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The Netherlands
Chamber of Commerce
09076358
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Radio test report
20071254301 - rev. 2.0

based on:
- FCC Part 15 Subpart C, section 15.247 (10-1-06 Edition);
- FCC Part 15 Subpart B, section 15.109 (10-1-06 Edition).

Wireless Barcode Scanner / Cradle for Scanner
OPTICON
OPR-3101 & CRD-3101

Contents

This report comprises of four modules. The total number of pages is: 51

Main module

1 Introduction

This report contains the result of tests performed by:

Telefication B.V.
Edisonstraat 12a
6902 PK Zevenaar
The Netherlands

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Ordering party:

Company name	:	Optoelectronics Co., Ltd.
Address	:	5-5-3 Tsukagoshi Warabi, Saitama Pref.
Zipcode	:	335-002
City/town	:	Warabi
Country	:	Japan
Date of order	:	12 March 2007

2 Product

A sample of the following product was submitted for testing:

OPR-3101

Product category	:	Wireless Barcode Scanner
Manufacturer	:	OPTOELECTRONICS CO., LTD
Trademark	:	OPTICON
Type designation	:	OPR-3101
FCC ID	:	UFOOPR3101
Hardware version	:	--
Software release	:	TW0J00G/RD36J00D
Serial number	:	--

CRD-3101

Product category	:	Cradle for Scanner
Manufacturer	:	OPTOELECTRONICS CO., LTD
Trademark	:	OPTICON
Type designation	:	CRD-3101
FCC ID	:	UFOCRD3101
Hardware version	:	--
Software release	:	TW0J00G/RD36J00D
Serial number	:	--

3 Test schedule

Tests are carried out in accordance with the specification detailed in chapter 7 “Summary” of this report.

Tests are carried out at the following location:

- Telefication, Zevenaar

The samples of the product were received on:

- 20 March 2007

Tests are carried out from:

- 13 April 2007 to 4 May 2007

4 Product documentation

For production of this report the following product documentation is used:

Description	Date	Identification
Simple Instruction Manual	--	OPR-3101
Block diagram	--	Bluetooth Module
Block Diagram	--	OPR-3101
Bill of material	2007/2/26	OPR-3101
Parts Layout Diagram	2007/02/27	OPR-3101
Circuit diagram	February 09, 2007	OPR-3101
Block Diagram	--	CRD-3101
Component Layout	--	CRD-3101
Component List	--	CRD-3101
Circuit diagram	February 09, 2007	CRD-3101

The above-mentioned documentation will be filed at Telefication for a period of 10 years following the issue of this test report.

5 Observations and comments

The Device-Under-Test consists of three items: OPR-3101 wireless barcode scanner and CRD-3101 cradle for scanner.

Both OPR-3101 scanner and CRD-3101 cradle contain the same Bluetooth module, type EYSF3CAXX-XV. The Bluetooth module is tested in the following modes: GFSK (DH5 packets), π/4DQPSK (2DH5 packets) and 8DPSK (3DH5 packets).

Both units contain the same integral antenna. Type SF2450-01. This antenna is a Chip Antenna for 2.45GHz with a nominal impedance of 50 Ω and a maximum gain of 2.1 dBi.

During the tests the cradle was controlled by means of serial test commands on the RS-232 port.

The test sample used for the transmitter tests was provided with a temporary SMA antenna connector.

All tests are performed with frequency hopping disabled.
The test sample used for the receiver tests was provided with the (original) integral antenna.

Initially an appointment has been made for final measurements of unwanted emissions 30 - 1000 MHz on the Open Area Test Site of TNO EPS in Niekerk

TNO Electronic Products & Services (EPS) B.V
Smidshornerweg 18
9822 TL Niekerk
The Netherlands

FCC listed : 90828
Industry Canada : IC3501A-1

Exploratory measurements (section 3.8) revealed that these final measurements are unnecessary.

6 Modifications to the sample

No modifications are made to the sample during the assessment.

7 Summary

The product is intended for use in the following application area(s):

INTENTIONAL RADIATOR OPERATING IN THE FREQUENCY BAND 2400 - 2483.5 MHz

The sample is tested according to the following specification(s):

FCC Part 15 Subpart C, section 15.247 (10-1-06 Edition);
FCC Part 15 Subpart B, section 15.109 (10-1-06 Edition).

8 Conclusions

The samples of the product showed **NO NON-COMPLIANCES** to the specification stated in chapter 7 of this report.

The results of the tests as stated in this report, are exclusively applicable to the product items as identified in this test report. Telefication does not accept any responsibility for the results stated in this test report, with respect to the properties of product items not involved in these tests.

All tests are performed by:

name : ing. K.A Roes

function : Test Engineer

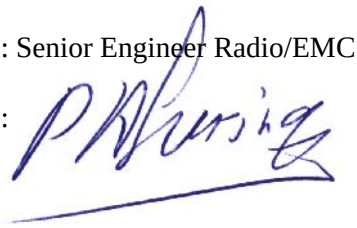
signature :

Review of test report by:

name : ing. P.A. Suringa

function : Senior Engineer Radio/EMC

signature :



The above conclusions have been verified by the following signatory:

Date : 5 June 2007

name : J.P. van de Poll

function : Co-ordinator Test Group

signature :

Test results module

1 Test results OPR-3101

2 General information

2.1 Equipment information

Type of equipment	Wireless Barcode Scanner
Bluetooth specification	GFSK (DH5 packets), π/4DQPSK (2DH5 packets) and 8DPSK (3DH5 packets)
Rated conducted RF power	-3.6 dBm
Operating frequency range	2402 - 2480 MHz
Modulation types	GFSK, π/4DQPSK, 8DPSK
Duty cycle	79 % (during testing)
ITU designation	890KF1D, 1M25G1D, 1M27G1D
Antenna type	Integral
Antenna gain	2.1 dBi
FCC ID	UFOOPR3101

2.2 Tested channels

	Channel 2	Channel 41	Channel 80
Frequency (MHz)	2402	2441	2480

2.3 Summary of test data

NAME OF TEST	PARA. NO.	Limit	MEAS.	RESULT
20 dB bandwidth	15.247(a)(1)	--	1270 kHz	Complies
Channel separation	15.247(a)(1)	≥ 2/3*20 dB BW	997 kHz	Complies
Number of channels	15.247(a)(1)(iii)	≥ 15	79	Complies
Average time of occupancy	15.247(a)(1) (iii)	0.4 sec.	0.4 sec.	Complies
Maximum Peak Power Output	15.247(b)(1)&(4)	27 dBm E.I.R.P.	0.1 dBm E.I.R.P.	Complies
Peak Power Spectral Density	15.247(e)	8 dBm/3 kHz	--	N/A
Spurious Emissions Tx (Conducted)	15.247(d)	> 20 dB below fundamental	≥ 40 dB below fundamental	Complies
Spurious Emissions Rx (Radiated)	15.109	54 dBµV/m(av)	31.2 dBµV/m(pk)	Complies
Restricted band emissions (Radiated)	15.205(a)	54 dBµV/m(av) 74 dBµV/m(pk)	39.7 dBµV/m(pk)	Complies

3 Emission tests

3.1 20 dB bandwidth

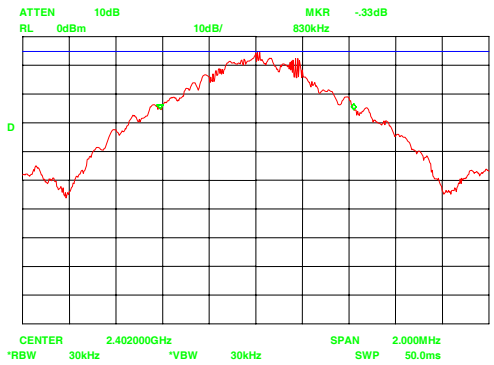
Compliance standard : FCC part 15, subpart C, section 15.247 (a)(1)
Method of test : Public Notice DA 00-705

Ambient temperature : 21 °C
Relative humidity : 42 %

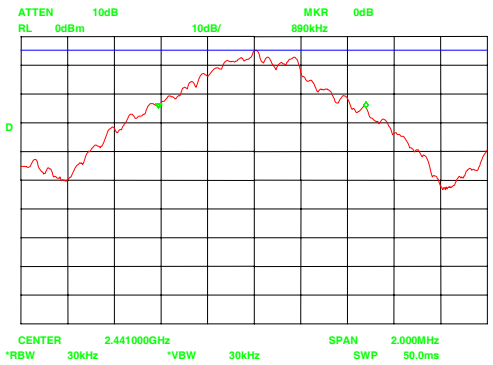
Test results :

Modulation	Channel 2	Channel 41	Channel 80
GFSK	830 kHz	890 kHz	877 kHz
π/4DQPSK	1237 kHz	1217 kHz	1253 kHz
8DPSK	1267 kHz	1267 kHz	1270 kHz

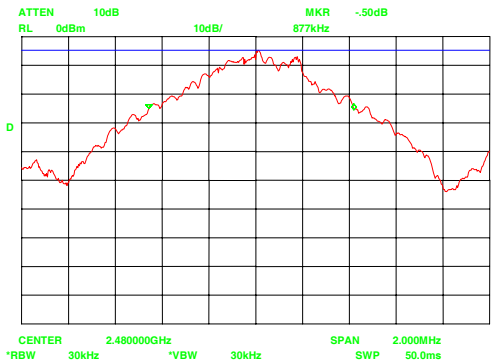
GFSK plots



CH 2

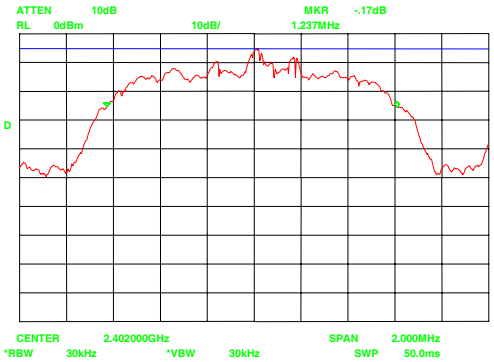


CH 41



CH 80

π/4DQPSK plots



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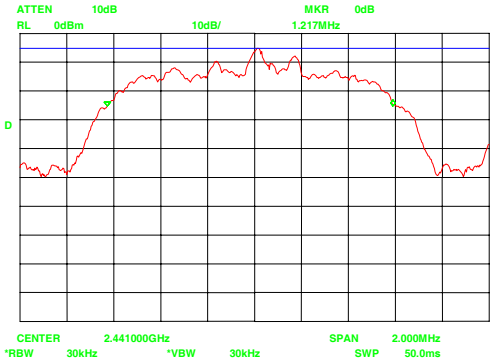
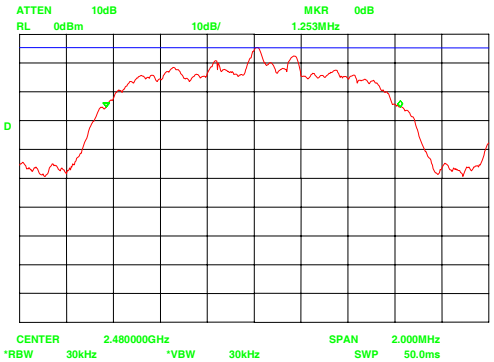
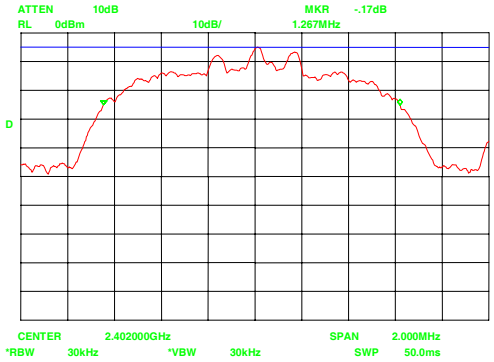


CH 41

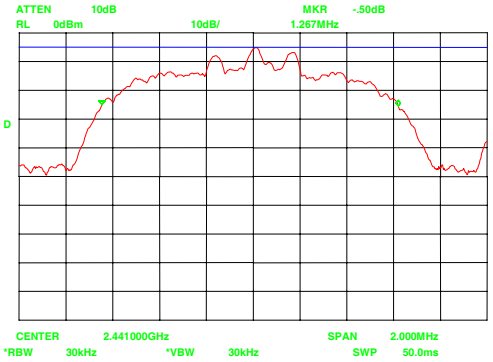


CH 80

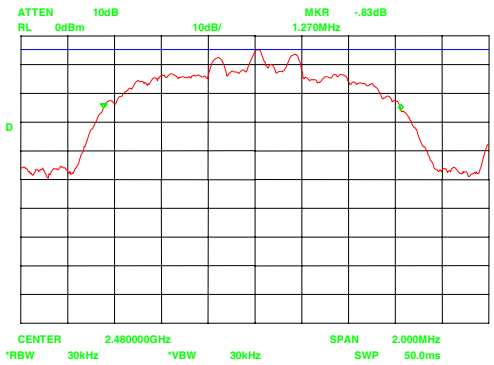
8DPSK plots



CH 2



CH 41



CH 80

Measurement uncertainty: + 23/- 23 kHz

3.2 Channel separation

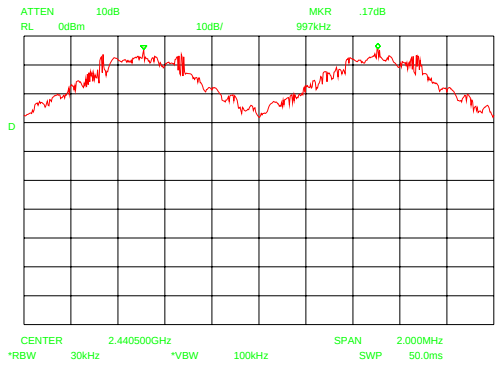
Compliance standard : FCC part 15, subpart C, section 15.247 (a)(1)
Method of test : Public Notice DA 00-705

