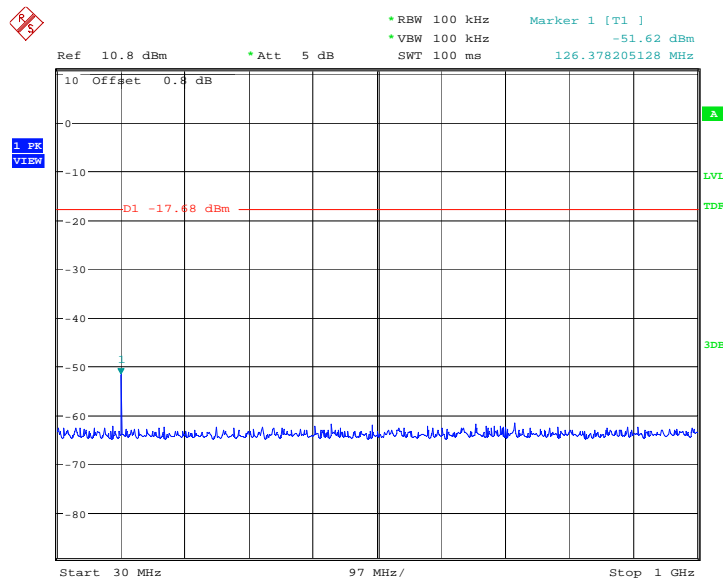
Date: 25.JAN.2013 05:15:24

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



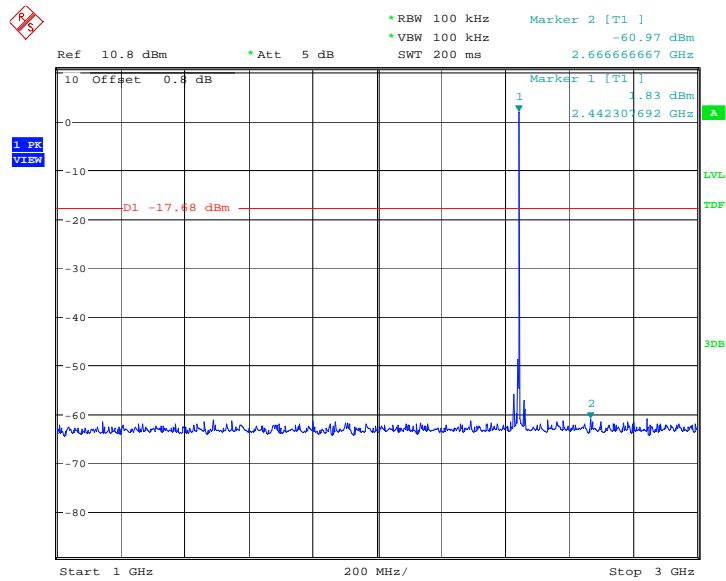
Date: 25.JAN.2013 05:15:40

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



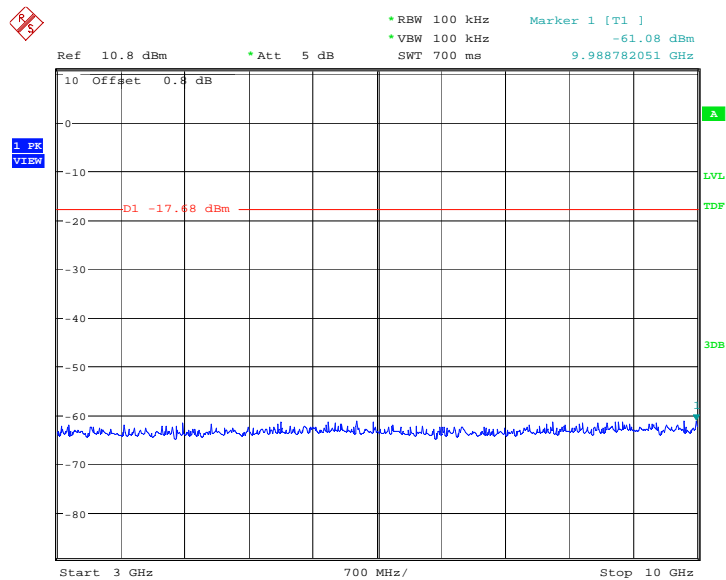
Date: 25.JAN.2013 05:15:57

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



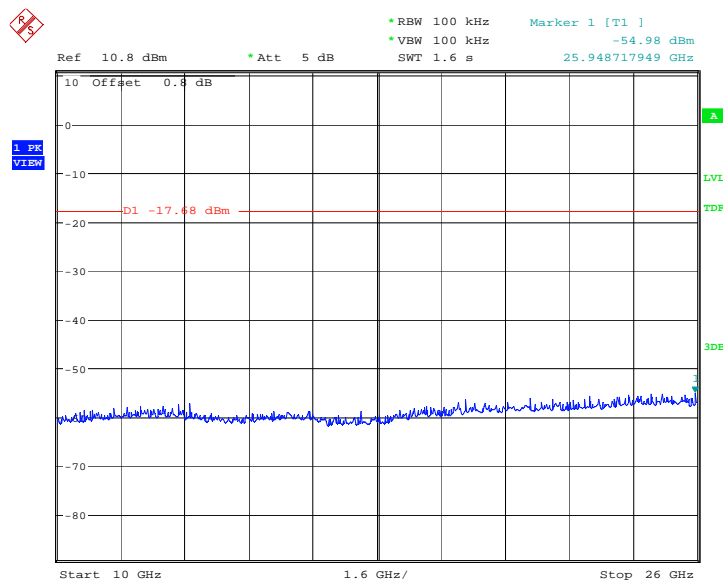
Date: 25.JAN.2013 05:16:29

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



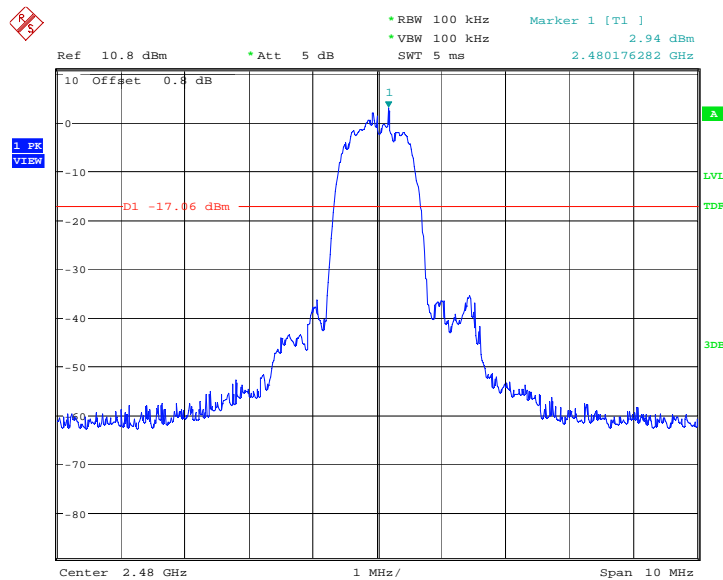
Date: 25.JAN.2013 05:16:45

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



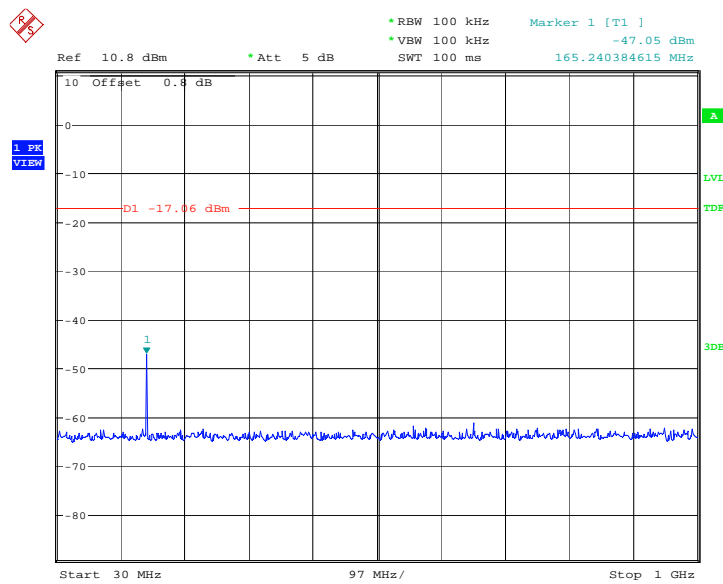
Date: 25.JAN.2013 05:17:02

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



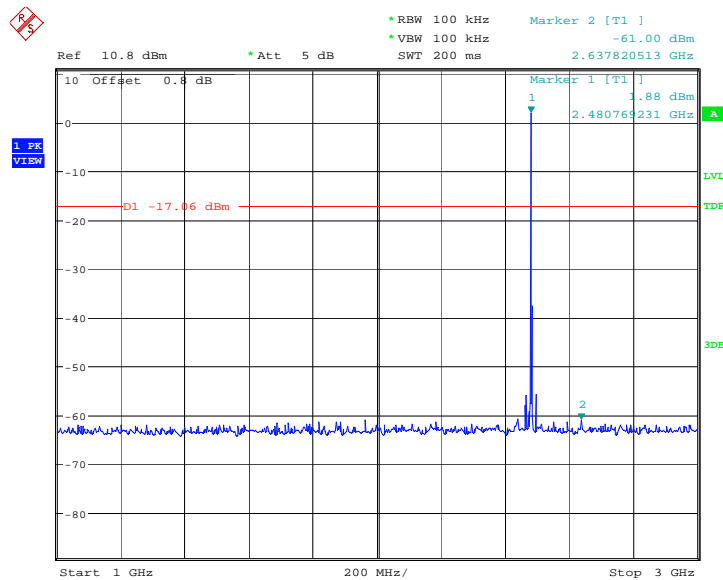
Date: 25.JAN.2013 05:17:18

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



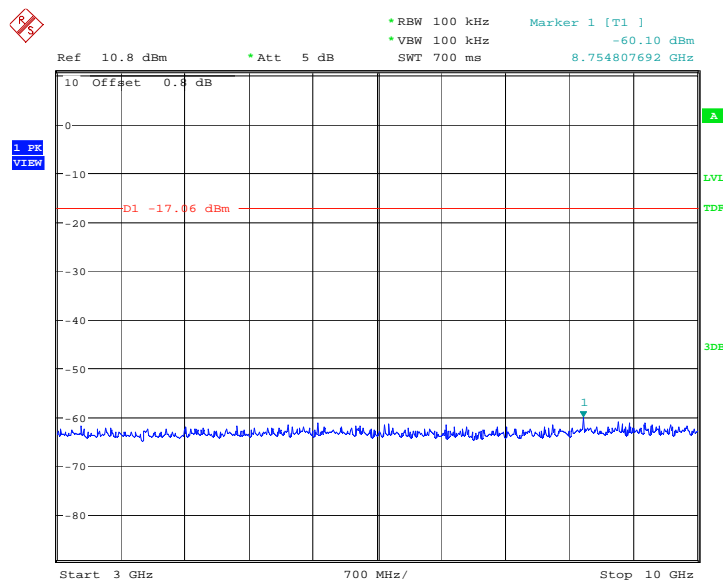
Date: 25.JAN.2013 05:17:35

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



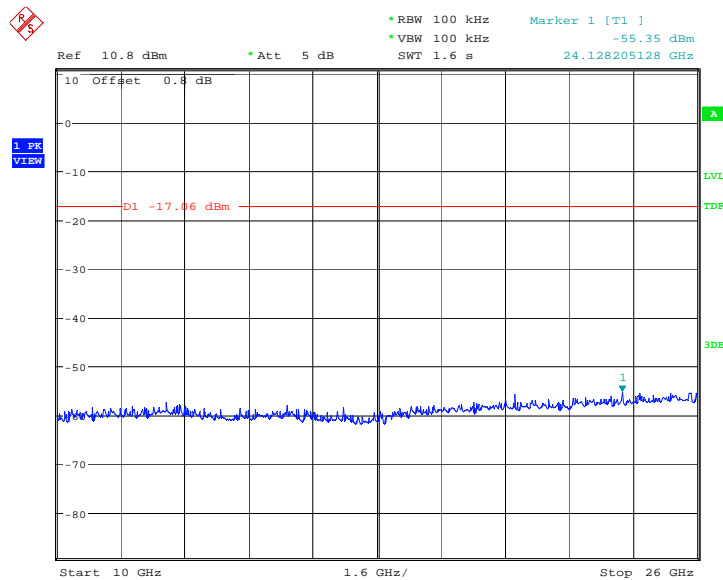
Date: 25.JAN.2013 05:18:07

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



Date: 25.JAN.2013 05:18:23

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



Date: 25.JAN.2013 05:18:40

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 RSS-210 A8.5	20dB below peak output power

In addition, radiated emissions which fall in the restricted bands, as defined in § 15.205(a), must also comply with the radiated emission limits specified in § 15.209(a) (see § 15.205(c)).

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

Limit in restricted band:

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

Test Condition

The EUT was placed on a non-conductive table. The measurement antenna was placed at a distance of 3 meters from the EUT. During the tests, the antenna height and the EUT azimuth were varied in order to identify the maximum level of emissions from the EUT. This maximization process was repeated with the EUT positioned in each of its three orthogonal orientations.

Frequency of emission (MHz)	RBW/VBW	Sweep Time(s)
30-1000	100KHz/300KHz	5
1000-4000	1MHz/1MHz	15
4000-18000	1MHz/1MHz	40
18000-26500	1MHz/1MHz	20

Measurement Results:

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

The measurement results are obtained as described below:

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

For GFSK

Channel	Frequency Range	Test Results	Conclusion
Ch 0 2402 MHz	30 MHz ~ 1 GHz	Fig.58	P
	1 GHz ~ 3 GHz	Fig.59	P
	3 GHz ~ 18 GHz	Fig.60	P
Ch 39 2441 MHz	9KHz ~ 30MHz	Fig.61	P
	30 MHz ~ 1 GHz	Fig.62	P
	1 GHz ~ 3 GHz	Fig.63	P
	3 GHz ~ 18 GHz	Fig.64	P

Ch 78 2480 MHz	30 MHz ~ 1 GHz	Fig.65	P
	1 GHz ~ 3 GHz	Fig.66	P
	3 GHz ~ 18 GHz	Fig.67	P
Power	2.38GHz~2.4GHz---L	Fig.68	P
Power	2.45GHz~2.5GHz---H	Fig.69	P
For all channels	18 GHz ~ 26 GHz	Fig.70	P

Forπ/4 DQPSK

Channel	Frequency Range	Test Results	Conclusion
Ch 0 2402 MHz	30 MHz ~ 1 GHz	Fig.71	P
	1 GHz ~ 3 GHz	Fig.72	P
	3 GHz ~ 18 GHz	Fig.73	P
Ch 39 2441 MHz	9KHz ~ 30MHz	Fig.74	P
	30 MHz ~ 1 GHz	Fig.75	P
	1 GHz ~ 3 GHz	Fig.76	P
	3 GHz ~ 18 GHz	Fig.77	P
Ch 78 2480 MHz	30 MHz ~ 1 GHz	Fig.78	P
	1 GHz ~ 3 GHz	Fig.79	P
	3 GHz ~ 18 GHz	Fig.80	P
Power	2.38GHz~2.4GHz---L	Fig.81	P
Power	2.45GHz~2.5GHz---H	Fig.82	P
For all channels	18 GHz ~ 26 GHz	Fig.83	P

For 8DPSK

Channel	Frequency Range	Test Results	Conclusion
Ch 0 2402 MHz	30 MHz ~ 1 GHz	Fig.84	P
	1 GHz ~ 3 GHz	Fig.85	P
	3 GHz ~ 18 GHz	Fig.86	P
Ch 39 2441 MHz	9KHz ~ 30MHz	Fig.87	P
	30 MHz ~ 1 GHz	Fig.88	P
	1 GHz ~ 3 GHz	Fig.89	P
	3 GHz ~ 18 GHz	Fig.90	P
Ch 78 2480 MHz	30 MHz ~ 1 GHz	Fig.91	P
	1 GHz ~ 3 GHz	Fig.92	P
	3 GHz ~ 18 GHz	Fig.93	P
Power	2.38GHz~2.4GHz---L	Fig.94	P
Power	2.45GHz~2.5GHz---H	Fig.95	P
For all channels	18 GHz ~ 26 GHz	Fig.96	P

GFSK Ch 0

Frequency(MHz)	Result(dBuV/m)	ARpl (dB)	PMea(dBuV/m)	Polarity
17511.75	43.70	17.47	26.23	H
17505.75	43.70	17.47	26.23	H

17510.25	43.60	17.47	26.13	V
17487.00	43.60	17.74	25.86	H
17514.75	43.50	17.47	26.03	H
18000.00	43.50	18.10	25.40	V

GFSK Ch 39

Frequency(MHz)	Result(dBuV/m)	ARpl (dB)	PMea(dBuV/m)	Polarity
17494.50	43.60	17.74	25.86	V
17523.00	43.50	17.47	26.03	H
17540.25	43.50	17.63	25.87	H
17517.00	43.50	17.47	26.03	V
17505.00	43.50	17.47	26.03	V
17474.25	43.50	17.30	26.20	V

GFSK Ch 78

Frequency(MHz)	Result(dBuV/m)	ARpl (dB)	PMea(dBuV/m)	Polarity
17502.75	43.70	17.47	26.23	V
17517.75	43.70	17.47	26.23	V
17543.25	43.60	17.63	25.97	H
17529.75	43.60	17.63	25.97	H
17523.00	43.60	17.47	26.13	V
17494.50	43.50	17.74	25.76	H

 $\pi/4$ DQPSK Ch 0

Frequency(MHz)	Result(dBuV/m)	ARpl (dB)	PMea(dBuV/m)	Polarity
17498.25	43.70	17.74	25.96	V
17515.50	43.70	17.47	26.23	V
17502.75	43.60	17.47	26.13	V
17539.50	43.50	17.63	25.87	H
17470.50	43.50	17.30	26.20	H
17992.50	43.50	17.55	25.95	V

 $\pi/4$ DQPSK Ch 39

Frequency(MHz)	Result(dBuV/m)	ARpl (dB)	PMea(dBuV/m)	Polarity
17523.00	43.60	17.47	26.13	H
17479.50	43.60	17.74	25.86	V
17499.00	43.50	17.74	25.76	H
17518.50	43.50	17.47	26.03	H
17511.00	43.50	17.47	26.03	H
17517.00	43.50	17.47	26.03	V

 $\pi/4$ DQPSK Ch 78

Frequency(MHz)	Result(dBuV/m)	ARpl (dB)	PMea(dBuV/m)	Polarity
17539.50	43.70	17.63	26.07	V
17479.50	43.60	17.74	25.86	H
17021.25	43.60	17.66	25.94	V
17505.75	43.60	17.47	26.13	H

17520.75	43.60	17.47	26.13	V
17550.00	43.50	16.96	26.54	H

8DPSK Ch 0

Frequency(MHz)	Result(dBuV/m)	ARpl (dB)	PMea(dBuV/m)	Polarity
17512.50	44.00	17.47	26.53	H
17516.25	43.70	17.47	26.23	H
17457.75	43.60	16.28	27.32	H
17505.75	43.60	17.47	26.13	V
17503.50	43.60	17.47	26.13	H
17502.75	43.60	17.47	26.13	V

8DPSK Ch 39

Frequency(MHz)	Result(dBuV/m)	ARpl (dB)	PMea(dBuV/m)	Polarity
17499.00	43.80	17.74	26.06	H
17503.50	43.70	17.47	26.23	V
17513.25	43.70	17.47	26.23	H
17991.75	43.60	17.55	26.05	V
17514.75	43.60	17.47	26.13	H
17523.00	43.60	17.47	26.13	V

8DPSK Ch 78

Frequency(MHz)	Result(dBuV/m)	ARpl (dB)	PMea(dBuV/m)	Polarity
17514.75	43.70	17.47	26.23	V
17526.75	43.60	17.63	25.97	V
17513.25	43.60	17.47	26.13	H
17522.25	43.60	17.47	26.13	H
17503.50	43.60	17.47	26.13	V
17981.25	43.60	17.03	26.57	H

Conclusion: PASS

Test graphs as below:

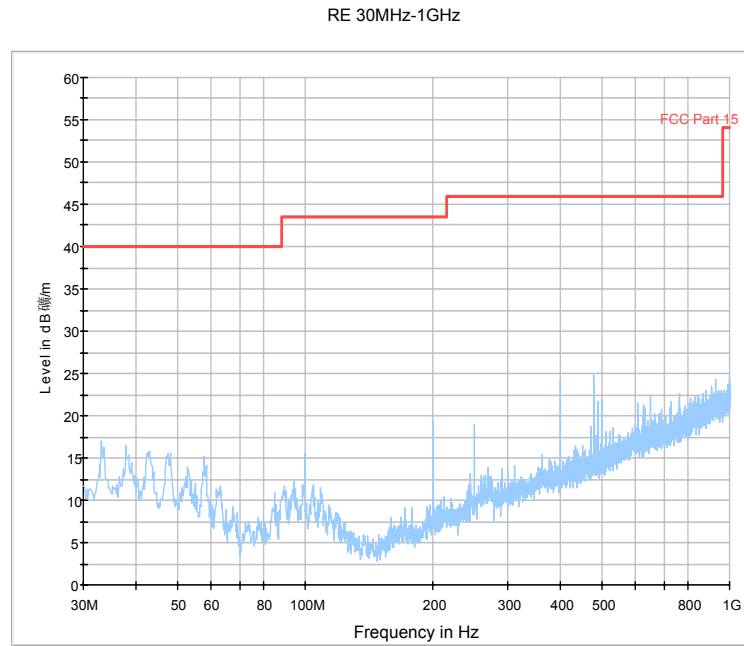


Fig.58. Radiated emission: GFSK, Channel 0, 30 MHz - 1 GHz

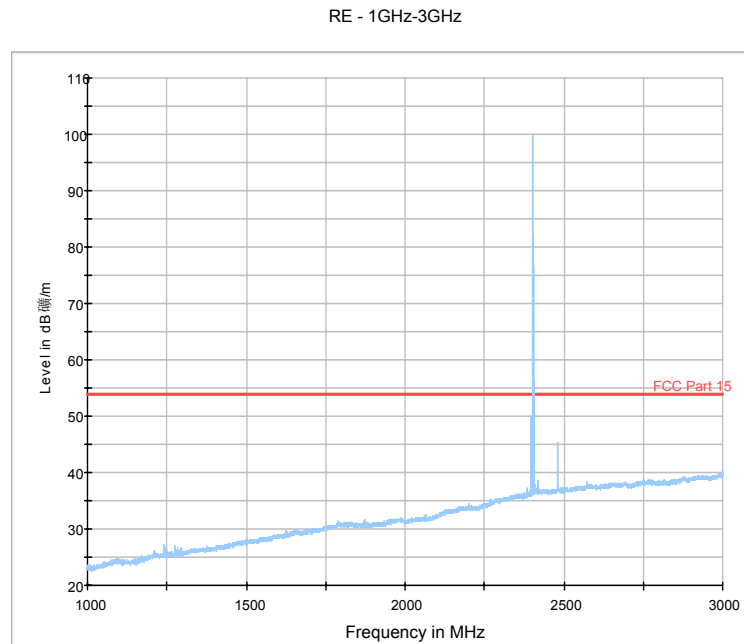


Fig.59. Radiated emission: GFSK, Channel 0, 1 GHz - 3 GHz

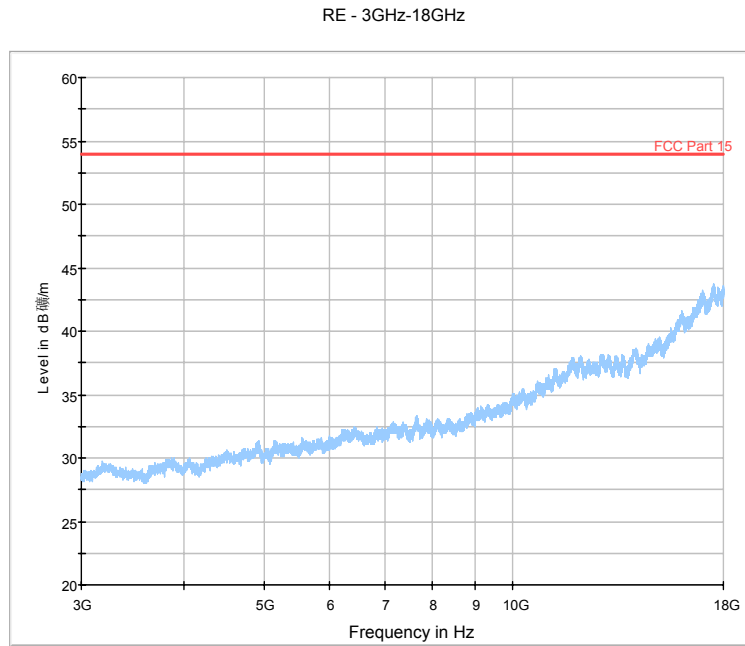


Fig.60. Radiated emission: GFSK, Channel 0, 3 GHz - 18 GHz

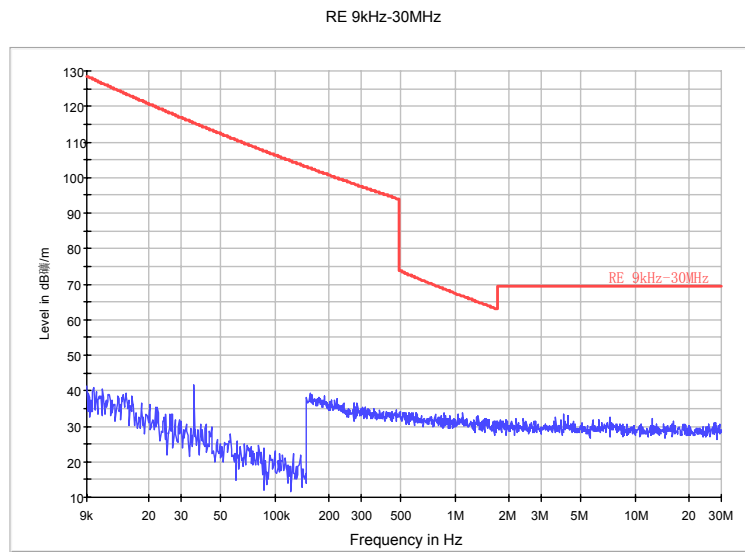


Fig.61. Radiated emission: GFSK, Channel 39, 9KHz – 30MHz

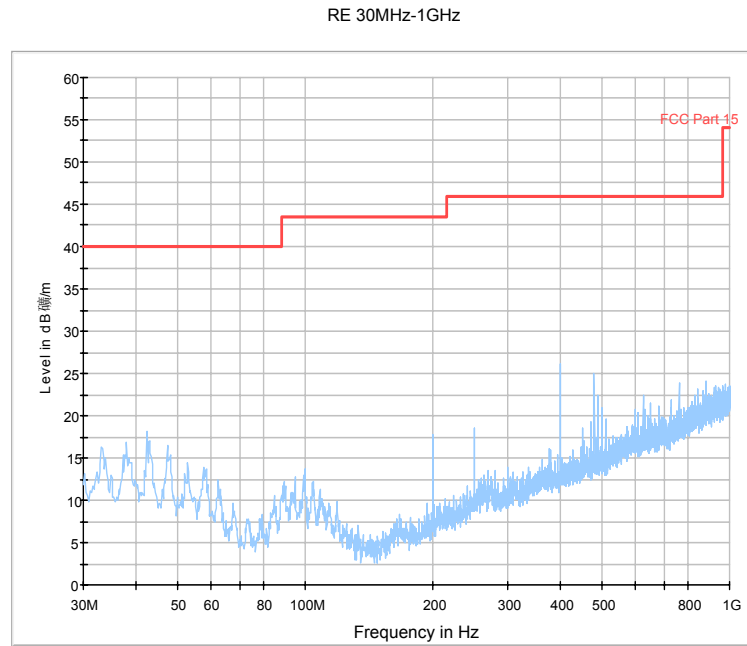


Fig.62. Radiated emission: GFSK, Channel 39, 30 MHz - 1 GHz

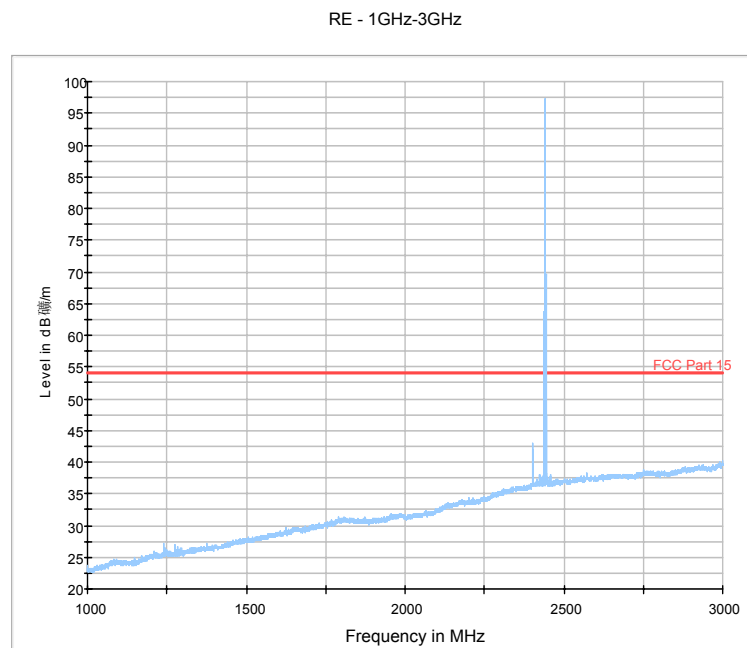


Fig.63. Radiated emission: GFSK, Channel 39, 1 GHz - 3 GHz

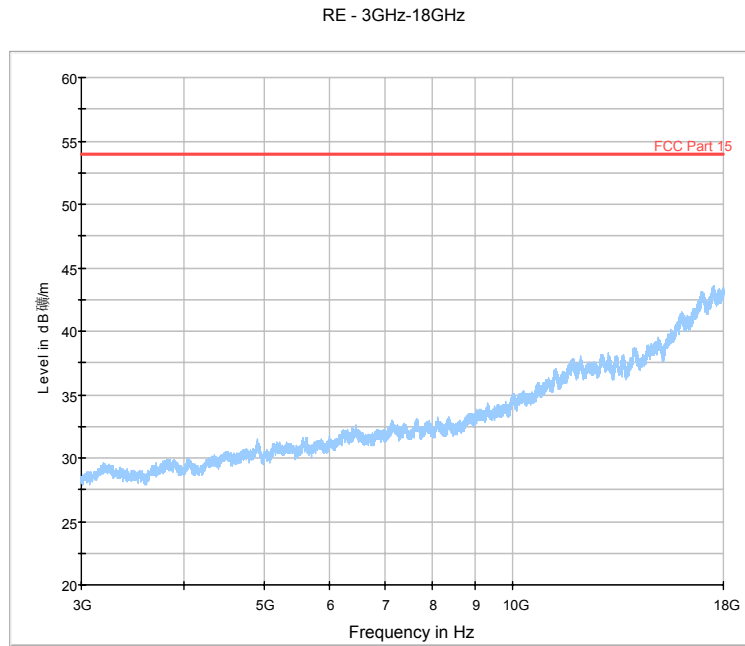


Fig.64. Radiated emission: GFSK, Channel 39, 3 GHz - 18 GHz

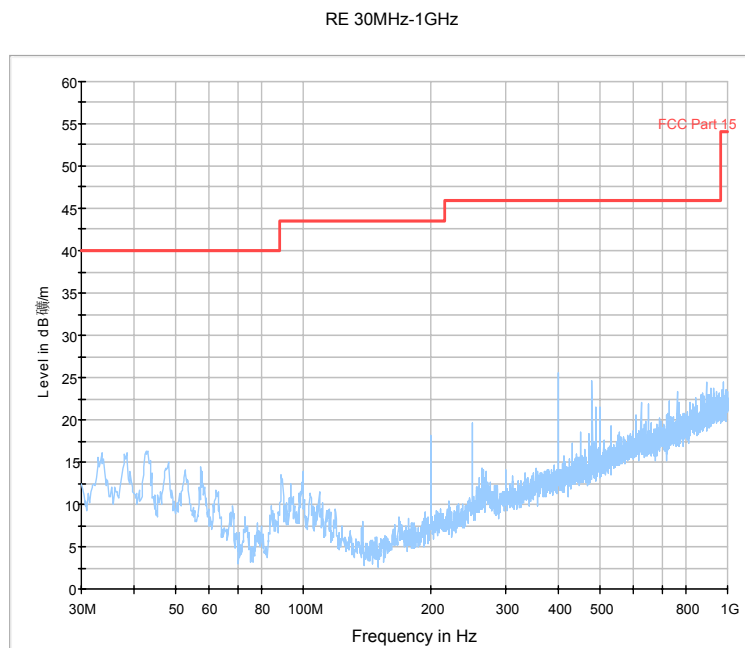


Fig.65. Radiated emission: GFSK, Channel 78, 30 MHz - 1 GHz

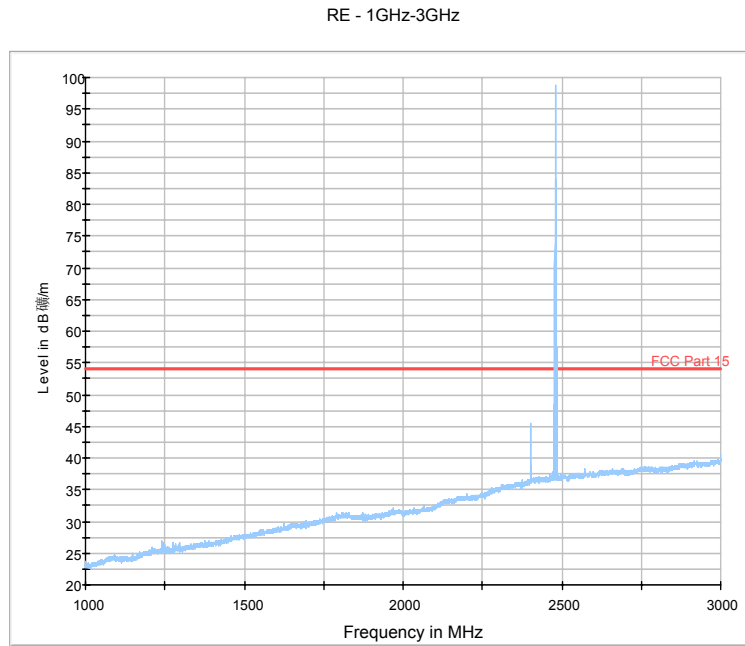


Fig.66. Fig.47 Radiated emission: GFSK, Channel 78, 1 GHz - 3 GHz

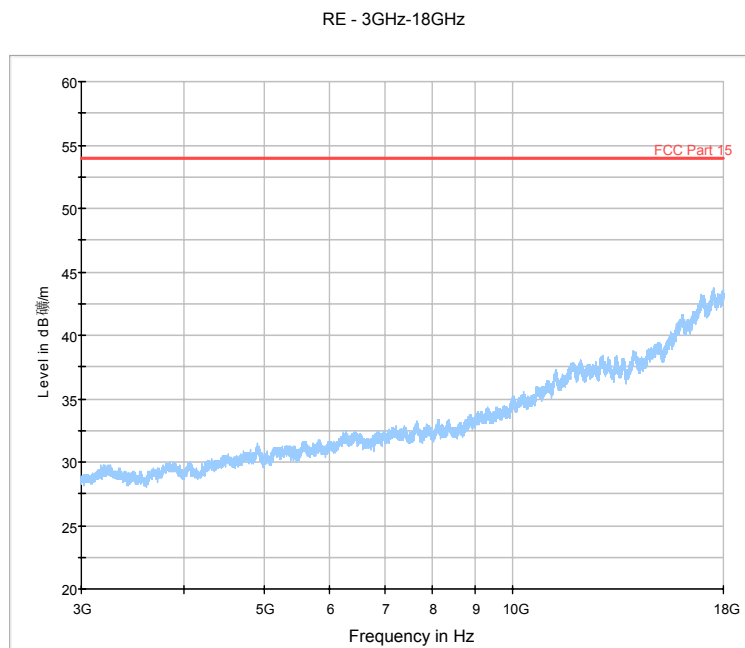


Fig.67. Radiated emission: GFSK, Channel 78, 3 GHz - 18 GHz

RE - Power-2.38GHz-2.45GHz

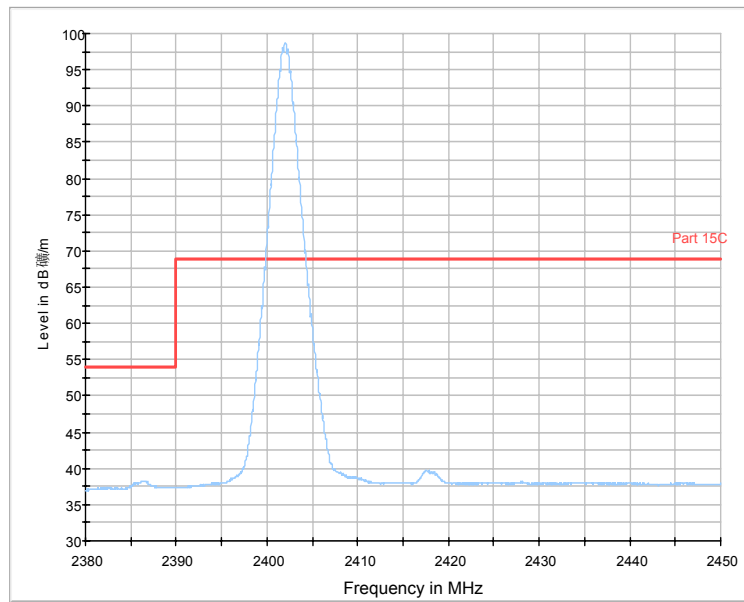


Fig.68. Radiated emission (Power): GFSK, low channel

RE - Power-2.45GHz-2.5GHz

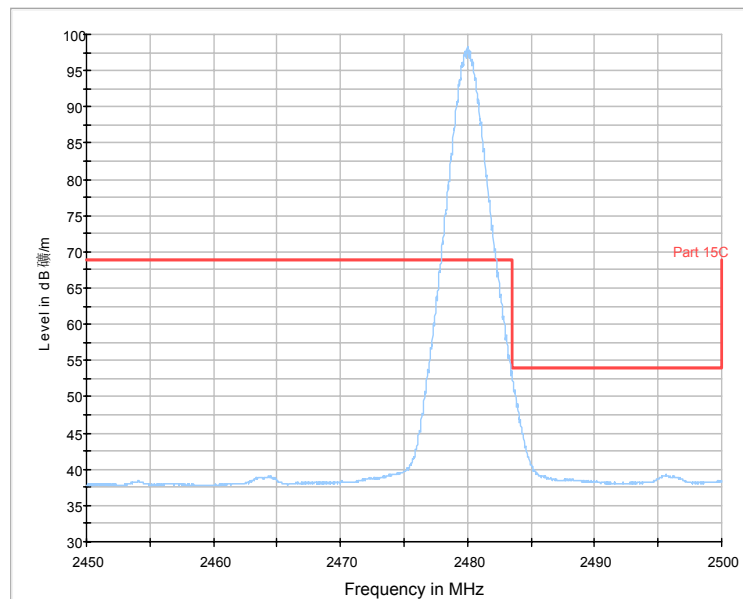


Fig.69. Radiated emission (Power) GFSK, high channel

EMI 18GHz-26.5GHz

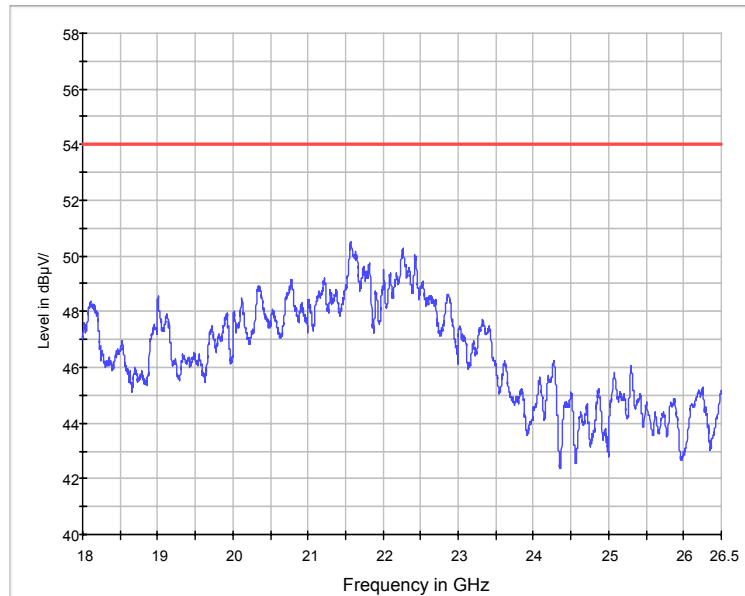


Fig.70. Radiated emission: GFSK, 18 GHz - 26 GHz

RE 30MHz-1GHz

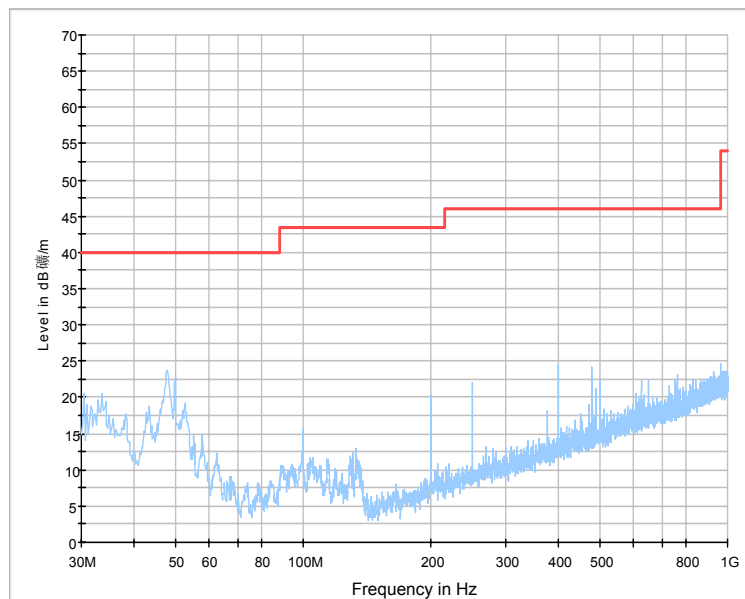


Fig.71. Radiated emission: $\pi/4$ DQPSK, Channel 0, 30 MHz - 1 GHz

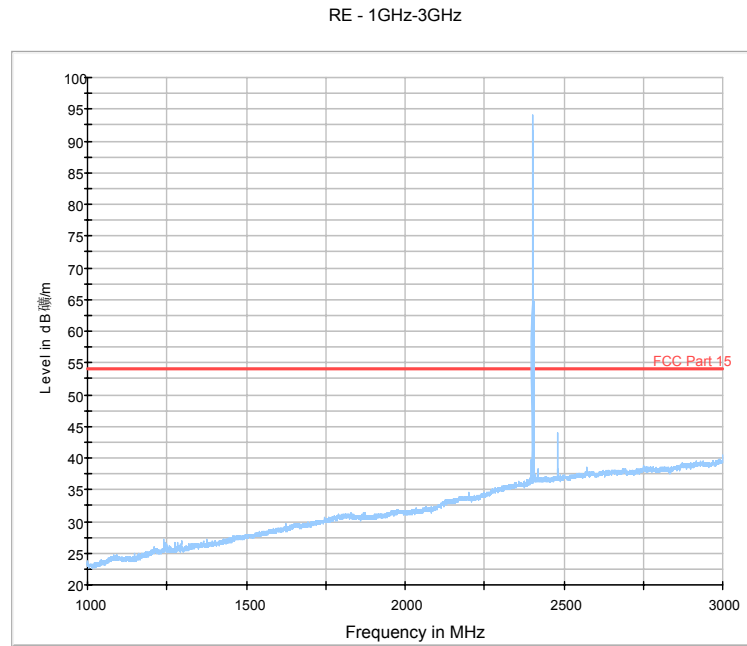


Fig.72. Radiated emission: $\pi/4$ DQPSK, Channel 0, 1 GHz - 3 GHz

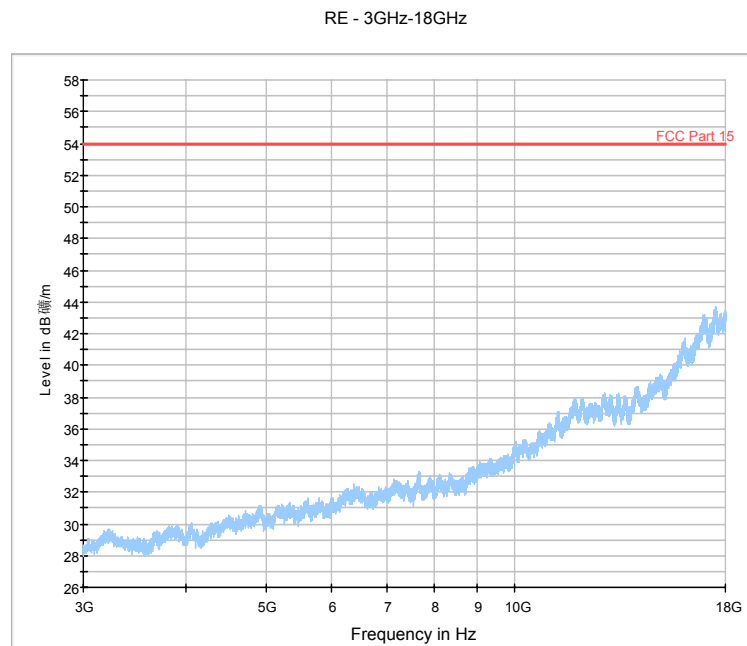


