



Accredited testing-laboratory

DAR registration number: DAT-P-176/94-D1

**Federal Motor Transport Authority (KBA)
DAR registration number: KBA-P 00070-97**

Recognized by the Federal Communications Commission

Anechoic chamber registration no.: 90462 (FCC)

Anechoic chamber registration no.: 3463A-1 (IC)

Certification ID: DE 0001

Accreditation ID: DE 0002

Accredited Bluetooth® Test Facility (BQTF)

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Test report no. : 4-3120-01-05_C/08
Type identification : RBW71CW
Applicant : Research In Motion Limited
FCC ID : L6ARBW70CW
IC Certification No : 2503A-RBW70CW
Test standards : 47 CFR Part 15

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1 General information

1.1 Notes

The test results of this test report relate exclusively to the test item specified in 3.1.1. The CETECOM ICT Services GmbH does not assume responsibility for any conclusions and generalisations drawn from the test results with regard to other specimens or samples of the type of the equipment represented by the test item. The test report may only be reproduced or published in full. Reproduction or publication of extracts from the report requires the prior written approval of the CETECOM ICT Services GmbH.

Test laboratory manager:

2008-09-15	Nicolas Stamber	
Date	Name	Signature

Technical responsibility for area of testing:

2008-09-15	Stefan Bös	
Date	Name	Signature

1.2 Testing laboratory

CETECOM ICT Services GmbH

Untertürkheimer Straße 6 - 10

66117 Saarbrücken

Germany

Phone: + 49 681 5 98 - 0

Fax: + 49 681 5 98 - 9075

e-mail: info@ICT.cetecom.de

Internet: http://www.cetecom-ict.de

State of accreditation: The test laboratory (area of testing) is accredited according to
DIN EN ISO/IEC 17025
DAR registration number: DAT-P-176/94-D1

Accredited by: Federal Motor Transport Authority (KBA)
DAR registration number: KBA-P 00070-97

Testing location, if different from CETECOM ICT Services GmbH:

Name :
Street :
Town :
Country :
Phone :
Fax :

1.3 Details of applicant

Name:	Research In Motion Limited
Street:	295 Phillip Street
Town:	Waterloo, ON N2L 3W8
Country:	Canada
Telephone:	+1-519-888-7465
Fax:	+1-519-888-6906
Contact:	Masud Attayi
E-mail:	mattayi@rim.com
Telephone:	+1-519-888-7465

1.4 Application details

Date of receipt of order:	2008-08-20
Date of receipt of test item:	2008-09-08
Date of start test:	2008-09-08
Date of end test:	2008-09-11
Persons(s) who have been present during the test:	Mr. Masud Attayi

2 Test standard/s:

47 CFR Part 15	2007-09	Title 47 of the Code of Federal Regulations; Chapter I- Federal Communications Commission subchapter A - general, Part 15-Radio frequency devices
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3 Technical tests

3.1 Details of manufacturer

Name:	Research In Motion Limited
Street:	295 Phillip Street
Town:	Waterloo, ON N2L 3W8
Country:	Canada

3.1.1 Test item

Kind of test item	:	Blackberry Smartphone
Type identification	:	RBW71CW
S/N serial number	:	PIN: 3047A85C, 3047A850
HW hardware status	:	CER-1763-004 Rev 4
SW software status	:	V4.7.0.35 (Platform 4.0.0.33)
Frequency Band [MHz]	:	ISM 2.400 - 2.483,5
Type of Modulation	:	FHSS
Number of channels	:	79
Antenna	:	Internal antenna
Power Supply	:	Battery 3.7 V DC
Temperature Range	:	-10 °C to +55°C

Max. power radiated: Not performed

Max. power conducted: Not performed

FCC ID: L6ARBW70CW

IC: 2503A-RBW70CW

3.1.2 Additional EUT information For IC Canada (appendix 2)

IC Registration Number:	2503A-RBW70CW
Model Name:	RBW71CW
Manufacturer (complete Address):	Research In Motion Limited 295 Phillip Street Waterloo, ON N2L 3W8 Canada
Tested to Radio Standards Specification (RSS) No.:	RSS-210 Issue 7
Open Area Test Site Industry Canada Number:	IC 3463A-1
Frequency Range (or fixed frequency) [MHz]:	2400 – 2483.5 MHz
RF: Power [W] (max):	Rad. EIRP: Not performed Conducted : Not performed
Antenna Type:	Internal antenna
Field Strength [dBμV/m in 3m]:	Not performed
Occupied Bandwidth (99% BW) [kHz]:	Not performed
Type of Modulation:	GFSK, Pi/4 DQPSK, 8 DPSK
Emission Designator (TRC-43):	IM00FXD / 79M0GXD (FHSS) at EDR
Transmitter Spurious (worst case) [μV/m in 3m]:	130.3
Receiver Spurious (worst case) [μV/m in 3m]:	Not performed

ATTESTATION:

I attest that the testing was performed or supervised by me; that the test measurements were made in accordance with the above-mentioned departmental standard(s), and that the radio equipment identified in this application has been subject to all applicable test conditions specified in the departmental standards and all of the requirements of the standards have been met.

Signature:



Test engineer: Nicolas Stamber Date: 2008-09-15

3.1.3 EUT operating modes

EUT operating mode no. *)	Description of operating modes	Additional information
Op. 0	Normal mode	Normal temperature and power source conditions
Op. 1		low temperature, low power source conditions
Op. 2		low temperature, high power source conditions
Op. 3		high temperature, low power source conditions
Op. 4		high temperature, high power source conditions

*) EUT operating mode no. is used to simplify the test plan

3.1.4 Extreme conditions testing values

Description	Shortcut	Unit	Value
Nominal Temperature	T _{nom}	°C	23
Nominal Humidity	H _{nom}	%	56
Nominal Power Source	V _{nom}	V DC	3.7

Type of power source:

Deviations from these values are reported in chapter 2

4 Summary of Measurement Results and list of all performed test cases

- No deviations from the technical specifications were ascertained
- There were deviations from the technical specifications ascertained

TC identifier	Description	verdict	date	Remark
RF-Testing	FCC Part 15 §15.247 - CANADA RSS-210	pass	2008-09-15	-/-

Test Specification Clause	Test Case	Modulation	Pass	Fail	N/A	Not performed
None	Antenna Gain	GFSK				Yes
§15.247(a1)	Carrier frequency separation	GFSK				Yes
§15.247(a1)	Number of hopping channels	GFSK				Yes
§15.247(a)(1)(iii)	Time of occupancy (dwell time)	--				Yes
§15.247(e)	Power Spectral density (Hybrid system in Inquiry mode/Page scan)	--				Yes
§15.247(a)(1)	Spectrum Bandwidth of a FHSS System / 20dB Bandwith	GFSK Pi/4 DQPSK 8 DPSK				Yes Yes Yes
§ 15.247 (b)(1)	Maximum output power (conducted)	GFSK Pi/4 DQPSK 8 DPSK				Yes Yes Yes
§ 15.247 (b)(1)	Max. peak output power (radiated)	GFSK				Yes
§ 15.247 (d)	Band-edge compliance of conducted emissions	Widest modulation				Yes
§ 15.205	Band-edge compliance of radiated emissions	GFSK Pi/4 DQPSK 8 DPSK	Yes			
§ 15.247 (d)	Spurious Emissions - conducted (Transmitter)	GFSK				Yes
§ 15.247 (d)	Spurious Emissions - radiated (Transmitter) >30 MHz	GFSK Pi/4 DQPSK 8 DPSK	Yes			
§ 15.109	Spurious Emissions - radiated (Receiver)	GFSK				Yes
§ 15.209	Spurious Emissions - radiated (Transmitter) <30 MHz	GFSK Pi/4 DQPSK 8 DPSK	Yes			
§ 15.107/207	Conducted Emissions <30 MHz	GFSK				Yes

5 RF measurement testing

5.1 Description of test set-up

5.1.1 Radiated measurements

The radiated measurements are performed in vertical and horizontal plane in the frequency range from 9 kHz to 25 GHz in semi-anechoic chambers. The EUT is positioned on a non-conductive support with a height of 0.80 m above a conductive ground plane that covers the whole chamber. The receiving antennas are confirmed with specifications ANSI C63.2-1996 clause 15 and ANSI C63.4-2003 clause 4.1.5. These antennas can be moved over the height range between 1.0 m and 4.0 m in order to search for maximum field strength emitted from EUT. The measurement distances between EUT and receiving antennas are indicated in the test setups for the various frequency ranges. For each measurement, the EUT is rotated in all three axes until the maximum field strength is received. The wanted and unwanted emissions are received by spectrum analysers where the detector modes and resolution bandwidths over various frequency ranges are set according to requirement ANSI C63-4-2003 clause 4.2. Antennas are confirmed with ANSI C63.2-1996 item 15.

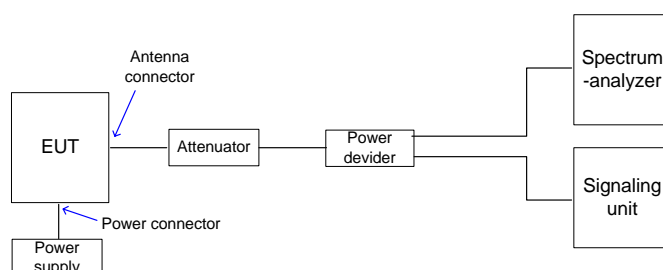
- 9 kHz - 150 kHz: Quasi Peak measurement, 200 Hz Bandwidth, passive loop antenna.
- 150 kHz - 30 MHz: Quasi Peak measurement, 9 kHz Bandwidth, passive loop antenna.
- 30 MHz - 200 MHz: Quasi Peak measurement, 120 kHz Bandwidth, bi-conical antenna
- 200MHz - 1GHz: Quasi Peak measurement, 120 kHz Bandwidth, log periodic antenna
- >1GHz: Average, RBW 1MHz, VBW 10 Hz, waveguide horn

All measurements are done in accordance with the Filing and Measurement Guidelines for Frequency Hopping Spread Spectrum Systems DA 00-705 and Appendix A “BLUETOOTH APPROVALS”

The EUT is powered by an external power supply with nominal voltage. The signalling is performed from outside the chamber with a signalling unit (CMU200 or other) by air link using signalling antenna.

5.1.2 Conducted measurements

The EUT’s RF signal is coupled out by the antenna connector which is supplied by the manufacturer. The signal is first 10dB attenuated before it is power divided (~6dB loss per branch). One of the signal paths is connected to the communication base Station (CMU200 or other), the other one is connected to the spectrum analyzer. The specific losses for both signal paths are first checked within a calibration. The measurement readings on the signalling unit/spectrum analyzer are corrected by the specific test set-up loss. The attenuator, power divider, signalling unit and the spectrum analyzer are impedance matched on 50 Ohm.



5.2 Referenced documents

None

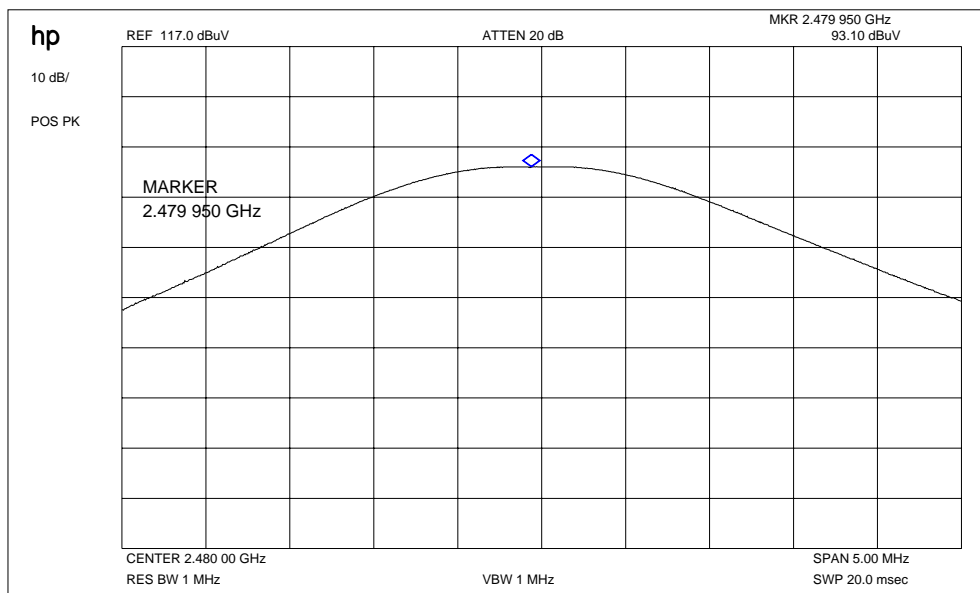
5.3 Additional comments

None

5.4 Band-edge compliance of radiated emissions §15.205

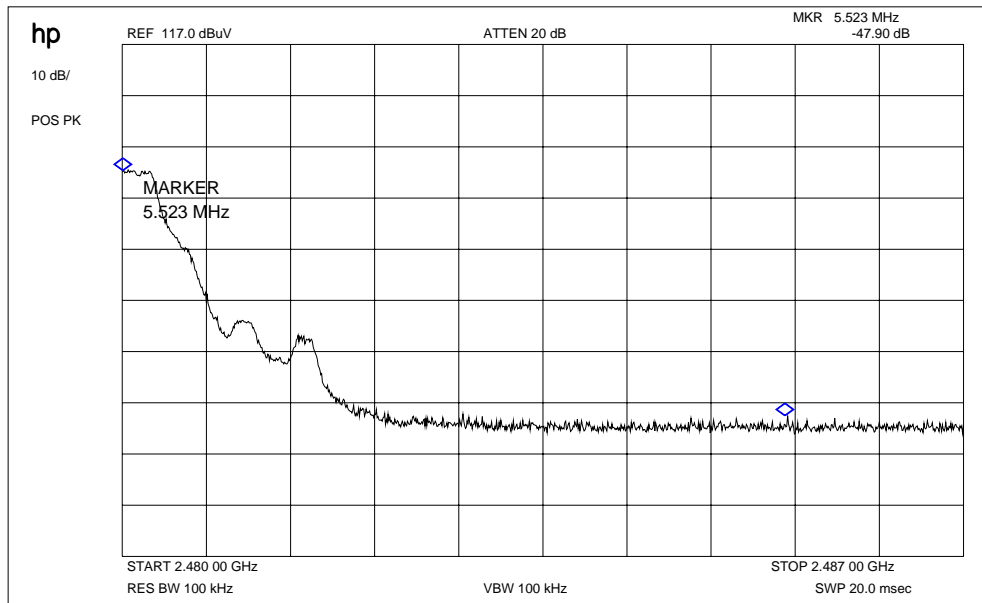
Modulation: GFSK

Plot 1: Max field strength in 3m distance (single frequency)



Result: 93.1 dB μ V/m

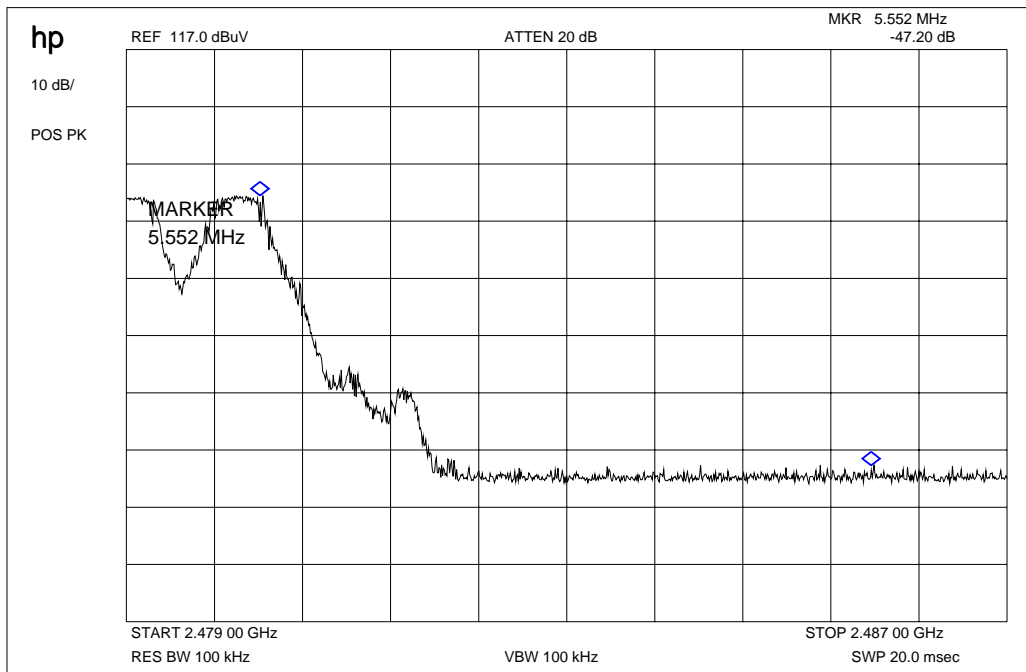
Plot 2: Marker-Delta Method (single carrier)



Marker-Delta-Value: 47.9 dB

This measurement was made to show that the behaviour of the system is conform to FCC 15.205 (restricted bands)

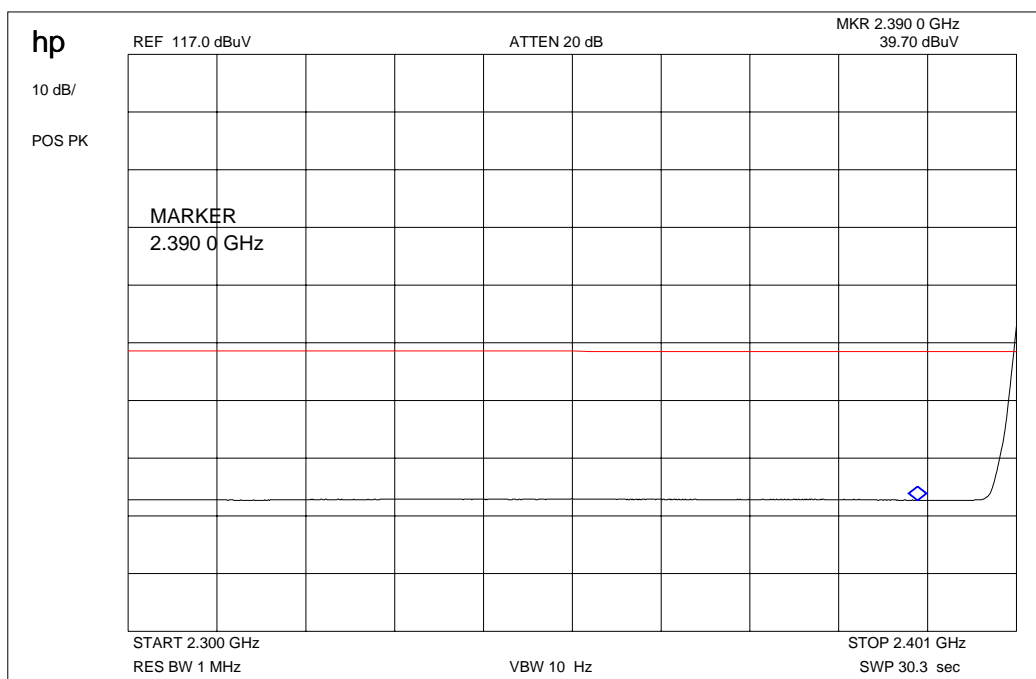
Plot 3: Marker-Delta Method (hopping)