Ambient temperature : 21 °C
Relative humidity : 42 %

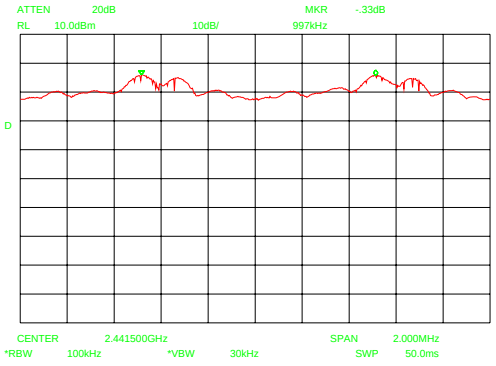
Test results :

Modulation	Separation
GFSK	997 kHz
π/4DQPSK	997 kHz
8DPSK	997 kHz

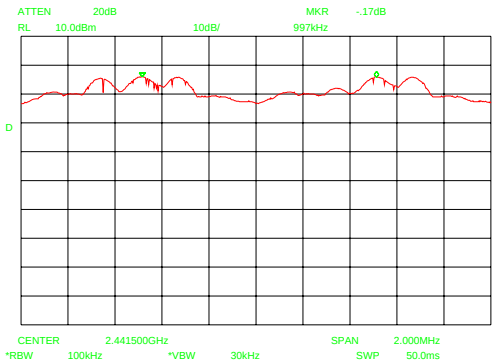
Plots



GFSK



π/4DQPSK

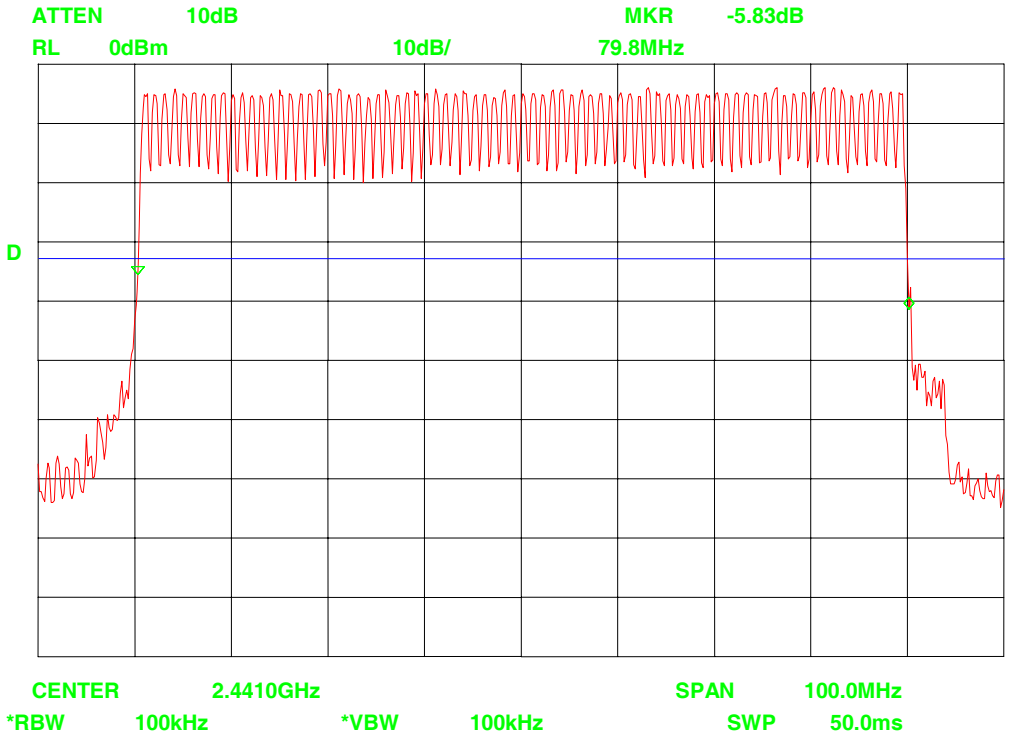


8DPSK

Measurement uncertainty: + 46/- 46 kHz

3.3 Number of channels

Compliance standard	:	FCC part 15, subpart C, section 15.247 (a)(1)(iii)
Method of test	:	Public Notice DA 00-705
Ambient temperature	:	21 °C
Relative humidity	:	42 %



From the plot above it can be seen that 79 channels are contained in the frequency band 2400 – 2483.5 MHz.

3.4 Peak power output

Compliance standard : FCC part 15, subpart C, section 15.247 (b)(1)
Method of test : Public Notice DA 00-705 (conducted test)

Ambient temperature : 21 °C
Relative humidity : 42 %

Test results :

For 2.1 dBi antenna gain

Modulation	Channel 2	Channel 41	Channel 80
GFSK	0 dBm e.i.r.p.	0.1 dBm e.i.r.p.	-0.8 dBm e.i.r.p.
π/4DQPSK	0 dBm e.i.r.p.	-0.3 dBm e.i.r.p.	-0.3 dBm e.i.r.p.
8DPSK	0 dBm e.i.r.p.	-0.3 dBm e.i.r.p.	-0.3 dBm e.i.r.p.

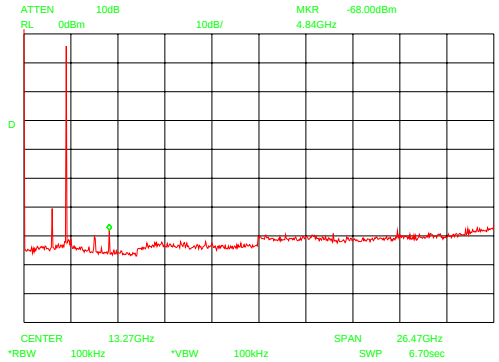
Measurement uncertainty: + 1.6/ -1.9 dB

3.5 Field strength of Tx unwanted emissions - conducted

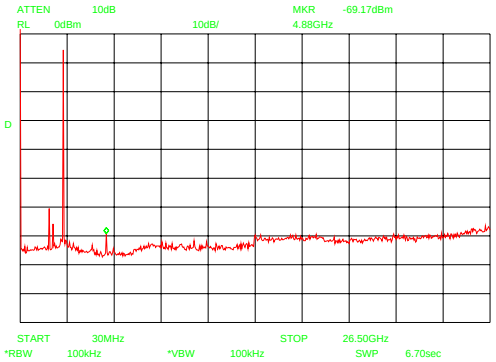
Compliance standard : FCC part 15, subpart C, section 15.247(d)
Method of test : KDB publication number 558074
Ambient temperature : 21 °C
Relative humidity : 42 %

Test results :

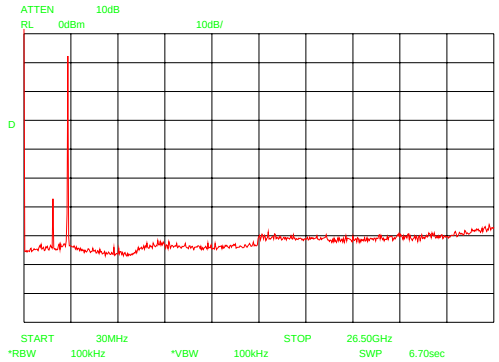
GFSK



CH 2 30 - 26500 MHz

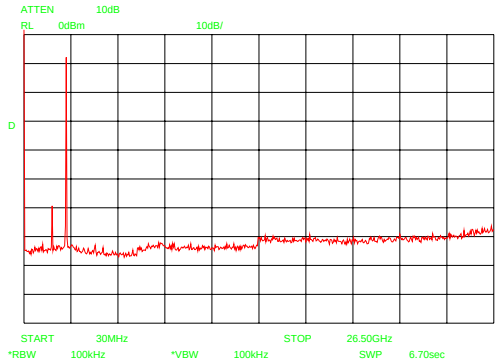


CH 41 30 - 26500 MHz

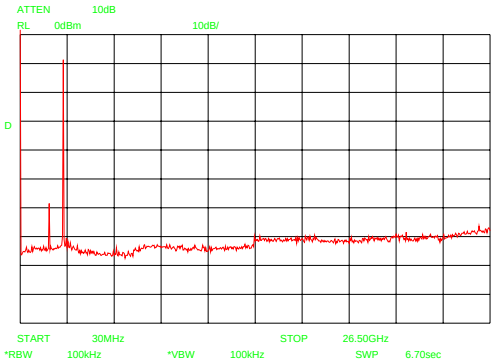


CH 80 30 - 26500 MHz

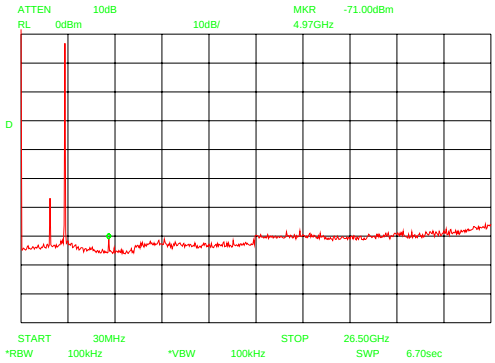
Π/4 DQPSK



CH 2 30 - 26500 MHz

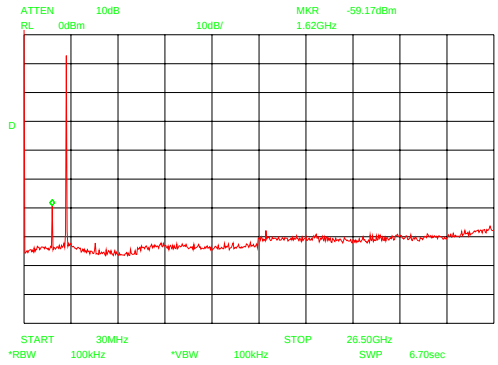


CH 41 30 - 26500 MHz

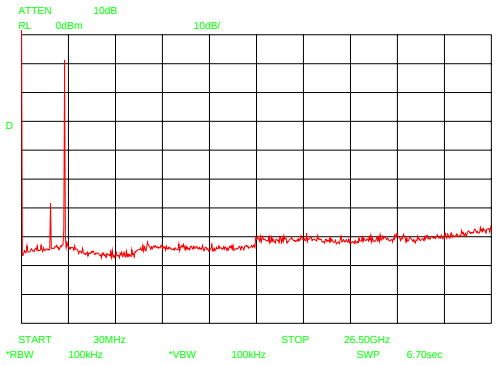


CH 80 30 - 26500 MHz

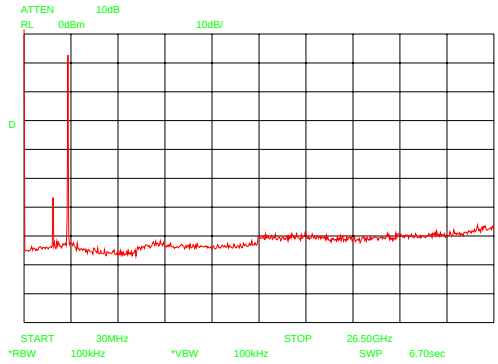
8DPSK



CH 2 30 - 26500 MHz



CH 41 30 - 26500 MHz



CH 80 30 - 26500 MHz

Measurement uncertainty: 0.03 – 2 GHz: +1.7 / -1.9 dB
> 2 GHz: +2.4 /-2.7 dB

3.6 Field strength of unwanted emissions in restricted bands

Compliance standard : FCC part 15, subpart C, section 15.205(a)
Method of test : FCC Public Notice DA 00-705

Ambient temperature : 21 °C
Relative humidity : 42 %

Frequency (MHz)	Peak value (dBµV/m)	Remark
1650	38.2	Relates to ch 80 (π/4DQPSK)
1650	38.2	Relates to ch 80 (8DPSK)
4003	25.2	Relates to ch 2 (GFSK)
4068	22.2	Relates to ch 41(GFSK)
4134	22.2	Relates to ch 80 (GFSK)
4804	39.7	2nd harm. of ch 2 (GFSK)
4882	35.9	2nd harm. of ch 41 (GFSK)
4960	39.0	2nd harm. of ch 80 (GFSK)

Measurement uncertainty: +4.5 dB / -6.0 dB

Note 1: values stated in the table above are worst case for all three types of modulation.

Note 2: as the peak values are below the average limit, there was no need to perform average detector measurements.

3.7 Average time of occupancy *

Hops per second (Bluetooth specification)	1600
Time of occupancy on any channel	1/1600 sec.
Frequency retention time in one 31.6 sec. period on any channel	(time slot length × hop rate / no. of hopping channels) × 31.6 sec
	(5 × 625 µsec × 1600 × 1/5 × 1/sec /79) × 31.6 sec = 0.4 sec.

* DM5/DH5 packet size for Tx; DM1/DH1 packet size for Rx

Limit values:

Frequency retention time	≤ 0.4 sec. in one 31.6 sec. period (79 x .4 sec.)