Fig.73. Radiated emission: $\pi/4$ DQPSK, Channel 0, 3 GHz - 18 GHz

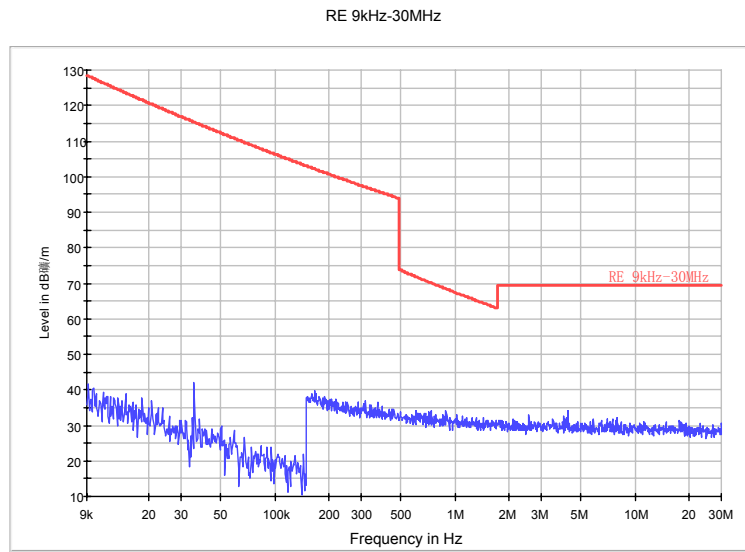


Fig.74. Radiated emission: $\pi/4$ DQPSK, Channel 39, 9KHz – 30MHz

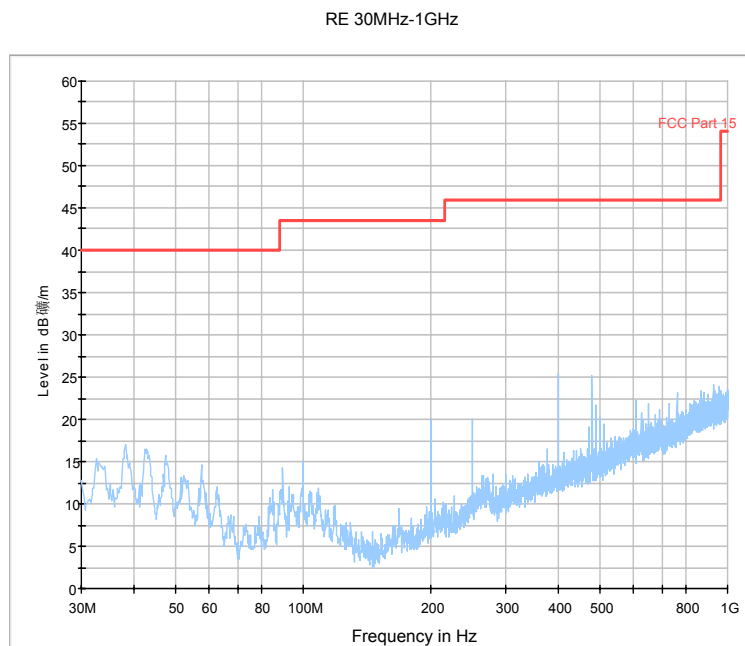


Fig.75. Radiated emission: $\pi/4$ DQPSK, Channel 39, 30 MHz - 1 GHz

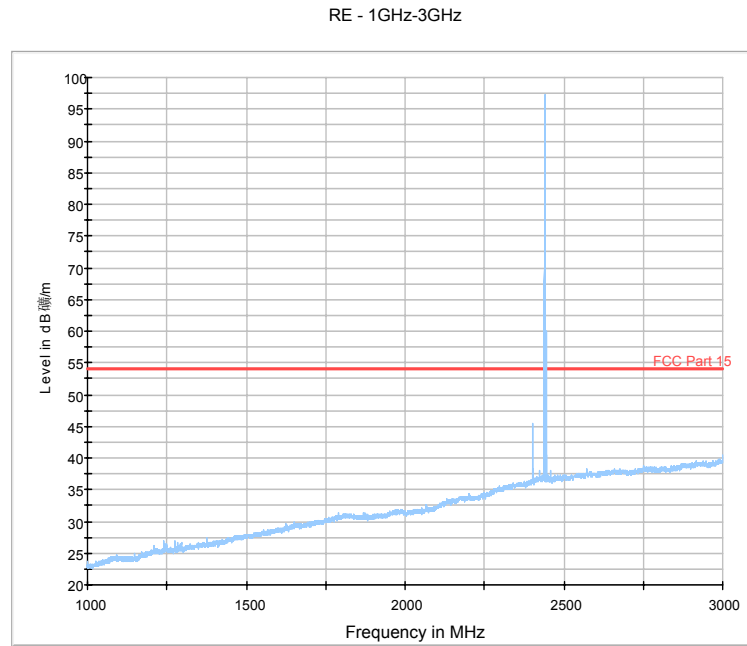


Fig.76. Radiated emission: $\pi/4$ DQPSK, Channel 39, 1 GHz - 3 GHz

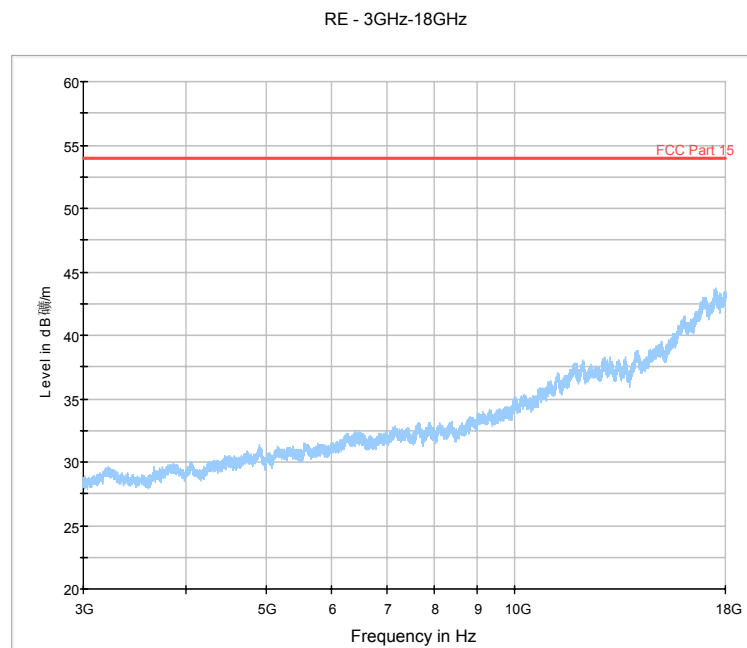


Fig.77. Radiated emission: $\pi/4$ DQPSK, Channel 39, 3 GHz - 18 GHz

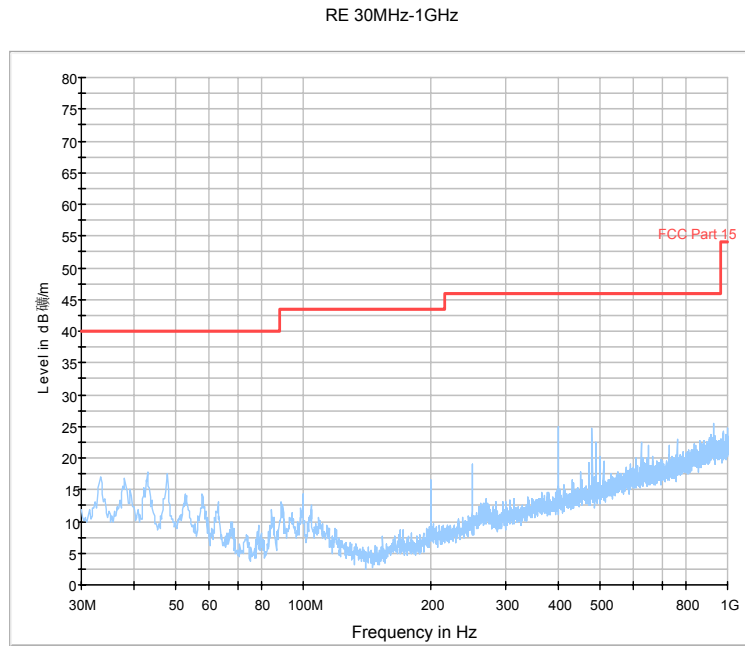


Fig.78. Radiated emission: $\pi/4$ DQPSK, Channel 78, 30 MHz - 1 GHz

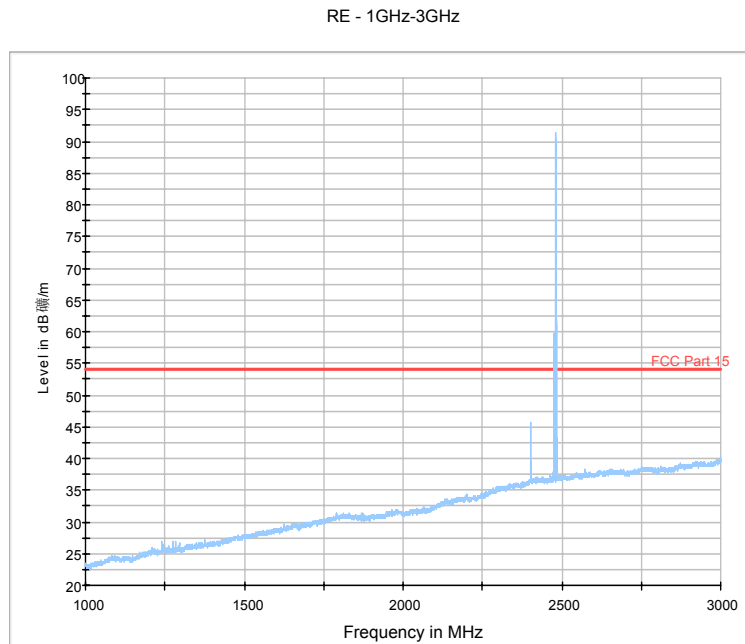


Fig.79. Radiated emission: $\pi/4$ DQPSK, Channel 78, 1 GHz - 3 GHz

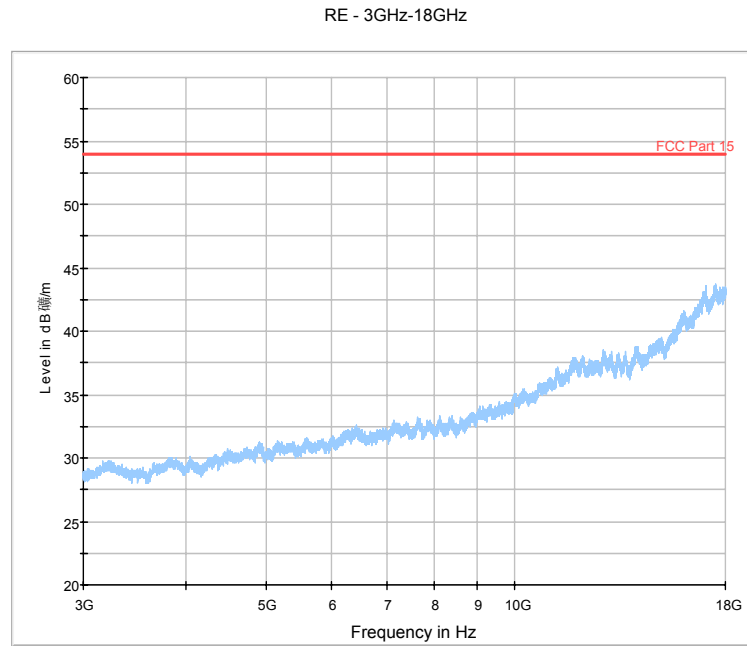


Fig.80. Radiated emission: $\pi/4$ DQPSK, Channel 78, 3 GHz - 18 GHz

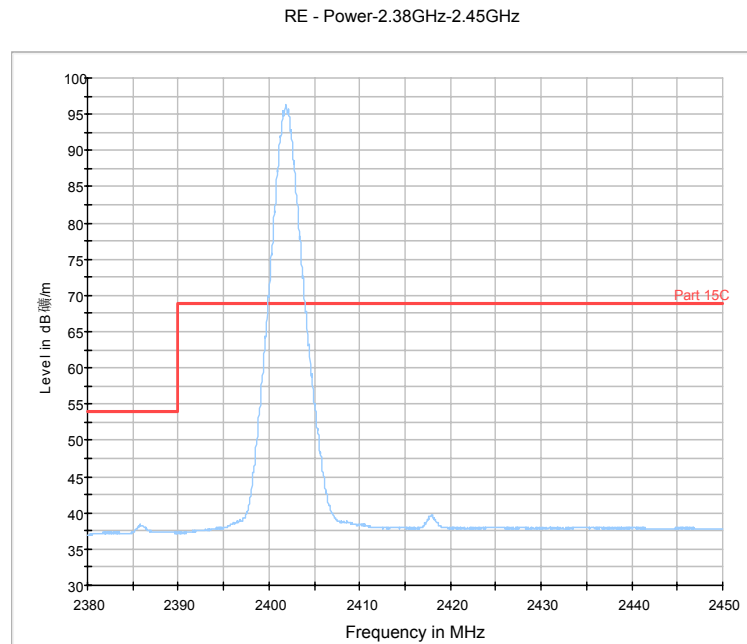


Fig.81. Radiated emission (Power): $\pi/4$ DQPSK, low channel

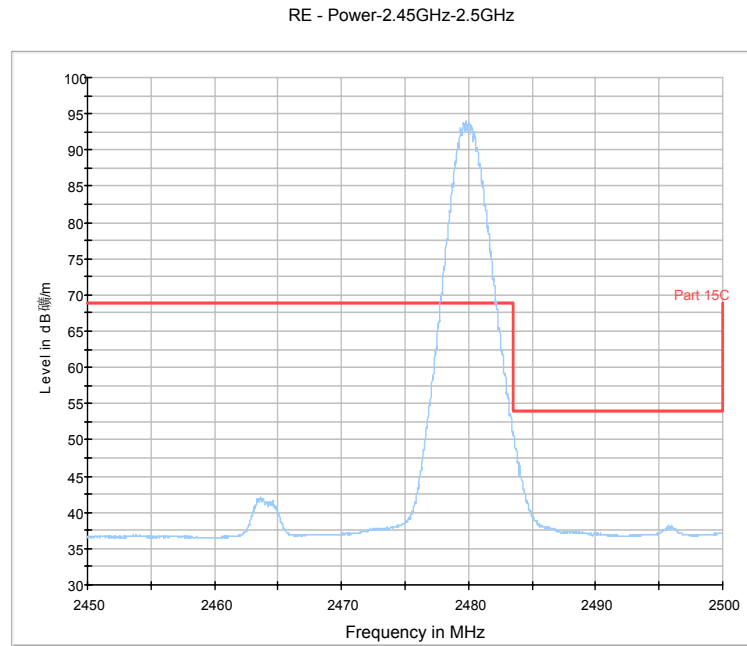


Fig.82. Radiated emission (Power): $\pi/4$ DQPSK, high channel

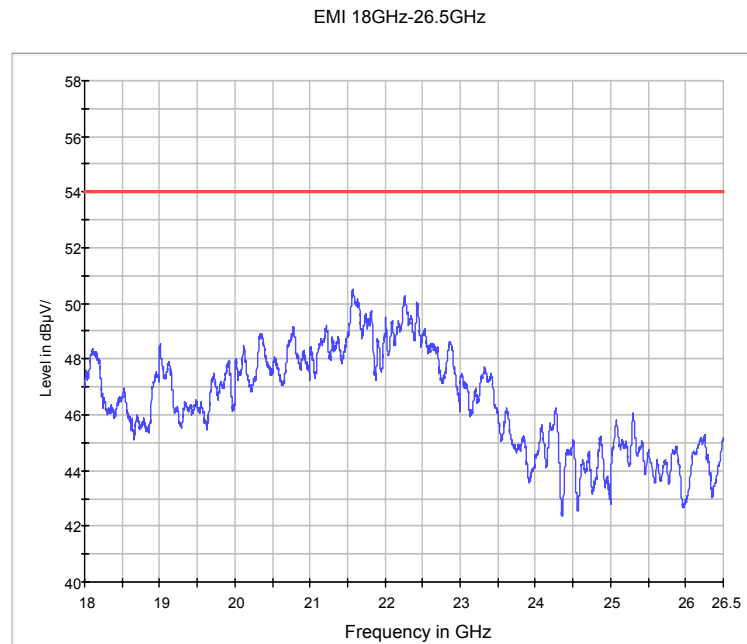


Fig.83. Radiated emission: $\pi/4$ DQPSK, 18 GHz - 26 GHz

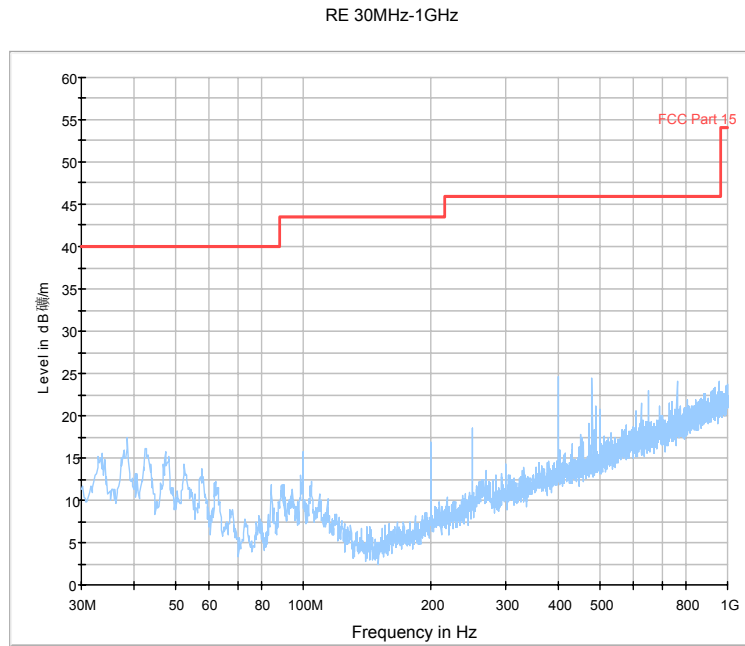


Fig.84. Radiated emission: 8DPSK, Channel 0, 30 MHz - 1 GHz

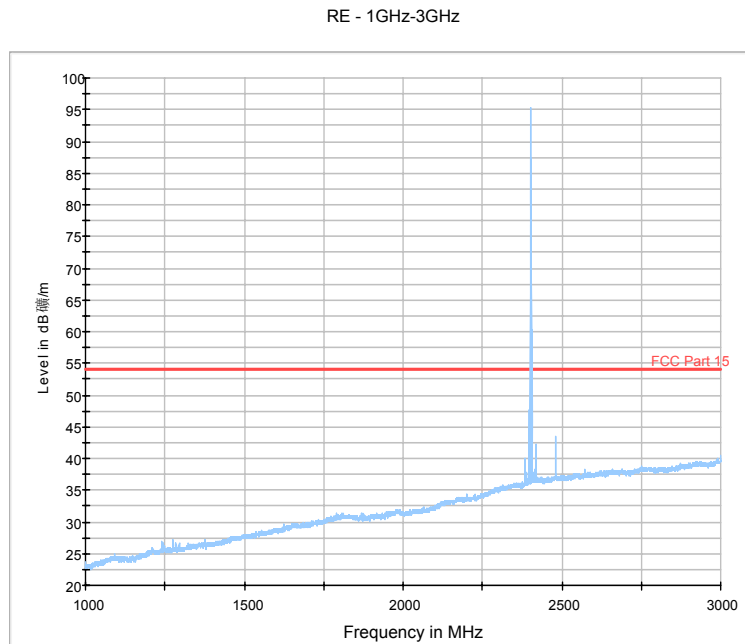


Fig.85. Radiated emission: 8DPSK, Channel 0, 1 GHz - 3 GHz

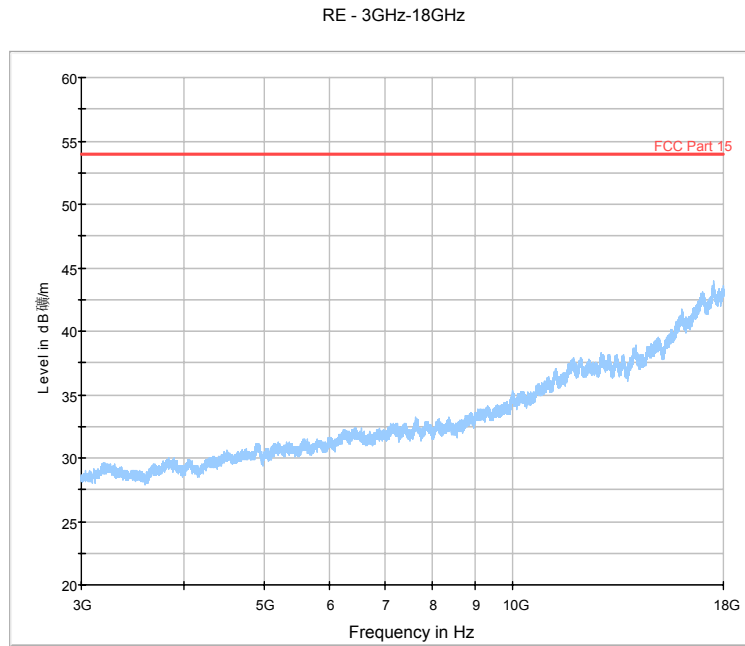


Fig.86. Radiated emission: 8DPSK, Channel 0, 3 GHz - 18 GHz

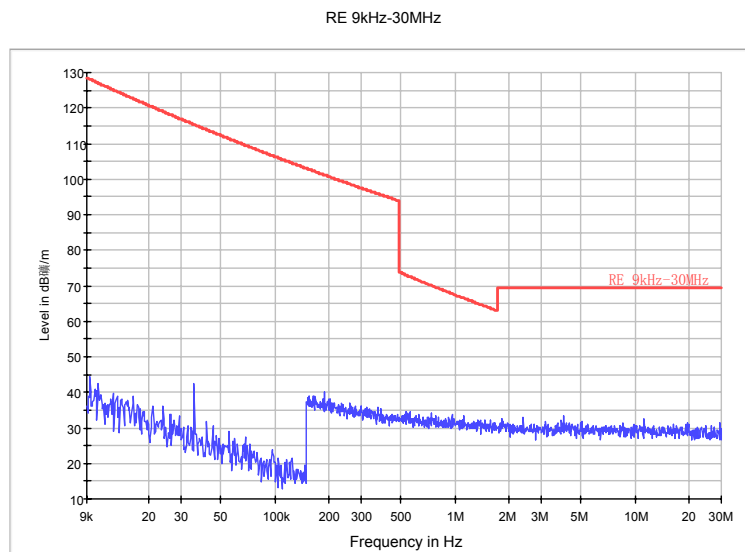


Fig.87. Radiated emission: 8DPSK, Channel 39, 9KHz – 30MHz

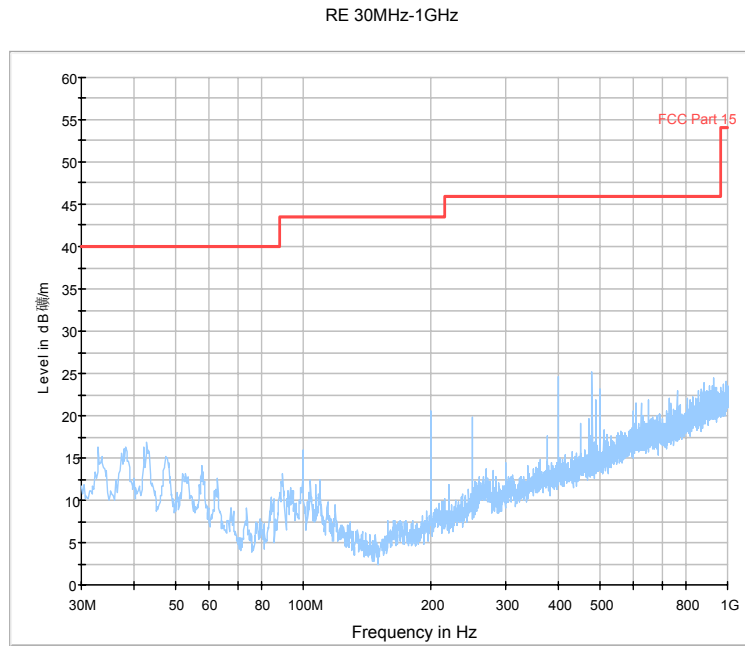


Fig.88. Radiated emission: 8DPSK, Channel 39, 30 MHz - 1 GHz