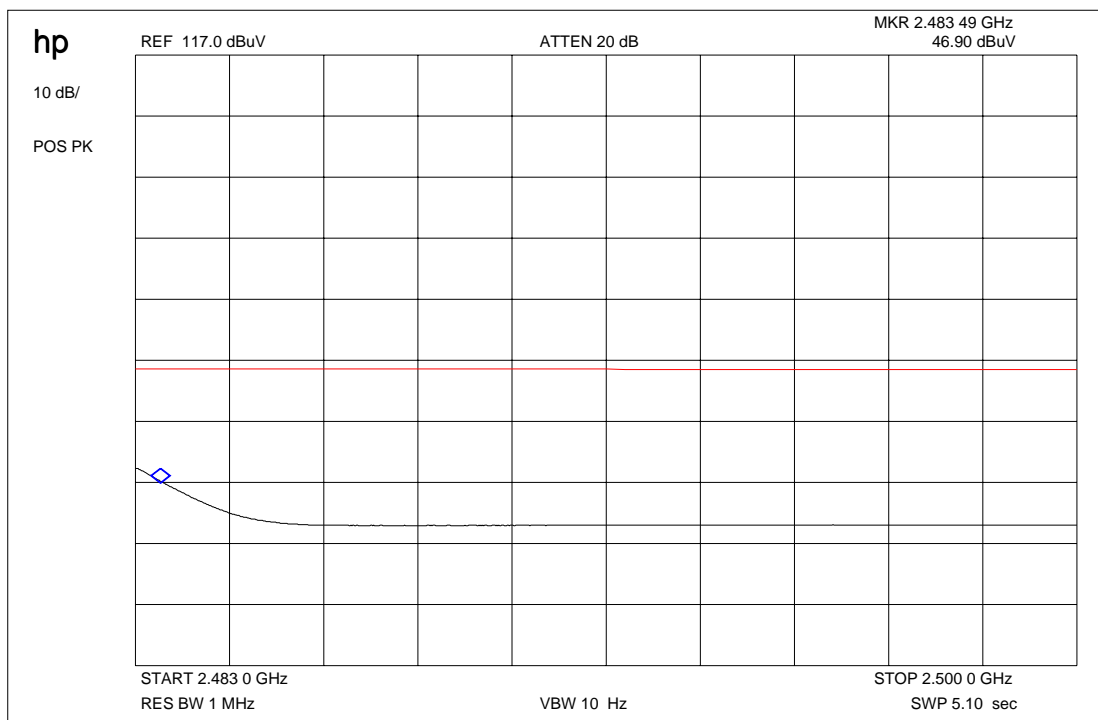
Marker-Delta-Value: 47.2 dB

This measurement was made to show that the behaviour of the system is conform to FCC 15.205 (restricted bands)

Plot 4: Restricted Bands low



Plot 5: Restricted Bands high



Results & Limits:

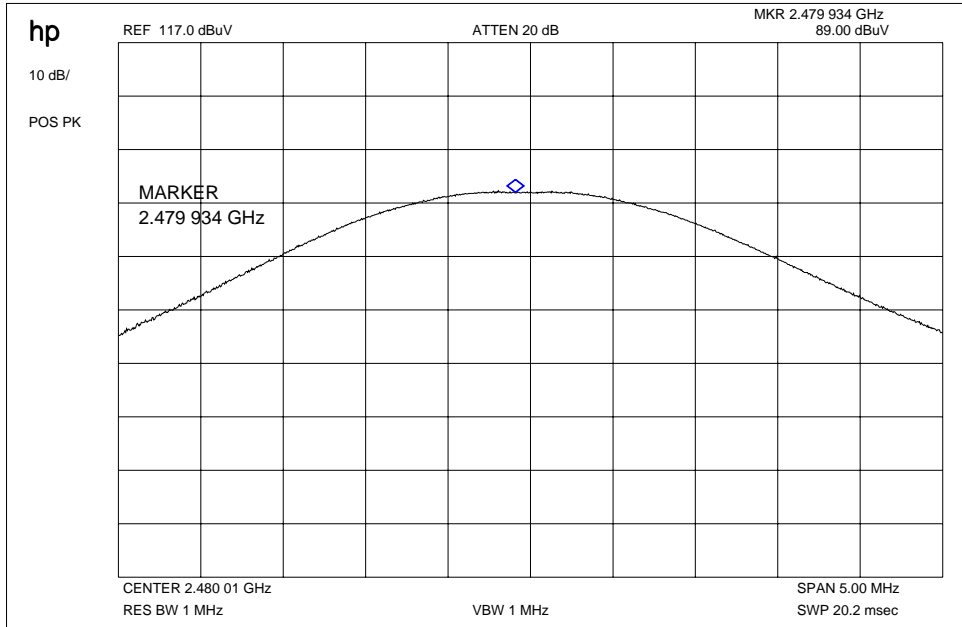
Radiated field strength

The field strength was measured with an EMI measuring receiver and 1 MHz RBW / VBW for peak and with 1MHz RBW / 10Hz VBW for average at a distance of 3m.

high channel	setup	measured value (3m)	correction factor (3m)	calculated value (3m)
Max. peak value	1 MHz RBW 1 MHz VBW	93.1 dB μ V/m	-6.3	86.8 dB μ V/m
Max. average value	Calculated with duty cycle correction factor	86.8 dB μ V/m peak	-1,07dB duty cycle correction factor (worst case DH5)	85.73 dB μ V/m
Delta value	Peak 100 kHz RBW/VBW	47.9 dB (single carrier) 47.2 dB (hopping mode)	-	-
Value at band edge	limit 54 dB μ V/m			37.83 dB μ V/m (single carrier) 38.53 dB μ V/m (hopping mode)
Statement:				Complies

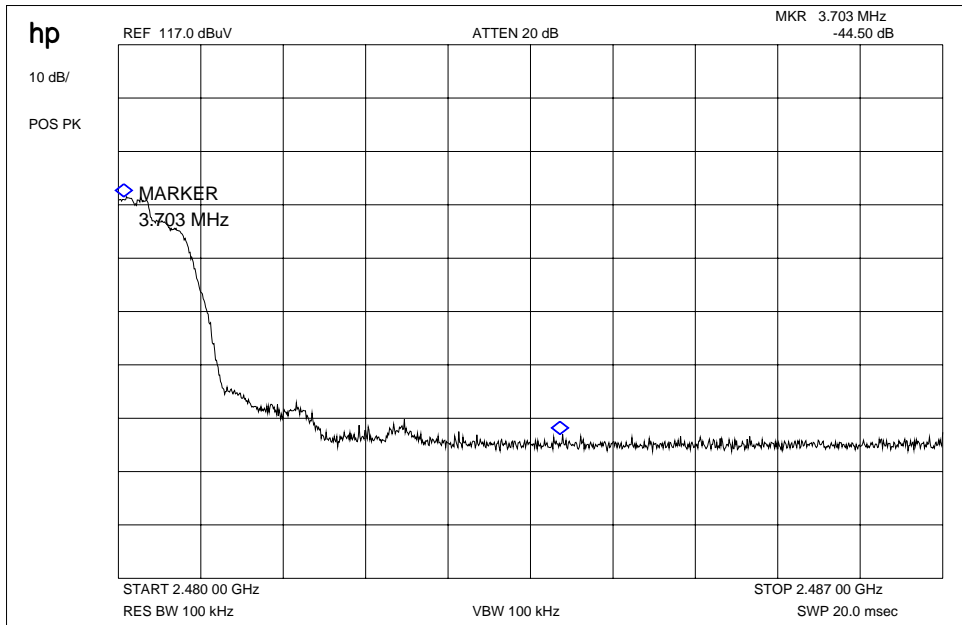
Modulation: Pi/4 DQPSK

Plot 1: Max field strength in 3m distance (single frequency)



Result: 89.0 dB μ V/m

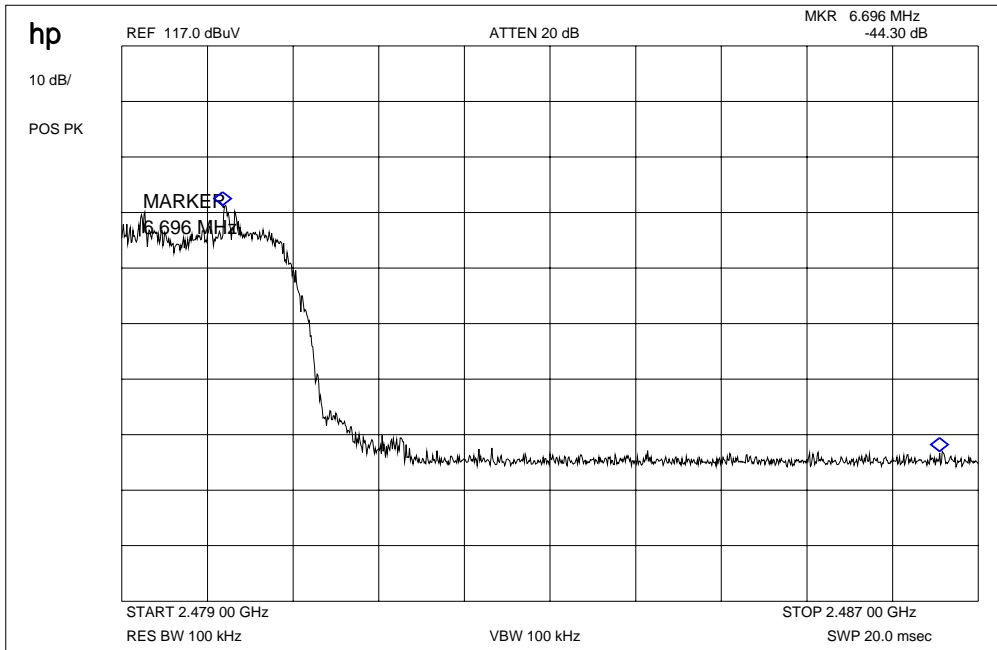
Plot 2: Marker-Delta Method (single carrier)



Marker-Delta-Value: 44.5 dB

This measurement was made to show that the behaviour of the system is conform to FCC 15.205 (restricted bands)

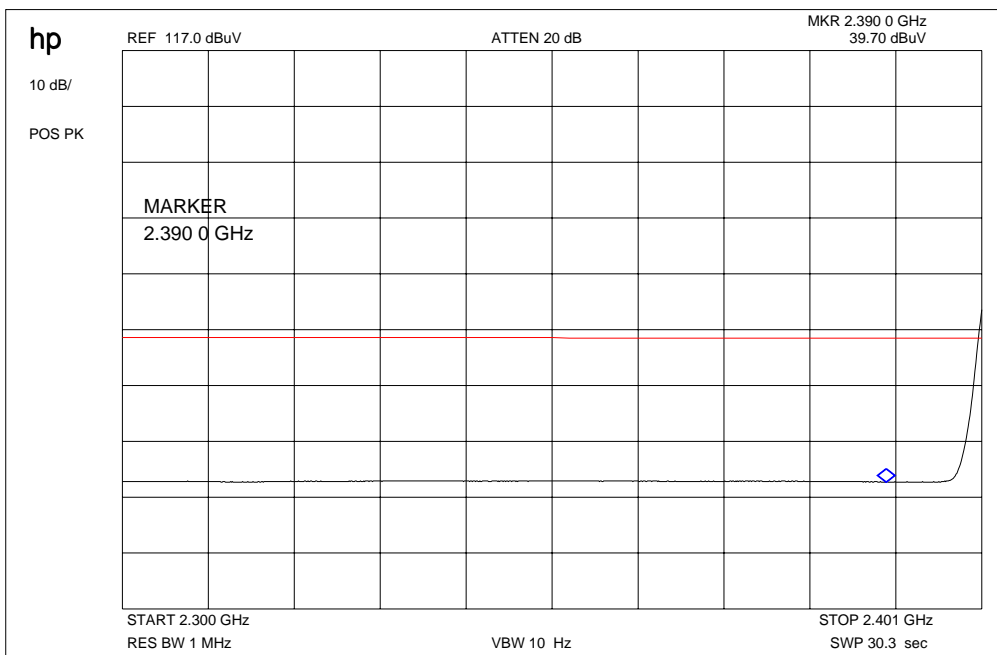
Plot 3: Marker-Delta Method (hopping)



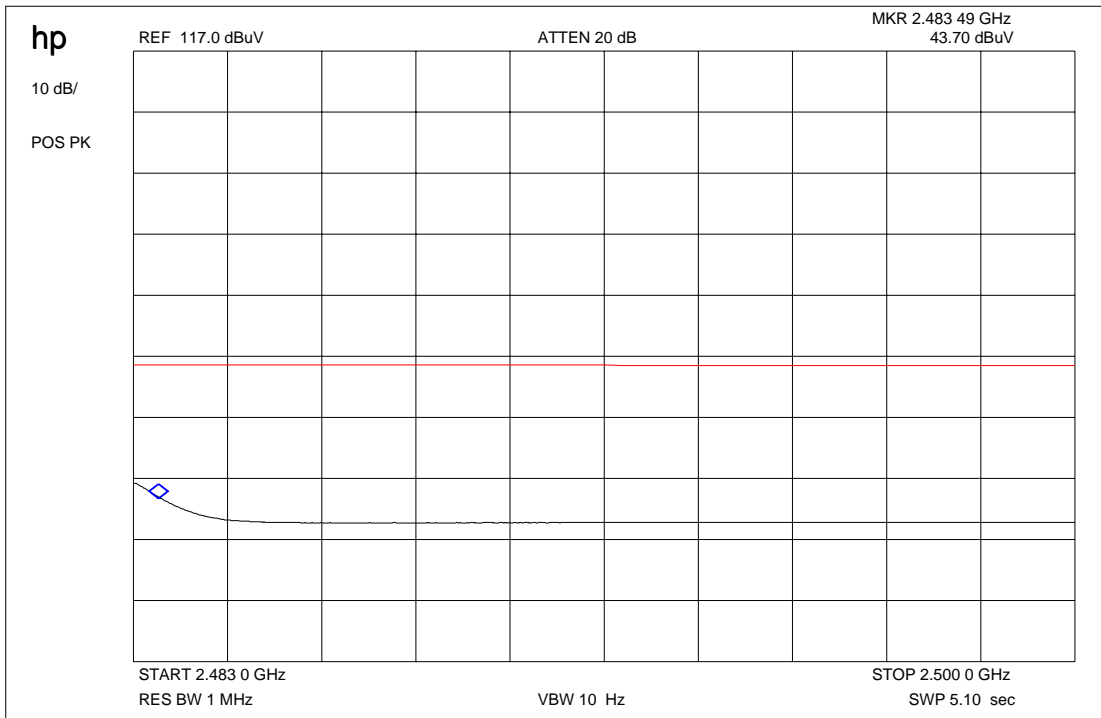
Marker-Delta-Value: 44.3 dB

This measurement was made to show that the behaviour of the system is conform to FCC 15.205 (restricted bands)

Plot 4: Restricted Bands low



Plot 5: Restricted Bands high



Results & Limits:

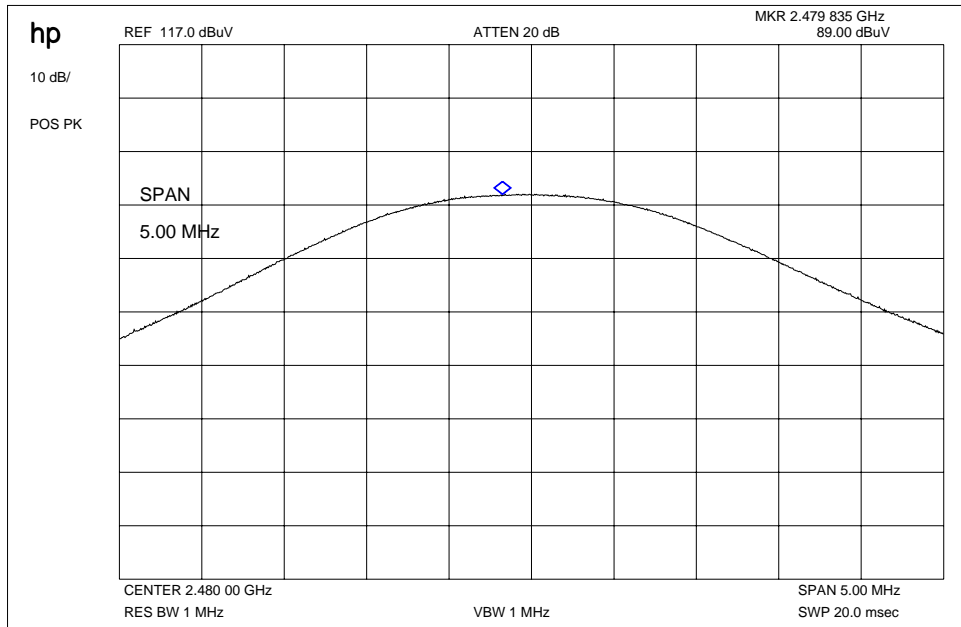
Radiated field strength

The field strength was measured with an EMI measuring receiver and 1 MHz RBW / VBW for peak and with 1MHz RBW / 10Hz VBW for average at a distance of 3m.

high channel	setup	measured value (3m)	correction factor (3m)	calculated value (3m)
Max. peak value	1 MHz RBW 1 MHz VBW	89.0 dB μ V/m	-6.3	82.7 dB μ V/m
Max. average value	Calculated with duty cycle correction factor	82.7 dB μ V/m peak	-1,07dB duty cycle correction factor (worst case DH5)	81.63 dB μ V/m
Delta value	Peak 100 kHz RBW/VBW	44.5 dB (single carrier) 44.3 dB (hopping mode)	-	-
Value at band edge	limit 54 dB μ V/m			37.13 dB μ V/m (single carrier) 37.33 dB μ V/m (hopping mode)
Statement:				Complies

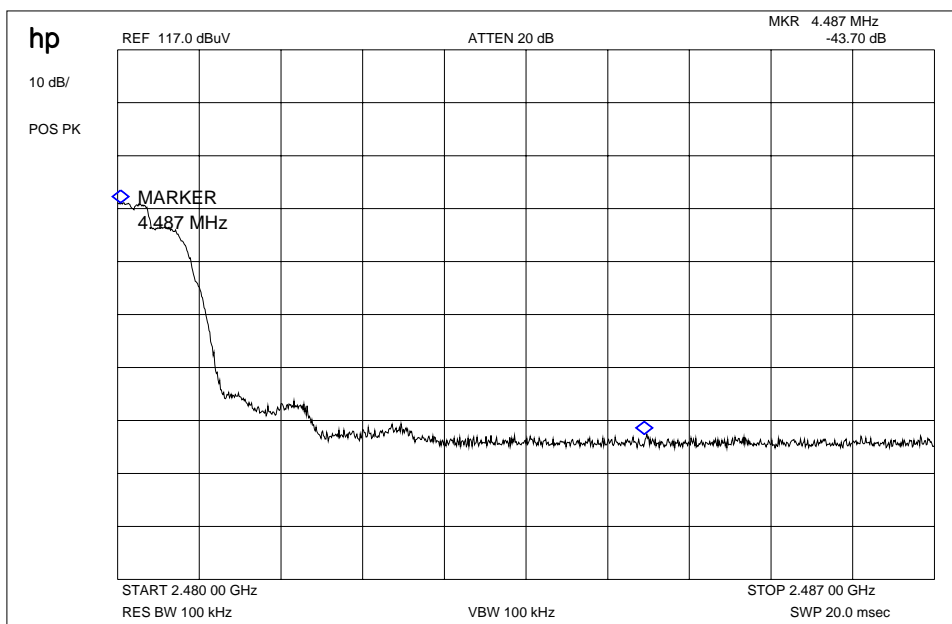
Modulation: 8DPSK

Plot 1: Max field strength in 3m distance (single frequency)



Result: 89.0 dB μ V/m

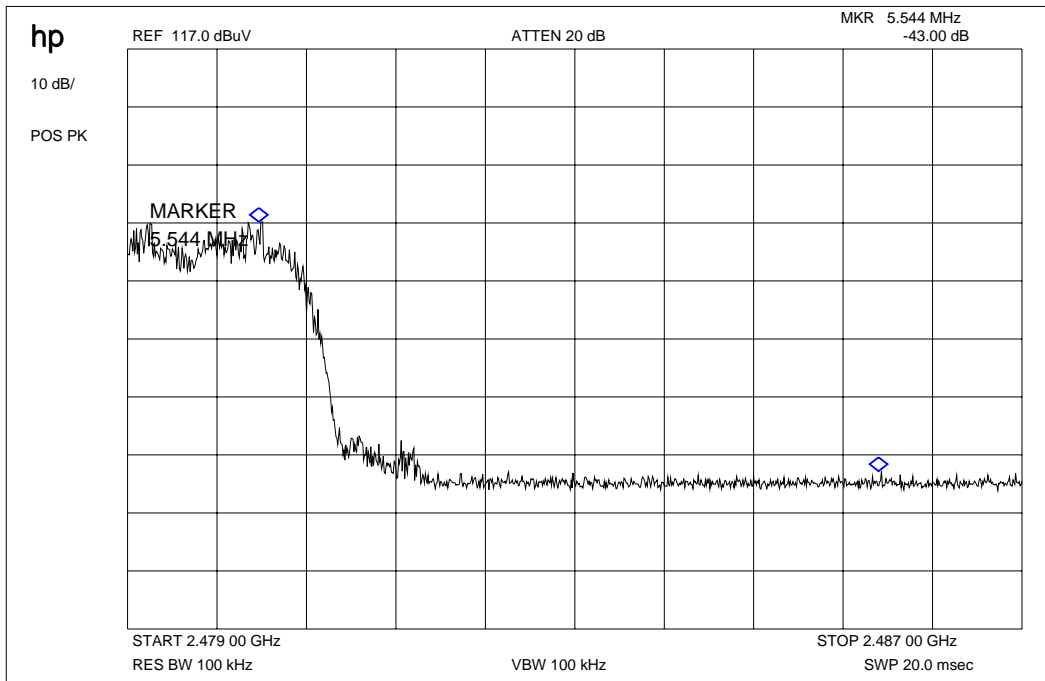
Plot 2: Marker-Delta Method (single carrier)



