



TEST REPORT

No. 2010TAR187

for

Nokia (China) investment CO.LTD.

TD-SCDMA/GSM mobile phone

Model Name: Nokia X5-00 (RM-678)

Marketing Name: X5-00

With

FCC ID: QTLRM-678

Hardware Version: 2001

Software Version: 0.1011.C.16

Issued Date: 2010-05-31



No. DGA-PL-114/01-02

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.

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1. Test Laboratory

1.1. Testing Location

Company Name: TMC Beijing, Telecommunication Metrology Center of MIIT
Address: No 52, Huayuan beilu, Haidian District, Beijing,P.R.China
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Fax: 00861062304793

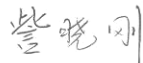
1.2. Testing Environment

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

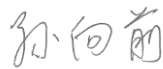
1.3. Project data

Project Leader: Zi Xiaogang
Testing Start Date: 2010-05-04
Testing End Date: 2010-05-31

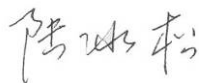
1.4. Signature



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

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2.2. Manufacturer Information

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

3.1. About EUT

Description	TD-SCDMA/GSM mobile phone
Model Name	Nokia X5-00 (RM-678)
Marketing Name	X5-00
FCC ID	QTLRM-678
Frequency Band	ISM 2400MHz~2483.5MHz
Type of Modulation	GFSK/ $\pi/4$ DQPSK/8DPSK
Number of Channels	79
Power Supply	3.7V DC by Battery

3.2. Internal Identification of EUT used during the test

EUT ID*	SN or IMEI	HW Version	SW Version
N05	004401019715941	2001	0.1011.C.16
N12	004401019719877	2001	0.1011.C.16

*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	Type	SN
AE1	Battery	BL-5F	/
AE2	Travel charger	AC-8C	/

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

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:	July 10, 2008 Edition
	15.205 Restricted bands of operation;	
	15.209 Radiated emission limits, general requirements;	
ANSI C63.4	15.247 Operation within the bands 902–928MHz, 2400–2483.5 MHz, and 5725–5850 MHz.	2009
	Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz	
	Filing and Measurement Guidelines for Frequency Hopping Spread Spectrum Systems	
FCC Public Notice DA 00-705		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 °C, Max. = 30 °C
Relative humidity	Min. = 30 %, Max. = 60 %
Shielding effectiveness	> 110 dB
Ground system resistance	< 0.5 Ω
Uniformity of field strength	Between 0 and 6 dB, from 80MHz to 3000 MHz

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

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

Fully-anechoic chamber1 (6.8 meters×3.08 meters×3.53 meters) did not exceed following limits along the EMC testing:

Temperature	Min. = 15 °C, Max. = 30 °C
Relative humidity	Min. = 30 %, Max. = 60 %
Shielding effectiveness	> 110 dB
Electrical insulation	> 10 kΩ
Ground system resistance	< 0.5 Ω
Uniformity of field strength	Between 0 and 6 dB, from 80MHz to 3000 MHz

Fully-anechoic chamber2 (7.30 meters×4.00 meters×3.80 meters) did not exceed following limits along the EMC testing:

Temperature	Min. = 15 °C, Max. = 30 °C
Relative humidity	Min. = 35 %, Max. = 60 %
Shielding effectiveness	> 110 dB
Electrical insulation	> 10 kΩ
Ground system resistance	< 0.5 Ω
Uniformity of field strength	Between 0 and 6 dB, from 80MHz to 3000 MHz

6. SUMMARY OF TEST RESULTS

6.1. Summary of Test Results

Abbreviations used in this clause:

P Pass, The EUT complies with the essential requirements in the standard.

F Fail, The EUT does not comply with the essential requirements in the standard

NA Not Applicable, The test was not applicable

NP Not Performed, The test was not performed by TMC

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

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

The measurement is made according to 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	2010-06-18
2	Bluetooth Tester	CBT32	100649	Rohde & Schwarz	2011-02-03

Radiated emission test system

No.	Equipment	Model	Serial Number	Manufacturer	Calibration Due date
1	Test Receiver	ESI40	831564/002	Rohde & Schwarz	2011-02-11
2	EMI Antenna	VULB 9163	9163 301	Schwarzbeck	2011-04-29
3	Dual-Ridge Waveguide Horn Antenna	3115	9906-5827	EMCO	2010-12-24
4	Dual-Ridge Waveguide Horn Antenna	3116	2663	EMCO	2011-03-01
5	Dual-Ridge Waveguide Horn Antenna	3116	2661	EMCO	2011-03-01
6	Universal Radio Communication Tester	CMU200	105948	Rohde & Schwarz	2010-08-14

Anechoic chamber

Fully anechoic chamber by Frankonia German.

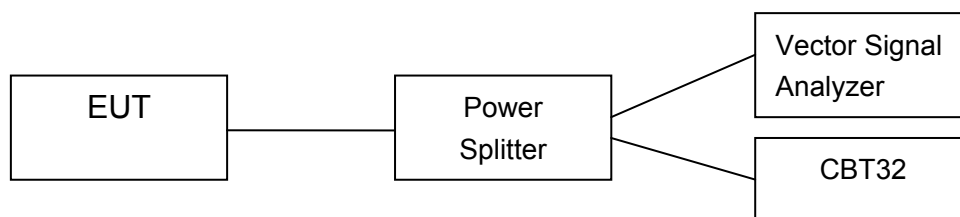
ANNEX A: MEASUREMENT RESULTS

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

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	Sweptime
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)	3.07	3.10	3.17	P

For $\pi/4$ DQPSK

Channel	Ch 0 2402 MHz	Ch 39 2441 MHz	Ch 78 2480 MHz	Conclusion
Peak Conducted Output Power	-2.15	-2.76	-1.89	P

(dBm)				
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For 8DPSK

Channel	Ch 0 2402 MHz	Ch 39 2441 MHz	Ch 78 2480 MHz	Conclusion
Peak Conducted Output Power (dBm)	-1.89	-2.45	-1.60	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	-50.94	P
	Hopping ON	Fig.2	-52.10	P
78	Hopping OFF	Fig.3	-58.68	P
	Hopping ON	Fig.4	-59.03	P

For $\pi/4$ DQPSK

Channel	Hopping	Band Edge Power (dBc)		Conclusion
0	Hopping OFF	Fig.5	-47.92	P
	Hopping ON	Fig.6	-49.71	P
78	Hopping OFF	Fig.7	-57.04	P
	Hopping ON	Fig.8	-51.49	P

For 8DPSK

Channel	Hopping	Band Edge Power (dBc)		Conclusion
0	Hopping OFF	Fig.9	-48.64	P
	Hopping ON	Fig.10	-49.81	P
78	Hopping OFF	Fig.11	-57.90	P
	Hopping ON	Fig.12	-51.29	P

See annex B for test graphs.

Conclusion: PASS

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:

Please see the plots in ANNEX B, the power P(in 100KHz BW) is shown as the highest point and get the limit line $P(\text{line}) = P(\text{in } 100\text{KHz BW}) - 20\text{dB}$, the measurement results of conducted spurious emission are obtained as P(dBc) which should be below the P(line).

For GFSK

Channel	Frequency Range	Test Results	Conclusion
Ch 0 2402 MHz	30MHz ~ 26 GHz	Fig.13	P
Ch 39 2441 MHz	30MHz ~ 26 GHz	Fig.14	P
Ch 78 2480 MHz	30MHz ~ 26 GHz	Fig.15	P

For $\pi/4$ DQPSK

Channel	Frequency Range	Test Results	Conclusion
Ch 0 2402 MHz	30MHz ~ 26 GHz	Fig.16	P
Ch 39 2441 MHz	30MHz ~ 26 GHz	Fig.17	P
Ch 78 2480 MHz	30MHz ~ 26 GHz	Fig.18	P

For 8DPSK

Channel	Frequency Range	Test Results	Conclusion
Ch 0 2402 MHz	30MHz ~ 26 GHz	Fig.19	P
Ch 39 2441 MHz	30MHz ~ 26 GHz	Fig.20	P
Ch 78 2480 MHz	30MHz ~ 26 GHz	Fig.21	P

GFSK Ch0

Frequency(MHz)	P(dBc)
2372.260	-42.68
9613.894	-46.70
4786.138	-48.17

GFSK Ch39

Frequency(MHz)	P(dBc)
2413.878	-43.40
2330.641	-51.06
4869.375	-51.53

GFSK Ch78

Frequency(MHz)	P(dBc)
2372.260	-43.96
9613.894	-46.01
9946.843	-46.64

$\pi/4$ DQPSK Ch0

Frequency(MHz)	P(dBc)
2372.260	-44.55
2497.115	-51.36
7449.728	-51.87

$\pi/4$ DQPSK Ch39

Frequency(MHz)	P(dBc)
2415.449	-44.94
22933.413	-51.30
7326.442	-51.32

$\pi/4$ DQPSK Ch78

Frequency(MHz)	P(dBc)
2483.974	-51.00
20769.247	-51.48
22683.702	-51.50

8DPSK Ch0

Frequency(MHz)	P(dBc)
2372.276	-42.48
23056.715	-50.39
23348.045	-50.54

8DPSK Ch39

Frequency(MHz)	P(dBc)
2415.449	-47.02
23516.074	-51.65
22933.413	-51.87

8DPSK Ch78

Frequency(MHz)	P(dBc)
2498.686	-50.12
7409.679	-50.65
23224.744	-51.22

See annex B for test graphs.

Conclusion: PASS

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

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.22	P
	1 GHz ~ 4 GHz	Fig.23	P
	4 GHz ~ 18 GHz	Fig.24	P
Ch 39 2441 MHz	30 MHz ~ 1 GHz	Fig.25	P
	1 GHz ~ 4 GHz	Fig.26	P
	4 GHz ~ 18 GHz	Fig.27	P
Ch 78 2480 MHz	30 MHz ~ 1 GHz	Fig.28	P
	1 GHz ~ 4 GHz	Fig.29	P
	4 GHz ~ 18 GHz	Fig.30	P
Power	2.45GHz~2.5GHz	Fig.31	P
For all channels	18 GHz ~ 26 GHz	Fig.32	P

For $\pi/4$ DQPSK

Channel	Frequency Range	Test Results	Conclusion
Ch 0 2402 MHz	30 MHz ~ 1 GHz	Fig.33	P
	1 GHz ~ 4 GHz	Fig.34	P
	4 GHz ~ 18 GHz	Fig.35	P
Ch 39 2441 MHz	30 MHz ~ 1 GHz	Fig.36	P
	1 GHz ~ 4 GHz	Fig.37	P
	4 GHz ~ 18 GHz	Fig.38	P
Ch 78 2480 MHz	30 MHz ~ 1 GHz	Fig.39	P
	1 GHz ~ 4 GHz	Fig.40	P
	4 GHz ~ 18 GHz	Fig.41	P
Power	2.45GHz~2.5GHz	Fig.42	P
For all channels	18 GHz ~ 26 GHz	Fig.43	P

For 8DPSK

Channel	Frequency Range	Test Results	Conclusion
Ch 0 2402 MHz	30 MHz ~ 1 GHz	Fig.44	P
	1 GHz ~ 4 GHz	Fig.45	P
	4 GHz ~ 18 GHz	Fig.46	P
Ch 39 2441 MHz	30 MHz ~ 1 GHz	Fig.47	P
	1 GHz ~ 4 GHz	Fig.48	P
	4 GHz ~ 18 GHz	Fig.49	P
Ch 78 2480 MHz	30 MHz ~ 1 GHz	Fig.50	P
	1 GHz ~ 4 GHz	Fig.51	P
	4 GHz ~ 18 GHz	Fig.52	P
Power	2.45GHz~2.5GHz	Fig.53	P
For all channels	18 GHz ~ 26 GHz	Fig.54	P

GFSK Ch 0

Frequency(MHz)	Result(dBuV/m)	ARpl (dB)	PMea(dBuV/m)	Polarity
2398.798	67.79	8.7	59.09	VERTICAL
2442.886	63.28	8.6	54.68	VERTICAL
2438.878	53.39	8.6	44.79	VERTICAL
3507.014	50.6	14.5	36.1	VERTICAL
3725.451	50.59	14.4	36.19	VERTICAL
3745.491	50.56	14.4	36.16	VERTICAL

GFSK Ch 39

Frequency(MHz)	Result(dBuV/m)	ARpl (dB)	PMea(dBuV/m)	Polarity
2446.894	56.83	8.6	48.23	VERTICAL
3965.932	50.69	14.4	36.29	VERTICAL
3529.058	50.49	14.2	36.29	VERTICAL
3871.743	50.42	14.4	36.02	VERTICAL

3492.986	50.4	12.3	38.1	VERTICAL
3501.002	50.29	14.5	35.79	VERTICAL

GFSK Ch 78

Frequency(MHz)	Result(dBuV/m)	ARpl (dB)	PMea(dBuV/m)	Polarity
2482.966	87.83	9.4	78.43	VERTICAL
2402.806	68.24	8.8	59.44	VERTICAL
3967.936	50.99	14.4	36.59	VERTICAL
3631.263	50.82	14.1	36.72	VERTICAL
3713.427	50.66	14.5	36.16	VERTICAL
3867.735	50.55	14.2	36.35	VERTICAL

$\pi/4$ DQPSK Ch 0

Frequency(MHz)	Result(dBuV/m)	ARpl (dB)	PMea(dBuV/m)	Polarity
2442.886	63.18	8.6	54.58	VERTICAL
2398.798	54.61	8.7	45.91	VERTICAL
2438.878	53.78	8.6	45.18	VERTICAL
3915.832	51.11	14.3	36.81	VERTICAL
3496.994	51.01	12.3	38.71	VERTICAL
3895.792	50.9	14.4	36.5	VERTICAL

$\pi/4$ DQPSK Ch 39

Frequency(MHz)	Result(dBuV/m)	ARpl (dB)	PMea(dBuV/m)	Polarity
2482.966	51.85	9.4	42.45	VERTICAL
2478.958	51.84	9.1	42.74	VERTICAL
3929.86	50.77	14.1	36.67	VERTICAL
3861.723	50.71	14.2	36.51	VERTICAL
3873.747	50.59	14.4	36.19	VERTICAL
3503.006	50.57	14.5	36.07	VERTICAL

$\pi/4$ DQPSK Ch 78

Frequency(MHz)	Result(dBuV/m)	ARpl (dB)	PMea(dBuV/m)	Polarity
2482.966	85.51	9.4	76.11	VERTICAL
2402.806	69.42	8.8	60.62	VERTICAL
3717.435	50.45	14.5	35.95	VERTICAL
3474.95	50.42	12.2	38.22	VERTICAL
3899.8	50.42	14.4	36.02	VERTICAL
3555.11	50.24	14.3	35.94	VERTICAL

8DPSK Ch 0

Frequency(MHz)	Result(dBuV/m)	ARpl (dB)	PMea(dBuV/m)	Polarity
2442.886	63.81	8.6	55.21	VERTICAL
2398.798	57.9	8.7	49.2	VERTICAL
2406.814	57.4	8.8	48.6	VERTICAL
2438.878	55.46	8.6	46.86	VERTICAL

3727.455	50.6	14.4	36.2	VERTICAL
3240.481	50.56	12.4	38.16	VERTICAL

8DPSK Ch 39

Frequency(MHz)	Result(dBuV/m)	ARpl (dB)	PMea(dBuV/m)	Polarity
2482.966	51.72	9.4	42.32	VERTICAL
2478.958	51.33	9.1	42.23	VERTICAL
2446.894	51.09	8.6	42.49	VERTICAL
3633.267	50.92	14.1	36.82	VERTICAL
3801.603	50.86	14.2	36.66	VERTICAL
3488.978	50.68	12.2	38.48	VERTICAL

8DPSK Ch 78

Frequency(MHz)	Result(dBuV/m)	ARpl (dB)	PMea(dBuV/m)	Polarity
2482.966	85.71	9.4	76.31	VERTICAL
2402.806	68.69	8.8	59.89	VERTICAL
3511.022	50.77	14.4	36.37	VERTICAL
3515.03	50.55	14.4	36.15	VERTICAL
3719.439	50.53	14.5	36.03	VERTICAL
3913.828	50.49	14.3	36.19	VERTICAL

See annex B for test graphs.

Conclusion: PASS

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.55	110.66	P
		Fig.56		
	DH3	Fig.57	198.63	P
		Fig.58		
	DH5	Fig.59	227.70	P
		Fig.60		

For $\pi/4$ DQPSK

Channel	Packet	Dwell Time (ms)		Conclusion
39	DH1	Fig.61	114.15	P
		Fig.62		
	DH3	Fig.63	177.68	P

	DH5	Fig.64	195.59	P
		Fig.65		
		Fig.66		

For 8DPSK

Channel	Packet	Dwell Time (ms)		Conclusion
39	DH1	Fig.67	112.64	P
		Fig.68		
	DH3	Fig.69	190.97	P
		Fig.70		
	DH5	Fig.71	216.02	P
		Fig.72		

See annex B for test graphs.

Conclusion: PASS

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.73	762.82	NA
39	Fig.74	766.02	NA
78	Fig.75	762.82	NA

For $\pi/4$ DQPSK

Channel	20dB Bandwidth (kHz)		Conclusion
0	Fig.76	1240.38	NA
39	Fig.77	1243.59	NA
78	Fig.78	1233.97	NA

For 8DPSK

Channel	20dB Bandwidth (kHz)		Conclusion
0	Fig.79	1269.23	NA
39	Fig.80	1269.23	NA
78	Fig.81	1269.23	NA

See annex B for test graphs.

Conclusion: NA

A.8. Carrier Frequency Separation

Measurement Limit:

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

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

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

Measurement Result:

For GFSK

Channel	Carrier frequency separation (kHz)	Conclusion
39	Fig.82	995.19 P

For $\pi/4$ DQPSK

Channel	Carrier frequency separation (kHz)	Conclusion
39	Fig.83	1129.81 P

For 8DPSK

Channel	Carrier frequency separation (kHz)	Conclusion
39	Fig.84	1168.27 P

See annex B for test graphs.

Conclusion: PASS

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.85	79 P
40~78	Fig.86	

For $\pi/4$ DQPSK

Channel	Number of hopping channels	Conclusion
0~39	Fig.87	79 P
40~78	Fig.88	

For 8DPSK

Channel	Number of hopping channels	Conclusion
0~39	Fig.89	79 P
40~78	Fig.90	

See annex B for test graphs.

Conclusion: PASS

A.10. AC Powerline Conducted Emission

Test Condition

Voltage (V)	Frequency (Hz)
110	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.91 (TX Mode)	Fig.92 (Idle Mode)	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)

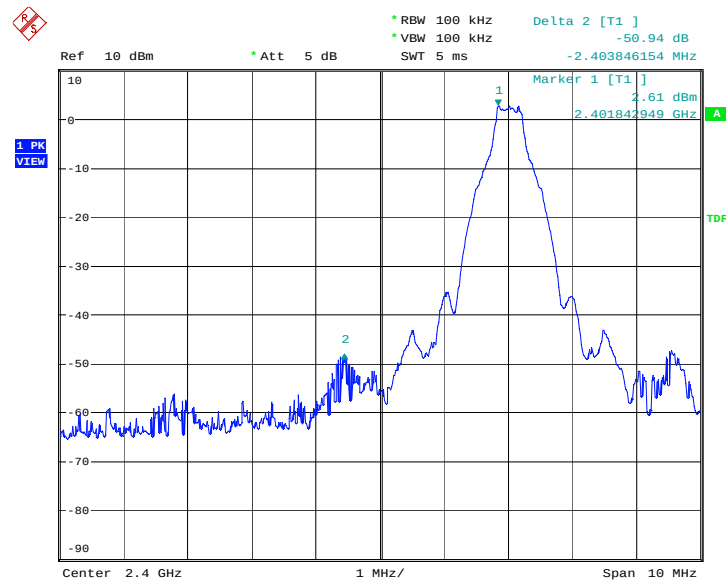
Frequency range (MHz)	Average Limit (dBμV)	Result (dBμV)		Conclusion
		With Charger		
0.15 to 0.5	56 to 46	Fig.91 (TX Mode)	Fig.92 (Idle Mode)	P
0.5 to 5	46			
5 to 30	50			
NOTE: The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.5 MHz.				