Test equipment:

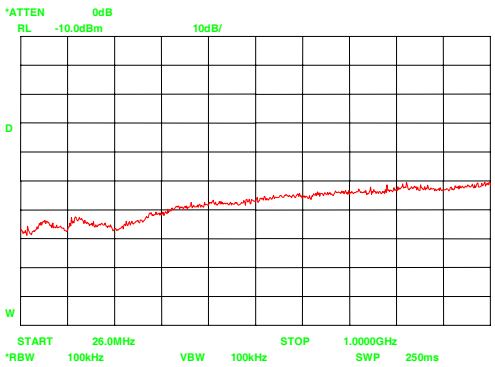
Test equipment used: (Item numbers)	n.a.

3.8 Field strength of Rx unwanted emissions - radiated

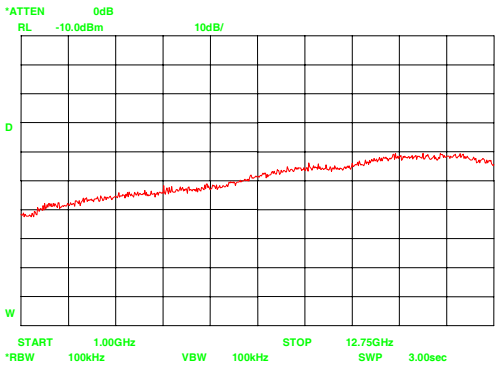
Compliance standard	:	FCC part 15, subpart B, section 15.109
Method of test	:	FCC Public Notice DA 00-705 FCC part 15, subpart A, sections 15.31(f)(1), 15.31(m), 15.33, 15.35.
Ambient temperature	:	21 °C
Relative humidity	:	42 %
Test results	:	

GFSK

Ch 2: Vertical direction

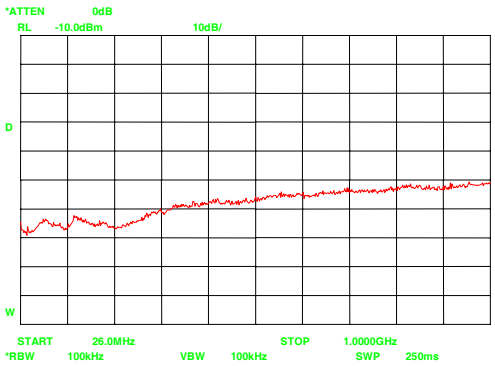


30 – 1000 MHz

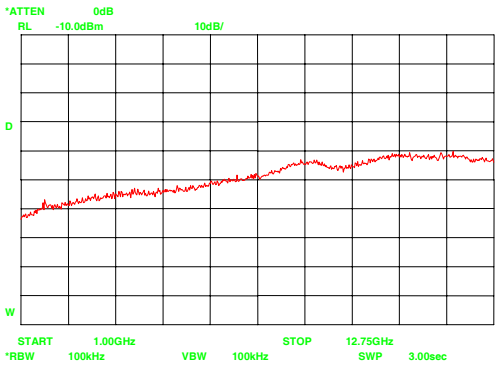


1 – 12.75 GHz

Ch 2: Horizontal direction

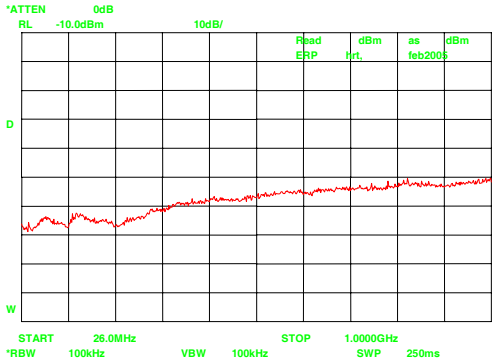


30 – 1000 MHz

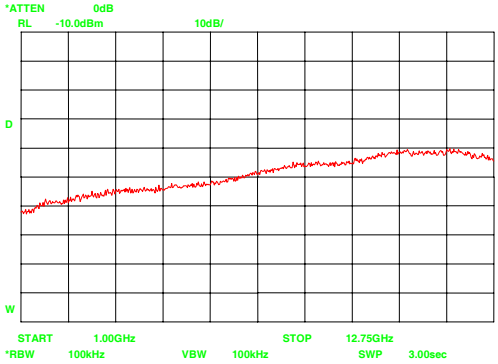


1 – 12.75 GHz

Ch 41: Vertical direction

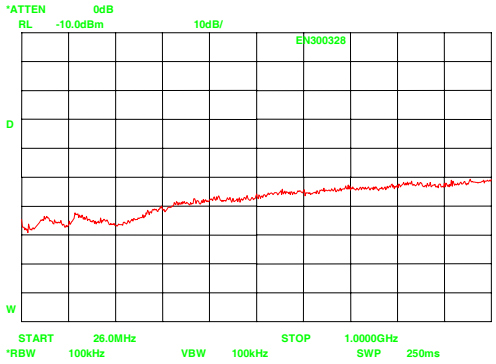


30 – 1000 MHz

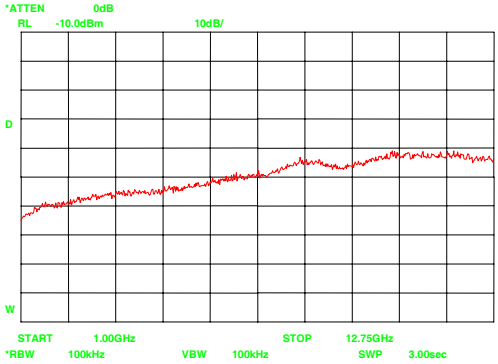


1 – 12.75 GHz

Ch 41: Horizontal direction

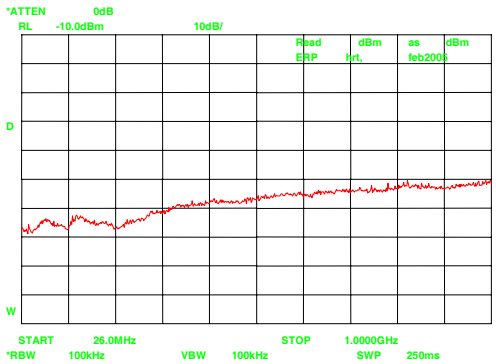


30 – 1000 MHz

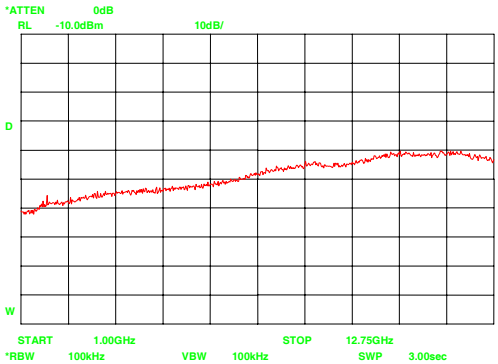


1 – 12.75 GHz

Ch 80: Vertical direction

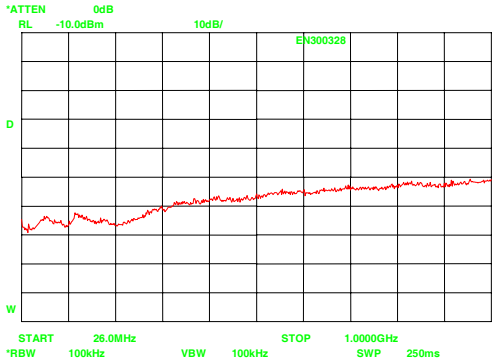
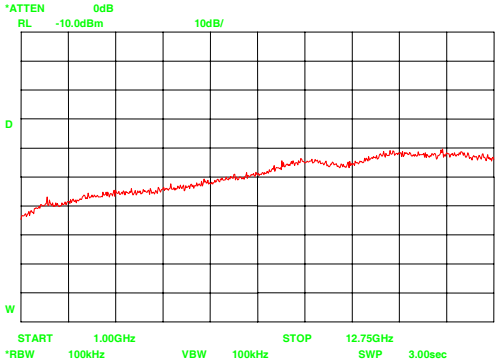


30 – 1000 MHz



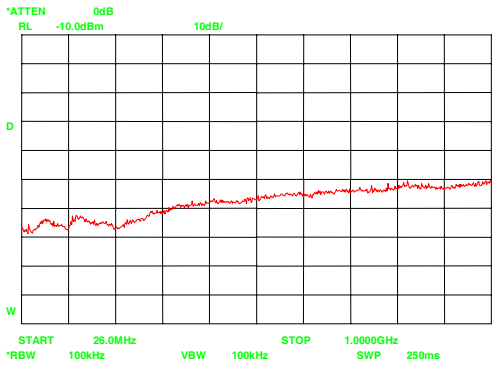
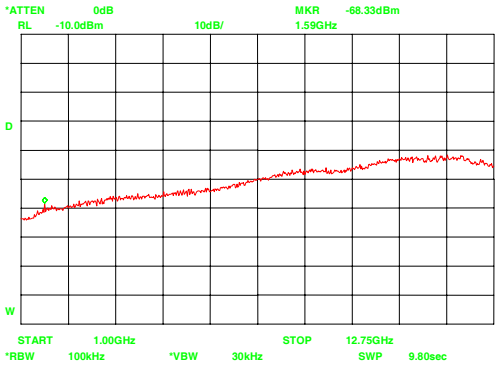
1 – 12.75 GHz

Ch 80: Horizontal direction

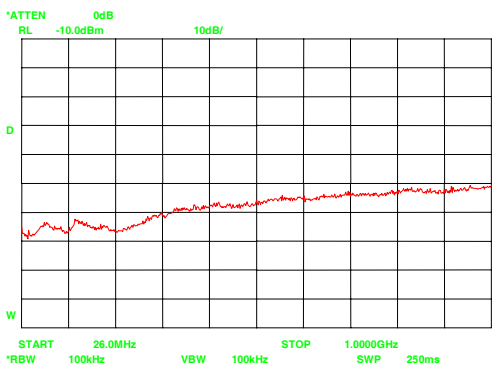
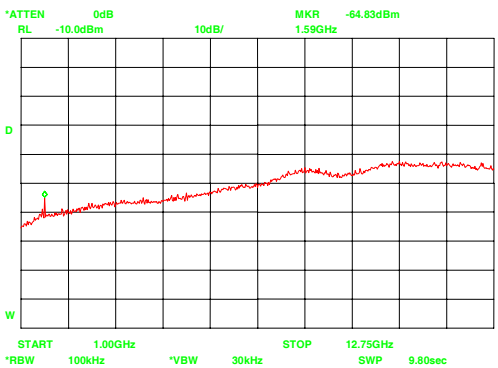
	
30 – 1000 MHz	1 – 12.75 GHz

π/4DQPSK

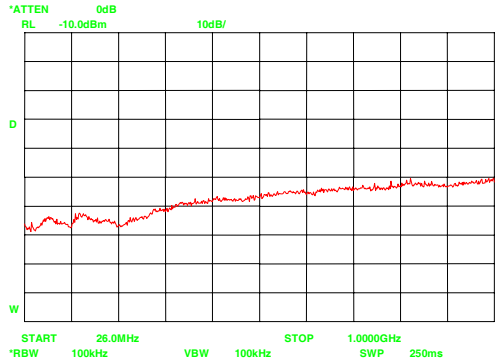
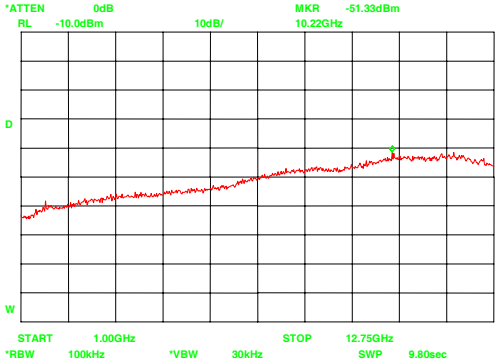
Ch 2: Vertical direction

	
30 – 1000 MHz	1 – 12.75 GHz

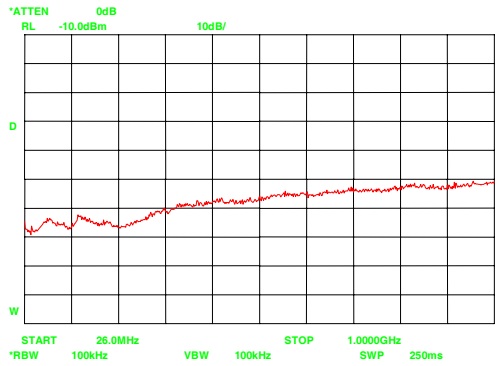
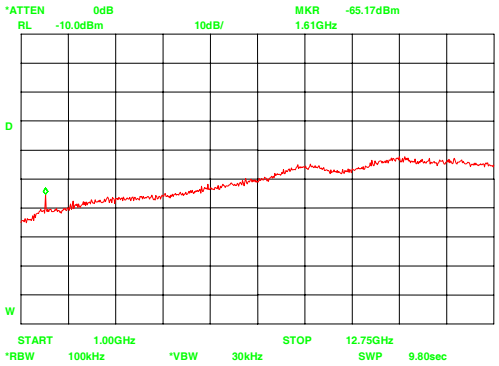
Ch 2: Horizontal direction