Marker-Delta-Value: 43.7 dB

This measurement was made to show that the behaviour of the system is conform to FCC 15.205 (restricted bands)

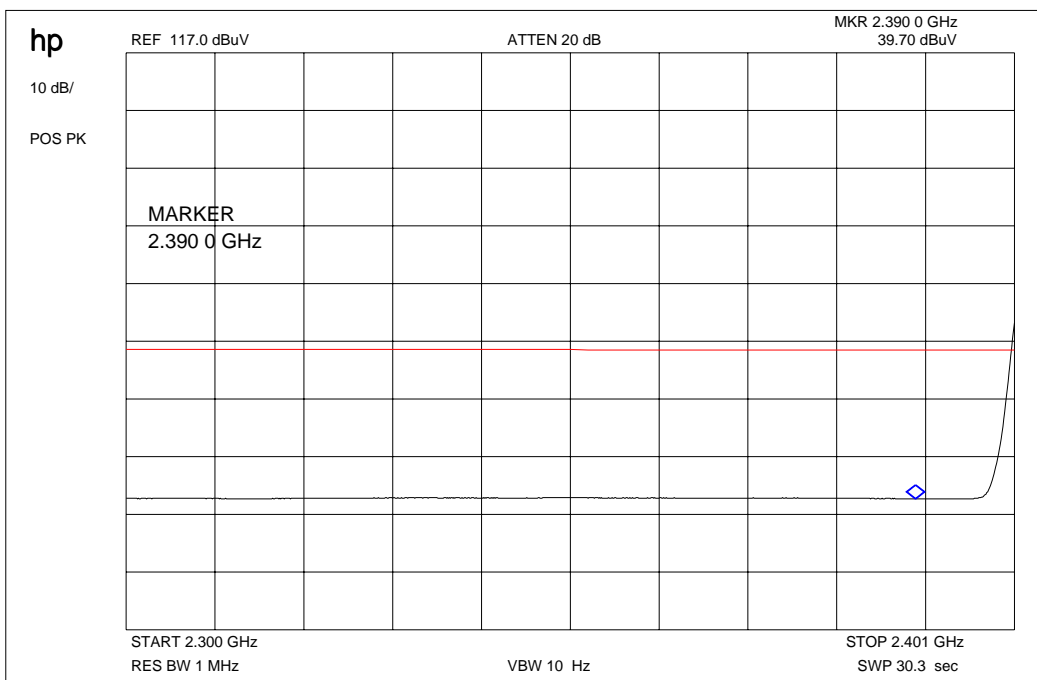
Plot 3: Marker-Delta Method (hopping)



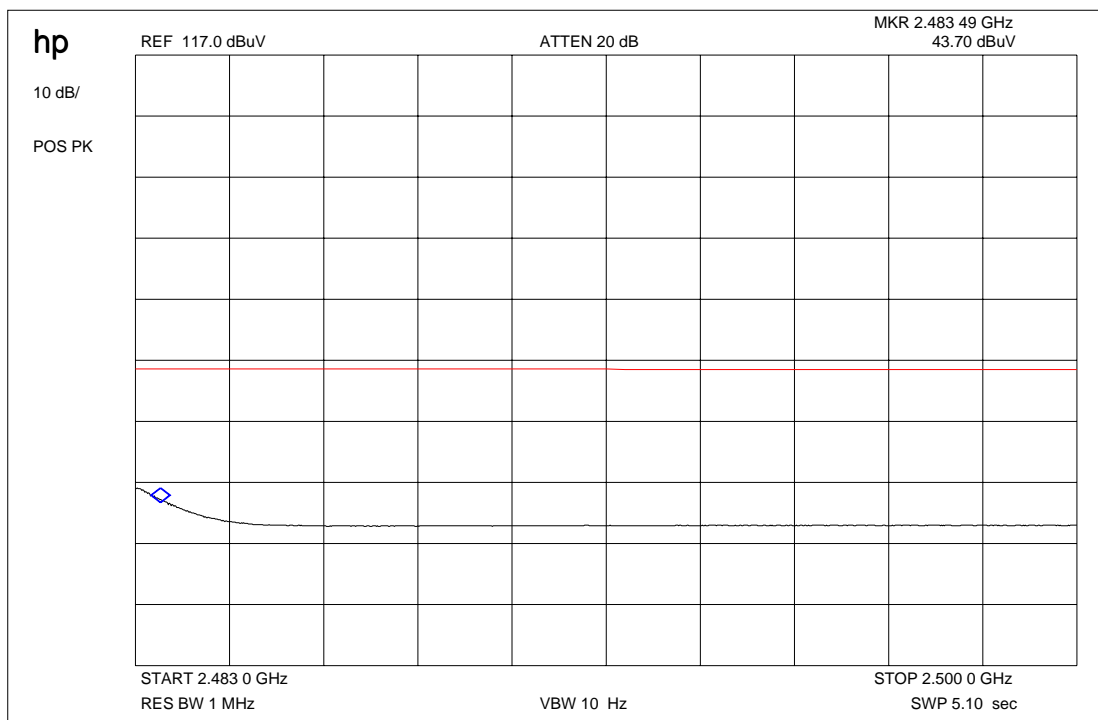
Marker-Delta-Value: 43.0 dB

This measurement was made to show that the behaviour of the system is conform to FCC 15.205 (restricted bands)

Plot 4: Restricted Bands low



Plot 5: Restricted Bands high



Results & Limits:

Radiated field strength

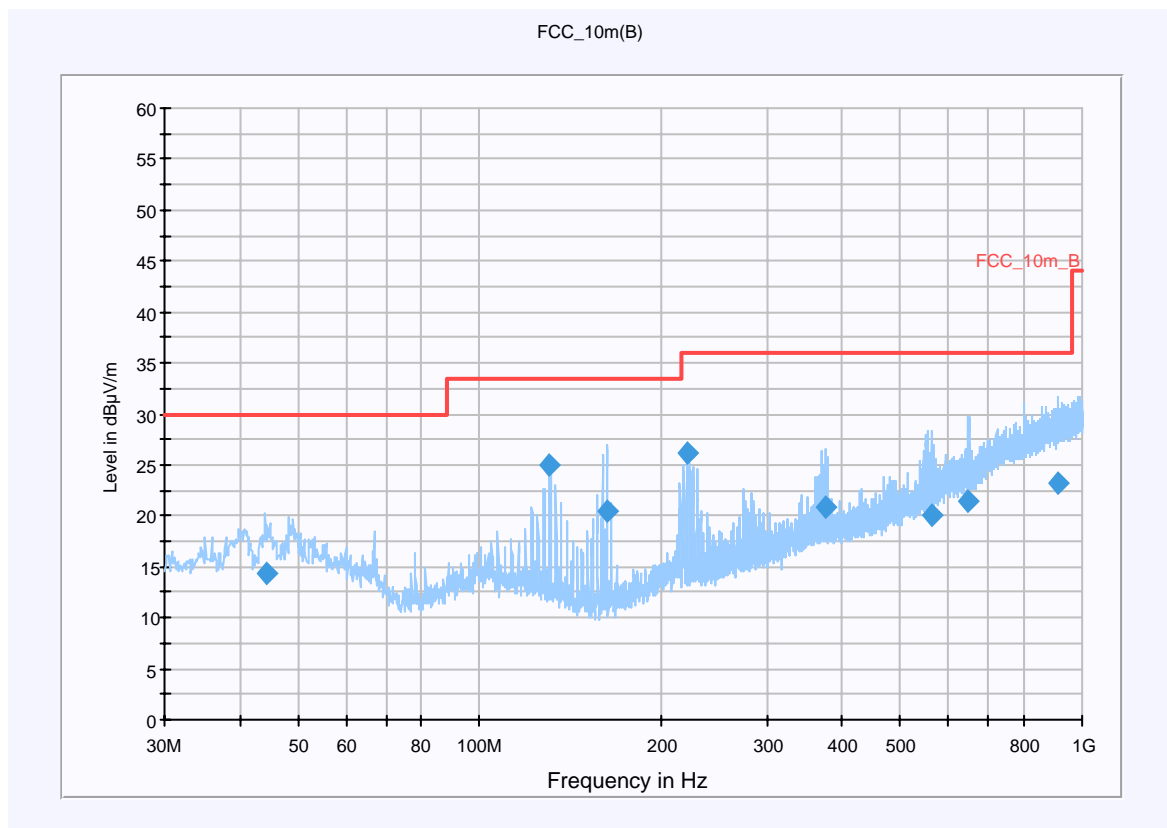
The field strength was measured with an EMI measuring receiver and 1 MHz RBW / VBW for peak and with 1MHz RBW / 10Hz VBW for average at a distance of 3m.

high channel	setup	measured value (3m)	correction factor (3m)	calculated value (3m)
Max. peak value	1 MHz RBW 1 MHz VBW	89.0 dB μ V/m	-6.3	82.7 dB μ V/m
Max. average value	Calculated with duty cycle correction factor	89.0 dB μ V/m peak	-1,07dB duty cycle correction factor (worst case DH5)	81.63 dB μ V/m
Delta value	Peak 100 kHz RBW/VBW	43.7 dB (single carrier) 43.0 dB (hopping mode)	-	-
Value at band edge	limit 54 dB μ V/m			37.93 dB μ V/m (single carrier) 38.63 dB μ V/m (hopping mode)
Statement:				Complies

5.5 Spurious Emissions > 30 MHz- radiated (Transmitter) § 15.247 (c)(1)

Modulation: GFSK

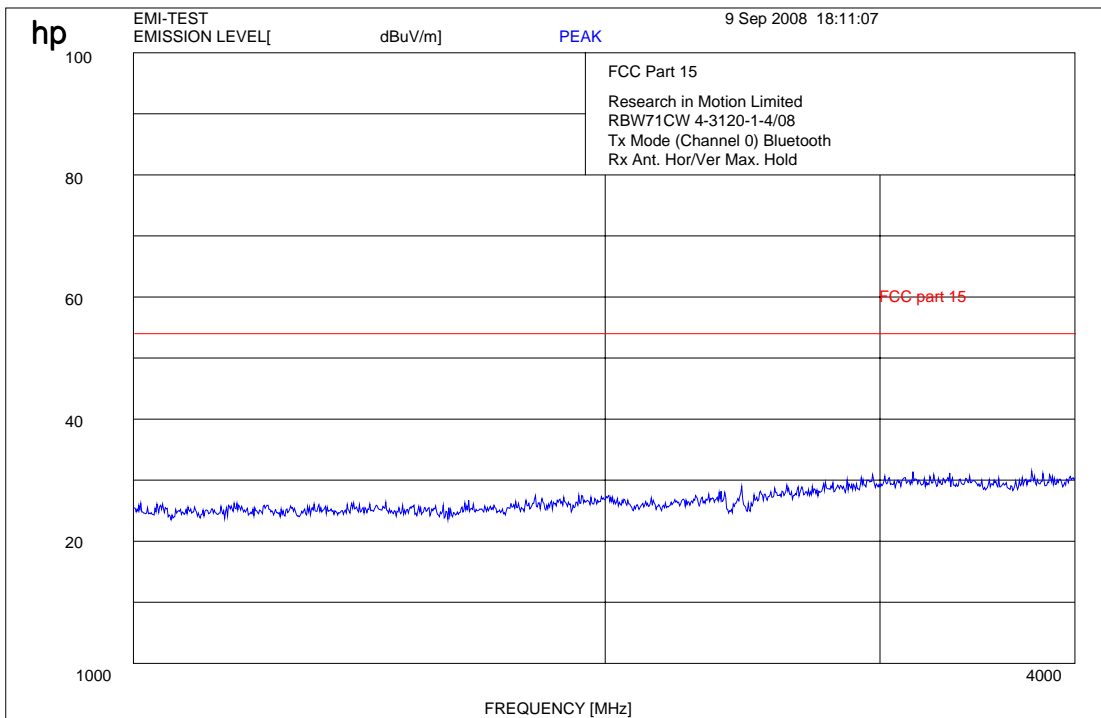
Plot 1: 0.03 - 1 GHz vertical/horizontal (lowest channel)



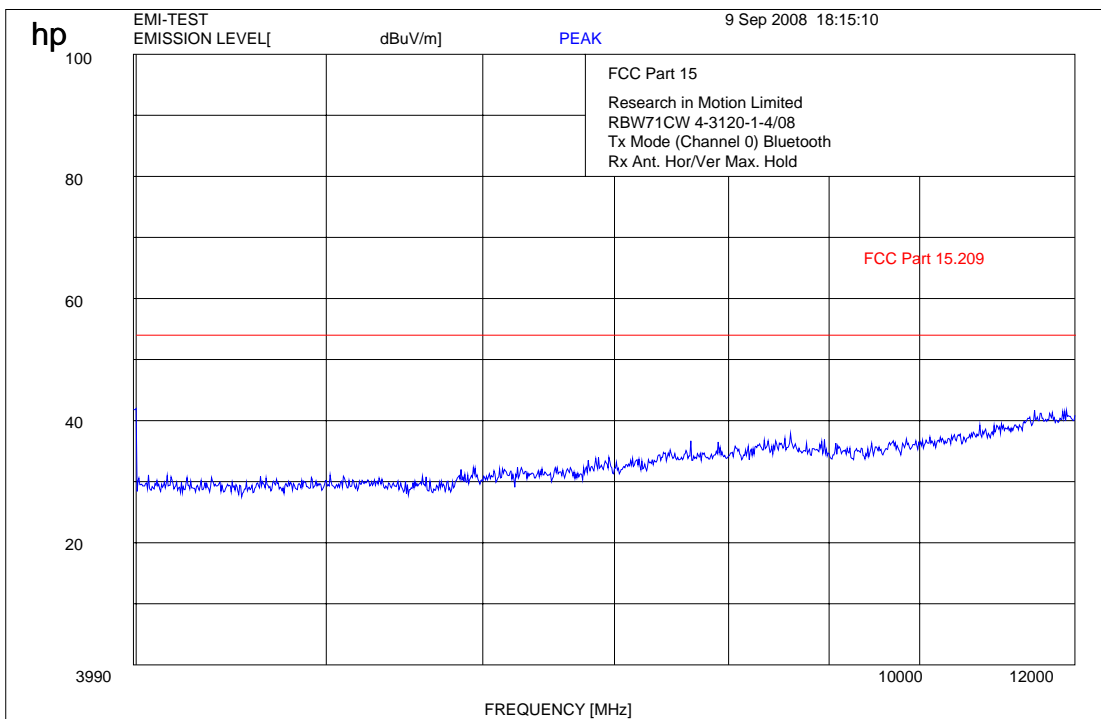
Final Result 1

Frequency (MHz)	QuasiPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Antenna height (cm)	Polarity	Turntable position (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)	Comment
44.293900	14.4	15000.000	120.000	123.0	V	136.0	13.5	15.6	30.0	
130.928800	25.1	15000.000	120.000	219.0	V	72.0	9.7	8.4	33.5	
163.027250	20.4	15000.000	120.000	200.0	V	267.0	9.7	13.1	33.5	
221.307800	26.2	15000.000	120.000	200.0	V	22.0	12.6	9.8	36.0	
375.789750	20.9	15000.000	120.000	300.0	H	184.0	16.6	15.1	36.0	
561.948000	20.1	15000.000	120.000	262.0	H	174.0	19.9	15.9	36.0	
646.401050	21.5	15000.000	120.000	214.0	H	174.0	21.4	14.5	36.0	
914.967450	23.2	15000.000	120.000	126.0	V	4.0	26.2	12.8	36.0	

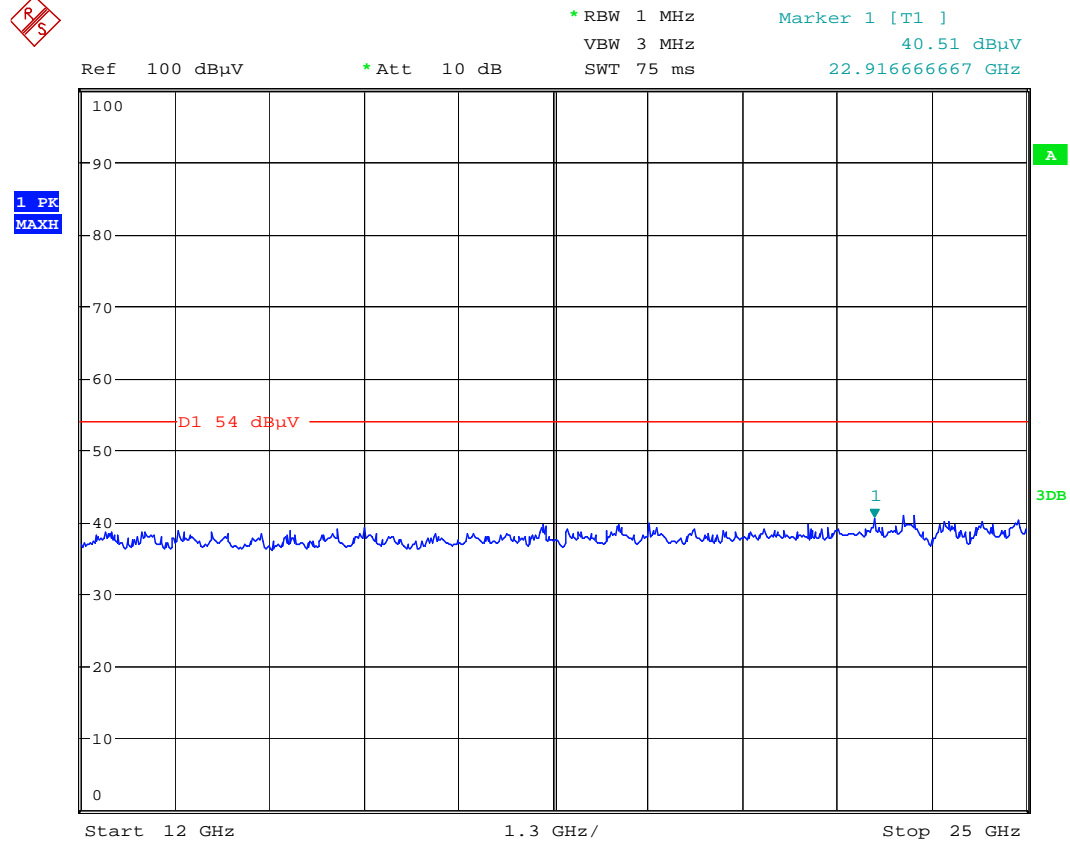
Plot 2: 1 - 4 GHz vertical/horizontal (lowest channel)



Plot 3: 4 - 12 GHz vertical/horizontal (lowest channel)