The measurement is made according to ANSI C63.4.

Note: the graphic result above is the maximum of the measurements for both phase line and neutral line.

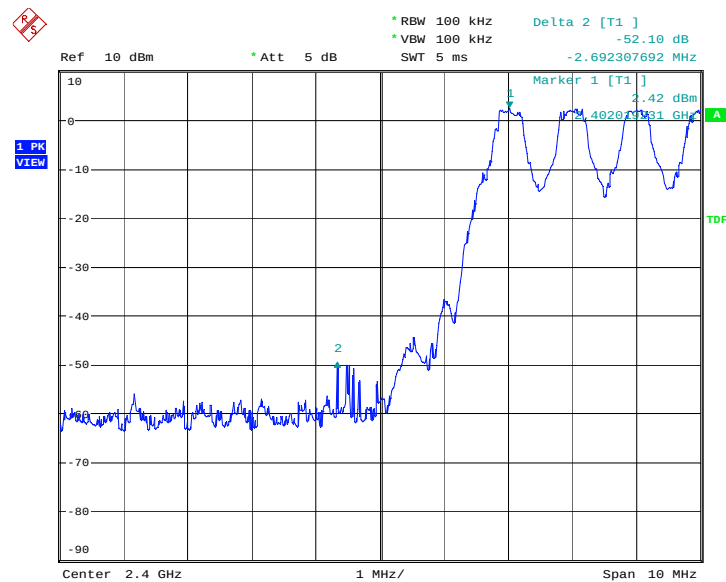
See annex B for test graphs.
Conclusion: PASS