	
30 – 1000 MHz	1 – 12.75 GHz

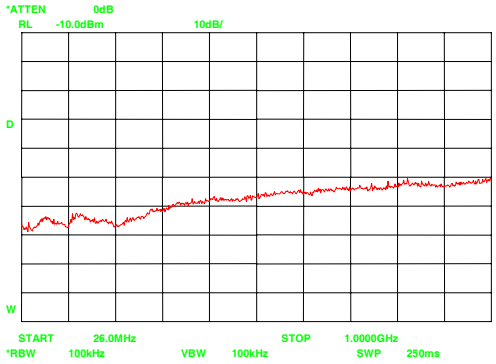
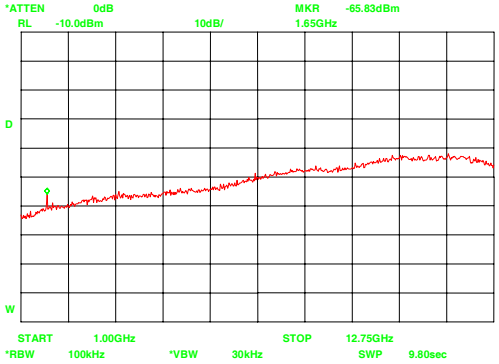
Ch 41: Vertical direction

	
30 – 1000 MHz	1 – 12.75 GHz

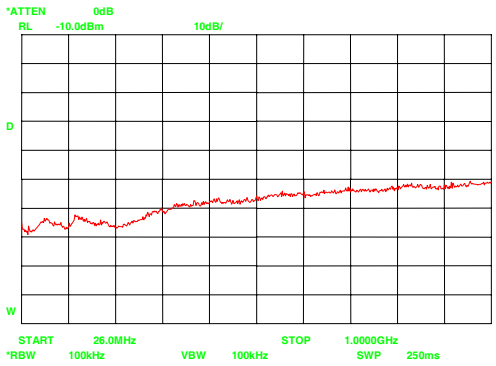
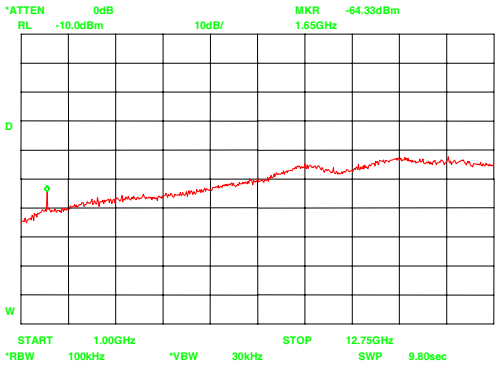
Ch 41: Horizontal direction

	
30 – 1000 MHz	1 – 12.75 GHz

Ch 80: Vertical direction

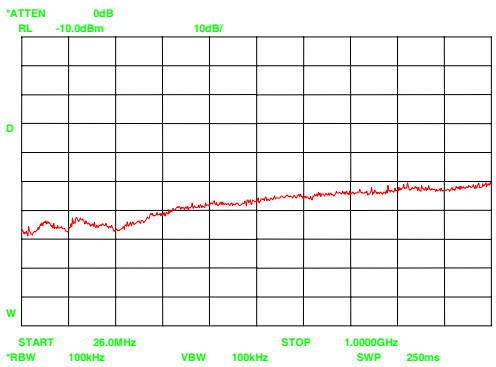
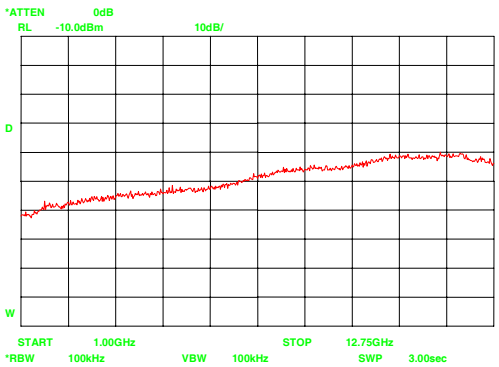
	
30 – 1000 MHz	1 – 12.75 GHz

Ch 80: Horizontal direction

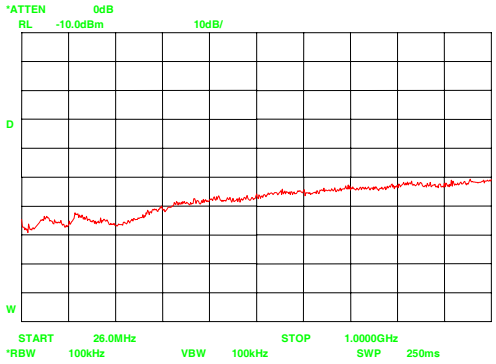
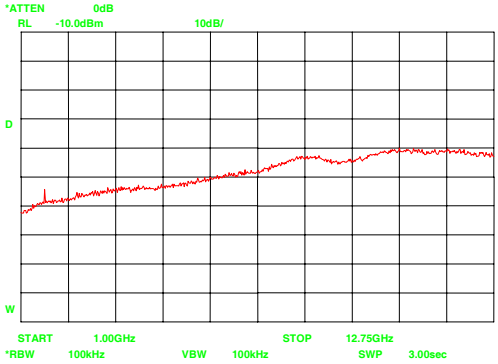
	
30 – 1000 MHz	1 – 12.75 GHz

8DPSK

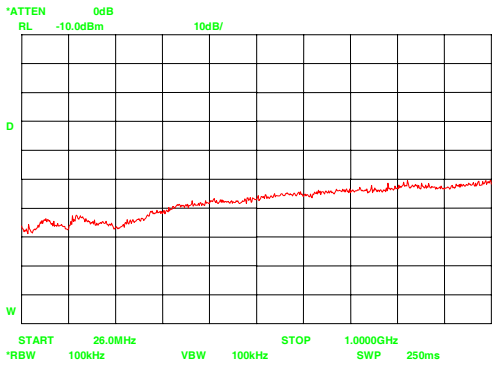
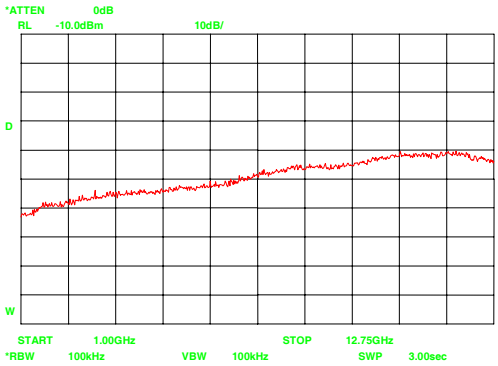
Ch 2: Vertical direction

	
30 – 1000 MHz	1 – 12.75 GHz

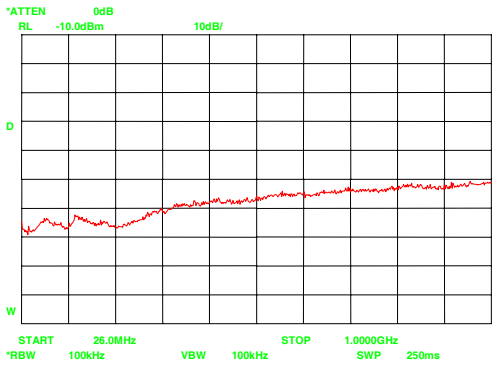
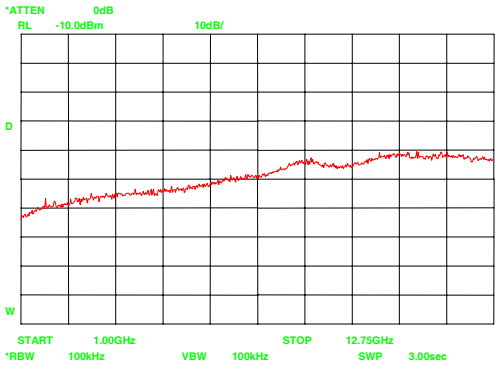
Ch 2: Horizontal direction

	
30 – 1000 MHz	1 – 12.75 GHz

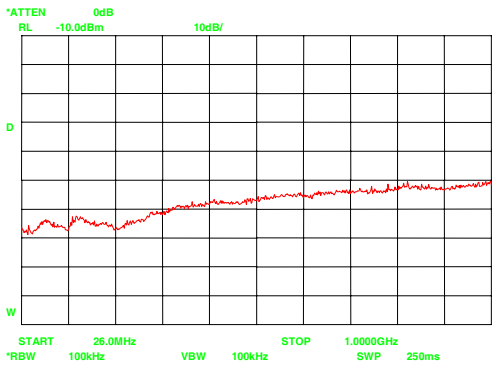
Ch 41: Vertical direction

	
30 – 1000 MHz	1 – 12.75 GHz

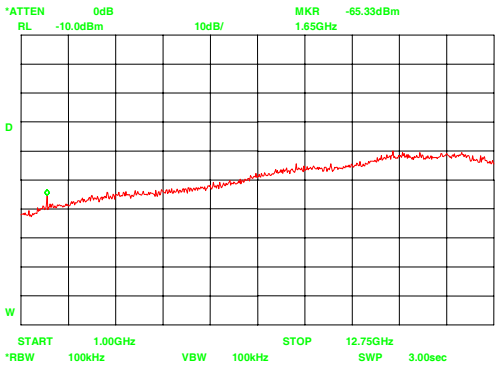
Ch 41: Horizontal direction

	
30 – 1000 MHz	1 – 12.75 GHz

Ch 80: Vertical direction

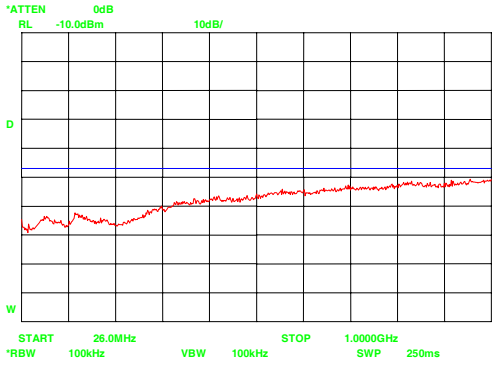


30 – 1000 MHz

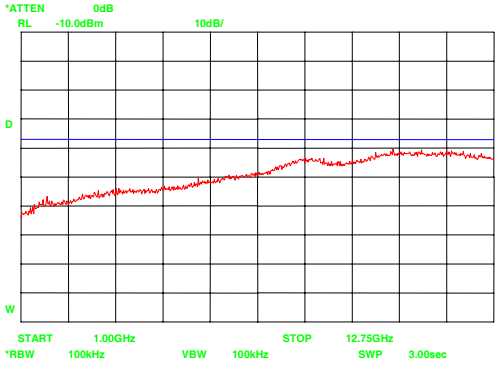


1 – 12.75 GHz

Ch 80: Horizontal direction



30 – 1000 MHz



1 – 12.75 GHz

Note 1: Applied limits in this section result from conversion using: $P_{dBm\ e.i.r.p.} = E_{dB\mu V/m} - 95.2_{dB}$

Measurement uncertainty: ≤ 1GHz: +2.6/-3.3 dB
> 1 GHz: +4.5/-6.1 dB

4 Test results CRD-3101

5 General information

5.1 Equipment information

Type of equipment	Cradle for Scanner
Bluetooth specification	V1.0 + V2.0 + V2.0 + EDR
Rated conducted RF power	-2.3 dBm
Operating frequency range	2402 - 2480 MHz
Modulation types	GFSK (DH5 packets), π/4DQPSK (2DH5 packets) and 8DPSK (3DH5 packets)
Duty cycle	79 % (during testing)
ITU designation	943KF1D, 1M24G1D, 1M27G1D
Antenna type	Integral
Antenna gain	2.1 dBi
FCC ID	UFOCRD3101