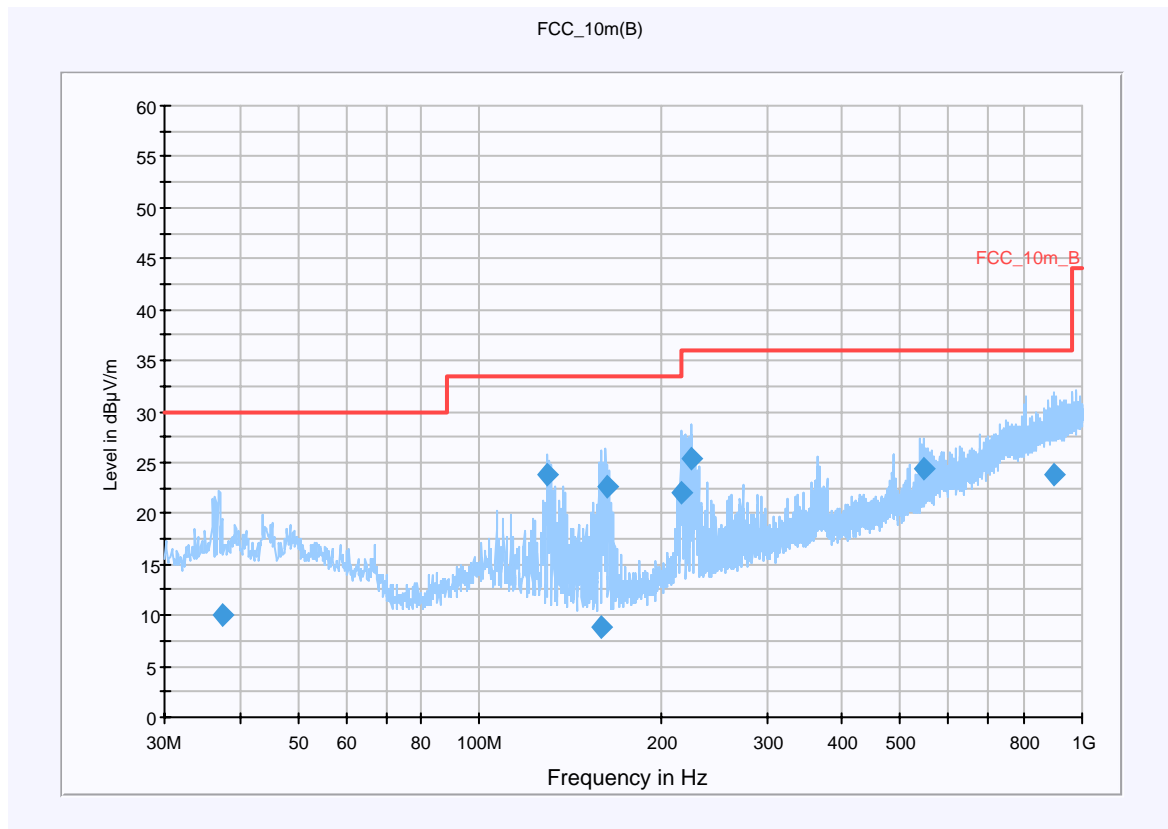


Plot 4: 12 - 25 GHz vertical/horizontal (valid for all channels)



Date: 11.SEP.2008 11:26:29

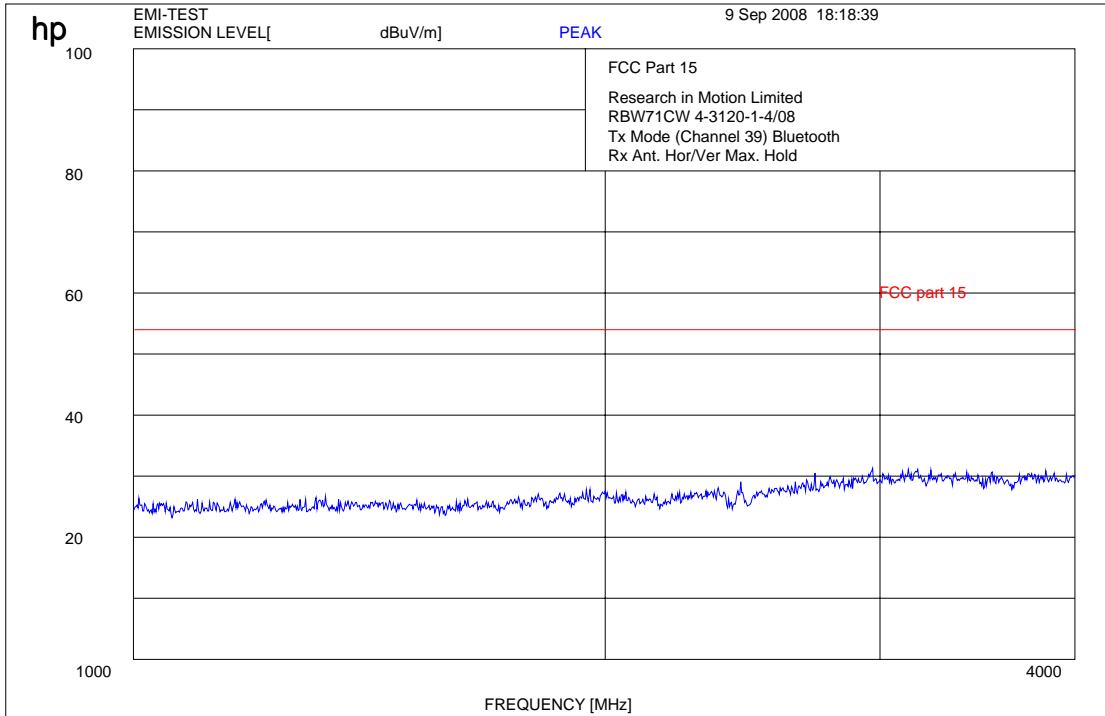
Plot 5: 0.03 - 1 GHz vertical/horizontal (middle channel)



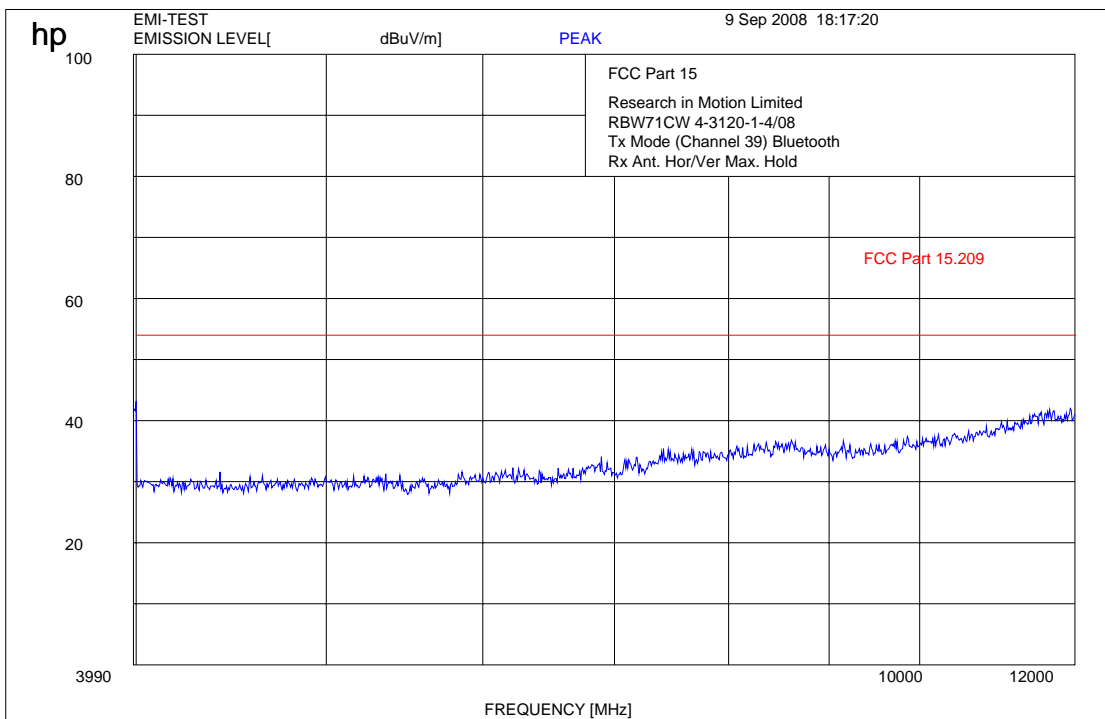
Final Result 1

Frequency (MHz)	QuasiPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Antenna height (cm)	Polarity	Turntable position (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)	Comment
37.354500	10.0	15000.000	120.000	133.0	V	80.0	13.4	20.0	30.0	
129.736500	23.7	15000.000	120.000	100.0	V	50.0	9.8	9.8	33.5	
159.395200	8.8	15000.000	120.000	135.0	V	68.0	9.4	24.7	33.5	
162.322900	22.6	15000.000	120.000	147.0	V	279.0	9.6	10.9	33.5	
216.820100	22.0	15000.000	120.000	100.0	V	-1.0	12.5	14.0	36.0	
224.162450	25.3	15000.000	120.000	124.0	V	228.0	12.7	10.7	36.0	
546.227500	24.3	15000.000	120.000	200.0	H	187.0	19.5	11.7	36.0	
899.371550	23.9	15000.000	120.000	139.0	H	26.0	26.1	12.1	36.0	

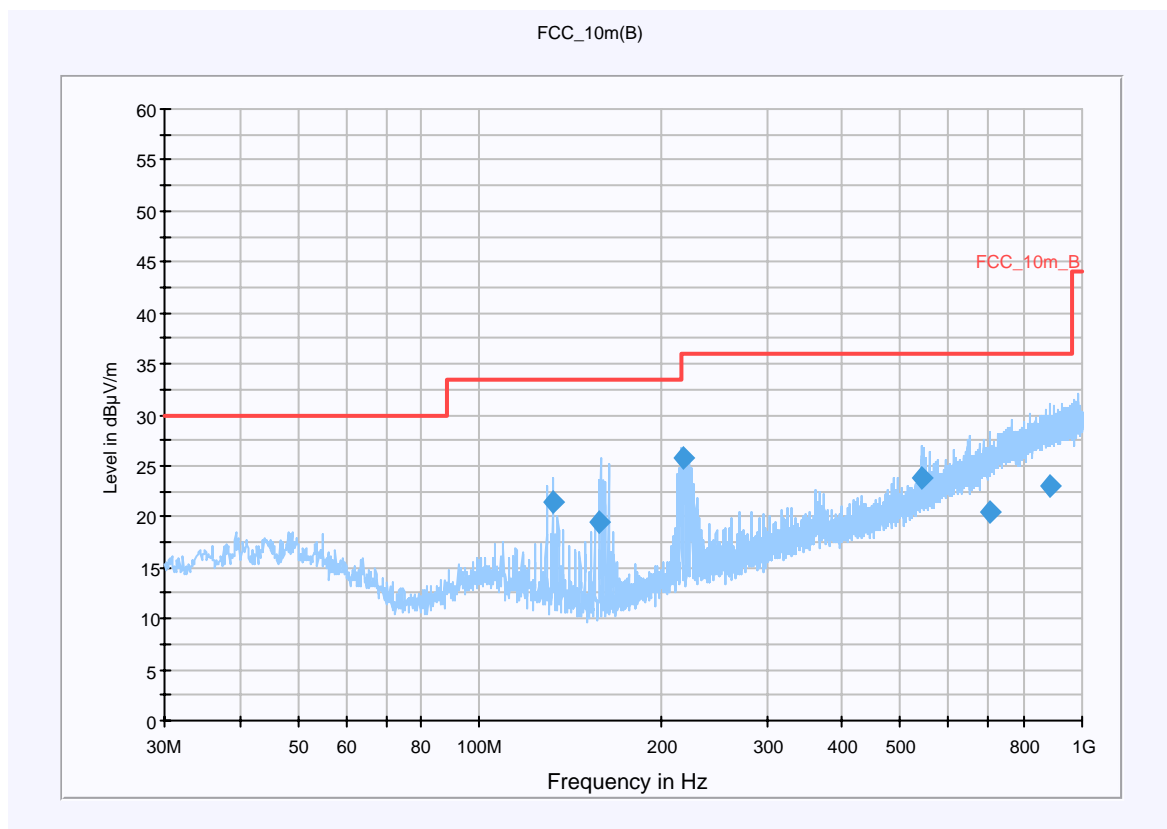
Plot 6: 1 - 4 GHz vertical/horizontal (middle channel)



Plot 7: 4 - 12 GHz vertical/horizontal (middle channel)



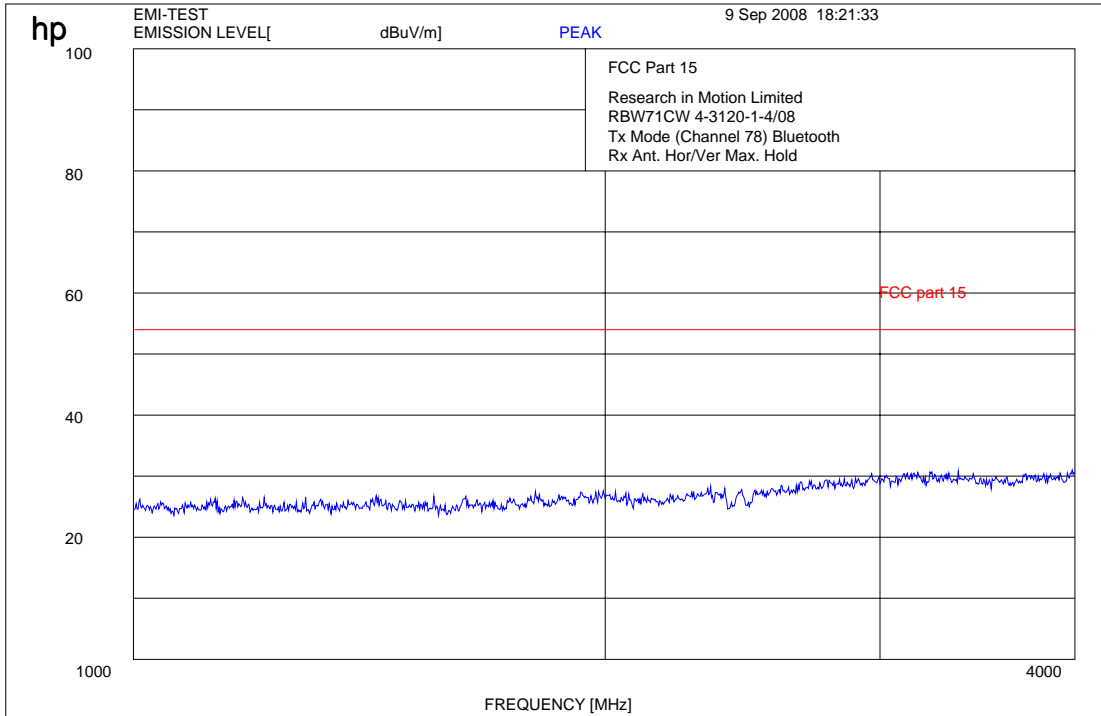
Plot 8: 0.03 - 1 GHz vertical/horizontal (highest channel)



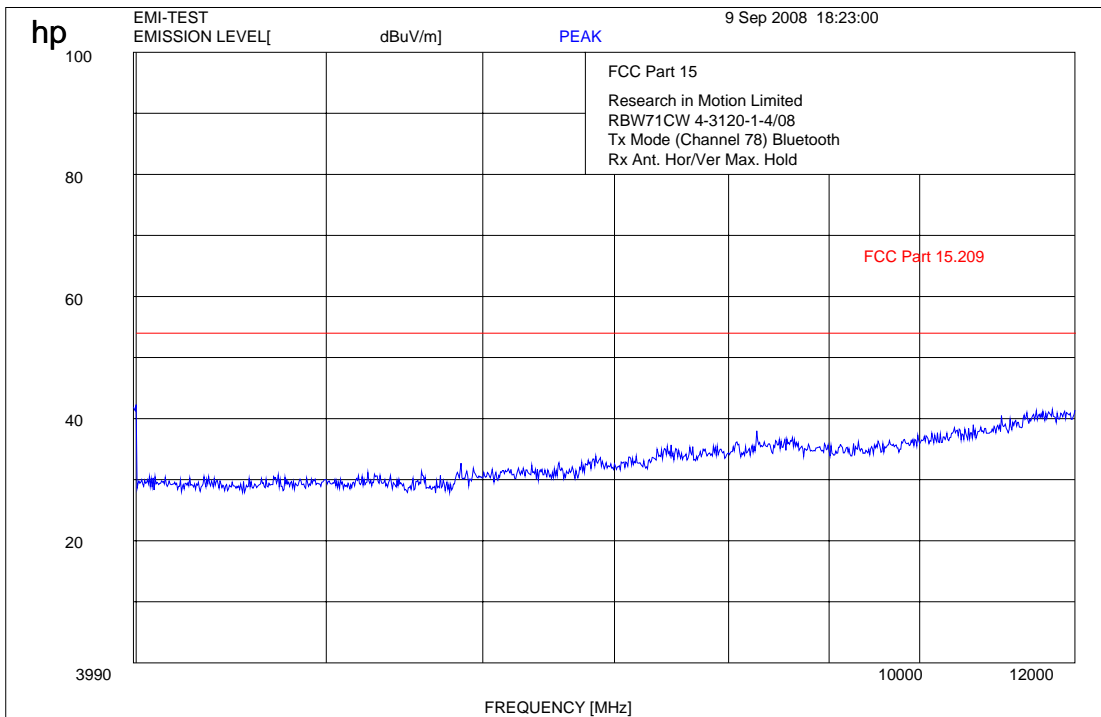
Final Result 1

Frequency (MHz)	QuasiPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Antenna height (cm)	Polarity	Turntable position (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)	Comment
132.110150	21.5	15000.000	120.000	136.0	V	94.0	9.6	12.0	33.5	
158.499850	19.5	15000.000	120.000	100.0	V	93.0	9.4	14.0	33.5	
218.436500	25.7	15000.000	120.000	123.0	V	0.0	12.5	10.3	36.0	
543.155850	23.7	15000.000	120.000	288.0	H	183.0	19.5	12.3	36.0	
703.980600	20.4	15000.000	120.000	400.0	H	4.0	23.0	15.6	36.0	
883.317450	23.1	15000.000	120.000	200.0	H	290.0	25.9	12.9	36.0	

Plot 9: 1 - 4 GHz vertical/horizontal (highest channel)

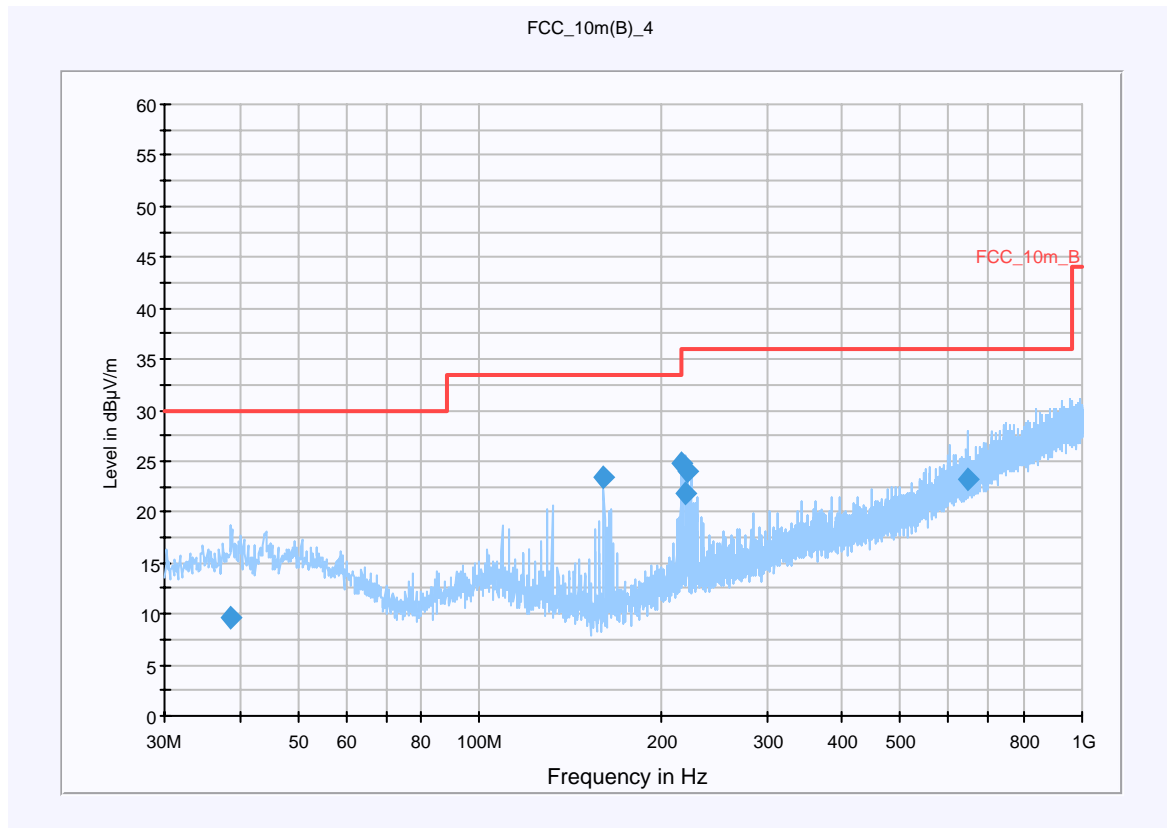


Plot 10: 4 - 12 GHz vertical/horizontal (highest channel)



