FCC PART 15C
TEST REPORT

No. 2011TAR268

for

ZTE CORPORATION

WCDMA/GSM（GPRS） Dual-Mode Digital Mobile Phone

Model Name: F160

With

FCC ID: Q78-ZTEF160-AWS

Hardware Version: wt7B

Software Version: VTR_CL_P622F2V1.0.0B01

Issued Date: 2011-06-08

Deutscher Akkreditierungs Rat

***No.* DGA-PL-114/01-02**

DAR accreditation (DIN EN ISO/IEC 17025): No. DGA-PL-114/01-02

FCC 2.948 Listed: No.733176

IC O.A.T.S listed: No.6629A-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)10-62304633-2678, Fax:+86(0)10-62304793 Email:welcome@emcite.com. www.emcite.com

CONTENTS

1. Test Laboratory

1.1. Testing Location

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

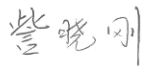
1.2. Testing Environment

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

1.3. Project data

Project Leader:	Zi Xiaogang
Testing Start Date:	2011-05-23
Testing End Date:	2011-06-08

1.4. Signature

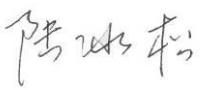


Zi Xiaogang

(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:	ZTE CORPORATION
Address /Post:	ZTE Plaza, Keji Road South, Hi-Tech Industrial Park, Nanshan District, Shenzhen, Guangdong, 518057, P.R.China
Contact:	Zhang Min
Email	zhang.min13@zte.com.cn
Telephone:	0086 21 68897541
Fax:	0086 21 50801070

2.2. Manufacturer Information

Company Name:	ZTE CORPORATION
Address /Post:	ZTE Plaza, Keji Road South, Hi-Tech Industrial Park, Nanshan District, Shenzhen, Guangdong, 518057, P.R.China
Contact:	Zhang Min
Email	zhang.min13@zte.com.cn
Telephone:	0086 21 68897541
Fax:	0086 21 50801070

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

3.1. About EUT

Description	WCDMA/GSM（GPRS） Dual-Mode Digital Mobile Phone
Model Name	F160
FCC ID	Q78-ZTEF160-AWS
Frequency Band	ISM 2400MHz~2483.5MHz
Type of Modulation	GFSK/π/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*	SN or IMEI	HW Version	SW Version
N07	865008001662813	wt7B	VTR_CL_P622F2V1.0.0B01
N10	865008001662847	wt7B	VTR_CL_P622F2V1.0.0B01

*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	SN
AE1	Battery	
AE2	Charger	

AE1

Model	Li3708T42P3h553447
Manufacturer	ZTE
Capacitance	820mAh
Nominal Voltage	3.7V

AE3

Model	STC-A22O50I700USBA-Z
Manufacturer	RUIDE
Length of DC line	120cm

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

3.4. General Description

The Equipment Under Test (EUT) is a model of WCDMA/GSM（GPRS） Dual-Mode Digital 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 Part15	FCC CFR 47, Part 15, Subpart C: 15.205 Restricted bands of operation; 15.209 Radiated emission limits, general requirements; 15.247 Operation within the bands 902–928MHz, 2400–2483.5 MHz, and 5725–5850 MHz.	July 10, 2008 Edition
ANSI C63.4	Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz	2003
FCC Public Notice DA 00-705	Filing and Measurement Guidelines for Frequency Hopping Spread Spectrum Systems	March 2000

5. LABORATORY ENVIRONMENT

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

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

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

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

Semi-anechoic chamber (23 meters×17meters×10meters) did not exceed following limits along the EMC testing:

Temperature	Min. = 15 ℃, Max. = 30 ℃
Relative humidity	Min. = 30 %, Max. = 60 %
Shielding effectiveness	> 110 dB
Electrical insulation	> 10 kΩ
Ground system resistance	< 0.5 Ω
Normalised site attenuation (NSA)	< ±3.2 dB, 10 m distance, from 30 to 1000 MHz
Uniformity of field strength	Between 0 and 6 dB, from 80 to 2000 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 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	2011-08-18
2	Bluetooth Tester	CBT32	100649	Rohde & Schwarz	2011-08-03

Radiated emission test system

No.	Equipment	Model	Serial Number	Manufacturer	Calibration Due date
1	Test Receiver	ESI40	831564/002	Rohde & Schwarz	2011-08-11
2	EMI Antenna	VULB 9163	9163 301	Schwarzbeck	2011-08-29
3	EMI Antenna	3117	00034610	EMCO	2011-08-30
4	Dual-Ridge Waveguide Horn Antenna	3116	2663	EMCO	2011-08-01
5	Dual-Ridge Waveguide Horn Antenna	3116	2661	EMCO	2011-08-01
6	Universal Radio Communication Tester	CMU200	105948	Rohde & Schwarz	2011-08-13
7	LISN	ESH2-Z5	829991/012	Rohde & Schwarz	2011-08-12
8	Pre-amplifier(18GHz)	/	1005277	Rohde & Schwarz	/
9	Pre-amplifier(26.5GHz)	/	1005277	Rohde & Schwarz	/

Anechoic chamber

Fully anechoic chamber by Frankonia German.

ANNEX A: MEASUREMENT RESULTS

A.1. Measurement Method

A.1.1. Conducted Measurements

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

1). Connect the EUT to the test system correctly.

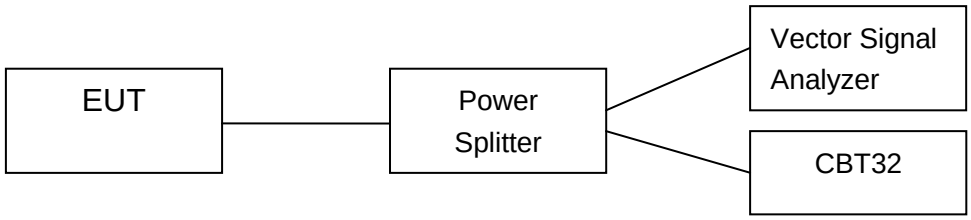
2). Set the EUT to the required work mode (Transmitter, receiver or transmitter & receiver).

3). Set the EUT to the required channel.

4). Set the EUT hopping mode (hopping or hopping off).

5). Set the spectrum analyzer to start measurement.

6). Record the values. Vector Signal Analyzer



A.1.2. Radiated Emission Measurements

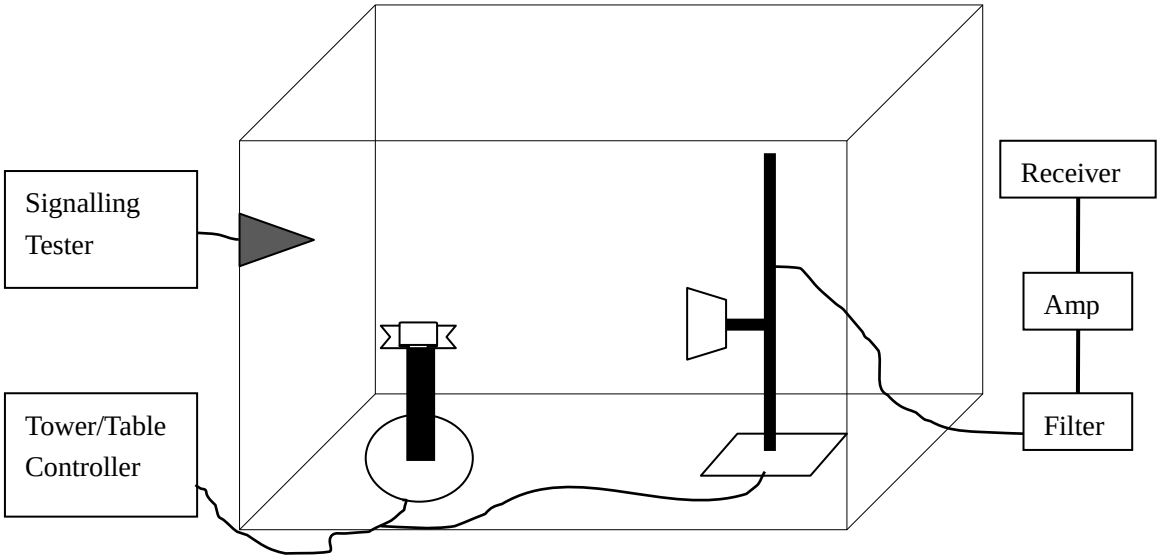
The measurement is made according to Public notice DA 00-705 and ANSI C63.4

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

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

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

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



A.2. Peak Output Power - Conducted

Measurement Limit:

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

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

Test Condition

Hopping Mode	RBW	VBW	Span	Sweeptime
Hopping OFF	1MHz	1MHz	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)	4.87	6.35	6.00	P

Forπ/4 DQPSK

Channel	Ch 0 2402 MHz	Ch 39 2441 MHz	Ch 78 2480 MHz	Conclusion
Peak Conducted Output Power (dBm)	3.90	5.56	5.12	P

For 8DPSK

Channel	Ch 0 2402 MHz	Ch 39 2441 MHz	Ch 78 2480 MHz	Conclusion
Peak Conducted Output Power (dBm)	3.22	4.74	4.33	P

Conclusion: PASS

A.3. Frequency Band Edges - Conducted

Measurement Limit:

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

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

Measurement Result:

For GFSK

Channel	Hopping	Band Edge Power (dBc)		Conclusion
0	Hopping OFF	Fig.1	-58.65	P
	Hopping ON	Fig.2	-58.54	P
78	Hopping OFF	Fig.3	-65.46	P
	Hopping ON	Fig.4	-65.85	P

Forπ/4 DQPSK

Channel	Hopping	Band Edge Power (dBc)		Conclusion
0	Hopping OFF	Fig.5	-55.84	P
	Hopping ON	Fig.6	-57.02	P
78	Hopping OFF	Fig.7	-63.41	P
	Hopping ON	Fig.8	-62.24	P

For 8DPSK

Channel	Hopping	Band Edge Power (dBc)		Conclusion
0	Hopping OFF	Fig.9	-57.45	P
	Hopping ON	Fig.10	-58.58	P
78	Hopping OFF	Fig.11	-63.71	P
	Hopping ON	Fig.12	-62.81	P

Conclusion: PASS

Test graphs as below

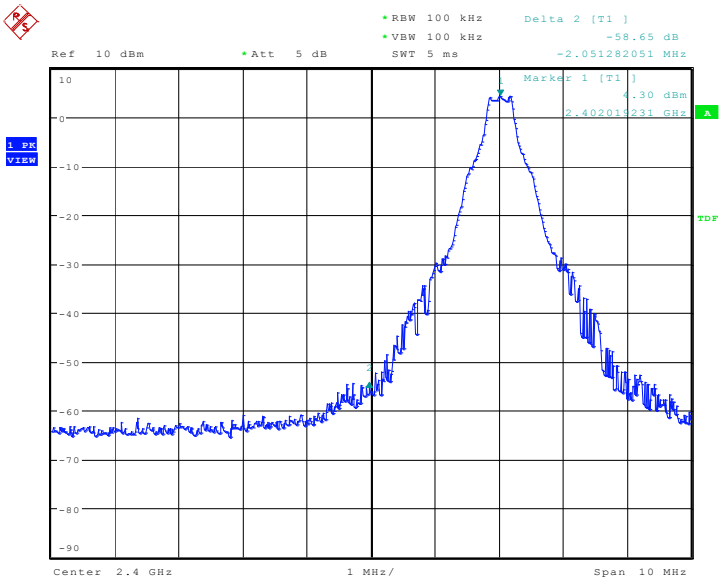


Fig. 1 Frequency Band Edges: GFSK, Channel 0, Hopping Off

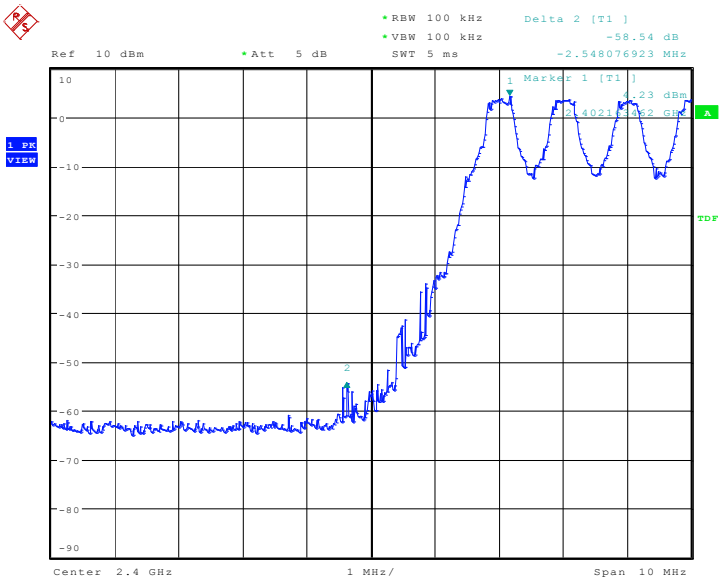


Fig. 2 Frequency Band Edges: GFSK, Channel 0, Hopping On

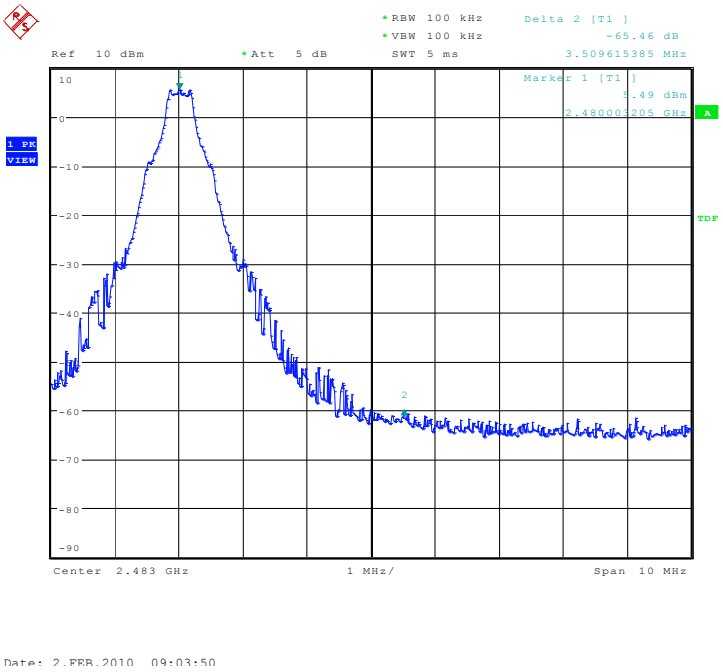


Fig. 3 Frequency Band Edges: GFSK, Channel 78, Hopping Off

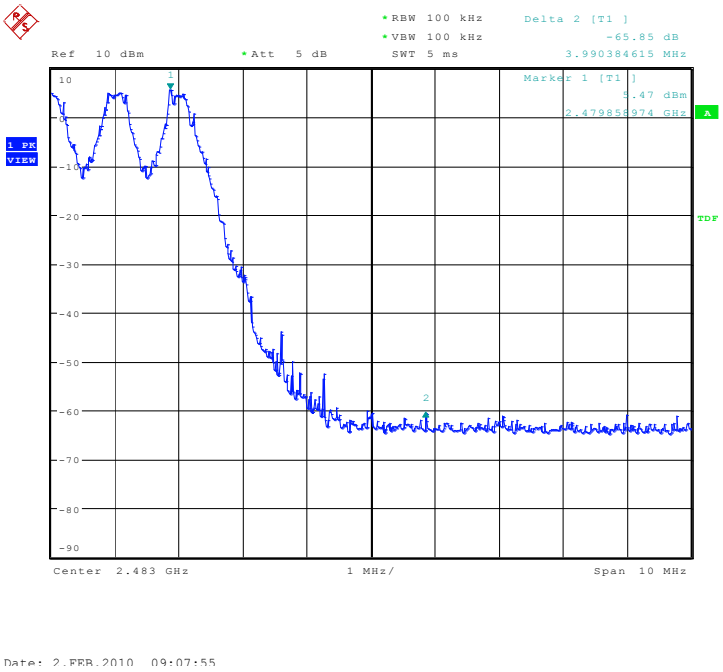


Fig. 4 Frequency Band Edges: GFSK, Channel 78, Hopping On

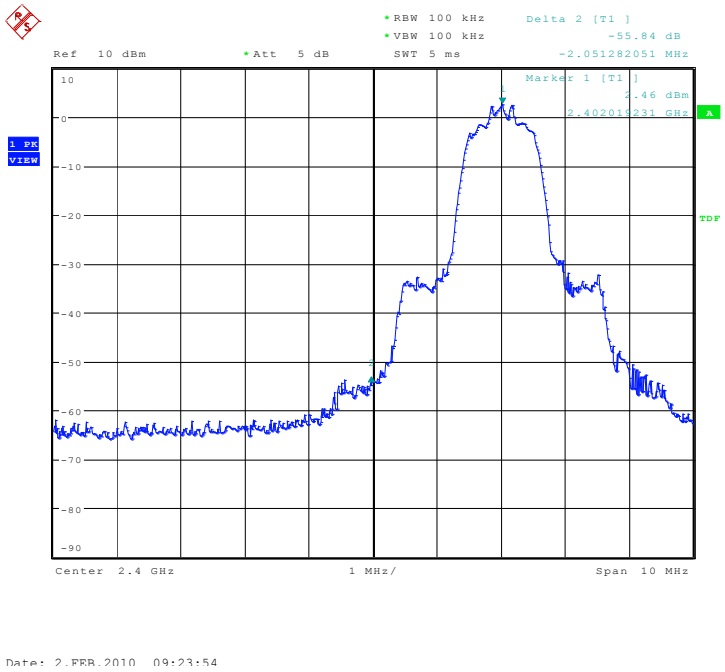


Fig. 5 Frequency Band Edges: π/4 DQPSK, Channel 0, Hopping Off

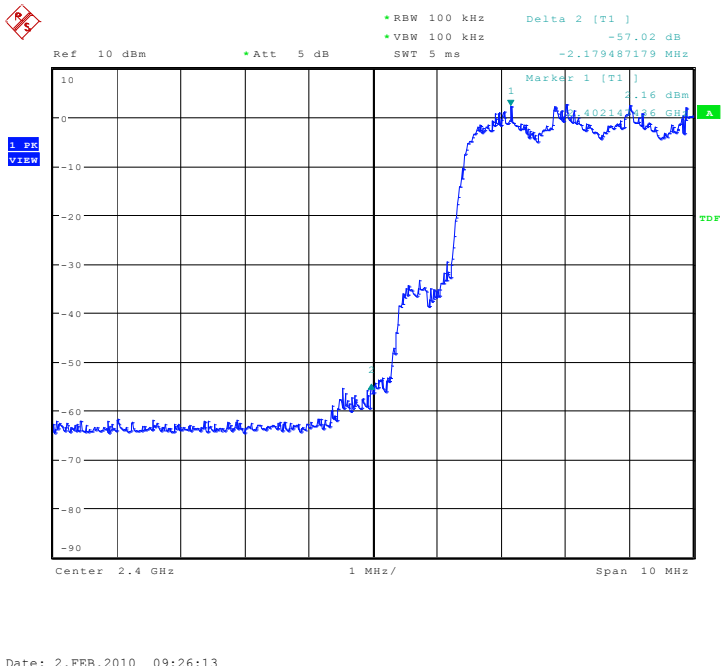


Fig. 6 Frequency Band Edges: π/4 DQPSK, Channel 0, Hopping On

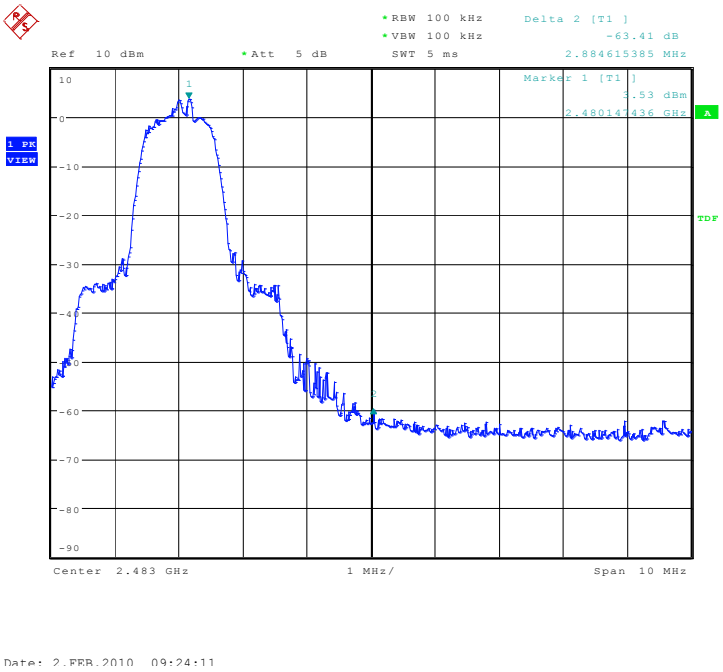


Fig. 7 Frequency Band Edges: π/4 DQPSK, Channel 78, Hopping Off

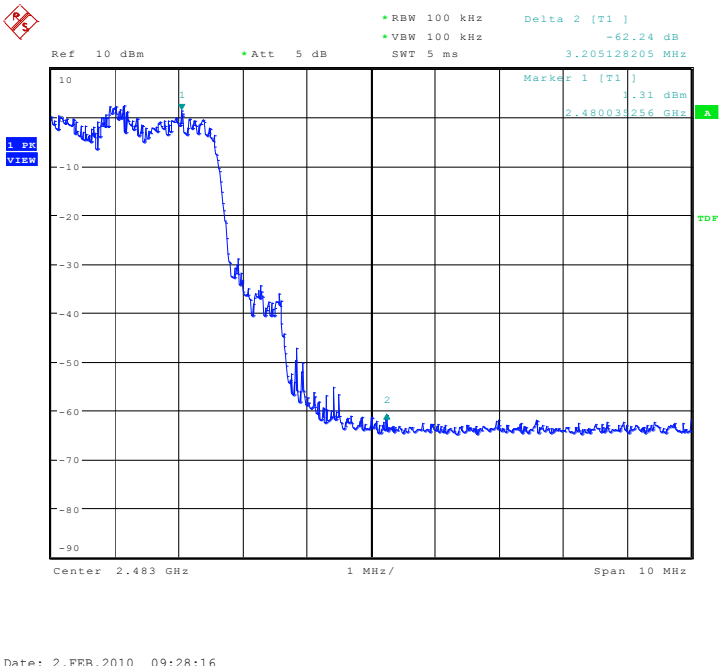


Fig. 8 Frequency Band Edges: π/4 DQPSK, Channel 78, Hopping On

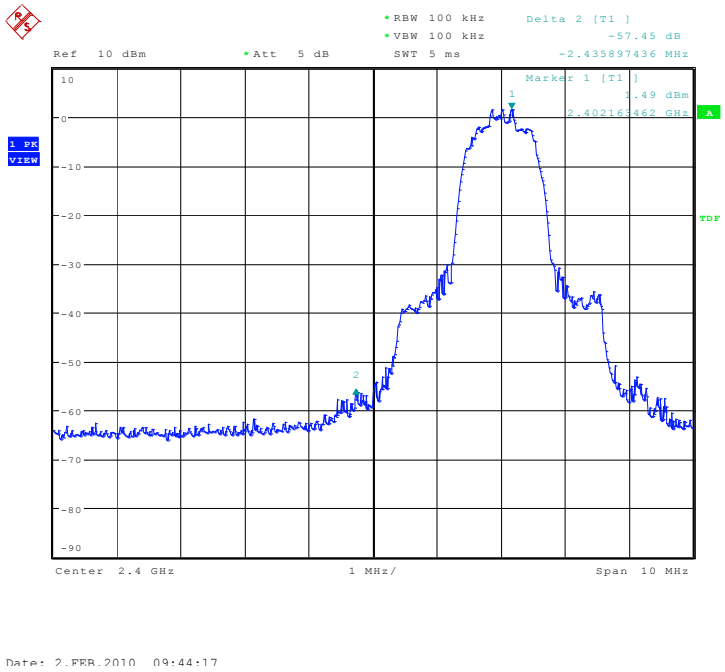


Fig. 9 Frequency Band Edges: 8DPSK, Channel 0, Hopping Off

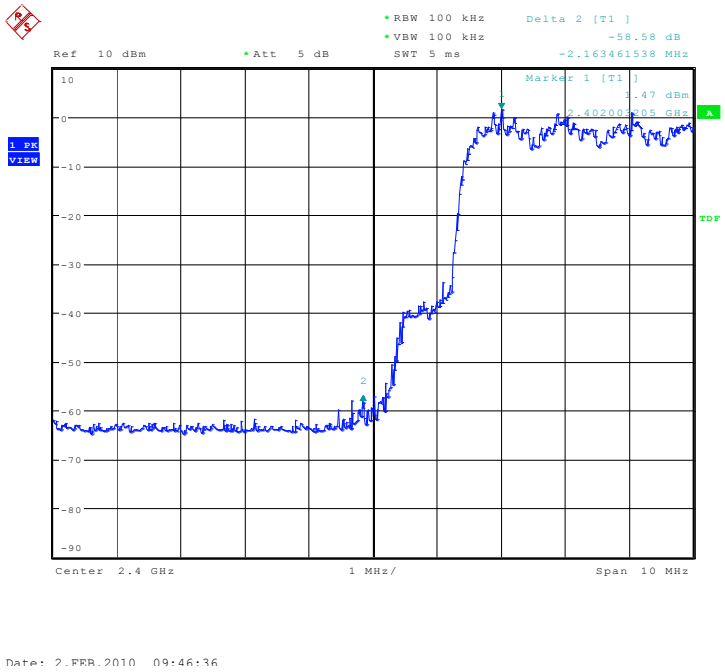


Fig. 10 Frequency Band Edges: 8DPSK, Channel 0, Hopping On

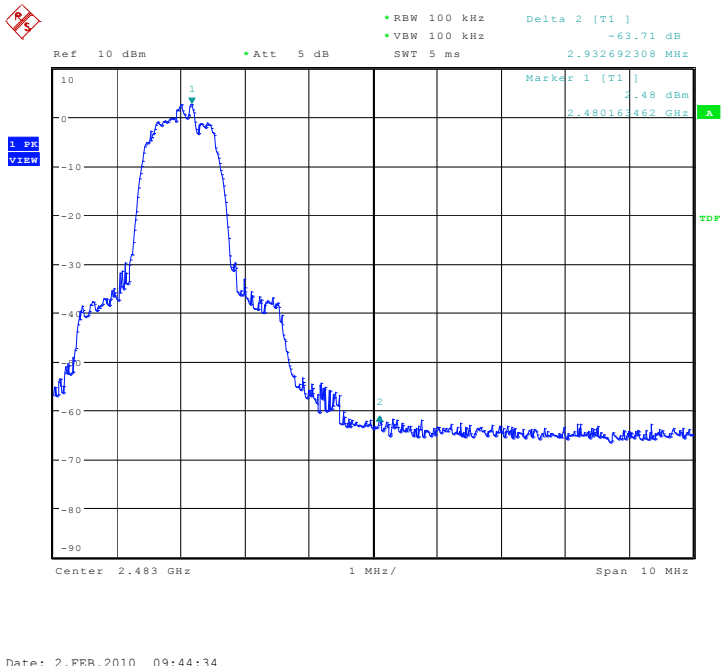


Fig. 11 Frequency Band Edges: 8DPSK, Channel 78, Hopping Off

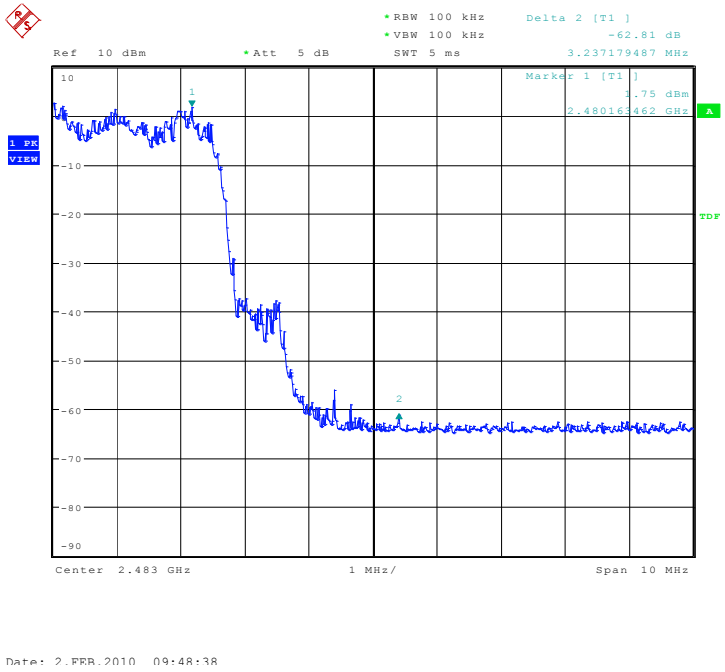


Fig. 12 Frequency Band Edges: 8DPSK, Channel 78, Hopping On

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 ~ 26 GHz	Fig.15	**P**
Ch 39 2441 MHz	Center Frequency	Fig.16	**P**
	30 MHz ~ 1 GHz	Fig.17	**P**
	1 GHz ~ 26 GHz	Fig.18	**P**
Ch 78 2480 MHz	Center Frequency	Fig.19	**P**
	30 MHz ~ 1 GHz	Fig.20	**P**
	1 GHz ~ 26 GHz	Fig.21	**P**