5.2 Tested channels

	Channel 2	Channel 41	Channel 80
Frequency (MHz)	2402	2441	2480

5.3 Summary of test data

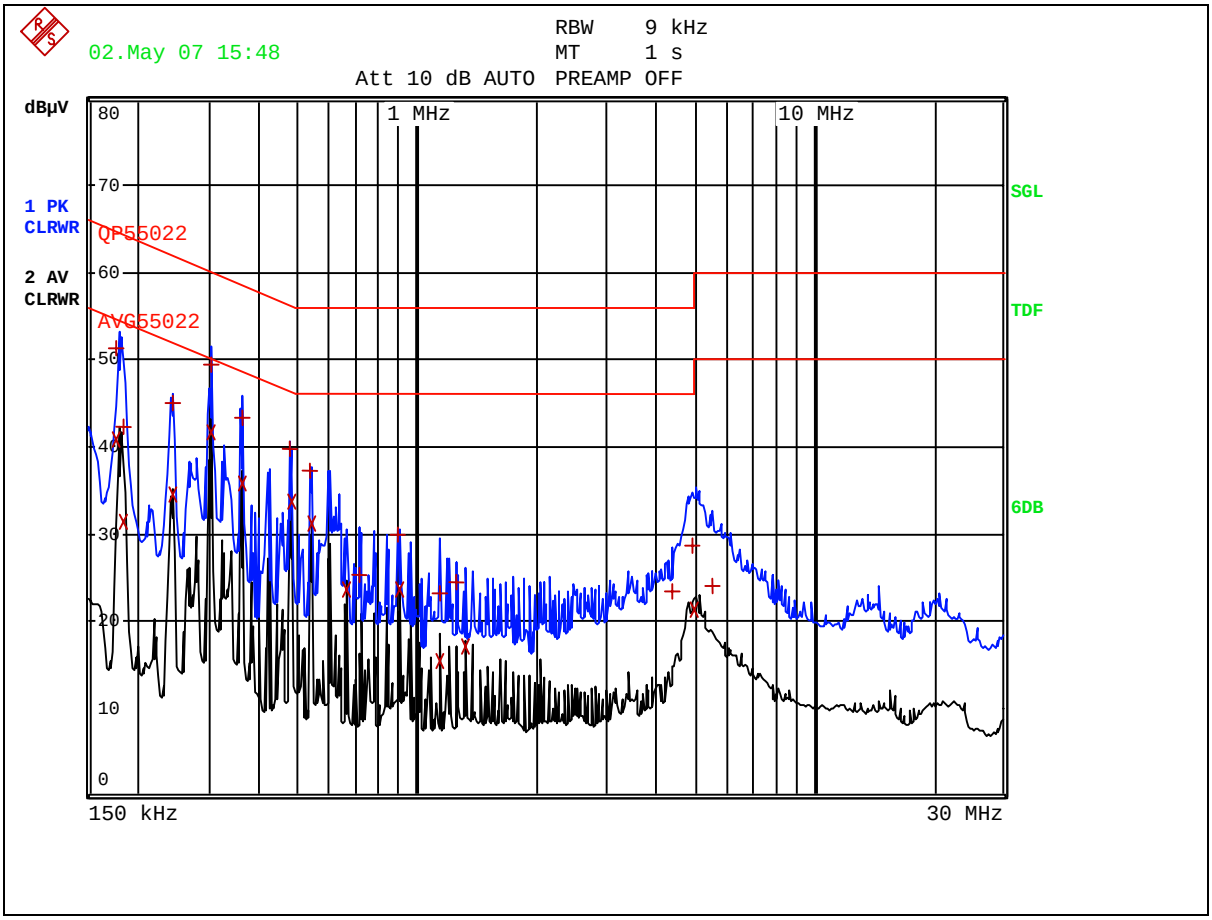
NAME OF TEST	PARA. NO.	Limit	MEAS.	RESULT
Power line conducted emissions	15.207(a)	56 dBµV	< 56 dBµV	Complies
20 dB bandwidth	15.247(a)(1)	--	1270 kHz	Complies
Channel separation	15.247(a)(1)	≥ 2/3*20 dB BW	1010 kHz	Complies
Number of channels	15.247(a)(1)(iii)	≥ 15	79	Complies
Average time of occupancy	15.247(a)(1) (iii)	0.4 sec.	0.4 sec.	Complies
Maximum Peak Power Output	15.247(b)(1)&(4)	27 dBm E.I.R.P.	2.9 dBm E.I.R.P.	Complies
Peak Power Spectral Density	15.247(e)	8 dBm/3 kHz	--	N/A
Spurious Emissions Tx (Conducted)	15.247(d)	> 20 dB below fundamental	≥ 40 dB below fundamental	Complies
Spurious Emissions Rx (Radiated)	15.109	54 dBµV/m(av)	45.5 dBµV/m(pk)	Complies
Restricted band emissions (Radiated)	15.205(a)	54 dBµV/m(av) 74 dBµV/m(pk)	37.7 dBµV/m(pk)	Complies

6 Emission tests

6.1 Power line conducted emissions

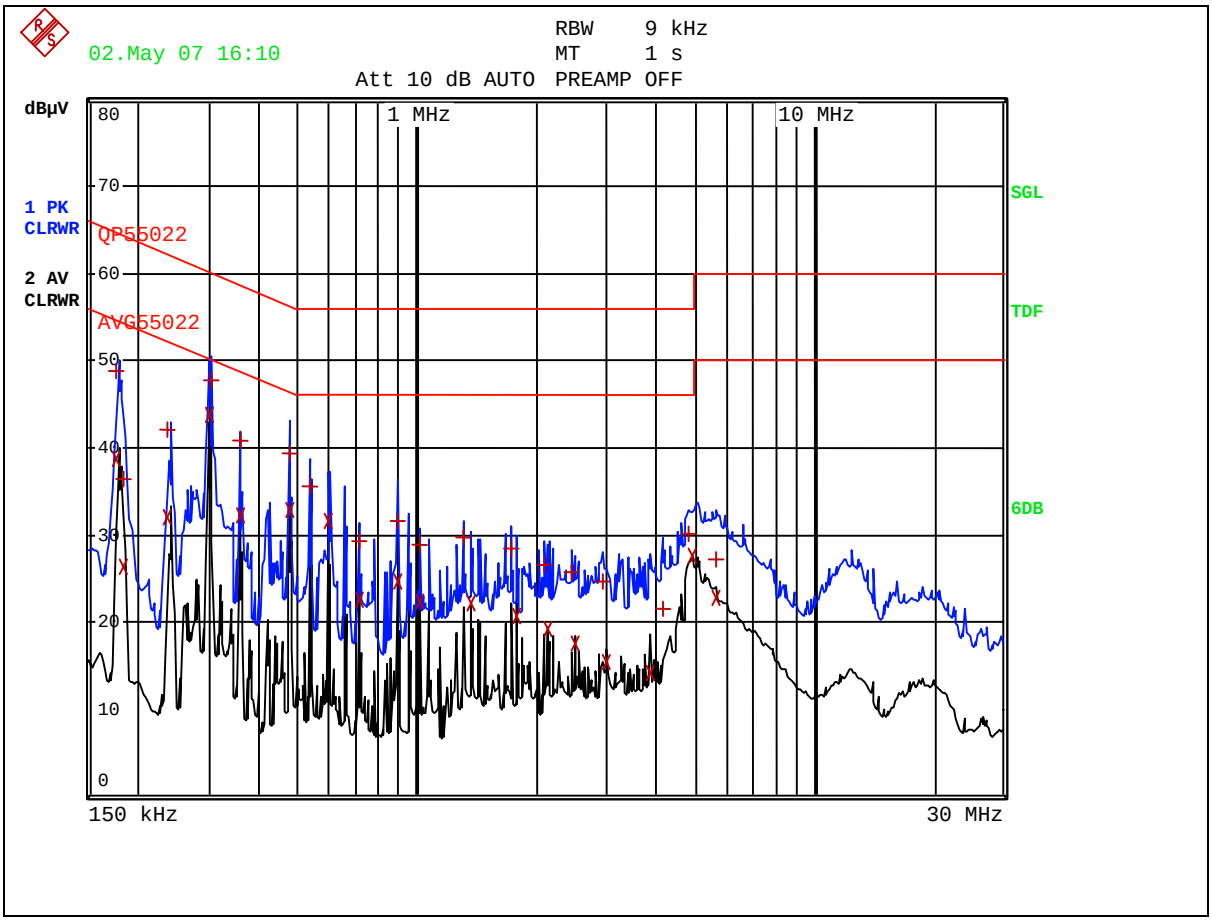
Compliance standard	:	FCC part 15, subpart C, section 15.207 (a)
Method of test	:	ANSI C63.4-2003, sections 7 & 11.5
Ambient temperature	:	21 °C
Relative humidity	:	42 %
EUT condition	:	Transmitting

Mains port – line



Remark: x = Average values
+ = Quasi Peak values

Mains port – Neutral



Remark: x = Average values
+ = Quasi Peak values

Measurement uncertainty: +3.70/-3.70 dB

6.2 20 dB bandwidth

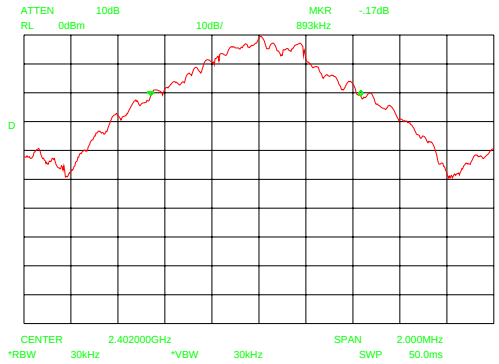
Compliance standard : FCC part 15, subpart C, section 15.247 (a)(1)
Method of test : Public Notice DA 00-705

Ambient temperature : 21 °C
Relative humidity : 42 %

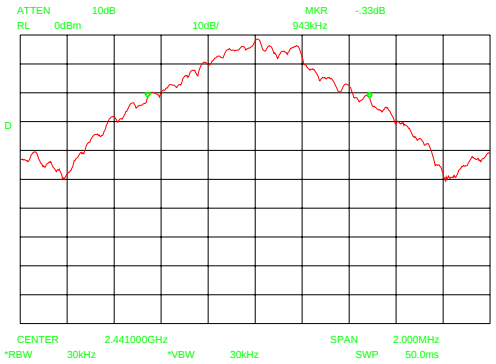
Test results :

Modulation	Channel 2	Channel 41	Channel 80
GFSK	893 kHz	943 kHz	920 kHz
π/4DQPSK	1240 kHz	1237 kHz	1230 kHz
8DPSK	1270 kHz	1263 kHz	1267 kHz

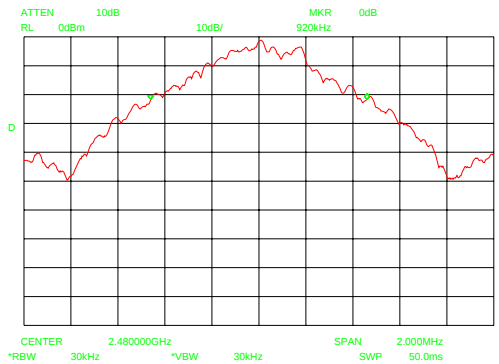
GFSK plots



CH 2

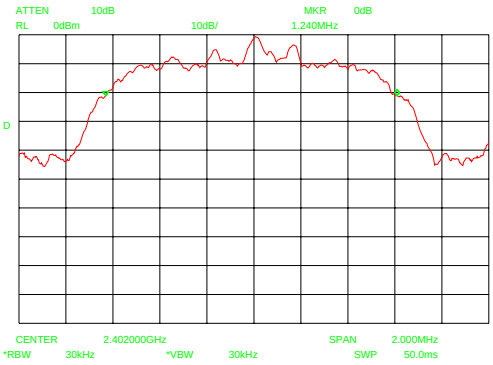


CH 41

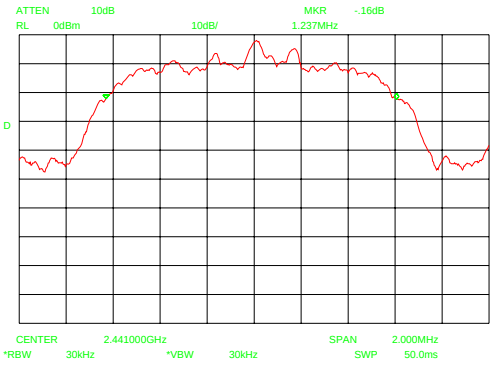


CH 80

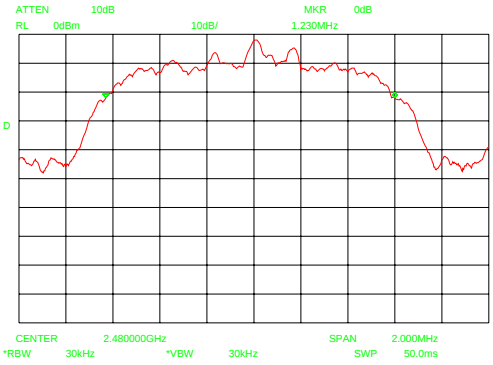
π/4DQPSK plots



CH 2

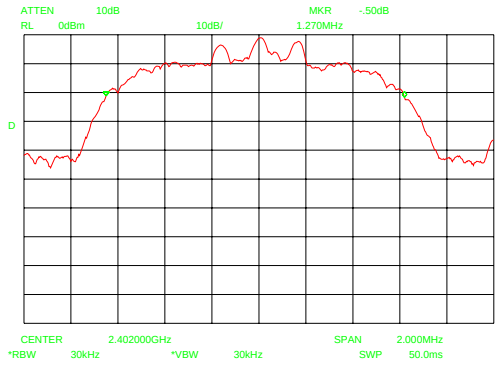


CH 41

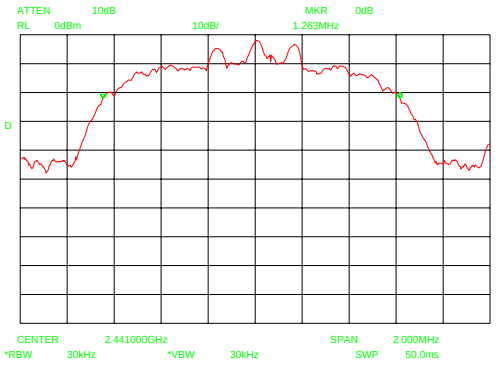


CH 80

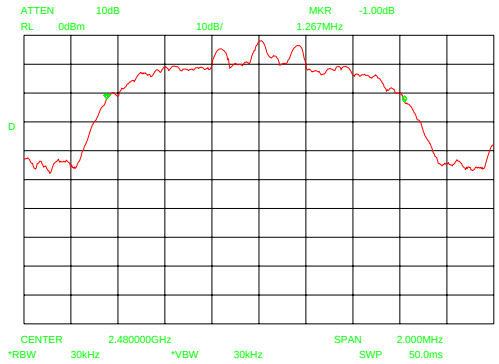
8DPSK plots



CH 2



CH 41



CH 80

Measurement uncertainty: + 23/- 23 kHz

6.3 Channel separation

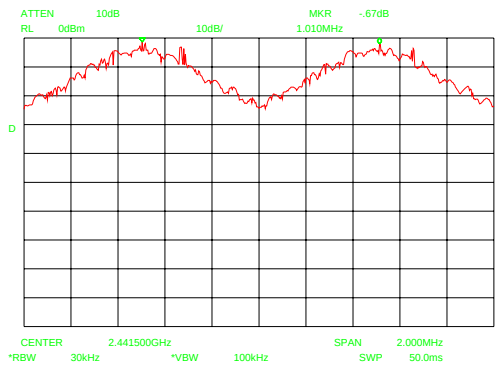
Compliance standard : FCC part 15, subpart C, section 15.247 (a)(1)
Method of test : Public Notice DA 00-705