Modulation: Pi/4 DQPSK

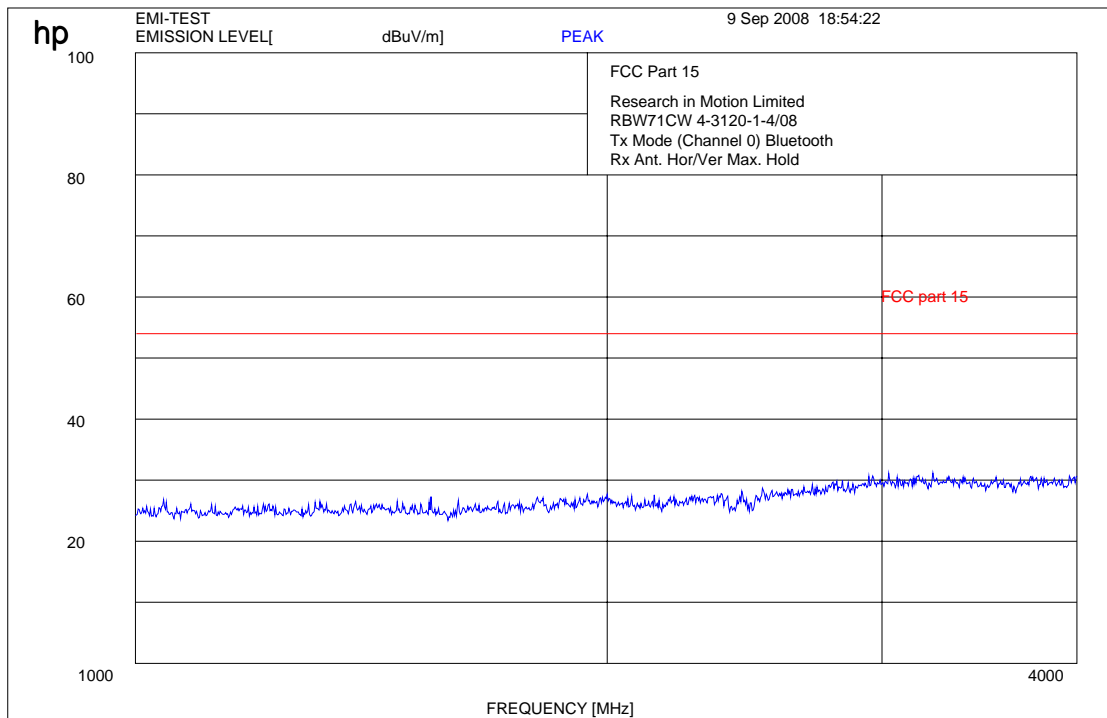
Plot 1: 0.03 - 1 GHz vertical/horizontal (lowest channel)



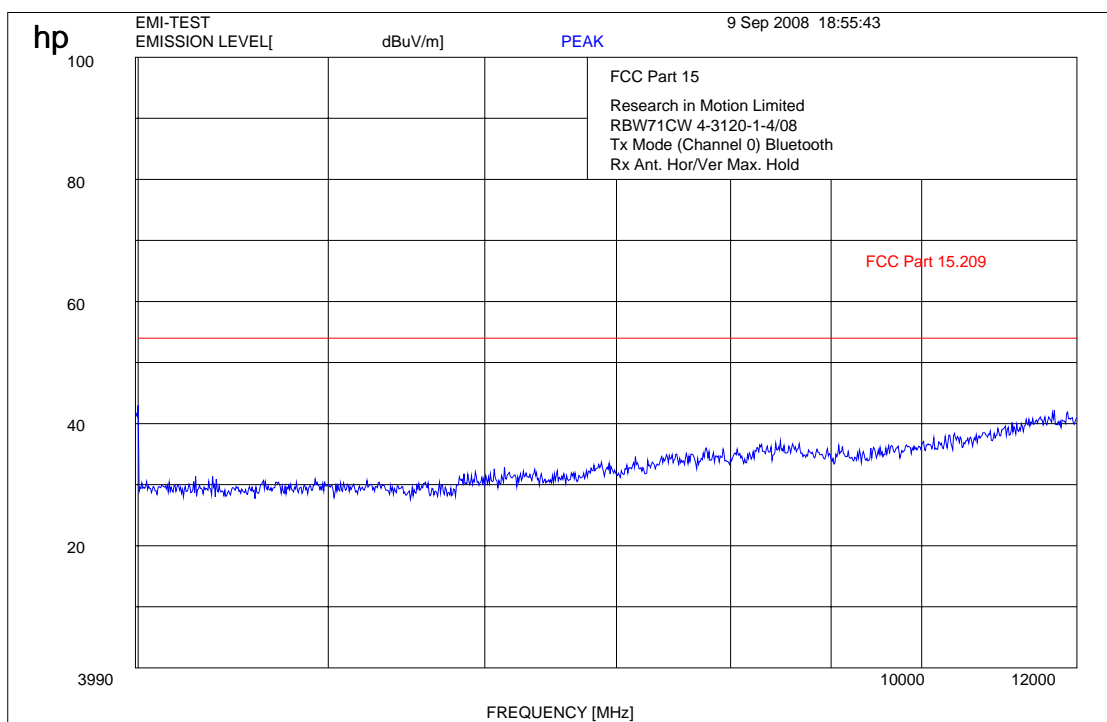
Final Result 1

Frequency (MHz)	QuasiPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Antenna height (cm)	Polarity	Turntable position (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)	Comment
38.594800	9.6	15000.000	120.000	191.0	H	23.0	13.5	20.4	30.0	
160.912650	23.4	15000.000	120.000	100.0	V	94.0	9.5	10.1	33.5	
216.201650	24.8	15000.000	120.000	100.0	V	-1.0	12.5	11.2	36.0	
219.270900	21.8	15000.000	120.000	114.0	V	0.0	12.6	14.2	36.0	
221.443950	23.9	15000.000	120.000	123.0	V	193.0	12.6	12.1	36.0	
646.823100	23.1	15000.000	120.000	207.0	H	169.0	21.4	12.9	36.0	

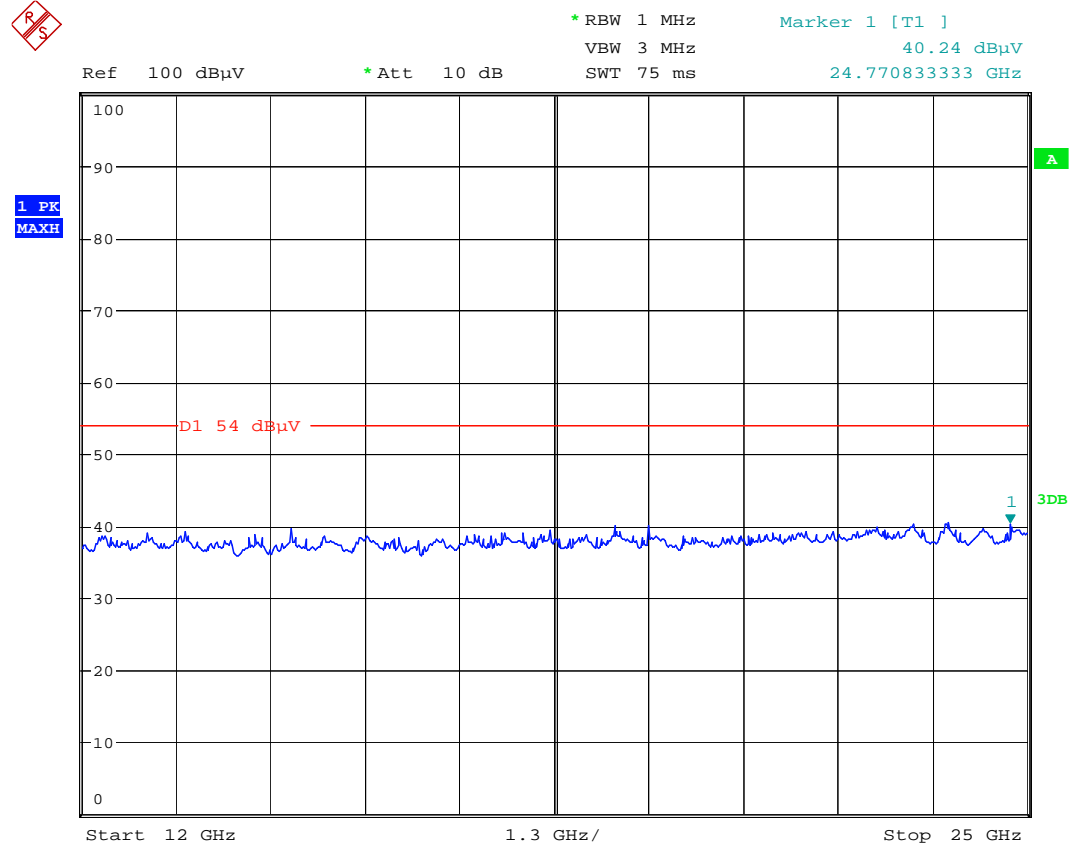
Plot 2: 1 - 4 GHz vertical/horizontal (lowest channel)



Plot 3: 4 - 12 GHz vertical/horizontal (lowest channel)

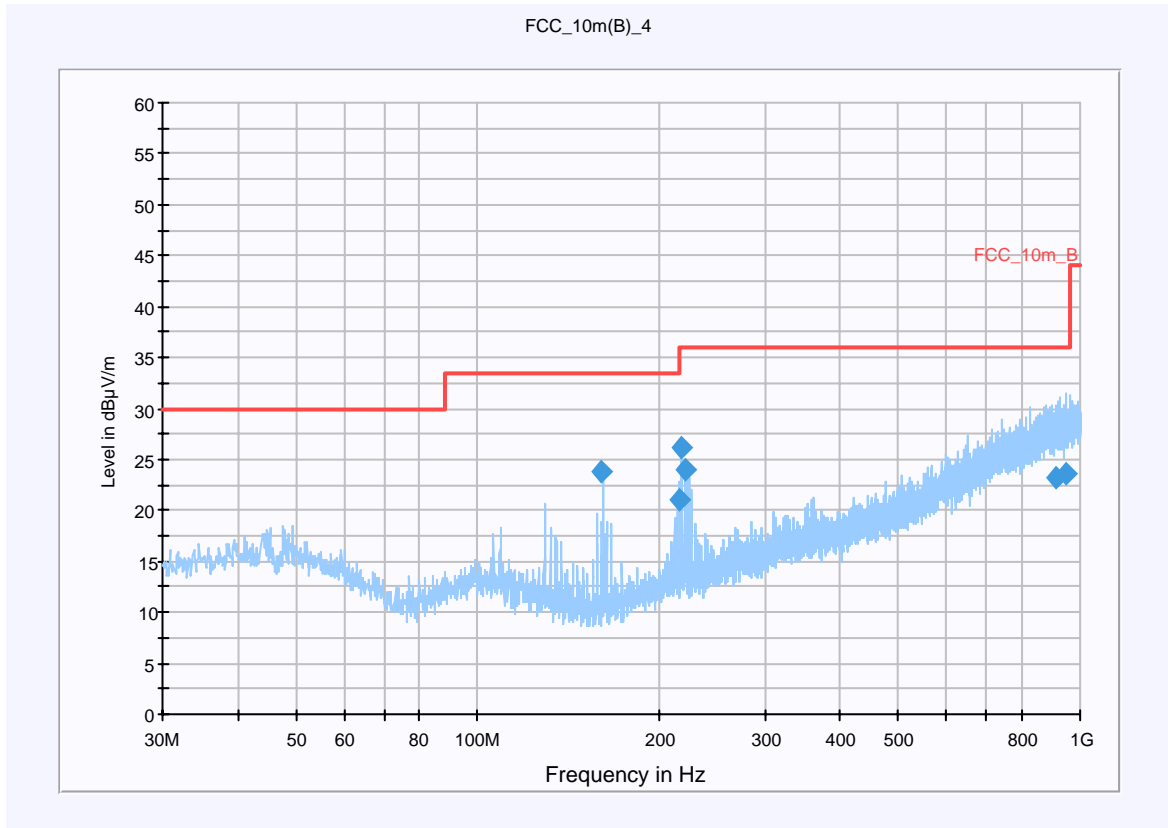


Plot 4: 12 - 25 GHz vertical/horizontal (valid for all channels)



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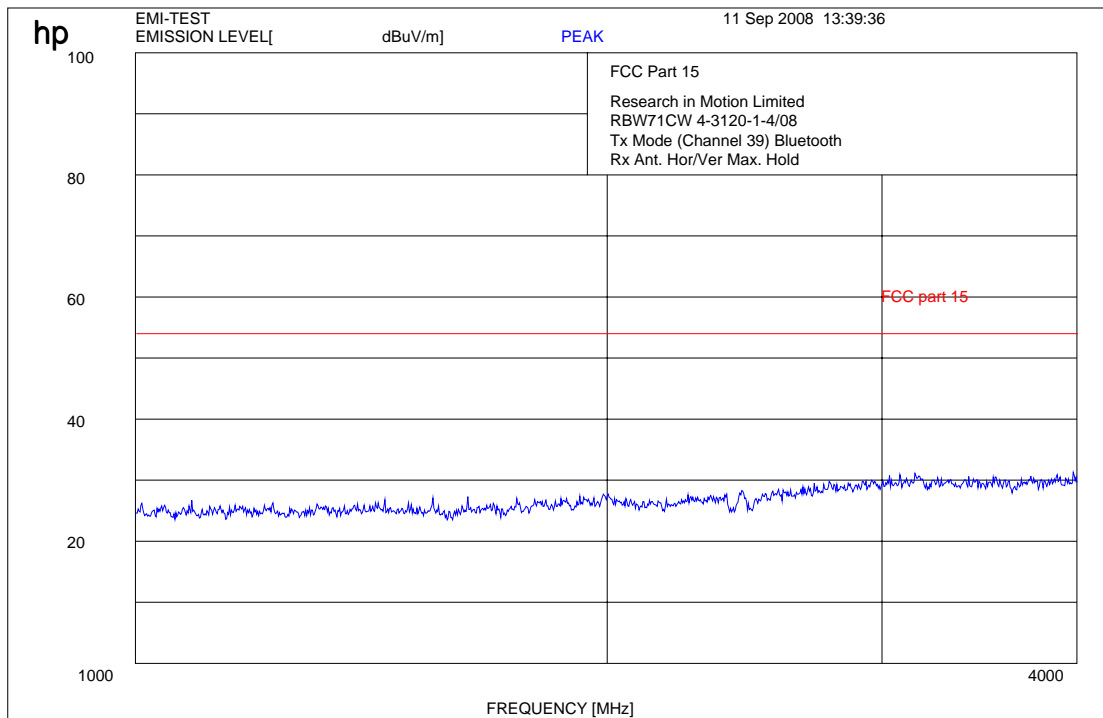
Plot 5: 0.03 - 1 GHz vertical/horizontal (middle channel)



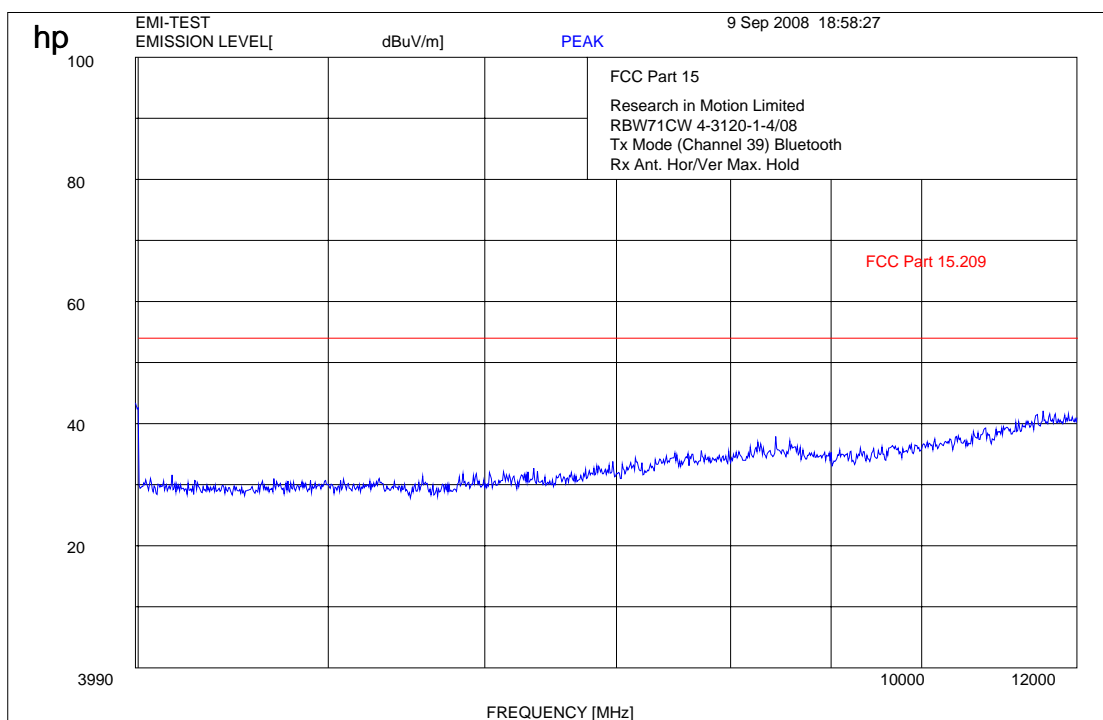
Final Result 1

Frequency (MHz)	QuasiPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Antenna height (cm)	Polarity	Turntable position (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)	Comment
160.908200	23.8	15000.000	120.000	100.0	V	277.0	9.5	9.7	33.5	
216.016600	21.1	15000.000	120.000	123.0	V	-2.0	12.5	14.9	36.0	
218.391500	26.2	15000.000	120.000	123.0	V	4.0	12.5	9.8	36.0	
221.331600	24.0	15000.000	120.000	114.0	V	0.0	12.6	12.0	36.0	
908.801950	23.2	15000.000	120.000	201.0	V	60.0	26.2	12.8	36.0	
949.971800	23.6	15000.000	120.000	123.0	H	69.0	26.4	12.4	36.0	

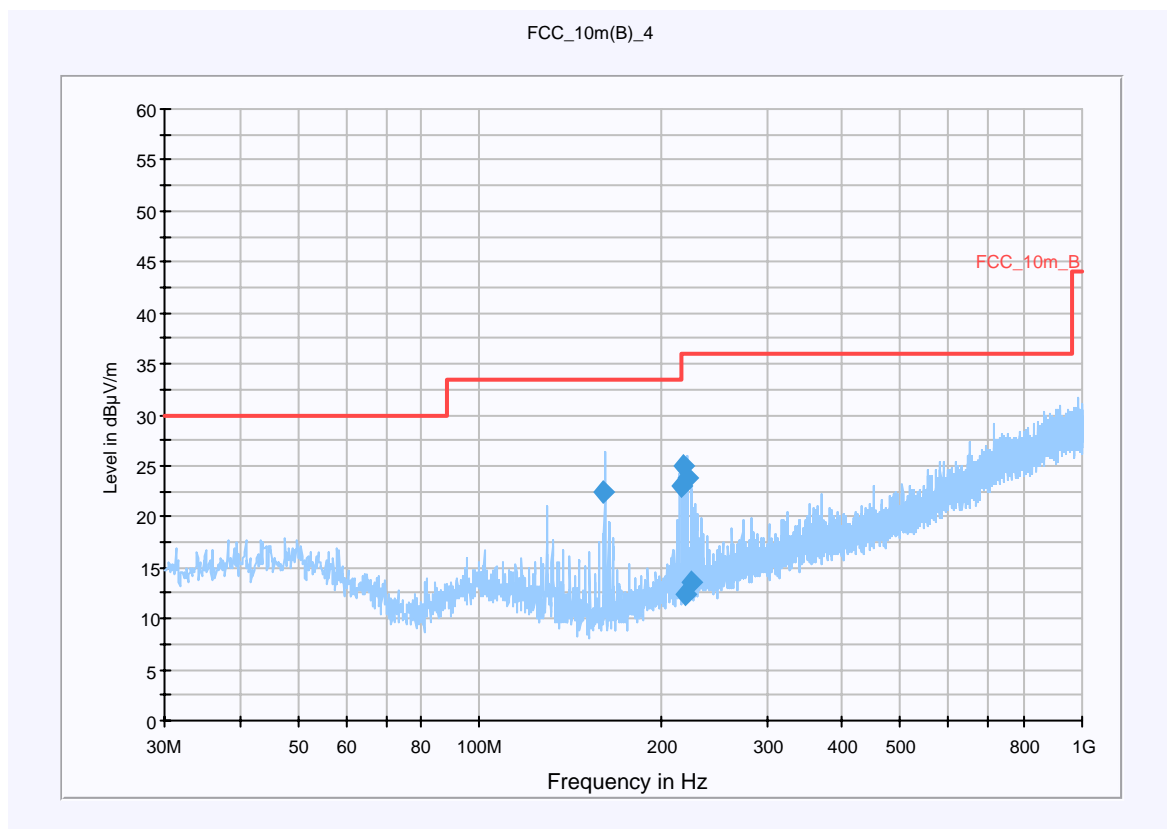
Plot 6: 1 - 4 GHz vertical/horizontal (middle channel)