For π/4 DQPSK

Channel	Frequency Range	Test Results	Conclusion
Ch 0 2402 MHz	Center Frequency	Fig.22	**P**
	30 MHz ~ 1 GHz	Fig.23	**P**
	1 GHz ~ 26 GHz	Fig.24	**P**
Ch 39 2441 MHz	Center Frequency	Fig.25	**P**
	30 MHz ~ 1 GHz	Fig.26	**P**
	1 GHz ~ 26 GHz	Fig.27	**P**
Ch 78 2480 MHz	Center Frequency	Fig.28	**P**
	30 MHz ~ 1 GHz	Fig.29	**P**
	1 GHz ~ 26 GHz	Fig.30	**P**

For 8DPSK

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

Conclusion: PASS

Test graphs as below

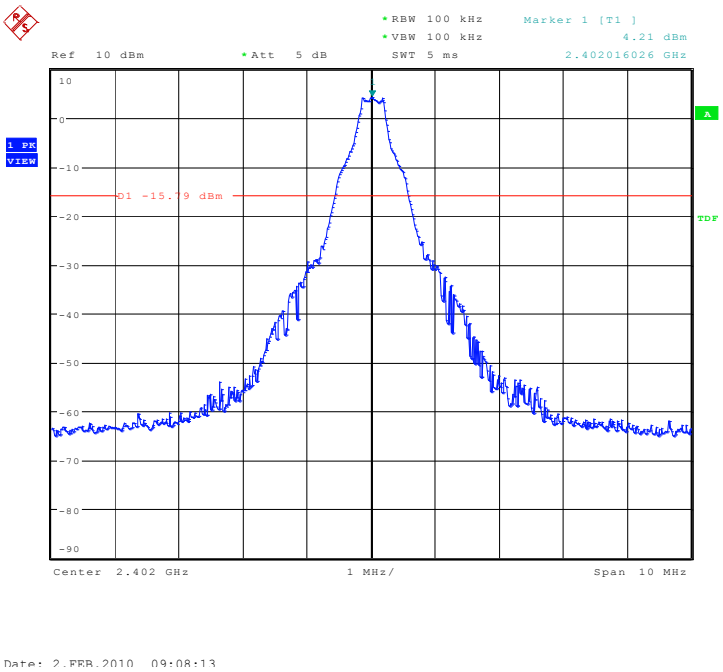


Fig. 13 Conducted spurious emission: GFSK, Channel 0,2402MHz

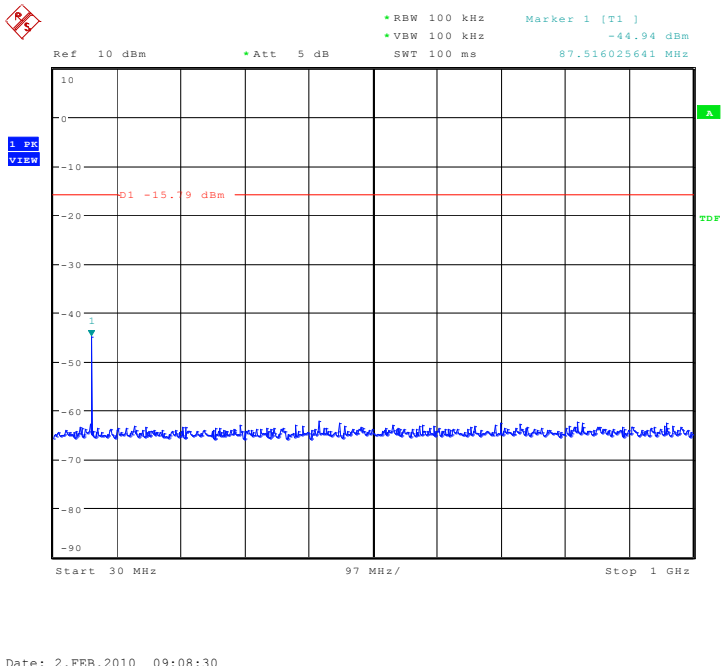


Fig. 14 Conducted spurious emission: GFSK, Channel 0, 30MHz - 1GHz

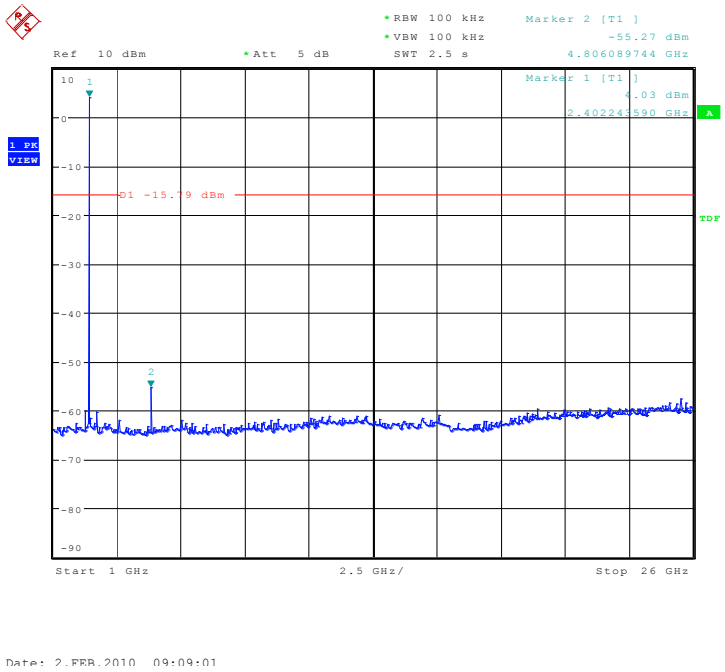


Fig. 15 Conducted spurious emission: GFSK, Channel 0,1GHz - 26GHz

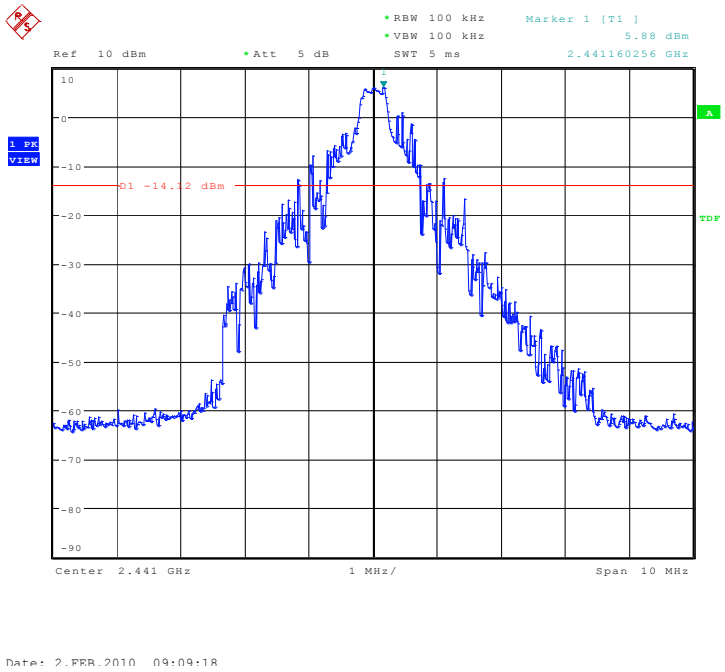


Fig. 16 Conducted spurious emission: GFSK, Channel 39, 2441MHz

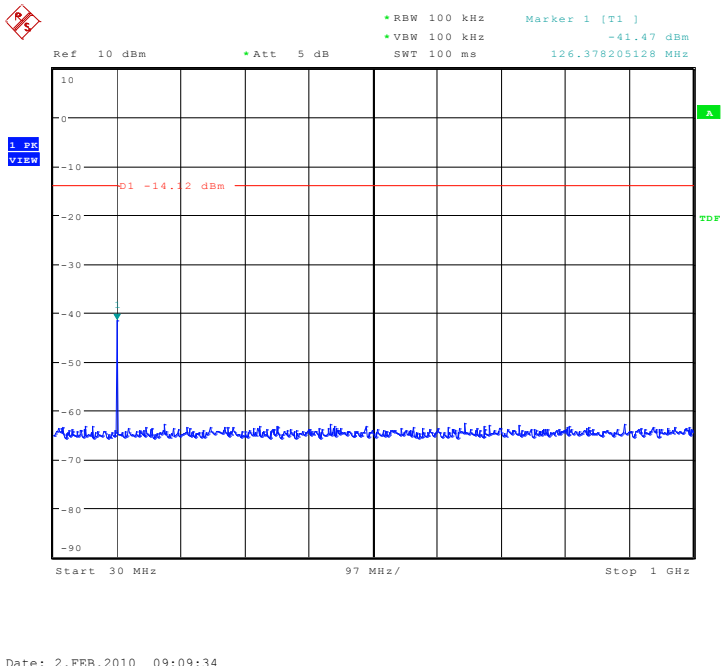


Fig. 17 Conducted spurious emission: GFSK, Channel 39, 30MHz - 1GHz

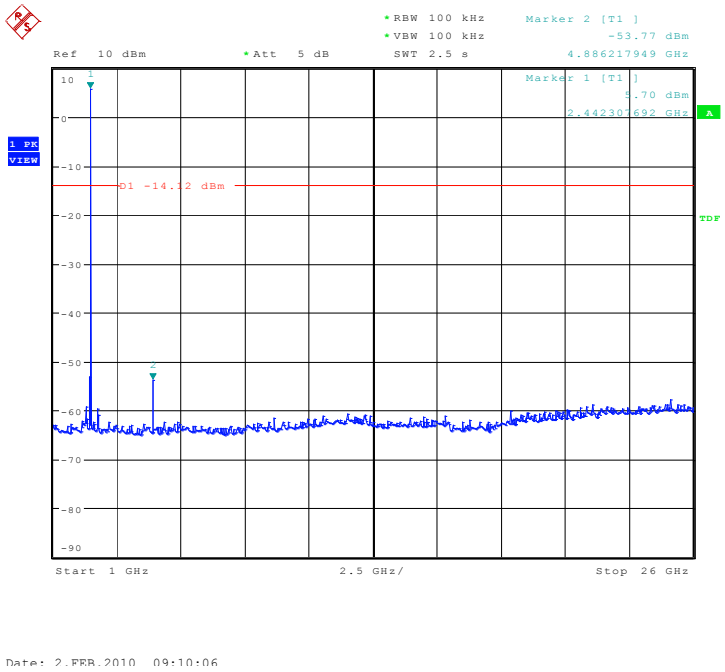


Fig. 18 Conducted spurious emission: GFSK, Channel 39, 1GHz – 26GHz

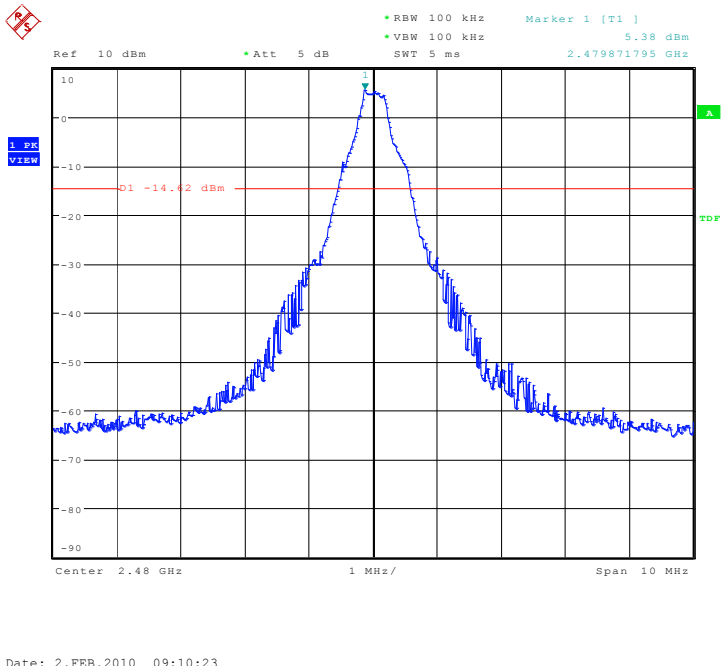


Fig. 19 Conducted spurious emission: GFSK, Channel 78, 2480MHz

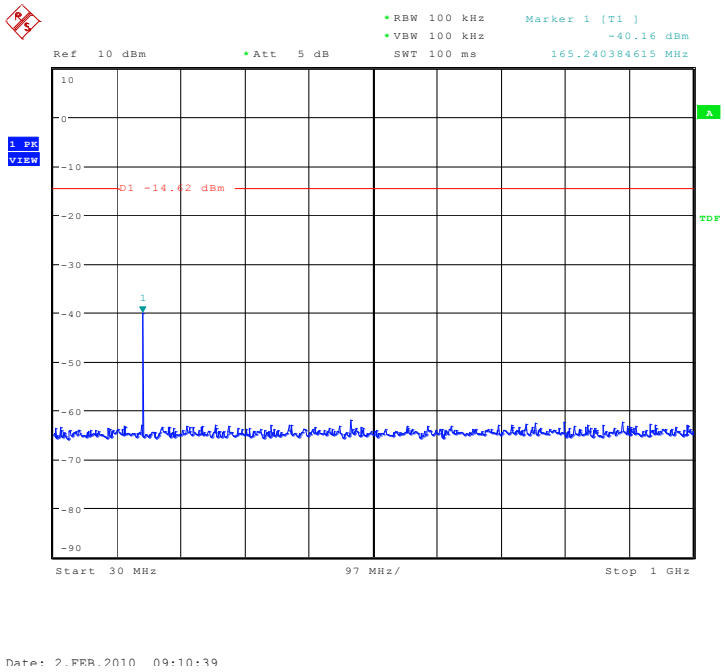


Fig. 20 Conducted spurious emission: GFSK, Channel 78, 30MHz - 1GHz

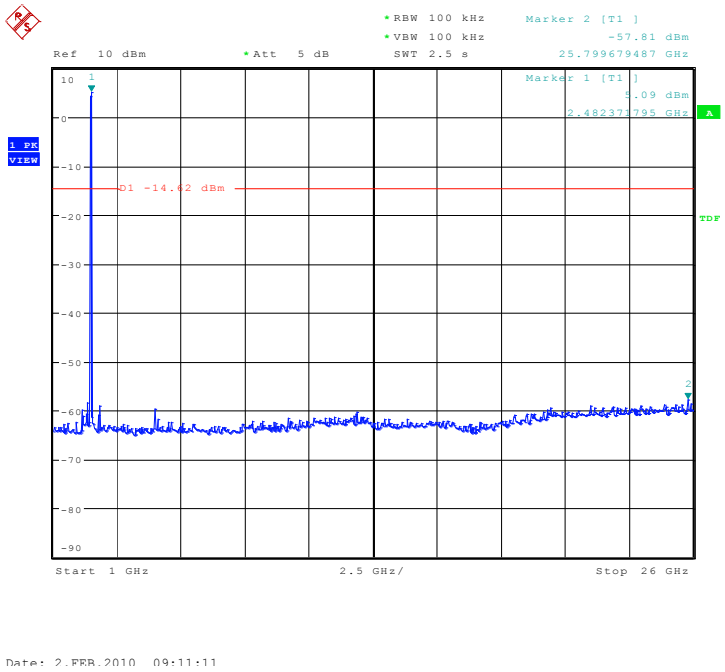


Fig. 21 Conducted spurious emission: GFSK, Channel 78, 1GHz - 26GHz

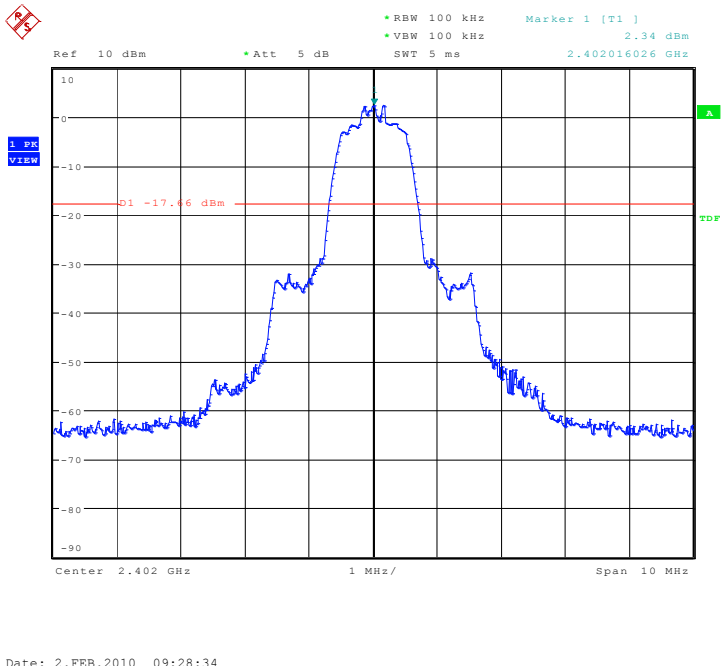


Fig. 22 Conducted spurious emission: π/4 DQPSK, Channel 0,2402MHz

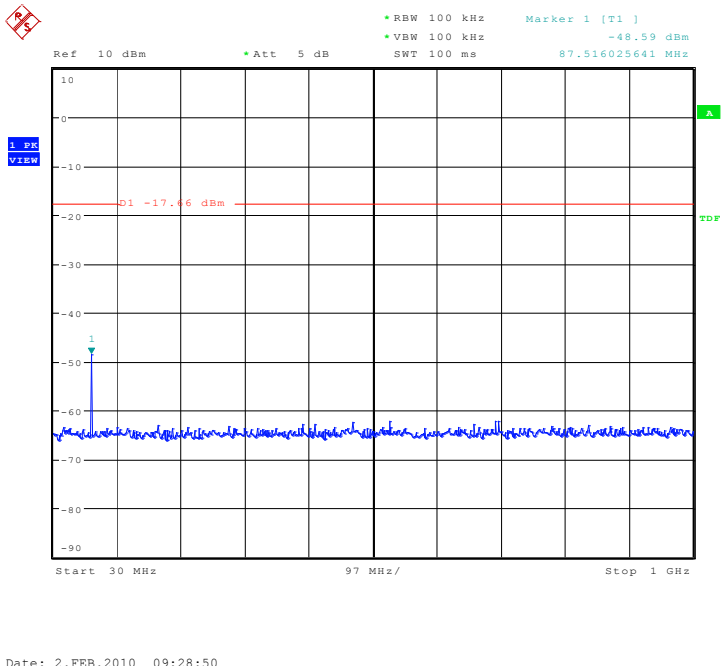


Fig. 23 Conducted spurious emission: π/4 DQPSK, Channel 0, 30MHz - 1GHz

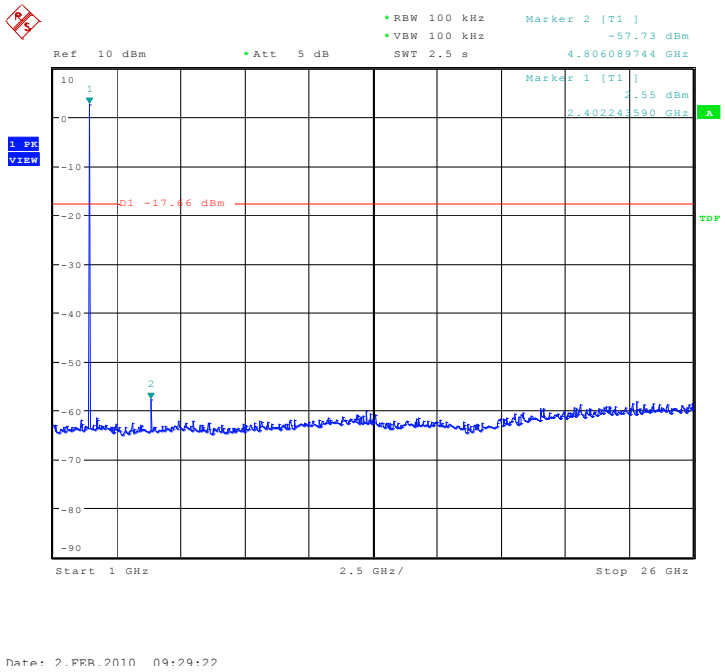


Fig. 24 Conducted spurious emission: π/4 DQPSK, Channel 0,1GHz - 26GHz

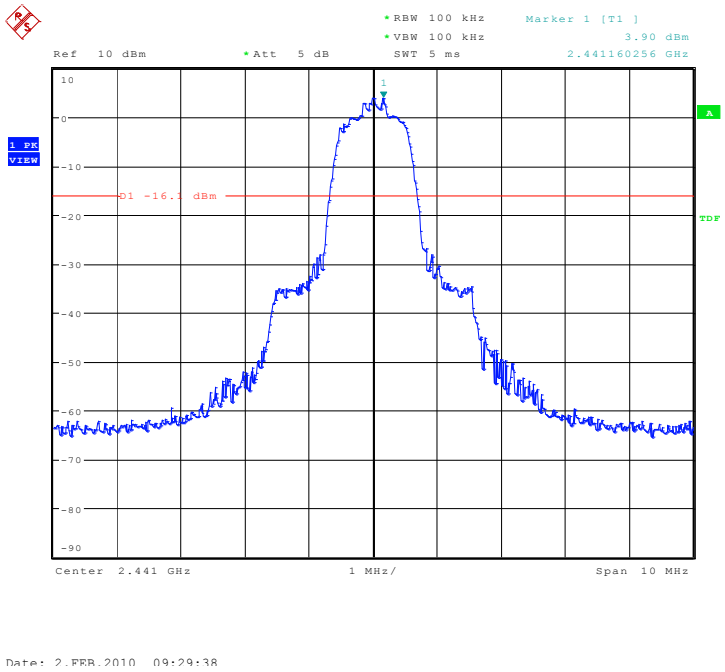


Fig. 25 Conducted spurious emission: π/4 DQPSK, Channel 39, 2441MHz

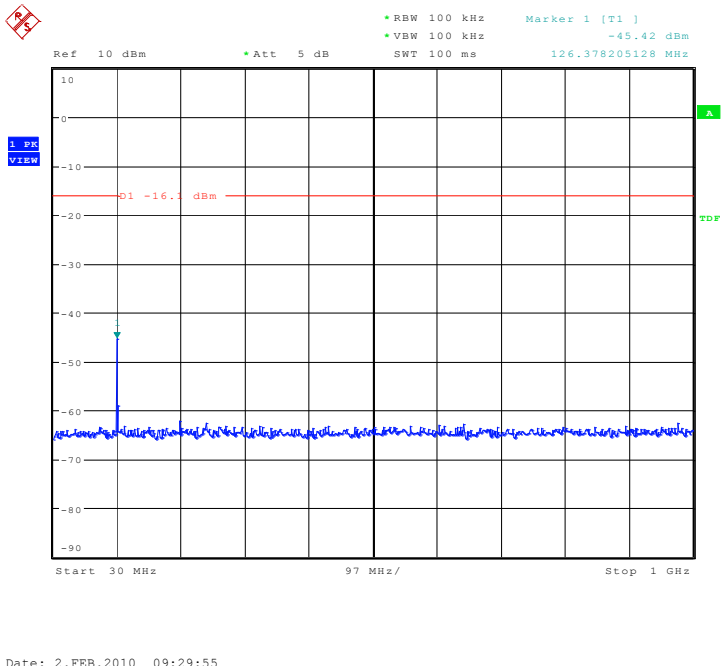


Fig. 26 Conducted spurious emission: π/4 DQPSK, Channel 39, 30MHz - 1GHz

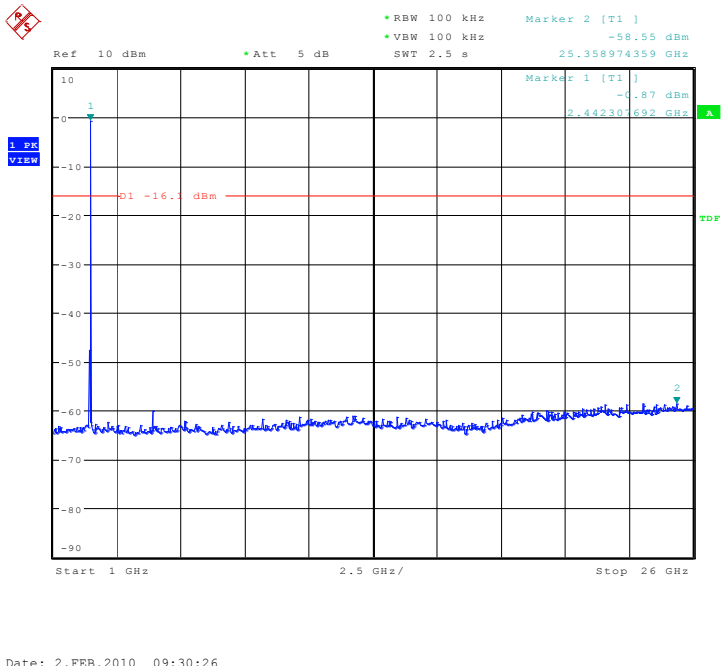


Fig. 27 Conducted spurious emission: π/4 DQPSK, Channel 39, 1GHz – 26GHz

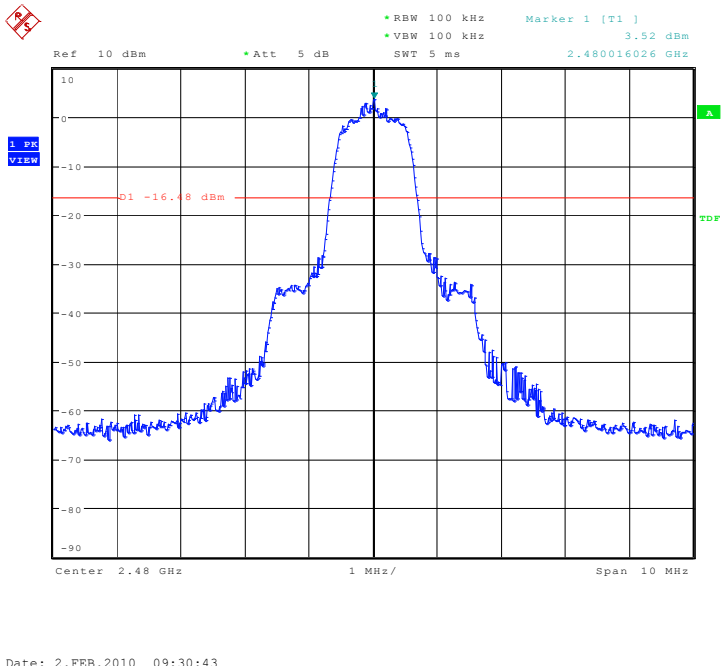


Fig. 28 Conducted spurious emission: π/4 DQPSK, Channel 78, 2480MHz

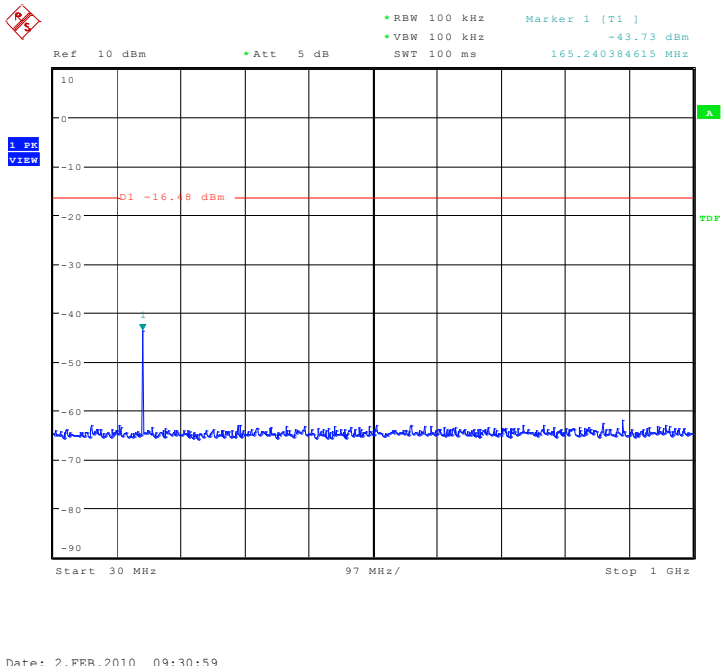


Fig. 29 Conducted spurious emission: π/4 DQPSK, Channel 78, 30MHz - 1GHz

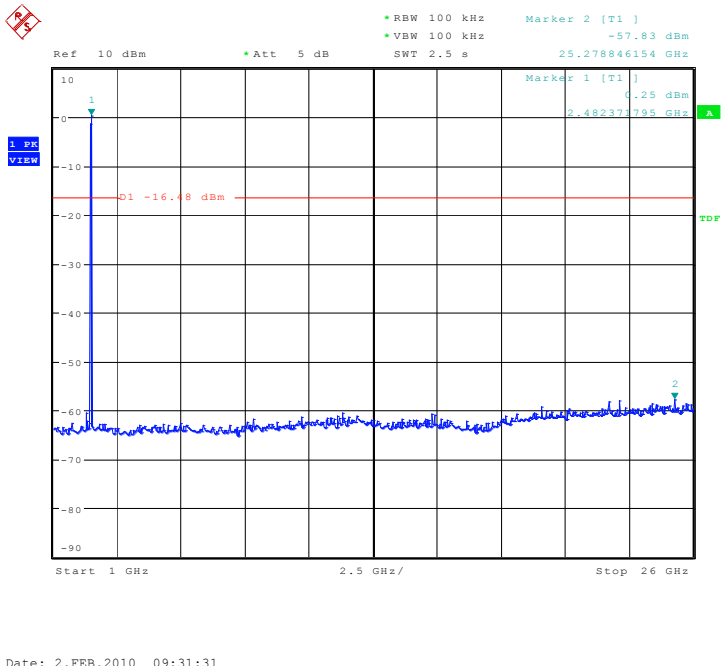


Fig. 30 Conducted spurious emission: π/4 DQPSK, Channel 78, 1GHz - 26GHz

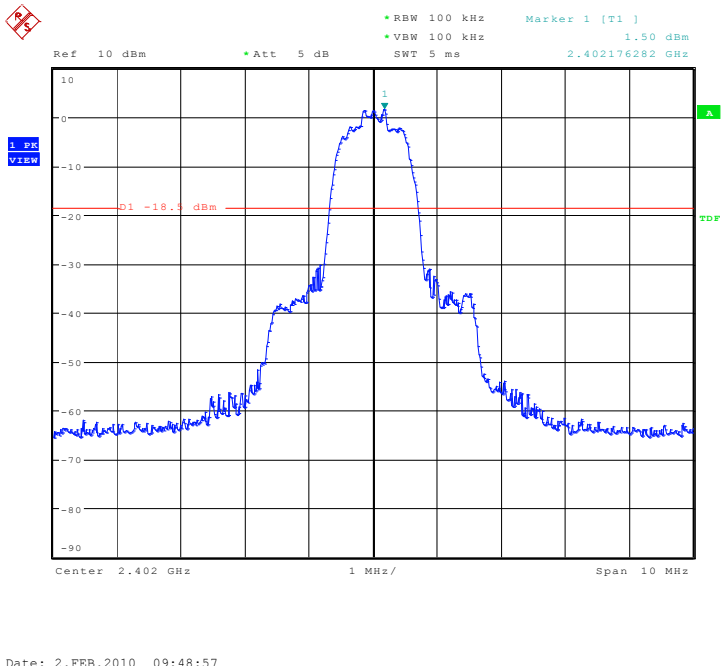


Fig. 31 Conducted spurious emission: 8DPSK, Channel 0,2402MHz

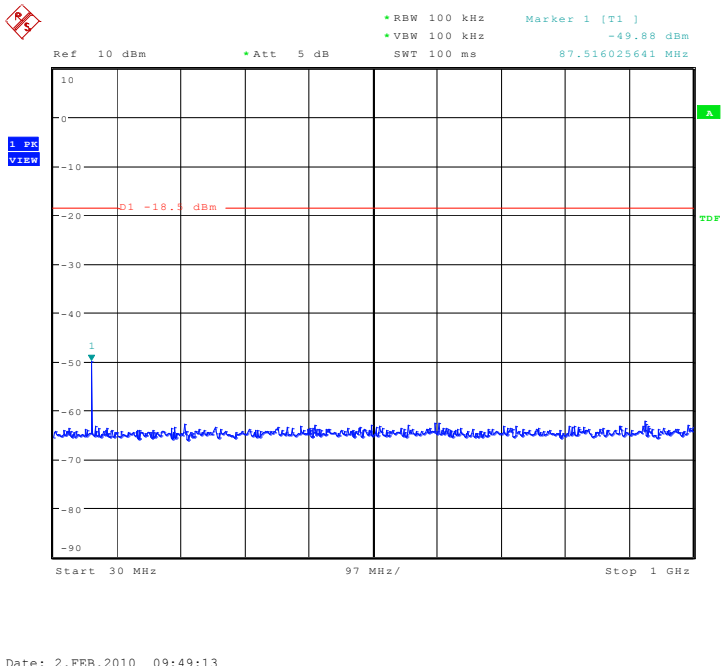


Fig. 32 Conducted spurious emission: 8DPSK, Channel 0, 30MHz - 1GHz

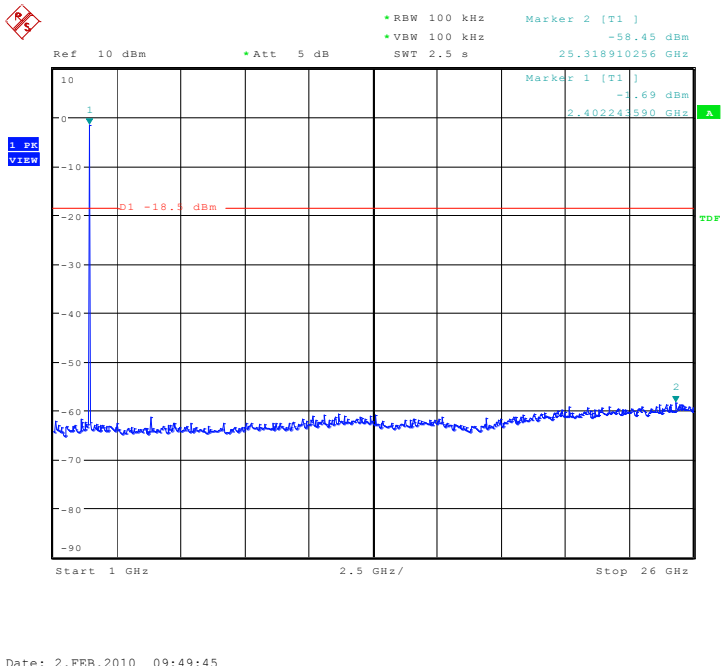


Fig. 33 Conducted spurious emission: 8DPSK, Channel 0,1GHz - 26GHz

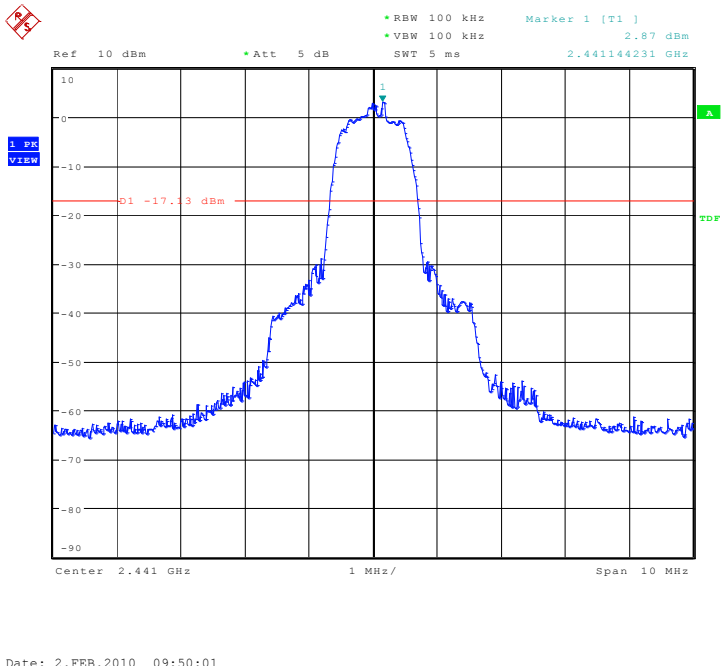


Fig. 34 Conducted spurious emission: 8DPSK, Channel 39, 2441MHz

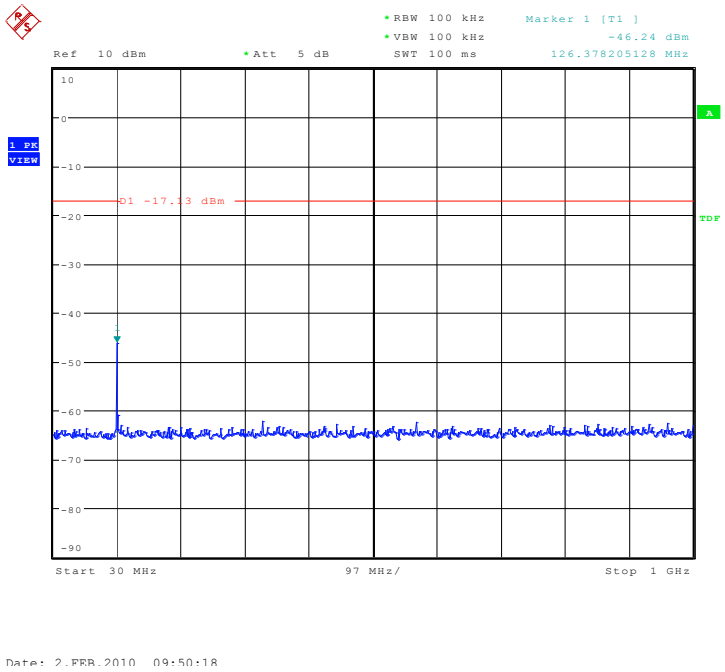


Fig. 35 Conducted spurious emission: 8DPSK, Channel 39, 30MHz - 1GHz