ANNEX B: TEST FIGURE LIST



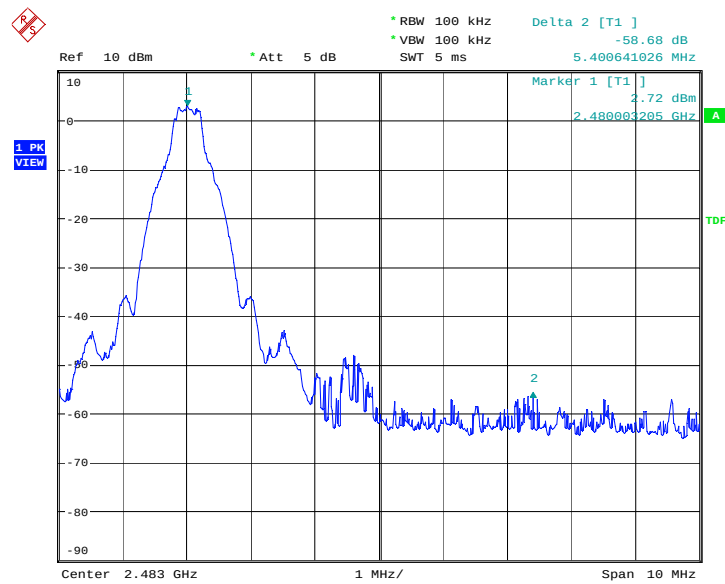
Date: 4.MAY.2010 09:17:53

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



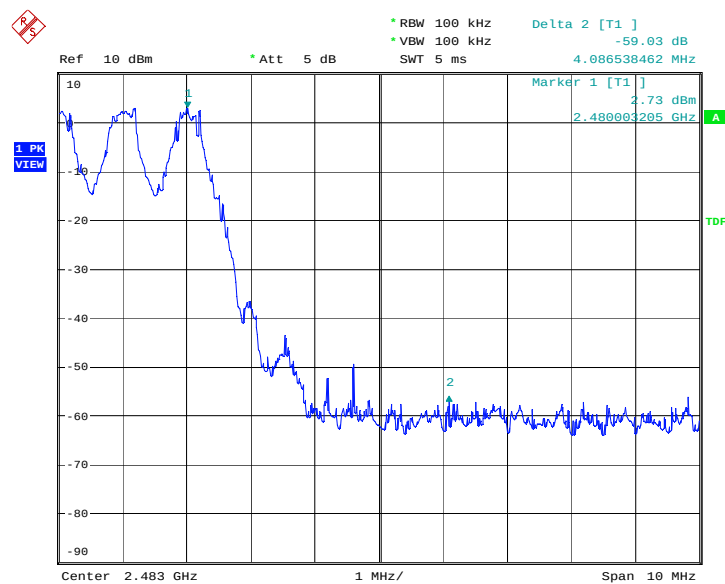
Date: 4.MAY.2010 09:20:13

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



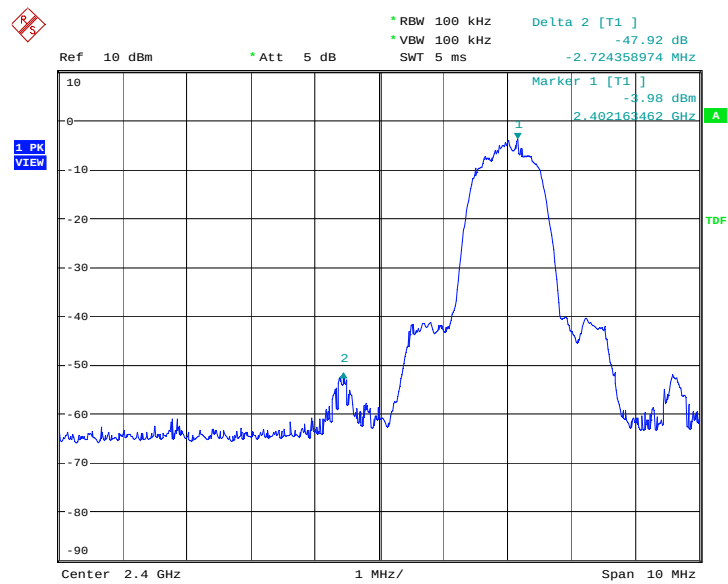
Date: 4.MAY.2010 09:18:10

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



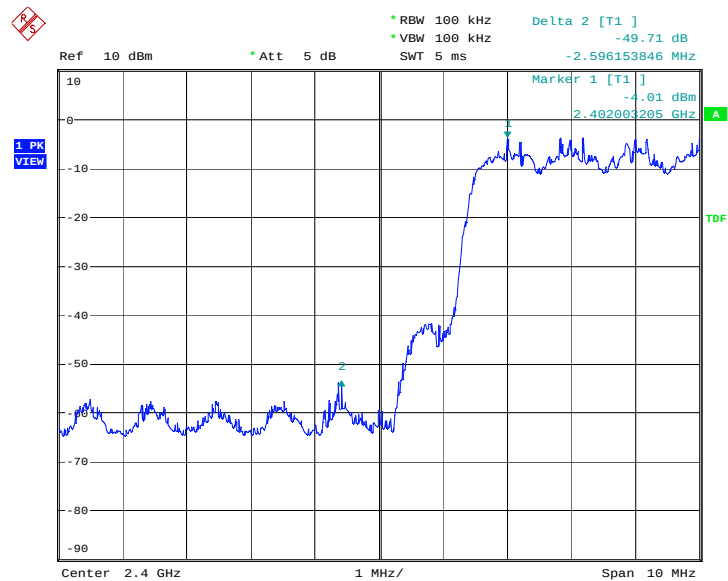
Date: 4.MAY.2010 09:22:15

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



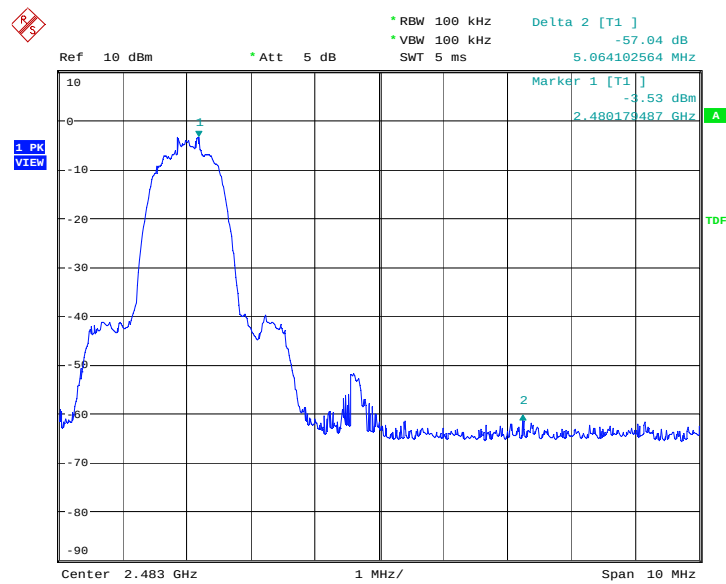
Date: 4.MAY.2010 09:43:24

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



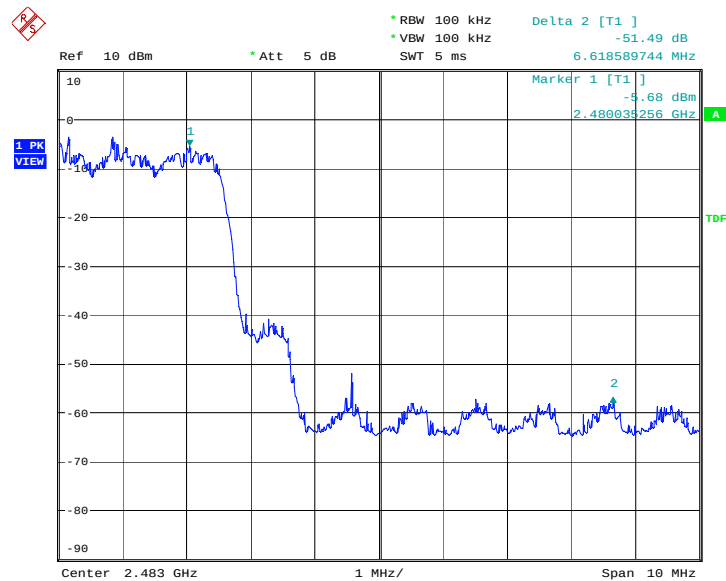
Date: 4.MAY.2010 09:45:43

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



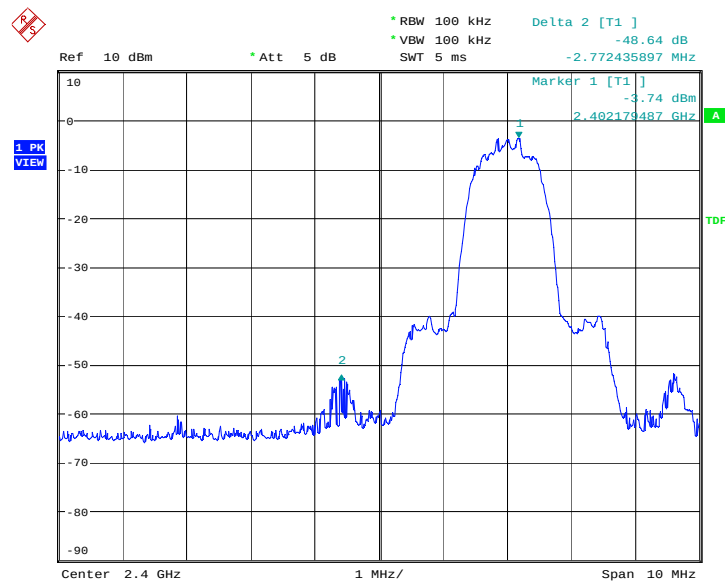
Date: 4.MAY.2010 09:43:41

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



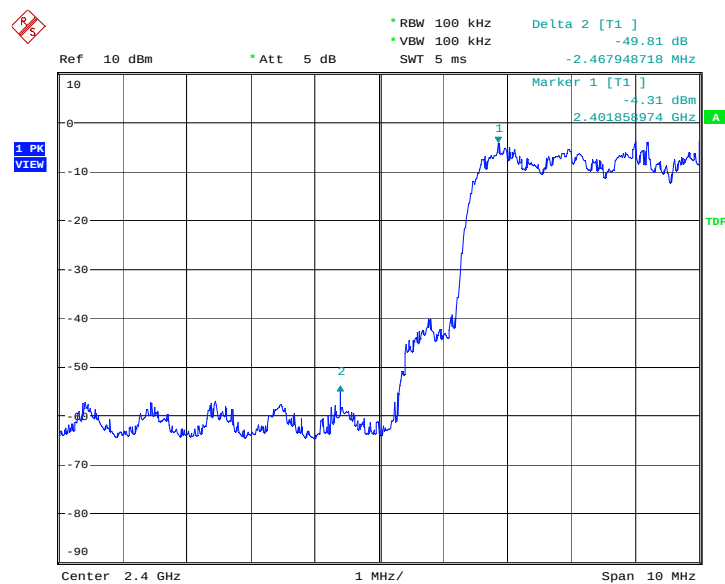
Date: 4.MAY.2010 09:47:45

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



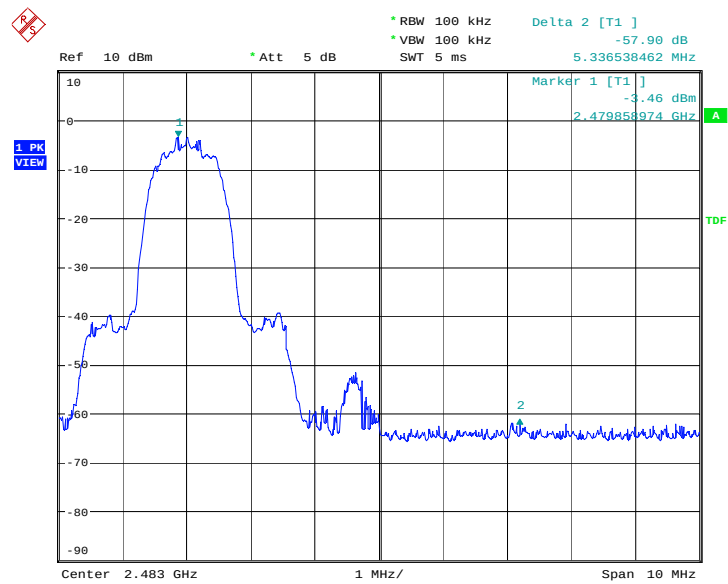
Date: 4.MAY.2010 10:08:48

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



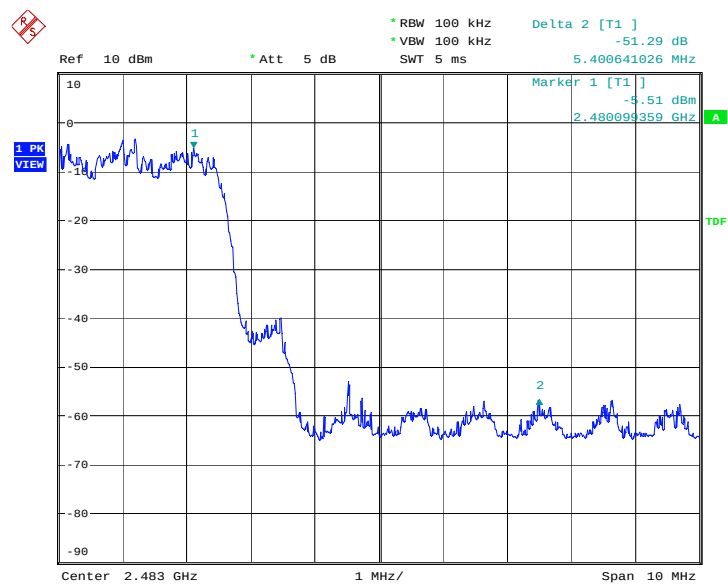
Date: 4.MAY.2010 10:11:07

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



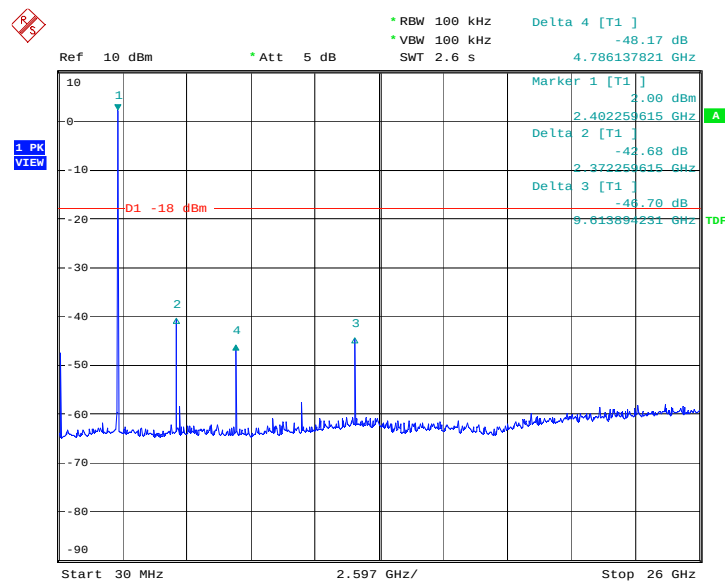
Date: 4.MAY.2010 10:09:05

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



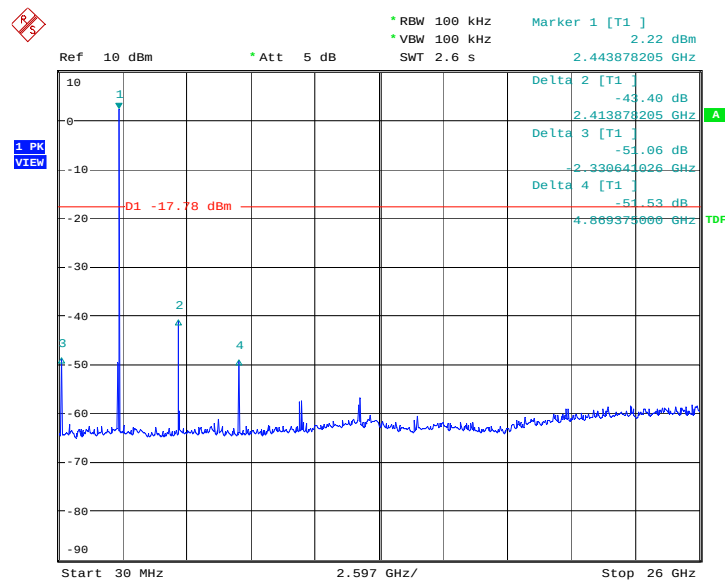
Date: 4.MAY.2010 10:13:09

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



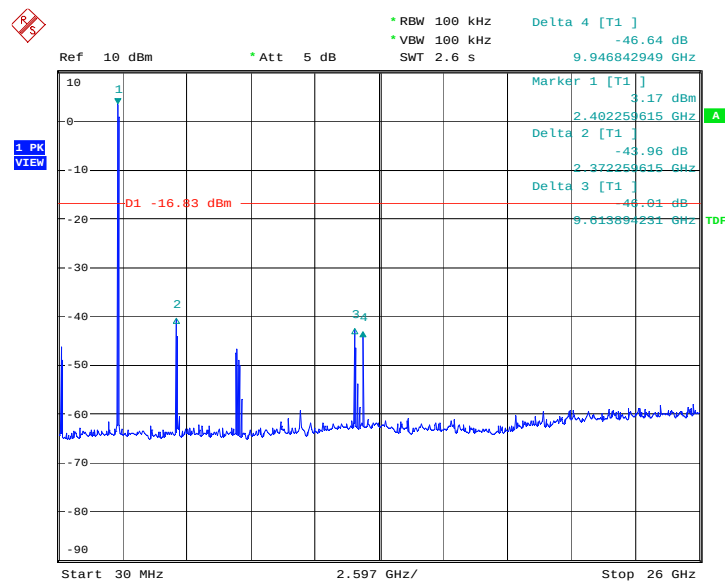
Date: 1.JUN.2010 01:10:08

Fig. 13 Conducted spurious emission: GFSK, Channel 0,30MHz - 26GHz



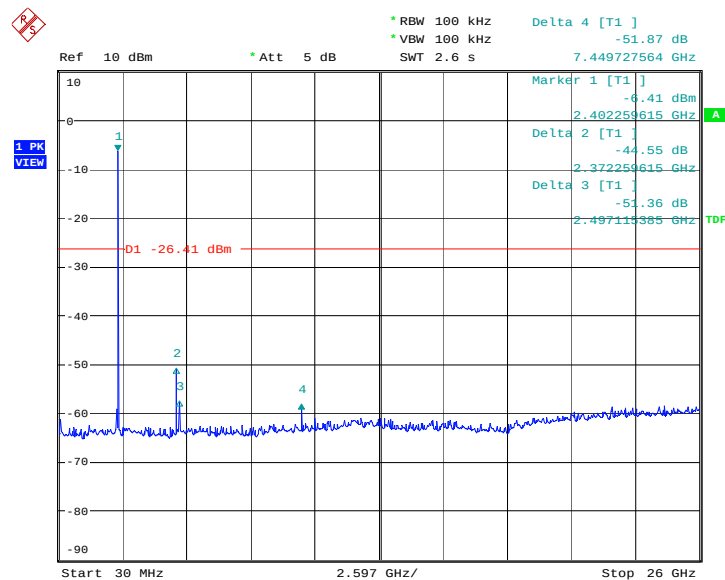
Date: 1.JUN.2010 01:15:31

Fig. 14 Conducted spurious emission: GFSK, Channel 39, 30MHz – 26GHz



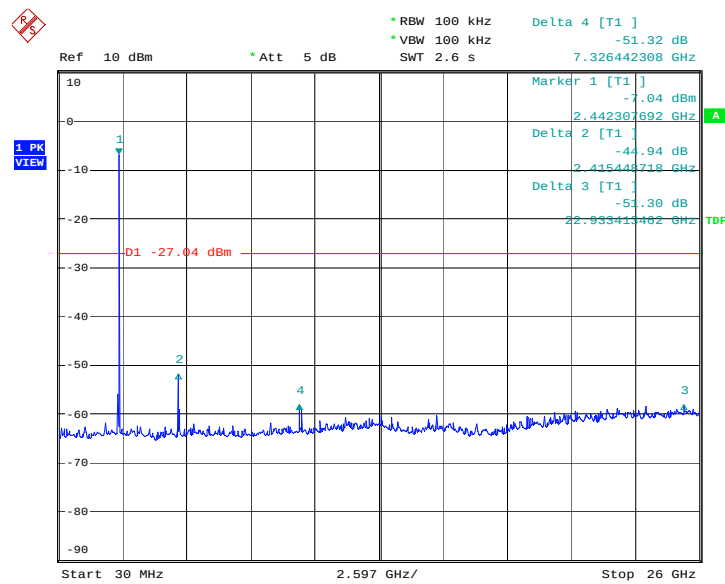
Date: 1.JUN.2010 01:20:55

Fig. 15 Conducted spurious emission: GFSK, Channel 78, 30MHz - 26GHz