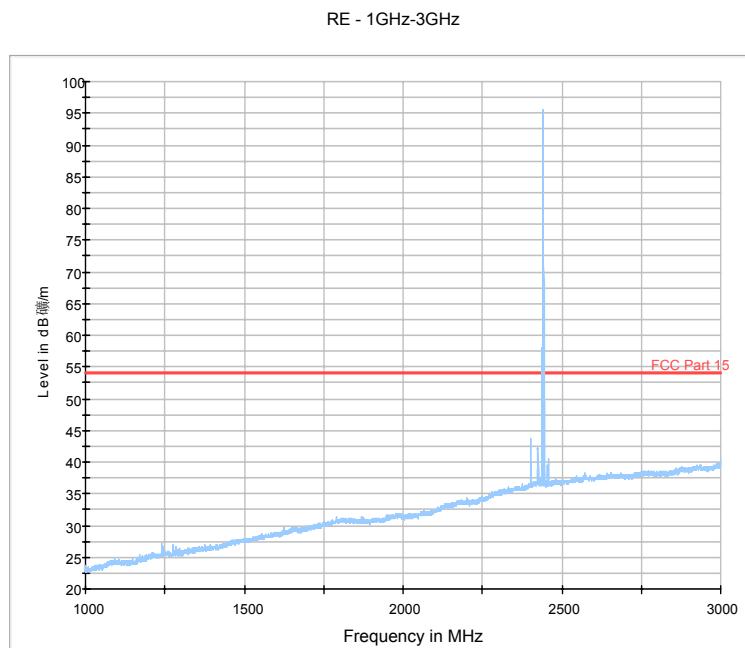


Fig.89. Radiated emission: 8DPSK, Channel 39, 1 GHz - 3 GHz

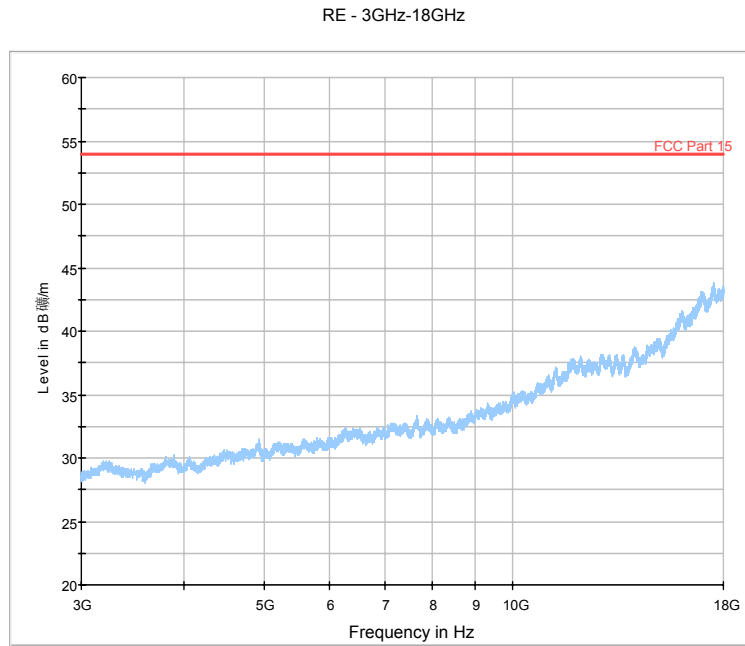


Fig.90. Radiated emission: 8DPSK, Channel 39, 3 GHz - 18 GHz

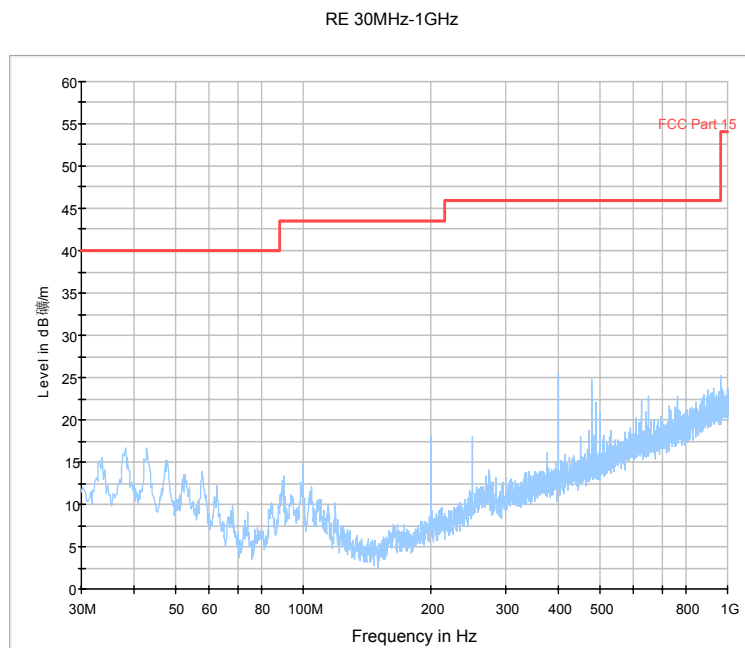


Fig.91. Radiated emission: 8DPSK, Channel 78, 30 MHz - 1 GHz

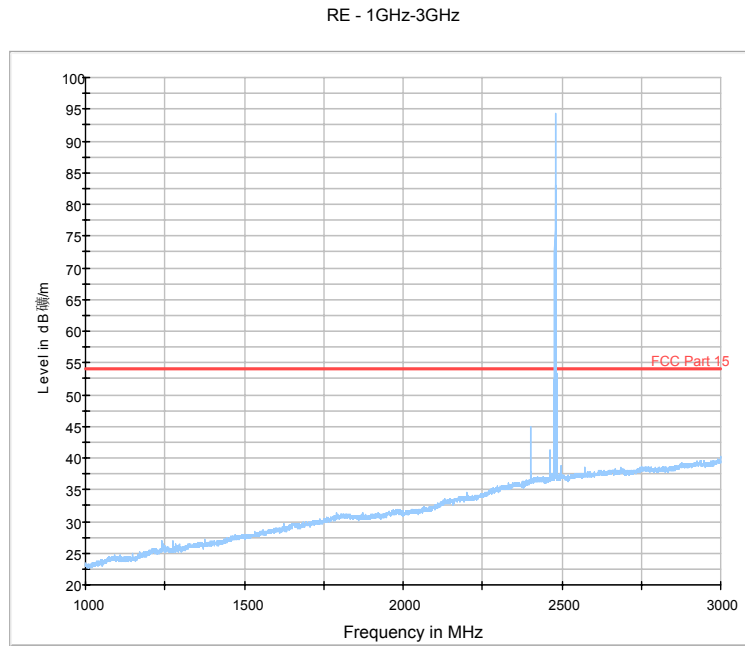


Fig.92. Radiated emission: 8DPSK, Channel 78, 1 GHz - 3 GHz

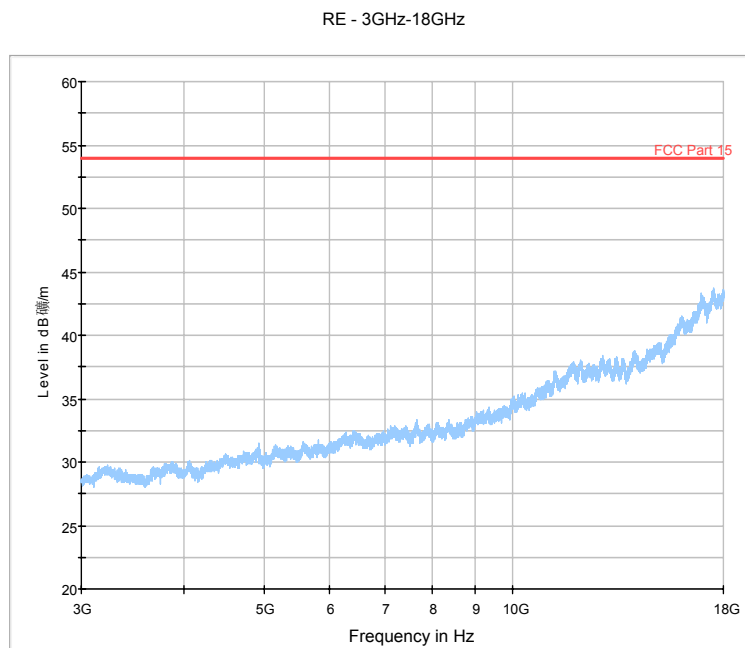


Fig.93. Radiated emission: 8DPSK, Channel 78, 3 GHz - 18 GHz

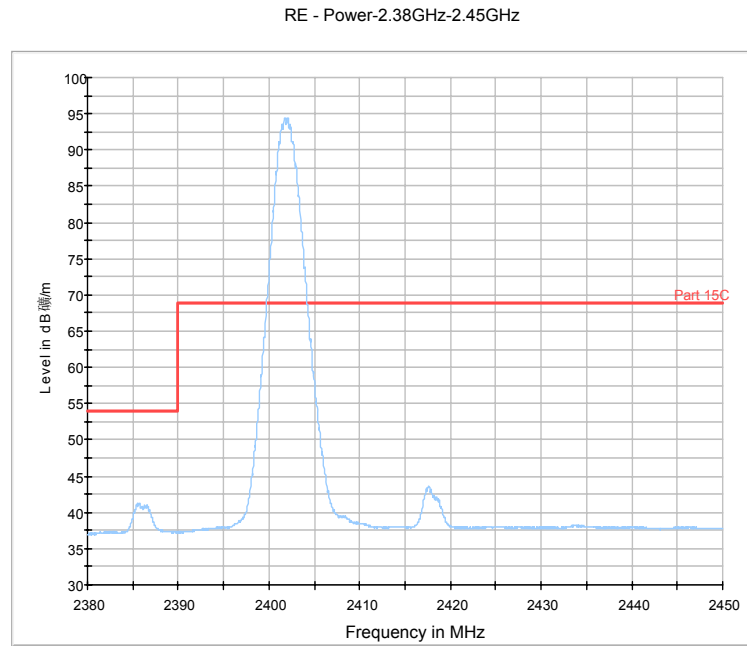


Fig.94. Radiated emission (Power): 8DPSK, low channel

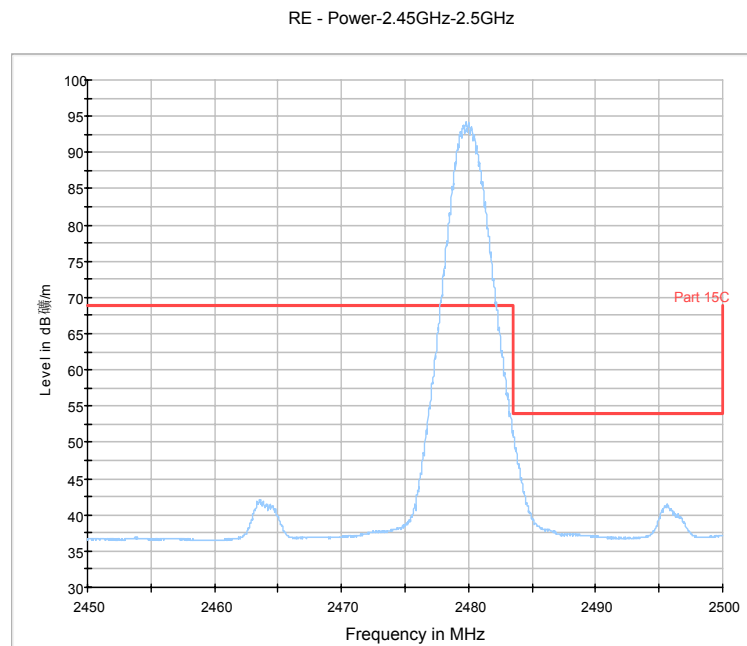


Fig.95. Radiated emission (Power): 8DPSK, high channel

EMI 18GHz-26.5GHz

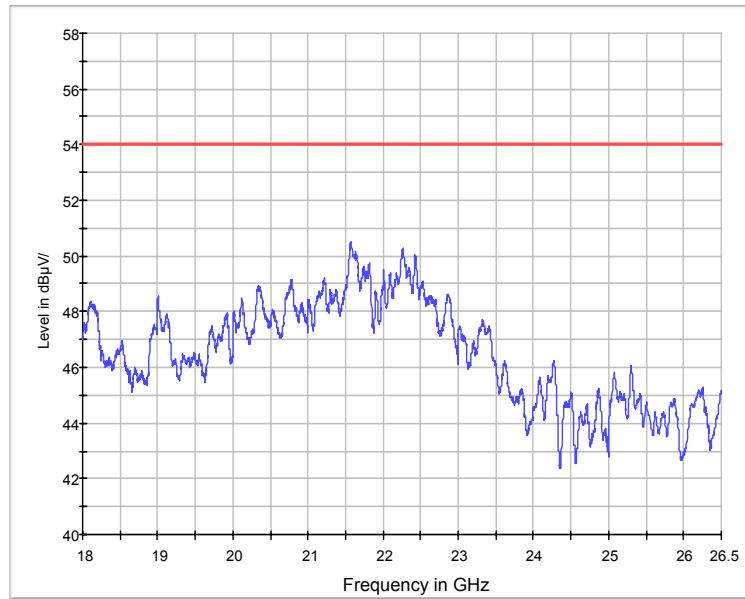


Fig.96. Radiated emission: 8DPSK, 18 GHz - 26 GHz

A.6. Time of Occupancy (Dwell Time)

Measurement Limit:

Standard	Limit (ms)
FCC 47 CFR Part 15.247(a) (1)(iii) RSS-210 A8.1 (4)	< 400

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

Measurement Result:

For GFSK

Channel	Packet	Dwell Time (ms)		Conclusion
39	DH1	Fig.97	109.66	P
		Fig.98		
	DH3	Fig.99	190.79	P
		Fig.100		
	DH5	Fig.101	203.24	P
		Fig.102		

For $\pi/4$ DQPSK

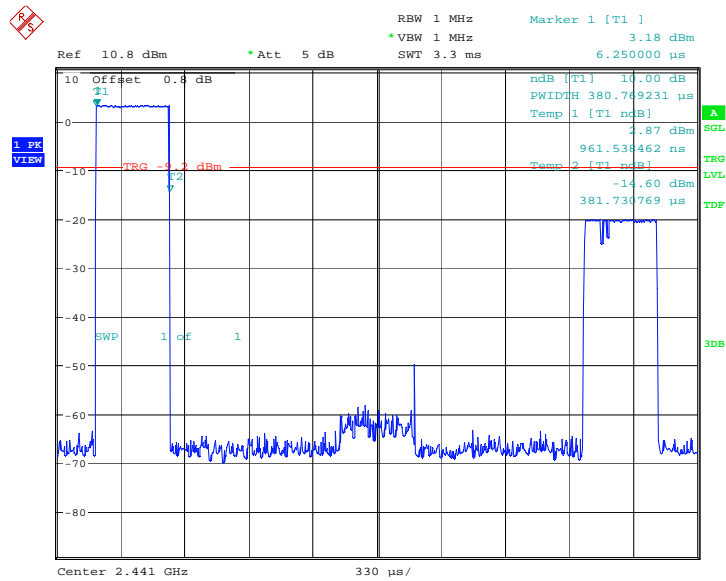
Channel	Packet	Dwell Time (ms)		Conclusion
39	DH1	Fig.103	110.41	P
		Fig.104		
	DH3	Fig.105	193.05	P
		Fig.106		
	DH5	Fig.107	209.42	P
		Fig.108		

For 8DPSK

Channel	Packet	Dwell Time (ms)		Conclusion
39	DH1	Fig.109	103.85	P
		Fig.110		
	DH3	Fig.111	166.12	P
		Fig.112		
	DH5	Fig.113	165.49	P
		Fig.114		

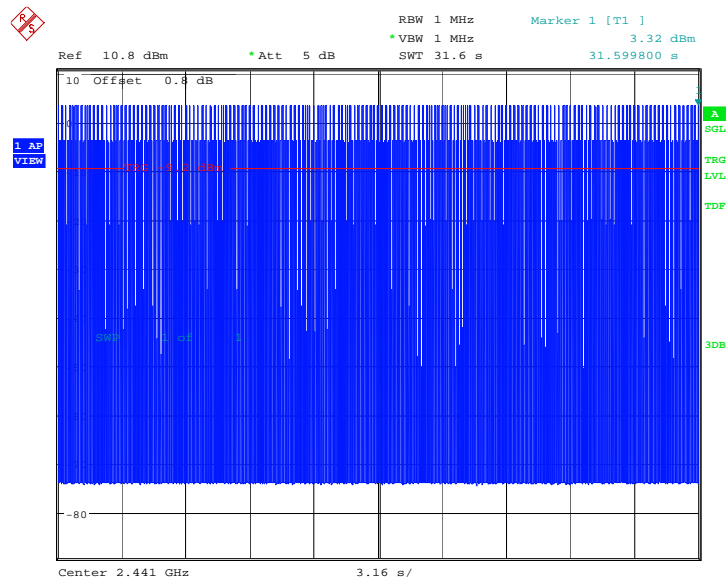
Conclusion: PASS

Test graphs as below:



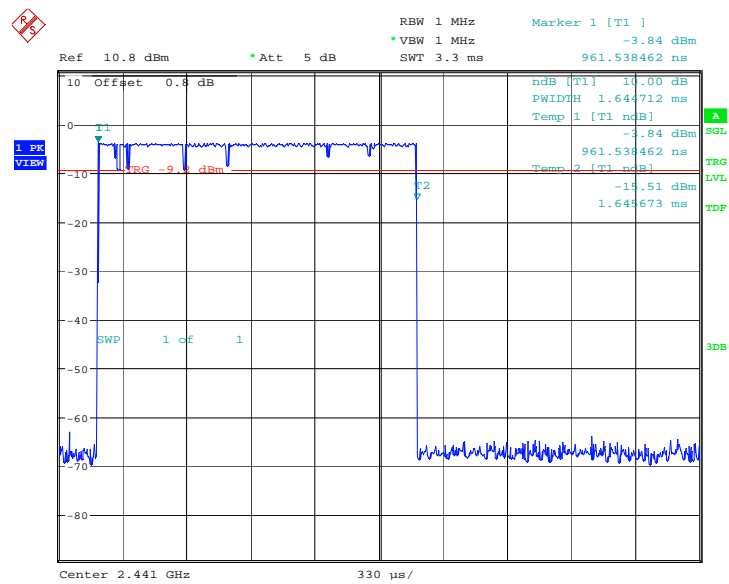
Date: 25.JAN.2013 04:37:08

Fig.97. Time of occupancy (Dwell Time): Channel 39, Packet DH1



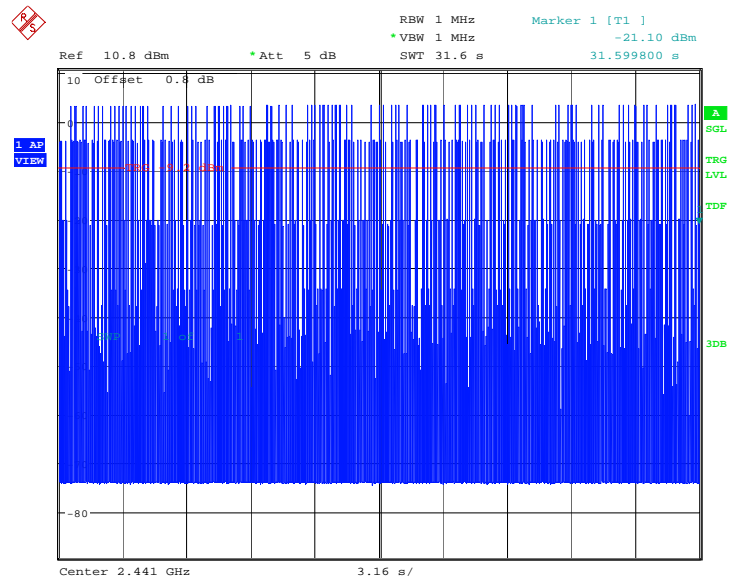
Date: 25.JAN.2013 04:36:57

Fig.98. Number of Transmissions Measurement: Channel 39, Packet DH1



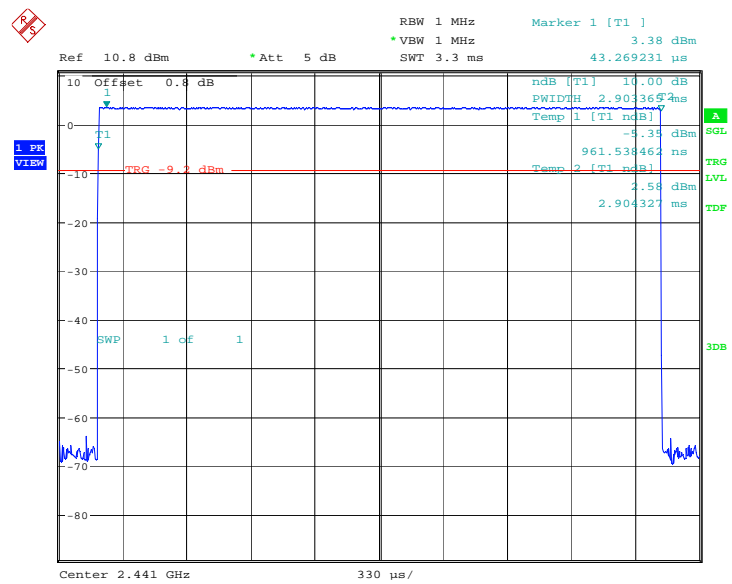
Date: 25.JAN.2013 04:38:26

Fig.99. Time of occupancy (Dwell Time): Channel 39, Packet DH3



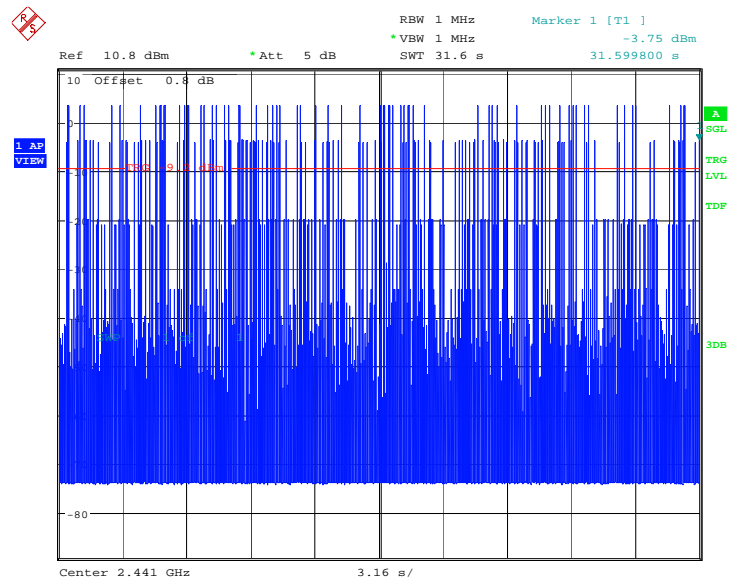
Date: 25.JAN.2013 04:38:14

Fig.100. Number of Transmissions Measurement: Channel 39, Packet DH3



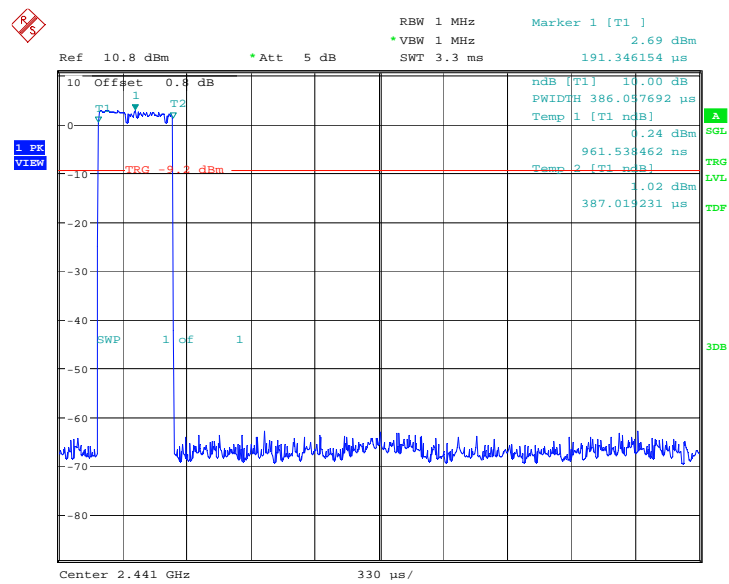
Date: 25.JAN.2013 04:39:45

Fig.101. Time of occupancy (Dwell Time): Channel 39, Packet DH5



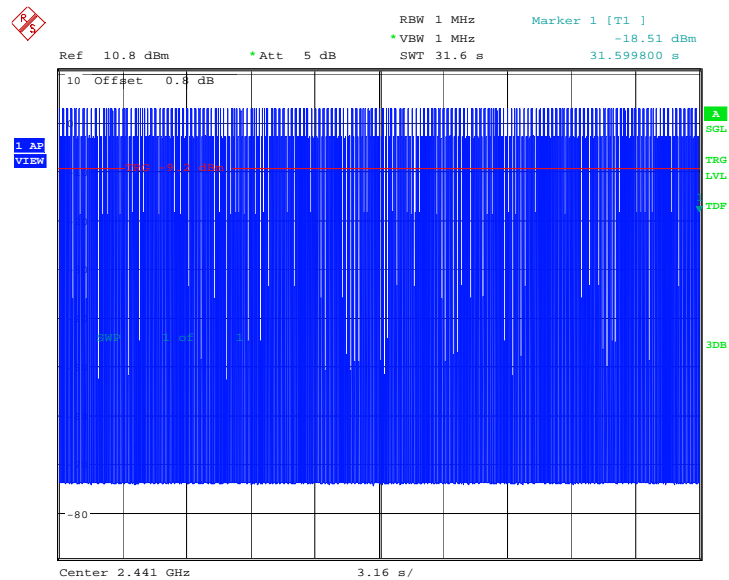
Date: 25.JAN.2013 04:39:33

Fig.102. Number of Transmissions Measurement:Channel 39,Packet DH5



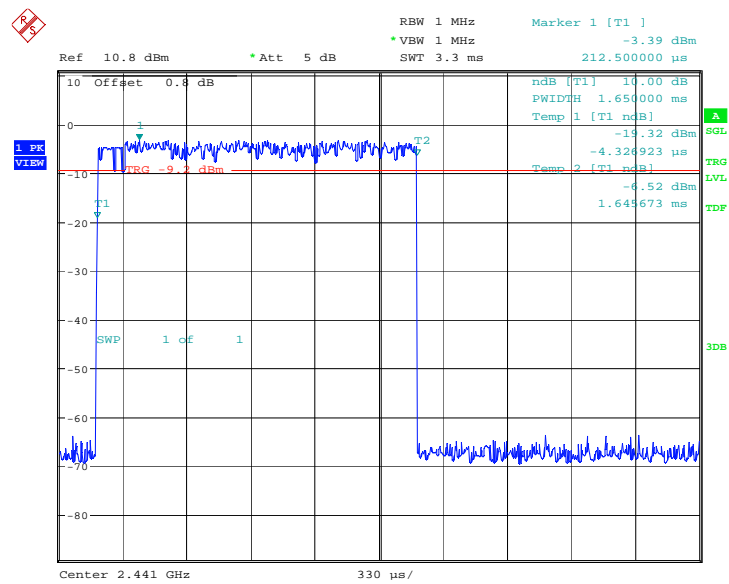
Date: 25.JAN.2013 04:58:37

Fig.103. Time of occupancy (Dwell Time): Channel 39, Packet 2-DH1



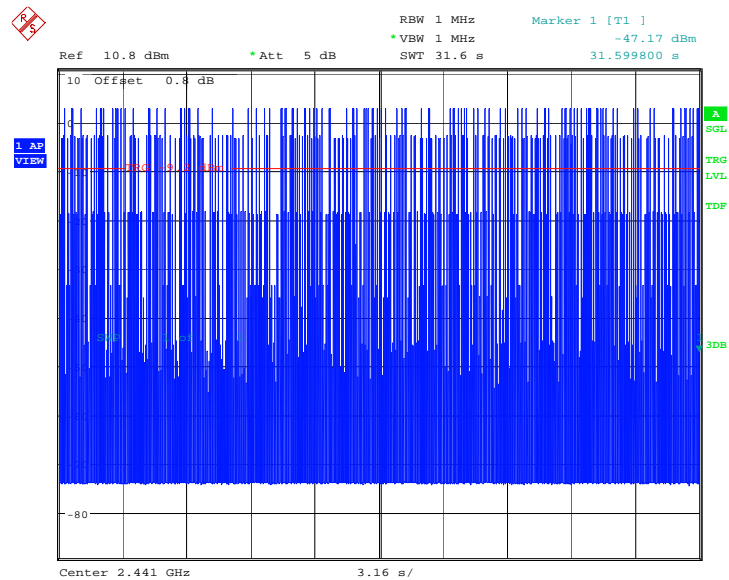
Date: 25.JAN.2013 04:58:25

Fig.104. Number of Transmissions Measurement:Channel 39,Packet 2-DH1



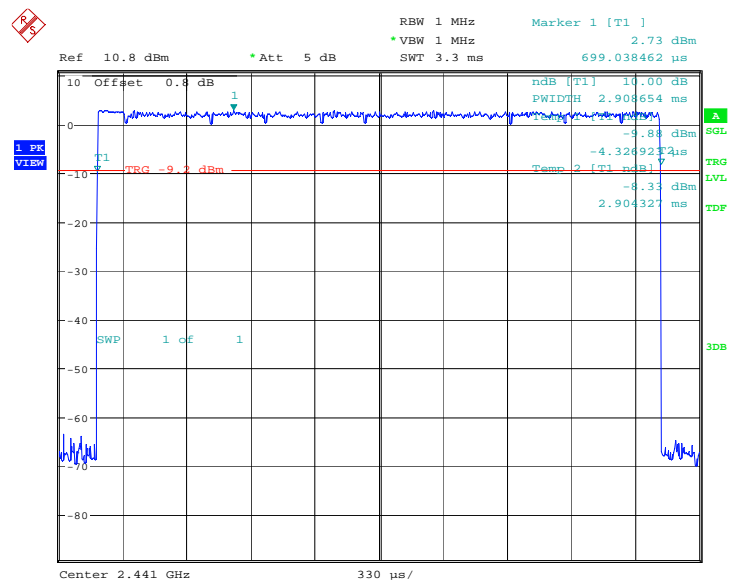
Date: 25.JAN.2013 04:59:54

Fig.105. Time of occupancy (Dwell Time): Channel 39, Packet 2-DH3



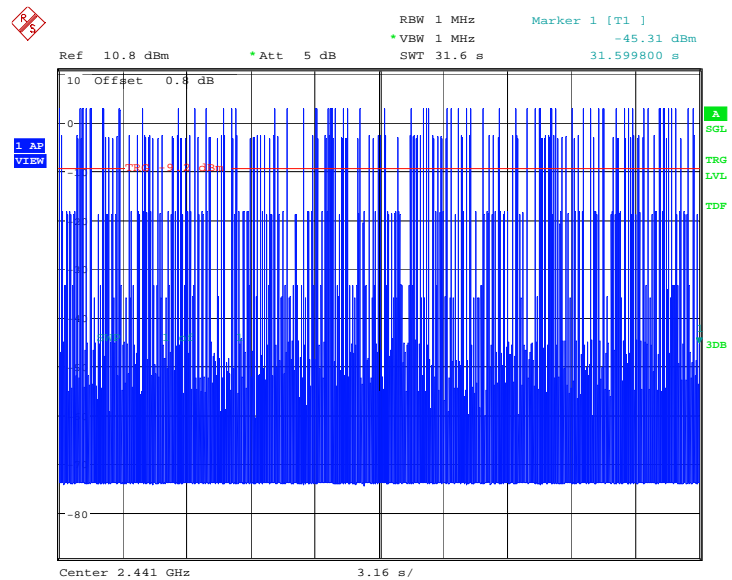
Date: 25.JAN.2013 04:59:43

Fig.106. Number of Transmissions Measurement:Channel 39,Packet 2-DH3



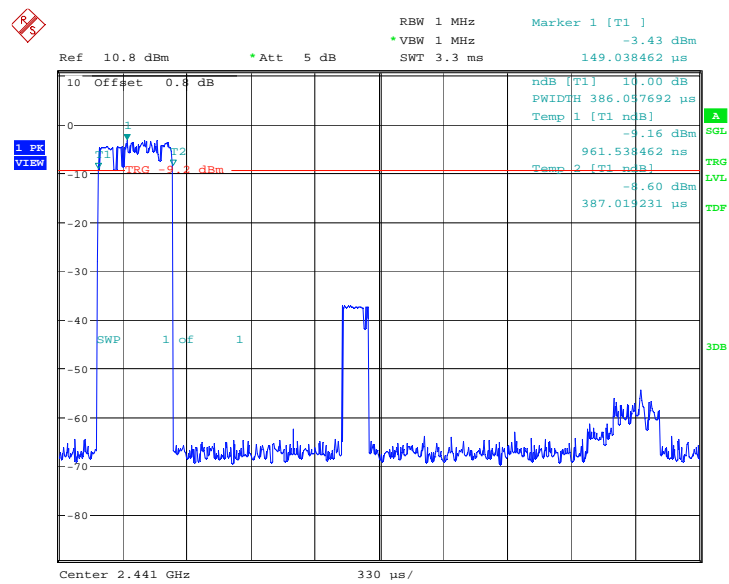
Date: 25.JAN.2013 05:01:12

Fig.107. Time of occupancy (Dwell Time): Channel 39, Packet 2-DH5



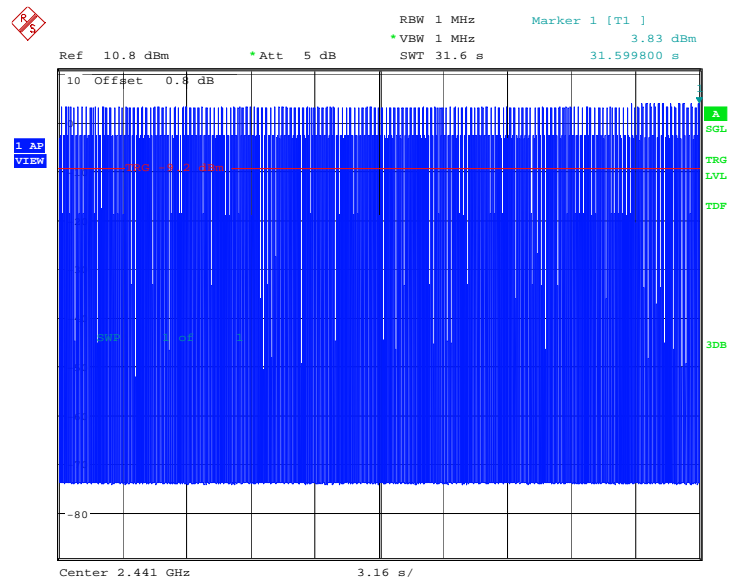
Date: 25.JAN.2013 05:01:01

Fig.108. Number of Transmissions Measurement: Channel 39, Packet 2-DH5



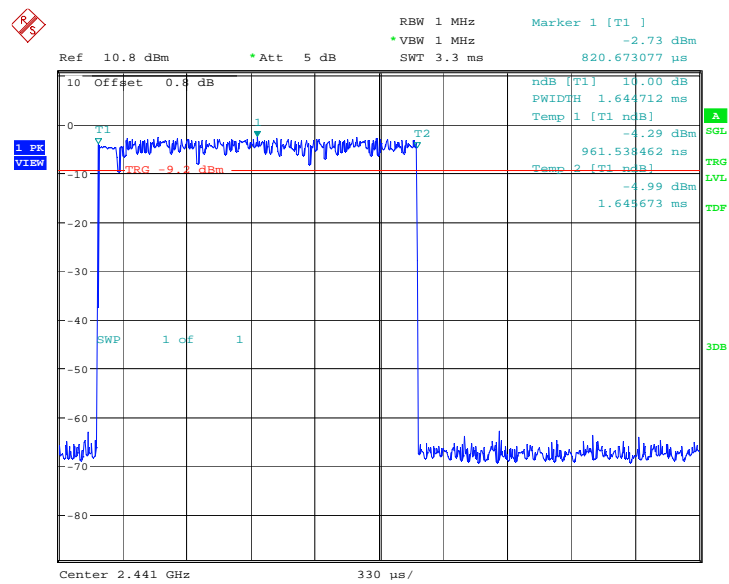
Date: 25.JAN.2013 05:20:06

Fig.109. Time of occupancy (Dwell Time): Channel 39, Packet 3-DH1



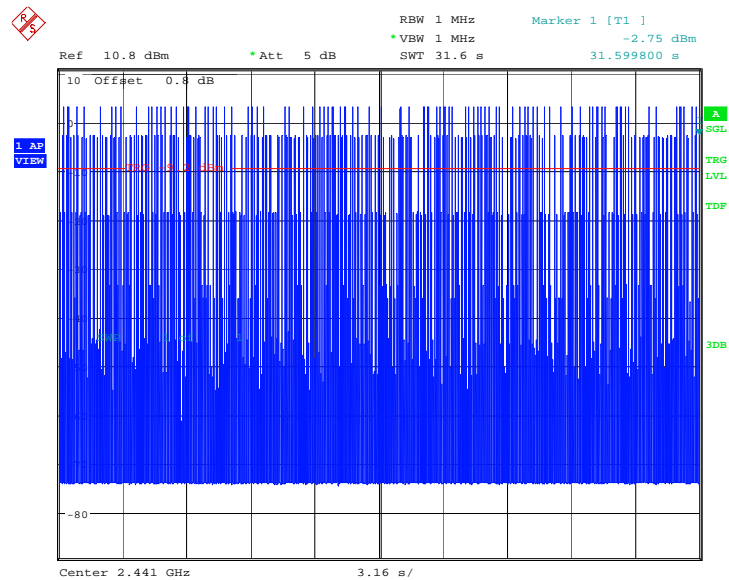
Date: 25.JAN.2013 05:19:54

Fig.110. Number of Transmissions Measurement:Channel 39,Packet 3-DH1



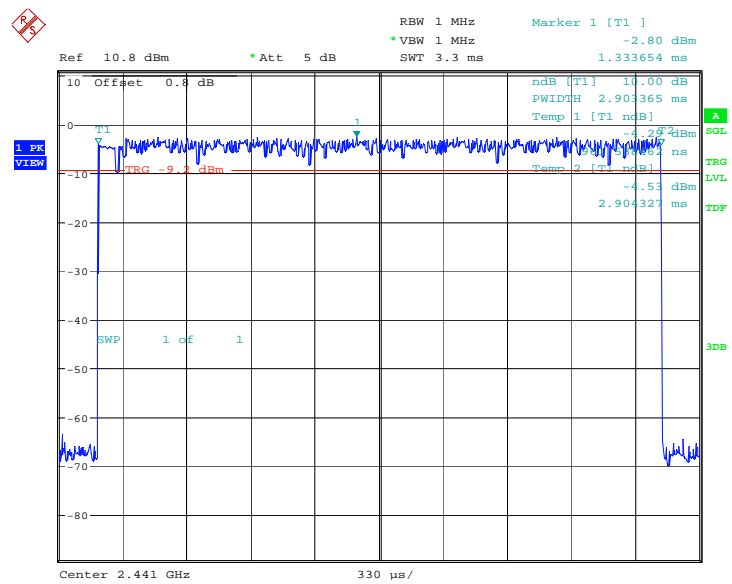
Date: 25.JAN.2013 05:21:26

Fig.111. Time of occupancy (Dwell Time): Channel 39, Packet 3-DH3



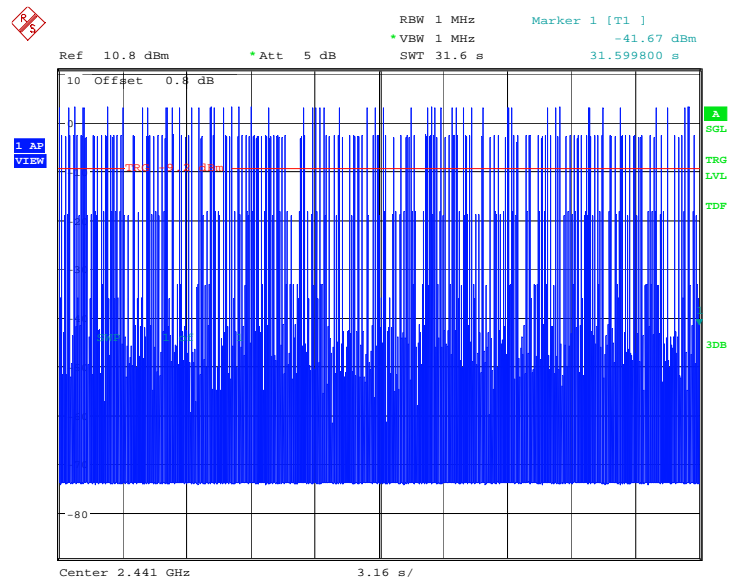
Date: 25.JAN.2013 05:21:14

Fig.112. Number of Transmissions Measurement:Channel 39,Packet 3-DH3



Date: 25.JAN.2013 05:22:44

Fig.113. Time of occupancy (Dwell Time): Channel 39, Packet 3-DH5



Date: 25.JAN.2013 05:22:33

Fig.114. 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) RSS-210 A8.1 (1)	NA *

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

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

Measurement Results:

For GFSK

Channel	20dB Bandwidth (kHz)		Conclusion
0	Fig.115	826.92	NA
39	Fig.116	865.38	NA
78	Fig.117	865.38	NA

For $\pi/4$ DQPSK

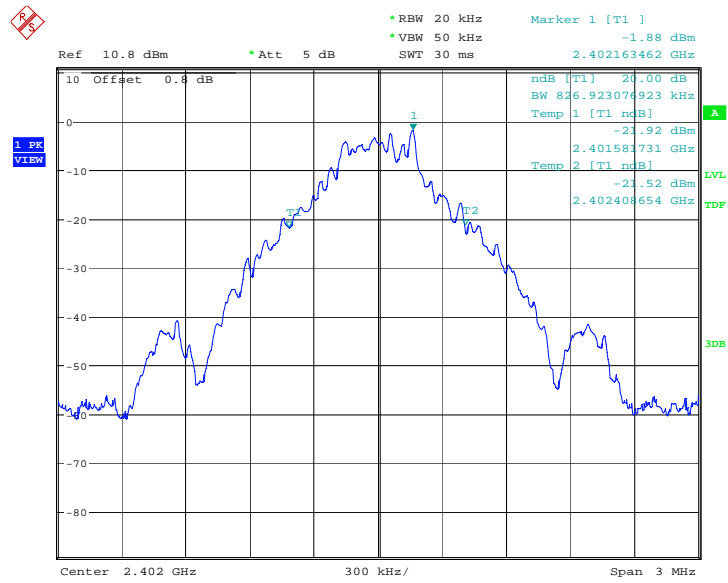
Channel	20dB Bandwidth (kHz)		Conclusion
0	Fig.118	1264.42	NA
39	Fig.119	1250.00	NA
78	Fig.120	1259.62	NA

For 8DPSK

Channel	20dB Bandwidth (kHz)		Conclusion
0	Fig.121	1216.35	NA
39	Fig.122	1264.42	NA
78	Fig.123	1211.54	NA

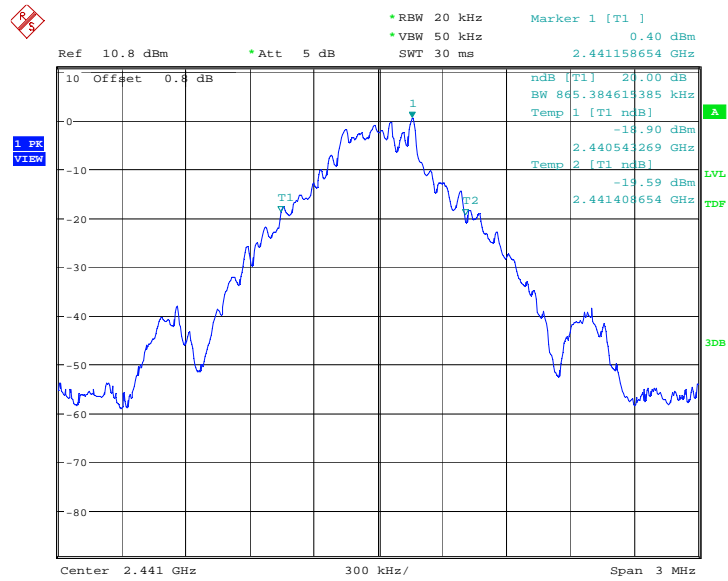
Conclusion: NA

Test graphs as below:



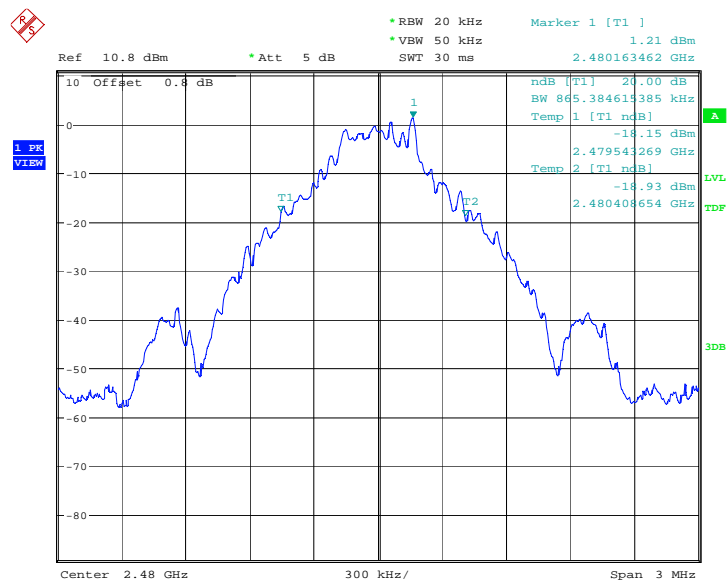
Date: 25.JAN.2013 04:40:18

Fig.115. 20dB Bandwidth: GFSK, Channel 0



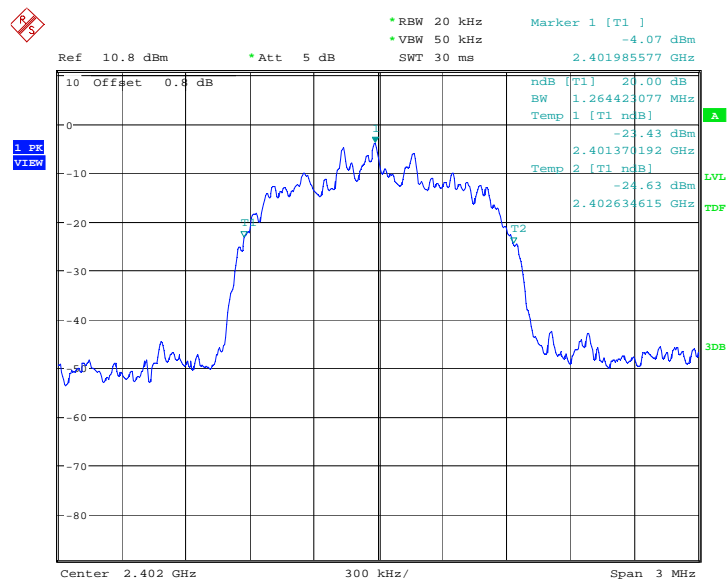
Date: 25.JAN.2013 04:40:50

Fig.116. 20dB Bandwidth: GFSK, Channel 39



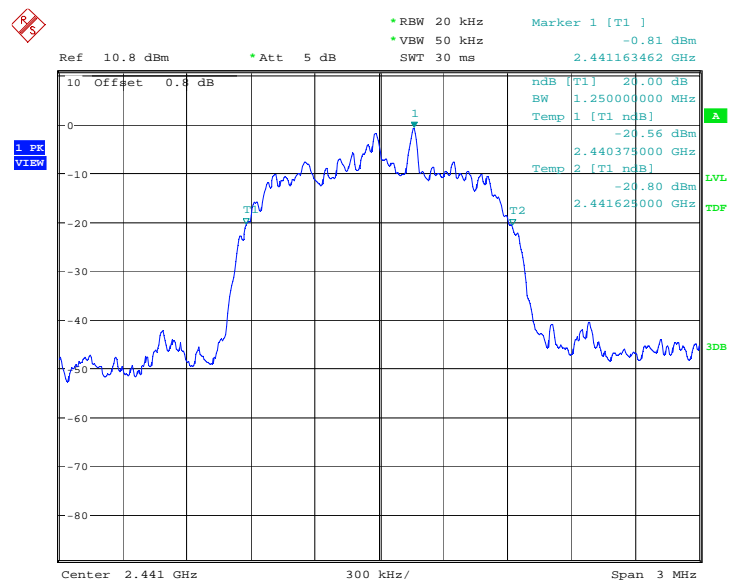
Date: 25.JAN.2013 04:41:22

Fig.117. 20dB Bandwidth: GFSK, Channel 78



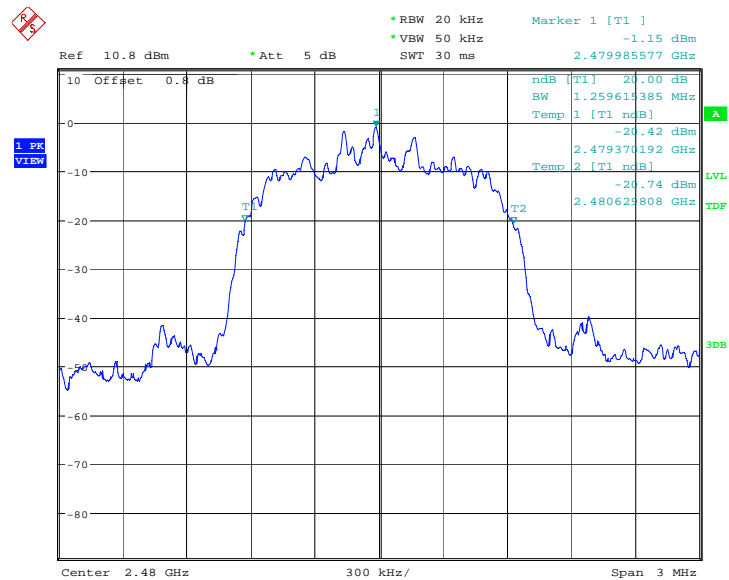
Date: 25.JAN.2013 05:01:46

Fig.118. 20dB Bandwidth: $\pi/4$ DQPSK, Channel 0



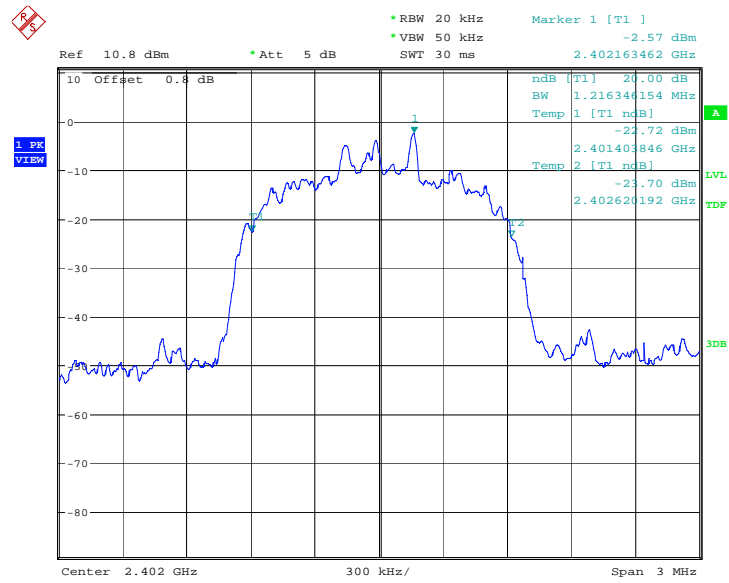
Date: 25.JAN.2013 05:02:18

Fig.119. 20dB Bandwidth: $\pi/4$ DQPSK, Channel 39



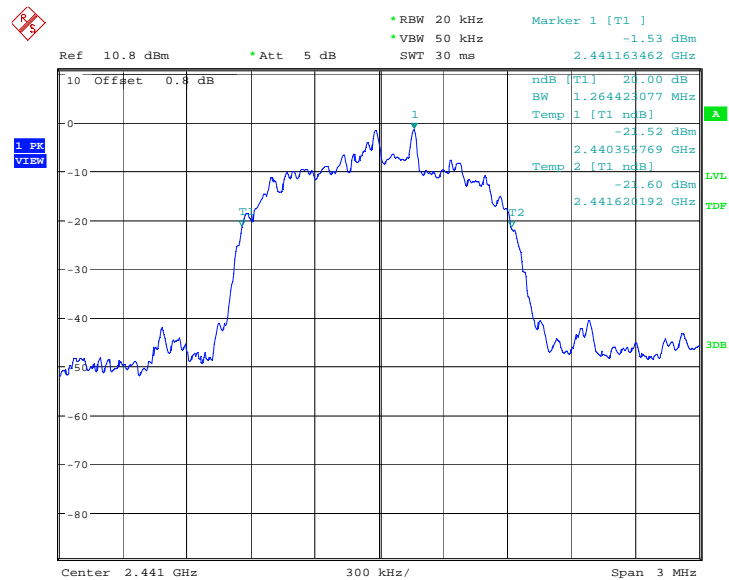
Date: 25.JAN.2013 05:02:50

Fig.120. 20dB Bandwidth: $\pi/4$ DQPSK, Channel 78



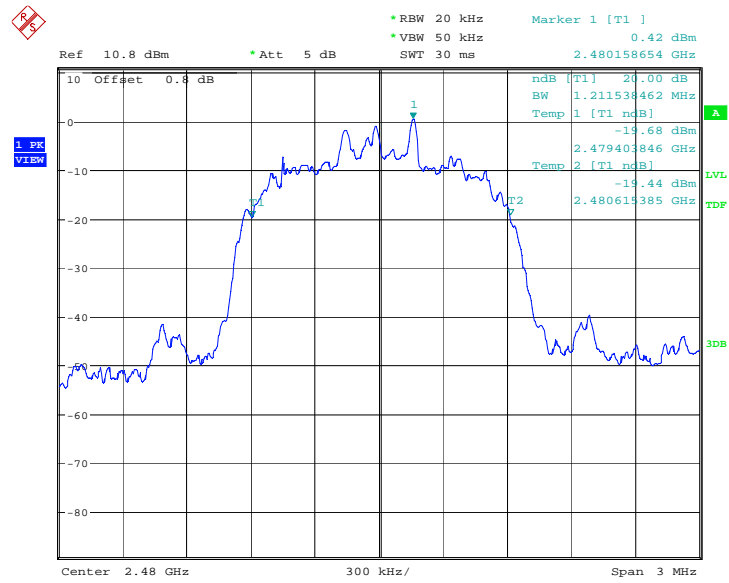
Date: 25.JAN.2013 05:23:18

Fig.121. 20dB Bandwidth: 8DPSK, Channel 0



Date: 25.JAN.2013 05:23:50

Fig.122. 20dB Bandwidth: 8DPSK, Channel 39



Date: 25.JAN.2013 05:24:22

Fig.123. 20dB Bandwidth: 8DPSK, Channel 78

A.8. Carrier Frequency Separation

Measurement Limit:

Standard	Limit(kHz)
FCC 47 CFR Part 15.247(a)(1) RSS-210 A8.1 (1)	over 25 kHz or $(2/3) * 20\text{dB bandwidth}$

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

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

Measurement Result:

For GFSK

Channel	Carrier frequency separation (kHz)	Conclusion
39	Fig.124	P

For $\pi/4$ DQPSK

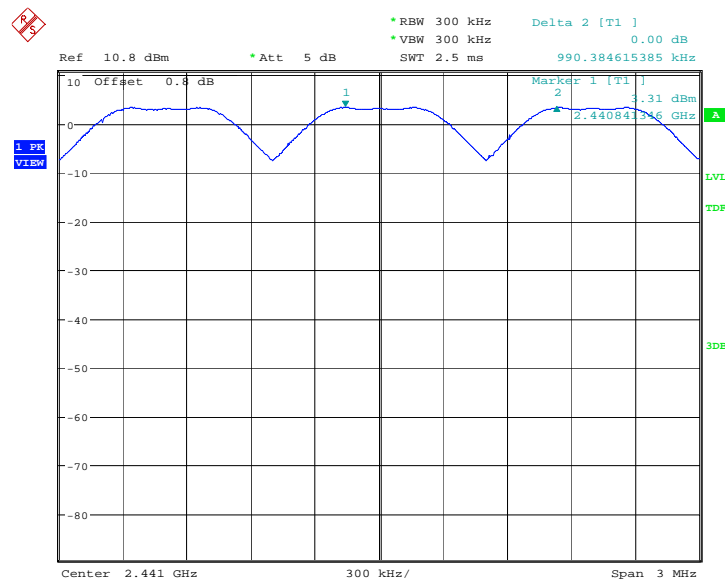
Channel	Carrier frequency separation (kHz)	Conclusion
39	Fig.125	P

For 8DPSK

Channel	Carrier frequency separation (kHz)	Conclusion
39	Fig.126	P

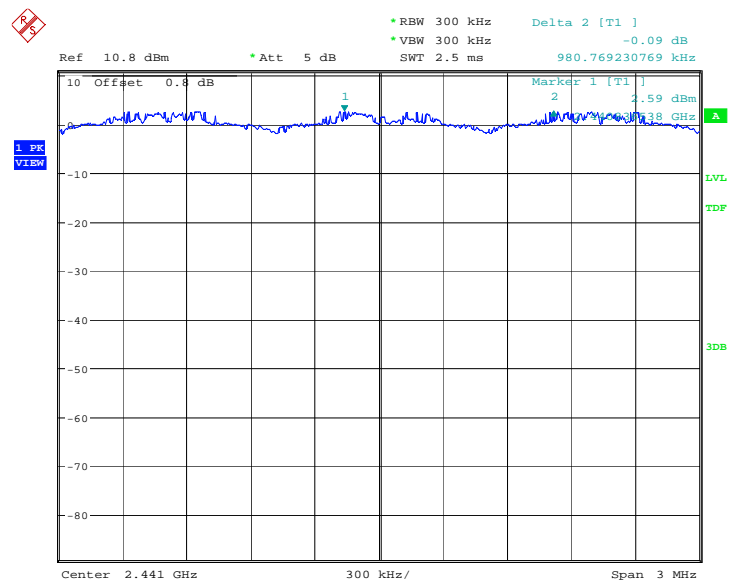
Conclusion: PASS

Test graphs as below:



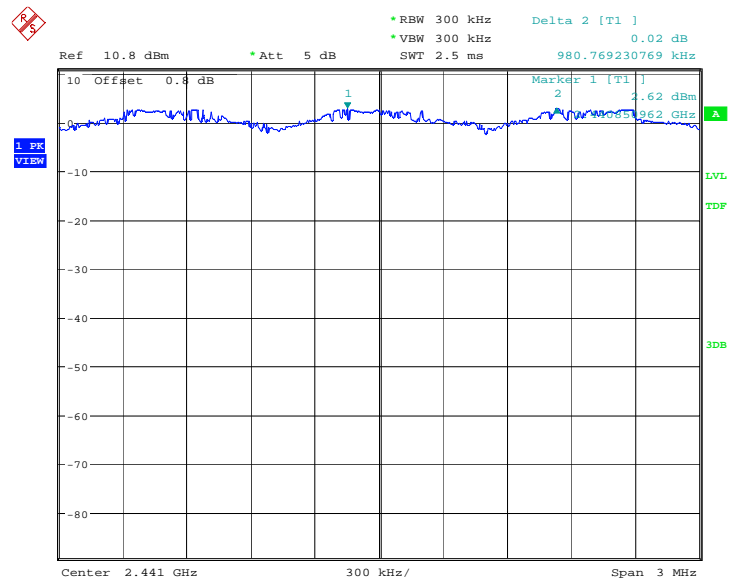
Date: 25.JAN.2013 04:43:26