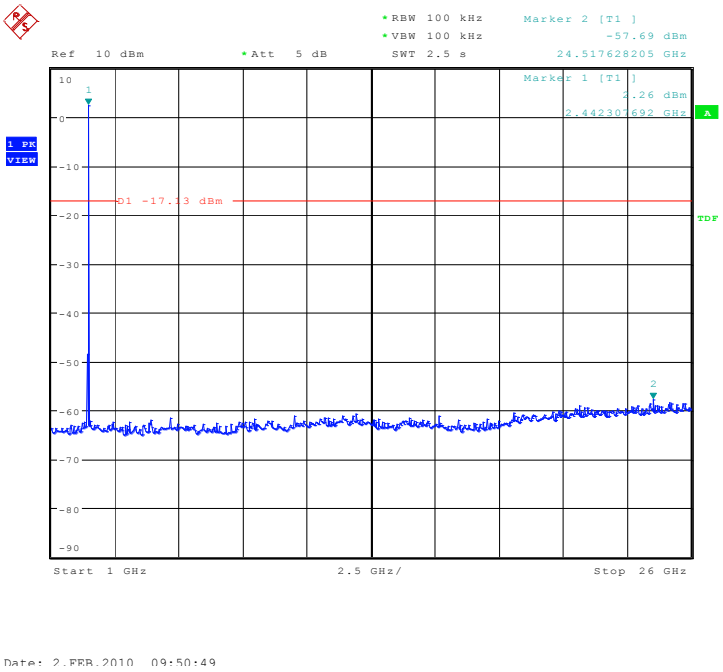


Fig. 36 Conducted spurious emission: 8DPSK, Channel 39, 1GHz – 26GHz

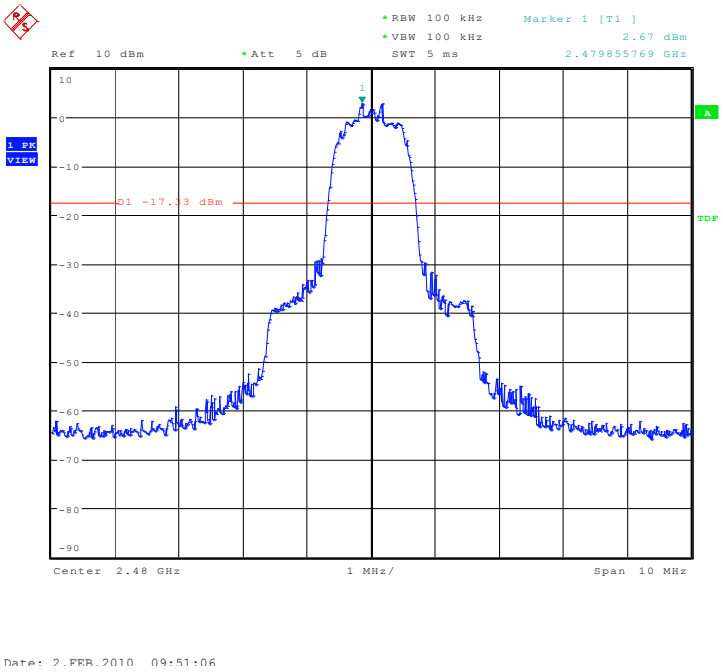


Fig. 37 Conducted spurious emission: 8DPSK, Channel 78, 2480MHz

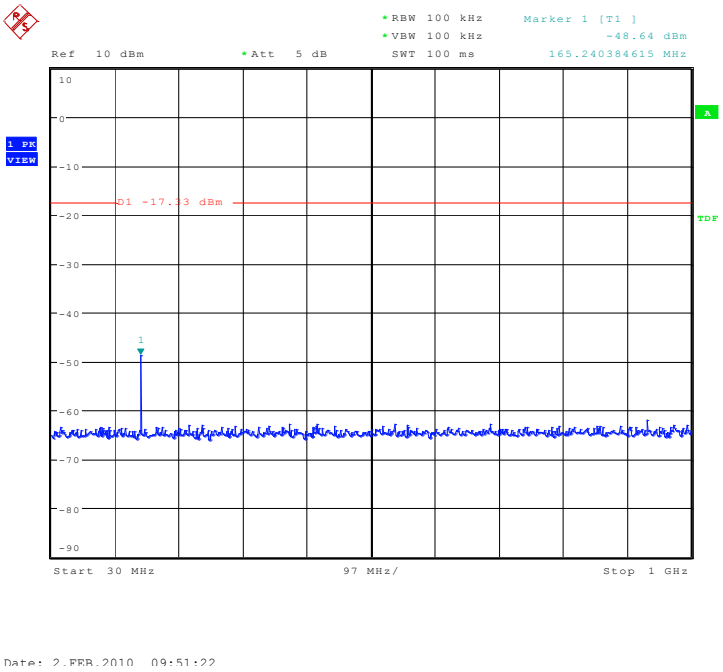


Fig. 38 Conducted spurious emission: 8DPSK, Channel 78, 30MHz - 1GHz

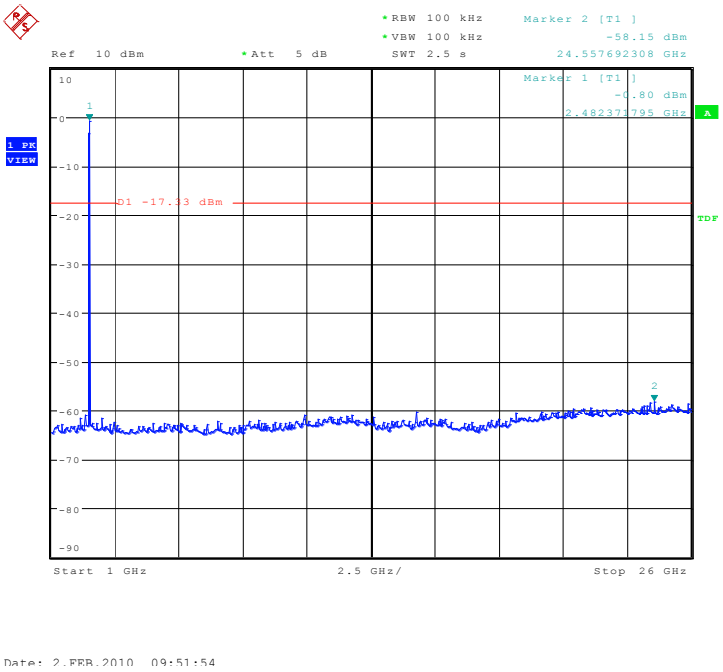


Fig. 39 Conducted spurious emission: 8DPSK, Channel 78, 1GHz - 26GHz

A.5. Radiated Emission

Measurement Limit:

Standard	Limit
FCC 47 CFR Part 15.247, 15.205, 15.209	20dB below peak output power

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

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

Limit in restricted band:

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

Test Condition

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

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

Measurement Results:

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

The measurement results are obtained as described below:

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

For GFSK

Channel	Frequency Range	Test Results	Conclusion
Ch 0 2402 MHz	30 MHz ~ 1 GHz	Fig.40	**P**
	1 GHz ~ 4 GHz	Fig.41	**P**
	4 GHz ~ 18 GHz	Fig.42	**P**
Ch 39 2441 MHz	30 MHz ~ 1 GHz	Fig.43	**P**
	1 GHz ~ 4 GHz	Fig.44	**P**
	4 GHz ~ 18 GHz	Fig.45	**P**

Ch 78 2480 MHz	30 MHz ~ 1 GHz	Fig.46	**P**
	1 GHz ~ 4 GHz	Fig.47	**P**
	4 GHz ~ 18 GHz	Fig.48	**P**
Power	2.45GHz~2.5GHz	Fig.49	**P**
For all channels	18 GHz ~ 26 GHz	Fig.50	**P**

Forπ/4 DQPSK

Channel	Frequency Range	Test Results	Conclusion
Ch 0 2402 MHz	30 MHz ~ 1 GHz	Fig.51	**P**
	1 GHz ~ 4 GHz	Fig.52	**P**
	4 GHz ~ 18 GHz	Fig.53	**P**
Ch 39 2441 MHz	30 MHz ~ 1 GHz	Fig.54	**P**
	1 GHz ~ 4 GHz	Fig.55	**P**
	4 GHz ~ 18 GHz	Fig.56	**P**
Ch 78 2480 MHz	30 MHz ~ 1 GHz	Fig.57	**P**
	1 GHz ~ 4 GHz	Fig.58	**P**
	4 GHz ~ 18 GHz	Fig.59	**P**
Power	2.45GHz~2.5GHz	Fig.60	**P**
For all channels	18 GHz ~ 26 GHz	Fig.61	**P**

For 8DPSK

Channel	Frequency Range	Test Results	Conclusion
Ch 0 2402 MHz	30 MHz ~ 1 GHz	Fig.62	**P**
	1 GHz ~ 4 GHz	Fig.63	**P**
	4 GHz ~ 18 GHz	Fig.64	**P**
Ch 39 2441 MHz	30 MHz ~ 1 GHz	Fig.65	**P**
	1 GHz ~ 4 GHz	Fig.66	**P**
	4 GHz ~ 18 GHz	Fig.67	**P**
Ch 78 2480 MHz	30 MHz ~ 1 GHz	Fig.68	**P**
	1 GHz ~ 4 GHz	Fig.69	**P**
	4 GHz ~ 18 GHz	Fig.70	**P**
Power	2.45GHz~2.5GHz	Fig.71	**P**
For all channels	18 GHz ~ 26 GHz	Fig.72	**P**

GFSK Ch 0

Frequency(MHz)	Result(dBuV/m)	ARpl (dB)	PMea(dBuV/m)	Polarity
3819.639	52.34	14.1	38.24	HORIZONTAL
3547.094	52.16	14.3	37.86	HORIZONTAL
3783.567	52.07	14.2	37.87	HORIZONTAL
3685.371	51.82	14.2	37.62	HORIZONTAL
3462.926	51.73	11.9	39.83	HORIZONTAL
3739.479	51.73	14.4	37.33	HORIZONTAL

GFSK Ch 39

Frequency(MHz)	Result(dBuV/m)	ARpl (dB)	PMea(dBuV/m)	Polarity
3675.351	52.16	14.2	37.96	HORIZONTAL
3579.158	51.94	14.2	37.74	HORIZONTAL
3707.415	51.89	14.3	37.59	HORIZONTAL
3515.03	51.76	14.4	37.36	HORIZONTAL
3717.435	51.75	14.5	37.25	HORIZONTAL
3699.399	51.56	14.2	37.36	HORIZONTAL