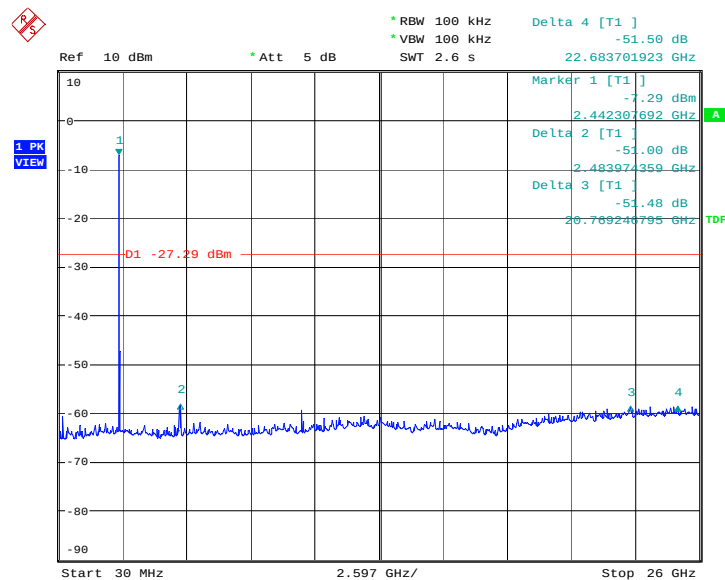
Date: 1.JUN.2010 01:27:02

Fig. 16 Conducted spurious emission: $\pi/4$ DQPSK, Channel 0, 30MHz - 26GHz



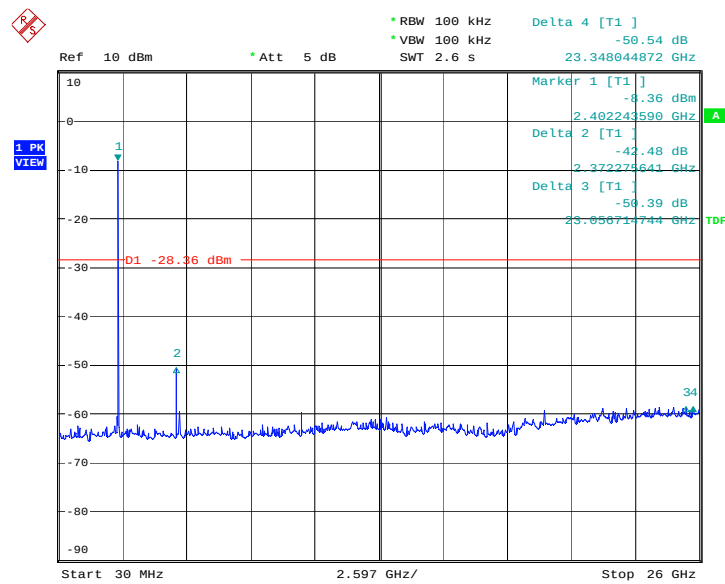
Date: 1.JUN.2010 01:30:05

Fig. 17 Conducted spurious emission: $\pi/4$ DQPSK, Channel 39, 30MHz – 26GHz



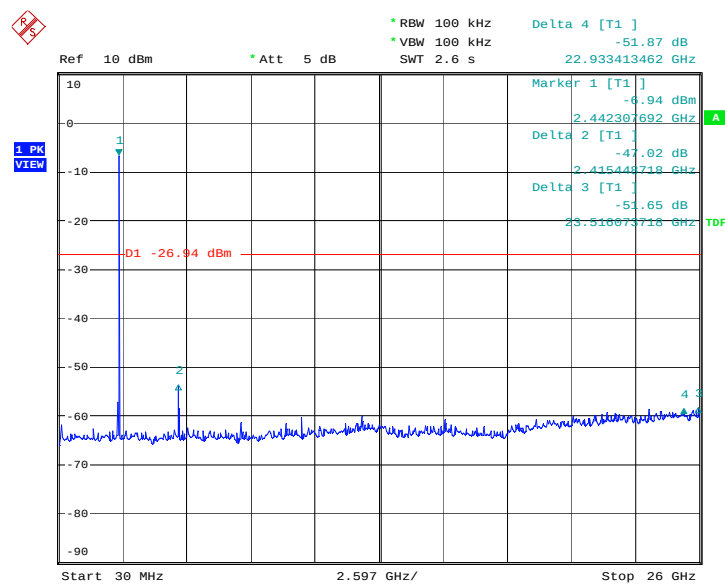
Date: 1.JUN.2010 01:33:32

Fig. 18 Conducted spurious emission: $\pi/4$ DQPSK, Channel 78, 30MHz - 26GHz



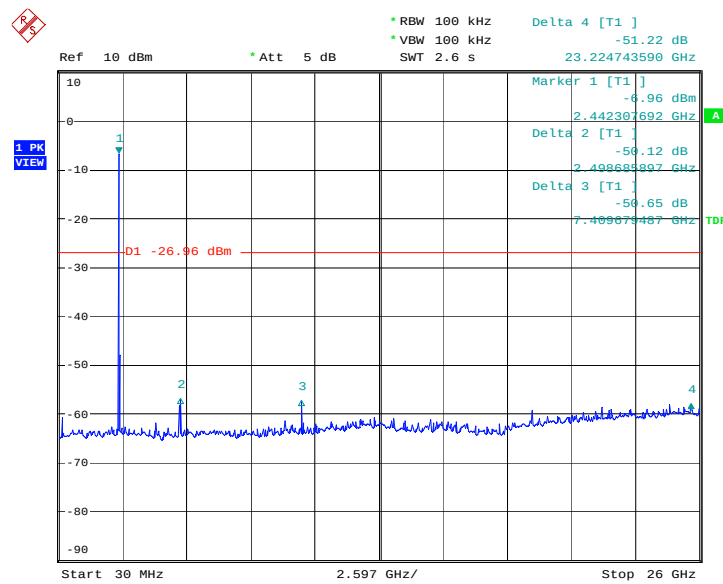
Date: 1.JUN.2010 01:36:11

Fig. 19 Conducted spurious emission: 8DPSK, Channel 0,30MHz - 26GHz



Date: 1.JUN.2010 01:39:38

Fig. 20 Conducted spurious emission: 8DPSK, Channel 39, 30MHz – 26GHz



Date: 1.JUN.2010 01:42:21

Fig. 21 Conducted spurious emission: 8DPSK, Channel 78, 30MHz - 26GHz

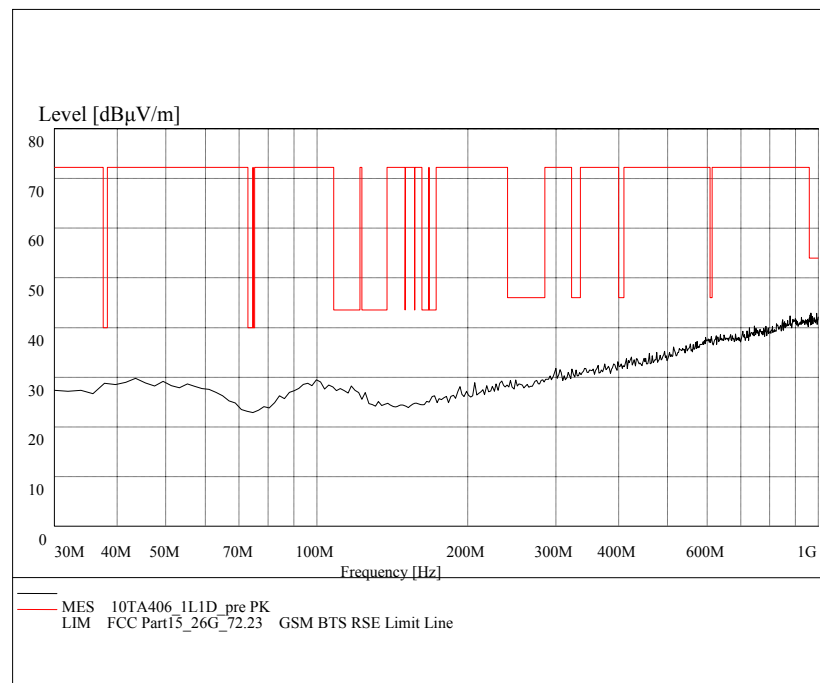


Fig. 22 Radiated emission: GFSK, Channel 0, 30 MHz - 1 GHz

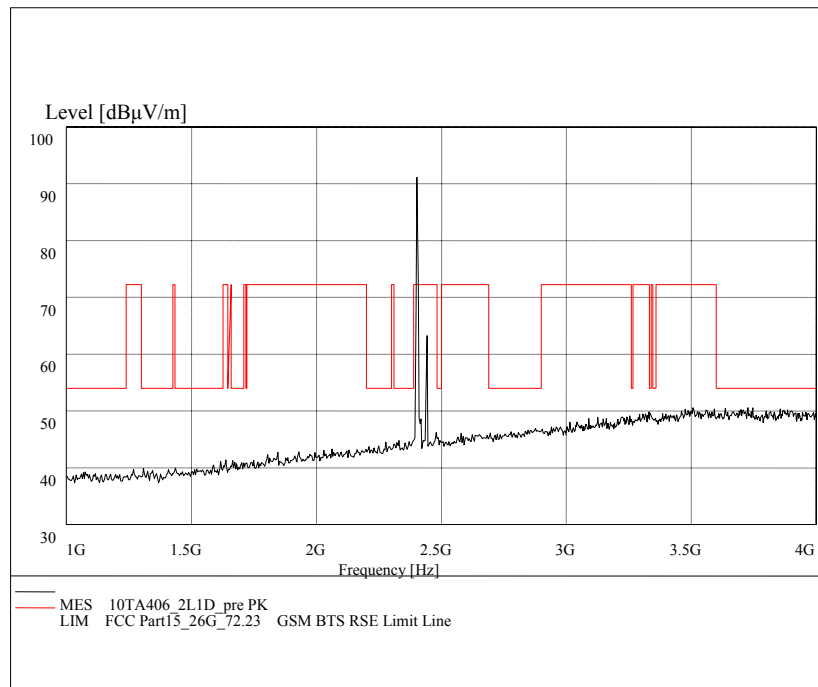


Fig. 23 Radiated emission: GFSK, Channel 0, 1 GHz - 4 GHz

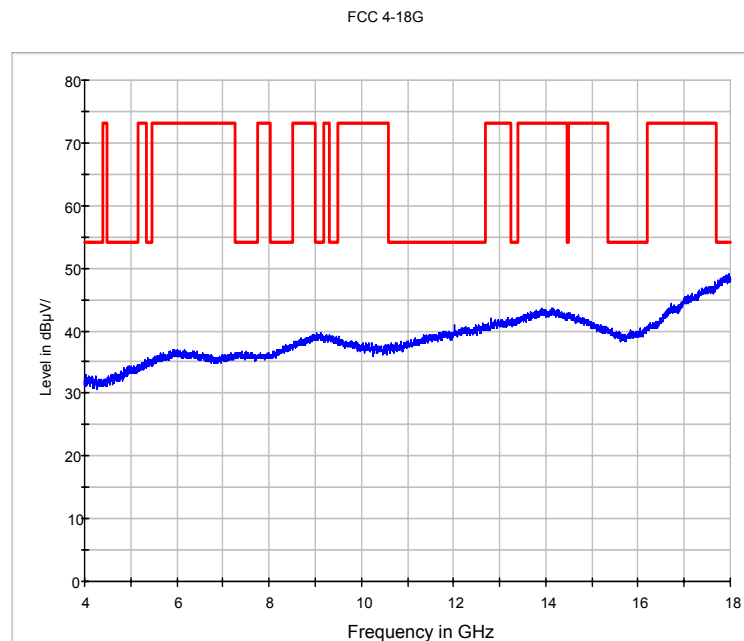


Fig. 24 Radiated emission: GFSK, Channel 0, 4 GHz - 18 GHz

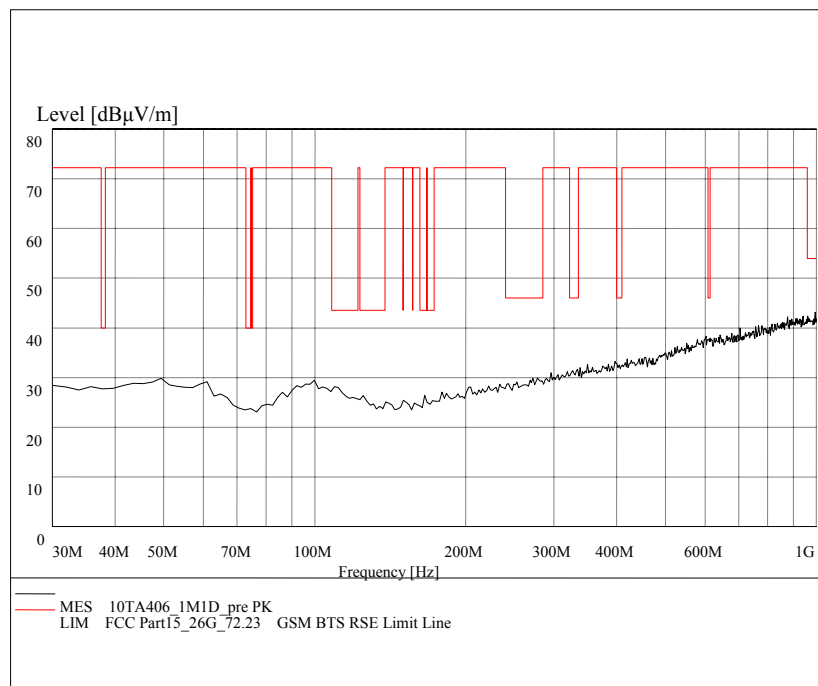


Fig. 25 Radiated emission: GFSK, Channel 39, 30 MHz - 1 GHz

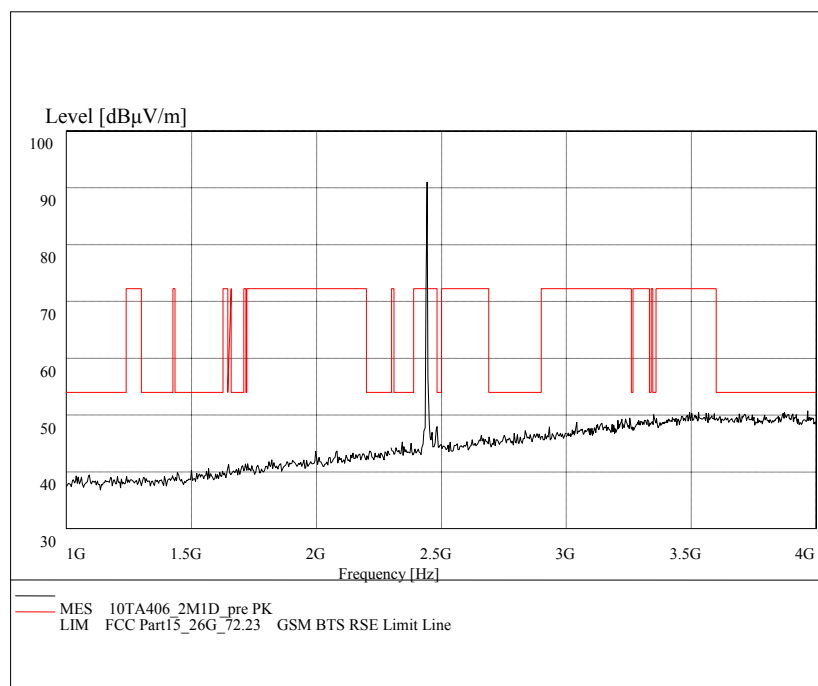


Fig. 26 Radiated emission: GFSK, Channel 39, 1 GHz - 4 GHz

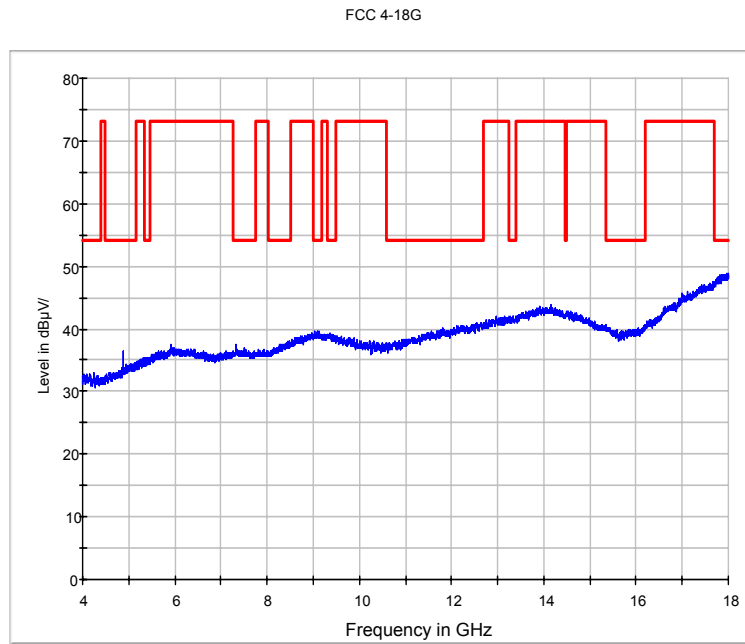


Fig. 27 Radiated emission: GFSK, Channel 39, 4 GHz - 18 GHz

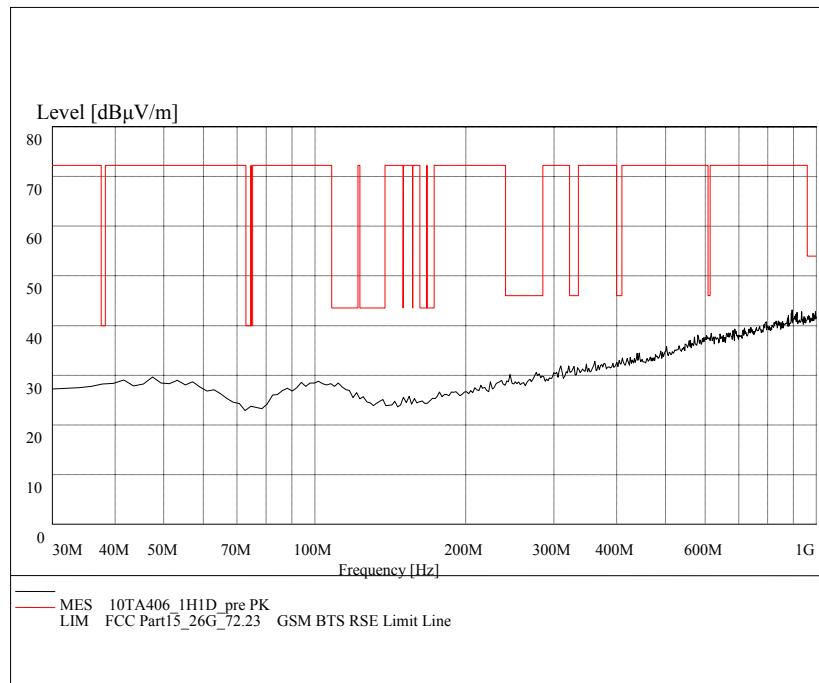


Fig. 28 Radiated emission: GFSK, Channel 78, 30 MHz - 1 GHz

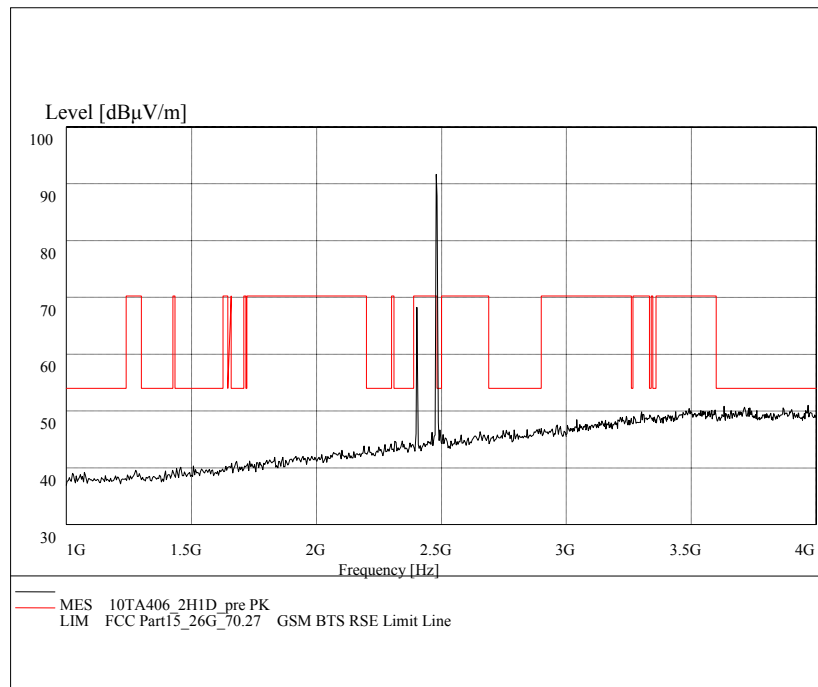


Fig. 29 Radiated emission: GFSK, Channel 78, 1 GHz - 4 GHz

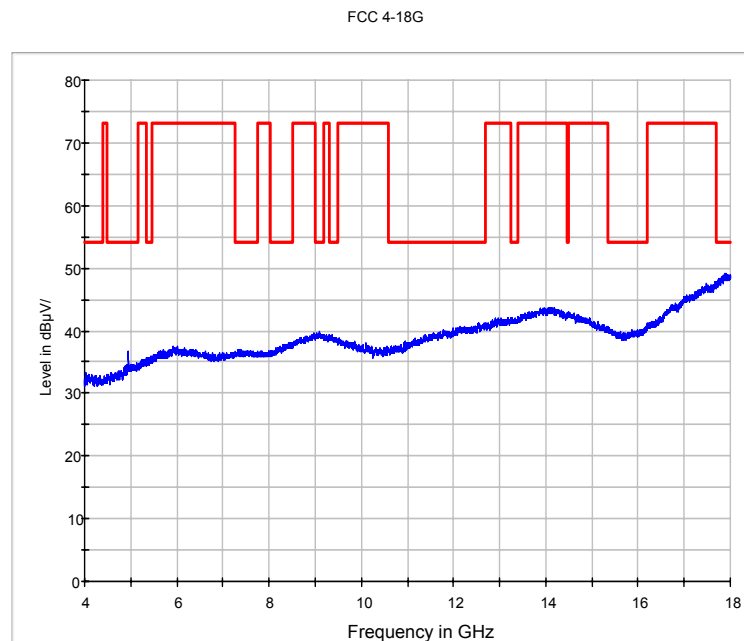


Fig. 30 Radiated emission: GFSK, Channel 78, 4 GHz - 18 GHz

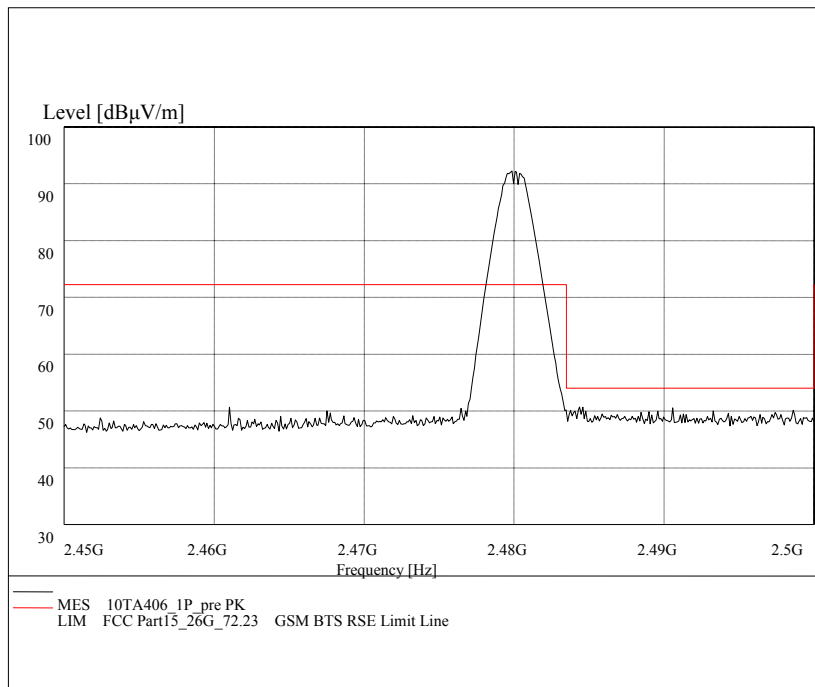


Fig. 31 Radiated emission (Power): GFSK, 2.45GHz - 2.5GHz

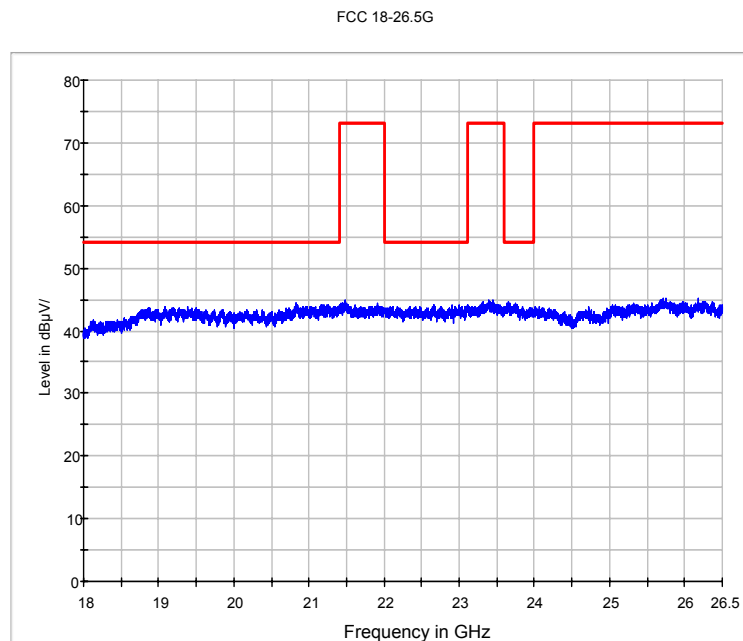


Fig. 32 Radiated emission: GFSK, 18 GHz - 26 GHz

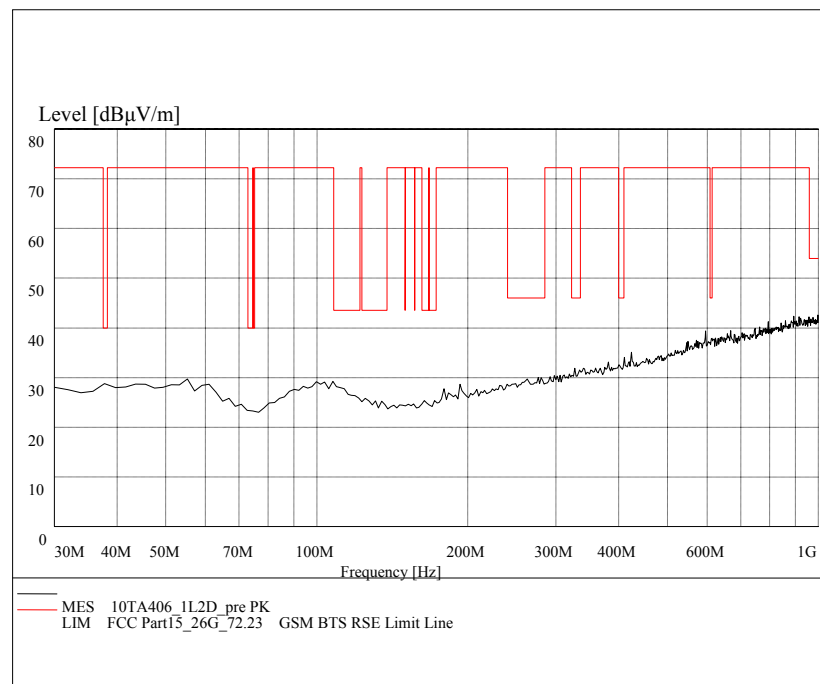