Fig.124. Carrier frequency separation measurement: GFSK, Channel 39



Date: 25.JAN.2013 05:04:54

Fig.125. Carrier frequency separation measurement: $\pi/4$ DQPSK, Channel 39



Date: 25.JAN.2013 06:11:46

Fig.126. 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) RSS-210 A8.1 (4)	At least 15 non-overlapping channels

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

Measurement Result:

For GFSK

Channel	Number of hopping channels	Conclusion
0~39	Fig.127	P
40~78	Fig.128	

For $\pi/4$ DQPSK

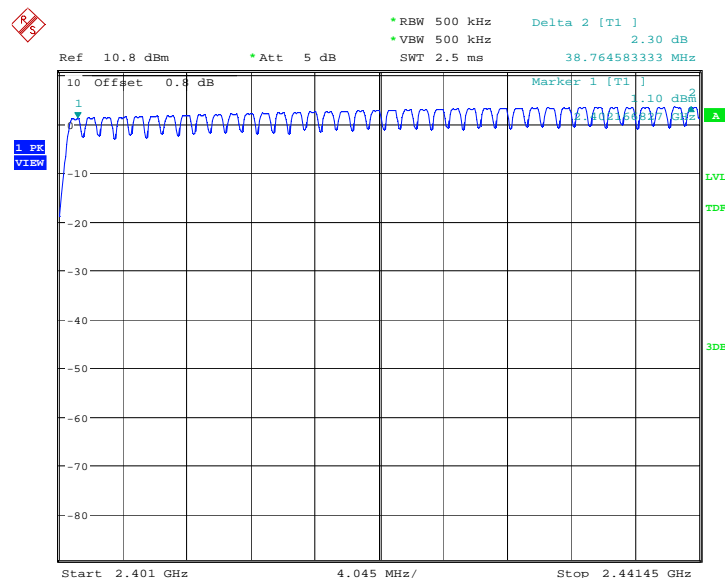
Channel	Number of hopping channels	Conclusion
0~39	Fig.129	P
40~78	Fig.130	

For 8DPSK

Channel	Number of hopping channels	Conclusion
0~39	Fig.131	P
40~78	Fig.132	

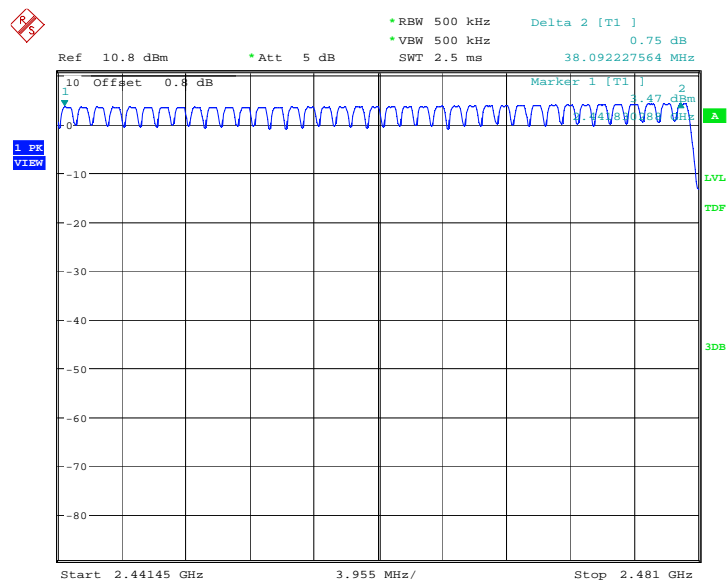
Conclusion: PASS

Test graphs as below:



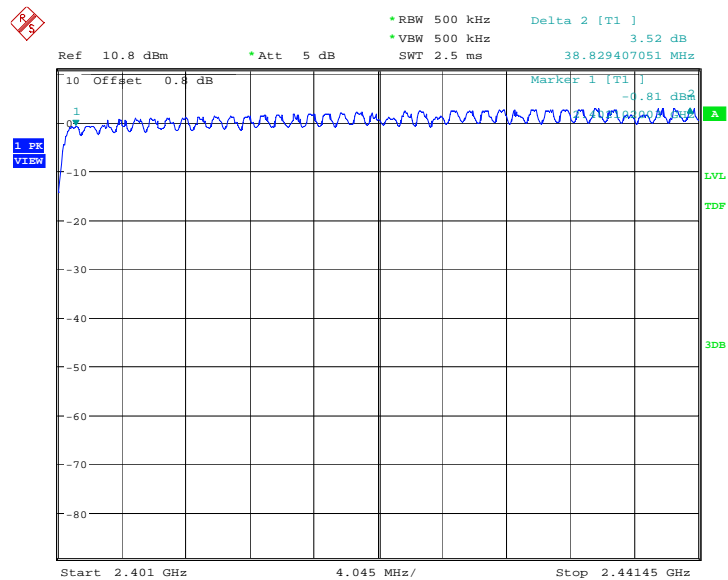
Date: 25.JAN.2013 04:45:31

Fig.127. Number of hopping frequencies: GFSK, Channel 0 - 39



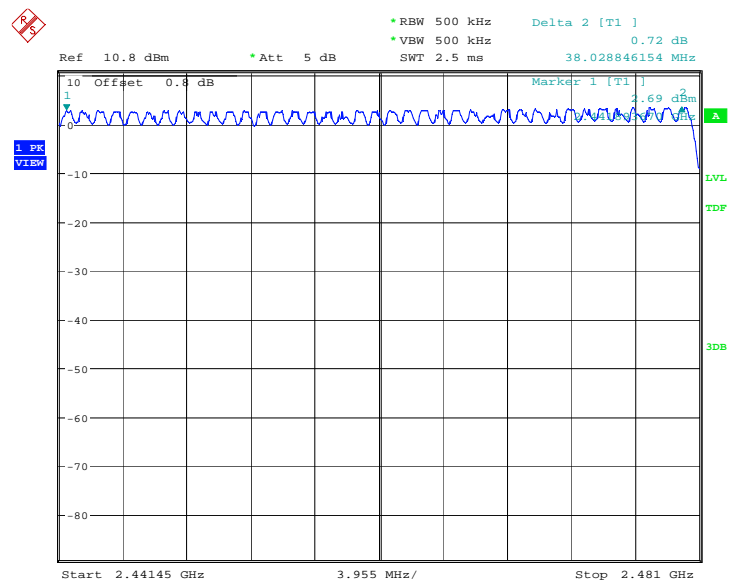
Date: 25.JAN.2013 04:47:33

Fig.128. Number of hopping frequencies: GFSK, Channel 40 - 78



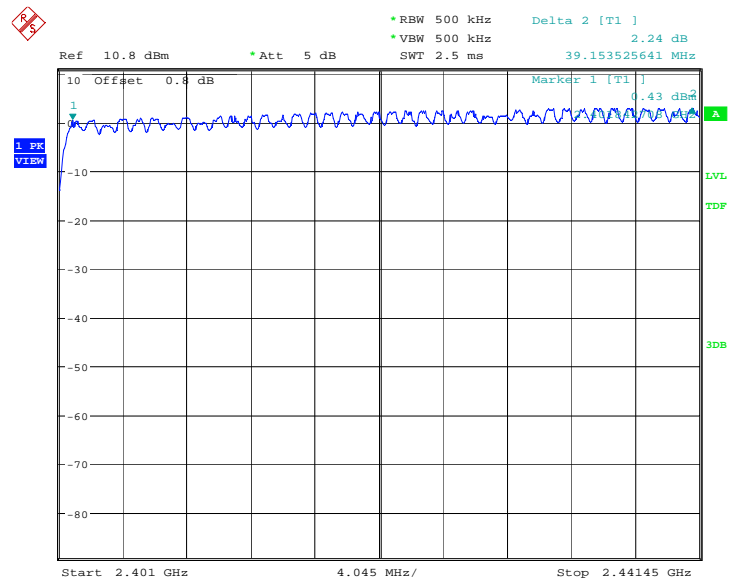
Date: 25.JAN.2013 05:06:59

Fig.129. Number of hopping frequencies: $\pi/4$ DQPSK, Channel 0 - 39



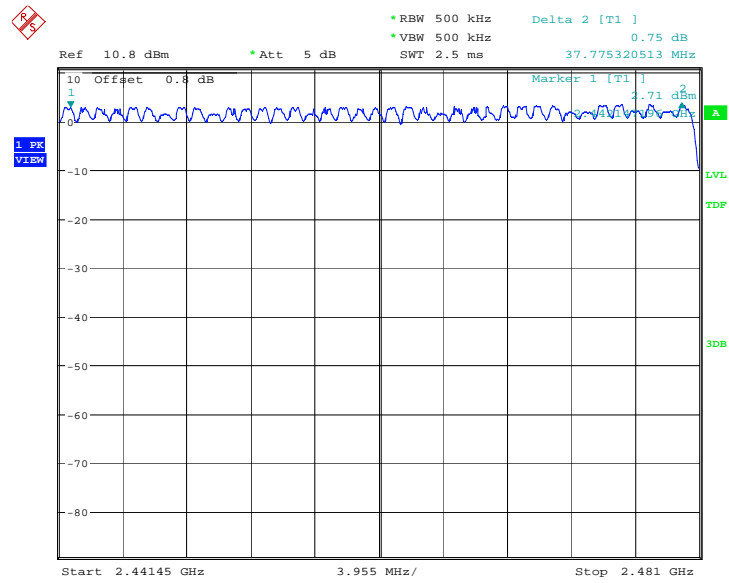
Date: 25.JAN.2013 05:09:01

Fig.130. Number of hopping frequencies: $\pi/4$ DQPSK, Channel 40 - 78



Date: 25.JAN.2013 05:28:31

Fig.131. Number of hopping frequencies: 8DPSK, Channel 0 - 39



Date: 25.JAN.2013 05:30:33

Fig.132. 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)	Quasi-peak Limit (dB μ V)	Conclusion
0.15 to 0.5	56 to 46	P
0.5 to 5	46	
5 to 30	50	

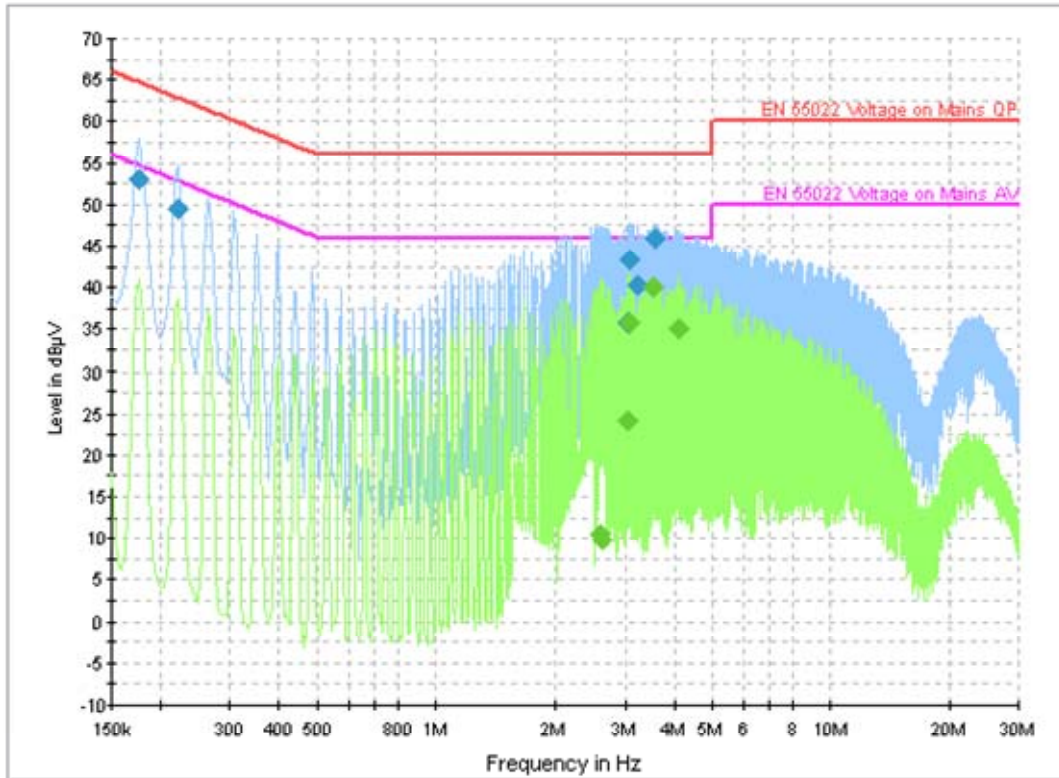
NOTE: The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.5 MHz.