Ambient temperature : 21 °C
Relative humidity : 42 %

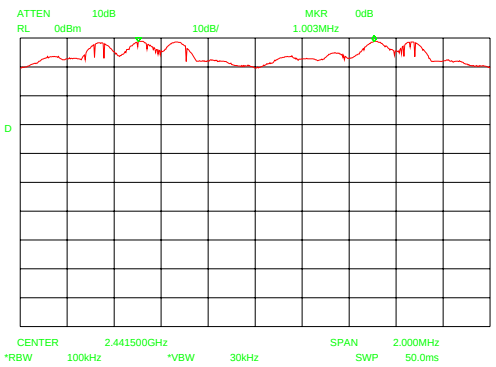
Test results :

Modulation	Separation
GFSK	1010 kHz
π/4DQPSK	1003 kHz
8DPSK	987 kHz

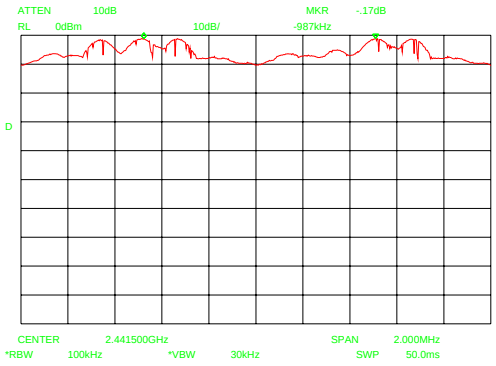
Plots



GFSK



π/4DQPSK

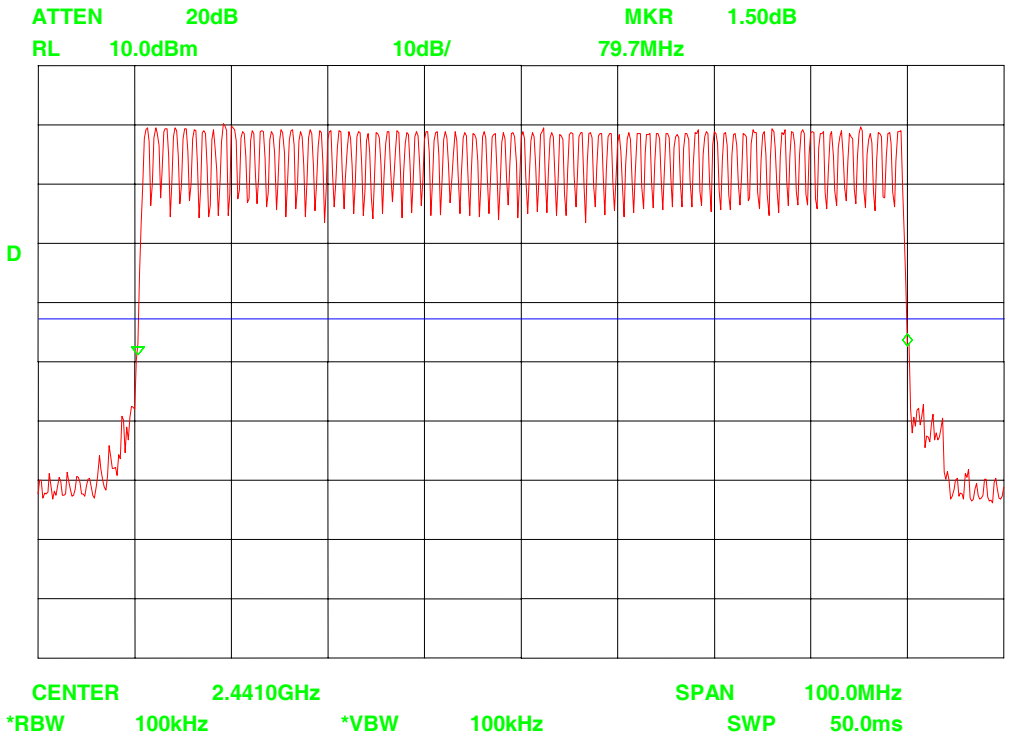


8DPSK

Measurement uncertainty: + 46/- 46 kHz

6.4 Number of channels

Compliance standard	:	FCC part 15, subpart C, section 15.247 (a)(1)(iii)
Method of test	:	Public Notice DA 00-705
Ambient temperature	:	21 °C
Relative humidity	:	42 %



From the plot above it can be seen that 79 channels are contained in the frequency band 2400 – 2483.5 MHz.

6.5 Peak power output

Compliance standard : FCC part 15, subpart C, section 15.247 (b)(1)
Method of test : Public Notice DA 00-705 (conducted test)

Ambient temperature : 21 °C
Relative humidity : 42 %

Test results :

For 2.1 dBi antenna gain

Modulation	Channel 2	Channel 41	Channel 80
GFSK	2.3 dBm e.i.r.p.	2.3 dBm e.i.r.p.	2.0 dBm e.i.r.p.
π/4DQPSK	2.7 dBm e.i.r.p.	2.6 dBm e.i.r.p.	2.0dBm e.i.r.p.
8DPSK	2.9 dBm e.i.r.p.	2.7 dBm e.i.r.p.	2.4 dBm e.i.r.p.

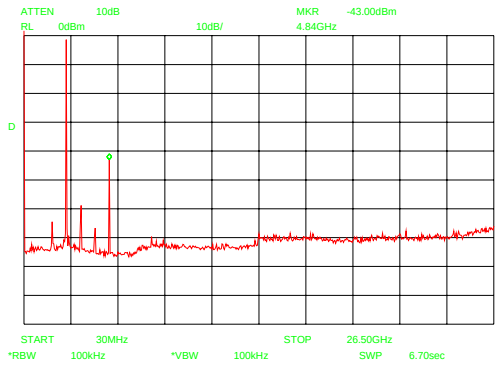
Measurement uncertainty: + 1.6/ -1.9 dB

6.6 Field strength of Tx unwanted emissions - conducted

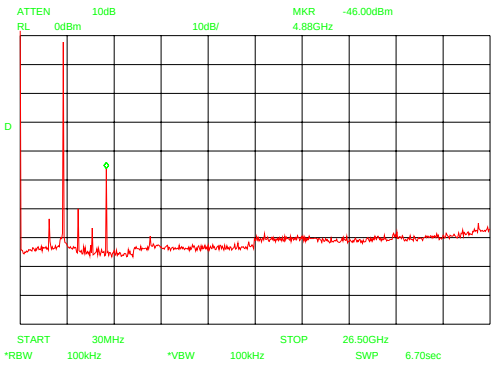
Compliance standard	:	FCC part 15, subpart C, section 15.247(d)
Method of test	:	KDB publication number 558074
Ambient temperature	:	21 °C
Relative humidity	:	42 %

Test results :

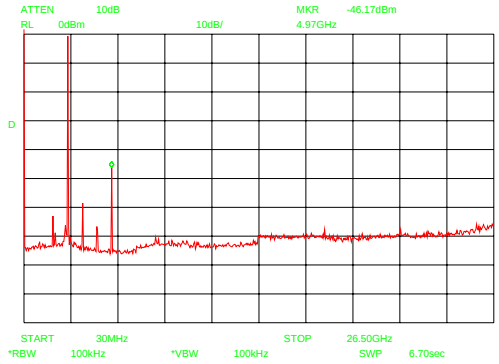
GFSK



CH 2 30 - 26500 MHz

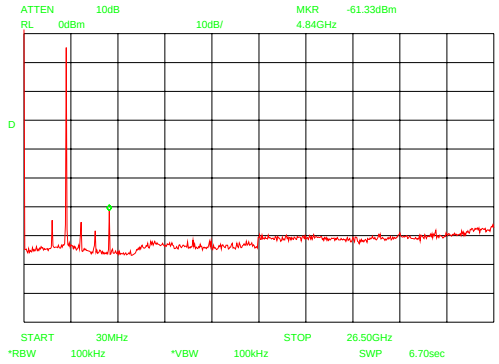


CH 41 30 - 26500 MHz

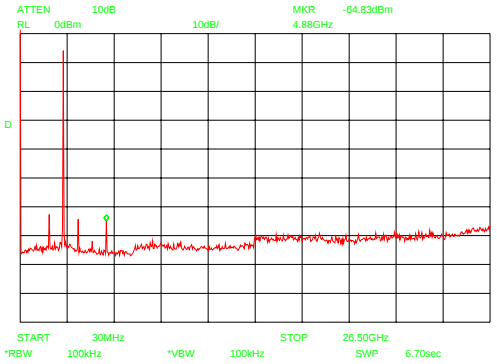


CH 80 30 - 26500 MHz

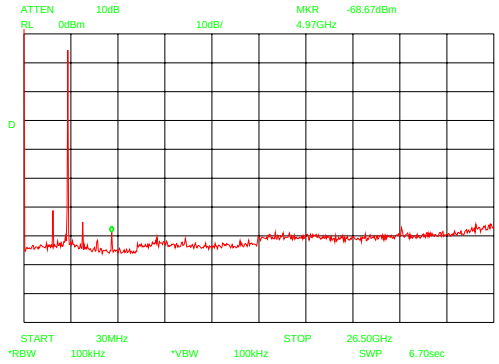
Π/4 DQPSK



CH 2 30 - 26500 MHz

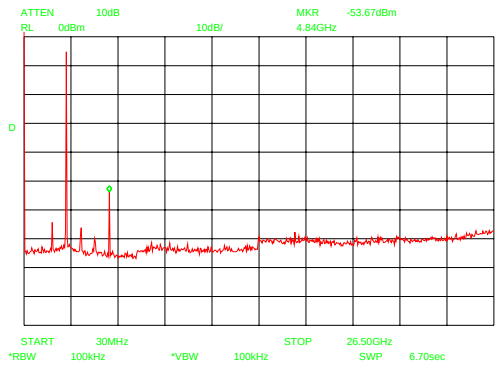


CH 41 30 - 26500 MHz

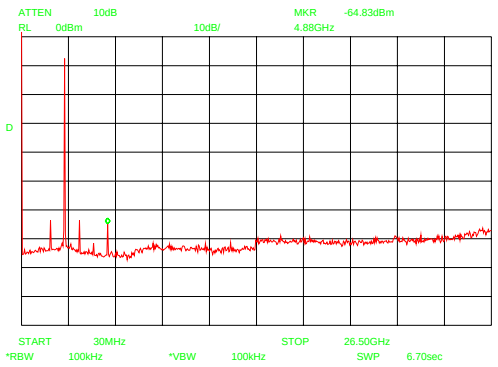


CH 80 30 - 26500 MHz

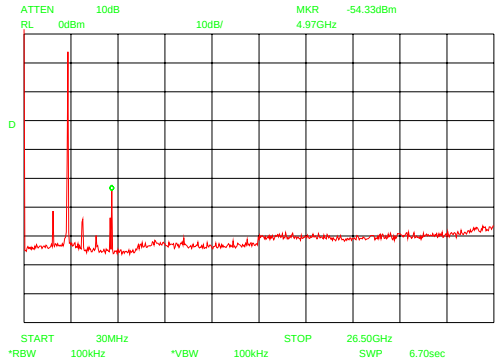
8DPSK



CH 2 30 - 26500 MHz



CH 41 30 - 26500 MHz



CH 80 30 - 26500 MHz

Measurement uncertainty: 0.03 – 2 GHz: +1.7 / -1.9 dB
> 2 GHz: +2.4 /-2.7 dB

6.7 Field strength of unwanted emissions in restricted bands

Compliance standard : FCC part 15, subpart C, section 15.205(a)
Method of test : FCC Public Notice DA 00-705

Ambient temperature : 21 °C
Relative humidity : 42 %

Frequency (MHz)	Peak value (dBµV/m)	Remark
1650	38.2	Relates to ch 2 (π/4DQPSK)
1650	38.2	Relates to ch 41 (8DPSK)
4003	39.2	Relates to ch 2 (GFSK)
4068	37.2	Relates to ch 41(GFSK)
4134	39.2	Relates to ch 80 (GFSK)
4804	54.0	2nd harm. of ch 2 (GFSK)
4882	51.2	2nd harm. of ch 41 (GFSK)
4960	51.2	2nd harm. of ch 80 (GFSK)

Measurement uncertainty: +4.5 dB / -6.0 dB

Note 1: values stated in the table above are worst case for all three types of modulation.