Fig. 33 Radiated emission: $\pi/4$ DQPSK, Channel 0, 30 MHz - 1 GHz

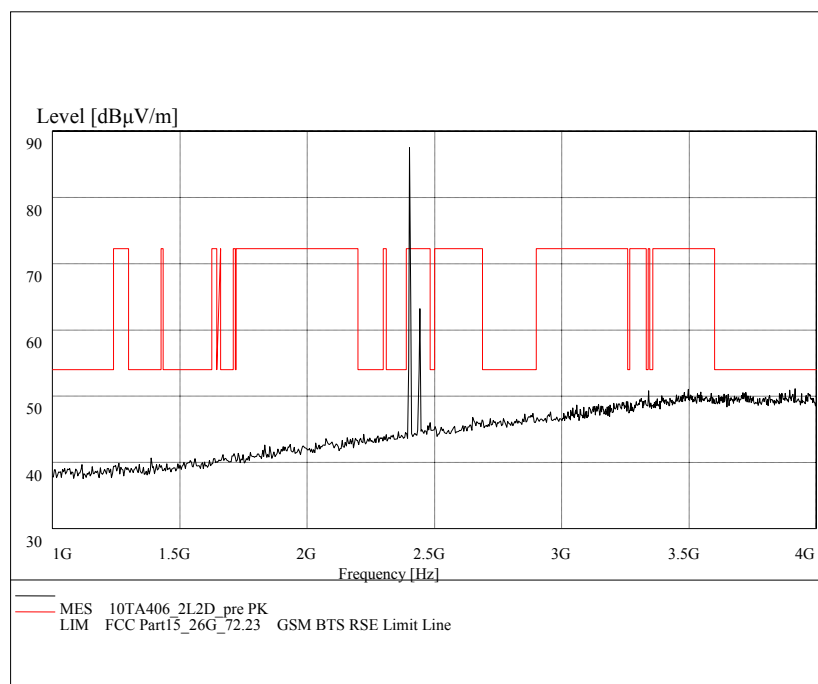


Fig. 34 Radiated emission: $\pi/4$ DQPSK, Channel 0, 1 GHz - 4 GHz

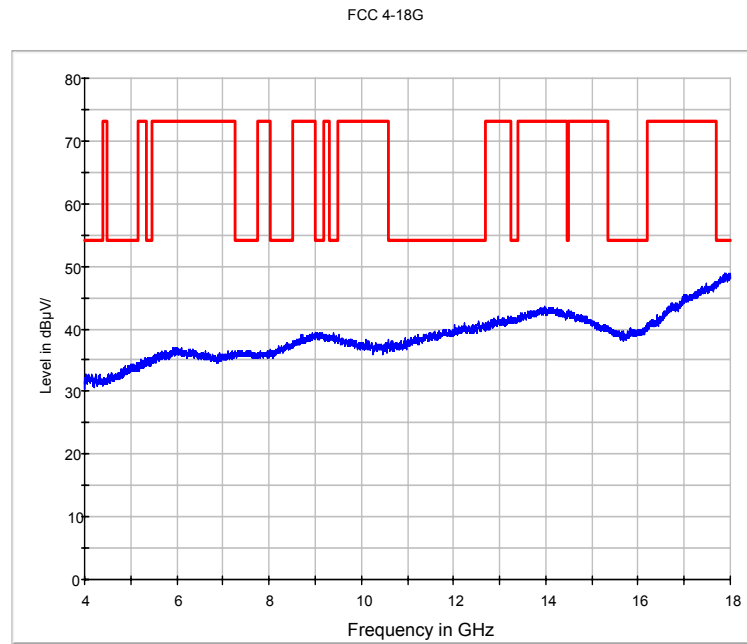


Fig. 35 Radiated emission: $\pi/4$ DQPSK, Channel 0, 4 GHz - 18 GHz

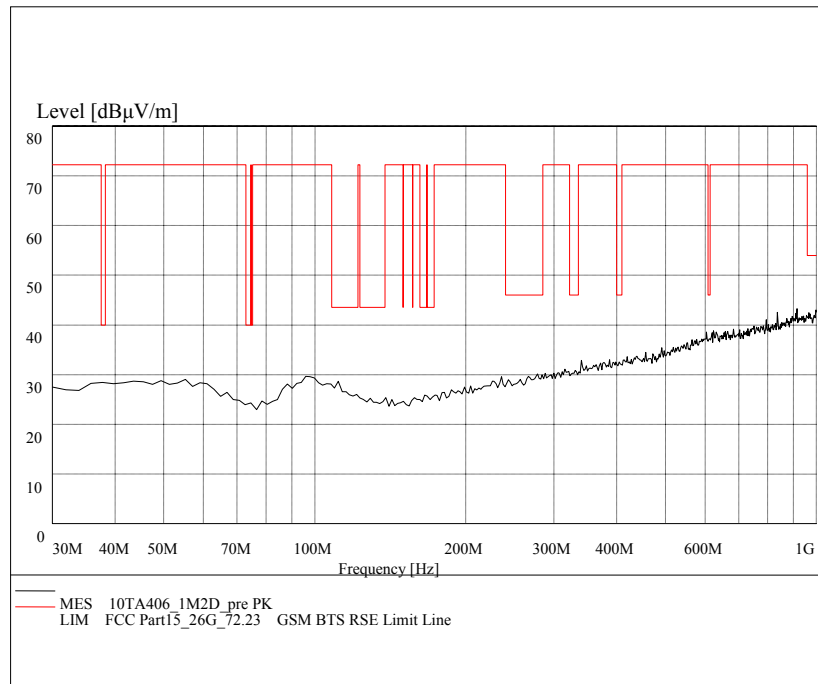


Fig. 36 Radiated emission: $\pi/4$ DQPSK, Channel 39, 30 MHz - 1 GHz

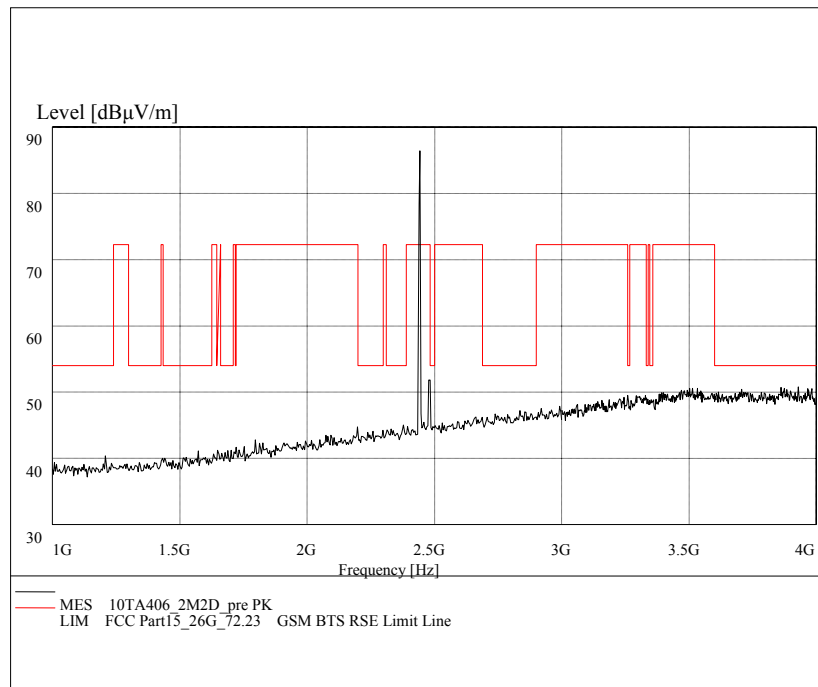


Fig. 37 Radiated emission: $\pi/4$ DQPSK, Channel 39, 1 GHz - 4 GHz

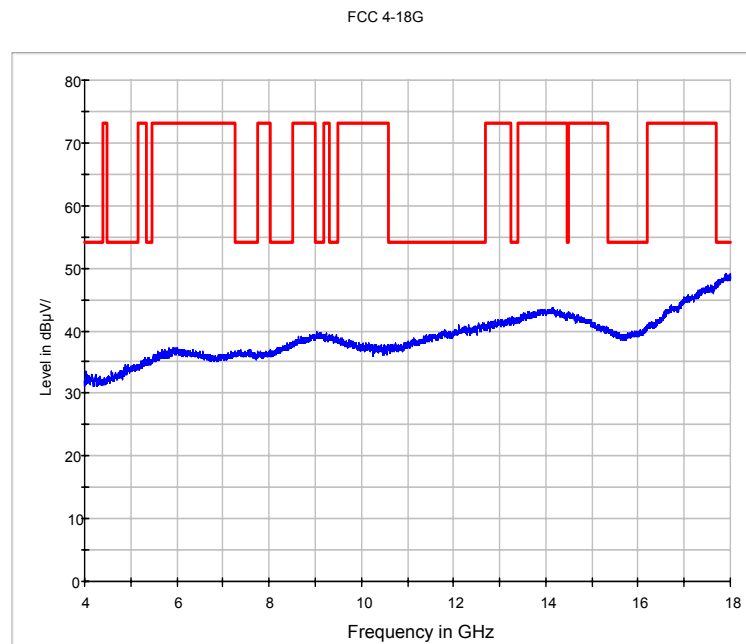


Fig. 38 Radiated emission: $\pi/4$ DQPSK, Channel 39, 4 GHz - 18 GHz

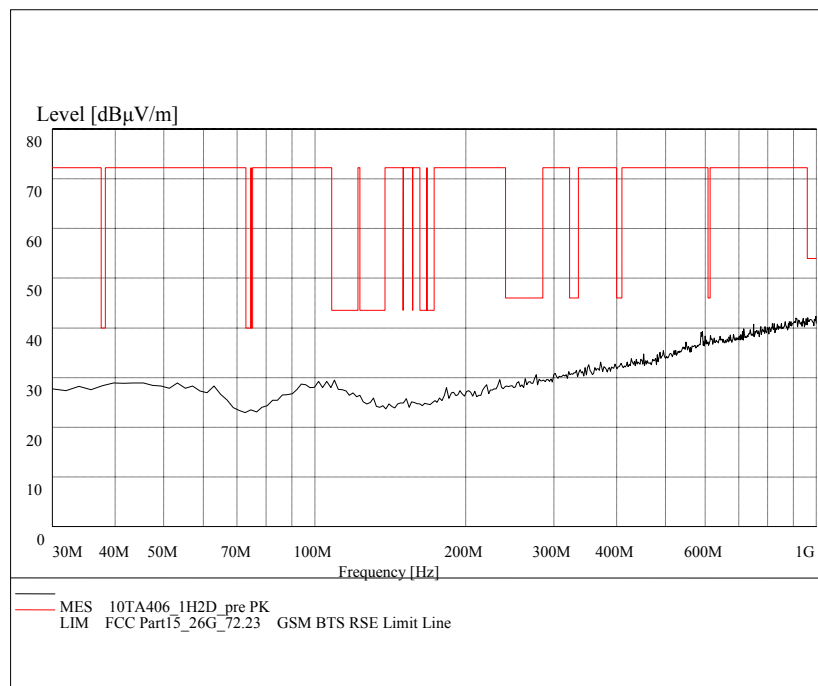


Fig. 39 Radiated emission: $\pi/4$ DQPSK, Channel 78, 30 MHz - 1 GHz

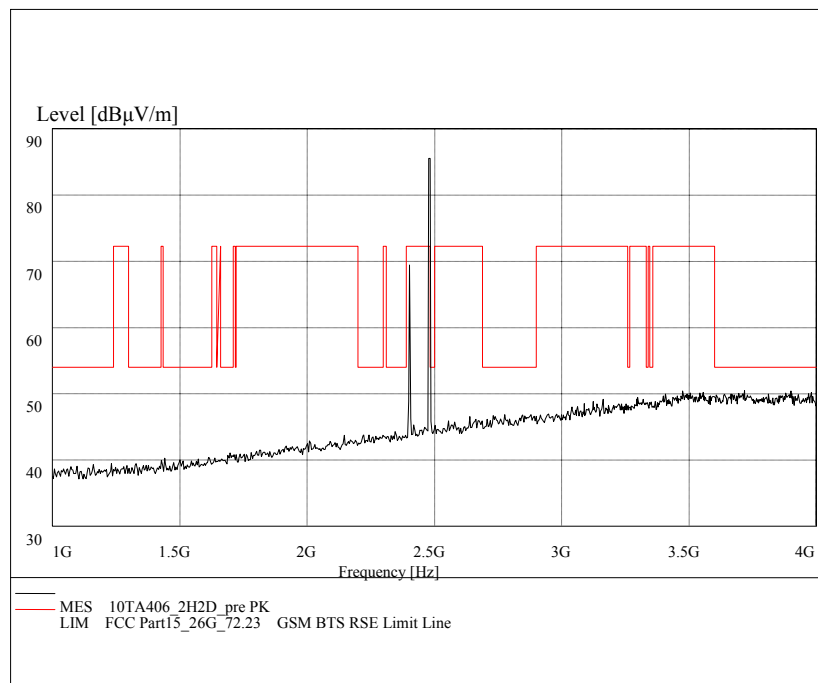


Fig. 40 Radiated emission: $\pi/4$ DQPSK, Channel 78, 1 GHz - 4 GHz

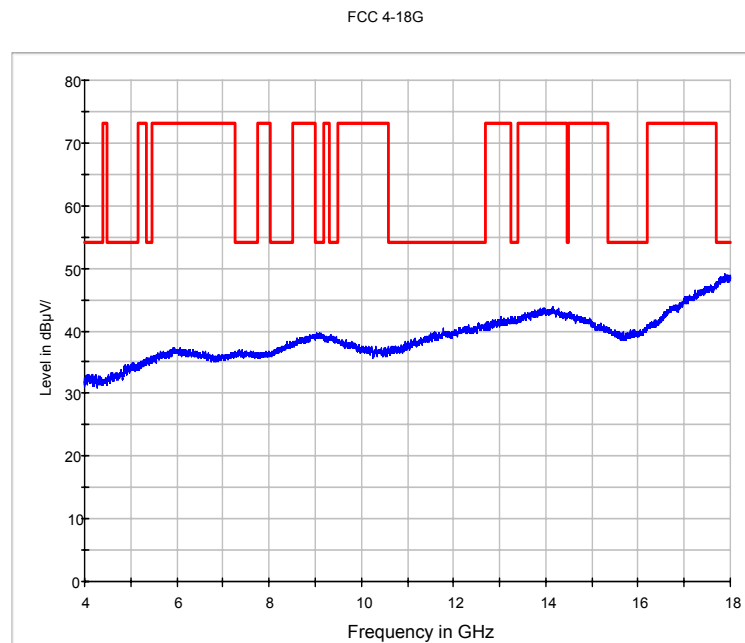


Fig. 41 Radiated emission: $\pi/4$ DQPSK, Channel 78, 4 GHz - 18 GHz

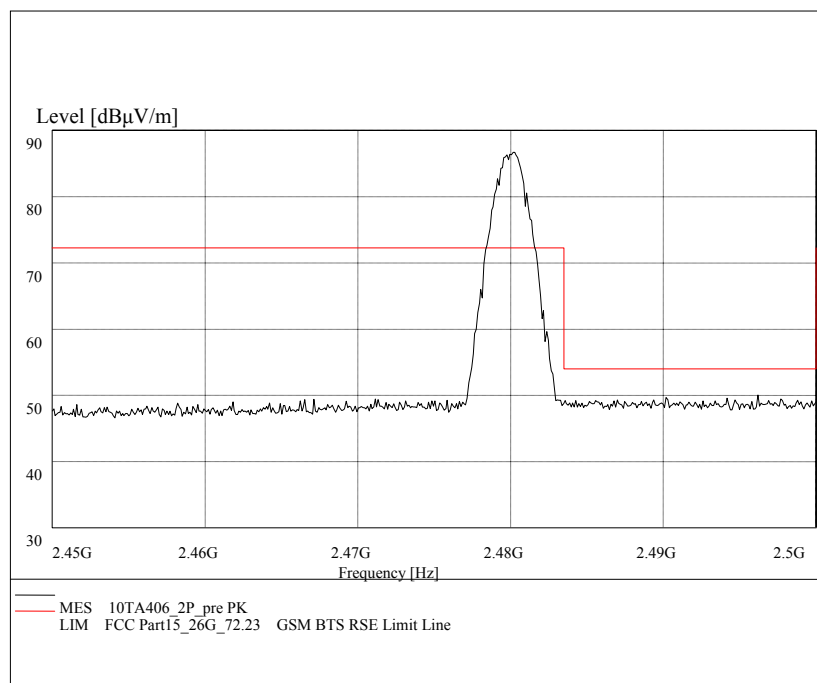


Fig. 42 Radiated emission (Power): $\pi/4$ DQPSK, 2.45GHz - 2.5GHz

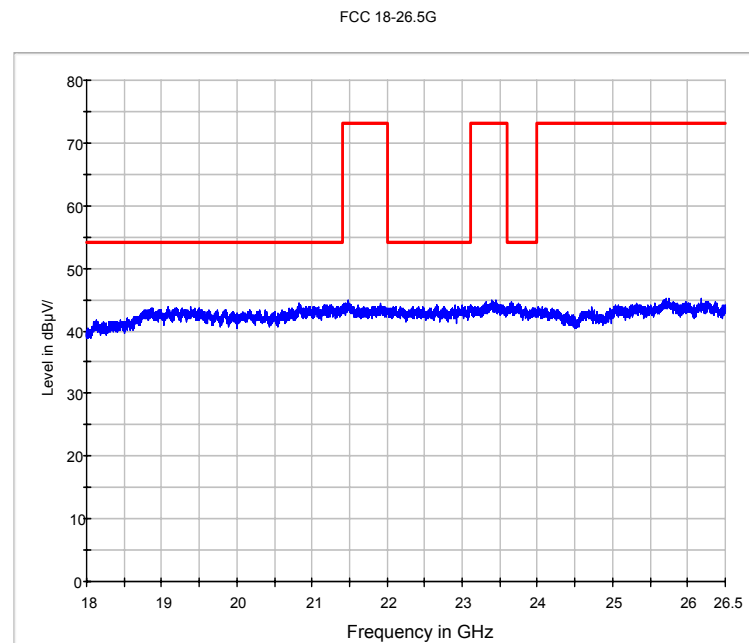


Fig. 43 Radiated emission: $\pi/4$ DQPSK, 18 GHz - 26 GHz

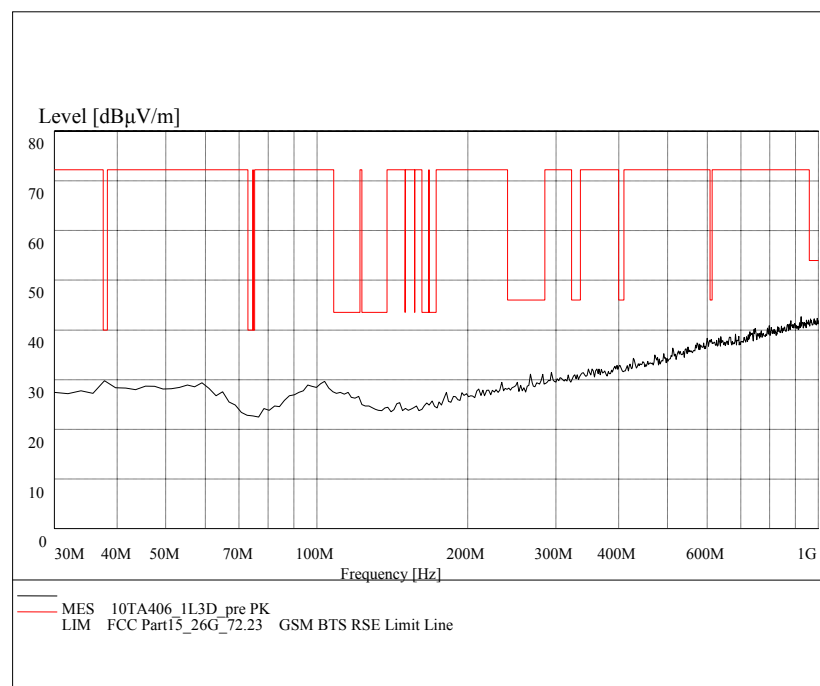


Fig. 44 Radiated emission: 8DPSK, Channel 0, 30 MHz - 1 GHz

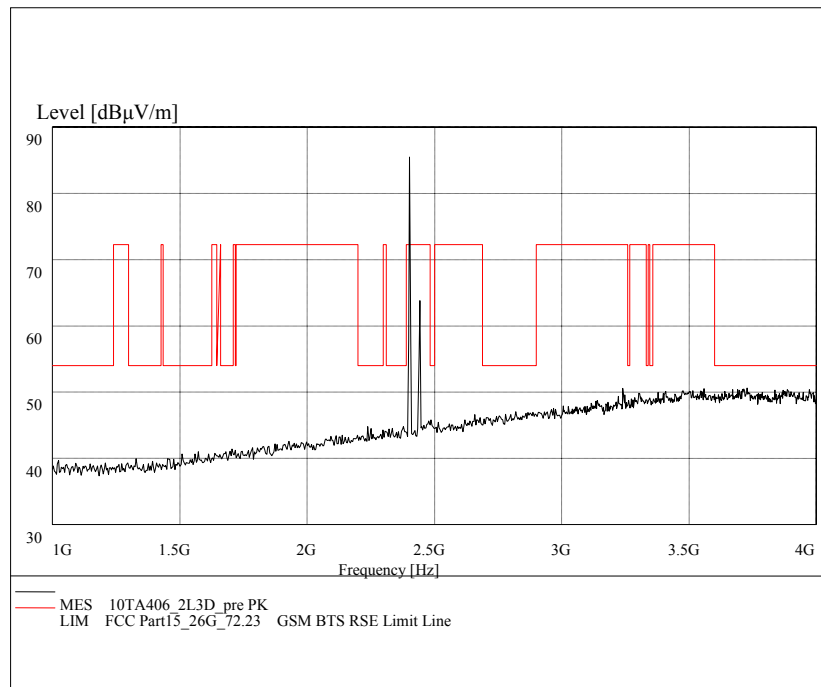


Fig. 45 Radiated emission: 8DPSK, Channel 0, 1 GHz - 4 GHz

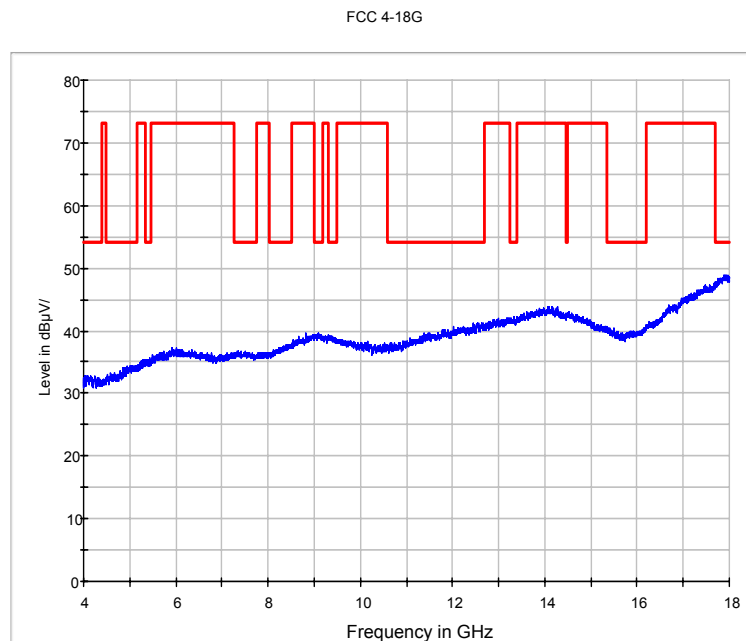


Fig. 46 Radiated emission: 8DPSK, Channel 0, 4 GHz - 18 GHz

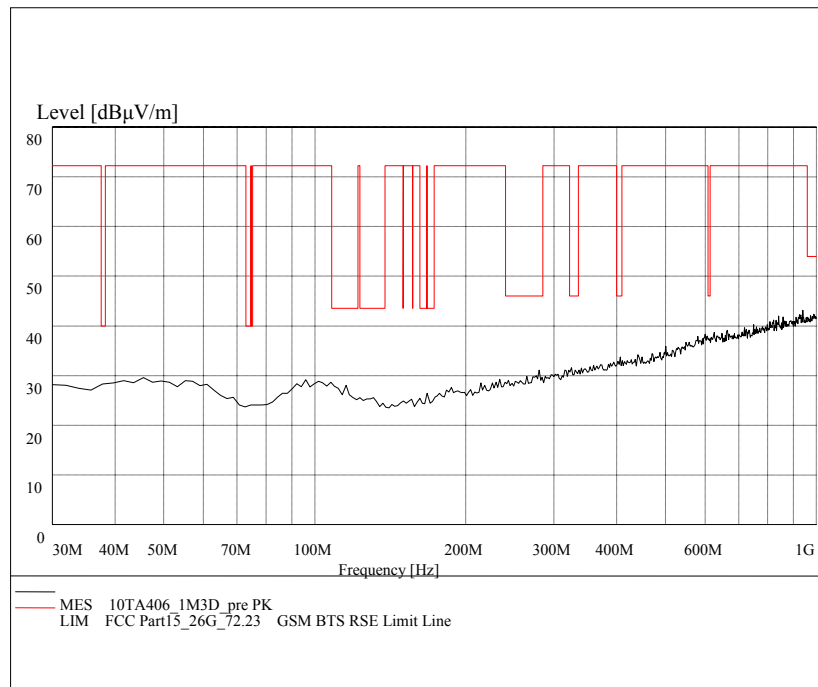


Fig. 47 Radiated emission: 8DPSK, Channel 39, 30 MHz - 1 GHz

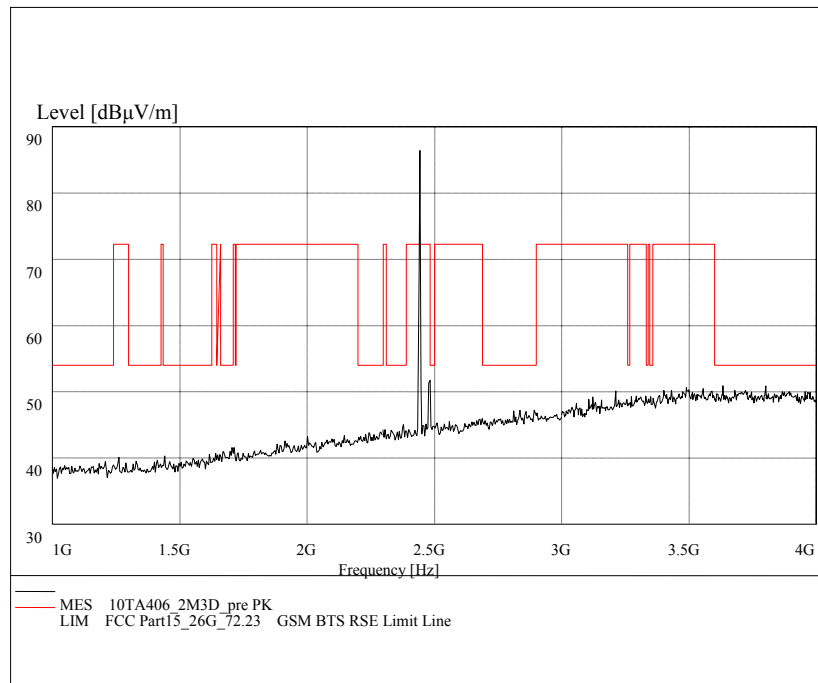


Fig. 48 Radiated emission: 8DPSK, Channel 39, 1 GHz - 4 GHz

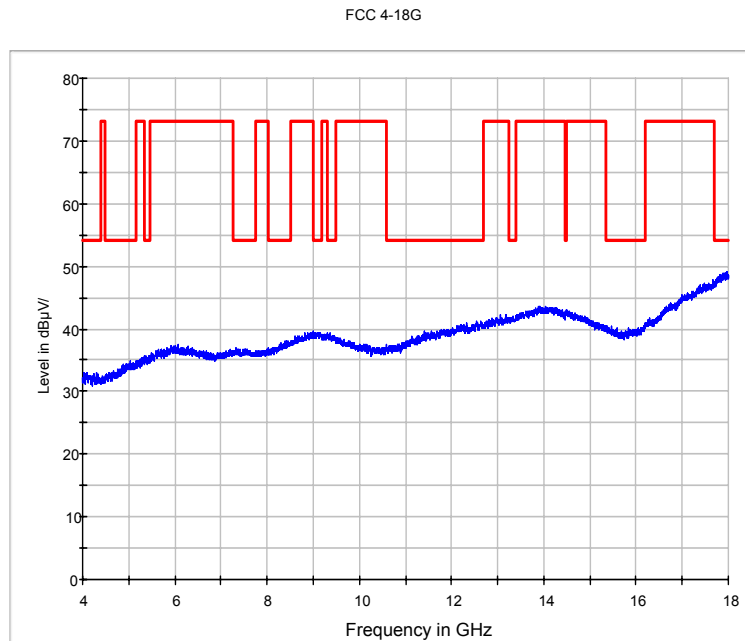


Fig. 49 Radiated emission: 8DPSK, Channel 39, 4 GHz - 18 GHz

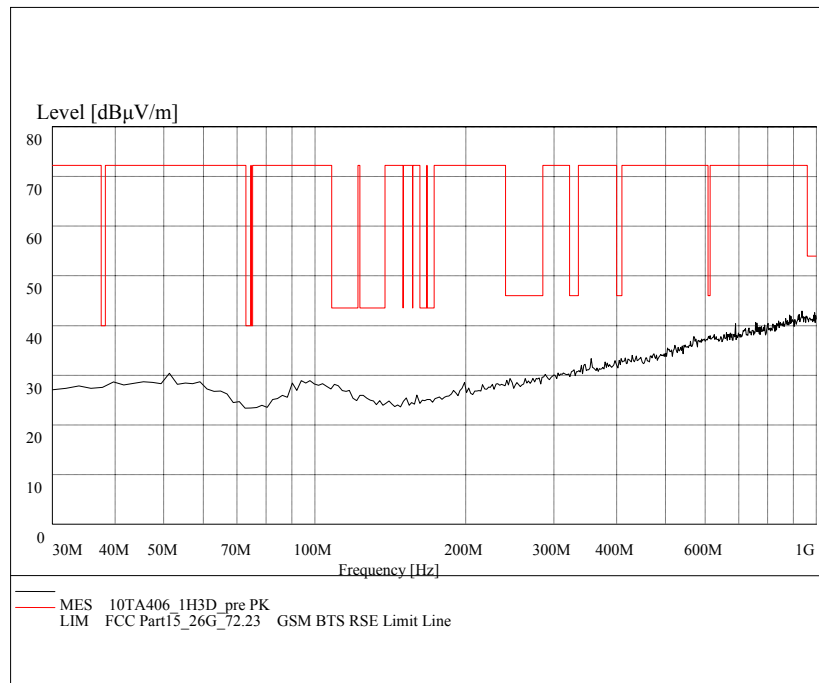


Fig. 50 Radiated emission: 8DPSK, Channel 78, 30 MHz - 1 GHz

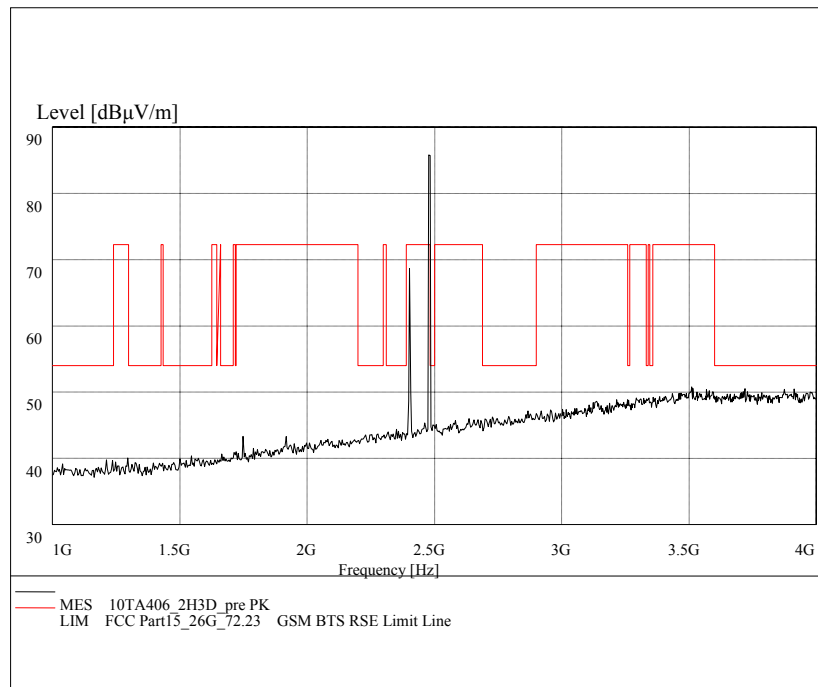