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

Conclusion: PASS

Test graphs as below:

Traffic:

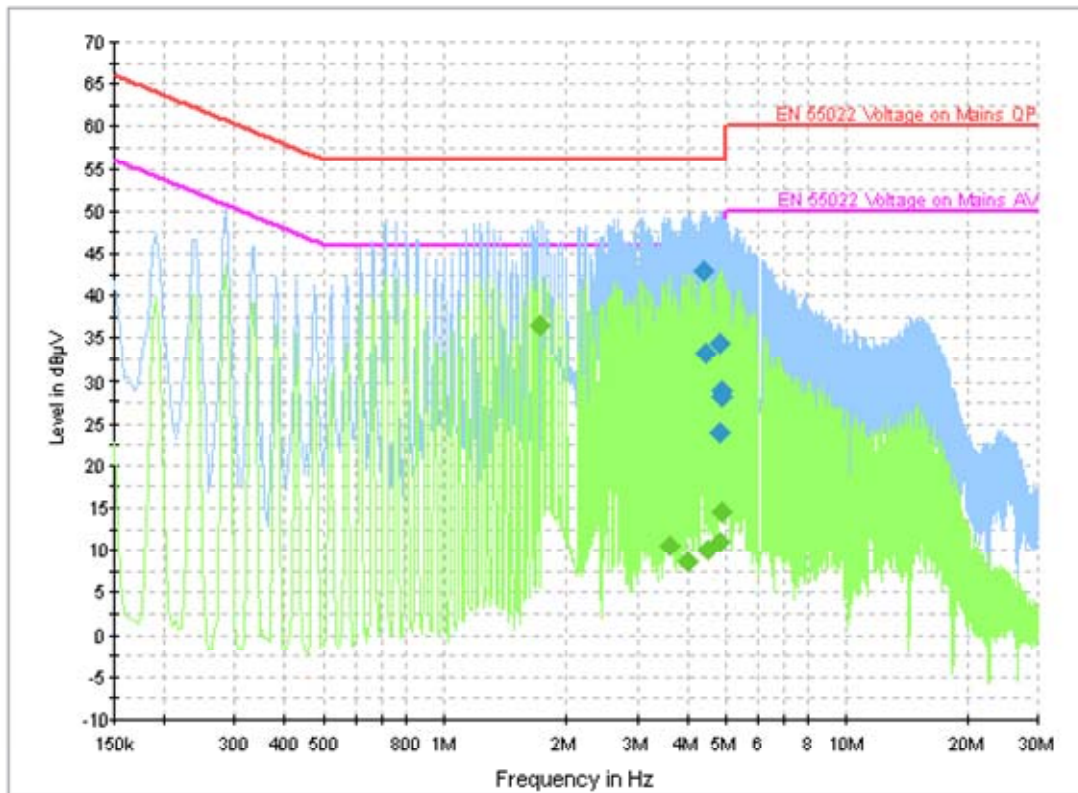


Final Result 1

Frequency (MHz)	QuasiPeak (dBµV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.177000	53.0	GND	L1	10.0	11.6	64.6
0.222000	49.4	GND	L1	10.0	13.3	62.7
3.043500	35.8	GND	N	10.0	20.2	56.0
3.084000	43.4	GND	N	10.0	12.6	56.0
3.214500	40.2	GND	N	10.0	15.8	56.0
3.561000	45.9	GND	N	10.0	10.1	56.0

Final Result 2

Frequency (MHz)	Average (dBµV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
2.584500	10.4	GND	N	10.0	35.6	46.0
2.625000	9.7	GND	N	10.0	36.3	46.0
3.043500	24.1	GND	N	10.0	21.9	46.0
3.084000	35.7	GND	N	10.0	10.3	46.0
3.520500	40.1	GND	L1	10.0	5.9	46.0
4.092000	35.2	GND	L1	10.0	10.8	46.0



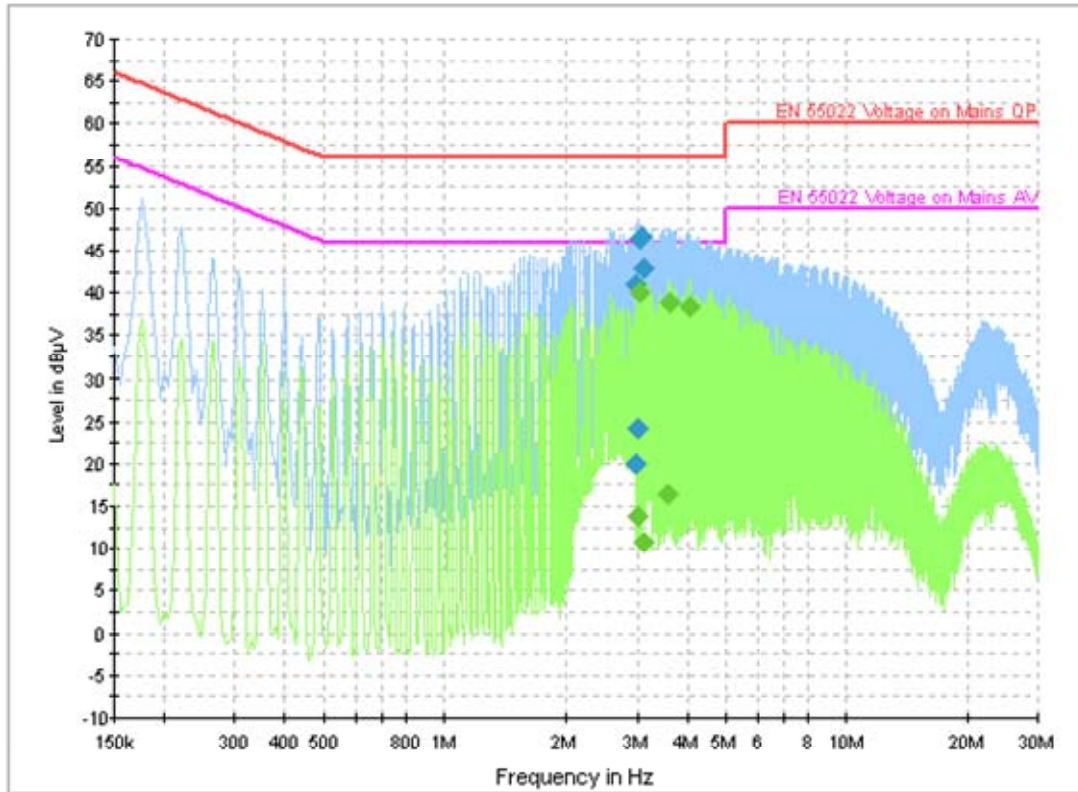
Final Result 1

Frequency (MHz)	QuasiPeak (dBµV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
4.407000	42.8	GND	L1	10.0	13.2	56.0
4.470000	33.3	GND	N	10.0	22.7	56.0
4.803000	34.3	GND	N	10.0	21.7	56.0
4.848000	24.0	GND	N	10.0	32.0	56.0
4.884000	28.2	GND	L1	10.0	27.8	56.0
4.897500	28.8	GND	N	10.0	27.2	56.0

Final Result 2

Frequency (MHz)	Average (dBµV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
1.711500	36.6	GND	N	10.0	9.4	46.0
3.610500	10.6	GND	N	10.0	35.4	46.0
4.029000	8.5	GND	L1	10.0	37.5	46.0
4.506000	10.2	GND	L1	10.0	35.8	46.0
4.848000	11.0	GND	N	10.0	35.0	46.0
4.897500	14.5	GND	N	10.0	31.5	46.0

Idle:

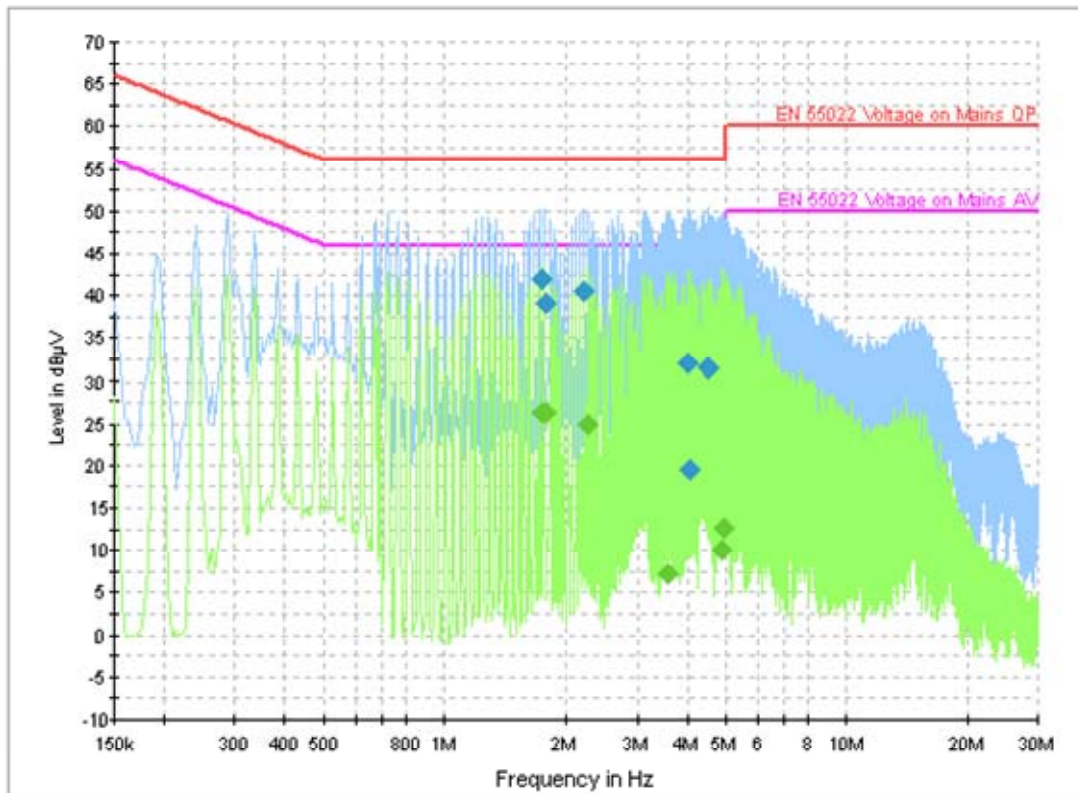


Final Result 1

Frequency (MHz)	QuasiPeak (dBµV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
2.967000	20.0	GND	N	10.0	36.0	56.0
2.980500	41.0	GND	N	10.0	15.0	56.0
3.007500	24.1	GND	N	10.0	31.9	56.0
3.039000	46.4	GND	N	10.0	9.6	56.0
3.084000	46.6	GND	L1	10.0	9.4	56.0
3.111000	42.9	GND	N	10.0	13.1	56.0

Final Result 2

Frequency (MHz)	Average (dBµV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
3.007500	13.9	GND	N	10.0	32.1	46.0
3.039000	40.0	GND	N	10.0	6.0	46.0
3.111000	10.8	GND	N	10.0	35.2	46.0
3.565500	16.4	GND	L1	10.0	29.6	46.0
3.610500	38.8	GND	L1	10.0	7.2	46.0
4.051500	38.4	GND	N	10.0	7.6	46.0



Final Result 1

Frequency (MHz)	QuasiPeak (dBµV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
1.725000	42.0	GND	L1	10.0	14.0	56.0
1.774500	39.1	GND	N	10.0	16.9	56.0
2.206500	40.6	GND	N	10.0	15.4	56.0
4.033500	32.1	GND	N	10.0	23.9	56.0
4.069500	19.5	GND	L1	10.0	36.5	56.0
4.501500	31.6	GND	L1	10.0	24.4	56.0

Final Result 2

Frequency (MHz)	Average (dBµV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
1.725000	26.4	GND	L1	10.0	19.6	46.0
1.774500	26.4	GND	N	10.0	19.6	46.0
2.251500	24.8	GND	L1	10.0	21.2	46.0
3.588000	7.1	GND	L1	10.0	38.9	46.0
4.888500	10.0	GND	N	10.0	36.0	46.0
4.938000	12.5	GND	N	10.0	33.5	46.0

A.11 RECEIVER RADIATION EMISSION

Reference

FCC: CFR Part 15.109, 2.1053

A.11.1 Method of Measurement

The measurement procedure in ANSI C64.4-2003 is used. The EUT is placed on a 80cm height non-conductive table locating on the center of turntable. From 30MHz-1GHz, the measurement distance is 10m. For frequency range above 1GHz, the measurement distance is 3m.

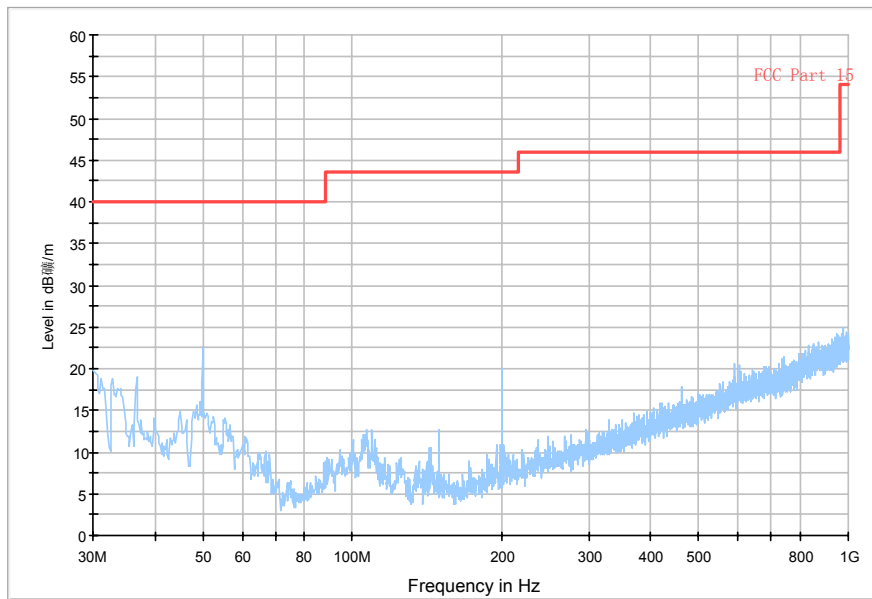
The EUT is measured with travel charger and the operating mode is idle without CMU200's signaling.

A.11.2 Method of Measurement

Frequency of Emission (MHz)	Limit (dB μ V/m)	Measurement Distance (m)
30-88	30	10
88-216	33.5	10
216-960	36	10
960-1000	44	10
>1000	54	3

A. 11.3 Measurement results

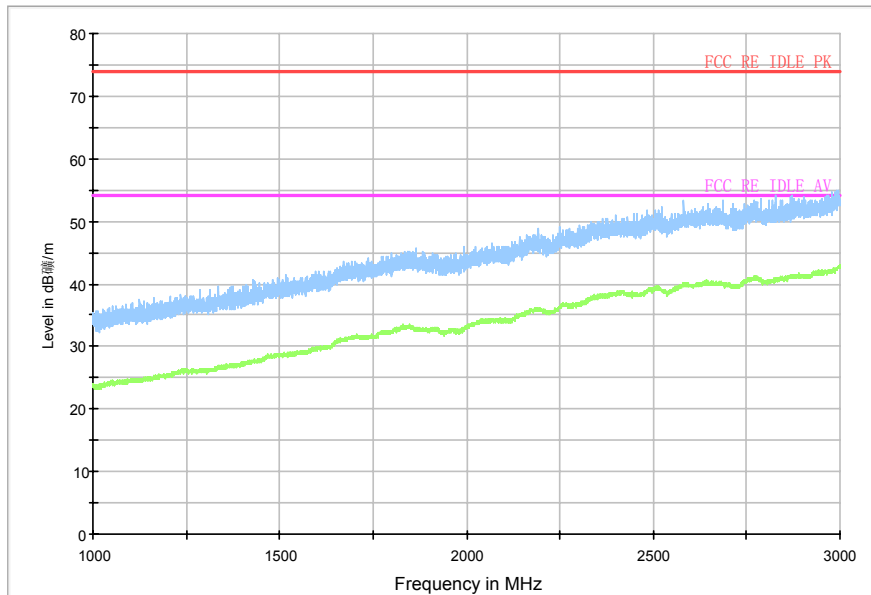
RE 30MHz-1GHz



IF bandwidth: 120 kHz

Idle Mode: 30MHz-1GHz

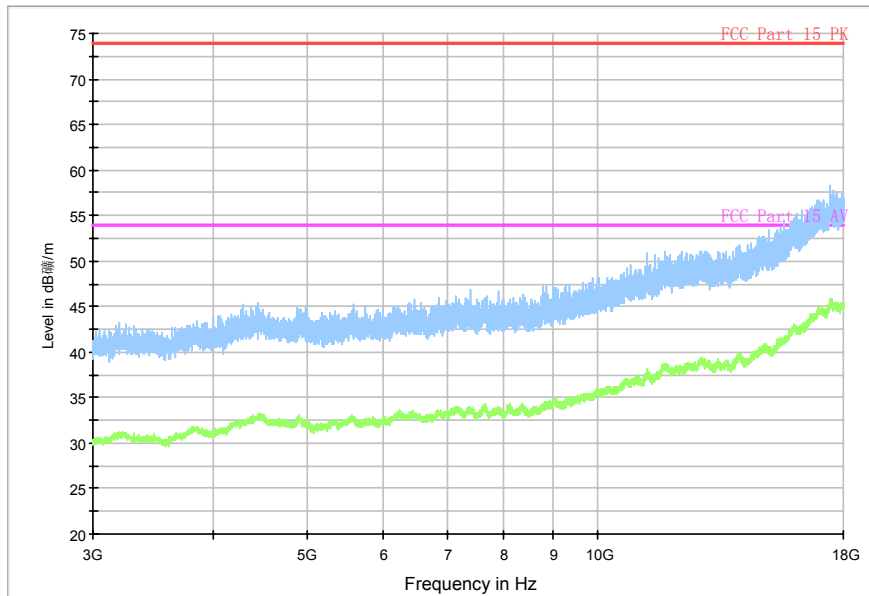
RE - 1GHz-3GHz



RBW / VBW 1 MHz

Idle Mode: 1GHz-3GHz

RE - 3GHz-18GHz



RBW / VBW 1 MHz

Idle Mode: 3GHz-18GHz

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