Plot 7: 4 - 12 GHz vertical/horizontal (middle channel)



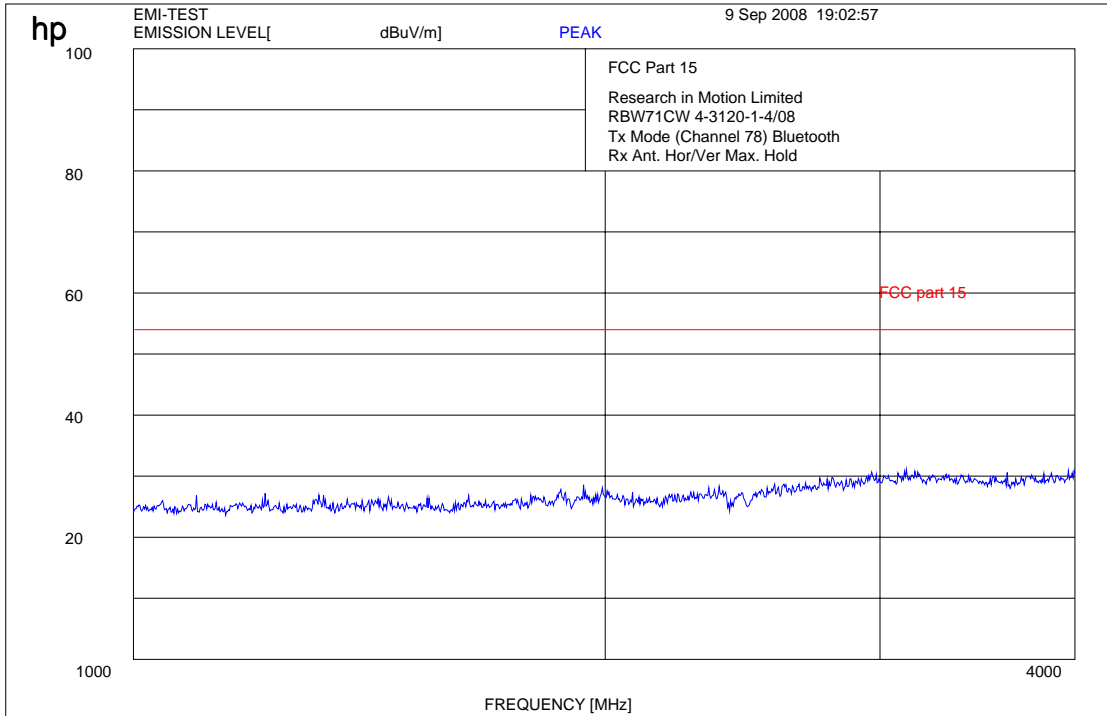
Plot 8: 0.03 - 1 GHz vertical/horizontal (highest channel)



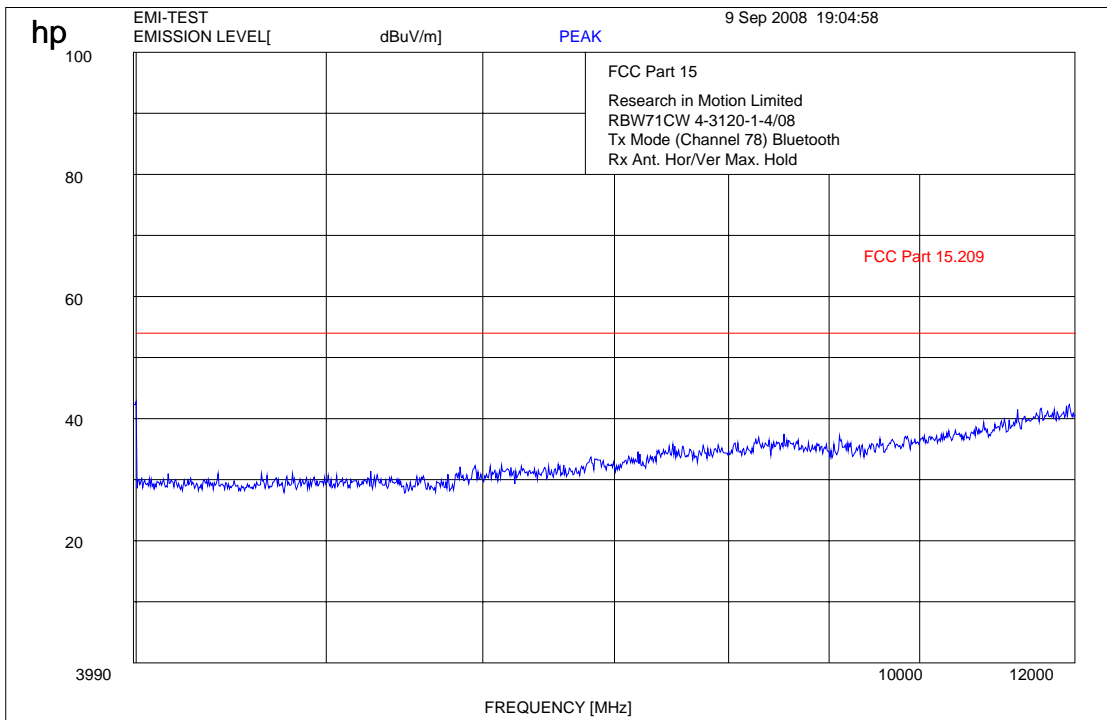
Final Result 1

Frequency (MHz)	QuasiPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Antenna height (cm)	Polarity	Turntable position (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)	Comment
160.965700	22.5	15000.000	120.000	100.0	V	300.0	9.5	11.0	33.5	
216.229600	23.1	15000.000	120.000	139.0	V	0.0	12.5	13.0	36.0	
218.357650	25.0	15000.000	120.000	114.0	V	-2.0	12.5	11.0	36.0	
219.144650	12.4	15000.000	120.000	138.0	V	44.0	12.6	23.6	36.0	
221.193450	23.8	15000.000	120.000	114.0	V	221.0	12.6	12.2	36.0	
225.098350	13.6	15000.000	120.000	115.0	V	323.0	12.8	22.4	36.0	

Plot 9: 1 - 4 GHz vertical/horizontal (highest channel)

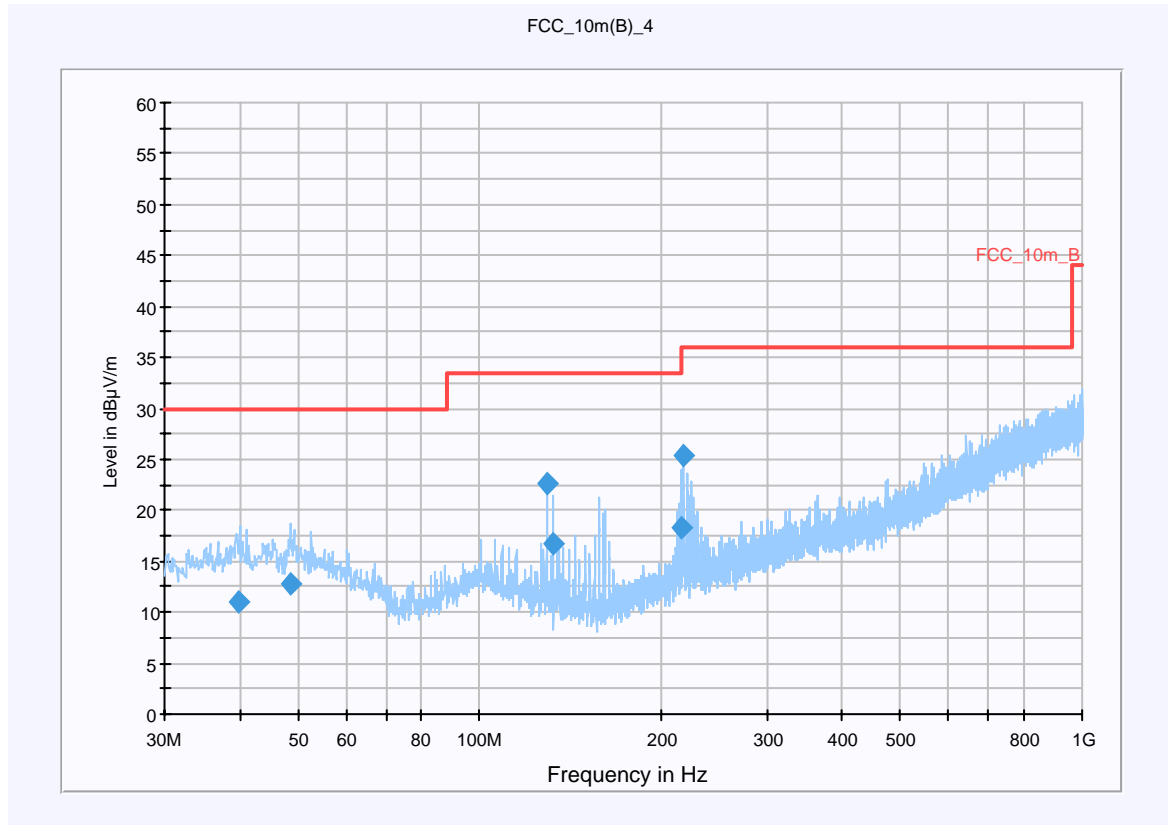


Plot 10: 4 - 12 GHz vertical/horizontal (highest channel)



Modulation: 8DPSK

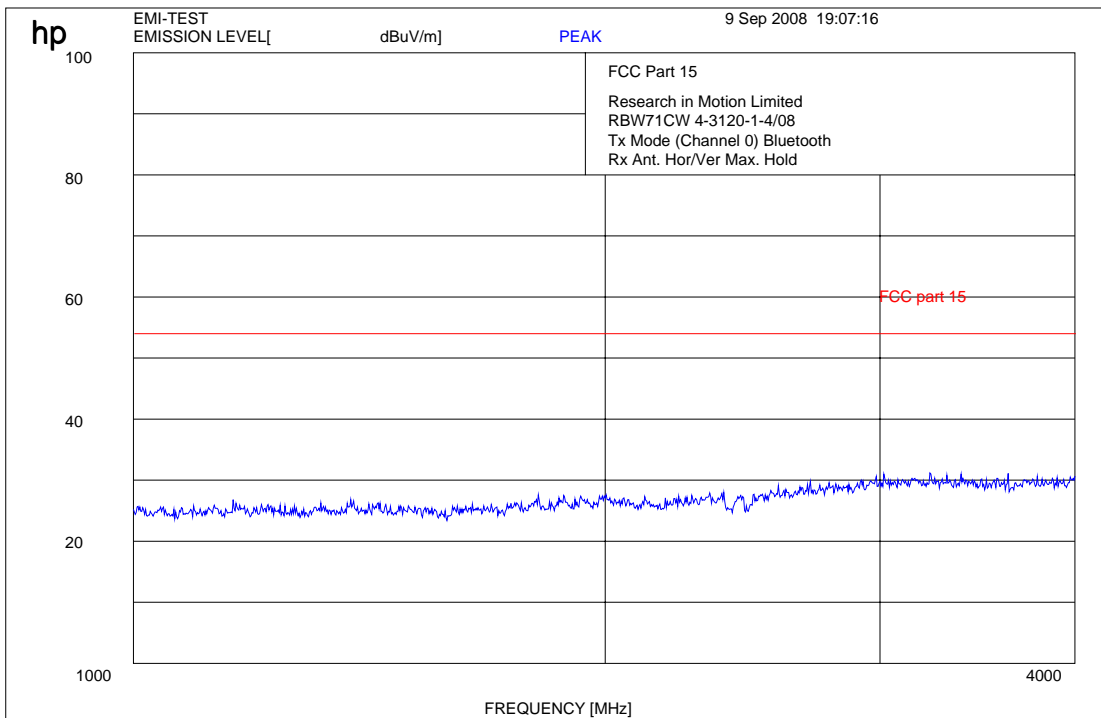
Plot 1: 0.03 - 1 GHz vertical/horizontal (lowest channel)



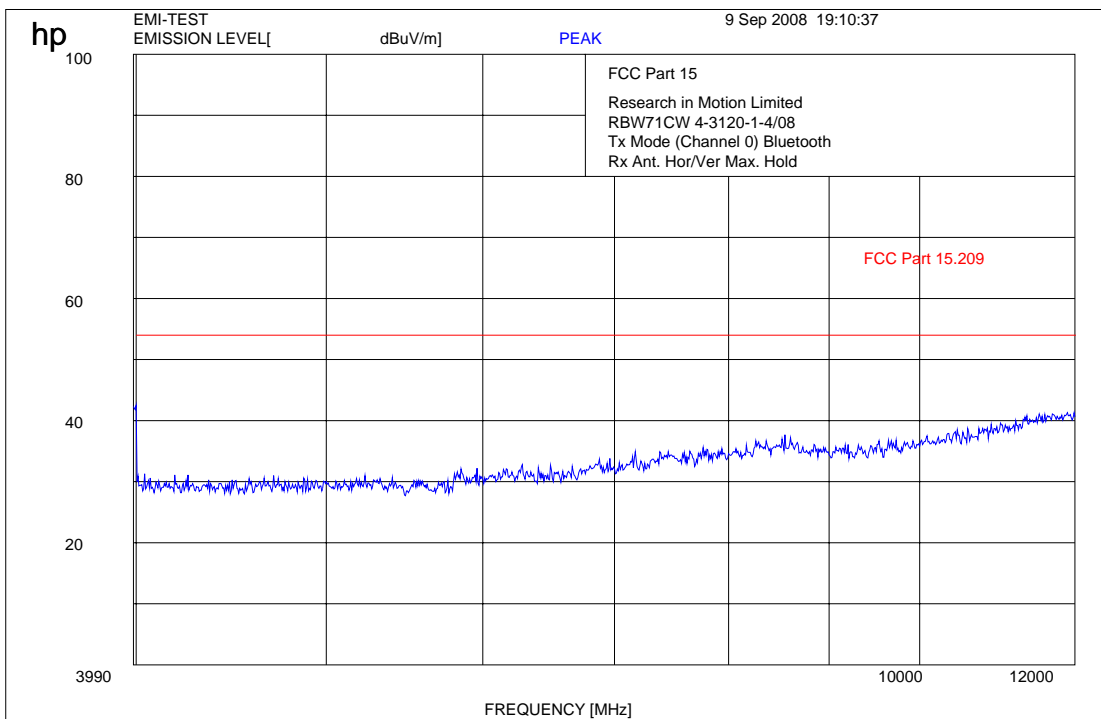
Final Result 1

Frequency (MHz)	QuasiPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Antenna height (cm)	Polarity	Turntable position (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)	Comment
39.783850	11.0	15000.000	120.000	139.0	V	-1.0	13.6	19.0	30.0	
48.735750	12.7	15000.000	120.000	100.0	V	231.0	13.6	17.3	30.0	
129.618600	22.6	15000.000	120.000	100.0	V	61.0	9.8	10.9	33.5	
132.318700	16.7	15000.000	120.000	124.0	V	83.0	9.6	16.8	33.5	
216.075600	18.3	15000.000	120.000	115.0	V	-2.0	12.5	17.7	36.0	
218.340200	25.5	15000.000	120.000	122.0	V	-2.0	12.5	10.5	36.0	

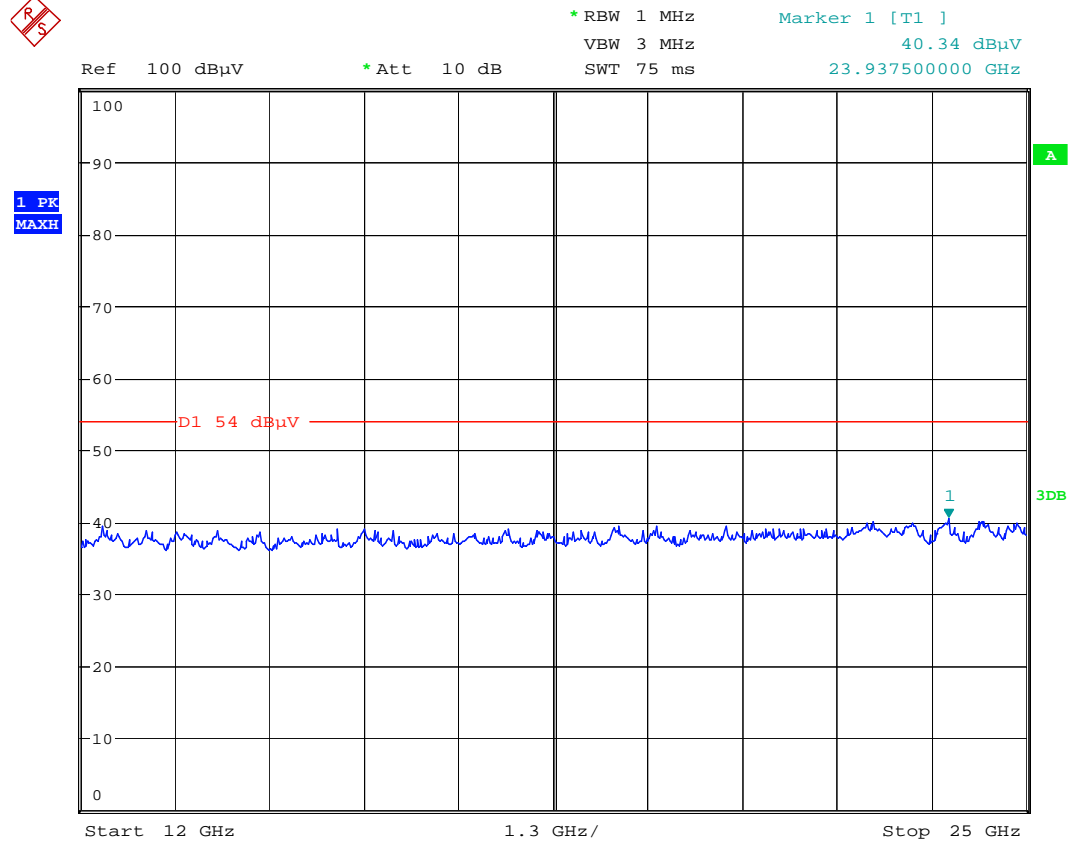
Plot 2: 1 - 4 GHz vertical/horizontal (lowest channel)



Plot 3: 4 - 12 GHz vertical/horizontal (lowest channel)