GFSK Ch 78

Frequency(MHz)	Result(dBuV/m)	ARpl (dB)	PMea(dBuV/m)	Polarity
3891.784	52.51	14.4	38.11	HORIZONTAL
3807.615	52.39	14.2	38.19	HORIZONTAL
3965.932	51.99	14.4	37.59	HORIZONTAL
3637.275	51.91	14.1	37.81	HORIZONTAL
3490.982	51.88	12.3	39.58	HORIZONTAL
3705.411	51.66	14.3	37.36	HORIZONTAL

Conclusion: PASS

Test graphs as below:

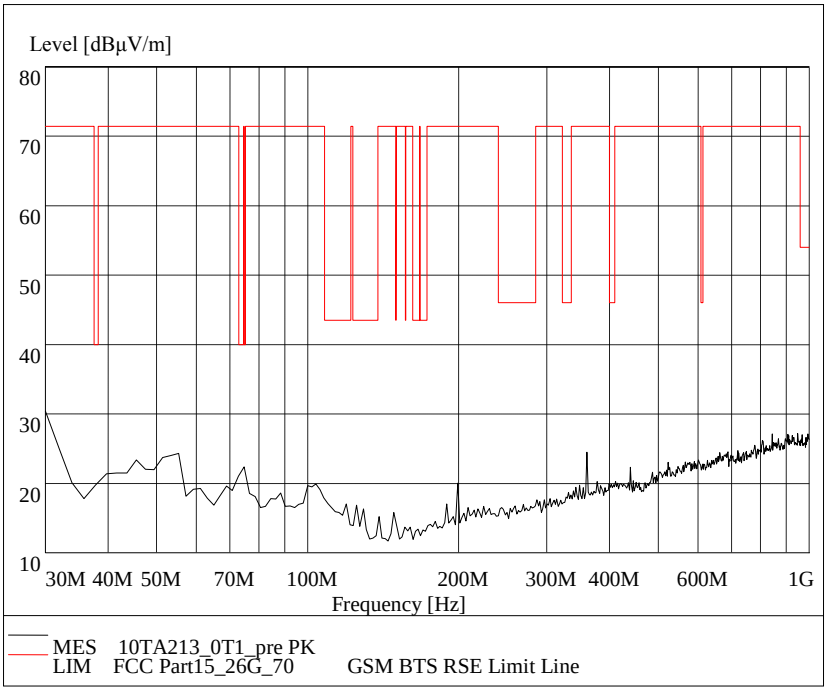


Fig. 40 Radiated emission: GFSK, Channel 0, 30 MHz - 1 GHz

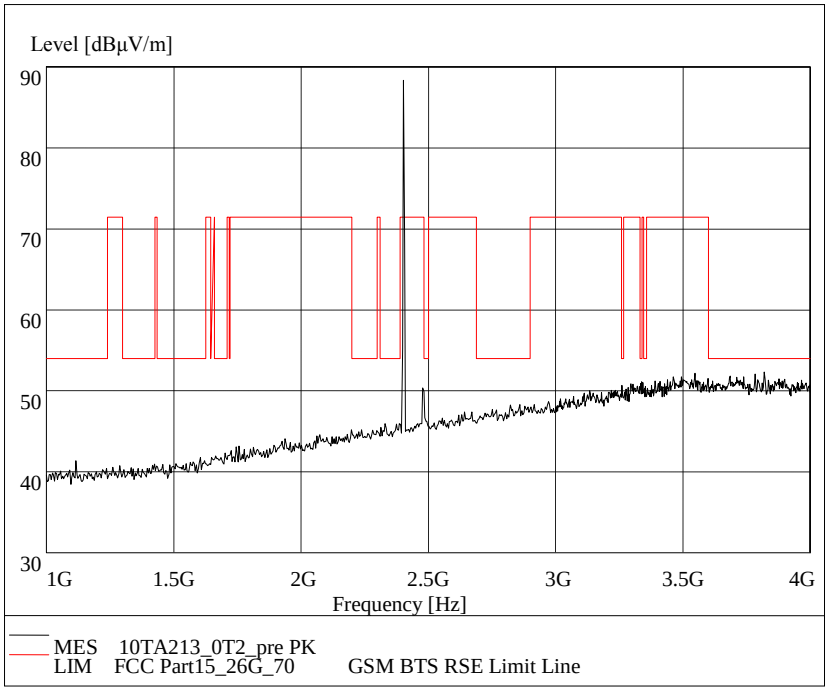


Fig. 41 Radiated emission: GFSK, Channel 0, 1 GHz - 4 GHz

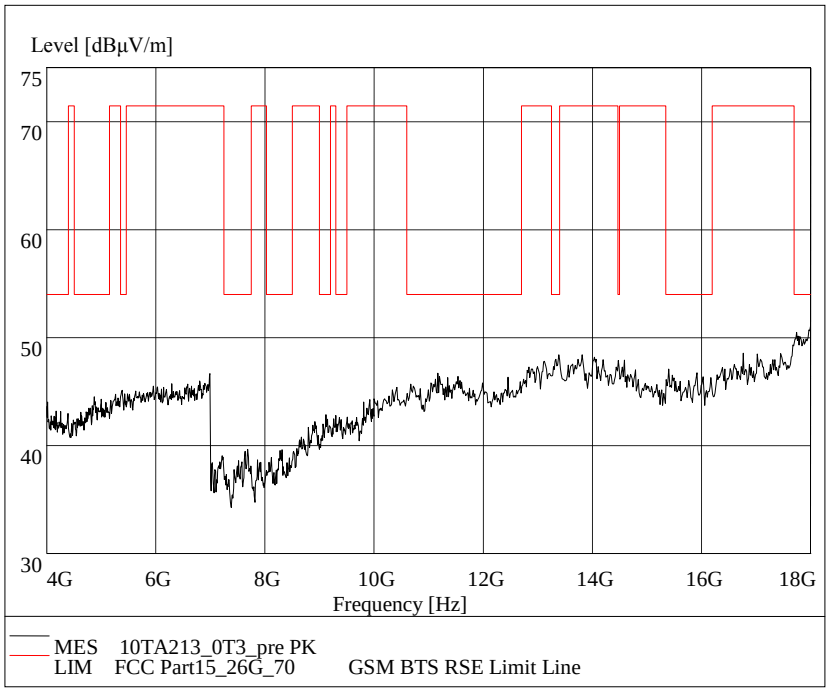


Fig. 42 Radiated emission: GFSK, Channel 0, 4 GHz - 18 GHz

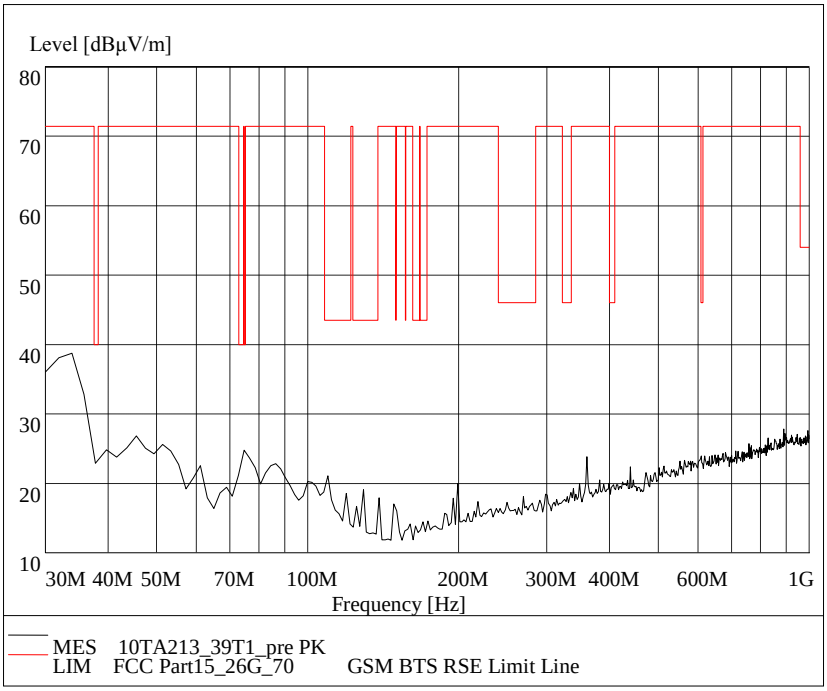


Fig. 43 Radiated emission: GFSK, Channel 39, 30 MHz - 1 GHz

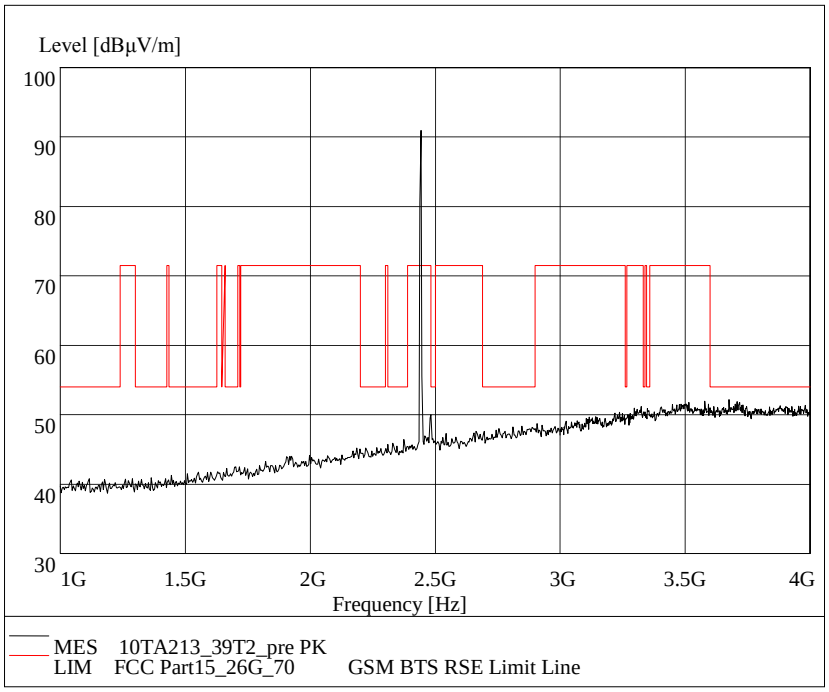


Fig. 44 Radiated emission: GFSK, Channel 39, 1 GHz - 4 GHz

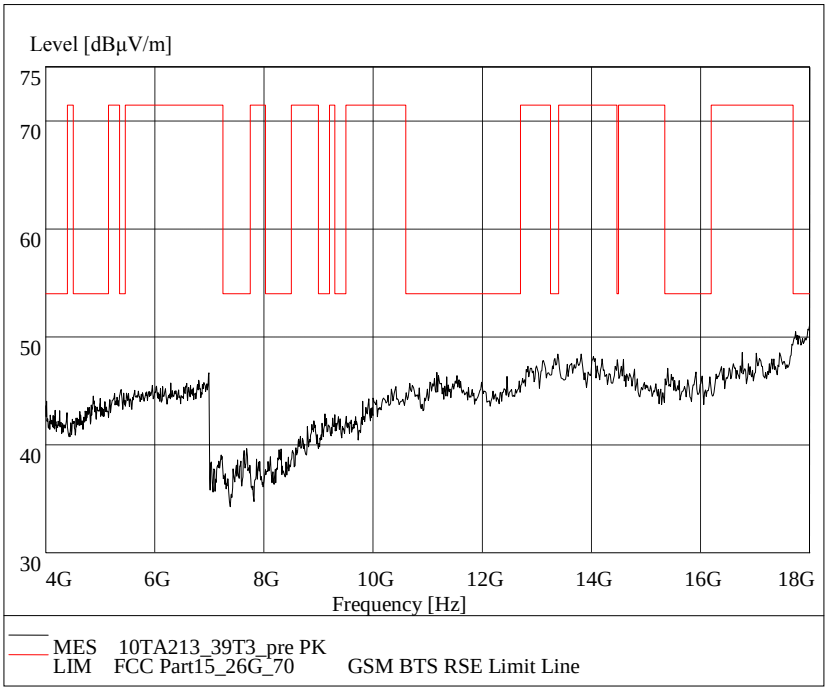


Fig. 45 Radiated emission: GFSK, Channel 39, 4 GHz - 18 GHz

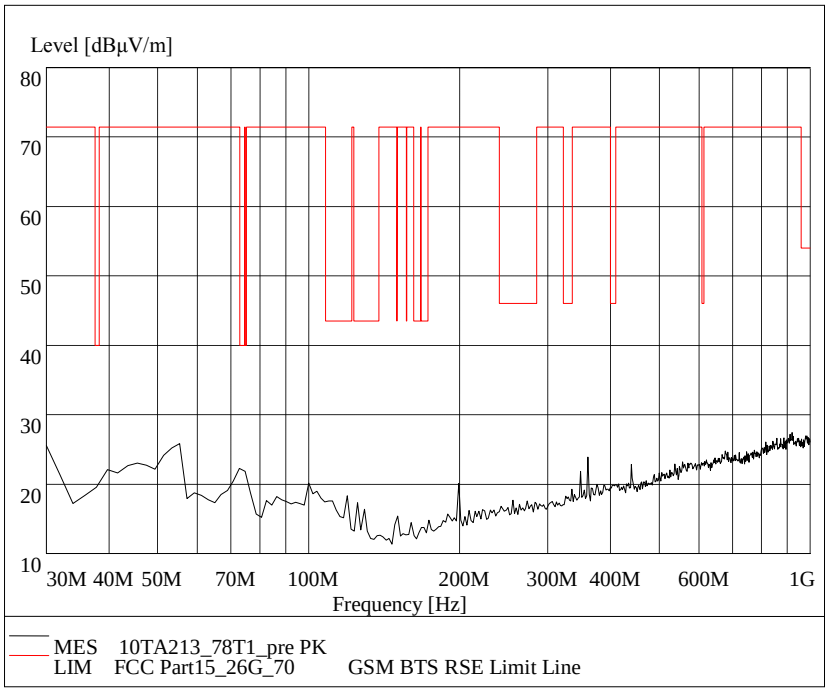


Fig. 46 Radiated emission: GFSK, Channel 78, 30 MHz - 1 GHz

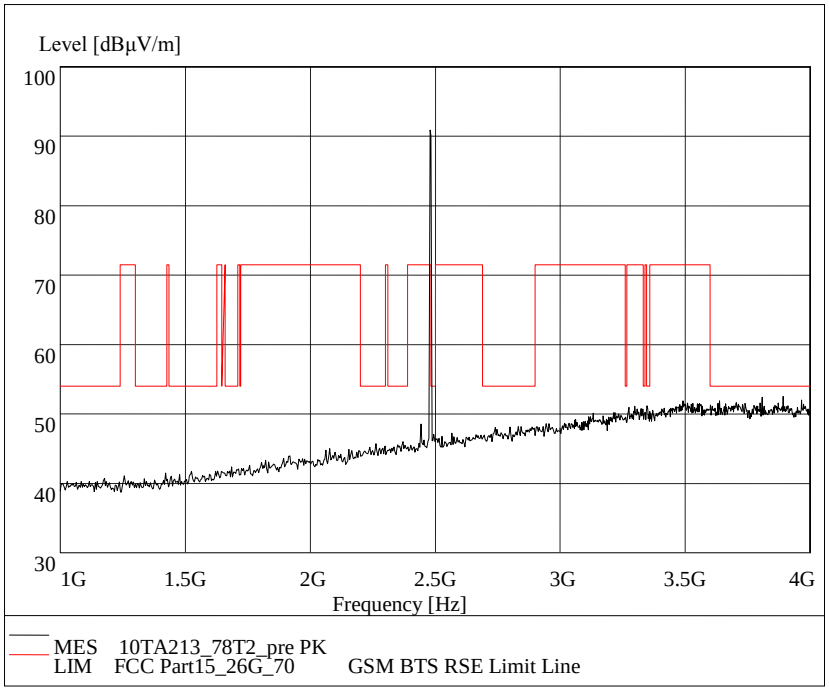


Fig. 47 Radiated emission: GFSK, Channel 78, 1 GHz - 4 GHz

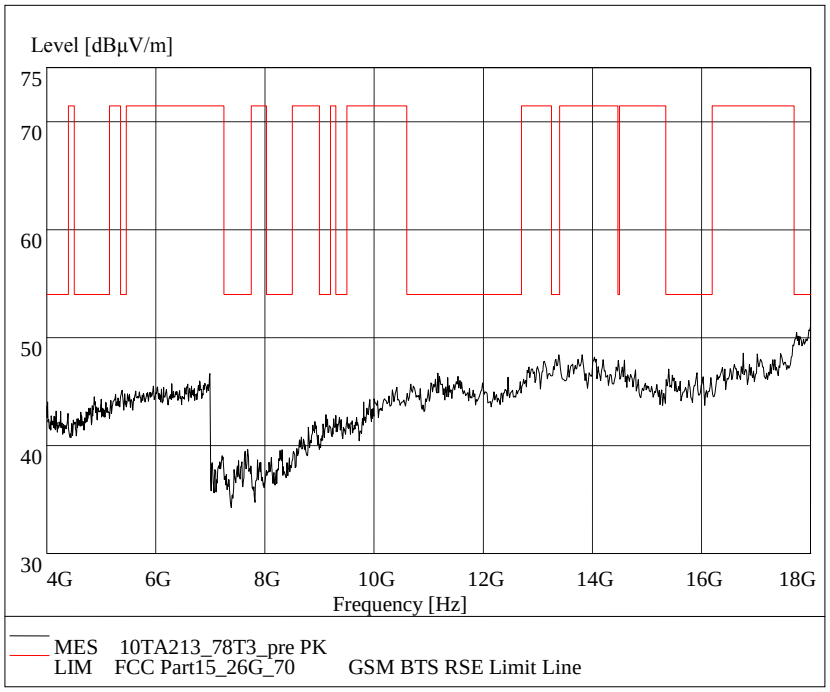


Fig. 48 Radiated emission: GFSK, Channel 78, 4 GHz - 18 GHz

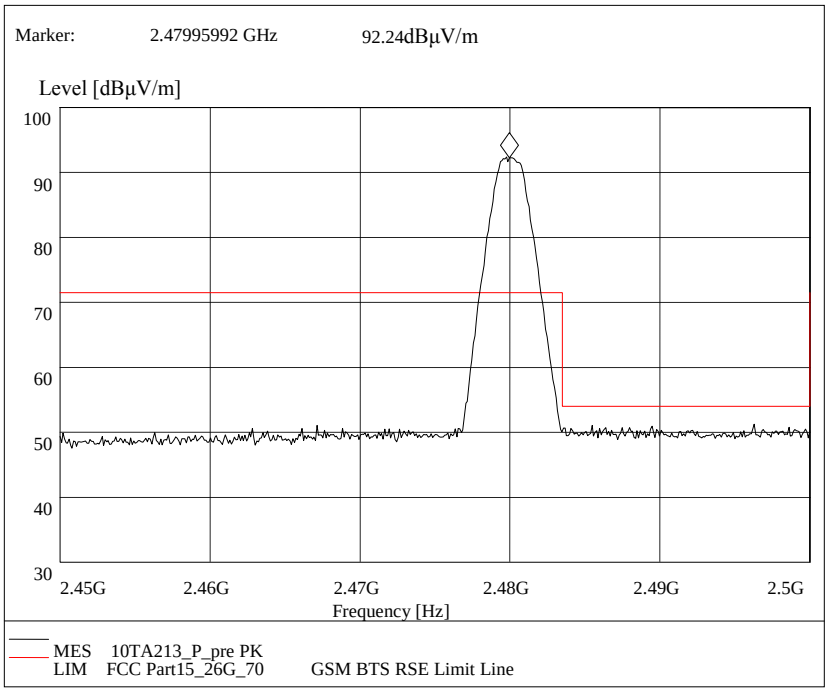


Fig. 49 Radiated emission (Power): GFSK, 2.45GHz - 2.5GHz

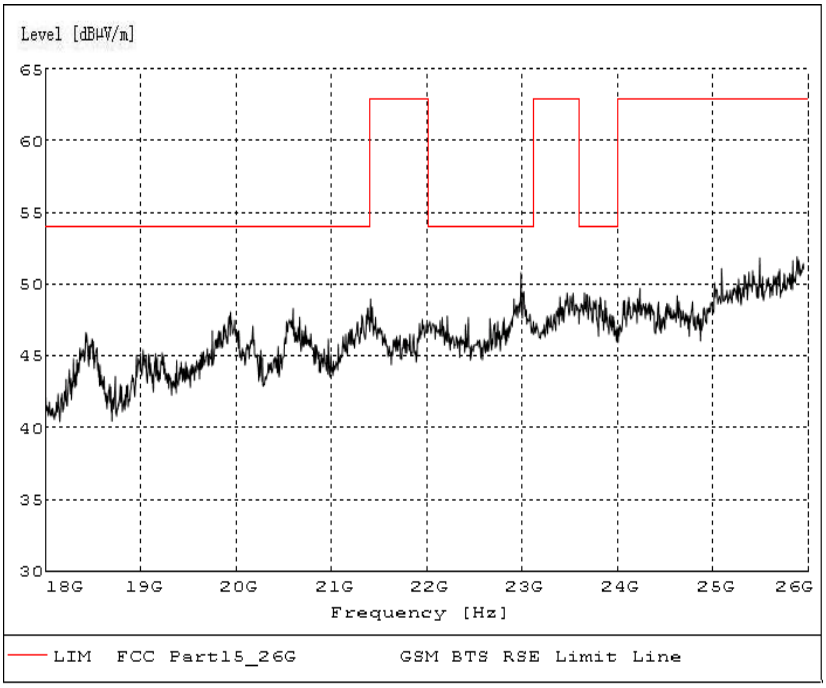


Fig. 50 Radiated emission: GFSK, 18 GHz - 26 GHz

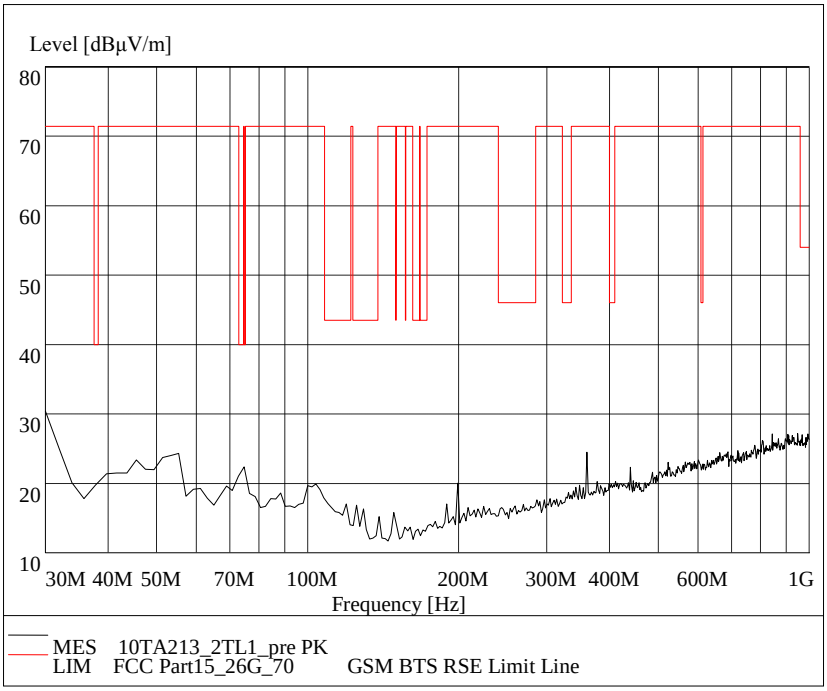