Note 2: as the peak values do not exceed the average limit, there was no need to perform average detector measurements.

6.8 Average time of occupancy *

Hops per second (Bluetooth specification)	1600
Time of occupancy on any channel	1/1600 sec.
Frequency retention time in one 31.6 sec. period on any channel	(time slot length × hop rate / no. of hopping channels) × 31.6 sec
	(5 × 625 µsec × 1600 × 1/5 × 1/sec /79) × 31.6 sec = 0.4 sec.

* DM5/DH5 packet size for Tx; DM1/DH1 packet size for Rx

Limit values:

Frequency retention time	≤ 0.4 sec. in one 31.6 sec. period (79 x .4 sec.)

Test equipment:

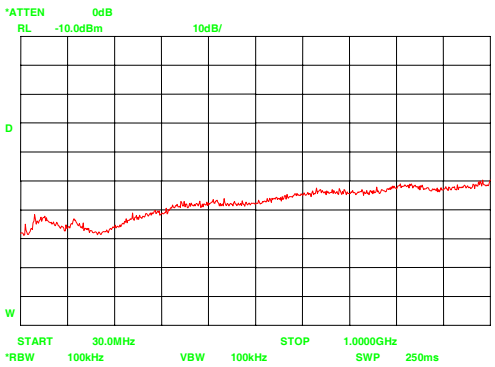
Test equipment used: (Item numbers)	n.a.

6.9 Field strength of Rx unwanted emissions - radiated

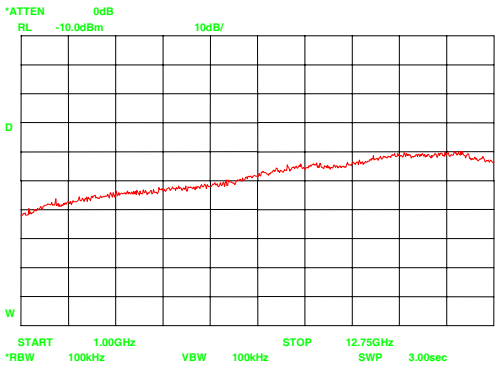
Compliance standard	:	FCC part 15, subpart B, section 15.109
Method of test	:	FCC Public Notice DA 00-705 FCC part 15, subpart A, sections 15.31(f)(1), 15.31(m), 15.33, 15.35.
Ambient temperature	:	21 °C
Relative humidity	:	42 %
Test results	:	

GFSK

Ch 2: Vertical direction

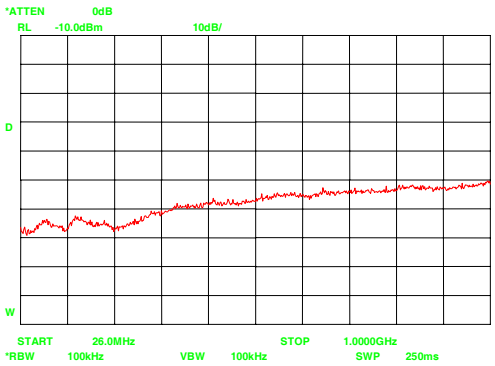


30 – 1000 MHz

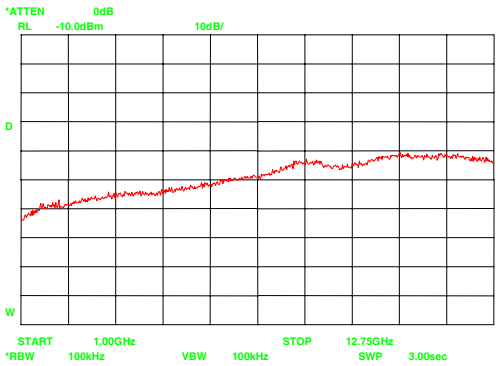


1 – 12.75 GHz

Ch 2: Horizontal direction

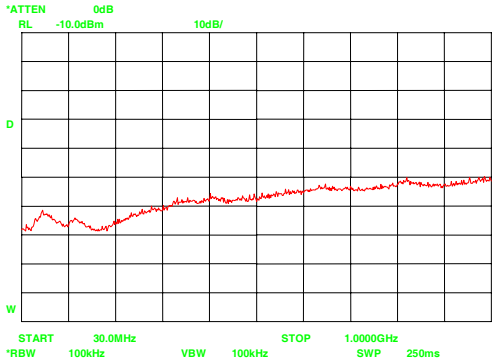
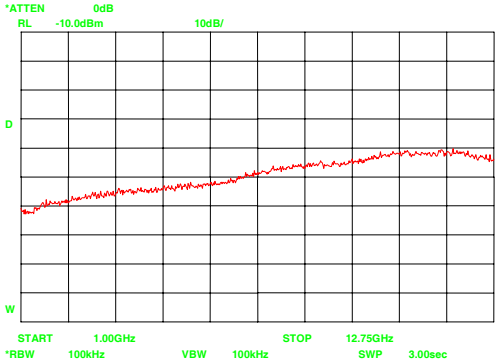


30 – 1000 MHz

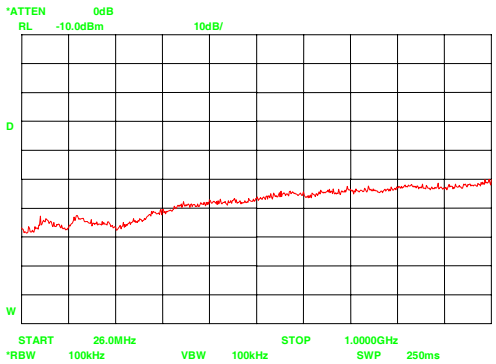
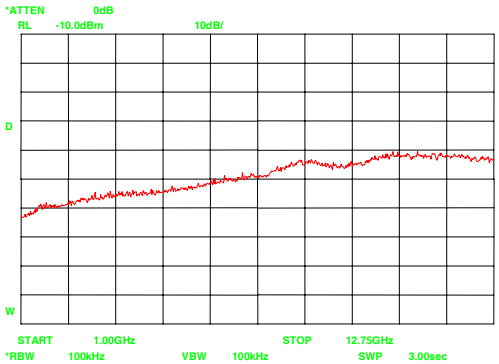


1 – 12.75 GHz

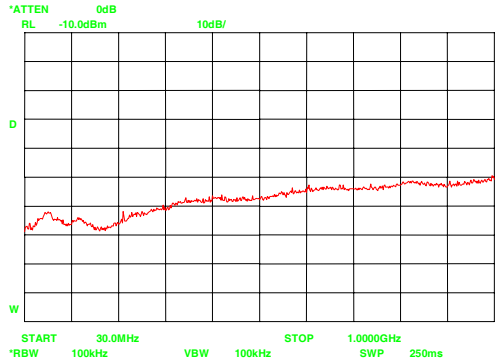
Ch 41: Vertical direction

	
30 – 1000 MHz	1 – 12.75 GHz

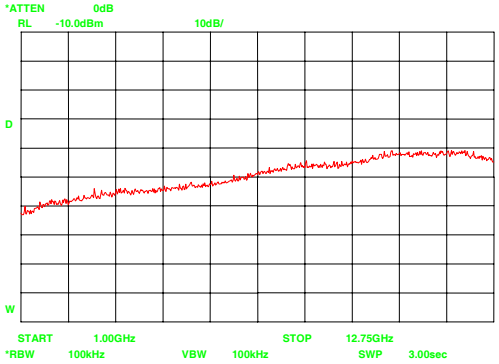
Ch 41: Horizontal direction

	
30 – 1000 MHz	1 – 12.75 GHz

Ch 80: Vertical direction

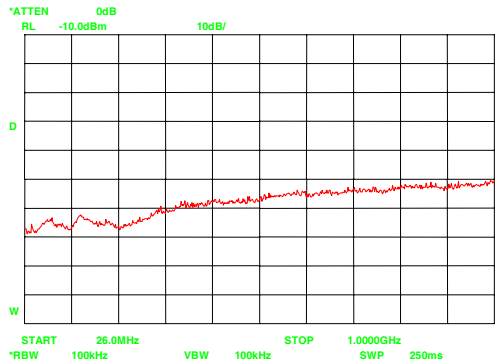


30 – 1000 MHz

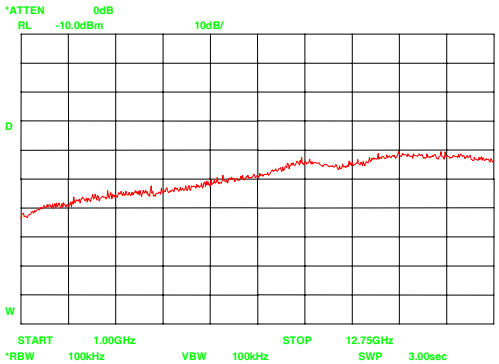


1 – 12.75 GHz

Ch 80: Horizontal direction



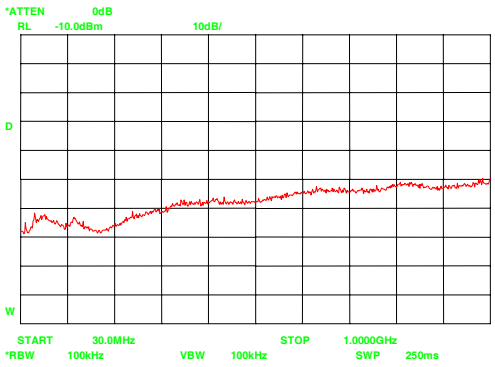
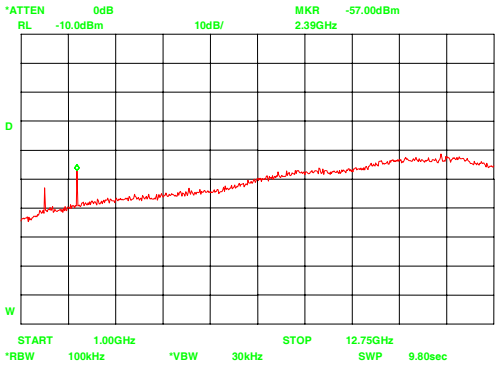
30 – 1000 MHz



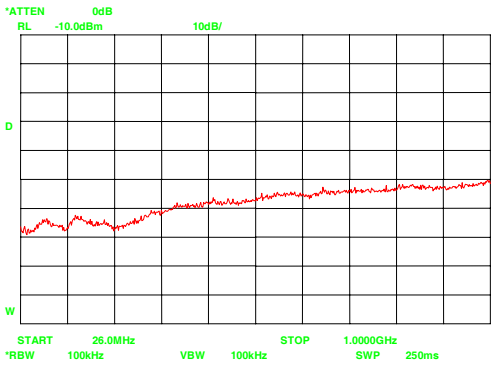
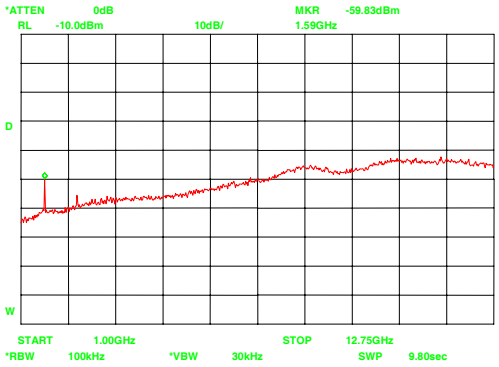
1 – 12.75 GHz

π/4DQPSK

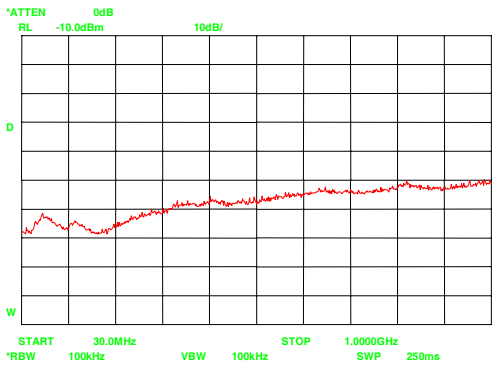
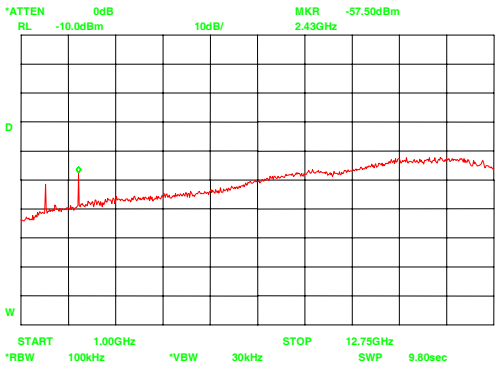
Ch 2: Vertical direction

	
30 – 1000 MHz	1 – 12.75 GHz

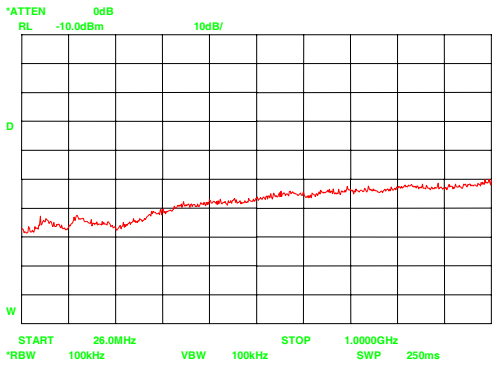
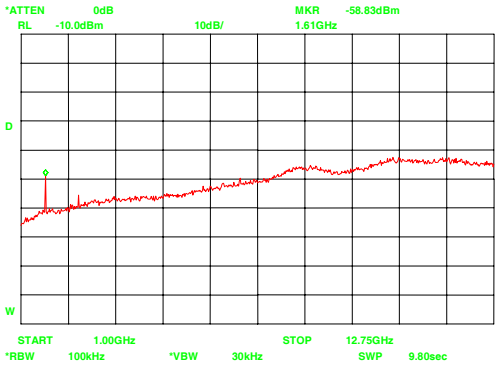
Ch 2: Horizontal direction