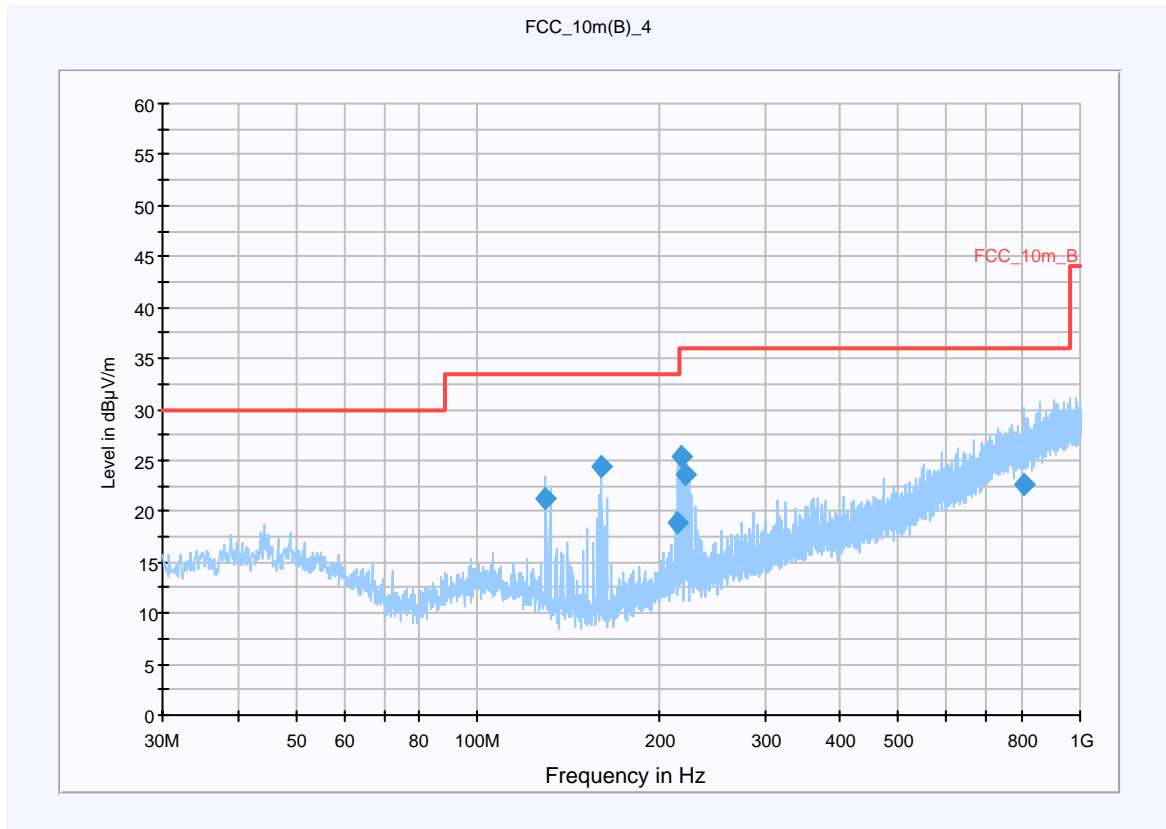


Plot 4: 12 - 25 GHz vertical/horizontal (valid for all channels)



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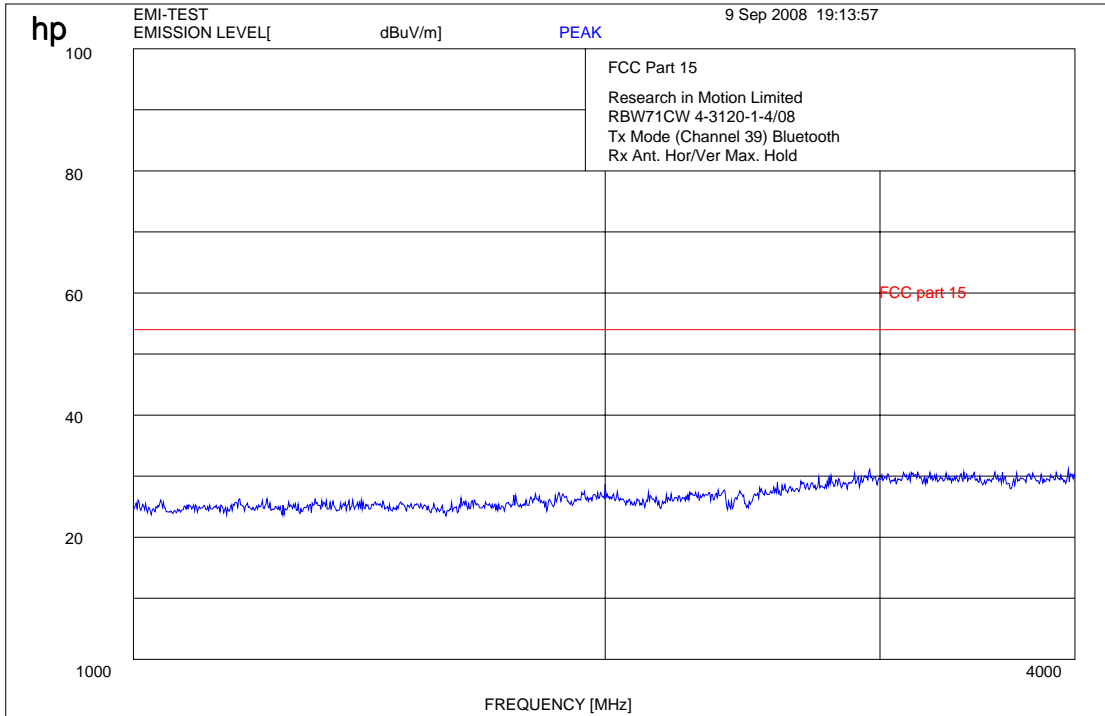
Plot 5: 0.03 - 1 GHz vertical/horizontal (middle channel)



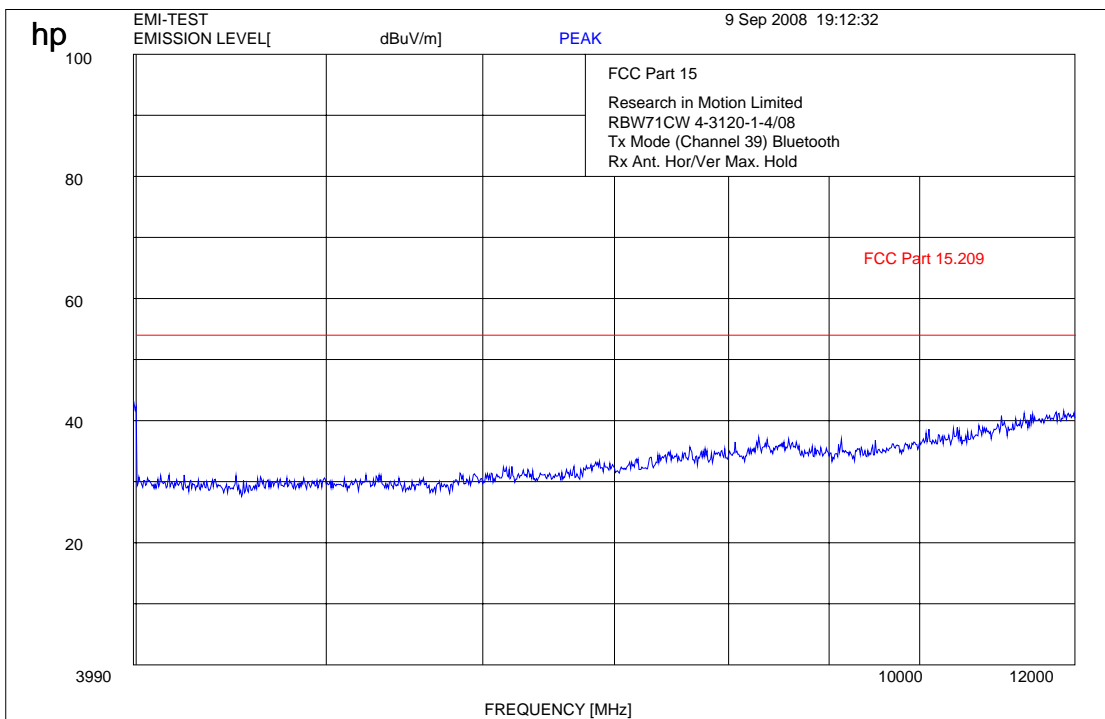
Final Result 1

Frequency (MHz)	QuasiPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Antenna height (cm)	Polarity	Turntable position (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)	Comment
129.296450	21.3	15000.000	120.000	124.0	V	92.0	9.8	12.2	33.5	
160.886800	24.3	15000.000	120.000	100.0	V	92.0	9.5	9.2	33.5	
215.404800	18.9	15000.000	120.000	100.0	V	4.0	12.4	14.6	33.5	
218.454800	25.3	15000.000	120.000	100.0	V	0.0	12.5	10.7	36.0	
221.269550	23.7	15000.000	120.000	121.0	V	1.0	12.6	12.3	36.0	
808.992900	22.6	15000.000	120.000	169.0	H	-1.0	24.7	13.4	36.0	

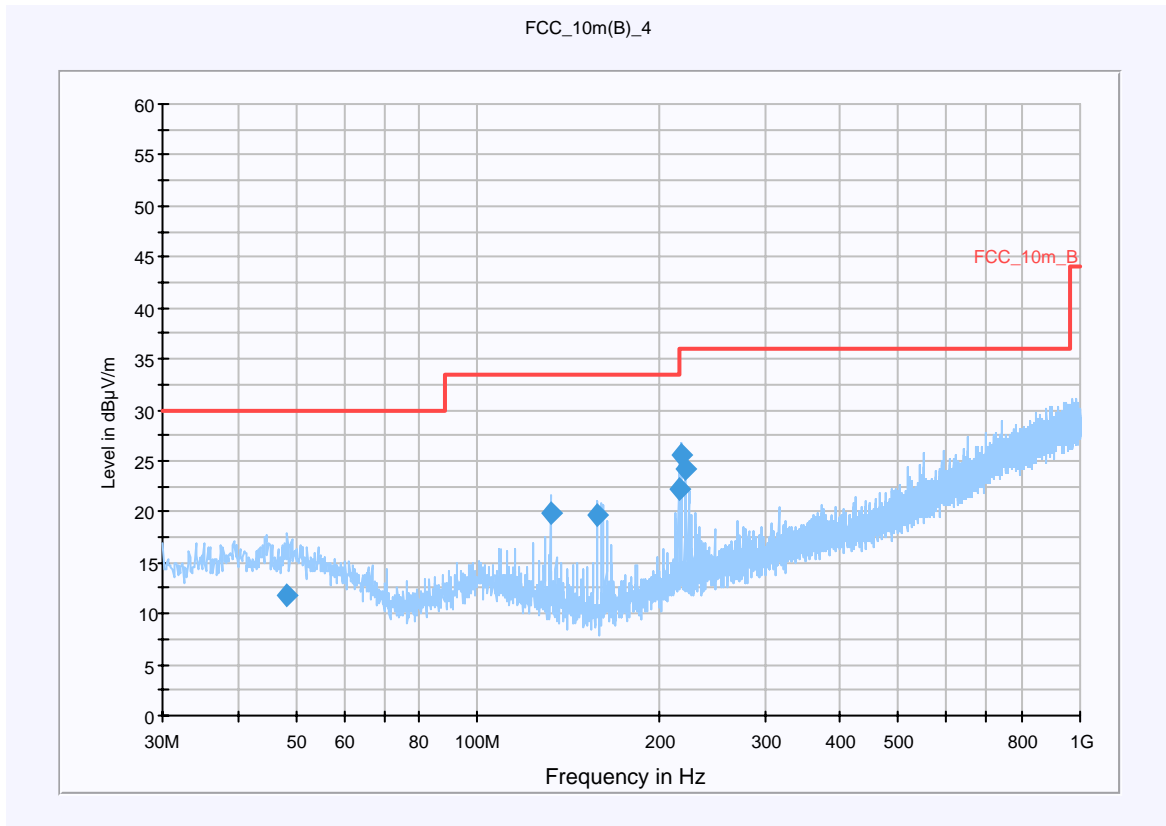
Plot 6: 1 - 4 GHz vertical/horizontal (middle channel)



Plot 7: 4 - 12 GHz vertical/horizontal (middle channel)



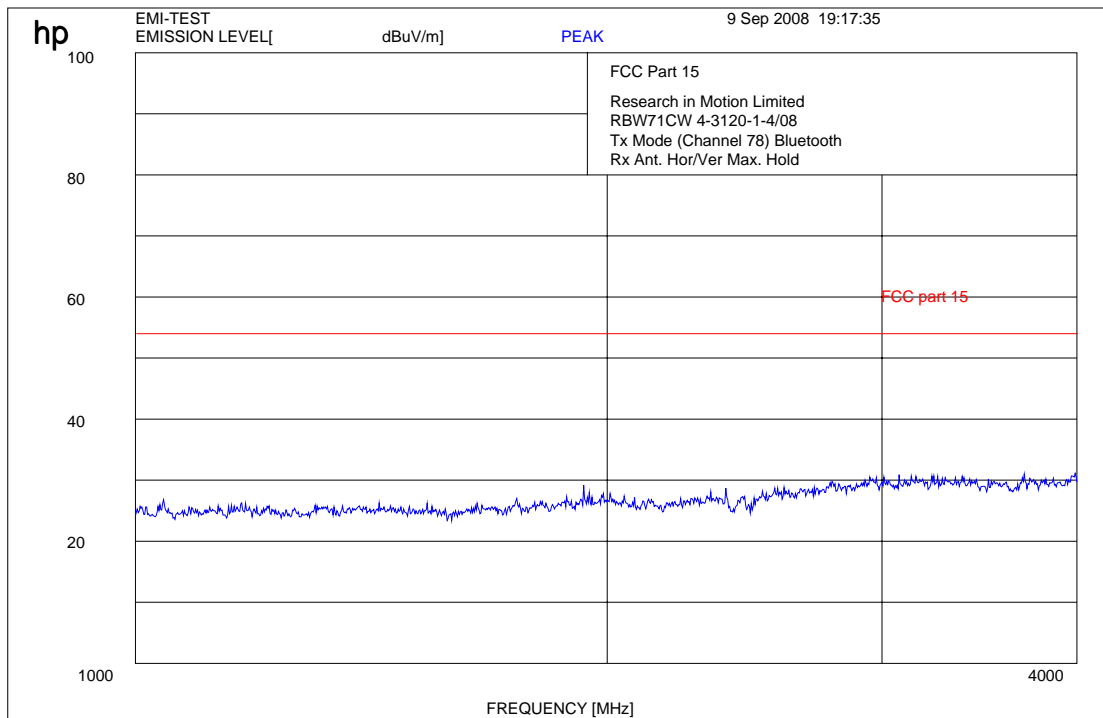
Plot 8: 0.03 - 1 GHz vertical/horizontal (highest channel)



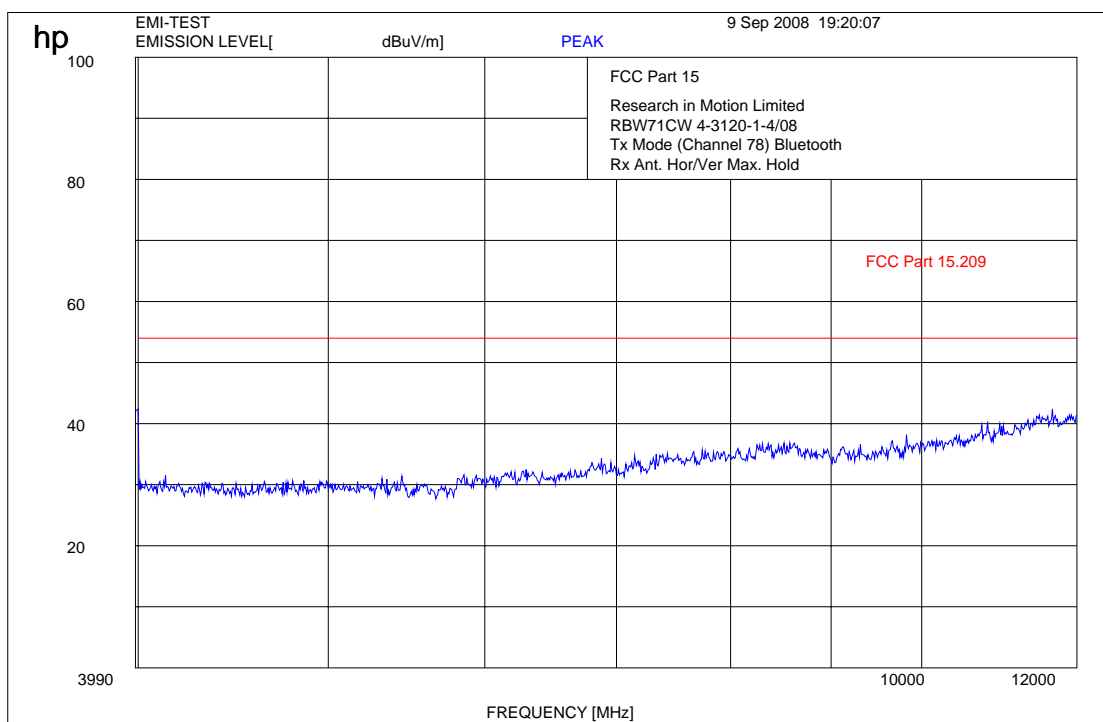
Final Result 1

Frequency (MHz)	QuasiPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Antenna height (cm)	Polarity	Turntable position (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)	Comment
48.325400	11.8	15000.000	120.000	176.0	V	43.0	13.6	18.2	30.0	
132.207850	19.9	15000.000	120.000	120.0	V	55.0	9.6	13.6	33.5	
158.049000	19.7	15000.000	120.000	127.0	V	40.0	9.4	13.8	33.5	
215.931950	22.2	15000.000	120.000	100.0	V	-1.0	12.5	11.3	33.5	
218.428550	25.6	15000.000	120.000	100.0	V	0.0	12.5	10.4	36.0	
221.342750	24.3	15000.000	120.000	100.0	V	190.0	12.6	11.7	36.0	

Plot 9: 1 - 4 GHz vertical/horizontal (highest channel)



Plot 10: 4 - 12 GHz vertical/horizontal (highest channel)



Results:

SPURIOUS EMISSIONS LEVEL (dB μ V/m)								
2402 MHz			2441 MHz			2480 MHz		
F [MHz]	Detector	Level [dB μ V/m]	F [MHz]	Detector	Level [dB μ V/m]	F [MHz]	Detector	Level [dB μ V/m]
See plots			See plots			See plots		
Measurement uncertainty			±3 dB					

f < 1 GHz : RBW/VBW: 100 kHz

f ≥ 1GHz : RBW/VBW: 1 MHz

No critical peaks found

Limits: § 15.247 (c)

In any 100 kHz bandwidth outside the frequency band at least 20dB below the highest level of the desired 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)).

Limits: § 15.209

Frequency [MHz]	Field strength [μ V/m]	Measurement distance (m)
30 - 88	100 (40 dB μ V/m)	3
88 - 216	150 (43.5 dB μ V/m)	3
216 - 960	200 (46 dB μ V/m)	3
above 960	500 (54 dB μ V/m)	3

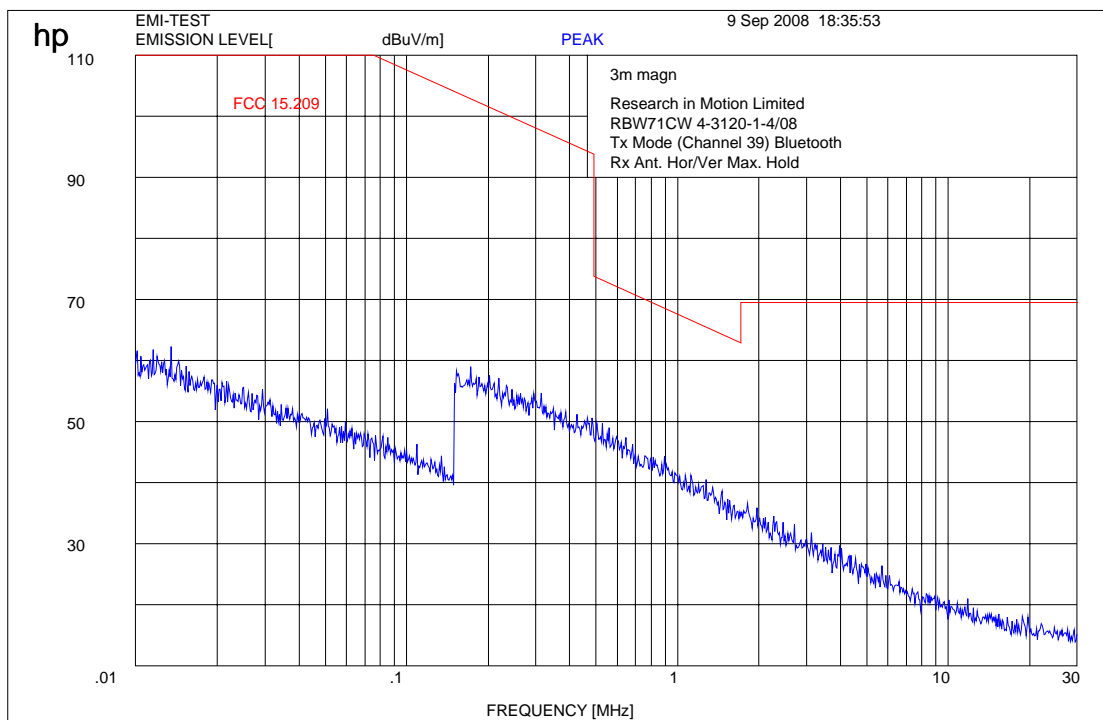
5.6 Spurious Emissions < 30 MHz - Transmitter radiated § 15.209

Modulation: GFSK

Measured at 10 m distance.