Fig. 51 Radiated emission: 8DPSK, Channel 78, 1 GHz - 4 GHz

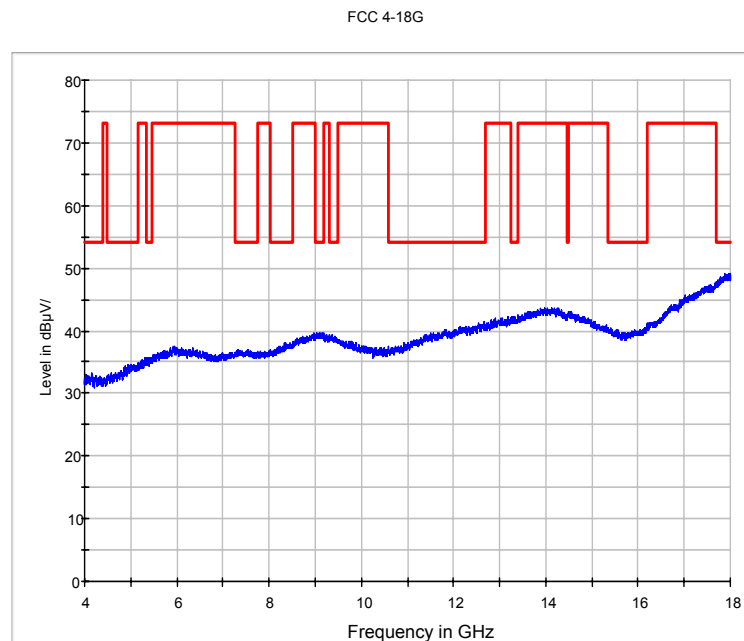


Fig. 52 Radiated emission: 8DPSK, Channel 78, 4 GHz - 18 GHz

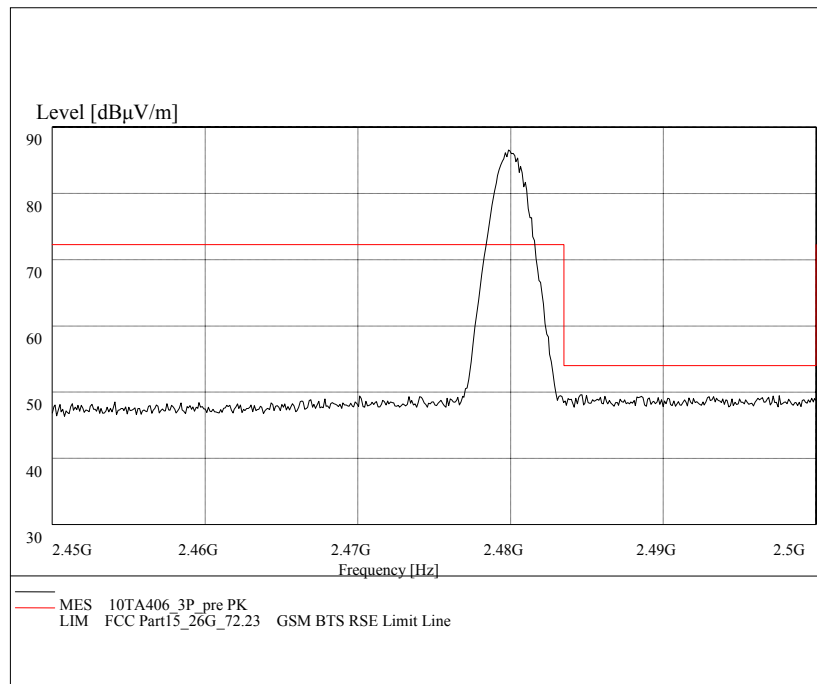


Fig. 53 Radiated emission (Power): 8DPSK, 2.45GHz - 2.5GHz

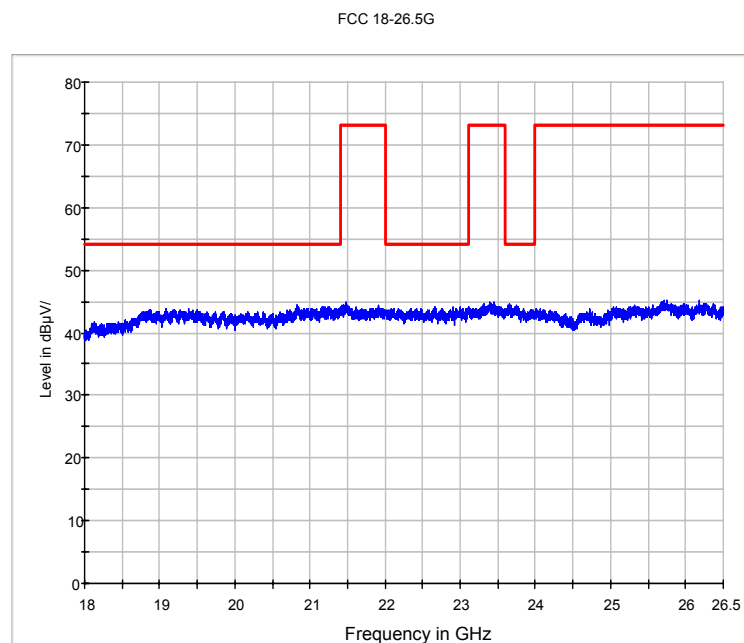


Fig. 54 Radiated emission: 8DPSK, 18 GHz - 26 GHz

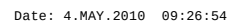


Fig. 55 Time of occupancy (Dwell Time): Channel 39, Packet DH1

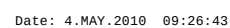
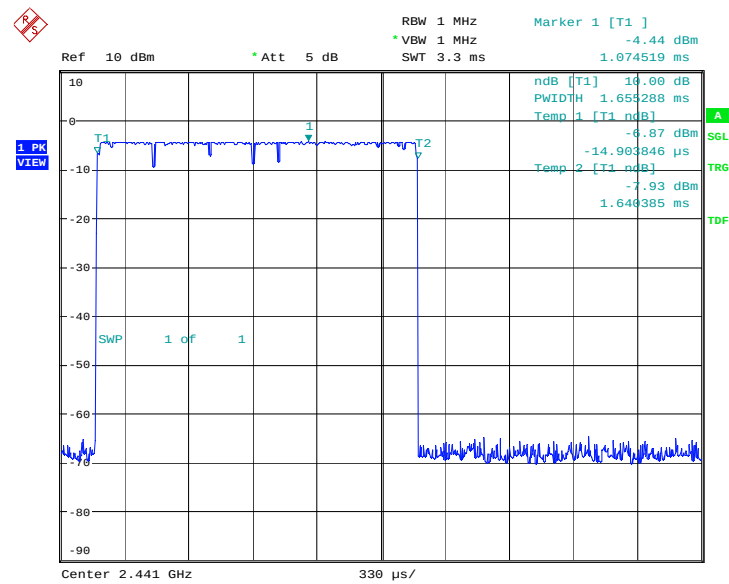
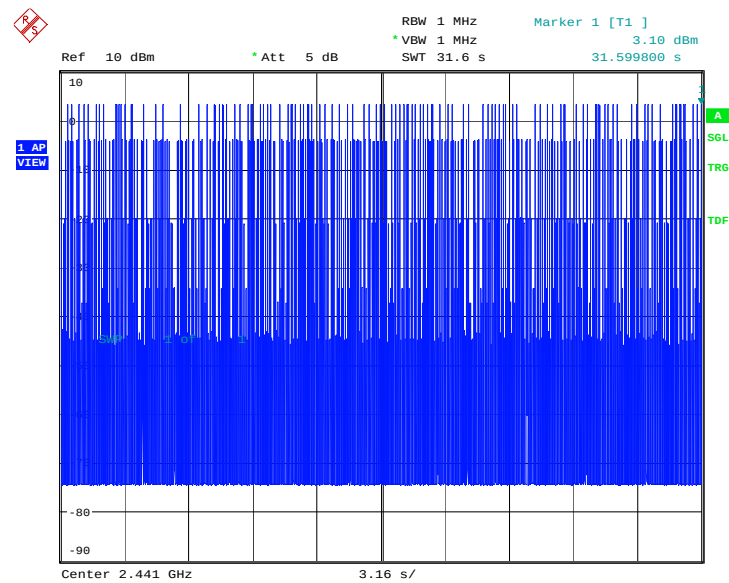


Fig. 56 Number of Transmissions Measurement:Channel 39,Packet DH1



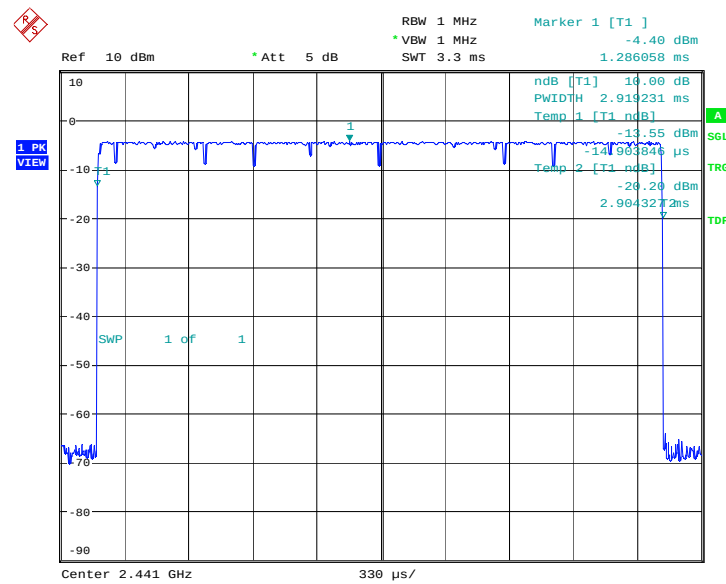
Date: 4.MAY.2010 09:28:13

Fig. 57 Time of occupancy (Dwell Time): Channel 39, Packet DH3



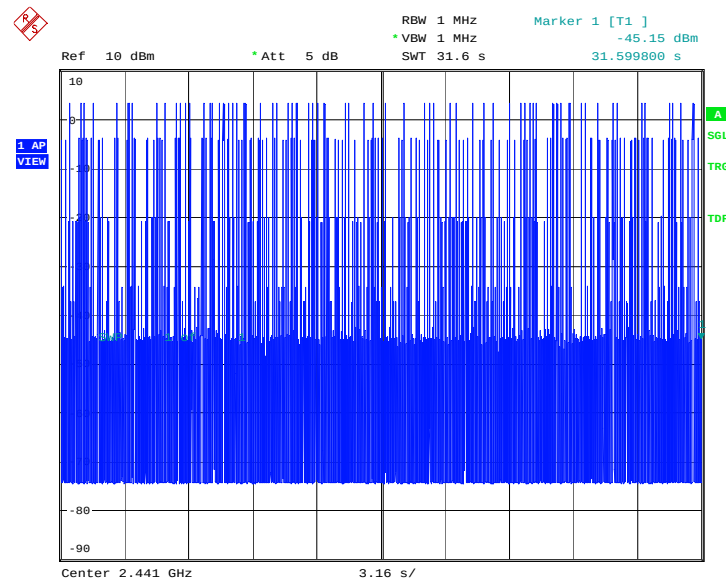
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Fig. 58 Number of Transmissions Measurement:Channel 39,Packet DH3



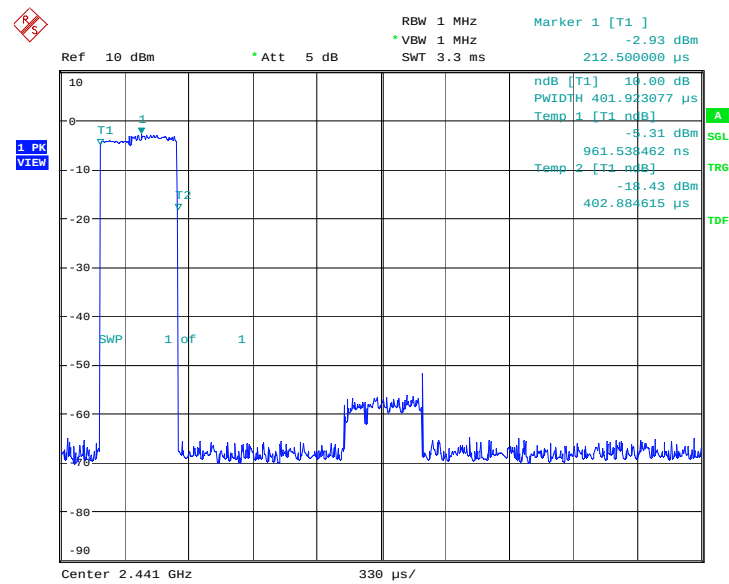
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Fig. 59 Time of occupancy (Dwell Time): Channel 39, Packet DH5



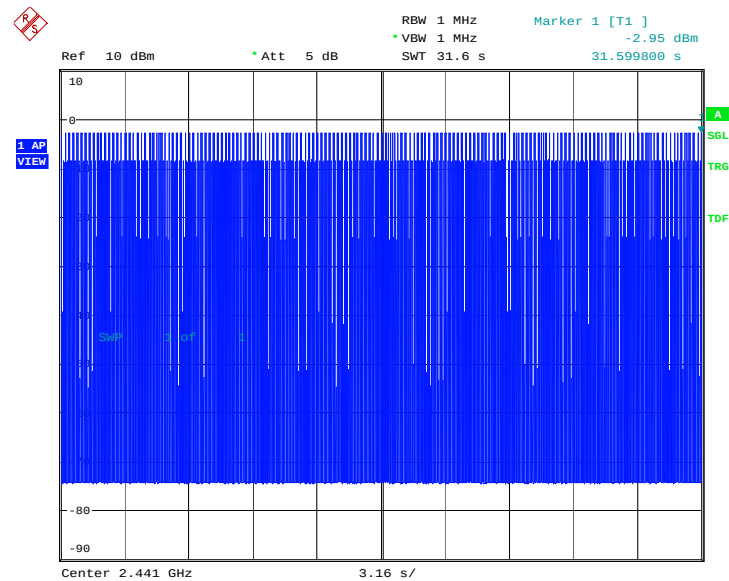
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Fig. 60 Number of Transmissions Measurement:Channel 39,Packet DH5



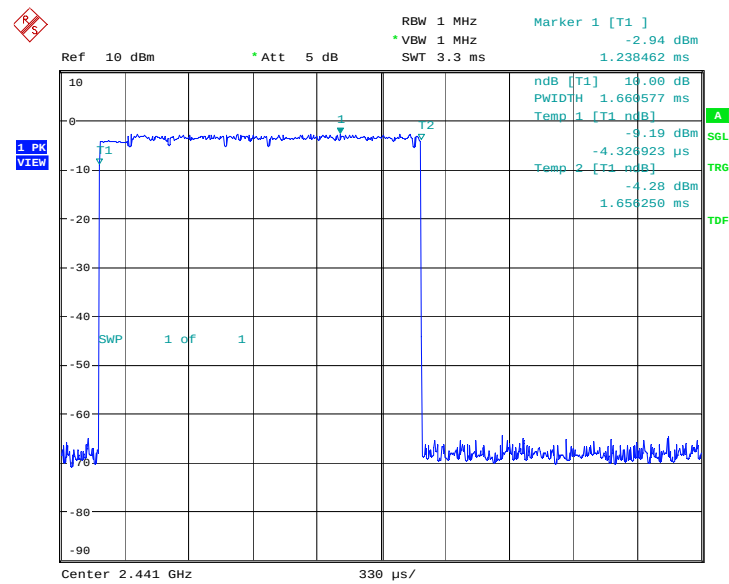
Date: 4.MAY.2010 09:52:23

Fig. 61 Time of occupancy (Dwell Time): Channel 39, Packet 2-DH1



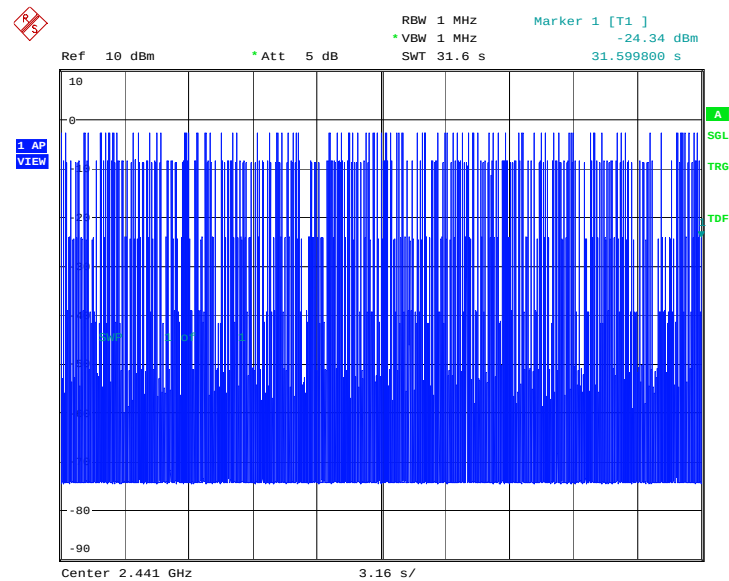
Date: 4.MAY.2010 09:52:11

Fig. 62 Number of Transmissions Measurement:Channel 39,Packet 2-DH1



Date: 4.MAY.2010 09:53:40

Fig. 63 Time of occupancy (Dwell Time): Channel 39, Packet 2-DH3



Date: 4.MAY.2010 09:53:29

Fig. 64 Number of Transmissions Measurement:Channel 39,Packet 2-DH3

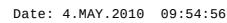


Fig. 65 Time of occupancy (Dwell Time): Channel 39, Packet 2-DH5

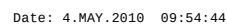
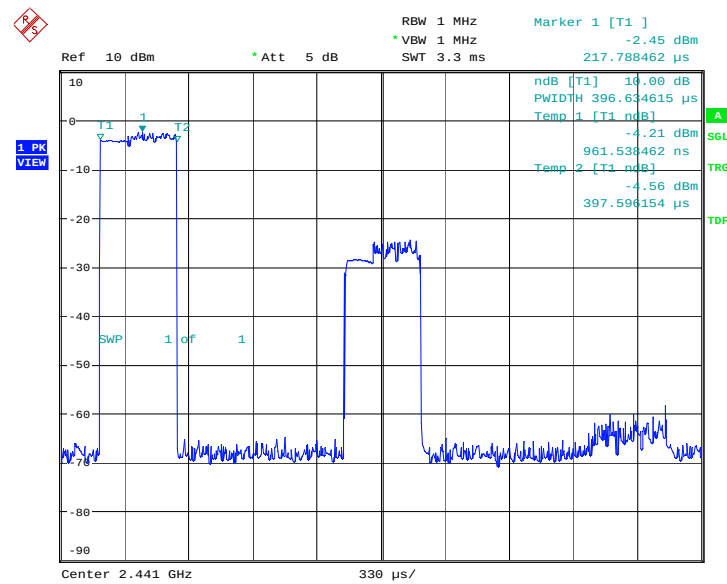
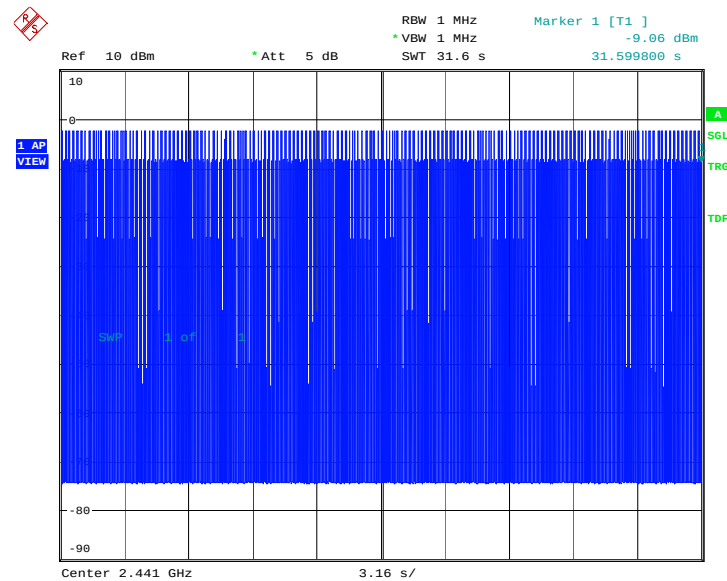