Fig. 51 Radiated emission: π/4 DQPSK, Channel 0, 30 MHz - 1 GHz

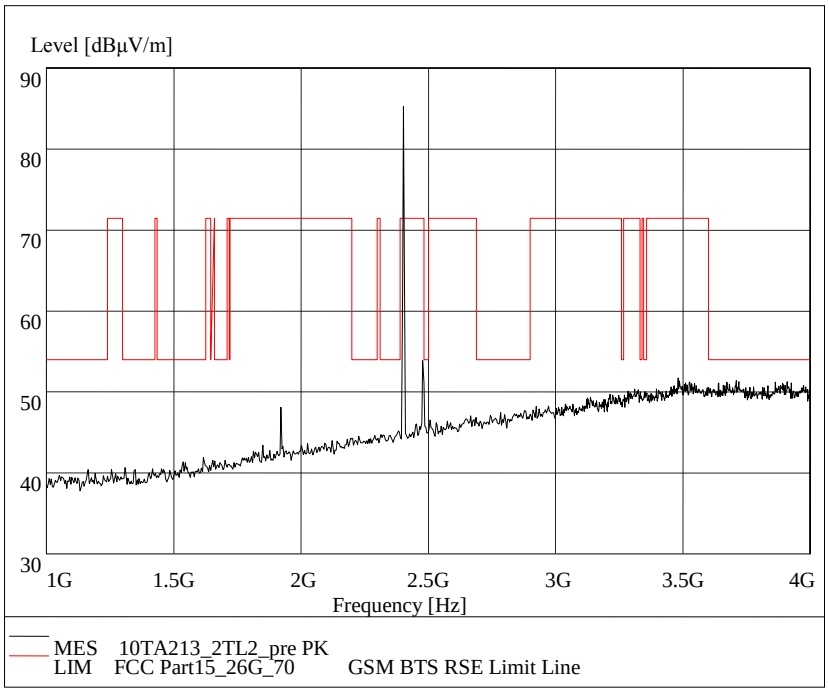


Fig. 52 Radiated emission: π/4 DQPSK, Channel 0, 1 GHz - 4 GHz

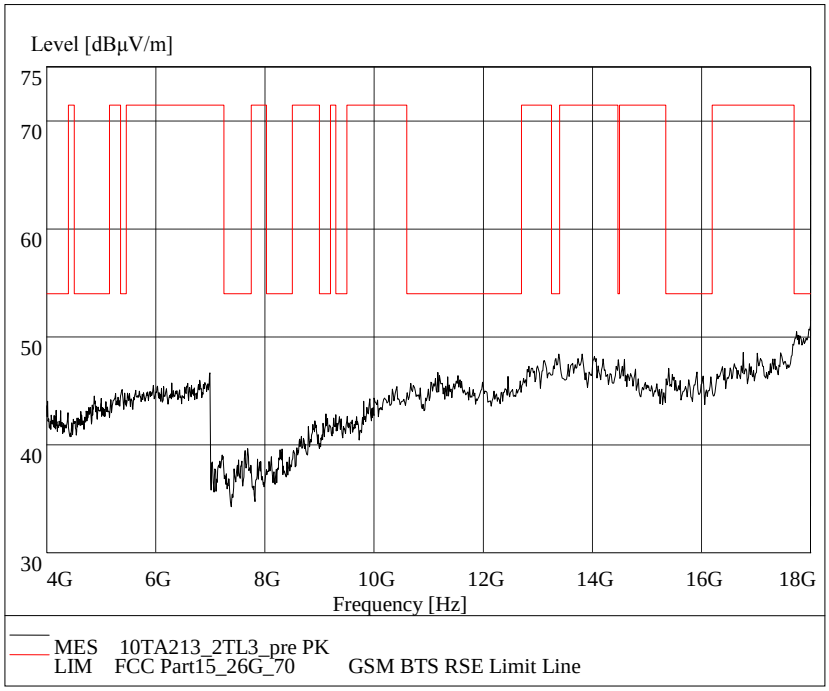


Fig. 53 Radiated emission: π/4 DQPSK, Channel 0, 4 GHz - 18 GHz

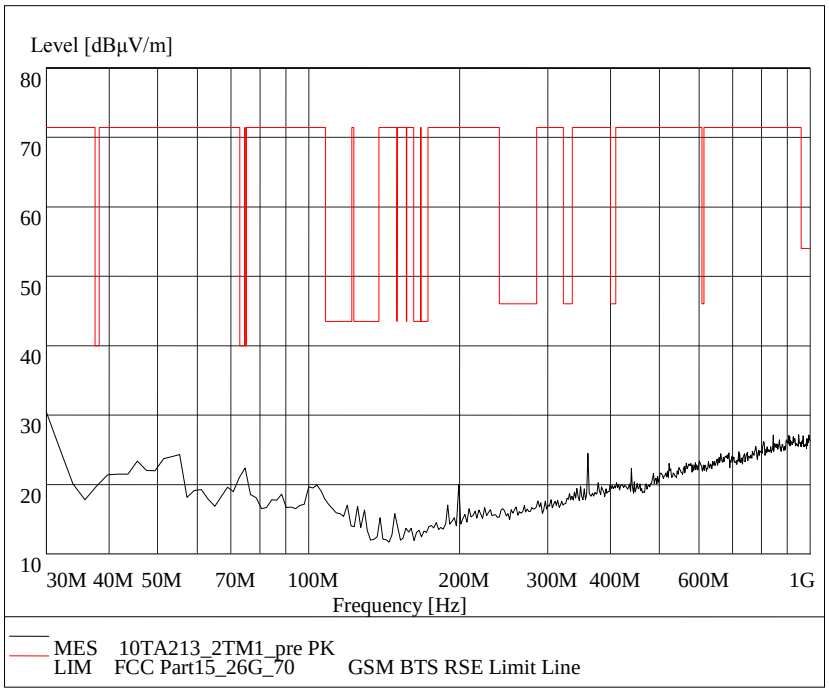


Fig. 54 Radiated emission: π/4 DQPSK, Channel 39, 30 MHz - 1 GHz

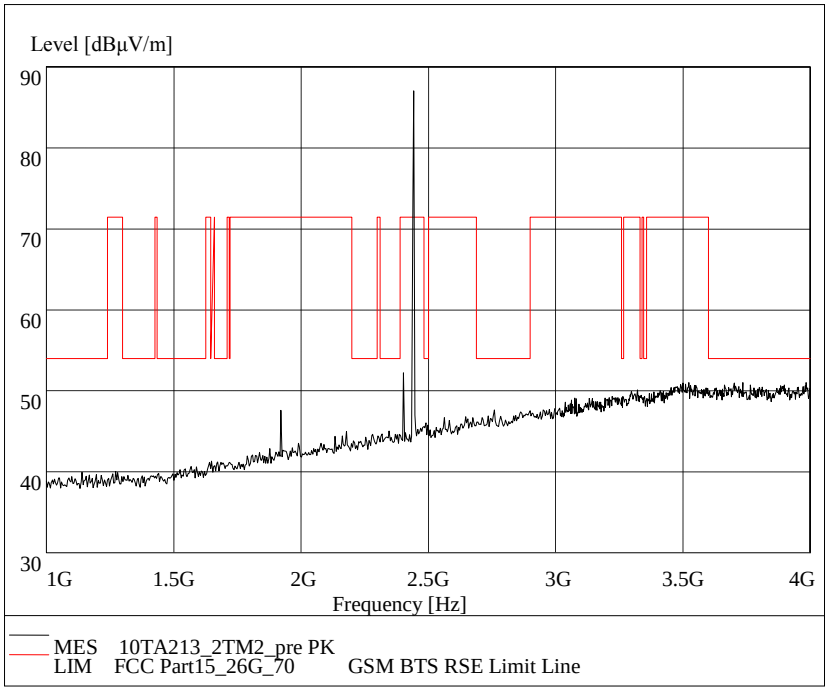


Fig. 55 Radiated emission: π/4 DQPSK, Channel 39, 1 GHz - 4 GHz

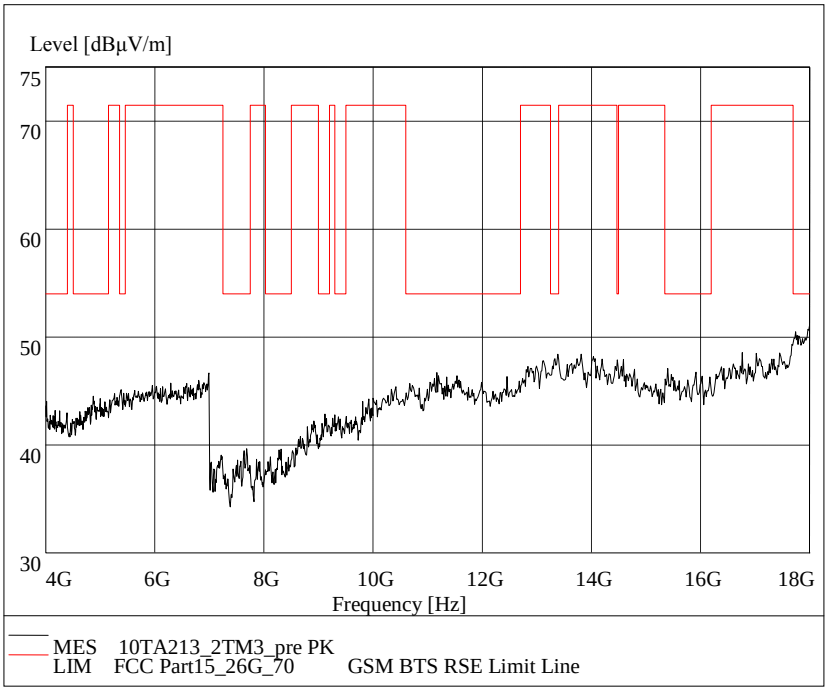


Fig. 56 Radiated emission: π/4 DQPSK, Channel 39, 4 GHz - 18 GHz

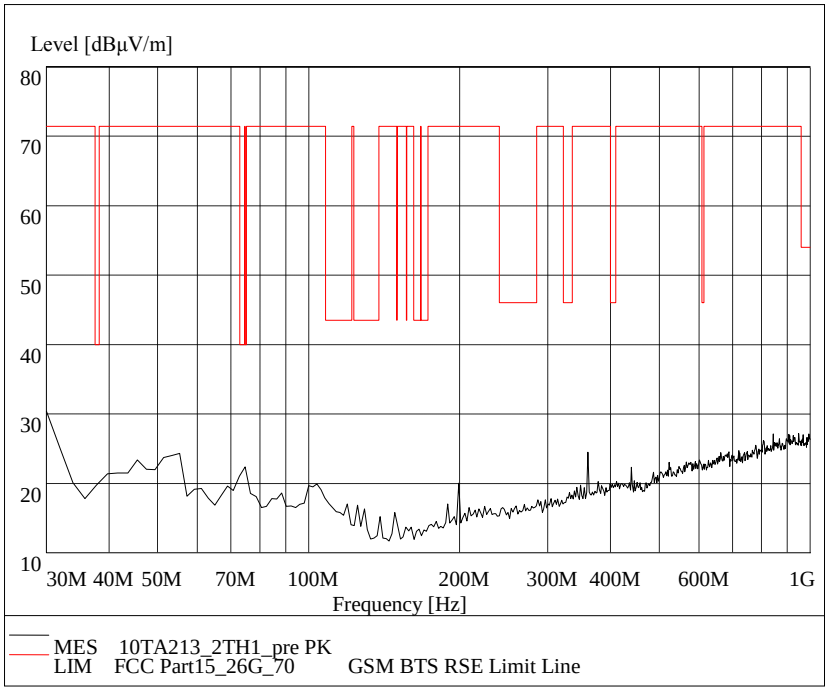


Fig. 57 Radiated emission: π/4 DQPSK, Channel 78, 30 MHz - 1 GHz

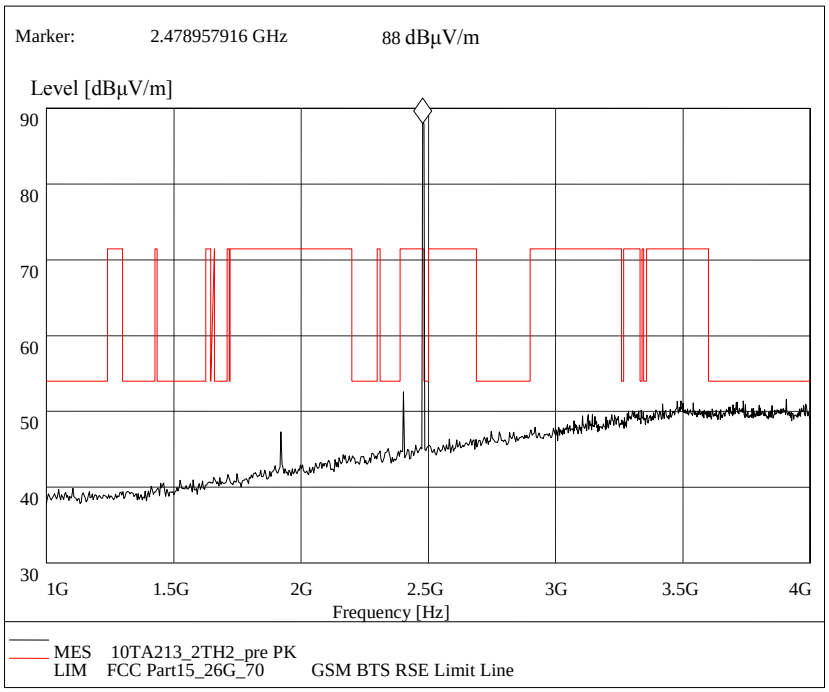


Fig. 58 Radiated emission: π/4 DQPSK, Channel 78, 1 GHz - 4 GHz

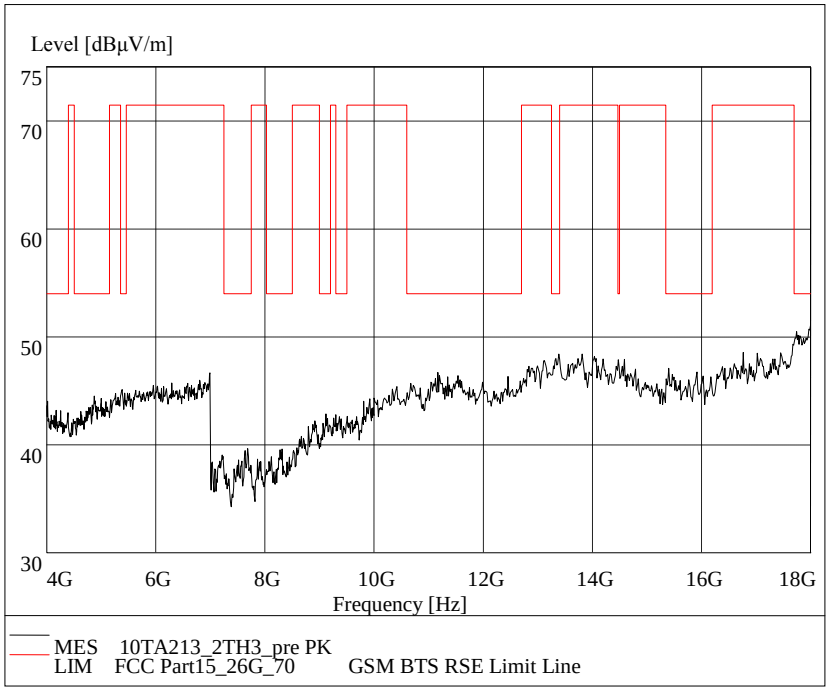


Fig. 59 Radiated emission: π/4 DQPSK, Channel 78, 4 GHz - 18 GHz

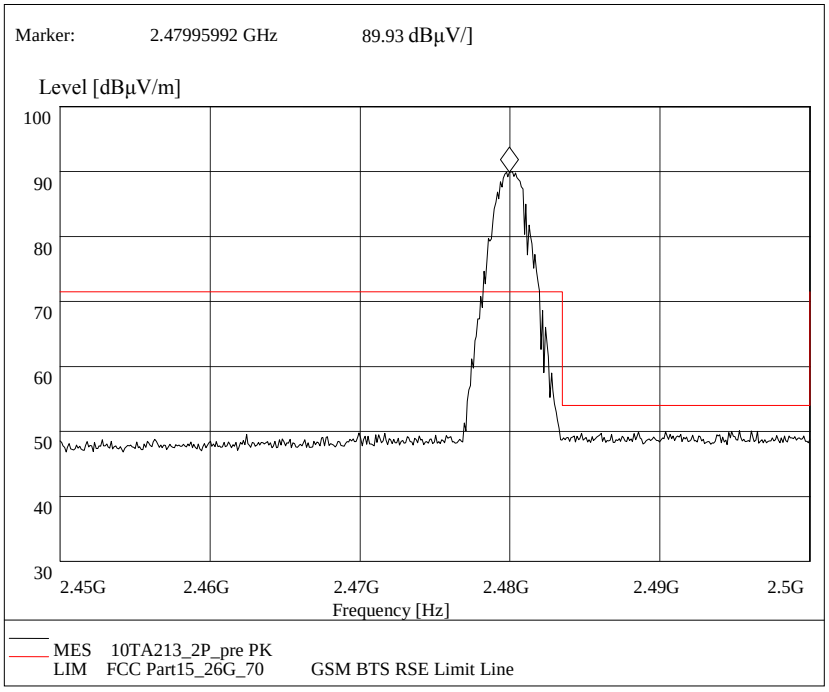


Fig. 60 Radiated emission (Power): π/4 DQPSK, 2.45GHz - 2.5GHz

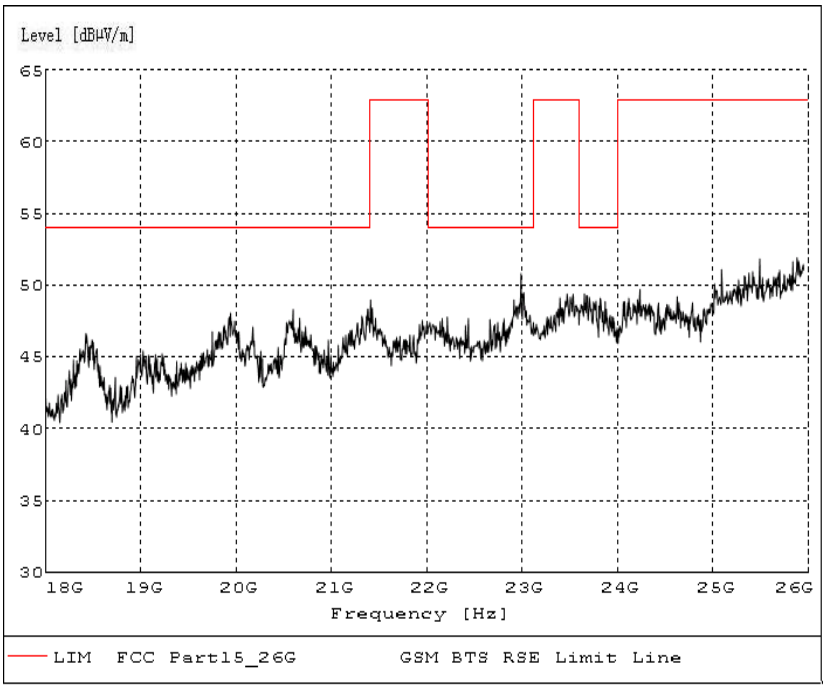


Fig. 61 Radiated emission: π/4 DQPSK, 18 GHz - 26 GHz

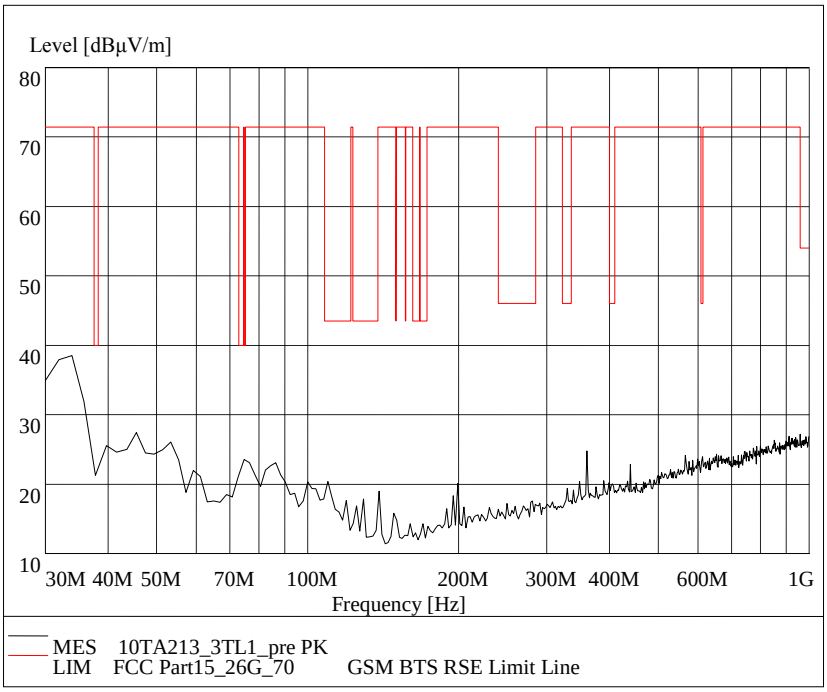


Fig. 62 Radiated emission: 8DPSK, Channel 0, 30 MHz - 1 GHz

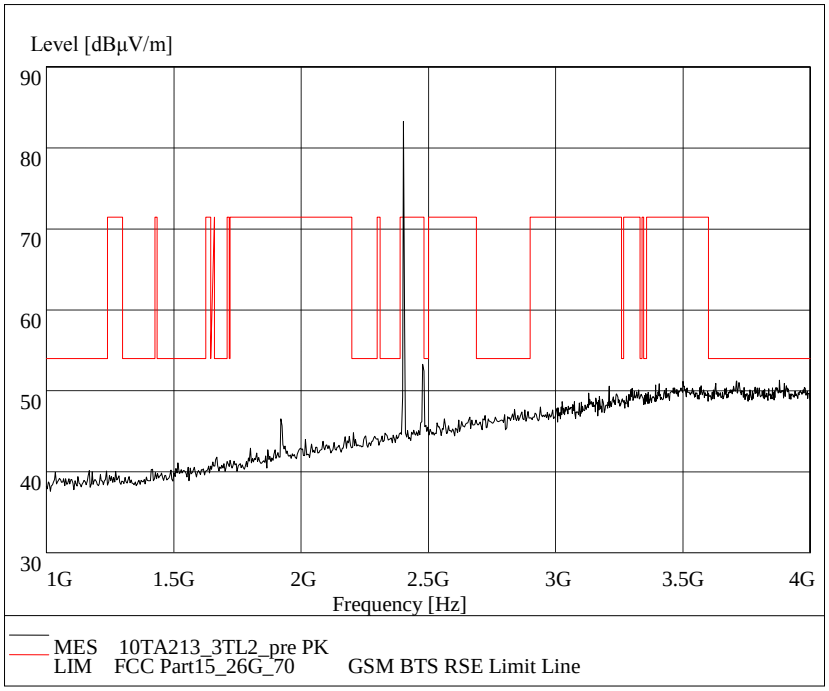


Fig. 63 Radiated emission: 8DPSK, Channel 0, 1 GHz - 4 GHz

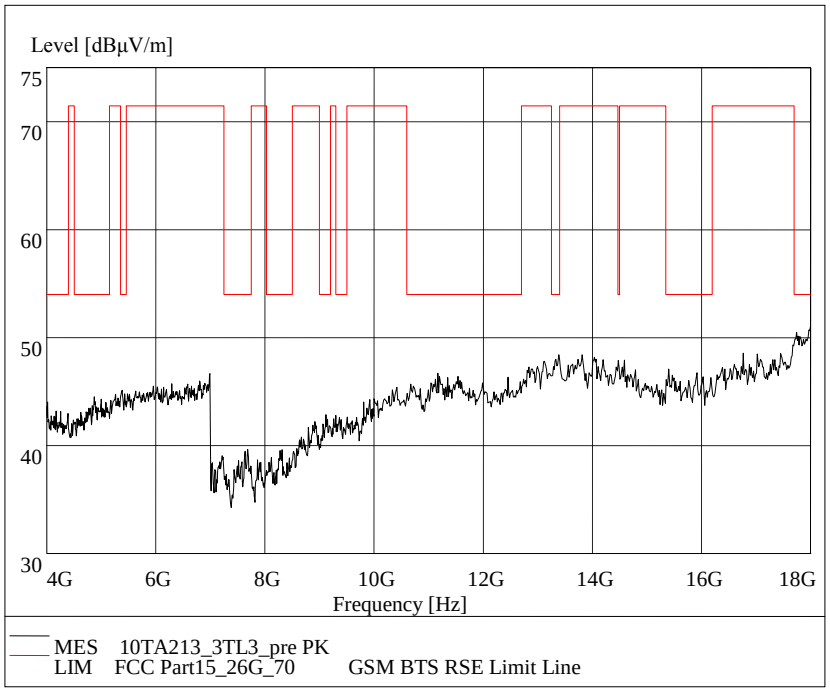


Fig. 64 Radiated emission: 8DPSK, Channel 0, 4 GHz - 18 GHz

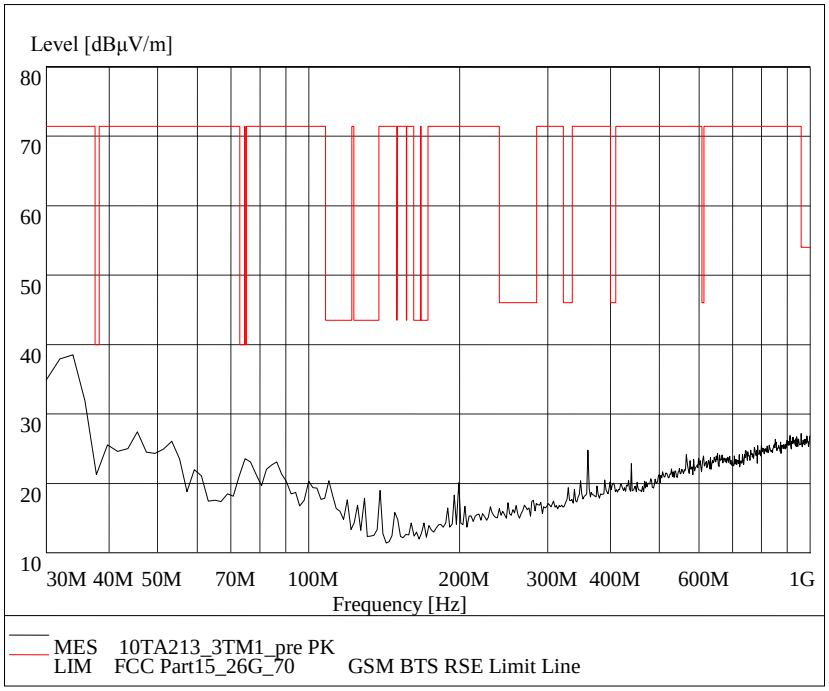