Values recalculated with 40 dB/decade according to FCC rules.

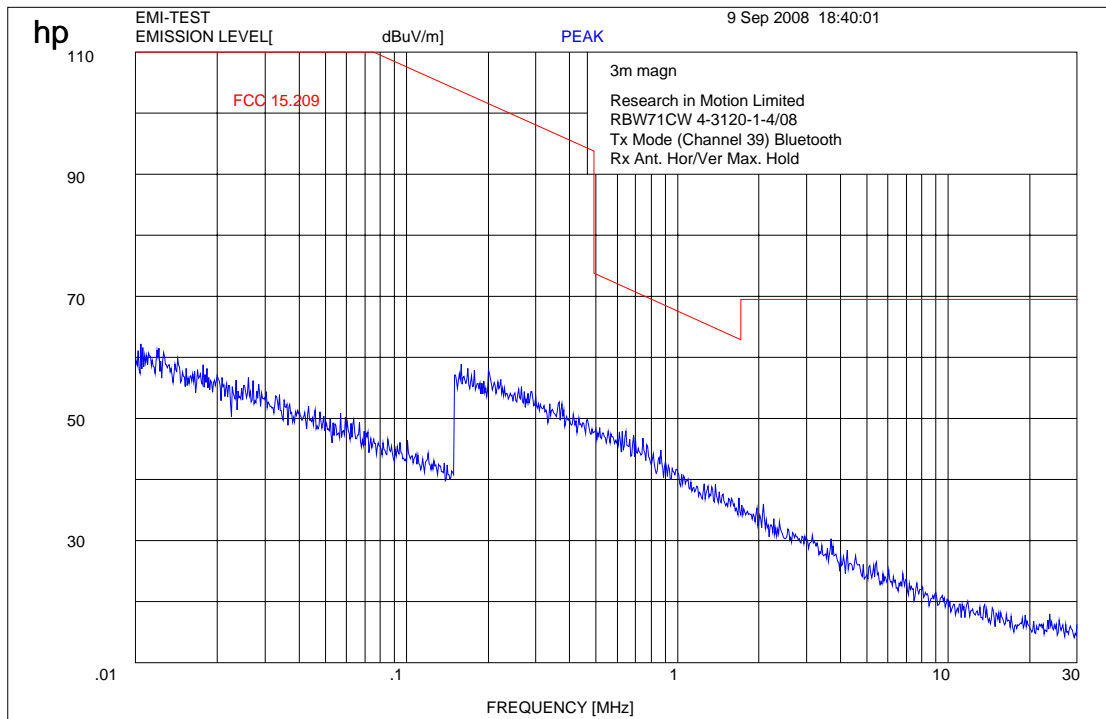
Plot 1:



Modulation: Pi/4 DQPSK

Measured at 10 m distance.
Values recalculated with 40 dB/decade according to FCC rules.

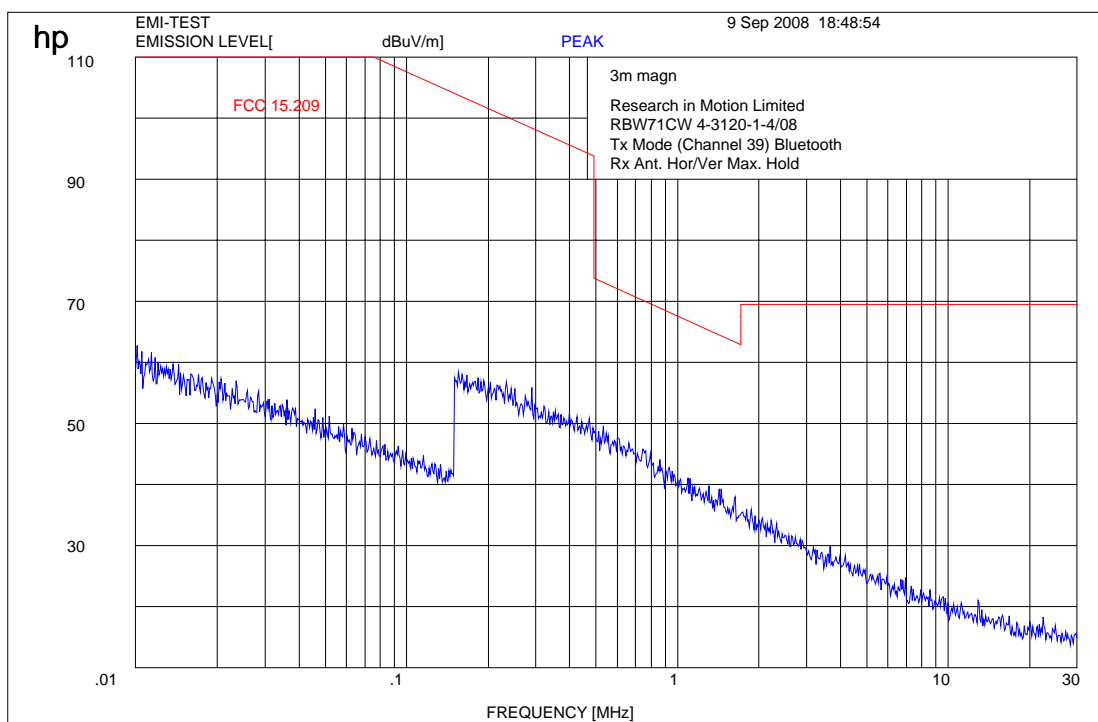
Plot 2:



Modulation: 8DPSK

Measured at 10 m distance.
 Values recalculated with 40 dB/decade according to FCC rules.

Plot 1:



Limits:

Frequency (MHz)	Field strength ($\mu\text{V/m}$)	Measurement distance (m)
0.009 – 0.490	2400/F(kHz)	300
0.490 – 1.705	24000/F(kHz)	30
1.705 – 30.0	30 / 29.5 dB $\mu\text{V/m}$	30

6 Test equipment and ancillaries used for tests

To simplify the identification on each page of the test equipment used, on each page of the test report, each item of test equipment and ancillaries such as cables are identified (numbered) by the Test Laboratory, below.

Anechoic chamber C:

No	Equipment/Type	Manuf.	Serial Nr.	Inv. No. Cetecom	Last Calibration	Frequency (months)	Next Calibration
1	Anechoic chamber	MWB	87400/02	300000996	Monthly verification		
2	System-Rack 85900	HP I.V.	*	300000222	n.a.		
3	Measurement System 1						
4	Spektrum Analyzer 8566B	HP	3138A07614	300001207	13.12.2007	24	13.12.2009
5	Spektrum Analyzer Display 85662A	HP	3144A28627	300001208	13.12.2007	24	13.12.2009
6	Quasi-Peak-Adapter 85650A	HP	2811A01204	300002308	13.12.2007	24	13.12.2009
7	RF-Preselector 85685A	HP	2837A00778	300002448	13.12.2007	24	13.12.2009
8	PC Vectra VL	HP		300001688	n.a.		
9	Software EMI	HP		300000983	n.a.		
10	Measurement System 2						
11	FSP 30	R&S	100886	300003575	25.08.2008	24	25.08.2010
12	PC	F+W			n.a.		
13	TILE	TILE			n.a.		
14	Biconical antenna	EMCO	S/N: 860 942/003		Monthly verification (System cal.)		
15	Log. Period. Antenna 3146	EMCO	2130	300001603	Monthly verification (System cal.)		
16	Double Ridged Antenna HP 3115P	EMCO	3088	300001032	Monthly verification (System cal.)		
17	Active Loop Antenna 6502	EMCO	2210	300001015	Monthly verification (System cal.)		
18	Power Supply 6032A	HP	2818A03450	300001040	12.05.2007	36	12.05.2010
19	Busisolator	Kontron		300001056	n.a.		
20	Leitungsteiler 11850C	HP		300000997	Monthly verification (System cal.)		
21	Power attenuator 8325	Byrd	1530	300001595	Monthly verification (System cal.)		
22	Band reject filter WRCG1855/1910	Wainwright	7	300003350	Monthly verification (System cal.)		
23	Band reject filter WRCG2400/2483	Wainwright	11	300003351	Monthly verification (System cal.)		

System Rack Room 005 :

No	Equipment/Type	Manuf.	Serial Nr.	Inv. No. Cetecom	Last Calibration	Frequency (months)	Next Calibration
1	FSP 30	R&S	100886	300003575	25.08.2008	24	25.08.2010
2	CBT	R&S	100313	300003516	03.09.2008	24	03.09.2010
3	Switch Matrix	HP		300000929	n.a.		
4	Power Supply	HP	3041A00544	300002270	13.05.2007	36	13.05.2010
5	Signal Generator	R&S	836206/0092	300002680	30.05.2007	36	30.05.2010

Signalling Units:

No	Equipment/Type	Manuf.	Serial Nr.	Inv. No. Cetecom	Last Calibration	Frequency (months)	Next Calibration
1	CBT	R&S	100313	300003516	03.09.2008	24	03.09.2010
2	CBT	R&S	100185	300003416	27.08.2008	24	27.08.2010
3	CMU-200	R&S	103992	300003231	04.06.2008	12	04.06.2009
4	CMU-200	R&S	106240	300003321	27.08.2008	24	27.08.2010
5	CMU-200	R&S	832221/0055	300002862	20.03.2008	24	20.03.2010

Climatic Box:

No	Equipment/Type	Manuf.	Serial Nr.	Inv. No. Cetecom	Last Calibration	Frequency (months)	Next Calibration
1	Climatic box VT 4002	Heraeus Vötsch	58566046820010	300003019	11.05.2007	24	11.05.2009
2	Climatic box CTS T-40/50	CTS	064023	300003540	03.01.2007	24	03.01.2009

SRD Laboratory Room 002:

No	Equipment/Type	Manuf.	Serial Nr.	Inv. No. Cetecom	Last Calibration	Frequency (months)	Next Calibration
1	System Controller PSM 12	R&S	835259/007	3000002681-00xx	n.a.		
2	Memory Extension PSM-K10	R&S	To 1	3000002681	n.a.		
3	Operating Software PSM-B2	R&S	To 1	3000002681	n.a.		
4	19" Monitor		22759020-ED	3000002681	n.a.		
5	Mouse		LZE 0095/6639	3000002681	n.a.		
6	Keyboard		G00013834L461	3000002681	n.a.		
7	Spectrum Analyser FSIQ 26	R&S	835540/018	3000002681-0005	10.01.2008	24	10.01.2010
8	Tracking Generator FSIQ-B10	R&S	835107/015	3000002681	s.No.7		
10	RF-Generator SMIQ03 (B1 Signal)	R&S	835541/056	3000002681-0002	26.08.2008	36	26.08.2011
11	Modulation Coder SMIQ-B20	R&S	To 10	3000002681	s.No.10		
12	Data Generator SMIQ-B11	R&S	To 10	3000002681	s.No.10		
13	RF Rear Connection SMIQ-B19	R&S	To 10	3000002681	s.No.10		
14	Fast CPU SM-B50	R&S	To 10	3000002681	s.No.10		
15	FM Modulator SM-B5	R&S	835676/033	3000002681	s.No.10		
16	RF-Generator SMIQ03 (B2 Signal)	R&S	835541/055	3000002681-0001	25.08.2008	36	25.08.2011
17	Modulation Coder SMIQ-B20	R&S	To 16	3000002681	s.No.16		
18	Data Generator SMIQ-B11	R&S	To 16	3000002681	s.No.16		
19	RF Rear Connection SMIQ-B19	R&S	To 16	3000002681	s.No.16		
20	Fast CPU SM-B50	R&S	To 16	3000002681	s.No.16		
21	FM Modulator SM-B5	R&S	836061/022	3000002681	s.No.16		
22	RF-Generator SMP03 (B3 Signal)	R&S	835133/011	3000002681-0003	26.08.2008	36	26.08.2011
23	Attenuator SMP-B15	R&S	835136/014	3000002681	S.No.22		
24	RF Rear Connection SMP-B19	R&S	834745/007	3000002681	S.No.22		
25	Power Meter NRVD	R&S	835430/044	3000002681-0004	26.08.2008	24	26.08.2010
26	Power Sensor NRVD-Z1	R&S	833894/012	3000002681-0013	26.08.2008	24	26.08.2010
27	Power Sensor NRVD-Z1	R&S	833894/011	3000002681-0010	26.08.2008	24	26.08.2010
28	Rubidium Standard RUB	R&S		3000002681-0009	27.08.2008	24	27.08.2010
29	Switching and Signal Conditioning Unit SSCU	R&S	338864/003	3000002681-0006	01.08.2006	24	01.08.2008

30	Laser Printer HP Deskjet 2100	HP	N/A	3000002681-0011	n.a.		
31	19" Rack	R&S	11138363000004	3000002681	n.a.		
32	RF-cable set	R&S	N/A	3000002681	n.a.		
33	IEEE-cables	R&S	N/A	3000002681	n.a.		
34	Sampling System FSIQ-B70	R&S	835355/009	3000002681	s.No.7		
35	RSP programmable attenuator	R&S	834500/010	3000002681-0007	26.08.2008	24	26.08.2010
36	Signalling Unit	R&S	838312/011	3000002681	n.a.		
37	NGPE programmable Power Supply for EUT	R&S	192.033.41	3000002681			
39	Power Splitter 6005-3	Inmet Corp.	none	300002841	23.12.2006	24	23.12.2008
40	SMA Cables SPS-1151-985-SPS	Insulated Wire	different	different	n.a.		
41	CBT32 with EDR Signaling Unit	R&S					
42	Coupling unit	Narda	N/A	--	n.a.		
43	2xSwitch Matrix PSU	R&S	872584/021	300001329	n.a.		
44	RF-cable set	R&S	N/A	different	n.a.		
45	IEEE-cables	R&S	N/A	--	n.a.		

Note: 3000002681-00xx inventoried as a system

SRD Laboratory Room 005:

No	Equipment/Type	Manuf.	Serial Nr.	Inv. No. Cetecom	Last Calibration	Frequency (months)	Next Calibration
1	Spektrum Analyzer 8566B	HP	2747A05275	300000219	08.11.2006	24	08.11.2008
2	Spektrum Analyzer Display 85662A	HP	2816A16497	300001690	08.11.2006	24	08.11.2008
3	Quasi-Peak-Adapter 85650A	HP	2811A01135	300000216	08.11.2006	24	08.11.2008
4	Power Supply	Heiden	003202	300001187	12.05.2007	36	12.05.2010
5	Power Supply	Heiden	1701	300001392	12.05.2007	36	12.05.2010

SRD Laboratory Room 011:

No	Equipment/Type	Manuf.	Serial Nr.	Inv. No. Cetecom	Last Calibration	Frequency (months)	Next Calibration
1	NRP Power Meter	R&S	100212	300003780	27.02.2008	24	27.02.2010

Anechoic chamber F:

No	Equipment/Type	Manuf.	Serial Nr.	Inv. No. Cetecom	Last Calibration	Frequency (months)	Next Calibration
1	Control Computer	F+W	FW0502032	300003303	-/-	-/-	-/-
2	Trilog Antenna	9163-295	-/-	-/-	30.04.2008	24	30.04.2010
3	Amplifier - 0518C-138	Veritech Micro-wave Inc.	-/-	-/-	-/-	-/-	-/-
4	Switch - 3488A	HP		300000368	-/-	-/-	-/-
5	EMI Test receiver - ESCI	R&S	100083	300003312	31.01.2009	24	31.01.2009
6	Turntable Controller - 1061 3M	EMCO	1218	300000661	-/-	-/-	-/-
7	Tower Controller 1051 Controller	EMCO	1262	300000625	-/-	-/-	-/-
8	Tower - 1051	EMCO	1262	300000625	-/-	-/-	-/-
10	Ultra Notch-Filter Rejected band Ch. 62	WRCD	9	-/-	-/-	-/-	-/-

C.BER Bluetooth Rack Room AC2:

No	Equipment/Type	Manuf.	Inv. No. Cetecom	Last Calibration	Frequency (months)	Next Calibration
1	System Controller with XP Prof. & C.BER Control Software	F&W	300003580	na		
2	GPIO to USB Converter	Agilent	300003426	na		
3	Spectrum Analyser FSIQ26	R&S	300002681-005	10.01.2008	24	10.01.2010
	Sampling System FSIQ-B70	R&S	300002681-005	s.No.3		
	Tracking Generator FSIQ-B10 for FSIQ26	R&S	300002681-005	s.No.3		
4	RF-Generator SMIQ03 (Interferer Signal)	R&S	300002681-001	25.08.2008	36	25.08.2011
	Modulation Coder SMIQ-B20	R&S	300002681-001	s.No.4		
	Data Generator SMIQ-B11	R&S	300002681-001	s.No.4		
	RF Rear Connection SMIQ-B19	R&S	300002681-001	s.No.4		
	Fast CPU SM-B50	R&S	300002681-001	s.No.4		
	FM Modulator SM-B5	R&S	300002681-001	s.No.4		
5	Rubidium Standard RUB	R&S	300002681-009	27.08.2008	24	27.08.2010
6	Switching Unit 3488A including 2 44476A cards	HP	300000926	Verified with path compensation		
	44472A VHF switch	HP	300000926	Verified with path compensation		
7	Signalling Unit: CBT with EDR	R&S	300003416	27.08.2008	24	27.08.2010
8	RF-cable set	different	no	Verified with path compensation		
9	IEEE-cables	R&S	no	na		
10	NGPE programmable Power Supply for EUT	R&S	400000078	27.08.2008	24	27.08.2010
11	Coupling Unit 4324-2	Narda	no	Verified with path compensation		
12	Climatic Chamber VT4002	Voetch	300003019	11.05.2007	24	11.05.2009
13	6 dB Attenuator 1W	Narda	no	Verified with path compensation		
14	DCBlocker 30 MHz to 12.75 GHz 1W	Narda	no	Verified with path compensation		

OTA chamber:

No	Equipment	Type	Manuf.	Serial Nr.	Inv. No. Cetecom	Last Calibration	Frequency (months)	Next Calibration
1	Splitter	15542	Mini Circuits	15542	400000086	Verified with path compensation		
2	Splitter	42000	Anaren	4730	400000085	Verified with path compensation		
3	Cable N-Con. 15m	Aircell 7	Aircell	--	400000087	Verified with path compensation		
4	CTIA-Chamber	AMS 8500	ETS-Lindgren	--	300003327-0000	Verified with chamber and ripple tests		
5	CTIA-Chamber - Positioning Equipment	--	EMCO	--	300003328-0000	na		
6	CTIA-Chamber – Software EMQuest	--	EMCO	--	300003328-0001	na		
7	CTIA-Chamber - Antennas	Double Ridged Horn, Dipoles/Loops	EMCO	--	300003328-0002	na		
8	Power supply 0-50V	6633A	HP Meßtechnik	2851A-01222	300001530	12.5.2007	24	12.05.2009
9	MP5 Five-Beam-Laser	MP5	CST/berger		400000088	na		
10	Mount kit for Laptop	--	EMCO		300003295	na		
15	Antenna for signalling	3102 L Conical log spir	EMCO	40953	300003296	na		
16	Cable SMA-Con. 15m	KK-MF141-15	Huber & Suhner		400000090	Verified with path compensation		
17	Cables	--	Huber & Suhner	different	400000083	Verified with path compensation		
18	Limiting Amplifier	LA 02-801	JCA Tech.	101	300003341	na		
19	Spectrum Analyzer	FSP 30	R&S	100623	300003575	25.08.2008	24	25.08.2010
20	Switch Unit	TS-RSP	R&S	100155	300003281	Verified with path compensation		
21	Step Attenuator 0 ...139.9 dB	RSP	R&S	860712002	400000079	Verified with path compensation		
22	Signalgenerator	SMIQ03B	R&S	836206/0091	300002679	01.06.2007	36	01.06.2010
23	Universal Communication Tester	CMU 200	R&S	106240	300003321	27.08.2008	24	27.08.2010
24	Hygro-Thermometer	-/-, 5-45°C, 20-100%rF	Thies Klima	-/-	400000089	27.04.2007	12	27.04.2008