Fig. 66 Number of Transmissions Measurement:Channel 39,Packet 2-DH5



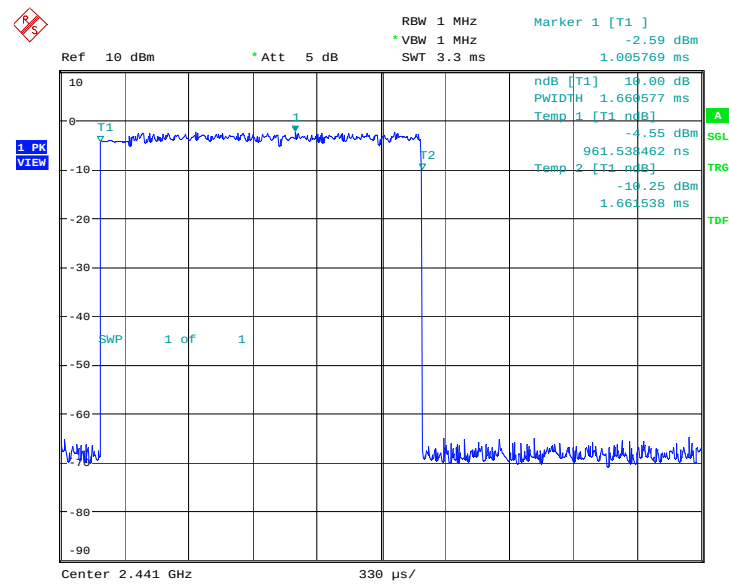
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Fig. 67 Time of occupancy (Dwell Time): Channel 39, Packet 3-DH1



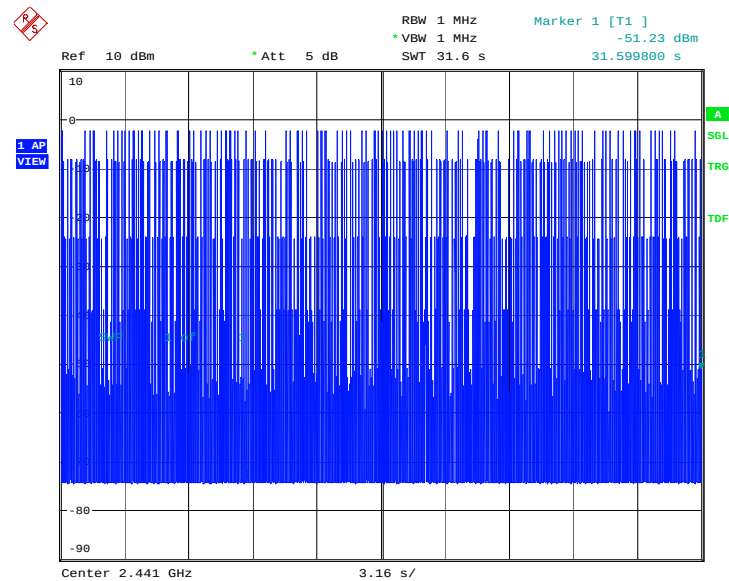
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Fig. 68 Number of Transmissions Measurement:Channel 39,Packet 3-DH1



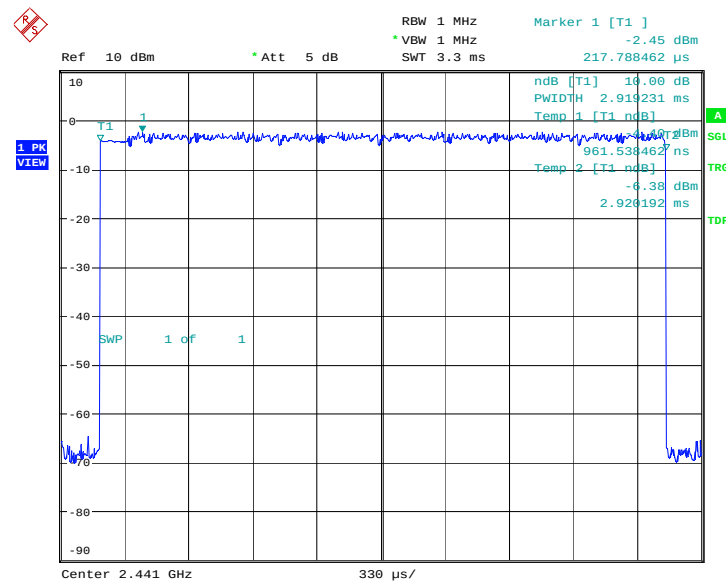
Date: 4.MAY.2010 10:19:05

Fig. 69 Time of occupancy (Dwell Time): Channel 39, Packet 3-DH3



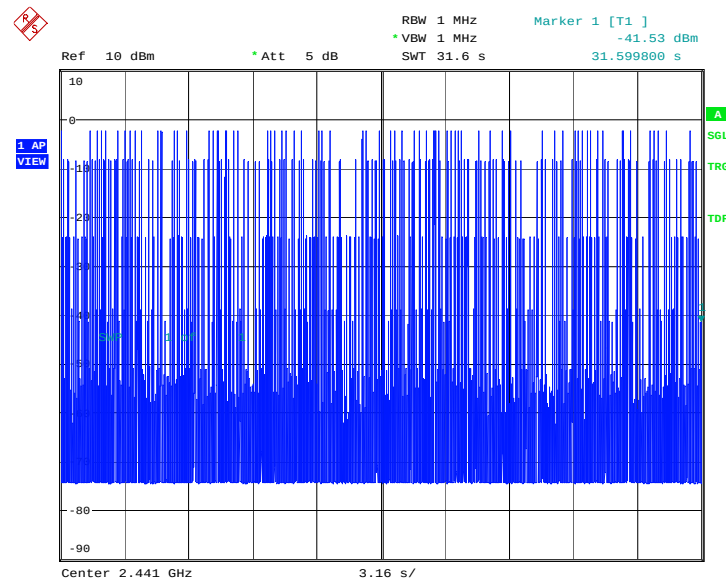
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Fig. 70 Number of Transmissions Measurement:Channel 39,Packet 3-DH3



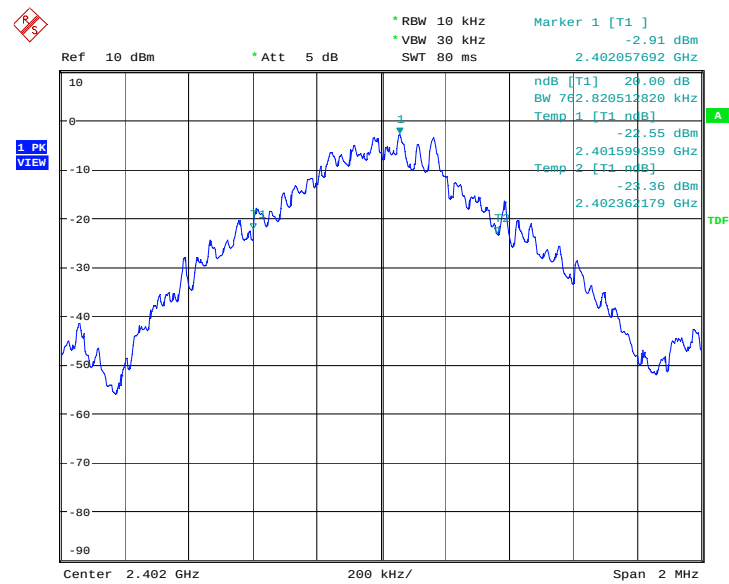
Date: 4.MAY.2010 10:20:21

Fig. 71 Time of occupancy (Dwell Time): Channel 39, Packet 3-DH5



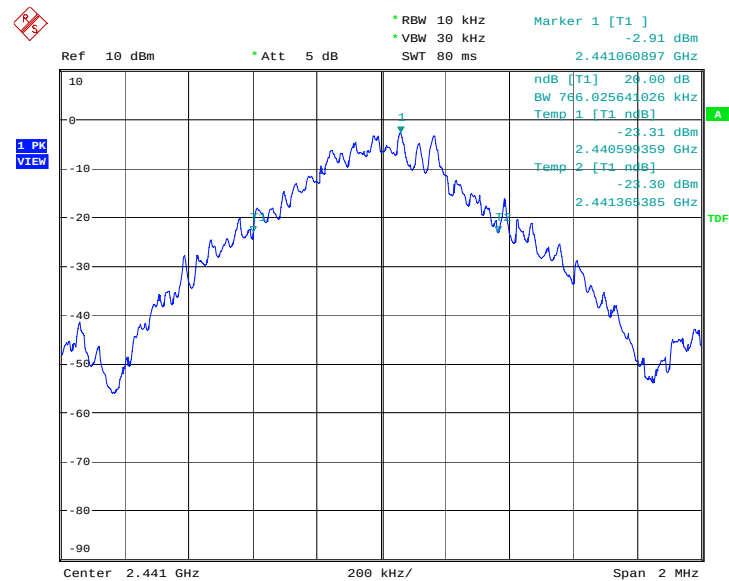
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Fig. 72 Number of Transmissions Measurement:Channel 39,Packet 3-DH5



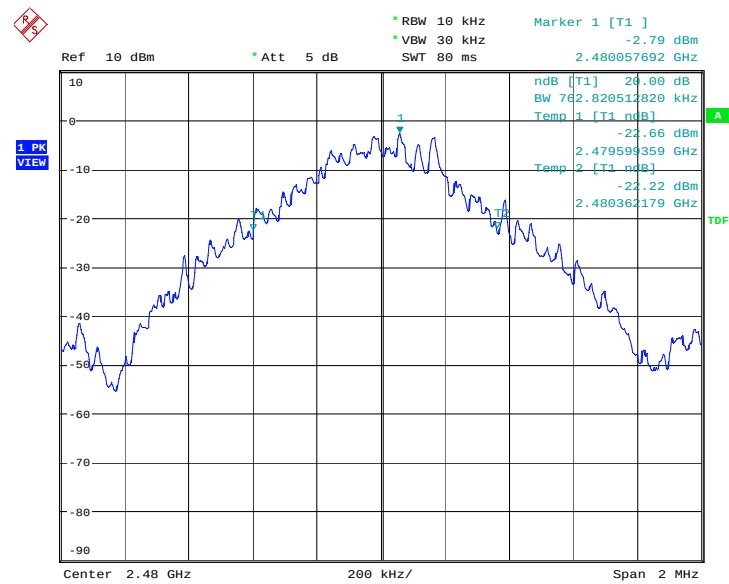
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Fig. 73 20dB Bandwidth: GFSK, Channel 0



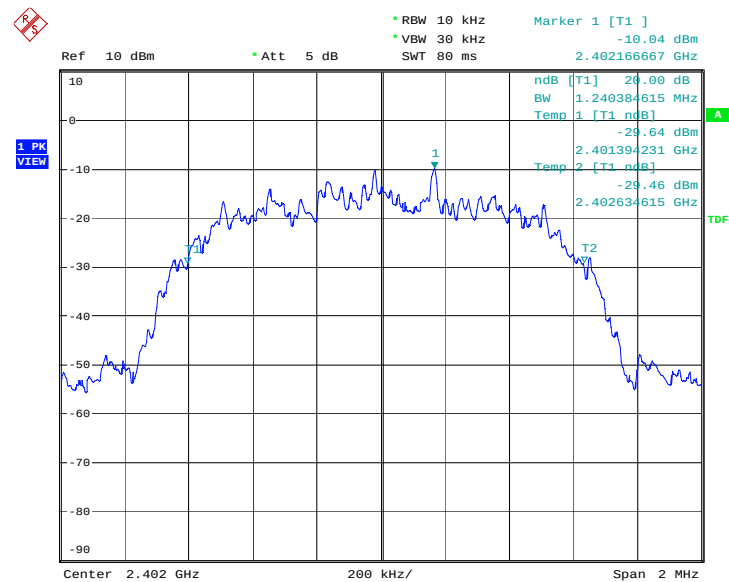
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Fig. 74 20dB Bandwidth: GFSK, Channel 39



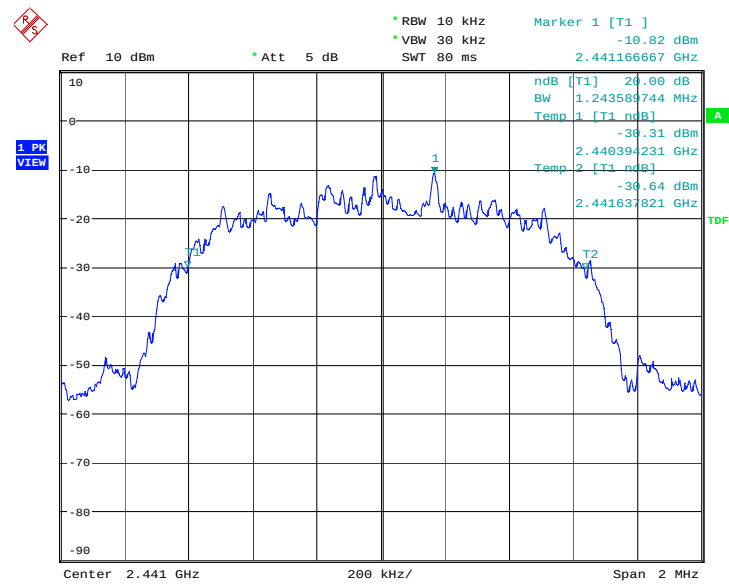
Date: 4.MAY.2010 09:31:07

Fig. 75 20dB Bandwidth: GFSK, Channel 78



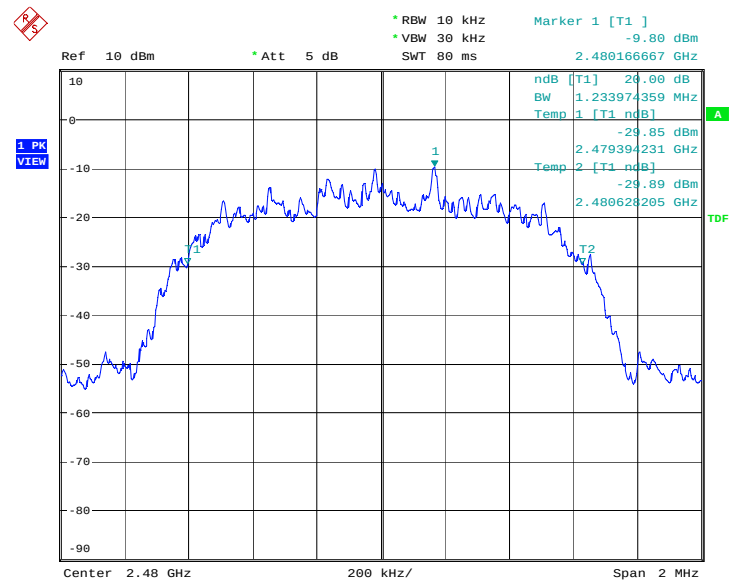
Date: 4.MAY.2010 09:55:29

Fig. 76 20dB Bandwidth: $\pi/4$ DQPSK, Channel 0



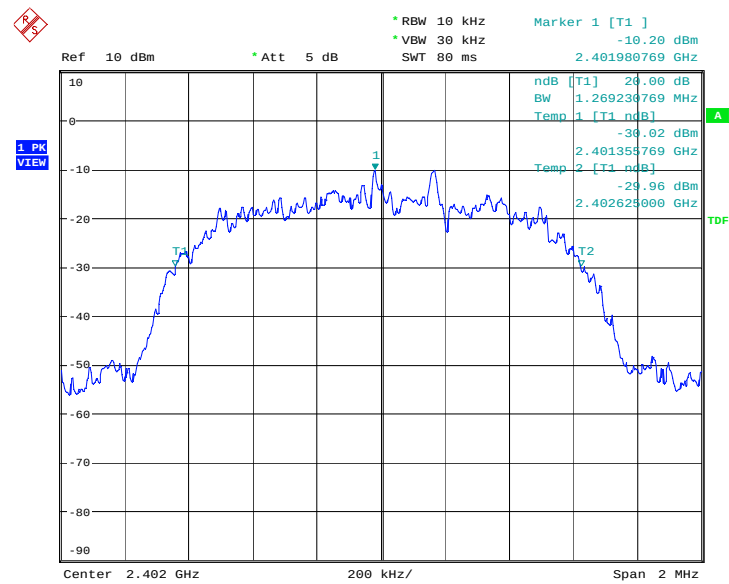
Date: 4.MAY.2010 09:56:01

Fig. 77 20dB Bandwidth: $\pi/4$ DQPSK, Channel 39



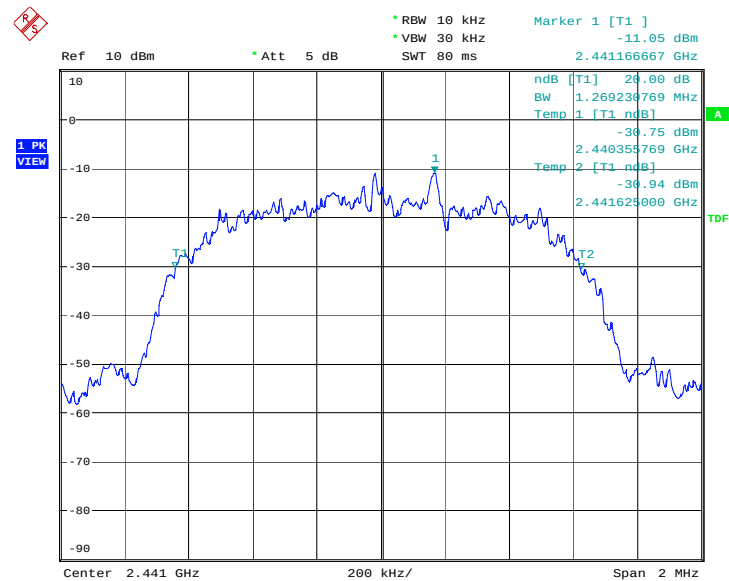
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Fig. 78 20dB Bandwidth: $\pi/4$ DQPSK, Channel 78