Fig. 65 Radiated emission: 8DPSK, Channel 39, 30 MHz - 1 GHz

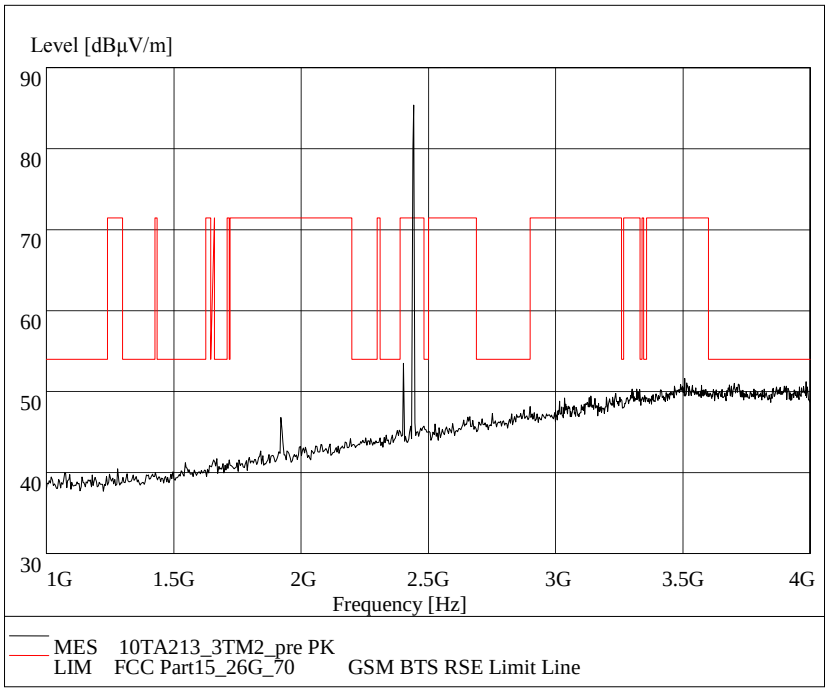


Fig. 66 Radiated emission: 8DPSK, Channel 39, 1 GHz - 4 GHz

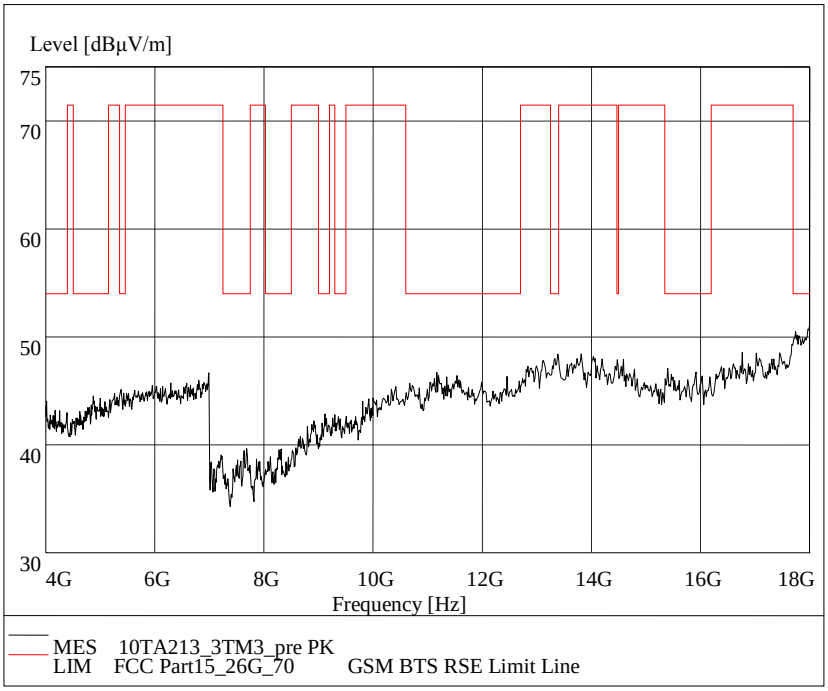


Fig. 67 Radiated emission: 8DPSK, Channel 39, 4 GHz - 18 GHz

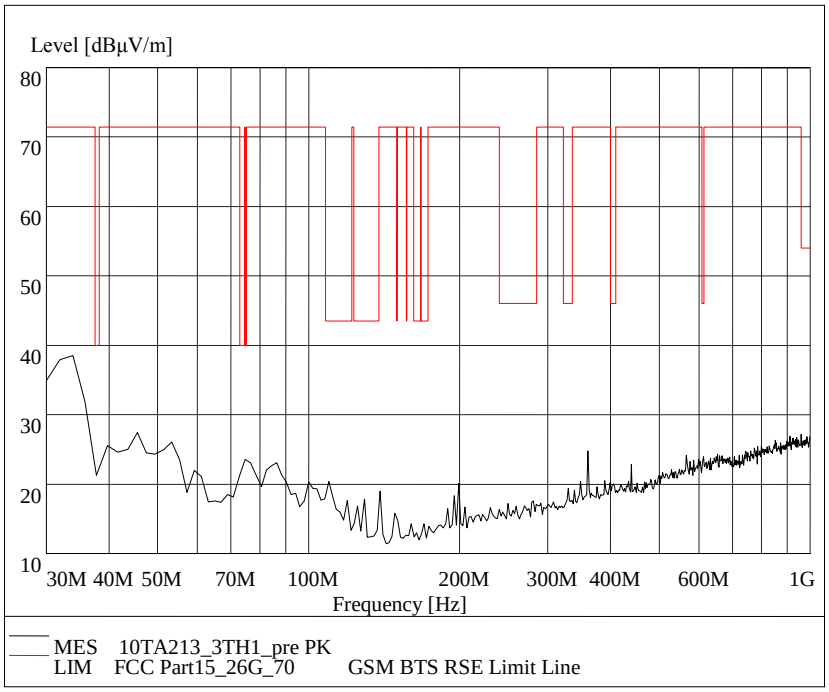


Fig. 68 Radiated emission: 8DPSK, Channel 78, 30 MHz - 1 GHz

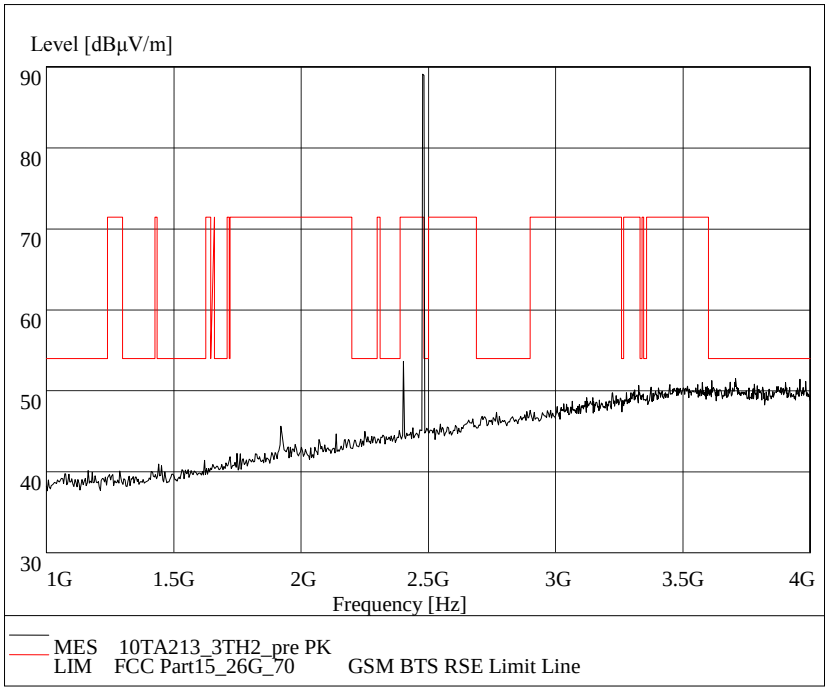


Fig. 69 Radiated emission: 8DPSK, Channel 78, 1 GHz - 4 GHz

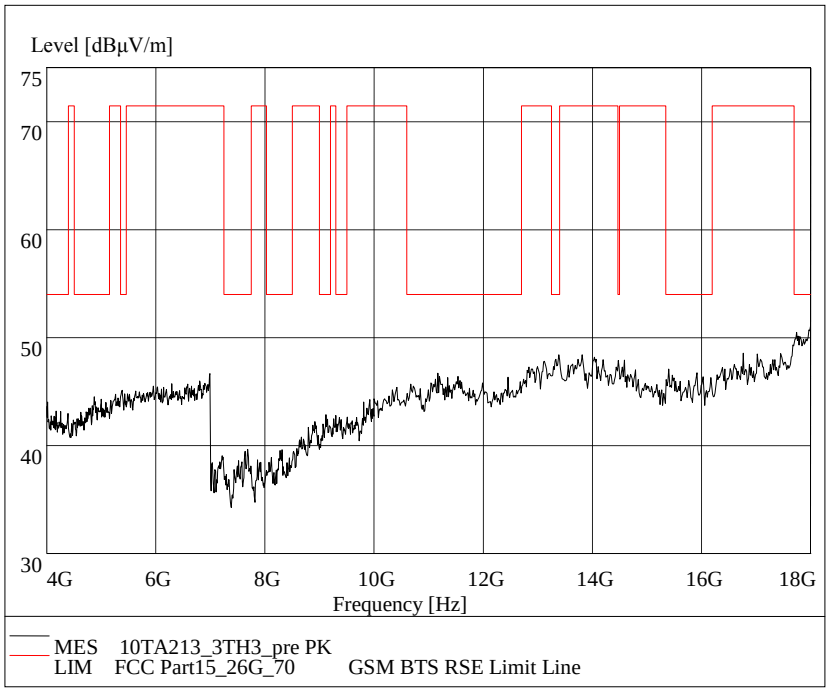


Fig. 70 Radiated emission: 8DPSK, Channel 78, 4 GHz - 18 GHz

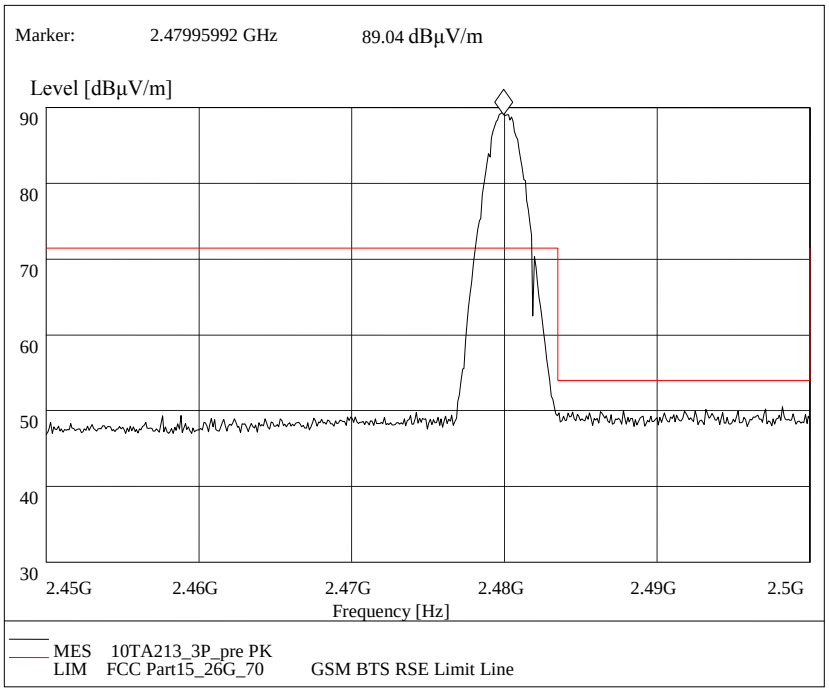


Fig. 71 Radiated emission (Power): 8DPSK, 2.45GHz - 2.5GHz

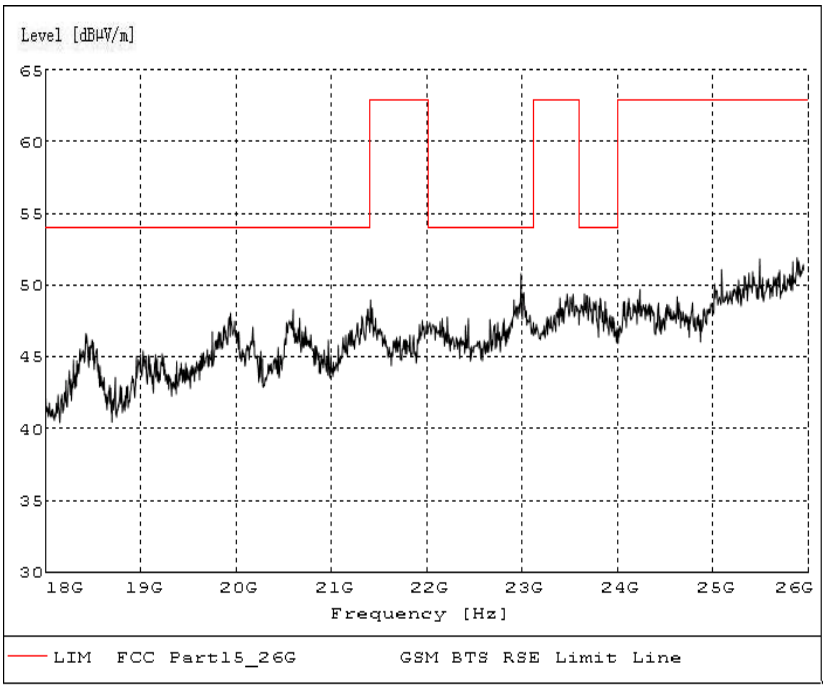


Fig. 72 Radiated emission: 8DPSK, 18 GHz - 26 GHz

A.6. Time of Occupancy (Dwell Time)

Measurement Limit:

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

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

Measurement Result:

For GFSK

Channel	Packet	Dwell Time (ms)		Conclusion
39	DH1	Fig.73	112.25	P
		Fig.74		
	DH3	Fig.75	179.34	P
		Fig.76		
	DH5	Fig.77	178.07	P
		Fig.78		

For π/4 DQPSK

Channel	Packet	Dwell Time (ms)		Conclusion
39	DH1	Fig.79	110.93	P
		Fig.80		
	DH3	Fig.81	171.04	P
		Fig.82		
	DH5	Fig.83	189.75	P
		Fig.84		

For 8DPSK

Channel	Packet	Dwell Time (ms)		Conclusion
39	DH1	Fig.85	114.55	P
		Fig.86		
	DH3	Fig.87	158.26	P
		Fig.88		
	DH5	Fig.89	166.70	P
		Fig.90		

Conclusion: PASS

Test graphs as below:

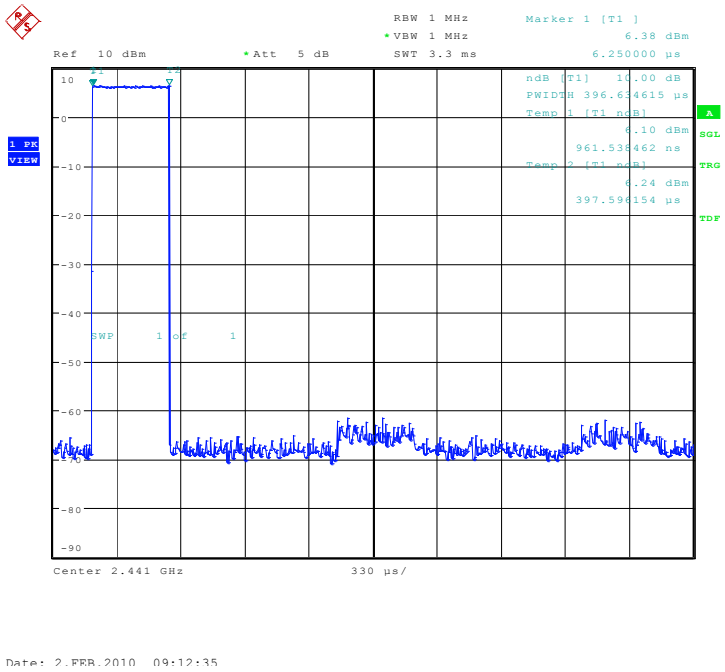


Fig. 73 Time of occupancy (Dwell Time): Channel 39, Packet DH1

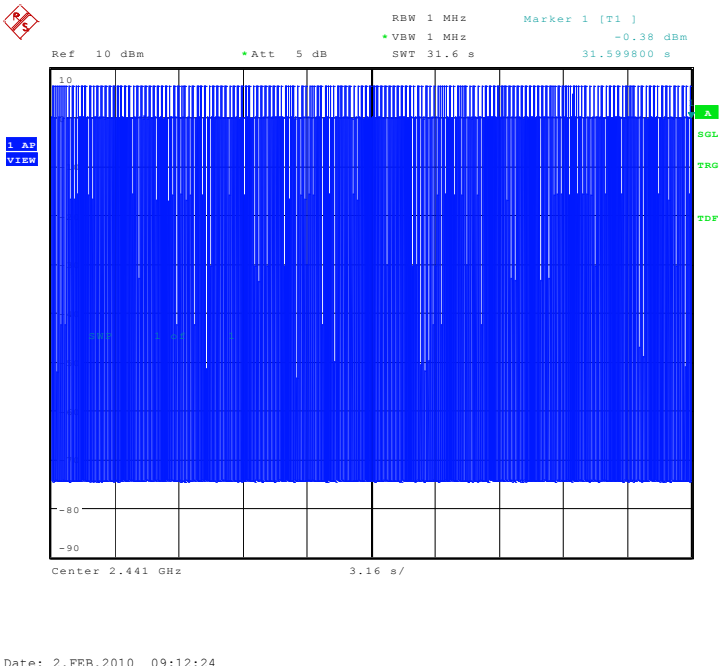


Fig. 74 Number of Transmissions Measurement:Channel 39,Packet DH1

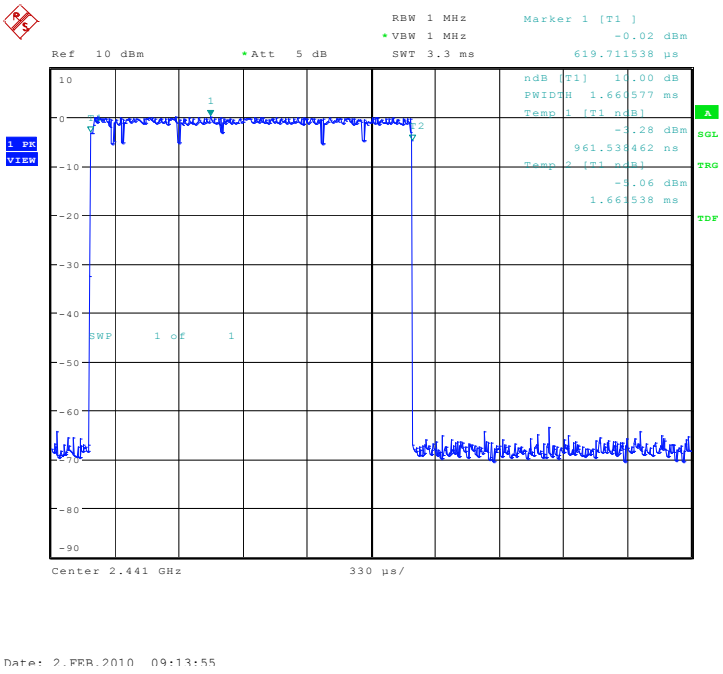


Fig. 75 Time of occupancy (Dwell Time): Channel 39, Packet DH3

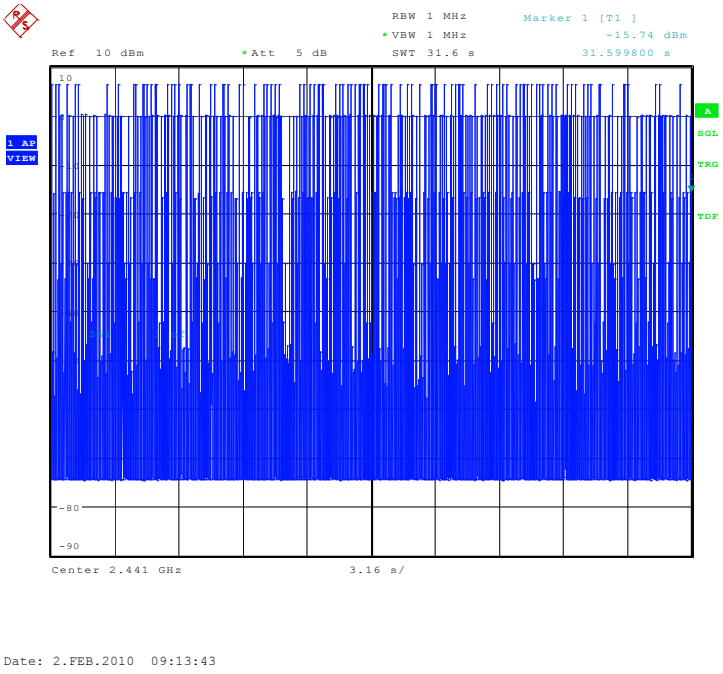


Fig. 76 Number of Transmissions Measurement:Channel 39,Packet DH3

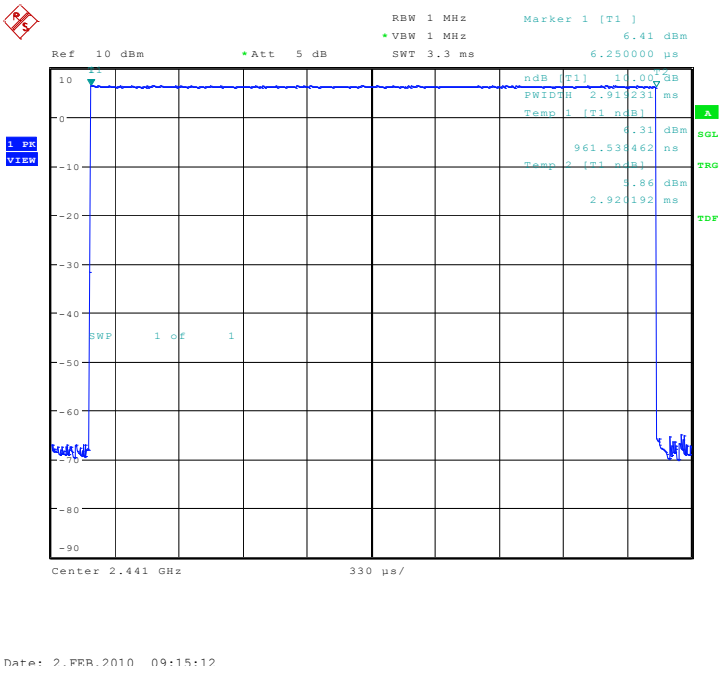


Fig. 77 Time of occupancy (Dwell Time): Channel 39, Packet DH5

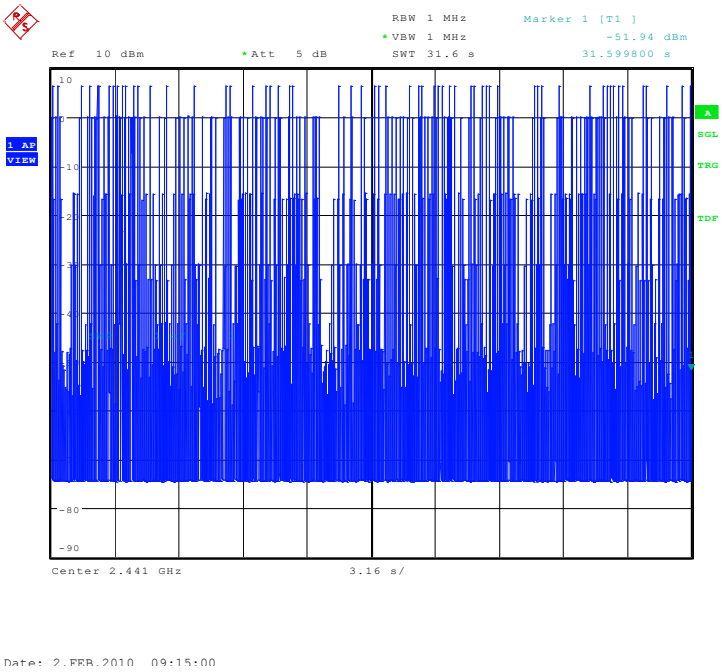


Fig. 78 Number of Transmissions Measurement:Channel 39,Packet DH5

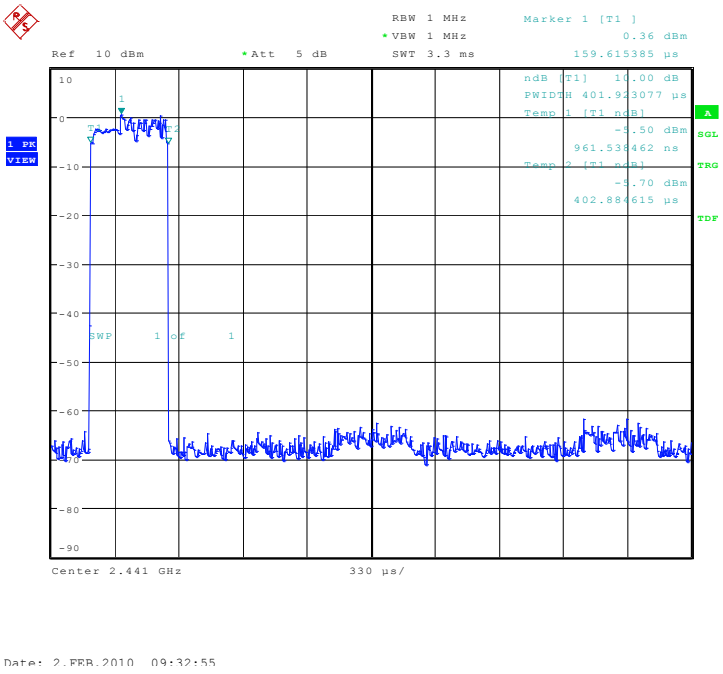


Fig. 79 Time of occupancy (Dwell Time): Channel 39, Packet 2-DH1

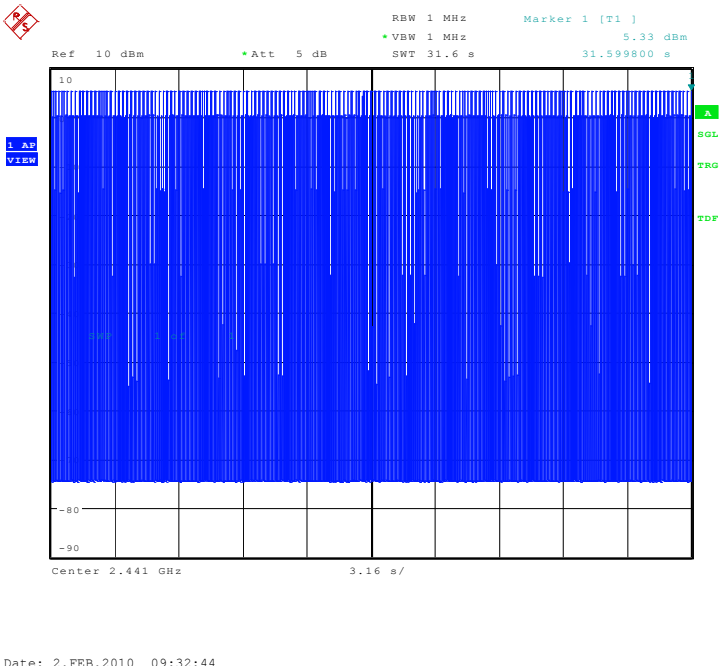


Fig. 80 Number of Transmissions Measurement:Channel 39,Packet 2-DH1

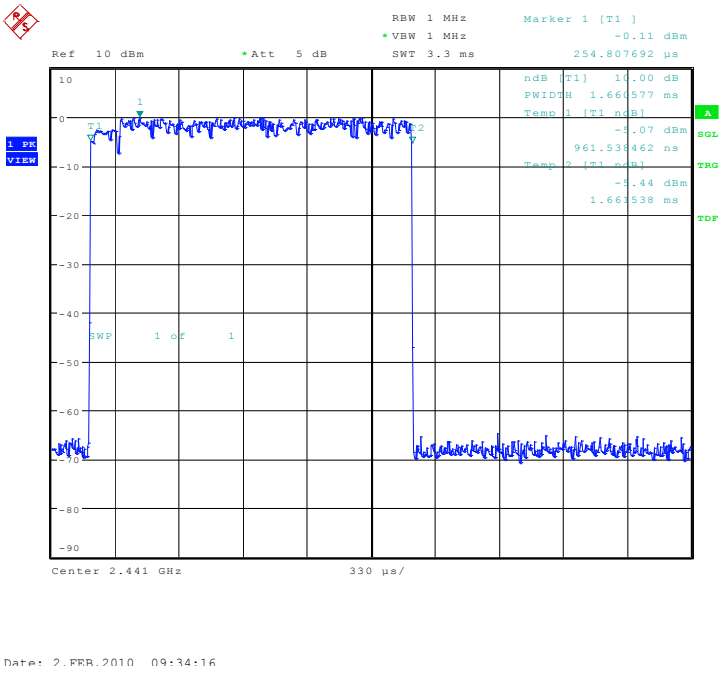


Fig. 81 Time of occupancy (Dwell Time): Channel 39, Packet 2-DH3

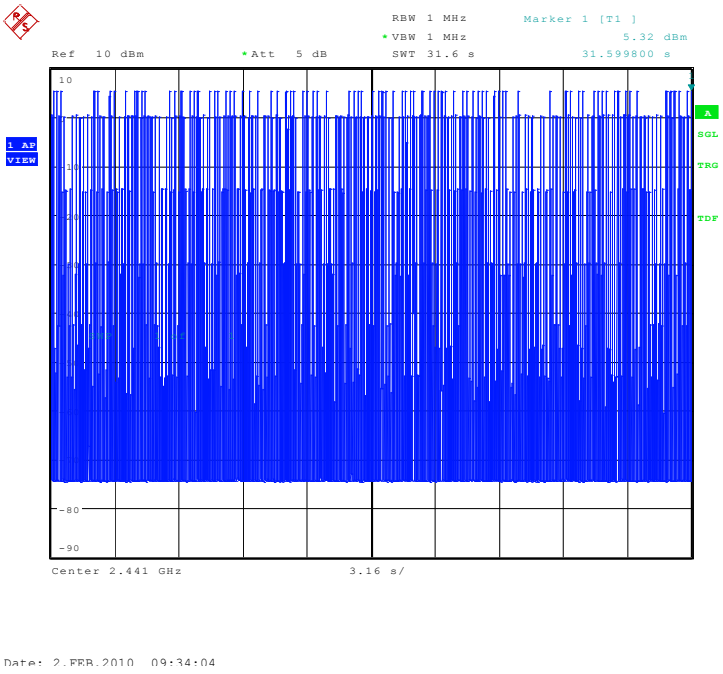


Fig. 82 Number of Transmissions Measurement:Channel 39,Packet 2-DH3

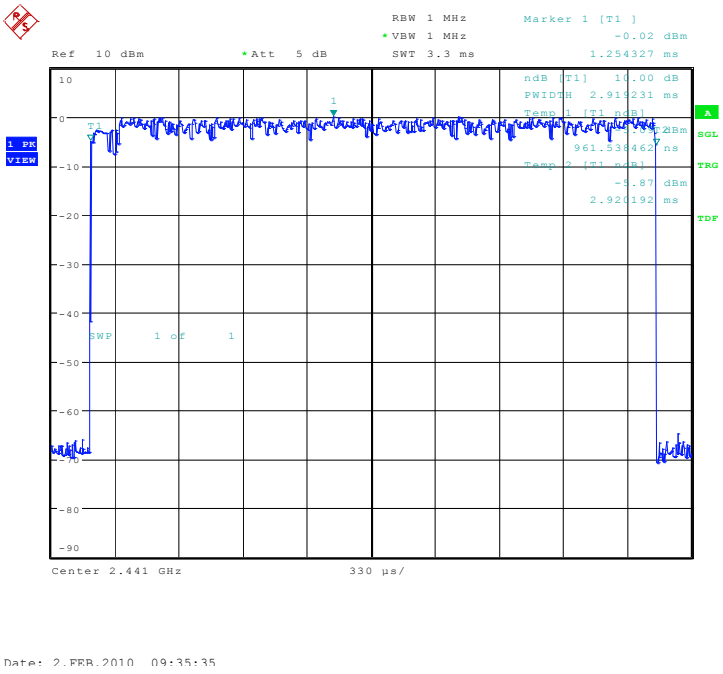


Fig. 83 Time of occupancy (Dwell Time): Channel 39, Packet 2-DH5

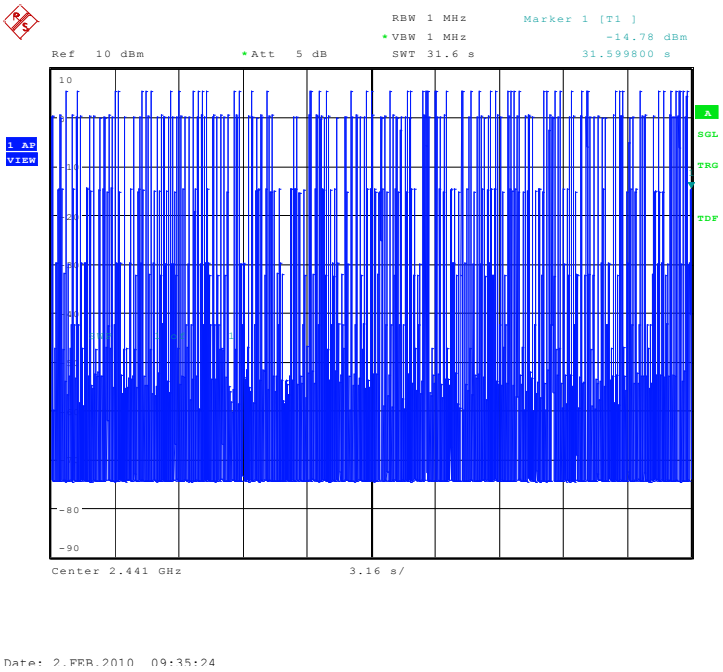


Fig. 84 Number of Transmissions Measurement:Channel 39,Packet 2-DH5

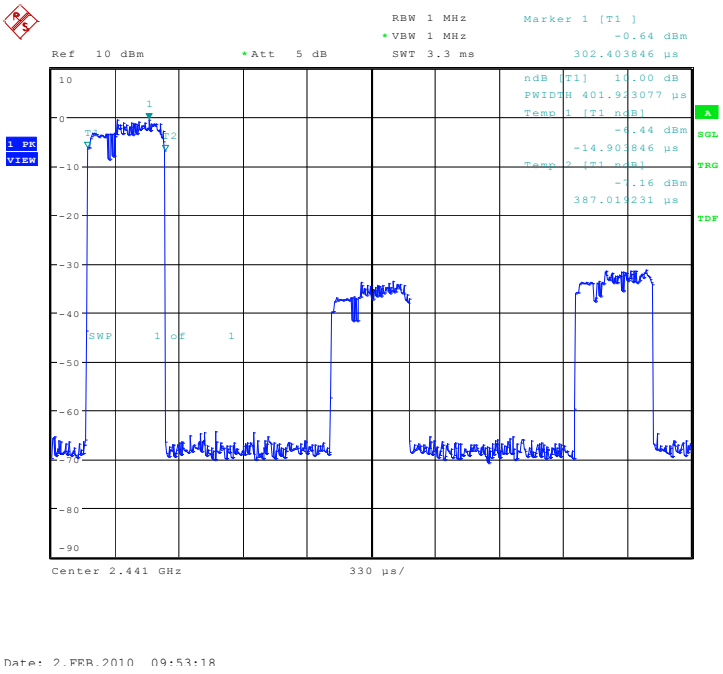


Fig. 85 Time of occupancy (Dwell Time): Channel 39, Packet 3-DH1

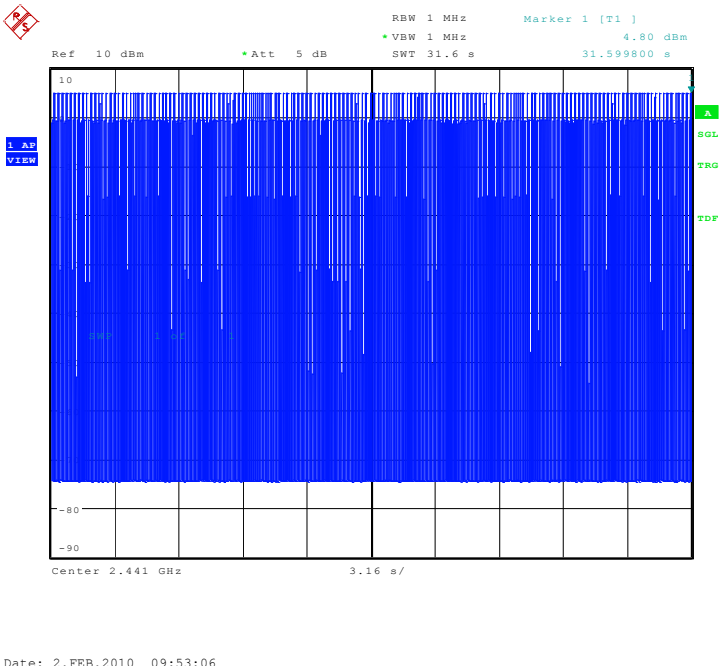


Fig. 86 Number of Transmissions Measurement:Channel 39,Packet 3-DH1

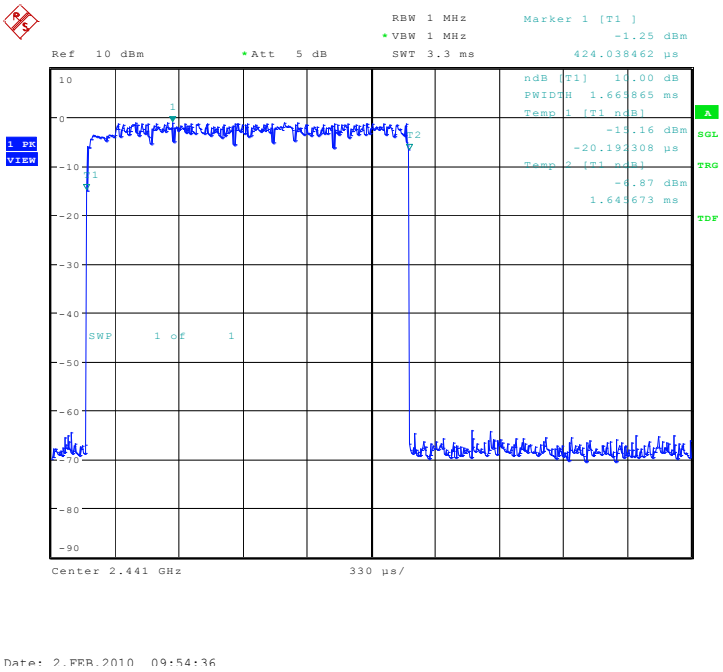


Fig. 87 Time of occupancy (Dwell Time): Channel 39, Packet 3-DH3

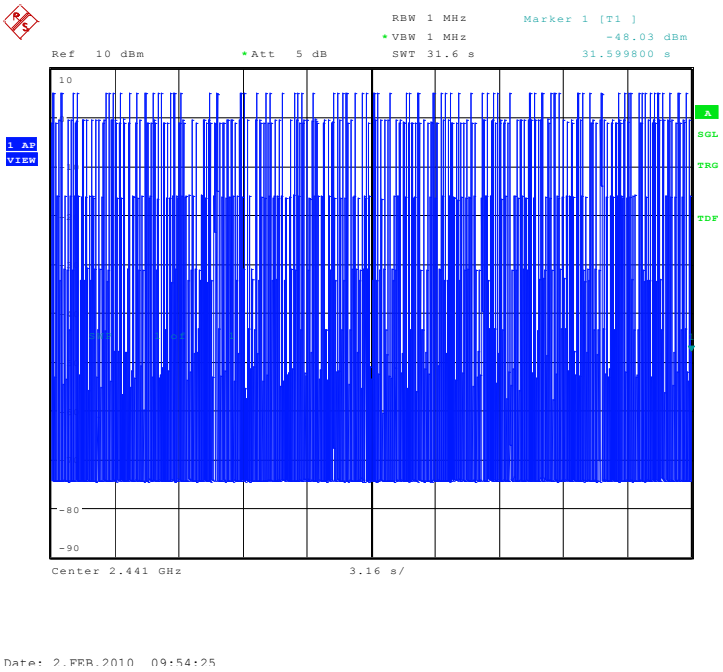


Fig. 88 Number of Transmissions Measurement:Channel 39,Packet 3-DH3

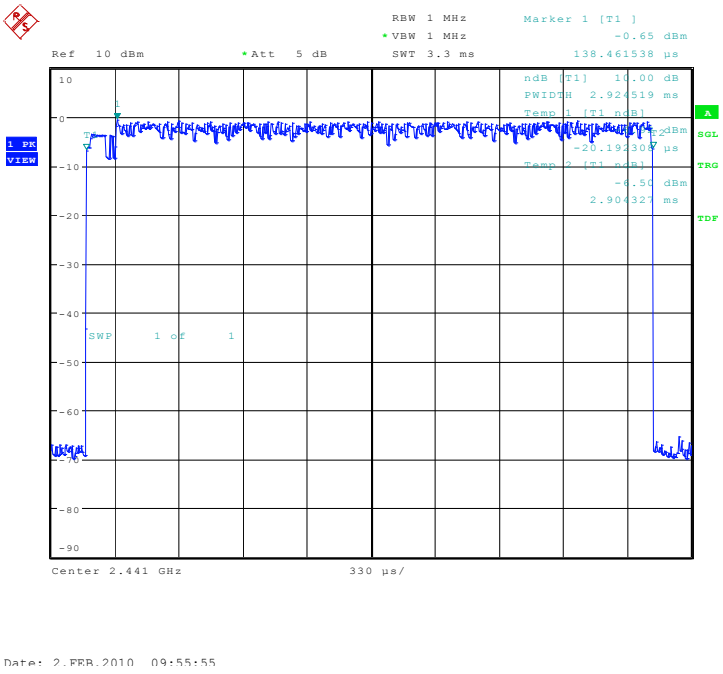


Fig. 89 Time of occupancy (Dwell Time): Channel 39, Packet 3-DH5

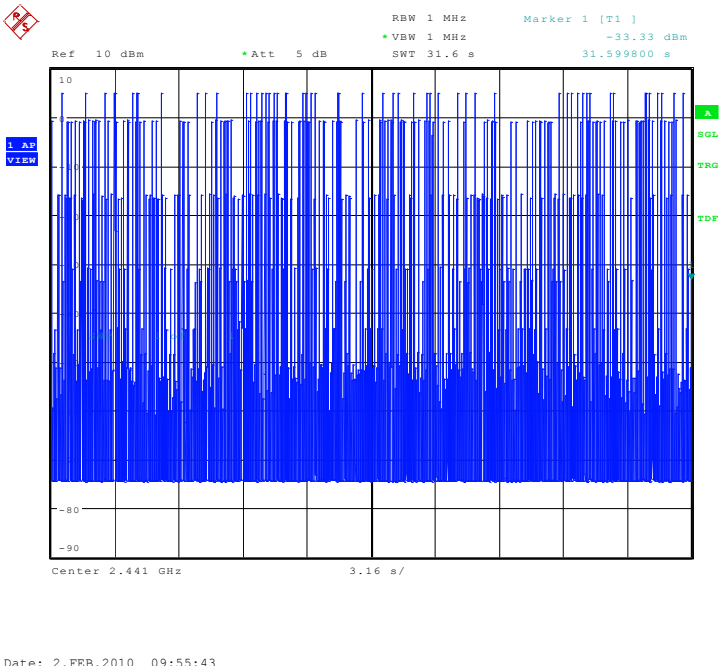


Fig. 90 Number of Transmissions Measurement:Channel 39,Packet 3-DH5

A.7. 20dB Bandwidth

Measurement Limit:

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

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

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

Measurement Results:

For GFSK

Channel	20dB Bandwidth (kHz)		Conclusion
0	Fig.91	804.49	NA
39	Fig.92	804.49	NA
78	Fig.93	804.49	NA

Forπ/4 DQPSK

Channel	20dB Bandwidth (kHz)		Conclusion
0	Fig.94	1243.59	NA
39	Fig.95	1246.79	NA
78	Fig.96	1243.59	NA

For 8DPSK

Channel	20dB Bandwidth (kHz)		Conclusion
0	Fig.97	1262.82	NA
39	Fig.98	1266.02	NA
78	Fig.99	1262.82	NA

Conclusion: NA

Test graphs as below:

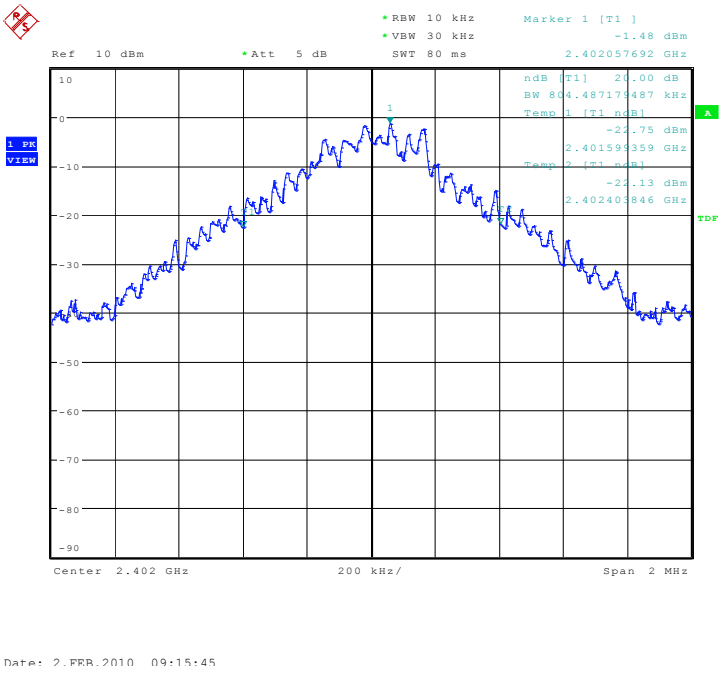


Fig. 91 20dB Bandwidth: GFSK, Channel 0

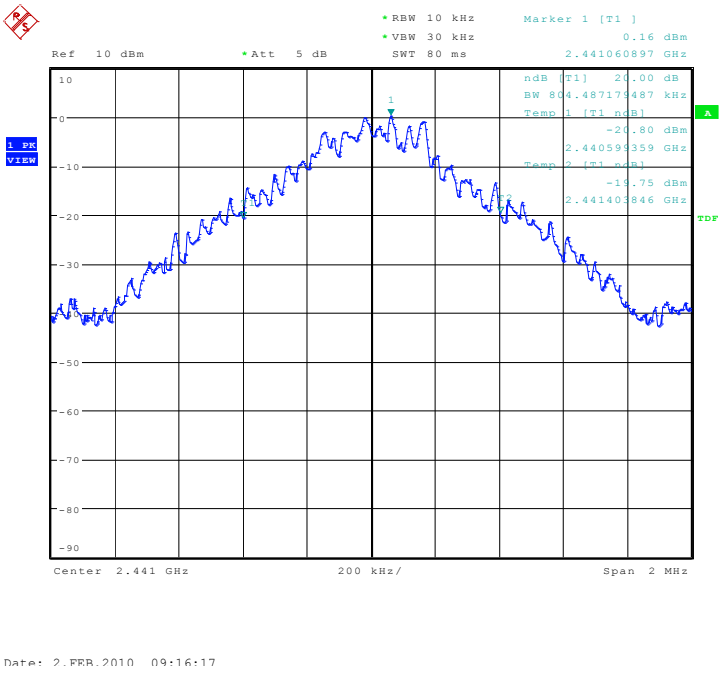


Fig. 92 20dB Bandwidth: GFSK, Channel 39

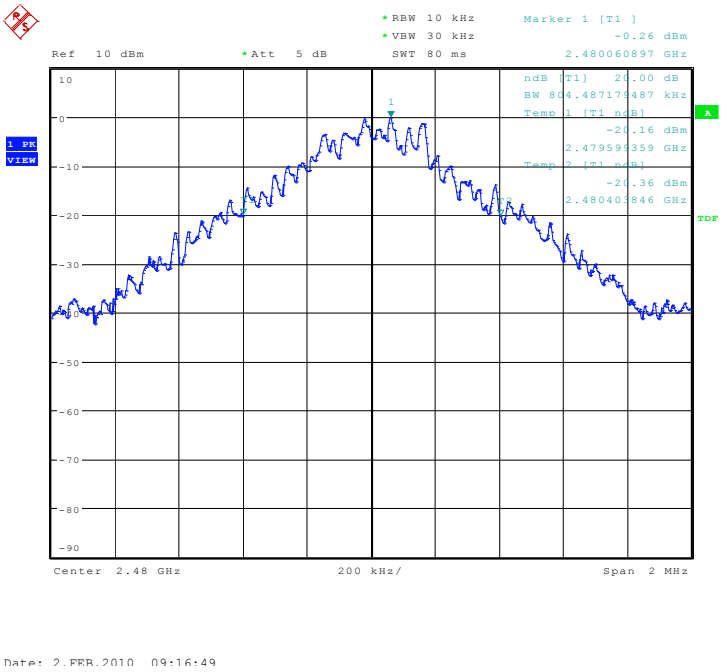


Fig. 93 20dB Bandwidth: GFSK, Channel 78

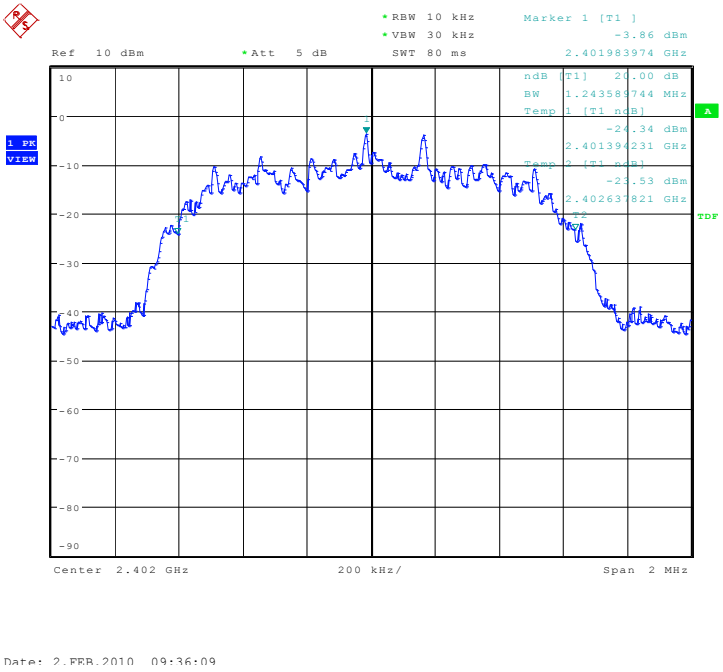


Fig. 94 20dB Bandwidth: π/4 DQPSK, Channel 0

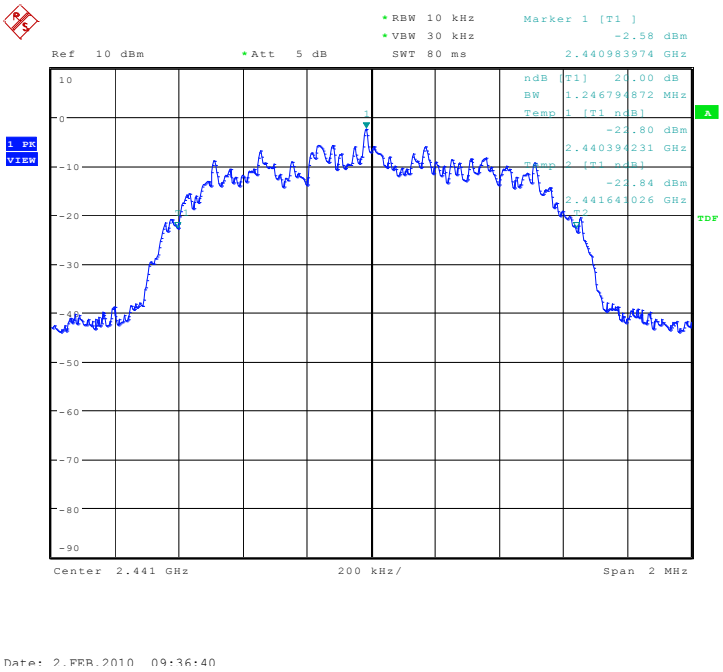


Fig. 95 20dB Bandwidth: π/4 DQPSK, Channel 39

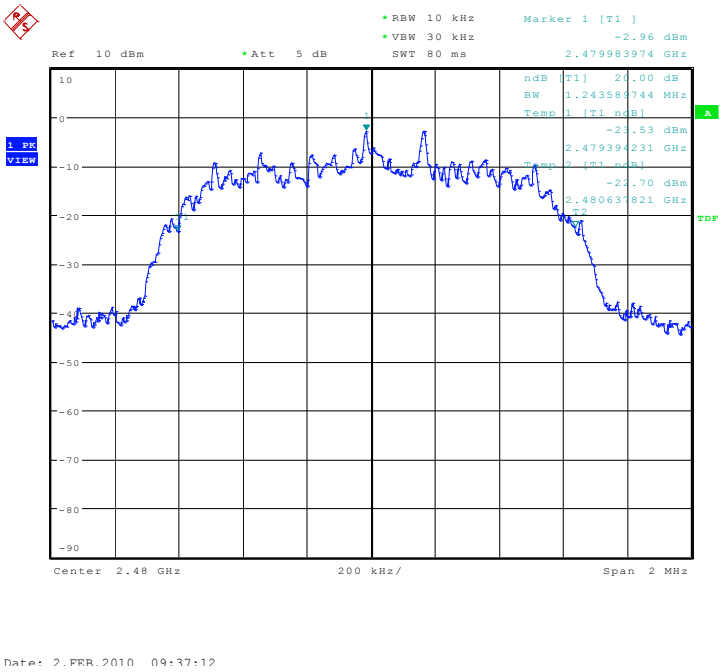


Fig. 96 20dB Bandwidth: π/4 DQPSK, Channel 78

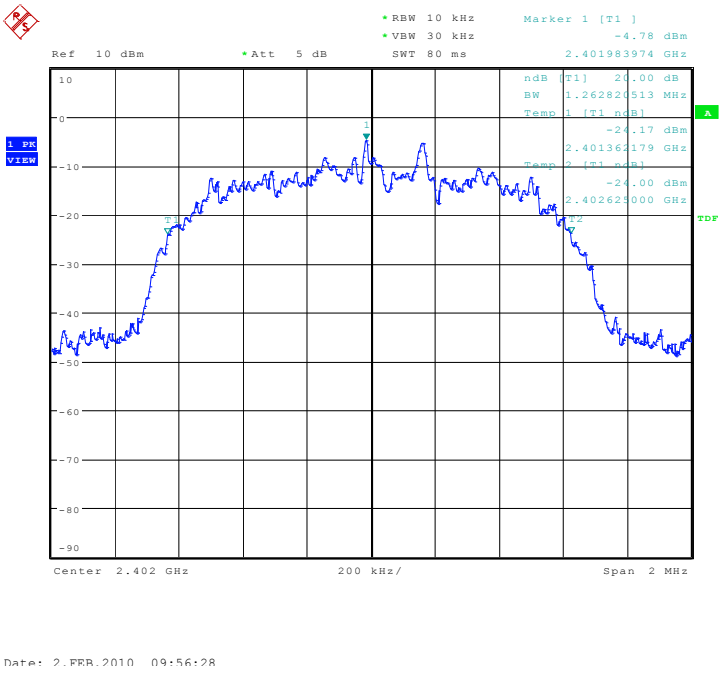


Fig. 97 20dB Bandwidth: 8DPSK, Channel 0

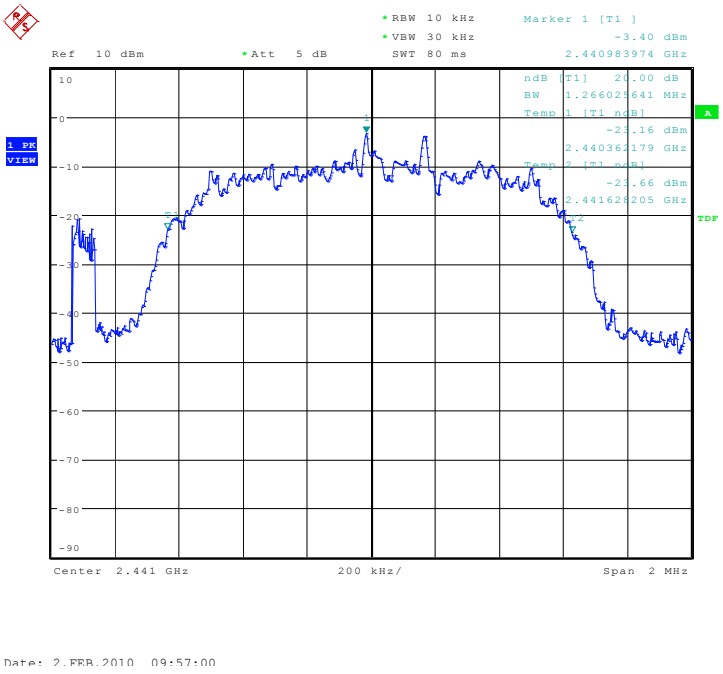


Fig. 98 20dB Bandwidth: 8DPSK, Channel 39

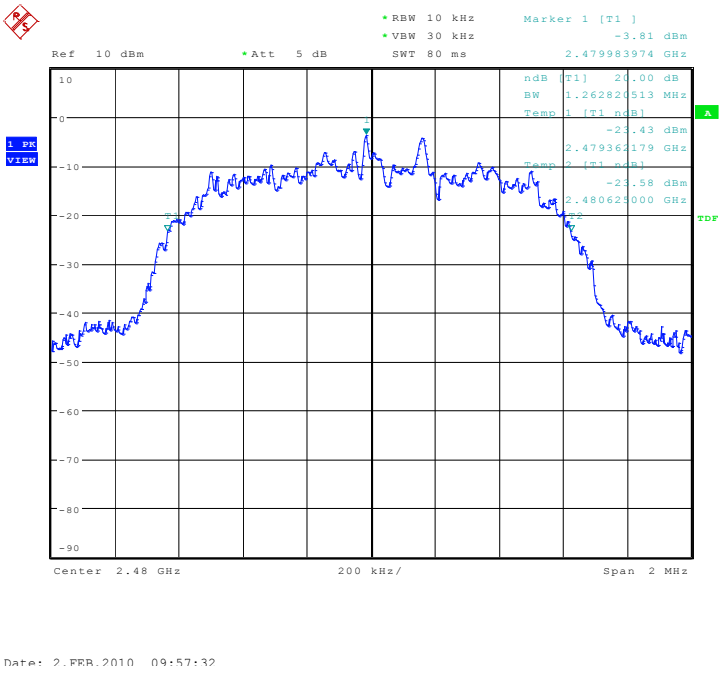


Fig. 99 20dB Bandwidth: 8DPSK, Channel 78

A.8. Carrier Frequency Separation

Measurement Limit:

Standard	Limit(kHz)
FCC 47 CFR Part 15.247(a)(1)	over 25 kHz or (2/3) * 20dB 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) * 20dB bandwidth, whichever is greater.

Measurement Result:

For GFSK

Channel	Carrier frequency separation (kHz)		Conclusion
39	Fig.100	1000.00	P

For π/4 DQPSK

Channel	Carrier frequency separation (kHz)		Conclusion
39	Fig.101	1014.42	P

For 8DPSK

Channel	Carrier frequency separation (kHz)		Conclusion
39	Fig.102	711.54	P

Conclusion: PASS

Test graphs as below:

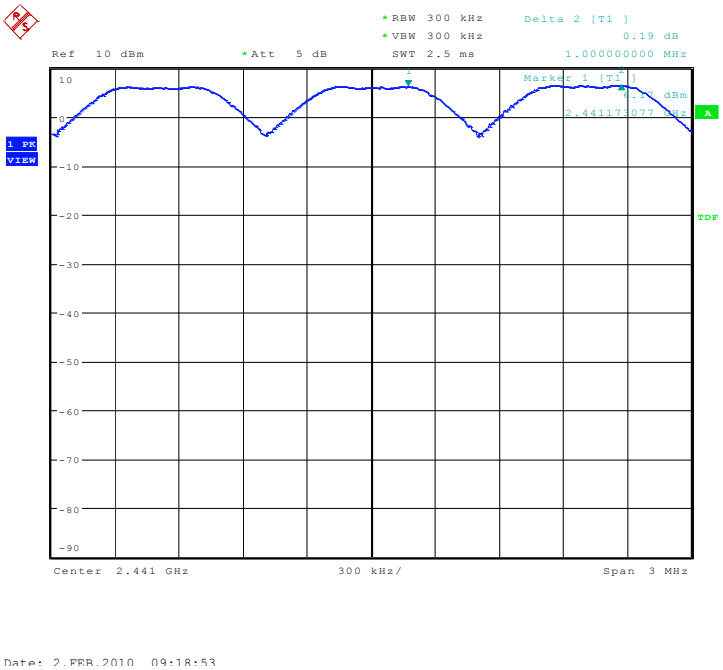


Fig. 100 Carrier frequency separation measurement: GFSK, Channel 39

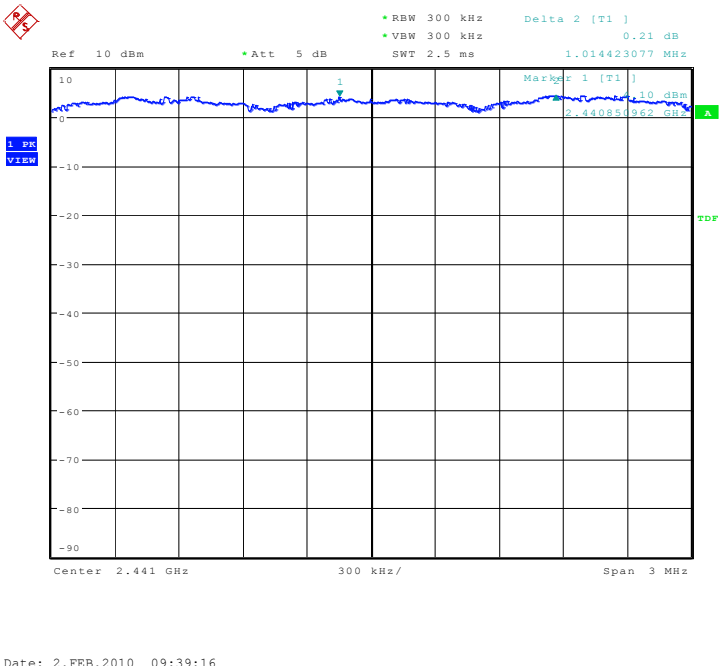


Fig. 101 Carrier frequency separation measurement: π/4 DQPSK, Channel 39

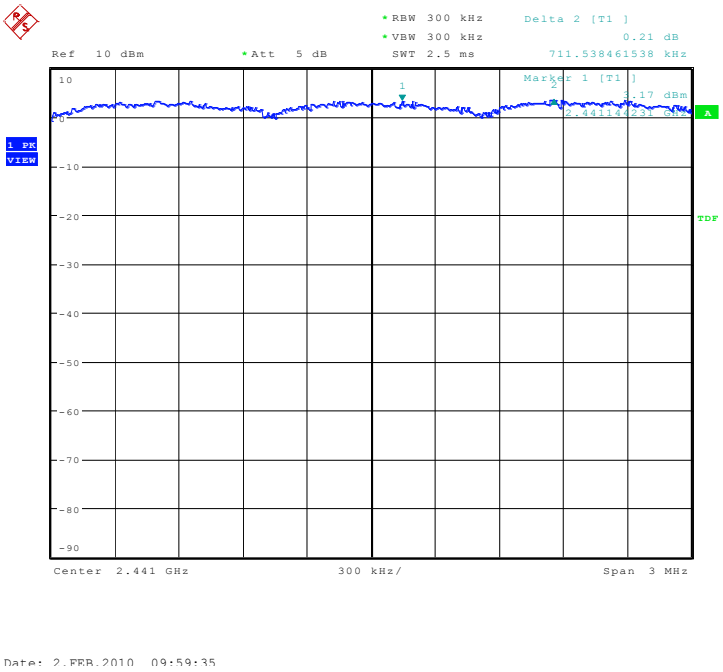


Fig. 102 Carrier frequency separation measurement: 8DPSK, Channel 39

A.9. Number of Hopping Channels

Measurement Limit:

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

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

Measurement Result:

For GFSK

Channel	Number of hopping channels		Conclusion
0~39	Fig.103	79	P
40~78	Fig.104		

Forπ/4 DQPSK

Channel	Number of hopping channels		Conclusion
0~39	Fig.105	79	P
40~78	Fig.106		

For 8DPSK

Channel	Number of hopping channels		Conclusion
0~39	Fig.107	79	P
40~78	Fig.108		

Conclusion: PASS

Test graphs as below:

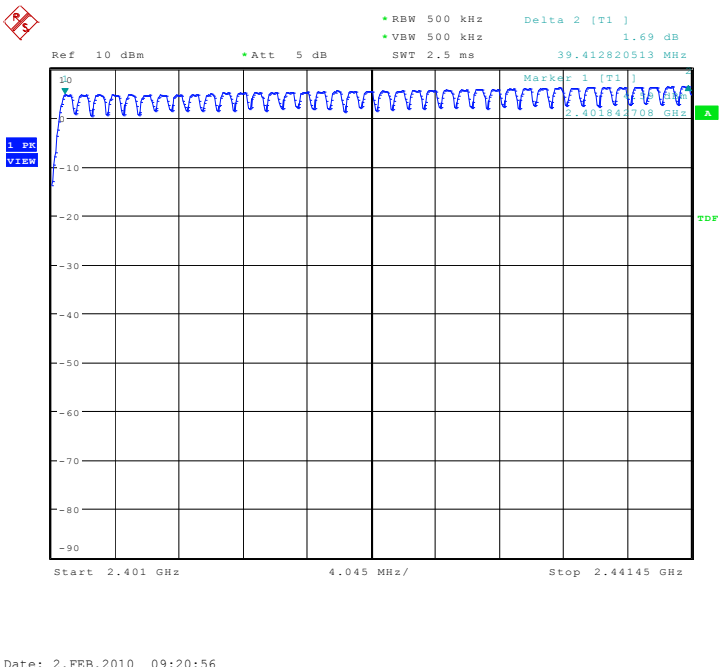


Fig. 103 Number of hopping frequencies: GFSK, Channel 0 - 39

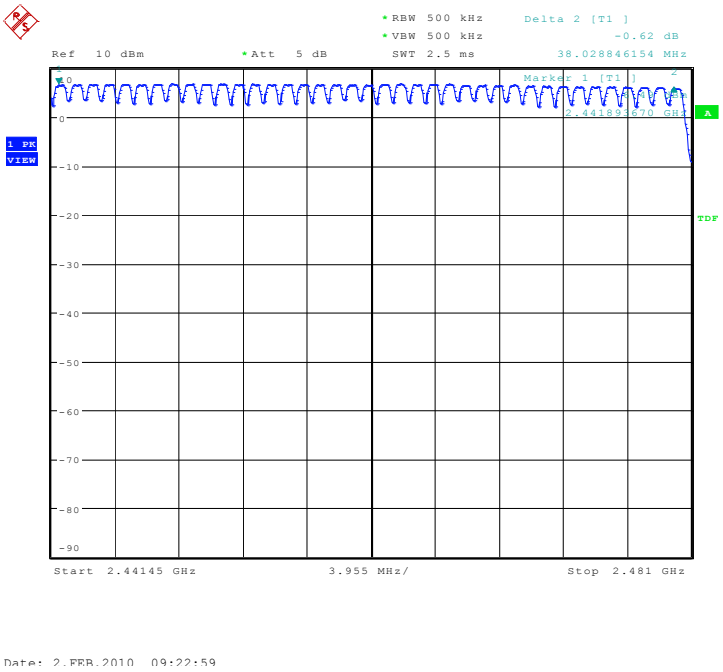


Fig. 104 Number of hopping frequencies: GFSK, Channel 40 - 78

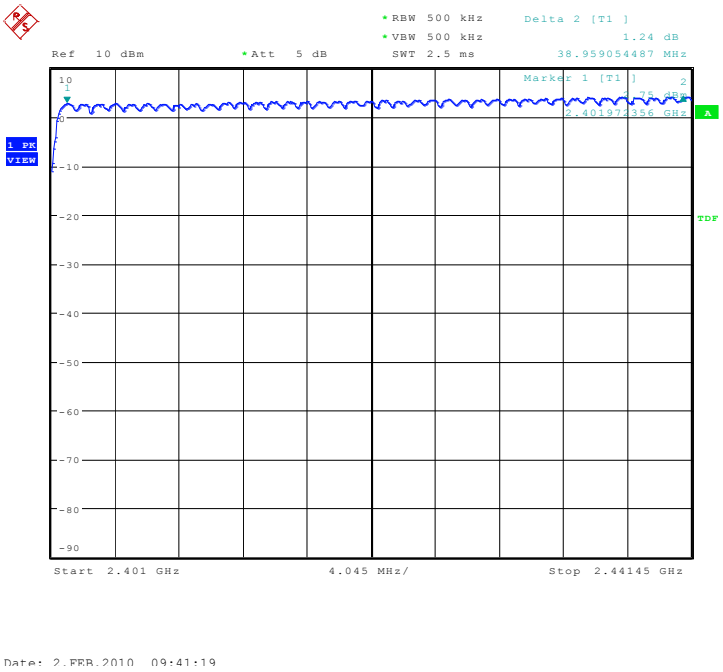


Fig. 105 Number of hopping frequencies: π/4 DQPSK, Channel 0 - 39

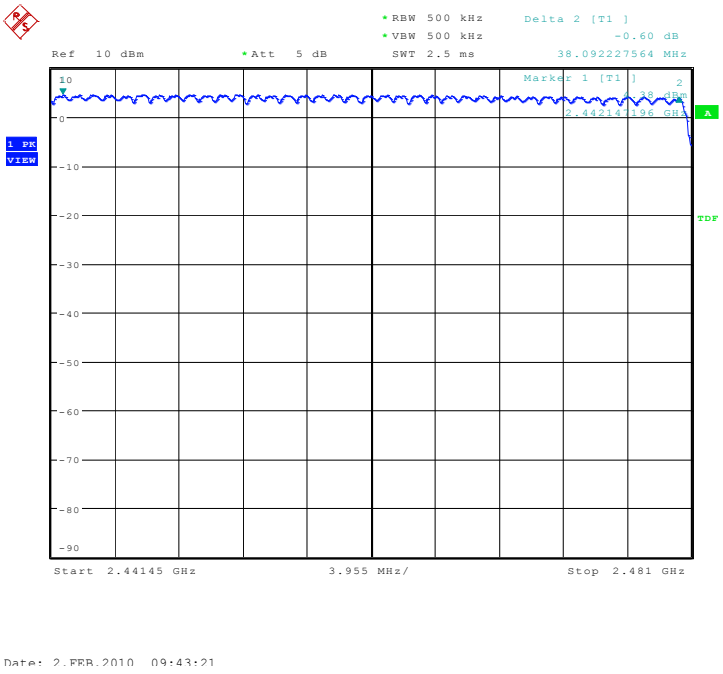


Fig. 106 Number of hopping frequencies: π/4 DQPSK, Channel 40 - 78

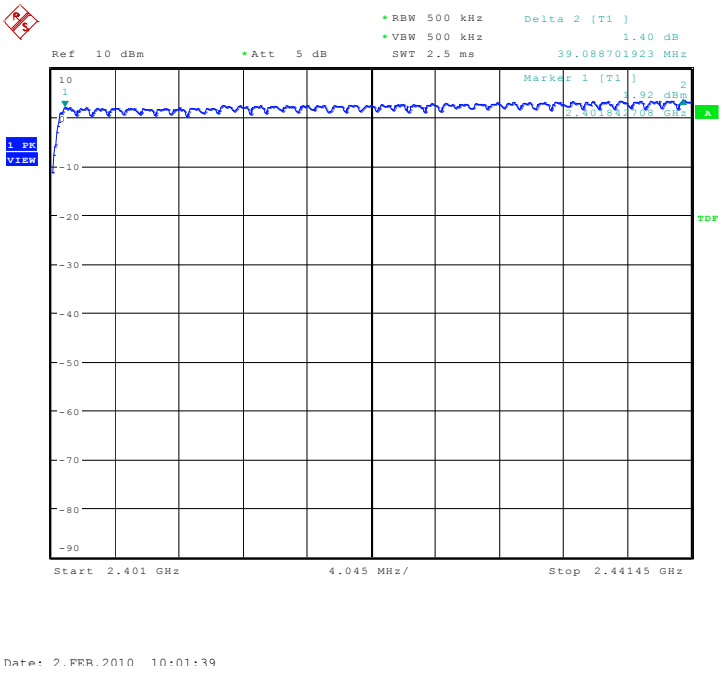


Fig. 107 Number of hopping frequencies: 8DPSK, Channel 0 - 39

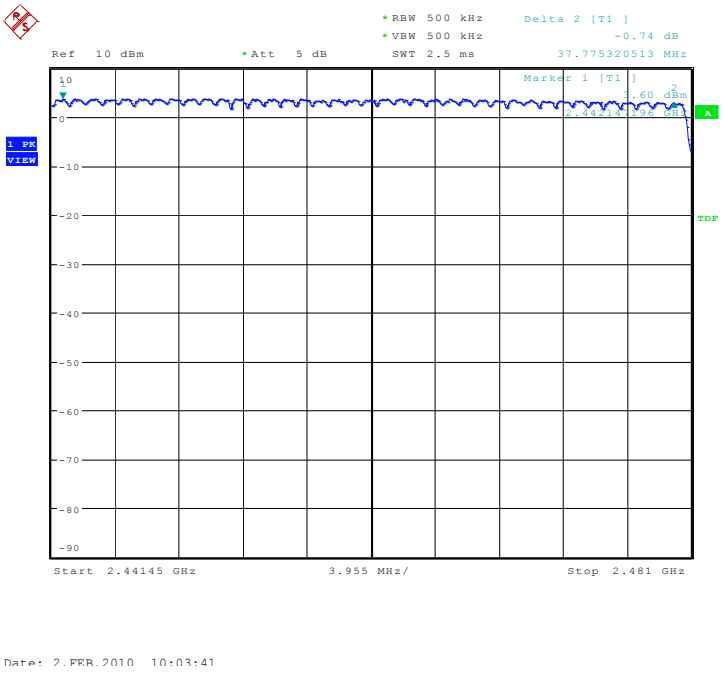


Fig. 108 Number of hopping frequencies: 8DPSK, Channel 40 - 78

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 (dBμV)	Result (dBμV)	Conclusion
		With Charger	
0.15 to 0.5	66 o 56	Fig.109	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 (dBμV)	Result (dBμV)	Conclusion
		With Charger	
0.15 to 0.5	56 to 46	Fig.109	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:

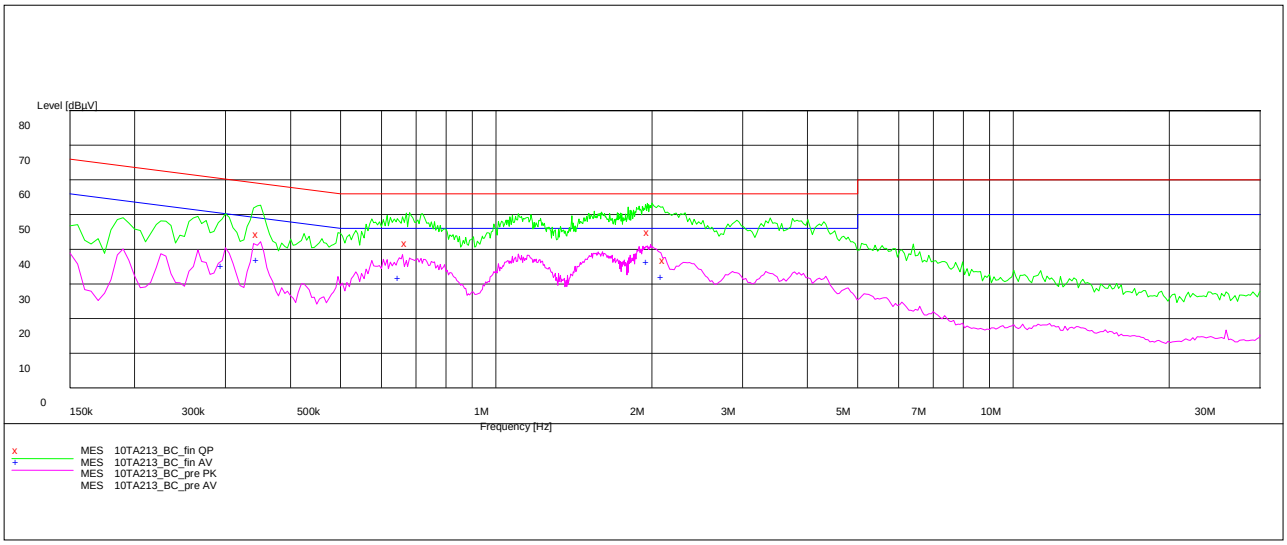


Fig. 109 AC Powerline Conducted Emission with charger

MEASUREMENT RESULT: "10TA213_BC_fin QP"

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Line	PE
0.350000	48.60	10.1	59	10.4	L1	GND
0.680000	46.10	10.1	56	9.9	L1	FLO
2.000000	49.00	10.1	56	7.0	L1	FLO
2.144271	41.20	10.1	56	14.8	N	FLO

MEASUREMENT RESULT: "10TA213_BC_fin AV"

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Line	PE
0.300000	39.50	10.1	50	10.8	L1	FLO
0.350000	41.20	10.1	49	7.8	L1	FLO
0.660000	35.90	10.1	46	10.1	L1	GND
1.990000	40.60	10.1	46	5.4	L1	GND
2.123040	36.20	10.1	46	9.8	L1	GND

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