	
30 – 1000 MHz	1 – 12.75 GHz

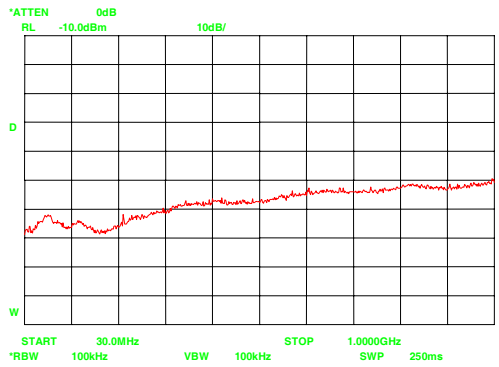
Ch 41: Vertical direction

	
30 – 1000 MHz	1 – 12.75 GHz

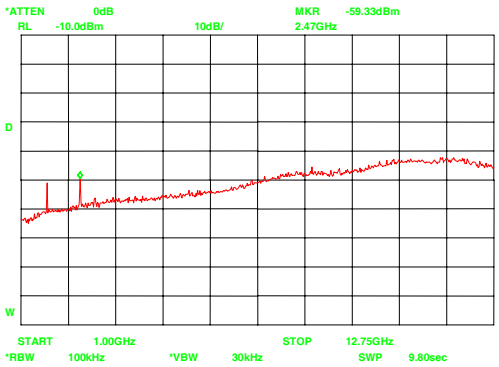
Ch 41: Horizontal direction

	
30 – 1000 MHz	1 – 12.75 GHz

Ch 80: Vertical direction

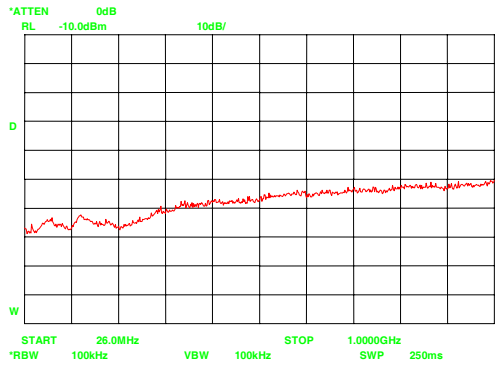


30 – 1000 MHz

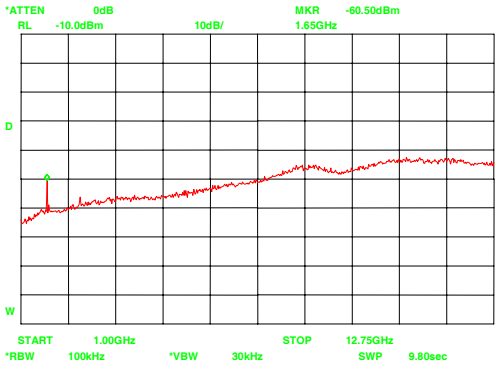


1 – 12.75 GHz

Ch 80: Horizontal direction



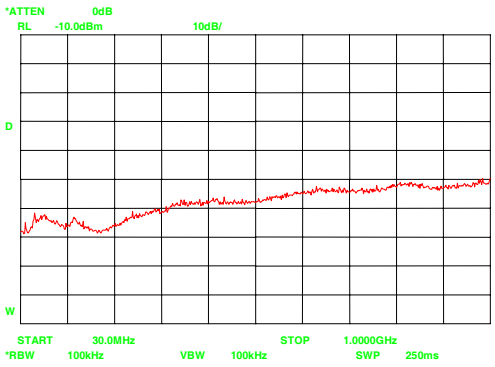
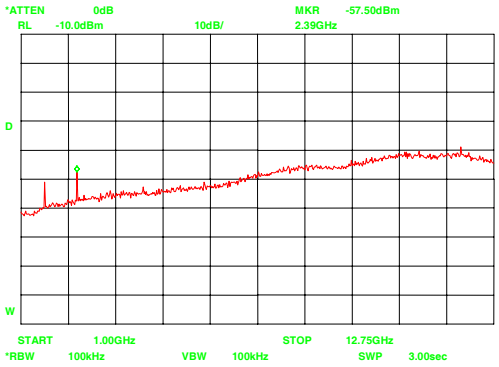
30 – 1000 MHz



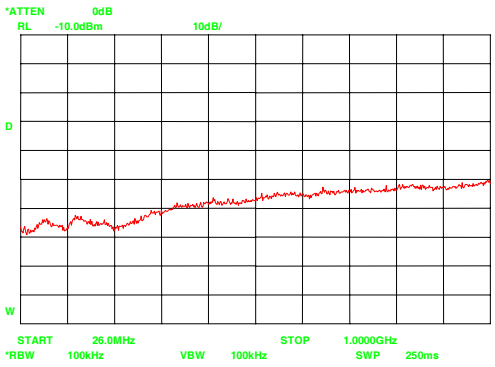
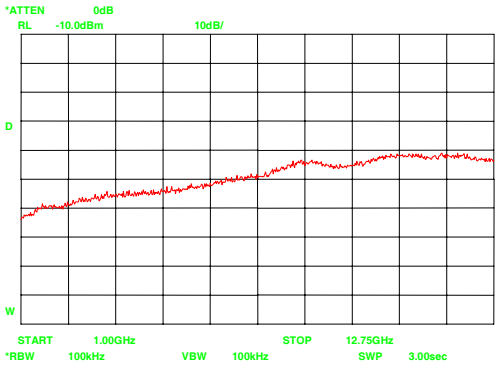
1 – 12.75 GHz

8DPSK

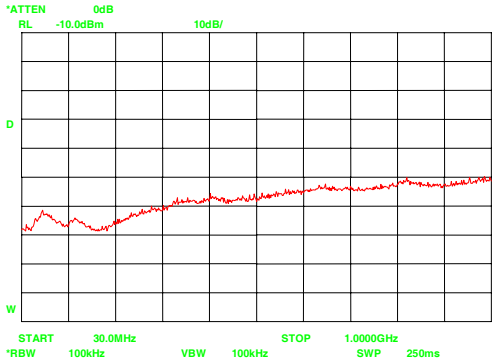
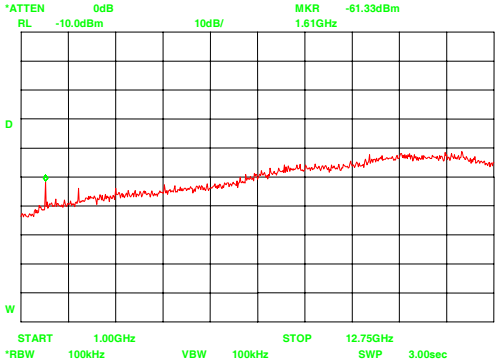
Ch 2: Vertical direction

	
30 – 1000 MHz	1 – 12.75 GHz

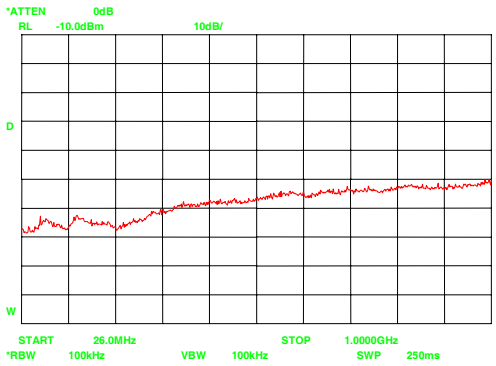
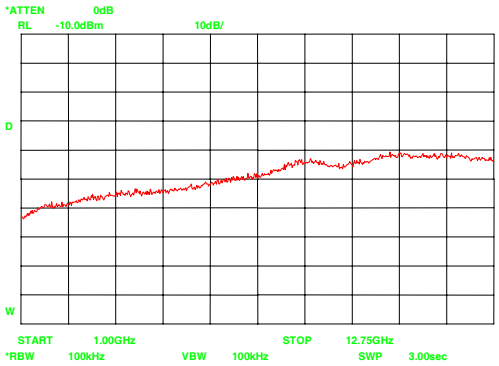
Ch 2: Horizontal direction

	
30 – 1000 MHz	1 – 12.75 GHz

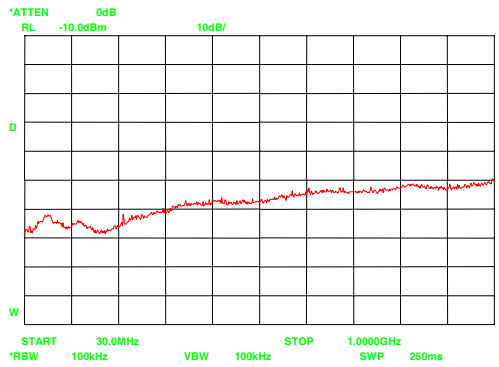
Ch 41: Vertical direction

	
30 – 1000 MHz	1 – 12.75 GHz

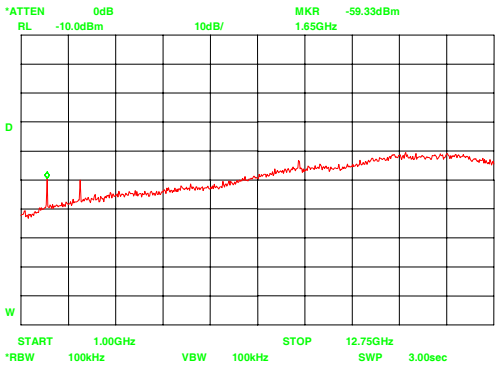
Ch 41: Horizontal direction

	
30 – 1000 MHz	1 – 12.75 GHz

Ch 80: Vertical direction

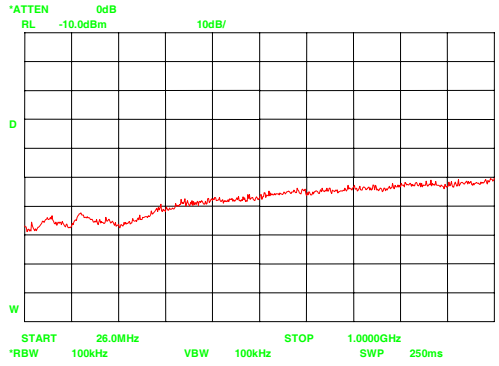


30 – 1000 MHz

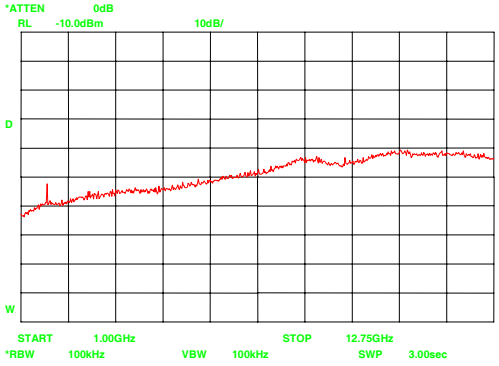


1 – 12.75 GHz

Ch 80: Horizontal direction



30 – 1000 MHz



1 – 12.75 GHz

Note 1: Applied limits in this section result from conversion using: $P_{dBm\ e.i.r.p.} = E_{dB\mu V/m} - 95.2_{dB}$

Measurement uncertainty: ≤ 1GHz: +2.6/-3.3 dB
> 1 GHz: +4.5/-6.1 dB

Used test equipment module

Description	Telef. ID	Manufacturer	Model	Used at par.
Receiver	--	Rohde & Schwarz	ESCI	6.1
Spectrum Analyzer	TE 00481	Hewlett Packard	HP8563E	3.1 – 3.8, 6.2 – 6.9
Power meter	TE 00489	Hewlett Packard	437B	3.4, 6.5
Power sensor	TE 00355	Hewlett Packard	8481A	3.4, 6.5
RF Pre-amplifier up to 1000 MHz	TE 00098	Rohde & Schwarz	ESV-Z3	3.8, 6.9
RF Pre-amplifier 1 - 26.5 GHz	TE 00093	Hewlett Packard	HP8449B	3.5, 3.6, 6.6, 6.7
Biconilog antenna	TE 00700	Emco	3143	3.8, 6.9
Horn Antenna 1 – 18 GHz	TE 00532	Emco	3115	3.8, 6.9
Horn Antenna 18 – 40 GHz	TE 00533	Emco	3116	3.8, 6.9
Anechoic Chamber	TE 01064	Euroshield	RFD-F-100	3.8, 6.9
Antenna tower	--	HD	AS 620p	3.8, 6.9
Turntable	--	HD	DS 412	3.8, 6.9
Turntable controller	--	HD	HD 050	3.8, 6.9

Revision history

REVISION	DATE	REMARKS
1.0	21 May 2007	- Added FCC ID's.
2.0	5 June 2007	- Removed references to product variant CHG-3101.