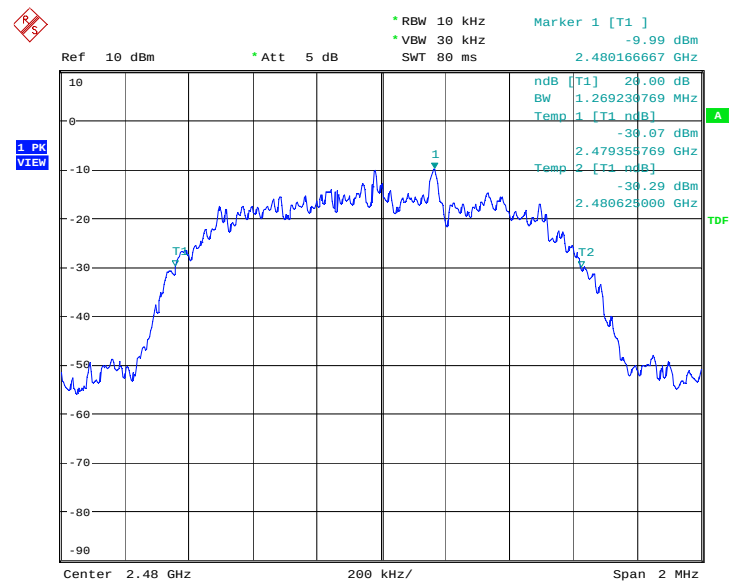
Date: 4.MAY.2010 10:20:54

Fig. 79 20dB Bandwidth: 8DPSK, Channel 0



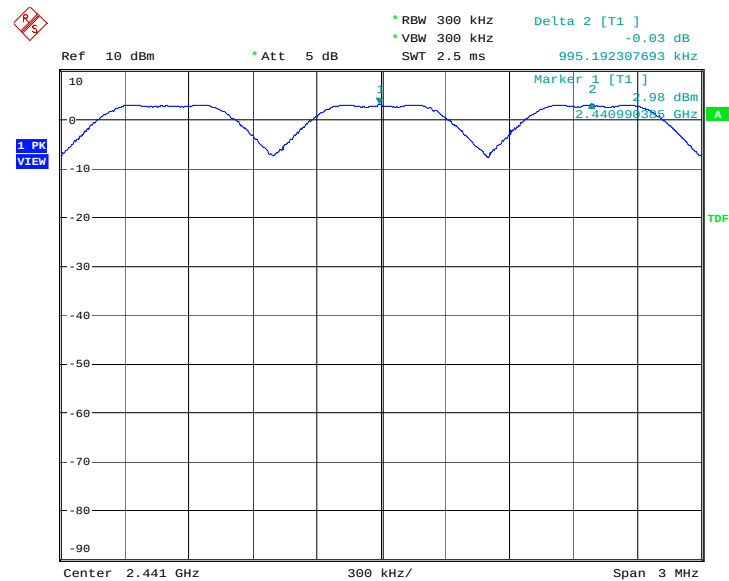
Date: 4.MAY.2010 10:21:26

Fig. 80 20dB Bandwidth: 8DPSK, Channel 39



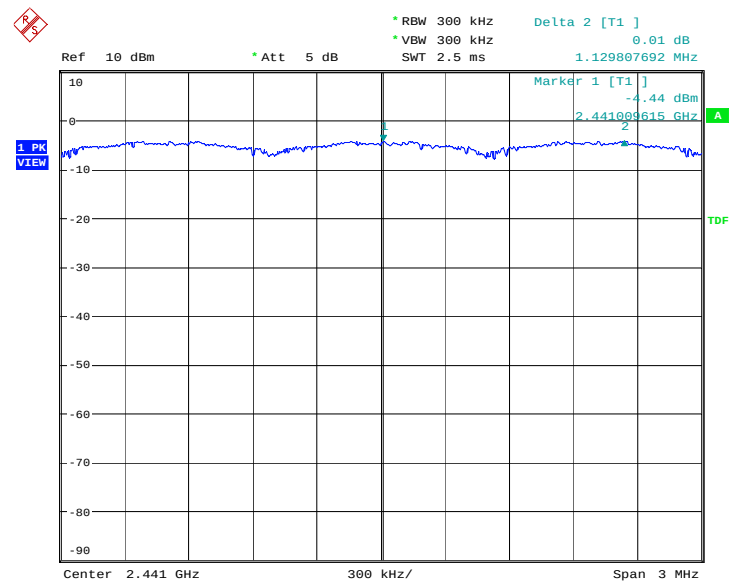
Date: 4.MAY.2010 10:21:58

Fig. 81 20dB Bandwidth: 8DPSK, Channel 78



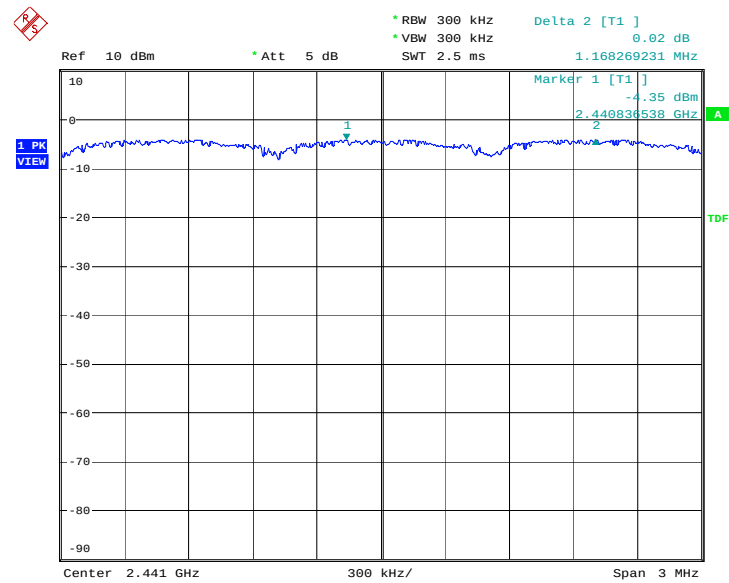
Date: 4.MAY.2010 09:33:10

Fig. 82 Carrier frequency separation measurement: GFSK, Channel 39



Date: 4.MAY.2010 09:58:36

Fig. 83 Carrier frequency separation measurement: $\pi/4$ DQPSK, Channel 39



Date: 4.MAY.2010 10:24:02

Fig. 84 Carrier frequency separation measurement: 8DPSK, Channel 39

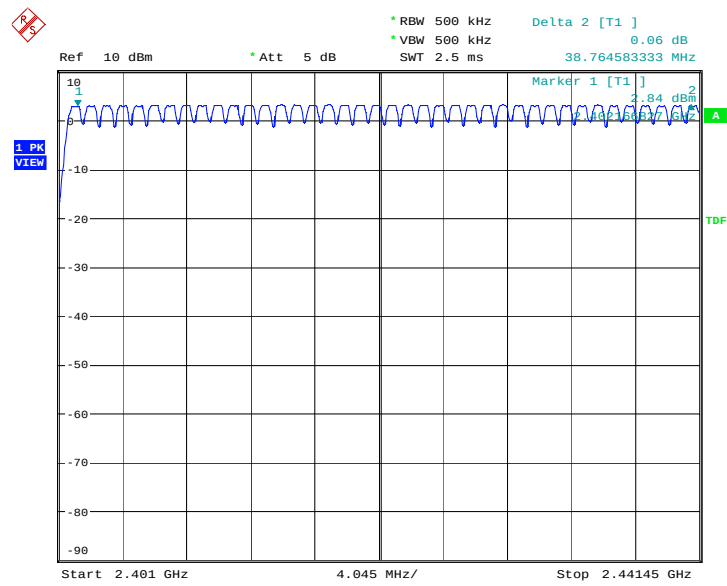


Fig. 85 Number of hopping frequencies: GFSK, Channel 0 - 39

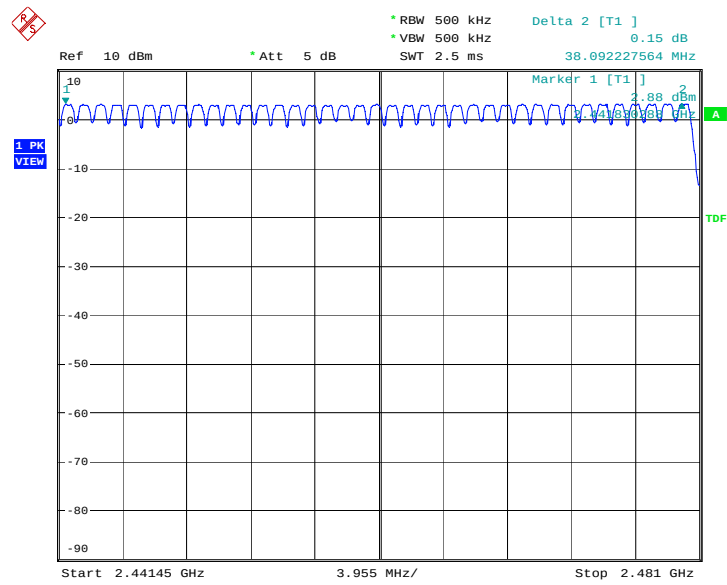


Fig. 86 Number of hopping frequencies: GFSK, Channel 40 - 78

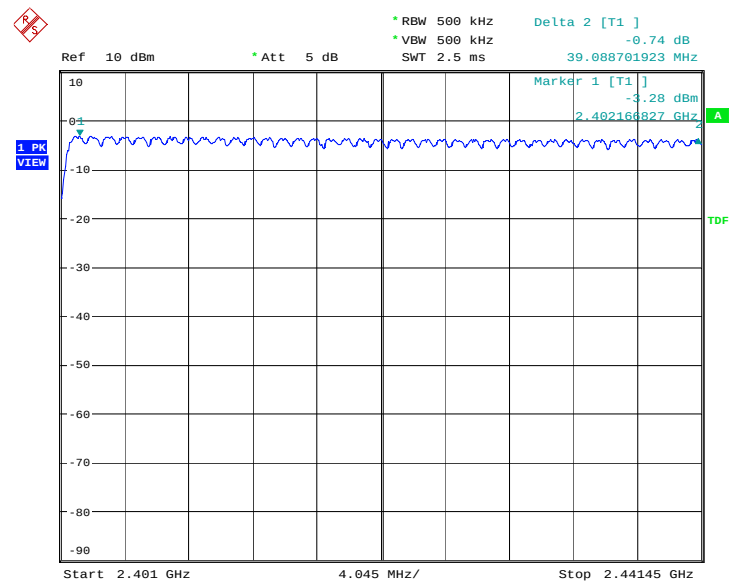


Fig. 87 Number of hopping frequencies: $\pi/4$ DQPSK, Channel 0 - 39

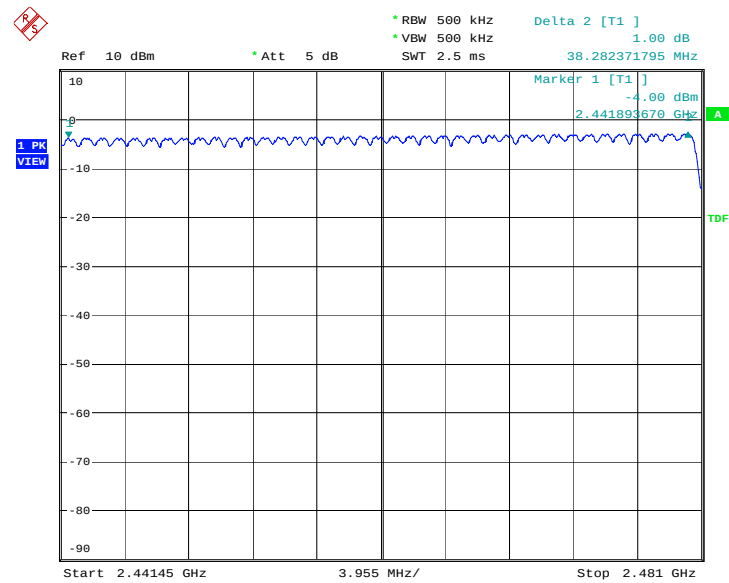
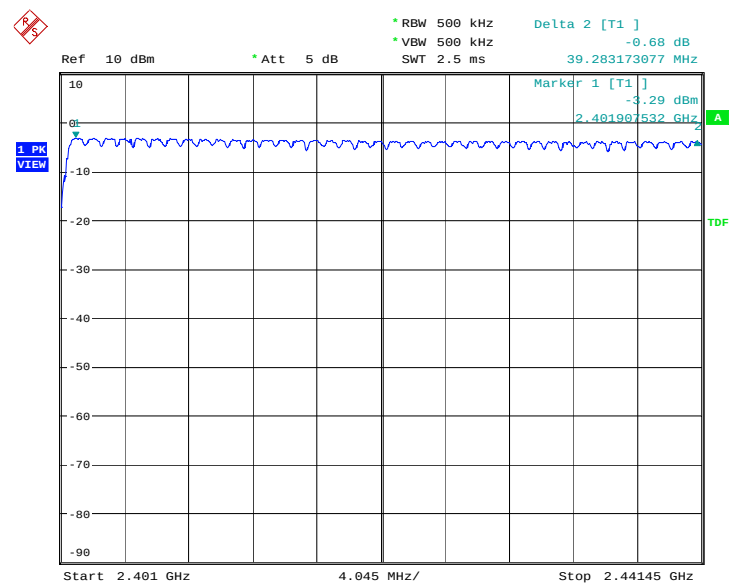
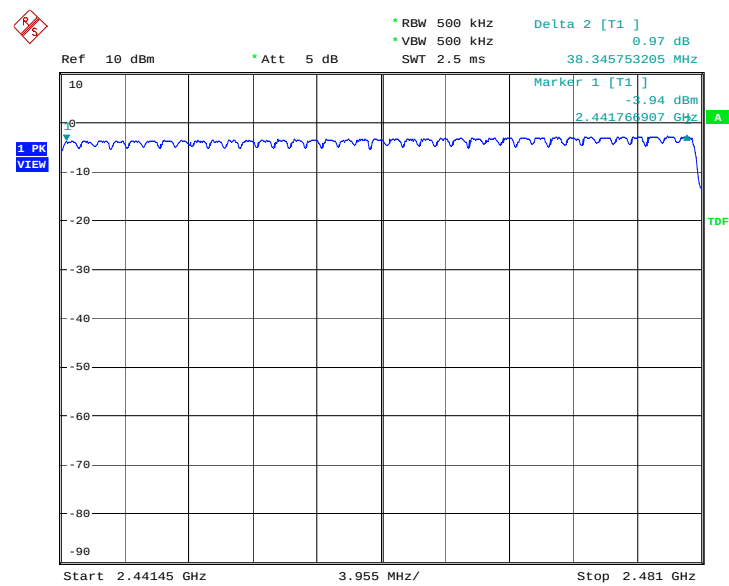


Fig. 88 Number of hopping frequencies: $\pi/4$ DQPSK, Channel 40 - 78



Date: 4.MAY.2010 10:26:05

Fig. 89 Number of hopping frequencies: 8DPSK, Channel 0 - 39



Date: 4.MAY.2010 10:28:07

Fig. 90 Number of hopping frequencies: 8DPSK, Channel 40 - 78

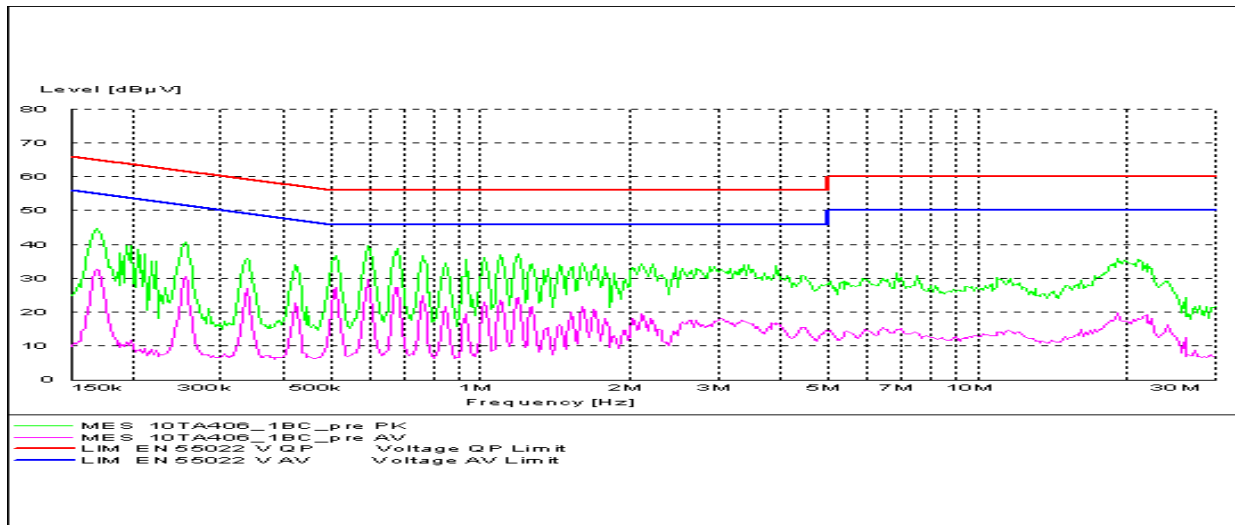


Fig. 91 AC Powerline Conducted Emission with charger-TX mode

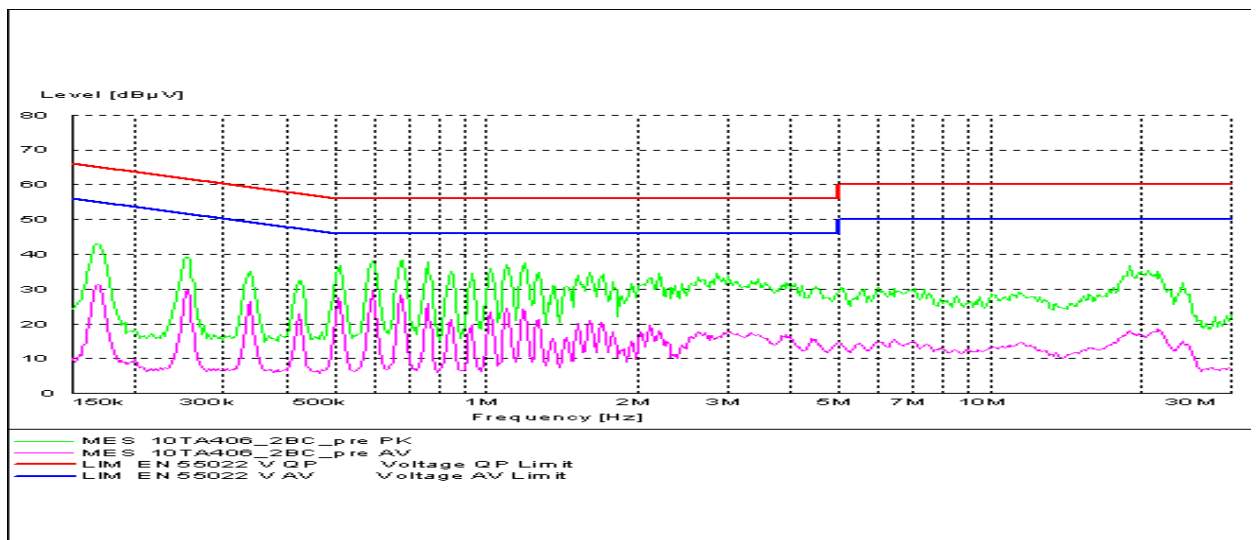


Fig. 92 AC Powerline Conducted Emission with charger-Idle mode

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